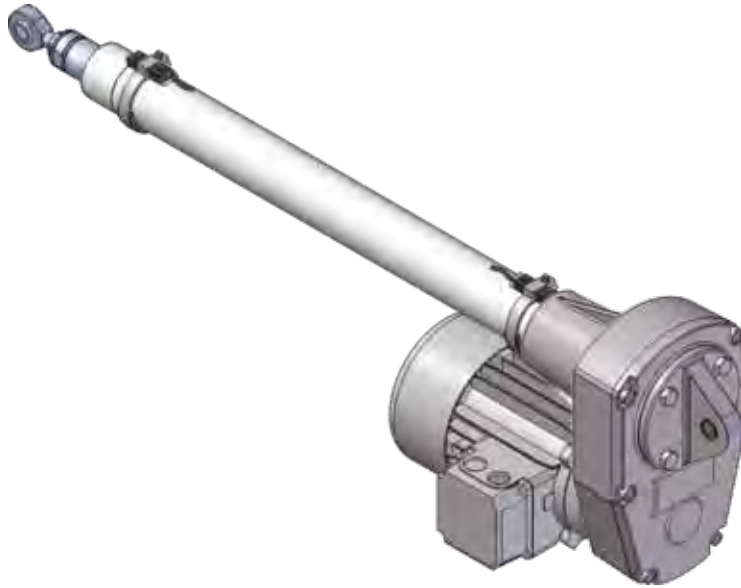
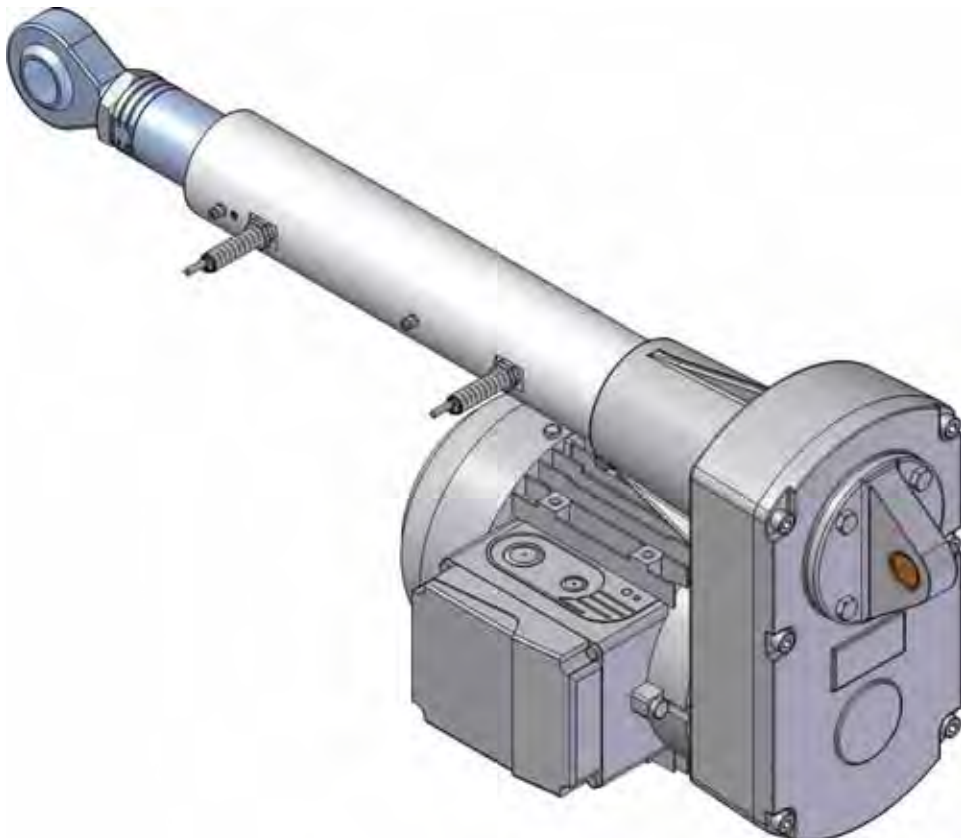


Linear actuators UBA Series and UAL Series

UBA - UAL Series, size 1 - 2 - 3 - 4



UBA - UAL Series, size 5



4

Linear actuators UBA Series and UAL Series

4.1 MANUFACTURING FEATURES

Input drive: timing belt transmission; pulleys UNI ISO 5294:1991 in aluminium for low inertia; positive timing belts UNI ISO 5296-1:1991.

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

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 ± 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 actuator axis: angular contact ball 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
- pin in stainless steel AISI 303

Magnetic stroke end switches FCM:

- magnetic switches activated by a magnetic ring, for UAL-UBA 1, 2, 3, 4

Proximity stroke end switches FCP:

- proximity switches activated by the nut, for UAL-UBA 5

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 UBA Series

4.2 TECHNICAL DATA - ball screw linear actuators UBA Series

| SIZE | | UBA 1 | UBA 2 | UBA 3 | UBA 4 | UBA 5 | |
|--|---------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------|
| Push rod diameter | [mm] | 25 | 30 | 35 | 40 | 50 | |
| Outer tube diameter | [mm] | 36 | 45 | 55 | 60 | 70 | |
| Attachment flange for IEC standard motor | | 56 B14 | 63 B14 | 71 B14 | 80 B14 90 B14 | 80 B14 90 B14 | |
| Max. dynamic load. | [N] | 1 800 | 3 400 | 3 900 | 5 700 | 10 850 | |
| Max. static load | pull [N] | 4 000 | 6 000 | 10 000 | 12 000 | 15 000 | |
| | push [N] | 4 000 | 6 000 | 10 000 | 12 000 | 15 000 | |
| Ratio | RV | 1 : 1.33 (18 : 24) | 1 : 1.4 (20 : 28) | 1 : 1.04 (24 : 25) | 1 : 1.07 (30 : 32) | 1 : 1.07 (30 : 32) | |
| | RN | 1 : 2.15 (13 : 28) | 1 : 2.13 (15 : 32) | 1 : 2 (16 : 32) | 1 : 1.94 (18 : 35) | 1 : 1.94 (18 : 35) | |
| | RL | 1 : 3 (10 : 30) | 1 : 2.83 (12 : 34) | 1 : 2.92 (12 : 35) | 1 : 2.93 (15 : 44) | 1 : 2.93 (15 : 44) | |
| Ball screw | Diameter × Lead | 14×5 | 16×5 | 20×5 | 25×6 | 32×10 | |
| | Ball [mm] | 3.175 (1/8 ") | 3.175 (1/8 ") | 3.175 (1/8 ") | 3.969 (5/32 ") | 6.350 (1/4 ") | |
| | N° of circuits | 2 | 3 | 3 | 3 | 4 | |
| | Dynamic load C _a [N] | 6 600 | 10 400 | 12 000 | 17 400 | 41 800 | |
| | Static load C _{0a} [N] | 8 600 | 15 600 | 21 200 | 30 500 | 73 000 | |
| Linear travel [mm] for 1 input shaft revolution | Ratio | RV1 | 3.75 | 3.57 | 4.8 | 5.62 | 9.38 |
| | | RN1 | 2.32 | 2.34 | 2.5 | 3.09 | 5.14 |
| | | RL1 | 1.67 | 1.76 | 1.71 | 2.05 | 3.41 |
| Ball screw | Diameter × Lead | 14×10 | 16×10 | 20×10 | 25×10 | 32×20 | |
| | Ball [mm] | 3.175 (1/8 ") | 3.175 (1/8 ") | 3.175 (1/8 ") | 3.969 (5/32 ") | 6.350 (1/4 ") | |
| | N° of circuits | 2 | 3 | 3 | 3 | 3 | |
| | Dynamic load C _a [N] | 6 900 | 11 300 | 12 900 | 18 000 | 32 200 | |
| | Static load C _{0a} [N] | 9 300 | 18 000 | 23 500 | 33 000 | 53 000 | |
| Linear travel [mm] for 1 input shaft revolution | Ratio | RV2 | 7.5 | 7.14 | 9.6 | 9.38 | 18.75 |
| | | RN2 | 4.64 | 4.69 | 5 | 5.14 | 10.29 |
| | | RL2 | 3.33 | 3.53 | 3.43 | 3.41 | 6.82 |
| Mass (actuator 100 mm stroke length, without motor, with lubricant) | [kg] | 3.3 | 5 | 8 | 11 | 19 | |
| Extra-mass for each additional 100 mm stroke length | [kg] | 0.3 | 0.5 | 0.8 | 0.9 | 2 | |

Linear actuators UAL Series

4.2 TECHNICAL DATA - acme screw linear actuators UAL Series

| SIZE | | UAL 1 | UAL 2 | UAL 3 | UAL 4 | UAL 5 | |
|--|----------|--------------------|--------------------|--------------------|--------------------|--------------------|-------|
| Push rod diameter | [mm] | 25 | 30 | 35 | 40 | 50 | |
| Outer tube diameter | [mm] | 36 | 45 | 55 | 60 | 70 | |
| Attachment flange for IEC standard motor | | 56 B14 | 63 B14 | 71 B14 | 80 B14 90 B14 | 80 B14 90 B14 | |
| Max. dynamic load | [N] | 1 600 | 2 500 | 5 100 | 8 700 | 10 400 | |
| Max. static load | pull [N] | 4 000 | 6 000 | 10 000 | 12 000 | 15 000 | |
| | push [N] | 4 000 | 6 000 | 10 000 | 12 000 | 15 000 | |
| Ratio | RV | 1 : 1.33 (18 : 24) | 1 : 1.4 (20 : 28) | 1 : 1.04 (24 : 25) | 1 : 1.07 (30 : 32) | 1 : 1.07 (30 : 32) | |
| | RN | 1 : 2.15 (13 : 28) | 1 : 2.13 (15 : 32) | 1 : 2 (16 : 32) | 1 : 1.94 (18 : 35) | 1 : 1.94 (18 : 35) | |
| | RL | 1 : 3 (10 : 30) | 1 : 2.83 (12 : 34) | 1 : 2.92 (12 : 35) | 1 : 2.93 (15 : 44) | 1 : 2.93 (15 : 44) | |
| 1-start acme screw | | Tr 13.5×3 | Tr 16×4 | Tr 18×4 | Tr 22×5 | Tr 30×6 | |
| Linear travel [mm] for 1 input shaft revolution | Ratio | RV1 | 2.25 | 2.86 | 3.84 | 4.69 | 5.63 |
| | | RN1 | 1.39 | 1.88 | 2 | 2.57 | 3.09 |
| | | RL1 | 1 | 1.41 | 1.37 | 1.70 | 2.05 |
| 2-start acme screw | | Tr 14×8 (P4) | Tr 16×8 (P4) | Tr 18×8 (P4) | Tr 22×10 (P5) | Tr 30×12 (P6) | |
| Linear travel [mm] for 1 input shaft revolution | Ratio | RV2 | 6 | 5.71 | 7.68 | 9.38 | 11.25 |
| | | RN2 | 3.71 | 3.75 | 4 | 5.14 | 6.17 |
| | | RL2 | 2.67 | 2.82 | 2.74 | 3.41 | 4.09 |
| Mass (actuator 100 mm stroke length, without motor, with lubricant) | | [kg] | 3.3 | 5 | 8 | 11 | 18 |
| Extra-mass for each additional 100 mm stroke length | | [kg] | 0.3 | 0.5 | 0.8 | 0.9 | 2 |

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA 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 |
|---------------------|---------------------|-------|---|--------------------------|
| UBA 1 | | | | |
| 350 | 290 ¹⁾ | RV2 | 0.12 kW 2-pole 2800 | 0.72 |
| 215 | 460 ¹⁾ | RN2 | 0.12 kW 2-pole 2800 | 0.72 |
| 175 | 570 ¹⁾ | RV1 | 0.12 kW 2-pole 2800 | 0.72 |
| 155 | 650 ¹⁾ | RL2 | 0.12 kW 2-pole 2800 | 0.72 |
| 105 | 950 ¹⁾ | RN1 | 0.12 kW 2-pole 2800 | 0.72 |
| 85 | 800 ¹⁾ | RV1 | 0.09 kW 4-pole 1400 | 0.72 |
| 75 | 1300 ¹⁾ | RL1 | 0.12 kW 2-pole 2800 | 0.72 |
| 55 | 1300 ¹⁾ | RN1 | 0.09 kW 4-pole 1400 | 0.72 |
| 40 | 1800 ³⁾ | RL1 | 0.09 kW 4-pole 1400 | 0.72 |
| UBA 2 | | | | |
| 330 | 600 ¹⁾ | RV2 | 0.25 kW 2-pole 2800 | 0.71 |
| 220 | 900 ¹⁾ | RN2 | 0.25 kW 2-pole 2800 | 0.71 |
| 165 | 1200 ¹⁾ | RL2 | 0.25 kW 2-pole 2800 | 0.71 |
| 110 | 1850 ¹⁾ | RN1 | 0.25 kW 2-pole 2800 | 0.71 |
| 80 | 2450 ¹⁾ | RL1 | 0.25 kW 2-pole 2800 | 0.71 |
| 55 | 2550 ¹⁾ | RN1 | 0.18 kW 4-pole 1400 | 0.71 |
| 40 | 3400 ³⁾ | RL1 | 0.18 kW 4-pole 1400 | 0.71 |
| UBA 3 | | | | |
| 450 | 960 ¹⁾ | RV2 | 0.55 kW 2-pole 2800 | 0.70 |
| 235 | 1850 ¹⁾ | RN2 | 0.55 kW 2-pole 2800 | 0.70 |
| 160 | 2700 ¹⁾ | RL2 | 0.55 kW 2-pole 2800 | 0.70 |
| 115 | 2750 ²⁾ | RN1 | 0.55 kW 2-pole 2800 | 0.70 |
| 80 | 3550 ¹⁾ | RL2 | 0.37 kW 4-pole 1400 | 0.70 |
| 60 | 3450 ²⁾ | RN1 | 0.37 kW 4-pole 1400 | 0.70 |
| 40 | 3900 ²⁾ | RL1 | 0.37 kW 4-pole 1400 | 0.70 |
| UBA 4 | | | | |
| 440 | 1950 ¹⁾ | RV2 | 1.1 kW 2-pole 2800 | 0.70 |
| 240 | 3550 ¹⁾ | RN2 | 1.1 kW 2-pole 2800 | 0.70 |
| 160 | 4700 ²⁾ | RL2 | 1.1 kW 2-pole 2800 | 0.70 |
| 120 | 4800 ¹⁾ | RN2 | 0.75 kW 4-pole 1400 | 0.70 |
| 96 | 4500 ²⁾ | RL1 | 1.1 kW 2-pole 2800 | 0.70 |
| 80 | 5900 ²⁾ | RL2 | 0.75 kW 4-pole 1400 | 0.70 |
| 48 | 5700 ²⁾ | RL1 | 0.75 kW 4-pole 1400 | 0.70 |
| UBA 5 | | | | |
| 875 | 1300 ¹⁾ | RV2 | 1.5 kW 2-pole 2800 | 0.70 |
| 480 | 2400 ¹⁾ | RN2 | 1.5 kW 2-pole 2800 | 0.70 |
| 440 | 2650 ¹⁾ | RV1 | 1.5 kW 2-pole 2800 | 0.70 |
| 320 | 3650 ¹⁾ | RL2 | 1.5 kW 2-pole 2800 | 0.70 |
| 240 | 4800 ¹⁾ | RN1 | 1.5 kW 2-pole 2800 | 0.70 |
| 160 | 7250 ¹⁾ | RL1 | 1.5 kW 2-pole 2800 | 0.70 |
| 120 | 7050 ¹⁾ | RN1 | 1.1 kW 4-pole 1400 | 0.70 |
| 80 | 10650 ¹⁾ | RL1 | 1.1 kW 4-pole 1400 | 0.70 |

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

The total dynamic efficiency (η) of UBA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

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

where:

$\eta_1 = 0.95$ – timing belt transmission efficiency

$\eta_2 = 0.9$ – 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 128)

Linear actuators UAL Series

ACME SCREW LINEAR ACTUATORS UAL 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 |
|------------------------|---------------------|-------|---|-----------------------------|
| UAL 1 | | | | |
| 280 | 300 ¹⁾ | RV2 | 0.12 kW 2-pole 2800 | 0.51 |
| 170 | 450 ¹⁾ | RN2 | 0.12 kW 2-pole 2800 | 0.51 |
| 120 | 600 ¹⁾ | RL2 | 0.12 kW 2-pole 2800 | 0.51 |
| 105 | 600 ¹⁾ | RV1 | 0.12 kW 2-pole 2800 | 0.32 |
| 85 | 600 ¹⁾ | RN2 | 0.09 kW 4-pole 1400 | 0.51 |
| 60 | 860 ¹⁾ | RL2 | 0.09 kW 4-pole 1400 | 0.51 |
| 50 | 800 ¹⁾ | RV1 | 0.09 kW 4-pole 1400 | 0.32 |
| 45 | 1200 ¹⁾ | RL1 | 0.12 kW 2-pole 2800 | 0.32 |
| 32 | 1200 ¹⁾ | RN1 | 0.09 kW 4-pole 1400 | 0.32 |
| 23 | 1600 ²⁾ | RL1 | 0.09 kW 4-pole 1400 | 0.32 |
| UAL 2 | | | | |
| 265 | 650 ¹⁾ | RV2 | 0.25 kW 2-pole 2800 | 0.48 |
| 175 | 950 ¹⁾ | RN2 | 0.25 kW 2-pole 2800 | 0.48 |
| 130 | 1200 ¹⁾ | RL2 | 0.25 kW 2-pole 2800 | 0.48 |
| 87 | 1300 ¹⁾ | RN2 | 0.18 kW 4-pole 1400 | 0.48 |
| 65 | 1950 ¹⁾ | RL1 | 0.25 kW 2-pole 2800 | 0.35 |
| 43 | 2000 ¹⁾ | RN1 | 0.18 kW 4-pole 1400 | 0.35 |
| 32 | 2500 ²⁾ | RL1 | 0.18 kW 4-pole 1400 | 0.35 |
| UAL 3 | | | | |
| 360 | 1000 ¹⁾ | RV2 | 0.55 kW 2-pole 2800 | 0.46 |
| 180 | 1850 ¹⁾ | RN2 | 0.55 kW 2-pole 2800 | 0.46 |
| 130 | 2600 ¹⁾ | RL2 | 0.55 kW 2-pole 2800 | 0.46 |
| 90 | 3000 ¹⁾ | RN1 | 0.55 kW 2-pole 2800 | 0.32 |
| 64 | 4100 ¹⁾ | RL1 | 0.55 kW 2-pole 2800 | 0.32 |
| 46 | 3650 ¹⁾ | RN1 | 0.37 kW 4-pole 1400 | 0.32 |
| 32 | 5100 ²⁾ | RL1 | 0.37 kW 4-pole 1400 | 0.32 |
| UAL 4 | | | | |
| 440 | 1700 ¹⁾ | RV2 | 1.1 kW 2-pole 2800 | 0.46 |
| 240 | 3000 ¹⁾ | RN2 | 1.1 kW 2-pole 2800 | 0.46 |
| 160 | 4300 ¹⁾ | RL2 | 1.1 kW 2-pole 2800 | 0.46 |
| 120 | 5000 ¹⁾ | RN1 | 1.1 kW 2-pole 2800 | 0.32 |
| 80 | 7000 ¹⁾ | RL1 | 1.1 kW 2-pole 2800 | 0.32 |
| 60 | 6200 ¹⁾ | RN1 | 0.75 kW 4-pole 1400 | 0.32 |
| 40 | 8700 ²⁾ | RL1 | 0.75 kW 4-pole 1400 | 0.32 |
| UAL 5 | | | | |
| 529 | 2000 ¹⁾ | RV2 | 1.5 kW 2-pole 2800 | 0.44 |
| 292 | 3350 ¹⁾ | RN2 | 1.5 kW 2-pole 2800 | 0.44 |
| 265 | 3350 ¹⁾ | RV1 | 1.5 kW 2-pole 2800 | 0.30 |
| 193 | 4800 ¹⁾ | RL2 | 1.5 kW 2-pole 2800 | 0.44 |
| 146 | 5500 ¹⁾ | RN1 | 1.5 kW 2-pole 2800 | 0.30 |
| 97 | 7800 ¹⁾ | RL1 | 1.5 kW 2-pole 2800 | 0.30 |
| 72 | 7300 ¹⁾ | RN1 | 1.1 kW 4-pole 1400 | 0.30 |
| 48 | 10400 ²⁾ | RL1 | 1.1 kW 4-pole 1400 | 0.30 |

1) value limited by electric motor power

The total dynamic efficiency (η) of UAL Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

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

where:

$\eta_1 = 0.95$ – timing belt transmission efficiency

η_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 129)

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA 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 |
|---------------------|--------------------|-------|---|--------------------------|
| UBA 1 | | | | |
| 350 | 250 ¹⁾ | RV2 | 0.12 kW 2-pole 2800 | 0.72 |
| 215 | 400 ¹⁾ | RN2 | 0.12 kW 2-pole 2800 | 0.72 |
| 175 | 500 ¹⁾ | RV1 | 0.12 kW 2-pole 2800 | 0.72 |
| 155 | 600 ¹⁾ | RL2 | 0.12 kW 2-pole 2800 | 0.72 |
| 105 | 850 ¹⁾ | RN1 | 0.12 kW 2-pole 2800 | 0.72 |
| 85 | 750 ¹⁾ | RV1 | 0.09 kW 4-pole 1400 | 0.72 |
| 75 | 1200 ¹⁾ | RL1 | 0.12 kW 2-pole 2800 | 0.72 |
| 55 | 1300 ¹⁾ | RN1 | 0.09 kW 4-pole 1400 | 0.72 |
| 40 | 1800 ³⁾ | RL1 | 0.09 kW 4-pole 1400 | 0.72 |
| UBA 2 | | | | |
| 330 | 550 ¹⁾ | RV2 | 0.25 kW 2-pole 2800 | 0.71 |
| 220 | 850 ¹⁾ | RN2 | 0.25 kW 2-pole 2800 | 0.71 |
| 165 | 1100 ¹⁾ | RL2 | 0.25 kW 2-pole 2800 | 0.71 |
| 110 | 1650 ¹⁾ | RN1 | 0.25 kW 2-pole 2800 | 0.71 |
| 80 | 2300 ¹⁾ | RL1 | 0.25 kW 2-pole 2800 | 0.71 |
| 55 | 2550 ¹⁾ | RN1 | 0.18 kW 4-pole 1400 | 0.71 |
| 40 | 3400 ³⁾ | RL1 | 0.18 kW 4-pole 1400 | 0.71 |
| UBA 3 | | | | |
| 450 | 960 ¹⁾ | RV2 | 0.55 kW 2-pole 2800 | 0.70 |
| 235 | 1850 ¹⁾ | RN2 | 0.55 kW 2-pole 2800 | 0.70 |
| 160 | 2700 ¹⁾ | RL2 | 0.55 kW 2-pole 2800 | 0.70 |
| 115 | 2750 ²⁾ | RN1 | 0.55 kW 2-pole 2800 | 0.70 |
| 80 | 3550 ¹⁾ | RL2 | 0.37 kW 4-pole 1400 | 0.70 |
| 60 | 3450 ²⁾ | RN1 | 0.37 kW 4-pole 1400 | 0.70 |
| 40 | 3900 ²⁾ | RL1 | 0.37 kW 4-pole 1400 | 0.70 |
| UBA 4 | | | | |
| 440 | 1900 ¹⁾ | RV2 | 1.1 kW 2-pole 2800 | 0.70 |
| 240 | 3500 ¹⁾ | RN2 | 1.1 kW 2-pole 2800 | 0.70 |
| 160 | 4700 ²⁾ | RL2 | 1.1 kW 2-pole 2800 | 0.70 |
| 120 | 4800 ¹⁾ | RN2 | 0.75 kW 4-pole 1400 | 0.70 |
| 96 | 4500 ²⁾ | RL1 | 1.1 kW 2-pole 2800 | 0.70 |
| 80 | 5900 ²⁾ | RL2 | 0.75 kW 4-pole 1400 | 0.70 |
| 48 | 5700 ²⁾ | RL1 | 0.75 kW 4-pole 1400 | 0.70 |

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

The total dynamic efficiency (η) of UBA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

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

where:

$\eta_1 = 0.95$ – timing belt transmission efficiency

$\eta_2 = 0.9$ – 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 128)

Linear actuators UAL Series

ACME SCREW LINEAR ACTUATORS UAL Series with AC 1-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 |
|------------------------|---------------------|-------|---|-----------------------------|
| UAL 1 | | | | |
| 280 | 300 ¹⁾ | RV2 | 0.12 kW 2-pole 2800 | 0.51 |
| 170 | 450 ¹⁾ | RN2 | 0.12 kW 2-pole 2800 | 0.51 |
| 120 | 600 ¹⁾ | RL2 | 0.12 kW 2-pole 2800 | 0.51 |
| 105 | 600 ¹⁾ | RV1 | 0.12 kW 2-pole 2800 | 0.32 |
| 85 | 600 ¹⁾ | RN2 | 0.09 kW 4-pole 1400 | 0.51 |
| 60 | 860 ¹⁾ | RL2 | 0.09 kW 4-pole 1400 | 0.51 |
| 50 | 800 ¹⁾ | RV1 | 0.09 kW 4-pole 1400 | 0.32 |
| 45 | 1200 ¹⁾ | RL1 | 0.12 kW 2-pole 2800 | 0.32 |
| 32 | 1200 ¹⁾ | RN1 | 0.09 kW 4-pole 1400 | 0.32 |
| 23 | 1600 ²⁾ | RL1 | 0.09 kW 4-pole 1400 | 0.32 |
| UAL 2 | | | | |
| 265 | 600 ¹⁾ | RV2 | 0.25 kW 2-pole 2800 | 0.48 |
| 175 | 850 ¹⁾ | RN2 | 0.25 kW 2-pole 2800 | 0.48 |
| 130 | 1100 ¹⁾ | RL2 | 0.25 kW 2-pole 2800 | 0.48 |
| 87 | 1200 ¹⁾ | RN2 | 0.18 kW 4-pole 1400 | 0.48 |
| 65 | 1800 ¹⁾ | RL1 | 0.25 kW 2-pole 2800 | 0.35 |
| 43 | 2000 ¹⁾ | RN1 | 0.18 kW 4-pole 1400 | 0.35 |
| 32 | 2500 ²⁾ | RL1 | 0.18 kW 4-pole 1400 | 0.35 |
| UAL 3 | | | | |
| 360 | 900 ¹⁾ | RV2 | 0.55 kW 2-pole 2800 | 0.46 |
| 180 | 1650 ¹⁾ | RN2 | 0.55 kW 2-pole 2800 | 0.46 |
| 130 | 2350 ¹⁾ | RL2 | 0.55 kW 2-pole 2800 | 0.46 |
| 90 | 2700 ¹⁾ | RN1 | 0.55 kW 2-pole 2800 | 0.32 |
| 64 | 3700 ¹⁾ | RL1 | 0.55 kW 2-pole 2800 | 0.32 |
| 46 | 3300 ¹⁾ | RN1 | 0.37 kW 4-pole 1400 | 0.32 |
| 32 | 4600 ¹⁾ | RL1 | 0.37 kW 4-pole 1400 | 0.32 |
| UAL 4 | | | | |
| 440 | 1550 ¹⁾ | RV2 | 1.1 kW 2-pole 2800 | 0.46 |
| 240 | 2700 ¹⁾ | RN2 | 1.1 kW 2-pole 2800 | 0.46 |
| 160 | 3900 ¹⁾ | RL2 | 1.1 kW 2-pole 2800 | 0.46 |
| 120 | 4500 ¹⁾ | RN1 | 1.1 kW 2-pole 2800 | 0.32 |
| 80 | 6300 ¹⁾ | RL1 | 1.1 kW 2-pole 2800 | 0.32 |
| 60 | 5600 ¹⁾ | RN1 | 0.75 kW 4-pole 1400 | 0.32 |
| 40 | 7900 ¹⁾ | RL1 | 0.75 kW 4-pole 1400 | 0.32 |

1) value limited by electric motor power

The total dynamic efficiency (η) of UAL Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

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

where:

$\eta_1 = 0.95$ – timing belt transmission efficiency

η_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 129)

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA 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 | MOTOR: POWER [kW] – N° of POLES SPEED [rpm] | SELF-LOCKING COEFFICIENT |
|---|---------------------|-------|---|-----------------------------|
| UBA 1 with DC motor 24 V 3000 rpm 150 W 8.4 A | | | | |
| 375 | 300 ¹⁾ | RV2 | 9 | 0.72 |
| 230 | 500 ¹⁾ | RN2 | 9 | 0.72 |
| 165 | 700 ¹⁾ | RL2 | 9 | 0.72 |
| 115 | 1000 ¹⁾ | RN1 | 9 | 0.72 |
| 85 | 1400 ¹⁾ | RL1 | 9 | 0.72 |
| UBA 2 with DC motor 24 V 3000 rpm 300 W 15.6 A | | | | |
| 360 | 650 ¹⁾ | RV2 | 16 | 0.71 |
| 235 | 1000 ¹⁾ | RN2 | 16 | 0.71 |
| 175 | 1300 ¹⁾ | RL2 | 16 | 0.71 |
| 120 | 2000 ¹⁾ | RN1 | 16 | 0.71 |
| 90 | 2600 ²⁾ | RL1 | 16 | 0.71 |
| UBA 3 with DC motor 24 V 3000 rpm 500 W 25 A | | | | |
| 480 | 800 ¹⁾ | RV2 | 26 | 0.70 |
| 240 | 1600 ¹⁾ | RV1 | 26 | 0.70 |
| 170 | 2250 ¹⁾ | RL2 | 26 | 0.70 |
| 125 | 2700 ²⁾ | RN1 | 22 | 0.70 |
| 85 | 3050 ²⁾ | RL1 | 17.5 (*) | 0.70 |
| * - performances with DC motor 24 V 3000 rpm 300 W | | | | |
| UBA 4 with DC motor 90 V 3000 rpm 750 W 10.6 A | | | | |
| 470 | 1250 ¹⁾ | RV2 | 11 | 0.70 |
| 260 | 2250 ¹⁾ | RN2 | 11 | 0.70 |
| 155 | 3750 ¹⁾ | RN1 | 11 | 0.70 |
| 100 | 4400 ²⁾ | RL1 | 8.5 | 0.70 |

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

The total dynamic efficiency (η) of UBA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

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

where:

$\eta_1 = 0.95$ – timing belt transmission efficiency

$\eta_2 = 0.9$ – 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 128)

Linear actuators UAL Series

ACME SCREW LINEAR ACTUATORS UAL 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 | MOTOR: POWER [kW] – N° of POLES SPEED [rpm] | SELF-LOCKING COEFFICIENT |
|---|---------------------|-------|---|-----------------------------|
| UAL 1 with DC motor 24 V 3000 rpm 150 W 8.4 A | | | | |
| 300 | 350 ¹⁾ | RV2 | 9 | 0.51 |
| 185 | 500 ¹⁾ | RN2 | 9 | 0.51 |
| 130 | 700 ¹⁾ | RL2 | 9 | 0.51 |
| 112 | 700 ¹⁾ | RV1 | 9 | 0.32 |
| 70 | 1000 ¹⁾ | RN1 | 9 | 0.32 |
| 50 | 1400 ¹⁾ | RL1 | 9 | 0.32 |
| UAL 2 with DC motor 24 V 3000 rpm 300 W 15.6 A | | | | |
| 285 | 700 ¹⁾ | RV2 | 16 | 0.48 |
| 185 | 1050 ¹⁾ | RN2 | 16 | 0.48 |
| 140 | 1350 ¹⁾ | RL2 | 16 | 0.48 |
| 93 | 1700 ¹⁾ | RN1 | 16 | 0.35 |
| 70 | 2200 ¹⁾ | RL1 | 16 | 0.35 |
| UAL 3 with DC motor 24 V 3000 rpm 500 W 25 A | | | | |
| 384 | 900 ¹⁾ | RV2 | 26 | 0.46 |
| 200 | 1600 ¹⁾ | RN2 | 26 | 0.46 |
| 137 | 2300 ¹⁾ | RL2 | 26 | 0.46 |
| 100 | 2600 ¹⁾ | RN1 | 26 | 0.32 |
| 68 | 3600 ¹⁾ | RL1 | 26 | 0.32 |
| UAL 4 with DC motor 90 V 3000 rpm 750 W 10.6 A | | | | |
| 470 | 1100 ¹⁾ | RV2 | 11 | 0.46 |
| 250 | 2000 ¹⁾ | RN2 | 12 | 0.46 |
| 170 | 2750 ¹⁾ | RL2 | 11 | 0.46 |
| 125 | 3150 ¹⁾ | RN1 | 11 | 0.32 |
| 85 | 4500 ¹⁾ | RL1 | 11 | 0.32 |

1) value limited by electric motor power

The total dynamic efficiency (η) of UAL Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

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

where:

$\eta_1 = 0.95$ – timing belt transmission efficiency

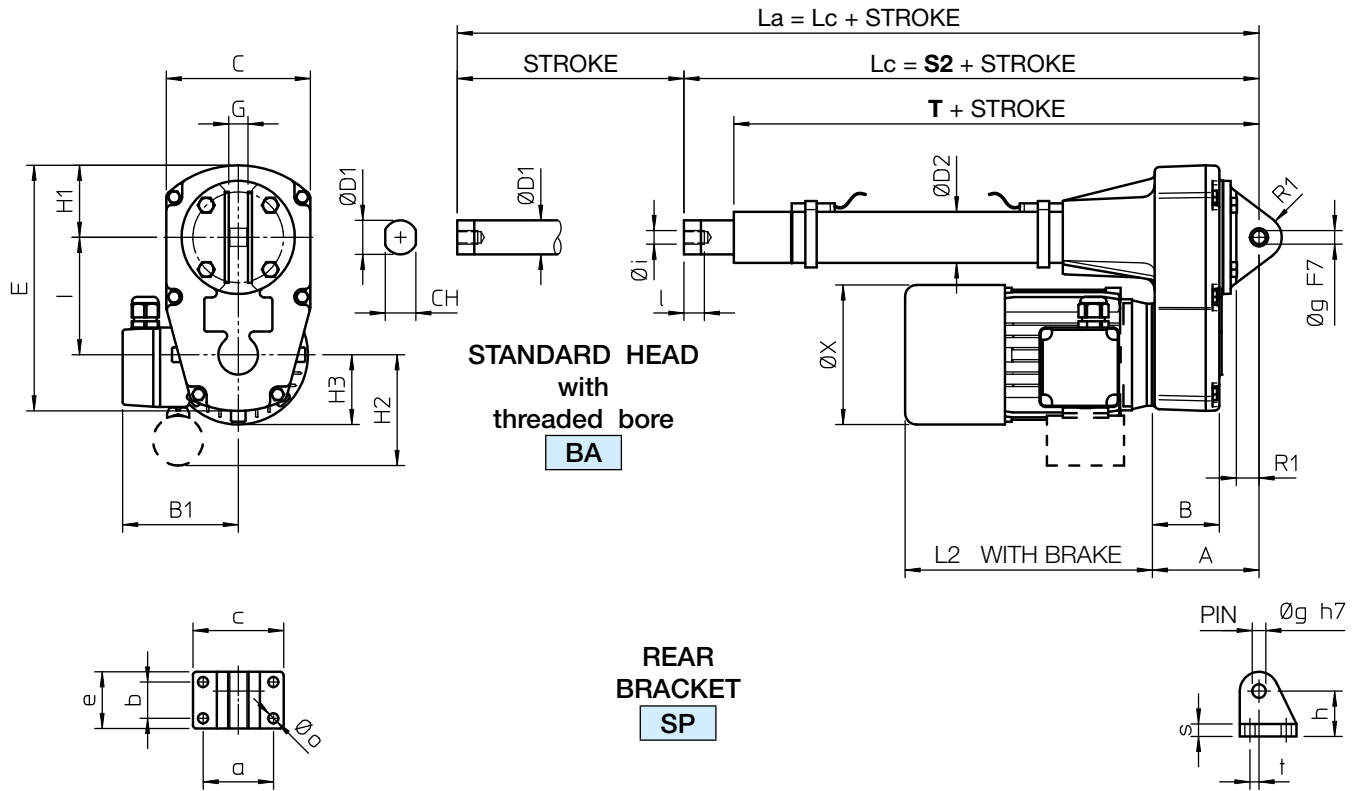
η_2 – acme screw-bronze nut dynamic efficiency, calculated with reference to the speed

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

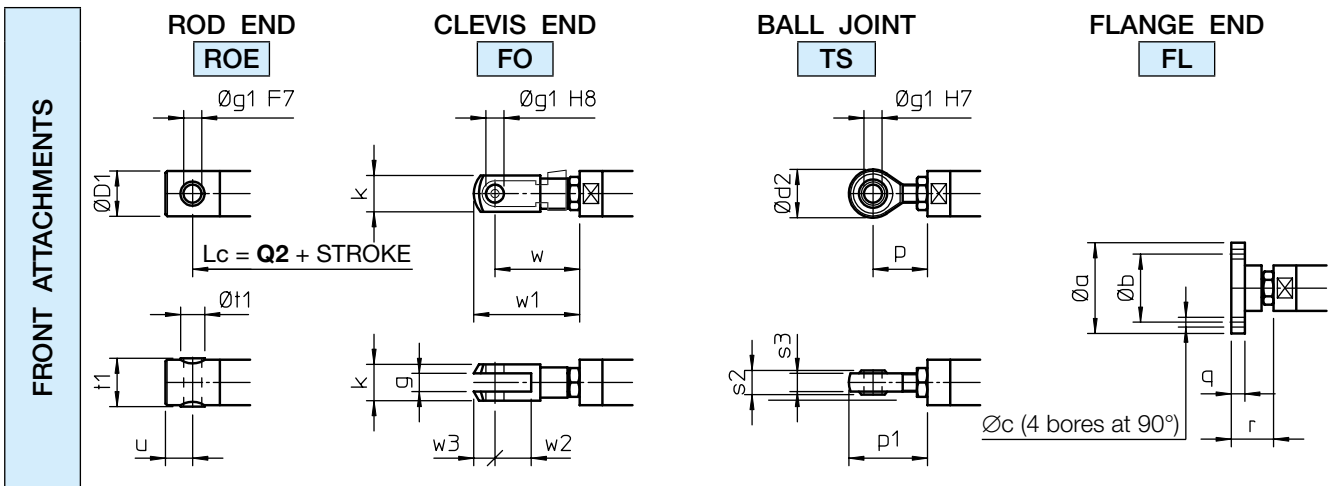
2) limit value of linear actuator dynamic load capacity (see page 129)

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA Series, size 1 – 2 – 3 – 4
 AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Switches FCM

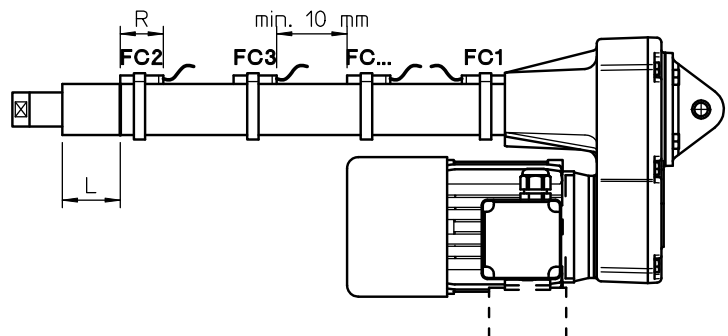


Lc - RETRACTED ACTUATOR length
 La - EXTENDED ACTUATOR length



MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

| | L | |
|-------|-------------------------------|----|
| | REED CONTACT NC or (NC+NO) | NO |
| UBA 1 | 42 | 47 |
| UBA 2 | 51 | 56 |
| UBA 3 | 59 | 64 |
| UBA 4 | 69 | 74 |



Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA Series, size 1 – 2 – 3 – 4
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 |
|-------|-----|-------------|------|------|------|------|------|------|------|------|-----|-----|-----|
| UBA 1 | R_1 | STROKE [mm] | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 287 | 250 | 287 |
| | R_2 | | | | | | | | | | 303 | 266 | 303 |
| UBA 2 | R_1 | | | | | | | | | | 307 | 263 | 310 |
| | R_2 | | | | | | | | | | 330 | 286 | 333 |
| UBA 3 | R_1 | | | | | | | | | | 342 | 296 | 348 |
| | R_2 | | | | | | | | | | 367 | 321 | 373 |
| UBA 4 | R_1 | | | | | | | | | | 406 | 352 | 418 |
| | R_2 | | | | | | | | | | 419 | 365 | 431 |

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 | E | G | H1 | H2 | H3 | I | L2 |
|-------|-----|----|-----|-----|----|------|------|-----|----|----|----|----|-----|-----|
| UBA 1 | 85 | 52 | 110 | 114 | 22 | 25 | 36 | 189 | 15 | 58 | 75 | 55 | 90 | 193 |
| UBA 2 | 94 | 60 | 115 | 127 | 27 | 30 | 45 | 217 | 17 | 64 | 90 | 62 | 104 | 229 |
| UBA 3 | 106 | 71 | 124 | 135 | 30 | 35 | 55 | 247 | 20 | 68 | 90 | 75 | 121 | 304 |
| UBA 4 | 120 | 77 | 141 | 161 | 36 | 40 | 60 | 293 | 24 | 81 | 95 | 90 | 138 | 340 |

| | R1 | ∅ X | a | b | c | e | ∅ g | h | ∅ i | l | ∅ o | r1 | s | t |
|-------|----|-----|----|----|-----|----|-----|----|----------|----|-----|----|----|----|
| UBA 1 | 17 | 110 | 54 | 28 | 73 | 46 | 10 | 36 | M10×1.5 | 17 | 9 | 18 | 10 | 4 |
| UBA 2 | 20 | 123 | 62 | 32 | 80 | 50 | 12 | 40 | M12×1.75 | 18 | 9 | 20 | 11 | 8 |
| UBA 3 | 20 | 150 | 72 | 38 | 90 | 58 | 14 | 45 | M14×2 | 24 | 9 | 22 | 12 | 8 |
| UBA 4 | 22 | 170 | 85 | 55 | 110 | 81 | 20 | 58 | M20×1.5 | 27 | 11 | 29 | 15 | 15 |

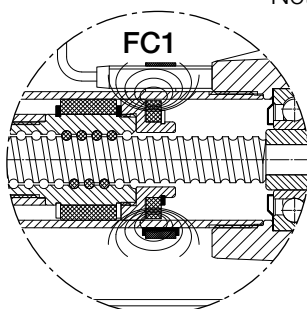
4

FRONT ATTACHMENT Dimensions

| | ∅ a | ∅ b | ∅ c | ∅ D1 | ∅ d2 | g | ∅ g1 | k | p | p1 |
|-------|-----|-----|-----|------|------|----|------|----|----|----|
| UBA 1 | 55 | 40 | 5.5 | 25 | 28 | 10 | 10 | 20 | 31 | 45 |
| UBA 2 | 60 | 45 | 6.5 | 30 | 32 | 12 | 12 | 24 | 36 | 52 |
| UBA 3 | 65 | 50 | 6.5 | 35 | 36 | 14 | 14 | 27 | 36 | 54 |
| UBA 4 | 80 | 60 | 8.5 | 40 | 50 | 20 | 20 | 40 | 53 | 78 |

| | q | r | s2 | s3 | t1 | ∅ t1 | u | w | w1 | w2 | w3 |
|-------|----|----|----|----|----|------|----|----|-----|----|----|
| UBA 1 | 8 | 27 | 14 | 11 | 26 | 14 | 15 | 49 | 61 | 20 | 12 |
| UBA 2 | 9 | 28 | 16 | 12 | 32 | 16 | 18 | 56 | 70 | 24 | 14 |
| UBA 3 | 9 | 32 | 19 | 14 | 36 | 18 | 21 | 65 | 81 | 28 | 16 |
| UBA 4 | 10 | 42 | 25 | 18 | 42 | 25 | 27 | 90 | 115 | 40 | 25 |

MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions



Note: - Additional extra magnetic REED SWITCHES are available for intermediate positions.

- The minimum distance between the REED SWITCHES must be of at least 10 mm.

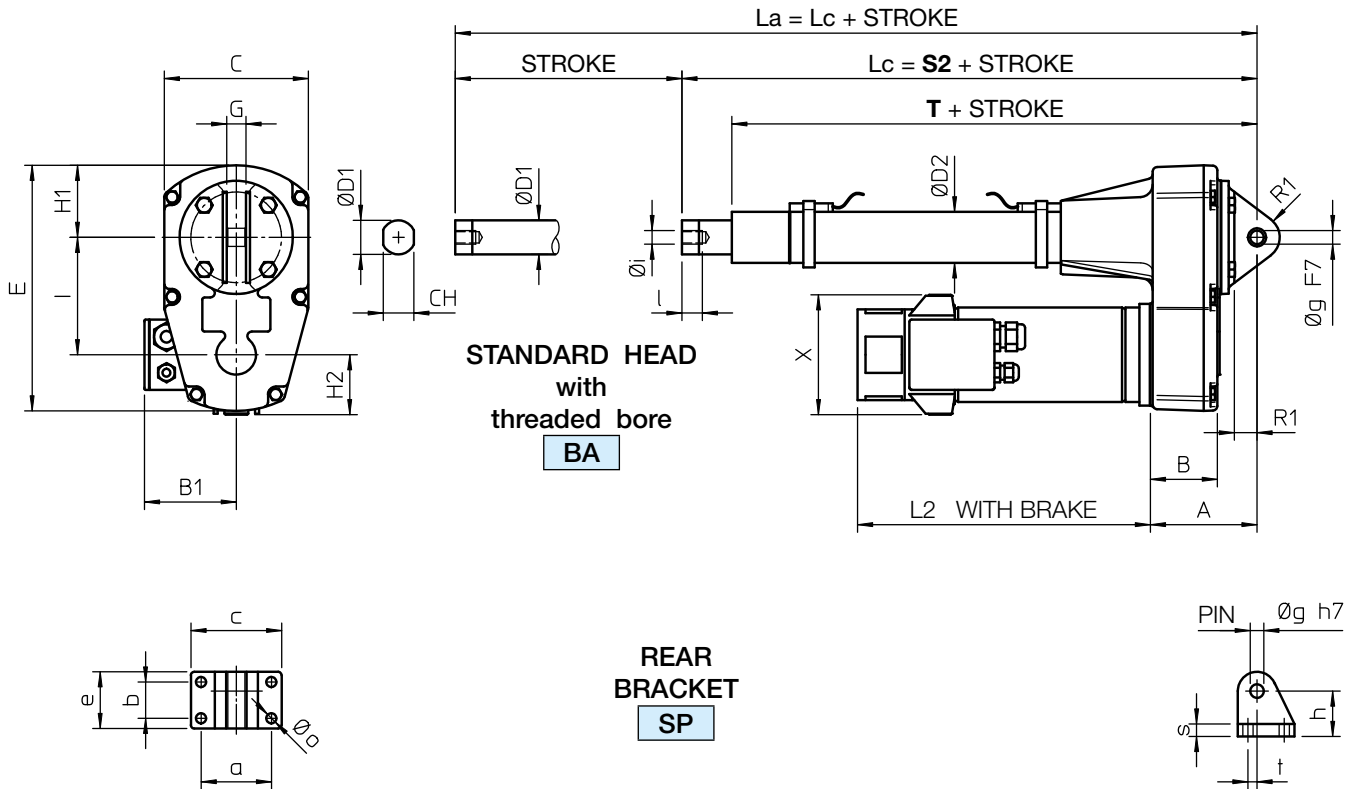
- REED SWITCH Normally Closed (NC) R = 39 mm

- REED SWITCH Change-over (NC+NO) R = 39 mm

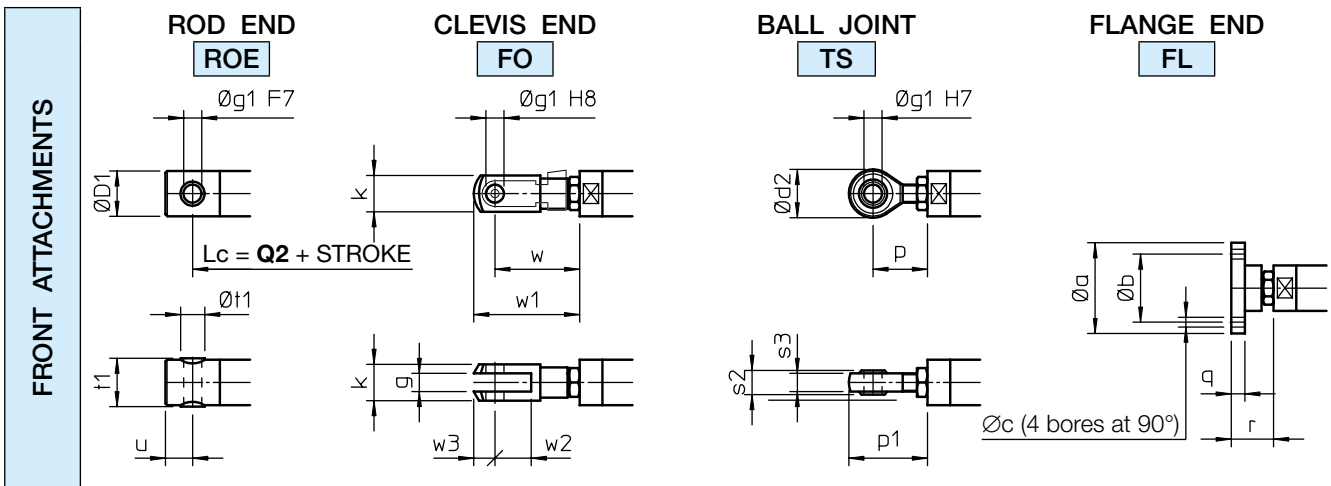
- REED SWITCH Normally Open (NO) R = 29 mm

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA Series, size 1 – 2 – 3 – 4
DC MOTOR – with Magnetic Stroke Limit Switches FCM

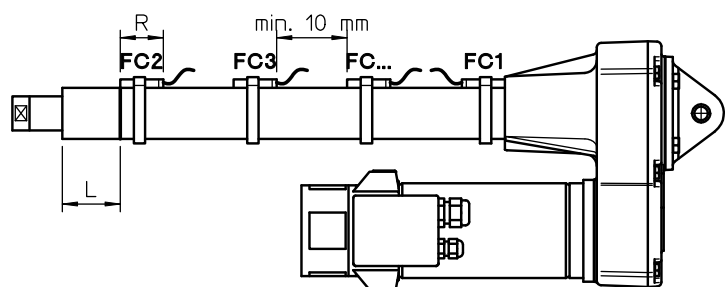


Lc - RETRACTED ACTUATOR length
La - EXTENDED ACTUATOR length



MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

| | L | |
|-------|-------------------------------|----|
| | REED CONTACT NC or (NC+NO) | NO |
| UBA 1 | 42 | 47 |
| UBA 2 | 51 | 56 |
| UBA 3 | 59 | 64 |
| UBA 4 | 69 | 74 |



Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA Series, size 1 – 2 – 3 – 4
DC MOTOR – with Magnetic Stroke Limit Switches FCM
STANDARD STROKE LENGTHS

| | | STROKE CODE | C100 | C200 | C300 | C400 | C500 | C600 | C700 | C800 | S2 | T | Q2 |
|-------|-----|-------------|------|------|------|------|------|------|------|------|-----|-----|-----|
| UBA 1 | R_1 | STROKE [mm] | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 287 | 250 | 287 |
| | R_2 | | | | | | | | | | 303 | 266 | 303 |
| UBA 2 | R_1 | | | | | | | | | | 307 | 263 | 310 |
| | R_2 | | | | | | | | | | 330 | 286 | 333 |
| UBA 3 | R_1 | | | | | | | | | | 342 | 296 | 348 |
| | R_2 | | | | | | | | | | 367 | 321 | 373 |
| UBA 4 | R_1 | | | | | | | | | | 406 | 352 | 418 |
| | R_2 | | | | | | | | | | 419 | 365 | 431 |

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 | E | G | H1 | H2 | H3 | I | L2 |
|-------|-----|----|-----|-----|----|------|------|-----|----|----|----|----|-----|-----|
| UBA 1 | 85 | 52 | 80 | 114 | 22 | 25 | 36 | 189 | 15 | 58 | 75 | 55 | 90 | 193 |
| UBA 2 | 94 | 60 | 80 | 127 | 27 | 30 | 45 | 217 | 17 | 64 | 90 | 62 | 104 | 229 |
| UBA 3 | 106 | 71 | 80 | 135 | 30 | 35 | 55 | 247 | 20 | 68 | 90 | 75 | 121 | 304 |
| UBA 4 | 120 | 77 | 118 | 161 | 36 | 40 | 60 | 293 | 24 | 81 | 95 | 90 | 138 | 340 |

| | R1 | X | a | b | c | e | ∅ g | h | ∅ i | l | ∅ o | r1 | s | t |
|-------|----|-----|----|----|-----|----|-----|----|----------|----|-----|----|----|----|
| UBA 1 | 17 | 107 | 54 | 28 | 73 | 46 | 10 | 36 | M10×1.5 | 17 | 9 | 18 | 10 | 4 |
| UBA 2 | 20 | 107 | 62 | 32 | 80 | 50 | 12 | 40 | M12×1.75 | 18 | 9 | 20 | 11 | 8 |
| UBA 3 | 20 | 107 | 72 | 38 | 90 | 58 | 14 | 45 | M14×2 | 24 | 9 | 22 | 12 | 8 |
| UBA 4 | 22 | 138 | 85 | 55 | 110 | 81 | 20 | 58 | M20×1.5 | 27 | 11 | 29 | 15 | 15 |

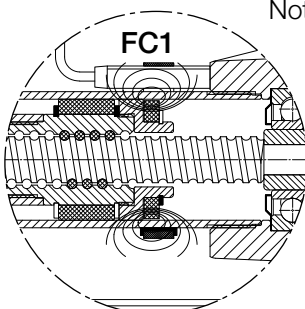
4

FRONT ATTACHMENT Dimensions

| | ∅ a | ∅ b | ∅ c | ∅ D1 | ∅ d2 | g | ∅ g1 | k | p | p1 |
|-------|-----|-----|-----|------|------|----|------|----|----|----|
| UBA 1 | 55 | 40 | 5.5 | 25 | 28 | 10 | 10 | 20 | 31 | 45 |
| UBA 2 | 60 | 45 | 6.5 | 30 | 32 | 12 | 12 | 24 | 36 | 52 |
| UBA 3 | 65 | 50 | 6.5 | 35 | 36 | 14 | 14 | 27 | 36 | 54 |
| UBA 4 | 80 | 60 | 8.5 | 40 | 50 | 20 | 20 | 40 | 53 | 78 |

| | q | r | s2 | s3 | t1 | ∅ t1 | u | w | w1 | w2 | w3 |
|-------|----|----|----|----|----|------|----|----|-----|----|----|
| UBA 1 | 8 | 27 | 14 | 11 | 26 | 14 | 15 | 49 | 61 | 20 | 12 |
| UBA 2 | 9 | 28 | 16 | 12 | 32 | 16 | 18 | 56 | 70 | 24 | 14 |
| UBA 3 | 9 | 32 | 19 | 14 | 36 | 18 | 21 | 65 | 81 | 28 | 16 |
| UBA 4 | 10 | 42 | 25 | 18 | 42 | 25 | 27 | 90 | 115 | 40 | 25 |

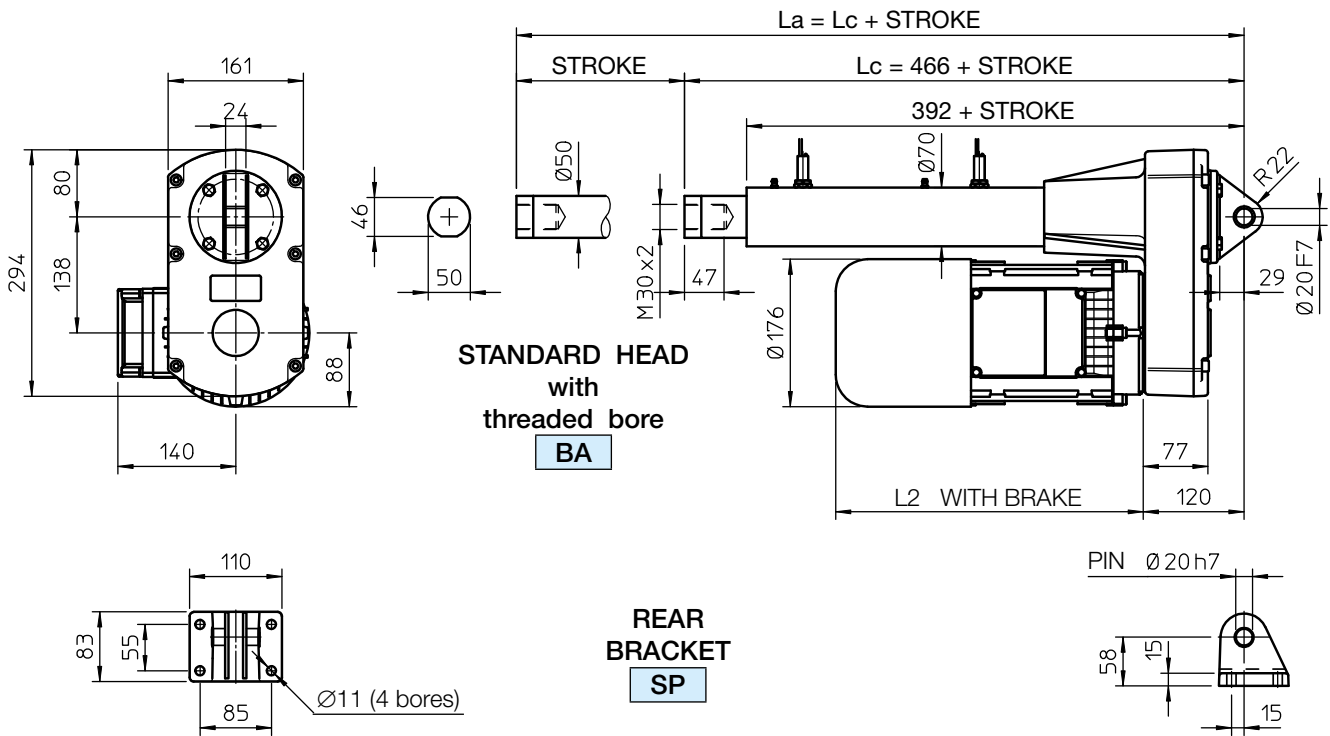
MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions



- Note: - 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 |

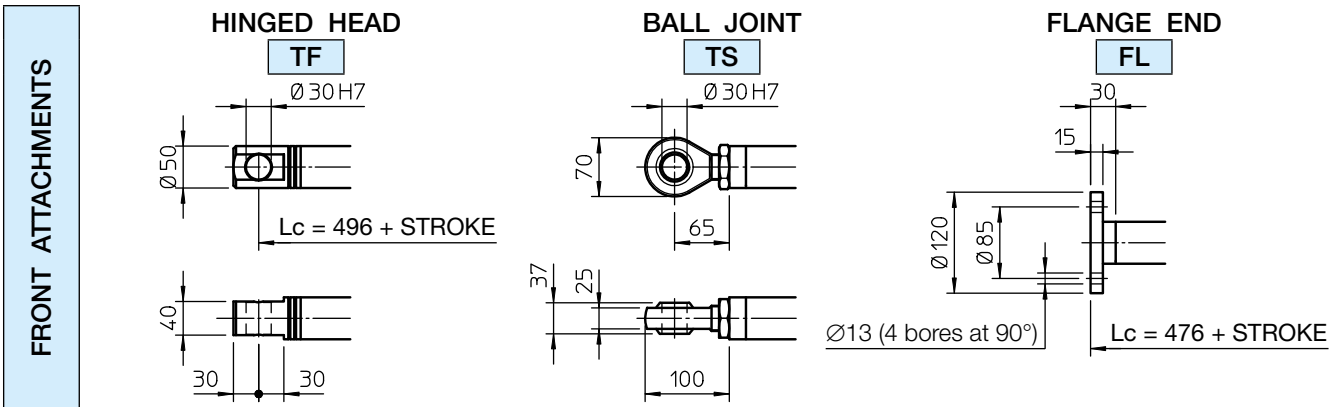
Linear actuators UBA Series

BALL SCREW LINEAR ACTUATOR UBA 5 AC 3-phase MOTOR — with Proximity Stroke Limit Switches FCP



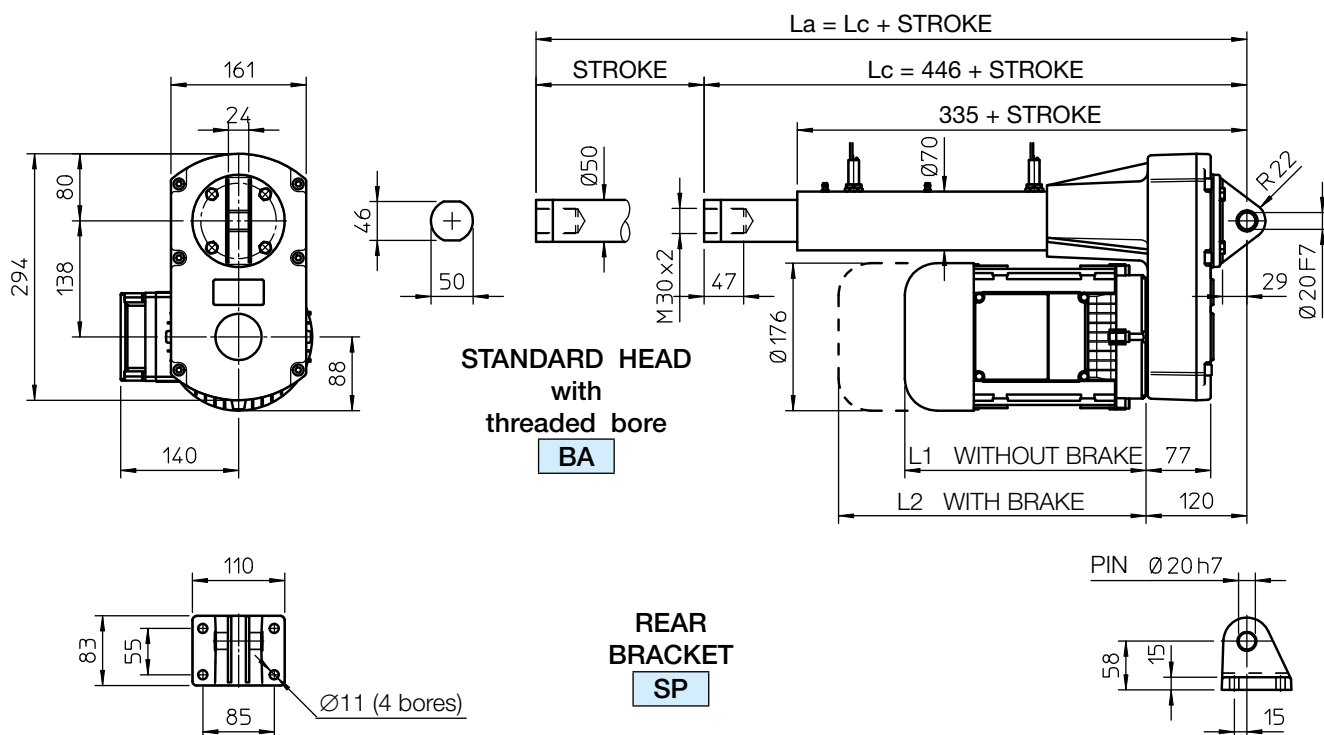
L_c - RETRACTED ACTUATOR length
 L_a - EXTENDED ACTUATOR length

NOTE: The STROKE that the actuator can perform corresponds to the STROKE CODE of the ordering code (STROKE CODE C100 means STROKE = 100 mm)
 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. The length L_c shall be considered increased by 200 mm for stroke lengths up to 1500 mm.
 For stroke lengths longer than 1500 mm please contact SERVOMECH.



Linear actuators UAL Series

ACME SCREW LINEAR ACTUATOR UAL 5 AC 3-phase MOTOR – with Proximity Stroke Limit Switches FCP

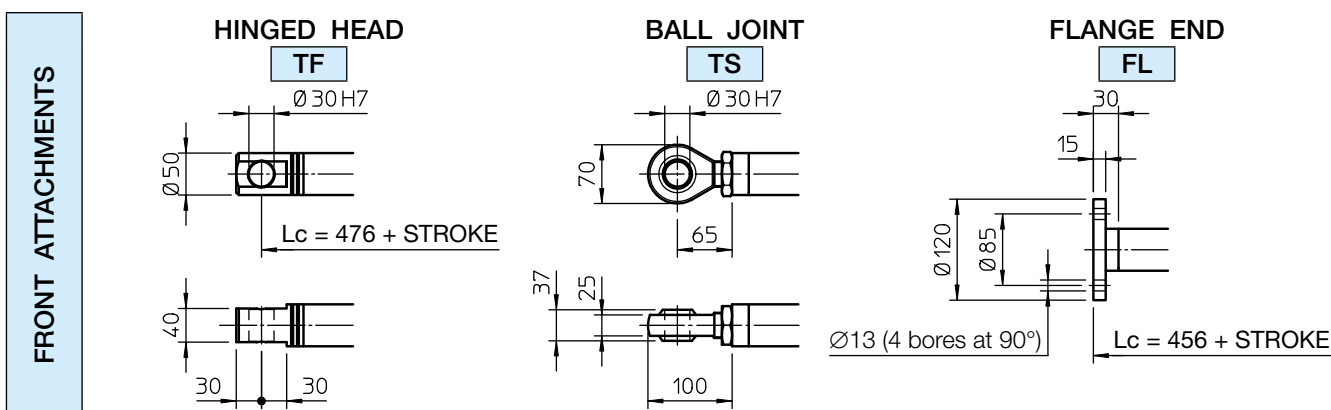


Lc - RETRACTED ACTUATOR length
 La - EXTENDED ACTUATOR length

NOTE: The STROKE that the actuator can perform corresponds to the STROKE CODE of the ordering code (STROKE CODE C100 means STROKE = 100 mm)

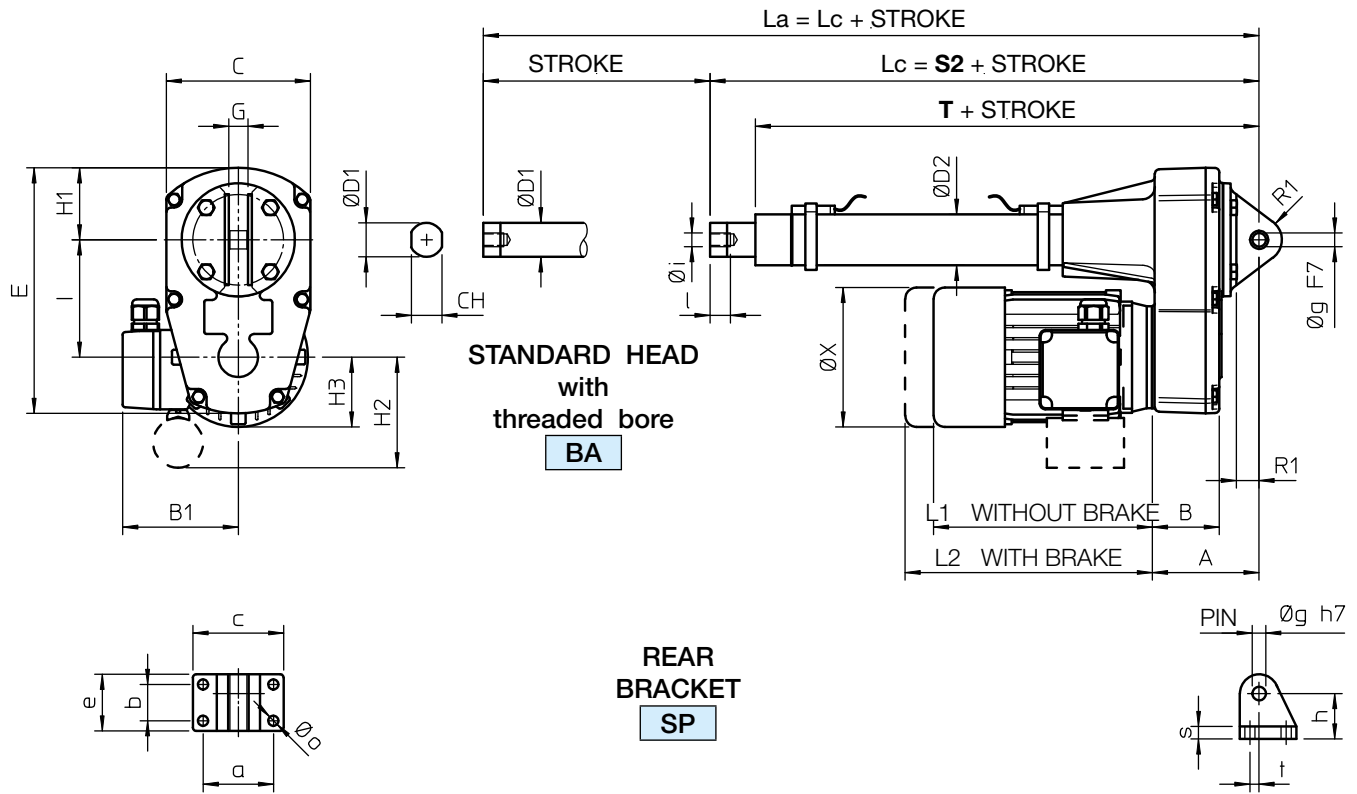
For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. The length Lc shall be considered increased by 200 mm for stroke lengths up to 1500 mm.

For stroke lengths longer than 1500 mm please contact SERVOMECH.

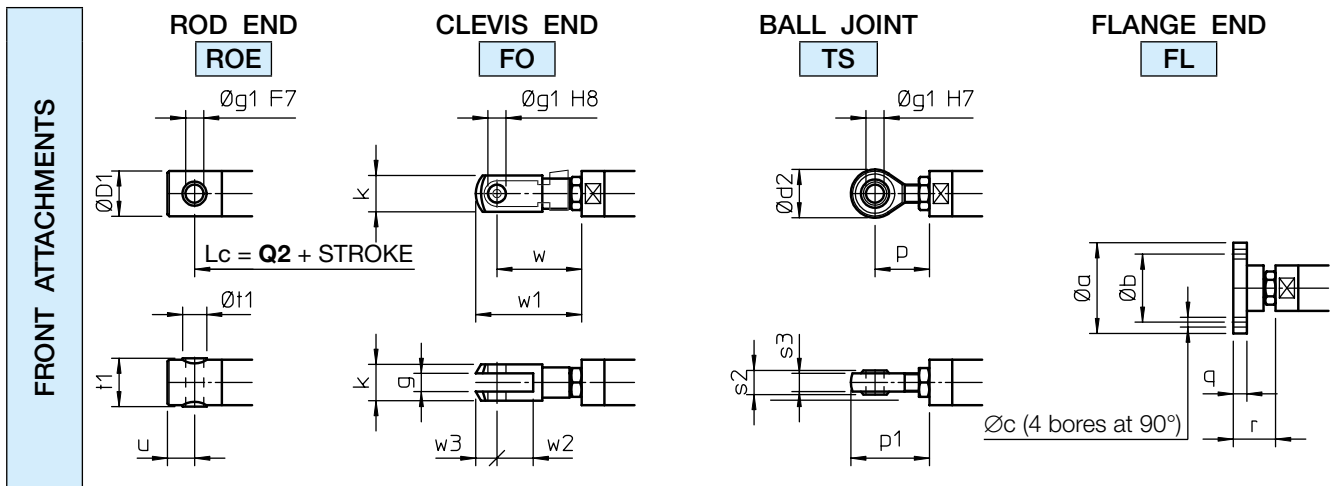


Linear actuators UAL Series

ACME SCREW LINEAR ACTUATORS UAL Series, size 1 – 2 – 3 – 4
 AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Switches FCM

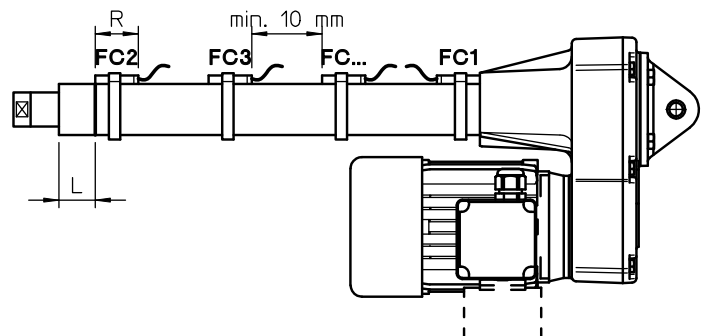


Lc - RETRACTED ACTUATOR length
 La - EXTENDED ACTUATOR length



MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

| | L | |
|-------|-------------------------------|----|
| | REED CONTACT NC or (NC+NO) | NO |
| UAL 1 | 42 | 47 |
| UAL 2 | 51 | 56 |
| UAL 3 | 59 | 64 |
| UAL 4 | 69 | 74 |



Linear actuators UAL Series

ACME SCREW LINEAR ACTUATORS UAL Series, size 1 – 2 – 3 – 4
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 |
|-------|-------------|------|------|------|------|------|------|------|------|-----|-----|-----|
| UAL 1 | STROKE [mm] | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 265 | 232 | 265 |
| UAL 2 | | | | | | | | | | 284 | 244 | 287 |
| UAL 3 | | | | | | | | | | 317 | 274 | 324 |
| UAL 4 | | | | | | | | | | 377 | 323 | 389 |

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 | E | G | H1 | H2 | H3 | I | L1 | L2 |
|-------|-----|----|-----|-----|----|------|------|-----|----|----|----|----|-----|-----|-----|
| UAL 1 | 85 | 52 | 110 | 114 | 22 | 25 | 36 | 189 | 15 | 58 | 75 | 55 | 90 | 167 | 193 |
| UAL 2 | 94 | 60 | 115 | 127 | 27 | 30 | 45 | 217 | 17 | 64 | 90 | 62 | 104 | 193 | 229 |
| UAL 3 | 106 | 71 | 124 | 135 | 30 | 35 | 55 | 247 | 20 | 68 | 90 | 75 | 121 | 215 | 304 |
| UAL 4 | 120 | 77 | 141 | 161 | 36 | 40 | 60 | 293 | 24 | 81 | 95 | 90 | 138 | 235 | 340 |

| | R1 | ∅ X | a | b | c | e | ∅ g | h | ∅ i | l | ∅ o | r1 | s | t |
|-------|----|-----|----|----|-----|----|-----|----|----------|----|-----|----|----|----|
| UAL 1 | 17 | 110 | 54 | 28 | 73 | 46 | 10 | 36 | M10x1.5 | 17 | 9 | 18 | 10 | 4 |
| UAL 2 | 20 | 123 | 62 | 32 | 80 | 50 | 12 | 40 | M12x1.75 | 18 | 9 | 20 | 11 | 8 |
| UAL 3 | 20 | 150 | 72 | 38 | 90 | 58 | 14 | 45 | M14x2 | 24 | 9 | 22 | 12 | 8 |
| UAL 4 | 22 | 170 | 85 | 55 | 110 | 81 | 20 | 58 | M20x1.5 | 27 | 11 | 29 | 15 | 15 |

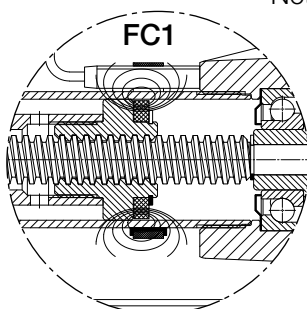
4

FRONT ATTACHMENT Dimensions

| | ∅ a | ∅ b | ∅ c | ∅ D1 | ∅ d2 | g | ∅ g1 | k | p | p1 |
|-------|-----|-----|-----|------|------|----|------|----|----|----|
| UAL 1 | 55 | 40 | 5.5 | 25 | 28 | 10 | 10 | 20 | 31 | 45 |
| UAL 2 | 60 | 45 | 6.5 | 30 | 32 | 12 | 12 | 24 | 36 | 52 |
| UAL 3 | 65 | 50 | 6.5 | 35 | 36 | 14 | 14 | 27 | 36 | 54 |
| UAL 4 | 80 | 60 | 8.5 | 40 | 50 | 20 | 20 | 40 | 53 | 78 |

| | q | r | s2 | s3 | t1 | ∅ t1 | u | w | w1 | w2 | w3 |
|-------|----|----|----|----|----|------|----|----|-----|----|----|
| UAL 1 | 8 | 27 | 14 | 11 | 26 | 14 | 15 | 49 | 61 | 20 | 12 |
| UAL 2 | 9 | 28 | 16 | 12 | 32 | 16 | 18 | 56 | 70 | 24 | 14 |
| UAL 3 | 9 | 32 | 19 | 14 | 36 | 18 | 21 | 65 | 81 | 28 | 16 |
| UAL 4 | 10 | 42 | 25 | 18 | 42 | 25 | 27 | 90 | 115 | 40 | 25 |

MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions



Note: - Additional extra magnetic REED SWITCHES are available for intermediate positions.

- The minimum distance between the REED SWITCHES must be of at least 10 mm.

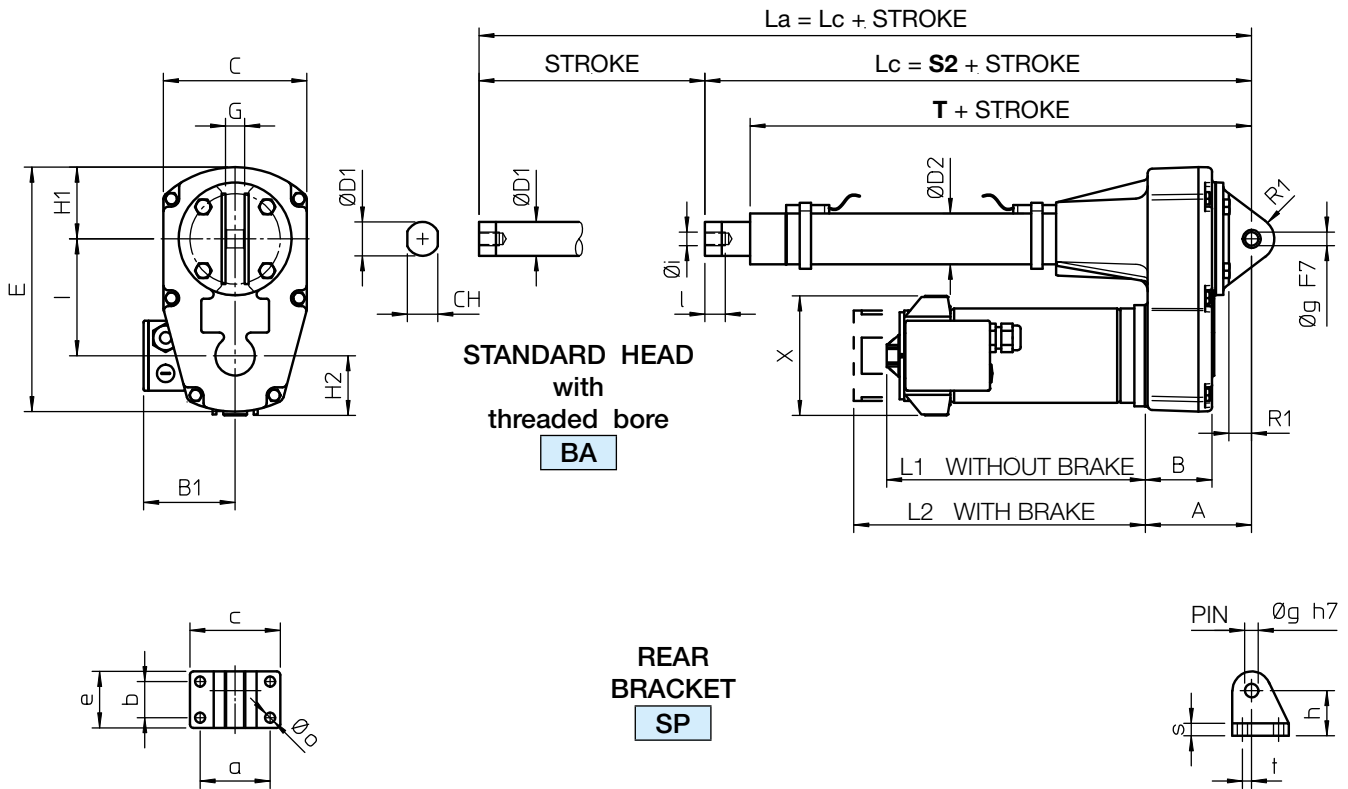
- REED SWITCH Normally Closed (NC) R = 39 mm

- REED SWITCH Change-over (NC+NO) R = 39 mm

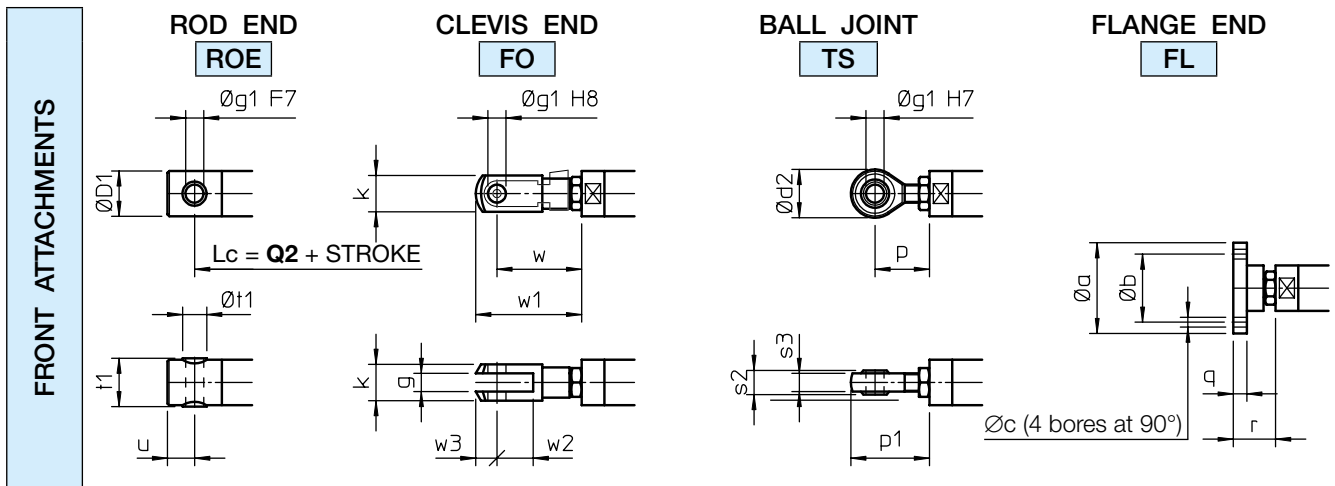
- REED SWITCH Normally Open (NO) R = 29 mm

Linear actuators UAL Series

ACME SCREW LINEAR ACTUATORS UAL Series, size 1 – 2 – 3 – 4
DC MOTOR – with Magnetic Stroke Limit Switches FCM

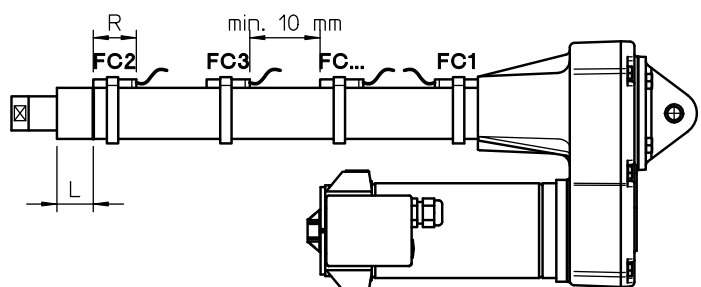


Lc - RETRACTED ACTUATOR length
La - EXTENDED ACTUATOR length



MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

| | L | |
|-------|-------------------------------|----|
| | REED CONTACT NC or (NC+NO) | NO |
| UAL 1 | 42 | 47 |
| UAL 2 | 51 | 56 |
| UAL 3 | 59 | 64 |
| UAL 4 | 69 | 74 |



Linear actuators UAL Series

ACME SCREW LINEAR ACTUATORS UAL Series, size 1 – 2 – 3 – 4
DC MOTOR – with Magnetic Stroke Limit Switches FCM
STANDARD STROKE LENGTHS

| | STROKE CODE | C100 | C200 | C300 | C400 | C500 | C600 | C700 | C800 | S2 | T | Q2 |
|-------|-------------|------|------|------|------|------|------|------|------|-----|-----|-----|
| UAL 1 | STROKE [mm] | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 265 | 232 | 265 |
| UAL 2 | | | | | | | | | | 284 | 244 | 287 |
| UAL 3 | | | | | | | | | | 317 | 274 | 324 |
| UAL 4 | | | | | | | | | | 377 | 323 | 389 |

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 | E | G | H1 | H2 | H3 | I | L1 | L2 |
|-------|-----|----|-----|-----|----|------|------|-----|----|----|----|----|-----|-----|-----|
| UAL 1 | 85 | 52 | 110 | 114 | 22 | 25 | 36 | 189 | 15 | 58 | 75 | 55 | 90 | 167 | 193 |
| UAL 2 | 94 | 60 | 115 | 127 | 27 | 30 | 45 | 217 | 17 | 64 | 90 | 62 | 104 | 193 | 229 |
| UAL 3 | 106 | 71 | 124 | 135 | 30 | 35 | 55 | 247 | 20 | 68 | 90 | 75 | 121 | 215 | 304 |
| UAL 4 | 120 | 77 | 141 | 161 | 36 | 40 | 60 | 293 | 24 | 81 | 95 | 90 | 138 | 235 | 340 |

| | R1 | ∅ X | a | b | c | e | ∅ g | h | ∅ i | l | ∅ o | r1 | s | t |
|-------|----|-----|----|----|-----|----|-----|----|----------|----|-----|----|----|----|
| UAL 1 | 17 | 110 | 54 | 28 | 73 | 46 | 10 | 36 | M10x1.5 | 17 | 9 | 18 | 10 | 4 |
| UAL 2 | 20 | 123 | 62 | 32 | 80 | 50 | 12 | 40 | M12x1.75 | 18 | 9 | 20 | 11 | 8 |
| UAL 3 | 20 | 150 | 72 | 38 | 90 | 58 | 14 | 45 | M14x2 | 24 | 9 | 22 | 12 | 8 |
| UAL 4 | 22 | 170 | 85 | 55 | 110 | 81 | 20 | 58 | M20x1.5 | 27 | 11 | 29 | 15 | 15 |

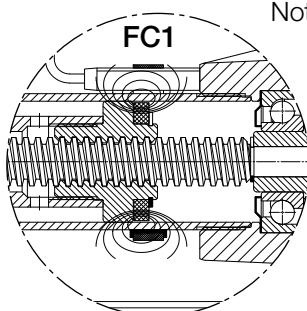
4

FRONT ATTACHMENT Dimensions

| | ∅ a | ∅ b | ∅ c | ∅ D1 | ∅ d2 | g | ∅ g1 | k | p | p1 |
|-------|-----|-----|-----|------|------|----|------|----|----|----|
| UAL 1 | 55 | 40 | 5.5 | 25 | 28 | 10 | 10 | 20 | 31 | 45 |
| UAL 2 | 60 | 45 | 6.5 | 30 | 32 | 12 | 12 | 24 | 36 | 52 |
| UAL 3 | 65 | 50 | 6.5 | 35 | 36 | 14 | 14 | 27 | 36 | 54 |
| UAL 4 | 80 | 60 | 8.5 | 40 | 50 | 20 | 20 | 40 | 53 | 78 |

| | q | r | s2 | s3 | t1 | ∅ t1 | u | w | w1 | w2 | w3 |
|-------|----|----|----|----|----|------|----|----|-----|----|----|
| UAL 1 | 8 | 27 | 14 | 11 | 26 | 14 | 15 | 49 | 61 | 20 | 12 |
| UAL 2 | 9 | 28 | 16 | 12 | 32 | 16 | 18 | 56 | 70 | 24 | 14 |
| UAL 3 | 9 | 32 | 19 | 14 | 36 | 18 | 21 | 65 | 81 | 28 | 16 |
| UAL 4 | 10 | 42 | 25 | 18 | 42 | 25 | 27 | 90 | 115 | 40 | 25 |

MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions

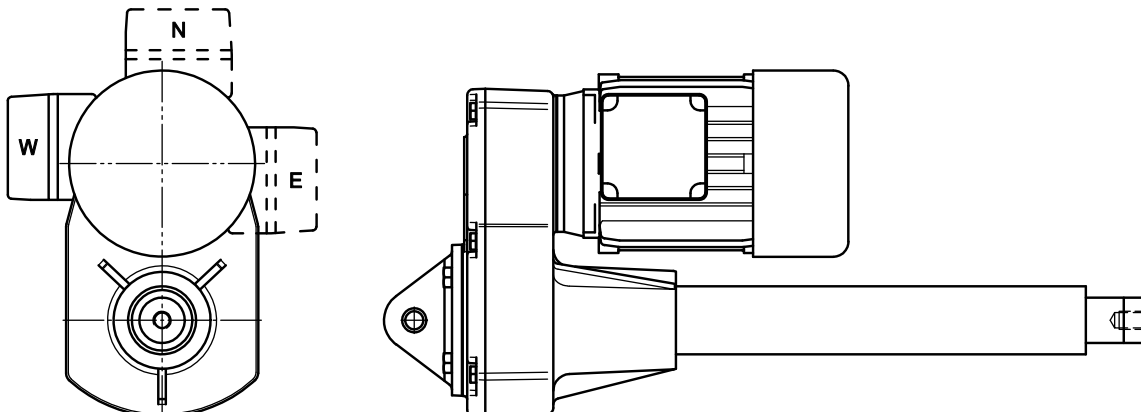


- Note: - Additional extra magnetic REED SWITCHES are available for intermediate positions.
 - The minimum distance between the REED SWITCHES must be of at least 10 mm.
- | | | | |
|---------------|-----------------|---------|-----------|
| - REED SWITCH | Normally Closed | (NC) | R = 39 mm |
| - REED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

Linear actuators UBA Series and UAL Series

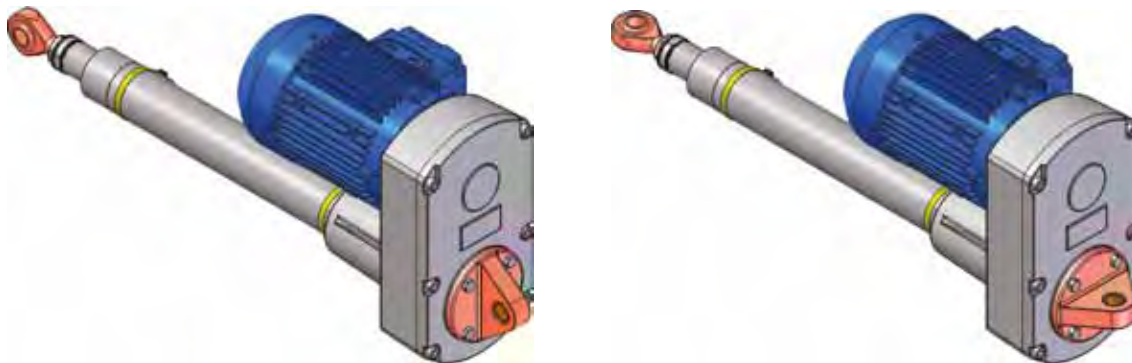
4.5 OPTIONS AND ACCESSORIES

ELECTRIC MOTOR TERMINAL BOX POSITION



STANDARD side: W
ON REQUEST side E ; N

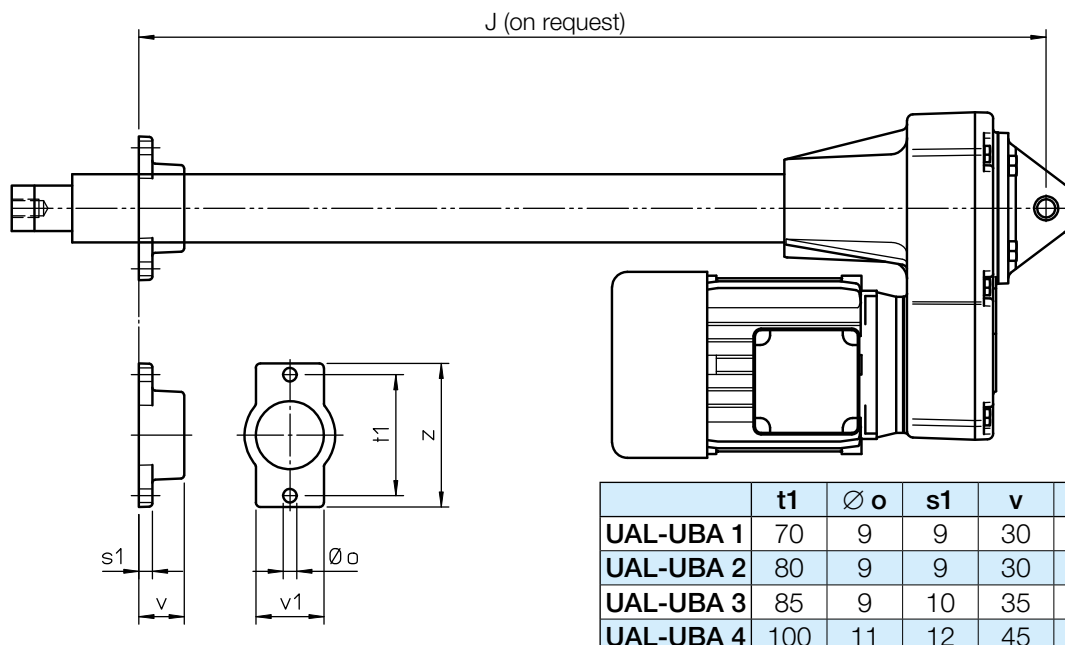
POSITION OF FRONT AND REAR ACTUATOR ATTACHMENT



STANDARD

ON REQUEST: turned at 90°
Code: RPT 90°

INTERMEDIATE FLANGE Code FI



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

Linear actuators UBA Series and UAL Series

4.5 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.

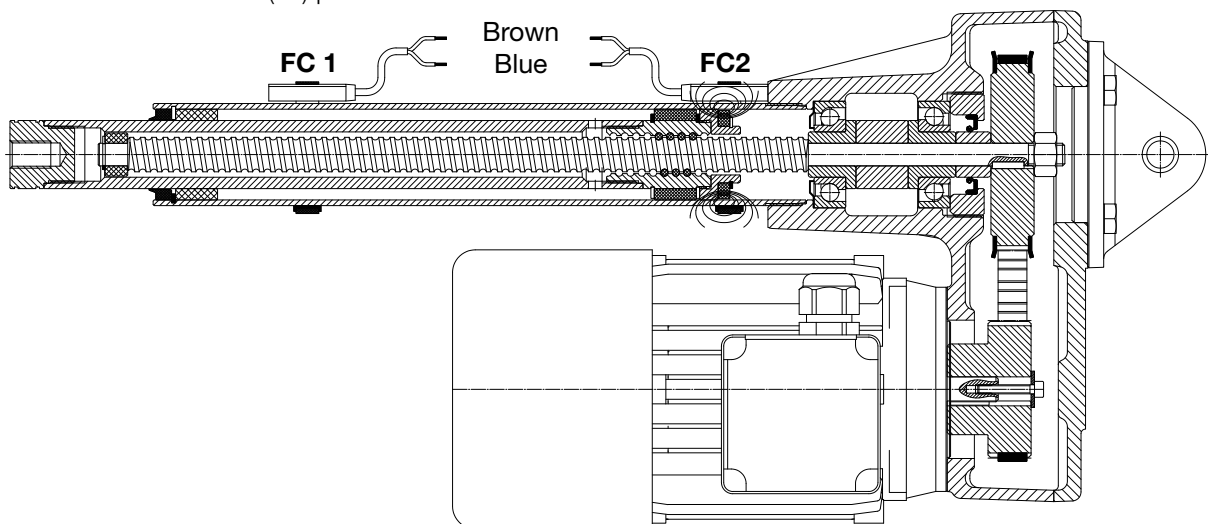
The outer tubes are made in non-magnetic material, such as anodized aluminium or stainless steel, thus allowing the external transmission of the magnetic field and therefore activation of the reeds switches.

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



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.

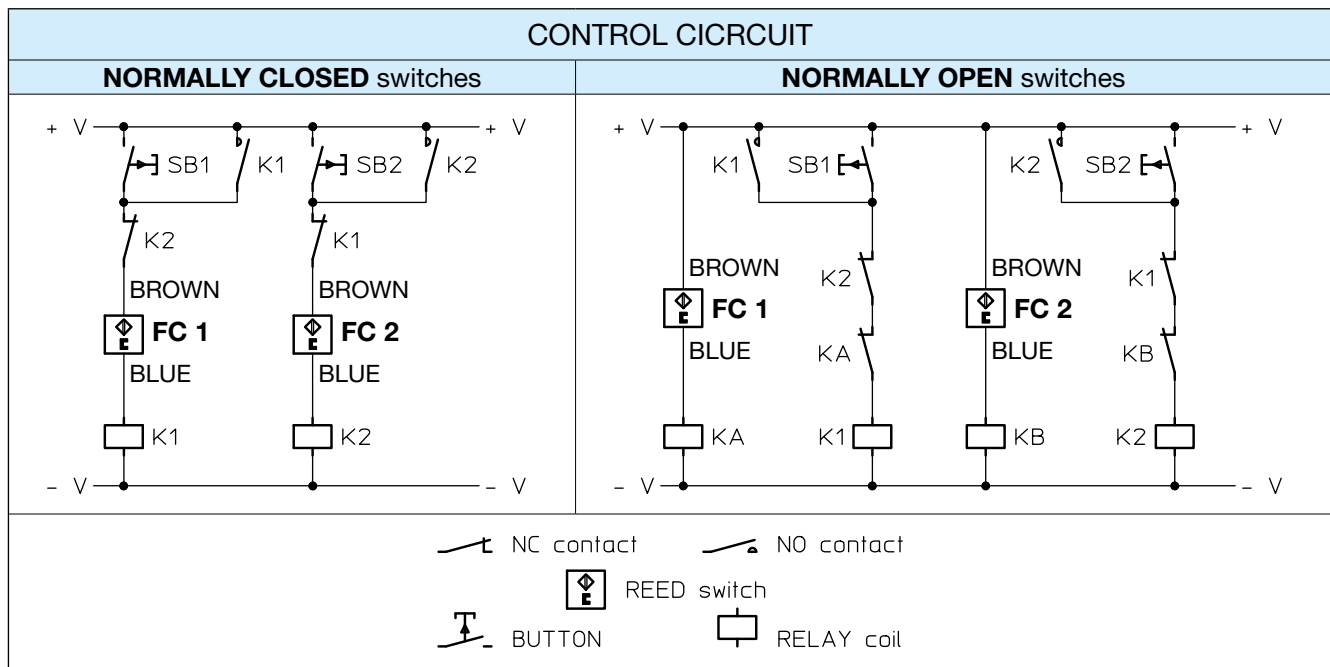
The position of the reed switches can be adjusted by changing the fixing clamp position on the outer tube.

The MAGNETIC STROKE END SWITCHES FCM are available for actuators of both UAL and UBA Series, for size 1 ... 4.

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

Linear actuators UBA Series and UAL Series

4.5 ACCESSORIES



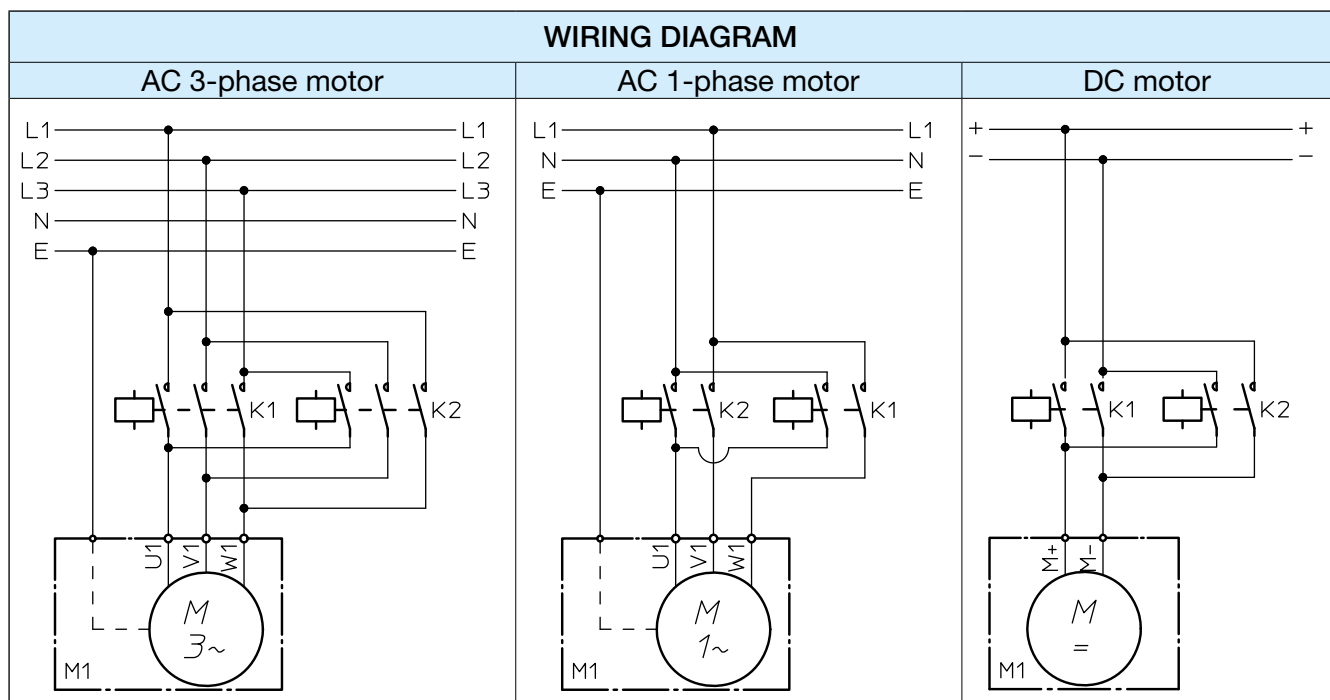
The extreme reed switches positions are:

- 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 given 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).

| 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 × 0.25 mm², standard length 2 m.



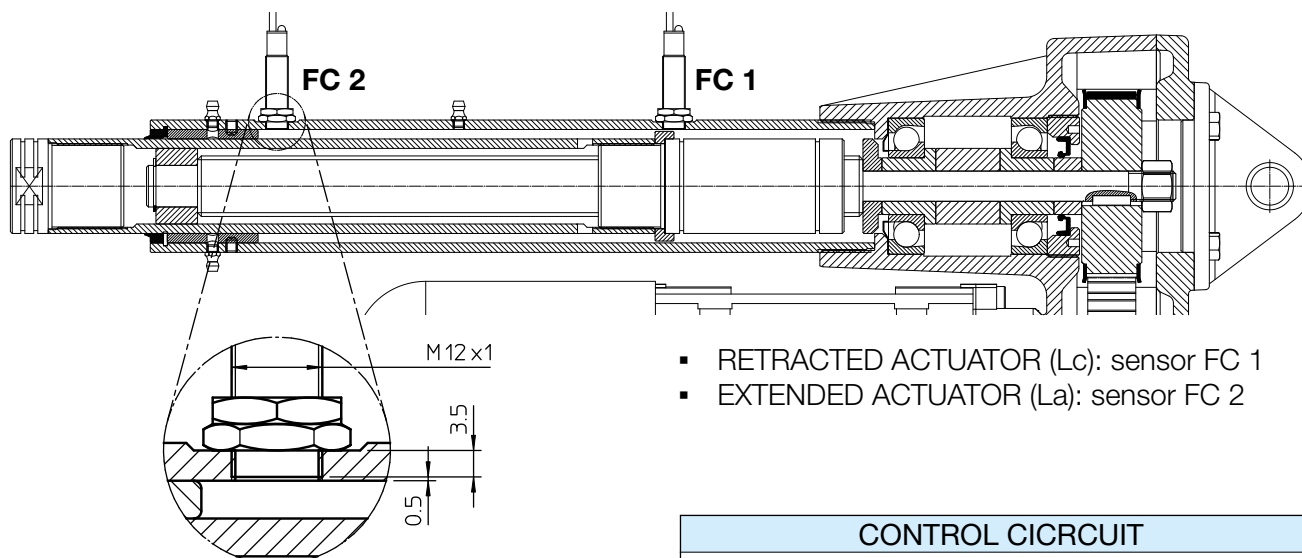
Linear actuators UBA Series and UAL Series

4.5 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.

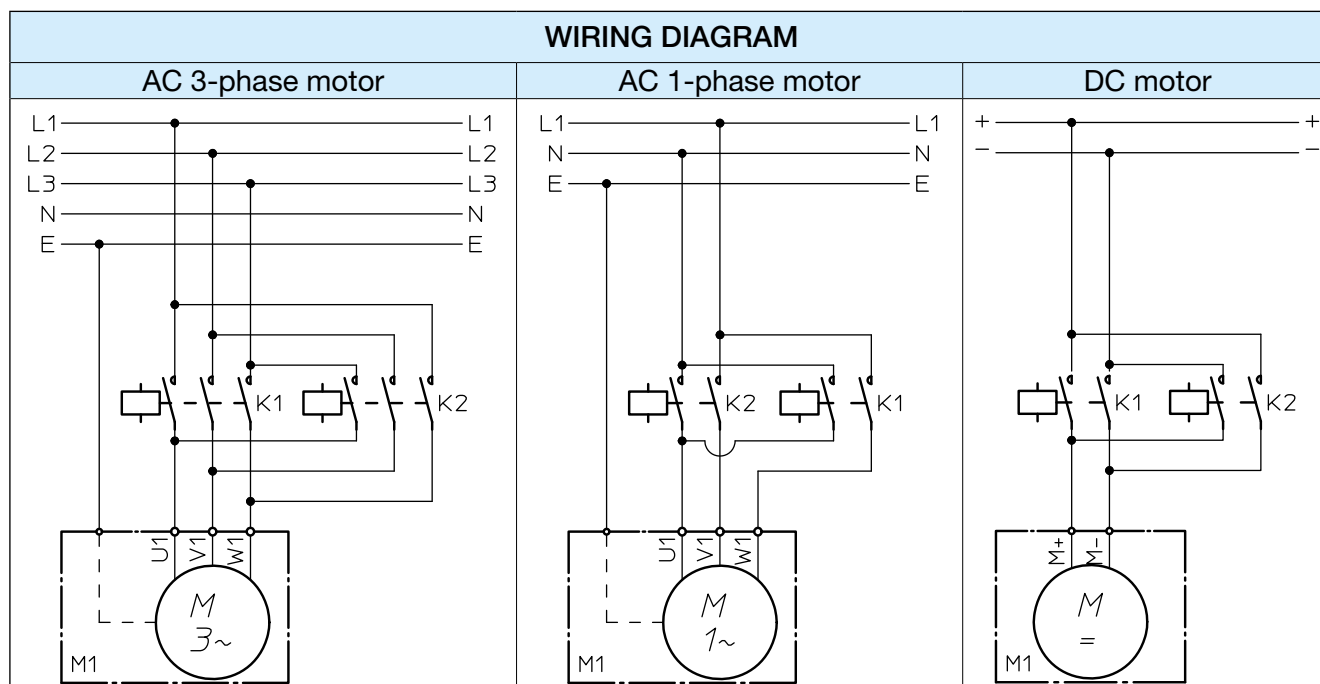
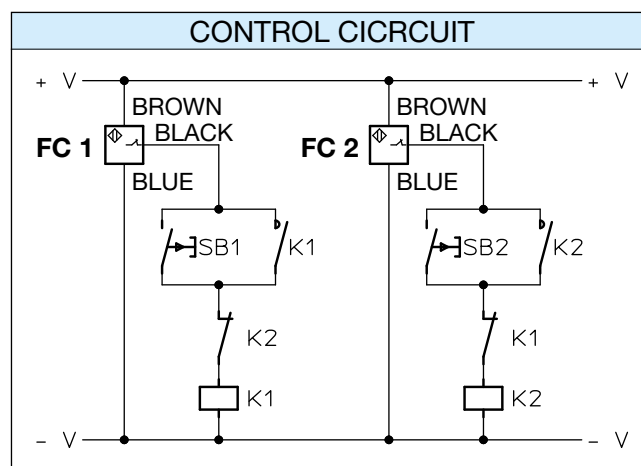
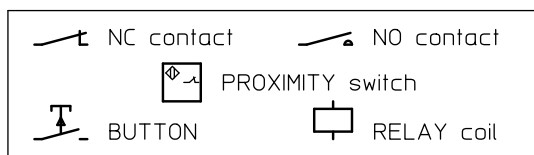
The INDUCTIVE PROXIMITY STROKE END SWITCHES are fixed directly on the actuator outer tube in the required position. Their position is not adjustable. Standard proximity switches are normally closed.



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

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

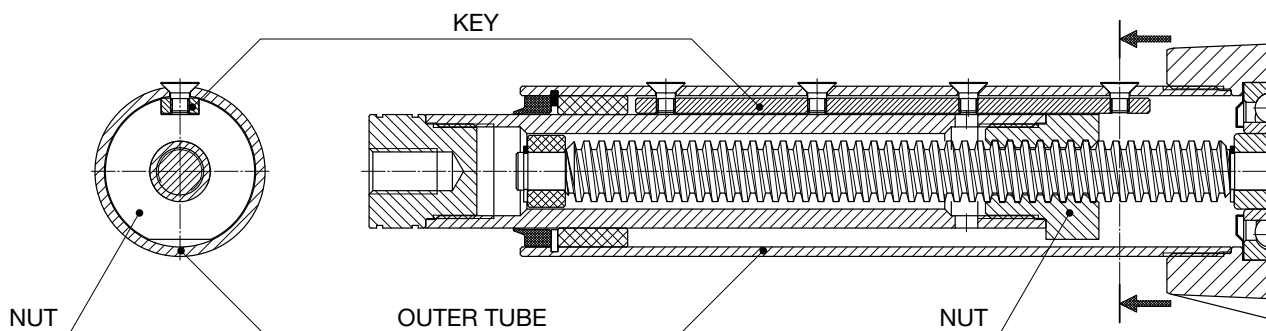
The switches are equipped with a multicore cable 3 × 0.2 mm², standard length 2 m.



Linear actuators UBA Series and UAL Series

4.5 ACCESSORIES

ANTI-TURN device Code AR



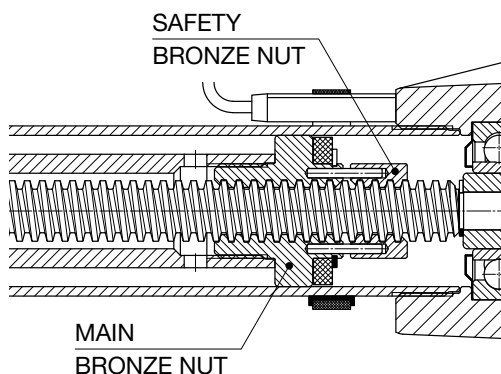
To achieve a linear motion it is necessary to prevent the rotary movement of the nut and of the push rod fixed to it. In many applications it is the external structure itself that, being connected to the push rod, prevents the rotation and allows the linear motion.

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 UAL 2, UAL 3, UAL 4 **without MAGNETIC STROKE END SWITCHES FCM** and UAL 5. **It is not available** for actuators UAL 1 and for all ball screw linear actuators (UBA Series).

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).

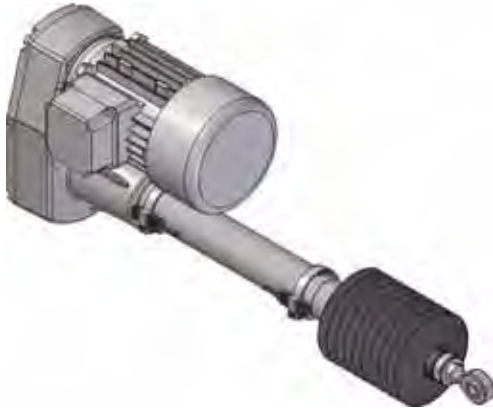
The SAFETY NUT MS is available for acme screw actuators UAL 2, UAL 3, UAL 4 and UAL 5.

4

Linear actuators UBA Series and UAL Series

4.5 ACCESSORIES

PROTECTIVE BELLOWS Code B



When the actuators are used in particular 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 hard environments are available upon request.

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 to the housing, the side opposite to the motor, and connected to the motor shaft through an auxiliary shaft.

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

ROTARY ENCODER Code EH 53

Optical encoder, incremental, bi-directional

Resolution: 100 or 500 pulses per revolution

Output: PUSH-PULL
2 channels (phase difference 90°)
channel ZERO

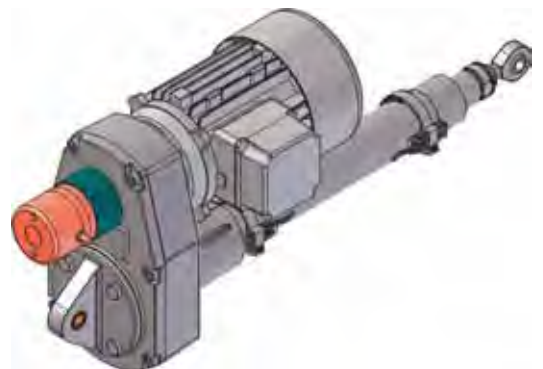
Input voltage: (8 ... 24) Vcc

No-load current: 100 mA

Max. commutable current: 50 mA

Cable length: 0.5 m

Protection: IP 54



(On request, 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.)

4.6 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 UBA Series and UAL Series

4.6 ORDERING CODE

| | | | | | | |
|-----|---|-----|------|----|---|-----|
| UBA | 4 | RN2 | C300 | FO | — | FCM |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | |
|----------------|---|
| SP encoder ... | 8 |
|----------------|---|

| | |
|--|-----|
| AC 3-phase brake-motor 0.75 kW 4-pole 230/400 V 50 Hz IP 55 Ins. F | W |
| 9.A | 9.B |

| | | |
|-----|--|---|
| 1 | Actuator series UBA or UAL | |
| 2 | Actuator size 1, 2, 3, 4, 5 | pages 128 ... 129 |
| 3 | Ratio RV1, RN1, RL1 RV2, RN2, RL2 | pages 128 ... 129 |
| 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 136 ... 145 |
| 6 | Position of front and rear actuator attachment STANDARD (without code) or RPT 90° | page 146 |
| 7 | Stroke end switches FCM-NC - magnetic reed switches, normally closed FCM-NO - magnetic reed switches normally open FCP - inductive proximity switches | pages 147 ... 148 pages 147 ... 148 page 149 |
| 8 | Accessories SP - rear bracket FI - intermediate support flange AR - anti-turn device MS - safety nut for push load B - bellows encoder - EH 53 or according to required specifications | pages 136 ... 145 page 146 page 150 page 150 page 151 page 151 |
| 9.A | Motor data | pages 200 ... 201 |
| 9.B | Motor terminal box position | page 146 |
| 10 | Other specifications example: push rod in stainless steel AISI 303 example: lubricant for low temperature | |
| 11 | Filled in SELECTION DATA sheet | page 147 |
| 12 | 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: _____

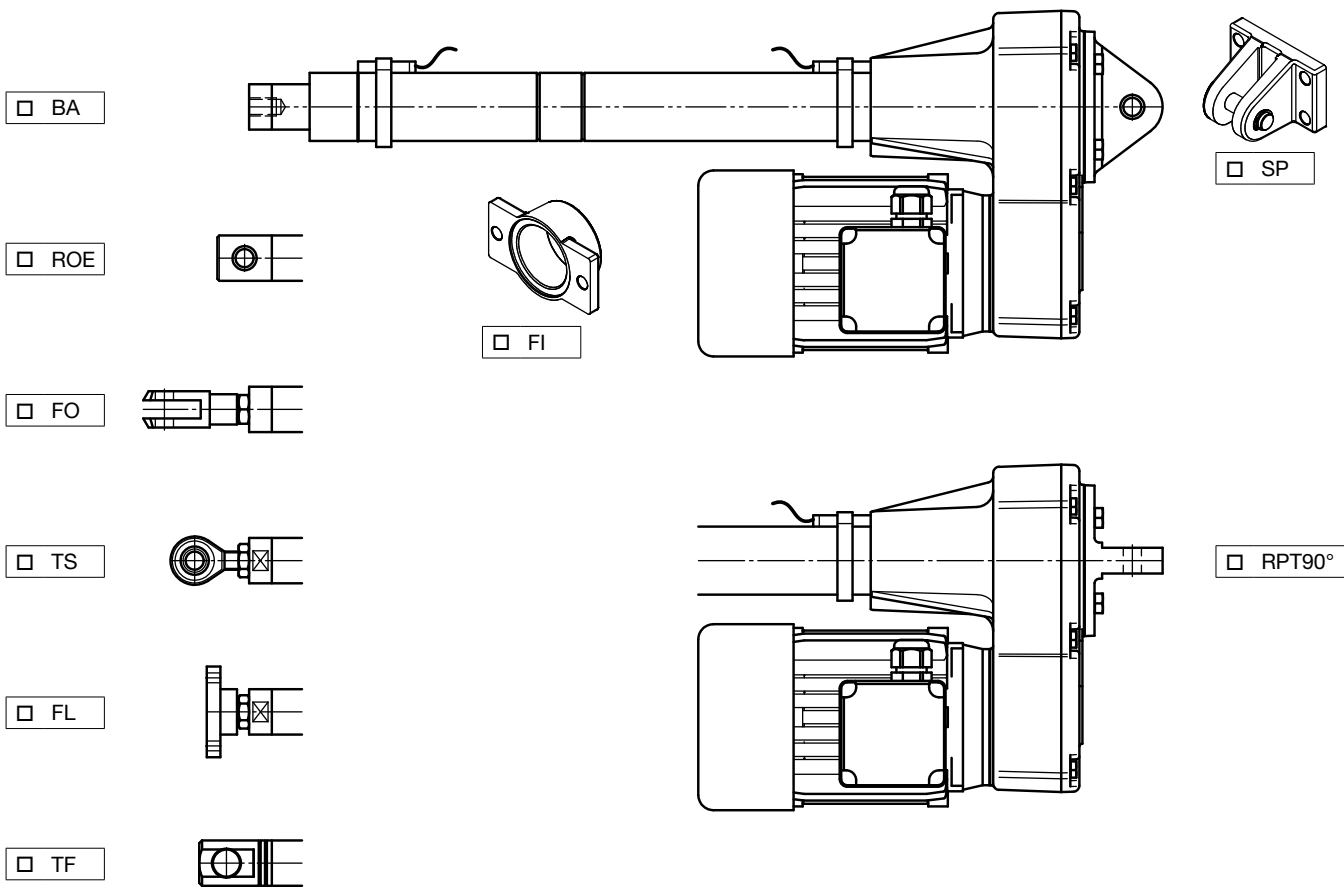
REQUIRED LIFETIME: _____ cycle _____ hours _____ calendar days Notes: _____

ENVIRONMENT: TEMPERATURE _____ °C DUST HUMIDITY _____ % AGGRESSIVE AGENT _____

Ball screw actuators **UBA Series** Acme screw actuators **UAL Series**

Size: 1 2 3 4 5

Ratio: RV2 RV1 RN2 RN1 RL2 RL1



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

ROTARY ENCODER

ANTI-TURN DEVICE AR SAFETY NUT MS

BELLOWS PUSH ROD IN STAINLESS STEEL OUTER TUBE IN STAINLESS STEEL

OTHER: _____

Ball screw actuators **UBA Series**

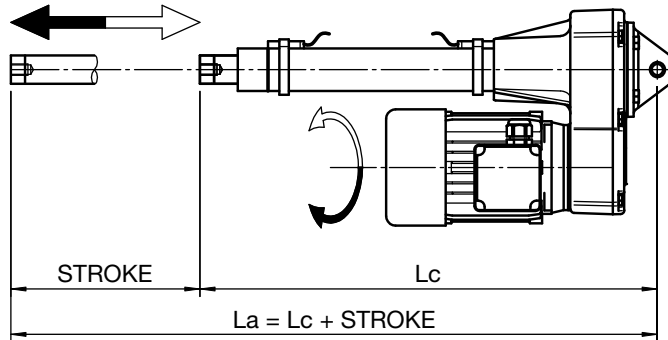
Acme screw actuators **UAL Series**

PRODUCT: _____

Product serial number: _____ ; q.ty: _____

STANDARD HEAD

BA

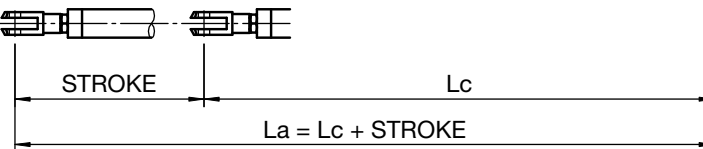


ELECTRIC MOTOR

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

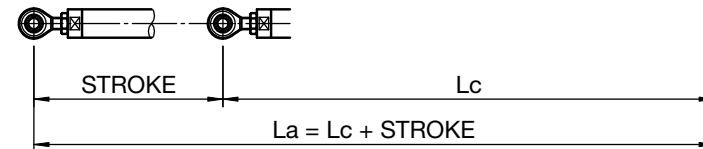
CLEVIS END

FO



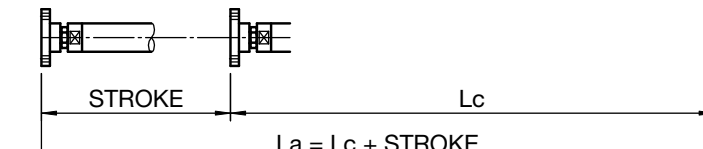
BALL JOINT

TS



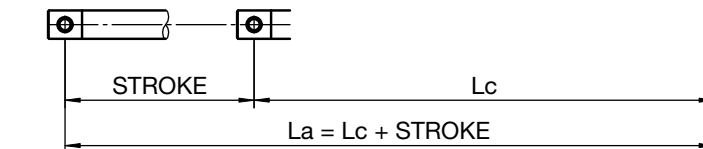
FLANGE END

FL



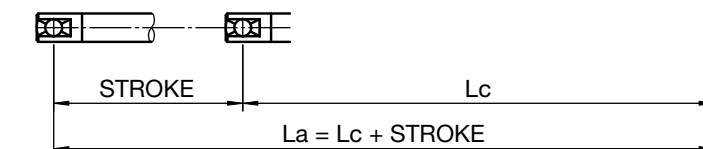
ROD END

ROE



HINGED HEAD

TF



Servomech. QCS

PASSED

Date: _____

Signature: _____

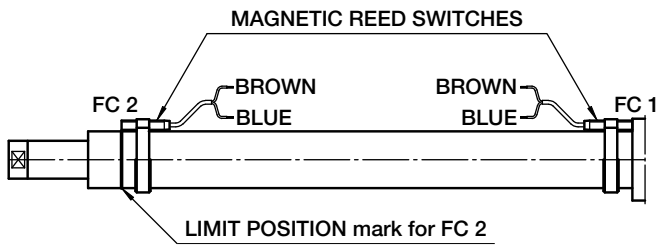
LINEAR ACTUATOR LENGTH

WORKING RANGE

INTERNAL MECHANICAL STOP LIMIT

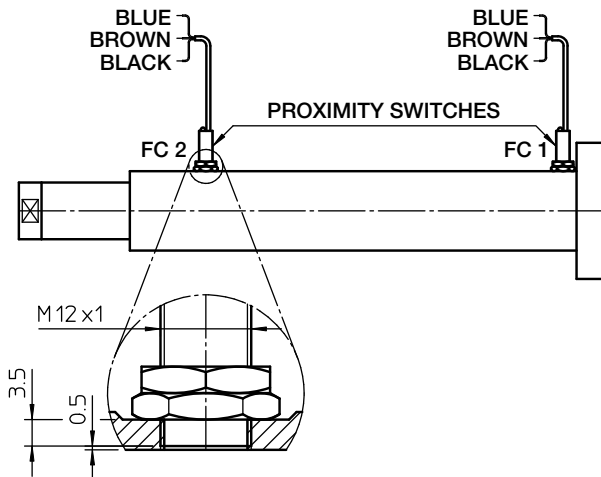
| | | | |
|----------------------------|------------------|-----------------------|----------|
| RETRACTED ACTUATOR length: | $L_c =$ _____ mm | MIN. actuator length: | _____ mm |
| EXTENDED ACTUATOR length: | $L_a =$ _____ mm | MAX. actuator length: | _____ mm |
| STROKE ($L_a - L_c$): | $C =$ _____ mm | | |

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

SINGLE SENSOR 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 rotating 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.

NOTE: _____

WORMGEAR LUBRICANT: _____

SCREW – NUT LUBRICANT: _____