# Reduced Bore Ball Valves

## Three-piece design

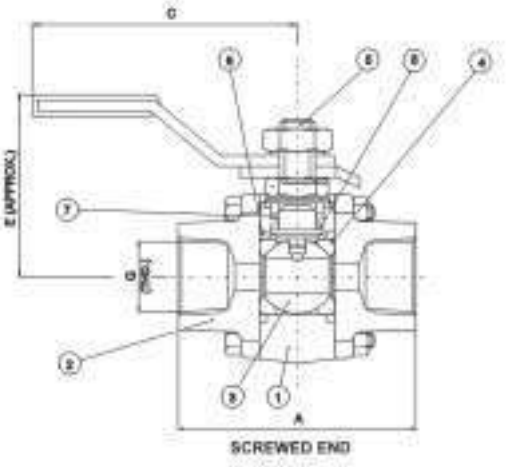
HaMa Engineering Pvt. Ltd.
The Engineering Excellency

### 3XR - Standard series

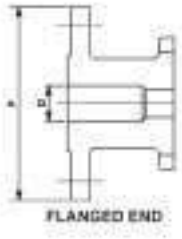
This 3-piece Ball Valve is the most easily on-line maintainable in its class. By removing three body connector bolts and loosening the fourth, the body can be swung away using the fourth bolt as the fulcrum, to carry out any installation or maintenance operation on the valve, thus reducing downtime. This valve can be offered in a wide variety of body and seat combinations.

### 3FXR - Fire-safe series

This 3-piece fire-safe design Ball Valve features a secondary metal seat which renders the valve fire-safe. When the seat is totally sublimated in a fire, the ball moves and rests against the lip, forming a metal-to-metal seat, thus ensuring leak-tightness.









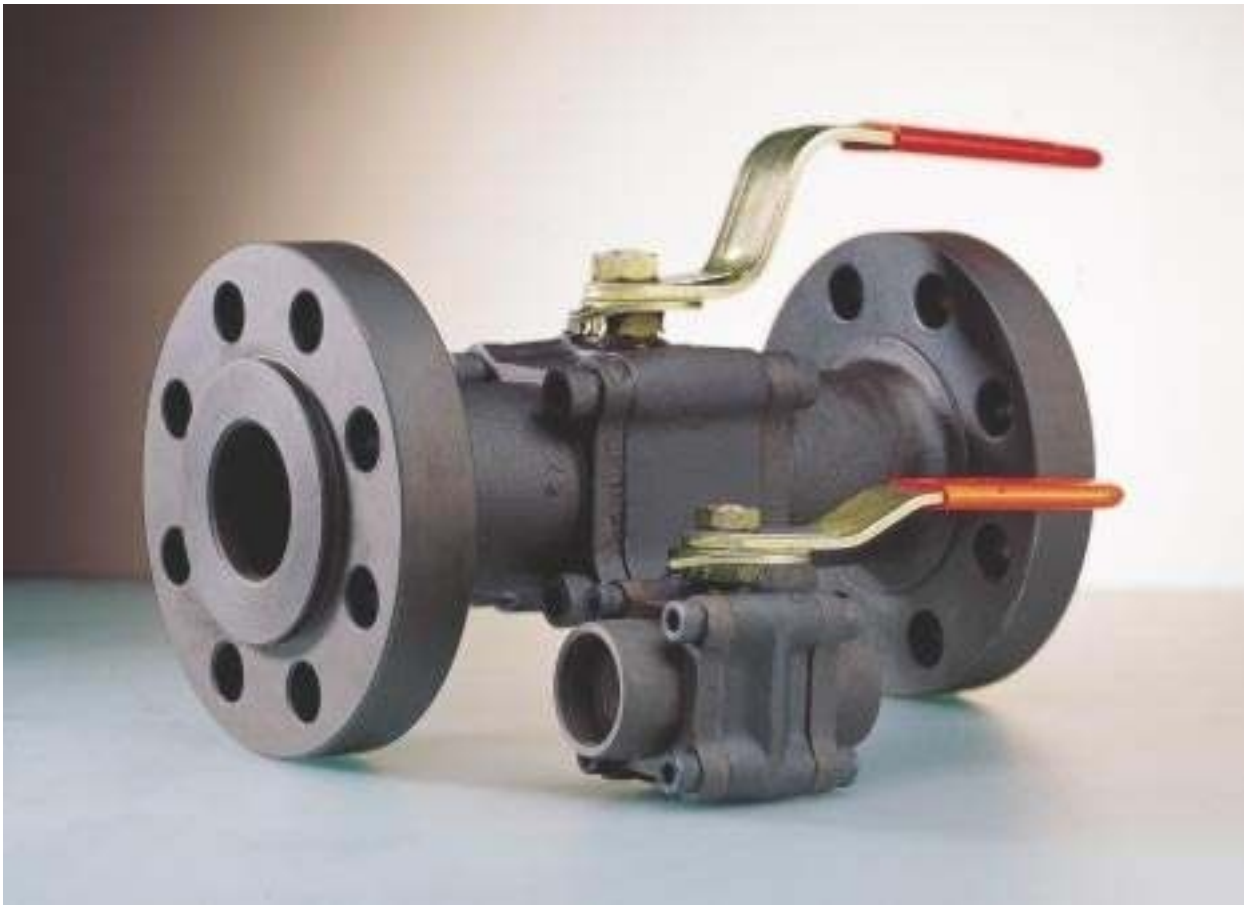

### Dimensional Details

Screwed/Socket-weld end (in mm, unless specified)

| Valve Size | A | C | D | E | F | G | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|
| 8 | 65 | 122 | 14.6 / 14.2 | 45 | 9.7 | 1/4" | 0.6 |
| 10 | 65 | 122 | 18.0 / 17.6 | 45 | 9.7 | 3/8" | 0.6 |
| 15 | 67 | 122 | 22.2 / 21.8 | 45 | 9.7 | 1/2" | 0.6 |
| 20 | 73 | 122 | 27.6 / 27.1 | 48 | 12.7 | 3/4" | 0.8 |
| 25 | 95 | 149 | 34.3 / 33.8 | 59 | 12.7 | 1" | 1.6 |
| 32 | 107 | 149 | 43.1 / 42.7 | 65 | 12.7 | 1 1/4" | 2.5 |
| 40 | 116 | 181 | 49.2 / 48.7 | 75 | 12.7 | 1 1/2" | 3.3 |
| 50 | 128 | 181 | 61.7 / 61.1 | 80 | 15.9 | 2" | 4.1 |

### Dimensional Details - Flanged end (in mm, unless specified)

| Valve Size | C | D | E | Class 150 | | | Class 300 | | | Class 600 | | | Approx. Weight (kg) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | F | G | A | F | G | A | F | G | Cl. 150 | Cl. 300 | Cl. 600 |
| 15 | 152 | 12.7 | 90 | 108 | 89 | 11.1 | 140 | 96 | 15 | 165 | 96 | 22 | 1.8 | 2.2 | 4.5 |
| 20 | 152 | 19.1 | 98 | 117 | 99 | 12.2 | 153 | 118 | 17 | 191 | 118 | 24 | 2.3 | 3.2 | 6.3 |
| 25 | 177 | 25.4 | 102 | 127 | 108 | 11.1 | 165 | 124 | 19 | 216 | 124 | 26 | 3.1 | 4.5 | 9.1 |
| 40 | 202 | 38.1 | 121 | 165 | 127 | 14.3 | 191 | 156 | 22 | 241 | 156 | 30 | 6.4 | 8.7 | 15.4 |
| 50 | 202 | 50.8 | 126 | 178 | 154 | 15.9 | 216 | 165 | 23 | 292 | 165 | 33 | 9.0 | 10.8 | 21.6 |



| Material Specification | | 3XR | | 3FXR | |
|---|---|---|---|---|---|
| **Sl. No.** | **Part** | **Carbon Steel** | **Stainless Steel** | **Carbon Steel** | **Stainless Steel** |
| 1<br>2 | Body<br>Body Connector | ASTM A105 or<br>ASTM A216 Gr. WCB | ASTM A351 Gr. CF8M | ASTM A105 | ASTM A351 Gr. CF8M |
| 3 | Ball | ASTM A351 Gr. CF 8M | | ASTM A351 Gr. CF 8M | |
| 4 | Seat | PTFE | | PTFE | |
| 5 | Stem | AISI 316 | | AISI 316 | |
| 6 | Body Seal | PTFE | | Graphite | |
| 7 | Gland Packing | 35% Carbon-filled PTFE | | Graphite | |
| 8 | Stem Seal | 35% Carbon-filled PTFE | | 35% Carbon-filled PTFE | |

## Specifications

| | |
|---|---|
| Max. cold working pressure | 69kg/cm$^2$ for screwed/socket-weld end valves with PTFE seat<br>103kg/cm$^2$ for screwed/socket-weld end valves with special-filled PTFE seat<br>As per flange rating for flanged valves |
| Valve design | BS 5159 for 3XR Series<br>BS 5351 for 3FXR Series |
| Fire Test (for 3FXR) | API 607 4th edition |
| Testing | API 598 for flanged valves |
| Face-to-face dimensions | ASME B16.10 for flanged valves and AIL Standard for screwed/socket-weld end valves |

## Pressure Testing

Test pressures

| | Ends | kg/cm$^2$ | (psi) |
|---|---|---|---|
| Shell | Screwed/Socket weld (air) | 5.6 | (80) |
| | Flanged 150 (hydrostatic) | 31.5 | (450) |
| | Flanged 300 (hydrostatic) | 79.0 | (1125) |
| | Flanged 600 (hydrostatic) | 154.0 | (2225) |
| Seat | All valves (air) | 5.6 | (80) |

NOTE Pressure testing as per BS 6755 available on request.

Shell hydrostatic test can be done for screwed and socket-weld end valves on request.

Shell hydrostatic test can be done as per Class 800 rating for both versions on request.

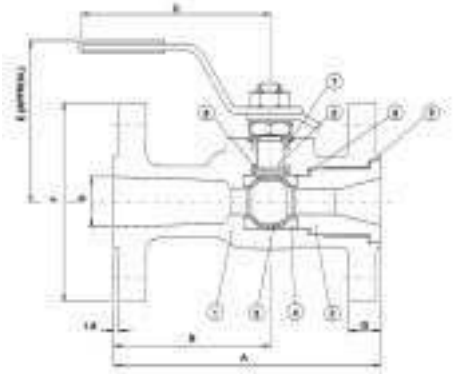
# Reduced Bore Ball Valves

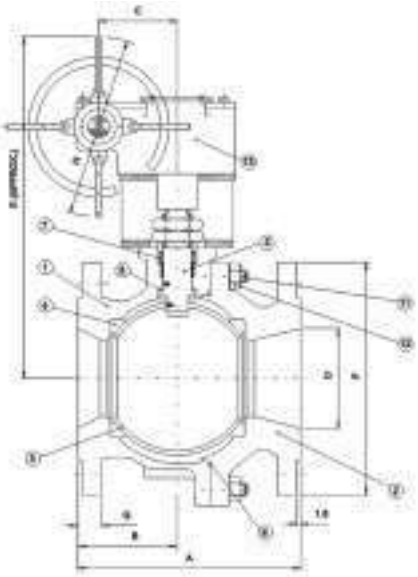
## Single-piece and two-piece design

### XR - Fire-safe series

These single-piece Ball Valves are high performance valves which come with a one-piece integrally flanged body, in sizes of up to 200mm. This design offers the unique advantage of eliminating the possibility of external leakage to the atmosphere through bolted body joints. These environment-friendly and high-integrity valves are preferred in critical applications where the media is expensive, volatile or toxic, and where external leakage or wastage is unacceptable.

The 2-piece design fire-safe design Ball Valves complement the single-piece design in 250mm size.





Dimensional Details - Flanged end (in mm, unless specified)

Single-piece (Class 150)

| Valve Size | A | B | C | D | E | F | G | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|---|
| 15 | 108 | 62 | 152 | 12.7 | 89 | 89 | 11.5 | 1.5 |
| 20 | 117 | 68 | 152 | 19.1 | 91 | 99 | 11.5 | 2.0 |
| 25 | 127 | 70 | 177 | 25.4 | 103 | 108 | 11.5 | 3.0 |
| 40 | 165 | 78 | 202 | 38.1 | 118 | 127 | 14.5 | 5.0 |
| 50 | 178 | 107 | 202 | 50.8 | 131 | 154 | 16.0 | 8.1 |
| 80 | 203 | 120 | 546 | 76.2 | 169 | 191 | 19.5 | 17.0 |
| 100 | 229 | 130 | 546 | 102.0 | 182 | 229 | 24.0 | 27.8 |
| 150 | 267 | 138 | 762 | 150.8 | 275 | 280 | 25.4 | 47.0 |
| 200 | 292 | 148 | - | 203.0 | - | 343 | 28.4 | 115.0 |

Single-piece (Class 300)

| Valve Size | A | B | C | D | E | F | G | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|---|
| 15 | 140 | 94 | 152 | 12.7 | 89 | 96 | 15 | 2.2 |
| 20 | 152 | 103 | 152 | 19.1 | 91 | 118 | 16 | 3.2 |
| 25 | 165 | 108 | 177 | 25.4 | 103 | 124 | 18 | 4.5 |
| 40 | 190 | 116 | 202 | 38.1 | 118 | 156 | 21 | 8.7 |
| 50 | 216 | 145 | 202 | 50.8 | 131 | 165 | 22.5 | 10.8 |
| 80 | 283 | 199 | 546 | 76.2 | 169 | 210 | 29 | 24.1 |
| 100 | 305 | 206 | 546 | 102.0 | 182 | 254 | 32 | 37.5 |
| 150 | 403 | 274 | 762 | 150.8 | 275 | 318 | 37 | 67.0 |
| 200 | 419 | 275 | - | 203.0 | - | 381 | 41 | 167.0 |

Two-piece (Class 150)

| Valve Size | A | B | C | D | E | F | G | H | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 250 | 330 | 165 | 148 | 254 | 686 | 406 | 30.5 | 578 | 210 |

Two-piece (Class 300)

| Valve Size | A | B | C | D | E | F | G | H | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 250 | 457 | 229 | 148 | 254 | 686 | 445 | 48 | 578 | 280 |

| Material Specification | | XR Series | |
|---|---|---|---|
| Sl. No. | Part | Carbon Steel | Stainless Steel |
| 1 | Body | ASTM A216 Gr. WCB | ASTM A351 Gr. CF8M |
| 2 | Insert | ASTM A105 or ASTM A216 Gr. WCB | AISI 316 or ASTM A351 Gr. CF8M |
| 3 | Ball | ASTM A351 Gr. CF 8M | ASTM A351 Gr. CF8M |
| 4 | Seat | PTFE | PTFE |
| 5 | Stem | AISI 316 | AISI 316 |
| 6 | Body Seal | PTFE | PTFE |
| 7 | Gland Packing | Graphite | Graphite |
| 8 | Stem Seal | 35% Carbon-filled PTFE | 35% Carbon-filled PTFE |
| 9 | Insert Seal | 15mm - 40mm, 200mm : Metal-to-metal<br>50mm - 150mm : Graphite | 15mm - 40mm, 200mm : Metal-to-metal<br>50mm - 150mm : Graphite |

## Specifications

| | |
|---|---|
| Valve design | BS 5351 |
| Fire test | API 607, 4th edition |
| Pressure testing | API 598 (testing as per BS6755 Part I on request) |
| Face-to-face dimensions | ASME B16.10 |
| End flange dimensions | ASME B16.5 Class 150 RF and Class 300 RF |

## Pressure Testing

Test pressures

| | Ends | kg/cm$^2$ (psi) |
|---|---|---|
| Shell | Class 150 (hydrostatic) | 31.5 (450) |
| | Class 300 (hydrostatic) | 79.0 (1125) |
| Seat | Class 150 (air) | 5.6 (80) |
| | Class 300 (air) | 5.6 (80) |

# Full Bore Ball Valves

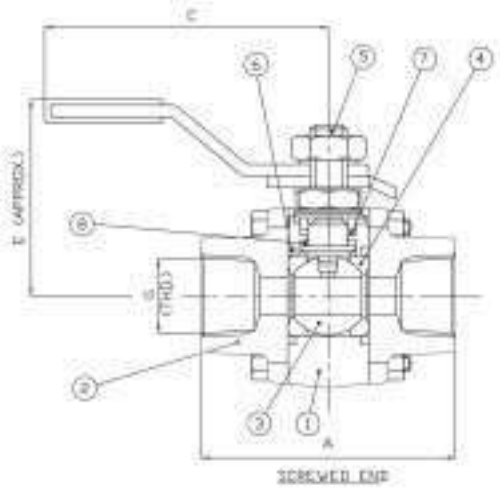
## Three-piece design

### 3XF - Standard series

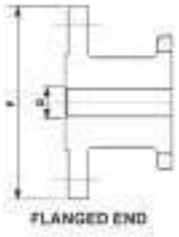
This 3-piece Ball Valve is the most easily on-line maintainable in its class. By removing three body connector bolts and loosening the fourth, the body can be swung away using the fourth bolt as the fulcrum, to carry out any installation or maintenance operation on the valve, thus reducing downtime. This valve can be offered in a wide variety of body and seat combinations.

### 3FXF - Fire-safe series

This 3-piece fire-safe design Ball Valve features a secondary metal seat which renders the valve fire-safe. When the seat is totally sublimated in a fire, the ball moves and rests against the lip, forming a metal-to-metal seat, thus ensuring leak-tightness.










Dimensional Details

Screwed/Socket-weld end (in mm, unless specified)

| Valve Size | A | C | D | E | F | G | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|
| 15 | 73 | 122 | 22.2 / 21.8 | 48 | 9.7 | 1/2” | 0.8 |
| 20 | 95 | 149 | 27.6 / 27.1 | 59 | 12.7 | 3/4” | 1.6 |
| 25 | 116 | 181 | 34.3 / 33.8 | 75 | 12.7 | 1” | 3.3 |
| 40 | 128 | 181 | 49.2 / 48.7 | 80 | 12.7 | 1 1/2” | 4.1 |

Dimensional Details

Flanged end (in mm, unless specified)

| Valve Size | C | D | E | Class 150 | | | Class 300 | | | Class 600 | | | Approx. Weight (kg) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | F | G | A | F | G | A | F | G | Cl. 150 | Cl. 300 | Cl. 600 |
| 15 | 152 | 12.7 | 98 | 108 | 89 | 11.1 | 140 | 96 | 15 | 165 | 96 | 22 | 2.3 | 3.2 | 6.3 |
| 20 | 177 | 19.1 | 102 | 117 | 99 | 12.2 | 153 | 118 | 17 | 191 | 118 | 24 | 3.1 | 4.5 | 9.1 |
| 25 | 202 | 25.4 | 121 | 127 | 108 | 11.1 | 165 | 124 | 19 | 216 | 124 | 26 | 6.4 | 8.7 | 15.4 |
| 40 | 202 | 38.1 | 126 | 165 | 127 | 14.3 | 191 | 156 | 22 | 241 | 156 | 30 | 9.0 | 10.8 | 21.6 |

| | Material Specification | 3XF | | 3FXF | |
|---|---|---|---|---|---|
| Sl. No. | Part | Carbon Steel | Stainless Steel | Carbon Steel | Stainless Steel |
| 1<br>2 | Body<br>Body Connector | ASTM A105 or<br>ASTM A216 Gr. WCB | ASTM A351 Gr. CF8M | ASTM A105 | ASTM A351 Gr. CF8M |
| 3 | Ball | ASTM A351 Gr. CF8M | | ASTM A351 Gr. CF8M | |
| 4 | Seat | PTFE | | PTFE | |
| 5 | Stem | AISI 316 | | AISI 316 | |
| 6 | Body Seal | PTFE | | Graphite | |
| 7 | Gland Packing | 35% Carbon-filled PTFE | | Graphite | |
| 8 | Stem Seal | 35% Carbon-filled PTFE | | 35% Carbon-filled PTFE | |

## Specifications

| | |
|---|---|
| Max. cold working pressure | 69kg/cm$^2$ for screwed/socket-weld end valves with PTFE seat<br>103kg/cm$^2$ for screwed/socket-weld end valves with special-filled PTFE seat<br>As per flange rating for flanged valves |
| Valve design | BS 5159 for 3XF Series<br>BS 5351 for 3FXF Series |
| Fire Test (for3FXF) | API 607 4th edition |
| Testing | API 598 for flanged valves |
| Face-to-face dimensions | ASME B16.10 for flanged valves and AIL Standard for screwed/socket-weld end valves |

## Pressure Testing

Test pressures

| | Ends | kg/cm$^2$ (psi) |
|---|---|---|
| Shell | Scr./Socket weld (air) | 5.6 (80) |
| | Flanged 150 (hydrostatic) | 31.5 (450) |
| | Flanged 300 (hydrostatic) | 79.0 (1125) |
| | Flanged 600 (hydrostatic) | 154.0 (2225) |
| Seat | All valves (air) | 5.6 (80) |

NOTE Pressure testing as per BS 6755 available on request.

Shell hydrostatic test can be done for screwed and socket-weld end valves on request.

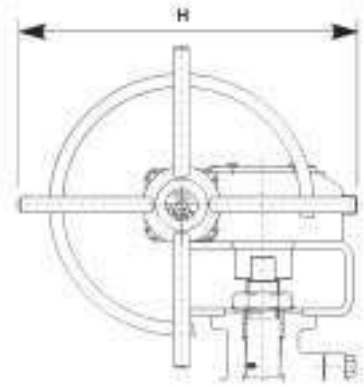
Shell hydrostatic test can be done as per Class 800 rating for both versions on request.

# Full Bore Ball Valves

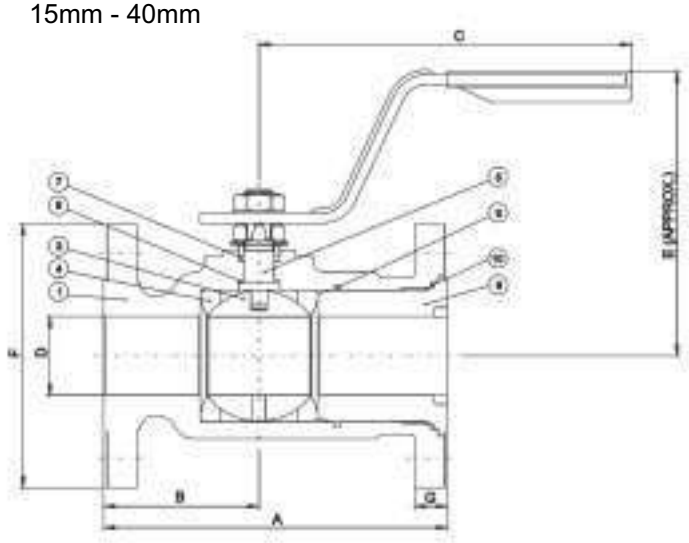
## Single-piece / Two-piece design

### XF Fire-safe Series (Class 150 & Class 300)

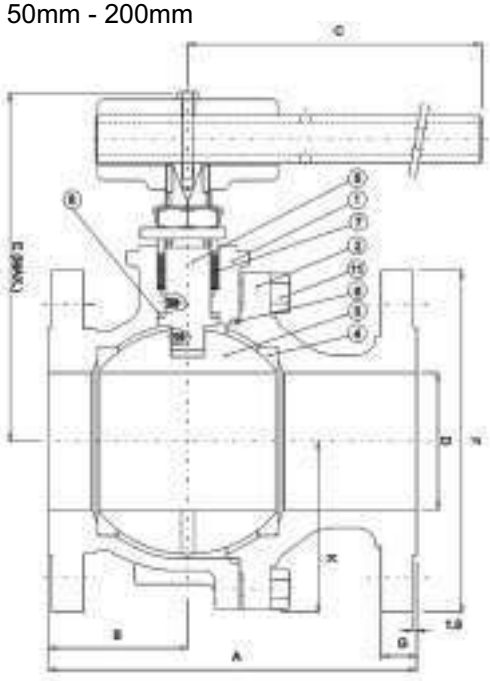
These high performance full bore ball valves come in single-piece design (in sizes of 15 - 40mm) as well as in two-piece design (in sizes of 50 - 200mm). Advanced features such as fire safety, antistatic capability, cavity relief and blow-out proof stem are built into these valves. They are supplied with an integral actuator mounting flange with drilled and tapped holes conforming to ISO 5211.




15mm - 40mm



50mm - 200mm



Dimensional Details (in mm, unless specified)

Class 150

| Valve Size | A | B | C | D | E | H | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|
| 15 | 108 | 46 | 163 | 12.7 | 97 | - | 1.8 |
| 20 | 117 | 50 | 168 | 19.1 | 118 | - | 2.5 |
| 25 | 127 | 56 | 168 | 25.4 | 123 | - | 3.4 |
| 40 | 165 | 75 | 193 | 38.1 | 139 | - | 8.5 |
| 50 | 178 | 84 | 193 | 50.8 | 150 | - | 12.2 |
| 65 | 191 | 77 | 402 | 64.1 | 190 | - | 18.5 |
| 80 | 203 | 99 | 256 | 76.2 | 155 | - | 23.0 |
| 100 | 229 | 108 | 402 | 101.6 | 196 | - | 42.6 |
| 150 | 394 | 179 | 1004 | 150.8 | 315 | - | 90.0 |
| 200 | 457 | 206 | - | 203.0 | 690 | 578 | 170.0 |

Class 300

| Valve Size | A | B | C | D | E | H | Approx. Weight (kg) |
|---|---|---|---|---|---|---|---|
| 15 | 140 | 78 | 163 | 12.7 | 97 | - | 2.5 |
| 20 | 153 | 85 | 168 | 19.1 | 118 | - | 3.8 |
| 25 | 165 | 94 | 168 | 25.4 | 123 | - | 5.1 |
| 40 | 191 | 100 | 193 | 38.1 | 139 | - | 9.5 |
| 50 | 216 | 84 | 193 | 50.8 | 150 | - | 15.2 |
| 65 | 241 | 83 | 402 | 64.1 | 190 | - | 26.0 |
| 80 | 283 | 99 | 402 | 76.2 | 205 | - | 32.6 |
| 100 | 305 | 122 | 610 | 101.6 | 240 | - | 59.0 |
| 150 | 403 | 179 | - | 150.8 | 645 | 578 | 121.0 |
| 200 | 502 | 231 | - | 203.0 | 745 | 578 | 210.0 |

| | Material Specification | XF Series | |
|---|---|---|---|
| Sl. No. | Part | Carbon Steel | Stainless Steel |
| 1 | Body | ASTM A216 Gr. WCB | ASTM A351 Gr. CF8M |
| 2 | Body Connector | ASTM A216 Gr. WCB | ASTM A351 Gr. CF8M |
| 3 | Ball | ASTM A351 Gr. CF 8M | ASTM A351 Gr. CF8M |
| 4 | Seat | PTFE | PTFE |
| 5 | Stem | AISI 316 | AISI 316 |
| 6 | Body Seal | Graphite | Graphite |
| 7 | Gland Packing | Graphite | Graphite |
| 8 | Stem Seal | 25% Glass-filled PTFE | 25% Glass-filled PTFE |
| 9 | Insert | ASTM A105 / ASTM A216 Gr. WCB / IS1875 Cl 2 | AISI 316 or ASTM A351 Gr. CF8M |
| 10 | Insert gasket | Graphite | Graphite |

XF Series - single-piece valves up to 40mm ; two-piece valves from 50mm onwards.

## Specifications

| | |
|---|---|
| Valve design | BS 5351 |
| Fire test | API 607, 4th edition |
| Pressure testing | API 598 (testing as per BS6755 Part I on request) |
| Face-to-face dimensions | ASME B16.10 (compliance to BS 2080 can be offered on request) |
| End flange dimensions | ASME B16.5 Class 150 RF and Class 300 RF |

## Pressure Testing

Test pressures

| | Ends | kg/cm$^2$ (psi) |
|---|---|---|
| Shell | Class 150 (hydrostatic) | 31.5 (450) |
| | Class 300 (hydrostatic) | 79.0 (1125) |
| Seat | Class 150 (air) | 5.6 (80) |
| | Class 300 (air) | 5.6 (80) |