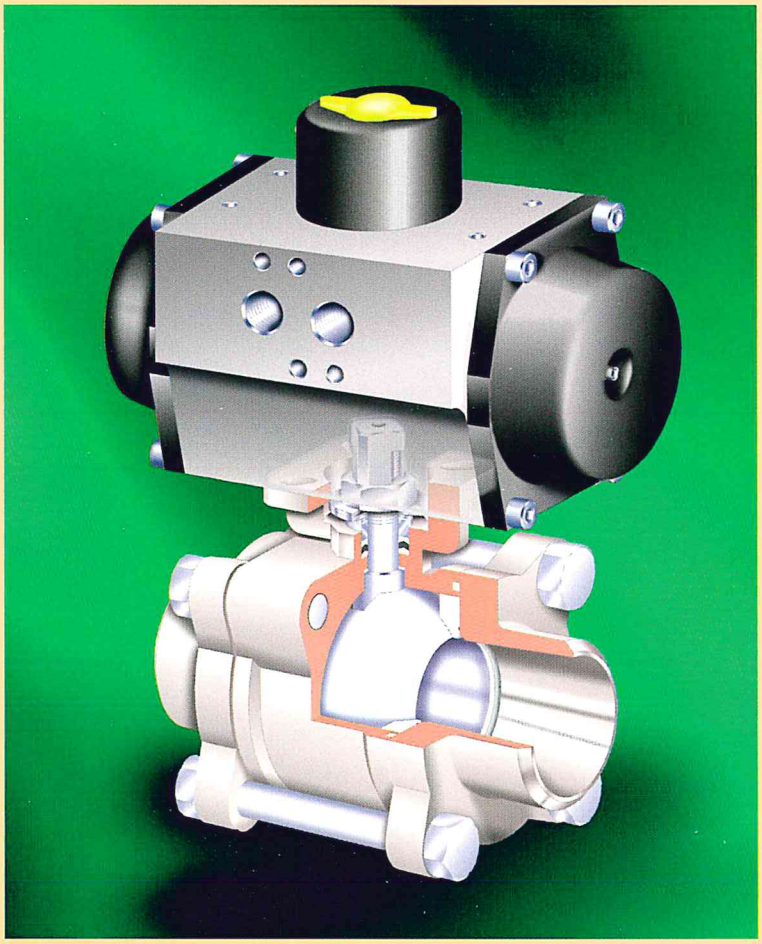
GEFA

PROCESSTECHNIK GMBH

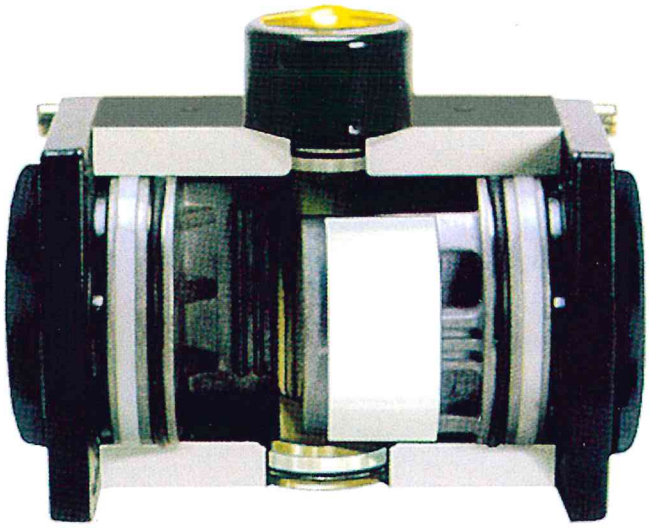


Pneumatic rotary actuators series AP

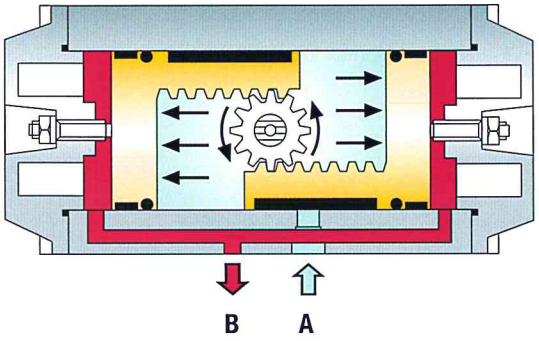
GEFA Pneumatic actuator AP

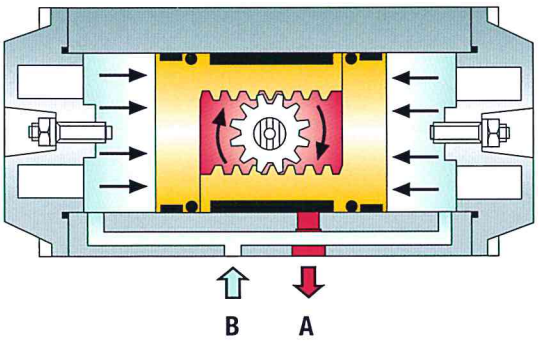
Double acting actuator DA ISO 5211

Function



Counter clockwise output operation is achieved by inserting pressure into Port **A** to force the pistons apart thus rotating the actuator pinion counter clockwise. During this operation, air from the outer chambers is exhausted through Port **B**. Clockwise output operation is achieved by reverse of the above and inserting pressure into Port **B**.





Data required for actuator sizing

1. Valve torque
   (min. 25% safety recommended)
2. Double acting or spring return operation
3. Minimum operating pressure available

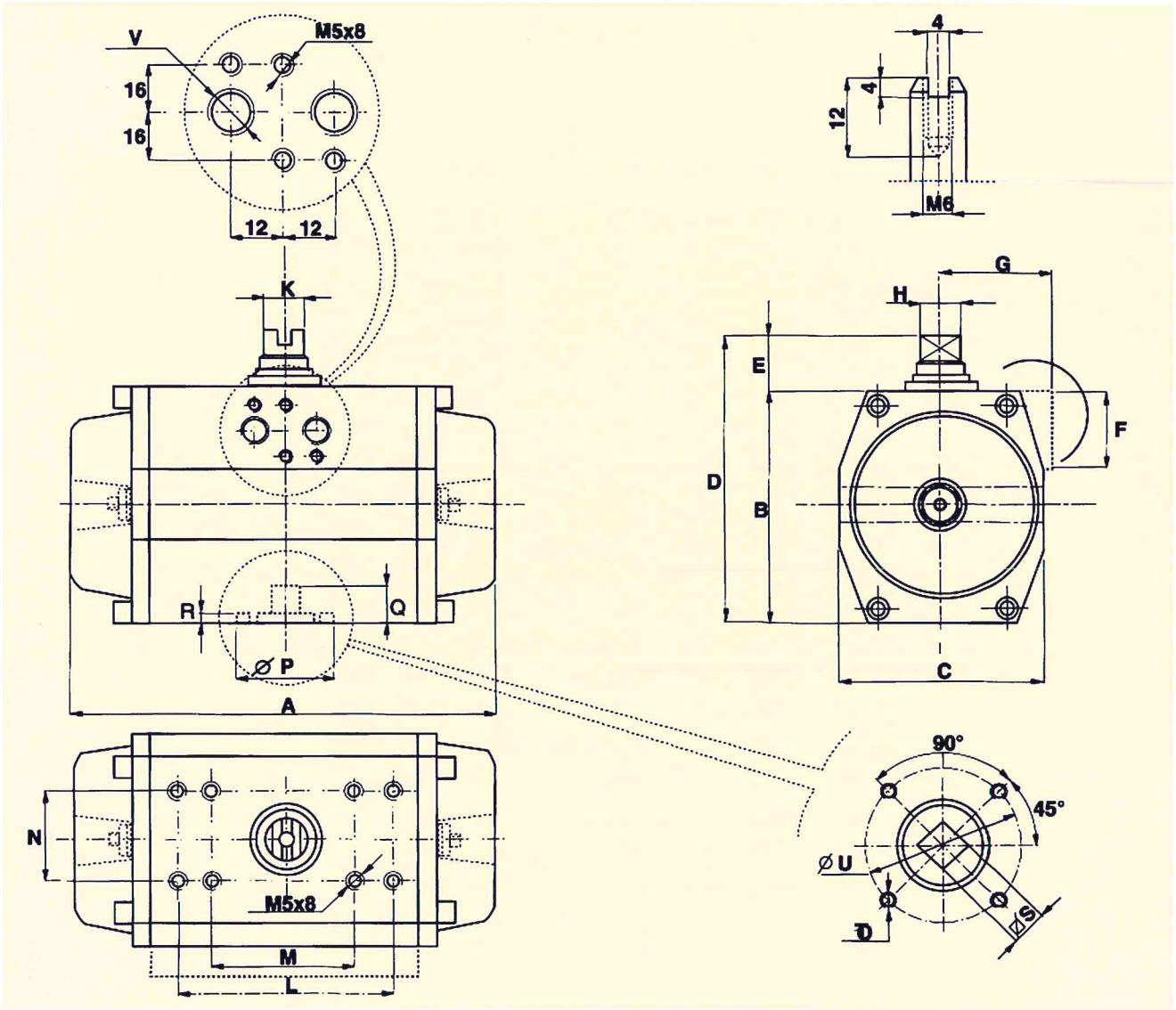
Selection of double acting actuators (DA)

Determine the required valve torque, this should include 25% safety margin, and the minimum operating pressure available. Refer to the pressure/torque table and select the minimum pressure column applicable. Follow this column down until a value not less than that required is found. Next read across to the left hand column and select the model number to be taken.

Example: Valve torque 80 Nm plus 25% = 100 Nm, minimum operating pressure 5 bar. Following the 5 bar column down the closest value is 119 Nm. The model number shown in the left hand column is AP4 DA.

Remark: The torque of the actuator must not be less than the requested torque of the valve.

Actuator	bar	2	3	4	5	6	7	8
AP1 DA	Nm	5.9	8.9	11.8	14.8	17.7	21.7	24.8
AP2 DA	Nm	9.4	14.1	18.8	23.5	28.2	32.9	37.6
AP3 DA	Nm	20	30	40	50	60	70	80
AP3.5 DA	Nm	34	51	68	85	102	119	136
AP4 DA	Nm	48	71	95	119	142	168	192
AP4.5 DA	Nm	87.2	130.8	174.4	218	261.6	305.2	348.8
AP5 DA	Nm	111	167	222	278	333	388.5	444
AP5.5 DA	Nm	157.6	236.4	315.3	394.1	473	551.8	630.6
AP6 DA	Nm	227	340	454	567	680	794.5	908
AP8 DA	Nm	426	638	851	1064	1276	1491	1704



Technical data

Parts / Materials

Description	Qty	Material	Description	Qty	Material
Body	1	aluminium with hard-coat protection	Piston guide	2	acetal resin
Piston	2	aluminium	Piston guide ring	2	acetal resin
End cap	2	aluminium, Epoxy-coated	O-ring	2	NBR
Pinion	1	steel, nickel-plated			

Temperature range

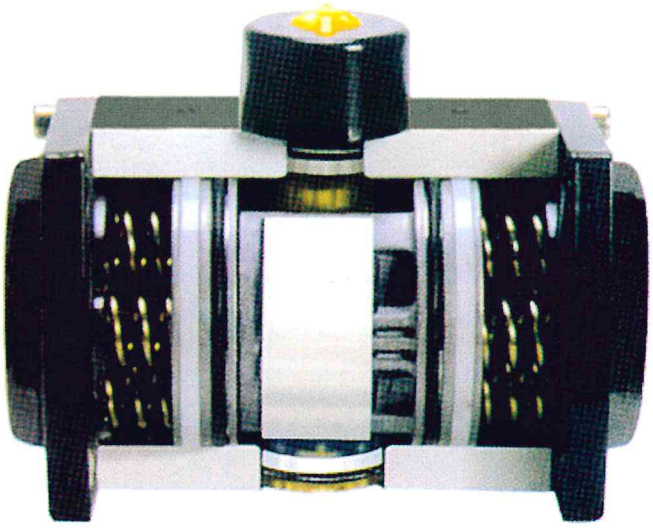
standard execution: -20 °C – +80 °C Option: high temperature version +20 °C – +150 °C

Dimensions

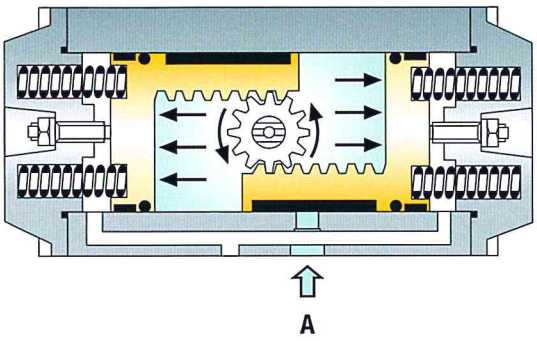
Actuator type	A	B	C	D	E	F	G	H	K	L	M	N	P f8	Q	R	S H11	T	U	V	ISO 5211
mm																				
AP1 DA/SR	137	67	60	87	20	42	41	12	8	-	80	30	25	10	2	9	M5	36	1/8"	F 03 / F 05
AP2 DA/SR	150	83	73	103	20	42	44.5	12	8	-	80	30	35	12	2	11	M5	42	1/4"	F 04 / F 05
AP3 DA/SR	204	100	85	120	20	50	49.5	14	10	-	80	30	35	16	3	14	M6	50	1/4"	F 05 / F 07
AP3.5 DA/SR	230	110	98	130	20	50	53	19	14	-	80	30	55	20	3.5	17	M8	70	1/4"	F 07
AP4 DA/SR	271	125	110	145	20	50	58	19	14	-	80	30	55	20	3.5	17	M8	70	1/4"	F 07 / F 10
AP4.5 DA/SR	305	142	128	172	30	58	69	28	20	130	80	30	70	24	3.5	22	M10	102	1/4"	F 10
AP5 DA/SR	360	155	140	185	30	-	-	28	20	130	80	30	70	24	3.5	22	M10	102	1/4"	F 10
AP5.5 DA/SR	380	176	160	206	30	-	-	36	28	130	80	30	85	29	3.5	27	M12	125	1/4"	F 12
AP6 DA/SR	462	200	175	230	30	-	-	36	28	130	80	30	85	29	3.5	27	M12	125	1/4"	F 12
AP8 DA/SR	555	250	215	300	50	-	-	48	32	130	-	30	100	38	5	36	M16	140	1/4"	F 14

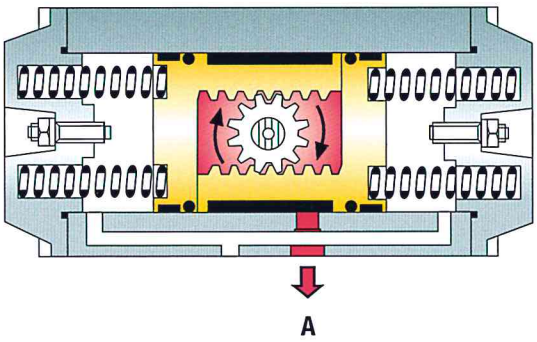
Actuator	No. of springs	Spring Stroke Nm		Operating pressure (bar)									
				3 bar		4 bar		5 bar		6 bar		7 bar	
		90°	0°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
	4	3.5	2.4	6.5	5.4	9.4	8.3	12.4	11.3	15.3	14.2	19.3	18.2
	6	5.2	3.6	5.3	3.7	8.2	6.6	11.2	9.6	14.1	12.5	18.1	16.5
AP1 SR	8	7.0	4.8	4.1	1.9	7	4.8	10	7.8	12.9	10.7	16.9	14.7
	10	8.7	6	=	=	3.1	2.7	8.8	6.1	11.7	9.0	15.7	13.0
	12	10.5	7.2	=	=	=	=	7.6	4.3	10.5	7.2	14.5	11.2
	4	5.6	3.8	10.3	8.5	15.0	13.2	19.7	17.9	24.4	22.6	29.1	27.3
	6	8.4	5.7	8.4	5.7	13.1	10.4	17.8	15.1	22.5	19.8	27.2	24.5
AP2 SR	8	11.2	7.6	=	=	11.2	7.6	15.9	12.3	20.6	17.0	25.3	21.7
	10	14.0	9.5	=	=	=	=	14.0	9.5	18.7	14.2	23.4	18.9
	12	16.8	11.4	=	=	=	=	12.1	6.7	16.8	11.4	21.5	16.1
	4	12.0	8.0	22.0	18.0	32.0	28.0	42.0	38.0	52.0	48.0	62.0	58.0
	6	18.0	12.0	18.0	12.0	28.0	22.0	38.0	32.0	48.0	42.0	58.0	52.0
AP3 SR	8	24.0	16.0	=	=	24.0	16.0	34.0	26.0	44.0	36.0	54.0	46.0
	10	30.0	20.0	=	=	=	=	30.0	20.0	40.0	30.0	50.0	40.0
	12	36.0	24.0	=	=	=	=	26.0	14.0	36.0	24.0	46.0	34.0
	4	21.0	9.5	41.5	30.0	58.5	47.0	75.5	64.0	92.5	81.0	109.5	98.0
	6	31.0	19.0	32.0	20.0	49.0	37.0	66.0	54.0	83.0	71.0	100.0	88.0
AP3.5 SR	8	48.0	25.0	=	=	43.0	20.0	60.0	37.0	77.0	54.0	94.0	71.0
	10	52.0	32.0	=	=	=	=	53.0	33.0	70.0	50.0	87.0	67.0
	12	63.0	38.0	=	=	=	=	47.0	22.0	64.0	39.0	81.0	56.0
	4	28.6	18.3	52.7	42.4	76.7	66.4	100.7	90.4	123.7	113.4	149.7	139.4
	6	43.0	28.0	43.0	28.0	67.0	52.0	91.0	76.0	114.0	99.0	140.0	125.0
AP4 SR	8	57.0	37.0	=	=	58.0	38.0	82.0	62.0	105.0	85.0	131.0	111.0
	10	72.0	46.0	=	=	=	=	73.0	47.0	96.0	70.0	122.0	96.0
	12	86.0	55.0	=	=	=	=	64.0	33.0	87.0	56.0	113.0	82.0
	4	53.3	34	96.8	77.5	140.4	121.1	184	164.7	227.6	208.3	271.2	251.9
	6	79.9	51	79.8	50.9	123.4	94.5	167	138.1	210.6	181.7	254.2	225.3
AP4,5 SR	8	106.6	68	62.8	24.2	106.4	67.8	150	111.4	193.6	155	237.2	198.6
	10	133.3	85	=	=	89.4	41.1	133	84.7	176.6	128.3	220.2	171.9
	12	160	102	=	=	72.4	14.4	116	58	159.6	101.6	203.2	145.2
	4	67.6	43.3	123.7	99.4	178.7	154.4	234.7	210.4	289.7	265.4	345.2	320.9
	6	101.0	64.0	103.0	66.0	158.0	121.0	214.0	177.0	269.0	232.0	324.5	287.5
AP5 SR	8	135.0	86.0	=	=	136.0	87.0	192.0	143.0	247.0	198.0	302.5	253.5
	10	169.0	108.0	=	=	=	=	170.0	109.0	225.0	164.0	280.5	219.5
	12	203.0	130.0	=	=	=	=	148.0	75.0	203.0	130.0	258.5	185.5
	4	100	56.6	176.2	132.8	258.7	215.3	337.5	294.1	416.4	373	495.2	451.8
	6	150	84.9	147.9	82.8	230.4	165.3	309.2	244.1	388.1	323	466.9	401.8
AP5,5 SR	8	200	113.3	119.5	32.8	202	115.3	280.8	194.1	359.7	273	438.5	351.8
	10	250	141.6	=	=	173.7	65.3	252.5	144.1	331.4	223	410.2	301.8
	12	300	170	=	=	145.3	15.3	224.1	94.1	303	173	381.8	251.8
	4	140.0	83.0	257.0	200.0	371.0	314.0	484.0	427.0	597.0	540.0	711.5	654.5
	6	210.0	125.0	215.0	130.0	329.0	244.0	442.0	357.0	555.0	470.0	669.5	584.5
AP6 SR	8	280.0	167.0	=	=	287.0	174.0	400.0	287.0	513.0	400.0	627.5	514.5
	10	350.0	209.0	=	=	=	=	358.0	217.0	471.0	330.0	585.5	444.5
	12	420.0	251.0	=	=	=	=	316.0	147.0	429.0	260.0	543.5	374.5
	4	252.0	160.0	478.0	386.0	691.0	599.0	904.0	812.0	1116.0	1024.0	1331.0	1239.0
	6	378.0	240.0	398.0	260.0	611.0	473.0	824.0	686.0	1036.0	898.0	1251.0	1113.0
AP8 SR	8	504.0	320.0	=	=	531.0	347.0	744.0	560.0	956.0	772.0	1171.0	987.0
	10	630.0	400.0	=	=	=	=	664.0	434.0	876.0	646.0	1091.0	861.0
	12	756.0	480.0	=	=	=	=	584.0	308.0	796.0	520.0	1011.0	735.0

Spring return actuator SR ISO 5211



Pressure applied to Port **A** will cause the inner chambers to be pressurized, forcing the pistons outward to compress the springs. The pinion is rotated counter clockwise. Upon release of pressure through Port **A** the springs will exert pressure to close the pistons and rotate the pinion clockwise rapidly. **This action will often be used to close a 90° turn valve in shutdown mode.**

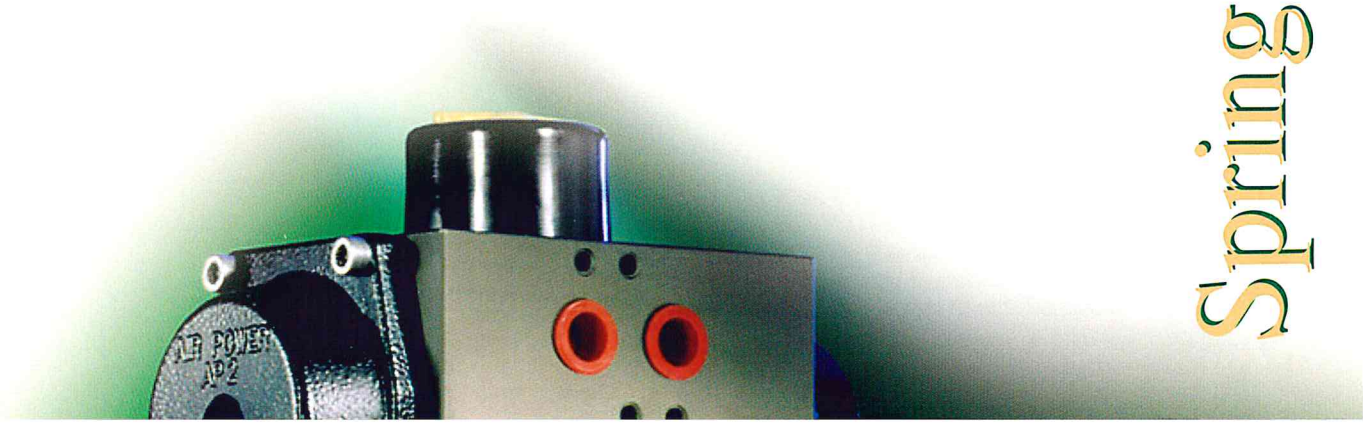




Selection of spring return actuators (SR)

Determine the required valve torque (include 25° safety margin), and the minimum operating pressure available. Select from the „Spring Stroke“ / „0°“ table a value that is not less than the required valve torque (including safety margin). Next refer to the pressure table and select under your minimum pressure and „0°“ torque column, a figure not less than that required (including safety margin).

Example: Valve torque 60 Nm plus 25% = 75 Nm. Checking the „Spring Stroke“ / „0°“ column, it will be noted that the nearest value is 85 Nm. By following the line across to the vertical 5 bar „90°“ torque column, a figure of 84,7 Nm is shown. The suitable actuator is the AP4,5 SR. If the torque of the actuator is too low, select the next larger actuator. The value „Spring Stroke“ / „0°“ must be higher than the torque of the valve.



Technische Daten

Compressed air

Actuator	Counter clockwise	Clockwise (DA only)
	Litre	Litre
AP1 DA/SR	0.08	0.10
AP2 DA/SR	0.12	0.16
AP3 DA/SR	0.24	0.44
AP3.5 DA/SR	0.48	0.56
AP4 DA/SR	0.68	0.96
AP4.5 DA/SR	1.0	1.6
AP5 DA/SR	1.4	2.16
AP5.5 DA/SR	1.6	2.56
AP6 DA/SR	3.2	4
AP8 DA/SR	5.3	8.6

Weights

Actuator	DA Kg	SR Kg
AP1	0.85	1.08
AP2	1.62	1.74
AP3	2.92	3.16
AP3.5	4.18	4.66
AP4	5.86	6.34
AP4.5	8.6	9.8
AP5	11.18	13.1
AP5.5	15.2	18.8
AP6	21.2	24.6
AP8	43	54.5

Specification

Operating pressure
2 – 8 bar double acting
3 – 8 bar spring return
max. operating pressure 10 bar

Medium
Dry or lubricated air, inert gas, water or light hydraulic oil

Temperature
Standard -20 °C to + 80 °C
On demand +20 °C to +150 °C

Adjustment
90°stroke which can be adjusted +/-3°

Lubrication
All moving parts are factory lubricated for cycle life

Construction
Suitable for indoor and outdoor use

Connections
Bottom drilling acc. to ISO 5211/DIN 3337 interface for solenoid valve, top and shaft and top drilling to assemble accessories acc. to VDI/VDE 3845, NAMUR

Inspection
Each unit is tested

TÜV CERT EN ISO 9001

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