



**TORK**<sup>®</sup>  
**MÁS TORK**

## VTY-Series Scotch Yoke Actuator



- High performance and high reliability
- Fully compliant with the latest international standards and regulations
- More applicable to a wide range of specifications and torque requirements
- Compact design is better suited for a variety of industrial applications

## Design And Structure

### Design

VTY-series Scotch Yoke Actuator adopts a new type of scotch yoke structure, integrated the latest pneumatic actuator technology and application materials, based on rich field installation and product application experience of innovative design.

It has been proved through sufficient practice that our products have the following advantages

- ☆ High performance and reliability
- ☆ Better industrial styling is more suitable for variety of application environments
- ☆ More applicable specifications and higher cost performance
- ☆ Comply with the latest international norms

### Structure

1. One-piece universal compact design: double-acting and spring-return actuators of the same type, with the same cylinder and transmission parts, can be converted in the field by adding or removing springs and replacing end caps, greatly facilitating field applications.

2. Full compliance with the latest international norms including ISO5211, DIN3337 and VDI/VDE3845, etc. Fully support NUMAR standard, with good interchangeability, easy to install solenoid valve limit switch and other related accessories.

3. Double piston scotch yoke type structure design: it has the advantages of compact structure, large torque, fast and stable action, etc. The steering can be easily changed through simple piston exchange.

4. Two independent external travel adjustment bolts allow easy and precise adjustment of  $\pm 5^\circ$  in the  $0^\circ$  and  $90^\circ$  directions, thus keeping the actuator in the fully open and fully closed position in line with the valve position.

5. The composite bearing and guide ring on the shaft and piston can ensure accurate operation, low friction and long service life.

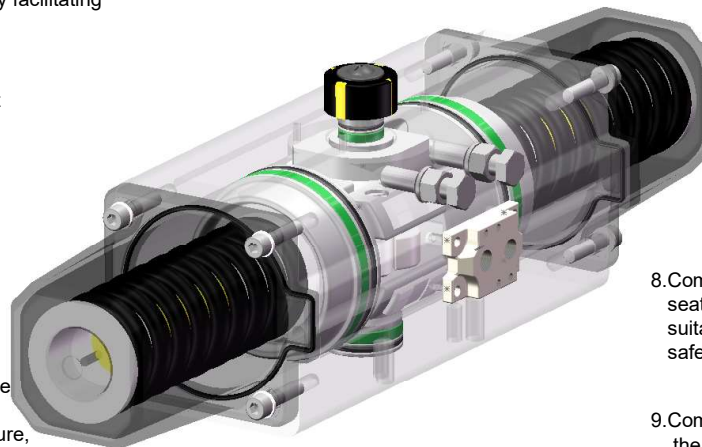
6. The shaped seal ring design between the end cap and cylinder body avoids the rubber plug inhalation phenomenon that is easy to occur in conventional actuators, which largely improves safety, more reliable sealing performance and higher life expectancy.

7. The output shaft, fork disc, stopper and other load-bearing parts are made of high-strength alloy steel to ensure safe and reliable operation of the actuator.

8. Combined pre-compression spring seat with special plated spring, suitable for a variety of applications, safer and more corrosion resistant.

9. Compared to rack and pinion actuators, the VTY improves torque on opening and closing, and is lighter in weight and consumes less air, thus saving the corresponding cost of the air compressor.

10. The design of scotch yoke type actuator greatly reduces the friction between the piston and the cylinder wall from the structure, thus reducing the wear of related parts, and greatly improving the stability, reliability and life of the product.



## Product Selection Scope, Accessories And Quality Management

### Selection Scope :

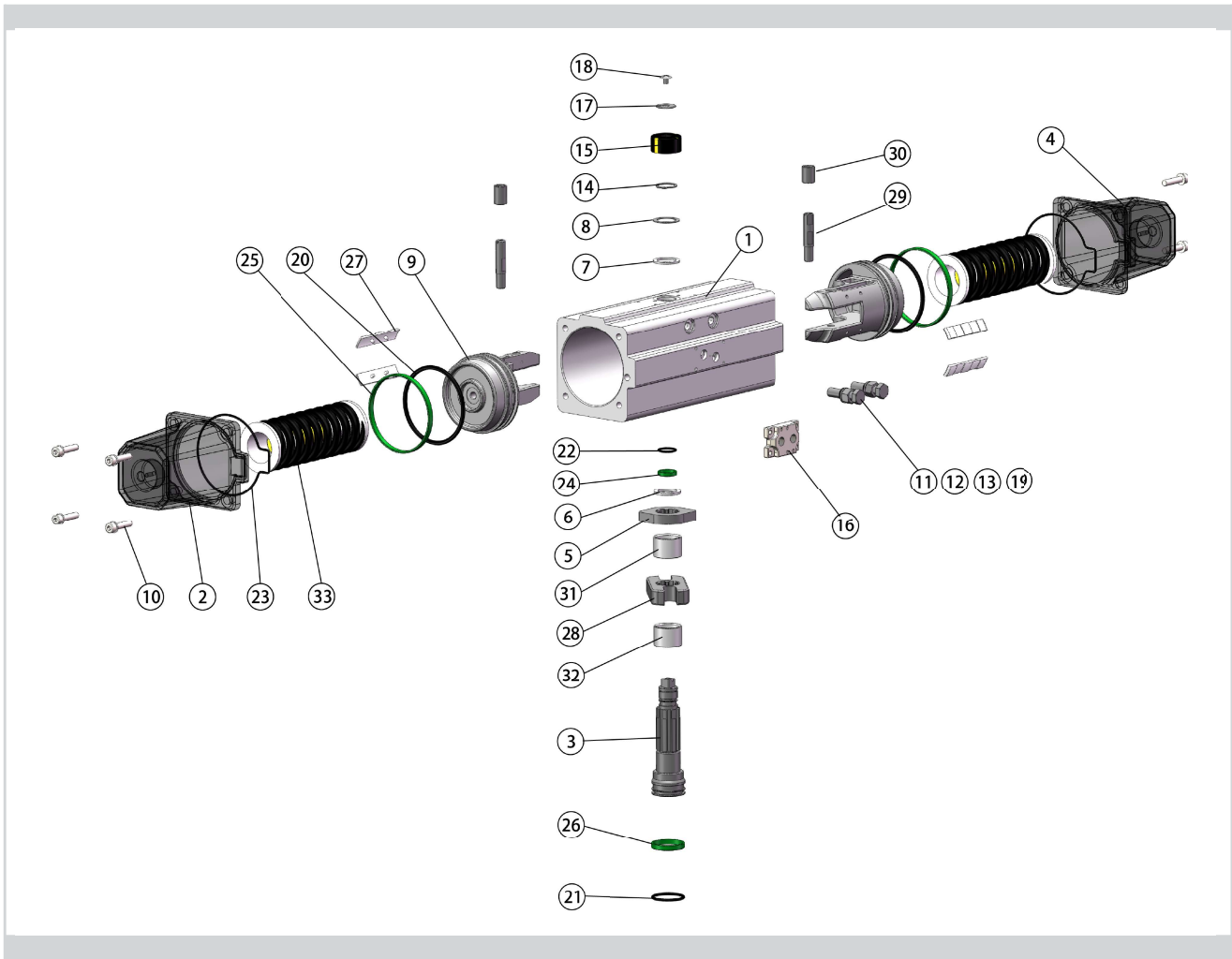
- A. For high and low temperature occasions, there are corresponding fluororubber and silicone rubber dust rings and special lubricants.
- B. In addition to the standard octagonal output shaft at the bottom, other forms specified by customers can also be provided (contact the factory for confirmation).

### Quality Management :

- The production of VTY pneumatic actuator fully conforms to ISO9001 system specifications.
- Each individual actuator is tested before delivery, and a unique serial number is provided for identification and tracking.
- Each actuator is packed in an appropriate cardboard box. For the protection and identification of the actuator, each carton has a detailed identification description.

### Optional Accessories:

Bracket、Connector、Solenoid valve、Limit switch box、Proximity sensor、Gear box(manual gear override)、Positioner、Complete set of squar output shaft sleeves in reduced sizes .



No.	Part Name	Material	Quantity	No.	Part Name	Material	Quantity
1	Cylinder	Aluminium Alloy	1	19	O-Ring (Adjustment) *	Rubber	2
2	Left End Cap	Aluminium Alloy	1	20	O-Ring (Piston) *	Rubber	2
3	Driving Shaft	Alloy Steel	1	21	O-Ring (Lower Part Of Shaft)	Rubber	1
4	Right End Cap	Aluminium Alloy	1	22	O-Ring (Upper Part Of Shaft)	Rubber	1
5	Stopper	Alloy Steel	1	23	O-Ring (End Cap) *	Rubber	2
6	Inner Shim *	Acetal Resin (POM)	1	24	Upper Retaining Ring *	Acetal Resin (POM)	1
7	Outer Shim *	Acetal Resin (POM)	1	25	Support Band *	Acetal Resin (POM)	2
8	Washer	Stainless Steel	1	26	Lower Retainer Ring *	Acetal Resin (POM)	1
9	Piston	Aluminium Alloy	2	27	Support Element *	Acetal Resin (POM)	4
10	End Cover Bolt	Stainless Steel	8	28	Scotch Yoke	Alloy Steel	1
11	Adjusting Bolt	Stainless Steel	2	29	Piston Pin	Alloy Steel	2
12	Adjusting Nut	Stainless Steel	2	30	Piston Roller	Alloy Steel	2
13	Washer	Stainless Steel	2	31	Upper Supporting Ring	Acetal Resin (POM)	1
14	Elastic Collar	Spring Steel	1	32	Lower Support Ring	Acetal Resin (POM)	1
15	Indicator	Acetal Resin (POM)	1	33	Spring	Spring Steel	2
16	Adapter Plate	Aluminium Alloy	1				
17	Indicator Gasket	Stainless Steel	1				
18	Screw	Stainless Steel	1				

Notes: \* Materials Contained In The Repair Kit

# Torque - Metric Torque Output



Double Acting Actuator Output Torque(N.m)																							
Model	Air Supply Pressure(Unit:Bar)																						
	3.5			4			4.5			5			5.5			6			7				
	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°		
VTY100	71	35.5	71	81.2	40.6	81.2	91.3	45.7	91.3	101.5	50.75	101.5	111.6	55.8	111.6	121.8	60.9	121.8	142.1	71.05	142.1		
VTY150	107.7	53.9	107.7	123.1	61.6	123.1	138.5	69.3	138.5	153.9	77	153.9	169.3	84.7	169.3	184.7	92.4	184.7	215.5	107.8	215.5		
VTY250	165.4	82.7	165.4	189	94.5	189	212.7	106.4	212.7	236.3	118.2	236.3	260	130.0	260	283.6	141.8	283.6	330.8	165.4	330.8		
VTY350	231.9	116.0	231.9	265.1	132.6	265.1	298.2	149.1	298.2	331.3	165.65	331.3	364.5	182.3	364.5	397.6	198.8	397.6	463.9	231.95	463.9		
VTY450	309.1	154.6	309.1	353.3	176.65	353.3	397.4	198.7	397.4	441.6	220.8	441.6	485.7	242.85	485.7	529.9	265.0	529.9	618.2	309.1	618.2		
VTY800	554.9	277.45	554.9	634.2	317.1	634.2	713.4	356.7	713.4	792.7	396.4	792.7	872	436	872	951.3	475.7	951.3	1109.8	554.9	1109.8		
VTY1000	751	375.5	751	858.3	429.2	858.3	965.6	482.8	965.6	1072.9	536.5	1072.9	1180.2	590.1	1180.2	1287.5	643.75	1287.5	1502.1	751.05	1502.1		
VTY1500	1080.9	540.45	1080.9	1235.3	617.65	1235.3	1389.7	694.9	1389.7	1544.1	772.05	1544.1	1698.5	849.3	1698.5	1853	926.5	1853	2161.8	1080.9	2161.8		
VTY2000	1425	712.5	1425	1628.6	814.3	1628.6	1832.1	916.1	1832.1	2035.8	1017.9	2035.8	2239.3	1119.7	2239.3	2442.9	1221.5	2442.9	2850	1425	2850		

Single Acting Actuator Output Torque(N.m)																										
Model	Air Supply Pressure(Unit:Bar)																		Spring Return Torque (N.m)							
	3.5			4			4.5			5			5.5			6			7			0°	45°	90°		
	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°		
VTY100SR1	37.6	15.3	23.3	47.8	20.3	33.5	57.9	25.4	43.6	68.1	30.5	53.8											33.5	20.3	47.8	
VTY100SR2				39.4	15.2	21.5	49.6	20.3	31.6	59.7	25.4	41.8	69.9	30.5	51.9									41.8	25.4	59.7
VTY100SR3										51.4	20.3	29.9	61.5	25.4	40	71.7	30.5	50.2	92	40.6	70.5	50.2	30.5	71.7		
VTY150SR1	57	23.1	35.2	72.4	30.8	50.6	87.8	38.5	66	103.2	46.2	81.4												50.7	30.8	72.4
VTY150SR2				59.7	23.1	32.5	75.1	30.8	47.9	90.5	38.5	63.3	105.9	46.2	78.7									63.4	38.5	90.6
VTY150SR3										77.8	30.8	45.2	93.2	38.5	60.6	127.8	54.3	89.4	164	72.4	125.7	76.1	46.2	108.7		
VTY250SR1	87.6	35.5	54.2	111.2	47.2	77.9	134.9	59.1	101.5	158.5	70.9	125.1												77.8	47.3	111.2
VTY250SR2				91.8	35.4	50.1	115.4	47.3	73.7	139	59.1	97.3	162.7	70.9	121									97.3	59.1	139
VTY250SR3										119.6	47.3	69.5	143.2	59.1	93.2	166.8	70.9	116.8	214.1	94.5	164	116.8	70.9	166.8		
VTY350SR1	122.6	49.7	76.3	155.7	66.3	109.4	188.8	82.9	142.6	222	99.4	175.7												109.4	66.3	155.7
VTY350SR2				128.6	49.8	70.4	161.7	66.3	103.5	194.8	82.9	136.7	228	99.5	169.8									136.5	82.8	194.7
VTY350SR3										167.7	66.4	97.6	200.9	83	130.8	234	99.5	163.9	300.3	132.7	230.2	163.6	99.4	233.8		
VTY450SR1	163.6	66.3	101.3	207.8	88.3	145.5	252	110.4	189.6	296.1	132.5	233.8												145.5	88.3	207.8
VTY450SR2				171.5	66.2	93.5	215.6	88.3	137.7	259.8	110.4	181.8	303.9	132.5	226									181.8	110.4	259.7
VTY450SR3										223.4	88.2	129.9	267.6	110.4	174	311.7	132.5	218.2	400	176.6	306.5	218.2	132.5	311.7		
VTY800SR1	293.8	118.9	181.9	373	158.5	261.1	452.3	198.1	340.4	531.6	237.8	419.7												261.1	158.6	373
VTY800SR2				307.8	118.9	167.9	387	158.5	247.1	466.3	198.2	326.4	545.6	237.8	405.7									326.4	198.2	466.3
VTY800SR3										401	158.5	233.2	480.3	198.2	312.4	559.6	237.8	391.7	718.1	317.1	550.3	391.7	237.8	559.6		
VTY1000SR1	397.6	160.9	246.1	504.9	214.6	353.4	612.2	268.2	460.7	719.5	321.9	568												353.5	214.6	504.9
VTY1000SR2				416.5	160.9	227.2	523.8	214.6	334.5	631.1	268.2	441.8	738.4	321.9	549.1									441.8	268.2	631.1
VTY1000SR3										542.8	214.6	315.6	650.1	268.2	422.9	757.4	321.9	530.2	971.9	429.2	744.7	530.2	321.9	757.4		
VTY1500SR1	572.2	231.6	354.2	726.6	308.9	508.6	881.1	386.1	663.1	1035.5	463.3	817.5												508.7	308.8	726.6
VTY1500SR2				599.5	231.6	327	753.9	308.8	481.4	908.3	386	635.8	1062.7	463.3	790.2									635.8	386	908.3
VTY1500SR3										781.1	308.83	454.1	935.6	386	608.6	1090	463.3	763	1399	617.7	1071.8	763	463.3	1090		
VTY2000SR1	754.6	305.3	466.6	958.2	407.1	670.2	1161.8	508.9	873.8	1365.4	610.7	1077.4												670.4	407.2	958.4
VTY2000SR2				765.4	305.5	456.6	968.9	407.3	660.2	1172.5	509.1	863.7	1376.1	610.9	1067.3									863.2	508.8	1172
VTY2000SR3										1078.7	431.5	650.1	1279.3	533.3	853.7	1482.9	635	1057.3	1890	838.6	1464.5	960	586.4	1385.6		

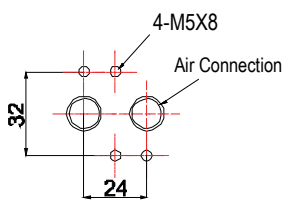
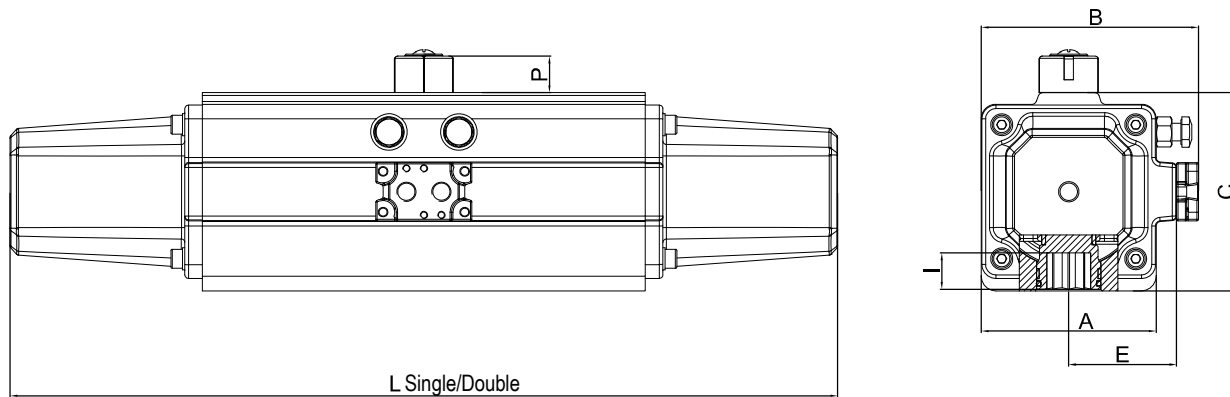
## Technical Data

Model	VTY100		VTY150		VTY250		VTY350		VTY450		VTY800		VTY1000		VTY1500		VTY2000	
	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR
Cylinder Bore(mm)	Ø65		Ø75		Ø85		Ø95		Ø105		Ø125		Ø140		Ø160		Ø180	
Open Volume(L)	0.32	0.32	0.61	0.61	0.89	0.89	1.25	1.25	1.73	1.73	3.08	3.08	4.16	4.16	5.74	5.74	8.67	8.67
Close Volume(L)	0.36	0.72	0.72	1.4	1.05	1.6	1.47	3.1	1.95	3.8	3.26	6.5	4.34	9.5	6.01	13.2	9.21	18.2
Open Time(S)	0.1	0.3	0.12	0.62	0.13	0.66	0.2	0.8	0.26	0.8	0.46	1.1	0.63	1.2	0.9	1.6	1.3	1.8
Close Time(S)	0.1	0.3	0.12	0.82	0.16	0.86	0.22	1	0.3	1	0.5	1.3	0.66	1.5	0.92	1.8	1.4	2.1

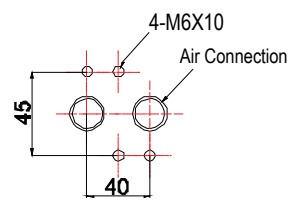
Notice: The action time of the actuator (opening or closing) is calculated theoretically under the following test conditions

- Double acting actuators: (1) Normal temperature (2) Travel of the actuator 0° to 90° (3) Compressed air pressure 0.5MPa, Compressed air flow rate 400 l/min (4) Dry and clean compressed air (5) Actuator without any load
  - Single acting actuators: (1) Normal temperature (2) Travel of the actuator 0° to 90° (3) Compressed air pressure 0.5MPa, Compressed air flow rate 400 l/min (4) Dry and clean compressed air (5) Actuator without any load (6) Actuator relies on spring return
- The opening and closing times in this table are theoretically calculated, and there are many external factors in the actual operation of the actuator, so this table is for reference only

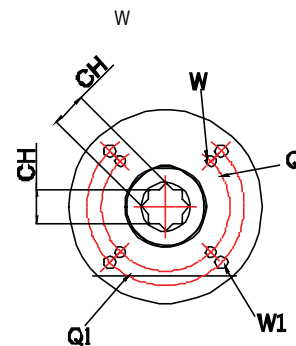
Sample Reference



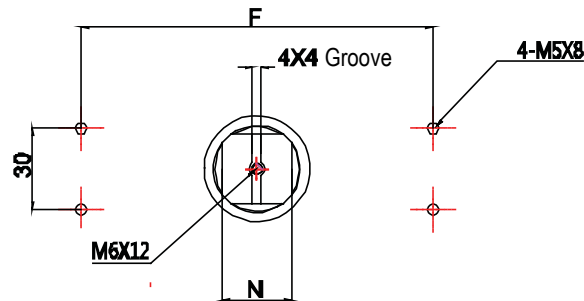
G1/4 NAMUR standard



G1/2 NAMUR standard



Top View



Dimension Table of VTY Series Pneumatic Actuator(mm)

Model	A	B	C	L/Single	L/Double	E	F	P	N	Flange	Q	Q1	W	W1	Ch	I	Air connection
VTY100	78	105	89	360	228	51	80	20	10	F05/F07	50	70	M6x9	M8x12	14x14	16	G1/4"
VTY150	88	115	100	398	265	60	80	20	10	F05/F07	50	70	M6x9	M8x12	14x14	16	G1/4"
VTY250	100	127	113	451	301	62	80	20	14	F07/F10	70	102	M8x12	M10x15	17x17	19	G1/4"
VTY350	110	139	123	521	340	69	80	20	14	F07/F10	70	102	M8x12	M10x15	22x22	25	G1/4"
VTY450	120	149	136	568	366	74	80	20	14	F10/F12	102	125	M10x15	M12x18	22x22	25	G1/4"
VTY800	142	176	159	677	450	90	80/130	30	22.1	F10/F12	102	125	M10x15	M12x18	27x27	31	G1/4"
VTY1000	160	195	178	769	483	100	80/130	30	22.1	F10/F14	102	140	M10x15	M16x24	36x36	41	G1/4"
VTY1500	180	218	200	880	565	113	80/130	30	22.1	F14	-	140	-	M16x24	36x36	41	G1/4"
VTY2000	202	239	222	895	605	123	130	30	22.1	F14	-	140	-	M16x24	36x36	41	G1/4"

## Model Designation



Model	Spring Code	Flange	Square End (CH)	Housing Type	Color Of End Cap	Sealing Element	Failure Type
VTY100	DA= Double acting	F05/F07	14	S: Sandblasted Surface&Hard Anodize (Color:Grey)	■ 9004 Black	Standard NBR seal -18°C~+80°C	FC Fail Close FO Fail Open
VTY150		F05/F07	14				
VTY250		F07/F10	17				
VTY350		F07/F10	22				
VTY450	Spring Return SR1 SR2 SR3	F10/F12	22			HT Fluororubber seal (High Temperature) -18°C~+150°C	
VTY800		F10/F12	27				
VTY1000		F10/F14	36				
VTY1500		F14	36			LT Silastic seal (Low Temperature) -40°C~+80°C	
VTY2000		F14	36				

### Remarks:

- The standard rotation of double acting and spring return is clockwise to close.
- Sealing parts come standard with normal temperature ranges of -18°C to +80°C. Corresponding sealing types are available for environment at high or low temperature.
- Please refer to brochure for technical parameter details.
- Customized service including but not limited to:
  - Color combination;
  - Flange and square;
  - Higher protection grade;

### Model Selection Example:

Example1: VTY350DA F07/F10 22 S9004

Description: Actuator model VTY350, double acting, ISO flange F07/F10 22mm diagonal square, standard NBR seal, light color cylinder block, The color of end cap is RAL9004 black.

Example2: VTY350SR1 F07/F10 22 S9004 HT FC

Description: Actuator model VTY350, Single acting SR1, ISO flange F07/F10, 22mm diagonal square, High temperature fluororubber seal, light color cylinder block, The color of end cap is RAL9004 black, FC Fail Close