

Neles™ high performance metal seated Neldisc™ triple eccentric disc valve Series L1 & L2

Neles Neldisc series L1 is a wafer type, and series L2 a lug type, metal seated high performance triple eccentric disc valve. With close to equal percentage characteristics and superior tightness, Neldisc triple eccentric disc valves operate both in control and shut-off applications.

As a result of the unique geometry of Neldisc, the contact between disc and seat is mechanically induced and does not rely on assistance from differential pressure. The valve is very tight even in low Δp applications.

Due to a number of special constructions developed from the versatile Neldisc design, these valves offer a powerful tool for standardization and are true high performance valves.

Features

- Metal to metal
- Bidirectional long lasting tightness
- Low friction
- Excellent wear resistance
- Extended life cycle
- Lower operational torque

Applications

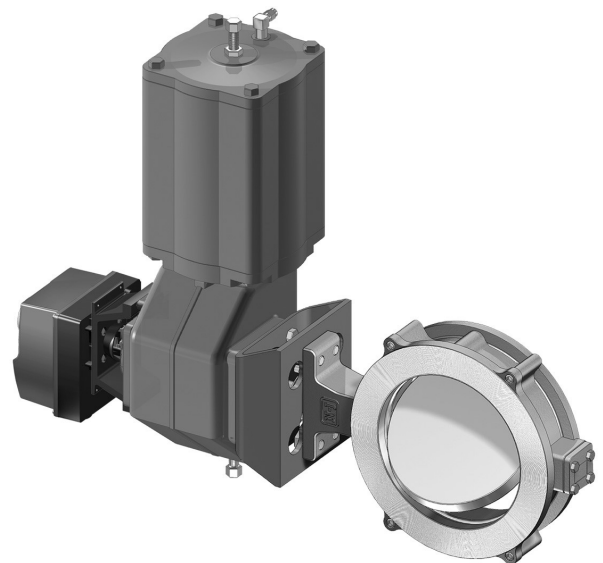
The Neldisc triple eccentric disc valves are widely used in applications such as:

- Liquids
- Gases
- Steam
- Pulpstocks both on control and shutoff services.

FEATURES

Bidirectional tight seat

- Unique all-metal seat design assures superior tightness in difficult applications over long time periods.
- Contact between disc and seat is mechanically induced and does not rely on assistance from differential pressure.



Abrasion resistant

- Solid metal seat design is offered in a variety of materials to suit your application.
- Fully metal seated construction with no resilient parts exposed to the medium.

Wide pressure and temperature range

- Differential pressure/temperature ratings in accordance with ASME B16.34.
- Appropriate constructions perform equally well from - 200 °C to +600 °C / -330 °F to +1110 °F.

Low cost of ownership

- Extremely high cycle life minimizes need for maintenance.
- Totally interchangeable seats can be replaced without disassembly of the disc and shaft.

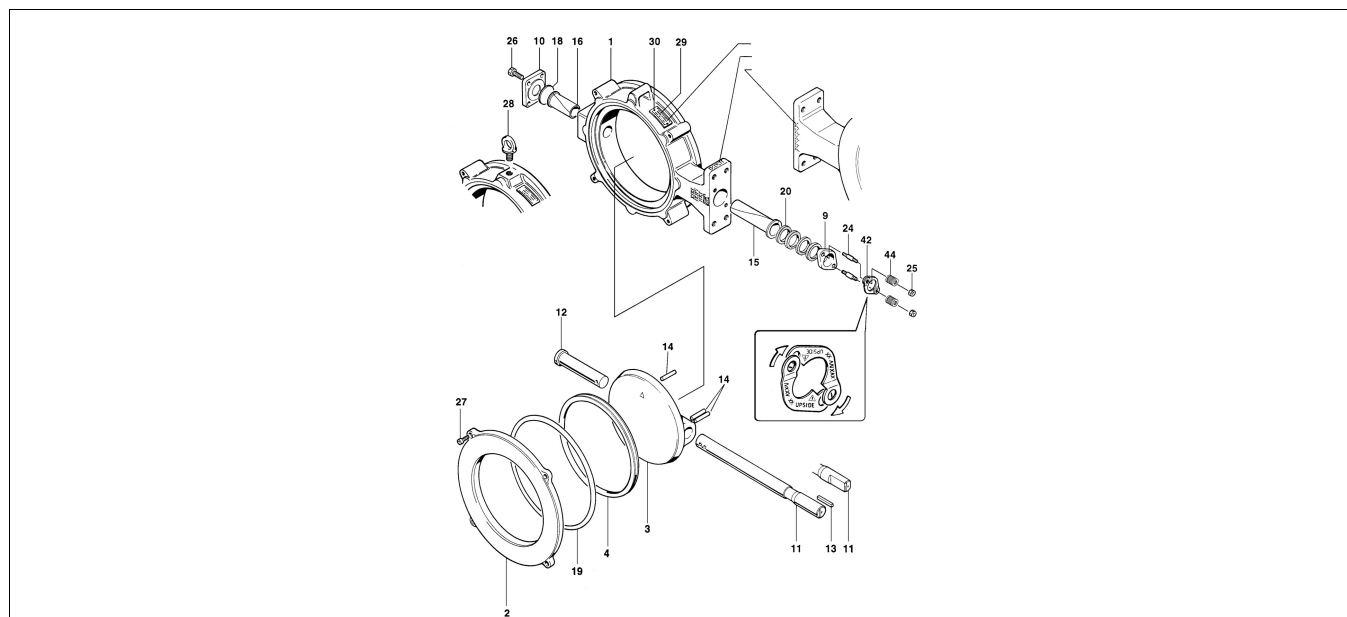
Offset shaft and eccentric disc

- No seat/disc contact in the open or intermediate position.
- Eliminates wear points at top and bottom of disc.

Anti-blow out shaft

- Anti-blow out shaft construction standard in all valves, see page 2 exploded view.

Exploded view

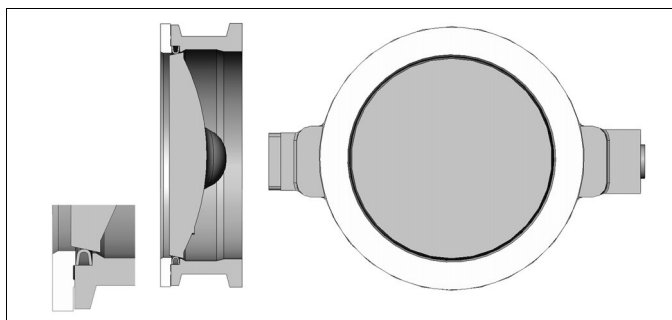


Parts list

Item	Part description	Material	
1	BODY	Carbon steel, ASTM A 216 gr. WCB	Stainless steel, ASTM A 351 gr. CF8M
2	CLAMP RING	Carbon steel, 1.0425 (Type ASTM A 515 gr. 55)	Stainless steel, ASTM A 351 gr. CF8M
3	DISC	Stainless steel, ASTM A 351 gr. CF8M	
4	SEAT RING	Ni-Fe-base superalloy + Hard chrome, ASTM B 424 (Incoloy 825) or W.no. 1.4418	
9	GLAND	Stainless steel, ASTM A 351 gr. CF8M	
10	BLIND FLANGE	DN 450-500 Stainless steel, ASTM A 351 gr. CF8M DN 600- Carbon steel, ASTM A 216 gr. WCB or equal	Stainless steel ASTM A 351 gr. CF8M
11	DRIVE SHAFT	L1/L2C AISI 329 (SS 14 2324) L1/L2D Stainless steel, ASTM A 564 gr. 630 (17-4PH)	
12	SHAFT	L1/L2C AISI 329 (SS 14 2324) L1/L2D Stainless steel, ASTM A 564 gr. 630 (17-4PH)	
13	KEY	Stainless steel, Type AISI 329 (SS 14 2324)	
14	PIN	L1/L2C AISI 329 (SS 14 2324) L1/L2D Stainless steel, ASTM A 564 gr. 630 (17-4PH)	
15	BEARING	PTFE on stainless steel net	
16	BEARING	PTFE on stainless steel net	
18	GASKET	Graphite	
19	BODY SEAL	Graphite	
20	GLAND PACKING	Polytetrafluoroethylene (PTFE)	
24	STUD	Stainless steel	
25	HEXAGON NUT	Stainless steel	
26	HEXAGON SCREW	DN 450-500 Stainless steel DN 600- Steel, zinc plated	
27	HEXAGON SOCKET SCREW	Stainless steel, ISO 3506 A4-80	
28	LIFTING EYE BOLT (DN 600-)	Steel	
29	IDENTIFICATION PLATE	Stainless steel, AISI 304	
42	RETAINING PLATE	Stainless steel, DIN 17440-1.4435 (AISI 316L)	
44	Disc spring set	Electroless nickel plated spring steel (EN 10083-1.8159)	

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. When the valve is opened, the contact is released and the seat ring returns to its original circular shape.



Technical specification

Product type

High performance triple eccentric disc valve
Metal seated fully rated
L1 - Wafer type
L2 - Lug type

Pressure ratings

Body: L1C, L2C ASME 150/PN 25
L1D, L2D ASME 300/PN 40
Trim: L1C, L2CASME 150
L1D, L2DASME 300

Size range

L1C: DN 450 - DN 1200 / 18" - 48"
L1D: DN 400 - DN 900 / 16" - 36"
L2C: DN 450 - DN 750 / 18" - 30"
L2D: DN 400 - DN 750 / 16" - 30"

Temperature range

-200 °C ... +600 °C / -330 °F...+1110 °F
(over +600 °C/+1110 °F please consult with factory).

Design standards

Body: ASME B16.34.
Face to face: ISO 5752, L2D face to face according to manufacturer.

Standard materials

Body: ASTM A216 gr. WCB
ASTM A351 gr. CF8M
ASTM A351 gr. CG8M
Disc: ASTM A351 gr. CF8M
ASTM A351 gr. CG8M
Clamp ring: DIN 17155 - 1.0425
ASTM A351 gr. CF8M
ASTM A351 gr. CG8M
Shaft and pins: AISI 329 (SS 14 2324) in Class ASME 150
ASTM A564 gr. 630 (17-4 PH) in Class
ASME 300
Seat ring: ASTM B424 (Incoloy 825) in DN 450 -
DN 600 / 18"-24"

W.Nr. 1.4418 (Avesta 248SV) in
DN 700 - DN 1200 / 28" - 48"
Seat ring is always hard chrome plated.

Bearing: PTFE + AISI 316 net

Certification

Body and
clamp ring: EN 10 204 - 3.1B
Disc: EN 10 204 - 3.1B on request

Approvals

Emission: TA-Luft, chapter 3.1.8.4, Shell SPE 77/
312, ISO 15848
Fire test: BS6755 and API607, 4th edition.

Valve testing

Each valve undergoes a shell test and a seat test. The shell test pressure is 1.5 x PN. The seat test pressure is 1.1 x PN. The test medium is inhibited water.

Valve tightness: Bidirectionally ISO 5208 Rate D or
ANSI Class V
(Improved tightness available on
request).
10x ISO 5208 rate D with RH hand lever

Options

- Cryogenic.
- High temperature.
- Heating jacket.
- S-disc, flow balancing trim, see bulletin 2S-L1 20.
- NACE.
- High cyclic design.
- Erosion resistant design.

Flow data

C_v tables of L1 and L2 valves in pressure classes ASME 150 and ASME 300.

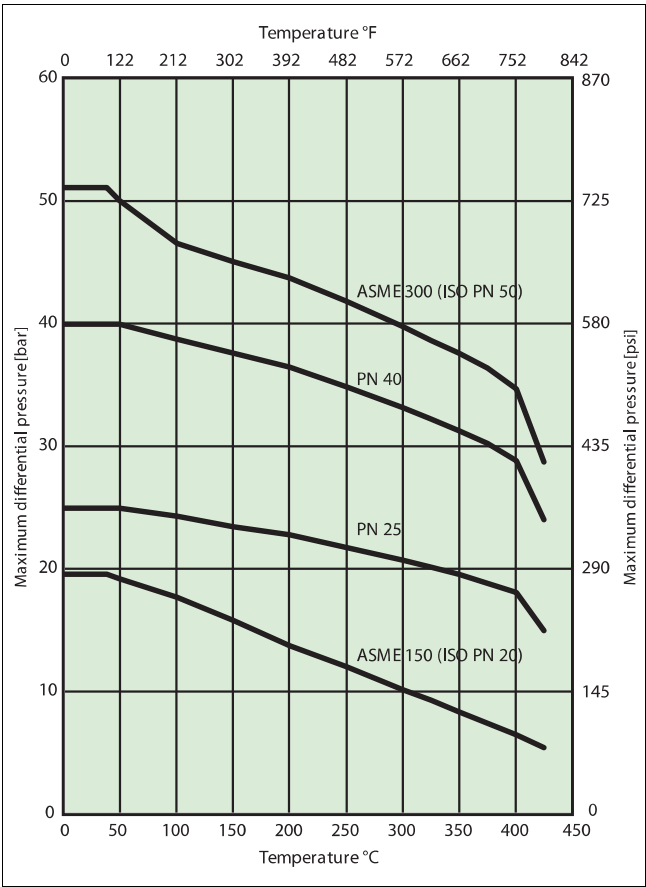
ASME 150

DN	inch	Relative opening h 100%
450	18	17600
500	20	21900
600	24	31000
700	28	39300
750	30	46900
800	32	53600
900	36	66400
1000	40	82800
1200	48	116000

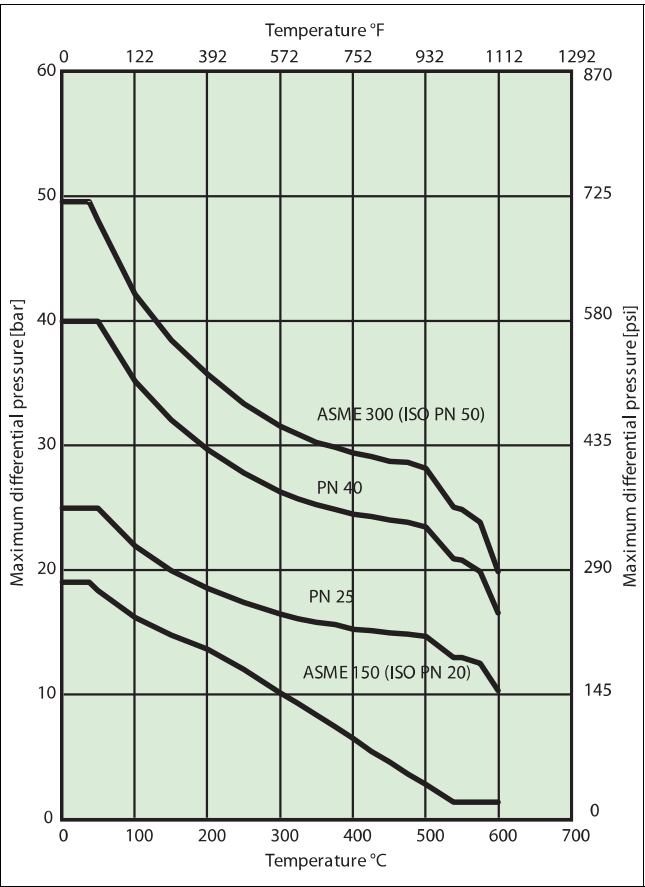
ASME 300

DN	inch	Relative opening h 100%
400	16	9100
450	18	12100
500	20	14400
600	24	22000
700	28	28100
750	30	28800
900	36	40300

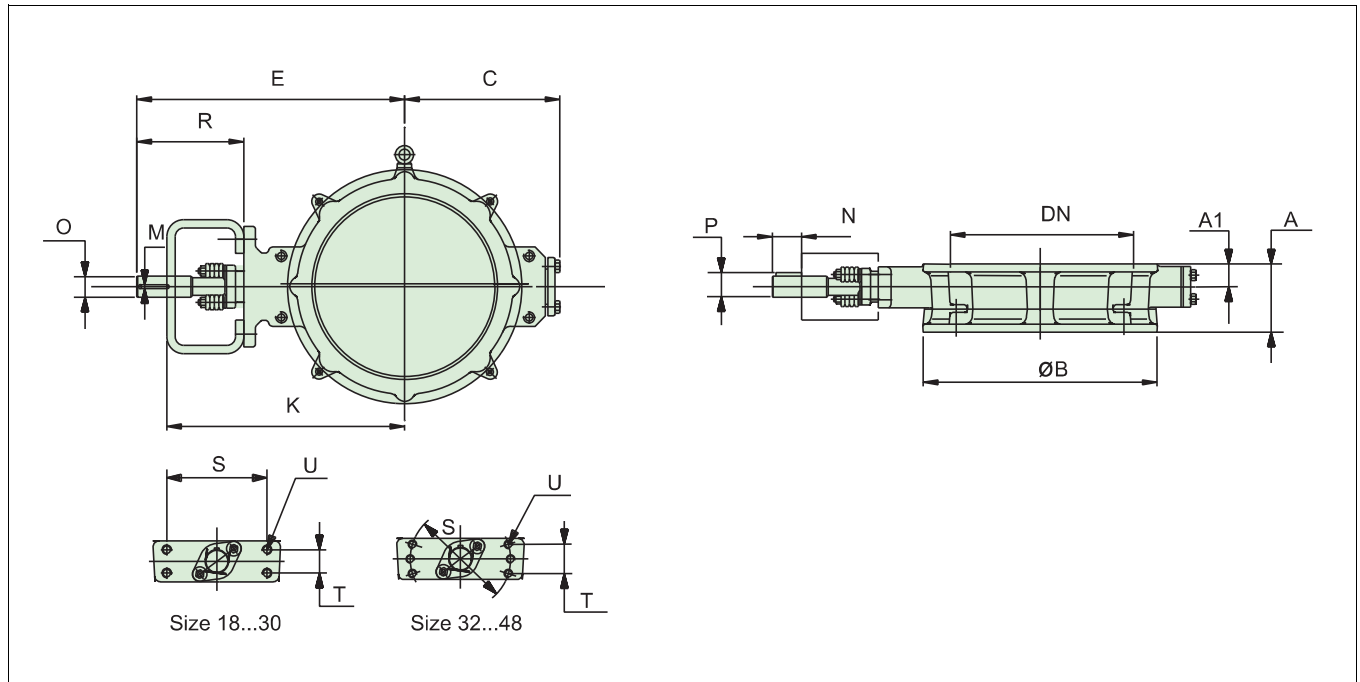
Pressure/temperature ratings for valve body, WCB



Pressure/temperature ratings for valve body, CF8M



Dimensions, weights and c_v -values

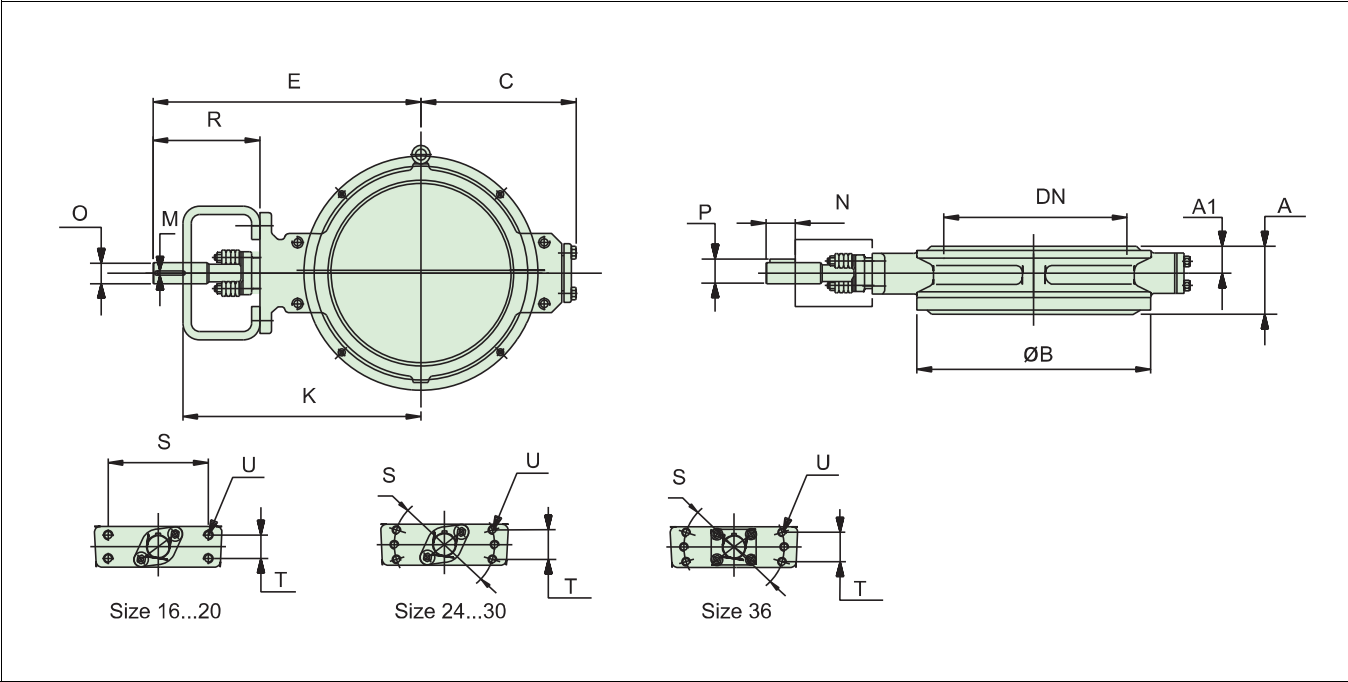


L1/L2C, ASME 150

Size		Dimensions, mm											U UNC	Dimensions, mm					Δp bar	L1C		L2C	
		L1C			L2C			C	E	K	S	T											
in	DN	A	A1	B	A	A1	B						C	E	K	S	T	O	R	M	P	N	Cv 90°
18	450	114	46	537	152	46	635	370	610	520	160	55	3/4	50	230	12.7	55.5	90	20	17600	130	14800	260
20	500	127	53	590	152	53	700	415	650	560	160	55	3/4	55	230	12.7	60.6	90	20	21900	160	18200	300
24	600	154	65	690	178	65	813	505	794	675	230	90	1	70	299	19.05	78.2	119	20	31000	280	27300	470
28	700	229	96	805	250	96	927	545	886	740	230	90	1	85	326	22.23	94.7	146	20	39300	400	39000	700
30	750	229	96	870	250	96	985	585	911	765	230	90	1	85	326	22.23	94.7	146	20	46900	470	46000	820
32	800	241	101	910	270	101	1060	600	1006	850	330	120	1 1/4	95	376	22.23	104.8	156	20	53600	550	52800	1000
36	900	241	105	1010	241	105	1170	660	1065	885	330	120	1 1/4	105	400	25.4	116.2	180	20	66400	710	68000	1400
40*	1000*	300	130	1120				715	1185	980	330	120	1 1/4	120	425	31.75	133.8	205	20	82800	950		
48*	1200*	350	175	1355				960	1440	1190	400	160	1 1/2	150	500	38.10	167	250	20	116000	2100		

Size		Dimensions, inch											U UNC	Dimensions, inch					Δp psi	L1C		L2C	
		L1C			L2C			C	E	K	S	T		O	R	M	P	N		Cv 90°	lbs	Cv 90°	lbs
in	DN	A	A1	B	A	A1	B																
18	450	4.49	1.81	21.14	5.98	1.81	25.00	14.57	24.02	20.47	6.30	2.17	3/4	1.97	9.06	0.50	2.19	3.54	280	17600	286	14800	572
20	500	5.00	2.09	23.23	5.98	2.09	27.56	16.34	25.59	22.05	6.30	2.17	3/4	2.17	9.06	0.50	2.39	3.54	280	21900	352	18200	660
24	600	6.06	2.56	27.17	7.01	2.56	32.01	19.88	31.26	26.57	9.06	3.54	1	2.76	11.77	0.75	3.08	4.69	280	31000	616	27300	1034
28	700	9.02	3.78	31.69	9.84	3.78	36.50	21.46	34.88	29.13	9.06	3.54	1	3.35	12.83	0.88	3.73	5.75	280	39300	880	39000	1540
30	750	9.02	3.78	34.25	9.84	3.78	38.78	23.03	35.87	30.12	9.06	3.54	1	3.35	12.83	0.88	3.73	5.75	280	46900	1034	46000	1804
32	800	9.49	3.98	35.83	10.63	3.98	41.73	23.62	39.61	33.46	12.99	4.72	1 1/4	3.74	14.80	0.88	4.13	6.14	280	53600	1210	52800	2200
36	900	9.49	4.13	39.76	9.49	4.13	46.06	25.98	41.93	34.84	12.99	4.72	1 1/4	4.13	15.75	1.00	4.57	7.09	280	66400	1562	68000	3080
40*	1000*	11.81	5.12	44.09				28.15	46.65	38.58	12.99	4.72	1 1/4	4.72	16.73	1.25	5.27	8.07	280	82800	2090		
48*	1200*	13.78	6.89	53.35				37.80	56.69	46.85	15.75	6.30	1 1/2	5.91	19.69	1.50	6.57	9.84	280	116000	4620		

*) Only L1C series



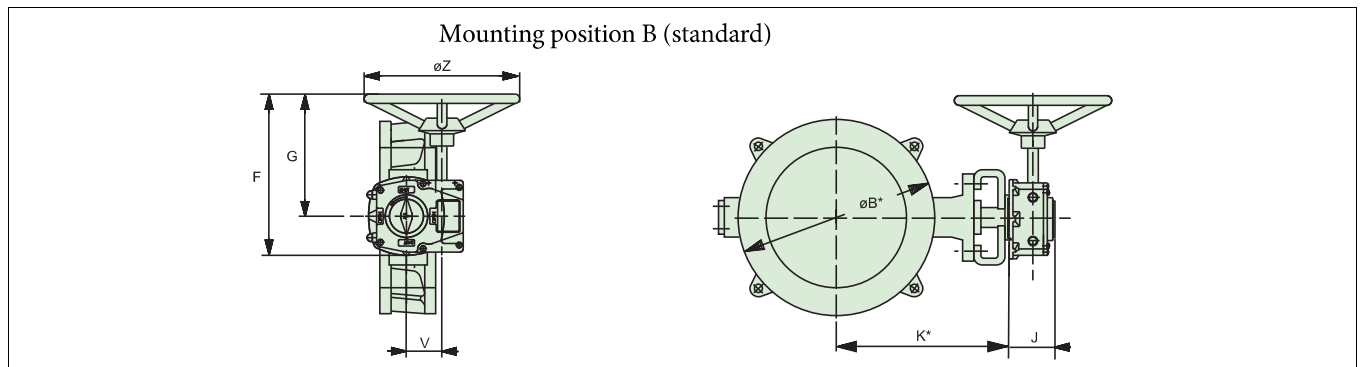
L1/L2D, ANSI 300

Size		Dimensions, mm											U UNC	Dimensions, mm					Δp bar	L1D		L2D	
		L1D			L2D			C	E	K	S	T		O	R	M	P	N		Cv 90°	kg	Cv 90°	kg
in	DN	A	A1	B	A	A1	B																
16	400	165	83	530	195	83	645	385	679	560	230	90	1	70	299	19.05	78.2	119	51	9100	200	9460	370
18	450	180	90	565	210	88	710	410	704	585	230	90	1	70	299	19.05	78.2	119	51	12100	245	12700	500
20	500	200	100	625	230	107	775	465	781	635	230	90	1	85	326	22.23	94.7	146	51	14400	305	15200	620
24	600	240	120	743	250	105	915	525	906	750	330	120	1 1/4	95	376	22.23	104.8	156	51	22000	540	21200	950
28*	700*	250	125	848				615	1028	823	330	120	1 1/4	120	425	31.75	133.8	205	51	28100	830		
30	750	300	150	942	300	130	1090	655	1115	890	360	135	1 1/4	135	475	31.75	149	225	51	28800	1250	28800	1200
36*	900*	360	180	1100				730	1260	980	360	135	1 1/4	165	530	38.1	181.8	280	51	40300	2000		

Size		Dimensions, inch											U UNC	Dimensions, inch					Δp psi	L1D		L2D	
		L1D			L2D			C	E	K	S	T		O	R	M	P	N		Cv 90°	lbs	Cv 90°	lbs
in	DN	A	A1	B	A	A1	B																
16	400	6.50	3.27	20.87	195	3.27	25.39	15.16	26.73	22.05	9.06	3.54	1	2.76	11.77	0.75	3.08	4.69	735	9100	440	9460	814
18	450	7.09	3.54	22.24	210	3.46	27.95	16.14	27.72	23.03	9.06	3.54	1	2.76	11.77	0.75	3.08	4.69	735	12100	539	12700	1100
20	500	7.87	3.94	24.61	230	4.21	30.51	18.31	30.75	25.00	9.06	3.54	1	3.35	12.83	0.88	3.73	5.75	735	14400	671	15200	1364
24	600	9.45	4.72	29.25	250	4.13	36.02	20.67	35.67	29.53	12.99	4.72	1 1/4	3.74	14.80	0.88	4.13	6.14	735	22000	1188	21200	2090
28*	700*	9.84	4.92	33.39				24.21	40.47	32.40	12.99	4.72	1 1/4	4.72	16.73	1.25	5.27	8.07	735	28100	1826		
30	750	11.81	5.91	37.09	300	5.12	42.91	25.79	43.90	35.04	14.17	5.31	1 1/4	5.31	18.70	1.25	5.87	8.86	735	28800	2750	28800	2640
36*	900*	14.17	7.09	43.31				28.74	49.61	38.58	14.17	5.31	1 1/4	6.50	20.87	1.50	7.16	11.02	735	40300	4400		

*) Only L1D series

Valve + manual gear operator series M

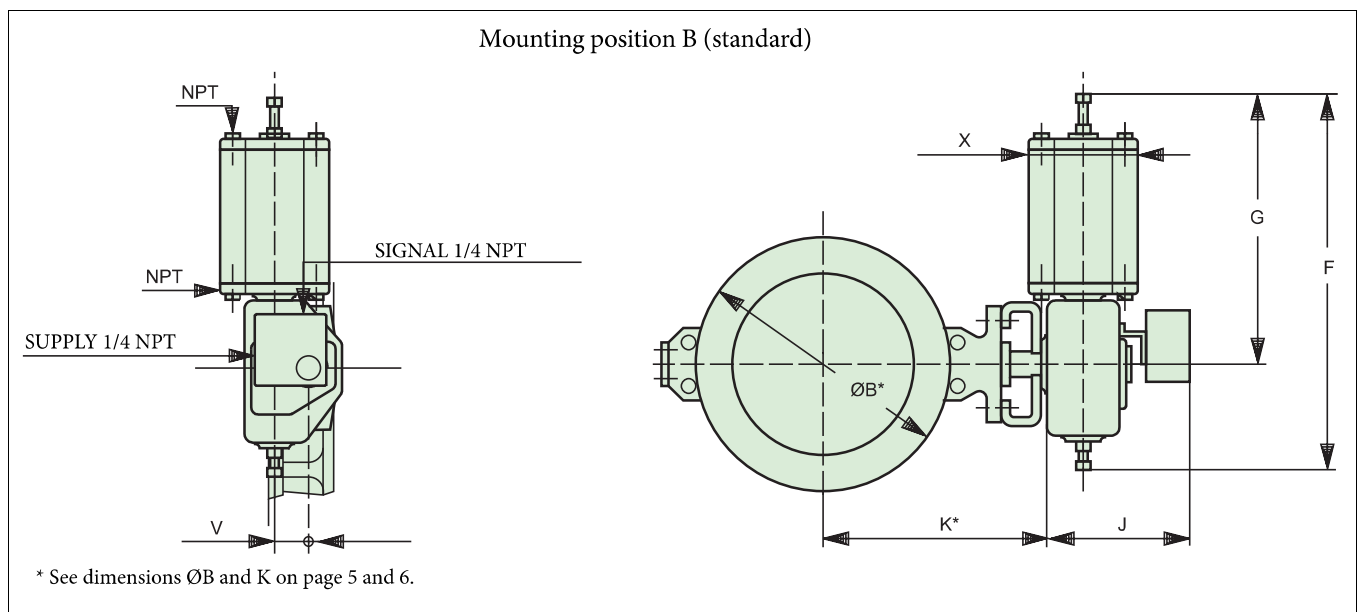


Type	Dimensions, mm					kg
	F	G	J	V	ØZ	
M15/F16	532	406	106	123	500	31
M16/F25	642	466	127	154	600	45

Type	Dimensions, inch					lbs
	F	G	J	V	ØZ	
M15/F16	20.94	15.98	4.15	4.84	19.69	68
M16/F25	25.28	18.35	4.98	6.06	23.62	99

* See dimensions ØB and K on page 5 and 6.

Valve + pneumatic actuator / B1C / B1J / B1JA



Type	Dimensions, mm					NPT	kg
	X	G	F	V	J		
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, mm					NPT	kg
	X	G	F	V	J		
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, inch					NPT	lbs
	X	G	F	V	J		
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, inch					NPT	lbs
	X	G	F	V	J		
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

Typical Neldisc triple eccentric disc valves

L1CMA_AAJAT standard valve ($T_{\max} = +250\text{ }^{\circ}\text{C}$)

L1CMH_AANHG high temp. ($T_{\max} = +600\text{ }^{\circ}\text{C}$)

L1CMH_AAHHG high temp. ($T_{\max} = +600\text{ }^{\circ}\text{C}$)

L1CMC_AACAG cryo temp. ($T_{\max} = -200 \dots +250\text{ }^{\circ}\text{C}$)

Example

1	2	3	4	5	6	7	8	9	10	11		12	13
S-	L1	C	M	A	20	A	A	J	A	T	/	-	-

1	S-DISC
S-	Flow balancing trim on downstream side

2	VALVE TYPE
L1	Wafer type.
L2	Lug type.

3	PRESSURE RATING
C	ASME Class 150.
D	ASME Class 300.

4	SEAT TYPE
M	Metal seat.

5	CONSTRUCTION TYPE
A	Standard.
C	Cryogenic.
H	High-temp.

6	VALVE SIZE
L1C	18, 20, 24, 28, 30, 32, 36, 40, 48
L2C	28, 30, 32, 36
L1D	28, 30, 36
L2D	28, 30, 36

7	BODY MATERIAL
A	ASTM A351 gr CF8M.
C	ASTM A351 gr CG8M.
P	ASTM A216 gr WCB.
F	ASTM A352 gr LCC.

8	DISC MATERIAL
A	ASTM A351 gr CF8M.
C	ASTM A351 gr CG8M.
P	ASTM A216 gr WCB.

9	SHAFT AND PIN MATERIAL
C	17-4PH.
J	SIS 2324.
H	Nimonic 80A
N	XM-19 (Nitronic 50)

10	SEAT MATERIAL
A	Incoloy 825.
B	SS Avesta 248 SV.
H	Nimonic 80H HCr plated (only upto 24")
K	Ultimet (2.4681) (only upto 24")

11	PACKING CONSTRUCTION
T	Live loaded PTFE
G	Live loaded graphite

12	FLANGE FACING
-	Ra 3.2 - 6.3 standard, covers; ASME B16.5 (Ra 3.2 - 6.3) DIN 2526 Form E EN 1092-1 type B1 The flange face roughness 10 - 12.5 has to be defined separately in the order.

13	FLANGE DRILLING
-	without sign (drilling according to pressure rating)
J*	PN10
K*	PN16
L*	PN25
M*	PN40
X*	ISO PN20
Z*	ISO PN50
R*	JIS 10K
S*	JIS 16K
T*	JIS 20K
U*	JIS 30K

* Assure suitability from Valmet sales office.

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