



KQL
ISO 9001 / ISO 14001

GERMAN
ENGINEERING

● Energy

● Environment

● Design



PRODUCT CATALOG



SAMYANG ARCA CO., LTD.
JOINT VENTURE COMPANY

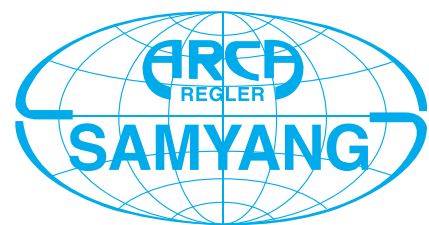
About⁺ **SAMYANG-ARCA** **GERMAN ENGINEERING**

Samyang-Arca co.,Ltd. was established in 1987 through a technology alliance and a joint investment with Germany'ARCA-Regler GmbH, a professional control valve company with a tradition of 100 years.

More than 90 years of technology and know-how,
Plant Company

SAMYANG ARCA CO., LTD.

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Message from the CEO

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SAMYANG-ARCA History

The start of the business

- 1987
 - Establishment of Samyang-ARCA Co.,Ltd. through joint investment between German ARCA-Regler GmbH and Samyang Comprehensive Valve Co.,Ltd.
- 1992
 - New construction of the office of Samyang-ARCA Co.,Ltd.
- 1995
 - Chosen as a company having a domestic superior technology in the field of control by KEPCO
- 1996
 - Chosen as an eligible manufacturer for nuclear power generation facility
- 1997
 - ISO 9001 certification acquired (Korea Foundation for Quality)
- 1998
 - Registration as a supplier of nuclear power generation item (KEPCO : R CLASS)
 - Registration as a supplier of hydroelectric & thermal electric power generation item (KEPCO)
- 1999
 - Contract accomplishment for general service control valve of Uljin nuclear power generation unit 5&6 with KEPCO (T, R CLASS)
- 2000
 - Renewal of registration as a supplier of nuclear power generation item (KEPCO : T, R CLASS)
 - Renewal of registration as a supplier of nuclear power generation item (KEPCO : R CLASS)
 - Periodical renewal of ISO 9001 quality system (Korean Foundation for Quality)
- 2001
 - Supply of general service control valve to Uljin nuclear power generation unit 5&6
 - Localization completion of Korean-German joint steam converting valve and shipment for Korean-Chinese Umm Al Nar project

Develop technology

- 2002
 - Award of the minister of Ministry of Trade, Industry & Energy according to the contribution for development of national industry and increase of export
 - Registration as a supplier of Korea Hydro & Nuclear Power item
 - Renewal of ISO 9001 quality system (BVQI)
- 2003
 - Registration as a supplier of nuclear power generation item (Korea Western Power, Korea South-East Power : R CLASS)
- 2004
 - Registration as a supplier of hydroelectric & thermal electric power generation item (Korea Southern Power : R CLASS)
 - Registration as a supplier of nuclear power generation, hydroelectric & thermal electric power generation item (Korea Middle Power, Korea East-West Power : R CLASS)
- 2005
 - Acquisition of ISO 9001 quality management system certificate (Korean Standards Association)
- 2006
 - Acquisition of ISO 14001 environmental management system certificate (Crebiz QM)
- 2008
 - Acquisition of SABIC CTRL vendor register certificate (Saudi Basic Industries Corp.)
- 2009
 - Periodical renewal of ISO 9001 quality system (Korean Standards Association)
 - Renewal of registration as a supplier of nuclear power generation item (Korea Middle Power, Korea Western Power : R CLASS)
- 2010
 - Acquisition of SEC CTRL vendor register certificate (Saudi Electricity Company)

New challenges

- 2011
 - Renewal of registration as a supplier of nuclear power generation item (Korea Hydro & Nuclear Power : T CLASS)
 - Renewal of registration as a supplier of nuclear power generation, hydroelectric & thermal electric power generation item (Korea South-East Power, Korea East-West Power : R CLASS)
- 2013
 - Periodical renewal of ISO 9001, ISO 14001 (Korean Standards Association)
 - Renewal of registration as a supplier of nuclear power generation item (Korea Western Power : R CLASS)
- 2014
 - Renewal of registration as a supplier of the power generation item (The five generation : Korea Southern Power, Korea Western Power, Korea Middle Power, Korea East-West Power, Korea South-East Power)
- 2016
 - Periodical renewal of ISO 9001, ISO 14001(Korean Standards Association)
- 2017
 - Certified tRegistration as a supplier of Nuclear Power Generation
- 2018
 - Certified Changeover as 2015's edition of ISO 9001 & 14001 from KQL(Korea Quality Leader)
- 2019
 - Joint Research and Development Task(Korea Energy Research Institute)

SAMYANG-ARCA Certificate



KHNP
(KOREA HYDRO &
NUCLEAR POWER CO.,LTD)



Korean Five Power
Companies



ISO-9001



ISO-14001



SEC
(Saudi Electricity Company)



SABIC
(Saudi Arabia Basic
Industries Corporation)

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General Specifications
Dimensions

Actuator

811 Actuator

General Specifications
Dimensions

813 Actuator

General Specifications
Dimensions

SAMYANG ARCA

SYA's Control valve

is a robust, compact and lightweight control valve with a pneumatically operated, easy field reversible multi-spring diaphragm actuator 811, 813 and a sturdy, pipeless and vibration-resistant mounted digital positioner. Optional, the actuator can be equipped with a fully enclosed emergency handwheel which is in compliance with general safety precautions. The high-light of this valve series is the ARCA-double-life (quick-changeable trim combination) with the option of a double-side use by reversing the seat ring (4). Because of its simple geometry the valve seat can be economically produced in different materials like for example steel, hardened and stellited steel, alloy steel, Hastelloy, etc., with or without soft sealing. In comparison to conventional designs the speciality of the valve's soft sealing is, that the PTFE-element is flexibly supported by an additional Elastomer O-Ring. Both sealing elements are located in the seat ring and not as usual in the valve plug. The additional metal-to-metal sealing of plug and seat ring ensures that the PTFE-disc suitable for doubleside use is not plastically deformed by excessive loads.

The remarkable difference between the common screwed-in seat ring and this unique quick-change(able) trim combination shown in the figures hereinafter is given by the principle of retaining and sealing the seat ring in the valve body. With a screwed-in seat ring the sealing between seat and valve body is provided by the metal-to-metal contact of two conical faces,



The conical counter-face in the valve body has a slightly different angle so that there is only a theoretical circumferential line contact. The required torque to screw-in the seat ring is individually different depending on the construction and the operating conditions. With the SYA valve series the seat sealing is done purely axial and achieved by the method of initial compression. The required torque to screw-in the seat ring is individually different depending on the construction and the operating conditions. With the SYA valve series the seat sealing is done purely axial and achieved by the method of initial compression.

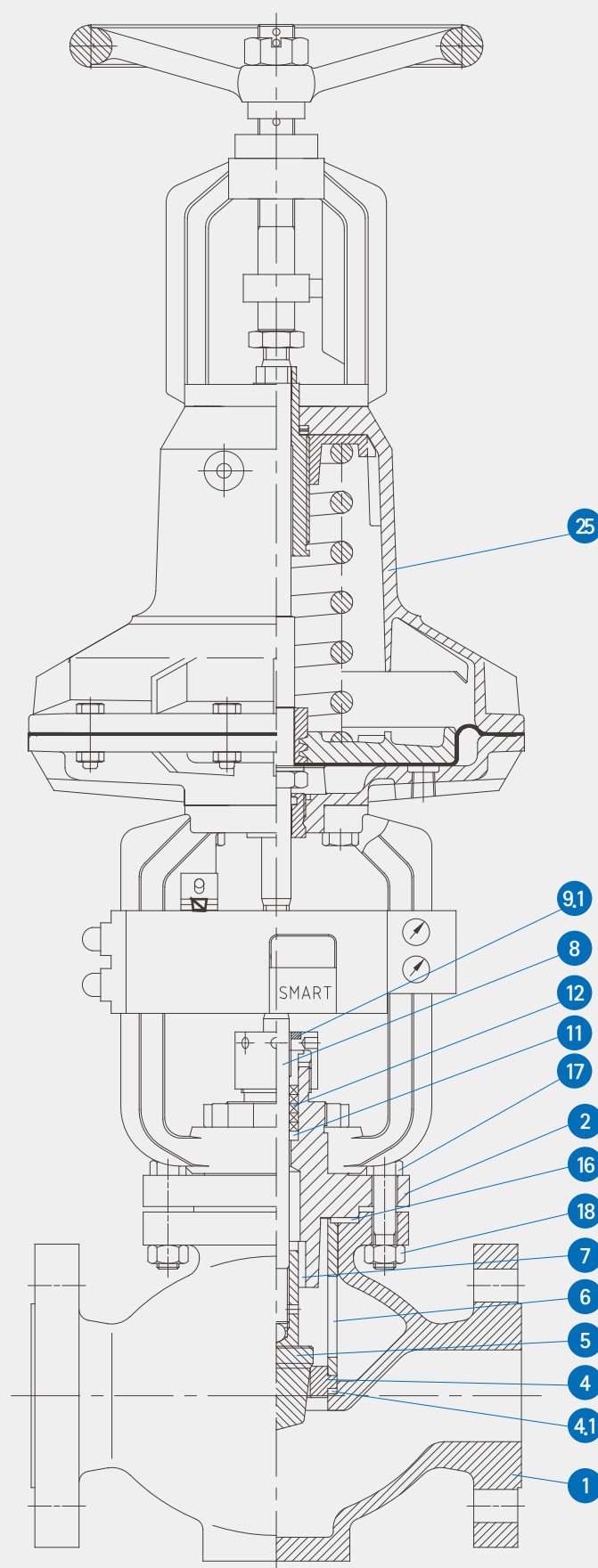
The compression of the sealing elements (4,1, 16) is limited by the precisely sized recess in the body for containment of the flat gasket. This limits the gasket's compressive loading and guarantees a perfect alignment between the sealing surfaces of plug and seat ring.

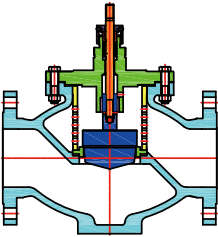
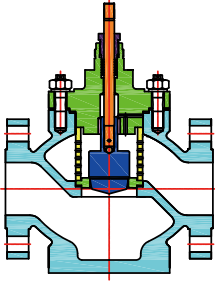
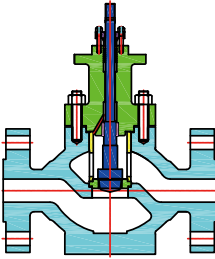
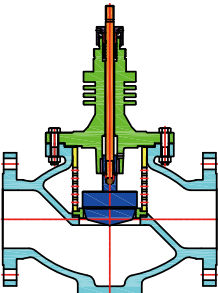
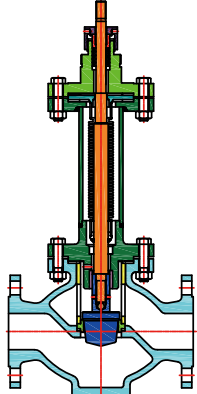
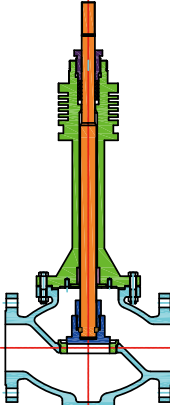
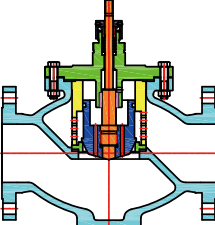
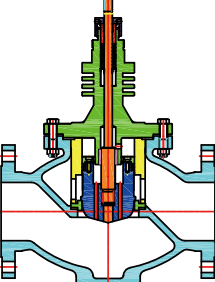
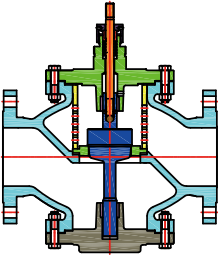
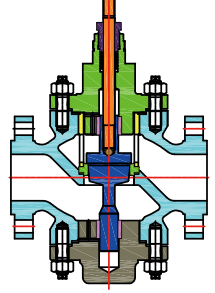
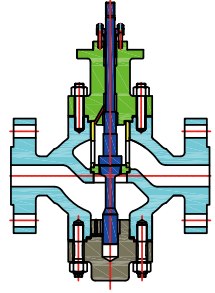
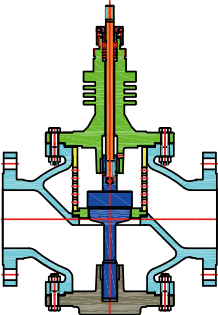
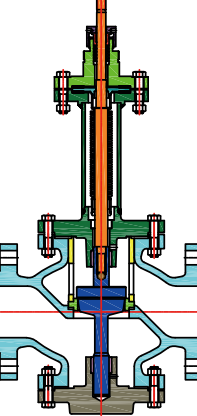
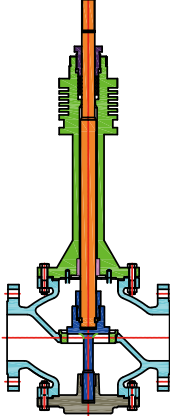
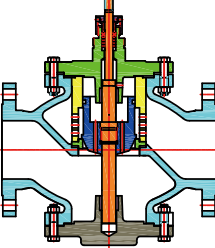
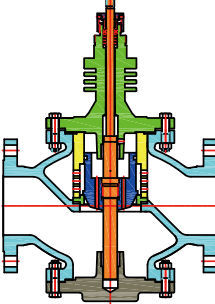
The self-aligning seat ring (4) is hold by the retaining cage (6). The tightness is achieved by transferring a portion of the bonnet-to-body bolting force via the retaining cage to the seat ring. The valve body (1), retaining cage, and seat ring are manufactured on special CNC-machining centers to meet the stringent tolerance of each part. This guarantees the required compression of the sealing elements. Excellent stem guiding is performed by two special guide bushings (7, 11) located as far as possible from each other.

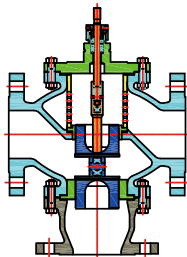
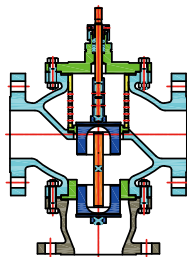
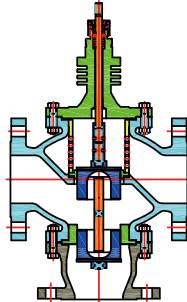
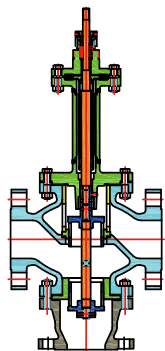
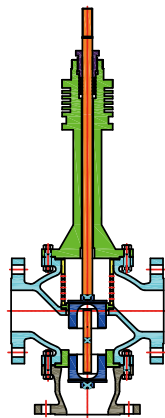
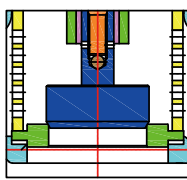
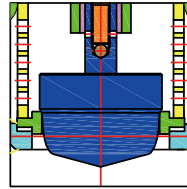
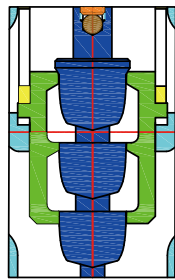
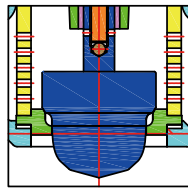
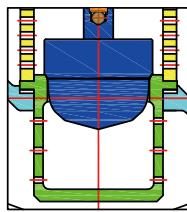
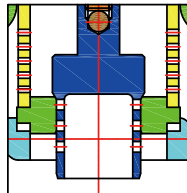
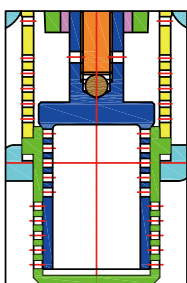
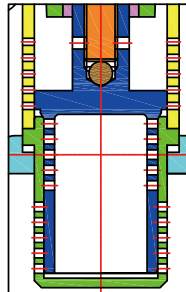
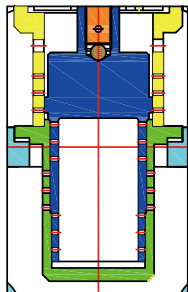
“New” is also the standard spring energized stem seal configuration including a PTFE packing set (12) with an additional micro-sealing element and wiper ring (9.1). The PTFE packing set is preloaded by a stainless steel spring and pressed against the valve stem and the bonnet insert (2). The packing set acts as primary sealing and as wiper. The valve stem is guided at two locations right before and behind the stem sealing (12). Besides of the extremely reliable sealing performance even under varying operating temperatures the stem sealing provides minimised static and sliding friction forces in comparison to conventional stuffing box packing.

Cost Saving Benefits

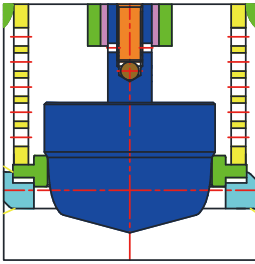
- excellent performance in liquid and gas applications
- extended lifetime due to double-side use by reversing the seat ring (4; upper and lower side)
- easy and fast assembly, maintenance without any special tools
- low cost performance ratio
- prevention of leakage (12) and bypass leakage by a limited compressive load acting on both encapsulated gaskets (4,1, 16)
- multiple material options
- optimal flow conditions by seat retaining cage (6)
- optional: PTFE-soft seat sealing with back-up O-Ring and metal-to-metal end stop



101Q	2WAY - VALVE (3FLANGE)		111Q	121Q
	Valve size	DN15~DN350		
	Pressure ranges	DN16~PN400		
	Material (Body)	Cast steel A216WCB Alloy steel A217WC6, WC9 Stainless steel A351CF3M, CF8M		
	Trim Material	A276-410, 420, 316 A564-630		
PN16~PN40	Special Material on request		PN63~PN160	PN250~PN400
103Q	104Q	105	107Q	108Q
				
Cooling Fin	Bellows Seal	Insulating Column	Balanced	Balanced + Cooling
141Q	2WAY - VALVE (4FLANGE)		161Q	171Q
	Valve size	DN25~DN500		
	Pressure ranges	DN16~PN400		
	Material (Body)	Cast steel A216WCB Alloy steel A217WC6, WC9 Stainless steel A351CF8M		
	Trim Material	A276-420, 316 A564-630		
Peforated plug. Single-step metallic sealing	Special Material on request		PN63~PN160	PN250~PN400
143Q	144Q	145	147Q	148Q
				
Cooling Fin	Bellows Seal	Insulating Column	Balanced	Balanced + Cooling

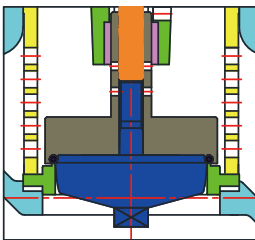
201Q - M	201Q - T	3WAY - VALVE		203Q
		Valve size	DN25~DN500	
		Pressure ranges	DN16~PN400	
		Material (Body)	Cast steel A216WCB Alloy steel A217WC6, WC9 Stainless steel A351CF3M, CF8M	
		Trim Material	A276-410, 420, 316 A564-630	
Mixing	Dividing	Special Material on request		Cooling Fin
204Q	205Q			
				
Bellows Seal	Insulating Column			
ON-OFF	P1	P3	Pabl	P1 LK
				
... - QUICK	... - P1	... - P3	... - Pabl	... - P1 LK
L1	L2	L3	L4	
				
... - L1	... - L2	... - L3	... - L4	

Trim Detail



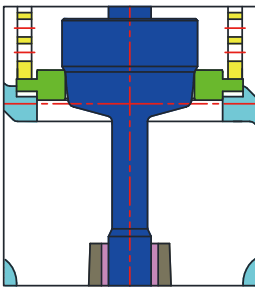
Parabolic Plug(Standard)

Metal-seated quick-changeable trim combination.
Insensitive to impurities with low cavitation design.
Fast and easy to produce due to its rotational symmetry.



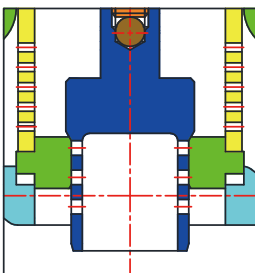
Parabolic Plug with soft sealing

Soft-seated quick-changeable trim combination The PTFE-soft sealing (for unrestricted use on both sides) is flexibly supported by an additional Elastomer O-Ring. The additional metal-to-metal sealing of plug and seat ring ensures that the PTFE-disc is not plastically deformed by excessive loads when the plug reaches its final closed position.



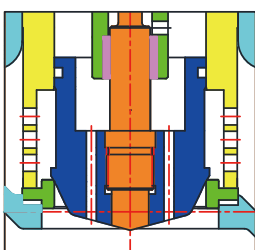
Parabolic Plug double guided

Metal-seated quick-changeable trim combination with top and bottom guiding. This double guiding construction stabilises stem and plug over the full travel range. Therefore, it is recommended for high pressure drop applications. The additional guiding is located right below the seat ring and can be easily replaced. Most conventional body designs with top and bottom guided trim have a bolted bottom flange which requires an extra body gasket plus the risk of additional external leakage. one-piece body design eliminates this problem and ensures optimum tightness.



Perforated Plug/Perforated Low Noise Cage

Metal-seated quick-changeable trim combination. Particular effective for liquids and compressible fluids at high pressure drop ratios. Liquid flow can cause erosion by cavitation. The flow, directed through the holes of the trim, is divided into numerous jets of cavitating liquid. In the centre of the cage the jets impact and the vapour bubbles collapse. Here, they do not center any damage to the valve internals and the noise level is also considerably reduced. For more noise abatement a perforated low noise cage is available for all trim designs.



Balance Trim

Valves with balanced trims require much lower control forces than valves without balancing. As sealing elements we offer

- Quad Ring
- metallic piston rings
- Er-seal
- pure graphite

Kv Calculation

Liquids

Incompressible media

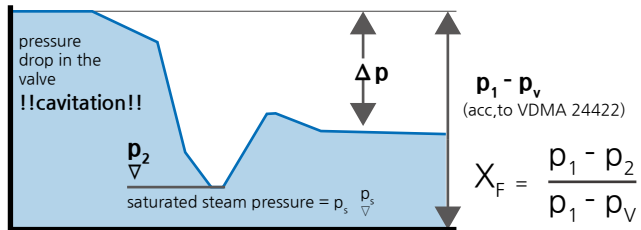
Calculation formulas

$$K_v = \frac{Q}{31,6} \sqrt{\frac{\rho_1}{\Delta p}} \quad [m^3/h]$$

$$\text{resp. } K_v = \frac{G}{31,6} \sqrt{\frac{1}{\rho_1 \Delta p}} \quad [m^3/h]$$

For water

°C	0	30	50	100	120	130	130	140	150
Bar abs.	0.006	0.042	0.123	1.01	1.985	2.7	2.7	3.6	4.76



Water steam

Incompressible media

bar p abs.	to °C								
	150	200	250	300	350	400	450	500	550
1	1.9	2.2	2.4	2.6	2.9	3.1	3.3	3.6	3.8
2	0.96	1.1	1.2	1.3	1.4	1.5	1.6	1.8	1.9
4	0.47	0.5	0.6	0.65	0.7	0.77	0.8	0.89	0.95
10		0.2	0.23	0.26	0.28	0.31	0.33	0.35	0.38
16			0.14	0.16	0.175	0.119	0.205	0.22	0.235
25			0.087	0.099	0.11	0.12	0.13	0.14	0.15
40	Water steam			0.059	0.066	0.073	0.08	0.086	0.093
64	v" (m³/kg)			0.033	0.039	0.044	0.049	0.053	0.057
100					0.022	0.026	0.03	0.033	0.035

Calculation formulas

If $\Delta p < 0,5 p_1$
 $p_2 > 0,5 p_1$
 = subcritical pressure drop

$$\text{is } K_v = \frac{G}{31,6} \sqrt{\frac{V_2}{\Delta p}} \quad [m^3/h]$$

If $\Delta p < 0,5 p_1$ noise
 $\Delta p_2 > 0,5 p_1$ problems!
 = overcritical pressure drop

$$\text{is } K_v = \frac{G}{31,6} \sqrt{\frac{V}{0,5 p_1}} \quad [m^3/h]$$

Medium	Temp. °C	Velocity of sound M (m/s)
steam super-heated	150	504
	200	532
	250	560
	275	573
	300	586
	400	635
	500	680

Liquids

Incompressible media

Calculation formulas

If $\Delta p < 0,5 p_1$
 $p_2 > 0,5 p_1$
 = subcritical pressure drop

$$\text{is } K_v = \frac{G}{514} \sqrt{\frac{T_1}{\rho_1 \Delta p p_2}} \quad [m^3/h]$$

$$\text{resp. } K_v = \frac{Q_n}{514} \sqrt{\frac{\rho_n T_1}{\rho_1 \Delta p p_2}} \quad [m^3/h]$$

If $\Delta p > 0,5 p_1$ noise
 $p_2 < 0,5 p_1$ problems!
 = overcritical pressure drop

$$\text{is } K_v = \frac{G}{257 \cdot p_1} \sqrt{\frac{T_1}{\rho_n}} \quad [m^3/h]$$

$$\text{resp. } K_v = \frac{Q_n}{257 \cdot p_1} \sqrt{\frac{T_1}{\rho_n}} \quad [m^3/h]$$

Medium	Temp. °C	Velocity of sound M (m/s)
air	20	343
CO2	20	278
Amonia	20	430
Methane	20	445
N2	20	350
O2	20	326
H2	20	1300
Helium	20	1000

Key

$Q(m^3/h) \rightarrow p_1 \rightarrow p_2(\text{bar abs.})$

$Q_n(Nm^3/h) \Delta p(\text{bar})$

$G(\text{kg/h})$

$Q_1(\text{kg/m}^3)$

Standard $Q_n(\text{kg/Nm}^3)$

Density

$V(m^3/kg)$ at $0,5 p_1$ and t_1

$V_2(\text{kg/m}^3)$

$T_1 \approx 273 + t_1(\text{kelvin})$

$t_1(°C)$

Code numbering system

Code No.	Valve type	PN	Code No.	Bonnet flange design (--X)
10-	Single seat, valve 3flange top guided	10-40	1	Standard design
11-	Single seat, valve 3flange top guided	63-160	2	Double stuffing box with sealing connection
12-	Single seat, valve 3flange top guided	250	3	With cooling fins
14-	Single seat, valve 4flange	320-400	4	With bellows sealing and safety stuffing box
	top and bottom guided	10-40	5	With insulating column
160-	Single seat, valve 4flange		7	Pressure balance type
	top and bottom guided	63-160	8	Pressure balanced type with cooling fins
17-	Single seat, valve		9	Special design
	special design	250	0	Basic design
20-	Three-way valve			
22-	Three-way valve	10-40		
23-	Three-way valve	63-160	Code No.	Actuator
		250	811	Universal diaphragm actuator
25-	Double seat, valve		813	Multi-spring actuator
28-	Double seat, valve	10-40	PDH	Piston actuator
		63-160		
A10-	Angle valve		Code No.	Trim (---XX)
A11-	Angle valve	16-40	P1-P5	Parabolic plug (1-5step)
A12-	Angle valve	63-160	L1-L4	Perforated plug (1-4step)
		250	QUICK	On/off plug
			LK 1-4	Low-noise cage (1-4fold)
Code No.	Valve type	PN	SLK	Seat low-noise cage (1fold)
590N	Steam desuperheater TEMPRA N	40-400	LS 1-4	Low-noise disc (1-4fold)
595	Steam desuperheater mini-type	40-400		
596	Nozzle head		Code No.	Trim (...Q-XX)
597	Steam supported dual nozzle-F		Q	Quick change trim
598	Steam supported dual nozzle-A			
600	Diaphragm valve (Saunders)	10		
620	Diaphragm valve (Dürholdt)	10		
650	Butterfly valve ARCADISC®	10-40		
720	Butterfly valve sandwich	10		
750	Butterfly valve sandwich/flange	10-40		
760	Butterfly valve double/electric tight	10-40		
770	Butterfly valve sandwich/resilient liner	10-16		
780	Butterfly valve sandwich/PTFE-liner	10-16		

Special design = forged-, welding design / CWI - cooling water injection

Examples

Type 104Q-P1	Single seat, Valve with bellows sealing and safety stuffing box, parabolic plug 1step
Type 128Q-L1-LK2	Single seat, Valve PN 250, 3-flange-body, pressure balanced type with cooling fins, perforated plug 1step, low-noise cage 2fold
Type 141Q-P1	Single seat, Valve, top and bottom guided, PN 10-40, 3-flange-body-parabolic plug 1step

BODY



100Q/140Q

General Specifications
Dimensions

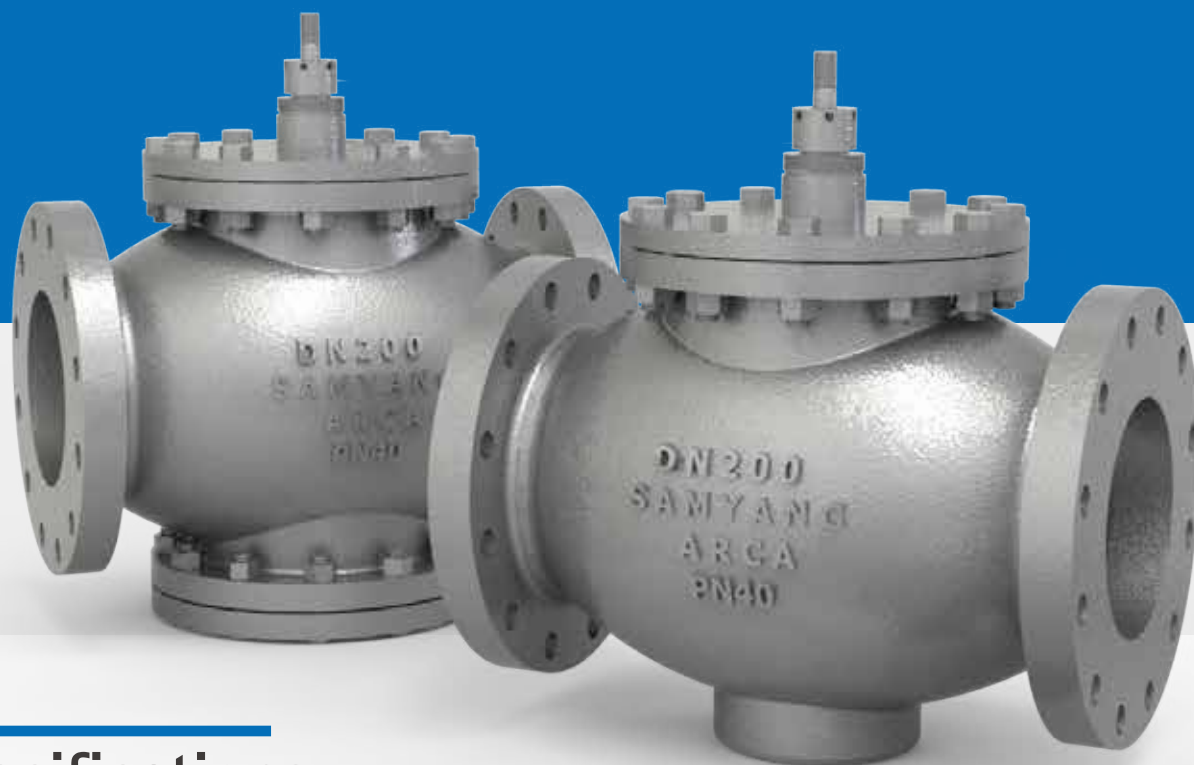
110Q/160Q

General Specifications
Dimensions

120Q/170Q

General Specifications
Dimensions

100Q/140Q



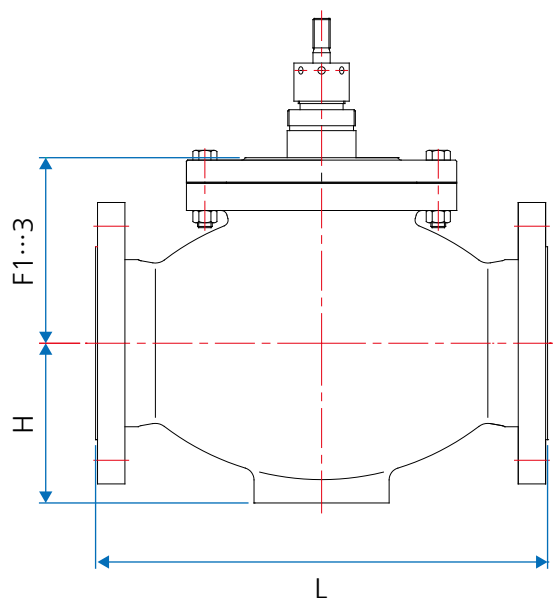
Specifications

General Specifications

Series	100Q/140Q			
DN	15-500 / 1/2"-20"			
PN/ANSI class	16-40 / Class 150-300			
Body Material	Designation	Body / Top Flange	Bolt / Nut	For Temperatures
	C-Si	A216 WCB	A193-B7 / A194-2H	-29℃ to 425℃
	C-Mn-Si	A216 WCC		-50℃ to 345℃
		A352 LCC		
	18Cr-8Ni	A351 CF3	A193-B8 / A194-8	-196℃ to 400℃
		A351 CF8		
	16Cr-12Ni-2Mo	A351 CF3M		
		A351 CF8M		
Trim Material	316SS, 410SS, 420SS, 440SS, Etc.			
Plug Characteristic	Standard : Equal Percentage, Linear, Quick opening			
	Optional : Modified Linear			
Rangeability	40:1			
Double Guide	Optional : Intergrated bottom guide for DN25-DN500			
Seat Leakage	Metal sealing : Leakage rate class IV; Optional leakage rate class V			
	Soft sealing : Leakage rate class VI			
Bellows Seal	Double walled, made of 316			
	(for ANSI 150-900, other rated pressures available on request)			

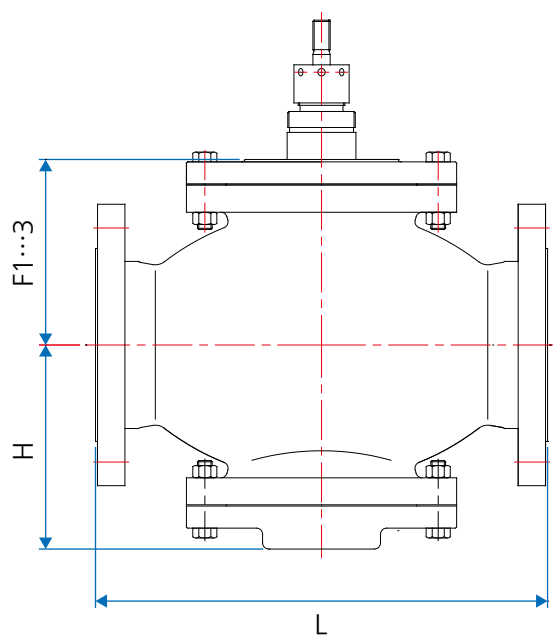
Dimensions

External Dimensions SERIES 100



Desc DN	JIS 10K	JIS 20K	150, 300#	H	F1	F3
	150#	300#	SW, BW		STD	COOL
15	130	130	130	50	70	165
20	150	150	150	55	75	170
25	184	197	197	60	85	180
32	180	180	180	75	95	190
40	222	235	235	85	100	195
50	254	267	267	90	120	220
65	276	292	292	110	140	240
80	298	318	318	120	145	245
100	352	368	368	135	155	255
125	400	400	400	150	180	310
150	451	473	473	180	210	340
200	543	568	568	240	250	380

External Dimensions SERIES 140



Desc DN	JIS 10K	150#	JIS 20K	300#	WELD	H	F1	F3
	RF	RF	RF	RF	SW, BW		STD	COOL
25	160	160	160	160	160	85	85	180
32	180	180	180	180	180	95	95	190
40	200	200	205	205	205	100	100	195
50	230	230	234	234	234	140	120	220
65	290	276	292	292	292	150	140	240
80	310	298	318	318	318	155	145	245
100	350	352	368	368	368	160	155	255
125	400	400	400	400	400	185	180	310
150	480	451	473	473	473	215	210	340
200	600	600	600	600	600	260	245	380
250	730	730	740	740	740	330	320	450
300	850	850	860	860	860	390	380	510
350	980	-	980	980	980	455	440	560
400	-	-	-	-	1150	460	450	570
500	-	1370	-	1370	1370	500	574	-

110Q/160Q



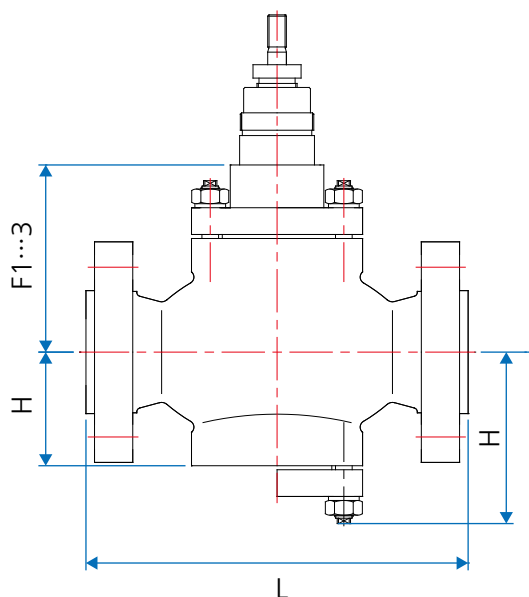
Specifications

General Specifications

Series	110Q/160Q			
DN	25-300 / 1"-12"			
PN/ANSI class	63-150 / Class 600-900			
Body Material	Designation	Body / Top Flange	Bolt / Nut	For Temperatures
	C-Si	A216 WCB	A193-B7 / A194-2H	-29℃ to 425℃
	C-Mn-Si	A216 WCC		-50℃ to 345℃
		A352 LCC		
	1 1/4Cr-1/2Mo	A217-WC6	A193-B16 / A194-4	-29℃ to 530℃
	2 1/4Cr-1Mo	A217-WC9		-29℃ to 565℃
	18Cr-8Ni	A351 CF3	A193-B8 / A194-8	-196℃ to 400℃
		A351 CF8		
	16Cr-12Ni-2Mo	A351 CF3M		
		A351 CF8M		
Trim Material	316SS. 410SS. 420SS. 440SS. Etc.			
Plug Characteristic	Standard : Equal Percentage, Linear, Quick opening			
	Optional : Modified Linear			
Rangeability	40:1			
Double Guide	Optional : Intergrated bottom guide for DN25-DN300			
Seat Leakage	Metal sealing : Leakage rate class IV; Optional leakage rate class V			
	Soft sealing : Leakage rate class VI			
Bellows Seal	Double walled, made of 316			

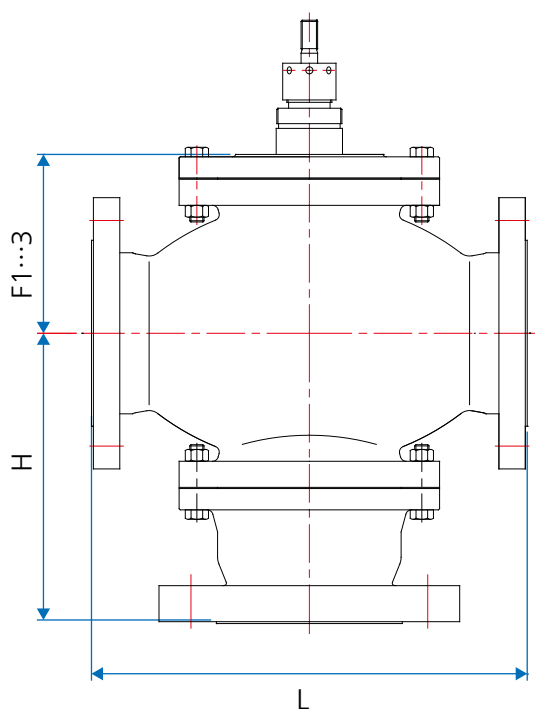
Dimensions

External Dimensions SERIES 110



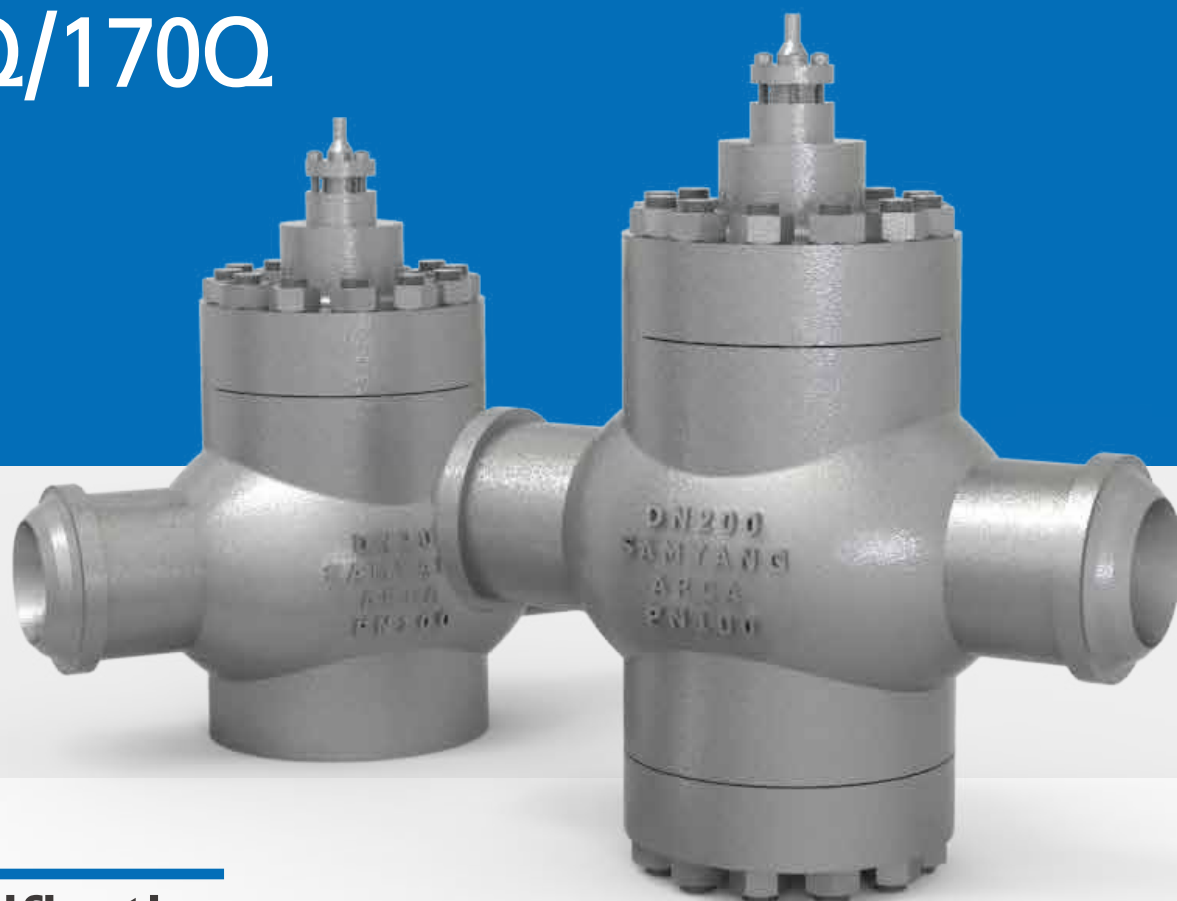
Desc DN	600# RF	900# RF	600, 900# RF	DIN 100-160	H 110	H 160	F1 STD	F3 COOL
25	210	230	230	230	70	-	135	165
40	251	260	260	260	75	110	140	170
50	286	300	300	300	90	135	135	190
65	311	340	340	340	105	150	190	210
80	337	380	380	380	125	180	196	245
100	394	450	450	430	160	220	226	300
125	500	500	500	500	190	245	260	330
150	550	570	570	550	205	275	270	350
200	660	700	700	700	270	355	340	515
250	775	780	780	775	320	410	390	530
300	900	920	920	900	350	450	440	630

External Dimensions SERIES 200



Desc DN	DIN 16-40	JIS 10K RF	150# RF	JIS 20K RF	300# RF	WELD SW, BW	H	F1 STD	F3 COOL
25	160	160	160	160	160	160	130	85	180
32	180	180	180	180	180	180	140	95	190
40	200	200	200	205	205	205	150	100	195
50	230	230	230	234	234	234	195	120	220
65	290	276	276	292	292	292	210	140	240
80	310	298	298	318	318	318	230	145	245
100	350	352	352	368	368	368	250	155	255
125	400	400	400	400	400	400	305	180	310
150	480	451	451	473	473	473	355	210	340
200	600	600	600	600	600	600	420	245	380
250	730	730	730	740	740	740	530	320	450
300	850	850	850	860	850	860	630	380	510
350	980	-	980	980	980	980	700	440	560
400	1050	-	1050	1060	1060	1060	850	450	570

120Q/170Q



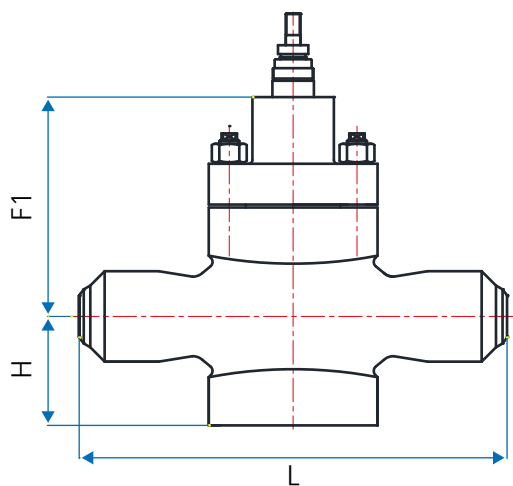
Specifications

General Specifications

Series	120Q/170Q			
DN	25-350 / 1"-14"			
PN/ANSI class	PN250~420 / Class 1500-2500			
Body Material	Designation	Body / Top Flange	Bolt / Nut	For Temperatures
	C-Si	A216 WCB	A193-B7 / A194-2H	-29℃ to 425℃
	C-Mn-Si	A216 WCC		
		A352 LCC		-50℃ to 345℃
	1 1/4Cr-1/2Mo	A217-WC6	A193-B16 / A194-4	-29℃ to 530℃
	2 1/4Cr-1Mo	A217-WC9		-29℃ to 565℃
	9Cr-1Mo-V	A217-C12A		-29℃ to 565℃
	18Cr-8Ni	A351 CF3	A193-B8 / A194-8	-196℃ to 400℃
		A351 CF8		
16Cr-12Ni-2Mo	A351 CF3M			
Trim Material	316SS, 410SS, 420SS, 440SS, 630SS Etc.			
Plug Characteristic	Standard : Equal Percentage, Linear, Quick opening			
	Optional : Modified Linear			
Rangeability	40:1			
Double Guide	Optional : Intergrated bottom guide for DN25-DN350			
Seat Leakage	Metal sealing : Leakage rate class IV; Optional leakage rate class V			
	Soft sealing : Leakage rate class VI			

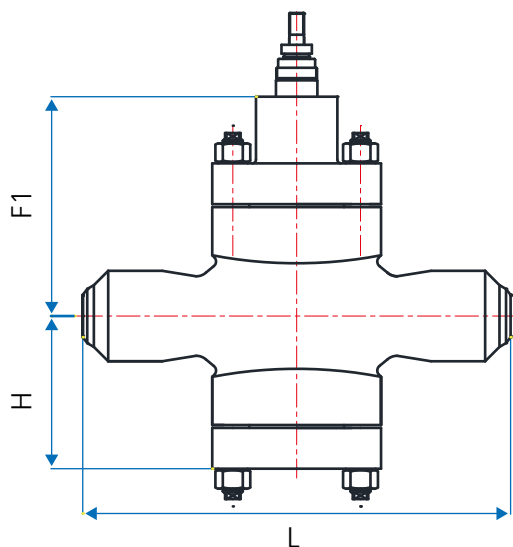
Dimensions

External Dimensions SERIES 120



SIZE	면간(mm)	120Q	F
DN	L	H	
25	308	68	191
40	384	77.5	193
50	450	113	217
80	578	147	297
100	673	200	351
150	914	240	436
200	1022	320	598
250	1000	370	548
350	1260	452	693

External Dimensions SERIES 170



SIZE	면간(mm)	170Q	F
DN	L	H	
25	308	110	191
40	384	112	193
50	450	152	217
80	578	264	297
100	673	281	351
150	914	336	436
200	1022	448	598
250	1000	482	548
350	1260	593	693

ACTUATOR



811 Actuator

General Specifications
Dimensions

813 Actuator

General Specifications
Dimensions

Technical Data

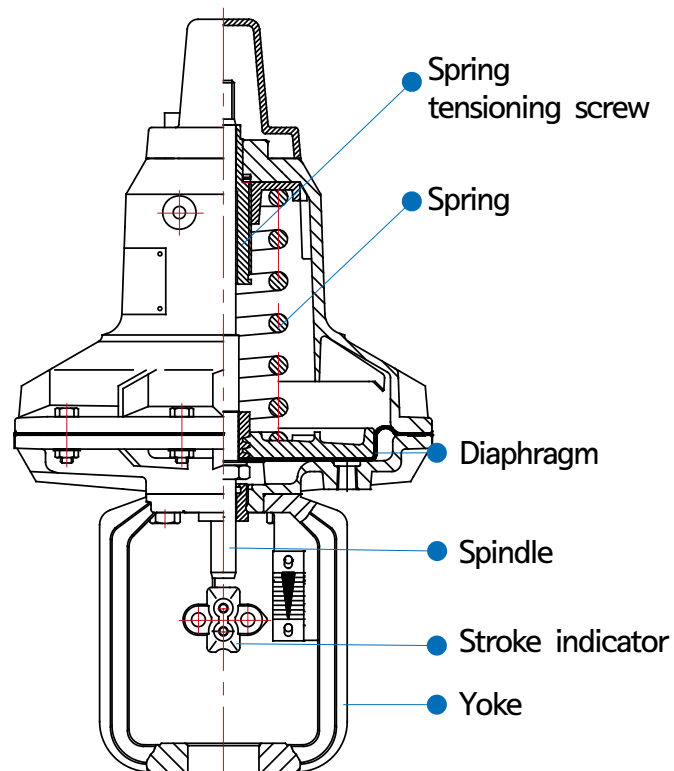


Series	811
Diaphragm Effective Area	210 - 1440cm ²
Stroke	10 - 100mm
Control Signal	6 bar max.
Materials	<p>Body parts and diaphragm plates: seawater-proof aluminium alloy AC4C</p> <p>Spring tensioning screw, spindle bushing: 304</p> <p>Spindle: 420SS</p> <p>Yoke: A395 or SS400, free of nonferrous metal</p> <p>Diaphragm : EPDM, fabric-reinforced (moulded)"</p>
Operating Temperature	-20°C to 80°C
Spindle Bushing	"Straight-through spindle with rolled surface, top and bottom guided in PTFE Graphite slot ring bearings. Pressure chamber with O-ring sealing."
Spring	Control range = 0.8bar, for control function: air to open or air to close

Functional Description

This is a pneumatic diaphragm actuator with spring return (fail safe) and is used to actuate linear valves. The actuator positions the valve plug, which in turn is controlled by a pneumatic or electro-pneumatic positioner. These actuators can be operated in the "Air to open" function or with the reverse action "Air to Close".

- The central spring preload can be adjusted to optimum effect to the required actuating forces using the spring tensioning screw (1).
- A fabric-reinforced diaphragm ensures smooth conversion of the pneumatic application of pressure into the linear motion of the actuator spindle. The power diaphragm (3), supported by the diaphragm disc, is connected to the actuator spindle (4) and divides the actuator housing into pressure and spring chambers. If the force of the compressed air control signal exceeds the opposing spring force (2), the actuator spindle (4) moves and actuates the linear valve.
- The valve yoke (6) connects the actuator to the control valve, while the actuator spindle (4) is connected to the valve spindle via the coupling shown as a stroke indicator (5), securely guided in the slide bearing and sealed with a sealing.



Universal diaphragm actuator for individual control and regulating functions

Important advantages

Universal

Same type applicable for control and regulating functions.

Reversible

For reversing the control action only loosen four screws, turn the actuator at 180° and tighten the screws again. Possible planning errors can still be corrected on the spot without any problems.

Enormous forces

The strong springs in a solid casing made of high quality aluminium alloy are providing these actuators with control forces of up to 4t.

Long duty life

All parts are designed for approx. 1 million strokes. A special diaphragm allows max. 6 bar operating pressure.

Mounting facilities

FA at the support (NAMUR) provided for positioner, limit switches, stroke limitations or field controller. Several instruments can be mounted directly.

Low-price hand adjustment

For emergency operation of your valves hand adjustment devices can be subsequently mounted, too.

Few spare parts, little maintenance

The restriction to 4 sizes only enables the disposition of only a few spare parts for emergency cases.

Also in the electronic age many industrial sectors cannot renounce the application of diaphragm actuators in connection with pneumatic or electro-pneumatic positioners as standard actuators.

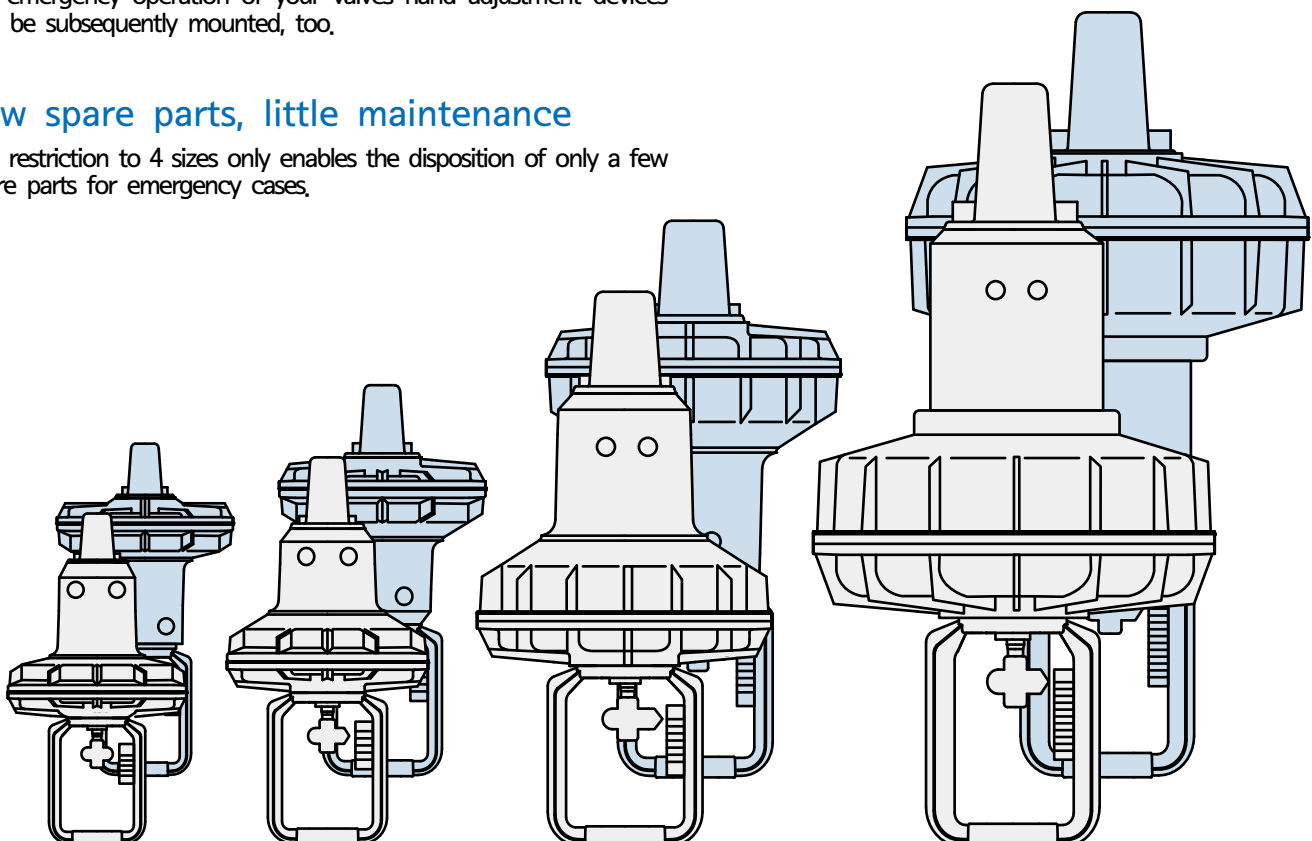
Short floating speed and high control forces are criterions resulting in extreme efficiency, reliability and especially long duty life.

ARCA diaphragm actuators have proven themselves in the industry for more than 50 years. Everywhere, where robust design, function safety and specially favorable ratio of costs and performance are required.

The function

Air power moves the spindle via the diaphragm against the spring power. In case of decreasing air pressure the spring acts in opposite direction. The initial spring tension can be adapted to the process data by means of the spring tensioning screw. The support is connecting the actuator with the control valve. At the same time the stroke indicator is the connection to the valve spindle.

The proven ARCA modular system enables you to combine all valves type with the UMA-types.



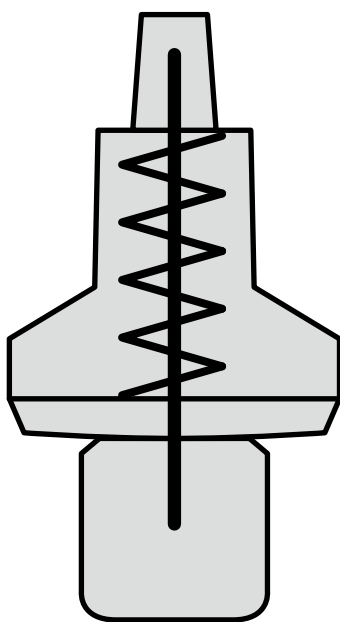
U0 (210cm³)

U I (320cm³)

U III (720cm³)

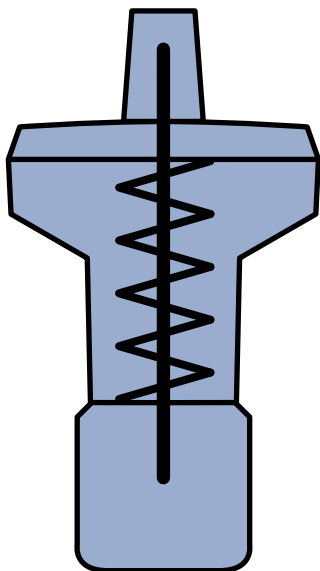
U V (1440cm³)

Opening Function (Air to open - Fail close)



Size	Diaphragm Surface (cm ²)	Order No.	Spring No.	Stroke (mm)	Control range adjustable		Control Force (kN)
					From	To	
U0	210	811.11	54610	10	0.4-0.8	1.4-1.8	2.8
				20	0.0-0.8	1.0-1.8	2.1
		811.12	54610	10	0.4-0.8	1.4-1.8	2.8
				20	0.0-0.8	1.0-1.8	2.1
		811.13	54611	10	1.0-1.8	2.2-3.0	4.5
				20	0.2-1.8	1.4-3.0	2.8
UI	320	811.12	54621	10	1.0-1.8	2.2-3.0	4.5
				20	0.2-1.8	1.4-3.0	2.8
		811.21	54620	10	0.55-0.95	1.4-1.8	4.4
				20	0.15-0.95	1.0-1.8	3.1
		811.22	54621	20	0.46-1.0	1.26-1.8	4
				30	0.2-1.0	1.0-1.8	3.1
		811.23	54632	10	1.28-1.8	2.48-3.0	7.7
				20	0.75-1.8	1.95-3.0	5.7
		811.24	54632	20	0.75-1.8	1.95-3.0	5.7
				30	0.4-2.0	1.4-3.0	4.4
UIII	720	811.31	54630	20	0.46-1.0	1.46-2.0	10.3
				30	0.2-1.0	1.2-2.0	8.4
		811.32	54631	30	0.46-1.0	1.26-1.8	8.8
				45	0.2-1.0	1.0-1.8	7
		811.33	54632	60	0.2-1.0	0.8-1.6	5.7
				20	1.36-1.9	2.46-3.0	17.3
		811.34	54633	30	1.4-2.2	2.2-3.0	15.5
				30	1.4-2.2	2.2-3.0	15.5
		811.35	54633	45	1.0-2.2	1.8-3.0	12.7
				60	0.7-2.3	1.4-3.0	9.8
V	1440	811.41	54650	30	0.5-0.9	1.4-1.8	19.7
				45	0.3-0.9	1.2-1.8	16.9
		811.42	54651	60	0.1-0.9	1.0-1.8	14.1
				75	0.3-0.9	1.0-1.6	14.1
		811.43	54652	100	0.1-0.9	0.6-1.4	8.4
				30	1.0-1.65	2.35-3.0	33.1
		811.44	54658	45	0.7-1.65	2.05-3.0	28.9
				60	0.4-1.65	1.75-3.0	24.7
		811.45	54658	75	0.4-2.0	1.4-3.0	19.7
				100	0.4-2.4	1.0-3.0	14.1

Closing Function (Air to close - Fail open)



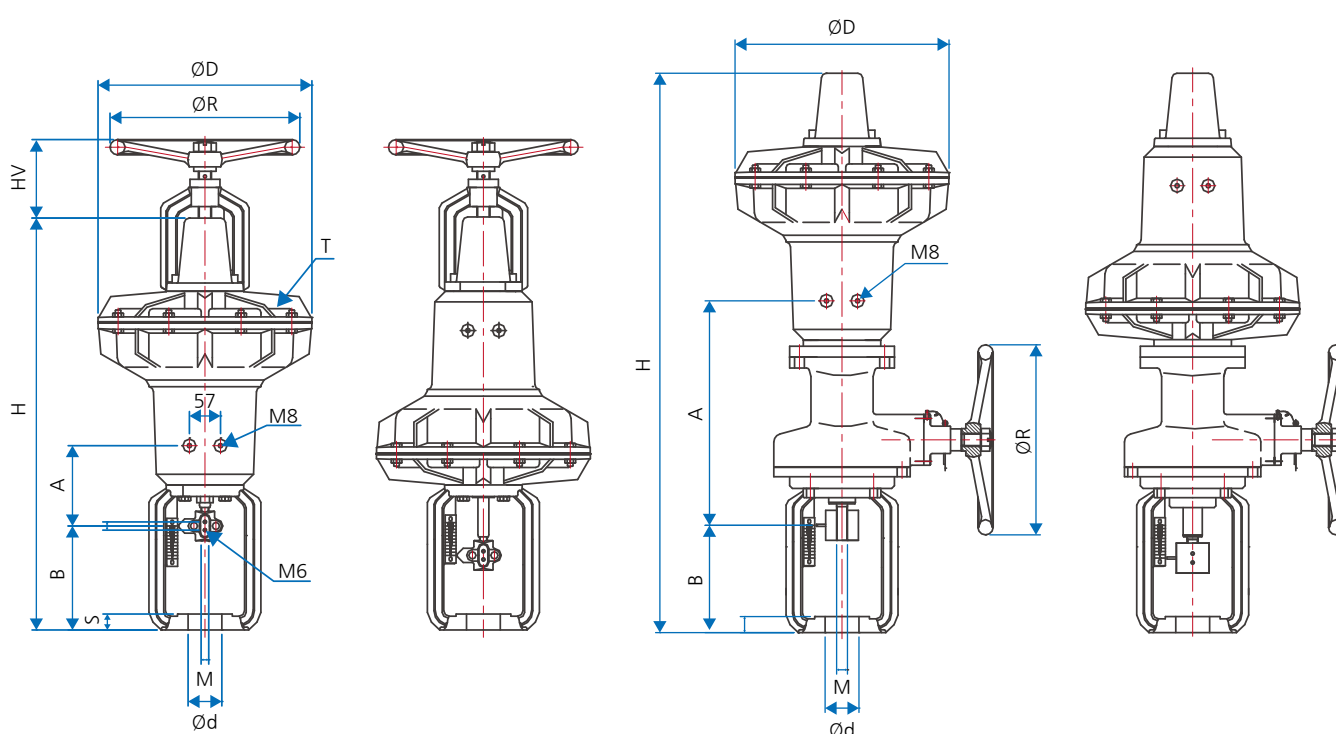
Size	Diaphragm Surface (cm)	Order No.	Spring No.	Stroke (mm)	Control Range (bar)	Control Force kN depending on control pressure					
						1.4	2	2.5	3	4.5	6
U0	210	811.11	54610	10	0.4	2	3.2	4.3	5.3	8.5	11.6
				20	0.8	1.1	2.4	3.4	4.5	7.6	10.8
		811.12		10	0.4	2	3.2	4.3	5.3	8.5	11.6
				20	0.8	1.1	2.4	3.4	4.5	7.6	10.8
UI	320	811.21	54620	10	0.4	3.1	5	6.6	8.2	13.2	17.8
				20	0.8	1.9	3.8	5.4	7	11.8	16.6
		811.22	54621	20	0.53	2.1	4	5.6	7.2	12	16.8
				30	0.8	1.3	3.2	4.8	6.4	11.2	16
UIII	720	811.31	54630	20	0.53	6.3	10.6	14.2	17.8	28.6	39.4
				30	0.8	3.7	8	11.6	15.2	26	36
		811.32	54631	30	0.53	6.4	10.7	14.3	17.9	28.7	39.5
				45	0.8	4.6	8.9	12.5	16.1	26.9	37.7
UV	1440	811.33	54632	60	0.8	3.8	8.1	11.7	15.3	26.1	36.9
				30	0.4	14.9	23.6	30.8	38	59.6	81.2
		811.41	54650	45	0.6	12.3	21	28.2	35.4	57.1	78.6
				60	0.8	9.7	18.4	25.6	32.8	54.4	76.2
		811.42	54651	60	0.6	11.8	20.4	27.6	34.8	56.4	78
				75	0.8	9.7	18.3	25.5	32.7	54.3	75.9
		811.43	54652	100	0.8	7.9	16.5	23.7	30.9	52.5	74.1
				100	0.8	7.9	16.5	23.7	30.9	52.5	74.1

Top mounted handwheel

Size	Diaphragm surface	Weight hand adjustment		Stroke	ØD	M	Ød	S	B	A	H	Hv	ØR	T
		with	without											
UO-20	210	7	8.6	10/20	230	M10	40	15	117	77	430	110	180	NPT $\frac{1}{4}$
UO-20(A)	210	7.4	9	20	230	M10	48	20	117	77	438	110	180	NPT $\frac{1}{4}$
UI-20	320	14.1	16.9	20	270	M10	48	20	127	82	495	135	225	NPT $\frac{1}{4}$
UI-30	320	14.6	17.4	30	270	M14	56	25	147	77	510	135	225	NPT $\frac{1}{4}$
UIII-30	720	36.2	45.5	30	392	M14	56	25	151	155	722	197	320	NPT $\frac{1}{2}$
UIII-60	720	39.3	48.6	60	392	M20x1.5	72	30	196	140	752	197	320	NPT $\frac{1}{2}$
UV-60	1440	85	105	60	530	M20x1.5	72	30	194	154	1006	295	400	NPT $\frac{1}{2}$
UV-100	1440	87	107	100	530	M20x1.5	72	30	234	127	1026	295	400	NPT $\frac{1}{2}$

Top mounted handwheel

Size	Diaphragm surface	Weight hand adjustment		Stroke	ØD	M	Ød	S	B	A	H	ØR	T
		with	without										
UIII-60	720	51	61	60	392	M20x1.5	56	30	196	411	1024	320	NPT $\frac{1}{2}$
UV-100	1440	98	118	100	530	M20x1.5	72	30	234	368	1273	400	NPT $\frac{1}{2}$



Technical Data

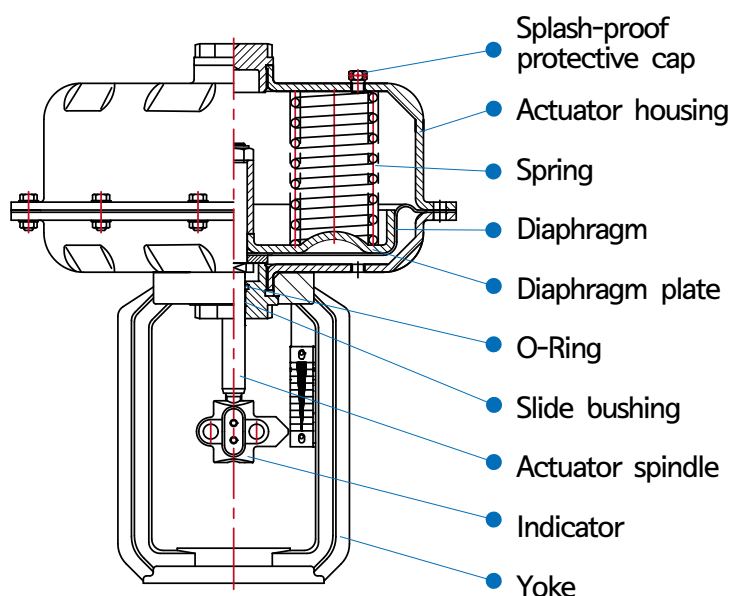


Series	813
Diaphragm Effective Area	210 - 720 cm ²
Stroke	20 - 60mm
Control Signal	6 bar max.
Materials	Actuator Housing, Diaphragm plate: PO powder coated Yoke: A395 or SS400, free of nonferrous metal Stem: 420SS Diaphragm : EPDM, fabric-reinforced (moulded)
Operating Temperature	Optionally with instrument air purge
Spindle Bushing	-20°C to 80°C
Spring	MO/MI/MIII: 3-6

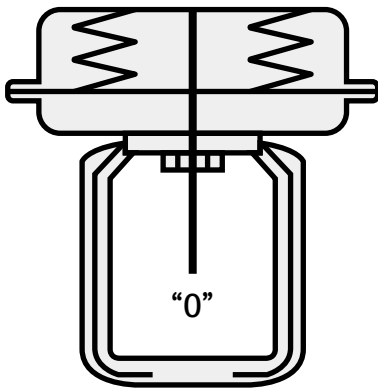
Functional Description

The M Series is a pneumatic multi-spring diaphragm actuator with spring return (fail safe) and is used to actuate linear valves. The actuator positions the valve plug, which in turn is controlled by a pneumatic or electro-pneumatic positioner. These actuators can be operated in the "Air to open" function or with the reverse action "Air to close".

- The actuator has a compact design with a low installed height. Various spring sets with different ranges ensure good adaptation to the relevant operating conditions.
- A fabric-reinforced diaphragm ensures smooth conversion of the pneumatic application of pressure into the linear motion of the actuator spindle. The power diaphragm (4), supported by the diaphragm disc (5), is connected to the actuator spindle (8) and separates the actuator housing (2) into pressure and spring chambers. If the force of the compressed air control signal exceeds the opposing spring force (3), the actuator spindle (8) moves and actuates the linear valve.
- The control signal is carried to the diaphragm chamber via internal channels in the yoke (10). The air supply and venting (ventilation) of the spring chamber is carried out by means of the protective cap (1), which is impermeable to splash water, or the chamber is purged through internal channels with the air from the positioner.
- The yoke (10) connects the actuator to the control valve, while the actuator spindle (8) is connected to the valve spindle via the coupling shown as a stroke indicator (9), securely guided in the O-ring (6) and sealed with a slide bushing (7) with wiper.

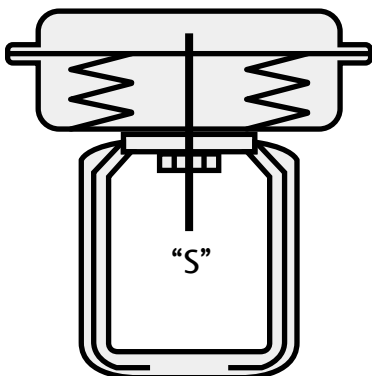


Opening Function (Air to open - Fail close)



Size	Order Point	Diaphragm Area	Spring No.	Quantity of Spring	Stroke	Control Range	Thrust Force
M0-20 M0-20A	-1	210	N54710	3	20	0.4-1.2	0.8
					20(10)	0.8-1.2	1.7
	-2			6	20	0.8-2.5	1.7
MI-20	-1	320	N54720	3	20	1.6-2.5	3.4
					20(10)	0.4-1.4	1.3
	-2			6	20	0.9-1.4	2.9
MI-30	-1	320	N54721	3	20	0.8-2.8	2.6
					20(10)	1.8-2.8	5.8
	-2			6	30	0.8-1.9	2.6
MI-30	-1	320	N54721	3	30(20)	1.1-1.9	3.5
					30	1.6-3.8	5.2
	-2			6	30(20)	2.3-3.8	7.5
MIII-30	-1	320	N54731	3	30	0.6-1.4	4.4
					30(20)	0.8-1.4	5.8
	-2			6	30	1.2-2.9	8.8
MIII-30	-1	320	N54731	3	30	1.7-2.9	12.3
					30(20)	1.4-3.4	10.2
	-2			6	30(20)	2.0-3.4	14.5
MIII-30	-1	320	N54730	3	30	1.6-3.9	11.7
					30(20)	2.3-3.9	16.5
	-2			6	30(20)	0.6-1.4	4.4
MIII-30	-1	320	N54731	3	30	0.5-1.3	3.6
					30(20)	0.9-1.3	6.5
	-2			6	30	0.7-1.3	5.1
MIII-60	-1	720	N54733	3	60	1.0-2.7	7.3
					60(30)	1.8-2.7	13.2
	-2			6	60(45)	1.4-2.7	10.2
MIII-60	-1	720	N54732 N54733	36	60	1.2-3.2	8.8
					60(30)	2.2-3.2	16
	-2			6	60(45)	1.7-3.2	12.4
MIII-60	-1	720	N54732 N54733	6	60	1.4-3.8	10.2
					60(30)	2.6-3.8	19
	-2			6	60(45)	2.0-3.8	14.5

Closing Function (Air to close - Fail open)

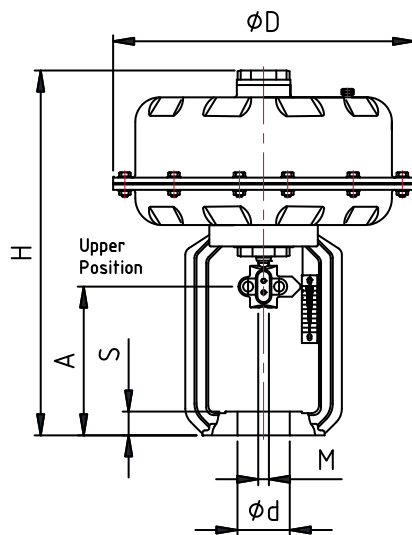


Size	Order Point	Diaphragm Area	Spring No.	Quantity of Spring	Stroke	Spring Range	"Thrust Force(kN) by supply pressure(bar)"			
							2	3	4	5
MO-20	-1	210	N54710	3	20	0.4-1.2	1.7	3.8	5.9	8
MI-20	-1	320	N54720	3	20	0.4-1.4	1.9	5.2	8.4	11.7
MI-30	-1		N54721	3		0.8-1.9	-	3.5	6.8	10.1
MIII-30	-1	720	N54731	3	30	0.6-1.4	4.4	11.7	19	26.4
	-2		N54730	3		1.4-3.4	-	-	4.4	11.7
MIII-60	-1	720	N54733	3	60	0.5-1.3	4.4	11.7	19	26.4
	-2		N54732	3		1.2-3.2	-	-	4.4	11.7

Technical Data

Type	Stroke	ØD	S	A	H	M
813-M0-20	20	230	20	103	278	M10
813-MI-20	20	275	20	120	303	M10
813-MI-30	30		25	142	343	M14
813-MIII-30		400	30		386	
813-MIII-60	60		30	192	477	M20

Control signal: 6 bar max.



Material

All body parts and diaphragm plates made of seawater-proof aluminium alloy. Spring tensioning screw, spindle bushing and spindle made of stainless chromium steel. Support made of GG-25 (U0 and UI) or GGG-40 (UIII and UV). Free of nonferrous metal. On request, body parts with sintered polyamid plastic coating.

Service diaphragm

Perbunan mixture with tissue reinforcement for air, oil or water from -40 up to +90°C

Spindle bushing

Straight-through spindle with rolled surface, top- and bottom-guided in teflon slot ring bearings. Pressure chamber with O-ring sealing

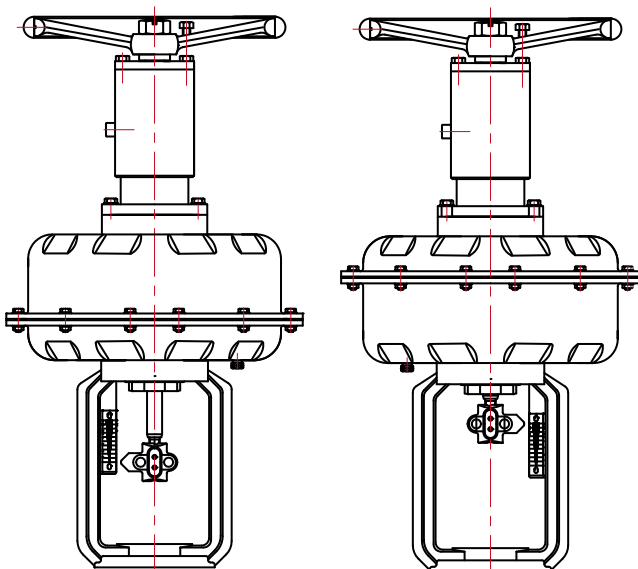
Standard spring

Control range = 0,8 bar; for control action: air to open or air to close

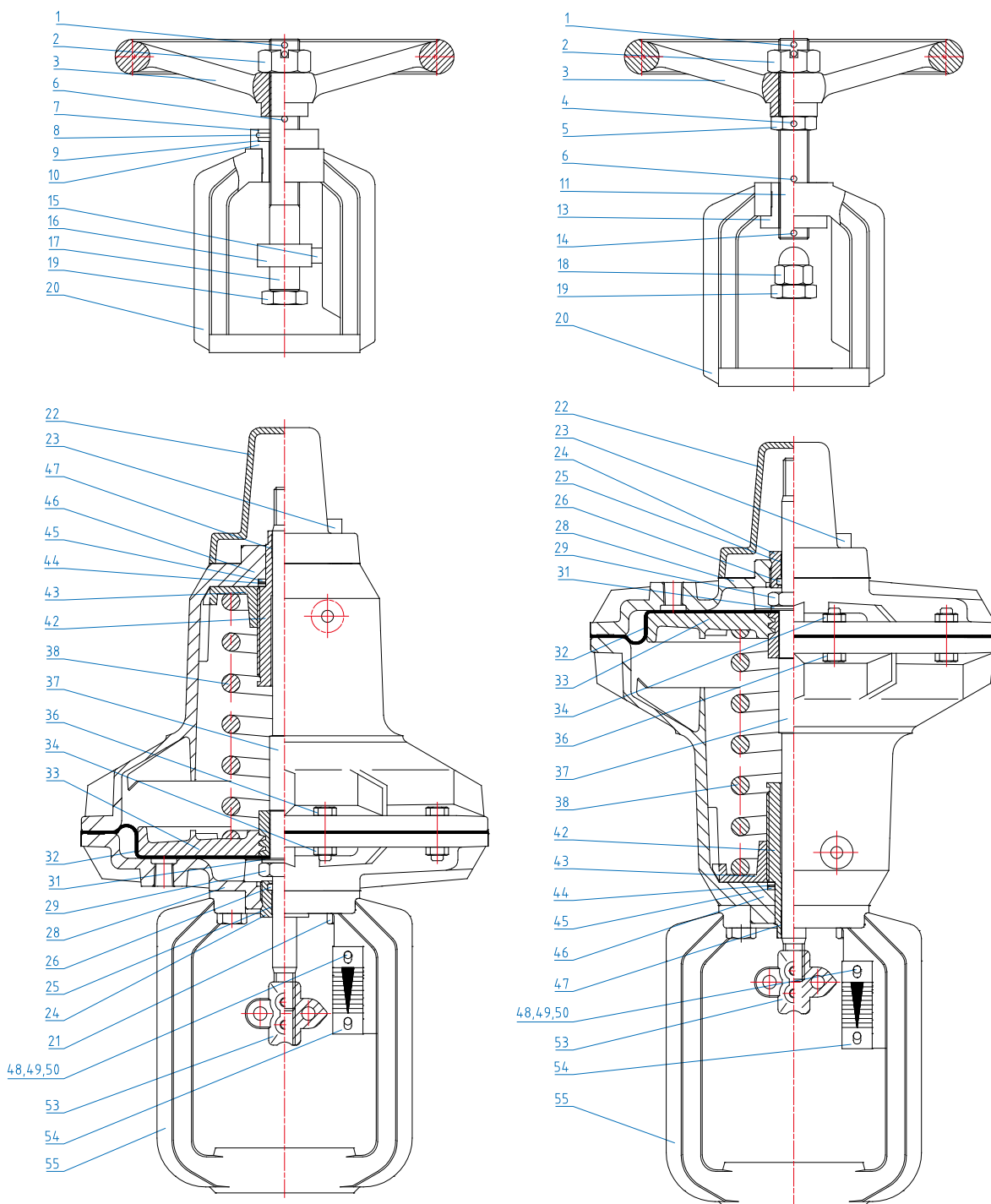
Strong spring

Control range > 0,8 bar; for max. spring forces with control action: air to open.

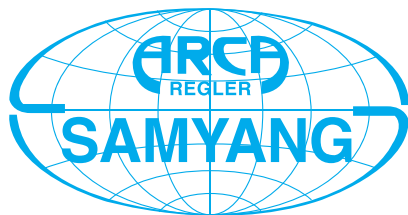
Subject to technical modifications



Mounting and Operating Instructions



1	Splint	11	Hand-wheel spindle	23	Cyl. Screw	36	Hex. nut	49	Toothed disc
2	Nut	13	Threaded bushing	24	Guide bushing	37	Spindle	50	Hex. nut
3	Hand wheel	14	Adaptor sleeve	25	Slide bushing	38	Spring	51	Hex. nut
4	Adaptor sleeve	15	Plug notched-pin	26	O-ring	42	Tightening screw	52	Cyl. screw
5	Hex. Nut	16	Clamp ring	28	Diaphragm cover	43	Spring date	53	Lift indicator
6	Hand-wheel lock	17	Hand-wheel spindle	29	Hex. nut	44	Supporting disc	54	Lift plate
7	Bearing lock	18	Cap nut	31	Disc	45	Teflon disc	55	Support
8	Bearing disc	19	Hex. nut	32	Diaphragm	46	Spring case		
9	Bearing	20	Support for hand-wheel	33	Diaphragm plate	47	Slide bushing		
10	Guide bushing	22	Cap nut	34	Hex. screw	48	Cyl. Screw		



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PRODUCT CATALOG

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