



# WKM Valves— Triple Offset Valves

High-quality bidirectional valves for critical applications in demanding markets

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## The Difference

### Manufacturing

The portfolio of WKM\* valves include the triple offset valve (TOV), built with the manufacturing excellence and commitment to quality that comes with all Cameron products. Combined with arduous qualification and testing processes that simulate valve life cycle, the TOV sets a new benchmark for performance.

### Support

Our commitment to global support and strategic networks brings the TOV to markets where it's needed, when it's needed—fully designed, tested, qualified, and backed by Cameron. The TOV meets the demanding requirements for bidirectional shutoff, delivery, and quality.

### Organization

Our global network of strategic partners helps distribute high-quality valves for critical applications. With millions of valves manufactured by Cameron and delivered around the world, our portfolio also includes ORBIT\* rising stem ball valves, and NEWCO\* gate, globe, and check valves as part of the Cameron family.

- Strong global distribution network
- Industry leader in valve technology and innovation
- Broadest portfolio of quarter-turn valves in the industry
- In-house engineering and manufacturing
- Commitment to health, safety, and the environment



# WKM Valves — Triple Offset Valves

The TOV completes our reliable, performance-proven, quarter-turn butterfly valve portfolio. The true triple offset geometry of this valve allows for bubble-tight sealing to create a valve that delivers fully bidirectional zero-leakage shutoff per API Standard 598.

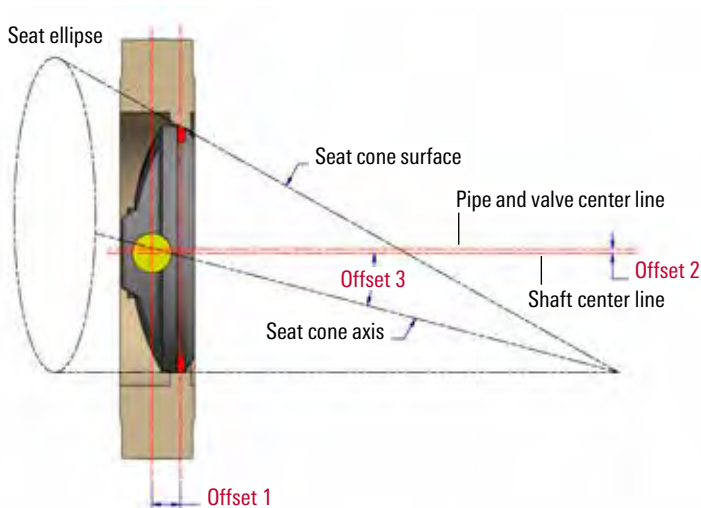
Backed by our world-class engineering, manufacturing, and sourcing expertise, the TOV provides a trusted solution ideal for crucial applications. Operators around the world rely on our dedication to high-quality standards, competitive manufacturing processes, and world-class support for total valve life cycle support.

## Advantages

- True triple offset geometry
- Fully bidirectional zero-leakage shutoff per API 598
- Field-replaceable metal seat
- Life cycle tested as a bubble-tight bidirectional valve
- Standard bearing seals
- Self-centering disc
- Available in a wide range of configurations: lug and short (ISO) and long pattern
- Carbon and stainless steel standard; other materials on request



## Triple Offset Geometry



Offset 1 provides full 360° uninterrupted sealing.

Offset 2 provides eccentric rotation of the disc that swings the seal ring completely off the seat upon opening.

Offset 3 moves the centerline of the cone rotation laterally from the centerline of the disc rotation, enabling the cone to seal without rubbing.

### Compliance and Specifications

|  |
|--|
| API Standard 609   |
| ASME B16.34  |
| ASME B16.5   |
| API Standard 598   |
| ISO-5752 flange dimension  |
| ASME B16.47 for Series A mating pipe flange dimensions for valve sizes 26 in and larger, Classes 150, 300, and 600 |
| ASME B16.10  |
| MSS-SP-55  |
| ISO 5211   |
| API Standard 607, latest edition for fire testing  |
| Fugitive-emissions testing per API Spec 641 and ISO 15848-1  |

# Major Markets

## Power and steam

- District heating
- Bitumen

## Petrochemicals (refining and chemicals)

- Coking
- Reformers — cracking
- Tank switching
- Ethylene
- Butadiene
- Isocyanates — plastics

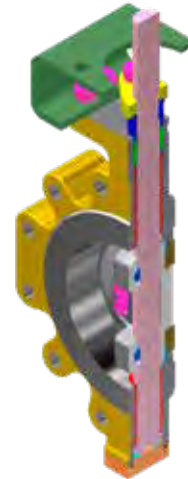
## Midstream

- Tank and terminal
- Tank switching
- Long pattern for gate valve replacement
- Storage for all types of hydrocarbons and chemicals
- Liquid transfer

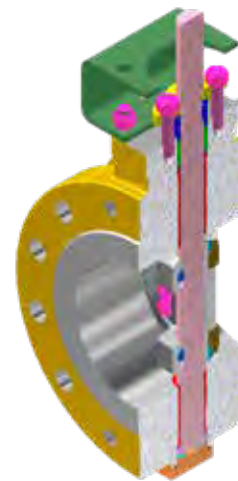
## Upstream production

- Process equipment
- Separation — molecular sieve
- Switching
- Floating production platforms
- Manifolds
- Slurry, oil sands, and SAGD methods
- Secondary recovery

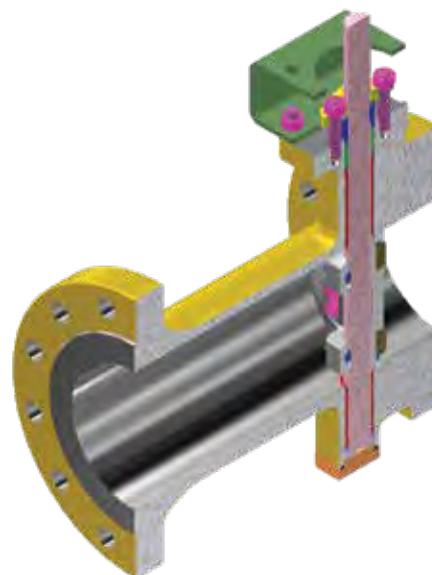
# Flange Connections



Lug pattern  
per API 609



Short pattern  
per ISO 5752/API 609



Long pattern  
per ASME B16.10  
and API 609

# Applications

## Oil and gas

- Critical isolation
- Steam piping and condensate
- Offshore platforms
- Cooling water systems
- Seawater
- Produced fluids processing systems

## Refining and petrochemical processing

- Hydrocarbon processing
- Hydrogen
- Oxygen
- Thermal fluids
- Hot gases
- Sulfur (tail gas)
- Chemical solvents
- Chlorinated solvents
- Flare gas

## Liquefied natural gas

- LNG storage
- LNG production

## Power and district heating

- Steam isolation
- Hot water control systems
- Geothermal steam

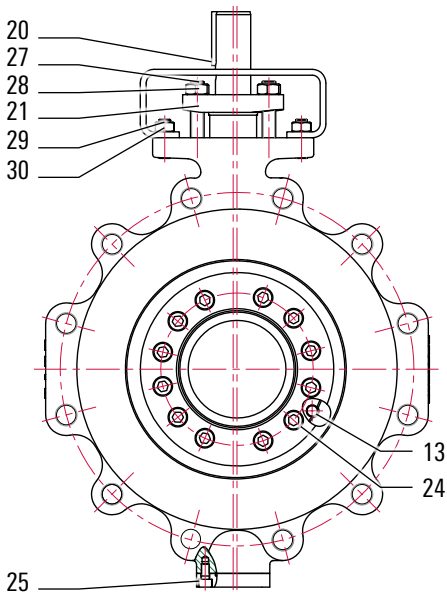
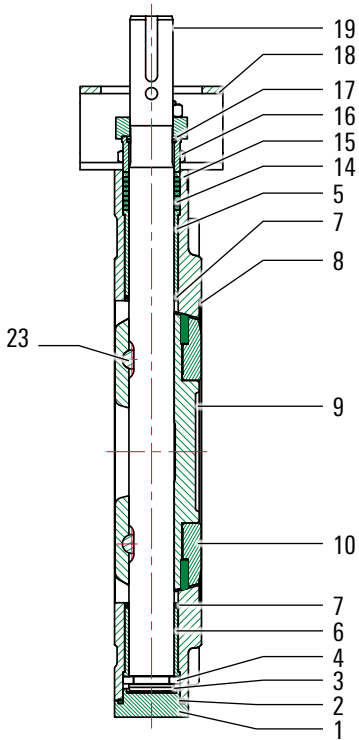
## Midstream

- Tank isolation
- Manifold system isolation
- Metering systems
- SCADA systems



# Part List: 3 to 24 in

ASME Class 150, 300, and 600—lug, short, and long pattern



| Item | Part                         | Material                     | ASTM Specification                    | Material                     | ASTM Specification         |
|------|------------------------------|------------------------------|---------------------------------------|------------------------------|----------------------------|
| 1    | Bottom cap                   | Carbon steel                 | A105                                  | Stainless steel              | A182 F316                  |
| 2    | Spiral-wound (SW) gasket†    | SS316 and graphite           |                                       | SS316 and graphite           |                            |
| 3    | Thrust washer                | INCONEL® X-750               |                                       | INCONEL® X-750               |                            |
| 4    | Split ring                   | Stainless steel              | A182 F316 with nitriding              | Stainless steel              | A182 F316 with nitriding   |
| 5    | Solid bearing top            | Stainless steel              | A182 FXM-19 with nitriding            | Stainless steel              | A182 FXM-19 with nitriding |
| 6    | Solid bearing bottom         | Stainless steel              | A182 FXM-19 with nitriding            | Stainless steel              | A182 FXM-19 with nitriding |
| 7    | Bearing seal                 | Graphite                     |                                       | Graphite                     |                            |
| 8    | Body                         | Carbon steel                 | A216 carbon steel (WCB) and Stellite® | Stainless steel              | A351 CF8M and Stellite     |
| 9    | Disc                         | Carbon steel                 | A216 WCB                              | Stainless steel              | A351 CF8M                  |
| 10   | Retainer                     | Carbon steel                 | A516 Grade 70                         | Stainless steel              | A240 316                   |
| 11‡  | Seal ring†                   | Duplex and graphite          | A182 F51                              | Duplex and graphite          | A182 F51                   |
| 12‡  | Seal ring gasket†            | Stainless steel and graphite |                                       | Stainless steel and graphite |                            |
| 13   | Seal locating pin            | 17-4PH condition H1150D      | A564 630                              | 17-4PH condition H1150D      | A564 630                   |
| 14   | Packing washer               | Stainless steel              | A182 F316                             | Stainless steel              | A182 F316                  |
| 15   | Packing†                     | Graphite                     |                                       | Graphite                     |                            |
| 16   | Packing bushing              | Stainless steel              | A182 F316                             | Stainless steel              | A182 F316                  |
| 17   | Blowout ring                 | 17-4PH condition H1150D      | A564 630                              | 17-4PH condition H1150D      | A564 630                   |
| 18   | Mounting bracket             | Carbon steel                 | A1020                                 | Carbon steel                 | A1020                      |
| 19   | Shaft                        | 17-4PH condition H1150D      | A564 630                              | 17-4PH condition H1150D      | A564 630                   |
| 20   | Key                          | Steel                        | AISI 1045                             | Steel                        | AISI 1045                  |
| 21   | Packing retainer             | Carbon steel                 | A216 WCB                              | Stainless steel              | A351 CF8M                  |
| 22‡  | Center key                   | Stainless steel              | A182 F316                             | Stainless steel              | A182 F316                  |
| 23   | Wedge pin                    | 17-4PH condition H1150D      | A564 630                              | 17-4PH condition H1150D      | A564 630                   |
| 24   | Socket head cap screw (SHCS) | Carbon steel                 | A193 B7M                              | Stainless steel              | A453 660D                  |
| 25   | SHCS                         | Carbon steel                 | A193 B7M                              | Stainless steel              | A453 660D                  |
| 26‡  | SHCS                         | Carbon steel                 | A193 B7M                              | Stainless steel              | A453 660D                  |
| 27   | Stud                         | Carbon steel                 | A193 B7M                              | Stainless steel              | A453 660D                  |
| 28   | Hex nut                      | Carbon steel                 | A194 2HM                              | Stainless steel              | A453 660D                  |
| 29   | Stud                         | Carbon steel                 | A193 B7M                              | Stainless steel              | A453 660D                  |
| 30   | Hex nut                      | Carbon steel                 | A194 2HM                              | Stainless steel              | A453 660D                  |
| 31‡  | Nameplate                    | Stainless steel              |                                       | Stainless steel              |                            |
| 32‡  | Dowel pin                    | Carbon steel                 | A105                                  | Stainless steel              | A182 F316                  |

† Recommended spare parts

‡ Part not shown

#### Notes

Basic design—application requirements of API 609B and ASME B16.34

Pressure test—API 598

End flanged—ASME B16.5

Face-to-face dimensions and tolerances—API 609B

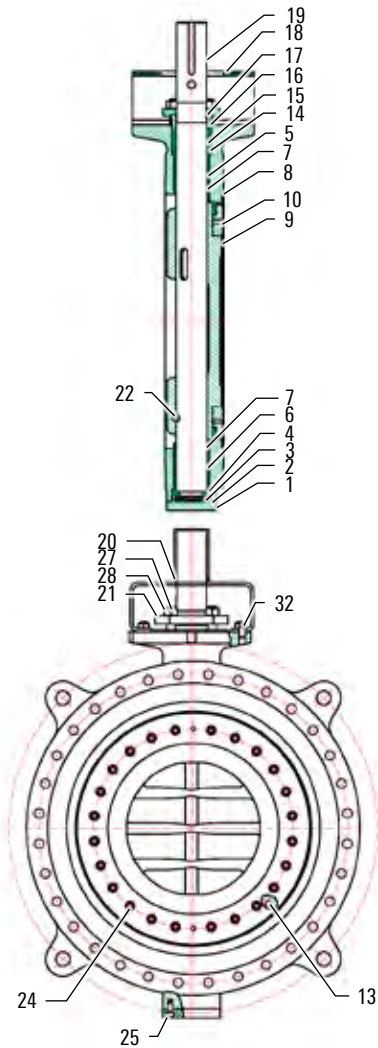
Fire test—API 607

Actuation mounting—ISO 5211

Materials meet the requirements of NACE MR0103 and MR0175

# Part List: 26 to 60 in

ASME Class 150, 300, and 600—lug, short, and long pattern



| Item            | Part                          | Material                | ASTM Specification         | Material                | ASTM Specification         |
|-----------------|-------------------------------|-------------------------|----------------------------|-------------------------|----------------------------|
| 1               | Bottom cap                    | Carbon steel            | A105                       | Stainless steel         | A182 F316                  |
| 2               | SW gasket <sup>1</sup>        | SS316 and graphite      |                            | SS316 and graphite      |                            |
| 3               | Thrust washer                 | Inconel® X-750          |                            | INCONEL® X-750          |                            |
| 4               | Split ring                    | Stainless steel         | A182 F316 with nitriding   | Stainless steel         | A182 F316 with nitriding   |
| 5               | Solid bearing top             | Stainless steel         | A182 FXM-19 with nitriding | Stainless steel         | A182 FXM-19 with nitriding |
| 6               | Solid bearing bottom          | Stainless steel         | A182 FXM-19 with nitriding | Stainless steel         | A182 FXM-19 with nitriding |
| 7               | Bearing seal                  | Graphite rope           |                            | Graphite rope           |                            |
| 8               | Body                          | Carbon steel            | A216 WCB + Stellite®       | Stainless steel         | A351 CF8M + Stellite®      |
| 9               | Disc                          | Carbon steel            | A216 WCB                   | Stainless steel         | A351 CF8M                  |
| 10              | Retainer                      | Carbon steel            | A516 Grade 70              | Stainless steel         | A240 316                   |
| 11 <sup>1</sup> | Seal ring <sup>1</sup>        | Duplex and graphite     | A182 F51                   | Duplex and graphite     | A182 F51                   |
| 12 <sup>2</sup> | Seal ring gasket <sup>1</sup> | SS316 and graphite      |                            | SS316 and graphite      |                            |
| 13              | Seal locating pin             | 17-4PH condition H1150D | A564 630                   | 17-4PH condition H1150D | A564 630                   |
| 14              | Packing washer                | Stainless steel         | A182 F316                  | Stainless steel         | A182 F316                  |
| 15              | Packing <sup>3</sup>          | Graphite                |                            | Graphite                |                            |
| 16              | Packing bushing               | Stainless steel         | A182 F316                  | Stainless steel         | A182 F316                  |
| 17              | Blowout ring                  | 17-4PH condition H1150D | A564 630                   | 17-4PH condition H1150D | A564 630                   |
| 18              | Mounting bracket              | Carbon steel            | A1020                      | Carbon steel            | A1020                      |
| 19              | Shaft                         | 17-4PH condition H1150D | A564 630                   | 17-4PH condition H1150D | A564 630                   |
| 20              | Key                           | Steel                   | AISI 1045                  | Steel                   | AISI 1045                  |
| 21              | Packing retainer              | Carbon Steel            | A216 WCB                   | Stainless Steel         | A351 CF8M                  |
| 22 <sup>2</sup> | Cylindrical taper pin         | 17-4PH condition H1150D | A564 630                   | 17-4PH condition H1150D | A564 630                   |
| 23 <sup>3</sup> | Disc key                      | 17-4PH condition H1150D | A564 630                   | 17-4PH condition H1150D | A564 630                   |
| 24              | SHCS                          | Carbon steel            | A193 B7M                   | Stainless steel         | A453 660D                  |
| 25              | SHCS                          | Carbon steel            | A193 B7M                   | Stainless steel         | A453 660D                  |
| 26 <sup>4</sup> | Hex slotted nut               | Carbon steel            | A194 2HM                   | Stainless steel         | A453 660D                  |
| 27              | Stud                          | Carbon steel            | A193 B7M                   | Stainless steel         | A453 660D                  |
| 28              | Hex nut                       | Carbon steel            | A194 2HM                   | Stainless steel         | A453 660D                  |
| 29              | Stud                          | Carbon steel            | A193 B7M                   | Stainless steel         | A453 660D                  |
| 30              | Hex nut                       | Carbon steel            | A194 2HM                   | Stainless steel         | A453 660D                  |
| 31 <sup>5</sup> | Nameplate                     | Stainless steel         |                            | Stainless steel         |                            |
| 32 <sup>6</sup> | Dowel pin                     | Carbon steel            | A105                       | Stainless steel         | A182 F316                  |

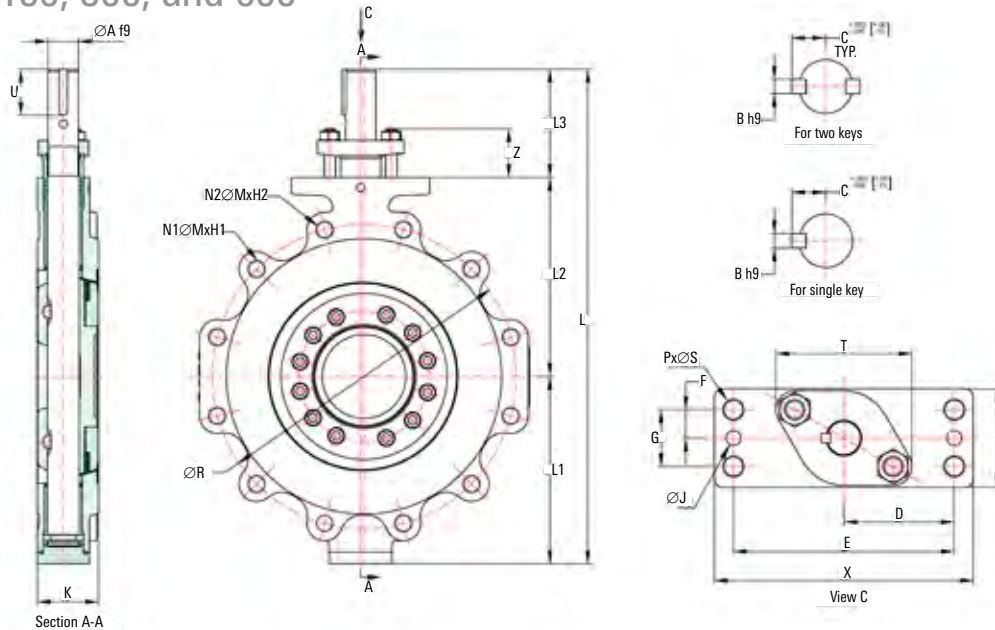
<sup>1</sup> Recommended spare parts

<sup>2</sup> Part not shown

1. Basic design – Application requirements of API 609B and ASME B16.34
2. Pressure test – API 598
3. End flanges – ASME B16.47 Series A
4. Face-to-face dimensions and tolerances – API 609B, ISO 5752, ASME B16.10
5. Fire test – API 607
6. Materials meet the requirements of NACE MR-01-03 and MR-01-75

# Lug Pattern Dimensions: 3 to 24 in per API 609

ASME Class 150, 300, and 600

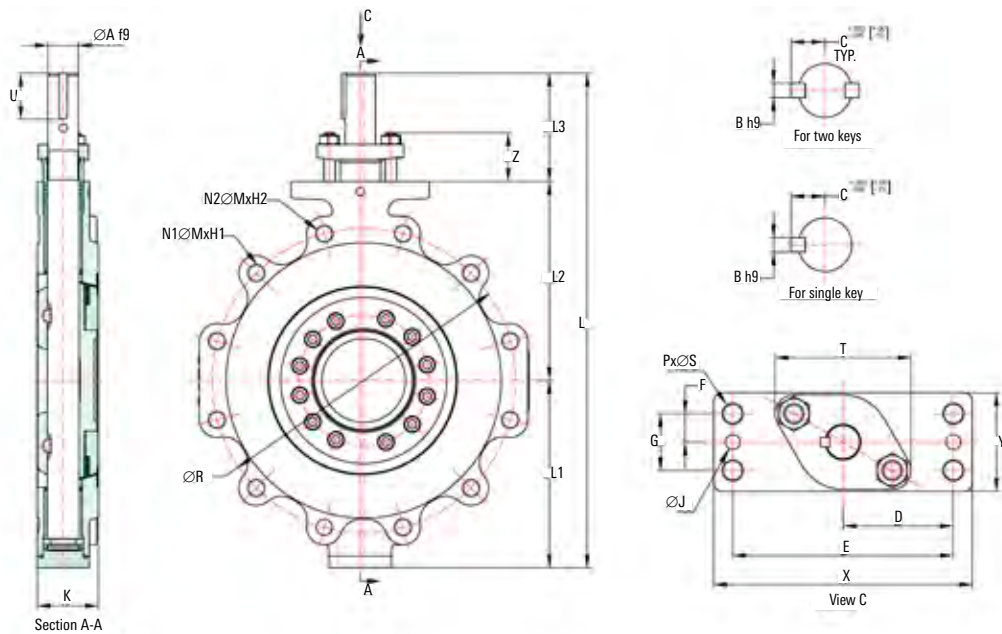


Lug Pattern Dimensions: 3 to 24 in per API 609, ASME Class 150, 300, and 600

| Size, in [mm] | Class | $\varnothing A f9$ | B h9        | C +0.000/-0.006 [+0.00/-0.15] | NO. OF KEYS | D            | E             | F            | G           | K            |
|---------------|-------|--------------------|-------------|-------------------------------|-------------|--------------|---------------|--------------|-------------|--------------|
| 3 [80]        | 150   | 0.83 [21.0]        | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | 1.85 [47.0]  | 3.70 [94.0]   | 0.49 [12.5]  | 0.98 [25.0] | 1.88 [48.0]  |
|               | 300   | 0.83 [21.0]        | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | 1.85 [47.0]  | 3.70 [94.0]   | 0.49 [12.5]  | 0.98 [25.0] | 1.88 [48.0]  |
| 4 [100]       | 150   | 0.83 [21.0]        | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | 1.85 [47.0]  | 3.70 [94.0]   | 0.49 [12.5]  | 0.98 [25.0] | 2.12 [54.0]  |
|               | 300   | 0.83 [21.0]        | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | 1.85 [47.0]  | 3.70 [94.0]   | 0.49 [12.5]  | 0.98 [25.0] | 2.12 [54.0]  |
|               | 600   | 1.02 [26.0]        | 0.31 [8.0]  | 0.63 [16.0]                   | 1           | 2.76 [70.0]  | 5.51 [140.0]  | 1.02 [26.0]  | 0.51 [13.0] | 2.50 [64.0]  |
| 6 [150]       | 150   | 0.98 [25.0]        | 0.31 [8.0]  | 0.61 [15.5]                   | 1           | 2.17 [55.0]  | 4.33 [110.0]  | 0.47 [12.0]  | 0.94 [24.0] | 2.25 [57.0]  |
|               | 300   | 1.18 [30.0]        | 0.31 [8.0]  | 0.75 [19.0]                   | 1           | 2.76 [70.0]  | 5.51 [140.0]  | 0.51 [13.0]  | 1.02 [26.0] | 2.31 [59.0]  |
|               | 600   | 1.42 [36.0]        | 0.47 [12.0] | 0.91 [23.0]                   | 1           | 2.95 [75.0]  | 5.91 [150.0]  | 1.34 [34.0]  | 0.67 [17.0] | 3.06 [78.0]  |
| 8 [200]       | 150   | 1.26 [32.0]        | 0.31 [8.0]  | 0.75 [19.0]                   | 1           | 2.76 [70.0]  | 5.51 [140.0]  | 0.51 [13.0]  | 1.02 [26.0] | 2.50 [64.0]  |
|               | 300   | 1.50 [38.0]        | 0.39 [10.0] | 0.91 [23.0]                   | 2           | 2.76 [70.0]  | 5.51 [140.0]  | 0.67 [17.0]  | 1.34 [34.0] | 2.88 [73.0]  |
|               | 600   | 1.81 [46.0]        | 0.55 [14.0] | 1.10 [28.0]                   | 2           | 3.44 [87.5]  | 6.89 [175.0]  | 1.77 [45.0]  | 0.89 [22.5] | 4.00 [102.0] |
| 10 [250]      | 150   | 1.42 [36.0]        | 0.39 [10.0] | 0.87 [22.0]                   | 1           | 2.76 [70.0]  | 5.51 [140.0]  | 0.67 [17.0]  | 1.34 [34.0] | 2.81 [71.0]  |
|               | 300   | 1.57 [40.0]        | 0.47 [12.0] | 0.96 [24.5]                   | 2           | 3.25 [82.5]  | 6.50 [165.0]  | 0.79 [20.0]  | 1.57 [40.0] | 3.25 [83.0]  |
|               | 600   | 2.17 [55.0]        | 0.63 [16.0] | 1.32 [33.5]                   | 2           | 4.43 [112.5] | 8.86 [225.0]  | 2.13 [54.0]  | 1.06 [27.0] | 4.62 [117.0] |
| 12 [300]      | 150   | 1.65 [42.0]        | 0.47 [12.0] | 1.00 [25.5]                   | 1           | 3.25 [82.5]  | 6.50 [165.0]  | 0.79 [20.0]  | 1.57 [40.0] | 3.19 [81.0]  |
|               | 300   | 1.81 [46.0]        | 0.55 [14.0] | 1.10 [28.0]                   | 2           | 3.44 [87.5]  | 6.89 [175.0]  | 0.89 [22.5]  | 1.77 [45.0] | 3.62 [92.0]  |
|               | 600   | 2.56 [65.0]        | 0.71 [18.0] | 1.56 [39.5]                   | 2           | 5.91 [150.0] | 11.81 [300.0] | 3.15 [80.0]  | 1.57 [40.0] | 5.52 [140.0] |
| 14 [350]      | 150   | 1.77 [45.0]        | 0.55 [14.0] | 1.10 [28.0]                   | 2           | 3.44 [87.5]  | 6.89 [175.0]  | 0.89 [22.5]  | 1.77 [45.0] | 3.62 [92.0]  |
|               | 300   | 2.17 [55.0]        | 0.63 [16.0] | 1.32 [33.5]                   | 2           | 4.43 [112.5] | 8.86 [225.0]  | 1.06 [27.0]  | 2.13 [54.0] | 4.62 [117.0] |
|               | 600   | 2.95 [75.0]        | 0.79 [20.0] | 1.79 [45.5]                   | 2           | 5.91 [150.0] | 11.81 [300.0] | 3.15 [80.0]  | 1.57 [40.0] | 6.12 [155.0] |
| 16 [400]      | 150   | 1.97 [50.0]        | 0.63 [16.0] | 1.22 [31.0]                   | 2           | 3.44 [87.5]  | 6.89 [175.0]  | 0.89 [22.5]  | 1.77 [45.0] | 4.00 [102.0] |
|               | 300   | 2.56 [65.0]        | 0.71 [18.0] | 1.56 [39.5]                   | 2           | 5.91 [150.0] | 11.81 [300.0] | 1.57 [40.0]  | 3.15 [80.0] | 5.25 [133.0] |
|               | 600   | 3.35 [85.0]        | 0.87 [22.0] | 2.03 [51.5]                   | 2           | 6.99 [177.5] | 13.98 [355.0] | 3.54 [90.0]  | 1.77 [45.0] | 7.00 [178.0] |
| 18 [450]      | 150   | 2.28 [58.0]        | 0.71 [18.0] | 1.42 [36.0]                   | 2           | 4.43 [112.5] | 8.86 [225.0]  | 1.06 [27.0]  | 2.13 [54.0] | 4.50 [114.0] |
|               | 300   | 2.76 [70.0]        | 0.79 [20.0] | 1.73 [44.0]                   | 2           | 5.91 [150.0] | 11.81 [300.0] | 1.57 [40.0]  | 3.15 [80.0] | 5.88 [149.0] |
|               | 600   | 3.74 [95.0]        | 0.87 [22.0] | 2.22 [56.5]                   | 2           | 6.99 [177.5] | 13.98 [355.0] | 3.54 [90.0]  | 1.77 [45.0] | 7.88 [200.0] |
| 20 [500]      | 150   | 2.68 [68.0]        | 0.71 [18.0] | 1.61 [41.0]                   | 2           | 4.43 [112.5] | 8.86 [225.0]  | 1.06 [27.0]  | 2.13 [54.0] | 5.00 [127.0] |
|               | 300   | 3.07 [78.0]        | 0.87 [22.0] | 1.89 [48.0]                   | 2           | 6.99 [177.5] | 13.98 [355.0] | 1.77 [45.0]  | 3.54 [90.0] | 6.25 [159.0] |
|               | 600   | 4.13 [105.0]       | 0.87 [22.0] | 2.42 [61.5]                   | 2           | 7.99 [203.0] | 15.98 [406.0] | 4.53 [115.0] | 2.26 [57.5] | 8.50 [216.0] |
| 24 [600]      | 150   | 3.07 [78.0]        | 0.87 [22.0] | 1.89 [48.0]                   | 2           | 5.91 [150.0] | 11.81 [300.0] | 1.57 [40.0]  | 3.15 [80.0] | 6.06 [154.0] |
|               | 300   | 3.62 [92.0]        | 0.87 [22.0] | 2.17 [55.0]                   | 2           | 6.99 [177.5] | 13.98 [355.0] | 1.77 [45.0]  | 3.54 [90.0] | 7.12 [181.0] |
|               | 600   | 5.12 [130.0]       | 1.10 [28.0] | 3.19 [81.0]                   | 2           | 7.99 [203.0] | 15.98 [406.0] | 4.53 [115.0] | 2.26 [57.5] | 9.13 [232.0] |

All the dimensions are in Inch [Metric]



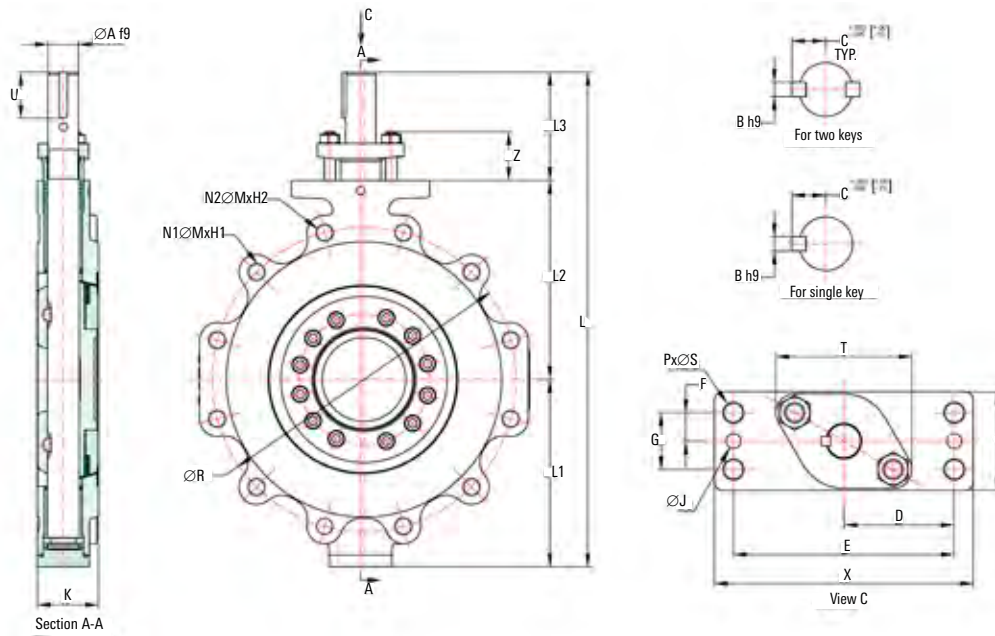


Lug Pattern Dimensions: 3 to 24 in per API 609, ASME Class 150, 300, and 600

| Size, in [mm] | Class | L              | L1            | L2            | L3            | $\varnothing R$ | P x $\varnothing S$ | $\varnothing M$ | N1 (No's) | N2 (No's) |
|---------------|-------|----------------|---------------|---------------|---------------|-----------------|---------------------|-----------------|-----------|-----------|
| 3 [80]        | 150   | 12.68 [322.0]  | 4.27 [108.5]  | 3.94 [100.0]  | 4.47 [113.5]  | 6.00 [152.4]    | 4X M8 X 1.25        | .625-11 UNC     | 4         | —         |
|               | 300   | 13.82 [351.0]  | 4.67 [118.5]  | 4.72 [120.0]  | 4.43 [112.5]  | 6.62 [168.3]    | 4X M8 X 1.25        | .750-10 UNC     | 8         | —         |
| 4 [100]       | 150   | 14.65 [372.0]  | 5.02 [127.5]  | 5.16 [131.0]  | 4.47 [113.5]  | 7.50 [190.5]    | 4X M8 X 1.25        | .625-11 UNC     | 8         | —         |
|               | 300   | 15.63 [397.0]  | 5.57 [141.5]  | 5.51 [140.0]  | 4.55 [115.5]  | 7.88 [200.0]    | 4X M8 X 1.25        | .750-10 UNC     | 8         | —         |
|               | 600   | 20.00 [508.0]  | 7.56 [192.0]  | 7.52 [191.0]  | 4.92 [125.0]  | 8.50 [215.9]    | 4XM12X1.75          | .875-9 UNC      | 8         | —         |
| 6 [150]       | 150   | 17.09 [434.0]  | 5.87 [149.0]  | 6.30 [160.0]  | 4.92 [125.0]  | 9.50 [241.3]    | 4X M10 X 1.50       | .750-10 UNC     | 8         | —         |
|               | 300   | 20.12 [511.0]  | 7.09 [180.0]  | 8.07 [205.0]  | 4.96 [126.0]  | 10.62 [270.0]   | 4X M12 X 1.75       | .750-10 UNC     | 12        | —         |
|               | 600   | 25.59 [650.0]  | 9.53 [242.0]  | 10.04 [255.0] | 6.02 [153.0]  | 11.50 [292.1]   | 4XM14X2             | 1.00-8 UNC      | 10        | 2         |
| 8 [200]       | 150   | 19.76 [502.0]  | 7.09 [180.0]  | 7.76 [197.0]  | 4.92 [125.0]  | 11.75 [298.5]   | 4X M12 X 1.75       | .750-10 UNC     | 8         | —         |
|               | 300   | 21.79 [553.5]  | 8.21 [208.5]  | 8.66 [220.0]  | 4.92 [125.0]  | 13.00 [330.0]   | 4X M14 X 2.00       | .875-9 UNC      | 12        | —         |
|               | 600   | 27.60 [701.0]  | 10.35 [263.0] | 10.71 [272.0] | 6.54 [166.0]  | 13.75 [349.2]   | 4XM18X2.5           | 1.125-8 UN      | 10        | 2         |
| 10 [250]      | 150   | 23.19 [589.0]  | 8.78 [223.0]  | 9.33 [237.0]  | 5.08 [129.0]  | 14.25 [362.0]   | 4X M12 X 1.75       | .875-9 UNC      | 12        | —         |
|               | 300   | 26.14 [664.0]  | 9.69 [246.0]  | 10.24 [260.0] | 6.22 [158.0]  | 15.25 [387.4]   | 4X M16 X 2.00       | 1.000-8 UNC     | 12        | 4         |
|               | 600   | 32.32 [821.0]  | 11.81 [300.0] | 12.20 [310.0] | 8.31 [211.0]  | 17.00 [431.8]   | 4XM20X2.5           | 1.250-8 UN      | 12        | 4         |
| 12 [300]      | 150   | 27.01 [686.0]  | 9.92 [252.0]  | 10.79 [274.0] | 6.30 [160.0]  | 17.00 [431.8]   | 4X M16 X 2.00       | .875-9 UNC      | 12        | —         |
|               | 300   | 30.31 [770.0]  | 11.10 [282.0] | 11.81 [300.0] | 7.40 [188.0]  | 17.75 [450.8]   | 4X M18 X 2.50       | 1.125-8 UN      | 14        | 2         |
|               | 600   | 34.65 [880.0]  | 13.27 [337.0] | 13.39 [340.0] | 7.99 [203.0]  | 19.25 [489.0]   | 4XM24X3.0           | 1.250-8 UN      | 16        | 4         |
| 14 [350]      | 150   | 32.44 [824.0]  | 11.26 [286.0] | 13.00 [330.0] | 8.19 [208.0]  | 18.75 [476.3]   | 4X M16 X 2.00       | 1.000-8 UNC     | 12        | —         |
|               | 300   | 35.91 [912.0]  | 12.60 [320.0] | 13.78 [350.0] | 9.53 [242.0]  | 20.25 [514.4]   | 4X M20 X 2.50       | 1.125-8 UN      | 16        | 4         |
|               | 600   | 39.84 [1012.0] | 14.25 [362.0] | 14.88 [378.0] | 10.71 [272.0] | 20.75 [527.0]   | 4XM24X3.0           | 1.375-8 UN      | 16        | 4         |
| 16 [400]      | 150   | 35.28 [896.0]  | 12.52 [318.0] | 14.37 [365.0] | 8.39 [213.0]  | 21.25 [540.0]   | 4X M18 X 2.50       | 1.000-8 UNC     | 16        | —         |
|               | 300   | 40.47 [1028.0] | 13.94 [354.0] | 15.35 [390.0] | 11.18 [284.0] | 22.50 [571.5]   | 4X M24 X 3.00       | 1.250-8 UN      | 16        | 4         |
|               | 600   | 45.59 [1158.0] | 15.94 [405.0] | 16.54 [420.0] | 13.11 [333.0] | 23.75 [603.2]   | 4XM30X3.5           | 1.50-8 UN       | 16        | 4         |
| 18 [450]      | 150   | 38.47 [977.0]  | 13.78 [350.0] | 15.55 [395.0] | 9.13 [232.0]  | 22.75 [577.9]   | 4X M20 X 2.50       | 1.125-8 UN      | 14        | 2         |
|               | 300   | 43.94 [1116.0] | 15.16 [385.0] | 17.13 [435.0] | 11.65 [296.0] | 24.75 [628.6]   | 4X M24 X 3.00       | 1.250-8 UN      | 20        | 4         |
|               | 600   | 50.79 [1290.0] | 17.99 [457.0] | 18.50 [470.0] | 14.29 [363.0] | 25.75 [654.0]   | 4XM30X3.5           | 1.625-8 UN      | 16        | 4         |
| 20 [500]      | 150   | 41.65 [1058.0] | 15.12 [384.0] | 16.93 [430.0] | 9.61 [244.0]  | 25.00 [635.0]   | 4X M20 X 2.50       | 1.125-8 UN      | 16        | 4         |
|               | 300   | 48.74 [1238.0] | 17.05 [433.0] | 18.70 [475.0] | 13.00 [330.0] | 27.00 [685.8]   | 4X M30 X 3.50       | 1.250-8 UN      | 20        | 4         |
|               | 600   | 54.49 [1384.0] | 19.17 [487.0] | 20.47 [520.0] | 14.84 [377.0] | 28.50 [723.9]   | 4XM36X4.0           | 1.625-8 UN      | 20        | 4         |
| 24 [600]      | 150   | 48.41 [1229.5] | 17.50 [444.5] | 19.29 [490.0] | 11.61 [295.0] | 29.50 [749.3]   | 4X M24 X 3.00       | 1.250-8 UN      | 16        | 4         |
|               | 300   | 55.71 [1415.0] | 19.37 [492.0] | 21.46 [545.0] | 14.88 [378.0] | 32.00 [812.8]   | 4X M30 X 3.50       | 1.500-8 UN      | 20        | 4         |
|               | 600   | 59.21 [1504.0] | 21.14 [537.0] | 22.24 [565.0] | 15.83 [402.0] | 33.00 [838.2]   | 4XM36X4.0           | 1.875-8 UN      | 20        | 4         |

All the dimensions are in Inch [Metric]

# Lug Pattern Dimensions: 3 to 24 in per API 609



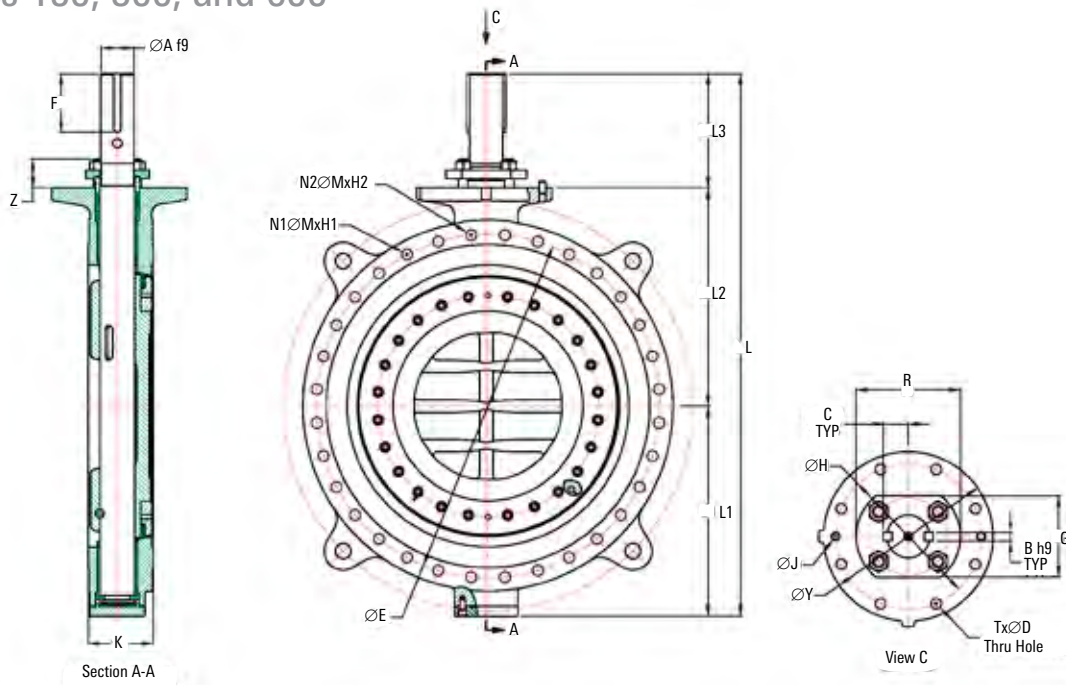
**Lug Pattern Dimensions: 3 to 24 in per API 609, ASME Class 150, 300, and 600**

| Size, in [mm] | Class | H1          | H2          | $\varnothing J$ | T             | U            | X             | Y            | Z            |
|---------------|-------|-------------|-------------|-----------------|---------------|--------------|---------------|--------------|--------------|
| 3 [80]        | 150   | 0.79 [20.0] | —           | —               | 2.54 [65.0]   | 1.77 [45.0]  | 4.33 [110.0]  | 1.57 [40.0]  | 1.70 [43.0]  |
|               | 300   | 0.79 [20.0] | —           | —               | 2.54 [65.0]   | 1.77 [45.0]  | 4.33 [110.0]  | 1.81 [46.0]  | 1.70 [43.0]  |
| 4 [100]       | 150   | 0.94 [24.0] | —           | —               | 2.54 [65.0]   | 1.77 [45.0]  | 4.33 [110.0]  | 1.65 [42.0]  | 1.70 [43.0]  |
|               | 300   | 0.94 [24.0] | —           | —               | 2.54 [65.0]   | 1.77 [45.0]  | 4.33 [110.0]  | 1.89 [48.0]  | 1.70 [43.0]  |
|               | 600   | 1.02 [26.0] | —           | —               | 3.47 [88.1]   | 2.17 [55.0]  | 6.50 [165.0]  | 2.28 [58.0]  | 2.09 [53.0]  |
| 6 [150]       | 150   | 0.94 [24.0] | —           | —               | 2.74 [70.0]   | 2.17 [55.0]  | 5.71 [145.0]  | 1.89 [48.0]  | 1.97 [50.0]  |
|               | 300   | 1.02 [26.0] | —           | —               | 3.47 [88.0]   | 2.17 [55.0]  | 6.50 [165.0]  | 2.13 [54.0]  | 2.17 [55.0]  |
|               | 600   | 1.30 [33.0] | 0.67 [17.1] | —               | 4.33 [109.9]  | 2.17 [55.0]  | 7.28 [185.0]  | 2.91 [74.0]  | 2.36 [60.0]  |
| 8 [200]       | 150   | 1.10 [28.0] | —           | —               | 3.55 [90.0]   | 2.17 [55.0]  | 6.50 [165.0]  | 2.13 [54.0]  | 2.28 [58.0]  |
|               | 300   | 0.98 [25.0] | —           | —               | 3.86 [98.0]   | 2.17 [55.0]  | 6.50 [165.0]  | 2.56 [65.0]  | 2.36 [60.0]  |
|               | 600   | 1.77 [45.0] | 0.79 [20.0] | 0.47 [12.0]     | 5.04 [128.0]  | 2.95 [75.0]  | 8.27 [210.0]  | 3.54 [90.0]  | 2.64 [67.0]  |
| 10 [250]      | 150   | 1.26 [32.0] | —           | —               | 4.07 [104.0]  | 2.17 [55.0]  | 6.50 [165.0]  | 2.44 [62.0]  | 2.36 [60.0]  |
|               | 300   | 1.18 [30.0] | 0.68 [17.3] | 0.47 [12.0]     | 4.75 [122.0]  | 2.76 [70.0]  | 7.68 [195.0]  | 2.76 [70.0]  | 2.56 [65.0]  |
|               | 600   | 1.89 [48.0] | 0.84 [21.3] | 0.47 [12.0]     | 6.30 [160.0]  | 3.35 [85.0]  | 10.63 [270.0] | 4.13 [105.0] | 3.03 [77.0]  |
| 12 [300]      | 150   | 1.26 [32.0] | —           | —               | 4.08 [104.0]  | 2.76 [70.0]  | 7.68 [195.0]  | 2.80 [71.0]  | 2.64 [67.0]  |
|               | 300   | 1.38 [35.0] | 0.79 [20.0] | 0.47 [12.0]     | 4.25 [108.0]  | 3.74 [95.0]  | 8.07 [205.0]  | 3.07 [78.0]  | 2.76 [70.0]  |
|               | 600   | 1.97 [50.0] | 0.84 [21.3] | 0.63 [16.0]     | 6.10 [155.0]  | 3.94 [100.0] | 13.78 [350.0] | 5.59 [142.0] | 2.95 [75.0]  |
| 14 [350]      | 150   | 1.50 [38.0] | —           | 0.47 [12.0]     | 4.92 [125.0]  | 3.74 [95.0]  | 8.07 [205.0]  | 3.19 [81.0]  | 3.07 [78.0]  |
|               | 300   | 1.65 [42.0] | 0.79 [20.0] | 0.47 [12.0]     | 5.71 [144.0]  | 5.51 [140.0] | 10.63 [270.0] | 3.94 [100.0] | 3.07 [78.0]  |
|               | 600   | 2.05 [52.0] | 0.94 [24.0] | 0.63 [16.0]     | 7.09 [180.0]  | 5.12 [130.0] | 13.78 [350.0] | 5.43 [138.0] | 3.27 [83.0]  |
| 16 [400]      | 150   | 1.38 [35.0] | —           | 0.47 [12.0]     | 5.00 [127.0]  | 3.94 [100.0] | 8.07 [205.0]  | 3.62 [92.0]  | 3.15 [80.0]  |
|               | 300   | 1.89 [48.0] | 0.87 [22.0] | 0.63 [16.0]     | 5.63 [143.0]  | 5.71 [145.0] | 13.78 [350.0] | 5.12 [130.0] | 3.35 [85.0]  |
|               | 600   | 2.24 [57.0] | 1.02 [26.0] | 0.87 [22.0]     | 8.27 [210.0]  | 5.91 [150.0] | 16.38 [416.0] | 6.38 [162.0] | 3.70 [94.0]  |
| 18 [450]      | 150   | 1.73 [44.0] | 0.79 [20.0] | 0.47 [12.0]     | 5.31 [136.0]  | 4.72 [120.0] | 10.63 [270.0] | 3.70 [94.0]  | 3.27 [83.0]  |
|               | 300   | 1.89 [48.0] | 0.87 [22.0] | 0.63 [16.0]     | 5.91 [150.0]  | 6.30 [160.0] | 13.78 [350.0] | 5.12 [130.0] | 3.39 [86.0]  |
|               | 600   | 2.56 [65.0] | 1.10 [28.0] | 0.87 [22.0]     | 9.84 [250.0]  | 7.28 [185.0] | 16.34 [415.0] | 7.24 [184.0] | 3.94 [100.0] |
| 20 [500]      | 150   | 1.77 [45.0] | 0.71 [18.0] | 0.47 [12.0]     | 6.97 [177.0]  | 4.72 [120.0] | 10.63 [270.0] | 4.21 [107.0] | 3.50 [89.0]  |
|               | 300   | 1.89 [48.0] | 0.87 [22.0] | 0.87 [22.0]     | 7.48 [190.0]  | 6.50 [165.0] | 16.73 [425.0] | 5.51 [140.0] | 3.46 [88.0]  |
|               | 600   | 2.56 [65.0] | 1.18 [30.0] | 0.87 [22.0]     | 10.04 [255.0] | 7.28 [185.0] | 19.69 [500.0] | 7.87 [200.0] | 4.13 [105.0] |
| 24 [600]      | 150   | 1.77 [45.0] | 0.87 [22.0] | 0.63 [16.0]     | 7.48 [190.0]  | 6.50 [165.0] | 13.78 [350.0] | 5.04 [128.0] | 3.35 [85.0]  |
|               | 300   | 2.24 [57.0] | 1.02 [26.0] | 0.87 [22.0]     | 7.48 [190.0]  | 8.07 [205.0] | 16.34 [415.0] | 5.91 [150.0] | 3.54 [90.0]  |
|               | 600   | 2.83 [72.0] | 1.26 [32.0] | 0.87 [22.0]     | 11.02 [280.0] | 8.66 [220.0] | 18.70 [475.0] | 8.46 [215.0] | 4.72 [120.0] |

All the dimensions are in Inch [Metric]

# Lug Pattern Dimensions: 26 to 48 in per API 609

ASME Class 150, 300, and 600

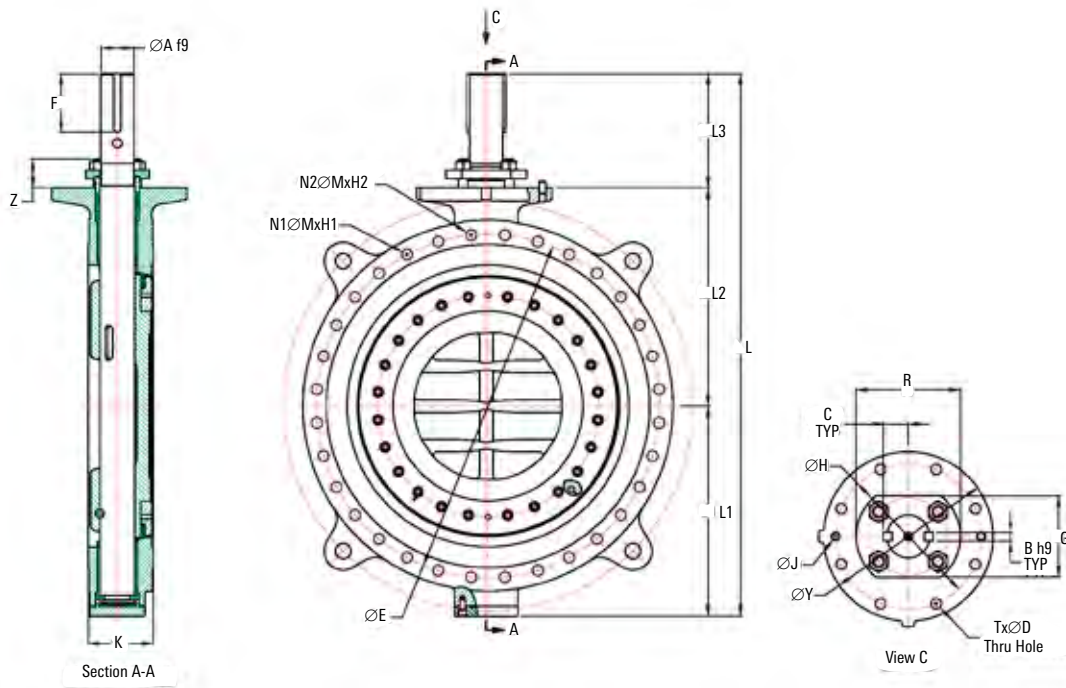


Lug Pattern Dimensions: 26 to 48 in per API 609, ASME Class 150, 300, and 600

| Size, in [mm] | Class | ØA f9        | B h9        | C +0.000/-0.006 [+0.00/-0.15] | Flange Type | ØY            | T x ØD THRU HOLE | ØH            | ØJ          | R             | G             | L                |
|---------------|-------|--------------|-------------|-------------------------------|-------------|---------------|------------------|---------------|-------------|---------------|---------------|------------------|
| 26 [650]      | 150   | 3.15 [80.0]  | 0.79 [20.0] | 1.89 [48.0]                   | F30         | 13.78 [350.0] | 8 x M20          | 11.73 [298.0] | 0.61 [15.5] | 8.86 [225.0]  | 7.09 [180.0]  | 52.76 [1,340.0]  |
|               | 300   | 3.94 [100.0] | 0.87 [22.0] | 2.32 [59.0]                   | F40         | 18.70 [475.0] | 8 x M36          | 15.98 [406.0] | 0.87 [22.0] | 10.24 [260.0] | 7.87 [200.0]  | 58.66 [1,490.0]  |
|               | 600   | 5.31 [135.0] | 1.26 [32.0] | 3.17 [80.5]                   | F48         | 22.05 [560.0] | 12 x M36         | 19.02 [483.0] | 0.98 [25.0] | 12.60 [320.0] | 9.06 [230.0]  | 67.72 [1,720.0]  |
| 30 [750]      | 150   | 3.35 [85.0]  | 0.87 [22.0] | 2.03 [51.5]                   | F35         | 16.34 [415.0] | 8 x M30          | 14.02 [356.0] | 0.87 [22.0] | 8.27 [210.0]  | 5.91 [150.0]  | 61.50 [1,562.0]  |
|               | 300   | 4.53 [115.0] | 1.10 [28.0] | 2.70 [68.5]                   | F40         | 18.70 [475.0] | 8 x M36          | 15.98 [406.0] | 0.87 [22.0] | 11.42 [290.0] | 8.66 [220.0]  | 67.20 [1,707.0]  |
|               | 600   | 5.71 [145.0] | 1.42 [36.0] | 3.41 [86.5]                   | F48         | 22.05 [560.0] | 12 x M36         | 19.02 [483.0] | 0.98 [25.0] | 12.99 [330.0] | 9.29 [236.0]  | 72.64 [1,845.0]  |
| 32 [800]      | 150   | 3.54 [90.0]  | 0.87 [22.0] | 2.13 [54.0]                   | F35         | 16.34 [415.0] | 8 x M30          | 14.02 [356.0] | 0.87 [22.0] | 8.46 [215.0]  | 6.14 [156.0]  | 62.72 [1,593.0]  |
|               | 300   | 5.12 [130.0] | 1.10 [28.0] | 2.99 [76.0]                   | F40         | 18.70 [475.0] | 8 x M36          | 15.98 [406.0] | 0.87 [22.0] | 11.02 [280.0] | 8.46 [215.0]  | 69.88 [1,775.0]  |
|               | 600   | 6.89 [175.0] | 1.42 [36.0] | 4.00 [101.5]                  | F48         | 22.05 [560.0] | 12 x M36         | 19.02 [483.0] | 0.98 [25.0] | 14.37 [365.0] | 10.63 [270.0] | 77.17 [1,960.0]  |
| 36 [900]      | 150   | 4.13 [105.0] | 0.87 [22.0] | 2.42 [61.5]                   | F35         | 16.34 [415.0] | 8 x M30          | 14.02 [356.0] | 0.87 [22.0] | 10.04 [255.0] | 7.87 [200.0]  | 67.48 [1,714.0]  |
|               | 300   | 5.51 [140.0] | 1.10 [28.0] | 3.19 [81.0]                   | F48         | 22.05 [560.0] | 12 x M36         | 19.02 [483.0] | 0.96 [24.5] | 12.80 [325.0] | 9.06 [230.0]  | 75.59 [1,920.0]  |
|               | 600   | 7.68 [195.0] | 1.77 [45.0] | 4.51 [114.5]                  | F60         | 27.01 [686.0] | 20 x M36         | 23.74 [603.0] | 1.18 [30.0] | 15.75 [400.0] | 11.18 [284.0] | 84.84 [2,155.0]  |
| 40 [1,000]    | 150   | 4.53 [115.0] | 1.10 [28.0] | 2.70 [68.5]                   | F40         | 18.70 [475.0] | 8 x M36          | 15.98 [406.0] | 0.87 [22.0] | 11.42 [290.0] | 8.66 [220.0]  | 74.21 [1,885.0]  |
|               | 300   | 6.30 [160.0] | 1.42 [36.0] | 3.70 [94.0]                   | F48         | 22.05 [560.0] | 12 x M36         | 19.02 [483.0] | 0.98 [25.0] | 12.80 [325.0] | 9.84 [250.0]  | 79.13 [2,010.0]  |
|               | 600   | 8.46 [215.0] | 1.77 [45.0] | 4.90 [124.5]                  | F60         | 27.01 [686.0] | 20 x M36         | 23.74 [603.0] | 1.18 [30.0] | 18.11 [460.0] | 13.86 [352.0] | 89.96 [2,285.0]  |
| 42 [1,050]    | 150   | 5.12 [130.0] | 1.10 [28.0] | 3.09 [78.5]                   | F40         | 18.70 [475.0] | 8 x M36          | 15.98 [406.0] | 0.87 [22.0] | 11.02 [280.0] | 8.46 [215.0]  | 78.35 [1,990.0]  |
|               | 300   | 6.30 [160.0] | 1.42 [36.0] | 3.70 [94.0]                   | F48         | 22.05 [560.0] | 12 x M36         | 19.02 [483.0] | 0.98 [25.0] | 12.80 [325.0] | 9.84 [250.0]  | 82.36 [2,092.0]  |
|               | 600   | 8.66 [220.0] | 1.77 [45.0] | 5.00 [127.0]                  | F60         | 27.01 [686.0] | 20 x M36         | 23.74 [603.0] | 1.18 [30.0] | 18.11 [460.0] | 13.39 [340.0] | 93.90 [2,385.0]  |
| 46 [1,150]    | 150   | 5.51 [140.0] | 1.10 [28.0] | 3.19 [81.0]                   | F40         | 18.70 [475.0] | 8 x M36          | 15.98 [406.0] | 0.87 [22.0] | 11.42 [290.0] | 8.66 [220.0]  | 82.09 [2,085.0]  |
|               | 300   | 6.69 [170.0] | 1.10 [28.0] | 3.78 [96.0]                   | F60         | 27.01 [686.0] | 20 x M36         | 23.74 [603.0] | 1.18 [30.0] | 14.37 [365.0] | 9.84 [250.0]  | 89.96 [2,285.0]  |
|               | 600   | 9.25 [235.0] | 1.77 [45.0] | 5.30 [134.5]                  | F60         | 27.01 [686.0] | 20 x M36         | 23.74 [603.0] | 1.18 [30.0] | 19.09 [485.0] | 14.96 [380.0] | 100.24 [2,546.0] |
| 48 [1,200]    | 150   | 5.91 [150.0] | 1.42 [36.0] | 3.50 [89.0]                   | F40         | 18.70 [475.0] | 8 x M36          | 15.98 [406.0] | 0.87 [22.0] | 11.61 [295.0] | 9.29 [236.0]  | 83.27 [2,115.0]  |
|               | 300   | 6.69 [170.0] | 1.10 [28.0] | 3.78 [96.0]                   | F60         | 27.01 [686.0] | 20 x M36         | 23.74 [603.0] | 1.18 [30.0] | 14.37 [365.0] | 9.84 [250.0]  | 90.55 [2,300.0]  |
|               | 600   | 9.25 [235.0] | 1.77 [45.0] | 5.30 [134.5]                  | F60         | 27.01 [686.0] | 20 x M36         | 23.74 [603.0] | 1.18 [30.0] | 19.09 [485.0] | 14.96 [380.0] | 101.81 [2,586.0] |

All the dimensions are in Inch [Metric]

## Lug Pattern Dimensions: 26 to 48 in per API 609



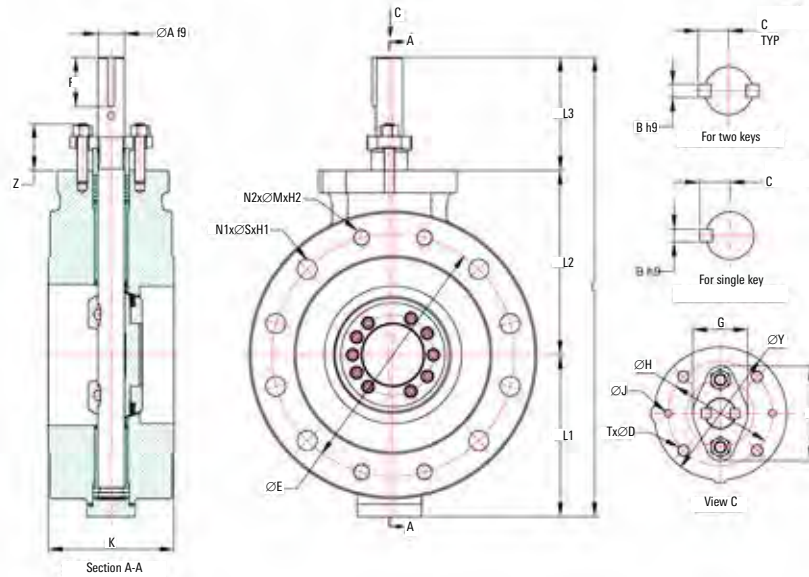
Lug Pattern Dimensions: 26 to 48 in per API 609, ASME Class 150, 300, and 600

| Size,<br>in [mm] | Class | L1            | L2              | L3            | ØE              | N1<br>(No's) | ØM         | H1          | N2<br>(No's) | H2          | K             | F             | Z            |
|------------------|-------|---------------|-----------------|---------------|-----------------|--------------|------------|-------------|--------------|-------------|---------------|---------------|--------------|
| 26 [650]         | 150   | 19.76 [502.0] | 21.65 [550.0]   | 11.34 [288.0] | 31.75 [806.4]   | 20           | 1.250-8 UN | 1.57 [40.0] | 4            | 1.06 [27.0] | 6.69 [170.0]  | 5.91 [150.0]  | 3.74 [95.0]  |
|                  | 300   | 21.57 [548.0] | 23.62 [600.0]   | 13.46 [342.0] | 34.50 [876.3]   | 24           | 1.625-8 UN | 2.05 [52.0] | 4            | 1.18 [30.0] | 8.27 [210.0]  | 5.91 [150.0]  | 4.13 [105.0] |
|                  | 600   | 25.79 [655.0] | 25.39 [645.0]   | 16.54 [420.0] | 36.00 [914.4]   | 20           | 1.875-8 UN | 2.52 [64.0] | 8            | 1.57 [40.0] | 11.50 [292.0] | 7.87 [200.0]  | 5.12 [130.0] |
| 30 [750]         | 150   | 23.31 [592.0] | 25.28 [642.0]   | 12.91 [328.0] | 36.00 [914.4]   | 24           | 1.250-8 UN | 1.57 [40.0] | 4            | 0.87 [22.0] | 6.69 [170.0]  | 5.91 [150.0]  | 3.70 [94.0]  |
|                  | 300   | 25.04 [636.0] | 26.54 [674.0]   | 15.63 [397.0] | 39.25 [997.0]   | 24           | 1.750-8 UN | 2.20 [56.0] | 4            | 1.26 [32.0] | 9.25 [235.0]  | 8.66 [220.0]  | 4.53 [115.0] |
|                  | 600   | 28.35 [720.0] | 27.76 [705.0]   | 16.54 [420.0] | 40.25 [1022.4]  | 20           | 2.000-8 UN | 2.60 [66.0] | 8            | 1.57 [40.0] | 12.52 [318.0] | 7.87 [200.0]  | 4.92 [125.0] |
| 32 [800]         | 150   | 23.94 [608.0] | 25.98 [660.0]   | 12.80 [325.0] | 38.50 [977.9]   | 24           | 1.500-8 UN | 1.97 [50.0] | 4            | 1.57 [40.0] | 9.06 [230.0]  | 5.91 [150.0]  | 3.94 [100.0] |
|                  | 300   | 26.10 [663.0] | 27.56 [700.0]   | 16.22 [412.0] | 41.50 [1,054.1] | 24           | 1.875-8 UN | 2.44 [62.0] | 4            | 1.26 [32.0] | 9.49 [241.0]  | 8.66 [220.0]  | 4.72 [120.0] |
|                  | 600   | 30.12 [765.0] | 30.51 [775.0]   | 16.54 [420.0] | 42.50 [1,079.5] | 20           | 2.250-8 UN | 3.15 [80.0] | 8            | 1.57 [40.0] | 12.60 [320.0] | 7.87 [200.0]  | 5.91 [150.0] |
| 36 [900]         | 150   | 26.14 [664.0] | 27.17 [690.0]   | 14.17 [360.0] | 42.75 [1,085.8] | 28           | 1.500-8 UN | 1.97 [50.0] | 4            | 1.10 [28.0] | 8.07 [205.0]  | 7.28 [185.0]  | 3.74 [95.0]  |
|                  | 300   | 29.06 [738.0] | 29.72 [755.0]   | 16.81 [427.0] | 46.00 [1,168.4] | 26           | 2.000-8 UN | 2.58 [65.5] | 6            | 1.35 [34.3] | 9.69 [246.0]  | 8.66 [220.0]  | 4.72 [120.0] |
|                  | 600   | 32.72 [831.0] | 32.48 [825.0]   | 19.65 [499.0] | 47.00 [1,193.8] | 24           | 2.500-8 UN | 3.19 [81.0] | 4            | 1.69 [43.0] | 13.07 [332.0] | 10.63 [270.0] | 6.69 [170.0] |
| 40 [1,000]       | 150   | 28.07 [713.0] | 29.92 [760.0]   | 16.22 [412.0] | 47.25 [1,200.2] | 32           | 1.500-8 UN | 1.97 [50.0] | 4            | 1.02 [26.0] | 9.21 [234.0]  | 8.66 [220.0]  | 4.72 [120.0] |
|                  | 300   | 30.12 [765.0] | 32.48 [825.0]   | 16.54 [420.0] | 45.50 [1,155.7] | 24           | 1.625-8 UN | 2.05 [52.0] | 8            | 1.18 [30.0] | 11.81 [300.0] | 7.87 [200.0]  | 4.92 [125.0] |
|                  | 600   | 33.66 [855.0] | 36.81 [935.0]   | 19.49 [495.0] | 47.75 [1,212.8] | 24           | 2.250-8 UN | 3.31 [84.0] | 8            | 1.77 [45.0] | 16.14 [410.0] | 10.63 [270.0] | 6.50 [165.0] |
| 42 [1,050]       | 150   | 30.91 [785.0] | 31.50 [800.0]   | 15.94 [405.0] | 49.50 [1,257.3] | 32           | 1.500-8 UN | 1.97 [50.0] | 4            | 1.10 [28.0] | 9.88 [251.0]  | 8.66 [220.0]  | 5.31 [135.0] |
|                  | 300   | 31.69 [805.0] | 34.65 [880.0]   | 16.02 [407.0] | 47.50 [1,206.5] | 28           | 1.625-8 UN | 2.13 [54.0] | 4            | 1.18 [30.0] | 11.81 [300.0] | 7.87 [200.0]  | 5.12 [130.0] |
|                  | 600   | 35.83 [910.0] | 38.39 [975.0]   | 19.69 [500.0] | 50.50 [1,282.7] | 24           | 2.500-8 UN | 3.74 [95.0] | 4            | 1.77 [45.0] | 16.14 [410.0] | 10.63 [270.0] | 6.69 [170.0] |
| 46 [1,150]       | 150   | 31.89 [810.0] | 33.86 [860.0]   | 16.34 [415.0] | 53.75 [1,365.2] | 36           | 1.500-8 UN | 1.97 [50.0] | 4            | 1.50 [38.0] | 10.87 [276.0] | 8.66 [220.0]  | 5.31 [135.0] |
|                  | 300   | 32.87 [835.0] | 37.40 [950.0]   | 19.69 [500.0] | 52.00 [1,320.8] | 24           | 1.875-8 UN | 2.36 [60.0] | 4            | 1.89 [48.0] | 13.78 [350.0] | 10.24 [260.0] | 5.12 [130.0] |
|                  | 600   | 37.80 [960.0] | 41.34 [1,050.0] | 21.10 [536.0] | 54.75 [1,390.6] | 24           | 2.500-8 UN | 3.78 [96.0] | 8            | 2.56 [65.0] | 18.50 [470.0] | 10.63 [270.0] | 6.50 [165.0] |
| 48 [1,200]       | 150   | 32.28 [820.0] | 35.63 [905.0]   | 15.35 [390.0] | 56.00 [1,422.4] | 36           | 1.500-8 UN | 2.28 [58.0] | 8            | 1.10 [28.0] | 11.02 [280.0] | 7.87 [200.0]  | 5.31 [135.0] |
|                  | 300   | 32.87 [835.0] | 37.99 [965.0]   | 19.69 [500.0] | 54.00 [1,371.6] | 28           | 1.875-8 UN | 2.36 [60.0] | 4            | 1.89 [48.0] | 13.78 [350.0] | 10.24 [260.0] | 5.12 [130.0] |
|                  | 600   | 38.98 [990.0] | 42.72 [1,085.0] | 20.12 [511.0] | 57.50 [1,460.5] | 24           | 2.750-8 UN | 3.46 [88.0] | 8            | 2.17 [55.0] | 18.50 [470.0] | 10.63 [270.0] | 6.50 [165.0] |

All the dimensions are in Inch [Metric]

# Short Pattern Dimensions: 3 to 24 in per ISO 5752/API 609

ASME Class 150, 300, and 600

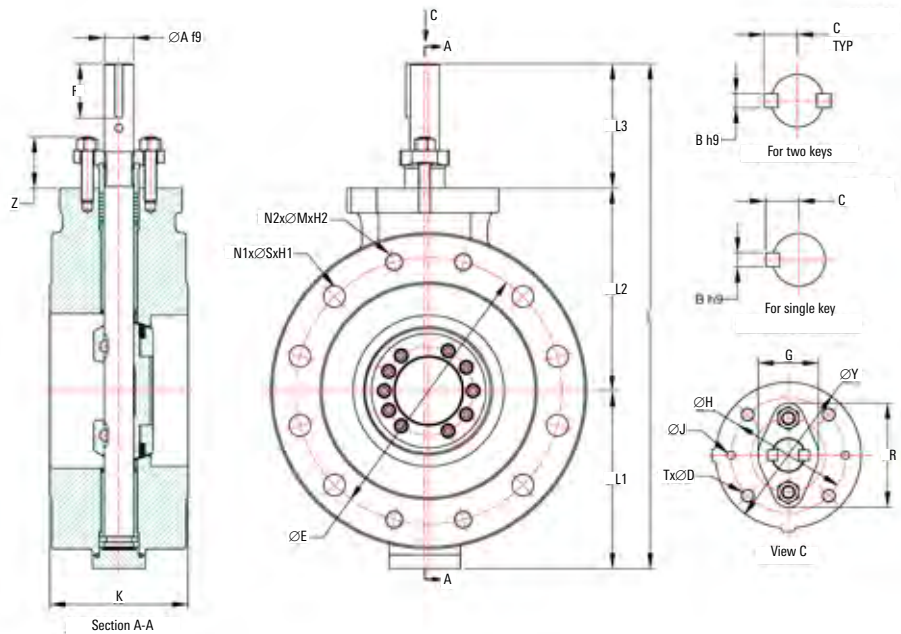


Short Pattern Dimensions: 3 to 24 in per ISO 5752/API 609, ASME Class 150, 300, and 600

| Size, in [mm] | Class | ØA f9        | B h9        | C +0.000/-0.006 [+0.00/-0.15] | NO. OF KEYS | FLANGE TYPE | ØY            | T x ØD THRU HOLE | ØH            | ØJ          |
|---------------|-------|--------------|-------------|-------------------------------|-------------|-------------|---------------|------------------|---------------|-------------|
| 3 [80]        | 150   | 0.83 [21.0]  | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | F07         | 3.54 [90.0]   | 4x8x1.25         | 2.76 [70.0]   | 0.24 [6.0]  |
|               | 300   | 0.83 [21.0]  | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | F07         | 3.54 [90.0]   | 4x8x1.25         | 2.76 [70.0]   | 0.24 [6.0]  |
| 4 [100]       | 150   | 0.83 [21.0]  | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | F07         | 3.54 [90.0]   | 4x8x1.25         | 2.76 [70.0]   | 0.24 [6.0]  |
|               | 300   | 0.83 [21.0]  | 0.24 [6.0]  | 0.51 [13.0]                   | 1           | F07         | 3.54 [90.0]   | 4x8x1.25         | 2.76 [70.0]   | 0.24 [6.0]  |
|               | 600   | 1.02 [26.0]  | 0.32 [8.0]  | 0.63 [16.0]                   | 1           | F12         | 5.91 [150.0]  | 4x12x1.75        | 4.92 [125.0]  | 0.39 [10.0] |
| 6 [150]       | 150   | 0.98 [25.0]  | 0.32 [8.0]  | 0.61 [15.5]                   | 1           | F10         | 4.92 [125.0]  | 4x10x1.50        | 4.02 [102.0]  | 0.39 [10.0] |
|               | 300   | 1.18 [30.0]  | 0.32 [8.0]  | 0.75 [19.0]                   | 1           | F12         | 5.91 [150.0]  | 4x12x1.75        | 4.92 [125.0]  | 0.39 [10.0] |
|               | 600   | 1.42 [36.0]  | 0.47 [12.0] | 0.91 [23.0]                   | 1           | F14         | 6.89 [175.0]  | 4x16x2.00        | 5.51 [140.0]  | 0.39 [10.0] |
| 8 [200]       | 150   | 1.26 [32.0]  | 0.32 [8.0]  | 0.75 [19.0]                   | 1           | F12         | 5.91 [150.0]  | 4x12x1.75        | 4.92 [125.0]  | 0.39 [10.0] |
|               | 300   | 1.50 [38.0]  | 0.39 [10.0] | 0.91 [23.0]                   | 2           | F14         | 6.89 [175.0]  | 4x16x2.00        | 5.51 [140.0]  | 0.39 [10.0] |
|               | 600   | 1.81 [46.0]  | 0.55 [14.0] | 1.10 [28.0]                   | 2           | F16         | 8.27 [210.0]  | 4x20x2.5         | 6.50 [165.0]  | 0.47 [12.0] |
| 10 [250]      | 150   | 1.42 [36.0]  | 0.39 [10.0] | 0.87 [22.0]                   | 1           | F12         | 5.91 [150.0]  | 4x12x1.75        | 4.92 [125.0]  | 0.39 [10.0] |
|               | 300   | 1.58 [40.0]  | 0.47 [12.0] | 0.97 [24.5]                   | 2           | F16         | 8.27 [210.0]  | 4x20x2.50        | 6.50 [165.0]  | 0.47 [12.0] |
|               | 600   | 2.17 [55.0]  | 0.63 [16.0] | 1.32 [33.5]                   | 2           | F25         | 11.81 [300.0] | 8x16x2.0         | 10.00 [254.0] | 0.47 [12.0] |
| 12 [300]      | 150   | 1.65 [42.0]  | 0.47 [12.0] | 1.00 [25.5]                   | 1           | F14         | 6.89 [175.0]  | 4x16x2.00        | 5.51 [140.0]  | 0.39 [10.0] |
|               | 300   | 1.81 [46.0]  | 0.55 [14.0] | 1.10 [28.0]                   | 2           | F16         | 8.27 [210.0]  | 4x20x2.50        | 6.50 [165.0]  | 0.47 [12.0] |
|               | 600   | 2.56 [65.0]  | 0.71 [18.0] | 1.56 [39.5]                   | 2           | F30         | 13.78 [350.0] | 8x20x2.5         | 11.73 [298.0] | 0.63 [16.0] |
| 14 [350]      | 150   | 1.77 [45.0]  | 0.55 [14.0] | 1.10 [28.0]                   | 2           | F16         | 8.27 [210.0]  | 4x20x2.5         | 6.50 [165.0]  | 0.47 [12.0] |
|               | 300   | 2.17 [55.0]  | 0.63 [16.0] | 1.32 [33.5]                   | 2           | F25         | 11.81 [300.0] | 8x16x2.0         | 10.00 [254.0] | 0.47 [12.0] |
|               | 600   | 2.95 [75.0]  | 0.79 [20.0] | 1.79 [45.5]                   | 2           | F30         | 13.78 [350.0] | 8x20x2.5         | 11.73 [298.0] | 0.63 [16.0] |
| 16 [400]      | 150   | 1.97 [50.0]  | 0.63 [16.0] | 1.22 [31.0]                   | 2           | F16         | 8.27 [210.0]  | 4x20x2.5         | 6.50 [165.0]  | 0.47 [12.0] |
|               | 300   | 2.56 [65.0]  | 0.71 [18.0] | 1.56 [39.5]                   | 2           | F30         | 13.78 [350.0] | 8x20x2.5         | 11.73 [298.0] | 0.63 [16.0] |
|               | 600   | 3.35 [85.0]  | 0.87 [22.0] | 2.03 [51.5]                   | 2           | F35         | 16.34 [415.0] | 8x30x3.5         | 14.02 [356.0] | 0.87 [22.0] |
| 18 [450]      | 150   | 2.28 [58.0]  | 0.71 [18.0] | 1.42 [36.0]                   | 2           | F25         | 11.81 [300.0] | 8x16x2.0         | 10.00 [254.0] | 0.47 [12.0] |
|               | 300   | 2.76 [70.0]  | 0.79 [20.0] | 1.73 [44.0]                   | 2           | F30         | 13.78 [350.0] | 8x20x2.5         | 11.73 [298.0] | 0.63 [16.0] |
|               | 600   | 3.74 [95.0]  | 0.87 [22.0] | 2.22 [56.5]                   | 2           | F35         | 16.34 [415.0] | 8x30x3.5         | 14.02 [356.0] | 0.87 [22.0] |
| 20 [500]      | 150   | 2.68 [68.0]  | 0.71 [18.0] | 1.61 [41.0]                   | 2           | F25         | 11.81 [300.0] | 8x16x2.0         | 10.00 [254.0] | 0.47 [12.0] |
|               | 300   | 3.07 [78.0]  | 0.87 [22.0] | 1.89 [48.0]                   | 2           | F35         | 16.34 [415.0] | 8x30x3.5         | 14.02 [356.0] | 0.87 [22.0] |
|               | 600   | 4.13 [105.0] | 0.87 [22.0] | 2.42 [61.5]                   | 2           | F40         | 18.70 [475.0] | 8x36x4.0         | 15.98 [406.0] | 0.87 [22.0] |
| 24 [600]      | 150   | 3.07 [78.0]  | 0.87 [22.0] | 1.89 [48.0]                   | 2           | F30         | 13.78 [350.0] | 8x20x2.5         | 11.73 [298.0] | 0.63 [16.0] |
|               | 300   | 3.62 [92.0]  | 0.87 [22.0] | 2.17 [55.0]                   | 2           | F35         | 16.34 [415.0] | 8x30x3.5         | 14.02 [356.0] | 0.87 [22.0] |
|               | 600   | 5.12 [130.0] | 1.10 [28.0] | 3.19 [81.0]                   | 2           | F40         | 18.70 [475.0] | 8x36x4.0         | 15.98 [406.0] | 0.87 [22.0] |

All the dimensions are in Inch [Metric]

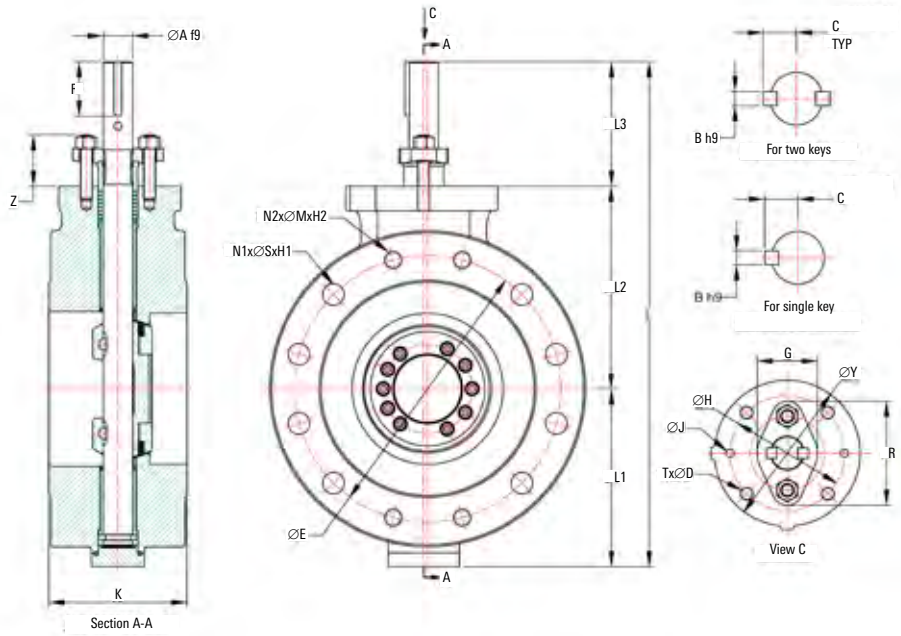
Short Pattern Dimensions: 3 to 24 in per ISO 5752/API 609



Short Pattern Dimensions: 3 to 24 in per ISO 5752/API 609, ASME Class 150, 300, and 600

| Size, in [mm] | Class | R             | G            | L               | L1            | L2            | L3            | ØE            | N1 (No's) | ØS            |
|---------------|-------|---------------|--------------|-----------------|---------------|---------------|---------------|---------------|-----------|---------------|
| 3 [80]        | 150   | 2.71 [69.0]   | 1.34 [34.0]  | 12.68 [322.0]   | 4.27 [108.5]  | 3.94 [100.0]  | 4.47 [113.5]  | 6.00 [152.4]  | 4         | .750 [19.00]  |
|               | 300   | 2.71 [69.0]   | 1.34 [34.0]  | 13.82 [351.0]   | 4.67 [118.5]  | 4.72 [120.0]  | 4.43 [112.5]  | 6.63 [168.3]  | 4         | .875 [22.00]  |
| 4 [100]       | 150   | 2.71 [69.0]   | 1.34 [34.0]  | 14.65 [372.0]   | 5.02 [127.5]  | 5.16 [131.0]  | 4.47 [113.5]  | 7.50 [190.5]  | 4         | .750 [19.00]  |
|               | 300   | 2.71 [69.0]   | 1.34 [34.0]  | 15.63 [397.0]   | 5.57 [141.5]  | 5.51 [140.0]  | 4.55 [115.5]  | 7.87 [200.0]  | 4         | .875 [22.00]  |
|               | 600   | 3.62 [92.0]   | 1.97 [50.0]  | 20.00 [508.0]   | 7.56 [192.0]  | 7.52 [191.0]  | 4.92 [125.0]  | 8.50 [215.9]  | 4         | 1.000 [25.40] |
| 6 [150]       | 150   | 3.03 [77.0]   | 1.77 [45.0]  | 17.09 [434.0]   | 5.87 [149.0]  | 6.30 [160.0]  | 4.92 [125.0]  | 9.50 [241.3]  | 4         | .875 [22.00]  |
|               | 300   | 3.62 [92.0]   | 1.97 [50.0]  | 20.12 [511.0]   | 7.09 [180.0]  | 8.07 [205.0]  | 4.96 [126.0]  | 10.63 [269.9] | 8         | .875 [22.00]  |
|               | 600   | 4.53 [115.0]  | 2.56 [65.0]  | 25.59 [650.0]   | 9.53 [242.0]  | 10.04 [255.0] | 6.02 [153.0]  | 11.50 [292.0] | 8         | 1.125 [29.00] |
| 8 [200]       | 150   | 3.70 [94.0]   | 1.97 [50.0]  | 19.76 [502.0]   | 7.09 [180.0]  | 7.76 [197.0]  | 4.92 [125.0]  | 11.75 [298.5] | 4         | .875 [22.00]  |
|               | 300   | 4.13 [105.0]  | 2.20 [56.0]  | 21.79 [553.5]   | 8.21 [208.5]  | 8.66 [220.0]  | 4.92 [125.0]  | 13.00 [330.2] | 8         | 1.000 [25.00] |
|               | 600   | 5.04 [128.0]  | 3.15 [80.0]  | 27.60 [701.0]   | 10.35 [263.0] | 10.71 [272.0] | 6.54 [166.0]  | 13.75 [349.2] | 8         | 1.250 [32.00] |
| 10 [250]      | 150   | 4.25 [108.0]  | 2.36 [60.0]  | 23.19 [589.0]   | 8.78 [223.0]  | 9.33 [237.0]  | 5.08 [129.0]  | 14.25 [362.0] | 8         | 1.000 [25.00] |
|               | 300   | 4.96 [126.0]  | 2.76 [70.0]  | 26.14 [664.0]   | 9.69 [246.0]  | 10.24 [260.0] | 6.22 [158.0]  | 15.25 [387.4] | 12        | 1.125 [29.00] |
|               | 600   | 6.30 [160.0]  | 3.94 [100.0] | 32.32 [821.0]   | 11.81 [300.0] | 12.20 [310.0] | 8.31 [211.0]  | 17.00 [431.8] | 12        | 1.375 [35.00] |
| 12 [300]      | 150   | 4.53 [115.0]  | 2.56 [65.0]  | 27.01 [686.0]   | 9.92 [252.0]  | 10.79 [274.0] | 6.30 [160.0]  | 17.00 [431.8] | 8         | 1.000 [25.00] |
|               | 300   | 4.72 [120.0]  | 2.95 [75.0]  | 30.31 [770.0]   | 11.10 [282.0] | 11.81 [300.0] | 7.40 [188.0]  | 17.75 [450.9] | 12        | 1.250 [32.00] |
|               | 600   | 6.10 [155.0]  | 4.33 [110.0] | 34.65 [880.0]   | 13.27 [337.0] | 13.39 [340.0] | 7.99 [203.0]  | 19.25 [489.0] | 16        | 1.375 [35.00] |
| 14 [350]      | 150   | 5.43 [138.0]  | 3.15 [80.0]  | 32.44 [824.0]   | 11.26 [286.0] | 13.00 [330.0] | 8.19 [208.0]  | 18.75 [476.3] | 8         | 1.125 [29.00] |
|               | 300   | 6.30 [160.0]  | 3.74 [95.0]  | 35.91 [912.0]   | 12.60 [320.0] | 13.78 [350.0] | 9.53 [242.0]  | 20.25 [514.4] | 16        | 1.250 [32.00] |
|               | 600   | 7.09 [180.0]  | 5.32 [135.0] | 39.84 [1,012.0] | 14.25 [362.0] | 14.88 [378.0] | 10.71 [272.0] | 20.75 [527.0] | 12        | 1.500 [38.00] |
| 16 [400]      | 150   | 5.51 [140.0]  | 3.23 [82.0]  | 35.28 [896.0]   | 12.52 [318.0] | 14.37 [365.0] | 8.39 [213.0]  | 21.25 [539.8] | 12        | 1.125 [29.00] |
|               | 300   | 6.50 [165.0]  | 3.94 [100.0] | 40.47 [1,028.0] | 13.94 [354.0] | 15.35 [390.0] | 11.18 [284.0] | 22.50 [571.5] | 16        | 1.375 [35.00] |
|               | 600   | 8.27 [210.0]  | 5.91 [150.0] | 45.59 [1,158.0] | 15.94 [405.0] | 16.54 [420.0] | 13.11 [333.0] | 23.75 [603.2] | 12        | 1.625 [42.00] |
| 18 [450]      | 150   | 5.88 [150.0]  | 3.54 [90.0]  | 38.47 [977.0]   | 13.78 [350.0] | 15.55 [395.0] | 9.13 [232.0]  | 22.75 [577.9] | 12        | 1.250 [32.00] |
|               | 300   | 7.09 [180.0]  | 4.13 [105.0] | 43.94 [1,116.0] | 15.16 [385.0] | 17.13 [435.0] | 11.65 [296.0] | 24.75 [628.6] | 20        | 1.375 [35.00] |
|               | 600   | 9.84 [250.0]  | 7.09 [180.0] | 50.79 [1,290.0] | 17.99 [457.0] | 18.50 [470.0] | 14.29 [363.0] | 25.75 [654.0] | 12        | 1.750 [44.50] |
| 20 [500]      | 150   | 7.28 [185.0]  | 4.13 [105.0] | 41.65 [1,058.0] | 15.12 [384.0] | 16.93 [430.0] | 9.61 [244.0]  | 25.00 [635.0] | 16        | 1.250 [32.00] |
|               | 300   | 5.50 [140.0]  | 7.48 [190.0] | 48.74 [1,238.0] | 17.05 [433.0] | 18.70 [475.0] | 13.00 [330.0] | 27.00 [685.8] | 20        | 1.375 [35.00] |
|               | 600   | 10.04 [255.0] | 7.87 [200.0] | 54.49 [1,384.0] | 19.17 [487.0] | 20.47 [520.0] | 14.84 [377.0] | 28.50 [723.9] | 16        | 1.750 [44.50] |
| 24 [600]      | 150   | 5.12 [130.0]  | 7.48 [190.0] | 48.41 [1,229.5] | 17.50 [444.5] | 19.29 [490.0] | 11.61 [295.0] | 29.50 [749.3] | 16        | 1.375 [35.00] |
|               | 300   | 5.91 [150.0]  | 7.48 [190.0] | 55.71 [1,415.0] | 19.37 [492.0] | 21.46 [545.0] | 14.88 [378.0] | 32.00 [812.8] | 20        | 1.625 [41.50] |
|               | 600   | 11.02 [280.0] | 8.47 [215.0] | 59.21 [1,504.0] | 21.14 [537.0] | 22.24 [565.0] | 15.83 [402.0] | 33.00 [838.2] | 16        | 2.000 [51.00] |

All the dimensions are in Inch [Metric]



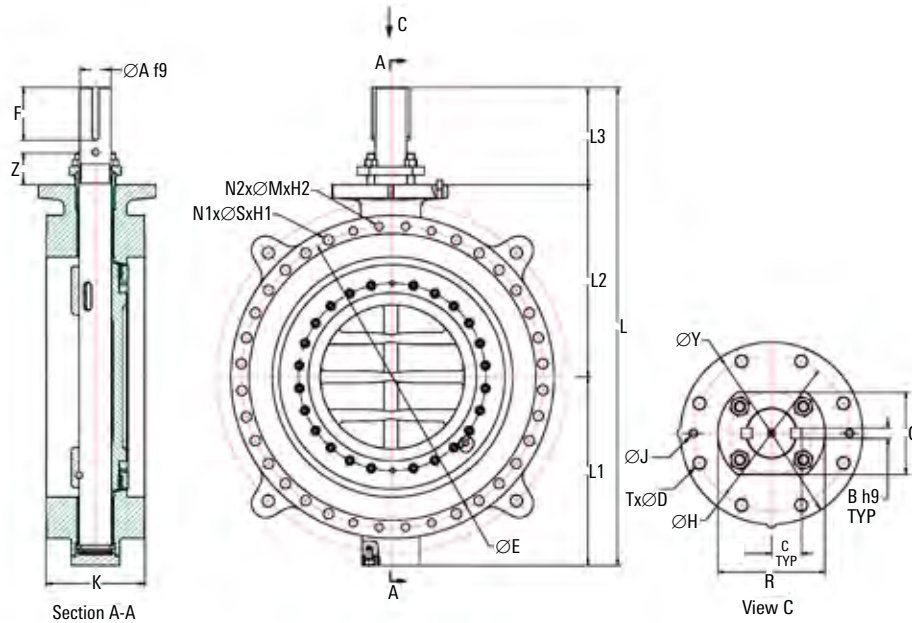
Short Pattern Dimensions: 3 to 24 in per ISO 5752/API 609, ASME Class 150, 300, and 600

| Size, in [mm] | Class | H1           | N2 (No's) | $\varnothing M$ | H2          | K             | F            | Z            |
|---------------|-------|--------------|-----------|-----------------|-------------|---------------|--------------|--------------|
| 3 [80]        | 150   | 0.71 [18.0]  | -         | -               | -           | 4.50 [114.0]  | 1.77 [45.0]  | 1.70 [43.0]  |
|               | 300   | 1.06 [27.0]  | 4         | .750-10 UNC     | 0.87 [22.0] | 4.50 [114.0]  | 1.77 [45.0]  | 1.70 [43.0]  |
| 4 [100]       | 150   | 0.91 [23.0]  | 4         | .625-11 UNC     | 0.91 [23.0] | 5.00 [127.0]  | 1.77 [45.0]  | 1.70 [43.0]  |
|               | 300   | 1.22 [31.0]  | 4         | .750-10 UNC     | 0.79 [20.0] | 5.00 [127.0]  | 1.77 [45.0]  | 1.70 [43.0]  |
| 6 [150]       | 600   | 1.54 [39.0]  | 4         | .875-9 UNC      | 1.10 [28.0] | 7.48 [190.0]  | 2.17 [55.0]  | 2.09 [53.0]  |
|               | 150   | 0.94 [24.0]  | 4         | .750-10 UNC     | 0.87 [22.0] | 5.50 [140.0]  | 2.17 [55.0]  | 1.97 [50.0]  |
| 8 [200]       | 300   | 1.38 [35.0]  | 4         | .750-10 UNC     | 0.87 [22.0] | 5.50 [140.0]  | 2.17 [55.0]  | 2.17 [55.0]  |
|               | 600   | 1.89 [48.0]  | 4         | 1.00-8 UNC      | 1.50 [38.0] | 8.27 [210.0]  | 2.17 [55.0]  | 2.36 [60.0]  |
| 10 [250]      | 150   | 1.06 [27.0]  | 4         | .750-10 UNC     | 0.94 [24.0] | 6.00 [152.0]  | 2.17 [55.0]  | 2.28 [58.0]  |
|               | 300   | 1.57 [40.0]  | 4         | .875-9 UNC      | 0.98 [25.0] | 6.00 [152.0]  | 2.17 [55.0]  | 2.36 [60.0]  |
| 12 [300]      | 600   | 2.20 [56.0]  | 4         | 1.125-8 UN      | 1.57 [40.0] | 9.06 [230.0]  | 2.95 [75.0]  | 2.64 [67.0]  |
|               | 150   | 1.14 [29.0]  | 4         | .875-9 UNC      | 1.02 [26.0] | 6.50 [165.0]  | 2.17 [55.0]  | 2.36 [60.0]  |
| 14 [350]      | 300   | 1.85 [47.0]  | 4         | 1.000-8 UNC     | 1.18 [30.0] | 6.50 [165.0]  | 2.76 [70.0]  | 2.56 [65.0]  |
|               | 600   | 2.52 [64.0]  | 4         | 1.250-8 UN      | 1.89 [48.0] | 9.84 [250.0]  | 3.35 [85.0]  | 3.03 [77.0]  |
| 16 [400]      | 150   | 1.22 [31.0]  | 4         | .875-9 UNC      | 1.02 [26.0] | 7.00 [178.0]  | 2.76 [70.0]  | 2.64 [67.0]  |
|               | 300   | 1.97 [50.0]  | 4         | 1.125-8 UN      | 1.38 [35.0] | 7.00 [178.0]  | 3.74 [95.0]  | 2.76 [70.0]  |
| 18 [450]      | 600   | 2.64 [67.0]  | 4         | 1.250-8 UN      | 1.77 [45.0] | 10.63 [270.0] | 3.94 [100.0] | 2.95 [75.0]  |
|               | 150   | 1.38 [35.0]  | 4         | 1.000-8 UNC     | 1.50 [38.0] | 7.48 [190.0]  | 3.74 [95.0]  | 3.07 [78.0]  |
| 20 [500]      | 300   | 2.13 [54.0]  | 4         | 1.125-8 UN      | 1.57 [40.0] | 7.48 [190.0]  | 5.51 [140.0] | 3.07 [78.0]  |
|               | 600   | 2.76 [70.0]  | 8         | 1.375-8 UN      | 2.05 [52.0] | 11.42 [290.0] | 5.12 [130.0] | 3.27 [83.0]  |
| 24 [600]      | 150   | 1.46 [37.0]  | 4         | 1.000-8 UNC     | 1.50 [38.0] | 8.50 [216.0]  | 3.94 [100.0] | 3.15 [80.0]  |
|               | 300   | 2.28 [58.0]  | 4         | 1.250-8 UN      | 1.57 [40.0] | 8.50 [216.0]  | 5.71 [145.0] | 3.35 [85.0]  |
| 30 [750]      | 600   | 3.03 [77.0]  | 8         | 1.50-8 UN       | 2.28 [58.0] | 12.20 [310.0] | 5.91 [150.0] | 3.70 [94.0]  |
|               | 150   | 1.57 [40.0]  | 4         | 1.125-8 UN      | 1.57 [40.0] | 8.74 [222.0]  | 4.72 [120.0] | 3.27 [83.0]  |
| 36 [900]      | 300   | 2.40 [61.0]  | 4         | 1.250-8 UN      | 1.57 [40.0] | 8.74 [222.0]  | 6.30 [160.0] | 3.39 [86.0]  |
|               | 600   | 3.27 [83.0]  | 8         | 1.625-8 UN      | 2.16 [55.0] | 12.99 [330.0] | 7.28 [185.0] | 3.94 [100.0] |
| 42 [1050]     | 150   | 1.69 [43.0]  | 4         | 1.125-8 UN      | 1.77 [45.0] | 9.02 [229.0]  | 4.72 [120.0] | 3.50 [89.0]  |
|               | 300   | 2.52 [64.0]  | 4         | 1.250-8 UN      | 1.57 [40.0] | 9.02 [229.0]  | 6.50 [165.0] | 3.46 [88.0]  |
| 48 [1200]     | 600   | 3.54 [90.0]  | 8         | 1.625-8 UN      | 2.05 [52.0] | 13.78 [350.0] | 7.28 [185.0] | 4.13 [105.0] |
|               | 150   | 1.89 [48.0]  | 4         | 1.250-8 UN      | 1.57 [40.0] | 10.51 [267.0] | 6.50 [165.0] | 3.35 [85.0]  |
| 54 [1350]     | 300   | 2.76 [70.0]  | 4         | 1.500-8 UN      | 1.97 [50.0] | 10.51 [267.0] | 8.07 [205.0] | 3.54 [90.0]  |
|               | 600   | 4.02 [102.0] | 8         | 1.875-8 UN      | 2.36 [60.0] | 15.35 [390.0] | 8.66 [220.0] | 4.72 [120.0] |

All the dimensions are in Inch [Metric]

# Short Pattern Dimensions: 26 to 60 in per ISO 5752/API 609

ASME Class 150, 300, and 600

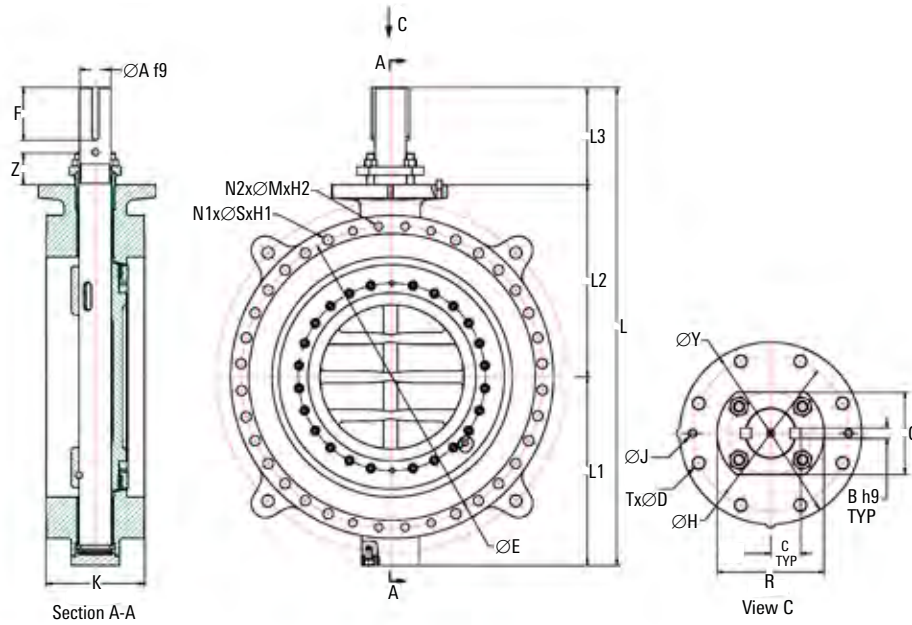


Short Pattern Dimensions: 26 to 60 in per ISO 5752/API 609, ASME Class 150, 300, and 600

| Size,<br>in [mm] | Class | ØA f9        | B h9        | C +0.000/-0.006<br>[+0.00/-0.15] | Flange<br>Type | ØY            | T x ØD<br>THRU HOLE | ØH            | ØJ          | R             | G             | L                |
|------------------|-------|--------------|-------------|----------------------------------|----------------|---------------|---------------------|---------------|-------------|---------------|---------------|------------------|
| 26 [650]         | 150   | 3.15 [80.0]  | 0.79 [20.0] | 1.89 [48.0]                      | F30            | 13.78 [350.0] | 8 X M20             | 11.73 [298.0] | 0.61 [15.5] | 8.86 [225.0]  | 7.09 [180.0]  | 52.76 [1,340.0]  |
|                  | 300   | 3.94 [100.0] | 0.87 [22.0] | 2.32 [59.0]                      | F40            | 18.70 [475.0] | 8 x M36             | 15.98 [406.0] | 0.87 [22.0] | 10.24 [260.0] | 7.87 [200.0]  | 58.66 [1,490.0]  |
|                  | 600   | 5.31 [135.0] | 1.26 [32.0] | 3.17 [80.5]                      | F48            | 22.05 [560.0] | 12 x M36            | 19.02 [483.0] | 0.98 [25.0] | 12.60 [320.0] | 9.06 [230.0]  | 67.72 [1,720.0]  |
| 30 [750]         | 150   | 3.35 [85.0]  | 0.87 [22.0] | 2.03 [51.5]                      | F35            | 16.34 [415.0] | 8 X M30             | 14.02 [356.0] | 0.87 [22.0] | 8.27 [210.0]  | 5.91 [150.0]  | 61.50 [1,562.0]  |
|                  | 300   | 4.53 [115.0] | 1.10 [28.0] | 2.70 [68.5]                      | F40            | 18.70 [475.0] | 8 x M36             | 15.98 [406.0] | 0.87 [22.0] | 11.42 [290.0] | 8.66 [220.0]  | 67.20 [1,707.0]  |
|                  | 600   | 5.71 [145.0] | 1.42 [36.0] | 3.41 [86.5]                      | F48            | 22.05 [560.0] | 12 x M36            | 19.02 [483.0] | 0.98 [25.0] | 12.99 [330.0] | 9.29 [236.0]  | 72.64 [1,845.0]  |
| 32 [800]         | 150   | 3.54 [90.0]  | 0.87 [22.0] | 2.13 [54.0]                      | F35            | 16.34 [415.0] | 8 X M30             | 14.02 [356.0] | 0.87 [22.0] | 8.46 [215.0]  | 6.14 [156.0]  | 62.72 [1,593.0]  |
|                  | 300   | 5.12 [130.0] | 1.10 [28.0] | 2.99 [76.0]                      | F40            | 18.70 [475.0] | 8 x M36             | 15.98 [406.0] | 0.87 [22.0] | 11.02 [280.0] | 8.46 [215.0]  | 69.88 [1,775.0]  |
|                  | 600   | 6.89 [175.0] | 1.42 [36.0] | 4.00 [101.5]                     | F48            | 22.05 [560.0] | 12 x M36            | 19.02 [483.0] | 0.98 [25.0] | 14.37 [365.0] | 10.63 [270.0] | 77.17 [1,960.0]  |
| 36 [900]         | 150   | 4.13 [105.0] | 0.87 [22.0] | 2.42 [61.5]                      | F35            | 16.34 [415.0] | 8 X M30             | 14.02 [356.0] | 0.87 [22.0] | 10.04 [255.0] | 7.87 [200.0]  | 67.48 [1,714.0]  |
|                  | 300   | 5.51 [140.0] | 1.10 [28.0] | 3.19 [81.0]                      | F48            | 22.05 [560.0] | 12 x M36            | 19.02 [483.0] | 0.96 [24.5] | 12.80 [325.0] | 9.06 [230.0]  | 75.59 [1,920.0]  |
|                  | 600   | 7.68 [195.0] | 1.77 [45.0] | 4.51 [114.5]                     | F60            | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 15.75 [400.0] | 11.18 [284.0] | 84.84 [2,155.0]  |
| 40 [1,000]       | 150   | 4.53 [115.0] | 1.10 [28.0] | 2.70 [68.5]                      | F40            | 18.70 [475.0] | 8 X M36             | 15.98 [406.0] | 0.87 [22.0] | 11.42 [290.0] | 8.66 [220.0]  | 74.21 [1,885.0]  |
|                  | 300   | 6.30 [160.0] | 1.42 [36.0] | 3.70 [94.0]                      | F48            | 22.05 [560.0] | 12 x M36            | 19.02 [483.0] | 0.98 [25.0] | 12.80 [325.0] | 9.84 [250.0]  | 79.13 [2,010.0]  |
|                  | 600   | 8.46 [215.0] | 1.77 [45.0] | 4.90 [124.5]                     | F60            | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 18.11 [460.0] | 13.86 [352.0] | 89.96 [2,285.0]  |
| 42 [1,050]       | 150   | 5.12 [130.0] | 1.10 [28.0] | 3.09 [78.5]                      | F40            | 18.70 [475.0] | 8 X M36             | 15.98 [406.0] | 0.87 [22.0] | 11.02 [280.0] | 8.46 [215.0]  | 78.35 [1,990.0]  |
|                  | 300   | 6.30 [160.0] | 1.42 [36.0] | 3.70 [94.0]                      | F48            | 22.05 [560.0] | 12 x M36            | 19.02 [483.0] | 0.98 [25.0] | 12.80 [325.0] | 9.84 [250.0]  | 82.36 [2,092.0]  |
|                  | 600   | 8.66 [220.0] | 1.77 [45.0] | 5.00 [127.0]                     | F60            | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 18.11 [460.0] | 13.39 [340.0] | 93.90 [2,385.0]  |
| 46 [1,150]       | 150   | 5.51 [140.0] | 1.10 [28.0] | 3.19 [81.0]                      | F40            | 18.70 [475.0] | 8 X M36             | 15.98 [406.0] | 0.87 [22.0] | 11.42 [290.0] | 8.66 [220.0]  | 82.09 [2,085.0]  |
|                  | 300   | 6.69 [170.0] | 1.10 [28.0] | 3.78 [96.0]                      | F60            | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 14.37 [365.0] | 9.84 [250.0]  | 89.96 [2,285.0]  |
|                  | 600   | 9.25 [235.0] | 1.77 [45.0] | 5.30 [134.5]                     | F60            | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 19.09 [485.0] | 14.96 [380.0] | 100.24 [2,546.0] |

All the dimensions are in Inch [Metric]



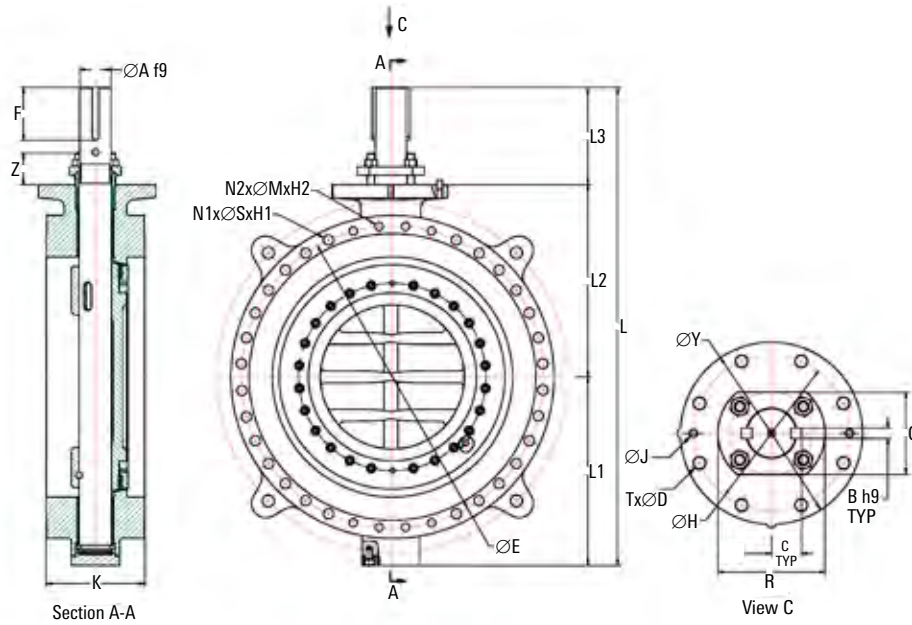


Short Pattern Dimensions: 26 to 60 in per ISO 5752/API 609, ASME Class 150, 300, and 600

| Size, in [mm] | Class | ØA f9         | B h9        | C<br>+0.000/-0.006 | Flange Type | ØY            | T x ØD<br>THRU HOLE | ØH            | ØJ          | R             | G             | L                |
|---------------|-------|---------------|-------------|--------------------|-------------|---------------|---------------------|---------------|-------------|---------------|---------------|------------------|
| 48 [1,200]    | 150   | 5.91 [150.0]  | 1.42 [36.0] | 3.50 [89.0]        | F40         | 18.70 [475.0] | 8 X M36             | 15.98 [406.0] | 0.87 [22.0] | 11.61 [295.0] | 9.29 [236.0]  | 83.27 [2,115.0]  |
|               | 300   | 6.69 [170.0]  | 1.10 [28.0] | 3.78 [96.0]        | F60         | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 14.37 [365.0] | 9.84 [250.0]  | 90.55 [2,300.0]  |
|               | 600   | 9.25 [235.0]  | 1.77 [45.0] | 5.30 [134.5]       | F60         | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 19.09 [485.0] | 14.96 [380.0] | 101.81 [2,586.0] |
| 52 [1,300]    | 150   | 6.50 [165.0]  | 1.42 [36.0] | 3.80 [96.5]        | F48         | 22.05 [560.0] | 12 X M36            | 19.02 [483.0] | 0.98 [25.0] | 13.19 [335.0] | 10.24 [260.0] | 90.94 [2,310.0]  |
|               | 300   | 8.07 [205.0]  | 1.77 [45.0] | 4.70 [119.5]       | F60         | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 16.93 [430.0] | 12.99 [330.0] | 98.82 [2,510.0]  |
|               | 600   | 11.61 [295.0] | 2.48 [63.0] | 6.87 [174.5]       | F80         | 35.43 [900.0] | 20 x M42            | 32.01 [813.0] | 1.38 [35.0] | 21.65 [550.0] | 15.75 [400.0] | 114.17 [2,900.0] |
| 54 [1,350]    | 150   | 6.69 [170.0]  | 1.42 [36.0] | 3.90 [99.0]        | F48         | 22.05 [560.0] | 12 X M36            | 19.02 [483.0] | 0.98 [25.0] | 14.37 [365.0] | 9.84 [250.0]  | 93.90 [2,385.0]  |
|               | 300   | 8.46 [215.0]  | 1.77 [45.0] | 4.90 [124.5]       | F60         | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 18.11 [460.0] | 13.86 [352.0] | 101.18 [2,570.0] |
|               | 600   | 12.60 [320.0] | 2.48 [63.0] | 7.36 [187.0]       | F80         | 35.43 [900.0] | 20 x M42            | 32.01 [813.0] | 1.38 [35.0] | 22.44 [570.0] | —             | 119.21 [3,028.0] |
| 56 [1,400]    | 150   | 7.09 [180.0]  | 1.42 [36.0] | 4.09 [104.0]       | F48         | 22.05 [560.0] | 12 X M36            | 19.02 [483.0] | 0.98 [25.0] | 14.37 [365.0] | 11.02 [280.0] | 97.64 [2,480.0]  |
|               | 300   | 8.86 [225.0]  | 1.77 [45.0] | 5.10 [129.5]       | F60         | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 16.14 [410.0] | 11.42 [290.0] | 107.09 [2,720.0] |
|               | 600   | 13.19 [335.0] | 2.76 [70.0] | 7.78 [197.5]       | F80         | 35.43 [900.0] | 20 x M42            | 32.01 [813.0] | 1.38 [35.0] | 23.23 [590.0] | —             | 126.38 [3,210.0] |
| 58 [1,450]    | 150   | 7.48 [190.0]  | 1.57 [40.0] | 4.33 [110.0]       | F48         | 22.05 [560.0] | 12 X M36            | 19.02 [483.0] | 0.98 [25.0] | 14.37 [365.0] | 11.42 [290.0] | 102.95 [2,615.0] |
|               | 300   | 9.45 [240.0]  | 1.77 [45.0] | 5.39 [137.0]       | F60         | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 18.70 [475.0] | 14.17 [360.0] | 110.63 [2,810.0] |
|               | 600   | 13.58 [345.0] | 2.76 [70.0] | 7.97 [202.5]       | F80         | 35.43 [900.0] | 20 x M42            | 32.01 [813.0] | 1.38 [35.0] | 25.20 [640.0] | —             | 129.65 [3,293.0] |
| 60 [1,500]    | 150   | 8.46 [215.0]  | 1.77 [45.0] | 4.90 [124.5]       | F48         | 22.05 [560.0] | 12 X M36            | 19.02 [483.0] | 0.98 [25.0] | 15.16 [385.0] | 12.20 [310.0] | 103.74 [2,635.0] |
|               | 300   | 10.04 [255.0] | 1.97 [50.0] | 5.77 [146.5]       | F60         | 27.01 [686.0] | 20 x M36            | 23.74 [603.0] | 1.18 [30.0] | 18.70 [475.0] | 14.76 [375.0] | 115.55 [2,935.0] |
|               | 600   | 13.98 [355.0] | 2.76 [70.0] | 8.17 [207.5]       | F80         | 35.43 [900.0] | 20 x M42            | 32.01 [813.0] | 1.38 [35.0] | 24.41 [620.0] | —             | 134.06 [3,405.0] |

All the dimensions are in Inch [Metric]

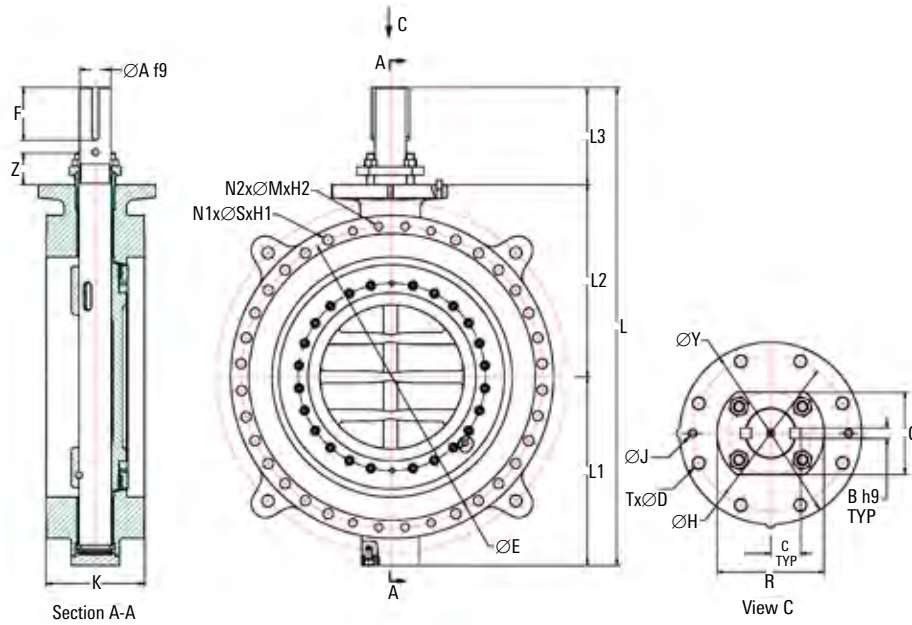
Short Pattern Dimensions: 26 to 60 in per ISO 5752/API 609



Short Pattern Dimensions: 26 to 60 in per ISO 5752/API 609, AMSE Class 150, 300, and 600

| Size, in [mm] | Class | L1            | L2              | L3            | ØE              | N1 (No's) | ØS          | H1           | N2 (No's) | ØM         | H2          | K             | F             | Z            |
|---------------|-------|---------------|-----------------|---------------|-----------------|-----------|-------------|--------------|-----------|------------|-------------|---------------|---------------|--------------|
| 26 [650]      | 150   | 19.76 [502.0] | 21.65 [550.0]   | 11.34 [288.0] | 31.75 [806.4]   | 20        | 1.38 [35.0] | 2.68 [68.0]  | 4         | 1.250-8 UN | 1.57 [40.0] | 11.50 [292.0] | 5.91 [150.0]  | 3.74 [95.0]  |
|               | 300   | 21.57 [548.0] | 23.62 [600.0]   | 13.46 [342.0] | 34.50 [876.3]   | 20        | 1.75 [44.5] | 3.15 [80.0]  | 8         | 1.625-8 UN | 1.77 [45.0] | 11.50 [292.0] | 5.91 [150.0]  | 4.13 [105.0] |
|               | 600   | 25.79 [655.0] | 25.39 [645.0]   | 16.54 [420.0] | 36.00 [914.4]   | 20        | 2.01 [51.0] | 4.33 [110.0] | 8         | 1.875-8 UN | 2.36 [60.0] | 16.93 [430.0] | 7.87 [200.0]  | 5.12 [130.0] |
| 30 [750]      | 150   | 23.31 [592.0] | 25.28 [642.0]   | 12.91 [328.0] | 36.00 [914.4]   | 24        | 1.38 [35.0] | 3.17 [80.5]  | 4         | 1.250-8 UN | 1.57 [40.0] | 12.52 [318.0] | 5.91 [150.0]  | 3.70 [94.0]  |
|               | 300   | 25.04 [636.0] | 26.54 [674.0]   | 15.63 [397.0] | 39.25 [997.0]   | 22        | 1.89 [48.0] | 3.70 [94.0]  | 6         | 1.750-8 UN | 2.17 [55.0] | 12.52 [318.0] | 8.66 [220.0]  | 4.53 [115.0] |
|               | 600   | 28.35 [720.0] | 27.76 [705.0]   | 16.54 [420.0] | 40.25 [1022.4]  | 20        | 2.13 [54.0] | 4.61 [117.0] | 8         | 2.000-8 UN | 2.56 [65.0] | 16.93 [430.0] | 7.87 [200.0]  | 4.92 [125.0] |
| 32 [800]      | 150   | 23.94 [608.0] | 25.98 [660.0]   | 12.80 [325.0] | 38.50 [977.9]   | 24        | 1.65 [42.0] | 3.19 [81.0]  | 4         | 1.500-8 UN | 1.97 [50.0] | 12.52 [318.0] | 5.91 [150.0]  | 3.94 [100.0] |
|               | 300   | 26.10 [663.0] | 27.56 [700.0]   | 16.22 [412.0] | 41.50 [1,054.1] | 20        | 2.01 [51.0] | 3.90 [99.0]  | 8         | 1.875-8 UN | 1.97 [50.0] | 12.52 [318.0] | 8.66 [220.0]  | 4.72 [120.0] |
|               | 600   | 30.12 [765.0] | 30.51 [775.0]   | 16.54 [420.0] | 42.50 [1,079.5] | 20        | 2.40 [61.0] | 4.72 [120.0] | 8         | 2.250-8 UN | 2.76 [70.0] | 18.50 [470.0] | 7.87 [200.0]  | 5.91 [150.0] |
| 36 [900]      | 150   | 26.14 [664.0] | 27.17 [690.0]   | 14.17 [360.0] | 42.75 [1,085.8] | 28        | 1.65 [42.0] | 3.80 [96.5]  | 4         | 1.500-8 UN | 1.97 [50.0] | 12.99 [330.0] | 7.28 [185.0]  | 3.54 [90.0]  |
|               | 300   | 29.06 [738.0] | 29.72 [755.0]   | 16.81 [427.0] | 46.00 [1,168.4] | 24        | 2.13 [54.0] | 4.25 [108.0] | 8         | 2.000-8 UN | 2.36 [60.0] | 12.99 [330.0] | 8.66 [220.0]  | 4.72 [120.0] |
|               | 600   | 32.72 [831.0] | 32.48 [825.0]   | 19.65 [499.0] | 47.00 [1,193.8] | 20        | 2.64 [67.0] | 4.96 [126.0] | 8         | 2.500-8 UN | 2.56 [65.0] | 20.08 [510.0] | 10.63 [270.0] | 6.69 [170.0] |
| 40 [1,000]    | 150   | 28.07 [713.0] | 29.92 [760.0]   | 16.22 [412.0] | 47.25 [1,200.2] | 28        | 1.63 [41.5] | 3.62 [92.0]  | 8         | 1.500-8 UN | 1.97 [50.0] | 16.14 [410.0] | 8.66 [220.0]  | 4.72 [120.0] |
|               | 300   | 30.12 [765.0] | 32.48 [825.0]   | 16.54 [420.0] | 45.50 [1,155.7] | 24        | 1.77 [45.0] | 4.53 [115.0] | 8         | 1.625-8 UN | 1.97 [50.0] | 16.14 [410.0] | 7.87 [200.0]  | 4.92 [125.0] |
|               | 600   | 33.66 [855.0] | 36.81 [935.0]   | 19.49 [495.0] | 47.75 [1,212.8] | 24        | 2.40 [61.0] | 6.34 [161.0] | 8         | 2.250-8 UN | 2.76 [70.0] | 21.65 [550.0] | 10.63 [270.0] | 6.50 [165.0] |
| 42 [1,050]    | 150   | 30.91 [785.0] | 31.50 [800.0]   | 15.94 [405.0] | 49.50 [1,257.3] | 28        | 1.63 [41.5] | 3.94 [100.0] | 8         | 1.500-8 UN | 1.57 [40.0] | 16.14 [410.0] | 8.66 [220.0]  | 5.31 [135.0] |
|               | 300   | 31.69 [805.0] | 34.65 [880.0]   | 16.02 [407.0] | 47.50 [1,206.5] | 24        | 1.75 [44.5] | 4.80 [122.0] | 8         | 1.625-8 UN | 1.75 [44.5] | 16.14 [410.0] | 7.87 [200.0]  | 5.12 [130.0] |
|               | 600   | 35.83 [910.0] | 38.39 [975.0]   | 19.69 [500.0] | 50.50 [1,282.7] | 20        | 2.64 [67.0] | 6.73 [171.0] | 8         | 2.500-8 UN | 2.56 [65.0] | 21.65 [550.0] | 10.63 [270.0] | 6.69 [170.0] |
| 46 [1,150]    | 150   | 31.89 [810.0] | 33.86 [860.0]   | 16.34 [415.0] | 53.75 [1,365.2] | 32        | 1.63 [41.5] | 4.13 [105.0] | 8         | 1.500-8 UN | 1.97 [50.0] | 18.50 [470.0] | 8.66 [220.0]  | 5.31 [135.0] |
|               | 300   | 32.87 [835.0] | 37.40 [950.0]   | 19.69 [500.0] | 52.00 [1,320.8] | 24        | 2.01 [51.0] | 5.12 [130.0] | 4         | 1.875-8 UN | 2.36 [60.0] | 18.50 [470.0] | 10.24 [260.0] | 5.12 [130.0] |
|               | 600   | 37.80 [960.0] | 41.34 [1,050.0] | 21.10 [536.0] | 54.75 [1,390.6] | 24        | 2.64 [67.0] | 7.17 [182.0] | 8         | 2.500-8 UN | 2.95 [75.0] | 24.80 [630.0] | 10.63 [270.0] | 6.50 [165.0] |

All the dimensions are in Inch [Metric]



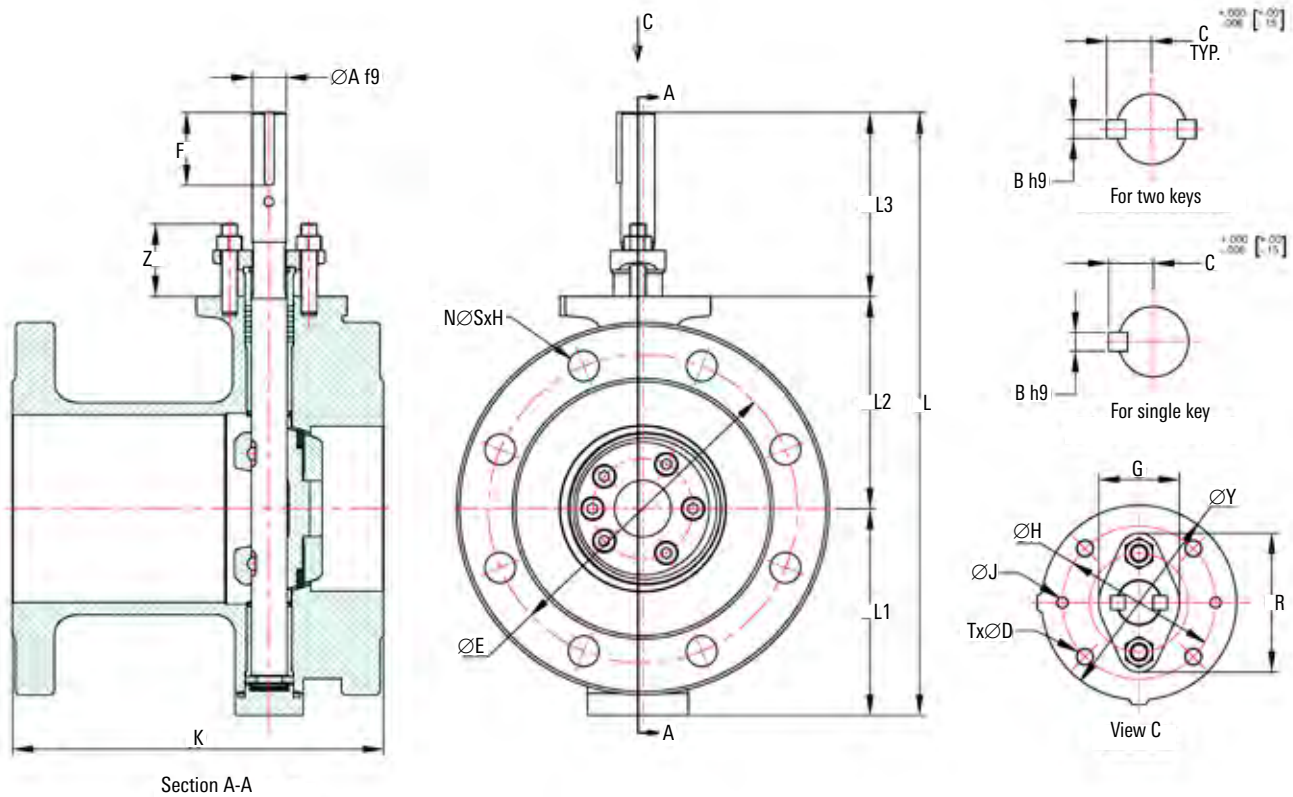
Short Pattern Dimensions: 26 to 60 in per ISO 5752/API 609, AMSE Class 150, 300, and 600

| Size, in [mm] | Class | L1              | L2              | L3            | ØE              | N1 (No's) ØS   | H1           | N2 (No's) ØM | H2           | K             | F             | Z            |
|---------------|-------|-----------------|-----------------|---------------|-----------------|----------------|--------------|--------------|--------------|---------------|---------------|--------------|
| 48 [1,200]    | 150   | 32.28 [820.0]   | 35.63 [905.0]   | 15.35 [390.0] | 56.00 [1,422.4] | 36 1.63 [41.5] | 4.33 [110.0] | 8 1.500-8 UN | 1.57 [40.0]  | 18.50 [470.0] | 7.87 [200.0]  | 5.31 [135.0] |
|               | 300   | 32.87 [835.0]   | 37.99 [965.0]   | 19.69 [500.0] | 54.00 [1,371.6] | 24 2.01 [51.0] | 5.43 [138.0] | 8 1.875-8 UN | 2.76 [70.0]  | 18.50 [470.0] | 10.24 [260.0] | 5.12 [130.0] |
|               | 600   | 38.98 [990.0]   | 42.72 [1085.0]  | 20.12 [511.0] | 57.50 [1,460.5] | 24 2.87 [73.0] | 7.52 [191.0] | 8 2.750-8 UN | 3.15 [80.0]  | 24.80 [630.0] | 10.63 [270.0] | 6.50 [165.0] |
| 52 [1,300]    | 150   | 36.22 [920.0]   | 38.19 [970.0]   | 16.54 [420.0] | 60.50 [1,536.7] | 36 1.89 [48.0] | 4.65 [118.0] | 8 1.750-8 UN | 2.17 [55.0]  | 20.87 [530.0] | 7.87 [200.0]  | 5.12 [130.0] |
|               | 300   | 38.19 [970.0]   | 41.34 [1,050.0] | 19.29 [490.0] | 58.25 [1,479.6] | 24 2.13 [54.0] | 5.75 [146.0] | 8 2.000-8 UN | 2.17 [55.0]  | 20.87 [530.0] | 9.84 [250.0]  | 6.10 [155.0] |
|               | 600   | 43.07 [1094.0]  | 47.05 [1,195.0] | 24.06 [611.0] | 62.00 [1,574.8] | 24 3.15 [80.0] | 8.11 [206.0] | 8 3.000-8 UN | 3.15 [80.0]  | 26.77 [680.0] | 13.78 [350.0] | 8.46 [215.0] |
| 54 [1,350]    | 150   | 37.60 [955.0]   | 39.76 [1,010.0] | 16.54 [420.0] | 62.75 [1,593.8] | 36 1.89 [48.0] | 4.84 [123.0] | 8 1.750-8 UN | 2.36 [60.0]  | 20.87 [530.0] | 7.87 [200.0]  | 5.12 [130.0] |
|               | 300   | 39.37 [1,000.0] | 43.31 [1,100.0] | 18.50 [470.0] | 61.00 [1,549.4] | 24 2.38 [60.5] | 6.06 [154.0] | 4 2.250-8 UN | 2.36 [60.0]  | 20.87 [530.0] | 9.06 [230.0]  | 6.50 [165.0] |
|               | 600   | 46.54 [1,182.0] | 48.23 [1,225.0] | 24.45 [621.0] | 64.25 [1,632.0] | 24 3.15 [80.0] | 8.35 [212.0] | 8 3.000-8 UN | 3.07 [78.0]  | 27.95 [710.0] | 14.17 [360.0] | 8.66 [220.0] |
| 56 [1,400]    | 150   | 38.58 [980.0]   | 40.16 [1,020.0] | 18.90 [480.0] | 65.00 [1,651.0] | 40 1.89 [48.0] | 4.96 [126.0] | 8 1.750-8 UN | 2.76 [70.0]  | 20.87 [530.0] | 10.24 [260.0] | 6.10 [155.0] |
|               | 300   | 40.75 [1,035.0] | 45.28 [1,150.0] | 21.06 [535.0] | 63.00 [1,600.2] | 24 2.38 [60.5] | 6.14 [156.0] | 4 2.250-8 UN | 2.76 [70.0]  | 20.87 [530.0] | 11.81 [300.0] | 6.30 [160.0] |
|               | 600   | 48.19 [1,224.0] | 50.79 [1,290.0] | 27.40 [696.0] | 66.75 [1,695.4] | 24 3.39 [86.0] | 8.66 [220.0] | 8 3.250-8 UN | 3.94 [100.0] | 27.95 [710.0] | 14.76 [375.0] | 8.66 [220.0] |
| 58 [1,450]    | 150   | 39.17 [995.0]   | 42.32 [1,075.0] | 21.46 [545.0] | 67.25 [1,708.2] | 40 1.89 [48.0] | 5.12 [130.0] | 8 1.750-8 UN | 2.36 [60.0]  | 23.62 [600.0] | 12.80 [325.0] | 6.10 [155.0] |
|               | 300   | 42.13 [1,070.0] | 46.26 [1,175.0] | 22.24 [565.0] | 65.00 [1,651.0] | 24 2.38 [60.5] | 6.34 [161.0] | 8 2.250-8 UN | 2.95 [75.0]  | 23.62 [600.0] | 12.80 [325.0] | 6.50 [165.0] |
|               | 600   | 49.33 [1,253.0] | 52.36 [1,330.0] | 27.95 [710.0] | 68.75 [1,746.2] | 24 3.39 [86.0] | 8.86 [225.0] | 8 3.250-8 UN | 3.94 [100.0] | 31.10 [790.0] | 15.75 [400.0] | 8.86 [225.0] |
| 60 [1,500]    | 150   | 41.14 [1,045.0] | 44.09 [1,120.0] | 18.50 [470.0] | 69.25 [1,759.0] | 44 1.89 [48.0] | 5.28 [134.0] | 8 1.750-8 UN | 2.36 [60.0]  | 23.62 [600.0] | 9.84 [250.0]  | 6.30 [160.0] |
|               | 300   | 45.24 [1,149.0] | 48.03 [1,220.0] | 22.28 [566.0] | 67.00 [1,701.8] | 24 2.36 [60.0] | 6.67 [169.5] | 8 2.250-8 UN | 2.95 [75.0]  | 23.62 [600.0] | 12.80 [325.0] | 7.28 [185.0] |
|               | 600   | 52.32 [1,329.0] | 53.74 [1,365.0] | 27.99 [711.0] | 71.75 [1,822.4] | 20 3.62 [92.0] | 9.72 [247.0] | 8 3.500-8 UN | 4.53 [115.0] | 30.71 [780.0] | 15.75 [400.0] | 9.65 [245.0] |

All the dimensions are in Inch [Metric]

# Long Pattern Dimensions: 3 to 24 in per ASME B16.10 and API 609

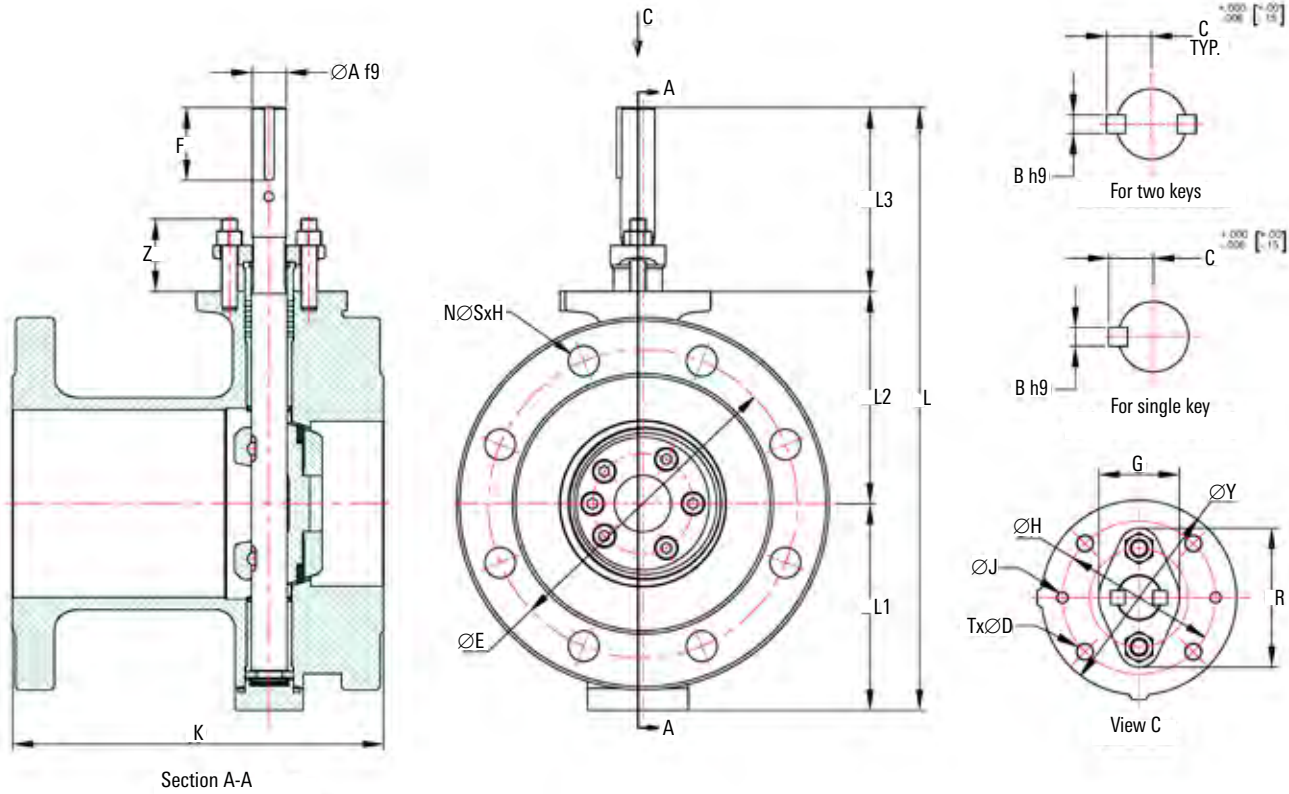
ASME Class 150 and 300



Long Pattern Dimensions: 3 to 24 in per ASME B16.10 and API 609, ASME Class 150 and 300

| Size,<br>in [mm] | Class | ØA f9       | B h9        | C +0.000/-0.006<br>[+0.00/-0.15] | NO.<br>of keys | FLANGE<br>TYPE | ØE            | F            | ØH            | ØJ          | K               | L               |
|------------------|-------|-------------|-------------|----------------------------------|----------------|----------------|---------------|--------------|---------------|-------------|-----------------|-----------------|
| 3 [80]           | 150   | 0.83 [21.0] | 0.24 [6.0]  | 0.51 [13.0]                      | 1              | F07            | 6.00 [152.4]  | 1.77 [45.0]  | 2.76 [70.0]   | 0.24 [6.0]  | 8.00 [203.0]    | 12.68 [322.0]   |
|                  | 300   | 0.83 [21.0] | 0.24 [6.0]  | 0.51 [13.0]                      | 1              | F07            | 6.62 [168.3]  | 1.77 [45.0]  | 2.76 [70.0]   | 0.24 [6.0]  | 11.12 [282.0]   | 13.82 [351.0]   |
| 4 [100]          | 150   | 0.83 [21.0] | 0.24 [6.0]  | 0.51 [13.0]                      | 1              | F07            | 7.50 [190.5]  | 1.77 [45.0]  | 2.76 [70.0]   | 0.24 [6.0]  | 9.00 [229.0]    | 14.65 [372.0]   |
|                  | 300   | 0.83 [21.0] | 0.24 [6.0]  | 0.51 [13.0]                      | 1              | F07            | 7.88 [200.0]  | 1.77 [45.0]  | 2.76 [70.0]   | 0.24 [6.0]  | 12.00 [305.0]   | 15.63 [397.0]   |
| 6 [150]          | 150   | 0.98 [25.0] | 0.31 [8.0]  | 0.61 [15.5]                      | 1              | F10            | 10.62 [269.9] | 2.17 [55.0]  | 4.02 [102.0]  | 0.39 [10.0] | 10.50 [267.0]   | 17.09 [434.0]   |
|                  | 300   | 1.18 [30.0] | 0.31 [8.0]  | 0.75 [19.0]                      | 1              | F12            | 10.62 [269.9] | 2.17 [55.0]  | 4.92 [125.0]  | 0.39 [10.0] | 15.88 [403.0]   | 20.12 [511.0]   |
| 8 [200]          | 150   | 1.26 [32.0] | 0.31 [8.0]  | 0.75 [19.0]                      | 1              | F12            | 11.75 [298.5] | 2.17 [55.0]  | 4.92 [125.0]  | 0.39 [10.0] | 11.50 [292.0]   | 19.76 [502.0]   |
|                  | 300   | 1.50 [38.0] | 0.39 [10.0] | 0.91 [23.0]                      | 2              | F14            | 13.00 [330.2] | 2.17 [55.0]  | 5.51 [140.0]  | 0.39 [10.0] | 16.50 [418.0]   | 21.79 [553.5]   |
| 10 [250]         | 150   | 1.42 [36.0] | 0.39 [10.0] | 0.87 [22.0]                      | 1              | F12            | 14.25 [362.0] | 2.17 [55.0]  | 4.92 [125.0]  | 0.39 [10.0] | 13.00 [330.0]   | 23.19 [589.0]   |
|                  | 300   | 1.57 [40.0] | 0.47 [12.0] | 0.96 [24.5]                      | 2              | F16            | 15.25 [387.4] | 2.76 [70.0]  | 6.50 [165.0]  | 0.47 [12.0] | 18.00 [457.0]   | 26.14 [664.0]   |
| 12 [300]         | 150   | 1.65 [42.0] | 0.47 [12.0] | 1.00 [25.5]                      | 1              | F14            | 17.00 [431.8] | 2.76 [70.0]  | 5.51 [140.0]  | 0.39 [10.0] | 14.00 [356.0]   | 27.01 [686.0]   |
|                  | 300   | 1.81 [46.0] | 0.55 [14.0] | 1.10 [28.0]                      | 2              | F16            | 17.75 [450.9] | 3.74 [95.0]  | 6.50 [165.0]  | 0.47 [12.0] | 19.75 [502.0]   | 30.31 [770.0]   |
| 14 [350]         | 150   | 1.77 [45.0] | 0.55 [14.0] | 1.10 [28.0]                      | 2              | F16            | 18.75 [476.3] | 3.74 [95.0]  | 6.50 [165.0]  | 0.47 [12.0] | 15.00 [381.0]   | 32.44 [824.0]   |
|                  | 300   | 2.17 [55.0] | 0.63 [16.0] | 1.32 [33.5]                      | 2              | F25            | 20.25 [514.4] | 5.51 [140.0] | 10.00 [254.0] | 0.47 [12.0] | 30.00 [762.0]   | 35.91 [912.0]   |
| 16 [400]         | 150   | 1.97 [50.0] | 0.63 [16.0] | 1.22 [31.0]                      | 2              | F16            | 21.25 [539.8] | 3.94 [100.0] | 6.50 [165.0]  | 0.47 [12.0] | 16.00 [406.0]   | 35.28 [896.0]   |
|                  | 300   | 2.56 [65.0] | 0.71 [18.0] | 1.56 [39.5]                      | 2              | F30            | 22.50 [571.5] | 5.71 [145.0] | 11.73 [298.0] | 0.63 [16.0] | 33.00 [838.0]   | 40.47 [1,028.0] |
| 18 [450]         | 150   | 2.28 [58.0] | 0.71 [18.0] | 1.42 [36.0]                      | 2              | F25            | 22.75 [577.9] | 4.72 [120.0] | 10.00 [254.0] | 0.47 [12.0] | 17.00 [432.0]   | 38.46 [977.0]   |
|                  | 300   | 2.76 [70.0] | 0.79 [20.0] | 1.73 [44.0]                      | 2              | F30            | 24.75 [628.6] | 6.30 [160.0] | 11.73 [298.0] | 0.63 [16.0] | 36.00 [914.0]   | 43.94 [1,116.0] |
| 20 [500]         | 150   | 2.68 [68.0] | 0.71 [18.0] | 1.61 [41.0]                      | 2              | F25            | 25.00 [635.0] | 4.72 [120.0] | 10.00 [254.0] | 0.47 [12.0] | 18.00 [457.0]   | 41.65 [1,058.0] |
|                  | 300   | 3.07 [78.0] | 0.87 [22.0] | 1.89 [48.0]                      | 2              | F35            | 27.00 [688.8] | 6.50 [165.0] | 14.02 [356.0] | 0.87 [22.0] | 39.00 [991.0]   | 48.74 [1,238.0] |
| 24 [600]         | 150   | 3.07 [78.0] | 0.87 [22.0] | 1.89 [48.0]                      | 2              | F30            | 29.50 [749.3] | 6.50 [165.0] | 11.73 [298.0] | 0.63 [16.0] | 20.00 [508.0]   | 48.39 [1,229.5] |
|                  | 300   | 3.62 [92.0] | 0.87 [22.0] | 2.17 [55.0]                      | 2              | F35            | 32.00 [812.8] | 8.07 [205.0] | 14.02 [356.0] | 0.87 [22.0] | 45.00 [1,143.0] | 55.71 [1,415.0] |

All the dimensions are in Inch [Metric]



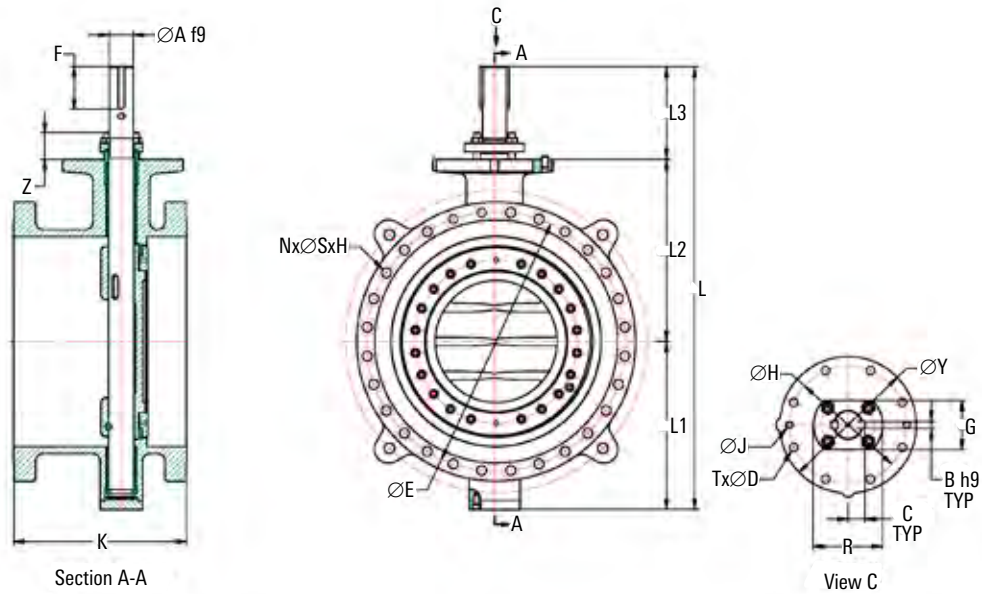
Long Pattern Dimensions: 3 to 24 in per ASME B16.10 and API 609, ASME Class 150 and 300

| Size, in [mm] | Class | L1            | L2            | L3            | N  | $\varnothing S$ | H           | T x $\varnothing D$ THRU HOLE | G            | R            | $\varnothing Y$ | Z           |
|---------------|-------|---------------|---------------|---------------|----|-----------------|-------------|-------------------------------|--------------|--------------|-----------------|-------------|
| 3 [80]        | 150   | 4.27 [108.5]  | 3.94 [100.0]  | 4.47 [113.5]  | 4  | 0.750 [19.00]   | 0.71 [18.0] | 4 X M8x1.25                   | 1.34 [34.0]  | 2.71 [69.0]  | 3.54 [90.0]     | 1.70 [43.0] |
|               | 300   | 4.67 [118.5]  | 4.72 [120.0]  | 4.43 [112.5]  | 8  | 0.875 [22.00]   | 1.06 [27.0] | 4 X M8x1.25                   | 1.34 [34.0]  | 2.71 [69.0]  | 3.54 [90.0]     | 1.70 [43.0] |
| 4 [100]       | 150   | 5.02 [127.5]  | 5.16 [131.0]  | 4.47 [113.5]  | 8  | 0.750 [19.00]   | 0.91 [23.0] | 4 X M8x1.25                   | 1.34 [34.0]  | 2.71 [69.0]  | 3.54 [90.0]     | 1.70 [43.0] |
|               | 300   | 5.57 [141.5]  | 5.51 [140.0]  | 4.55 [115.5]  | 8  | 0.875 [22.00]   | 1.22 [31.0] | 4 X M8x1.25                   | 1.34 [34.0]  | 2.71 [69.0]  | 3.54 [90.0]     | 1.70 [43.0] |
| 6 [150]       | 150   | 5.87 [149.0]  | 6.30 [160.0]  | 4.92 [125.0]  | 8  | 0.875 [22.00]   | 0.94 [24.0] | 4 X M10x1.50                  | 1.77 [45.0]  | 3.03 [77.0]  | 4.92 [125.0]    | 1.97 [50.0] |
|               | 300   | 7.09 [180.0]  | 8.07 [205.0]  | 4.96 [126.0]  | 12 | 0.875 [22.00]   | 1.38 [35.0] | 4 X M12x1.75                  | 1.97 [50.0]  | 3.62 [92.0]  | 5.91 [150.0]    | 2.17 [55.0] |
| 8 [200]       | 150   | 7.09 [180.0]  | 7.76 [197.0]  | 4.92 [125.0]  | 8  | 0.875 [22.00]   | 1.06 [27.0] | 4 X M12x1.75                  | 1.97 [50.0]  | 3.70 [94.0]  | 5.91 [150.0]    | 2.28 [58.0] |
|               | 300   | 8.21 [208.5]  | 8.66 [220.0]  | 4.92 [125.0]  | 12 | 1.000 [25.00]   | 1.57 [40.0] | 4 X M16x2.00                  | 2.20 [56.0]  | 4.13 [105.0] | 6.89 [175.0]    | 2.36 [60.0] |
| 10 [250]      | 150   | 8.78 [223.0]  | 9.33 [237.0]  | 5.08 [129.0]  | 12 | 1.000 [25.00]   | 1.14 [29.0] | 4 X M12x1.75                  | 2.36 [60.0]  | 4.25 [108.0] | 5.91 [150.0]    | 2.36 [60.0] |
|               | 300   | 9.69 [246.0]  | 10.24 [260.0] | 6.22 [158.0]  | 16 | 1.125 [29.00]   | 1.85 [47.0] | 4 X M20x2.50                  | 2.76 [70.0]  | 4.96 [126.0] | 8.27 [210.0]    | 2.56 [65.0] |
| 12 [300]      | 150   | 9.92 [252.0]  | 10.79 [274.0] | 6.30 [160.0]  | 12 | 1.000 [25.00]   | 1.22 [31.0] | 4 X M16x2.00                  | 2.56 [65.0]  | 4.53 [115.0] | 6.89 [175.0]    | 2.64 [67.0] |
|               | 300   | 11.10 [282.0] | 11.81 [300.0] | 7.40 [188.0]  | 16 | 1.250 [32.00]   | 1.97 [50.0] | 4 X M20x2.5                   | 2.95 [75.0]  | 4.72 [120.0] | 8.27 [210.0]    | 2.76 [70.0] |
| 14 [350]      | 150   | 11.26 [286.0] | 12.99 [330.0] | 8.19 [208.0]  | 12 | 1.125 [29.00]   | 1.38 [35.0] | 4 X M20x2.5                   | 3.15 [80.0]  | 5.43 [138.0] | 8.27 [210.0]    | 3.07 [78.0] |
|               | 300   | 12.60 [320.0] | 13.78 [350.0] | 9.53 [242.0]  | 20 | 1.250 [32.00]   | 2.13 [54.0] | 8 X M16x2.0                   | 3.74 [95.0]  | 6.30 [160.0] | 11.81 [300.0]   | 3.07 [78.0] |
| 16 [400]      | 150   | 12.52 [318.0] | 14.37 [365.0] | 8.39 [213.0]  | 16 | 1.125 [29.00]   | 1.46 [37.0] | 4 X M20x2.5                   | 3.23 [82.0]  | 5.51 [140.0] | 8.27 [210.0]    | 3.15 [80.0] |
|               | 300   | 13.94 [354.0] | 15.35 [390.0] | 11.18 [284.0] | 20 | 1.375 [35.00]   | 2.28 [58.0] | 8 X M20x2.5                   | 3.94 [100.0] | 6.50 [165.0] | 13.78 [350.0]   | 3.35 [85.0] |
| 18 [450]      | 150   | 13.78 [350.0] | 15.55 [395.0] | 9.13 [232.0]  | 16 | 1.250 [32.00]   | 1.57 [40.0] | 8 X M16x2.0                   | 3.54 [90.0]  | 5.91 [150.0] | 11.81 [300.0]   | 3.27 [83.0] |
|               | 300   | 15.16 [385.0] | 17.13 [435.0] | 11.65 [296.0] | 24 | 1.375 [35.00]   | 2.40 [61.0] | 8 X M20x2.5                   | 4.13 [105.0] | 7.09 [180.0] | 13.78 [350.0]   | 3.39 [86.0] |
| 20 [500]      | 150   | 15.12 [384.0] | 16.93 [430.0] | 9.61 [244.0]  | 20 | 1.250 [32.00]   | 1.69 [43.0] | 8 X M16x2.0                   | 4.13 [105.0] | 7.09 [180.0] | 11.81 [300.0]   | 3.54 [90.0] |
|               | 300   | 17.05 [433.0] | 18.70 [475.0] | 12.99 [330.0] | 24 | 1.375 [35.00]   | 2.52 [64.0] | 8 X M30x3.5                   | 7.48 [190.0] | 5.51 [140.0] | 16.34 [415.0]   | 3.46 [88.0] |
| 24 [600]      | 150   | 17.48 [444.5] | 19.29 [490.0] | 11.61 [295.0] | 20 | 1.375 [35.00]   | 1.89 [48.0] | 8 X M20x2.5                   | 7.48 [190.0] | 5.12 [130.0] | 13.78 [350.0]   | 3.35 [85.0] |
|               | 300   | 19.37 [492.0] | 21.46 [545.0] | 14.88 [378.0] | 24 | 1.625 [42.00]   | 2.76 [70.0] | 8 X M30x3.5                   | 7.48 [190.0] | 5.91 [150.0] | 16.34 [415.0]   | 3.54 [90.0] |

All the dimensions are in Inch [Metric]

# Long Pattern Dimensions: 26 to 60 in per ASME B16.10 and API 609

ASME Class 150, 300, and 600

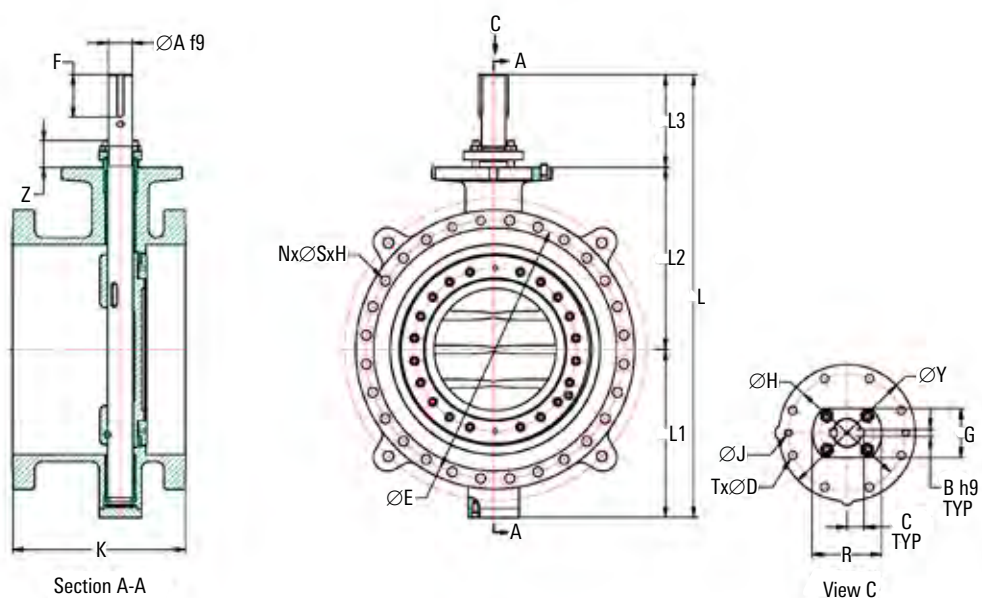


Long Pattern Dimensions: 26 to 60 in per ASME B16.10 and API 609

| Size,<br>in [mm] | Class | ØA f9       | B h9       | C +0.000/-0.006<br>[+0.00/-0.15] | Flange<br>Type | ØY           | T x ØD<br>THRU HOLE | ØH           | ØJ         | R            | G            | L               |
|------------------|-------|-------------|------------|----------------------------------|----------------|--------------|---------------------|--------------|------------|--------------|--------------|-----------------|
| 26 [650]         | 150   | 3.1 [80.0]  | 0.8 [20.0] | 1.9 [48.0]                       | F30            | 13.8 [350.0] | 8 X M20             | 11.7 [298.0] | 0.6 [15.5] | 8.9 [225.0]  | 7.1 [180.0]  | 52.8 [1,340.0]  |
|                  | 300   | 3.9 [100.0] | 0.9 [22.0] | 2.3 [59.0]                       | F40            | 18.7 [475.0] | 8 x M36             | 16.0 [406.0] | 0.9 [22.0] | 10.2 [260.0] | 7.9 [200.0]  | 58.7 [1,490.0]  |
|                  | 600   | 5.3 [135.0] | 1.3 [32.0] | 3.2 [80.5]                       | F48            | 22.0 [560.0] | 12 x M36            | 19.0 [483.0] | 1.0 [25.0] | 12.6 [320.0] | 9.1 [230.0]  | 67.7 [1,720.0]  |
| 30 [750]         | 150   | 3.3 [85.0]  | 0.9 [22.0] | 2.0 [51.5]                       | F35            | 16.3 [415.0] | 8 x M30             | 14.0 [356.0] | 0.9 [22.0] | 8.3 [210.0]  | 5.9 [150.0]  | 61.5 [1,562.0]  |
|                  | 300   | 4.5 [115.0] | 1.1 [28.0] | 2.7 [68.5]                       | F40            | 18.7 [475.0] | 8 x M36             | 16.0 [406.0] | 0.9 [22.0] | 11.4 [290.0] | 8.7 [220.0]  | 67.2 [1,707.0]  |
|                  | 600   | 5.7 [145.0] | 1.4 [36.0] | 3.4 [86.5]                       | F48            | 22.0 [560.0] | 12 x M36            | 19.0 [483.0] | 1.0 [25.0] | 13.0 [330.0] | 9.3 [236.0]  | 72.6 [1,845.0]  |
| 32 [800]         | 150   | 3.5 [90.0]  | 0.9 [22.0] | 2.1 [54.0]                       | F35            | 16.3 [415.0] | 8 X M30             | 14.0 [356.0] | 0.9 [22.0] | 8.5 [215.0]  | 6.1 [156.0]  | 62.7 [1,593.0]  |
|                  | 300   | 5.1 [130.0] | 1.1 [28.0] | 3.0 [76.0]                       | F40            | 18.7 [475.0] | 8 x M36             | 16.0 [406.0] | 0.9 [22.0] | 11.0 [280.0] | 8.5 [215.0]  | 69.9 [1,775.0]  |
|                  | 600   | 6.9 [175.0] | 1.4 [36.0] | 4.0 [101.5]                      | F48            | 22.0 [560.0] | 12 x M36            | 19.0 [483.0] | 1.0 [25.0] | 14.4 [365.0] | 10.6 [270.0] | 77.2 [1,960.0]  |
| 36 [900]         | 150   | 4.1 [105.0] | 0.9 [22.0] | 2.4 [61.5]                       | F35            | 16.3 [415.0] | 8 x M30             | 14.0 [356.0] | 0.9 [22.0] | 10.0 [255.0] | 7.9 [200.0]  | 67.5 [1,714.0]  |
|                  | 300   | 5.5 [140.0] | 1.1 [28.0] | 3.2 [81.0]                       | F48            | 22.0 [560.0] | 12 x M36            | 19.0 [483.0] | 1.0 [24.5] | 12.8 [325.0] | 9.1 [230.0]  | 75.6 [1,920.0]  |
|                  | 600   | 7.7 [195.0] | 1.8 [45.0] | 4.5 [114.5]                      | F60            | 27.0 [686.0] | 20 x M36            | 23.7 [603.0] | 1.2 [30.0] | 15.7 [400.0] | 11.2 [284.0] | 84.8 [2,155.0]  |
| 40 [1,000]       | 150   | 4.5 [115.0] | 1.1 [28.0] | 2.7 [68.5]                       | F40            | 18.7 [475.0] | 8 X M36             | 16.0 [406.0] | 0.9 [22.0] | 11.4 [290.0] | 8.7 [220.0]  | 74.2 [1,885.0]  |
|                  | 300   | 6.3 [160.0] | 1.4 [36.0] | 3.7 [94.0]                       | F48            | 22.0 [560.0] | 12 x M36            | 19.0 [483.0] | 1.0 [25.0] | 12.8 [325.0] | 9.8 [250.0]  | 79.1 [2,010.0]  |
|                  | 600   | 8.5 [215.0] | 1.8 [45.0] | 4.9 [124.5]                      | F60            | 27.0 [686.0] | 20 x M36            | 23.7 [603.0] | 1.2 [30.0] | 18.1 [460.0] | 13.9 [352.0] | 90.0 [2,285.0]  |
| 42 [1,050]       | 150   | 5.1 [130.0] | 1.1 [28.0] | 3.1 [78.5]                       | F40            | 18.7 [475.0] | 8 x M36             | 16.0 [406.0] | 0.9 [22.0] | 11.0 [280.0] | 8.5 [215.0]  | 78.3 [1,990.0]  |
|                  | 300   | 6.3 [160.0] | 1.4 [36.0] | 3.7 [94.0]                       | F48            | 22.0 [560.0] | 12 x M36            | 19.0 [483.0] | 1.0 [25.0] | 12.8 [325.0] | 9.8 [250.0]  | 82.4 [2,092.0]  |
|                  | 600   | 8.7 [220.0] | 1.8 [45.0] | 5.0 [127.0]                      | F60            | 27.0 [686.0] | 20 x M36            | 23.7 [603.0] | 1.2 [30.0] | 18.1 [460.0] | 13.4 [340.0] | 93.9 [2,385.0]  |
| 46 [1,150]       | 150   | 5.5 [140.0] | 1.1 [28.0] | 3.2 [81.0]                       | F40            | 18.7 [475.0] | 8 X M36             | 16.0 [406.0] | 0.9 [22.0] | 11.4 [290.0] | 8.7 [220.0]  | 82.1 [2,085.0]  |
|                  | 300   | 6.7 [170.0] | 1.1 [28.0] | 3.8 [96.0]                       | F60            | 27.0 [686.0] | 20 x M36            | 23.7 [603.0] | 1.2 [30.0] | 14.4 [365.0] | 9.8 [250.0]  | 90.0 [2,285.0]  |
|                  | 600   | 9.3 [235.0] | 1.8 [45.0] | 5.3 [134.5]                      | F60            | 27.0 [686.0] | 20 x M36            | 23.7 [603.0] | 1.2 [30.0] | 19.1 [485.0] | 15.0 [380.0] | 100.2 [2,546.0] |

All the dimensions are in Inch [Metric]

Long Pattern Dimensions: 26 to 60 in per ASME B 16.10 and API 609

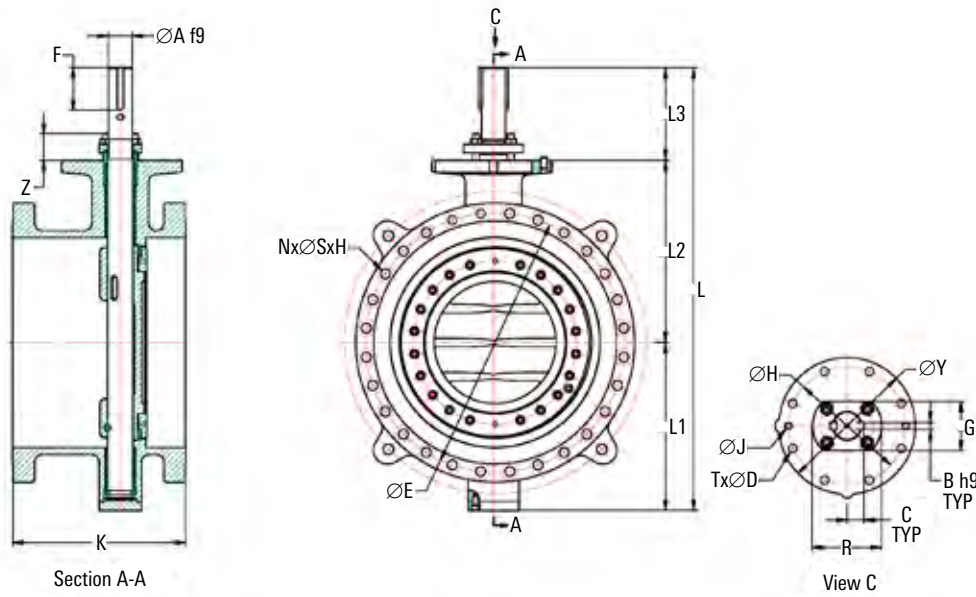


Long Pattern Dimensions: 26 to 60 in per ASME B16.10 and API 609

| Size, in [mm] | Class | ØA f9        | B h9       | C +0.000/-0.006 [+0.00/-0.15] | Flange Type | ØY           | T x ØD THRU HOLE | ØH           | ØJ         | R            | G            | L               |
|---------------|-------|--------------|------------|-------------------------------|-------------|--------------|------------------|--------------|------------|--------------|--------------|-----------------|
| 48 [1,200]    | 150   | 5.9 [150.0]  | 1.4 [36.0] | 3.5 [89.0]                    | F40         | 18.7 [475.0] | 8 x M36          | 16.0 [406.0] | 0.9 [22.0] | 11.6 [295.0] | 9.3 [236.0]  | 83.3 [2,115.0]  |
|               | 300   | 6.7 [170.0]  | 1.1 [28.0] | 3.8 [96.0]                    | F60         | 27.0 [686.0] | 20 x M36         | 23.7 [603.0] | 1.2 [30.0] | 14.4 [365.0] | 9.8 [250.0]  | 90.6 [2,300.0]  |
|               | 600   | 9.3 [235.0]  | 1.8 [45.0] | 5.3 [134.5]                   | F60         | 27.0 [686.0] | 20 x M36         | 23.7 [603.0] | 1.2 [30.0] | 19.1 [485.0] | 15.0 [380.0] | 101.8 [2,586.0] |
| 52 [1,300]    | 150   | 6.5 [165.0]  | 1.4 [36.0] | 3.8 [96.5]                    | F48         | 22.0 [560.0] | 12 X M36         | 19.0 [483.0] | 1.0 [25.0] | 13.2 [335.0] | 10.2 [260.0] | 90.9 [2,310.0]  |
|               | 300   | 8.1 [205.0]  | 1.8 [45.0] | 4.7 [119.5]                   | F60         | 27.0 [686.0] | 20 x M36         | 23.7 [603.0] | 1.2 [30.0] | 16.9 [430.0] | 13.0 [330.0] | 98.8 [2,510.0]  |
|               | 600   | 11.6 [295.0] | 2.5 [63.0] | 6.9 [174.5]                   | F80         | 35.4 [900.0] | 20 x M42         | 32.0 [813.0] | 1.4 [35.0] | 21.7 [550.0] | 15.7 [400.0] | 114.2 [2,900.0] |
| 54 [1,350]    | 150   | 6.7 [170.0]  | 1.4 [36.0] | 3.9 [99.0]                    | F48         | 22.0 [560.0] | 12 X M36         | 19.0 [483.0] | 1.0 [25.0] | 14.4 [365.0] | 9.8 [250.0]  | 93.9 [2,385.0]  |
|               | 300   | 8.5 [215.0]  | 1.8 [45.0] | 4.9 [124.5]                   | F60         | 27.0 [686.0] | 20 x M36         | 23.7 [603.0] | 1.2 [30.0] | 18.1 [460.0] | 13.9 [352.0] | 101.2 [2,570.0] |
|               | 600   | 12.6 [320.0] | 2.5 [63.0] | 7.4 [187.0]                   | F80         | 35.4 [900.0] | 20 x M42         | 32.0 [813.0] | 1.4 [35.0] | 22.4 [570.0] | —            | 119.2 [3,028.0] |
| 56 [1,400]    | 150   | 7.1 [180.0]  | 1.4 [36.0] | 4.1 [104.0]                   | F48         | 22.0 [560.0] | 12 X M36         | 19.0 [483.0] | 1.0 [25.0] | 14.4 [365.0] | 11.0 [280.0] | 97.6 [2,480.0]  |
|               | 300   | 8.9 [225.0]  | 1.8 [45.0] | 5.1 [129.5]                   | F60         | 27.0 [686.0] | 20 x M36         | 23.7 [603.0] | 1.2 [30.0] | 16.1 [410.0] | 11.4 [290.0] | 107.1 [2,720.0] |
|               | 600   | 13.2 [335.0] | 2.8 [70.0] | 7.8 [197.5]                   | F80         | 35.4 [900.0] | 20 x M42         | 32.0 [813.0] | 1.4 [35.0] | 23.2 [590.0] | —            | 126.4 [3,210.0] |
| 58 [1,450]    | 150   | 7.5 [190.0]  | 1.6 [40.0] | 4.3 [110.0]                   | F48         | 22.0 [560.0] | 12 X M36         | 19.0 [483.0] | 1.0 [25.0] | 14.4 [365.0] | 11.4 [290.0] | 103.0 [2,615.0] |
|               | 300   | 9.4 [240.0]  | 1.8 [45.0] | 5.4 [137.0]                   | F60         | 27.0 [686.0] | 20 x M36         | 23.7 [603.0] | 1.2 [30.0] | 18.7 [475.0] | 14.2 [360.0] | 110.6 [2,810.0] |
|               | 600   | 13.6 [345.0] | 2.8 [70.0] | 8.0 [202.5]                   | F80         | 35.4 [900.0] | 20 x M42         | 32.0 [813.0] | 1.4 [35.0] | 25.2 [640.0] | —            | 129.6 [3,293.0] |
| 60 [1,500]    | 150   | 8.5 [215.0]  | 1.8 [45.0] | 4.9 [124.5]                   | F48         | 22.0 [560.0] | 12 X M36         | 19.0 [483.0] | 1.0 [25.0] | 15.2 [385.0] | 12.2 [310.0] | 103.7 [2,635.0] |
|               | 300   | 10.0 [255.0] | 2.0 [50.0] | 5.8 [146.5]                   | F60         | 27.0 [686.0] | 20 x M36         | 23.7 [603.0] | 1.2 [30.0] | 18.7 [475.0] | 14.8 [375.0] | 115.6 [2,935.0] |
|               | 600   | 14.0 [355.0] | 2.8 [70.0] | 8.2 [207.5]                   | F80         | 35.4 [900.0] | 20 x M42         | 32.0 [813.0] | 1.4 [35.0] | 24.4 [620.0] | —            | 134.1 [3,405.0] |

All the dimensions are in Inch [Metric]

Long Pattern Dimensions: 26 to 60 in per ASME B16.10 and API 609

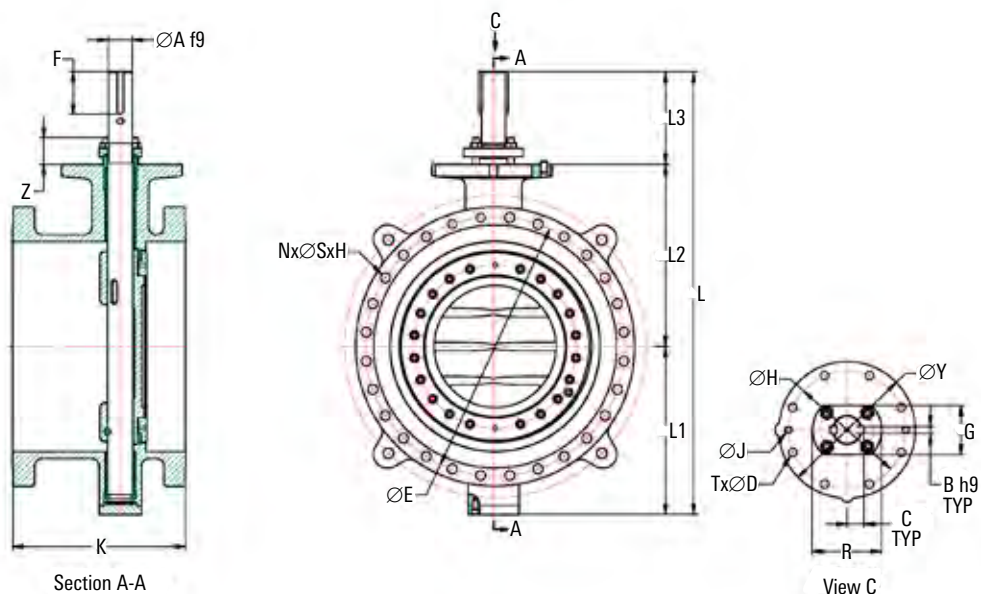


Long Pattern Dimensions: 26 to 60 in per ASME B16.10 and API 609

| Size, in [mm] | Class | L1           | L2             | L3           | ØE             | N (No's) | ØS         | H           | K               | F            | Z           |
|---------------|-------|--------------|----------------|--------------|----------------|----------|------------|-------------|-----------------|--------------|-------------|
| 26 [650]      | 150   | 19.8 [502.0] | 21.7 [550.0]   | 11.3 [288.0] | 31.7 [806.4]   | 24       | 1.4 [35.0] | 2.8 [71.0]  | 22.0 [559.0]    | 5.9 [150.0]  | 3.7 [95.0]  |
|               | 300   | 21.6 [548.0] | 23.6 [600.0]   | 13.5 [342.0] | 34.5 [876.3]   | 28       | 1.8 [44.5] | 3.2 [82.0]  | 49.0 [1,245.0]  | 6.0 [152.0]  | 4.1 [105.0] |
|               | 600   | 25.8 [655.0] | 25.4 [645.0]   | 16.5 [420.0] | 36.0 [914.4]   | 28       | 2.0 [51.0] | 4.4 [111.0] | 57.0 [1,448.0]  | 7.9 [200.0]  | 5.1 [130.0] |
| 30 [750]      | 150   | 23.3 [592.0] | 25.3 [642.0]   | 12.9 [328.0] | 36.0 [914.4]   | 28       | 1.4 [35.0] | 3.0 [77.0]  | 24.0 [610.0]    | 5.9 [150.0]  | 3.7 [94.0]  |
|               | 300   | 25.0 [636.0] | 26.5 [674.0]   | 15.6 [397.0] | 39.3 [997.0]   | 28       | 1.9 [48.0] | 3.7 [94.0]  | 55.0 [1,397.0]  | 8.1 [207.0]  | 4.5 [115.0] |
|               | 600   | 28.3 [720.0] | 27.8 [705.0]   | 16.5 [420.0] | 40.3 [1022.4]  | 28       | 2.1 [54.0] | 4.6 [118.0] | 65.0 [1,651.0]  | 7.9 [200.0]  | 4.9 [125.0] |
| 32 [800]      | 150   | 23.9 [608.0] | 26.0 [660.0]   | 12.8 [325.0] | 38.5 [977.9]   | 28       | 1.7 [42.0] | 3.3 [83.0]  | 26.0 [660.0]    | 5.9 [150.0]  | 3.9 [100.0] |
|               | 300   | 26.1 [663.0] | 27.6 [700.0]   | 16.2 [412.0] | 41.5 [1,054.1] | 28       | 2.0 [51.0] | 4.0 [101.0] | 60.0 [1,524.0]  | 8.7 [222.0]  | 4.7 [120.0] |
|               | 600   | 30.1 [765.0] | 30.5 [775.0]   | 16.5 [420.0] | 42.5 [1,079.5] | 28       | 2.4 [61.0] | 4.8 [121.0] | 70.0 [1,778.0]  | 7.9 [200.0]  | 5.9 [150.0] |
| 36 [900]      | 150   | 26.1 [664.0] | 27.2 [690.0]   | 14.2 [360.0] | 42.7 [1,085.8] | 32       | 1.7 [42.0] | 3.7 [93.0]  | 28.0 [711.0]    | 7.3 [185.0]  | 3.5 [90.0]  |
|               | 300   | 29.1 [738.0] | 29.7 [755.0]   | 16.8 [427.0] | 46.0 [1,168.4] | 32       | 2.1 [54.0] | 4.2 [107.0] | 68.0 [1,727.0]  | 8.1 [207.0]  | 4.7 [120.0] |
|               | 600   | 32.7 [831.0] | 32.5 [825.0]   | 19.6 [499.0] | 47.0 [1,193.8] | 28       | 2.6 [67.0] | 5.0 [127.0] | 82.0 [2,083.0]  | 10.6 [270.0] | 6.7 [170.0] |
| 40 [1,000]    | 150   | 28.1 [713.0] | 29.9 [760.0]   | 16.2 [412.0] | 47.3 [1,200.2] | 36       | 1.6 [41.5] | 3.7 [93.0]  | 30.0 [762.0]    | 8.7 [220.0]  | 4.7 [120.0] |
|               | 300   | 30.1 [765.0] | 32.5 [825.0]   | 16.5 [420.0] | 45.5 [1,155.7] | 32       | 1.8 [44.5] | 4.6 [117.0] | 76.0 [1,930.0]  | 7.9 [200.0]  | 4.9 [125.0] |
|               | 600   | 33.7 [855.0] | 36.8 [935.0]   | 19.5 [495.0] | 47.7 [1,212.8] | 32       | 2.4 [61.0] | 6.4 [162.0] | 90.0 [2,286.0]  | 10.6 [270.0] | 6.5 [165.0] |
| 42 [1,050]    | 150   | 30.9 [785.0] | 31.5 [800.0]   | 15.9 [405.0] | 49.5 [1,257.3] | 36       | 1.6 [41.5] | 3.9 [99.0]  | 32.0 [812.0]    | 8.7 [220.0]  | 5.3 [135.0] |
|               | 300   | 31.7 [805.0] | 34.6 [880.0]   | 16.0 [407.0] | 47.5 [1,206.5] | 32       | 1.8 [44.5] | 4.8 [121.0] | 76.0 [1,930.0]  | 7.4 [187.0]  | 5.1 [130.0] |
|               | 600   | 35.8 [910.0] | 38.4 [975.0]   | 19.7 [500.0] | 50.5 [1,282.7] | 28       | 2.6 [67.0] | 6.8 [172.0] | 96.0 [2,438.0]  | 10.6 [270.0] | 6.7 [170.0] |
| 46 [1,150]    | 150   | 31.9 [810.0] | 33.9 [860.0]   | 16.3 [415.0] | 53.7 [1,365.2] | 40       | 1.6 [41.5] | 4.2 [106.0] | 33.5 [850.0]    | 8.7 [220.0]  | 5.3 [135.0] |
|               | 300   | 32.9 [835.0] | 37.4 [950.0]   | 19.7 [500.0] | 52.0 [1,320.8] | 28       | 2.0 [51.0] | 5.2 [131.0] | 88.0 [2,235.0]  | 10.2 [260.0] | 5.1 [130.0] |
|               | 600   | 37.8 [960.0] | 41.3 [1,050.0] | 21.1 [536.0] | 54.7 [1,390.6] | 32       | 2.6 [67.0] | 7.3 [185.0] | 100.0 [2,540.0] | 10.6 [270.0] | 6.5 [165.0] |

All the dimensions are in Inch [Metric]



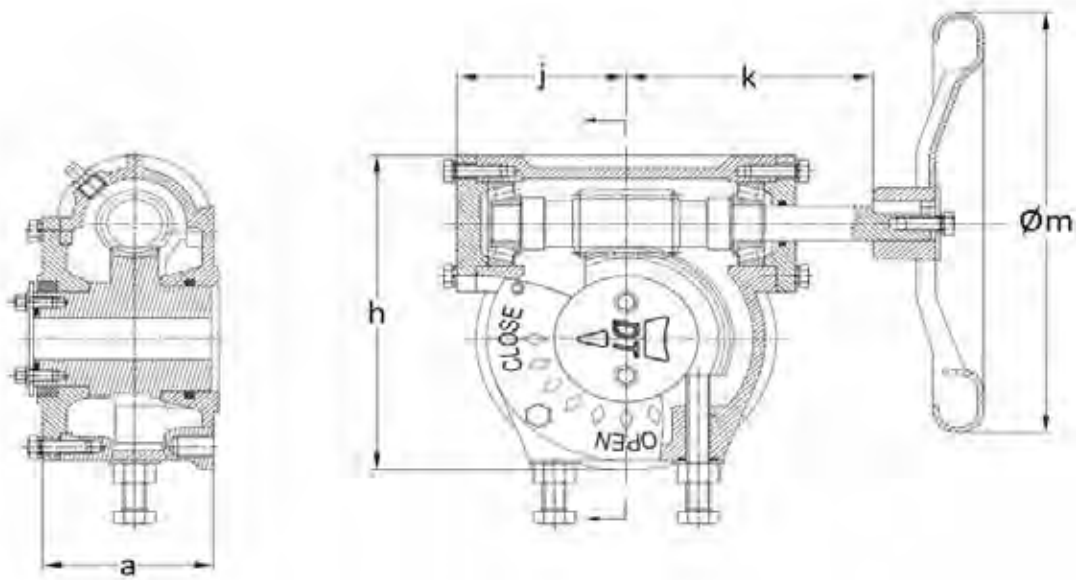


Long Pattern Dimensions: 26 to 60 in per ASME B16.10 and API 609

| Size, in [mm] | Class | L1             | L2             | L3           | ØE             | N (No's) | ØS         | H           | K               | F            | Z           |
|---------------|-------|----------------|----------------|--------------|----------------|----------|------------|-------------|-----------------|--------------|-------------|
| 48 [1,200]    | 150   | 32.3 [820.0]   | 35.6 [905.0]   | 15.4 [390.0] | 56.0 [1,422.4] | 44       | 1.6 [41.5] | 4.3 [110.0] | 34.0 [864.0]    | 7.9 [200.0]  | 5.3 [135.0] |
|               | 300   | 32.9 [835.0]   | 38.0 [965.0]   | 19.7 [500.0] | 54.0 [1,371.6] | 32       | 2.0 [51.0] | 5.4 [136.0] | 88.0 [2,235.0]  | 10.2 [260.0] | 5.1 [130.0] |
|               | 600   | 39.0 [990.0]   | 42.7 [1,085.0] | 20.1 [511.0] | 57.5 [1,460.5] | 32       | 2.9 [73.0] | 7.6 [192.0] | 100.0 [2,540.0] | 10.6 [270.0] | 6.5 [165.0] |
| 52 [1,300]    | 150   | 36.2 [920.0]   | 38.2 [970.0]   | 16.5 [420.0] | 60.5 [1,536.7] | 44       | 1.9 [48.0] | 4.6 [118.0] |                 | 7.9 [200.0]  | 5.1 [130.0] |
|               | 300   | 38.2 [970.0]   | 41.3 [1,050.0] | 19.3 [490.0] | 58.3 [1,479.6] | 32       | 2.1 [54.0] | 5.7 [146.0] |                 | 9.8 [250.0]  | 6.1 [155.0] |
|               | 600   | 43.1 [1,094.0] | 47.0 [1,195.0] | 24.1 [611.0] | 62.0 [1,574.8] | 32       | 3.1 [80.0] | 8.1 [207.0] |                 | 13.8 [350.0] | 8.5 [215.0] |
| 54 [1,350]    | 150   | 37.6 [955.0]   | 39.8 [1,010.0] | 16.5 [420.0] | 62.7 [1,593.8] | 44       | 1.9 [48.0] | 4.8 [123.0] |                 | 7.9 [200.0]  | 5.1 [130.0] |
|               | 300   | 39.4 [1,000.0] | 43.3 [1,100.0] | 18.5 [470.0] | 61.0 [1,549.4] | 28       | 2.4 [60.5] | 6.1 [154.0] |                 | 9.1 [230.0]  | 6.5 [165.0] |
|               | 600   | 46.5 [1,182.0] | 48.2 [1,225.0] | 24.4 [621.0] | 64.3 [1,632.0] | 32       | 3.1 [80.0] | 8.4 [213.0] |                 | 14.2 [360.0] | 8.7 [220.0] |
| 56 [1,400]    | 150   | 38.6 [980.0]   | 40.2 [1,020.0] | 18.9 [480.0] | 65.0 [1,651.0] | 48       | 1.9 [48.0] | 5.0 [126.0] |                 | 10.2 [260.0] | 6.1 [155.0] |
|               | 300   | 40.7 [1,035.0] | 45.3 [1,150.0] | 21.1 [535.0] | 63.0 [1,600.2] | 28       | 2.4 [60.5] | 6.1 [156.0] | Upon Request    | 11.8 [300.0] | 6.3 [160.0] |
|               | 600   | 48.2 [1,224.0] | 50.8 [1,290.0] | 27.4 [696.0] | 66.7 [1,695.4] | 32       | 3.4 [86.0] | 8.7 [221.0] |                 | 14.8 [375.0] | 8.7 [220.0] |
| 58 [1,450]    | 150   | 39.2 [995.0]   | 42.3 [1,075.0] | 21.5 [545.0] | 67.3 [1,708.2] | 48       | 1.9 [48.0] | 5.1 [130.0] |                 | 12.8 [325.0] | 6.1 [155.0] |
|               | 300   | 42.1 [1,070.0] | 46.3 [1,175.0] | 22.2 [565.0] | 65.0 [1,651.0] | 32       | 2.4 [60.5] | 6.3 [161.0] |                 | 12.8 [325.0] | 6.5 [165.0] |
|               | 600   | 49.3 [1,253.0] | 52.4 [1,330.0] | 28.0 [710.0] | 68.7 [1,746.2] | 32       | 3.4 [86.0] | 8.9 [226.0] |                 | 15.7 [400.0] | 8.9 [225.0] |
| 60 [1,500]    | 150   | 41.1 [1,045.0] | 44.1 [1,120.0] | 18.5 [470.0] | 69.3 [1,759.0] | 52       | 1.9 [48.0] | 5.3 [134.0] |                 | 9.8 [250.0]  | 6.3 [160.0] |
|               | 300   | 45.2 [1,149.0] | 48.0 [1,220.0] | 22.3 [566.0] | 67.0 [1,701.8] | 32       | 2.4 [60.0] | 6.7 [170.0] |                 | 12.8 [325.0] | 7.3 [185.0] |
|               | 600   | 52.3 [1,329.0] | 53.7 [1,365.0] | 28.0 [711.0] | 71.7 [1,822.4] | 28       | 3.6 [92.0] | 9.7 [247.0] |                 | 15.7 [400.0] | 9.6 [245.0] |

All the dimensions are in Inch [Metric]

# Gear Operator Dimensions



## Gear Dimensions

| Valve Size,<br>in [mm] | ASME Class | Model          | a          | h           | k           | j           | Øm         |
|------------------------|------------|----------------|------------|-------------|-------------|-------------|------------|
| 3 [80]                 | 150        | GB-BF          | 1.81 [46]  | 4.45 [113]  | 2.09 [53]   | 3.58 [91]   | 6 [152]    |
|                        | 300        | GB-BF          | 1.81 [46]  | 4.45 [113]  | 2.09 [53]   | 3.58 [91]   | 8 [203]    |
| 4 [100]                | 150        | GB-BF          | 1.81 [46]  | 4.45 [113]  | 2.09 [53]   | 3.58 [91]   | 6 [152]    |
|                        | 300        | GB-00          | 2.87 [73]  | 5.91 [150]  | 2.80 [71]   | 4.06 [103]  | 12 [305]   |
|                        | 600        | GB-01-1S       | 3.66 [93]  | 8.86 [225]  | 3.66 [93]   | 6.73 [171]  | 14 [350]   |
| 6 [150]                | 150        | GB-00          | 2.87 [73]  | 5.91 [150]  | 2.80 [71]   | 4.06 [103]  | 10 [254]   |
|                        | 300        | GB-01          | 3.82 [97]  | 7.99 [203]  | 3.66 [93]   | 5.71 [145]  | 20 [508]   |
|                        | 600        | GB-02-1S       | 4.33 [110] | 11.26 [286] | 4.45 [113]  | 8.07 [205]  | 18 [450]   |
| 8 [200]                | 150        | GB-0           | 3.70 [94]  | 7.13 [181]  | 3.27 [83]   | 5.28 [134]  | 16 [406]   |
|                        | 300        | GB-02          | 4.49 [114] | 9.65 [245]  | 4.45 [113]  | 7.64 [194]  | 34 [864]   |
|                        | 600        | GB-04-1SD      | 4.88 [124] | 15.31 [389] | 6.22 [158]  | 11.30 [287] | 26 [650]   |
| 10 [250]               | 150        | GB-01          | 3.82 [97]  | 7.99 [203]  | 3.66 [93]   | 5.71 [145]  | 24 [610]   |
|                        | 300        | GB-03-1S       | 4.50 [115] | 12.80 [325] | 4.92 [125]  | 8.54 [217]  | 22 [559]   |
|                        | 600        | B38            | 5.79 [147] | 16.69 [424] | 6.26 [159]  | 10.91 [277] | 28 [700]   |
| 12 [300]               | 150        | GB-02          | 4.49 [114] | 9.65 [245]  | 4.45 [113]  | 7.64 [194]  | 28 [711]   |
|                        | 300        | GB-04-1S       | 5.04 [128] | 15.08 [383] | 6.22 [158]  | 9.69 [246]  | 34 [864]   |
|                        | 600        | B48            | 6.50 [165] | 21.42 [544] | 8.39 [213]  | 15.04 [382] | 28 [700]   |
| 14 [350]               | 150        | GB-02-1S       | 4.49 [114] | 11.26 [286] | 4.45 [113]  | 8.07 [205]  | 24 [610]   |
|                        | 300        | B38            | 5.91 [150] | 16.69 [424] | 6.26 [159]  | 10.71 [272] | 30 [762]   |
|                        | 600        | B48            | 6.50 [165] | 21.42 [544] | 8.39 [213]  | 15.04 [382] | 33 [850]   |
| 16 [400]               | 150        | GB-03-1S       | 4.50 [115] | 12.80 [325] | 4.92 [125]  | 8.54 [217]  | 26 [660]   |
|                        | 300        | B48            | 6.69 [170] | 21.42 [544] | 8.39 [213]  | 14.84 [377] | 24 [610]   |
|                        | 600        | B58            | 7.91 [201] | 26.18 [665] | 10.98 [279] | 17.91 [455] | 30 [750]   |
| 18 [450]               | 150        | GB-04-1S       | 5.04 [128] | 15.08 [383] | 6.22 [158]  | 9.69 [246]  | 34 [864]   |
|                        | 300        | B48            | 6.69 [170] | 21.42 [544] | 8.39 [213]  | 14.84 [377] | 32 [813]   |
|                        | 600        | B58+1S02       | 7.91 [201] | 26.18 [665] | 10.98 [279] | 21.14 [537] | 30 [750]   |
| 20 [500]               | 150        | B38            | 5.91 [150] | 16.69 [424] | 6.26 [159]  | 10.71 [272] | 26 [660]   |
|                        | 300        | B48            | 6.69 [170] | 21.42 [544] | 8.39 [213]  | 14.84 [377] | 40 [1,016] |
|                        | 600        | GB-09-1SD+1S02 | 9.21 [234] | 30.43 [773] | 13.19 [335] | 23.31 [592] | 24 [600]   |
| 24 [600]               | 150        | B48            | 6.69 [170] | 21.42 [544] | 8.39 [213]  | 14.84 [377] | 22 [559]   |
|                        | 300        | B58            | 8.07 [205] | 26.18 [665] | 10.98 [279] | 17.52 [445] | 36 [914]   |
|                        | 600        | GB-09-1SD+1S02 | 9.21 [234] | 30.43 [773] | 13.19 [335] | 23.31 [592] | 35 [900]   |

All the dimensions are in Inch [Metric]

| Valve Size, in [mm] | ASME Class | Model          | a           | h           | j           | k           | Øm       |
|---------------------|------------|----------------|-------------|-------------|-------------|-------------|----------|
| 26 [650]            | 150        | B48            | 6.50 [165]  | 21.42 [544] | 8.39 [213]  | 16.22 [412] | 28 [700] |
| 30 [750]            | 150        | B48            | 6.50 [165]  | 21.42 [544] | 8.39 [213]  | 16.22 [412] | 28 [700] |
| 32 [800]            | 150        | GB-07-2SD      | 7.48 [190]  | 22.95 [583] | 9.33 [237]  | 15.79 [401] | 30 [750] |
| 36 [900]            | 150        | B58            | 7.91 [201]  | 26.18 [665] | 10.98 [279] | 17.52 [445] | 31 [800] |
| 40 [1000]           | 150        | GB-08-1SD+1S04 | 7.91 [201]  | 26.38 [670] | 10.98 [279] | 21.10 [536] | 31 [800] |
| 42 [1050]           | 150        | GB-09-1SD+1S04 | 9.13 [232]  | 30.59 [777] | 13.43 [341] | 23.90 [607] | 31 [800] |
| 46 [1150]           | 150        | GB-09-1SD+1S04 | 9.13 [232]  | 30.59 [777] | 13.43 [341] | 23.90 [607] | 31 [800] |
| 48 [1200]           | 150        | GB-09-1SD+1S04 | 9.13 [232]  | 30.59 [777] | 13.43 [341] | 23.90 [607] | 31 [800] |
| 52 [1300]           | 150        | GB-09-1SD+1S04 | 9.13 [232]  | 30.59 [777] | 13.43 [341] | 23.90 [607] | 31 [800] |
| 54 [1350]           | 150        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958] | 15.24 [387] | 28.94 [735] | 31 [800] |
| 56 [1400]           | 150        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958] | 15.24 [387] | 28.94 [735] | 31 [800] |
| 58 [1450]           | 150        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958] | 15.24 [387] | 28.94 [735] | 31 [800] |
| 60 [1500]           | 150        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958] | 15.24 [387] | 28.94 [735] | 31 [800] |

| Valve Size, in [mm] | ASME Class | Model          | a           | h             | j           | k           | ØM       |
|---------------------|------------|----------------|-------------|---------------|-------------|-------------|----------|
| 26 [650]            | 300        | GB-08-1SD+1S04 | 7.91 [201]  | 26.38 [670]   | 10.98 [279] | 21.10 [536] | 31 [800] |
| 30 [750]            | 300        | GB-09-1SD+1S04 | 9.13 [232]  | 30.59 [777]   | 13.43 [341] | 23.90 [607] | 31 [800] |
| 32 [800]            | 300        | GB-09-1SD+1S04 | 9.13 [232]  | 30.59 [777]   | 13.43 [341] | 23.90 [607] | 31 [800] |
| 36 [900]            | 300        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958]   | 15.24 [387] | 28.94 [735] | 31 [800] |
| 40 [1,000]          | 300        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958]   | 15.24 [387] | 28.94 [735] | 31 [800] |
| 42 [1,050]          | 300        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958]   | 15.24 [387] | 28.94 [735] | 31 [800] |
| 46 [1,150]          | 300        | KB-11-1SD+V8   | 13.31 [338] | 43.70 [1,110] | 18.39 [467] | 37.05 [941] | 33 [850] |
| 48 [1,200]          | 300        | KB-11-1SD+V8   | 13.31 [338] | 43.70 [1,110] | 18.39 [467] | 37.05 [941] | 33 [850] |
| 52 [1,300]          | 300        | KB-11-1SD+V8   | 13.31 [338] | 43.70 [1,110] | 18.39 [467] | 37.05 [941] | 33 [850] |
| 54 [1,350]          | 300        |                |             |               |             |             |          |
| 56 [1,400]          | 300        |                |             |               |             |             |          |
| 58 [1,450]          | 300        |                |             |               |             |             |          |
| 60 [1,500]          | 300        |                |             |               |             |             |          |

Upon request

| Valve Size, in [mm] | ASME Class | Model          | A           | H             | J           | K           | ØM       |
|---------------------|------------|----------------|-------------|---------------|-------------|-------------|----------|
| 26 [650]            | 600        | GB-09-1SD+1S04 | 9.13 [232]  | 30.59 [777]   | 13.43 [341] | 23.90 [607] | 31 [800] |
| 30 [750]            | 600        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958]   | 15.24 [387] | 28.94 [735] | 31 [800] |
| 32 [800]            | 600        | KB-10-1SD+1S05 | 11.10 [282] | 37.70 [958]   | 15.24 [387] | 28.94 [735] | 31 [800] |
| 36 [900]            | 600        | KB-11-1SD+V8   | 13.31 [338] | 43.70 [1,110] | 18.39 [467] | 37.05 [941] | 33 [850] |
| 40 [1,000]          | 600        | KB-11-1SD+V8   | 13.31 [338] | 43.70 [1,110] | 18.39 [467] | 37.05 [941] | 33 [850] |
| 42 [1,050]          | 600        |                |             |               |             |             |          |
| 46 [1,150]          | 600        |                |             |               |             |             |          |
| 48 [1,200]          | 600        |                |             |               |             |             |          |
| 52 [1,300]          | 600        |                |             |               |             |             |          |
| 54 [1,350]          | 600        |                |             |               |             |             |          |
| 56 [1,400]          | 600        |                |             |               |             |             |          |
| 58 [1,450]          | 600        |                |             |               |             |             |          |
| 60 [1,500]          | 600        |                |             |               |             |             |          |

Upon request

All the dimensions are in Inch [Metric]

# Pressure and Temperature Ratings (ASME B16.34)<sup>†</sup>

| Temperature, degF [degC] | ASME 150     |                              | ASME 300     |                              | ASME 600     |                              |
|--------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|
|                          | Carbon Steel | Stainless Steel <sup>‡</sup> | Carbon Steel | Stainless Steel <sup>‡</sup> | Carbon Steel | Stainless Steel <sup>‡</sup> |
| -20 to 100 [-29 to 38]   | 285          | 275                          | 740          | 720                          | 1,480        | 1,440                        |
| 200 [93]                 | 260          | 240                          | 675          | 620                          | 1,350        | 1,240                        |
| 300 [149]                | 230          | 215                          | 655          | 560                          | 1,315        | 1,120                        |
| 400 [204]                | 200          | 195                          | 635          | 515                          | 1,270        | 1,030                        |
| 500 [260]                | 170          | 170                          | 600          | 480                          | 1,200        | 955                          |
| 600 [316]                | 140          | 140                          | 550          | 450                          | 1,095        | 905                          |
| 650 [343]                | 125          | 125                          | 535          | 445                          | 1,075        | 890                          |
| 700 [371]                | 110          | 110                          | 535          | 430                          | 1,065        | 865                          |
| 750 [399]                | 95           | 95                           | 505          | 425                          | 1,010        | 845                          |
| 800 <sup>‡</sup> [427]   | 80           | 80                           | 410          | 415                          | 825          | 830                          |
| 850 [454]                | 65           | 65                           | 270          | 405                          | 535          | 810                          |
| 900 [482]                | 50           | 50                           | 170          | 395                          | 345          | 790                          |
| 950 [510]                | 35           | 35                           | 105          | 385                          | 205          | 775                          |
| 1,000 [538]              | 20           | 20 <sup>§</sup>              | 50           | 365                          | 105          | 725                          |
| 1,100 [593]              | —            | 20 <sup>§</sup>              | —            | 305                          | —            | 610                          |
| 1,150 [621]              | —            | 20 <sup>§</sup>              | —            | 235                          | —            | 472                          |
| 1,200 [649]              | —            | 20 <sup>§</sup>              | —            | 185                          | —            | 370                          |
| 1,250 [677]              | —            | 20 <sup>§</sup>              | —            | 145                          | —            | 295                          |
| 1,300 [704]              | —            | 20 <sup>§</sup>              | —            | 115                          | —            | 235                          |
| 1,350 [732]              | —            | 20 <sup>§</sup>              | —            | 95                           | —            | 190                          |
| 1,400 [760]              | —            | 20 <sup>§</sup>              | —            | 75                           | —            | 150                          |
| 1,450 [788]              | —            | 20 <sup>§</sup>              | —            | 60                           | —            | 115                          |
| 1,500 [816]              | —            | 15 <sup>§</sup>              | —            | 40                           | —            | 85                           |

Low-temperature gas test per API 598 for services below -20 degF [-29 degC] (316SS and PTFE seals)

<sup>‡</sup>WCB permissible, but not recommended for prolonged use above 800 degF [427 degC]

<sup>‡</sup>Above 800 degF [427 degC] stainless steel body valves, stem material to be determined

<sup>§</sup> Flanged-end valve ratings terminate at 1,000 degF [538 degC] for ASME Class 150

## Weights

### Weight, lbm [kg]—Valve Only—Bare Stem and Bracket

| Size, in [mm] | Lug Pattern |             |               | ISO Short Pattern |             |               | Long Pattern |               |
|---------------|-------------|-------------|---------------|-------------------|-------------|---------------|--------------|---------------|
|               | ASME Class  |             |               | ASME Class        |             |               | ASME Class   |               |
|               | 150         | 300         | 600           | 150               | 300         | 600           | 150          | 300           |
| 3 [80]        | 20 [9]      | 27 [11]     | —             | 34 [16]           | 46 [21]     | —             | 37 [17]      | 53 [24]       |
| 4 [100]       | 30 [14]     | 34 [16]     | 61 [28]       | 47 [22]           | 67 [31]     | 129 [59]      | 51 [23]      | 80 [36]       |
| 6 [150]       | 48 [22]     | 67 [30]     | 126 [57]      | 79 [36]           | 123 [56]    | 233 [106]     | 82 [37]      | 153 [70]      |
| 8 [200]       | 78 [36]     | 112 [51]    | 213 [96]      | 124 [56]          | 182 [83]    | 373 [169]     | 131 [60]     | 223 [101]     |
| 10 [250]      | 127 [58]    | 184 [84]    | 393 [178]     | 184 [84]          | 281 [128]   | 591 [268]     | 198 [90]     | 350 [159]     |
| 12 [300]      | 199 [91]    | 270 [123]   | 573 [260]     | 270 [123]         | 392 [178]   | 787 [357]     | 294 [133]    | 497 [226]     |
| 14 [350]      | 271 [123]   | 482 [219]   | 712 [323]     | 373 [169]         | 591 [269]   | 988 [448]     | 392 [178]    | 813 [369]     |
| 16 [400]      | 367 [167]   | 690 [313]   | 1,068 [484]   | 477 [217]         | 816 [370]   | 1,414 [641]   | 528 [240]    | 1,116 [506]   |
| 18 [450]      | 522 [237]   | 870 [395]   | 1,388 [630]   | 646 [293]         | 1,020 [463] | 1,797 [815]   | 680 [309]    | 1,402 [636]   |
| 20 [500]      | 699 [317]   | 1,127 [512] | 1,817 [824]   | 819 [372]         | 1,310 [595] | 2,329 [1,057] | 892 [405]    | 1,871 [849]   |
| 24 [600]      | 1,060 [481] | 1,670 [758] | 2,457 [1,114] | 1,211 [550]       | 1,906 [865] | 3,194 [1,449] | 1,317 [598]  | 2,781 [1,262] |

**Weight, lbm [kg]—Valve Only—Bare Stem and Bracket**

| Size<br>in [mm] | ASME Class 150 |                   |               |
|-----------------|----------------|-------------------|---------------|
|                 | Lug Pattern    | ISO Short Pattern | Long Pattern  |
| 26 [650]        | 1,294 [587]    | 1,598 [725]       | 1,779 [807]   |
| 30 [750]        | 1,731 [785]    | 2,339 [1,061]     | 2,497 [1,133] |
| 32 [800]        | 2,234 [1,013]  | 2,584 [1,172]     | 2,931 [1,329] |
| 36 [900]        | 2,762 [1,253]  | 3,368 [1,528]     | 3,922 [1,779] |
| 40 [1,000]      | 3,657 [1,659]  | 4,589 [2,082]     | 4,991 [2,264] |
| 42 [1,050]      | 4,308 [1,954]  | 5,318 [2,412]     | 5,852 [2,655] |
| 46 [1,150]      | 5,214 [2,365]  | 6,623 [3,004]     | 7,249 [3,288] |
| 48 [1,200]      | 5,917 [2,684]  | 7,301 [3,312]     | 8,090 [3,670] |
| 52 [1,300]      | —              | 9,637 [4,372]     | Upon request  |
| 54 [1,350]      | —              | 10,622 [4,818]    |               |
| 56 [1,400]      | —              | 11,994 [5,440]    |               |
| 58 [1,450]      | —              | 13,527 [6,136]    |               |
| 60 [1,500]      | —              | 14,162 [6,424]    |               |

**Weight, lbm [kg]—Valve Only—Bare Stem and Bracket**

| Size<br>in [mm] | ASME Class - 300 |                   |                |
|-----------------|------------------|-------------------|----------------|
|                 | Lug Pattern      | ISO Short Pattern | Long Pattern   |
| 26 [650]        | 2,160 [980]      | 2,528 [1,147]     | 3,619 [1,641]  |
| 30 [750]        | 2,898 [1,315]    | 3,431 [1,556]     | 5,047 [2,289]  |
| 32 [800]        | 3,327 [1,509]    | 3,903 [1,770]     | 9,862 [4,474]  |
| 36 [900]        | 4,372 [1,983]    | 5,177 [2,348]     | 8,356 [3,790]  |
| 40 [1,000]      | 4896 [2,221]     | 5,725 [2,597]     | 9,475 [4,298]  |
| 42 [1,050]      | 5,312 [2,409]    | 6,214 [2,819]     | 10,117 [4,589] |
| 46 [1,150]      | 7,110 [3,225]    | 8,256 [3,745]     | 13,845 [6,280] |
| 48 [1,200]      | 7,238 [3,283]    | 8,480 [3,846]     | 14,687 [6,662] |
| 52 [1,300]      | —                | 11,701 [5,307]    | Upon request   |
| 54 [1,350]      | —                | 13,061 [5,925]    |                |
| 56 [1,400]      | —                | 14,385 [6,525]    |                |
| 58 [1,450]      | —                | 16,316 [7,401]    |                |
| 60 [1,500]      | —                | 18,264 [8,285]    |                |

**Weight, lbm [kg]—Valve Only—Bare Stem and Bracket**

| Size<br>in [mm] | ASME Class - 600 |                   |                 |
|-----------------|------------------|-------------------|-----------------|
|                 | Lug Pattern      | ISO Short Pattern | Long Pattern    |
| 26 [650]        | 3,400 [1,542]    | 4,156 [1,885]     | 5,936 [2,692]   |
| 30 [750]        | 4,406 [1,999]    | 5,264 [2,388]     | 8,212 [3,725]   |
| 32 [800]        | 5,287 [2,398]    | 6,294 [2,855]     | 98,62 [4,474]   |
| 36 [900]        | 6,700 [3,039]    | 8,180 [3,710]     | 13,483 [6,116]  |
| 40 [1,000]      | 8,200 [3,719]    | 9,731 [4,414]     | 16,634 [7,545]  |
| 42 [1,050]      | 9,351 [4,242]    | 11,059 [5,016]    | 19,649 [8,913]  |
| 46 [1,150]      | 11,449 [5,193]   | 13,584 [6,162]    | 23,799 [10,795] |
| 48 [1,200]      | 12,395 [5,622]   | 14,900 [6,759]    | 27,071 [12,279] |
| 52 [1,300]      | —                | 19,989 [9,067]    | Upon request    |
| 54 [1,350]      | —                | 23,198 [10,522]   |                 |
| 56 [1,400]      | —                | 25,594 [11,609]   |                 |
| 58 [1,450]      | —                | 29,337 [13,307]   |                 |
| 60 [1,500]      | —                | 32,279 [14,642]   |                 |

# How to Order

## Figure number

The figure number shown below identifies specific valve configuration details of TOVs, such as valve type, pressure class, end connections, body and bonnet and trim materials, and special features.

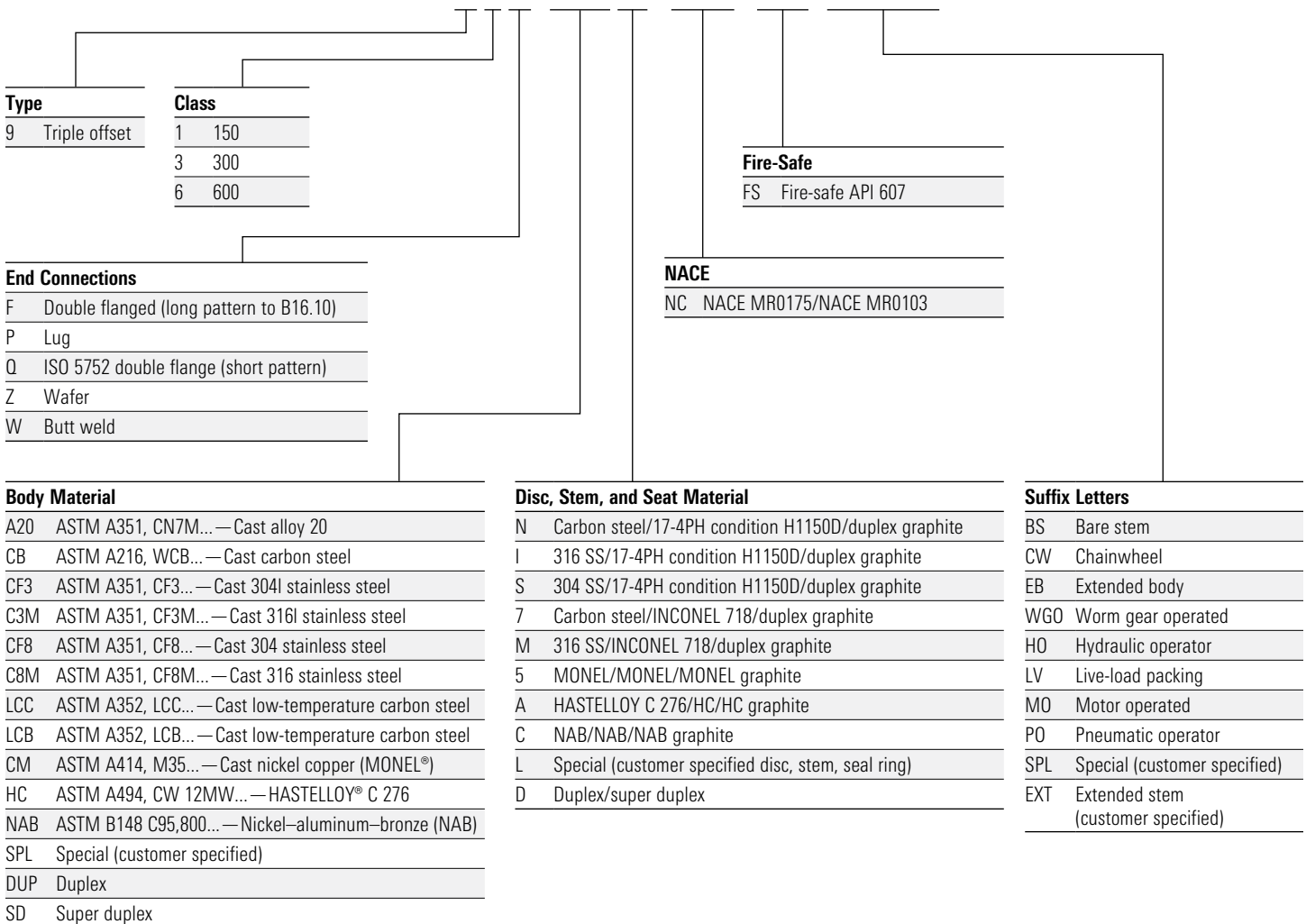
Please specify end connections, body materials, and trims not listed below.

When placing an order, refer to the respective product section of the catalog for size availability. A detailed description must be included with any special orders.

Additional details for nonstandard materials must be specified in the order.



## 91F-CBN-NC-FS-WGO





# WKM Valves—Triple Offset Valves



[products.slb.com/wkmtov](https://products.slb.com/wkmtov)

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