

PENDULUM CONTROL VALVE, SERIES 65.0

Downstream pressure control and isolation valve for SEMI and FPD processes.
Optimal for corrosive etching and cleaning processes.



Blank aluminum

Hard anodized aluminum

Virtually particle-free and shock-free operation

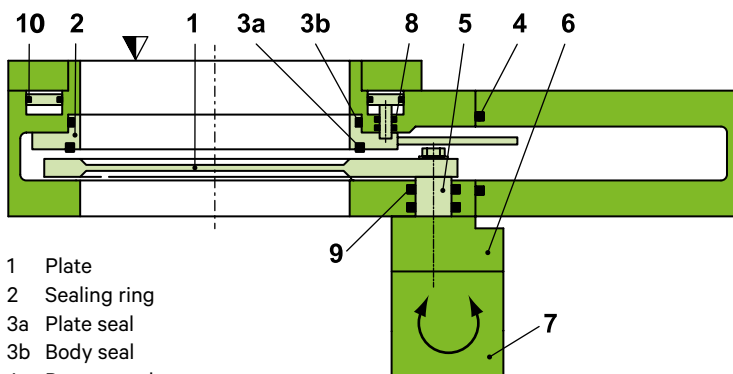
Excellent pressure control performance

Service port to connect a computer or a service box

MAIN FEATURES

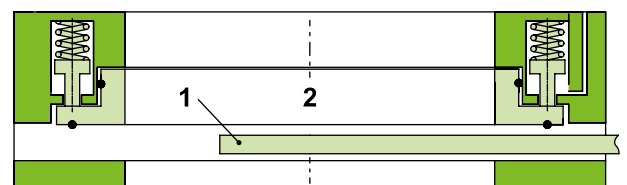
Sizes	DN 100 – 400 mm (4" – 16")
Actuator	integrated pressure controller with stepper motor
Body material	blank or hard anodized aluminum
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, JIS

FUNCTIONAL PRINCIPLE

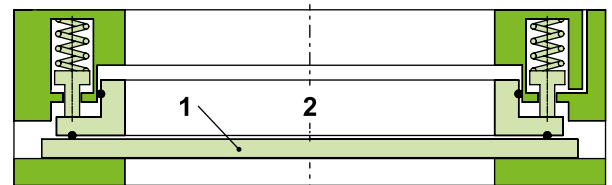


- 1 Plate
- 2 Sealing ring
- 3a Plate seal
- 3b Body seal
- 4 Bonnet seal
- 5 Actuator shaft
- 6 Actuator
- 7 Controller
- 8 Shaft feedthrough seal
- 9 Rotary feedthrough seal
- 10 Piston ring seal
- ▽ Valve seat side

Pressure control



Isolation



The plate acts as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing in the glossary, chapter «Pressure closed-loop control». Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control.

For leaktight closing the sealing ring is pressed downwards by a spring. For opening the sealing ring is lifted pneumatically.

COMPARISON SERIES 65.0 / 65.1

FEATURES	SERIES 65.0	SERIES 65.1
Control range	standard	extended
Minimum controllable conductance	standard	minimized
Pressure rise time (up to setpoint)	standard	reduced
Vibration	very low	very low

TECHNICAL DATA

Leak rate ¹⁾	Valve body: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾	Valve seat: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾	Blank aluminum Hard anodized aluminum	1·10 ⁻⁸ mbar to 1.2 bar (abs) 1·10 ⁻⁶ mbar to 1.2 bar (abs)
Cycles until first service ²⁾	Pressure control Closing / opening	1 million 200 000
Temperature ²⁾	Valve body Controller	≤ 120 °C max. 50 °C (≤ 35 °C recommended)
Material	Valve body, plate Sealing ring Other parts	EN AW-6082 (3.2315) EN AW-6082 (3.2315), AISI 305 (1.4303) AISI 420C (1.3541), AISI 631 (1.4568) AISI 316L (1.4404, 1.4435), AISI 440 (1.4122), AISI 301 (1.4310), AISI 316 Ti (1.4571), AISI 304 (1.4301)
Seal	Bonnet, plate, body, feedthrough	FKM (Viton®)
Feedthrough	Actuator Sealing ring	rotary feedthrough shaft feedthrough
Mounting position	DN 100 – 250 DN 320 – 400	any ³⁾ horizontal only ³⁾

DN (nominal I.D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Max. differential pressure during operation	Compressed air min. – max. overpressure		Operating time for throttling	Typical closing / opening time open → closed	Typical closing / opening time closed → open	Weight	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	mbar	bar	psi	s	s	s	kg	lbs
100	4	1700	3	1200	30	4 – 7	58 – 102	0.70	3	4	12	27
160	6	5 000	5	1200	10	4 – 7	58 – 102	0.80	3	4	18	40
200	8	12 000	10	1200	5	4 – 7	58 – 102	0.90	3	4	22	49
250	10	22 000	15	1200	5	4 – 7	58 – 102	0.90	3	4	29	64
320	12	30 000	22	1200	5	4 – 7	58 – 102	1.10	5	6	48	106
350	14	43 000	25	1200	5	4 – 7	58 – 102	1.30	5	6	59	130
400	16	61 000	30	1200	5	4 – 7	58 – 102	1.50	5	6	68	150

¹⁾ Unheated on delivery.

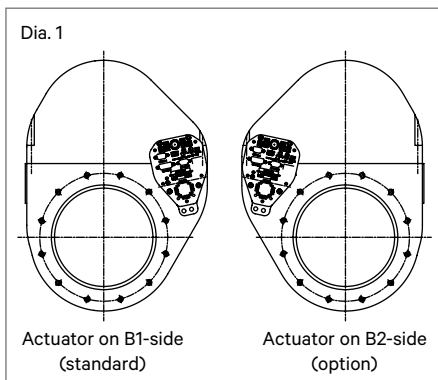
²⁾ Maximum values: depending on operating conditions and sealing materials.

³⁾ Valve seat on chamber side recommended.

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

Certain options are not available for some nominal diameters or cannot be combined. Moreover, options can affect the general technical data.



ACTUATOR

- Actuator on B2-side (Dia. 1)
- Special control algorithms (adaptive, fix PID, upstream, soft-pump)

VALVE

- Other sizes, e. g. DN 80
- Other flanges, e. g. ASA-LP
- Customer specified flanges, e. g. rectangular flange for direct mounting to chamber
- Surface treatment, e. g. nickel-plated
- Other sealing materials
- KF ports in body
- Heater with insulation (Pic. 2) for valve temperatures up to 120 °C
- Valve with external pressure controller (Pic. 3)
- Valve for pressure control only (no leaktight closing)
- Wedge-shaped plate for smaller controllable conductances
 - DN 320: 16 ls⁻¹ (standard 22 ls⁻¹)
 - DN 350: 19 ls⁻¹ (standard 25 ls⁻¹)
 - DN 400: 22 ls⁻¹ (standard 30 ls⁻¹)

Pic. 2



Pic. 3



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 32

ORDERING INFORMATION FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers											
mm	inch	blank aluminum				hard anodized aluminum							
		ISO-F		JIS		ISO-F		JIS					
100	4	65040-PA	x	y	65040-JA	x	y	65040-PH	x	y	65040-JH	x	y
160	6	65044-PA	x	y	65044-JA	x	y	65044-PH	x	y	65044-JH	x	y
200	8	65046-PA	x	y	65046-JA	x	y	65046-PH	x	y	65046-JH	x	y
250	10	65048-PA	x	y	65048-JA	x	y	65048-PH	x	y	65048-JH	x	y
320	12	65050-PA	x	y	65050-JA	x	y	65050-PH	x	y	65050-JH	x	y
350	14	-			65051-JA	x	y	-			65051-JH	x	y
400	16	65052-PA	x	y	65052-JA	x	y	65052-PH	x	y	65052-JH	x	y

Controller configurations:	x		y		Interface	Number of sensors				
	G = basic version	A = with SPS	H = with PFO	C = with SPS and PFO			T = basic version with VC master	V = with SPS and VC master	U = with PFO and VC master	W = with SPS, PFO and VC master
					H = RS232	2			V = RS232 + analog output	1
					W = RS232 + analog output	2			C = Logic (analog / digital)	1
					E = Logic (analog / digital)	2			P = DeviceNet®	1
					D = Profibus	1			Q = DeviceNet®	2
					F = Profibus	2			D = Profibus	1
					J = RS485	1			F = Profibus	2
					K = RS485	2			J = RS485	1
					Y = Ethernet	1			K = RS485	2
					Z = Ethernet	2			Y = Ethernet	1
					L = CC-Link	1			Z = Ethernet	2
					N = CC-Link	2			L = CC-Link	1
					I = EtherCAT	1			N = CC-Link	2
					X = EtherCAT	2			I = EtherCAT	1
					S = VC slave (without interface)				X = EtherCAT	2

Example: 65040-PAGG
= aluminum valve with ISO-F DN 100 flanges, RS232 interface, for 1 sensor

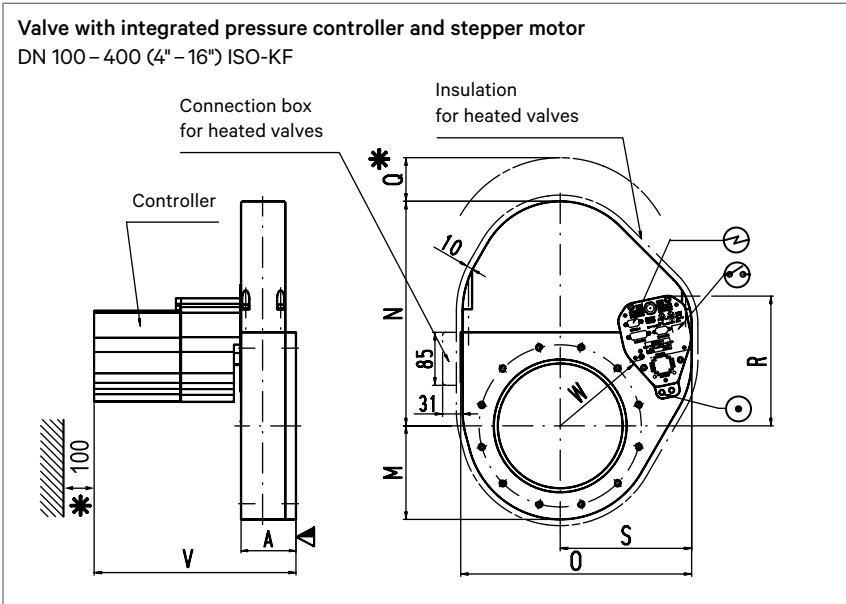
Pressure controller: see pages 184 – 189

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
Example: 65046-PAGH-X, X = valve with heater for 120 °C

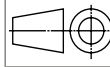


MAIN DIMENSIONS



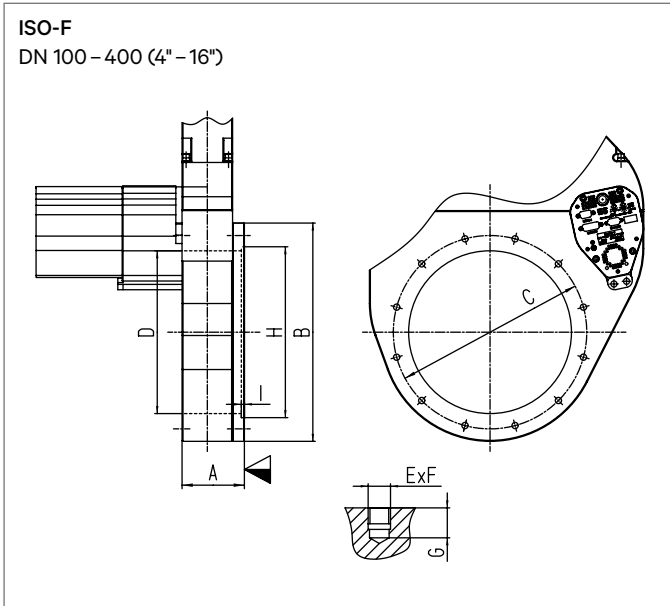
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊗ Position indicator

Projection E

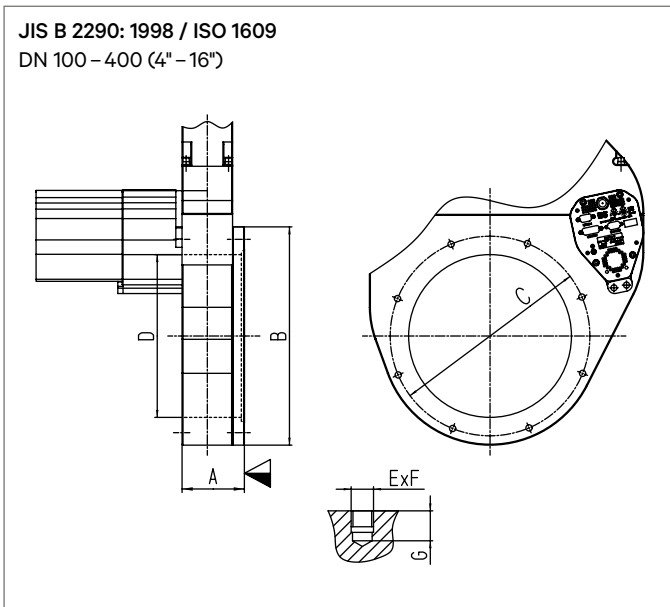


DN	mm inch	100 4	160 6	200 8	250 10	320 12	350 14	400 16
A	mm inch	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04
M	mm inch	95 3.74	121.50 4.78	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24
N	mm inch	200 7.87	302 11.88	360 14.17	438 17.24	538 21.18	590 23.23	655 25.79
O	mm inch	260.90 10.27	321 12.64	370.15 14.57	442.70 17.43	536.40 21.12	582 22.91	633 24.92
Q	mm inch	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97
R	mm inch	176 6.93	192 7.56	208.50 8.21	233.50 9.19	277 10.91	290 11.42	313 12.32
S	mm inch	162.90 6.41	184.70 7.27	210.80 8.30	246.40 9.70	276 10.86	300 11.81	320 12.60
V	mm inch	309 12.17	326 12.83	326 12.83	331 13.03	357 14.06	363 14.29	360 14.17
W	mm inch	94 3.70	122 4.80	152 5.98	195 7.68	236 9.29	258 10.16	292 11.50

FLANGE DIMENSIONS



DN	mm	100	160	200	250	320	400
	inch	4	6	8	10	12	16
A	mm	70	88	88	100	120	128
	inch	2.76	3.46	3.46	3.94	4.72	5.04
B	mm	190	243	300	350	425	520
	inch	7.48	9.57	11.81	13.78	16.73	20.47
C	mm	145	200	260	310	395	480
	inch	5.71	7.87	10.24	12.20	15.55	18.90
D	mm	100	150	200	261	318	400
	inch	3.94	5.91	7.87	10.28	12.52	15.75
E × F		8 × M8	8 × M10	12 × M10	12 × M10	12 × M12	16 × M12
G	mm	12	14	15	16	18	20
	inch	0.47	0.55	0.59	0.63	0.71	0.79
H	mm	-	153	213.20	-	-	-
	inch	-	6.02	8.39	-	-	-
I	mm	-	5	5	-	-	-
	inch	-	0.20	0.20	-	-	-



DN	mm	100	150	200	250	300	350	400
	inch	4	6	8	10	12	14	16
A	mm	70	88	88	100	120	126	128
	inch	2.76	3.46	3.46	3.94	4.72	4.96	5.04
B	mm	190	243	300	350	425	470	520
	inch	7.48	9.57	11.81	13.78	16.73	18.50	20.47
C	mm	160	210	270	320	370	420	480
	inch	6.30	8.27	10.63	12.60	14.57	16.54	18.90
D	mm	100	150	200	261	318	350	400
	inch	3.94	5.91	7.87	10.28	12.52	13.78	15.75
E × F		8 × M10	8 × M10	8 × M12	12 × M12	12 × M12	12 × M12	12 × M16
G	mm	12	14	15	16	18	18	25
	inch	0.47	0.55	0.59	0.63	0.71	0.71	0.98

▼ Valve seat side

Projection E

