

# twintorque®

The new pneumatic actuator

The result of 35 years experience

## The result of 35 years experience

Welcome to airpower europe! We are proud to present you the new actuator twintorque®, a new concept in the field of actuators. Now is the best time to profit from 35 years of experience in the field of actuating technology and periphery accessories as well as automation and process engineering.

### Let's get things moving!

As a completely independent company, we have the capability to offer extensive and professional consulting and support in process engineering with customer service. Talks are tailor-made to and revolve around your specific requirements; unbiased and with the aim of reaching an optimum cost-benefit-ratio together.

Personal contact to you is of most importance.

**Your needs are our commitment.**



Peter Willscheid



Peter Hessling



Linked with the Technology Center in Rheinbreitbach we have all the possibilities for technical implementation of your requirements. Adherence to standards is an integral part of our activities. As well as the completion of actuators and the valve. Our flexible approach to your specific wishes is aimed at lightening your workload.

**Your absolute satisfaction is our goal.**



### Gains to be made with airpower

Technically mature product know-how, constructed and produced according to international standards, guarantees absolute safety. The most important advantages and benefits in the deployment of twin-torque actuators have been put together and listed on page 4. We also assume that it is right that you always have access to our extensive know-how and experience in valve control technology- when and where you need it.

### Let's work together and talk technology.

Get to know our know-how...

we are only 50 cm away:

Tel.: + 49 (0) 22 24 / 98 83 20.

Looking forward to your call!

### Your ape product range:


- Pneumatic actuators
- wide-ranging accessories program for all actuator interfaces.
- Assembly and mounting service
- Industrial Valves


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## Advantages

### Construction features

Same dimensions for the double & single-acting actuators with 90° pivoting angle. 180° pivoting angle Adjustable from 180° to 120°.

### Position indicator

The position indicator is mounted onto the actuator in such a way that it does not interfere with the NAMUR interface and thereby according to VDI/VDE 3847

### End position setting

About two independently functioning adjustment can be separately adjusted in a range from +5 ° to -5 ° on the screw types APD/APS-040-351 the two end positions.

### Stroke limiter

In addition to the final positions of the twin torque has for types APD/APS-050-210 standard with a stroke limit adjustment in one direction (opening or closing). This means the rated pivoting angle can be adjusted in a range of +5° to -30°.

**Corrosion protection:** Housing and Caps Aluminium housing is hard-anodised and additionally from the outside powder-coated. Caps in die-cast aluminium is likewise powder-coated.

**Corrosion protection:** Piston Aluminium die-cast pistons are hard anodised.

**Corrosion protection:** airpower-safety-springs Captive springs are plastic-coated.

### O-Rings and bearings

Standard seals deployable from -35° bis +80° C.

### ISO-Flange patterns

Multiple ISO-Flange patterns per actuator size.

### Silicon-free

## Benefits

- Low capital lockup because only double-acting actuators have to be kept in stock and single-acting actuators can be made by simply installing the springs.
- Simple, safe handling through the use of captive, pre-stressed springs.
- Covers a very wide range of applications.

- Use of cost-efficient standardised components.
- Quicker, less expensive mounting of signal units.
- Indicators can be seen from long distances.

- Butterfly valves: discs only need to touch the seal and the valve is closed.
- Longer service life through low wear. Low torque and low cost choice of actuator.
- Ball and plug valves: opened position of the ball, i.e. plug can be adjusted exactly.
- Avoids turbulent flow of the medium and cavitations.

- The additional stroke limitation means the amount of flow can be reproducibly set for butterflies and seals.
- Savings in costs, as special solutions are simply not needed [e.g. special switching cams or electrical solutions]

- Deployment possibilities in almost all situations, especially in critical environments.

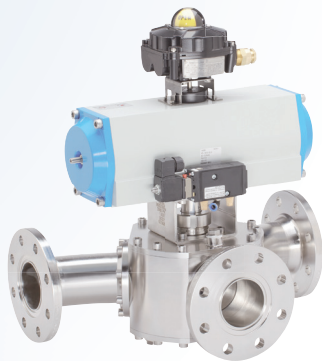
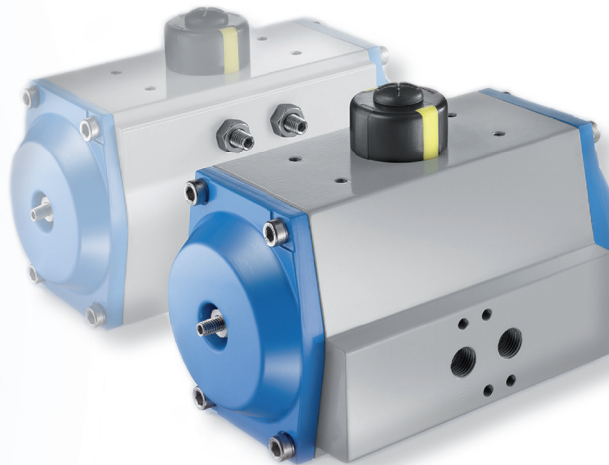
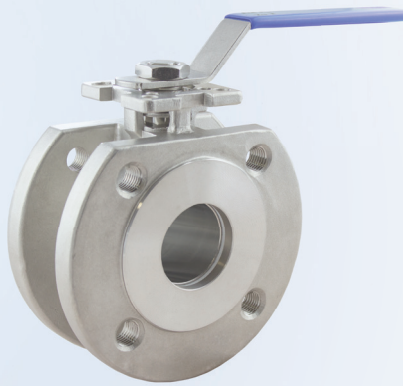
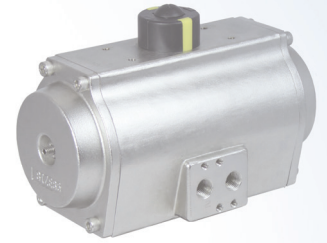
- Functional security even when using critical control device.

- Good corrosion protection ensures good service life.
- From APS-070 non-ferrous metal.
- Reduced service & maintenance costs.
- No danger of accidents.

- Wide temperature range.
- Cost-effective maintenance via easy exchange of seals and wearing parts.

- Costs-savings through flexible automation of valves.

- Application also in locations where Silicon is not permitted for one reason or another, e.g. in paint spraying shops.



## Technical Data

	Standard model	Optional extras
<b>Design/construction</b>	Double-piston actuator acc. to the rack and pinion principle with self-centering piston guide in housing, single-acting: with captive springs	3-position actuator ( 3P )
<b>Construction features</b>	Pneumatic double-piston – actuator Type APD = double-acting Type APS = single-acting	
<b>Positioning</b>	Optional	
<b>Standards</b>	Interface actuator signal unit: acc. to VDI/VDE 3845 (Namur) Interface actuator / control valve: acc. to Namur i.e. VDI/VDE 3845 Interface actuator / valve: 4 i.e. 8 internal threads in housing as well as Pinion with internal 4 sided (8-sided) acc. to EN ISO 5211	Other interface dimensions possible  Option of pinion with inner double-D acc. to customer wishes Inner double-D acc. to EN ISO 5211
<b>Guidelines</b>	ATEX-94/9/EG, EG-Machine Guidelines 2006/42/EG, CE GOST	
<b>Materials</b>	Housing: Al-alloy, hard anodised, outside PE-coated Caps: Al-alloy, PE-coated Piston: Al-alloy, hard-anodised (APD/S-040-210), APD/S-240-400 steel coated Pinion: Steel, corrosion protected (C-Steel AISI 1045) Seals: NBR (Perbunan) Bearing: Plastic, POM Screws: Stainless steel, AISI 304	Other housing coatings  Pinion: stainless steel AISI 304 or 316
<b>Ambient temperature</b>	-35° to +80°C	High temperature model: -15° to +140°C Low temperature model: -50° to +70°C
<b>Rated pivoting angle</b>	Double & single-acting: 90°, adjustable from +5° to -5° additional one direction: adjustable +5° to -30° (not at type APD/S-240-350)	180° rotation: 180° to 120° adjustable
<b>Torque</b>	2,4 Nm to 13.022 Nm	Higher torque
<b>Control pressure</b>	2 to 10 bar	Higher control pressure upon request
<b>Control medium/ quality</b>	Filtered air minimum acc. to DIN/ISO 8573-1 Class 4	Other non-aggressive, gaseous or liquid media

## Criteria for actuator selection

	Examples of selection	
Which mode of operation for the actuator is required?	<b>Double</b> In case of an air-loss there is no safety position required	<b>Single-acting (spring return)</b> Required safety position in case of an air-loss
Minimum control pressure at actuator?	Minimum control pressure = 5 bar	Minimum control pressure = 5 bar
What is the break away torque in Nm for the valve?	Manufacturer's break away torque for valve = 40 Nm	Manufacturer's break away torque for valve = 35 Nm
Is the break away torque with or without safety factor?	Safety factor (+ 20%) 40 Nm + 20% = 48 Nm	Safety factor (+ 20%) 35 Nm + 20% = 42 Nm
Selection of results	The double-acting actuator, which at 5 bar control pressure reaches a minimum 48 Nm, is the <a href="#">APD-070</a>	The single-acting actuator, which at 5 bar control pressure reaches a minimum 42 Nm, is the <a href="#">APS-90-10</a>

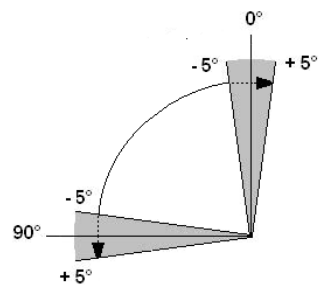
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## Function double-acting

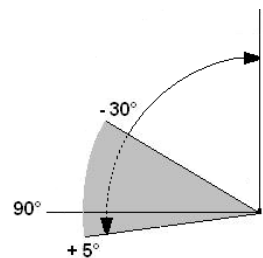
When pressure is applied to connection "2", both pistons move apart from their basic position of  $0^\circ$  and move into the  $90^\circ$  switch position.

The force from both pistons is transferred onto the pinion „C“ via the toothed rack.  
If the pistons are given pressure through the connection "4", then both pistons move together into the basic position  $0^\circ$ .



### End position adjustment APD - 040 - 351

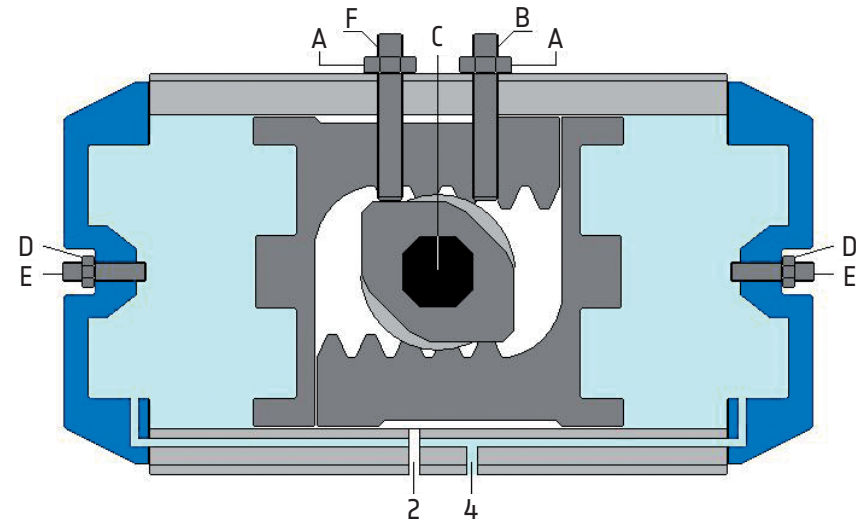
The pivoting angle can be adjusted in both end positions with the adjustment screws "B" and "F" in a pressure-free condition by between  $+5^\circ$  and  $-5^\circ$ . The lock-nuts "A" ensure that the new position is secured.



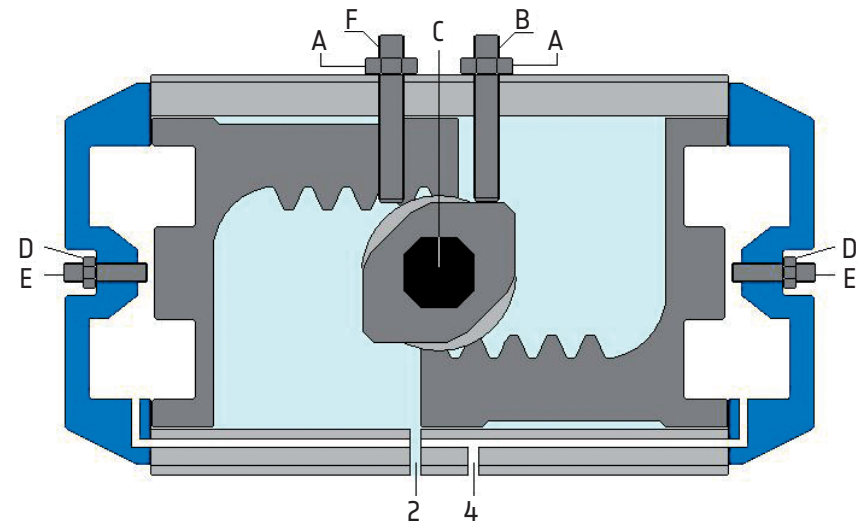
### Stroke limiting APD - 050-210 + 400

The rated pivoting angle can be set in the switch position with the setting screws "E" in a pressure-free condition by between  $+5^\circ$  and  $-30^\circ$ . The lock-nuts "D" ensure that the new position is secured.

### Basic position $0^\circ$



### Switch position $90^\circ$





## Torque-table double-acting, Type APD (Nm)

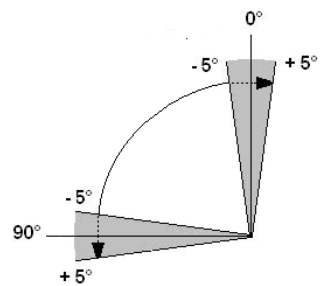
Actuator type	Control pressure Pst (bar)										
	2	2,5	3	3,5	4	4,5	5	5,5	6	7	8
APD - 040	4,8	6	7,2	8,4	9,6	10,8	12	13,2	14,4	16,8	19,2
APD - 050	8	10	12	14	16	18	20	22	24	28	32
APD - 060	14	18	22	25	29	32	36	40	43	50	58
APD - 070	20	25	30	35	40	45	50	55	60	70	80
APD - 080	31	39	47	55	62	70	78	86	94	109	125
APD - 090	45	57	68	79	91	102	114	125	136	159	182
APD - 110	66	82	99	115	132	148	165	181	197	230	263
APD - 130	103	128	154	180	205	231	257	282	308	359	410
APD - 140	175	219	263	307	351	395	439	482	526	614	702
APD - 160	267	334	401	468	534	601	668	735	802	935	1069
APD - 190	431	539	646	754	862	969	1077	1185	1292	1508	1723
APD - 210	526	658	789	921	1052	1184	1315	1447	1578	1841	2104
APD - 240	773	966	1160	1353	1546	1739	1933	2126	2319	2706	3092
APD - 270	1174	1468	1761	2054	2349	2642	2936	3229	3523	4110	4697
APD - 301	1526	1908	2289	2670	3052	3434	3815	4197	4578	5341	6104
APD - 351	2285	2856	3427	3998	4570	5141	5712	6283	6854	7997	9139
APBD - 400	3256	4069	4883	5697	6511	7325	8139	8953	9767	11394	13022

## Function single-acting

When pressure is applied to connection „2“, both pistons move apart from their basic position of  $0^\circ$ , move into the  $90^\circ$  switch position and compress the springs.

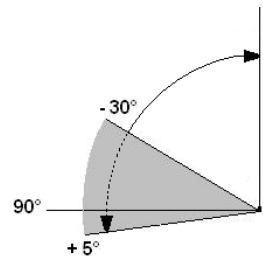
Release the pressure in the inner chamber through connection „4“, the springs push back the pistons into the  $0^\circ$  basic position.

The number of springs ( 4 up to 16 pieces ), must be matched to the control pressure beforehand.



### End position adjustment APS - 050 - 351

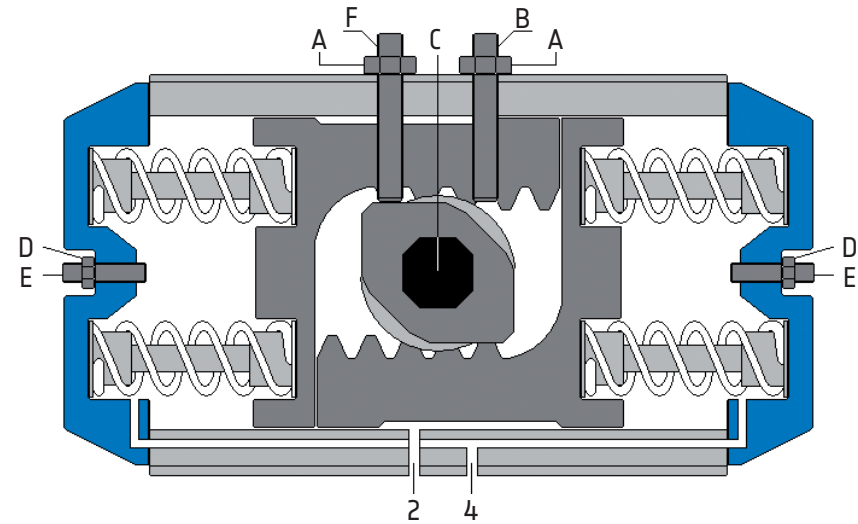
The pivoting angle can be adjusted in both end positions with the adjustment screws „B“ and „F“ in a pressure-free condition by between  $+5^\circ$  and  $-5^\circ$ . The lock-nuts „A“ ensure that the new position is secured.



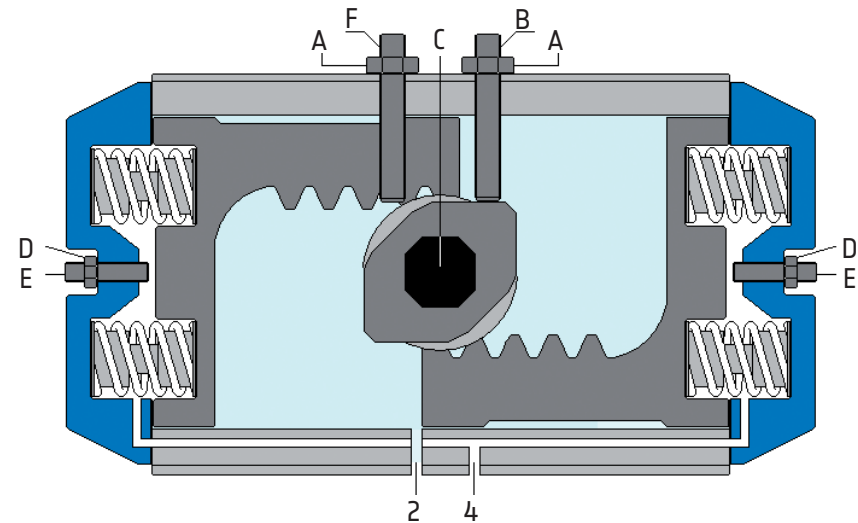
### Stroke limiting APS - 050-210 + 400

The rated pivoting angle can be set in the switch position with the setting screws „E“ in a pressure-free condition by between  $+5^\circ$  and  $-30^\circ$ . The lock-nuts „D“ ensure that the new position is secured.

## Basic position $0^\circ$



## Switch position $90^\circ$



## Torque-tables - single-acting, Type APS (Nm)

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
				min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APS-050	4	3,1	4,7	<b>3,3</b>	<b>5,3</b>	5,3	7,3																
	5	4,2	6,2	1,8	3,8	<b>3,8</b>	<b>5,8</b>	5,8	7,8														
	6	5,1	7,4			2,6	4,9	<b>4,6</b>	<b>6,9</b>	6,6	8,9												
	7	5,9	8,6					3,4	6,1	<b>5,4</b>	<b>8,1</b>	7,4	10,1										
	8	6,8	9,9							4,1	7,2	<b>6,1</b>	<b>9,2</b>	8,1	11,2								
	9	7,6	11,1									4,9	8,4	<b>6,9</b>	<b>10,4</b>	8,9	12,4						
	10	8,5	12,4											5,6	9,5	<b>7,6</b>	<b>11,5</b>	9,6	13,5				
	11	9,3	13,6													6,4	10,7	<b>8,4</b>	<b>12,7</b>	10,4	14,7		
12	10,1	14,8															7,2	11,9	<b>9,2</b>	<b>13,9</b>	13,2	17,9	

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
				min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APS-060	4	5,4	8,3	<b>6,1</b>	<b>9,0</b>	9,7	12,6																
	5	6,8	10,4	4,0	7,6	<b>7,6</b>	<b>11,2</b>	11,2	14,8														
	6	8,2	12,5			5,5	9,8	<b>9,1</b>	<b>13,4</b>	12,7	17,0												
	7	9,6	14,6					7,0	12,0	<b>10,6</b>	<b>15,6</b>	14,2	19,2										
	8	10,9	16,7							8,5	14,3	<b>12,1</b>	<b>17,9</b>	15,7	21,5								
	9	12,3	18,8									10,0	16,5	<b>13,6</b>	<b>20,1</b>	17,2	23,7						
	10	13,7	20,9											11,5	18,7	<b>15,1</b>	<b>22,3</b>	18,7	25,9				
	11	15,0	22,9													13,1	21,0	<b>16,7</b>	<b>24,6</b>	20,3	28,2		
12	16,4	25,0															14,6	23,2	<b>18,2</b>	<b>26,8</b>	25,4	34,0	

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
				min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APS-070	4	8,4	11,6	<b>8,4</b>	<b>11,6</b>	13,4	16,6																
	5	10,5	14,5	5,5	9,5	<b>10,5</b>	<b>14,5</b>	15,5	19,5														
	6	12,7	17,4			7,6	12,3	<b>12,6</b>	<b>17,3</b>	17,6	22,3												
	7	14,8	20,3					9,7	15,2	<b>14,7</b>	<b>20,2</b>	19,7	25,2										
	8	16,9	23,2							11,8	18,1	<b>16,8</b>	<b>23,1</b>	21,8	28,1								
	9	19,0	26,1									13,9	21,0	<b>18,9</b>	<b>26,0</b>	23,9	31,0						
	10	21,1	29,0											16,0	23,9	<b>21,0</b>	<b>28,9</b>	26,0	33,9				
	11	23,2	31,9													18,1	26,8	<b>23,1</b>	<b>31,8</b>	28,1	36,8		
12	25,3	34,7															20,3	29,7	<b>25,3</b>	<b>34,7</b>	35,3	44,7	

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
				min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APS-080	4	12,6	18,4	<b>12,8</b>	<b>18,6</b>	20,6	26,4																
	5	15,8	23,0	8,2	15,4	<b>16,0</b>	<b>23,2</b>	23,8	31,0														
	6	19,0	27,6			11,4	20,0	<b>19,2</b>	<b>27,8</b>	27,0	35,6												
	7	22,1	32,2					14,6	24,7	<b>22,4</b>	<b>32,5</b>	30,2	40,3										
	8	25,3	36,8							17,8	29,3	<b>25,6</b>	<b>37,1</b>	33,4	44,9								
	9	28,5	41,4									21,0	33,9	<b>28,8</b>	<b>41,7</b>	36,6	49,5						
	10	31,6	46,0											24,2	38,6	<b>32,0</b>	<b>46,4</b>	39,8	54,2				
	11	34,8	50,6													27,4	43,2	<b>35,2</b>	<b>51,0</b>	43,0	58,8		
12	38,0	55,2															30,6	47,8	<b>38,4</b>	<b>55,6</b>	54,0	71,2	

Bold blue numbers = Priority choice

## Torque-tables - single-acting, Type APS (Nm)

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																					
				2		2,5		3		3,5		4		4,5		5		5,5		6		7			
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
APS-090	4	18,6	27,5	17,9	26,8	29,2	38,1																		
	5	23,3	34,4	11,0	22,1	22,4	33,5	33,7	44,8																
	6	28,0	41,0			15,8	28,8	27,1	40,1	38,5	51,5														
	7	32,7	48,1					20,0	35,4	31,4	46,8	42,7	58,1												
	8	37,3	55,0							24,5	42,2	35,8	53,5	47,2	64,9										
	9	42,0	61,9									28,9	48,8	40,3	60,2	51,6	71,5								
	10	46,7	68,7											33,5	55,5	44,8	66,8	56,2	78,2						
	11	51,4	75,6													37,9	62,1	49,3	73,5	60,6	84,8				
	12	56,0	82,5															42,4	68,9	53,7	80,2	76,4	102,9		

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																					
				2		2,5		3		3,5		4		4,5		5		5,5		6		7			
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
APS-110	4	25,3	39,4	26,4	40,5	42,9	57,0																		
	5	31,6	49,2	16,6	34,2	33,1	50,7	49,5	67,1																
	6	38,0	59,1			23,2	44,3	39,6	60,7	56,1	77,2														
	7	44,3	69,9					28,8	54,4	45,3	70,9	61,7	87,3												
	8	50,6	78,7							36,5	64,6	52,9	81,0	69,4	97,5										
	9	56,9	88,6									43,0	74,7	59,5	91,2	75,9	107,6								
	10	63,3	98,4											49,7	84,8	66,1	101,2	82,6	117,7						
	11	69,6	108,3													56,2	94,9	72,7	111,4	89,1	127,8				
	12	75,9	118,1															62,9	105,1	79,3	121,5	112,2	154,4		

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																					
				2		2,5		3		3,5		4		4,5		5		5,5		6		7			
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
APS-130	4	41,9	62,7	39,9	60,7	65,5	86,3																		
	5	52,4	78,4	24,2	50,2	49,9	75,9	75,5	101,5																
	6	62,8	94,1			34,2	65,5	59,8	91,1	85,5	116,8														
	7	73,3	109,7					44,2	80,6	69,9	106,3	95,5	131,9												
	8	83,8	125,4							54,2	95,8	79,8	121,4	105,5	147,1										
	9	94,2	141,1									64,1	111,0	89,8	136,7	115,4	162,3								
	10	104,7	156,8											74,1	126,2	99,7	151,8	125,4	177,5						
	11	115,2	172,4													84,1	141,3	109,8	167,0	135,4	192,6				
	12	125,7	188,1															94,1	156,5	119,7	182,1	171,0	233,4		

Bold blue numbers = Priority choice

## Torque-tables - single-acting, Type APS (Nm)

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																					
		min	max	2		2,5		3		3,5		4		4,5		5		5,5		6		7			
APS-140	4	68,6	103,2	72,2	106,8	116,1	150,6																		
	5	85,8	129,0	46,4	89,6	90,3	133,5	134,1	177,3																
	6	102,9	154,8			64,5	116,4	108,3	160,2	152,2	204,1														
	7	120,1	180,5					82,6	143,0	126,5	186,9	170,3	230,7												
	8	137,3	206,3							100,7	169,7	144,5	213,5	188,4	257,4										
	9	154,4	232,1									118,7	196,4	162,6	240,3	206,4	284,1								
	10	171,6	257,9											136,8	223,1	180,6	266,9	224,5	310,8						
	11	188,7	283,7													154,8	249,8	198,7	293,7	242,5	337,5				
	12	205,9	309,5															172,9	276,5	216,7	320,3	304,4	408,0		

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																					
		min	max	2		2,5		3		3,5		4		4,5		5		5,5		6		7			
APS-160	4	111,7	166,6	100,6	155,4	167,4	222,2																		
	5	139,7	208,3	58,9	127,5	125,7	194,3	192,5	261,1																
	6	168,0	250,0			84,0	166,0	150,8	232,8	217,6	299,6														
	7	196,0	292,0					108,8	204,8	175,6	271,6	242,4	338,4												
	8	223,0	333,0							134,6	244,6	201,4	311,4	268,2	378,2										
	9	251,0	375,0									159,4	283,4	226,2	350,2	293,0	417,0								
	10	279,0	417,0											184,2	322,2	251,0	389,0	317,8	455,8						
	11	307,0	458,0													210,0	361,0	276,8	427,8	343,6	494,6				
	12	335,0	500,0															234,8	399,8	301,6	466,6	435,2	600,2		

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																					
		min	max	2		2,5		3		3,5		4		4,5		5		5,5		6		7			
APS-190	4	152,0	234,4	196,4	278,8	304,1	386,5																		
	5	190,0	293,0	137,8	240,8	245,5	348,5	353,2	456,2																
	6	227,0	352,0			186,5	311,5	294,2	419,2	401,9	526,9														
	7	265,0	410,0					236,2	381,2	343,9	488,9	451,6	596,6												
	8	303,0	469,0							284,9	450,9	392,6	558,6	500,3	666,3										
	9	341,0	527,0									334,6	520,6	442,3	628,3	550,0	736,0								
	10	379,0	586,0											383,3	590,3	491,0	698,0	598,7	805,7						
	11	417,0	645,0													432,0	660,0	539,7	767,7	647,4	875,4				
	12	455,0	703,0															481,7	729,7	589,4	837,4	804,8	1052,8		

Bold blue numbers = Priority choice

## Torque-tables - single-acting, Type APS (Nm)

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
				min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APS-210	4	208,0	288,0	<b>238,0</b>	<b>318,0</b>	369,5	449,5																
	5	260,0	360,0	166,0	266,0	<b>297,5</b>	<b>397,5</b>	429,0	529,0														
	6	313,0	432,0			225,5	344,5	<b>357,0</b>	<b>476,0</b>	488,5	607,5												
	7	365,0	503,0					286,0	424,0	<b>417,5</b>	<b>555,5</b>	549,0	687,0										
	8	417,0	575,0							345,5	503,5	<b>477,0</b>	<b>635,0</b>	608,5	766,5								
	9	469,0	647,0									405,0	583,0	<b>536,5</b>	<b>714,5</b>	668,0	846,0						
	10	521,0	719,0											464,5	662,5	<b>596,0</b>	<b>794,0</b>	727,5	925,5				
	11	573,0	791,0													524,0	742,0	<b>655,5</b>	<b>873,5</b>	787,0	1005,0		
	12	625,0	863,0															583,5	821,5	<b>715,0</b>	<b>953,0</b>	978,0	1216,0

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
				min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APS-240	4	311	420	<b>352</b>	<b>461</b>	545	654																
	5	389	525	247	383	<b>440</b>	<b>576</b>	633	769														
	6	467	630			335	498	<b>528</b>	<b>691</b>	721	884												
	7	544	735					423	614	<b>616</b>	<b>807</b>	809	1000										
	8	622	840							511	729	<b>704</b>	<b>922</b>	897	1115								
	9	700	945									599	844	<b>792</b>	<b>1037</b>	985	1230						
	10	778	1050											687	959	<b>880</b>	<b>1152</b>	1073	1345				
	11	855	1155													775	1075	<b>968</b>	<b>1268</b>	1161	1461		
	12	933	1260															863	1190	<b>1056</b>	<b>1383</b>	1442	1769

Actuator type	No. springs	Md F (Nm)		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
				min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APS-270	4	424	596	<b>578</b>	<b>750</b>	872	1043,5																
	5	530	745	<b>429</b>	<b>644</b>	723	938	1016	1231														
	6	636	894			574	832	867	1125	1161	1419												
	7	742	1043					<b>718</b>	<b>1019</b>	1012	1313	1305	1606										
	8	848	1192							<b>863</b>	<b>1207</b>	1156	1500	1450	1794								
	9	954	1341									<b>1007</b>	<b>1394</b>	1301	1688	1594	1981						
	10	1060	1490											<b>1152</b>	<b>1582</b>	1445	1875	1739	2169				
	11	1166	1639													<b>1296</b>	<b>1769</b>	1590	2063	1883	2356		
	12	1272	1788															<b>1441</b>	<b>1957</b>	1734	2250	2321	2837

Bold blue numbers = Priority choice

## Torque-tables - single-acting, Type APS (Nm)

Actuator type	No. springs	Md F [Nm]		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																				
				2		2,5		3		3,5		4		4,5		5		5,5		6		7		
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
APS-301	4	584	849	677	942	1058,5	1323,5																	
	5	730	1061			846,5	1177,5	1228	1559															
	6	876	1273					1016	1413	1397,5	1794,5													
	7	1022	1485							1185,5	1648,5	1567	2030											
	8	1168	1697									1355	1884	1736,5	2265,5									
	9	1314	1909											1524,5	2119,5	1906	2501							
	10	1460	2122													1693	2355	2074,5	2736,5					
	11	1606	2334															1862,5	2590,5	2244	2972			
	12	1752	2546																	2032	2826	2795	3589	

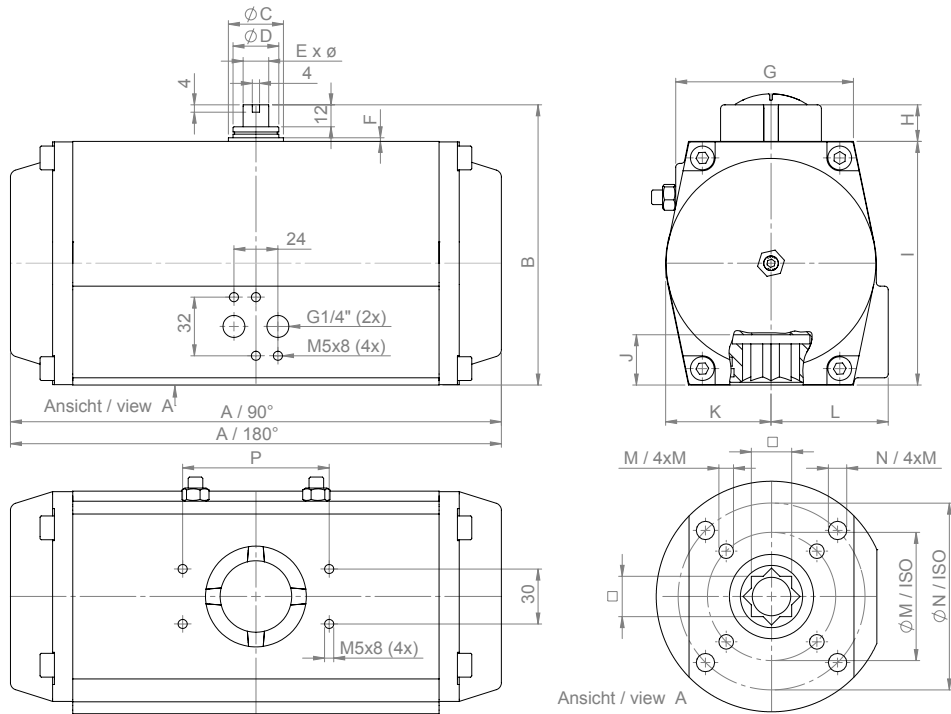
Actuator type	No. springs	Md F [Nm]		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																				
				2		2,5		3		3,5		4		4,5		5		5,5		6		7		
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
APS-351	4	938	1361	924	1347	1495,25	1918,25																	
	5	1173	1702			1154,3	1683,3	1725,5	2254,5															
	6	1408	2043					1384,5	2019,5	1955,75	2590,75													
	7	1642	2383							1615,8	2356,8	2187	2928											
	8	1877	2724									1846	2693	2417,25	3264,25									
	9	2112	3064											2077,3	3029,3	2648,5	3600,5							
	10	2346	3405													2307,5	3366,5	2878,75	3937,75					
	11	2581	3745															2538,8	3702,8	3110	4274			
	12	2816	4086																	2769	4039	3911,5	5181	

Actuator type	No. springs	Md F [Nm]		Pneumatic Applied Torque Md (Nm) at Minimum Control Pressure Pst [bar]																			
				2		2,5		3		3,5		4		4,5		5		5,5		6		7	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
APBS-400	7	1837	2880	376	1419	1190	2233	2004	3047														
	8	2100	3292					1592	2784	2406	3598												
	9	2362	3703							1995	3336	2809	4150										
	10	2624	4115									2397	3888	3211	4702								
	11	2887	4526											2800	4439	3614	5253						
	12	3149	4938													3202	4991	4016	5805				
	13	3412	5349															3605	5542	4419	6356		
	14	3674	5761																	4007	6094		
	15	3937	6172																			5635	7722
	16	4199	6584																			4812	7197

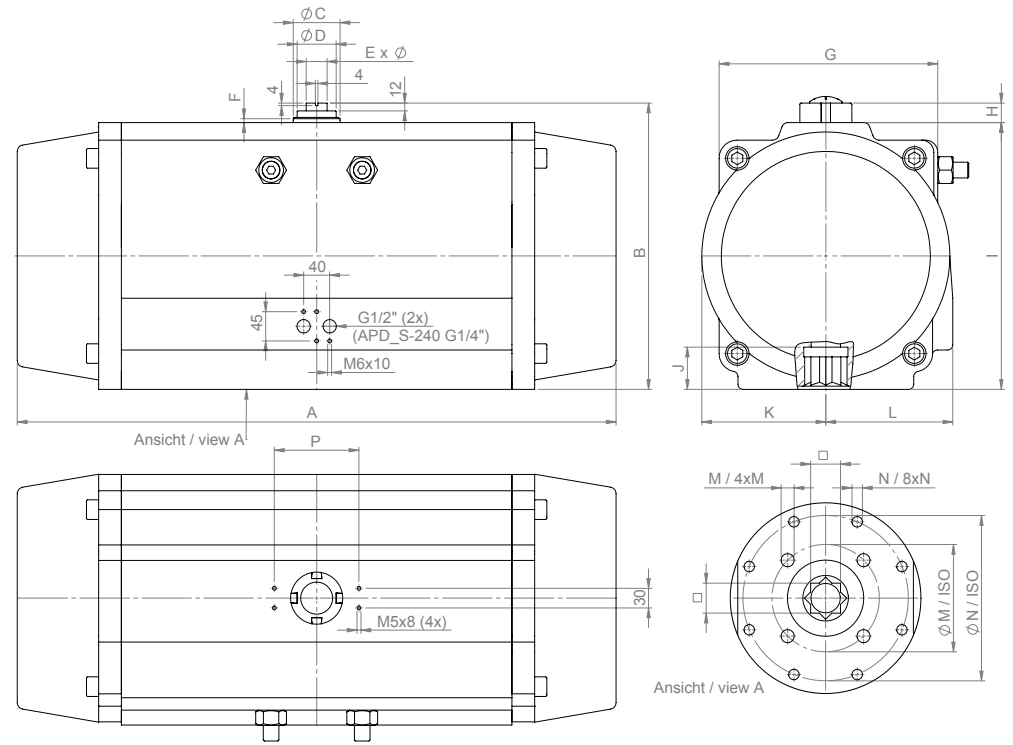
Bold blue numbers = Priority choice

# Dimensioned drawing

## APD/APS - 040 up to 210



## APD/APS - 240 + 270



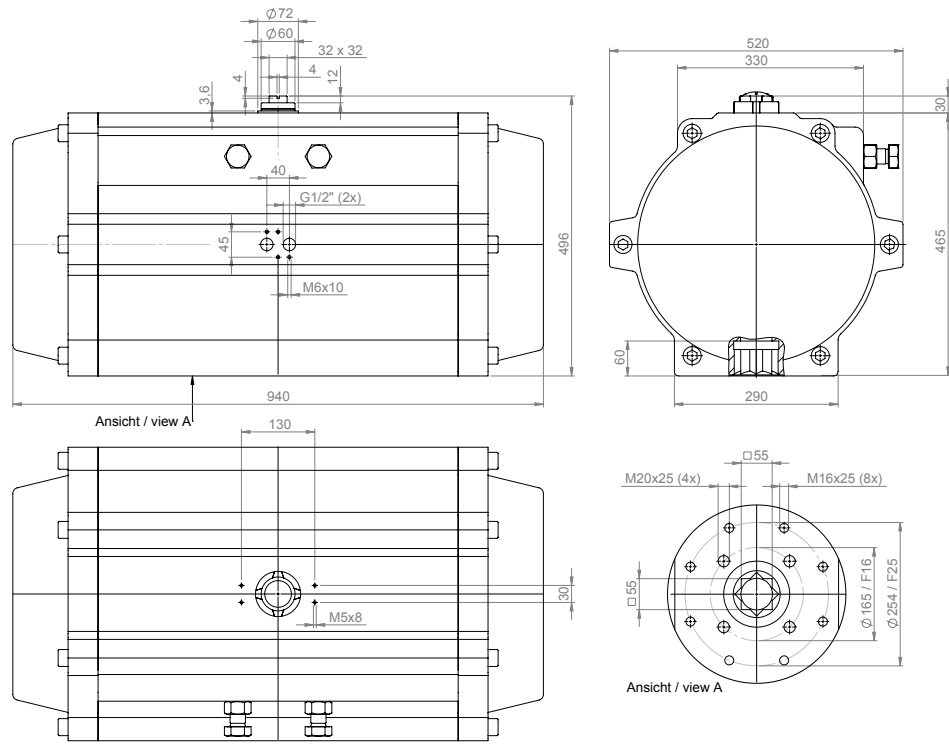


## Table of dimensions

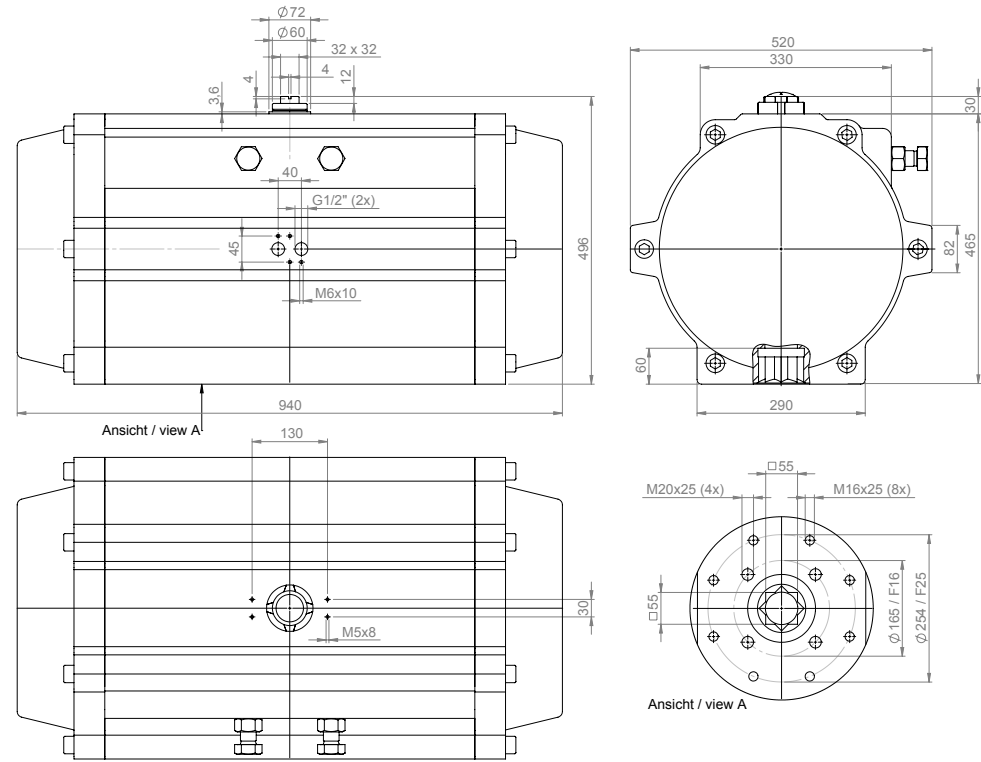
actuator type	A / 90°	A / 180°	B	øC	øD	E x ø	F	G	H	I	J	K	L	□	øM / ISO	M / 4xM	øN / ISO	N / 4xM	P
APD -040	120	/	80	ø22	ø14	10 x ø12	2,2	65	20	60	11	28,5	36,5	9	ø36 / F03	4xM5	ø50 / F05	4xM6	80
APD/APS - 050	146	210	94	ø22	ø14	10 x ø12	2,2	60	20	74	14	29,5	41,5	11	ø36 / F03	4xM5	ø50 / F05	4xM6	80
APD/APS - 060	168	243	108	ø27	ø18	10 x ø12	2,2	66	20	88	18	36	47	14	ø50 / F05	4xM6	ø70 / F07	4xM8	80
APD/APS - 070	184	258	120	ø27	ø18	10 x ø12	2,2	71,5	20	100	19	41,5	53	17	ø50 / F05	4xM6	ø70 / F07	4xM8	80
APD/APS - 080	204	298	129	ø27	ø18	10 x ø12	2,2	79,5	20	109	21	45	56	17	ø50 / F05	4xM6	ø70 / F07	4xM8	80
APD/APS - 090	260	360	140	ø34	ø25	14 x ø18	3	86	20	120	21	52	55	17	ø50 / F05	4xM6	ø70 / F07	4xM8	80
APD/APS - 110	268	386	153	ø34	ø25	14 x ø18	3	97	20	133	26	57,5	64	22	ø70 / F07	4xM8	ø102 / F10	4xM10	80
APD/APS - 130	298	426	175	ø45	ø35	20 x ø28	2,5	113,3	20	155	26	70	71	22	ø70 / F07	4xM8	ø102 / F10	4xM10	80
APD/APS - 140	390	565	202	ø50	ø40	20 x ø28	2,5	119,5	30	172	31	76	77	27	ø102 / F10	4xM10	ø125 / F12	4xM12	130
APD/APS - 160	458	652	227	ø50	ø40	20 x ø28	2,5	140	30	197	31	88	88	27	ø102 / F10	4xM10	ø125 / F12	4xM12	130
APD/APS - 190	528	756	260	ø60	ø50	32 x ø44	3,6	153,5	30	230	40	103	101	36	ø140 / F14	4xM16	/	/	130
APD/APS - 210	532	760	285	ø72	ø60	32 x ø44	3,6	164,5	30	255	40	113	111	36	ø140 / F14	4xM16	/	/	130
APD/APS - 240	602	/	319	ø72	ø60	32 x ø44	3,6	230	30	289	50	130	130	46	ø165 / F16	4xM20	/	/	130
APD/APS - 270	722	/	358	ø72	ø60	32 x ø44	3,6	252	30	328	50	147	147	46	ø165 / F16	4xM20	/	/	130
APD/APS - 301	760	/	380	ø72	ø60	32 x 32	3,6	288	30	350	50	162	173	46	ø165 / F16	4xM20	/	/	130
APD/APS - 351	920	/	440	ø72	ø60	32 x ø44	3,6	336	30	410	60	191	95	55	ø165 / F16	4xM20	ø254 / F25	8xM16	130

# Dimensioned drawing

## APD/APS - 301 -400



## APBD/APBS - 400



## Weight, Air Consumption, Switch Times: Double-acting, Type APD

## Single-acting, Type APS

Type	Weight (kg)		Volume/Double-stroke (l)		Switch time (sec.) *	
	90°	180°	90°	180°	90°	180°
040	0,90	–	0,11	–	0,50	–
050	1,40	2,50	0,25	0,39	0,60	1,54
060	2,10	3,60	0,43	0,67	0,70	1,68
070	2,60	4,90	0,67	1,04	0,80	1,96
080	3,30	5,60	0,96	1,49	1,00	2,10
090	5,00	8,30	1,53	2,37	1,50	2,66
110	6,20	12,20	2,12	3,29	2,50	3,64
130	9,61	16,10	3,32	5,15	3,50	5,88
140	13,75	24,10	5,63	8,73	4,00	6,44
160	21,95	36,50	8,68	13,45	5,00	9,10
190	33,20	56,60	13,80	21,39	7,00	11,20
210	40,0	84,00	17,60	27,28	8,00	13,72
240	67,00	–	20,00	–	9,00	–
270	97,00	–	31,00	–	10,00	–
301	137,00	–	54,00	–	12,00	–
351	205,00	–	81,00	–	13,00	–
400	289,00	–	89,00	–	14,00	–

Type	Weight (kg)	Volume/Double-stroke (l)	Switch time (sec.)**	
			0° - 90°	90° - 0°
–	–	–	–	–
050	1,50	0,11	0,50	0,40
060	2,30	0,20	0,60	0,45
070	2,90	0,29	0,70	0,50
080	3,70	0,41	0,80	0,60
090	5,75	0,62	1,00	0,70
110	7,80	0,94	1,20	0,80
130	11,00	1,47	1,40	1,10
140	16,25	2,43	1,60	1,30
160	26,00	3,65	2,00	1,65
190	39,80	5,90	2,50	2,00
210	49,60	7,40	3,00	2,50
240	80,00	11,00	3,50	3,00
270	118,00	17,00	4,00	3,50
301	163,00	24,00	4,50	4,00
351	258,00	35,00	5,00	4,50
400	361,00	53,00	6,00	5,00

\*quoted switch times are guidelines for a double-stroke at 5 bar control pressure and at 50% rated loading  
With high valve actuating speeds potentially dangerous large braking forces can arise in the actuator end positions.

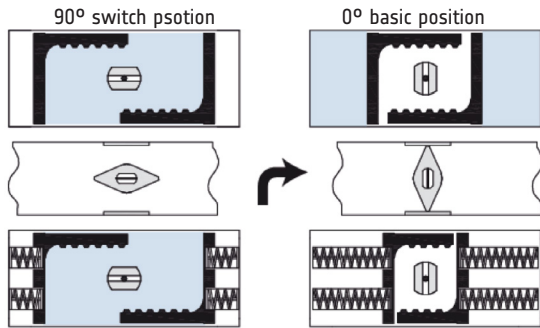
Tip: throttle the exhaust air or select a larger actuator

\*\*single-acting actuator with 12 springs

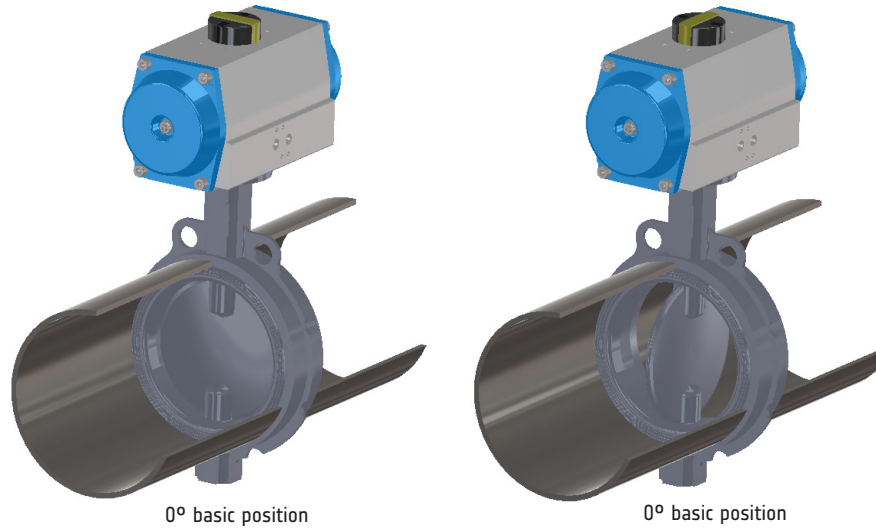
## Assembly variants for actuator mounting „parallel to the pipe“

mounting variants: **H** (double + single acting)

- safety position: spring-closed, clockwise

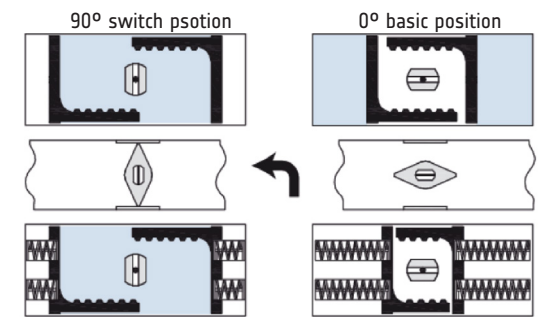


**default: clockwise „closed“**  
- to DIN EN 15714-1



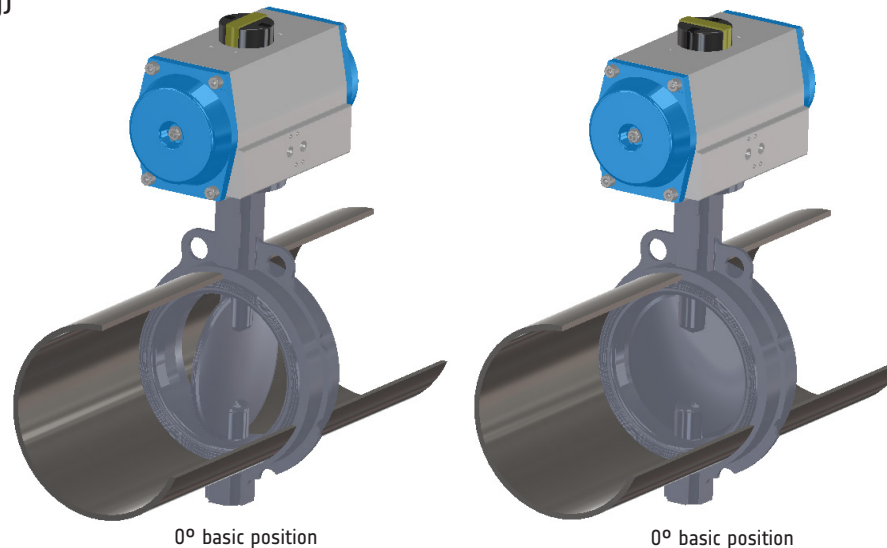
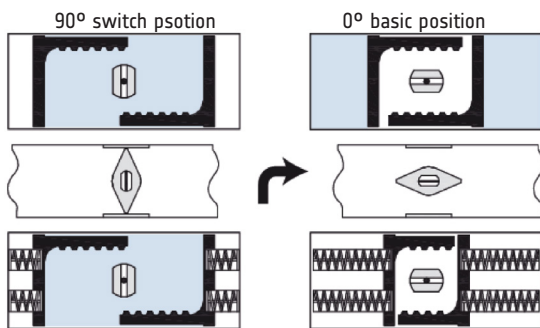
mounting variants: **F** (double + single acting)

- safety position: spring-open, anticlockwise



mounting variants: **E** (double + single acting)

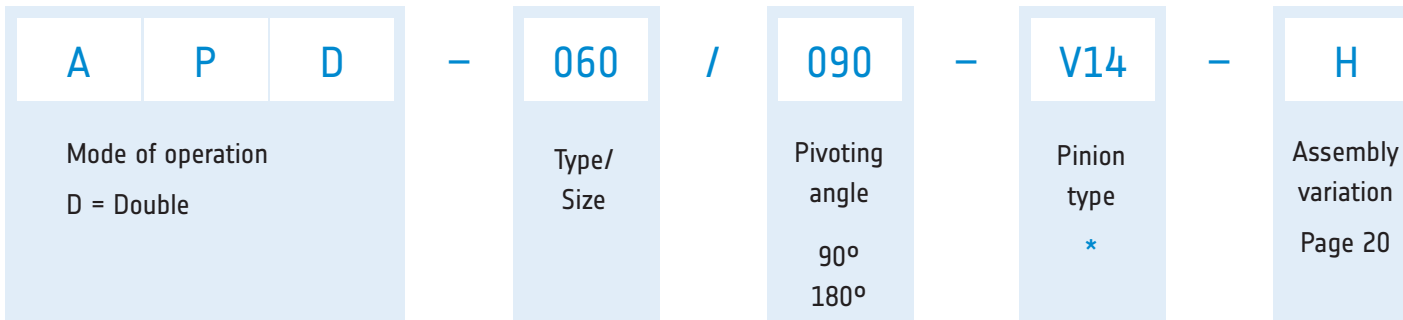
- safety position: spring-closed, anticlockwise



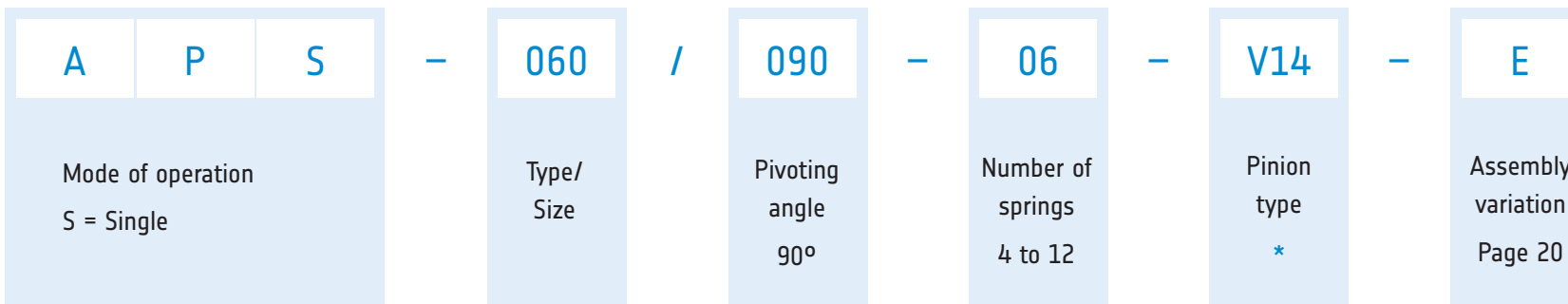
Actuator mounting „crossmount to the pipe“ on request.

## Ordering code

### Example of an order for a double-acting actuator



### Example of an order for a single-acting actuator (spring-return)



Service-Hotline for enquiries and Information:

☎ +49 (0) 22 24 / 98 83 20

\* V14 = octagonal = 14 mm

## Spare parts

- 1 Screw
- 2 Position indicator
- 3 Circlip
- 4 Washer
- 5 Slide ring

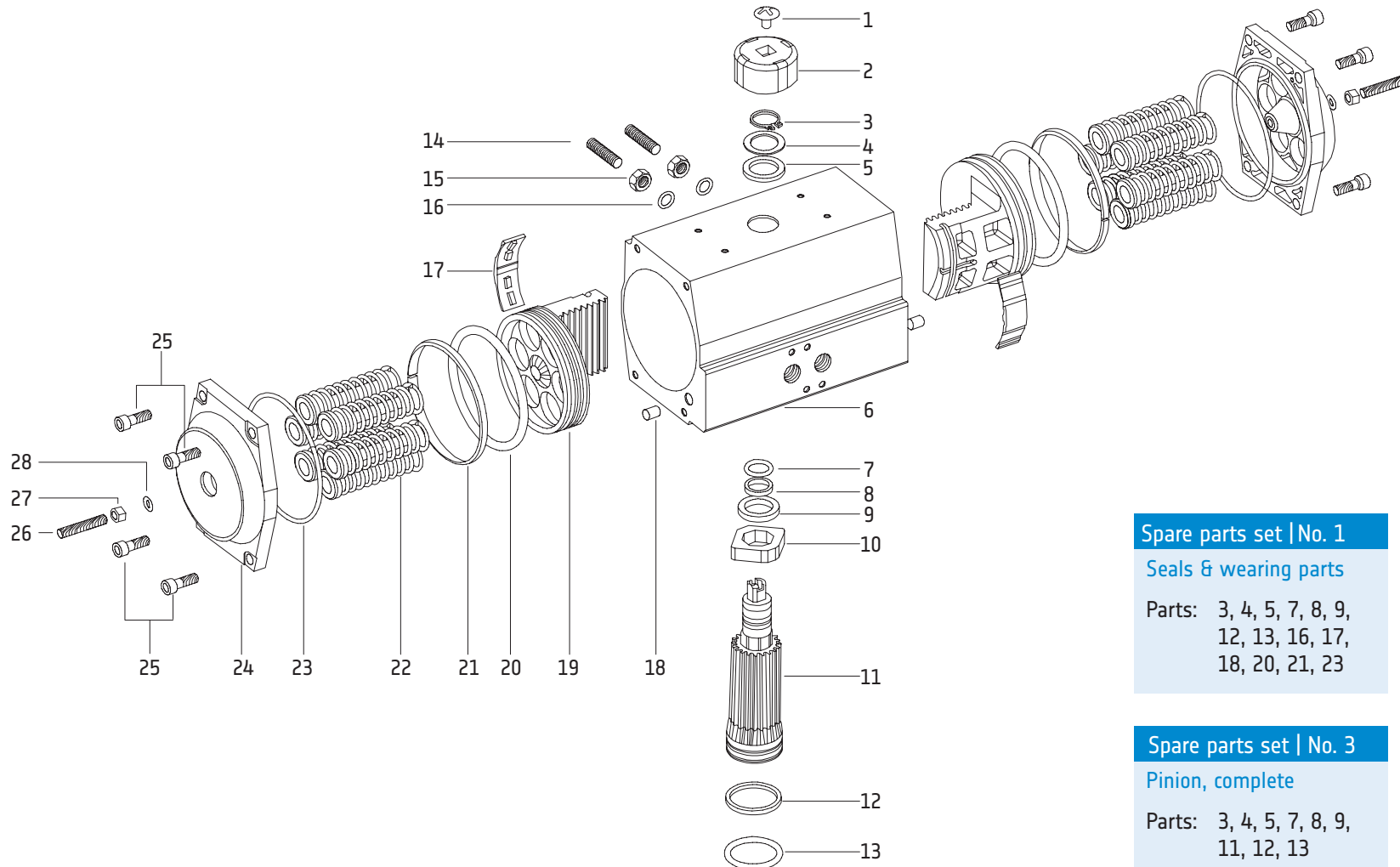
- 6 Housing
- 7 O-Ring
- 8 Bearing
- 9 Shim
- 10 Stop cam

- 11 Pinion
- 12 Bearing
- 13 O-Ring
- 14 Threaded pin
- 15 Lock-nut

- 16 O-Ring
- 17 Guide segment
- 18 Plug
- 19 Piston
- 20 O-Ring

- 21 Piston guide ring
- 22 Springs
- 23 O-Ring
- 24 Cap
- 25 End-cap screw

- 26 Threaded pin
- 27 Locknut
- 28 O-Ring



### Spare parts set | No. 1

#### Seals & wearing parts

Parts: 3, 4, 5, 7, 8, 9,  
12, 13, 16, 17,  
18, 20, 21, 23

### Spare parts set | Nr. 2

#### Piston, complete

Parts: 17, 19, 20, 21

### Spare parts set | No. 3

#### Pinion, complete

Parts: 3, 4, 5, 7, 8, 9,  
11, 12, 13

### Spare parts set | No. 4

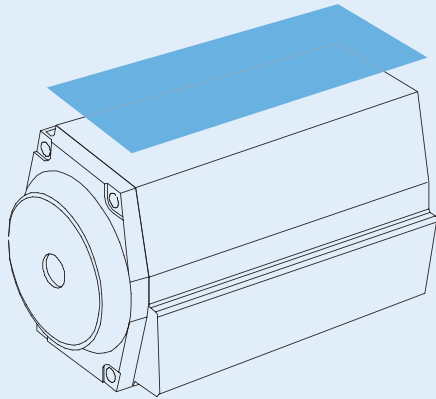
#### Cap, complete

Parts: 23, 24, 25,  
26\*, 27\*, 28\*

\*not for APD/S-240-351

# Complete accessories program for all interfaces

## Interface Actuator/Signal unit acc. to VDI/VDE 3845 and 3847



**Switchbox**  
made of different materials and different types of switches

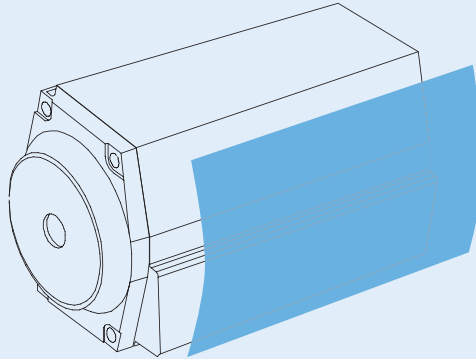


**Switchbox**  
made of different materials and different types of switches



**Positioner**  
pneumatic and electro-pneumatic

## Interface Actuator/Control valve acc. to VDI/VDE 3845 i.e. NAMUR



**Solenoid valves**  
of different materials, also available in ATEX



**Speed controller**  
with NAMUR flange

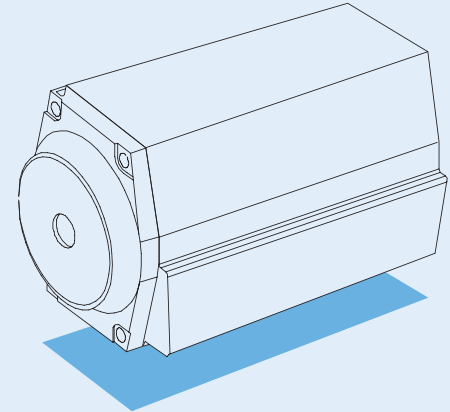


**Throttle - silencer**  
and fine throttles for speed regulation



**Silencer**  
prevents the entry of dirt and dust

## Interface Actuator/Valve acc. to DIN EN ISO 5211



**Declutch override gear with hand wheel**



**Mounting bracket**



**Coupling**



**Reducers**



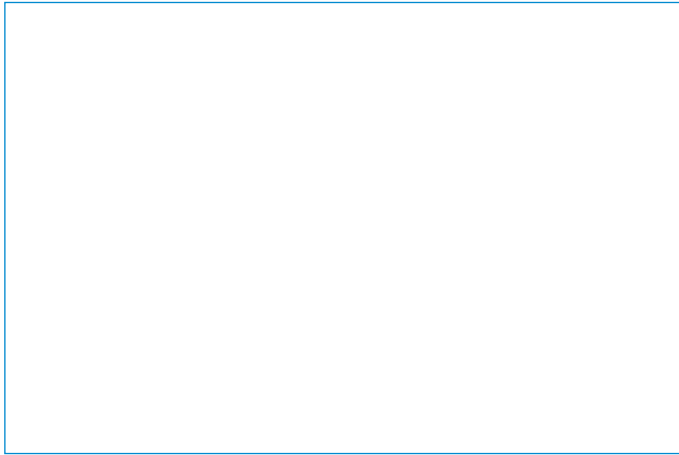
**Assembly and installation service**

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#### Areas of application

Regenerative energies, solar technology, food, environmental protection, water processing, water distribution and disposal, filter and process technology, bulk cargo, paper and pulp. Petrochemical industry, bio and pharma technology, mining, offshore, plant engineering and machine manufacturing, steel and metallurgy, process automation, sugar industry, valve manufacturer, automotive technology, train technology and so on.



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