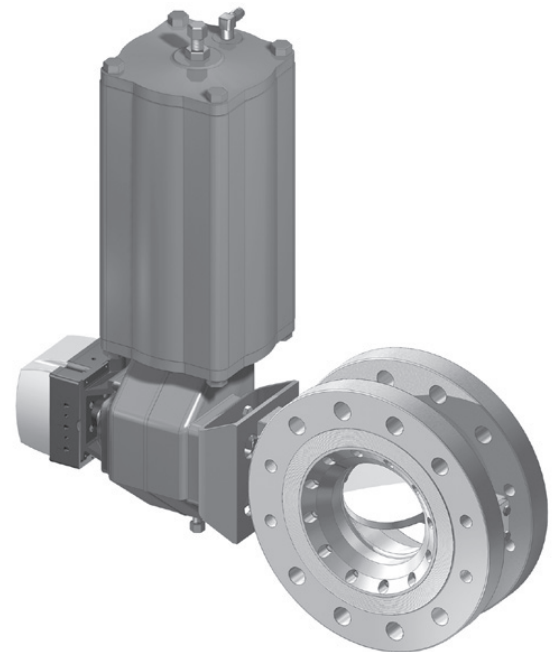


Neles™ Neldisc™ high performance butterfly valves

Series L6, Previous generation 4"-24" for all pressure ratings except F/D & F/E

Neles series L6 is a double flanged metal seated Neldisc triple eccentric disc valve with one piece body design, for both control and tight shut-off applications. It is particularly well suited for the refining, power, petrochemical and chemical industries.

The L6 incorporates the Neldisc triple offset metal seated design, which provides extended operational life in control, tight shut-off, high cycle, high temperature and abrasive applications. S-disc flow construction expands application possibilities beyond those of typical butterfly valves. Pressure rating from ASME 150 to 300 makes the L6 a sound control or shut-off valve and an ideal replacement for gate valves.



Excellent on-off capabilities

- Uniquely functioning full metal seat design assures tightness over long time periods.
- Contact between disc and seat is mechanically induced and does not rely on assistance from differential pressure.
- Bi-directional long term tightness is maintained even in high cycle rate services. Tightness is not compromised by large thermal cycling either.
- Low friction and excellent wear resistance.
- Lowered operational torque reduces actuator size
- Heavy-duty stem and bearings arrangement extends service life and is insensitive to thermal cycles and impurities.

Excellent flow control capabilities

- Good controllability via smoothly rising installed characteristic curve at both very small openings and nearly full Cv positions. L6 provides very wide rangeability in fairly low pressure drop services.
- Good dynamic stability in both flow directions.
- S-disc design provides dynamic torque balancing and noise abatement, allowing L6 valve use in applications where high performance butterflies could not typically be considered. This offers very cost effective control solutions.
- Available with a variety of actuators, positioners and accessories for single source responsibility.

Abrasion resistant

- Solid, sturdy all metal seat design is based on metal-to-metal contact. No resilient parts are needed for seating. Furthermore, there are no resilient parts exposed to the medium.

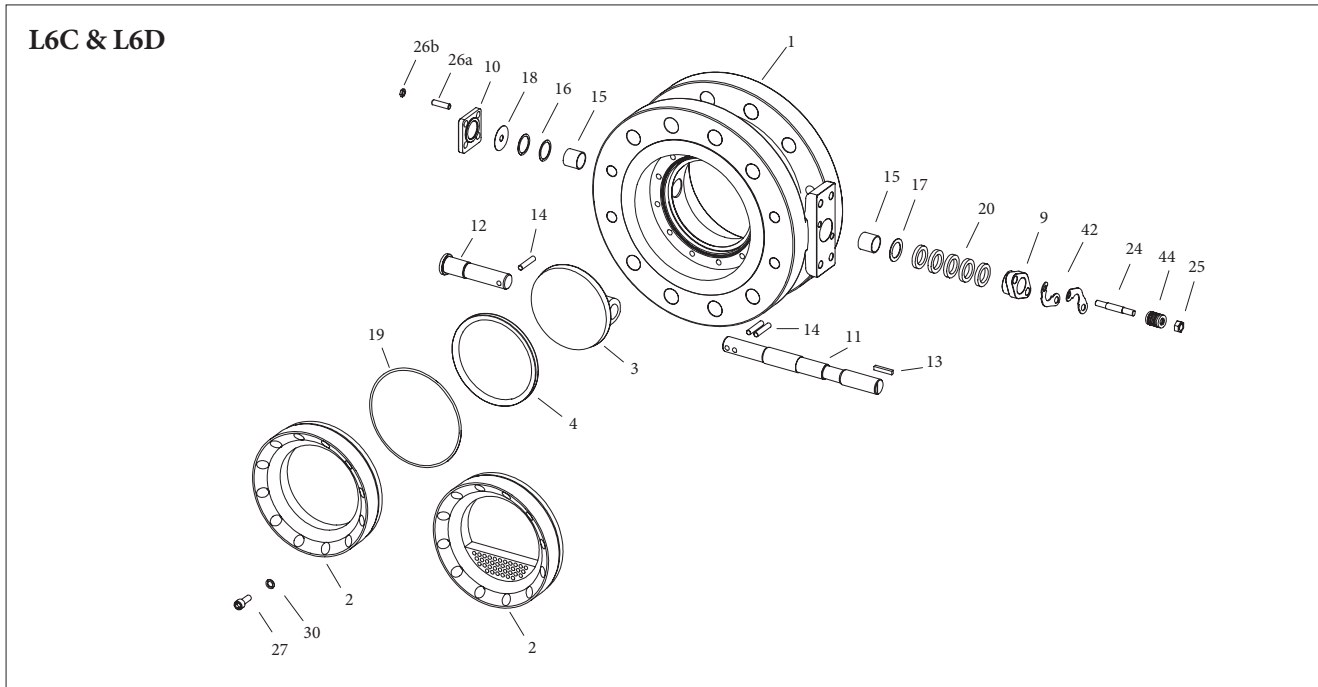
Wide pressure and temperature range

- Differential pressure/temperature ratings in accordance with ASME B16.34.
- Standard construction performs equally well from -200 ...+538 °C / -328 ...+1000 °F.

Low cost of ownership

- Extremely high cycle life minimizes the need for maintenance, and increases Mean Time Between Failure (MTBF).
- Interchangeable seat can be replaced without disassembling the disc and shaft. Seat replacement does not require any adjustment or special tools. Seat design is exactly the same in ASME class 150 and 300 regardless of pressure rating.

Exploded view

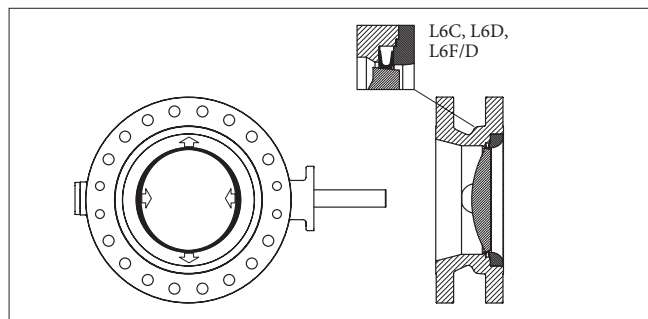


Parts list

Part no.	Part name	Material
1	Body	Carbon Steel ASTM A216 Type WCB / 316 Stainless Steel ASTM A351 Type CF8M
2	Clamp ring	316 Stainless Steel ASTM A182 type F316 / 316 Stainless Steel ASTM A351 Type CF8M
3	Disc	316 stainless steel ASTM A351 type CF8M
4	Seat ring	Incoloy® 825 hard chrome plated DN 100-750 / 4"-30" W:no I.4418 (Avesta® 248 SV) hard chrome plated DN 800-1500 / 32"-64"
9	Gland	316 stainless steel ASTM A351 type CF8M
10	Blind flange	316 stainless steel ASTM A351 type CF8M
11	Drive shaft	17-4PH stainless steel hard chrome plated
12	Shaft	17-4PH stainless steel hard chrome plated
13	Key	329 stainless steel
14	Cylindrical pin	17-4PH stainless steel
15	Bearing (upper & lower)	Cobalt based alloy / Nitronic® 60
16	Thrust bearing	Cobalt based alloy
17	Anti extrusion ring	Stainless steel
18	Gasket	Graphite
19	Body seal	Graphite
20	Gland packing	PTFE / Graphite.
24	Stud	Stainless steel
25	Nut	Stainless steel
26a	Stud	Stainless steel
26b	Nut	Stainless steel
27	Socket screw	Stainless steel
30	Spring washer	Stainless steel
42	Retaining plate	Stainless steel
44	Spring stack	Stainless steel
44	Boîtier ressort	Acier inoxydable

Neldisc triple eccentric seating principle

The disc of the valve is machined to close tolerances, to create an elliptical shape, similar to an oblique slice taken from a solid metal cone. When the valve is closed, the elliptical disc at the major axis displaces the seat ring outward, causing the seat ring to contact the disc at the minor axis. The seat ring is able to move freely in a plane in its recess, to accommodate the disc in an optimal manner. When the valve is opened, the contact is released, and the seat ring returns to its original circular shape.



Technical specifications

Valve ratings

ASME Class 150, 300 and PN10-50.

Sizes and end connection types

ASME cl. 150 valves are available in sizes 4"-24" (DN 100-600).

ASME cl. 300 valves are available in sizes 4"-24" (DN 100-600).

Flanges are designed as per:

- ASME B16.5 for 4"-24" (DN 100-600) valves

ASME cl. 150 & 300 face-to-face dimensions are acc. to ISO 5752 series 13.

Inherent flow characteristic

Standard: Equal percentage

S-disc: Modified equal percentage

Valve tightness (bi-directionally)

- Standard seat, code A:
 - ANSI Class V
 - ISO 5208, rate D, air
 - DIN 3230 rate 3
 - 10 x ISO 5208 rate D with RH hand lever

Flow data

Flow coefficients of L6 Neldisc triple eccentric disc valves.

Size	Cv-values					
	Standard			S-Disc		
	#150	#300	#600/300	#150	#300	#600/300
4	189	189	189	160	160	160
6	546	546	546	410	410	410
8	1080	978	978	730	670	670
10	2150	1830	1830	1401	1200	1200
12	3650	2790	2790	2300	1817	1817
14	5250	4220	2790	3314	2726	1817
16	7250	5540	4220	4183	3500	2726
18	10000	6810	5540	5338	4170	3500
20	14300	9110	6810	7300	5732	4170
24	15900	10400	10400	8400	6720	6720

- Optional tightness:
 - API 598 (metal seated),
 - ANSI Class VI
 - ISO 5208 rate A, air (4" - 24")

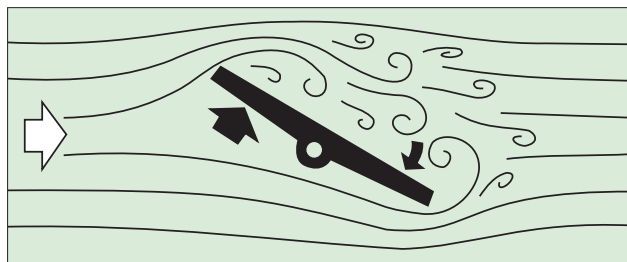
Safety features

- Fire-tested per API 607, 6th edition and BS 6755 part 2.
- Fugitive emission control with live loaded stem sealing as standard, ISO 15848 & TA-Luft/VDI 2440.
- Rugged single piece double flanged body eliminates potential leak paths associated with jointed bodies.
- Positive shaft blow-out prevention.

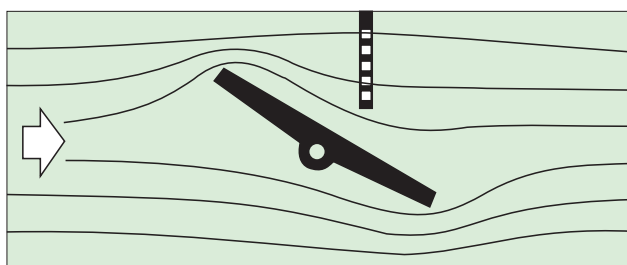
Options

- S-Disc, flow balancing trim, see bulletin 2 S-L1 20
- Oxygen construction for gaseous oxygen service
- High temperature design
- High cycle/cycling design
- Erosion resistant design
- Cryogenic
- Steam jacket, heat tracing
- NACE MR0103/MR0175

Conventional butterfly valve flow



S-Disc™ flow



S-DISC design offers stable flow control, reduced dynamic torque, noise level and vibration. For more information see technical bulletin 2SL120.

Not recommended mounting position coding for valve-actuator unit if using S-Disc: A-HL, B-HL, C-HL and D-HL.

Constructions

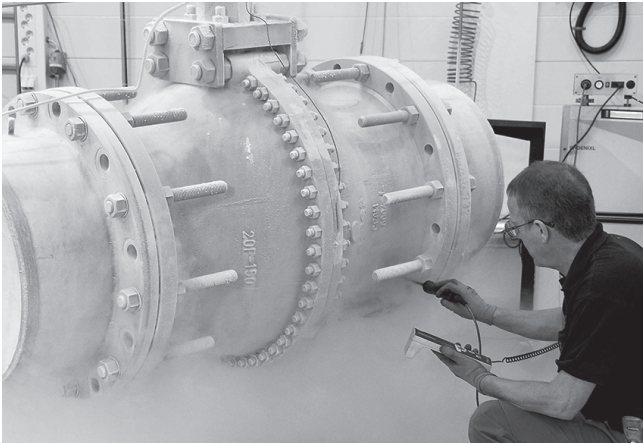
Standard

Fire-tested construction in accordance with API 607 is standard. Standard design also carries a live loaded stem packing.

Abrasive

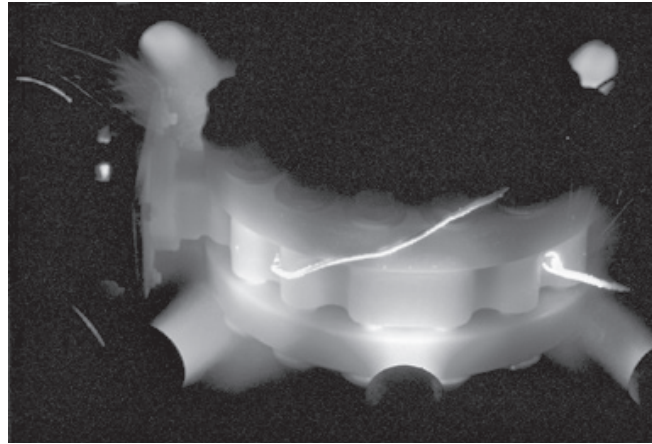
The disc can be protected against erosion by HCr plating or cobalt based alloy. The shaft is protected by special bearing bushings and can be flushed with a purge.

Cryogenic



L6 is an excellent valve for cryogenic applications, temperatures -200 ... -46 °C / -320 ... -50 °F. Tight sealing over a wide range of cryogenic temperatures is accomplished with a high nickel alloy seat which maintains its mechanical properties even at cryogenic temperatures. The testing of these valves is done in the cryogenic laboratory. The testing procedure is agreed together with customer to fulfill the available standards and requirements.

High temperature

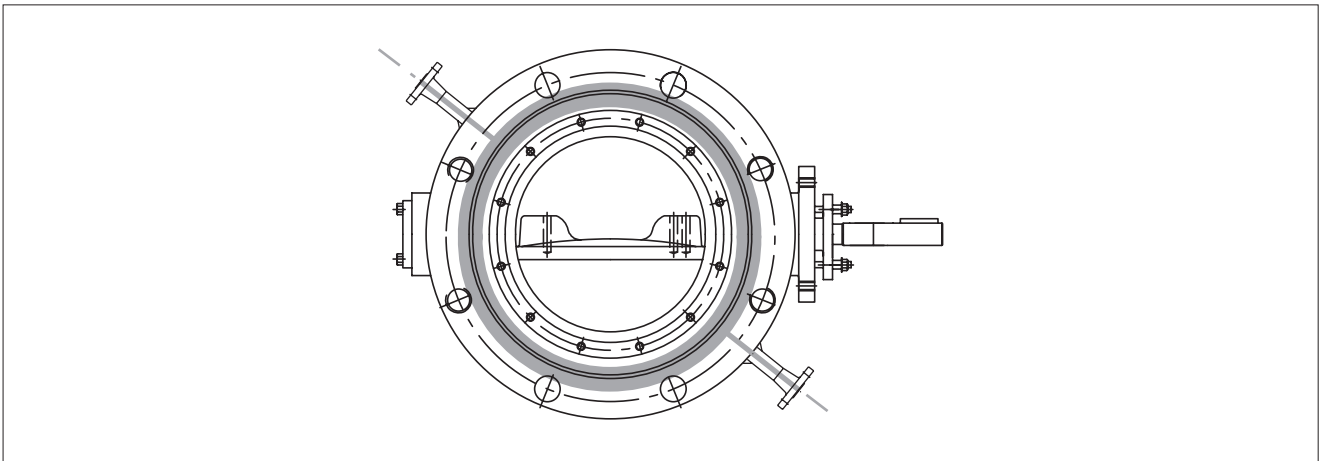


Service temperatures above +425 °C / +800 °F require high temperature construction with cobalt based alloy bearings and high temperature alloy shafts and seat. +600 °C / +1110 °F, consult the factory for proper material selection and higher temperatures.

NACE

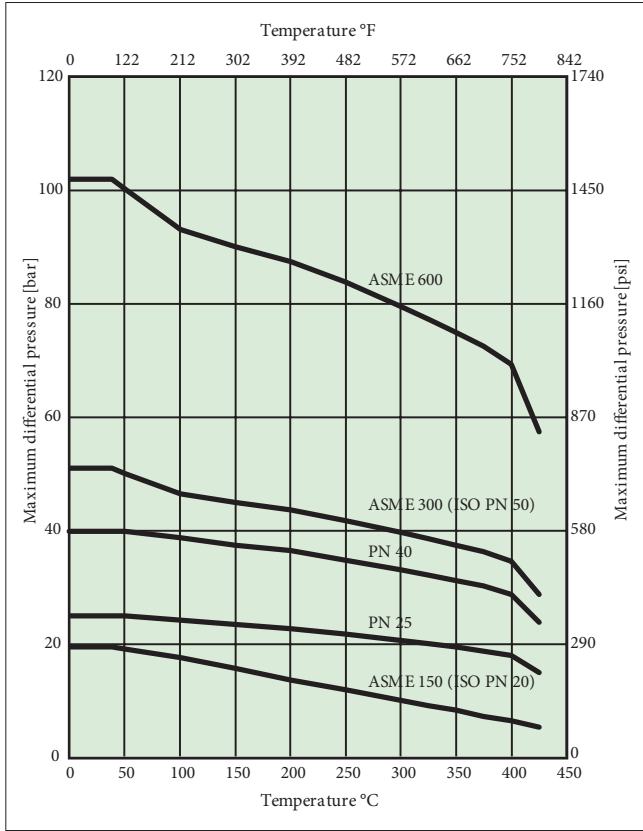
L6 Neldisc valves are available to comply with NACE MR 0103 or NACE MR 0175.

Steam jacket

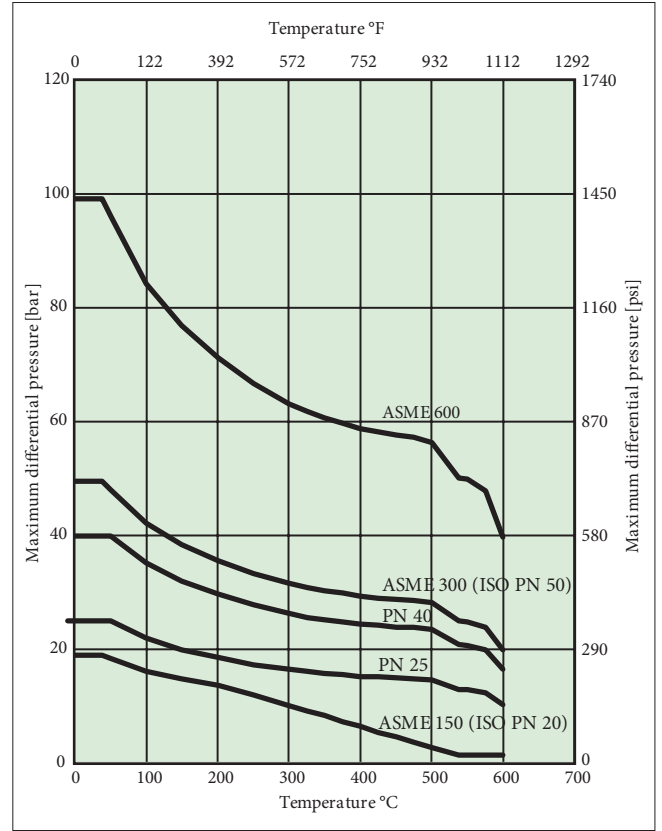


For applications requiring constant higher temperature levels, the L6 valve can be equipped with steam jacket to prevent e.g. liquid sulphur to crystallize. The bearing area is protected by an O-ring to prevent contaminant particles from entering the bearing and packing area.

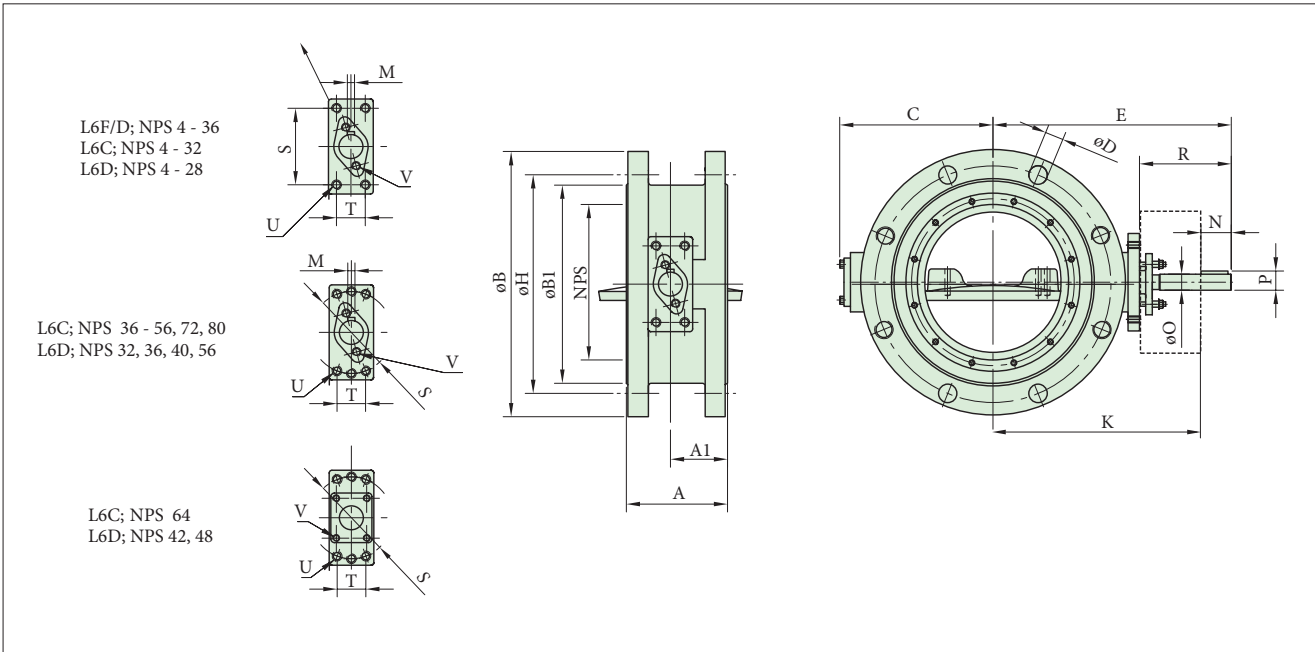
Pressure/temperature ratings for valve body, WCB



Pressure/temperature ratings for valve body, CF8M



Dimensions



L6C, ASME CLASS 150

NPS	Dimensions, mm																kg	U	V
	A	A1	øB	øB1	øH	øD	C	E	øO	R	P	M	N	K	S	T			
4	127	74	230	157.2	190.5	19	90	273	15	105	17	4.76	25	248	70	-	25	M10	M8
6	140	79	280	215.9	241.3	23	135	330	20	125	22.2	4.76	35	295	90	-	40	M12	M8
8	152	82.5	345	269.9	298.5	23	160	352	20	125	22.2	4.76	35	317	110	32	60	M12	M8
10	165	88	405	323.8	362	26	185	393	25	136	27.8	6.35	46	347	110	32	85	M12	M10
12	178	104	485	381	431.8	26	225	451	30	161	32.9	6.35	51	400	130	32	120	M12	M10
14	190	118	535	412.8	476.3	29	280	490	35	170	39.1	9.52	58	430	130	32	150	M12	M10
16	216	134	595	469.9	539.8	29	315	545	40	190	44.2	9.52	68	475	160	40	220	M16	M10
18	222	131	635	533.4	577.9	32	340	568	45	200	50.4	12.7	80	488	160	40	250	5/8	1/2
20	229	129	700	584.2	635	32	370	608	50	230	55.5	12.7	90	518	160	55	320	3/4	1/2
24	267	158	815	692.2	749.3	35	435	669	55	230	60.6	12.7	90	579	160	55	490	3/4	1/2

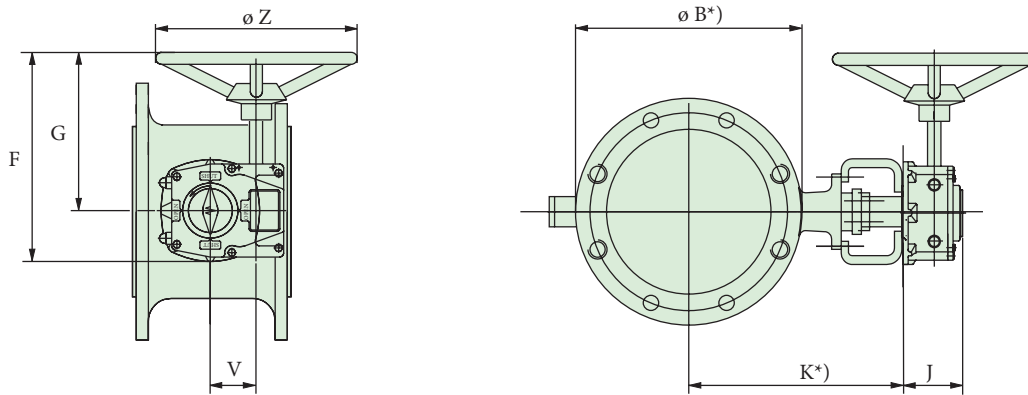
NPS	Dimensions, inch																lb	U	V
	A	A1	øB	øB1	øH	øD	C	E	øO	R	P	M	N	K	S	T			
4	5.00	2.91	9.13	6.18	7.50	0.75	3.54	10.75	0.59	4.13	0.67	0.19	0.98	9.76	2.76	-	55	M10	M8
6	5.51	3.11	11.81	8.50	9.50	0.91	5.31	12.99	0.79	4.92	0.87	0.19	1.38	11.61	3.54	-	88	M12	M8
8	5.98	3.25	13.62	10.62	11.75	0.91	6.30	13.86	0.79	4.92	0.87	0.19	1.38	12.48	4.33	1.26	132	M12	M8
10	6.50	3.46	16.18	12.75	14.25	1.02	7.28	15.47	0.98	5.35	1.09	0.25	1.81	13.66	4.33	1.26	187	M12	M10
12	7.01	4.09	19.21	15.00	17.00	1.02	8.86	17.76	1.18	6.34	1.30	0.25	2.01	15.75	5.12	1.26	264	M12	M10
14	7.48	4.65	21.22	16.25	18.75	1.14	11.02	19.29	1.38	6.69	1.54	0.37	2.28	16.93	5.12	1.26	330	M12	M10
16	8.50	5.28	23.70	18.50	21.25	1.14	12.40	21.46	1.57	7.48	1.74	0.37	2.68	18.70	6.30	1.57	484	M16	M10
18	8.74	5.16	25.00	21.00	22.75	1.26	13.39	22.36	1.77	7.87	1.98	0.50	3.15	19.21	6.30	1.57	550	5/8	1/2
20	9.02	5.08	27.52	23.00	25.00	1.26	14.57	23.94	1.97	9.06	2.19	0.50	3.54	20.39	6.30	2.17	704	3/4	1/2
24	10.51	6.22	32.01	24.77	29.50	1.38	17.13	26.34	2.17	9.06	2.39	0.50	3.54	22.80	6.30	2.17	1078	3/4	1/2

L6D, ASME CLASS 300

NPS	Dimensions, mm																kg	U	V
	A	A1	øB	øB1	øH	øD	C	E	øO	R	P	M	N	K	S	T			
4	127	74	255	157.2	200	23	90	273	15	105	17	4.76	25	248	70	-	34	M10	M8
6	140	79	320	215.9	269.9	23	135	330	20	125	22.2	4.76	35	295	90	-	60	M12	M8
8	152	80	380	269.9	330.2	26	165	368	25	136	27.8	6.35	46	322	110	32	90	M12	M10
10	165	83	445	323.8	387.4	29	205	440	35	166	39.1	9.52	58	382	130	32	135	M12	M10
12	178	96.5	520	381	450.8	32	280	520	45	200	50.4	12.7	80	440	160	40	200	M16	M14
14	190	110.5	585	412.8	514.4	32	335	590	50	230	55.5	12.7	90	500	160	55	250	M20	M14
16	216	126.5	650	469.9	571.5	35	375	630	55	230	60.6	12.7	90	540	160	55	330	M20	M14
18	222	115.5	710	533.4	628.6	35	395	725	70	310	78.2	19.05	119	606	230	90	420	1	5/8
20	229	116	775	584.2	685.8	35	445	750	70	310	78.2	19.05	119	631	230	90	510	1	5/8
24	267	140	915	692.2	812.8	41	510	810	85	310	94.7	22.23	146	664	230	90	760	1	5/8

NPS	Dimensions, inch																lb	U	V
	A	A1	øB	øB1	øH	øD	C	E	øO	R	P	M	N	K	S	T			
4	5.00	2.91	10.12	6.19	7.87	0.91	3.54	10.75	0.59	4.13	0.67	0.19	0.98	9.76	2.76	-	75	M10	M8
6	5.51	3.11	12.64	8.50	10.63	0.91	5.31	12.99	0.79	4.92	0.87	0.19	1.38	11.61	3.54	-	132	M12	M8
8	5.98	3.15	15.12	10.62	13.00	1.02	6.50	14.49	0.98	5.35	1.09	0.25	1.81	12.68	4.33	1.26	198	M12	M10
10	6.50	3.27	17.72	12.75	15.25	1.14	8.07	17.32	1.38	6.54	1.54	0.37	2.28	15.04	5.12	1.26	297	M12	M10
12	7.01	3.80	20.71	15.00	17.75	1.26	11.02	20.47	1.77	7.87	1.98	0.50	3.15	17.32	6.30	1.57	440	M16	M14
14	7.48	4.35	23.19	16.25	20.25	1.26	13.19	23.23	1.97	9.06	2.19	0.50	3.54	19.69	6.30	2.17	550	M20	M14
16	8.50	4.98	26.18	18.50	22.50	1.38	14.76	24.80	2.17	9.06	2.39	0.50	3.54	21.26	6.30	2.17	726	M20	M14
18	8.74	4.55	28.00	21.00	24.75	1.38	15.55	28.54	2.76	12.20	3.08	0.75	4.69	23.86	9.06	3.54	924	1	5/8
20	9.02	4.57	30.50	23.01	27.00	1.38	17.52	29.53	2.76	12.20	3.08	0.75	4.69	24.84	9.06	3.54	1122	1	5/8
24	10.51	5.51	36.00	27.25	32.00	1.61	20.08	31.89	3.35	12.20	3.73	0.88	5.75	26.14	9.06	3.54	1672	1	5/8

VALVE + MANUAL GEAR OPERATOR

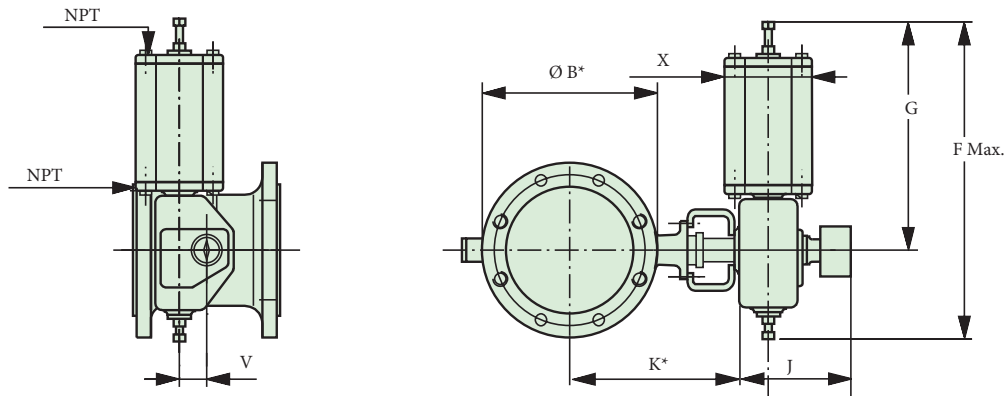


*) See dimensions K and ϕB on pages 6-7.

Type	Dimensions in mm					kg
	F	G	J	V	Z	
M07	196	152	58	38	160	3
M10	297	239	67	52	200	5
M12	357	282	81	66	315	10
M14	435	345	93	89	400	18
M15	532	406	105	123	500	31
M16	642	466	126	154	600	45
M25	597	412	160	182	600	61

Type	Dimensions in inch					lbs
	F	G	J	V	Z	
M07	7.72	5.98	2.28	1.52	6.30	6
M10	11.69	9.41	2.64	2.05	7.87	11
M12	14.06	11.10	3.19	2.63	12.40	21
M14	17.13	13.58	3.68	3.52	25.75	40
M15	20.94	15.98	4.15	4.84	19.69	68
M16	25.28	18.35	4.98	6.06	23.62	99
M25	23.28	16.07	6.24	7.10	23.40	134

VALVE + PNEUMATIC ACTUATOR B1C, B1J, B1JA



*) See dimensions K and ϕB on pages 6-7.

Type	Dimensions in mm					NPT	kg
	X	G	F	V	J		
B1C6	90	260	400	36	283	1/4	4,2
B1C9	110	315	455	43	279	1/4	9,6
B1C11	135	375	540	51	290	3/8	16
B1C13	175	445	635	65	316	3/8	31
B1C17	215	545	770	78	351	1/2	54
B1C20	215	575	840	97	385	1/2	73
B1C25	265	710	1040	121	448	1/2	131
B1C32	395	910	1330	153	525	3/4	256
B1C40	505	1150	1660	194	595	3/4	446
B1C50	610	1350	1970	242	690	1	830

Type	Dimensions in inch					NPT	lbs
	X	G	F	V	J		
B1C6	3.54	10.24	15.75	1.42	11.14	1/4	9
B1C9	4.33	12.40	17.91	1.69	10.98	1/4	21
B1C11	5.31	14.76	21.26	2.01	11.42	3/8	35
B1C13	6.89	17.52	25.00	2.56	12.44	3/8	68
B1C17	8.46	21.46	30.31	3.07	13.82	1/2	119
B1C20	8.46	22.64	33.07	3.82	15.16	1/2	161
B1C25	10.43	27.95	40.94	4.76	17.64	1/2	289
B1C32	15.55	35.83	52.36	6.02	20.67	3/4	564
B1C40	19.88	45.28	65.35	7.64	23.43	3/4	983
B1C50	24.02	53.15	77.56	9.53	27.17	1	1829

Type	Dimensions in mm					NPT	kg
	X	G	F	V	J		
B1J, B1JA8	135	420	560	43	279	3/8	17
B1J, B1JA10	175	490	650	51	290	3/8	30
B1J, B1JA12	215	620	800	65	316	1/2	57
B1J, B1JA16	265	760	990	78	351	1/2	100
B1J, B1JA20	395	935	1200	97	358	3/4	175
B1J, B1JA25	505	1200	1530	121	448	3/4	350
B1J, B1JA32	540	1410	1830	153	525	1	671
B1J/B1JA40	724	1578	2095	194	580	1	1100

Type	Dimensions in inch					NPT	lbs
	X	G	F	V	J		
B1J, B1JA8	5.31	16.54	22.05	1.69	10.98	3/8	37
B1J, B1JA10	6.89	19.29	25.59	2.01	11.42	3/8	66
B1J, B1JA12	8.46	24.41	31.5	2.56	12.44	1/2	126
B1J, B1JA16	10.43	29.92	38.98	3.07	13.82	1/2	220
B1J, B1JA20	15.55	36.81	47.24	3.82	14.09	3/4	386
B1J, B1JA25	19.88	47.24	60.24	4.76	17.64	3/4	771
B1J, B1JA32	21.26	55.51	72.05	6.02	20.67	1	1479
B1J/B1JA40	28.50	62.13	84.48	7.64	22.83	1	2424

How to order

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
	L6	C	B	N	8	P	A	C	A	G	/	

1. Sign	S-disc construction
S-	Flow balancing trim on downstream side of the body flow port

2. Sign	Product series/design
L6	L6C and L6D pressure ratings are flanged and face-to-face according to EN 558 part 1, basic serie 13, ISO 5752 series 13, API 609 category B, double flanged, short pattern

3. Sign	Pressure rating
C	Body ASME Class 150
D	Body ASME Class 300

4. Sign	Seat design
B	Metal seat - actuator mounting manufacturer standard / metric threads with drive shaft with 2 key ways - pipe flange threads according to pipe flange standard applied (sign 13) Used together with sign 5, codes N, C, H, S (also NACE versions)

5. Sign	Construction
N or 1N (NACE)	STANDARD in size range 4”...24” (cl.150, cl.300) - $t_{max} = +425\text{ °C} / +800\text{ °F}$ - bearings cobalt based alloy, shaft bearing surface nitrated (17-4PH shaft) - body and blind flange gaskets graphite - bare shaft valve ATEX II 2 G c
A	Standard design in size range 04”...24” (cl.150, cl.300) - Bearings PTFE + C25 + AISI 316 or PTFE + C25 + Alloy 625 depending on body material, shaft bearing surface non-nitrated. - $t_{max} = +260\text{ °C} / +500\text{ °F}$ - Gr. 630 (17-4PH) shaft - body and blind flange gaskets graphite
H or 1H (NACE)	High temperature / High Cycle - $t_{max} = +538\text{ °C}$ (for higher temperatures contact product line) - bearing surfaces of shafts cobalt based alloy - bearings cobalt based alloy - body and blind flange gaskets graphite (ATEX II 2 G c)
C	Cryogenic, $t = -200\text{ °C} \dots +260\text{ °C}$, code C $t = -50\text{ °C}$ or $-100\text{ °C} \dots +260\text{ °C}$, code 1C $t = -200\text{ °C} \dots +260\text{ °C}$, code 2C - extended bonnet and drive shaft (Cryo extension for T = -200 °C to +260 °C) - bearings PTFE+ C25 + AISI 316 - body and blind flange gaskets graphite
X or 1X (NACE)	LOW EMISSION CONSTRUCTION - Low emission graphite packing - Low emission blind flange - Low emission blind flange bolting - Otherwise as construction “N” or “1N”
S or 1S (NACE)	STEAM JACKET WITH BEARING PROTECTION - steam jacket on valve body and graphite bearing protection, otherwise as construction “BN” or “BU”
Z	OXYGEN CONSTRUCTION - BAM tested non-metallic materials - T = -50 ...+200 °C - Max pressure as per body rating - Bearings cobalt based alloy - Oxygen cleaning acc. to manufacturer internal procedures. - Recommended typecodes L__ BZH AACAG or L__ BZH AMMKG or L__ BZH MMMKG

Note! Only “Z” construction available for oxygen flow media. Not to be used with other flow medias.

6. Sign	Size
	L6C: 04, 06, 08, 10, 12, 14, 16, 18, 20, 24
	L6D: 04, 06, 08, 10, 12, 14, 16, 18, 20, 24

7. Sign	Body materials
A	ASTM A 351 gr. CF8M. Standard.
P	ASTM A 216 gr. WCB. Standard.
F	ASTM A 352 gr. LCC

8. Sign	Disc material
A	ASTM A 351 gr. CF8M / F 316. Standard

9. Sign	Shaft and pin material
C	Gr. 630 (17-4PH). Standard.
H	Nimonic 80A (high temp. above +425 °C / +800 °F)

10. Sign	Seat material
	Standard
A	Incoloy 825, hard chrome plated.
B	W.no. 1.4418, hard chrome plated (AVESTA 248 SV).
D	F6NM, hard chrome plated (Nace) $t = -75\text{ °C} \dots +425\text{ °C} / -100\text{ °C} \dots +800\text{ °F}$
H	Nimonic 80A, hard chrome plated, (high temp. above +425 °C / +800 °F).

11. Sign	Packing material option
G	Live loaded graphite packing, Fire-safe
T	Live loaded PTFE V-ring packing

12. Sign	Flange facing
-	Ra 3.2 - 6.3, standard, without sign cover: EN 1092-1 Type B1 (Ra 3.2 - 12.5) ASME B16.5, Ra 3.2 - 6.3 (125 - 250 µin)

13. Sign	Flange drilling
-	According to ASME B16.5, without sign (4” - 24”).

- Examples:**
- L6CBN08AACAG = Standard construction with metal bearings, stainless steel body and disc.
Max. temperature +425 °C
 - L6CBN08AACAT = Max. temperature +230 °C
 - L6CBH10AAHHG = High temperature construction
 - L6CBC12AACAG = Cryo construction

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