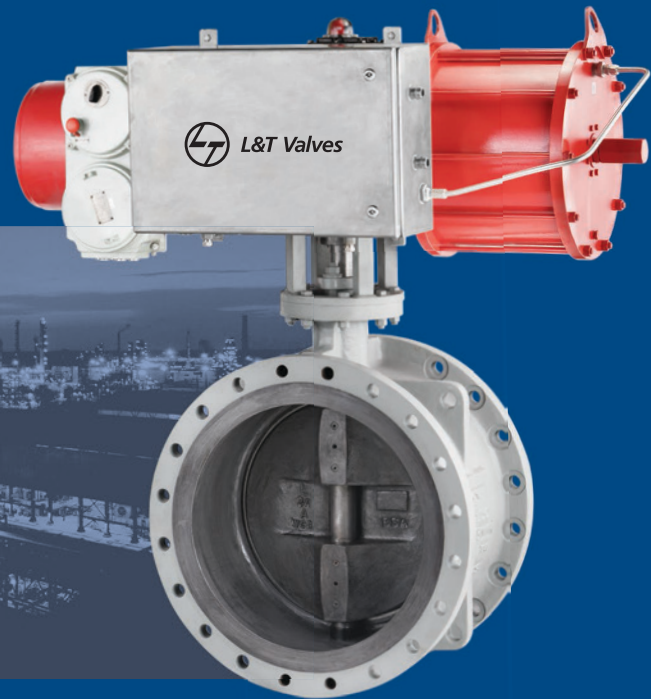


Triple-offset Butterfly Valves



ASME Class 150 to 1500 | 3" to 100" (80 mm to 2500 mm)
API 609

L&T Valves is a wholly owned subsidiary of Larsen & Toubro. Backed by a heritage of excellence that exceeds five decades, the company manufactures engineered flow-control solutions for key sectors of the economy.

Product Range:

- Gate, Globe & Check Valves
- Pipeline & Process Ball Valves
- Triple-offset Butterfly Valves
- Flanged & Wafer-type Butterfly Valves
- Double Block and Bleed Plug Valves
- Customized Solutions including HIPPS
- Smart and Digital Solutions

The valves are designed using state-of-the-art 3D design, simulation and analysis software. Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) are used to fine-tune product performance.

The Quality Management System of L&T Valves is certified to comply with ISO 9001 and API Spec Q1. The company is licensed to offer products monogrammed API 600, API 6D and API 609 as well as valves with CE Marking (Pressure Equipment Directive 97/23/EC) and ATEX certification (Council Directive 94/9/EC). Ball and Butterfly Valves with SIL-3 certification (IEC 61508) are also offered.

Valve manufacturing at L&T Valves leverages the best in technology and skill, and all manufacturing operations are guided by international safety, health and environment standards.

L&T Valves distribution network spans the globe, partnering key valve distribution companies in all major industrial centres.





Triple-offset Butterfly Valves

L&T Valves offers a comprehensive range of Triple-offset Butterfly Valves in a variety of body styles and materials to address critical process requirements in diverse industries such as hydrocarbon, power, chemicals & fertiliser, water, etc.

The product range covers valves in ASME classes up to 1500, in sizes up to 100" (2500 mm), in carbon steel, stainless steel and alloy steels, suitable for temperatures from -196°C to 538°C. Based on customer requirements, valves in higher pressure classes, larger sizes and other materials are also offered.

The metal-seated valves conform to API 609 Category B and offer high-integrity bi-directional sealing.



L&T Valves offers Fabricated Steel Triple-offset Butterfly Valves for water industry in pressure classes from PN 6 to PN 25, in sizes up to 100" (2500 mm)

Flanged - Short and Long Patterns

| ASME Class | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 48 | 54 | 64 | 72 | 84 | 100 |
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1200 | 1350 | 1600 | 1800 | 2100 | 2500 |
| 150 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 300 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | | | |
| 600 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | | | | | | | |
| 900 | • | • | • | • | • | • | • | • | • | • | | | | | | | | | | | | | | | | |
| 1500 | • | • | • | • | • | • | • | • | | | | | | | | | | | | | | | | | | |

Wafer and Wafer-Lugged

| ASME Class | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 |
| 150 | • | • | • | • | • | • | • | • | • | • | • |
| 300 | • | • | • | • | • | • | • | • | • | • | • |
| 600 | • | • | • | • | • | • | • | • | • | • | • |

Compliance Standards

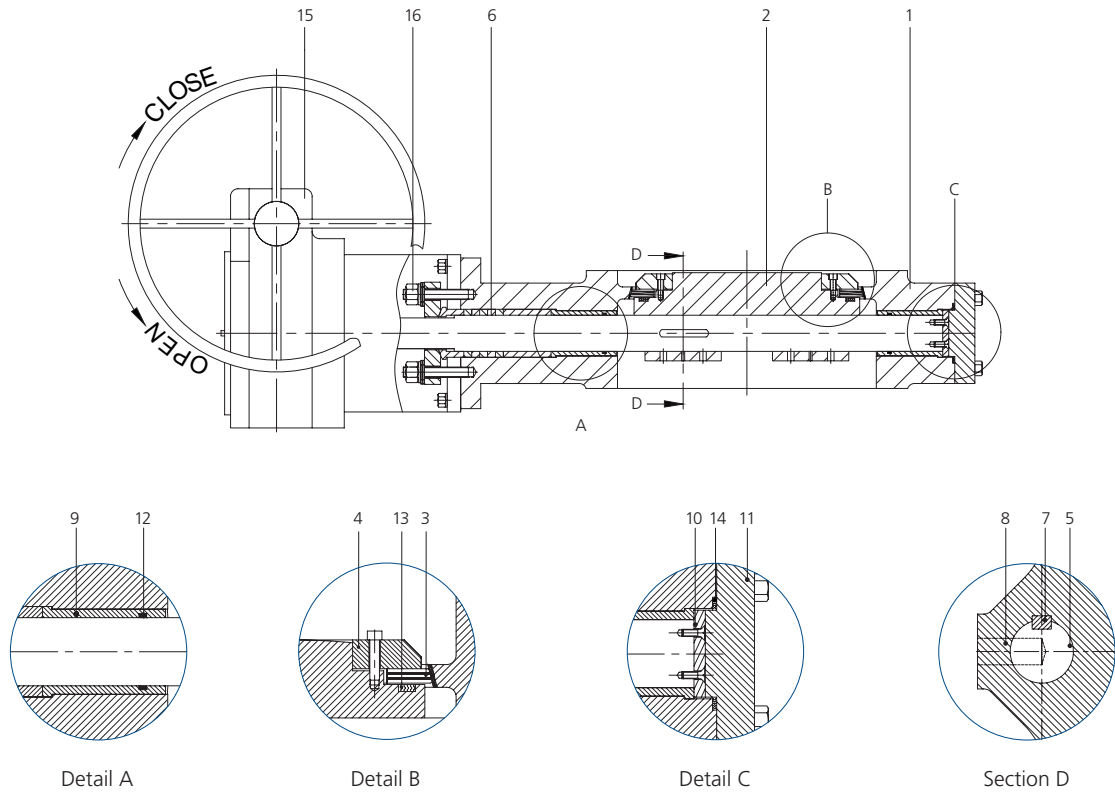
Triple-offset Butterfly Valves are designed in accordance with key international standards. They also meet the requirements of major oil & gas and power industry standards/ customer specifications.

| Parameter | | Standard | |
|-------------------------------|----------------|-----------------------------------|--|
| Design | | API 609 (Category B), ASME B16.34 | |
| Ends | Wafer/ Lugged | Face-to-face | API 609 |
| | | End Flange Dimensions | ASME B16.5 |
| | Flanged | Face-to-face | API 609/ ISO 5752 Ser. 13/ Ser. 14/ Ser. 8 |
| | | End Flange Dimensions | ASME B16.5/ ASME B16.47 |
| | Butt-weld | End-to-end | ASME B16.10 |
| | | End Dimensions | ASME B16.25 |
| Testing | Shell and Seat | | API 598 |
| | Cryogenic Test | | BS 6364 |
| | Fire Test | | API 607/ ISO 10497 |
| Pressure - Temperature Rating | | ASME B16.34 | |



Materials of Construction

| No. | Components | Materials | | | |
|--|-------------------|--|--------------------------------------|---|---|
| | | WCB/ WCC | LCB/ LCC | WC6/ WC9 | C5 |
| 1 | Body | A 216 Gr. WCB/ WCC | A 352 Gr. LCB/ LCC | A 217 Gr. WC6/ WC9 | A 217 Gr. C5 |
| 2 | Disc | A 216 Gr. WCB/ WCC | A 352 Gr. LCB/ LCC | A 217 Gr. WC6/ WC9 | A 217 Gr. C5 |
| 3 | Laminar Seal | UNS S31803 + Graphite/ UNS S20910 + Graphite | | SS 410 + Graphite/ UNS S20910 + Graphite | |
| 4 | Retainer | A 516 Gr. 70 | SS 316 | SS 410 | SS 410/ SS 316 |
| 5 | Shaft | A 479 Type SS 410/ A 564 Type 630 | A 479 Type S20910/ A 564 Type 630 | A 479 Type SS 410 | A 479 Type SS 410/ A 479 Type S20910 |
| 6 | Packing | Graphite - 5 Braided rings / Graphite - 3 moulded and 2 braided rings / PTFE | | | |
| 7 | Key | SS 410/ 17-4-PH | UNS S20910 / 17-4-PH | SS 410 | SS 410/ UNS S20910 |
| 8 | Dowel Pin | SS 410/ 17-4-PH | UNS S20910 / 17-4-PH | SS 410 | SS 410/ UNS S20910 |
| 9 | Bearing | SS 316/ UNS S20910 Nitrided | | | |
| 10 | Thrust Plate | SS 316/ UNS S20910 Nitrided | | | |
| 11 | Bottom Cover | A 516 Gr. 70 | SS 316 / A 516 Gr. 70 | SS 410 | SS 410/ SS 316 |
| 12 | Bearing Protector | Graphite | | | |
| 13 | Gasket - Disc | SS 316 / 316L with Graphite | | | |
| 14 | Gasket - Cover | SS 316 / 316L with Graphite | | | |
| 15 | Gear Unit | Worm type (self-locking) | | | |
| 16 | Bolting | A 193 Gr. B7/ A 194 Gr. 2H | A 320 Gr. L7/ A 194 Gr. 7 | A 193 Gr. B16/ A 194 Gr. 7 | A 193 Gr. B16/ A 194 Gr. 7 |
| Body seat hard-faced with Stellite 21 or 6 | | | | | |



| No. | Components | Materials | | |
|--|----------------|--|---|--|
| | | CF3/ CF8 | CF3M/ CF8M | 4A/ 5A |
| 1 | Body | A 351 Gr. CF3/ CF8 | A 351 Gr. CF3M/ CF8M | A 995 Gr. 4A/ 5A |
| 2 | Disc | A 351 Gr. CF3/ CF8 | A 351 Gr. CF3M/ CF8M | A 995 Gr. 4A/ 5A |
| 3 | Laminar Seal | UNS S31803 + Graphite / UNS S20910 + Graphite / UNS N06625 + Graphite | UNS S31803 + Graphite / UNS S20910 + Graphite / UNS N06625 + Graphite | UNS S31803 + Graphite / UNS S32750 + Graphite |
| 4 | Retainer | SS 316/ 304/ 304L | SS 316/ 316L | UNS S31803/ UNS S32750 |
| 5 | Shaft | UNS N07718 / 17-4-PH / A 479 Type S20910 | UNS N07718 / 17-4-PH / A 479 Type S20910 | UNS S32750/ UNS N07718 |
| 6 | Packing | Graphite - 5 Braided rings / Graphite - 3 moulded and 2 braided rings / PTFE | | |
| 7 | Key | UNS N07718/ 17-4-PH / UNS S20910 | UNS N07718/ 17-4-PH / UNS S20910 | UNS S32750/ UNS N07718 |
| 8 | Dowel Pin | UNS N07718/ 17-4-PH / UNS S20910 | UNS N07718/ 17-4-PH / UNS S20910 | UNS S32750/ UNS N07718 |
| 9 | Bearing | SS 316/ SS 316L / UNS S20910/ UNS S32750 Chrome-plated | | |
| 10 | Thrust Plate | SS 316/ SS 316L / UNS S20910/ UNS S32750 Chrome-plated | | |
| 11 | Bottom Cover | SS 304L/ 304/ 316 | SS 316L/ 316 | UNS S31803/ UNS S32750 |
| 12 | Bearing Seal | Graphite / PTFE | | |
| 13 | Gasket - Disc | SS 316 / 316L with Graphite | | UNS S32750 with Graphite |
| 14 | Gasket - Cover | SS 316 / 316L with Graphite | | UNS S32750 with Graphite |
| 15 | Gear Unit | Worm type (self-locking) | | |
| 16 | Bolting | A 193 Gr. B8 / A 194 Gr. 8 | A 193 Gr. B8M/ A 194 Gr. 8M | A 193 Gr. B8M/ A 194 Gr. 8M/ UNS S32750 |
| Body seat hard-faced with Stellite 21 or 6 | | | | |



The expertise in Butterfly Valves that spans three decades forms the core of L&T Triple-offset range. The designs for these valves are created in a 3D environment using the latest design and analysis software. Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) are extensively used to fine-tune product designs.

The valves conform to API 609 Category B and can be offered with the API Monogram. The valves also meet the requirements of Fugitive Emission (Class A) as per ISO 15848. In addition, Triple-offset Butterfly Valves are certified Fire Safe as per API 607.

In-house Test Facilities:

- Fire Test
- Fugitive Emission Test
- Cryogenic Tests
- Endurance & Cycle tests



The valves are truly bi-directional and provide reliable performance in critical services. Customer confidence in this product is further enhanced by its SIL-3 (Safety Integrity Level - 3) certification for systematic integrity as per IEC 61508.

L&T Valves leverages world-class manufacturing infrastructure and systems to produce Triple-offset Butterfly Valves that set global benchmarks.

State-of-the-art manufacturing facilities include:

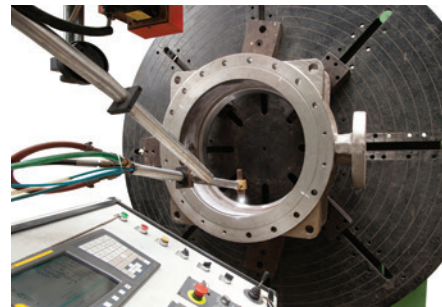
- 5-axis Machining Centres
- Special Purpose CNC Machines
- Customised Welding Machines

The quality management systems have been certified to comply with:

- ISO 9001: 2008
- API Spec Q1
- CE PED 97/ 23/ EC

Quality is built into each and every valve through a meticulously implemented QAP. Established processes control all stages of manufacture to ensure quality consistent with international standards and customer requirements.

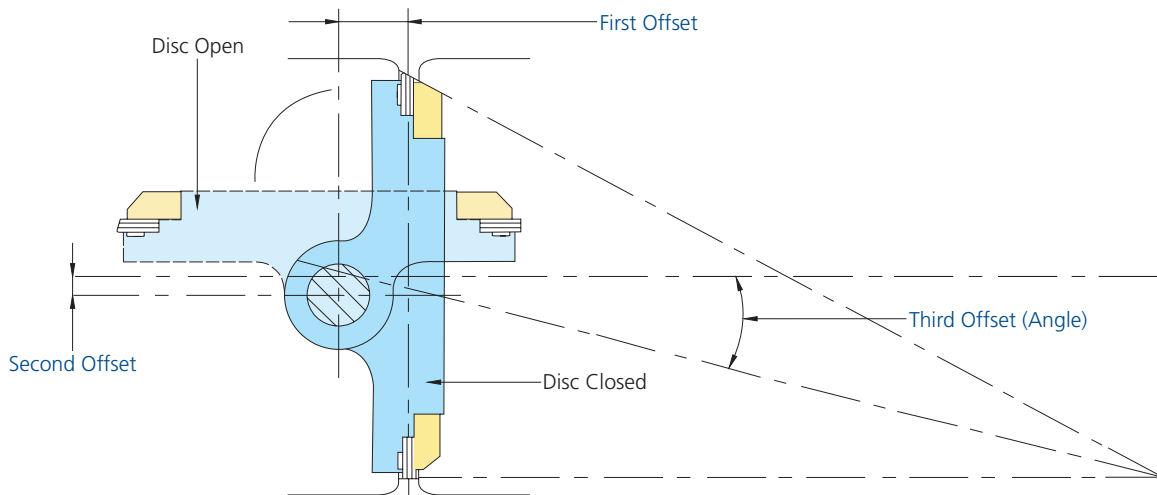
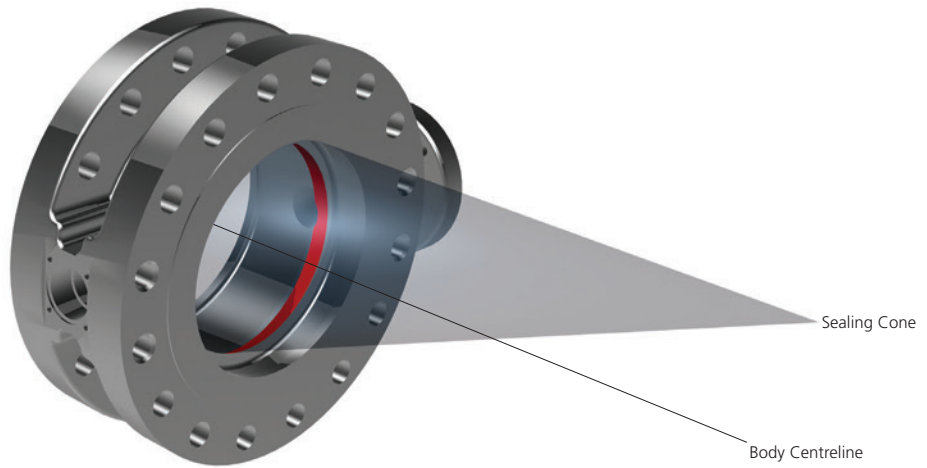
Occupational health and safety as well as environmental protection are accorded prime significance and guide all aspects of manufacturing at the plant.



Triple-offset Geometry

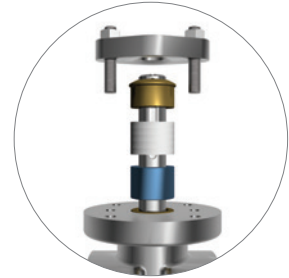
In Triple-offset Butterfly Valves, the shaft is offset from the sealing surface and body centreline. Further the sealing cone is rotated away from the bore centreline to create a third offset.

The triple-offset geometry ensures that the body and disc come into contact only at the final shut-off position. This eliminates wear and tear due to interference, reduces operating torque and enhances product life.



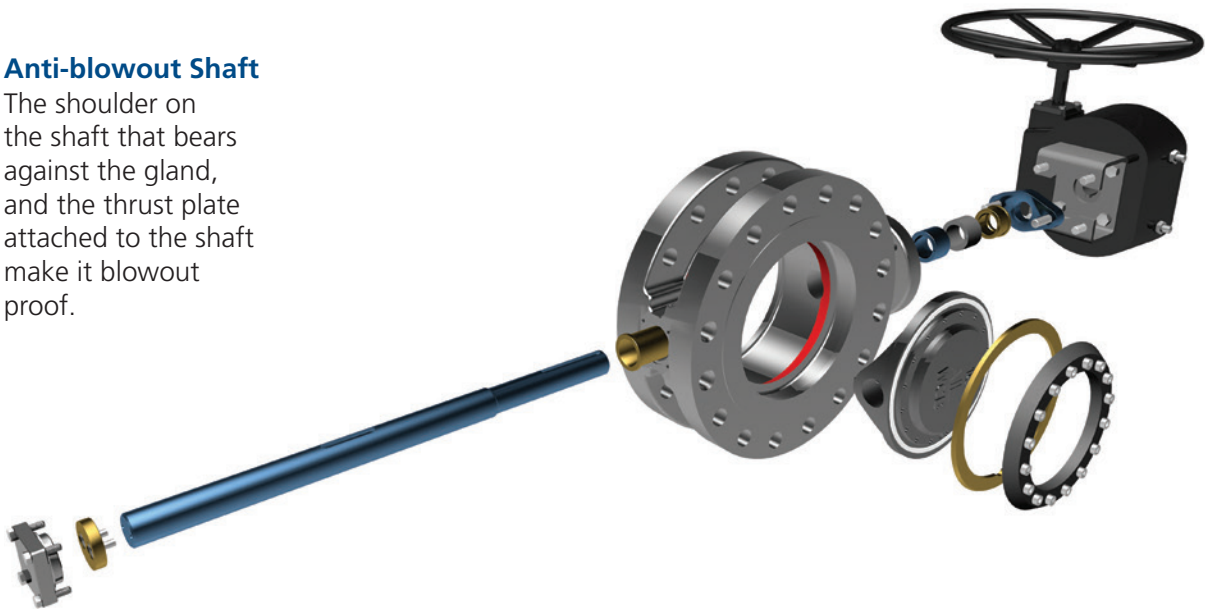
Assured Sealing to Atmosphere

Triple-offset Butterfly Valves meet the Fugitive Emission Test requirement of ISO 15848. This is achieved by employing high-integrity graphite gland packing and a gasket between bottom cover and body.



Anti-blowout Shaft

The shoulder on the shaft that bears against the gland, and the thrust plate attached to the shaft make it blowout proof.



Bi-directional bubble-tight sealing

Triple-offset Butterfly Valves are torque-seated valves where bubble-tight sealing is achieved when the laminar seal flexes and generates a compressive force all around the hard-faced body seat.

Replaceable Metal-to-Metal Seats

The laminar seal of Triple-offset Butterfly Valves are designed to be replaceable at site. It is also possible to renew the integral hard-faced body seat of TOBV by re-depositing Stellite.

Remote-operated Shut-off Valves (ROSOV)



Triple-offset Butterfly Valve, an inherently fire-safe valve that provides bi-directional bubble-tight sealing, has emerged as the valve of choice for oil movement and storage application worldwide. With this versatile valve at its core, L&T Valves offers Remote-operated Shut-off Valves (ROSOV) that leverages in-house capabilities in valve automation, and system design and integration.

A typical ROSOV is a fail-safe system that comprises pneumatic/ electro-hydraulic actuator, and solenoid valves, positioners and accessories integrated on a control panel. The product meets the requirements of IEC 61508 and IEC 61511 standards and is designed to enhance operational safety and efficiency in oil tankages and terminals.

Cryogenic Valves



L&T Valves manufactures a range of cryogenic and low temperature Triple-offset Butterfly Valves that conforms to BS 6364. The austenitic stainless steel valves are designed to perform at temperatures as low as -196°C . The valves are offered with extended shaft to ensure that cryogenic line fluids do not impair the performance of gland packing.

Triple-offset Butterfly Valves are available in ASME classes 150 to 600, in a variety of body styles and end-connections.

Fabricated Steel Triple-offset Butterfly Valves for Water



L&T Valves, a pioneer in valves for water service, has introduced an innovation for the water industry - Fabricated Steel Triple-offset Butterfly Valves for Water.

The valve is available in sizes up to 100" (2500 mm) in pressure classes from PN 6 to PN 25 to suit customer requirement. The valves meet the requirements of AWWA C 504, AWWA C 516, EN 593 and ISO 5752 standards.

The valve body, fabricated from carbon steel plates, has better mechanical and structural properties compared to cast iron body. Further, the metal-seated valve handles line impurities better than soft-seated valves, and provides reliable sealing for a longer period.

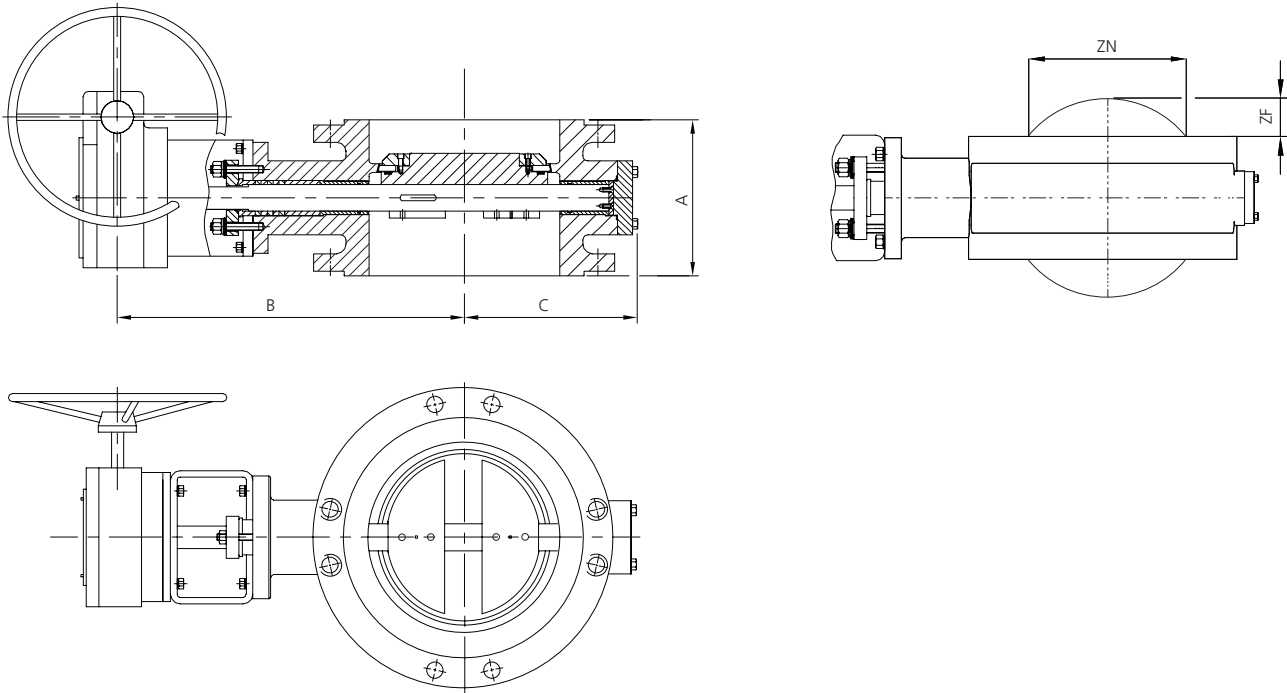
Top-entry Triple-offset Butterfly Valves



L&T Top-entry Triple-offset Butterfly Valve range is the specially designed for applications that require online maintenance. The top cover provides access to valve internals for complete renewal of valve trim - without removing the valve from the line, without jeopardising system safety and operator life.

The valve is available in sizes up to 48" (1200 mm), in ASME classes up to 900, with long pattern body and butt-weld ends.

Triple-offset Butterfly Valves - Short Pattern



Dimensions & Weights

| Size | | Class 150 | | | | | | Class 300 | | | | | |
|------|------|-----------|------|------|------|-----|-------|-----------|------|-----|-----|-----|------|
| NPS | DN | A | B | C | ZN | ZF | Wt. | A | B | C | ZN | ZF | Wt. |
| 3 | 80 | 114 | 265 | 130 | | | 30 | 114 | 265 | 130 | | | 50 |
| 4 | 100 | 127 | 275 | 140 | | | 35 | 127 | 275 | 150 | | | 70 |
| 6 | 150 | 140 | 300 | 160 | 45 | 8 | 45 | 140 | 390 | 200 | | | 80 |
| 8 | 200 | 152 | 415 | 205 | 128 | 28 | 65 | 152 | 455 | 230 | 125 | 28 | 125 |
| 10 | 250 | 165 | 475 | 240 | 182 | 45 | 110 | 165 | 490 | 253 | 180 | 46 | 165 |
| 12 | 300 | 178 | 510 | 265 | 235 | 65 | 150 | 178 | 545 | 295 | 235 | 66 | 216 |
| 14 | 350 | 190 | 560 | 305 | 265 | 75 | 190 | 190 | 585 | 335 | 275 | 78 | 305 |
| 16 | 400 | 216 | 590 | 335 | 294 | 78 | 250 | 216 | 625 | 375 | 291 | 77 | 380 |
| 18 | 450 | 222 | 585 | 360 | 345 | 100 | 280 | 222 | 680 | 405 | 336 | 105 | 420 |
| 20 | 500 | 229 | 670 | 395 | 380 | 115 | 385 | 229 | 755 | 455 | 395 | 120 | 530 |
| 24 | 600 | 267 | 725 | 475 | 475 | 145 | 570 | 267 | 910 | 530 | 476 | 150 | 1040 |
| 26 | 650 | 292 | 760 | 475 | 515 | 156 | 600 | 292 | 920 | 530 | 513 | 155 | 1060 |
| 28 | 700 | 292 | 820 | 495 | 555 | 180 | 760 | 292 | 950 | 565 | 564 | 185 | 1440 |
| 30 | 750 | 318 | 930 | 585 | 595 | 185 | 845 | 318 | 970 | 625 | 595 | 190 | 1450 |
| 32 | 800 | 318 | 1000 | 640 | 677 | 224 | 860 | 318 | 1082 | 665 | 655 | 211 | 1720 |
| 34 | 850 | 330 | 1025 | 650 | 706 | 235 | 1060 | 330 | 1130 | 695 | 699 | 235 | 1960 |
| 36 | 900 | 330 | 1030 | 675 | 740 | 250 | 1100 | 330 | 1192 | 745 | 699 | 235 | 2035 |
| 38 | 950 | 410 | 1055 | 690 | 752 | 238 | 1240 | 410 | 1120 | 715 | 762 | 235 | 2460 |
| 40 | 1000 | 410 | 1145 | 745 | 783 | 250 | 1657 | 410 | 1140 | 735 | 815 | 261 | 2750 |
| 42 | 1050 | 410 | 1200 | 795 | 867 | 285 | 1871 | 410 | 1220 | 775 | 868 | 290 | 3275 |
| 48 | 1200 | 470 | 1385 | 905 | 980 | 320 | 2858 | 470 | 1405 | 885 | 994 | 335 | 5100 |
| 54 | 1350 | 530 | 1365 | 950 | 1110 | 369 | 3800 | | | | | | |
| 60 | 1500 | 600 | 1450 | 1040 | 1240 | 402 | 4600 | | | | | | |
| 64 | 1600 | 600 | 1700 | 1150 | 1271 | 416 | 6080 | | | | | | |
| 100 | 2500 | 700 | 2550 | 1745 | 2270 | 865 | 23500 | | | | | | |

Face-to-face dimensions for valves in sizes above 48" & intermediate sizes are as per manufacturer's standard

All dimensions in mm and weights in kg



10" Class 600



32" Class 300

| Size | | Class 600 | | | | | | Class 900 | | | | Class 1500 | | | |
|------|-----|-----------|------|-----|-----|-----|------|-----------|------|-----|------|------------|------|-----|------|
| NPS | DN | A | B | C | ZN | ZF | Wt. | A | B | C | Wt. | A | B | C | Wt. |
| 3 | 80 | 180 | 335 | 155 | | | 50 | | | | | | | | |
| 4 | 100 | 190 | 372 | 170 | | | 60 | | | | | | | | |
| 6 | 150 | 210 | 410 | 200 | | | 95 | 225 | 466 | 254 | 199 | 275 | 475 | 257 | 450 |
| 8 | 200 | 230 | 490 | 255 | | | 230 | 275 | 568 | 305 | 445 | 325 | 575 | 307 | 770 |
| 10 | 250 | 250 | 580 | 305 | | | 365 | 325 | 618 | 331 | 504 | 390 | 630 | 371 | 1323 |
| 12 | 300 | 270 | 600 | 335 | 61 | 4 | 395 | 375 | 700 | 407 | 710 | 450 | 720 | 414 | 1628 |
| 14 | 350 | 290 | 630 | 370 | 150 | 20 | 445 | 425 | 759 | 432 | 978 | 515 | 770 | 493 | 2860 |
| 16 | 400 | 310 | 750 | 410 | 172 | 25 | 735 | 475 | 825 | 483 | 1354 | 575 | 830 | 530 | 3630 |
| 18 | 450 | 330 | 816 | 455 | 226 | 40 | 910 | 500 | 875 | 534 | 1737 | 640 | 925 | 591 | 4730 |
| 20 | 500 | 350 | 820 | 475 | 263 | 50 | 1435 | 575 | 985 | 585 | 2212 | 700 | 1015 | 664 | 5500 |
| 24 | 600 | 390 | 990 | 565 | 353 | 72 | 1520 | 675 | 1055 | 661 | 3793 | 765 | 1090 | 780 | 8448 |
| 30 | 750 | 470 | 1200 | 665 | 470 | 106 | 2440 | | | | | | | | |

All dimensions in mm and weights in kg

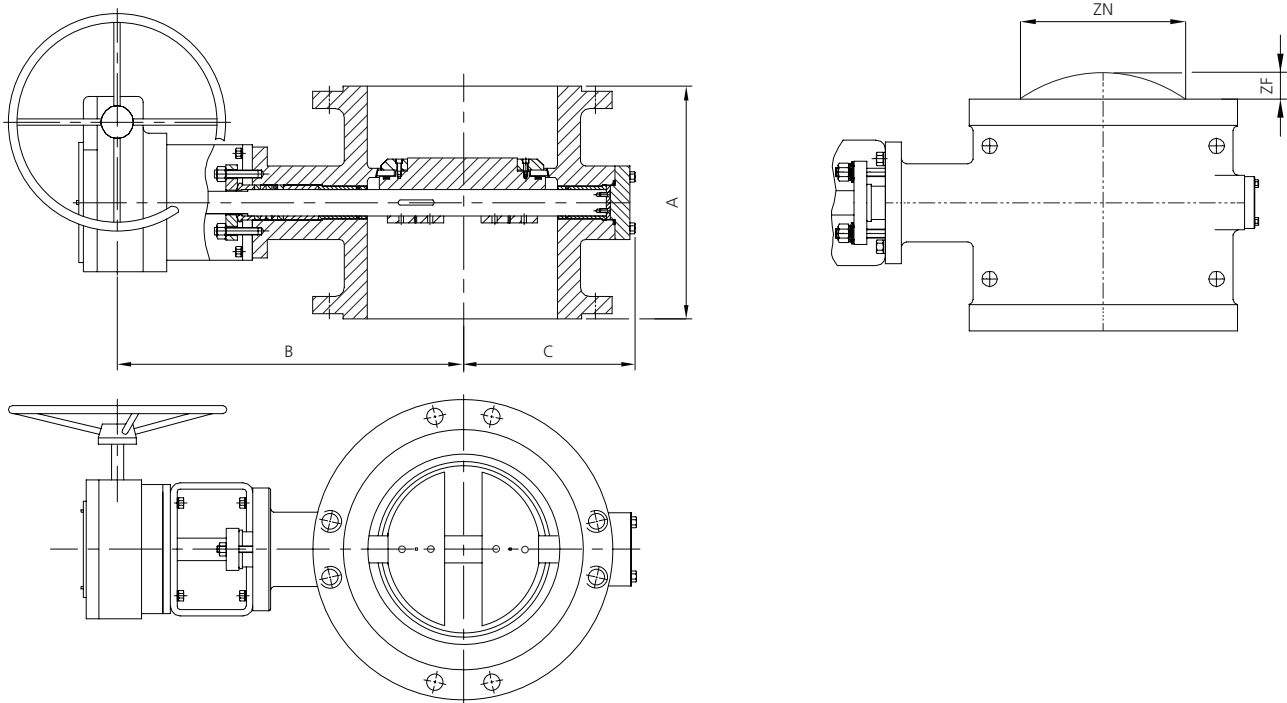
Class 600 - Face-to-face dimensions above 24" are manufacturer's standard

Class 900 - Face-to-face dimensions are as per ISO 5752 Ser. 8

Class 1500 - Face-to-face dimensions are as per manufacturer's standard

Triple-offset Butterfly Valves - Long Pattern

Face-to-face dimensions of Flanged - Long Pattern valves conform to ASME B16.10 and are the same as that of comparable API 600 Gate Valves.



Dimensions & Weights

| Size | | Class 150 | | | | | | Class 300 | | | |
|------|------|-----------|------|------|------|-----|------|-----------|------|-----|------|
| NPS | DN | A | B | C | ZN | ZF | Wt. | A | B | C | Wt. |
| 3 | 80 | 203 | 265 | 130 | | | 35 | 282 | 258 | 122 | 50 |
| 4 | 100 | 229 | 275 | 140 | | | 40 | 305 | 267 | 142 | 81 |
| 6 | 150 | 267 | 350 | 160 | | | 55 | 403 | 368 | 185 | 96 |
| 8 | 200 | 292 | 415 | 205 | | | 80 | 418 | 433 | 212 | 151 |
| 10 | 250 | 330 | 475 | 240 | | | 130 | 457 | 433 | 232 | 186 |
| 12 | 300 | 356 | 475 | 265 | | | 175 | 502 | 522 | 284 | 261 |
| 14 | 350 | 381 | 560 | 305 | | | 220 | 762 | 607 | 320 | 420 |
| 16 | 400 | 406 | 590 | 335 | | | 290 | 838 | 642 | 356 | 520 |
| 18 | 450 | 432 | 610 | 360 | | | 330 | 914 | 665 | 385 | 625 |
| 20 | 500 | 457 | 670 | 395 | | | 445 | 991 | 756 | 437 | 796 |
| 24 | 600 | 508 | 725 | 475 | 475 | 145 | 650 | 1143 | 920 | 510 | 1360 |
| 26 | 650 | 559 | 760 | 475 | 515 | 156 | 700 | 1245 | 920 | 512 | 1530 |
| 28 | 700 | 610 | 820 | 495 | 555 | 180 | 890 | 1346 | 952 | 548 | 2120 |
| 30 | 750 | 610 | 930 | 585 | 595 | 185 | 995 | 1397 | 980 | 600 | 2125 |
| 32 | 800 | 660 | 1000 | 640 | 677 | 224 | 1025 | 1524 | 1042 | 652 | 2475 |
| 34 | 850 | 711 | 1025 | 650 | 706 | 235 | 1270 | 1727 | 1092 | 685 | 3100 |
| 36 | 900 | 711 | 1030 | 675 | 740 | 250 | 1340 | 1727 | 1125 | 695 | 3249 |
| 38 | 950 | 762 | 1055 | 690 | 752 | 238 | 1470 | 1930 | 1178 | 762 | 4065 |
| 40 | 1000 | 762 | 1145 | 745 | 783 | 250 | 1910 | 1930 | 1250 | 790 | 4050 |
| 42 | 1050 | 787 | 1200 | 795 | 867 | 285 | 2180 | 1981 | 1290 | 840 | 5100 |
| 48 | 1200 | 864 | 1385 | 905 | 980 | 320 | 3230 | 2235 | 1500 | 938 | 6545 |
| 54 | 1350 | 1067 | 1365 | 950 | 1110 | 369 | 4450 | | | | |
| 60 | 1500 | 1143 | 1450 | 1040 | 1240 | 402 | 5480 | | | | |
| 64 | 1600 | 1372 | 1700 | 1150 | 1271 | 416 | 7495 | | | | |

Face-to-face dimensions for valves in sizes above 36" are as per manufacturer's standard
 All dimensions in mm and weights in kg



48" Class 150

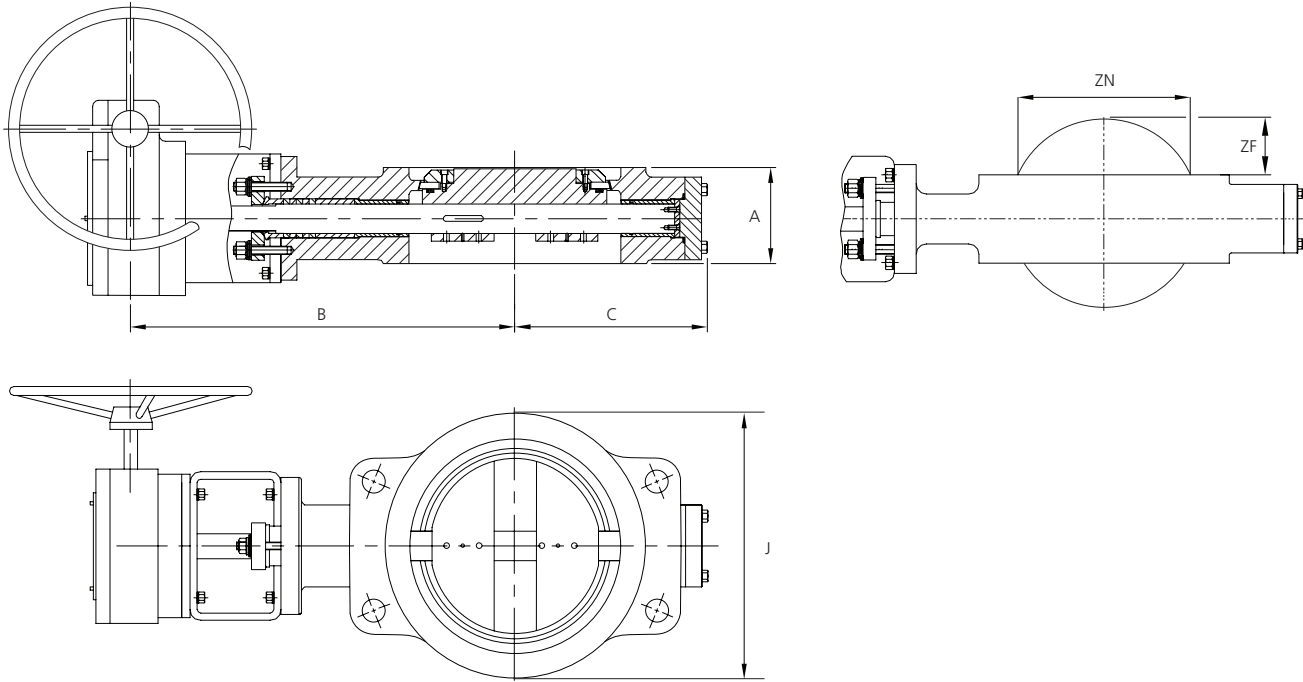
| Size | | Class 600 | | | | Class 900 | | | | Class 1500 | | | |
|------|-----|-----------|------|-----|------|-----------|------|-----|------|------------|------|-----|-------|
| NPS | DN | A | B | C | Wt. | A | B | C | Wt. | A | B | C | Wt. |
| 3 | 80 | 356 | 335 | 155 | 58 | | | | | | | | |
| 4 | 100 | 432 | 372 | 170 | 75 | | | | | | | | |
| 6 | 150 | 559 | 410 | 200 | 120 | 610 | 466 | 254 | 266 | 705 | 475 | 257 | 517 |
| 8 | 200 | 660 | 490 | 255 | 250 | 737 | 568 | 305 | 624 | 832 | 575 | 307 | 898 |
| 10 | 250 | 787 | 580 | 305 | 465 | 838 | 618 | 331 | 748 | 991 | 630 | 371 | 1549 |
| 12 | 300 | 838 | 600 | 335 | 528 | 965 | 700 | 407 | 1072 | 1130 | 720 | 414 | 1982 |
| 14 | 350 | 889 | 630 | 370 | 590 | 1029 | 759 | 432 | 1204 | 1257 | 770 | 493 | 3348 |
| 16 | 400 | 991 | 750 | 410 | 1070 | 1130 | 825 | 483 | 1756 | 1384 | 830 | 530 | 4312 |
| 18 | 450 | 1092 | 816 | 455 | 1265 | 1219 | 875 | 534 | 2545 | 1537 | 925 | 591 | 5673 |
| 20 | 500 | 1194 | 820 | 475 | 1560 | 1321 | 985 | 585 | 3290 | 1664 | 1015 | 664 | 6745 |
| 24 | 600 | 1397 | 990 | 565 | 2260 | 1549 | 1055 | 661 | 5239 | 1943 | 1090 | 780 | 10598 |
| 30 | 600 | 1651 | 1200 | 665 | 3950 | | | | | | | | |

All dimensions in mm and weights in kg

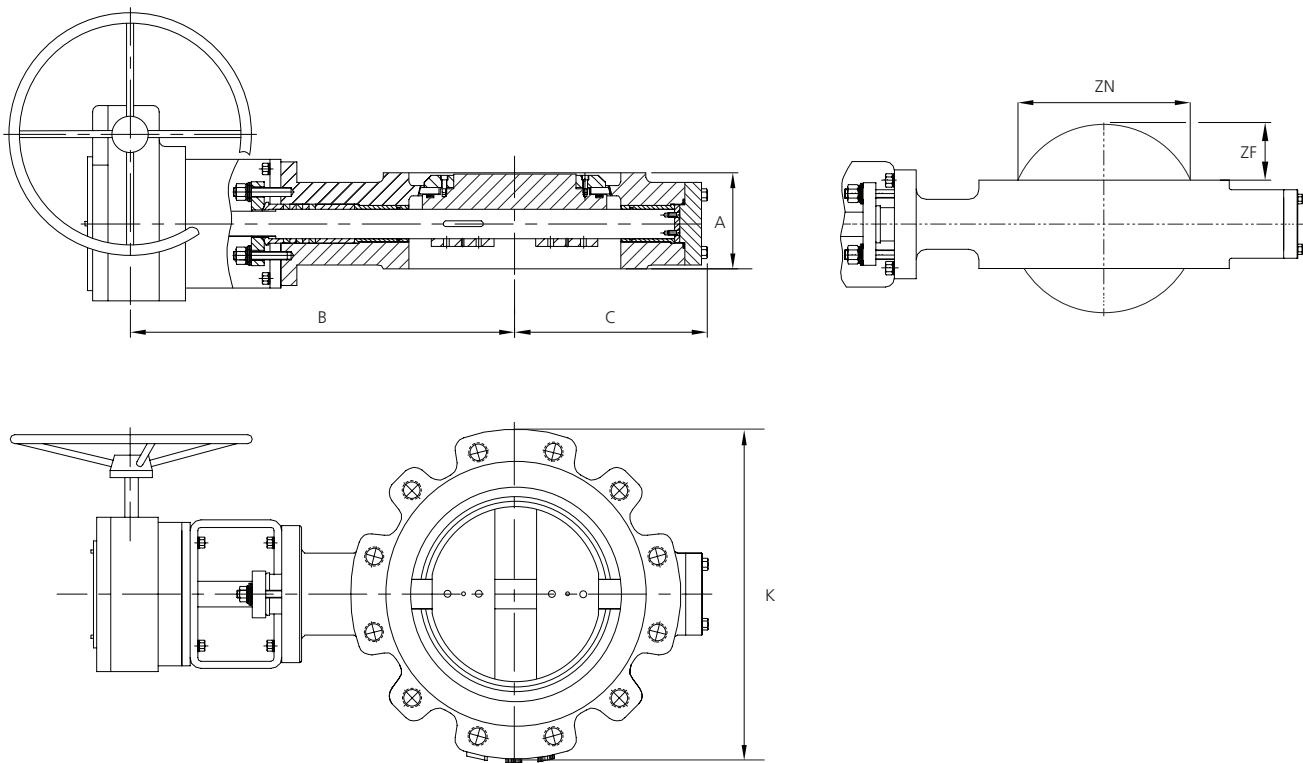
Triple-offset Butterfly Valves - Wafer and Wafer-Lugged

Face-to-face dimensions of Triple-offset Butterfly Valves in Wafer Flangeless and Wafer Lugged constructions conform to API 609. The valves are compact in design and significantly lighter than comparable gate valves.

Wafer-type



Wafer-Lugged





12" Class 150

Dimensions & Weights

| Size | | Class | A | B | C | ZN | ZF | Wafer-type | | Lug-type | |
|------|-----|-------|-----|-----|-----|-----|-----|------------|------|----------|------|
| NPS | DN | | | | | | | J | Wt. | K | Wt. |
| 3 | 80 | 150 | 48 | 265 | 130 | 75 | 18 | 127 | 25 | 190 | 30 |
| | | 300 | 48 | 265 | 130 | 71 | 18 | 127 | 31 | 210 | 40 |
| | | 600 | 54 | 335 | 155 | 71 | 15 | 127 | 35 | 210 | 48 |
| 4 | 100 | 150 | 54 | 270 | 140 | 99 | 27 | 158 | 31 | 230 | 35 |
| | | 300 | 54 | 267 | 148 | 94 | 27 | 158 | 60 | 255 | 71 |
| | | 600 | 64 | 372 | 170 | 94 | 16 | 158 | 44 | 275 | 60 |
| 6 | 150 | 150 | 57 | 300 | 160 | 151 | 52 | 216 | 40 | 280 | 45 |
| | | 300 | 59 | 350 | 195 | 143 | 52 | 216 | 58 | 320 | 76 |
| | | 600 | 78 | 410 | 182 | 143 | 30 | 216 | 70 | 355 | 95 |
| 8 | 200 | 150 | 64 | 325 | 190 | 197 | 70 | 270 | 58 | 345 | 65 |
| | | 300 | 73 | 423 | 222 | 188 | 70 | 270 | 97 | 380 | 126 |
| | | 600 | 102 | 490 | 255 | 183 | 41 | 270 | 147 | 420 | 200 |
| 10 | 250 | 150 | 71 | 470 | 240 | 249 | 85 | 324 | 98 | 405 | 110 |
| | | 300 | 83 | 435 | 250 | 242 | 85 | 324 | 120 | 445 | 156 |
| | | 600 | 117 | 580 | 305 | 231 | 64 | 324 | 268 | 510 | 365 |
| 12 | 300 | 150 | 81 | 460 | 260 | 299 | 110 | 381 | 134 | 485 | 150 |
| | | 300 | 92 | 535 | 295 | 292 | 110 | 381 | 166 | 520 | 216 |
| | | 600 | 140 | 600 | 335 | 275 | 64 | 381 | 300 | 560 | 408 |
| 14 | 350 | 150 | 92 | 560 | 305 | 331 | 147 | 413 | 170 | 535 | 190 |
| | | 300 | 117 | 610 | 330 | 324 | 147 | 413 | 235 | 585 | 305 |
| | | 600 | 155 | 630 | 370 | 302 | 85 | 413 | 313 | 605 | 425 |
| 16 | 400 | 150 | 102 | 560 | 345 | 381 | 153 | 470 | 223 | 595 | 250 |
| | | 300 | 133 | 642 | 370 | 375 | 153 | 470 | 292 | 650 | 380 |
| | | 600 | 178 | 750 | 410 | 348 | 89 | 470 | 603 | 685 | 820 |
| 18 | 450 | 150 | 114 | 586 | 360 | 432 | 165 | 534 | 250 | 635 | 280 |
| | | 300 | 149 | 690 | 400 | 422 | 165 | 534 | 323 | 710 | 420 |
| | | 600 | 200 | 816 | 455 | 392 | 101 | 534 | 669 | 745 | 910 |
| 20 | 500 | 150 | 127 | 700 | 390 | 483 | 157 | 585 | 344 | 700 | 385 |
| | | 300 | 159 | 755 | 450 | 472 | 157 | 585 | 408 | 775 | 530 |
| | | 600 | 216 | 820 | 475 | 437 | 113 | 585 | 809 | 815 | 1100 |
| 24 | 600 | 150 | 154 | 725 | 455 | 578 | 220 | 693 | 491 | 815 | 550 |
| | | 300 | 181 | 925 | 530 | 562 | 220 | 693 | 785 | 915 | 1020 |
| | | 600 | 232 | 990 | 565 | 519 | 132 | 693 | 1118 | 940 | 1520 |

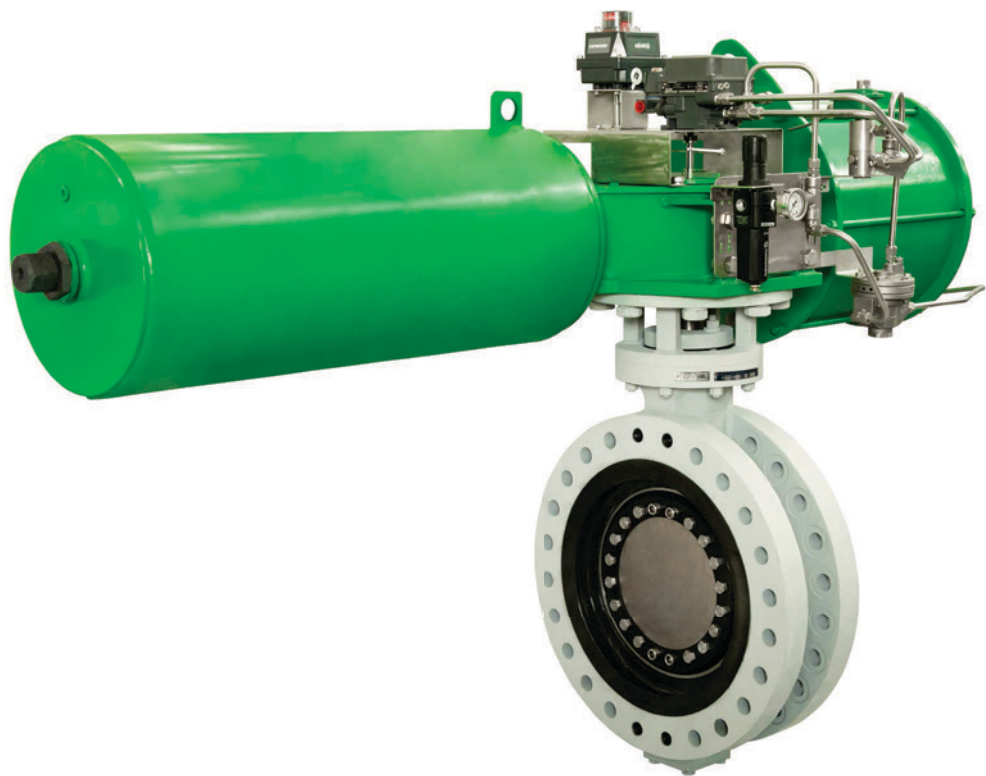
All dimensions in mm and weights in kg

Ordering Information

| Body Style | Class Rating | Face-to-face | End Detail | Operator |
|------------------------------------|----------------|---|----------------------------------|--|
| 1 - Wafer-type | 1 - Class 150 | 1 - API 609, Lug & Wafer-type | 1 - ASME B16.5 Class 150 | BS - Bare Shaft |
| 2 - Wafer-Lugged | 2 - Class 300 | 2 - API 609 SP/ ISO 5752 Table 1, Ser. 13 | 2 - ASME B16.5 Class 300 | GU - Gear Unit |
| 3 - Short Pattern (Double-flanged) | 3 - Class 600 | 3 - ISO 5752 Table 1, Ser. 14 | 3 - ASME B16.47 Ser. A Class 150 | EA - Electrical Actuator |
| 4 - Long Pattern (Double-flanged) | 4 - Class 900 | 4 - ISO 5752 Table 1, Ser. 8 | 4 - ASME B16.47 Ser. A Class 300 | EH - Electro-Hydraulic Actuator |
| 5 - Short Pattern (Butt-weld) | 5 - Class 1500 | 5 - ASME B16.10, Long Pattern | 5 - ASME B16.47 Ser. B Class 150 | DA - Pneumatic Actuator, Double Acting |
| 6 - Long Pattern (Butt-weld) | 6 - PN 16 | 6 - Manufacturer Standard | 6 - ASME B16.47 Ser. B Class 300 | SR - Pneumatic Actuator, Spring Return |
| | | | 7 - ASME B16.5 Class 600 | |
| | | | 8 - ASME B16.47 Ser. A Class 600 | |
| | | | 9 - ASME B16.47 Ser. B Class 600 | |
| | | | A - ASME B16.5 Class 900 | |
| | | | B - ASME B16.5 Class 1500 | |
| | | | W - Butt-weld as per ASME B16.25 | |
| | | | X- IS : 6392 - PN 16 | |
| | | | Y- IS : 9523 - PN 16 | |
| | | | Z- AWWA C 207 - Class E | |

Valves Automation Solutions

Leveraging in-house capabilities in system design, manufacture, integration and testing, L&T Valves offers a comprehensive range of SIL-capable Valve Automation Solutions that go beyond industry standards and customer expectations.



The L&T Valves Advantage

- Versatile range of valves
- Flow-control expertise of over 55 years
- World-class manufacturing facility
- In-house capability to design and integrate customized automation solutions
- Designs reviewed by Functional Safety Engineer
- Flexibility to offer any combination of valve/ actuator/ accessory/ communication protocol
- New-build and retrofitting options for automation systems for valves
- Trained personnel for commissioning and service support
- Single-point warranty for the complete valve automation system

Gate, Globe & Check Valves

Bolted Bonnet & Pressure-seal

#150 to 4500, Up to 72" (1800 mm)

Cryogenic Valves

Low Emission Valves

Bellow-sealed Valves

API monogrammed, SIL3-Capable



Ball Valves

Trunnion-mounted

#150 to 2500, Up to 56" (1400 mm)

Side-entry and Top-entry

Soft-seated and Metal-seated

API monogrammed, SIL3-Capable

Floating Ball Valves, #150 to 2500, Up to 8" (200 mm)

Soft-seated and Metal-seated



Butterfly Valves

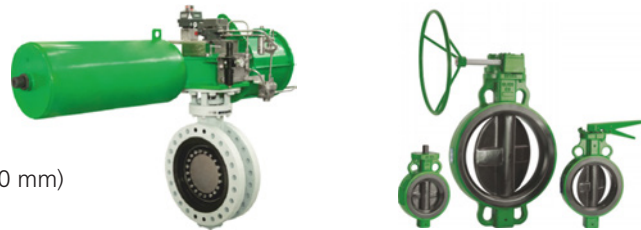
Triple-offset, #150 to 1500, Up to 100" (2500 mm)

API monogrammed, SIL3-Capable

Soft-seated, PN6 to PN25

Integrally-moulded - Wafer, Lugged & Flanged, Up to 36" (900 mm)

Large-size Flanged Valves, Up to 120" (3000 mm)



Double Block and Bleed Plug Valves

#150 to 600,

Up to 42" (1050 mm)

API Monogrammed



Valve Automation Solutions

SIL3-capable Automation Solutions

High Integrity Pressure Protection System (HIPPS),
Emergency Shutdown Valves (ESDV)



LAMP L&T Valves Asset Management Programme

Smart Valves with diagnostic and communication modules



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