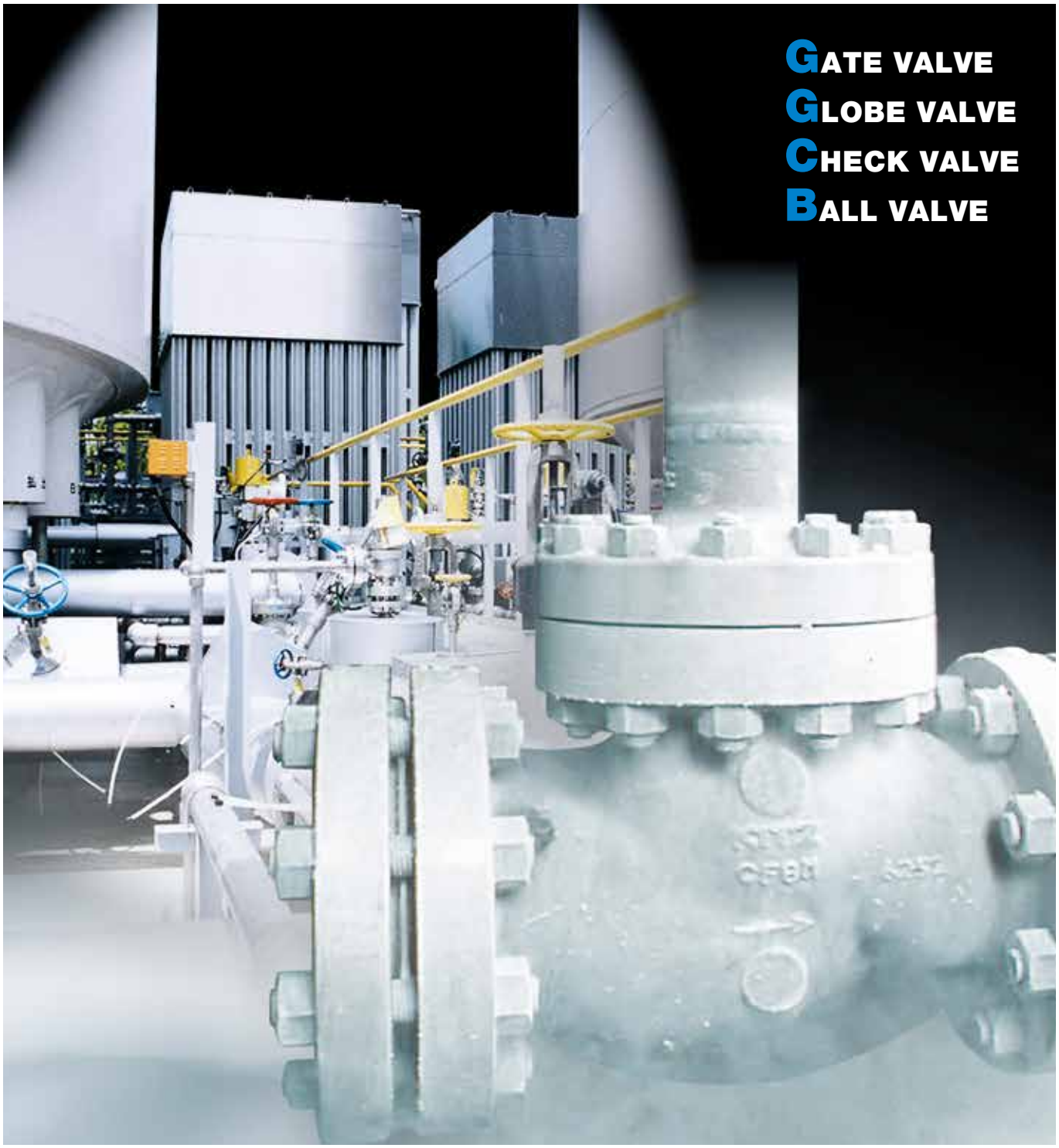
KITZ

Low-Temperature, Cryogenic Valves



KITZ CORPORATION

KITZ

Low-Temperature, Cryogenic Valves

GATE VALVE | GLOBE VALVE | CHECK VALVE | BALL VALVE

KITZ valves have been developed to meet the most advanced and demanding technological standards of Japan, the world's leading importer of environmentally friendly, clean-energy LNG (Liquefied Natural Gas). KITZ offers a series of cryogenic valves of proven high quality, as demonstrated by repeated testing.

We offer stainless steel and cast carbon steel gate, globe, check, and ball valves for processing, storage, shipment, and distribution of ethylene, LPG (Liquefied Petroleum Gas), LNG, and other low-temperature or cryogenic fluids, down to –196°C (–321°F).

Use applications

- LNG (Liquefied Natural Gas): LNG Liquefaction plants,Terminal
- Ethylene plants
- Industrial low-temperature gases plants

KITZ Cryogen
Mnufactur

perrin BALL VALVES **/Perrin GmbH**
・Ball Valves

"Jso"
/KITZ Corporation of Europe,S.A
・Ball Valves

●/● : KITZ Group Locations

Casting technology

Our cryogenic service valve castings are typically made of modified ASTM CF8M austenitic stainless steel, which contains a higher percentage of nickel so as to minimize transformation of the austenitic structure to the martensitic structure. This undesirable transformation occurs when valve parts are machined during the production process (or subjected to mechanical stress), which makes them vulnerable to distortion when valve assemblies are exposed to extremely low temperatures in the field. This property must be prevented during production, because it results in subsequent degradation of seat face precision, and therefore, concerns about seat leakage. Additionally, a higher nickel content typically lowers the temperature at which the martensitic transformation begins (Martensitic Transformation Temperature or MTT below). For this reason, our foundries ensure proper adjustment of other chemicals such as carbon and chromium to reduce the MTT.

Standard Material Variation & Operational Temperature Range

Category	Temperature Range	−196 −104 −80 −46 0℃	Service	Valve Shell Materials (Standard)	
I	-196°C (-321°F)		For LNG service ・LNG Liquefaction plants ・LNG Receiving Terminals	Stainless Steel	A351 Gr.CF8 A351 Gr.CF8M A351 Gr.CF3M
II	-104°C (-155°F)		For Ethylene service ・Ethylene plants	Stainless Steel	A351 Gr.CF8 A351 Gr.CF8M A351 Gr.CF3M
III	-46°C (-51°F)		For Industrial service ・Industrial gas plants ・Low-temperature gas plants	Stainless Steel	A351 Gr.CF8 A351 Gr.CF8M A351 Gr.CF3M
				Carbon Steel	A352 Gr.LCB A352 Gr.LCC

Color tags corresponding to usage temperature are provided.

ic Valve Series

ing Network

TZ

KITZ Corporation

- Gate, Globe & Check Valves
- Ball Valves

Standard Product Range

Category	Valve	Valve Type	Wall thickness	Standard Material	Class	Size	Connection	Product Code	Page
I -196℃/-321℉	Gate	Bolted Bonnet	ASME B16.34	CF8,CF8M,CF3M	150	2"-24"	Flanged	150UMALMY	10
					300			300UMALMY	
					600	2"-12"		600UMALMY	
			API600		150	1/2"-24"		150UMCLMY	
					300			300UMCLMY	
					600			600UMCMLY	
					150	2"-24"	Butt weld	(T)W150UMCLMY	
					300			(T)W300UMCLMY	
					600			(T)W600UMCMLY	
					300	1/2"-2"	Socket weld	(T)SW300UMCLMY	
					600	1/2"-11/2"		(T)SW600UMCMLY	
	Globe	Bolted Bonnet	API623		150	2"-8"	Flanged	150UPCRLMD	11
					300			300UPCRLMD	
					600			600UPCRLMD	
			API600		150	1/2"-8"		150UPCLMY	
					300			300UPCLMY	
					600			600UPCMLY	
					150	2"-8"	Butt Weld	(T)W150UPCLMY	
					300			(T)W300UPCLMY	
					600			(T)W600UPCMLY	
					300	1/2"-2"	Socket weld	(T)SW300UPCLMY	
					600	1/2"-11/2"		(T)SW600UPCMLY	
		Bolted Bonnet Soft seated	ASME B16.34		150	2"-4"	Butt weld	W150UPDCL	12
					300	1/2"-2"	Socket weld	SW300UPDAL	
	Check	Swing	API600		150	1/2"-24"	Flanged	150UOCLMY	
					300	2"-24"		300UOCLMY	
					600	1/2"-12"		600UOCLMY	
					150	2"-24"	Butt weld	(T)W150UOCLMY	
					300			(T)W300UOCLMY	
					600	2"-12"		(T)W600UOCMLY	
					300	2"	Socket weld	(T)SW300UOCLMY	
		Lift			300	1/2"-11/2"		(T)SW300UNCLMY	
					600			(T)SW600UNCLMY	
	Ball	Floating / 1piece	ASME B16.34	CF8,CF8M	150	1/2"-10"	Flanged	150UTAZLM	13
					300			300UTAZLM	
		Floating / 2piece			150			150UTDZL	
					300			300UTDZL	
		Trunnion	ASME B16.34	F316,CF8M	150	2"-16"		150UPG14K	14
					300			300UPG14K	
					600			600UPG14K	
		Top Entry	ASME B16.34	CF8M,CF3M	150	1"-8"	Butt weld	150UPG67K	
					300			300UPG67K	
II -104℃/-155℉	Gate	Bolted Bonnet	ASME B16.34	CF8,CF8M,CF3M	150	1/2"-16"	Flanged	150UMAXY	15
					300	1/2"-24"		300UMAXY	
					300	1/2"-11/2"	Socket weld	SW300UMAXY	
			API600		150	2"-12"	Butt weld	W150UMCXY	※
					300			W300UMCXY	
					600			W600UMCXY	
	Globe	Bolted Bonnet	ASME B16.34	CF8,CF8M,CF3M	150	1/2"-12"	Flanged	150UPXY	15
					300	1/2"-8"		300UPXY	
					300	1/2"-11/2"	Socket weld	SW300UPXY	
			API600		150	2"-12"	Butt weld	W150UPCXY	※
					300			W300UPCXY	
					600			W600UPCXY	
		Bolted Bonnet Soft seated	API600		150	2"-4"		W150UPDCX	16
			ASME B16.34		300	1/2"-2"	Socket weld	SW300UPDX	
	Check	Swing	ASME B16.34	CF8,CF8M,CF3M	150	11/2"-16"	Flanged	150UOAXY	
					300			300UOAXY	
		Lift			150	1/2"-11/2"		150UNAXY	
					300			300UNAXY	
					300		Socket weld	SW300UNXY	
		Swing	API600		150	2"-12"	Butt weld	W150UOCXY	※
					300			W300UOCXY	
					600			W600UOCXY	
	Ball	Floating / 1piece	ASME B16.34	CF8,CF8M	150	1/2"-10"	Flanged	150UTAZXLM	17
					300			300UTAZXLM	
		Floating / 2piece			150			150UTDZXL	
					300			300UTDZXL	

Standard Product Range

Category	Valve	Valve Type	Wall thickness	Standard Material	Class	Size	Connection	Product Code	Page
Ⅲ -46℃/-51℉	Gate	Bolted Bonnet	API600	LCB,LCC	150	1 1/2"-24"	Flanged	150SCLSXBLY	18
					300	2"-20"		300SCLSXBLY	
					600			600SCLSXBLY	
					150	1 1/2"-24"	Butt weld	W150SCLSXBLY	
					300	2"-20"		W300SCLSXBLY	
					600			W600SCLSXBLY	
	Globe				150	2"-12"	Flanged	150SCJSXBLY	19
					300	2"-8"		300SCJSXBLY	
					600	2"-10"		600SCJSXBLY	
	Check				150	2"-24"	Butt weld	W150SCJSXBLY	
					300			W300SCJSXBLY	
					600			W600SCJSXBLY	
					150		Flanged	150SCOSXBLY	
					300			300SCOSXBLY	
					600			600SCOSXBLY	
					150		Butt weld	W150SCOSXBLY	
					300			W300SCOSXBLY	
					600			W600SCOSXBLY	
	Ball	Floating / 1piece	ASME B16.34	LCC	150	1/2"-10"	Flanged	150SCTAZXCL	20
					300			300SCTAZXCL	
		Floating / 2piece			150			150SCTDZXCL	
					300	1/2"-8"		300SCTDZXCL	
				LCB	150	1/2"-10"		150SCTDZXBL	21
					300	1/2"-8"		300SCTDZXBL	

※ Please contact KITZ corporation.

KITZ Production Control

Order inflow

KITZ cryogenic valves are tailored to meet our clients' specifications. KITZ selects the most suitable valve types and analyzes the clients' needs before deciding on valve manufacturing specifications. These manufacturing specifications serve as the basis for unified control of every step of valve manufacture, from sales and design to production and shipping.

Design

KITZ's valve designs reflect know-how resulting from both a long record of achievement and proven, performance-tested technology.

Casting

Our high-quality stainless steels are manufactured from castings produced at KITZ's in-house foundry. Therefore, special materials that are required for low-temperature or cryogenic applications can be used.

Machining

We have established production technologies and performance tests based on many years of experience manufacturing valves for industrial use.

Assembly and Inspection

KITZ performs strict inspections of cryogenic valves on a dedicated assembly and inspection line. In addition to performing a variety of non-destructive tests, in house, KITZ can accommodate any type of special-method inspection that is requested by our customers.

Features of KITZ metal-seated gate valves

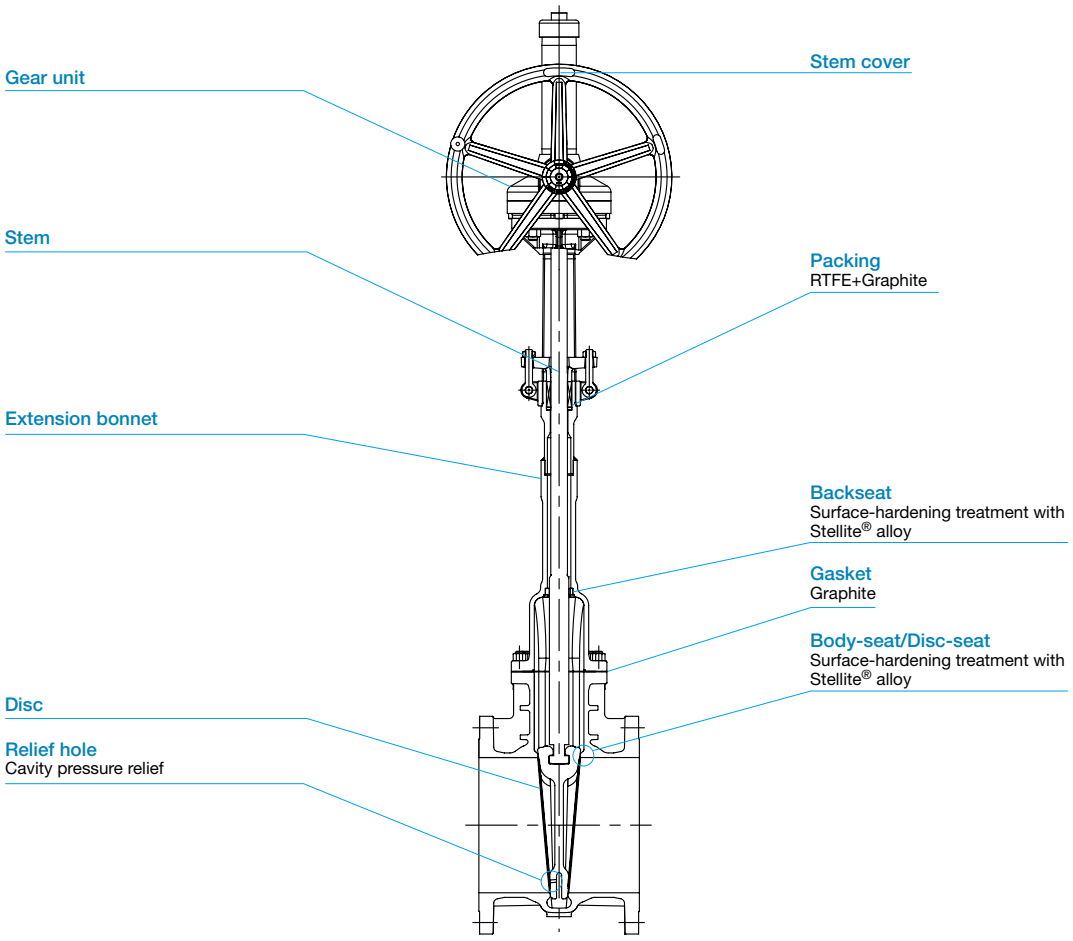
Extension bonnet
The extension bonnet provides efficient cold insulation, minimizing heat conduction and transfer from cryogenic flow, while preventing exposure of the valve packing to cryogenic media and providing a secure seal.

Surface-hardening treatment with Stellite® alloy
Stellite® alloy is used to apply a surface-hardening treatment to the sliding portions of the body and disc seat assemblies, preventing wear and improving durability.

Cavity pressure relief
A hole in the disc on the high-pressure side prevents any excessive rise in the cavity pressure.
(Liquid trapped within the body cavity may evaporate, causing an excessive rise in the cavity pressure.)

Seat lapping
We polish dry-lapped seat surfaces to compare the surface finish before and after polishing. Additionally, we compare the seat surface finish and the sealing performance of valve samples provided with only-lapped seats and lapped-and-polished seats.

Illustrated cross-section of a typical KITZ cryogenic service gate valve to show the basic design concept –196°C specification



Stellite® is a registered trademark of Mitsubishi Materials.

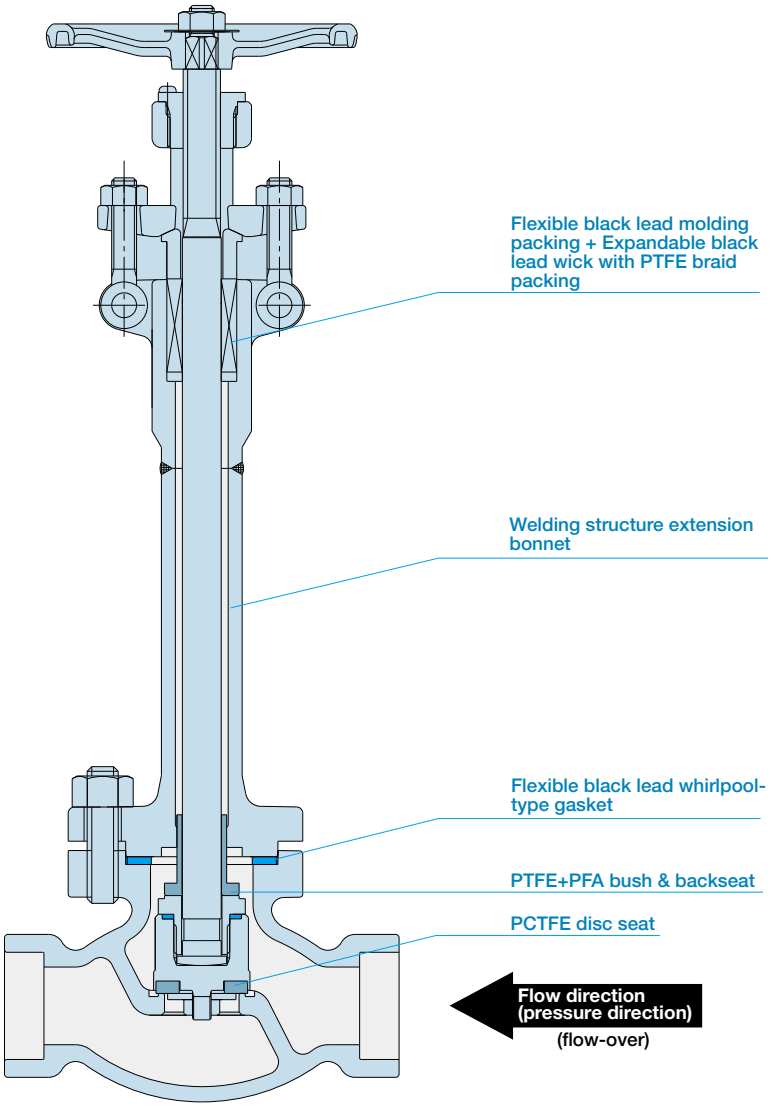
Features of KITZ soft-seated globe valves

- A higher cost performance is achieved than for the disc seat structure.
- The flow direction (pressure direction) becomes flow over the disc. A low operation strength is enabled by flow-over.
- A PCTFE disc seat with excellent low-temperature characteristics and mechanical properties is used to achieve high durability and high sealant quality.
- Stem binding prevention is realized with back seat and all-in-one type PTFE+PFA construction bushing.
- The disc seats can only be replaced by removing the disc nut.
- This valve is the same low-emission type as in the metal seat structure used for the seal material of the packing/gasket. This cancels compression creep stress relief and ensures seal quality for extended periods.
- Improvement of maintenance and avoidance of binding are achieved through all-in-one design of backseat and bush PTFE+PFA.

*1 Soft structure applicable only to globe valves
*2 Even when valves are all closed with flow over, packing unit is always pressurized.

Representative structural assembly of soft-seat globe valve

–196℃ specification



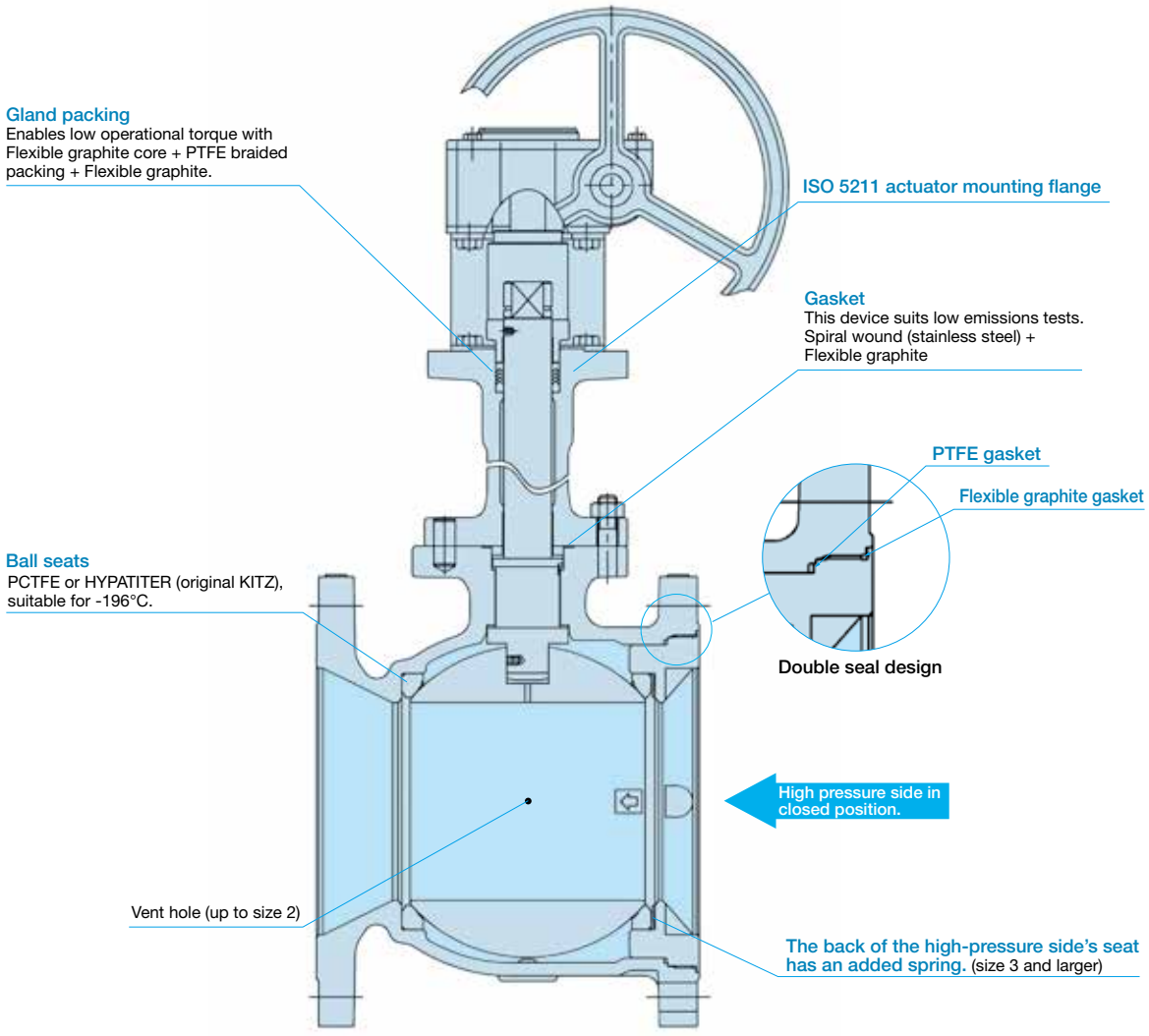
※This figure shows the valve in the closed position.

Features of KITZ floating ball valves

-196˚C Specification

- Easy opening and closing, with 90° rotation.
- There is little pressure loss.
- Extension bonnet
  Thermal conduction and heat transmission from the low-temperature fluid is suppressed to a minimum while a cooling effect is provided. The packing is prevented from being exposed to the low-temperature liquid and a secure seal is realized.
- Packing/Gasket
  Flexible graphite with excellent resistance to low temperatures, sealing quality, and durability is used in the packing and gasket.
- Seat structure
  Size 3B and larger utilizes a seat spring and achieves a secure seal with a low operation torque.
- Prevention of abnormal pressure within cavity
  Sizes ½B to 2B have vent holes, and sizes 3B to 10B have upstream-side seat springs installed. These adjustments prevent abnormal pressure within the cavity.
- Fire-safe design

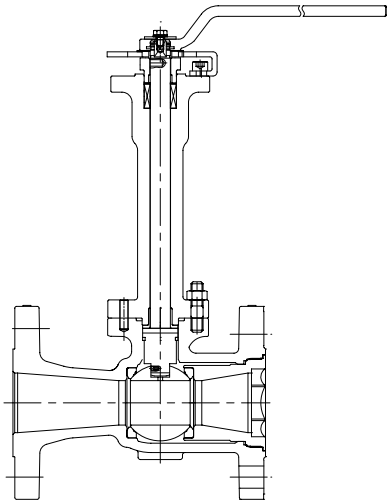
Illustrated cross-section of a KITZ cryogenic floating ball valve, with operational temperature of -196°C



The valve design that is appropriate for operational temperatures can be selected by combining an extension bonnet and ball seat.

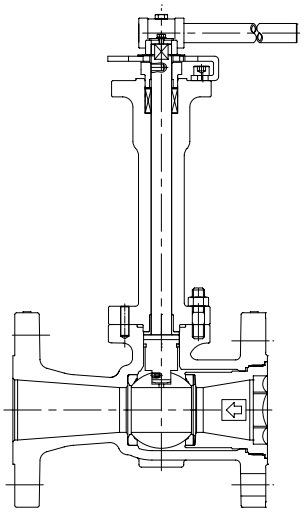
Design comparison based on operational temperature

−46℃ | −104℃



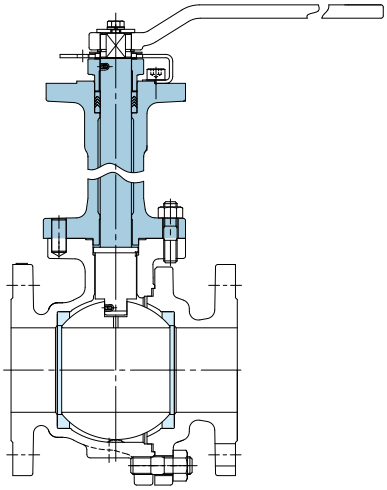
Operational Temperature	−46℃	−104℃
Body material	A352 Gr. LCC	A351 Gr. CF8M
Bore	Reduced bore	
Body design	1-piece	
Flow direction	Bi-directional flow	
Gland packing	Flexible graphite	
Gasket	PTFE + Flexible graphite	

−196℃



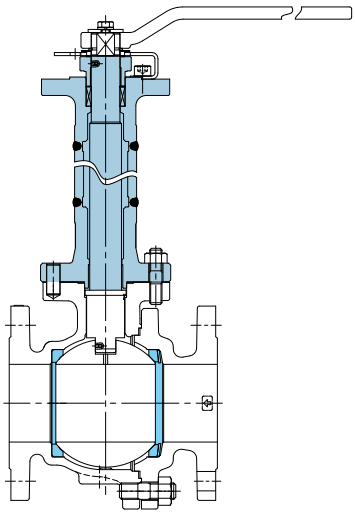
Body material	A351 Gr. CF8
Bore	Full bore
Body design	2-piece
Flow direction	Bi-directional flow
Gland packing	Flexible graphite
Gasket	Flexible graphite
Seat spring	Size 2 and larger

−46℃ | −104℃



Operational Temperature	−46℃	−104℃
Body material	A352 Gr. LCC/LCB	A351 Gr. CF8
Bore	Full bore	
Body design	2-piece	
Flow direction	Unidirectional flow	
Gland packing	Flexible graphite	PTFE
Gasket	Flexible graphite	PTFE

−196℃



Body material	A351 Gr. CF8
Bore	Full bore
Body design	2-piece
Flow direction	Bi-directional flow
Gland packing	Flexible graphite
Gasket	Flexible graphite
Seat spring	Size 2 and larger

KITZ low emission service valves

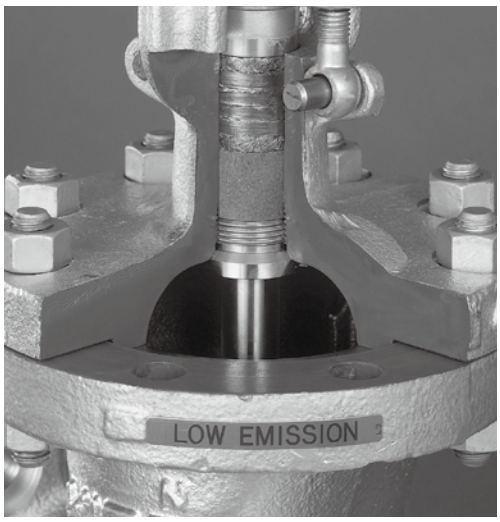
In the United States, the Federal Clean Air Act was amended in 1990 to realize a new environmental protection policy that stipulates a 95% reduction in fugitive emissions or leak levels of toxic gases and chemicals from plant equipment.

From April 1994, the new law requires all plants handling toxic gases (as specified by the Environmental Protection Agency), to periodically monitor their plant equipment to detect leaks exceeding 500 ppm, and repair or replace all defective parts immediately. California has gone further than the federal law with a state regulation requiring 100 ppm maximum leak levels, representing a 99% reduction of this kind of environmental pollution for the Northern California Region since 1997.

Our current low emission valves, the result of several years of trial and error at our laboratory, are designed, engineered, manufactured, and tested to meet the 100 ppm maximum emission level. This standard specification in North America is met by KITZ Class 150, 300, and 600 Series A and C stainless and high-alloy steel valves. In other markets, similar low emission valves are available as options. Major design considerations for upgrading our standard valves to have low emission performance are introduced below.

Gland packing <Gate valves, Globe valves>
KITZ's original "SEALEVER_" graphite packing set, with a pure carbon spacer bush for Class 300 and 600.
*US Patent No. 5522603 and 5573253. Other patents registered or pending worldwide.

Bonnet gaskets and check valve cover gaskets <Gate valves, Globe valves, Swing check valves>
Class 150 : Flexible graphite sheet with stainless steel insert and permeation-protective barrier for low-emission applications or spiral wound
Class 300 : Spiral wound (flexible graphite filler and stainless steel hoop) with a stainless steel inner ring
Class 600 : Spiral wound

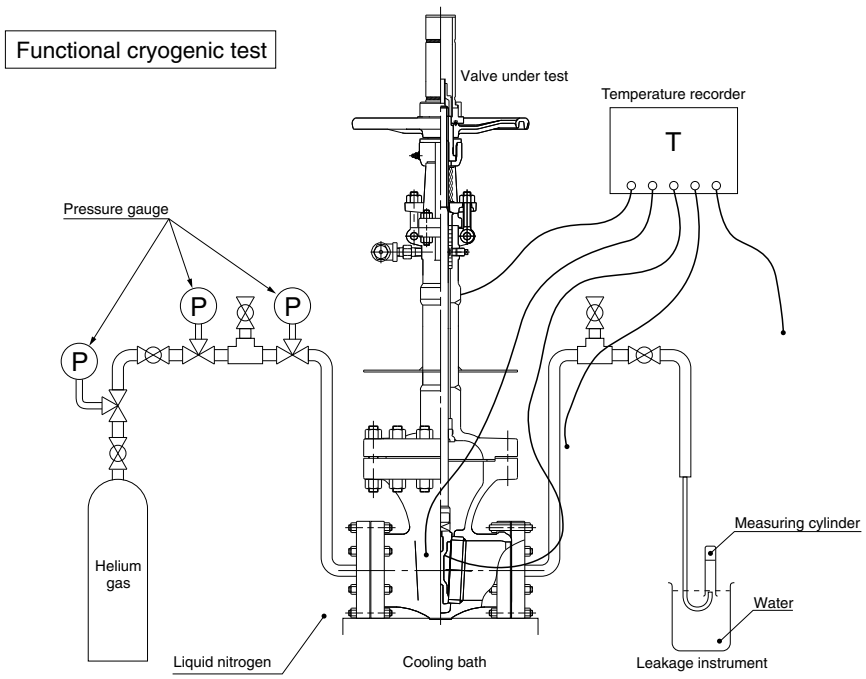


Inspection tests

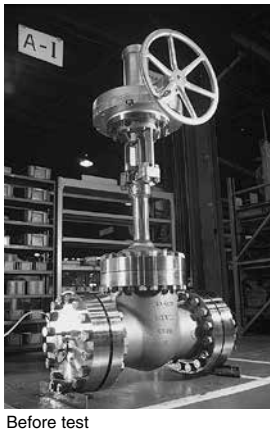
Test/Inspection Item	Method	Evaluation
Chemical composition analysis		Relevant ASTM Standards
Mechanical property test	ASTM A370	Relevant ASTM Standards
Pressure tests	API 598 or BS 6755 Part1	API 598
Radiographic inspection	ASTM E446/E146	ASME B16.34
Wet magnetic particle inspection	ASTM E 138	
Liquid penetrant inspection	ASTM E165	
Low-temperature impact test	ASTM A370	ASTM A352/ASME BPVC Sec.Ⅷ Div.1
Dimension inspection		Relevant Valve Standards
Visual inspection		MSS SP-55
Emission test	EPA Method 21 and KITZ Std	KITZ Std.
Cryogenic test	ISO 28921-1	ISO 28921-1

* The test requirements such as test items, methods, and criteria must be agreed upon by both the customer and KITZ.

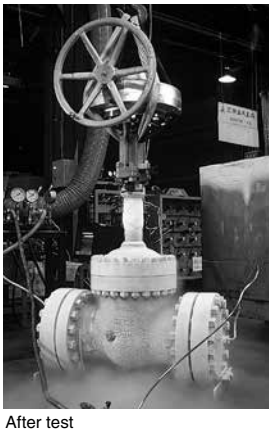
Cryogenic Valves Test



Thermocouple connecting point
1) Gland
2) Body
3) Disc (proximity)
4) Cooling bath temperature
5) Chamber temperature

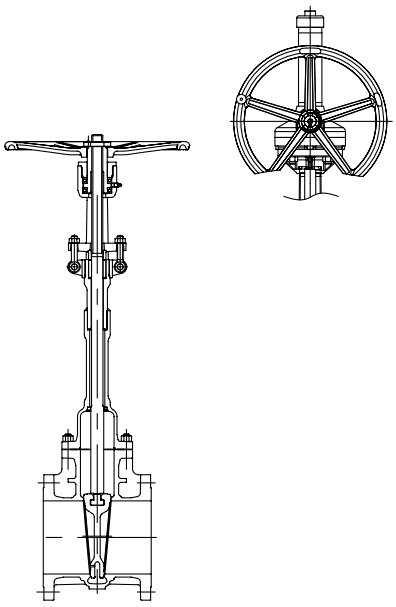


Before test


After test

Categoly I | **-196℃ / -321℉**

CLASS 150 / 300 / 600 Stainless Steel Gate Valves



Design Specifications	
Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.5

Materials	
Name of parts	Materials
Body	CF8M+HF*
Bonnet	CF8M
Stem	316SS
Disc	CF8M+HF*
Gland packing	RTFE+Graphite
Gasket	Graphite
Bonnet bolt	A320 Gr. B8 CL2
Bonnet nut	A194 Gr. 8

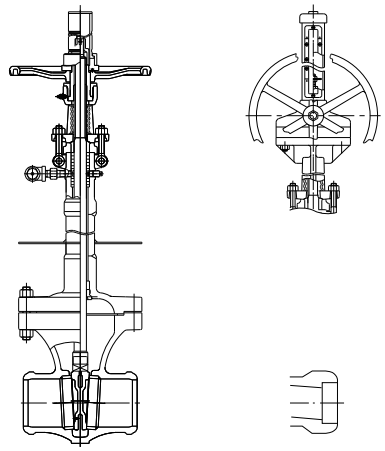
*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Class 150	150UMALMY						●		●	●		●	●	■	■	■	■	■	■	■
Class 300	300UMALMY						●		●	●		●	■	■	■	■	■	■	■	■
Class 600	600UMALMY						●		●	●		■	■	■	■					

● : Handle operation ■ : Gear operation

Class 150 / 300 / 600 Stainless Steel Gate Valves



Butt-weld

Socket-weld

Design Specifications	
Wall thickness	API600
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.25

Materials		
Name of parts		Materials
Body	1 ½B and smaller	CF8M+HF*
	2B and larger	CF8M
Bonnet	1B and smaller	CF8M+HF*
	1 ½B and larger	CF8M
Stem		316SS+HF*
Disc		CF8M+HF*
Gland packing		Flexible graphite braided packing + Flexible graphite die mold packing
Gasket		Flexible graphite spiral wound
Body seat ring (2B and larger)		316SS+HF*
Bonnet bolt		A320 Gr. B8 CL2
Bonnet nut		A194 Gr. 8

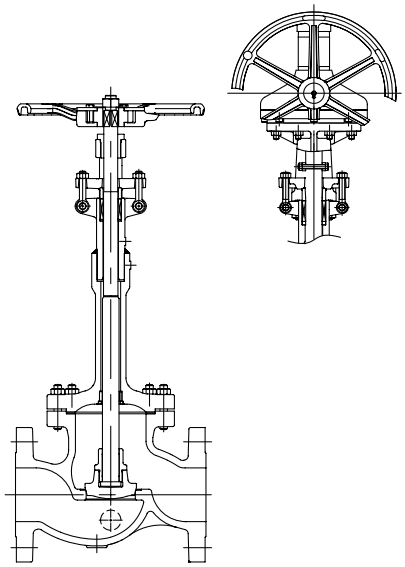
*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
RF-flanged	150UMCLMY		●	●	●	●	●	●	●	●	●	●	●	■	■	■	■	■	■	■
RF-flanged	300UMCLMY		●	●	●	●	●	●	●	●	●	●	■	■	■	■	■	■	■	■
RF-flanged	600UMCLMY		●	●	●	●	●	●	●	●		■	■	■	■	■	■	■	■	■
Butt-weld	(T)W150UMCLMY						●	●	●	●	●	●	●	■	■	■	■	■	■	■
Butt-weld	(T)W300UMCLMY						●	●	●	●	●	●	■	■	■	■	■	■	■	■
Butt-weld	(T)W600UMCLMY						●	●	●	●	■	■	■	■	■	■	■	■	■	■
Socket-weld	(T)SW300UMCLMY		●	●	●	●	●													
Socket-weld	(T)SW600UMCLMY		●	●	●	●														

● : Handle operation ■ : Gear operation

CLASS 150 / 300 / 600 Stainless Steel Globe Valves



Design Specifications	
Wall thickness	API623
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.5

Materials	
Name of parts	Materials
Body	CF8M
Bonnet	CF8M
Stem	316SS
Disc	CF8M+HF*
Gland packing	RTFE+Graphite
Gasket	Graphite
Bonnet bolt	A320 Gr. B8 CL2
Bonnet nut	A194 Gr. 8

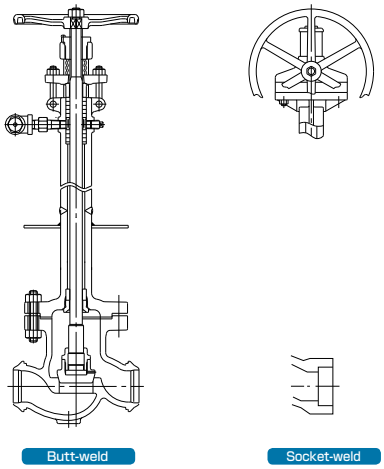
*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Class 150	150UPCRLMD						●	●	●	●		●	■							
Class 300	300UPCRLMD						●	●	●	●		■	■							
Class 600	600UPCRLMD						●	●	●	■		■	■							

● : Handle operation ■ : Gear operation

Class 150 / 300 / 600 Stainless Steel Globe Valves



Design Specifications	
Wall thickness	API600
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.25

Materials		
Name of parts		Materials
Body	1 ½B and smaller	CF8M+HF*
	2B and larger	CF8M+HF*
Bonnet	1B and smaller	CF8M
	1 ½B and larger	316SS+HF*
Stem		316SS+HF*
Disc		CF8M+HF*
Gland packing		Flexible graphite braided packing + Flexible graphite die mold packing
Gasket		Flexible graphite spiral wound
Bonnet bolt		A320 Gr. B8 CL2
Bonnet nut		A194 Gr. 8

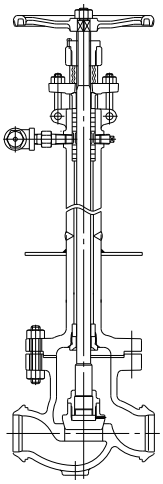
*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
RF-flanged	150UPCLMY		●	●	●	●	●	●	●	●		●	■							
RF-flanged	300UPCLMY		●	●	●	●	●	●	●	●		■	■							
RF-flanged	600UPCLMY		●	●	●	●	●		■	■		■	■							
Butt-weld	(T)W150UPCLMY						●	●	●	●	●	●	■							
Butt-weld	(T)W300UPCLMY						●	●	●	●		■	■							
Butt-weld	(T)W600UPCLMY						●		■	■		■	■							
Socket-weld	(T)SW300UPCLMY		●	●	●	●	●													
Socket-weld	(T)SW600UPCLMY		●	●	●	●														

Categoly I | **-196℃ / -321℉**

Class 150 / 300 Stainless Steel Globe Valves (Soft-Seated)



Butt-weld

Socket-weld

Design Specifications

Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	JPI-7S-67 (Butt-weld) JPI-7S-36-96 (Socket-weld)
End connection dimensions	JPI-7S-67 JIS B2316 (Socket-weld)

Materials

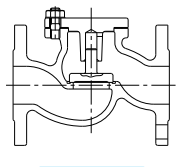
Name of parts	Materials
Body	CF8
Bonnet	CF8
Stem	304SS
Valve holder	304SS or CF8 (Butt-weld) 304SS (Socket-weld)
Gland	304SS
Gland packing	Flexible graphite cored PTFE braided packing + Flexible graphite die mold packing
Handle	FCD400
Gasket	Flexible graphite spiral wound
Bonnet bolt	A320 2Gr. B8
Bonnet nut	A194 Gr. 8
Seat	PCTFE (Socket-weld)

Range

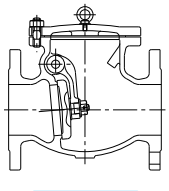
Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Butt-weld	W150UPDCL						●	●	●	●										
Socket-weld	SW300UPDAL		●	●	●	●	●													

Class 150 / 300 / 600 Stainless Steel Lift Check / Swing Check Valves

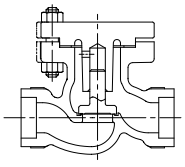
Lift Check Valves | Swing Check Valves



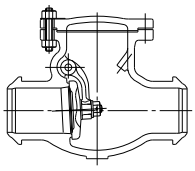
RF-flanged



RF-flanged



Socket-weld



Butt-weld

Design Specifications

Wall thickness	API600
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.25

Materials

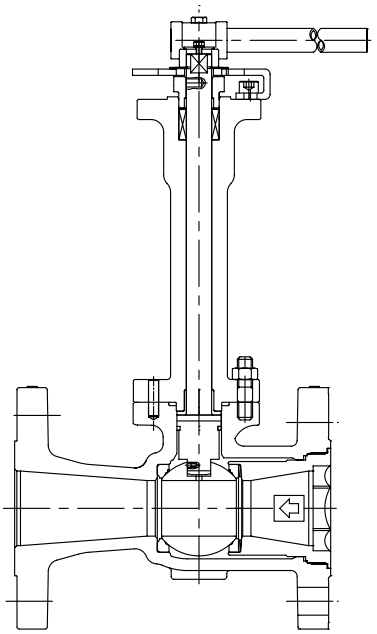
Name of parts	Materials
Body	CF8M+HF*
Cover	CF8M
Disc	CF8M+HF*
Gasket	Flexible graphite spiral wound
Cover bolt	A320 Gr. B8 CL2
Cover nut	A194 Gr. 8

*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
RF-flanged	150UOCLMY		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
RF-flanged (Swing check)	300UOCLMY						●	●	●	●		●	●	●	●	●	●	●	●	●
RF-flanged (Swing check)	600UOCLMY		●	●	●	●	●		●	●		●	●	●	●					
Butt-weld	(T)W150UOCLMY						●	●	●	●	●	●	●	●	●	●	●	●	●	●
Butt-weld (Swing check)	(T)W300UOCLMY						●	●	●	●		●	●	●	●	●	●	●	●	●
Butt-weld (Swing check)	(T)W600UOCLMY						●		●	●		●	●	●	●					
Socket-weld (Lift check)	(T)SW300UNCLMY		●	●	●	●														
Socket-weld (Swing check)	(T)SW300UOCLMY						●													
Socket-weld (Lift check)	(T)SW600UNCLMY		●	●	●	●														

Class 150 / 300 Stainless Steel Floating Ball Design, Reduced Bore



Design Specifications	
Wall thickness	ASME B16.34
Face to face dimensions	ASME B16.10
Flange specifications	ASME B16.5

Materials	
Name of parts	Materials
Body	CF8M
Bonnet	316SS
Insert	CF8M
Stem	SUS660
Seat spring	304SSCSP (Size 3B and larger)
Ball	CF8M
Gland	CF8M
Gland packing	Flexible graphite
Ball seat (Insert side)	HYPATITE PTFE
Ball seat (Body side)	HYPATITE PTFE
	PCTFE (Size 2B and Smaller)
Handle	FCD450-10
Gasket	Flexible graphite
	PTFE
Bonnet bolt	A320 Gr. B8M
Bonnet nut	A194 Gr. 8M

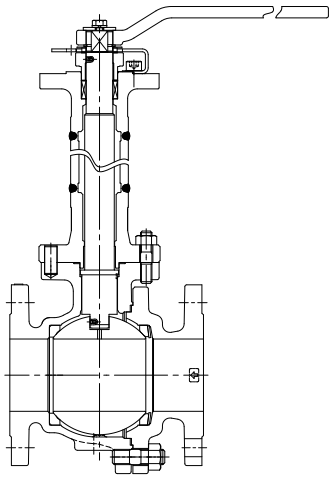
Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16
Class 150	RF-flanged	150UTAZLM	●	●	●	●	●		●	●		■	■	■			
Class 300	RF-flanged	300UTAZLM	●	●	●	●	●		●	■		■	■	■			

● : Lever operation ■ : Gear operation

※Pege 22 for Pressure-Tenperature Rating.

Class 150 / 300 Stainless Steel Floating Ball Design, Full Bore



Design Specifications	
Wall thickness	ASME B16.34
Face to face dimensions	ASME B16.10
Flange specifications	ASME B16.5 (150／300)

Materials	
Name of parts	Materials
Body	CF8M
Body cap	CF8M
Bonnet	304SS
Stem	304SS
Seat spring	304SSCSP (Size 2B and larger)
Ball	304SS or CF8M
Ball seat A	HYPATITE PTFE
Ball seat B	HYPATITE PTFE
	PCTFE (Size 1 ½B and smaller)
Gasket	Flexible graphite spiral wound
	Flexible graphite seat
Bonnet bolt	304SS(B8)
Bonnet nut	304SS(8)
Gland packing	Flexible graphite die mold packing

Range

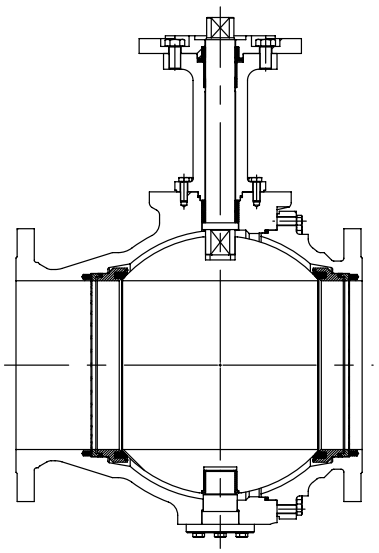
Nominal size		A	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
		B	½	¾	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16
Class 150	RF-flanged	150UTDZL	●	●	●	●	●	●	●	●	■	■	■	■	■			
Class 300	RF-flanged	300UTDZL	●	●	●		●	●	●	■	■		■	■				

● : Lever operation ■ : Gear operation

※Pege 22 for Pressure-Tenperature Rating.

Categoly I | -196℃ / -321℉

CLASS 150 / 300 / 600 Stainless Steel Trunnion Ball Design,Full Bore



Design Specifications	
Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.5

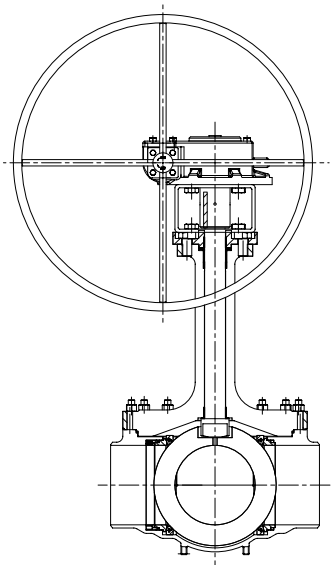
Materials	
Name of parts	Materials
Body	316SS／CF8M
Bonnet	316SS／CF8M
Stem	316SS
Ball	316SS／CF8M
Ball seat	UHMW-PE
Gland packing	PTFE
Gasket	PTFE

※Fluid temperature range
:-196℃~100℃
(-321℉~212℉)

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Class 150	150UPG14K						●	●	●	●		●	●	●	●	●	●			
Class 300	300UPG14K						●	●	●	●		●	●	●	●	●	●			
Class 600	600UPG14K						●	●	●	●		●	●	●	●	●	●			

CLASS 150 / 300 Stainless Steel Top Entry Ball Design,Full Bore



Design Specifications	
Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.10

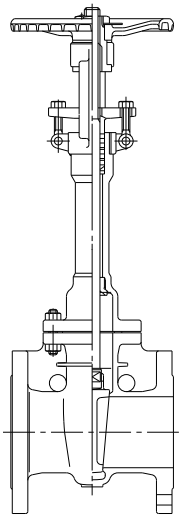
Materials	
Name of parts	Materials
Body	CF8M／CF3M
Bonnet	CF8M／CF3M
Stem	UNS S66286
Ball	CF8M／CF3M
Ball seat	PCTFE
Gland packing	Graphite
Gasket	Graphite

※Fluid temperature range
:-196℃~100℃
(-321℉~212℉)

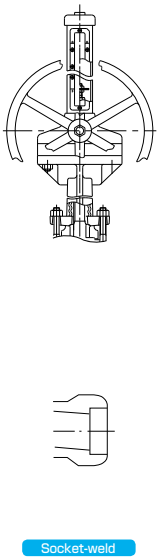
Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Class 150	150UPG67K				●	●	●	●	●	●		●	●							
Class 300	300UPG67K				●	●	●	●	●	●		●	●							

Class 150 / 300 Stainless Steel Gate Valves



RF-flanged



Socket-weld

Design Specifications

Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.5

Materials

Name of parts	Materials
Body	CF8M+HF*
Bonnet	CF8M
Stem	304SS
Disc	CF8M+HF*
Gland packing	Flexible graphite+PTFE braided
Handle	FCD400
Gasket	Ceramic PTFE(Class 150) PTFE spiral wound(Class 300)
Bonnet bolt	A193 Gr. B8 CL2
Bonnet nut	A194 Gr. 8
York sleeve	C6782BE

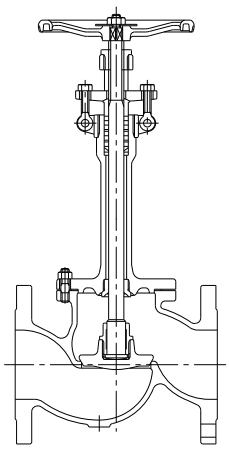
*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
RF-flanged	150UMAXY		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Socket-weld	SW300UMXY		●	●	●	●														
RF-flanged	300UMAXY		●	●	●	●	●	●	●	●	●	●	■	■	■	■	■		■	■

● : Handle operation ■ : Gear operation

Class 150 / 300 Stainless Steel Globe Valves



RF-flanged

Socket-weld

Design Specifications

Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.5

Materials

Name of parts		Materials
Body		CF8M+HF*
Bonnet		CF8M
Stem		304SS
Disc	1½B and smaller	304SS+HF*
	2B and larger	CF8M+HF*
Gland packing		Flexible graphite+PTFE braided
Gasket		Ceramic PTFE
Bonnet bolt		A193 Gr. B8 CL2
Bonnet nut		A194 Gr. 8

*Co-Cr-W Alloy

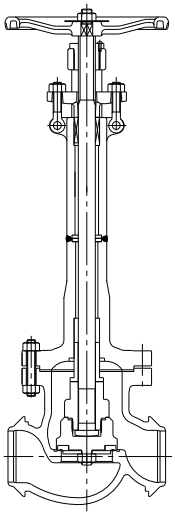
Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
RF-flanged	150UPAXY		●	●	●	●	●	●	●	●	●	■	■		■					
Socket-weld	SW300UPXY		●	●	●	●														
RF-flanged	300UPAXY		●	●	●	●	●	●	●	●	●	●	■							

● : Handle operation ■ : Gear operation

Categoly Ⅱ | **-104℃ / -155℉**

Class 150 / 300 Stainless Steel Globe Valves (Soft-Seated)



Butt-weld

Socket-weld

Design Specifications	
Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	JPI-7S-67(Butt-weld) JPI-7S-36-96(Socket-weld)
End connection dimensions	JPI-7S-67(Butt-weld) JIS B2316 (Socket-weld)

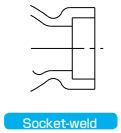
Materials	
Name of parts	Materials
Body	CF8M
Bonnet	CF8M
Stem	304SS
Valve holding	304SS or CF8M
Gland	304SS
Gland packing	Flexible graphite cored PTFE braided packing + Flexible graphite die mold packing
Handle	FCD400
Gasket	Flexible graphite spiral wound
Bonnet bolt	A320 2Gr. B8
Bonnet nut	A194 Gr. 8
Seat	PCTFE

Range C series

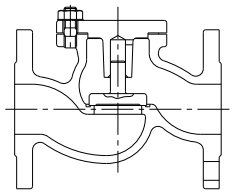
Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Butt-weld	W150UPDCX						●	●	●	●										
Socket-weld	SW300UPDX		●	●	●	●	●													

Class 150 / 300 Stainless Steel Lift Check / Swing Check Valves

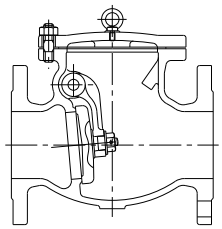
Lift Check Valves | Swing Check Valves



Socket-weld



RF-flanged



RF-flanged

Design Specifications	
Wall thickness	ASME B16.34
Pressure-temperature ratings	ASME B16.34
Face to face dimensions	ASME B16.10
End connection dimensions	ASME B16.5

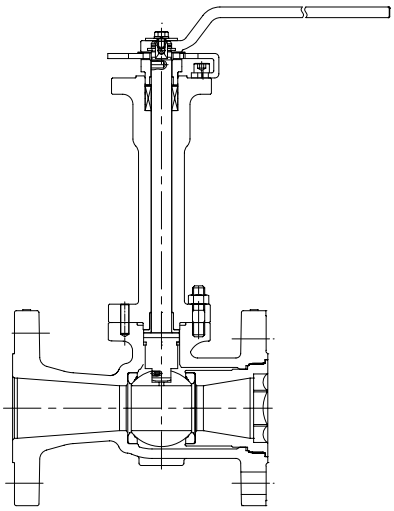
Materials	
Name of parts	Materials
Body	CF8+HF*
Bonnet	CF8
Disc	Lift Check Valves: 304SS+HF* Swing Check Valves: CF8+HF*
Gasket	Ceramic PTFE(Class 150) PTFE spiral wound(Class 300)
Cover bolt	A193 Gr. B8 CL2
Cover nut	A194 Gr. 8

*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
RF-flanged (Lift check)	150UNAXY		●	●	●	●														
RF-flanged (Swing check)	150UOAXY					●	●	●	●	●	●	●	●	●	●	●	●			
Socket-weld (Lift check)	SW300UNXY		●	●	●	●														
RF-flanged (Lift check)	300UNAXY		●	●	●	●														
RF-flanged (Swing check)	300UOAXY					●	●	●	●	●	●	●	●	●	●	●	●			

Class 150 / 300 Stainless Steel Floating Ball Design, Reduced Bore



Design Specifications	
Wall thickness	ASME B16.34
Face to face dimensions	ASME B16.10
Flange specifications	ASME B16.5

Materials	
Name of parts	Materials
Body	CF8M
Bonnet	CF8M
Insert	CF8M
Stem	316SS／XM-19HS
Ball	CF8M
Gland	CF8M
Gland packing	Flexible graphite
Ball seat	HYPATITE PTFE
Handle	FCD450-10
Gasket	Flexible graphite seat
	PTFE
Bonnet bolt	A320 Gr. B8M
Bonnet nut	A194 Gr. 8M

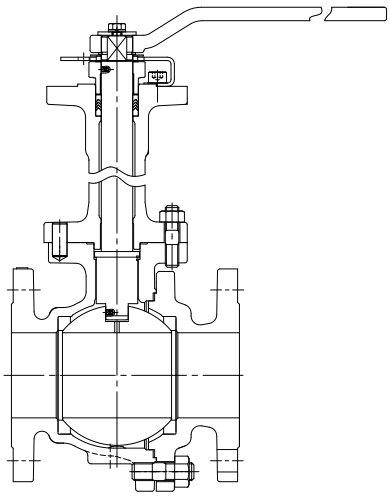
Range

Nominal size			A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400
			B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16
Class 150	RF-flanged	150UTAZXLM		●	●	●	●	●		●	●		■	■	■			
Class 300	RF-flanged	300UTAZXLM		●	●	●	●	●		●	●		■	■	■			

● : Lever operation ■ : Gear operation

※Pege 22 for Pressure-Tenperature Rating.

Class 150 / 300 Stainless Steel Floating Ball Design, Full Bore



Design Specifications	
Wall thickness	ASME B16.34
Face to face dimensions	ASME B16.10
Flange specifications	ASME B16.5 (150／300)

Materials	
Name of parts	Materials
Body	CF8
Body cap	CF8
Bonnet	CF8
Stem	304SS
Ball	304SS or CF8
Ball seat	HYPATITE PTFE
Gasket	Ceramic PTFE
	Flexible graphite spiral wound
Bonnet bolt	304SS(B8)
Bonnet nut	304SS(8)
Gland packing	PTFE

Range

Nominal size			A	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
			B	½	¾	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16
Class 150	RF-flanged	150UTDZXL		●	●	●	●	●	●	●	●	●	■	■	■	■			
Class 300	RF-flanged	300UTDZXL		●	●	●		●	●	●	●	●		■	■	■			

● : Lever operation ■ : Gear operation

※Pege 22 for Pressure-Tenperature Rating.

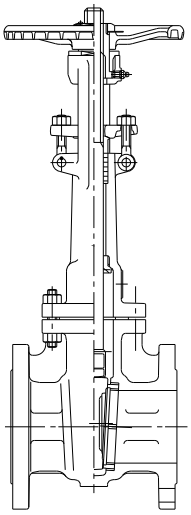
Categoly Ⅲ | **-46℃ / -51℉**

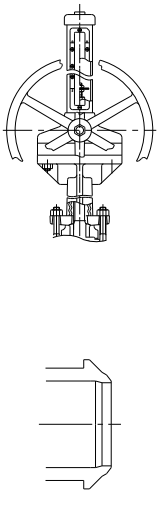
Cast Carbon steel / Low alloy for low-temperature Valves

Body / Bonnet		Trim Materials *1				Bonnet bolt / Nut *1		Operating temperature *2	
Material	Code	Body seat	Disc seat	Stem	Bonnet bush	Bolt	Nut	Min	Max
LCB(SCPL1)	BL	304SS	304SS or 308	304SS	316SS	—	—	350℃ (343℃)	−45℃ (−46℃)
LCC(−)	CL					(Gr. L7)	(Gr. 4)	343℃	— (−46℃)

The materials in parentheses indicate the material standards from ASTM standard.
The figures in parentheses indicate temperature from ASTM standard.
*1 : The trim material and bonnet bolt/nut material shown is a representative example. The appropriate material will be selected according to the temperature.
*2 : The usage temperature is the temperature for the body/bonnet material ; and the temperature for the valve (with consideration for the bonnet shape) will be selected separately.

Class 150 / 300 / 600 Cast Carbon Steel / Low Alloy Gate Valves


RF-flanged


Butt-weld

Design Specifications

Wall thickness		API600
Pressure-temperature ratings		ASME B16.34
Face to face dimensions		ASME B16.10
End connection dimensions	RF-flanged	ASME B16.5
	Butt-weld	ASME B16.25

Materials

Name of parts		Materials
Body		※
Bonnet		※
Stem		304SS
Disc	4B and smaller	304SS+HF*
	6B and larger	※
Gland packing		Flexible graphite
Gasket		Flexible graphite spiral wound
Body seat ring (2B and larger)		304SS+HF*
Bonnet bolt		A320 Gr. L7
Bonnet nut		A194 Gr. 8

※The minimum working temperatures are dependent on the material. (See table above.)
Class150: Flexible graphite seat spiral wound
Class300: Flexible graphite seat spiral wound
Class600: Soft iron
*Co-Cr-W Alloy

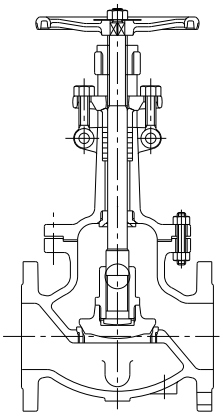
Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Butt-weld	W150SCLSXBLY					●	●	●	●	●	●	●	●	●	●	●	●	■	■	■
RF-flanged	150SCLSXBLY					●	●	●	●	●	●	●	●	●	●	●	●	■	■	■
Butt-weld	W300SCLSXBLY						●	●	●	●	●	●	●	■	■	■	■	■	■	
RF-flanged	300SCLSXBLY						●	●	●	●	●	●	●	■	■	■	■	■	■	
Butt-weld	W600SCLSXBLY						●	●	●	●		■	■	■	■	■				
RF-flanged	600SCLSXBLY						●	●	●	●		■	■	■	■	■				

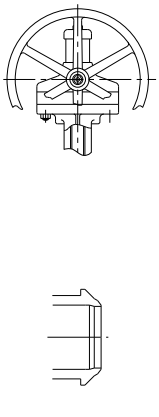
● : Handle operation ■ : Gear operation

Memo

Class 150 / 300 / 600 Cast Carbon Steel / Low Alloy Globe Valves



RF-flanged



Butt-weld

Design Specifications

Wall thickness		API600
Pressure-temperature ratings		ASME B16.34
Face to face dimensions		ASME B16.10
End connection dimensions	RF-flanged	ASME B16.5
	Butt-weld	ASME B16.25

Materials

Name of parts		Materials
Body		※
Bonnet		※
Stem		304SS
Disc	4B and smaller	304SS+HF*
	6B and larger	※
Gland packing		Flexible graphite
Gasket		Flexible graphite spiral wound
Body seat ring (2B and larger)		304SS+HF*
Bonnet bolt		A320 Gr. L7
Bonnet nut		A194 Gr. 8

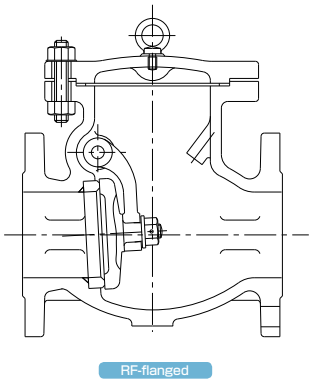
※The minimum working temperatures are dependent on the material.
Class150: Flexible graphite seat Class300: Flexible graphite seat
Class600: Soft iron
*Co-Cr-W Alloy

Range

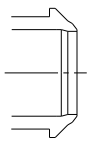
Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Butt-weld	W150SCJSXBLY						●	●	●	●		●	●		■					
RF-flanged	150SCJSXBLY						●	●	●	●		●	●		■					
Butt-weld	W300SCJSXBLY						●	●	●	●		■	■							
RF-flanged	300SCJSXBLY						●	●	●	●		■	■							
Butt-weld	W600SCJSXBLY						●	●	●	■		■	■	■						
RF-flanged	600SCJSXBLY						●	●	●	■		■	■	■						

● : Handle operation ■ : Gear operation

Class 150 / 300 / 600 Cast Carbon Steel / Low Alloy Swing Check Valves



RF-flanged



Butt-weld

Design Specifications

Wall thickness		API600
Pressure-temperature ratings		ASME B16.34
Face to face dimensions		ASME B16.10
End connection dimensions	RF-flanged	ASME B16.5
	Butt-weld	ASME B16.25

Materials

Name of parts		Materials
Body		※
Cover		※
Disc	4B and smaller	304SS+HF*
	6B and larger	※
Gasket		Flexible graphite spiral wound
Body seat ring (2B and larger)		304SS+HF*
Bonnet bolt		A320 Gr. L7
Bonnet nut		A194 Gr. 8

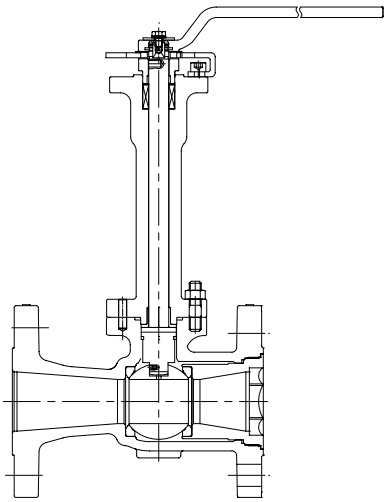
※The minimum working temperatures are dependent on the material.
Class150: Flexible graphite seat Class300: Flexible graphite seat
Class600: Soft iron
*Co-Cr-W Alloy

Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24
Butt-weld	W150SCOSXBLY						●	●	●	●		●	●	●	●	●	●	●	●	●
RF-flanged	150SCOSXBLY						●	●	●	●		●	●	●	●	●	●	●	●	●
Butt-weld	W300SCOSXBLY						●	●	●	●		●	●	●	●	●	●	●	●	●
RF-flanged	300SCOSXBLY						●	●	●	●		●	●	●	●	●	●	●	●	●
Butt-weld	W600SCOSXBLY						●	●	●	●		●	●	●	●	●	●	●	●	●
RF-flanged	600SCOSXBLY						●	●	●	●		●	●	●	●	●	●	●	●	●

Categoly Ⅲ | -46℃ / -51℉

Class 150 / 300 Cast Carbon Steel Floating Ball Design, Reduced Bore



Design Specifications	
Wall thickness	ASME B16.34
Face to face dimensions	ASME B16.10
Flange	ASME B16.5

Materials	
Name of parts	Materials
Body	LCC
Bonnet	LF2
Insert	LCC
Stem	316SS
Ball	CF8M
Gland packing	Flexible graphite
Ball seat	HYPATITE PTFE
Handle	FCD450-10
Gasket	Flexible graphite
	PTFE
Bonnet bolt	A320 Gr. L7M
Bonnet nut	A194 Gr. 7M

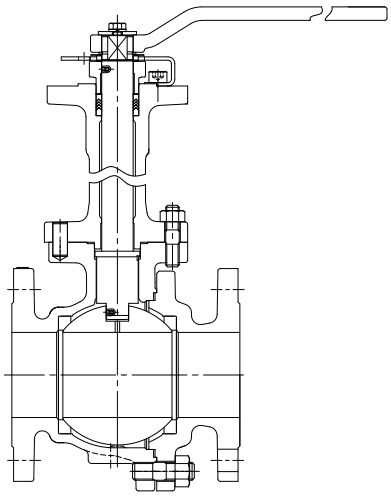
Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16
Class 150	RF-flanged	150SCTAZXCL	●	●	●	●	●		●	●		■	■	■			
Class 300	RF-flanged	300SCTAZXCL	●	●	●	●	●		●	●		■	■	■			

● : Lever operation ■ : Gear operation

※Pege 22 for Pressure-Tenperature Rating.

Class 150 / 300 Cast Carbon Steel Floating Ball Design, Full Bore



Design Specifications	
Wall thickness	ASME B16.34
Face to face dimensions	ASME B16.10
Flange	ASME B16.5

Materials	
Name of parts	Materials
Body	LCC
Body cap	LCC
Bonnet	A350 Gr. LF2
Stem	316SS／XM-19HS
Ball	316SS･CF8M
Ball seat	HYPATITE PTFE
Gasket	Flexible graphite spiral wound
	Flexible graphite
Bonnet bolt	A320 Gr. L7M
Bonnet nut	A194 Gr. 7M
Gland packing	Flexible graphite

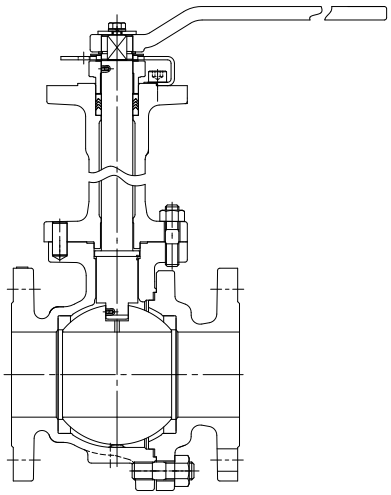
Range

Nominal size		A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400
		B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16
Class 150	RF-flanged	150SCTDZXCL	●	●	●	●	●		●	●		■	■	■			
Class 300	RF-flanged	300SCTDZXCL	●	●	●	●	●		●	●		■	■				

● : Lever operation ■ : Gear operation

※Pege 22 for Pressure-Tenperature Rating.

Class 150 / 300 Cast Carbon Steel Floating Ball Design, Full Bore



Design Specifications	
Wall thickness	ASME B16.34
Face to face dimensions	ASME B16.10
Flange	ASME B16.5

Materials	
Name of parts	Materials
Body	LCB
Body cap	LCB
Bonnet	A350 Gr. LF2
Stem	316SS／XM-19HS
Ball	316SS・CF8M
Ball seat	HYPATITE PTFE
Gasket	Flexible graphite spiral wound
	Flexible graphite
Bonnet bolt	A320 Gr. L7M
Bonnet nut	A194 Gr. 7M
Gland packing	Flexible graphite

Range

Nominal size			A	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400
			B	½	¾	1	1 ½	2	2 ½	3	4	5	6	8	10	12	14	16
Class 150	RF-flanged	150SCTDZXBL		●	●	●	●	●		●	●		■	■	■			
Class 300	RF-flanged	300SCTDZXBL		●	●	●	●	●		●	●		■	■				

● : Lever operation ■ : Gear operation

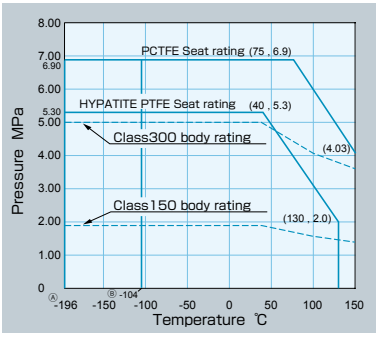
※Pege 22 for Pressure-Tenperature Rating.

Memo

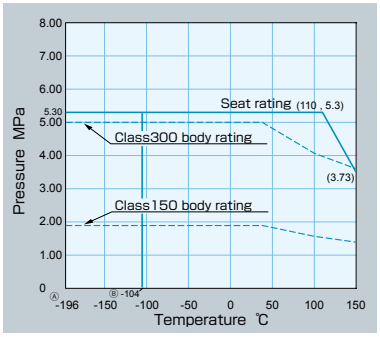
Pressure-Temperature Rating (Seat Rating)

Stainless Steel

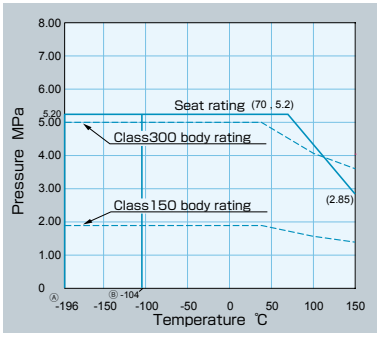
Ⓐ UTAZLM : ½B to 2B
Ⓐ UTDZL : ½B to 1½B
Ⓑ UTAZXLM : ½B to 1B
Ⓑ UTDZXL : ½B to ¾B



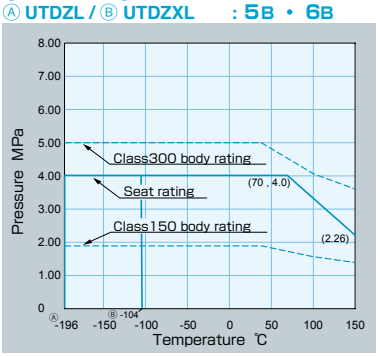
Ⓐ UTAZLM : 3B
Ⓐ UTDZL : 2B • 2½B
Ⓑ UTAZXLM : 1½B to 3B
Ⓑ UTDZXL : 1B to 2½B



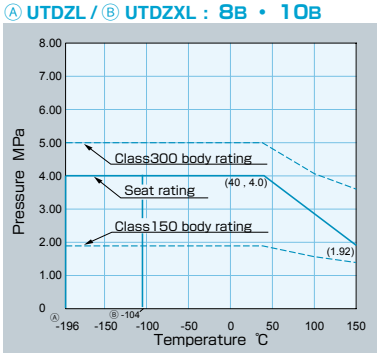
Ⓐ UTAZLM / Ⓑ UTAZXLM : 4B • 6B
Ⓐ UTDZL / Ⓑ UTDZXL : 3B • 4B



Ⓐ UTAZLM / Ⓑ UTAZXLM : 8B • 10B
Ⓐ UTDZL / Ⓑ UTDZXL : 5B • 6B

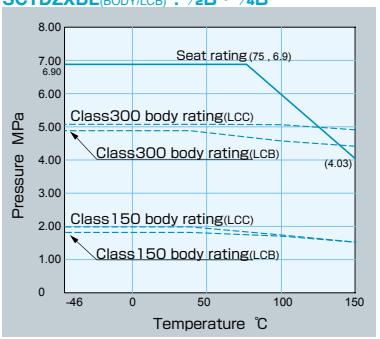


Ⓐ UTDZL / Ⓑ UTDZXL : 8B • 10B

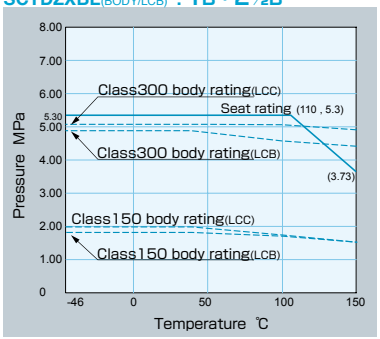


Cast Carbon Steel

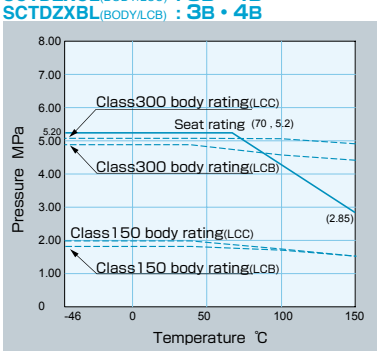
SCTAZXCL(BODY/LCC) : ½B • 1B
SCTDZXCL(BODY/LCC) : ½B • ¾B
SCTDZXBL(BODY/LCB) : ½B • ¾B



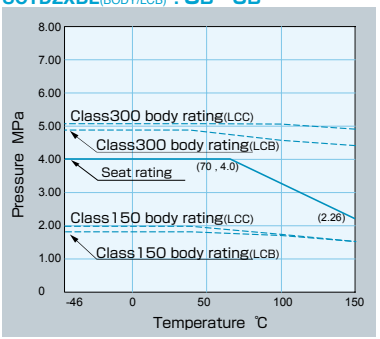
SCTAZXCL(BODY/LCC) : 1½B • 3B
SCTDZXCL(BODY/LCC) : 1B • 2½B
SCTDZXBL(BODY/LCB) : 1B • 2½B



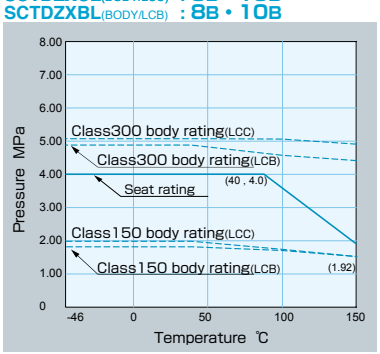
SCTAZXCL(BODY/LCC) : 4B • 6B
SCTDZXCL(BODY/LCC) : 3B • 4B
SCTDZXBL(BODY/LCB) : 3B • 4B



SCTAZXCL(BODY/LCC) : 8B • 10B
SCTDZXCL(BODY/LCC) : 5B • 6B
SCTDZXBL(BODY/LCB) : 5B • 6B



SCTDZXCL(BODY/LCC) : 8B • 10B
SCTDZXBL(BODY/LCB) : 8B • 10B



※Please contact KITZ Corporation for details of pressure-temperature range of trunnion ball and topentry ball valves.

Considerations when selecting a product

- The products described in this catalog are designed and produced specifically for low temperatures. Please have the person deciding on the design and specifications of the equipment and facilities determine the suitability of these valves.
- The range of usage of the products described in this catalog is based on official standards and specifications, and our internal company standards. Please confirm each product's specifications and fluid, temperature, and pressure usage conditions when selecting the appropriate product.
- When using our products in an environment in which there are legal restrictions, or voluntary specifications for standards and regulations of use have been established, please select the appropriate product after confirming all regulations and restrictions.
- Please ensure all necessary safety precautions are carried out (after confirming them with our company) when using our products in association with nuclear power, railways, aircraft, vehicles, ships, medical equipment, food processing equipment, safety equipment, and amusement park machinery.
- Our products use fluorine resin and rubber are not designed and manufactured for use in transplants into the human body or for use in medical equipment that will come into contact with bodily fluids or biological tissue. Usage for such purposes is not possible.
- The corrosion resistance of different materials used in the composition of these products can be different. Please select a product after confirming the required corrosion resistance under the conditions of usage for each material (fluid, temperature, and pressure).
- Even when used within the pressure and temperature standards for usage of the product, please confirm suitability with us when usage is close to the limitations or when used with frequent opening and closing for prolonged periods.
- Be sure to confirm with us when using these devices in a corrosive environment. Precautions must be taken when handling these products.
- Our product has oil and grease coated on the inside, outside, sliding areas, and areas contacting with fluids to prevent rust and to increase lubrication. When safety, hygiene, and functional problems arise because of oil or grease spillage, please take appropriate measures such as washing.
- Removal of foreign matter is not part of the design of our products. If the product is to be used for equipment processing beverages, food, etc., please take the appropriate measures to remove any foreign matter.
- Please use gate valves in either the completely open or the completely closed position. Using the valve partially open or closed may damage the valve or the surface of the valve seat.
- Swing check valves can be used for horizontal and vertical piping. However, the upward fluid flow is limited when used in vertical piping. Lift check valves cannot be used for vertical piping.
- Ball valves must be used in the fully open or fully closed positions. The ball seats may become deformed if the valve is not in the fully open or fully closed position during use.
- When in operation, the check valve may generate noise caused by chattering and water hammer. Please take these phenomena into consideration in the design of your pipe layout for prevention of chattering and water hammer when selecting the appropriate size of valve.
- If our product is to be exported, it is necessary to acquire export permission from the Ministry of Economy, Trade and Industry, in accordance with regulations of the Export Trade Control Ordinance for foreign currency exchange and Foreign Trade Law. Please consult our company if you require additional information.
- The figures in this catalog show representative sizes. Please access our company homepage to submit a request if detailed illustrations of the selected product are required. (Our company homepages: www.kitz.com)

Precautions when handling products

- Precautions when handling products introduced in this catalog are not described in the catalog. Make sure to obtain the applicable instruction manual for the product and observe the warnings and precautions to ensure correct, safe use of the product.

Liability Disclaimer

Our company does not assume any responsibility for damage caused by natural disasters, acts by third parties, other accidents, deliberate damage by customers, misuse, usage under abnormal conditions, or other conditions outside our responsibility. Our company does not assume any responsibility for damage when the purchaser of our product does not observe the restrictions described in the catalog, instruction manual included with the product, or any damage caused by usage outside the specifications, either during installation or during use of the product. Our company does not assume any responsibility for damage caused by modifications to the product that are done by a company other than our own, including damage caused to other equipment.

Memo

Memo

⚠ CAUTION

Pressure-temperature ratings and other performance data published in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications. They are good only to cover typical applications as a general guideline to users of KITZ products introduced in this catalog.

For any specific application, users are kindly requested to contact KITZ Corporation for technical advice, or to carry out their own study and evaluation for proving the suitability of these products to such an application. Failure to follow this request could result in property damage and/or personal injury, for which we shall not be liable.

While this catalog has been compiled with the utmost care, we assume no responsibility for errors, impropriety, or inadequacy. Any information provided in this catalog is subject to from-time-to-time change without notice for error rectification, product discontinuation, design modification, new product introduction or any other cause that KITZ Corporation considers necessary. This edition cancels all previous issues.

Read the instruction manual carefully before use.

⚠ NOTICE

If any products designated as strategic material in the Foreign Exchange and Foreign Trade Law, Cabinet Ordrer Concerning Control of Export Trade, Cabinet order Concerning Control of Foreign Exchange and other related laws and ordinances ("Foreign Exchange Laws") are exported to any foreign country or countries, an export license issued by the Japanese Government will be required under the Foreign Exchange Laws.

Further, there may be cases where an export license issued by the government of the United States or other country will be required under the applicable export-related laws and ordinances in such relevant countries.

The contract shall become effective subject to the fact that a relevant export license is obtained from the Japanese Government.

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the brand of valve reliability

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KITZ

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