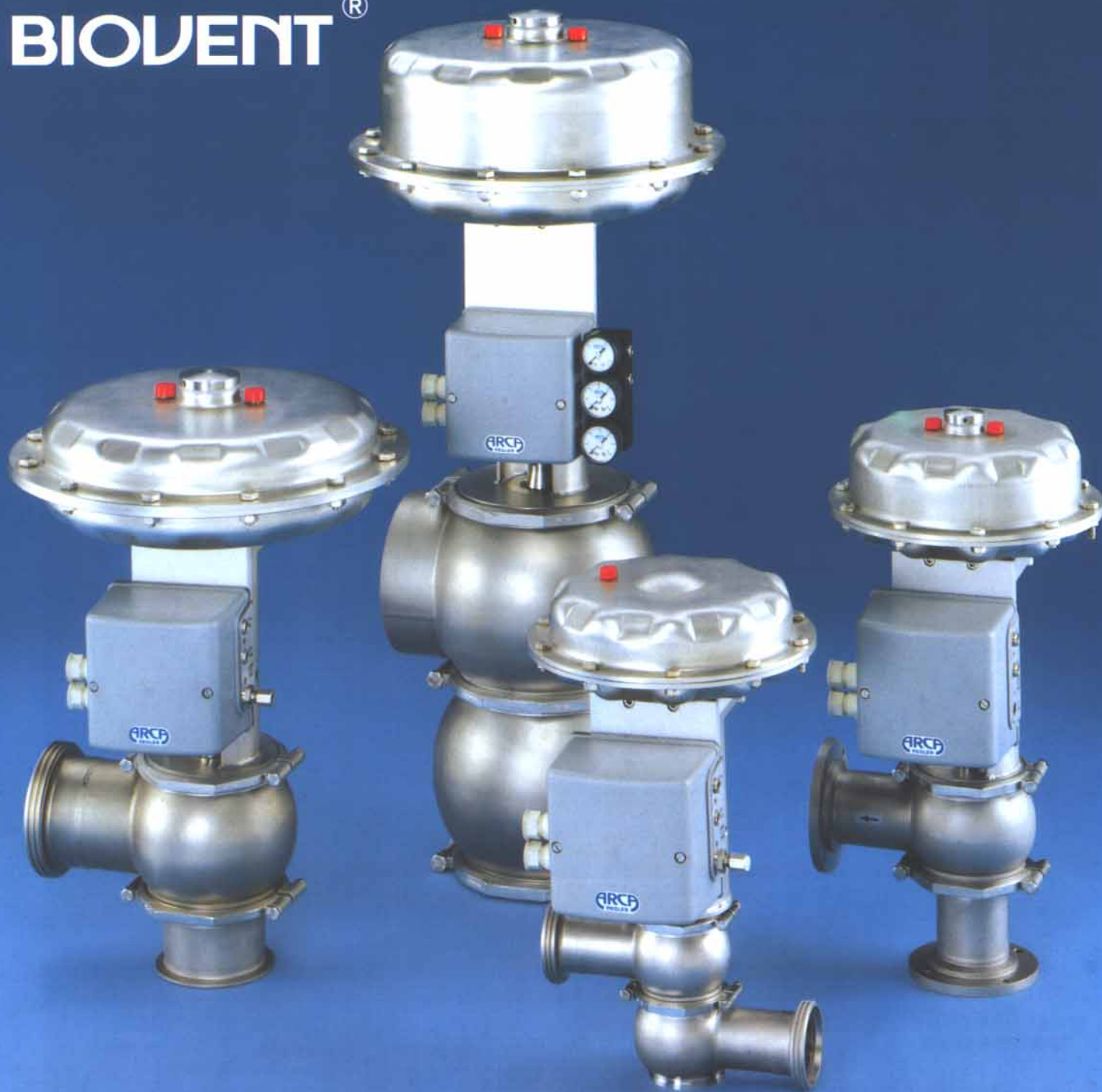


BIOVENT[®]



Hygienic Control Valves

with pneumatic Multi-Spring Actuator
made of Stainless Steel





- Ball-shaped stainless steel body with optimum flow characteristics and suitable for CIP-conditions (cleaning in place)
- The inside height of the body is equal to the diameter of the pipeline, thus avoiding domes and pockets, with their negative effects. Corrosion, residues when changing the medium, and cleaning problems are definitely excluded.
- Rigid connection of the valve components by means of solid clamping rings of precision-cast stainless steel. Easy to remove and simple dismantling of the valve.
- The direction of the pipe connections is freely adjustable.
- The clamped valve seat is interchangeable: An excellent mode to adapt the valve to the controlled circuit by selecting the most suitable K_{VS} -value.
- Sealing elements without dead gaps prevent infection sources.
- Reliable sealing of the valve spindle by wiper ring, and extremely low friction through roller-finished spindle-surface.
- Troublefree maintenance of the valve parts in contact with the medium by pulling them up in one unit.
- Free choice of metallic or soft sealing valve plugs.
- Optionally the valve bodies type L, B, and BP3 are available to conform US-standards (FDA, conforming 3A).

Universal: Patterns, Pipe-Connections, Free Selection of Inner Valve Parts

Technical Data

Valve Body	DN 25 to DN 150, angular or straight-flow valve Material No. 1.4404. Threaded ends 1.4301. Body parts blasted with final super finish.
Valve Connections	Threaded sockets or welding ends. Other connections on request.
Valve Plug	Material No. 1.4571, microfinished with extra roller-finished guiding surfaces. Control ratio 40:1, with linear or equal percentage characteristics.
Valve Seat	Material No. 1.4404
Leakage rate acc.to VDI 2174	<0,01% of K_{VS} -value with metallic seal, <0,001% of K_{VS} -value with soft sealing plug.
Spindle Sealing	Sealing ring made of EPDM, for a temperature range from -30 to + 135 °C. Resistant against alkaline solutions and acids from 2 to 5%, up to 85 °C. Other materials on request.

Soft Sealing

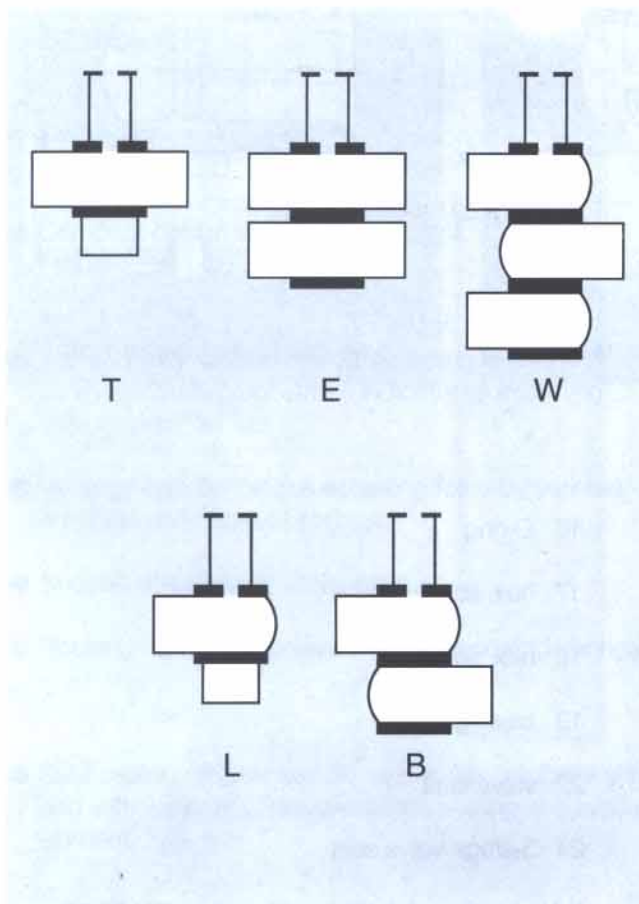
The additional function of the control valve as a shut-off valve is achieved by means of a V-ring seat gasket. The softsealing elements in precision-machined dovetail grooves provide for a long service life by means of a

tension-balanced gasket. In the closed position, the V-ring will fill out the groove completely, while the closing force is supplied by the metallic contact surface. Safe positioning even under vacuum or at high velocities.

3-Step Trim Valve Body

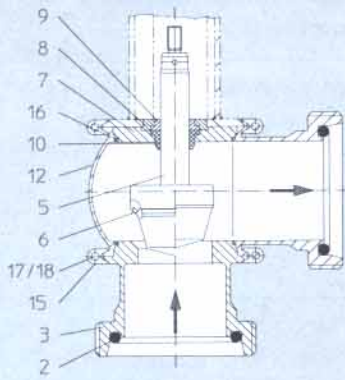
Multi-step valve P3 for the reduction of high pressure drops, e. g. for flash pasteurizers. CO_2 -exhalation and the resulting cavitation are avoided as well as their consequences, such as noise and erosion of the valve. The medium is treated carefully.

Examples of Possible Body Designs

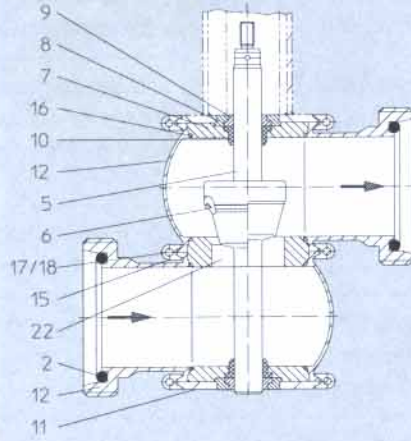


Type Code Series 391

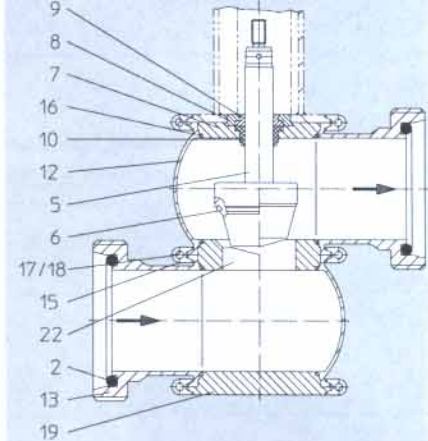
39	1	-P L M T	1 3	-L B W T E	M O
Series					
1 = hygienic design					
P = parabolic plug L = perforated plug M = mixer T = divider					
1 = 1-step 3 = 3-step inapplicable in case of mixer and divider					
Body Design „L“ Body Design „B“ Body Design „W“ Body Design „T“ Body Design „E“					
M = removable bottom plate with guiding O = removable bottom plate without guiding					



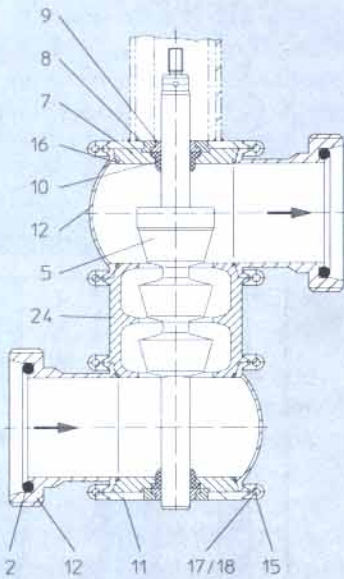
Angular Valve 391-P1-L



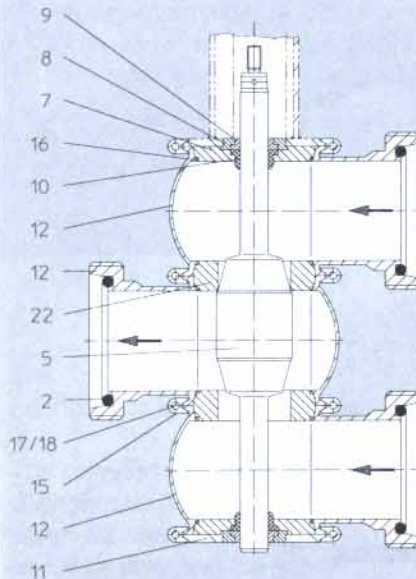
Straight Valve 391-P1-BM



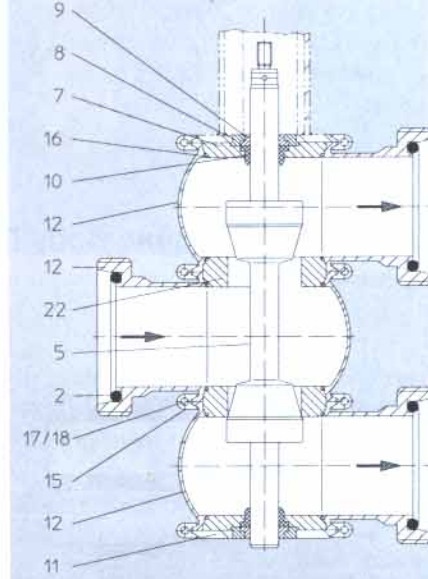
Straight Valve 391-P1-BO



3-Stage Valve 391-P3-BM



3-Way Mixing Valve 391-M-WM



3-Way Flow Dividing Valve 391-T-WM

Parts List

2 gasket	9 spindle guide	16 O-ring
3 valve pipe connection	10 gasket	17 hex. screw
5 valve plug	11 clamping ring	18 hex. screw
6 T-type sealing ring	12 valve body	19 sealing plate
7 sealing plate	13 valve with closed body	22 valve seat
8 bearing disk *)	15 half ring	24 3-stage valve seat

*) No bearing disk (8) for valve sizes DN 25-50

Technical Data:

	MFI-20	MFI-30	MFIII-30	MFIII-60
Actuator body	Mat. No. 1.4301, cold-moulded, blasted and superfinished			
Valve spindle	Mat. No. 1.4122, micro-finished and additionally roller-finished			
Actuator yoke	Mat. No. 1.4571/1.4301, plasma-welded, blasted and superfinished			
Effective diaphragm area (cm ²)	320		720	
Number of springs	3 or 6		3, 6 or 12	
Direction of action	Air to open: Valve is opened by air pressure and closed by spring Air to close: Valve is opened by spring and closed by air pressure			
Operating air pressure	Max. air pressure: 6 bar			
Ambient temperature	-20...+80°C (Check temperature limits for valve positioner!)			

Design Features

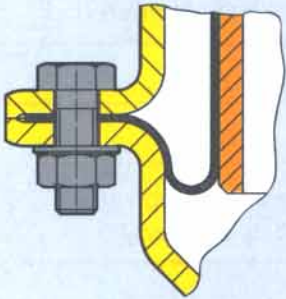
- Rolling diaphragm design, proven in thousands of the most versatile industrial applications.
- Direction of action easily reversible, even on site, without special tools and without dismantling the actuator.
- Small volume between diaphragm and housing.
- Compact and completely closed design with integrated air supply.
- Waste-air scavenging of the spring chamber with type „C“
- Compact design with reduced height.
- The specially shaped spindle-coupling is also serving as an accident-proof stroke indicator (conforming UVV-standards)
- Versatile selection of the actuating force by variable numbers and types of springs.
- Special, splash-proof de-aerator.
- Housing made of stainless steel, with coated springs.
- Safe sealing of valve spindle with super-finished surface and with wiper ring, designed as a sealing and wiping element.

Your Advantage

- High reliability and power with high positioning speed and neglectably low friction.
- Simple handling and low cost for stock-keeping. Free choice of the action „spring to close/spring to open“ by simply turning the actuator.
- Short reaction time.
- Unique safety of operation. Electro-pneumatic or pneumatic, alternatively intelligent valve positioners for integrated mounting.
- Maintenance- and slack-free stroke pickup for high reliability.
- Reduced space requirement makes it possible to install ARCA BIOVENT valves even in places with limited space, without reducing their easy maintenance.
- Protected against accidents and injuries.
- Individual adaptation to the process requirements.
- Mounting in any direction.
- Suitable for humid surroundings through stainless steel design, especially when used with waste-air scavenging of the spring chamber.
- Long and maintenance-free service life.

The innovative ARCAPAQ design

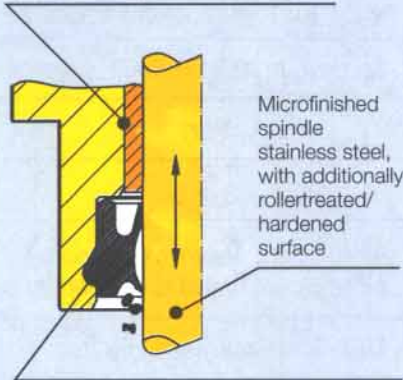
Diaphragm clamping



Definite pressing (clamping) of the proven diaphragm in the powerbypass mode. High availability by defined diaphragm motion.

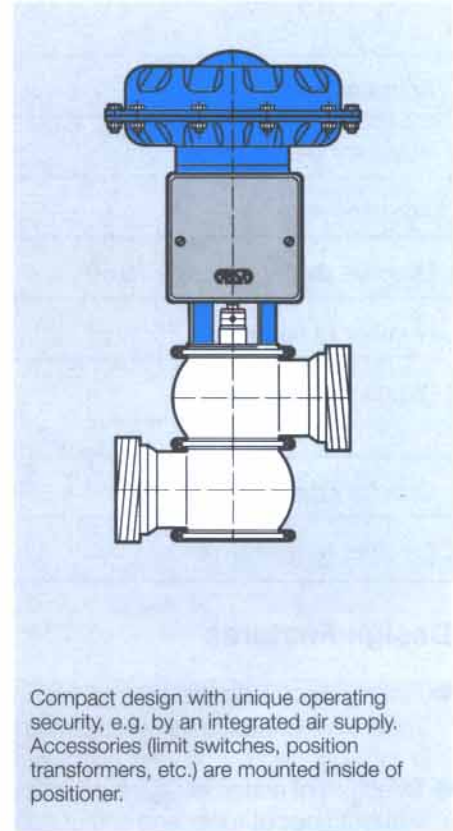
Spindle bearing and sealing

Maintenance-free and oversized spindle bearing



Special, combined packing- and wiper ring

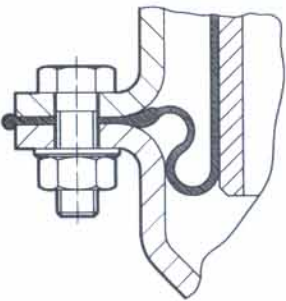
Durable and maintenance-free. Flushing liquids and/or wearing particles are wiped off before they reach gasket or bearing, thus avoiding the penetration of wearing particles between spindle and its bearing.



Compact design with unique operating security, e.g. by an integrated air supply. Accessories (limit switches, position transformers, etc.) are mounted inside of positioner.

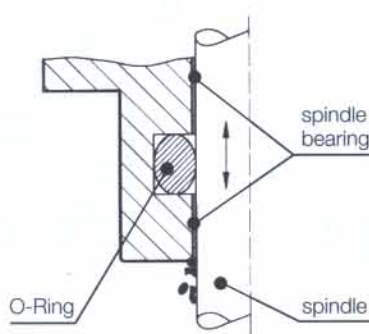
The usual design

Diaphragm clamping



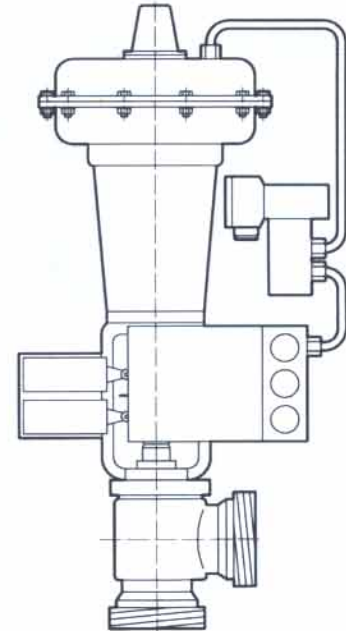
Risk of an uncontrolled pressing of the diaphragm and the forming of creases. Reduced lifetime of - diaphragm by uncontrolled motion and flexing work. Uncomfortable maintenance and ugly „pizza-effect“.

Spindle bearing and sealing

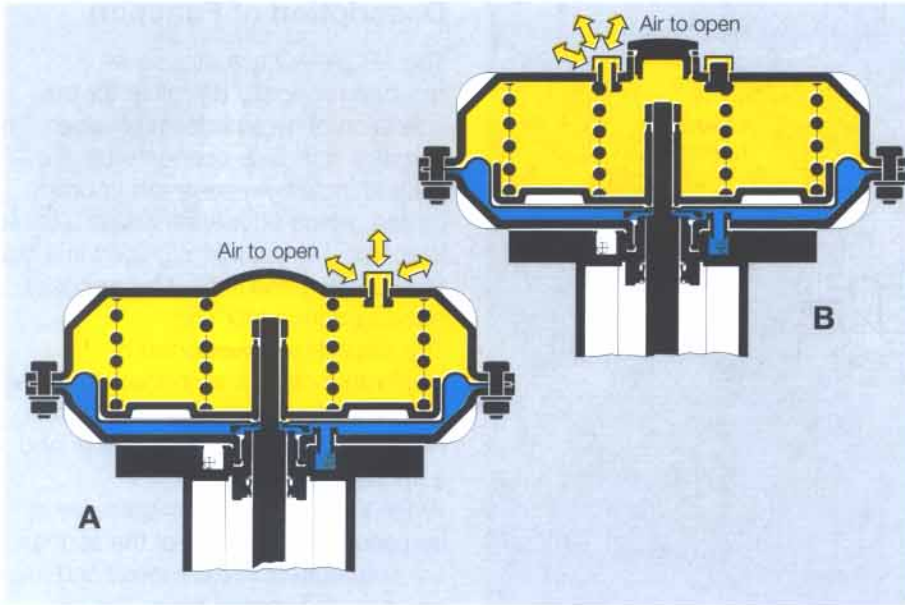


O-ring seal, basically suitable for static load. Sensitive against dirt. Possibility of wearing particles getting between bearing and spindle, with resulting damage to the sealing surface (leakage).

Accessories



The mounting of different options produces an unsightly „Christmas-tree“.



Design A

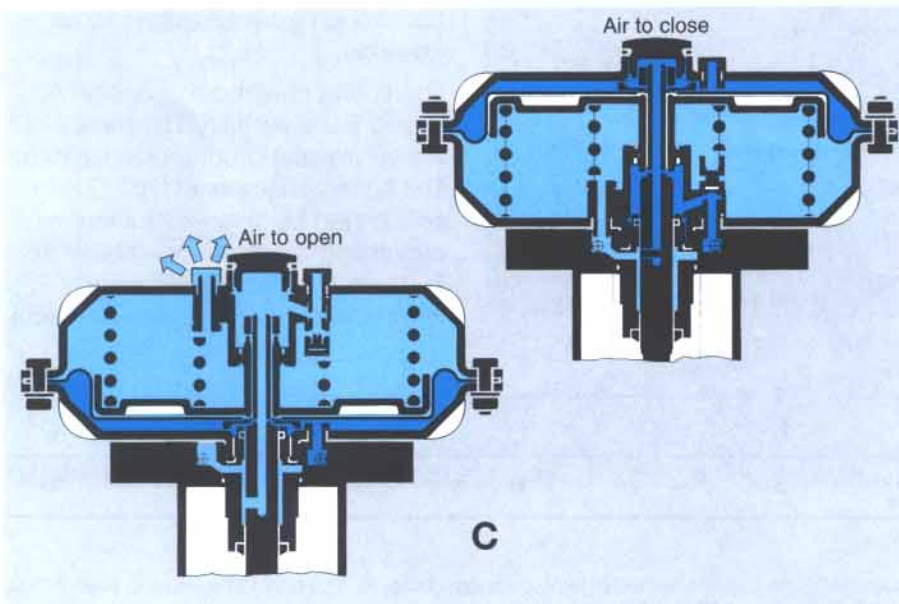
- Air to open only (not reversible)
- No external piping
- Integr. mounting of valve positioner
- Splash-proof design
- Corrosion resistant

Design B

- Air to open (not reversible without piping)
- No external piping
- Integr. mounting of valve positioner
- Splash-proof design
- Corrosion-resistant

Optional:

- Transport eye-bolt
- Stroke limitation

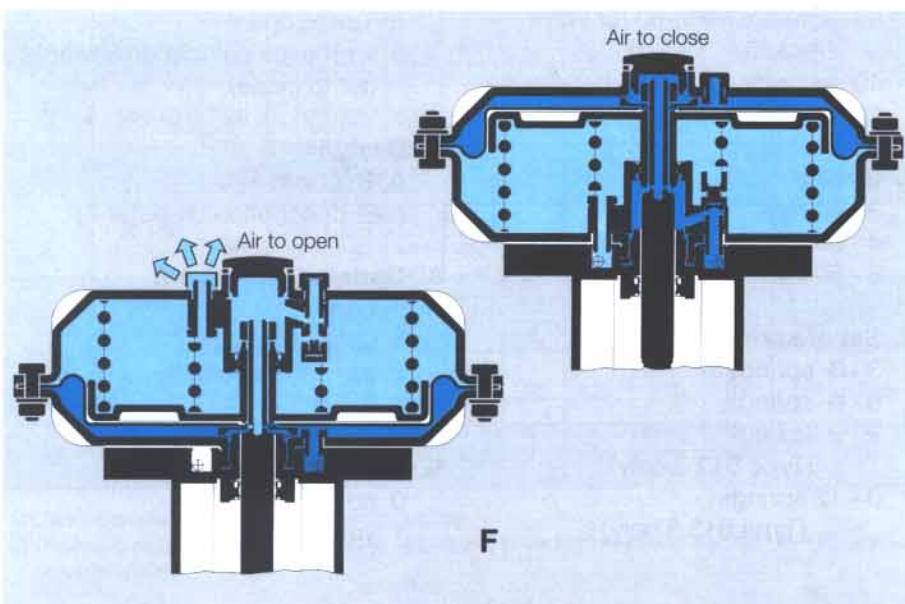


Design C

- Fully reversible by means of air reversing sleeve.
- Air scavenging of spring chamber without external piping.
- Air to open and air to close actions without external piping.
- Integrated mounting of valve positioner
- Splash-proof design
- Corrosion-resistant

Optional:

- Transport eye-bolt
- Stroke limitation

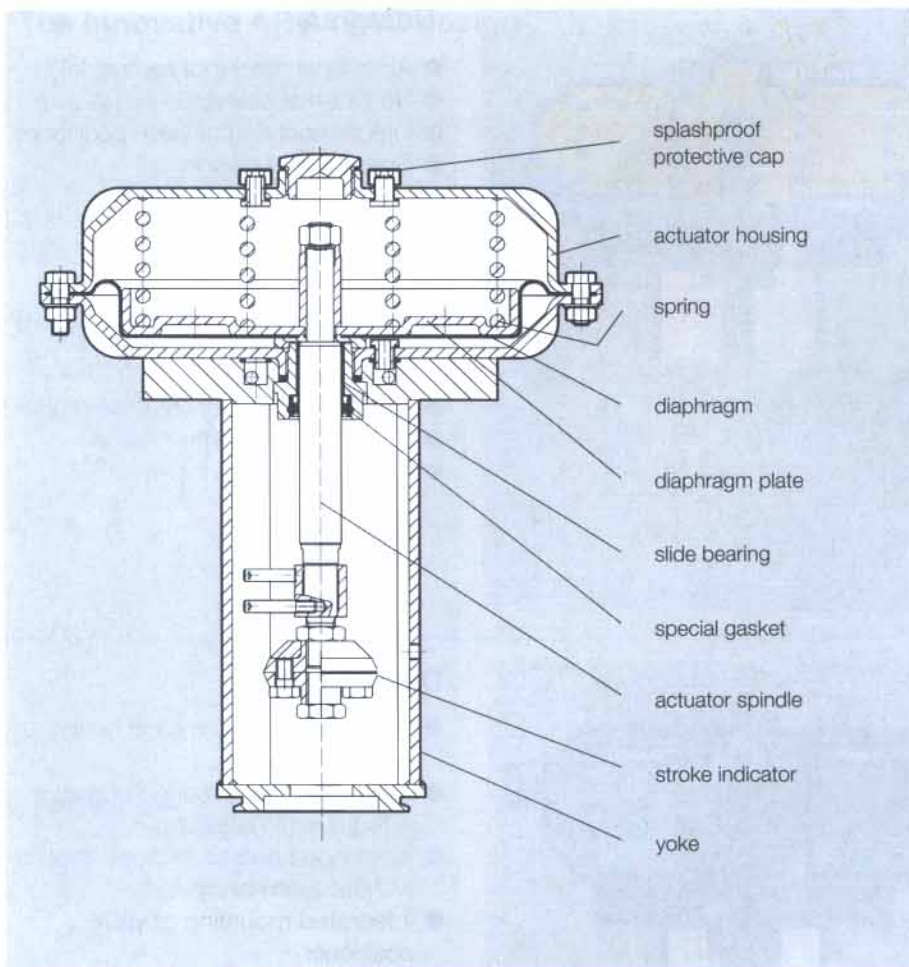


Design F

- Fully reversible by means of air reversing sleeve.
- Air to open and air to close actions without external piping.
- Integrated mounting of valve positioner
- Splash-proof design
- Corrosion-resistant

Optional:

- Transport eye-bolt
- Stroke limitation



Description of Function

The ARCAPAQ actuator series 813 has been specially designed for the operation of hygienic control valves. The actuator spindle is connected to the valve spindle by means of a coupling device, which equally serves as a stroke indicator. The spindle is guided in a solid slide bearing and sealed by a special packing-cum-wiper ring.

The diaphragm, supported by the diaphragm plate and connected to the actuator spindle, divides the actuator housing into a pressure chamber and a spring chamber.

When the force of the air pressure is surpassed by the force of the springs, the actuator spindle is moved and operates the control valve. The air supply is not realised by external piping, but through extremely safe internal channels.

The spring chambers of design A, B, and F are ventilated by means of the spraywater-proof protective cap. The spring chamber of type C is scavenged by clean instrument air, preventing the intake of ambient air. Furthermore, the actuators are completely free from greasing media.

Type Code

813	-	2	0 0	3	6	-	0	B	0	0
1		2	3	4	5		6	7	8	9

1. Pneumatic, stainless steel, multi-spring actuator

2. Size of actuator

- 2 MFI effective diaphragm area 320 cm
- 3 MFIII effective diaphragm area 720 cm

3. Yoke

- 00 without yoke
- 01 actuator MFI-20 for valve DN 25 + 32
- 02 actuator MFI-20 for valve DN 40 + 50
- 03 actuator MFI-30 for valve DN 65 + 80
- 05 actuator MFI-30 for valve DN 100
- 06 actuator MFIII-30 for valve DN 65 + 80

- 08 actuator MFIII-30 for valve DN 100
- 09 actuator MFIII-60 for valve DN 125
- 10 actuator MFIII-60 for valve DN 150

4. Stroke

- 3 - 20 mm
- 4 - 30 mm
- 6 - 60 mm

5. Set of springs

- 3 - 3 springs
- 6 - 6 springs
- 9 - 9 springs (Type 813.3.only)
- 0 - 12 springs (Type 813.3.only)

6. Function

- O air moves spindle upwards (air to open)
- S air moves spindle downwards (air to close)

7. Design

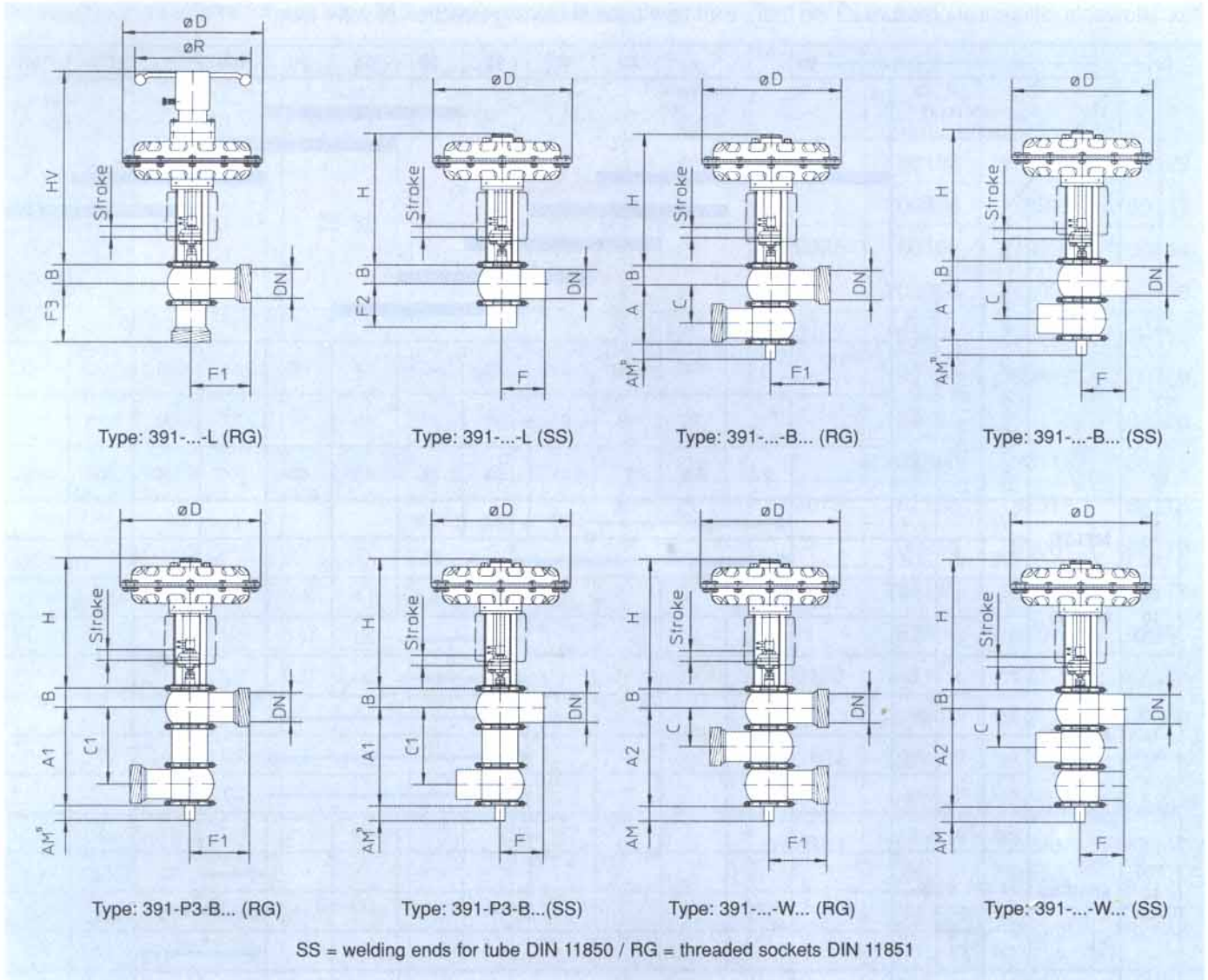
- A, B, C and F;
- (see description on page 7)

8. Optional Equipment

- 0 none
- 1 stroke limitation
- 2 transport eye bolt
- 3 1 + 2

9. hand adjustment

- 0 no
- 1 yes



ARCA valve positioner 824 and 827, integrally mounted. Integrated mounting of other on request.

DN	Actuator	Stroke	Ø D	H	HV	R	B	F	F 1	F 2	F 3	A	A 1	A 2	AM 1)	C	C 1	Weight (kg) 2)
25	MFI-20	20	270	325	530	270	25	90	119	58	87	87	102	137	30	50	65	13,5
40	MFI-20	20	270	325	530	270	31	90	123	64	97	109	157	171	30	62	114	14,5
50	MFI-20	20	270	325	530	270	37	90	125	70	105	126	186	200	30	74	134	23,0
65	MFI-30	30	270	355	573	270	48	125	165	83	123	154	234	250	40	96	171	23,0
	400		387	651	400	38,0												
80	MFI-30	30	270	355	573	270	55,5	125	170	90,5	135,5	175	251	286	40	111	186	24,0
	400		387	651	400	39,0												
100	MFI-30	30	270	355	573	270	65	125	179	100	154	205	295	335	40	130	215	27,0
	400		387	651	400	42,0												
125	MFI-60	60	400	510	888	400	77,5	150	---	112,5	---	245	415	400	70	155	325	61,0

1) Dimension AM only in case of double guiding.

2) The listed weights are valid for valves with round thread connections (except DN 125 with welding ends) and for actuators without valve-positioner.

Max. allowable differential pressure Δdp (bar), with flow against closing direction of valve plug

DN		25 32 40 50 65 80 100 125 150															
Actuator	K _{vs} - allocation to DN	Min. operating air pressure (bar)	Number of springs	Positioning force (kN)	V-Ring Ø N (mm)	17	17	29	29	36	46	54	68	77	96	121	143
					Seat Ø (mm)	11	16	19	24	32	37	48	62	73	90	115	135
					K _v (m ³ /h)	2.5	4.0	7	11	18	26	43	68	100	150	260	380
Function: air to open – spring to close	25 to 50	MFI-20	2.0	3	2.4	← 25 23.5 16.9											
			3.5	6	4.8	← 25											
	65 to 100	MFI-30	2.7	3	2.4	← 20 16.9 9.1 4.7 3											
			4.9	6	4.8	← 20 12.6 8.7											
	65 to 100	MFIII-30	2.0	3	5	← 20 13.3 9.2											
			3.5	6	10	← 20											
			4.2	9	13	← 20											
			4.9	12	16	← 20											
	125 to 150	MFIII-60	2.0	3	5	← 9.2 5.6 3 2											
			3.5	6	10	← 10 7.8 5.5											
			4.1	9	12	← 10 9.8 6.9											
			4.8	12	14	← 10 8.2											
Function: air to close – spring to open	25 to 50	MFI-20	3.0	3	4.8	← 25											
			4.5		9.6	← 25											
			6.0		14.4	← 25											
	65 to 100	MFI-30	3.0	3	4.8	← 20 12.6 8.7											
			4.5		9.6	← 20											
			6.0		14.4	← 20											
	65 to 100	MFIII-30	3.0	3	10.8	← 20											
			4.5		21.6	← 20											
			6.0		32.4	← 20											
	125 to 150	MFIII-60	3.0	3	10.8	← 10 8.6 6											
			4.5		21.6	← 10											
			6.0		32.4	← 10											

The tabulated differential pressure is not applicable to valves with V-ring (soft) sealing.

The max. operating pressure is normally 10 bar. The max. allowable operating pressure may, however, be higher, depending on the type of pipe connection and nominal diameter:

- DN 25 to DN 50 = 25 bar
- DN 65 to DN 100 = 20 bar
- DN 125 and DN 150 = 10 bar

Technical part-numbers for actuator 813 without optional equipment

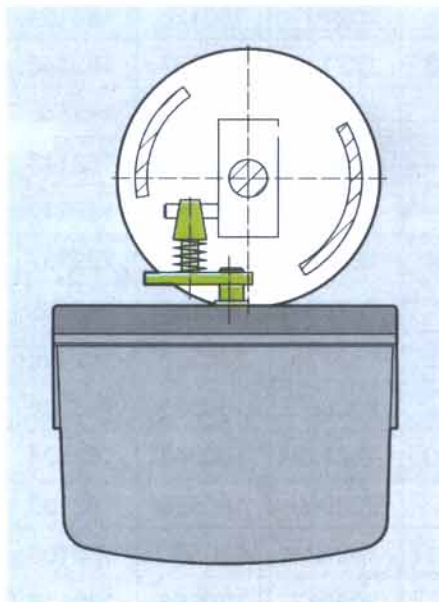
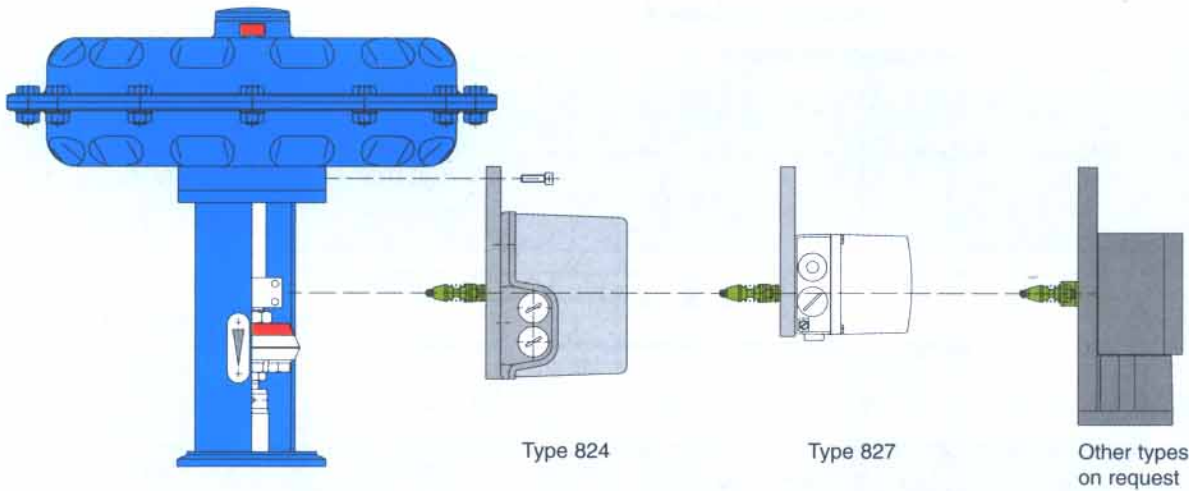
Size of actuator/ Stroke (mm)	Effective diaphragm area (cm)	For valve size DN	Number of springs	Air pressure range (bar)	Function	A	B	C	F
MFI-20	320	25-32	3	0,75-1,5	O	179934	180103	179888	180109
					C	-	200376	179929	180117
			6	1,5-3,0	O	179935	180106	179828	180114
					C	-	202858	177930	180120
MFI-20	320	40-50	3	0,75-1,5	O	180102	180104	180108	180110
					C	-	199294	180116	180118
			6	1,5-3,0	O	180105	181385	180113	181386
					C	-	202859	180119	180121
MFI-30	320	65-80	3	0,75-1,5	O	182075	182168	182078	182173
					C	-	200950	182081	182179
			6	1,5-3,0	O	182077	182169	182079	182174
					C	-	202860	182082	182180
MFI-30	320	100	3	0,75-1,5	O	180123	182172	180125	182177
					C	-	201346	180127	182183
			6	1,5-3,0	O	180124	181472	180126	182178
					C	-	202861	180128	182184
MFIII-30	720	65-80	3	0,7-1,5	O	182083	182131	182087	182142
					C	-	202862	182091	182146
			6	1,5-3,0	O	182084	182132	182088	182143
					C	-	202863	182092	182147
MFIII-30	720	100	3	0,7-1,5	O	180534	182138	180512	182157
					C	-	202864	180517	182163
			6	1,5-3,0	O	180535	182139	180513	182158
					C	-	202865	180518	182164
MFIII-60	720	125	3	0,7-1,5	O	180560	182123	180548	182104
					C	-	202866	180555	182109
			6	1,4-3,0	O	180561	182124	180550	182105
					C	-	202867	180556	182110
			12	2,0-4,3	O	180563	182126	180553	182107
					C	-	202868	180558	182113
MFIII-60	720	150	3	0,7-1,5	O	180576	182127	180568	182114
					C	-	202869	180572	182118
			6	1,4-3,0	O	180577	182128	180569	182115
					C	-	202870	180573	182119
			12	2,0-4,3	O	180579	181473	180571	182117
					C	-	202871	180575	182121

Mounting of Valve Positioner

Solid and vibration-proof mounting of the valve positioners. The positioner can easily be mounted in the simple plug-on mode by which the air supply connection and the stroke pickup are

realised simultaneously and without any extra parts. Exposed and sensitive external pipes and unions are not required. The control air supply from the positioner, as well

as the scavenging air are conducted through internal channels in both mounting plate and yoke of the actuator.



The elements for the stroke pickup of the positioner are protected within the yoke of the actuator. The self-adjusting tapered roller „ARCAPLUG“ provides for a stroke transmission of the actuator spindle without backlash. The spring chamber of design „C“ is additionally scavenged with clean instrument air, which prevents the intake of air from the ambient atmosphere.

