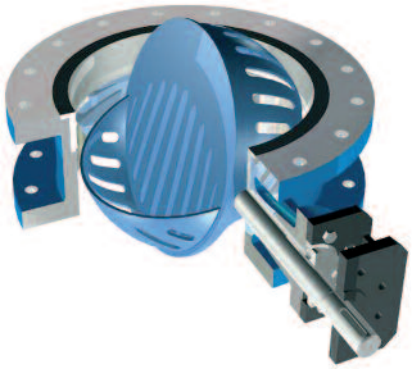
K-LO high-performance Rotary Control Valves



K-LO rotary control valves have been especially designed to meet the usual cavitation problems of processes when hot liquids and not negligible pressure drops facilitate the development of cavitation. These special valves are deriving from the double eccentric DYNA-LOK series by modifying the basic disc design with particular baffles, integral or welded-in on both the disc sides, which increase the recovery factor of valve as well as its cavitation index grows. These baffles are wing-shaped and machined with many rectangular windows providing a moderate pressure drop so to not greatly affect the Cv of the valve with the plain disc. The distribution of the windows takes into account the presence of the sealing ring fitted into the body, with particular care to the area close to the shaft axis. Due to particular disc baffled design, max valve openings greater than the usual 90° are allowed to achieve higher Cv values. As for DYNA-LOK valves, the off-set design reduces the torque tending to close the valve. In addition, the cam effect caused by second shaft eccentricity improves the seal ring life.

Technical characteristics:

Body:

- **Sizes:** from DN 250 up to DN 2000
- **Ratings:** up to ANSI 300, PN 40, up to DN 600 included, ANSI 150, PN16 for greater sizes.
- Flanged design (cast or fabricated construction depending on the size and material selection)
- Face-to-face dimensions as per EN558, ISO 5752, basic series 13
- **Materials:** all carbon and stainless steel grades, duplex and copper alloys

Disc:

- **Double eccentric** design when tightness in closed position is requested
- Two disc designs are available: drilled wings for low noise services and multi-windows wings for anticavitating service
- Full-bore swing-through contruction with single off-set disc when no sealing device is requested in closed position
- Both sides flow directions. Best leakage performance is assured by flow on flat disc side
- **Opening up to 100°**
- High $\mathbf{x_{FZ}}$ cavitation index values
- **Flow characteristic:** increasing gain up to approx. 50° opening, linear from 50° to max travel
- **Materials:** same as the body

Shaft:

- **Constructions:** one and two pieces depending on sizes
- **Connection** to the disc: by pins protected by screws
- **External sealing:** single stuffing box actuator side
- **Packing materials:** teflon or graphite seal rings
- **Materials:** stainless steels, 17-4-PH, XM19

Bearings:

- **Radial bearings:** Teflon-based compounds embedded in SS bushing. The oversizing of these bearings (tot. length = 3,5 x Φ) allows a smooth rotation and a long maintenance-free valve life allow a smooth rotation and a long maintenance-free valve life
- **Axial bearings:** axial thrusts are held by a couple of anti-friction washers

Seat Ring:

- Two designs are available to fulfil different temperature conditions:
  - **spring-energized Teflon ring** for temperatures up to 200°C
  - **SS ring** for higher temperatures

  Both seal rings are locked inside the body by means of an easily removable spacer

Leakage Class:

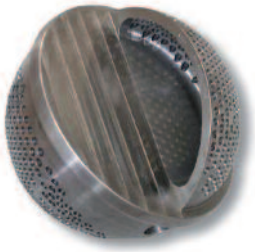
- **Teflon seal ring** assembly is consistent with class V (IEC 60534-4) for sizes up to 20".
  For higher dimensions IVS1 class or better depending on actuator
- For **metal SS** type **IVS1 class** is allowed for all sizes

Actuators:

- **Valvitalia DRA pneumatic diaphragm** actuator for valve sizes up to 16"
- **Valvitalia PRA piston types** actuators with low friction scotch-yoke mechanism for higher valve sizes
- Pneumatic **rack and pinion** both single and **double acting** for sizes up 24" included
- **Electric** and **hydraulic** actuators available on request

Cavitation and noise control

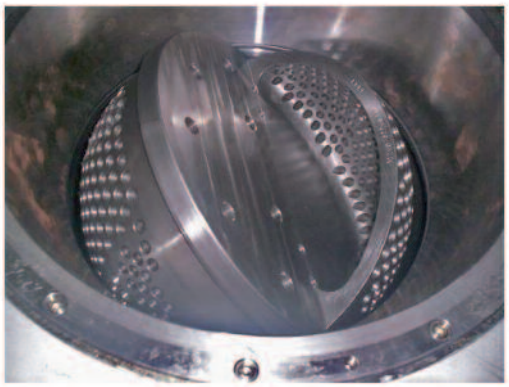
Multi windows wings



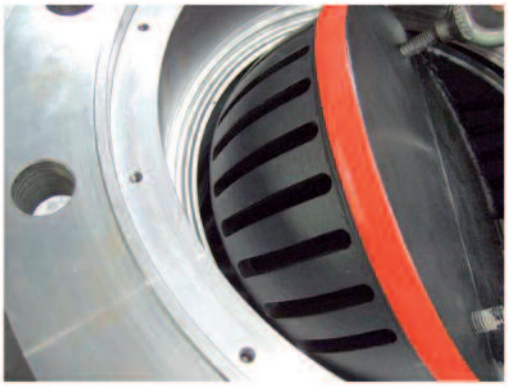
These special trim executions are machined, depending on wings size, from a solid cast or forged block. The design of K-LO disc is very effective against potential cavitating conditions due to its high x_{FZ} values, which are close to 0,4 at 70° opening approximately for all the dimensions. This allows to avoid cavitation under critical conditions, such as, for example: p_1 = 15 bar, p_2 = 10 bar and max vapour pressure = 2,5 bar (water at 125°C). Flow coefficients are slightly affected by the anti-cavitation large windows of the wings, while allowed disc opening is limited to the region where recovery factor is higher.

Drilled wings

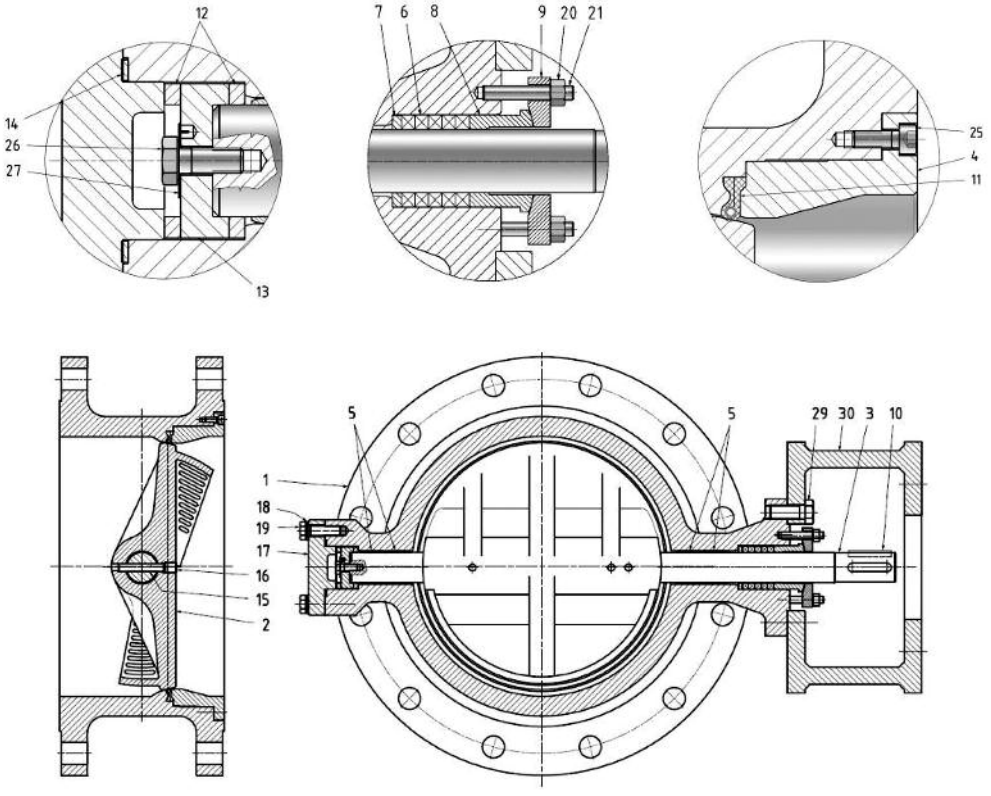
Special drilled wings allow K-LO control valve to reduce noise. This peculiar trim pattern combines high efficiency in reducing noise with an excellent modulating performance.



Low-noise disc design



Anti-cavitation disc design



Pos.	Part Name
1	BODY
2	VANE
3	SHAFT
4	LOCKING RING
5	RADIAL BEARING
6	PACKING RING
7	PACKING WASHER
8	PACKING FOLLOWER
9	PACKING FLANGE
10	KEY
11	SEALING RING
12	THRUST BEARING
13	SPACER
14	GASKET
15	PIN
16	DOWEL
17	COVER
18	WASHER
19	SCREW
20	NUT
21	STUD
25	SCREW
26	SCREW
27	WASHER
29	SCREW
30	ACTUATOR YOKE