VoL. MCO21-09

The Strong Of
Technical Renovation

The strongest in technical innovation for specialized production
of customized valves and building the power generation facilities!

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SEO-HEUNG M C O

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SHM VALVE

The Strong Of
Technical Renovation

LT-Metal Seal Ball Valve
ANSI / ASME Class 4500

TOP ENTRY
Trunnion type

SIDE ENTRY
Trunnion type

SEO-HEUNG MCO

History

2020
- **Dec.** Won R&D Innovation Award (MSIT ministerial prize)
- **Nov.** Certified for occupational health and safety assessment series (KS Q ISO 45001)
- **Oct.** Won citation of model small businessman (MSS ministerial prize)
- **Oct.** Signed R&D agreement with Korea Institute of Energy Technology Evaluation & Planning
  "Nuclear power plant valve seat, disc wear-resistant surface treatment material and process development"
- **Jun.** Registered mechanical works (nationwide) in KEPCO Plant Service & Engineering Co., Ltd.
- **Jun.** Certified for excellent corporate research institute by the Ministry of Science and ICT
- **Mar.** Certified for materials & components company

2019
- **Aug.** Registered as supplier of KHNP reserve items equipment & material
- **Jun.** Registered as supplier of KHNP auxiliary equipment

2018
- **Apr.** Performance certification by SMBA was extended
  (Non-seat of deteriorating scale and durability improved valve trim)
- **Jan.** Signed MOU for technical support of nuclear power with Hanvit Power co.

2017
- **Jul.** Registered as equipment repair company of KHNP

2016
- **Jan.** Registered as 5 power generation companies' integrated maintenance eligible company

2015
- **Apr.** Acquired performance certification from SMBA
  (Non-seat of deteriorating scale and durability improved valve trim)
- **Apr.** Registered as KPS vendor

2014
- **Jul.** Registration of construction business – machine equipment construction business
  (registration no.: Ansan2014-10-006)

2013
- **Apr.** Certified for ISO quality management system

2012
- **Jul.** Signed result sharing contract (no. 2012-19) with Korea East-West Power Co.
  Agreement item: Deteriorating scale non-seat type valve trim
- **Apr.** Agreement for on-site technology R&D project (Samchonpo Thermal Power Plant Center)
  Standard thermal power localization of BFPT HP STOP VAVLE DISC & STEM

2011
- **Jun.** Signed agreement for the first purchase conditional development of new product in 2011
  (Korea East-West Power Co.)
- **May.** Registered as venture business
- **Apr.** Registered corporate-affiliated research institute

2010
- **Oct.** Certified for quality management system ISO 9001:2000

2009
- **Nov.** Renewed INNO-BIZ (Technology Innovative Business)

2006
- **Nov.** Certified for Clean Workplace
- **Nov.** Registered as INNO-BIZ
- **Sep.** Certified for R&D exclusively responsible department
- **Sep.** Certified for ISO 9001 quality management system
- **May.** Relocated to new factory. Renamed to Seoheung MCO

1999
- **Nov.** November. Established Seoheung Maintenance Industry

Certification & Registration

1.	KTR-CC	ISO 9001. ISO 14001, ISO 45001
2.	Venture for Tomorrow	Certificate of venture business
3.	INNOBIZ 기술혁신형중소기업	Certificate of Inno-Biz
4.	ECRC	Appointment of excellent research institute
5.		Certificate of construction business registration
6.	koita	Certificate of corporate affiliated research institute
7.	KHNP	Certificate of qualified supplier registration (quality grade A)
8.	KOEN EWP cwp	Certificate of integrated maintenance eligible corporate (5 power generation companies)
9.	KPS	Nationwide vendor of mechanical works
10.	KPS	Repairing and manufacturing (thermal power) outsourced carrying out
11.	KPS	Repairing and manufacturing (nuclear power) outsourced carrying out
12.	Ministry of SMEs and Startups	Material-component company
13.	EP 성능인증제품	Performance certification

Korean Intellectual Property Office Certificate of Patent

01. Utility model " High temperature high pressure overhauling seat structure "
02. Patent " Combination safety control valve system and safety valve system "
03. Patent " Globe valve having double sealing structure "
04. Patent " Deteriorating scale non-attaching valve trim and manufacturing method of valve trim apparatus "
05. Patent " Rotating apparatus of turbine rotor "
06. Patent " Boring apparatus of valve seat "
07. Patent " Manufacturing method of fluid valve apparatus easy to open and close and fluid valve apparatus manufactured thereby "
08. Patent " Screw pump for anti-wear feature improved bio heavy oil and manufacturing method thereof "
09. Patent " Manufacturing method to improve airtight durability of valve trim under harsh conditions of power plant and valve trim applying this "
10. Patent " Mud removal apparatus equipped at screen of intake in power plant "
11. Patent " Overhauling type metal ball valve for high temperature & high pressure fluid of valve grade 4500 or less "

Features of SHM LT-Metal Seal Ball Valve

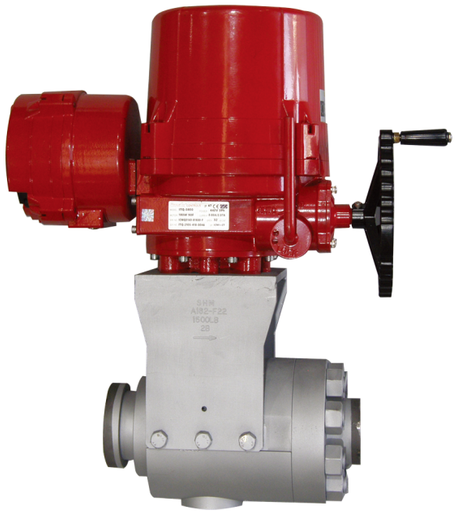
- Metal-Seal Ball Valve designed and manufactured based on ANSI/ASME Class 4500 has the excellent properties and advantages excellent for high pressure and high temperature (300kg/㎠ @ 700℃) fluid by combining nano-coating / PVD.
- The **LT**-Ball Valve has a trunnion structure supporting the central axis of the ball with **L**ow **T**orque and nano-coating (Nano-Coating / PVD) on the operating part to extend the life of the valve even under severe operating conditions.
- It is a high-performance **LT**-Metal Ball Valve that has remedied the shortcomings of floating metal ball valve, such as "impossible operation, trim sticking, high-torque, leakage, life-shortening, etc."

TOP ENTRY
Trunnion type

Korean Intellectual Property Office
No.10-1579600
No.10-2259180

Top Entry Type (overhauling structure)

- For the pipe that requires valve repair and maintenance, a Top Entry Ball Valve that can be disassembled and assembled at the top without cutting the valve is essential.
- It is composed of an integrated body, so it is safe from external leakage without fastening flanges and bolts and is suitable for high temperature and high pressure.
- It is excellent for isolation blocking requiring periodic maintenance due to the importance of piping.
- The trunnion structure has the advantages of low torque and less wear on the sealing part, so the valve life is long.
- It is excellent for MS-DRN, HP-DRN, CBD-DRN, IBD-DRN among power generation lines
- Power generation main steam system 300kg/㎠ @ 700℃
- Maintenance cost is low because of easy overhauling.



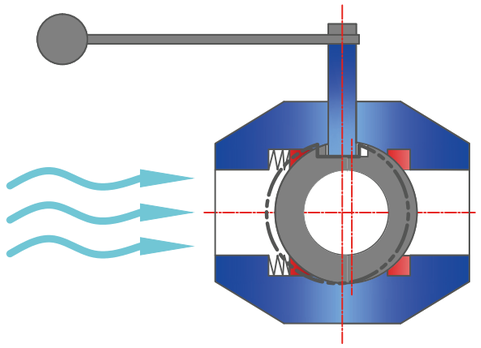
SIDE ENTRY
Trunnion type

Korean Intellectual Property Office
No.10-1579600

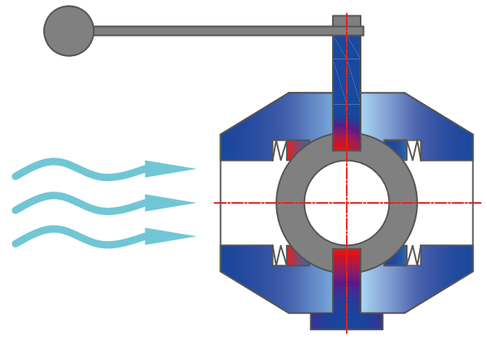
Side Entry Type

- It is a compact product with 2-pieces body.
- The trunnion structure has a low-torque and sealing force, so the service life is more than twice as long as that of the floating structure.
- It is economical because the capacity of the actuator can be minimized with the compact valve and low torque.
- It is suitable for steam and fluid at 300kg/㎠ @ 700℃ in the industrial field.

Types of Ball Valves



Floating Ball



Trunnion Ball

Division	Floating Ball	Trunnion Ball
Characteristics Comparison	• The higher the inlet pressure, the greater the wear of the outlet seal. • The life of the sealing part is short because the torque caused by the friction force and the wear is high. • When used for a long time, stuck sealing part on the outlet side may cause inoperability or damage to the stem. • Production cost is low thanks to smaller size compared to standard	• With a trunnion structure, the ball axis is fixed up and down on the body so that it works stably in response to pressure. • The moving part of the trunnion structure obtains low torque with the nano-coating PVD. • The low friction force of the sealing part maintains a high service life without leakage of the valve.

TOP ENTRY
Trunnion type

High Temperature & pressure 700℃

STANDARD MATERIALS

PART NAME	MATERIALS
BODY	A105, A182-F22, A182-F91, Alloy Steel
BALL	Cr. Alloy Steel + P.V.D
STEM	Cr. Alloy Steel + P.V.D
SEAT RING	Cr. Alloy Steel + P.V.D
PACKING	Graphite
P.S. GASKET	Graphite
SEAT SPRING	Inconel

Overhauling

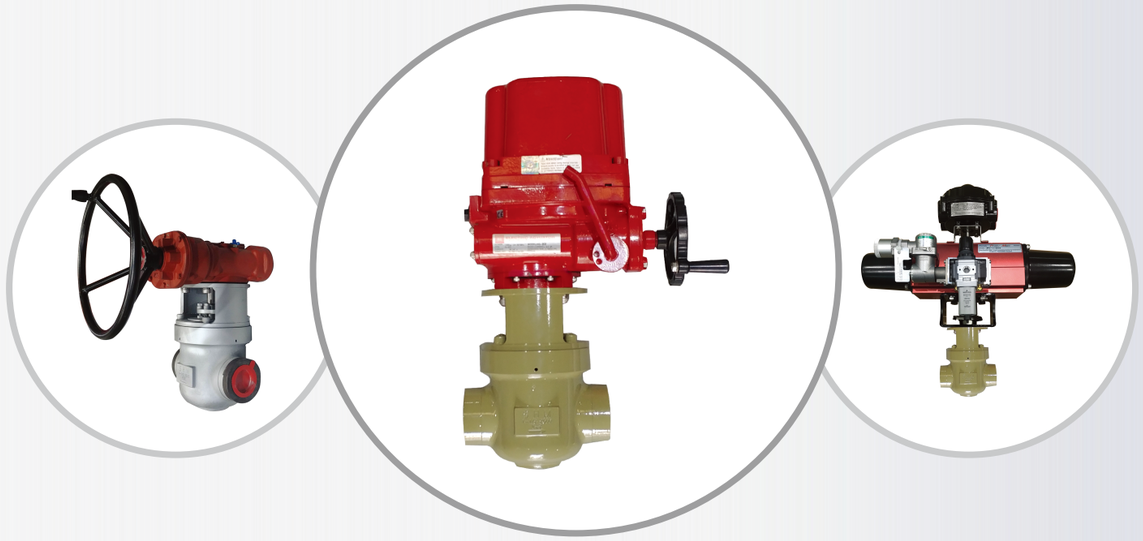
SPECIFICATIONS

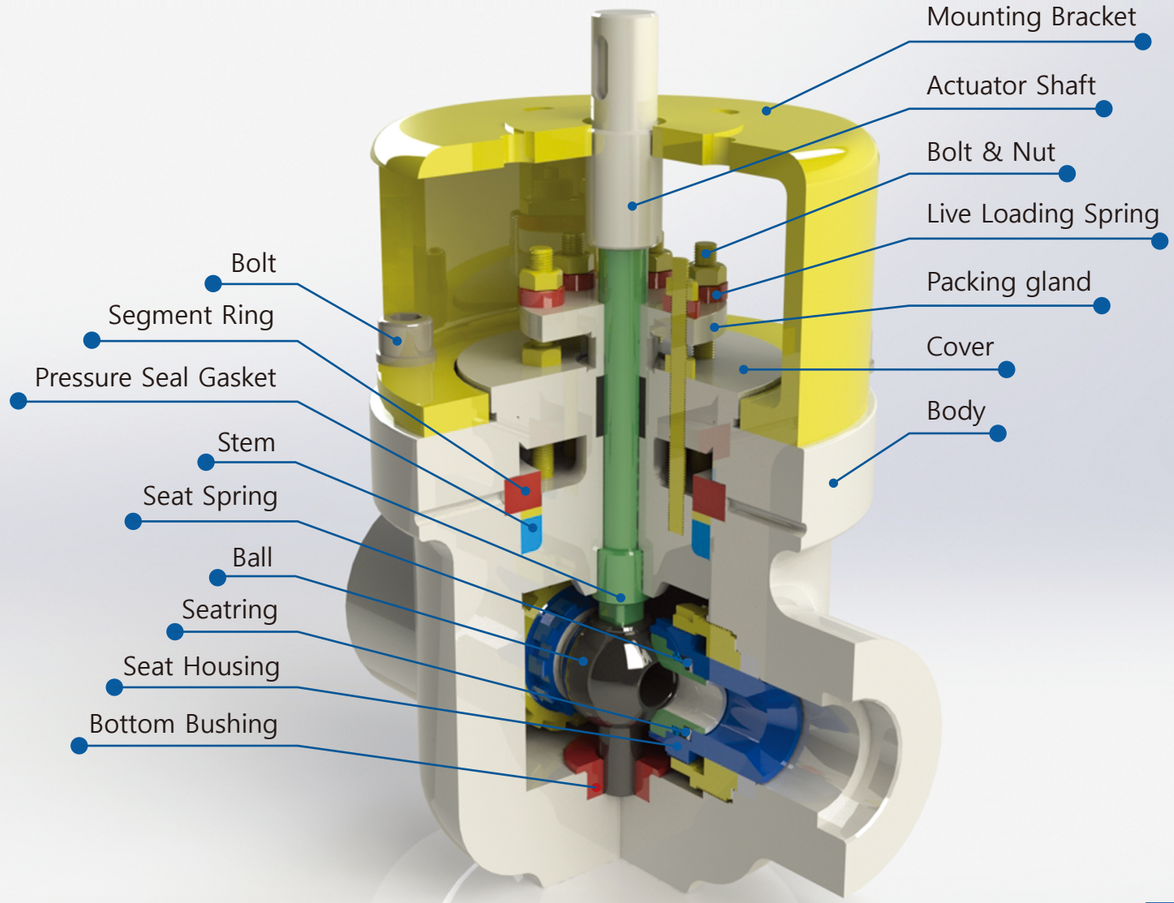
- **VALVE SIZE** : ½″ ~ 4″
- **APPLICABLE RATING** : ASME CLASS 150 ~ 4500
- **TEMPERATURE** : Max. 700℃
- **CODE & STANDARD** : API, ASME, MSS, ASTM
- **MAIN STEAM : 300㎏/㎠ @ 700℃**
- **LT : LOW TORQUE**

Purpose(High Temperature & Pressure)

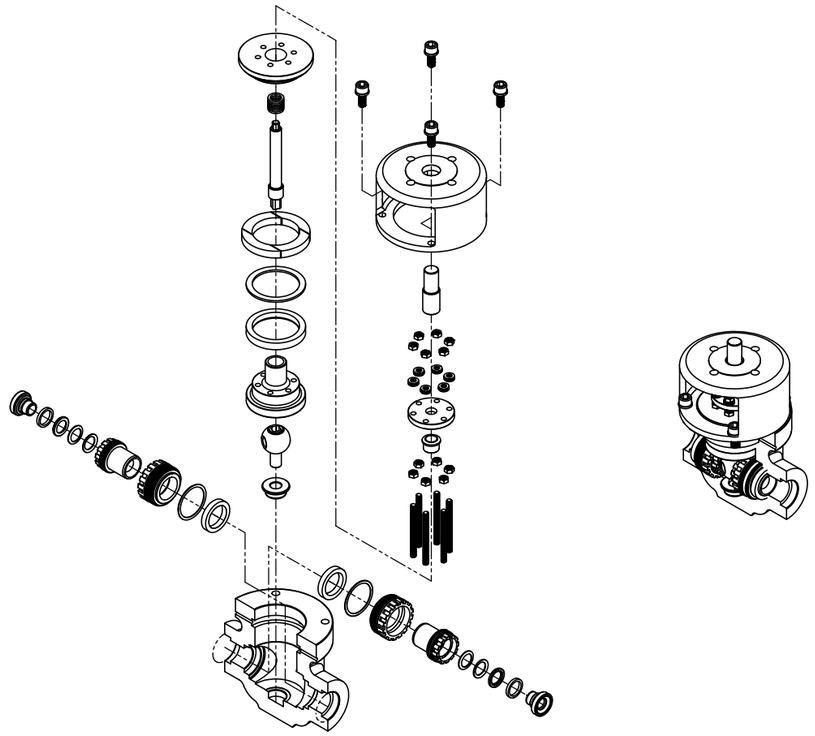
HP DRN, MS DRN, CBD DRN

Class 4500



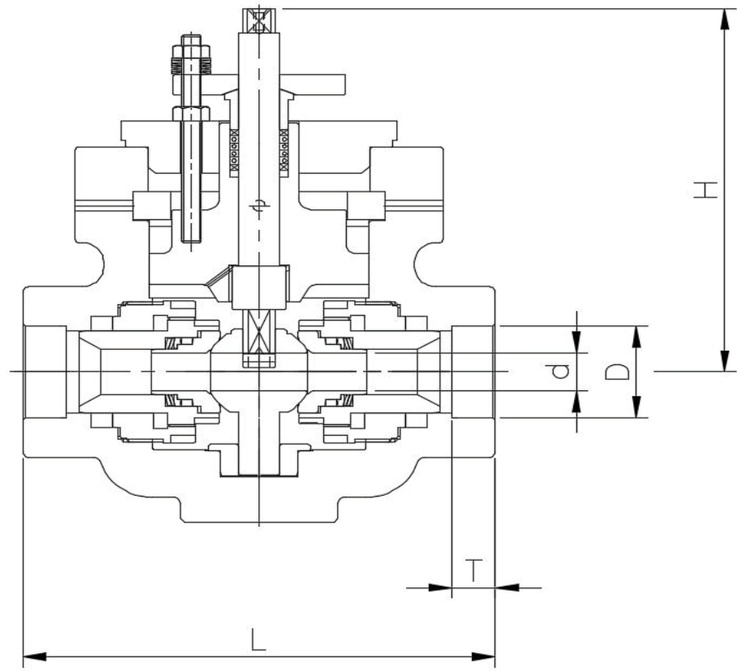


Material Selection



Parts	Material	Remarks
Body	A105, A182-F22, A182-F91	-
Bottom Bushing	Cr. Alloy Steel	PVD Coating
Ball	Cr. Alloy Steel	PVD Coating
Seatring	Cr. Alloy Steel	PVD Coating
Seat Spring	Inconel 718	-
Load Ring	Cr. Alloy Steel	-
Seat Seal	Graphite	-
Seat Housing	Cr. Alloy Steel	PVD Coating
Body Seal Retainer	Cr. Alloy Steel	PVD Coating
Body Seal	Graphite	-
Washer	SUS304	-
Bonnet	A105, A182-F22, A182-F91	-
Press, Seal Gasket	Graphite	-
Gasket Washer	A479-410	-
Segment Ring	A105, A182-F22, A182-F91	-
Bonnet Cover	A105	-
Gland Packing	A479-410	-
Gland Flange	A105	-
Stem	Cr. Alloy Steel	PVD Coating
Packing	Graphite	-
Packing Washer	A479-410	-
Grand Bolt	A193-B7, B16	-
Bonnet Bolt	A193-B7, B16	-

Dimension Table



TOP ENTRY

Model NO : LT-TR100 Series

Division		Demension		Class								
				1500			2500			4500		
Size		D	T	L	d	H	L	d	H	L	d	H
1/2	15A	21.8	10	200	11	150	200	11	150	290	11	200
3/4	20A	27.2	10	200	11	150	200	11	150	290	11	200
1	25A	34.1	10	200	16	150	200	16	150	290	16	200
1-1/4	32A	42.8	13	220	16	170	220	16	170	290	16	200
1-1/2	40A	48.9	13	220	16	170	220	16	170	290	16	200
2	50A	61.4	16	250	25	190	250	25	190	330	25	230
2-1/2	65A	Butt Weld		330	30	340	419	30	290	508	30	300
3	80A			356	35	390	470	35	340	578	35	350
4	100A			431	42	520	546	42	450	673	42	420

SIDE ENTRY
Trunnion type

High Temperature & pressure COMPACT 700℃

STANDARD MATERIALS

PART NAME	MATERIALS
BODY	A105, A182-F22, A182-F91, Alloy Steel
BALL	Cr. Alloy Steel + P.V.D
STEM	Cr. Alloy Steel + P.V.D
SEAT RING	Cr. Alloy Steel + P.V.D
PACKING	Graphite
SEAT LOAD RING	Cr. Alloy Steel + P.V.D
SEAT SPRING	Inconel

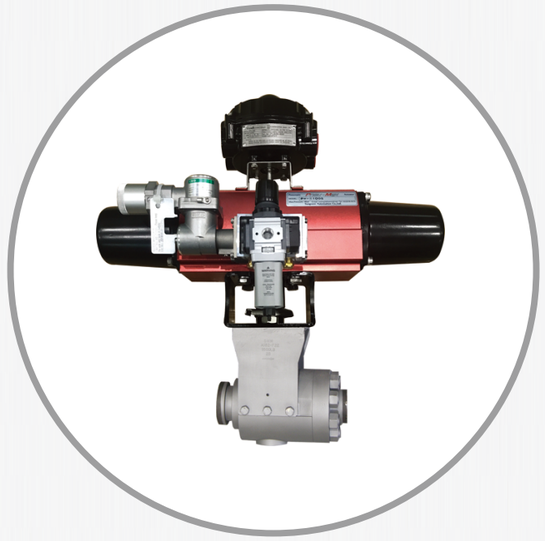
SPECIFICATIONS

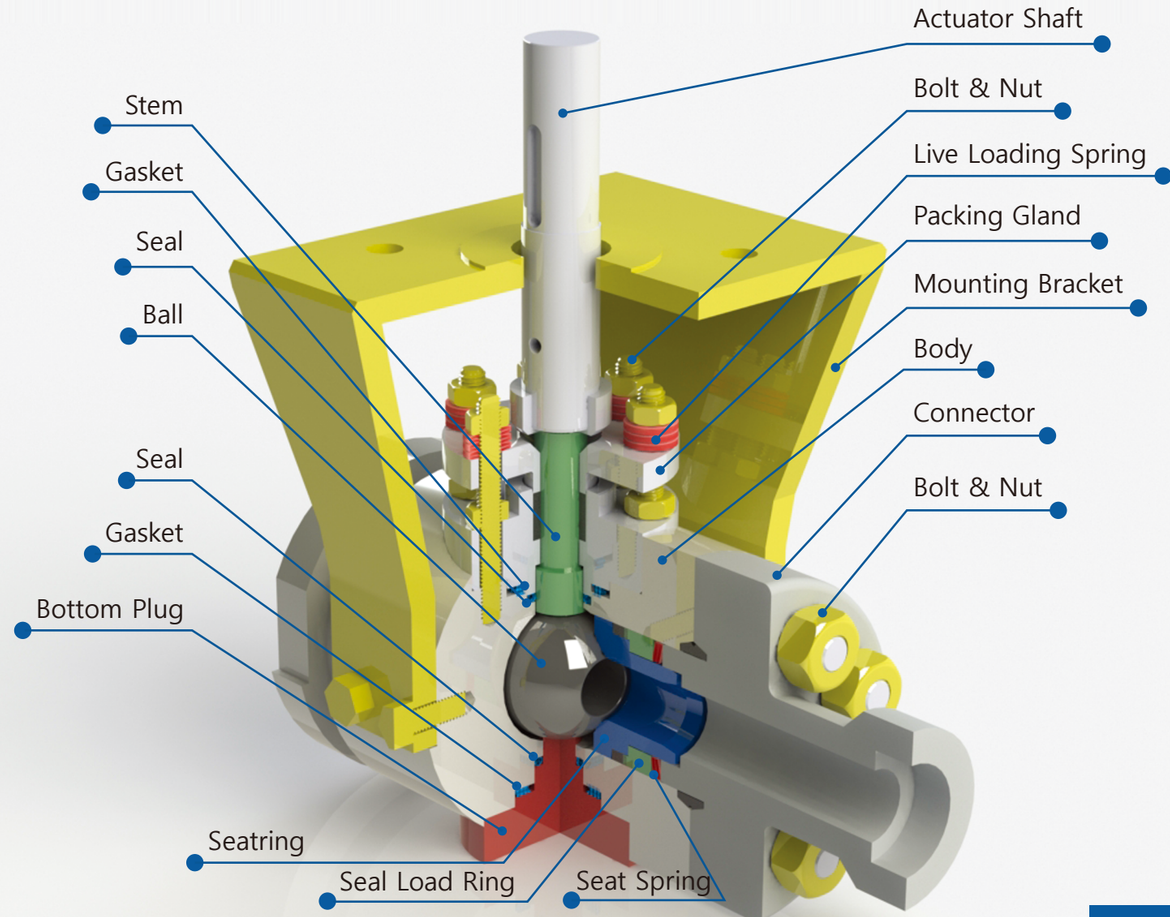
- **VALVE SIZE** : ½" ~ 4"
- **APPLICABLE RATING** : ASME CLASS 150 ~ 4500
- **TEMPERATURE** : Max. 700℃
- **CODE & STANDARD** : API, ASME, MSS, ASTM
- **MAIN STEAM : 300㎏/㎠ @ 700℃**
- **LT : LOW TORQUE**

Purpose(High Temperature & Pressure)

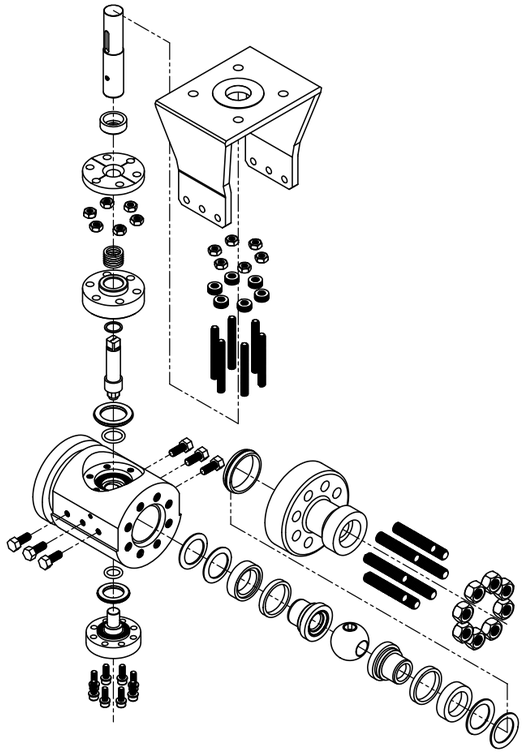
HP DRN, MS DRN, CBD DRN

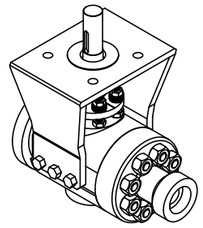
Class 4500





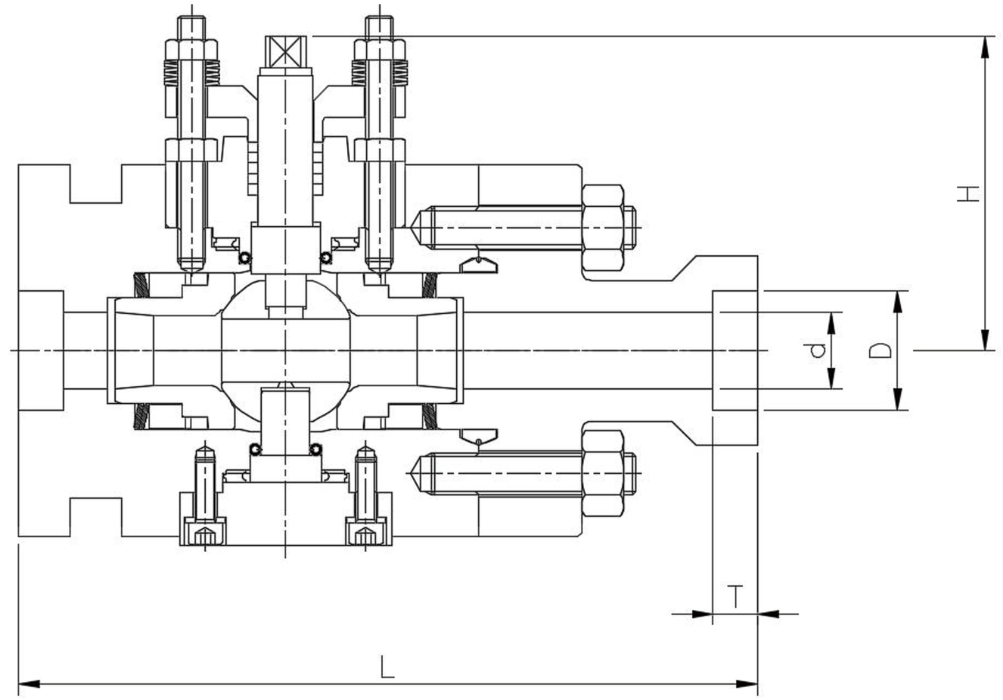
Material Selection





Parts	Material	Remarks
Body	A105, A182-F22, A182-F91	-
Bonnet	A105, A182-F22, A182-F91	-
Connector	A105, A182-F22, A182-F91	-
Ball	Cr. Alloy Steel	PVD Coating
Seatring	Cr. Alloy Steel	PVD Coating
Stem	Cr. Alloy Steel	PVD Coating
Seat Seal	Graphite	-
Seat Load Ring	Cr. Alloy Steel	-
Seat Spring	Inconel 718	-
Body Gasket	Cr. Alloy Steel	-
Bonnet Gasket	316+Graphite	-
Bonnet C-Seal	SUS316L	-
Packing	Graphite	-
Packing Gland	A479-304	-
Stem Bearing	B150	-
Connector Bolts	A193-B7, B16	-
Nut	A194-2H, A194Gr4, 7, 8	-
Gland Bolts	A193-B7, B16	-
Live Loading Spring	SK-5	-
Bottom Plug	Cr. Alloy Steel	PVD Coating
Bottom Gasket	316+Graphite	-
Bottom C-Seal	SUS316L	-
Socket Bolts	A193-B7	-

Dimension Table



Side Entry-Reduce Bore

Model NO : LT-SR200 Series

Division		Type		Reduce Bore											
		Dimension / Class		600			1500 (900)			2500			4500		
Size		D	T	L	d	H	L	d	H	L	d	H	L	d	H
1/2	15A	21.8	10	170	11	55	170	11	55	170	11	60	170	11	75
3/4	20A	27.2	10	170	11	55	170	11	55	170	11	60	170	11	75
1	25A	34.1	10	170	16	80	190	16	80	215	16	90	250	16	110
1-1/4	32A	42.8	13	265	25	125	190	16	80	215	16	90	280	16	110
1-1/2	40A	48.9	13	265	25	125	190	16	80	215	16	90	280	16	110
2	50A	61.4	16	330	35	175	290	25	125	290	25	125	330	25	130

Side Entry-Full Bore

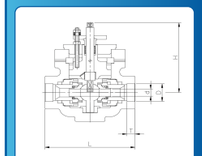
Model NO : LT-SF200 Series

Division		Type		Full Bore								
		Demension / Class		150 ~ 600			1500 (900)			2500		
Size		D	T	L	d	H	L	d	H	L	d	H
1/2	15A	21.8	10	170	11	55	170	11	55	170	11	60
3/4	20A	27.2	10	170	16	80	170	16	80	170	11	60
1	25A	34.1	10	220	25	125	220	25	125	220	16	90
1-1/4	32A	42.8	13	285	30	150	285	25	125	285	25	120
1-1/2	40A	48.9	13	285	35	175	285	32	160	285	25	120
2	50A	61.4	16	310	42	210	310	42	210	370	35	150
2-1/2	65A	Butt Weld		330	60	300	419	50	250	508	42	185
3	80A			356	68	340	470	60	300	578	50	220
4	100A			431	90	450	546	80	400	673	60	260

NANO Coating (PVD)

성능인증제품

Design



Raw Material Heat Treatment

1st Machining

Usually, in the pre-stage of heat treatment or welding, a step of leaving a subsequent machining allowance in preparation for material deformation

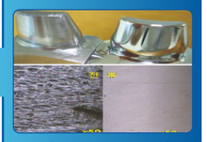
Heat Treatment

It refers to a series of treatment processes to impart surface hardness and toughness to materials by means of quenching, normalizing, tempering, etc

2'nd Machining

Final precision dimensional machining

Lapping



Perform to improve the surface roughness of parts

Buffing

After polishing in the polishing process, the abrasive particles that may be attached to the surface are removed by the buffing process

Cleaning

Clean the leftovers from polishing and buffing

Demagnetization

Remove the magnetism from metal

Nano-Nitriding

Increase the surface hardness through ultra-thin ion-nitriding

Buffing

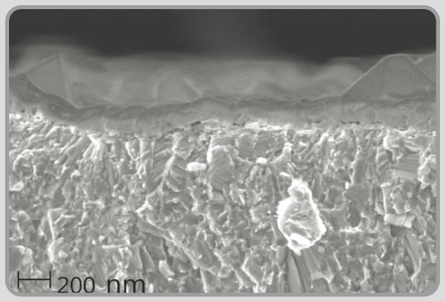
After nano-nitriding treatment, the fine particles of the residues on the metal surface are removed by the buffing process

Cleaning

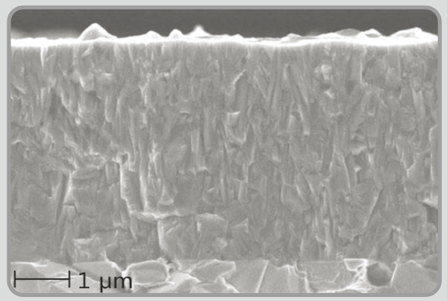
Perform the automatic ultrasonic cleaning as a pre-stage of coating

PVD Coating

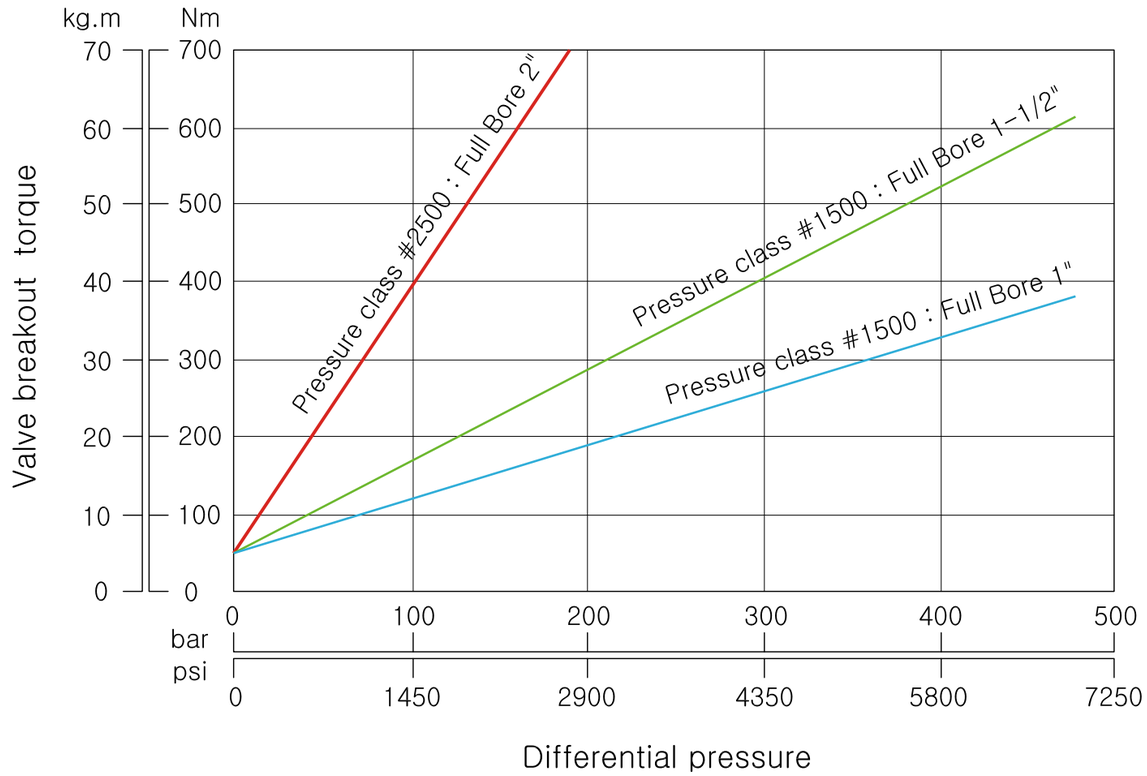
Chemical stability and oxidation resistance



Hardness & hot hardness



LT Ball Valve Torque



Differential pressure

NANO-Coating / PVD Feature

Metal ball valve which is excellent for high temperature and high pressure combined with NANO-Coating/PVD

- Low Torque
- Long Lifecycle

" It is advantage of SEO- HEUNG MCO valve "

TOP ENTRY BALL VALVE prototype on-site maintenance demonstration

Installation, overhaul and demonstration "On-site maintenance"

The maintainability verification demonstration was conducted 3 months after the start of installation and operation of overhauling type ball valve of the developed product installed in the Honam thermal power plant site of Korea East-West Power.

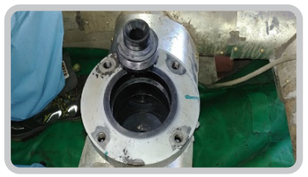
Photos during maintenance process


Completion of replacement of existing valves


Removal of bonnet after 3 months


Removal of seat housing


Removal of ball seatring

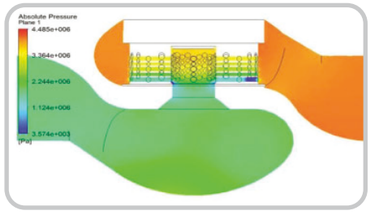
Removal of seal retainer ring

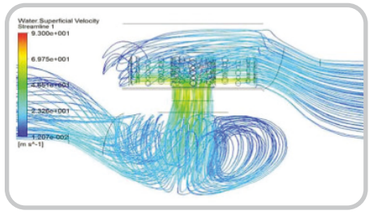

Completion of disassembly, Dedicated tool

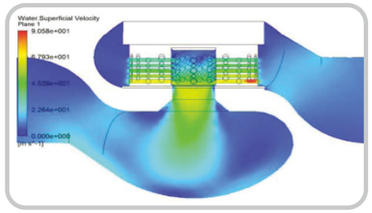
※ It is a TOP ENTRY TYPE that can be overhauled on-site without cutting the DRN system valve, was developed in October, 2020 and has been operating till now after installation & operation of prototype and demonstration of maintenance.

Test & Inspection

Flow analysis







Durability test (100,000 times)

Scale settling test

Wear state after durability test

Cv test

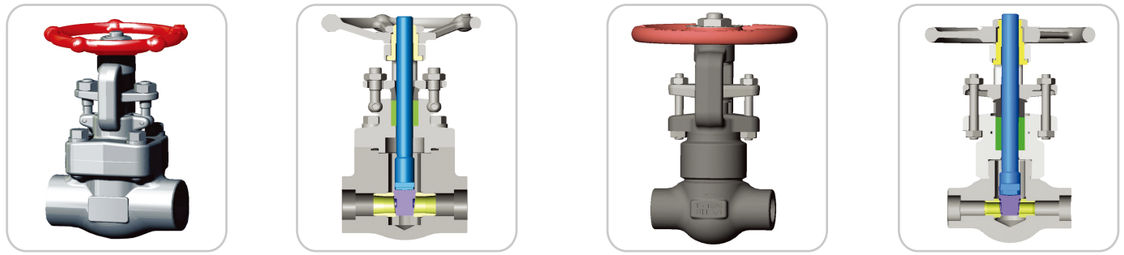
S&S Valve

Forged Valve

Valve for toxic gas piping approved by Korea Gas Safety Corporation (KGS)

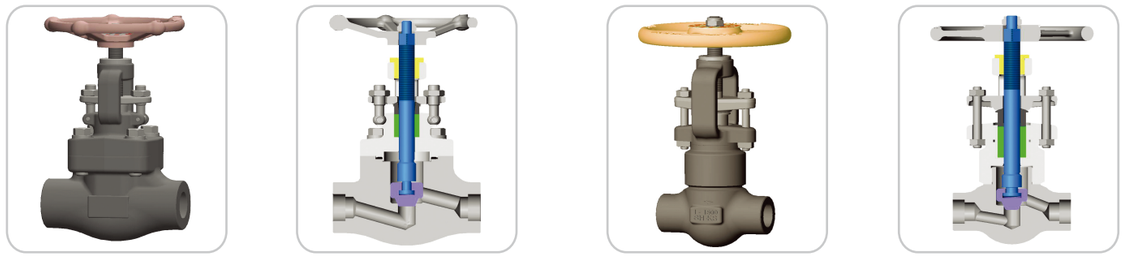
Supplied nuclear power plant P207A/B/C

2"below Forged gate valve



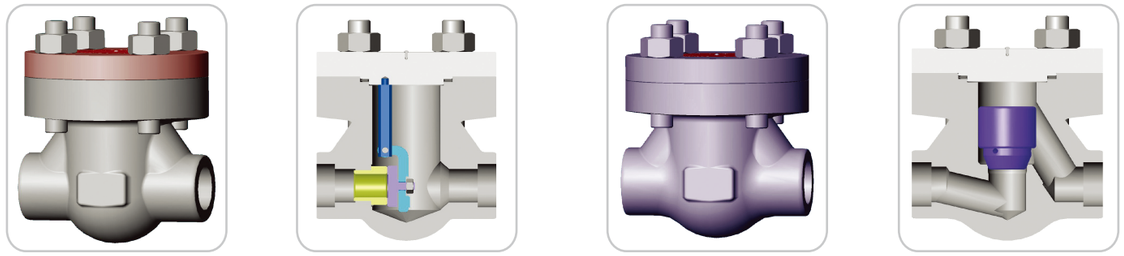
Class 150 ~ 800"　　Class 900 ~ 4500"

2"below Forged globe valve



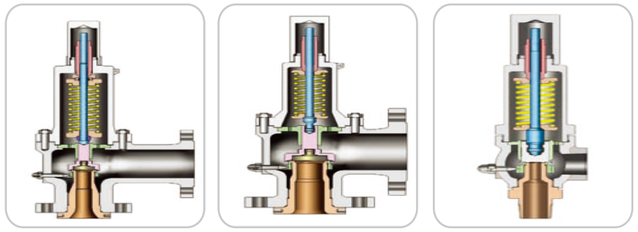
Class 150 ~ 800"　　Class 900 ~ 4500"

2"below Forged check valve

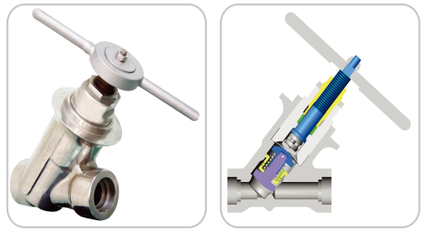


Class 150 ~ 1500"　　Class 150 ~ 1500"

Safety valve



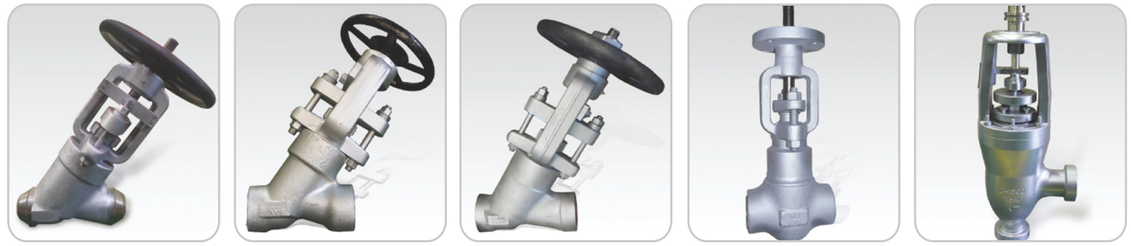
Packless metal diaphragm valve



Class 600 ~ 2500"

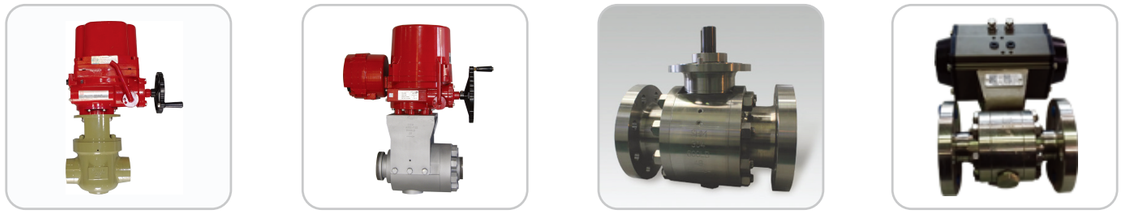
" The best technology and service to satisfy customers "

Special forged valve



Class 900 ~ 4500 / Material : Alloy Steel, A105, F22, F91 ½" ~ 4"　　CBD DRN Angle V/V 1" ~ 3"

LT metal-seat ball valve



A105-Class4500 ½" ~ 4"　　A105-Class4500 ½" ~ 4"　　F304 – Class600 ½" ~ 12"　　A105-Class300

Other valve

MOV 2" ~ 24"　　Hydraulic V/V 1½" ~ 5"　　Poppet　　Control Valve 3/8"~12"

Control valve trim