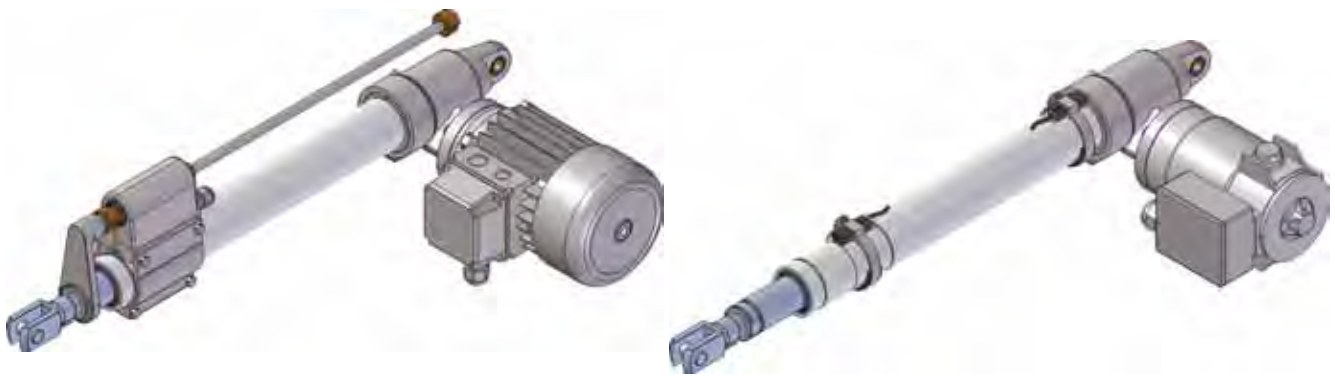


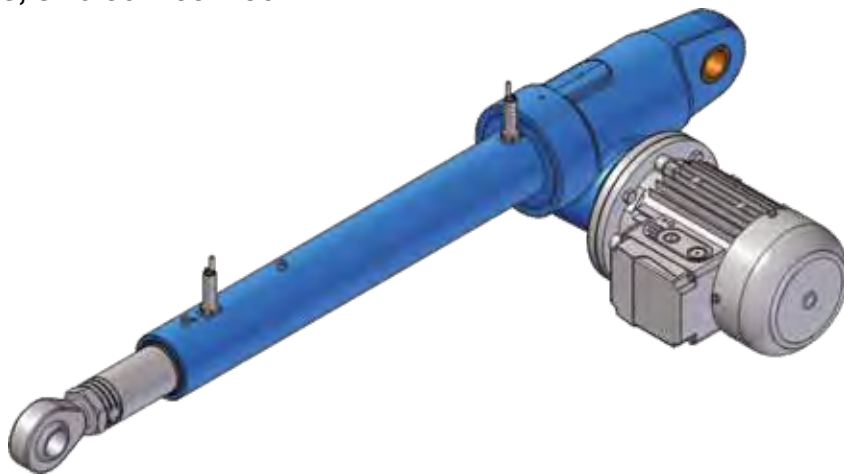
**Linear actuators ATL Series and BSA Series**

ATL - BSA Series, size 20 - 25 - 28 - 30 - 40

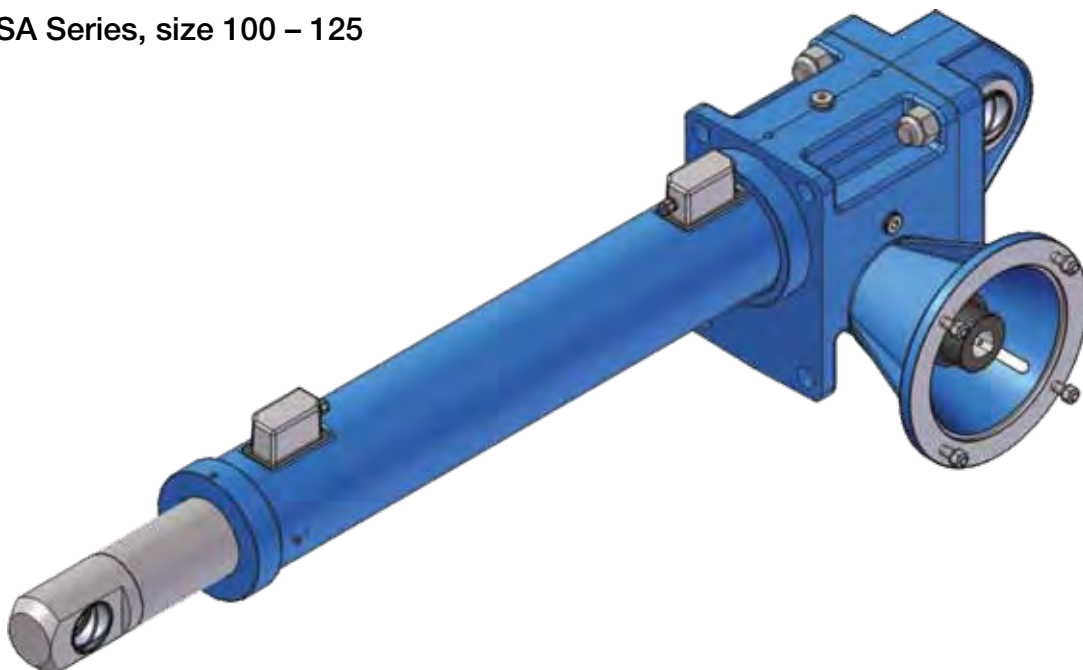
2



ATL - BSA Series, size 50 - 63 - 80



ATL - BSA Series, size 100 - 125



## Linear actuators ATL Series and BSA Series

### 2.1 MANUFACTURING FEATURES

**Input drive:** worm gear - precision helical wheel, geometric design for high performance, involute profile ZI (UNI 4760 : Part 4), low angular backlash. Worm in case hardened steel 20 MnCr 5 (UNI EN 10084), with thread and input shafts ground. Helical wormwheel in bronze EN 1982 – CuSn12-C.

**Housing:** designed and manufactured in monobloc form to obtain a compact body able to sustain heavy axial loads and high machining accuracy. High quality materials are used:

- castings in hardened aluminium alloy EN 1706 AC-AISI10Mg T6
- castings in spheroidal graphite cast iron EN-GJS-500-7 (UNI EN 1563).

**Acme screw:**

- ISO trapezoidal thread ISO 2901 ... ISO 2904
- material: steel C 43 (UNI 7847)
- rolled or whirled
- subjected to straightening, to ensure accurate alignment in operation
- max. pitch error  $\pm 0.05$  mm over 300 mm length

**Bronze nut:**

- ISO trapezoidal thread ISO 2901 ... ISO 2904
- material: bronze EN 1982 – CuAl9-C (1-start thread)
- material: bronze EN 1982 – CuSn12-C (multiple start thread)
- max. axial backlash for new nut (0.10 ... 0.12) mm

**Outer tube:**

- material: aluminium alloy EN AW-6060 thick cold-drawn tube anodized ARC 20 (UNI 4522/66) inner diameter tolerance ISO H9
- steel St 52.2 (DIN 2391) cold-drawn tube inner diameter tolerance ISO H10 ... H11

**Bearings:**

- on motor axis: radial ball bearings or taper roller bearings
- on actuator axis: angular contact ball bearings or taper roller bearings, to avoid axial backlash and to assure high push-pull load capacity

**Front attachment:**

- standard – with threaded hollow bore, in stainless steel AISI 303 or steel C 43 (UNI 7847)

**Rear bracket:**

- in aluminium alloy for ATL-BSA 20, 25, 28, 30, 40
- in spheroidal graphite cast iron for ATL-BSA 50, 63, 80
- pin in stainless steel AISI 303

**Electric stroke length limit device FCE:**

- electric micro-switches activated by a shaped sleeve, for ATL-BSA 20, 25, 28, 30, 40, 50, 63, 80

**Magnetic stroke end switches FCM:**

- magnetic switches activated by a magnetic ring, for ATL-BSA 20, 25, 28, 30, 40

**Proximity stroke end switches FCP:**

- proximity switches activated by the nut, for ATL-BSA 50, 63, 80 and on request for ATL-BSA 100, 125

**Electric stroke end switches FC:**

- cam-operated electric switches for ATL-BSA 100, 125

**Ball screw:**

- designed and manufactured by SERVOMECH
- rolled and hardened material: steel 42 CrMo 4 (UNI EN 10083) accuracy grade: ISO IT 7
- hardened and machined material: steel 42 CrMo 4 (UNI EN 10083) accuracy grade: ISO IT 5

**Ball nut:**

- designed and manufactured by SERVOMECH
- material: steel 18 NiCrMo 5 (UNI EN 10084), case hardened
- max. axial backlash (0.07 ... 0.08) mm
- on request, ball nut with ZERO backlash or pre-loaded using selected diameter balls

**Push rod:**

- material: steel St 52 (DIN 2391) thick tube chrome-plated, min. chrome thickness 5/100 mm inner diameter tolerance ISO f7
- push rod in stainless steel INOX AISI 304 or special stainless steel on request

## Linear actuators ATL Series

### 2.2 TECHNICAL DATA - acme screw linear actuators ATL Series

SIZE		ATL 20	ATL 25	ATL 28	ATL 30	ATL 40	
Push rod diameter	[mm]	25	30	30	35	40	
Outer tube diameter	[mm]	36	45	45	55	60	
Front attachment diameter	[mm]	10	12	12	14	20	
Rear attachment diameter	[mm]	12	12	12	14	20	
Input solid shaft diameter	[mm]	9	9	9	10	14	
Attachment for IEC standard motor (flange and hollow shaft)		56 B14	56 B14	63 B14	63 B14	71 B14	
Attachment for IEC standard motor (flange adapter + coupling)		—	—	—	—	—	
Max. dynamic load	[N]	4 000	6 000	8 000	10 000	12 000	
Max. static load	pull [N]	4 000	6 000	8 000	10 000	12 000	
	push [N]	6 000	8 000	10 000	12 000	15 000	
Ratio	RH	1 : 4 (5 : 20)	1 : 4 (5 : 20)	1 : 4 (5 : 20)	—	—	
	RV	1 : 6.25 (4 : 25)	1 : 6.25 (4 : 25)	1 : 6.25 (4 : 25)	1 : 4 (4 : 16)	1 : 5 (4 : 20)	
	RN	1 : 12.5 (2 : 25)	1 : 12.5 (2 : 25)	1 : 12.5 (2 : 25)	1 : 16 (2 : 32)	1 : 20	
	RL	1 : 25	1 : 25	1 : 25	1 : 24	1 : 25	
	RXL	1 : 50	1 : 50	1 : 50	1 : 34	1 : 55	
1-start acme screw		Tr 13.5×3	Tr 16×4	Tr 16×4	Tr 18×4	Tr 22×5	
Linear travel [mm] for 1 input shaft revolution	Ratio	RH1	0.75	1	1	—	—
		RV1	0.48	0.64	0.64	1	1
		RN1	0.24	0.32	0.32	0.25	0.25
		RL1	0.12	0.16	0.16	0.17	0.2
		RXL1	0.06	0.08	0.08	0.12	0.09
2-start acme screw		Tr 14×8 (P4)	Tr 16×8 (P4)	Tr 16×8 (P4)	Tr 18×8 (P4)	Tr 22×10 (P5)	
Linear travel [mm] for 1 input shaft revolution	Ratio	RH2	2	2	2	—	—
		RV2	1.28	1.28	1.28	2	2
		RN2	0.64	0.64	0.64	0.5	0.5
		RL2	0.32	0.32	0.32	0.33	0.4
		RXL2	0.16	0.16	0.16	0.24	0.18
Mass (actuator 100 mm stroke length, without motor, with lubricant)	[kg]	2.2	2.5	2.5	3.8	6.5	
Extra-mass for each additional 100 mm stroke length	[kg]	0.3	0.5	0.5	0.8	0.8	

## Linear actuators ATL Series

### 2.2 TECHNICAL DATA - acme screw linear actuators ATL Series

2

ATL 50	ATL 63	ATL 80	ATL 100	ATL 125	SIZE	
50	60	90	100	150	Push rod diameter	[mm]
70	90	115	150	200	Outer tube diameter	[mm]
30	35	40	60	80	Front attachment diameter	[mm]
30	35	40	60	80	Rear attachment diameter	[mm]
19	24	28	32	38	Input solid shaft diameter	[mm]
63 B5 - 71 B5	80 B5	80 B5 - 90 B5	100 - 112 B5	—	Attachment for IEC standard motor (flange and hollow shaft)	
80 B5 - 90 B5 80 B14 - 90 B14	90 B5 - 100 B5 90 B14 - 100 B14	100 - 112 B5 100 - 112 B14	132 B5	132 B5 160 B5	Attachment for IEC standard motor (flange adapter + coupling)	
25 000	50 000	80 000	200 000	350 000	Max. dynamic load	[N]
25 000	50 000	80 000	200 000	350 000	pull	Max. static load [N]
25 000	50 000	100 000	200 000	350 000	push	
—	—	—	—	—	RH	Ratio
1 : 6 (4 : 24)	1 : 7 (4 : 28)	1 : 8 (4 : 32)	1 : 8 (4 : 32)	3 : 32	RV	
1 : 18 (2 : 36)	1 : 14 (2 : 28)	1 : 24	1 : 24	1 : 16 (2 : 32)	RN	
1 : 24	1 : 28	1 : 32	1 : 32	1 : 32	RL	
1 : 44	1 : 40	—	—	—	RXL	
Tr 30×6	Tr 40×7	Tr 60×12	Tr 70×12	Tr 100×12	1-start acme screw	
—	—	—	—	—	RH1	Ratio Linear travel [mm] for 1 input shaft revolution
1	1	1.5	1.5	1.12	RV1	
0.33	0.5	0.5	0.5	0.75	RN1	
0.25	0.25	0.38	0.38	0.38	RL1	
0.14	0.18	—	—	—	RXL1	
Tr 30×12 (P6)	Tr 40×14 (P7)	Tr 60×24 (P12)	Tr 70×24 (P12)	Tr 100×24 (P12)	2-start acme screw	
—	—	—	—	—	RH2	Ratio Linear travel [mm] for 1 input shaft revolution
2	2	3	3	2.25	RV2	
0.67	1	1	1	1.5	RN2	
0.5	0.5	0.75	0.75	0.75	RL2	
0.27	0.35	—	—	—	RXL2	
30	50	95	200	400	Mass (actuator 100 mm stroke length, without motor, with lubricant)	[kg]
2	3	5.5	10.5	18.5	Extra-mass for each additional 100 mm stroke length	[kg]

## Linear actuators BSA Series

### 2.2 TECHNICAL DATA - ball screw linear actuators BSA Series

SIZE		BSA 20	BSA 25	BSA 28	BSA 30	BSA 40	
Push rod diameter	[mm]	25	30	30	35	40	
Outer tube diameter	[mm]	36	45	45	55	60	
Front attachment diameter	[mm]	10	12	12	14	20	
Rear attachment diameter	[mm]	12	12	12	14	20	
Input solid shaft diameter	[mm]	9	9	9	10	14	
Attachment for IEC standard motor (flange and hollow shaft)		56 B14	56 B14	63 B14	63 B14	71 B14	
Attachment for IEC standard motor (flange adapter + coupling)		—	—	—	—	—	
Max. dynamic load	[N]	4 000	6 000	7 500	9 000	12 000	
Max. static load	pull [N]	4 000	6 000	8 000	10 000	12 000	
	push [N]	6 000	8 000	10 000	12 000	15 000	
Ratio	RH	1 : 4 (5 : 20)	1 : 4 (5 : 20)	1 : 4 (5 : 20)	—	—	
	RV	1 : 6.25 (4 : 25)	1 : 6.25 (4 : 25)	1 : 6.25 (4 : 25)	1 : 4 (4 : 16)	1 : 5 (4 : 20)	
	RN	1 : 12.5 (2 : 25)	1 : 12.5 (2 : 25)	1 : 12.5 (2 : 25)	1 : 16 (2 : 32)	1 : 20	
	RL	1 : 25	1 : 25	1 : 25	1 : 24	1 : 25	
	RXL	1 : 50	1 : 50	1 : 50	1 : 34	1 : 55	
Ball screw (STANDARD)	Diameter × Lead	14×5	16×5	16×5	20×5	25×6	
	Ball [mm]	3.175 (1/8 ")	3.175 (1/8 ")	3.175 (1/8 ")	3.175 (1/8 ")	3.969 (5/32 ")	
	N° of circuits	2	3	4	3	3	
	Dynamic load C <sub>a</sub> [N]	6 600	10 400	13 400	12 000	17 400	
	Static load C <sub>0a</sub> [N]	8 600	15 600	20 900	21 200	30 500	
Linear travel [mm] for 1 input shaft revolution (STANDARD ball screw)	Ratio	RH1	1.25	1.25	1.25	—	—
		RV1	0.8	0.8	0.8	1.25	1.2
		RN1	0.4	0.4	0.4	0.31	0.3
		RL1	0.2	0.2	0.2	0.21	0.24
		RXL1	0.1	0.1	0.1	0.15	0.11
Mass (actuator 100 mm stroke length, without motor, with lubricant)	[kg]	2.2	2.5	2.5	3.8	6.5	
Extra-mass for each additional 100 mm stroke length	[kg]	0.3	0.5	0.5	0.8	0.9	

#### ON REQUEST

Ball screw (Diameter × Lead)		14×10	16×10	16×10	20×10	25×10
Ball [mm]		3.175 (1/8 ")	3.175 (1/8 ")	3.175 (1/8 ")	3.175 (1/8 ")	3.969 (5/32 ")
N° of circuits		2	3	3	3	3
Dynamic load C <sub>a</sub> [N]		6 900	11 300	11 300	12 900	18 000
Static load C <sub>0a</sub> [N]		9 300	18 000	18 000	23 500	33 000

NOTE: When these ball screws are used, the actuator length will be increased.  
Please, contact SERVOMECH to get information about the exact length.

## Linear actuators BSA Series

### 2.2 TECHNICAL DATA - ball screw linear actuators BSA Series

2

BSA 50	BSA 63	BSA 80	BSA 100	BSA 125	SIZE
50	60	90	110	150	Push rod diameter [mm]
70	90	115	160	200	Outer tube diameter [mm]
30	35	40	60	80	Front attachment diameter [mm]
30	35	40	60	80	Rear attachment diameter [mm]
19	24	28	32	38	Input solid shaft diameter [mm]
63 B5 - 71 B5	80 B5	80 B5 - 90 B5	100 - 112 B5	—	Attachment for IEC standard motor (flange and hollow shaft)
80 B5 - 90 B5 80 B14 - 90 B14	90 B5 - 100 B5 90 B14 - 100 B14	100 - 112 B5 100 - 112 B14	132 B5	132 B5 160 B5	Attachment for IEC standard motor (flange adapter + coupling)
25 000	50 000	80 000	108 000	123 000	Max. dynamic load [N]
25 000	50 000	80 000	200 000	350 000	pull ————— Max. static load [N]
25 000	50 000	100 000	200 000	350 000	push
—	—	—	—	—	RH
1 : 6 (4 : 24)	1 : 7 (4 : 28)	1 : 8 (4 : 32)	1 : 8 (4 : 32)	3 : 32	RV
1 : 18 (2 : 36)	1 : 14 (2 : 28)	1 : 24	1 : 24	1 : 16 (2 : 32)	RN Ratio
1 : 24	1 : 28	1 : 32	1 : 32	1 : 32	RL
1 : 44	1 : 40	—	—	—	RXL
32×10	40×10	63×10	80×16	100×16	Diameter × Lead
6.35 (1/4 ")	6.35 (1/4 ")	7.144 (9/32 ")	9.525 (3/8 ")	9.525 (3/8 ")	[mm] Ball
4	5	6	5	5	N° of circuits
41 800	60 000	112 000	149 000	170 000	[N] Dynamic load C <sub>a</sub>
73 000	123 000	313 000	393 000	523 000	[N] Static load C <sub>0a</sub>
—	—	—	—	—	RH1
1.67	1.43	1.25	2	1.5	RV1
0.56	0.71	0.42	0.67	1	RN1 Ratio
0.42	0.36	0.31	0.5	0.5	RL1
0.23	0.25	—	—	—	RXL1
30	50	95	200	400	Mass (actuator 100 mm stroke length, without motor, with lubricant) [kg]
2	3	5.5	12.5	19	Extra-mass for each additional 100 mm stroke length [kg]

#### ON REQUEST

32×20	40×20	63×20	80×20	100×20	Ball screw (Diameter × Lead)
6.35 (1/4 ")	6.35 (1/4 ")	9.525 (3/8 ")	12.7 (1/2 ")	12.7 (1/2 ")	[mm] Ball
3	3	4	4	4	N° of circuits
32 200	38 500	101 000	213 000	239 000	[N] Dynamic load C <sub>a</sub>
53 000	74 000	220 000	516 000	687 000	[N] Static load C <sub>0a</sub>

**NOTE:** When these ball screws are used, the actuator length will be increased.  
Please, contact SERVOMECH to get information about the exact length.

## Linear actuators ATL Series

ACME SCREW LINEAR ACTUATORS ATL Series with AC 3-PHASE MOTOR  
 PERFORMANCE with: Duty Cycle  $F_i = 30\%$  over 10 min at ambient temperature 25 °C

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR: POWER [kW] – N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
<b>ATL 20</b>				
93	600 <sup>1)</sup>	RH2	0.12 kW 2-pole 2800	0.40
60	1000 <sup>1)</sup>	RV2	0.12 kW 2-pole 2800	0.41
46	850 <sup>1)</sup>	RH2	0.09 kW 4-pole 1400	0.40
35	1100 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.25
30	1750 <sup>1)</sup>	RN2	0.12 kW 2-pole 2800	0.35
22	1500 <sup>1)</sup>	RV1	0.12 kW 2-pole 2800	0.25
15	3000 <sup>1)</sup>	RL2	0.12 kW 2-pole 2800	0.27
11	4000 <sup>1)2)</sup>	RN1	0.12 kW 2-pole 2800	0.22
7.5	4000 <sup>2)</sup>	RL2	0.09 kW 4-pole 1400	0.27
5.5	4000 <sup>2)</sup>	RL1	0.12 kW 2-pole 2800	0.16
2.8	4000 <sup>2)</sup>	RL1	0.09 kW 4-pole 1400	0.16
1.4	4000 <sup>2)</sup>	RXL1	0.09 kW 4-pole 1400	0.11
<b>ATL 25</b>				
93	830 <sup>1)</sup>	RH2	0.12 kW 2-pole 2800	0.38
60	1250 <sup>1)</sup>	RV2	0.12 kW 2-pole 2800	0.38
46	1300 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.27
30	2200 <sup>1)</sup>	RN2	0.12 kW 2-pole 2800	0.33
23	1650 <sup>1)</sup>	RH1	0.09 kW 4-pole 1400	0.27
15	3750 <sup>1)</sup>	RL2	0.12 kW 2-pole 2800	0.25
7.5	5550 <sup>1)</sup>	RL1	0.12 kW 2-pole 2800	0.18
3.5	6000 <sup>2)</sup>	RL1	0.09 kW 4-pole 1400	0.18
1.9	6000 <sup>2)</sup>	RXL1	0.09 kW 4-pole 1400	0.12
<b>ATL 28</b>				
93	1250 <sup>1)</sup>	RH2	0.25 kW 2-pole 2800	0.38
60	1850 <sup>1)</sup>	RV2	0.25 kW 2-pole 2800	0.38
46	1950 <sup>1)</sup>	RH1	0.25 kW 2-pole 2800	0.27
30	3300 <sup>1)</sup>	RN2	0.25 kW 2-pole 2800	0.33
23	2500 <sup>1)</sup>	RH1	0.18 kW 4-pole 1400	0.27
15	5600 <sup>1)</sup>	RL2	0.25 kW 2-pole 2800	0.25
7.5	8000 <sup>2)</sup>	RL1	0.25 kW 2-pole 2800	0.18
3.5	8000 <sup>2)</sup>	RL1	0.18 kW 4-pole 1400	0.18
1.9	8000 <sup>2)</sup>	RXL1	0.18 kW 4-pole 1400	0.12
<b>ATL 30</b>				
93	1650 <sup>1)</sup>	RV2	0.25 kW 2-pole 2800	0.37
46	2550 <sup>1)</sup>	RV1	0.25 kW 2-pole 2800	0.25
23	5200 <sup>1)</sup>	RN2	0.25 kW 2-pole 2800	0.28
15	6850 <sup>1)</sup>	RL2	0.25 kW 2-pole 2800	0.22
11	8500 <sup>1)</sup>	RXL2	0.25 kW 2-pole 2800	0.18
7.5	10000 <sup>1)2)</sup>	RL1	0.25 kW 2-pole 2800	0.16
5.5	10000 <sup>2)</sup>	RXL1	0.25 kW 2-pole 2800	0.13
4	10000 <sup>2)</sup>	RL1	0.18 kW 4-pole 1400	0.16
2.7	10000 <sup>2)</sup>	RXL1	0.18 kW 4-pole 1400	0.13
<b>ATL 40</b>				
93	3500 <sup>1)</sup>	RV2	0.55 kW 2-pole 2800	0.37
46	5400 <sup>1)</sup>	RV1	0.55 kW 2-pole 2800	0.26
23	10500 <sup>1)</sup>	RN2	0.55 kW 2-pole 2800	0.25
18	12000 <sup>2)</sup>	RL2	0.55 kW 2-pole 2800	0.24
11	12000 <sup>2)</sup>	RN1	0.55 kW 2-pole 2800	0.18
8.5	12000 <sup>2)</sup>	RXL2	0.55 kW 2-pole 2800	0.12
5.5	12000 <sup>2)</sup>	RN1	0.37 kW 4-pole 1400	0.18
4.5	12000 <sup>2)</sup>	RL1	0.37 kW 4-pole 1400	0.17
2.1	12000 <sup>2)</sup>	RXL1	0.37 kW 4-pole 1400	0.08

## Linear actuators ATL Series

**ACME SCREW LINEAR ACTUATORS ATL Series with AC 3-PHASE MOTOR**  
**PERFORMANCE with: Duty Cycle  $F_i = 30\%$  over 10 min at ambient temperature 25 °C**

LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR: POWER [kW] – N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
<b>ATL 50</b>				
93	13.7 <sup>1)</sup>	RV2	2.2 kW 2-pole 2800	0.34
46	17 <sup>1)</sup>	RV2	1.5 kW 4-pole 1400	0.34
30	25 <sup>2)</sup>	RN2	2.2 kW 2-pole 2800	0.26
23	25 <sup>2)</sup>	RV1	1.5 kW 4-pole 1400	0.24
15	25 <sup>2)</sup>	RN2	1.5 kW 4-pole 1400	0.26
11	25 <sup>2)</sup>	RL2	0.75 kW 4-pole 1400	0.23
7.5	25 <sup>2)</sup>	RN1	0.75 kW 4-pole 1400	0.18
5.5	25 <sup>2)</sup>	RL1	0.75 kW 4-pole 1400	0.15
3.2	25 <sup>2)</sup>	RXL1	0.37 kW 4-pole 1400	0.12
<b>ATL 63</b>				
93	18 <sup>1)</sup>	RV2	3 kW 2-pole 2800	0.32
46	33 <sup>1)</sup>	RV2	3 kW 4-pole 1400	0.32
23	45 <sup>1)</sup>	RV1	3 kW 4-pole 1400	0.21
11	40 <sup>1)</sup>	RN1	1.5 kW 4-pole 1400	0.18
5.5	50 <sup>2)</sup>	RL1	1.5 kW 4-pole 1400	0.13
4.1	50 <sup>2)</sup>	RXL1	1.1 kW 4-pole 1400	0.12
<b>ATL 80</b>				
140	17 <sup>1)</sup>	RV2	4 kW 2-pole 2800	0.34
70	31 <sup>1)</sup>	RV2	4 kW 4-pole 1400	0.34
46	41 <sup>1)</sup>	RN2	4 kW 2-pole 2800	0.24
35	48 <sup>1)</sup>	RV1	4 kW 4-pole 1400	0.23
23	73 <sup>1)</sup>	RN2	4 kW 4-pole 1400	0.24
17	80 <sup>2)</sup>	RL2	4 kW 4-pole 1400	0.22
11	80 <sup>2)</sup>	RN1	4 kW 4-pole 1400	0.16
8.5	80 <sup>2)</sup>	RL1	3 kW 4-pole 1400	0.15
<b>ATL 100</b>				
140	31 <sup>1)</sup>	RV2	7.5 kW 2-pole 2800	0.31
70	57 <sup>1)</sup>	RV2	7.5 kW 4-pole 1400	0.31
47	75 <sup>1)</sup>	RN2	7.5 kW 2-pole 2800	0.22
35	95 <sup>1)</sup>	RL2	7.5 kW 2-pole 2800	0.20
23	137 <sup>1)</sup>	RN2	7.5 kW 4-pole 1400	0.22
18	167 <sup>1)</sup>	RL2	7.5 kW 4-pole 1400	0.20
12	194 <sup>1)</sup>	RN1	7.5 kW 4-pole 1400	0.15
9	200 <sup>2)</sup>	RL1	7.5 kW 4-pole 1400	0.13
<b>ATL 125</b>				
105	74 <sup>1)</sup>	RV2	15 kW 2-pole 2800	0.24
70	102 <sup>1)</sup>	RN2	15 kW 2-pole 2800	0.22
53	131 <sup>1)</sup>	RV2	15 kW 4-pole 1400	0.24
35	180 <sup>1)</sup>	RN2	15 kW 4-pole 1400	0.22
26	183 <sup>1)</sup>	RV1	15 kW 4-pole 1400	0.15
18	302 <sup>1)</sup>	RL2	15 kW 4-pole 1400	0.17
9	350 <sup>2)</sup>	RL1	15 kW 4-pole 1400	0.10

1) value limited by electric motor power

The total dynamic efficiency ( $\eta$ ) of ATL Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:

$\eta_1$  – wormgear dynamic efficiency, calculated according to BS 721 : Part 2 : 1983

$\eta_2$  – acme screw-bronze nut dynamic efficiency, calculated with reference to the speed

$\eta_3 = 0.9$  – bearings and sealing elements “efficiency”

2) limit value of linear actuator dynamic load capacity (see pages 42 ... 43)



## Linear actuators ATL Series

ACME SCREW LINEAR ACTUATORS ATL Series with AC 1-PHASE MOTOR  
 PERFORMANCE with: Duty Cycle  $F_d = 30\%$  over 10 min at ambient temperature 25 °C

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR: POWER [kW] – N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
<b>ATL 20</b>				
93	600 <sup>1)</sup>	RH2	0.12 kW 2-pole 2800	0.40
60	1000 <sup>1)</sup>	RV2	0.12 kW 2-pole 2800	0.41
46	850 <sup>1)</sup>	RH2	0.09 kW 4-pole 1400	0.40
35	1100 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.25
30	1750 <sup>1)</sup>	RN2	0.12 kW 2-pole 2800	0.35
22	1500 <sup>1)</sup>	RV1	0.12 kW 2-pole 2800	0.25
15	3000 <sup>1)</sup>	RL2	0.12 kW 2-pole 2800	0.27
11	3750 <sup>1)</sup>	RN1	0.12 kW 2-pole 2800	0.22
7.5	4000 <sup>1)2)</sup>	RL2	0.09 kW 4-pole 1400	0.27
5.5	4000 <sup>2)</sup>	RL1	0.12 kW 2-pole 2800	0.16
2.8	4000 <sup>2)</sup>	RL1	0.09 kW 4-pole 1400	0.16
1.4	4000 <sup>2)</sup>	RXL1	0.09 kW 4-pole 1400	0.11
<b>ATL 25</b>				
93	770 <sup>1)</sup>	RH2	0.12 kW 2-pole 2800	0.38
60	1100 <sup>1)</sup>	RV2	0.12 kW 2-pole 2800	0.38
46	1200 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.27
28	2050 <sup>1)</sup>	RN2	0.12 kW 2-pole 2800	0.33
23	1600 <sup>1)</sup>	RH1	0.09 kW 4-pole 1400	0.27
14	3450 <sup>1)</sup>	RL2	0.12 kW 2-pole 2800	0.25
7	5100 <sup>1)</sup>	RL1	0.12 kW 2-pole 2800	0.18
3.5	6000 <sup>2)</sup>	RL1	0.09 kW 4-pole 1400	0.18
1.9	6000 <sup>2)</sup>	RXL1	0.09 kW 4-pole 1400	0.12
<b>ATL 28</b>				
93	1250 <sup>1)</sup>	RH2	0.25 kW 2-pole 2800	0.38
60	1850 <sup>1)</sup>	RV2	0.25 kW 2-pole 2800	0.38
46	1950 <sup>1)</sup>	RH1	0.25 kW 2-pole 2800	0.27
30	3300 <sup>1)</sup>	RN2	0.25 kW 2-pole 2800	0.33
23	2500 <sup>1)</sup>	RH1	0.18 kW 4-pole 1400	0.27
15	5600 <sup>1)</sup>	RL2	0.25 kW 2-pole 2800	0.25
7.5	8000 <sup>2)</sup>	RL1	0.25 kW 2-pole 2800	0.18
3.5	8000 <sup>2)</sup>	RL1	0.18 kW 4-pole 1400	0.18
1.9	8000 <sup>2)</sup>	RXL1	0.18 kW 4-pole 1400	0.12
<b>ATL 30</b>				
93	1500 <sup>1)</sup>	RV2	0.25 kW 2-pole 2800	0.37
46	2350 <sup>1)</sup>	RV1	0.25 kW 2-pole 2800	0.25
23	4800 <sup>1)</sup>	RN2	0.25 kW 2-pole 2800	0.28
15	6300 <sup>1)</sup>	RL2	0.25 kW 2-pole 2800	0.22
11	8000 <sup>1)</sup>	RXL2	0.25 kW 2-pole 2800	0.18
7.5	9200 <sup>1)</sup>	RL1	0.25 kW 2-pole 2800	0.16
5.5	10000 <sup>2)</sup>	RXL1	0.25 kW 2-pole 2800	0.13
4	10000 <sup>2)</sup>	RL1	0.18 kW 4-pole 1400	0.16
2.7	10000 <sup>2)</sup>	RXL1	0.18 kW 4-pole 1400	0.13
<b>ATL 40</b>				
93	3400 <sup>1)</sup>	RV2	0.55 kW 2-pole 2800	0.37
46	5400 <sup>1)</sup>	RV1	0.55 kW 2-pole 2800	0.26
23	10000 <sup>1)</sup>	RN2	0.55 kW 2-pole 2800	0.25
18	12000 <sup>2)</sup>	RL2	0.55 kW 2-pole 2800	0.24
11	12000 <sup>2)</sup>	RN1	0.55 kW 2-pole 2800	0.18
8.5	12000 <sup>2)</sup>	RXL2	0.55 kW 2-pole 2800	0.12
5.5	12000 <sup>2)</sup>	RN1	0.37 kW 4-pole 1400	0.18
4.5	12000 <sup>2)</sup>	RL1	0.37 kW 4-pole 1400	0.17
2.1	12000 <sup>2)</sup>	RXL1	0.37 kW 4-pole 1400	0.08

## Linear actuators ATL Series

### ACME SCREW LINEAR ACTUATORS ATL Series with DC MOTOR

PERFORMANCE with: Duty Cycle  $F_i = 30\%$  over 10 min at ambient temperature 25 °C

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	CURRENT [A]	SELF-LOCKING COEFFICIENT
<b>ATL 20</b> with DC motor 24 V 3000 rpm 100 W 5.5 A				
100	600 <sup>1)</sup>	RH2	10	0.40
64	920 <sup>1)</sup>	RV2	9.5	0.41
37	1150 <sup>1)</sup>	RH1	9	0.25
32	1650 <sup>1)</sup>	RN2	9	0.35
24	1700 <sup>1)</sup>	RV1	8.5	0.25
16	2800 <sup>1)</sup>	RL2	8.5	0.27
12	2900 <sup>1)</sup>	RN1	8	0.22
8	4000 <sup>2)</sup>	RXL2	6.5	0.18
6	4000 <sup>2)</sup>	RL1	6	0.16
3	4000 <sup>2)</sup>	RXL1	3	0.11
<b>ATL 25</b> with DC motor 24 V 3000 rpm 150 W 8.4 A				
100	900 <sup>1)</sup>	RH2	14.5	0.38
64	1330 <sup>1)</sup>	RV2	13.5	0.38
50	1450 <sup>1)</sup>	RH1	15	0.27
32	2100 <sup>1)</sup>	RV1	14	0.27
16	4000 <sup>1)</sup>	RL2	12	0.25
8	6000 <sup>2)</sup>	RL1	11.5	0.18
4	6000 <sup>2)</sup>	RXL1	5.5	0.12
<b>ATL 30</b> with DC motor 24 V 3000 rpm 300 W 15.6 A				
100	1750 <sup>1)</sup>	RV2	26	0.37
50	2750 <sup>1)</sup>	RV1	27	0.25
25	5600 <sup>1)</sup>	RN2	23	0.28
16	7500 <sup>1)</sup>	RL2	21	0.22
12	8400 <sup>1)</sup>	RN1	22	0.20
8	10000 <sup>2)</sup>	RL1	18	0.16
6	10000 <sup>2)</sup>	RXL1	15	0.13
<b>ATL 40</b> with DC motor 24 V 3000 rpm 500 W 25 A				
100	3000 <sup>1)</sup>	RV2	43	0.37
50	4700 <sup>1)</sup>	RV1	44	0.26
25	9200 <sup>1)</sup>	RN2	38	0.25
20	11000 <sup>1)</sup>	RL2	36	0.24
12	12000 <sup>2)</sup>	RN1	31	0.18
10	12000 <sup>2)</sup>	RL1	26	0.17
4.5	12000 <sup>2)</sup>	RXL1	17	0.08

1) value limited by electric motor power

The total dynamic efficiency ( $\eta$ ) of ATL Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:

$\eta_1$  – wormgear dynamic efficiency, calculated according to BS 721 : Part 2 : 1983

$\eta_2$  – acme screw-bronze nut dynamic efficiency, calculated with reference to the speed

$\eta_3 = 0.9$  – bearings and sealing elements "efficiency"

2) limit value of linear actuator dynamic load capacity (see page 42)

## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series with AC 3-PHASE MOTOR**  
**PERFORMANCE with: Duty Cycle  $F_i = 100\%$  at ambient temperature  $25\text{ }^\circ\text{C}$**

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR: POWER [kW] — N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
<b>BSA 20</b>				
60	1650 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.56
37	2200 <sup>2)</sup>	RV1	0.12 kW 2-pole 2800	0.57
30	2250 <sup>1)</sup>	RH1	0.09 kW 4-pole 1400	0.56
20	2800 <sup>2)</sup>	RN1	0.12 kW 2-pole 2800	0.49
9	3500 <sup>2)</sup>	RN1	0.09 kW 4-pole 1400	0.49
4.5	4000 <sup>3)</sup>	RL1	0.09 kW 4-pole 1400	0.37
2.3	4000 <sup>3)</sup>	RXL1	0.09 kW 4-pole 1400	0.25
<b>BSA 25</b>				
60	1650 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.56
37	2550 <sup>1)</sup>	RV1	0.12 kW 2-pole 2800	0.56
30	2250 <sup>1)</sup>	RH1	0.09 kW 4-pole 1400	0.56
20	4400 <sup>2)</sup>	RN1	0.12 kW 2-pole 2800	0.48
9	5500 <sup>2)</sup>	RN1	0.09 kW 4-pole 1400	0.48
4.5	6000 <sup>3)</sup>	RL1	0.09 kW 4-pole 1400	0.37
2.3	6000 <sup>3)</sup>	RXL1	0.09 kW 4-pole 1400	0.25
<b>BSA 28</b>				
60	3300 <sup>1)</sup>	RH1	0.25 kW 2-pole 2800	0.56
37	4500 <sup>2)</sup>	RV1	0.25 kW 2-pole 2800	0.56
30	4500 <sup>1)</sup>	RH1	0.18 kW 4-pole 1400	0.56
20	5650 <sup>2)</sup>	RN1	0.25 kW 2-pole 2800	0.48
9	7100 <sup>2)</sup>	RN1	0.18 kW 4-pole 1400	0.48
4.5	7500 <sup>3)</sup>	RL1	0.18 kW 4-pole 1400	0.37
2.3	7500 <sup>3)</sup>	RXL1	0.18 kW 4-pole 1400	0.25
<b>BSA 30</b>				
60	3350 <sup>1)</sup>	RV1	0.25 kW 2-pole 2800	0.56
30	4350 <sup>2)</sup>	RV1	0.18 kW 4-pole 1400	0.56
15	5500 <sup>2)</sup>	RN1	0.25 kW 2-pole 2800	0.43
10	6300 <sup>2)</sup>	RL1	0.25 kW 2-pole 2800	0.34
7	7000 <sup>2)</sup>	RN1	0.18 kW 4-pole 1400	0.43
5	7900 <sup>2)</sup>	RL1	0.18 kW 4-pole 1400	0.34
3.5	9000 <sup>2)</sup>	RXL1	0.18 kW 4-pole 1400	0.30
<b>BSA 40</b>				
56	5400 <sup>2)</sup>	RV1	0.55 kW 2-pole 2800	0.56
28	6800 <sup>2)</sup>	RV1	0.37 kW 4-pole 1400	0.56
14	8600 <sup>2)</sup>	RN1	0.55 kW 2-pole 2800	0.38
11	9250 <sup>2)</sup>	RL1	0.55 kW 2-pole 2800	0.36
7	10800 <sup>2)</sup>	RN1	0.37 kW 4-pole 1400	0.38
5.5	11600 <sup>2)</sup>	RL1	0.37 kW 4-pole 1400	0.36
2.5	12000 <sup>3)</sup>	RXL1	0.37 kW 4-pole 1400	0.20

<sup>1)</sup> value limited by electric motor power; ball screw lifetime  $L_{10h} > 1000$  hours (see diagrams on pages 33 ... 35)

The total dynamic efficiency ( $\eta$ ) of BSA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:

$\eta_1$  – wormgear dynamic efficiency, calculated according to BS 721 : Part 2 : 1983

$\eta_2 = 0.9$  – ball screw - nut efficiency

$\eta_3 = 0.9$  – bearings and sealing elements "efficiency"

<sup>2)</sup> value related to the ball screw lifetime  $L_{10h} = 1000$  h, with constant load, without load vibrations nor shocks; for different lifetime refer to diagrams on pages 33 ... 35

<sup>3)</sup> limit value of linear actuator dynamic load capacity (see page 44)

## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series with AC 3-PHASE MOTOR**  
**PERFORMANCE with: Duty Cycle  $F_i = 100\%$  at ambient temperature  $25\text{ }^\circ\text{C}$**

LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR: POWER [kW] – N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
<b>BSA 50</b>				
78	14 <sup>2)</sup>	RV1	1.5 kW 2-pole 2800	0.56
40	17 <sup>2)</sup>	RV1	1.1 kW 4-pole 1400	0.56
25	20 <sup>2)</sup>	RN1	1.1 kW 2-pole 2800	0.43
20	22 <sup>2)</sup>	RL1	1.1 kW 2-pole 2800	0.37
13	25 <sup>2) 3)</sup>	RN1	0.75 kW 4-pole 1400	0.43
10	25 <sup>3)</sup>	RL1	0.75 kW 4-pole 1400	0.37
5.3	25 <sup>3)</sup>	RXL1	0.37 kW 4-pole 1400	0.31
<b>BSA 63</b>				
66	21 <sup>2)</sup>	RV1	2.2 kW 2-pole 2800	0.56
33	25 <sup>1)</sup>	RV1	1.5 kW 4-pole 1400	0.56
17	31 <sup>1)</sup>	RN1	0.75 kW 4-pole 1400	0.46
8	41 <sup>2)</sup>	RL1	0.75 kW 4-pole 1400	0.35
5.8	47 <sup>2)</sup>	RXL1	0.75 kW 4-pole 1400	0.34
<b>BSA 80</b>				
58	39 <sup>1)</sup>	RV1	3 kW 2-pole 2800	0.56
29	51 <sup>2)</sup>	RV1	2.2 kW 4-pole 1400	0.56
19	59 <sup>2)</sup>	RN1	2.2 kW 2-pole 2800	0.38
15	65 <sup>2)</sup>	RL1	1.5 kW 2-pole 2800	0.35
10	73 <sup>1)</sup>	RN1	1.1 kW 4-pole 1400	0.38
7	81 <sup>2)</sup>	RL1	1.1 kW 4-pole 1400	0.35
<b>BSA 100</b>				
93	54 <sup>2)</sup>	RV1	7.5 kW 2-pole 2800	0.60
47	68 <sup>2)</sup>	RV1	5.2 kW 4-pole 1400	0.60
31	78 <sup>2)</sup>	RN1	4 kW 2-pole 2800	0.42
23	86 <sup>2) 3)</sup>	RL1	3 kW 2-pole 2800	0.39
16	98 <sup>2)</sup>	RN1	3 kW 4-pole 1400	0.42
12	108 <sup>2)</sup>	RL1	2.2 kW 4-pole 1400	0.39
<b>BSA 125</b>				
70	68 <sup>2)</sup>	RV1	7.5 kW 2-pole 2800	0.58
47	78 <sup>2)</sup>	RN1	5.5 kW 2-pole 2800	0.52
35	85 <sup>2)</sup>	RV1	4 kW 4-pole 1400	0.58
23	98 <sup>2)</sup>	RN1	5.5 kW 4-pole 1400	0.52
12	123 <sup>2)</sup>	RL1	5.5 kW 4-pole 1400	0.40

1) value limited by electric motor power; ball screw lifetime  $L_{10h} > 1000$  hours (see diagrams on pages 35 ... 38)

The total dynamic efficiency ( $\eta$ ) of BSA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:

$\eta_1$  – wormgear dynamic efficiency, calculated according to BS 721 : Part 2 : 1983

$\eta_2 = 0.9$  – ball screw - nut efficiency

$\eta_3 = 0.9$  – bearings and sealing elements "efficiency"

2) value related to the ball screw lifetime  $L_{10h} = 1000$  h, with constant load, without load vibrations nor shocks; for different lifetime refer to diagrams on pages 35 ... 38

3) limit value of linear actuator dynamic load capacity (see page 45)

## Linear actuators BSA Series

BALL SCREW LINEAR ACTUATORS BSA Series with AC 1-PHASE MOTOR  
PERFORMANCE with: Duty Cycle  $F_i = 100\%$  at ambient temperature  $25\text{ }^\circ\text{C}$

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR: POWER [kW] – N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
<b>BSA 20</b>				
60	1550 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.56
37	2200 <sup>2)</sup>	RV1	0.12 kW 2-pole 2800	0.57
30	2250 <sup>1)</sup>	RH1	0.09 kW 4-pole 1400	0.56
20	2800 <sup>2)</sup>	RN1	0.12 kW 2-pole 2800	0.49
9	3500 <sup>2)</sup>	RN1	0.09 kW 4-pole 1400	0.49
4.5	4000 <sup>3)</sup>	RL1	0.09 kW 4-pole 1400	0.37
2.3	4000 <sup>3)</sup>	RXL1	0.09 kW 4-pole 1400	0.25
<b>BSA 25</b>				
60	1550 <sup>1)</sup>	RH1	0.12 kW 2-pole 2800	0.56
37	2450 <sup>1)</sup>	RV1	0.12 kW 2-pole 2800	0.56
30	2200 <sup>1)</sup>	RH1	0.09 kW 4-pole 1400	0.56
20	4400 <sup>2)</sup>	RN1	0.12 kW 2-pole 2800	0.48
9	5500 <sup>2)</sup>	RN1	0.09 kW 4-pole 1400	0.48
4.5	6000 <sup>3)</sup>	RL1	0.09 kW 4-pole 1400	0.37
2.3	6000 <sup>3)</sup>	RXL1	0.09 kW 4-pole 1400	0.25
<b>BSA 28</b>				
60	3200 <sup>1)</sup>	RH1	0.25 kW 2-pole 2800	0.56
37	4500 <sup>2)</sup>	RV1	0.25 kW 2-pole 2800	0.56
30	4450 <sup>1)</sup>	RH1	0.18 kW 4-pole 1400	0.56
20	5650 <sup>2)</sup>	RN1	0.25 kW 2-pole 2800	0.48
9	7100 <sup>2)</sup>	RN1	0.18 kW 4-pole 1400	0.48
4.5	7500 <sup>3)</sup>	RL1	0.18 kW 4-pole 1400	0.37
2.3	7500 <sup>3)</sup>	RXL1	0.18 kW 4-pole 1400	0.25
<b>BSA 30</b>				
60	3300 <sup>1)</sup>	RV1	0.25 kW 2-pole 2800	0.56
30	4350 <sup>2)</sup>	RV1	0.18 kW 4-pole 1400	0.56
15	5500 <sup>2)</sup>	RN1	0.25 kW 2-pole 2800	0.43
10	6300 <sup>2)</sup>	RL1	0.25 kW 2-pole 2800	0.34
7	7000 <sup>2)</sup>	RN1	0.18 kW 4-pole 1400	0.43
5	7900 <sup>2)</sup>	RL1	0.18 kW 4-pole 1400	0.34
3.5	9000 <sup>2)</sup>	RXL1	0.18 kW 4-pole 1400	0.30
<b>BSA 40</b>				
56	5400 <sup>2)</sup>	RV1	0.55 kW 2-pole 2800	0.56
28	6800 <sup>2)</sup>	RV1	0.37 kW 4-pole 1400	0.56
14	8600 <sup>2)</sup>	RN1	0.55 kW 2-pole 2800	0.38
11	9250 <sup>2)</sup>	RL1	0.55 kW 2-pole 2800	0.36
7	10800 <sup>2)</sup>	RN1	0.37 kW 4-pole 1400	0.38
5.5	11600 <sup>2)</sup>	RL1	0.37 kW 4-pole 1400	0.36
2.5	12000 <sup>3)</sup>	RXL1	0.37 kW 4-pole 1400	0.20

1) value limited by electric motor power; ball screw lifetime  $L_{10h} > 1000$  hours (see diagrams on pages 33 ... 35)

The total dynamic efficiency ( $\eta$ ) of BSA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:

$\eta_1$  – wormgear dynamic efficiency, calculated according to BS 721 : Part 2 : 1983

$\eta_2 = 0.9$  – ball screw - nut efficiency

$\eta_3 = 0.9$  – bearings and sealing elements "efficiency"

- 2) value related to the ball screw lifetime  $L_{10h} = 1000$  h, with constant load, without load vibrations nor shocks; for different lifetime refer to diagrams on pages 33 ... 35
- 3) limit value of linear actuator dynamic load capacity (see page 44)

## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series with DC MOTOR**  
**PERFORMANCE with: Duty Cycle  $F_i = 100\%$  at ambient temperature  $25\text{ }^\circ\text{C}$**

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	CURRENT [A]	SELF-LOCKING COEFFICIENT
<b>BSA 20</b> with DC motor 24 V 3000 g/min 100 W 5.5 A				
62	1200 <sup>1)</sup>	RH1	6.5	0.56
40	1850 <sup>1)</sup>	RV1	6.5	0.57
20	2750 <sup>2)</sup>	RN1	5.5	0.49
10	3500 <sup>2)</sup>	RL1	3.5	0.37
5	4000 <sup>3)</sup>	RXL1	2.5	0.25
<b>BSA 25</b> with DC motor 24 V 3000 g/min 150 W 8.4 A				
62	1800 <sup>1)</sup>	RH1	9.5	0.56
40	2800 <sup>1)</sup>	RV1	9.5	0.57
20	4300 <sup>2)</sup>	RN1	7	0.48
10	5400 <sup>2)</sup>	RL1	5	0.37
5	6000 <sup>3)</sup>	RXL1	3	0.25
<b>BSA 30</b> with DC motor 24 V 3000 g/min 300 W 15.6 A				
62	3400 <sup>2)</sup>	RV1	16	0.56
15	5350 <sup>2)</sup>	RN1	7	0.43
10	6150 <sup>2)</sup>	RL1	6	0.34
7.5	7000 <sup>2)</sup>	RXL1	5	0.30
<b>BSA 40</b> with DC motor 24 V 3000 g/min 500 W 25 A				
60	5300 <sup>2)</sup>	RV1	25	0.56
15	8400 <sup>2)</sup>	RN1	12	0.38
12	9000 <sup>2)</sup>	RL1	10	0.36
5.5	12000 <sup>2) 3)</sup>	RXL1	8	0.20

1) value limited by electric motor power; ball screw lifetime  $L_{10h} > 1000$  hours (see diagrams on pages 33 ... 35)

The total dynamic efficiency ( $\eta$ ) of BSA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:

$\eta_1$  – wormgear dynamic efficiency, calculated according to BS 721 : Part 2 : 1983

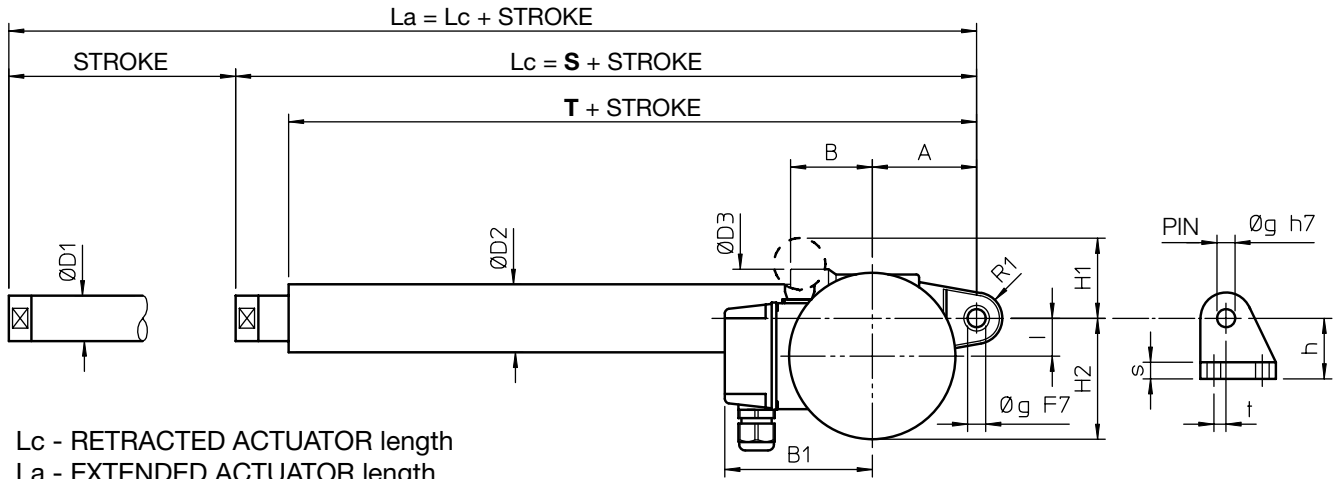
$\eta_2 = 0.9$  – ball screw - nut efficiency

$\eta_3 = 0.9$  – bearings and sealing elements "efficiency"

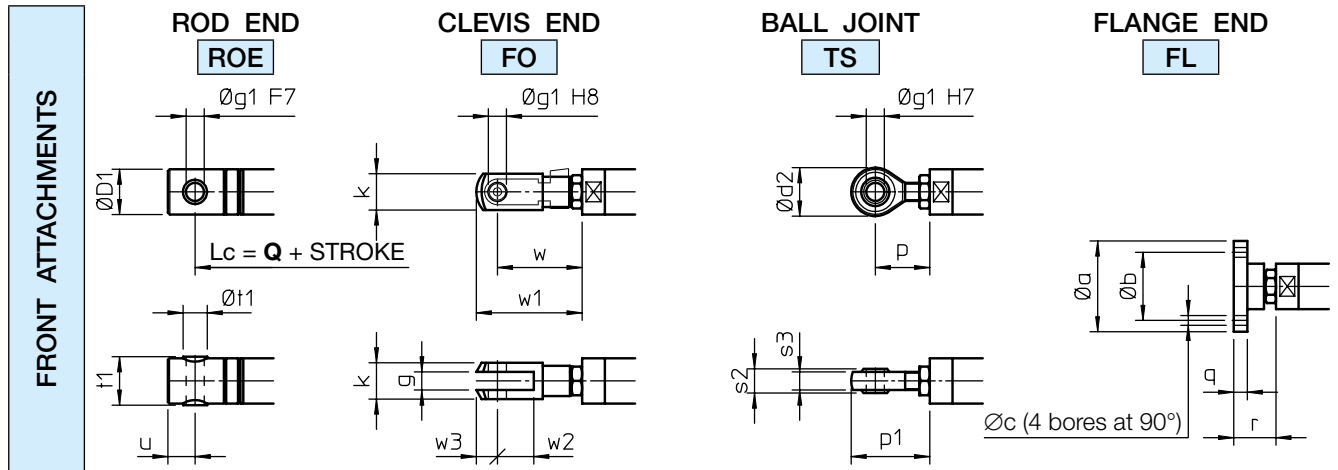
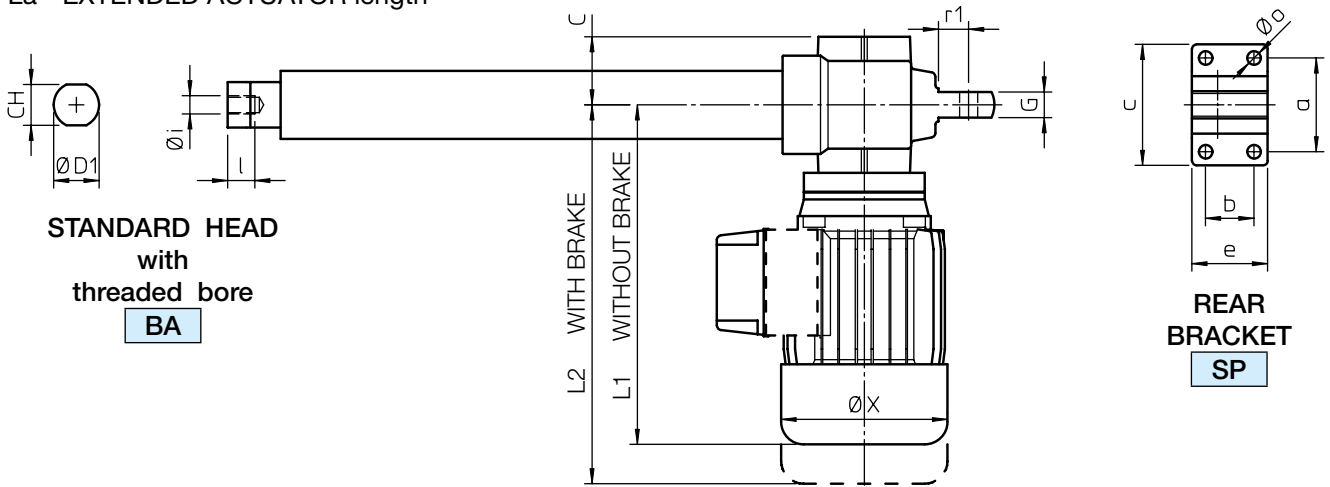
- 2) value related to the ball screw lifetime  $L_{10h} = 1000$  h, with constant load, without load vibrations nor shocks; for different lifetime refer to diagrams on pages 33 ... 35
- 3) limit value of linear actuator dynamic load capacity (see page 44)

# Linear actuators ATL Series

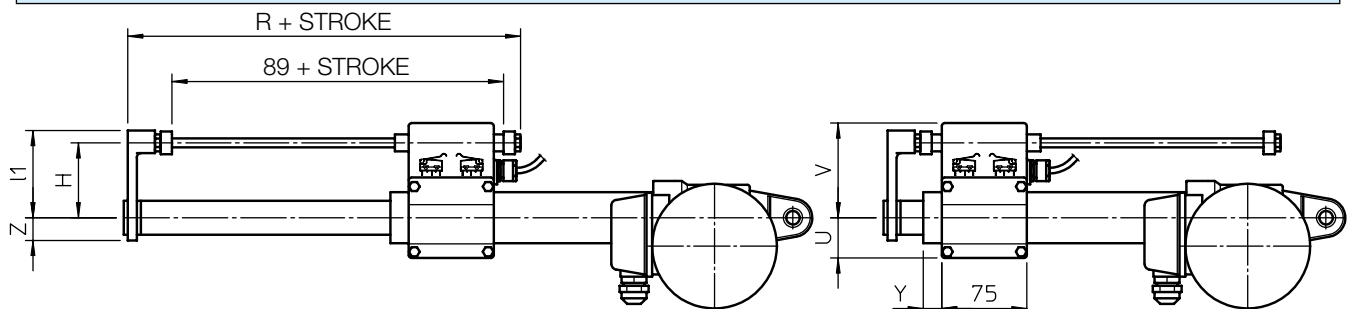
ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 28 – 30 – 40  
AC 3-phase or 1-phase MOTOR – with Electric Stroke Limit Device FCE



$Lc$  - RETRACTED ACTUATOR length  
 $La$  - EXTENDED ACTUATOR length



## ELECTRIC STROKE LIMIT DEVICE FCE



## Linear actuators ATL Series

**ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 28 – 30 – 40**  
**AC 3-phase or 1-phase MOTOR – with Electric Stroke Limit Device FCE**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S	T	Q
ATL 20	STROKE [mm]	100	200	300	400	500	600	700	800	183	152	198
ATL 25										190	155	207
ATL 28										190	155	207
ATL 30										218	180	238
ATL 40										275	225	300

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T** and **Q** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	∅ D3	G	H1	H2	I	L1	L2
ATL 20	69	54	110	45	22	25	36	65	17	50	80	25	225	251
ATL 25	69	54	110	45	27	30	45	65	17	50	80	25	225	251
ATL 28	69	54	115	45	27	30	45	65	17	60	87	25	251	287
ATL 30	76	62	115	50	30	35	55	78	20	60	92	30	255	291
ATL 40	104	78	124	57	36	40	60	92	24	50	115	40	284	373

	R1	∅ X	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
ATL 20	17	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	17	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 28	17	123	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	18	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	28	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
ATL 20	55	40	5.5	25	28	10	10	20	31	45
ATL 25	60	45	6.5	30	32	12	12	24	36	52
ATL 28	60	45	6.5	30	32	12	12	24	36	52
ATL 30	65	50	6.5	35	36	14	14	27	36	54
ATL 40	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
ATL 20	8	27	14	11	26	14	15	49	61	20	12
ATL 25	9	28	16	12	32	16	18	56	70	24	14
ATL 28	9	28	16	12	32	16	18	56	70	24	14
ATL 30	9	32	19	14	36	18	21	65	81	28	16
ATL 40	10	42	25	18	42	25	27	90	115	40	25

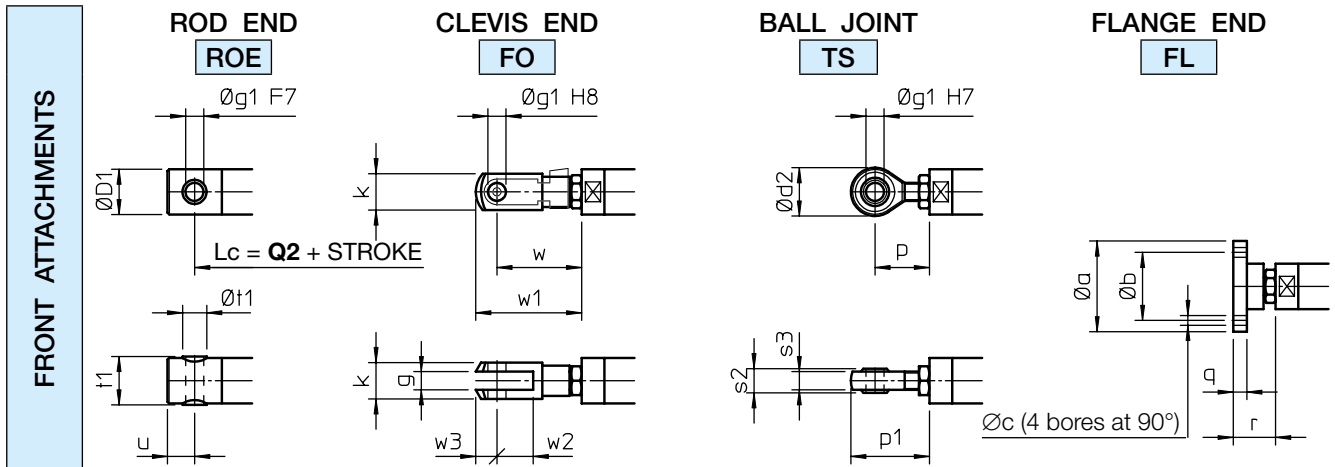
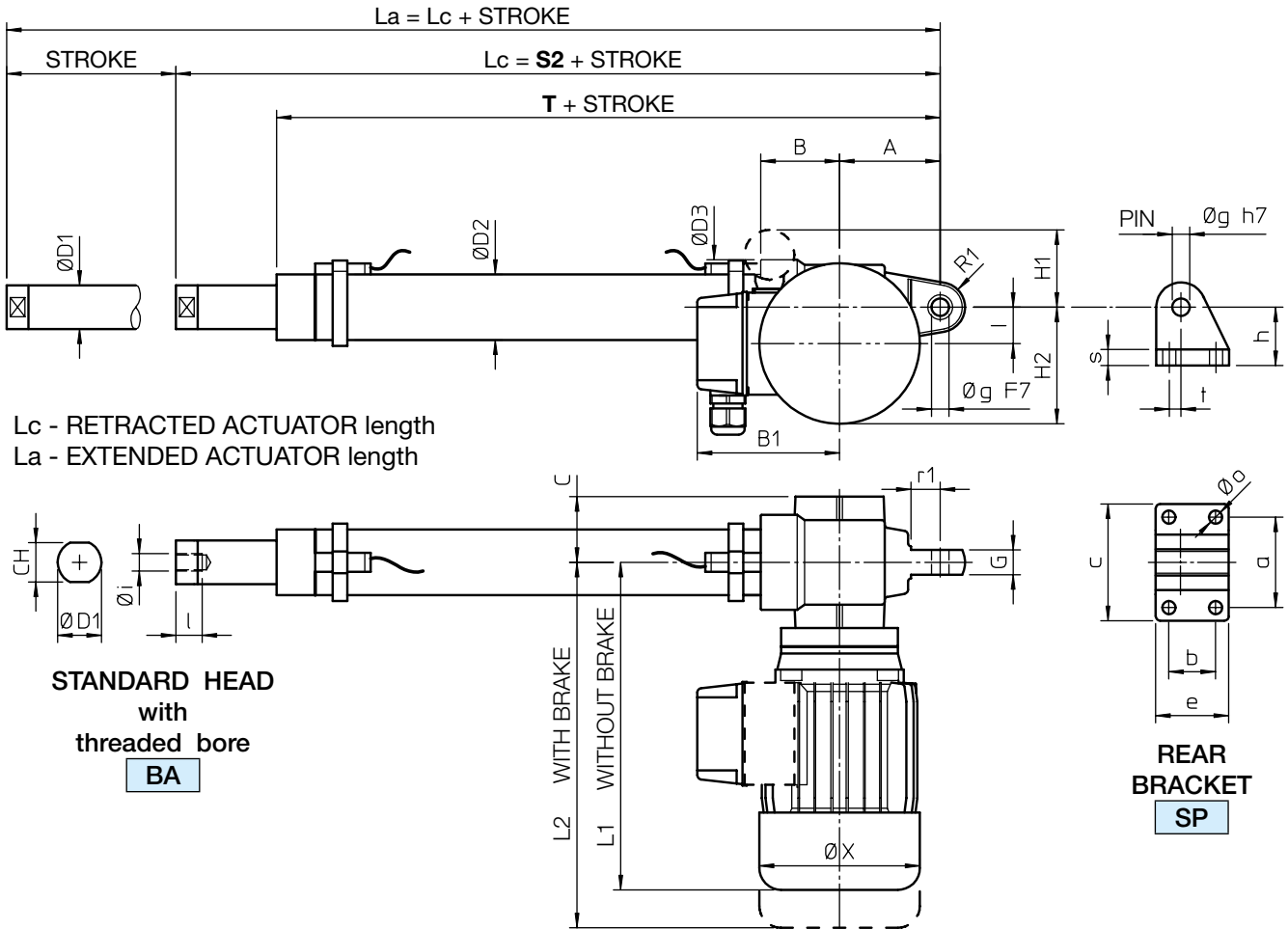
### ELECTRIC STROKE LIMIT DEVICE FCE Dimensions

	H	R	U	V	Y	Z	l1
ATL 20	62	144	30	80	20	18	72
ATL 25	67	146	35	85	16	20	77
ATL 28	67	146	35	85	16	20	77
ATL 30	71	147	38	90	15	23	82
ATL 40	75	163	43	93	17	25	85



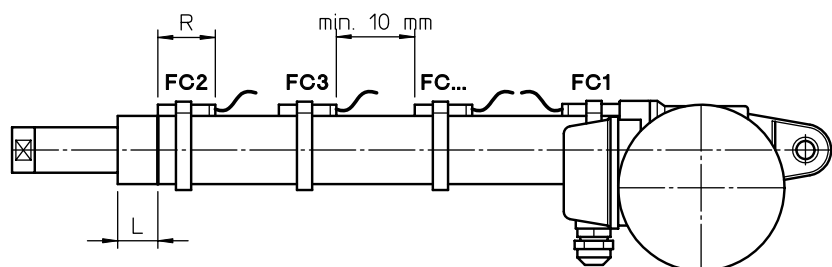
# Linear actuators ATL Series

ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 28 – 30 – 40  
 AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Switches FCM



## MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

	L	
	REED CONTACT NC or (NC+NO)	NO
ATL 20	18.5	23.5
ATL 25	26.5	31.5
ATL 28	26.5	31.5
ATL 30	29	34
ATL 40	35	40



## Linear actuators ATL Series

**ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 28 – 30 – 40**  
**AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Switches FCM**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S2	T	Q2
ATL 20	STROKE [mm]	72	172	272	372	472	572	672	772	235	180	235
ATL 25		66	166	266	366	466	566	666	766	252	189	255
ATL 28		66	166	266	366	466	566	666	766	252	189	255
ATL 30		68	168	268	368	468	568	668	768	276	212	282
ATL 40		63	163	263	363	463	563	663	763	339	262	351

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T** and **Q2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	∅ D3	G	H1	H2	I	L1	L2
ATL 20	69	54	110	45	22	25	36	65	17	50	80	25	225	251
ATL 25	69	54	110	45	27	30	45	65	17	50	80	25	225	251
ATL 28	69	54	115	45	27	30	45	65	17	60	87	25	251	287
ATL 30	76	62	115	50	30	35	55	78	20	60	92	30	255	291
ATL 40	104	78	124	57	36	40	60	92	24	50	115	40	284	373

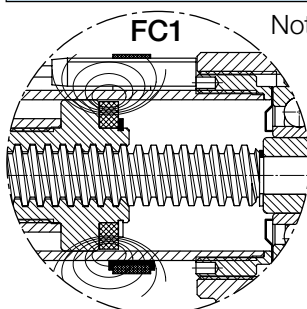
	R1	∅ X	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
ATL 20	17	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	17	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 28	17	123	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	18	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	28	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
ATL 20	55	40	5.5	25	28	10	10	20	31	45
ATL 25	60	45	6.5	30	32	12	12	24	36	52
ATL 28	60	45	6.5	30	32	12	12	24	36	52
ATL 30	65	50	6.5	35	36	14	14	27	36	54
ATL 40	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
ATL 20	8	27	14	11	26	14	15	49	61	20	12
ATL 25	9	28	16	12	32	16	18	56	70	24	14
ATL 28	9	28	16	12	32	16	18	56	70	24	14
ATL 30	9	32	19	14	36	18	21	65	81	28	16
ATL 40	10	42	25	18	42	25	27	90	115	40	25

### MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions



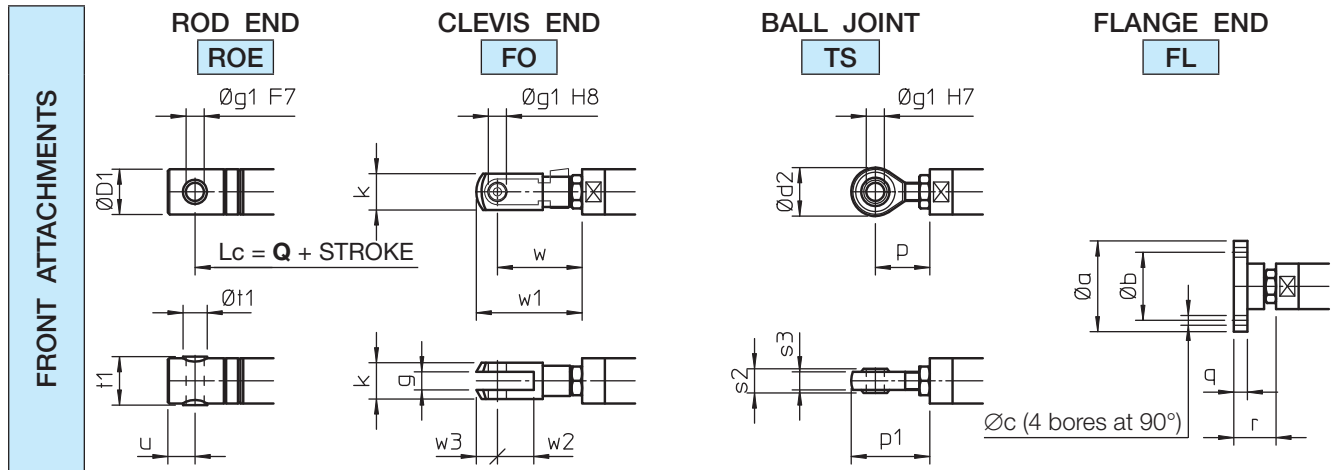
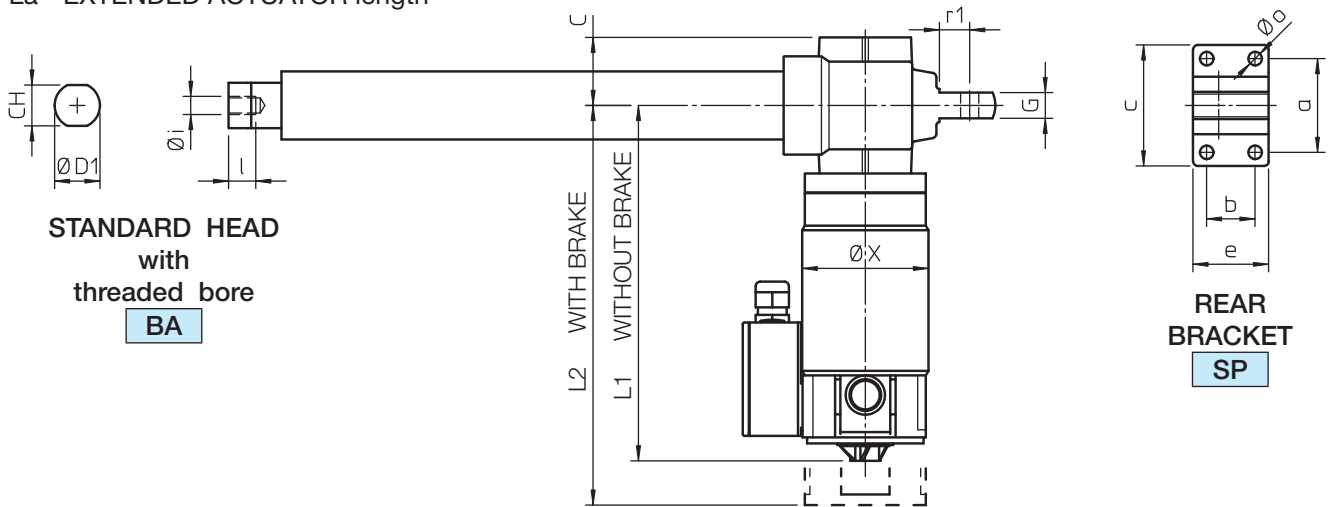
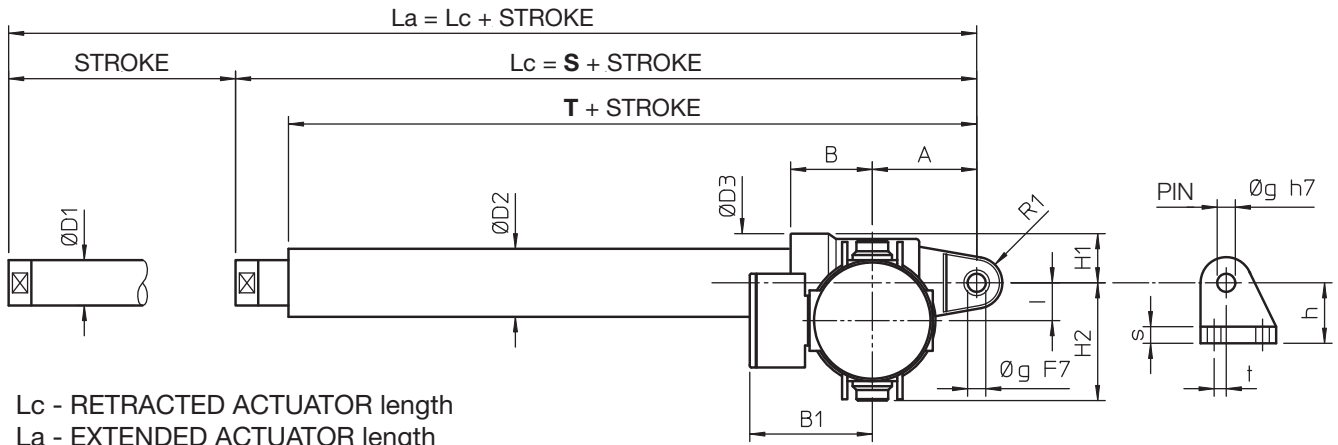
Note: - The travel length performed by an actuator with FCM is reduced if compared to the travel length of an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimum retracted length.

Therefore the actuator in retracted position is longer.

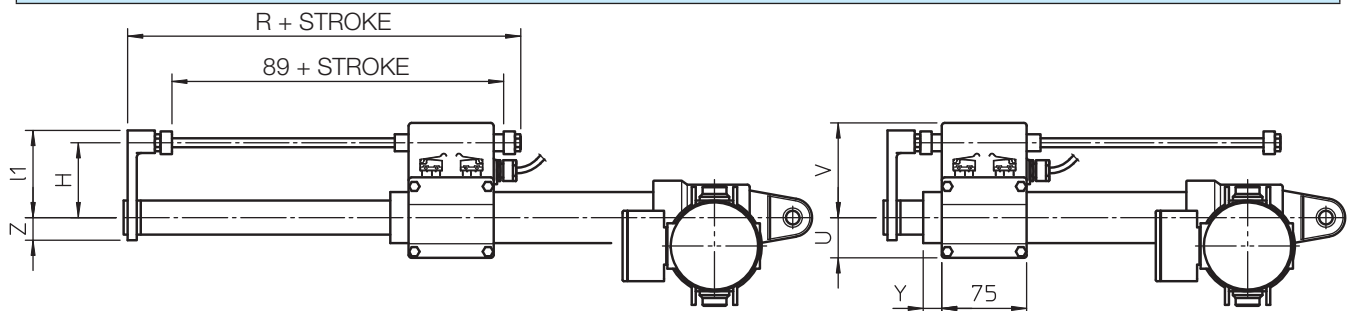
- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimum distance between the REED SWITCHES must be of at least 10 mm.
- REED SWITCH Normally Closed (NC) R = 39 mm
- REED SWITCH Change-over (NC+NO) R = 39 mm
- REED SWITCH Normally Open (NO) R = 29 mm

# Linear actuators ATL Series

ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 30 – 40  
 DC MOTOR – without stroke limit switches or with Electric Stroke Limit Device FCE



## ELECTRIC STROKE LIMIT DEVICE FCE



## Linear actuators ATL Series

**ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 30 – 40**  
**DC MOTOR – without stroke limit switches or with Electric Stroke Limit Device FCE**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S	T	Q
ATL 20	STROKE [mm]	100	200	300	400	500	600	700	800	183	152	198
ATL 25										190	155	207
ATL 30										218	180	238
ATL 40										275	225	300

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T** and **Q** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	∅ D3	G	H1	H2	I	L1	L2
ATL 20	69	54	80	45	22	25	36	65	17	33	80	25	202	243
ATL 25	69	54	80	45	27	30	45	65	17	33	80	25	235	276
ATL 30	76	62	80	50	30	35	55	78	20	39	92	30	291	332
ATL 40	104	78	80	57	36	40	60	92	24	46	115	40	391	432

	R1	∅ X	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
ATL 20	17	107	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	17	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	18	107	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	28	107	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
ATL 20	55	40	5.5	25	28	10	10	20	31	45
ATL 25	60	45	6.5	30	32	12	12	24	36	52
ATL 30	65	50	6.5	35	36	14	14	27	36	54
ATL 40	80	60	8.5	40	50	20	20	40	53	78

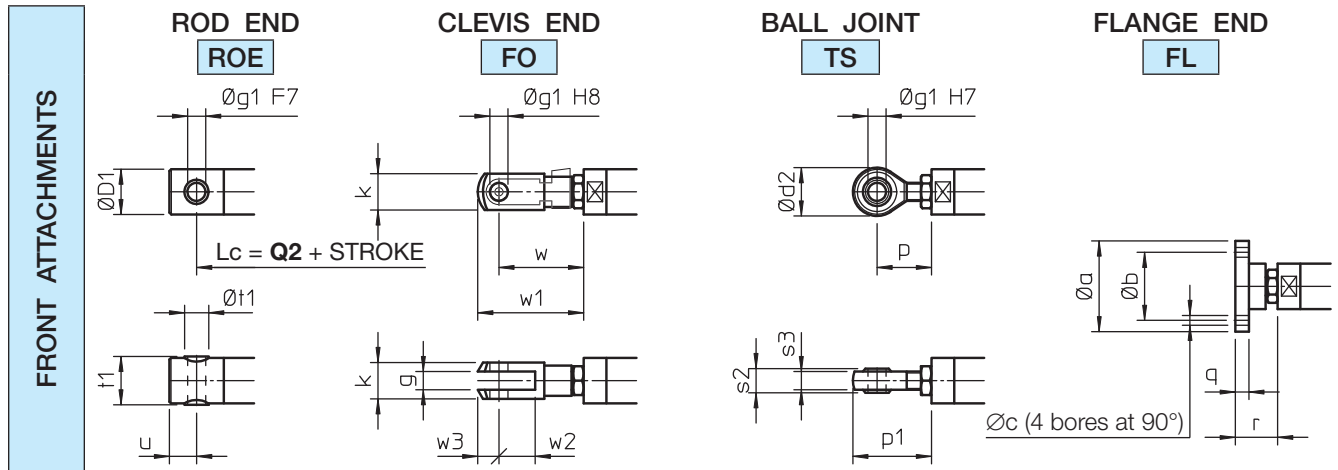
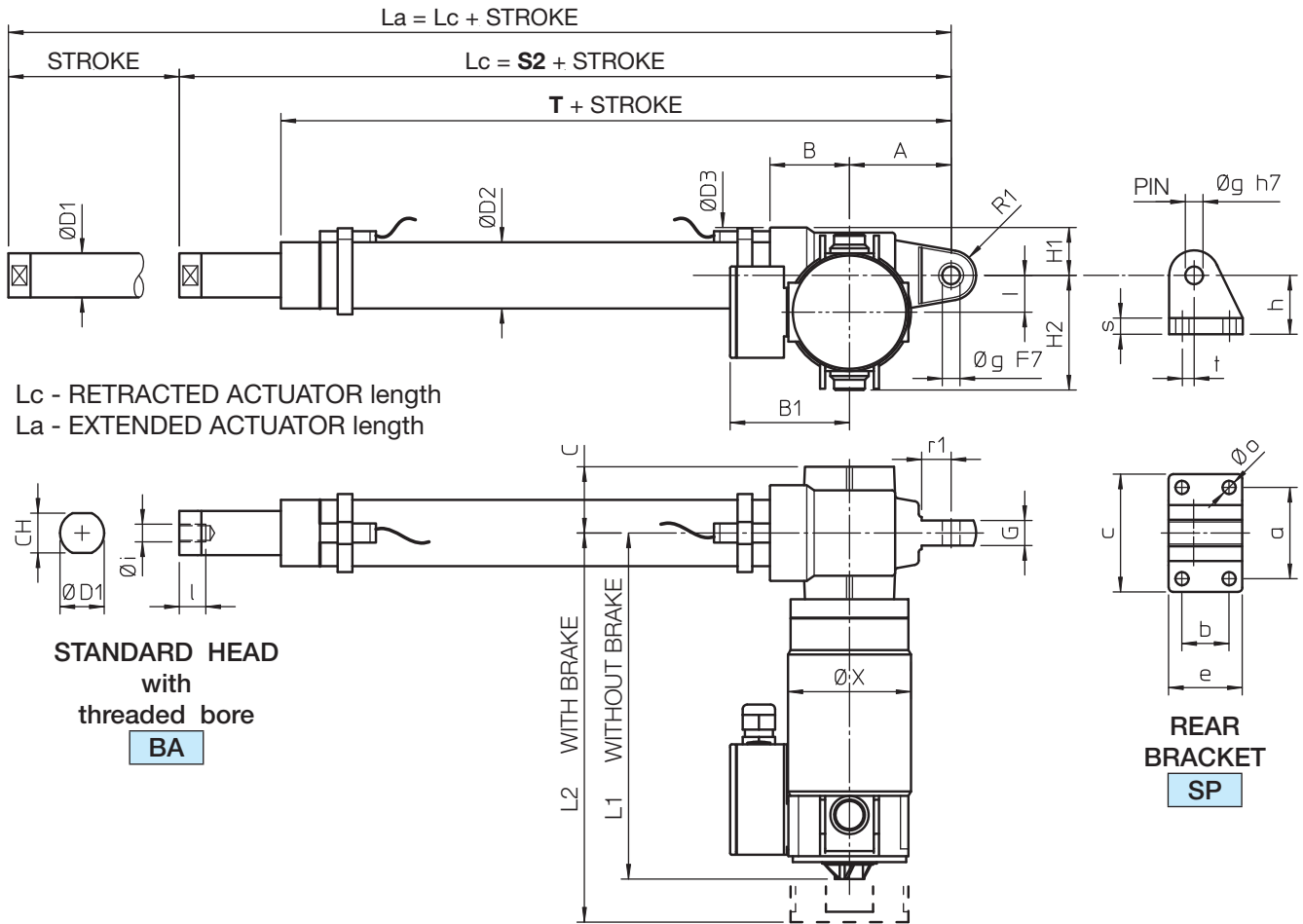
	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
ATL 20	8	27	14	11	26	14	15	49	61	20	12
ATL 25	9	28	16	12	32	16	18	56	70	24	14
ATL 30	9	32	19	14	36	18	21	65	81	28	16
ATL 40	10	42	25	18	42	25	27	90	115	40	25

### ELECTRIC STROKE LIMIT DEVICE FCE Dimensions

	H	R	U	V	Y	Z	l1
ATL 20	62	144	30	80	20	18	72
ATL 25	67	146	35	85	16	20	77
ATL 30	71	147	38	90	15	23	82
ATL 40	75	163	43	93	17	25	85

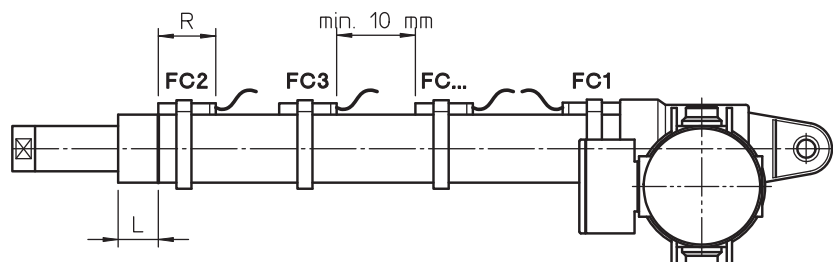
# Linear actuators ATL Series

ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 30 – 40  
DC MOTOR – with Magnetic Stroke Limit Switches FCM



## MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

	L	
	REED CONTACT NC or (NC+NO)	NO
ATL 20	18.5	23.5
ATL 25	26.5	31.5
ATL 28	26.5	31.5
ATL 30	29	34
ATL 40	35	40



## Linear actuators ATL Series

**ACME SCREW LINEAR ACTUATORS ATL Series, size 20 – 25 – 30 – 40  
DC MOTOR – with Magnetic Stroke Limit Switches FCM**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S2	T	Q2
ATL 20	STROKE [mm]	72	172	272	372	472	572	672	772	235	180	235
ATL 25		66	166	266	366	466	566	666	766	252	189	255
ATL 30		68	168	268	368	468	568	668	768	276	212	282
ATL 40		63	163	263	363	463	563	663	763	339	262	351

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T** and **Q2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	∅ D3	G	H1	H2	I	L1	L2
ATL 20	69	54	80	45	22	25	36	65	17	33	80	25	202	243
ATL 25	69	54	80	45	27	30	45	65	17	33	80	25	235	276
ATL 30	76	62	80	50	30	35	55	78	20	39	92	30	291	332
ATL 40	104	78	80	57	36	40	60	92	24	46	115	40	391	432

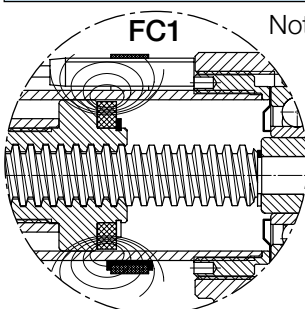
	R1	∅ X	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
ATL 20	17	107	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	17	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	18	107	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	28	107	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
ATL 20	55	40	5.5	25	28	10	10	20	31	45
ATL 25	60	45	6.5	30	32	12	12	24	36	52
ATL 30	65	50	6.5	35	36	14	14	27	36	54
ATL 40	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
ATL 20	8	27	14	11	26	14	15	49	61	20	12
ATL 25	9	28	16	12	32	16	18	56	70	24	14
ATL 30	9	32	19	14	36	18	21	65	81	28	16
ATL 40	10	42	25	18	42	25	27	90	115	40	25

### MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions



Note: - The travel length performed by an actuator with FCM is reduced if compared to the travel length of an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimum retracted length.

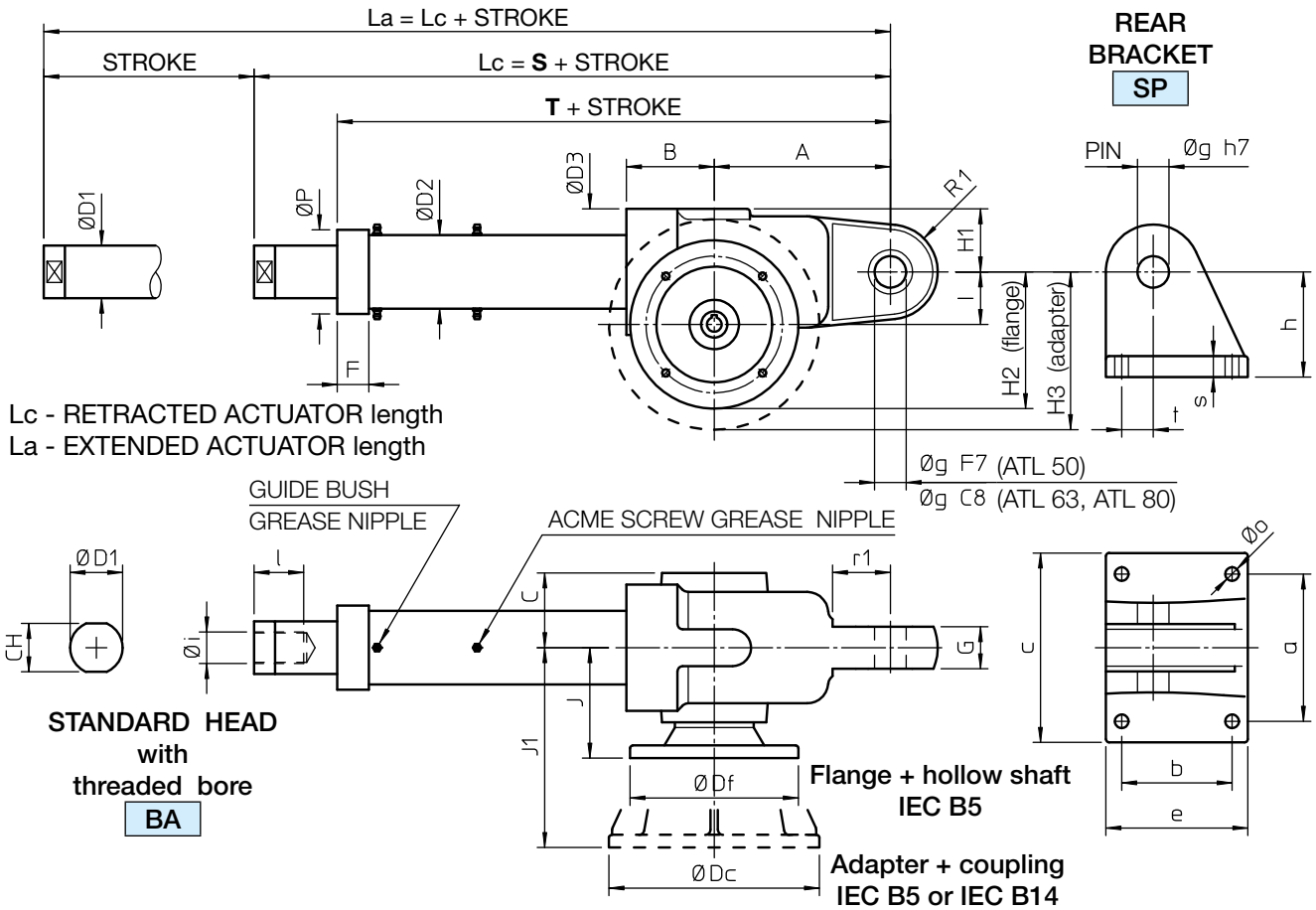
Therefore the actuator in retracted position is longer.

- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimum distance between the REED SWITCHES must be of at least 10 mm.
- REED SWITCH Normally Closed (NC) R = 39 mm
- REED SWITCH Change-over (NC+NO) R = 39 mm
- REED SWITCH Normally Open (NO) R = 29 mm

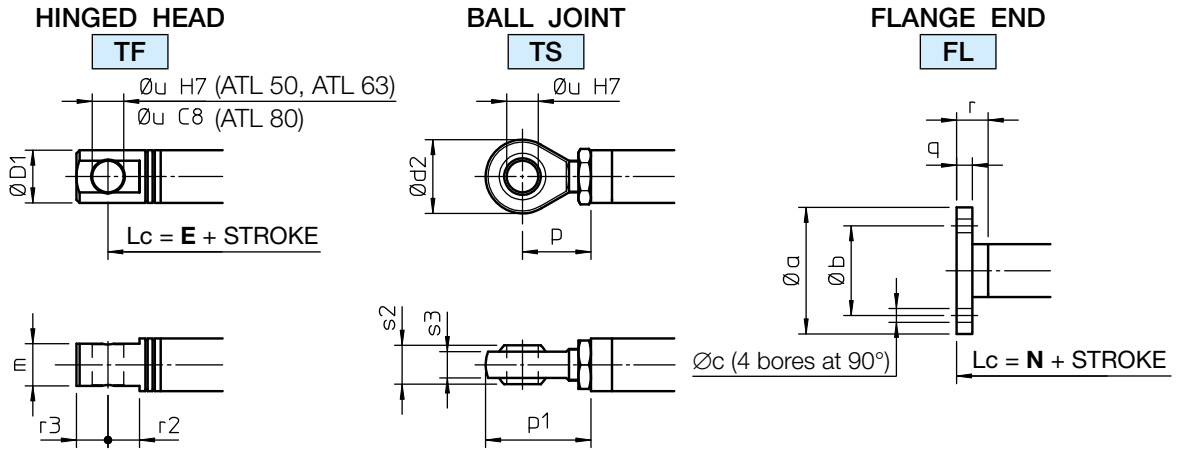
# Linear actuators ATL Series

ACME SCREW LINEAR ACTUATORS ATL Series, size 50 – 63 – 80  
AC 3-phase MOTOR – with Electric Stroke Limit Device FCE

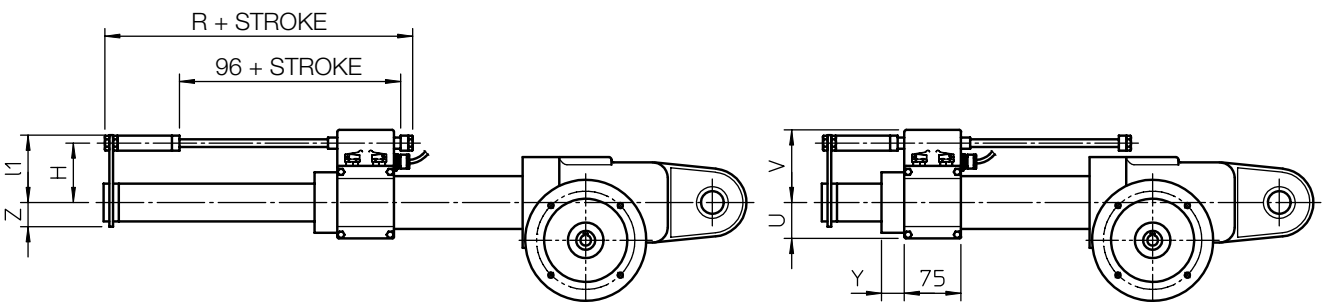
2



FRONT ATTACHMENTS



## ELECTRIC STROKE LIMIT DEVICE FCE



## Linear actuators ATL Series

**ACME SCREW LINEAR ACTUATORS ATL Series, size 50 – 63 – 80**  
**AC 3-phase MOTOR – with Electric Stroke Limit Device FCE**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S	T	E	N
ATL 50	STROKE [mm]	100	200	300	400	500	600	700	800	405	326	435	415
ATL 63										516	419	546	526
ATL 80										603 (653)*	509 (569)*	638 (688)*	623 (673)*

\* - value in brackets refers to ATL 80 with AR; ATL 80 with AR not available with FCE

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T**, **E** and **N** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	C	CH	∅ D1	∅ D2	∅ D3	F	G	H1	I	∅ P	R1
ATL 50	168	83	68	46	50	70	120	—	40	63	50	—	45
ATL 63	206	96	83	—	60	90	140	37	50	70	63	95	50
ATL 80	240	119	103	—	90	115 (150)*	160	40	60	90	80	125 (150)*	60

\* - value in brackets refers to ATL 80 with AR; ATL 80 with AR not available with FCE

	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
ATL 50	140	105	185	143	30	100	M30×2	45	13	55	20	30
ATL 63	180	120	228	160	35	120	M36×2	55	17	58	30	30
ATL 80	210	122	278	180	40	130	M42×2	65	21	62	35	32

	Flange IEC	∅ Df	H2	J	Adapter IEC	∅ Dc	H3	J1
ATL 50	63 B5	140	120	102	80 B14 – 80 B5	120 – 200	110 – 150	176 – 182
	71 B5	160	130	102	90 B14 – 90 B5	140 – 200	120 – 150	182
ATL 63	80 B5	200	163	100	90 B14 – 90 B5	140 – 200	133 – 163	200
					100 B14 – 100 B5	160 – 250	143 – 188	220
ATL 80	80 B5; 90 B5	200	180	119	112 B14 – 112 B5	160 – 250	160 – 205	240

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	m	p	p1
ATL 50	120	85	13	50	70	40	65	100
ATL 63	140	100	17	60	80	50	86	126
ATL 80	170	130	21	90	90	50	85	130

	q	r	r2	r3	s2	s3	∅ u
ATL 50	15	30	30	30	37	25	30
ATL 63	15	30	30	35	43	28	35
ATL 80	20	40	35	45	49	33	40

### ELECTRIC STROKE LIMIT DEVICE FCE Dimensions

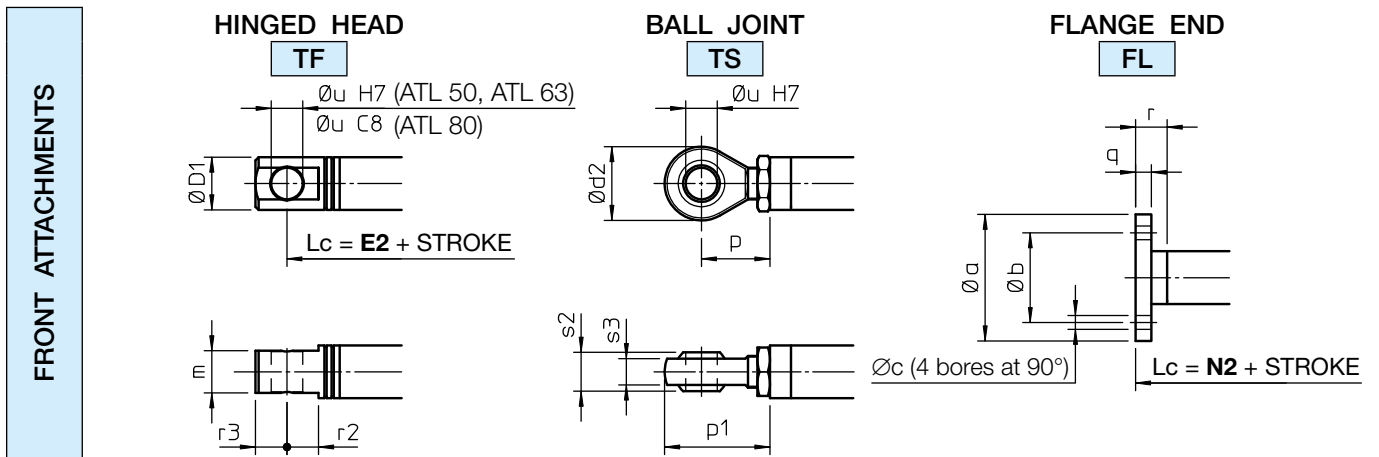
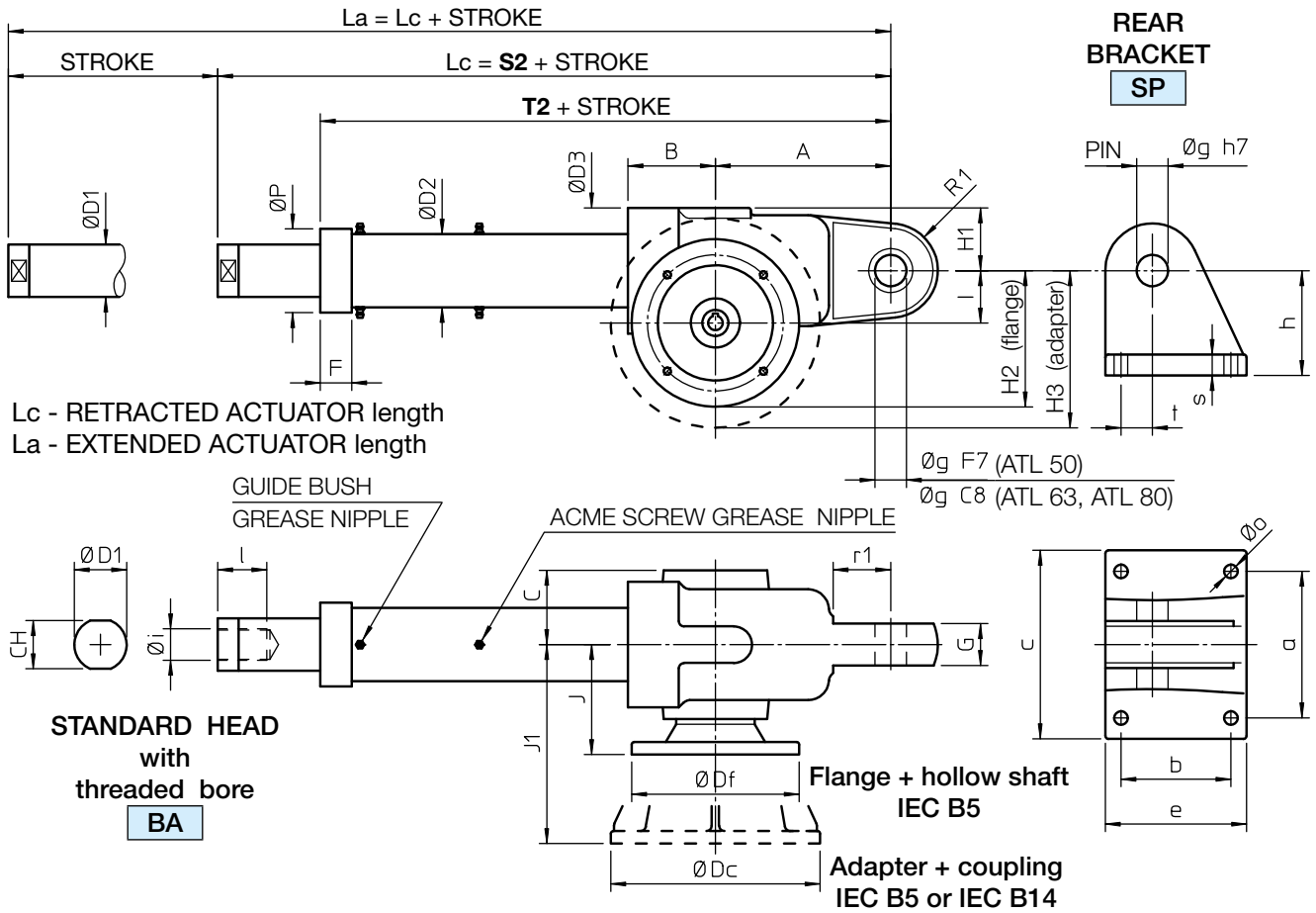
	H	R	U	V	Y	Z	l1
ATL 50	79	188	50	97	5	32	89
ATL 63	89	237	60	107	37	37	100
ATL 80 *	101	237	73	119	40	55	113

\* - ATL 80 with AR not available with FCE



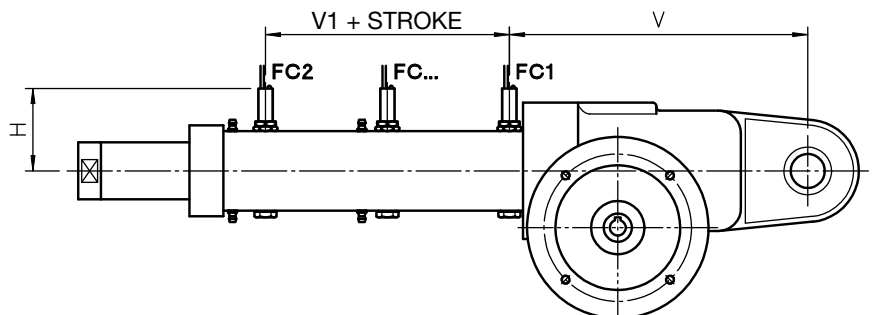
# Linear actuators ATL Series

ACME SCREW LINEAR ACTUATORS ATL Series, size 50 – 63 – 80  
AC 3-phase MOTOR – Proximity Stroke Limit Switches FCP



## PROXIMITY STROKE LIMIT SWITCHES FCP Dimensions

	H	V	V1
ATL 50	79.5	263	15
ATL 63	86.5	314	40
ATL 80	99	371	40



## Linear actuators ATL Series

### ACME SCREW LINEAR ACTUATORS ATL Series, size 50 – 63 – 80 AC 3-phase MOTOR – Proximity Stroke Limit Switches FCP STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S2	T2	E2	N2
ATL 50	STROKE [mm]	100	200	300	400	500	600	700	800	443	345	473	453
ATL 63										554	438	584	564
ATL 80										647 (653)*	531 (569)*	682 (688)*	667 (673)*

\* - value in brackets refers to ATL 80 with AR

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T2**, **E2** and **N2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	C	CH	∅ D1	∅ D2	∅ D3	F	G	H1	I	∅ P	R1
ATL 50	168	83	68	46	50	70	120	—	40	63	50	—	45
ATL 63	206	96	83	—	60	90	140	37	50	70	63	95	50
ATL 80	240	119	103	—	90	115 (150)*	160	40	60	90	80	125 (150)*	60

\* - value in brackets refers to ATL 80 with AR

	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
ATL 50	140	105	185	143	30	100	M30×2	45	13	55	20	30
ATL 63	180	120	228	160	35	120	M36×2	55	17	58	30	30
ATL 80	210	122	278	180	40	130	M42×2	65	21	62	35	32

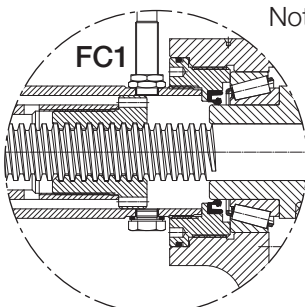
	Flange IEC	∅ Df	H2	J	Adapter IEC	∅ Dc	H3	J1
ATL 50	63 B5	140	120	102	80 B14 – 80 B5	120 – 200	110 – 150	176 – 182
	71 B5	160	130	102	90 B14 – 90 B5	140 – 200	120 – 150	182
ATL 63	80 B5	200	163	100	90 B14 – 90 B5	140 – 200	133 – 163	200
					100 B14 – 100 B5	160 – 250	143 – 188	220
ATL 80	80 B5; 90 B5	200	180	119	112 B14 – 112 B5	160 – 250	160 – 205	240

#### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	m	p	p1
ATL 50	120	85	13	50	70	40	65	100
ATL 63	140	100	17	60	80	50	86	126
ATL 80	170	130	21	90	90	50	85	130

	q	r	r2	r3	s2	s3	∅ u
ATL 50	15	30	30	30	37	25	30
ATL 63	15	30	30	35	43	28	35
ATL 80	20	40	35	45	49	33	40

#### PROXIMITY STROKE LIMIT SWITCHES FCP Technical features

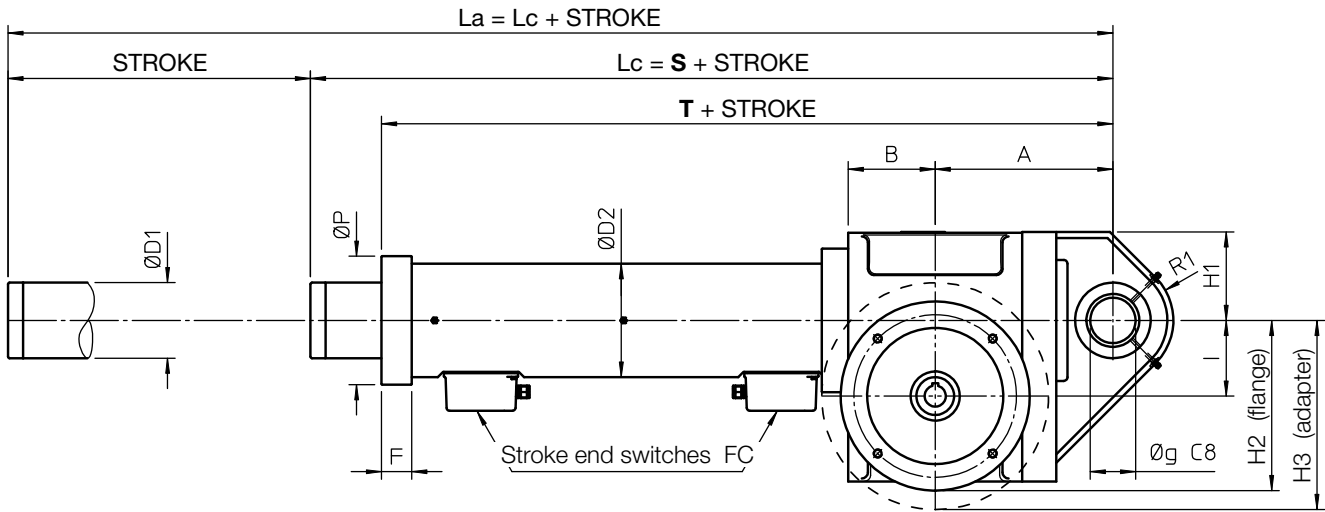


- Note: - The PROXIMITY SWITCH FC1, when activated, gives a signal to stop the motor by means of electric relays before the actuator reaches its minimal retracted length. The RETRACTED ACTUATOR LENGTH ( $L_c$ ) and EXTENDED ACTUATOR LENGTH ( $L_a$ ) of the actuator equipped with PROXIMITY SWITCHES FCP are longer than  $L_a$  and  $L_c$  of the actuator with electric stroke limit device FCE or without stroke end switches.
- Additional PROXIMITY SWITCHES are available for intermediate positions.
  - The minimum distance between the PROXIMITY SWITCHES must be of at least 25 mm.

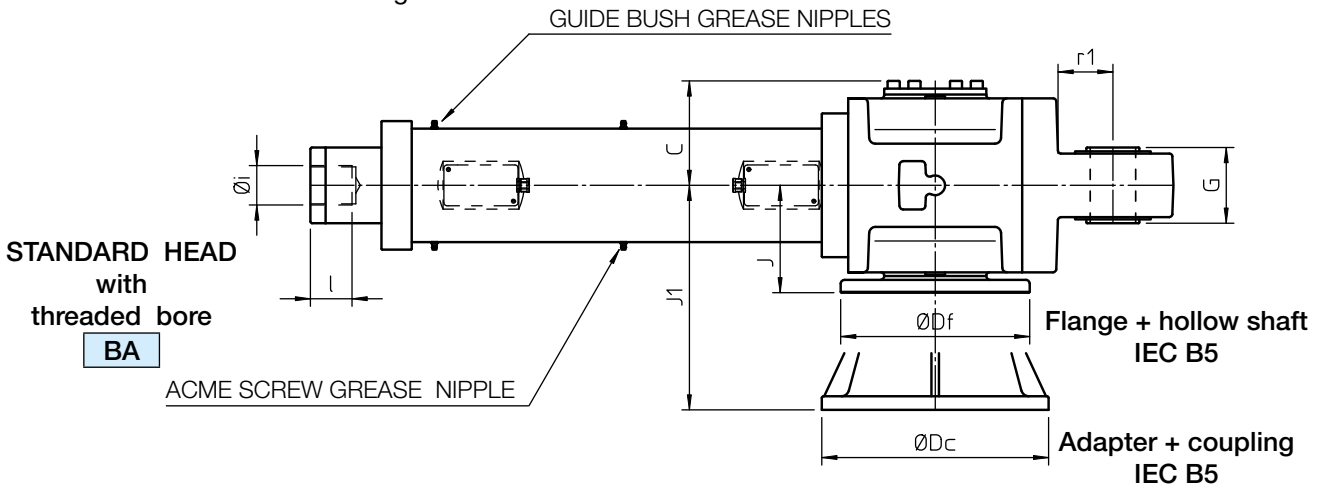
**Linear actuators ATL Series**

ACME SCREW LINEAR ACTUATORS ATL Series, size 100 – 125  
AC 3-phase MOTOR – with Electric Stroke End Switches FC

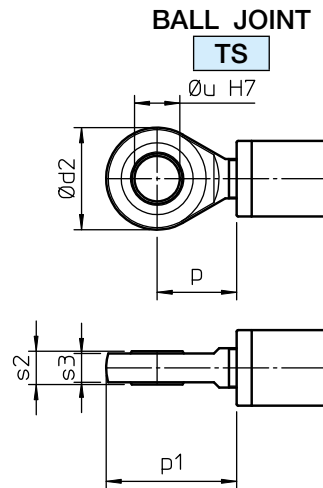
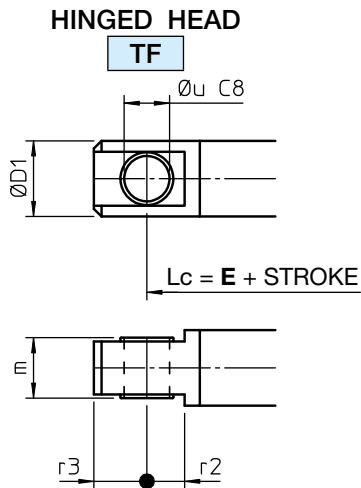
2



Lc - RETRACTED ACTUATOR length  
La - EXTENDED ACTUATOR length



FRONT ATTACHMENTS



## Linear actuators ATL Series

### ACME SCREW LINEAR ACTUATORS ATL Series, size 100 – 125 AC 3-phase MOTOR – with Electric Stroke End Switches FC

	STROKE CODE	C...	S	T	E
ATL 100	STROKE [mm] = STROKE CODE	...	764	669	809
ATL 125			945	875	1030

NOTE: All stroke lengths are made on request.

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T** and **E** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm please contact SERVOMECH.

	A	B	C	∅ D1	∅ D2	F	G	H1	I	∅ P	R1	∅ g	∅ i	l	r1
ATL 100	235	115	138	100	150	40	90	120	100	170	80	60	M60×4	60	72
ATL 125	320	140	173	150	200	—	100	335	125	—	90	80	M80×4	80	100

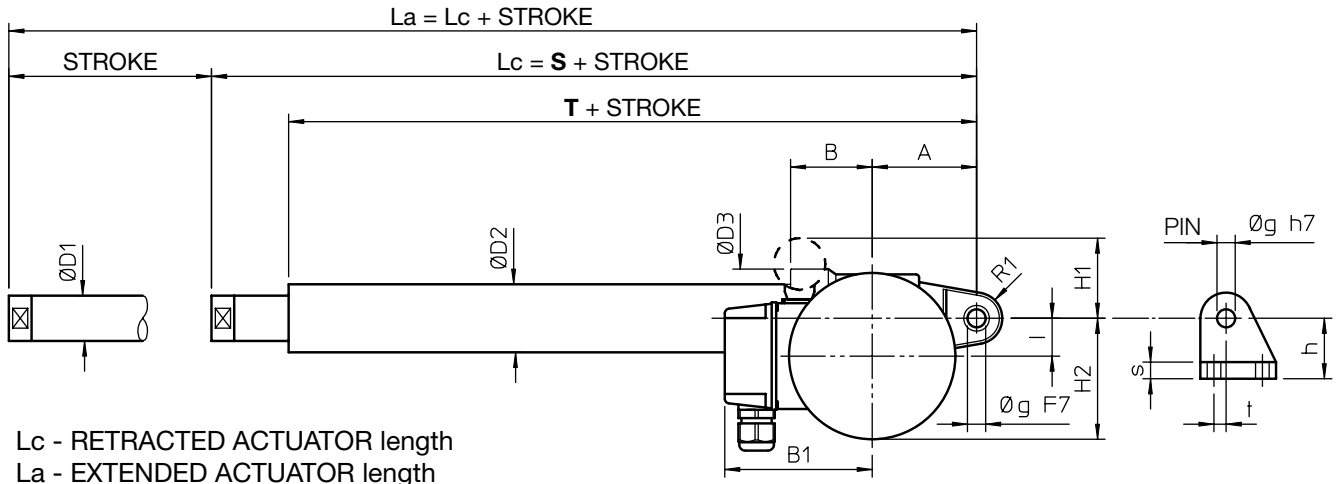
	Flange IEC	∅ Df	H2	J	Adapter IEC	∅ Dc	H3	J1
ATL 100	90 B5	200	225	142	132 B5	300	250	297
	100-112 B5	250	250	142				
ATL 125	—	—	—	—	132 B5	300	275	353
					160 B5	420	335	365

#### FRONT ATTACHMENT Dimensions

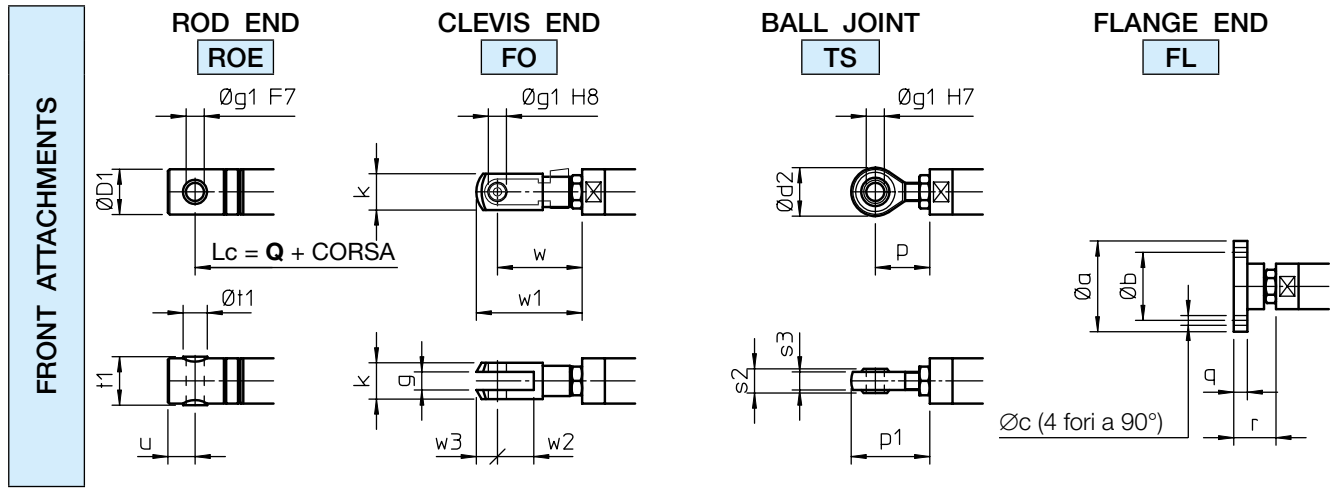
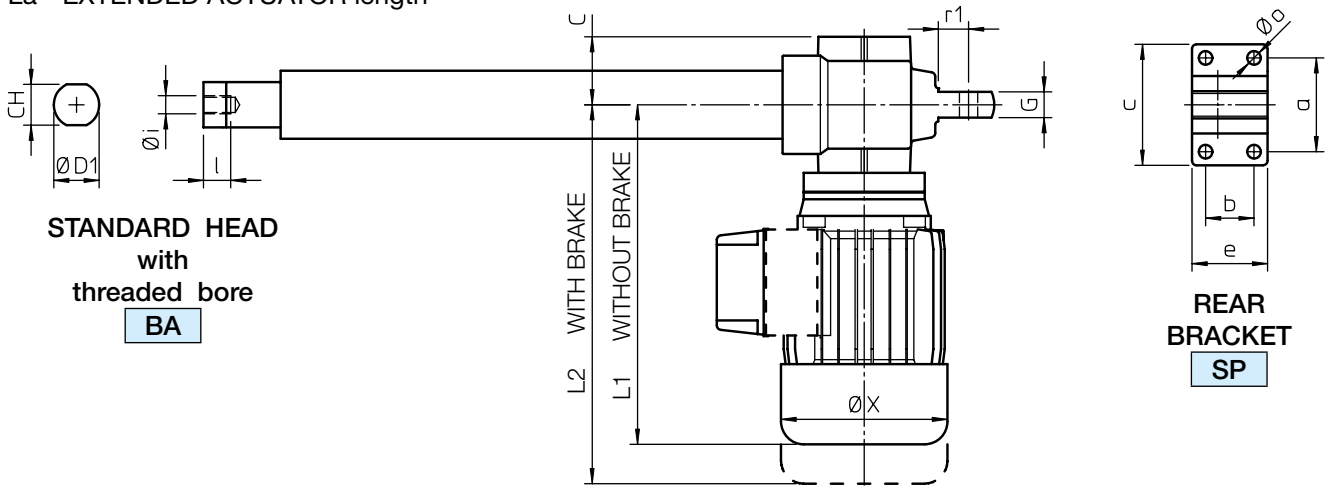
	∅ D1	∅ d2	m	p	p1	r2	r3	s2	s3	∅ u
ATL 100	100	135	70	95	163	50	70	44	38	60
ATL 125	150	180	100	130	220	80	80	55	47	80

# Linear actuators BSA Series

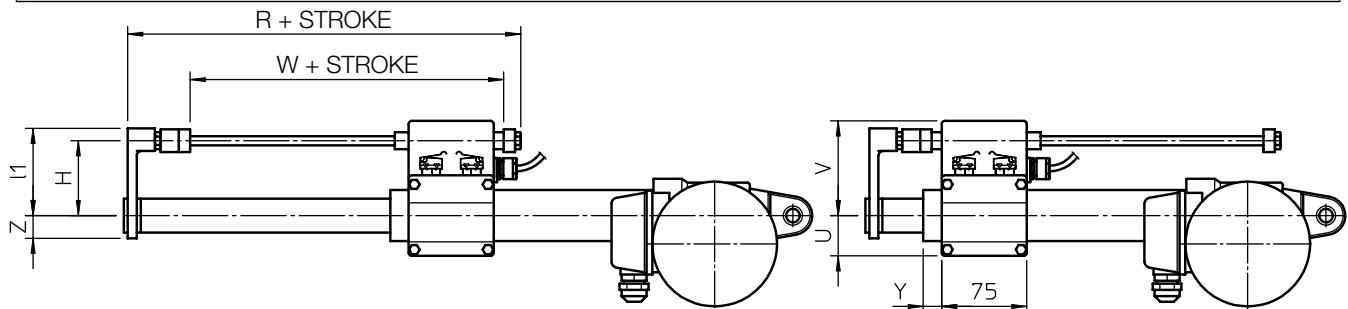
BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 28 – 30 – 40  
AC 3-phase or 1-phase MOTOR – with Electric Stroke Limit Device FCE



Lc - RETRACTED ACTUATOR length  
La - EXTENDED ACTUATOR length



## ELECTRIC STROKE LIMIT DEVICE FCE



## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 28 – 30 – 40**  
**AC 3-phase or 1-phase MOTOR – with Electric Stroke Limit Device FCE**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S	T	Q
BSA 20	STROKE [mm]	86	186	286	386	486	586	686	786	211	166	226
BSA 25		84	184	284	384	484	584	684	784	222	171	239
BSA 28		78	178	278	378	478	578	678	778	234	177	251
BSA 30		90	190	290	390	490	590	690	790	238	190	258
BSA 40		90	190	290	390	490	590	690	790	295	235	320

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T** and **Q** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	∅ D3	G	H1	H2	I	L1	L2
BSA 20	69	54	110	45	22	25	36	65	17	50	80	25	225	251
BSA 25	69	54	110	45	27	30	45	65	17	50	80	25	225	251
BSA 28	69	54	115	45	27	30	45	65	17	60	87	25	251	287
BSA 30	76	62	115	50	30	35	55	78	20	60	92	30	255	291
BSA 40	104	78	124	57	36	40	60	92	24	50	115	40	284	373

	R1	∅ X	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
BSA 20	17	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
BSA 25	17	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
BSA 28	17	123	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
BSA 30	18	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
BSA 40	28	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
BSA 20	55	40	5.5	25	28	10	10	20	31	45
BSA 25	60	45	6.5	30	32	12	12	24	36	52
BSA 28	60	45	6.5	30	32	12	12	24	36	52
BSA 30	65	50	6.5	35	36	14	14	27	36	54
BSA 40	80	60	8.5	40	50	20	20	40	53	78

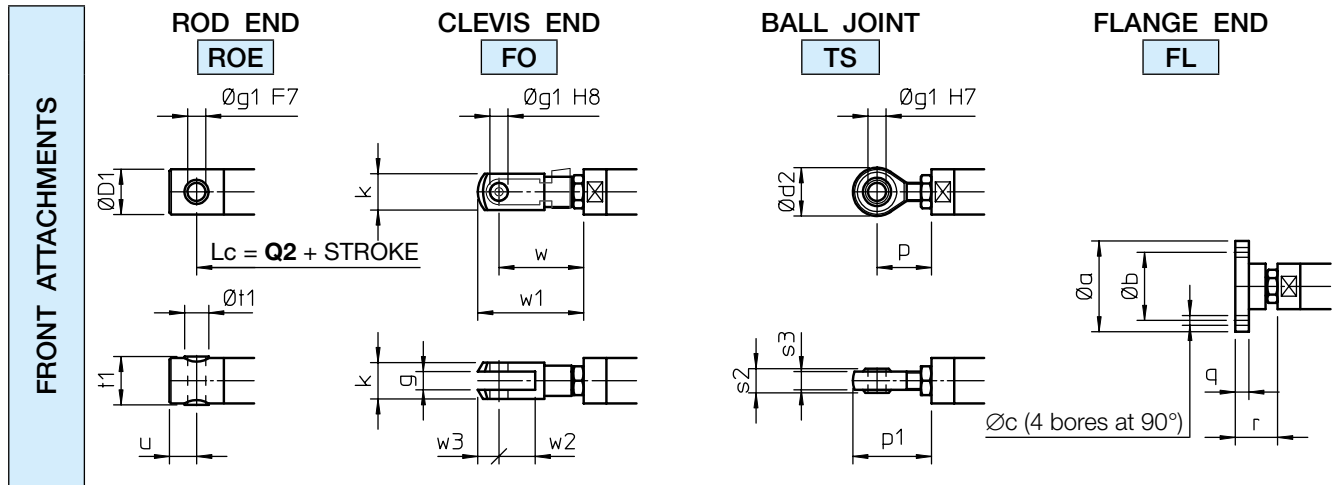
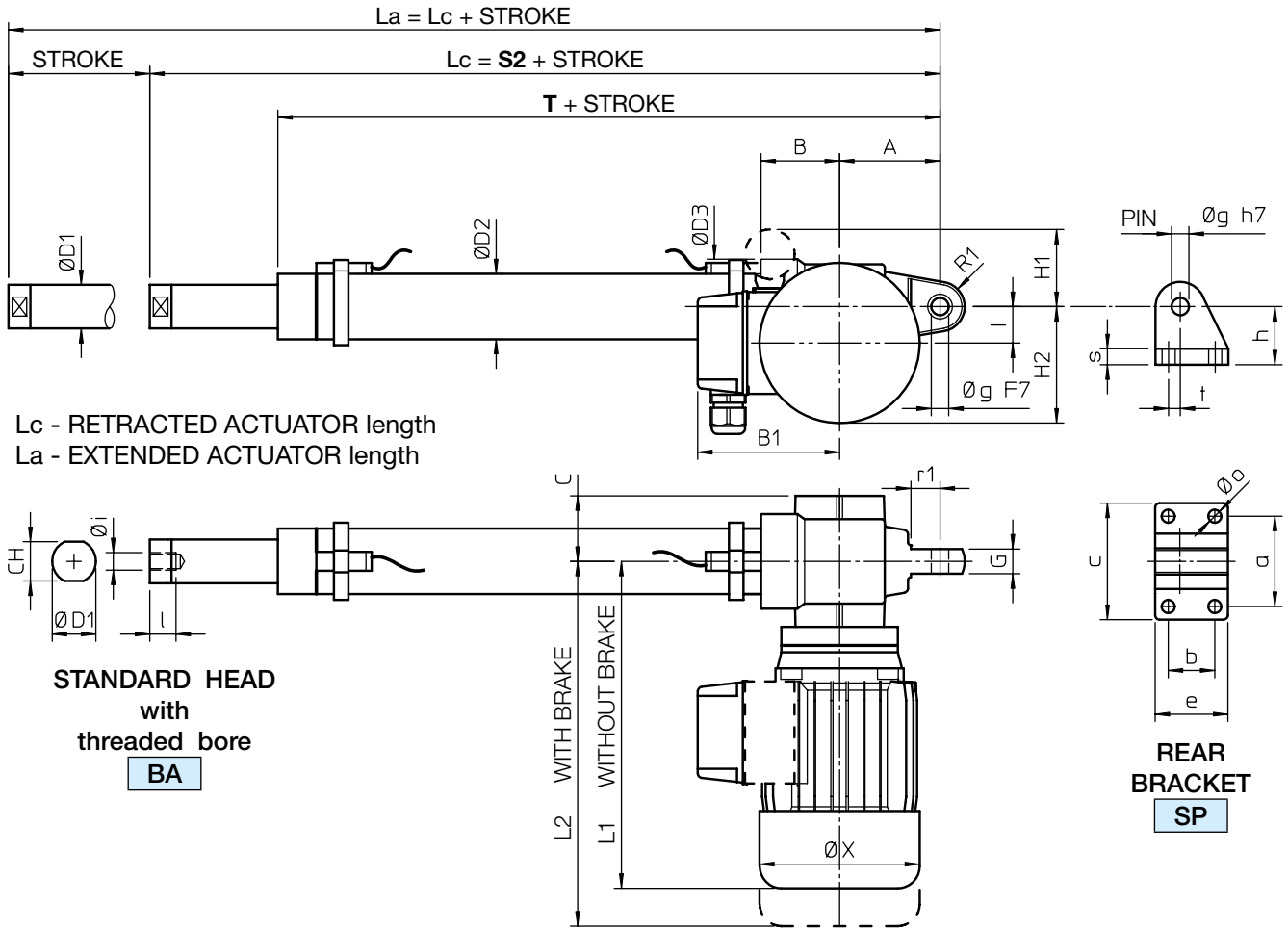
	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
BSA 20	8	27	14	11	26	14	15	49	61	20	12
BSA 25	9	28	16	12	32	16	18	56	70	24	14
BSA 28	9	28	16	12	32	16	18	56	70	24	14
BSA 30	9	32	19	14	36	18	21	65	81	28	16
BSA 40	10	42	25	18	42	25	27	90	115	40	25

### ELECTRIC STROKE LIMIT DEVICE FCE Dimensions

	H	R	U	V	W	Y	Z	l1
BSA 20	62	144	30	80	74	20	18	72
BSA 25	67	146	35	85	74	16	20	77
BSA 28	67	146	35	85	74	16	20	77
BSA 30	71	147	38	90	79	15	23	82
BSA 40	75	163	43	93	79	17	25	85

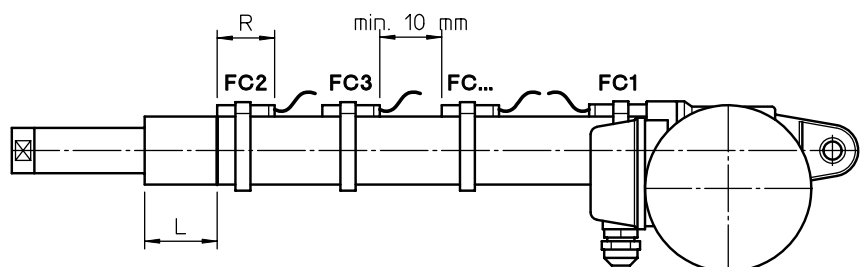
# Linear actuators BSA Series

BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 28 – 30 – 40  
AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Switches FCM



## MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

	L	
	REED CONTACT NC or (NC+NO)	NO
BSA 20	18.5	23.5
BSA 25	26.5	31.5
BSA 28	26.5	31.5
BSA 30	29	34
BSA 40	35	40



## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 28 – 30 – 40**  
**AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Switches FCM**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S2	T	Q2
<b>BSA 20</b>	<b>STROKE [mm]</b>	54	154	254	354	454	554	654	754	<b>275</b>	<b>198</b>	<b>275</b>
<b>BSA 25</b>		47	147	247	347	447	547	647	747	<b>296</b>	<b>208</b>	<b>299</b>
<b>BSA 28</b>		41	141	241	341	441	541	641	741	<b>308</b>	<b>214</b>	<b>311</b>
<b>BSA 30</b>		46	146	246	346	446	546	646	746	<b>326</b>	<b>234</b>	<b>332</b>
<b>BSA 40</b>		37	137	237	337	437	537	637	737	<b>401</b>	<b>288</b>	<b>413</b>

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T** and **Q2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2
<b>BSA 20</b>	69	54	110	45	22	25	36	65	17	50	80	25	225	251
<b>BSA 25</b>	69	54	110	45	27	30	45	65	17	50	80	25	225	251
<b>BSA 28</b>	69	54	115	45	27	30	45	65	17	60	87	25	251	287
<b>BSA 30</b>	76	62	115	50	30	35	55	78	20	60	92	30	255	291
<b>BSA 40</b>	104	78	124	57	36	40	60	92	24	50	115	40	284	373

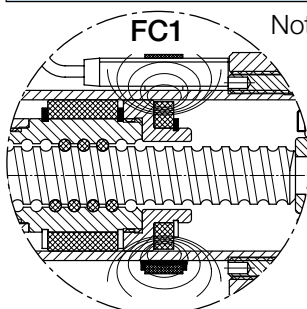
	R1	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
<b>BSA 20</b>	17	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
<b>BSA 25</b>	17	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
<b>BSA 28</b>	17	123	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
<b>BSA 30</b>	18	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
<b>BSA 40</b>	28	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1
<b>BSA 20</b>	55	40	5.5	25	28	10	10	20	31	45
<b>BSA 25</b>	60	45	6.5	30	32	12	12	24	36	52
<b>BSA 28</b>	60	45	6.5	30	32	12	12	24	36	52
<b>BSA 30</b>	65	50	6.5	35	36	14	14	27	36	54
<b>BSA 40</b>	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	Ø t1	u	w	w1	w2	w3
<b>BSA 20</b>	8	27	14	11	26	14	15	49	61	20	12
<b>BSA 25</b>	9	28	16	12	32	16	18	56	70	24	14
<b>BSA 28</b>	9	28	16	12	32	16	18	56	70	24	14
<b>BSA 30</b>	9	32	19	14	36	18	21	65	81	28	16
<b>BSA 40</b>	10	42	25	18	42	25	27	90	115	40	25

### FINECORSA MAGNETICI FCM - caratteristiche funzionali e dimensioni



Note: - The travel length performed by an actuator with FCM is reduced if compared to the travel length of an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimum retracted length.

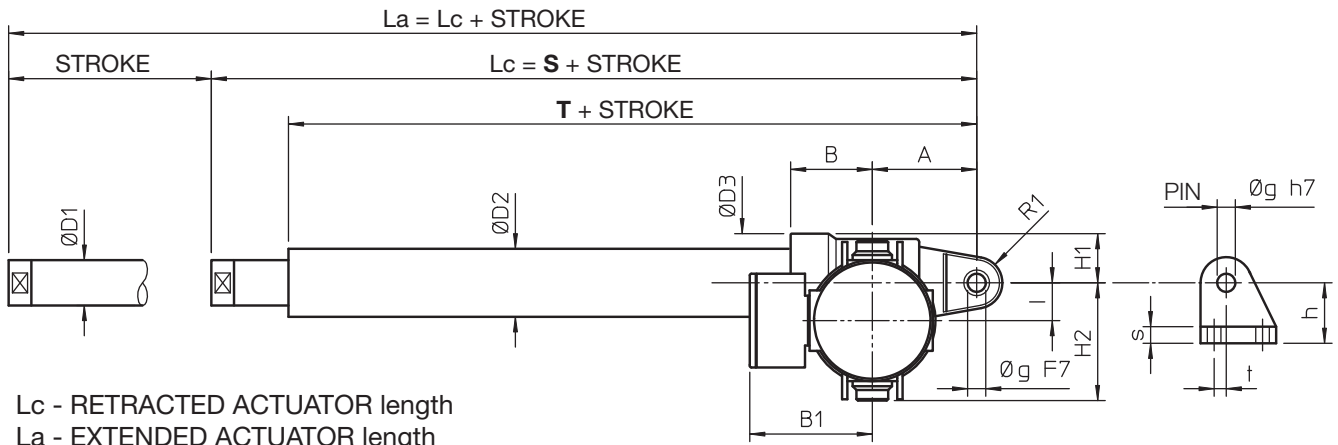
Therefore the actuator in retracted position is longer.

- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimum distance between the REED SWITCHES must be of at least 10 mm.
- REED SWITCH                      Normally Closed      (NC)                      R = 39 mm
- REED SWITCH                      Change-over            (NC+NO)                R = 39 mm
- REED SWITCH                      Normally Open        (NO)                      R = 29 mm

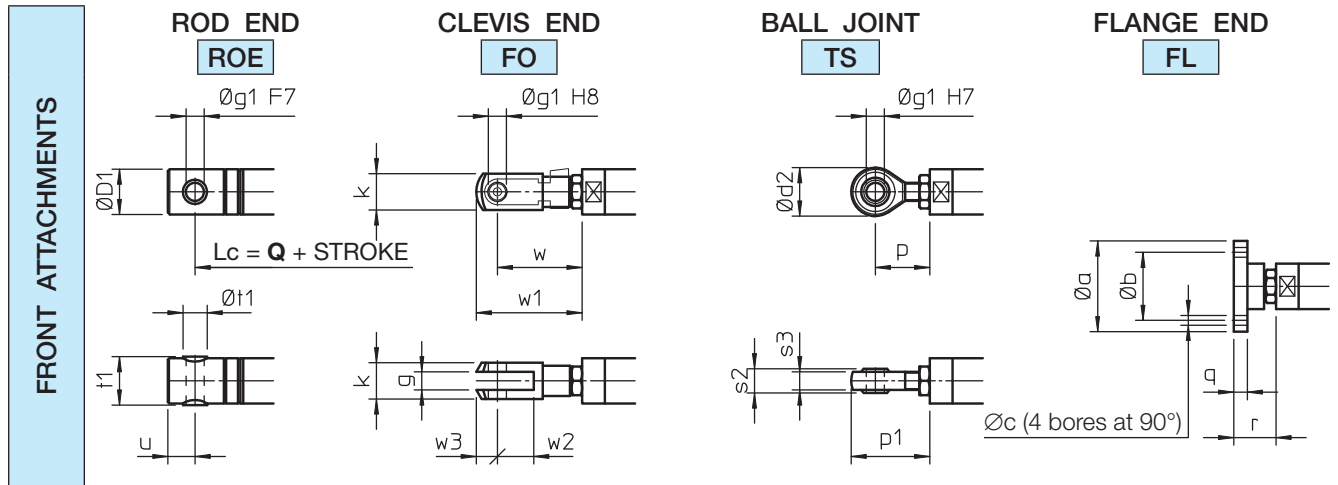
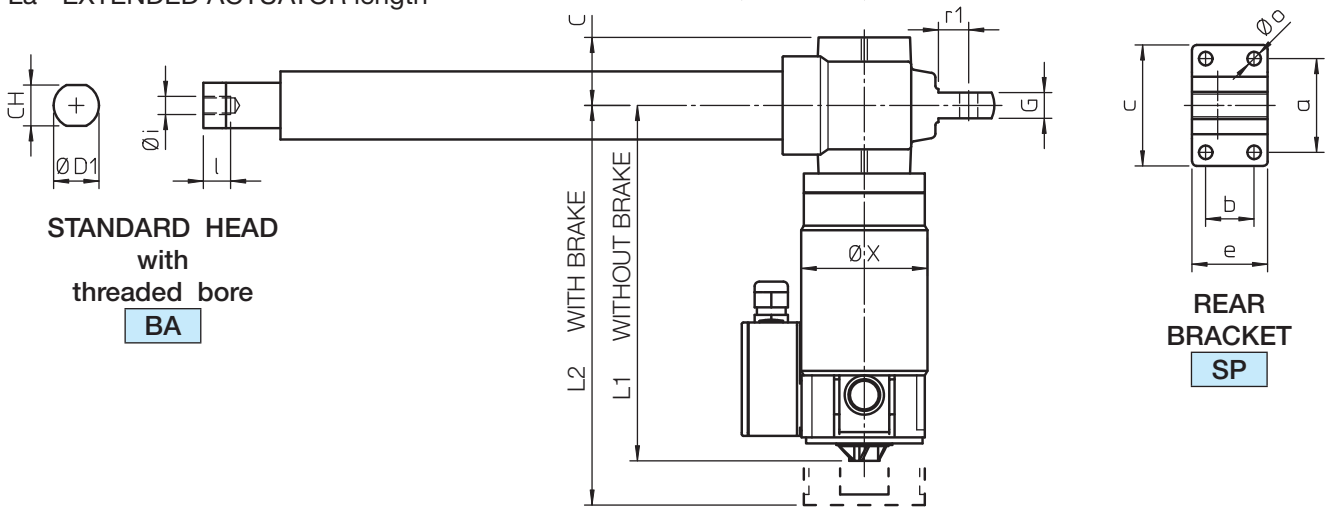


# Linear actuators BSA Series

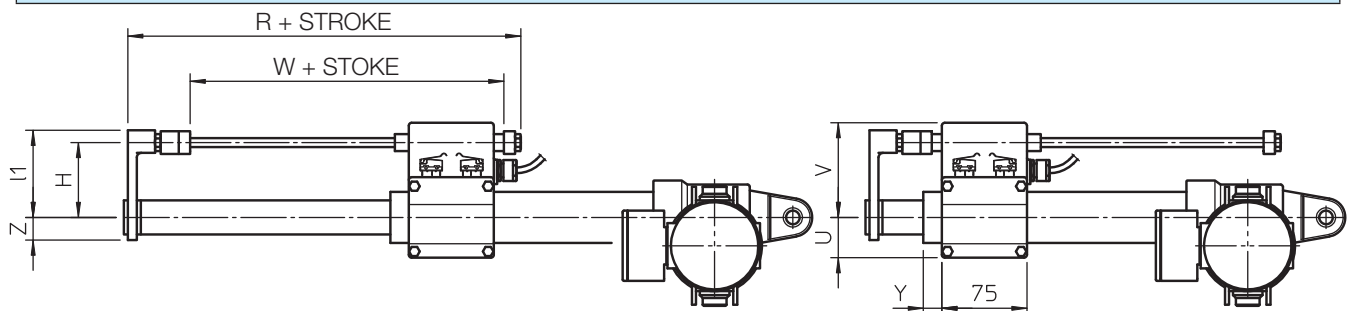
BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 30 – 40  
 DC MOTOR – without stroke limit switches or with Electric Stroke Limit Device FCE



Lc - RETRACTED ACTUATOR length  
 La - EXTENDED ACTUATOR length



## ELECTRIC STROKE LIMIT DEVICE FCE



## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 30 – 40**  
**DC MOTOR – without stroke limit switches or with Electric Stroke Limit Device FCE**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800		S	T	Q
<b>BSA 20</b>	STROKE [mm]	86	186	286	386	486	586	686	786		<b>211</b>	<b>166</b>	<b>226</b>
<b>BSA 25</b>		84	184	284	384	484	584	684	784		<b>222</b>	<b>171</b>	<b>239</b>
<b>BSA 30</b>		90	190	290	390	490	590	690	790		<b>238</b>	<b>190</b>	<b>258</b>
<b>BSA 40</b>		90	190	290	390	490	590	690	790		<b>295</b>	<b>235</b>	<b>320</b>

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T** and **Q** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	∅ D3	G	H1	H2	I	L1	L2
<b>BSA 20</b>	69	54	110	45	22	25	36	65	17	33	80	25	202	243
<b>BSA 25</b>	69	54	110	45	27	30	45	65	17	33	80	25	235	276
<b>BSA 30</b>	76	62	115	50	30	35	55	78	20	39	92	30	291	332
<b>BSA 40</b>	104	78	124	57	36	40	60	92	24	46	115	40	391	432

	R1	∅ X	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
<b>BSA 20</b>	17	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
<b>BSA 25</b>	17	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
<b>BSA 30</b>	18	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
<b>BSA 40</b>	28	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
<b>BSA 20</b>	55	40	5.5	25	28	10	10	20	31	45
<b>BSA 25</b>	60	45	6.5	30	32	12	12	24	36	52
<b>BSA 30</b>	65	50	6.5	35	36	14	14	27	36	54
<b>BSA 40</b>	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
<b>BSA 20</b>	8	27	14	11	26	14	15	49	61	20	12
<b>BSA 25</b>	9	28	16	12	32	16	18	56	70	24	14
<b>BSA 30</b>	9	32	19	14	36	18	21	65	81	28	16
<b>BSA 40</b>	10	42	25	18	42	25	27	90	115	40	25

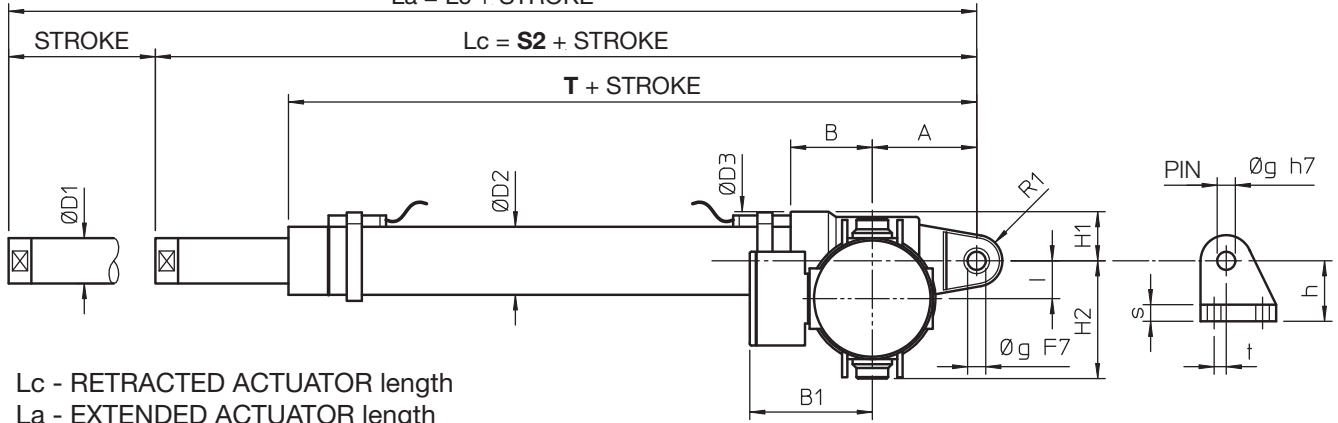
### ELECTRIC STROKE LIMIT DEVICE FCE Dimensions

	H	R	U	V	W	Y	Z	l1
<b>BSA 20</b>	62	144	30	80	74	20	18	72
<b>BSA 25</b>	67	146	35	85	74	16	20	77
<b>BSA 30</b>	71	147	38	90	79	15	23	82
<b>BSA 40</b>	75	163	43	93	79	17	25	85

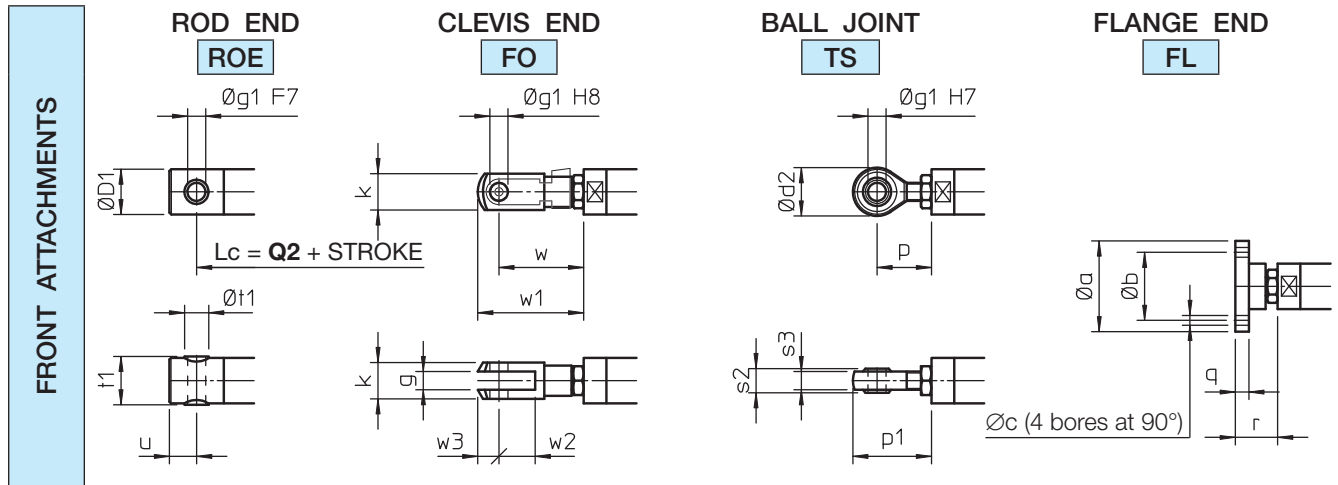
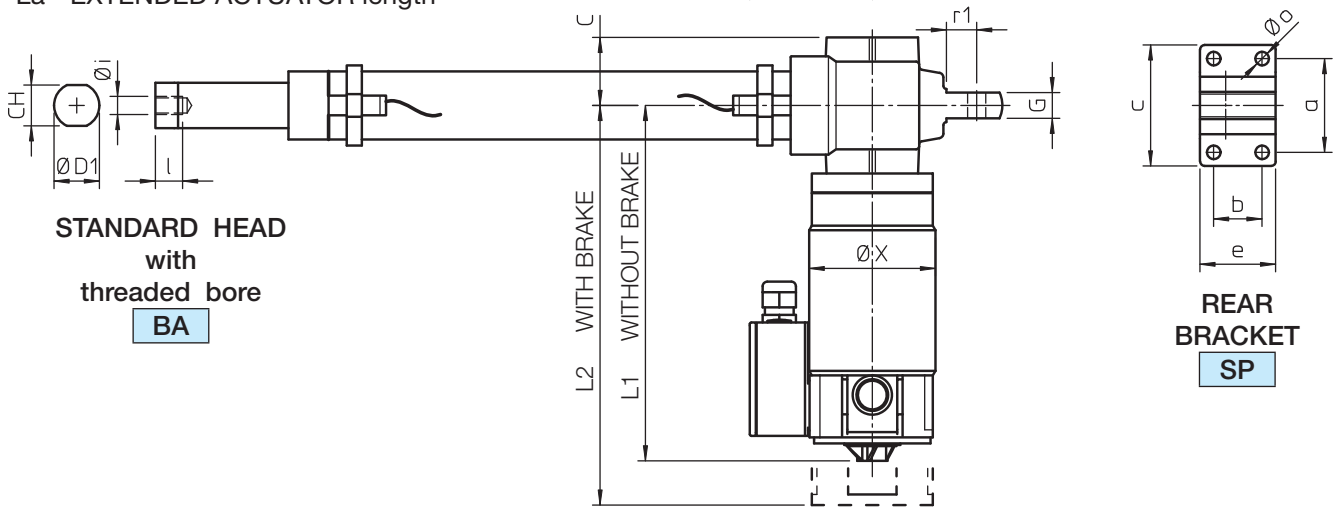
# Linear actuators BSA Series

BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 30 – 40  
DC MOTOR – with Magnetic Stroke Limit Switches FCM

$$L_a = L_c + \text{STROKE}$$

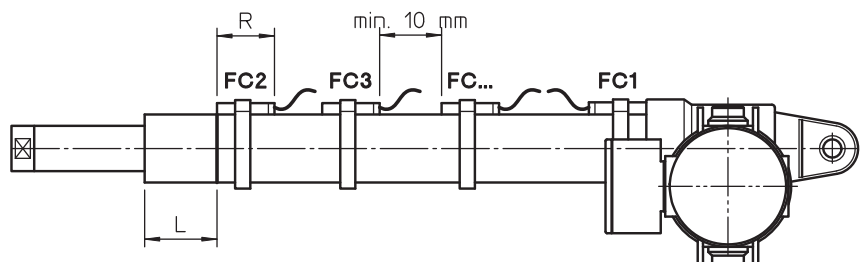


Lc - RETRACTED ACTUATOR length  
La - EXTENDED ACTUATOR length



## MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

	L	
	REED CONTACT NC or (NC+NO)	NO
BSA 20	18.5	23.5
BSA 25	26.5	31.5
BSA 28	26.5	31.5
BSA 30	29	34
BSA 40	35	40



## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series, size 20 – 25 – 30 – 40**  
**DC MOTOR – with Magnetic Stroke Limit Switches FCM**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800		S2	T	Q2
<b>BSA 20</b>	<b>STROKE [mm]</b>	54	154	254	354	454	554	654	754		<b>275</b>	<b>198</b>	<b>275</b>
<b>BSA 25</b>		47	147	247	347	447	547	647	747		<b>296</b>	<b>208</b>	<b>299</b>
<b>BSA 30</b>		46	146	246	346	446	546	646	746		<b>326</b>	<b>234</b>	<b>332</b>
<b>BSA 40</b>		37	137	237	337	437	537	637	737		<b>401</b>	<b>288</b>	<b>413</b>

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T** and **Q2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	∅ D3	G	H1	H2	I	L1	L2
<b>BSA 20</b>	69	54	110	45	22	25	36	65	17	33	80	25	202	243
<b>BSA 25</b>	69	54	110	45	27	30	45	65	17	33	80	25	235	276
<b>BSA 30</b>	76	62	115	50	30	35	55	78	20	39	92	30	291	332
<b>BSA 40</b>	104	78	124	57	36	40	60	92	24	46	115	40	391	432

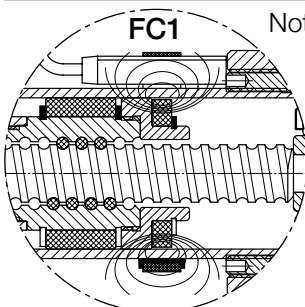
	R1	∅ X	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
<b>BSA 20</b>	17	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
<b>BSA 25</b>	17	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
<b>BSA 30</b>	18	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
<b>BSA 40</b>	28	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
<b>BSA 20</b>	55	40	5.5	25	28	10	10	20	31	45
<b>BSA 25</b>	60	45	6.5	30	32	12	12	24	36	52
<b>BSA 30</b>	65	50	6.5	35	36	14	14	27	36	54
<b>BSA 40</b>	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
<b>BSA 20</b>	8	27	14	11	26	14	15	49	61	20	12
<b>BSA 25</b>	9	28	16	12	32	16	18	56	70	24	14
<b>BSA 30</b>	9	32	19	14	36	18	21	65	81	28	16
<b>BSA 40</b>	10	42	25	18	42	25	27	90	115	40	25

### MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions



Note: - The travel length performed by an actuator with FCM is reduced if compared to the travel length of an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimum retracted length.

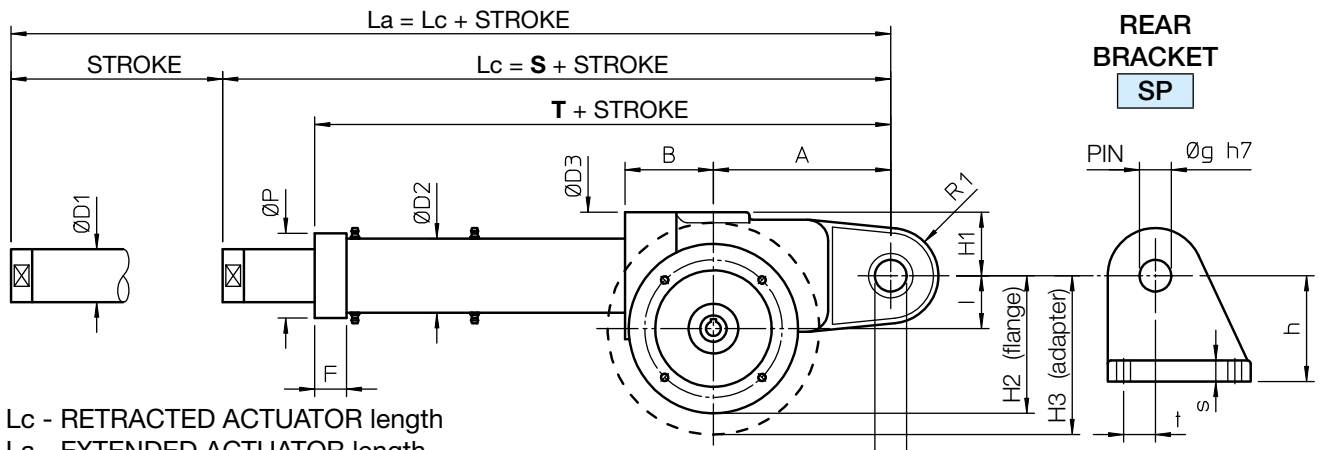
Therefore the actuator in retracted position is longer.

- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimum distance between the REED SWITCHES must be of at least 10 mm.
- REED SWITCH                      Normally Closed      (NC)                      R = 39 mm
- REED SWITCH                      Change-over            (NC+NO)                  R = 39 mm
- REED SWITCH                      Normally Open        (NO)                        R = 29 mm

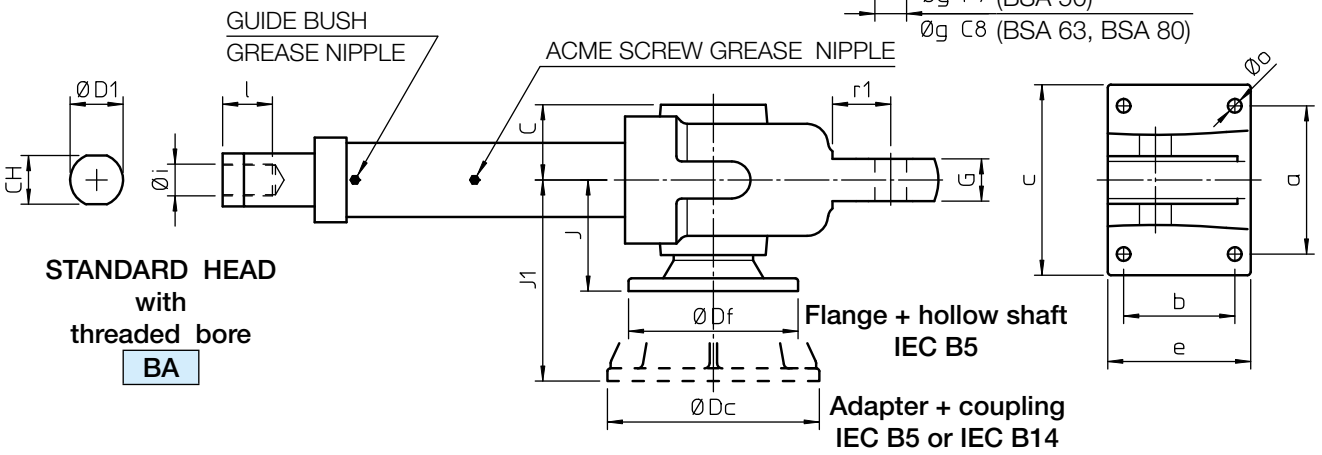
**Linear actuators BSA Series**

**BALL SCREW LINEAR ACTUATORS BSA Series, size 50 – 63 – 80**  
**AC 3-phase MOTOR – with Electric Stroke Limit Device FCE**

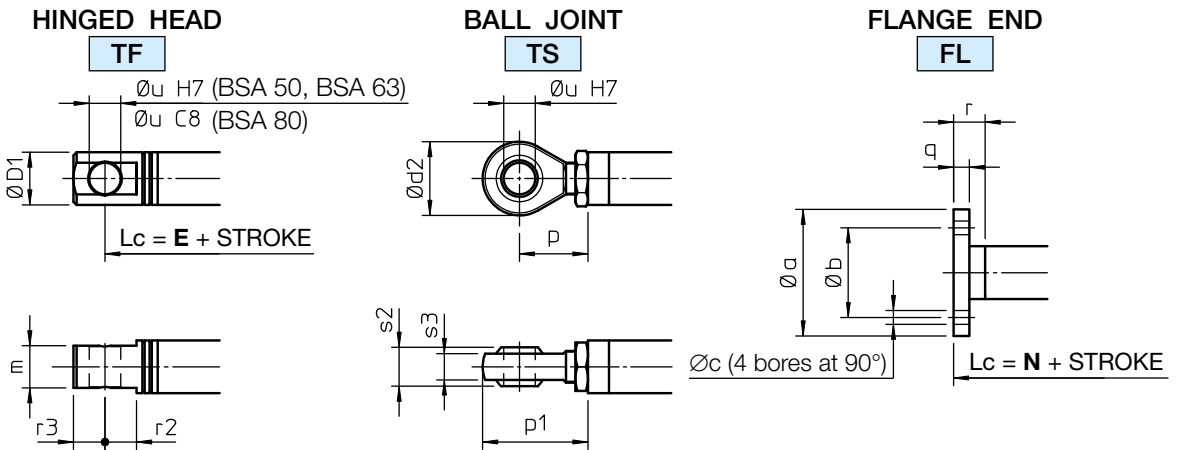
2



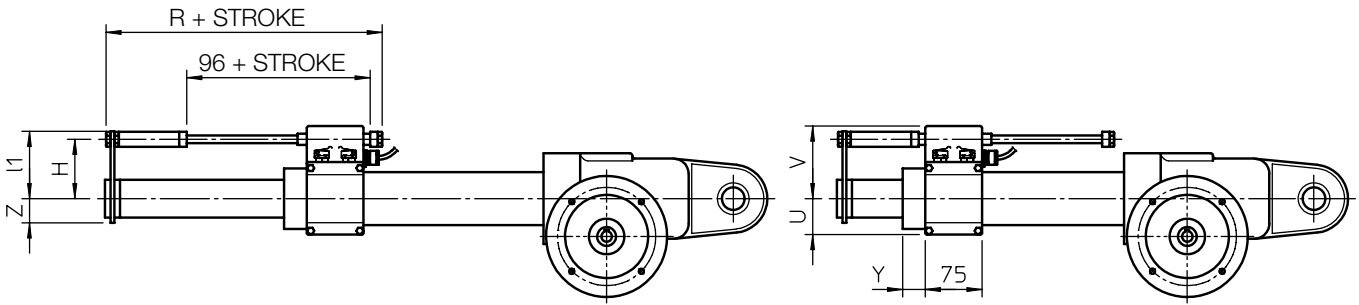
Lc - RETRACTED ACTUATOR length  
 La - EXTENDED ACTUATOR length



**FRONT ATTACHMENTS**



**ELECTRIC STROKE LIMIT DEVICE FCE**



## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series, size 50 – 63 – 80**  
**AC 3-phase MOTOR – with Electric Stroke Limit Device FCE**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S	T	E	N
<b>BSA 50</b>	<b>STROKE [mm]</b>	100	200	300	400	500	600	700	800	<b>481</b>	<b>394</b>	<b>511</b>	<b>491</b>
<b>BSA 63</b>										<b>571</b>	<b>467</b>	<b>601</b>	<b>581</b>
<b>BSA 80</b>										<b>673</b>	<b>576</b>	<b>708</b>	<b>693</b>

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T**, **E** and **N** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	C	CH	∅ D1	∅ D2	∅ D3	F	G	H1	I	∅ P	R1
<b>BSA 50</b>	168	83	68	46	50	70	120	—	40	63	50	—	45
<b>BSA 63</b>	206	96	83	—	60	90	140	37	50	70	63	95	50
<b>BSA 80</b>	240	119	103	—	90	115	160	40	60	90	80	125	60

	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
<b>BSA 50</b>	140	105	185	143	30	100	M30×2	45	13	55	20	30
<b>BSA 63</b>	180	120	228	160	35	120	M36×2	55	17	58	30	30
<b>BSA 80</b>	210	122	278	180	40	130	M42×2	65	21	62	35	32

	Flange IEC	∅ Df	H2	J	Adapter IEC	∅ Dc	H3	J1
<b>BSA 50</b>	63 B5	140	120	102	80 B14 – 80 B5	120 – 200	110 – 150	176 – 182
	71 B5	160	130	102	90 B14 – 90 B5	140 – 200	120 – 150	182
<b>BSA 63</b>	80 B5	200	163	100	90 B14 – 90 B5	140 – 200	133 – 163	200
					100 B14 – 100 B5	160 – 250	143 – 188	220
<b>BSA 80</b>	80 B5; 90 B5	200	180	119	112 B14 – 112 B5	160 – 250	160 – 205	240

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	m	p
<b>BSA 50</b>	120	85	13	50	70	40	65
<b>BSA 63</b>	140	100	17	60	80	50	86
<b>BSA 80</b>	170	130	21	90	90	50	85

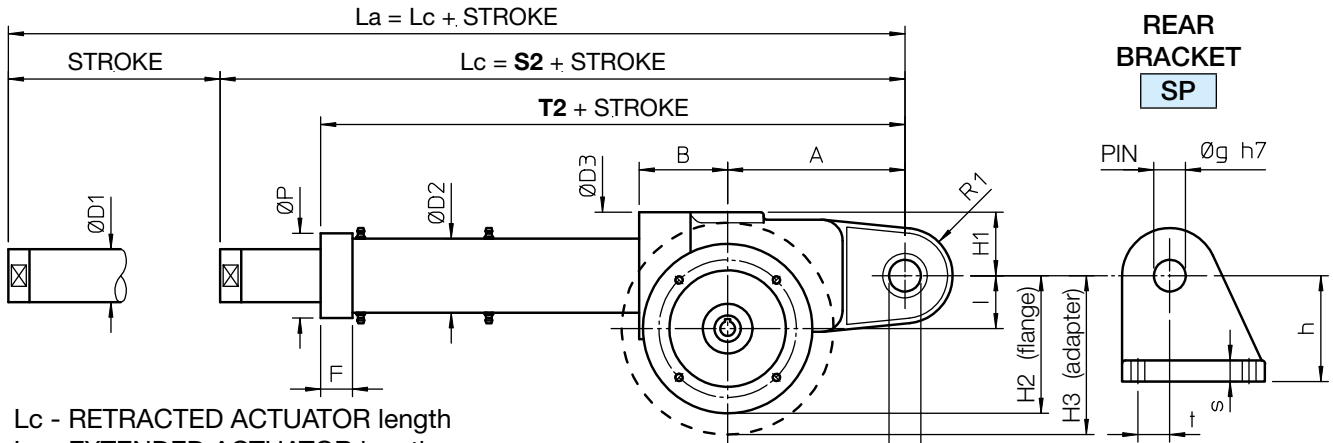
	p1	q	r	r2	r3	s2	s3	∅ u
<b>BSA 50</b>	100	15	30	30	30	37	25	30
<b>BSA 63</b>	126	15	30	30	35	43	28	35
<b>BSA 80</b>	130	20	40	35	45	49	33	40

### ELECTRIC STROKE LIMIT DEVICE FCE Dimensions

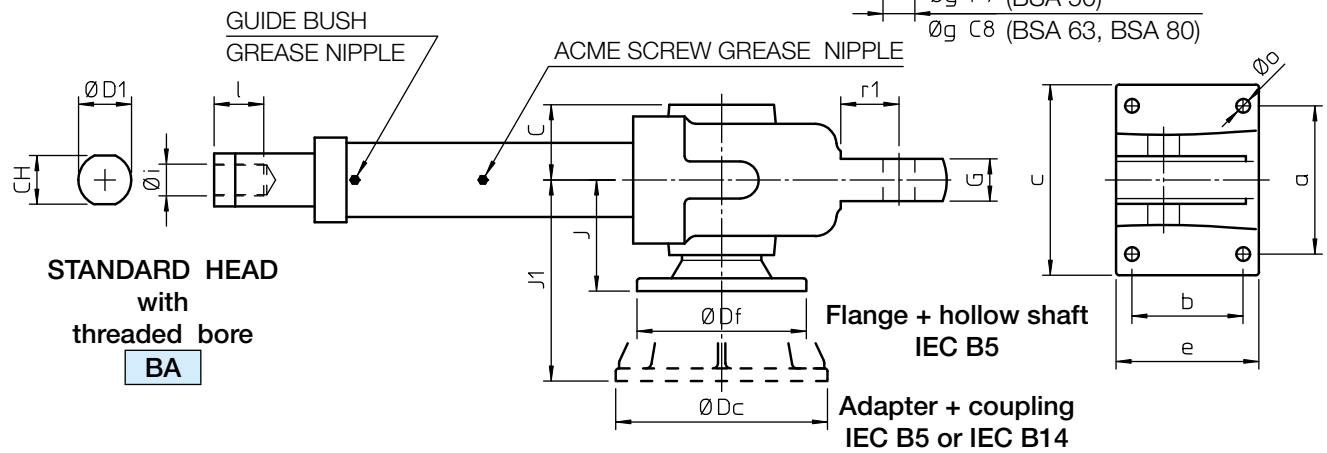
	H	R	U	V	Y	Z	l1
<b>BSA 50</b>	79	188	50	97	5	32	89
<b>BSA 63</b>	89	237	60	107	37	37	100
<b>BSA 80</b>	101	237	73	119	40	55	113

# Linear actuators BSA Series

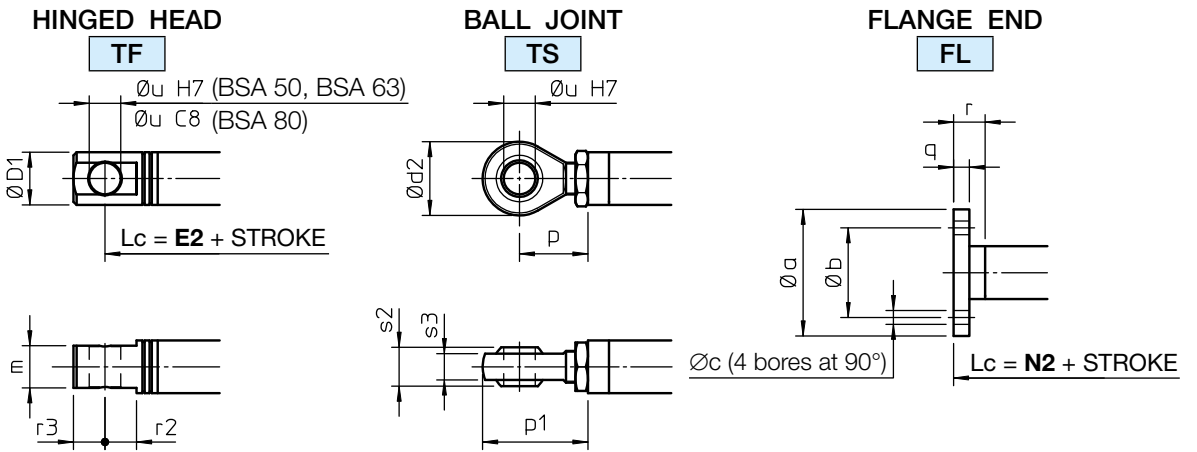
BALL SCREW LINEAR ACTUATORS BSA Series, size 50 – 63 – 80  
AC 3-phase MOTOR – Proximity Stroke Limit Switches FCP



Lc - RETRACTED ACTUATOR length  
La - EXTENDED ACTUATOR length

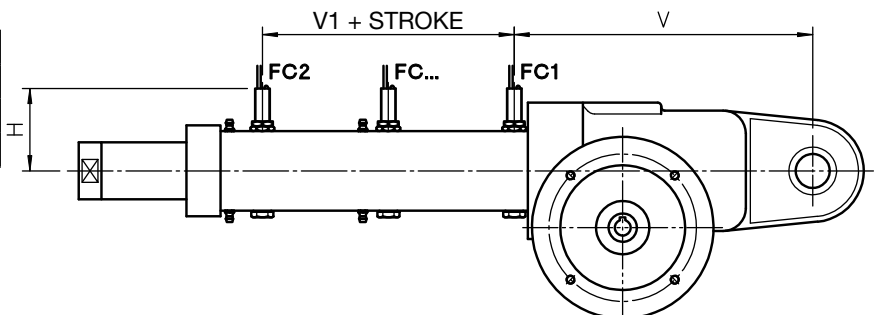


FRONT ATTACHMENTS



PROXIMITY STROKE LIMIT SWITCHES FCP Dimensions

	H	V	V1
BSA 50	79.5	263	70
BSA 63	86.5	314	71
BSA 80	99	371	10



## Linear actuators BSA Series

**BALL SCREW LINEAR ACTUATORS BSA Series, size 50 – 63 – 80**  
**AC 3-phase MOTOR – Proximity Stroke Limit Switches FCP**

### STANDARD STROKE LENGTHS

	STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S2	T2	E2	N2
BSA 50										497	402	527	507
BSA 63	STROKE [mm]	100	200	300	400	500	600	700	800	579	471	609	589
BSA 80										673	576	708	693

NOTE: Different stroke lengths available on request.  $L_a = L_c + \text{STROKE}$

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T2**, **E2** and **N2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	C	CH	∅ D1	∅ D2	∅ D3	F	G	H1	I	∅ P	R1
BSA 50	168	83	68	46	50	70	120	—	40	63	50	—	45
BSA 63	206	96	83	—	60	90	140	37	50	70	63	95	50
BSA 80	240	119	103	—	90	115	160	40	60	90	80	125	60

	a	b	c	e	∅ g	h	∅ i	l	∅ o	r1	s	t
BSA 50	140	105	185	143	30	100	M30×2	45	13	55	20	30
BSA 63	180	120	228	160	35	120	M36×2	55	17	58	30	30
BSA 80	210	122	278	180	40	130	M42×2	65	21	62	35	32

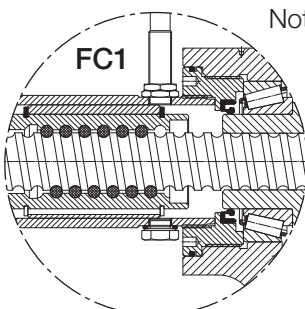
	Flange IEC	∅ Df	H2	J	Adapter IEC	∅ Dc	H3	J1
BSA 50	63 B5	140	120	102	80 B14 – 80 B5	120 – 200	110 – 150	176 – 182
	71 B5	160	130	102	90 B14 – 90 B5	140 – 200	120 – 150	182
BSA 63	80 B5	200	163	100	90 B14 – 90 B5	140 – 200	133 – 163	200
					100 B14 – 100 B5	160 – 250	143 – 188	220
BSA 80	80 B5; 90 B5	200	180	119	112 B14 – 112 B5	160 – 250	160 – 205	240

### FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	m	p
BSA 50	120	85	13	50	70	40	65
BSA 63	140	100	17	60	80	50	86
BSA 80	170	130	21	90	90	50	85

	p1	q	r	r2	r3	s2	s3	∅ u
BSA 50	100	15	30	30	30	37	25	30
BSA 63	126	15	30	30	35	43	28	35
BSA 80	130	20	40	35	45	49	33	40

### PROXIMITY STROKE LIMIT SWITCHES FCP Technical features



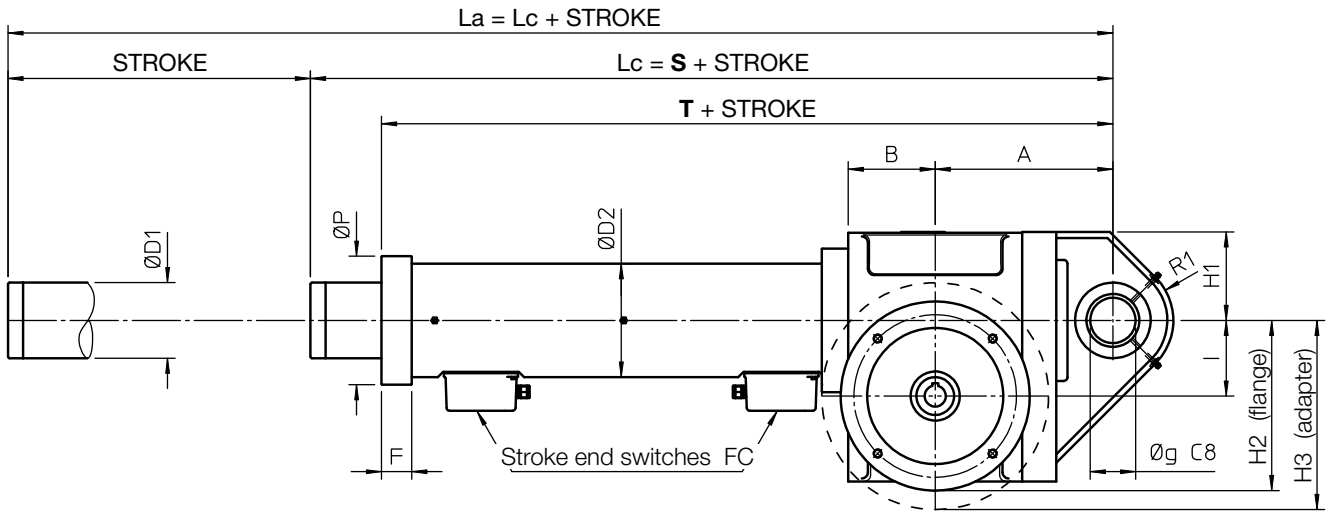
- Note: - The PROXIMITY SWITCH FC1, when activated, gives a signal to stop the motor by means of electric relays before the actuator reaches its minimal retracted length. The RETRACTED ACTUATOR LENGTH ( $L_c$ ) and EXTENDED ACTUATOR LENGTH ( $L_a$ ) of the actuator equipped with PROXIMITY SWITCHES FCP are longer than  $L_a$  and  $L_a$  of the actuator with electric stroke limit device FCE or without stroke end switches.
- Additional PROXIMITY SWITCHES are available for intermediate positions.
  - The minimum distance between the PROXIMITY SWITCHES must be of at least 25 mm.



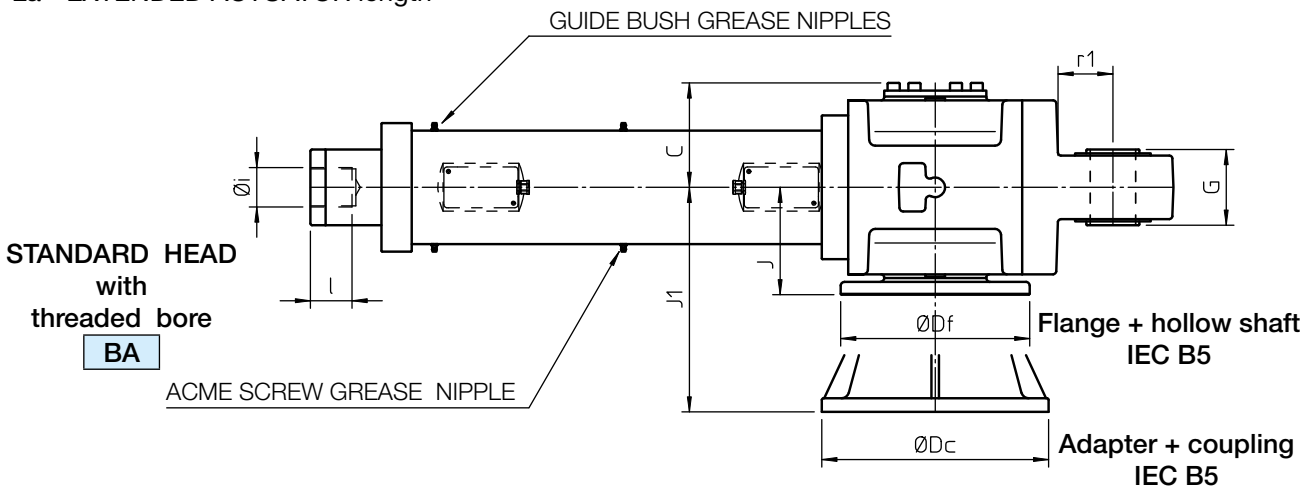
**Linear actuators BSA Series**

**BALL SCREW LINEAR ACTUATORS BSA Series, size 100 – 125**  
**AC 3-phase MOTOR – with Electric Stroke End Switches FC**

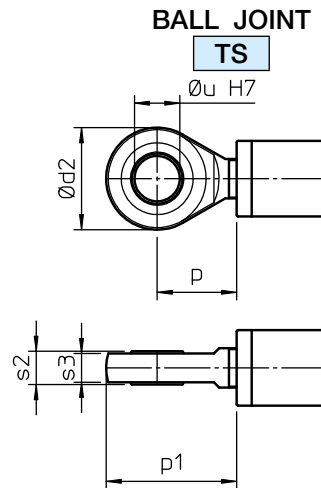
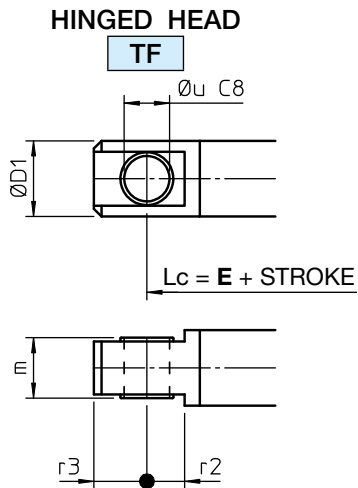
2



$Lc$  - RETRACTED ACTUATOR length  
 $La$  - EXTENDED ACTUATOR length



FRONT ATTACHMENTS



## Linear actuators BSA Series

### BALL SCREW LINEAR ACTUATORS BSA Series, size 100 – 125 AC 3-phase MOTOR – with Electric Stroke End Switches FC

	STROKE CODE	C...	S	T	E
<b>BSA 100</b>	<b>STROKE [mm] = STROKE CODE</b>	...	<b>804</b>	<b>678</b>	<b>864</b>
<b>BSA 125</b>			<b>955</b>	<b>894</b>	<b>1040</b>

NOTE: All stroke lengths are made on request.

For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S**, **T** and **E** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm please contact SERVOMECH.

	<b>A</b>	<b>B</b>	<b>C</b>	$\varnothing$ <b>D1</b>	$\varnothing$ <b>D2</b>	<b>F</b>	<b>G</b>	<b>H1</b>	<b>I</b>	$\varnothing$ <b>P</b>	<b>R1</b>	$\varnothing$ <b>g</b>	$\varnothing$ <b>i</b>	<b>l</b>	<b>r1</b>
<b>BSA 100</b>	235	115	138	115	150	40	90	120	100	170	80	60	M60x4	60	72
<b>BSA 125</b>	320	140	173	160	200	—	100	335	125	—	90	80	M80x4	80	100

	<b>Flange IEC</b>	$\varnothing$ <b>Df</b>	<b>H2</b>	<b>J</b>	<b>Adapter IEC</b>	$\varnothing$ <b>Dc</b>	<b>H3</b>	<b>J1</b>
<b>BSA 100</b>	90 B5	200	225	142	132 B5	300	250	297
	100-112 B5	250	250	142				
<b>BSA 125</b>	—	—	—	—	132 B5	300	275	353
					160 B5	420	335	365

#### FRONT ATTACHMENT Dimensions

	$\varnothing$ <b>D1</b>	$\varnothing$ <b>d2</b>	<b>m</b>	<b>p</b>	<b>p1</b>	<b>r2</b>	<b>r3</b>	<b>s2</b>	<b>s3</b>	$\varnothing$ <b>u</b>
<b>BSA 100</b>	115	135	70	95	163	50	70	44	38	60
<b>BSA 125</b>	150	180	100	130	220	80	80	55	47	80

# Linear actuators ATL Series and BSA Series

## 2.5 OPTIONS AND ACCESSORIES

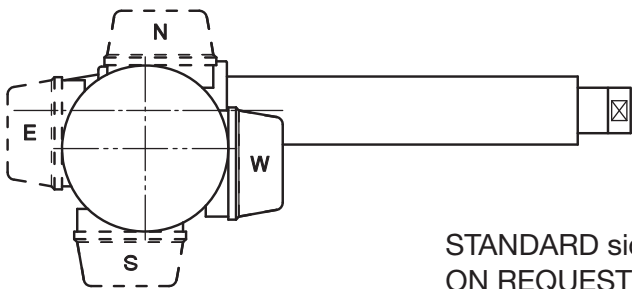
### MOTOR MOUNTING SIDE – MAIN INPUT SIDE



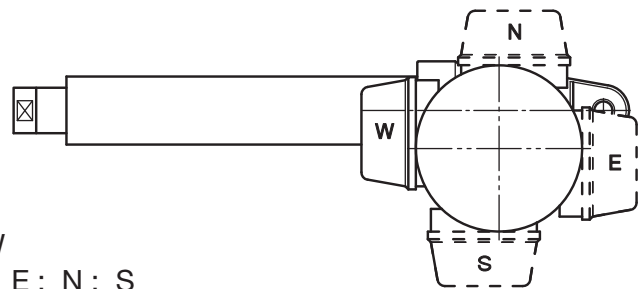
ON REQUEST: LEFT side  
Code: LH

STANDARD: RIGHT side  
Code: RH

### ELECTRIC MOTOR TERMINAL BOX POSITION



STANDARD side: W  
ON REQUEST side: E ; N ; S



### POSITION OF FRONT AND REAR ACTUATOR ATTACHMENT

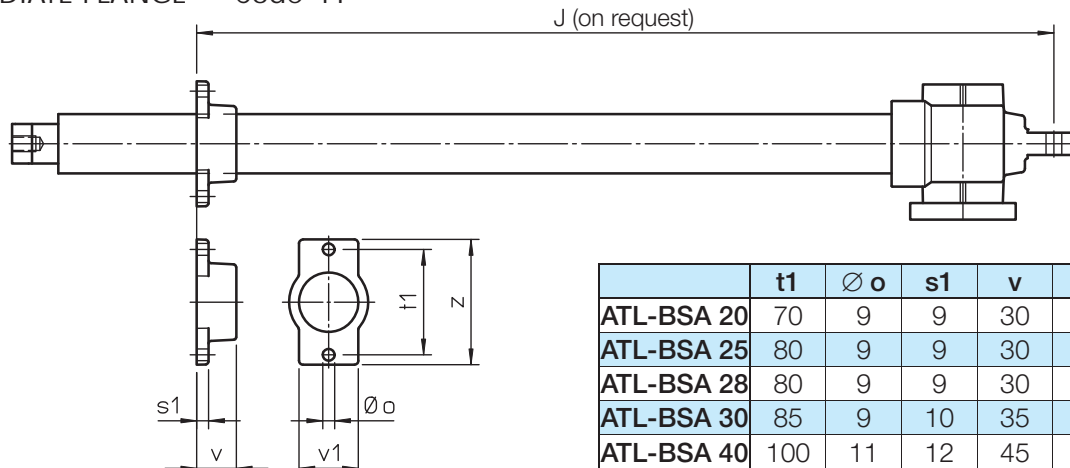


STANDARD



ON REQUEST: turned at 90°  
Code: RPT 90°  
NOTE: NOT available for size 100 and 125

### INTERMEDIATE FLANGE Code FI



	t1	Ø o	s1	v	v1	z
ATL-BSA 20	70	9	9	30	40	85
ATL-BSA 25	80	9	9	30	45	95
ATL-BSA 28	80	9	9	30	45	95
ATL-BSA 30	85	9	10	35	50	100
ATL-BSA 40	100	11	12	45	60	120

NOTE: the intermediate flange FI can be used as sustainer only and not to support the axial load!

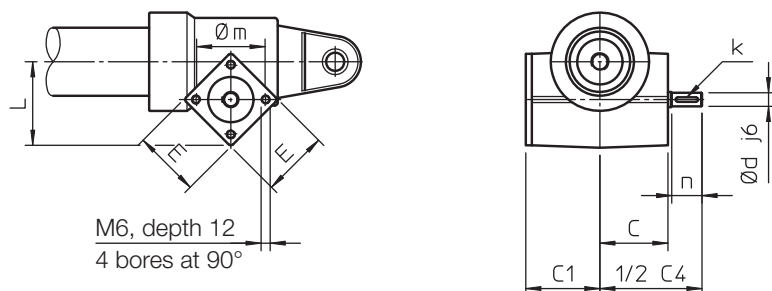
# Linear actuators ATL Series and BSA Series

## 2.5 OPTIONS

### ACTUATOR INPUT – size 20 - 25 - 28 - 30 - 40

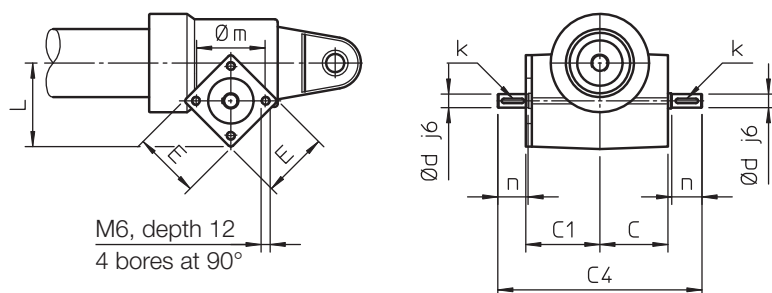
#### Single input shaft

Code: **Vers.1**



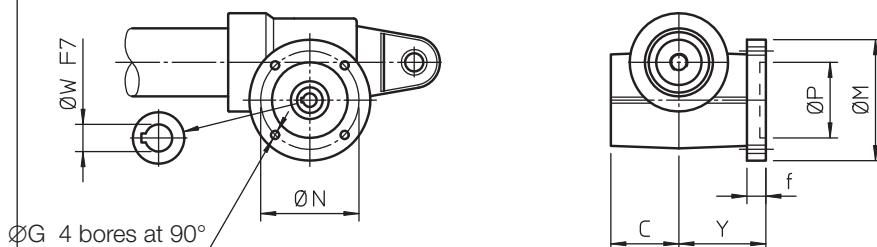
#### Double input shaft

Code: **Vers.2**



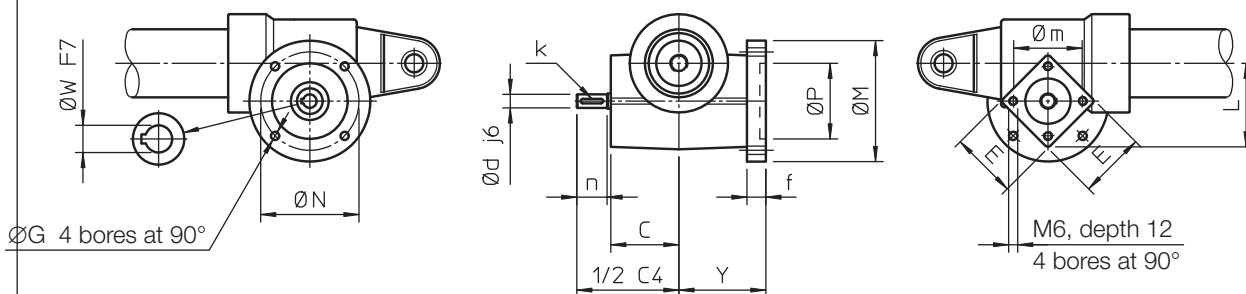
#### Attachment for IEC \_ B14 electric motor (flange and hollow shaft)

Code: **Vers.3**



#### Attachment for IEC \_ B14 electric motor (flange and hollow shaft) and second shaft

Code: **Vers.4**



#### Attachment for IEC motor: flange and hollow shaft

	C	C1	C4	E	L	k	Y	Ø d	Øm	n	IEC motor	Ø G	Ø M	Ø N	Ø P	Ø W	f
ATL-BSA 20	45	49	135	44	58	3×3×15	58	9	46	20	56 B14	5.5	80	65	50	9	12.5
ATL-BSA 25	45	49	135	44	58	3×3×15	58	9	46	20	56 B14	5.5	80	65	50	9	12.5
ATL-BSA 28	45	—	135	44	58	3×3×15	58	9	46	20	63 B14	5.5	90	75	60	11	12
ATL-BSA 30	50	54	149	52	66	3×3×15	62	10	54	22	63 B14	5.5	90	75	60	11	12
ATL-BSA 40	57	61	179	53	80	5×5×20	69	14	54	30	71 B14	6.5	105	85	70	14	12

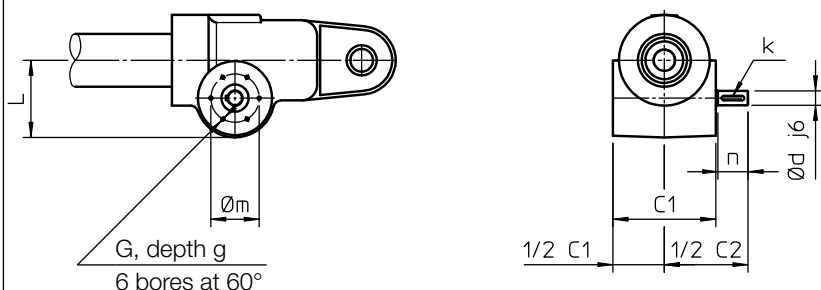
# Linear actuators ATL Series and BSA Series

## 2.5 OPTIONS

### ACTUATOR INPUT – size 50 - 63 - 80

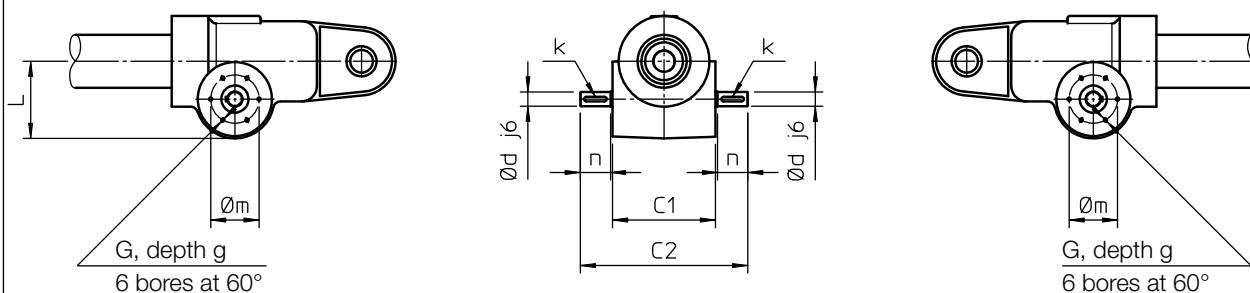
#### Single input shaft

Code: **Vers.1**



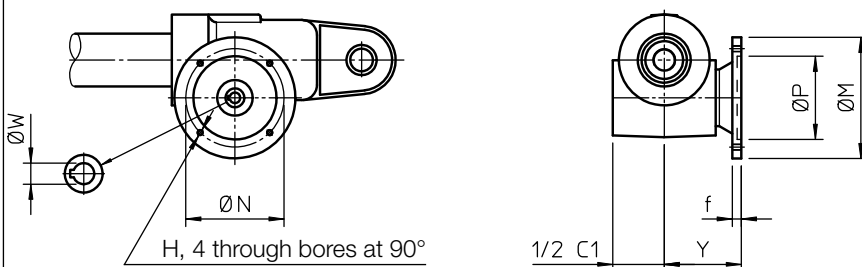
#### Double input shaft

Code: **Vers.2**



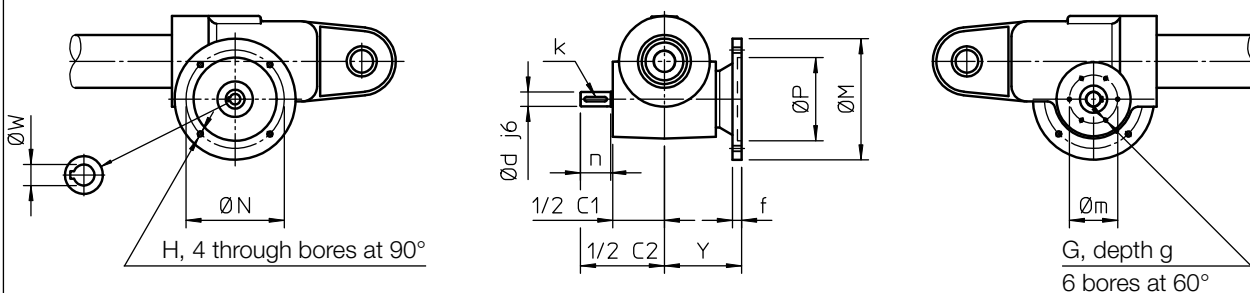
#### Attachment for IEC \_ B5 electric motor (flange and hollow shaft)

Code: **Vers.3**



#### Attachment for IEC \_ B5 electric motor (flange and hollow shaft) and second shaft

Code: **Vers.4**



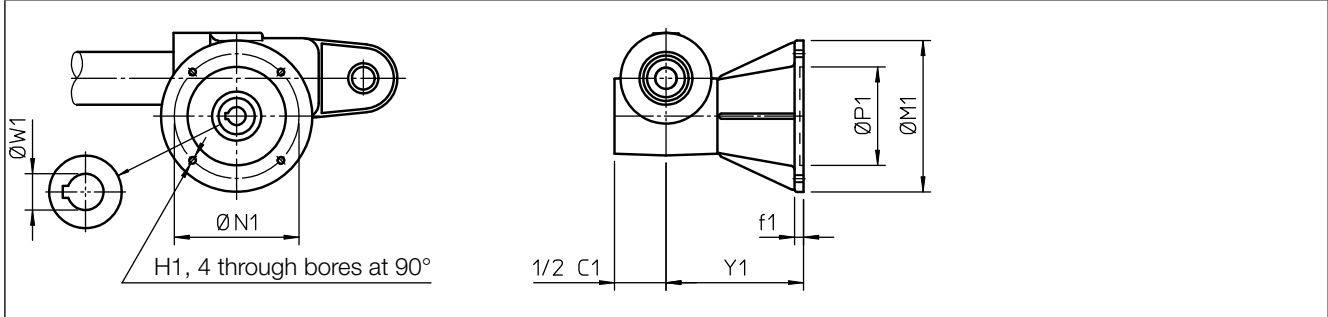
# Linear actuators ATL Series and BSA Series

## 2.5 OPTIONS

### ACTUATOR INPUT – size 50 - 63 - 80

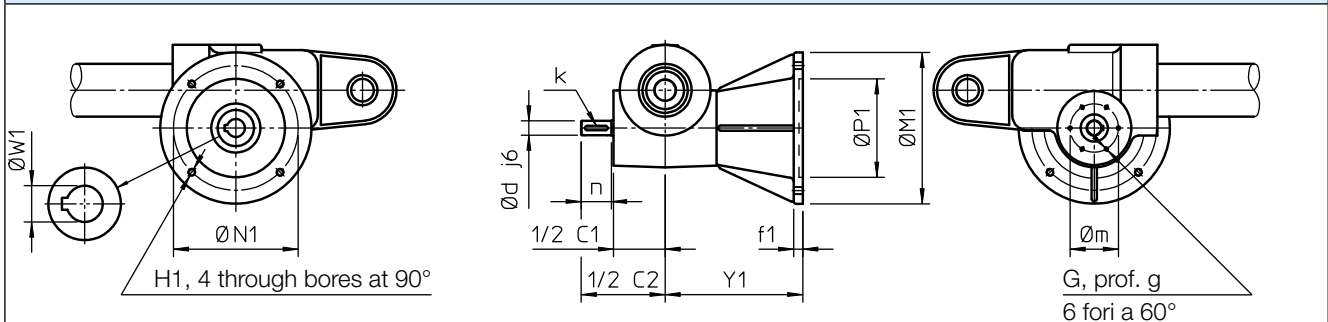
#### Attachment for IEC \_ B5 or IEC \_ B14 electric motor (adapter and coupling)

Code: **Vers.5**



#### Attachment for IEC \_ B5 or IEC \_ B14 electric motor (adapter and coupling) and second shaft

Code: **Vers.6**



	C1	C2	G	L	g	Ø d	k	Ø m	n
<b>ATL-BSA 50</b>	136	222	M5	102	10	19	6x6x30	64	40
<b>ATL-BSA 63</b>	165	269	M6	125	14	24	8x7x40	63	50
<b>ATL-BSA 80</b>	205	330	M6	143	14	28	8x7x40	74	60

#### Attachment for IEC electric motor: flange and hollow shaft

	IEC motor		H	Ø M		Ø N		Ø P		Ø W		Y	f
<b>ATL-BSA 50</b>	63 B5	71 B5	M8	140	160	115	130	95	110	11	14	102	12
<b>ATL-BSA 63</b>	80 B5		M10	200		165		130		19		100	12
<b>ATL-BSA 80</b>	80 B5	90 B5	M10	200		165		130		19	24	119	12

#### Attachment for IEC electric motor: adapter and coupling

	IEC motor		H1		Ø M1		Ø N1		Ø P1		Ø W1		Y1	f1
<b>ATL-BSA 50</b>	80 B14	80 B5	Ø 6.5	M10	120	200	100	165	80	130	19	182	10	12
<b>ATL-BSA 63</b>	90 B14	90 B5	Ø 8.5	M10	140	200	115	165	95	130	24	220	10	12
<b>ATL-BSA 80</b>	100 B14	100 B5	Ø 8.5	M12	160	250	130	215	110	180	28	240	15	17

#### Attachment for IEC electric motor: adapter and coupling

	IEC motor		H1		Ø M1		Ø N1		Ø P1		Ø W1		Y1	f1
<b>ATL-BSA 50</b>	90 B14	90 B5	Ø 8.5	M10	140	200	115	165	95	130	24	182	10	12
<b>ATL-BSA 63</b>	100-112 B14	100-112 B5	Ø 8.5	M12	160	250	130	215	110	180	28	220	15	17
<b>ATL-BSA 80</b>	112 B14	112 B5	Ø 8.5	M12	160	250	130	215	110	180	28	240	15	17

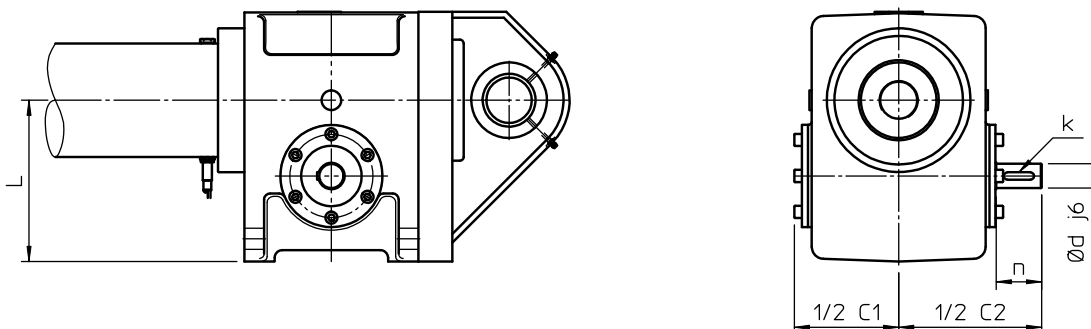
# Linear actuators ATL Series and BSA Series

## 2.5 OPTIONS

### ACTUATOR INPUT – size 100 - 125

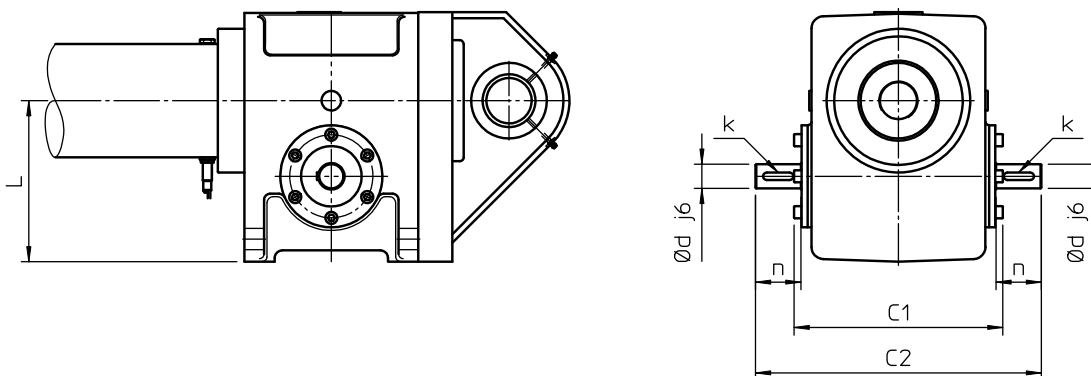
#### Single input shaft

Code: **Vers.1**



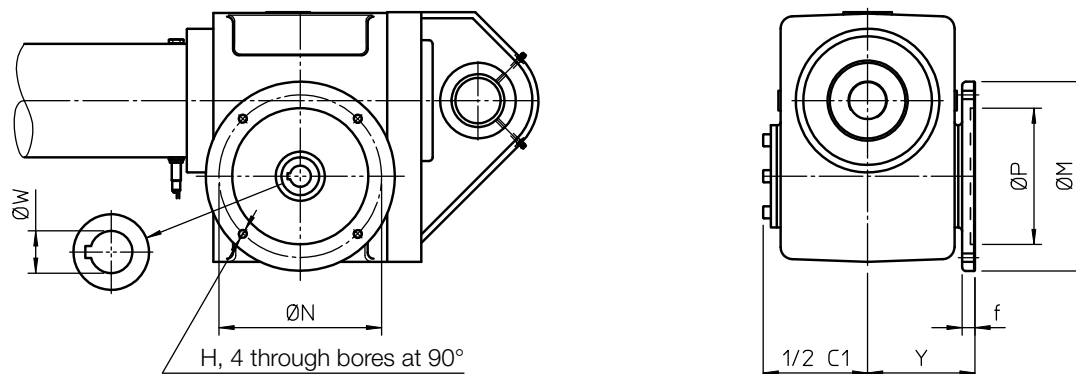
#### Double input shaft

Code: **Vers.2**



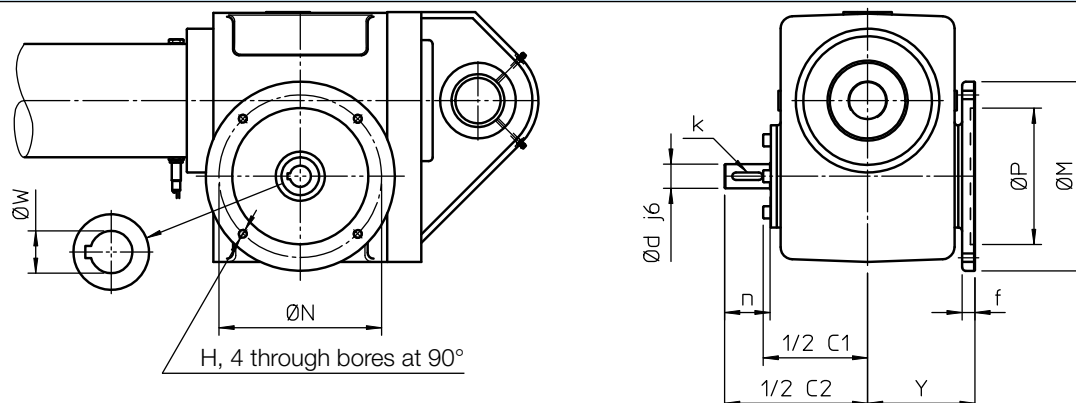
#### Attachment for IEC \_ B5 electric motor (flange and hollow shaft)

Code: **Vers.3**



#### Attachment for IEC \_ B5 electric motor (flange and hollow shaft) and second shaft

Code: **Vers.4**



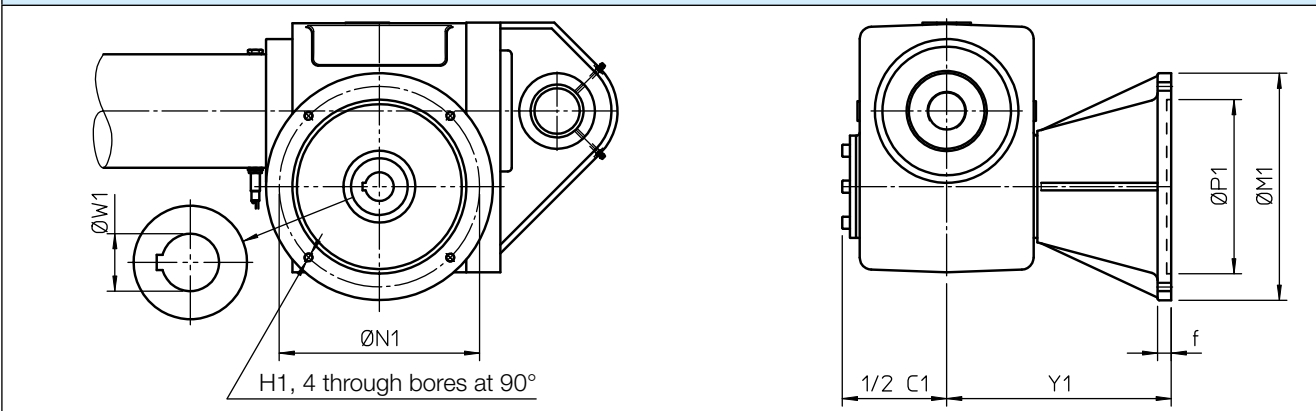
# Linear actuators ATL Series and BSA Series

## 2.5 OPTIONS

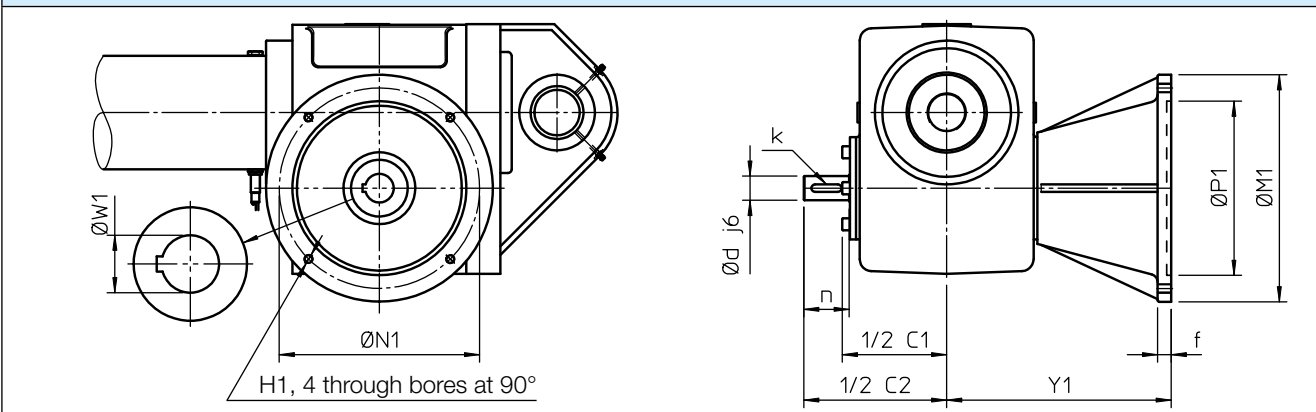
### ACTUATOR INPUT – size 100 - 125

2

**Attachment for IEC \_ B5 electric motor (adapter and coupling)**  
Code: **Vers.5**



**Attachment for IEC \_ B5 electric motor (adapter and coupling) and second shaft**  
Code: **Vers.6**



	C1	C2	L	Ø d	k	n
<b>ATL-BSA 100</b>	276	378	225	32	10×8×40	60
<b>ATL-BSA 125</b>	346	490	260	38	10×8×60	80

**Attachment for IEC electric motor: flange and hollow shaft**

	IEC motor	H	Ø M	Ø N	Ø P	Ø W	Y	f
<b>ATL-BSA 100</b>	90 B5	M10	200	165	130	24	142	17
	100-112 B5	M12	250	215	180	28	142	17

**Attachment for IEC electric motor: adapter and coupling**

	IEC motor	H1	Ø M1	Ø N1	Ø P1	Ø W1	Y1	f1
<b>ATL-BSA 100</b>	132 B5	M12	300	265	230	38	297	18
<b>ATL-BSA 125</b>	132 B5	M12	300	265	230	38	508	16
	160 B5	M16	350	300	250	42	520	22



# Linear actuators ATL Series and BSA Series

## 2.5 ACCESSORIES

### ELECTRIC STROKE LENGTH LIMIT DEVICE Code FCE

The ELECTRIC STROKE LENGTH LIMIT DEVICE allows to limit the actuator stroke length avoiding to reach the extreme positions (mechanical stop) and preventing damage. It is a strong and reliable device, suitable for indoor and outdoor environments; it is available for all standard stroke lengths and for special stroke lengths on request.

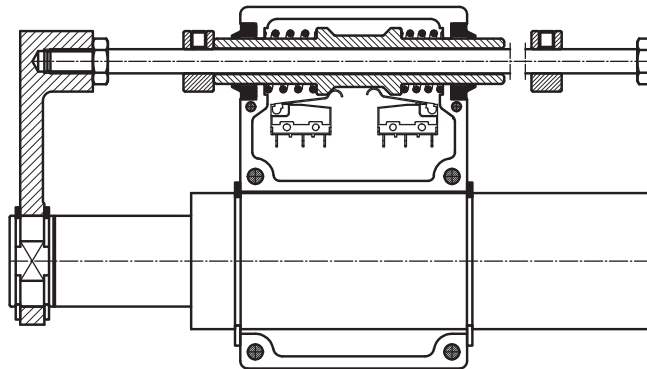
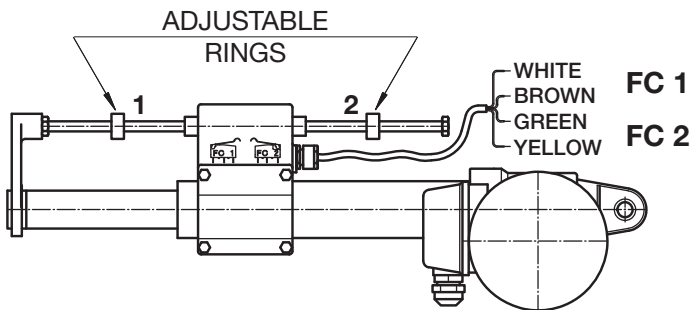
The FCE device consists of 2 normally closed electric switches installed inside a sealed box made in engineering plastic or aluminium alloy. A brass collar allows, with its special shape, activation of the electric switches. It is balanced by 2 opposite preloaded helical springs, which reset the position when the actuator starts moving again in the opposite direction. 2 wiper seals between the axial travelling collar and the housing. The activation of the collar, and consequently of the limit switches, in one or in the opposite direction is done by a stainless steel rod driven by the push rod. The stainless steel rod slides inside the collar activating it when the adjustable ring **1** or **2** pushes on the collar, which activates the switches **FC 1** and **FC 2**.

The stop position is easy to adjust: ring **1** fixes the RETRACTED ACTUATOR (Lc) stop position, ring **2** fixes the EXTENDED ACTUATOR (La) stop position. The adjustment of both rings **1** and **2** is made directly on the actuator cylinder, so it is very easy to set the actuator stop positions.

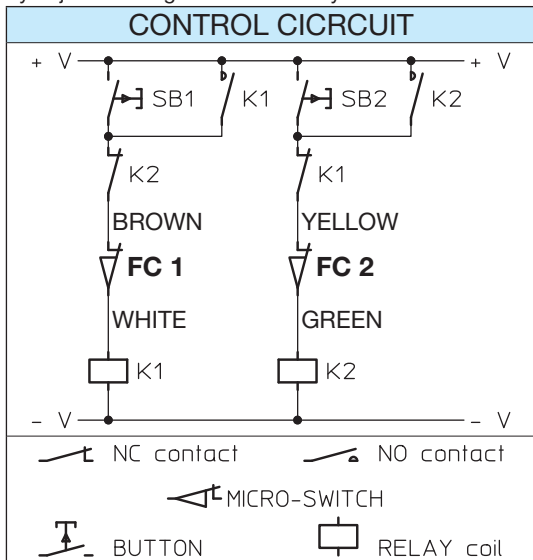
The total actuator stroke length can be set by adjusting both rings **1** and **2** in the required extreme positions. The safety extra-stroke cannot be used! If the application requires an extra-stroke to stop the actuator, please, contact SERVOMECH.

**WARNING: Compare the stroke length required by the application to the actuator dimensions (refer to the CHECK SHEET supplied with the actuator). The FCE device controls only the actuator stroke length, so the stroke length required by the application must fit within it and cannot be longer!**

The ELECTRIC STROKE LENGTH LIMIT DEVICE must be connected to the electric control circuit as shown in the following WIRING DIAGRAM, to guarantee motor switch off and to prevent damage to the actuator and the machine.



The RETRACTED ACTUATOR position (Lc) is set by adjustable ring 1 and controlled by SWITCH FC 1  
 The EXTENDED ACTUATOR position (La) is set by adjustable ring 2 and controlled by SWITCH FC 2



The FCE device is recommended for linear speeds up to about 30 mm/sec. For higher speeds it is better to use magnetic or proximity switches because, due to the inertia, the actuator could travel over the safe stop position and damage the front lever. The stop can be ensured by a brake motor.

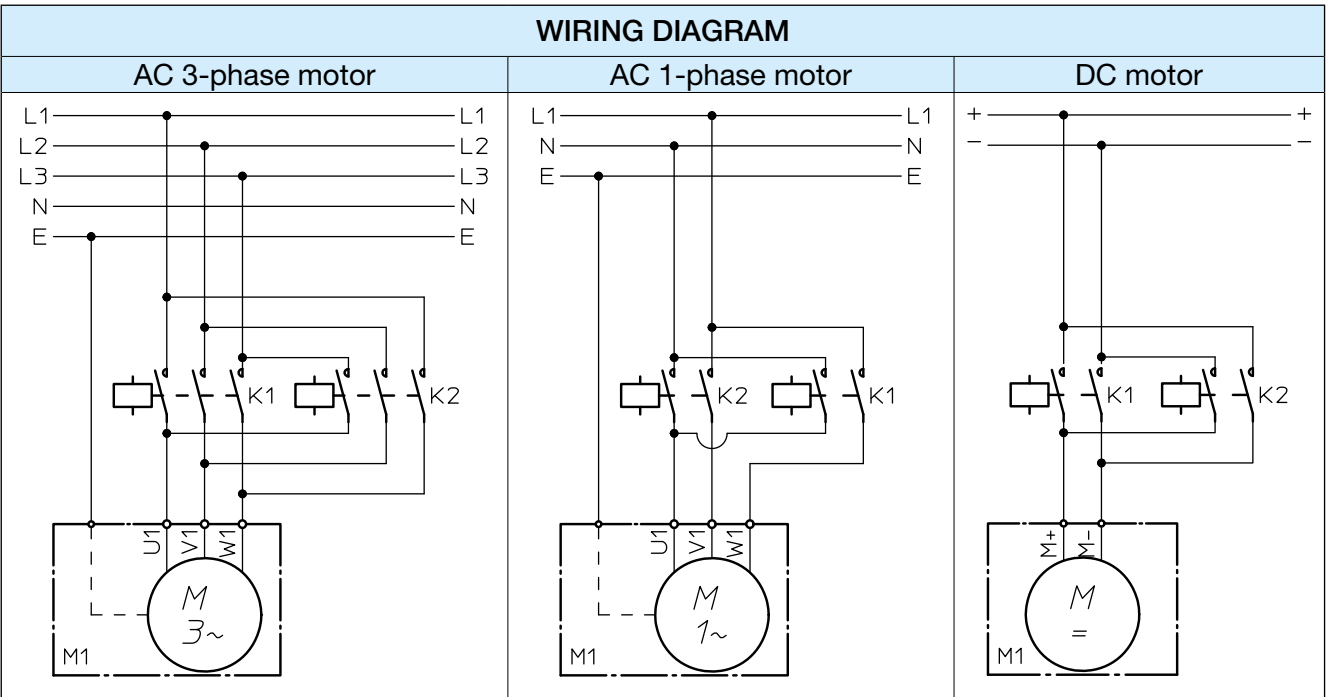
RATED CONTACT VALUES			
Voltage	250 V AC	30 V DC	125 V DC
Current (resistive load)	5 A	5 A	1.4 A
Current (inductive load)	3 A	0.1 A	—

The FCE device is equipped with a multicore cable 4 × 0.75 mm<sup>2</sup>, standard length 1.5 m; longer cable on request.

Electric micro-switches with max. current (referred to resistive load) of 10 A are available on request.

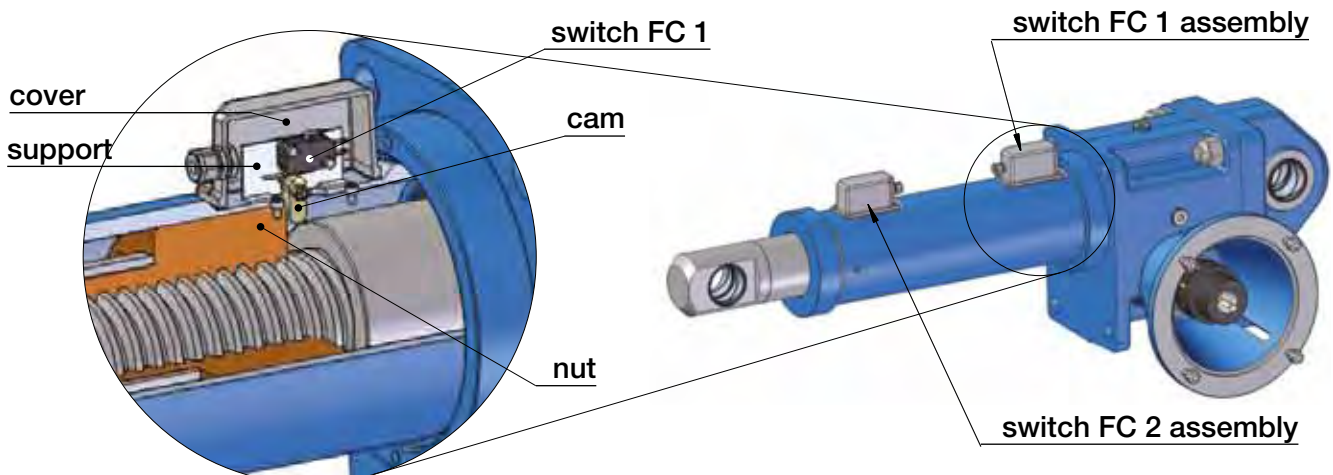
# Linear actuators ATL Series and BSA Series

## 2.5 ACCESSORIES



### ELECTRIC STROKE END SWITCHES Code FC

The ELECTRIC STROKE END SWITCHES FC allow to limit the actuator stroke avoiding to reach the extreme positions (mechanical stops) and preventing damage. The device consists of two switch assemblies, each of them consisting of one miniature electric switch (FC 1, FC 2) fixed to the relative support, a switch operating cam, rotating around the relative support pin when operated by the actuator nut, and a spring that allows the return of the cam to its neutral position, thus deactivating the switch; the entire assembly is covered by an aluminium cover and sealed by a rubber seal. Each assembly determines one of the two extreme positions of the push rod (Lc or La), but it can not be used to fix any intermediate position. The position of the assembly along the push rod is not adjustable.



The ELECTRIC STROKE END SWITCHES FC must be connected to the electric control circuit to guarantee the motor switch off and to prevent damages to the actuator and the application equipment. The relevant WIRING DIAGRAM is on page 88.

RATED CONTACT VALUES			
Voltage	250 V AC	125 V AC	125 V DC
Current (resistive load)	16 A	16 A	0.6 A
Current (inductive load)	10 A	10 A	0.6 A

The ELECTRIC STROKE END SWITCHES FC are available for actuators of both ATL and BSA Series for size 100 and 125.

## 2.5 ACCESSORIES

### MAGNETIC STROKE END SWITCHES Code FCM

The MAGNETIC STROKE END SWITCHES FCM allow to limit the actuator stroke length avoiding to reach the extreme positions (mechanical stop) and preventing damage. Using more switches it is also possible to set intermediate positions along the actuator stroke length.

These reeds can be used to stop the actuator or simply to signal its position during the linear motion.

A magnetic ring on the actuator push road creates a toroidal magnetic field of 100 Gauß.

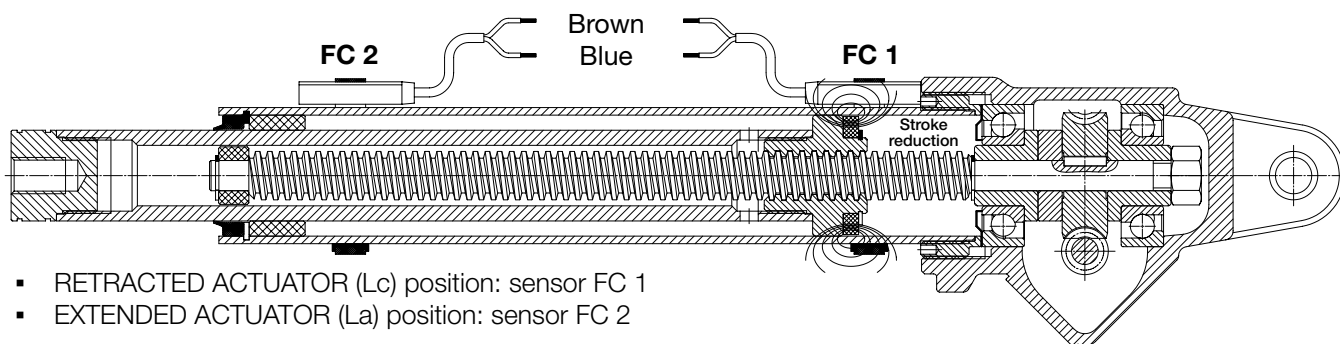
The stroke end switches must be fixed on the push rod and are activated by the toroidal magnetic field independently of their angular position.

The outer tubes are made in non-magnetic material, such as anodized aluminium or stainless steel, thus allowing the external transmission of the magnetic field and therefore activation of the reeds switches.

The standard construction of actuators with FCM includes the outer tube in anodized aluminium; tubes in stainless steel are available on request.

The stroke end switches must be fixed with clamps in non-magnetic material and, to be activated, they must be mounted with the side with the code number upwards (the sensor code number shall be visible).

**WARNING: Max. performances stated in this catalogue and/or technical data sheets supplied with the actuator must not be exceeded, in order to avoid damages and malfunction!**  
**The magnetic reed switches can work only if connected to a control circuit to activate electric relay. They shall not be connected in series between the power supply and the electric motor.**



- RETRACTED ACTUATOR (Lc) position: sensor FC 1
- EXTENDED ACTUATOR (La) position: sensor FC 2

Actuators equipped with MAGNETIC STROKE END SWITCHES perform a linear travel shorter than their stroke length code, because the reed switch FCM 1 gives the stopping signal to the actuator before the actuator has travelled the total stroke length. To know the difference refer to the tables relating to the STROKE LENGTHS AVAILABLE IN STOCK WITH FCM on the pages concerning the OVERALL DIMENSIONS.

The toroidal magnetic field created by the internal magnetic ring has an arch-like form. When using more contact reeds for intermediate positions, it shall be considered that the same reed switch can give the signal in 2 different positions, depending on the actuator motion which can be retracting or extending. To know the difference between these 2 positions please contact SERVOMECH.

The position of the reed switches can be adjusted by changing the fixing clamp position on the outer tube.

The extreme reed switches positions are:

- RETRACTED ACTUATOR (Lc) position: the reed switch fixed on the tube up to the actuator housing
- EXTENDED ACTUATOR (La) position: the reed switch must exceed the limit marked on the outer tube. This limit position is stated on the tables stating the dimensions for standard stroke lengths up to 800 mm.

For special stroke lengths longer than 800 mm, the limit position is the one marked on the tube, otherwise please contact SERVOMECH (also in this case it is marked on the actuator).

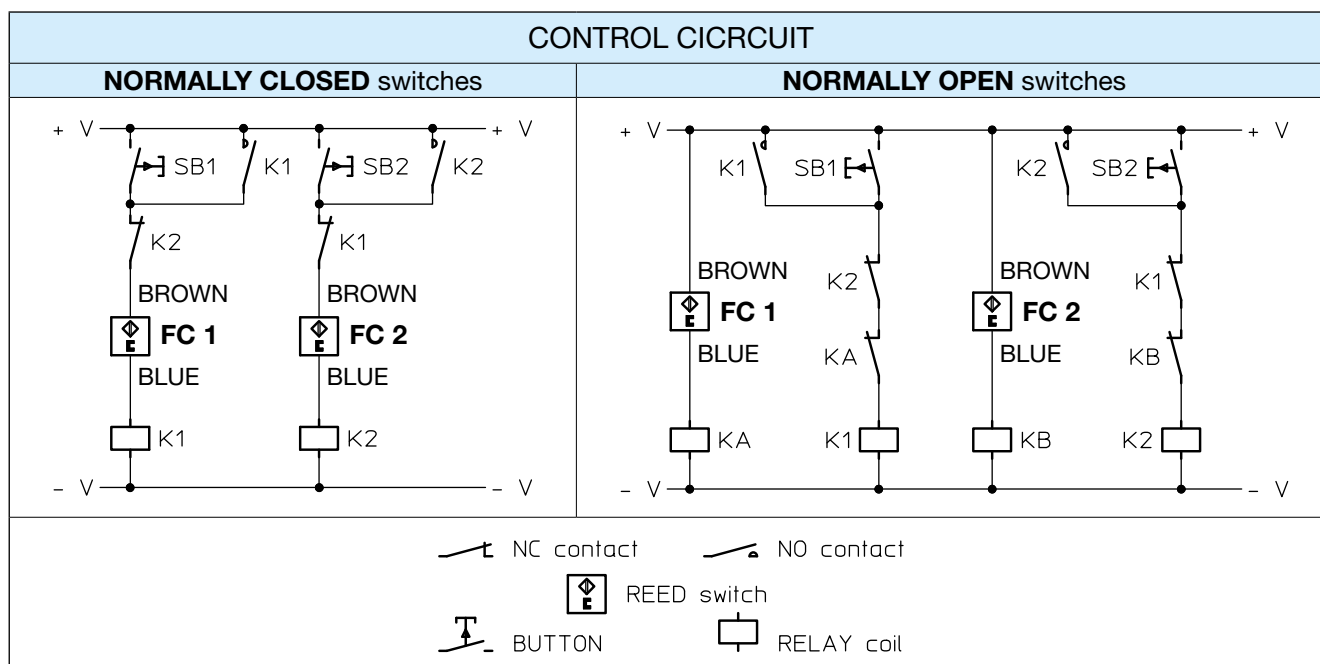
**NOTE: The FCM is not available if the actuator is equipped with ANTI-TURN device AR.**

The MAGNETIC STROKE END SWITCHES FCM are available for actuators of both ATL and BSA Series, for size 20 ... 40.

# Linear actuators ATL Series and BSA Series

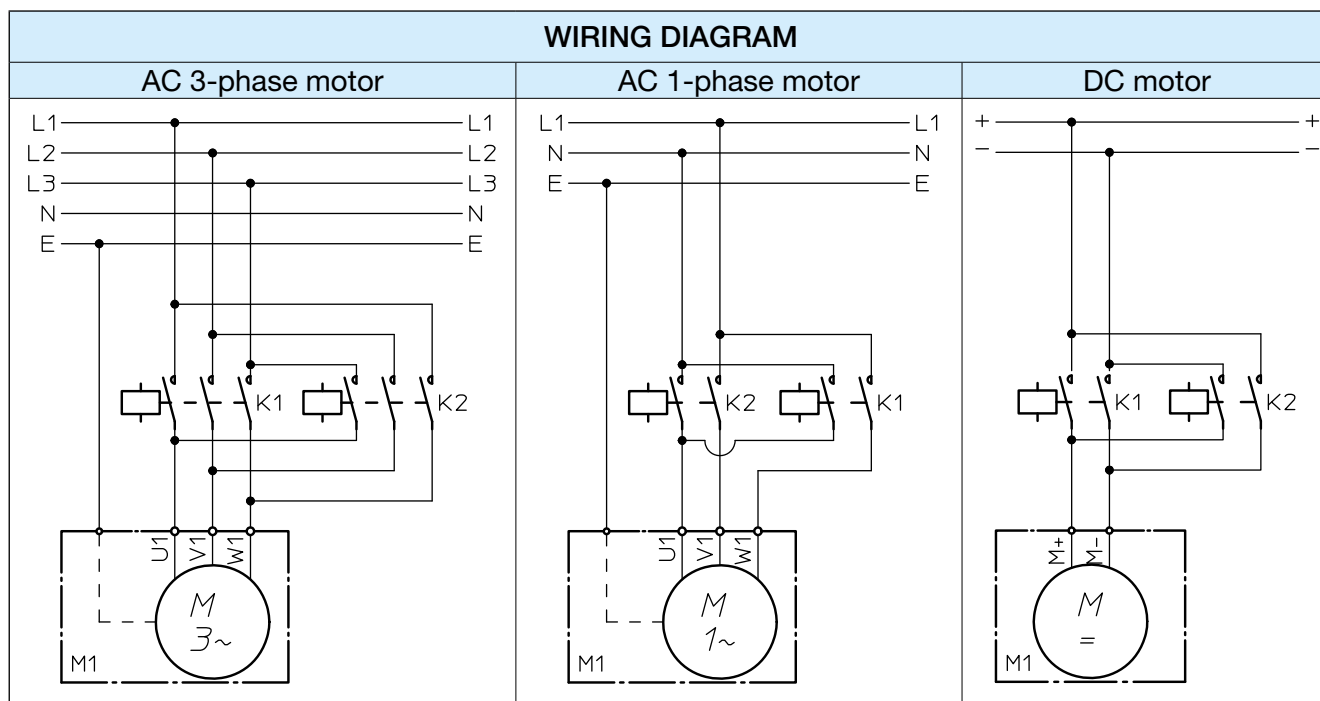
## 2.5 ACCESSORIES

2



ELECTRIC FEATURES		
Voltage	(3 ... 130) V DC	(3 ... 130) V AC
Max. commutable power	20 W	20 VA
Max. commutable current	300 mA (resistive load)	
Max. inductive load	3 W (simple coil)	

The reed switches are equipped with a multicore cable  $2 \times 0.25 \text{ mm}^2$ , standard length 2 m.



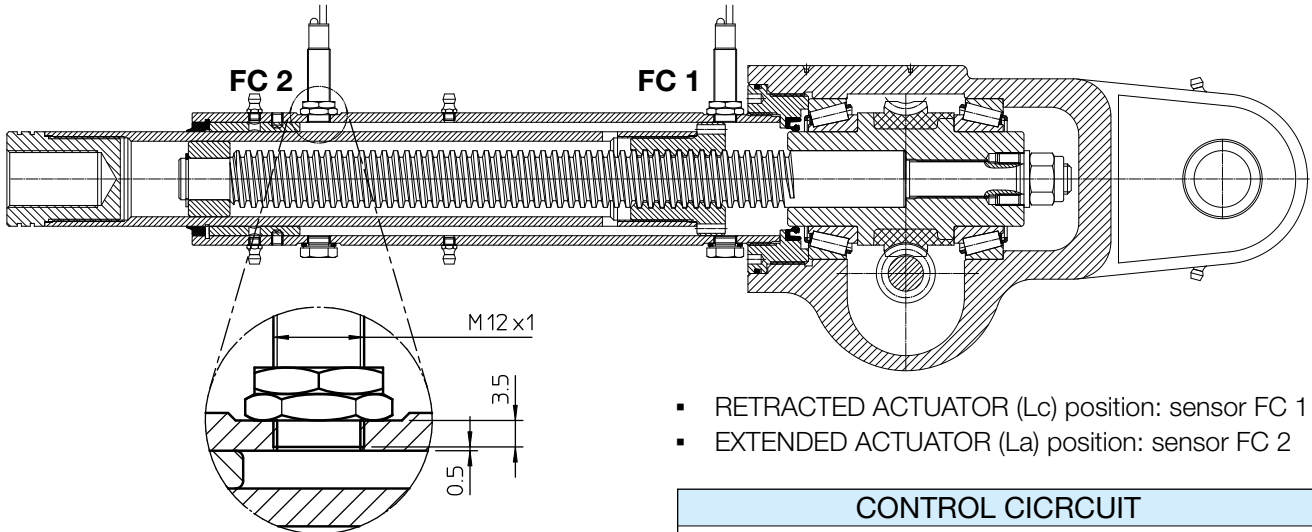
# Linear actuators ATL Series and BSA Series

## 2.5 ACCESSORIES

### INDUCTIVE PROXIMITY STROKE END SWITCHES Code FCP

The INDUCTIVE PROXIMITY STROKE END SWITCHES FCP allow the actuator to stop before reaching the internal mechanical stop avoiding damage. They can be also used to fix intermediate positions along the actuator stroke length.

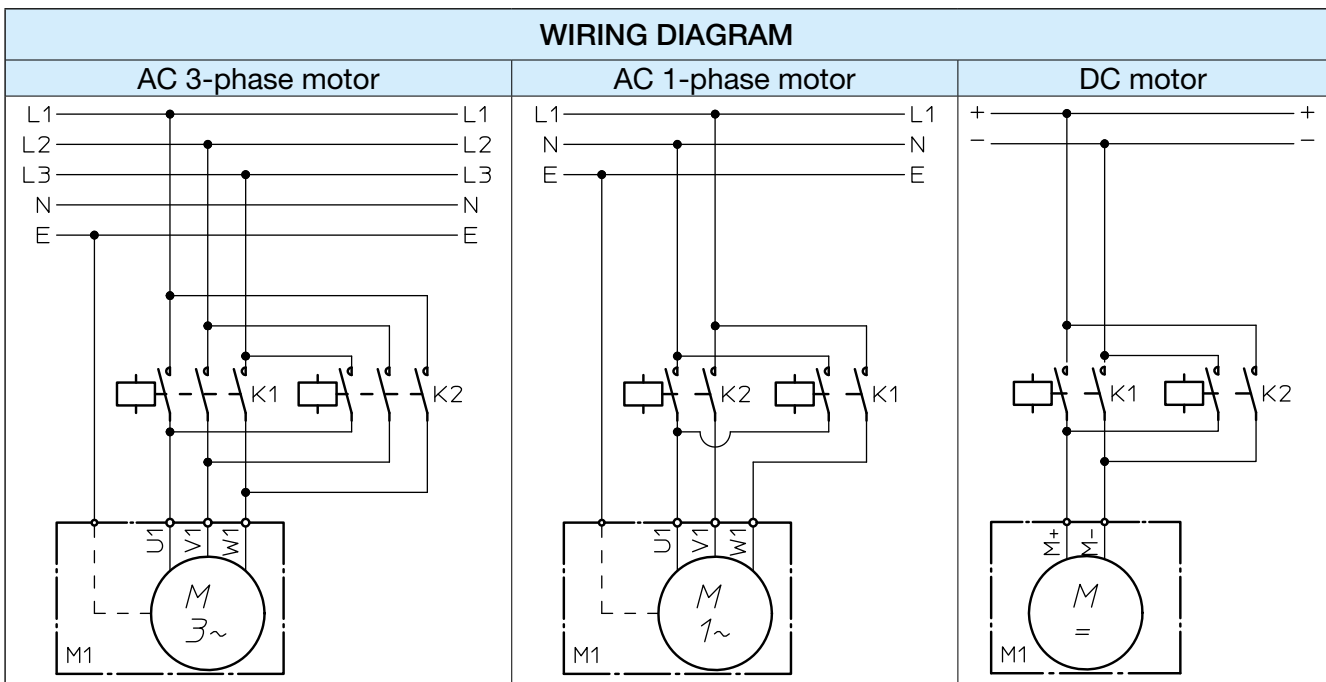
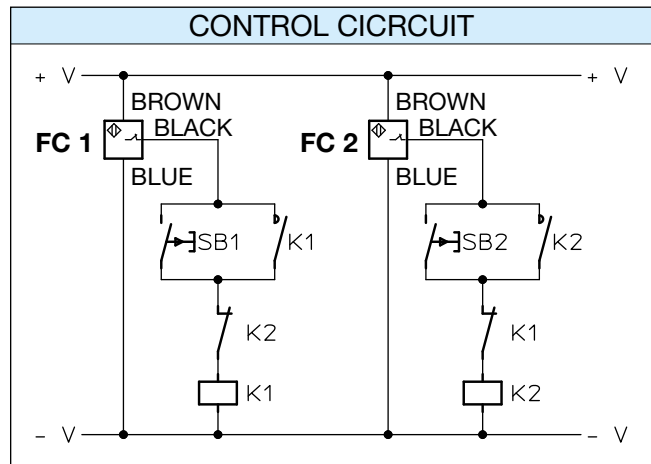
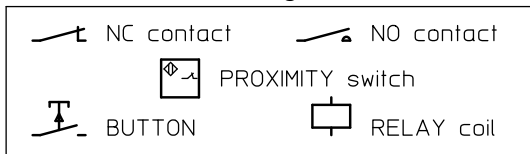
The INDUCTIVE PROXIMITY STROKE END SWITCHES are fixed directly on the actuator outer tube in the required position. Their position is not adjustable. Standard proximity switches are normally closed.



- RETRACTED ACTUATOR (Lc) position: sensor FC 1
- EXTENDED ACTUATOR (La) position: sensor FC 2

ELECTRIC FEATURES	
Voltage	(10 ... 30) V DC
Max. output current	200 mA
Voltage drop (activated switch)	< 3 V (at 200 mA)

The switches are equipped with a multicore cable  $3 \times 0.2 \text{ mm}^2$ , standard length 2 m.

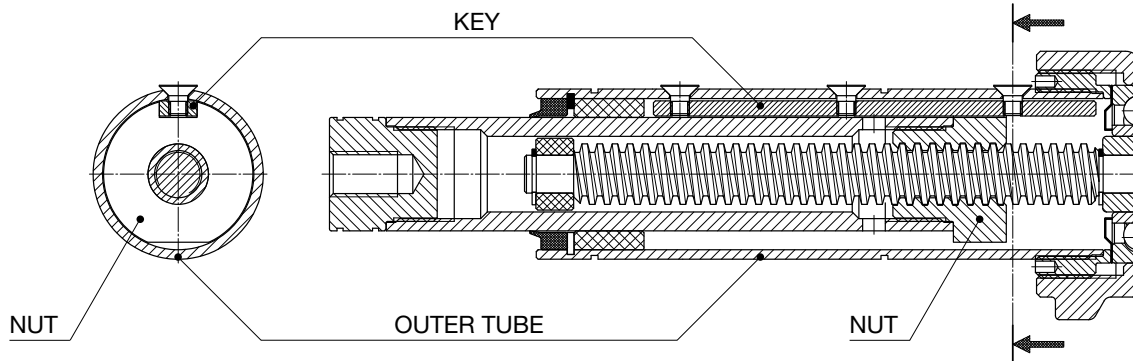


# Linear actuators ATL Series and BSA Series

## 2.5 ACCESSORIES

2

### ANTI-TURN device Code AR



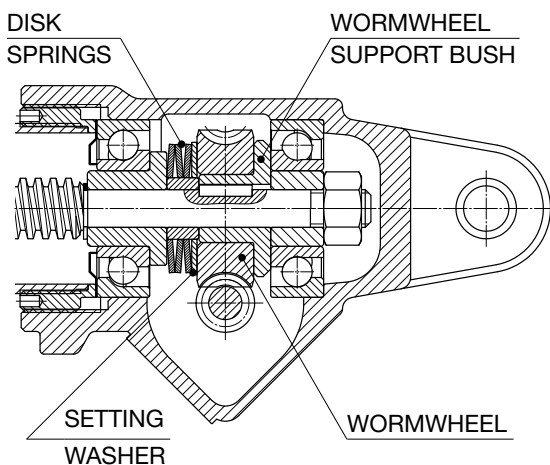
To achieve a linear motion it is necessary to prevent the rotary movement of the nut and of the push rod fixed to it. In many applications it is the external structure itself that, being connected to the push rod, prevents the rotation and allows the linear motion.

In some cases the load applied on the push rod cannot be guided and therefore the rotation cannot be avoided. In such cases it is necessary to use actuators with an internal anti-turn device. The ANTI-TURN device allows the linear motion without any external reaction on the push rod. It can be supplied upon request.

The anti-turn device shown in the above picture consists in a steel key fixed and aligned along the outer tube. The bronze nut, provided with a suitable keyway, slides on this key, making translate the push rod.

The ANTI-TURN device AR is available for linear actuators ATL 25, ATL 28, ATL 30, ATL 40, ATL 50, ATL 63 and ATL 80. **It is not available** for actuators ATL 20, for all acme screw linear actuators (ATL Series) equipped with MAGNETIC STROKE END SWITCHES FCM and for all ball screw linear actuators (UBA Series).

### SAFETY CLUTCH Code FS



The SAFETY CLUTCH is a device able to protect the actuator and the machinery where it is installed from dynamic overload during the linear travel and from incorrect use which could bring the actuator to the mechanical stop. This device is a torque limiter on the worm wheel. The torque limiter clutch is preloaded during assembly. The preload is fixed and related to the ratio and the performances of each actuator as stated on the PERFORMANCE TABLES in this catalogue.

On request, with a purchasing order, a different preload can be set to achieve different performance.

If an overload is applied on the actuator, the SAFETY CLUTCH starts slipping and the push rod stops while the motor is still running.

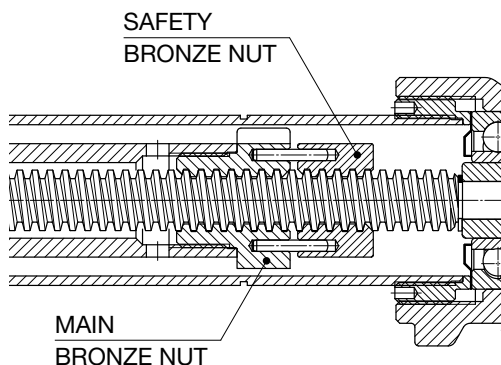
When the overload decreases up to the rated load value or less, the SAFETY CLUTCH stops slipping and the push rod starts travelling again. The SAFETY CLUTCH FS is not intended to be used as a load limiter, but only to protect the actuator and the machinery where it is installed. Do not use the SAFETY CLUTCH as a stroke end control device! If it is frequently activated it rapidly wears, the preload is reduced and consequently also the actuator load performance is lower.

The SAFETY CLUTCH FS can be supplied for actuators of both ATL and BSA Series for sizes 20 – 25 - 28 -30 and 40.

## Linear actuators ATL Series and BSA Series

### 2.5 ACCESSORIES

#### SAFETY NUT Code MS

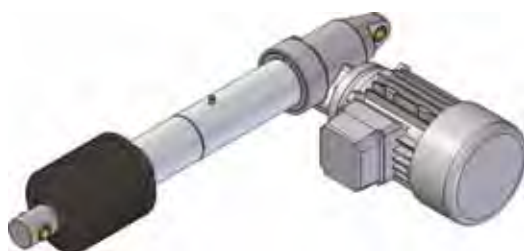


The SAFETY NUT is an auxiliary bronze nut connected by 2 pins to the main bronze nut. The distance between the two nuts in a new actuator is equal to a half of the thread pitch. If the main nut wears up to a half of the thread pitch or crashes, the SAFETY NUT supports the load avoiding its fall.

**The SAFETY NUT is a one-direction device.** Its position with respect to the main nut depends on the load direction. The SAFETY NUT is available for actuators working with push load. For applications with pull load a special design is available (contact SERVOMECH).

The SAFETY NUT MS is available for all acme screw actuators (ATL Series) except for actuator ATL 20 equipped with FCM device.

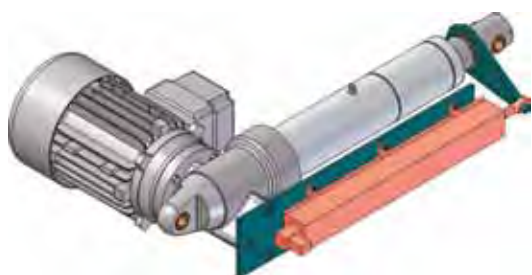
#### PROTECTIVE BELLOWS Code B



When the actuators are used in severe environment conditions with contaminant agents that can damage the seal scraper between the outer tube and the push rod, BELLOWS protection can be useful.

Bellows made of special materials for severe environments are available upon request.

#### LINEAR TRANSDUCER



On request, all linear actuators of both ATL and BSA Series can be supplied with an external absolute linear transducer such as linear potentiometer or linear encoder. For further information, please, contact SERVOMECH.

#### ROTARY ENCODER

For the positioning control of all linear actuators ATL Series and BSA Series (all sizes), an incremental rotary encoders can be supplied fixed on the input shaft on the side opposite to the motor.

On request, the linear actuator can be equipped with an absolute rotary encoder.

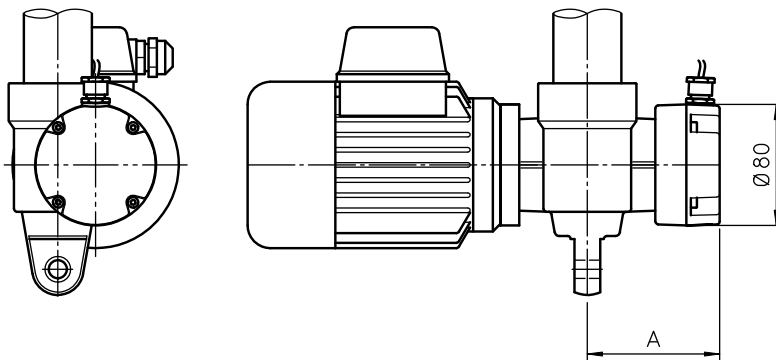
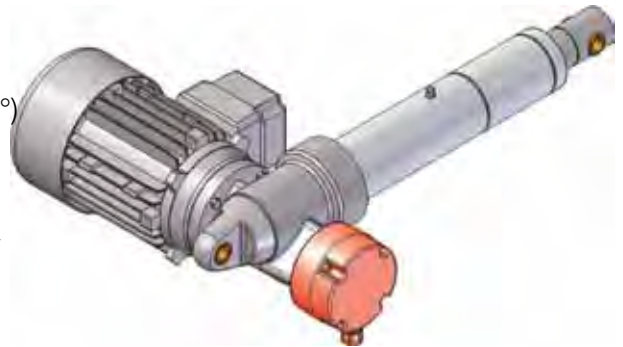
In case of linear actuators with DC motor, the motor can be supplied with a tacho-generator mounted on the opposite side of the motor shaft.

# Linear actuators ATL Series and BSA Series

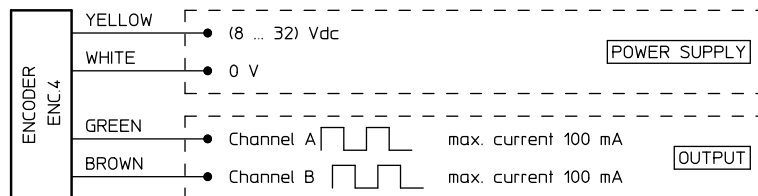
## 2.5 ACCESSORIES

### ROTARY ENCODER Code ENC.4

Hall-effect encoder, incremental, bi-directional  
 Resolution: 4 pulses per revolution  
 Output: PUSH-PULL  
 2 channels (A and B, phase difference 90°)  
 Input voltage: (8 ... 32) Vdc  
 Max. commutable current ( $I_{out}$ ): 100 mA  
 Max output voltage drop:  
 with load connected to 0 and  $I_{out} = 100$  mA: 4.6 V  
 with load connected to + V and  $I_{out} = 100$  mA: 2 V  
 Protection:  
 against short circuit  
 against input polarity inversion  
 against any incorrect output connection  
 Cable length: 1.3 m  
 Protection: IP 55

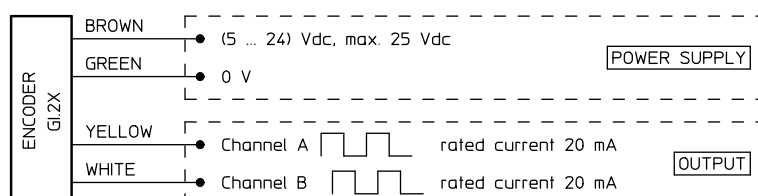


ACTUATOR	A [mm]
ATL – BSA 20	88
ATL – BSA 25	88
ATL – BSA 28	88
ATL – BSA 30	96
ATL – BSA 40	112



### ROTARY ENCODER Code GI.2X (available only for ATL-BSA 30)

Hall-effect encoder, incremental, bi-directional  
 Resolution: GI.21: 1 puls per revolution  
 GI.24: 4 pulses per revolution  
 Output: PUSH-PULL  
 2 channels (A and B, phase difference 90°)  
 Input voltage: (5 ... 24) Vdc, max. 25 Vdc  
 No-load current: 5 mA  
 Max. commutable current: 50 mA  
 Protection:  
 against input overvoltage peaks  
 against input polarity inversion  
 Cable length: 1.5 m





# Linear actuators ATL Series and BSA Series

## 2.5 ACCESSORIES

### ROTARY ENCODER Code EH 53

Optical encoder, incremental, bi-directional

Resolution: 100 or 500 pulses per revolution

Output: PUSH-PULL  
2 channels (A and B, phase difference 90°)  
channel ZERO

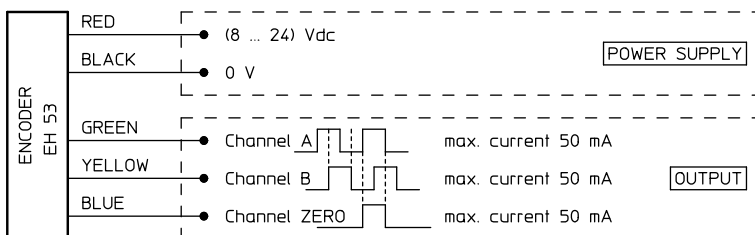
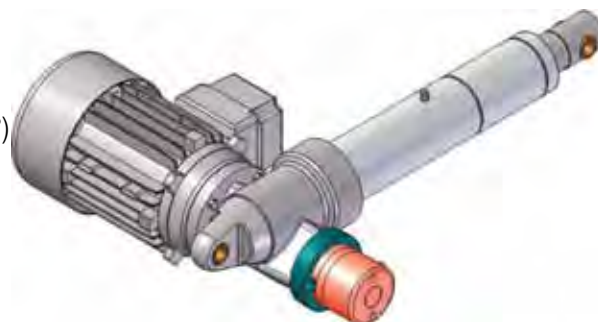
Input voltage: (8 ... 24) Vcc

No-load current: 100 mA

Max. commutable current: 50 mA

Cable length: 0.5 m

Protection: IP 54



## 2.6 SPECIAL DESIGNS

According to specific application requirements, special designs can be carried out on standard actuators.

Some possible options are for example:

- push rod in stainless steel AISI 304
- outer tube in stainless steel AISI 304
- lubricants for high or low ambient temperature
- lubricants suitable for food industry
- seals in VITON or silicone
- wiper seal on push rod with second lip in brass (ice scrapers)

Thanks to the long experience and know-how, SERVOMECH is able to support customers in selecting the right actuator version and accessories suitable for specific environment and installation conditions.

# Linear actuators ATL Series and BSA Series

## 2.7 ORDERING CODE

ATL	30	RN2	C300	FO	—	FCE	Vers. 3	RH
1	2	3	4	5	6	7	8.A	8.B

SP	FS	
9		

AC 3-phase brake-motor 0.18 kW 4-pole 230/400 V 50 Hz IP 55 Ins. F	W
10.A	10.B

1	Actuator series ATL or BSA	
2	Actuator size 20, 25, 28, 30, 40, 50, 63, 80, 100, 125	pages 42 ... 45
3	Ratio RH1, RV1, RN1, RL1, RXL1 RH2, RV2, RN2, RL2, RXL2	pages 42 ... 45
4	Stroke code C100, C200, C300, C400, C500, C600, C700, C800 (special stroke available on request)	
5	Front attachment BA - standard head with threaded bore ROE - rod end FO - clevis end TS - ball joint FL - flange end TF - hinged head	pages 54 ... 81
6	Position of front and rear actuator attachment STANDARD (without code) or RPT 90°	page 82
7	Stroke end switches FCE - electric stroke length limit device FC - electric switches FCM-NC - magnetic reed switches, normally closed FCM-NO - magnetic reed switches normally open FCP - inductive proximity switches	page 88 page 89 page 90 page 90 page 92
8.A	Actuator input Vers.1 - single input shaft Vers.2 - double input shaft Vers.3 - attachment for IEC motor (flange and hollow shaft) Vers.4 - attachment for IEC motor (flange and hollow shaft) + second shaft Vers.5 - attachment for IEC motor (adapter and coupling) Vers.6 - attachment for IEC motor (adapter and coupling) + second shaft	pages 83 ... 87
8.B	Motor mounting side - main input drive side RH (standard) or LH	page 82
9	Accessories SP - rear bracket FI - intermediate support flange AR - anti-turn device FS - safety clutch MS - safety nut for push load B - bellows encoder - EH 53 or ENC.4 or GI.2X or according to required specifications	pages 54 ... 81 page 82 page 93 page 93 page 94 page 94 pages 95 ... 96
10.A	Motor data	pages 200 ... 201
10.B	Motor terminal box position	page 82
11	Other specifications example: push rod in stainless steel AISI 304 example: lubricant for low temperature	
12	Filled in SELECTION DATA sheet	page 98 ... 99
13	Application layout	

APPLICATION: \_\_\_\_\_

REQUIRED STROKE: \_\_\_\_\_ mm

REQUIRED LINEAR SPEED: \_\_\_\_\_ mm/s    \_\_\_\_\_ mm/min    \_\_\_\_\_ m/min    TIME TO PERFORM 1 STROKE: \_\_\_\_\_ s

**STATIC LOAD:**            PULL: \_\_\_\_\_ N            PUSH: \_\_\_\_\_ N            at STROKE \_\_\_\_\_ mm

**DYNAMIC LOAD:**        PULL: \_\_\_\_\_ N            PUSH: \_\_\_\_\_ N            at STROKE \_\_\_\_\_ mm

ACTUATOR     SUBJECTED TO VIBRATIONS     NOT SUBJECTED TO VIBRATIONS

OPERATING:            \_\_\_\_\_ cycle / hour    \_\_\_\_\_ working hours / day            Notes: \_\_\_\_\_

REQUIRED LIFETIME: \_\_\_\_\_ cycle    \_\_\_\_\_ hours    \_\_\_\_\_ calendar days            Notes: \_\_\_\_\_

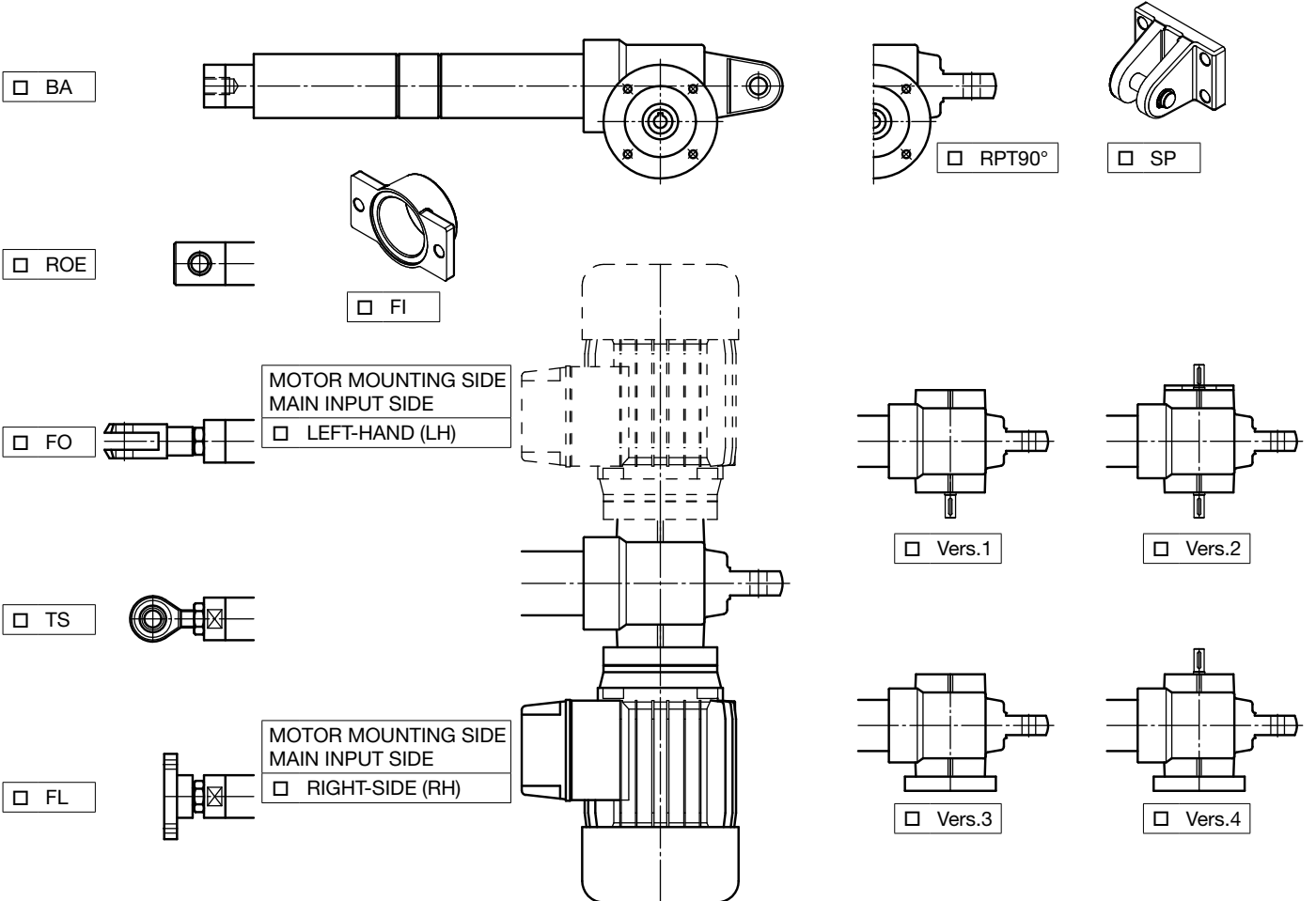
ENVIRONMENT:    TEMPERATURE \_\_\_\_\_ °C     DUST    HUMIDITY \_\_\_\_\_ %    AGGRESSIVE AGENT \_\_\_\_\_

Acme screw actuators **ATL Series**

Ball screw actuators **BSA Series**

**Size:**             20     25     28     30     40

**Ratio:**             RH2     RH1     RV2     RV1     RN2     RN1     RL2     RL1     RXL2     RXL1



**ELECTRIC MOTOR**     AC 3-phase     AC 1-phase     DC 24 V or 12 V             WITHOUT BRAKE     WITH BRAKE

**STROKE END SWITCHES**     ELECTRIC FCE             MAGNETIC FCM             PROXIMITY FCP

ANTI-TURN DEVICE AR     SAFETY CLUTCH FS             SAFETY NUT MS

BELLOWS             PUSH ROD IN STAINLESS STEEL     OUTER TUBE IN STAINLESS STEEL

POSITIONING CONTROL WITH     ROTARY ENCODER             LINEAR TRANSDUCER

OTHER: \_\_\_\_\_

APPLICATION: \_\_\_\_\_

REQUIRED STROKE: \_\_\_\_\_ mm

REQUIRED LINEAR SPEED: \_\_\_\_\_ mm/s    \_\_\_\_\_ mm/min    \_\_\_\_\_ m/min    TIME TO PERFORM 1 STROKE: \_\_\_\_\_ s

**STATIC LOAD:**            PULL: \_\_\_\_\_ N            PUSH: \_\_\_\_\_ N            at STROKE \_\_\_\_\_ mm

**DYNAMIC LOAD:**        PULL: \_\_\_\_\_ N            PUSH: \_\_\_\_\_ N            at STROKE \_\_\_\_\_ mm

ACTUATOR     SUBJECTED TO VIBRATIONS     NOT SUBJECTED TO VIBRATIONS

OPERATING:            \_\_\_\_\_ cycle / hour    \_\_\_\_\_ working hours / day            Notes: \_\_\_\_\_

REQUIRED LIFETIME: \_\_\_\_\_ cycle    \_\_\_\_\_ hours    \_\_\_\_\_ calendar days            Notes: \_\_\_\_\_

ENVIRONMENT:    TEMPERATURE \_\_\_\_\_ °C     DUST    HUMIDITY \_\_\_\_\_ %    AGGRESSIVE AGENT \_\_\_\_\_

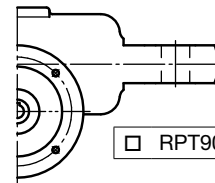
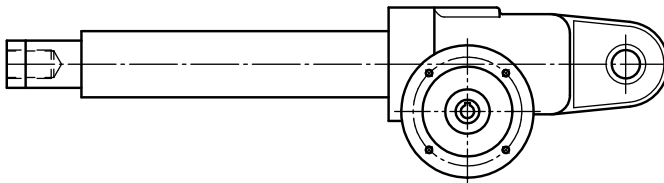
Acme screw actuators **ATL Series**

Ball screw actuators **BSA Series**

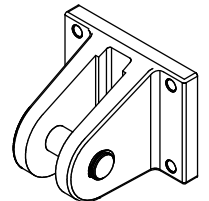
**Size:**             50     63     80     100     125

**Ratio:**             RV2     RV1     RN2     RN1     RL2     RL1     RXL2     RXL1

BA



RPT90°

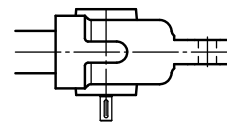
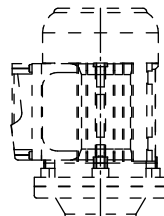


SP

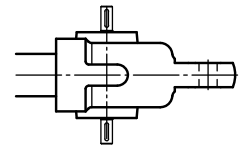
TF



MOTOR MOUNTING SIDE  
 MAIN INPUT SIDE  
 LEFT-HAND (LH)

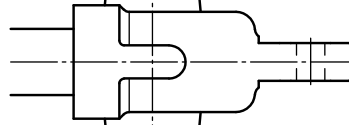
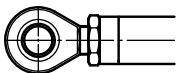


Vers.1

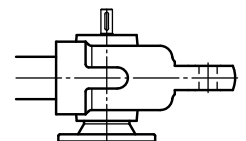


Vers.2

TS

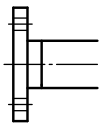


Vers.3

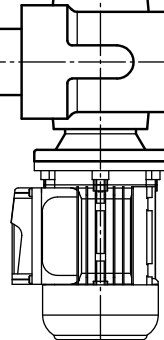


Vers.4

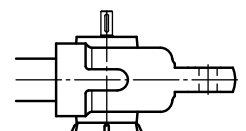
FL



MOTOR MOUNTING SIDE  
 MAIN INPUT SIDE  
 RIGHT-SIDE (RH)



Vers.5



Vers.6

ELECTRIC MOTOR AC 3-phase \_\_\_\_\_             WITHOUT BRAKE     WITH BRAKE

STROKE END SWITCHES     ELECTRIC FCE     PROXIMITY FCP     ELECTRIC FC

ANTI-TURN DEVICE AR     SAFETY CLUTCH FS     SAFETY NUT MS

BELLOWS             PUSH ROD IN STAINLESS STEEL     OUTER TUBE IN STAINLESS STEEL

POSITIONING CONTROL WITH     ROTARY ENCODER     LINEAR TRANSDUCER

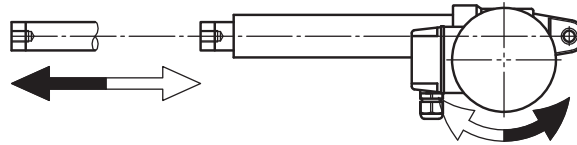
OTHER: \_\_\_\_\_

Acme screw actuators **ATL Series**

Ball screw actuators **BSA Series**

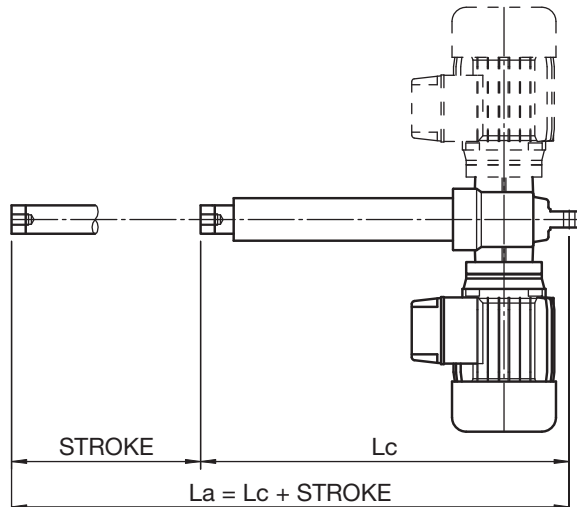
PRODUCT: \_\_\_\_\_

Product serial number: \_\_\_\_\_ ; q.ty: \_\_\_\_\_



**STANDARD HEAD**

BA

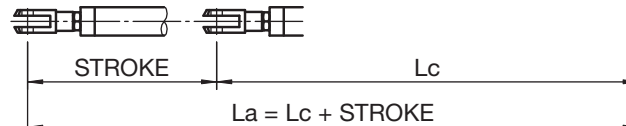


**LEFT-HAND MOUNTING**

**RIGHT-HAND MOUNTING**

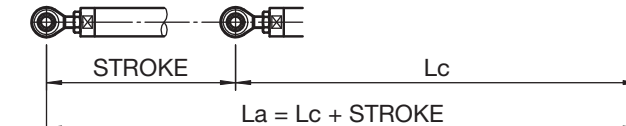
**CLEVIS END**

FO



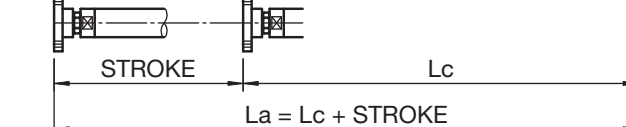
**BALL JOINT**

TS



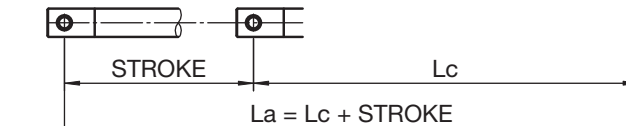
**FLANGE END**

FL



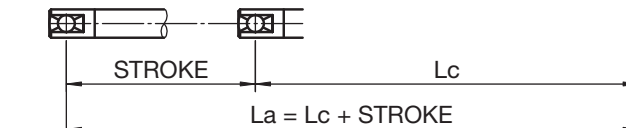
**ROD END**

ROE



**HINGED HEAD**

TF



**ELECTRIC MOTOR**

- AC 3-phase
- AC 1-phase
- DC
- WITHOUT brake
- WITH brake
  - internally powered
  - separately powered

**Servomech. QMS**

**PASSED**

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

**LINEAR ACTUATOR LENGTH (ref. to**  BA  ROE  TF  FL)

**WORKING RANGE**

RETRACTED ACTUATOR length:  $L_c =$  \_\_\_\_\_ mm  
 EXTENDED ACTUATOR length:  $L_a =$  \_\_\_\_\_ mm  
 STROKE ( $L_a - L_c$ ):  $C =$  \_\_\_\_\_ mm

**INTERNAL MECHANICAL STOP LIMIT**

MIN. actuator length: \_\_\_\_\_ mm  
 MAX. actuator length: \_\_\_\_\_ mm

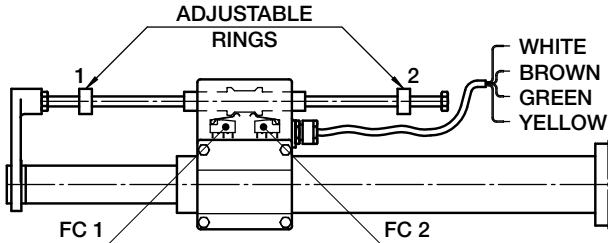
## ELECTRIC STROKE END DEVICE **FCE** □

The ELECTRIC STROKE END DEVICE **FCE** is activated by microswitches FC 1 and FC 2.

- contact: **normally CLOSED**
- voltage: 250 V AC / 30 V DC
- current: 5 A (resistive load)  
3 A (inductive load)

The RETRACTED ACTUATOR position is set by the adjustable ring 1. The wires that connect the switch FC 1 are WHITE and BROWN.

The EXTENDED ACTUATOR position is set by the adjustable ring 2. The wires that connect the switch FC 2 are GREEN and YELLOW.



## MAGNETIC STROKE END SWITCHES **FCM** □

The MAGNETIC STROKE END SWITCHES **FCM** has reed switches FC 1 and FC 2.

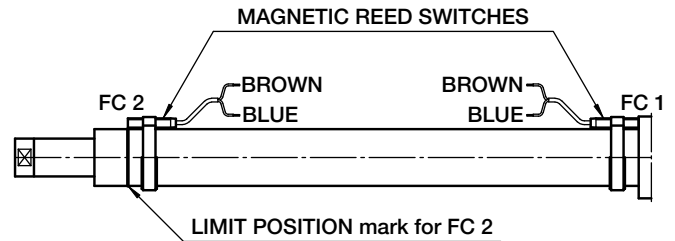
The rated electric values are indicated on the reed switch.

The RETRACTED ACTUATOR position is adjusted and controlled by FC 1.

The EXTENDED ACTUATOR position is adjusted and controlled by FC 2.

Reed switch wires are BROWN and BLUE (and the third, BLACK, for change-over contact).

For DC supply: connect the BROWN wire to ⊕.



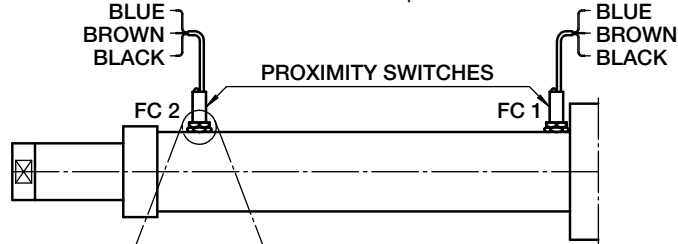
## PROXIMITY STROKE END SWITCHES **FCP** □

The PROXIMITY STROKE END SWITCHES **FCP** has proximity sensors FC 1 and FC 2.

- type: inductive, PNP
- contact: **normally CLOSED**
- supply voltage: (10 ... 30) V DC
- max. output current: 200 mA
- max. voltage drop (activated sensor): < 3 V (ref. 200 mA)

FC 1 - sensor for RETRACTED ACTUATOR position

FC 2 - sensor for EXTENDED ACTUATOR position



ACTUATOR	P [mm]
ATL-BSA 50	3.5
ATL-BSA 63	
ATL-BSA 80	



## ELECTRIC STROKE END SWITCHES **FC** □

The ELECTRIC STROKE END SWITCHES **FC** has miniature switches FC 1 and FC 2.

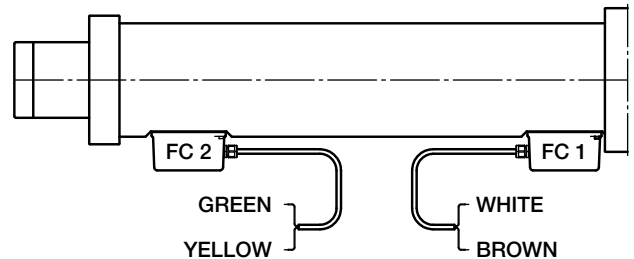
- contact: **normally CLOSED**
- supply voltage: 250 V AC / 125 V AC / 125 V DC
- current: 16 A / 16 A / 0.6 A (resistive load)  
10 A / 10 A / 0.6 A (inductive load)

FC 1 - switch for RETRACTED ACTUATOR position

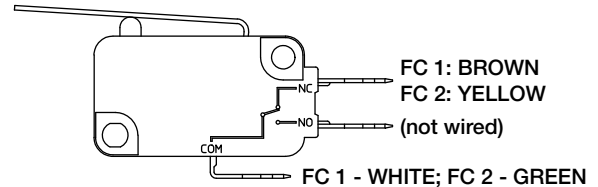
The wires that connect the switch FC 1 are WHITE and BROWN.

FC 2 - switch for EXTENDED ACTUATOR position

The wires that connect the switch FC 2 are GREEN and YELLOW.



SINGLE SWITCH WIRING:



## WARNING!

1. The values **Lc** (RETRACTED ACTUATOR length), **La** (EXTENDED ACTUATOR length) and **C** (STROKE) are the extreme limit values.
2. **BEFORE** using the linear actuator:
  - verify the input shaft rotation direction and the push rod running direction;
  - check the stroke end switches position: they must not exceed the extreme limit positions;
  - make sure that the motor and the limit switches are correctly connected and that the right voltage is used.
3. Linear actuators equipped with brake motor:
  - the brake is **NORMALLY CLOSED** (NEGATIVE action). When the power supply is switched off, the brake is engaged. The brake opens only when power is supplied;
  - if the brake is wired directly to the connecting pins of the terminal box, it does not require any power supply;
  - if the brake is wired separately, make sure that the correct voltage is used;
  - if the brake is equipped with hand release device, make sure that the brake is engaged before starting the linear actuator.
4. **Alignment check:** the load must be in line with the actuator. No off-set or radial loads are allowed.

WORMGEAR LUBRICANT: \_\_\_\_\_

SCREW – NUT LUBRICANT: \_\_\_\_\_