

NELES® HIGH PERFORMANCE TRIPLE ECCENTRIC DISC VALVE, METAL SEATED, NELDISC® WITH FLOW BALANCING TRIM

FEATURES

- Excellent flow and control performance.
- Wide temperature range from -200 to +600 °C / -330 to +1110 °F.
- Reduced dynamic torque and noise.
- Mechanical and flow dynamic stability allows higher pressure drop service than a conventional disc.
- ASME 150 / PN20 and ASME 300 / PN 40.
- Sizes DN 80... 1500 / 3" ... 60".

NELDISC TRIPLE ECCENTRIC SEATING PRINCIPLE

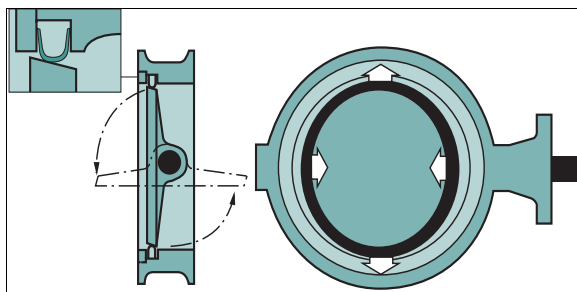


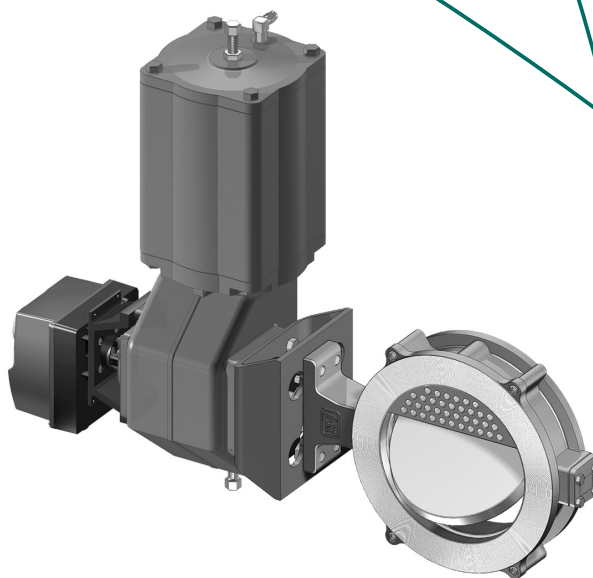
Figure 1. The principle of a seat ring construction.

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 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 NELDISC® 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 NELDISC are available.

The most standard NELDISC can be easily modified to the S-DISC design, just by changing the flange ring.

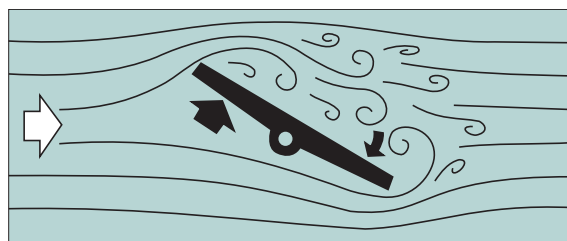


Figure 2. Conventional concentric-type valve flow treatment.

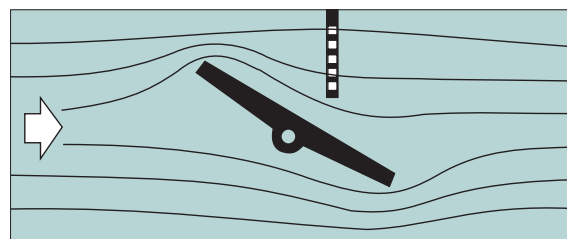


Figure 3. S-DISC flow treatment.

SIZING COEFFICIENTS

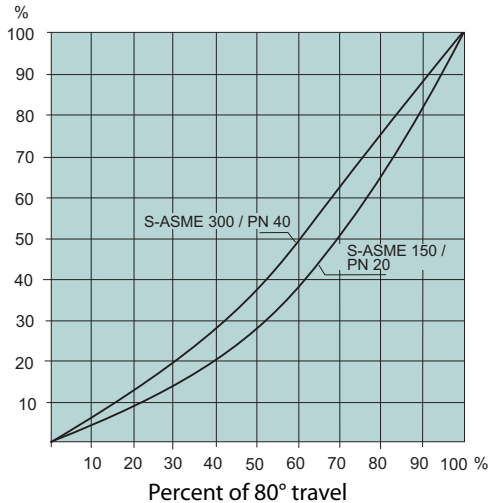


Figure 4. The Graph of the relative C_v behavior of S-DISC triple eccentric disc valve.

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 and Max Δp at max dynamic torque. For L6 take account the disc reduction, see bulletin 2L621.

Valve size		ASME 150 / PN 20		ASME 300 / PN 40	
mm	inch	C_v max	Δp max (bar)	C_v max	Δp max (bar)
80	3	150	13.4	150	13.4
100	4	265	17.0	265	17.0
125	5	490	9.0	-	-
150	6	790	5.2	640	11.5
200	8	1610	4.7	1100	13.2
250	10	2580	3.3	1640	15.5
300	12	3880	3.7	2630	9.8
350	14	5610	2.8	3870	8.7
400	16	7300	3.7	3870	8.7
450	18	9330	2.8	6300	9.2
500	20	11600	2.8	7500	12.0
600	24	16500	3.7	9400	8.7
700	28	20800	4.3		
800	32	28500	3.5		
900	36	35100	3.5		
1000	40	43800	4.0		

SIZING

Sizing of the S-DISC control valve is based on the ANSI/ISA S-75.01 standard.

We recommend use of the NELPROF® Selection Program available from Metso subsidiaries.

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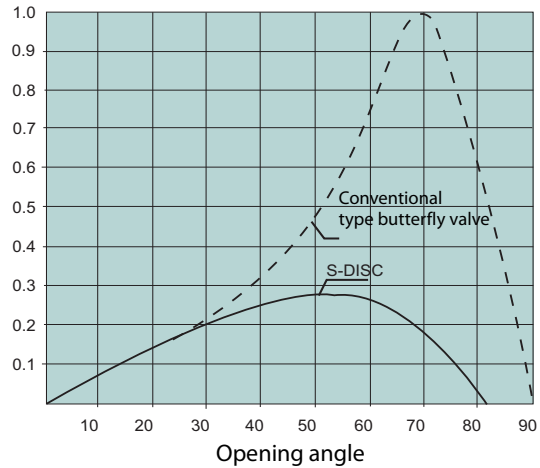


Figure 5. The comparison of the torque requirements of conventional and S-DISC equipped triple eccentric disc valve.

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	ASME 150 / PN 20 C_v/C_v max	ASME 300 / PN 40 C_v/C_v max	F_L	Z	X_T
10	0.021	0.030	0.86	0.49	0.57
20	0.090	0.124	0.86	0.44	0.57
30	0.142	0.196	0.86	0.41	0.57
40	0.207	0.279	0.86	0.37	0.57
50	0.286	0.377	0.85	0.34	0.57
60	0.386	0.498	0.84	0.30	0.55
70	0.502	0.627	0.83	0.27	0.50
80	0.651	0.764	0.78	0.24	0.42
90	0.810	0.886	0.73	0.22	0.36
100	1.000	1.000	0.63	0.19	0.29

Δp max = max. differential pressure across a fully open valve allowed by its mechanical strength at room temperature. Max. opening angle is 80°.

ENGINEERING DIMENSIONS

The engineering dimensions type coding and sizing of the actuators have been presented in Metso bulletins 2 LW 20, 2 L1 21, 2 L6 21, 2 L9B 20.

The complete valve code should have a prefix S- for S-DISC control valves (e.g. S-LW 8 BA 10 ...).

Subject to change without prior notice.

