

# 4th GENERATION PNEUMATIC ACTUATOR



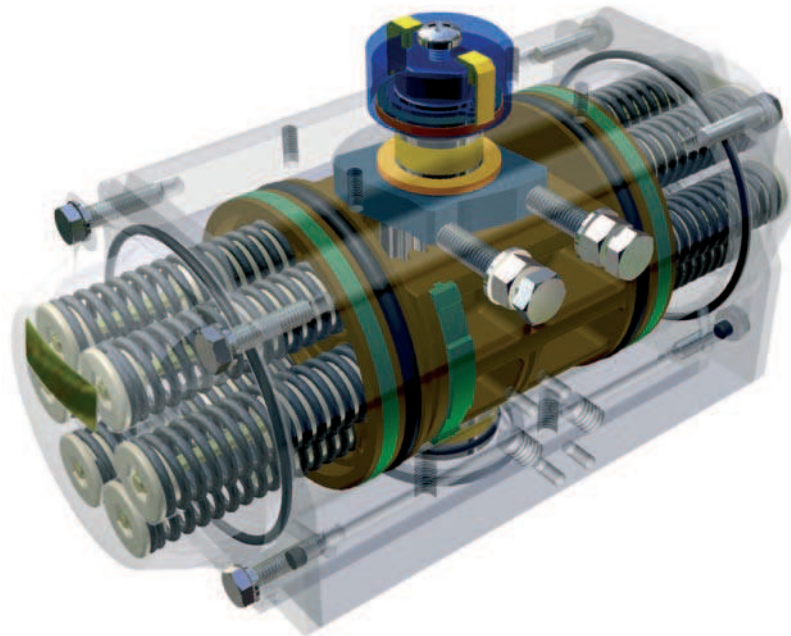
### DESIGN

The new 4th Generation rack and pinion pneumatic actuator has been designed, developed and tested incorporating the latest technology and materials available, with some innovative design features. As a result of this product research we have obtained a high grade product with the following characteristics:

- ◆ Reliability
- ◆ High performance
- ◆ Wider product range permitting a more economical sizing selection
- ◆ Innovative and patented universal drive shaft and multifunction position indicator
- ◆ Full compliance with latest worldwide specifications
- ◆ A wide selection of highest levels of corrosion protection technology
- ◆ Aesthetically compact and modern style with no external cavities to avoid deposit build up

### CONSTRUCTION

1. **Extruded aluminium body**, with both internal and external corrosion protection having honed cylinder surface for longer life and lower coefficient of friction.
2. **Dual piston rack and pinion design** for compact construction, symmetric mounting position, high cycle life and fast operation, reverse rotation can be accomplished in the field by simply inverting the pistons.
3. **Two independent external travel stop adjustments.** Permits an easy and precise adjustment of +/- 4° in both directions, in the open and close positions for an accurate valve alignment.
4. **Universal and anti-blowout patented drive shaft** for an easy conversion from parallel to diagonal square and vice versa. This feature permits a lower and more flexible stock.
5. **One compact design** with identical body and end caps for double acting and spring return models reducing inventory and allowing field conversion, by adding or removing modular spring cartridge.
6. **Multifunction position indicator** with Namur slot to allow: visual position indication, to fit and drive all accessories, to fit easily and economically the most popular sensors. Available in a special black material for ATEX version.
7. **Multiple bearings and guides** on racks and pistons for precise operation, low friction, high cycle life and prevent shaft blowout.
8. **Modular preloaded spring cartridge design.** With coated spring for simple versatile range, greater safety and corrosion resistance.
9. **Fully machined teeth** on piston rack and pinion for accurate low backlash rack and pinion engagement and maximum efficiency.
10. **Electroless nickel-plated** blowout resistant, bearing guided one-piece pinion for improved safety and maximum cycle life.
11. **Selected high quality bearings** and seal for low friction, high cycle life and a wide operating temperature range.
12. **Internal and external stainless steel fasteners** for long term corrosion resistance.
13. **Full conformance** to the latest specifications: ISO 5211, DIN 3337 and VDI/VDE 3845 NAMUR for product interchangeability and easy mounting of solenoids, limit switches and other accessories.



### RANGE OF OPTIONS, QUALITY MANUFACTURING, AND ACCESSORIES

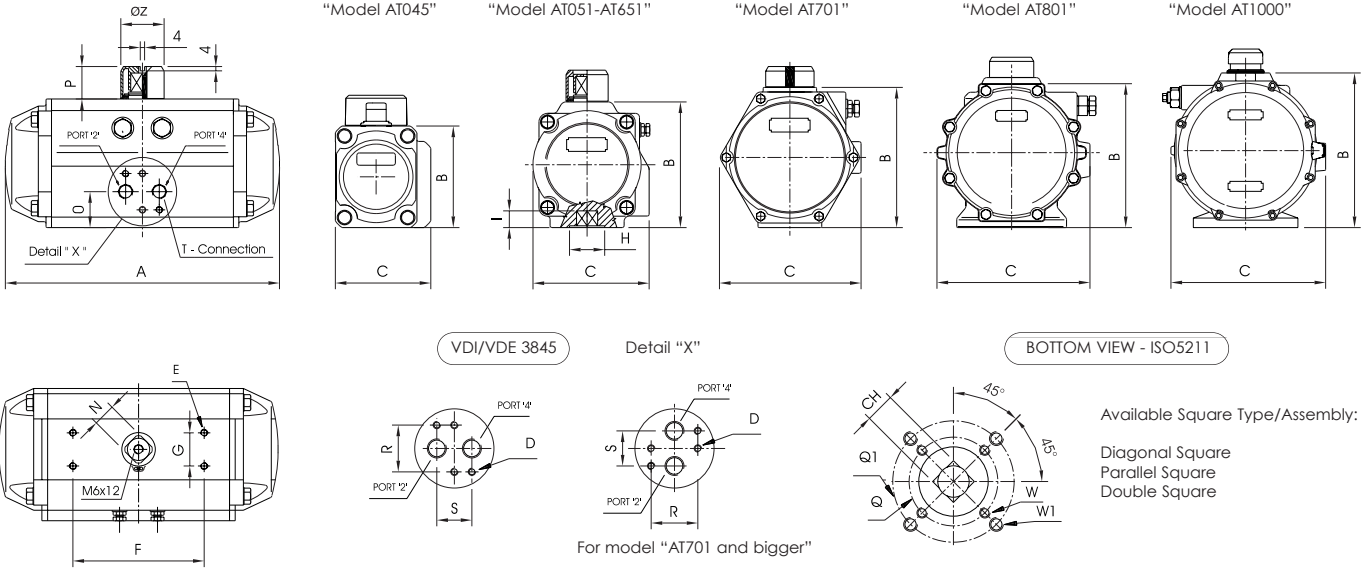
#### RANGE OF OPTIONS

- A. With the 4th generation actuator we are able to offer 6 different levels of protections A, B, C, D, E, P. Please see table of protection levels available N° P01/99.
- B. Stainless steel 303 or 316 drive shaft is available on request on all sizes and all different protection levels.
- C. For high and low temperature applications FPM or Silicon O rings combined with a suitable lubricant are available for all models.
- D. 100% Adjustable travel stop.
- E. Economical Lock out capability in the fully-open or the fully-closed position.
- F. Multifunction Position indicator with S.S. metal inserts for proximity sensing.
- G. S.S. drive shaft Cover with namur slot for high temperature application and manual override.
- H. Other than the standard Parallel or Diagonal bottom drive shaft connection, we can supply Keyed drive connection, Flat head connection or special customized connections.
- I. 120° and 180° Actuator rotation and intermediate rotations like 135°.
- J. 3 position Actuators.

#### ACCESSORIES AVAILABLE

- ◆ Square drive reduction pieces for all drive shafts
- ◆ Centering/location ring for all sizes
- ◆ Brackets
- ◆ Couplings
- ◆ Solenoid valves
- ◆ Switch boxes
- ◆ Proximity sensors
- ◆ Gear boxes
- ◆ Positioners

# METRIC DIMENSIONS AND TECHNICAL DATA



Available Square Type/Assembly:  
 Diagonal Square  
 Parallel Square  
 Double Square

FOR DETAILED DIMENSIONS PLEASE SEE THE SPECIFIC ACTUATOR TECHNICAL DATA SHEET.

ACTUATOR MODEL	AT045	AT051	AT101	AT201	AT251	AT301	AT351	AT401	AT451	AT501	AT551	AT601	AT651	AT701			AT801			AT1000
	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S	D/S
<b>A</b>	118	140,5	158,5	210,5	247,5	268,5	315	345	408,5	437,5	487	543	621	728			876			950
<b>B</b>	66	69	85	102	115	127	145	157	177	196	220,5	245	298,5	330			410			520
<b>C</b>	62	70,5	83	94,5	106,3	123	141	151,5	171,5	187	204	222	262	329,5			418			525
<b>D</b>	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M6x10	M6x10		M6x10			M6x10
<b>E</b>	M5x8	M5x4	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8		M5x8			M6x10
<b>F</b>	50	80	80	80	80	80	80	80	80	80	130	130	130	130			130			200
<b>G</b>	25	30	30	30	30	30	30	30	30	30	30	30	30	30			30			50
<b>N</b>	11	11	11	17	17	17	17	27	27	27	36	36	36	36			36			36
<b>O</b>	25	26,5	30	30,5	32,5	37,5	42,5	45	47	52	58	62	78,5	165			205			237
<b>P</b>	20	20	20	20	20	20	30	30	30	30	50	50	50	50			50			80
<b>R</b>	32	32	32	32	32	32	32	32	32	32	32	32	45	45			45			45
<b>S</b>	24	24	24	24	24	24	24	24	24	24	24	24	40	40			40			40
<b>T-ISO 228</b>	1/8"	1/8"	1/8"	1/8"	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/8"	1/2"			1/2"			1/2"
<b>ØZ1</b>	40	40	40	40	40	40	56/65	56/65	65	65	80/115	80/115	115	115			115			115
<b>ISO Flange</b>	F04	F04	F05	F05	F07	F07	F10	F10	F12	F12	F14	F14	F16	F16			F25			F30
<b>Ch</b>	11	11	14	14	17	17	22	22	27	27	36	36	46	46			55			75
<b>I min.</b>	12	12	16	16	19	19	24	24	29	29	38	38	48	48			57			77
<b>H</b>	30	30	35	35	55	55	70	70	85	85	100	100	130	130			200			230
<b>Q</b>	42	42	50	50	70	70	102	102	125	125	140	140	165	165			254			298
<b>Q1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-			-
<b>W</b>	M5	M5	M6	M6	M8	M8	M10	M10	M12	M12	M16	M16	M20	M20			M16			M20
<b>W1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-			-
<b>ISO Flange</b>	F03	F03	F04	F05-F07	F05-F07	F05-F07	F07-F10	F07-F10	F10-F12	F10-F12	F12	F12	F14	F14			F16			F25
<b>H</b>	25	25	30	35	40	40	55	55	70	70	85	85	100	112			130			200
<b>Q</b>	36	36	42	50	50	50	70	70	102	102	125	125	140	140			165			254
<b>Q1</b>	-	-	-	70	70	70	102	102	125	125	-	-	-	-			-			-
<b>W</b>	M5	M5	M5	M6	M6	M6	M8	M8	M10	M10	M12	M12	M16	M16			M20			M16
<b>W1</b>	-	-	-	M8	M8	M8	M10	M10	M12	M12	-	-	-	-			-			-
<b>CH</b>	9	9	11	17	17	17	22	22	27	27	27	27	36	36			46			55
<b>I min.</b>	10	10	12	19	19	19	24	24	29	29	29	29	38	38			48			57

METRIC	MODEL TYPE	AT045	AT051	AT101	AT201	AT251	AT301	AT351	AT401	AT451	AT501	AT551	AT601	AT651	AT701			AT801			AT1000																
		D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S																
Chamber	φ (mm)	45	50	63	75	88	100	115	125	145	160	180	200	240	265			330			420																
Screw stroke adjustment	For 1° adj.need	NA	1/6 turn	1/6 turn	1/6 turn	1/5 turn	1/5 turn	1/5 turn	1/4 turn	1/5 turn	1/4 turn	1/4 turn	1/4 turn	1/4 turn	1/4 turn			1/4 turn			1/4 turn																
Air Volume Opening	(L)	0,06	0,09	0,16	0,31	0,51	0,71	1,19	1,54	2,41	3,14	4,26	5,94	10	14,5			25			49																
Air volume Closing	(L)	0,10	0,15	0,26	0,49	0,78	1,11	1,8	2,34	3,78	4,92	6,89	9,46	15,2	21,38			40			84																
Opening Time (A)	(Sec.)	0,15	0,2	0,25	0,25	0,3	0,3	0,4	0,4	0,5	0,5	0,7	0,7	0,9	0,9	1,2	1,2	1,5	1,5	1,8	2	2,4	2,7	3,5	3,5	4,1	4	4,5			6	7,5			8	10	
Closing Time (A)	(Sec.)	0,2	0,25	0,25	0,3	0,3	0,35	0,35	0,5	0,5	0,6	0,6	0,9	0,8	1,1	1,1	1,4	1,4	1,8	1,7	2,1	2,2	2,8	3,2	4	4	4,6	4,5	5			7	8,5			9	11
Approximate weight	(Kg)	0,75	0,90	1,03	1,14	1,57	1,77	2,8	3,2	3,9	4,5	5,6	6,4	8,3	9,7	10,2	12,1	14,8	18	18,7	22,9	25	33	35	43	54	69	76	96			127	169			(B)	(B)

- Notes:**  
 (A) The above indicated moving time of the actuator is obtained in the following test conditions:  
 For model AT045 + AT501 >>> (1) Room Temperature, (2) Actuator Stroke 90°, (3) Solenoid Valve with Orifice Of 4 mm and a flow capacity Qn 400 L/min., (4) Inside pipe diameter 8 mm, (5) Medium clean air, (6) Air supply pressure 5,5 bar (79,75 Psi), (7) Actuator without external resistance load.  
 For model AT551 + AT1000 >>> (1) Room Temperature, (2) Actuator Stroke 90°, (3) Solenoid Valve with Orifice Of 11 mm and a flow capacity Qn 6000 L/min., (4) Inside pipe diameter 11 mm, (5) Medium clean air, (6) Air supply pressure 5,5 bar (79,75 Psi), (7) Actuator without external resistance load.  
 Cautions: obviously on the field applications when one or more of the above parameters are different, the moving time will be different.
- (B) For AT1000 with Aluminum drive shaft: Double Acting = 170 Kg / Spring Return = 238 Kg  
 For AT1000 with Steel drive shaft: Double Acting = 201 Kg / Spring Return = 269 Kg



