

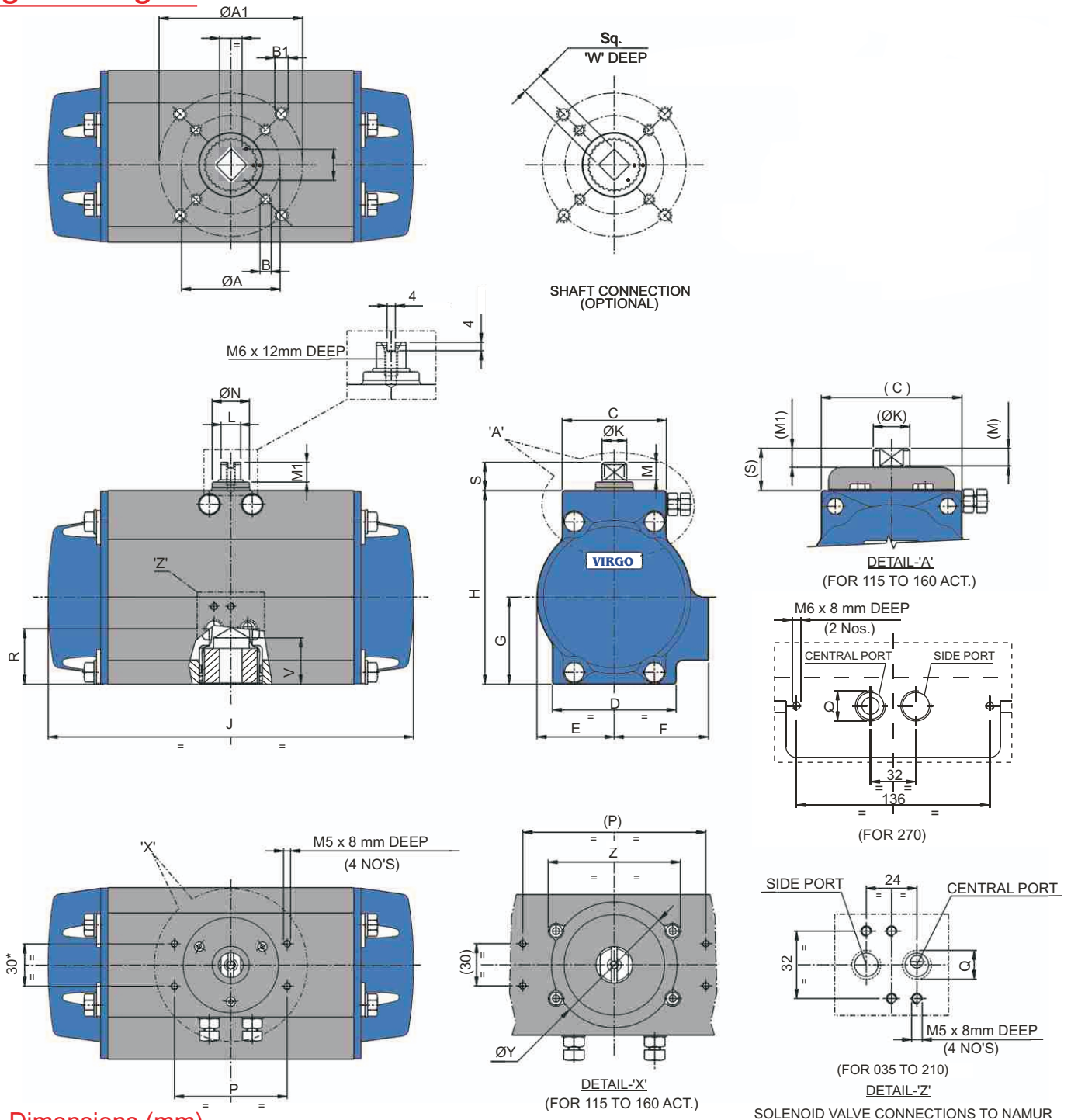
Series 20



◆ Pneumatic Rack & Pinion Actuators

◆ Double Acting and Spring Return





Dimensions (mm)

SIZE	ØA	ØA1	B	B1	C	D	E	F	G	H	J	ØK	L	M	M1	ØN	P	Q (NPT)	R	S	V	Sq	W (Min)	ØY	Z
052	42	70	M5 x 8mm	M8 x 8mm	47.5	63	31.5	40	36.6	79.1	150	10	8	12.5	14	17	80	1/8	25	20	32.5	11	12	--	--
065	42	70	M5 x 8mm	M8 x 10mm	58	63	36.5	48	44.7	96.4	184	14	10	12.5	14	26.5	80	1/4	28.7	20	32.5	14	16	--	--
075	50	70	M6 x 8mm	M8 x 10mm	59	63	41.5	52	51.6	111	205	14	10	12.5	14	26.5	80	1/4	31.6	20	32.5	17	19	--	--
085	50	70	M6 x 8mm	M8 x 10mm	67	75	47.5	58	54.2	119.2	253	17.5	14	12.5	14	26.5	80	1/4	34.2	20	32.5	17	19	--	--
100	70	102	M8 x 10mm	M10 x 12mm	75	88	55	67	62.7	141	260	17.5	14	12.5	14	26.5	80	1/4	40.2	20	32.5	22	24	--	--
115	70	125	M8 x 10mm	M12 x 12mm	100	110	63	77.5	71.3	143.8	310	26	20	12.5	13.5	--	130	1/4	48.8	30	32.5	22	24	89.4	96
125	70	125	M8 x 10mm	M12 x 12mm	100	110	68	82.5	76.3	154.3	368	26	20	12.5	13.5	--	130	1/4	53.8	30	54	22	24	89.4	96
160	--	125	--	M12 x 12mm	116.4	116.4	87.5	108	99	198	471.5	32	27	20	32	--	130	1/4	76.5	50	54	27	29	105.8	110.2
210	125	165	M12 x 20 mm	M20 x 25mm	205	--	118.5	148	135	268	668	42	32	30	50	163	130	1/4	112.5	77.5	64	36	39	--	--

Torques (N-m)

Actuator Speeds (sec.)									
Size	052	065	075	085	100	115	125	160	210
Open Stroke/ Close Stroke	0.3	0.35	0.45	0.6	0.8	1.0	1.3	2.0	3.8

Actuator Weights (Kgs)									
Size	052	065	075	085	100	115	125	160	210
Double Acting	1.3	2.2	2.7	3.8	5.5	8.1	10.2	19.4	45.3
Spring Return	1.4	2.5	3.2	4.4	6.5	9.5	12.3	24.1	58.4

Actuator Volumes (cm) ³									
Size	052	065	075	085	100	115	125	160	210
Counter Clockwise	100	180	315	460	750	1195	1520	3340	6770
Clockwise	160	350	526	840	1164	1760	2420	5240	12320

Actuator Speeds are at 5.5 bar & Orifice dia. of approx 4mm

Double Acting Actuator Torque Data (N-m)						
Size	Air Supply Pressure (bar)					
	3	4	5.5	6	7	8
052	11	15	21	23	27	31
065	22	29	39	43	50	57
075	32	42	58	64	75	86
085	47	63	88	96	112	129
100	76	102	140	153	178	204
115	125	167	231	252	294	337
125	166	221	304	331	387	442
160	326	434	597	651	760	869
210	786	1047	1440	1571	1833	2095

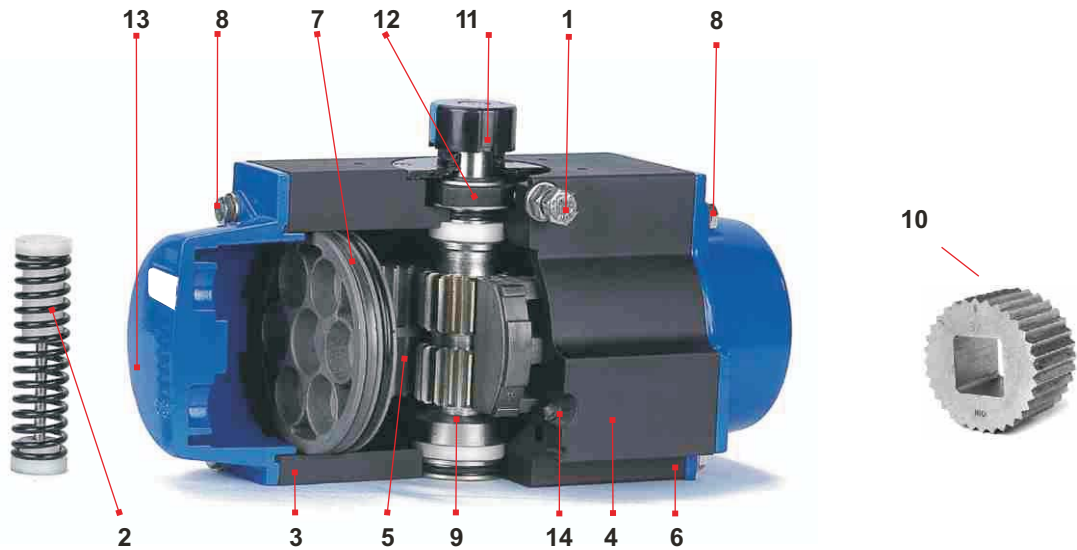
Spring Return Actuator Torque Data (N-m)															
Size	Total Springs*	Air Supply Pressure (bar)												Spring stroke	
		3		4		5.5		6		7		8			
		PB	PE	PB	PE	PB	PE	PB	PE	PB	PE	PB	PE	SB	SE
052	06	7	4.7	10.8	8.6	16.5	14.3							6	4.1
	08			9.3	6.3	15	12.1	16.9	14	20.8	17.8			7.3	5.4
	10					13.5	9.8	15.4	11.7	19.3	15.6	23.1	19.4	10.1	6.8
	12					12	7.6	13.9	9.5	17.8	13.3	21.6	17.1	12.1	8.1
065	06	14	7.5	21.1	14.5	31.9	25.5							11.3	6.8
	08			18.6	11	29.4	21.5	33	25	40.1	32			14.1	9
	10					26.9	17.5	30.4	21	37.6	28	44.8	35	18.8	11.3
	12					24.3	13	27.9	16.5	35.1	24	42.3	31	22.6	13.6
075	06	17.7	8.0	28.8	19.1	45.5	36.3							22.0	13.1
	08			23.6	10.8	40.3	28.0	45.9	33.0	57.0	44.7			30.0	17.5
	10					35.1	18.7	40.6	24.0	51.8	35.5	62.9	46.5	37.4	23.1
	12					29.8	10.8	35.4	16.0	46.5	27.0	57.6	38.2	44.0	27.0
085	06	31.0	17.0	47.4	33.9	71.9	58.4							28.3	15.2
	08			41.4	23.4	65.9	47.9	74.1	56.1	90.4	72.4			37.0	20.6
	10					58.9	37.4	67.1	45.6	84.4	61.9	100.7	78.3	47.2	26.0
	12					53.9	26.4	62.1	34.1	78.4	51.4	94.7	67.8	56.7	31.4
100	06	44.0	25.5	69.5	50.9	107.7	89.1							45.0	28.1
	08			58.7	34.0	96.9	72.1	109.6	84.9	135.1	110.3			58.0	37.5
	10					86.1	55.2	98.9	67.9	124.3	93.3	149.8	118.8	76.3	47.0
	12					75.4	38.2	88.1	50.9	113.5	76.4	139.0	101.8	91.6	57.1
115	06	77.4	49.0	119.5	91.1	182.6	154.2							68.0	42.0
	08			103.2	65.4	166.3	128.5	187.3	149.5	229.4	191.6			88.0	56.0
	10					150.0	102.8	171.1	123.8	213.1	165.9	255.2	207.9	113.0	71.0
	12					133.8	77.1	154.8	98.1	196.9	140.2	238.9	182.2	136.0	85.0
125	06	100.6	64.6	155.8	119.8	238.6	202.6							91.0	58.6
	08			134.1	86.1	216.9	168.9	244.5	196.5	299.8	251.8			119.0	78.1
	10					195.2	135.2	222.8	162.8	278.1	218.1	333.3	273.3	151.7	97.7
	12					173.5	101.5	201.1	129.1	256.4	184.4	311.6	239.6	182.0	115.0
160	06	201.0	125.4	309.6	234.0	472.4	396.8							180.3	110.3
	08			268.0	167.2	430.8	330.0	485.1	384.3	593.7	492.9			240.4	147.7
	10					389.3	263.3	443.5	317.5	552.1	426.1	660.7	534.7	300.5	187.1
	12					347.7	196.5	402.0	250.8	510.5	359.3	619.1	467.9	360.6	224.5
210	06	462.2	311.0	724.1	572.9	1116.9	965.7							427.1	291.0
	08			616.3	414.7	1009.1	807.5	1140.0	938.4	1401.9	1200.3			589.5	388.0
	10					901.3	649.3	1032.2	780.2	1294.1	1042.1	1555.9	1303.9	711.8	485.0
	12					793.5	491.1	924.5	622.1	1186.3	883.9	1448.2	1145.8	854.1	582.0

In between torque values to be interpolated.

SE= Spring End Torque, SB= Spring Break Torque, PE= Pneumatic End Torque, PB=Pneumatic Break Torque

Features

Virgo Engineers Ltd. is pleased to offer top-of-the-line products in flow control automation. The Virgo Series 20 are pneumatically operated, quarter turn rotary, dual rack and pinion design actuators. These actuators are built with several of the latest features that enhance safety and performance. The actuators are manufactured in modern with state-of-the-art machinery and under a robust quality assurance system complying to ISO 9001: 2000. Virgo actuators are SIL 3 capable. Listed below are the features and benefits of Virgo actuators. Also included is the comprehensive technical data, which can be useful for selecting the correct Virgo actuator.



1 Two independent external travel stops permit easy and precise adjustment of +/- 5° in both directions.

2 Modular pre-loaded spring cartridges for safe, efficient use of spring actuator. Also, facilitate easy field conversion from double acting to spring return & vice versa. Spring cartridges have corrosion resistant springs.

3 Extruded aluminum body, hard anodized and black dyeing with honed internal surface for strength and lower coefficient of friction. This ensures extended service life and low maintenance down-time. The air passages are machined internally to avoid external tubing. The external shape is contoured and rounded to avoid buildup of contaminants.

4 Compact modular design with same body and end caps for double acting and spring return actuators. Shaft with insert design offers the most efficient use of inventory.

5 Dual rack and pinion design for compact construction, symmetrical mounting position, fast and efficient operation and offers both spring-to-open and spring-to-close options. Reverse rotation can be accomplished in the field by simply inverting the pistons.

6 Wide actuator base design option can be adapted to mount to valve designs requiring wider than EN ISO 5211 drilling. This feature coupled with the unique shaft insert design can be customized to fit your specific requirements.

7 Top quality bearings and seals for low friction & high cycle life are permanently factory lubricated to ensure trouble free, long service life.

8 Internal and external stainless steel fasteners and specially coated springs provide excellent corrosion resistance in a variety of environments and applications.

9 The unique manufacturing techniques of shaft combine a high strength alloy steel-shaft with electro-less nickel-plating having precision-machined gear teeth with precision drive end.

10 The bottom of the pinion shaft is available in parallel square, diagonal square, configurations to accommodate several valve mounting options.

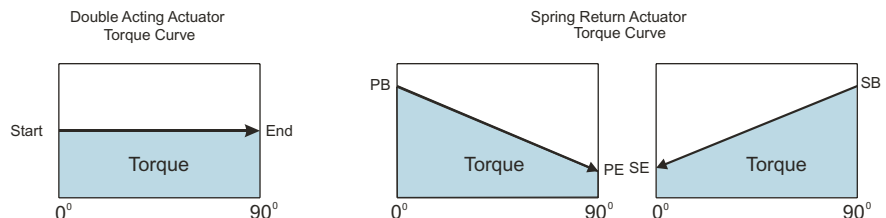
11 Unique position indicator can be indexed to show alternate position. Top of actuator shaft has a NAMUR slot to drive all popular sensors and positioners.

12 The design of the stop adjustment cam permits the actuator to be locked out in the full open or full closed position before performing mechanical maintenance work. A special lock out enclosure is also available as an option to prevent unwanted operation.

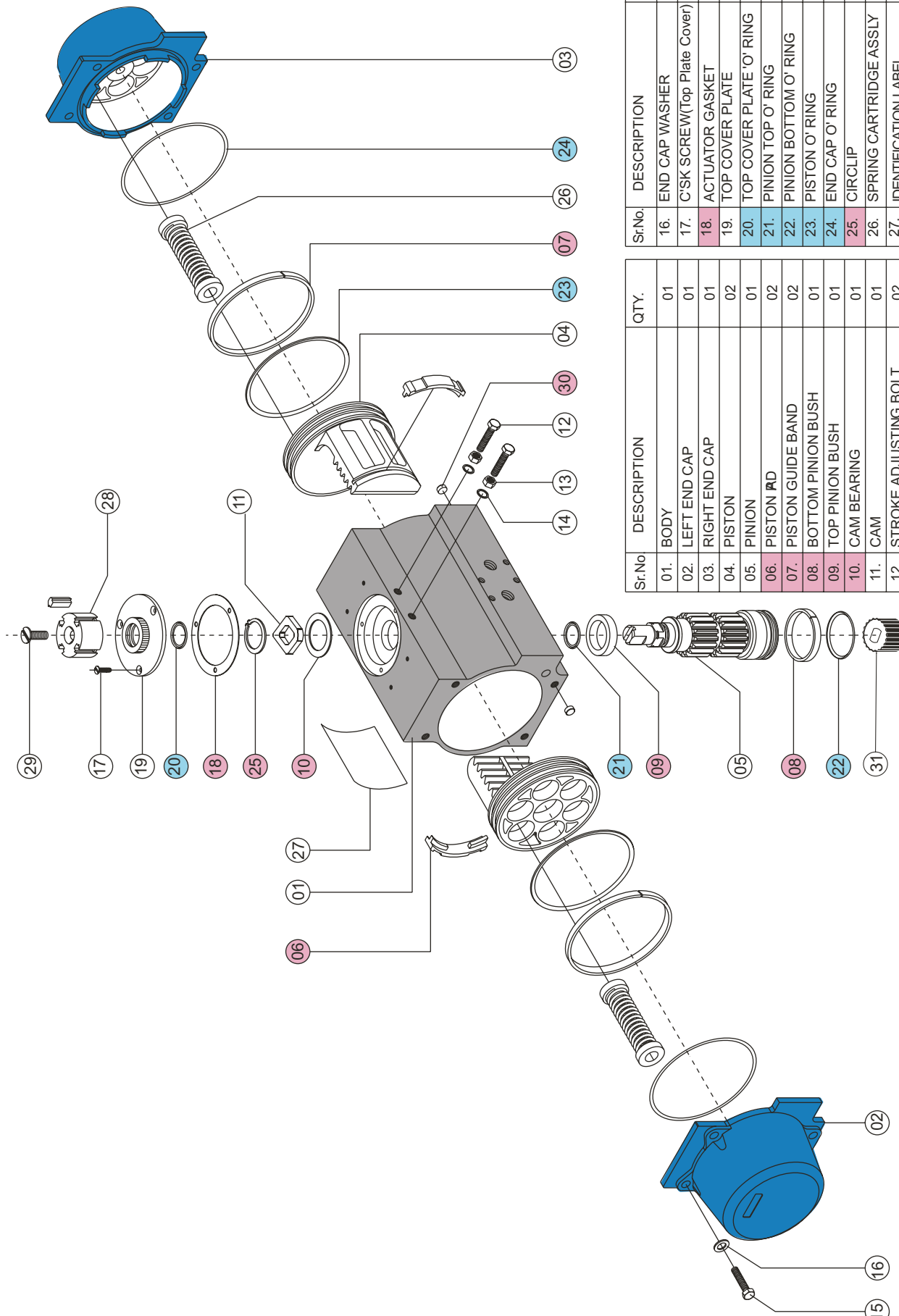
13 Standard end caps are rounded with no crevices to accumulate contamination or corrosive chemicals. Optional end caps are available to provide 100% stroke adjustment in one direction. The external and internal surface is coated with an epoxy based powder to provide resistance to atmospheric corrosion and general resistance to mild chemicals.

14 Manufactured in full compliance with the latest requirements of EN ISO 5211. Provisions for mounting solenoid valves and accessories comply with Namur VDI/VDE 3845.

Torque Curve



Exploded View



Sr.No.	DESCRIPTION	QTY.
16.	END CAP WASHER	08
17.	C'SK SCREW(Top Plate Cover)	03
18.	ACTUATOR GASKET	01
19.	TOP COVER PLATE	01
20.	TOP COVER PLATE 'O' RING	01
21.	PINION TOP 'O' RING	01
22.	PINION BOTTOM 'O' RING	01
23.	PISTON 'O' RING	02
24.	END CAP 'O' RING	02
25.	CIRCLIP	01
26.	SPRING CARTRIDGE ASSLY	12 (MAX.)
27.	IDENTIFICATION LABEL	01
28.	LOCAL POSITION INDICATOR	01
29.	C'SK SCREW (Indicator)	01
30.	PLUG TRANSFER PORT	02
31.	SHAFT INSERT	01

Sr.No.	DESCRIPTION	QTY.
01.	BODY	01
02.	LEFT END CAP	01
03.	RIGHT END CAP	01
04.	PISTON	02
05.	PINION	01
06.	PISTON RD	02
07.	PISTON GUIDE BAND	02
08.	BOTTOM PINION BUSH	01
09.	TOP PINION BUSH	01
10.	CAM BEARING	01
11.	CAM	01
12.	STROKE ADJUSTING BOLT	02
13.	STROKE ADJUSTING NUT	02
14.	STROKE ADJUSTING WASHER	02
15.	END CAP BOLT	08

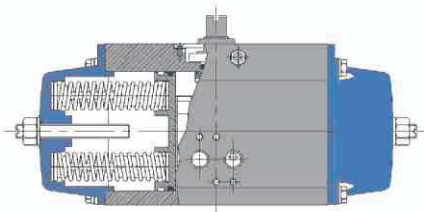
Recommended as Seal Kit

Recommended as Repair Kit



Options & Other products

100% Travel Stops



The stops are located in the end caps and allow the valve position on the counter clockwise (CCW) to be set anywhere between the full-closed and the full-open position.

Safety Lock-out



The unique travel stop cam has a built in safety lock out feature that allows for locking the actuator in either the full-open or full-closed position prior to performing maintenance work.

Stainless Steel Actuators



The Virgo series 22 compact Rack and Pinion St.Steel actuators are used for corrosive environment with limited torque range.

How to order actuators

Series <input type="checkbox"/> <input type="checkbox"/>	Size <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Type <input type="checkbox"/> <input type="checkbox"/>	Trim / Other Variables/specials			
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>
	052 to 210	No.of springs	Shaft Rotation	Bolt Circle & Tapping	Shaft Connection	Sp.Options
20: Hard Anodized Aluminum Body 22**: St. Steel Body	052 065 075 085 100 115 125 160 210	00 = Dble Acting 12* = 6 & 6 (Max)	C: Fail Clockwise Direction (Standard) F: Fail Counter Clockwise Direction S: Stayput (for double acting models: CCW opening of Actuators) Y: Stayput (for double acting models : CW opening of Actuators)	J : 42mm / 70mm M5/M8 (052 - 065) K : 50mm / 70mm M6/M8 (075 - 085) L : 70mm /102mm M8/M10 (100) M : 70mm / 125mm M8/M12 (115 - 125) N : 125mm / 165mm M12/M20 (210 - 270) Q : 125mm / M12 (160) X: Other	06: 11 mm SQ (052-085) 07: 14 mm SQ (065-115) 08: 17 mm SQ (075-115) 09: 19 mm SQ (100-160) 10: 22 mm SQ (100-160) 11: 27 mm SQ (160) 13: 36 mm SQ (210) XX: Other	0: No Special requirements. S: Special requirements as specified by customer.

* Standard

** Series 22 is available in sizes 065,085,100,115,125 and 160

Note: For ordering actuators with standard bolt circles and shaft connection, please refer to the dimensions table in this bulletin.

For other consult Virgo Engineers Limited.

All statements, technical information and recommendations in the bulletin are for general use only. Virgo is not responsible for suitability or compatibility of these products in relation to system requirements. Consult Virgo distributors or factory for the specific requirements and material selection for your intended application. Virgo reserves the right to change or modify product design or product without prior notice.

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