

Series 72 - Rotary Plug Valve Type 72.3

Double eccentric control valve for process engineering and industrial applications.

Valve Size	DN 25 to 600	NPS 1 to 24
Pressure Rating	PN 10 to 40	Class 150 and 300
Temperature Range	-196 to +500 °C	-321 to +932 °F



Valve body made of

- Cast steel
- Cast stainless steel
- Special alloys (Duplex, Hastelloy etc.)
- Other special materials on request

Seat version

- Metal sealing, armored or unarmored
- Soft sealing
- Standard seat factors 1 / 0.6 / 0.4 / 0.25

Versions

Flanged version

- DN 25 to 250, PN 10 to 40, face-to-face dimensions acc. to EN 558, Table 2, Series 1
- DN 300 to 600, PN 10 to 40, face-to-face dimensions acc. to EN 558, Table 2, Series 15
- NPS 1 to 10, Class 150, CL 300, face-to-face dimensions acc. to EN 558, Table 2, Series 37/38
- NPS 12 to 24, Class 150, CL 300, face-to-face dimensions acc. to EN 558, Table 2, Series 15

Further versions

- With temperature extension (IT2) for cryogenic service, fig. 5
- With high and low temperature extension (IT1), fig. 6
- Double stuffing box (DSB), fig. 7
- Heating jacket, fig. 9
- Cleaning connections, fig. 8
- TA-Luft packing
- Special materials for body and trim
- Noise-reducing features
- Flange version with tongue/groove, male face/female face according to EN 1092-1
- RF and RTJ according to ANSI B16.5

The valves can be equipped with different accessories, such as positioners, solenoid valves and other accessories according to DIN EN 60534-6-1 and VDI/VDE 3845.

Configuration samples



Fig. 1: Type 72.3/AT

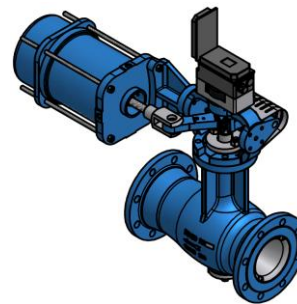


Fig. 2: Type 72.3/R



Fig. 3: Type 72.3/MD



Fig. 4: Type 72.3/MZ

Special designs



Fig 5: 72.3-IT2



Fig 6: 72.3-IT 1



Fig. 7: 72.3-DSB

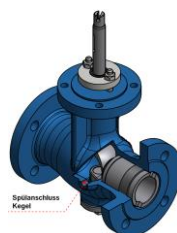


Fig 8: 72.3- Cleaning connections



Fig. 9: 72.3-Heating jacket

Principle of operation

The shaft/plug arrangement is eccentric (Fig. 3 and 4). The double-eccentric design of the rotary plug valve is achieved in combination with the offset of the plug's pivot.

When turning the plug shaft from closed position in opening direction, the double-eccentric design allows the plug to lift smoothly off the seat without any friction, eliminating any breakaway torque.

This smooth opening also allows for stable control, even at small opening angles.

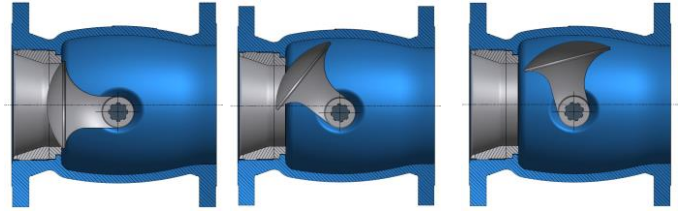


Fig. 3 Plug movement with Double-Eccentric Arrangement

Fail-safe Action

In combination with the Type R/M/AT/S actuators, the control valve has two fail-safe actions, which become effective when the piston is relieved of pressure or when the supply air fails.

Fail Close - the rotary plug valve will close upon loss of supply air

Fail Open - the rotary plug valve will open upon loss of supply air

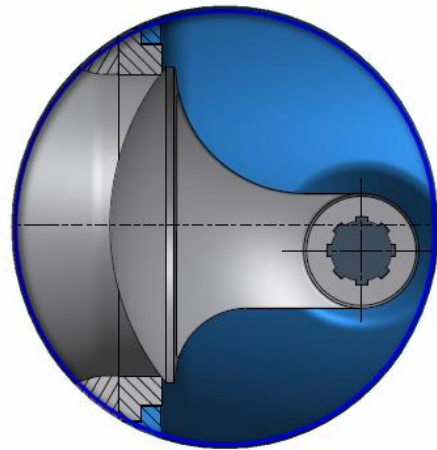


Fig. 4 Double-Eccentric Principle

Flow Direction

The rotary plug valve may be used in either flow direction, depending on the medium, operating conditions, and shut-off and flow requirements of the valve (fig.5):

Flow to close = FTC

Flow to open = FTO

For gases and vapors, the direction of flow is FTC.

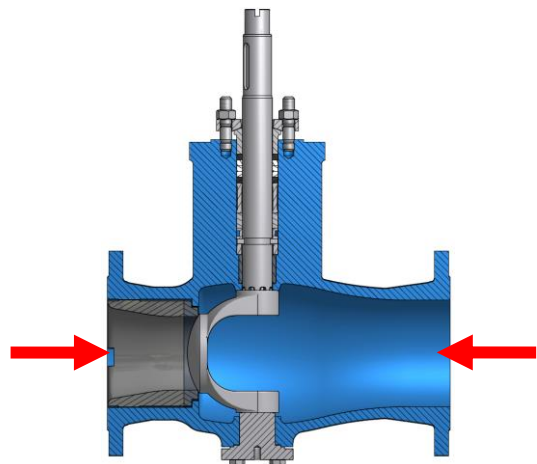


Fig 5. Flow Direction

Installation

An arrow on the valve indicates the direction of flow the valve has been configured for (fig.6).

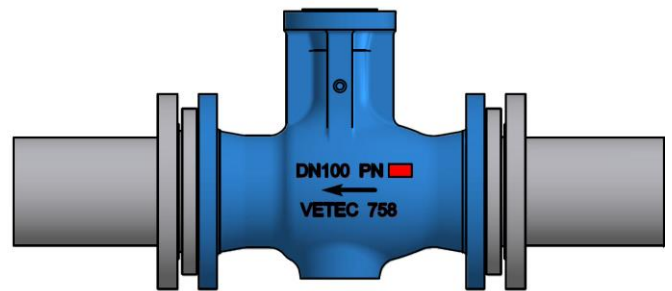


Fig. 6: Installation into the Pipeline

Flow Characteristic

The flow coefficient (Kvs/Cv) depends on the opening angle of the valve.

Using positioners or cam disks, the natural characteristic of the rotary plug valve can be modified to achieve a linear or equal-percentage characteristic (Fig. 6 and 7).

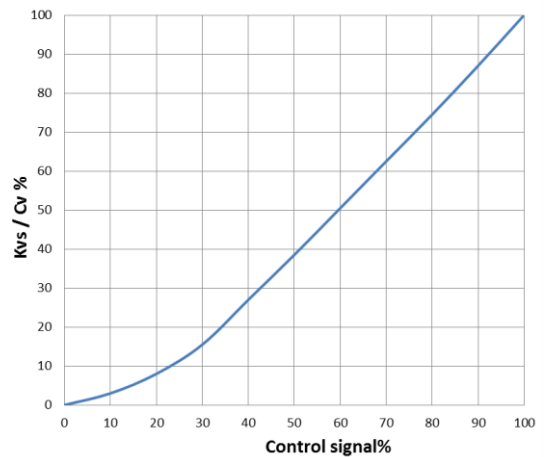


Fig. 7 Inherent Characteristic

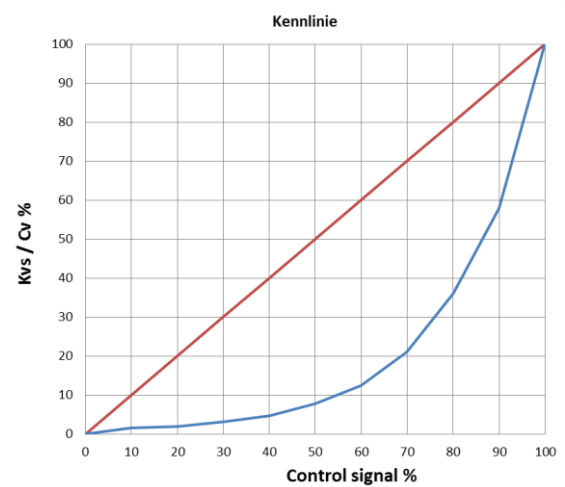


Fig. 8 Equal-percentage and linear Characteristic

Table 1. Technical Data

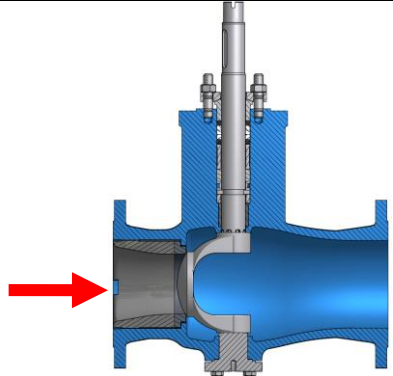
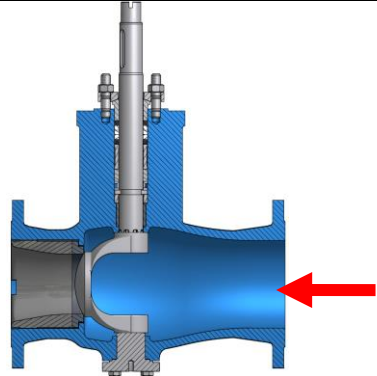
Type	72.3			
Valve size	DN 25 to 600		NPS 1 to 24	
Style	Flange		Flange	
Flange pressure rating	PN 10 / 16 / 25 / 40		CL 150 / CL 300	
Max. operating pressure	40 bar		50 bar	
Overall length	DN 25 to 250	DN 300 to 600	NPS 1 to 10	NPS 12 to 24
	EN 558, Table 2, Series 1	EN 558, Table 2, Series 15	EN 558, Table 2, Series 37/38	558, Table 2, Series 15
Flange bore/form	DIN EN 1092 B1		ASME B16.5	
Flow direction	 <p>Direction of flow from the front: FTO</p>		 <p>Direction of flow from behind: FTC</p>	
Characteristic	equal percentage / linear characteristic (by means of positioner)			
Rangeability	up to 200:1			
Temperature range of the process medium	-196°C to +500 °C (-321 °F bis +932 °F)			
Opening angle	75°			
Plug movement	Closes counterclockwise			
Leakage class acc. to DIN EN 60534-4	Standard - metal seat		Optional - soft seat	
	IV		VI	

Table 2. Standard Materials

Body	1.0619/ (-10... +400 °C)	A216 WCC -29... +400 °C	1.4408/A351 CF8M (-196... +500 °C)
Plug	R30006 (Stellite® 6); 1.4408 (stellite)		
Shaft	1.4542 (17-4PH®) -29... +315 °C	1.4404 and 1.4980 -196... +500 °C	
Trunnion bearing	1.4404 (stellite); 1.4408 (stellite)		
Seat ring	1.4404 (stellite); 1.4408 (stellite)		
Seat holder	1.4404; 1.4408		
Packing	PTFE/Graphite -29... +280 °C	Graphite, Aramid -196... +500 °C	
O-ring	FPM 80		
Seal	ss/Graphite		

Other materials on request.

Table 3. Kvs and Cvs Coefficients

3a. Seat with Metal Sealing - FTO

DN	25	40	50	80	100	150	200	250	300	400	500	600
NPS	1	1 ½	2	3	4	6	8	10	12	16	20	24

Flow rate

100%	Kvs	16	36	70	220	360	720	1100	1950	2700	4700	6700	9700
	Cv	18	42	81	254	416	832	1272	2254	3121	5434	7746	11214
	Seat Ø mm	18	26	36	60	76	105	135	170	210	290	350	420
60%	Kvs	12	22	43	145	210	430	630	1230	1500	2700	3800	5800
	Cv	14	25	50	168	243	497	728	1422	1734	3121	4393	6705
	Seat Ø mm	16	21,5	29,5	50	60	86	106	146	163	225	271	330
40%	Kvs	10	16	31	105	150	275	390	850	900	1600	2300	3900
	Cv	12	18	36	121	173	318	451	983	1040	1850	2659	4509
	Seat Ø mm	14	18,5	25,5	44	53	73	88	126	133	184	221	275
25%	Kvs	4	12	19	70	100	185	245	500	640	1100	1250	2400
	Cv	4,6	14	22	81	116	214	283	578	740	1272	1445	2775
	Seat Ø mm	10	16	21	37	45	62	73	102	116	160	175	225

3b. Seat with Metal Sealing - FTC

DN	25	40	50	80	100	150	200	250	300	400	500	600
NPS	1	1 ½	2	3	4	6	8	10	12	16	20	24

Flow rate

100%	Kvs	16	36	70	210	340	660	810	1300	2100	3400	4800	7680
	Cv	18	42	81	243	393	763	936	1503	2428	3931	5549	8879
	Seat Ø mm	18	26	36	60	76	105	135	170	210	290	350	420
60%	Kvs	12	22	43	135	200	320	410	820	900	1800	2700	4030
	Cv	14	25	50	156	231	370	474	948	1040	2081	3121	4659
	Seat Ø mm	16	21,5	29,5	50	60	86	106	146	163	225	271	330
40%	Kvs	10	16	31	95	120	185	250	540	570	1120	1600	2530
	Cv	12	18	36	110	139	214	289	624	659	1295	1850	2925
	Seat Ø mm	14	18,5	25,5	44	53	73	88	126	133	184	221	275
25%	Kvs	4	12	19	56	90	125	160	320	410	860	870	1410
	Cv	4,6	14	22	65	104	145	185	370	474	994	1006	1630
	Seat Ø mm	10	16	21	37	45	62	73	102	116	160	175	225

3c. Seat with Soft Sealing - FTC

DN	25	40	50	80	100	150	200	250	300	400	500	600
NPS	1	1 ½	2	3	4	6	8	10	12	16	20	24

Flow rate

Flow rate	Kvs	12	36	68	180	290	535	730	1220	2000	2700	4800	7680
	Cv	14	42	79	208	335	618	844	1410	2312	3121	5549	8879
Seat Ø mm	16	26	35	54	70	98	128	160	204	270	350	420	
60%	Kvs	11	22	43	135	200	320	410	820	900	1800	2700	4030
	Cv	13	25	50	156	231	370	474	948	1040	2081	3121	4659
	Seat Ø mm	15	21,5	29,5	50	60	86	106	146	163	225	271	330
40%	Kvs	10	16	31	105	120	185	250	540	570	1120	1600	2530
	Cv	12	18	36	121	139	214	289	624	659	1295	1850	2925
	Seat Ø mm	14	18,5	25,5	46	53	73	88	126	133	184	221	275
25%	Kvs	4	12	19	56	90	125	160	320	410	860	870	1410
	Cv	4,6	14	22	65	104	145	185	370	474	994	1006	1630
	Seat Ø mm	10	16	21	37	45	62	73	102	116	160	175	225

Table 4. Weight kg (without Actuator)

DN	25	40	50	80	100	150	200	250	300	400	500	600
NPS	1	1 ½	2	3	4	6	8	10	12	16	20	24
Weight kg	8	15	20	40	50	100	160	220	250	450	850	1500

Table 5. DIN Face-to-Face Dimensions

	DN	25	40	50	80	100	150	200	250	300	400	500	600
PN 10	Length mm	160	200	230	310	350	480	600	730	500	600	700	800
PN 16													
PN 25													
PN 40													

Table 6. ANSI Face-to-Face Dimensions, Series 37

	NPS	1	1 ½	2	3	4	6	8	10	12	16	20	24
CL 150	Length mm	184	222	254	298	352	451	543	673	500	600	700	800

Table 7. ANSI Face-to-Face Dimensions, Series 38

	NPS	1	1 ½	2	3	4	6	8	10	12	16	20	24
CL 300	Length mm	197	235	267	317	368	473	568	708	500	600	700	800

Order specifications:

Type	According to table
Valve size	DN / NPS
Nominal pressure	PN / CL
Body material	According to table
Seat version	Metal or soft sealing
Characteristic	Equal percentage / linear
Kvs/Cv	According to table
Direction of flow	FTO (medium opens) FTC (medium closes)
Actuator	Type
Type of mounting	Mounting location of actuator
Fail-safe action	when supply air fails Fail-close (FC) Fail-open (FO)
Max. differential pressure for actuator	... bar
Supply air	... bar
Bench range	... bar
Accessories	e.g. positioners, limit switches, solenoid valve etc.
Others	e.g. special version, certificates, approvals, documentation etc.

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