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## KCM TECHNOLOGY GROUP

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# MADE IN CHINA FOCUS ON WORLD

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## KCM TECHNOLOGY GROUP

# DREAM TEAM

REASON-BRILLIANT NON-STOP ONE TEAM ONE DREAM

One team.  One dream.



## BRIEF INTRODUCTION



Situated in Yongqiang Hi-tech Park, Longwan District, Wenzhou, a China hometown for valves where is the origin of Chinese private economy, KCM technology group Co., Ltd is an innovative high-tech key enterprise integrating R&D, design, production, sales and service.

Now KCM has five branch companies, has more than 500 staff, involving 3 senior engineers and 2 senior administrator of professional title. And the group has established EPR management system and advanced examination and test center of valve performance, as well as CAD valve design center, 3D analogue design system of manufacture, and introduced some special equipments including direct reading spectrograph, stress test bench, chemical composition analyzer, mechanical performance tester, hardness tester, spectrograph, ultrasonic thickness gage and so on, which forms a first class capacity of production and test of valves to ensure the powerful guarantee for producing high quality valves. In this case, the company has obtained ISO9001, ISO14001, OHSAS18001, CE, TS and so on; and fulfilled the confirmation of standardized good system and metering examination system; and got the self-support right to import and export.

Products in the company cover high, low-pressure valves including flanged end ball valve, gate valve, globe valve, y-strainer, check valve, camlock coupling, pipe fittings, etc., in accordance with domestic and foreign advanced standards like ANSI, API, JIS, BS, DIN, GOST. They are widely used in industries like petroleum, chemicals, nature gas, food industry, power supply, pharmacy, metallurgy, water supply and so on.

Since the establishment of KCM, the products are sold to Europe, USA, and Middle East, Africa and many other countries and regions, and win the trust and praise of domestic and foreign customers. The company meets the needs of vast customers with reasonable price and thorough pre-sale, in-sale, after-sale service abiding by the goal of creating a first-brand brand of KCM. KCM forges ahead with broad minds, and warmly welcome domestic and foreign customers to visit and negotiate business with us. KCM is looking forward to strengthening cooperation with various sectors of society to create brilliancy together.

[www.kcmtech-valve.com](http://www.kcmtech-valve.com)



KCM TECHNOLOGY GROUP CO.,LTD



## MADE IN CHINA FOCUS ON WORLD

We own advanced production equipment and produce high-quality products with international standard. We hope that every product can exert their performances during effective life by our perfect design, manufacture and service.



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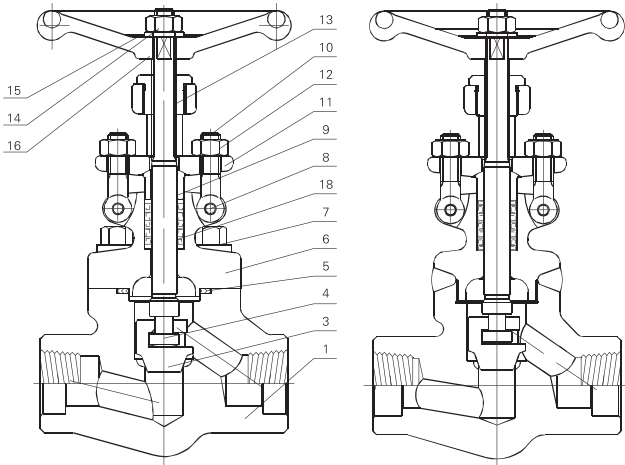
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valves are available in Three bonnet designs. The first design is the Bolted Bonnet, with male–Female joint, spiral wound gasket, made in F304L/graphite, Ring joint gasket are also available on request. The second design is the welded bonnet, with a threaded and seal welded joint. On request a full penetration strength welded joint is available. The third design is the pressure seal bonnet, with a threaded and pressure seal bonnet joint.

Construction is as follows

- ※ Full port or conventional port;
- ※ Outside screw and yoke (OS&Y);
- ※ Two piece self-aligning packing gland;
- ※ Bolted bonnet with spiral-wound gasket, threaded and seal welded bonnet or threaded and pressure seal bonnet;
- ※ Integral backseat;
- ※ Socket weld ends to ASME B16.11;
- ※ Screwed ends(NPT) to ANSI/ASME B1.20.1;
- ※ Disc can change for throttle type、needle type、 ball type and check type.



Application standards

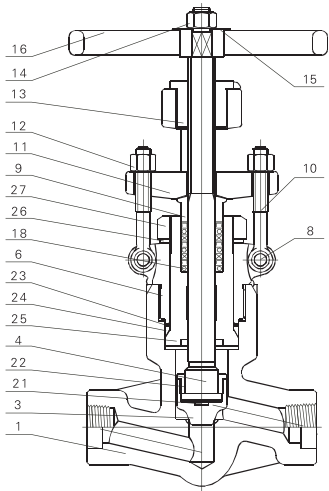
- Design and manufacture conform to BS5352 MSS SP-118;
- Connection ends conform to:
  - Socket welded ends conform to ANSI B16.11;JB/T1751
  - Screw ends conform to ANSI B1.20.1;JB/T7306
  - Butt-welded ends conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to:
  - API 598; GB/T13927; JB/T9092
- Structure features:
  - Bolted bonnet, outside screw and yoke
  - Welded bonnet, outside screw and yoke
- Materials conform to ANSI/ASTM.
- Main materials:
  - A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F51; Monel; 20 Alloy.

Carbon steel temperature–pressure rate

CL150–285 P.S.I @ 100° F  
 CL300–740 P.S.I @ 100° F  
 CL600–1480 P.S.I @ 100° F  
 CL800–1975 P.S.I @ 100° F  
 CL1500–3705 P.S.I @ 100° F

Main part materials list

| NO. | Part name     | A105/F6a               | A105/F6aHFS            | LF2/304                | F11/F6aHF              | F304(L)/304(L)         | F316(L)/316(L)         | F51/ F51               |
|-----|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1   | Body          | A105                   | A105+HF                | LF2                    | F11+HF                 | F304(L)                | F316(L)                | F51                    |
| 3   | Disc          | F6a                    | F6a                    | F304                   | F6aHF                  | F304(L)                | F316(L)                | F51                    |
| 4   | Stem          | 410                    | 410                    | 304                    | 410                    | 304(L)                 | 316(L)                 | F51                    |
| 5   | Gasket        | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 316+ Flexible graphite | 316+ Flexible graphite |
| 6   | Bonnet        | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 7   | Bolt          | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 8   | Pin           | 410                    | 410                    | 410                    | 410                    | 304                    | 304                    | 304                    |
| 9   | Gland         | 410                    | 410                    | 304                    | 410                    | 304                    | 316                    | F51                    |
| 10  | Gland eyebolt | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 11  | Gland flange  | A105                   | A105                   | LF2                    | F11                    | F304                   | F304                   | F304                   |
| 12  | Hex nut       | 2H                     | 2H                     | 2H                     | 2H                     | 8(M)                   | 8(M)                   | 8M                     |
| 13  | Stem nut      | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    |
| 14  | Locking nut   | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     |
| 15  | Nameplate     | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 16  | Handwheel     | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   |
| 18  | Packing       | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               |



### Application standards

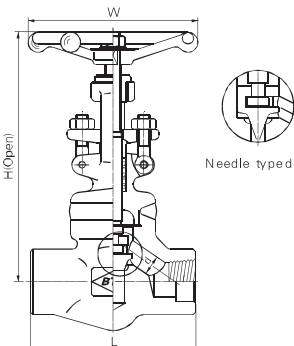
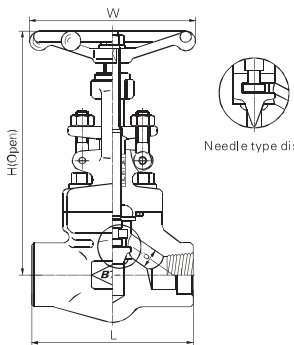
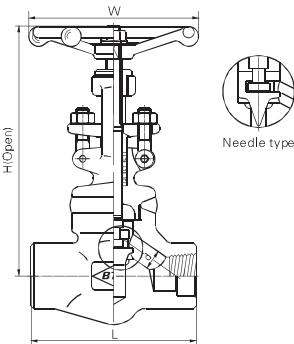
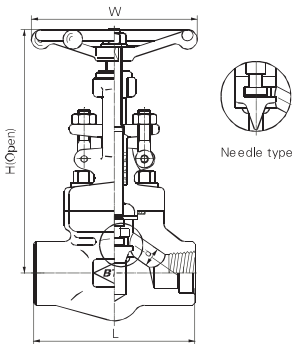
- Design and manufacture conform to BS5352 MSS SP-118;
- Connection ends conform to:
  - Socket welded ends conform to ANSI B16.11;JB/T1751
  - Screw ends conform to ANSI B1.20.1;JB/T7306
  - Butt-welded ends conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to: API 598; GB/T13927; JB/T9092
- Structure features: A threaded and pressure seal bonnet; Y type and T type
- Materials conform to ANSI/ASTM.
- Main materials: A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F91; Monel; 20 Alloy.

### Carbon steel temperature-pressure rate

CL1500-3705 P.S.I @ 100° F  
CL2500-6170 P.S.I @ 100° F

### Main part materials list

| NO. | Part name        | A105/F6a   | A105/F6aHFS | LF2/304    | F11/F6aHF  | F304(L)/304(L)  | F316(L)/316(L)  | F91/410HF  |
|-----|------------------|------------|-------------|------------|------------|-----------------|-----------------|------------|
| 1   | Body             | A105       | A105+HF     | LF2        | F11+HF     | F304(L)         | F316(L)         | F91+HF     |
| 3   | Disc             | 410        | 410         | 304        | 410        | 304(L)          | 316(L)          | 410+HF     |
| 4   | Stem             | 410        | 410         | 304        | 410        | 304(L)          | 316(L)          | 410        |
| 6   | Bonnet           | A105       | A105        | LF2        | F11        | F304(L)         | F316(L)         | F91        |
| 8   | Pin              | 410        | 410         | 410        | 410        | 304             | 304             | 410        |
| 9   | Gland            | 410        | 410         | 304        | 410        | 304             | 316             | 410        |
| 10  | Gland eyebolt    | B7         | B7          | L7         | B16        | B8(M)           | B8(M)           | B8         |
| 11  | Gland flange     | A105       | A105        | LF2        | F11        | F304            | F304            | F91        |
| 12  | Hex nut          | 2H         | 2H          | 2H         | 2H         | 8(M)            | 8(M)            | 8          |
| 13  | Stem nut         | 410        | 410         | 410        | 410        | 410             | 410             | 410        |
| 14  | Locking nut      | 35         | 35          | 35         | 35         | 35              | 35              | 35         |
| 15  | Nameplate        | Aluminum   | Aluminum    | Aluminum   | Aluminum   | Aluminum        | Aluminum        | Aluminum   |
| 16  | Handwheel        | A197       | A197        | A197       | A197       | A197            | A197            | A197       |
| 18  | Packing          | Graphite   | Graphite    | Graphite   | Graphite   | Graphite        | Graphite        | Graphite   |
| 21  | Stem pad         | 420        | 420         | 420        | 420        | 316SH           | 316SH           | 420        |
| 22  | Disc nut         | 410        | 410         | 410        | 410        | 304(L)          | 316(L)          | 410        |
| 23  | Seal ring gasket | 420        | 420         | 304        | 304        | 304(L)          | 316(L)          | 316(L)     |
| 24  | P.S.ring         | 304        | 304         | 304        | 304        | 304             | 316             | 304        |
| 25  | P.S.seat         | 420        | 420         | 304        | 304        | 304(L)          | 316(L)          | F91        |
| 26  | Nut pad          | 410        | 410         | 410        | 410        | 410             | 410             | 410        |
| 27  | Draw-in stud     | Cart steel | Cart steel  | Cart steel | Cart steel | Stainless steel | Stainless steel | Cart steel |



### CL800

Bolted bonnet, full port & reducing port outside screw and yoke(OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS 5352.

| Specification (NPS) | R.P | -   | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|------|------|------|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8  | 1/2  | 3/4  | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 79  | 79   | 92   | 111  | 120   | 152   | 172   | 200   |       |
| Handwheel diameter  | W   | 100 | 100  | 100  | 125  | 160   | 160   | 180   | 200   |       |
| Height              | H   | 164 | 164  | 164  | 203  | 224   | 260   | 300   | 355   |       |
| Flow port dimension | d   | 7   | 9    | 13   | 17.5 | 23    | 30    | 35    | 46    |       |
| Weight(Kg)          |     | 1.9 | 2.28 | 2.37 | 4.3  | 5.75  | 7.8   | 12.5  | 17.5  |       |

### CL800

Welded bonnet, full port & reducing port outside screw and yoke(OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification (NPS) | R.P | -   | 1/2 | 3/4 | 1    | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|-----|-----|------|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8 | 1/2 | 3/4  | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 79  | 79  | 92  | 111  | 120   | 152   | 172   | 200   |       |
| Handwheel diameter  | W   | 100 | 100 | 100 | 125  | 160   | 160   | 180   | 200   |       |
| Height              | H   | 164 | 164 | 164 | 203  | 224   | 260   | 300   | 355   |       |
| Flow port dimension | d   | 7   | 9   | 13  | 17.5 | 23    | 30    | 35    | 46    |       |
| Weight(Kg)          |     | 1.7 | 1.7 | 1.9 | 3.3  | 5.2   | 6.8   | 10.6  | 13.8  |       |

### CL900-CL1500

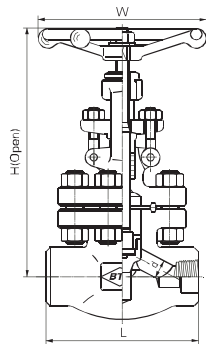
Bolted bonnet, full port&reducing port outside screw and yoke(OS&Y)  
Threaded, butt-welded or socket welded ends; design to BS 5352

| Specification (NPS) | R.P | -   | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8 | 1/2 | 3/4 | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 92  | 111 | 111 | 120 | 152   | 172   | 200   | 220   | -     |
| Handwheel diameter  | W   | 100 | 125 | 125 | 160 | 160   | 180   | 200   | 240   | -     |
| Height              | H   | 171 | 207 | 207 | 240 | 258   | 330   | 355   | 370   | -     |
| Flow port dimension | d   | 7   | 12  | 15  | 20  | 28    | 32    | 40    | 45    | -     |
| Weight(Kg)          |     | 2.3 | 3.7 | 3.6 | 6.8 | 7.6   | 11.6  | 15    | 21.9  | -     |

### CL900-CL1500

Welded bonnet, full port&reducing port outside screw and yoke(OS&Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

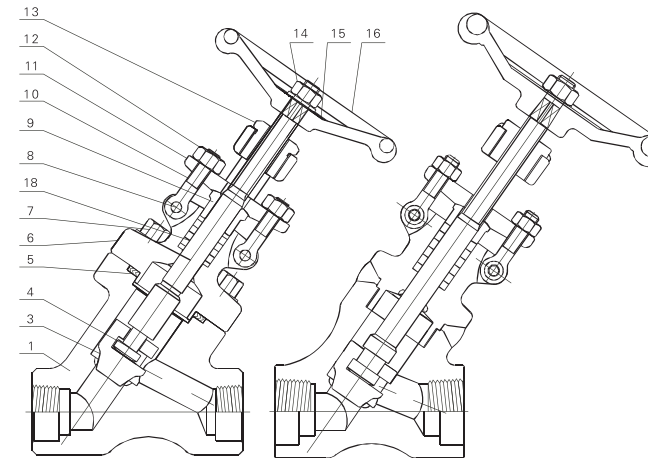
| Specification (NPS) | R.P | -   | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8 | 1/2 | 3/4 | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 92  | 111 | 111 | 120 | 152   | 172   | 200   | 220   | -     |
| Handwheel diameter  | W   | 100 | 125 | 125 | 160 | 160   | 180   | 200   | 240   | -     |
| Height              | H   | 171 | 207 | 207 | 240 | 258   | 330   | 355   | 370   | -     |
| Flow port dimension | d   |     | 12  | 15  | 20  | 28    | 32    | 40    | 45    | -     |
| Weight(Kg)          |     | 270 | 3.4 | 3.3 | 6.0 | 5.6   | 10.3  | 14.2  | 18.0  | -     |



### CL900–CL1500

Bolted bonnet, full port outside screw and yoke (OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification(NPS)  | F.P | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2   | 2 1/2 |
|---------------------|-----|-----|-----|-----|-------|-------|-----|-------|
| Face to face        | L   | 110 | 110 | 150 | 150   |       | 210 | 235   |
| Handwheel diameter  | W   | 110 | 110 | 130 | 210   |       | 180 | 250   |
| Height              | H   | 227 | 227 | 300 | 307   |       | 40  | 448   |
| Flow port dimension | d   | 9   | 12  | 15  | 20    |       | 32  | 40    |
| Weight(Kg)          |     | 5   | 5   | 10  | 11.5  |       | 22  | 37    |

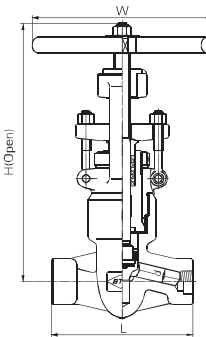


### Application standards

- Design and manufacture conform to BS5352 MSS SP-118;
- Connection ends conform to:
  - Socket welded ends conform to ANSI B16.11;JB/T1751
  - Screw ends conform to ANSI B1.20.1;JB/T7306
  - Butt-welded ends conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to:
  - API 598; GB/T13927; JB/T9092
- Structure features:
  - Bolted bonnet, outside screw and yoke
  - Welded bonnet, outside screw and yoke
- Materials conform to ANSI/ASTM.
- Main materials:
  - A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F51; Monel; 20 Alloy; Hastelloy.

### Carbon steel temperature–pressure rate

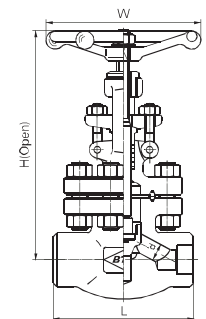
CL150–285 P.S.I @ 100° F  
 CL300–740 P.S.I @ 100° F  
 CL600–1480 P.S.I @ 100° F  
 CL800–1975 P.S.I @ 100° F  
 CL1500–3705 P.S.I @ 100° F



### CL900–CL1500

Pressure seal bonnet, full port outside screw and yoke(OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification(NPS)  | F.P | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2    | 2 1/2 |
|---------------------|-----|------|------|------|-------|-------|------|-------|
| Face to face        | L   | 140  | 140  | 140  | 178   | 178   | 216  |       |
| Handwheel diameter  | W   | 200  | 200  | 200  | 280   | 280   | 300  |       |
| Height              | H   | 320  | 320  | 320  | 440   | 440   | 490  |       |
| Flow port dimension | d   | 12   | 15   | 20   | 28    | 32    | 40   |       |
| Weight(Kg)          |     | 11.5 | 10.8 | 10.5 | 19.6  | 21.1  | 55.4 |       |



Welded bonnet

### CL2500

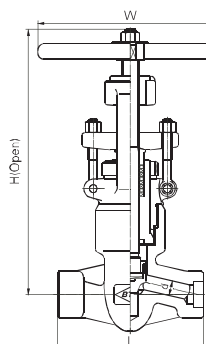
Bolted bonnet, full port outside screw and yoke (OS & Y)  
Socket welded ends, design conform to ASME B16.34

| Specification(NPS)  | F.P | 1/2 | 3/4  | 1    | 1 1/4 | 1 1/2 | 2   | 2 1/2 |
|---------------------|-----|-----|------|------|-------|-------|-----|-------|
| Face to face        | L   | 150 | 150  | 210  |       | 235   | 235 |       |
| Handwheel diameter  | W   | 130 | 130  | 250  |       | 300   | 300 |       |
| Height              | H   | 293 | 300  | 390  |       | 435   | 435 |       |
| Flow port dimension | d   | 11  | 14   | 19   |       | 28    | 35  |       |
| Weight(Kg)          |     | 10  | 10.3 | 22.4 |       | 38    | 38  |       |

### CL2500

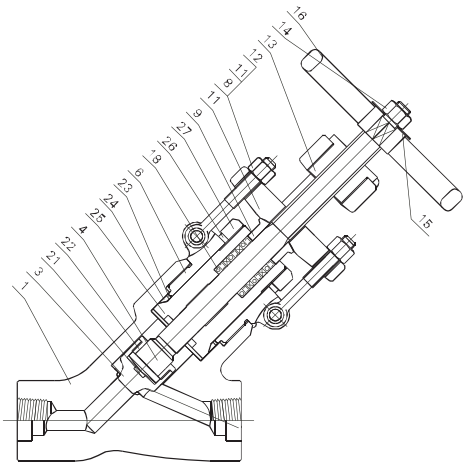
Pressure seal bonnet, full port outside screw and yoke(OS & Y)  
Socket welded ends, design conform to ASME B16.34

| Specification(NPS)  | F.P | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2   | 2 1/2 |
|---------------------|-----|------|------|------|-------|-------|-----|-------|
| Face to face        | L   | 186  | 186  | 186  | 232   | 232   | 279 |       |
| Handwheel diameter  | W   | 200  | 200  | 200  | 280   | 280   | 300 |       |
| Height              | H   | 375  | 378  | 380  | 490   | 490   | 540 |       |
| Flow port dimension | d   | 11   | 14   | 19   | 25    | 28    | 35  |       |
| Weight(Kg)          |     | 12.3 | 11.6 | 10.8 | 26.0  | 28.4  | 60  |       |



### Main part materials list

| NO. | Part name     | A105/F6a               | A105/F6aHFS            | LF2/304                | F11/F6aHF              | F304(L)/304(L)         | F316(L)/316(L)         | F51/F51                |
|-----|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1   | Body          | A105                   | A105+HF                | LF2                    | F11+HF                 | F304(L)                | F316(L)                | F51                    |
| 3   | Disc          | F6a                    | F6a                    | F304                   | F6aHF                  | F304(L)                | F316(L)                | F51                    |
| 4   | Stem          | 410                    | 410                    | 304                    | 410                    | 304(L)                 | 316(L)                 | F51                    |
| 5   | Gasket        | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 316+ Flexible graphite | 316+ Flexible graphite |
| 6   | Bonnet        | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 7   | Bolt          | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 8   | Pin           | 410                    | 410                    | 410                    | 410                    | 304                    | 304                    | 304                    |
| 9   | Gland         | 410                    | 410                    | 304                    | 410                    | 304                    | 316                    | F51                    |
| 10  | Gland eyebolt | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 11  | Gland flange  | A105                   | A105                   | LF2                    | F11                    | F304                   | F304                   | F304                   |
| 12  | Hex nut       | 2H                     | 2H                     | 2H                     | 2H                     | 8(M)                   | 8(M)                   | 8M                     |
| 13  | Stem nut      | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    |
| 14  | Locking nut   | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     |
| 15  | Nameplate     | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 16  | Handwheel     | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   |
| 18  | Packing       | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               |



### Application standards

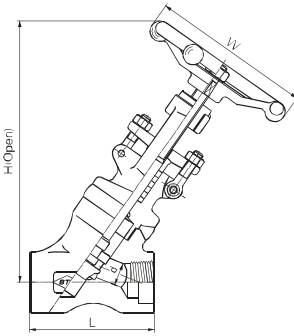
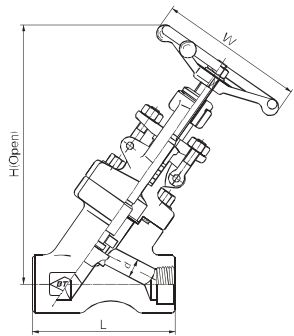
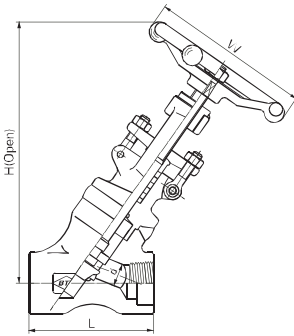
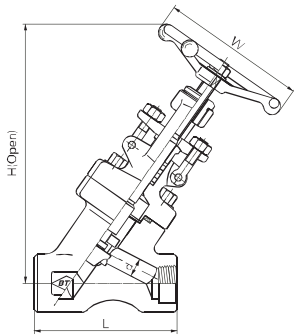
- Design and manufacture conform to BS5352 MSS SP-118;
- Connection ends conform to:
  - Socket welded ends conform to ANSI B16.11;JB/T1751
  - Screw ends conform to ANSI B1.20.1;JB/T7306
  - Butt-welded ends conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to:
  - API 598; GB/T13927; JB/T9092
- Structure features:
  - A threaded and pressure seal bonnet; Y type and T type
- Materials conform to ANSI/ASTM.
- Main materials:
  - A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F51; Monel; 20 Alloy; Hastelloy.

### Carbon steel temperature-pressure rate

CL1500-3705 P.S.I @ 100° F  
CL2500-6170 P.S.I @ 100° F

### Main part materials list

| NO. | Part name        | A105/F6a   | A105/F6aHFS | LF2/304    | F11/F6aHF  | F304(L)/304(L)  | F316(L)/316(L)  | F91/410HF  |
|-----|------------------|------------|-------------|------------|------------|-----------------|-----------------|------------|
| 1   | Body             | A105       | A105+HF     | LF2        | F11+HF     | F304(L)         | F316(L)         | F91+HF     |
| 3   | Disc             | 410        | 410         | 304        | 410        | 304(L)          | 316(L)          | 410+HF     |
| 4   | Stem             | 410        | 410         | 304        | 410        | 304(L)          | 316(L)          | 410        |
| 6   | Bonnet           | A105       | A105        | LF2        | F11        | F304(L)         | F316(L)         | F91        |
| 8   | Pin              | 410        | 410         | 410        | 410        | 304             | 304             | 410        |
| 9   | Gland            | 410        | 410         | 304        | 410        | 304             | 316             | 410        |
| 10  | Gland eyebolt    | B7         | B7          | L7         | B16        | B8(M)           | B8(M)           | B8         |
| 11  | Gland flange     | A105       | A105        | LF2        | F11        | F304            | F304            | F91        |
| 12  | Hex nut          | 2H         | 2H          | 2H         | 2H         | 8(M)            | 8(M)            | 8          |
| 13  | Stem nut         | 410        | 410         | 410        | 410        | 410             | 410             | 410        |
| 14  | Locking nut      | 35         | 35          | 35         | 35         | 35              | 35              | 35         |
| 15  | Nameplate        | Aluminum   | Aluminum    | Aluminum   | Aluminum   | Aluminum        | Aluminum        | Aluminum   |
| 16  | Handwheel        | A197       | A197        | A197       | A197       | A197            | A197            | A197       |
| 18  | Packing          | Graphite   | Graphite    | Graphite   | Graphite   | Graphite        | Graphite        | Graphite   |
| 21  | Stem pad         | 420        | 420         | 420        | 420        | 316SH           | 316SH           | 420        |
| 22  | Disc nut         | 410        | 410         | 410        | 410        | 304(L)          | 316(L)          | 410        |
| 23  | Seal ring gasket | 420        | 420         | 304        | 304        | 304(L)          | 316(L)          | 316(L)     |
| 24  | P.S.ring         | 304        | 304         | 304        | 304        | 304             | 316             | 304        |
| 25  | P.S.seat         | 420        | 420         | 304        | 304        | 304(L)          | 316(L)          | F91        |
| 26  | Nut pad          | 410        | 410         | 410        | 410        | 410             | 410             | 410        |
| 27  | Draw-in stud     | Cart steel | Cart steel  | Cart steel | Cart steel | Stainless steel | Stainless steel | Cart steel |



### CL800

Welded bonnet, full port & reducing port outside screw and yoke(OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification (NPS)      | R.P | -   | 1/2 | 3/4 | 1    | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|--------------------------|-----|-----|-----|-----|------|-------|-------|-------|-------|-------|
|                          | F.P | 1/4 | 3/8 | 1/2 | 3/4  | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face             | L   | 98  | 98  | 98  | 111  | 140   | 140   | 155   | 170   |       |
| Handwheel diameter       | W   | 100 | 100 | 100 | 125  | 160   | 160   | 180   | 200   |       |
| Height                   | H   | 180 | 180 | 180 | 188  | 280   | 280   | 295   | 350   |       |
| Height(angle dinmension) | d   | 7   | 9   | 13  | 17.5 | 23    | 30    | 35    | 46    |       |
| Weight(Kg)               |     | 2.6 | 2.6 | 3.8 | 4.6  | 9.3   | 9.3   | 14    | 19.6  |       |

### CL800

Welded bonnet, full port & reducing port outside screw and yoke(OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification (NPS)      | R.P | -   | 1/2 | 3/4 | 1    | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|--------------------------|-----|-----|-----|-----|------|-------|-------|-------|-------|-------|
|                          | F.P | 1/4 | 3/8 | 1/2 | 3/4  | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face             | L   | 79  | 79  | 92  | 100  | 140   | 140   | 155   | 170   |       |
| Handwheel diameter       | W   | 100 | 100 | 100 | 125  | 160   | 160   | 180   | 200   |       |
| Height                   | H   | 198 | 198 | 198 | 207  | 280   | 280   | 295   | 350   |       |
| Height(angle dinmension) | d   | 7   | 9   | 13  | 17.5 | 23    | 30    | 35    | 46    |       |
| Weight(Kg)               |     | 1.8 | 1.8 | 2.0 | 3.5  | 8.0   | 8.0   | 12    | 19.5  |       |

### CL900-CL1500

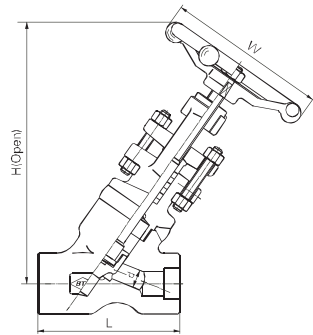
Bolted bonnet, full port & outside screw and yoke (OS & Y)  
Threaded,butt-welded or socket welded ends;design to BS5352

| Specification(NPS)       | F.P | 3/8 | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2    | 2 1/2 |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|------|-------|
| Face to face             | L   | 98  | 111 | 111 | 140 | 140   | 155   | 170  |       |
| Handwheel diameter       | W   | 100 | 125 | 125 | 160 | 160   | 180   | 200  |       |
| Height                   | H   | 175 | 175 | 215 | 215 | 254   | 305   | 305  |       |
| Height(angle dinmension) | d   | 9   | 12  | 15  | 20  | 28    | 32    | 40   |       |
| Weight(Kg)               |     | 2.6 | 4.6 | 4.6 | 9.3 | 9.3   | 14    | 19.6 |       |

### CL900-CL1500

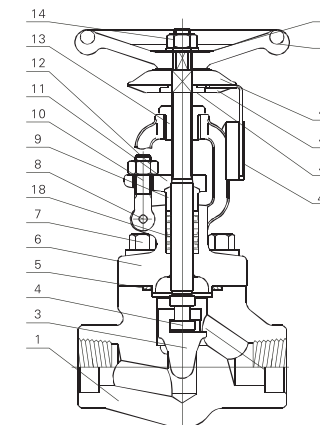
Welded bonnet, full port & outside screw and yoke (OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification(NPS)       | F.P | 3/8 | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2   | 2 1/2 |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-----|-------|
| Face to face             | L   | 92  | 100 | 100 | 140 | 140   | 155   | 170 |       |
| Handwheel diameter       | W   | 100 | 125 | 125 | 160 | 160   | 180   | 200 |       |
| Height                   | H   | 175 | 207 | 207 | 280 | 280   | 295   | 350 |       |
| Height(angle dinmension) | d   | 9   | 12  | 15  | 20  | 28    | 32    | 40  |       |
| Weight(Kg)               |     | 1.8 | 3.5 | 3.5 | 8.0 | 8.0   | 12    | 16  |       |



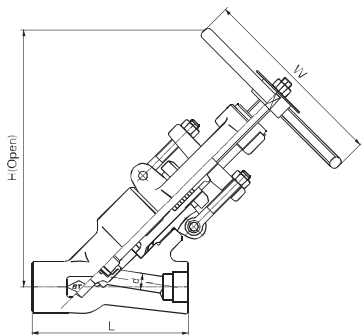
**CL2500** Welded bonnet, full port outside screw and yoke(OS & Y)  
Socket welded, design conform to ASME16.34

| Specification(NPS)      | F.P | 3/8  | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2    |
|-------------------------|-----|------|------|------|------|-------|-------|------|
| Face to face            | L   | 186  | 186  | 186  | 186  | 232   | 232   | 310  |
| Handwheel diameter      | W   | 200  | 200  | 20   | 200  | 280   | 280   | 300  |
| Height                  | H   | 329  | 329  | 329  | 329  | 350   | 350   | 383  |
| Height(angle dimension) | d   | 9    | 11   | 14   | 19   | 25    | 28    | 35   |
| Weight(Kg)              |     | 12.3 | 12.3 | 11.6 | 10.8 | 28.0  | 26.4  | 43.8 |



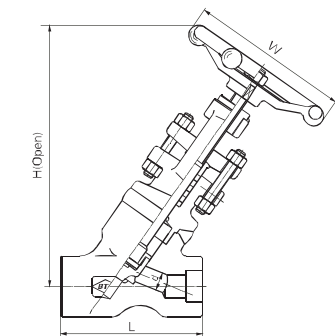
### Application standards

- Design and manufacture conform to BS5352 MSS SP-118;
- Connection ends conform to:
  - Socket welded ends conform to ANSI B16.11;JB/T1751
  - Screw ends conform to ANSI B1.20.1;JB/T7306
  - Butt-welded ends conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to:
  - API 598; GB/T13927; JB/T9092
- Structure features:
  - Bolted bonnet, outside screw and yoke
  - Welded bonnet, outside screw and yoke
  - Disc is one piece or "V" type double or four pieces.
- Materials conform to ANSI/ASTM.
- Main materials:
  - A105; LF2; F5; 304(L); 316(L); F347; F321;
  - F51; Monel; 20 Alloy.



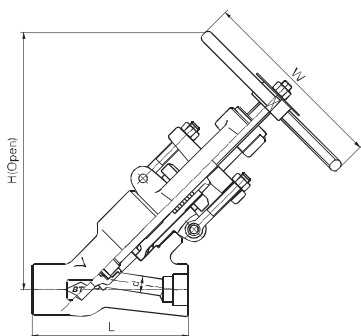
**CL2500** Pressure seal bonnet, full port outside screw and yoke(OS & Y)  
Socket welded, design conform to ASME16.34

| Specification(NPS)      | F.P | 3/8  | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2    |
|-------------------------|-----|------|------|------|------|-------|-------|------|
| Face to face            | L   | 186  | 186  | 186  | 186  | 232   | 232   | 310  |
| Handwheel diameter      | W   | 200  | 200  | 20   | 200  | 280   | 280   | 300  |
| Height                  | H   | 333  | 333  | 333  | 333  | 406   | 406   | 524  |
| Height(angle dimension) | d   | 9    | 11   | 14   | 19   | 25    | 28    | 35   |
| Weight(Kg)              |     | 12.3 | 12.3 | 11.6 | 10.8 | 28.0  | 26.4  | 43.8 |



**CL4500** Welded seal bonnet, full port outside screw and yoke(OS & Y)  
Socket welded, design conform to ASME16.34

| Specification(NPS)      | F.P | 3/8 | 1/2 | 3/4 | 1    | 1 1/4 | 1 1/2 | 2   |
|-------------------------|-----|-----|-----|-----|------|-------|-------|-----|
| Face to face            | L   | 155 | 155 | 155 | 155  |       | 225   | 225 |
| Handwheel diameter      | W   | 180 | 180 | 180 | 180  |       | 400   | 400 |
| Height                  | H   | 350 | 350 | 350 | 380  |       | 453   | 453 |
| Height(angle dimension) | d   | 9   | 11  | 11  | 15   |       | 26    | 28  |
| Weight(Kg)              |     | 9.6 | 9.6 | 9.4 | 10.5 |       | 34    | 36  |



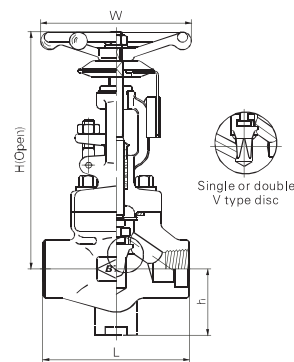
**CL4500** Pressure seal bonnet, full port outside screw and yoke(OS & Y)  
Socket welded, design conform to ASME16.34

| Specification(NPS)      | F.P | 3/8 | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2   |
|-------------------------|-----|-----|-----|-----|-----|-------|-------|-----|
| Face to face            | L   | 200 | 200 | 200 | 200 | 250   | 250   | 330 |
| Handwheel diameter      | W   | 280 | 280 | 280 | 280 | 300   | 300   | 320 |
| Height                  | H   | 400 | 400 | 400 | 400 | 460   | 460   | 540 |
| Height(angle dimension) | d   | 9   | 11  | 11  | 15  | 20    | 26    | 28  |
| Weight(Kg)              |     | 30  | 30  | 30  | 30  | 30    | 36    | 58  |

BTL regulating valves is compose of combination valves and flow control staff guage. because equip with micrometer graduation and finger, whenoperator turn hand wheel around, finger would move ten percent. BTL regulating valves equip with regulating disc to ensure flow,so it can accuracy control. Seal facing of BTL regulating valves is stellite deposit, so seal facing is more corrosion resistant, anti-abrasive and abrasion resistance. BTL regulating valves is manual operate, liner fow regulating function, abrasion resistance. If you want to equip with locking device,please note you BTL requirement.

### Main part materials list

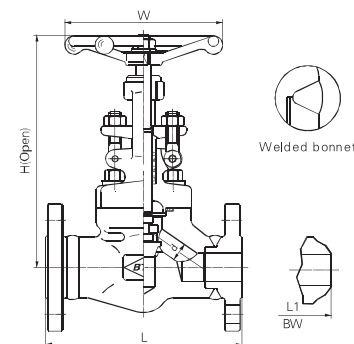
| NO. | Part name       | A105/F6a               | A105/Fa6HFS            | LF2/304                | F11/F6aHF              | F304(L)/304(L)         | F316(L)/316(L)         | F51/F51                |
|-----|-----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1   | Body            | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 3   | Disc            | F6a                    | F6a                    | F304                   | F6aHF                  | F304(L)                | F316(L)                | F51                    |
| 4   | Stem            | 410                    | 410                    | 304                    | 410                    | 304(L)                 | 316(L)                 | F51                    |
| 5   | gasket          | 304+ flexible graphite | 304+ flexible graphite | 304+ flexible graphite | 304+ flexible graphite | 304+ flexible graphite | 316+ flexible graphite | 316+ flexible graphite |
| 6   | Bonnet          | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 7   | Bolt            | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 8   | Pin             | 410                    | 410                    | 410                    | 410                    | 304                    | 304                    | 304                    |
| 9   | Gland           | 410                    | 410                    | 304                    | 410                    | 304                    | 316                    | F51                    |
| 10  | Gland eyebolt   | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 11  | Gland flange    | A105                   | A105                   | LF2                    | F11                    | F304                   | F304                   | F304                   |
| 12  | Hex nut         | 2H                     | 2H                     | 2H                     | 2H                     | 8(M)                   | 8(M)                   | 8M                     |
| 13  | Stem nut        | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    |
| 14  | Locking nut     | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     |
| 15  | Nameplate       | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 16  | Handwheel       | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   |
| 18  | Packing         | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               |
| 41  | Index plate     | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             |
| 42  | Lower plate     | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             |
| 43  | Back block      | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             |
| 44  | Indicative stem | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             | Cast steel             |



### CL800

Bolted bonnet, full port outside screw and yoke (OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

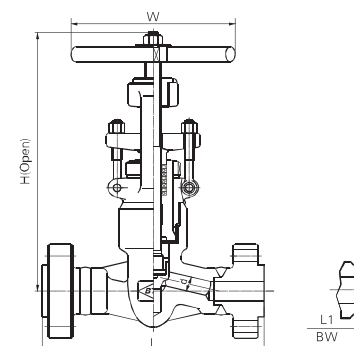
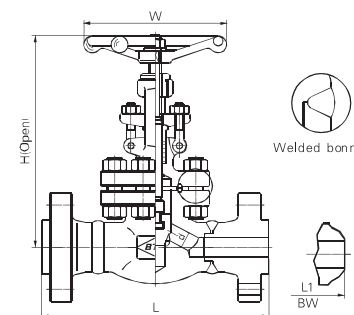
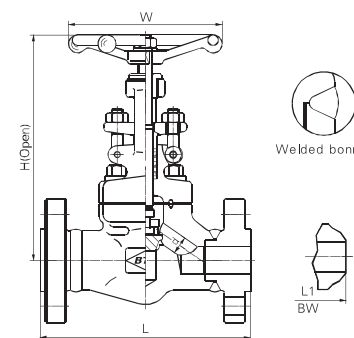
| Specification(NPS)       | F.P            | 1/4 | 3/8 | 1/2 | 3/4  | 1    | 1 1/4 | 1 1/2 | 2    |
|--------------------------|----------------|-----|-----|-----|------|------|-------|-------|------|
| Face to face             | L              | 79  | 79  | 92  | 111  | 120  | 152   | 172   | 200  |
| Handwheel diameter       | W              | 100 | 100 | 100 | 125  | 160  | 160   | 180   | 200  |
| Height                   | H              | 166 | 166 | 171 | 207  | 240  | 258   | 330   | 355  |
| Height (angle dimension) | SW & NPT(Rc)   | 40  | 40  | 40  | 45   | 50   | 55    | 60    | 70   |
| Flow port dimension      | d              | 7.0 | 9.0 | 13  | 17.5 | 23   | 30    | 35    | 46   |
| Weight(Kg)               |                | 1.9 | 2.3 | 2.4 | 4.35 | 5.25 | 7.8   | 12.5  | 14.6 |
| Flow coefficient Cv      | Single disc    | 0.2 | 0.5 | 0.5 | 1.0  | 2.0  | 5.2   | 5.2   | 7.0  |
|                          | Four part disc | 0.4 | 1.0 | 1.0 | 2.0  | 4.0  | 10.4  | 10.4  | 14   |



### CL150-300-600

Bolted bonnet, reducing port outside screw and yoke (OS & Y)  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification(NPS)       | R.P             | 1/4   | 3/8   | 1/2   | 3/4   | 1     | 1 1/4 | 1 1/2 | 2     |
|--------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Face to face             | L(RF)<br>L1(BW) | CL150 | CL300 | CL600 | CL150 | CL300 | CL600 | CL150 | CL300 |
| Handwheel diameter       | W               | 100   | 100   | 125   | 160   | 160   | 180   | 200   | 200   |
| Height                   | H               | 164   | 200   | 220   | 295   | 350   |       |       |       |
| Height (angle dimension) | SW & NPT(Rc)    | 40    | 45    | 50    | 60    | 70    |       |       |       |
| Flow port dimension      | d               | 9.0   | 13    | 17.5  | 30    | 35    |       |       |       |
| Weight(Kg)               | CL150           | 3.45  | 4.0   | 6.19  | 10.5  | 17    |       |       |       |
|                          | CL300           | 3.8   | 5.1   | 7.2   | 13.5  | 19.7  |       |       |       |
|                          | CL600           | 5.6   | 7.8   | 12.5  | 23.5  | 38.8  |       |       |       |
| Flow coefficient Cv      | Single disc     | 0.5   | 1.0   | 2.0   | 5.2   | 7.0   |       |       |       |
|                          | Four part disc  | 1.0   | 2.0   | 4.0   | 10.4  | 14    |       |       |       |



### CL150-300-600

Welded bonnet, reducing port outside screw and yoke(OS & Y)  
Flange or butt-welding design to BS5352

| Specification(NPS)      | R.P             | 1/4   | 3/8   | 1/2   | 3/4   | 1     | 1 1/4 | 1 1/2 | 2     |
|-------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Face to face            | L(RF)<br>L1(BW) | CL150 | CL300 | CL600 | CL150 | CL300 | CL600 | CL150 | CL300 |
| Handwheel diameter      | W               | 100   | 100   | 125   | 160   | 160   | 180   | 200   | 200   |
| Height                  | H               | 180   | 184   | 217   | 224   | 260   | 300   |       |       |
| Height(angle dimension) | d               | 9     | 13    | 17.5  | 23    | 30    | 35    |       |       |
| Weight(Kg)              | CL150           | 3.45  | 4.00  | 6.19  | 9.6   | 10.5  | 17    |       |       |
|                         | CL300           | 2.3   | 3.6   | 7.8   | 8.2   | 12.0  | 15.0  |       |       |
|                         | CL600           | 5.6   | 7.8   | 12.5  | 17    | 23.5  | 38.8  |       |       |

If you want to order one piece body, please contract with sale department

### CL900-CL1500

Welded bonnet, full port outside screw and yoke(OS & Y)  
Flange or butt-welding design to BS5352

| Specification(NPS)      | F.P                    | 1/4 | 3/8  | 1/2  | 3/4 | 1    | 1 1/4 | 1 1/2 | 2 |
|-------------------------|------------------------|-----|------|------|-----|------|-------|-------|---|
| Face to face            | L(RF),L1(BW)<br>L(RTJ) | 216 | 229  | 254  | 279 | 305  | 368   |       |   |
| Handwheel diameter      | W                      | 125 | 125  | 160  | 160 | 180  | 200   |       |   |
| Height                  | H                      | 207 | 207  | 230  | 160 | 300  | 355   |       |   |
| Height(angle dimension) | d                      | 12  | 15   | 20   | 28  | 32   | 40    |       |   |
| Weight (Kg)             |                        | 11  | 13.2 | 17.4 | 19  | 24.5 | 31    |       |   |

If you want to order one piece body, please contract with sale department

### CL2500

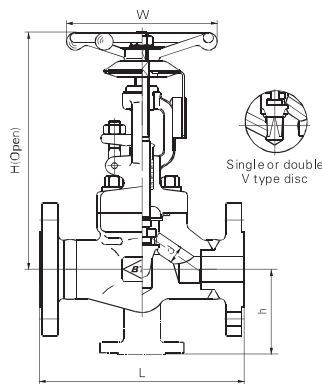
Welding flange or butt-welded design conform to ASME B16.34

| Specification(NPS)      | F.P                    | 1/4  | 3/8  | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2 |
|-------------------------|------------------------|------|------|-----|-----|-----|-------|-------|---|
| Face to face            | L(RF),L1(BW)<br>L(RTJ) | 264  | 273  | 308 | 349 | 384 | 451   |       |   |
| Handwheel diameter      | W                      | 125  | 160  | 200 | 280 | 280 | 300   |       |   |
| Height                  | H                      | 207  | 240  | 258 | 355 | 300 |       |       |   |
| Height(angle dimension) | d                      | 11   | 14   | 19  | 25  | 28  | 35    |       |   |
| Weight (Kg)             |                        | 19.5 | 21.5 | 42  | 65  | 95  |       |       |   |

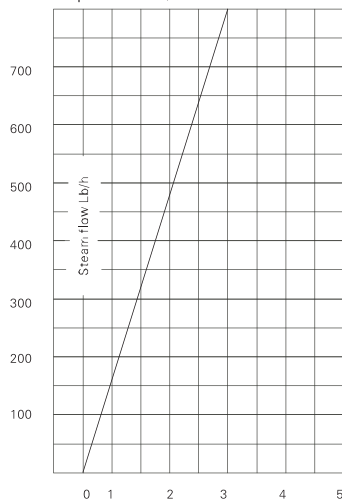
### CL2500

Pressure seal bonnet, full port outside screw and yoke(OS & Y)  
Welding flange or butt-welded design conform to ASME B16.34

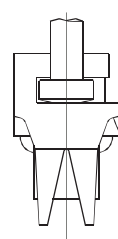
| Specification(NPS)      | F.P                    | 1/4  | 3/8  | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2 |
|-------------------------|------------------------|------|------|------|------|------|-------|-------|---|
| Face to face            | L(RF),L1(BW)<br>L(RTJ) | 264  | 273  | 308  | 349  | 384  | 451   |       |   |
| Handwheel diameter      | W                      | 125  | 160  | 200  | 280  | 280  | 300   |       |   |
| Height                  | H                      | 207  | 240  | 258  | 355  | 300  |       |       |   |
| Height(angle dimension) | d                      | 11   | 14   | 19   | 25   | 28   | 35    |       |   |
| Weight(Kg)              |                        | 21.5 | 24.7 | 30.4 | 48.1 | 58.1 | 130   |       |   |



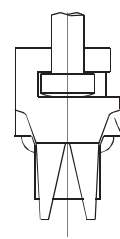
Typical stream flow chart(from experiment)



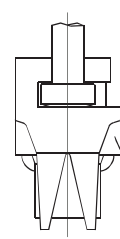
### Regulating valves operation



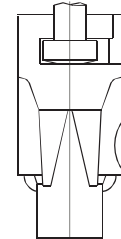
When valves full closed, disc and seat could be shut tightly.



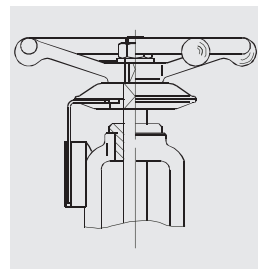
When the disc is opened a little it allows media to flow acc.to a known quota.



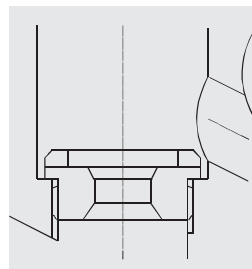
When the disc in the middle of the full lifting height,medium flow can to be reduced or increased according to control scale.



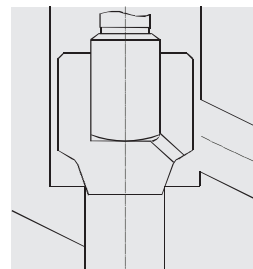
When disc in full open position, valves permit max flow to go through its port, medium flow can be reduced or acc. To control scale.



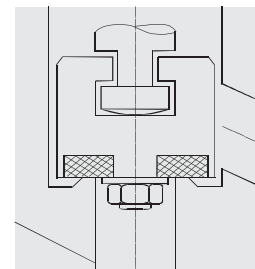
Position indicator



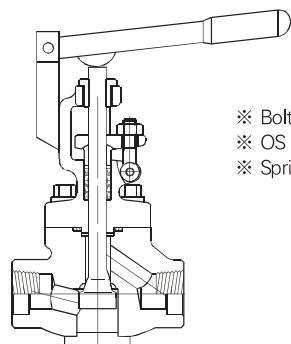
Renewable seat



Globe check valve disc



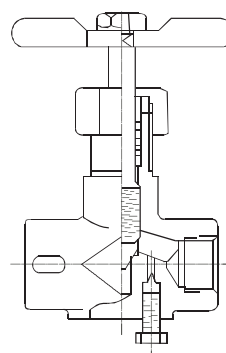
Insert PTFE seat



- ※ Bolted
- ※ OS & Y
- ※ Spring operation

#### Manual-automatic shut-off valves

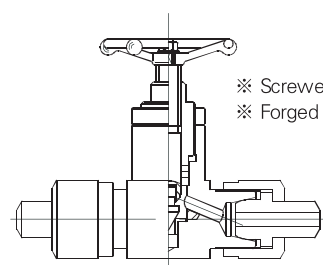
| CLASS                  | Materials                                      |
|------------------------|------------------------------------------------|
| 800                    | Carbon Steel<br>Alloy Steel<br>Stainless steel |
| 1500                   |                                                |
| Flange and butt-welded |                                                |



- ※ Screwed bonnet
- ※ Forged structure

#### Instrument valves

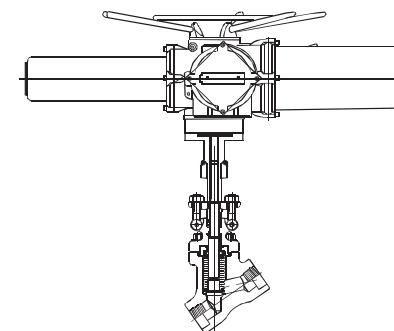
| CLASS | Materials                       |
|-------|---------------------------------|
| 3000  | Carbon steel<br>Stainless steel |
| 6000  |                                 |



- ※ Screwed bonnet
- ※ Forged structure

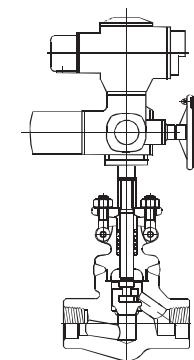
#### Needle valves

| CLASS | Materials                       |
|-------|---------------------------------|
| 800   | Carbon steel<br>Stainless steel |
| 1500  |                                 |



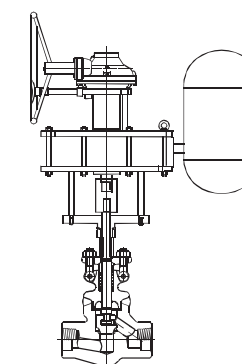
#### Electric actuator

| CLASS    | Materials                      |
|----------|--------------------------------|
| 150~2500 | Cart steel,<br>Stainless steel |



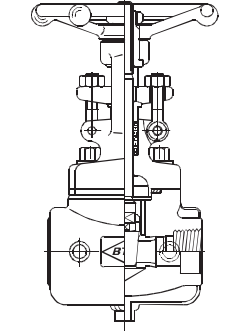
#### Electric actuator

| CLASS    | Materials                       |
|----------|---------------------------------|
| 150~2500 | Carbon steel<br>Stainless steel |



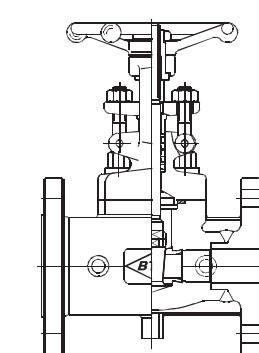
#### Pneumatic actuator

| CLASS    | Materials                       |
|----------|---------------------------------|
| 150~2500 | Carbon steel<br>Stainless steel |



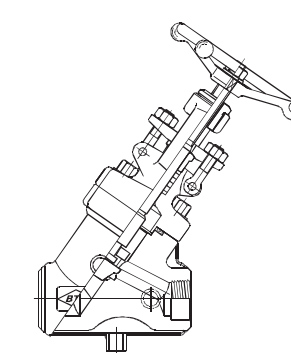
#### Jacketed valves (socket welding/screw/butt-welding)

| CLASS    | Materials                      |
|----------|--------------------------------|
| 150~2500 | Cart steel,<br>Stainless steel |



#### Jacketed valves(flange)

| CLASS    | Materials                       |
|----------|---------------------------------|
| 150~2500 | Carbon steel<br>Stainless steel |



#### Y type jacketed valves(socket welding/screw/butt-welding/flange)

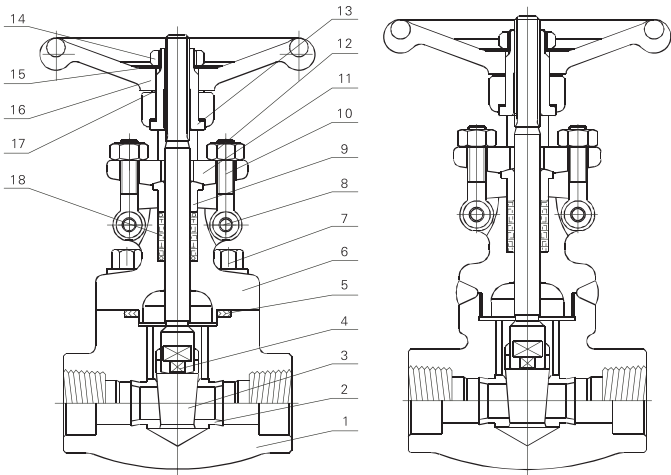
| CLASS    | Materials                       |
|----------|---------------------------------|
| 150~2500 | Carbon steel<br>Stainless steel |



valves are available in three bonnet designs. The first design is the Bolted Bonnet, with male–female joint, spiral wound gasket, made in F304L/graphite. Ring joint gasket are also available on request. The second design is the welded bonnet, with a threaded and seal welded joint. On request a full penetration strength welded joint is available, The third design is the pressure seal bonnet, with a threaded and pressure seal bonnet joint.

Construction is as follows

- ※ Full port or conventional port;
- ※ Outside screw and yoke (OS & Y);
- ※ Two piece self-aligning packing gland;
- ※ Bolted bonnet & spiral wound gasket seal bonnet;
- ※ Bolted bonnet with spiral-wound gasket,threaded and seal welded bonnet or threaded and pressure seal bonnet;
- ※ Integral backseat;
- ※ Socket weld ends to ASME B16.11;
- ※ Screwed ends (NPT) to ANSI/ASME B1.20.1.



Application standards

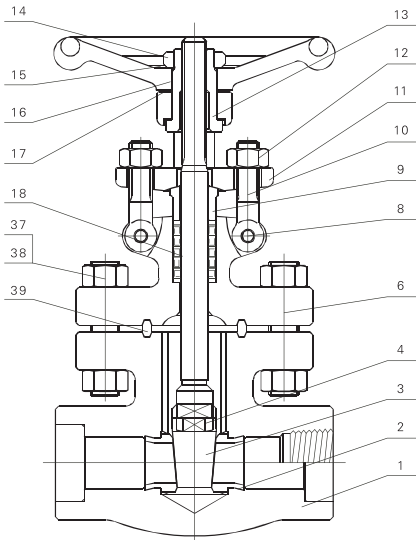
- Design and manufacture conform to API 602、BS5352、ANSI B16.34;
- Connection ends conform to:
  - Socket welded dimension conform to ANSI B16.11;JB/T1751
  - Screw ends dimension conform to ANSI B1.20.1;JB/T7306
  - Butt-welded conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to: API 598; GB/T13927; JB/T9092
- Structure features:
  - Bolted bonnet, outside screw and yoke
  - Welded bonnet, outside screw and yoke
- Materials conform to ANIS/ASTM.
- Main materials:
  - A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F51; Monel; 20 Alloy.

Carbon steel temperature–pressure rate

CL150–285 P.S.I @ 100° F  
 CL300–740 P.S.I @ 100° F  
 CL600–1480 P.S.I @ 100° F  
 CL800–1975 P.S.I @ 100° F  
 CL1500–3705 P.S.I @ 100° F

Main part materials list

| NO. | Part name          | A105/F6a               | A105/F6aHFS            | LF2/304                | F11/F6aHF              | F304(L)/304(L)         | F316(L)/316(L)         | F51/ F51               |
|-----|--------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1   | Body               | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 2   | Seat               | 410                    | 410HF                  | 304                    | 410HF                  | 304(L)                 | 316(L)                 | F51                    |
| 3   | Wedge              | F6a                    | F6a                    | F304                   | F6aHF                  | F304(L)                | F316(L)                | F51                    |
| 4   | Stem               | 410                    | 410                    | 304                    | 410                    | 304(L)                 | 316(L)                 | F51                    |
| 5   | Gasket             | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 316+ Flexible graphite | 316+ Flexible graphite |
| 6   | Bonnet             | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 7   | Bolt               | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 8   | Pin                | 410                    | 410                    | 410                    | 410                    | 304                    | 304                    | 304                    |
| 9   | Gland              | 410                    | 410                    | 304                    | 410                    | 304                    | 316                    | F51                    |
| 10  | Gland eyebolt      | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 11  | Gland flange       | A105                   | A105                   | LF2                    | F11                    | F304                   | F304                   | F304                   |
| 12  | Hex nut            | 2H                     | 2H                     | 2H                     | 2H                     | 8(M)                   | 8(M)                   | 8M                     |
| 13  | Stem nut           | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    |
| 14  | Locking nut        | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     | 35                     |
| 15  | Nameplate          | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 16  | Handwheel          | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   | A197                   |
| 17  | Lubricating gasket | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    | 410                    |
| 18  | Packing            | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               | Graphite               |



Application standards

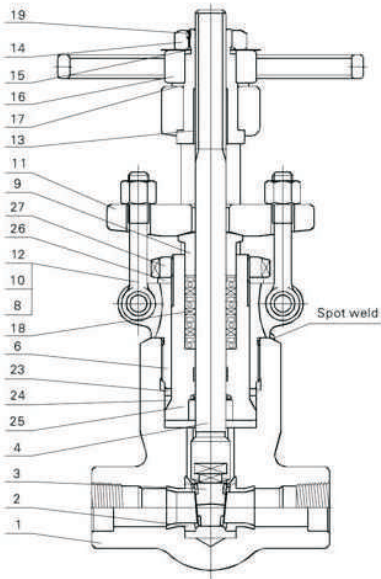
- Design and manufacture conform to API 602、BS5352、ANSI B16.34;
- Connection ends conform to :
  - Socket welded ends conform to ANSI B16.11;JB/T1751
  - Screw ends conform to ANSI B1.20.1;JB/T7306
  - Butt-welded ends conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to: API 598；GB/T13927；JB/T9092
- Structure features:  
Bolted bonnet, outside screw and yoke  
Welded bonnet, outside screw and yoke
- Materials conform to ANSI/ASTM.
- Main materials:  
A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F51; Monel; 20 Alloy.

Carbon steel temperature–pressure rate

CL150–285 P.S.I @ 100° F  
CL300–740 P.S.I @ 100° F  
CL600–1480 P.S.I @ 100° F  
CL800–1975 P.S.I @ 100° F  
CL1500–3705 P.S.I @ 100° F

Main part materials list

| NO. | Part name          | A105/F6a | A105/F6aHFS | LF2/304  | F11/F6aHF | F304(L)/304(L) | F316(L)/316(L) | F51/F51  |
|-----|--------------------|----------|-------------|----------|-----------|----------------|----------------|----------|
| 1   | Body               | A105     | A105        | LF2      | F11       | F304(L)        | F316(L)        | F51      |
| 2   | Seat               | 410      | 410HF       | 304      | 410HF     | 304(L)         | 316(L)         | F51      |
| 3   | Wedge              | F6a      | F6a         | F304     | F6aHF     | F304(L)        | F316(L)        | F51      |
| 4   | Stem               | 410      | 410         | 304      | 410       | 304(L)         | 316(L)         | F51      |
| 6   | Bonnet             | A105     | A105        | LF2      | F11       | F304(L)        | F316(L)        | F51      |
| 8   | Pin                | 410      | 410         | 410      | 410       | 304            | 304            | 304      |
| 9   | Gland              | 410      | 410         | 304      | 410       | 304            | 316            | F51      |
| 10  | Gland eyebolt      | B7       | B7          | L7       | B16       | B8(M)          | B8(M)          | B8M      |
| 11  | Gland flange       | A105     | A105        | LF2      | F11       | F304           | F304           | F304     |
| 12  | Hex nut            | 2H       | 2H          | 2H       | 2H        | 8(M)           | 8(M)           | 8M       |
| 13  | Stem nut           | 410      | 410         | 410      | 410       | 410            | 410            | 410      |
| 14  | Locking nut        | 35       | 35          | 35       | 35        | 35             | 35             | 35       |
| 15  | Nameplate          | Aluminum | Aluminum    | Aluminum | Aluminum  | Aluminum       | Aluminum       | Aluminum |
| 16  | Handwheel          | A197     | A197        | A197     | A197      | A197           | A197           | A197     |
| 17  | Lubricating gasket | 410      | 410         | 410      | 410       | 410            | 410            | 410      |
| 18  | Packing            | Graphite | Graphite    | Graphite | Graphite  | Graphite       | Graphite       | Graphite |
| 37  | Screwed stud       | B7       | B7          | L7       | B16       | B8(M)          | B8(M)          | B8(M)    |
| 38  | Nut                | 2H       | 2H          | 8        | 8         | 8(M)           | 8(M)           | 8(M)     |
| 39  | Metal ring         | 304      | 304         | 304      | 304       | 304(L)         | 316(L)         | F51      |



Application standards

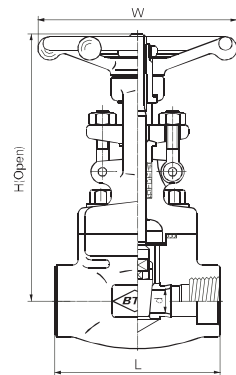
- Design and manufacture conform to API 602、BS5352、ANSI B16.34
- Connection ends conform to :
  - Socket welded dimension conform to ANSI B16.11;JB/T1751
  - Screw ends dimension conform to ANSI B1.20.1;JB/T7306
  - Butt-welded conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to: API 598；GB/T13927；JB/T9092
- Structure features:  
A threaded and pressure seal bonnet
- Materials conform to ANSI/ASTM.
- Main materials:  
A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F91; Monel; 20 Alloy.

Carbon steel temperature–pressure rate

CL1500–3705 P.S.I @ 100° F  
CL2500–6170 P.S.I @ 100° F

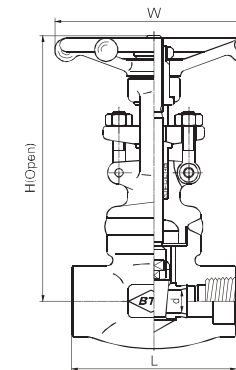
Main part materials list

| NO. | Part name          | A105/F6a   | A105/F6aHFS | LF2/304    | F11/F6aHF  | F304(L)/304(L)  | F316(L)/316(L)  | F91/410HF  |
|-----|--------------------|------------|-------------|------------|------------|-----------------|-----------------|------------|
| 1   | Body               | A105       | A105        | LF2        | L11        | F304(L)         | F316(L)         | F91        |
| 2   | Seat               | 410        | 410HF       | 304        | 410HF      | 304(L)          | 316(L)          | 410(L)     |
| 3   | Wedge              | F6a        | F6a         | F304       | F6aHF      | F304(L)         | F316(L)         | F6aHF      |
| 4   | Stem               | 410        | 410         | 304        | 410        | 304(L)          | 316(L)          | 410        |
| 6   | Bonnet             | A105       | A105        | LF2        | F11        | F304(L)         | F316(L)         | F91        |
| 8   | Pin                | 410        | 410         | 410        | 410        | 304             | 304             | 410        |
| 9   | Gland              | 410        | 410         | 304        | 410        | 304             | 316             | 410        |
| 10  | Gland eyebo        | B7         | B7          | L7         | B16        | B8(M)           | B8(M)           | B8         |
| 11  | Gland flange       | A105       | A105        | LF2        | F11        | F304            | F304            | F91        |
| 12  | Hex nut            | 2H         | 2H          | 2H         | 2H         | 8(M)            | 8(M)            | 8          |
| 13  | Stem nut           | 410        | 410         | 410        | 410        | 410             | 410             | 410        |
| 14  | Locking nut        | 35         | 35          | 35         | 35         | 35              | 35              | 35         |
| 15  | Nameplate          | Aluminum   | Aluminum    | Aluminum   | Aluminum   | Aluminum        | Aluminum        | Aluminum   |
| 16  | Handwheel          | A197       | A197        | A197       | A197       | A197            | A197            | A190       |
| 17  | Lubricating gasket | 410        | 410         | 410        | 410        | 410             | 410             | 410        |
| 18  | Packing            | Graphite   | Graphite    | Graphite   | Graphite   | Graphite        | Graphite        | Graphite   |
| 19  | Stop nut           | 35         | 35          | 35         | 35         | 35              | 35              | 35         |
| 23  | Seal gasket        | 420        | 420         | 304        | 304        | 304(L)          | 316(L)          | 420        |
| 24  | P.S.ring           | 304        | 304         | 304        | 304        | 304             | 316             | 316        |
| 25  | P.S.seat           | 420        | 420         | 304        | 304        | 304(L)          | 316(L)          | F91        |
| 26  | Nut pad            | 410        | 410         | 410        | 410        | 410             | 410             | 410        |
| 27  | Packing nut        | Cast steel | Cast steel  | Cast steel | Cast steel | Stainless steel | Stainless steel | Cast steel |



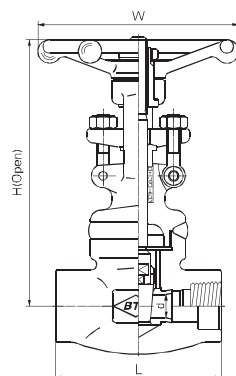
**CL800** Bolted bonnet, full port reducing port outside screw and yoke(OS & Y)  
Threaded, butt-welded or socket welded ends; design to API 602

| Specification (NPS) | R.P | -   | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|------|------|------|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8  | 1/2  | 3/4  | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 79  | 79   | 92   | 111  | 120   | 120   | 140   | 178   | 180   |
| Handwheel diameter  | W   | 100 | 100  | 100  | 125  | 160   | 160   | 180   | 200   | 220   |
| Height              | H   | 161 | 161  | 163  | 196  | 223   | 251   | 290   | 333   | 370   |
| Flow port dimension | d   | 8   | 10.5 | 13.5 | 18   | 24    | 29    | 36.5  | 45    | 51    |
| Weight(Kg)          |     | 2.3 | 2.22 | 2.39 | 4.24 | 5.7   | 7.05  | 10.9  | 16.8  | 24    |



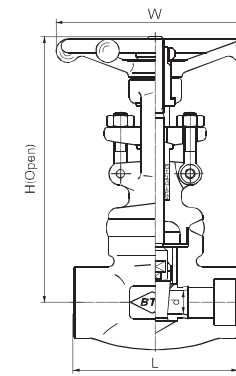
**CL900-CL1500** Welded bonnet, full port reducing port outside screw and yoke(OS&Y)  
Threaded, butt-welded or socket welded ends; design to API 602

| Specification (NPS) | R.P | -   | 1/2  | 3/4  | 1   | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|------|------|-----|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8  | 1/2  | 3/4 | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 92  | 111  | 111  | 120 | 120   | 140   | 178   | 180   | -     |
| Handwheel diameter  | W   | 100 | 125  | 125  | 160 | 160   | 160   | 200   | 220   | -     |
| Height              | H   | 171 | 207  | 207  | 240 | 258   | 330   | 355   | 370   | -     |
| Flow port dimension | d   | 8   | 10.5 | 13.5 | 18  | 24    | 29    | 36.5  | 45    | -     |
| Weight(Kg)          |     | 2.3 | 4    | 4    | 4.8 | 7.1   | 11    | 16    | 22.8  | -     |



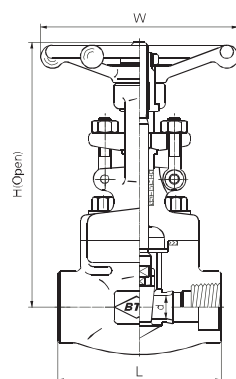
**CL800** Welded bonnet, full port reducing port outside screw and yoke(OS & Y)  
Threaded, butt-welded or socket welded ends; design to API 602

| Specification (NPS) | R.P | -   | 1/2  | 3/4  | 1   | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|------|------|-----|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8  | 1/2  | 3/4 | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 79  | 79   | 92   | 111 | 120   | 120   | 140   | 178   | 180   |
| Handwheel diameter  | W   | 100 | 100  | 100  | 125 | 160   | 160   | 180   | 200   | 220   |
| Height              | H   | 161 | 161  | 163  | 196 | 223   | 251   | 290   | 333   | 370   |
| Flow port dimension | d   | 8   | 10.5 | 13.5 | 18  | 24    | 29    | 36.5  | 45    | 51    |
| Weight(Kg)          |     | 1.9 | 1.9  | 2.1  | 3.2 | 5.2   | 6.9   | 10.4  | 15.8  | 22    |



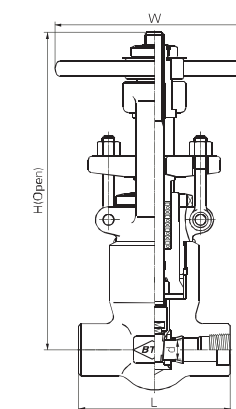
**CL2500** Welded bonnet, full port outside screw and yoke (OS & Y)  
Socket welded ends, design conform to ASME B16.34

| Specification(NPS)  | F.P | 1/4 | 3/8 | 1/2 | 3/4 | 1    | 1 1/4 | 2 |
|---------------------|-----|-----|-----|-----|-----|------|-------|---|
| Face to face        | L   |     | 111 | 120 | 120 | 120  | 140   |   |
| Handwheel diameter  | W   |     | 125 | 160 | 160 | 180  | 220   |   |
| Height              | H   |     | 215 | 218 | 220 | 238  | 281   |   |
| Flow port dimension | d   |     | 14  | 14  | 14  | 19   | 25    |   |
| Weight(Kg)          |     |     | 7   | 8.7 | 8.5 | 11.7 | 17    |   |



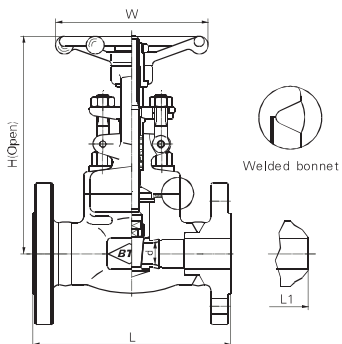
**CL900-CL1500** Bolted bonnet, full port reducing port outside screw and yoke(OS&Y)  
Threaded, butt-welded or socket welded ends; design to API 602

| Specification (NPS) | R.P | -   | 1/2  | 3/4  | 1   | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|---------------------|-----|-----|------|------|-----|-------|-------|-------|-------|-------|
|                     | F.P | 1/4 | 3/8  | 1/2  | 3/4 | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face        | L   | 92  | 111  | 111  | 120 | 120   | 140   | 178   | 180   | -     |
| Handwheel diameter  | W   | 100 | 125  | 125  | 160 | 160   | 180   | 200   | 220   | -     |
| Height              | H   | 191 | 191  | 192  | 219 | 243   | 296   | 316   | 370   | -     |
| Flow port dimension | d   | 8   | 10.5 | 13.5 | 18  | 24    | 29    | 36.5  | 45    | -     |
| Weight(Kg)          |     | 2.4 | 4.4  | 4.3  | 6   | 7.2   | 11.4  | 16    | 23    | -     |



**CL1500-CL2500** Pressure seal bonnet, full port outside screw and yoke(OS & Y)  
Socket welded ends, design conform to ASME B16.34

| Specification(NPS)  | F.P |            | 3/8  | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2    |
|---------------------|-----|------------|------|------|------|------|-------|-------|------|
| Face to face        | L   | CL900~1500 | 140  | 140  | 140  | 140  | 178   | 178   | 216  |
|                     |     | CL2500     | 186  | 186  | 186  | 186  | 232   | 232   | 279  |
| Handwheel diameter  | W   | CL900~1500 | 200  | 200  | 200  | 200  | 280   | 280   | 300  |
|                     |     | CL2500     | 200  | 200  | 200  | 200  | 280   | 280   | 300  |
| Height              | H   | CL900~1500 | 318  | 318  | 318  | 322  | 467   | 468   | 540  |
|                     |     | CL2500     | 325  | 325  | 325  | 327  | 467   | 468   | 540  |
| Flow port dimension |     | CL900~1500 | 14   | 14   | 14   | 19   | 25    | 30    | 36.5 |
|                     |     | CL2500     | 14   | 14   | 14   | 19   | 25    | 30    | 36.5 |
| Weight(Kg)          |     | CL900~1500 | 11.5 | 11.5 | 10.8 | 10.5 | 19.6  | 21.0  | 55.4 |
|                     |     | CL2500     | 12.3 | 12.3 | 11.6 | 10.8 | 26.0  | 28.4  | 60.0 |



### CL150-300-600

Bolted bonnet, reducing port outside screw and yoke(OS & Y)  
Flange-welded or butt-welded ends; design to API602;BS5352

| Specification(NPS)        |             |                                          | 1/4 | 3/8 | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2    | 2 1/2 |    |
|---------------------------|-------------|------------------------------------------|-----|-----|------|------|------|-------|-------|------|-------|----|
|                           |             |                                          |     |     |      |      |      |       |       |      |       |    |
| Face to face              | CL150       | L <sup>(RF)</sup><br>L <sub>1</sub> (BW) | —   | —   | 108  | 117  | 127  | 140   | 165   | 178  | 190   |    |
|                           | CL300       |                                          | —   | —   | 140  | 152  | 165  | 178   | 190   | 216  | 241   |    |
|                           | CL600       |                                          | —   | —   | 165  | 190  | 216  | 229   | 241   | 292  | 330   |    |
| Handwheel diameter        |             | W                                        | —   | —   | 100  | 100  | 125  | 160   | 160   | 180  | 200   |    |
| Height                    | CL150       | H                                        | —   | —   | 176  | 184  | 217  | 226   | 250   | 290  | 357   |    |
|                           | CL300,CL600 |                                          | —   | —   | 161  | 163  | 196  | 226   | 250   | 290  | 357   |    |
| Height (angle dinmension) |             |                                          | d   | —   | —    | 10   | 13.5 | 18    | 24    | 29   | 36.5  | 45 |
| Weight<br>(Kg)            | CL150       | RF                                       | —   | —   | 3.4  | 3.98 | 6.1  | 27.2  | 10.4  | 15.5 | 24.5  |    |
|                           |             | BW                                       | —   | —   | 2.8  | 3.3  | 5.4  | 7.1   | 8.2   | 12.5 | 20    |    |
|                           | CL300       | RF                                       | —   | —   | 3.77 | 4.89 | 7.2  | 39.6  | 12.64 | 18   | 26.2  |    |
|                           |             | BW                                       | —   | —   | 3.5  | 4.4  | 6.8  | 8.1   | 9.2   | 15.4 | 22    |    |
|                           | CL600       | RF                                       | —   | —   | 4.2  | 5.8  | 8.8  | 12.1  | 15.6  | 19.5 | 32    |    |
|                           |             | BW                                       | —   | —   | 4.5  | 5.1  | 8.2  | 10.5  | 12.4  | 20.1 | 28    |    |

If you want to order one piece body, please contract with sale department

### CL900-CL1500

Welded bonnet, full port outside screw and yoke(OS & Y)  
Flange-welded or butt-welded ends; design to BS 5352

| Specification(NPS)  |              | 1/4 | 3/8 | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2    |
|---------------------|--------------|-----|-----|------|------|------|-------|-------|------|
| Face to face        | L(RF),L1(BW) | -   | -   | 216  | 229  | 254  | 279   | 305   | 368  |
|                     | L(RTJ)       | -   | -   | 216  | 229  | 254  | 279   | 305   | 371  |
| Handwheel diameter  | W            | -   | -   | 125  | 125  | 160  | 180   | 200   | 220  |
| Height              | H            | -   | -   | 191  | 192  | 219  | 257   | 296   | 316  |
| Flow port dimension | d            | -   | -   | 13.5 | 18   | 24   | 29    | 36.5  | 45   |
| Weight(Kg)          |              | -   | -   | 7.2  | 11.5 | 15.6 | 16.2  | 22.6  | 28.2 |

If you want to order one piece body, please contract with sale department

### CL2500

Pressure seal gate valves, full port outside screw and yoke(OS & Y)  
Flange-welded or butt-welded ends; design to ASME B16.34

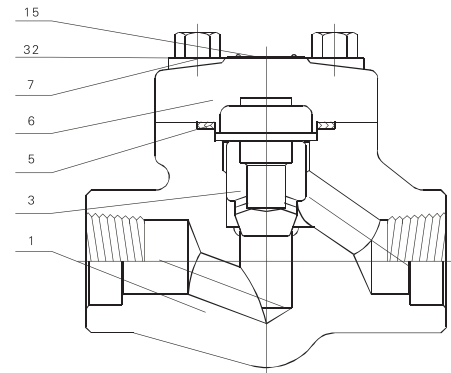
| Specification(NPS)  |              | 1/4 | 3/8 | 1/2  | 3/4  | 1   | 1 1/4 | 1 1/2 | 2    |
|---------------------|--------------|-----|-----|------|------|-----|-------|-------|------|
| Face to face        | L(RF),L1(BW) | -   | -   | 264  | 273  | 308 | -     | 384   | 451  |
|                     | L(RTJ)       | -   | -   | 264  | 273  | 308 | -     | 387   | 454  |
| Handwheel diameter  | W            | -   | -   | 200  | 200  | 200 | -     | 280   | 300  |
| Height              | H            | -   | -   | 325  | 325  | 327 | -     | 478   | 540  |
| Flow port dimension | d            | -   | -   | 13.5 | 13.5 | 19  | -     | 30    | 36.5 |
| Weight(Kg)          |              | -   | -   | 4.6  | 6.8  | 7.6 | -     | 15    | 21.9 |

valves are available in Three bonnet designs. The first design is the Bolted Bonnet, with male-female joint, spiral wound gasket, made in F304L/graphite. Ring joint gasket are also available on request. The second design is the welded bonnet, with a threaded and seal welded joint. On request a full penetration strength welded joint is available. The third design is the pressure seal bonnet, with a threaded and pressure seal bonnet joint. The check valves are also available in three different design configurations. These are piston check, ball check, or swing check designs.

#### Construction is as follows

- ※ Full port or conventional port;
- ※ Lift type check valves;
- ※ Ball type check valves;
- ※ Swing type check valves;
- ※ Acceding to requirement equip inside spring;
- ※ Bolted bonnet with spiral-wound gasket, threaded and seal welded bonnet or threaded and pressure seal bonnet;
- ※ Socket weld ends to ASME B16.11;
- ※ Screwed ends (NPT) to ANSI/ASME B1.20.1;
- ※ Disc can change for soft seal disc and ball disc.

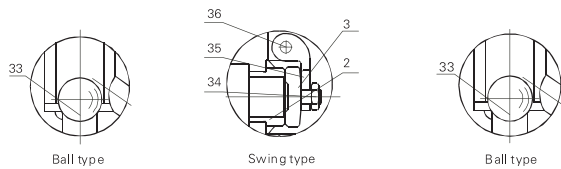




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### Application standards

- Design and manufacture conform to BS5352 MSS SP-118;
- Connection ends conform to:
  - Socket welded ends conform to ANSI B16.11;JB/T1751
  - Screw ends conform to ANSI B1.20.1;JB/T7306
  - Butt-welded ends conform to ANSI B16.25;JB/T12224
  - Flanged ends conform to ANSI B16.5;JB79
- Test and inspection conform to:
  - API 598; GB/T13927; JB/T9092
- Structure features:
  - Bolted bonnet、Welded bonnet
- Materials conform to ANSI/ASTM.
- Main materials:
  - A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F51; Monel; 20 Alloy.

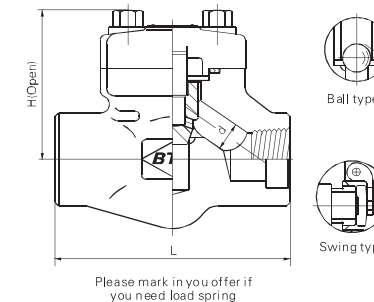


### Carbon steel temperature-pressure rate

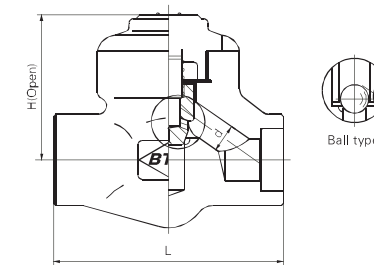
CL150—285 P.S.I @ 100° F  
 CL300—740 P.S.I @ 100° F  
 CL600—1480 P.S.I @ 100° F  
 CL800—1975 P.S.I @ 100° F  
 CL1500—3705 P.S.I @ 100° F

### Main part materials list

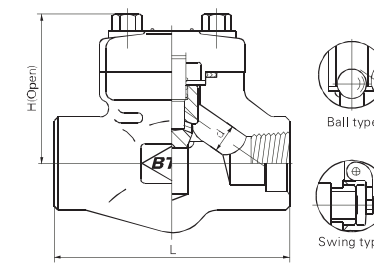
| NO. | Part name  | A105/F6a               | A105/F6aHFS            | LF2/304                | F11/F6aHF              | F304(L)/304(L)         | F316(L)/316(L)         | F51/F51                |
|-----|------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1   | Body       | A105                   | A105+HF                | LF2                    | F11+HF                 | F304(L)                | F316(L)                | F51                    |
| 2   | Seat ring  | 410                    | 410HF                  | 304                    | 410HF                  | 304(L)                 | 316(L)                 | F51                    |
| 3   | Disc       | F6a                    | F6a                    | F304                   | F6aHF                  | F304(L)                | F316(L)                | F51                    |
| 5   | Gasket     | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 316+ Flexible graphite | 316+ Flexible graphite |
| 6   | Bonnet     | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 7   | Bolt       | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 15  | Nameplate  | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 32  | Revit      | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 33  | Steel ball | 430                    | 430                    | 304                    | STL                    | 316(L)                 | 316(L)                 | STL                    |
| 34  | Disc nut   | 2H                     | 2H                     | 8                      | 8                      | 8(M)                   | 8(M)                   | 8M                     |
| 35  | Hinge      | 410                    | 410                    | 304                    | 410                    | 316(L)                 | 316(L)                 | F51                    |
| 36  | Pin        | 410                    | 410                    | 304                    | 410                    | 304(L)                 | 316(L)                 | F51                    |



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### CL800 Bolted bonnet, full port and reducing port Threaded, butt-welded or socket welded ends; design to BS5352

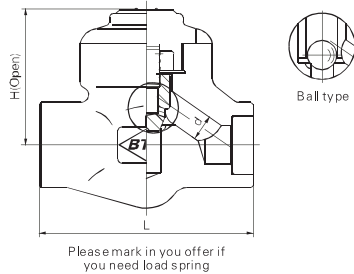
| Specification<br>(NPS)       | R.P |       | -   | 1/2  | 3/4  | 1    | 1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>2</sub> | 2                             |      |
|------------------------------|-----|-------|-----|------|------|------|-------------------------------|-------------------------------|-------------------------------|------|
|                              | F.P |       | 1/4 | 3/8  | 1/2  | 3/4  | 1                             | 1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>2</sub> | 2    |
|                              |     |       |     |      |      |      |                               |                               |                               |      |
| Face to face                 | L   | Lift  | 79  | 79   | 92   | 111  | 120                           | 152                           | 172                           | 200  |
|                              |     | Swing | 79  | 79   | 92   | 111  | 120                           | 120                           | 140                           | 178  |
| Height                       | H   | Lift  | 61  | 61   | 61   | 78   | 84                            | 84                            | 118                           | 132  |
|                              |     | Swing | 61  | 61   | 61   | 78   | 84                            | 84                            | 120                           | 133  |
| Height (angle<br>dinmension) | d   | Lift  | 7   | 9    | 13   | 17.5 | 23                            | 30                            | 35                            | 46   |
|                              |     | Swing | 8   | 10.5 | 13.5 | 18   | 24                            | 29                            | 36.5                          | 45   |
| Weight(Kg)                   |     | Lift  | 1.2 | 1.5  | 1.7  | 3.3  | 4.2                           | 4.2                           | 10.5                          | 12.5 |
|                              |     | Swing | 1.4 | 1.5  | 1.7  | 3.3  | 4.2                           | 4.2                           | 8.5                           | 10.9 |

### CL800 Welded bonnet, full port and reducing port Threaded, butt-welded or socket welded ends; design to BS5352

| Specification<br>(NPS)       | R.P |     | 1/2 | 3/4 | 1    | 1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>2</sub> | 2                             | 2 <sup>1</sup> / <sub>2</sub> |
|------------------------------|-----|-----|-----|-----|------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
|                              | F.P | 1/4 | 3/8 | 1/2 | 3/4  | 1                             | 1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>2</sub> | 2                             |
|                              |     |     |     |     |      |                               |                               |                               |                               |
| Face to face                 | L   | 79  | 79  | 92  | 111  | 120                           | 152                           | 172                           | 200                           |
| Height                       | H   | 61  | 61  | 61  | 78   | 84                            | 103                           | 118                           | 132                           |
| Height (angle<br>dinmension) | d   | 7   | 9   | 13  | 17.5 | 23                            | 30                            | 35                            | 46                            |
| Weight(Kg)                   |     | 1.2 | 1.3 | 1.5 | 3.0  | 3.9                           | 6.0                           | 10                            | 12                            |

### CL900-CL1500 Bolted bonnet, full port and reducing port Threaded,butt-welded or socket welded ends;design to BS5352

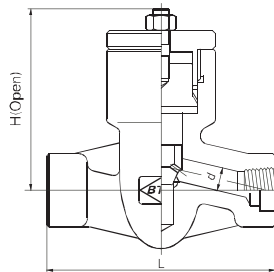
| Specification<br>(NPS)       | R.P |       | -   | 1/2 | 3/4  | 1    | 1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>2</sub> | 2                             |      |
|------------------------------|-----|-------|-----|-----|------|------|-------------------------------|-------------------------------|-------------------------------|------|
|                              | F.P |       | 1/4 | 3/8 | 1/2  | 3/4  | 1                             | 1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>2</sub> | 2    |
|                              |     |       |     |     |      |      |                               |                               |                               |      |
| Face to face                 | L   | Lift  |     | 92  | 111  | 111  | 120                           | 152                           | 172                           | 200  |
|                              |     | Swing |     | 92  | 111  | 111  | 120                           | 120                           | 140                           | 178  |
| Height                       | H   | Lift  |     | 61  | 78   | 78   | 84                            | 103                           | 118                           | 132  |
|                              |     | Swing |     | 61  | 78   | 78   | 84                            | 101                           | 120                           | 133  |
| Height (angle<br>dinmension) | d   | Lift  |     | 7   | 12   | 15   | 20                            | 28                            | 32                            | 40   |
|                              |     | Swing |     | 8   | 10.5 | 13.5 | 18                            | 24                            | 29                            | 45   |
| Weight(Kg)                   |     | Lift  |     | 1.5 | 3.4  | 3.3  | 4.2                           | 6.3                           | 10.5                          | 12.5 |
|                              |     | Swing |     | 1.5 | 3.4  | 3.3  | 4.2                           | 5.0                           | 8.5                           | 10.9 |



### CL900-CL1500

Welded bonnet, full port and reducing port  
Threaded, butt-welded or socket welded ends; design to BS5352

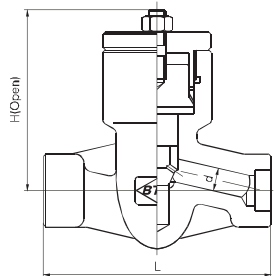
| Specification (NPS)      | R.P |     | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2     |   |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-------|---|
|                          | F.P | 1/4 | 3/8 | 1/2 | 3/4 | 1     | 1 1/4 | 1 1/2 | 2 |
| Face to face             | L   | 92  | 111 | 111 | 120 | 152   | 172   | 200   |   |
| Height                   | H   | 61  | 78  | 78  | 84  | 103   | 118   | 132   |   |
| Height (angle dimension) | d   | 7   | 12  | 15  | 20  | 28    | 32    | 40    |   |
| Weight(Kg)               |     | 1.3 | 3.1 | 3.1 | 3.9 | 5.8   | 10.0  | 11.5  |   |



### CL900-CL1500

Pressure seal bonnet, full port and reducing port  
Threaded, butt-welded or socket welded ends; design to BS5352

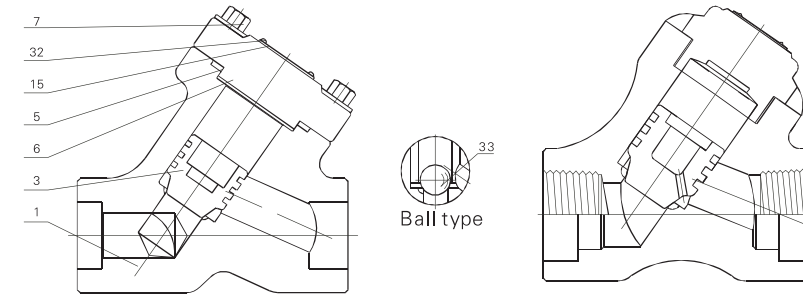
| Specification (NPS)      | R.P | -   | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|
|                          | F.P | 1/4 | 3/8 | 1/2 | 3/4 | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face             | L   |     | 140 | 140 | 140 | 178   | 216   | 216   |       |       |
| Height                   | H   |     | 117 | 117 | 117 | 152   | 195   | 195   |       |       |
| Height (angle dimension) | d   |     | 12  | 15  | 20  | 28    | 32    | 40    |       |       |
| Weight(Kg)               |     |     | 7.5 | 7.0 | 6.8 | 18.5  | 20.3  | 22    |       |       |



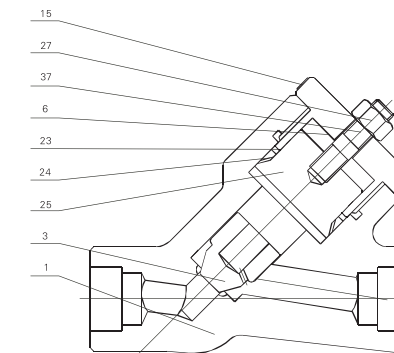
### CL2500

Pressure seal bonnet, full port  
Threaded, butt-welded or socket welded ends; design to ASME B16.34

| Specification(NPS)       | F.P | 1/4 | 3/8 | 1/2  | 3/4 | 1    | 1 1/4 | 1 1/2 | 2   |
|--------------------------|-----|-----|-----|------|-----|------|-------|-------|-----|
| Face to face             | L   |     |     | 186  | 186 | 186  | 232   | 232   | 279 |
| Height                   | H   |     |     | 117  | 117 | 117  | 152   | 152   | 195 |
| Height (angle dimension) | d   |     |     | 11   | 14  | 19   | 25    | 28    | 35  |
| Weight(Kg)               |     |     |     | 11.8 | 11  | 10.5 | 23    | 26.4  | 39  |



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### Application standards

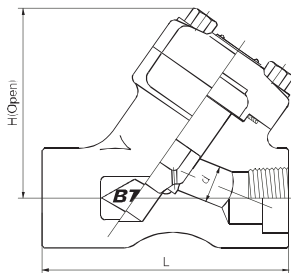
- Design and manufacture conform to BS5352 MSS SP-118;
- Connection ends conform to:
  - Socket welded ends conform to ANSI B16.11; JB/T1751
  - Screw ends conform to ANSI B1.20.1; JB/T7306
  - Butt-welded ends conform to ANSI B16.25; JB/T12224
  - Flanged ends conform to ANSI B16.5; JB79
- Test and inspection conform to: API 598; GB/T13927; JB/T9092
- Structure features: Bolted bonnet, Welded bonnet, A threaded and pressure seal bonnet; Y type and T type.
- Materials conform to ANSI/ASTM.
- Main materials: A105; LF2; F5; F11; F22; 304(L); 316(L); F347; F321; F51; Monel; 20 Alloy.

### Carbon steel temperature-pressure rate

CL1500-3705 P.S.I @ 100° F  
CL2500-6170 P.S.I @ 100° F  
CL4500-1111 P.S.I @ 100° F

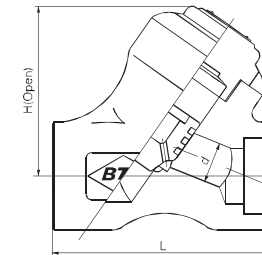
### Main part materials list

| NO. | Part name        | A105/F6a               | A105/F6aHFS            | LF2/304                | F11/F6aHF              | F304(L)/304(L)         | F316(L)/316(L)         | F51/F51                |
|-----|------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1   | Body             | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 3   | Disc             | 410                    | 410HF                  | 304                    | 410HF                  | 304(L)                 | 316(L)                 | F51                    |
| 5   | Gasket           | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 304+ Flexible graphite | 316+ Flexible graphite | 316+ Flexible graphite |
| 6   | Bonnet           | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 7   | Bolt             | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |
| 15  | Nameplate        | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 32  | Revit            | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 33  | Steel ball       | 430                    | 430                    | 304                    | STL                    | 316(L)                 | 316(L)                 | STL                    |
| 1   | Body             | A105                   | A105+HF                | LF2                    | F11+HF                 | F304(L)                | F316(L)                | F51                    |
| 3   | Disc             | F6a                    | F6a                    | F304                   | F6aHF                  | F304(L)                | F316(L)                | F51                    |
| 6   | Bonnet           | A105                   | A105                   | LF2                    | F11                    | F304(L)                | F316(L)                | F51                    |
| 15  | Nameplate        | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               | Aluminum               |
| 23  | Seal ring gasket | 420                    | 420                    | 304                    | 304                    | 304(L)                 | 316(L)                 | 410                    |
| 24  | P.S. ring        | 304                    | 304                    | 304                    | 304                    | 316L                   | 316L                   | 316L                   |
| 25  | P.S. seat        | F410                   | F410                   | F304                   | F410                   | F304                   | F316                   | F51                    |
| 27  | Lift nut         | 2H                     | 2H                     | 8                      | 8                      | 8(M)                   | 8(M)                   | 8M                     |
| 37  | Lift stud        | B7                     | B7                     | L7                     | B16                    | B8(M)                  | B8(M)                  | B8M                    |



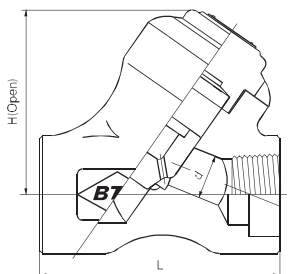
**CL800** Welded bonnet, full port and reducing port  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification (NPS)      | R.P |     | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|
|                          | F.P | 1/4 | 3/8 | 1/2 | 3/4 | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face             | L   |     | 98  | 98  | 98  | 111   | 140   | 140   | 155   | 170   |
| Height                   | H   |     | 70  | 70  | 70  | 100   | 110   | 120   | 120   | 150   |
| Height (angle dimension) | d   |     | 7   | 10  | 13  | 17.5  | 23    | 30    | 35    | 46    |
| Weight(Kg)               |     |     | 2.2 | 2.2 | 2.1 | 4.2   | 9     | 8.9   | 10    | 18.6  |



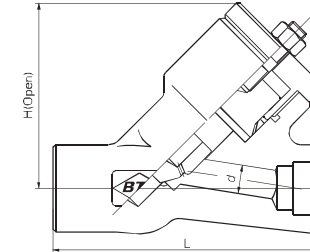
**CL2500** Welded bonnet, full port  
Threaded, butt-welded or socket welded ends; design to ASME B16.34

| Specification(NPS)       | F.P | 3/8  | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2   |
|--------------------------|-----|------|------|------|------|-------|-------|-----|
| Face to face             | L   | 186  | 186  | 186  | 186  | 232   | 232   | 310 |
| Height                   | H   | 115  | 115  | 120  | 150  | 150   | 150   | 160 |
| Height (angle dimension) | d   | 9    | 11   | 14   | 19   | 25    | 28    | 35  |
| Weight(Kg)               |     | 11.2 | 11.5 | 10.6 | 10.8 | 25    | 22    | 39  |



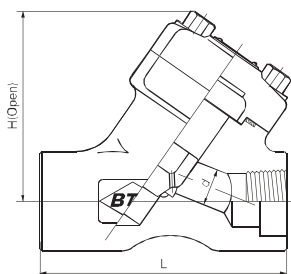
**CL800** Welded bonnet, full port and reducing port  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification (NPS)      | R.P |     | 1/2 | 3/4 | 1    | 1 1/4 | 1 1/2 | 2     | 2 1/2 | 3     |
|--------------------------|-----|-----|-----|-----|------|-------|-------|-------|-------|-------|
|                          | F.P | 1/4 | 3/8 | 1/2 | 3/4  | 1     | 1 1/4 | 1 1/2 | 2     | 2 1/2 |
| Face to face             | L   | 79  | 79  | 92  | 100  | 140   | 140   | 155   | 170   |       |
| Height                   | H   | 65  | 65  | 65  | 95   | 105   | 110   | 110   | 140   |       |
| Height (angle dimension) | d   | 7   | 10  | 13  | 17.5 | 23    | 30    | 35    | 46    |       |
| Weight(Kg)               |     | 1.8 | 1.8 | 2.0 | 3.5  | 8.0   | 8.0   | 12    | 16    |       |



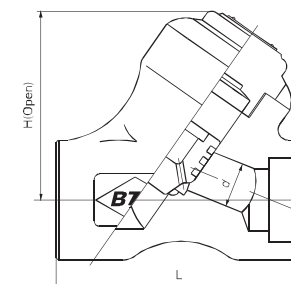
**CL2500** Pressure seal, bolted bonnet, full port  
Threaded, butt-welded or socket welded ends; design to ASME B16.34

| Specification(NPS)       | F.P | 3/8  | 1/2  | 3/4  | 1    | 1 1/4 | 1 1/2 | 2   |
|--------------------------|-----|------|------|------|------|-------|-------|-----|
| Face to face             | L   | 186  | 186  | 186  | 186  | 232   | 232   | 310 |
| Height                   | H   | 233  | 233  | 233  | 233  | 256   | 256   | 330 |
| Height (angle dimension) | d   | 9    | 11   | 14   | 19   | 25    | 28    | 35  |
| Weight(Kg)               |     | 11.2 | 11.5 | 10.6 | 10.8 | 25    | 22    | 39  |



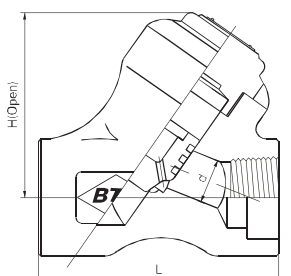
**CL900-CL1500** Bolted bonnet, full port  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification(NPS)       | F.P | 3/8 | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2   |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-----|
| Face to face             | L   | 98  | 111 | 111 | 140 | 140   | 155   | 170 |
| Height                   | H   | 70  | 70  | 100 | 110 | 110   | 120   | 150 |
| Height (angle dimension) | d   | 9   | 12  | 15  | 20  | 28    | 32    | 40  |
| Weight(Kg)               |     | 2.1 | 4.2 | 9   | 8.9 | 10    | 18.6  | 20  |



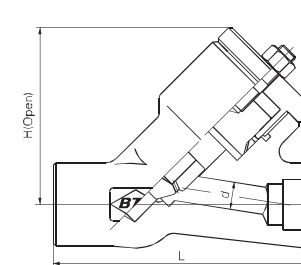
**CL4500** Welded bonnet, full port  
Threaded, butt-welded or socket welded ends; design to ASME B16.34

| Specification(NPS)       | F.P | 3/8 | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2   |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-----|
| Face to face             | L   | 155 | 155 | 155 | 155 |       | 225   | 225 |
| Height                   | H   | 120 | 120 | 120 | 145 |       | 160   | 160 |
| Height (angle dimension) | d   | 9   | 11  | 11  | 15  |       | 26    | 28  |
| Weight(Kg)               |     | 8.7 | 8.7 | 8.7 | 8   |       | 16.5  | 16  |



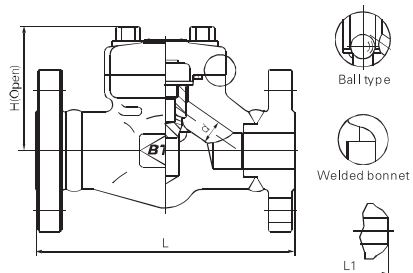
**CL900-CL1500** Bolted bonnet, full port  
Threaded, butt-welded or socket welded ends; design to BS5352

| Specification(NPS)       | F.P | 3/8 | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2   |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-----|
| Face to face             | L   | 92  | 100 | 100 | 140 | 140   | 155   | 170 |
| Height                   | H   | 65  | 65  | 65  | 105 | 110   | 110   | 140 |
| Height (angle dimension) | d   | 9   | 12  | 15  | 20  | 32    | 28    | 40  |
| Weight(Kg)               |     | 2.0 | 3.5 | 3.5 | 8.0 | 12    | 12    | 18  |



**CL4500** Pressure seal, bolted bonnet, full port  
Threaded, butt-welded or socket welded ends; design to ASME B16.34

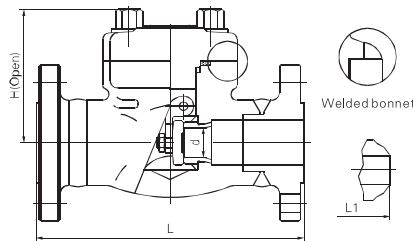
| Specification(NPS)       | F.P | 3/8 | 1/2 | 3/4 | 1   | 1 1/4 | 1 1/2 | 2   |
|--------------------------|-----|-----|-----|-----|-----|-------|-------|-----|
| Face to face             | L   | 200 | 200 | 200 | 200 | 250   | 250   | 330 |
| Height                   | H   | 140 | 140 | 140 | 140 | 160   | 160   | 180 |
| Height (angle dimension) | d   | 9   | 11  | 11  | 15  | 20    | 26    | 28  |
| Weight(Kg)               |     | 20  | 20  | 20  | 20  | 28    | 28    | 45  |



### CL150-300-600

Bolted bonnet, full port  
Flange-welded or butt-welded ends; design to BS5352

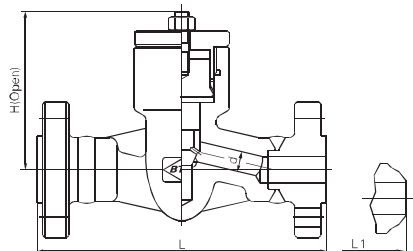
| Specification(NPS)     |           | R.P             | 1/4 | 3/8 | 1/2  | 3/4  | 1   | 1 1/4 | 1 1/2 | 2    |
|------------------------|-----------|-----------------|-----|-----|------|------|-----|-------|-------|------|
|                        |           |                 |     |     |      |      |     |       |       |      |
| Face to face           | CL150     | L(RF)<br>L1(BW) | —   | —   | 108  | 118  | 127 | 140   | 165   | 203  |
|                        | CL300     |                 | —   | —   | 153  | 178  | 203 | 216   | 229   | 267  |
|                        | CL600     |                 | —   | —   | 165  | 191  | 216 | 229   | 241   | 292  |
| Height                 | CL150     |                 | —   | —   | 77   | 81   | 93  | 95    | 103   | 118  |
|                        | CL300/600 | H               | —   | —   | 61   | 78   | 84  | 101   | 120   | 133  |
| Heigh(angle dimension) | d         |                 | —   | —   | 10.5 | 13.5 | 18  | 24    | 29    | 36.5 |
| Weight (Kg)            | CL150     | RF              | —   | —   | 3.6  | 4.6  | 8.5 | 9.2   | 12.5  | 14.8 |
|                        |           | BW              | —   | —   | 3.0  | 3.6  | 7.6 | 8.5   | 11.3  | 13.6 |
|                        | CL300     | RF              | —   | —   | 3.7  | 4.8  | 8.8 | 9.6   | 13.7  | 17.8 |
|                        |           | BW              | —   | —   | 3.2  | 4.3  | 8.0 | 8.6   | 12.7  | 16.2 |
|                        | CL600     | RF              | —   | —   | 4.0  | 5.8  | 9.5 | 10.4  | 15.6  | 24.5 |
|                        |           | BW              | —   | —   | 3.4  | 5.1  | 8.8 | 9.2   | 14.8  | 22.5 |



### CL150-300-600

Bolted bonnet, full port  
Flange-welded or butt-welded ends; design to BS5352

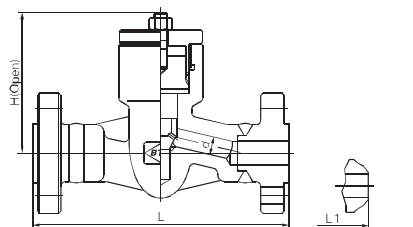
| Specification(NPS)      |           | R.P             | 1/4 | 3/8 | 1/2  | 3/4  | 1   | 1 <sup>1</sup> /4 | 1 <sup>1</sup> /2 | 2    |
|-------------------------|-----------|-----------------|-----|-----|------|------|-----|-------------------|-------------------|------|
|                         |           |                 |     |     |      |      |     |                   |                   |      |
| Face to face            | CL150     | L(RF)<br>L1(BW) | —   | —   | 108  | 118  | 127 | 140               | 165               | 203  |
|                         | CL300     |                 | —   | —   | 153  | 178  | 203 | 216               | 229               | 267  |
|                         | CL600     |                 | —   | —   | 165  | 191  | 216 | 229               | 241               | 292  |
| Height                  | CL150     |                 | —   | —   | 77   | 81   | 93  | 95                | 103               | 118  |
|                         | CL300/600 | H               | —   | —   | 61   | 78   | 84  | 101               | 120               | 133  |
| Height(angle dimension) |           | d               | —   | —   | 10.5 | 13.5 | 18  | 24                | 29                | 36.5 |
| Weight (Kg)             | CL150     | RF              | —   | —   | 3.6  | 4.6  | 8.5 | 9.2               | 12.5              | 14.8 |
|                         |           | BW              | —   | —   | 3.0  | 3.6  | 7.6 | 8.5               | 11.3              | 13.6 |
|                         | CL300     | RF              | —   | —   | 3.7  | 4.8  | 8.8 | 9.6               | 13.7              | 17.8 |
|                         |           | BW              | —   | —   | 3.2  | 4.3  | 8.0 | 8.6               | 12.7              | 16.2 |
|                         | CL600     | RF              | —   | —   | 4.0  | 5.8  | 9.5 | 10.4              | 15.6              | 24.5 |
|                         |           | BW              | —   | —   | 3.4  | 5.1  | 8.8 | 9.2               | 14.8              | 22.5 |



### CL900-CL1500

Pressure seal, bolted bonnet, full port and reducing port  
Flange-welded or butt-welded ends; design to BS5352

| Specification(NPS)       | F.P                     | 3/8    | 1/2        | 3/4        | 1          | 1 1/4      | 1 1/2      | 2          |
|--------------------------|-------------------------|--------|------------|------------|------------|------------|------------|------------|
| Face to face             | L(RF), L1(BW)<br>L(RTJ) | —<br>— | 216<br>216 | 229<br>229 | 254<br>254 | 280<br>280 | 305<br>305 | 268<br>371 |
| Height                   | H                       | —      | 117        | 117        | 117        | 152        | 152        | 195        |
| Height (angle dimension) | d                       | —      | 12         | 15         | 20         | 28         | 32         | 40         |
| Weight(Kg)               | —                       | —      | 10.5       | 11.9       | 13.9       | 19.9       | 26.9       | 32.5       |



### CL2500

Pressure seal, bolted bonnet, full port  
Flange-welded or butt-welded ends; design to ASME B16.34

| Specification(NPS)       | F.P                     | 3/8    | 1/2        | 3/4        | 1          | 1 1/4      | 1 1/2      | 2          |
|--------------------------|-------------------------|--------|------------|------------|------------|------------|------------|------------|
| Face to face             | L(RF), L1(BW)<br>L(RTJ) | —<br>— | 264<br>264 | 273<br>273 | 308<br>308 | 349<br>352 | 384<br>387 | 450<br>454 |
| Height                   | H                       | —      | 117        | 117        | 117        | 152        | 152        | 195        |
| Height (angle dimension) | d                       | —      | 12         | 15         | 20         | 32         | 28         | 40         |
| Weight(Kg)               | —                       | —      | 12.6       | 14.9       | 16.5       | 24.8       | 30         | 35         |

