

Single, Two & Three-piece **Ball Valves**



ASME Class 150, 300 & 600 | 8 mm - 200 mm (1/4" - 8")



Larsen & Toubro (L&T) is a technology, engineering, construction and manufacturing company. Seven decades of strong, customer-focused approach and the continuous quest for world-class quality have enabled L&T to attain and sustain leadership position in all its major lines of business.

L&T believes that progress must be achieved in harmony with the environment. A commitment to community welfare and environment protection are an integral part of the corporate vision.

The company has an international presence, with a global spread of marketing offices and manufacturing facilities.

L&T executes projects in critical sectors including hydrocarbon, power and infrastructure. A key component of the company's business portfolio is the design, manufacture and marketing of a wide variety of valves.



L&T Valves manufactures and markets products for oil & gas, power and other key sectors.

We have on board experienced valve specialists equipped to translate your requirements into custom-engineered flow-control solutions. Our project management expertise ensures that deliveries match your project schedules.

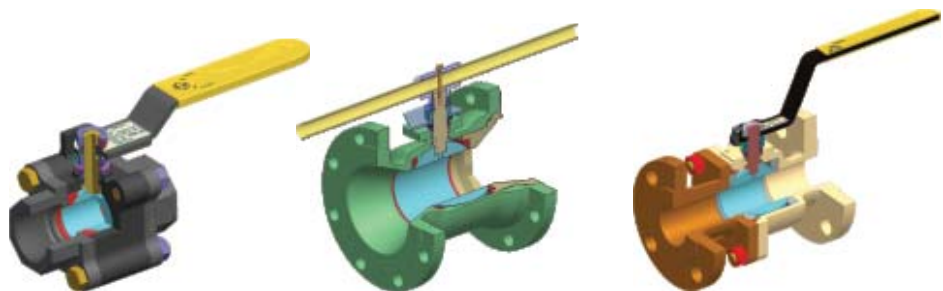
Our distribution network spans the globe, partnering some of the largest valve distribution companies in the world. In India, we have a presence in every industrial centre through a network of offices, field engineers, stockists, automation centres and service franchisees.

Product Range:

- Gate, Globe & Check Valves
- Trunnion-mounted Ball Valves
- Process Ball Valves
- Triple-offset Butterfly Valves
- Flanged & Wafer-type Butterfly Valves
- Plug Valves
- Customised solutions

Ball Valves - Product Portfolio

Valve type		End Connection	Valve Size (mm)															
			8	10	15	20	25	32	40	50	65	80	100	150	200			
Regular Bore	Three-piece	Standard					✓	✓	✓	✓	✓			✓	✓			
		Fire-safe					✓	✓	✓		✓			✓	✓			
	Single-piece	IBR					✓	✓	✓	✓	✓							
		Fire-safe			✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			
Full Bore	Three-piece	Standard	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
		Fire-safe	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	Two-piece	IBR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
		Fire-safe			✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓





Three-Piece Ball Valves

Three-piece ball valves comprise of a body and two connectors. These valves are available in a variety of end connections such as socket weld, screwed and flanged.

The valves are designed to be serviced inline. The middle section (body) that houses the ball, seat and stem can be rotated away from the pipeline axis for service, after three body-connector bolts are removed. This allows quick replacement of seats, seals, etc. without disturbing the pipe alignment.

Single-Piece Ball Valves

Single-piece ball valves have a one-piece body and a threaded insert. The integrally-flanged valves are offered in regular bore.

The inserts in L&T single-piece ball valves are provided with a hexagonal slot for easy removal.

Two-Piece Ball Valves

Two-piece ball valve are split body valves where the body and connector are bolted together. These full bore valves are offered with flanged ends.

Mirror-Finished Solid Ball

The balls used in L&T ball valves are mirror-finished to ensure bubble-tight sealing and lower operating torques. Further the stainless steel balls of solid construction possess higher corrosion resistance as well as structural strength.

A pressure-equalizing hole provided on the ball connects the body cavity and the ball port. This prevents build up of cavity pressure when the valve is in open position.



PTFE Seat with Slots

PTFE seats used in L&T ball valves are manufactured in a controlled process that ensures a finer grain structure and longer service life.



When the valve is in the closed position, upstream pressure can force the upstream seat against the ball. This can cause damage to the seats as well as increase operating torques. In L&T ball valves slots are provided in the seats to relieve upstream pressure to ensure that the upstream seat does not get forced against the ball.

Fire-Safe Feature

L&T fire-safe ball valves, available in three-piece, single-piece and two-piece designs, feature a secondary metal seat. In the event of a fire, if the soft-seat is totally sublimated, the ball moves and abuts the metal seat on the body/ connector on the downstream side to form a leak-tight seal.

Cavity Pressure Relief

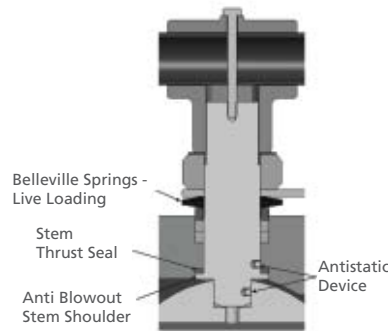
A slight increase in temperature of the fluid entrapped in the ball cavity can cause a rapid increase of pressure and damage the ball and seats. L&T ball valves are provided with a pressure relief mechanism that prevents build up of excessive pressure inside the ball cavity.

In the closed condition when the cavity pressure increases above a designated level, the seat lip deflects and relieves pressure to the upstream side.

In the open condition, the hole in the ball that connects the body cavity and the ball port prevents build up of cavity pressure.

Blow-out Proof Stem

The bottom-entry stem in all L&T ball valves have a shoulder that bears against a matching shoulder in the body to make it blow-out proof. In this design, the higher the line pressure, the better the sealing to atmosphere.



Leak Tight Stem Sealing

Stem sealing is further enhanced by stem thrust seal and stem packing rings. The Belleville springs provided ensure sealing integrity by compensating for wear and thermal expansions.

Antistatic Feature

When the valve is operated, the ball rubs against the non-metallic seats and this can create static electricity. Build up of static electricity can create a potential fire hazard especially with flammable media.

All L&T ball valves have inbuilt antistatic features for proper grounding of the charge generated. Full bore valves of size DN 65 and above and regular bore valves of size DN 80 and above are provided with spring-loaded plungers between the stem and the body for full mechanical antistatic capability. In valves of smaller sizes, electrical

continuity is achieved using 35% carbon filled PTFE thrust seal and stem packing.

Actuator Mounting Flange

L&T single-piece and two-piece ball valves are provided with an integral actuator mounting flange conforming to ISO 5211 (Please note that full bore valves in sizes DN 15 to DN 25 would be supplied with flanges as per L&T's manufacturing standard)

End Connection Identification

L&T three-piece ball valves are supplied with socket weld, screwed and flanged ends. To make identification easier grooves are provided on the distinctive octagonal body connectors - one groove for socket weld ends, two grooves for valves with screwed ends - NPT threads and no grooves for valves with screwed ends - BSPT threads



Socket Weld
One groove



NPT
Two grooves



BSPT
No groove

Standards of Compliance

For Three-piece Ball Valves

Wall thickness & bore	– ISO 17292
Socket weld ends	– ASME B16.11
Screwed end BSPT	– ISO 7-1
Screwed end NPT	– ASME B1.20.1

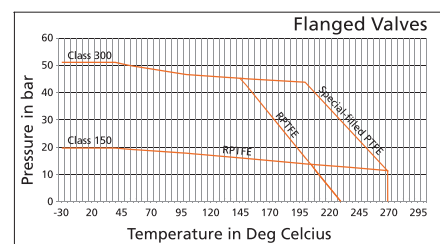
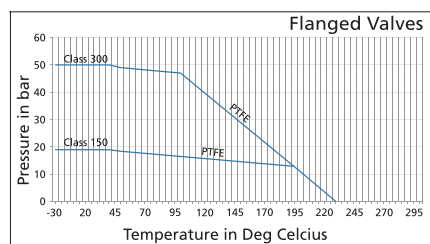
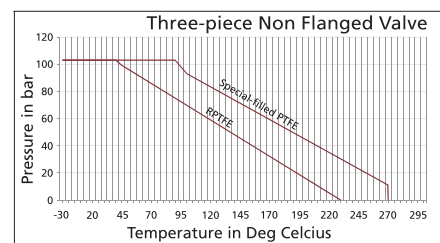
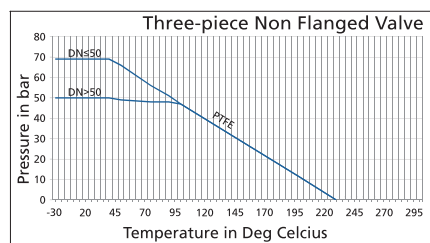
For Single-piece & Two-piece Ball Valves

Design	– ISO 17292
Face-to-face dimensions (Flanged)	– ASME B16.10
End flange dimensions	– ASME B16.5 RF
Pressure testing	– ISO 5208
Fire testing	– API 607 & ISO 10497

Material of Construction

Sl. No.	Part	Material specification			
		L3R Series	L3F Series	L1R Series	L2F Series
1	Body/ Connector/ Insert	CS	ASTM A216 Gr. WCB/ ASTM A105		ASTM A216 Gr. WCB
		SS	ASTM A351 Gr. CF8M		ASTM A351 Gr. CF8M
2	Ball	ASTM A351 Gr. CF8M			
3	Seat	PTFE/ RPTFE/ Special-filled PTFE			
4	Stem	ASTM A479 Type 316			
5	Body Seal	PTFE/ RPTFE/ Special-filled PTFE/ Graphite		Graphite	
6	Stem Thrust Seal	Carbon-filled PTFE			
7	Stem Packing	Carbon-filled PTFE/ Graphite			

Pressure Temperature Charts



Valve Torque Data (in Nm)

Size	Bore	Three-piece Screwed/ Socket Weld	Three-piece Flanged Class 150	Three-piece Flanged Class 300	Single-piece Flanged Class 150	Single-piece Flanged Class 300	Two-piece Flanged Class 150	Two-piece Flanged Class 300
DN 8	FB	6.5	-	-	-	-	-	-
	RB	6.5	-	-	-	-	-	-
DN 10	FB	6.5	-	-	-	-	-	-
	RB	6.5	-	-	-	-	-	-
DN 15	FB	6.5	5.0	5.0	5.0	5.0	9.0	9.0
	RB	6.5	-	-	-	-	-	-
DN 20	FB	11.0	8.0	10.0	-	-	9.0	9.0
	RB	6.5	5.0	5.0	5.0	5.0	-	-
DN 25	FB	16.0	10.0	13.0	-	-	11.0	13.0
	RB	11.0	8.0	10.0	8.0	10.0	-	-
DN 32	FB	34.0	-	-	-	-	-	-
	RB	16.0	-	-	-	-	-	-
DN 40	FB	34.0	18.0	32.0	-	-	25.0	33.0
	RB	22.0	13.0	17.0	13.0	17.0	-	-
DN 50	FB	54.0	26.0	30.0	-	-	46.0	55.0
	RB	34.0	30.0	32.0	21.0	32.0	-	-
DN 65	FB	-	-	-	-	-	70.0	76.0
	RB	-	-	-	30.0	57.0	-	-
DN 80	FB	-	-	-	-	-	90.0	125.0
	RB	-	-	-	69.0	127.0	-	-
DN 100	FB	-	-	-	-	-	165.0	240.0
	RB	-	-	-	110.0	216.0	-	-
DN 150	FB	-	-	-	-	-	360.0	540.0
	RB	-	-	-	226.0	438.0	-	-
DN 200	FB	-	-	-	-	-	765.0	1000.0
	RB	-	-	-	-	-	-	-

- Note :-
- For screwed/ SW end three-piece valves, torque values are as per full rated working pressure of 69 bar
 - Indicated design torque values are without Factor of Safety

Flow Co-efficients

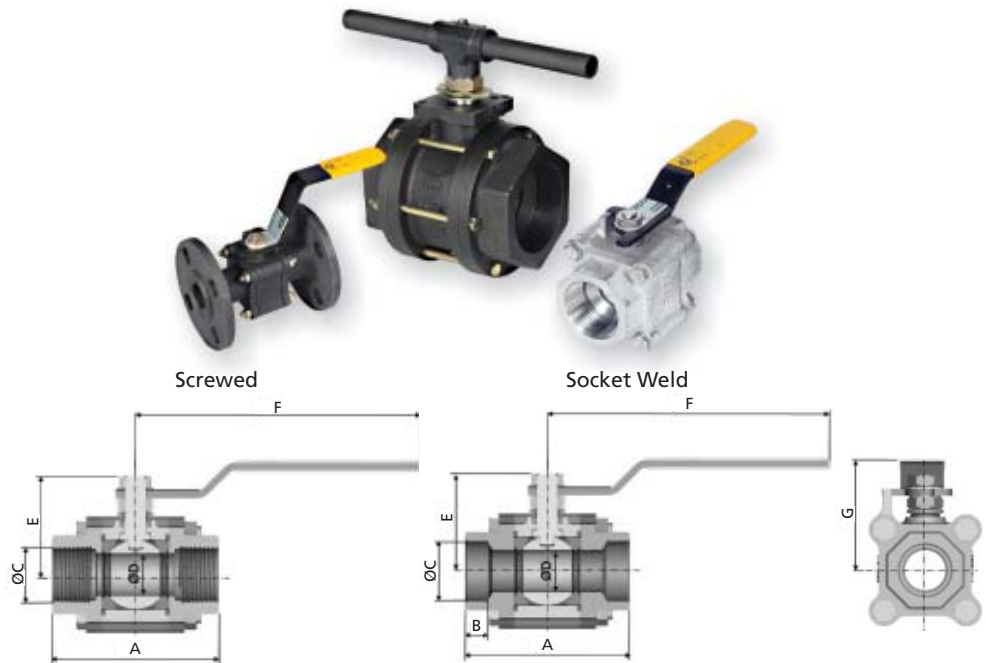
	Bore	DN 8	DN 10	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 150	DN 200
C _v	FB	8	9	30	58	108	215	280	478	680	1260	2150	5180	9400
	RB	8	9	9	12	36	52	84	128	245	358	720	1075	1850
K _v	FB	7	7	26	50	93	186	242	412	586	1086	1854	4466	8104
	RB	7	7	8	11	31	45	73	111	211	309	621	926	1595

C_v & K_v values are given for valve in fully open condition

C_v - Flow Co-efficient of a valve is defined as flow of water at 60° F in gallon (US) per minute at a pressure drop of one psi across the valve

K_v - Flow Co-efficient of a valve is defined as flow of water with temperature ranging 5 to 30° C in cubic meter per hour (m³/hr) at a pressure drop of one kgf/cm² across the valve

Three-Piece Ball Valves - Regular Bore



Dimensional Details

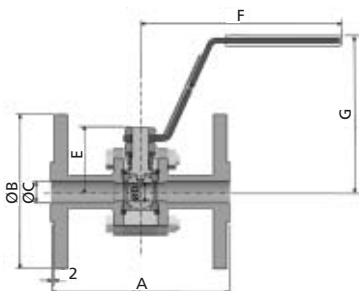
Screwed/ Socket weld end (in mm, unless specified)

Size	A	B	C			D	E	F	G	Wt. (kg)
			SW	BSPT	NPT					
DN 8	62	10.0	14.6	¼" - 19 BSPT	¼" - 18 NPT	11	38	132	50	0.7
		9.5	14.2							
DN 10	62	10.0	18.0	⅜" - 19 BSPT	⅜" - 18 NPT	11	38	132	50	0.7
		9.5	17.6							
DN 15	66	10.5	22.2	½" - 14 BSPT	½" - 14 NPT	11	38	132	50	0.7
		10.0	21.8							
DN 20	69	13.5	27.6	¾" - 14 BSPT	¾" - 14 NPT	11	38	132	50	0.8
		13.0	27.2							
DN 25	90	13.5	34.3	1" - 11 BSPT	1" - 11½ NPT	17	46	132	58	1.3
		13.0	33.9							
DN 32	97	13.5	43.1	1¼" - 11 BSPT	1¼" - 11½ NPT	24	54	162	65	1.8
		13.0	42.7							
DN 40	103	13.5	49.2	1½" - 11 BSPT	1½" - 11½ NPT	27	56	162	66	2.5
		13.0	48.8							
DN 50	122	16.5	61.7	2" - 11 BSPT	2" - 11½ NPT	37	75	162	83	4.5
		16.0	61.2							

Valves size DN 8 - DN 15 will be supplied in full bore construction

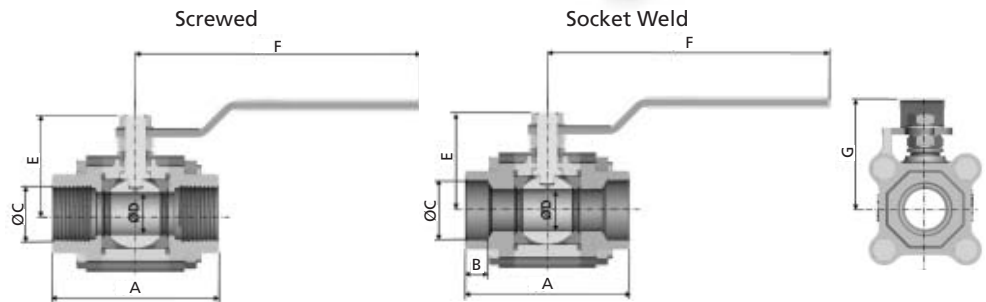
Dimensional Details

Flanged end (in mm, unless specified)



Size	A		B		C	D	E	F	G	Weight (kg)	
	CI 150	CI 300	CI 150	CI 300						CI 150	CI 300
DN 15	108	140	90	95	13	11	38	122	92	1.8	2.2
DN 20	117	152	100	115	19	11	38	122	92	1.8	3.0
DN 25	127	165	110	125	25	17	46	142	98	2.5	4.2
DN 40	165	190	125	155	38	27	56	180	117	4.7	8.0
DN 50	178	216	150	165	51	37	75	212	125	7.7	12.1

Three-Piece Ball Valves - Full Bore



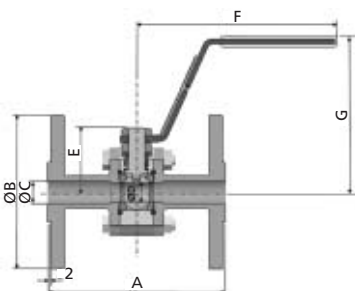
Dimensional Details

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

Size	A	B	C			D	E	F	G	Wt. (kg)
			SW	BSPT	NPT					
DN 8	62	10.0	14.6	¼" - 19 BSPT	¼" - 18 NPT	11	38	132	50	0.7
		9.5	14.2							
DN 10	62	10.0	18.0	⅜" - 19 BSPT	⅜" - 18 NPT	11	38	132	50	0.7
		9.5	17.6							
DN 15	66	10.5	22.2	½" - 14 BSPT	½" - 14 NPT	11	38	132	50	0.7
		10.0	21.8							
DN 20	75	13.5	27.6	¾" - 14 BSPT	¾" - 14 NPT	17	46	132	58	1.1
		13.0	27.2							
DN 25	92	13.5	34.3	1" - 11 BSPT	1" - 11½ NPT	24	54	162	65	1.7
		13.0	33.9							
DN 32	114	13.5	43.1	1¼" - 11 BSPT	1¼" - 11½ NPT	37	75	192	83	4.2
		13.0	42.7							
DN 40	114	13.5	49.2	1½" - 11 BSPT	1½" - 11½ NPT	37	75	192	83	4.2
		13.0	48.8							
DN 50	132	16.5	61.7	2" - 11 BSPT	2" - 11½ NPT	49	87	202	94	6.3
		16.0	61.2							

Dimensional Details

Flanged end (in mm, unless specified)

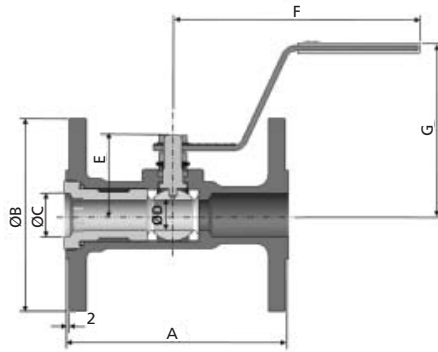


Size	A		B		C	D	E	F	G	Weight (kg)	
	CI 150	CI 300	CI 150	CI 300						CI 150	CI 300
DN 15	108	140	90	95	13	11	38	122	92	1.8	2.2
DN 20	117	152	100	115	19	17	46	142	98	2.2	3.4
DN 25	127	165	110	125	25	24	54	152	98	3.2	4.8
DN 40	165	190	125	155	38	37	75	212	125	7.8	10.7
DN 50	178	216	150	165	51	49	87	212	125	12.6	15.5

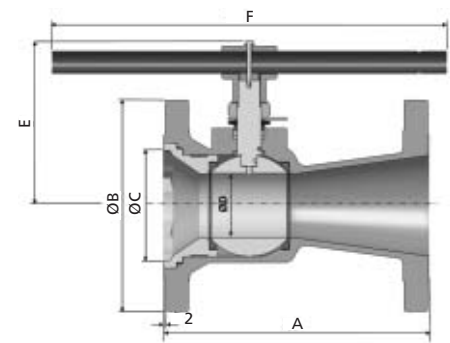
Single-Piece Ball Valves - Regular Bore



DN 15 - DN 65



DN 80 - DN 150

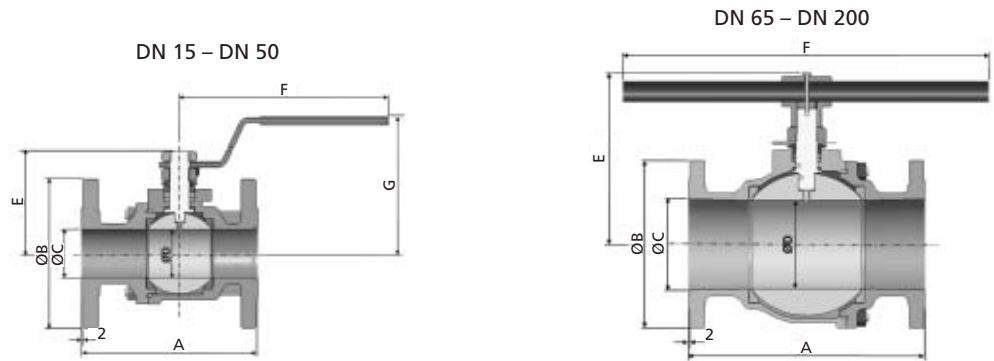


Dimensional Details (in mm, unless specified)

Size	A		B		C	D	E	F	G	Base Type ISO 5211		Weight (kg)	
	CI 150	CI 300	CI 150	CI 300						CI 150	CI 300	CI 150	CI 300
DN 15	108	140	90	95	13	11	38	120	90	F03	F03	1.4	1.7
DN 20	117	152	100	115	19	11	38	120	90	F03	F03	1.4	2.5
DN 25	127	165	110	125	25	17	46	140	100	F03	F03	2.1	3.6
DN 40	165	190	125	155	38	27	56	180	115	F04	F04	3.8	6.9
DN 50	178	216	150	165	51	37	75	210	122	F05	F05	6.5	9.2
DN 65	190	241	180	190	64	49	102	210	142	F07	F07	11.6	15.0
DN 80	203	282	190	210	76	62	175	390		F07	F07	15.5	22.0
DN 100	229	305	230	255	102	74	195	390		F07	F07	24.6	34.8
DN 150	267	403	280	320	152	98	245	*		F10	F12	40	65

* 600 mm for CI 150 & 890 mm for CI 300

Two-Piece Ball Valves - Full Bore

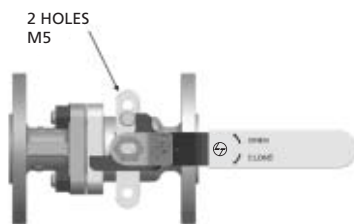


Dimensional Details (in mm, unless specified)

Size	A		B		C	D	E		F	G	Base Type ISO 5211		Weight (kg)	
	CI 150	CI 300	CI 150	CI 300			CI 150	CI 300			CI 150	CI 300	CI 150	CI 300
DN 15	108	140	90	95	13	11	38	38	120	90	Manufacturer standard		1.4	1.9
DN 20	117	152	100	115	19	17	45	45	120	97	Manufacturer standard		1.8	3.2
DN 25	127	165	110	125	25	24	55	55	154	97	Manufacturer standard		2.9	4.3
DN 40	165	190	125	155	38	37	75	75	212	120	F05	F05	5.3	6.4
DN 50	178	216	150	165	51	49	103	103	212	141	F07	F07	9.4	12.0
DN 65	190	241	180	190	64	62	175	175	390		F07	F07	14.1	20.0
DN 80	203	282	190	210	76	74	185	195	390		F07	F07	19.2	28
DN 100	229	305	230	255	102	98	235	247	*		F10	F12	31	45.0
DN 150	394	403	280	320	154	148	285	315	**		F12	F14	78.2	105
DN 200	457	502	345	380	203	198	340	371	980		F14	F16	141.5	169.0

* 600 mm for CI 150 & 890 mm for CI 300

** 890 mm for CI 150 & 980 mm for CI 300



Full bore valves in sizes DN 15 to DN 25 would be supplied with actuator mounting flanges as per L&T's manufacturing standard

Ordering Information

Series	Type	Bore	Ends	Material	Option*
L	1 - Single-piece design	F - Full	BT - BSPT Threaded	C - Carbon steel	F - Fire-safe
	2 - Two-piece design	R - Regular	NT - NPT Threaded	S - Stainless steel	
	3 - Three-piece design		SW - Socket weld		
	6 - Three-piece (IBR)		F1 - Flanged CL 150		
			F3 - Flanged CL 300		

* For Three-piece Valves

Example – Catalogue no. for Three-piece Regular Bore, Socket weld end, Carbon steel valve is L3RSWC. In case of Fire-safe valves the catalogue no. will be L3RSWCF

L	3	R	SW	C	F
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