

Design & Construction

DESIGN

Vtork series pneumatic actuators have introduced improvement design for rack and pinion. It is always Vtork's mission to offer initiative products by combining the long field experiences in products application and

the latest production and materials technology available in the market today. The benefit of new design has long been verified in practice. With new technical features equipped, Vtork series pneumatic actuators have advantageous characteristic in:

- Reliability
- High performance
- Innovations and patented solutions for a universal drive shaft
- Fully compliance with all the latest international standards
- Multifunction position indicator
- Compact and light

CONSTRUCTION

1. A single compact design utilizing identical body and end caps for both double acting and spring return models. This feature reduces inventory and allows field conversion, by adding or removing modular spring cartridges.

2. Full conformance to following latest specifications: ISO 5211, DIN 3337 and VDI/VDE 3845 for product interchangeability and easy mounting of solenoids, limit switches and other accessories.

3. Vtork 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.

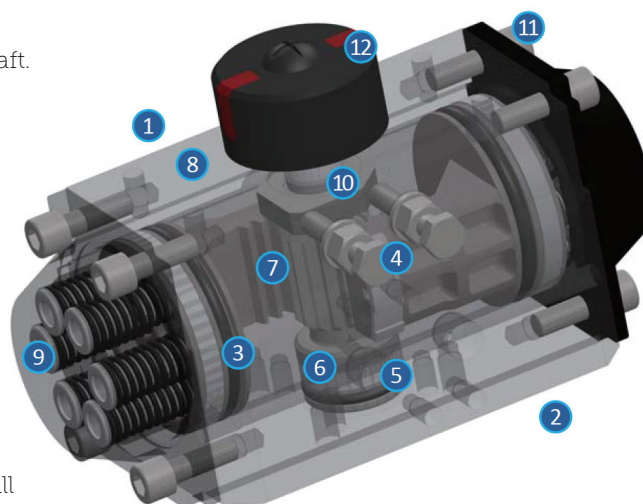
4. Two independent external travel stop adjustments permit easy and precise adjustment of +/- 5° in both directions. This adjustment may be made in either the open or closed position and provides for accurate valve alignment.

5. Multiple bearings and guides on pistons and racks for precise operation, low friction, high cycle life and a blowout proof pinion shaft.

6. Electroless nickel-plated blowout resistant, bearing guided, one-piece pinion shaft for improved safety and maximum cycle life.

7. High precision teeth on piston racks and pinion shaft for accurate positioning, low backlash, and maximum engagement resulting in overall efficient operation.

8. Extruded aluminum body with both internal and external corrosion protections having a honed cylinder surface for longer life and a lower coefficient of friction.



9. Modular preloaded spring cartridges designed with coated springs for simple range versatility, greater safety and corrosion resistance.

10. Selected high quality bearings and seals that provide a wide operating temperature range, low friction, and high cycle life.

11. Internal and external stainless steel fasteners for long term corrosion resistance.

12. Multifunctional position indicator for visual position indication, and a direct, easy, economical way to mount popular sensors.

RANGE OF OPTIONS, QUALITY MANUFACTURING, AND ACCESSORIES

RANGE OF OPTIONS

A. Stainless steel 304 or 316 drive shafts are available on request for all sizes no matter the type of corrosion protection selected.

B. For extremely high or low temperature applications, all models may be equipped with FPM or Silicon O rings along with an Vtork tested and certified suitable lubricant.

C. Other than the standard double square bottom drive shaft connection, we can supply a keyed drive connection, a flat head connection or a special personalized drive connection.

QUALITY MANAGEMENT

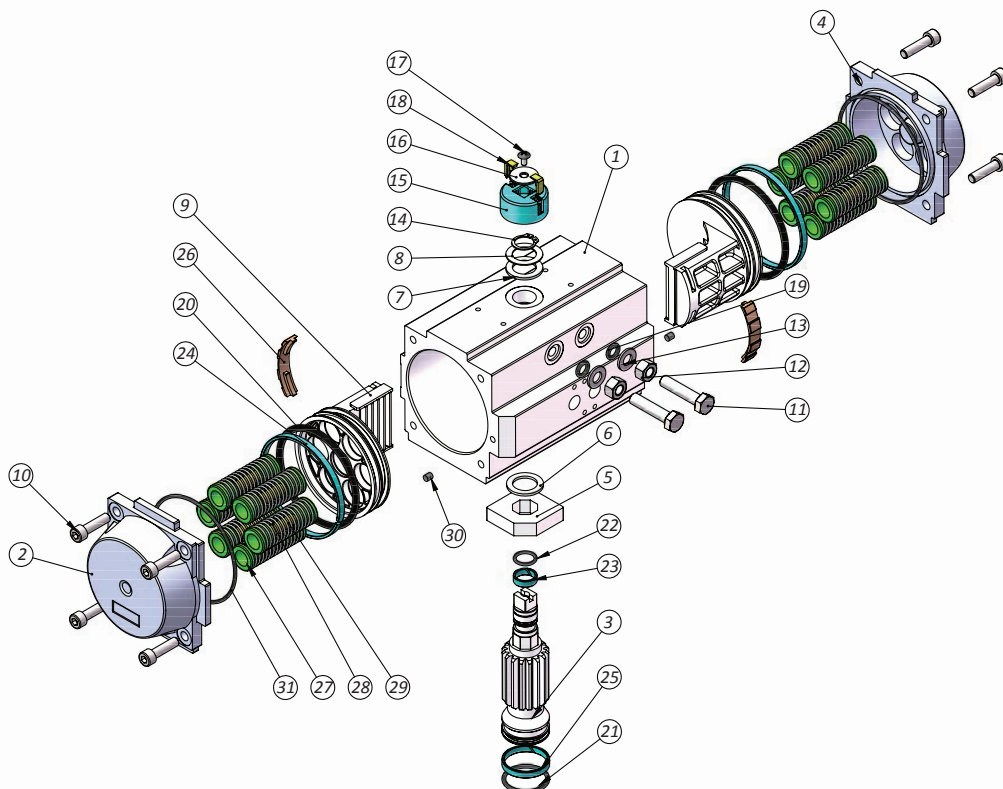
- Production conforms to ISO9001.
- Each individual actuator has been factory inspected and tested and given a serial number for full traceability.

- Each individual actuator is individually packed in a special cardboard carton for protection, with a product description label for easy identification and includes installation, operation and maintenance instructions

ACCESSORIES AVAILABLE

- Different Square reductions suitable for drive shaft
- Centering rings for all sizes
- Brackets
- Couplings
- Solenoid valves
- Switch boxes
- Proximity switches
- Gear boxes
- Positioners

PARTS AND MATERIALS



Pneumatic Actuator



Item Number	Part Description	Material Quality	QTY	Item Number	Part Description	Material Quality	QTY	Item Number	Part Description	Material Quality	QTY
1	Body	Aluminium alloy	1	12	Nut(stop screw)	Stainless steel	2	23	Bearing(pinion top)	POM+PTFE	1
2	Left End cap	Aluminium alloy	1	13	Washer (stop screw)	Stainless steel	2	24	Bearing(pinion head)	POM+PTFE	2
3	Drive shaft	Alloy Steel	1	14	Spring clip	Spring steel	1	25	Bearing(pinion bottom)	POM+PTFE	1
4	Right end cap	Aluminium alloy	1	15	Position indicator	Nylon	1	26	Wear band	Nylon	2
5	OCT-CAM	Alloy Steel	1	16	Indicator thrust bearing	Stainless steel	1	27	Spring seat	Nylon	24
6	Thrust bearing (pinion top)	POM+PTFE	1	17	Cap screw	Stainless steel	1	28	Spring	High-carbon steel	12
7	Thrust bearing	POM+PTFE	1	18	Color code	Nylon	2	29	Straining beam	Copper pipe	12
8	Thrust washer	Stainless steel	1	19	"o" ring(stop screw)	NBR	2	30	Plug	NBR	2
9	Piston	Aluminium alloy	2	20	"o" ring(piston)	NBR	2	31	"o" ring(end cap)	NBR	2
10	Cap screw (end cap)	Stainless steel	8	21	"o" ring(pinion bottom)	NBR	1				
11	Stop top screw	Stainless steel	2	22	"o" ring(pinion top)	NBR	1				

TECHNICAL DATA (METRIC UNIT)

Model TypeA	VT032		VT050		VT065		VT075		VT085		VT095		VT110		VT125		VT140		VT160		VT190		VT210		VT240		VT270		VT300		VT350		VT400	
	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		
Diameter (mm)	32		50		65		75		85		95		110		125		140		160		190		210		240		270		300		350		400	
Air Volume Opening [l/s]	0.03		0.09		0.19		0.30		0.44		0.88		0.83		1.41		1.76		2.85		4.75		6.60		11.40		15.80		19.09		27.65		42.81	
Air Volume Closing [l/s]	0.04		0.15		0.32		0.50		0.66		1.17		1.27		2.13		2.72		4.08		7.20		10.29		15.10		18.80		28.23		44.10		62.05	
Opening Time [sec]	0.3	0.3	0.9	0.4	0.9	0.4	0.9	0.9	1.0	0.9	1.4	0.9	1.4	1.3	2.4	1.3	2.8	2.0	4.8	2.2	2.4	2.9	3.4	3.2	3.8	4.4	5.0	5.0	6.0	6.2	7.4	7.5	9.6	
Closing Time [sec]	0.4	0.4	0.7	0.4	0.8	0.4	0.9	0.9	1.2	1.0	1.4	1.0	1.6	1.4	2.4	1.4	3.0	2.4	4.9	2.6	3.0	3.8	4.1	3.7	4.0	4.9	5.5	6.0	6.8	7.2	8.4	8.5	10.6	
Weight (Kg)of	0.47	0.59	1.13	1.25	1.97	2.21	2.93	3.29	3.78	4.26	5.14	5.86	6.09	7.17	10.86	12.54	13.77	15.93	20.15	23.75	28.41	33.81	40.03	48.43	52.6	77.76	73.64	90.6	108	135.6	146.7	188.1	220.5	283.5

1.For model 32-160

(1)Room temperature (2)Actuator stroke 90° (3)Solenoid valve with orifice of 4 mm and a flow capacity Qn400L/min (4)Inside pipe diameter 6 mm (5)Medium clean air (6)Air supply pressure 5.5 bar (7)Actuator without external resistance load

2.For model 190-400

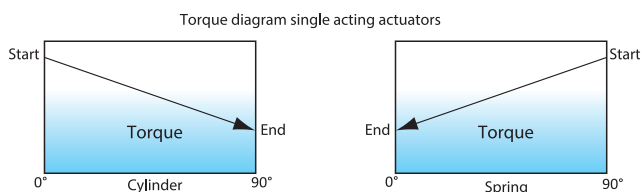
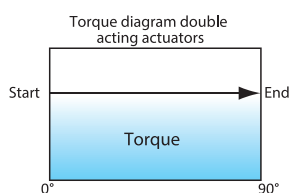
(1)Room temperature (2)Actuator stroke 90° (3)Solenoid valve with orifice of 12 mm and a flow capacity Qn5100L/min (4)Inside pipe diameter 8 mm (5)Medium clean air (6)Air supply pressure 5.5 bar (7)Actuator without external resistance load

Cautions: obviously on the field applications when one or more of the above parameter are different, the moving time will be different

Air consumption rest with air supply, air volume and action cycle times. Expressions:

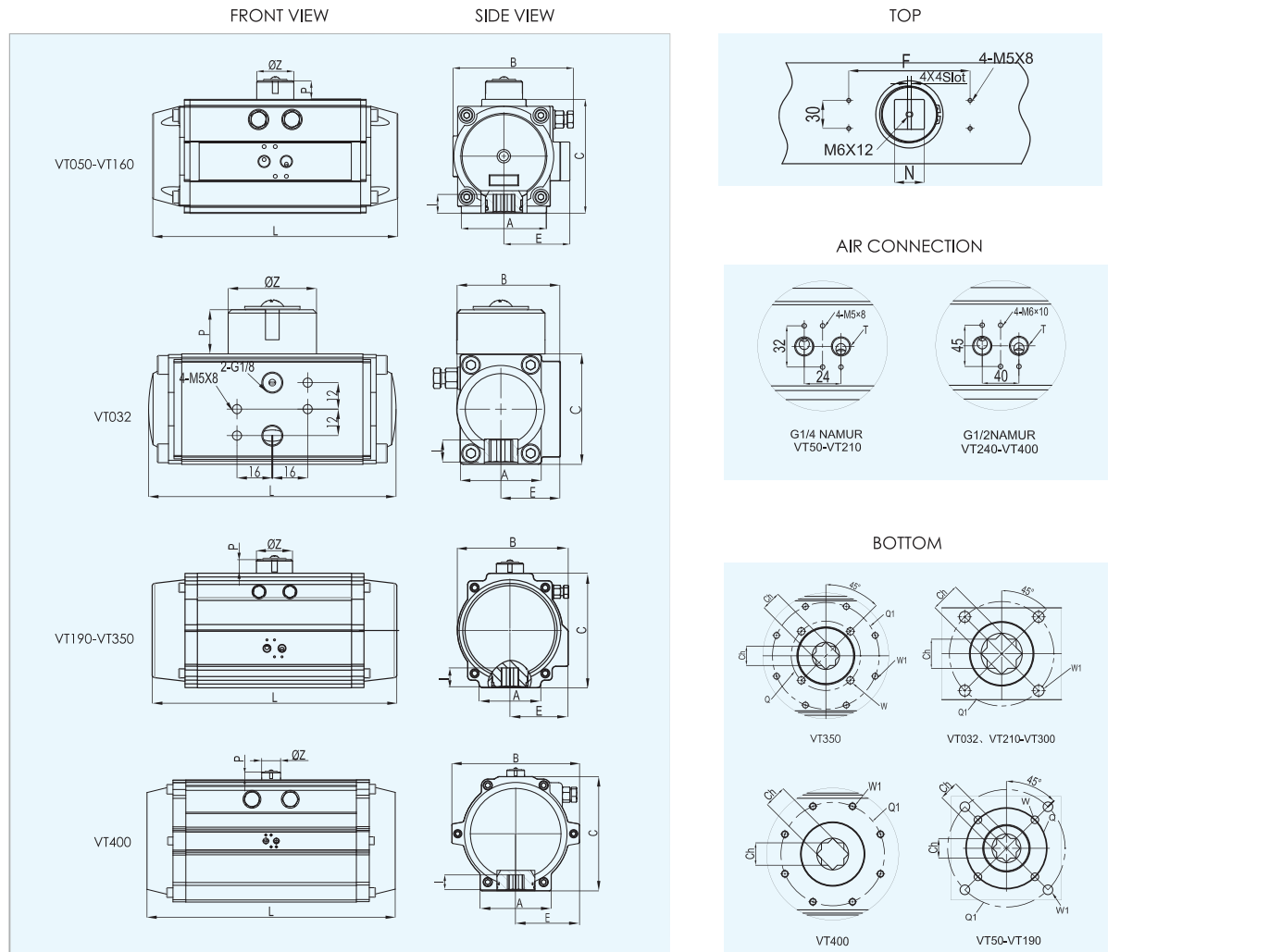
$$L/min = \text{Air volume}(\text{opening air volume} + \text{closing air volume}) \times \left(\frac{\text{Air Supply}(\text{Kpa}) + 101.3}{101.3} \right) \times \text{Action times}(\text{min})$$

METRIC TORQUE RATINGS



Model	DOUBLE ACTING TORQUE RATINGS IN Nm									
	Supply Pressure (Unit:bar)									
	2.5	3	3.5	4	4.5	5	5.5	6	7	8
VT032	2.9	3.4	4.0	4.6	5.3	5.9	6.5	7.1	8.3	9.5
VT050	8.6	10.4	12.3	14.2	16.0	17.9	19.8	21.6	25.4	29.1
VT065	17.4	21.2	25.0	28.7	32.5	36.3	40.1	43.9	51.4	59.0
VT075	27.0	32.9	38.8	44.7	50.5	56.4	62.3	68.2	79.9	91.7
VT085	39.7	48.3	56.9	65.6	74.2	82.8	91.4	100.1	117.3	134.6
VT095	55.7	67.9	80.0	92.1	104.2	116.4	128.5	140.6	164.8	189.1
VT110	72.0	89.3	105.0	120.6	136.3	152.0	167.6	183.3	214.6	245.9
VT125	128.7	159.5	187.5	215.4	243.4	271.4	299.4	327.4	383.3	439.3
VT140	196	237	278	319	360	401	442	483	565	647
VT160	263.5	326.6	383.9	441.2	498.5	555.8	613.1	670.4	785.0	899.7
VT190	428.5	518.0	607.3	696.6	785.9	875.3	964.6	1053.9	1232.5	1411.1
VT210	598.2	723.2	847.9	972.6	1097.3	1222.0	1346.6	1471.3	1720.7	1970.1
VT240	928.3	1122.0	1315.0	1508.0	1702.0	1895.0	2089.0	2282.0	2669.0	3056.0
VT270	1305.0	1577.0	1849.0	2121.0	2393.0	2665.0	2937.0	3209.0	3753.0	4297.0
VT300	1678.6	2029.4	2379.3	2729.2	3079.1	3429.0	3778.9	4128.8	4828.5	5528.3
VT350	2492.5	3011.8	3531.1	4050.4	4569.6	5088.9	5608.2	6127.5	7166.0	8204.6
VT400	3798.1	4589.4	5380.7	6172.0	6963.3	7754.5	8545.8	9337.1	10919.7	12502.2

INSTALLATION



MODEL	A	B	C	L	E	F	P	ØZ	N	I	FLANGE	Q	Q1	W	W1	Ch	T
VT032	37	47	50	110	27	50	20	40	10	10	F03	-	36	-	M5×9	9×9	G1/8"
VT050	45	70.5	70	154	41.5	80	20	40	10	12	F03/05	36	50	M5×7.5	M6×9	11×11	G1/4"
VT065	62	89.5	89	189	51.5	80	20	40	10	16	F05/07	50	70	M6×9	M8×12	14×14	G1/4"
VT075	68	102.5	100	210	59	80	20	40	14	16	F05/07	50	70	M6×9	M8×12	14×14	G1/4"
VT085	68	112.5	113	229	63.5	80	20	40	14	19	F05/07	50	70	M6×9	M8×12	17×17	G1/4"
VT095	92	126	123	264	71	80	20	40	14	19	F05/07	50	70	M6×9	M8×12	17×17	G1/4"
VT110	93	138.5	136	266	76.5	80	20	40	14	19	F07/10	70	102	M8×12	M10×15	17×17	G1/4"
VT125	96	157	161	337	85	80	30	56	22	25	F07/10	70	102	M8×12	M10×15	22×22	G1/4"
VT140	110	178	178	377	97	80	30	56	22	31	F10/12	102	125	M10×15	M12×18	27×27	G1/4"
VT160	112	196	200	412	106	130	30	56	22	31	F10/12	102	125	M10×15	M12×18	27×27	G1/4"
VT190	136	216.5	232	488	112	130	30	56	22	41	F10/14	102	140	M10×15	M16×24	36×36	G1/4"
VT210	140	235.5	255	550	120	130	30	80	32	40	F14	-	140	-	M16×24	36×36	G1/4"
VT240	159	262	292	602	131	130	30	80	32	50	F16	-	165	-	M20×28	46×46	G1/2"
VT270	159	295	331	672	147.5	130	30	80	32	50	F16	-	165	-	M20×28	46×46	G1/2"
VT300	180	335	354	784	173	130	30	80	32	50	F16	-	165	-	M20×28	46×46	G1/2"
VT350	270	385	410	845	195	130	30	80	32	50	F16/F25	165	254	M20×28	M16×30	46×46	G1/2"
VT400	290	520	466	956	260	130	30	80	32	60	F25	-	254	-	M16×30	55×55	G1/2"

MODEL SELECTION

MODEL	TYPE	SPRING QTY	FLANGE	SQURE	OPTION	SEALING PART
VT032	D=DOUBLE ACTING S=SPRING RETURN		F03	9×9	CAP COLOR RAL	STANDARD NITRILE RUBBER -15~+80℃ HT FLUORORUBBER (FOR HIGH TEMPERATURE) -15~+150℃ LT SILASTIC (FOR LOW TEMPERATURE) -40~+80℃
VT050			F03/05	11×11	7046 9004	
VT065		ONLY FOR SPRING REST	F05/07	14×14	5021 3020	
VT075			F05/07	14×14	6002 5015	
VT085		4	F05/07	17×17	TYPE OF BODY P Smooth Surface + hard Anodized	
VT095		5	F05/07	17×17		
VT110		6	F07/10	17×17	S Sandblasted Surface + hard Anodized (Color: Grey)	
VT125		7	F07/10	22×22		
VT140		8	F10/12	27×27	H Sandblasted Surface + hard Anodized (Color: Dark Grey)	
VT160		9	F10/12	27×27		
VT190		10	F10/14	36×36	F Sandblasted Surface + hard Anodized + PTFE Coated	
VT210		11	F14	36×36		
VT240		12	F16	46×46		
VT270			F16	46×46		
VT300			F16	46×46		
VT350			F16/25	46×46		
VT400		F25	55×55			

Note:

- 1.The standard rotation of double acting and spring return is clockwise to close(for double acting when port 4 is pressurised).
- 2.The standard temperature of sealing part is -15 C to 80 C ,if high temperature or low temperature required, relevant sealing parts can be used.
- 3.All technical parameters of products please refer to this catalog. Customization for special requirement is available. Please contact the sales.
4. Customization including but not limited to the items below:
 - 1) Color combination.
 - 2) Flange and Square custom made.
 - 3) Higher protection level.

Model Selection Example:

Example1: VT095D F07/10 17 P7046

Description: Actuator model VT095, double acting, ISO flange F07&F10, 17 mm bottom square with standard indicator, P body, cap color grey (RAL7046), nitrile rubber sealing.

Example2: VT190S12 F10/14 36 S5021HT

Description: Actuator model VT190, single acting spring return, with 12 springs, ISO flange F10&F14, 36 mm bottom square, S body, cap color green (RAL5021), fluororubber sealing.