

Cooling & Heating Division

NON ASBESTOS
GREEN VALVE



Engineered to Perfection...

THERMAX BELLOW SEAL VALVE

THE ULTIMATE CHOICE FOR STEAM AND THERMIC FLUID APPLICATION

Improving your business is our business

Thermax offers products, systems and solutions in energy and environment engineering to industrial and commercial establishments around the world. Its business expertise covers heating, cooling, waste heat recovery, captive power, water treatment & recycling, air pollution control & waste management and performance chemicals.

Thermax brings to customer extensive experience in industrial applications and expertise through technology partnerships and strategic alliances.

Operating from its Head Quarters in Pune (Western India), Thermax has built an international sales & service network spread over South East Asia, Middle East Africa, Russia, UK and the US. It has a full-fledged ISO 9001, 2000 and ISO 14000 accredited manufacturing setup.

Cooling & Heating Division

Offers a wide range of steam boilers, thermal oil heaters and hot water generators. It has expertise in a wide range of fuels - oil, gas, solid and agro - waste/biomass fuels. Supporting a broad array of industries to generate, transfer and conserve heat for a host of application, divisions products are exported to South East Asia, Middle East, Africa, Europe, CIS and SAARC.

Why Bellow Seal Valves ?

One of the most frequent and serious problems associated with valves is of gland leakage. This results in loss of medium, energy and increases plant downtime. Apart from the high cost of energy, gland leakages can also cause serious environmental, ecological and health hazards to plant workers and personnel. Leakage of sensitive material can also contribute to a fire hazard, explosion, or damage the equipment. Gland packed valves often need continuous maintenance. The bellow seal valves give a complete solution for such problems.

Bellow Seal Design Features

Design Standards

- Forged valves as per EN ISO 15761
- Cast Steel valves as per ASME B16.34
- Bellows inspection and test as per MSS SP-117
- End flange dimensions as per ASME B16.5
- Butt weld end dimensions as per ASME B16.25
- Face to Face & End to End dimensions as per ASME B16.10
- Inspection & testing as per API 598

Two Secondary Stem Seals

- Graphite spiral wound gasket and graphite gland packings
- Stem packing ensure perfect sealing as an additional feature

Long Life of Seating Surfaces

- Stellite faced seat and disc to prevent seizing and galling
- Helium leak test performed on each bellow assembly using a Helium detector with sensitivity of 10^{-6} std cc/sec
- Multi-ply bellows
- Integral seat provided as standard
- Soft seat available for gas and vacuum services

Material of Construction

- Body Material Cast Steel - ASTM A 216 Gr. WCB
 Forged Steel - ASTM A 105
- Bellows Material AISI - 316 Ti

Features

- Maintenance-free globe valve with bellows sealed stem
- Zero leak valve to prevent leakage :
 - To atmosphere by Multi stage sealing - Bellows, Spiral wound gasket & Gland packing
 - Across the ports by Stellite integral seat & plug
- No need to tighten or replace gland packing
- Smooth handwheel operation
- Durable stainless steel bellows tested for 10,000 cycles
- Non-Rotating stem prevents torsion of bellows
- Indicating rising stem design

BELLOW SEAL GLOBE VALVES FOR STEAM AND THERMIC FLUID APPLICATION

- Zero leakage & Zero emissions
- Special stellite integral seat design
- Improved throttling control
- Assured performance and energy saving

Size range
15mm to 250 mm NB

Easy opening
Operating convenience

Welding of bellows by unique fusion process in PLASMA welding - Superior quality

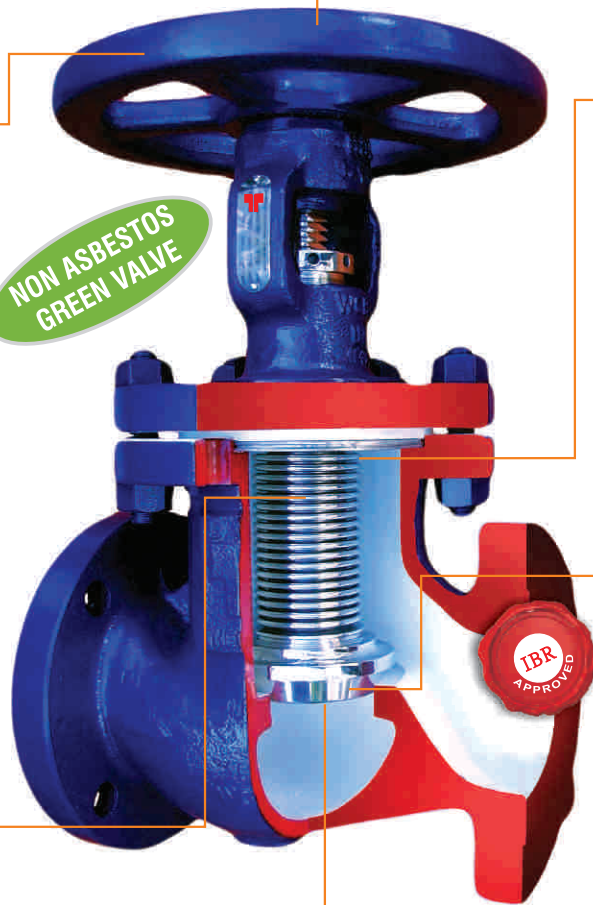
End connections available

- Flanged ANSI 150# and 300#
- Butt welded
- Socket welded / Screwed

High quality of bellows assured by

- Imported multi-ply bellows of SS 316 Ti material
- Helium leak test done for all bellows ensuring long life & quality of bellows

NON ASBESTOS
GREEN VALVE



Non rotating rising stem design
Indicating valve -
partly open/fully open/closed

Secondary stem seal -
Zero leak ensured by
graphite spiral wound gasket
and graphite gland packings

100% testing and inspection to
prevent leakage across port and
atmosphere

Stellite seat and plug ensuring

- Increased surface hardness
- High resistance to erosion
- Long life of valve internals

Low pressure drop

Valve with special integral
stellite design - No leakage

User Benefits

Improved flow characteristics due to special integral seat design

No ongoing maintenance required

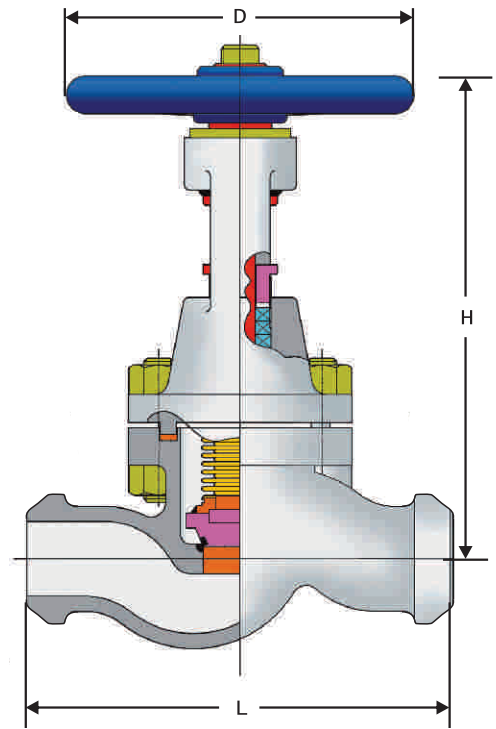
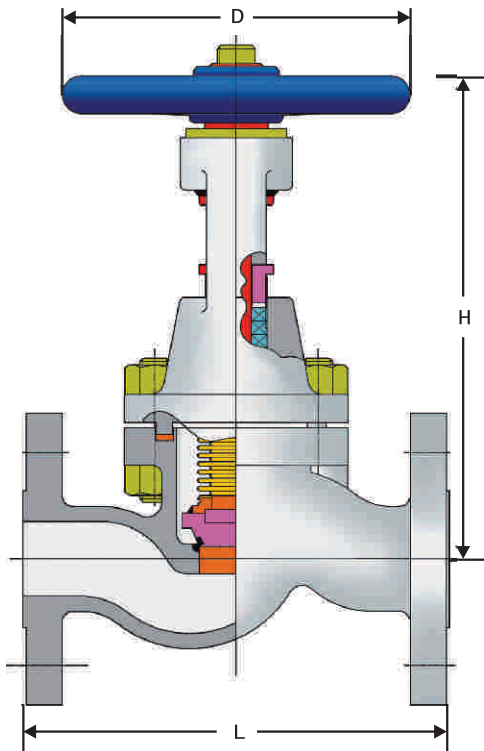
Long valve life, Easy to operate, Energy efficient

Cast Steel Valves provided with integral Stellite seat & plug

All India sales and service network

CAST BELLOW SEAL GLOBE VALVE

WITH FLANGED / BUTT WELD ENDS



Material of Construction

Parts	Material
Body	ASTM - A 216 Gr. WCB
Bonnet	ASTM - A 216 Gr. WCB
Plug	Stellited
Integral Seat	ASTM - A 216 Gr. WCB Stellited
Bellow	AISI - 316 Ti
Stem	AISI - 410
Packing	Graphite
Gasket	SPW. SS - 304 + Graphite

Technical Data

- Valve designed to ASME B 16.34
- Valve tested to API - 598
- Flanges as per ANSI - B 16.5
- Face to Face as per ASME - B 16.10

Note:

- IBR certified
- Valves with butt weld end connections available for Thermic Fluid application upto 300°C
- Socket weld end connections also available for 50mm NB Class 300#
- For Application above 300°C for Steam & Thermic Fluid please refer back to Thermax
- All dimension are in mm

Dimensions of Flanged Class 150# / Butt Weld

Size - NB (mm)	50	65	80	100	150	200	250
Face To Face (L)	203	216	241	292	406	495	622
Height (H)*	265	295	335	380	487	620	750
Dia (D)	200	250	250	300	350	450	450
Flange Diameter	152	178	191	229	279	343	406
Flange Thickness	19	22	24	24	26	29	30
Raised Face Diameter	92	105	127	157	216	270	324
Raised Face Thickness	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Flange P.C.D.	121	140	152	191	241	299	362
No.Of Holes/Hole Dia.	4/19	4/19	4/19	8/19	8/22	8/22	12/25

Dimensions of Flanged Class 300# / Butt Weld

Size - NB (mm)	50	65	80	100	150	200	250
Face To Face (L)	267	292	318	356	444	559	622
Height (H)*	275	300	340	390	510	635	755
Dia (D)	200	250	300	300	350	450	450
Flange Diameter	165	191	210	254	318	381	445
Flange Thickness	22	25	29	32	37	41	48
Raised Face Diameter	92	105	127	157	216	270	324
Raised Face Thickness	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Flange P.C.D.	127	149	168	200	270	330	387
No.Of Holes / Hole Dia.	8/19	8/22	8/22	8/22	12/22	12/25	16/28

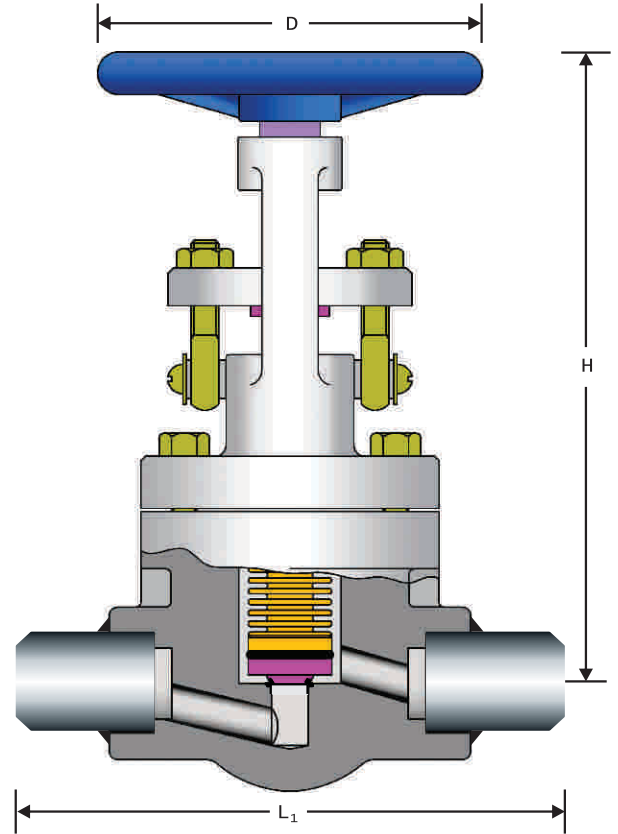
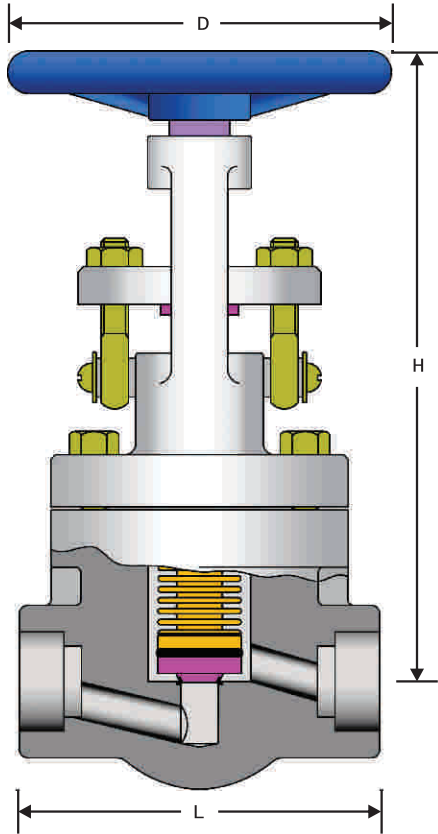
Test Pressures

Test Pressure	150 #	300 #
Body (Hyd)	30 Kg/cm ²	77 Kg/cm ²
Seat (Hyd)	22 Kg/cm ²	57 Kg/cm ²
Seat (Air)	06 Kg/cm ²	06 Kg/cm ²

*Approximate height with valve in closed position

FORGED BELLOW SEAL GLOBE VALVE

WITH SOCKET WELD / BUTT WELD ENDS



Technical Data

- Valve designed to EN-ISO-15761
- Valve tested to API-598
- Socket weld ends as per ANSI-B 16.11

Note

- Standard full port design upto 40mm NB
- Optional screwed ends (NPT)
- Optional butt weld ends
- Optional flanged ends
- For Application above 300°C for Steam & Thermic Fluid please refer back to Thermax
- All dimensions are in mm

Test Pressures

Test Pressure	800 #	
Hydro	BODY	205 Kg/cm ²
	SEAT	150 Kg/cm ²
Air	SEAT	06 Kg/cm ²
Hydro	BODY with BELLOW	77 Kg/cm ²

Material of Construction

Parts	Material
Body	ASTM - A 105
Bonnet	ASTM - A 105
Plug	AISI - 316 Stellite
Integral Seat	ASTM - A 105 Stellite
Bellow	AISI - 316 Ti
Stem	AISI - 410
Packing	Graphite
Gasket	SPW SS 304 + Graphite

Dimensions of Socket Weld Class 800# / Butt Weld

Size - NB (mm)	15	20	25	40
Face To Face (L)	86	92	130	160
Height (H)*	155	165	225	245
Dia (D)	100	100	150	150
Socket Diameter	21.72	27.05	33.78	48.64
Socket Depth	9.7	12.7	12.7	12.7
Face to Face L ₁	152	178	203	229

*Approximate height with valve in closed position

Comparison of Thermax Bellow Seal Valves and Piston Valves

CRITERIA	BELLOW SEAL VALVES	PISTON VALVES
Prevention of leakage		
Prevention of Leakage Across Ports	Achieved by providing stellited integral seat and stellited plug	Only soft seat in the form of piston rings which is prone to wear, tear and ageing
Prevention of Leakage To Atmosphere	Three seals provided in series to prevent leakage to atmosphere - Metallic bellow - Spiral wound gasket between valve body and bonnet - Gland Packing	Two seals provided - Soft seal piston rings - Gasket between valve body and bonnet - Gland Packing for higher sizes only
Energy / Media Loss / Monetary Loss	Zero	High due to Leakage
Superior Trim Material	- Special aerodynamical design plug hardened to 250 BHN suitable for throttling - Special SS 316 with Titanium used for bellows giving long life, high corrosion resistance and high resistance to impingement attack	- SS seat and plug of lower hardness prone to failure due to wear and tear and erosion - Graphite rings provided of lower hardness
Product loss / Deterioration in product quality	Nil	Starvation of fluid to user equipment in case of leakage / inadequate rate of heating / longer batch timing
Throttling	Suitable for applications where regulation of flow is required	Not recommended for regulation of flow. Only on/off valve
Easy for Operation	- Easy to open and close due to low torque required to operate the valve - Indicating stem design helps in detecting whether the valve is open/closed/partially open.	- High torque required to operate the valve - Indicating valves are manufactured on case to case basis.
Down Time and Maintenance	Zero downtime and maintenance.	Down time and maintenance cost is high due to frequent replacement of piston rings, stem leakage to atmosphere and leakage through ports.
Life of Valves	Long life due to superior quality of bellows tested for 10000 operating cycles and helium leak test to 10 ⁻⁶ torr	- Sealing ring laminas tend to separate requiring replacement - Probability of spindle breakage
Cost of ownership	Low	High

Bellow Seal Valve for Thermic Fluid application

A must for safety and prevention of costly medium loss

- Ideal valve for Thermic Fluid application
- Available in both flanged and butt weld end connection
- Suitable upto 300°C. For application above 300°C please refer back to Thermax
- Eliminate high cost Thermic Fluid loss
- Fit and forget maintenance free valve
- Butt welded ends
 - Zero leakage from joints between valve and pipe
 - Freedom from gasket failure and gasket replacement

How to Order?

- Applications : Steam / Condensate / Thermic Fluid
- Sizes : 15, 20, 25, 40, 50, 65, 80, 100, 150, 200, 250
- MOC : Forged Steel / Cast Steel
- End Connections : Flanged / Butt Weld / Socket Weld / Screwed
- Class : 150# / 300# / 800#
- Certification : IBR / NON-IBR

Special inspection and certification available on request

In view of our constant endeavor to improve the quality of our products, we reserve the right to alter or change specifications without prior notice.



THERMAX

Sustainable Solutions in
Energy & Environment

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