



**WALWORTH<sup>®</sup>**  
*Since 1842*



VÁLVULA BONETE BRIDADO FUNDIDO  
**CATÁLOGO**



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## VÁLVULAS DE COMPUERTA, GLOBO Y RETENCIÓN BONETE BRIDADO FUNDIDO MARCA WALWORTH

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6D-0097



600-0109



YARMOUTH RESEARCH AND TECHNOLOGY



## WALWORTH

WALWORTH es una compañía fabricante de válvulas industriales considerada entre las más importantes de todo el mundo. Desde su fundación en el siglo XIX por James WALWORTH, ha enfocado sus esfuerzos en innovar y producir diferentes líneas de productos para el control de fluidos.

La experiencia acumulada en este largo y exitoso trayecto en combinación con un espíritu de constante innovación, permite brindar soluciones satisfactorias a una amplia gama de industrias y usuarios finales, cumpliendo y superando los estándares de calidad más estrictos. Entre estas industrias se encuentran la petroquímica, gasera, petrolera, generadoras de energía eléctrica y transformadoras de pulpa y papel; de igual forma compañías relacionadas con tecnologías geotérmica y criogénica, entre otras.

En su trayectoria, ha producido más de 40,000 diferentes productos, colocándose como una corporación globalizada atendiendo a diferentes mercados con la experiencia de más de 500 empleados.

WALWORTH cuenta con instalaciones para la fabricación de las líneas de válvulas en un flujo de operaciones completo: Almacenes de materia prima, diferentes tipos de maquinado, procesos de soldadura como SMAW, GMAW, SAW, PAW, ensamble, pruebas para baja y alta presión para servicio a alta temperatura o criogénicas, proceso de pintura, embalaje y embarque.

Toda esta infraestructura permite satisfacer el mercado de Norteamérica, Centroamérica, Sudamérica, Europa y África; adicionalmente, con nuestros distribuidores masters llegamos a países tan lejanos como Indonesia, Singapur o Australia, así como al medio y lejano oriente.



## VALORES WALWORTH

### MISIÓN

WALWORTH es un fabricante de válvulas y componentes de clase mundial para la Industria del control de fluidos ofreciendo un servicio excepcional, precios competitivos y una consistente puntualidad en los tiempos de entrega.



### VISIÓN

Para ser un líder mundial y referente en la manufactura de válvulas, WALWORTH:

- Define los estándares de calidad en la industria del control de fluidos.
- Excede las expectativas de los clientes sobre el servicio.
- Forja relaciones duraderas con clientes, miembros del equipo WALWORTH y la comunidad.
- Emplea, desarrolla y retiene a miembros del equipo que se caracterizan por su experiencia y dedicación.

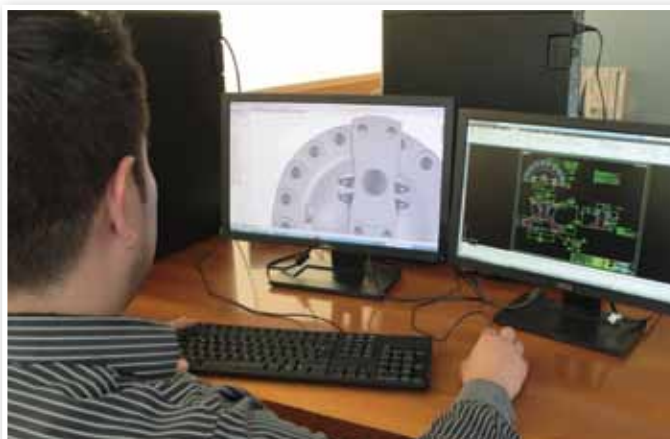




## CONTROL DE DISEÑO WALWORTH

Los productos WALWORTH son fabricados de acuerdo a un estricto seguimiento de las normas más importantes a nivel mundial como API, ANSI, ASME, ASTM, MSS, NACE, AWWA, BSI, CSA, entre otras. Nuestro equipo de ingeniería siempre está estudiando las nuevas actualizaciones de estas normas para incorporar cualquier cambio que afecte al diseño, regulaciones o desempeño de nuestros productos, siendo siempre líderes en los nuevos desarrollos obtenidos.

El departamento de ingeniería utiliza la más avanzada tecnología y equipo, como el uso de elementos finitos y programas de diseño para asegurar el adecuado ensamble y desempeño de los productos desde su concepción, cálculo y generación de dibujos de detalle para la fabricación, colocando a WALWORTH como el líder en el desarrollo de productos de acuerdo con las necesidades de estos días en el mercado de válvulas.



## SISTEMA DE CALIDAD WALWORTH

Con el paso del tiempo, WALWORTH desarrolló su Sistema de Administración de Calidad, el cual no se usa como un sistema separado de información, sino como el principal Sistema Administrativo enfocado a la Calidad. En este sentido, WALWORTH es una compañía certificada ISO-9001 y mantiene las certificaciones más importantes a nivel mundial.

Este sistema requiere de un riguroso control de calidad y selección de materia prima proveniente de proveedores aprobados, así como el control de los procesos de manufactura. Con el número de serie, WALWORTH es capaz de monitorear el producto en su proceso de fabricación y proporciona información de rastreabilidad de los materiales empleados en cada válvula. A continuación se muestran algunas de las principales certificaciones:



### Certificado API-6D No. 6D-0097

Emitido por el American Petroleum Institute que aplica a válvulas de Compuerta, Macho, Bola y Retención fabricadas de acuerdo a las especificaciones de API-6D.



### Certificado API-6A No. 6A-0234

Emitido por el American Petroleum Institute que aplica a válvulas PSI 1 a 4.



#### Certificado API-594

Emitido por el Instituto Americano del Petróleo para válvulas de retención tipo A y B fabricadas de acuerdo a la especificación API-594.



#### Certificado API-600

Emitido por el Instituto Americano del Petróleo para válvulas de compuerta en acero de bonete bridado fundido, fabricadas de acuerdo a la especificación API-600.



#### Certificado API-602

Emitido por el Instituto Americano del Petróleo para válvulas de compuerta en acero compacto de bonete bridado fundido, fabricadas de acuerdo a la especificación API-602.



#### Certificado ISO-9001 No. 038

Emitido por el American Petroleum Institute desde abril de 1999.



Certificado de acuerdo a PED 97/23/EC módulo H  
Para estampar productos CE.





**Constancia de calificación de proveedor No. 279/13**  
Emitido por el Laboratorio de Pruebas de Equipos y Materiales (LAPEM) de la Comisión Federal de Electricidad (CFE).



**Certificado NMX-CC-9001 (Norma Mexicana ISO-9001) No. 0552/2007** Emitido por PEMEX de acuerdo a la ISO-9001 de Aseguramiento de Calidad.

## CERTIFICACIONES DE PRODUCTOS WALWORTH



**Certificado de Emisiones Fugitivas de 500 ciclos para válvulas de compuerta de 3" clase 300#**  
Emitido por Yarmouth Research and Technology, que califican toda la gama de productos de Acero Fundido.



**Certificado de Emisiones Fugitivas de 500 ciclos para válvulas de compuerta de 8" clase 300#**  
Emitido por Yarmouth Research and Technology, que califican toda la gama de productos de Acero Fundido.



**Certificado de Emisiones Fugitivas de 500 ciclos para válvulas de compuerta de 16" clase 150#**  
Emitido por Yarmouth Research and Technology, que califican toda la gama de productos de Acero Fundido.



**YARMOUTH RESEARCH AND TECHNOLOGY**  
**PROJECT SUMMARY**

Project Number: 99009

Customer: The Walworth Company

Contact: David Cornelison

Date(s) of Test: 12/8/98 - 12/23/98

Product(s) Tested: One 6" Class 300 Gate Valve with Empire-Mex EAF-300-001 packing.

Purpose of Test: The test was conducted to evaluate the valve's stem sealing performance at ambient and at 250° F as related to the 1900 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 250 deg. F were conducted throughout 3500 open/close cycles with the valve pressurized to 640 psig. The valve was cycled with a 12 EPM gear motor coupled to the handwheel. One packing nut adjustment was required at cycle number 300 to maintain leakage levels below 100 PPMs.

At cycle number 3500, the packing leakage was 25-29 PPMs with the stem static. The packing nuts were tightened from 12 1/4 lb-ft back to 28 lb-ft and leakage decreased to about 1 PPMs.

See the attached data sheets for more information.

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

Phone at Fax (217) 246-7000  
41 East Elm Street, P.O. Box 150, Yarmouth, Maine 04090-0150

**TÜV Rheinland Argentina S.A.**  
Servicios Industriales  
Centro de Certificación  
San José 22 - 1° Piso  
(2137) 554411 Buenos Aires

**TÜVRheinland®**

**Certificado**

Certificado No. 700-13-0019

Cliente: Industrias TRASA S.A. - Industria de Valvulas S.A. de C.V.  
Av. de la Industria 16 Fracc. Industrial El Trébol, Tepic, Jalisco, Estado de México

Producto Evaluado: Válvulas industriales con montaje Trunnion API 6D, esfera guiada a cuerpo abulonado de acero al carbono (A105 - WCB), función Doble Bloqueo y Purga.

Marca Comercial: Trunnion

Modelo / Tipo: 6D

Norma Aplicada: ISO 5211-1:2000 Parte 1 y 2, ISO 5211-2:2000 Parte 2

Interventor TUV No. 700-13-0019

Resolución: Integración Normativa API 6D, 3 Integración Normativa Operativa API 6D

Función de Seguridad: Las válvulas certificadas con este certificado, cumplen con los requisitos de seguridad de la Norma ISO 5211-1:2000 Parte 1 y 2, ISO 5211-2:2000 Parte 2.

Reservados los derechos: Todos los derechos reservados. No se permite la reproducción o el uso no autorizado de este certificado sin el consentimiento escrito de TÜV Rheinland Argentina S.A.

Fecha de Emisión: 22 de Enero de 2000

Arg. Mauricio Schuster

Page 01 of 02

**Certificado de Emisiones Fugitivas Bajas No. 20985-3, 8 y 16 de acuerdo a la ISO-15848-1 "Válvulas Industriales"**  
Medición, Prueba y Calificación en los procedimientos para emisiones fugitivas. "Parte 1: Clasificación y Calificación de procedimientos para prueba de válvulas".

**Certificado TÜV Rheinland TRASA 700-13-0019**  
Válvulas esféricas con montaje Trunnion API-6D esfera guiada y cuerpo abulonado de acero al carbono (A105 - WCB) función Doble Bloqueo y Purga.

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

January 22, 2005

Ruben Paredes  
Walworth - Inval Facility  
Av. De la Industria Lote 16 Fracc. Industrial El Trébol  
Tepic, Jalisco, Edo. De Mexico  
CP 54600, Mexico

Reference: Witness Report - API Spec 6FA Fire Test Number 01-1/05

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 Self-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. CORNELISON, P.E.  
President

24803 Motom Drive • Katy, Texas 77604  
Telephone (281) 395-9270 • Telefax (281) 395-9213

**TÜV**  
**CEIAT**

**TÜVRheinland®**  
Precisely Right.

**CERTIFICATE**  
Certificate No.: 01 202 USA-TA-05-79798

Concerning the Agreement with the Technical Requirements in:  
**TA-Luft 2002, VDI 2440 Nov. 2000, Sec. 3.3.1.3**

Test report: 200140 Date: 02 December, 2000

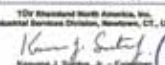
Client: Industrial de Válvulas, S.A. de C.V.

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

The stem sealing system and internal baffle connection have been successfully tested to meet the tightness criteria of a 10<sup>-6</sup> (mbar x l/s) with a helium mass spectrometer under the following conditions. The BFW valve with the standard mechanical shaft seals fulfills the requirements of Section 3.3.1.3 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 6D Gate Valve              |                       |
| Valve Type:                     | 4 inch, Class 300, Figure 8200F         |                       |
| Sealing System:                 | WCB Body / CR 11 Stem & Disc / HF Seal  |                       |
| Nominal Size, Nominal Pressure: | 4 inch, ANSI 300                        |                       |
| Inspection Media/Pressure:      | Helium / 50 Bars                        | Temperature = Ambient |
| Switching Cycles (cycles):      | 0 Cycles                                | Total Cycles 300      |
| Leakage Rate (mbar x l/s):      | 0.2x-7 (mbar x l/s)                     | 0.2x-6 (mbar x l/s)   |
| Testing Method:                 | Helium Leak Test - VDI 2440, Appendix A |                       |

Testing Laboratory: TÜV Rheinland North America, Inc., Industrial Services Division, Newtown, CT, USA

Signature:   
Name: J. Cornelison, Jr. - Engineer

24803 Motom Drive • Katy, Texas 77604  
Telephone (281) 395-9270 • Telefax (281) 395-9213

**Certificado de pruebas de fuego No. 01-1/05**  
De acuerdo a API-6FA y API para válvulas de Bola de acuerdo a API-6D.

**Certificado de aprobación Ta Luft (emisiones fugitivas)**  
ISO-5211 en la brida superior, y dispositivo antiestático.

## EQUIPO DE CONTROL DE CALIDAD

Para asegurar que los productos WALWORTH cumplen con las Normas Internacionales, contamos con equipo profesional de monitoreo de calidad, algunos de los cuales se describen a continuación:



**Equipo para Examinación Radiográfica.-** WALWORTH cuenta en sus instalaciones con su propia fuente de Iridio Ir-92, para pruebas de radiografía a las fundiciones desde 0.100" hasta 2 1/2" de espesor de pared, verificando la sanidad de las materias primas.

**Identificación Positiva de Materiales (PMI).-** Se cuenta con equipos de nueva generación para la identificación positiva de materiales. Estos sirven para obtener análisis químicos cualitativos desde la etapa de inspección recibo y/o sobre componentes que serán ensamblados para comprobar que se están utilizando los materiales correctos para el servicio específico de las válvulas de acuerdo a los requerimientos del cliente.



**Prueba de Partículas Magnéticas.-** WALWORTH cuenta con el equipo para pruebas por partículas magnéticas aplicada a materiales ferrosos susceptibles a magnetismo. Esta prueba se realiza por muestreo o cuando el cliente solicita la Certificación de Partículas Magnéticas.

**Prueba de Líquidos Penetrantes.-** WALWORTH cuenta con el personal y materiales para realizar esta prueba, mediante las técnicas de líquidos penetrantes removibles con agua o con solventes. El personal está certificado de acuerdo con la American Society for Non Destructive Testing (ASNT).



**Circuito de Pruebas.-** Se cuenta con un laboratorio completo para la validación de diseño, simulando las condiciones de operación más severas. La duración de una prueba es de 4 a 6 meses, tiempo en el cual se realizan de 3,000 a 5,000 ciclos (apertura y cierre).

**Prueba de Transientes de Presión.-** Esta prueba expone a las válvulas macho a presiones transientes positivas y negativas para verificar que el tapón de la válvula, en un diseño balanceado, no quede atorado en el cuerpo.







**Laboratorio de Metrología.**- WALWORTH desarrolló un sistema de verificación y calibración de todo el equipo utilizado en nuestras instalaciones para asegurar la rastreabilidad de las mediciones contra patrones internacionalmente reconocidos. De esta manera, se mantiene un control en las mediciones realizadas durante la fabricación, asegurando que se cumple con las normas internacionales más importantes.

**Prueba de Fuego.**- Se cuenta con instalaciones apropiadas para ejecutar la prueba de fuego de acuerdo a los requerimientos de API. Esta prueba expone la válvula a fuego de 1,400 a 1,800°F (761 a 980°C) para verificar la hermeticidad y sello adecuado de la válvula después de cierto tiempo de exposición.



**Equipo de Pruebas de Bajas Emisiones Fugitivas.**- Se aplica cuando un cliente requiere un certificado de Bajas Emisiones Fugitivas. El laboratorio tiene su propio equipo LFE capaz de medir menos de 20 ppm en condiciones estáticas o dinámicas a temperatura ambiente o bajo condiciones de operación de ciclos térmicos.

**Equipo de medición de espesor de pared.**- Usando las técnicas de ultrasonido, se puede medir el espesor de pared de los diferentes materiales metálicos incluyendo ferrosos y acero inoxidable.



**Equipo de Prueba de Tensión.**- Para asegurar las propiedades mecánicas de los materiales empleados en la fabricación. WALWORTH realiza pruebas por muestreo de probetas de las materias primas provenientes de nuestros proveedores, aún cuando se reciban certificaciones de calidad de las mismas.

**Equipo de Dureza.**- Tanto para pruebas en laboratorio como pruebas en planta, WALWORTH cuenta con equipos de prueba Rockwell B, C, Brinell y Vickers para verificar el cumplimiento de los requerimientos de dureza que exigen las normas.



# VÁLVULAS DE COMPUERTA, GLOBO Y RETENCIÓN

## BONETE BRIDADO FUNDIDO

### ACERO AL CARBÓN; ACERO ALEADO, ACERO INOXIDABLE Y ALEACIONES ESPECIALES

Esta es la línea principal de productos WALWORTH, fabricada bajo los estándares ANSI/ASME para las clases 150, 300, 600, 900, 1500 y 2500 #, en tamaños desde 2" hasta 72" de diámetro, proporcionando al usuario final una amplia variedad de válvulas para satisfacer sus necesidades. WALWORTH siempre mantiene en existencia estas válvulas en los arreglos de interiores (trims) más comunes utilizados en la industria. Esta línea de productos se fabrica según los requisitos de diseño API-600 para válvulas de Compuerta; API 623 para las válvulas de Globo; y API-6D para las válvulas de Retención.

Una de las características más importantes de las Válvulas de Bonete Bridado Walworth, es garantizar un máximo de 50 ppm de bajas emisiones fugitivas a la atmósfera tanto en la caja de empaques como en la unión CUERPO/BONETE ó CUERPO/TAPA sin requerimiento especial del cliente.

Las válvulas WALWORTH han sido probadas y aprobadas de acuerdo con los requerimientos de API RP-591. WALWORTH ofrece la mayoría de los materiales conocidos y utilizados para esta línea de productos, incluyendo pero no limitado a:

- a. Aceros al carbón como el WCA, WCB, WCC, etc
- b. Aceros con bajo contenido de carbón como LCB, LCC, etc
- c. Aceros baja aleación como WC1, WC5, WC6, WC9, etc
- d. Aceros bajo carbono y baja aleación como LC2, LC3, etc
- e. Aceros media aleación como el C5, C12, C12A, etc
- f. Aceros inoxidable como CF8, CF8M, CF8C, CG8M, etc
- g. Aceros inoxidable bajo carbono como CF3, CF3M, CG3M, etc
- h. Super Aceros inoxidable como CN7M (alloy 20), CN3M (Alloy 20 modificado), CT15C, etc
- i. Aceros inoxidable DUPLEX como CE8MN, CD6MN, CD3MN, etc
- j. Aleaciones de alto Níquel como Monel M30C, Monel M35-1, Monel CZ100, Inconel CY40 (Inconel 600), CW2M ( Hastelloy C4), N12MV (Hastelloy B), CW12MW (antiguo Hastelloy C-276), CW6M (Nuevo Hastelloy C-276), CU5MCuC ( Incoloy 825 ), N7M (Hastelloy B2), CW6MC (Incoloy 625), etc
- k. Aceros inoxidable Super Duplex como CE3MN, CD3MNCuN
- l. Bronce al Aluminio como 95500, 95600, 95800, etc

| TIPO      | TAMAÑO   | PRESIÓN CLASE SEGÚN ASME B16.34 | EXTREMOS         |
|-----------|----------|---------------------------------|------------------|
| Compuerta | 2" a 72" | 150, 300, 600, 900, 1500, 2500# | FF, RF, RTJ o BW |
| Globo     | 2" a 24" | 150, 300, 600, 900, 1500, 2500# | FF, RF, RTJ o BW |
| Retención | 2" a 48" | 150, 300, 600, 900, 1500, 2500# | FF, RF, RTJ o BW |

NOTA: Para válvulas clase 2500# solicitar información a su distribuidor o representante más cercano.



# MATERIALES BASE DE LAS VÁLVULAS

## BONETE BRIDADO FUNDIDO

WALWORTH ofrece esta línea de producto de válvulas de diseño de bonete bridado fundido en una amplia variedad de aceros al carbón, aceros baja y aceros de media aleación y se suministran en cualquier combinación de interiores (trims) listados en API-600. Sin embargo, debido a las necesidades actuales que demanda el mercado mundial, WALWORTH ofrece ahora materiales adicionales tales como aceros inoxidables, aleaciones de níquel o aleaciones especiales, utilizando diseños de grueso espesor de pared requeridos para satisfacer las necesidades de aquellos usuarios finales que no aceptan el diseño de espesor delgado según API -603\*.

WALWORTH ofrece además, una nueva línea de productos para válvulas con espesores de pared de acuerdo a API-600 en materiales de bronce al aluminio, tales como ASTM B148 grados 95500, 95600 ó 95800.

\* Para aquellos Usuarios finales que si aceptan válvulas con espesores de pared delgados de acuerdo a API-603, por favor pregunte por nuestro catálogo WALWORTH API-603.

| NORMA DEL MATERIAL  | DESIGNACIÓN COMÚN                             | ESPECIFICACIÓN DE FORJA | ESPECIFICACIÓN DE BARRA | SERVICIOS RECOMENDADOS (1)                                                                                                                                 | TRIM COMÚN PARA ESTE MATERIAL BASE |              |
|---------------------|-----------------------------------------------|-------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------|
|                     |                                               |                         |                         |                                                                                                                                                            | 150 A 600 #                        | 900 A 2500 # |
| ASTM A216 Grado WCB | Acero al Carbón                               | A105                    | A105                    | Servicios no corrosivos incluyendo agua, petróleo o gas a temperaturas entre -20°F (-30°C) y +800°F (+425°C)                                               | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A216 Grado WCC | Acero al Carbón                               | A105N                   | A105N                   | Servicios no corrosivos incluyendo agua, petróleo o gas a temperaturas entre -20°F (-30°C) y +800°F (+425°C)                                               | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A352 Grado LCB | Acero al Carbón para baja temperatura         | A350 LF1                | A350 LF1                | Servicio a baja temperatura bajo -50 °F (-46°C). No para uso arriba de + 650°F(+340°C).                                                                    | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A352 Grado LCC | Acero al Carbón para baja temperatura         | A350 LF2                | A350 LF2                | Servicio a baja temperatura bajo -50 °F (-46°C). No para uso arriba de + 650°F(+340°C).                                                                    | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A352 Grado LC3 | Acero con 3 1/2 % Ni                          | A350 LF3                | A350 LF3                | Servicio a baja temperatura bajo - 150°F (-101°C). No para uso arriba de + 650°F(+340°C).                                                                  | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A217 Grado WC1 | Acero de baja aleación C-1/2 Mo               | A182 F1                 | A182 F1                 | Servicios no corrosivos incluyendo agua, petróleo o gas a temperaturas entre -20°F (-30°C) y + 1100°F (+593°C).                                            | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A217 Grado WC5 | Acero de baja aleación 0.75% Ni; Mo; 0.75% Cr | A182 F2                 | A182 F2                 | Servicios no corrosivos incluyendo agua, petróleo o gas a temperaturas entre -20°F (-30°C) y + 1100°F (+593°C).                                            | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A217 Grado WC6 | Acero de baja aleación de 1 1/4% Cr; 1/2% Mo  | A182 F11                | A182 F11 Clase 2        | Servicios no corrosivos incluyendo agua, petróleo o gas a temperaturas entre -20°F (-30°C) y + 1100°F (+593°C).                                            | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A217 Grado WC9 | Acero de baja aleación de 2 1/4 % Cr          | A182 F22                | A182 F11 Clase 3        | Servicios no corrosivos incluyendo agua, petróleo o gas a temperaturas entre -20°F (-30°C) y + 1100°F (+593°C).                                            | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A217 Grado C5  | Acero media aleación 5% Cr; 1/2 % Mo          | A182 F5                 | A182 F5                 | Servicios ligeramente corrosivos o aplicaciones erosivas así como servicios no corrosivos a temperaturas entre - 20°F (-30°C) y + 1200°F (+649°C).         | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A217 Grado C12 | Acero media aleación 9% Cr; 1% Mo             | A182 F9                 | A182 F9                 | Servicio de media agresividad en corrosión o aplicaciones erosivas así como servicios no corrosivos a temperaturas entre 20°F (-30°C) y + 1200°F (+649°C). | UT, 3HF, A                         | HF, 3HF+HF   |



# MATERIALES BASE DE LAS VÁLVULAS

## BONETE BRIDADO FUNDIDO

| NORMA DEL MATERIAL      | DESIGNACIÓN COMÚN                                              | ESPECIFICACIÓN DE FORJA | ESPECIFICACIÓN DE BARRA | SERVICIOS RECOMENDADOS (1)                                                                                                                                                                                                                                                                                                                                                                                                     | TRIM COMÚN PARA ESTE MATERIAL BASE |              |
|-------------------------|----------------------------------------------------------------|-------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------|
|                         |                                                                |                         |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                | 150 A 600 #                        | 900 A 2500 # |
| ASTM A217 Grado C12-A   | Acero media aleación nitrogenado 9% Cr; 1% Mo; V-N             | A182 F91                | A182 F91                | Servicios ligeramente corrosivos o aplicaciones erosivas así como servicios no corrosivos a temperaturas entre -20°F (-30°C) y +1200°F (+649°C).                                                                                                                                                                                                                                                                               | UT, 3HF, A                         | HF, 3HF+HF   |
| ASTM A351 Grado CF8     | Acero Inoxidable 18% Cr; 8% Ni; 0.08 % C                       | ASTM A182 F304          | ASTM A479 304           | Servicios corrosivos o servicios no corrosivos pero a alta temperatura entre -450°F (-268°C) y +1200°F (+649°C). Arriba de +800°F (+425°C) especificar contenido de carbón mínimo 0.04%.                                                                                                                                                                                                                                       | 2, 4HF                             | 4HF+HF       |
| ASTM A351 Grado CF8M    | Acero Inoxidable 18% Cr; 12% Ni; 2 % Mo; 0.08 % C              | ASTM A182 F316          | ASTM A479 316           | Servicios corrosivos o servicios no corrosivos a alta o baja temperatura entre -450°F (-268°C) y +1200°F (+649°C). Arriba de +800°F (+425°C) especificar contenido de carbón mínimo 0.04 %.                                                                                                                                                                                                                                    | 18-8smo, 3HF                       | 3HF+HF       |
| ASTM A351 Grado CF3     | Acero Inoxidable bajo carbono 18% Cr; 8% Ni; 0.03 % C          | ASTM A182 304L          | ASTM A479 304L          | Agua salobre, soluciones fosfatadas, agua presurizada @ 570 °F (299 °C), agua de mar, vapor.                                                                                                                                                                                                                                                                                                                                   | 304L, 3HF                          | 304L, 3HF+HF |
| ASTM A351 Grado CF3M    | Acero Inoxidable bajo carbono 18% Cr; 12% Ni; 2 % Mo; 0.03 % C | ASTM A182 F316L         | ASTM A479 316L          | Ácido acético, carbonato de calcio, lactato de calcio, agua potable, agua de mar, vapor, sulfitos.                                                                                                                                                                                                                                                                                                                             | 316L, 3HF                          | 316L, 3HF+HF |
| ASTM A351 Grado CG3M    | Acero Inoxidable bajo carbono 18% Cr; 12% Ni; 3 % Mo; 0.03 % C | ASTM A182 F317L         | ASTM A182 F317L         | Servicio corrosivo o servicio no corrosivo a +800°F (+425°C)*                                                                                                                                                                                                                                                                                                                                                                  | 317L, 317LH                        | 317L, 317LH  |
| ASTM A351 Grado CF8C    | Acero inoxidable 18% Cr; 10% Ni; Cb; 0.08 % C                  | ASTM A182 F347          | ASTM A479 347           | Primariamente para servicio a alta temperatura en aplicaciones no corrosivas entre -450°F (-268°C) y +1200°F (+649°C). Arriba de +1000°F (+540°C) especificar contenido de carbón mínimo 0.04 %. Servicio de hidrógeno.                                                                                                                                                                                                        | 347H, 347HF                        | 347H, 347HF  |
| ASTM A351 Grado CF10    | Acero inoxidable 18% Cr; 8% Ni; 0.08 % C                       | ASTM A182 F304H         | ASTM A479 304H          | Servicio corrosivo o servicio no corrosivo a extremadamente alta temperatura entre -450°F (-268°C) y +1200°F (+649°C). Arriba de +800°F (+425°C) especificar contenido de carbón mínimo 0.04%.                                                                                                                                                                                                                                 | 310, 310HF                         | 310HF        |
| ASTM A351 Grado CF10M   | Acero inoxidable 18% Cr; 8% Ni; 2% Mo; 0.08 % C                | ASTM A182 F316H         | ASTM A479 316H          | Servicio corrosivo o servicio no corrosivo a extremadamente alta temperatura entre -450°F (-268°C) y +1200°F (+649°C). Arriba de +800°F (+425°C) especificar contenido de carbón mínimo 0.04%.                                                                                                                                                                                                                                 | 310, 310HF                         | 310HF        |
| ASTM A351 Grado CG8M    | Acero inoxidable 18% Cr; 10% Ni; 3 % Mo; 0.08 % C              | ASTM A182 F317          | ASTM A182 F317          | Agua pesada, Aguas nucleares, petróleo, líneas de conducción, plantas de energía, pulpa o papel, textiles para impresión, soluciones de tintas corrosivas, tintas, líquidos con sulfitos.                                                                                                                                                                                                                                      | 317H, 21HF                         | 317H, 21HF   |
| ASTM A351 Grado CK20    | Super acero inoxidable 25% Cr; 20% Ni; 0.04 a 0.2 % C          | ASTM A182 F310H         | ASTM A182 F310H         | Procesos químicos, Petróleo Refinado, pulpa o papel. Productos corrosivos a temperaturas alrededor de 1200 °F (649 °C), líquidos con sulfitos, ácido sulfúrico diluido.                                                                                                                                                                                                                                                        | 310, 310HF                         | 310HF        |
| ASTM A351 Grado CN7M    | Super acero inoxidable 19% Cr; 28% Ni; Cu-Mo; 0.07 % C         | ASTM B462 N08020        | ASTM B473 N08020        | Ácido acético caliente, salmuera, soluciones cáusticas (concentradas, calientes), ácido hidroclorehídrico diluido, ácido hidroflorehídrico diluido, y ácido hidroflorehídrico diluido, ácido nítrico (concentrado, caliente), ácido nítrico-hidroflorehídrico, sulfatos y sulfitos, ácido sulfúrico en todas sus concentraciones a 150 °F (65.6 °C), ácido sulfuroso, ácido fosfórico.                                         | A20, A20H                          | A20, A20H    |
| ASTM A351 Grado CN3MN   | Super acero inoxidable 19% Cr; 28% Ni; Cu-Mo; 0.03 % C         | ASTM B462 N08020        | ASTM B473 N08020        | Ácido acético caliente, salmuera, soluciones cáusticas (concentradas, calientes), ácido hidroclorehídrico diluido, ácido hidroflorehídrico y ácido hidroflorehídrico diluido, ácido nítrico (concentrado, caliente), ácido nítrico hidroflorehídrico, sulfatos y sulfitos, ácido sulfúrico en todas sus concentraciones a 150 °F (65.6 °C), ácido sulfuroso, ácido fosfórico. Mejores propiedades de soldabilidad que el CN7M. | A20, A20H                          | A20, A20H    |
| ASTM A351 Grado CK3MCuN | Super acero inoxidable 20% Cr; 18% Ni; 6% Mo; 0.25 % C         | ASTM A182 F44           | ASTM A479 S31254        | Ácido acético, antibióticos y drogas, componentes blanqueadores, ácido fórmico, fruta y jugo, aire caliente, agua caliente, hidrocarburos, ácido hidroclorehídrico, líquidos y ácidos orgánicos, ácido nítrico, sales orgánicas, ácido oxálico, ácido fosfórico, agua de mar, aguas residuales, bisulfato de sodio, vapor, + ácido sulfámico, ácido sulfúrico al 10 %.                                                         | 254HF                              | 254HF        |
| ASTM A351 Grado CT15C   | Incoloy 800. 19% Cr; 32% Ni; 0.05 a 0.15 % C.                  | ASTM B564 N08810        | ASTM B408 N08810        |                                                                                                                                                                                                                                                                                                                                                                                                                                | 810T                               | 810T         |

# MATERIALES BASE DE LAS VÁLVULAS

## BONETE BRIDADO FUNDIDO

| NORMA DEL MATERIAL      | DESIGNACIÓN COMÚN                                                 | ESPECIFICACIÓN DE FORJA | ESPECIFICACIÓN DE BARRA | SERVICIOS RECOMENDADOS (1)                                                                                                                                                                                                                                                                                                                                                   | TRIM COMÚN PARA ESTE MATERIAL BASE |              |
|-------------------------|-------------------------------------------------------------------|-------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------|
|                         |                                                                   |                         |                         |                                                                                                                                                                                                                                                                                                                                                                              | 150 A 600 #                        | 900 A 2500 # |
| ASTM A351 Grado CD4MCu  | Super acero inoxidable 20% Cr; 18% Ni; 6.5% Mo; 0.025% C          | N/A                     | ASTM A479 S32550        | Salmuera concentrada, ácidos grasos, agua potable, pulpas de agua, pulpas de licor a 220 °F (104 °C), agua de mar, ácido sulfúrico en concentraciones de 15-30% @ 140-160 °F (60-71 °C), ácido sulfúrico en concentraciones de 35-40 % @ 185 °F (85 °C), más 5 % orgánicos.                                                                                                  | 31254H                             | 31254H       |
| ASTM A351 Grado CN2MCuN | Super acero inoxidable 21% Cr; 25.5% Ni; 4.5% Mo; 1.5%Cu; 0.02% C | ASTM B469 8904          | ASTM B625 8904          | Ambientes que contienen cloro donde los aceros inoxidables de la serie 300 no proveen de una adecuada resistencia a la corrosión por picaduras y por fragilización.                                                                                                                                                                                                          | 8904H                              | 8904H        |
| ASTM A487 Grado CA15    | Acero inoxidable con 12% Cr                                       | ASTM A182 F6            | ASTM A276 410           | Servicios corrosivos en aplicaciones a temperaturas entre -20°F (-30°C) y + 900°F (+482°C).                                                                                                                                                                                                                                                                                  | UT, HF                             | UT, HF       |
| ASTM A487 Grado CA6NM   | Acero inoxidable con 12 % Cr                                      | ASTM A182 F6            | ASTM A276 410           | Servicios corrosivos en aplicaciones a temperaturas hasta +1300°F (704°C). Agua para alimentación de calderas a 250 °F (115°C), agua de mar, vapor sulfuroso                                                                                                                                                                                                                 | UT, HF                             | UT, HF       |
| ASTM A494 Grado M-35-1  | Monel 67% Ni; 30% Cu                                              | ASTM B564 N04400        | ASTM B164 N04400        | Grado soldable, Buena resistencia a la corrosión de la mayoría de los ácidos orgánicos y agua de mar. También altamente resistente a la mayoría de las soluciones alcalinas a +7W°F (+400°C)                                                                                                                                                                                 | A, AHF                             | A, AHF       |
| ASTM A494 Grado CZ100   | Níquel al 95%                                                     | ASTM B160 N02200        | ASTM B160 N02200        | Procesos químicos, procesos minerales, procesos alimenticios. El níquel es útil para el manejo de concentrados alcalinos o soluciones cáusticas, ácidos reductores, ciertos productos alimenticios, ácidos orgánicos bajo ciertas condiciones, cloruros secos y anhídridos de amoníaco. La fundición de níquel no es aplicable para ácidos oxidantes y percloratos alcalinos | 2200                               | 2200         |
| ASTM A494 Grado CY-40   | Inconel 600. 75% Ni; 15% Cr; 8% Fe                                | ASTM B564 N06600        | ASTM B166 N06600        | Excelente para servicios a alta temperatura. Buena resistencia a medios altamente corrosivos y atmósferas a + 800°F (+425°C). Agua caliente para calderas, aguas cáusticas calientes, aguas alcalinas concentradas calientes, condiciones oxidantes a elevada temperatura                                                                                                    | 600, 600HF                         | 600, 600HF   |
| ASTM A494 Grado CW6MC   | Inconel 625. 60% Ni; 22% Cr; 9% Mo; 3.5% Cb                       | ASTM B564 N06625        | ASTM B446 N06625        | Excelente para servicios a alta temperatura. Buena resistencia a medios altamente corrosivos y atmósferas a + 800°F (+425°C).                                                                                                                                                                                                                                                | 625, 625HF                         | 625, 625HF   |
| ASTM A494 Grado CU5MCuC | Incoloy 825. 42% Ni; 21.5% Cr; 3% Mo; 2.3% Cu                     | ASTM B564 N08825        | ASTM B425 N08825        | Servicio de gas amargo. Excelente resistencia a ácidos reductores y oxidantes, agrietamiento por estrés por corrosión, ataques localizados tales como picaduras y fragilización, y ácido sulfúrico y fosfórico.                                                                                                                                                              | 825, 23HF                          | 825, 23HF    |
| ASTM A494 Grado N12MV   | Hastelloy B. 62% Nickel; 28% Mo; 5% Fe, Hastelloy B               | ASTM B335 N10001        | ASTM B335 N10001        | Excelente resistencia a la corrosión. Apropiado para la mayoría de las aplicaciones de procesos químicos. Excelente resistencia a corrosión por picaduras y fragilización por corrosión y esfuerzo (SCC).                                                                                                                                                                    | HB                                 | HB           |
| ASTM A494 Grade N7M     | Hastelloy B2. 62% Ni; 28% Mo; 2% Fe                               | ASTM B335 N10665        | ASTM B335 N10665        | Excelente resistencia a la corrosión y resistencia mejorada a líneas calientes y zonas de ataque afectadas por calor. Resiste la formación de precipitados de carburo en el límite de grano en zonas afectadas por el calor por soldadura.                                                                                                                                   | HB                                 | HB           |
| ASTM A494 Grado CW2M    | Hastelloy C4. 61% Ni; 16% Mo; 16% Cr                              | ASTM B574 N06455        | ASTM B574 N06455        | Buena resistencia a fuertes condiciones oxidantes. Buenas propiedades a alta temperatura, alta resistencia a los ácidos fórmico, fosfórico, sulfuroso y sulfúrico a + 1200°F (+649°C)                                                                                                                                                                                        | HC, HCH                            | HC, HCH      |
| ASTM A494 Grado CW12MW  | Antiguo Hastelloy C-276. 56% Ni; 18% Mo; 17% Cr; 6% Fe            | ASTM B574 N10276        | ASTM B574 N10276        | Buena resistencia a fuertes condiciones oxidantes. Buenas propiedades a alta temperatura, alta resistencia a los ácidos fórmico, fosfórico, sulfuroso y sulfúrico a + 1200°F (+649°C)                                                                                                                                                                                        | HC, HCH                            | HC, HCH      |
| ASTM A494 Grado CW6M    | Nuevo Hastelloy C-276. 56% Ni; 19% Mo; 18% Cr; 16% Fe             | ASTM B574 N10276        | ASTM B574 N10276        | Buena resistencia a fuertes condiciones oxidantes, Buenas propiedades a alta temperatura, alta resistencia a los ácidos fórmico, fosfórico, sulfuroso y sulfúrico a + 1200°F (+649°C)                                                                                                                                                                                        | HC, HCH                            | HC, HCH      |

# MATERIALES BASE DE LAS VÁLVULAS

## BONETE BRIDADO FUNDIDO

| NORMA DEL MATERIAL       | DESIGNACIÓN COMÚN                                                         | ESPECIFICACIÓN DE FORJA | ESPECIFICACIÓN DE BARRA | SERVICIOS RECOMENDADOS (1)                                                                                                                                                                                                                                                                                               | TRIM COMÚN PARA ESTE MATERIAL BASE |                     |
|--------------------------|---------------------------------------------------------------------------|-------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|
|                          |                                                                           |                         |                         |                                                                                                                                                                                                                                                                                                                          | 150 A 600 #                        | 900 A 2500 #        |
| ASTM A995 Grado CD4MCuN  | Acero Inoxidable Duplex Grado 1A, 25.5% Cr; 5.5% Ni; 2% Mo; 0.040% C.     | N/A                     | ASTM A479 S32550        | Salmuera concentrada, ácidos grasos, agua potable, pulpas de agua, pulpa de líquidos a 220 °F (104 °C), agua de mar, ácido sulfúrico (15-30% @ 140-160 °F (60-71 °C), ácido sulfúrico (35-40 % @185 °F (85 °C), más 5 % orgánicos).                                                                                      | 32250H                             | 32250H              |
| ASTM A995 Grado CE8MN    | Acero Inoxidable Duplex Grado 2A, 24% Cr; 9.5% Ni; 4% Mo; 0.080% C.       | ASTM A182 F51           | ASTM A479 32750         | Salmuera concentrada, ácidos grasos, agua potable, pulpas de agua, pulpas de líquidos a 220 °F (104 °C), agua de mar, ácido sulfúrico (15-30% @ 140-160 °F (60-71 °C), ácido sulfúrico (35-40 % @185 °F (85 °C), más 5 % orgánicos).                                                                                     | 32750H, 31803H, 51H                | 32750H, 31803H, 51H |
| ASTM A995 Grado CD3MN    | Acero Inoxidable Duplex Grado 4A, 22% Cr; 5% Ni; 3% Mo; N; 0.030% C.      | ASTM A182 F51           | ASTM A479 31803         | Salmuera concentrada, ácidos grasos, agua potable, pulpas de agua, pulpas de líquidos a 220 °F (104 °C), agua de mar, ácido sulfúrico (15-30% @ 140-160 °F (60-71 °C), ácido sulfúrico (35-40 % @185 °F (85 °C), más 5 % orgánicos).                                                                                     | 32750H, 31803H, 51H                | 32750H, 31803H, 51H |
| ASTM A995 Grado CE3MN    | Acero inoxidable Duplex Grado 5A, 25% Cr; 7% Ni; 4.5% Mo; N; 0.030% C.    | ASTM A182 F53           | ASTM A182 F53           | Salmuera concentrada, ácidos grasos, agua potable, pulpas de agua, pulpas de líquidos a 220 °F (104 °C), agua de mar, ácido sulfúrico (15-30% @ 140-160 °F (60-71 °C), ácido sulfúrico (35-40 % @185 °F (85 °C), más 5 % orgánicos). Muy útil donde se requiere Resistencia a la corrosión por picaduras (pitting PREN). | 53H, 53HF                          | 53H, 53HF           |
| ASTM A995 Grado CD3MWCuN | Acero Inoxidable Duplex Grado 6A, 25% Cr; 7.5% Ni; 3.5% Mo; N; 0.030% C.  | ASTM A182 F53           | ASTM A182 F53           | Salmuera concentrada, ácidos grasos, agua potable, pulpas de agua, pulpas de líquidos a 220 °F (104 °C), agua de mar, ácido sulfúrico (15-30% @ 140-160 °F (60-71 °C), ácido sulfúrico (35-40 % @185 °F (85 °C), más 5 % orgánicos). Muy útil donde se requiere Resistencia a la corrosión por picaduras (pitting PREN). | 53H, 53HF                          | 53H, 53HF           |
| ASTM B148 Grado 95800    | Bronce al Aluminio. 79% min Cu; 4.5% Ni; 9% Al; 3-4.5% Fe; 0.03 % max Pb. | N/A                     | ASTM B150 C63000        | Servicio de agua de mar.                                                                                                                                                                                                                                                                                                 | BCE630                             | BCE630              |

(1) La lista anterior de las industrias de consumo y materiales corrosivos son útiles como ejemplos de las aplicaciones típicas donde estos materiales pueden ser utilizados, sin embargo, la responsabilidad de la selección de la aleación y el trim adecuados es de la firma de ingeniería o el usuario final.

### NOMENCLATURA

| TIPO  | CLASE                                 |
|-------|---------------------------------------|
| ST6   | Stellite 6                            |
| 13%Cr | Acero Inoxidable 410                  |
| 316   | Acero Inoxidable 316                  |
| 304   | Acero Inoxidable 304                  |
| HC    | HASTELLOY "C"                         |
| CN7M  | Acero Inoxidable Cromo-Níquel         |
| 321   | Acero Inoxidable 321                  |
| ST21  | Stellite 21                           |
| A20   | Super acero inoxidable Alloy 20       |
| 347   | Acero Inoxidable 347                  |
| 321   | Acero Inoxidable 321                  |
| 8810  | Super Acero Inoxidable 8810           |
| 625   | Inconel 625                           |
| 410 T | Inoxidable 410 (HARDNESS 200-275 BHN) |

| TIPO   | CLASE                                |
|--------|--------------------------------------|
| 316L   | Acero Inoxidable 316L                |
| HB     | Hastelloy "B"                        |
| 317L   | Acero Inoxidable 317L                |
| 17 4PH | Acero Inoxidable martensítico 17 4PH |
| 317    | Acero Inoxidable 317                 |
| 825    | Incoloy 825                          |
| 304L   | Acero Inoxidable 304L                |
| K500   | MONEL K500                           |
| 31803  | Acero Inoxidable Duplex 31803        |
| 718    | Inconel 718                          |
| 8367   | Super Acero Inoxidable 8367          |
| TC     | Carburo de Tungsteno                 |
| W1     | Walweld-100 (Trim especial Walworth) |
| NUC    | Nucalloy                             |



# ARREGLOS DE INTERIORES (TRIM) DE LAS VÁLVULAS BONETE BRIDADO FUNDIDO

Las válvulas WALWORTH están disponibles en la más amplia gama de materiales para interiores (trims) utilizados en la industria. La siguiente tabla muestra los arreglos de interiores (trims) más utilizados para las válvulas que la Compañía ofrece actualmente. Arreglos adicionales de interiores (trims) especiales según los requisitos del cliente están disponibles bajo solicitud. Para mayor información póngase en contacto con su distribuidor WALWORTH más cercano o directamente a la Planta.

| WALWORTH TRIM No. | API-600 TRIM No. | COMPOSICIÓN NOMINAL DE LOS INTERIORES (TRIM) | VÁSTAGO Y OTRAS PARTES INTERIORES (TRIM) (1) | MATERIAL DE SELLO COM-PUERTA/DISCO | MATERIAL DE SELLO DEL (LOS) ANILLO (S) (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               | NO ESPECIFICADO  | 13Cr-0.5Ni-1Mn/NUCALLOY                      | SS-410(200-275 HBN)                          | NUCALLOY                           | NUCALLOY                                   |
| 4HF               | NO ESPECIFICADO  | 19Cr-9.5Ni-2Mn-0.08C/1/2Co-Cr-A              | SS-304                                       | SS-304                             | Stellite 6 (350 HBN min)                   |
| 4HF+HF            | NO ESPECIFICADO  | 19Cr-9.5Ni-2Mn-0.08C/Co-Cr-A                 | SS-304                                       | Stellite 6 (350 HBN min)           | Stellite 6 (350 HBN min)                   |
| 304L              | NO ESPECIFICADO  | 19Cr-9.5Ni-2Mn-0.03C                         | SS-304L                                      | SS-304L                            | SS-304L                                    |
| 1HF               | NO ESPECIFICADO  | 18Cr-12Ni-2.5Mo-2Mn/Co-Cr-Mo                 | SS-316                                       | Stellite 21 (320 HBN min)          | Stellite 21 (320 HBN min)                  |
| 3HF+HF            | 16               | 18Cr-12Ni-2.5Mo-2Mn/Co-Cr-A                  | SS-316                                       | Stellite 6 (350 HBN min)           | Stellite 6 (350 HBN min)                   |
| 3TC (3)           | NO ESPECIFICADO  | 18Cr-8Ni-Mo/TgC                              | SS-316/Carburo de Tungsteno                  | Carburo de Tungsteno               | Stellite 6 (350 HBN min)                   |
| 316L              | NO ESPECIFICADO  | 17Cr-12Ni-2.5Mo-2Mn0.03C                     | SS-316L                                      | SS-316L                            | SS-316L                                    |
| 3LHF              | NO ESPECIFICADO  | 17Cr-12Ni-2.5Mo-2Mn0.03C/1/2Co-Cr-A          | SS-316L                                      | SS-316L                            | Stellite 6 (350 HBN min)                   |
| 3HFL              | NO ESPECIFICADO  | 17Cr-12Ni-2.5Mo-2Mn0.03C/Co-Cr-A             | SS-316L                                      | Stellite 6 (350 HBN min)           | Stellite 6 (350 HBN min)                   |
| 21HF              | NO ESPECIFICADO  | 19Cr-11.5Ni-3.5Mo/Co-Cr-A                    | SS-317                                       | Stellite 6 (350 HBN min)           | Stellite 6 (350 HBN min)                   |
| 317               | NO ESPECIFICADO  | 19Cr-11.5Ni-3.5Mo                            | SS-317                                       | SS-317                             | SS-317                                     |

Notas: 1. Grados libres de maquinado para 13 Cr están prohibidos.  
2. Un diferencial de dureza de 50 HB mínimo contra el (los) anillo (s) es requerido.

# ARREGLOS DE INTERIORES (TRIM) DE LAS VÁLVULAS BONETE BRIDADO FUNDIDO

| WALWORTH TRIM No. | API-600 TRIM No. | COMPOSICIÓN NOMINAL DE LOS INTERIORES (TRIM) | VÁSTAGO Y OTRAS PARTES INTERIORES (TRIM) (1) | MATERIAL DE SELLO COM-PUERTA / DISCO | MATERIAL DE SELLO DEL (LOS) ANILLO (S) (2) |
|-------------------|------------------|----------------------------------------------|----------------------------------------------|--------------------------------------|--------------------------------------------|
| 317H              | NO ESPECIFICADO  | 19Cr-11.5Ni-3.5Mo/1/2Co-Cr-A                 | SS-317                                       | SS-317                               | Stellite 6 (350 HBN min)                   |
| 317LH             | NO ESPECIFICADO  | 19Cr-13Ni-3.5Mo/Co-Cr-A                      | SS-317L                                      | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |
| 317L              | NO ESPECIFICADO  | 19Cr-13Ni-3.5Mo-0.03C                        | SS-317L                                      | SS-317L                              | SS-317L                                    |
| 317LS             | NO ESPECIFICADO  | 19Cr-13Ni-3.5Mo/1/2Co-Cr-A                   | SS-317L                                      | SS-317L                              | Stellite 6 (350 HBN min)                   |
| 2HF               | NO ESPECIFICADO  | 18Cr-10Ni-0.1N/Co-Cr-A                       | SS-321                                       | SS-321                               | Stellite 6 (350 HBN min)                   |
| 321F              | NO ESPECIFICADO  | 18.5Cr-11Ni-2Mn/Co-Cr-A                      | SS-321                                       | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |
| 321               | NO ESPECIFICADO  | 19Cr-11.5Ni-3.5Mo                            | SS-321                                       | SS-321                               | SS-321                                     |
| 347HF             | NO ESPECIFICADO  | 18.5Cr-11Ni-2Mn-Co/Co-Cr-A                   | SS-347                                       | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |
| 347               | NO ESPECIFICADO  | 18.5Cr-11Ni-2Mn-Co                           | SS-347                                       | SS-347                               | SS-347                                     |
| 347H              | NO ESPECIFICADO  | 18.5Cr-11Ni-2Mn-Co/1/2Co-Cr-A                | SS-347                                       | SS-347                               | Stellite 6 (350 HBN min)                   |
| 254HF             | NO ESPECIFICADO  | 20Cr-18Ni-6.2Mo-0.02C-Cu+N                   | UNS S31254                                   | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |
| 51H               | NO ESPECIFICADO  | 22Cr-5.5Ni-3Mo-N-0.03C/Co-Cr-A               | UNS S31803                                   | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |
| 31803H            | NO ESPECIFICADO  | 22Cr-5.5Ni-3Mo-N-0.03C/Co-Cr-A               | UNS S31803                                   | UNS S31803                           | Stellite 6 (350 HBN min)                   |
| T9                | NO ESPECIFICADO  | 16Cr-4Ni-4Cu-Nb+Ta/Co-Cr                     | 17-4pH                                       | Triballoy 900                        | Triballoy 900                              |
| HC                | NO ESPECIFICADO  | 55Ni-15.5Cr-16Mo-3Tg-4Fe                     | Hastelloy C-276                              | Hastelloy C-276                      | Hastelloy C-276                            |
| HCH               | NO ESPECIFICADO  | 55Ni-15.5Cr-16Mo-3Tg-4Fe/1/2Co-Cr-A          | Hastelloy C-276                              | Hastelloy C-276                      | Stellite 6 (350 HBN min)                   |
| UOP               | NO ESPECIFICADO  | 63Ni-30Cu-Al+Ti/70Ni-30Cu                    | UN N05500 (Monel K-500)                      | UN N04400 (Monel 400)                | UN N04400 (Monel 400)                      |
| 625               | NO ESPECIFICADO  | 60Ni-22Cr-9Mo-3.5Cb                          | UNS N06625 (Inconel 625)                     | UNS N06625 (Inconel 625)             | UNS N06625 (Inconel 625)                   |
| 625HF             | NO ESPECIFICADO  | 60Ni-22Cr-9Mo-3.5Cb/Co-Cr-A                  | UNS N06625 (Inconel 625)                     | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |
| 8367HF+HF         | NO ESPECIFICADO  | 25Ni-20Cr-6.5Mo-2Mn-0.03C/Co-Cr-A            | UNS N08367 (AL6XN)                           | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |
| 810T              | NO ESPECIFICADO  | 33Ni-21Cr-39.5Fe-1.5Mn                       | UNS N08810 (Incoloy 800H)                    | UNS N08810 (Incoloy 800H)            | UNS N08810 (Incoloy 800H)                  |
| 825               | NO ESPECIFICADO  | 42Ni-21.5Cr-3Mo-Ti+Al-0.05C                  | UNS N08825 (Incoloy 825)                     | UNS N08825 (Incoloy 825)             | UNS N08825 (Incoloy 825)                   |
| 23HF              | NO ESPECIFICADO  | 42Ni-21.5Cr-3Mo/CO-Cr-Mo                     | UNS N08825 (Incoloy 825)                     | Stellite 21 (320 HBN min)            | Stellite 21 (320 HBN min)                  |
| HB                | NO ESPECIFICADO  | 66Ni-28Mo-1Mn-0.02C                          | UNS N10665 (Hastelloy B2)                    | UNS N10665 (Hastelloy B2)            | UNS N10665 (Hastelloy B2)                  |
| BCE630            | NO ESPECIFICADO  | 79Cu-4.5Ni-9Al-4Fe-0.03Pb                    | ASTMB B150 63000                             | ASTMB B148 95800                     | ASTM B150 63000                            |
| HB                | NO ESPECIFICADO  | 66Ni-28Mo-1Mn-0.02C                          | UNS N10665 (Hastelloy B2)                    | UNS N10665 (Hastelloy B2)            | UNS N10665 (Hastelloy B2)                  |
| 1F                | NO ESPECIFICADO  | 16% Cr-4%Ni-Nb/13%Cr-0.75Ni-1Mn/Co-Cr-A      | ASTM A564-H1150                              | SS-410 (250HBN min)                  | Stellite 6 (350 HBN min)                   |
| 1G                | NO ESPECIFICADO  | 16% Cr-4%Ni-Nb/13%Cr-0.75Ni-1Mn/Co-Cr-A      | ASTM A564-H1150                              | Stellite 6 (350 HBN min)             | Stellite 6 (350 HBN min)                   |

## COMBINACIÓN MATERIALES BASE E INTERIORES MÁS COMUNES

La siguiente tabla muestra las combinaciones más comunes entre materiales base e interiores (trims). Hay muchos otros arreglos que se pueden combinar con estos materiales de base, por favor, consulte otras secciones de este catálogo para obtener información adicional.

| VÁLVULA DE TIPO COMPUERTA CLASE 150# |                                                |                                           |                                          |                                         |                                          |                                                |
|--------------------------------------|------------------------------------------------|-------------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------------|
| DESCRIPCIÓN                          | ASTM A216 WCB O WCC<br>TRIM UT (API-600 No. 8) | ASTM A217 WC6<br>TRIM UT (API-600 No. 8)  | ASTM A217 WC9<br>TRIM UT (API-600 No. 8) | ASTM A217 C5<br>TRIM UT (API-600 No. 8) | ASTM A217 C12<br>TRIM UT (API-600 No. 8) | ASTM A352 LCB O LCC<br>TRIM UT (API-600 No. 8) |
| Cuerpo                               | ASTM A216 WCB/WCC                              | ASTM A217 WC6                             | ASTM A217 WC9                            | ASTM A217 C5                            | ASTM A217 Gr. C12                        | ASTM A352 LCB/<br>LCC                          |
| Bonete                               | ASTM A216 WCB/WCC                              | ASTM A217 WC6                             | ASTM A217 WC9                            | ASTM 217 C5                             | ASTM A217 Gr. C12                        | ASTM A352 LCB/<br>LCC                          |
| Compuerta/área<br>de sello           | ASTM A216WCB/WCC<br>+13% Cr.                   | ASTM A217 WC6 +<br>13% Cr.                | ASTM A217 WC9 +<br>13% Cr.               | ASTM A217 C5 + 13% Cr.                  | ASTM A217 Gr. C12 +<br>13% Cr.           | ASTM A352 LCB/<br>LCC + 13% Cr.                |
| Asiento (s)                          | ASTM A515 Gr. 70 +<br>ST 6                     | ASTM A240 Gr.<br>410 + ST 6               | ASTM A240 410 + ST 6                     | ASTM A240 410 + ST 6                    | ASTM A240 Gr. 410<br>+ ST 6              | ASTM A516 GR 65<br>+ ST 6                      |
| Tuerca Vástago                       | ASTM A439 Tipo D2<br>o ASTM B148 UNS<br>C95600 | ASTM A439 D2 o<br>ASTM B148 UNS<br>C95600 | ASTM A439 D2 o ASTM<br>B148 UNS C95600   | ASTM A439 D2 o ASTM<br>B148 UNS C95600  | ASTM A439 D2 o ASTM<br>B148 UNS C95600   | ASTM A439 D2 o<br>ASTM B148 UNS<br>C95600      |
| Casquillo                            | ASTM A276 Gr. 410                              | ASTM A276 Gr. 410                         | ASTM A276 Gr. 410                        | ASTM A276 Gr. 410                       | ASTM A276 Gr. 410                        | ASTM A276 Gr. 410                              |
| Espárragos                           | ASTM A193 Gr. B7                               | ASTM A193 Gr.B16                          | ASTM A193 Gr. B16                        | ASTM A193 Gr. B16                       | ASTM A193 Gr. B16                        | ASTM A193 Gr. L7                               |
| Tuercas Espárragos                   | ASTM A194 Gr. 2H                               | ASTM A194 Gr. 7                           | ASTM A194 Gr. 7                          | ASTM A194 Gr. 7                         | ASTM A194 Gr. 7                          | ASTM A194 Gr. 7                                |
| Empaque de<br>Vástago                | Grafito                                        | Grafito                                   | Grafito                                  | Grafito                                 | Grafito                                  | Grafito                                        |
| Junta                                | Grafito/Inoxidable 316                         | Grafito/Inoxidable<br>316                 | Grafito/Inoxidable 316                   | Grafito/Inoxidable 316                  | Grafito/Inoxidable 316                   | Grafito/Inoxidable<br>316                      |
| Volante                              | ASTM A197                                      | ASTM A197                                 | ASTM A197                                | ASTM A 197                              | ASTM A197                                | ASTM A197                                      |
| Operador de<br>Engranajes            | Según diseño                                   | Según diseño                              | Según diseño                             | Según diseño                            | Según diseño                             | Según diseño                                   |

## COMPOSICIÓN QUÍMICA Y PROPIEDADES MECÁNICAS

La siguiente tabla muestra la composición química y propiedades mecánicas de los materiales suministrados más comunes. Para otros aceros, aceros inoxidables y aleaciones de níquel puede solicitar Información adicional a su distribuidor WALWORTH más cercano o directamente a la Planta.

| COMPOSICIÓN QUÍMICA Y PROPIEDADES MECÁNICAS                                                                                                       |                 |        |                    |              |                      |           |                       |                |                    |            |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------|--------------------|--------------|----------------------|-----------|-----------------------|----------------|--------------------|------------|------------|
| ELEMENTOS Y PROPIEDADES                                                                                                                           | ACERO AL CARBÓN |        | ACERO BAJO CARBONO |              | ACEROS BAJA ALEACIÓN |           | ACEROS MEDIA ALEACIÓN |                | ACEROS INOXIDABLES |            |            |
|                                                                                                                                                   | ASTM A216       |        | ASTM A352          |              | ASTMA217             |           |                       |                | ASTMA351           |            |            |
|                                                                                                                                                   | WCB             | WCC    | LCB                | LCC          | WC6                  | WC9       | C5                    | C12            | CF8                | CF8M       | CF8C       |
| Carbono (C)                                                                                                                                       | 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       |
| Manganeso (Mn)                                                                                                                                    | 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        |
| Fósforo (P)                                                                                                                                       | 0.04            | 0.04   | 0.04               | 0.04         | 0.04                 | 0.04      | 0.04                  | 0.04           | 0.04               | 0.04       | 0.04       |
| Azufre (S)                                                                                                                                        | 0.045           | 0.045  | 0.045              | 0.045        | 0.045                | 0.045     | 0.045                 | 0.045          | 0.04               | 0.04       | 0.04       |
| Silicio (Si)                                                                                                                                      | 0.6             | 0.6    | 0.6                | 0.6          | 0.6                  | 0.6       | 0.75                  | 1              | 2                  | 1.5        | 2          |
| Níquel (Ni)                                                                                                                                       | 0.5             | 0.5    | 0.5                | 0.5          | -                    | -         | -                     | -              | 8.00-11.0          | 9.00-12.0  | 9.00-12.0  |
| Cromo (Cr)                                                                                                                                        | 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 |
| Molibdeno (Mo)                                                                                                                                    | 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        |
| Cobre (Cu)                                                                                                                                        | 0.3             | 0.3    | 0.3                | 0.3          | 0.5                  | 0.5       | 0.5                   | 0.5            | -                  | -          | -          |
| Columbio (Cb)                                                                                                                                     | -               | -      | -                  | -            | -                    | -         | -                     | -              | -                  | -          | (2)        |
| Vanadio (V)                                                                                                                                       | 0.03            | 0.03   | 0.03               | 0.03         | -                    | -         | -                     | -              | -                  | -          | -          |
| TENSIÓN PSI (mínimo)                                                                                                                              | 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     |
| CEDECENCIA PSI (mínimo)                                                                                                                           | 36,000          | 40,000 | 35,000             | 40,000       | 40,000               | 40,000    | 60,000                | 60,000         | 30,000             | 30,000     | 30,000     |
| ALARGAMIENTO EN 2" (mínimo)                                                                                                                       | 22              | 22     | 24                 | 22           | 20                   | 20        | 18                    | 18             | 35                 | 30         | 30         |
| Reducción de Área % (mínimo)                                                                                                                      | 35              | 35     | 35                 | 35           | 35                   | 35        | 35                    | 35             | -                  | -          | -          |
| DUREZA (HB) (máximo)                                                                                                                              | 185             | 185    | 190                | 200          | 200                  | 200       | 237                   | 237            | -                  | -          | -          |
| Notas:                                                                                                                                            |                 |        |                    |              |                      |           |                       |                |                    |            |            |
| 1. El porcentaje (%) mostrado sobre los elementos es el máximo excepto donde los rangos están indicados.                                          |                 |        |                    |              |                      |           |                       |                |                    |            |            |
| 2. Pare el acero inoxidable CF8C se deberá tener un contenido de Columbio de no menos de 8 veces el contenido de carbono, pero sin exceder de 1%. |                 |        |                    |              |                      |           |                       |                |                    |            |            |

# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 150

VÁLVULA DE COMPUERTA TIPO OS&Y CON YUGO, VOLANTE FIJO Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DE DISEÑO

- Válvula de compuerta diseñada de acuerdo con API-600, Compuerta Sólida o Flexible, flexible o tipo caras paralelas.
- Alternativa para Válvulas de compuerta de acuerdo con API-603, solamente en acero inoxidable y aleaciones de níquel (consulte catálogo para esta línea).
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- Válvula de Compuerta para servicio criogénico con columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas hasta 24" de diámetro nominal.
- Volante, volante de impacto, operador de cadena, operador de engrane, actuador eléctrico, actuador neumático e hidráulico a requerimiento del cliente.
- By-Pass, buje linterna, cámara de condensados, inyectores de grasa, conexiones especiales, etc
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó MR-01-03.
- Pruebas de acuerdo con API-598.

① Tuerca de Vástago giratoria, intercambiable en línea para evitar paros por mantenimiento.

② Vástago ascendente con rosca ACME con entrada sencilla o doble para una operación rápida. Acabado fino para adecuado para sellar perfectamente y obtener bajas emisiones de fugas

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado pulido en el área de sello del vástago, las estrictas tolerancias diametrales y el paralelismo de los empaques contra la cámara de empaques. Arreglo de empaques con carga viva están disponibles a solicitud del Cliente.

④ Superficie de sello posterior, ya sea roscado o soldado diseñado para aliviar la presión trasera en el empaque del vástago cuando esta completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

⑤ El engarce vástago-compuerta esta diseñado para soportar fuertes cargas de operación y, en caso necesario, que el vástago rompa fuera de los límites de las áreas sometidas a presión (interior del cuerpo-bonete).

⑥ La unión cuerpo-bonete está diseñada para aplicar una carga uniforme a la junta, asegurando el sello hermético para una baja emisión de fugas a la atmósfera.

⑦ Los anillos de sello son soldados al cuerpo para proporcionar un sello entre la unión y de esta manera evitar fugas.

⑧ El recubrimiento de stellite 6 en la zona de sello de los anillos de asiento proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión en servicio, dando mayor vida útil al producto.

⑨ La brida prensa empaque y el buje prensa-empaques se suministran en dos piezas separadas para evitar dañar el vástago por mala alineación durante el apriete de los empaques.

⑩ Las válvulas de compuerta son suministradas con volante y/o con operador de engranes por diseño.





# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 150 (OPERACIÓN CON VOLANTE)

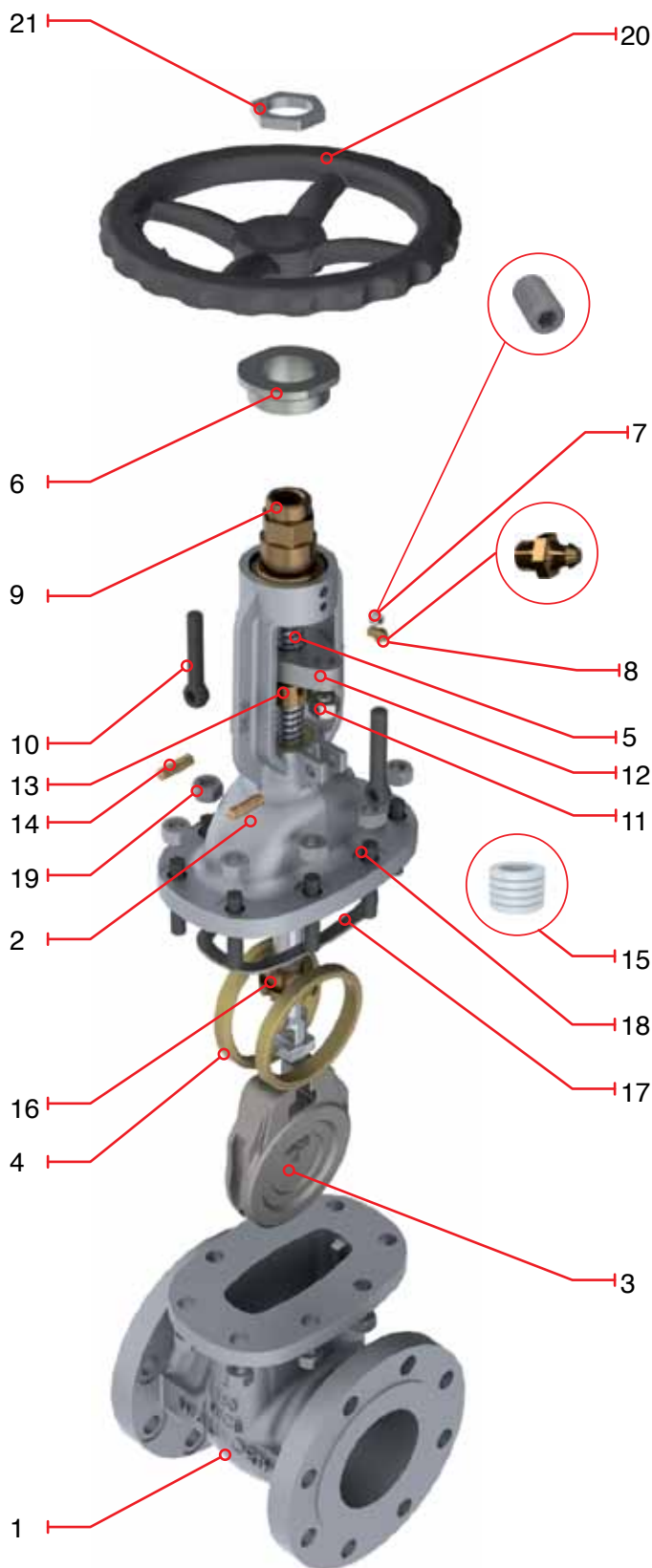
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- De 2" a 24" de diámetro se suministra con volante como estándar.
- Dimensiones de bridas según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de extremo a extremo para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5202RF     | 5202F                 | Bridados Cara Realzada, Cara Plana |
| 5202RTJ    | 5202RJ                | Bridados Junta Tipo Anillo         |
| 5202WE     | 5202WE                | Soldables                          |

### Lista de Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                |
|-----|-------------------------|----------------------------|
| 1   | Cuerpo                  | ASTM A216 Gr. WCB          |
| 2   | Bonete                  | ASTM A216 Gr. WCB          |
| 3   | Compuerta               | ASTM A216 GR WCB + 13% Cr. |
| 4   | Asiento                 | ASTM A515 GR 70 + ST 6     |
| 5   | Vástago                 | ASTM A276 Gr. 410          |
| 6   | Tuerca Retén            | ASTM A108 Gr. 1020         |
| 7   | Opresor Tuerca Retén    | Acero Aleado               |
| 8   | Grasera                 | Acero Comercial            |
| 9   | Tuerca Vástago          | UNS C95600 o Ni-Resist     |
| 10  | Tornillo de Ojo         | Acero Aleado               |
| 11  | Tuerca Tornillo de Ojo  | ASTM A307                  |
| 12  | Brida Prensa Empaques   | ASTM A515 Gr. 70           |
| 13  | Buje Prensa Empaque     | ASTM A108 Gr. 1020         |
| 14  | Perno Tornillo de Ojo   | Acero Aleado               |
| 15  | Empaque de Vástago      | Grafito                    |
| 16  | Casquillo               | ASTM A276 Gr. 410          |
| 17  | Junta                   | Grafito/Inoxidable 316     |
| 18  | Espárrago               | ASTM A193 Gr. B7           |
| 19  | Tuerca Espárrago        | ASTM A194 Gr. 2H           |
| 20  | Volante                 | ASTM A197                  |
| 21  | Tuerca Volante          | ASTM A108 Gr. 1020         |
| *22 | Opresor Tuerca Retén    | Acero Aleado               |
| *23 | Placa de Identificación | Acero Inoxidable           |

\*No mostrado



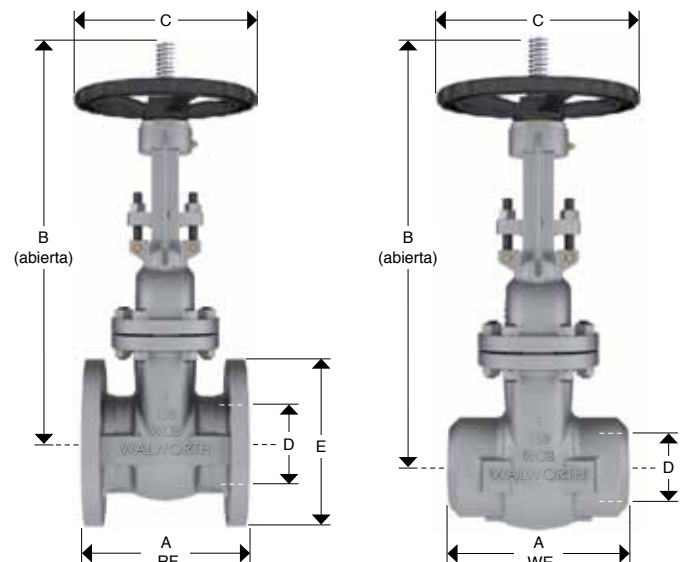
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 150 (OPERACIÓN CON VOLANTE)



- Diseño de acuerdo con API-600.
- Válvulas tipo OS & Y con volante fijo y vástago ascendente.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- De 2" a 24" de diámetro se suministra con volante como estándar.
- Dimensiones de bridas según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5202RF     | 5202F                 | Bridados Cara Realzada, Cara Plana |
| 5202RTJ    | 5202RJ                | Bridados Junta Tipo Anillo         |
| 5202WE     | 5202WE                | Soldables                          |



### Dimensiones y Pesos

| D                | mm | 51       | 64    | 76     | 102     | 127 | 152      | 203      | 254     | 305    | 356    | 406    | 457      | 508     | 610     |
|------------------|----|----------|-------|--------|---------|-----|----------|----------|---------|--------|--------|--------|----------|---------|---------|
| Diametro Nominal | 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      |
| Peso             | 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    |
| Peso             | 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    |

# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO CLASE 150 (OPERACIÓN CON CAJA DE ENGRANES)

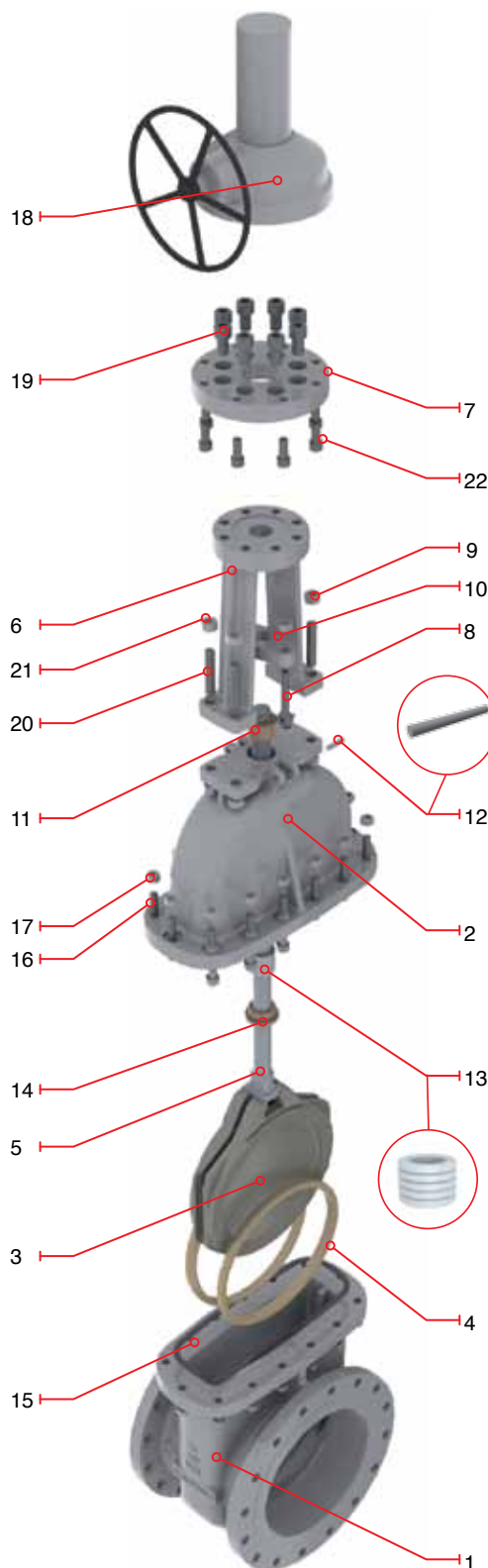
- Diseño de acuerdo con API-600.
- Válvulas tipo OS & Y con volante fijo y vástago ascendente.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- De 30" a 72" de diámetro se suministra con Operador de Engranés.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5202RF     | 5202F                 | Bridados Cara Realzada, Cara Plana |
| 5202RTJ    | 5202RJ                | Bridados Junta Tipo Anillo         |
| 5202WE     | 5202WE                | Soldables                          |

## Lista de Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                 |
|-----|-------------------------|-----------------------------|
| 1   | Cuerpo                  | ASTM A216 Gr. WCB           |
| 2   | Bonete                  | ASTM A216 Gr. WCB           |
| 3   | Compuerta               | ASTM A216 Gr. WCB + 13% Cr. |
| 4   | Asientos                | ASTM A515 Gr. 70 + ST 6     |
| 5   | Vástago                 | ASTM A276 Gr. 410           |
| 6   | Yugo                    | ASTM A216 Gr. WCB           |
| 7   | Tuerca Retén            | ASTM A36                    |
| 8   | Tornillo de Ojo         | Acero Aleado                |
| 9   | Tuerca Tornillo de Ojo  | ASTM A307                   |
| 10  | Brida Prensa Empaques   | ASTM A515 Gr. 70            |
| 11  | Buje Prensa Empaque     | ASTM A108 Gr. 1020          |
| 12  | Perno Tornillo de Ojo   | Acero Aleado                |
| 13  | Empaque de Vástago      | Grafito                     |
| 14  | Casquillo               | ASTM A276 Gr. 410           |
| 15  | Junta                   | Grafito/Inoxidable 316      |
| 16  | Espárragos              | ASTM A193 Gr. B7            |
| 17  | Tuercas Espárragos      | ASTM A194 Gr. 2H            |
| 18  | Operador de Engranés    | Según diseño                |
| 19  | Tornillos del Operador  | Acero Aleado                |
| 20  | Tornillo de Yugo        | Acero Aleado                |
| 21  | Tuerca Tornillo de Yugo | ASTM A307                   |
| 22  | Tornillo Retén          | Acero Aleado                |
| *23 | Placa de Identificación | Acero Inoxidable            |

\*No mostrados



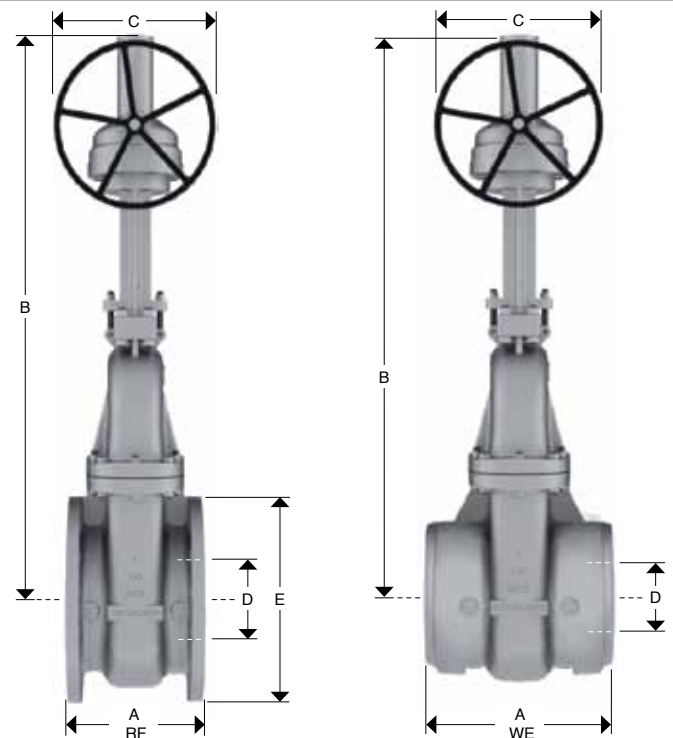
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 150 (OPERACIÓN CON CAJA DE ENGRANES)



- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- De 30" a 72" de diámetro se suministra con Operador de Engranés.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5202RF     | 5202F                 | Bridados Cara Realzada, Cara Plana |
| 5202RTJ    | 5202RJ                | Bridados Junta Tipo Anillo         |
| 5202WE     | 5202WE                | Soldables                          |



### Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | 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    |
| Peso                     | Kg | 2242    | 3470   | 5300    | 7050   | 10310   | 14890 | 23200 |
| 5202RF                   | lb | 4932    | 7634   | 11660   | 15510  | 22682   | 32758 | 51040 |
| Peso                     | Kg | 1910    | 3198   | 4880    | 6490   | 9490    | 13700 | 21350 |
| 5202WE                   | lb | 4202    | 7035.6 | 10736   | 14278  | 20878   | 30140 | 46970 |



# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO CLASE 300

VÁLVULA DE COMPUERTA TIPO OS&Y CON YUGO, VOLANTE FIJO Y VÁSTAGO ASCENDENTE

## CARACTERÍSTICAS DE DISEÑO

- Válvula de compuerta diseñada de acuerdo con API-600, Compuerta Sólida o Flexible, flexible o tipo caras paralelas.
- Alternativa para Válvulas de compuerta de acuerdo con API-603, solamente en acero inoxidable y aleaciones de níquel (consulte catálogo para esta línea).
- Compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- Válvula de Compuerta para servicio criogénico con columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas hasta 24" de diámetro nominal.
- Volante, volante de impacto, operador de cadena, operador de engrane, actuador eléctrico, actuador neumático e hidráulico a requerimiento del cliente.
- By-Pass, buje linterna, cámara de condensados, inyectores de grasa, conexiones especiales, etc
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó MR-01-03.
- Pruebas de acuerdo con API-598.

① Tuerca de Vástago giratoria, intercambiable en línea para evitar paros por mantenimiento.

② Vástago ascendente con rosca ACME con entrada sencilla o doble para una operación rápida. Acabado fino para adecuado para sellar perfectamente y obtener bajas emisiones de fugas

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado pulido en el área de sello del vástago, las estrictas tolerancias diametrales y el paralelismo de los empaques contra la cámara de empaques. Arreglo de empaques con carga viva están disponibles a solicitud del Cliente.

④ Superficie de sello del casquillo, ya sea roscado o soldado diseñado para aliviar la presión trasera en el empaque del vástago cuando esta completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

⑤ El engarce vástago-compuerta esta diseñado para soportar fuertes cargas de operación y, en caso necesario, que el vástago rompa fuera de los límites de las áreas sometidas a presión (interior del cuerpo-bonete).

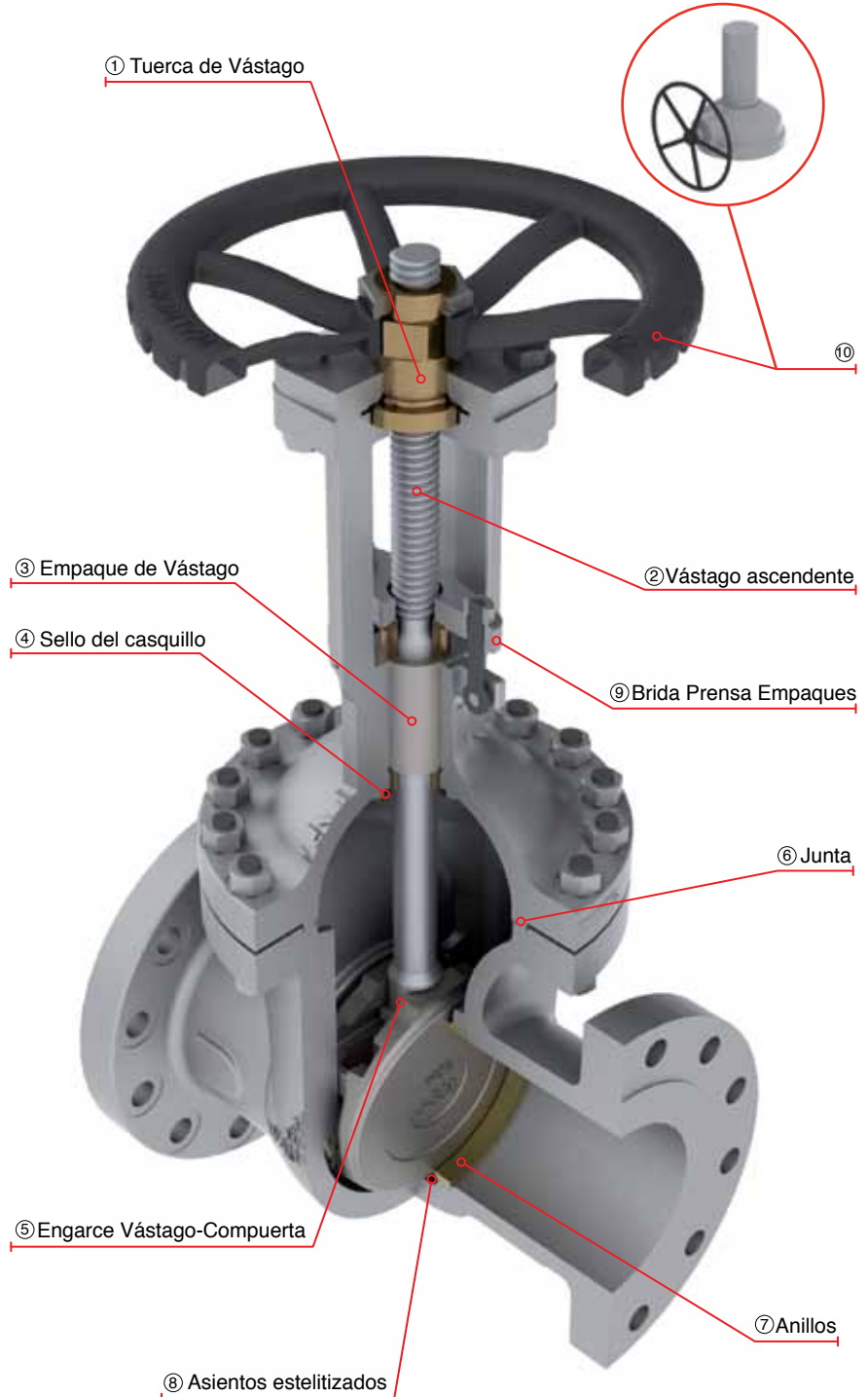
⑥ La unión cuerpo-bonete está diseñada para aplicar una carga uniforme a la junta, asegurando el sello hermético para una baja emisión de fugas a la atmósfera.

⑦ Los anillos de sello son soldados al cuerpo para proporcionar un sello entre la unión y de esta manera evitar fugas.

⑧ El recubrimiento de stellite 6 en la zona de sello de los anillos de asiento proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión en servicio, dando mayor vida útil al producto.

⑨ La brida prensa empaque y el buje prensa-empaques se suministran en dos piezas separadas para evitar dañar el vástago por mala alineación durante el apriete de los empaques.

⑩ Las válvulas de compuerta son suministradas con volante u operador de engranes por diseño.



# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 300 (OPERACIÓN CON VOLANTE)

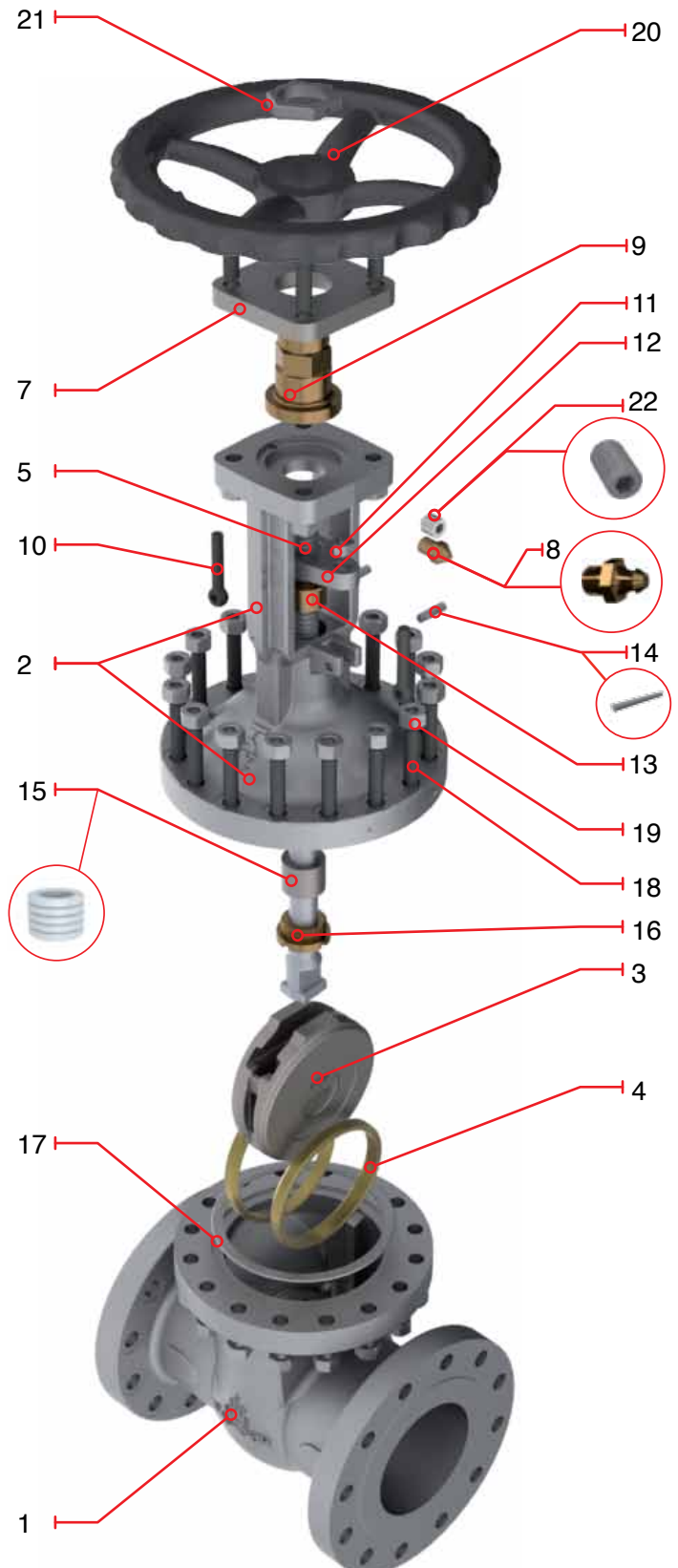
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta Sólida o Flexible de 2" a 4" de diámetro.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- De 2" a 24" de diámetro se suministra con volante como estándar.
- Dimensiones de bridas según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5206RF     | 5206F                 | Bridados Cara Realzada, Cara Plana |
| 5206RTJ    | 5206RJ                | Bridados Junta Tipo Anillo         |
| 5206WE     | 5206WE                | Soldable                           |

### Partes y Materiales

| No. | DESCRIPCIÓN             | STANDARD MATERIAL             |
|-----|-------------------------|-------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB             |
| 2   | Yugo/Bonete             | ASTM A 216 GR WCB             |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr.   |
| 4   | Asiento                 | ASTM A 515 GR 70              |
| 5   | Vástago                 | ASTM A 276 Type 410           |
| *6  | Tuerca Retén            | ASTM A 108 GR 1020            |
| 7   | Retén                   | Acero Aleado                  |
| 8   | Grasera                 | Acero Comercial               |
| 9   | Tuerca Vástago          | UNS C95600 or Ni-Resist       |
| 10  | Tornillo de Ojo         | Acero Aleado                  |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                    |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70              |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020            |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                  |
| 15  | Empaque de Vástago      | Grafito                       |
| 16  | Casquillo               | ASTM A 276 Type 410           |
| 17  | Junta                   | Spiral Inoxidable 304/Grafito |
| 18  | Espárrago               | ASTM A 193 GR B7              |
| 19  | Tuerca Espárrago        | ASTM A 194 GR 2H              |
| 20  | Volante                 | ASTM A 197                    |
| 21  | Tuerca Volante          | ASTM A 108 GR 1020            |
| 22  | Opresor Tuerca Retén    | Acero Aleado                  |
| *23 | Placa de Identificación | Acero Inoxidable              |

\*No mostrado



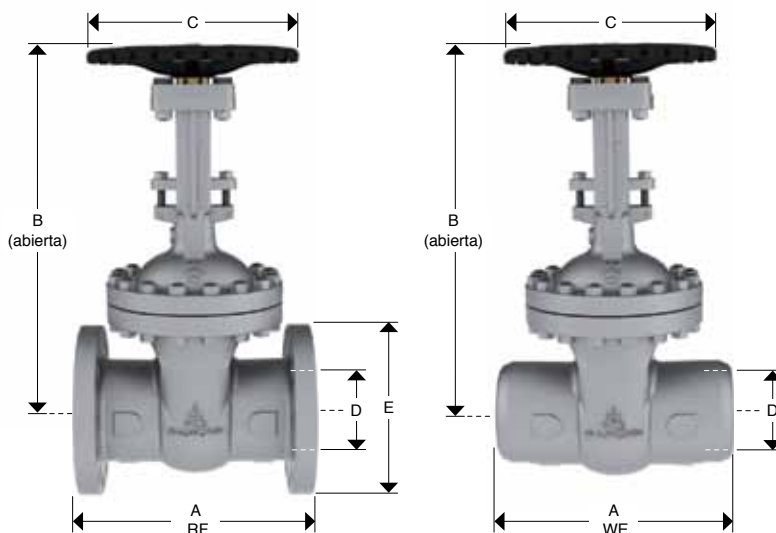
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 300 (OPERACIÓN CON VOLANTE)



- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- Compuerta flexible de 5" de diámetro y mayores.
- De 2" a 24" de diámetro se suministra con volante como estándar.
- Dimensiones de bridas según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5206RF     | 5206F                 | Bridados Cara Realzada, Cara Plana |
| 5206RTJ    | 5206RJ                | Bridados Junta Tipo Anillo         |
| 5206WE     | 5206WE                | Soldable                           |



### Dimensiones y Pesos

| D                | mm | 51     | 64       | 76       | 102     | 127      | 152      | 203    | 254    | 305    | 356     | 406    | 457    | 508    | 610     |
|------------------|----|--------|----------|----------|---------|----------|----------|--------|--------|--------|---------|--------|--------|--------|---------|
| Diametro Nominal | 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 y 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      |
| Peso             | 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    |
| Peso             | 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    |

# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 300 (OPERACIÓN CON CAJA DE ENGRANES)

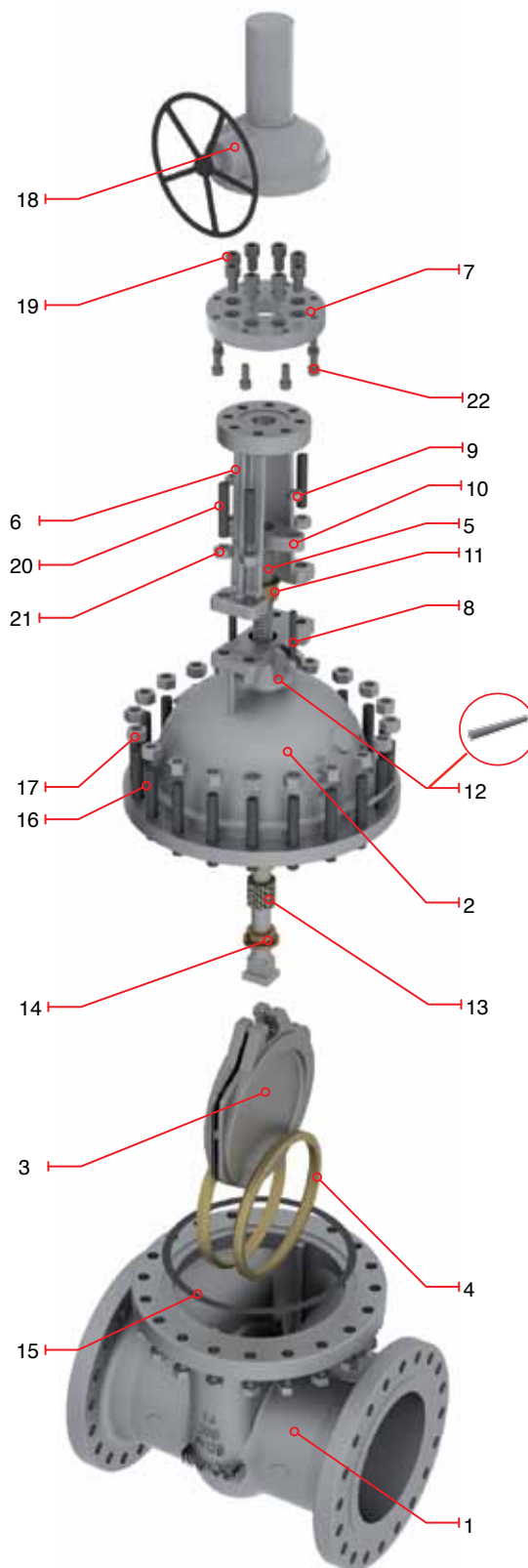
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- De 30" a 42" de diámetro se suministra con Operador de Engranés.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5206RF     | 5206F                 | Bridados Cara Realzada, Cara Plana |
| 5206RTJ    | 5206RJ                | Bridados Junta Tipo Anillo         |
| 5206WE     | 5206WE                | Soldable                           |

### Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                     |
|-----|-------------------------|---------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB               |
| 2   | Bonete                  | ASTM A 216 GR WCB               |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr.     |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST 6         |
| 5   | Vástago                 | ASTM A 276 Type 410             |
| 6   | Yugo                    | ASTM A 216 GR WCB               |
| 7   | Tuerca Retén            | ASTM A 36                       |
| 8   | Tornillo de Ojo         | Acero Aleado                    |
| 9   | Tuerca Tornillo de Ojo  | ASTM A 307                      |
| 10  | Brida Prensa Empaques   | ASTM A 515 GR 70                |
| 11  | Buje Prensa Empaque     | ASTM A 108 GR 1020              |
| 12  | Perno Tornillo de Ojo   | Acero Aleado                    |
| 13  | Empaque de Vástago      | Grafito                         |
| 14  | Casquillo               | ASTM A 276 Type 410             |
| 15  | Junta                   | Spiral Inoxidable 304/Grafito   |
| 16  | Espárrago               | ASTM A 193 GR B7                |
| 17  | Tuerca Espárrago        | ASTM A 194 GR 2H                |
| 18  | Operador de Engranés    | Según requerimiento del cliente |
| 19  | Tornillos del Operador  | Acero Aleado                    |
| 20  | Tornillo de Yugo        | Acero Aleado                    |
| 21  | Tuerca Tornillo de Yugo | ASTM A 307                      |
| 22  | Tornillo Retén          | Acero Aleado                    |
| *23 | Placa de Identificación | Acero Inoxidable                |

\*No mostrado





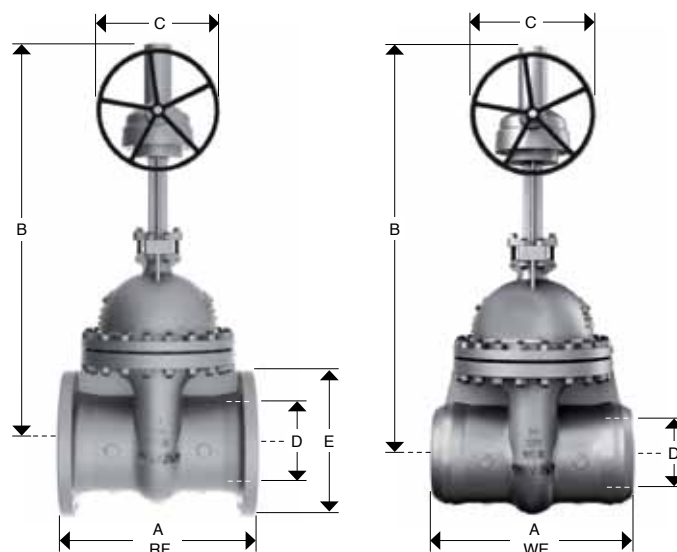
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 300 (OPERACIÓN CON CAJA DE ENGRANES)



- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Fabricada con compuerta flexible como estándar; compuerta sólida disponible bajo pedido.
- De 30" a 42" de diámetro se suministra con Operador de Engranés.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5206RF     | 5206F                 | Bridados Cara Realzada, Cara Plana |
| 5206RTJ    | 5206RJ                | Bridados Junta Tipo Anillo         |
| 5206WE     | 5206WE                | Soldable                           |



### Dimensiones y Pesos

| D                | mm | 762  | 914       | 1067     |
|------------------|----|------|-----------|----------|
| Diametro Nominal | in | 30   | 36        | 42       |
| A                | mm | 1397 | 1727      | 2172     |
| (RF y 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 |
| Peso             | Kg | 3680 | 6500      | 11405    |
| 5206RF           | lb | 8096 | 14300     | 25091    |
| Peso             | Kg | 3128 | 5525      | 9494     |
| 5206WE           | lb | 6882 | 12155     | 20887    |

# VÁLVULA DE COMPUERTA WALWORTH BONETE BRIDADO FUNDIDO CLASE 600

VÁLVULA DE COMPUERTA TIPO OS&Y CON YUGO, VOLANTE FIJO Y VÁSTAGO ASCENDENTE

## CARACTERÍSTICAS DE DISEÑO

- Válvula de compuerta diseñada de acuerdo con API-600,
- Compuerta flexible o tipo caras paralelas.
- Alternativa para Válvulas de compuerta de acuerdo con API-603, solamente en acero inoxidable y aleaciones de níquel (consulte catálogo para esta línea).
- Válvula de Compuerta para servicio criogénico con columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas hasta 24" de diámetro nominal.
- Volante, volante de impacto, operador de cadena, operador de engrane, actuador eléctrico, actuador neumático e hidráulico a requerimiento del cliente.
- By-Pass, buje linterna, cámara de condensados, inyectores de grasa, conexiones especiales, etc
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó MR-01-03.
- Pruebas de acuerdo con API-598.

① Tuerca de Vástago giratoria, intercambiable en línea para evitar paros por mantenimiento.

② Vástago ascendente con rosca ACME con entrada sencilla o doble para una operación rápida. Acabado fino para adecuado para sellar perfectamente y obtener bajas emisiones de fugas

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado pulido en el área de sello del vástago, las estrictas tolerancias diametrales y el paralelismo de los empaques contra la cámara de empaques. Arreglo de empaques con carga viva están disponibles a solicitud del Cliente.

④ Superficie de sello posterior, ya sea roscado o soldado diseñado para aliviar la presión trasera en el empaque del vástago cuando esta completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

⑤ El engarce vástago-compuerta esta diseñado para soportar fuertes cargas de operación y, en caso necesario, que el vástago rompa fuera de los límites de las áreas sometidas a presión (interior del cuerpo-bonete).

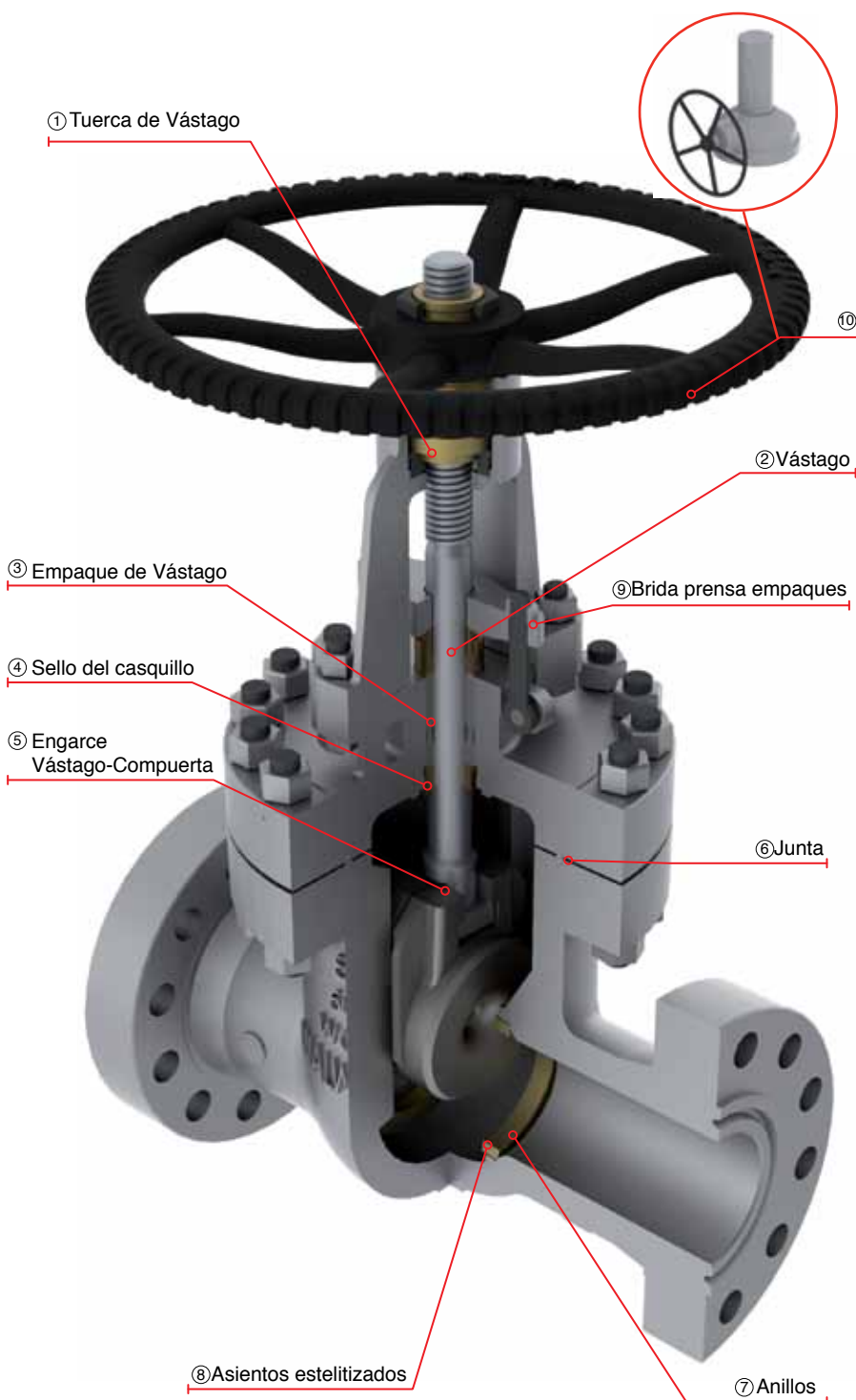
⑥ La unión cuerpo-bonete está diseñada para aplicar una carga uniforme a la junta, asegurando el sello hermético para una baja emisión de fugas a la atmósfera.

⑦ Los anillos de sello son soldados al cuerpo para proporcionar un sello entre la unión y de esta manera evitar fugas.

⑧ El recubrimiento de stellite 6 en la zona de sello de los anillos de asiento proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión en servicio, dando mayor vida útil al producto.

⑨ La brida prensa empaque y el buje prensa-empaques se suministran en dos piezas separadas para evitar dañar el vástago por mala alineación durante el apriete de los empaques.

⑩ Las válvulas de compuerta son suministradas con volante y/u operador de engranes por diseño.



# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO CLASE 600 (OPERACIÓN CON VOLANTE)

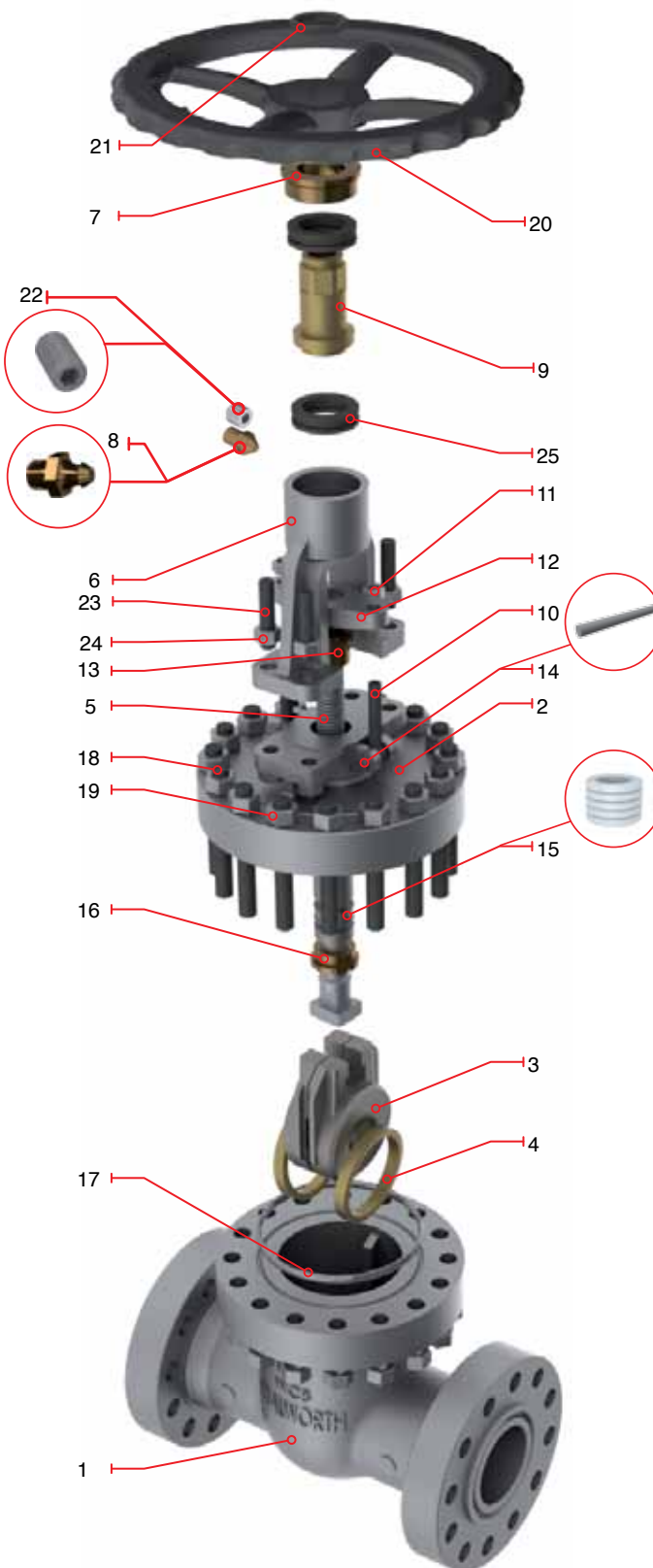
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 2" a 20" de diámetro se suministra con volante como estándar.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5232RF     | 5232F                 | Bridados Cara Realzada, Cara Plana |
| 5232RTJ    | 5232RJ                | Bridados Junta Tipo Anillo         |
| 5232WE     | 5232WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                 |
|-----|-------------------------|-----------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB           |
| 2   | Bonete                  | ASTM A 216 GR WCB           |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr. |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST6      |
| 5   | Vástago                 | ASTM A 276 Type 410         |
| 6   | Yugo                    | ASTM A 216 GR WCB           |
| 7   | Tuerca Retén            | ASTM A 36                   |
| 8   | Grasera                 | Acero Comercial             |
| 9   | Tuerca Vástago          | UNS C95600 or Ni-Resist     |
| 10  | Tornillo de Ojo         | Acero Aleado                |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                  |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70            |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020          |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                |
| 15  | Empaque de Vástago      | Grafito                     |
| 16  | Casquillo               | ASTM A 276 Type 410         |
| 17  | Junta                   | ASTM A 108 GR 1010          |
| 18  | Espárrago               | ASTM A 193 GR B7            |
| 19  | Tuerca Espárrago        | ASTM A 194 GR 2H            |
| 20  | Volante                 | ASTM A 197                  |
| 21  | Tuerca Volante          | ASTM A 108 GR 1020          |
| 22  | Opresor Tuerca Retén    | Acero Aleado                |
| 23  | Tornillo de Yugo        | Acero Aleado                |
| 24  | Tuerca Tornillo de Yugo | ASTM A 307                  |
| 25  | Rodamientos             | Acero Comercial             |
| *26 | Sello de Aceite         | Rubber/Acero Comercial      |
| *27 | Placa de Identificación | Acero Inoxidable            |

\*No mostrado



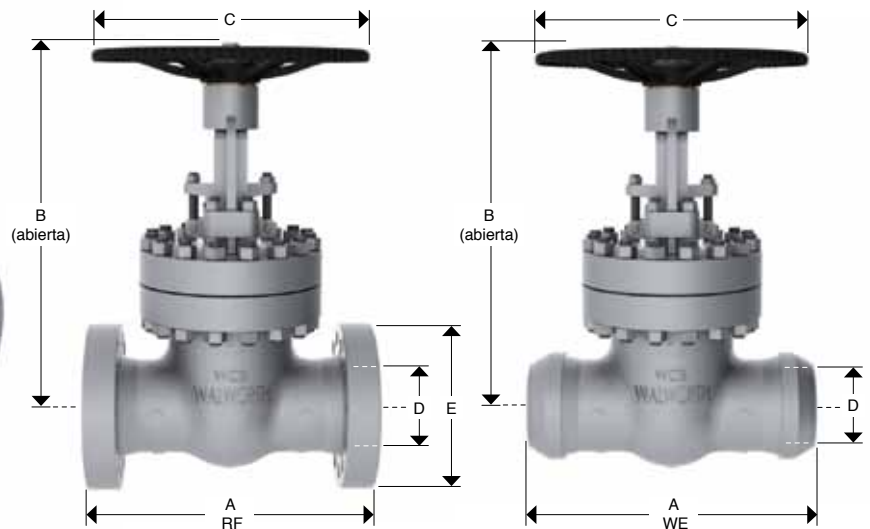
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 600 (OPERACIÓN CON VOLANTE)



- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 2" a 20" de diámetro se suministra con volante como estándar.
- Dimensiones de bridas según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5232RF     | 5232F                 | Bridados Cara Realzada, Cara Plana |
| 5232RTJ    | 5232RJ                | Bridados Junta Tipo Anillo         |
| 5232WE     | 5232WE                | Soldable                           |



| D<br>Diámetro<br>Nominal | 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<br>(RF y 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<br>(RTJ)               | mm | 295    | 333    | 359    | 435    | 562     | 663    | 790      | 841      | 892      | 994     | 1095   |
|                          | 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 |
| Peso<br>5232RF/RTJ       | Kg | 37     | 53     | 65     | 115    | 224     | 440    | 653      | 863      | 1141     | 1565    | 2560   |
|                          | lb | 80.3   | 116.6  | 143    | 253    | 492.8   | 968    | 1436.6   | 1898.6   | 2510.2   | 3443    | 5632   |
| Peso<br>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 |



# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO CLASE 600 (OPERACIÓN CON CAJA DE ENGRANES)

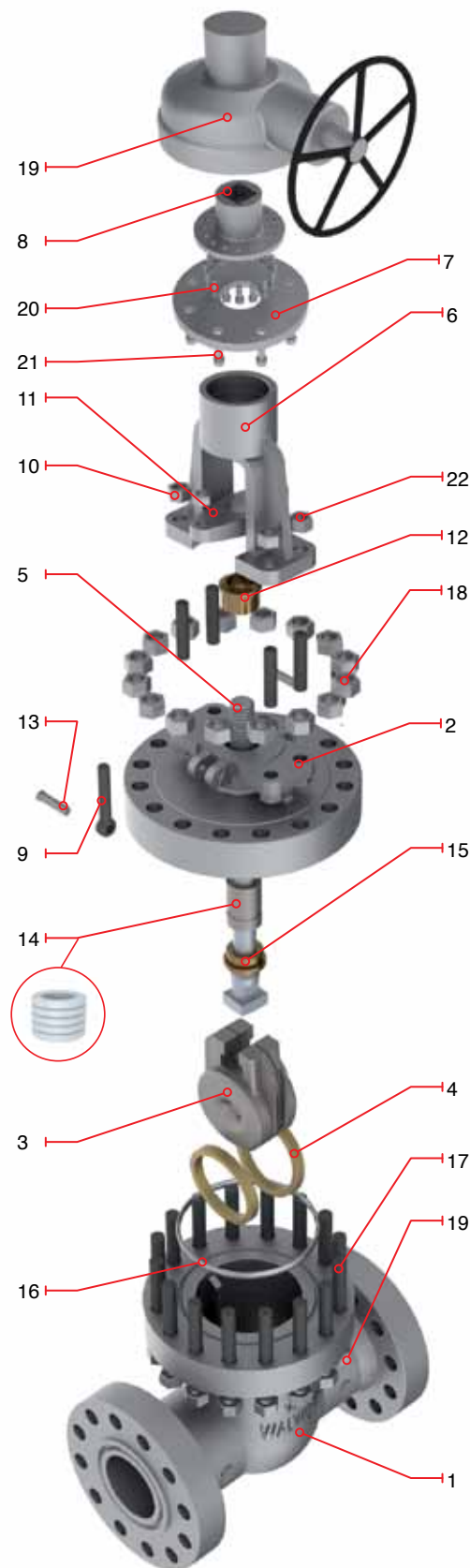
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 24" a 36" de diámetro se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 6" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5232RF     | 5232F                 | Bridados Cara Realzada, Cara Plana |
| 5232RTJ    | 5232RJ                | Bridados Junta Tipo Anillo         |
| 5232WE     | 5232WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                      |
|-----|-------------------------|----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                |
| 2   | Bonete                  | ASTM A 216 GR WCB                |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr.      |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST6           |
| 5   | Vástago                 | ASTM A 276 Type 410              |
| 6   | Yugo                    | ASTM A 216 GR WCB                |
| 7   | Tuerca Retén            | ASTM A 36                        |
| 8   | Tuerca Vástago          | ASTM B 148 UNS C95600            |
| 9   | Tornillo de Ojo         | Acero Aleado                     |
| 10  | Tuerca Tornillo de Ojo  | ASTM A 307                       |
| 11  | Brida Prensa Empaques   | ASTM A 515 GR 70                 |
| 12  | Buje Prensa Empaque     | ASTM A 108 GR 1020               |
| 13  | Perno Tornillo de Ojo   | Acero Aleado                     |
| 14  | Empaque de Vástago      | Grafito                          |
| 15  | Casquillo               | ASTM A 276 Type 410              |
| 16  | Junta                   | ASTM A 108 GR 1010               |
| 17  | Espárrago               | ASTM A 193 GR B7                 |
| 18  | Tuerca Espárrago        | ASTM A 194 GR 2H                 |
| 19  | Operador de Engranés    | Según requerimientos del cliente |
| 20  | Tornillos del Operador  | Acero Aleado                     |
| 21  | Tornillo de Yugo        | Acero Aleado                     |
| *22 | Tuerca Tornillo de Yugo | ASTM A 307                       |
| *23 | Placa de Identificación | Acero Inoxidable                 |

\*No mostrado

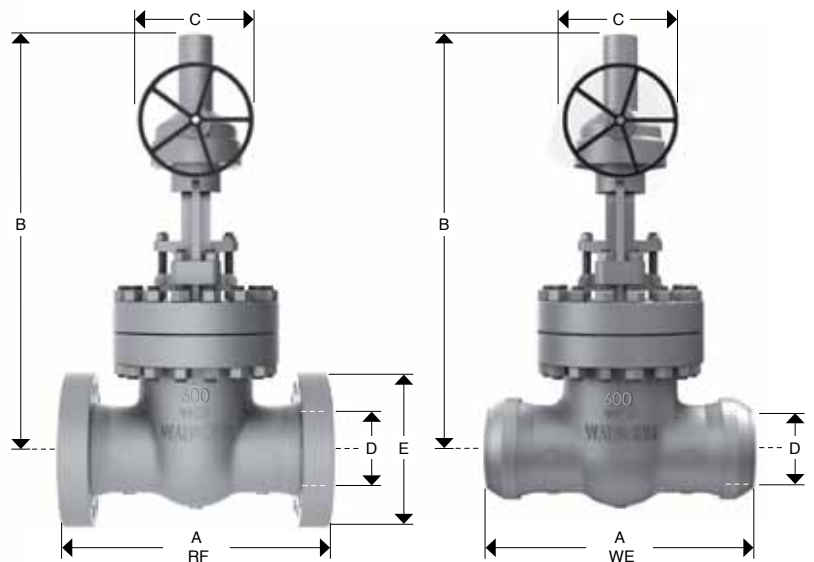


# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 600 (OPERACIÓN CON CAJA DE ENGRANES)

- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 24" a 36" de diámetro se suministra con Operador de Engranés.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID de Fábrica | Tipo de Extremos                   |
|------------|--------------------------|------------------------------------|
| 5232RF     | 5232F                    | Bridados Cara Realzada, Cara Plana |
| 5232RTJ    | 5232RJ                   | Bridados Junta Tipo Anillo         |
| 5232WE     | 5232WE                   | Soldable                           |



### Dimensiones y Pesos

| D                | mm | 508    | 610    | 762    | 914    |
|------------------|----|--------|--------|--------|--------|
| Diametro Nominal | in | 20     | 24     | 30     | 36     |
| A                | mm | 1,194  | 1,397  | 1,651  | 2,083  |
| (RF y WE)        | in | 47     | 55     | 65     | 82     |
| A                | mm | 1200   | 1,407  | 1,664  | 2,099  |
| (RTJ)            | 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 |
| Peso             | Kg | 3000   | 4300   | 9890   | 14000  |
| 5232RF/RTJ       | lb | 6600   | 9460   | 21758  | 30800  |
| Peso             | Kg | 2705   | 3901   | 8406   | 11900  |
| 5232WE           | lb | 5951   | 8582   | 18493  | 26180  |

# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 900

VÁLVULA DE COMPUERTA TIPO OS&Y CON YUGO, VOLANTE FIJO Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DE DISEÑO

- Válvula de compuerta diseñada de acuerdo con API-600,
- Compuerta flexible o tipo caras paralelas.
- Alternativa para Válvulas de compuerta de acuerdo con API-603, solamente en acero inoxidable y aleaciones de níquel (consulte catálogo para esta línea).
- Válvula de Compuerta para servicio criogénico con columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas hasta 24" de diámetro nominal.
- Volante, volante de impacto, operador de cadena, operador de engrane, actuador eléctrico, actuador neumático e hidráulico a requerimiento del cliente.
- By-Pass, buje linterna, cámara de condensados, inyector de grasa, conexiones especiales, etc
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó MR-01-03.
- Pruebas de acuerdo con API-598.

① Tuerca de Vástago giratoria, intercambiable en línea para evitar paros por mantenimiento.

② Vástago ascendente con rosca ACME con entrada sencilla o doble para una operación rápida. Acabado fino para adecuado para sellar perfectamente y obtener bajas emisiones de fugas

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado pulido en el área de sello del vástago, las estrictas tolerancias diametrales y el paralelismo de los empaques contra la cámara de empaques. Arreglo de empaques con carga viva están disponibles a solicitud del Cliente.

④ Superficie de sello del casquillo, ya sea roscado o soldado diseñado para aliviar la presión trasera en el empaque del vástago cuando esta completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

⑤ El engarce vástago-compuerta esta diseñado para soportar fuertes cargas de operación y, en caso necesario, que el vástago rompa fuera de los límites de las áreas sometidas a presión (interior del cuerpo-bonete).

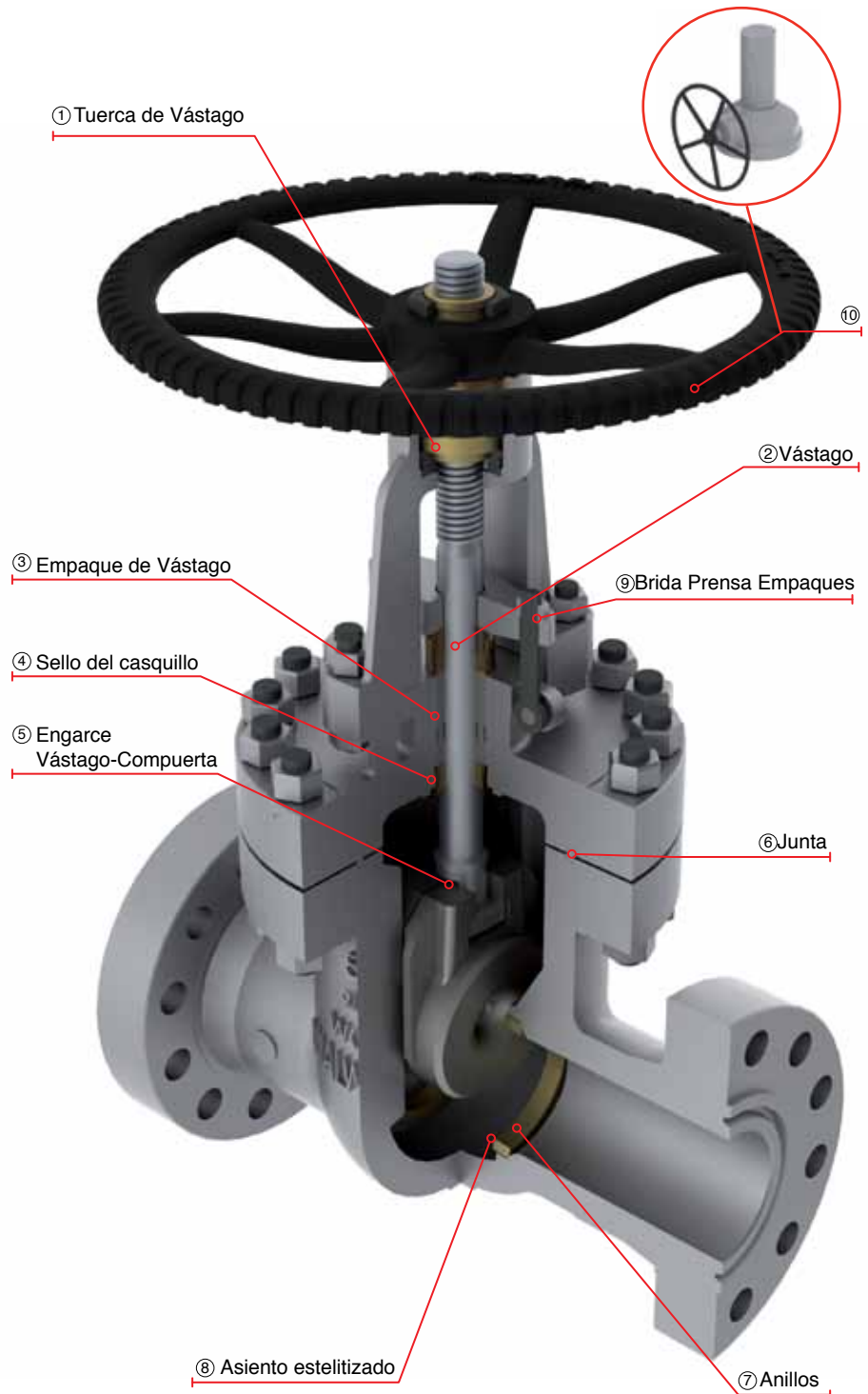
⑥ La unión Cuerpo - Bonete está diseñada para aplicar una carga uniforme a la junta, asegurando el sello hermético para una baja emisión de fugas a la atmósfera.

⑦ Los anillos de sello son soldados al cuerpo para proporcionar un sello entre la unión y de esta manera evitar fugas.

⑧ El recubrimiento de stellite 6 en la zona de sello de los anillos de asiento proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión en servicio, dando mayor vida útil al producto.

⑨ La brida prensa empaque y el buje prensa-empaques se suministran en dos piezas separadas para evitar dañar el vástago por mala alineación durante el apriete de los empaques.

⑩ Las válvulas de compuerta son suministradas con volante y/u operador de engranes por diseño.



# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 900 (OPERACIÓN CON VOLANTE)

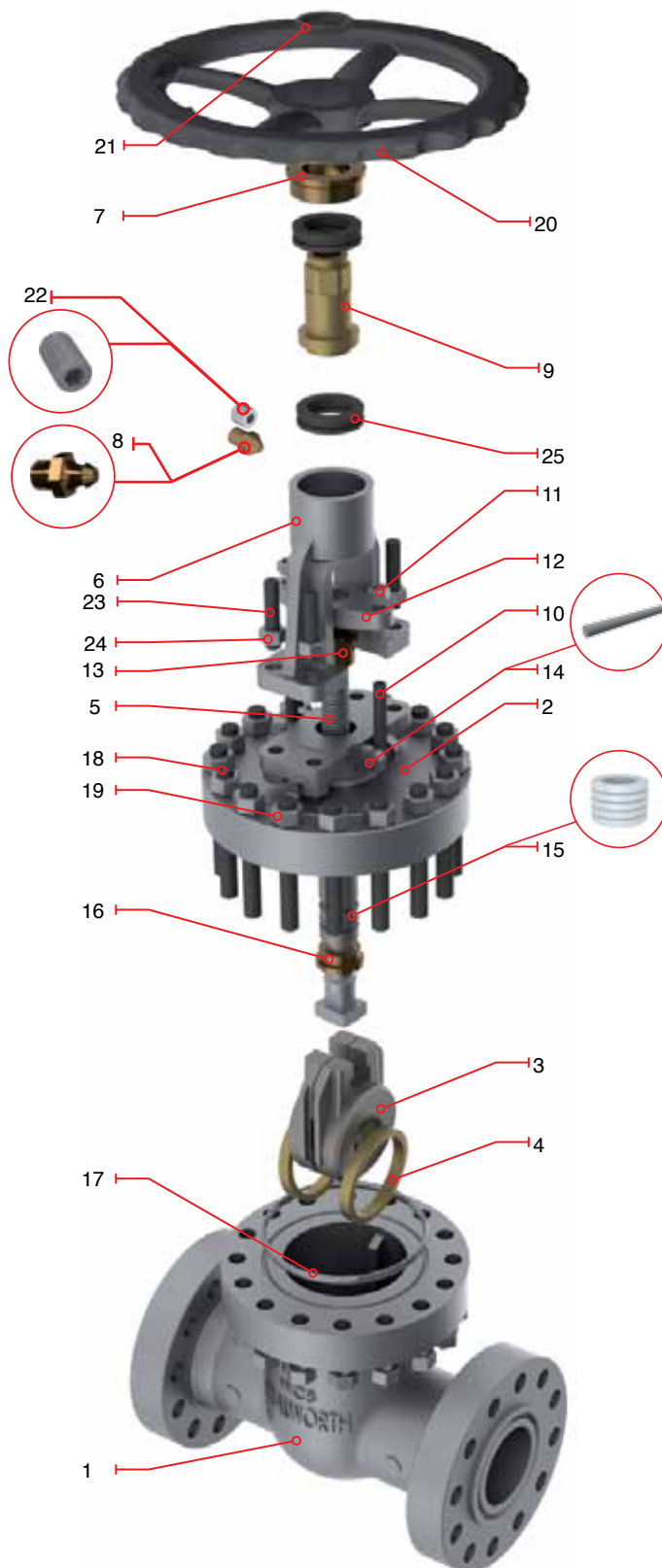
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 2" a 16" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5247RF     | 5247F                 | Bridados Cara Realzada, Cara Plana |
| 5247RTJ    | 5247RJ                | Bridados Junta Tipo Anillo         |
| 5247WE     | 5247WE                | Soldable                           |

### Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                 |
|-----|-------------------------|-----------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB           |
| 2   | Bonete                  | ASTM A 216 GR WCB           |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr. |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST6      |
| 5   | Vástago                 | ASTM A 276 Type 410         |
| 6   | Yoke                    | ASTM A 216 GR WCB           |
| 7   | Tuerca Retén            | ASTM A 36                   |
| 8   | Grasera                 | Acero Comercial             |
| 9   | Tuerca Vástago          | UNS C95600 or Ni-Resist     |
| 10  | Tornillo de Ojo         | Acero Aleado                |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                  |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70            |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020          |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                |
| 15  | Empaque de Vástago      | Grafito                     |
| 16  | Casquillo               | ASTM A 276 Type 410         |
| 17  | Junta                   | ASTM A 108 GR 1010          |
| 18  | Espárrago               | ASTM A 193 GR B7            |
| 19  | Tuerca Espárrago        | ASTM A 194 GR 2H            |
| 20  | Volante                 | ASTM A 197                  |
| 21  | Tuerca Volante          | ASTM A 108 GR 1020          |
| 22  | Opresor Tuerca Retén    | Acero Aleado                |
| 23  | Tornillo de Yugo        | Acero Aleado                |
| 24  | Tuerca Tornillo de Yugo | ASTM A 307                  |
| 25  | Tuerca Vástago Bearing  | Acero Comercial             |
| *26 | Tuerca Vástago Oil Seal | Rubber/Acero Comercial      |
| *27 | Placa de Identificación | Acero Inoxidable            |

\*No mostrado





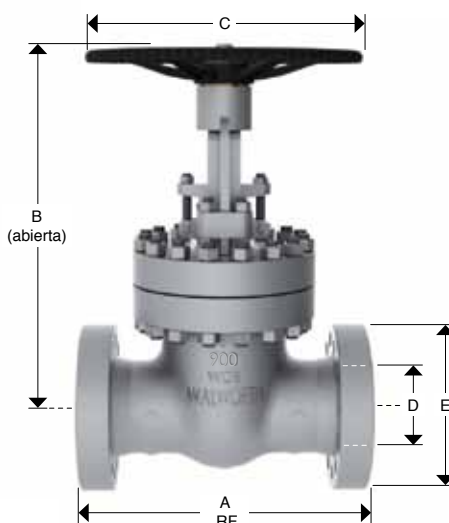
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 900 (OPERACIÓN CON VOLANTE)



- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 2" a 16" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5247RF     | 5247F                 | Bridados Cara Realzada, Cara Plana |
| 5247RTJ    | 5247RJ                | Bridados Junta Tipo Anillo         |
| 5247WE     | 5247WE                | Soldable                           |



### Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 76     | 102    | 127    | 152     | 203    | 254    | 305    |
|--------------------------|----|--------|--------|--------|---------|--------|--------|--------|
|                          | in | 3      | 4      | 5      | 6       | 8      | 10     | 12     |
| A<br>(RF y WE)           | mm | 381    | 457    | 559    | 610     | 737    | 838    | 965    |
|                          | in | 15     | 18     | 22     | 24      | 29     | 33     | 38     |
| A<br>(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     |
| Peso<br>5247 RF/RTJ      | Kg | 106.5  | 153    | 367    | 352     | 542    | 905    | 1385   |
|                          | lb | 212    | 336.6  | 807.4  | 774.4   | 1192.4 | 1991   | 3047   |
| Peso<br>5247 WE          | Kg | 95     | 136    | 327    | 313     | 482    | 805    | 1233   |
|                          | lb | 209    | 300    | 719    | 689     | 1061   | 1772   | 2712   |

# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 900 (OPERACIÓN CON CAJA DE ENGRANES)

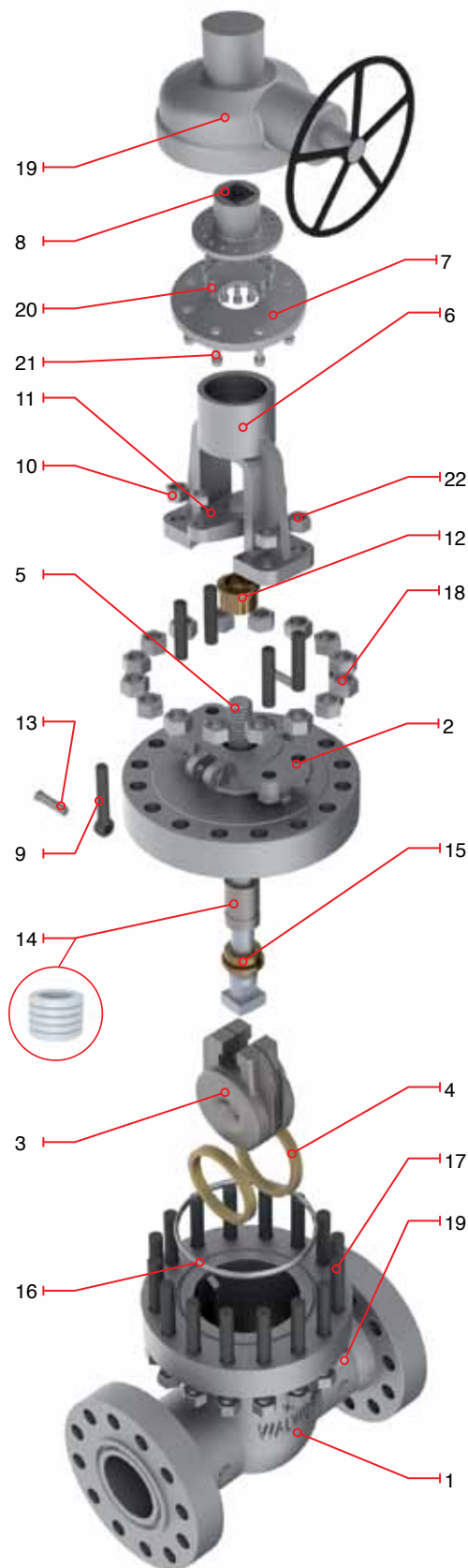
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 18" a 24" de diámetro se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5247RF     | 5247F                 | Bridados Cara Realzada, Cara Plana |
| 5247RTJ    | 5247RJ                | Bridados Junta Tipo Anillo         |
| 5247WE     | 5247WE                | Soldable                           |

### Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                      |
|-----|-------------------------|----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                |
| 2   | Bonete                  | ASTM A 216 GR WCB                |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr.      |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST6           |
| 5   | Vástago                 | ASTM A 276 Type 410              |
| 6   | Yoke                    | ASTM A 216 GR WCB                |
| 7   | Tuerca Retén            | ASTM A 36                        |
| 8   | Tuerca Vástago          | ASTM B 148 UNS C95600            |
| 9   | Tornillo de Ojo         | Acero Aleado                     |
| 10  | Tuerca Tornillo de Ojo  | ASTM A 307                       |
| 11  | Brida Prensa Empaques   | ASTM A 515 GR 70                 |
| 12  | Buje Prensa Empaque     | ASTM A 108 GR 1020               |
| 13  | Perno Tornillo de Ojo   | Acero Aleado                     |
| 14  | Empaque de Vástago      | Grafito                          |
| 15  | Casquillo               | ASTM A 276 Type 410              |
| 16  | Junta                   | ASTM A 108 GR 1010               |
| 17  | Espárrago               | ASTM A 193 GR B7                 |
| 18  | Tuerca Espárrago        | ASTM A 194 GR 2H                 |
| 19  | Operador de Engranés    | Según requerimientos del cliente |
| 20  | Tornillos del Operador  | Acero Aleado                     |
| 21  | Tornillo de Yugo        | Acero Aleado                     |
| *22 | Tuerca Tornillo de Yugo | ASTM A 307                       |
| *23 | Placa de Identificación | Acero Inoxidable                 |

\*No mostrado



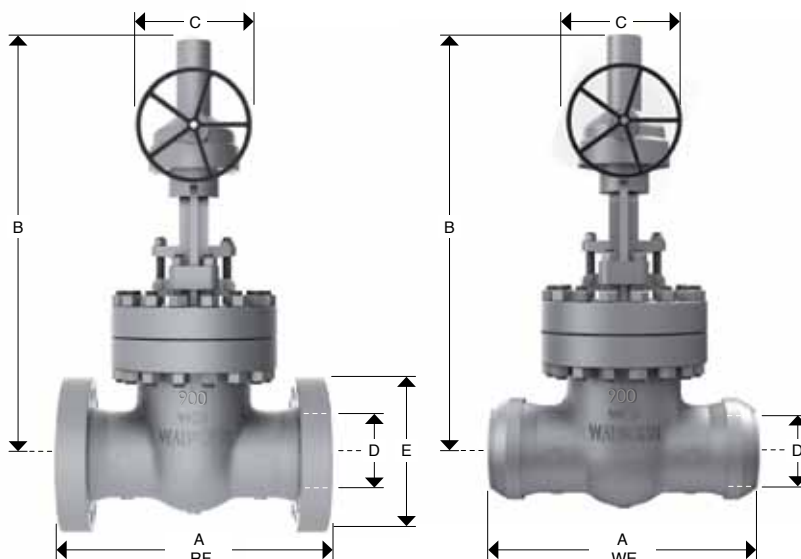
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 900 (OPERACIÓN CON CAJA DE ENGRANES)

- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 18" a 24" de diámetro se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.



| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5247RF     | 5247F                 | Bridados Cara Realzada, Cara Plana |
| 5247RTJ    | 5247RJ                | Bridados Junta Tipo Anillo         |
| 5247WE     | 5247WE                | Soldable                           |



### Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 356    | 406    | 457  | 508    | 610   |
|--------------------------|----|--------|--------|------|--------|-------|
|                          | in | 14     | 16     | 18   | 20     | 24    |
| A<br>(RF y WE)           | mm | 1029   | 1130   | 1219 | 1321   | 1549  |
|                          | in | 40 1/2 | 44 1/2 | 48   | 52     | 61    |
| A<br>(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    |
| Peso<br>5247RF/RTJ       | Kg | 2778   | 3459   | 4370 | 6300   | 8410  |
|                          | lb | 6111.6 | 7609.8 | 9614 | 13860  | 18502 |
| Peso<br>5247WE           | Kg | 2472   | 3079   | 3889 | 5607   | 7485  |
|                          | lb | 5439   | 6773   | 8556 | 12335  | 16467 |

# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

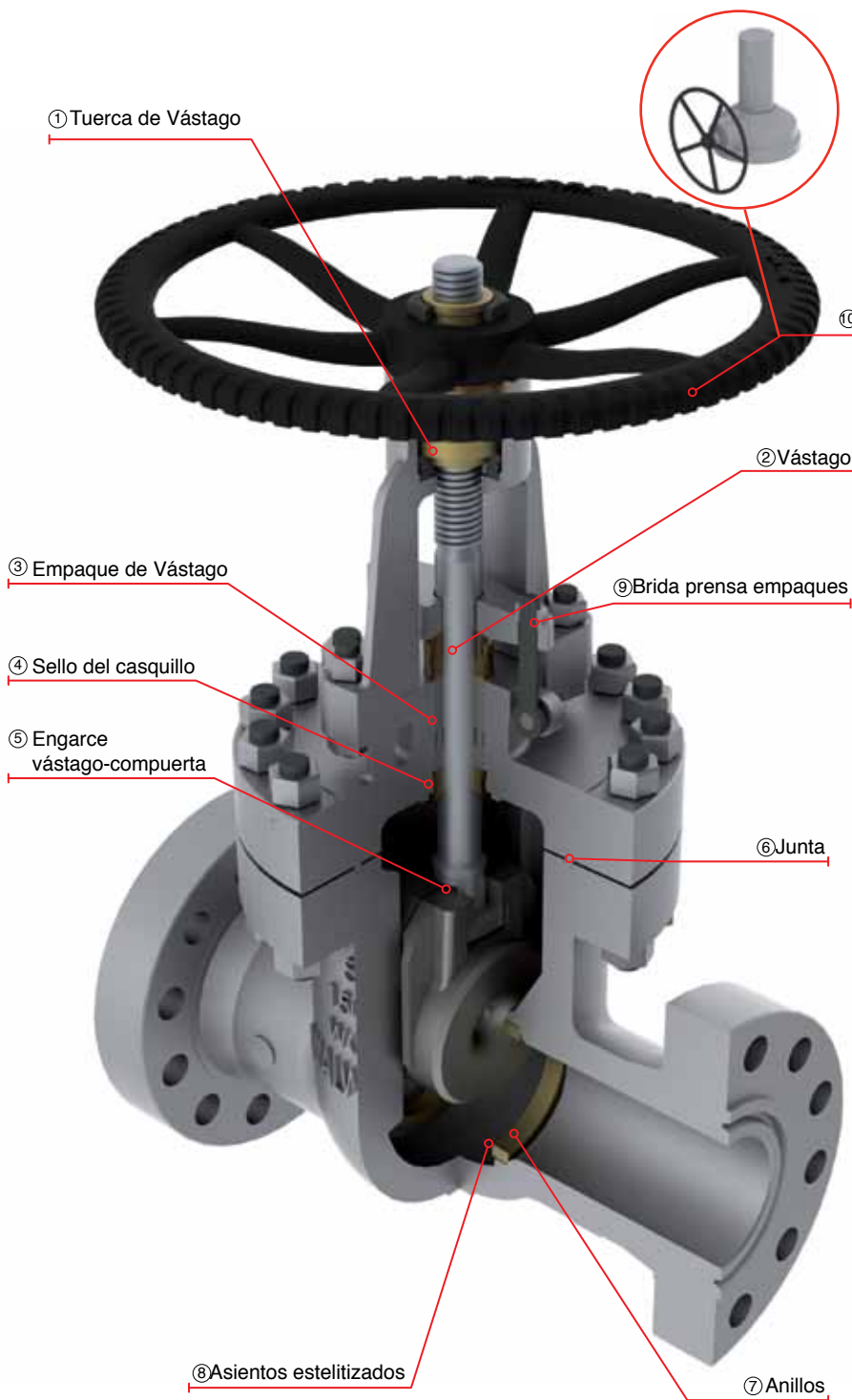
## CLASE 1500

VÁLVULA DE COMPUERTA TIPO OS&Y CON YUGO, VOLANTE FIJO Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DE DISEÑO

- Válvula de compuerta diseñada de acuerdo con API-600,
- Compuerta flexible o tipo caras paralelas.
- Alternativa para Válvulas de compuerta de acuerdo con API-603, solamente en acero inoxidable y aleaciones de níquel (consulte catálogo para esta línea).
- Válvula de Compuerta para servicio criogénico con columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas hasta 24" de diámetro nominal.
- Volante, volante de impacto, operador de cadena, operador de engrane, actuador eléctrico, actuador neumático e hidráulico a requerimiento del cliente.
- By-Pass, buje linterna, cámara de condensados, inyector de grasa, conexiones especiales, etc
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó MR-01-03.
- Pruebas de acuerdo con API-598.

- ① Tuerca de Vástago giratoria, intercambiable en línea para evitar paros por mantenimiento.
- ② Vástago ascendente con rosca ACME con entrada sencilla o doble para una operación rápida. Acabado fino para adecuado para sellar perfectamente y obtener bajas emisiones de fugas
- ③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado pulido en el área de sello del vástago, las estrictas tolerancias diametrales y el paralelismo de los empaques contra la cámara de empaques. Arreglo de empaques con carga viva están disponibles a solicitud del Cliente.
- ④ Superficie de sello posterior, ya sea roscado o soldado diseñado para aliviar la presión trasera en el empaque del vástago cuando esta completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.
- ⑤ El engarce vástago-compuerta esta diseñado para soportar fuertes cargas de operación y, en caso necesario, que el vástago rompa fuera de los límites de las áreas sometidas a presión (interior del cuerpo-bonete).
- ⑥ La unión cuerpo-bonete está diseñada para aplicar una carga uniforme a la junta, asegurando el sello hermético para una baja emisión de fugas a la atmósfera.
- ⑦ Los anillos de sello son soldados al cuerpo para proporcionar un sello entre la unión y de esta manera evitar fugas.
- ⑧ El recubrimiento de stellite 6 en la zona de sello de los anillos de asiento proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión en servicio, dando mayor vida útil al producto.
- ⑨ La brida prensa empaque y el buje prensa-empaques se suministran en dos piezas separadas para evitar dañar el vástago por mala alineación durante el apriete de los empaques.
- ⑩ Las válvulas de compuerta son suministradas con volante y/u operador de engranes por diseño.





# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO CLASE 1500 (OPERACIÓN CON VOLANTE)

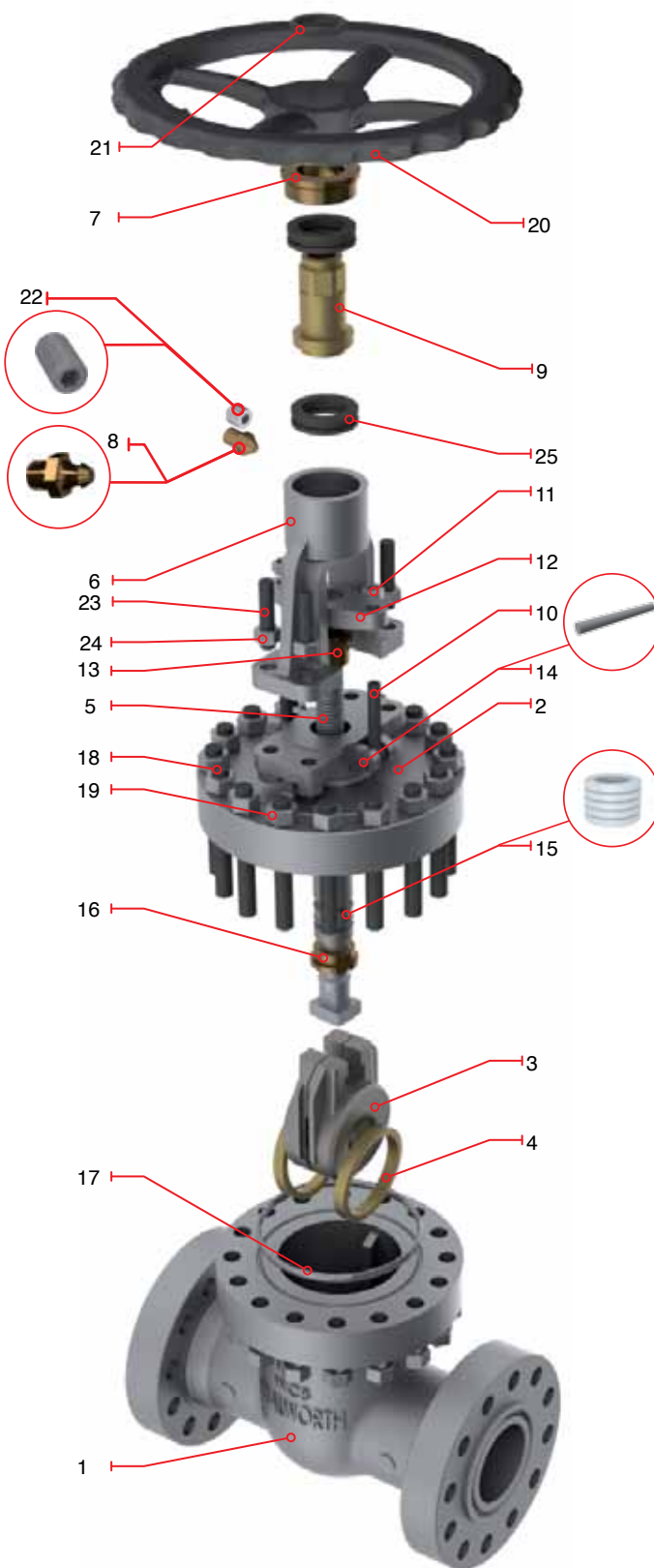
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 2" a 16" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5262RF     | 5262F                 | Bridados Cara Realzada, Cara Plana |
| 5262RTJ    | 5262RJ                | Bridados Junta Tipo Anillo         |
| 5262WE     | 5262WE                | Soldable                           |

## Partes y materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                 |
|-----|-------------------------|-----------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB           |
| 2   | Bonete                  | ASTM A 216 GR WCB           |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr. |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST6      |
| 5   | Vástago                 | ASTM A 276 Type 410         |
| 6   | Yugo                    | ASTM A 216 GR WCB           |
| 7   | Tuerca Retén            | ASTM A 36                   |
| 8   | Grasera                 | Acero Comercial             |
| 9   | Tuerca Vástago          | UNS C95600 or Ni-Resist     |
| 10  | Tornillo de Ojo         | Acero Aleado                |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                  |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70            |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020          |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                |
| 15  | Empaque de Vástago      | Grafito                     |
| 16  | Casquillo               | ASTM A 276 Type 410         |
| 17  | Junta                   | ASTM A 108 GR 1010          |
| 18  | Espárrago               | ASTM A 193 GR B7            |
| 19  | Tuerca Espárrago        | ASTM A 194 GR 2H            |
| 20  | Volante                 | ASTM A 197                  |
| 21  | Tuerca Volante          | ASTM A 108 GR 1020          |
| 22  | Opresor Tuerca Retén    | Acero Aleado                |
| 23  | Tornillo de Yugo        | Acero Aleado                |
| 24  | Tuerca Tornillo de Yugo | ASTM A 307                  |
| 25  | Tuerca Vástago Bearing  | Acero Comercial             |
| *26 | Tuerca Vástago Oil Seal | Rubber/Acero Comercial      |
| *27 | Placa de Identificación | Acero Inoxidable            |

\*No mostrado



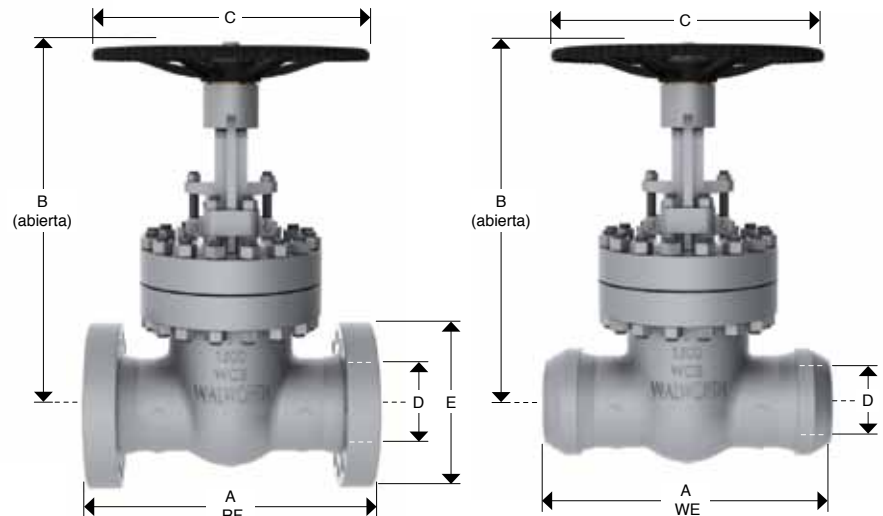
# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 1500 (OPERACIÓN CON VOLANTE)



- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 2" a 16" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5262RF     | 5262F                 | Bridados Cara Realzada, Cara Plana |
| 5262RTJ    | 5262RJ                | Bridados Junta Tipo Anillo         |
| 5262WE     | 5262WE                | Soldable                           |



### Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 51     | 64     | 76     | 102    | 127    | 152    | 203    | 254    | 305    |
|--------------------------|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                          | in | 2      | 2 1/2  | 3      | 4      | 5      | 6      | 8      | 10     | 12     |
| A<br>(RF y 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<br>(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 |
| Peso<br>5262RF/RTJ       | Kg | 78.5   | 99     | 140    | 209    | 510    | 523    | 893    | 2010   | 3080   |
|                          | lb | 173    | 218    | 308    | 460    | 1122   | 1151   | 1965   | 4422   | 6776   |
| Peso<br>5262WE           | Kg | 56     | 67     | 97     | 141    | 383    | 402    | 700    | 1685   | 2600   |
|                          | lb | 123    | 148    | 214    | 311    | 844    | 886    | 1543   | 3714   | 5732   |

# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO CLASE 1500 (OPERACIÓN CON CAJA DE ENGRANES)

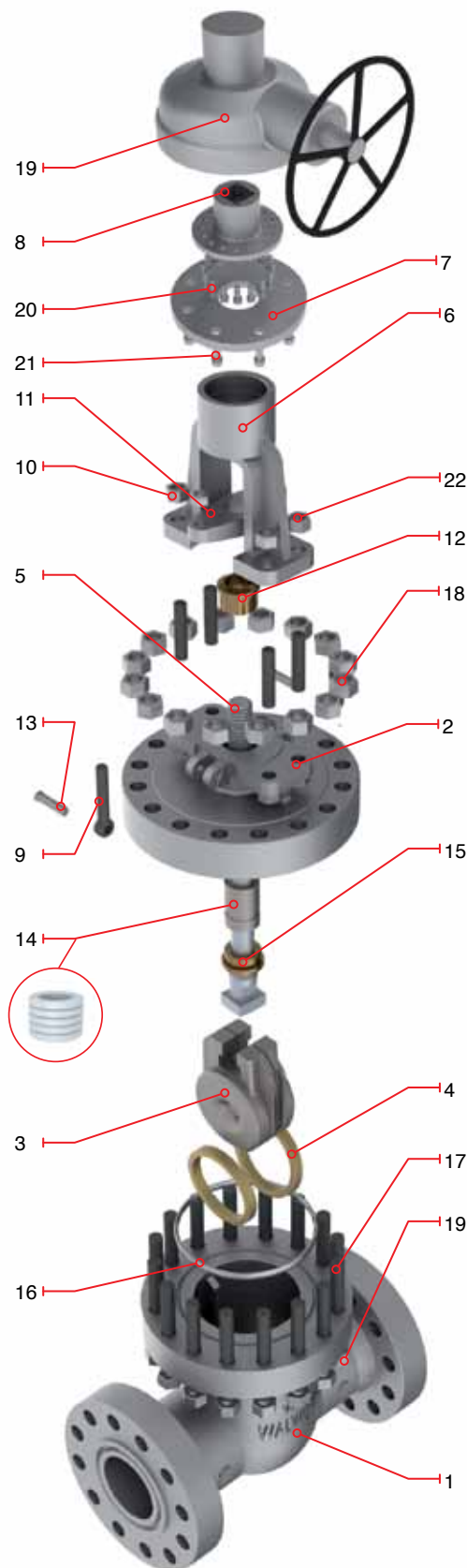
- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 18" a 24" de diámetro se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5262RF     | 5262F                 | Bridados Cara Realzada, Cara Plana |
| 5262RTJ    | 5262RJ                | Bridados Junta Tipo Anillo         |
| 5262WE     | 5262WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                      |
|-----|-------------------------|----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                |
| 2   | Bonete                  | ASTM A 216 GR WCB                |
| 3   | Compuerta               | ASTM A 216 GR WCB + 13% Cr.      |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST6           |
| 5   | Vástago                 | ASTM A 276 Type 410              |
| 6   | Yugo                    | ASTM A 216 GR WCB                |
| 7   | Tuerca Retén            | ASTM A 36                        |
| 8   | Tuerca Vástago          | ASTM B 148 UNS C95600            |
| 9   | Tornillo de Ojo         | Acero Aleado                     |
| 10  | Tuerca Tornillo de Ojo  | ASTM A 307                       |
| 11  | Brida Prensa Empaques   | ASTM A 515 GR 70                 |
| 12  | Buje Prensa Empaque     | ASTM A 108 GR 1020               |
| 13  | Perno Tornillo de Ojo   | Acero Aleado                     |
| 14  | Empaque de Vástago      | Grafito                          |
| 15  | Casquillo               | ASTM A 276 Type 410              |
| 16  | Junta                   | ASTM A 108 GR 1010               |
| 17  | Espárrago               | ASTM A 193 GR B7                 |
| 18  | Tuerca Espárrago        | ASTM A 194 GR 2H                 |
| 19  | Operador de Engranés    | Según requerimientos del cliente |
| 20  | Tornillos del Operador  | Acero Aleado                     |
| 21  | Tornillo de Yugo        | Acero Aleado                     |
| *22 | Tuerca Tornillo de Yugo | ASTM A 307                       |
| *23 | Placa de Identificación | Acero Inoxidable                 |

\*No mostrado

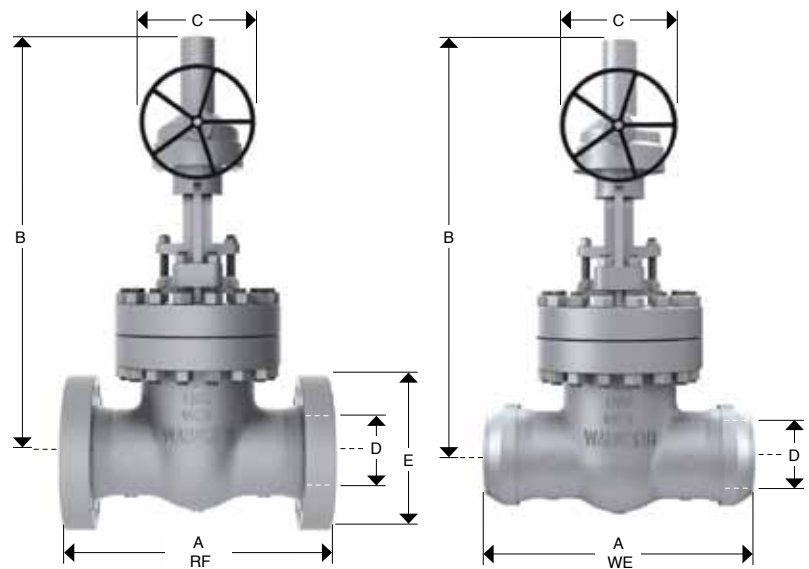


# VÁLVULA DE COMPUERTA BONETE BRIDADO FUNDIDO

## CLASE 1500 (OPERACIÓN CON CAJA DE ENGRANES)

- Diseño de acuerdo con API-600.
- Válvulas tipo OS&Y con volante fijo y vástago ascendente.
- Compuerta flexible como estándar.
- De 18" a 24" de diámetro se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5262RF     | 5262F                 | Bridados Cara Realzada, Cara Plana |
| 5262RTJ    | 5262RJ                | Bridados Junta Tipo Anillo         |
| 5262WE     | 5262WE                | Soldable                           |



### Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 356    | 406    | 457    | 508    | 610    |
|--------------------------|----|--------|--------|--------|--------|--------|
|                          | in | 14     | 16     | 18     | 20     | 24     |
| A<br>(RF y WE)           | mm | 1257   | 1384   | 1537   | 1664   | 1943   |
|                          | in | 49 1/2 | 54 1/2 | 60 1/2 | 65 1/2 | 76 1/2 |
| A<br>(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     |
| Peso<br>5262RF           | Kg | 4480   | 5110   | 7105   | 9000   | 11500  |
|                          | lb | 9856   | 11242  | 15631  | 19800  | 25300  |
| Peso<br>5262WE           | Kg | 3823   | 4270   | 5969   | 8100   | 10350  |
|                          | lb | 8428   | 9413   | 13132  | 17820  | 22770  |



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 150

## VÁLVULA DE GLOBO CON VOLANTE Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas tipo Globo diseñada de acuerdo con API-603.
- Alternativa para Válvulas de Globo de acuerdo con API-603 solamente en acero inoxidable y aleaciones de níquel.
- Válvulas de Globo para servicio criogénico con la columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Volante, volante de impacto, operadores de cadena, operadores de engrane, actuadores eléctricos, actuadores neumáticos e hidráulicos según los requisitos del cliente.
- By-Pass, buje linterna, cámara de condensados, inyector de grasa, conexiones especiales, etc.
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03.
- Pruebas de acuerdo con API-598.
- Válvula de Globo tipo STOP-CHECK disponible.

① Tuerca de Vástago, intercambiable en línea para evitar el cierre de los procesos de tubería.

② Vástago giratorio de tipo ascendente con rosca ACME de precisión simple ó doble para una operación rápida. Acabado fino, adecuado para sellar perfectamente y obtener bajas emisiones fugitivas.

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado de pulido en el área de sello del vástago, la reducidas tolerancias diametrales y la rectitud de los empaques de vástago diseñado especialmente. Empaques de carga viva disponibles bajo solicitud del cliente.

④ Superficie de sello de casquillo, ya sea roscado o soldado, diseñado para aliviar la presión trasera en el empaque del vástago cuando está completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

Conexión vástago-compuerta diseñado para recibir fuertes cargas, y fallar fuera de los límites de la caja de presión.

⑤ Unión cuerpo-bonete diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

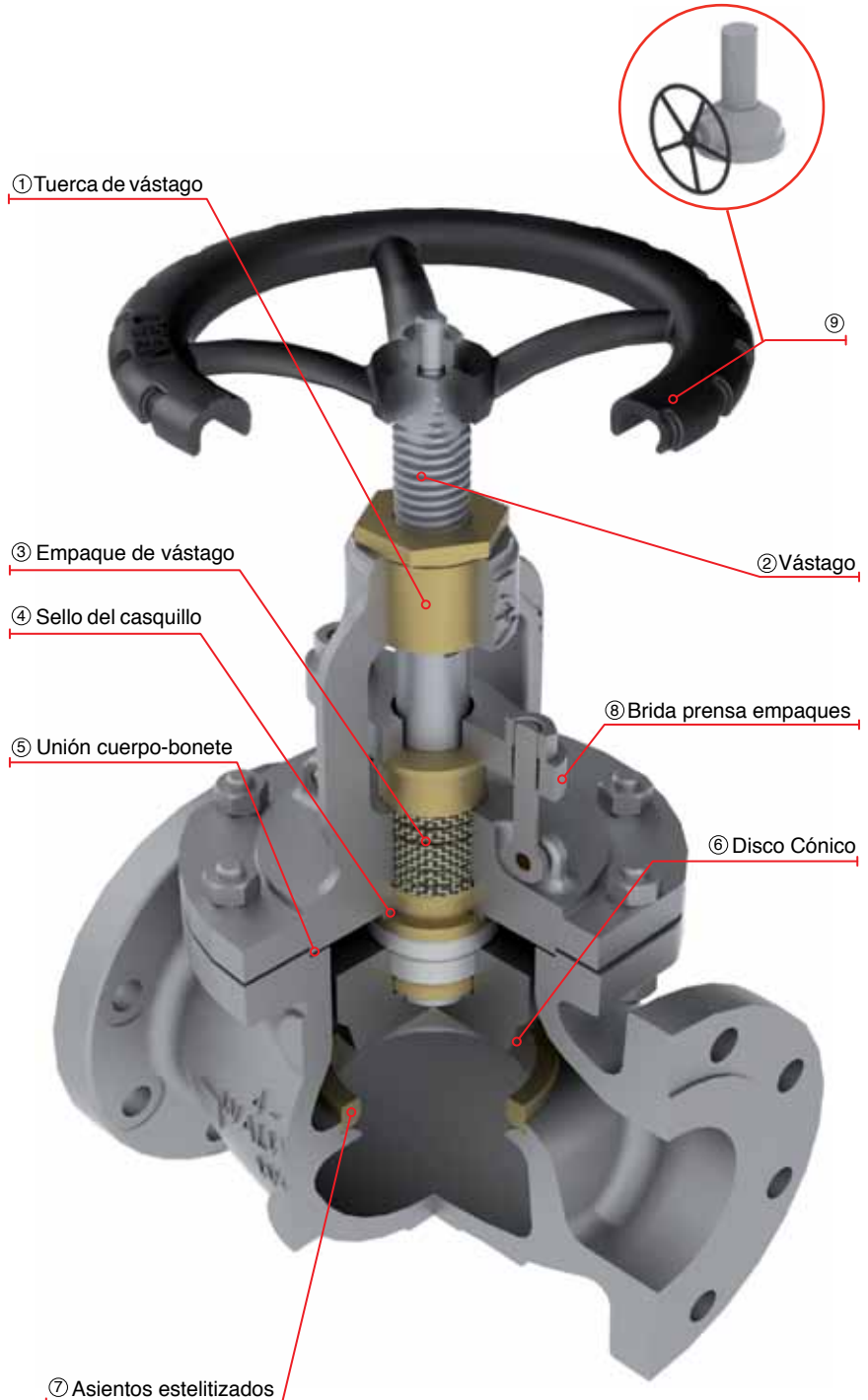
⑥ Disco cónico, totalmente guiado para una verdadera alineación entre el Disco y el cuerpo de la válvula y así evitar atascamientos. El diseño de Disco suelto facilita el sello de éste con el asiento, permitiendo el cierre perfecto de la válvula.

⑦ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑧ Arreglo de dos piezas de la brida y el casquillo para evitar daños de vástago.

⑨ Volante Impactor, mecanismo basado en transmitir el impulso generado por la masa del volante a través del impacto ó impulso generado durante la acción de cierre del volante.

Este tipo de volante se utiliza cuando un volante estándar no puede crear fuerza suficiente para efectuar un sello correcto. Operador de Engranes también está disponible.



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 150 (OPERACIÓN CON VOLANTE)

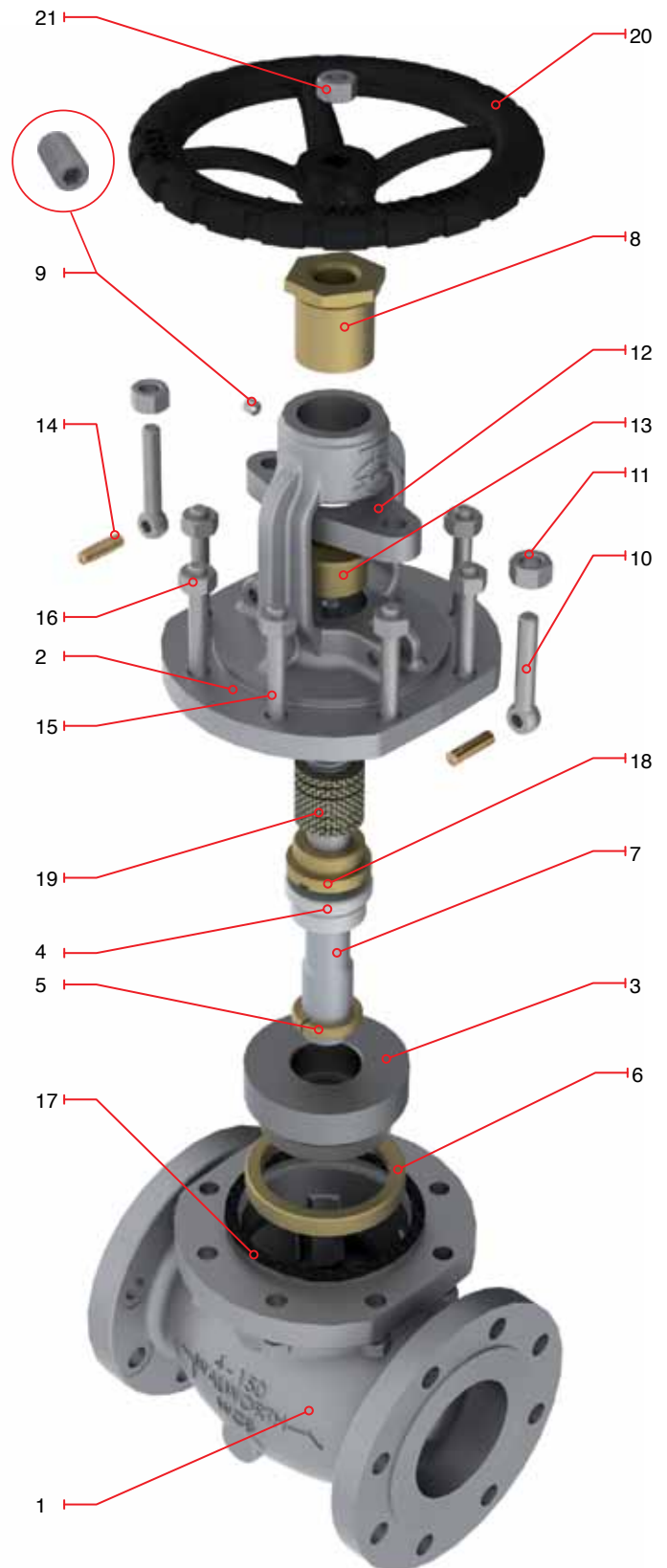
- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente.
- Disco tipo tapón.
- De 2" a 12" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 14" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5275RF     | 5275F                 | Bridados Cara Realzada, Cara Plana |
| 5275RTJ    | 5275RJ                | Bridados Junta Tipo Anillo         |
| 5275WE     | 5275WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | MATERIAL ESTÁNDAR             |
|-----|-------------------------|-------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB             |
| 2   | Bonete                  | ASTM A 216 GR WCB             |
| 3   | Disco                   | ASTM A 276 Type 410           |
| 4   | Tuerca de Disco         | Acero Aleado                  |
| 5   | Seguro                  | ASTM A 276 Type 410           |
| 6   | Asiento                 | ASTM A 515 GR 70 + ST6        |
| 7   | Vástago                 | ASTM A 276 Type 410           |
| 8   | Tuerca Vástago          | ASTM B 148 UNS C95600         |
| 9   | Opresor Tuerca Retén    | Acero Aleado                  |
| 10  | Tornillo de Ojo         | Acero Aleado                  |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                    |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70              |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020            |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                  |
| 15  | Espárrago               | ASTM A 193 GR B7              |
| 16  | Tuerca Espárrago        | ASTM A 194 GR 2H              |
| 17  | Junta                   | Spiral Inoxidable 304/Grafito |
| 18  | Casquillo               | ASTM A 276 Type 410           |
| 19  | Empaque de Vástago      | Grafito                       |
| 20  | Volante                 | ASTM A 197                    |
| 21  | Tuerca Volante          | ASTM A 307                    |
| *22 | Roldana Volante         | Acero Comercial               |
| *23 | Placa de Identificación | Acero Inoxidable              |

\*No mostrado

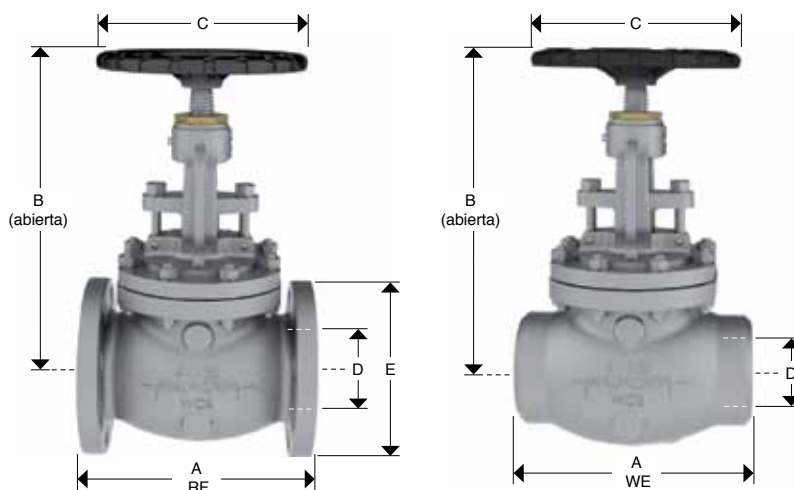


# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 150 (OPERACIÓN CON VOLANTE)



- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente
- Disco tipo tapón
- De 2" a 12" de diámetro se suministra con volante como estándar
- Tuerca vástago y baleros a partir de 14" y mayores
- Dimensiones de brida según ASME B16.5
- Dimensiones de extremo a extremo según ASME B16.10
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5275RF     | 5275F                 | Bridados Cara Realzada, Cara Plana |
| 5275RTJ    | 5275RJ                | Bridados Junta Tipo Anillo         |
| 5275WE     | 5275WE                | Soldable                           |



## Dimensiones y Pesos

| D                | mm | 51       | 64      | 76    | 102    | 152     | 203     | 254     | 305      |
|------------------|----|----------|---------|-------|--------|---------|---------|---------|----------|
| Diametro Nominal | in | 2        | 2 1/2   | 3     | 4      | 6       | 8       | 10      | 12       |
| A                | mm | 203      | 216     | 241   | 292    | 406     | 495     | 622     | 699      |
| (RF y 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       |
| Peso             | Kg | 18       | 29      | 34    | 55     | 100     | 186     | 267     | 399      |
| 5275RF           | lb | 40       | 64      | 75    | 121    | 220     | 409     | 587     | 878      |
| Peso             | Kg | 15       | 25      | 25    | 45     | 84      | 155     | 233     | 341      |
| 5275WE           | lb | 33       | 55      | 55    | 99     | 185     | 341     | 513     | 752      |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 150 (OPERACIÓN CON CAJA DE ENGRANES)

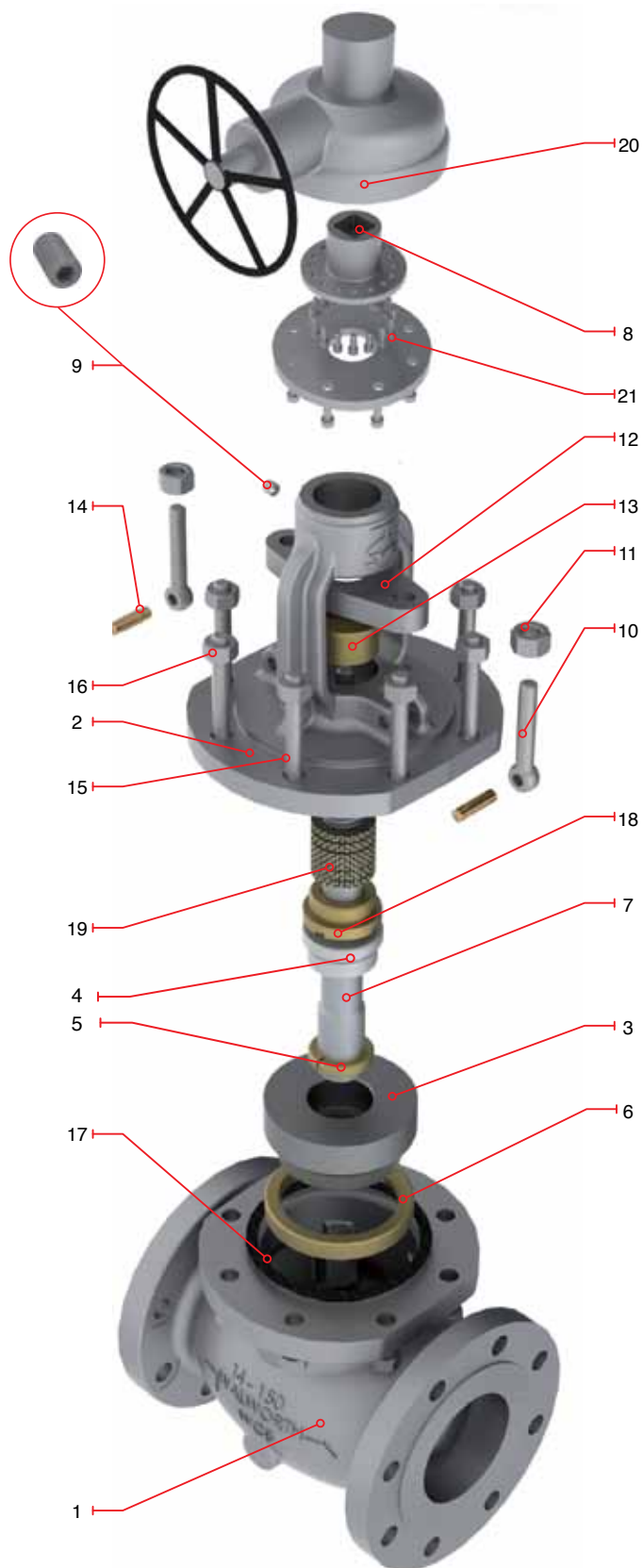
- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente 6" y menores
- Válvulas con vástago ascendente y volante fijo 8" y mayores
- Disco tipo tapón
- De 2" a 12" de diámetro se suministra con volante como estándar
- Tuerca vástago y baleros a partir de 14" y mayores
- Dimensiones de brida según ASME B16.5
- Dimensiones de extremo a extremo según ASME B16.10
- Dimensiones de cara a cara para extremos WE según ASME B16.25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5275RF     | 5275F                 | Bridados Cara Realzada, Cara Plana |
| 5275RTJ    | 5275RJ                | Bridados Junta Tipo Anillo         |
| 5275WE     | 5275WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | MATERIAL ESTÁNDAR                 |
|-----|-------------------------|-----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                 |
| 2   | Bonete                  | ASTM A 216 GR WCB                 |
| 3   | Disco                   | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco         | Acero Aleado                      |
| 5   | Seguro                  | ASTM A 276 Type 410               |
| 6   | Asiento                 | ASTM A 515 GR 70 + ST6            |
| 7   | Vástago                 | ASTM A 276 Type 410               |
| 8   | Tuerca Vástago          | ASTM B 148 UNS C95600 o Ni Resist |
| 9   | Opresor Tuerca Retén    | Acero Aleado                      |
| 10  | Tornillo de Ojo         | Acero Aleado                      |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                        |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70                  |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020                |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                      |
| 15  | Espárrago               | ASTM A 193 GR B7                  |
| 16  | Tuerca Espárrago        | ASTM A 194 GR 2H                  |
| 17  | Junta                   | Spiral Inoxidable 304/Grafito     |
| 18  | Casquillo               | ASTM A 276 Type 410               |
| 19  | Empaque de Vástago      | Grafito                           |
| 20  | Operador de Engranés    | Según requerimientos del cliente  |
| *21 | Tornillos del Operador  | Acero Aleado                      |
| *22 | Placa de Identificación | Acero Inoxidable                  |

\*No mostrado



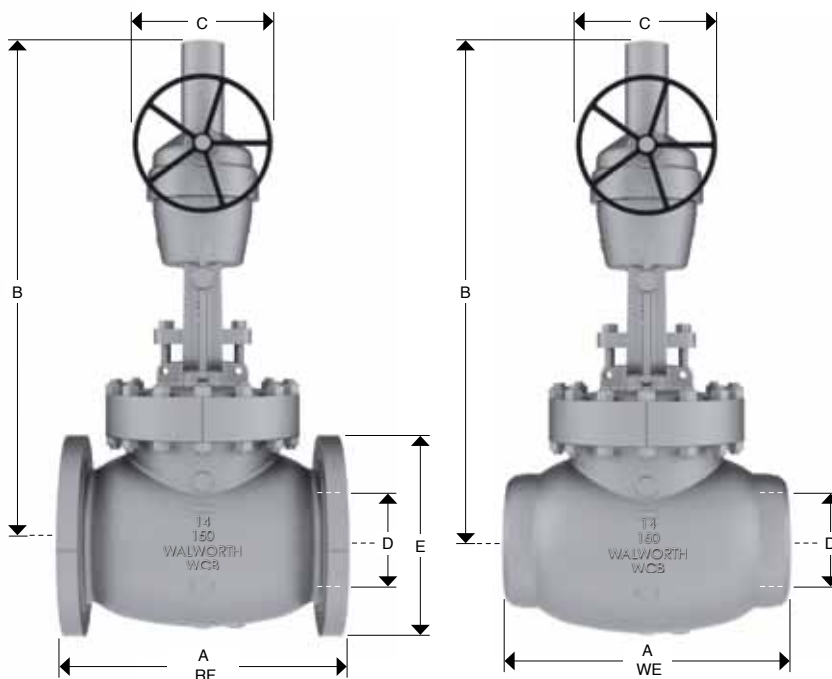


# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 150

(OPERACIÓN CON CAJA DE ENGRANES)

- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente y volante fijo 8" y mayores.
- Disco tipo tapón.
- De 20" a 24" de diámetro se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 14" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5275RF     | 5275F                 | Bridados Cara Realzada, Cara Plana |
| 5275RTJ    | 5275RJ                | Bridados Junta Tipo Anillo         |
| 5275WE     | 5275WE                | Soldable                           |



## Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 356  | 406    | 457    | 508    | 610    |
|--------------------------|----|------|--------|--------|--------|--------|
|                          | in | 14   | 16     | 18     | 20     | 24     |
| A<br>(RF y 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     |
| Peso<br>5275RF           | mm | 530  | 678    | 998    | 1097   | 1613   |
|                          | in | 1166 | 1492   | 2196   | 2413.4 | 3548.6 |
| Peso<br>5275WE           | Kg | 472  | 603    | 888    | 976    | 1436   |
|                          | lb | 1038 | 1328   | 1954   | 2148   | 3158   |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 300

## VÁLVULA DE GLOBO CON VOLANTE Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas tipo Globo diseñada de acuerdo con API-623.
- Alternativa para Válvulas de Globo de acuerdo con API-603 solamente en acero inoxidable y aleaciones de níquel.
- Válvulas de Globo para servicio criogénico con la columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Volante, volante de impacto, operadores de cadena, operadores de engrane, actuadores eléctricos, actuadores neumáticos e hidráulicos según los requisitos del cliente.
- By-Pass, buje linterna, cámara de condensados, inyectores de grasa, conexiones especiales, etc.
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03.
- Pruebas de acuerdo con API-598.
- Válvula de Globo tipo STOP-CHECK disponible.

① Tuerca de Vástago, intercambiable en línea para evitar el cierre de los procesos de tubería.

② Vástago giratorio de tipo ascendente con rosca ACME de precisión simple ó doble para una operación rápida. Acabado fino, adecuado para sellar perfectamente y obtener bajas emisiones fugitivas.

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado de pulido en el área de sello del vástago, la reducidas tolerancias diametrales y la rectitud de los empaques de vástago diseñado especialmente. Empaques de carga viva disponibles bajo solicitud del cliente.

④ Superficie de sello del casquillo, ya sea roscado o soldado, diseñado para aliviar la presión trasera en el empaque del vástago cuando está completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

Conexión vástago-compuerta diseñado para recibir fuertes cargas, y fallar fuera de los límites de la caja de presión.

⑤ Unión Cuerpo-Bonete diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

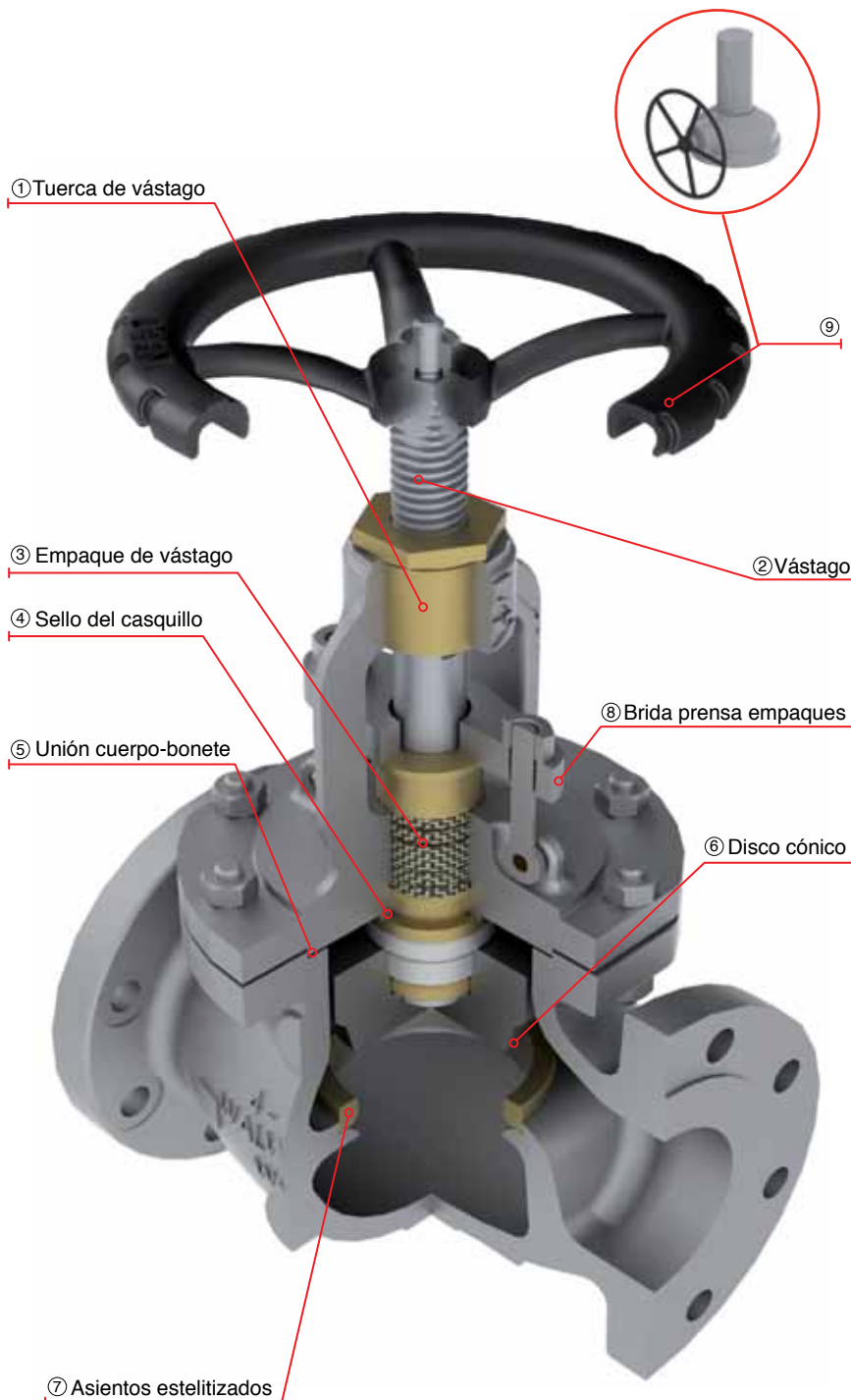
⑥ Disco cónico, totalmente guiado para una verdadera alineación entre el Disco y el cuerpo de la válvula y así evitar atascamientos. El diseño de Disco suelto facilita el sello de éste con el asiento, permitiendo el cierre perfecto de la válvula.

⑦ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑧ Arreglo de dos piezas de la brida y el casquillo para evitar daños de vástago.

⑨ Volante Impactor, mecanismo basado en transmitir el impulso generado por la masa del volante a través del impacto ó impulso generado durante la acción de cierre del volante.

Este tipo de volante se utiliza cuando un volante estándar no puede crear fuerza suficiente para efectuar un sello correcto. Operador de Engranes también está disponible.



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 300 (OPERACIÓN CON VOLANTE)

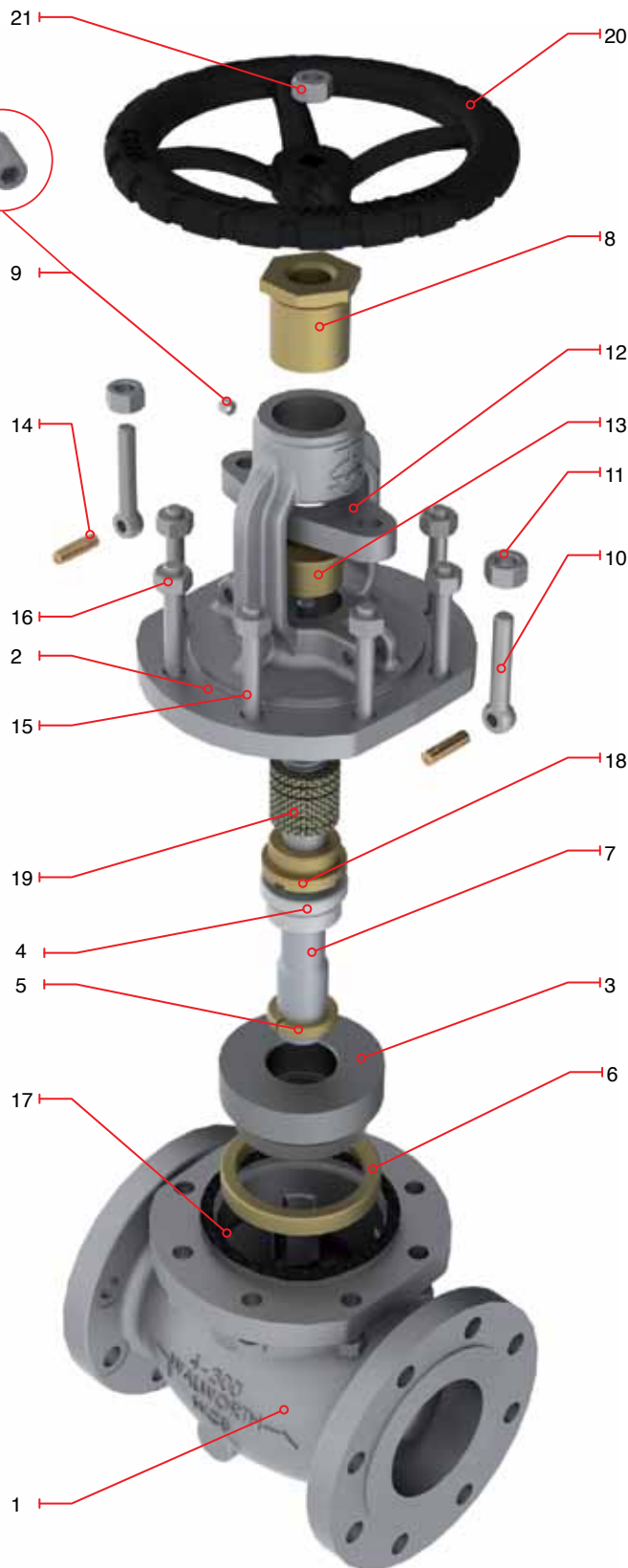
- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente 6" y menores.
- Válvulas con vástago ascendente y volante fijo 8" y mayores.
- Disco tipo tapón.
- De 2" a 12" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5281RF     | 5281F                 | Bridados Cara Realzada, Cara Plana |
| 5281RTJ    | 5281RJ                | Bridados Junta Tipo Anillo         |
| 5281WE     | 5281WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | STANDARD MATERIAL                 |
|-----|-------------------------|-----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                 |
| 2   | Bonete                  | ASTM A 216 GR WCB                 |
| 3   | Disco                   | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco         | Acero Aleado                      |
| 5   | Seguro                  | ASTM A 276 Type 410               |
| 6   | Asiento                 | ASTM A 515 GR 70 + ST6            |
| 7   | Vástago                 | ASTM A 276 Type 410               |
| 8   | Tuerca Vástago          | ASTM B 148 UNS C95600 o Ni Resist |
| 9   | Screw                   | Acero Aleado                      |
| 10  | Tornillo de Ojo         | Acero Aleado                      |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                        |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70                  |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020                |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                      |
| 15  | Espárrago               | ASTM A 193 GR B7                  |
| 16  | Tuerca Espárrago        | ASTM A 194 GR 2H                  |
| 17  | Junta                   | Spiral Inoxidable 304/Grafito     |
| 18  | Casquillo               | ASTM A 276 Type 410               |
| 19  | Empaque de Vástago      | Grafito                           |
| 20  | Volante                 | ASTM A 197                        |
| 21  | Roldana Volante         | Acero Comercial                   |
| 22  | Tuerca Volante          | ASTM A 307                        |
| *23 | Placa de Identificación | Acero Inoxidable                  |

\*No mostrado

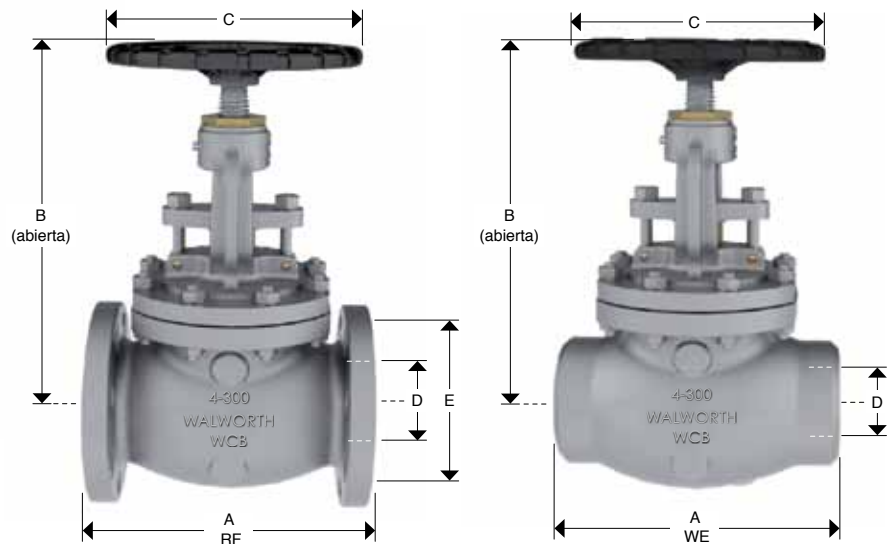


# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 300 (OPERACIÓN CON VOLANTE)



- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente 6" y menores.
- Válvulas con vástago ascendente y volante fijo 8" y mayores.
- Disco tipo tapón.
- De 2" a 12" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5281RF     | 5281F                 | Bridados Cara Realzada, Cara Plana |
| 5281RTJ    | 5281RJ                | Bridados Junta Tipo Anillo         |
| 5281WE     | 5281WE                | Soldable                           |



## Dimensiones y Pesos

| D<br>Diametro<br>Nominal | mm | 51      | 64     | 76      | 102    | 152     | 203    | 254    | 305     |
|--------------------------|----|---------|--------|---------|--------|---------|--------|--------|---------|
|                          | in | 2       | 2 1/2  | 3       | 4      | 6       | 8      | 10     | 12      |
| A<br>(RF y 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  |
| Peso<br>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    |
| Peso<br>5281WE           | Kg | 20      | 35     | 40      | 62     | 148     | 254    | 381    | 574     |
|                          | lb | 44      | 77     | 88      | 136    | 326     | 559    | 838    | 1262    |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 300 (OPERACIÓN CON CAJA DE ENGRANES)

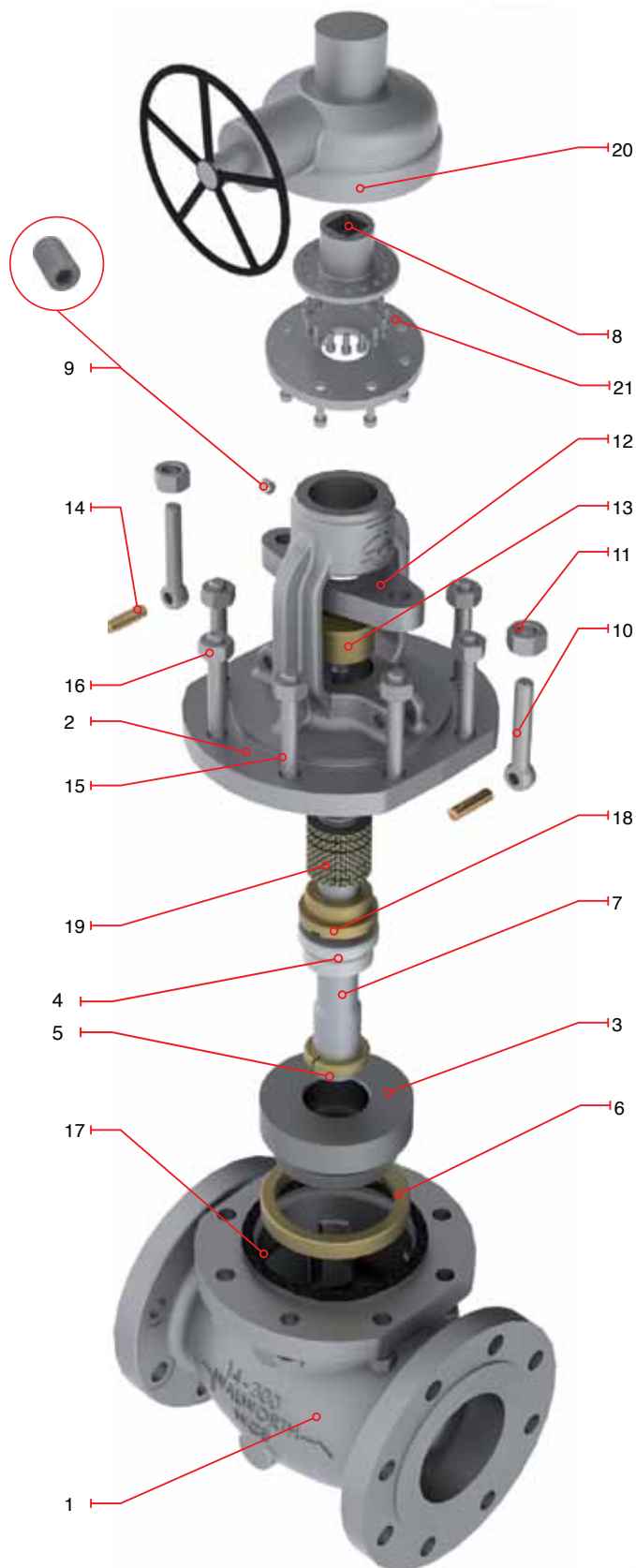
- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 14" de diámetro y mayores se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5281RF     | 5281F                 | Bridados Cara Realzada, Cara Plana |
| 5281RTJ    | 5281RJ                | Bridados Junta Tipo Anillo         |
| 5281WE     | 5281WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | MATERIAL ESTÁNDAR                 |
|-----|-------------------------|-----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                 |
| 2   | Bonete                  | ASTM A 216 GR WCB                 |
| 3   | Disco                   | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco         | Acero Aleado                      |
| 5   | Seguro                  | ASTM A 276 Type 410               |
| 6   | Asiento                 | ASTM A 515 GR 70 + ST6            |
| 7   | Vástago                 | ASTM A 276 Type 410               |
| 8   | Tuerca Vástago          | ASTM B 148 UNS C95600 o Ni Resist |
| 9   | Opresor Tuerca Retén    | Acero Aleado                      |
| 10  | Tornillo de Ojo         | Acero Aleado                      |
| 11  | Tuerca Tornillo de Ojo  | ASTM A 307                        |
| 12  | Brida Prensa Empaques   | ASTM A 515 GR 70                  |
| 13  | Buje Prensa Empaque     | ASTM A 108 GR 1020                |
| 14  | Perno Tornillo de Ojo   | Acero Aleado                      |
| 15  | Espárrago               | ASTM A 193 GR B7                  |
| 16  | Tuerca Espárrago        | ASTM A 194 GR 2H                  |
| 17  | Junta                   | Spiral Inoxidable 304/Grafito     |
| 18  | Casquillo               | ASTM A 276 Type 410               |
| 19  | Empaque de Vástago      | Grafito                           |
| 20  | Operador de Engranés    | Según requerimientos del cliente  |
| 21  | Tornillos del Operador  | Acero Aleado                      |
| *22 | Placa de Identificación | Acero Inoxidable                  |

\*No mostrado

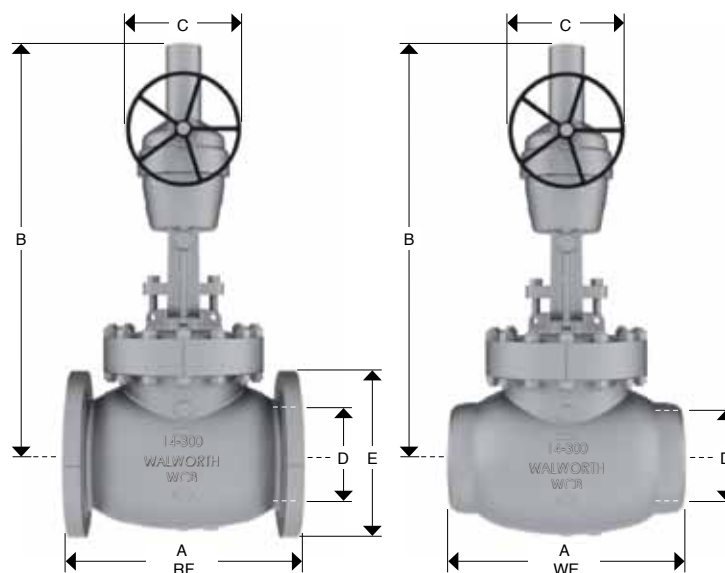


# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 300 (OPERACIÓN CON CAJA DE ENGRANES)

- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 14" de diámetro y mayores se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25



| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5281RF     | 5281F                 | Bridados Cara Realzada, Cara Plana |
| 5281RTJ    | 5281RJ                | Bridados Junta Tipo Anillo         |
| 5281WE     | 5281WE                | Soldable                           |



## Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 356    | 406    | 457    | 508    | 610    |
|--------------------------|----|--------|--------|--------|--------|--------|
|                          | in | 14     | 16     | 18     | 20     | 24     |
| A<br>(RF y 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     |
| Peso<br>5281RF           | Kg | 787    | 1097   | 1907   | 2119   | 2338   |
|                          | lb | 1731.4 | 2413.4 | 4195   | 4662   | 5144   |
| Peso<br>5281WE           | Kg | 669    | 932    | 1678   | 1865   | 2057   |
|                          | lb | 1472   | 2051   | 3692   | 4102   | 4526   |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 600

## VÁLVULA DE GLOBO CON VOLANTE Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas tipo Globo diseñada de acuerdo con API-623.
- Alternativa para Válvulas de Globo de acuerdo con API-603 solamente en acero inoxidable y aleaciones de níquel.
- Válvulas de Globo para servicio criogénico con la columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Volante, volante de impacto, operadores de cadena, operadores de engrane, actuadores eléctricos, actuadores neumáticos e hidráulicos según los requisitos del cliente.
- By-Pass, buje linterna, cámara de condensados, inyector de grasa, conexiones especiales, etc.
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03.
- Pruebas de acuerdo con API-598.
- Válvula de Globo tipo STOP-CHECK disponible.

① Tuerca de Vástago, intercambiable en línea para evitar el cierre de los procesos de tubería.

② Vástago giratorio de tipo ascendente con rosca ACME de precisión simple ó doble para una operación rápida. Acabado fino, adecuado para sellar perfectamente y obtener bajas emisiones fugitivas.

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado de pulido en el área de sello del vástago, la reducidas tolerancias diametrales y la rectitud de los empaques de vástago diseñado especialmente.

Empaques de carga viva disponibles bajo solicitud del cliente.

④ Superficie de sello del casquillo, ya sea roscado o soldado, diseñado para aliviar la presión trasera en el empaque del vástago cuando está completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

Conexión vástago-compuerta diseñado para recibir fuertes cargas, y fallar fuera de los límites de la caja de presión.

⑤ Unión cuerpo-bonete diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

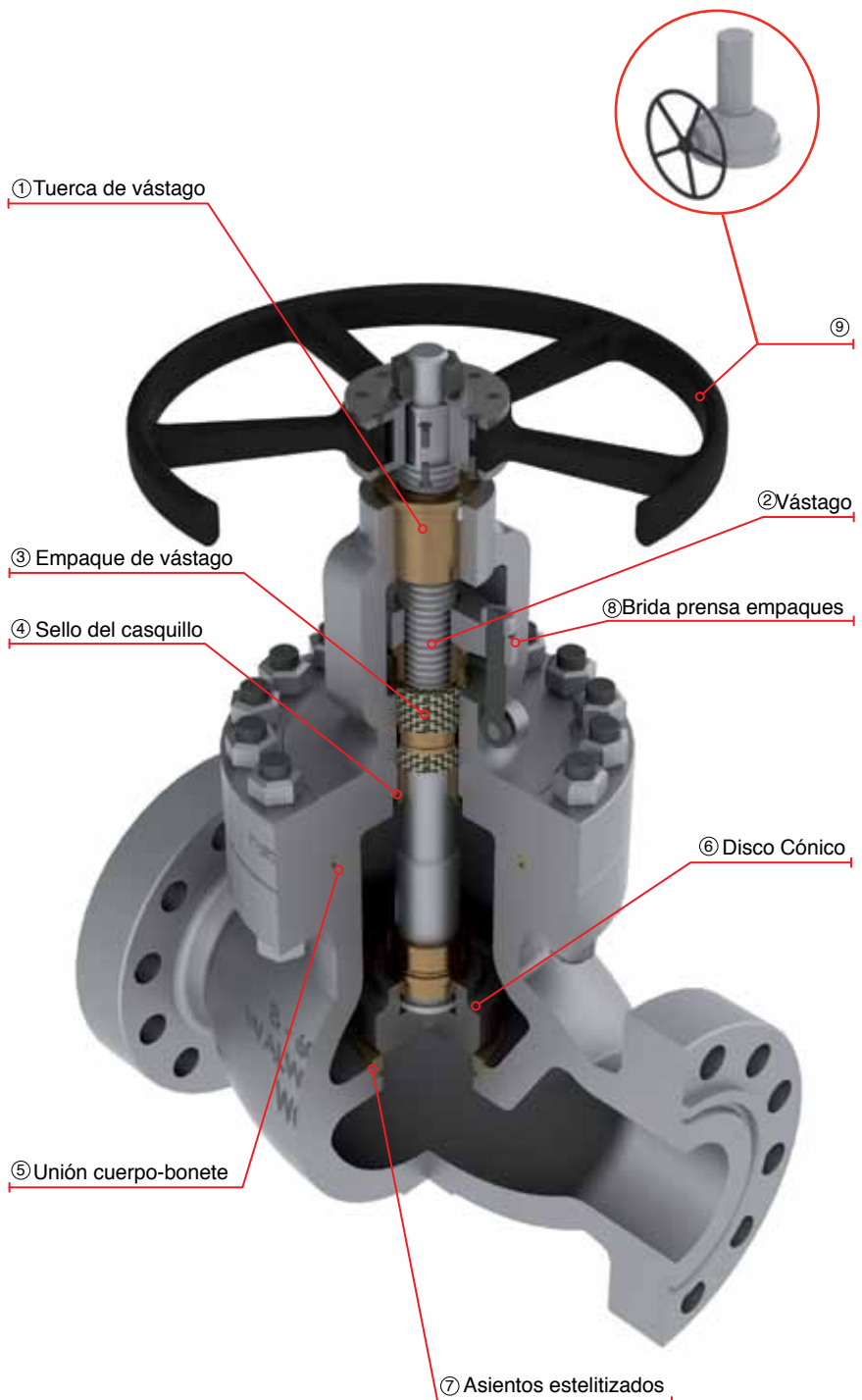
⑥ Disco cónico, totalmente guiado para una verdadera alineación entre el Disco y el cuerpo de la válvula y así evitar atascamientos. El diseño de Disco suelto facilita el sello de éste con el asiento, permitiendo el cierre perfecto de la válvula.

⑦ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑧ Arreglo de dos piezas de la brida y el casquillo para evitar daños de vástago.

⑨ Volante Impactor, mecanismo basado en transmitir el impulso generado por la masa del volante a través del impacto ó impulso generado durante la acción de cierre del volante.

Este tipo de volante se utiliza cuando un volante estándar no puede crear fuerza suficiente para efectuar un sello correcto. Operador de Engranajes también está disponible.



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 600 (OPERACIÓN CON VOLANTE)

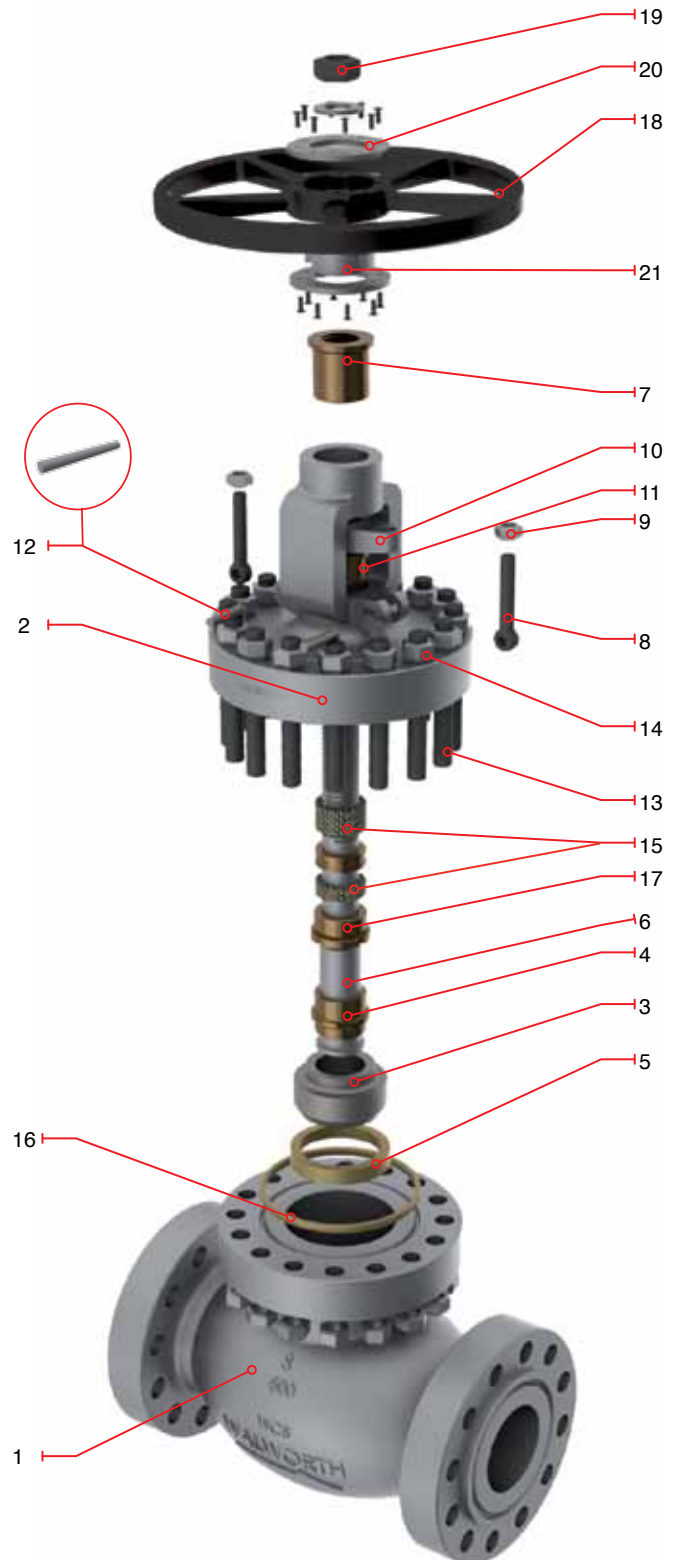
- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente de 2" 6".
- Válvulas con vástago ascendente y volante fijo 8" y mayores.
- Disco tipo tapón.
- De 2" a 8" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5295RF     | 5295F                 | Bridados Cara Realzada, Cara Plana |
| 5295RTJ    | 5295RJ                | Bridados Junta Tipo Anillo         |
| 5295WE     | 5295WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN                         | MATERIAL ESTÁNDAR                 |
|-----|-------------------------------------|-----------------------------------|
| 1   | Cuerpo                              | ASTM A 216 GR WCB                 |
| 2   | Bonete                              | ASTM A 216 GR WCB                 |
| 3   | Disco                               | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco                     | Acero Aleado                      |
| 5   | Asiento                             | ASTM A 515 GR 70 + ST6            |
| 6   | Vástago                             | ASTM A 276 Type 410               |
| 7   | Tuerca Vástago                      | ASTM B 148 UNS C95600 o Ni Resist |
| 8   | Tornillo de Ojo                     | Acero Aleado                      |
| 9   | Tuerca Tornillo de Ojo              | ASTM A 307                        |
| 10  | Brida Prensa Empaques               | ASTM A 515 GR 70                  |
| 11  | Buje Prensa Empaque                 | ASTM A 108 GR 1020                |
| 12  | Perno Tornillo de Ojo               | Acero Aleado                      |
| 13  | Espárrago                           | ASTM A 193 GR B7                  |
| 14  | Tuerca Espárrago                    | ASTM A 194 GR 2H                  |
| 15  | Empaque de Vástago                  | Grafito                           |
| 16  | Junta                               | ASTM A 108 GR 1010                |
| 17  | Casquillo                           | ASTM A 276 Type 410               |
| 18  | Volante                             | ASTM A 197                        |
| 19  | Tuerca Volante                      | ASTM A 307                        |
| 20  | Clamp                               | Acero Comercial                   |
| 21  | Buje Impactor                       | ASTM A 216 GR WCB                 |
| 22* | Tuerca Vástago Opresor Tuerca Retén | Acero Aleado                      |
| 23* | Placa de Identificación             | Acero Inoxidable                  |

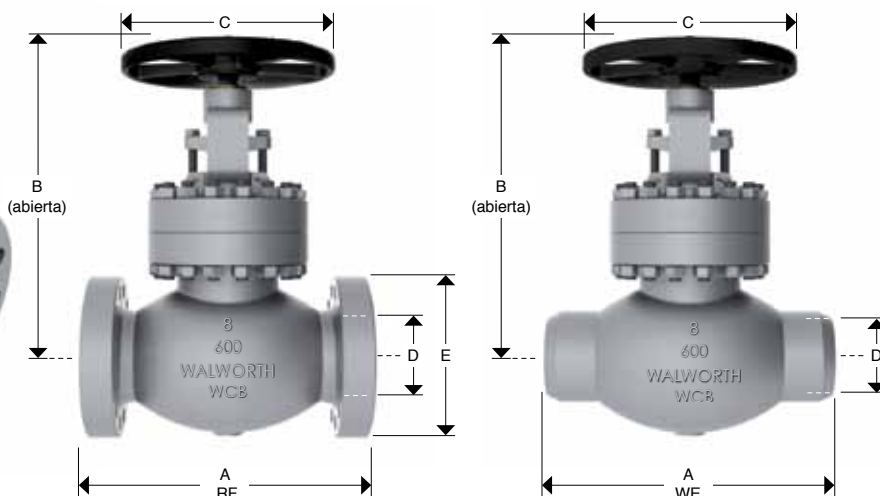
\*No mostrado





# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 600 (OPERACIÓN CON VOLANTE)

- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente de 2" 6".
- Válvulas con vástago ascendente y volante fijo 8" y mayores.
- Disco tipo tapón.
- De 2" a 8" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25



| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5295RF     | 5295F                 | Bridados Cara Realzada, Cara Plana |
| 5295RTJ    | 5295RJ                | Bridados Junta Tipo Anillo         |
| 5295WE     | 5295WE                | Soldable                           |

## Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 51     | 64     | 76     | 102    | 152    | 200    |
|--------------------------|----|--------|--------|--------|--------|--------|--------|
|                          | in | 2      | 2 1/2  | 3      | 4      | 6      | 8      |
| A<br>(RF y WE)           | mm | 292    | 330    | 356    | 432    | 559    | 660    |
|                          | in | 11 1/2 | 13     | 14     | 17     | 22     | 26     |
| A*<br>(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 |
| Peso<br>5295RF           | Kg | 36     | 63     | 66     | 120    | 278    | 429    |
|                          | lb | 79     | 139    | 145    | 264    | 611    | 944    |
| Peso<br>5295WE           | Kg | 30     | 52     | 55     | 102    | 236    | 365    |
|                          | lb | 66     | 115    | 121    | 224    | 519    | 802    |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 600 (OPERACIÓN CON CAJA DE ENGRANES)

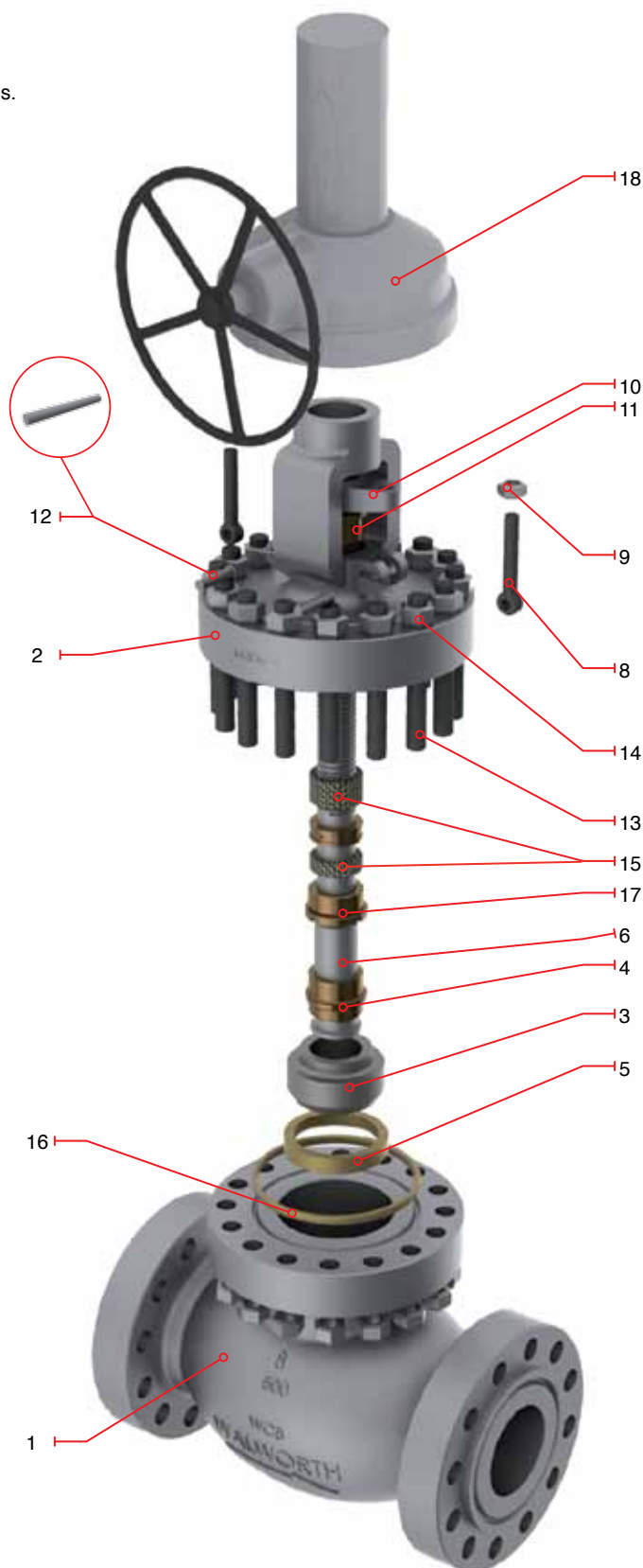
- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 10" de diámetro y mayores se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5295RF     | 5295F                 | Bridados Cara Realzada, Cara Plana |
| 5295RTJ    | 5295RJ                | Bridados Junta Tipo Anillo         |
| 5295WE     | 5295WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN              | MATERIAL ESTÁNDAR                 |
|-----|--------------------------|-----------------------------------|
| 1   | Cuerpo                   | ASTM A 216 GR WCB                 |
| 2   | Bonete                   | ASTM A 216 GR WCB                 |
| 3   | Disco                    | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco          | Acero Aleado                      |
| 5   | Asiento                  | ASTM A 515 GR 70 + ST6            |
| 6   | Vástago                  | ASTM A 276 Type 410               |
| *7  | Tuerca Vástago           | ASTM B 148 UNS C95600 o Ni Resist |
| 8   | Tornillo de Ojo          | Acero Aleado                      |
| 9   | Tuerca Tornillo de Ojo   | ASTM A 307                        |
| 10  | Brida Prensa Empaques    | ASTM A 515 GR 70                  |
| 11  | Buje Prensa Empaque      | ASTM A 108 GR 1020                |
| 12  | Perno Tornillo de Ojo    | Acero Aleado                      |
| 13  | Espárrago                | ASTM A 193 GR B7                  |
| 14  | Tuerca Espárrago         | ASTM A 194 GR 2H                  |
| 15  | Empaque de Vástago       | Grafito                           |
| 16  | Rising type Joint Gasket | ASTM A 108 GR 1010                |
| 17  | Casquillo                | ASTM A 276 Type 410               |
| 18  | Operador de Engranés     | Según requerimientos del cliente  |
| *19 | Tornillos del Operador   | Acero Aleado                      |
| *20 | Placa de Identificación  | Acero Inoxidable                  |

\*No mostrado



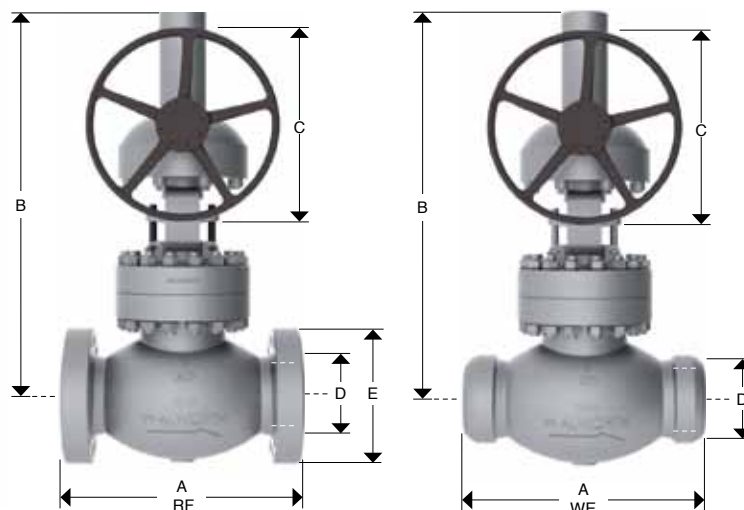
# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 600

## (OPERACIÓN CON CAJA DE ENGRANES)



- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 10" de diámetro y mayores se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 8" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5295RF     | 5295F                 | Bridados Cara Realzada, Cara Plana |
| 5295RTJ    | 5295RJ                | Bridados Junta Tipo Anillo         |
| 5295WE     | 5295WE                | Soldable                           |



### Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 254    | 305    | 356    | 406    | 457    | 508 | 610 |
|--------------------------|----|--------|--------|--------|--------|--------|-----|-----|
|                          | in | 10     | 12     | 14     | 16     | 18     | 20  | 24  |
| A<br>(RF y WE)           | mm | 787    | 838    | 889    | 991    | PCR    | PCR | PCR |
|                          | in | 31     | 33     | 35     | 39     | PCR    | PCR | PCR |
| A*<br>(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  |
| Peso<br>5295RF           | Kg | 737    | 1194   | 1421   | 1899   | PCR    | PCR | PCR |
|                          | lb | 1621   | 2627   | 3126   | 4178   | PCR    | PCR | PCR |
| Peso<br>5295WE           | Kg | 649    | 1051   | 1322   | 1766   | PCR    | PCR | PCR |
|                          | lb | 1427   | 2312   | 2907   | 3885   | PCR    | PCR | PCR |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 900

## VÁLVULA DE GLOBO CON VOLANTE Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas tipo Globo diseñada de acuerdo con API-623.
- Alternativa para Válvulas de Globo de acuerdo con API-603 solamente en acero inoxidable y aleaciones de níquel.
- Válvulas Globo para servicio criogénico con la columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Volante, volante de impacto, operadores de cadena, operadores de engrane, actuadores eléctricos, actuadores neumáticos e hidráulicos según los requisitos del cliente.
- By-Pass, buje linterna, cámara de condensados, inyector de grasa, conexiones especiales, etc.
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03.
- Pruebas de acuerdo con API-598.
- Válvula de Globo tipo STOP-CHECK disponible.

① Tuerca de Vástago, intercambiable en línea para evitar el cierre de los procesos de tubería.

② Vástago giratorio de tipo ascendente con rosca ACME de precisión simple ó doble para una operación rápida. Acabado fino, adecuado para sellar perfectamente y obtener bajas emisiones fugitivas.

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado de pulido en el área de sello del vástago, la reducidas tolerancias diametrales y la rectitud de los empaques de vástago diseñado especialmente.

Empaques de carga viva disponibles bajo solicitud del cliente.

④ Superficie de sello del casquillo, ya sea roscado o soldado, diseñado para aliviar la presión trasera en el empaque del vástago cuando está completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

Conexión vástago-compuerta diseñado para recibir fuertes cargas, y fallar fuera de los límites de la caja de presión.

⑤ Unión cuerpo-bonete diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

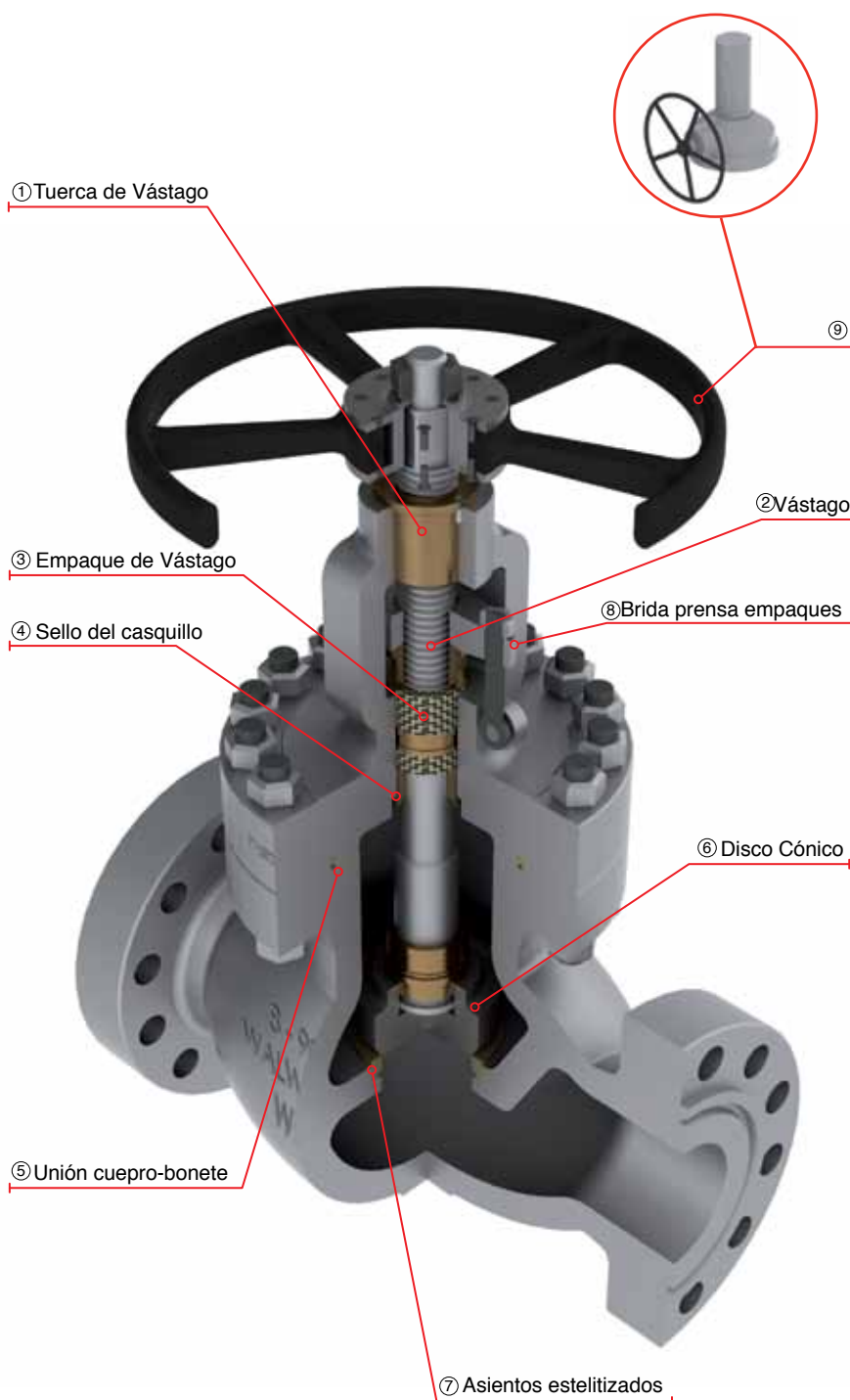
⑥ Disco cónico, totalmente guiado para una verdadera alineación entre el Disco y el cuerpo de la válvula y así evitar atascamientos. El diseño de Disco suelto facilita el sello de éste con el asiento, permitiendo el cierre perfecto de la válvula.

⑦ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑧ Arreglo de dos piezas de la brida y el casquillo para evitar daños de vástago.

⑨ Volante Impactor, mecanismo basado en transmitir el impulso generado por la masa del volante a través del impacto ó impulso generado durante la acción de cierre del volante.

Este tipo de volante se utiliza cuando un volante estándar no puede crear fuerza suficiente para efectuar un sello correcto. Operador de Engranajes también está disponible.





# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 900 (OPERACIÓN CON VOLANTE)

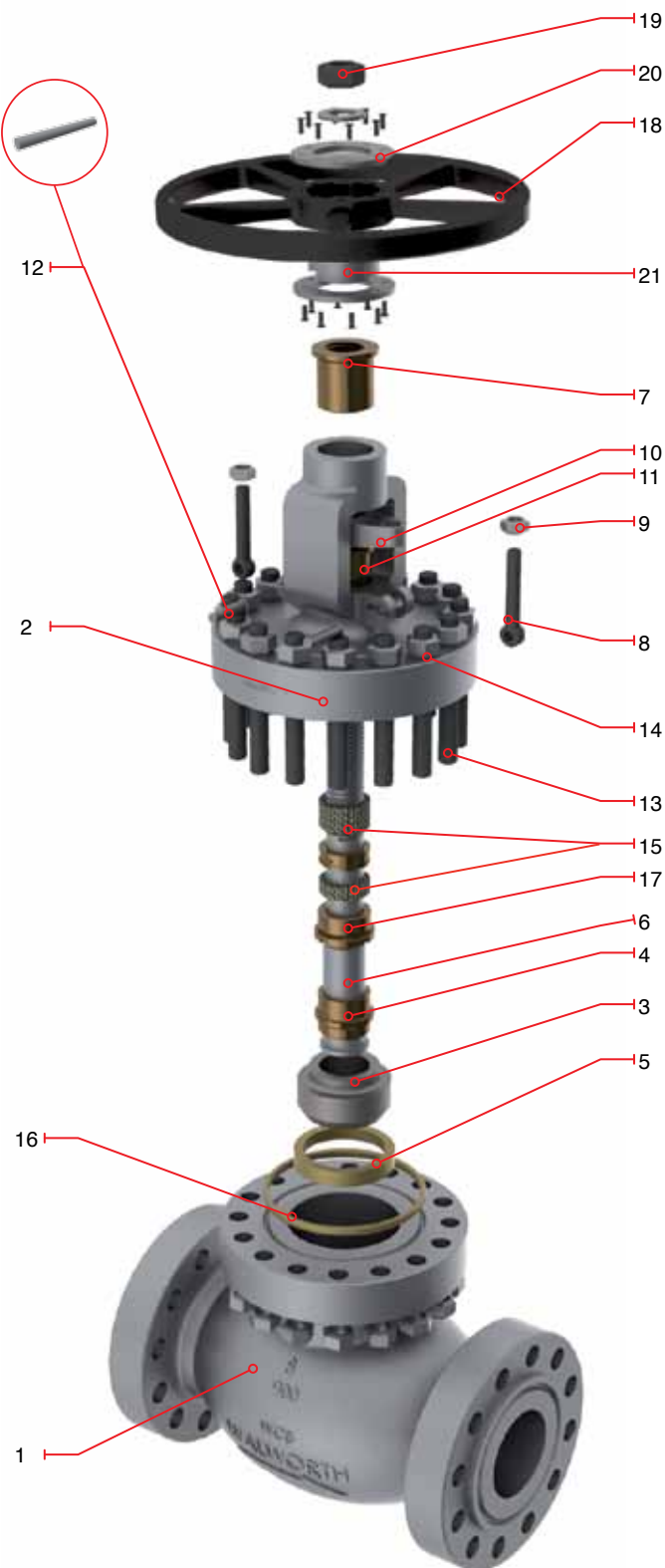
- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente 2" a 3".
- Válvulas con vástago ascendente y volante fijo 4" y mayores.
- Disco tipo tapón.
- De 2" a 6" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5301RF     | 5301F                 | Bridados Cara Realzada, Cara Plana |
| 5301RTJ    | 5301RJ                | Bridados Junta Tipo Anillo         |
| 5301WE     | 5301WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN                         | MATERIAL ESTÁNDAR                 |
|-----|-------------------------------------|-----------------------------------|
| 1   | Cuerpo                              | ASTM A 216 GR WCB                 |
| 2   | Bonete                              | ASTM A 216 GR WCB                 |
| 3   | Disco                               | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco                     | Acero Aleado                      |
| 5   | Seat Ring                           | ASTM A 515 GR 70 + ST6            |
| 6   | Vástago                             | ASTM A 276 Type 410               |
| 7   | Tuerca Vástago                      | ASTM B 148 UNS C95600 o Ni Resist |
| 8   | Tornillo de Ojo                     | Acero Aleado                      |
| 9   | Tuerca Tornillo de Ojo              | ASTM A 307                        |
| 10  | Brida Prensa Empaques               | ASTM A 515 GR 70                  |
| 11  | Buje Prensa Empaque                 | ASTM A 108 GR 1020                |
| 12  | Perno Tornillo de Ojo               | Acero Aleado                      |
| 13  | Espárrago                           | ASTM A 193 GR B7                  |
| 14  | Tuerca Espárrago                    | ASTM A 194 GR 2H                  |
| 15  | Empaque de Vástago                  | Grafito                           |
| 16  | Junta                               | ASTM A 108 GR 1010                |
| 17  | Casquillo                           | ASTM A 276 Type 410               |
| 18  | Volante                             | ASTM A 197                        |
| 19  | Tuerca Volante                      | ASTM A 307                        |
| 20  | Clamp                               | Acero Comercial                   |
| 21  | Buje Impactor                       | ASTM A 216 GR WCB                 |
| 22* | Tuerca Vástago Opresor Tuerca Retén | Acero Aleado                      |
| 23* | Placa de Identificación             | Acero Inoxidable                  |

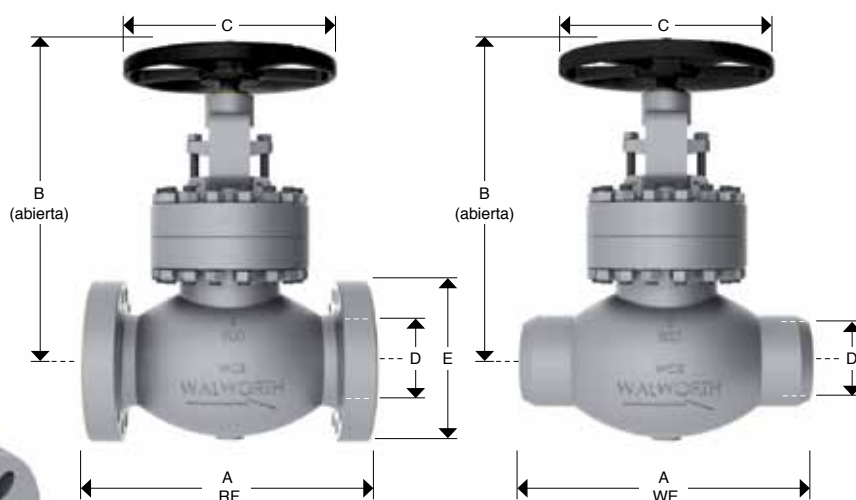
\*No mostrado



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 900 (OPERACIÓN CON VOLANTE)

- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente 2" a 3".
- Válvulas con vástago ascendente y volante fijo 4" y mayores.
- Disco tipo tapón.
- De 2" a 6" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 4" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5301RF     | 5301F                 | Bridados Cara Realzada, Cara Plana |
| 5301RTJ    | 5301RJ                | Bridados Junta Tipo Anillo         |
| 5301WE     | 5301WE                | Soldable                           |



## Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 76     | 102    | 152    |
|--------------------------|----|--------|--------|--------|
|                          | in | 3      | 4      | 6      |
| A<br>(RF y WE)           | mm | 381    | 457    | 610    |
|                          | in | 15     | 18     | 24     |
| A*<br>(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     |
| Peso<br>5301RF           | Kg | 113    | 206    | 328    |
|                          | lb | 249    | 453    | 722    |
| Peso<br>5301WE           | Kg | 94     | 175    | 279    |
|                          | lb | 206    | 385    | 613    |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 900 (OPERACIÓN CON CAJA DE ENGRANES)

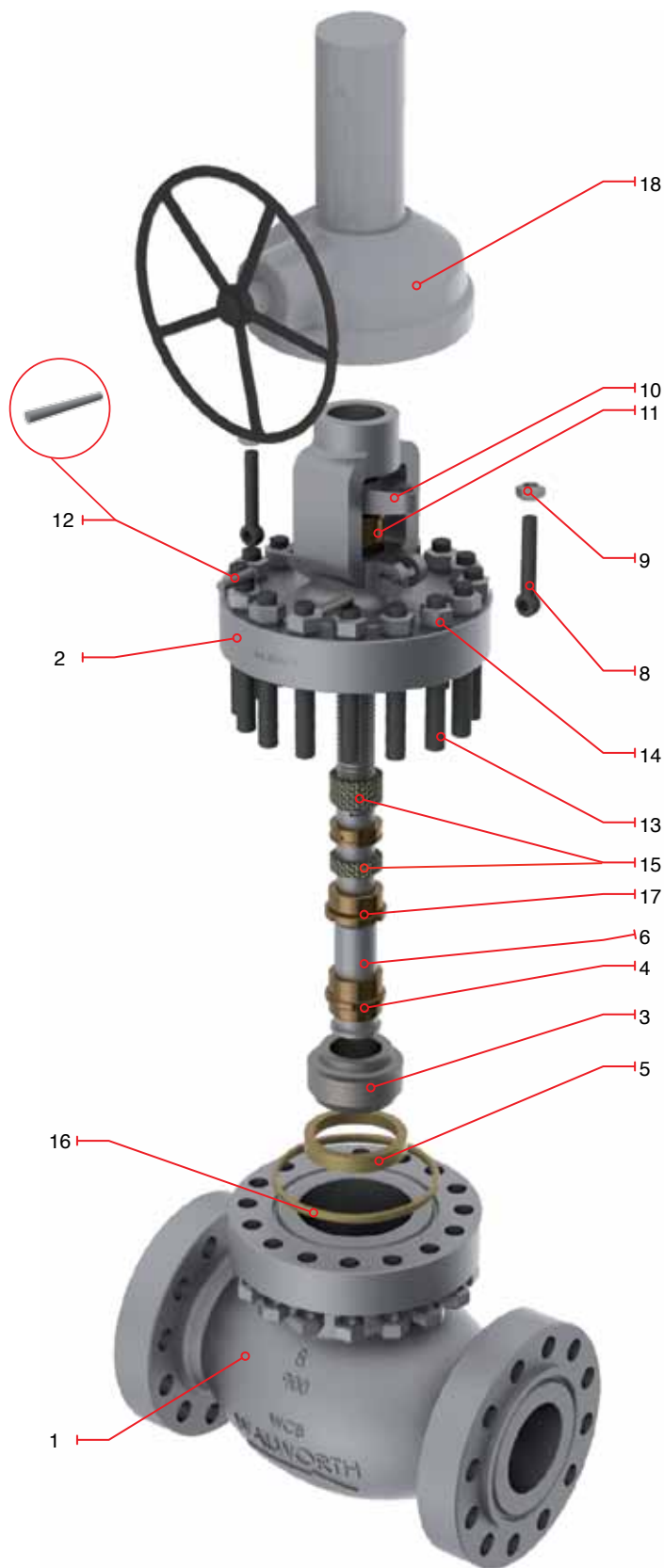
- Diseño de acuerdo con Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 8" de diámetro y mayores se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 3" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5301RF     | 5301F                 | Bridados Cara Realzada, Cara Plana |
| 5301RTJ    | 5301RJ                | Bridados Junta Tipo Anillo         |
| 5301WE     | 5301WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | MATERIAL ESTÁNDAR                 |
|-----|-------------------------|-----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                 |
| 2   | Bonete                  | ASTM A 216 GR WCB                 |
| 3   | Disco                   | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco         | Acero Aleado                      |
| 5   | Asiento                 | ASTM A 515 GR 70 + ST6            |
| 6   | Vástago                 | ASTM A 276 Type 410               |
| *7  | Tuerca Vástago          | ASTM B 148 UNS C95600 o Ni Resist |
| 8   | Tornillo de Ojo         | Acero Aleado                      |
| 9   | Tuerca Tornillo de Ojo  | ASTM A 307                        |
| 10  | Brida Prensa Empaques   | ASTM A 515 GR 70                  |
| 11  | Buje Prensa Empaque     | ASTM A 108 GR 1020                |
| 12  | Perno Tornillo de Ojo   | Acero Aleado                      |
| 13  | Espárrago               | ASTM A 193 GR B7                  |
| 14  | Tuerca Espárrago        | ASTM A 194 GR 2H                  |
| 15  | Empaque de Vástago      | Grafito                           |
| 16  | Junta                   | ASTM A 108 GR 1010                |
| 17  | Casquillo               | ASTM A 276 Type 410               |
| 18  | Operador de Engranés    | Según requerimientos del cliente  |
| *19 | Tornillos del Operador  | Acero Aleado                      |
| *20 | Placa de Identificación | Acero Inoxidable                  |

\*No mostrado



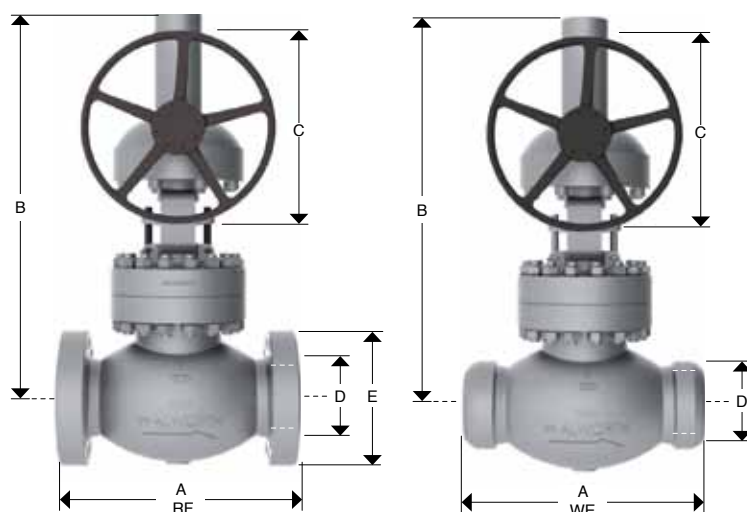
# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 900

## (OPERACIÓN CON CAJA DE ENGRANES)



- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 8" de diámetro y mayores se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 3" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5301RF     | 5301F                 | Bridados Cara Realzada, Cara Plana |
| 5301RTJ    | 5301RJ                | Bridados Junta Tipo Anillo         |
| 5301WE     | 5301WE                | Soldable                           |



### Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 203    | 254    | 305    | 356    | 406    | 457 | 508    | 610  |
|--------------------------|----|--------|--------|--------|--------|--------|-----|--------|------|
|                          | in | 8      | 10     | 12     | 14     | 16     | 18  | 20     | 24   |
| A<br>(RF y WE)           | mm | 737    | 838    | 965    | 1029   | PCR    | PCR | PCR    | PCR  |
|                          | in | 29     | 33     | 38     | 40 1/2 | PCR    | PCR | PCR    | PCR  |
| A*<br>(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   |
| Peso<br>5301RF           | Kg | 593    | 1850   | 2998   | 2900   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 1305   | 4070   | 6596   | 6380   | PCR    | PCR | PCR    | PCR  |
| Peso<br>5301WE           | Kg | 504    | 1721   | 2788   | 2697   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 1109   | 3785   | 6134   | 5933   | PCR    | PCR | PCR    | PCR  |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 1500

## VÁLVULA DE GLOBO CON VOLANTE Y VÁSTAGO ASCENDENTE

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas tipo Globo diseñada de acuerdo con API-623
- Alternativa para Válvulas de Globo de acuerdo con API-603 solamente en acero inoxidable y aleaciones de níquel.
- Válvulas de Globo para servicio criogénico con la columna de gas de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Volante, volante de impacto, operadores de cadena, operadores de engrane, actuadores eléctricos, actuadores neumáticos e hidráulicos según los requisitos del cliente.
- By-Pass, buje linterna, cámara de condensados, inyector de grasa, conexiones especiales, etc.
- Control para bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03.
- Pruebas de acuerdo con API-598.
- Válvula de Globo tipo STOP-CHECK disponible.

① Tuerca de Vástago, intercambiable en línea para evitar el cierre de los procesos de tubería.

② Vástago giratorio de tipo ascendente con rosca ACME de precisión simple ó doble para una operación rápida. Acabado fino, adecuado para sellar perfectamente y obtener bajas emisiones fugitivas.

③ Empaque de vástago diseñado para un control óptimo de emisiones fugitivas a la atmósfera. La tasa de emisiones fugitivas está garantizada por el acabado de pulido en el área de sello del vástago, la reducidas tolerancias diametrales y la rectitud de los empaques de vástago diseñado especialmente.

Empaques de carga viva disponibles bajo solicitud del cliente.

④ Superficie de sello posterior, ya sea roscado o soldado, diseñado para aliviar la presión trasera en el empaque del vástago cuando está completamente cerrado. Sustituir los empaques de vástago bajo presión no es recomendable.

Conexión vástago-compuerta diseñado para recibir fuertes cargas, y fallar fuera de los límites de la caja de presión.

⑤ Unión Cuerpo - Bonete diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

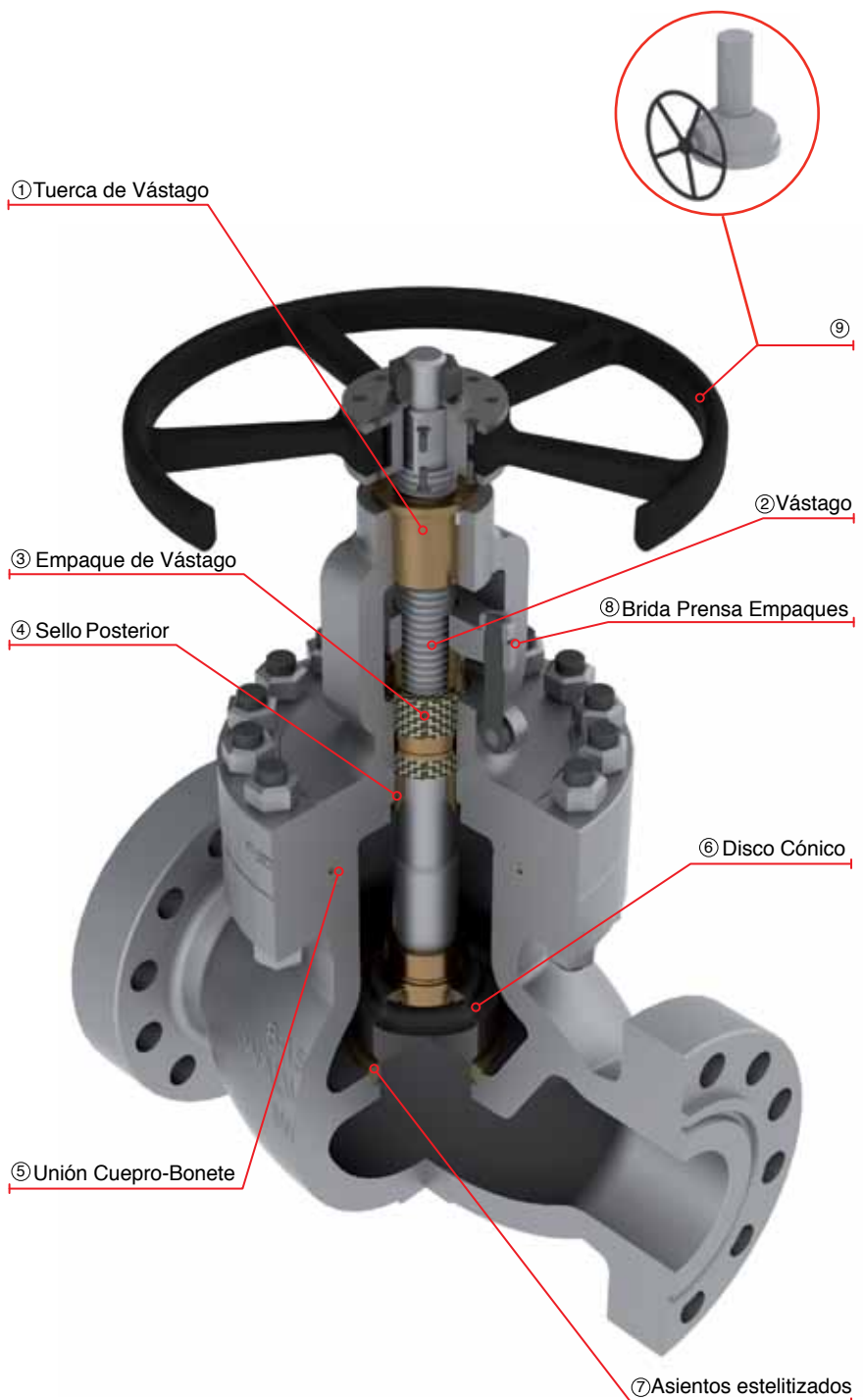
⑥ Disco cónico, totalmente guiado para una verdadera alineación entre el Disco y el cuerpo de la válvula y así evitar atascamientos. El diseño de Disco suelto facilita el sello de éste con el asiento, permitiendo el cierre perfecto de la válvula.

⑦ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑧ Arreglo de dos piezas de la brida y el casquillo para evitar daños de vástago.

⑨ Volante Impactor, mecanismo basado en transmitir el impulso generado por la masa del volante a través del impacto ó impulso generado durante la acción de cierre del volante.

Este tipo de volante se utiliza cuando un volante estándar no puede crear fuerza suficiente para efectuar un sello correcto. Operador de Engranajes también está disponible.



**VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 1500**  
(OPERACIÓN CON VOLANTE)

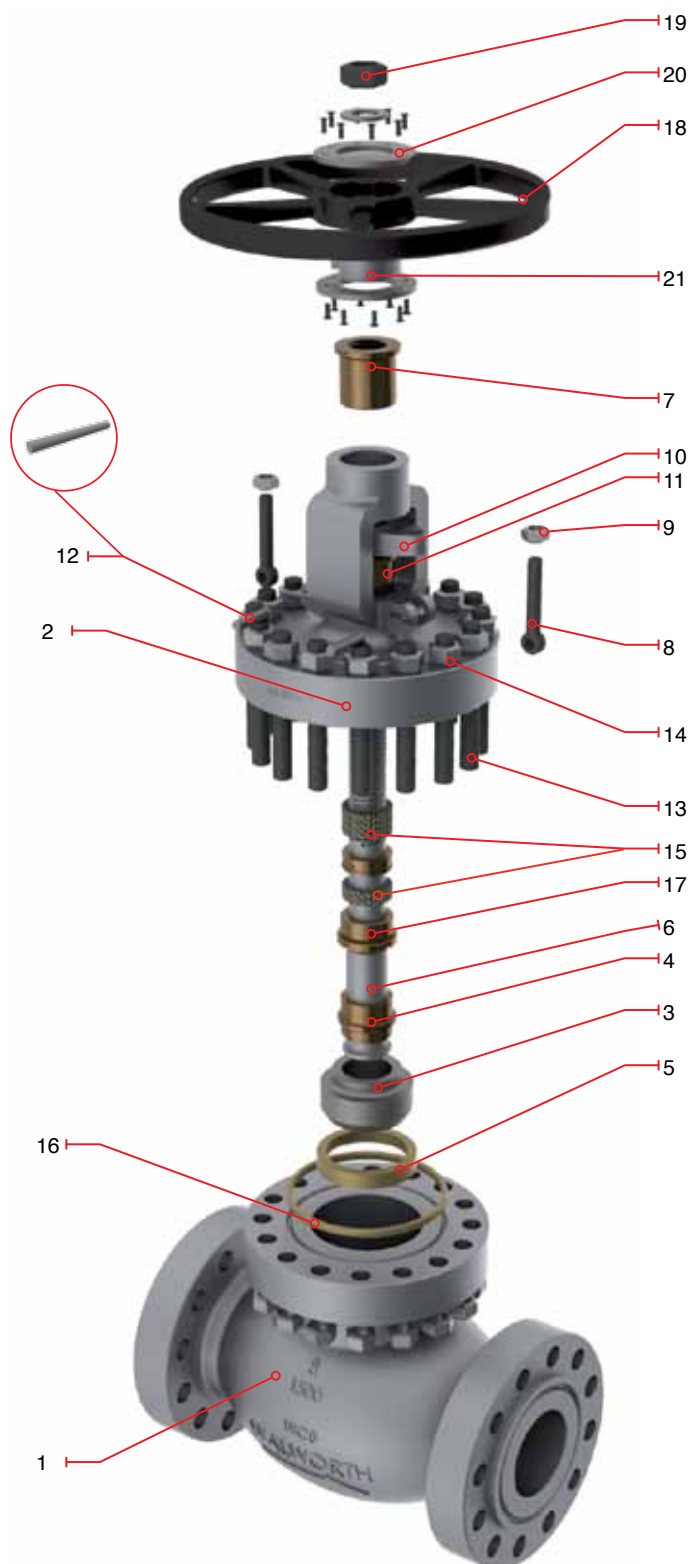
- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente 2" y 2 1/2".
- Válvulas con vástago ascendente y volante fijo 3" y mayores.
- Disco tipo tapón.
- De 2" a 6" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 3" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5308RF     | 5308F                 | Bridados Cara Realzada, Cara Plana |
| 5308RTJ    | 5308RJ                | Bridados Junta Tipo Anillo         |
| 5308WE     | 5308WE                | Soldable                           |

## Partes y Materiales

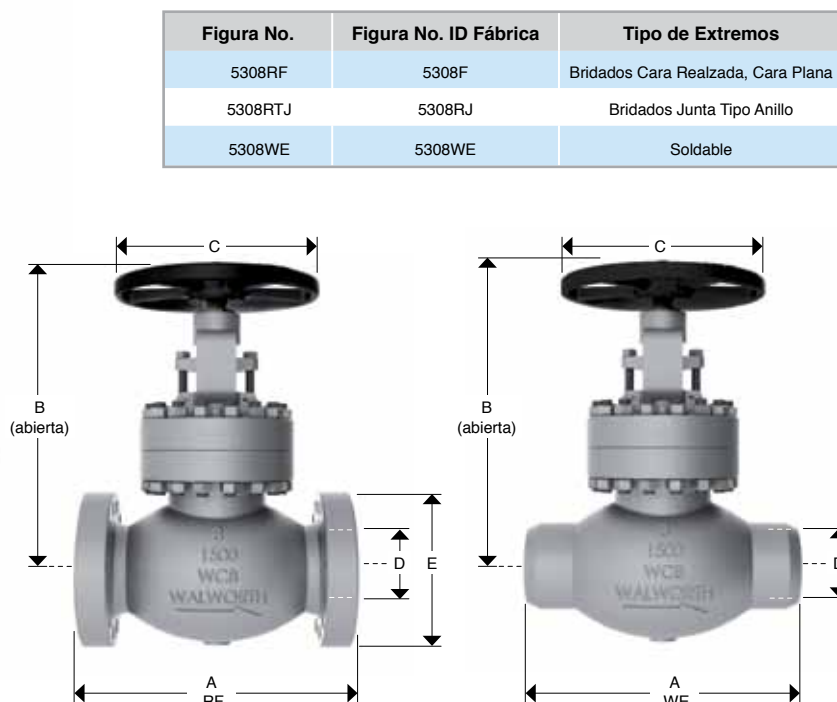
| No. | DESCRIPCIÓN                         | MATERIAL ESTÁNDAR                 |
|-----|-------------------------------------|-----------------------------------|
| 1   | Cuerpo                              | ASTM A 216 GR WCB                 |
| 2   | Bonete                              | ASTM A 216 GR WCB                 |
| 3   | Disco                               | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco                     | Acero Aleado                      |
| 5   | Asiento                             | ASTM A 515 GR 70 + ST6            |
| 6   | Vástago                             | ASTM A 276 Type 410               |
| 7   | Tuerca Vástago                      | ASTM B 148 UNS C95600 o Ni Resist |
| 8   | Tornillo de Ojo                     | Acero Aleado                      |
| 9   | Tuerca Tornillo de Ojo              | ASTM A 307                        |
| 10  | Brida Prensa Empaques               | ASTM A 515 GR 70                  |
| 11  | Buje Prensa Empaque                 | ASTM A 108 GR 1020                |
| 12  | Perno Tornillo de Ojo               | Acero Aleado                      |
| 13  | Espárrago                           | ASTM A 193 GR B7                  |
| 14  | Tuerca Espárrago                    | ASTM A 194 GR 2H                  |
| 15  | Empaque de Vástago                  | Grafito                           |
| 16  | Junta                               | ASTM A 108 GR 1010                |
| 17  | Casquillo                           | ASTM A 276 Type 410               |
| 18  | Volante                             | ASTM A 197                        |
| 19  | Tuerca Volante                      | ASTM A 307                        |
| 20  | Clamp                               | Acero Comercial                   |
| 21  | Buje Impactor                       | ASTM A 216 GR WCB                 |
| 22* | Tuerca Vástago Opresor Tuerca Retén | Acero Aleado                      |
| 23* | Placa de Identificación             | Acero Inoxidable                  |

\*No mostrado



# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 1500 (OPERACIÓN CON VOLANTE)

- Diseño de acuerdo con API-623.
- Válvulas con volante y vástago ascendente 2" y 2 1/2".
- Válvulas con vástago ascendente y volante fijo 3" y mayores.
- Disco tipo tapón.
- De 2" a 6" de diámetro se suministra con volante como estándar.
- Tuerca vástago y baleros a partir de 3" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25



## Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 51     | 64     | 76     | 102    | 152    |
|--------------------------|----|--------|--------|--------|--------|--------|
|                          | in | 2      | 2 1/2  | 3      | 4      | 6      |
| A<br>(RF y WE)           | mm | 368    | 419    | 470    | 546    | 705    |
|                          | in | 14 1/2 | 16 1/2 | 18 1/2 | 21 1/2 | 27 3/4 |
| A*<br>(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 |
| Peso<br>5308RF           | Kg | 82     | 121    | 161    | 252    | 574    |
|                          | lb | 180    | 266    | 354    | 554    | 1262   |
| Peso<br>5308WE           | Kg | 68     | 100    | 134    | 214    | 487    |
|                          | lb | 150    | 221    | 294    | 471    | 1072   |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 1500 (OPERACIÓN CON CAJA DE ENGRANES)

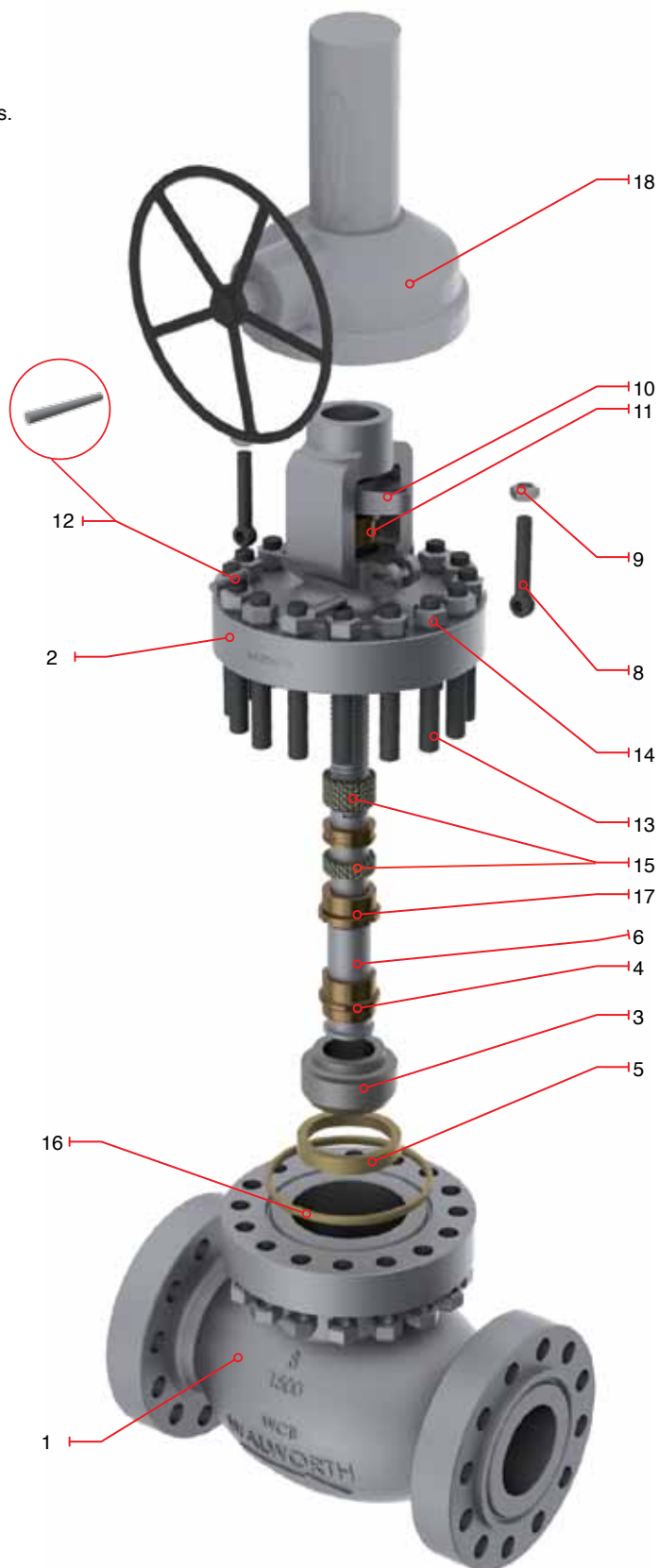
- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 8" de diámetro y mayores se suministra con Operador de Engranes.
- Tuerca vástago y baleros a partir de 3" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5308RF     | 5308F                 | Bridados Cara Realzada, Cara Plana |
| 5308RTJ    | 5308RJ                | Bridados Junta Tipo Anillo         |
| 5308WE     | 5308WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | MATERIAL ESTÁNDAR                 |
|-----|-------------------------|-----------------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB                 |
| 2   | Bonete                  | ASTM A 216 GR WCB                 |
| 3   | Disco                   | ASTM A 276 Type 410               |
| 4   | Tuerca de Disco         | Acero Aleado                      |
| 5   | Seat Ring               | ASTM A 515 GR 70 + ST6            |
| 6   | Vástago                 | ASTM A 276 Type 410               |
| *7  | Tuerca Vástago          | ASTM B 148 UNS C95600 o Ni Resist |
| 8   | Tornillo de Ojo         | Acero Aleado                      |
| 9   | Tuerca Tornillo de Ojo  | ASTM A 307                        |
| 10  | Brida Prensa Empaques   | ASTM A 515 GR 70                  |
| 11  | Buje Prensa Empaque     | ASTM A 108 GR 1020                |
| 12  | Perno Tornillo de Ojo   | Acero Aleado                      |
| 13  | Espárrago               | ASTM A 193 GR B7                  |
| 14  | Tuerca Espárrago        | ASTM A 194 GR 2H                  |
| 15  | Empaque de Vástago      | Grafito                           |
| 16  | Junta                   | ASTM A 108 GR 1010                |
| 17  | Casquillo               | ASTM A 276 Type 410               |
| 18  | Operador de Engranes    | Según requerimientos del cliente  |
| *19 | Tornillos del Operador  | Acero Aleado                      |
| *20 | Placa de Identificación | Acero Inoxidable                  |

\*No mostrado



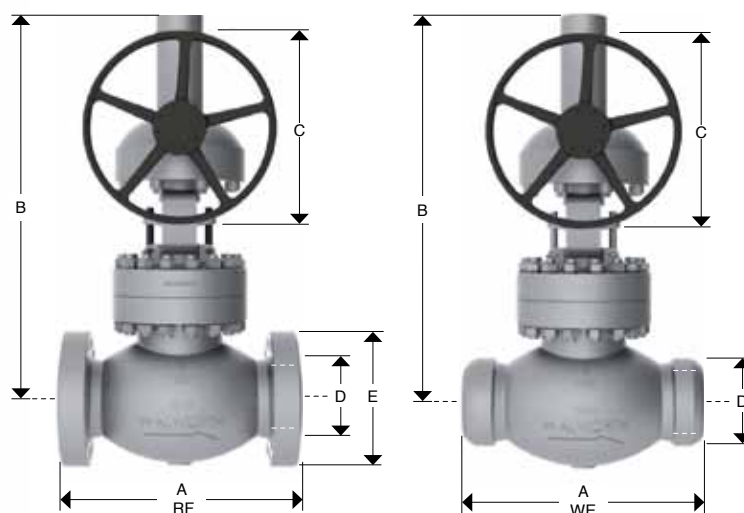


# VÁLVULA DE GLOBO BONETE BRIDADO FUNDIDO CLASE 1500 (OPERACIÓN CON CAJA DE ENGRANES)



- Diseño de acuerdo con API-623.
- Válvulas con vástago ascendente.
- Disco tipo tapón.
- De 8" de diámetro y mayores se suministra con Operador de Engranés.
- Tuerca vástago y baleros a partir de 3" y mayores.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5308RF     | 5308F                 | Bridados Cara Realzada, Cara Plana |
| 5308RTJ    | 5308RJ                | Bridados Junta Tipo Anillo         |
| 5308WE     | 5308WE                | Soldable                           |



## Dimensiones y Pesos

| D<br>Diámetro<br>Nominal | mm | 203    | 254    | 305    | 356    | 406    | 457 | 508    | 610  |
|--------------------------|----|--------|--------|--------|--------|--------|-----|--------|------|
|                          | in | 8      | 10     | 12     | 14     | 16     | 18  | 20     | 24   |
| A<br>(RF y 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*<br>(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   |
| Peso<br>5308RF           | Kg | 949    | 2238   | 3308   | 4678   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 2088   | 4924   | 7278   | 10292  | PCR    | PCR | PCR    | PCR  |
| Peso<br>5308WE           | Kg | 807    | 2081   | 3076   | 4351   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 1775   | 4579   | 6768   | 9571   | PCR    | PCR | PCR    | PCR  |

Para medidas no mostradas, favor de contactar a nuestro departamento de ventas.

# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 150

VÁLVULAS DE RETENCIÓN TIPO COLUMPIO (SWING CHECK)

## CARACTERÍSTICAS DEL DISEÑO

- Válvulas de RETENCIÓN diseñadas de acuerdo con API-6D
- Válvulas de RETENCIÓN diseñadas de acuerdo con API-599 disponibles bajo pedido.
- Alternativa para Válvulas de Retención de acuerdo con API-603 solamente para acero inoxidable y aleaciones de níquel.
- Válvulas de Retención para servicio criogénico de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Palancas y contrapesos con amortiguadores disponibles.
- Drenes disponibles de solicitud del cliente
- Control de bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03
- Pruebas de acuerdo con API-598..

① Unión Cuerpo-Tapa diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

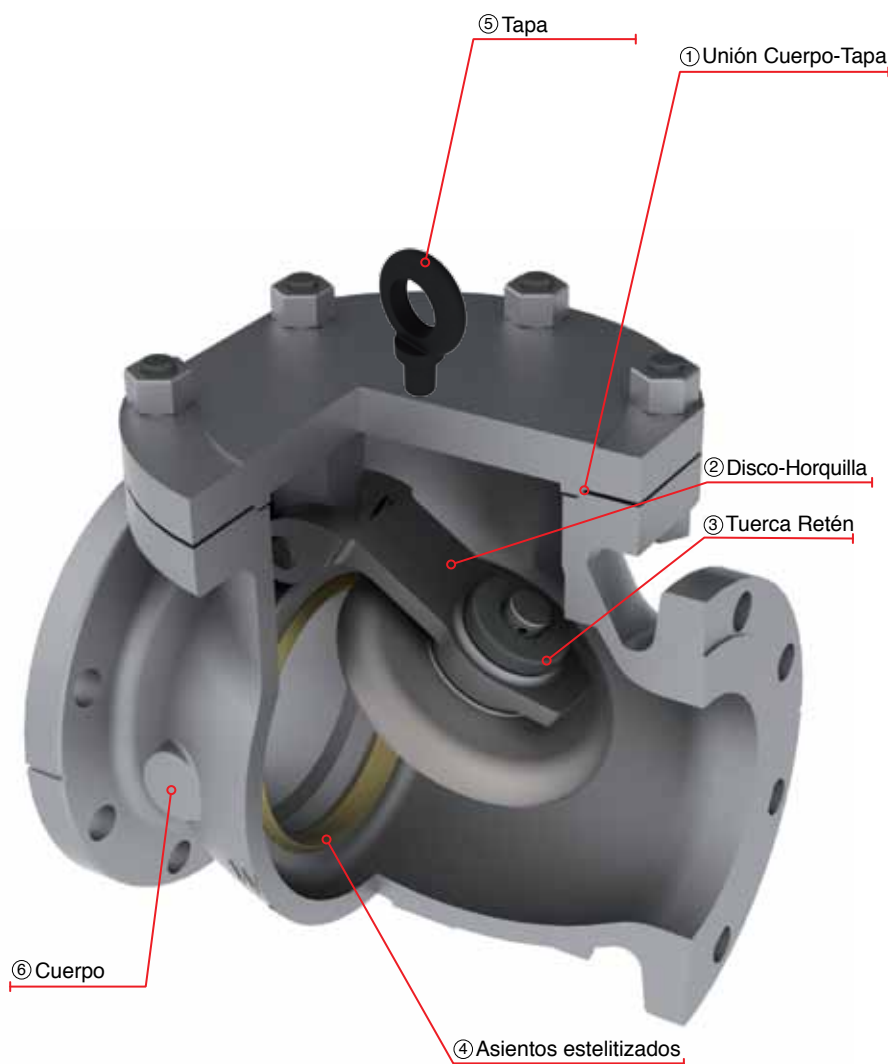
② Conexión Disco-Horquilla permite que el Disco controle independiente el movimiento de la horquilla para asegurar la alineación correcta del Disco con el asiento al momento del cierre.

③ La conexión está asegurada por la tuerca de Disco diseñada para prevenir el desensamble de la válvula debido a vibraciones y el cierre de la misma.

④ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑤ Para tamaños de 8" y mayores las válvulas de Retención Walworth ofrecen una agarradera en la tapa para fácil instalación.

⑥ Cuerpo con paredes de espesor gruesas de acuerdo a ASME B16.34 para un mayor servicio de vida útil. Disponibles con patrones para diferentes opciones de dren.



# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 150

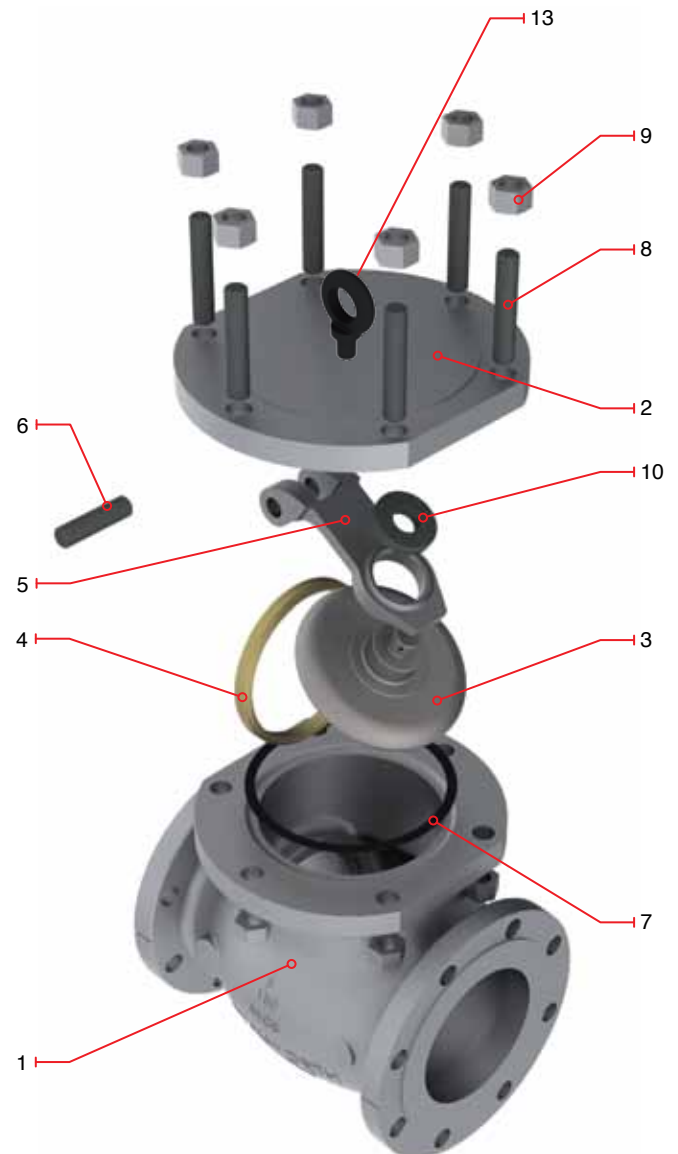
- Diseño de acuerdo con API-6D
- Diseño se acuerdo con API-599 disponible bajo pedido
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5341RF     | 5341F                 | Bridados Cara Realzada, Cara Plana |
| 5341RTJ    | 5341RJ                | Bridados Junta Tipo Anillo         |
| 5341WE     | 5341WE                | Soldable                           |

## Partes y Materiales

| No.  | DESCRIPCIÓN             | STANDARD MATERIAL             |
|------|-------------------------|-------------------------------|
| 1    | Cuerpo                  | ASTM A 216 GR WCB             |
| 2    | Tapa                    | ASTM A 216 GR WCB             |
| 3    | Disco                   | A 216 GR WCB + 13% Cr.        |
| 4    | Asiento                 | ASTM A 515 GR 70 + ST 6       |
| 5    | Horquilla               | ASTM A 216 GR WCB             |
| 6    | Flecha                  | ASTM A 276 Type 410           |
| 7    | Junta                   | Spiral Inoxidable 304/Grafito |
| 8    | Espárrago               | ASTM A 193 GR B7              |
| 9    | Tuerca de Espárrago     | ASTM A 194 GR 2H              |
| 10   | Tuerca Retén            | Acero Aleado                  |
| *11  | Tapón Cuerpo            | Acero Aleado                  |
| *12  | Placa de Identificación | Acero Inoxidable              |
| **13 | Tuerca de izaje         | Acero Comercial               |

\*No mostrado \*\*Únicamente a partir de 8"



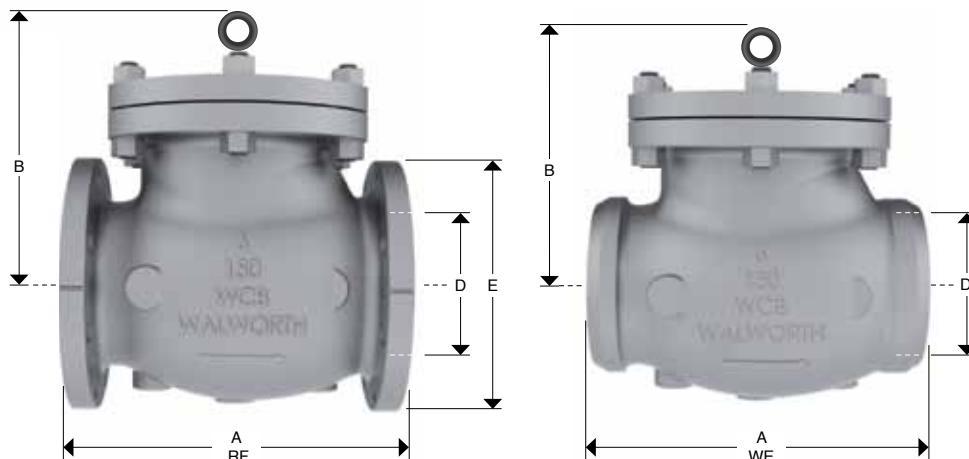
# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO

## CLASE 150



- Diseño de acuerdo con API-6D y ASME B16.34.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5341RF     | 5341F                 | Bridados Cara Realzada, Cara Plana |
| 5341RTJ    | 5341RJ                | Bridados Junta Tipo Anillo         |
| 5341WE     | 5341WE                | Soldable                           |



### Dimensiones y Pesos

| D                |           |        |          |       |        |       |         |        |        |        |        |         |        |        |        |        |         |         |
|------------------|-----------|--------|----------|-------|--------|-------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|---------|---------|
| Diámetro Nominal | mm. pulg. | 51 2   | 64 2 1/2 | 76 3  | 102 4  | 152 6 | 203 8   | 254 10 | 305 12 | 356 14 | 406 16 | 457 18  | 508 20 | 610 24 | 762 30 | 914 36 | 1067 42 | 1219 48 |
| A (RF y WE)      | mm.       | 203    | 216      | 241   | 292    | 356   | 495     | 622    | 699    | 787    | 864    | 978     | 978    | 1295   | 1524   | 1956   | POA     | POA     |
|                  | pulg.     | 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     | POA     | POA     |
| B                | mm.       | 134    | 156      | 162   | 205    | 238   | 291     | 349    | 381    | 457    | 502    | 573     | 606    | 702    | 1003   | 1118   | POA     | POA     |
|                  | pulg.     | 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     | -       | -       |
| E                | mm.       | 152    | 178      | 191   | 229    | 279   | 343     | 406    | 483    | 533    | 597    | 635     | 699    | 813    | 984    | 1168   | 1346    | 1511    |
|                  | pulg.     | 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    |
| Peso             | Kg.       | 15     | 21       | 27    | 40     | 69    | 172     | 266    | 399    | 388    | 510    | 600     | 918    | 1160   | 1816   | 3632   | POA     | POA     |
| 5341RF           | lb.       | 33     | 46.2     | 59.4  | 88     | 151.8 | 378.4   | 585.2  | 877.8  | 853.6  | 1122   | 1320    | 2019.6 | 2552   | 4000   | 8000   | POA     | POA     |
| Peso             | Kg.       | 13     | 19       | 17    | 36     | 64    | 132     | 210    | 305    | 318    | 418    | 492     | 753    | 951    | 1489   | 2978   | POA     | POA     |
| 5341WE           | lb.       | 28.6   | 41.8     | 37.4  | 79.2   | 140.8 | 290.4   | 462    | 671    | 700    | 920    | 1082    | 1656   | 2093   | 3276   | 6552   | POA     | POA     |



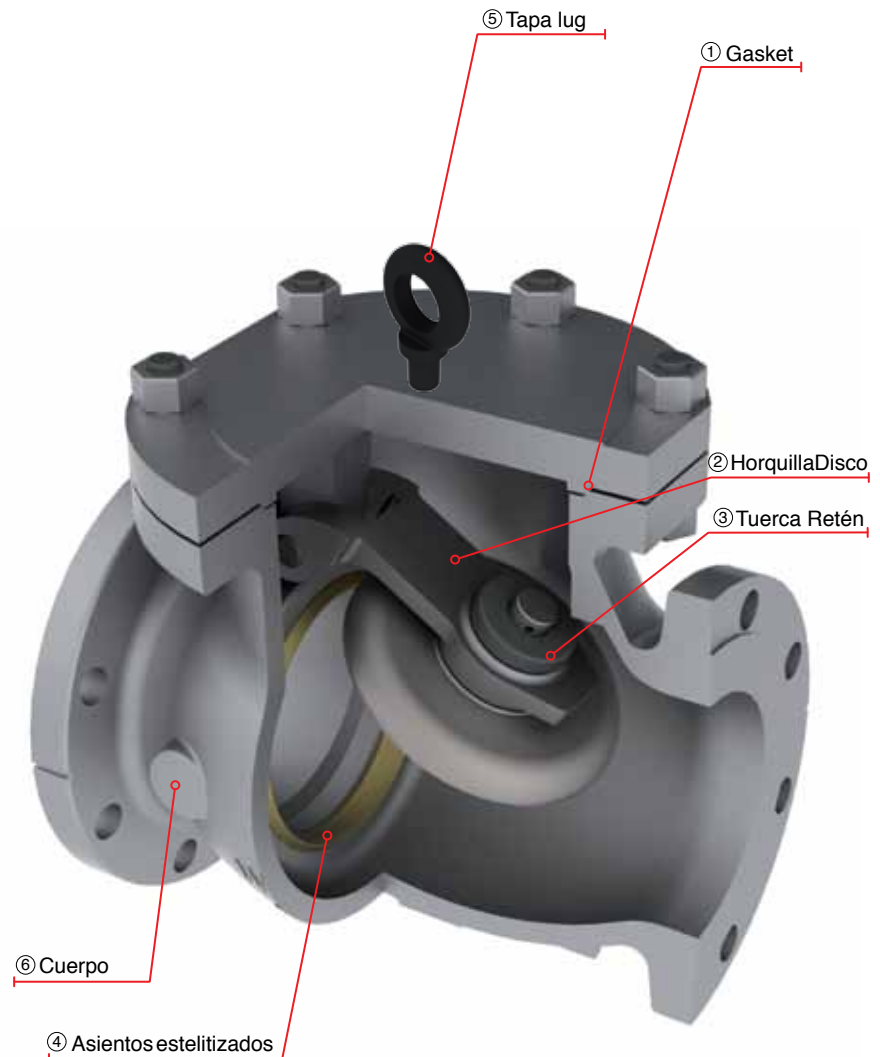
# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 300

## VÁLVULAS DE RETENCIÓN TIPO COLUMPIO (SWING CHECK)

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas de RETENCIÓN diseñadas de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Alternativa para Válvulas de Retención de acuerdo con API-603 solamente para acero inoxidable y aleaciones de níquel.
- Válvulas de Retención para servicio criogénico de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Palancas y contrapesos con amortiguadores disponibles.
- Drenos disponibles de solicitud del cliente.
- Control de bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03
- Pruebas de acuerdo con API-598.

- ① Unión Cuerpo-Tapa diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.
- ② Conexión Disco-Horquilla permite que el Disco controle independiente el movimiento de la horquilla para asegurar la alineación correcta del Disco con el asiento al momento del cierre.
- ③ La conexión está asegurada por la tuerca de Disco diseñada para prevenir el desensamble de la válvula debido a vibraciones y el cierre de la misma.
- ④ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.
- ⑤ Par tamaños de 8" y mayores las válvulas de Retención Walworth ofrecen una agarradera en la tapa para fácil instalación.
- ⑥ Cuerpo con paredes de espesor gruesas de acuerdo a ASME B16.34 para un mayor servicio de vida útil.  
Disponibles con patrones para diferentes opciones de dren.



# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 300

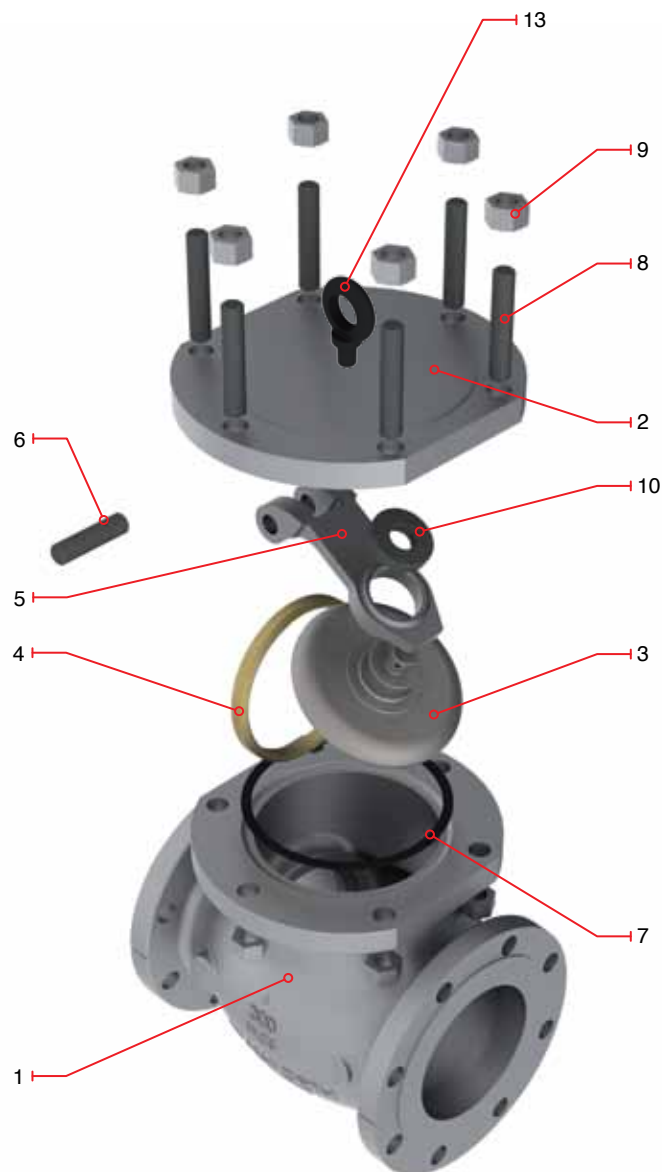
- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5344RF     | 5344F                 | Bridados Cara Realzada, Cara Plana |
| 5344RTJ    | 5344RJ                | Bridados Junta Tipo Anillo         |
| 5344WE     | 5344WE                | Soldable                           |

## Partes y Material

| No.  | DESCRIPCIÓN             | STANDARD MATERIAL             |
|------|-------------------------|-------------------------------|
| 1    | Cuerpo                  | ASTM A 216 GR WCB             |
| 2    | Tapa                    | ASTM A 216 GR WCB             |
| 3    | Disco                   | ASTM A 216 GR WCB + 13% Cr.   |
| 4    | Asiento                 | ASTM A 515 GR 70 + ST 6       |
| 5    | Horquilla               | ASTM A 216 GR WCB             |
| 6    | Flecha                  | ASTM A 276 Type 410           |
| 7    | Junta                   | Spiral Inoxidable 304/Grafito |
| 8    | Espárrago               | ASTM A 193 GR B7              |
| 9    | Tuerca de Espárrago     | ASTM A 194 GR 2H              |
| 10   | Tuerca Retén            | Acero Aleado                  |
| *11  | Cuerpo Plug             | Acero Aleado                  |
| *12  | Placa de Identificación | Acero Inoxidable              |
| **13 | Tuerca de izaje         | Acero Comercial               |

\*No mostrado \*\*Únicamente a partir de 8"



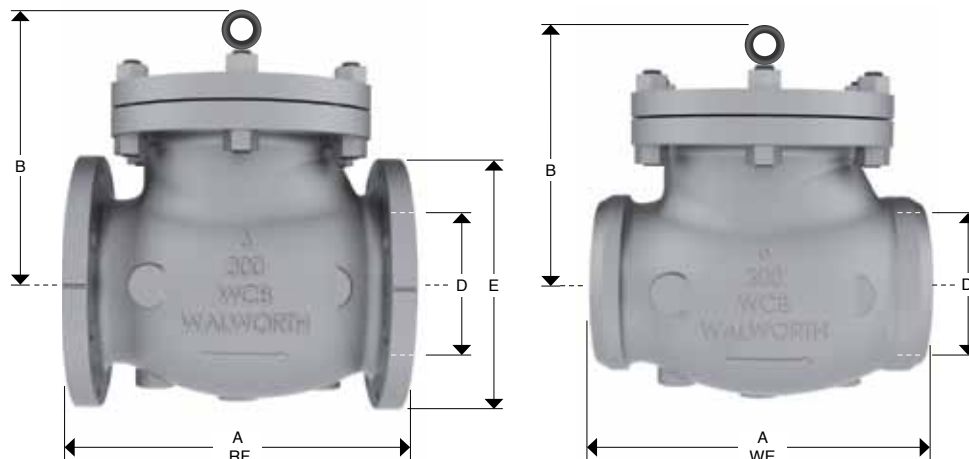
# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO

## CLASE 300



- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5344RF     | 5344F                 | Bridados Cara Realzada, Cara Plana |
| 5344RTJ    | 5344RJ                | Bridados Junta Tipo Anillo         |
| 5344WE     | 5344WE                | Soldable                           |



### Dimensiones y Pesos

| D        |       |         |        |        |         |        |          |         |          |        |          |        |          |      |        |       |  |
|----------|-------|---------|--------|--------|---------|--------|----------|---------|----------|--------|----------|--------|----------|------|--------|-------|--|
| Diámetro | mm.   | 51      | 64     | 76     | 102     | 152    | 203      | 254     | 305      | 356    | 406      | 457    | 508      | 610  | 762    | 914   |  |
| Nominal  | pulg. | 2       | 2 1/2  | 3      | 4       | 6      | 8        | 10      | 12       | 14     | 16       | 18     | 20       | 24   | 30     | 36    |  |
| A        | mm.   | 267     | 292    | 318    | 356     | 445    | 533      | 622     | 711      | 838    | 864      | 978    | 1016     | 1346 | 1594   | 2083  |  |
|          | pulg. | 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  |  |
|          | pulg. | 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    |  |
| E        | mm.   | 165     | 191    | 210    | 254     | 318    | 381      | 445     | 521      | 584    | 648      | 711    | 775      | 914  | 1092   | 1270  |  |
|          | pulg. | 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    |  |
| Peso     | Kg.   | 22      | 27     | 42     | 63      | 129    | 235      | 358     | 544      | 577    | 768      | 990    | 1136     | 2180 | 3000   | 5400  |  |
| 5344RF   | lb.   | 48      | 59     | 92     | 139     | 284    | 517      | 788     | 1197     | 1269   | 1690     | 2178   | 2499     | 4796 | 6600   | 11880 |  |
| Peso     | Kg.   | 19      | 25     | 31     | 58      | 95     | 159      | 305     | 470      | 531    | 707      | 911    | 1045     | 2006 | 2760   | 4968  |  |
| 5344WE   | lb.   | 41.8    | 54.648 | 68.2   | 127.6   | 209    | 349.8    | 671     | 1034     | 1168   | 1554     | 2004   | 2299     | 4412 | 6072   | 10930 |  |

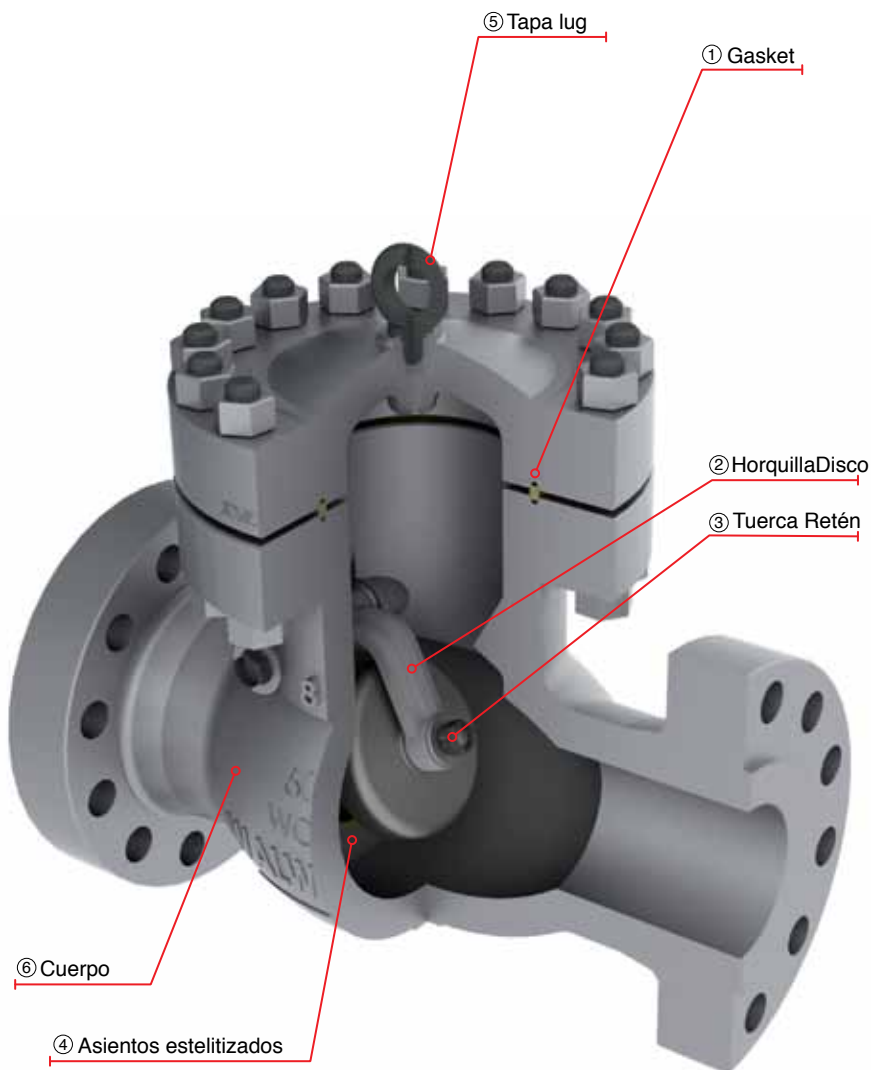
# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 600

VÁLVULAS DE RETENCIÓN TIPO COLUMPIO (SWING CHECK)

## CARACTERÍSTICAS DEL DISEÑO

- Válvulas de RETENCIÓN diseñadas de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Alternativa para Válvulas de Retención de acuerdo con API-603 solamente para acero inoxidable y aleaciones de níquel.
- Válvulas de Retención para servicio criogénico de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Palancas y contrapesos con amortiguadores disponibles.
- Drenes disponibles de solicitud del cliente
- Control de bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03
- Pruebas de acuerdo con API-598..

- ① Unión Cuerpo-Tapa diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.
- ② Conexión Disco-Horquilla permite que el Disco controle independiente el movimiento de la horquilla para asegurar la alineación correcta del Disco con el asiento al momento del cierre.
- ③ La conexión está asegurada por la tuerca de Disco diseñada para prevenir el desensamble de la válvula debido a vibraciones y el cierre de la misma.
- ④ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.
- ⑤ Par tamaños de 8" y mayores las válvulas de Retención Walworth ofrecen una agarradera en la tapa para fácil instalación.
- ⑥ Cuerpo con paredes de espesor gruesas de acuerdo a ASME B16.34 para un mayor servicio de vida útil.  
Disponibles con patrones para diferentes opciones de dren.





# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 600

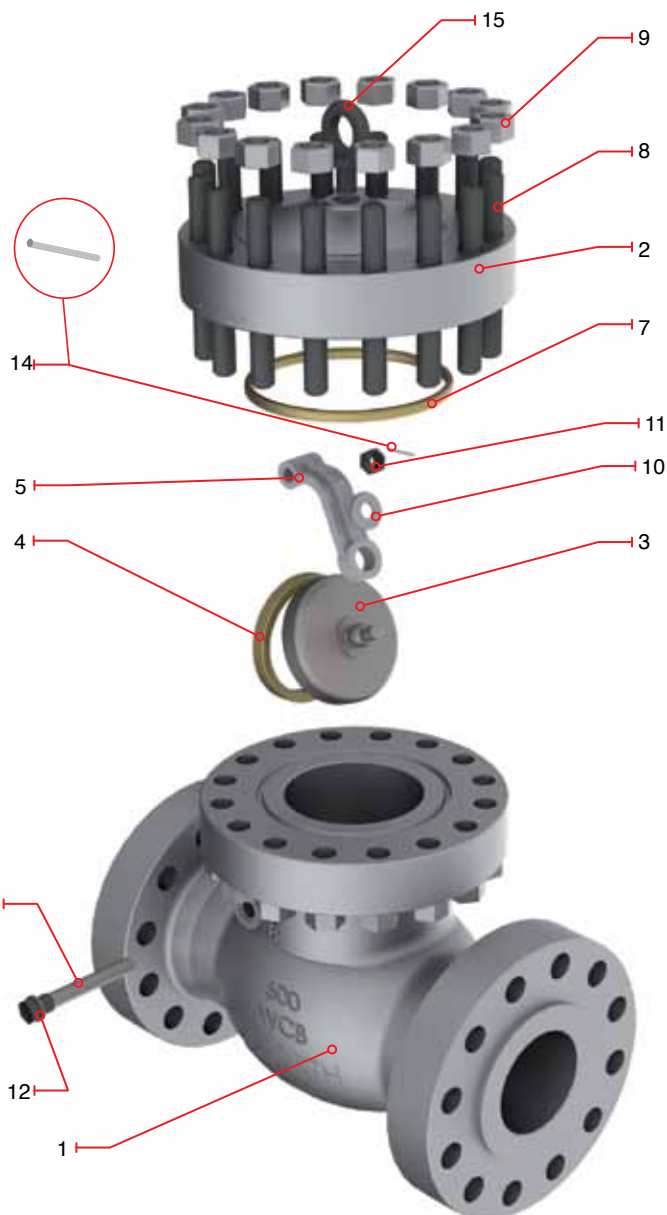
- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5350RF     | 5350F                 | Bridados Cara Realzada, Cara Plana |
| 5350RTJ    | 5350RJ                | Bridados Junta Tipo Anillo         |
| 5350WE     | 5350WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                 |
|-----|-------------------------|-----------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB           |
| 2   | Tapa                    | ASTM A 216 GR WCB           |
| 3   | Disco                   | ASTM A 216 GR WCB + 13% Cr. |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST 6     |
| 5   | Horquilla               | ASTM A 216 GR WCB           |
| 6   | Flecha                  | ASTM A 276 Type 410         |
| 7   | Junta                   | ASTM A 108 GR 1010          |
| 8   | Espárrago               | ASTM A 193 GR B7            |
| 9   | Tuerca de Espárrago     | ASTM A 194 GR 2H            |
| 10  | Roldana Disco           | ASTM A 276 Type 410         |
| 11  | Tuerca Retén            | Acero Aleado                |
| 12  | Tapón Cuerpo            | Acero Aleado                |
| *13 | Placa de Identificación | Acero Inoxidable            |
| 14  | Retén de la Horquilla   | Acero Inoxidable            |
| 15  | Tuerca de izaje         | Acero Comercial             |

\*No mostrado



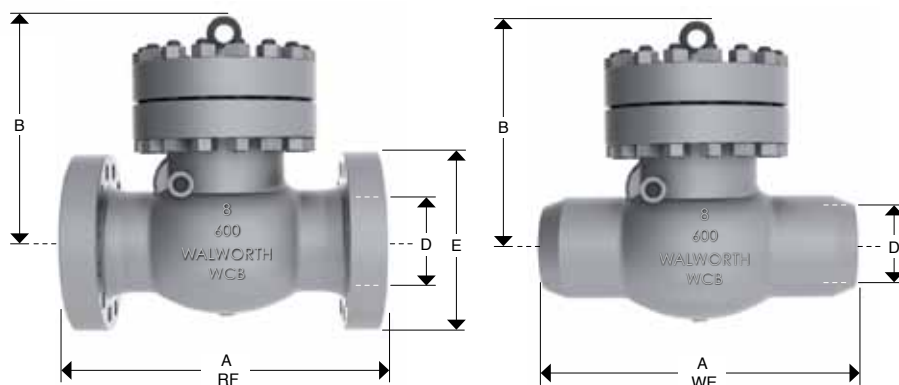
# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO

## CLASE 600



- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5350RF     | 5350F                 | Bridados Cara Realzada, Cara Plana |
| 5350RTJ    | 5350RJ                | Bridados Junta Tipo Anillo         |
| 5350WE     | 5350WE                | Soldable                           |



### Dimensiones y Pesos

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

# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 900

## VÁLVULAS DE RETENCIÓN TIPO COLUMPIO (SWING CHECK)

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas de RETENCIÓN diseñadas de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Alternativa para Válvulas de Retención de acuerdo con API-603 solamente para acero inoxidable y aleaciones de níquel.
- Válvulas de Retención para servicio criogénico de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Palancas y contrapesos con amortiguadores disponibles.
- Drenes disponibles de solicitud del cliente
- Control de bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03
- Pruebas de acuerdo con API-598..

① Unión Cuerpo-Tapa diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

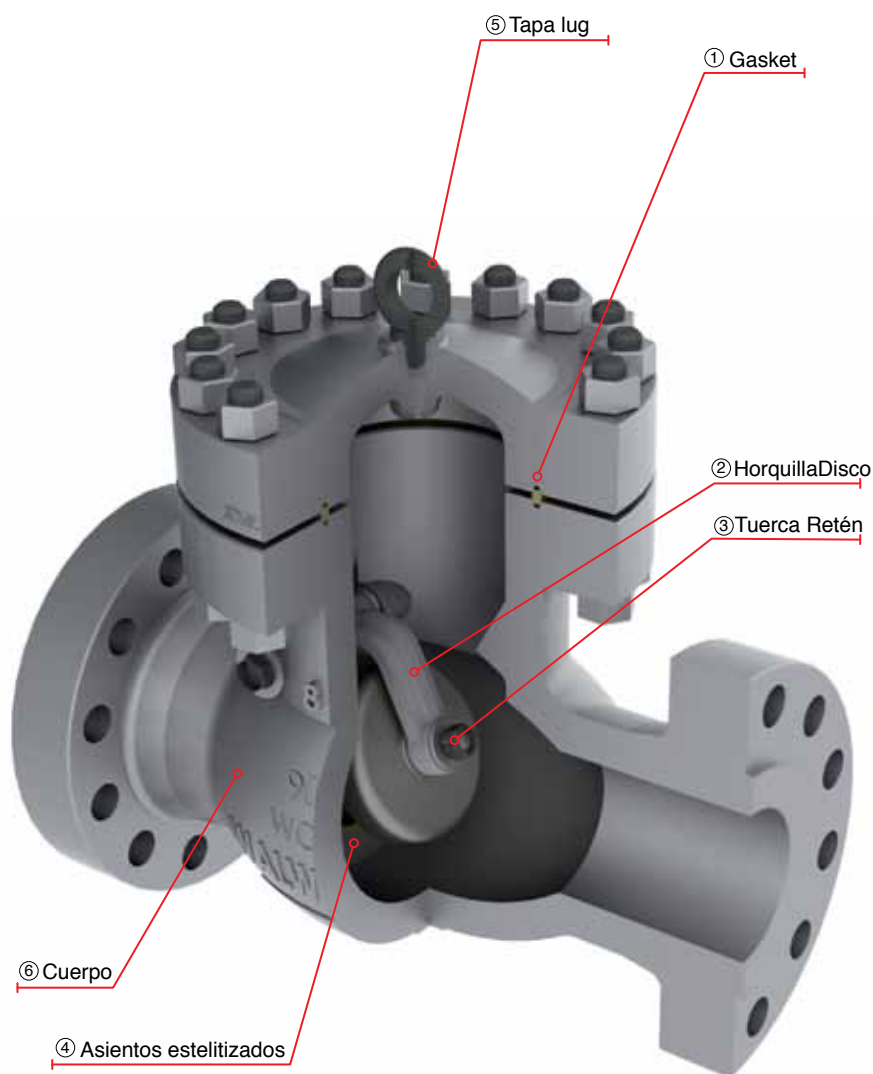
② Conexión Disco-Horquilla permite que el Disco controle independiente el movimiento de la horquilla para asegurar la alineación correcta del Disco con el asiento al momento del cierre.

③ La conexión está asegurada por la tuerca de Disco diseñada para prevenir el desensamble de la válvula debido a vibraciones y el cierre de la misma.

④ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑤ Par tamaños de 8" y mayores las válvulas de Retención Walworth ofrecen una agarradera en la tapa para fácil instalación.

⑥ Cuerpo con paredes de espesor gruesas de acuerdo a ASME B16.34 para un mayor servicio de vida útil.  
Disponibles con patrones para diferentes opciones de dren.



# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 900

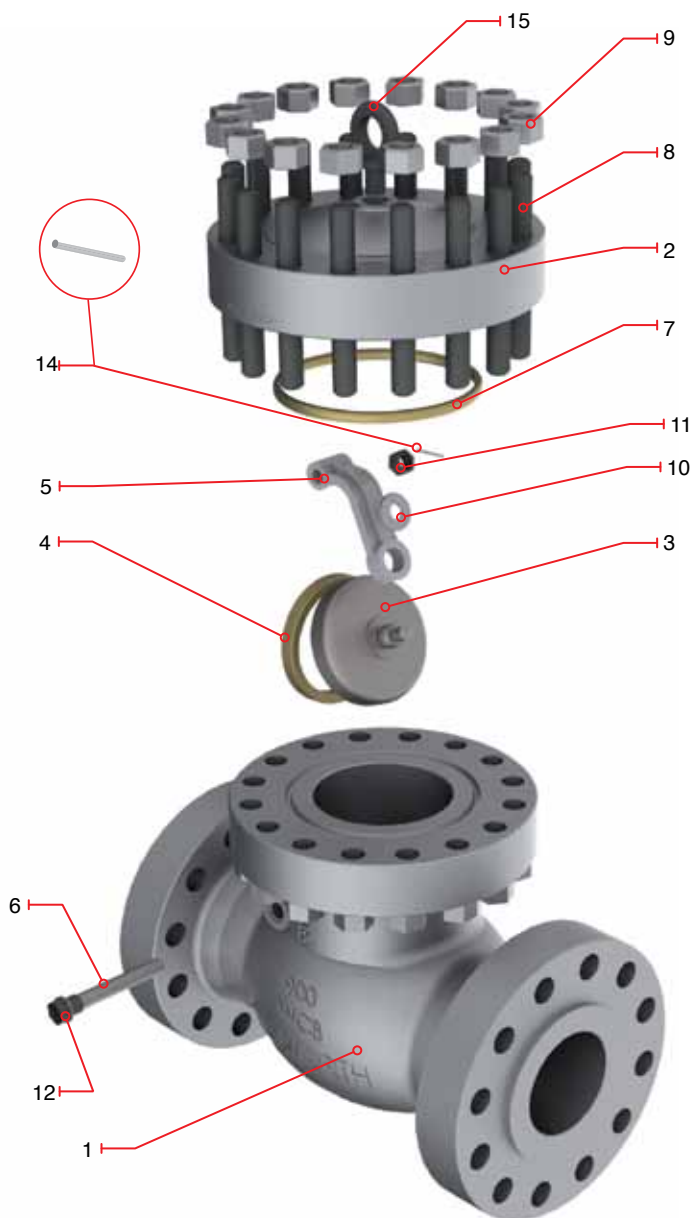
- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5353RF     | 5353F                 | Bridados Cara Realzada, Cara Plana |
| 5353RTJ    | 5353RJ                | Bridados Junta Tipo Anillo         |
| 5353WE     | 5353WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                 |
|-----|-------------------------|-----------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB           |
| 2   | Tapa                    | ASTM A 216 GR WCB           |
| 3   | Disco                   | ASTM A 216 GR WCB + 13% Cr. |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST 6     |
| 5   | Horquilla               | ASTM A 216 GR WCB           |
| 6   | Flecha                  | ASTM A 276 Type 410         |
| 7   | Junta                   | ASTM A 108 GR 1010          |
| 8   | Espárrago               | ASTM A 193 GR B7            |
| 9   | Tuerca de Espárrago     | ASTM A 194 GR 2H            |
| 10  | Roldana Disco           | ASTM A 276 Type 410         |
| 11  | Tuerca Retén            | Acero Aleado                |
| 12  | Tapón Cuerpo            | Acero Aleado                |
| *13 | Placa de Identificación | Acero Inoxidable            |
| 14  | Retén de la Horquilla   | Acero Inoxidable            |
| 15  | Tuerca de izaje         | Acero Comercial             |

\*No mostrado





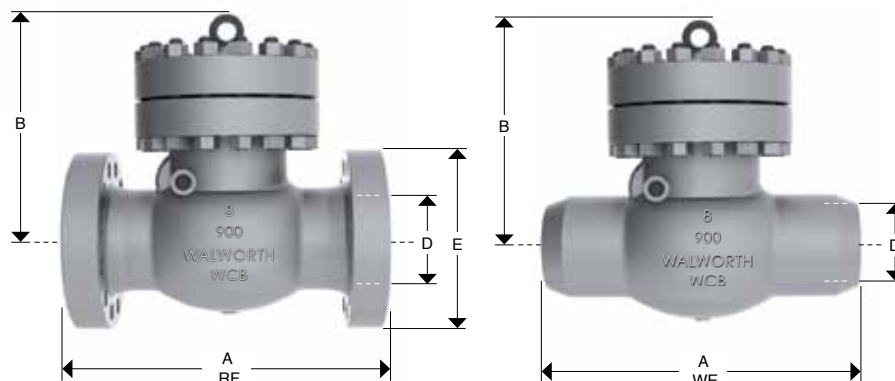
# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO

## CLASE 900



- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16 .25
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5353RF     | 5353F                 | Bridados Cara Realzada, Cara Plana |
| 5353RTJ    | 5353RJ                | Bridados Junta Tipo Anillo         |
| 5353WE     | 5353WE                | Soldable                           |



### Dimensiones y Pesos

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

# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 1500

## VÁLVULAS DE RETENCIÓN TIPO COLUMPIO (SWING CHECK)

### CARACTERÍSTICAS DEL DISEÑO

- Válvulas de RETENCIÓN diseñadas de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Alternativa para Válvulas de Retención de acuerdo con API-603 solamente para acero inoxidable y aleaciones de níquel.
- Válvulas de Retención para servicio criogénico de acuerdo con la norma BS-6364.
- Dimensiones de bridas según ASME B16.5 para válvulas arriba 24" de diámetro Diámetro.
- Palancas y contrapesos con amortiguadores disponibles.
- Drenes disponibles de solicitud del cliente
- Control de bajas emisiones fugitivas.
- Servicio NACE MR-01-75 ó de MR-01-03
- Pruebas de acuerdo con API-598..

① Unión Cuerpo-Tapa diseñado para aplicar una carga uniforme a la junta, para asegurar un sellado a prueba de fugas.

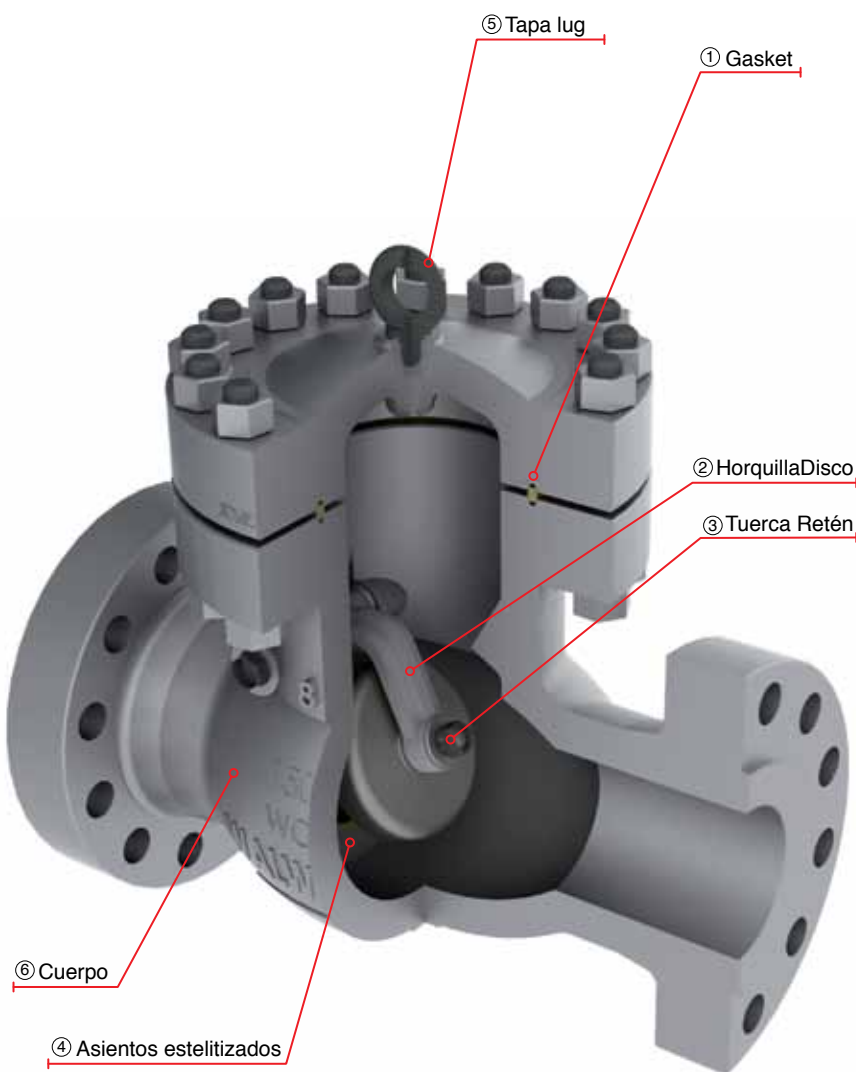
② Conexión Disco-Horquilla permite que el Disco controle independiente el movimiento de la horquilla para asegurar la alineación correcta del Disco con el asiento al momento del cierre.

③ La conexión está asegurada por la tuerca de Disco diseñada para prevenir el desensamble de la válvula debido a vibraciones y el cierre de la misma.

④ Recubrimiento de Stellite en los asientos, proporciona una mayor resistencia al desgaste provocado por la abrasión y erosión de las superficies de sello.

⑤ Par tamaños de 8" y mayores las válvulas de Retención Walworth ofrecen una agarradera en la tapa para fácil instalación.

⑥ Cuerpo con paredes de espesor gruesas de acuerdo a ASME B16.34 para un mayor servicio de vida útil.  
Disponibles con patrones para diferentes opciones de dren.



# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO CLASE 1500

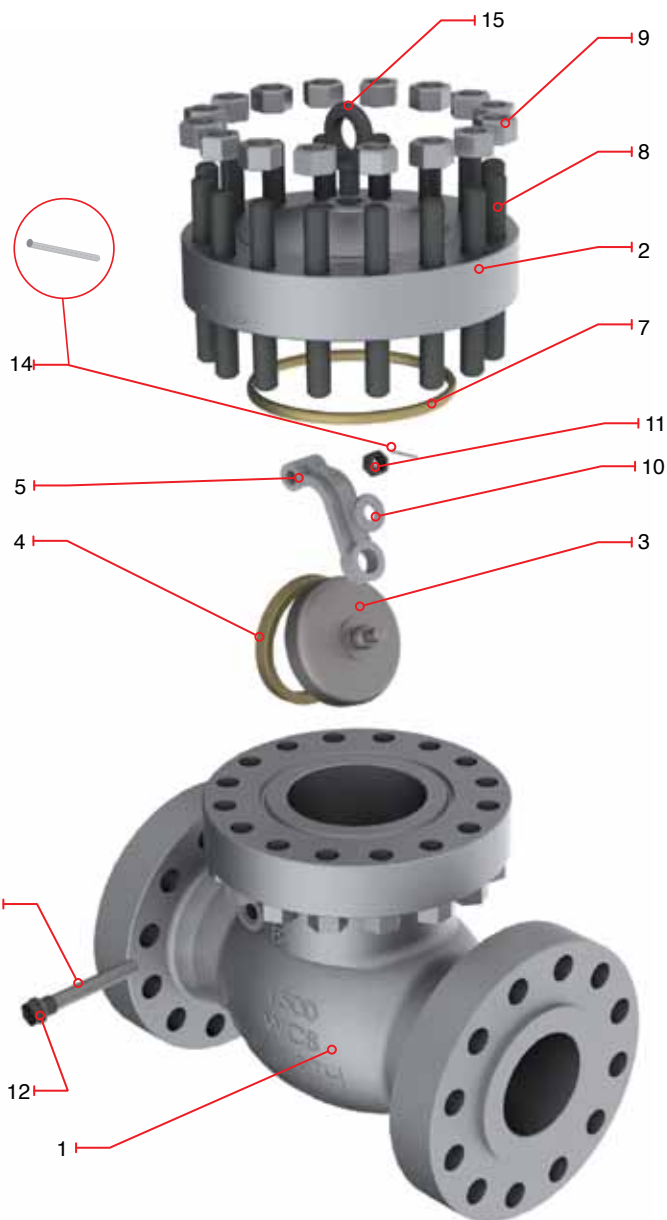
- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5356RF     | 5356F                 | Bridados Cara Realzada, Cara Plana |
| 5356RTJ    | 5356RJ                | Bridados Junta Tipo Anillo         |
| 5356WE     | 5356WE                | Soldable                           |

## Partes y Materiales

| No. | DESCRIPCIÓN             | WCB Trim UT                 |
|-----|-------------------------|-----------------------------|
| 1   | Cuerpo                  | ASTM A 216 GR WCB           |
| 2   | Tapa                    | ASTM A 216 GR WCB           |
| 3   | Disco                   | ASTM A 216 GR WCB + 13% Cr. |
| 4   | Asiento                 | ASTM A 515 GR 70 + ST 6     |
| 5   | Horquilla               | ASTM A 216 GR WCB           |
| 6   | Flecha                  | ASTM A 276 Type 410         |
| 7   | Junta                   | ASTM A 108 GR 1010          |
| 8   | Espárrago               | ASTM A 193 GR B7            |
| 9   | Tuerca de Espárrago     | ASTM A 194 GR 2H            |
| 10  | Roldana Disco           | ASTM A 276 Type 410         |
| 11  | Tuerca Retén            | Acero Aleado                |
| 12  | Tapón Cuerpo            | Acero Aleado                |
| *13 | Placa de Identificación | Acero Inoxidable            |
| 14  | Retén de la Horquilla   | Acero Inoxidable            |
| 15  | Tuerca de izaje         | Acero Comercial             |

\*No mostrado



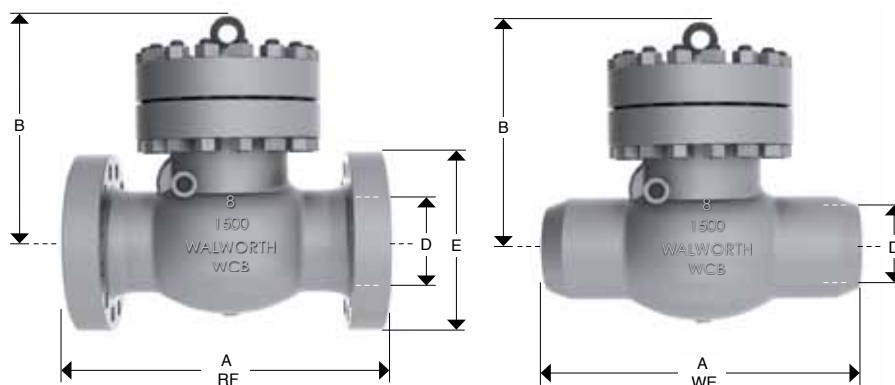
# VÁLVULA DE RETENCIÓN BONETE BRIDADO FUNDIDO

## CLASE 1500



- Diseño de acuerdo con API-6D.
- Válvulas de retención de acuerdo con API-599 disponibles bajo pedido.
- Disco tipo columpio.
- Dimensiones de brida según ASME B16.5.
- Dimensiones de extremo a extremo según ASME B16.10.
- Dimensiones de cara a cara para extremos WE según ASME B16.25.
- Dimensiones de brida para válvulas mayores a 24" se suministran de acuerdo a ASME B16.47 Series A como estándar.
- Dimensiones de bridas según ASME B16.47 Serie B disponibles a solicitud del Cliente.

| Figura No. | Figura No. ID Fábrica | Tipo de Extremos                   |
|------------|-----------------------|------------------------------------|
| 5356RF     | 5356F                 | Bridados Cara Realzada, Cara Plana |
| 5356RTJ    | 5356RJ                | Bridados Junta Tipo Anillo         |
| 5356WE     | 5356WE                | Soldable                           |



### Dimensiones y Pesos

| D         |       |        |          |          |        |          |         |          |        |        |        |        |        |        |
|-----------|-------|--------|----------|----------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|
| Diámetro  | mm.   | 51     | 64       | 76       | 102    | 152      | 203     | 508      | 305    | 356    | 406    | 457    | 508    | 610    |
| Nominal   | pulg. | 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 y WE) | pulg. | 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)     | pulg. | 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   | POA    |
|           | pulg. | 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 | POA    |
| E         | mm.   | 216    | 244      | 267      | 311    | 394      | 483     | 584      | 673    | 749    | 826    | 914    | 984    | 1168   |
|           | pulg. | 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     |
| Peso      | Kg.   | 64     | 127      | 127      | 211    | 418      | 777     | 1550     | 2100   | 2358   | 3400   | 4350   | 5500   | POA    |
| 5356RF    | lb.   | 141    | 279      | 279      | 464    | 920      | 1709    | 3410     | 4620   | 5188   | 7480   | 9570   | 12100  | POA    |
| Peso      | Kg.   | 54     | 108      | 108      | 179    | 355      | 660     | 1318     | 1785   | 2004   | 2890   | 3698   | 4675   | POA    |
| 5356WE    | lb.   | 120    | 237      | 237      | 395    | 782      | 1453    | 2899     | 3927   | 4409   | 6358   | 8135   | 10285  | POA    |



# INFORMACIÓN TÉCNICA

## DIFERENTES DISEÑOS DE COMPUERTA

### Características de la Compuerta Flexible:

- Evita el posible entrampamiento de la compuerta entre los asientos debido a las fluctuaciones de temperatura alta a baja ya que compensa los movimientos provocados en el cuerpo y los asientos.
- Facilita un sello adecuado contra los anillos de asiento y aumenta la vida útil de la válvula.
- Es susceptible a posible atascamiento cuando se utiliza en servicio con fluidos de alto contenido de sólidos.



### Características de la Compuerta Sólida o Flexible:

- Es susceptible al atascamiento de la compuerta entre los anillos provocando dificultad para abrir la válvula cuando se cierra a alta temperatura y se enfría la válvula ya que el conjunto cuerpo-anillos sufren una contracción que entrampa la compuerta.
- Es más sensible a perder el sello contra los anillos debido al deslizamiento forzado entre ellos.
- Opera sin problemas cuando se encuentra en servicio con fluidos con alto contenido de sólidos.



# INFORMACIÓN TÉCNICA

## ANILLO LINTERNA-CÁMARA DE CONDENSADOS

Las válvulas WALWORTH pueden ser provistas con una combinación que incluye empaques en la parte superior e inferior de la cámara de empaques, con un anillo linterna en la parte central, lo que permite la capacidad de la cámara de condensar y/o drenar el fluido procesado.

Este arreglo puede ser utilizado para lubricar el empaque o para drenar/purgar la cámara de empaques o para desviar alguna posible fuga cuando los fluidos líquidos o gases no pueden ser liberados a la atmósfera.



## VÁLVULAS PARA SERVICIO NACE

La Asociación Nacional de Ingenieros en Corrosión (NACE) establece normas para materiales resistentes a la fractura por esfuerzos por sulfuros "Sulfide Stress Cracking" (SSC) que deben ser utilizados cuando se encuentran en ambientes que contengan ácido sulfhídrico (H<sub>2</sub>S) en manejo de hidrocarburos.

La Norma NACE MR0175 o la Norma NACE MR0103 definen las características de las fracturas por esfuerzos por sulfuros en base a la correlación entre el H<sub>2</sub>S presente a la presión de operación.

Esta correlación entre H<sub>2</sub>S a las presiones de operación deben ser tomadas en cuenta cuando se seleccionen válvulas que estarán en contacto con servicio gas amargo.

La corrosión por fractura debida a esfuerzos provocados por sulfuros cuando se utilizan materiales no adecuados para servicio de gas amargo (H<sub>2</sub>S) pueden resultar en fallas que pueden dañar los equipos e inclusive al personal operativo.

### Consideraciones importantes cuando se especifican válvulas para servicio NACE.

1. Concentración de iones de hidrógeno.
2. Concentración y presión total del ácido sulfhídrico (H<sub>2</sub>S).
3. Concentración de agua, dióxido de carbono (CO<sub>2</sub>) y cloruros.
4. Temperatura de servicio.

El Cliente puede seleccionar válvulas fabricadas de acero al carbón o acero aleado a condición de que tengan una dureza controlada; así también se puede utilizar acero inoxidable dependiendo de la severidad del fluido. Válvulas que tienen cuerpo y bonete con dureza controlada entre de 22 HRC así como espárragos y tuercas B7M/2HM pueden ser combinados con interiores (trim) que cumplan con los requerimientos de la normativa NACE MR0175 o MR0103.

# INFORMACIÓN TÉCNICA

## EMPAQUE DE VÁSTAGO

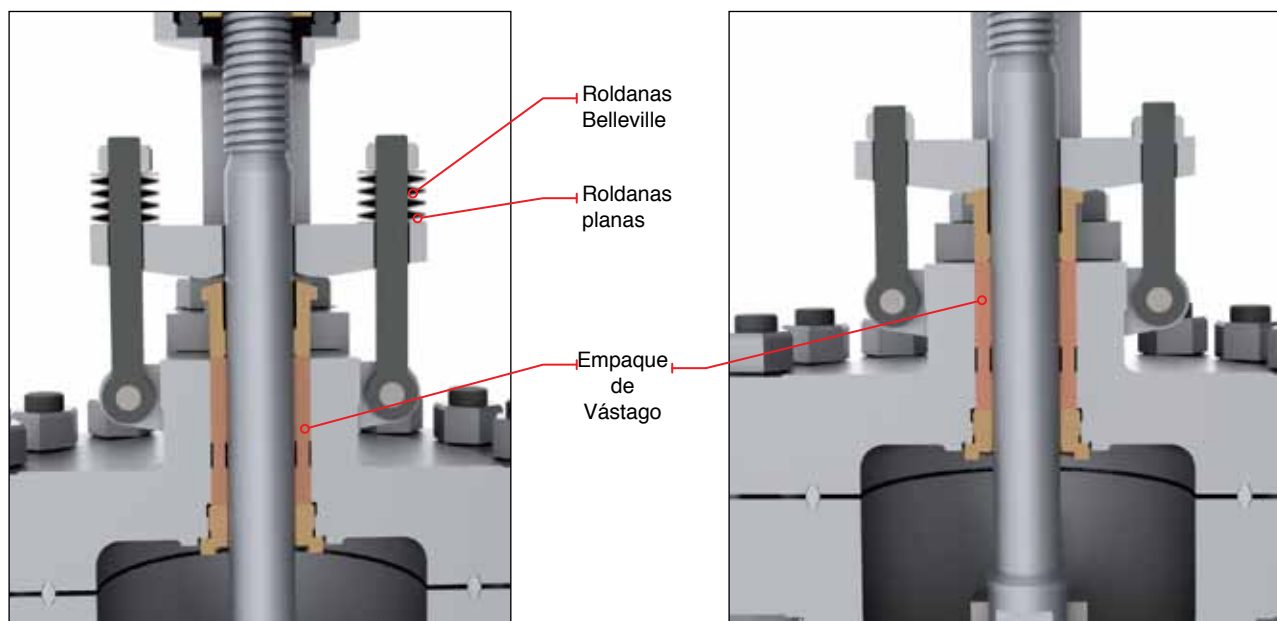
Las válvulas WALWORTH están diseñadas, fabricadas y probadas para permitir un máximo de 50 ppm VOC (compuestos orgánicos volátiles) de emisiones fugitivas a la atmósfera. Este diseño está incorporado en las válvulas de compuerta y globo tanto de acero fundido como de acero forjado sin necesidad de un requerimiento suplementario del Cliente.

El diseño de la empaquetadura WALWORTH incluye un inhibidor de corrosión así como la combinación de anillos centrales preformados de alta y baja densidad junto con anillos en los extremos reforzados con alambre de inonel.

La capacidad de mantener bajas emisiones fugitivas a la atmósfera del empaque WALWORTH es debida a la precisión en las dimensiones así como las cerradas tolerancias diametrales; el estricto control del paralelismo del vástago y de los empaques contra la cámara de empaques del bonete así como el acabado superficial del vástago en la zona de sello de los empaques.

WALWORTH también provee a solicitud del Cliente válvulas de compuerta y globo con sistemas de sello de la cámara de empaques con carga viva (live load) que son recomendables en servicios de frecuente operación de apertura y cierre o cuando tienen variaciones de presión-temperatura o cuando es deseable eliminar la necesidad de ajustes ocasionales del empaque para compensar las variaciones de la operación. Los sistemas de carga viva ofrecen una constante compresión del empaque para mantener un óptimo sello después de periodos prolongados de trabajo y variaciones de la operación.

WALWORTH suministra estos sistemas de carga viva (live load) en diferentes diseños y materiales para cumplir los requerimientos de los Clientes y Usuarios Finales.



**Sistema de Carga Viva  
(Live Load)**

**Empaque de Vástago  
estándar**

# INFORMACIÓN TÉCNICA

## JUNTAS DE SELLO DE UNIÓN CUERPO-BONETE

Las válvulas de bonete bridado fundido WALWORTH son fabricadas con uno de los diferentes diseños mostrados en la siguiente tabla.

Para condiciones especiales de servicio, WALWORTH ofrece diseños, formas y materiales especiales que se ajustan a las necesidades y requerimientos de los Clientes y Usuarios finales. Para mayor información, póngase en contacto con su Distribuidor o Representante más cercano o dirijase directamente a la Planta en [info@walworth.com.mx](mailto:info@walworth.com.mx).

| VÁLVULA   | CLASE |     |     |     |      |
|-----------|-------|-----|-----|-----|------|
|           | 150   | 300 | 600 | 900 | 1500 |
| COMPUERTA | 1     | 2   | 3   | 3   | 3    |
| GLOBO     | 1     | 2   | 3   | 3   | 3    |
| RETENCIÓN | 1     | 2   | 3   | 3   | 3    |

### JUNTA PLANA



1.- JUNTA PLANA: Fabricada con Grafito y reforzada con con malla de acero inoxidable 316.



### JUNTA ESPIROTÁLICA



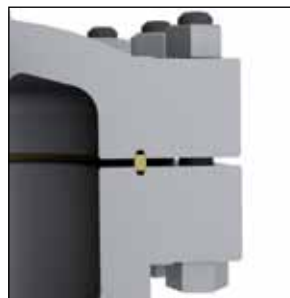
1.- JUNTA ESPIROTÁLICA: Fabricad de acero inoxidable 316 con grafito interior.



### ANILLO TIPO RTJ GASKET



1.- ANILLO RTJ: Se fabrica e forma oval u octagonal y en material de acero al carbón suave o acero inoxidable.





# INFORMACIÓN TÉCNICA

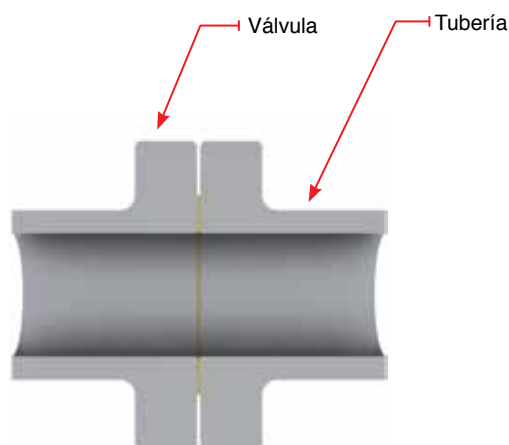
## TIPOS DE EXTREMOS

Las válvulas WALWORTH pueden ser suministradas con extremos bridados tipo cara realzada (RF); cara plana (FF) o con extremos tipo junta anillo (RTJ), así como con extremos para soldar a tope (WE). También puede fabricarse en combinaciones de extremos tales como extremo bridado con extremo soldable a tope a solicitud del Cliente.

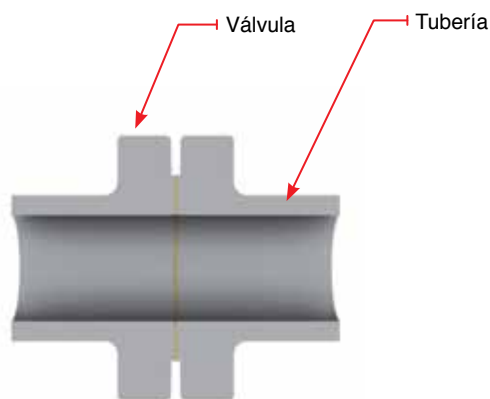
Los extremos soldables a tope (WE) en válvulas estándar son maquinados de acuerdo con ASME B16.25 y pueden ser fabricados de acuerdo a las siguientes cedulas de extremos:

| Presión Clase de la Válvula | Cedula para extremos de la tubería                                                  |
|-----------------------------|-------------------------------------------------------------------------------------|
| 150/300                     | Cedula 40 para diámetros de 2" a 10"<br>Cedula estándar para diámetros de 12" a 24" |
| 600                         | Cedula 80                                                                           |
| 900                         | Cedula 160 para diámetros de 2" a 3"<br>Cedula 120 para diámetros de 4" y mayores   |
| 1500                        | Cedula 160                                                                          |

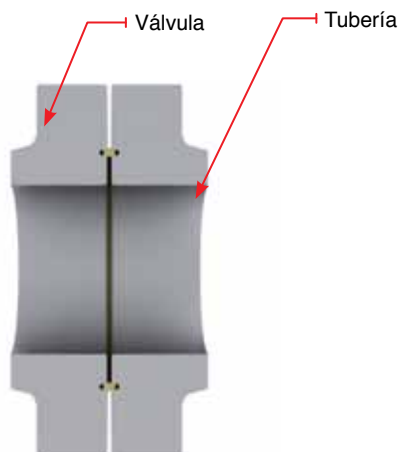
Cuando se requieran cedulas diferentes a las mencionadas arriba, el Cliente debe especificar claramente el tipo de cedula o el espesor de pared y tipo de tubería a ser soldado.



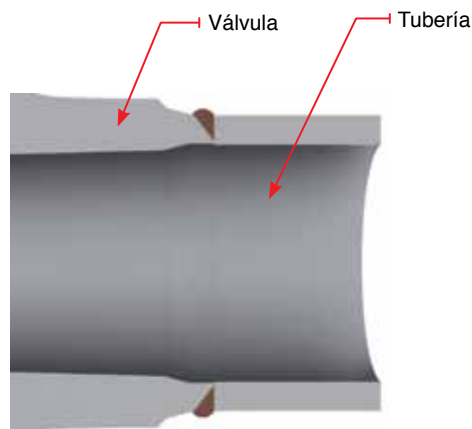
Extremos Bridados Cara Plana.



Extremos Bridados Cara Realzada



Extremos Bridados Junta RTJ



Extremos Soldables a Tope (WE)

# INFORMACIÓN TÉCNICA

## TIPOS DE OPERACIÓN

Las válvulas WALWORTH estándar son fabricadas con diferentes tipos de operación para cumplir los requerimientos de la mayoría de aplicaciones en campo.

Sin embargo, aplicaciones especiales pueden requerir adaptaciones para cumplir las necesidades específicas de operación para cierto tipo de Industria o servicio. Las válvulas pueden ser suministradas con operación de volante, operador de engranes cerrado, volante de cadena, así como actuadores eléctricos, neumáticos, hidráulicos, etc., a requerimiento específico del Cliente.

De esta manera, WALWORTH adapta sus productos a las necesidades del servicio para controlar las operaciones de apertura y cierre con instalaciones remotas.

Las válvulas pueden también ser fabricadas con By-Pass, drenes, conexiones de vente, extensión de vástago, indicadores de posición, montajes para piso, así como sistemas de amortiguación por contrapeso o pistón para válvulas tipo columpio (swing)

### Operador de Engranes

El operador de Engranes cerrado está diseñado con un engrane cónico y una relación de engranes que ofrece un torque de apertura y cierre que permite operar la válvula con un esfuerzo normal. Se puede suministrar con sellos para evitar la entrada de agua en su interior y/o con extensiones para servicio bajo tierra que incluye la tuerca cuadrada de operación.



### Operación de Volante con Cadena

Volantes con cadena son diseñados para operar a distancia o en zonas inaccesibles. Estos operadores de volante con cadena son suministrados con guías roladas para prevenir que el volante se suelte del volante. Operadores de Volante de Impacto y con Cadena están también disponibles para ayudar a sellar la válvula al aumentar el torque de cierre.



### Actuadores

Las válvulas pueden ser automatizadas con actuadores eléctricos, neumáticos, eléctricos o hidroneumáticos. También pueden ser fabricados a prueba de agua y/o a prueba de explosión. El Cliente debe especificar las características de automatización requeridas tales como velocidad de apertura y cierre, máxima presión diferencial, temperatura de servicio, tipo de voltaje-fases-frecuencia, alimentación con gas o aire para actuadores neumáticos y características de flujo para actuadores hidráulicos, también debe especificarse los accesorios tales como control remoto, accesorio anti-explosión NEMA, etc.



# INFORMACIÓN TÉCNICA

## ACCESORIOS

### Conexiones tipo By-pass, Drenes y Venteos.

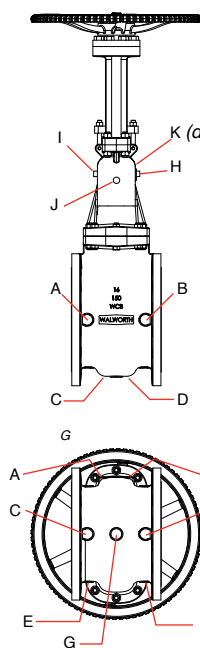
Una conexión con By-Pass es incorporada para igualar la presión alrededor de la válvula principal o para calentar la línea antes de abrir la válvula.

Los drenes son normalmente colocados en el cuerpo de la válvula para drenar la válvula cuando se requiere tomar muestra del fluido o para limpieza de las partes inferiores de la misma.

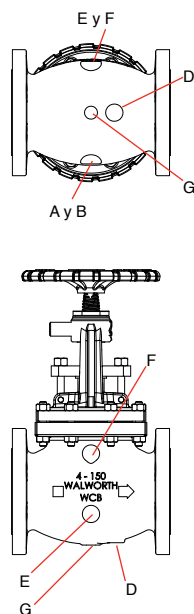
Una conexión de venteo puede ser colocada en el bonete de la válvula para liberar sobre-presión que pudiera existir en la cavidad interna debido a una expansión del fluido o entrapamiento.



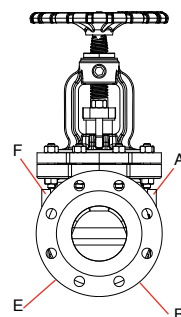
| Diámetro de la Válvula          | 2" a 4" | 6" a 8" | 10" y mayores |
|---------------------------------|---------|---------|---------------|
| Tamaño del By-Pass-Drene-Venteo | 1/2"    | 3/4"    | 1"            |



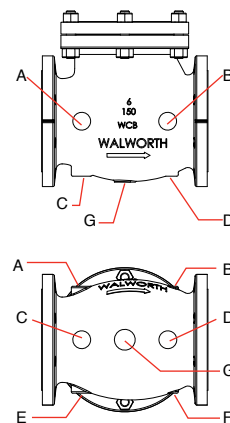
**Válvula de Compuerta**



**Válvula de Globo**



**Válvula de Retención**



Conexiones de bosses y drenes en posiciones de acuerdo con los estándares MSS-SP-45 y ASME B16.34

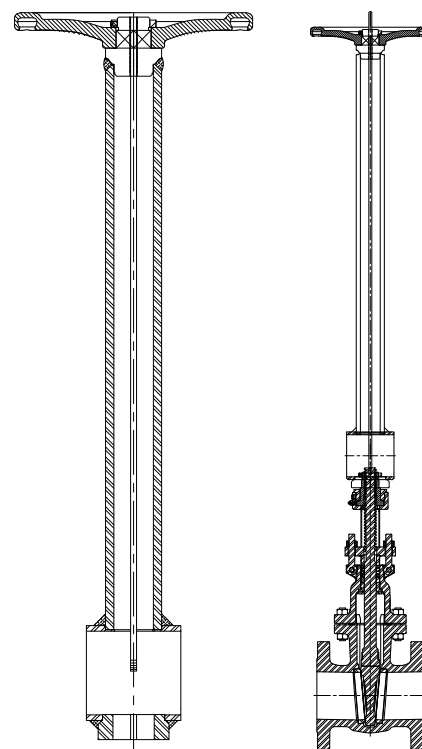
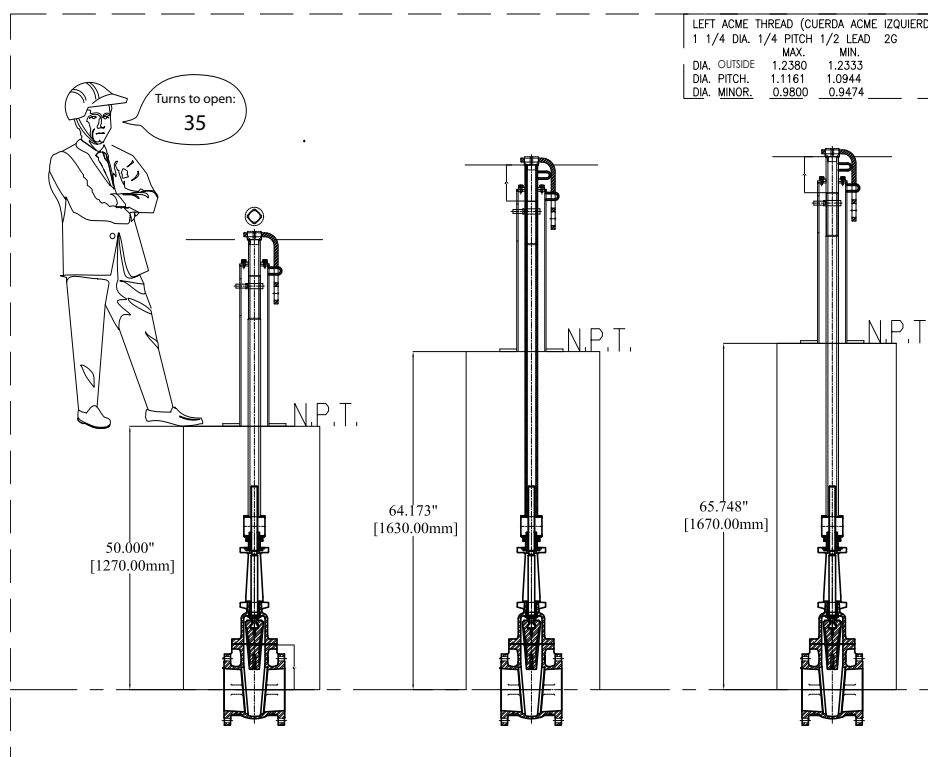
# INFORMACIÓN TÉCNICA

## ACCESORIOS

### Extensión de Vástago y Montajes para Piso

Pueden ser usados para facilitar la operación de una válvula que será instalada bajo tierra, dentro de una recámara sin acceso o en una plataforma. Estos arreglos están disponibles tanto para operación a volante, volante con cadena u operador de engranes.

La distancia desde la línea de centros del puerto de la válvula a la parte superior del vástago o línea de centros del operador de engranes debe ser especificado cuando se solicita extensión de vástago. La distancia desde la línea de centros del puerto de la válvula a la distancia del nivel del piso debe ser especificado para montajes para piso.



### Palanca y contrapeso

Una palanca y contrapeso es utilizada en válvulas de retención tipo columpio para para ayudar a controlar la velocidad de apertura y cierre bajo condiciones variables de operación al prevenir que el disco vibre. También asiste a controlar el cierre brusco del disco cuando se tiene presión de contra-flujo evitando dañar el disco. Un resorte puede ser incorporado para permitir una apertura y cierre más rápido en una carrera corta cuanto se tiene el contraflujo.



# RELACIÓN PRESIÓN-TEMPERATURA

## ACERO AL CARBÓN ASTM A216 GRADO WCB

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 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      | 95                                                     | 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  |

(\*) Para extremos soldables a tope únicamente. La relación para extremos bridados termina a 1000°F (538°C).

## ACERO AL CARBÓN ASTM A217 GRADO WC6

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 38 | 290                                                    | 750 | 1500 | 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 |
| 1000              | 538      | 20                                                     | 215 | 430  | 650  | 1080  | 1800 |
| 1050              | 566      | 20(*)                                                  | 145 | 290  | 430  | 720   | 1200 |
| 1100              | 593      | 20(*)                                                  | 95  | 190  | 290  | 480   | 800  |
| 1150              | 621      | 20(*)                                                  | 65  | 130  | 195  | 325   | 545  |
| 1200              | 649      | 15(*)                                                  | 40  | 80   | 125  | 205   | 345  |

(a) La relación para extremos bridados termina a 1000°F (538°C).



# RELACIÓN PRESIÓN-TEMPERATURA

## ACERO AL CARBÓN ASTM A217 GRADO WC9

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 38 | 290                                                    | 750 | 1500 | 2250 | 3750  | 6250 |
| 200               | 93       | 260                                                    | 750 | 1500 | 2250 | 3750  | 6250 |
| 300               | 149      | 230                                                    | 730 | 1455 | 2185 | 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                                                     | 450 | 900  | 1350 | 2245  | 3745 |
| 950               | 510      | 35                                                     | 385 | 755  | 1160 | 1930  | 3220 |
| 1000              | 538      | 20                                                     | 265 | 535  | 800  | 1335  | 2230 |
| 1050              | 566      | 20(*)                                                  | 175 | 350  | 525  | 875   | 1455 |
| 1100              | 593      | 20(*)                                                  | 110 | 220  | 330  | 550   | 915  |
| 1150              | 621      | 20(*)                                                  | 70  | 135  | 205  | 345   | 570  |
| 1200              | 649      | 15(*)                                                  | 40  | 80   | 125  | 205   | 345  |

(a) La relación para extremos bridados termina a 1000°F (538°C)..

## ACERO AL CARBÓN ASTM A217 GRADO C5

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 38 | 290                                                    | 750 | 1500 | 2250 | 3750  | 6250 |
| 200               | 93       | 260                                                    | 750 | 1500 | 2250 | 3750  | 6250 |
| 300               | 149      | 230                                                    | 730 | 1455 | 2185 | 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  |

(\*) Para extremos soldables a tope únicamente. La relación para extremos bridados termina a 1000°F (538°C).

# RELACIÓN PRESIÓN-TEMPERATURA

## ACERO AL CARBÓN ASTM A217 GRADO C12

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 38 | 290                                                    | 750 | 1500 | 2250 | 3750  | 6250 |
| 200               | 93       | 260                                                    | 750 | 1500 | 2250 | 3750  | 6250 |
| 300               | 149      | 230                                                    | 730 | 1455 | 2185 | 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                                                     | 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  |

(a) Para extremos soldables a tope únicamente. La relación para extremos bridados termina a 1000°F (538°C).

## ACERO AL CARBÓN ASTM A351 GRADO CF8

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 38 | 275                                                    | 720 | 1440 | 2160 | 3600  | 6000 |
| 200               | 93       | 230                                                    | 600 | 1200 | 1800 | 3000  | 5000 |
| 300               | 149      | 205                                                    | 540 | 1075 | 1615 | 2690  | 4480 |
| 400               | 204      | 190                                                    | 495 | 995  | 1490 | 2485  | 4140 |
| 500               | 260      | 170                                                    | 465 | 930  | 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 | 810  | 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  | 670   | 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  |

(a) Para extremos soldables a tope únicamente. La relación para extremos bridados termina a 1000°F (538°C).

# RELACIÓN PRESIÓN-TEMPERATURA

## ACERO AL CARBÓN ASTM A351 GRADO CF8M

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 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 | 845  | 1265 | 2110  | 3520 |
| 850               | 454      | 65                                                     | 420 | 835  | 1255 | 2090  | 3480 |
| 900               | 482      | 50                                                     | 415 | 830  | 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   | 485  |
| 1500              | 816      | 15(*)                                                  | 40  | 85   | 125  | 205   | 345  |

(a) Para extremos soldables a tope únicamente. La relación para extremos bridados termina a 1000°F (538°C).

## ACERO AL CARBÓN ASTM A352 GRADO LCB

| Temperature |          | Maximum allowable non-shock working pressure in PSIG by class |     |      |      |       |       |
|-------------|----------|---------------------------------------------------------------|-----|------|------|-------|-------|
| °F          | °C       | 150                                                           | 300 | 600  | 900  | 1,500 | 2,500 |
| -20 a 100   | -29 a 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  | 4595  |
| 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   |

No debe ser utilizado a más de 650 ° F

## BASES DE DISEÑO

Todas las válvulas WALWORTH son diseñadas donde sea aplicable, siguiendo una o más de los siguientes estándares.

- API** Instituto Americano del Petróleo:  
**6D** Válvula de acero de compuerta, bola y macho para servicio en tuberías.  
**6FA** Especificación para prueba de fuego para válvulas.  
**623** Válvulas de acero tipo Globo, - extremos bridados y soldables, bonete bridado.
- ASME/ANSI** Instituto Nacional Americano de Estandarización:  
**B2.1** Tubos roscados.  
**B16.5** Bridas de tubería de acero y conexiones bridadas.  
**B16.10** Longitud entre extremos de válvulas de acero bridado o soldables a tope.  
**B16.25** Bridas soldables a tope.  
**B18.2** Tornillería y tuercas cuadradas y hexagonales.  
**B16.47** Bridas de acero de diámetros nominales grandes.  
**B16.34** Válvulas, extremos bridados, roscables y soldables
- ASTM** Asociación Americana de Materiales y Pruebas:  
**A-193** Materiales para tornillería de acero aleado para servicio a alta temperatura.  
**A-194** Tuercas de acero y acero aleado para servicio a alta presión y temperatura.  
**A-216** Especificación para acero fundido al carbón adecuado para fusión por soldadura servicio a alta temperatura.
- MSS** Sociedad de Fabricantes para la Estandarización de Válvulas y Conexiones:  
**SP-25** Sistema de marcaje estandarizado para válvulas, conexiones, bridas y uniones.  
**SP-44** Bridas de acero para tuberías.  
**SP-47** Limitantes de dimensiones de juntas para bridas cara realzada.  
**SP-61** Presiones de prueba de válvulas de acero.
- ASME** Sociedad Americana de Ingenieros Mecánicos:  
**Section II** Parte A,B y C.  
**Section V** Pruebas No Destructivas.  
**Section VIII** Código para calderas y recipientes a presión para recipientes a presión no expuestos al fuego, Divisiones 1 y 2.  
**Section IX** Calificación de procedimientos de soldadura, soldadores y operadores de máquinas soldadoras.



# CÓMO ORDENAR

Las válvulas WALWORTH están definidas por un sistema de números de figura los cuales describen sus principales características de construcción. Este sistema de identificación de la válvula es una herramienta útil para asistir a nuestros Clientes a especificar la válvula requerida y evitar errores durante su construcción.

10"-5202-RF-UT-WCB-GO-NACEMR01-75

REQUERIMIENTOS SUPLEMENTARIOS  
 TIPO DE OPERACION  
 MATERIAL BASE  
 ARREGLO DE INTERIORES (TRIM)  
 TIPO DE EXTREMOS  
 TIPO DE VÁLVULA Y CLASE SEGUN No. DE FIGURA  
 TAMAÑO DE LA VALVULA EN PULGADAS

| DIAM.<br>(PULG) | TIPO DE VÁLVULA Y CLASE | EXTREMOS            | ARREGLO DE INTERIORES                                                         | MATERIALES BASE ASTM                                |
|-----------------|-------------------------|---------------------|-------------------------------------------------------------------------------|-----------------------------------------------------|
| 2"              | 5202=COMPUERTA 150      | RF= CARA REALZADA   | 18-8= API No. 2                                                               | ACEROS AL CARBÓN:                                   |
| 2 1/2"          | 5206= COMPUERTA 300     | RTJ= JUNTA TIPO RTJ | 310= API No. 3                                                                | A216-WCB (C-Si)                                     |
| 3"              | 5232= COMPUERTA 600     | WE= EXTREMOS WE     | HF= API No. 5                                                                 | A216-WCC (C-Si)                                     |
| 4"              | 5247= COMPUERTA 900     |                     | AAA= API No. 6                                                                | ACEROS BAJA Y MEDIA ALEACIÓN:                       |
| 5"              | 5262= COMPUERTA 1500    |                     | UT= API No. 8                                                                 | A217-WC1 (C-1/2Mo)                                  |
| 6"              | 5275= GLOBO 150         |                     | A= API No. 9                                                                  | A217-WC5 (Cr-Mo)                                    |
| 8"              | 5281= GLOBO 300         |                     | 18-8smo= API No. 10                                                           | A217-WC6 (1 1/4%Cr-1/2Mo)                           |
| 10"             | 5295= GLOBO 600         |                     | AHF= API No. 11                                                               | ASTM A217-WC9(2 1/4 % Cr-1%Mo)                      |
| 12"             | 5301= GLOBO 900         |                     | 3HF= API No. 12                                                               | ASTM A217-C5(5% Cr-1/2Mo)                           |
| 14"             | 5308= GLOBO 1500        |                     | A20= API No. 13                                                               | ASTM A217-C12(9%Cr-1%Mo)                            |
| 16"             | 5341= RETENCIÓN 150     |                     | A20H= API No. 14                                                              | ASTM A217-C12-A(9%Cr-1%Mo-V-N)                      |
| 18"             | 5344= RETENCIÓN 300     |                     | NUC= 410 + NUCALLOY                                                           | ACEROS INOXIDABLES AUSTENITICOS BAJO CARBONO:       |
| 20"             | 5350= RETENCIÓN 600     |                     | 4HF= 304+304+ST6                                                              | ASTM A351-CF3(18%Cr-8%Ni-0.03%C)                    |
| 22"             | 5353= RETENCIÓN 900     |                     | 4HF+HF= 304+ST6+ST6                                                           | ASTM A351-CF3M(18%Cr-12%Ni-2%Mo-0.03%C)             |
| 24"             | 5356= RETENCIÓN 1500    |                     | 304L= 304L+304L+304L                                                          | ASTM A351-CG3M(18%Cr-12%Ni-3%Mo-0.03%C)             |
| 28"             |                         |                     | 1HF= 316+ST21+ST21                                                            | ACEROS INOXIDABLES AUSTENITICOS:                    |
| 30"             |                         |                     | 3HF+HF= 316+ST6+ST6                                                           | ASTM A351-CF8(18%Cr-8%Ni-0.08%C)                    |
| 36"             |                         |                     | 3TC= 316/TC+TC+ST6 NOTE: TC=Carburo de Tungsteno                              | ASTM A351-CF8M(18%Cr-12%Ni-2%Mo-0.08%C)             |
| 42"             |                         |                     | 316L= 316+316+316                                                             | ASTM A351-CF10(18%Cr-8%Ni-0.08%C)                   |
| 48"             |                         |                     | 3LHF= 316L+316L+ST6                                                           | ASTM A351-CG8M(19%Cr-10%Ni-3%Mo-0.08%C)             |
| 54"             |                         |                     | 3HFL= 316L+ST6+ST6                                                            | ASTM A351-CF8C(18%Cr-10%Ni-Cb-0.08%C)               |
| 60"             |                         |                     | 21HF= 317+ST6+ST6                                                             | ASTM A351-CT15C(19%Cr-32%Ni-0.05A 0.15%C)           |
| 72"             |                         |                     | 317= 317+317+317                                                              | SUPER ACEROS INOXIDABLES AUSTENITICOS:              |
|                 |                         |                     | 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                                                           | ACEROS AL CARBÓN SERVICIO A BAJA TEMPERATURA:       |
|                 |                         |                     | 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                                                          | ACEROS ALEADOS SERVICIO A BAJA TEMPERATURA:         |
|                 |                         |                     | 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                                       | ACEROS INOXIDABLES MARTENSITICOS:                   |
|                 |                         |                     | 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                                            | ALEACIONES DE NIQUEL Y MATERIALES EXÓTICOS:         |
|                 |                         |                     | 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)              |
|                 |                         |                     | NOTA: MATERIALES BASE Y ARREGLOS DE INTERIORES ESTAN DISPONIBLES A SOLICITUD. | ASTM A494-CU5MCuC(42%Ni-21.5%Cr-3%Mo-2.3%Cu)        |
|                 |                         |                     |                                                                               | ASTM A494-N7M(65%Ni-28%Mo-2%Fe)                     |
|                 |                         |                     |                                                                               | ASTM A494-CW6MC(60%Ni-22%Cr-9%Mo-3.5%Cb)            |
|                 |                         |                     |                                                                               | ACEROS INOXIDABLES DUPLEX:                          |
|                 |                         |                     |                                                                               | 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 4A; CD3MN(22%Cr-5%Ni-3%Mo-N)              |

| REQUERIMIENTOS SUPLEMENTARIOS                            |
|----------------------------------------------------------|
| GO= Operador de Engranés.                                |
| CW=Operador de volante y cadena.                         |
| BS= Vástago desnudo preparado para montaje.              |
| MOV= Válvula operada con motor.                          |
| POV= Válvula con operador neumático.                     |
| LD= Candado.                                             |
| NACE MR-01-75.                                           |
| NACE MR-01-03                                            |
| SP= Pintura especial.                                    |
| SG= Junta especial.                                      |
| SPK= Empaque especial.                                   |
| VOC= Certificado de baja emisión de elementos volátiles. |
| BP=By-Pass                                               |
| LL=Sistema de carga viva (live load)                     |
| LR= Anillo linterna.                                     |
| LCW= Válvula con contrapeso.                             |
| SE=Extensión de vástago.                                 |
| FS= Monatje para piso.                                   |
| XX= Requerimientos adicionales.                          |



## TÉRMINOS Y CONDICIONES GENERALES

**CONFIRMACIÓN DE PEDIDO:** Todas las cotizaciones son aceptadas dentro de los primeros treinta días después a la fecha de cotización, a menos que se haya dado una extensión de la oferta por escrito. En el caso de que una orden de compra sea recibida después de este periodo, WALWORTH se reserva el derecho de re-cotizar la oferta. Todas las órdenes de compra y los contratos están sujetos a la aprobación del crédito por parte de WALWORTH.

**FLETES.-** Cuando los precios ofertados se basan en la entrega FOB punto de embarque sin flete pagado, WALWORTH intentará realizar los embarques por la vía que resulte en el costo más bajo a menos que el comprador indique instrucciones diferentes. Todos los embarques serán con flete por cobrar a menos que se estipule otra cosa en la orden de compra, en cuyo caso WALWORTH facturará los costos de transportación al comprador. La entrega a una línea de transportes será considerada como una entrega al comprador por lo que la carga será responsabilidad del mismo a partir de este punto. Reclamaciones por pérdida o daño de los materiales o productos durante el tránsito deberá ser tramitada directamente por el comprador con la línea de transportes.

**PRECIOS.-** A todos los precios cotizados se aumentarán los impuestos por los que la mercancía deba pagar al momento de la venta. El vendedor deberá establecer dichos impuestos de acuerdo a las leyes federales, estatales o cualquier otra regulación del gobierno relacionada con los productos los cuales deberán ser menores que los precios de la orden de compra.

**TERMINOS DE ESCALACIÓN.-** Los precios reflejados en las listas de precios se basan en los costos al momento de su publicación. Estos precios permanecerán firmes en aquellos productos cotizados por un tiempo de entrega de hasta 26 (veinte y seis) semanas o menos. Sobre aquellos productos cuyo tiempo de entrega sea mayor a 26 (veinte y seis) semanas, los bienes serán fabricados con base a los precios establecidos en las listas de precios efectiva a partir de la fecha del embarque de los productos. En ningún caso el precio a facturar será menor que el precio originalmente cotizado.

**COMPONENTES COMPRADOS.-** (Por ejemplo motores, operadores de engranes, etc.) Los precios son cotizados en base a los precios de nuestros proveedores al momento de la cotización. El precio de venta será actualizado de acuerdo a las políticas de escalación de precios de dichos proveedores.

**EMBARQUES DIFERIDOS.-** Si por alguna razón el Cliente desea retrasar el (los) embarque (s) por más de 30 días después de la terminación de fabricación de los productos, o decide poner en espera o si decide parar el proceso de fabricación en cualquier etapa de la misma, WALWORTH se reserva el derecho de considerar la orden de compra cancelada e invocar por los cargos por cancelación de acuerdo a la política de cancelaciones abajo mencionada.

**CANCELACIONES.-** Después de la aceptación de la orden de compra por parte de WALWORTH, las partidas u órdenes terminadas serán sujetas a cargos por cancelación de la siguiente manera:

- Cinco (5 %) por ciento del precio de venta para productos de stock.
- Diez (10 %) por ciento del precio de venta para productos de stock que excedan los niveles normales en inventario.
- Cinco (5 %) por ciento del precio de venta antes de la aprobación de dibujos para productos fabricados específicamente para dicha orden de compra.
- Quince (15 %) por ciento del precio de venta después de la emisión de dibujos para aprobación, pero antes del inicio de fabricación de materias primas.
- Treinta a cincuenta (30 a 50 %) del precio de venta durante las etapas de fabricación de materias primas, dependiendo del grado de avance de las mismas.
- Cincuenta y cinco a setenta y cinco (55 a 75 %) por ciento del precio de venta durante los procesos de maquinado y soldadura, dependiendo del grado de avance para la terminación del producto.
- Cien (100 %) por ciento después del ensamble y pruebas.

**PAGOS.-** Los envíos de pago deberán hacerse a la dirección indicada en la factura.

**TÉRMINOS DE CRÉDITO.-** Los términos serán los acordados en la cotización. Facturas debido a pagos retrasados tendrán un cargo adicional del 1.5 % mensual sobre los pagos pendientes.

**ENTREGA.-** Los embarques y las entregas serán siempre sujetos a la aprobación del Departamento de Crédito de WALWORTH. Si el comprador falla en los pagos oportunos de acuerdo con los términos del contrato. WALWORTH puede adicionalmente y sin limitaciones a sus otros derechos y prerrogativas, cancelar todos o algunos de los contratos incompletos o puede diferir las entregas o embarques que

estén asignados a dichos contratos hasta que se haya cubierto satisfactoriamente los pagos pendientes. Todos los embarques y entregas son estimados a la posible fecha de entrega, WALWORTH hará el mejor esfuerzo para entregar dentro del tiempo establecido, pero sin garantizar que así será. WALWORTH inicia la programación de entrega cuando recibe la autorización del Cliente de proceder con la orden, sujeto a las previsiones de la siguiente cláusula. La orden no será liberada para fabricación hasta que se hayan recibido en Planta todas las especificaciones y los dibujos para aprobación (cuando sean requeridos dibujos para aprobación); entonces la programación de entrega comienza con esta fecha. WALWORTH no será responsable directa o indirectamente por daños consecuenciales o pérdidas causadas por retrasos en la entrega, sin importar la naturaleza del retraso.

Sin limitar la generalidad de lo anterior, WALWORTH no asuma responsabilidad por retrasos en la entrega resultantes de incendios, inundaciones, accidentes, tumultos, huelgas, retrasos durante el transporte, falta de materiales o mano de obra, leyes actuales o futuras, actos de cualquier autoridad de gobierno, o cualquier otra causa fuera del control del vendedor. Productos ofrecidos de stock están disponibles salvo previa venta.

**INSPECCIÓN.-** La inspección final y la aceptación de los productos deberá hacerse en la Planta de fabricación, a menos que se especifique otra cosa en la orden de compra previa aceptación de las partes. Los precios no incluyen cargos por pruebas especiales o inspecciones ejecutadas a solicitud del comprador, a menos que se hayan incluido en la orden de compra y previo acuerdo entre WALWORTH y el Cliente.

**RETORNOS.-** Deberá obtenerse permiso por escrito de WALWORTH así como una tarjeta de instrucciones para retornar productos. Un cargo mínimo del 25% será aplicado al valor de factura más el costo relacionado del flete tanto del embarque original como del embarque de retorno de los productos, así como el costo de reacondicionamiento de los productos para su venta.

**CERTIFICADO DE GARANTÍA:** WALWORTH, extiende la presente Garantía de sus productos, por un periodo de 12 meses en operación o 18 meses en almacenamiento, lo que ocurra primero a partir de la fecha de entrega del producto.

WALWORTH, garantiza que sus productos son fabricados bajo los estándares de calidad, de diseño y manufactura normativos y contractuales solicitados por el cliente. En caso de que el comprador confirme expresamente y por escrito el incumplimiento de dichos estándares, WALWORTH se obliga a reparar o reemplazar o expedir autorización por escrito para que el cliente u otros reemplacen o reparen sin costo alguno para el comprador a costos de fabricación de WALWORTH, de aquellas partes probadas como defectuosas.

Esta Garantía será válida cuando la selección de materiales realizada por el cliente para el diseño, arreglo de materiales (TRIM, Cuerpos, Extremos, Mecanismos de Accionamiento, etc.), recubrimientos internos y/o externos, hayan sido los adecuados para el manejo del fluido en operación.

Esta Garantía aplicará cuando se mantengan las condiciones de operación y servicio para las cuales fue solicitado el producto.

Para hacer válida la Garantía, el usuario es responsable de realizar el correcto mantenimiento en tiempo y forma, de acuerdo a lo establecido en el manual de operación y mantenimiento correspondiente. WALWORTH, se reserva el derecho de solicitar los registros (evidencias) que confirmen el adecuado mantenimiento.

Las obligaciones de WALWORTH se limitan y serán liberadas de toda responsabilidad, en caso de que los productos sufran alteraciones, reparaciones o reemplazos sin el expreso consentimiento por escrito de WALWORTH.

Excepto a lo establecido en este documento, WALWORTH® renuncia y excluye todas las demás garantías expresas o implícitas por pérdida, daño directo, indirecto, incidental o consecuentes de otros productos, procesos, instalaciones o equipos del comprador o del usuario final, ya sea parcial o total debidos a defectos de materiales y/o trabajo y/o el diseño del producto WALWORTH.

**CARGO MÍNIMO.-** Órdenes de compra por un valor menor a \$ 100.00 usd neto tendrán un cargo del 100 %. Partes para reparación tendrán un cargo mínimo de \$ 50.00 usd.

**NOTA:** WALWORTH se reserva el derecho de corregir errores obvios administrativos en cotizaciones, facturas, así como en otros contratos.





# **WALWORTH®**

*Since 1842*



[www.walworth.com](http://www.walworth.com)

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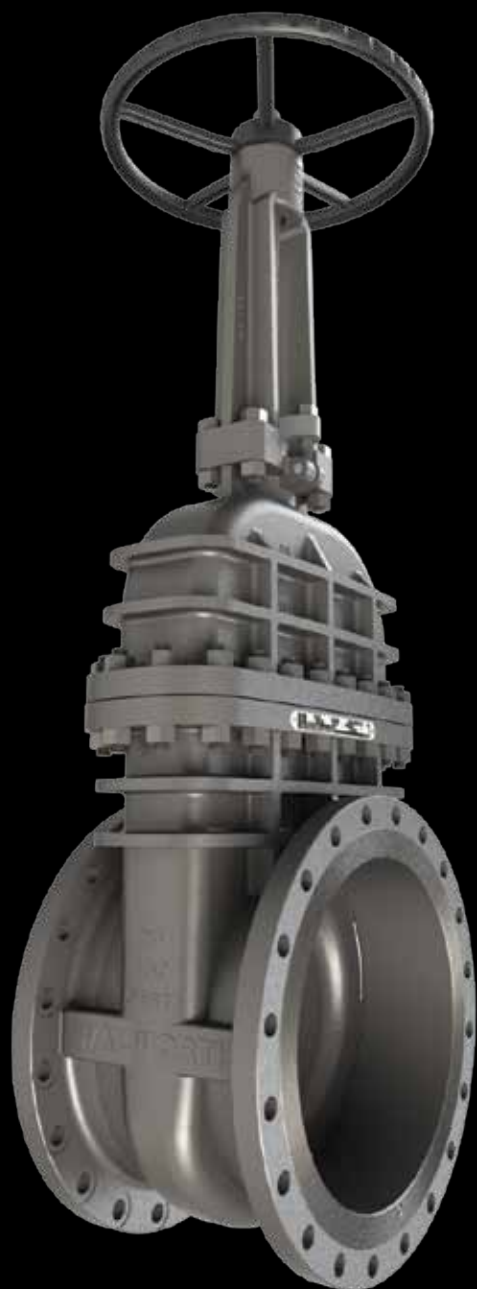


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para obtener más información sobre  
las Válvulas **WALWORTH**





**WALWORTH<sup>®</sup>**  
*Since 1842*



**API-603 CAST STAINLESS STEEL  
AND SPECIAL ALLOY VALVE**

# **CATALOG**





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## API-603 CAST STAINLESS STEEL AND SPECIAL ALLOY GATE, GLOBE AND SWING CHECK VALVES

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YARMOUTH RESEARCH AND TECHNOLOGY



# WALWORTH

WALWORTH is one of the world's most comprehensive industrial valve manufacturers. Founded in 19th century by James Walworth, the Company has consistently dedicated itself to improvements in design and manufacturing 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, WALWORTH has produced over 40,000 different types of products; by utilizing the expertise of over 500 trained employees, we serve as a global supplier to various markets.

Our manufacturing system includes: utilization of Company directed raw material warehouses; modern and newly acquired specialized machinery; welding processes such as SMAW, GMAW, SAW, PAW; assembly and testing for low pressure, high pressure, and low or high temperatures; painting and coating processes; export crating and shipment.

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 and satisfy the precise demands of our customers throughout the world by providing quality products, competitive costs and excellent service.



## WALWORTH VALUES

### MISSION

WALWORTH manufactures and supplies world-class valves and components for the flow control industry through exceptional service, competitive pricing, and consistent on-time deliveries.



### VISION

To be the world leader of unparalleled valve manufacturing and supply, WALWORTH:

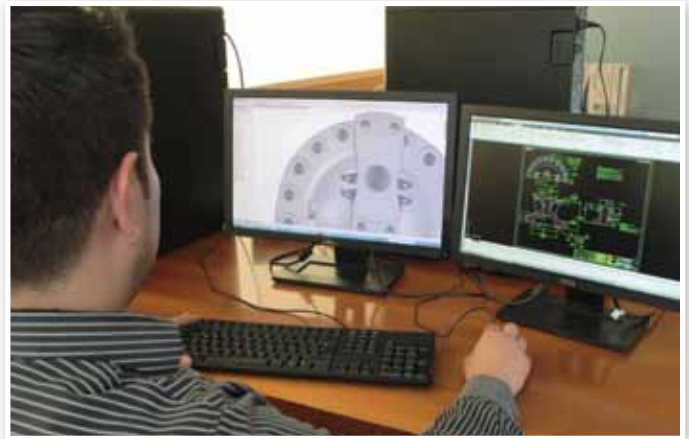
- Sets the standard for product quality in the flow control industry.
- Exceeds the service expectations of our customers.
- Forges enduring relationships with customers, team members, and community.
- Hires, develops, and retains experienced and dedicated team members.



## WALWORTH ENGINEERING CONTROL

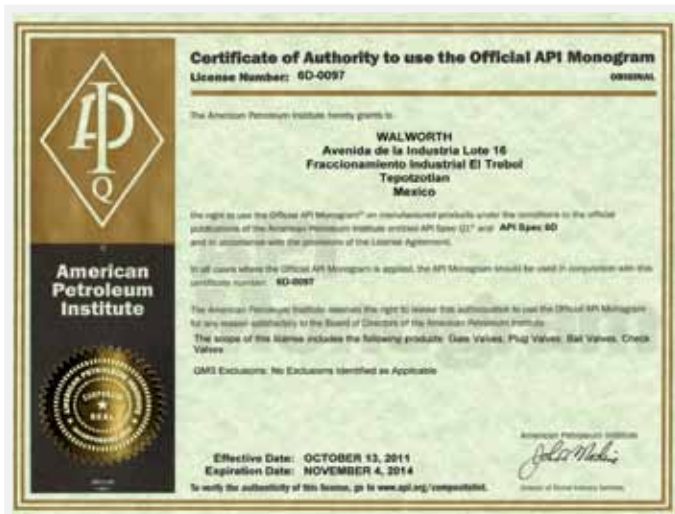
WALWORTH products are manufactured strictly following the most recognized international standards in the world, such as API, ANSI, ASME, ASTM, MSS, NACE, BSI and CSA, among others. As a leader in new developments, our Engineering team is constantly studying updates to these standards to incorporate any changes that may affect the design, regulation and/or performance of our products.

Design is produced using the most advanced technology and equipment, finite elements and CAD system programs to ensure proper assembly and performance of products - from concept to calculation to detailed drawings for manufacturing. WALWORTH is a leader in the development of new products according to current valve market 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 includes the selection of raw materials from approved vendors, and rigorous oversight of our manufacturing process that is vital to quality control. The use of serial numbers allows WALWORTH the ability to not only ensure the quality of components used but to monitor and trace the fabrication process as well.



### Certificate API-6D No. 6D-0097

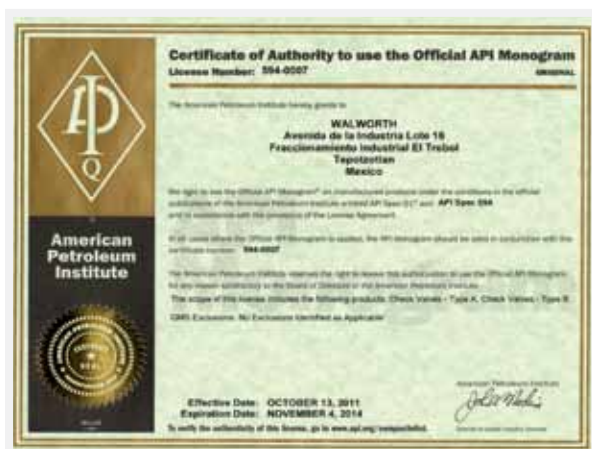
Issued by American Petroleum Institute to apply on Gate valves, Plug valves, Ball valves and Check valves manufactured in accordance with API-6D specification.



### Certificate API-6A No. 6A-0234

From American Petroleum Institute to apply on valves at PSI, 1 through 4.





#### Certificate API-594 No. 594-0007

Issued by American Petroleum Institute to apply on Check Valves-Type A; Check Valves Type B manufactured in accordance with API-594 specification.



#### Certificate ISO-9001 No. 0038

Issued by American Petroleum Institute since April 1999.



#### 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.



#### 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.



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



**Supplier Qualification Certificate NO. 279/13**  
Issued by the Equipment and Materials Testing Laboratory, CFE (LAPEM in Spanish)



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

## PRODUCT CERTIFICATIONS



**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.



**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.



**Emissions after 500 cycles at ambient and 350 °F**  
Issued by Yarmouth Research and Technology Lab for 16 inch Class 150 Gate Valve After 500 cycles the measurement result was less than 50 ppm.





**YARMOUTH RESEARCH AND TECHNOLOGY**  
**PROJECT SUMMARY**

**Project Number:** 89008

**Customer:** The Walworth Company

**Contact:** David Cornelien

**Date(s) of Test:** 12/8/99 - 12/23/99

**Product(s) Tested:** One 6" Class 300 Gate Valve with Empak 50ex EAF-100-001 packing.

**Purpose of Test:** The test was conducted to evaluate the valve's stem-sealing performance at ambient and at 300° F as related to the 1990 Amendments to the Clean Air Act requirements. Leakage measurements were conducted in accordance with API 6D Part 6D, Appendix A, Method 21.

**Conclusion:** Three thermal cycles from ambient to 300 deg. F were conducted throughout 3500 operations cycles with the valve pressurized to 6.49 psig. The valve was cycled with a 43 RPM gear motor coupled to the handwheel. One packing ret adjustment was required at cycle number 300 to maintain leakage levels below 100 PPF5h.

At cycle number 3500, the packing leakage was 25-29 PPF5h with the stem state. The packing nuts were tightened from 12/18 ft-lb back to 28 ft-lb and leakage decreased to about 1 PPF5h.

See the attached data sheets for more information.

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

Phone or Fax (202) 446-0466  
42 East Elm Street, P.O. Box 110, Yarmouth, Maine 04096-0110

**TÜV Rheinland Argentina S.A.**  
Servicios Industriales  
Certificación Central  
San José 03 - 7° Floor  
C1202BAAA Buenos Aires

**TÜVRheinland®**

**Certificate**

**Certificate No.** TRASA 700-13-0019

**Customer:** WALWORTH MEXICO - Industrial de Valvulas S.A. de C.V.  
Av. de la Industria Lote 16  
Fracc. Industrial El Trebol, Tepotzotlan, Edo. de Mexico

**Product Tested:** API 6D Trunnion mounted ball valve full-stem, carbon steel (A105-WCB) construction, double block and bleed service, primarily used for oil and gas standard and severe applications.

**Trademark:** WALWORTH

**Model / Type:** 6" Class 300 Gate Valve with Empak 50ex EAF-100-001 packing

**Applicable Standard:** ISO 15848-1 Part 1 and 2, 2014

**TUV Report No.:** TRASA 700-13-0019

**Results:** The valve passed the test according to the requirements of the standard.

**Safety:** The valve is designed with a full-stem design, which is suitable for use in applications where the full-stem design is required.

**Specific Requirements:** The valve is designed to meet the requirements of the standard.

**Signature:** Eng. Mauricio Schwaner

Page 1 of 5

**Certificates of Ultra Low Fugitive Emissions 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".

**TÜV Rheinland Certificate No. TRASA 700-13-0019**  
API-6D Trunnion mounted bolted body ball valves, carbon steel (A105-WCB) construction, double block and bleed service, primarily used but not limited to the oil and gas standard and severe applications.

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

**January 22, 2005**

**Ruben Paredes**  
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 01-1/05

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 Bolt-Sealed 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 V05801.

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. Cornelien P.E.  
President



24802 Markon Drive • Katy, Texas 77494  
Telephone (281) 395-5078 • Telex (281) 395-5078

**TÜV CERT** **TÜVRheinland®**  
Precisely Right.

**CERTIFICATE**  
Certificate No.: 91 202 USA-TA-09-79708

**Concerning the Agreement with the Technical Requirements in:**  
**TA-Luft 2002, VDI 2440 Nov. 2000, Sec. 3.3.1.3**

**Test report:** 200140 **Date:** 02 December, 2000

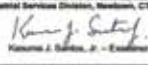
**Client:** Industrial de Valvulas, S.A. de C.V.

**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  $\leq 10^{-4}$  mbar  $\times$  (Vs  $\times$  h) with a helium mass spectrometer under the following conditions. The SPV Valve with the external mechanical shaft seals fulfills the requirements of Section 3.3.1.3 of the German Clean Air Act (TA-Luft, Gaseinleitungs-Verordnung) in accordance with Section 3.3.1.3 of VDI 2440 (Rev. 2000).

|                                     |                                                           |
|-------------------------------------|-----------------------------------------------------------|
| Kind of Valve:                      | Walworth API 600 Gate Valve                               |
| Valve Type:                         | 4 inch, Class 300, Figure 8200P                           |
| Sealing System:                     | WCB Body / CW 13 Stem & Stem / HP Seat                    |
| Sealing System:                     | Graphite Seals                                            |
| Nominal Size, Nominal Pressure:     | 4 inch, ANSI 300                                          |
| Inspection Media/Pressure:          | Helium / 81 Barre Temperature = Ambient                   |
| Switching Cycles (closed):          | 6 Cycles Total Cycles 800                                 |
| Leakage Rate: (mbar $\times$ l/sec) | 5.2e-7 (mbar $\times$ l/sec) 3.7e-6 (mbar $\times$ l/sec) |
| Testing Method:                     | Helium Leak Test - VDI 2440, Appendix A                   |

**Testing Laboratory:** YARMOUTH RESEARCH AND TECHNOLOGY  
Matthew J. Wawelowski, PE  
424 Walnut Hill Road, N. Yarmouth, ME 04096  
www.yarmouthresearch.com

**TÜV Rheinland North America, Inc.**  
Industrial Services Division, Houston, TX, USA  
  
Klaus J. Böhler, Jr. - E. Manager

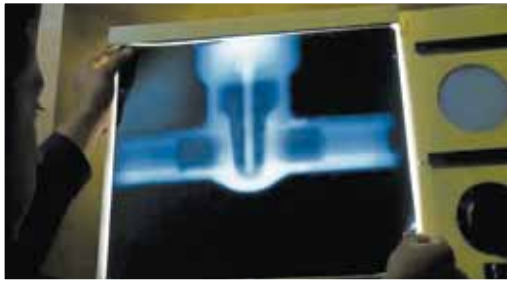


**Fire Test Certificate No. 01-1/05**  
In accordance with API-6FA and API Standard API-607 for Trunnion Ball Valves in accordance with API-6D.

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

## QUALITY CONTROL EQUIPMENT

In order to assure that **WALWORTH** products comply with international quality standards, in-house equipment is used for quality 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 raw casting 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.**- On a random basis for standard products or when a Customer requests MT Certification, WALWORTH uses Magnetic Particle Testing Equipment 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 takes more than four months to be completed.

**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 in 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 flame at 1400 to 1800°F (761 to 980°C) to verify proper sealing of the valve.



**Low Fugitive Emissions Test.**- When a Customer requires low fugitive emissions certification, the Lab has its own LFE Test Equipment capable of measuring less than 20 ppm in either static or mechanical conditions at ambient temperature or thermal cycle operations.

**Ultrasonic Testing Equipment.**- Using ultrasonic techniques, WALWORTH can detect sub-surface flaws in materials and evaluate castings and forgings that cannot be radiographed. In addition, WALWORTH utilizes 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 though we receive MTR's from our suppliers and foundries.

**Hardness Test Equipment.**- In either lab or shop tests, WALWORTH uses hardness testing equipment such as Rockwell B, C Brinell or Vickers to check compliance against specifications.





## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE, GLOBE AND CHECK VALVES

### API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE, GLOBE AND CHECK VALVES STAINLESS STEEL, SPECIAL ALLOY & EXOTIC ALLOY VALVES

The light pattern WALWORTH product line, manufactured in accordance with ANSI classes 150, 300 & 600# and sizes from 2" up to 24" nominal diameter, provides the end user a wide variety of valves to satisfy their needs. This product line is manufactured as per API-603 design requirements for gate, globe & swing check valves.

One of the most important features of WALWORTH API-603 Cast Stainless Steel Valves is that they guarantee a 50 ppm maximum fugitive emissions rate as furnished "off the shelf" without a Customer's special order requirements.

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

1. Stainless Steel such as CF8, CF8M, CF8C, CF10, CG8M, etc.
2. Low Carbon Stainless Steel such as CF3, CF3M, CG3M, etc.
3. Super Stainless Steel such as CN7M(Alloy 20), CN3M (Alloy 20 modified), CT15C, etc.
4. Duplex Stainless Steel such as CE8MN, CD6MN, CD3MN, etc.
5. High Nickel Alloys such as 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.
6. Super Duplex Stainless Steel such as CE3MN, CD3MNCuN, etc.

| Type        | Size      | Pressure class as per ASME B16.34 | Ends         |
|-------------|-----------|-----------------------------------|--------------|
| Gate        | 2" to 24" | 150, 300 & 600                    | RF, RTJ & WE |
| Globe       | 2" to 24" | 150, 300 & 600                    | RF, RTJ & WE |
| Swing Check | 2" to 24" | 150, 300 & 600                    | RF, RTJ & WE |



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY VALVES BODY MATERIALS

WALWORTH offers the standard product line of API 603 Cast Steel valves in a wide variety of stainless steel, high nickel alloys and exotic alloys that can be used in combination with either their specific trims or one requested by the Customer.

| Material suffix       | Common designation                                                            | Forging specification | Wrought bar specification | Service recommendations (1)                                                                                                                                                                  | Common trim for this base material |
|-----------------------|-------------------------------------------------------------------------------|-----------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| ASTM A351 Grade CF8   | 18% Chrome;<br>8% Nickel;<br>0.08% C<br>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                             |
| ASTM A351 Grade CF8M  | 18% Chrome;<br>12% Nickel;<br>2% Mo; 0.08% C<br>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                       |
| ASTM A351 Grade CF3   | 18% Chrome;<br>8% Nickel;<br>0.03% C<br>Low Carbon<br>Stainless Steel         | ASTM A182 304L        | ASTM A479 304L            | Brackish water, phosphate solutions, pressurized water @ 570°F (299°C), sea water, steam.                                                                                                    | 304L, 3HF                          |
| ASTM A351 Grade CF3M  | 18% Chrome;<br>12% Nickel;<br>2% Mo; 0.03% C<br>Low Carbon<br>Stainless Steel | ASTM A182 F316L       | ASTM A479 316L            | Acetic acid, calcium carbonate, calcium lactate, potable water, sea water, steam, sulfites.                                                                                                  | 316L, 3HF                          |
| ASTM A351 Grade CG3M  | 18% Chrome;<br>12% Nickel;<br>3% Mo; 0.03% C<br>Low Carbon<br>Stainless Steel | ASTM A182 F317L       | ASTM A182 F317L           | Corrosive or non corrosive services to +800°F (+425°C)"                                                                                                                                      | 317L, 317LH                        |
| ASTM A351 Grade CF8C  | 18% Chrome;<br>10% Nickel;<br>Cb; 0.08% C<br>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 content of 0.04% or greater. Hydrogen service."   | 347H, 347HF                        |
| ASTM A351 Grade CF10  | 18% Chrome;<br>8% Nickel;<br>0.08% C<br>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                         |
| ASTM A351 Grade CF10M | 18% Chrome;<br>8% Nickel; 2% Mo; 0.08% C<br>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                         |
| ASTM A351 Grade CG8M  | 18% Chrome;<br>10% Nickel; 3% Mo; 0.08% C<br>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                         |



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY VALVES BODY MATERIALS

| Material suffix         | Common designation                                                       | Forging specification | Wrought bar specification | Service recommendations (1)                                                                                                                                                                                                                                                                                                                                          | Common trim for this base material |
|-------------------------|--------------------------------------------------------------------------|-----------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 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                         |
| 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 pickling acids, sulfates and sulfites, sulfuric acid, (all concentrations to 150°F (65.6°C), sulfurous acid, phosphoric acid.                                         | 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 pickling acids, sulfates and sulfites, sulfuric acid, (all concentrations to 150°F (65.6°C), sulfurous acid, phosphoric acid. Better weldability properties than CN7M | 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, antibiotics 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                              |
| ASTM A351 Grade CT15C   | 19% Chrome; 32% Nickel; 0.05 to 0.15% C Incoloy 800.                     | ASTM B564 N08810      | ASTM B408 N08810          |                                                                                                                                                                                                                                                                                                                                                                      | 810T                               |
| ASTM A351 Grade CK3McuN | 20% Chrome; 18% Nickel; 6.5% Mo; 0.025% C Super Stainless Steel          | ASTM A182 F44         | ASTM A479 S31254          | High resistance to pitting and crevice corrosion. Very high resistance to chloride stress corrosion cracking. 50% stronger than 300 series austenitic stainless steels. Excellent impact resistance.                                                                                                                                                                 | 31254H                             |
| 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            | Chloride-containing environments where conventional 300 series stainless steel does not provide adequate pitting and crevice corrosion resistance.                                                                                                                                                                                                                   | 8904H                              |
| 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 +750 °F (+400°C)                                                                                                                                                                                                        | A, AHF                             |
| ASTM A494 Grade CZ100   | 95% Nickel                                                               | ASTM B160 N02200      | ASTM B160 N02200          | Chemical processing, mineral processing, food processing. Nickel 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 perchlorate.                                  | 2200                               |

## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY VALVES BODY MATERIALS

| Material suffix         | Common designation                                                          | Forging specification | Wrought bar specification | Service recommendations (1)                                                                                                                                                                                                       | Common trim for this base material |
|-------------------------|-----------------------------------------------------------------------------|-----------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| ASTM A494 Grade CY-40   | 75% Nickel; 15% Cr; 8% Fe, Inconel 600                                      | ASTM B564 N06600      | ASTM B166 N06600          | Very good for high temperature service. 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                         |
| 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 service. Good resistance to strongly corrosive media and atmosphere to +800°F (+425°C).                                                                                                            | 625, 625HF                         |
| ASTM A494 Grade CU5MCuC | 42% Nickel; 21.5% Cr; 3% Mo; 2.3% Cu, Incoloy 825                           | ASTM B564 N08825      | ASTM B425 N08825          | Sour gas service. Excellent resistance to both reducing and oxidizing acids, stress corrosion cracking, localized attack such as pitting and crevice corrosion, and sulfuric and phosphoric acids.                                | 825, 23HF                          |
| ASTM A494 Grade N12MV   | 62% Nickel; 28% Mo; 5% Fe, Hastelloy B                                      | ASTM B335 N10001      | ASTM B335 N10001          | Excellent corrosion resistance. Suitable for most chemical process applications. Excellent resistance to pitting and stress corrosion cracking.                                                                                   | 10001, HB                          |
| ASTM A494 Grade N7M     | 62% Nickel; 28% Mo; 2% Fe, Hastelloy B2                                     | ASTM B335 N10665      | ASTM B335 N10665          | Excellent corrosion resistance and improved resistance to knife-line and heat affected zone attack. Resists formation of grain-boundary carbide precipitates in the weld heat-affected zone.                                      | 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                              |
| 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                            |
| ASTM A494 Grade CW6M    | 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                            |
| ASTM A995 Grade CD4MCuN | 25.5% Chrome; 5.5% Nickel; 2% Mo; 0.040% C Duplex Stainless Steel Grade 1A. | N/A                   | ASTM A479 S32550          | Concentrated 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                             |
| 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           | Concentrated 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                |

## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY VALVES BODY MATERIALS

| Material suffix          | Common designation                                                             | Forging specification | Wrought bar specification | Service recommendations (1)                                                                                                                                                                                                                                                      | Common trim for this base material |
|--------------------------|--------------------------------------------------------------------------------|-----------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 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           | Concentrated 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                |
| ASTM A995 Grade CE3MN    | 25% Chrome; 7% Nickel; 4.5% Mo; N; 0.030% C Duplex Stainless Steel Grade 5A.   | ASTM A182 F53         | ASTM A182 F53             | Concentrated 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                          |
| 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             | Concentrated 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                          |

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

### NOMENCLATURE

| Type | Class                    |
|------|--------------------------|
| ST6  | STELLITE 6               |
| 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              |
| 316L | STAINLESS STEEL 316L     |

| Type   | Class                  |
|--------|------------------------|
| 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               |

## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY 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 currently offered.

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)    |
|-------------------|------------------|-------------------------------------|-------------------------------|---------------------------|---------------------------|
| 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                    |
| 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)  |
| 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            | 16               | 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                    |
| 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                    |
| 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                    |

Notes: 1. Free machining grades of 13 Cr are prohibited.  
 2. A minimum of 50 HB against seat ring(s) is required.



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY 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 (Inconel 625)      | UNS N06625 (Inconel 625)  | UNS N06625 (Inconel 625)  |
| 625HF             | Not specified    | 60Ni-22Cr-9Mo-3.5Cb/Co-Cr-A         | UNS N06625 (Inconel 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) |

Notes: 1. A minimum of 50 HB against seat ring(s) is required.

## COMMON CONSTRUCTION MATERIALS COMBINATION

The following table shows the most common combination of base materials 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.

| GATE VALVES 150# |                                                                                                                               |                                                                                                                               |                                                                                                                               |                                                                                                                               |                                                                                                                               |                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Description      | ASTM A351 CF8M<br>Trim 3HF<br>(API-600 nr. 12)                                                                                | ASTM A351 CF8C<br>Trim 347H<br>(API-600 nr. N/A)                                                                              | ASTM A351 CN7M<br>Trim A20H<br>(API-600 nr. 14)                                                                               | ASTM A494 M35-1<br>Trim AHF<br>(API-600 nr. 11)                                                                               | ASTM A494 CW12MW<br>Trim HCH<br>(API-600 N/A)                                                                                 | ASTM A995 CD3MN<br>Trim 31803H<br>(API-600 nr. N/A)                                                                           |
| Body             | ASTM A351 CF8M                                                                                                                | ASTM A351 CF8C                                                                                                                | ASTM A351 CN7M                                                                                                                | ASTM A494 M35-1                                                                                                               | ASTM A494 CW12MW                                                                                                              | ASTM A995 CD3MN                                                                                                               |
| Bonnet           | ASTM A351 CF8M                                                                                                                | ASTM A351 CF8C                                                                                                                | ASTM A351 CN7M                                                                                                                | ASTM A494 M35-1                                                                                                               | ASTM A494 CW12MW                                                                                                              | ASTM A995 CD3MN                                                                                                               |
| Wedge/seating    | ASTM A351 CF8M,<br>Stellite 6                                                                                                 | ASTM A351 CF8C,<br>Stellite 6                                                                                                 | ASTM A351 CN7M,<br>Stellite 6                                                                                                 | ASTM A494 M35-1,<br>Stellite 6                                                                                                | ASTM A494<br>CW12MW, Stellite 6                                                                                               | ASTM A995 CD3MN,<br>Stellite 6                                                                                                |
| Seat rings       | ASTM A351 CF8M                                                                                                                | ASTM A351 CF8C                                                                                                                | ASTM A351 CN7M                                                                                                                | ASTM A494 M35-1                                                                                                               | ASTM A494 CW12MW                                                                                                              | ASTM A995 CD3MN                                                                                                               |
| Stem nut         | ASTM B 148 UNS<br>C95600                                                                                                      | ASTM B 148 UNS<br>C95600                                                                                                      | ASTM B 148 UNS<br>C95600                                                                                                      | ASTM B 148 UNS<br>C95600                                                                                                      | ASTM B 148 UNS<br>C95600                                                                                                      | ASTM B 148 UNS<br>C95600                                                                                                      |
| Bonnet bushing   | SS-304                                                                                                                        | SS-410                                                                                                                        | ASTM A 276 Type 316                                                                                                           | ASTM A 276 Type 316                                                                                                           | ASTM A 276 Type 316                                                                                                           | ASTM A 276 Type<br>316                                                                                                        |
| Bonnet stud      | ASTM A193 Gr. B8                                                                                                              | ASTM A193 Gr. B8                                                                                                              | ASTM A193 Gr. B8                                                                                                              | ASTM A193 Gr. B8                                                                                                              | ASTM A193 Gr. B8                                                                                                              | ASTM A193 Gr. B8                                                                                                              |
| Bonnet stud nut  | ASTM A194 Gr. 8                                                                                                               | ASTM A194 Gr. 8                                                                                                               | ASTM A194 Gr. 8                                                                                                               | ASTM A194 Gr. 8                                                                                                               | ASTM A194 Gr. 8                                                                                                               | ASTM A194 Gr. 8                                                                                                               |
| Stem packing     | Flexible graphite<br>intermediate rings /<br>Anti-extrusion rings<br>on the top and bottom<br>sides of the packing<br>chamber | Flexible graphite<br>intermediate rings /<br>Anti-extrusion rings<br>on the top and bottom<br>sides of the packing<br>chamber | Flexible graphite<br>intermediate rings /<br>Anti-extrusion rings<br>on the top and bottom<br>sides of the packing<br>chamber | Flexible graphite<br>intermediate rings /<br>Anti-extrusion rings<br>on the top and bottom<br>sides of the packing<br>chamber | Flexible graphite<br>intermediate rings /<br>Anti-extrusion rings<br>on the top and bottom<br>sides of the packing<br>chamber | Flexible graphite<br>intermediate rings /<br>Anti-extrusion rings<br>on the top and bottom<br>sides of the packing<br>chamber |
| Bonnet gasket    | Graphite/316 Stainless                                                                                                        | Graphite/316 Stainless                                                                                                        | Graphite/316 Stainless                                                                                                        | Graphite/316 Stainless                                                                                                        | Graphite/316 Stainless                                                                                                        | Graphite/316 Stainless                                                                                                        |
| Handwheel        | As per WALWORTH<br>design                                                                                                     | As per WALWORTH<br>design                                                                                                     | As per WALWORTH<br>design                                                                                                     | As per WALWORTH<br>design                                                                                                     | As per WALWORTH<br>design                                                                                                     | As per WALWORTH<br>design                                                                                                     |
| Gear operator    | Commercial                                                                                                                    | Commercial                                                                                                                    | Commercial                                                                                                                    | Commercial                                                                                                                    | Commercial                                                                                                                    | Commercial                                                                                                                    |

## CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES

The 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 steels, stainless steels or Nickel alloys.

| Chemical composition and mechanical properties |                 |           |                            |           |                    |           |                    |           |                        |           |           |
|------------------------------------------------|-----------------|-----------|----------------------------|-----------|--------------------|-----------|--------------------|-----------|------------------------|-----------|-----------|
| Elements and properties                        | Stainless steel |           | Low carbon stainless steel |           | Nickel alloy steel |           | Nickel alloy steel |           | Duplex stainless steel |           |           |
|                                                | ASTM A 351      |           | ASTM A 351                 |           | ASTM A 494         |           |                    |           | ASTM A995              |           |           |
|                                                | CF8M            | CF8       | CG3M                       | CF3       | M35-1(B)           | CW12MW    | CW6MC              | CU5MCuC   | CD4MCuN                | CD3MN     | CE3MN     |
| Carbon                                         | 0.08            | 0.08      | 0.03                       | 0.03      | 0.35               | .012      | 0.06               | 0.050     | 0.040                  | 0.030     | 0.030     |
| Manganese                                      | 1.50            | 1.50      | 1.50                       | 1.50      | 1.50               | 1.00      | 1.00               | 1.0       | 1.00                   | 1.50      | 1.50      |
| Phosphorus                                     | 0.04            | 0.04      | 0.04                       | 0.04      | 0.03               | 0.040     | 0.015              | 0.030     | 0.040                  | 0.040     | 0.040     |
| Sulphur                                        | 0.04            | 0.04      | 0.04                       | 0.04      | 0.03               | 0.030     | 0.015              | 0.030     | 0.040                  | 0.020     | 0.040     |
| Silicon                                        | 1.50            | 2.00      | 1.50                       | 2.0       | 1.25               | 1.00      | 1.00               | 1.0       | 1.00                   | 1.00      | 1.00      |
| Nickel                                         | 9.0–12.0        | 8.0–11.0  | 9.0–13.0                   | 8-12      | Balance            | Balance   | Balance            | 38.0-44.0 | 4.7-6.0                | 4.5-6.5   | 6.0-8.0   |
| Iron                                           | -               | -         | -                          | -         | 3.50               | 4.5-7.5   | 5.0                | Balance   | -                      | -         | -         |
| Chromium                                       | 18.0–21.0       | 18.0-21.0 | 18.0–21.0                  | 17.0-21.0 | -                  | 15.5-17.5 | 20.0-23.0          | 19.5-23.5 | 24.5-26.5              | 21.0-23.5 | 24.0-26.0 |
| Niobium                                        | -               | -         | -                          | -         | 0.5                | (A)       | 3.15-4.50          | 0.60-1.20 | -                      | -         | -         |
| Molybdenum                                     | 2.0–3.0         | 0.50      | 3.0–4.0                    | 0.50      | -                  | 16.0-18.0 | 8.0-10.0           | 2.5-3.5   | 1.70-2.30              | 2.5-3.5   | 4.0-5.0   |
| Copper                                         | -               | -         | -                          | -         | 26.0-33.0          | (A)       | (A)                | 1.50-3.50 | 2.7-3.3                | 1.00      | -         |
| Tungsten                                       | -               | -         | -                          | -         | -                  | 0.20-0.40 | (A)                | (A)       | -                      | -         | -         |
| Nitrogen                                       | -               | -         | -                          | -         | -                  | -         | -                  | -         | 0.10-0.25              | 0.10-0.30 | 0.10-0.30 |
| Vanadium                                       | -               | -         | -                          | -         | -                  | 0.20-0.40 | (A)                | (A)       | -                      | -         | -         |
| Tensile Strength PSI minimum                   | 70,000          | 77,000    | 75,000                     | 70,000    | 65,000             | 72,000    | 72,000             | 75,000    | 100,000                | 90,000    | 100,000   |
| Yield Strength PSI minimum                     | 30,000          | 35,000    | 35,000                     | 30,000    | 25,000             | 40,000    | 40,000             | 35,000    | 70,000                 | 60,000    | 75,000    |
| Elongation In 2" minimum                       | 30.0            | 35.0      | 25.0                       | 35.0      | 25.0               | 4.0       | 25.0               | 20.0      | 16.0                   | 25.0      | 18.0      |

Notes: (A). Element to be analyzed and reported for information only. (B). Order M35-1 or M30C when weldability is required. 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%.

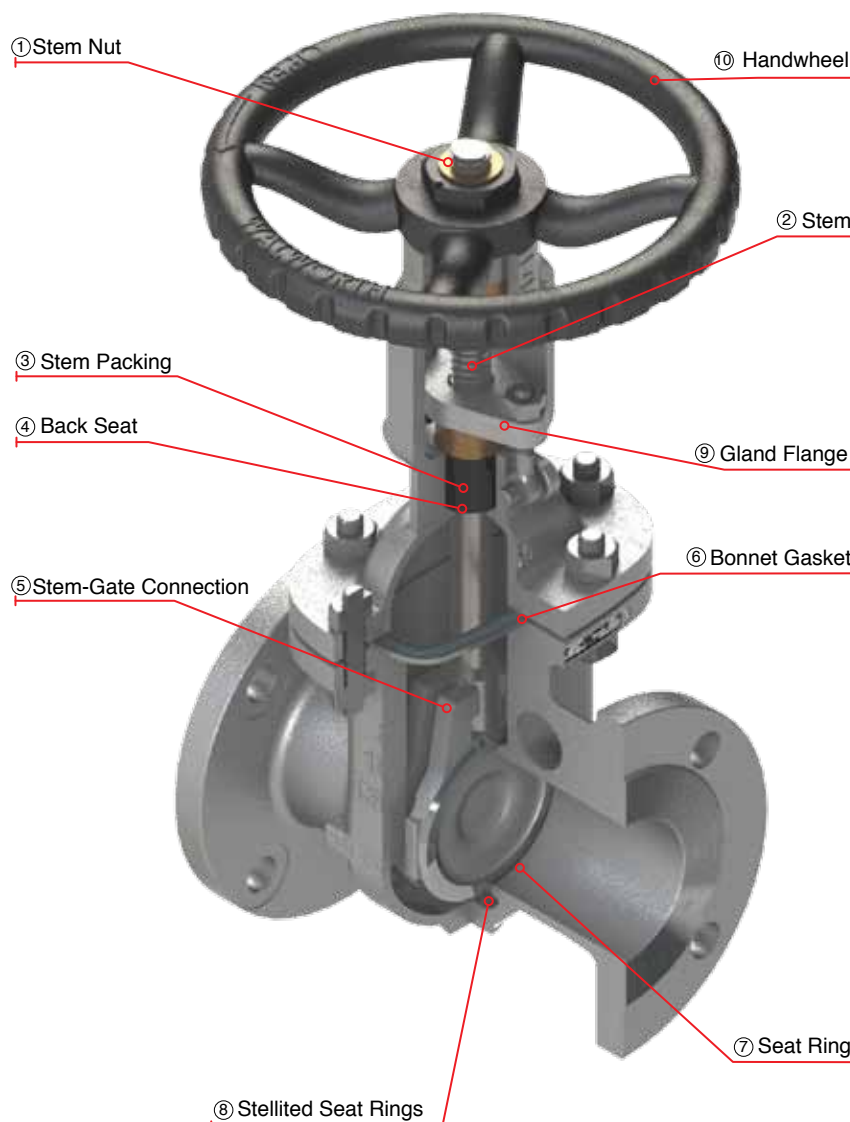
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 150

### CAST STEEL GATE VALVES, WITH RISING STEM AND OUTSIDE SCREW AND YOKE (OS&Y)

#### DESIGN FEATURES

- Gate valves design in accordance with API-603
- Standard manufacturing wedge flexible wedge
- Flange dimensions in accordance with ASME B16.5
- Gate and Globe Valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Hand-wheel, impact hand-wheel, chain-wheel, 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 pipeline 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 Integral backseat 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 Integral seat rings designed to provide a bubble tight joint.
- ⑧ Stellite 6 overlay on wedge Seating Surfaces provide increased resistance to wear, abrasion and erosion.
- ⑨ Two-piece arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.
- ⑩ Gate valves supplied handwheel operated as standard.



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 150 (INTEGRAL YOKE)

### DESIGN FEATURES:

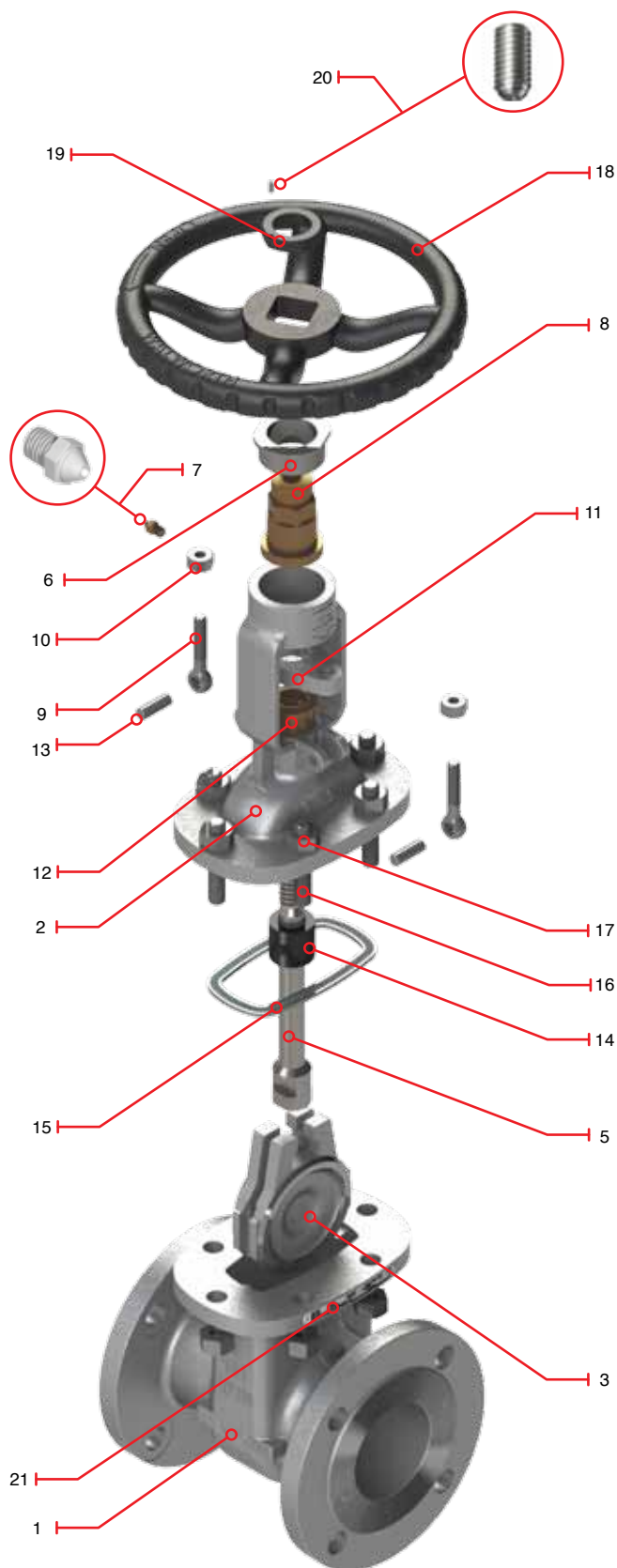
- Design in accordance with API - 603
- Outside Screw & Yoke (OS&Y)
- Flexible Wedge
- Handwheel operated as standard
- Integral Yoke
- Flange dimensions as per ASME B16.5
- End to end dimension as per ASME B16.10
- WE dimensions as per ASME B16.25

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5202RF            | S5202F              | Flanged Raised Face |
| S5202RTJ           | S5202RJ             | Ring Type Joint     |
| S5202WE            | S5202WE             | Buttweld            |

### Regular Bill of Materials

| No. | Description          | Standard Material<br>CF8M Trim 3HF                                                                             |
|-----|----------------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                             |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                             |
| 3   | Wedge                | ASTM A 351 GR CF8M + ST 6                                                                                      |
| *4  | Seat Ring            | Integral Seat Ring                                                                                             |
| 5   | Stem                 | ASTM A 276 Type 316                                                                                            |
| 6   | Stem Nut Retainer    | ASTM A182 F304                                                                                                 |
| 7   | Grease Fitting       | Commercial Steel                                                                                               |
| 8   | Stem Nut             | ASTM B 148 UNS C95600                                                                                          |
| 9   | Eyebolt              | ASTM A193 B8                                                                                                   |
| 10  | Eyebolt Nut          | ASTM A 194 Gr 8                                                                                                |
| 11  | Gland Flange         | ASTM A182 F304                                                                                                 |
| 12  | Packing Bushing      | ASTM A182 F316                                                                                                 |
| 13  | Eyebolt Pin          | Alloy Steel                                                                                                    |
| 14  | Stem Packing         | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| 15  | Bonnet Gasket        | Graphite/Stainless Steel 316                                                                                   |
| 16  | Bonnet Stud          | ASTM A 193 GR B8                                                                                               |
| 17  | Bonnet Stud Nut      | ASTM A 194 GR 8                                                                                                |
| 18  | Handwheel            | Commercial                                                                                                     |
| 19  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                             |
| 20  | Oppressor            | Alloy Steel                                                                                                    |
| 21  | Identification Plate | Stainless Steel                                                                                                |

\*Not shown



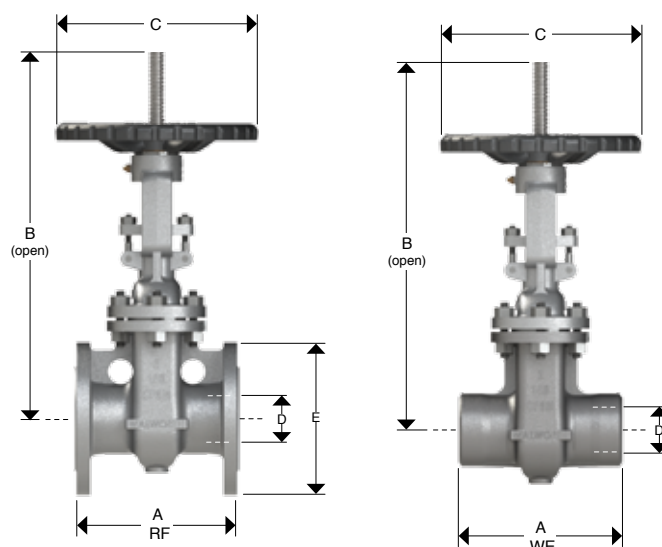
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 150 (INTEGRAL YOKE)



### DESIGN FEATURES:

- Design in accordance with API - 603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Integral yoke
- 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        |
|--------------------|---------------------|---------------------|
| S5202RF            | S5202F              | Flanged Raised Face |
| S5202RTJ           | S5202RJ             | Ring Type Joint     |
| S5202WE            | S5202WE             | Buttweld            |



### Dimensions and Weights

| D<br>Nominal<br>Diameter | mm | 51   | 64   | 76    | 102   | 152   | 203   | 254   | 305   |
|--------------------------|----|------|------|-------|-------|-------|-------|-------|-------|
|                          | in | 2    | 2.5  | 3     | 4     | 6     | 8     | 10    | 12    |
| A (RF and RTJ)           | mm | 178  | 191  | 203   | 229   | 267   | 292   | 330   | 356   |
|                          | in | 7    | 7.5  | 8     | 9     | 10.5  | 11.5  | 13    | 14    |
| A (WE)                   | mm | 216  | 241  | 283   | 305   | 403   | 419   | 457   | 502   |
|                          | in | 8.5  | 9.5  | 11.13 | 12    | 15.88 | 16.5  | 18    | 19.75 |
| B (Open)                 | mm | 350  | 355  | 373   | 571   | 740   | 946   | 1130  | 1332  |
|                          | in | 13.8 | 14   | 14.7  | 22.5  | 29.1  | 37.2  | 44.5  | 52.4  |
| C                        | mm | 200  | 200  | 250   | 250   | 300   | 350   | 400   | 450   |
|                          | in | 7.9  | 7.9  | 9.8   | 9.8   | 11.8  | 13.8  | 15.7  | 17.7  |
| E                        | mm | 152  | 178  | 191   | 229   | 279   | 343   | 406   | 483   |
|                          | in | 6    | 7    | 7.5   | 9     | 11    | 13.5  | 16    | 19    |
| Weight                   | Kg | 13   | 18   | 22    | 32    | 53    | 88    | 135   | 204   |
| S5202RF                  | lb | 28.7 | 39.7 | 48.5  | 70.56 | 116.9 | 194   | 297.7 | 449.8 |
| Weight                   | Kg | 9    | 15   | 18    | 28    | 45    | 72    | 108   | 180   |
| S5202WE                  | lb | 19.8 | 33.1 | 39.7  | 61.7  | 99.2  | 158.8 | 238.1 | 396.9 |



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 150 (INDEPENDENT YOKE)

### DESIGN FEATURES:

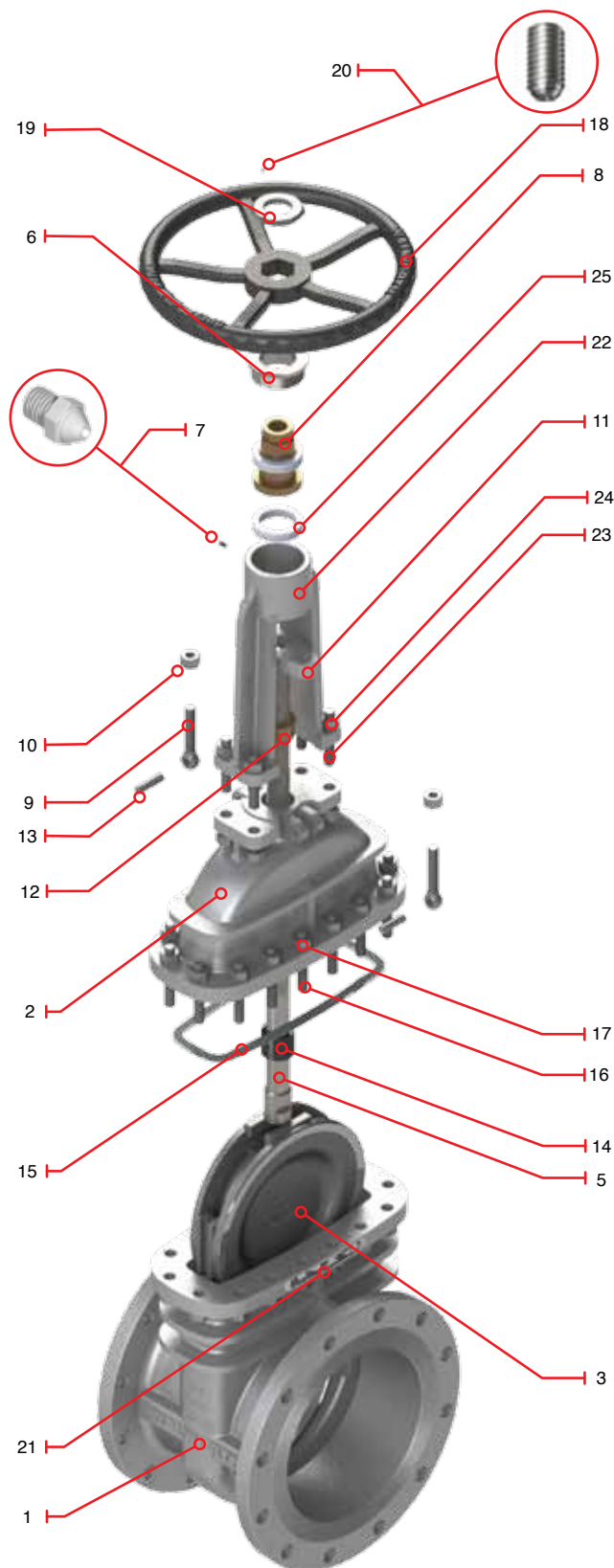
- Design in accordance with API - 603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Independent yoke
- Flange dimensions as per ASME B16.5
- End to end dimension as per ASME B16.10
- WE dimensions as per ASME B16.25

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5202RF            | S5202F              | Flanged Raised Face |
| S5202RTJ           | S5202RJ             | Ring Type Joint     |
| S5202WE            | S5202WE             | Buttweld            |

### Regular Bill of Materials

| No. | Description          | Standard Material<br>CF8M Trim 3HF                                                                                      |
|-----|----------------------|-------------------------------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                                      |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                                      |
| 3   | Wedge                | ASTM A 351 GR CF8M + ST 6                                                                                               |
| *4  | Seat Ring            | Integral Seat Ring                                                                                                      |
| 5   | Stem                 | ASTM A 276 Type 316                                                                                                     |
| 6   | Stem Nut Retainer    | ASTM A182 F304                                                                                                          |
| 7   | Grease Fitting       | Commercial Steel                                                                                                        |
| 8   | Stem Nut             | ASTM B 148 UNS C95600                                                                                                   |
| 9   | Eyebolt              | ASTM A193 B8                                                                                                            |
| 10  | Eyebolt Nut          | ASTM A 194 Gr 8                                                                                                         |
| 11  | Gland Flange         | ASTM A182 F304                                                                                                          |
| 12  | Packing Bushing      | ASTM A182 F316                                                                                                          |
| 13  | Eyebolt Pin          | Alloy Steel                                                                                                             |
| 14  | Stem Packing         | Flexible graphite intermediate rings<br>/ Anti-extrusion rings on the top<br>and bottom sides of the packing<br>chamber |
| 15  | Bonnet Gasket        | Graphite/Stainless 316                                                                                                  |
| 16  | Bonnet Stud          | ASTM A 193 GR B8M                                                                                                       |
| 17  | Bonnet Stud Nut      | ASTM A 194 GR 8M                                                                                                        |
| 18  | Handwheel            | Commercial                                                                                                              |
| 19  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                                      |
| 20  | Opressor             | Alloy Steel                                                                                                             |
| 21  | Identification Plate | Stainless Steel                                                                                                         |
| 22  | Yoke                 | ASTM A 351 GR CF8M                                                                                                      |
| 23  | Yoke Bolt            | ASTM A 193 GR B8                                                                                                        |
| 24  | Yoke Bolt Nut        | ASTM A 194 GR 8                                                                                                         |
| 25  | Bearings             | Commercial                                                                                                              |

\*Not shown



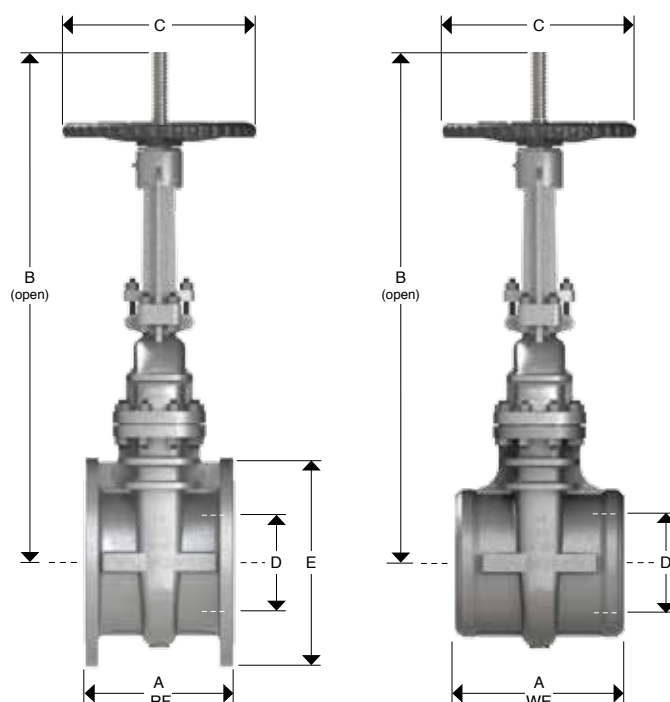
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 150 (INDEPENDENT YOKE)



### DESIGN FEATURES:

- Design in accordance with API - 603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Independent yoke
- 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        |
|--------------------|---------------------|---------------------|
| S5202RF            | S5202F              | Flanged Raised Face |
| S5202RTJ           | S5202RJ             | Ring Type Joint     |
| S5202WE            | S5202WE             | Buttweld            |



### Dimensions and Weights

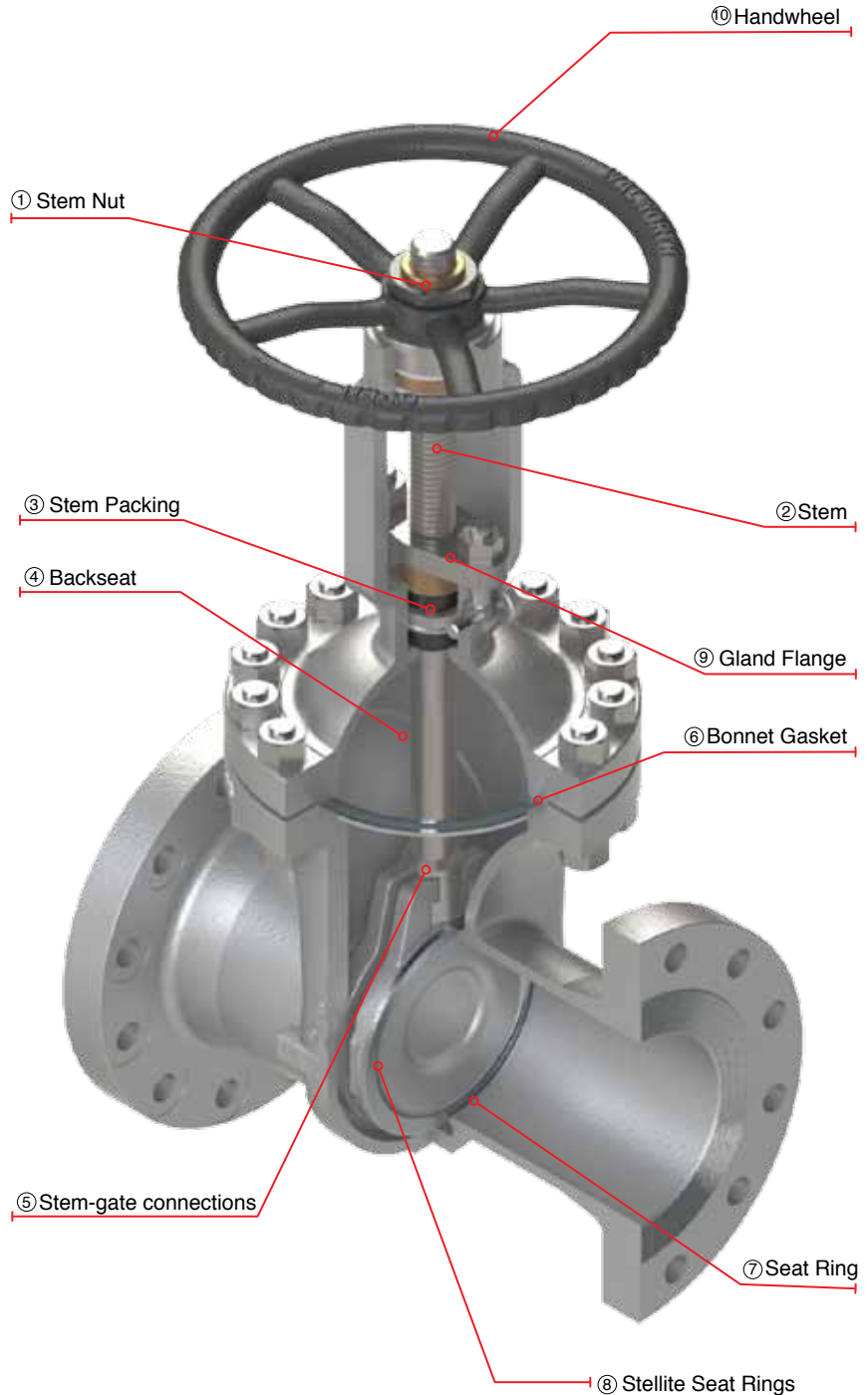
| D Nominal Diameter | mm | 356   | 406    | 457    | 508    | 610    |
|--------------------|----|-------|--------|--------|--------|--------|
|                    | in | 14    | 16     | 18     | 20     | 24     |
| A                  | mm | 381   | 406    | 432    | 457    | 508    |
| (RF)               | in | 15    | 16     | 17     | 18     | 20     |
| A                  | mm | 572   | 610    | 660    | 711    | 813    |
| (WE)               | in | 22.5  | 24     | 26     | 28     | 32     |
| B                  | mm | 1448  | 1680   | 1872   | 2058   | 2497   |
|                    | in | 57.0  | 66.1   | 73.7   | 81     | 98.3   |
| C                  | mm | 500   | 500    | 600    | 650    | 720    |
|                    | in | 19.7  | 19.7   | 23.6   | 25.6   | 28.3   |
| E                  | mm | 533   | 597    | 635    | 699    | 813    |
|                    | in | 21    | 23.5   | 25     | 27.5   | 32     |
| Weight             | Kg | 349.2 | 459    | 540    | 826.2  | 1044   |
| S5202RF            | lb | 770   | 1012.1 | 1190.7 | 1822   | 2302   |
| Weight             | Kg | 317.2 | 424    | 457    | 542.2  | 652    |
| S5202WE            | lb | 699.5 | 935    | 1007.7 | 1195.6 | 1437.7 |

## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 300 CAST STEEL GATE VALVES, WITH RISING STEM AND OUTSIDE SCREW AND YOKE (OS&Y)

### DESIGN FEATURES

- Gate valves design in accordance with API-603
- Standard manufacturing flexible wedge
- Flange dimensions in accordance with ASME B16.5
- Gate and Globe Valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Hand-wheel, impact hand-wheel, chain-wheel, 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 Integral backseat 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 Integral seat rings designed to provide a bubble tight joint.
- ⑧ Stellite 6 overlay on wedge Seating Surfaces provide increased resistance to wear, abrasion and erosion.
- ⑨ Two-piece arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.
- ⑩ Gate valves supplied handwheel operated as standard from 2" to 24".



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 300 (INTEGRAL YOKE)

### DESIGN FEATURES:

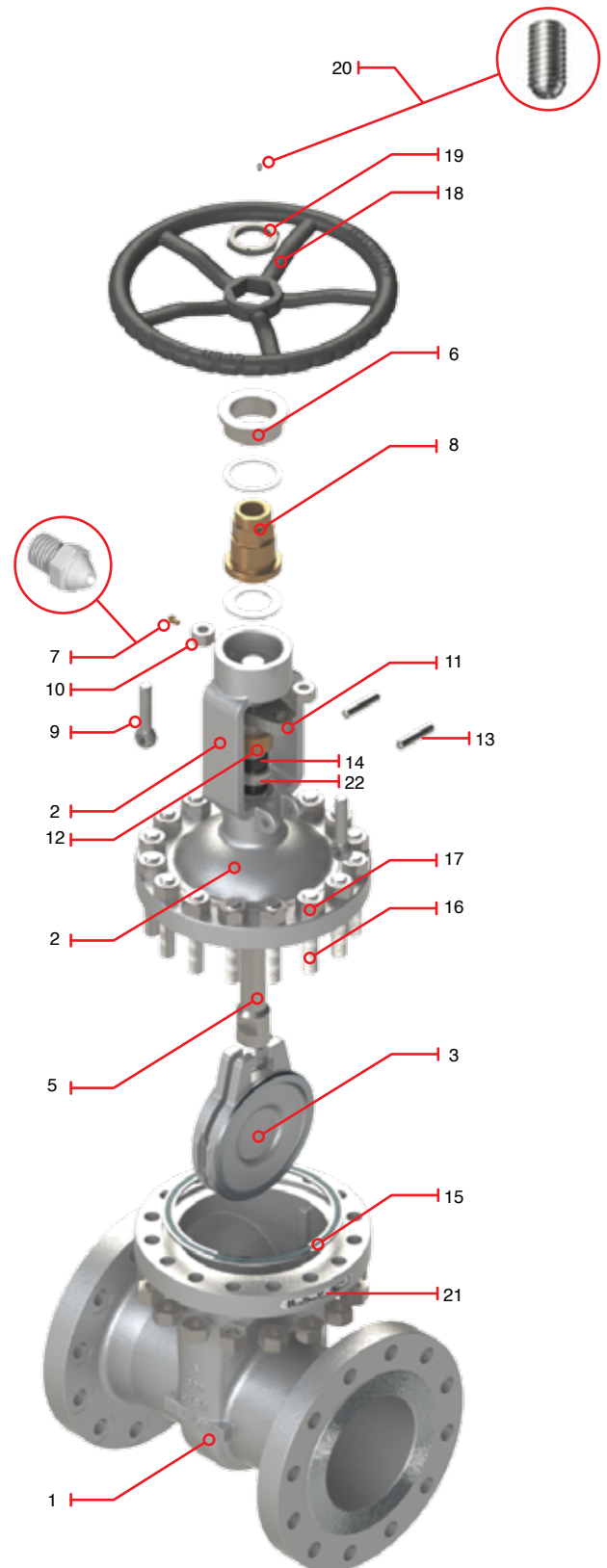
- Design in accordance with API-603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Integral yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5206RF            | S5206F              | Flanged Raised Face |
| S5206RTJ           | S5206RJ             | Ring T type Joint   |
| S5206WE            | S5206WE             | Buttweld            |

### Regular Bill of Materials

| No. | Description          | Standard material                                                                                  |
|-----|----------------------|----------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                 |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                 |
| 3   | Disc                 | ASTM A 351 GR CF8M + ST6                                                                           |
| *4  | Seat Ring            | Integral Seat Ring                                                                                 |
| 5   | Stem                 | ASTM A182 F316                                                                                     |
| 6   | Stem Nut Retainer    | ASTM A182 F304                                                                                     |
| 7   | Grease Fitting       | Commercial Steel                                                                                   |
| 8   | Stem Nut             | ASTM B 148 UNS C95600                                                                              |
| 9   | Eyebolt              | ASTM A193 B8                                                                                       |
| 10  | Eyebolt Nut          | ASTM A194 Gr 8                                                                                     |
| 11  | Gland Flange         | ASTM A182 F304                                                                                     |
| 12  | Packing Bushing      | ASTM A182 F316                                                                                     |
| 13  | Eyebolt Pin          | Alloy Steel                                                                                        |
| 14  | Stem Packing         | Flexible graphite intermediate rings / Anti extrusion rings top and bottom side of packing chamber |
| 15  | Bonnet Gasket        | Graphite / Stainless 316                                                                           |
| 16  | Bonnet Stud          | ASTM A 193 GR B8                                                                                   |
| 17  | Bonnet Stud Nut      | ASTM A 194 GR 8                                                                                    |
| 18  | Handwheel            | Commercial                                                                                         |
| 19  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                 |
| 20  | Opressor             | Alloy Steel                                                                                        |
| 21  | Identification Plate | Stainless Steel                                                                                    |
| 22  | Lantern Ring         | ASTM A182 F316                                                                                     |

\*Not Shown



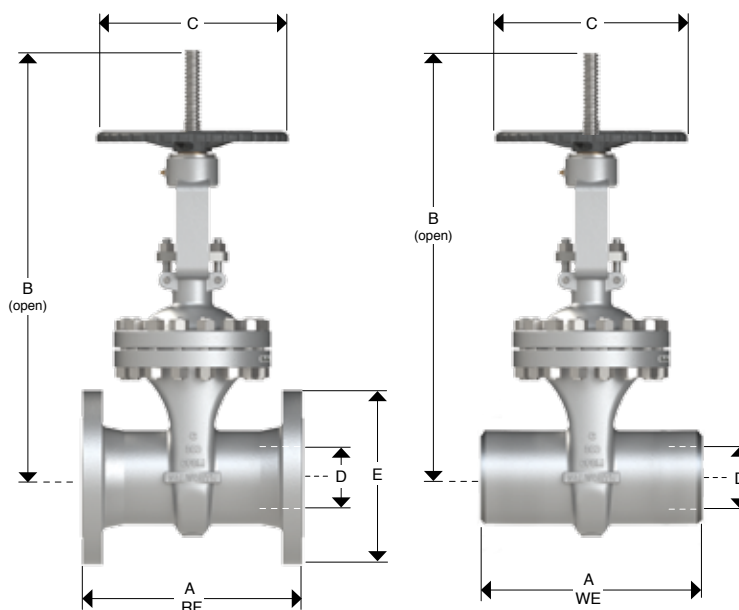
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 300 (INTEGRAL YOKE)

### DESIGN FEATURES:

- Design in accordance with API-603
- Flexible wedge
- Outside screw & yoke (OS&Y)
- Handwheel operated as standard
- Independent yoke
- 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        |
|--------------------|---------------------|---------------------|
| S5206RF            | S5206F              | Flanged Raised Face |
| S5206RTJ           | S5206RJ             | Ring Type Joint     |
| S5206WE            | S5206WE             | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 51   | 64   | 76    | 102   | 152   | 203   | 254   | 305   |
|--------------------|----|------|------|-------|-------|-------|-------|-------|-------|
|                    | in | 2    | 2.5  | 3     | 4     | 6     | 8     | 10    | 12    |
| A (RF and WE)      | mm | 216  | 241  | 283   | 305   | 403   | 419   | 457   | 502   |
|                    | in | 8.5  | 9.5  | 11.13 | 12    | 15.88 | 16.5  | 18    | 19.75 |
| B (Open)           | mm | 376  | 420  | 479   | 577   | 815   | 986   | 1123  | 1285  |
|                    | in | 14.8 | 16.5 | 18.9  | 22.7  | 32.1  | 38.8  | 44.2  | 50.6  |
| C                  | mm | 250  | 250  | 250   | 300   | 350   | 400   | 450   | 500   |
|                    | in | 9.8  | 9.8  | 9.8   | 11.8  | 13.8  | 15.7  | 17.7  | 19.7  |
| E                  | mm | 165  | 191  | 210   | 254   | 318   | 381   | 445   | 521   |
|                    | in | 6.5  | 7.5  | 8 ¼   | 10    | 12.5  | 15    | 17.5  | 20.5  |
| Weight             | Kg | 19   | 27   | 36    | 55    | 102   | 169   | 268   | 377   |
| S5206RF            | lb | 41.9 | 59.5 | 79.4  | 121.3 | 224.9 | 372.6 | 590.9 | 831.3 |
| Weight             | Kg | 14   | 19   | 26    | 36    | 82    | 141.6 | 245.9 | 314.3 |
| S5206WE            | lb | 30.9 | 41.9 | 57.3  | 79.4  | 180.8 | 312.2 | 542.2 | 693.0 |



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 300 (INDEPENDENT YOKE)

### DESIGN FEATURES:

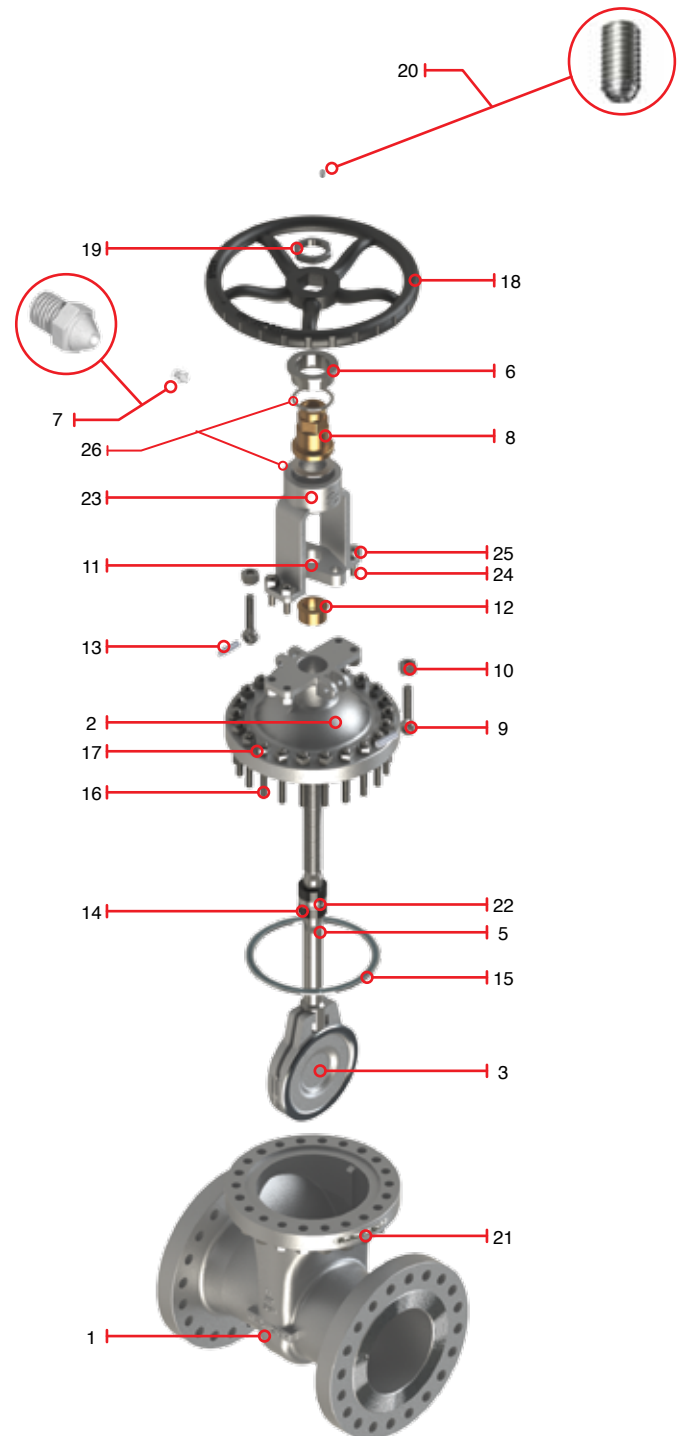
- Design in accordance with API-603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Independent yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5206RF            | S5206F              | Flanged Raised Face |
| S5206RTJ           | S5206RJ             | Ring Type Joint     |
| S5206WE            | S5206WE             | Buttweld            |

### Regular Bill of Materials

| No. | Description          | Standard Material<br>CF8M Trim 3HF                                                                 |
|-----|----------------------|----------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                 |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                 |
| 3   | Disc                 | ASTM A 351 GR CF8M + ST6                                                                           |
| *4  | Seat Ring            | Integral Seat Ring                                                                                 |
| 5   | Stem                 | ASTM A182 F316                                                                                     |
| 6   | Stem Nut Retainer    | ASTM A182 F304                                                                                     |
| 7   | Grease Fitting       | Commercial Steel                                                                                   |
| 8   | Stem Nut             | ASTM B 148 UNS C95600                                                                              |
| 9   | Eyebolt              | ASTM A193 B8M                                                                                      |
| 10  | Eyebolt Nut          | ASTM A194 Gr 8                                                                                     |
| 11  | Gland Flange         | ASTM A182 F304                                                                                     |
| 12  | Packing Bushing      | ASTM A182 F316                                                                                     |
| 13  | Eyebolt Pin          | Alloy Steel                                                                                        |
| 14  | Stem Packing         | Flexible graphite intermediate rings / Anti extrusion rings top and bottom side of packing chamber |
| 15  | Bonnet Gasket        | Graphite / Stainless 316                                                                           |
| 16  | Bonnet Stud          | ASTM A 193 GR B8                                                                                   |
| 17  | Bonnet Stud Nut      | ASTM A 194 GR 8                                                                                    |
| 18  | Handwheel            | Commercial                                                                                         |
| 19  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                 |
| 20  | Oppressor            | Alloy Steel                                                                                        |
| 21  | Identification Plate | Stainless Steel                                                                                    |
| 22  | Lantern Ring         | ASTM A182 F316                                                                                     |
| 23  | Yoke                 | ASTM A 351 GR CF8M                                                                                 |
| 24  | Yoke Bolt            | ASTM A 193 GR B8                                                                                   |
| 25  | Yoke Bolt Nut        | ASTM A 194 GR 8                                                                                    |
| 26  | Stem Nut Washer      | Commercial                                                                                         |

\*Not Shown



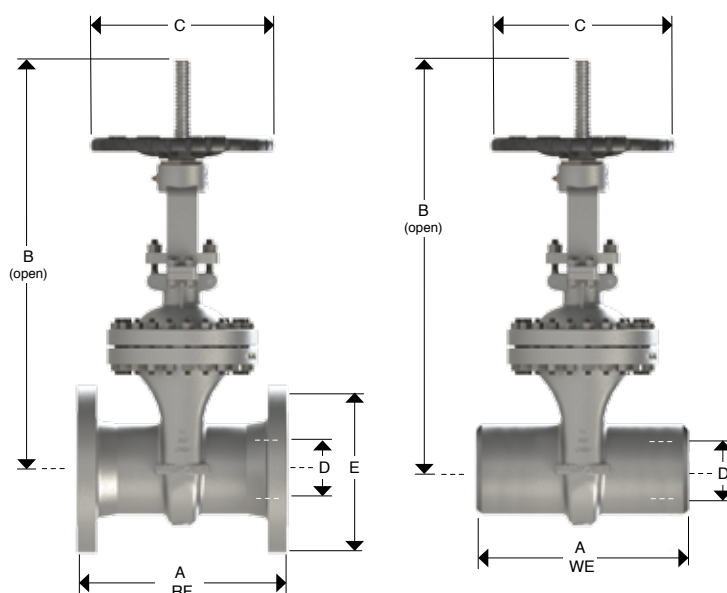
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 300 (INDEPENDENT YOKE)

### DESIGN FEATURES

- Design in accordance with API-603
- Flexible wedge
- Outside screw & yoke (OS&Y)
- Handwheel operated as standard
- Independent yoke
- 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        |
|--------------------|---------------------|---------------------|
| S5206RF            | S5206F              | Flanged Raised Face |
| S5206RTJ           | S5206RJ             | Ring Type Joint     |
| S5206WE            | S5206WE             | Buttweld            |



### Dimensions and Weights

| D<br>Nominal<br>Diameter | mm | 356    | 406    | 457    | 508    | 610    |
|--------------------------|----|--------|--------|--------|--------|--------|
|                          | in | 14     | 16     | 18     | 20     | 24     |
| A<br>(RF and WE)         | mm | 762    | 838    | 914    | 991    | 1143   |
|                          | in | 30     | 33     | 36     | 39     | 45     |
| B (Open)                 | mm | 1594   | 1730   | 1924   | 2105   | 2335   |
|                          | in | 62.75  | 68.13  | 75.75  | 82.88  | 91.88  |
| C                        | mm | 500    | 550    | 600    | 650    | 720    |
|                          | in | 19.7   | 21.7   | 23.6   | 25.6   | 28.3   |
| E                        | mm | 584    | 648    | 711    | 775    | 914    |
|                          | in | 23     | 25.5   | 28     | 30.5   | 36     |
| Weight                   | Kg | 816    | 1082   | 1469   | 1867   | 2200   |
| S5206RF                  | lb | 1799.3 | 2385.8 | 3239.1 | 4116.7 | 4851.0 |
| Weight                   | Kg | 725    | 923    | 1219   | 1582   | 1882   |
| S5206WE                  | lb | 1598.6 | 2035.2 | 2687.9 | 3488.3 | 4149.8 |

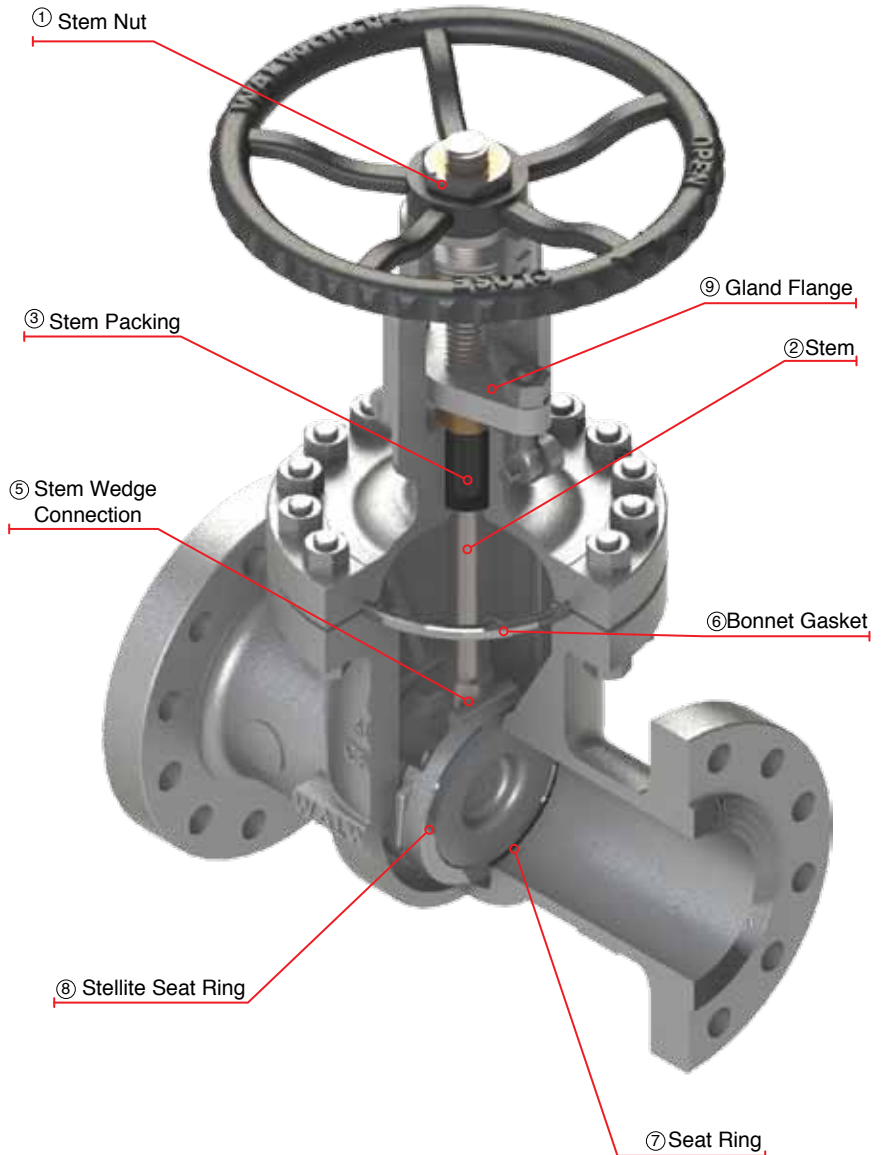
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES CLASS 600

### CAST STEEL GATE VALVES, WITH RISING STEM AND OUTSIDE SCREW AND YOKE (OS&Y)

#### DESIGN FEATURES:

- Gate valves design in accordance with API-603
- Standard manufacturing flexible wedge
- Flange dimensions in accordance with ASME B16.5
- Gate and Globe Valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Hand-wheel, impact hand-wheel, chain-wheel, 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 Integral Backseat 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 Integral seat rings to provide a bubble tight joint.
- ⑧ Stellite 6 overlay on wedge Seating Surfaces provide increased resistance to wear, abrasion and erosion.
- ⑨ Two-piece arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.
- ⑩ Gate and Globe valves supplied handwheel operated as standard.



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 600 (INTEGRAL YOKE)

### DESIGN FEATURES:

- Design in accordance with API-603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Integral yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

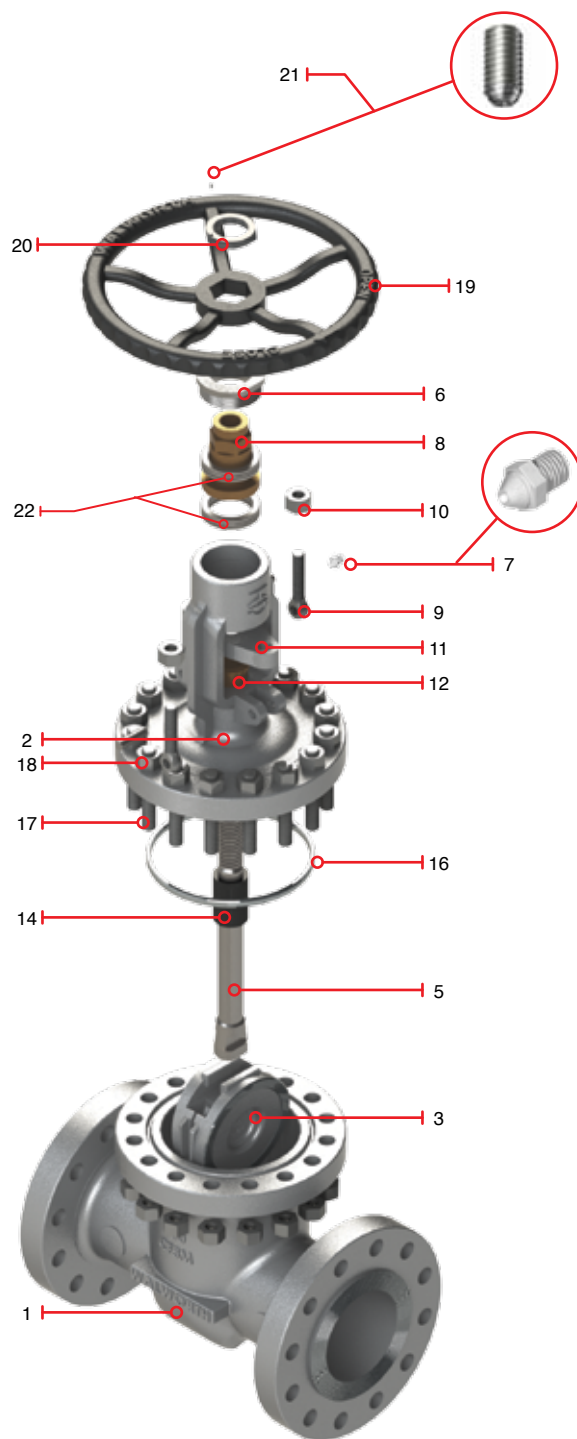
| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5232RF            | S5232F              | Flanged Raised Face |
| S5232RTJ           | S5232RJ             | Ring Type Joint     |
| S5232WE            | S5232WE             | Buttweld            |

### Regular Bill of Materials

| No.  | Description                  | Standard Material<br>CF8M Trim 3HF                                                                             |
|------|------------------------------|----------------------------------------------------------------------------------------------------------------|
| 1    | Body                         | ASTM A 351 GR CF8M                                                                                             |
| 2    | Bonnet                       | ASTM A 351 GR CF8M                                                                                             |
| 3    | Disc                         | ASTM A 351 GR CF8M + ST 6                                                                                      |
| *4   | Seat Ring                    | Integral Seat Ring                                                                                             |
| 5    | Stem                         | ASTM A 276 Type 316                                                                                            |
| 6    | Stem Nut Retainer            | ASTM A182 F304                                                                                                 |
| 7    | Grease Fitting               | Commercial Steel                                                                                               |
| 8    | Stem Nut                     | ASTM B 148 UNS C95600                                                                                          |
| 9    | Eyebolt / Gland Flange Studs | A193 B8                                                                                                        |
| 10   | Eyebolt Nut                  | ASTM A 194 Gr 8                                                                                                |
| 11   | Gland Flange                 | ASTM A182 F304                                                                                                 |
| 12   | Packing Bushing              | ASTM A182 F316                                                                                                 |
| *13  | Eyebolt Pin                  | Alloy Steel                                                                                                    |
| 14   | Stem Packing                 | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| **15 | Bonnet Gasket                | Graphite / Stainless 316                                                                                       |
| 16   | Ring Type Joint Gasket       | ASTM A 182 F316                                                                                                |
| 17   | Bonnet Stud                  | ASTM A 193 GR B8                                                                                               |
| 18   | Bonnet Stud Nut              | ASTM A 194 GR 8                                                                                                |
| 19   | Handwheel                    | Commercial                                                                                                     |
| 20   | Handwheel Nut                | ASTM A 108 GR 1020                                                                                             |
| 21   | Oppressor                    | Alloy Steel                                                                                                    |
| 22   | Stem Nut Bearing             | Commercial Steel                                                                                               |
| *23  | Identification Plate         | Stainless Steel                                                                                                |

\*Not Shown

\*\*Gasket used for smaller size valves



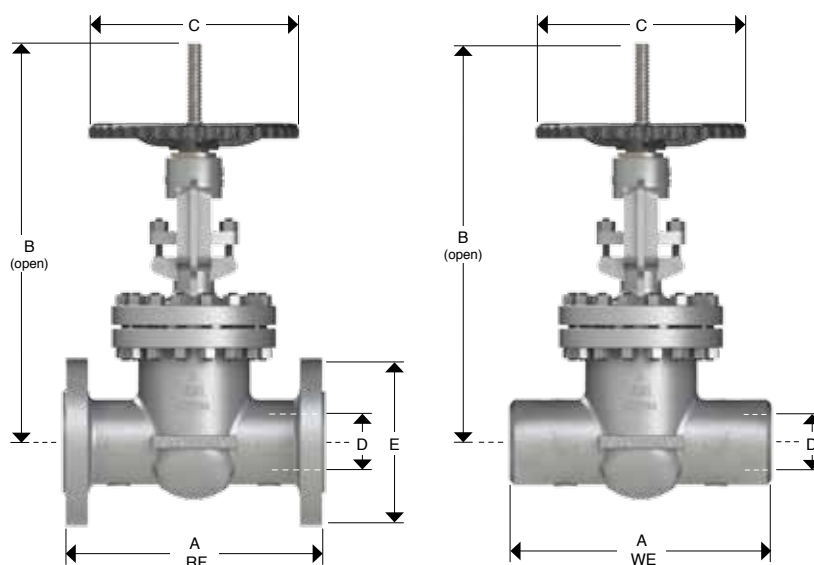
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 600 (INTEGRAL YOKE)

### DESIGN FEATURES:

- Design in accordance with API-603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- 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        |
|--------------------|---------------------|---------------------|
| S5232RF            | S5232F              | Flanged Raised Face |
| S5232RTJ           | S5232RJ             | Ring Type Joint     |
| 5232WE             | 5232WE              | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 50    | 65    | 80    | 100   | 150   | 200   |
|--------------------|----|-------|-------|-------|-------|-------|-------|
|                    | in | 2     | 2 1/2 | 3     | 4     | 6     | 8     |
| A<br>(RF and WE)   | mm | 292   | 330   | 356   | 432   | 559   | 660   |
|                    | in | 11.5  | 13    | 14    | 17    | 22    | 26    |
| B                  | mm | 447.5 | 495   | 543   | 681   | 854   | 893   |
|                    | in | 17.6  | 19.5  | 21.4  | 26.8  | 33.6  | 35.2  |
| C                  | mm | 200   | 250   | 300   | 300   | 450   | 600   |
|                    | in | 7.9   | 9.8   | 11.8  | 11.8  | 17.7  | 23.6  |
| E                  | mm | 165   | 191   | 210   | 273   | 356   | 419   |
|                    | in | 6.5   | 7.5   | 8 1/4 | 10.75 | 14    | 16.5  |
| Weight             | Kg | 24    | 36    | 53    | 93    | 190   | 338   |
| 5232RF/RTJ         | lb | 52.9  | 79.4  | 116.9 | 205.1 | 419.0 | 745.3 |
| Weight<br>5232WE   | Kg | 22    | 24    | 39.5  | 78    | 161   | 293   |
|                    | lb | 48.5  | 52.9  | 87.1  | 172.0 | 355.0 | 646.1 |



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 600 (INDEPENDENT YOKE)

### DESIGN FEATURES:

- Design in accordance with API-603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Independent yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

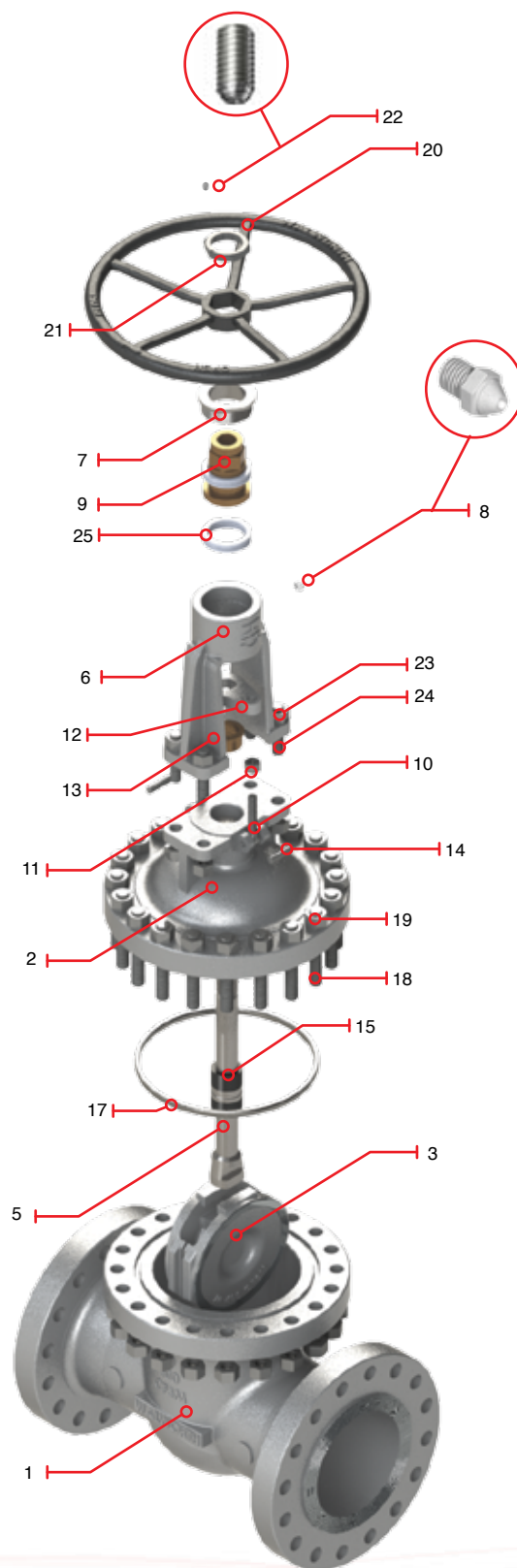
| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5232RF            | S5232F              | Flanged Raised Face |
| S5232RTJ           | S5232RJ             | Ring Type Joint     |
| S5232WE            | S5232WE             | Buttweld            |

### Regular Bill of Materials

| No.  | Description                  | Standard Material<br>CF8M Trim 3HF                                                                             |
|------|------------------------------|----------------------------------------------------------------------------------------------------------------|
| 1    | Body                         | ASTM A 351 GR CF8M                                                                                             |
| 2    | Bonnet                       | ASTM A 351 GR CF8M                                                                                             |
| 3    | Disc                         | ASTM A 351 GR CF8M + ST 6                                                                                      |
| *4   | Seat Ring                    | Integral Seat Ring                                                                                             |
| 5    | Stem                         | ASTM A 276 Type 316                                                                                            |
| 6    | Yoke                         | ASTM A 351 GR CF8M                                                                                             |
| 7    | Stem Nut Retainer            | ASTM A182 F304                                                                                                 |
| 8    | Grease Fitting               | Commercial Steel                                                                                               |
| 9    | Stem Nut                     | ASTM B 148 UNS C95600                                                                                          |
| 10   | Eyebolt / Gland Flange Studs | A193 B8M                                                                                                       |
| 11   | Eyebolt Nut                  | ASTM A 194 Gr 8                                                                                                |
| 12   | Gland Flange                 | ASTM A182 F304                                                                                                 |
| 13   | Packing Bushing              | ASTM A182 F316                                                                                                 |
| 14   | Eyebolt Pin                  | Alloy Steel                                                                                                    |
| 15   | Stem Packing                 | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| **16 | Bonnet Gasket                | Graphite / Stainless 316                                                                                       |
| 17   | Ring Type Joint Gasket       | ASTM A 182 F316                                                                                                |
| 18   | Bonnet Stud                  | ASTM A 193 GR B8M                                                                                              |
| 19   | Bonnet Stud Nut              | ASTM A 194 GR 8M                                                                                               |
| 20   | Handwheel                    | Commercial                                                                                                     |
| 21   | Handwheel Nut                | ASTM A 108 GR 1020                                                                                             |
| 22   | Opressor                     | Alloy Steel                                                                                                    |
| 23   | Yoke Bolt                    | ASTM A 193 GR B8M                                                                                              |
| 24   | Yoke Bolt Nut                | ASTM A 194 GR 8M                                                                                               |
| 25   | Stem Nut Bearing             | Commercial Steel                                                                                               |
| *26  | Identification Plate         | Stainless Steel                                                                                                |

\*Not Shown

\*\*Gasket used for smaller size valves

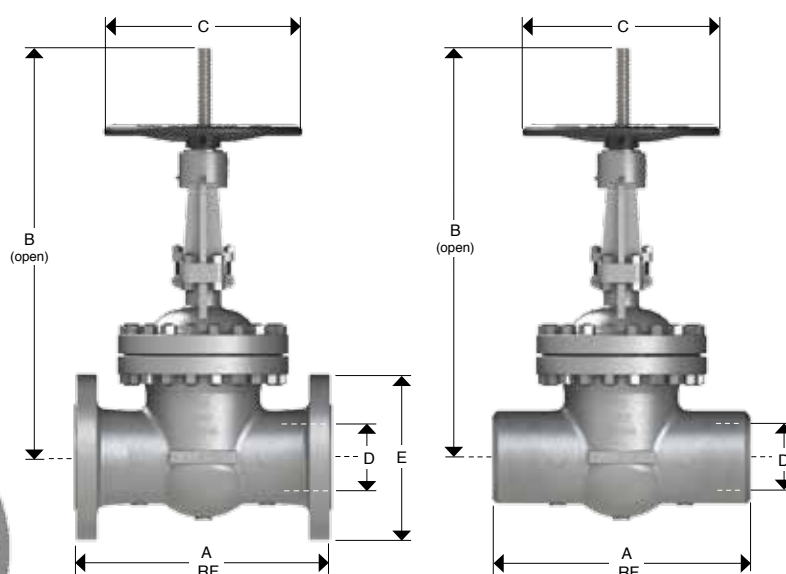


## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GATE VALVES, CLASS 600 (INDEPENDENT YOKE)

### DESIGN FEATURES:

- Design in accordance with API-603
- Outside screw & yoke (OS&Y)
- Flexible wedge
- Handwheel operated as standard
- Independent yoke
- 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 |
| S5232RTJ           | S5232RJ             | Ring Type Joint     |
| 5232WE             | 5232WE              | Buttweld            |



### Dimensions and Weights

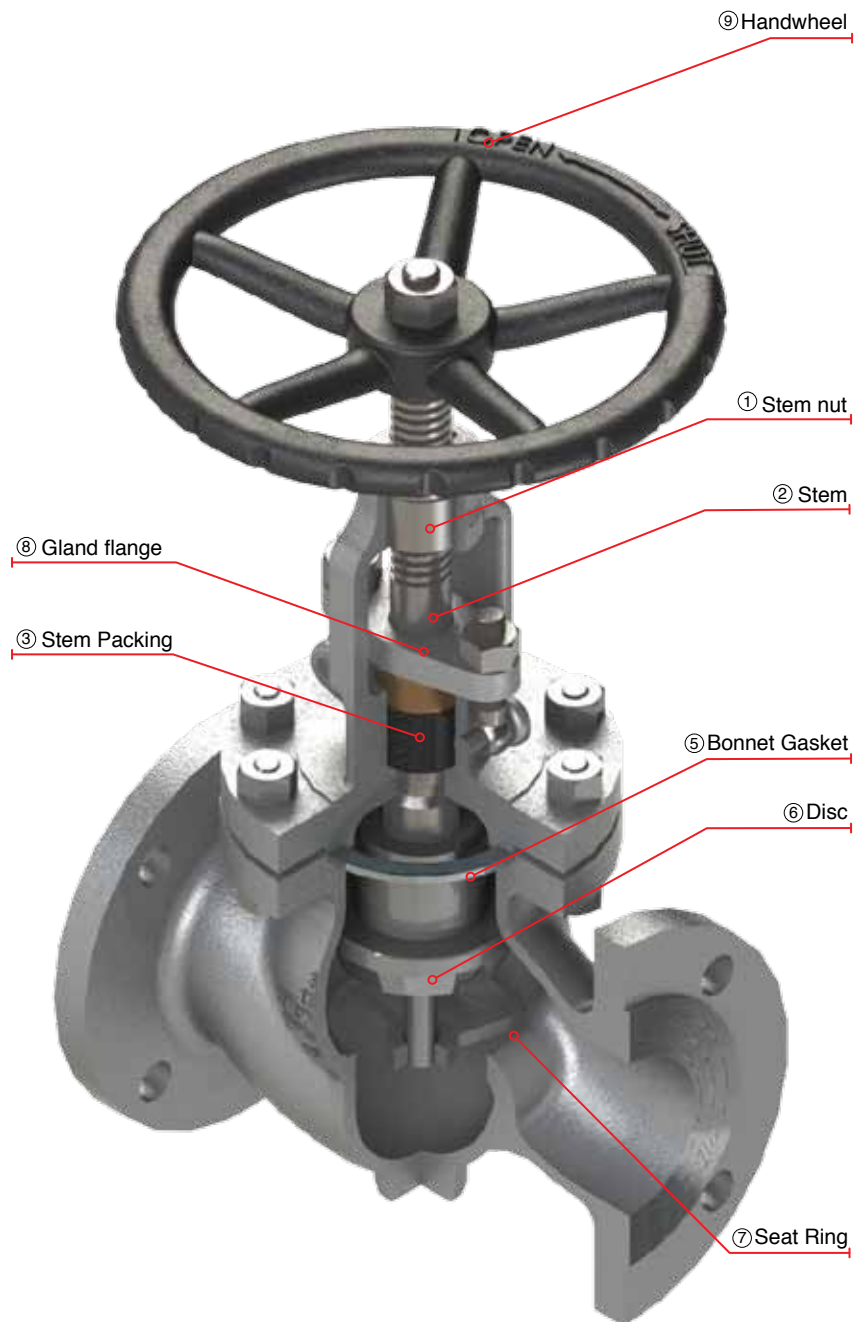
| D Nominal Diameter | mm | 254    | 305    |
|--------------------|----|--------|--------|
|                    | in | 10     | 12     |
| A (RF and WE)      | mm | 787    | 838    |
|                    | in | 31     | 33     |
| B                  | mm | 1295   | 1497   |
|                    | in | 51.0   | 58.9   |
| C                  | mm | 600    | 680    |
|                    | in | 23.6   | 26.8   |
| E                  | mm | 508    | 559    |
|                    | in | 20     | 22     |
| Weight             | Kg | 556    | 750    |
| 5232RF             | lb | 1226.0 | 1653.8 |
| Weight             | Kg | 480    | 638    |
|                    | lb | 1058.4 | 1406.8 |
| 5232WE             |    |        |        |

## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 150 CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM

### DESIGN FEATURES:

- Globe valves designed in accordance with API-603
- Gate & Globe Valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Flange dimensions in accordance with ASME B16.5
- Handwheel, handwheel impact, 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
- 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 Integral Backseat 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 disc design allows the disc and seat ring sealing surface to seat correctly without damage.
- ⑦ Integral Seat Ring.
- ⑧ Two-piece arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.
- ⑨ Globe valves supplied Handwheel operated as standard from 2" to 24".



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 150 (INTEGRAL YOKE)

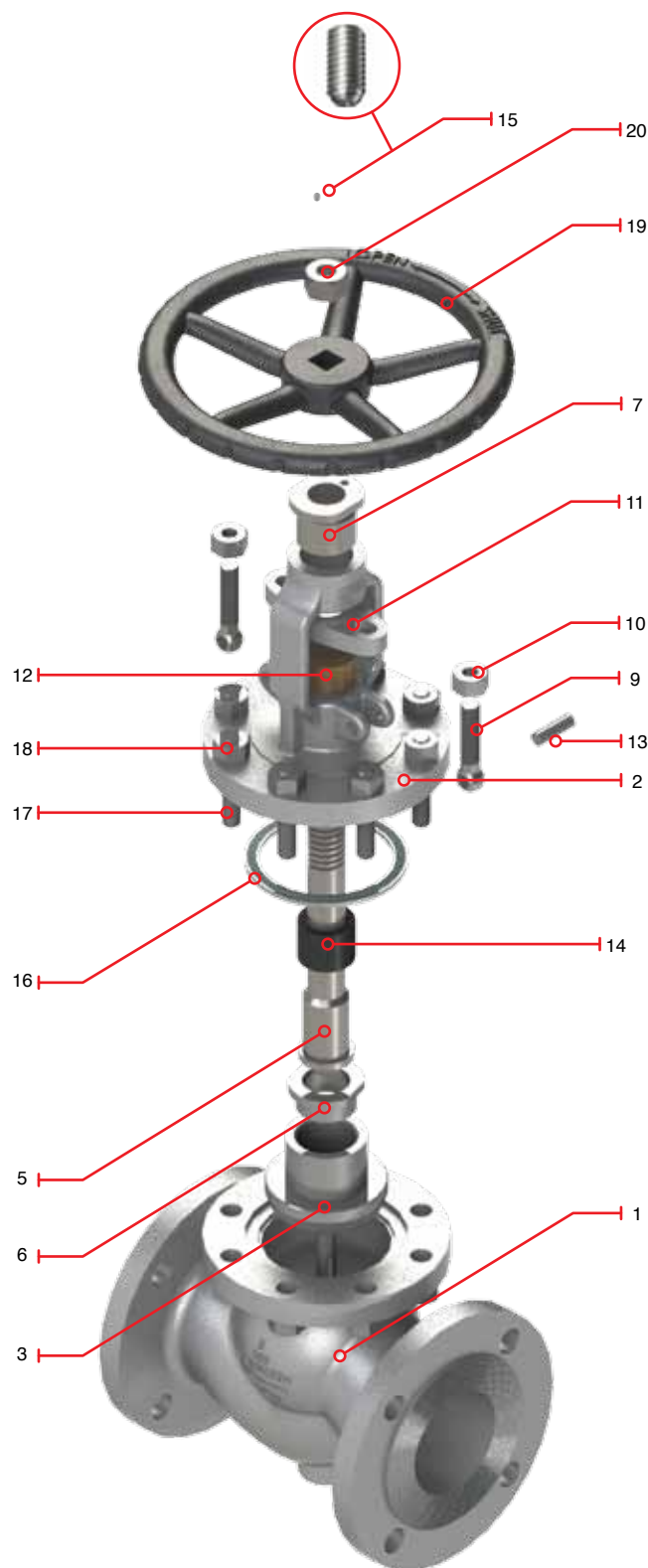
### DESIGN FEATURES:

- Design in accordance with API-603
- Rising stem and handwheel
- Integral yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5275RF            | S5275F              | Flanged Raised Face |
| S5275RTJ           | S5275RJ             | Ring Type Joint     |
| S5275WE            | S5275WE             | Buttweld            |

### Regular Bill of Materials

| No. | Description          | Standard Material<br>CF8M Trim 3HF                                                                             |
|-----|----------------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                             |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                             |
| 3   | Disc                 | ASTM A 351 Gr CF8M + ST 6                                                                                      |
| *4  | Seat Ring            | Integral Seat Ring                                                                                             |
| 5   | Stem                 | ASTM A 476 Type 316                                                                                            |
| 6   | Stem Retainer        | ASTM A 182 Type F316                                                                                           |
| 7   | Stem Nut             | UNS C95600                                                                                                     |
| *8  | Stem Seat            | ASTM A 476 Gr 316 + ST 6                                                                                       |
| 9   | Eyebolt              | ASTM A 193 GR B8                                                                                               |
| 10  | Eyebolt Nut          | ASTM A 194 GR 8                                                                                                |
| 11  | Gland Flange         | ASTM A 351 GR CF8M                                                                                             |
| 12  | Packing Bushing      | ASTM A 476 Type 316                                                                                            |
| 13  | Eyebolt Pin          | Alloy Steel                                                                                                    |
| 14  | Stem Packing         | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| 15  | Opressor             | Commercial                                                                                                     |
| 16  | Bonnet Gasket        | Spirotallic Graphite / Stainless 316                                                                           |
| 17  | Bonnet Stud          | ASTM A 193 GR B8                                                                                               |
| 18  | Bonnet Stud Nut      | ASTM A 194 GR 8                                                                                                |
| 19  | Handwheel            | As per WALWORTH design                                                                                         |
| 20  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                             |
| *21 | Handwheel Washer     | ASTM A 108 GR 1020                                                                                             |
| *22 | Identification Plate | Stainless Steel                                                                                                |



\*Not Shown

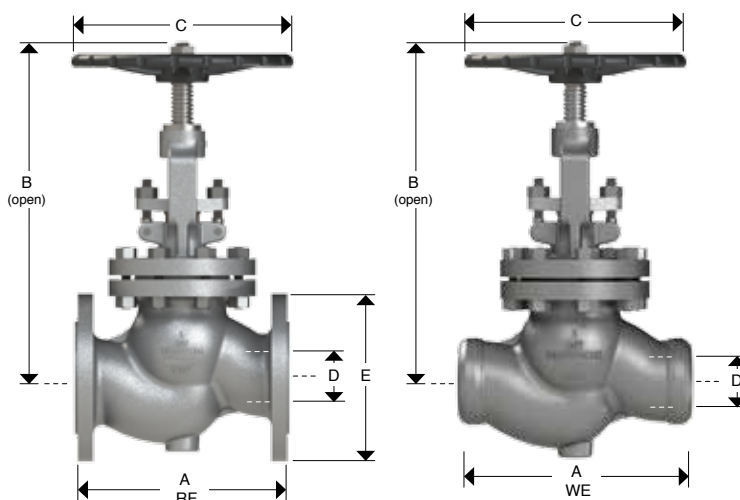
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 150 (INTEGRAL YOKE)



### DESIGN FEATURES:

- Design in accordance with ASME B 16.34
- Integral yoke
- 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
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5275RF            | S5275F              | Flanged Raised Face |
| S5275RTJ           | S5275RJ             | Ring Type Joint     |
| S5275WE            | S5275WE             | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 51   | 64   | 76   | 102  | 152   | 203   | 254   | 305   |
|--------------------|----|------|------|------|------|-------|-------|-------|-------|
|                    | in | 2    | 2.5  | 3    | 4    | 6     | 8     | 10    | 12    |
| A (RF and WE)      | mm | 203  | 216  | 241  | 292  | 406   | 495   | 622   | 699   |
|                    | in | 8    | 8.5  | 9.5  | 11.5 | 16    | 19.5  | 24.5  | 27.5  |
| B (Open)           | mm | 275  | 320  | 374  | 424  | 497   | 624   | 648   | 810   |
|                    | in | 10.8 | 12.6 | 14.7 | 16.7 | 19.6  | 24.6  | 25.5  | 31.9  |
| C                  | mm | 200  | 250  | 250  | 300  | 350   | 450   | 500   | 550   |
|                    | in | 7.9  | 9.8  | 9.8  | 11.8 | 13.8  | 17.7  | 19.7  | 21.7  |
| E                  | mm | 152  | 178  | 191  | 229  | 279   | 343   | 406   | 483   |
|                    | in | 6    | 7    | 7.5  | 9    | 11    | 13.5  | 16    | 19    |
| Weight S5275RF     | Kg | 14   | 19   | 24   | 36   | 68    | 98    | 200   | 299   |
|                    | lb | 30.9 | 41.9 | 52.9 | 79.4 | 149.9 | 216.1 | 441.0 | 659.3 |
| Weight S5275WE     | Kg | 11   | 15   | 15   | 26   | 52    | 67    | 166   | 241   |
|                    | lb | 24.3 | 33.1 | 33.1 | 57.3 | 114.7 | 147.7 | 366.0 | 531.4 |

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



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY

### GLOBE VALVES, CLASS 150 (INDEPENDENT YOKE)

#### DESIGN FEATURES:

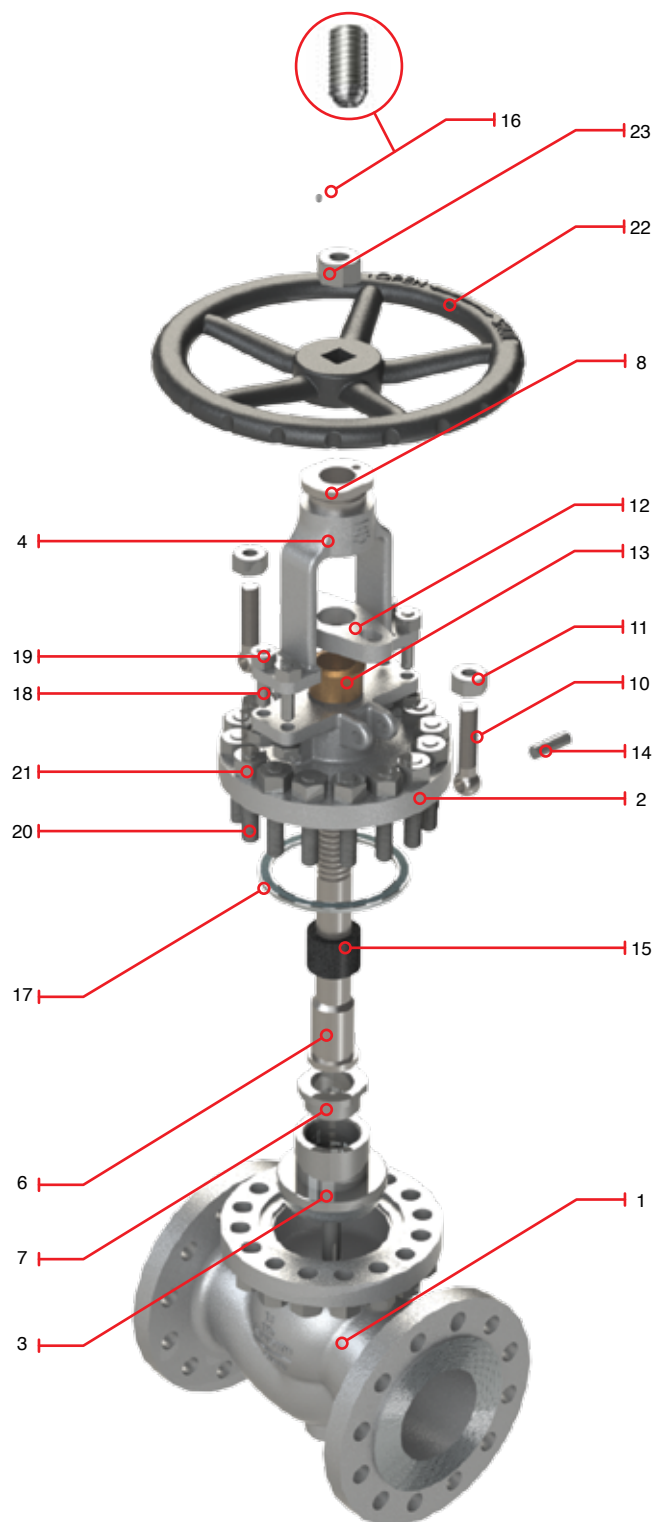
- Design in accordance with API-603
- Rising stem and handwheel
- Independent yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5275RF            | S5275F              | Flanged Raised Face |
| S5275RTJ           | S5275RJ             | Ring Type Joint     |
| S5275WE            | S5275WE             | Buttweld            |

#### Regular Bill of Materials

| No. | Description          | Standard Material<br>CF8M Trim 3HF                                                                             |
|-----|----------------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                             |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                             |
| 3   | Disc                 | ASTM A 351 Gr CF8M + ST 6                                                                                      |
| 4   | Yoke                 | ASTM A 351 GR CF8M                                                                                             |
| *5  | Seat Ring            | Integral Seat Ring                                                                                             |
| 6   | Stem                 | ASTM A 476 Type 316                                                                                            |
| 7   | Stem Retainer        | ASTM A 182 Type F316                                                                                           |
| 8   | Stem Nut             | UNS C95600                                                                                                     |
| *9  | Stem Seat            | ASTM A 476 Gr 316 + ST 6                                                                                       |
| 10  | Eyebolt              | ASTM A 193 GR B8                                                                                               |
| 11  | Eyebolt Nut          | ASTM A 194 GR 8                                                                                                |
| 12  | Gland Flange         | ASTM A 351 GR CF8M                                                                                             |
| 13  | Packing Bushing      | ASTM A 476 Type 316                                                                                            |
| 14  | Eyebolt Pin          | Alloy Steel                                                                                                    |
| 15  | Stem Packing         | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| 16  | Opressor             | Commercial                                                                                                     |
| 17  | Bonnet Gasket        | Spirotallic Graphite / Stainless 316                                                                           |
| 18  | Yoke Bolt            | ASTM A 193 GR B8                                                                                               |
| 19  | Yoke Bolt Nut        | ASTM A 194 GR 8                                                                                                |
| 20  | Bonnet Stud          | ASTM A 193 GR B8                                                                                               |
| 21  | Bonnet Stud Nut      | ASTM A 194 GR 8                                                                                                |
| 22  | Handwheel            | As per WALWORTH design                                                                                         |
| 23  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                             |
| *24 | Handwheel Washer     | ASTM A 108 GR 1020                                                                                             |
| *25 | Identification Plate | Stainless Steel                                                                                                |

\*Not Shown



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY

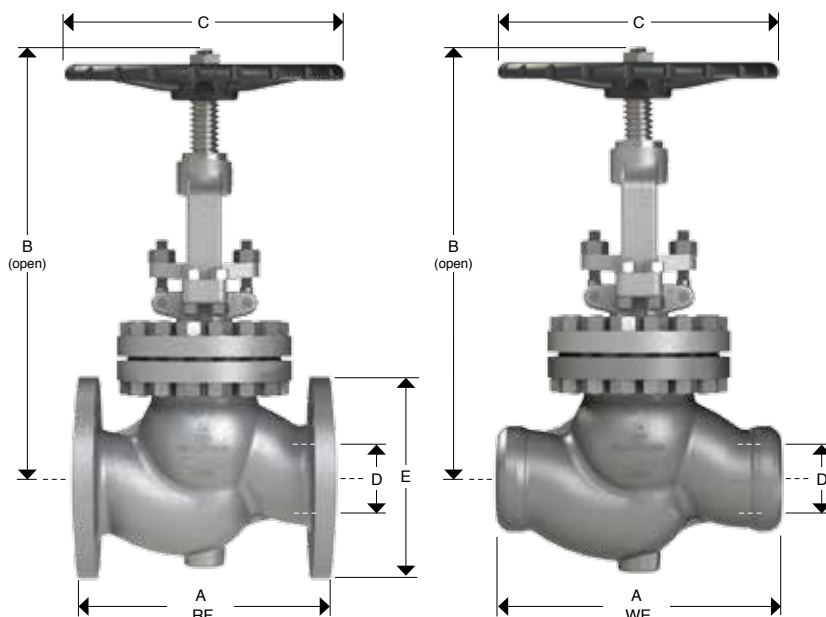
### GLOBE VALVES, CLASS 150 (INDEPENDENT YOKE)



#### DESIGN FEATURES:

- Design in accordance with API-603
- Integral yoke
- 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
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5275RF            | S5275F              | Flanged Raised Face |
| S5275RTJ           | S5275RJ             | Ring Type Joint     |
| S5275WE            | S5275WE             | Buttweld            |



#### Dimensions and Weights

| D Nominal Diameter | mm | 350   | 400    | 450    | 500    | 600     |
|--------------------|----|-------|--------|--------|--------|---------|
|                    | in | 14    | 16     | 18     | 20     | 24      |
| A<br>(RF and WE)   | mm | 787   | 914    | 978    | 978    | 1295    |
|                    | in | 31    | 36     | 38.5   | 38.5   | 51      |
| B (Open)           | mm | 970   | 986    | 1210   | 1307   | 1500    |
|                    | in | 38.2  | 38.8   | 47.6   | 51.5   | 59.1    |
| C                  | mm | 550   | 600    | 600    | 650    | 720     |
|                    | in | 21.7  | 23.6   | 23.6   | 25.6   | 28.3    |
| E                  | mm | 533   | 597    | 635    | 699    | 813     |
|                    | in | 21    | 23.5   | 25     | 27.5   | 32      |
| Weight<br>S5275RF  | Kg | 397.5 | 508.5  | 748.5  | 822.75 | 1209.75 |
|                    | lb | 876.5 | 1121.2 | 1650.4 | 1814.2 | 2667.5  |
| Weight<br>S5275WE  | Kg | 339.5 | 433.5  | 638.5  | 701.75 | 1032.75 |
|                    | lb | 748.6 | 955.9  | 1407.9 | 1547.4 | 2277.2  |

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

## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY

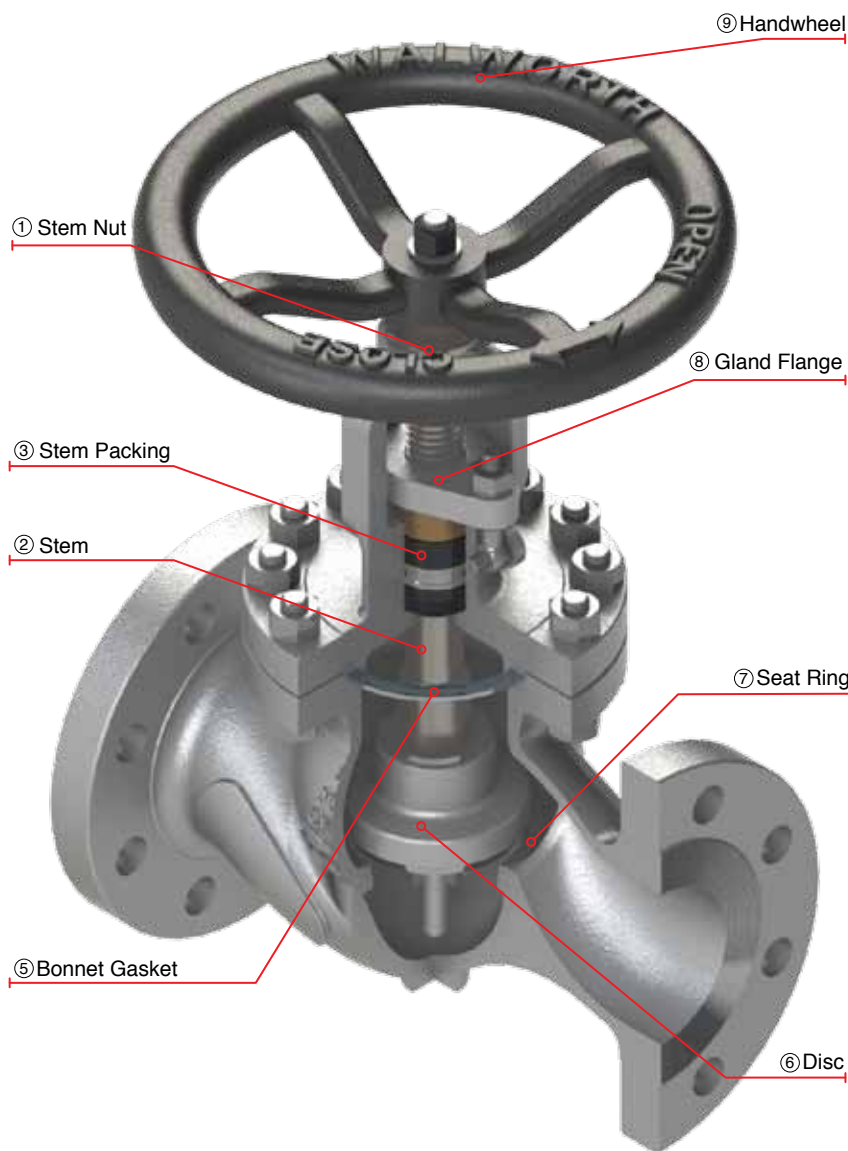
### GLOBE VALVES CLASS 300

#### CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM

#### DESIGN FEATURES:

- Globe valves design in accordance with API-603
- Gate & globe valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Flange dimensions in accordance with ASME B16.5
- Handwheel, handwheel impact, 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
- 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 Integral Backseat 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 disc design allows the disc and seat ring sealing surface to seat correctly without damage.
- ⑦ Integral Seat Ring.
- ⑧ Two-piece arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.
- ⑨ Globe Valves supplied handwheel operated as standard from 2" to 24".



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 300 (INTEGRAL YOKE)

### DESIGN FEATURES:

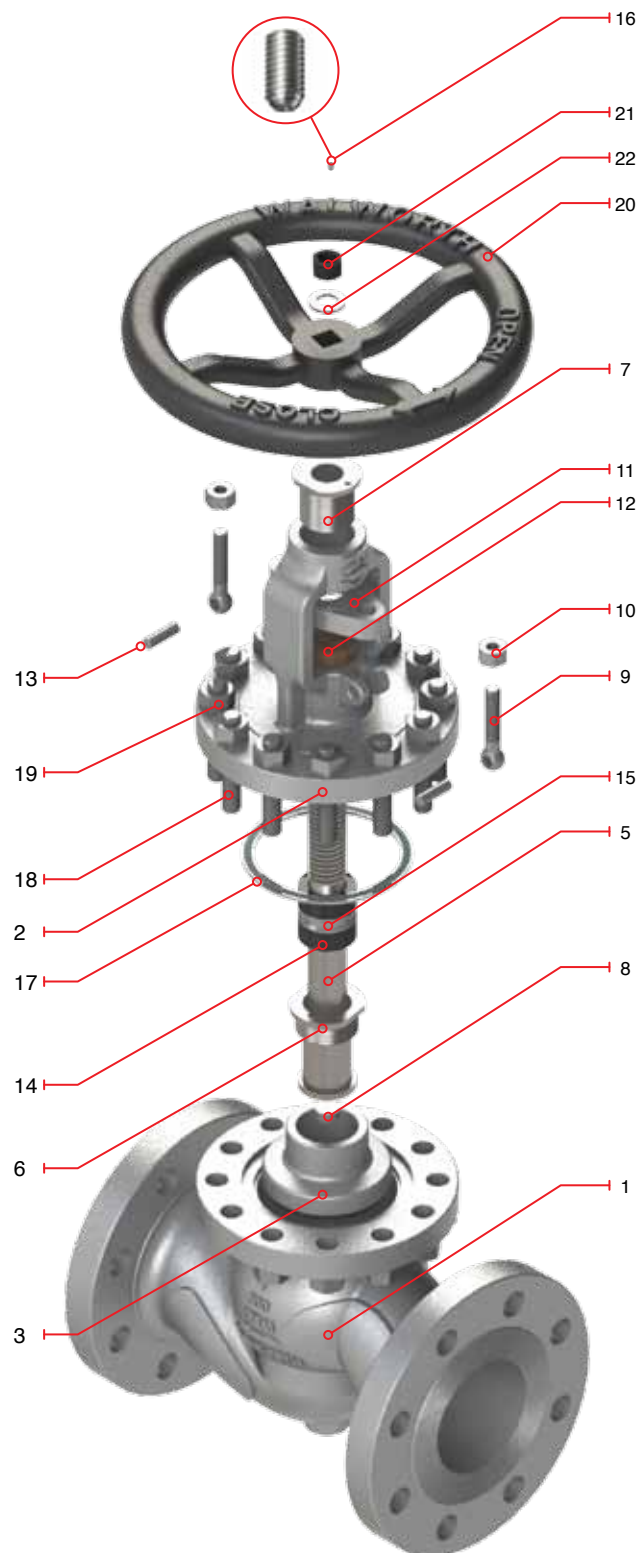
- Design in accordance with API-603
- Rising stem and handwheel
- Integral yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5281RF            | S5281F              | Flanged Raised Face |
| S5281RTJ           | S5281RJ             | Ring Type Joint     |
| 5281WE             | S5281WE             | Buttweld            |

### Regular Bill of Materials

| No. | Description          | Standard Material<br>CF8M Trim 3HF                                                                                   |
|-----|----------------------|----------------------------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                                   |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                                   |
| 3   | Disc                 | ASTM A 351 Gr CF8M + ST 6                                                                                            |
| *4  | Seat Ring            | Integral Seat Ring                                                                                                   |
| 5   | Stem                 | ASTM A 476 Type 316                                                                                                  |
| 6   | Stem Retainer        | ASTM A 182 Type F316                                                                                                 |
| 7   | Stem Nut             | UNS C95600                                                                                                           |
| 8   | Stem Seat            | ASTM A 476 Gr 316 + ST 6                                                                                             |
| 9   | Eyebolt              | ASTM A 193 GR B8                                                                                                     |
| 10  | Eyebolt Nut          | ASTM A 194 GR 8                                                                                                      |
| 11  | Gland Flange         | ASTM A 351 GR CF8M                                                                                                   |
| 12  | Packing Bushing      | ASTM A 476 Type 316                                                                                                  |
| 13  | Eyebolt Pin          | Alloy Steel                                                                                                          |
| 14  | Stem Packing         | Flexible graphite intermediate rings<br>/ Anti-extrusion rings on the top and<br>bottom sides of the packing chamber |
| 15  | Lantern Ring         | ASTM A 182 Type F316                                                                                                 |
| 16  | Opressor             | Commercial                                                                                                           |
| 17  | Bonnet Gasket        | Spirotallic Graphite / Stainless 316                                                                                 |
| 18  | Bonnet Stud          | ASTM A 193 GR B8                                                                                                     |
| 19  | Bonnet Stud Nut      | ASTM A 194 GR 8                                                                                                      |
| 20  | Handwheel            | As per WALWORTH design                                                                                               |
| 21  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                                   |
| 22  | Handwheel Washer     | ASTM A 108 GR 1020                                                                                                   |
| *23 | Identification Plate | Stainless Steel                                                                                                      |

\*Not Shown

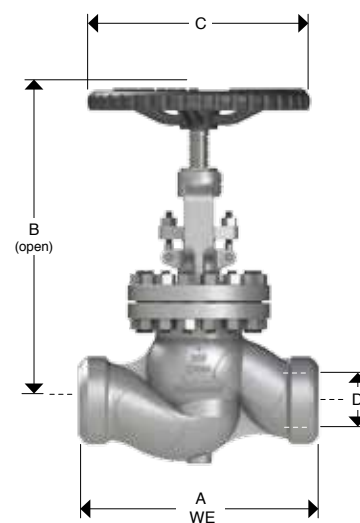
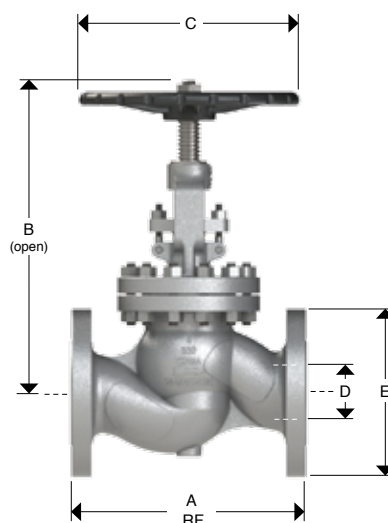




## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 300 (INTEGRAL YOKE)

### 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
- Size 2" to 12" handwheel operated as standard



### Dimensions and Weights

| D Nominal Diameter    | mm | 50   | 65   | 80   | 100   | 150   | 200   | 250   | 300    |
|-----------------------|----|------|------|------|-------|-------|-------|-------|--------|
|                       | in | 2    | 2.5  | 3    | 4     | 6     | 8     | 10    | 12     |
| A<br>(RF and WE)      | mm | 267  | 292  | 318  | 356   | 444   | 559   | 622   | 711    |
|                       | in | 10.5 | 11.5 | 12.5 | 14    | 17.5  | 22    | 24.5  | 28     |
| B (Open)              | mm | 300  | 340  | 400  | 463   | 586   | 804   | 928   | 1125   |
|                       | in | 11.8 | 13.4 | 15.7 | 18.2  | 23.1  | 31.7  | 36.5  | 44.3   |
| C                     | mm | 200  | 250  | 250  | 300   | 400   | 400   | 450   | 500    |
|                       | in | 7.9  | 9.8  | 9.8  | 11.8  | 15.7  | 15.7  | 17.7  | 19.7   |
| E                     | mm | 165  | 191  | 210  | 254   | 318   | 381   | 445   | 521    |
|                       | in | 6.5  | 7.5  | 8 ¼  | 10    | 12.5  | 15    | 17.5  | 20.5   |
| Weight<br>S5281RF/RTJ | Kg | 12   | 28   | 38   | 54    | 113   | 220.5 | 345.8 | 506.3  |
|                       | lb | 26.5 | 61.7 | 83.8 | 119.1 | 249.2 | 486.2 | 762.4 | 1116.3 |
| Weight<br>S5281WE     | Kg | 6    | 20   | 28   | 38    | 85    | 180.5 | 265.8 | 407.3  |
|                       | lb | 13.2 | 44.1 | 61.7 | 83.8  | 187.4 | 398.0 | 586.0 | 898.0  |

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



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 300 (INDEPENDENT YOKE)

### DESIGN FEATURES:

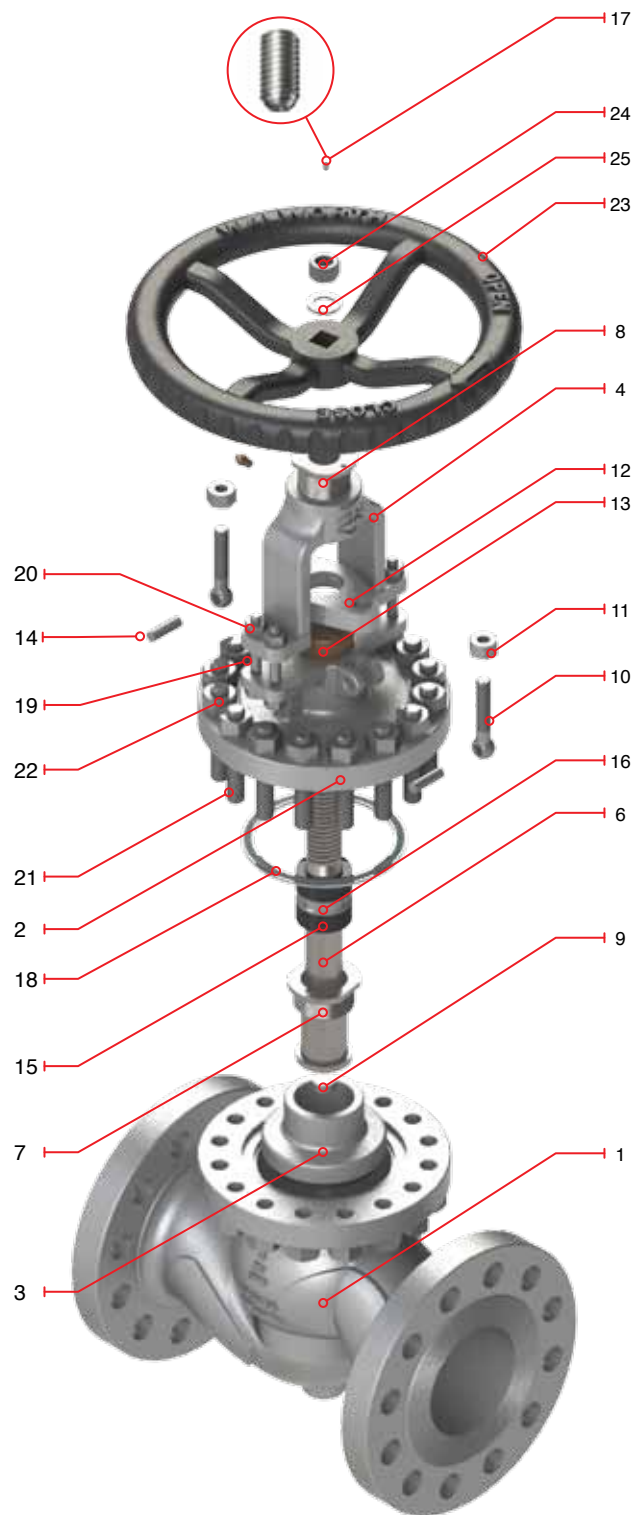
- Design in accordance with API-603
- Independent yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5281RF            | S5281F              | Flanged Raised Face |
| S5281RTJ           | S5281RJ             | Ring Type Joint     |
| 5281WE             | 5281WE              | Buttweld            |

### Regular Bill of Materials

| No. | Description          | Standard Material<br>CF8M Trim 3HF                                                                             |
|-----|----------------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M                                                                                             |
| 2   | Bonnet               | ASTM A 351 GR CF8M                                                                                             |
| 3   | Disc                 | ASTM A 351 Gr CF8M + ST 6                                                                                      |
| 4   | Yoke                 | ASTM A 351 GR CF8M                                                                                             |
| *5  | Seat Ring            | Integral Seat Ring                                                                                             |
| 6   | Stem                 | ASTM A 476 Type 316                                                                                            |
| 7   | Stem Retainer        | ASTM A 182 Type F316                                                                                           |
| 8   | Stem Nut             | UNS C95600                                                                                                     |
| 9   | Stem Seat            | ASTM A 476 Gr 316 + ST 6                                                                                       |
| 10  | Eyebolt              | ASTM A 193 GR B8                                                                                               |
| 11  | Eyebolt Nut          | ASTM A 194 GR 8                                                                                                |
| 12  | Gland Flange         | ASTM A 351 GR CF8M                                                                                             |
| 13  | Packing Bushing      | ASTM A 476 Type 316                                                                                            |
| 14  | Eyebolt Pin          | Alloy Steel                                                                                                    |
| 15  | Stem Packing         | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| 16  | Lantern Ring         | ASTM A 182 Type F316                                                                                           |
| 17  | Oppressor            | Commercial                                                                                                     |
| 18  | Bonnet Gasket        | Spirallic Graphite / Stainless 316                                                                             |
| 19  | Yoke Bolt            | ASTM A 193 GR B8                                                                                               |
| 20  | Yoke Bolt Nut        | ASTM A 194 GR 8                                                                                                |
| 21  | Bonnet Stud          | ASTM A 193 GR B8                                                                                               |
| 22  | Bonnet Stud Nut      | ASTM A 194 GR 8                                                                                                |
| 23  | Handwheel            | As per WALWORTH design                                                                                         |
| 24  | Handwheel Nut        | ASTM A 108 GR 1020                                                                                             |
| 25  | Handwheel Washer     | ASTM A 108 GR 1020                                                                                             |
| *26 | Identification Plate | Stainless Steel                                                                                                |

\*Not Shown



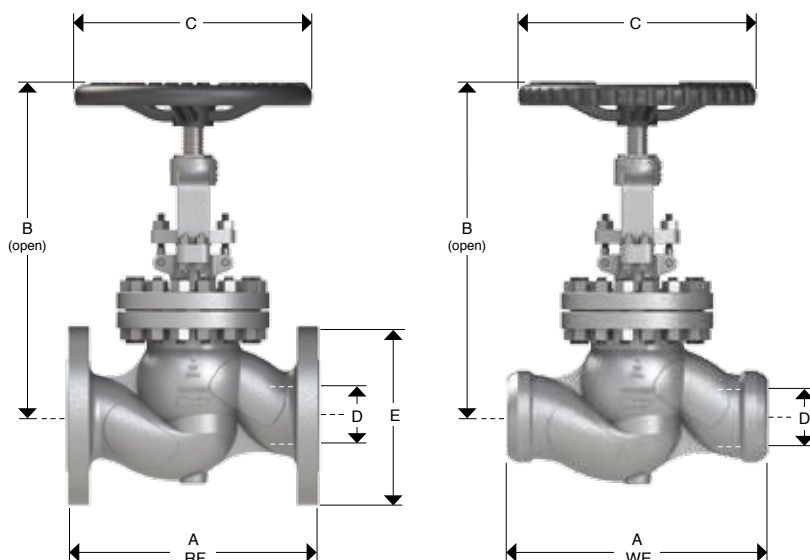
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 300 (INDEPENDENT YOKE)

### DESIGN FEATURES:

- Design in accordance with API-603
- Rising stem
- Integral yoke
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Handwheel operated as standard



| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5281RF            | S5281F              | Flanged Raised Face |
| S5281RTJ           | S5281RJ             | Ring Type Joint     |
| S5281WE            | S5281WE             | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 350    | 400    | 450    | 500     | 600    |
|--------------------|----|--------|--------|--------|---------|--------|
|                    | in | 14     | 16     | 18     | 20      | 24     |
| A (RF and WE)      | mm | 838    | 864    | 977    | 1016    | 1346   |
|                    | in | 33     | 34     | 38.5   | 40      | 53     |
| B (Open)           | mm | 1173   | 1180   | 1250   | 1392    | 1480   |
|                    | in | 46.2   | 46.5   | 49.2   | 54.8    | 58.3   |
| C                  | mm | 500    | 550    | 600    | 650     | 720    |
|                    | in | 19.7   | 21.7   | 23.6   | 25.6    | 28.3   |
| E                  | mm | 584    | 648    | 711    | 775     | 914    |
|                    | in | 23     | 25.5   | 28     | 30.5    | 36     |
| Weight S5281RF     | Kg | 590.3  | 822.8  | 1430.3 | 1589.25 | 1753.5 |
|                    | lb | 1301.5 | 1814.2 | 3153.7 | 3504.3  | 3866.5 |
| Weight S5281WE     | Kg | 472.25 | 657.8  | 1201.3 | 1335.25 | 1472.5 |
|                    | lb | 1041.3 | 1450.3 | 2648.8 | 2944.2  | 3246.9 |

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

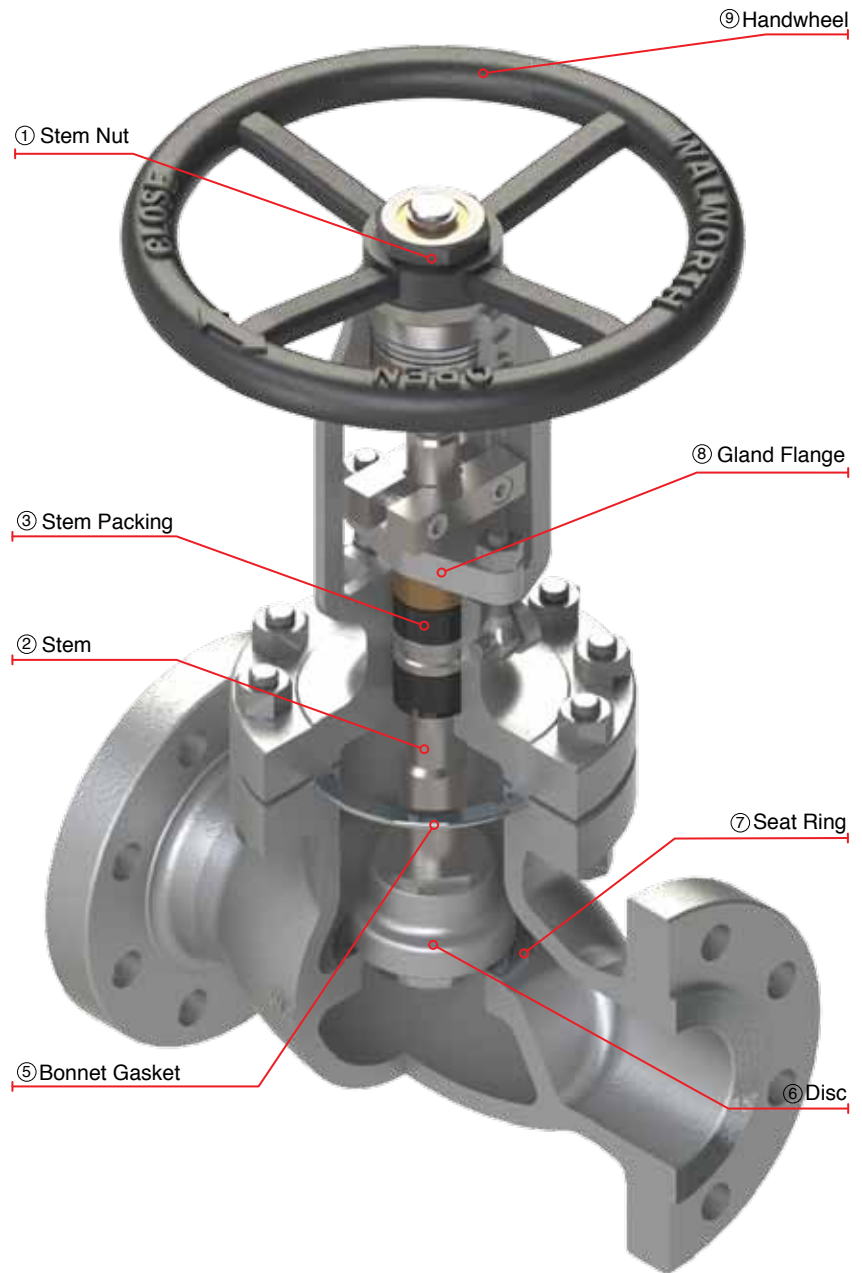
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 600

### CAST STEEL GLOBE VALVES WITH RISING STEM AND OUTSIDE SCREW AND YOKE (OS&Y)

#### DESIGN FEATURES:

- Globe valves design in accordance with API-603
- 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 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
- Stop check design option available

- ① Stem nut, replaceable in line to avoid shut down of pipe line process.
- ② Revolving non 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 Integral backseat, 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 or ring type joint to assure a leak proof seal.
- ⑥ Conical plug type disc, integrally guided to assure true alignment between disc and valve body. The disc design allows the disc and seat ring sealing surface to seat correctly without damage.
- ⑦ Integral seat ring
- ⑧ Two-piece arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.
- ⑨ Globe valves supplied handwheel operated as standard from 2" to 24".



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 600 (INTEGRAL YOKE)

### DESIGN FEATURES:

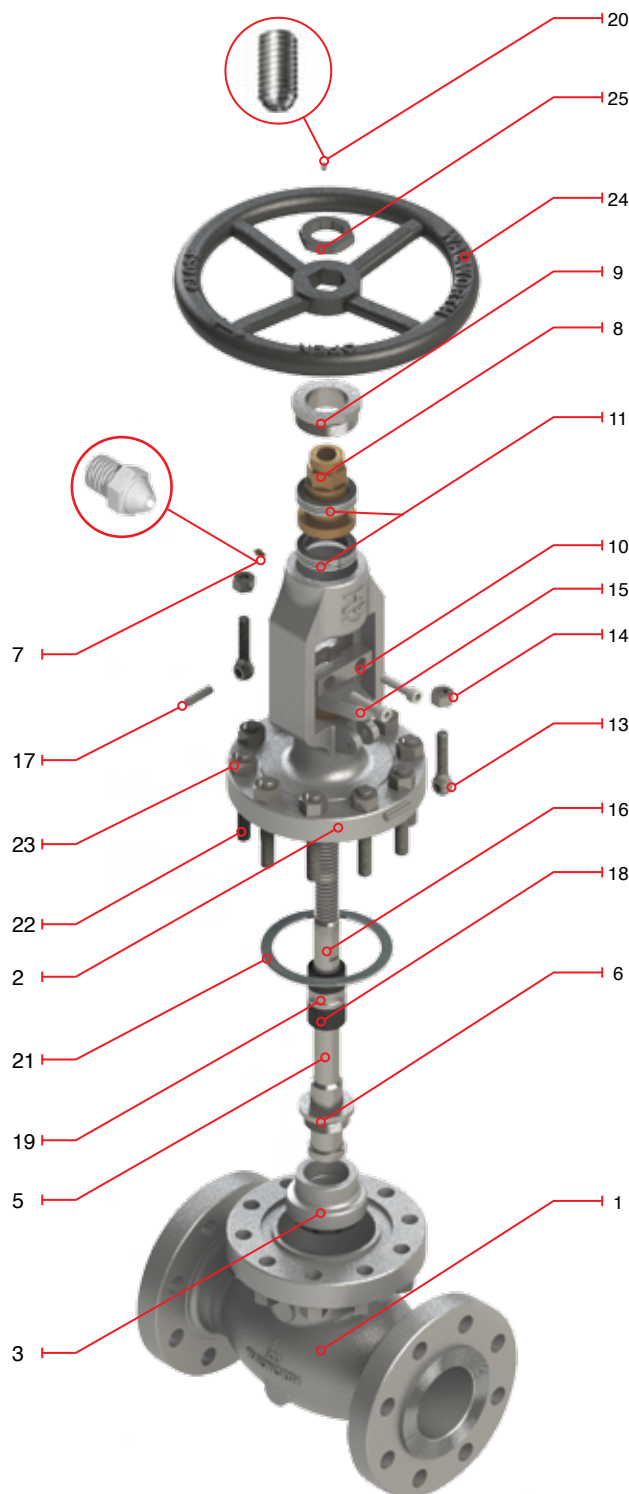
- Design in accordance with ASME B 16.34
- Rising stem and outside screw & yoke (OS&Y)
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with bearings: 4" and larger
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5295RF            | S5295F              | Flanged Raised Face |
| S5295RTJ           | S5295RJ             | Ring Type Joint     |
| S5295WE            | S5295WE             | Buttweld            |

### Regular Bill of Materials

| No. | Description                     | STANDARD MATERIAL                                                                                              |
|-----|---------------------------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Body                            | ASTM A 351 GR CF8M                                                                                             |
| 2   | Bonnet                          | ASTM A 351 GR CF8M                                                                                             |
| 3   | Disc                            | ASTM A 351 Gr CF8M + ST 6                                                                                      |
| *4  | Seat Ring                       | Integral Seat Ring                                                                                             |
| 5   | Stem                            | ASTM A 476 Type 316                                                                                            |
| 6   | Stem Retainer                   | ASTM A 182 Type F316                                                                                           |
| 7   | Grease Fitting                  | Commercial                                                                                                     |
| 8   | Stem Nut                        | UNS C95600                                                                                                     |
| 9   | Stem Nut Retainer               | ASTM A 182 GR F304                                                                                             |
| 10  | Position Indicator              | ASTM A 182 GR F304                                                                                             |
| 11  | Bearings                        | Commercial                                                                                                     |
| *12 | Stem Seat                       | ASTM A 476 Gr 316 + ST 6                                                                                       |
| 13  | Eyebolt                         | ASTM A 193 GR B8                                                                                               |
| 14  | Eyebolt Nut                     | ASTM A 194 GR 8                                                                                                |
| 15  | Gland Flange                    | ASTM A 351 GR CF8M                                                                                             |
| 16  | Packing Bushing                 | ASTM A 476 Type 316                                                                                            |
| 17  | Eyebolt Pin                     | Alloy Steel                                                                                                    |
| 18  | Stem Packing                    | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| 19  | Lantern Ring                    | ASTM A 182 Type F316                                                                                           |
| 20  | Oppressor                       | Commercial                                                                                                     |
| 21  | Bonnet Gasket / Ring Type Joint | Spiralweld Graphite + Stainless 316 / Stainless Steel 316                                                      |
| 22  | Bonnet Stud                     | ASTM A 193 GR B8                                                                                               |
| 23  | Bonnet Stud Nut                 | ASTM A 194 GR 8                                                                                                |
| 24  | Handwheel                       | As per WALWORTH design                                                                                         |
| 25  | Handwheel Nut                   | ASTM A 108 GR 1020                                                                                             |
| *26 | Identification Plate            | Stainless Steel                                                                                                |

\*Not shown





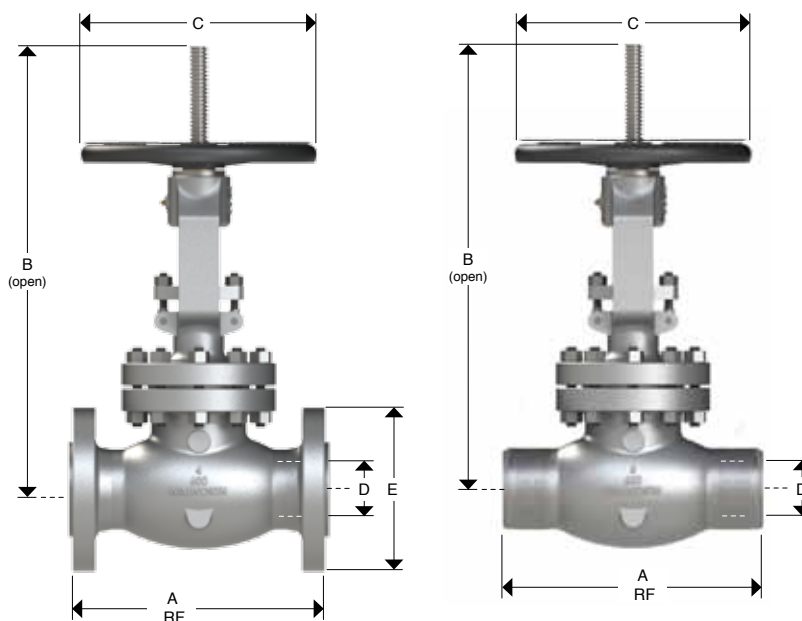
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 600 (INTEGRAL YOKE)

### DESIGN FEATURES:

- Design in accordance with ASME B 16.34
- Rising stem and outside screw & yoke (OS&Y)
- Integral yoke
- 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
- Handwheel operated as standard



| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5295RF            | S5295F              | Flanged Raised Face |
| S5295RTJ           | S5295RJ             | Ring Type Joint     |
| S5295WE            | S5295WE             | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 50   | 65   | 80    | 100   | 150   | 200   |
|--------------------|----|------|------|-------|-------|-------|-------|
|                    | in | 2    | 2.5  | 3     | 4     | 6     | 8     |
| A<br>(RF and WE)   | mm | 292  | 330  | 356   | 332   | 559   | 660   |
|                    | in | 11.5 | 13   | 14    | 17    | 22    | 26    |
| B (Open)           | mm | 416  | 462  | 509   | 619   | 738   | 854   |
|                    | in | 16.4 | 18.2 | 20.0  | 24.4  | 29.4  | 33.6  |
| C                  | mm | 250  | 250  | 300   | 400   | 450   | 500   |
|                    | in | 9.8  | 9.8  | 11.8  | 15.7  | 17.7  | 19.7  |
| E                  | mm | 165  | 190  | 210   | 273   | 356   | 419   |
|                    | in | 6.5  | 7.5  | 8 ¼   | 10.75 | 14    | 16.5  |
| Weight             | Kg | 30   | 42   | 54    | 95    | 208.5 | 321.8 |
| S5295RF            | lb | 66.2 | 92.6 | 119.1 | 209.5 | 459.7 | 709.5 |
| Weight             | Kg | 24   | 31   | 43    | 77    | 176.5 | 257.8 |
| S5295WE            | lb | 52.9 | 68.4 | 94.8  | 169.8 | 389.2 | 568.3 |

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



## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 600 (INDEPENDENT YOKE)

### DESIGN FEATURES:

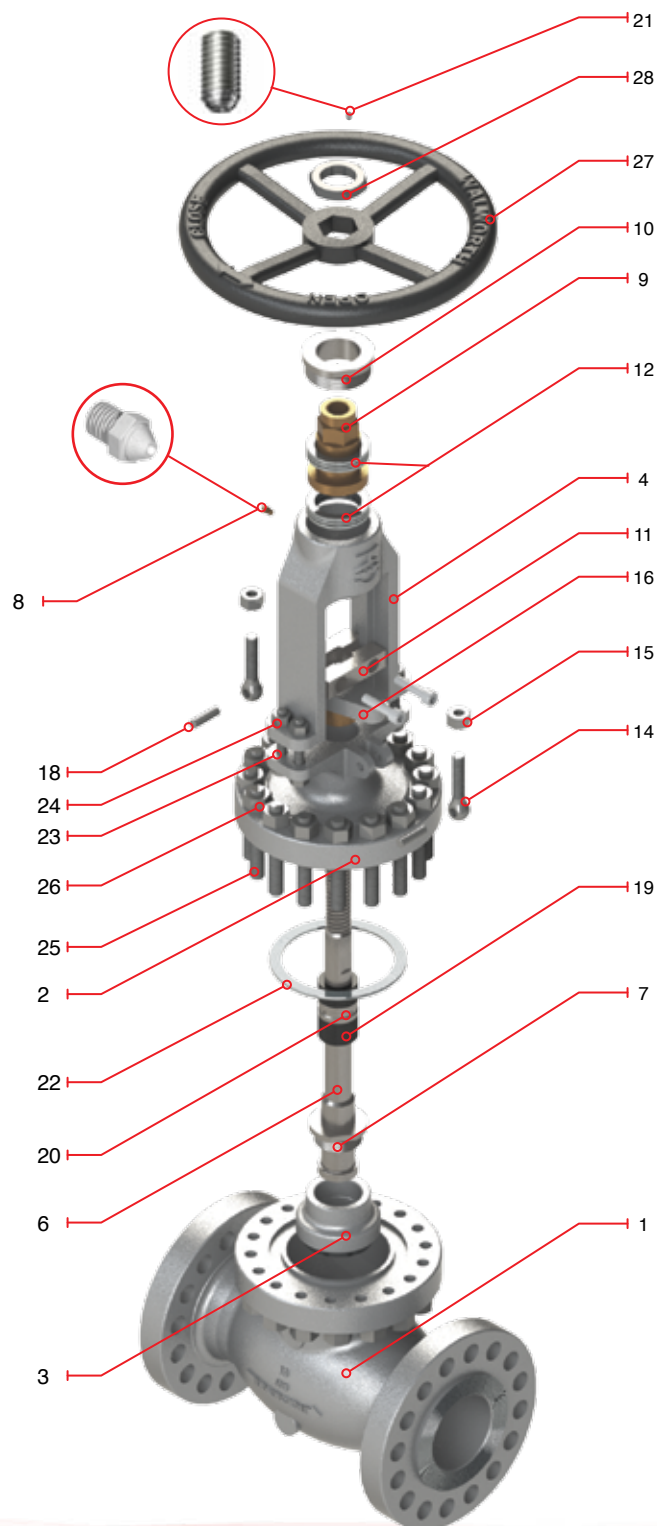
- Design in accordance with ASME B 16.34
- Rising stem and outside screw & yoke (OS&Y)
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with bearings: 4" and larger
- Handwheel operated as standard

### Regular Bill of Materials

| No. | Description                     | STANDARD MATERIAL                                                                                              |
|-----|---------------------------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Body                            | ASTM A 351 GR CF8M                                                                                             |
| 2   | Bonnet                          | ASTM A 351 GR CF8M                                                                                             |
| 3   | Disc                            | ASTM A 351 Gr CF8M + ST 6                                                                                      |
| 4   | Yoke                            | ASTM A 351 GR CF8M                                                                                             |
| *5  | Seat Ring                       | Integral Seat Ring                                                                                             |
| 6   | Stem                            | ASTM A 476 Type 316                                                                                            |
| 7   | Stem Retainer                   | ASTM A 182 Type F316                                                                                           |
| 8   | Grease Fitting                  | Commercial                                                                                                     |
| 9   | Stem Nut                        | UNS C95600                                                                                                     |
| 10  | Stem Nut Retainer               | ASTM A 182 GR F304                                                                                             |
| 11  | Position Indicator              | ASTM A 182 GR F304                                                                                             |
| 12  | Bearings                        | Commercial                                                                                                     |
| *13 | Stem Seat                       | ASTM A 476 Gr 316 + ST 6                                                                                       |
| 14  | Eyebolt                         | ASTM A 193 GR B8                                                                                               |
| 15  | Eyebolt Nut                     | ASTM A 194 GR 8                                                                                                |
| 16  | Gland Flange                    | ASTM A 351 GR CF8M                                                                                             |
| *17 | Packing Bushing                 | ASTM A 476 Type 316                                                                                            |
| 18  | Eyebolt Pin                     | Alloy Steel                                                                                                    |
| 19  | Stem Packing                    | Flexible graphite intermediate rings / Anti-extrusion rings on the top and bottom sides of the packing chamber |
| 20  | Lantern Ring                    | ASTM A 182 Type F316                                                                                           |
| 21  | Oppressor                       | Commercial                                                                                                     |
| 22  | Bonnet Gasket / Ring Type Joint | Spiralwound Graphite + Stainless 316 / Stainless Steel 316                                                     |
| 23  | Yoke Bolt                       | ASTM A 193 GR B8                                                                                               |
| 24  | Yoke Bolt Nut                   | ASTM A 194 GR 8                                                                                                |
| 25  | Bonnet Stud                     | ASTM A 193 GR B8                                                                                               |
| 26  | Bonnet Stud Nut                 | ASTM A 194 GR 8                                                                                                |
| 27  | Handwheel                       | As per WALWORTH design                                                                                         |
| 28  | Handwheel Nut                   | ASTM A 108 GR 1020                                                                                             |
| *29 | Identification Plate            | Stainless Steel                                                                                                |

\*Not shown

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5295RF            | S5295F              | Flanged Raised Face |
| S5295RTJ           | S5295RJ             | Ring Type Joint     |
| S5295WE            | S5295WE             | Buttweld            |

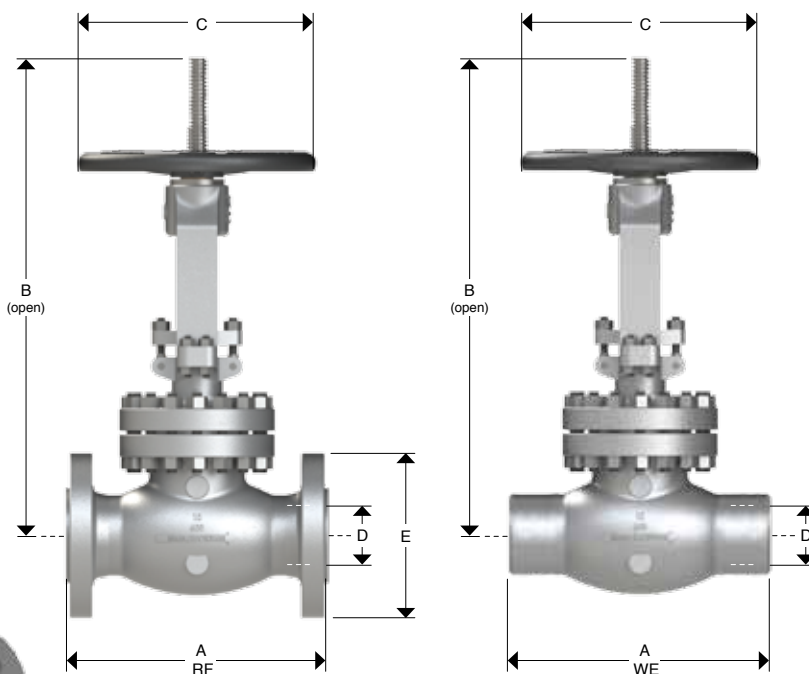


## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY GLOBE VALVES, CLASS 600 (INDEPENDENT YOKE)

### DESIGN FEATURES:

- Design in accordance with ASME B 16.34
- Rising stem and outside screw & yoke (OS&Y)
- 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
- Handwheel operated as standard

| Catalog Figure No. | ID Plant Figure No. | Type of Ends        |
|--------------------|---------------------|---------------------|
| S5295RF            | S5295F              | Flanged Raised Face |
| S5295RTJ           | S5295RJ             | Ring Type Joint     |
| S5295WE            | S5295WE             | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 250    | 300    |
|--------------------|----|--------|--------|
|                    | in | 10     | 12     |
| A (RF and WE)      | mm | 787    | 838    |
|                    | in | 31     | 33     |
| B (Open)           | mm | 935    | 1015   |
|                    | in | 36.8   | 40     |
| C                  | mm | 550    | 600    |
|                    | in | 21.7   | 23.6   |
| E                  | mm | 508    | 559    |
|                    | in | 20     | 22     |
| Weight S5295RF     | Kg | 552.8  | 895.5  |
|                    | lb | 1218.8 | 1974.6 |
| Weight S5295WE     | Kg | 484.75 | 752.5  |
|                    | lb | 1068.9 | 1659.3 |

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

## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY

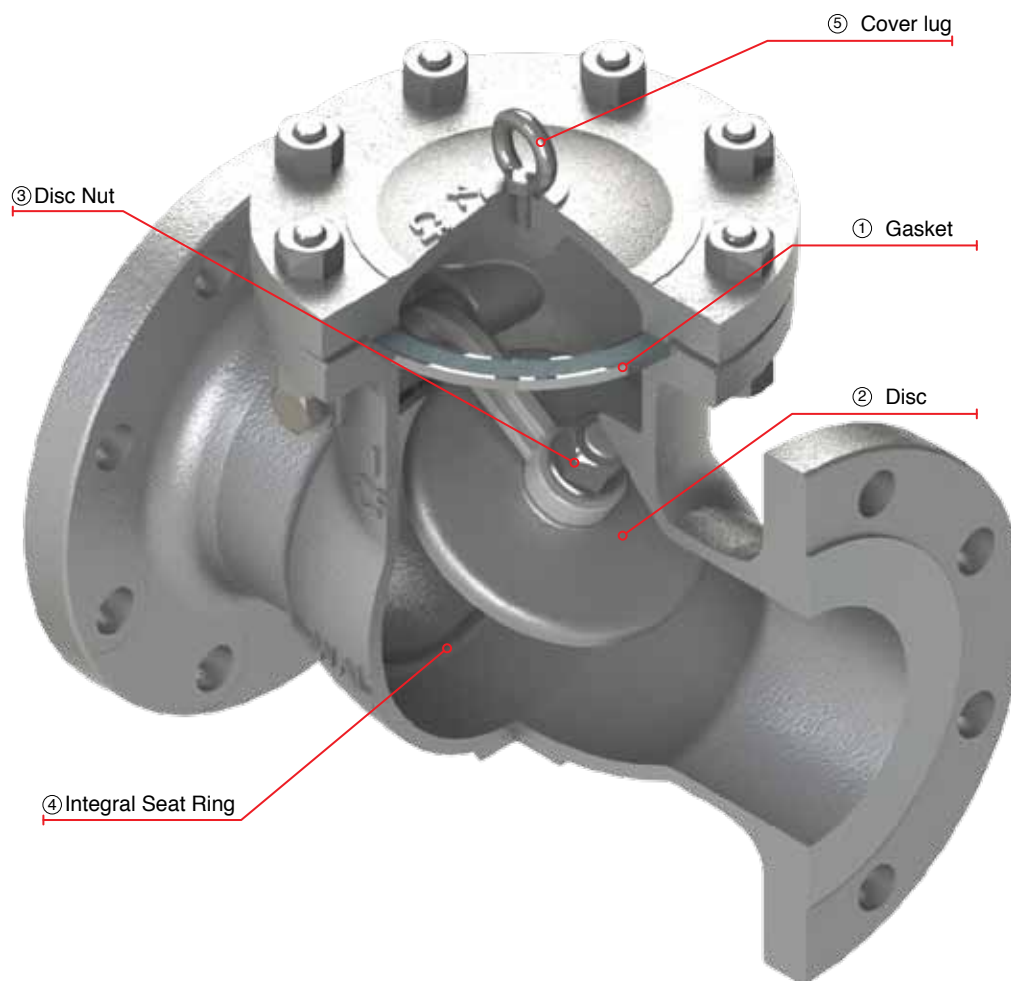
### SWING CHECK VALVES, CLASS 150

#### CAST STEEL SWING CHECK VALVES

#### DESIGN FEATURES

- Swing check valves design in accordance with API-603 & ASME B16.34
- Swing check valves for cryogenic service in accordance with BS-6364
- 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 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 Stellite seat ring provides increased resistance to wear abrasion and erosion of the sealing surface.
- ⑤ From 4" and up, WALWORTH check valves have cover lug for easy installation.

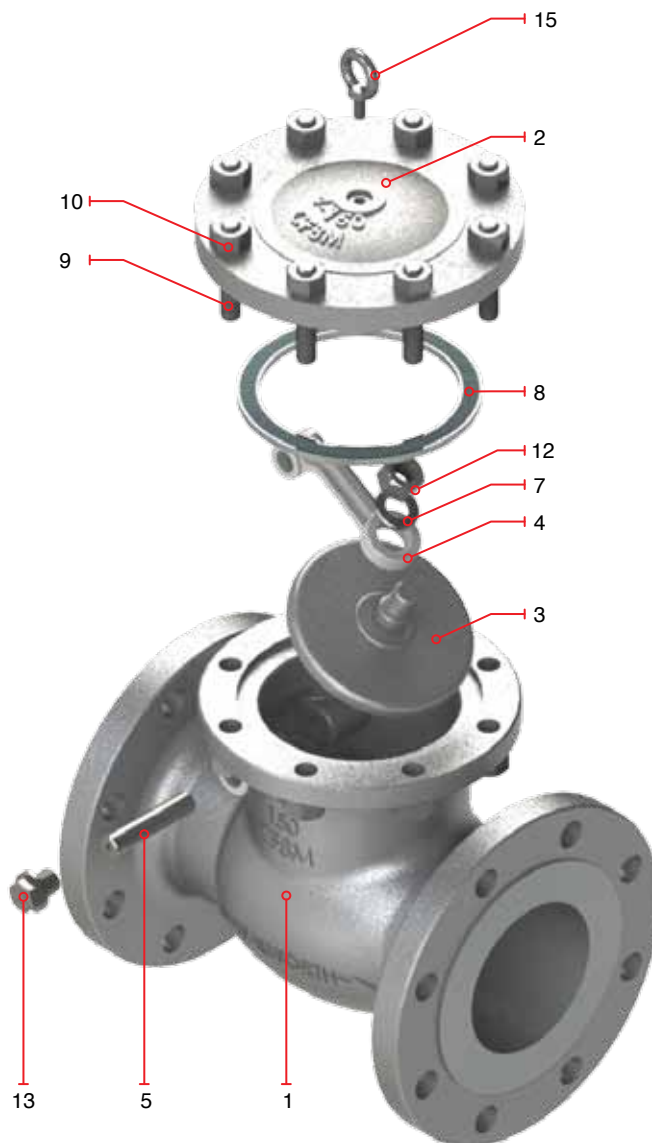


## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY SWING CHECK VALVES, CLASS 150

### DESIGN FEATURES:

- Design in accordance with API-603 & 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        |
|--------------------|---------------------|---------------------|
| S5341RF            | S5341F              | Flanged Raised Face |
| S5341RTJ           | S5341RJ             | Ring Type Joint     |
| S5341WE            | S5341WE             | Buttweld            |



### Regular Bill of Materials

| 5No. | Description          | STANDARD MATERIAL             |
|------|----------------------|-------------------------------|
| 1    | Body                 | ASTM A 351 GR CF8M            |
| 2    | Cover                | ASTM A 351 GR CF8M            |
| 3    | Disc                 | ASTM A 351 GR CF8M + ST 6     |
| 4    | Hanger               | ASTM A 351 GR CF8M            |
| 5    | Shaft                | ASTM A 182 Type F316          |
| *6   | Shaft Washer         | ASTM A 182 Type F316          |
| 7    | Disc Washer          | ASTM A 182 Type F316          |
| 8    | Gasket               | Spiral Stainless 316/Graphite |
| 9    | Stud                 | ASTM A 193 GR B8              |
| 10   | Stud Nut             | ASTM A 194 GR 8               |
| *11  | Set Screw            | ASTM A 479 Type 316           |
| 12   | Disc Nut             | ASTM A 194 GR 8               |
| 13   | Body Plug            | ASTM A 182 Type F316          |
| *14  | Identification Plate | Stainless Steel               |
| **15 | Cover lug            | Commercial Steel              |

\*Not Shown

\*\*Only from 4" and up

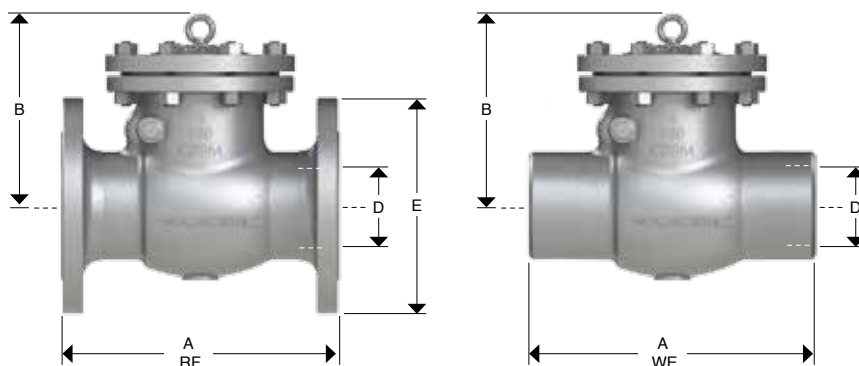
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY SWING CHECK VALVES, CLASS 150



### DESIGN FEATURES:

- Design in accordance with API-603 & 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        |
|--------------------|---------------------|---------------------|
| S5341RF            | S5341F              | Flanged Raised Face |
| S5341RTJ           | S5341RJ             | Ring Type Joint     |
| S5341WE            | S5341WE             | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 51   | 64   | 76   | 102  | 152   | 203   | 254   | 305   | 356   | 406    | 457    | 508    | 610    |
|--------------------|----|------|------|------|------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
|                    | in | 2    | 2.5  | 3    | 4    | 6     | 8     | 10    | 12    | 14    | 16     | 18     | 20     | 24     |
| A (RF and WE)      | mm | 203  | 216  | 241  | 292  | 406   | 495   | 622   | 698   | 787   | 914    | 978    | 978    | 1295   |
|                    | in | 8    | 8.5  | 9.5  | 11.5 | 16    | 19.5  | 24.5  | 27.5  | 31    | 36     | 38.5   | 38.5   | 51     |
| B                  | mm | 123  | 135  | 150  | 205  | 253   | 305   | 370   | 439   | 493   | 598    | 605    | 662    | 702    |
|                    | in | 4.8  | 5.3  | 5.9  | 8.1  | 10.0  | 12.0  | 14.6  | 17.3  | 19.4  | 21.6   | 23.8   | 26.1   | 27.6   |
| E                  | mm | 152  | 178  | 191  | 229  | 279   | 343   | 406   | 483   | 533   | 597    | 635    | 699    | 813    |
|                    | in | 6    | 7    | 7.5  | 9    | 11    | 13.5  | 16    | 19    | 21    | 23.5   | 25     | 27.5   | 32     |
| Weight S5341RF     | Kg | 8.8  | 13   | 18   | 30   | 50    | 91    | 135   | 210   | 349   | 459    | 540    | 826    | 1044   |
|                    | lb | 19.4 | 28.7 | 39.7 | 66.2 | 110.3 | 200.7 | 297.7 | 463.1 | 769.5 | 1012.1 | 1190.7 | 1821.3 | 2302.0 |
| Weight S5341WE     | Kg | 6.8  | 11   | 14   | 26   | 45    | 71    | 89    | 140   | 279   | 367    | 432    | 661    | 835    |
|                    | lb | 15.0 | 24.3 | 30.9 | 57.3 | 99.2  | 156.6 | 196.2 | 308.7 | 615.2 | 809.2  | 952.6  | 1457.5 | 1841.2 |

PCR = Per customer request

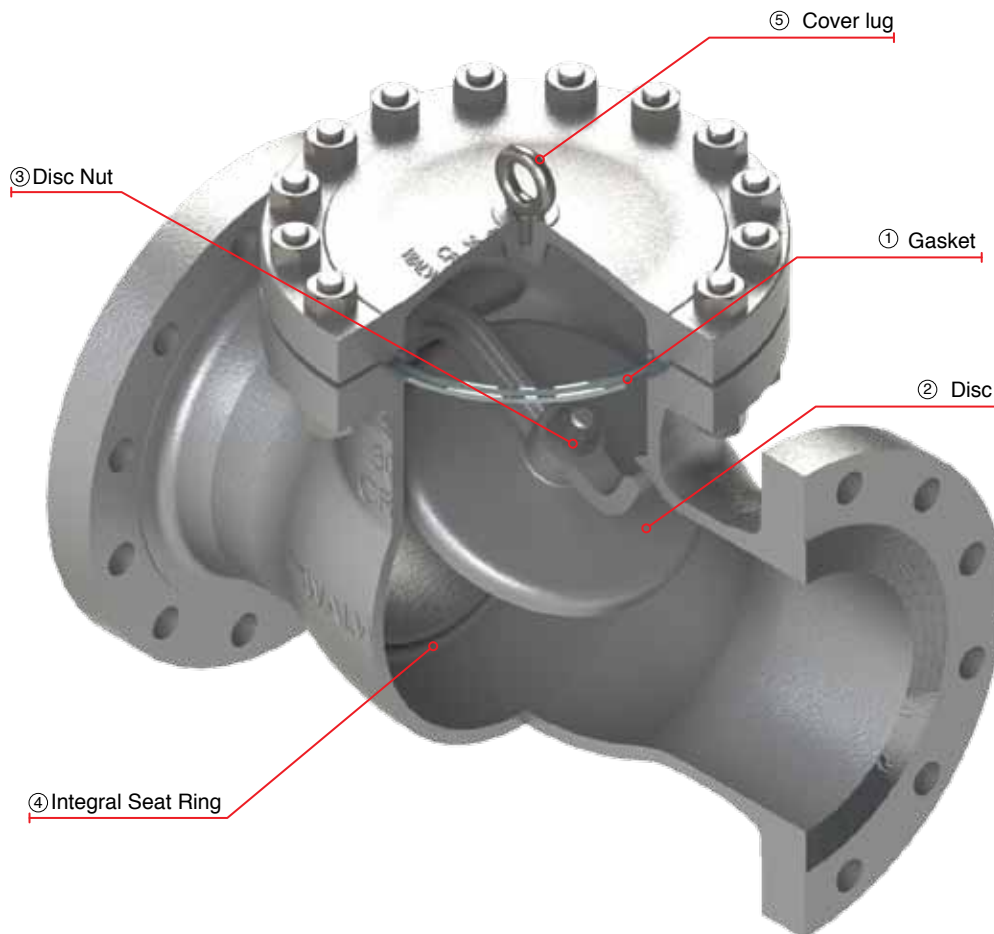


## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY

### SWING CHECK VALVES, CLASS 300 CAST STEEL SWING CHECK VALVES

#### DESIGN FEATURES

- Swing check valves design in accordance with API-603 & ASME B16.34.
  - Swing check valves for cryogenic service in accordance with BS-6364.
  - 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 Stellite seat ring provides increased resistance to wear abrasion and erosion of the sealing surface.
  - ⑤ From 4" and up, WALWORTH check valves have cover lug for easy installation.

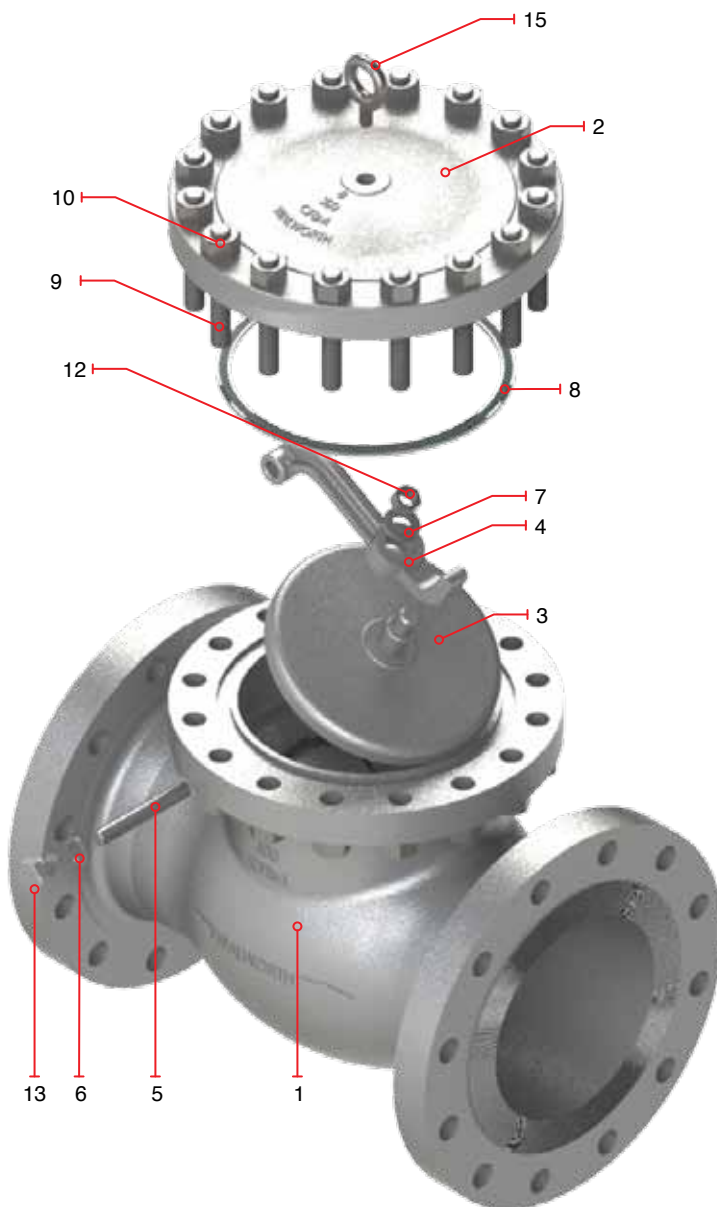


## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY SWING CHECK VALVES, CLASS 300

### DESIGN FEATURES:

- Design in accordance with API-603 & 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        |
|--------------------|---------------------|---------------------|
| S5344RF            | S5344F              | Flanged Raised Face |
| S5344RTJ           | S5344RJ             | Ring Type Joint     |
| S5344WE            | S5344WE             | Buttweld            |



### Regular Bill of Materials

| No. | Description          | STANDARD MATERIAL             |
|-----|----------------------|-------------------------------|
| 1   | Body                 | ASTM A 351 GR CF8M            |
| 2   | Cover                | ASTM A 351 GR CF8M            |
| 3   | Disc                 | ASTM A 351 GR CF8M + ST 6     |
| 4   | Hanger               | ASTM A 351 GR CF8M            |
| 5   | Shaft                | ASTM A 182 Type F316          |
| 6   | Shaft Washer         | ASTM A 182 Type F316          |
| 7   | Disc Washer          | ASTM A 182 Type F316          |
| 8   | Gasket               | Spiral Stainless 316/Graphite |
| 9   | Stud                 | ASTM A 193 GR B8              |
| 10  | Stud Nut             | ASTM A 194 GR 8               |
| *11 | Set Screw            | ASTM A 479 Type 316           |
| 12  | Disc Nut             | ASTM A 194 GR 8               |
| 13  | Body Plug            | ASTM A 182 Type F316          |
| *14 | Identification Plate | Stainless Steel               |
| 15  | Cover lug            | Commercial Steel              |

\*Not Shown

\*\*Only from 4" and up

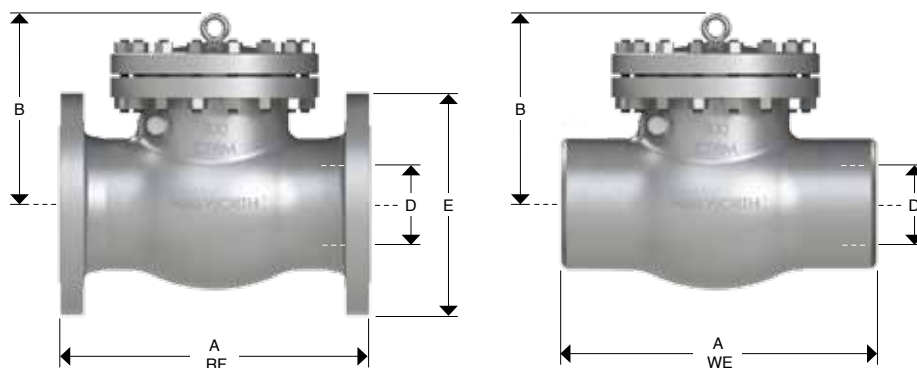
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY SWING CHECK VALVES, CLASS 300



### DESIGN FEATURES:

- Design in accordance with API-603 & 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        |
|--------------------|---------------------|---------------------|
| S5344RF            | S5344F              | Flanged Raised Face |
| S5344RTJ           | S5344RJ             | Ring Type Joint     |
| S5344WE            | S5344WE             | Buttweld            |



### Dimensions and Weights

| D<br>Nominal<br>Diameter | mm | 50   | 65   | 80   | 100   | 150   | 200   | 250   | 300   | 350    | 400    | 450    | 500    | 610    |
|--------------------------|----|------|------|------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
|                          | in | 2    | 2.5  | 3    | 4     | 6     | 8     | 10    | 12    | 14     | 16     | 18     | 20     | 24     |
| A (RF and WE)            | mm | 267  | 292  | 318  | 356   | 445   | 533   | 622   | 711   | 838    | 684    | 978    | 1016   | 1346   |
|                          | in | 10.5 | 11.5 | 12.5 | 14    | 17.5  | 21    | 24.5  | 28    | 33     | 34     | 38.5   | 40     | 53     |
| B                        | mm | 140  | 165  | 174  | 231   | 286   | 326   | 375   | 436   | 476    | 610    | 660    | 690    | 767    |
|                          | in | 5.5  | 6.5  | 6.9  | 9.1   | 11.3  | 12.8  | 14.8  | 17.2  | 18.7   | 24     | 26     | 27.2   | 30.2   |
| E                        | mm | 165  | 191  | 210  | 254   | 318   | 381   | 445   | 521   | 584    | 648    | 711    | 775    | 914    |
|                          | in | 6.5  | 7.5  | 8 ¼  | 10    | 12.5  | 15    | 17.5  | 20.5  | 23     | 25.5   | 28     | 30.5   | 36     |
| Weight<br>S5344RF        | Kg | 16   | 23   | 32   | 50    | 95    | 150   | 229   | 360   | 576    | 691    | 891    | 1022   | 1962   |
|                          | lb | 35.3 | 50.7 | 70.6 | 110.3 | 209.5 | 330.8 | 504.9 | 793.8 | 1270.1 | 1523.7 | 1964.7 | 2253.5 | 4326.2 |
| Weight<br>S5344WE        | Kg | 13   | 21   | 28   | 45    | 61    | 105   | 176   | 305   | 518    | 630    | 812    | 931    | 1788   |
|                          | lb | 28.7 | 46.3 | 61.7 | 99.2  | 134.5 | 231.5 | 388.1 | 672.5 | 1142.2 | 1389.2 | 1790.5 | 2052.9 | 3942.5 |

PCR = Per customer request

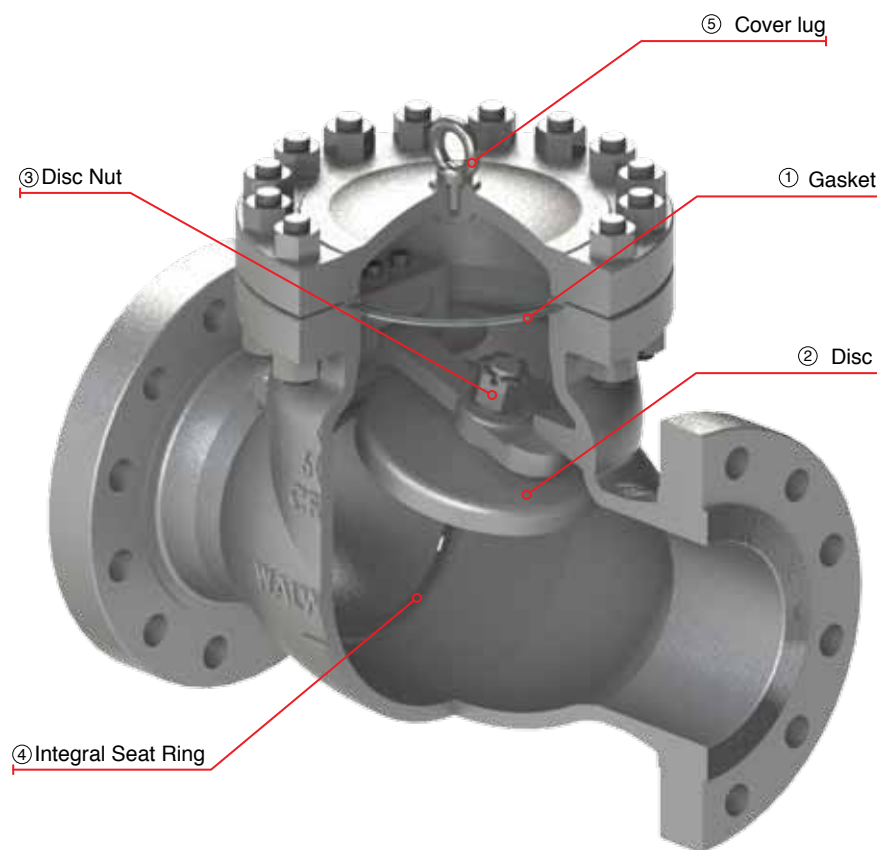
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY

### SWING CHECK VALVES, CLASS 600

### CAST STEEL SWING CHECK VALVES

#### DESIGN FEATURES

- Swing check valves design in accordance with API-603 & ASME B16.34.
  - Swing check valves for cryogenic service in accordance with BS-6364.
  - 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 Stellite seat ring provides increased resistance to wear abrasion and erosion of the sealing surface.
  - ⑤ From 4" and up, WALWORTH check valves have cover lug for easy installation.

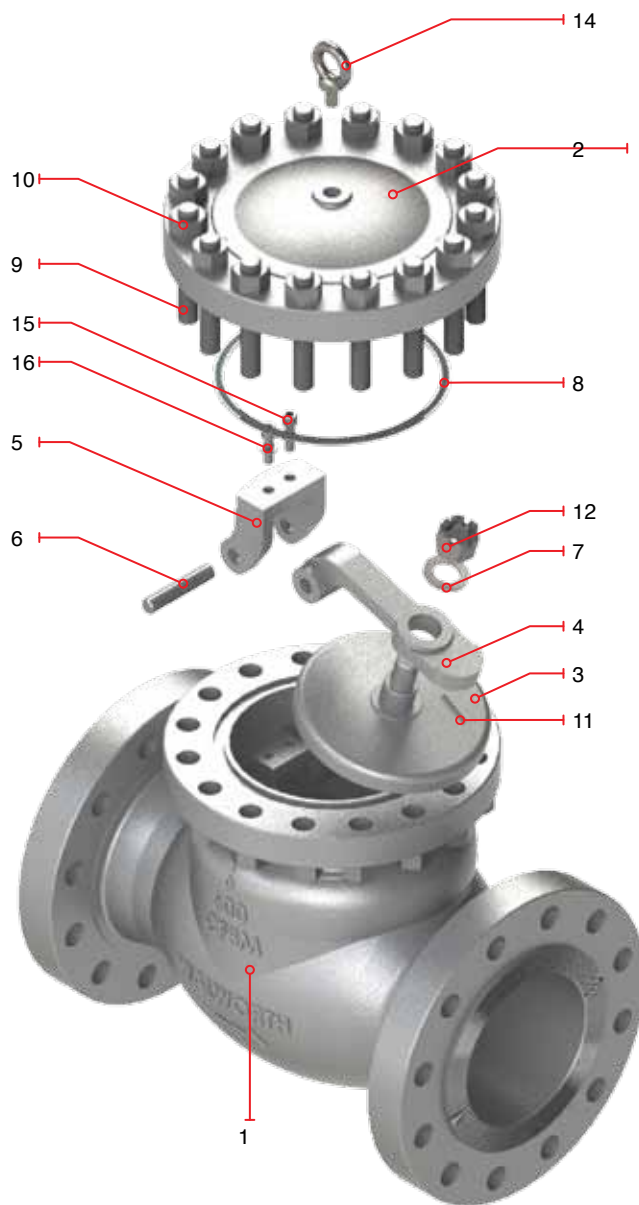


## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY SWING CHECK VALVES, CLASS 600

### DESIGN FEATURES:

- Design in accordance with API-603 & 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        |
|--------------------|---------------------|---------------------|
| S5350RF            | S5350F              | Flanged Raised Face |
| S5350RTJ           | S5350RJ             | Ring Type Joint     |
| S5350WE            | S5350WE             | Buttweld            |



### Regular Bill of Materials

| No.  | Description           | STANDARD MATERIAL             |
|------|-----------------------|-------------------------------|
| 1    | Body                  | ASTM A 351 GR CF8M            |
| 2    | Cover                 | ASTM A 351 GR CF8M            |
| 3    | Disc                  | ASTM A 351 GR CF8M + ST 6     |
| 4    | Hanger                | ASTM A 351 GR CF8M            |
| 5    | Hanger Support        | ASTM A 351 GR CF8M            |
| 6    | Shaft                 | ASTM A 182 Type F316          |
| 7    | Disc Washer           | ASTM A 182 Type F316          |
| 8    | Gasket                | Spiral Stainless 316/Graphite |
| 9    | Stud                  | ASTM A 193 GR B8              |
| 10   | Stud Nut              | ASTM A 194 GR 8               |
| 11   | Set Screw             | ASTM A 479 Type 316           |
| 12   | Disc Nut              | ASTM A 194 GR 8               |
| *13  | Identification Plate  | Stainless Steel               |
| **14 | Cover Lug             | Commercial Steel              |
| 15   | Hanger Support Screw  | ASTM A193 GR B8               |
| 16   | Hanger Support Washer | ASTM A351 GR F316             |

\*Not Shown

\*\*Only from 4" and up



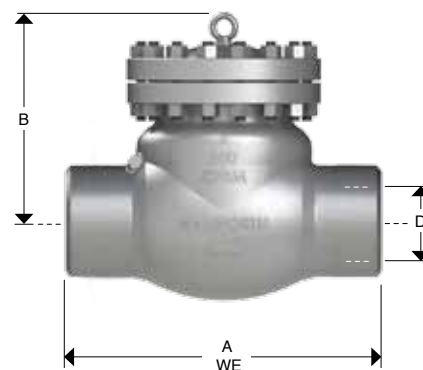
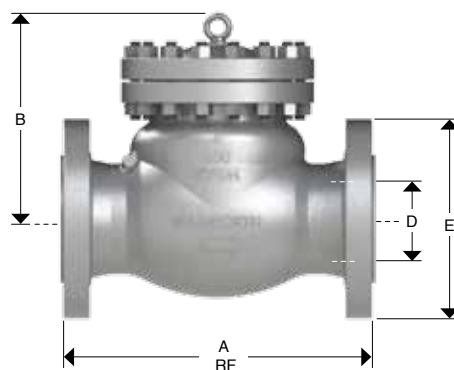
## API-603 CAST STAINLESS STEEL & SPECIAL ALLOY SWING CHECK VALVES, CLASS 600



### DESIGN FEATURES:

- Design in accordance with API-603 & 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        |
|--------------------|---------------------|---------------------|
| S5350RF            | S5350F              | Flanged Raised Face |
| S5350RTJ           | S5350RJ             | Ring Type Joint     |
| S5350WE            | S5350WE             | Buttweld            |



### Dimensions and Weights

| D Nominal Diameter | mm | 50   | 65   | 80   | 100   | 150   | 200   | 250    | 300    |
|--------------------|----|------|------|------|-------|-------|-------|--------|--------|
|                    | in | 2    | 2.5  | 3    | 4     | 6     | 8     | 10     | 12     |
| A (RF and WE)      | mm | 292  | 330  | 356  | 432   | 559   | 660   | 787    | 838    |
|                    | in | 11.5 | 13   | 14   | 17    | 22    | 26    | 31     | 33     |
| B                  | mm | 158  | 177  | 182  | 241   | 335   | 432.5 | 502    | 565    |
|                    | in | 6.2  | 7.0  | 7.2  | 9.5   | 13.2  | 17    | 19.8   | 22.2   |
| E                  | mm | 165  | 191  | 210  | 273   | 356   | 419   | 508    | 559    |
|                    | in | 6.5  | 7.5  | 8 ¼  | 10.75 | 14    | 16.5  | 20     | 22     |
| Weight S5350RF     | Kg | 20   | 28   | 40   | 82    | 170   | 271   | 477    | 609    |
|                    | lb | 44.1 | 61.7 | 88.2 | 180.8 | 374.9 | 597.6 | 1051.8 | 1342.8 |
| Weight S5350WE     | Kg | 16   | 22   | 33   | 69    | 144   | 225   | 409    | 517    |
|                    | lb | 35.3 | 48.5 | 72.8 | 152.1 | 317.5 | 496.1 | 901.8  | 1140.0 |

PCR = Per customer request

## TECHNICAL INFORMATION

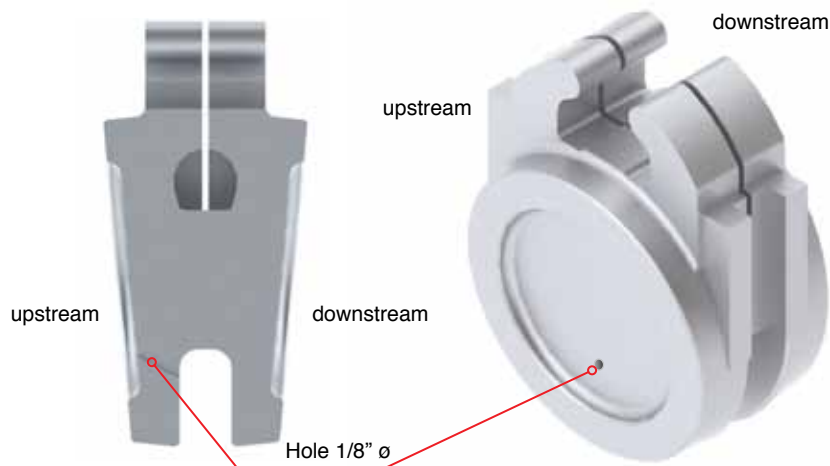
### FLEXIBLE WEDGE DESIGNS

- 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.



### RELIEVE PRESSURE ACCESSORIES

Excessive pressure trapped in the body center cavity of standard gate valves can produce overpressure in this area which makes opening the valve difficult. An equalizer system may release overpressure to another specific pipe system. In the case of globe or check valves, these pressure release fixtures are used also to bypass fluid from the center of the body to another specific area.



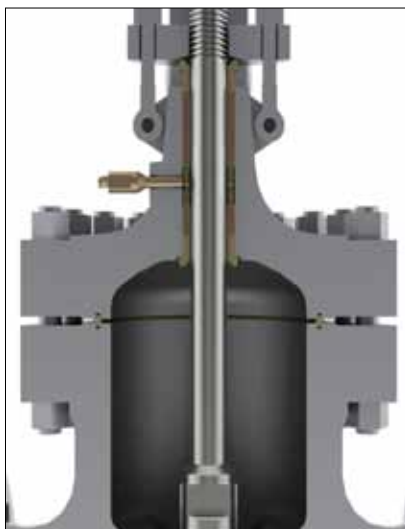
**Equalizer hole.**- A hole drilled of 1/8" in diameter or a groove 1/8" wide and deep is located in the upstream seat area of the disc.

## TECHNICAL INFORMATION

### LANTERN RING-CONDENSING CHAMBER

WALWORTH API 603 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 (H<sub>2</sub>S) bearing hydrocarbon service.

NACE standard MR0175 defines a sulfide stress cracking region based on the relationship of H<sub>2</sub>S present to the total operating pressure.

This must be considered when specifying valves for service where H<sub>2</sub>S is present, as proper selection of materials is the customer's responsibility.

Sulfide stress cracking in materials not suitable for H<sub>2</sub>S service can result in a sudden failure, with damage to equipment and harm to personnel.

Important considerations when specifying NACE service are:

1. Hydrogen ion concentration (Ph).
2. Concentration and total pressure of the hydrogen sulfide (H<sub>2</sub>S).
3. Concentration of water, carbon dioxide (CO<sub>2</sub>) and chlorides.
4. Service temperature.

The customer can select valves made of alloy 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's selected trim and manufactured to meet NACE MR0175 requirements.

## TECHNICAL INFORMATION

### STEM PACKING

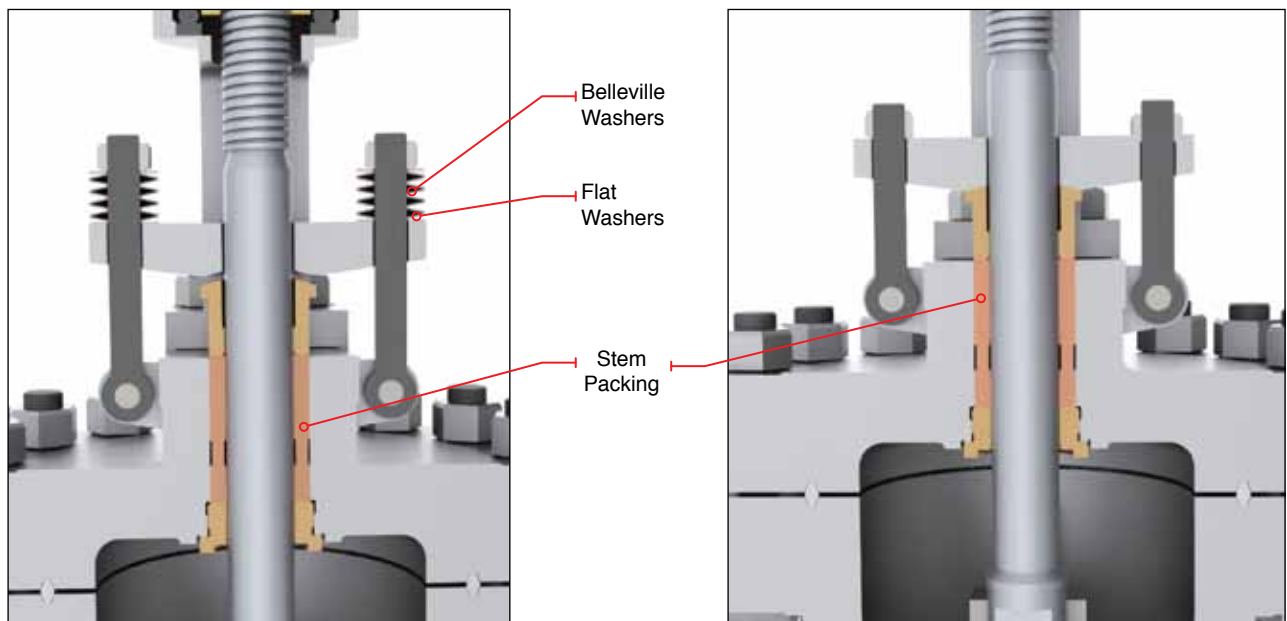
WALWORTH valves are designed, manufactured and tested to allow a maximum of 50 ppm voc (volatile organic compounds) of fugitive emissions as a standard. This applies to all gate and globe valves, without a requirement for a “special order”.

WALWORTH stem packing design consists of an arrangement of inner high and low density sealing rings and outer anti-extrusion rings which are reinforced with SS316 wire. This stem packing includes a passive corrosion inhibitor.

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 customer requirements.



**Live Loading Stem  
Packing System**

**Standard Stem Packing  
System**

# TECHNICAL INFORMATION

## BODY AND BONNET JOINT SEAL GASKETS

WALWORTH API-603 standard valves are supplied with the types of body/bonnet gaskets shown in the table.

For Special service conditions WALWORTH valves can be manufactured in special materials, with special shapes in joints to comply the specific customer requirements.

| VALVE | CLASS |     |        |
|-------|-------|-----|--------|
|       | 150   | 300 | 600    |
| GATE  | 1     | 2   | 2 or 3 |
| GLOBE | 1     | 2   | 2 or 3 |
| CHECK | 1     | 2   | 2 or 3 |

### FLAT GASKET



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



### SPIROTALLIC GASKET



2.- SPIROTALLIC GASKET: Stainless Steel / Graphite Filled



### RING GASKET



3.- RING TYPE JOINT: Oval or Octagonal shape, Soft Stainless Steel





# TECHNICAL INFORMATION

## TYPES OF END CONNECTIONS

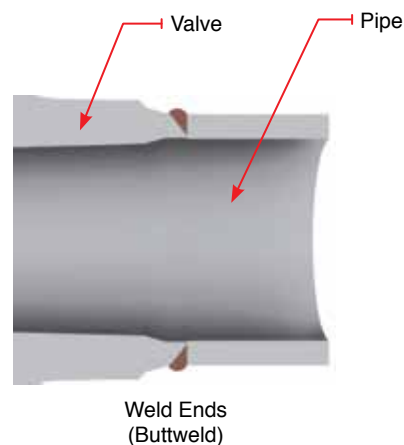
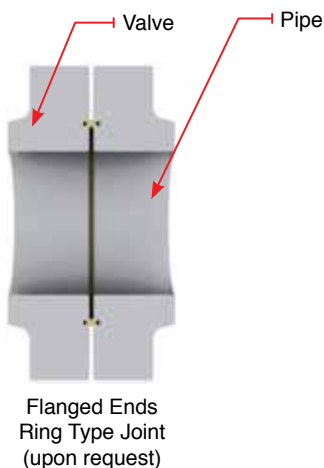
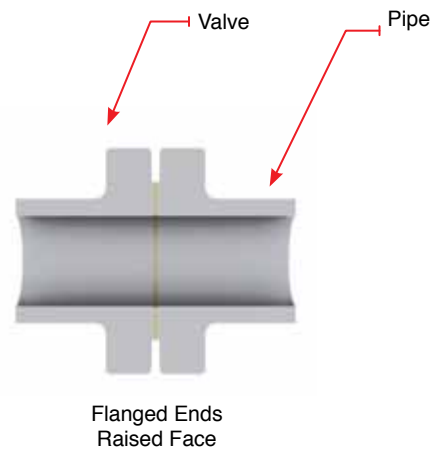
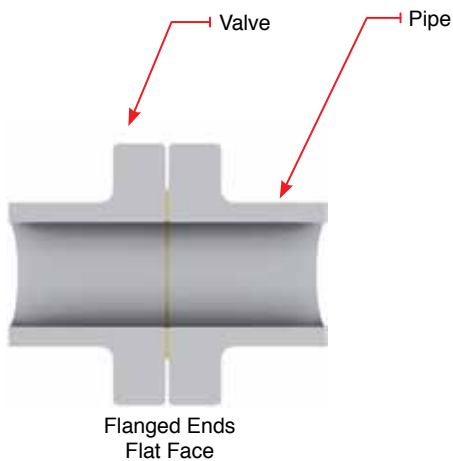
WALWORTH API-603 valves can be supplied with flanged ends in raised face, flat face or ring joint type as well as in weld ends (buttweld). They can also be supplied with combined ends, such as flanged by weld, in accordance with the customer's requirements.

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                                        |

\* Other schedules available upon request

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



# 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 our customer's 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 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

## ACCESSORIES

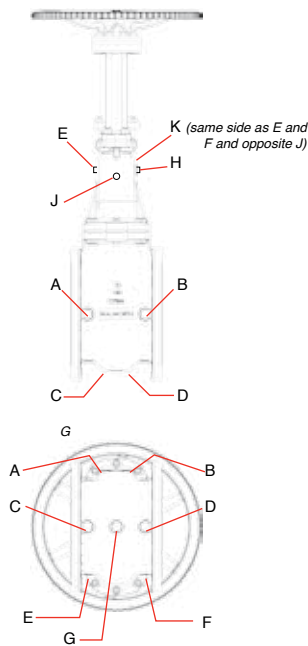
### Bypass, Drain and Vent Connections

A bypass line can be furnished with WALWORTH API-603 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.

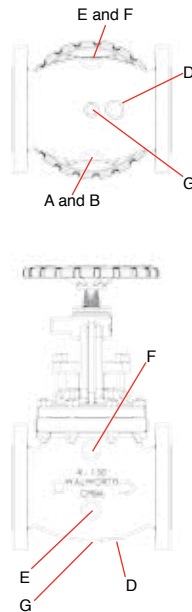
A vent connection can be located in the valve bonnet to relieve an over-pressure that could occur due to an expansion of trapped liquid. MSS SP-45 lists the standard locations and connection sizes for gate, globe and check valves.



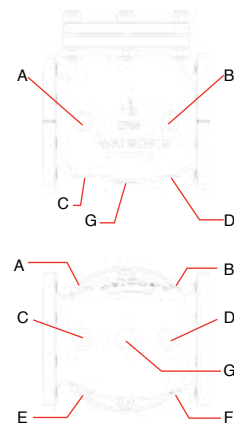
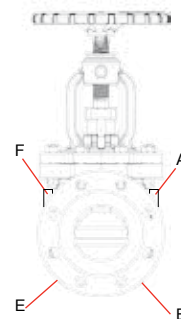
| Nominal Size of Valve     | 2" to 4" | 6" to 8" | 10" and larger |
|---------------------------|----------|----------|----------------|
| Size of Bypass-Drain-Vent | 1/2"     | 3/4"     | 1"             |



**Gate Valve**



**Globe Valve**



**Check Valve**

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

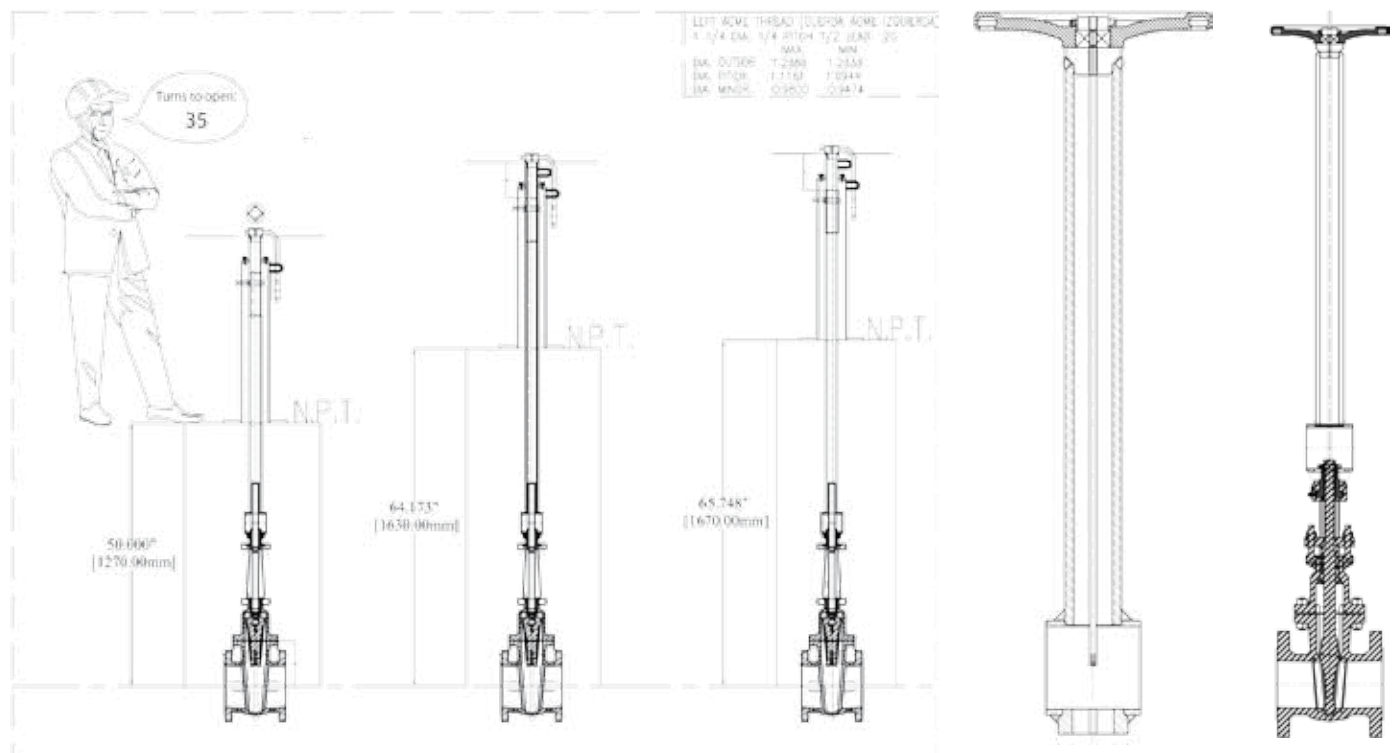
# TECHNICAL INFORMATION

## ACCESSORIES

### 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.

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/seal 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 351 GR CF8

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 275                                                           | 720 | 1440 |
| 200         | 93        | 230                                                           | 600 | 1200 |
| 300         | 149       | 205                                                           | 540 | 1075 |
| 400         | 204       | 190                                                           | 495 | 995  |
| 500         | 260       | 170                                                           | 465 | 9320 |
| 600         | 316       | 140                                                           | 440 | 885  |
| 650         | 343       | 125                                                           | 430 | 865  |
| 700         | 371       | 110                                                           | 420 | 845  |
| 750         | 399       | 95                                                            | 415 | 825  |
| 800         | 427       | 80                                                            | 405 | 710  |
| 850         | 454       | 65                                                            | 395 | 790  |
| 900         | 482       | 50                                                            | 390 | 780  |
| 950         | 510       | 35                                                            | 380 | 765  |
| 1000        | 538       | 20                                                            | 355 | 710  |
| 1050        | 566       | 20(a)                                                         | 325 | 650  |
| 1100        | 593       | 20(a)                                                         | 255 | 515  |
| 1150        | 621       | 20(a)                                                         | 205 | 410  |
| 1200        | 649       | 20(a)                                                         | 165 | 330  |
| 1250        | 677       | 20(a)                                                         | 135 | 265  |
| 1300        | 704       | 20(a)                                                         | 115 | 225  |
| 1350        | 732       | 20(a)                                                         | 95  | 185  |
| 1400        | 760       | 20(a)                                                         | 75  | 150  |
| 1450        | 788       | 20(a)                                                         | 60  | 115  |
| 1500        | 816       | 15(a)                                                         | 40  | 85   |

Note:

\* 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 351 GR CF8M

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 275                                                           | 720 | 1440 |
| 200         | 93        | 235                                                           | 620 | 1240 |
| 300         | 149       | 215                                                           | 560 | 1120 |
| 400         | 204       | 195                                                           | 515 | 1025 |
| 500         | 260       | 170                                                           | 480 | 955  |
| 600         | 316       | 140                                                           | 450 | 900  |
| 650         | 343       | 125                                                           | 440 | 885  |
| 700         | 371       | 110                                                           | 435 | 870  |
| 750         | 399       | 95                                                            | 425 | 855  |
| 800         | 427       | 80                                                            | 420 | 745  |
| 850         | 454       | 65                                                            | 420 | 735  |
| 900         | 482       | 50                                                            | 415 | 730  |
| 950         | 510       | 35                                                            | 385 | 775  |
| 1000        | 538       | 20                                                            | 365 | 725  |
| 1050        | 566       | 20                                                            | 360 | 720  |
| 1100        | 593       | 20(a)                                                         | 305 | 610  |
| 1150        | 621       | 20(a)                                                         | 235 | 475  |
| 1200        | 649       | 20(a)                                                         | 185 | 370  |
| 1250        | 677       | 20(a)                                                         | 145 | 295  |
| 1300        | 704       | 20(a)                                                         | 115 | 235  |
| 1350        | 732       | 20(a)                                                         | 95  | 190  |
| 1400        | 760       | 20(a)                                                         | 75  | 150  |
| 1450        | 788       | 20(a)                                                         | 60  | 115  |
| 1500        | 816       | 15(a)                                                         | 40  | 85   |

Note:

\* 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).

## STAINLESS STEEL ASTM A 351 GR CF3 or GR CF3M

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 230                                                           | 600 | 1200 |
| 200         | 93        | 195                                                           | 510 | 1020 |
| 300         | 149       | 175                                                           | 455 | 910  |
| 400         | 204       | 160                                                           | 420 | 840  |
| 500         | 260       | 150                                                           | 395 | 785  |
| 600         | 316       | 140                                                           | 370 | 745  |
| 650         | 343       | 125                                                           | 365 | 730  |
| 700         | 371       | 110                                                           | 360 | 720  |
| 750         | 399       | 110                                                           | 355 | 705  |
| 800         | 427       | 80                                                            | 345 | 690  |

## LOW CARBON STAINLESS STEEL ASTM A 351 GR CG3M

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 275                                                           | 720 | 1440 |
| 200         | 93        | 235                                                           | 620 | 1240 |
| 300         | 149       | 215                                                           | 560 | 1120 |
| 400         | 204       | 195                                                           | 515 | 1025 |
| 500         | 260       | 170                                                           | 480 | 955  |
| 600         | 316       | 140                                                           | 450 | 900  |
| 650         | 343       | 125                                                           | 440 | 885  |
| 700         | 371       | 110                                                           | 435 | 870  |
| 750         | 399       | 95                                                            | 425 | 855  |
| 800         | 427       | 80                                                            | 420 | 845  |
| 850         | 454       | 65                                                            | 420 | 835  |



# PRESSURE-TEMPERATURE RATINGS

## SUPER DUPLEX STAINLESS STEEL ASTM A 995 GR 6A CD3MWCuN (S32750)

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 290                                                           | 750 | 1500 |
| 200         | 93        | 260                                                           | 745 | 1490 |
| 300         | 149       | 230                                                           | 665 | 1335 |
| 400         | 204       | 200                                                           | 615 | 1230 |
| 500         | 260       | 170                                                           | 580 | 1160 |
| 600         | 316       | 140                                                           | 555 | 1115 |
| 650         | 343       | 125                                                           | 545 | 1095 |
| 700         | 371       | 110                                                           | 540 | 1085 |
| 750         | 399       | 95                                                            | 530 | 1065 |

Note:

\* This steel may become brittle after service at moderately elevated temperatures. Not to be used over 600°F.

## STAINLESS STEEL ASTM A 351 GR CG8M

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 275                                                           | 720 | 1440 |
| 200         | 93        | 235                                                           | 620 | 1240 |
| 300         | 149       | 215                                                           | 560 | 1120 |
| 400         | 204       | 195                                                           | 515 | 1025 |
| 500         | 260       | 170                                                           | 480 | 955  |
| 600         | 316       | 140                                                           | 450 | 900  |
| 650         | 343       | 125                                                           | 440 | 885  |
| 700         | 371       | 110                                                           | 435 | 870  |
| 750         | 399       | 95                                                            | 425 | 855  |
| 800         | 427       | 80                                                            | 420 | 845  |
| 850         | 454       | 65                                                            | 420 | 835  |
| 900         | 482       | 50                                                            | 415 | 830  |
| 950         | 510       | 35                                                            | 385 | 775  |
| 1000        | 538       | 20                                                            | 365 | 725  |

Note:

\* This steel may become brittle after service at moderately elevated temperatures. Not to be used over 600°F.

## DUPLEX STAINLESS STEEL ASTM A 995 GR 4A CD3MN (S31803)

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 290                                                           | 750 | 1500 |
| 200         | 93        | 260                                                           | 745 | 1490 |
| 300         | 149       | 230                                                           | 665 | 1335 |
| 400         | 204       | 200                                                           | 615 | 1230 |
| 500         | 260       | 170                                                           | 580 | 1160 |
| 600         | 316       | 140                                                           | 555 | 1115 |
| 650         | 343       | 125                                                           | 545 | 1095 |
| 700         | 371       | 110                                                           | 540 | 1085 |
| 750         | 399       | 95                                                            | 530 | 1065 |

## STAINLESS STEEL ASTM A 351 GR CN7M (ALLOY 20)

| Temperature |           | Maximum allowable non-shock working pressure in PSIG by class |     |      |
|-------------|-----------|---------------------------------------------------------------|-----|------|
| °F          | °C        | 150                                                           | 300 | 600  |
| -20 to 100  | -29 to 38 | 230                                                           | 600 | 1200 |
| 200         | 93        | 200                                                           | 520 | 1035 |
| 300         | 149       | 180                                                           | 465 | 930  |
| 400         | 204       | 160                                                           | 420 | 845  |
| 500         | 260       | 150                                                           | 390 | 780  |
| 600         | 316       | 140                                                           | 360 | 720  |

# DESIGN BASIS

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

|            |                                                                                |
|------------|--------------------------------------------------------------------------------|
| <b>API</b> | <b>American Petroleum Institute</b>                                            |
| <b>603</b> | Corrosion-resistant, Bolted Bonnet Gate Valves – Flanged and Butt-welding Ends |
| <b>598</b> | Valve Inspections and Testing                                                  |

## ASME Standards ASME International (American Society of Mechanical Engineers)

|               |                                                  |
|---------------|--------------------------------------------------|
| <b>B2.1</b>   | Pipe Threads                                     |
| <b>B16.5</b>  | Steel Pipe Flanges and Flanged Fittings          |
| <b>B16.10</b> | Length of Ferrous Flanged and Welding End Valves |
| <b>B16.25</b> | Butt-Welding Ends                                |
| <b>B18.2</b>  | Square and Hexagon Bolts and Nuts                |
| <b>B16.34</b> | Valves - Flanged, Threaded and Welding Ends      |
| <b>B16.47</b> | Large Diameter Steel Flanges                     |

|              |                                                                                |
|--------------|--------------------------------------------------------------------------------|
| <b>ASTM</b>  | <b>American Society for Testing and Materials</b>                              |
| <b>A-193</b> | Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service |
| <b>A-351</b> | Castings, Austenitic, for Pressure-Containing Parts                            |
| <b>A-439</b> | Austenitic Ductile Iron Castings                                               |

|                      |                                                                       |
|----------------------|-----------------------------------------------------------------------|
| <b>MSS Standards</b> | <b>Manufactures Standardization Society of the Valve and Fittings</b> |
| <b>SP-25</b>         | Standard Marking System for Valves, Fittings, Flanges and Unions      |
| <b>SP-44</b>         | Steel Pipeline Flanges                                                |
| <b>SP-45</b>         | Bypass and Drain Connections                                          |
| <b>SP-47</b>         | Limiting Dimensions of Raised Face Flange Gaskets                     |

|                       |                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------|
| <b>NACE Standards</b> | <b>National Association of Corrosion Engineers</b>                                                         |
| <b>NACE MR0175</b>    | Standard Material Requirements Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment |

## Boiler and pressure vessel code

|                          |                                                                                 |
|--------------------------|---------------------------------------------------------------------------------|
| <b>Section II Part A</b> | Ferrous Material Specifications                                                 |
| <b>Section II Part B</b> | Non Ferrous Material Specifications                                             |
| <b>Section II Part C</b> | Specifications for Welding Rods, Electrodes and Filler Metals                   |
| <b>Section V</b>         | Non Destructive Tests                                                           |
| <b>Section VIII</b>      | Boiler and Pressure Vessel Code for Unfired Pressure Vessels, Divisions 1 and 2 |
| <b>Section IX</b>        | 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 in specifying the required valve(s) so that mistakes are avoided during manufacturing.

10"-S5202-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<br>(In) | TYPE OF VALVE &<br>PRESSURE CLASS | ENDS                 | TRIM ARRANGEMENTS                                | BASE MATERIAL ASTM                                  |
|--------------|-----------------------------------|----------------------|--------------------------------------------------|-----------------------------------------------------|
| 2"           | S5202= GATE 150 #                 | RF= RAISED FACE      | 18-8 = API No. 2                                 | LOW CARBON AUSTENITIC STAINLESS STEELS:             |
| 2 1/2"       | S5206= GATE 300 #                 | RTJ= RING TYPE JOINT | 310 = API No. 3                                  | ASTM A351-CF3 (18% Cr- 8% Ni- 0.03% C)              |
| 3"           | S5232= GATE 600 #                 | WE=BUTTWELD          | 18-8smo = API No. 10                             | ASTM A351-CF3M (18% Cr-12%Ni-2%Mo-0.03%C)           |
| 4"           | S5275= GLOBE 150 #                |                      | 3HF = API No. 12                                 | ASTM A351-CG3M (18% Cr-12%Ni-3%Mo-0.03%C)           |
| 5"           | S5281= GLOBE 300 #                |                      | A20 = API No. 13                                 | AUSTENITIC STAINLESS STEELS:                        |
| 6"           | S5295= GLOBE 600 #                |                      | A20H = API No. 14                                | ASTM A351-CF8 (18% Cr- 8% Ni- 0.08% C)              |
| 8"           | S5341= SWING CHECK 150 #          |                      | NUC = 410 + NUCALLOY                             | ASTM A351-CF8M (18% Cr-12%Ni-2%Mo-0.08%C)           |
| 10"          | S5344= SWING CHECK 300 #          |                      | 4HF = 304+304+ST6                                | ASTM A351-CF10 (18% Cr-8%Ni-0.08%C)                 |
| 12"          | S5350= SWING CHECK 600 #          |                      | 4HF+HF = 304+ST6+ST6                             | ASTM A351-CG8M (19% Cr-10%Ni-3%Mo-0.08%C)           |
| 14"          |                                   |                      | 304L = 304L+304L+304L                            | ASTM A351-CF8C (18% Cr-10%Ni-Cb-0.08%C)             |
| 16"          |                                   |                      | 1HF = 316+ST21+ST21                              | ASTM A351-CT15C (19%Cr-32%Ni-0.05 A 0.15%C)         |
| 18"          |                                   |                      | 3HF+HF = 316+ST6+ST6                             | SUPER AUSTENITIC STAINLESS STEELS:                  |
| 20"          |                                   |                      | 3TC = 316/TC+TC+ST6 NOTE: TC = Tungsten Carbide. | ASTM A351-CK20 (25% Cr-20%Ni-0.04 A 0.2%C)          |
| 22"          |                                   |                      | 316L = 316+316+316                               | ASTM A351-CN7M (28% Ni-19%Cr-Cu-Mo0.07%C)           |
| 24"          |                                   |                      | 3LHF = 316L+316L+ST6                             | ASTM A351-CN3M (21%Cr-24.5%Ni-6.5%Mo)               |
|              |                                   |                      | 3HFL = 316L+ST6+ST6                              | ASTM A351-CN3MN (24%Ni-21%Cr-6%Mo-Cu-N-0.03%C)      |
|              |                                   |                      | 21HF = 317+ST6+ST6                               | ASTM A351 CD4MCu (25.5%Cr-5.5%Ni2%Mo)               |
|              |                                   |                      | 317 = 317+317+317                                | ASTM A351-CN2MCuN(.02C;19-23Cr;23-28Ni;4-5Mo;1-2Cu) |
|              |                                   |                      | 317H = 317+317+ST6                               | LOW TEMPERATURE SERVICE CARBON STEELS:              |
|              |                                   |                      | 317LH = 317L+ST6+ST6                             | ASTM A352-LCB (0.03%C-0.6%Si-1%Mn)                  |
|              |                                   |                      | 31L = 317L+317L+317L                             | ASTM A352-LCC (0.025%C-0.6%Si-1%Mn)                 |
|              |                                   |                      | 317LS = 317L+317L+ST6                            | LOW TEMPERATURE SERVICE LOW ALLOY STEELS:           |
|              |                                   |                      | 2HF = 321+321+ST6                                | ASTM A352-LC2 (0.25%C-2.5%Ni-0.65%Mn)               |
|              |                                   |                      | 321F = 321+ST6+ST6                               | ASTM A352-LC3 (0.15%C-3.5%Ni-0.65%Mn)               |
|              |                                   |                      | 321 = 321+321+321                                | MARTENSITIC STAINLESS STEELS:                       |
|              |                                   |                      | 347HF = 347+ ST6+ST6                             | ASTM A487-CA6NM (12.75%Cr-4%Ni-0.7%Mo)              |
|              |                                   |                      | 347 = 347+347+347                                | ASTM A487-CA15 (12.75%Cr-1%Ni-1%Mn)                 |
|              |                                   |                      | 347 = 347+347+ST6                                | NICKEL ALLOYS:                                      |
|              |                                   |                      | 254HF = 31254+ST6+ST6                            | ASTM A494-M30C (67% Ni- 30% Cu)                     |
|              |                                   |                      | 51H = 31803+ST6+ST6                              | ASTM A494-M35-1 (67% Ni- 30% Cu)                    |
|              |                                   |                      | 31803H = 31803+31803+ST6                         | ASTM A494-CZ100 (95% Ni)                            |
|              |                                   |                      | T9 = 17-4pH+TRIBALLOY 900+ TRIBALLOY 900         | ASTM A494-CY40 (75% Ni-15% Cr- 8% Fe)               |
|              |                                   |                      | HC = Hc-276+Hc-276+Hc-276                        | ASTM A494-CW2M (61% Ni- 16% Mo-16% Cr)              |
|              |                                   |                      | HCH = Hc-276+Hc-276+ST6                          | ASTM A494-N12MV (62% Ni- 28% Mo- 5% Fe)             |
|              |                                   |                      | UOP = MONELK500+MONEL 400+MONEL 400              | ASTM A494-CW12MW (56%Ni-18%Mo- 17%Cr-6% Fe)         |
|              |                                   |                      | 625 = INCONEL 625+INCONEL 625+INCONEL 625        | ASTM A494-CW6M (56% Ni-19% Mo-18% Cr-2% Fe)         |
|              |                                   |                      | 625HF = INCONEL 625+ST6+ST6                      | ASTM A494-CU5MCu ( 42%Ni-21.5%Cr-3%Mo-2.3%Cu)       |
|              |                                   |                      | 810T = INCOLOY 800H+INCOLOY 800H+INCOLOY 800H    | ASTM A494-N7M (65% Ni- 28% Mo- 2% FE)               |
|              |                                   |                      | 825 = INCOLOY 825+INCOLOY825+INCOLOY 825         | ASTM A494-CW6MC (60%Ni-22%Cr-9%Mo-3.5%Cb)           |
|              |                                   |                      | 23HF = INCOLOY 825+ST6+ST6                       | DUPLEX STAINLESS STEELS:                            |
|              |                                   |                      | HB = HASTELLOY B2+HASTELLOB2+HASTELLOY B2        | 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-2.25Mo)          |
|              |                                   |                      |                                                  | ASTM A890 4A; CD3MN (22%Cr-5%Ni-3%Mo-N)             |

NOTE: ADDITIONAL BASE MATERIALS & TRIMS  
 ARE  
 AVAILABLE UPON REQUEST.

# 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 placed after 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 FOB 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 Buyer'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 government regulation with respect to the product(s) covered 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.

**DEFERRED 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 below.

**CANCELLATION:** After order acceptance by WALWORTH, items or completed orders may be cancelled and buyer will be charged for work performed, 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 overdue 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 schedule 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 responsibility 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 will be acceptance. Where returned goods are accepted, a minimum 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 CERTIFICATE:** WALWORTH, exhibits this product Warranty, for a 12 month period in operation or 18 months in storage, whatever comes first as of the date of product delivery.

WALWORTH, guarantees that products are fabricated according to quality, design and manufacturing standards and customer requirements as well. When the buyer expressly and in written confirms the non-compliance of such standards, WALWORTH is forced to comply with the repair, replacement or to issue the written authorization for the buyer or another agent, to replace or repair at no cost for the buyer, at WALWORTH fabrication costs, those parts confirmed as defective.

This warranty is valid when the material selection by the customer for the design, material arrangement (TRIM, bodies, ends, operation devices, etc.) internal and/ or external overlays had been the proper ones for the operation fluid. This warranty is applicable if operation and service conditions are maintained as per the requirements of the product.

To validate the Warranty, the user is responsible of performing the proper maintenance according to what is stated in the Operation and Maintenance Manual applicable to the product. WALWORTH, reserves the right to request the records (evidence) to confirm the correct maintenance.

WALWORTH obligations are limited and will be released of any responsibility when the products are altered, repaired or replaced without WALWORTH' s written authorization.

Except of what is stated in this document WALWORTH waives and excludes any other warranty expressed or implied, for loss, direct damage, indirect damage or consequential of other products, processes, installations or equipment of the buyer or end user, either partial or total, due to material defects and/or work and/or WALWORTH product design.

**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 USD net will be billed at a minimum charge of \$100.00 USD. Repair parts will be billed at a minimum charge of \$50.00 USD.

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







# **WALWORTH®**

*Since 1842*



[www.walworth.com](http://www.walworth.com)

MÉXICO

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6D-0097



600-0109



YARMOUTH RESEARCH AND TECHNOLOGY





# WALWORTH

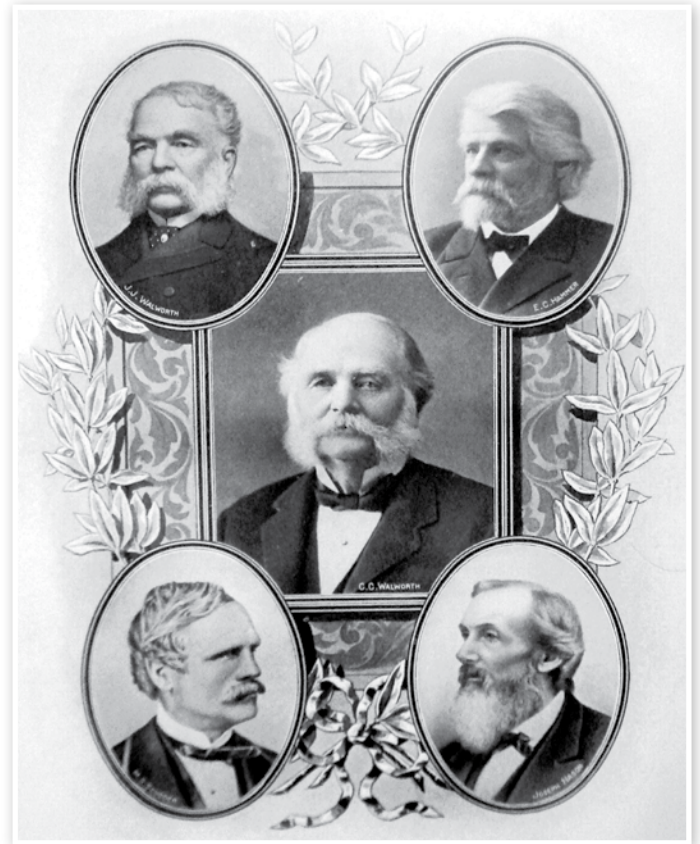
WALWORTH is one of the world's most comprehensive industrial valve manufacturers. Founded in 19th century by James Walworth, the Company has consistently dedicated itself to improvements in design and manufacturing of an array of valves exceptionally suited for the world's fluid control sector. We satisfy 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, Walworth has produced over 40,000 different types of products and serves as a global supplier to various markets utilizing the expertise of over 500 trained employees.

Our manufacturing system includes: utilization of Company directed raw material warehouses; modern and newly acquired specialized machinery; welding processes such as SMAW, GMAW, SAW, PAW; assembly testing for all low pressure, high pressure, and at low or high temperatures; painting and coating processes; export crating and shipment.

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 and satisfy the precise demands of our customers throughout the world by providing a quality product, competitive cost, and excellent service.



## VALORES WALWORTH

### MISIÓN

WALWORTH es un fabricante de válvulas y componentes de clase mundial para la Industria del control de fluidos ofreciendo un servicio excepcional, precios competitivos y una consistente puntualidad en los tiempos de entrega.



### VISIÓN

Para ser un líder mundial y referente en la manufactura de válvulas, WALWORTH:

- Define los estándares de calidad en la industria del control de fluidos.
- Excede las expectativas de los clientes sobre el servicio.
- Forja relaciones duraderas con clientes, miembros del equipo WALWORTH y la comunidad.
- Emplea, desarrolla y retiene a miembros del equipo que se caracterizan por su experiencia y dedicación.





## WALWORTH ENGINEERING CONTROL

WALWORTH products are manufactured following the strict international standards recognized all over the world, such as API, ANSI, ASME, ASTM, MSS, NACE, AWWA, BSI, CSA, among others. Our Engineering team consistently monitors updates to these standards and incorporates any applicable changes that affect the design, regulations and/or performance of our products.

Our designs are made using the most advanced technology and equipment, finite elements, and CAD system programs to ensure proper assembly and performance. From conception to calculation to detailed drawings for manufacturers, WALWORTH is a leader in development of new products that meet the needs of the current valve market."



## 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 includes the selection of raw materials from approved vendors, and rigorous oversight of our manufacturing process that is vital to quality control. The use of serial numbers allows WALWORTH the ability to not only ensure the quality of components used but to monitor and trace the fabrication process as well.



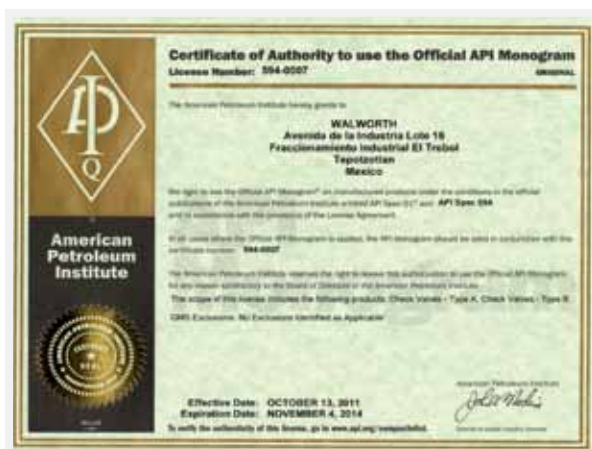
### Certificate API-6D No. 6D-0097

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 API-6A No. 6A-0234

From American Petroleum Institute to apply on valves at PSI, 1 through 4.



#### Certificate API-594 No. 594-0007

Issued by American Petroleum Institute to apply on Check Valves-Type A; Check Valves Type B manufactured in accordance with API-594 specification.



#### Certificate ISO-9001 No. 0038

Issued by American Petroleum Institute since April 1999.



#### 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.



#### 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.



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





**Supplier Qualification Certificate NO. 279/13**  
 Issued by the Equipment and Materials Testing Laboratory, CFE (LAPEM in Spanish)



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

## PRODUCT CERTIFICATIONS



**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.



**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.



**Emissions after 500 cycles at ambient and 350 °F**  
 Issued by Yarmouth Research and Technology Lab for 16 inch Class 150 Gate Valve After 500 cycles the measurement result was less than 50 ppm.



**YARMOUTH RESEARCH AND TECHNOLOGY**  
**PROJECT SUMMARY**

**Project Number:** 89008

**Customer:** The Walworth Company

**Contact:** David Cornelien

**Date(s) of Test:** 12/8/99 - 12/23/99

**Product(s) Tested:** One 6" Class 300 Gate Valve with Empak-Slex EAF-100-001 packing.

**Purpose of Test:** The test was conducted to evaluate the valve's stem-sealing performance at ambient and at 300° F as related to the 1990 Amendments to the Clean Air Act requirements. Leakage measurements were conducted in accordance with API 6D, Appendix A, Method 21.

**Conclusion:** Three thermal cycles from ambient to 300 deg. F were conducted throughout 3500 operations cycles with the valve pressurized to 6.49 psig. The valve was cycled with a 43 RPM gear motor coupled to the handwheel. One packing ret adjustment was required at cycle number 300 to maintain leakage levels below 100 PPSb.

At cycle number 3500, the packing leakage was 25-29 PPSb with the stem state. The packing nuts were tightened from 12/18 ft-lb back to 28 ft-lb and leakage decreased to about 1 PPSb.

See the attached data sheets for more information.

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

Phone or Fax (202) 446-0446  
42 East Elm Street P.O. Box 110 Yarmouth, Maine 04096-0110

**TÜV Rheinland Argentina S.A.**  
Servicios Industriales  
Certificación Central  
San José 03 - 7° Floor  
C1202BAAA Buenos Aires

**TÜVRheinland®**

**Certificate**

**Certificate No.** TRASA 700-13-0019

**Customer:** WALWORTH MEXICO - Industrial de Valvulas S.A. de C.V.  
Av. de la Industria Lote 16 Fracc. Industrial El Trebol Tepotzotlan, Edo. de Mexico

**Product Tested:** API 6D Trunnion mounted ball valve full seated, quarter turn (QTY) construction, double block and bleed service, primarily used in oil and gas standard and severe applications.

**Trademark:** WALWORTH

**Model / Type:** 6" Class 300 Gate Valve with Empak-Slex EAF-100-001 packing

**Applicable Standard:** ISO 15848-1 Part 1 and 2

**TUV Report No.** TRASA 700-13-0019

**Results:** The valve passed the test requirements for the applicable standard.

**Safety:** The valve is designed to be used in the oil and gas industry. The valve is not intended for use in the food and pharmaceutical industries.

**Specific Requirements:** The valve is designed to be used in the oil and gas industry. The valve is not intended for use in the food and pharmaceutical industries.

Issued in Mexico, January 23rd, 2004

Eng. Mauricio Schuchman

Page 1 of 5

**Certificates of Ultra Low Fugitive Emissions 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".

**TÜV Rheinland Certificate No. TRASA 700-13-0019**  
API-6D Trunnion mounted bolted body ball valves, carbon steel (A105-WCB) construction, double block and bleed service, primarily used but not limited to the oil and gas standard and severe applications.

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

**January 22, 2005**

**Ruben Paredes**  
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 01-1/05

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 Bolt-Sealed 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 V05801.

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. Cornelien P.E.  
President



24802 Markon Drive • Katy, Texas 77494  
Telephone (281) 395-5078 • Telex (281) 395-5078

**TÜV CERT** **TÜVRheinland®**  
Precisely Right.

**CERTIFICATE**  
Certificate No.: 91 202 USA-TA-09-79708

**Concerning the Agreement with the Technical Requirements in:**  
**TA-Luft 2002, VDI 2440 Nov. 2000, Sec. 3.3.1.3**

**Test report:** 200140 **Date:** 02 December, 2000

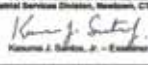
**Client:** Industrial de Valvulas, S.A. de C.V.

**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  $\leq 10^{-4}$  mbar  $\times$  (Vs  $\times$  m) with a helium mass spectrometer under the following conditions. The SPV Valve with the nominal mechanical shaft seals fulfills the requirements of Section 3.3.1.3 of The German Clean Air Act (TA-Luft, Gaseinleitungs-Verordnung) in accordance with Section 3.3.1.3 of VDI 2440 (Rev. 2000).

|                                     |                                                           |
|-------------------------------------|-----------------------------------------------------------|
| Kind of Valve:                      | Walworth API 600 Gate Valve                               |
| Valve Type:                         | 4 inch, Class 300, Figure 8200P                           |
| Sealing System:                     | WCB Body / CW 13 Stem & Stem / HP Seat                    |
| Sealing System:                     | Graphite Seals                                            |
| Nominal Size, Nominal Pressure:     | 4 inch, ANSI 300                                          |
| Inspection Media/Pressure:          | Helium / 81 Bar Temperature = Ambient                     |
| Switching Cycles (closed):          | 6 Cycles Total Cycles 800                                 |
| Leakage Rate: (mbar $\times$ l/sec) | 5.2e-7 (mbar $\times$ l/sec) 3.7e-6 (mbar $\times$ l/sec) |
| Testing Method:                     | Helium Leak Test - VDI 2440, Appendix A                   |

**Testing Laboratory:** YARMOUTH RESEARCH AND TECHNOLOGY  
Matthew J. Wawelowski, PE  
424 Walnut Hill Road, N. Yarmouth, ME 04096  
www.yarmouthresearch.com

**TÜV Rheinland North America, Inc.**  
Industrial Services Division, Houston, TX, USA  
  
Klaus J. Böhler, Jr. - E. Manager

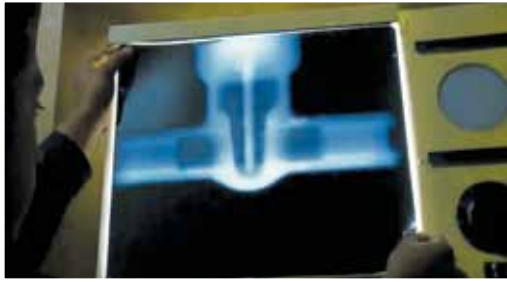


**Fire Test Certificate No. 01-1/05**  
In accordance with API-6FA and API Standard API-607 for Trunnion Ball Valves in accordance with API-6D.

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

## QUALITY CONTROL EQUIPMENT

In order to assure that WALWORTH products comply with international quality standards, in-house equipment is 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.** A 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's and our Customer's specifications.



**Magnetic Particle Test.** On a random basis for standard products or when a Customer requests 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. NDT personnel are ASNT Certified.



**Test Loop.** A complete Laboratory Test loop exists for design validation of WALWORTH products. The test is performed at maximum design pressure, advances the valves from 3000 to 5000 cycles, and requires more than four months to complete.

**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 in the body.







**Metrology Laboratory.** WALWORTH developed a calibration and/or verification system in all of the equipment used in its facilities. This ensures our ability to trace measurements, control products, and comply with international standards.

**Fire Test Facilities.** WALWORTH has the facilities to perform fire tests in accordance with 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.** This test is performed when a Customer requires low fugitive emissions certification. Our Lab has its own LFE test equipment that is capable of measuring less than 20 ppm in both static and mechanical conditions at either 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.** We use this equipment to verify the mechanical properties of materials used for manufacturing. WALWORTH tests samples on a random basis even though we receive MTRs from our suppliers and foundries.

**Hardness Test Equipments.-** In both lab and shop tests, WALWORTH uses hardness tester equipment, such as Rockwell B, C Brinell or Vickers, to ensure compliance with 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; API-623 for globe valves and API-6D & API-594 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, CD3MNCuN, 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 24" | 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 (-30°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 (-30°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 (-30°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 content 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 pickling acids, sulfates and sulfites, sulfuric acid, (all concentrations to 150 °F (65.6 °C), sulfuric 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 pickling acids, sulfates and sulfites, sulfuric acid, (all concentrations to 150 °F (65.6 °C), sulfuric 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, antibiotics 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 CK3MCuN | 20% Chrome; 18% Nickel; 6.5% Mo; 0.18% Nitrogen; 0.025% C Super Stainless Steel | ASTM A182 F44         | ASTM A479 S31254          | High resistance to pitting and crevice corrosion. Very High resistance to chloride stress corrosion cracking. 50% stronger than 300 series austenitic stainless steels. Excellent impact toughness.                                                                                                                                | 31254H                             | 31254H        |
| 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            | Chloride-containing environments where conventioned 300 series stainless steel do not provide adequate pitting and crevice corrosion resistance.                                                                                                                                                                                   | 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 service. 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 service. 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 B564 N08825      | ASTM B425 N08825          | Sour gas service. Excellent resistance to both reducing and oxidizing acids, stress corrosion cracking, localized attack such as pitting and crevice corrosion, and sulfuric and phosphoric acids.                                                                                                                                 | 825, 23HF                          | 825, 23HF     |
| ASTM A494 Grade N12MV   | 62% Nickel; 28% Mo; 5% Fe, Hastelloy B                                          | ASTM B335 N10001      | ASTM B335 N10001          | Excellent corrosion resistance. Suitable for the most chemical process applications. Excellent resistance to pitting and stress corrosion cracking.                                                                                                                                                                                | 10001, HB                          | 10001, HB     |
| ASTM A494 Grade N7M     | 62% Nickel; 28% Mo; 2% Fe, Hastelloy B2                                         | ASTM B335 N10665      | ASTM B335 N10665          | Excellent corrosion resistance and improved resistance to knife-line and heat affected zone attack. Resist formation of grain-boundary carbide precipitates in the weld heat-affected zone.                                                                                                                                        | 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 CW6M    | 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 CD4MCuN  | 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 CE3MN    | 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 Copper; 4.5% Nickel; 9% Aluminum; 3-4.5% Fe; 0.03 % max Pb.            | N/A                   | ASTM B150 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 responsibility to choose 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            | 16               | 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                    |

Notes: 1. Free machining grades of 13 Cr are prohibited.  
 2. A minimum of 50 HB against seat ring (s) is required.

# 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 (Inconel 625)      | UNS N06625 (Inconel 625)  | UNS N06625 (Inconel 625)  |
| 625HF             | Not specified    | 60Ni-22Cr-9Mo-3.5Cb/Co-Cr-A             | UNS N06625 (Inconel 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 B148 95800              | 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) |
| 1F                | Not specified    | 16% Cr-4%Ni-Nb/13%Cr-0.75Ni-1Mn/Co-Cr-A | ASTM A564-H1150               | SS-410 (250HBN min)       | Stellite 6 (350 HBN min)  |
| 1G                | Not specified    | 16% Cr-4%Ni-Nb/13%Cr-0.75Ni-1Mn/Co-Cr-A | ASTM A564-H1150               | Stellite 6 (350 HBN min)  | Stellite 6 (350 HBN min)  |

Notes: 1. Free machining grades of 13 Cr are prohibited.  
 2. A minimum of 50 HB against seat ring (s) is required.

## 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.

| GATE VALVES 150# |                                                    |                                                   |                                                   |                                                   |                                                   |                                                    |
|------------------|----------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|----------------------------------------------------|
| Description      | ASTM A216 WCB<br>or WCC trim UT<br>(API-600 nr. 8) | ASTM A217 WC6<br>Trim UT<br>(API-600 nr. 8)       | ASTM A21<br>WC9 Trim UT<br>(API-600 nr. 8)        | ASTM A217 C5<br>Trim UT (API-600 nr. 8)           | ASTM A217 C12<br>Trim UT (API-600<br>nr. 8)       | ASTM A352 LCB<br>or LCC trim UT<br>(API-600 nr. 8) |
| Body             | ASTM A 216 GR WCB/<br>WCC                          | ASTM A 217 GR<br>WC6                              | ASTM A 217 GR WC9                                 | ASTM A 217 GR C5                                  | ASTM A 217 GR C12                                 | ASTM A352 GR<br>LCB/LCC                            |
| Bonnet           | ASTM A 216 GR WCB/<br>WCC                          | ASTM A 217 GR<br>WC6                              | ASTM A 217 GR WC9                                 | ASTM A 217 GR C5                                  | ASTM A 217 GR C12                                 | ASTM A352 GR<br>LCB/LCC                            |
| Wedge/seating    | ASTM A 216 GR WCB/<br>WCC+13% Cr.                  | ASTM A 217 GR<br>WC6 + 13% Cr.                    | ASTM A 217 GR WC9<br>+ 13% Cr.                    | ASTM A 217 GR C5 +<br>13% Cr.                     | ASTM A 217 GR C12 +<br>13% Cr.                    | ASTM A 352 GR<br>LCB/LCC + 13% Cr.                 |
| Seat rings       | ASTM A 515 GR 70<br>+ ST 6                         | ASTM A 240 TYPE<br>410 + ST 6                     | ASTM A 240 TYPE 410<br>+ ST 6                     | ASTM A 240 TYPE 410<br>+ ST 6                     | ASTM A 240 TYPE 410<br>+ ST 6                     | ASTM A 516 GR 65<br>+ ST 6                         |
| Stem nut         | ASTM A 439 TYPE D2<br>OR ASTM B 148 UNS<br>C95600  | ASTM A 439 TYPE<br>D2 OR ASTM B 148<br>UNS C95600 | ASTM A 439 TYPE D2<br>OR ASTM B 148 UNS<br>C95600 | ASTM A 439 TYPE D2<br>OR ASTM B 148 UNS<br>C95600 | ASTM A 439 TYPE D2<br>OR ASTM B 148 UNS<br>C95600 | ASTM A 439 TYPE<br>D2 OR ASTM B 148<br>UNS C95600  |
| Bonnet bushing   | ASTM A 276 Type 410                                | ASTM A 276 Type<br>410                            | ASTM A 276 Type 410                               | ASTM A 276 Type 410                               | ASTM A 276 Type 410                               | ASTM A 276 Type<br>410                             |
| Bonnet stud      | ASTM A 193 GR B7                                   | ASTM A 193 GR<br>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<br>316                         | Graphite/Stainless 316                            | Graphite/Stainless 316                            | Graphite/Stainless 316                            | Graphite/Stainless<br>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<br>design                          | As per WALWORTH<br>design                         | As per WALWORTH<br>design                         | As per WALWORTH<br>design                         | As per WALWORTH<br>design                         | As per WALWORTH<br>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 flexible wedge
- Solid wedge available upon request.
- 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 Stellite 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

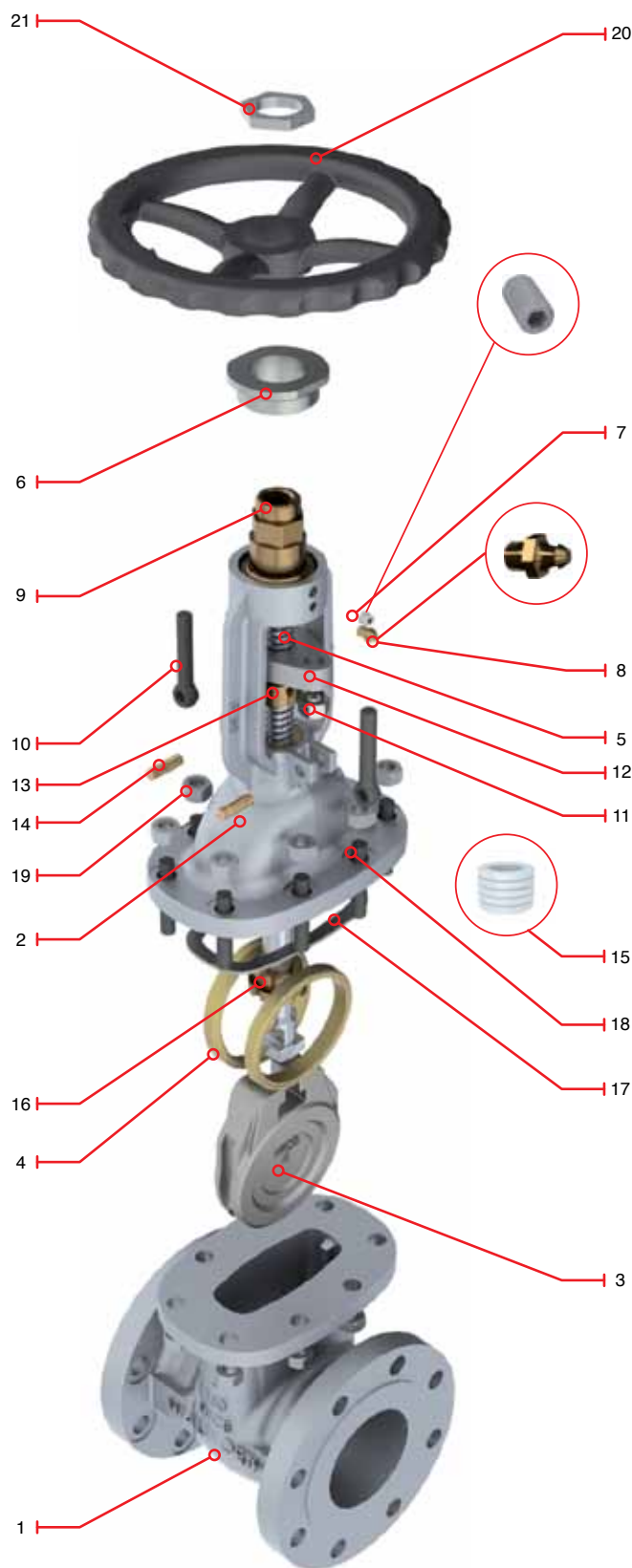
- Design in accordance with API - 600
- Outside Screw & Yoke (OS & Y)
- Flexible wedge as standard
- Solid wedge available upon request
- From 2" to 24" Handwheel operated as standard
- Flange dimensions as per ASME B16.5
- End to end dimension as per ASME B16.10
- WE dimensions as per ASME B16.25
- 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

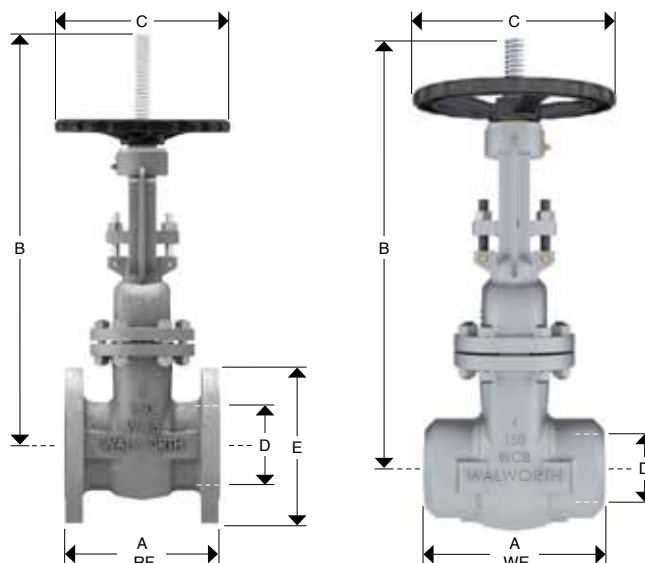
## (HANDWHEEL OPERATED)



### Design Features

- Design in accordance with API - 600
- Outside Screw & Yoke (OS & Y)
- Flexible wedge as standard
- Solid wedge available upon request
- 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<br>Nominal<br>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

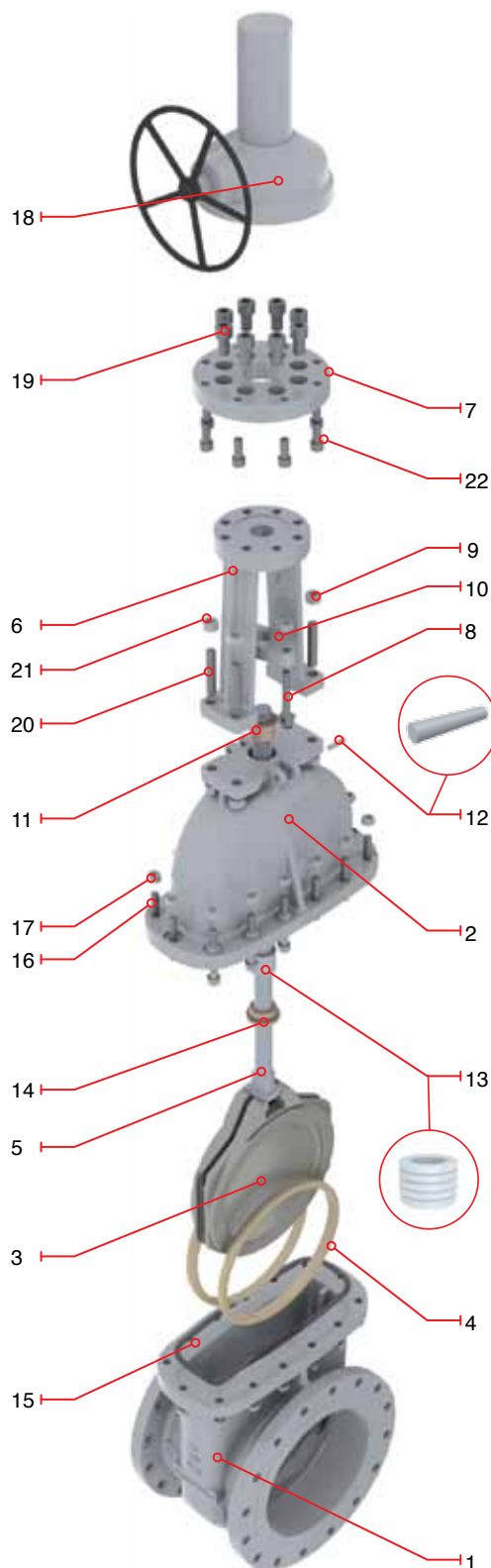
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible wedge as standard
- Solid wedge available upon request
- Size 30" up to 72", supplied with GEAR BOX as standard
- Flange dimensions as per ASME B16.47 Series A. Series B available upon request
- End to end dimensions as per 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 requirements    |
| 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

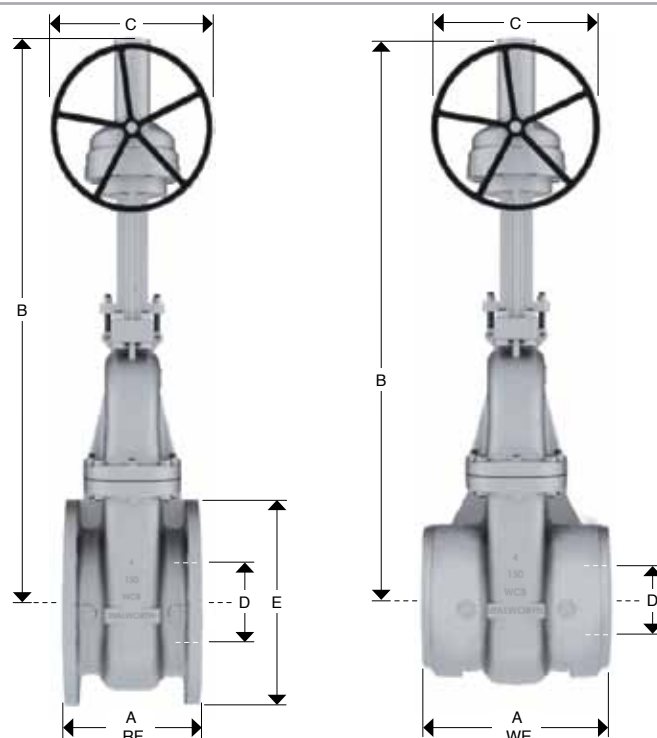
## (GEAR OPERATED)



### Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible wedge as standard
- Solid wedge available upon request 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<br>Nominal<br>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 |



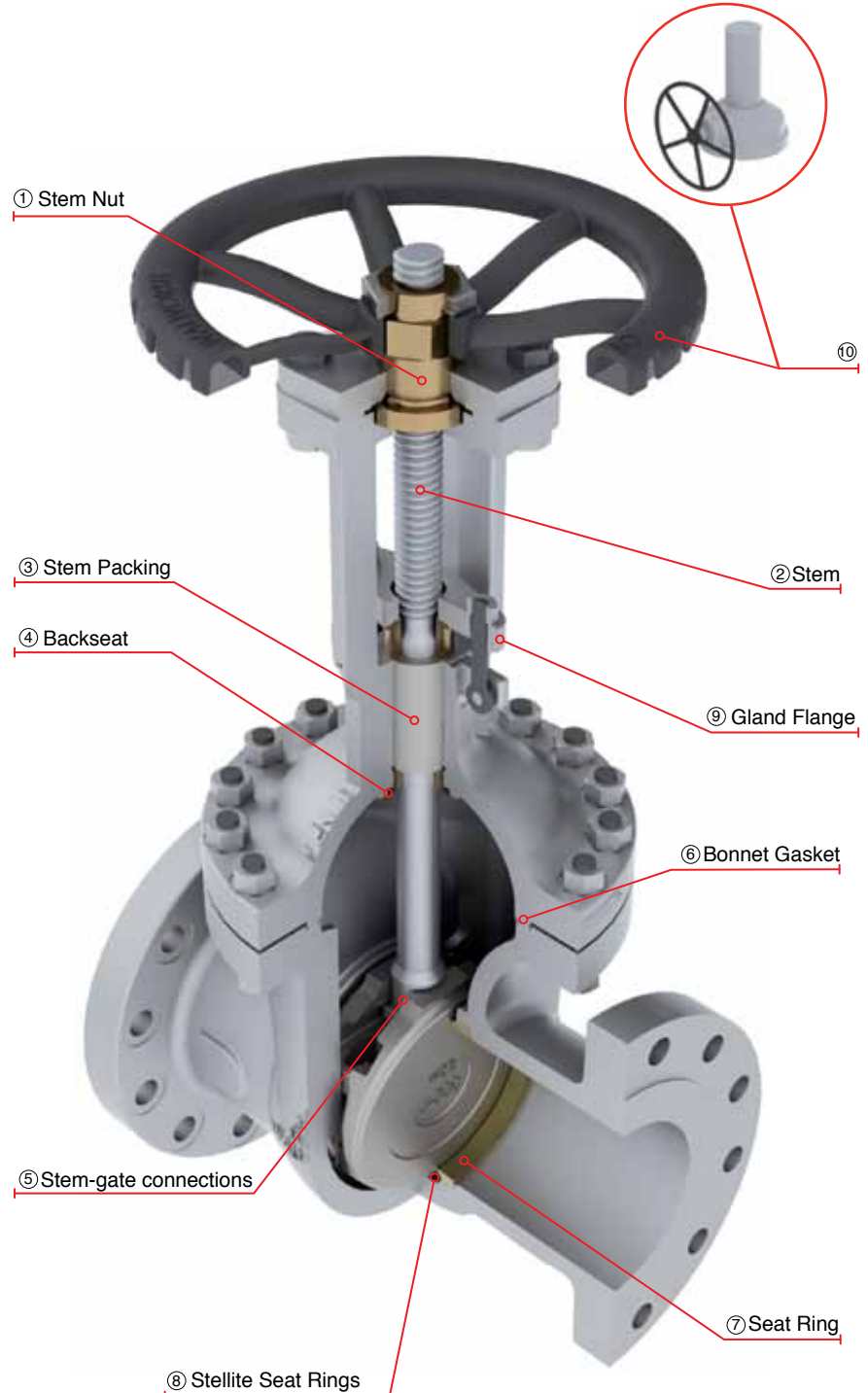
# CAST STEEL GATE VALVES CLASS 300

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.
- Flexible wedge as standard
- Solid wedge available upon request
- Gate 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 Stellite 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

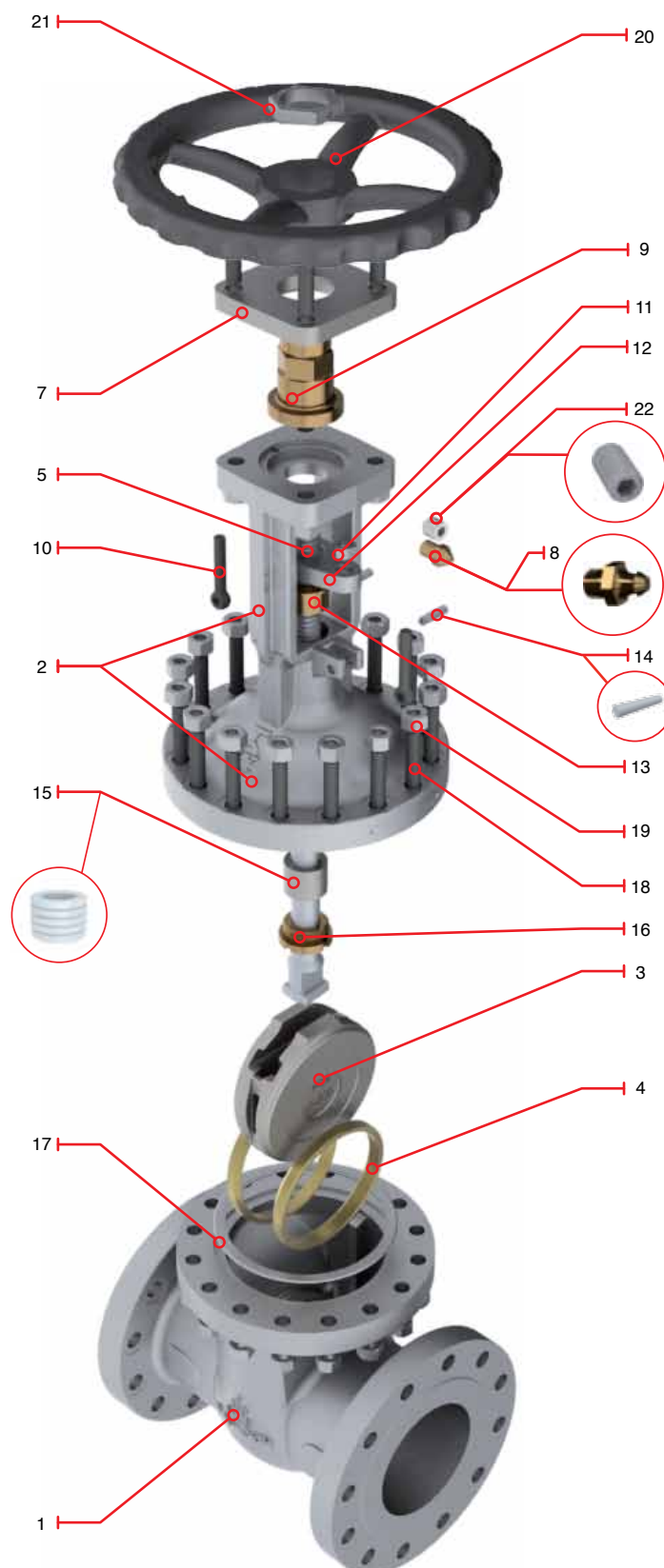
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible wedge as standard
- Solid wedge available upon request
- From 2" to 24" Handwheel operated as Standard.
- Flange Dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- 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

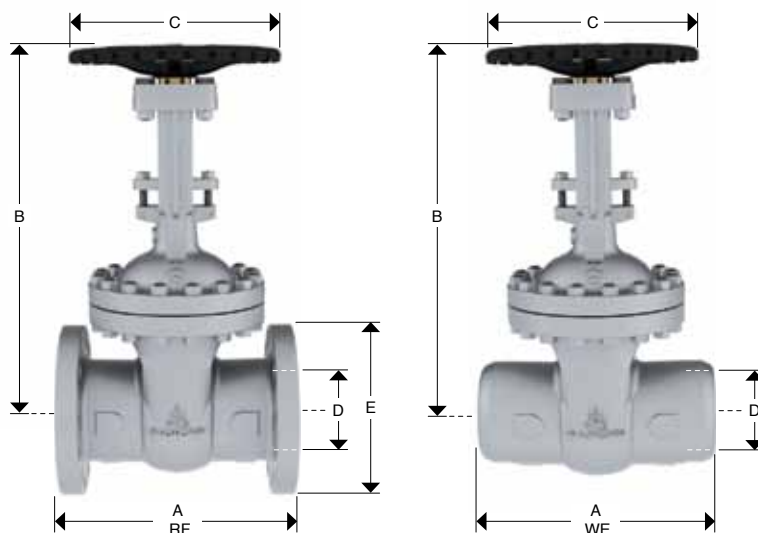
## (HANDWHEEL OPERATED)



### Design Features

- Design in accordance with API-600
- Flexible wedge as standard
- Solid wedge available upon request
- 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<br>Nominal<br>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

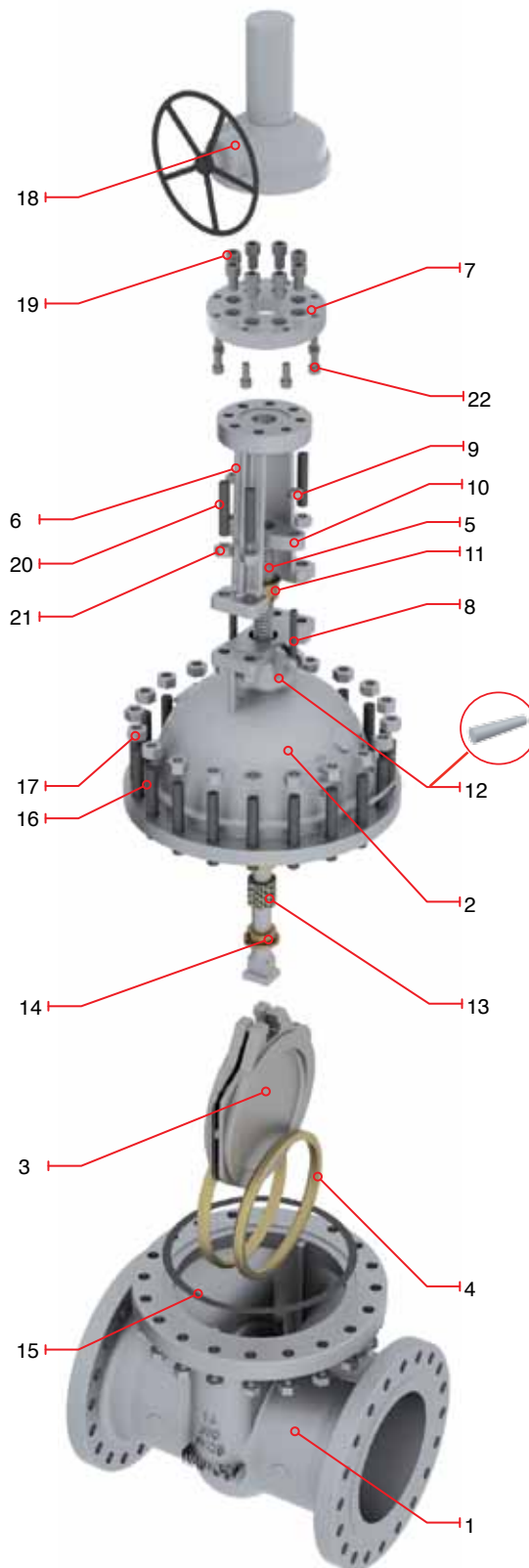
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible wedge as standard
- Solid wedge available upon request
- Size 30" and up to 42", supplied with GEAR operator as standard.
- Flange dimensions as per ASME B16.47 Series A. Series B available upon request.
- End to end dimensions 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                | Spiral Stainless 304/Graphite |
| 16  | Bonnet Stud                  | ASTM A 193 GR B7              |
| 17  | Bonnet Stud Nut              | ASTM A 194 GR 2H              |
| 18  | Gear Operator                | as customer requirements      |
| 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

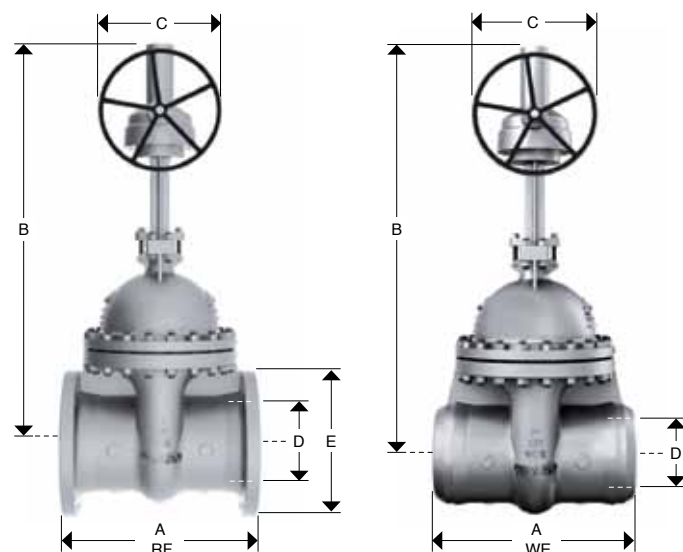
## (GEAR OPERATED)



### Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible wedge as standard
- Solid wedge available upon request
- 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<br>Nominal<br>Diameter | mm | 762  | 914       | 1067     |
|--------------------------|----|------|-----------|----------|
|                          | in | 30   | 36        | 42       |
| A                        | mm | 1397 | 1727      | 2172     |
|                          | 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    |

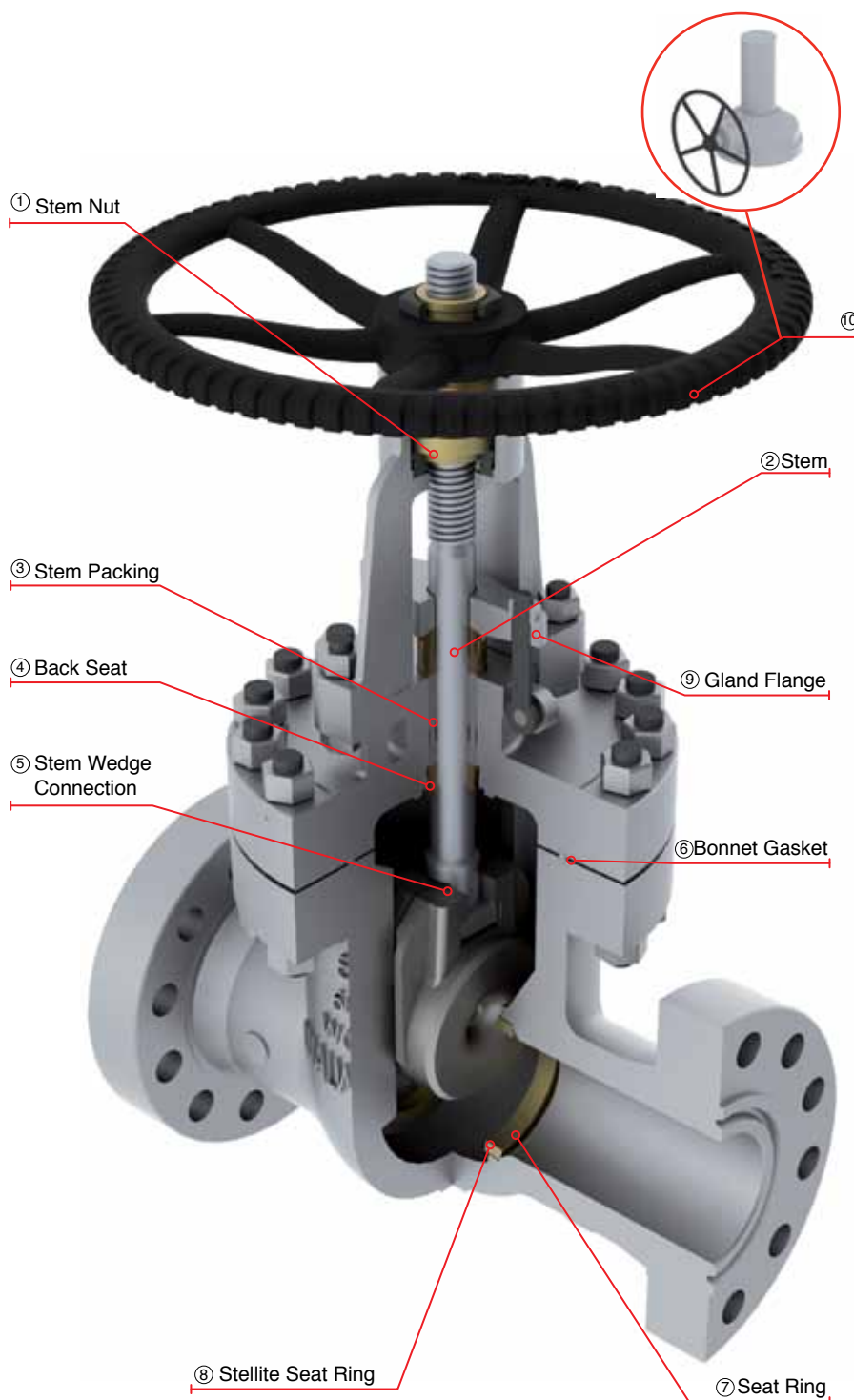


# CAST STEEL GATE VALVES CLASS 600

## 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 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 Stellite 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

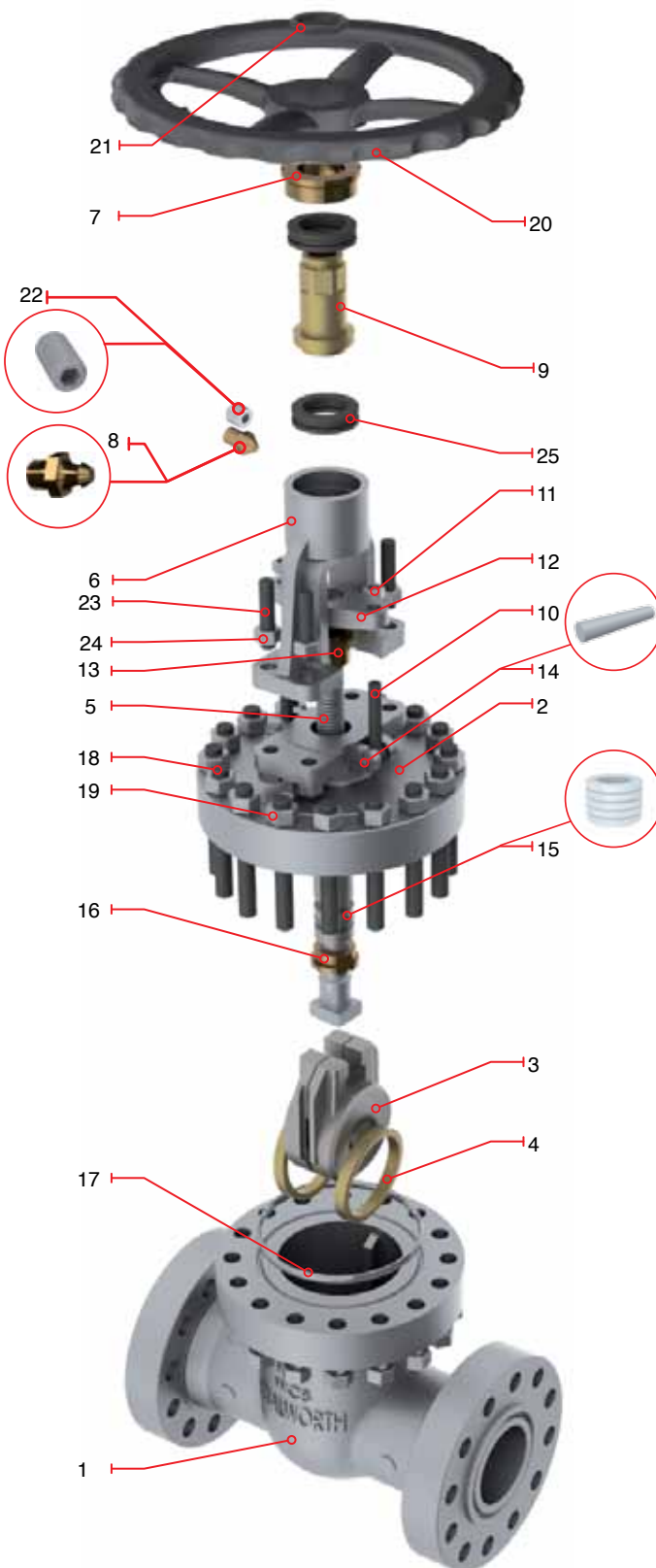
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- From 2" to 20" Handwheel operated as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Flange dimensions larger than 24" according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

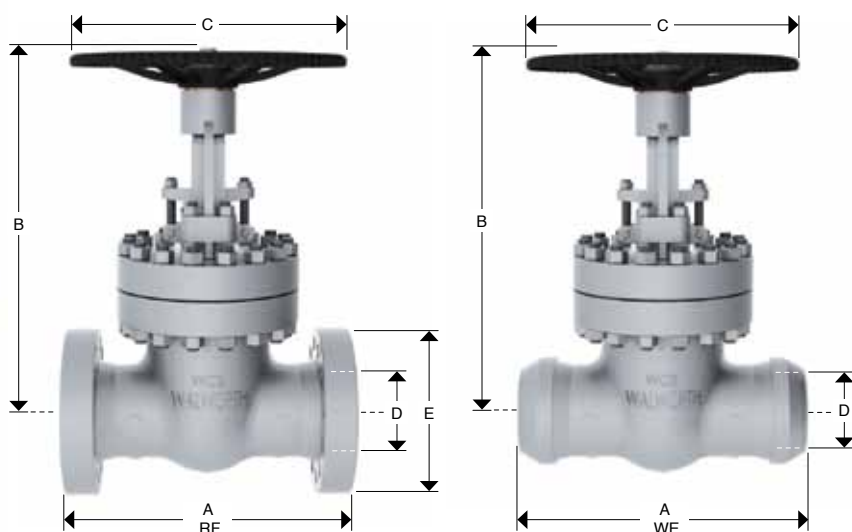
## (HANDWHEEL OPERATED)



### Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- 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<br>Nominal<br>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<br>(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<br>(RTJ)               | mm | 295    | 333    | 359    | 435    | 562     | 663    | 790      | 841      | 892      | 994     | 1095   |
|                          | 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<br>5232RF/RTJ     | Kg | 37     | 53     | 65     | 115    | 224     | 440    | 653      | 863      | 1141     | 1565    | 2560   |
|                          | lb | 80.3   | 116.6  | 143    | 253    | 492.8   | 968    | 1436.6   | 1898.6   | 2510.2   | 3443    | 5632   |
| Weight<br>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

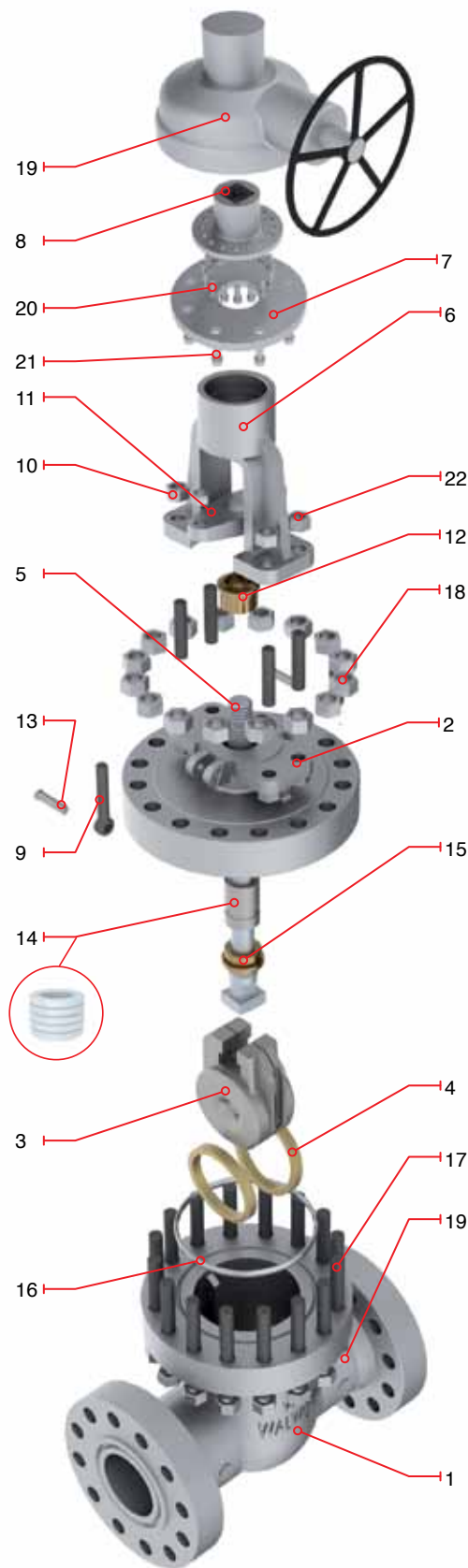
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- Size 24" and up to 36", supplied with gear operated as standard.
- Stem Nut with bearings 6" and up
- Flange dimensions for 24" as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions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

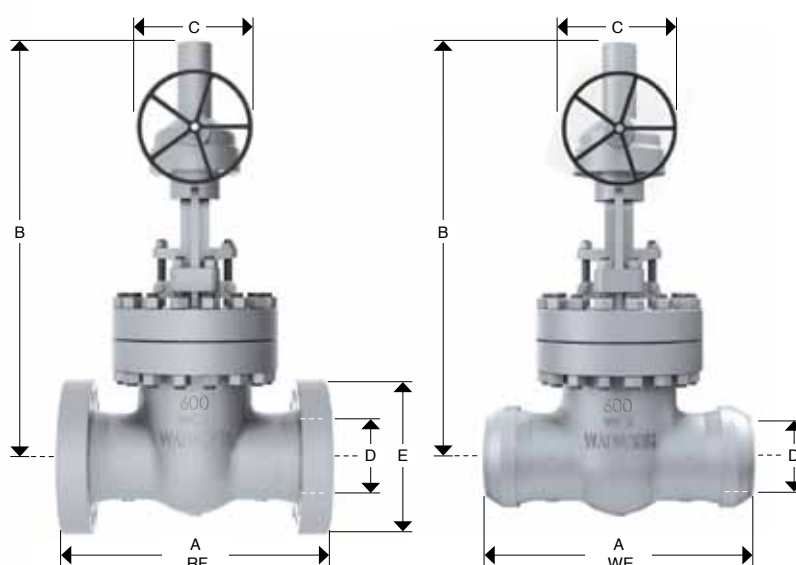


# CAST STEEL GATE VALVES, CLASS 600 (GEAR OPERATED)

## Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- Size 24" and 36", supplied with gear operator as standard.
- Flange Dimensions 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<br>Nominal<br>Diameter | mm | 508    | 610    | 762    | 914    |
|--------------------------|----|--------|--------|--------|--------|
|                          | in | 20     | 24     | 30     | 36     |
| A                        | mm | 1,194  | 1,397  | 1,651  | 2,083  |
|                          | in | 47     | 55     | 65     | 82     |
| A<br>(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<br>5232RF/RTJ     | Kg | 3000   | 4300   | 9890   | 14000  |
|                          | lb | 6600   | 9460   | 21758  | 30800  |
| Weight<br>5232WE         | Kg | 2705   | 3901   | 8406   | 11900  |
|                          | lb | 5951   | 8582   | 18493  | 26180  |



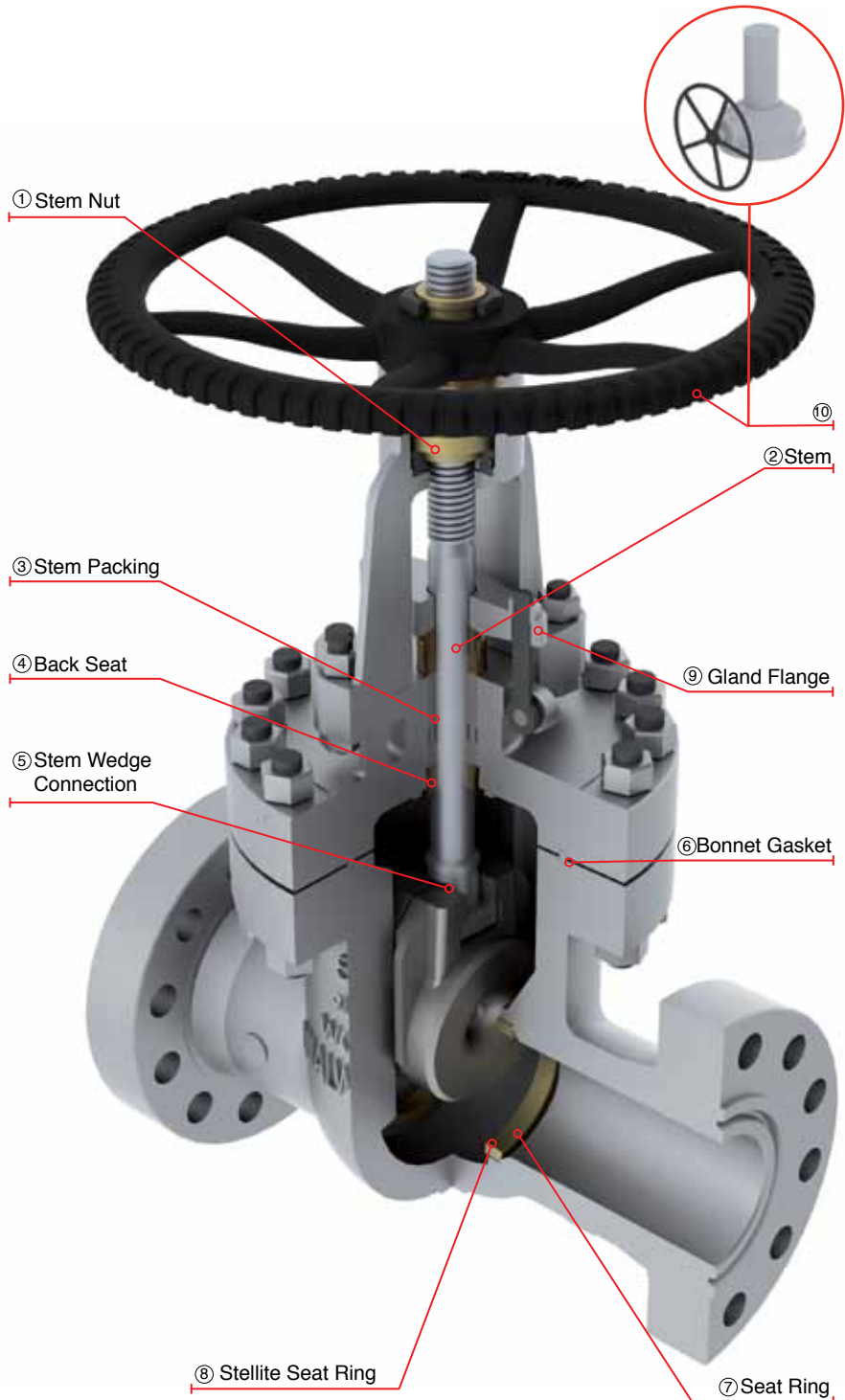
# CAST STEEL GATE VALVES CLASS 900

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 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 Stellite 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

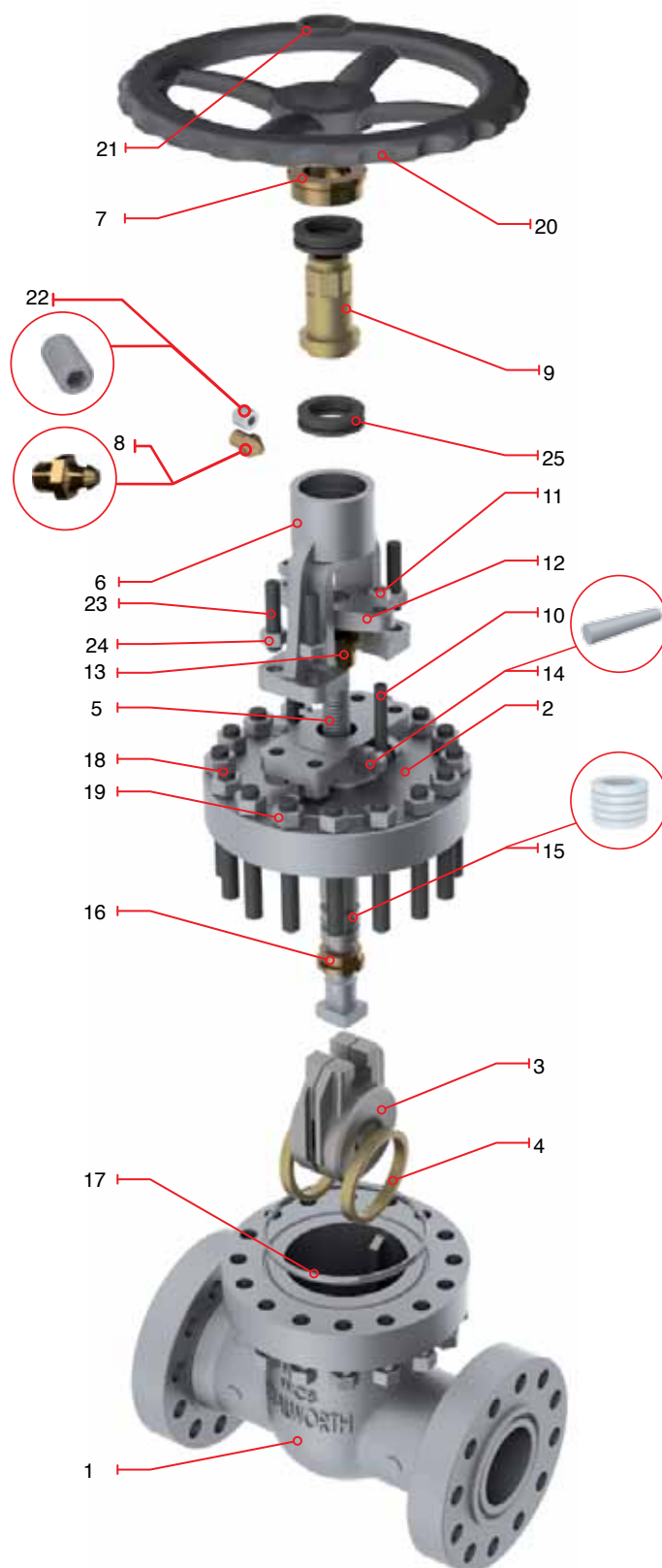
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- Size 2" and 16" supplied with Handwheel as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with Bearing: 4" and larger

| 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

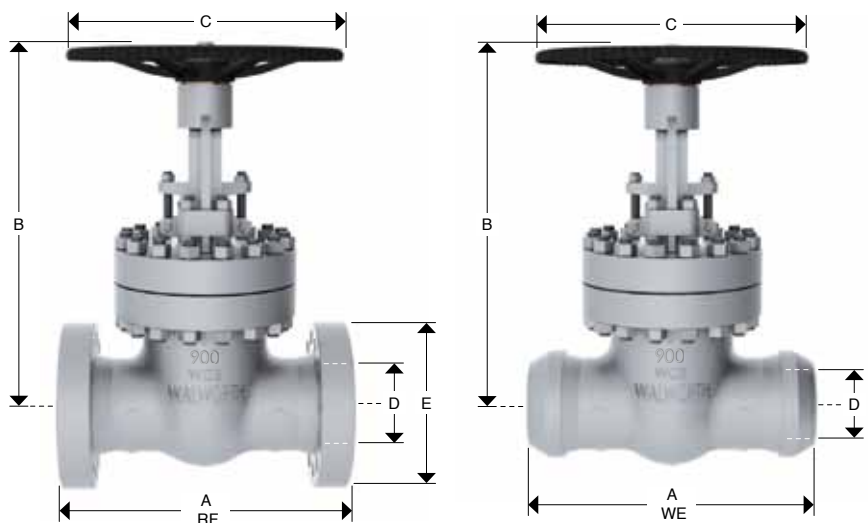
## (HANDWHEEL OPERATED)



### Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- 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<br>Nominal<br>Diameter | mm | 76     | 102    | 127    | 152     | 203    | 254    | 305    |
|--------------------------|----|--------|--------|--------|---------|--------|--------|--------|
|                          | in | 3      | 4      | 5      | 6       | 8      | 10     | 12     |
| A<br>(RF and WE)         | mm | 381    | 457    | 559    | 610     | 737    | 838    | 965    |
|                          | in | 15     | 18     | 22     | 24      | 29     | 33     | 38     |
| A<br>(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<br>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<br>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

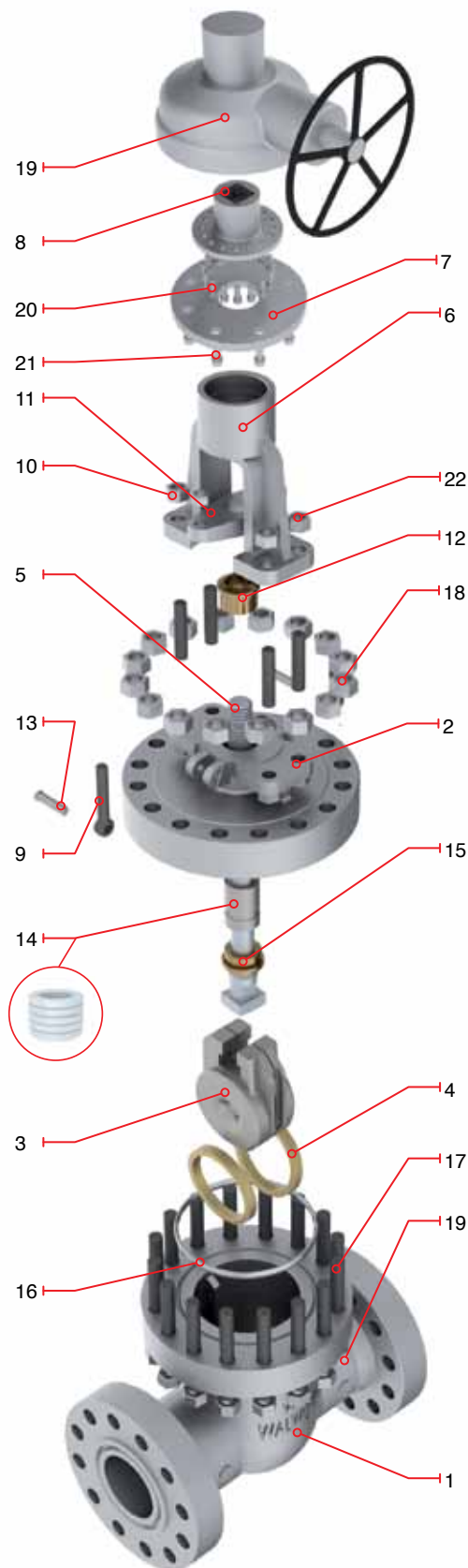
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- Size 18" to 24" supplied with Gear operator as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with Bearing: 4" and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



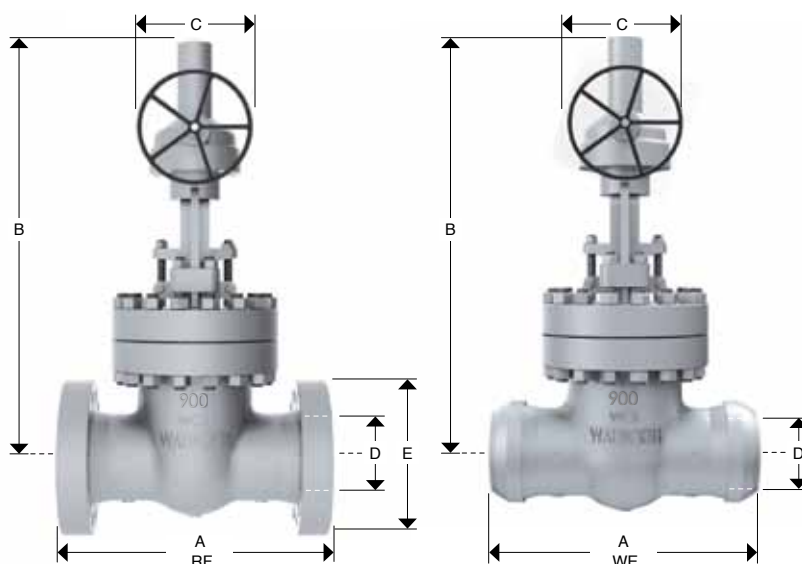
# CAST STEEL GATE VALVES, CLASS 900

## (GEAR OPERATED)

### Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- 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<br>Nominal<br>Diameter | mm | 356    | 406    | 457  | 508    | 610   |
|--------------------------|----|--------|--------|------|--------|-------|
|                          | in | 14     | 16     | 18   | 20     | 24    |
| A<br>(RF and WE)         | mm | 1029   | 1130   | 1219 | 1321   | 1549  |
|                          | in | 40 1/2 | 44 1/2 | 48   | 52     | 61    |
| A<br>(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<br>5247RF/RTJ     | Kg | 2778   | 3459   | 4370 | 6300   | 8410  |
|                          | lb | 6111.6 | 7609.8 | 9614 | 13860  | 18502 |
| Weight<br>5247WE         | Kg | 2472   | 3079   | 3889 | 5607   | 7485  |
|                          | lb | 5439   | 6773   | 8556 | 12335  | 16467 |



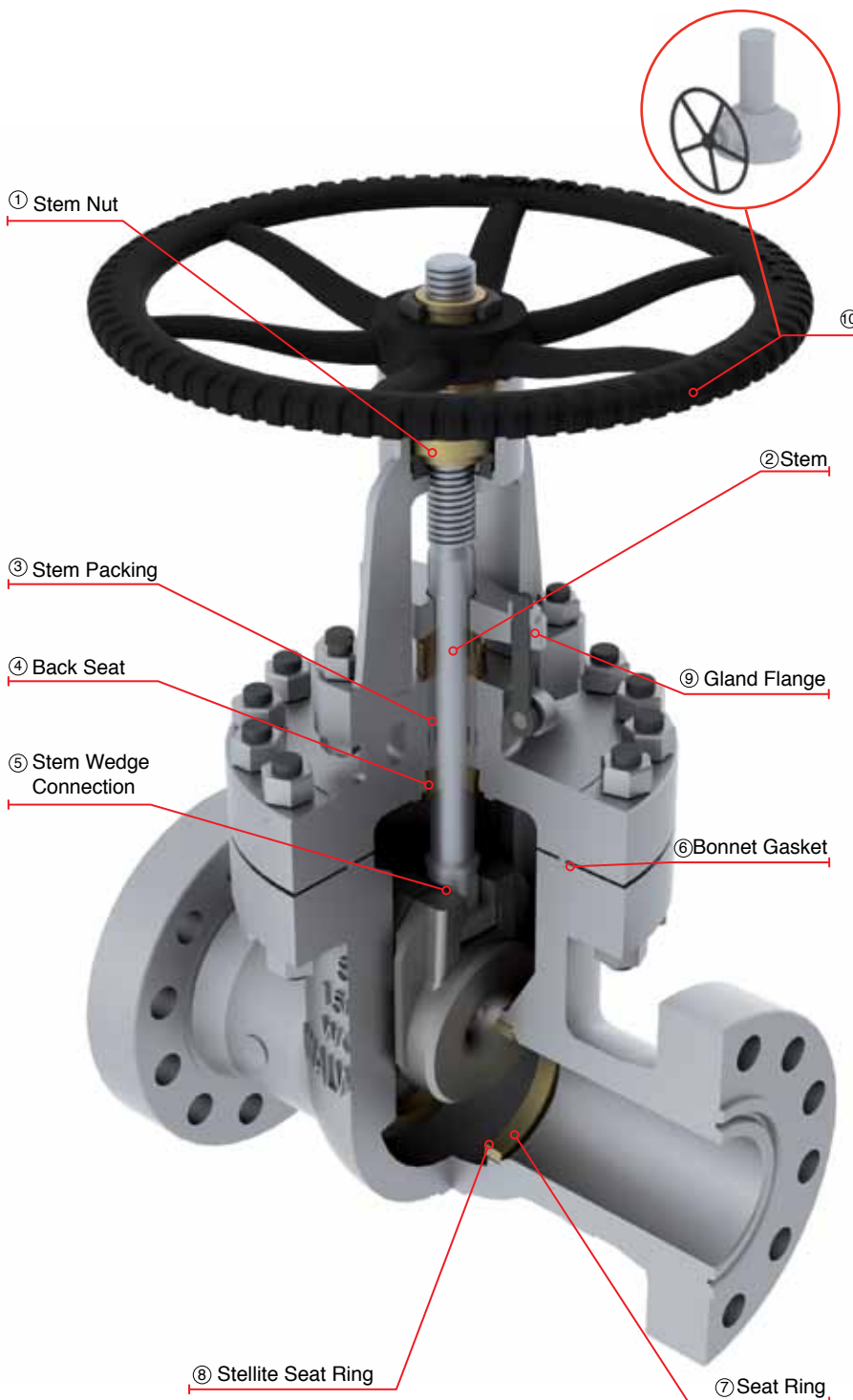
# CAST STEEL GATE VALVES CLASS 1500

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 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 Stellite 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

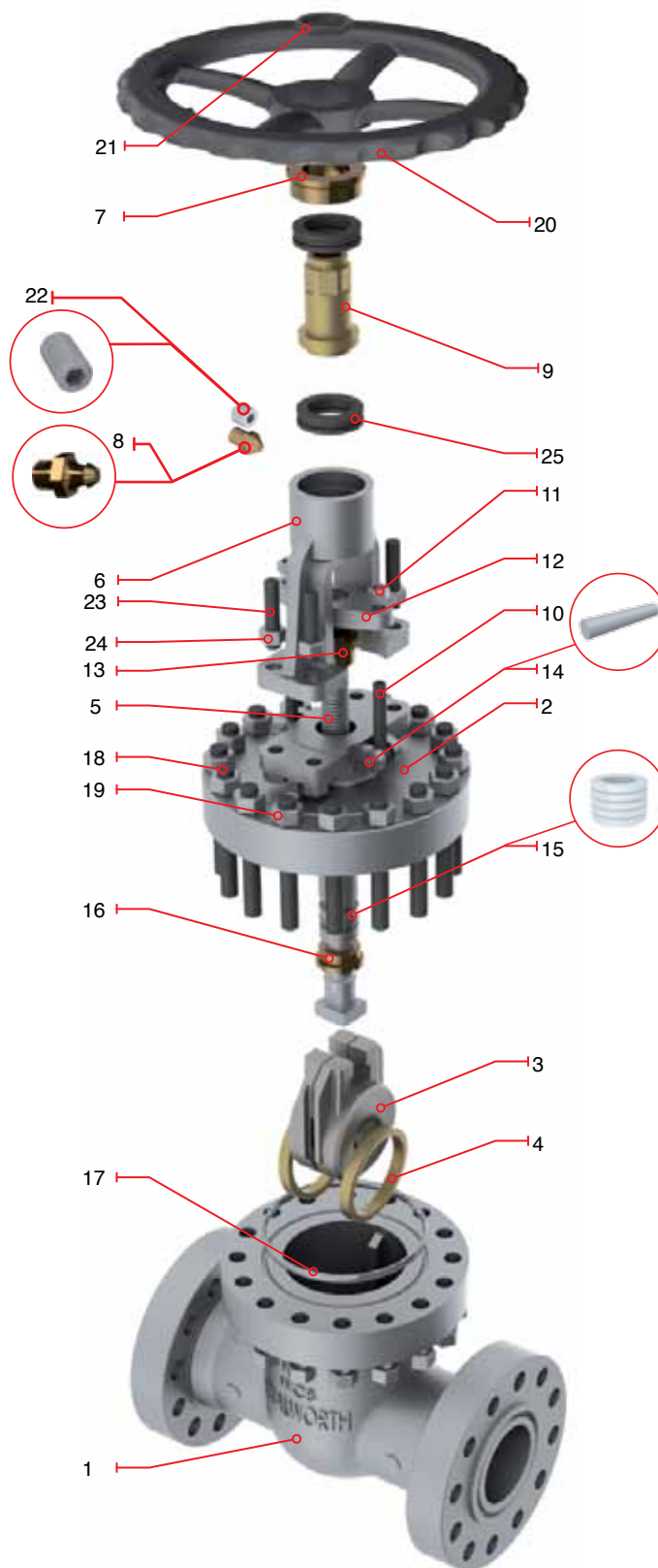
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- Stem Nut with bearings -Size 4" and larger
- Size 2" to 16" Normally Supplied with Handwheel as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions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

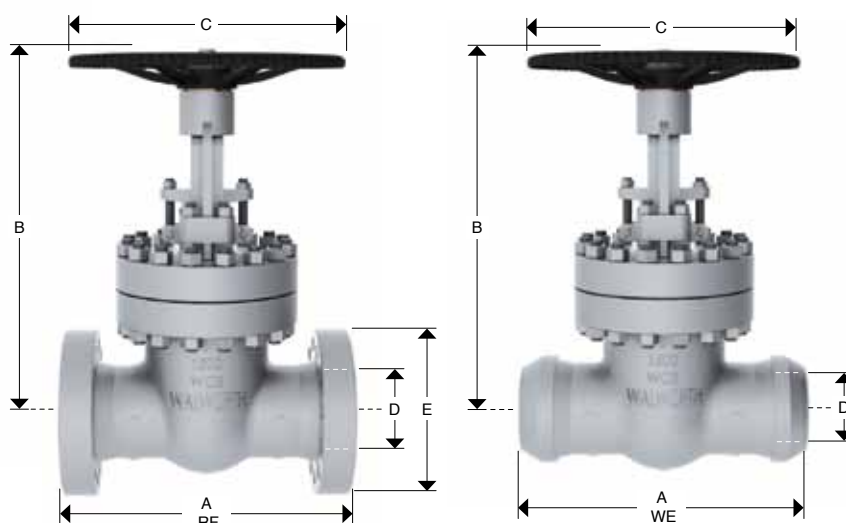
## (HANDWHEEL OPERATED)



### Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- 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<br>Nominal<br>Diameter | mm | 51     | 64     | 76     | 102    | 127    | 152    | 203    | 254    | 305    |
|--------------------------|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                          | in | 2      | 2 1/2  | 3      | 4      | 5      | 6      | 8      | 10     | 12     |
| A<br>(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<br>(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<br>5262RF/RTJ     | Kg | 78.5   | 99     | 140    | 209    | 510    | 523    | 893    | 2010   | 3080   |
|                          | lb | 173    | 218    | 308    | 460    | 1122   | 1151   | 1965   | 4422   | 6776   |
| Weight<br>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

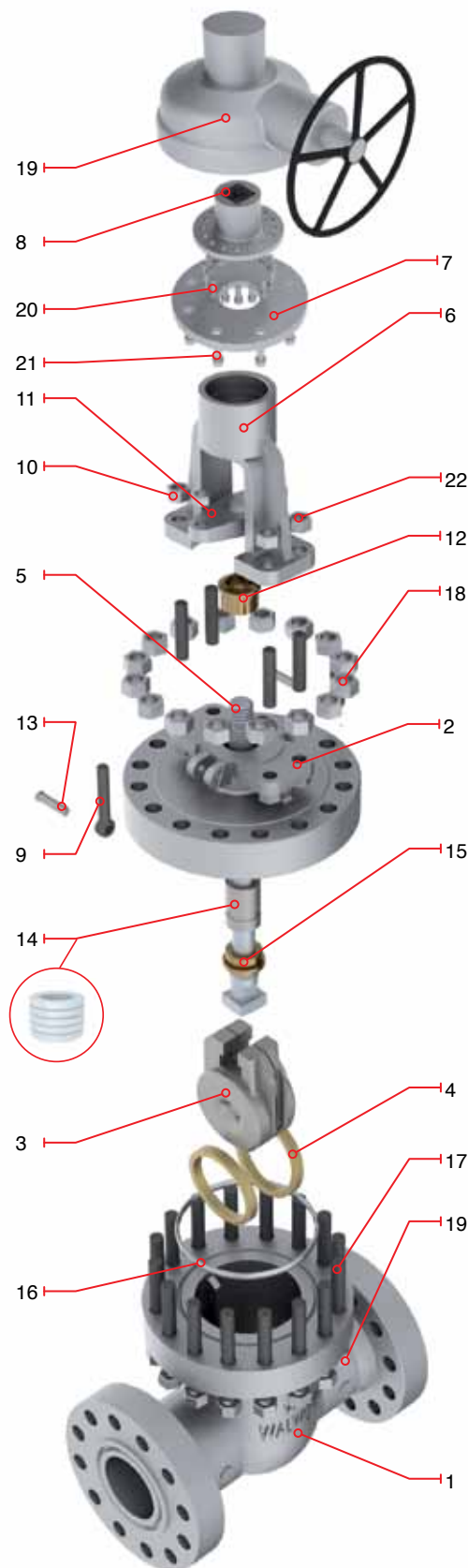
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- Size 18" to 24" Normally Supplied with gear box
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with bearings: Size 4" and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

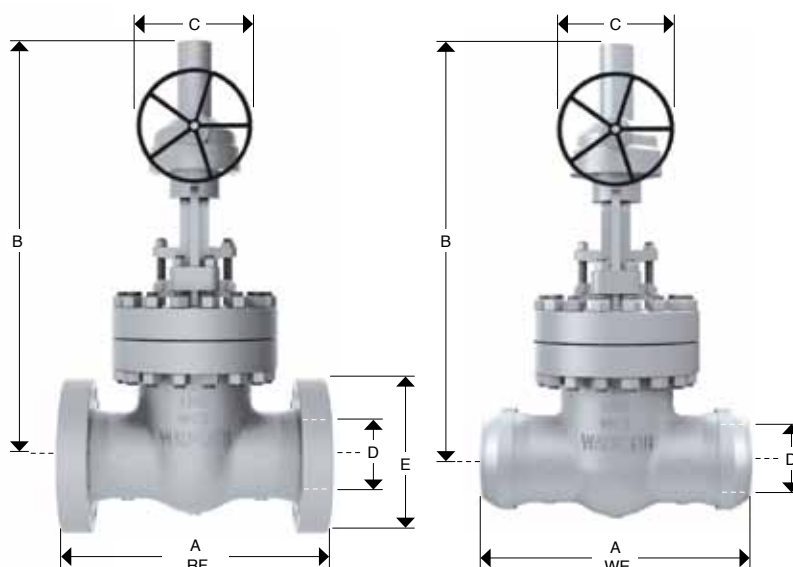


# CAST STEEL GATE VALVES, CLASS 1500 (GEAR OPERATED)

## Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge as standard
- 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<br>Nominal<br>Diameter | mm | 356    | 406    | 457    | 508    | 610    |
|--------------------------|----|--------|--------|--------|--------|--------|
|                          | in | 14     | 16     | 18     | 20     | 24     |
| A<br>(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<br>(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<br>5262RF         | Kg | 4480   | 5110   | 7105   | 9000   | 11500  |
|                          | lb | 9856   | 11242  | 15631  | 19800  | 25300  |
| Weight<br>5262WE         | Kg | 3823   | 4270   | 5969   | 8100   | 10350  |
|                          | lb | 8428   | 9413   | 13132  | 17820  | 22770  |



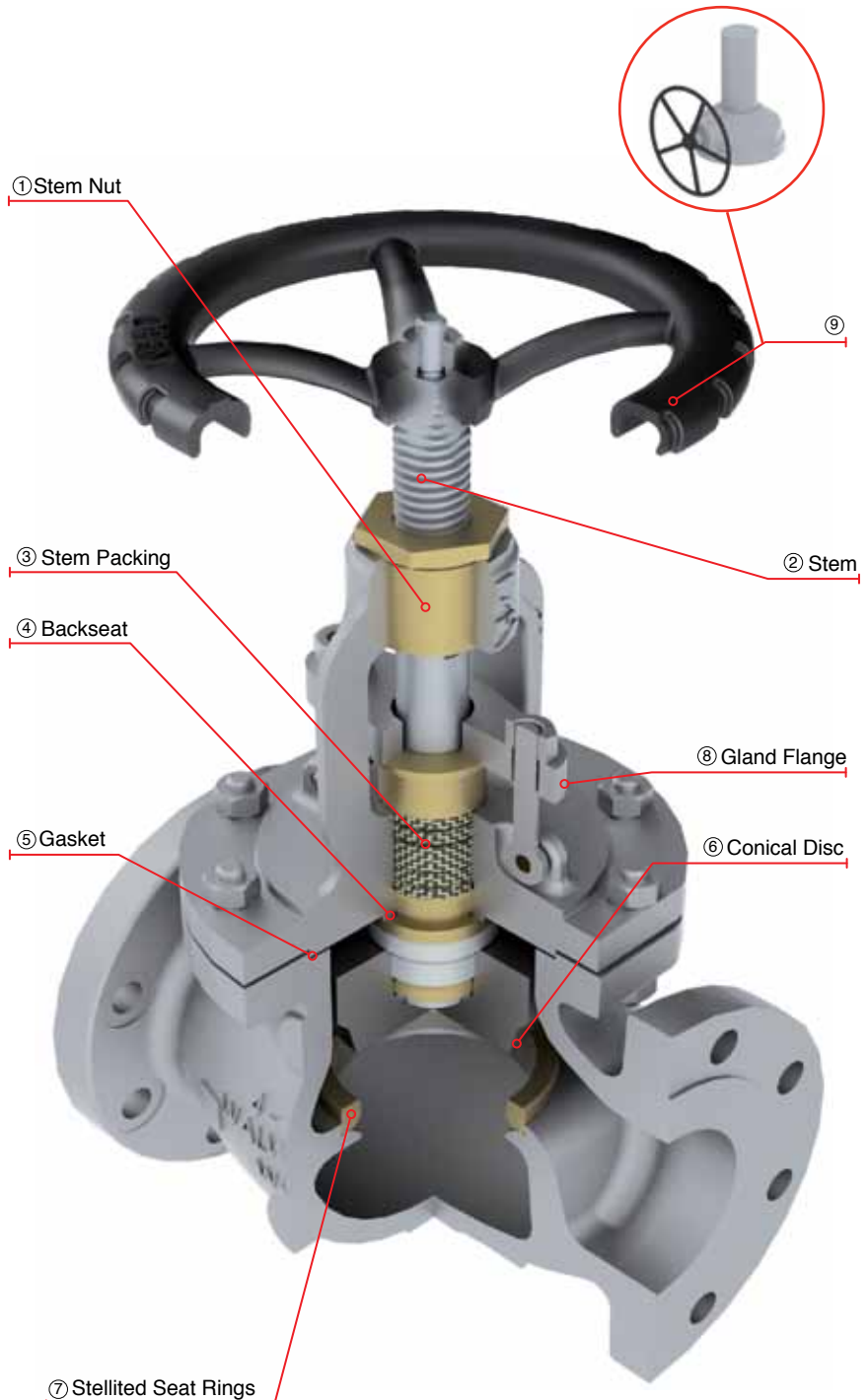
# CAST STEEL GLOBE VALVES CLASS 150

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

## DESIGN FEATURES

- Globe valves design in accordance with API-623
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- 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 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
- 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 Rings 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

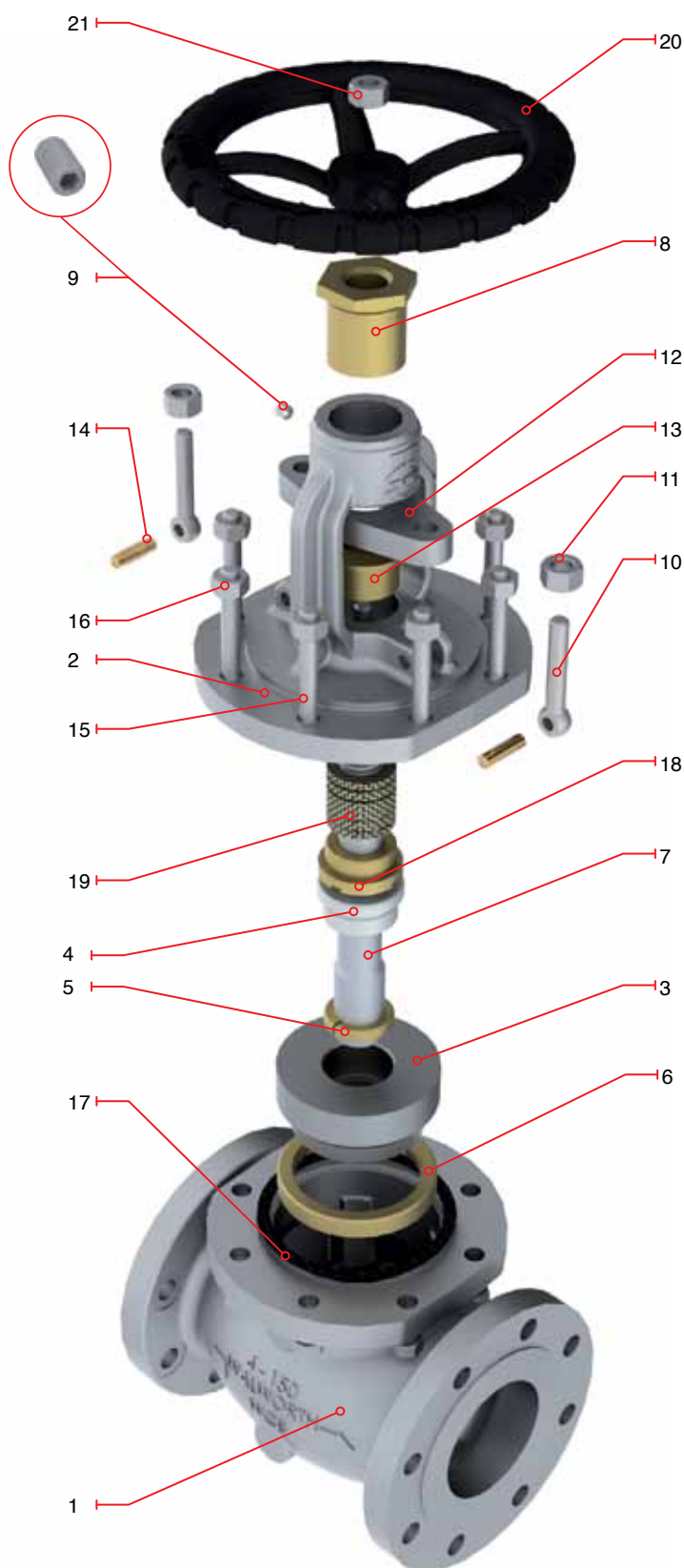
- Design in accordance with API-623
- Rising Stem and Handwheel
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 14" and larger
- Size 2" to 12" Handwheel Operated as standard

| 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        | Spiral Stainless 304/Graphite |
| 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

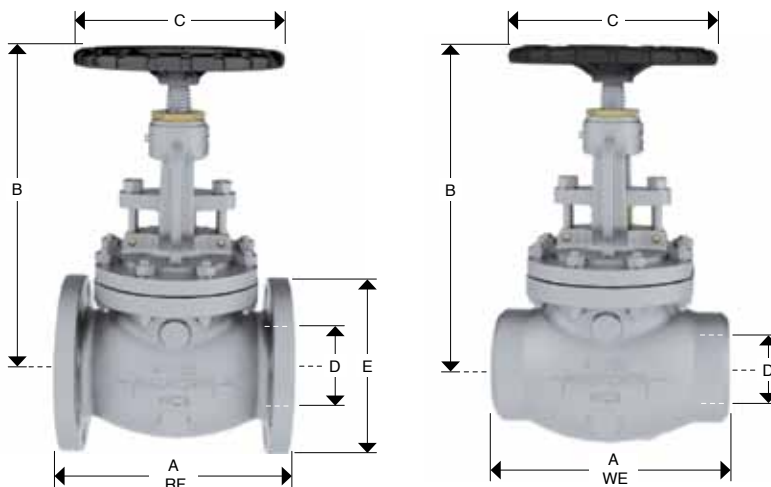
## (HANDWHEEL OPERATED)



### Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 51       | 64      | 76    | 102    | 152     | 203     | 254     | 305      |
|--------------------------|----|----------|---------|-------|--------|---------|---------|---------|----------|
|                          | in | 2        | 2 1/2   | 3     | 4      | 6       | 8       | 10      | 12       |
| A<br>(RF and WE)         | mm | 203      | 216     | 241   | 292    | 406     | 495     | 622     | 699      |
|                          | 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.

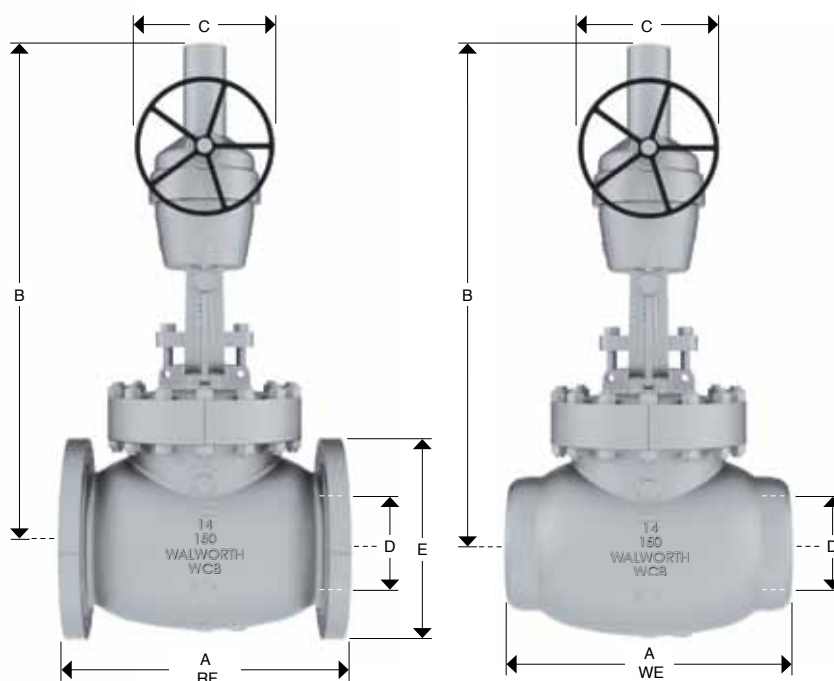


# CAST STEEL GLOBE VALVES, CLASS 150 (GEAR OPERATED)

## Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 356  | 406    | 457    | 508    | 610    |
|--------------------------|----|------|--------|--------|--------|--------|
|                          | in | 14   | 16     | 18     | 20     | 24     |
| A<br>(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<br>5275RF         | mm | 530  | 678    | 998    | 1097   | 1613   |
|                          | in | 1166 | 1492   | 2196   | 2413.4 | 3548.6 |
| Weight<br>5275WE         | Kg | 472  | 603    | 888    | 976    | 1436   |
|                          | lb | 1038 | 1328   | 1954   | 2148   | 3158   |

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



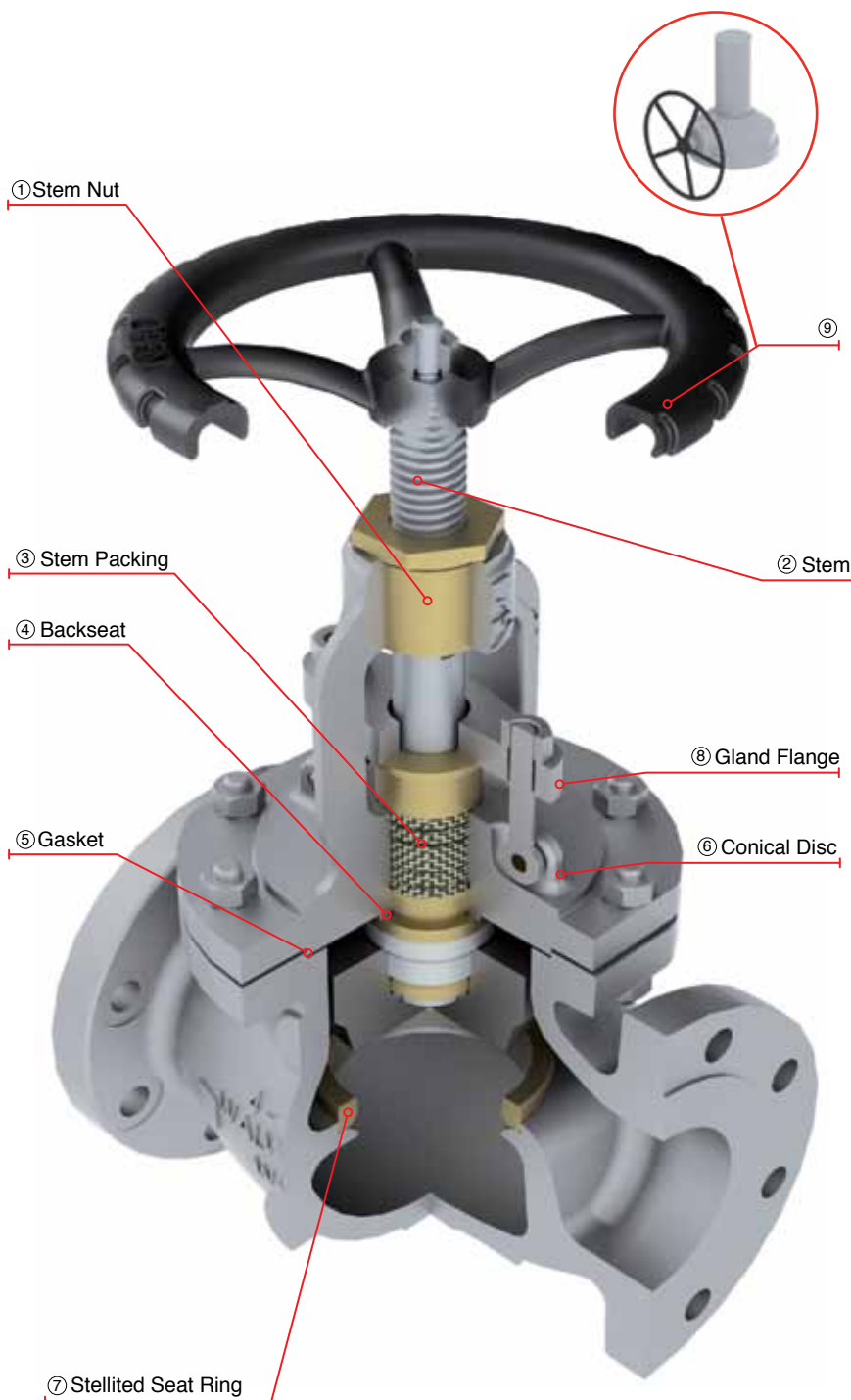
# CAST STEEL GLOBE VALVES CLASS 300

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

## DESIGN FEATURES

- Globe valves design in accordance with API-623
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- 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 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
- 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 Stellite 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

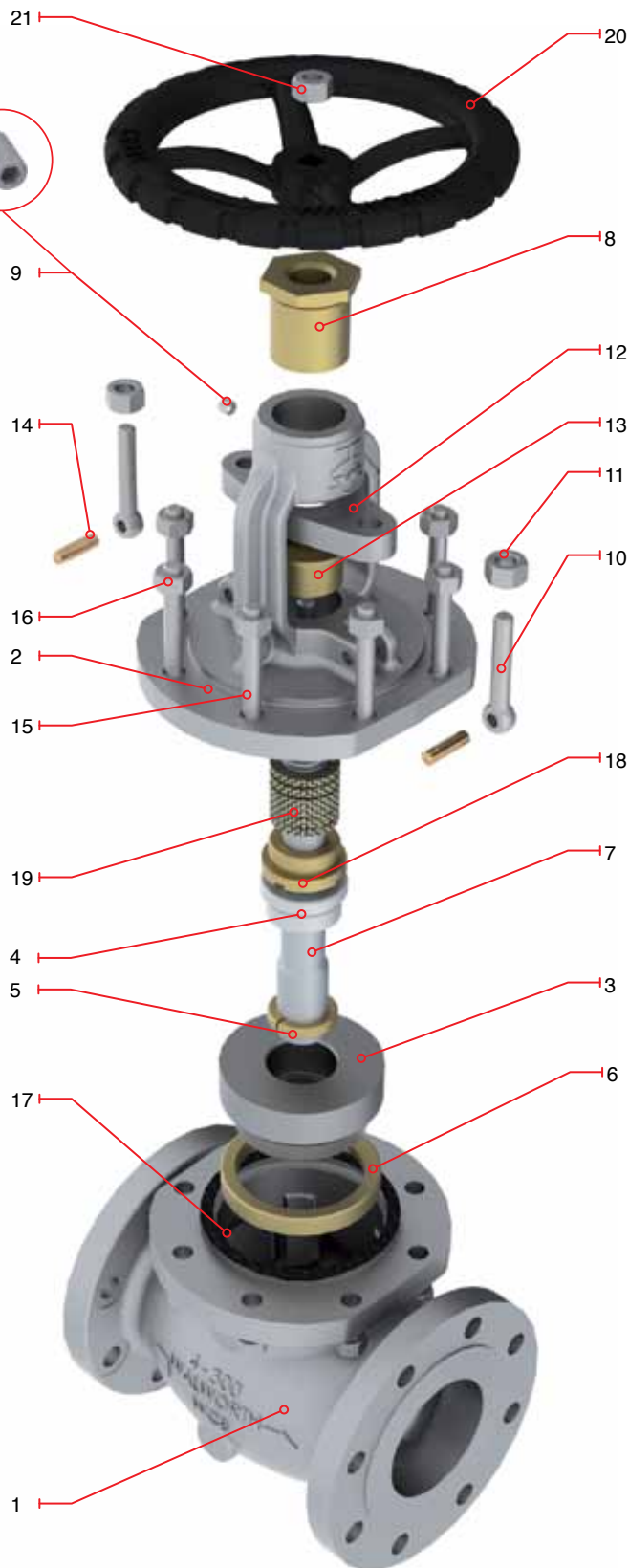
- Design in accordance with API-623
- Rising Stem and Handwheel: 6" and smaller
- Rising Stem and Fixed Handwheel: 8" and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8" and larger
- Size 2" to 12" Handwheel 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

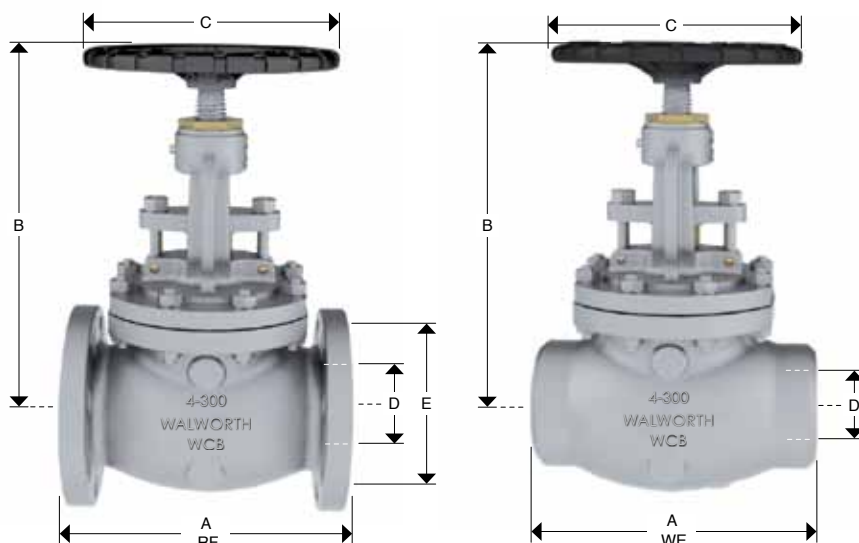
## (HANDWHEEL OPERATED)



### Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 51      | 64     | 76      | 102    | 152     | 203    | 254    | 305     |
|--------------------------|----|---------|--------|---------|--------|---------|--------|--------|---------|
|                          | in | 2       | 2 1/2  | 3       | 4      | 6       | 8      | 10     | 12      |
| A<br>(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<br>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<br>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

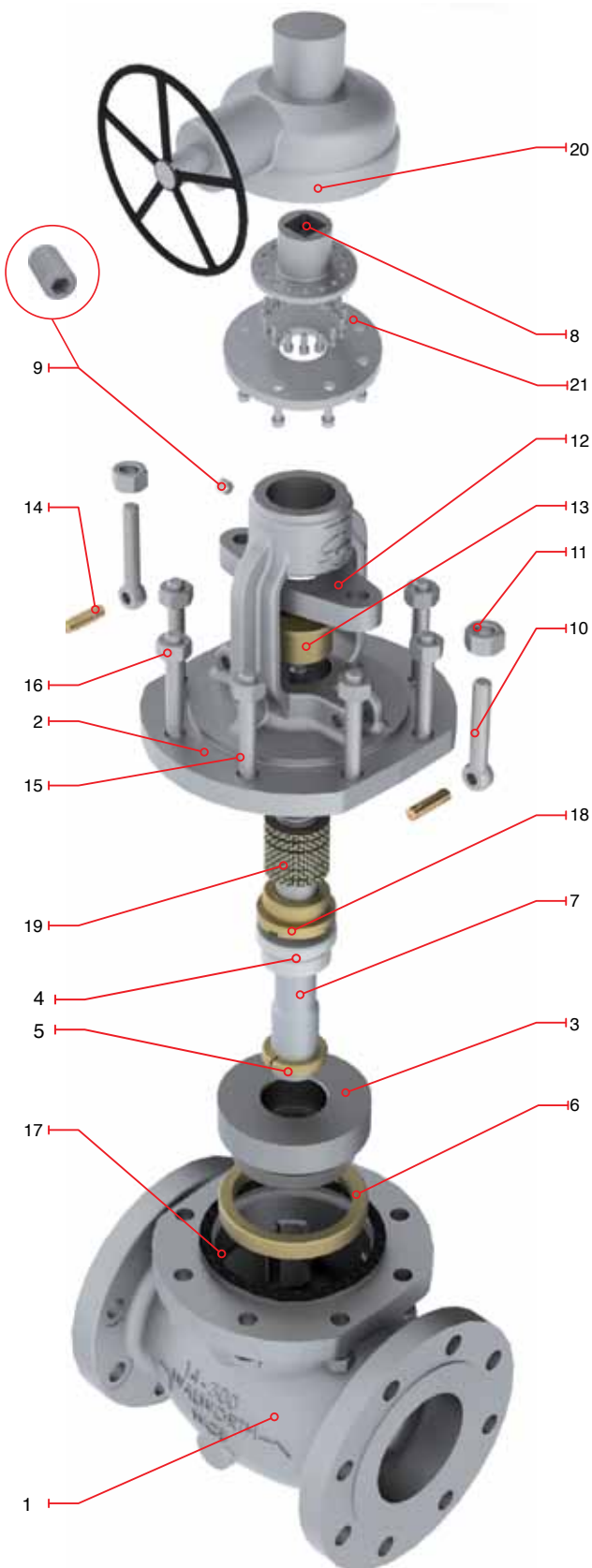
- Design in accordance with API-623
- Rising Stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8" and larger
- Size 14" and up Gear operated as standard

| 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        | Spiral Stainless 304/Graphite |
| 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

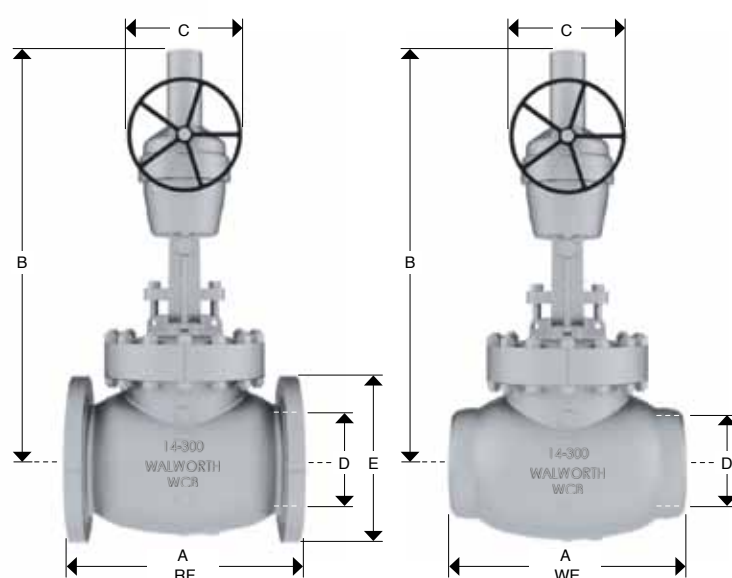


# CAST STEEL GLOBE VALVES, CLASS 300 (GEAR OPERATED)

## Design Features

- Design in accordance with with API-623
- 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<br>Nominal<br>Diameter | mm | 356    | 406    | 457    | 508    | 610    |
|--------------------------|----|--------|--------|--------|--------|--------|
|                          | in | 14     | 16     | 18     | 20     | 24     |
| A<br>(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<br>5281RF         | Kg | 787    | 1097   | 1907   | 2119   | 2338   |
|                          | lb | 1731.4 | 2413.4 | 4195   | 4662   | 5144   |
| Weight<br>5281WE         | Kg | 669    | 932    | 1678   | 1865   | 2057   |
|                          | lb | 1472   | 2051   | 3692   | 4102   | 4526   |

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



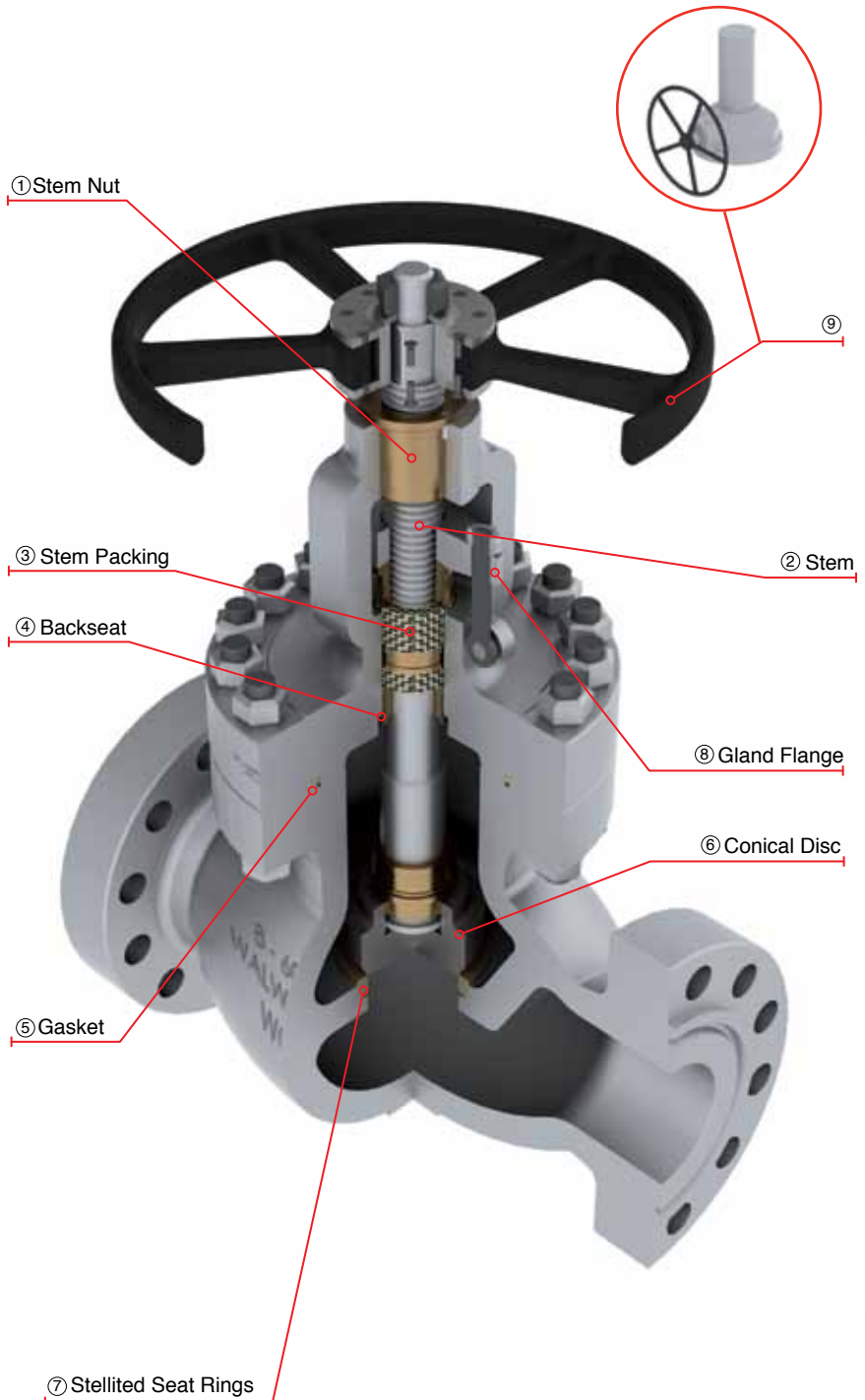
# CAST STEEL GLOBE VALVES CLASS 600

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

## DESIGN FEATURES

- Globe valves design in accordance with API-623
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- 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 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
- 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 Stellite Seat Rings 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

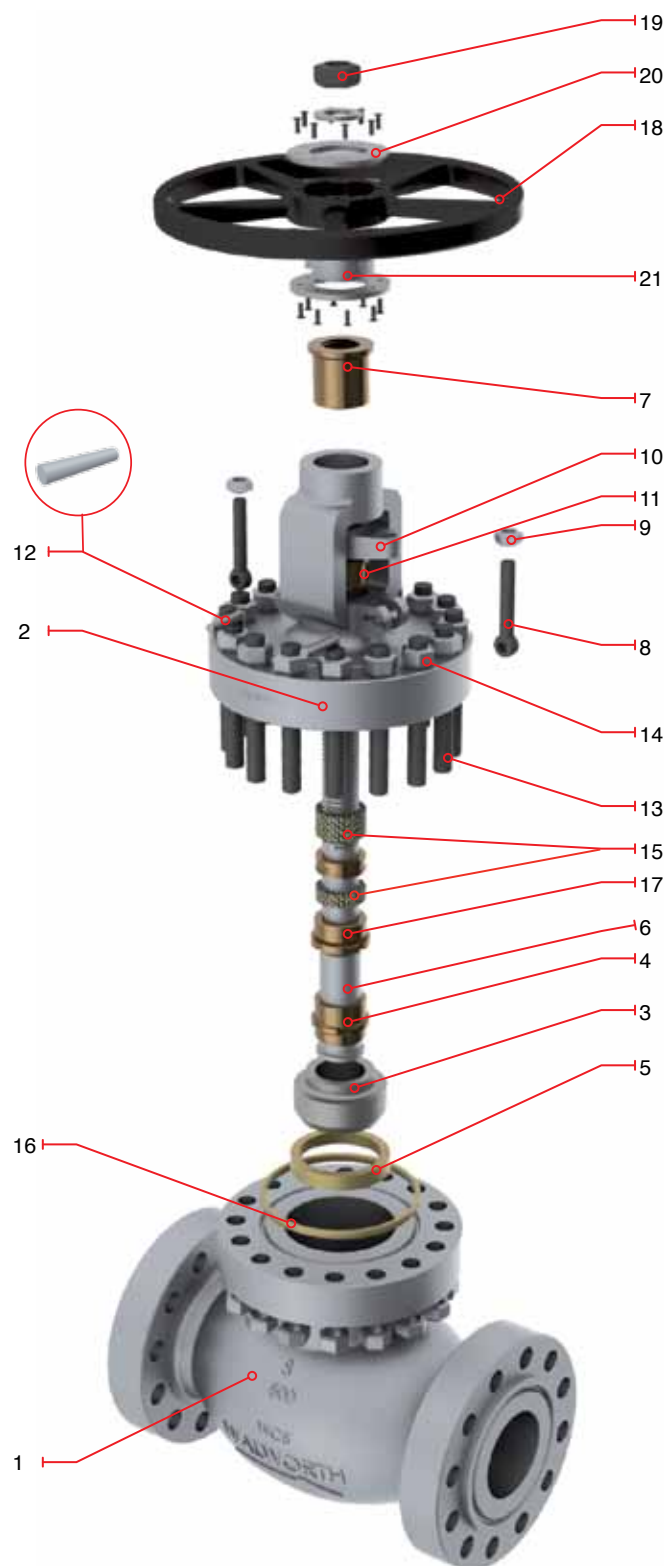
- Design in accordance with API-623
- Rising Stem and Handwheel: 2" to 6"
- Rising Stem and fixed handwheel 8" and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8" and larger
- Size 2" and 8" Handwheel operated 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



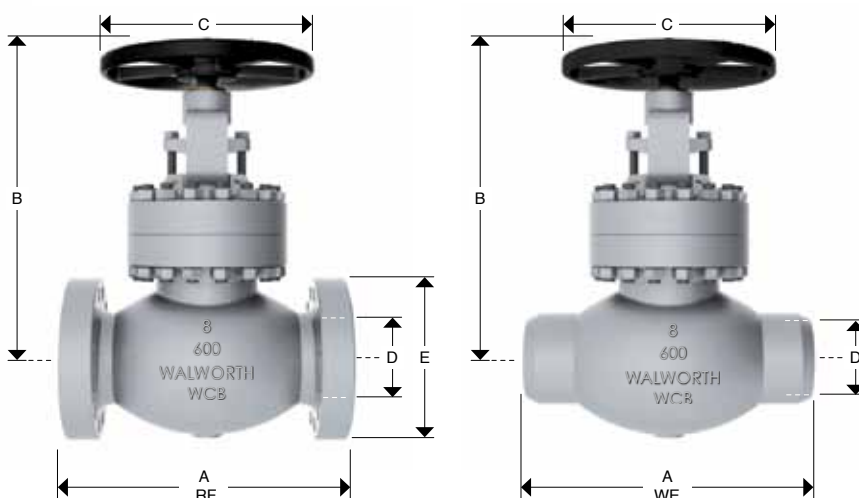
# CAST STEEL GLOBE VALVES, CLASS 600

## (HANDWHEEL OPERATED)

### Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 51     | 64     | 76     | 102    | 152    | 200    |
|--------------------------|----|--------|--------|--------|--------|--------|--------|
|                          | in | 2      | 2 1/2  | 3      | 4      | 6      | 8      |
| A<br>(RF and WE)         | mm | 292    | 330    | 356    | 432    | 559    | 660    |
|                          | in | 11 1/2 | 13     | 14     | 17     | 22     | 26     |
| A*<br>(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<br>5295RF         | Kg | 36     | 63     | 66     | 120    | 278    | 429    |
|                          | lb | 79     | 139    | 145    | 264    | 611    | 944    |
| Weight<br>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

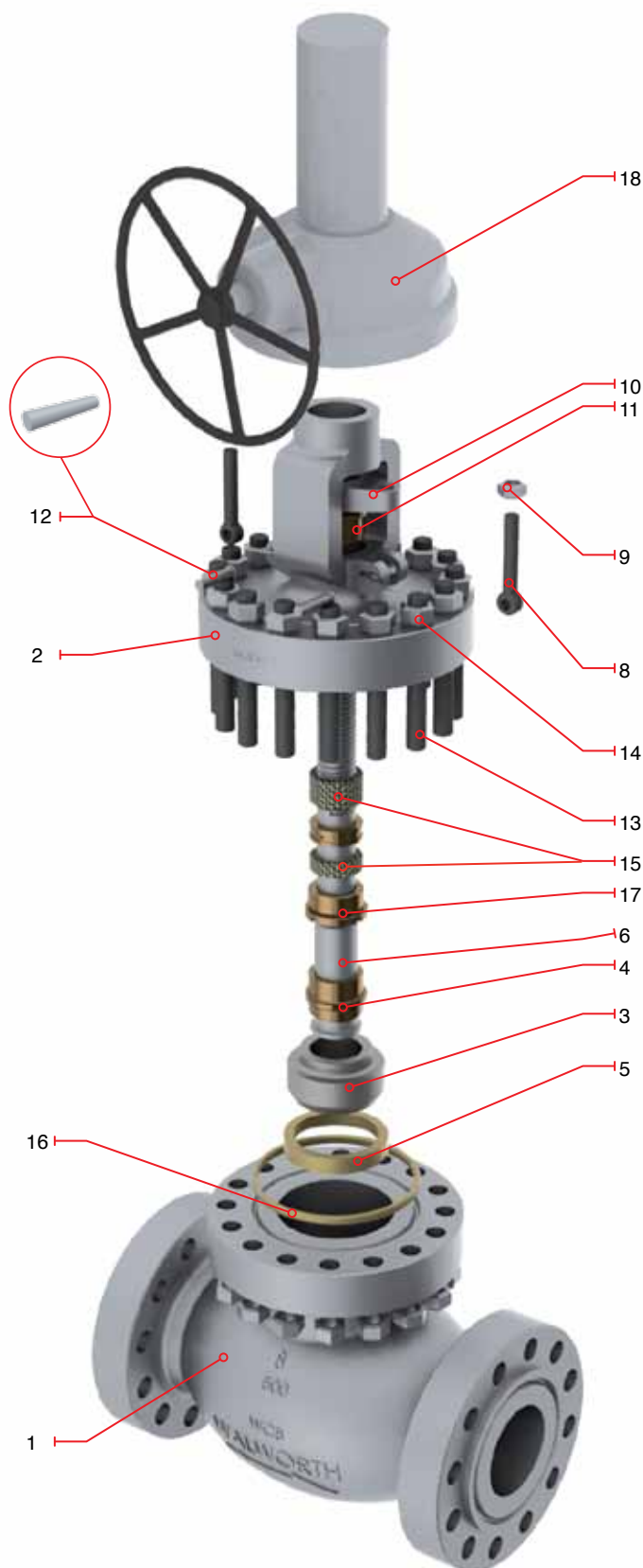
- Design in accordance with API-623
- Rising stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8" and larger
- Size 10" and up Gear operated as standard

| 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

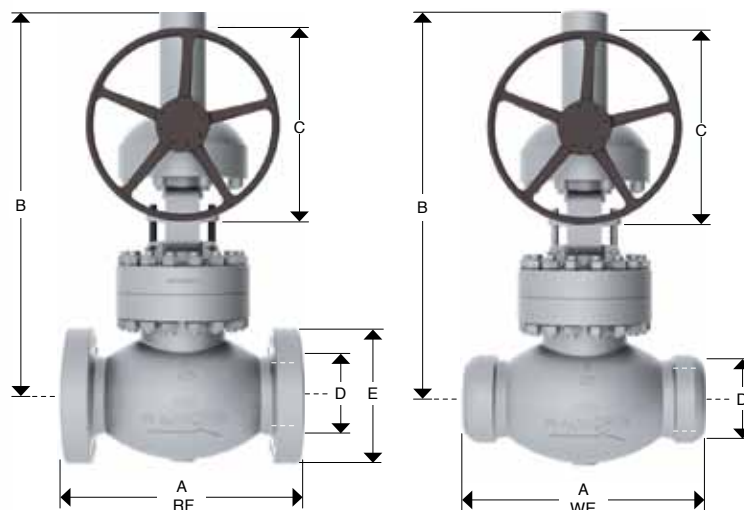
## (GEAR OPERATED)



### Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 254    | 305    | 356    | 406    | 457    | 508 | 610 |
|--------------------------|----|--------|--------|--------|--------|--------|-----|-----|
|                          | in | 10     | 12     | 14     | 16     | 18     | 20  | 24  |
| A<br>(RF and WE)         | mm | 787    | 838    | 889    | 991    | PCR    | PCR | PCR |
|                          | in | 31     | 33     | 35     | 39     | PCR    | PCR | PCR |
| A*<br>(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<br>5295RF         | Kg | 737    | 1194   | 1421   | 1899   | PCR    | PCR | PCR |
|                          | lb | 1621   | 2627   | 3126   | 4178   | PCR    | PCR | PCR |
| Weight<br>5295WE         | Kg | 649    | 1051   | 1322   | 1766   | PCR    | PCR | PCR |
|                          | lb | 1427   | 2312   | 2907   | 3885   | PCR    | PCR | PCR |

PCR = Per customer request

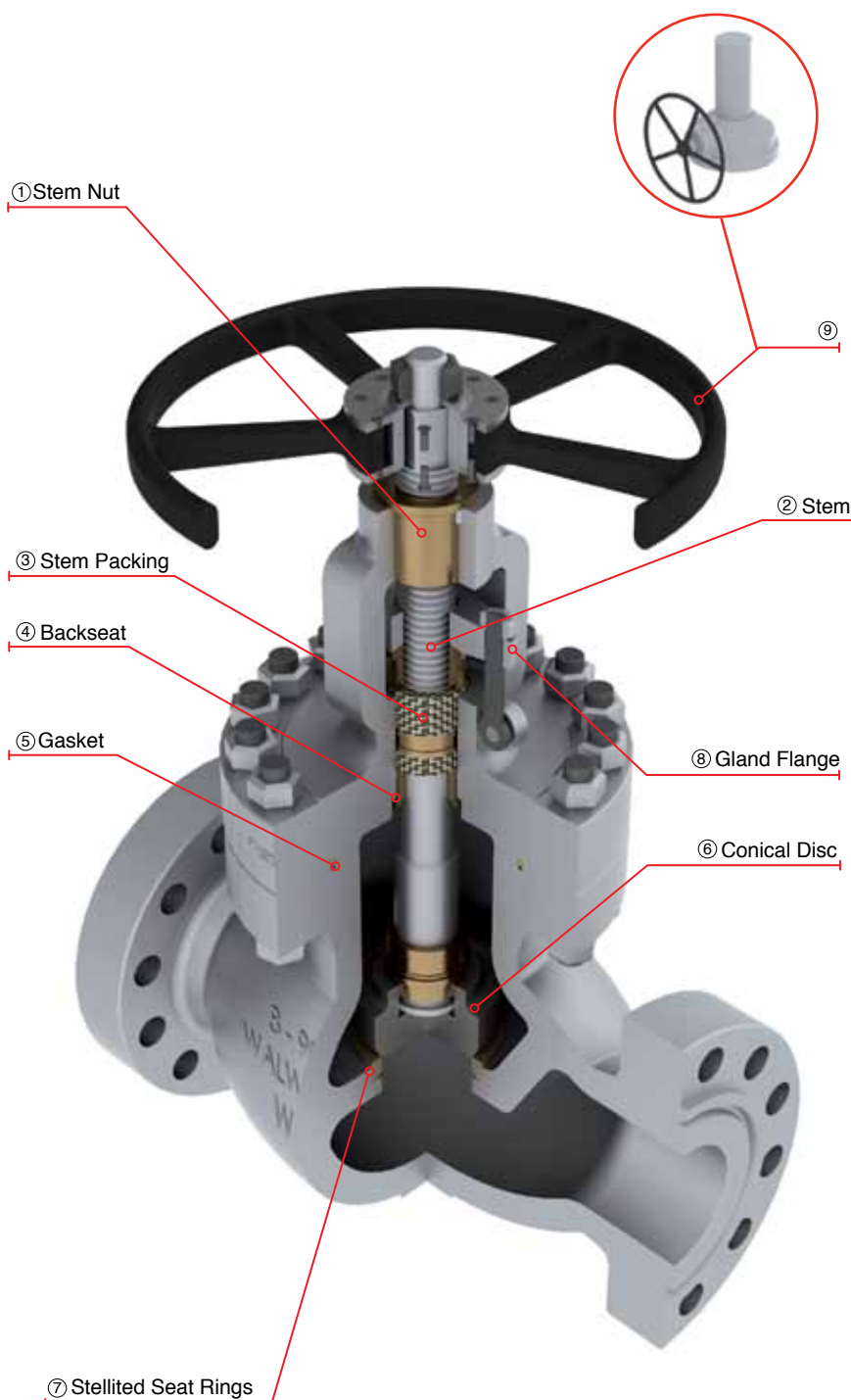
# CAST STEEL GLOBE VALVES CLASS 900

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

## DESIGN FEATURES

- Globe valves design in accordance with with API-623
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- 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 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
- 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 Stellite 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

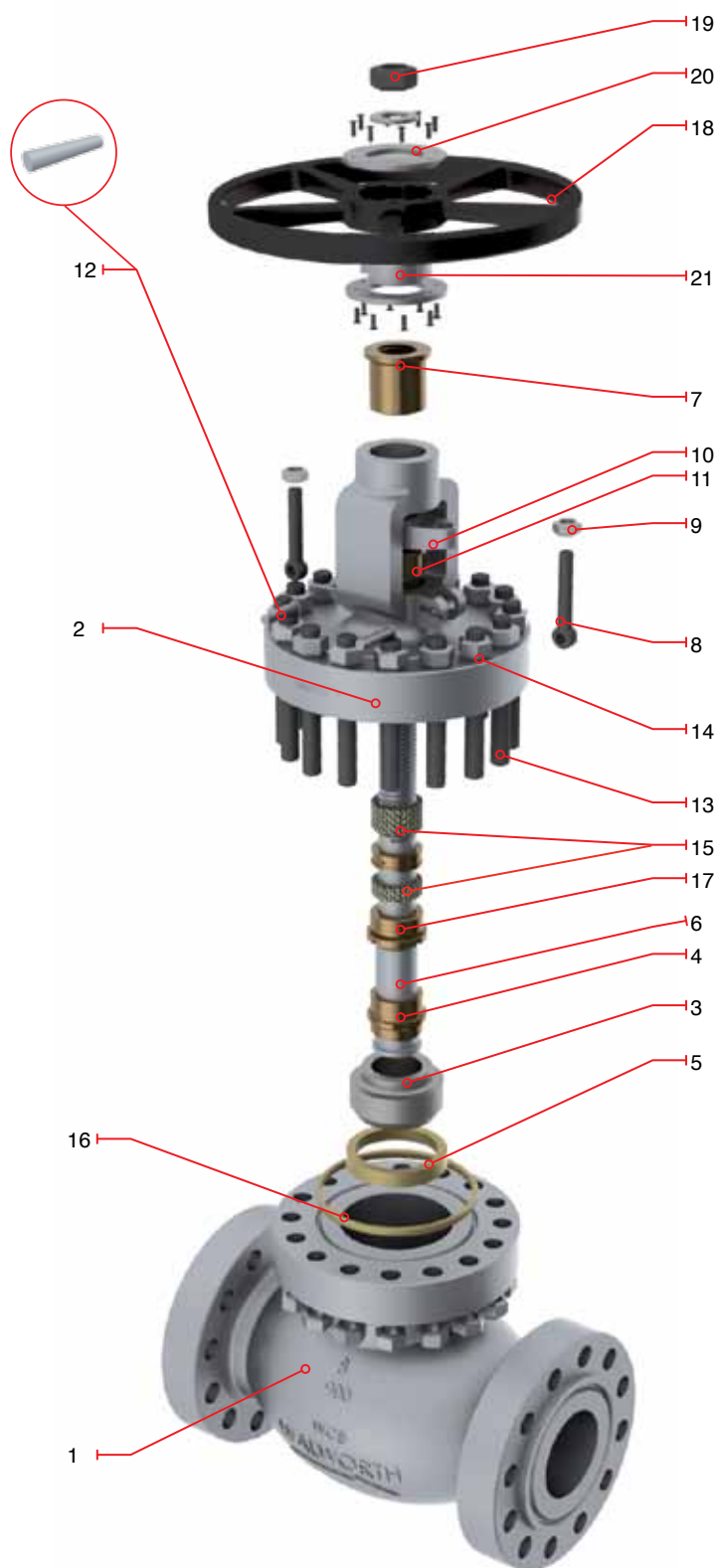
- Design in accordance with API-623
- Rising Stem and Handwheel: 2" to 3"
- Rising Stem and Fixed Handwheel: 4" and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with bearings 4" and larger
- Size 2" to 6" Handwheel operated 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

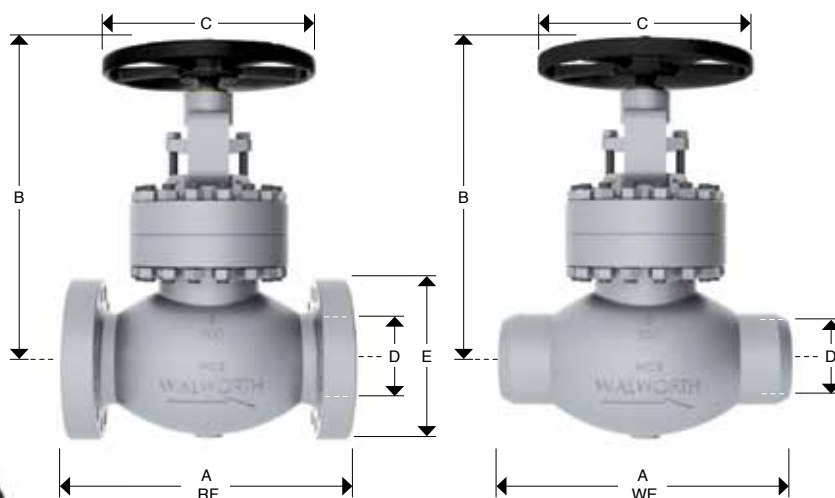


# CAST STEEL GLOBE VALVES, CLASS 900 (HANDWHEEL OPERATED)

## Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 76     | 102    | 152    |
|--------------------------|----|--------|--------|--------|
|                          | in | 3      | 4      | 6      |
| A<br>(RF and WE)         | mm | 381    | 457    | 610    |
|                          | in | 15     | 18     | 24     |
| A*<br>(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<br>5301RF         | Kg | 113    | 206    | 328    |
|                          | lb | 249    | 453    | 722    |
| Weight<br>5301WE         | Kg | 94     | 175    | 279    |
|                          | lb | 206    | 385    | 613    |

# CAST STEEL GLOBE VALVES, CLASS 900 (GEAR OPERATED)

## Design Features

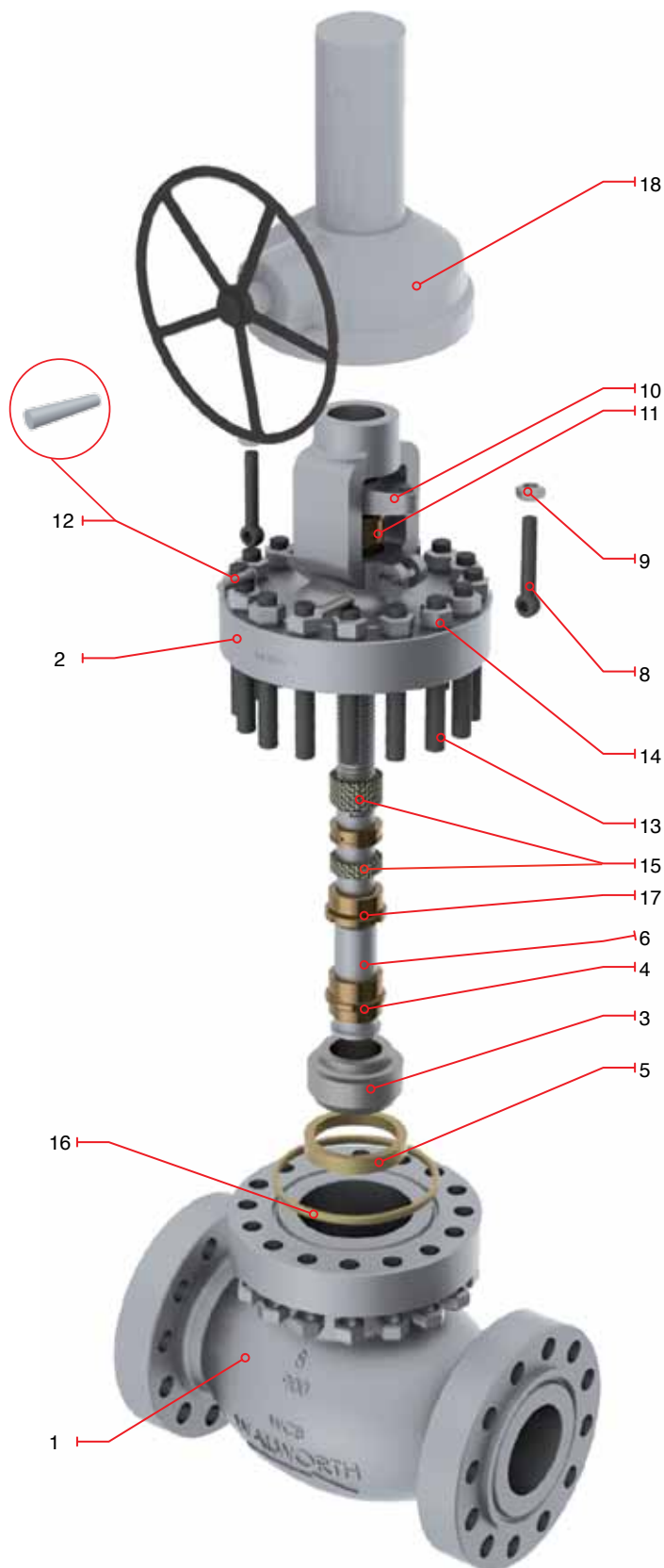
- Design in accordance with API-623
- Rising stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Size 8" and up Gear operated as standard

| 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

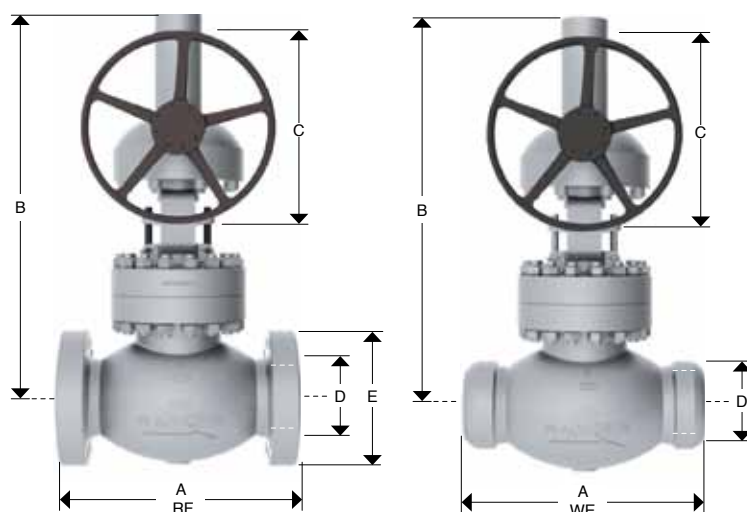
## (GEAR OPERATED)



### Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 203    | 254    | 305    | 356    | 406    | 457 | 508    | 610  |
|--------------------------|----|--------|--------|--------|--------|--------|-----|--------|------|
|                          | in | 8      | 10     | 12     | 14     | 16     | 18  | 20     | 24   |
| A<br>(RF and WE)         | mm | 737    | 838    | 965    | 1029   | PCR    | PCR | PCR    | PCR  |
|                          | in | 29     | 33     | 38     | 40 1/2 | PCR    | PCR | PCR    | PCR  |
| A*<br>(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<br>5301RF         | Kg | 593    | 1850   | 2998   | 2900   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 1305   | 4070   | 6596   | 6380   | PCR    | PCR | PCR    | PCR  |
| Weight<br>5301WE         | Kg | 504    | 1721   | 2788   | 2697   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 1109   | 3785   | 6134   | 5933   | PCR    | PCR | PCR    | PCR  |

PCR = Per customer request

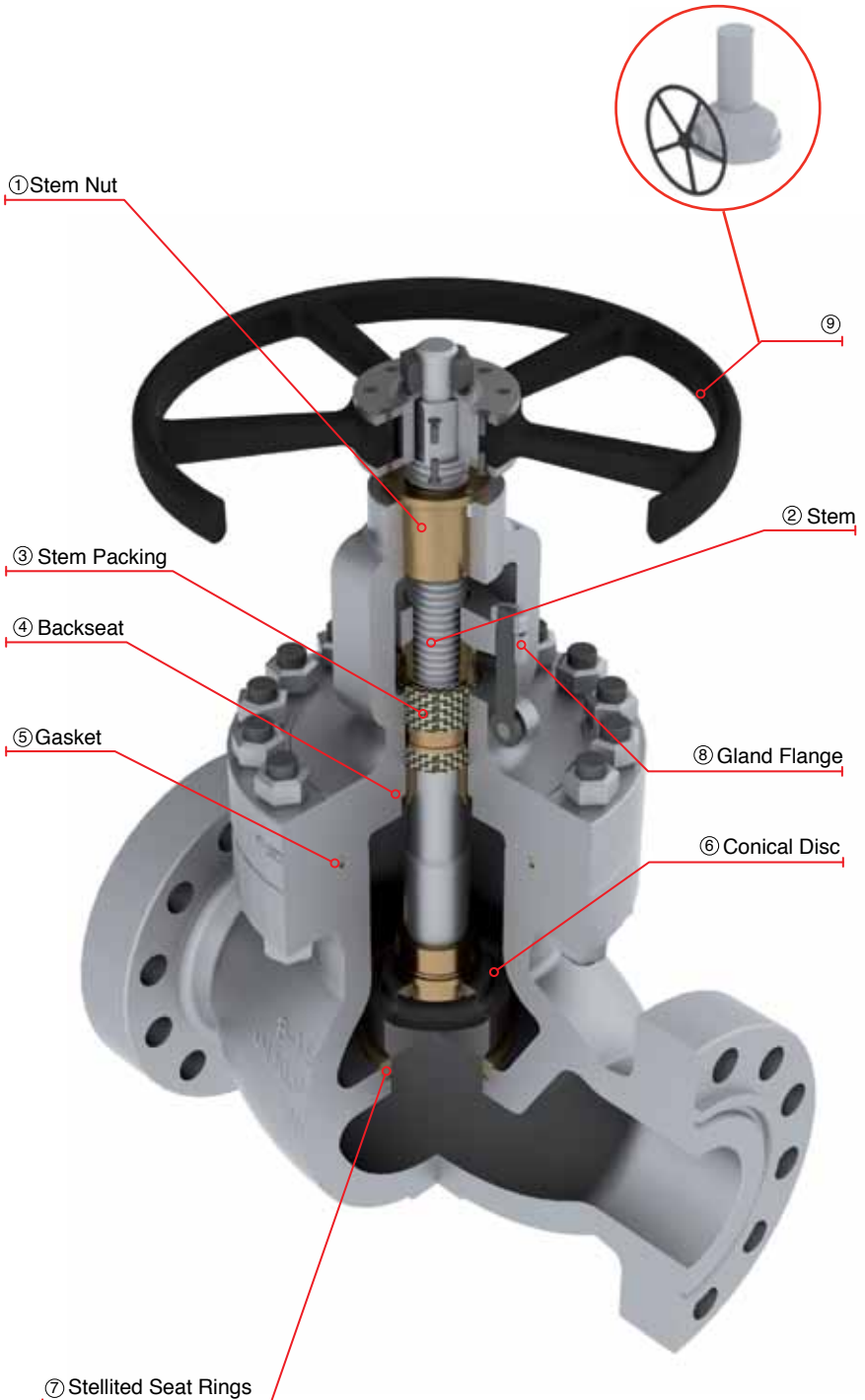
# CAST STEEL GLOBE VALVES CLASS 1500

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

## DESIGN FEATURES

- Globe valves design in accordance with with API-623
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- 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 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
- 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 Stellite 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

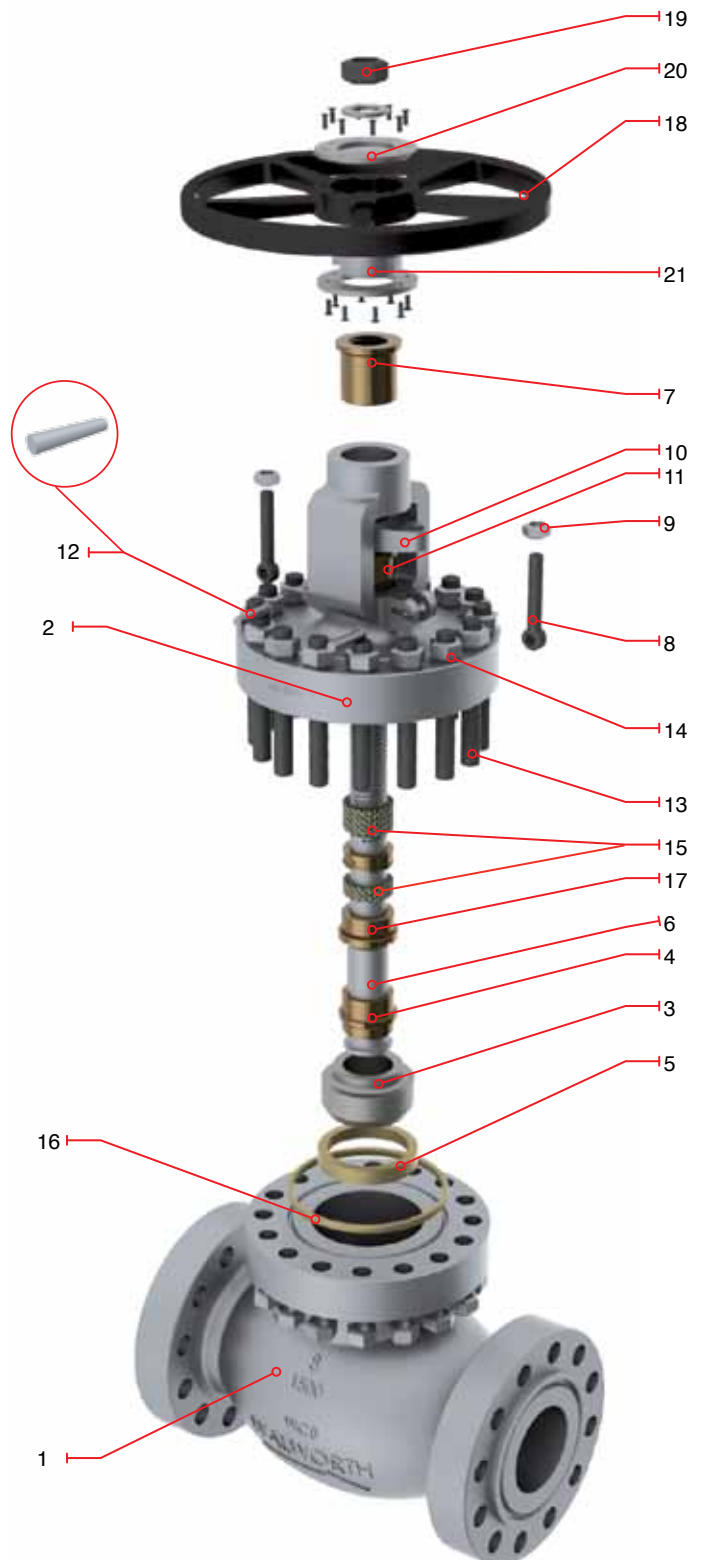
- Design in accordance with API-623
- Rising Stem and Handwheel: 2" and 2 1/2"
- Rising Stem and Fixed Handwheel: 3" and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Yoke with Bearings: 3" and larger
- Size 2" to 6" Handwheel 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

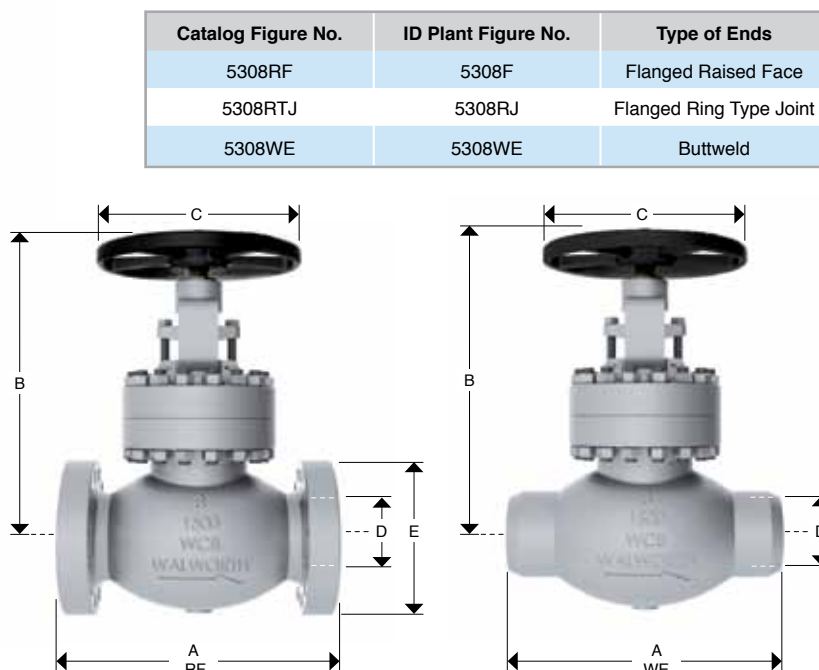


# CAST STEEL GLOBE VALVES, CLASS 1500

## (HANDWHEEL OPERATED)

### Design Features

- Design in accordance with API-623
- 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



### Dimensions and Weights

| D<br>Nominal<br>Diameter | mm | 51     | 64     | 76     | 102    | 152    |
|--------------------------|----|--------|--------|--------|--------|--------|
|                          | in | 2      | 2 1/2  | 3      | 4      | 6      |
| A<br>(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*<br>(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<br>5308RF         | Kg | 82     | 121    | 161    | 252    | 574    |
|                          | lb | 180    | 266    | 354    | 554    | 1262   |
| Weight<br>5308WE         | Kg | 68     | 100    | 134    | 214    | 487    |
|                          | lb | 150    | 221    | 294    | 471    | 1072   |

# CAST STEEL GLOBE VALVES, CLASS 1500 (GEAR OPERATED)

## Design Features

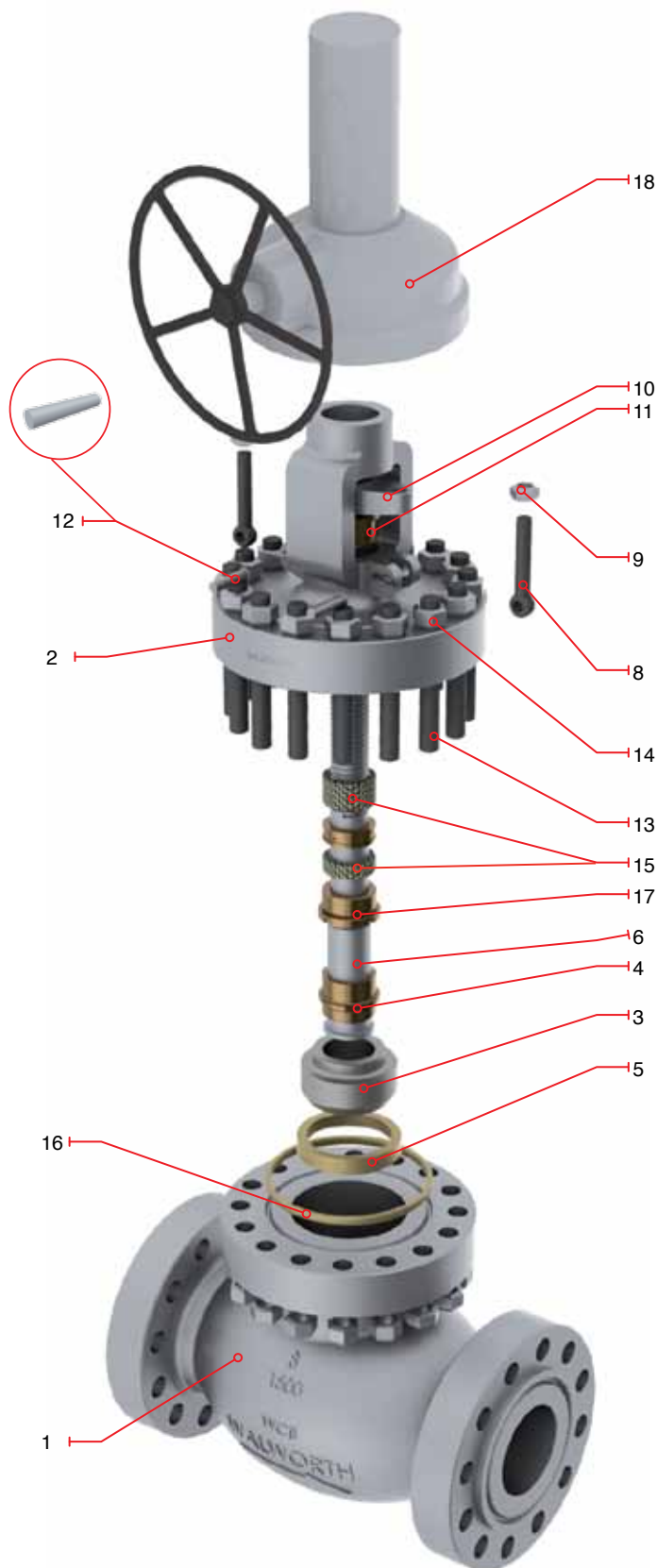
- Design in accordance with API-623
- Rising stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Yoke with Bearings: 3" and larger
- Size 8" and up Gear operated as standard

| 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



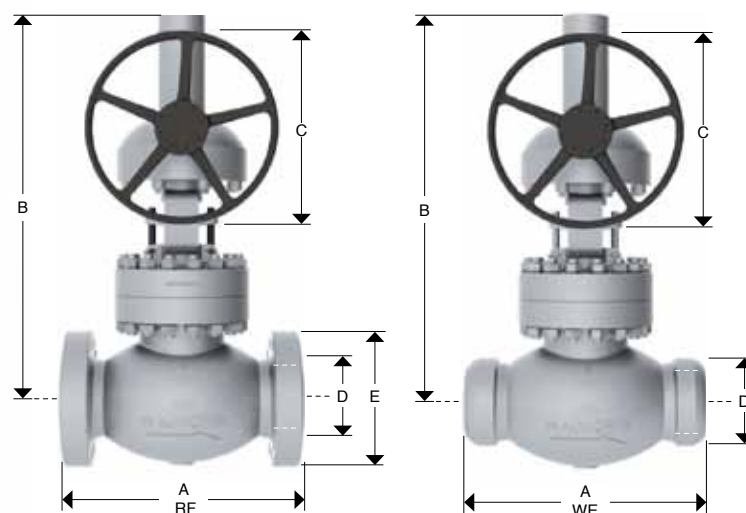
# CAST STEEL GLOBE VALVES, CLASS 1500

## Design Features

- Design in accordance with API-623
- 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<br>Nominal<br>Diameter | mm | 203    | 254    | 305    | 356    | 406    | 457 | 508    | 610  |
|--------------------------|----|--------|--------|--------|--------|--------|-----|--------|------|
|                          | in | 8      | 10     | 12     | 14     | 16     | 18  | 20     | 24   |
| A<br>(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*<br>(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<br>5308RF         | Kg | 949    | 2238   | 3308   | 4678   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 2088   | 4924   | 7278   | 10292  | PCR    | PCR | PCR    | PCR  |
| Weight<br>5308WE         | Kg | 807    | 2081   | 3076   | 4351   | PCR    | PCR | PCR    | PCR  |
|                          | lb | 1775   | 4579   | 6768   | 9571   | PCR    | PCR | PCR    | PCR  |

PCR = Per customer request

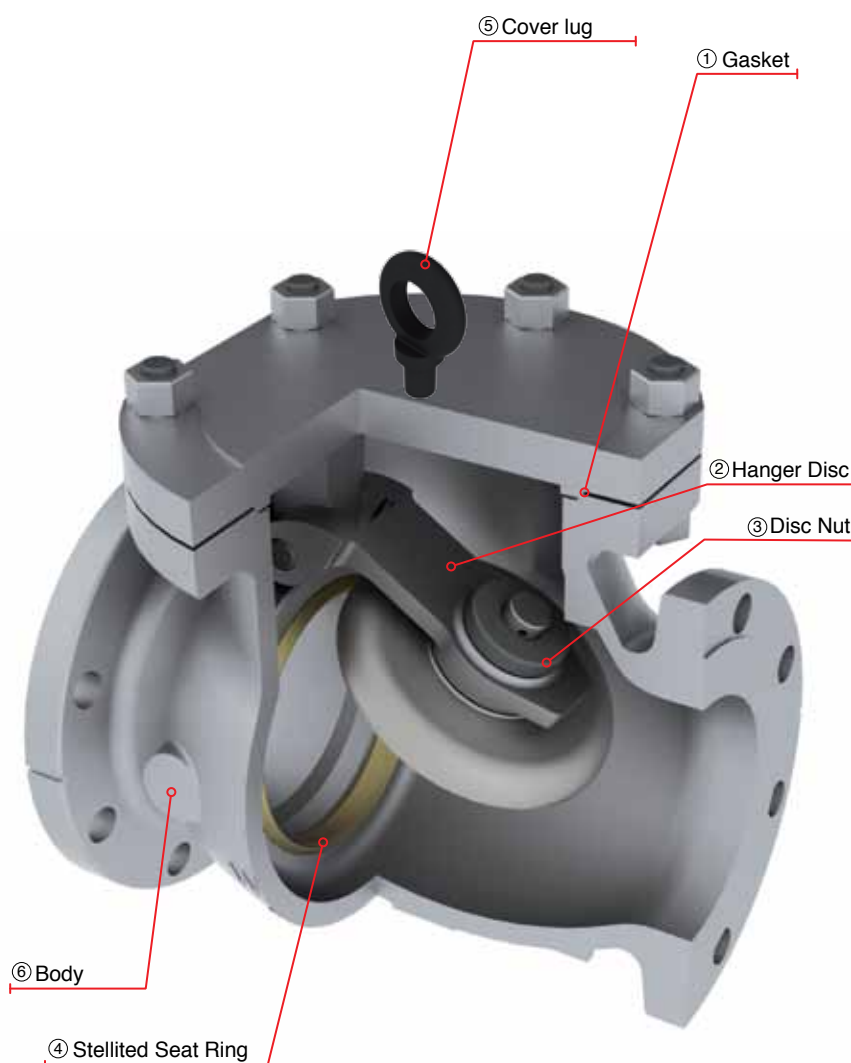
# CAST STEEL SWING CHECK VALVES CLASS 150

## CAST STEEL SWING CHECK VALVES

### DESIGN FEATURES

- Swing check valves design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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 Stellite 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 installation
- 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

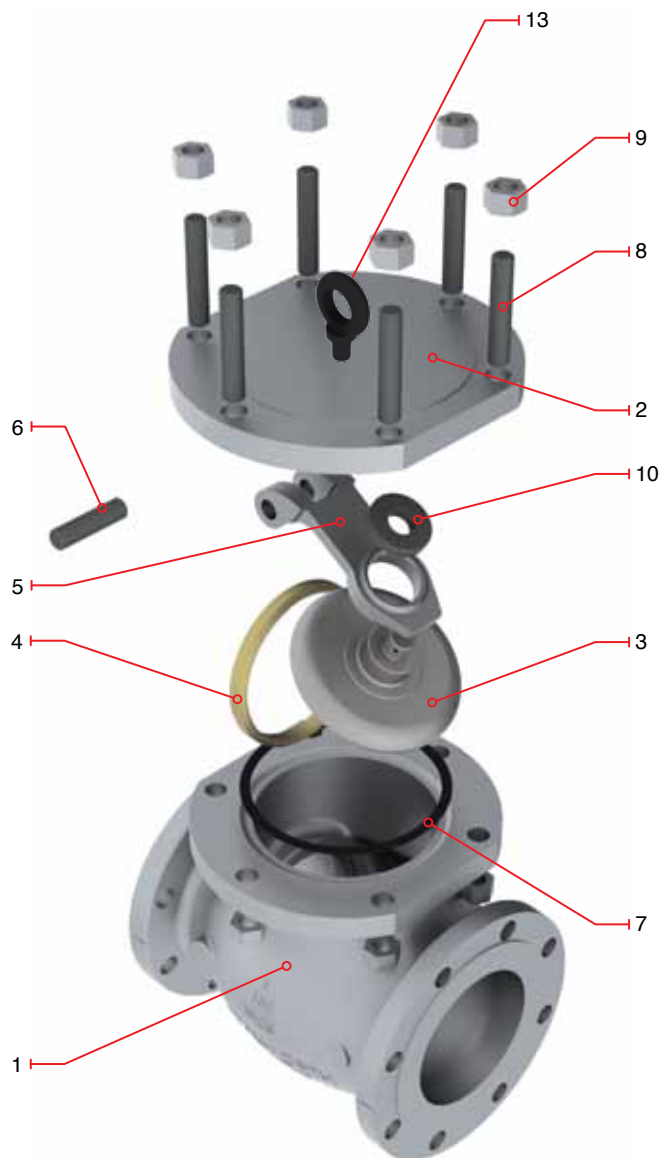
- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange 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         | 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 | Coverlug             | Commercial Steel              |

\*Not shown \*\*Only from 8" and up



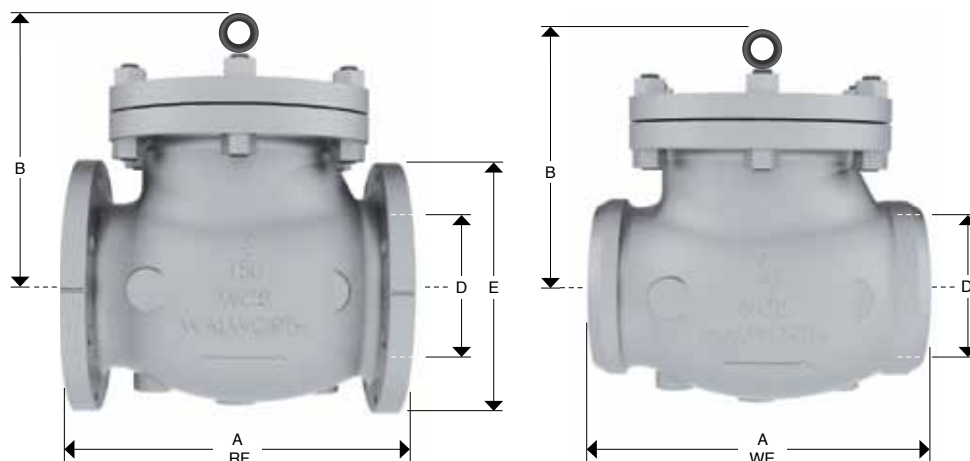
# CAST STEEL SWING CHECK VALVES, CLASS 150



## Design Features

- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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<br>Nominal<br>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<br>(RF and<br>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  |
| E                        | 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<br>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<br>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

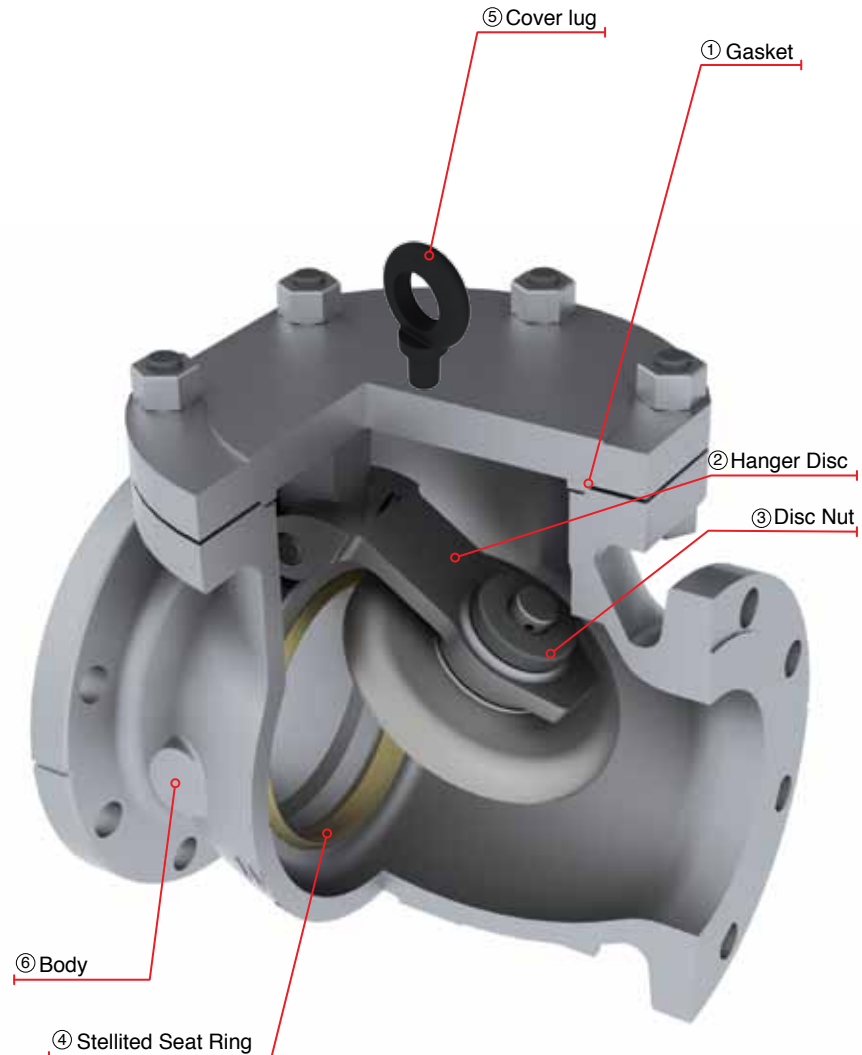
# CAST STEEL SWING CHECK VALVES CLASS 300

## CAST STEEL SWING CHECK VALVES

### DESIGN FEATURES

- Swing check valves design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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 Stellite 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 installation
- 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

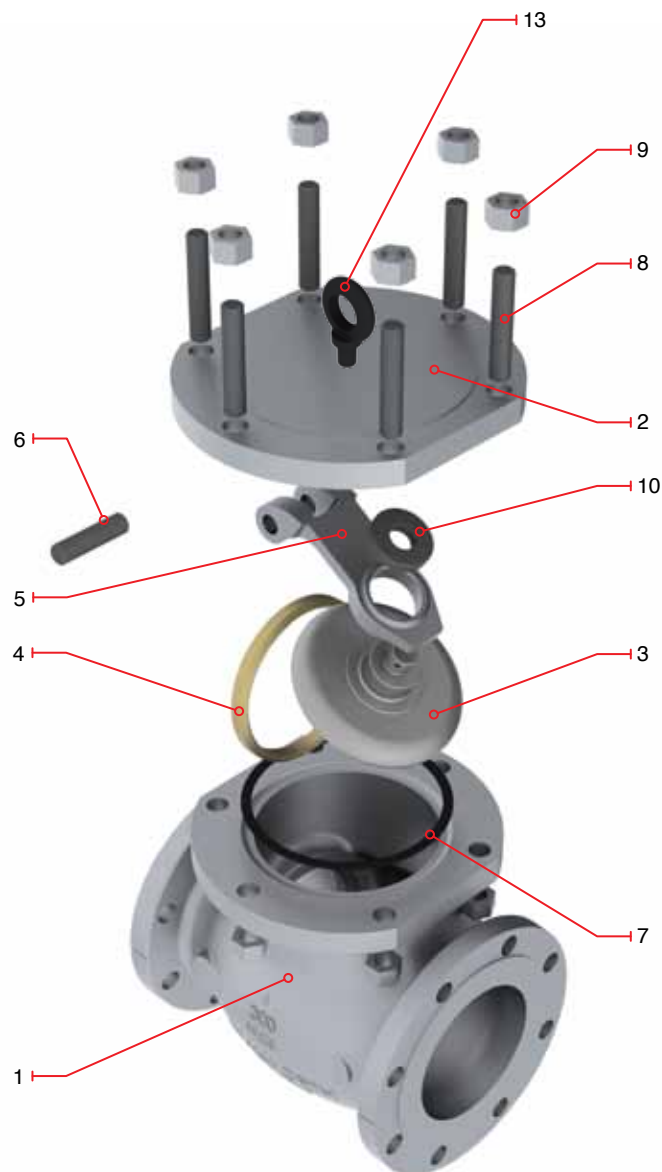
- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange 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



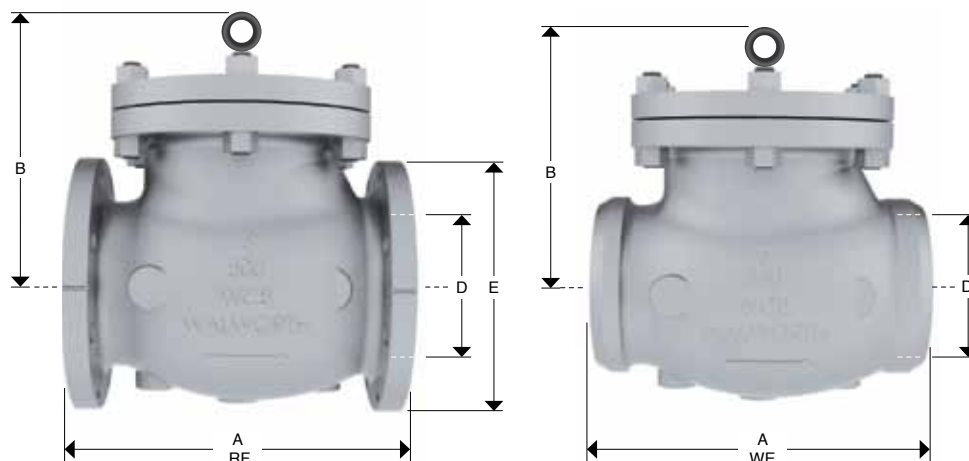
# CAST STEEL SWING CHECK VALVES CLASS 300



## Design Features

- Design in accordance with API-6D & ASME .
- Swing check valves as per API-599 available upon request.
- 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<br>Nominal<br>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<br>(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    |
| E                        | 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<br>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<br>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 |



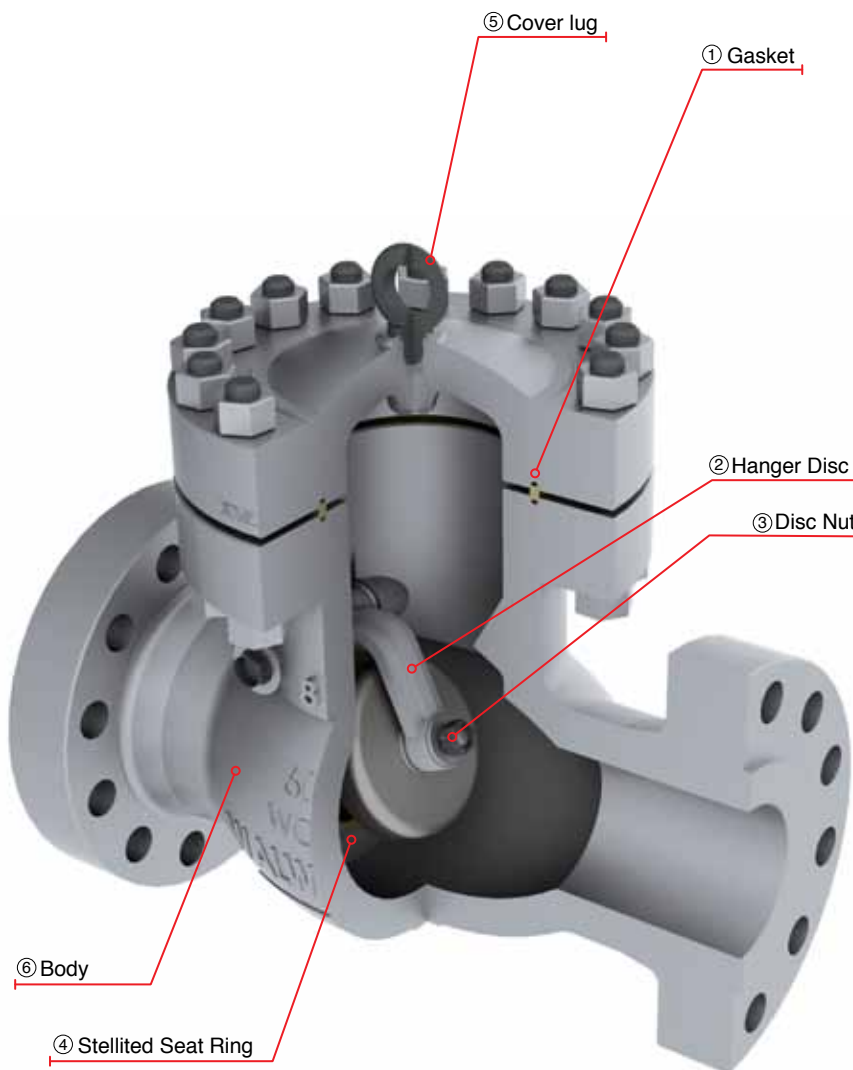
# CAST STEEL SWING CHECK VALVES CLASS 600

## CAST STEEL SWING CHECK VALVES

### DESIGN FEATURES

- Swing check valves design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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 Stellite 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 installation
- 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

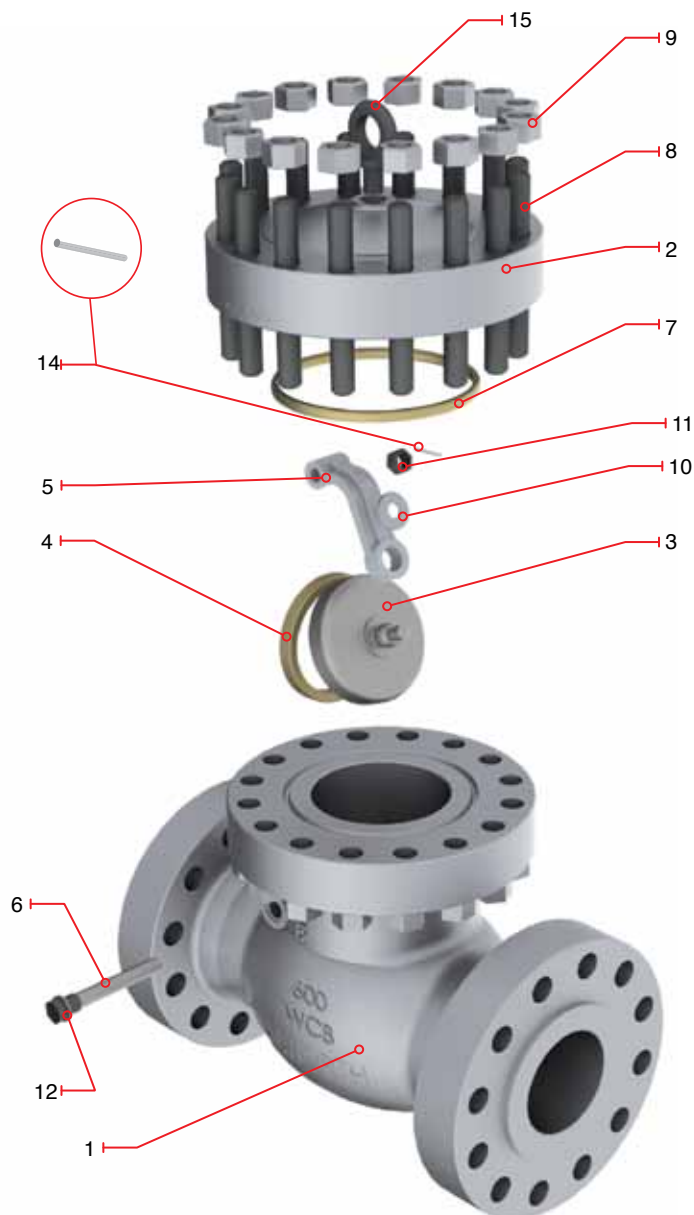
- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange 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



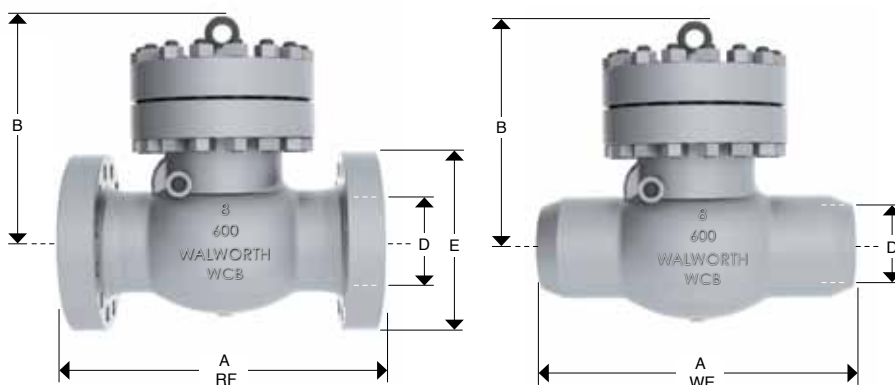
# CAST STEEL SWING CHECK VALVES CLASS 600



## Design Features

- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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<br>Nominal<br>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<br>(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*<br>(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     |
| E                        | 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<br>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<br>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

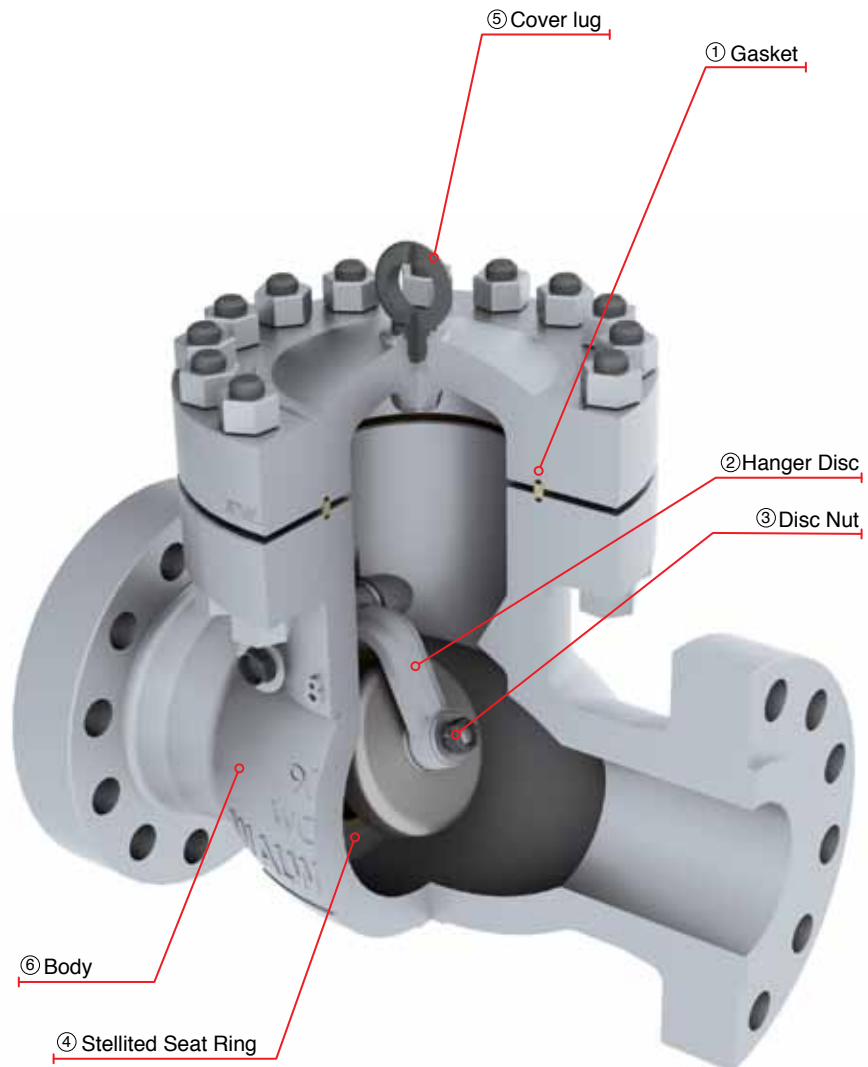
# CAST STEEL SWING CHECK VALVES CLASS 900

## CAST STEEL SWING CHECK VALVES

### DESIGN FEATURES

- Swing check valves design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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 Stellite 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 installation
- 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

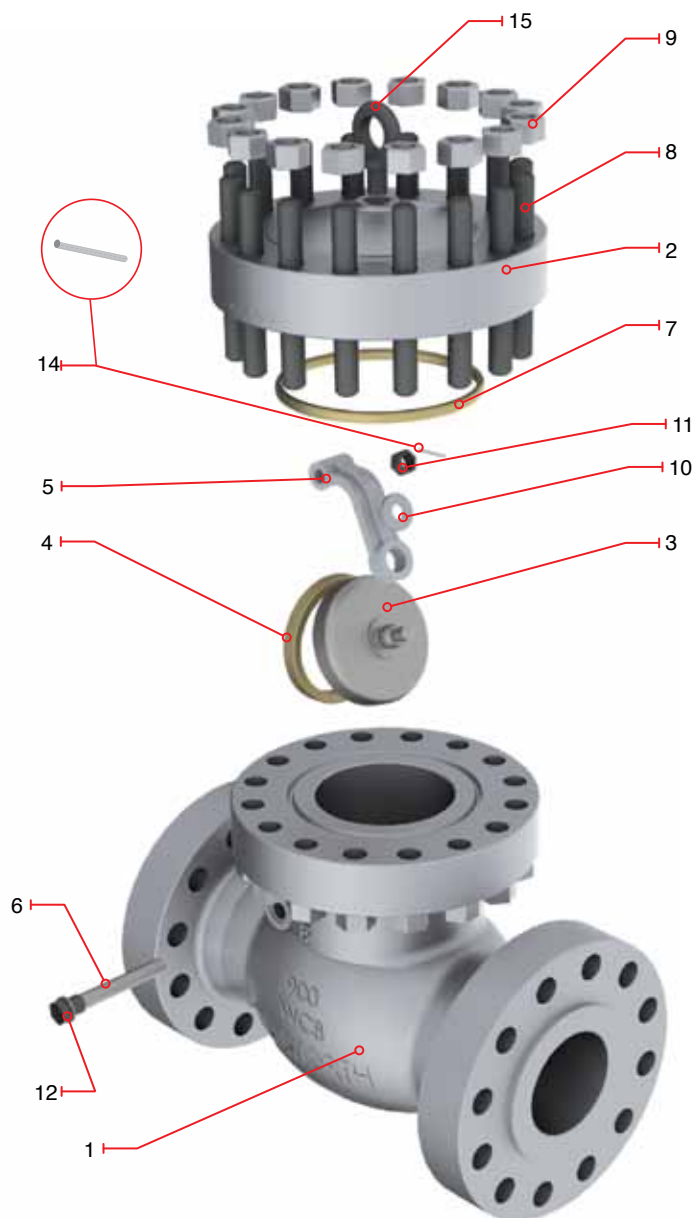
- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange 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





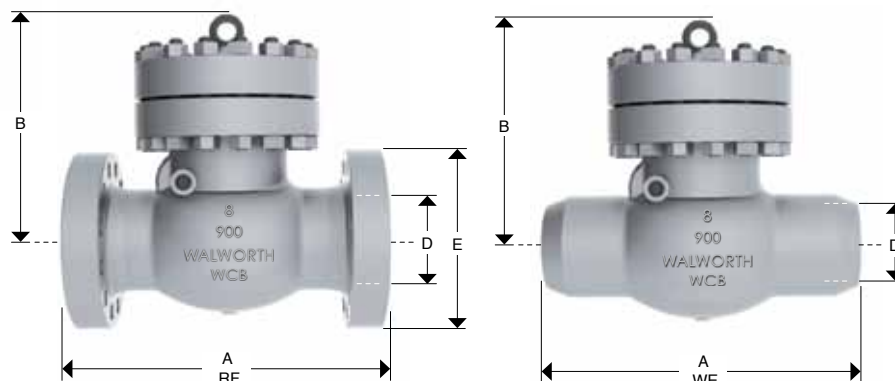
# CAST STEEL SWING CHECK VALVES CLASS 900



## Design Features

- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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<br>Nominal<br>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<br>(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*<br>(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    |
| E                        | 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<br>5353RF         | Kg | 64     | 93     | 127    | 263     | 505     | 1235     | 1450    | 1480   | PCR    | PCR    | PCR    | PCR    |
|                          | lb | 141    | 205    | 279    | 579     | 1111    | 2717     | 3190    | 3256   | PCR    | PCR    | PCR    | PCR    |
| Weight<br>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

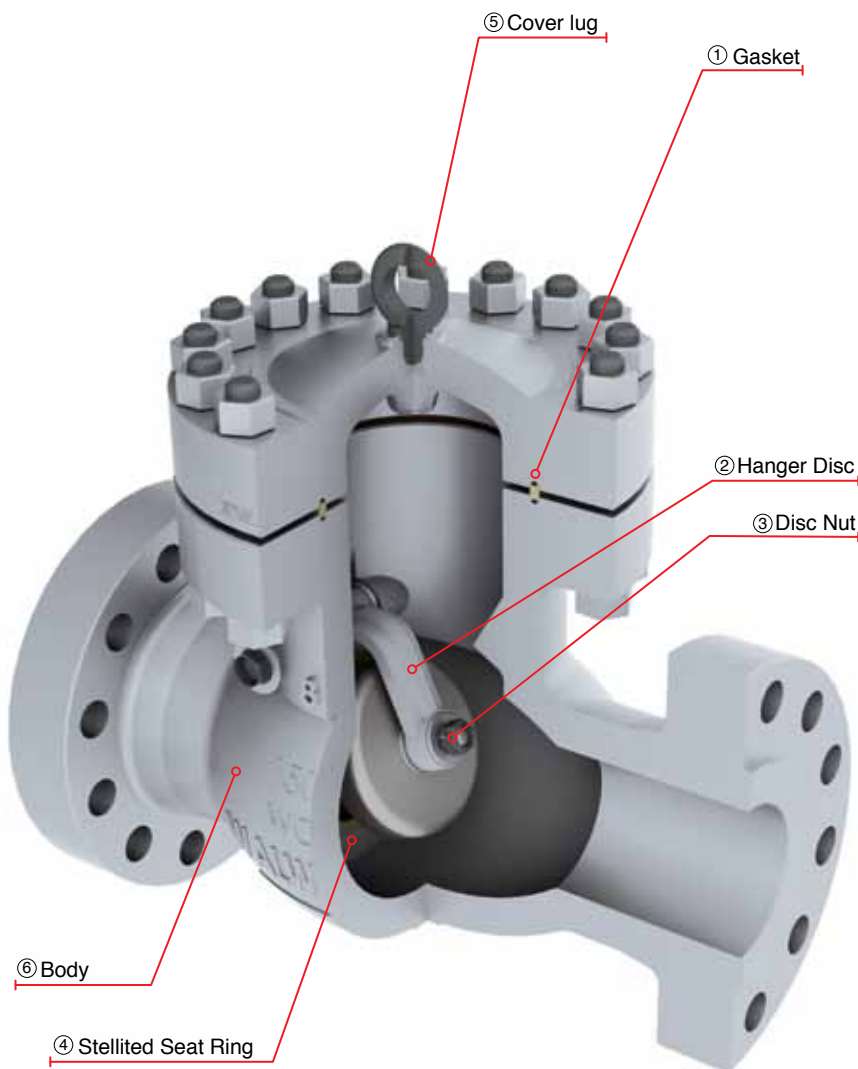
# CAST STEEL SWING CHECK VALVES CLASS 1500

## CAST STEEL SWING CHECK VALVES

### DESIGN FEATURES

- Swing check valves design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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 installation
- 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

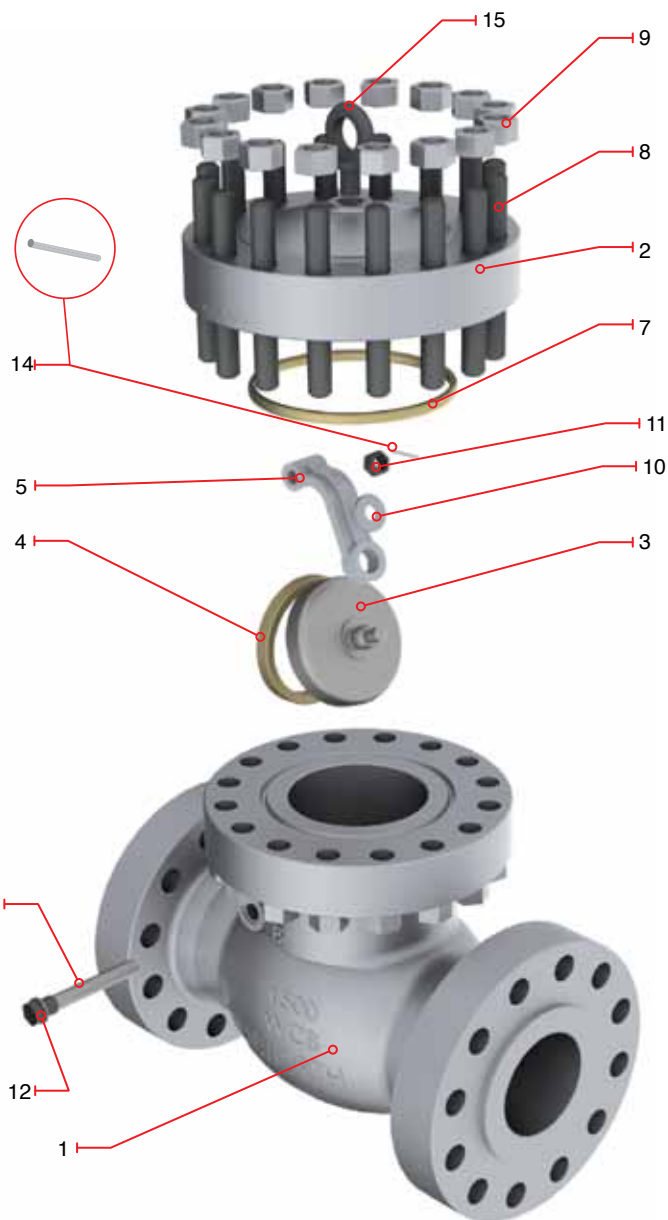
- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange 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



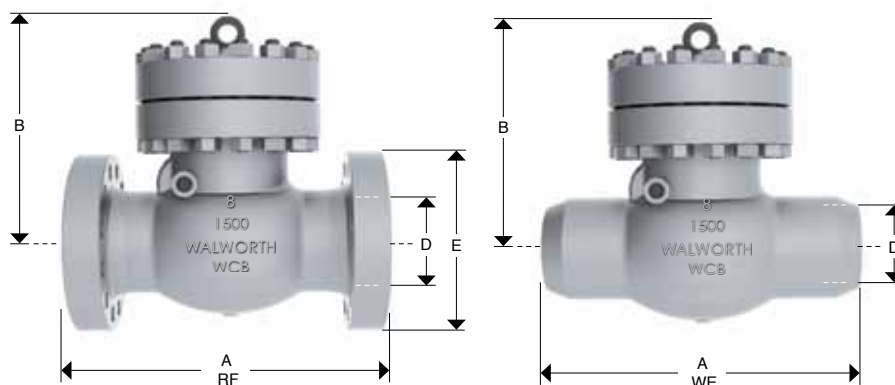
# CAST STEEL SWING CHECK VALVES, CLASS 1500



## Design Features

- Design in accordance with API-6D.
- Swing check valves as per API-599 available upon request.
- 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<br>Nominal<br>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    |
| E                        | 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

## GATE CONFIGURATIONS ARE CATEGORIZED AS FOLLOW

1. Solid one-piece wedge
2. Flexible one-piece wedge
3. Split wedge
4. Parallel double disc gate

## WEDGE DESIGNS

### Flexible wedge characteristics:

- Avoids 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 or flexible 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.



### Split wedge characteristics:

- Consist of two independent seating parts that conform to the body seats when closed.
- Similar characteristics as the flexible wedge design, but reserved for steam applications in which low differential pressure is required.



Note: Walworth produces double disc gate design only for pressure seal valves, please refer to the Walworth catalog.



## 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 used 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 (H<sub>2</sub>S) bearing hydrocarbon service.

NACE standard MR0175 defines a sulfide stress cracking region based on the relationship of H<sub>2</sub>S present to the total operating pressure.

This must be considered when specifying valves for service where H<sub>2</sub>S is present as proper selection of materials is a customer responsibility.

Sulfide stress cracking in materials not suitable for H<sub>2</sub>S 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 (H<sub>2</sub>S).
3. Concentration of water, carbon dioxide (CO<sub>2</sub>) 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

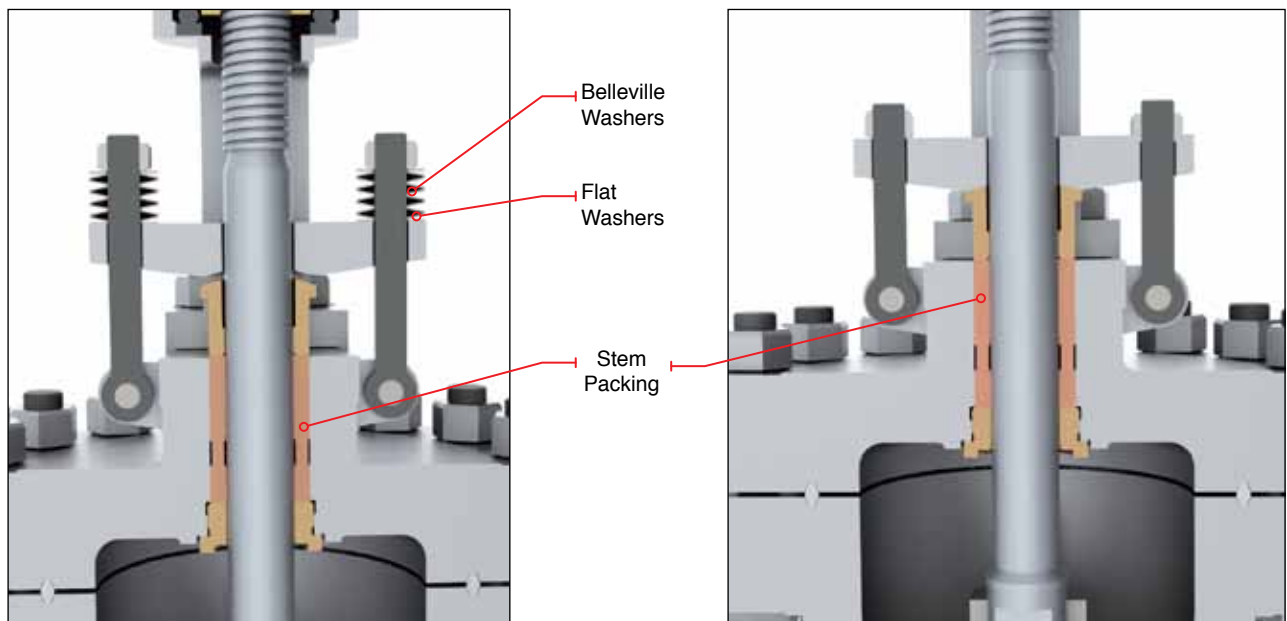
WALWORTH valves are designed, manufactured and tested to meet 50 PPM VOC fugitive emission leak rate as a standard off the shelf valve. This applies to all gate and globe valves, both Cast Steel and Forged Steel, without a requirement for a “special order”.

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 Customer's requirements.

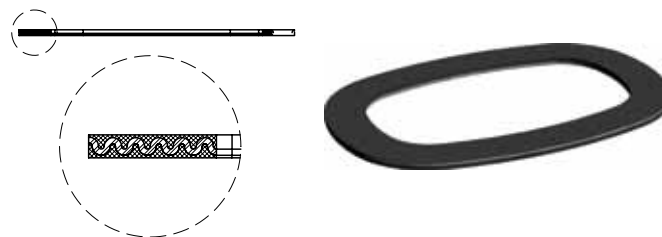
| VALVE | CLASS |     |     |     |      |
|-------|-------|-----|-----|-----|------|
|       | 150   | 300 | 600 | 900 | 1500 |
| GATE  | 1     | 2   | 3   | 3   | 3    |
| GLOBE | 1     | 2   | 3   | 3   | 3    |
| CHECK | 1     | 2   | 3   | 3   | 3    |

### 1. SOLID METAL, CORRUGATED (PROFILED) METAL GASKET WITH GRAPHITE FILLER

- For carbon steel; 304 stainless steel core.
- For alloy and stainless steel valve, 316 stainless steel core.
- For high nickel and exotic alloy valves, same or better material as de body.

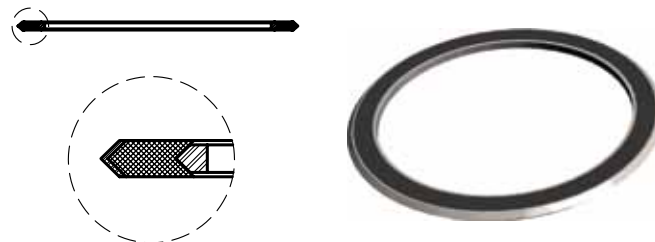
Note 1. For class 150, is also acceptable to use corrugated metal insert with graphite facings.

Note 2. When approved by purchaser, flexible gasket sheet, reinforced with a stainless steel flat, perforated, tanged, or corrugated insert equipped with annular containment rings.



### 2. SPIRAL WOUND METAL GASKET WITH FILLER AND A CENTERING/COMPRESSION RING

- For carbon steel valve; 304 stainless steel core.
- For alloy and stainless steel valve, 316 stainless steel core.
- For high nickel and exotic alloy valves, same or better material as de body.

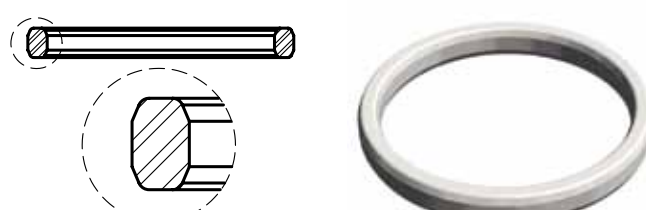


### 3. METAL RING JOINT

- Joint material at least equal to body material
- Oval or octagonal shape



Oval



Octagonal

# TECHNICAL INFORMATION

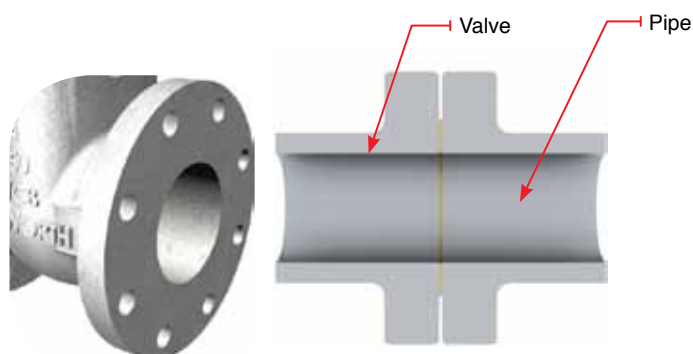
## TYPES OF END CONNECTIONS

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.

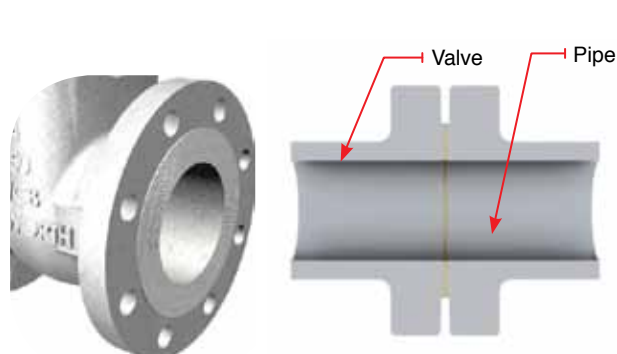
The buttweld ends in standard valves are machined in accordance with ASME B 16.25 and are supplied to meet the following pipe schedules:

| 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                                         |

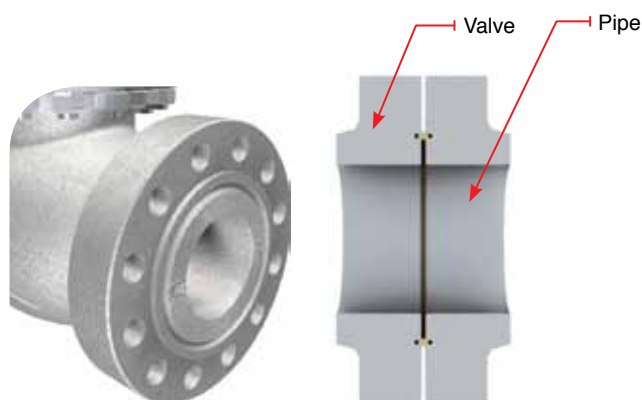
The customer must clearly specify the pipe wall thickness and type of pipe to be welded to the valves for schedules different than the above.



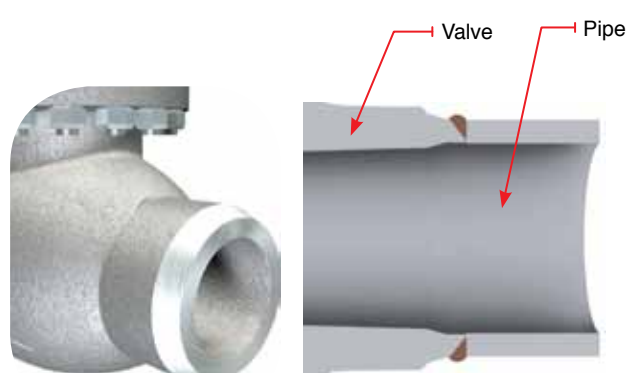
Flanged Ends  
Flat Face



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

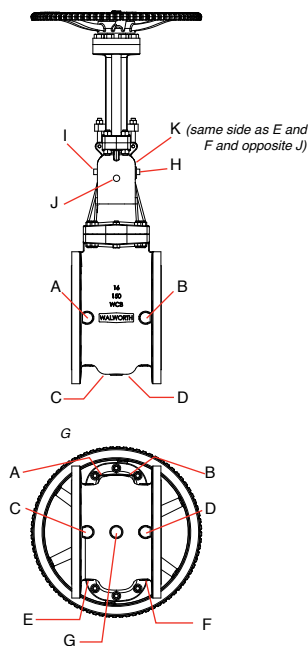
### Bypass, Drain and Vent Connections

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.

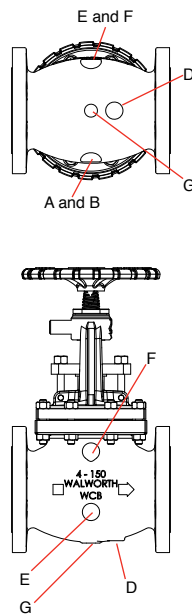
A vent connection can be located in the valve bonnet to relieve an over-pressure that could occur due to an expansion of trapped liquid. MSS SP-45 lists the standard locations and connection sizes for gate, globe and check valves



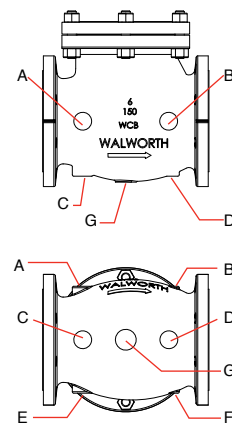
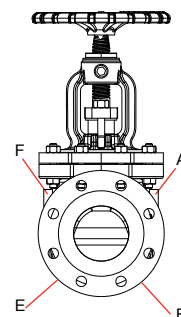
| Nominal Size of Valve     | 2" to 4" | 6" to 8" | 10" and larger |
|---------------------------|----------|----------|----------------|
| Size of Bypass-Drain-Vent | 1/2"     | 3/4"     | 1"             |



**Gate Valve**



**Globe Valve**



**Check Valve**

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

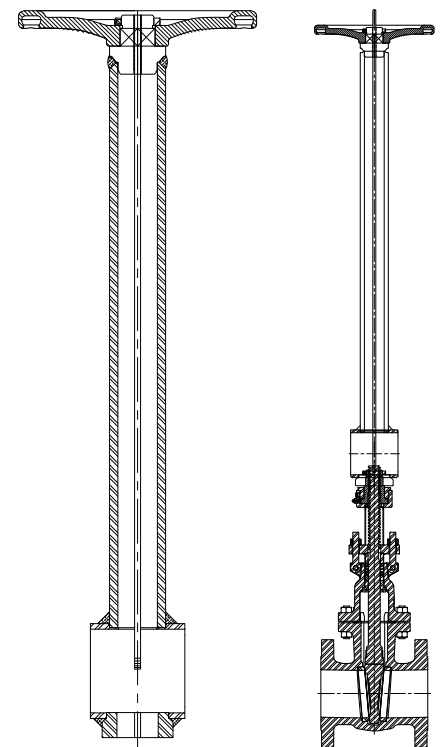
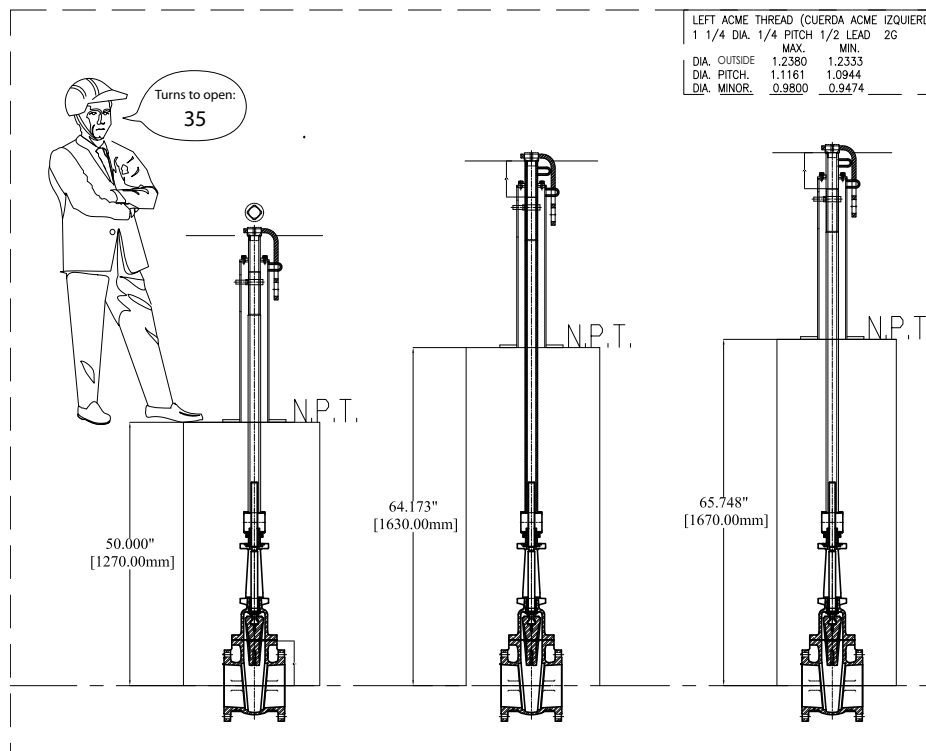
# TECHNICAL INFORMATION

## 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

| °F Temperature °C |          | MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG BY CLASS |     |      |      |       |       |
|-------------------|----------|---------------------------------------------------------------|-----|------|------|-------|-------|
|                   |          | 150                                                           | 300 | 600  | 900  | 1,500 | 2,500 |
| -20 a 100         | -29 a 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      | 95                                                            | 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

| °F Temperature °C |          | MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG BY CLASS |     |      |      |       |       |
|-------------------|----------|---------------------------------------------------------------|-----|------|------|-------|-------|
|                   |          | 150                                                           | 300 | 600  | 900  | 1,500 | 2,500 |
| -20 a 100         | -29 a 38 | 290                                                           | 750 | 1500 | 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  |
| 1000              | 538      | 20                                                            | 215 | 430  | 650  | 1080  | 1800  |
| 1050              | 566      | 20(*)                                                         | 145 | 290  | 430  | 720   | 1200  |
| 1100              | 593      | 20(*)                                                         | 95  | 190  | 290  | 480   | 800   |
| 1150              | 621      | 20(*)                                                         | 65  | 130  | 195  | 325   | 545   |
| 1200              | 649      | 15(*)                                                         | 40  | 80   | 125  | 205   | 345   |

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

# PRESSURE-TEMPERATURE RATINGS

## CAST STEEL ASTM A 217 GR WC9

| °F Temperature °C |          | MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG BY CLASS |     |      |      |       |       |
|-------------------|----------|---------------------------------------------------------------|-----|------|------|-------|-------|
|                   |          | 150                                                           | 300 | 600  | 900  | 1,500 | 2,500 |
| -20 a 100         | -29 a 38 | 290                                                           | 750 | 1500 | 2250 | 3750  | 6250  |
| 200               | 93       | 260                                                           | 750 | 1500 | 2250 | 3750  | 6250  |
| 300               | 149      | 230                                                           | 730 | 1455 | 2185 | 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                                                            | 450 | 900  | 1350 | 2245  | 3745  |
| 950               | 510      | 35                                                            | 385 | 755  | 1160 | 1930  | 3220  |
| 1000              | 538      | 20                                                            | 265 | 535  | 800  | 1335  | 2230  |
| 1050              | 566      | 20(*)                                                         | 175 | 350  | 525  | 875   | 1455  |
| 1100              | 593      | 20(*)                                                         | 110 | 220  | 330  | 550   | 915   |
| 1150              | 621      | 20(*)                                                         | 70  | 135  | 205  | 345   | 570   |
| 1200              | 649      | 15(*)                                                         | 40  | 80   | 125  | 205   | 345   |

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

## CAST STEEL ASTM A 217 GR C5

| °F Temperature °C |          | MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG BY CLASS |     |      |      |       |       |
|-------------------|----------|---------------------------------------------------------------|-----|------|------|-------|-------|
|                   |          | 150                                                           | 300 | 600  | 900  | 1,500 | 2,500 |
| -20 a 100         | -29 a 38 | 290                                                           | 750 | 1500 | 2250 | 3750  | 6250  |
| 200               | 93       | 260                                                           | 750 | 1500 | 2250 | 3750  | 6250  |
| 300               | 149      | 230                                                           | 730 | 1455 | 2185 | 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   |

(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

| °F Temperature °C |          | MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG BY CLASS |     |      |      |       |       |
|-------------------|----------|---------------------------------------------------------------|-----|------|------|-------|-------|
|                   |          | 150                                                           | 300 | 600  | 900  | 1,500 | 2,500 |
| -20 a 100         | -29 a 38 | 290                                                           | 750 | 1500 | 2250 | 3750  | 6250  |
| 200               | 93       | 260                                                           | 750 | 1500 | 2250 | 3750  | 6250  |
| 300               | 149      | 230                                                           | 730 | 1455 | 2185 | 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                                                            | 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   |

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

## CAST STEEL ASTM A 351 GR CF8

| °F Temperature °C |          | MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG BY CLASS |     |      |      |       |       |
|-------------------|----------|---------------------------------------------------------------|-----|------|------|-------|-------|
|                   |          | 150                                                           | 300 | 600  | 900  | 1,500 | 2,500 |
| -20 a 100         | -29 a 38 | 275                                                           | 720 | 1440 | 2160 | 3600  | 6000  |
| 200               | 93       | 230                                                           | 600 | 1200 | 1800 | 3000  | 5000  |
| 300               | 149      | 205                                                           | 540 | 1075 | 1615 | 2690  | 4480  |
| 400               | 204      | 190                                                           | 495 | 995  | 1490 | 2485  | 4140  |
| 500               | 260      | 170                                                           | 465 | 930  | 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 | 810  | 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  | 670   | 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   |

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



# PRESSURE-TEMPERATURE RATINGS

## CAST STEEL ASTM A 351 GR CF8M

| °F Temperatura °C |          | MÁXIMA PRESIÓN DE TRABAJO PERMISIBLE EN PSIG POR CLASE |     |      |      |       |      |
|-------------------|----------|--------------------------------------------------------|-----|------|------|-------|------|
|                   |          | 150                                                    | 300 | 600  | 900  | 1,500 | 2500 |
| -20 a 100         | -29 a 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 | 845  | 1265 | 2110  | 3520 |
| 850               | 454      | 65                                                     | 420 | 835  | 1255 | 2090  | 3480 |
| 900               | 482      | 50                                                     | 415 | 830  | 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   | 485  |
| 1500              | 816      | 15(*)                                                  | 40  | 85   | 125  | 205   | 345  |

(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  | 1,500 | 2,500 |
| -20 a 100   | -29 a 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  | 4595  |
| 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   |

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.

|            |                                                                                   |
|------------|-----------------------------------------------------------------------------------|
| <b>API</b> | <b>American Petroleum Institute</b>                                               |
| <b>598</b> | Valve Inspection and Testing                                                      |
| <b>600</b> | Steel Gate Valves-Flanges and Butt_Welding Ends, Bolted and Pressure Seal Bonnets |
| <b>6D</b>  | Steel Gate, Ball and Plug Valves for Pipeline Service                             |
| <b>6FA</b> | Specification for Fire Test for Valves.                                           |
| <b>623</b> | Steel Globe Valves-Flanges and Butt-Welding Ends, Bolted Bonnet.                  |

## ASME Standards ASME International (American Society of Mechanical Engineers)

|               |                                                  |
|---------------|--------------------------------------------------|
| <b>B2.1</b>   | Pipe Threads                                     |
| <b>B16.1</b>  | Cast Iron Pipe Flanges and Flanged Fittings      |
| <b>B16.5</b>  | Steel Pipe Flanges and Flanged Fittings          |
| <b>B16.10</b> | Length of Ferrous Flanged and Welding End Valves |
| <b>B16.25</b> | Butt-Welding Ends                                |
| <b>B18.2</b>  | Square and Hexagon Bolts and Nuts                |
| <b>B18.34</b> | Valves_Flanged, Threaded and Welding Ends        |
| <b>B16.47</b> | Large Diameter Steel Flanges                     |
| <b>B16.34</b> | Valves-Flanged, Threaded and Welding Ends        |

## ASTM American Society for Testing and Materials:

|              |                                                                                                               |
|--------------|---------------------------------------------------------------------------------------------------------------|
| <b>A-193</b> | Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service                                |
| <b>A-194</b> | Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature service                          |
| <b>A-216</b> | Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High Temperature Service. |

## MSS Standards Manufactures Standardization Society of the Valve and Fittings:

|                  |                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MSS SP-25</b> | Standard Marking System for Valves, Fittings, Flanges and Unions                                                                                                    |
| <b>MSS SP-44</b> | Steel Pipeline Flanges                                                                                                                                              |
| <b>MSS SP-45</b> | Bypass and Drain Connections                                                                                                                                        |
| <b>SP-47</b>     | Limiting Dimensions of Raised Face Flange Gaskets.                                                                                                                  |
| <b>MSS SP-53</b> | Quality Standard for Steel Castings and Forgings for Valves, Flanges and Fittings and other Piping component - Magnetic Particle Examination Method                 |
| <b>MSS SP-54</b> | Quality Standard for Steel Castings for Valves, Flanges and Fittings and other Piping Components - Radiographic Method                                              |
| <b>MSS SP-55</b> | Quality Standard for Steel Castings for Valves, Flanges and Fittings and other Piping Components - Visual Method for Eval of Surface Irregularities                 |
| <b>MSS SP-61</b> | Pressure Testing of Steel Valves                                                                                                                                    |
| <b>MSS SP-93</b> | <b>(R92)</b> Quality Standards for Steel Castings and Forgings for Valves, Flanges and Fittings and other Piping Components - Liquid Penetrant Examinations Method. |

## NACE Standards National Association of Corrosion Engineers:

|                    |                                                                                                            |
|--------------------|------------------------------------------------------------------------------------------------------------|
| <b>NACE MR0175</b> | Standard Material Requirements Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment |
|--------------------|------------------------------------------------------------------------------------------------------------|

## Boiler and pressure vessel code:

|                     |                                                                        |
|---------------------|------------------------------------------------------------------------|
| <b>Section II</b>   | Part A - Ferrous Material Specifications                               |
| <b>Section II</b>   | Part B - Non Ferrous Material Specifications                           |
| <b>Section II</b>   | Part C - Specifications for Welding Rods, Electrodes and Filler Metals |
| <b>Section V</b>    | Non Destructive Examination                                            |
| <b>Section VIII</b> | Rules for Construction of Pressure Vessels, Divisions 1 and 2          |
| <b>Section IX</b>   | Welding and Brazing 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 CLASS AS PER FIGURE NUMBER  
 SIZE OF THE VALVE IN INCHES

| SIZE<br>(In) | TYPE OF VALVE &<br>CLASS | ENDS                 | TRIM ARRANGEMENTS                                                              | BASE MATERIAL ASTM                                        |
|--------------|--------------------------|----------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------|
| 2"           | 5202= GATE 150           | RF= RAISED FACE      | 18-8= API No. 2                                                                | <b>CARBON STEELS:</b>                                     |
| 2 1/2"       | 5206= GATE 300           | RTJ= RING TYPE JOINT | 310= API No. 3                                                                 | A216-WCB (C-Si)                                           |
| 3"           | 5232= GATE 600           | WE=BUTTWELD          | HF= API No. 5                                                                  | A216-WCC (C-Si)                                           |
| 4"           | 5247= GATE 900           |                      | AAA= API No. 6                                                                 | <b>LOW ALLOY STEELS:</b>                                  |
| 5"           | 5262= GATE 1500          |                      | UT= API No. 8                                                                  | A217-WC1 (C-1/2Mo)                                        |
| 6"           | 5275= GLOBE 150          |                      | A= API No. 9                                                                   | A217-WC5 (Cr-Mo)                                          |
| 8"           | 5281= GLOBE 300          |                      | 18-8smo= API No. 10                                                            | A217-WC6 (1 1/4% Cr-1/2Mo)                                |
| 10"          | 5295= GLOBE 600          |                      | AHF= API No. 11                                                                | ASTM A217-WC9 (2 1/4 % Cr-1%Mo)                           |
| 12"          | 5301= GLOBE 900          |                      | 3HF= API No. 12                                                                | ASTM A217-C5 (5% Cr-1/2Mo)                                |
| 14"          | 5308= GLOBE 1500         |                      | A20= API No. 13                                                                | ASTM A217-C12 (9%Cr-1%Mo)                                 |
| 16"          | 5341= CHECK 150          |                      | A20H= API No. 14                                                               | ASTM A217-C12-A (9%Cr-1%Mo-V-N)                           |
| 18"          | 5344= CHECK 300          |                      | NUC= 410 + NUCALLOY                                                            | <b>LOW CARBON AUSTENITIC STAINLESS STEELS:</b>            |
| 20"          | 5350= CHECK 600          |                      | 4HF= 304+304+ST6                                                               | ASTM A351-CF3 (18%Cr-8%Ni-0.03%C)                         |
| 22"          | 5353= CHECK 900          |                      | 4HF+HF= 304+ST6+ST6                                                            | ASTM A351-CF3M (18%Cr-12%Ni-2%Mo-0.03%C)                  |
| 24"          | 5356= CHECK 1500         |                      | 304L= 304L+304L+304L                                                           | ASTM A351-CG3M (18%Cr-12%Ni-3%Mo-0.03%C)                  |
| 28"          |                          |                      | 1HF= 316+ST21+ST21                                                             | <b>AUSTENITIC STAINLESS STEELS:</b>                       |
| 30"          |                          |                      | 3HF+HF= 316+ST6+ST6                                                            | ASTM A351-CF8 (18%Cr-8%Ni-0.08%C)                         |
| 36"          |                          |                      | 3TC= 316/TC+TC+ST6 NOTE: TC= Tungsten Carbide.                                 | ASTM A351-CF8M (18%Cr-12%Ni-2%Mo-0.08%C)                  |
| 42"          |                          |                      | 316L= 316+316+316                                                              | ASTM A351-CF10 (18%Cr-8%Ni-0.08%C)                        |
| 48"          |                          |                      | 3LHF= 316L+316L+ST6                                                            | ASTM A351-CG8M (19%Cr-10%Ni-3%Mo-0.08%C)                  |
| 54"          |                          |                      | 3HFL= 316L+ST6+ST6                                                             | ASTM A351-CF8C (18%Cr-10%Ni-Cb-0.08%C)                    |
| 60"          |                          |                      | 21HF= 317+ST6+ST6                                                              | ASTM A351-CT15C (19%Cr-32%Ni-0.05A 0.15%C)                |
| 72"          |                          |                      | 317= 317+317+317                                                               | <b>SUPER AUSTENITIC STAINLESS STEELS:</b>                 |
|              |                          |                      | 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 (0.02C; 19-23Cr; 23-28Ni; 4-5Mo; 1-2Cu) |
|              |                          |                      | 347HF= 347+ ST6+ST6                                                            | <b>LOW TEMPERATURE SERVICE CARBON STEELS:</b>             |
|              |                          |                      | 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                                                           | <b>LOW TEMPERATURE SERVICE LOW ALLOYS STEELS:</b>         |
|              |                          |                      | 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                                        | <b>MARTENSITIC STAINLESS STEELS:</b>                      |
|              |                          |                      | 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                                             | <b>NICKEL ALLOYS:</b>                                     |
|              |                          |                      | 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)                   |
|              |                          |                      | <b>NOTE: ADDITIONAL BASE MATERIALS &amp; TRIMS ARE AVAILABLE UPON REQUEST.</b> | ASTM A494-CU5MCuC (42%Ni-21.5%Cr-3%Mo-2.3%Cu)             |
|              |                          |                      |                                                                                | ASTM A494-N7M (65%Ni-28%Mo-2%Fe)                          |
|              |                          |                      |                                                                                | ASTM A494-CW6MC (60%Ni-22%Cr-9%Mo-3.5%Cb)                 |
|              |                          |                      |                                                                                | <b>DUPLEX STAINLESS STEELS:</b>                           |
|              |                          |                      |                                                                                | 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)                   |

| 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 stands                                  |
| XX= Additional requirements.                     |

# 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 placed after 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 FOB 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 Buyer'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 government regulation with respect to the product(s) covered 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.

**DEFERRED 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 below.

**CANCELLATION:** After order acceptance by WALWORTH, items or completed orders may be cancelled and buyer will be charged for work performed, 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 overdue 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 schedule 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 responsibility 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 will be acceptance. Where returned goods are accepted, a minimum 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 CERTIFICATE:** WALWORTH, exhibits this product Warranty, for a 12 month period in operation or 18 months in storage, whatever comes first as of the date of product delivery.

WALWORTH, guarantees that products are fabricated according to quality, design and manufacturing standards and customer requirements as well. When the buyer expressly and in written confirms the non-compliance of such standards, WALWORTH is forced to comply with the repair, replacement or to issue the written authorization for the buyer or another agent, to replace or repair at no cost for the buyer, at WALWORTH fabrication costs, those parts confirmed as defective.

This warranty is valid when the material selection by the customer for the design, material arrangement (TRIM, bodies, ends, operation devices, etc.) internal and/ or external overlays had been the proper ones for the operation fluid. This warranty is applicable if operation and service conditions are maintained as per the requirements of the product.

To validate the Warranty, the user is responsible of performing the proper maintenance according to what is stated in the Operation and Maintenance Manual applicable to the product. WALWORTH, reserves the right to request the records (evidence) to confirm the correct maintenance.

WALWORTH obligations are limited and will be released of any responsibility when the products are altered, repaired or replaced without WALWORTH' s written authorization.

Except of what is stated in this document WALWORTH waives and excludes any other warranty expressed or implied, for loss, direct damage, indirect damage or consequential of other products, processes, installations or equipment of the buyer or end user, either partial or total, due to material defects and/or work and/or WALWORTH product design.

**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 USD net will be billed at a minimum charge of \$100.00 USD. Repair parts will be billed at a minimum charge of \$50.00 USD.

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







# **WALWORTH<sup>®</sup>**

*Since 1842*



[www.walworth.com](http://www.walworth.com)

**MÉXICO**

**Industrial de Válvulas, S.A. de C.V.**

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