Neles™ high performance metal seated Neldisc™ triple eccentric disc valve with flow balancing trim S-Disc™

Features

- Excellent flow and control performance.
- Wide temperature range from -200 ... +600 °C / -330 ... +1110 °F.
- Reduced dynamic torque and noise.
- Mechanical and flow dynamic stability allows higher pressure drop service than a conventional disc.
- ASME 150/PN 20, ASME 300/PN 40 and ASME 600/PN 100.
- Sizes DN 80… 1500 / 3" … 60".

Neldisc triple eccentric seating principle

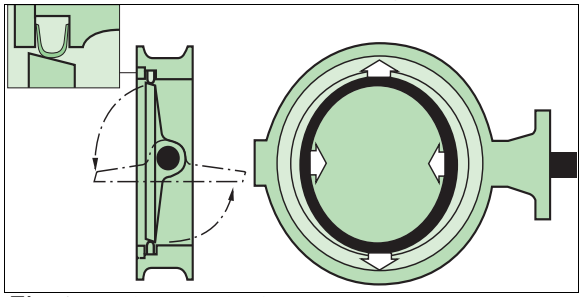
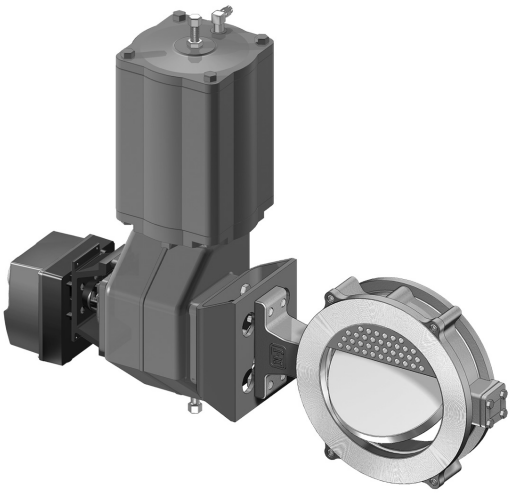


Fig. 1 The principle of a seat ring construction.

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 it 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.

Control stability and superior tightness

The S-Disc control valve unit provides outstanding control performance and excellent long-lasting tightness in the same valve. The very simple and robust construction guarantees long trouble-free operation and maximum reliability.
The S-Disc design consists of a standard Neldsic triple eccentric disc valve equipped with a flow-balancing trim. The trim has been located on the downstream side of the valve body. The ingenious idea of this design is to transfer fluid forces out of the disc to the body. Figures 2 and 3 illustrate the flow treatments with a concentric-type conventional butterfly valve compared to the S-Disc-design.



The S-Disc design offers stable flow control and reduced dynamic torque, noise level and vibrations. The dynamic behaviour of the valve is very smooth and stable, which means less load on the shaft bearings, less required torque, smaller actuators and more economical control unit total costs. All of the excellent features of the standard Neldsic are available.
The most standard Neldsic can be easily modified to the S-Disc design, just by changing the flange ring.

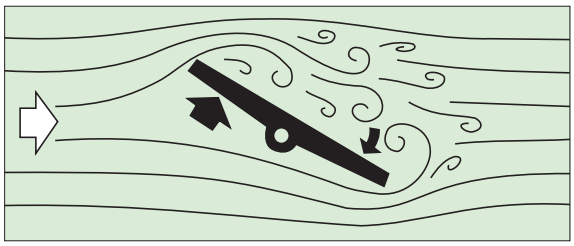


Fig. 2 Conventional concentric-type valve flow treatment.

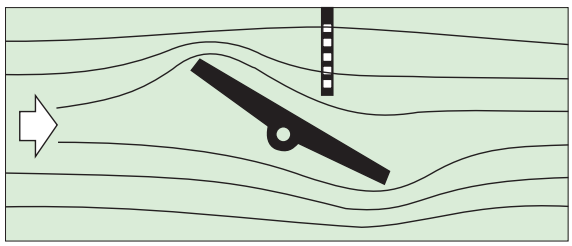


Fig. 3 S-Disc flow treatment.

Sizing coefficients

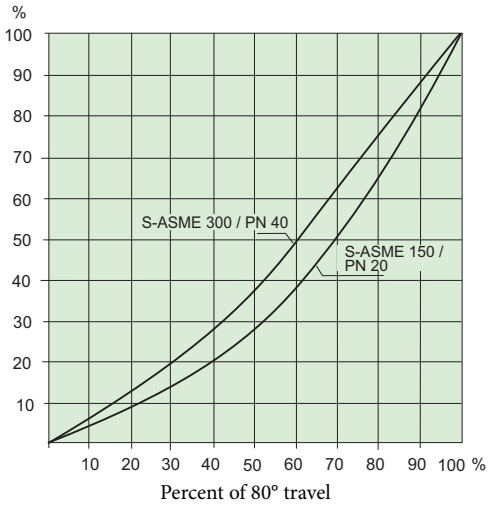


Fig. 4 The graph of the relative C_V behavior of S-Disc triple eccentric disc valve.

The flow-balancing trim is designed so that the inherent flow characteristic is optimal, providing excellent controllability and accuracy while installed in the pipeline (figure 4).

Table 1. Max C_V at max dynamic torque. For L6 take account the disc reduction, see bulletin 2L621.

Valve size		ASME 150 / PN 20	ASME 300 / PN 40	ASME 600 / PN 100
mm	inch	C_V max	C_V max	C_V max
80	3	210	210	–
100	4	310	310	–
125	5	520	–	–
150	6	790	680	322
200	8	1470	1160	488
250	10	2580	2130	978
300	12	3500	3480	1650
350	14	4500	5200	2205
400	16	5670	4750	3130
450	18	7670	5900	3940
500	20	9180	7840	5340
600	24	13500	9290	6470
700	28	12700	19100	9370
750	30	17800	19300	9370
800	32	20900	–	13200
900	36	23100	27400	13180
1000	40	30000	–	20180

SIZING

For larger sizes, consult factory.
Sizing of the S-Disc control valve is based on the ANSI/ISA S-75.01 standard.
We recommend use of the Nelprof™ sizing and selection software available from Neles subsidiaries.

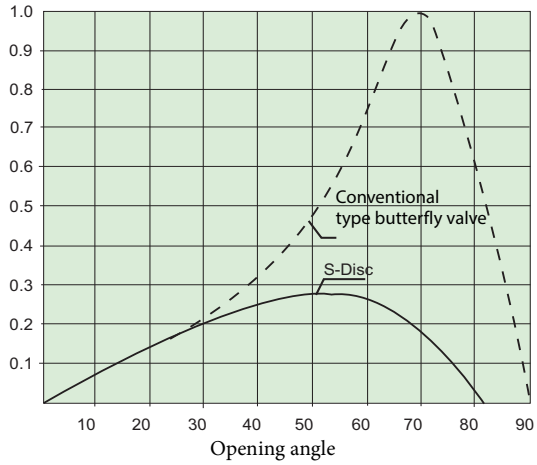


Fig. 5 The comparison of the torque requirements of conventional and S-Disc equipped triple eccentric disc valve.

The S-Disc gives a very smooth and low dynamic torque, obtaining excellent flow and control stability (figure 5).

Table 2. Flow coefficients in control service at different openings.

Percent of opening	C_V/C_V max			F_L	Z	X_T
	ASME 150 / PN 20	ASME 300 / PN 40	ASME 600 / PN 100			
10	0.040	0.061	0.061	0.86	0.49	0.57
20	0.086	0.126	0.124	0.86	0.44	0.57
30	0.140	0.202	0.200	0.86	0.41	0.57
40	0.208	0.292	0.291	0.86	0.37	0.57
50	0.295	0.405	0.401	0.85	0.34	0.57
60	0.401	0.531	0.528	0.84	0.30	0.55
70	0.538	0.667	0.662	0.83	0.27	0.50
80	0.688	0.788	0.781	0.78	0.24	0.42
90	0.872	0.899	0.891	0.73	0.22	0.36
100	1.000	1.000	1.000	0.63	0.19	0.29

ENGINEERING DIMENSIONS

The engineering dimensions type coding and sizing of the actuators have been presented in following bulletins:
2 LW 20, 2 L1 21, 2 L6 21.
The complete valve code should have a prefix S- for S-Disc control valves (e.g. S-LW 8 BA 10 …).

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