

Gemini Valve B.V.

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Trutorq-C



Actuator Type C 90° - Technical Data, Summary



TruTorq actuators are pneumatic quarter turn actuators based on double rack and pinion design. The C-type actuator is also available in half turn execution (180°).

The C-type 90° actuator is generally recommended to “small” Butterfly valves, Ball valves and Plug valves.

Data for C-Type actuators with movement 0 - 90°

Material, standard (outside)

- Anodized Aluminum, Black
- CNI, Chemically Nickel/PTFE Impregnated for increased corrosion resistance
- Other treatments upon request

Movement

- 0° to 90°

End Stop Adjustment

Single End Stop Adjustment, Open position, located in the End Cap

Over travel

- Open: 3°
- Closed: 0° to 0.5°
- Note! If the actuator is assembled Fail Open (FO), the over travel will be the opposite, ie.
Open: 0° to 0.5°
Closed: 3°

Sizes

- 2, 4, 8, 12, 20, 35, 55, 250 and 400

Torque

Linear torque, ie a Double Acting (DA) Actuator has the same rack power over the entire movement

Torque Output, Double Acting (DA) at 6 bar/80 psi

- 20 to 597 Nm and 2648 to 4803 Nm
- 166 to 4742 in.lbs and 21480 to 38971 in.lbs

Torque Output, Spring Return (SR) at 6 bar/80 psi

- 7 to 211 Nm and 1212 to 1888 Nm
- 59 to 1716 in.lbs and 10728 to 16711 in.lbs

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Operating Pressure

- DA: 2-10 bar / 30-145 psi
- SR: 2-10 bar / 30-145 psi. When the Actuators will be used at Operating pressures below 5.5 bar / 79.8 psi, we recommend that you contact your TT distributor.

Drive Medium

- Standard: Air (Dry or Lubricated) or inert gases (non-dangerous fluids)
- Options (require rebuilding): Oxygen, Hydraulic Oil or Water

Temperature Range, Standard execution (Buna Nitrile, NBR O-seals)

- -30° to +80°C
- -22° to +175°F

Temperature Range, High temperature (Viton O-seals)

- -20° to +140°C
- -4° to +284°F

Temperature Range, Low temperature

- -45° to +60°C
- -49° to +140°F

Temperature Range, Arctic temperature

- -50° to +60°C
- -58° to +140°F

Stroke, Double Acting (DA)

Looking at the front of the Actuator, Port A is on the left side and Port B is on the right

Port A: Air to Open (Anti-clockwise)

Port B: Air to Close (Clockwise)

Stroke, Spring Return (SR)

Port A: Air to Open (Anti-clockwise, compressing springs)

Port B: Exhaust Port

Setting from factory: Fail Close (FC), clockwise closing. To change to Fail Open (FO): see separate instructions

Max number of springs, size 2 to 55

A Spring Kit consists of 4 outer + 4 inner springs located inside the piston racks. To adjust for different Air Pressure; reduce the number of springs.

Max number of springs, size 250 & 400

The precompressed Spring Kits is located inside the piston racks and consists of 6 outer + 6 inner springs for size 250 and 8 outer + 8 inner springs for size 400. To adjust for different Air Pressure; reduce the number of springs.

Drive shaft

Stardrive shaft tailored to international standard for square-section shafts

Standard Connections

Solenoid valves – Namur

Fitting accessories – ISO 5211, DIN 3337, Namur

Stardrive shaft – ISO 5211 (90°), DIN 79 (45°), Namur

Lubricants, recommended

Springs and piston rack segments: Statoil Molyway LI 712 or similar

O-rings and plastic parts: Statoil Uniway LIX 42PA or similar

Standards and Certificates

The Actuators are designed to and in compliance with several different standards. They also have different types of certificates, see separate information.

End Caps, size 250 & 400

If conversion from DA to SR, or opposite, the End Caps must be changed (different for DA vs. SR).

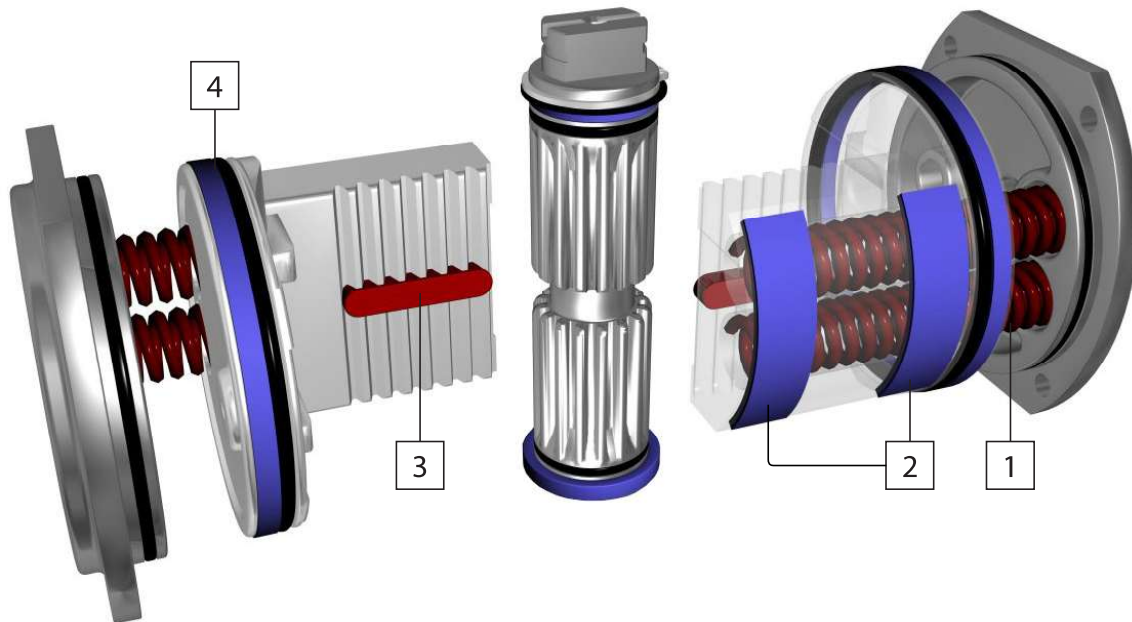
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C-Type Actuator, Features and Benefits



1. SPRINGS

- Springs are located inside the piston rack, same overall dimensions for DA and SR actuators.
- No special tools required to change from DA to SR or opposite.
- Long bolting is standard feature to fully relax springs.

2. PISTON WEAR PADS

- Dual encapsulated "POM" wear pads on the piston, prevent metal to metal contact between piston and cylinder, thus providing low friction travel.
- The dual encapsulated "POM" wear pads absorb the adverse side loading at start of each stroke.

3. TWIN GUIDE BARS

- Twin guide bars absorb any adverse side loading, from rack at the start of each stroke, which reduces pinion & rack wear.

4. BACK UP BEARING

- Piston back up bearings, which are situated behind the pistons "o" ring, ensure linear movement and prevent wear on the cylinder surface.

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TruTorq-C



TruTorq Pneumatic Actuator Type C, Metric Size 2, 4, 8, 12, 20, 35 and 55

TORQUE

Actuator Size	Air Supply	DA Torque	SR Torque (Nm)				
	BAR	Nm	Air - Start	Air - End	Spring - Start	Spring - End	Spring Qty
TT 2	6	20	13	7	13	7	4+4
TT 4	6	41	27	15	26	14	4+4
TT 8	6	90	58	32	57	31	4+4
TT 12	6	122	79	44	78	43	4+4
TT 20	6	202	130	71	130	71	4+4
TT 35	6	374	241	133	241	132	4+4
TT 55	6	597	385	212	384	211	4+4

OPERATING DETAILS

Actuator Size	Operating time (sec) *				Air consumption (litre)		Overall weight (kg)	
	DA Open	DA Close	SR Open	SR Close	Open	Close	DA	SR
TT 2	<1	<1	<1	<1	0.09	0.12	1.0	1.1
TT 4	<1	<1	<1	<1	0.18	0.24	1.8	1.9
TT 8	<1	<1	<1	<1	0.34	0.41	3.1	3.4
TT 12	1.5	1.5	1.5	1.0	0.49	0.64	4.2	4.7
TT 20	2.0	2.0	2.0	1.5	0.90	1.00	6.6	7.5
TT 35	2.5	2.5	2.5	2.0	1.69	1.90	11.1	12.8
TT 55	3.5	3.5	3.5	3.0	2.80	3.40	17.1	20.2

* Note! May be affected by air pipe diameter and type of solenoid valve

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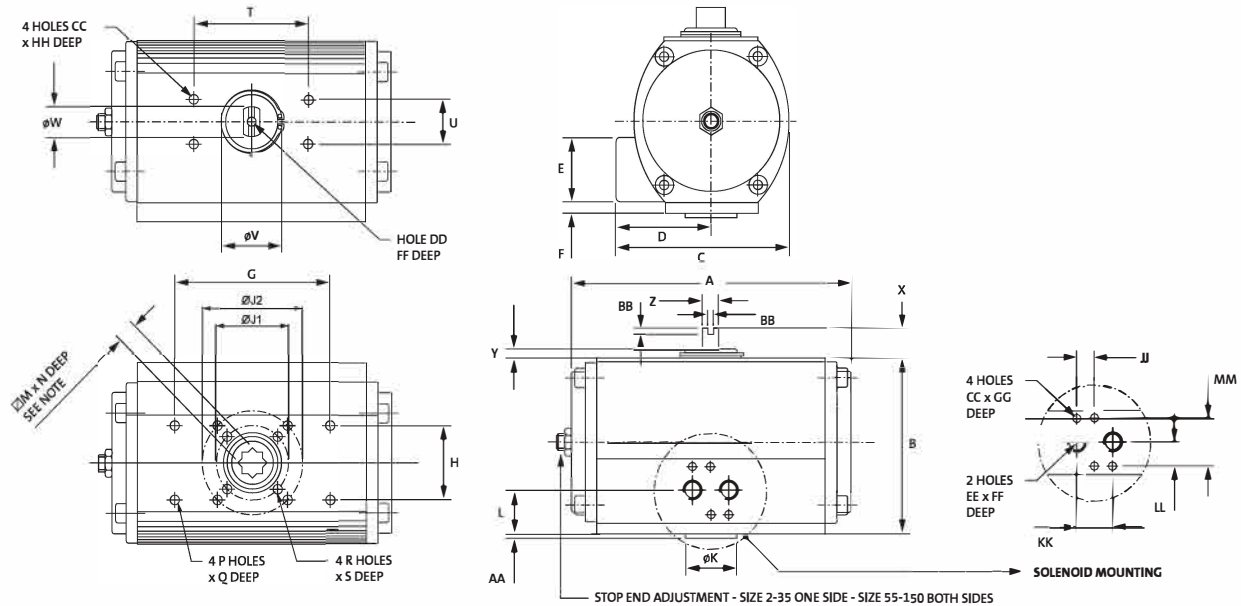
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TruTorq Pneumatic Actuator Type C, Metric Size 2, 4, 8, 12, 20, 35 and 55

- Double acting (DA) and Spring Return (SR)
- Single End Stop Adjustment, open position (DA and SR)
- Option: Single end stop adjustment, closed position (Only DA)



DIMENSIONS, METRIC (mm)

Actuator size	ISO 5211*		A	B	C	D	E	F	G	H	PCD		ØK	L	M	N	P	Q	R	S	T
	J1	J2									ØJ1	ØJ2									
TT 2	F03	—	114.5	73.0	75.5	43.5	41.0	—	73.0	32.0	36.0	—	25.0	20.5	9.0	10.0	M5	8.0	M5	8.0	80.0
TT 4	F04	—	133.0	90.5	87.5	47.5	41.0	—	73.0	32.0	42.0	—	30.0	20.5	11.0	12.0	M5	8.0	M5	8.0	80.0
TT 8	F05	F07	177.0	109.0	105.0	57.0	42.0	7.5	73.0	32.0	50.0	70.0	35.0	28.5	14.0	16.0	M6	10.0	M6	10.0	80.0
TT 12	F05	F07	194.0	118.5	121.0	67.0	43.0	8.0	107.0	49.0	50.0	70.0	35.0	29.5	17.0	16.0	M6	10.0	M6	10.0	80.0
TT 20	F07	F10	218.0	140.5	136.5	72.0	43.0	8.0	107.0	49.0	70.0	102.0	55.0	29.5	17.0	19.0	M6	10.0	M8	13.0	80.0
TT 35	F07	F10	266.0	166.5	156.0	78.0	43.0	8.5	161.0	73.0	70.0	102.0	70.0	30.0	22.0	24.0	M6	12.0	M10	16.0	80.0
TT 55	F10	F12	312.0	207.5	191.0	95.5	43.0	20.5	161.0	73.0	102.0	125.0	85.0	42.0	27.0	29.0	M8	15.0	M12	20.0	130.0

* When two different standards are given, e.g. F05/F07; dual drilled.

Figures in bold according to ISO 5211, correspond vs. size of square drive.

Actuator size	ISO 5211*		U	ØV	ØW	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM
	J1	J2																		
TT 2	F03	—	30.0	25.0	16.0	20.0	4.5	11.5	2.0	4.0	M5	M6	G1/8"	12.0	8.0	5.0	12.0	24.0	16.0	32.0
TT 4	F04	—	30.0	31.0	20.0	20.0	4.5	11.5	2.0	4.0	M5	M6	G1/8"	12.0	8.0	5.0	12.0	24.0	16.0	32.0
TT 8	F05	F07	30.0	35.0	20.0	20.0	5.0	11.5	3.0	4.0	M5	M6	G1/8"	12.0	8.0	5.0	12.0	24.0	16.0	32.0
TT 12	F05	F07	30.0	45.0	20.0	20.0	5.5	11.5	3.0	4.0	M5	M6	G1/4"	12.0	8.0	5.0	12.0	24.0	16.0	32.0
TT 20	F07	F10	30.0	50.0	32.0	20.0	6.5	19.0	3.0	4.0	M5	M6	G1/4"	12.0	8.0	5.0	12.0	24.0	16.0	32.0
TT 35	F07	F10	30.0	61.0	32.0	20.0	7.0	19.0	3.0	4.0	M5	M6	G1/4"	12.0	8.0	5.0	12.0	24.0	16.0	32.0
TT 55	F10	F12	30.0	61.0	40.0	30.0	7.5	25.4	3.0	4.0	M5	M6	G1/4"	12.0	8.0	5.0	12.0	24.0	16.0	32.0

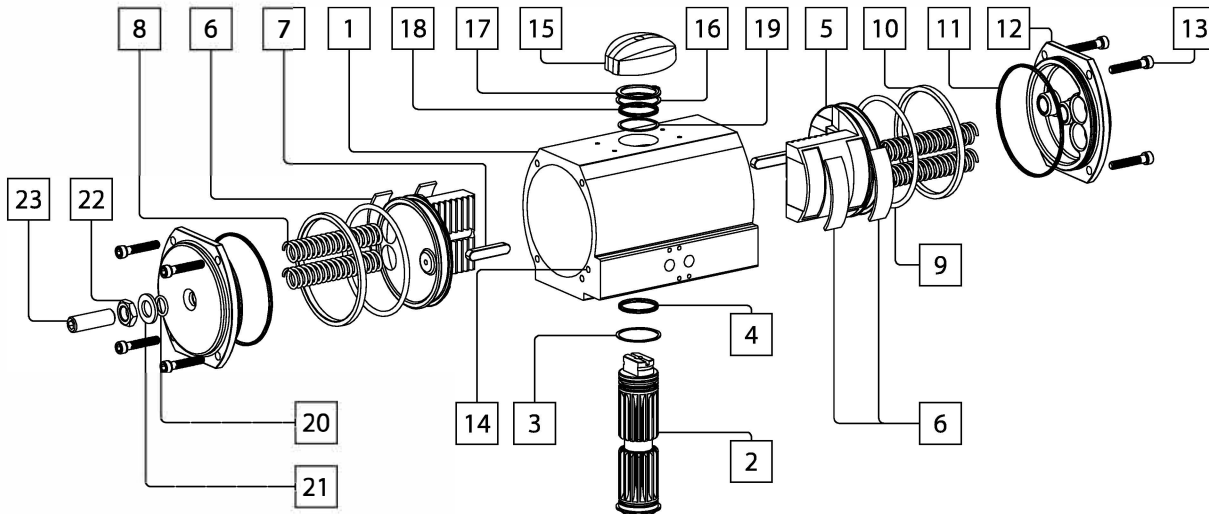
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Trutorq-C



Part List for Trutorq Pneumatic Actuator Type C, Metric Size 2, 4, 8, 12, 20, 35 and 55



Type 1 Actuator 90°, size 2-35			Material	
Ref.no.	Description	Quantity	Standard	CNI
1	Body	1	Alum. Anodized	Alum. CNI treated
2	Driveshaft	1	Ni Plated Steel + Teflon	Ni Plated Steel + Teflon
3	Washer	1	POM	POM
4	O-ring	1	Buna Nitril	Buna Nitril
5	Pistons	2	Alum.	Alum. Anodized
6	Wear Pads	4	POM	POM
7	Guide Bar	2	Steel	Steel
8	Spring	4	SiCr	SiCr
9	O-ring	2	Buna Nitril	Buna Nitril
10	Back-up Bearing	2	POM	POM
11	O-ring	2	Buna Nitril	Buna Nitril
12	End Cap	2	Alum. Polyester Coated	Alum. CNI treated
13	End Cap Bolt	8	Stainless Steel	Stainless Steel
14	Ball Seal	2	Buna Nitril	Buna Nitril
15	Position Indicator	1	POM	POM
16	Washer	1	POM	POM
17	Circlip	1	Ni plated Steel	Ni plated Steel
18	Bearing	1	POM	POM
19	O-ring	1	Buna Nitril	Buna Nitril
20	Stop Adjustment O-ring	1	Buna Nitril	Buna Nitril
21	Stop Adjustment Washer	1	Stainless Steel	Stainless Steel
22	Stop Adjustment Nut	1	Stainless Steel	Stainless Steel
23	Stop Adjustment Screw	1	Stainless Steel	Stainless Steel

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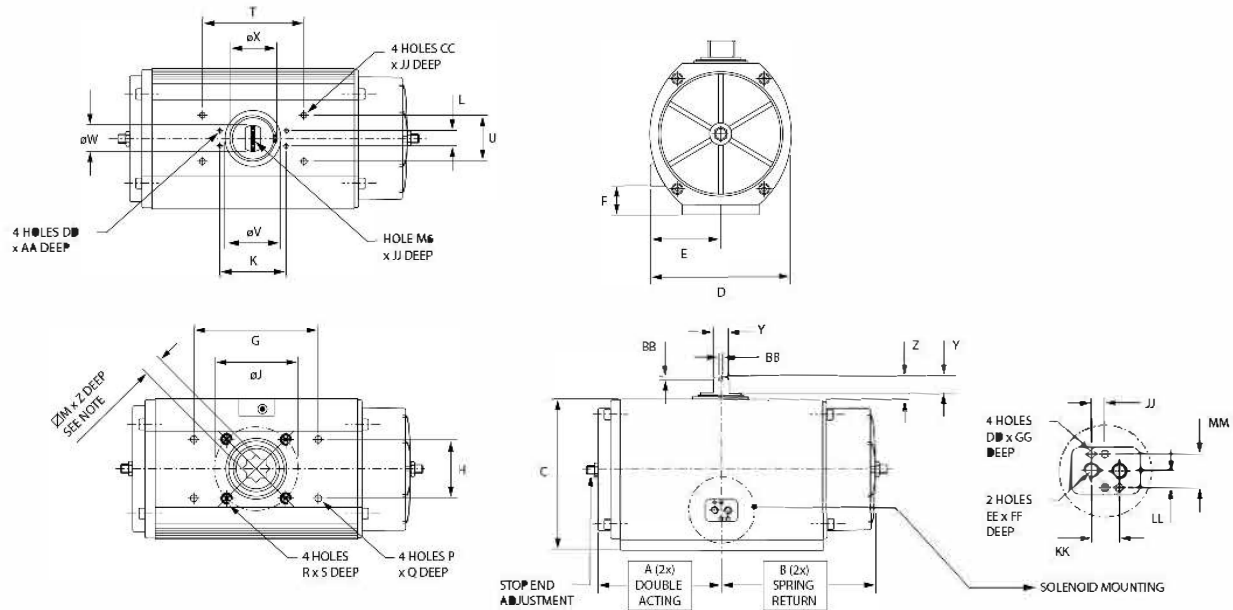
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TruTorq-C



TruTorq Pneumatic Actuator Type C, Metric Size 250

- Double acting (DA) and Spring Return (SR)
- Single end stop adjustment, open position (DA and SR)
- Option: Single end stop adjustment, closed position (Only DA)



DIMENSIONS, METRIC (mm)

Actuator size	ISO	A	B	C	D	E	F	G	H	ØJ	K	L	M	P	Q	R	S	T
TT250	F16	248	338	300	280	140	56	244	117	165	130	30	46	M12	22	M20	32	200

Actuator size	ISO	U	ØV	ØW	ØX	Y	Z	AA	BB	CC	DD	EE	FF	GG	JJ	KK	LL	MM
TT250	F16	90	120	60	111	36	50	6	4	M8	M5	G1/4"	12	8	12	24	16	32

TORQUE

Actuator size	Air Supply	DA Torque	SR Torque (Nm)				
	BAR	Nm	Air - Start	Air - End	Spring - Start	Spring - End	Spring Qty
TT250	6	2648	1436	776	1872	1212	12

OPERATING DETAILS

Actuator size	Operating time (sec) *				Air consumption (litre)		Overall weight (kg)	
	DA Open	DA Close	SR Open	SR Close	Open	Close	DA	SR
TT250	7	7	8	5	8.5	9.8	59	84

* Note! May be affected by air pipe diameter and type of solenoid valve

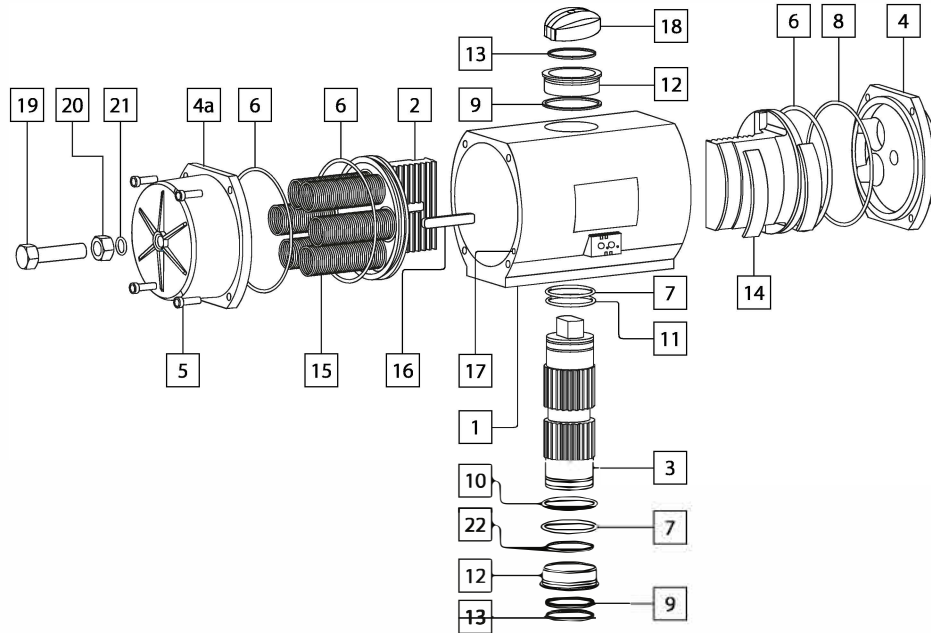
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Trutorq-C



Part List for Pneumatic Actuator Type C, size 250



C-Type Actuator, size 250			Material	
Ref.no.	Description	Quantity	Standard	CNI
1	Body	1	Alum. Anodized	CNI treated
2	Pistons	2	Alum.	Alum. Anodized
3	Driveshaft	1	Ni Plated Steel + Teflon	Ni Plated Steel + Teflon
4	End Cap, DA	2	Polyester Coated	CNI treated
4a	End Cap, SR	2	Polyester Coated	CNI treated
5	End Cap Bolt	8	Stainless Steel	Stainless Steel
6	O-ring	2	Buna Nitril	Buna Nitril
7	O-ring	2	Buna Nitril	Buna Nitril
8	O-ring	2	Buna Nitril	Buna Nitril
9	Washer	1	POM	POM
10	Washer	1	POM	POM
11	O-ring	2	Buna Nitril	Buna Nitril
12	Bushing	2	Bronze	Bronze
13	Circlip	2	Ni plated Steel	Stainless Steel
14	Wear Pad	4	POM	POM
15	Spring	max 12	SiCr	SiCr
16	Guide Bar	2	Steel	Stainless Steel
17	Ball Bearing	2	Nitril	Buna Nitril
18	Position Indicator	1	POM	POM
19	Stop Adjustment Screw	2	Stainless Steel	Stainless Steel
20	Stop Adjustment Nut	2	Stainless Steel	Stainless Steel
21	Stop Adjustment O-ring	2	Buna Nitril	Buna Nitril
22	Washer	1	POM	POM

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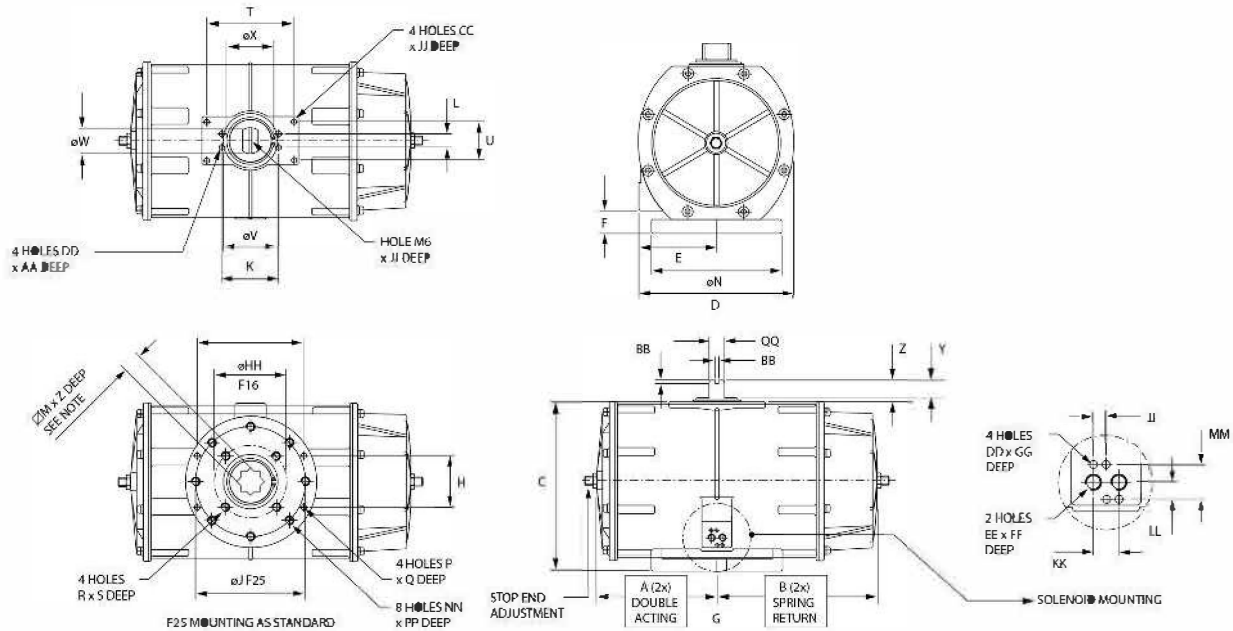
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TruTorq-C



TruTorq Pneumatic Actuator Type C, Metric Size 400

- Double acting (DA) and Spring Return (SR)
- Single end stop adjustment, open position (DA and SR)
- Option: Single end stop adjustment, closed position (Only DA)



Note! Older versions had different End Caps for Double Acting (DA) and Spring Return Actuators (SR). Later versions are delivered with the type of End Caps specified for SR Actuators, regardless function.

DIMENSIONS, METRIC (mm)

Actuator size	ISO	A	B	C	D	E	F	G	H	ØJ	ØK	L	M	ØN	P	Q	R	S	T	U
TT400	F25/F16	300	371	385	360	180	53	244	117	254	130	30	55	300	M12	22	M20	35	200	90

Actuator size	ISO	ØV	ØW	ØX	Y	Z	AA	BB	CC	DD	EE	FF	GG	ØHH	JJ	KK	LL	MM	NN	PP	QQ
TT400	F25/F16	120	60	111	40	60	9	4	M8	M5	G1/4"	12	8	165	12	24	16	32	M16	25	36

TORQUE

Actuator size	Air Supply	DA Torque	SR Torque (Nm)				
	BAR	Nm	Air - Start	Air - End	Spring - Start	Spring - End	Spring Qty
TT400	6	4803	2915	1891	2912	1888	16

OPERATING DETAILS

Actuator size	Operating time (sec) *				Air consumption (litre)		Overall weight (kg)	
	DA Open	DA Close	SR Open	SR Close	Open	Close	DA	SR
TT400	12	12	13	10	13.6	17.5	110.5	135.0

* Note! May be affected by air pipe diameter and type of solenoid valve