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### 1. Product Overview:-

It has been proven through various studies about process plant emission that 75% of leakages cause

Environmental Pollution

Production loss

Process Problems

Energy Loss

In line with present emphasis on prevention of environmental pollution and energy saving it is necessary to arrest completely.

UKL Bellow Seal Valves save energy, arrest leakages and prevent environmental pollution.

Irrespective of proper selection, installation, periodic and preventive care on conventional valves, leakages cannot be totally eliminated. Through performance seems to be satisfactory initially, they are bound to leak through gland after some operations.



Selection of Bellow seal valves is the only solution for this problem. Therefore the use of Bellow seal Valve is on increase.

UKL Bellow seal valves are designed and manufactured as per international standards, such as ANSI, API, ASTM, BS, DIN, MSS ,etc.

Custom made valves are designed based on feed back from actual users and understanding the customer specific requirements.

UKL Bellow Seal Valves are highly recommended for:-

Santotherm-66, Dowtherm, Hot Oil/HTM, Vaccum, Steam, ammonia, Refrigerant, Phosgene, Chlorine, Hydrogen, Oxygen, CO, Hazardous and Poisonous liquids, gases and radio active substances, etc.

## IDENTIFYING A BELLOW SEAL VALVE

### FINISH PRODUCTS IDENTIFICATION:

#### COLOUR CODE FOR ASSEMBLED VALVE :

- 1) ASTM A 216 Gr.WCB – Aluminium paint
- 2) ASTM A 351 Gr.CF8M –No paint ( Aluminium paint on customer requirement)
- 3) ASTM A 352 Gr.LCB – Aluminium paint

TRIM MATERIAL	:	AISI-410	:	10
		AISI-316	:	16
		AISI-316L	:	16L
		MONEL	:	07
		HAST-C	:	08

### BELLOW MATERIAL IDENTIFICATION:

316Ti	:	TI
Hast Alloy	:	HC
Inconel	:	I5
316L	:	6L
304	:	40
304L	:	4L

The above will be followed by Bellow sealed Globe, Gate valve in cast construction.

The prefix “T” denotes Tested.

The serial No. of the valve is punched on the top Flange, the Sr. no. preceded by ‘S’ indicates valves for export orders.

Trim identification is punched on the inlet Flange in case of cast flanged body.

For Forged valve Trim identification punched on the top Flange of valve body.

For example: Valve is identified as “S 13 1001” punched on the top flange and “T-10 TI” punched on inlet Flange.

# It means ‘S’ for valves for export orders

13 1001 - Serial no. of the valve (First two digits indicate year of manufacturing)

T	- Tested
10	- 410 Internals,i.e trims
TI	- 316Ti Bellow.

## **2. Installation and Commissioning Instructions:**

### **UNI Klinger BELLOW SEAL VALVES**

1. UKL Bellow seal valves can be mounted either horizontally or vertically.
2. UKL Bellow seal valves must be closed clockwise & opened anticlockwise.
3. All UKL , Bellow seal valves indicate flow directions by an arrow embossed or punched on the valve bodies, The head of arrow shows the path of flow (i.e.: inlet to out let) , the valves have to be installed accordingly. Attention should be paid to the correctness of direction.
4. Always lift the UKL Bellow seal valve by clamping necessary attachments to the valve body. Do not lift UKL Bellow seal valves by hand wheel, as this may cause breakage/deformation of the hand wheel.
5. Remove protective caps from the both side of the valves before installation, provide adequate pipe supports to make valves free from external stresses. For flange end valves bolt material of construction and size will be as per applicable standards.
6. UKL Bellow seal valves are designed with encapsulated bellows, however, during the flushing, temporary strainers are recommended if the media have suspended impurities, as these impurities may cause damage to the bellows. Also use heating jackets to crystallizing media. Use drain plugs (provided against request) to drain the valve, in case required. Ensure velocity of the media is within the piping recommendations.
7. Completely assembled UKL Bellow seal valves are set to close position with end caps.
8. During operating, the mobility of open/close should be gradual sudden jerks are not recommended.
9. UKL Bellow seal valves are metal seat valves, hence on final closure –leak tightness. Manual excess torque, with a help of a Tommy- lever equivalent to the Diameter of hand wheel may be used.
10. Regular greasing on the spindle threads and the sleeve, ensure smooth functional operation valve.
11. UKL Bellow seal valves are provided with secondary seal of gland packing. Due to the operational cycles and the gland packing may loosen, Check for packing tightness, and extra packing if required.
12. If the line & valve are subsequently insulated, the insulation should only extend as fact as the head flange on the body side so that access to the bonnet hexagon nuts is not impended. Since the valve body can remain in site for repairs and maintenance work, the valve insulation does not need to be removable.
13. UKL accepts no liability relating to guarantees, warrantees and product liability legislation for damage cause by failure to observe the operating instructions.
14. In case the pipe line where valves are mounted is insulated, provide insulation to valves also.

## Hazardous Operating Errors and Possible Sources of Danger

1. Do not loosen or undo Hex nuts while valves are under pressure, in case of bolted cast bonnet construction.
2. Valve must not be subjected to pressure shocks in excess of one and half times the rated pressure.
3. Avoid significant vibration of valve.
3. Do not apply impact pressure like water hammer etc.
4. Do not open / close very fast respect with actuators.
5. Use heating jacket for freezing media & cooling jackets for cooling media
6. Ensure clean fluids
7. Whatever the application, always consult the operating limits diagram (Pressure - Temperature refer Catalogue) and also consider the suitability of the materials for various process fluids.
8. In case of Valve is in isolation, and accidental sudden opening on its own is undesirable, chain the Hand Wheel along with Stem to Bonnet Yoke tightly.

### **3. MAINTENANCE AND TROUBLESHOOTING:-**

Your UKL make Bellow Seal Valve will provide you with long, trouble-free service if they are correctly installed and maintained.

A few minutes of your time spend reading these instructions now may save hours of trouble and downtime later.

Following procedure is recommended:

1. Depressurize and empty the system.
2. Open the valve fully.
3. Unscrew bonnet fastening nuts.
4. Lift the bonnet assembly together with the hand wheel and handle properly to avoid damages.
5. Open the valve fully.
6. Grind the tack weld on the stem nut, care should be taken so that bellow is not damaged.
7. Unscrew the plug from the spindle.
8. Clean the sealing surface, check for defects, dents wear and tear visually.
9. Check the seating surface in the valve body, for defect / damages.
10. If the defects are found, we recommend lapping the sealing surface by cast iron plate.
11. Measure the approximate diameter of the seat by calipers.
12. Prepare lapping rings for lapping of Plug & Seat as per above dimension.
13. Seat mating surfaces are at 15 degree, please note.

## LAPPING TO BE CARRIED IN FOLLOWING MANNER.

1. Hold plug & seat properly to start lapping.
2. Using a medium lapping paste rotate the plate over sealing surface slowly.
3. Do not apply any pressure during lapping or heavy lapping plates,(max 10mm thick)
4. Clean the surface after every few turns, apply new paste and re lap.
5. Carry out visual inspection before changing the paste
6. Lapping with medium paste has to be continued until the machine tool mark or the defect diminishes.
7. After the defect/machine tool mark diminishes follow the above lapping process using the fine paste
8. Once the fineness is achieved, check the mating area of sealing surface by applying stainer, i.e., colour to the seat.
9. Keep plug loosely on seat to check colour match.
10. If nearly 85% of print is observed on the plug, the valve is ready for assembly.
11. In case if the stain print is below 85% follow the lapping procedure till the result is achieved.

## LUBRICATION OF MOVING PARTS:

### (A) Routine maintenance:

1. Force lubricant through grease nipple near the yoke.
2. Apply the grease on threaded part of the stem regularly to keep the stem well greased.

Note:-Routine maintenance for Lubrication of threaded parts must be carried out every month.

However this may vary depending on operating and environmental conditions.

### (B) Off-line maintenance:

1. Unscrew the hand wheel nut and Remove the hand wheel.
2. Check the wear & tear hand wheel key, replace if necessary.
3. Unscrew the yoke nut and the yoke sleeve.
4. Wipe / clean the grease on the spindle threads.
5. Apply the fresh lubricant of recommended grade, Meta flux 70-81Gr or equivalent
6. Screw the yoke sleeve and Check the movement of sleeve on the spindle.
7. Screw the yoke nut.
8. Force grease through the grease nipple provided on the bonnet.
9. Insert the hand wheel with key in the keyway and Screw the hand wheel nut.
10. Check the motion of the spindle by opening/closing valve.
11. Check surface of the spindle for smoothness. It should not be corroded / eroded.

## REPLACEMENT OF GLAND PACKING.

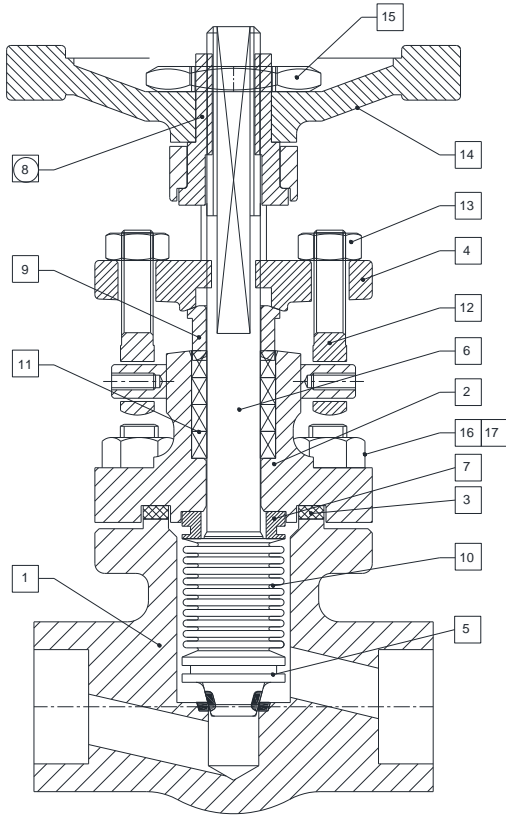
- 1) Open the valve fully and ensure that backseat rests on the backseat bush.
- 2) Loosen the eye bolt nut
- 3) Lift the gland flange
- 4) Lift the gland bush, visually observe for erosion and corrosion of gland bush / gland flange and stem surface.
- 5) Remove the old packing
- 6) Insert the recommended Gland Packing
- 7) Lower the gland bush and Gland Flange.
- 8) Tighten the eyebolt nuts uniformly.
- 9) During the tightening of eye bolt check the operation of the valve.(the valve spindle should sufficiently free enough for manual operation)
- 10) Visually observe alignment of gland flange.
- 11) Operate the valve a few times before commissioning.

## ASSEMBLY:

- 1) Reset the plug on the Stem Nut and tighten.
- 2) Tack weld the Stem Nut to plug to avoid unscrewing
- 3) Lift the complete bonnet assembly, open the valve fully.
- 4) Change the gasket use as recommended
- 5) Mount Bonnet assembly over the valve body, note the gap between the body / bonnet.
- 6) The Bonnet rib should be in line to valve ends.
- 7) Fix the nuts.
- 8) Close the valve, visually see that the plug rests on the seat surface.
- 9) Slowly tighten the nuts, corresponding opposite side, one by one
- 10) Simultaneously slowly open the valve. Always ensure that plug rests on the seat surface gently to avoid any mis-match.
- 11) Tighten the nut till the gap between the bonnet/body joint reduces to 50% of free gap.

Note: During the dismantling and assembly of maintained valve ensure all the components are free of corrosion & erosion.

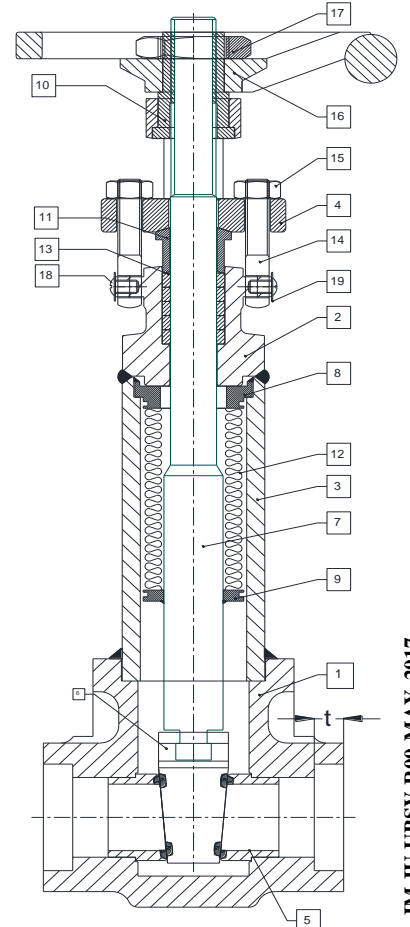
## BELLOW SEAL VALVE (FORGED GLOBE):-



NO. PART	PART NAME	MATERIAL CODE
1	BODY	ASTM A105
2	BONNET	ASTM A105
3	BODY GASKET	SPW 304+GRAPHITE FILLER
4	GLAND FLANGE	ASTM A105
5	PLUG	ASTM A276 TP.410 + HF
6	STEM	ASTM A276 TP.410
7	TOP BELLOW COLLAR	ASTM A276 TP.316
8	YOKE SLEEVE	SG IRON
9	GLAND BUSH	ASTM A276 TP.410
10	BELLOW	AISI 316 Ti
11	GLAND PACKING	GRAPHITE
12	EYE BOLT	ASTM A 193 Gr.B7
13	EYE BOLT NUT	ASTM A 194 Gr.2H
14	HAND WHEEL	CAST IRON / CARBON STEEL
15	HAND WHEEL NUT	CARBON STEEL
16	STUD	ASTM A 193 Gr.B7
17	NUT	ASTM A 194 Gr.2H

## BELLOW SEAL VALVE (FORGED GATE):-

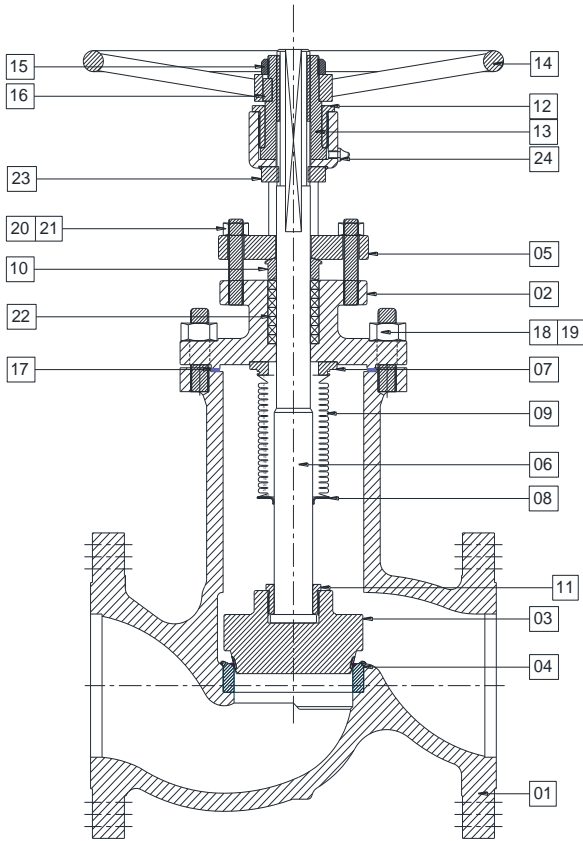
PART NO.	PART NAME	M.O.C.
1	BODY	ASTM A 105
2	BONNET	ASTM A 105
3	CYLINDER PIPE	ASTM A 106 Gr.B
4	GLAND FLANGE	ASTM A 105
5	SEAT	ASTM A 276 TP 410+ STELLITE Gr.6
6	WEDGE	ASTM A 276 TP 410+ STELLITE Gr.6
7	STEM	ASTM A 276 TP 410
8	TOP BELLOW COLLAR	ASTM A 276 TP 316
9	BOTTOM BELLOW COLLAR	ASTM A 276 TP 316
10	YOKE SLEEVE	S. G. IRON
11	GLAND BUSH	ASTM A 276 TP 410
12	BELLOW	AISI 316 Ti
13	GLAND PACKING	GRAPHITE
14	EYE BOLT	ASTM A 193 Gr.B7
15	EYE BOLT NUT	ASTM A 194 Gr.2H
16	HAND WHEEL	CAST IRON
17	HAND WHEEL NUT	CARBON STEEL
18	SCREW	CARBON STEEL
19	WASHER	CARBON STEEL



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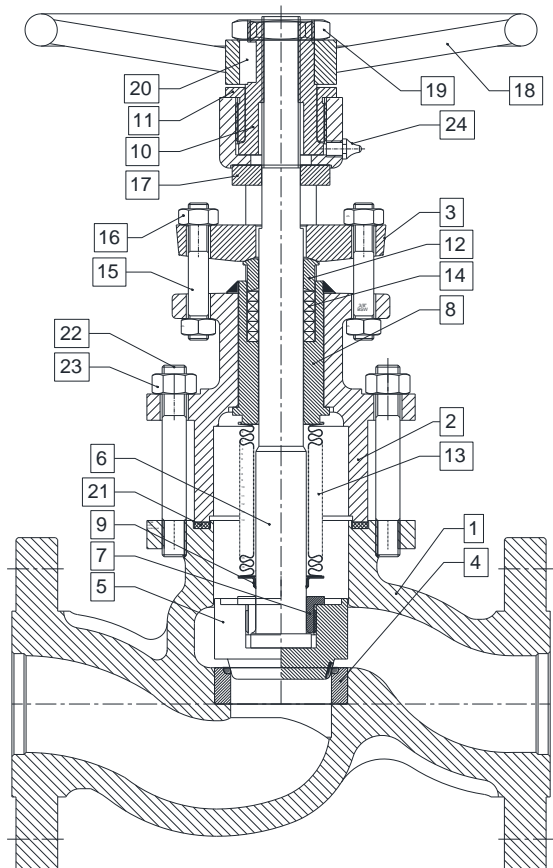
## BELLOW SEAL EXTENDED NECK TYPE GLOBE VALVE:-



SR.	PART DESCRIPTION	M.O.C.
01	BODY	ASTM A 216 GR. WCB
02	BONNET	ASTM A 216 GR. WCB
03	PLUG	ASTM A 216 GR. WCB + STELLITE
04	SEAT	ASTM A 216 GR. WCB + STELLITE
05	GLAND FLANGE	ASTM A 105
06	STEM	ASTM A 276 TP 410
07	TOP BELLOW COLLAR	ASTM A 276 TP 316
08	BOTTOM BELLOW COLLAR	ASTM A 276 TP 316
09	BELLOW	AISI 316 Ti
10	GLAND BUSH	ASTM A276 TP 410
11	STEM NUT	ASTM A276 TP 410
12	YOKE NUT	IS 2062 Gr.B
13	YOKE SLEEVE	S. G. IRON
14	HAND WHEEL	CARBON STEEL
15	HAND WHEEL NUT	CARBON STEEL
16	HAND WHEEL KEY	CARBON STEEL
17	BODY BONNET GASKET	SPW 304+GRAPHITE FILLER
18	BODY BONNET STUD	ASTM A 193 GR. B7
19	BODY BONNET NUT	ASTM A 194 GR. 2H
20	GF - BONNET STUD	ASTM A 193 GR. B7
21	GF - BONNET NUT	ASTM A 194 GR. 2H
22	GLAND PACKING	GRAPHITE
23	GUIDE PLATE	CARBON STEEL
24	GREASE NIPPLE	CARBON STEEL

## BELLOW SEAL BOLTED BONNET TYPE GLOBE VALVE:-

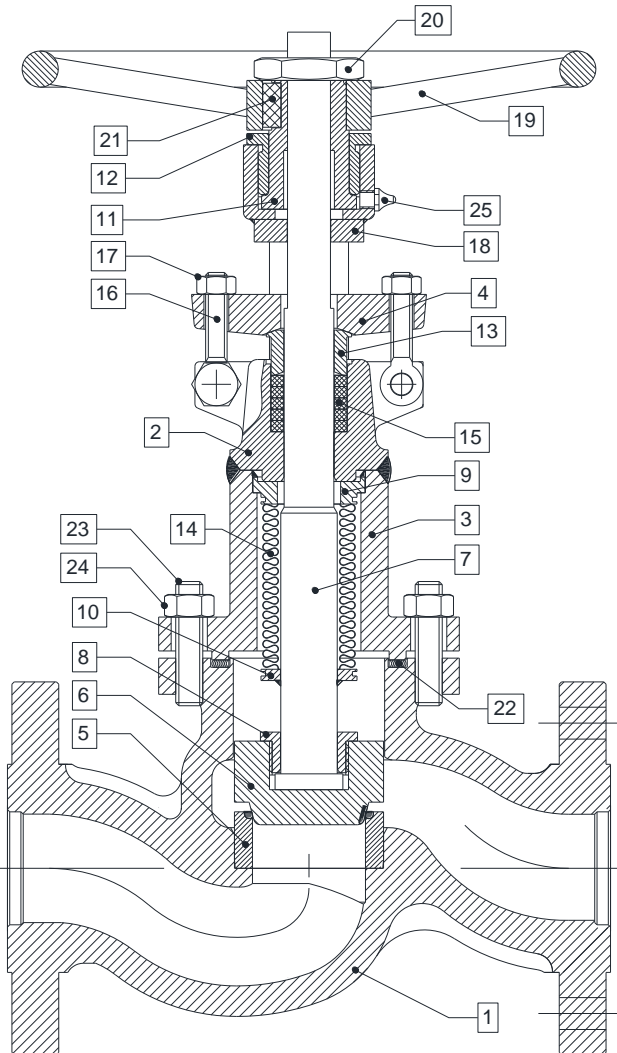
PART NO.	DESCRIPTION	MATERIAL
1	BODY	ASTM A216 GR. WCB
2	BONNET	ASTM A216 GR. WCB
3	GLANDE FLANGE	ASTM A105 / ASTM A216 Gr. WCB
4	SEAT	ASTM A216 Gr.WCB/ A276 TP.410+ST.
5	PLUG	ASTM A216 Gr.WCB/ A276 TP.410+ST.
6	STEM	ASTM A276 TP.410
7	STEM NUT	ASTM A276 TP.410
8	STUFFING BOX	ASTM A276 TP.316
9	BOTTOM COLLAR	ASTM A276 TP.316
10	YOKE SLEEVE	S. G. IRON 400/12
11	YOKE NUT	IS 2062 Gr.B
12	GLAND BUSH	ASTM A276 TP.410
13	BELLOW	AISI 316 Ti-2 PLY
14	GLAND PACKING	GRAPHITE
15	STUD	ASTM A 193 Gr.B7
16	NUT	ASTM A 194 Gr.2H
17	GUIDE PLATE	CARBON STEEL
18	HAND WHEEL	CARBON STEEL
19	HAND WHEEL NUT	CARBON STEEL
20	HAND WHEEL KEY	CARBON STEEL
21	BODY GASKET	SPW 304+GRAPHITE FILLER
22	STUD	ASTM A 193 GR. B7
23	NUT	ASTM A 194 GR. 2H
24	GREASE NIPPLE	CARBON STEEL





## 5. BILL OF MATERIAL

### BELLOW SEAL GLOBE VALVE CASTING:-

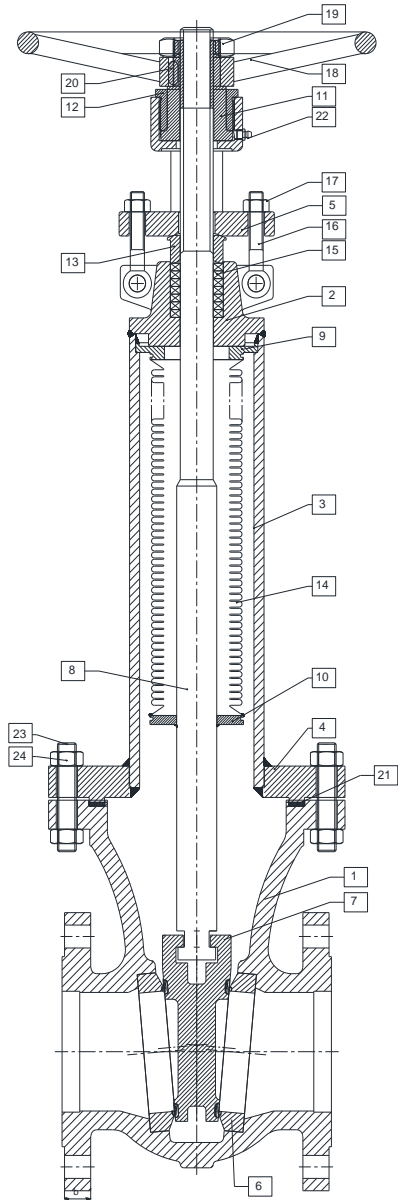


PART NO.	PART NAME	M.O.C.
1	BODY	ASTM A 216 Gr. WCB
2	BONNET	ASTM A 216 Gr. WCB
3	BELLOW CHAMBER	ASTM A 216 Gr. WCB
4	GLAND FLANGE	CS-IS 2062 B / ASTM A 105
5	SEAT	AISI 410 / CA15 + STELLITE
6	PLUG	AISI 410 / CA15 + STELLITE
7	STEM	ASTM A 276 TP 410
8	STEM NUT	AISI 410
9	TOP BELLOW COLLAR	AISI 316
10	BOTTOM BELLOW COLLAR	AISI 316
11	YOKE SLEEVE	S. G. IRON
12	YOKE NUT	IS 2062 Gr.B
13	GLAND BUSH	AISI 410
14	BELLOW	AISI 316 Ti
15	GLAND PACKING	GRAPHITE
16	EYE BOLT	CS-IS 2062 B / ASTM A 105
17	EYE BOLT NUT	CS-IS 2062 B / ASTM A 105
18	GUIDE PLATE	IS 2062 Gr.B
19	HAND WHEEL	IS 2062 Gr.B
20	HAND WHEEL NUT	IS 2062 Gr.B
21	HAND WHEEL KEY	IS 2062 Gr.B
22	BODY GASKET	AISI 304+GRAPHITE FILLER
23	STUD	ASTM A 193 Gr.B7
24	NUT	ASTM A 194 GR.2H
25	GREASE NIPPLE	IS 2062 Gr.B


### 5. STORAGE:-

- Completely assembled valves are to be stored in the “as-received“(valves set to CLOSED position, connections plugged). Spare parts for valves are to be handled with care, and should be kept in the original packing furnished by the factory if possible during all storage.
- If cover or shrink films are used, the appropriate measure must be taken to ensure that the atmosphere inside the covers stay free of condensate water.
- To avoid confusion, all parts stored must be labeled as on the delivery note and stored in the correct place.
- Instruction manuals should always be stored with products to ensure that important information and documents are appropriately passed on.
- Corresponding documents must be available for the identification of UKL components.
- Damages owing to improper storage will release UKL from any obligations as may be derived from the warranty, guarantee and product liability.

## BILL OF MATERIAL GATE VALVE CASTING:-



PART NO.	PART NAME	M.O.C
1	BODY	ASTM A 216 GR. WCB
2	BONNET	ASTM A 216 GR. WCB
3	CYLINDER PIPE/DOME	ASTM A 106 GR.B.
4	CYLINDER FLANGE	ASTM A 216 GR. WCB / ASTM A 105
5	GLAND FLANGE	ASTM A 216 GR. WCB / ASTM A 105
6	SEAT	ASTM A 216 GR. WCB +ST Gr.6
7	WEDGE	ASTM A 216 GR. WCB +ST Gr.6
8	STEM	ASTM A 276 TP 410
9	TOP BELLOW COLLAR	ASTM A 276 TP 316
10	BOTTOM BELLOW COLLAR	ASTM A 276 TP 316
11	YOKE SLEEVE	S.G. IRON
12	YOKE NUT	ASTM A276 TP 410
13	GLAND BUSH	ASTM A276 TP 410
14	BELLOW	AISI 316 Ti
15	GLAND PACKING	GRAPHITE
16	EYE BOLT	ASTM A 193 GR. B7
17	EYE BOLT NUT	ASTM A 194 GR. 2H
18	HAND WHEEL	CARBON STEEL
19	HAND WHEEL NUT	CARBON STEEL
20	HAND WHEEL KEY	IS 2062 Gr.B
21	BODY GASKET	SPW 304+GRAPHITE FILLER
22	GREASE NIPPLE	IS 2062 Gr.B
23	STUD	ASTM A 193 GR. B7
24	STUD NUT	ASTM A 194 GR. 2H

**Other Products :** 

Cast / Forged Steel Piston Valves, Bellow Seal Valves, High Pressure valves (Gate/Globe) , Strainers – "Y" Type, Flash Vessel.  
 Steam Traps (Thermodynamic, Thermostatic, Ball Float Traps, Inverted Bucket), Pressure Reducing Station, Condensate Recovery Products.  
 Level Gauges (Reflex, Transparent, Bicolor), Sight Glass, Hot Water Generation System, Safety and Relief Valves.  
**FSD Products :** Compressed Asbestos / Non Asbestos Fiber Sheetting / Cut Gaskets, Spiral Wound Gaskets.

*In view of technical progress design and dimensions are subjected to change without notice.*

**UKL**®

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