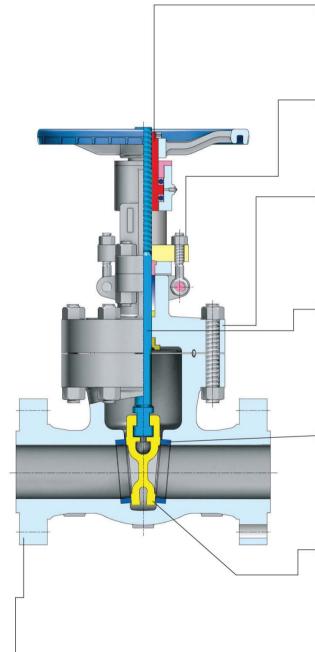


## CAST CARBON STEEL / BOLTED BONNET

### **GATE VALVES**



#### STEM NUT

The upper portion of the Yoke Sleeve is hexagonally tapered to fix the handwheel. The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over 1150 °C (2100°F) dissolution point in accordance with API Std. specifications.

#### BOLTING

The body-bonnet bolts are manufactured in accordance with API Std. 600 specifications. The nuts also strictly conform with ANSI B 1.1 The stud-bolt nuts, hexagonal, rigid and hot-forged, bear material notation as well as do the bolt nuts made according to ANSI B 18.2.2

#### BONNET

The bonnet and valve body have the same wall thickness. The bodybonnet flange drilling is spot-faced to exactly meet stud-bolt nuts. The bonnet back seat bushing guarantees packing replacement even when the valve is fully opened. The stem packing dimensions of the stuffing box are in accordance with API specifications.

#### STEM

The machined forged stem comes with a T-shape head, which connects the slot of the wedge. The Spherically shaped contacting The stem dimensions are in accordance with API Std. 600 Specifications. The heat treated stem delivers adequate mechanical properties as well as excellent surface hardness. Further, opening/shutting friction is minimized by accurate machining and lapping.

#### SEAT RING

Bottom seated type seat rings are welded or screwed into the body. The seating surface is finished by lapping. They are forgings that have been heat treated to deliver the best mechanical properties and required hardness. The difference in hardness between seats and wedge is in accordance with API specifications.

#### FLEXIBLE WEDGE

The standard disc of our valves is a one-piece flexible wedge. Slots are machined on both sides of the wedge to allow it to travel correctly in the integrally cast body guides. The wedge seating surfaces have been accurately machined, ground and lapped to a mirror finish to prevent leakage and eliminate galling.

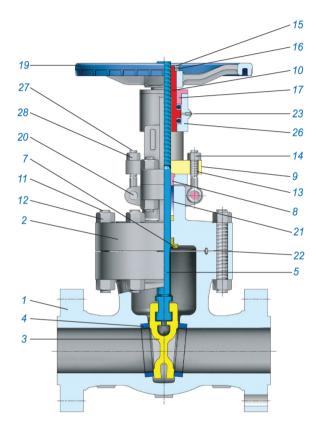
#### BODY

The cast steel body is designed to insure a wall thickness which is greater at any point than the minimum specified by API Std. 600. Special care has been taken with the design of the Class 150 valve body so that the elliptically shaped center section is free from intensified stesses in the critical area. The body of above Class 300 are made circular in shape as much as possible to minimize distortion even under extreme operating conditions. Inlet and outlet port dimensions conform with ANSI B 16.5 Pipe Fitting. The welded-in type seat ring is standard to insure interchangeability. Except for Class 150, the standard body-bonnet joint is male and female.



## CAST CARBON STEEL / BOLTED BONNET

### **GATE VALVES**





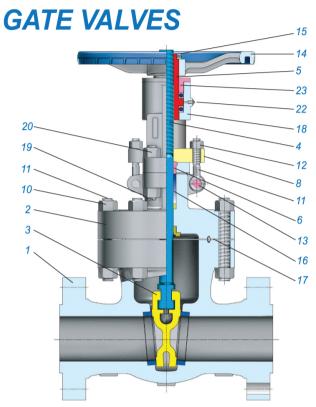
| No. | NAME OF PART  | ASTM SPECIFICATION |
|-----|---------------|--------------------|
| 15  | HANDLE NUT    | A 307.B+ZN PLATED  |
| 16  | SET SCREW     | A 307.B            |
| 17  | SLEEVE GLAND  | STEEL              |
| 19  | HANDWHEEL     | A395               |
| 21  | PACKING       | SEE PAGE 44        |
| 22  | GASKET        | SEE PAGE 44        |
| 23  | GREASE NIPPLE | B16                |

| No  | NAME OF DAD    |             |             | ASTM SPEC   | IFICATION   |             |                         | KS SPECIFICATION |
|-----|----------------|-------------|-------------|-------------|-------------|-------------|-------------------------|------------------|
| No. | NAME OF PART   | STANDARD    | HI          | IGH TEMPERA | TURE SERVIC | E           | LOW TEMPERATURE SERVICE | STANDARD         |
| 1   | BODY           | A216-WCB    | A217-WC1    | A217-WC6    | A217-WC9    | A217-C5     | A352-LCB                | SCPH2            |
| 2   | BONNET         | A216-WCB    | A217-WC1    | A217-WC6    | A217-WC9    | A217-C5     | A352-LCB                | SCPH2            |
| 3   | *DISC          | A217-CA15   | A217-WC1    | A217-WC6    | A217-WC9    | A217-C5     | A352-LCB                | SSC1             |
| 4   | BODY SEAT RING | C/S1020+HF  | A182-F1     | A182-F11    | A182-F22    | A182-F5a    | A182-F304               | STEEL+HF         |
| 5   | STEM           | A276-410    | A276-410    | A276-410    | A276-410    | A276-410    | A276-304                | STS410           |
| 7   | BONNET BUSH    | A276-410    | A276-410    | A276-410    | A276-410    | A276-410    | A276-304                | STS410           |
| 8   | PACKING GLAND  | A276-410    | A276-410    | A276-410    | A276-410    | A276-410    | A276-304                | STS410           |
| 9   | GLAND FLANGE   | A105/A283-D | A105/A283-D | A105/A283-D | A105/A283-D | A105/A283-D | A105/A283-D             | SF45             |
| 10  | STEM NUT       | A439-D2     | A439-D2     | A439-D2     | A439-D2     | A439-D2     | A439-D2                 | FCD45            |
| 11  | BONNET BOLT    | A193-B7     | A193-B7     | A193-B7     | A193-B16    | A193-B16    | A320-L7                 | SNB7             |
| 12  | BONNET NUT     | A194-2H     | A194-2H     | A194-2H     | A194-4      | A194-4      | A194-4                  | SM45C            |
| 13  | GLAND BOLT     | A307B       | A307B       | A307B       | A307B       | A307B       | A307B                   | SM45C            |
| 14  | GLAND NUT      | A307B       | A307B       | A307B       | A307B       | A307B       | A307B                   | SM45C            |
| 20  | HINGE PIN      | A108-1020   | A108-1020   | A108-1020   | A108-1020   | A108-1020   | A108-1020               | SM45C            |
| 26  | YOKE           | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB                | SCPH2            |
| 27  | YOKE BOLT      | A193-B7     | A193-B7     | A193-B7     | A193-B7     | A193-B7     | A193-B7                 | SNB7             |
| 28  | YOKE NUT       | A194-2H     | A194-2H     | A194-2H     | A194-2H     | A194-2H     | A194-2H                 | SM45C            |

\*DISC : In case of 12" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body



## CAST STAINLESS STEEL / BOLTED BONNET



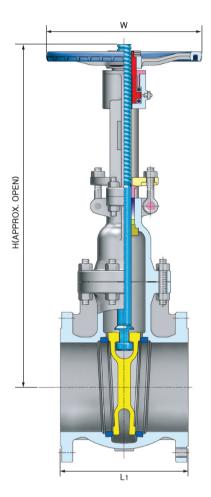


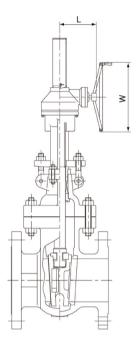
| No  | NAME OF DADE   |                   | ASTM SPEC         | CIFICATION        |                   |         |
|-----|----------------|-------------------|-------------------|-------------------|-------------------|---------|
| No. | NAME OF PART   |                   | CORROSIO          | N SERVICE         |                   | REMARKS |
| 1   | BODY           | A351-CF8          | A351-CF8M         | A351-CF3          | A351-CF3M         |         |
| 2   | BONNET         | A351-CF8          | A351-CF8M         | A351-CF3          | A351-CF3M         |         |
| 3   | DISC           | A351-CF8          | A351-CF8M         | A351-CF3          | A351-CF3M         |         |
| 4   | STEM           | A276-304          | A276-316          | A276-304L         | A276-316L         |         |
| 5   | STEM NUT       | A439-D2           | A439-D2           | A439-D2           | A439-D2           |         |
| 6   | PACKING GLAND  | A276-304          | A276-316          | A276-304L         | A276-316L         |         |
| 8   | GLAND FLANGE   | A351-CF8/A240-304 | A351-CF8/A240-304 | A351-CF8/A240-304 | A351-CF8/A240-304 |         |
| 9   | BONNET BOLT    | A193-B8           | A193-B8           | A193-B8           | A193-B8           |         |
| 10  | BONNET NUT     | A194-8            | A194-8            | A194-8            | A194-8            |         |
| 11  | GLAND BOLT     | A193-B8           | A193-B8           | A193-B8           | A193-B8           |         |
| 12  | GLAND NUT      | A194-8            | A194-8            | A194-8            | A194-8            |         |
| 13  | HINGE PIN      | A276-304          | A276-304          | A276-304          | A276-304          |         |
| 14  | HAND WHEEL     | A395              | A395              | A395              | A395              |         |
| 15  | HAND WHEEL NUT | A307-B+ZN PLATED  | A307-B+ZN PLATED  | A307-B+ZN PLATED  | A307-B+ZN PLATED  |         |
| 16  | PACKING        | COMMERCIAL        | COMMERCIAL        | COMMERCIAL        | COMMERCIAL        | NOTE1   |
| 17  | GASKET         | COMMERCIAL        | COMMERCIAL        | COMMERCIAL        | COMMERCIAL        | NOTE1   |
| 18  | YOKE           | A351-CF8          | A351-CF8/CF8M     | A351-CF8/CF3      | A351-CF8/CF3M     |         |
| 19  | YOKE BOLT      | A193-B8           | A193-B8           | A193-B8           | A193-B8           |         |
| 20  | YOKE NUT       | A194-8            | A194-8            | A194-8            | A194-8            |         |
| 21  | SET SCREW      | A307-B            | А307-В            | А307-В            | А307-В            |         |
| 22  | GREASE NIPPLE  | B16               | B16               | B16               | B16               |         |
| 23  | SLEEVE GLAND   | A351-CF8          | A351-CF8M         | A351-CF3          | A351-CF3M         |         |

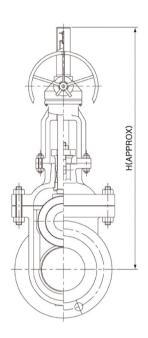
\*Note1. Packing & gasket material : customer's requirements, see page 44

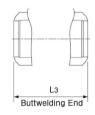


### **ASME CLASS 150LB**





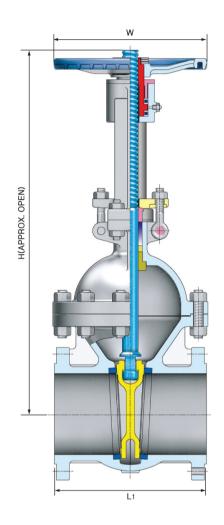


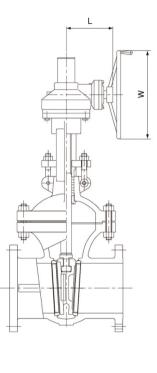


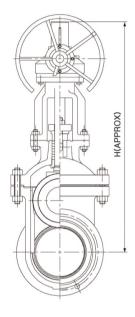
| VALVE  | inch | 2    | 2 <sup>1</sup> / <sub>2</sub> | 3     | 4    | 5     | 6     | 8     | 10    | 12    | 14    | 16     | 18     | 20     | 24     | 28     | 30     | 36     | 40     |
|--------|------|------|-------------------------------|-------|------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| SIZE   | mm   | 50   | 65                            | 80    | 100  | 125   | 150   | 200   | 250   | 300   | 350   | 400    | 450    | 500    | 600    | 700    | 750    | 900    | 1000   |
| T 1    | inch | 7.0  | 7.5                           | 8.0   | 9.0  | 10.0  | 10.5  | 11.5  | 13.0  | 14.0  | 15.0  | 16.0   | 17.0   | 18.0   | 20.0   | 24.0   | 24.0   | 28.0   | 30.0   |
| Li     | mm   | 178  | 191                           | 203   | 229  | 254   | 267   | 292   | 330   | 356   | 381   | 406    | 432    | 457    | 508    | 610    | 610    | 711    | 762    |
| I a    | inch |      | 9.5                           | 11.12 | 12.0 | 15.0  | 15.88 | 16.5  | 18.0  | 19.75 | 22.5  | 24.0   | 26.0   | 28.0   | 32.0   | 36.0   | 36.0   | 40.4   | 42.0   |
| L3     | mm   | 216  | 241                           | 283   | 305  | 381   | 403   | 419   | 457   | 502   | 572   | 610    | 660    | 711    | 813    | 914    | 914    | 1016   | 1067   |
| Н      | inch | 14.0 | 16.3                          | 18.4  | 22.2 | 26.5  | 30.0  | 41.9  | 50.6  | 58.3  | 60.0  | 68.7   | 79.1   | 91.7   | 109.6  | 127.4  | 134.5  | 161.8  | 183.9  |
| п      | mm   | 356  | 415                           | 468   | 565  | 674   | 762   | 1065  | 1285  | 1480  | 1523  | 1745   | 2010   | 2330   | 2784   | 3236   | 3417   | 4109   | 4670   |
| W      | inch | 7.7  | 7.7                           | 8.5   | 9.4  | 11.0  | 11.8  | 14.0  | 15.7  | 17.7  | 13.8  | 13.8   | 13.8   | 17.7   | 17.7   | 22.0   | 22.0   | 27.9   | 31.5   |
| •••    | mm   | 195  | 195                           | 215   | 240  | 280   | 300   | 355   | 400   | 450   | 350   | 350    | 350    | 450    | 450    | 560    | 560    | 710    | 800    |
| L      | inch | -    | -                             | -     | -    | -     | -     | -     | -     | -     | 13.1  | 13.1   | 13.1   | 14.3   | 14.3   | 16.3   | 16.3   | 18.4   | 20.7   |
| L      | mm   | -    | -                             | -     | -    | -     | -     | -     | -     | -     | 332   | 332    | 332    | 362    | 362    | 414    | 414    | 468    | 526    |
| WEIGHT | LB   | 44.1 | 55.1                          | 66.2  | 97.0 | 132.3 | 154.4 | 233.7 | 368.2 | 526.9 | 760.7 | 1080.5 | 1274.5 | 1611.9 | 2280.0 | 3572.1 | 4057.2 | 7497.0 | 9481.5 |
| WEIGHT | Kg   | 20   | 25                            | 30    | 44   | 60    | 70    | 106   | 167   | 239   | 345   | 490    | 578    | 731    | 1043   | 1620   | 1840   | 3400   | 4300   |

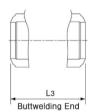
**KCL** Valve

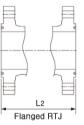
### ASME CLASS 300LB







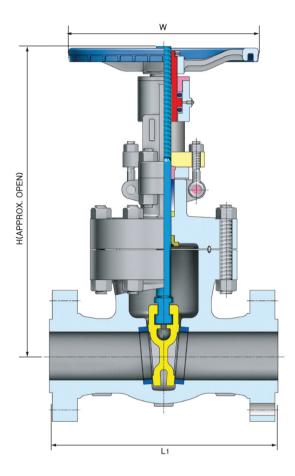


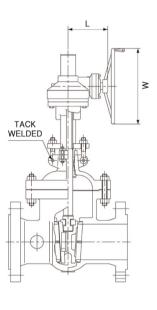


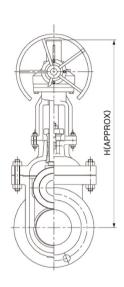
| VALVE   | inch | 2    | 2 1/2 | 3     | 4     | 5     | 6     | 8     | 10    | 12     | 14     | 16     | 18     | 20     | 24     | 28     | 30     | 36      | 40      | 42      |
|---------|------|------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|
| SIZE    | mm   | 50   | 65    | 80    | 100   | 125   | 150   | 200   | 250   | 300    | 350    | 400    | 450    | 500    | 600    | 700    | 750    | 900     | 1000    | 1050    |
| L1 & L3 | inch | 8.5  | 9.5   | 11.12 | 12.0  | 15.0  | 15.88 | 16.5  | 18.0  | 19.75  | 30.0   | 33.0   | 36.0   | 39.0   | 45.0   | 53.0   | 55.0   | 68.0    | 76.0    | 78.0    |
|         | mm   | 216  | 241   | 283   | 305   | 381   | 403   | 419   | 457   | 502    | 762    | 838    | 914    | 991    | 1143   | 1346   | 1397   | 1727    | 1930    | 1981    |
| L2      | inch | 9.12 | 10.12 | 11.74 | 12.62 | 15.63 | 16.5  | 17.12 | 18.62 | 20.37  | 30.62  | 33.62  | 36.62  | 39.75  | 45.88  | 54.0   | 56.0   | 69.12   | -       | -       |
| 1.2     | mm   | 216  | 257   | 298   | 321   | 397   | 419   | 435   | 473   | 518    | 778    | 854    | 930    | 1010   | 1165   | 1372   | 1422   | 1756    | -       | -       |
| Н       | inch | 16.3 | 17.5  | 20.5  | 23.2  | 28.3  | 33.3  | 40.4  | 48.2  | 61.4   | 60.0   | 68.7   | 79.1   | 91.7   | 109.6  | 130.0  | 148.5  | 169.8   | 188.6   | 198.1   |
| п       | mm   | 415  | 445   | 520   | 590   | 720   | 845   | 1025  | 1225  | 1560   | 1523   | 1745   | 2010   | 2330   | 2784   | 3302   | 3772   | 4312    | 4791    | 5032    |
| W       | inch | 7.7  | 7.7   | 8.5   | 9.4   | 11.0  | 14.0  | 15.7  | 17.7  | 19.7   | 17.7   | 17.7   | 22.0   | 22.0   | 27.9   | 35.4   | 35.4   | 30.0    | 30.0    | 30.0    |
| vv      | mm   | 195  | 195   | 215   | 240   | 280   | 355   | 400   | 450   | 500    | 450    | 450    | 560    | 560    | 710    | 900    | 900    | 760     | 760     | 760     |
| L       | inch | -    | -     | -     | -     | -     | -     | -     | -     | -      | 14.3   | 14.3   | 16.3   | 16.3   | 18.4   | 21.8   | 21.8   | 21.8    | 20.2    | 20.2    |
| L       | mm   | -    | -     | -     | -     | -     | -     | -     | -     | -      | 362    | 36     | 414    | 414    | 468    | 554    | 554    | 554     | 512     | 512     |
| WEIGHT  | LB   | 52.9 | 75.0  | 90.4  | 143.3 | 209.5 | 257.9 | 401.3 | 368.2 | 1060.6 | 1528.1 | 2094.8 | 2535.8 | 3307.5 | 4961.3 | 6637.1 | 8595.6 | 10579.2 | 15428.0 | 18734.0 |
| WEIGHT  | Kg   | 24   | 34    | 41    | 65    | 95    | 117   | 182   | 355   | 481    | 693    | 950    | 1150   | 1500   | 2250   | 3010   | 3900   | 4800    | 7000    | 8500    |

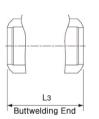


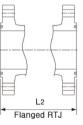
### ASME CLASS 600LB







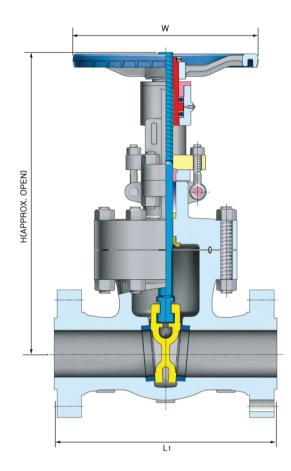


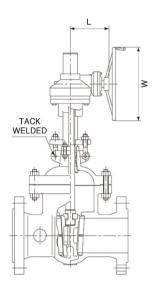


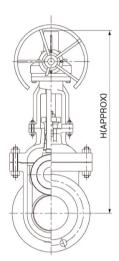
| VALVE    | inch | 2     | 2 <sup>1</sup> / <sub>2</sub> | 3     | 4     | 5     | 6     | 8     | 10     | 12     | 14     | 16     | 18     | 20     | 24     |
|----------|------|-------|-------------------------------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| SIZE     | mm   | 50    | 65                            | 80    | 100   | 125   | 150   | 200   | 250    | 300    | 350    | 400    | 450    | 500    | 600    |
| I LO I O | inch | 11.5  | 13.0                          | 14.0  | 17.0  | 20.0  | 22.0  | 26.0  | 31.0   | 33.0   | 35.0   | 39.0   | 43.0   | 47.0   | 55.00  |
| L1 & L3  | mm   | 292   | 330                           | 356   | 432   | 508   | 559   | 660   | 787    | 838    | 889    | 991    | 1092   | 1194   | 1397   |
| L2       | inch | 11.62 | 13.12                         | 14.12 | 17.12 | 19.57 | 22.12 | 26.12 | 31.12  | 33.12  | 35.12  | 39.12  | 43.12  | 47.25  | 55.38  |
| 1.2      | mm   | 295   | 333                           | 359   | 435   | 511   | 562   | 664   | 791    | 841    | 892    | 994    | 1095   | 1200   | 1406   |
| Н        | inch | 18.7  | 21.6                          | 23.5  | 26.8  | 31.5  | 36.6  | 45.7  | 53.1   | 61.8   | 72.1   | 82.9   | 98.0   | 104.8  | 116.9  |
| п        | mm   | 475   | 550                           | 598   | 680   | 800   | 930   | 1160  | 1350   | 1570   | 1832   | 2106   | 2489   | 2662   | 2970   |
| W        | inch | 7.7   | 7.7                           | 9.4   | 11.8  | 14.0  | 17.7  | 17.7  | 19.7   | 22.0   | 22.0   | 27.9   | 27.9   | 31.5   | 35.4   |
| vv       | mm   | 195   | 195                           | 240   | 300   | 355   | 450   | 450   | 500    | 560    | 560    | 710    | 710    | 800    | 900    |
| L        | inch | -     | -                             | -     | -     | -     | -     | -     | -      | 16.3   | 16.3   | 18.4   | 18.4   | 20.7   | 26.4   |
| L        | mm   | -     | -                             | -     | -     | -     | -     | -     | -      | 414    | 414    | 468    | 468    | 526    | 670    |
| WEIGHT   | LB   | 79.4  | 127.9                         | 154.4 | 269.0 | 441   | 551.2 | 893.0 | 1433.2 | 1896.3 | 2734.2 | 3109.1 | 4890.7 | 6198.3 | 8656.8 |
| WEIGHT   | Kg   | 36    | 58                            | 70    | 122   | 200   | 250   | 405   | 650    | 860    | 1240   | 1410   | 2218   | 2811   | 3926   |

**KCL** Valve

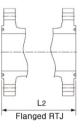
### ASME CLASS 900LB







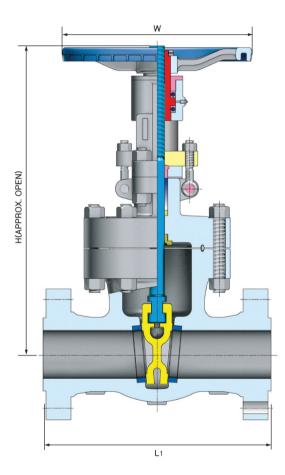


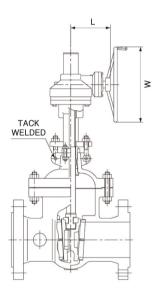


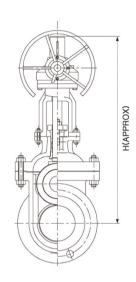
| VALVE   | inch | 2     | 2 <sup>1</sup> / <sub>2</sub> | 3     | 4     | 5     | 6     | 8     | 10    | 12    | 14     | 16    | 18     | 20      | 24      |
|---------|------|-------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------|---------|---------|
| SIZE    | mm   | 50    | 65                            | 80    | 100   | 125   | 150   | 200   | 250   | 300   | 350    | 400   | 450    | 500     | 600     |
| LIC LO  | inch | 14.5  | 16.5                          | 15.0  | 18.0  | 22.0  | 24.0  | 29.0  | 33.0  | 38.0  | 40.5   | 44.5  | 48.0   | 52.0    | 61.0    |
| L1 & L3 | mm   | 368   | 419                           | 381   | 457   | 559   | 610   | 737   | 838   | 965   | 1029   | 1130  | 1219   | 1321    | 1549    |
| L2      | inch | 14.62 | 16.62                         | 15.12 | 18.12 | 22.13 | 24.12 | 29.12 | 33.12 | 38.12 | 40.88  | 44.88 | 48.5   | 52.5    | 61.75   |
| L2      | mm   | 371   | 422                           | 384   | 460   | 562   | 613   | 740   | 841   | 968   | 1038   | 1140  | 1232   | 1334    | 1568    |
| TT      | inch | 21.2  | 26.4                          | 26.4  | 30.8  | 37.1  | 42.4  | 55.5  | 67.7  | 77.4  | 74.9   | 80.7  | 88.8   | 110.2   | 124.0   |
| Н       | mm   | 539   | 670                           | 672   | 782   | 943   | 1076  | 1411  | 1720  | 1965  | 1902   | 2051  | 2256   | 2800    | 3150    |
| W       | inch | 11.8  | 11.8                          | 14.0  | 15.7  | 19.7  | 22.0  | 17.7  | 22.0  | 22.0  | 24.0   | 24.0  | 30.0   | 30.0    | 24.0    |
| vv      | mm   | 300   | 300                           | 355   | 400   | 500   | 560   | 450   | 560   | 560   | 610    | 610   | 760    | 760     | 610     |
| т       | inch | -     | -                             | -     | -     | -     | -     | 14.3  | 16.3  | 16.3  | 20.2   | 20.2  | 21.8   | 21.8    | 20.0    |
| L       | mm   | -     | -                             | -     | -     | -     | -     | 362   | 414   | 414   | 512    | 512   | 554    | 554     | 512     |
| WEIGHT  | LB   | 181   | 341.8                         | 364   | 384   | 661.5 | 999   | 1720  | 2752  | 3400  | 4895.1 | 6615  | 8533.4 | 10716.3 | 16096.5 |
| WEIGHT  | Kg   | 82    | 155                           | 165   | 174   | 300   | 453   | 780   | 1248  | 1542  | 2220   | 3000  | 3870   | 4860    | 7300    |

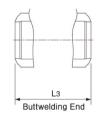


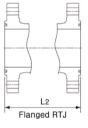
### ASME CLASS 1500LB







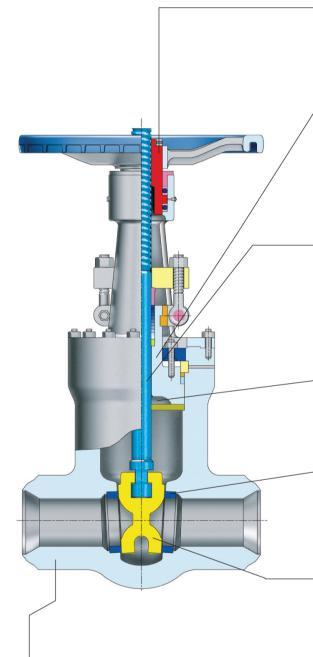




| VALVE    | inch | 2     | 2 <sup>1</sup> / <sub>2</sub> | 3     | 4     | 5     | 6     | 8     | 10    | 12    | 14     | 16      |
|----------|------|-------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|---------|
| SIZE     | mm   | 50    | 65                            | 80    | 100   | 125   | 150   | 200   | 250   | 300   | 350    | 400     |
| II O I O | inch | 14.5  | 16.5                          | 18.5  | 21.5  | 26.5  | 27.75 | 32.75 | 39.0  | 44.5  | 49.5   | 54.5    |
| L1 & L3  | mm   | 368   | 419                           | 470   | 546   | 673   | 705   | 832   | 991   | 1130  | 1257   | 1384    |
| In       | inch | 14.62 | 16.62                         | 18.62 | 21.62 | 26.61 | 28.0  | 33.13 | 39.38 | 45.12 | 50.25  | 55.38   |
| L2       | mm   | 371   | 422                           | 473   | 549   | 676   | 711   | 842   | 1000  | 1146  | 1276   | 1407    |
| TT       | inch | 21.2  | 26.4                          | 29.1  | 30.8  | 43.62 | 47.0  | 60.8  | 66.5  | 82.3  | 85.1   | 97.9    |
| H        | mm   | 539   | 670                           | 738   | 783   | 1108  | 1196  | 1546  | 1688  | 1090  | 2167   | 2486    |
| W        | inch | 11.8  | 11.8                          | 15.7  | 19.7  | 24.8  | 13.8  | 22.0  | 27.9  | 27.9  | 30.0   | 30.0    |
| w        | mm   | 300   | 300                           | 400   | 500   | 630   | 350   | 560   | 710   | 710   | 760    | 760     |
|          | inch | -     | -                             | -     | -     | -     | 13.1  | 16.3  | 18.4  | 18.4  | 21.8   | 21.8    |
| L        | mm   | -     | -                             | -     | -     | -     | 332   | 414   | 468   | 468   | 554    | 554     |
| WEIGHT   | LB   | 181   | 341.8                         | 401   | 573   | 926.1 | 1360  | 3175  | 4412  | 8417  | 9073.6 | 15324.8 |
| WEIGHT   | Kg   | 82    | 155                           | 182   | 260   | 420   | 617   | 1440  | 2001  | 3816  | 4115   | 6950    |



### **GATE VALVES**



#### STEM NUT

The upper portion of the Yoke Sleeve is hexagonally tapered to fix the handwheel. The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over a 1150  $^{\circ}$ C (2100° F) dissolution point in accordance with API Std. Specifications.

#### BONNET

The bonnet is of a steel forging identical to the body to insure high reliability. The bonnet has a perfect body-bonnet seal and both ease of dismantling and reassembly are endured. The bodies and bonnets of the valve are machined by special purpose machines to achieve perfect coaxiality and eliminate any misalignment which may damage the stems.

#### STEM

The machined forged stem comes with a T-shape head, which connects the slot of the wedge. The contacting surface of the head is spherically shaped, thereby giving it greater strength and durability. It is heat treated to give it adequate mechanical properties and surface hardness. Accurate machining and lapping insure minimized friction during opening and shutting.

#### BACK SEAT

All of our valves are provided with positive back seat, and packing replacement can be done with the valve fully open. The conical seat and the guide are integrally stellite faced.

#### SEAT RING

The Stellite 6 surface of the seat ring is integrally applied to the body by means of welding in all valve sizes.

Lapping applied to the seating surface ensures perfect mating with the wedge surfaces.

#### FLEXIBLE WEDGE

The flexible wedge designed to absorb thermally-induced body distortion, thereby making it ideal for high temperature steam or water supply piping. A Stellite 6 layer is applied to the seating surface, and this deposit is subjected to a special heat treatment to secure required hardness and soundness.

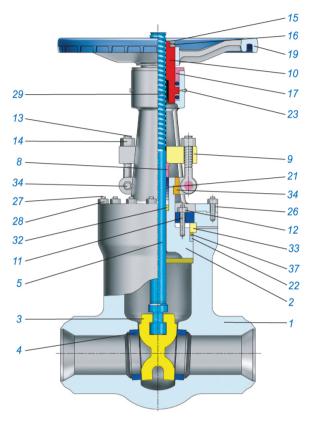
The lapped finish then insures perfect mating with the seats.

#### BODY

The valve body is cylindrically shaped to prevent distortion or undue stress during extreme working conditions. In addition, adequate padding helps to achieve a sound cast structure in critical area. The wall thickness is greater than, or in accordance with API, ANSI and ASME requirements. The contact surfaces ensure that a minimum specific pressure is achieved. The area contacting the pressure seal gasket has a stainless steel 18/8 inlay to eliminate corrosion or wire drawing and to insure easy dismantling at all times. The close tolerances of the inside diameter of this area are attained by accurate machining and honing finish.



### **GATE VALVES**



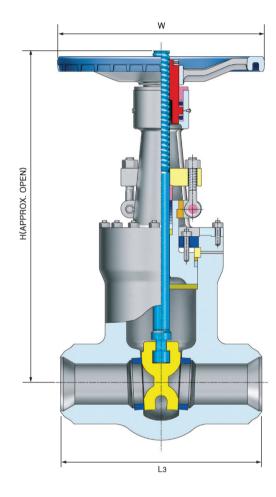


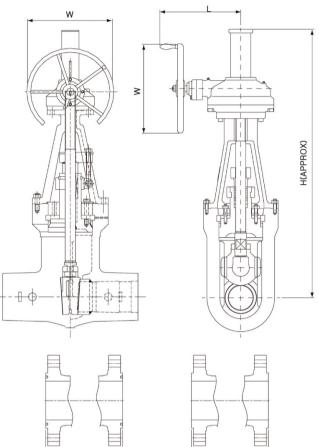
| No. | NAME OF PART  | ASTM SPECIFICATION |
|-----|---------------|--------------------|
| 15  | HANDLE NUT    | STEEL              |
| 16  | SET SCREW     | STEEL              |
| 17  | SLEEVE GLAND  | STEEL              |
| 19  | HANDWHEEL     | A395               |
| 21  | PACKING       | SEE PAGE 44        |
| 22  | GASKET        | SEE PAGE 44        |
| 23  | GREASE NIPPLE | STEEL              |
| 29  | BEARING       | COMMERCIAL         |

| No  | NAME OF DADT   |             |             | ASTM SPEC   | IFICATION   |             |                         | KS SPECIFICATION |
|-----|----------------|-------------|-------------|-------------|-------------|-------------|-------------------------|------------------|
| No. | NAME OF PART   | STANDARD    | H           | IGH TEMPERA | TURE SERVIC | CE          | LOW TEMPERATURE SERVICE | STANDARD         |
| 1   | BODY           | A216-WCB    | A217-WC1    | A217-WC6    | A216-WC9    | A217-C5     | A352-LCB                | A352-LC1/LC2/LC3 |
| 2   | BONNET         | A216-WCB    | A217-WC1    | A217-WC6    | A216-WC9    | A217-C5     | A352-LCB                | A352-LC1/LC2/LC3 |
| 3   | DISC           | A216-WCB+HF | A217-WC1+HF | A217-WC6+HF | A216-WC9+HF | A217-C5+HF  | A352-LCB+304            | A352-LC1/LC2/LC3 |
| 4   | BODY SEAT RING | A105+HF     | A182-F1     | A182-F11    | A182-F22    | A182-F5a    | A182-F304               | A182-F304        |
| 5   | STEM           | A276-410    | A276-410    | A276-410    | A276-410    | A276-410    | A276-304                | A276-304         |
| 8   | PACKING GLAND  | A276-410    | A276-410    | A276-410    | A276-410    | A276-410    | A276-304                | A276-304         |
| 9   | GLAND FLANGE   | A105/A283-D | A105/A283-D | A105/A283-D | A105/A283-D | A105/A283-D | A105/A283-D             | A105/A283-D      |
| 10  | YOKE SLEEVE    | A439-D2     | A439-D2     | A439-D2     | A439-D2     | A439-D2     | A439-D2                 | A439-D2          |
| 11  | BONNET BOLT    | A193-B7     | A193-B7     | A193-B16    | A193-B16    | A193-B16    | A320-L7                 | A320-L7          |
| 12  | BONNET NUT     | A194-2H     | A194-2H     | A194-4      | A194-4      | A194-4      | A194-4                  | A194-4           |
| 13  | GLAND BOLT     | A307-B      | A307-B      | A307-B      | A307-B      | A307-B      | A307-B                  | A307-B           |
| 14  | GLAND NUT      | A307-B      | A307-B      | A307-B      | A307-B      | A307-B      | A307-B                  | A307-B           |
| 26  | YOKE           | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB                | A216-WCB         |
| 27  | YOKE BOLT      | A193-B7     | A193-B7     | A193-B7     | A193-B7     | A193-B7     | A193-B7                 | A193-B7          |
| 28  | YOKE NUT       | A194-2H     | A194-2H     | A194-2H     | A194-2H     | A194-2H     | A194-2H                 | A194-2H          |
| 32  | PACKING WASHER | A276-410    | A276-410    | A276-410    | A276-410    | A276-410    | A276-304                | A276-304         |
| 33  | RETAINER       | A240-304    | A240-304    | A240-304    | A240-304    | A240-304    | A240-304                | A240-304         |
| 34  | HINGE CLAMP    | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB    | A216-WCB                | A216-WCB         |
| 35  | BONNET CLAMP   | A108-1045   | A108-1045   | A108-1045   | A108-1045   | A108-1045   | A108-1045               | A108-1045        |
| 37  | GASKET SPACER  | A276-410    | A276-410    | A276-410    | A276-410    | A276-410    | A276-410                | A276-410         |



### ASME CLASS 600LB





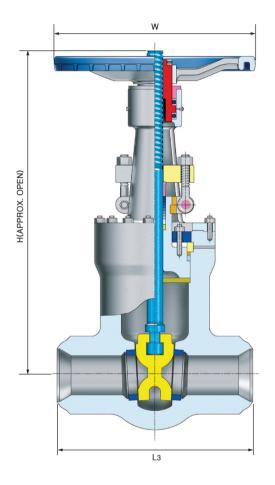
| L       | 2     |
|---------|-------|
| Flanged | d RTJ |

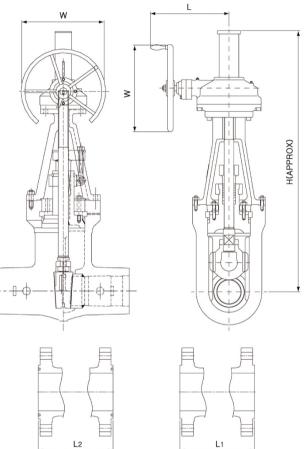
L1 Flanged RF

| VALVE  | inch | 2     | 2 <sup>1</sup> / <sub>2</sub> | 3     | 4     | 6     | 8     | 10    | 12     | 14     | 16     | 18     | 20     | 24     |
|--------|------|-------|-------------------------------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| SIZE   | mm   | 50    | 65                            | 80    | 100   | 150   | 200   | 250   | 300    | 350    | 400    | 450    | 500    | 600    |
| L3     | inch | 7.0   | 8.5                           | 10.0  | 12.0  | 18.0  | 23.1  | 28.0  | 32.0   | 35.0   | 39.0   | 43.0   | 47.0   | 55.0   |
| 113    | mm   | 178   | 216                           | 254   | 305   | 457   | 584   | 711   | 813    | 889    | 991    | 1092   | 1194   | 1397   |
| L2     | inch | 11.62 | 13.12                         | 14.12 | 17.12 | 22.12 | 26.12 | 31.12 | 33.12  | 35.12  | 39.12  | 43.12  | 47.25  | 55.38  |
| 112    | mm   | 295   | 333                           | 359   | 435   | 562   | 664   | 791   | 841    | 892    | 994    | 1095   | 1200   | 1407   |
| Li     | inch | 11.5  | 13.0                          | 14.0  | 17.0  | 22.0  | 26.0  | 31.0  | 33.0   | 35.0   | 39.0   | 43.0   | 47.0   | 55.0   |
| LI     | mm   | 292   | 330                           | 356   | 432   | 559   | 660   | 787   | 838    | 889    | 991    | 1092   | 1194   | 1397   |
| н      | inch | 23.2  | 24.8                          | 26.3  | 36.0  | 42.5  | 49.9  | 59.5  | 70.5   | 73.1   | 85.4   | 88.6   | 97.2   | 118.1  |
| п      | mm   | 590   | 629                           | 667   | 914   | 1080  | 1267  | 1511  | 1791   | 1857   | 2162   | 2251   | 2470   | 3000   |
| w      | inch | 7.9   | 93.8                          | 9.8   | 11.8  | 19.7  | 22.0  | 272.2 | 35.8   | 24.0   | 24.0   | 24.0   | 24.0   | 30.0   |
|        | mm   | 200   | 250                           | 250   | 300   | 500   | 560   | 690   | 610    | 610    | 610    | 610    | 610    | 760    |
| L      | inch | -     | -                             | -     | -     | -     | -     | -     | 17.0   | 17.0   | 20.2   | 20.2   | 20.2   | 21.8   |
|        | mm   | -     | -                             | -     | -     | -     | -     | -     | 432    | 432    | 512    | 512    | 512    | 554    |
| WEIGHT | LB   | 154.4 | 209.5                         | 220.5 | 326.3 | 540.2 | 705.6 | 948.2 | 1135.6 | 1477.4 | 1995.5 | 2535.8 | 3186.2 | 4586.4 |
| WEIGHT | Kg   | 70    | 95                            | 100   | 148   | 245   | 320   | 430   | 515    | 670    | 905    | 1150   | 1445   | 2080   |



### ASME CLASS 900LB





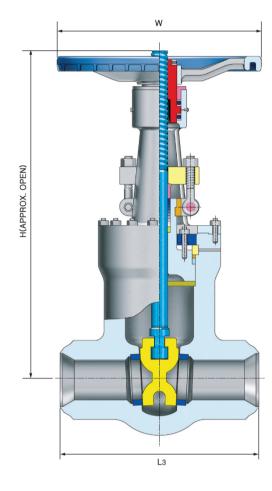
| - |         |    |
|---|---------|----|
|   | Flanged | RF |

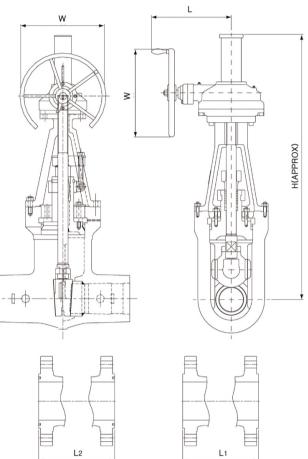
| VALVE  | inch | 2     | 2 <sup>1</sup> / <sub>2</sub> | 3     | 4     | 6     | 8      | 10     | 12     | 14     | 16    | 18     | 20     | 24      |
|--------|------|-------|-------------------------------|-------|-------|-------|--------|--------|--------|--------|-------|--------|--------|---------|
| SIZE   | mm   | 50    | 65                            | 80    | 100   | 150   | 200    | 250    | 300    | 350    | 400   | 450    | 500    | 600     |
| L3     | inch | 8.5   | 10.0                          | 12.0  | 14.0  | 20.0  | 26.0   | 31.0   | 36.0   | 39.0   | 43.0  | 46.5   | 50.5   | 59.5    |
| 15     | mm   | 216   | 254                           | 305   | 356   | 508   | 660    | 787    | 914    | 991    | 1092  | 1181   | 1283   | 1511    |
| L2     | inch | 14.62 | 16.62                         | 15.12 | 18.12 | 24.12 | 29.12  | 33.12  | 38.12  | 40.88  | 44.88 | 48.5   | 52.5   | 61.75   |
| 112    | mm   | 371   | 422                           | 384   | 460   | 613   | 740    | 841    | 968    | 1038   | 1140  | 1232   | 1334   | 1568    |
| LI     | inch | 14.5  | 16.5                          | 15.0  | 18.0  | 24.0  | 29.0   | 33.0   | 38.0   | 40.5   | 44.5  | 48.0   | 52.0   | 61.0    |
| LI     | mm   | 368   | 419                           | 381   | 457   | 610   | 737    | 838    | 965    | 1029   | 1130  | 1219   | 1321   | 1549    |
| п      | inch | 23.4  | 29.6                          | 29.8  | 34.0  | 39.9  | 50.2   | 60.7   | 70.1   | 79.8   | 89.0  | 97.2   | 108.3  | 1276.6  |
| Н      | mm   | 594   | 753                           | 756   | 864   | 1013  | 1276   | 1543   | 1781   | 2026   | 2261  | 2470   | 2750   | 3242    |
| W      | inch | 11.8  | 17.7                          | 17.7  | 19.7  | 220   | 18.1   | 24.0   | 24.0   | 24.0   | 24.0  | 29.9   | 29.9   | 24.0    |
| vv     | mm   | 300   | 450                           | 450   | 500   | 560   | 460    | 610    | 610    | 610    | 610   | 760    | 760    | 610     |
| т      | inch | -     | -                             | -     | -     | -     | 16.8   | 17.0   | 20.0   | 20.2   | 20.2  | 21.8   | 21.8   | 20.1    |
| L      | mm   | -     | -                             | -     | -     | -     | 427    | 432    | 512    | 512    | 512   | 554    | 554    | 512     |
| WEICHT | LB   | 132.3 | 207.3                         | 224.9 | 330.8 | 617.4 | 1455.3 | 2116.8 | 2976.8 | 3748.5 | 5292  | 7320.6 | 9702.0 | 14927.9 |
| WEIGHT | Kg   | 60    | 94                            | 102   | 150   | 280   | 660    | 960    | 1350   | 1700   | 2400  | 3320   | 4400   | 6770    |

Flanged RTJ

**KCL** Valve

### **ASME CLASS 1500LB**





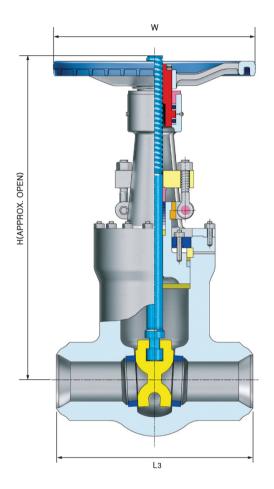
| - |         |     |
|---|---------|-----|
|   | Flanged | RT. |

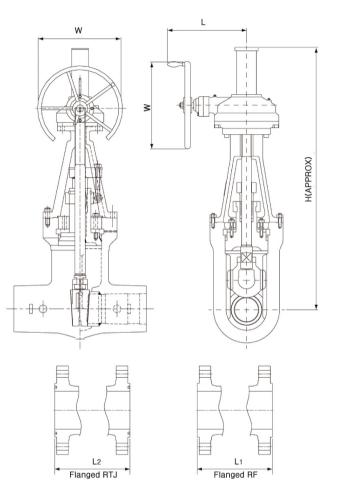
L1 Flanged RF

| VALVE  | inch | 2     | 2 1/2 | 3     | 4     | 6      | 8      | 10     | 12     | 14     | 16    |
|--------|------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|
| SIZE   | mm   | 50    | 65    | 80    | 100   | 150    | 200    | 250    | 300    | 350    | 400   |
| L3     | inch | 8.5   | 10.0  | 12.0  | 16.0  | 22.0   | 28.0   | 34.0   | 39.0   | 42.0   | 47.0  |
|        | mm   | 216   | 254   | 305   | 406   | 559    | 711    | 864    | 991    | 1067   | 1194  |
| L2     | inch | 14.62 | 16.62 | 18.62 | 21.62 | 28.0   | 33.13  | 39.38  | 45.12  | 5025   | 55.38 |
| 112    | mm   | 371   | 422   | 473   | 549   | 711    | 842    | 1000   | 1146   | 1276   | 1407  |
| Li     | inch | 14.5  | 16.5  | 18.5  | 21.5  | 27.75  | 32.75  | 39.0   | 44.5   | 49.5   | 54.5  |
| LI     | mm   | 368   | 419   | 470   | 546   | 705    | 832    | 991    | 1130   | 1257   | 1384  |
| н      | inch | 23.4  | 29.6  | 29.6  | 34.0  | 48.0   | 51.6   | 64.8   | 77.8   | 87.2   | 91.8  |
| п      | mm   | 594   | 753   | 753   | 864   | 1219   | 1311   | 1645   | 1975   | 2216   | 2331  |
| W      | inch | 11.8  | 17.7  | 17.7  | 19.7  | 24.0   | 24.0   | 24.0   | 24.0   | 29.9   | 29.9  |
| "      | mm   | 300   | 450   | 450   | 500   | 610    | 610    | 610    | 610    | 760    | 760   |
| т      | inch | -     | -     | -     | -     | 17.0   | 17.0   | 20.2   | 20.0   | 21.8   | 21.8  |
| L      | mm   | -     | -     | -     | -     | 432    | 432    | 512    | 512    | 554    | 554   |
| WEIGHT | LB   | 132.3 | 207.3 | 264.6 | 458.6 | 1058.4 | 2006.6 | 3109.1 | 4586.4 | 5379.5 | 7933  |
| WEIGHT | Kg   | 60    | 94    | 120   | 208   | 480    | 910    | 1410   | 2080   | 2650   | 3600  |



### ASME CLASS 2500LB





| VALVE  | inch | 2     | 2 <sup>1</sup> / <sub>2</sub> | 3     | 4     | 6     | 8      | 10     | 12     | 14     | 16      | 18      |
|--------|------|-------|-------------------------------|-------|-------|-------|--------|--------|--------|--------|---------|---------|
| SIZE   | mm   | 50    | 65                            | 80    | 100   | 150   | 200    | 250    | 300    | 350    | 400     | 450     |
| L3 -   | inch | 11.0  | 13.0                          | 14.5  | 18.0  | 24.0  | 30.0   | 36.0   | 41.0   | 44.0   | 49.0    | 55.0    |
|        | mm   | 279   | 330                           | 368   | 457   | 610   | 762    | 914    | 1041   | 1118   | 1245    | 1397    |
| L2     | inch | 17.87 | 20.25                         | 23.0  | 26.88 | 36.5  | 40.87  | 50.88  | 56.88  | -      | -       | -       |
| 1.2    | mm   | 454   | 514                           | 584   | 683   | 927   | 1038   | 1292   | 1445   | -      | -       | -       |
| Li     | inch | 17.75 | 20.0                          | 22.75 | 26.5  | 36.0  | 40.25  | 50.0   | 56.0   | -      | -       | -       |
| LI     | mm   | 451   | 508                           | 578   | 673   | 914   | 1022   | 1270   | 1422   | -      | -       | -       |
| н      | inch | 23.4  | 29.6                          | 29.6  | 34.3  | 47.3  | 57.1   | 63.4   | 82.5   | 90.2   | 97.2    | 116.1   |
| п      | mm   | 594   | 753                           | 753   | 870   | 1201  | 1451   | 1610   | 2096   | 2291   | 2470    | 2950    |
| w      | inch | 14.0  | 17.7                          | 19.7  | 23.6  | 24.0  | 24.0   | 24.0   | 29.9   | 29.9   | 24.0    | 24.0    |
| vv     | mm   | 355   | 450                           | 500   | 600   | 610   | 610    | 610    | 760    | 760    | 610     | 610     |
| L      | inch | -     | -                             | -     | -     | 17.0  | 20.2   | 20.2   | 21.8   | 21.8   | 20.2    | 20.2    |
| Ь      | mm   | -     | -                             | -     | -     | 432   | 512    | 512    | 554    | 554    | 512     | 512     |
| WEIGHT | LB   | 172.1 | 273.4                         | 334.1 | 568.4 | 954.1 | 1806.7 | 2943.5 | 4466.0 | 6902.0 | 10353.0 | 11774.0 |
|        | Kg   | 85    | 135                           | 165   | 280   | 470   | 890    | 1450   | 2200   | 3400   | 5100    | 5800    |