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SERVOMECH linear actuators are electromechanical cylinders able to transform a rotary movement into a linear motion.

Developed and manufactured for industrial applications, Servomech linear actuators can offer higher linear speeds and loads at up to 100% duty cycle, even in the most extreme conditions and arduous applications.

Able to work under push or pull load.

According to their features they can be:

- Statically self-locking: able to sustain static load keeping the same position when the motor is switched off.
- Statically non self-locking: the load can be sustained with a brake motor.

They are capable of maintaining constant speed with a varying load, at a very low noise level.

Their motion can be simply a push-pull "ON-OFF" action, also they can become servomechanisms working as controlled axes, by means of accessories such as encoders or potentiometers for the positioning control, motors with tachogenerator and servo drives.

Their installation is simple and not expensive: it requires just a front and rear hinging as for standard hydraulic and pneumatic cylinders.

They can perfectly replace pneumatic or hydraulic cylinders being able to perform:

- Accuracy in push-pull motion
- Accuracy in stopping position
- Position holding under load (self-locking)
- Energy consumption only while moving
- High safety in lifting a load (internal safety devices available)
- Use in hard environment
- Use in low temperature environment without freezing problems
- Use in high temperature environment without fire risk

SERVOMECH linear actuators have a wide application field.

They are intended for industrial applications where it is necessary to perform in total safety or to control a linear motion while moving, turning over or lifting a load.

The wide range of sizes, stroke lengths, linear speeds, motors and accessories makes it easy to adapt these products for new applications or replace even complicated mechanical solutions and hydraulic or pneumatic cylinders, improving the applications final performances.

SERVOMECH's linear actuator range consists of 2 main product groups determined by their different input drives:

- Worm gear drive with electric motor at 90° with respect to the actuator axis
- Timing belt drive with electric motor in parallel with respect to the actuator axis

Both groups are available with either of the leadscrews below:

- 1 or 2 starts trapezoidal acme screw
- Ball screw

1.2

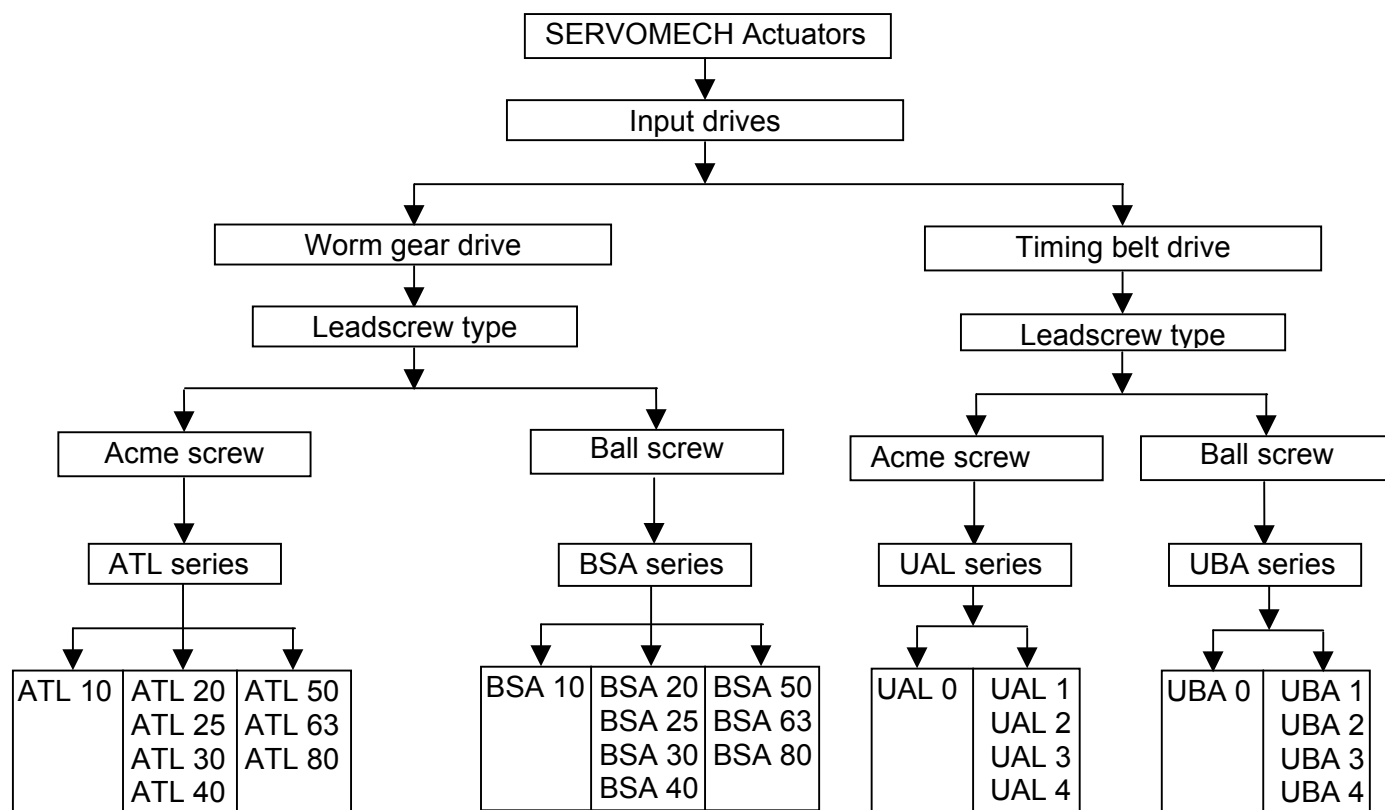
SERVOMECH LINEAR ACTUATORS RANGE

ATL series: Worm gear drive and acme leadscrew

BSA series: Worm gear drive and ball screw

UAL series: Timing belt drive and acme leadscrew

UBA series: Timing belt drive and ball screw



ATL and BSA Series

- ATL 10 and BSA 10:
Compact linear actuator with integral electric motor, available with AC 3-phases, AC 1-phase, DC 24 V or 12 V electric motors with or without brake.
- ATL 20 – 25 – 30 – 40 and BSA 20 – 25 – 30 – 40:
4 sizes with monoblock housing in hardened aluminium alloy.
Available in 4 different versions, see page 91.
 - Vers.1 single input shaft
 - Vers.2 double input shaft
 - Vers.3 input motor flange European standard IEC B14
 - Vers.4 input motor flange European standard IEC B14 and extended input shaft
 Electric motors available: AC 3-phases, AC 1-phase, DC 24 V or 12 V, with or without brake.
- ATL 50 – 63 – 80 and BSA 50 – 63 – 80:
3 sizes with monoblock housing in spheroidal graphite cast iron GS 500.
Available in 6 versions: 4 as the previous ones but with motor flange IEC B5 – 2 with motor flange adapter + coupling (see page 92). Electric motors available: AC 3-phases with or without brake.

UAL and UBA Series

- UAL 0 and UBA 0:
Compact linear actuator with integral electric motor.
Available only with DC motor 24 V or 12 V, with or without brake.
- UAL 1 – 2 – 3 – 4 and UBA 1 – 2 – 3 – 4:
Integral electric motors AC 3-phase, AC 1-phase or DC, available with or without brake.
Motors with European standard frame size IEC B14.

SERVOMECH linear actuators are manufactured completely inside with high tech CNC machinery.

Quality system currently in line with ISO 9002.

Statistical control to monitor the components batch quality during the manufacturing process.

Final inspection and testing are carried out on every finished product to ensure the total reliability of the product.

Input drive:

- Worm gear, geometric design for high performances according to British Standard BS 721. ZI involute profile, low angular backlash. Wormwheel in bronze EN 1982 – CuSn12-C. Worm in casehardened steel 20MnCr5 UNI 7846 with thread and input shafts ground.
- Timing pulleys UNI 8530 in aluminium for low inertia or in steel. Timing belts UNI 8529, on request HTD series.

Housing:

Housings are designed and manufactured in monoblock form to achieve:

- high quality and accuracy of the mechanical work,
- strong and compact body able to sustain heavy push or pull loads.

High quality material are used:

- Hardened aluminium alloy EN 1706 AC-AISI10 T6
- Spheroidal graphite cast iron EN 1563 – GJS-500-7.

Bronze nut - profile UNI ISO 2901-2904

- 1 start nut: material bronze
EN 1982 – CuAl9-C
- 2 starts nut: material bronze
EN 1982 – CuSn12-C
- Max. axial backlash with unused nut
(0.10 ÷ 0.12) mm

Trapezoidal acme screw profile UNI ISO 2901-2904

- Rolled or cut
- Material: steel C 43 UNI 7847
- Straightened to ensure the perfect alignment when working
- Max. lead error ± 0.05 mm on 300 mm length

Ball nut

- Carried out to SERVOMECH design
- Sized to guarantee high load capacity and performances
- Material: casehardened steel 18NiCrMo5 UNI 7846
- Ground profile
- Max. axial backlash (0.07 ÷ 0.08) mm

Ball screw

- Rolled and hardened
Material: 42CrMo4 UNI 7845
Max. lead error ± 0.05 mm on 300 mm length
- Hardened and ground
Material: 42CrMo4 UNI 7845
Max. lead error ± 0.025 mm on 300 mm length

Push rod

- Thick chrome plated steel tube
 - Material St 52 DIN 2391
 - Min. chrome plating thickness 0.05 mm
 - Tolerance on outer diameter ISO f7

On request push rods in stainless steel AISI 304 available.

Outer tubes in aluminium or steel

- Thick cold-drawn aluminium tube
 - Material: alloy 6060 UNI 90006/1
 - Anodizing 20 μ m
 - Inner tolerance ISO H9
- Cold-drawn steel tube
 - Material: St 52.2 DIN 2391
 - Outer galvanizing
 - Inner tolerance ISO H10 ÷ H11

Bearings

- Ball bearings on motor axis
- Preloaded angular contact ball bearings or taper roller bearings on actuator axis to avoid any axial backlash and to guarantee a high push-pull load capacity.

Front attachment

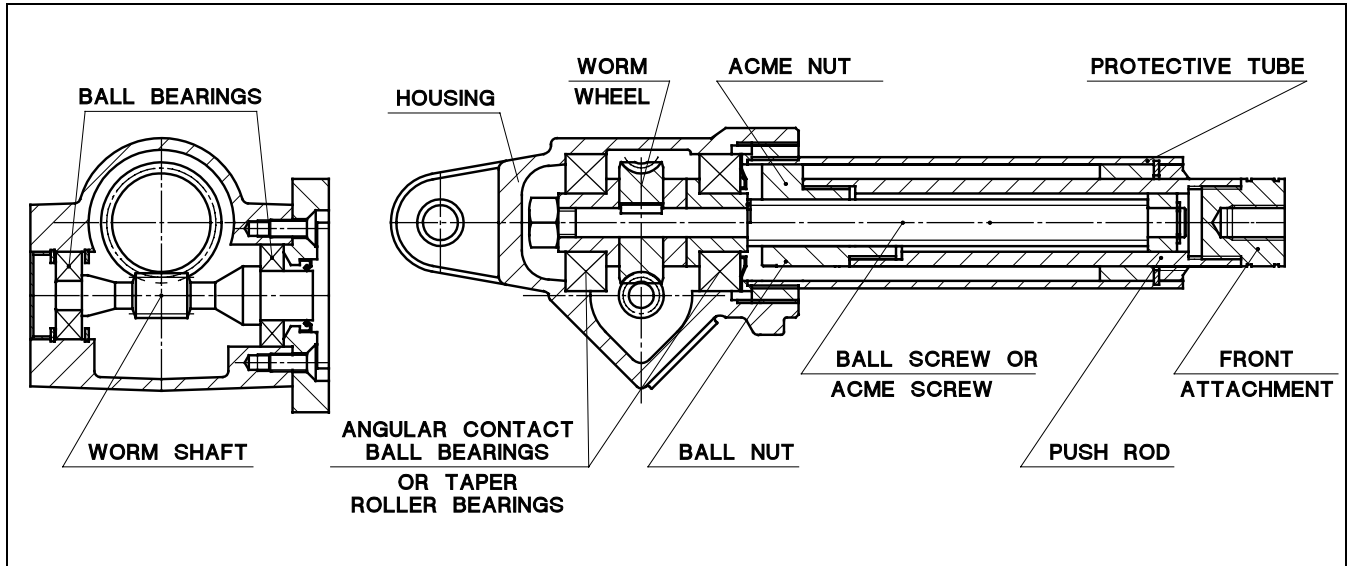
- Stainless steel AISI 303

Electrical stroke limit switches and rear bracket

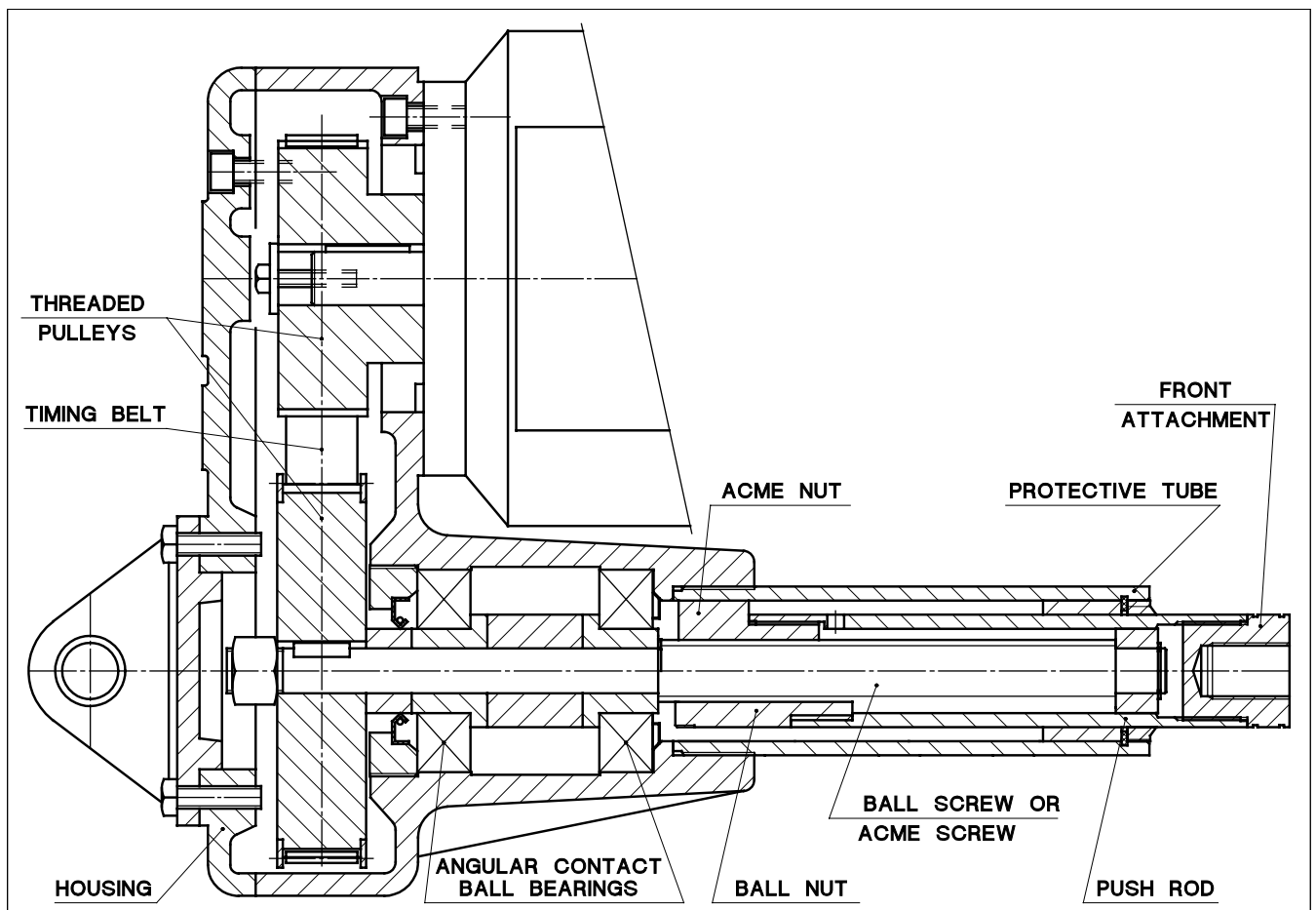
- Material: aluminium alloy (ATL-BSA 10, 20, 25, 30, 40 and Series UAL-UBA), spheroidal graphite iron (ATL-BSA 50, 63, 80)
- Pins in stainless steel AISI 303
- Adjustable rings in brass OT 58 UNI 5705/65

COMPONENTS

LINEAR ACTUATORS Series ATL – Series BSA



LINEAR ACTUATORS Series UAL – Series UBA



The performance tables show the main technical features and performance characteristics for each type of actuator.

They are ideal for quick reference when requiring specific details for control applications in positioning and speed.

GENERAL FEATURES:

- Rod diameter = external diameter of the driving rod
- Protective tube diameter = external diameter of the outer protective tube
- Motor flange = European standard IEC B14 or B5 frame size
- Max. dynamic load = max. load that the specific actuator size can lift. The max. load is achieved with low speeds, which means slow ratio (RL). When increasing the speed the load is reduced, because the actuator has the same motor and therefore a constant power.
- Max. push or pull load = max. push or pull load admitted when the actuator is in still position. Generally the max. push load is higher than the max. pull load due to the bigger mechanical resistance of the fixing parts on housing side. The max. push load depends on the stroke length (refer to graphs on page 18).
- Ratio = Exact ratio of the driving gears between electric motor and linear leadscrew.
- Linear travel for 1 input shaft turn = linear travel in mm performed by the actuator for each input shaft turn. This information is useful when the actuator is equipped with encoder mounted on the input shaft to quantify the total number of pulses for the required linear travel.
Example: encoder 100 pulses per revolution
travel for 1 input shaft turn = 0,25 mm
result: 400 pulses for 1 mm travel
- Weight = mass in kg referred to actuators of 100 mm stroke length without motor. The total weight of an actuator can be obtained adding to the given weight for 100 mm stroke, the weight increment for each further increase of 100 mm stroke.
The weight of the motor is stated in tables on pages 100-104.

ACME SCREW LINEAR ACTUATORS FEATURES:

- 1-start acme screw = acme screw external diameter and lead of the trapezoidal thread in [mm]. The lead gives the actuator feed or travel in mm for each acme screw turn, i.e. for each turn of the wheel leaded by the driving gear.
- 2-starts acme screw = acme screw external diameter and effective lead of the trapezoidal thread in [mm]. The effective lead gives the actuator feed or travel in mm for each input turn of the acme screw. The value in brackets states the pitch between the two contiguous threads.

BALL SCREW LINEAR ACTUATORS FEATURES:

- Diameter × pitch = ball screw external diameter and thread lead in [mm].
- Dynamic load C = max. operating load admitted on the nut. The max. load values acceptable on the ball nut are also necessary for the nut lifetime calculation.
- Static load C₀ = max. static push or pull load admitted on the nut.

The max. load values admitted on the ball nut cannot be considered as performances values achievable by the actuator, because the real performances depend on the motor power and on the actuator components strength.

- Ball circuits quantity = is the total number of ball complete circuits under load.

1.4 ACME SCREW LINEAR ACTUATORS Series ATL

Technical features table

FEATURES \ SIZE		ATL 10	ATL 20	ATL 25	ATL 30	ATL 40
Rod diameter	[mm]	25	25	30	35	40
Protective tube diameter	[mm]	36	36	45	55	60
Motor flange European standard IEC B14		–	56 B14	56 B14	63 B14	71 B14
Max. dynamic load	[N]	3000	4000	6000	10000	12000
Max. static load	Pull [N]	3000	4000	6000	10000	12000
	Push [N]	4000	6000	8000	12000	15000
1-start acme screw	[mm]	Tr 13.5×3	Tr 13.5×3	Tr 16×4	Tr 18×4	Tr 22×5
2-starts acme screw	[mm]	Tr 14×8 (P4)	Tr 14×8 (P4)	Tr 16×8 (P4)	Tr 18×8 (P4)	Tr 22×10 (P5)
Ratio	RH	1 : 4	1 : 4	1 : 4	–	–
	RV	1 : 6.25	1 : 6.25	1 : 6.25	1 : 4	1 : 5
	RN	1 : 12.5	1 : 12.5	1 : 12.5	1 : 16	1 : 20
	RL	1 : 25	1 : 25	1 : 25	1 : 24	1 : 25
	RXL	1 : 50	1 : 50	1 : 50	–	–
Linear travel [mm] for 1 input shaft turn (1-start acme screw)	RH1	0.75	0.75	1	–	–
	RV1	0.48	0.48	0.64	1	1
	RN1	0.24	0.24	0.32	0.25	0.25
	RL1	0.12	0.12	0.16	0.17	0.2
	RXL1	0.06	0.06	0.08	–	–
Linear travel [mm] for 1 input shaft turn (2-starts acme screw)	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	–	–
Weight (referred to actuator 100 mm stroke length, with lubricant, without motor)	[kg]	1.7	2.2	2.5	3.8	6.5
Extra-weight for each additional 100 mm stroke length	[kg]	0.3	0.3	0.5	0.8	0.9

FEATURES \ SIZE		ATL 50	ATL 63	ATL 80
Rod diameter	[mm]	50	60	90
Protective tube diameter	[mm]	70	90	115
Motor flange European standard IEC B5		63 B5 – 71 B5	80 B5	80 B5 – 90 B5
Motor flange adapter European standard IEC + coupling		80 B14 or 80 B5 90 B14 or 90 B5	90 B14 or 90 B5 100 B14 or 100 B5	100 B14 or 100 B5 112 B14 or 112 B5
Max. dynamic load	[kN]	25	50	80
Max. static load	pull [kN]	25	50	80
	push [kN]	25	50	100
1-start acme screw	[mm]	Tr 30 × 6	Tr 40 × 7	Tr 60 × 12
2-starts acme screw	[mm]	Tr 30 × 12 (P6)	Tr 40 × 14 (P7)	Tr 60 × 24 (P12)
Ratio	RV	1 : 6	1 : 7	1 : 8
	RN	1 : 18	1 : 14	1 : 24
	RL	1 : 24	1 : 28	1 : 32
Linear travel [mm] for 1 input shaft turn (1-start acme screw)	RV1	1	1	1.5
	RN1	0.33	0.50	0.50
	RL1	0.25	0.25	0.38
Linear travel [mm] for 1 input shaft turn (2-starts acme screw)	RV2	2	2	3
	RN2	0.67	1	1
	RL2	0.50	0.50	0.75
Weight (referred to actuator 100 mm stroke length, with lubricant, without motor)	[kg]	30	50	95
Extra-weight for each additional 100 mm stroke length	[kg]	2	3	5.5

FEATURES \ SIZE		BSA 10	BSA 20	BSA 25	BSA 30	BSA 40
Rod diameter	[mm]	25	25	30	35	40
Protective tube diameter	[mm]	36	36	45	55	60
Motor flange European standard IEC B14		–	56 B14	56 B14	63 B14	71 B14
Max. dynamic load (1)	[N]	3000	4000	5000	6000	8000
Max. static load	pull [N]	3000	4000	6000	8000	10000
	push [N]	4000	6000	8000	10000	12000
Ball screw	Diameter × Pitch [mm]	14×5 (rolled)		16×5 (rolled)	20×5 (rolled)	25×6 (rolled)
	Dynamic load C [N]	8400		11260	12300	19380
	Static load C ₀ [N]	8570		11570	15040	29420
	Ball diameter [mm]	3.175 (1/8 ")		3.175 (1/8 ")	3.175 (1/8 ")	3.969 (5/32 ")
	Ball circuit quantity	2		3	3	3
Ratio	RH	1 : 4	1 : 4	1 : 4	–	–
	RV	1 : 6.25	1 : 6.25	1 : 6.25	1 : 4	1 : 5
	RN	1 : 12.5	1 : 12.5	1 : 12.5	1 : 16	1 : 20
	RL	1 : 25	1 : 25	1 : 25	1 : 24	1 : 25
	RXL	1 : 50	1 : 50	1 : 50	–	–
Linear travel [mm] for 1 input shaft turn	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	–	–
Weight (referred to actuator 100 mm stroke length, with lubricant, without motor)	[kg]	1.8	2.2	2.5	3.8	6.5
Extra-weight for each additional 100 mm stroke length	[kg]	0.3	0.3	0.5	0.8	0.9

FEATURES \ SIZE		BSA 50	BSA 63	BSA 80
Rod diameter	[mm]	50	60	90
Protective tube diameter	[mm]	70	90	115
Motor flange European standard IEC B5		63 B5 - 71 B5	80 B5	80 B5 - 90 B5
Motor flange adapter European standard IEC + coupling		80 B14 or 80 B5 90 B14 or 90 B5	90 B14 or 90 B5 100 B14 or 100 B5	100 B14 or 100 B5 112 B14 or 112 B5
Max. dynamic load (1)	[kN]	25	37	45
Max. static load	pull [kN]	25	50	100
	push [kN]	25	50	100
Ball screw	Diameter × Pitch [mm]	32 × 10 (rolled)	40 × 10 (rolled)	63 × 20 (ground)
	Dynamic load C [kN]	52,2	65,8	105
	Static load C ₀ [kN]	65,3	87,7	225
	Ball diameter [mm]	6.35 (1/4 ")	6.35 (1/4 ")	9.525 (3/8 ")
	Ball circuit quantity	4	5	4
Ratio	RV	1 : 6	1 : 7	1 : 8
	RN	1 : 18	1 : 14	1 : 24
	RL	1 : 24	1 : 28	1 : 32
Linear travel [mm] for 1 input shaft turn	RV1	1.67	1.43	2.5
	RN1	0.56	0.71	0.83
	RL1	0.42	0.36	0.63
Weight (referred to actuator 100 mm stroke length, with lubricant, without motor)	[kg]	30	50	100
Extra-weight for each additional 100 mm stroke length	[kg]	2	3	6

(1) Values based on estimated ball screw lifetime of at least 2000 hours under load, without shocks or vibrations.

1.4 ACME SCREW LINEAR ACTUATORS Series UAL

Technical features table

FEATURES \ SIZE		UAL 0	UAL 1	UAL 2	UAL 3	UAL 4
Rod diameter	[mm]	25	25	30	35	40
Protective tube diameter	[mm]	36	36	45	55	60
Motor Flange European standard IEC B14		–	56 B14	63 B14	71 B14	80 B14 90 B14
Max. dynamic load	[N]	500	1600	2500	5100	8500
Max. static load	Pull [N]	3000	4000	6000	10000	12000
	Push [N]	3000	4000	6000	10000	12000
1-start acme screw	[mm]	Tr 13.5 × 3	Tr 13.5 × 3	Tr 16 × 4	Tr 18 × 4	Tr 22 × 5
2-starts acme screw	[mm]	Tr 14×8 (P4)	Tr 14×8 (P4)	Tr 16×8 (P4)	Tr 18×8 (P4)	Tr 22×10 (P5)
Ratio	RV	1 : 1	1 : 1.33	1 : 1.4	1 : 1.04	1 : 1.07
	RN	1 : 2	1 : 2.15	1 : 2.13	1 : 2	1 : 1.94
	RL	–	1 : 3	1 : 2.83	1 : 2.92	1 : 2.93
Linear travel [mm] for 1 input shaft turn (1-start acme screw)	Ratio RV1	3	2.25	2.86	3.84	4.69
	RN1	1.5	1.39	1.88	2	2.57
	RL1	–	1	1.41	1.37	1.70
Linear travel [mm] for 1 input shaft turn (2 starts acme screw)	Ratio RV2	8	6	5.71	7.68	9.38
	RN2	4	3.71	3.75	4	5.14
	RL2	–	2.67	2.82	2.74	3.41
Weight (referred to actuator 100 mm stroke length, with lubricant, without motor)	[kg]	2.2	3.3	5	8	11
Extra-weight for each additional 100 mm stroke length	[kg]	0.3	0.3	0.5	0.8	0.9

1.4 BALL SCREW LINEAR ACTUATORS Series UBA

Technical features table

FEATURES \ SIZE		UBA 0	UBA 0	UBA 1	UBA 2	UBA 3	UBA 4	
Rod diameter [mm]		30	25	25	30	35	40	
Protective tube diameter [mm]		45	36	36	45	55	60	
Motor Flange European standard IEC B14		–	–	56 B14	63 B14	71 B14	80 B14 90 B14	
Max. dynamic load (1) [N]		170	420	1750	2900	3200	5000	
Max. static load	Pull [N]	3000	3000	4000	6000	10000	12000	
	Push [N]	3000	3000	4000	6000	10000	12000	
ROLLED ball screw	Diameter × Pitch [mm]	12.7×12.7	14 × 5		16 × 5	20 × 5	25 × 6	
	Dynamic load C [N]	5250	8400		11260	12300	19380	
	Static load C ₀ [N]	9000	8570		11570	15040	29420	
	Ball diameter [mm]	3.175	3.175		3.175	3.175	3.969	
	Ball circuit quantity	2 × 1.5	2		3	3	3	
Ratio	RV	1 : 1	1 : 1	1 : 1.33	1 : 1.4	1 : 1.04	1 : 1.07	
	RN	1 : 2	1 : 2	1 : 2.15	1 : 2.13	1 : 2	1 : 1,94	
	RL	–	–	1 : 3	1 : 2.83	1 : 2.92	1 : 2.93	
Linear travel [mm] for 1 input shaft turn	Ratio	RV1	12.7 (RV2)	5	3.75	3.57	4.8	5.62
		RN1	6.35 (RN2)	2.5	2.32	2.34	2.5	3.09
		RL1	–	–	1.67	1.76	1.71	2.05
Weight (referred to actuator 100 mm stroke length, with lubricant, without motor) [kg]		2.2	2.2	3.3	5	8	11	
Extra-weight for each additional 100 mm stroke length [kg]		0.3	0.3	0.3	0.5	0.8	0.9	

(1) Values based on estimated ball screw lifetime of at least 2000 hours under load, without shocks or vibrations.

The electromechanical linear actuators transform a rotary movement into a linear motion. Due to the SCREW – NUT efficiency, there is a loss of energy which depends on the screw and nut type. The loss of energy is higher with 1-start acme screw and nut than with 2-starts acme screw and nut or ball screw and ball nut.

Therefore, to choose the right actuator for an application it is necessary to consider the DUTY CYCLE REQUIRED BY THE APPLICATION, which has to be compared to the WORKING DUTY CYCLE that the actuator can perform.

APPLICATION DUTY CYCLE F_u [%]: working time under load required by the application during 10 min., related to 10 minutes by percentage.

$$F_u [\%] = \frac{\text{Working time in 10 minutes}}{10 \text{ minutes}} \times 100$$

ACTUATOR DUTY CYCLE F_i [%]: working time under load that the actuator can perform during 10 minutes in environment temperature 25 °C, according to the performances stated in this catalogue, without risk of internal parts overheating, which is the main limit to the working time of an actuator.

To make the right selection of an actuator we recommend and advise to follow the SELECTION PROCEDURE as indicated below:

HOW TO SELECT A LINEAR ACTUATOR

1. Application Duty Cycle F_u [%]

Application data to be known:

- 1.1 Linear speed
- 1.2 Push or pull load
- 1.3 Working cycle
- 1.4 Stroke length
- 1.5 Electric motor type

Calculate the application duty cycle F_u [%] on 10 minutes

2. Selection of actuator series

- 2.1 $F_u \leq 30\%$: Select acme screw actuators Series ATL or Series UAL
- 2.2 $F_u \geq 50\%$: Select ball screw actuators Series BSA or Series UBA
- 2.3 $30\% < F_u < 50\%$: There are 2 possibilities:
 - Either select a ball screw series to avoid overheating risks
 - Or select an acme screw series after having checked the admitted load for a duty cycle higher than 30%. Refer to FORCE – DUTY CYCLE graphs on page 22.

Generally, the ball screw series is more expensive than the equivalent acme screw one, but note that the choice of the acme screw series will give (with $F_u > 30\%$) reduced performance, so it may be necessary to select a larger (and more expensive) size.

The ball screw actuators are not self-locking, so they require a brake motor to ensure static load holding. Furthermore, brake motor is also necessary whenever a precise positioning and repeatability are required, with both ball and acme screw actuators.

High linear speeds require a brake motor to stop and to avoid overrunning.

In such conditions the selection between ball screw or acme screw actuators is therefore influenced not only by technical factors but also by economical reasons.

3. Starting size selection

Based on the given load and linear speed required by the application, refer to graphs on page 17 to make the selection of the actuator size.

4. Mechanical checks

Make following mechanical checks on the selected size:

- 4.1 Push load: to check buckling risks refer to graphs on page 18 and 19.

It is recommended that this check is made based on the maximum load and stroke requirements.

- 4.2 Critical rotational speed for bending and whipping risks of acme or ball screw.

It is recommended that this check is made based on the maximum linear speed and stroke requirements.

Refer to graphs on page 20 and 21, where for each actuator size it is stated the linear speed limit referred to the actuator stroke length.

Either selected size can be confirmed if not select the next larger size.

- 4.3 Lifetime: acme screw and ball screw lifetime.

- Acme screw linear actuators

The performances stated in this catalogue (from page 26 to page 33) are related to duty cycle 30% in 10 min and environment temperature of 25°C.

For applications with duty cycle between 30% and 50% refer to graphs on page 22.

The screw nut lifetime calculation is complex, and is dependent on load, linear speed, temperature and duty cycle. For lifetime figures on individual applications contact Servomech's Technical Dpt.

- Ball screw linear actuators

The performances stated in this catalogue (from page 34 to page 41) are related to duty cycle 100%, environment temperature 25°C and minimum lifetime $L_{10} = 2000$ hours.

For lifetime longer or shorter than 2000 hours refer to graphs on page 23.

5. Final size selection

Based on the required motor type and on the actuator selected series and size, find in the performance tables the ratio which gives the required performance in terms of load and linear speed. Choose the performance nearest to those required.

6. Selection check point

With the performances (load – linear speed) achievable with the selected actuator and based on the duty cycle required by the application, calculate the working duty cycle.

Compare the resulting working duty cycle (F_u %) to the duty cycle allowed by the selected actuator (F_i %).

It must be $F_u \leq F_i$, otherwise repeat the actuator type selection starting from point 2.

7. Accessories selection

- 7.1 Front and rear attachment
- 7.2 Stroke limit device
- 7.3 Input versions
- 7.4 Other accessories

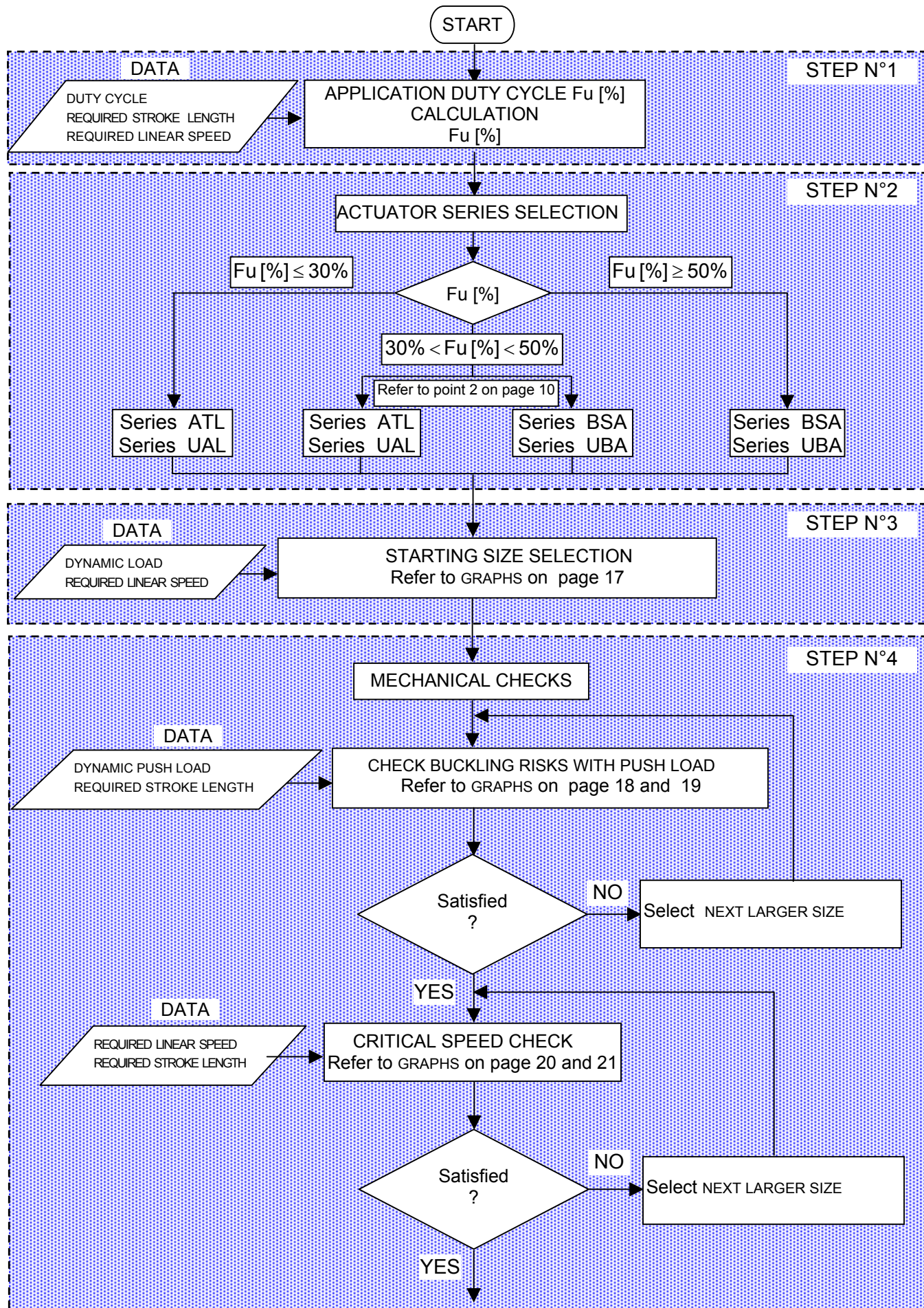
8. Actuator dimensions and fixing accessories

Refer to the dimensional tables to know the over-all dimensions of the actuator and relevant accessories and verify if they suit the application.

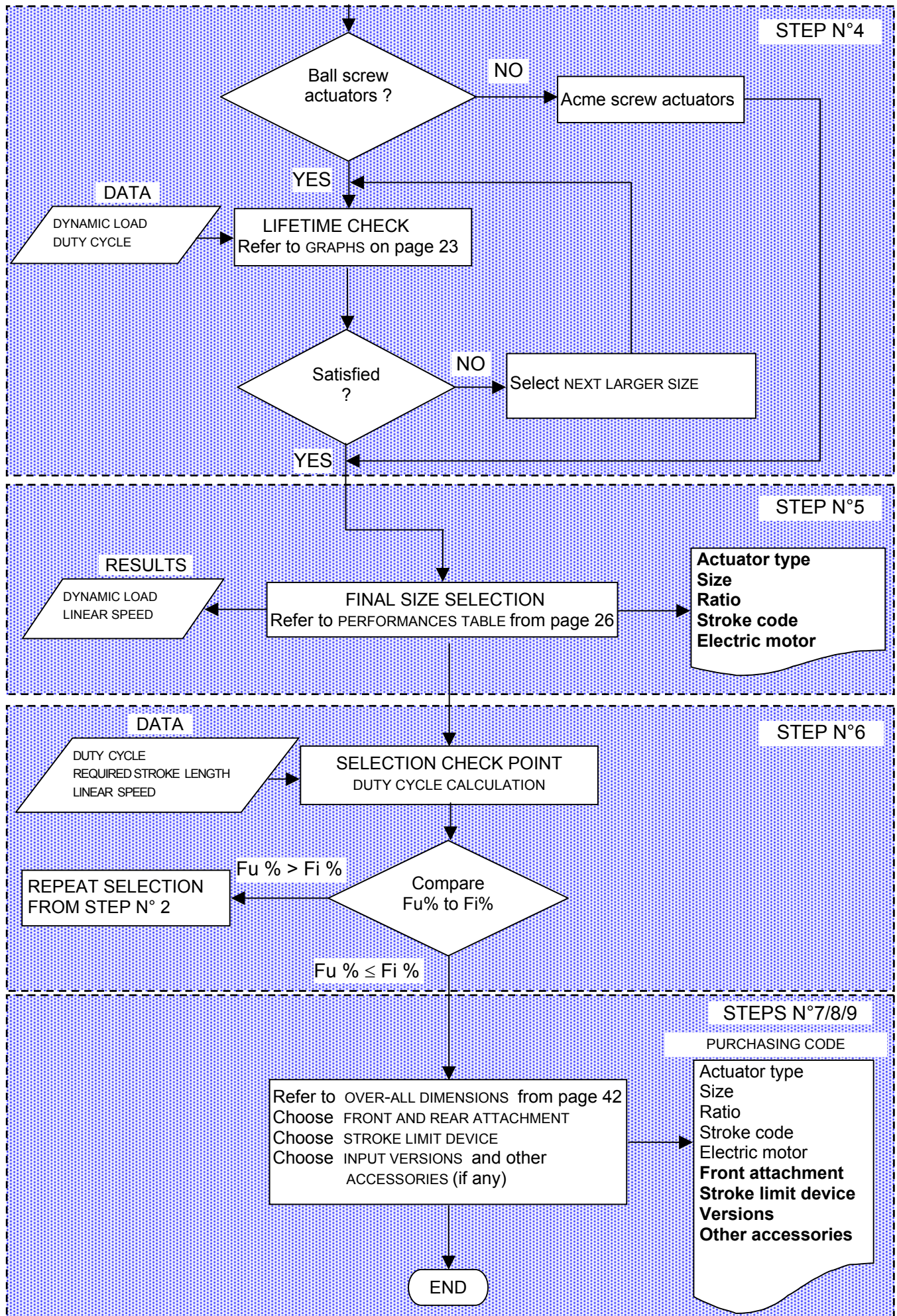
9. Purchasing code

Refer to example on page 24.

SELECTION PROCEDURE FLOW-CHART



SELECTION PROCEDURE FLOW-CHART



2.2 EXAMPLE OF LINEAR ACTUATOR SELECTION

1st EXAMPLE Application data

Required stroke length	300 mm
Required linear speed	20 mm/s
Dynamic push load	4500 N
Static load	4500 N
Duty Cycle	5 complete double travels every 10 min.
Motor	Alternate Current 3-phases

STEP N° 1

Calculate the DUTY CYCLE (Fu) required by the application:

$$Fu\% = \frac{2 \times \text{Stroke}}{\text{Speed}} \times \frac{\text{N° complete double travels in 10 minutes}}{10 \text{ minutes}} \times 100 = \frac{2 \times 300 [\text{mm}]}{20 [\text{mm/s}]} \times \frac{5}{10 [\text{min}]} \times \frac{1 [\text{min}]}{60 [\text{s}]} \times 100 = 25 \%$$

STEP N° 2

With the DUTY CYCLE lower than 30%, select an acme screw actuator. Furthermore, with the REQUIRED LINEAR SPEED of 20 mm/s choose the actuator **TYPE** ATL (refer to INITIAL SELECTION GRAPHS on page 17).

STEP N° 3

Referring to the SELECTION GRAPHS, which state the main performances of the actuator series ATL (page 17), select **SIZE** ATL 30.

STEP N° 4

- 4.1 Based on the DYNAMIC PUSH LOAD and referring to the BUCKLING PUSH LOAD GRAPHS (page 18), check if the actuator size ATL 30 is suitable.
- 4.2 Check the critical rotational speed referring to GRAPHS on page 20: size ATL 30 with STROKE LENGTH 300 [mm] is OK.

STEP N° 5

Now you can proceed to the final selection of the linear actuator. Referring to the performance table of the actuator ATL 30 with AC 3-phase motor, **RATIO** RN2 performs linear speed and load very near to those required:

LINEAR SPEED: 23 [mm/s] **DYNAMIC LOAD:** 5200 [N]
 With a AC 3-phase **MOTOR** 0.25 kW 2 poles

STEP N° 6

To confirm the selection made, calculate the working DUTY CYCLE (Fu) replacing in the formulae the real achievable linear speed:

$$Fu\% = \frac{2 \times 300 [\text{mm}]}{23 [\text{mm/s}]} \times \frac{5}{10 [\text{min}]} \times \frac{1 [\text{min}]}{60 [\text{s}]} \times 100 = 21.7 \%$$

Value lower than 30 % therefore admitted by the selected actuator.

STEPS N° 7 – 8 – 9

Select stroke limit device and mounting attachments shown on dimensional pages before completing the actuator ordering code by referring to page 24.

2.2 EXAMPLE OF LINEAR ACTUATOR SELECTION

2nd EXAMPLE Application data:

Required stroke length	600 mm
Required linear speed	60 mm/s
Dynamic push and pull load	900 N
Static push load	900 N
Duty Cycle	13 complete double travels every 10 min.
Motor	Direct Current 24 V

STEP N° 1

Calculate the DUTY CYCLE (Fu) required by the application:

$$Fu \% = \frac{2 \times \text{Stroke}}{\text{Speed}} \times \frac{\text{N° complete double travels in 10 minutes}}{10 \text{ minutes}} \times 100 = \frac{2 \times 600 [\text{mm}]}{60 [\text{mm/s}]} \times \frac{13}{10 [\text{min}]} \times \frac{1 [\text{min}]}{60 [\text{s}]} \times 100 = 43 \%$$

STEP N° 2

With the DUTY CYCLE higher than 30 % and lower than 50 % both acme or ball leadscrew can be chosen.

Choosing a ball leadscrew a duty cycle 43 % would be surely performed. This example is done and explained choosing an acme leadscrew actuator.

With the REQUIRED LINEAR SPEED of 60 mm/s, referring to the SELECTION GRAPHS on page 17, an actuator **TYPE** ATL can be chosen.

STEP N° 3

3.1 Referring to the SELECTION GRAPHS which state the main performances of the actuators series ATL (page 17) select **SIZE** ATL 20.

3.2 Referring to the performance table of the actuator ATL 20 with DC motor, **RATIO** RV2 achieves performances very near to those required:

LINEAR SPEED: 64 [mm/s] **DYNAMIC LOAD:** 920 [N]

With a DC **MOTOR** 24 V 100 W 3000 rpm

3.3 Referring to FORCE - DUTY CYCLE GRAPHS (page 22) the actuator ATL 20, with a DUTY CYCLE of 43%, can sustain only the 70 % of the nominal dynamic load: $0.7 \times 920 = 640$ N. This load does not satisfy the application requirement: choose NEXT LARGER SIZE ATL 25.

STEP N° 4

4.1 Based on the DYNAMIC PUSH LOAD and referring to the BUCKLING PUSH LOAD GRAPHS (page 18) check if the actuator size ATL 25 is suitable.

4.2 Check the critical speed referring to GRAPHS on page 20: size ATL 25 with STROKE LENGTH 600 [mm] is OK.

STEP N° 5

Referring to the performance table of the actuator ATL 25 with DC motor, **RATIO** RV2 performs linear speed and load very near to those required :

LINEAR SPEED: 64 [mm/s] **DYNAMIC LOAD:** 1330 [N]

With a DC **MOTOR** 150 W 3000rpm

$0.7 \times 1330 = 930$ N: this actuator size satisfies the application requirements.

STEP N° 6

To confirm the selection made, calculate the working DUTY CYCLE (Fu) replacing in the formulae the linear speed achievable:

$$Fu \% = \frac{2 \times 600 [\text{mm}]}{64 [\text{mm/s}]} \times \frac{13}{10 [\text{min}]} \times \frac{1 [\text{min}]}{60 [\text{s}]} \times 100 = 41 \%$$

Working duty cycle lower than the duty cycle accepted by the actuator with load 900 N: $Fu = 41 \%$; $Fi = 43 \%$, so the selection is right.

2.2 EXAMPLE OF LINEAR ACTUATOR SELECTION

STEPS N° 7 – 8 – 9

Select stroke limit device and mounting attachments shown on dimensional pages, before completing the actuator ordering code by referring to page 24.

3rd EXAMPLE Application data:

Required stroke length	1000 mm
Required linear speed	120 mm/s
Dynamic push and pull load	1700 N
Static load	0 N
Duty Cycle	28 complete double travels every 10 min.
Required Lifetime	2500 working hours under load
Motor	Alternate Current 3-phases

STEP N° 1

Calculate the DUTY CYCLE (Fu) required by the application:

$$Fu\% = \frac{2 \times \text{Stroke}}{\text{Speed}} \times \frac{\text{N° complete double travels in 10 minutes}}{10 \text{ minutes}} \times 100 = \frac{2 \times 1000 [\text{mm}]}{120 [\text{mm/s}]} \times \frac{28}{10 [\text{min}]} \times \frac{1 [\text{min}]}{60 [\text{s}]} \times 100 = 78 \%$$

STEP N° 2

With the DUTY CYCLE higher than 50%, select a ball screw actuator. Furthermore, with the REQUIRED LINEAR SPEED of 120 mm/s, choose an actuator **TYPE** UBA (see graphs on page 17).

STEP N° 3

Referring to the SELECTION GRAPHS which state the main performances of the actuators series UBA (page 17) select **SIZE** UBA 2.

STEP N° 4

- 4.1 Based on the DYNAMIC PUSH LOAD and referring to the BUCKLING PUSH LOAD GRAPHS (page 19) check if the actuator size UBA 2 is suitable.
- 4.2 Check the critical rotational speed for bending and whipping problems of the ball screw referring to GRAPHS on page 21. Size UBA 2 with STROKE LENGTH 1000 [mm] is not suitable: choose NEXT LARGER SIZE UBA 3. UBA 3 with STROKE LENGTH 1000 [mm] is OK.
- 4.3 Check if the required ball screw lifetime (2500 hours under load 1700 N) is achievable by UBA 3 referring to GRAPHS on page 23: the selected actuator size UBA 3 is OK.

STEP N° 5

Now you can proceed to the final selection of the linear actuator. Referring to the performance table of the actuator UBA 3 with AC 3-phase motor, **RATIO** RV1 performs linear speed and load very near to those required:

LINEAR SPEED: 110 [mm/s] **DYNAMIC LOAD:** 2300 [N]

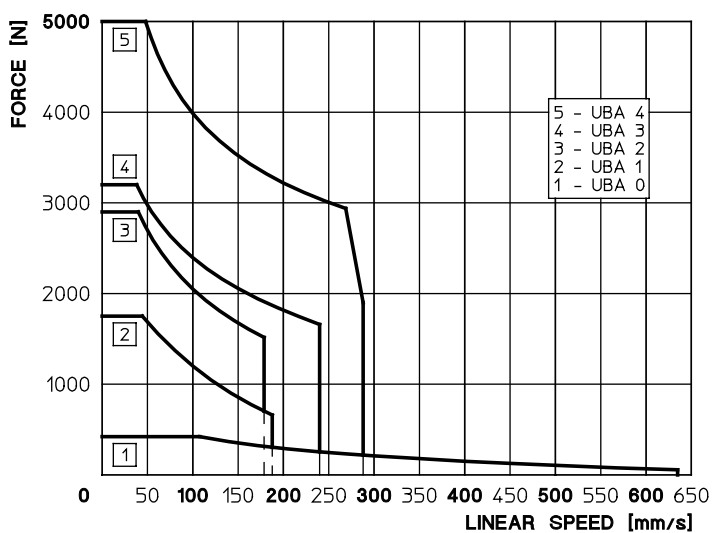
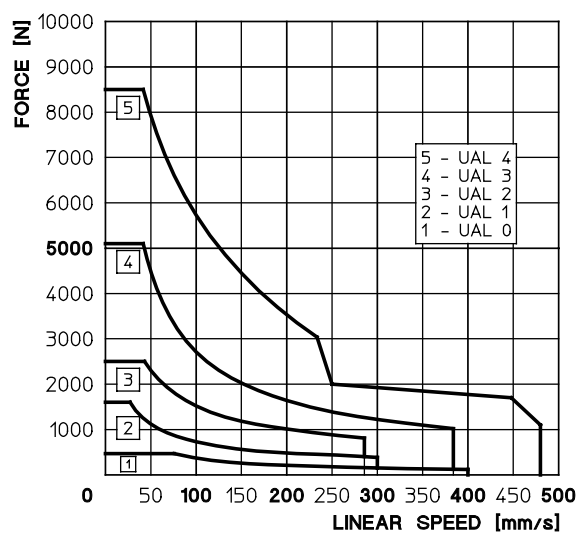
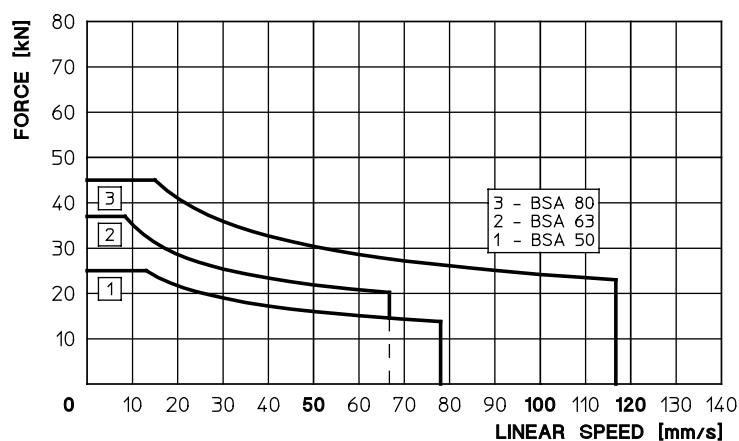
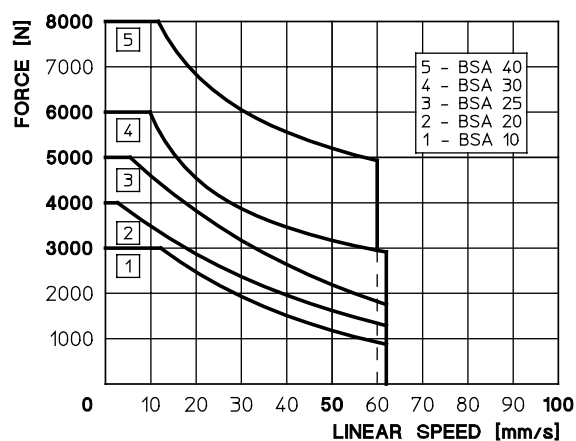
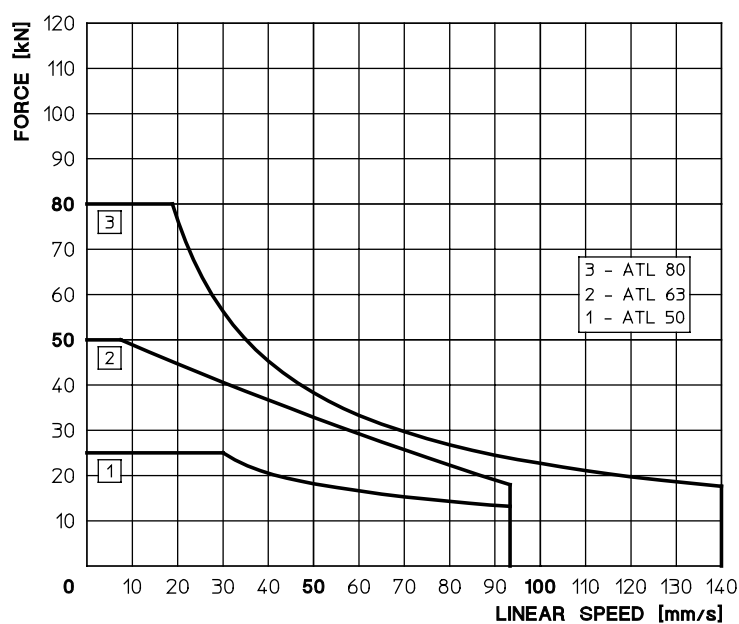
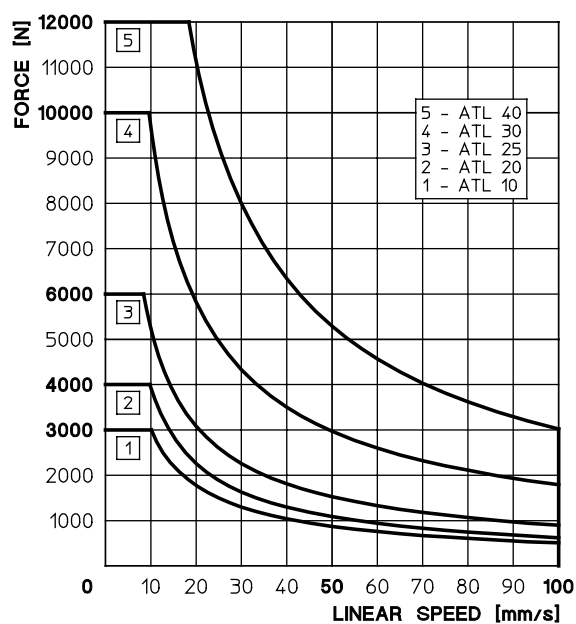
With AC 3-phase **BRAKE MOTOR** 0.37 kW 4 poles

STEPS N° 7 – 8 – 9

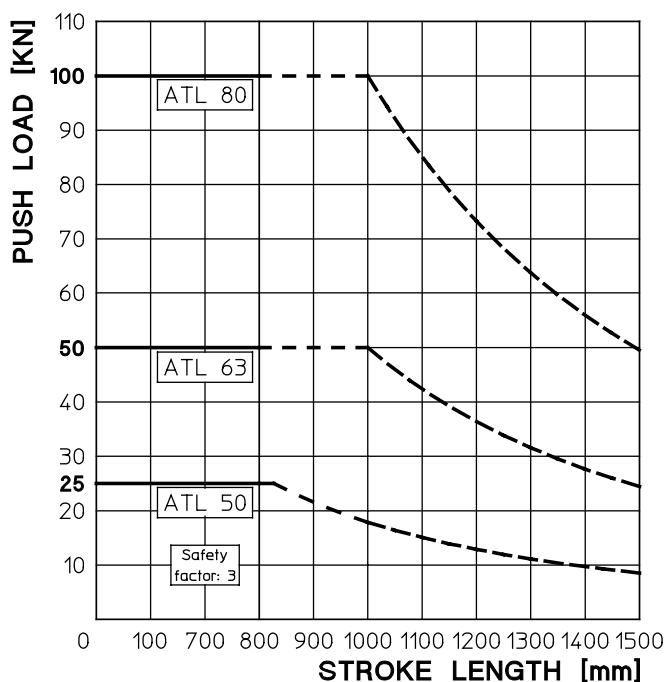
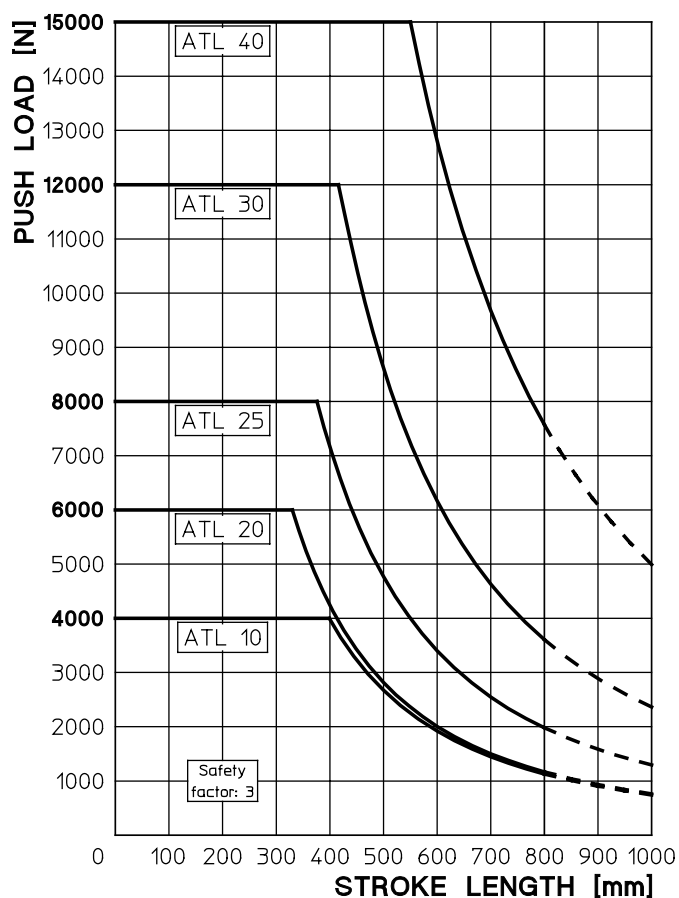
Select stroke limit device and mounting attachments shown on dimensional pages, before completing the actuator ordering code by referring to page 24.

2.3

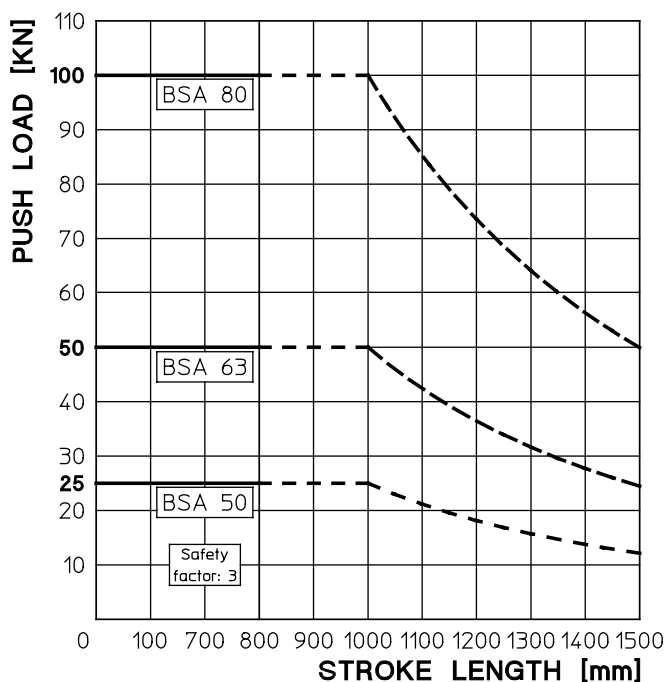
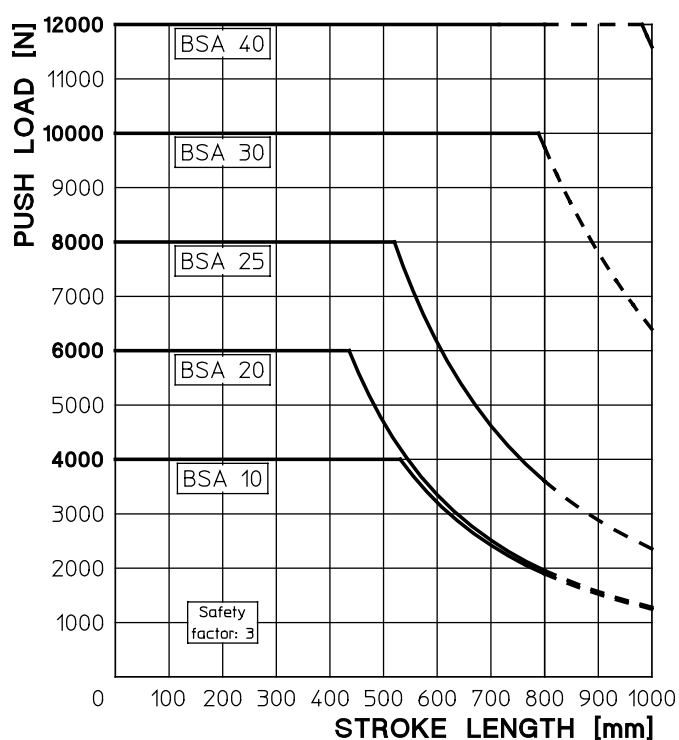
LINEAR ACTUATORS SELECTION GRAPHS



Series ATL



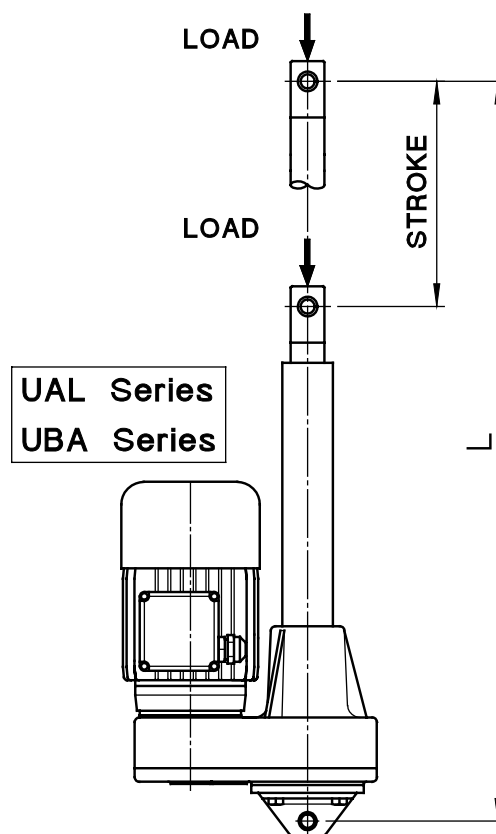
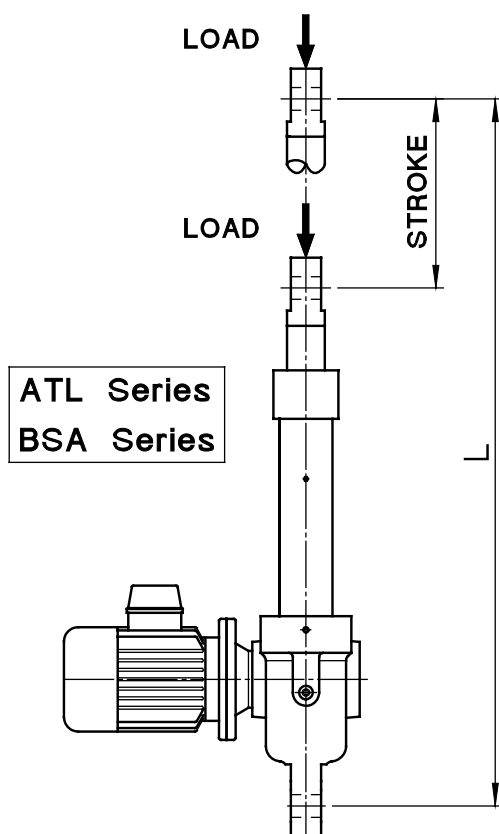
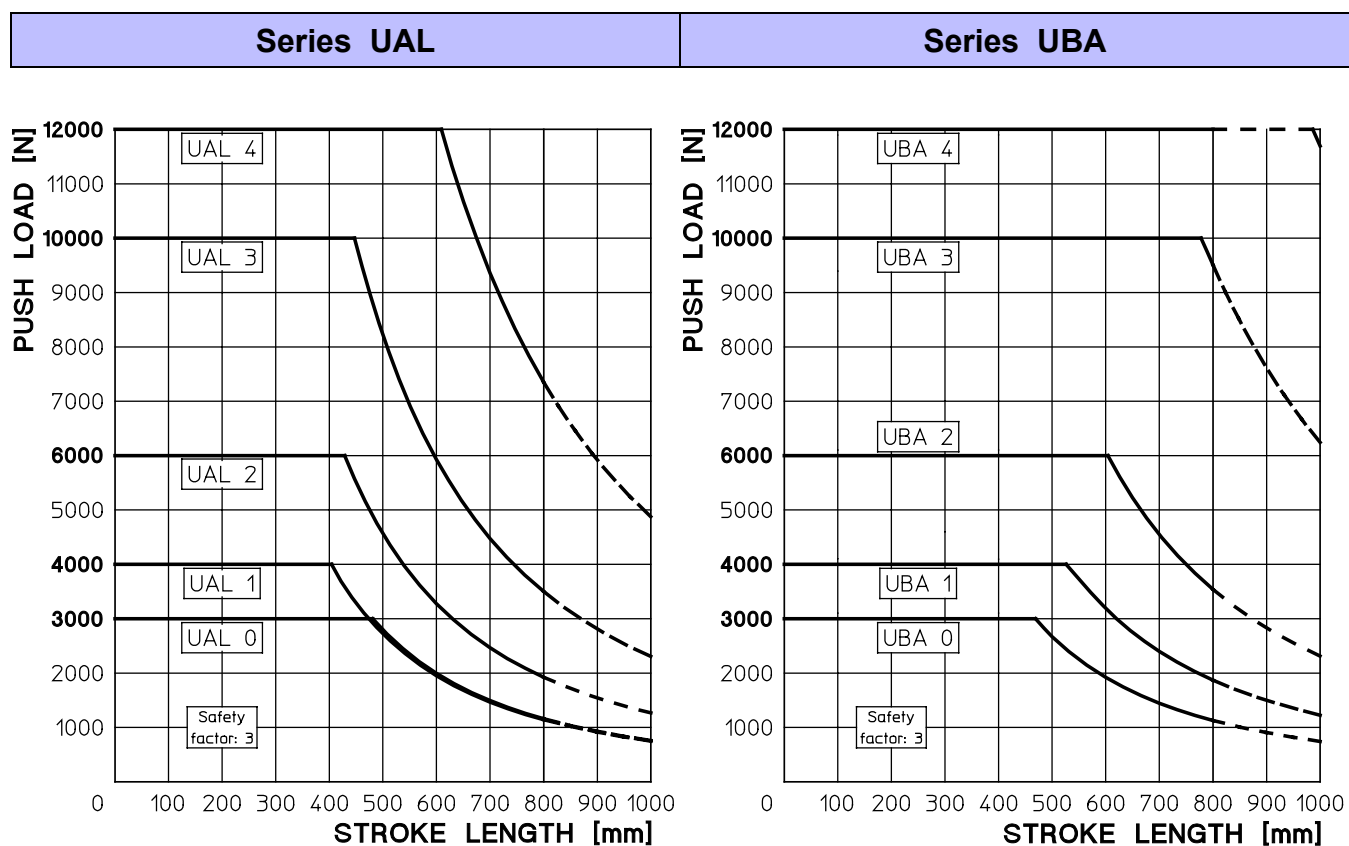
Series BSA

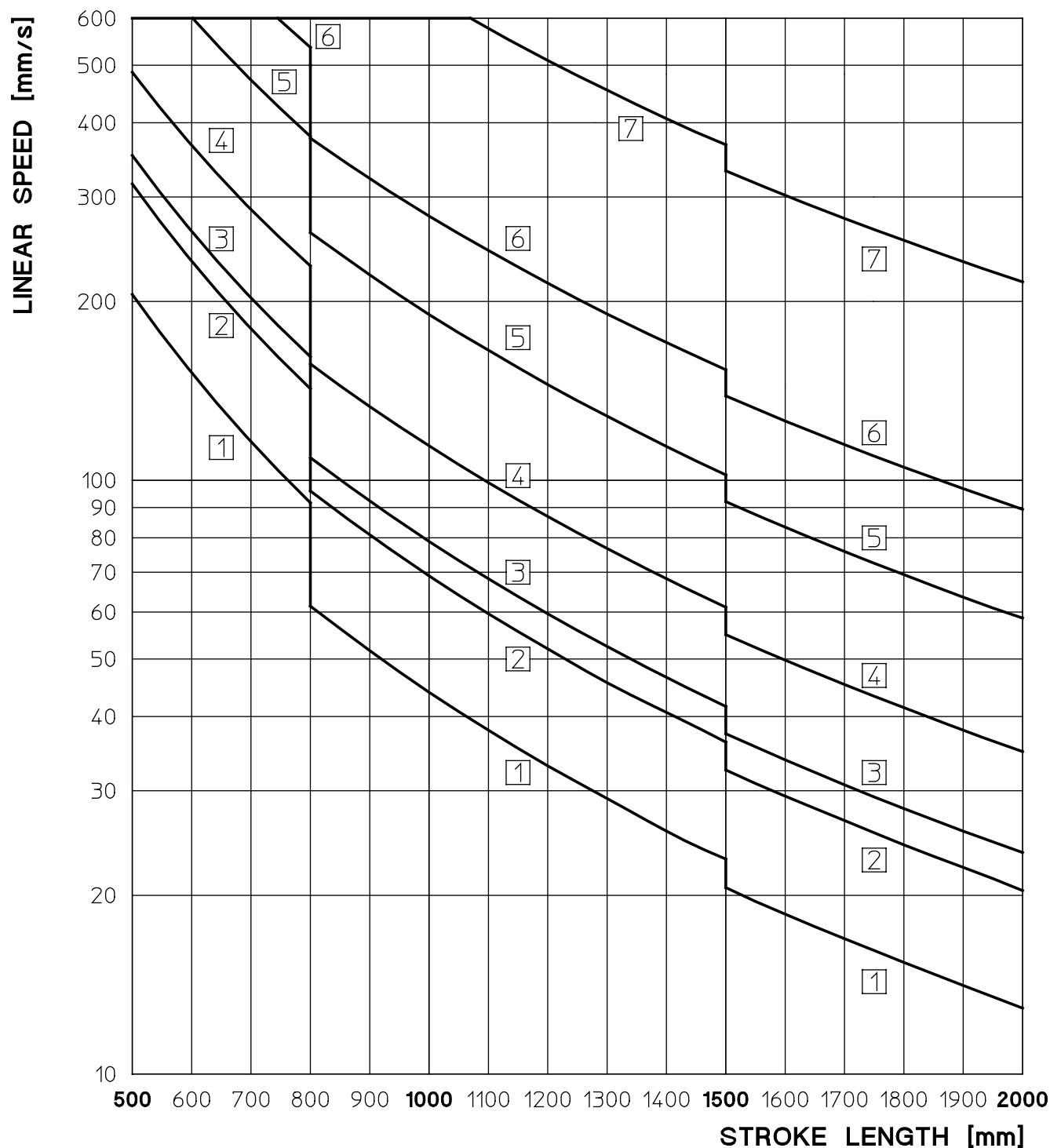


2.4

BUCKLING PUSH LOAD GRAPHS

Linear Actuators Series UAL and Series UBA




LEGEND

7	ATL 80
6	ATL 63
5	ATL 50
4	ATL 40 UAL 4
3	ATL 30 UAL 3
2	ATL 25 UAL 2
	ATL 10 ATL 20
1	UAL 0 UAL 1

NOTE 1: ONLY FOR ACME LEADSCREW ACTUATORS

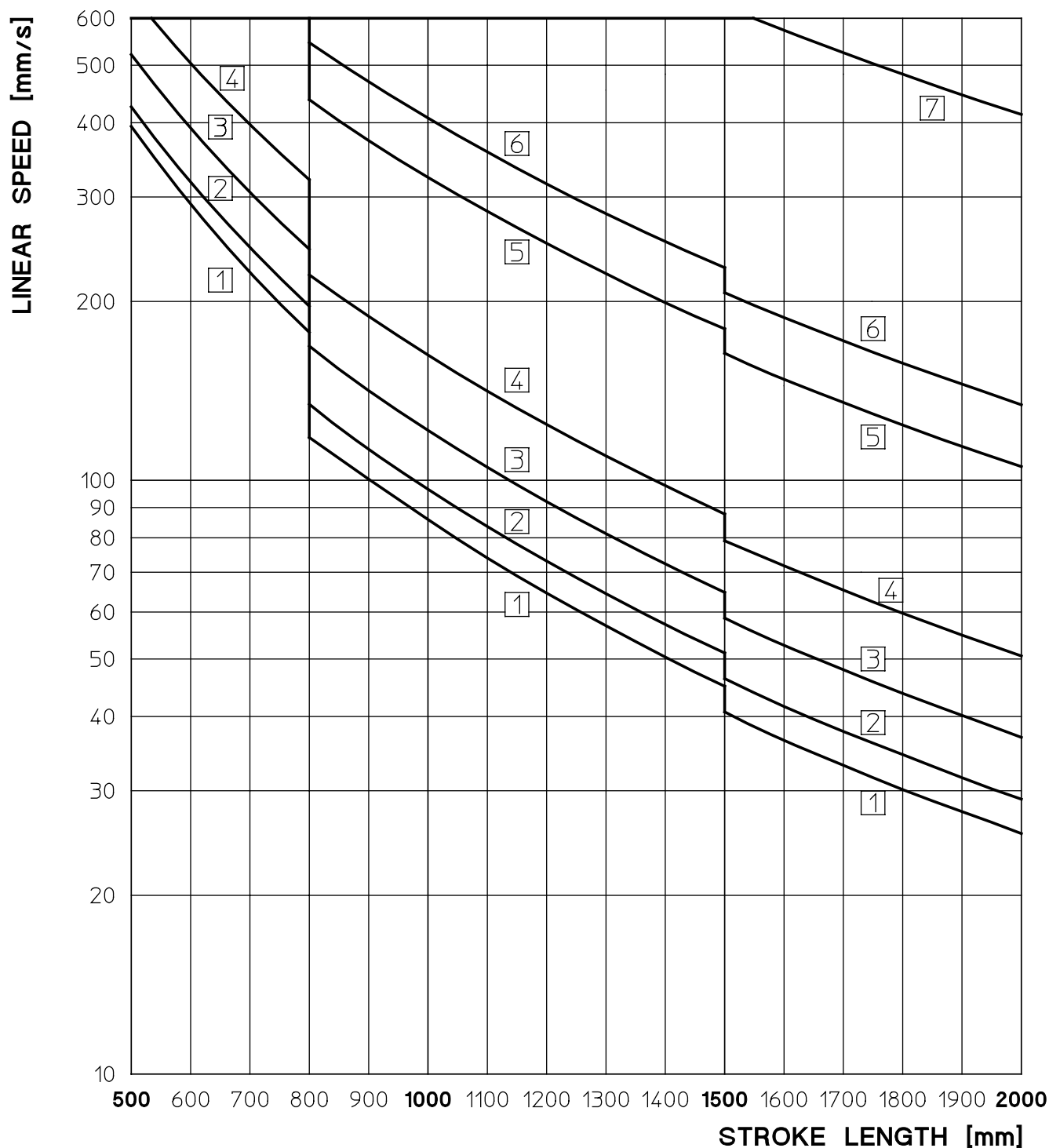
The data stated in the above graph refers to 1-start acme screw, more precisely to actuators with ratio R-1, where “-” is one of the different ratios available: H, V, N, L, XL.

2-starts acme screw actuators, identified with ratio R-2, with same linear speed admit double stroke length than the ones given in the above graph.

2.5

CRITICAL SPEED FOR BENDING AND WHIPPING RISKS

Ball screw linear actuators Series BSA and Series UBA



NOTE 2: FOR BOTH ACME AND BALL LEADSCREW ACTUATORS

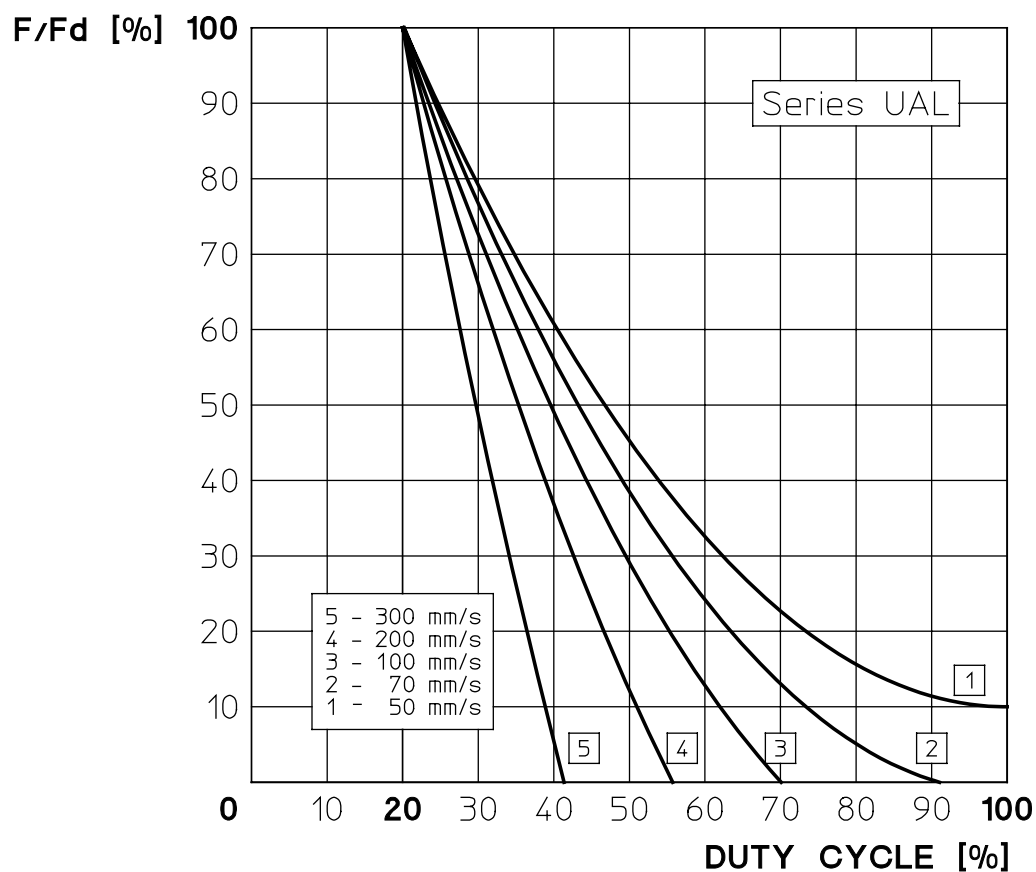
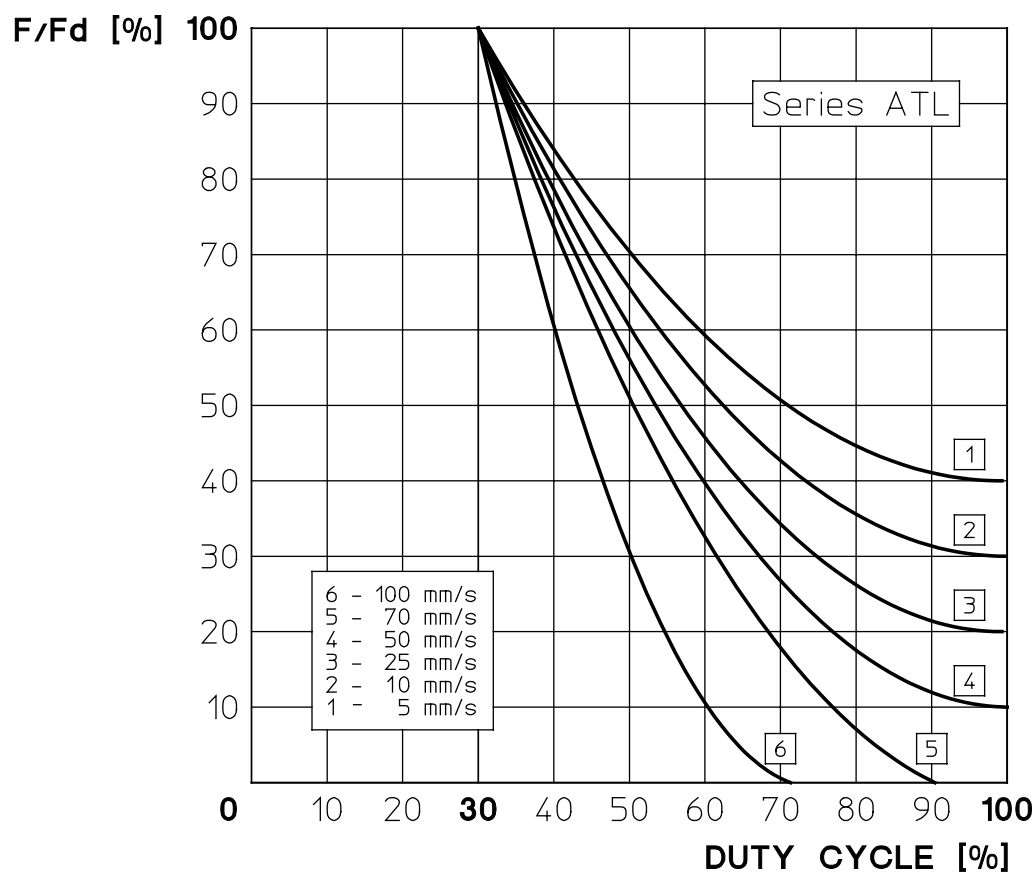
Whipping refers to the natural resonance which will occur when an acme or ball screw of a given diameter and length is rotated at a particular speed. The speed of the screw at which natural resonance will occur is known as the CRITICAL SCREW SPEED.

The acme or ball screw rotational speed is related to the actuator linear speed by the lead pitch of the screw.

The actuator linear speed, referred to the stroke length, should be therefore checked to be below the critical linear speed limit shown in the above graphs.

LEGEND

7	BSA 80
6	BSA 63
5	BSA 50
4	BSA 40 UBA 4
3	BSA 30 UBA 3
2	BSA 25 UBA 2
1	BSA 10 BSA 20
1	UBA 0 UBA 1



F – Dynamic load required by the application

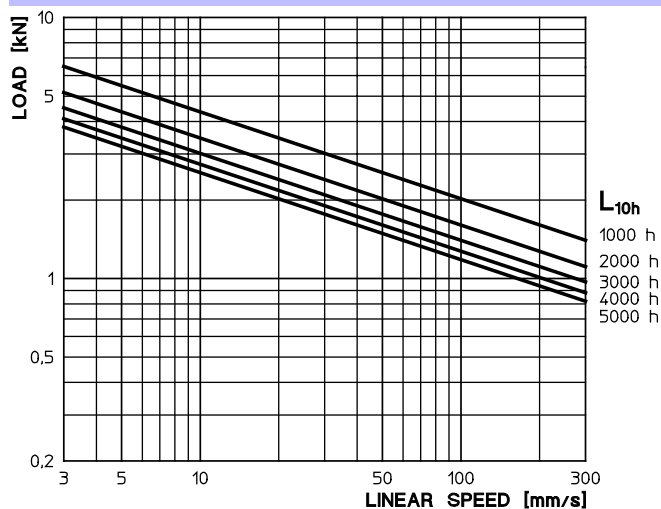
F_d – Dynamic load performed by the actuator (see Performances Tables from page 26 to page 41)

2.7

BALL SCREWS LIFETIME GRAPHS

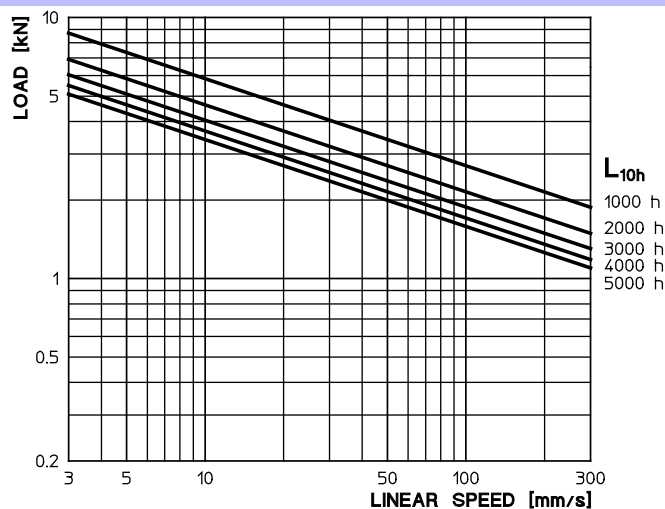
Bs 14 × 5

BSA 10 - BSA 20
UBA 0 - UBA 1



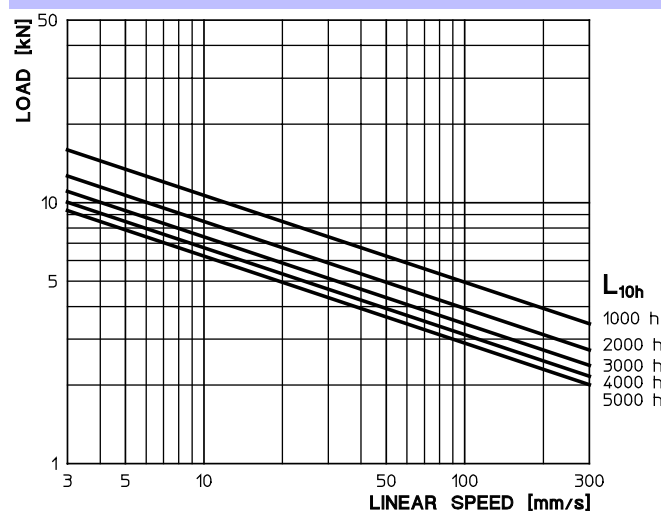
Bs 16 × 5
Bs 20 × 5

BSA 25 - UBA 2
BSA 30 - UBA 3



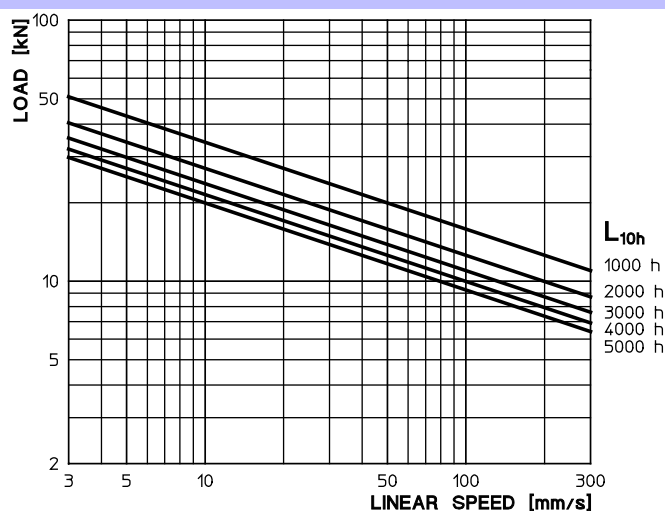
Bs 25 × 6

BSA 40 - UBA 4



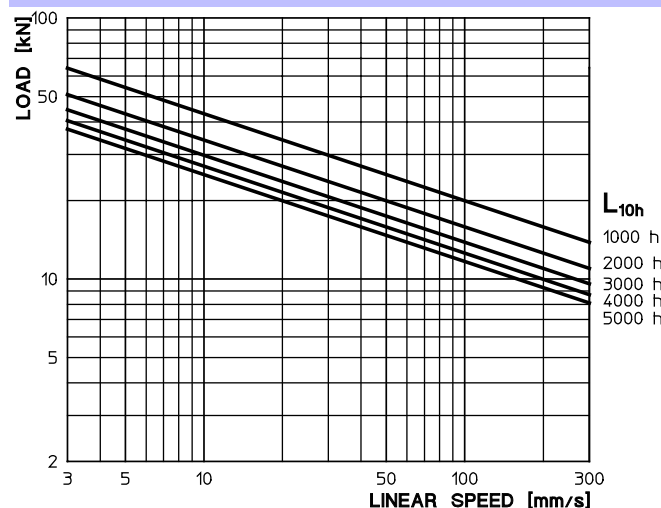
Bs 32 × 10

BSA 50



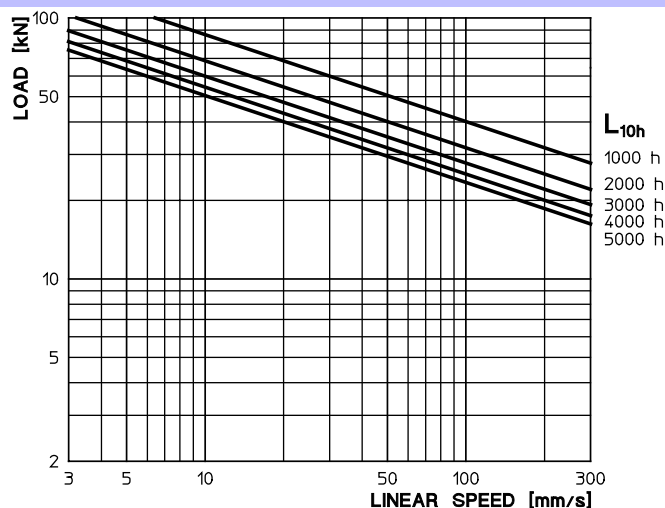
Bs 40 × 10

BSA 63



Bs 63 × 20

BSA 80



2.8
CODING

<u>ATL</u>	<u>30</u>	<u>RN2</u>	<u>C300</u>	<u>FO</u>	<u>FCE</u>	<u>VERS.3</u>	<u>RH</u>	
1	2	3	4	5	6	7.A	7.B	
<u>MOTOR</u>	<u>0,25 kW 2 POLES 3-PH.</u>	<u>230/400 V 50 Hz</u>	<u>IP55 F</u>	<u>BRAKE</u>	<u>W</u>			
8	8.A	8.B	8.C	8.D	8.E			
<u>ACCESSORIES</u>	<u>SP</u>	<u>FI</u>	<u>FS</u>	<u>AR</u>	<u>EH 53</u>	<u>MSB</u>	<u>BELLOW</u>	<u>OTHER</u>
9	9.A	9.B	9.C	9.D	9.E	9.F	9.G	9.H
1.	Actuator Series ATL; UAL; BSA; UBA							
2.	Size ATL / BSA 10, 20, 25, 30, 40, 50, 63, 80 UAL / UBA 0, 1, 2, 3, 4							
3.	Ratio RH1, RV1, RN1, RL1, RXL1 RH2, RV2, RN2, RL2, RXL2							
4.	Stroke Code. C100, C200, C300, C400, C500, C600, C700, C800 (or special strokes available on request)							
5.	Front attachment BA standard threaded head end; ROE rod end; FO clevis end; TS ball joint FL flange end; TF hinged head Rear attachment Standard : See over-all dimensions Housing pivot On request: turned at 90°, code RPT 90°							
6.	Stroke length limit device . . FCE electric switches FCM (NC) magnetic reed switches normally closed FCM (NO) magnetic reed switches normally open FCP inductive proximity switches							
7.A	Input versions. Vers.1 single input shaft Vers.2 double input shaft Vers.3 motor flange European standard IEC B5 or IEC B14 Vers.4 motor flange and extended input shaft Vers.5 motor flange adapter European standard IEC B5 + coupling Vers.6 motor flange adapter + coupling + extended input shaft							
7.B	Input shaft position. RH right hand, standard as per dimensional sheets LH left hand, on request input shaft at 180°							
MOTOR								
8.	Electric motor Alternate Current AC 3-phase Alternate Current AC 1-phase Direct Current DC							
8.A	Power and 2 poles number of poles 4 poles							
8.B	Voltage 3-phase standard multivoltage 230/400 V 50 Hz - 255/440 V 60 Hz 1-phase 230 V 50 Hz - 260 V 60 Hz DC 24 V, 12 V Other voltages available on request							
8.C	Protection IP 55 standard for 3-phase or 1-phase motors without brake IP 54 standard for AC motors with brake and DC motors Insulation Class F standard; on request special protections and insulation classes							
8.D	Motor brake Directly wired or separately wired							
8.E	Motor terminal box position W standard N, S ,E on request, see page 90							
ACCESSORIES								
9.A	SP Rear bracket							
9.B	FI Intermediate support flange, see page 93							
9.C	FS Safety clutch							
9.D	AR Anti-turn device							
9.E	Encoder. EH 53 or ENC.4							
9.F	MSB. Safety nut for push load							
9.G	B Protective bellows							
9.H	Special devices on request							

2.9

SELF - LOCKING CONDITIONS

A linear actuator is self-locking when:

- Applying a push or pull load when the actuator is in still position, the actuator does not start moving (statically self-locking)
- Switching off the electric motor of an actuator in motion, the actuator stops even under push or pull load (dynamically self-locking)

Self-locking and non self-locking conditions are defined in following 4 different situations:

1. Statically self-locking:

Actuator in still position without vibrations: when applying a push or pull load (up to the maximum load allowed) the actuator does not start moving.

This self-locking condition occurs whenever the self-locking coefficient is lower than 0.35 NOTE (1).

2. Dynamically self-locking:

2.1 Actuator in motion with an opposite load to its movement: switching off the motor, the actuator stops (self-lock).

This self-locking condition occurs whenever the self-locking coefficient is lower than 0.30 NOTE (1).

2.2. Actuator in motion with a load acting on the same motion direction: switching off the motor, the actuator stop is not guaranteed. The actuator stops only if its self-locking coefficient is lower than 0.25 NOTE (1) and in any case not always in the same position.

In the above condition we recommend to use a brake motor to stop the actuator under load and to lock it on that position, avoiding an unexpected start in case of vibrations or load shocks.

3. Uncertain locking:

With self-locking coefficient between 0.35 and 0.55 NOTE (1), the actuators are in an uncertain locking condition. Increasing the applied load the actuator can start moving.

We suggest to use a brake motor to ensure a locking condition or contact SERVOMECH Technical Dpt. for a better evaluation of the application.

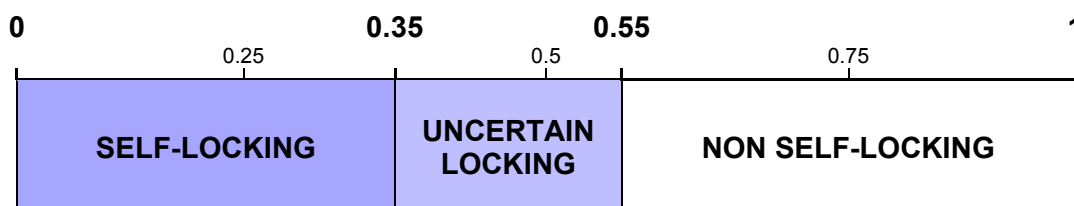
4. Non self-locking:

With self-locking coefficient higher than 0.55 NOTE (1) the actuators are never self-locking.

Note that even non self-locking actuators require a minimal push or pull force to start moving. This force value shall be checked and given by SERVOMECH Technical Dpt.

NOTE (1) To know the self-locking coefficient value of each actuator refer to the PERFORMANCES TABLES.

Self-locking coefficient table



3.1

ACME SCREW LINEAR ACTUATOR ATL 10

Compact acme screw linear actuator with integral electric motor suitable for push and pull motions.

- Electric AC 1-phase, 3-phase or DC motors, available with or without brake.
- Internal safety clutch (FS), available on request, to prevent damage caused by dynamic overloads.
- The dimensional drawings in this catalogue show the standard motor mounting position on the right side. On request the motor can be mounted on the left side, at 180° with respect to the standard position.
- Rear fixing attachment can be also supplied mounted at 90° with respect to the motor axis.

ACCESSORIES	Electric stroke limit device FCE	Magnetic stroke limit device FCM
	Rear bracket SP	Wide range of front attachments

PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

Max. static loads admitted: pull load 3000 N - push load 4000 N.

The linear speeds and dynamic loads stated below are performances achievable both at the same time during a working condition.

PERFORMANCE WITH AC 3-PHASE MOTOR

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]		RATIO	SELF-LOCKING COEFFICIENT
	AC MOTOR 0.06 kW	AC BRAKE-MOTOR 0.09 kW		
93	390	580	RH2	0.40
60	590	880	RV2	0.41
35	730	1100	RH1	0.25
30	1000	1550	RN2	0.35
22	1050	1600	RV1	0.25
15	1750	2650	RL2	0.27
11	1850	2800	RN1	0.22
7.5	2800	3000	RXL2	0.18
5.5	3000	3000	RL1	0.16
2.8	3000	3000	RXL1	0.11

PERFORMANCE WITH AC 1-PHASE MOTOR

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	SELF-LOCKING COEFFICIENT
90	580	RH2	0.40
58	880	RV2	0.41
35	1100	RH1	0.25
28	1550	RN2	0.35
21	1600	RV1	0.25
14	2650	RL2	0.27
11	2800	RN1	0.22
7	3000	RXL2	0.18
5	3000	RL1	0.16
2.5	3000	RXL1	0.11

PERFORMANCE WITH DC MOTOR 24 V or 12 V

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	SELF-LOCKING COEFFICIENT	RUNNING CURRENT [A]	
				24 V	12 V
100	430	RH2	0.40	7	14
64	650	RV2	0.41	6.5	13
37	800	RH1	0.25	6	12
32	1150	RN2	0.35	6	12
24	1200	RV1	0.25	6	12
16	1950	RL2	0.27	5.5	11
12	2000	RN1	0.22	5.5	11
8	3000	RXL2	0.18	4.5	9
6	3000	RL1	0.16	4.5	9
3	3000	RXL1	0.11	2.5	5

3.2 ACME SCREW LINEAR ACTUATORS Series ATL with AC 3-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

ATL 20				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	600	RH2	0.12 kW 2 poles 2800	0.40
60	1000	RV2	0.12 kW 2 poles 2800	0.41
46	850	RH2	0.09 kW 4 poles 1400	0.40
35	1100	RH1	0.12 kW 2 poles 2800	0.25
30	1750	RN2	0.12 kW 2 poles 2800	0.35
22	1500	RV1	0.12 kW 2 poles 2800	0.25
15	3000	RL2	0.12 kW 2 poles 2800	0.27
11	4000	RN1	0.12 kW 2 poles 2800	0.22
7.5	4000	RL2	0.09 kW 4 poles 1400	0.27
5.5	4000	RL1	0.12 kW 2 poles 2800	0.16
2.8	4000	RL1	0.09 kW 4 poles 1400	0.16
1.4	4000	RXL1	0.09 kW 4 poles 1400	0.11

ATL 25				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	830	RH2	0.12 kW 2 poles 2800	0.38
60	1250	RV2	0.12 kW 2 poles 2800	0.38
46	1300	RH1	0.12 kW 2 poles 2800	0.27
30	2200	RN2	0.12 kW 2 poles 2800	0.33
23	1650	RH1	0.09 kW 4 poles 1400	0.27
15	3750	RL2	0.12 kW 2 poles 2800	0.25
7.5	5550	RL1	0.12 kW 2 poles 2800	0.18
3.5	6000	RL1	0.09 kW 4 poles 1400	0.18
1.9	6000	RXL1	0.09 kW 4 poles 1400	0.12

ATL 30				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	1650	RV2	0.25 kW 2 poles 2800	0.37
46	2550	RV1	0.25 kW 2 poles 2800	0.25
23	5200	RN2	0.25 kW 2 poles 2800	0.28
15	6850	RL2	0.25 kW 2 poles 2800	0.22
11	7500	RN1	0.25 kW 2 poles 2800	0.20
7.5	10000	RL1	0.25 kW 2 poles 2800	0.16
5.5	9500	RN1	0.18 kW 4 poles 1400	0.20
4	10000	RL1	0.18 kW 4 poles 1400	0.16

ATL 40				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	3500	RV2	0.55 kW 2 poles 2800	0.37
46	5400	RV1	0.55 kW 2 poles 2800	0.26
23	10500	RN2	0.55 kW 2 poles 2800	0.25
18	12000	RL2	0.55 kW 2 poles 2800	0.24
11	12000	RN1	0.55 kW 2 poles 2800	0.18
9	12000	RL2	0.37 kW 4 poles 1400	0.24
5.5	12000	RN1	0.37 kW 4 poles 1400	0.18
4.5	12000	RL1	0.37 kW 4 poles 1400	0.17

3.2 ACME SCREW LINEAR ACTUATORS Series ATL with AC 1-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

ATL 20

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	600	RH2	0.12 kW 2 poles 2800	0.40
60	1000	RV2	0.12 kW 2 poles 2800	0.41
46	850	RH2	0.09 kW 4 poles 1400	0.40
35	1100	RH1	0.12 kW 2 poles 2800	0.25
30	1750	RN2	0.12 kW 2 poles 2800	0.35
22	1500	RV1	0.12 kW 2 poles 2800	0.25
15	2500	RL2	0.12 kW 2 poles 2800	0.27
11	3750	RN1	0.12 kW 2 poles 2800	0.22
7.5	4000	RL2	0.09 kW 4 poles 1400	0.27
5.5	4000	RL1	0.12 kW 2 poles 2800	0.16
2.8	4000	RL1	0.09 kW 4 poles 1400	0.16
1.4	4000	RXL1	0.09 kW 4 poles 1400	0.11

ATL 25

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	770	RH2	0.12 kW 2 poles 2800	0.38
60	1100	RV2	0.12 kW 2 poles 2800	0.38
46	1200	RH1	0.12 kW 2 poles 2800	0.27
28	2050	RN2	0.12 kW 2 poles 2800	0.33
23	1600	RH1	0.09 kW 4 poles 1400	0.27
14	3450	RL2	0.12 kW 2 poles 2800	0.25
7	5100	RL1	0.12 kW 2 poles 2800	0.18
3.5	6000	RL1	0.09 kW 4 poles 1400	0.18
1.9	6000	RXL1	0.09 kW 4 poles 1400	0.12

ATL 30

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	1500	RV2	0.25 kW 2 poles 2800	0.37
46	2350	RV1	0.25 kW 2 poles 2800	0.25
23	4800	RN2	0.25 kW 2 poles 2800	0.28
15	6300	RL2	0.25 kW 2 poles 2800	0.22
11	6950	RN1	0.25 kW 2 poles 2800	0.20
7.5	9200	RL1	0.25 kW 2 poles 2800	0.16
5.5	9500	RN1	0.18 kW 4 poles 1400	0.20
4	10000	RL1	0.18 kW 4 poles 1400	0.16

ATL 40

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	3400	RV2	0.55 kW 2 poles 2800	0.37
46	5400	RV1	0.55 kW 2 poles 2800	0.26
23	10000	RN2	0.55 kW 2 poles 2800	0.25
18	12000	RL2	0.55 kW 2 poles 2800	0.24
11	12000	RN1	0.55 kW 2 poles 2800	0.18
9	12000	RL2	0.37 kW 4 poles 1400	0.24
5.5	12000	RN1	0.37 kW 4 poles 1400	0.18
4.5	12000	RL1	0.37 kW 4 poles 1400	0.17

3.2 ACME SCREW LINEAR ACTUATORS Series ATL with DC MOTORS
PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

ATL 20 with DC motor 24 V 5.5 A 100 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
100	600	RH2	10	0.40
64	920	RV2	9.5	0.41
37	1150	RH1	9	0.25
32	1650	RN2	9	0.35
24	1700	RV1	8.5	0.25
16	2800	RL2	8.5	0.27
12	2900	RN1	8	0.22
8	4000	RXL2	6.5	0.18
6	4000	RL1	6	0.16
3	4000	RXL1	3	0.11

ATL 25 with DC motor 24 V 8.4 A 150 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
100	900	RH2	14.5	0.38
64	1330	RV2	13.5	0.38
50	1450	RH1	15	0.27
32	2100	RV1	14	0.27
16	4000	RL2	12	0.25
8	6000	RL1	11.5	0.18
4	6000	RXL1	5.5	0.12

ATL 30 with DC motor 24 V 15.6 A 300 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
100	1750	RV2	26	0.37
50	2750	RV1	27	0.25
25	5600	RN2	23	0.28
16	7500	RL2	21	0.22
12	8400	RN1	22	0.20
8	10000	RL1	18	0.16

ATL 40 with DC motor 24 V 25 A 500 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
100	3000	RV2	43	0.37
50	4700	RV1	44	0.26
25	9200	RN2	38	0.25
20	11000	RL2	36	0.24
12	12000	RN1	31	0.18
10	12000	RL1	26	0.17

3.3 ACME SCREW LINEAR ACTUATORS Series ATL with AC 3-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

ATL 50				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	13.7	RV2	2.2 kW 2 poles 2800	0.34
46	17	RV2	1.5 kW 4 poles 1400	0.34
30	25	RN2	2.2 kW 2 poles 2800	0.26
23	25	RV1	1.5 kW 4 poles 1400	0.24
15	25	RN2	1.5 kW 4 poles 1400	0.26
11	25	RL2	0.75 kW 4 poles 1400	0.23
7.5	25	RN1	0.75 kW 4 poles 1400	0.18
5.5	25	RL1	0.75 kW 4 poles 1400	0.15

ATL 63				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
93	18	RV2	3 kW 2 poles 2800	0.32
46	33	RV2	3 kW 4 poles 1400	0.32
23	45	RV1	3 kW 4 poles 1400	0.21
11	40	RN1	1.5 kW 4 poles 1400	0.18
5.5	50	RL1	1.5 kW 4 poles 1400	0.13

ATL 80				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
140	17	RV2	4 kW 2 poles 2800	0.34
70	31	RV2	4 kW 4 poles 1400	0.34
46	41	RN2	4 kW 2 poles 2800	0.24
35	48	RV1	4 kW 4 poles 1400	0.23
23	73	RN2	4 kW 4 poles 1400	0.24
17	80	RL2	4 kW 4 poles 1400	0.22
11	80	RN1	4 kW 4 poles 1400	0.16
8.5	80	RL1	3 kW 4 poles 1400	0.15

4.1 ACME SCREW LINEAR ACTUATORS Series UAL with AC 3-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

UAL 1				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
280	300	RV2	0.12 kW 2 poles 2800	0.51
170	450	RN2	0.12 kW 2 poles 2800	0.51
120	600	RL2	0.12 kW 2 poles 2800	0.51
105	600	RV1	0.12 kW 2 poles 2800	0.32
85	600	RN2	0.09 kW 4 poles 1400	0.51
60	860	RL2	0.09 kW 4 poles 1400	0.51
50	800	RV1	0.09 kW 4 poles 1400	0.32
45	1200	RL1	0.12 kW 2 poles 2800	0.32
32	1200	RN1	0.09 kW 4 poles 1400	0.32
23	1600	RL1	0.09 kW 4 poles 1400	0.32

UAL 2				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
265	650	RV2	0.25 kW 2 poles 2800	0.48
175	950	RN2	0.25 kW 2 poles 2800	0.48
130	1200	RL2	0.25 kW 2 poles 2800	0.48
87	1300	RN2	0.18 kW 4 poles 1400	0.48
65	1950	RL1	0.25 kW 2 poles 2800	0.35
43	2000	RN1	0.18 kW 4 poles 1400	0.35
32	2500	RL1	0.18 kW 4 poles 1400	0.35

UAL 3				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
360	1000	RV2	0.55 kW 2 poles 2800	0.46
180	1850	RN2	0.55 kW 2 poles 2800	0.46
130	2600	RL2	0.55 kW 2 poles 2800	0.46
90	3000	RN1	0.55 kW 2 poles 2800	0.32
64	4100	RL1	0.55 kW 2 poles 2800	0.32
46	3650	RN1	0.37 kW 4 poles 1400	0.32
32	5100	RL1	0.37 kW 4 poles 1400	0.32

UAL 4				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
450	1700	RV2	1.1 kW 2 poles 2800	0.46
230	3000	RN2	1.1 kW 2 poles 2800	0.46
160	4300	RL2	1.1 kW 2 poles 2800	0.46
115	5000	RN1	1.1 kW 2 poles 2800	0.32
80	6800	RL1	1.1 kW 2 poles 2800	0.32
58	6200	RN1	0.75 kW 4 poles 1400	0.32
40	8500	RL1	0.75 kW 4 poles 1400	0.32

4.1 ACME SCREW LINEAR ACTUATORS Series UAL with AC 1-PHASE MOTORS PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

UAL 1				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
265	300	RV2	0.12 kW 2 poles 2800	0.51
165	450	RN2	0.12 kW 2 poles 2800	0.51
115	600	RL2	0.12 kW 2 poles 2800	0.51
100	600	RV1	0.12 kW 2 poles 2800	0.32
85	600	RN2	0.09 kW 4 poles 1400	0.51
60	860	RL2	0.09 kW 4 poles 1400	0.51
50	800	RV1	0.09 kW 4 poles 1400	0.32
45	1200	RL1	0.12 kW 2 poles 2800	0.32
32	1200	RN1	0.09 kW 4 poles 1400	0.32
23	1600	RL1	0.09 kW 4 poles 1400	0.32

UAL 2				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
265	600	RV2	0.25 kW 2 poles 2800	0.48
175	850	RN2	0.25 kW 2 poles 2800	0.48
130	1100	RL2	0.25 kW 2 poles 2800	0.48
87	1200	RN2	0.18 kW 4 poles 1400	0.48
65	1800	RL1	0.25 kW 2 poles 2800	0.35
43	2000	RN1	0.18 kW 4 poles 1400	0.35
32	2500	RL1	0.18 kW 4 poles 1400	0.35

UAL 3				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
360	900	RV2	0.55 kW 2 poles 2800	0.46
180	1650	RN2	0.55 kW 2 poles 2800	0.46
130	2350	RL2	0.55 kW 2 poles 2800	0.46
90	2700	RN1	0.55 kW 2 poles 2800	0.32
64	3700	RL1	0.55 kW 2 poles 2800	0.32
46	3300	RN1	0.37 kW 4 poles 1400	0.32
32	4600	RL1	0.37 kW 4 poles 1400	0.32

UAL 4				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
450	1550	RV2	1.1 kW 2 poles 2800	0.46
230	2700	RN2	1.1 kW 2 poles 2800	0.46
160	3900	RL2	1.1 kW 2 poles 2800	0.46
115	4500	RN1	1.1 kW 2 poles 2800	0.32
80	6100	RL1	1.1 kW 2 poles 2800	0.32
58	5600	RN1	0.75 kW 4 poles 1400	0.32
40	7650	RL1	0.75 kW 4 poles 1400	0.32

4.1 ACME SCREW LINEAR ACTUATORS Series UAL with DC MOTORS
PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

UAL 1 with DC motor 24 V 8.4 A 150 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
300	350	RV2	14	0.51
185	500	RN2	13	0.51
130	700	RL2	12	0.51
112	700	RV1	14	0.32
70	1000	RN1	12	0.32
50	1400	RL1	12	0.32

UAL 2 with DC motor 24 V 15.6 A 300 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
285	700	RV2	25	0.48
185	1050	RN2	24	0.48
140	1350	RL2	24	0.48
93	1700	RN1	26	0.35
70	2200	RL1	25	0.35

UAL 3 with DC motor 24 V 25 A 500 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
384	900	RV2	41	0.46
200	1600	RN2	38	0.46
137	2300	RL2	38	0.46
100	2600	RN1	41	0.32
68	3600	RL1	38	0.32

UAL 4 with DC motor 90 V 10.6 A 750 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
480	1100	RV2	18	0.46
250	2000	RN2	17	0.46
170	2750	RL2	16	0.46
125	3250	RN1	18	0.32
85	4450	RL1	17	0.32

Compact ball screw linear actuator with integral electric motor suitable for push and pull motions.

- Rolled and hardened ball screw.
- Case hardened and ground ball nut.
- Electric A.C. 3-phase, 1-phase or D.C. motors, available with or without brake.
- Internal safety clutch (FS) is available on request, to prevent damage caused by dynamic overloads.
- The dimensional drawings in this catalogue show the standard motor mounting position on the right side. On request the motor can be mounted on the left side, at 180° with respect to the standard position.
- Rear fixing attachment can be also supplied mounted at 90° with respect to the motor axis.

The actuator BSA 10 is not self-locking: to sustain static push or pull loads it is necessary to have a brake motor. The ball screw linear actuator BSA 10 performances stated in this catalogue can be achieved with a continuous duty cycle.

ACCESSORIES	Electric stroke limit device FCE	Magnetic stroke limit device FCM
	Rear bracket SP	Wide range of front attachments

PERFORMANCE with: Duty Cycle Fi = 100 % over 10 min. at 25 °C environment

Max. static loads admitted: pull load 3000 N - push load 4000 N.

The linear speeds and dynamic loads stated below are performances achievable both at the same time during a working condition.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

PERFORMANCE WITH AC 3-PHASE MOTOR				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]		RATIO	SELF-LOCKING COEFFICIENT
	AC MOTOR 0.06 kW	AC BRAKE-MOTOR 0.09 kW		
58	750	1100	RH1	0.56
36	1150	1700	RV1	0.57
18	2150	2800	RN1	0.49
9	3000	3000	RL1	0.37
4.5	3000	3000	RXL1	0.25

PERFORMANCE WITH AC 1-PHASE MOTOR			
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	SELF-LOCKING COEFFICIENT
58	1100	RH1	0.56
36	1700	RV1	0.57
18	2800	RN1	0.49
9	3000	RL1	0.37
4.5	3000	RXL1	0.25

PERFORMANCE WITH DC MOTOR 24 V or 12 V					
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	SELF-LOCKING COEFFICIENT	RUNNING CURRENT [A]	
				24 V	12 V
62	800	RH1	0.56	5	10
40	1300	RV1	0.57	5	10
20	2500	RN1	0.49	5	10
10	3000	RL1	0.37	3	7
5	3000	RXL1	0.25	2	4.5

5.2 BALL SCREW LINEAR ACTUATORS Series BSA with AC 3-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 100 % at 25 °C environment temp.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

BSA 20				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
60	1600	RH1	0.12 kW 2 poles 2800	0.56
37	2250	RV1	0.12 kW 2 poles 2800	0.57
30	2150	RH1	0.09 kW 4 poles 1400	0.56
20	2800	RN1	0.12 kW 2 poles 2800	0.49
9	3550	RN1	0.09 kW 4 poles 1400	0.49
4.5	4000	RL1	0.09 kW 4 poles 1400	0.37
2.3	4000	RXL1	0.09 kW 4 poles 1400	0.25

BSA 25				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
60	1600	RH1	0.12 kW 2 poles 2800	0.56
37	2400	RV1	0.12 kW 2 poles 2800	0.56
30	2200	RH1	0.09 kW 4 poles 1400	0.56
20	3800	RN1	0.12 kW 2 poles 2800	0.48
9	4800	RN1	0.09 kW 4 poles 1400	0.48
4.5	5000	RL1	0.09 kW 4 poles 1400	0.37
2.3	5000	RXL1	0.09 kW 4 poles 1400	0.25

BSA 30				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
60	2850	RV1	0.25 kW 2 poles 2800	0.56
30	3700	RV1	0.18 kW 4 poles 1400	0.56
15	5000	RN1	0.25 kW 2 poles 2800	0.43
10	6000	RL1	0.25 kW 2 poles 2800	0.34
7	6000	RN1	0.18 kW 4 poles 1400	0.43
5	6000	RL1	0.18 kW 4 poles 1400	0.34

BSA 40				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
56	5000	RV1	0.55 kW 2 poles 2800	0.56
28	6000	RV1	0.37 kW 4 poles 1400	0.56
14	7600	RN1	0.55 kW 2 poles 2800	0.38
11	8000	RL1	0.55 kW 2 poles 2800	0.36
7	8000	RN1	0.37 kW 4 poles 1400	0.38
5.5	8000	RL1	0.37 kW 4 poles 1400	0.36

5.2 BALL SCREW LINEAR ACTUATORS Series BSA with AC 1-PHASE MOTORS

PERFORMANCE with: Duty Cycle $F_i = 100\%$ at 25°C environment temp.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

BSA 20				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
60	1500	RH1	0.12 kW 2 poles 2800	0.56
37	2250	RV1	0.12 kW 2 poles 2800	0.57
30	2150	RH1	0.09 kW 4 poles 1400	0.56
20	2800	RN1	0.12 kW 2 poles 2800	0.49
9	3500	RN1	0.09 kW 4 poles 1400	0.49
4.5	4000	RL1	0.09 kW 4 poles 1400	0.37
2.3	4000	RXL1	0.09 kW 4 poles 1400	0.25

BSA 25				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
60	1500	RH1	0.12 kW 2 poles 2800	0.56
37	2300	RV1	0.12 kW 2 poles 2800	0.56
30	2150	RH1	0.09 kW 4 poles 1400	0.56
20	3800	RN1	0.12 kW 2 poles 2800	0.48
9	4800	RN1	0.09 kW 4 poles 1400	0.48
4.5	5000	RL1	0.09 kW 4 poles 1400	0.37
2.3	5000	RXL1	0.09 kW 4 poles 1400	0.25

BSA 30				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
60	2800	RV1	0.25 kW 2 poles 2800	0.56
30	3700	RV1	0.18 kW 4 poles 1400	0.56
15	5000	RN1	0.25 kW 2 poles 2800	0.43
10	6000	RL1	0.25 kW 2 poles 2800	0.34
7	6000	RN1	0.18 kW 4 poles 1400	0.43
5	6000	RL1	0.18 kW 4 poles 1400	0.34

BSA 40				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
56	5000	RV1	0.55 kW 2 poles 2800	0.56
28	6000	RV1	0.37 kW 4 poles 1400	0.56
14	7600	RN1	0.55 kW 2 poles 2800	0.38
11	8000	RL1	0.55 kW 2 poles 2800	0.36
7	8000	RN1	0.37 kW 4 poles 1400	0.38
5.5	8000	RL1	0.37 kW 4 poles 1400	0.36

5.2 BALL SCREW LINEAR ACTUATORS Series BSA with DC MOTORS
PERFORMANCE with: Duty Cycle Fi = 100 % at 25 °C environment temp.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

BSA 20 with DC motor 24 V 5.5 A 100 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
62	1150	RH1	6.5	0.56
40	1800	RV1	6.5	0.57
20	2750	RN1	5.5	0.49
10	3500	RL1	3.5	0.37
5	4000	RXL1	2.5	0.25

BSA 25 with DC motor 24 V 8.4 A 150 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
62	1750	RH1	9.5	0.56
40	2650	RV1	9.5	0.56
20	3700	RN1	7	0.48
10	4700	RL1	5	0.37
5	5000	RXL1	3	0.25

BSA 30 with DC motor 24 V 15.6 A 300 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
62	3000	RV1	16	0.56
15	5000	RN1	7	0.43
10	6000	RL1	6	0.34

BSA 40 with DC motor 24 V 25 A 500 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
60	5000	RV1	24	0.56
15	7500	RN1	10	0.38
12	8000	RL1	9	0.36

5.3 BALL SCREW LINEAR ACTUATORS Series BSA with AC 3-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 100 % at 25 °C environment temp.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

BSA 50				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
78	14	RV1	1.5 kW 2 poles 2800	0.56
40	17	RV1	1.5 kW 4 poles 1400	0.56
25	20	RN1	1.1 kW 2 poles 2800	0.43
20	22	RL1	1.1 kW 2 poles 2800	0.37
13	25	RN1	0.75 kW 4 poles 1400	0.43
10	25	RL1	0.75 kW 4 poles 1400	0.37

BSA 63				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
66	20	RV1	2.2 kW 2 poles 2800	0.56
33	25	RV1	1.5 kW 4 poles 1400	0.56
17	30	RN1	0.75 kW 4 poles 1400	0.46
8	37	RL1	0.75 kW 4 poles 1400	0.35

BSA 80				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [kN]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
115	24	RV1	4 kW 2 poles 2800	0.56
60	35	RV1	3 kW 4 poles 1400	0.56
40	44	RN1	2.2 kW 2 poles 2800	0.38
30	48	RL1	2.2 kW 2 poles 2800	0.35
20	55	RN1	1.5 kW 4 poles 1400	0.38
15	60	RL1	2.2 kW 4 poles 1400	0.35

6.1 BALL SCREW LINEAR ACTUATORS Series UBA with AC 3-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 100 % at 25 °C environment temp.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

UBA 1				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
175	550	RV1	0.12 kW 2 poles 2800	0.72
105	900	RN1	0.12 kW 2 poles 2800	0.72
85	800	RV1	0.09 kW 4 poles 1400	0.72
75	1250	RL1	0.12 kW 2 poles 2800	0.72
55	1250	RN1	0.09 kW 4 poles 1400	0.72
40	1750	RL1	0.09 kW 4 poles 1400	0.72

UBA 2				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
165	1200	RV1	0.25 kW 2 poles 2800	0.71
110	1800	RN1	0.25 kW 2 poles 2800	0.71
80	2300	RL1	0.25 kW 2 poles 2800	0.71
55	2450	RN1	0.18 kW 4 poles 1400	0.71
40	2900	RL1	0.18 kW 4 poles 1400	0.71

UBA 3				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
225	1800	RV1	0.55 kW 2 poles 2800	0.70
110	2300	RV1	0.37 kW 4 poles 1400	0.70
80	2600	RL1	0.55 kW 2 poles 2800	0.70
60	2800	RN1	0.37 kW 4 poles 1400	0.70
40	3200	RL1	0.37 kW 4 poles 1400	0.70

UBA 4				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
265	3000	RV1	1.1 kW 2 poles 2800	0.70
135	3600	RV1	0.75 kW 4 poles 1400	0.70
96	4000	RL1	1.1 kW 2 poles 2800	0.70
70	4500	RN1	0.75 kW 4 poles 1400	0.70
48	5000	RL1	0.75 kW 4 poles 1400	0.70

6.1 BALL SCREW LINEAR ACTUATORS Series UBA with AC 1-PHASE MOTORS

PERFORMANCE with: Duty Cycle Fi = 100 % at 25 °C environment temp.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

UBA 1				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
175	500	RV1	0.12 kW 2 poles 2800	0.72
105	800	RN1	0.12 kW 2 poles 2800	0.72
85	750	RV1	0.09 kW 4 poles 1400	0.72
75	1150	RL1	0.12 kW 2 poles 2800	0.72
55	1250	RN1	0.09 kW 4 poles 1400	0.72
40	1750	RL1	0.09 kW 4 poles 1400	0.72

UBA 2				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
165	1100	RV1	0.25 kW 2 poles 2800	0.71
110	1600	RN1	0.25 kW 2 poles 2800	0.71
80	2150	RL1	0.25 kW 2 poles 2800	0.71
55	2400	RN1	0.18 kW 4 poles 1400	0.71
40	2900	RL1	0.18 kW 4 poles 1400	0.71

UBA 3				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
225	1800	RV1	0.55 kW 2 poles 2800	0.70
110	2300	RV1	0.37 kW 4 poles 1400	0.70
80	2600	RL1	0.55 kW 2 poles 2800	0.70
60	2800	RN1	0.37 kW 4 poles 1400	0.70
40	3200	RL1	0.37 kW 4 poles 1400	0.70

UBA 4				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR POWER [kW] NUMBER OF POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
265	2900	RV1	1.1 kW 2 poles 2800	0.70
135	3600	RV1	0.75 kW 4 poles 1400	0.70
96	4000	RL1	1.1 kW 2 poles 2800	0.70
70	4500	RN1	0.75 kW 4 poles 1400	0.70
48	5000	RL1	0.75 kW 4 poles 1400	0.70

6.1 BALL SCREW LINEAR ACTUATORS Series UBA with DC MOTORS
PERFORMANCE with: Duty Cycle Fi = 100 % at 25 °C environment temp.

The following actuators performances are related to ball screw rated lifetime $L_{10} = 2000$ hours, without shock-loads or vibrations. For different lifetime requirements refer to graphs on page 23.

UBA 1 with DC motor 24 V 8.4 A 150 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
185	650	RV1	9	0.72
115	1100	RN1	9.5	0.72
80	1400	RL1	8.5	0.72

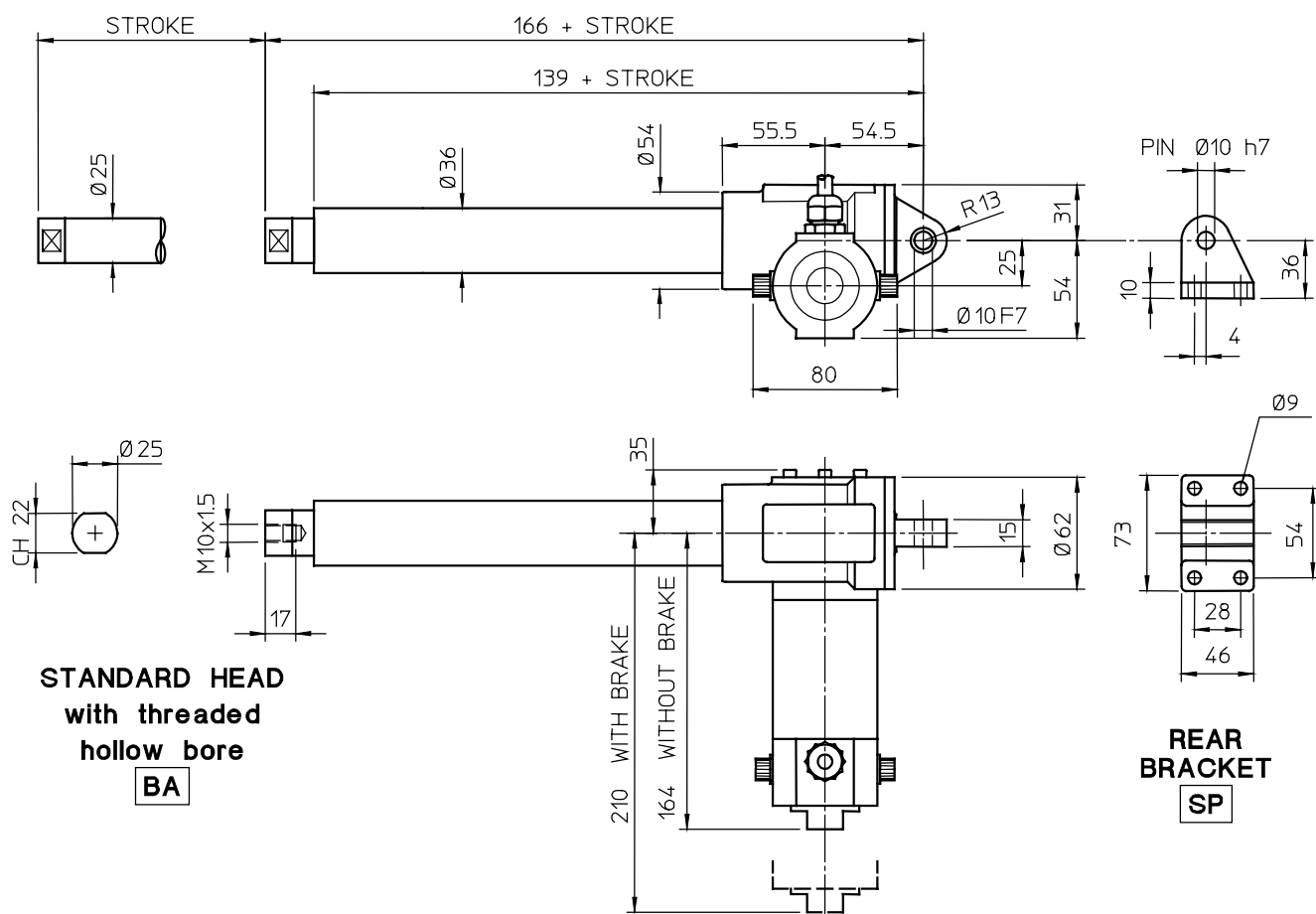
UBA 2 with DC motor 24 V 15.6 A 300 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
180	1400	RV1	17.5	0.71
120	2000	RN1	16.5	0.71
90	2250	RL1	14	0.71

UBA 3 with DC motor 24 V 25 A 500 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
240	1600	RV1	26	0.70
125	2200	RN1	20	0.70
85	2500	RL1	15.5 NOTE (1)	0.70

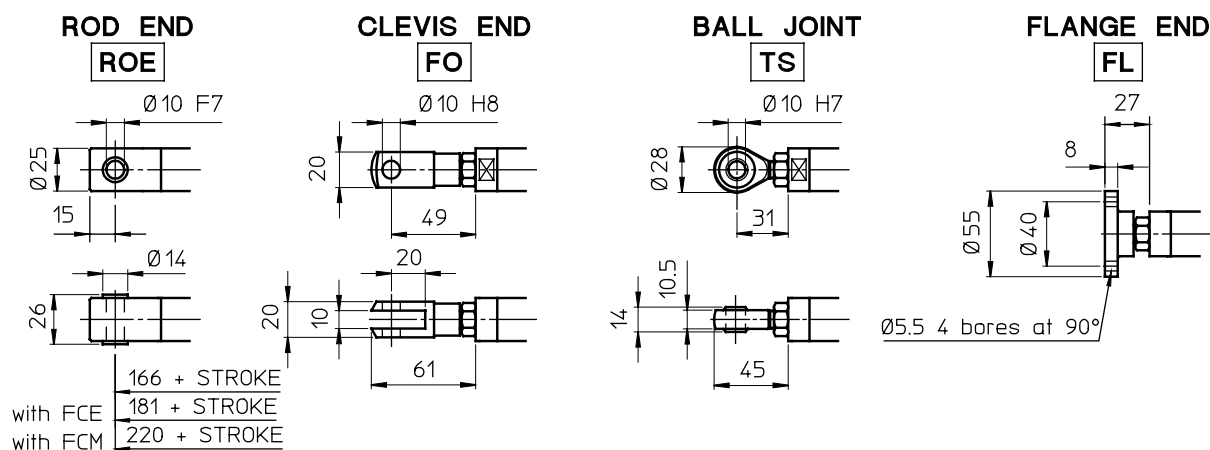
NOTE (1): Performance achievable with DC motor 24 V 15.6 A 300 Watts 3000 r/min.

UBA 4 with DC motor 90 V 10.6 A 750 W 3000 rpm				
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]	SELF-LOCKING COEFFICIENT
290	1900	RV1	11	0.70
150	3400	RN1	11	0.70
100	4000	RL1	8.5	0.70

7.1 ACME SCREW LINEAR ACTUATOR ATL 10 WITH DC MOTOR



FRONT ATTACHMENTS

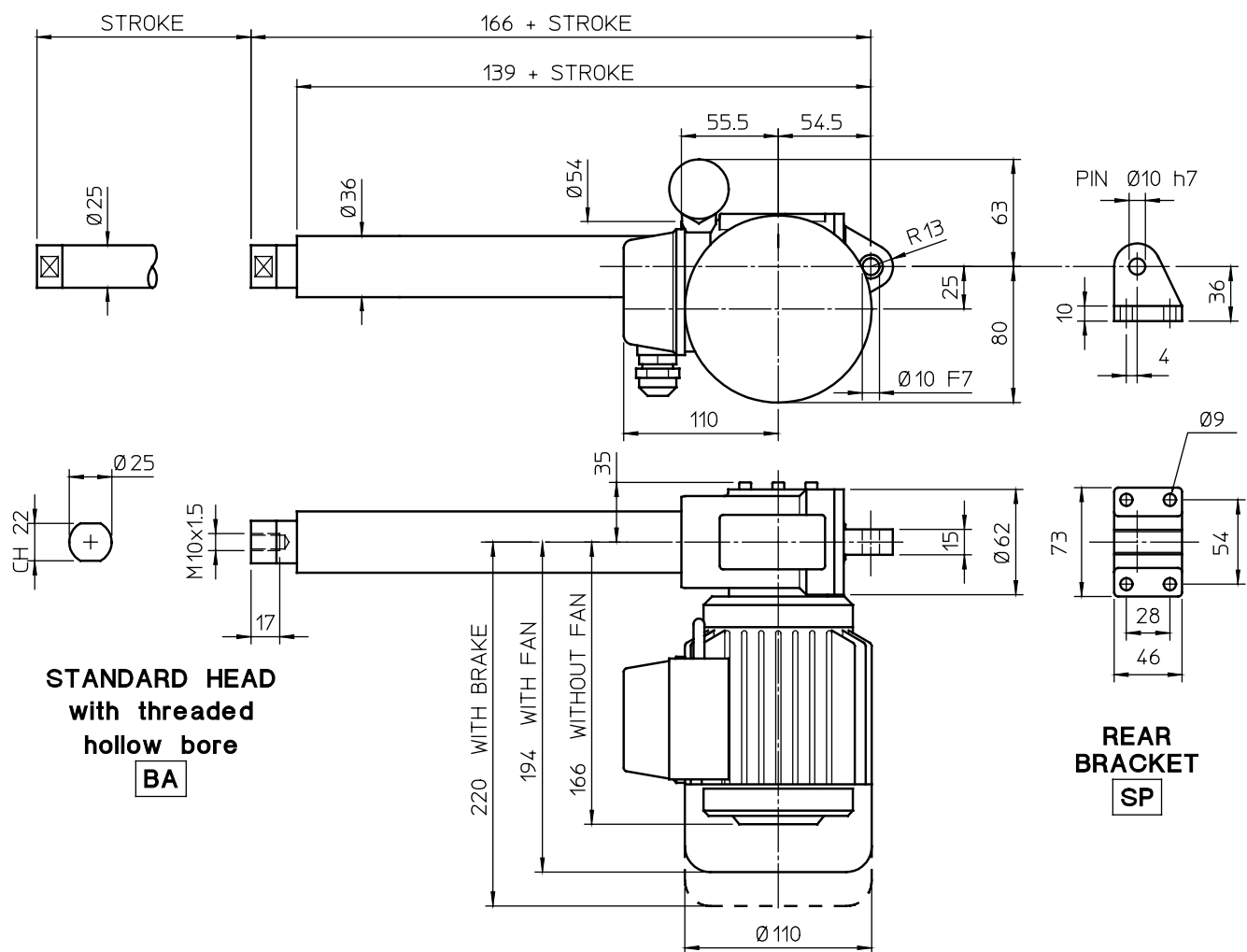


STROKE LENGTHS AVAILABLE IN STOCK WITH OR WITHOUT ELECTRIC STROKE LIMIT DEVICE FCE

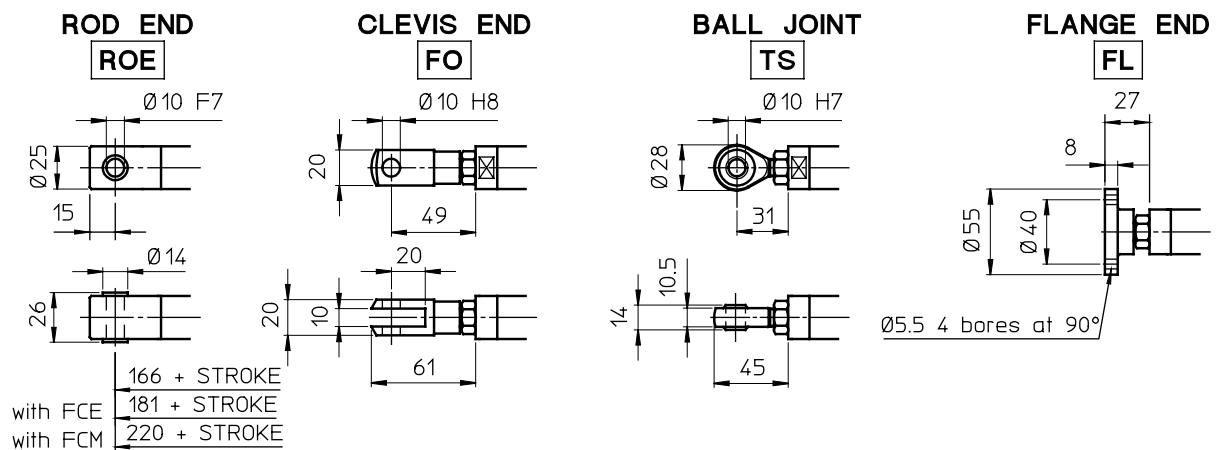
STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - DC motor features on page 101.
 - Over-all dimensions in millimetres (mm).

7.1 ACME SCREW LINEAR ACTUATOR ATL 10 WITH AC 1-PHASE MOTOR



FRONT ATTACHMENTS



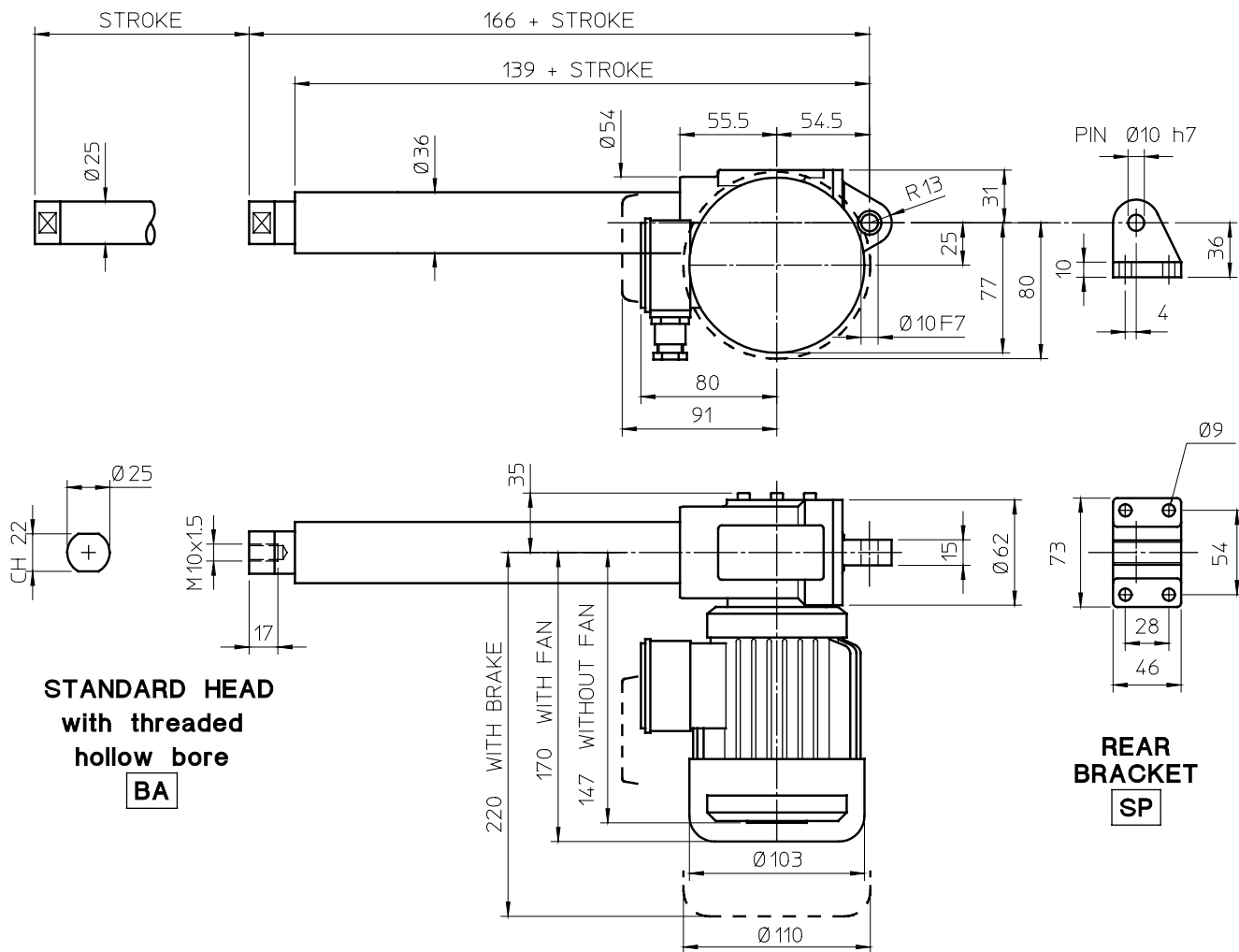
**STROKE LENGTHS AVAILABLE IN STOCK
WITH OR WITHOUT ELECTRIC STROKE LIMIT DEVICE FCE**

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

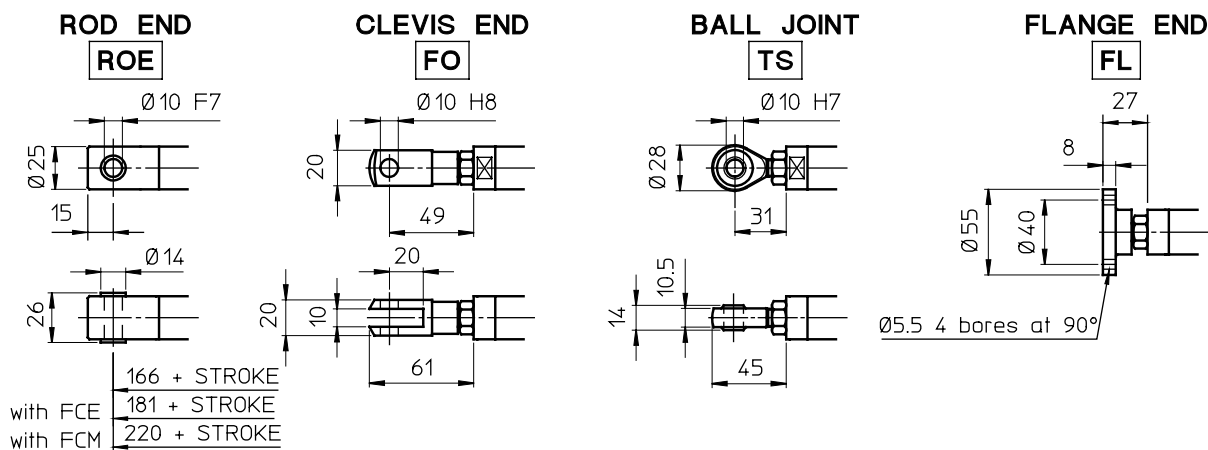
Note:

- Special stroke lengths available on request.
- AC 1-phase motor features on page 101.
- Over-all dimensions in millimetres (mm).

7.1 ACME SCREW LINEAR ACTUATOR ATL 10 WITH AC 3-PHASE MOTOR



FRONT ATTACHMENTS



**STROKE LENGTHS AVAILABLE IN STOCK
WITH OR WITHOUT ELECTRIC STROKE LIMIT DEVICE FCE**

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

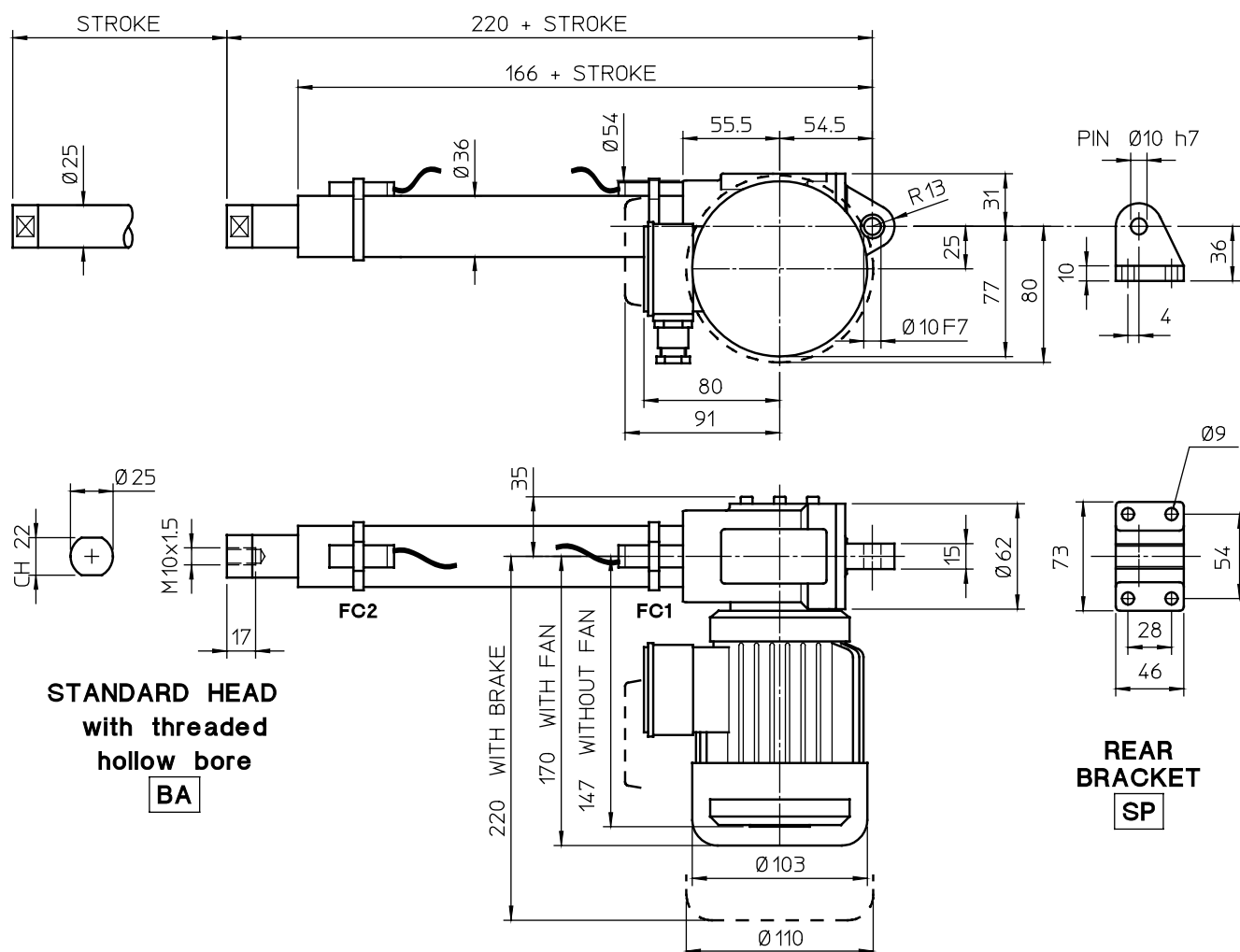
Note:

- Special stroke lengths available on request.
- AC 3-phase motor features on page 101.
- Over-all dimensions in millimetres (mm).

7.1 ACME SCREW LINEAR ACTUATOR ATL 10 WITH AC 3-PHASE MOTOR

DIMENSIONS WITH MAGNETIC STROKE LIMIT DEVICE FCM

Features, operation, adjustment and wiring diagrams: on page 95



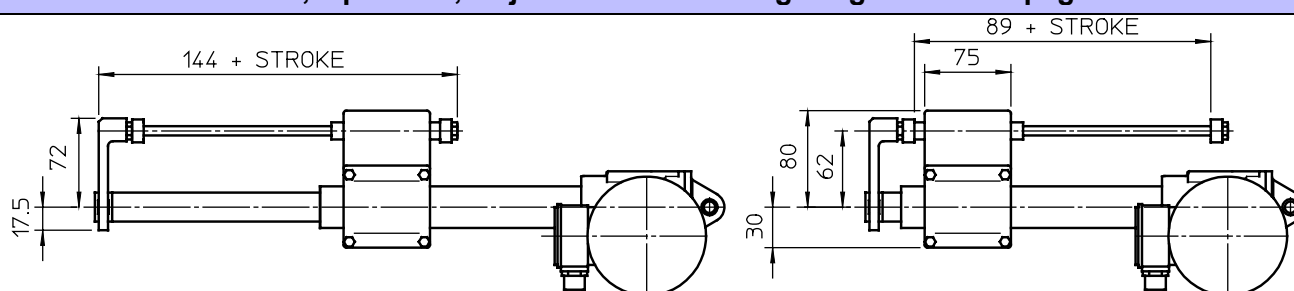
STROKE LENGTHS AVAILABLE IN STOCK WITH MAGNETIC STROKE LIMIT DEVICE FCM

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	73	173	273	373	473	573	673	773

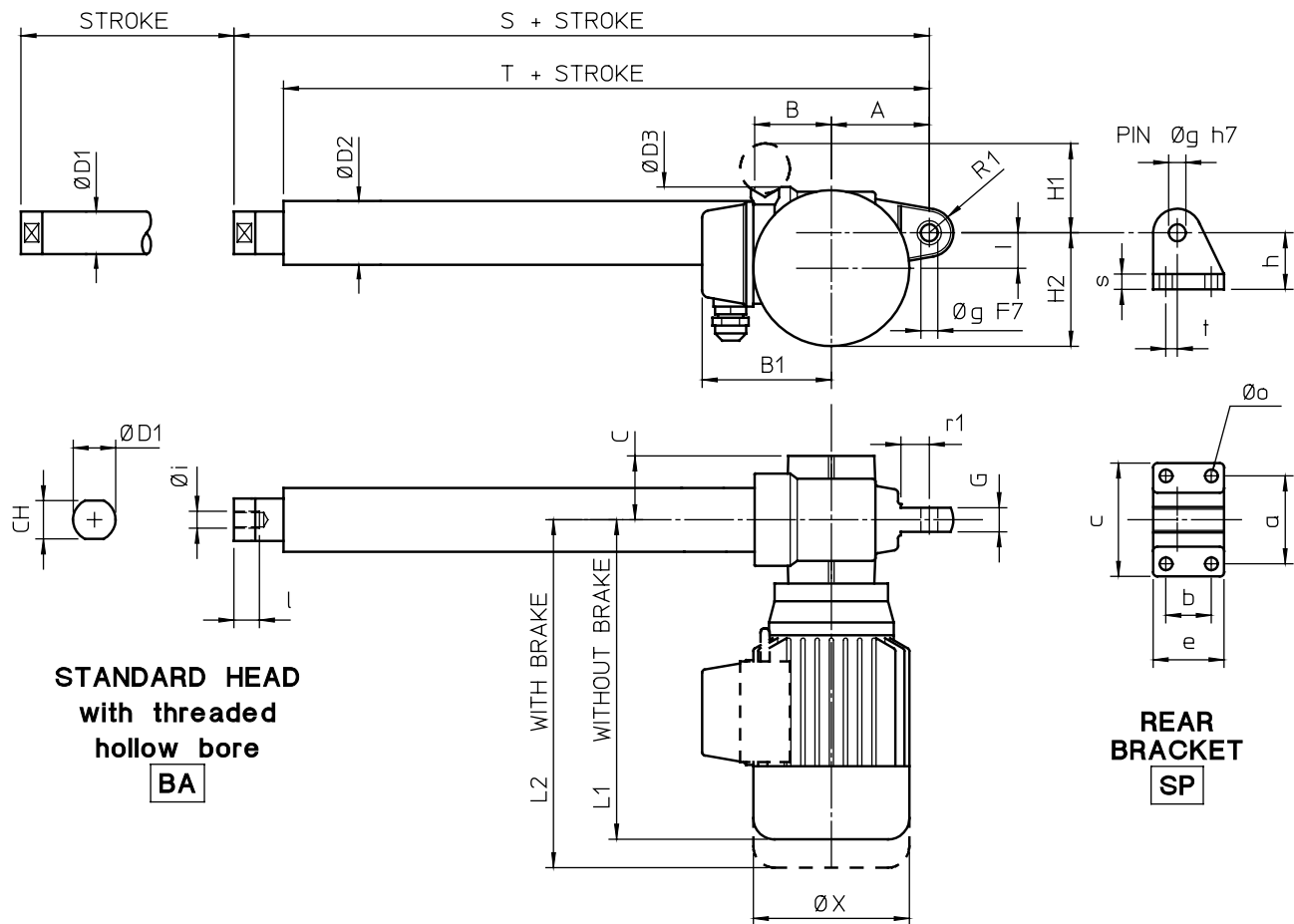
- Note:
- Special stroke lengths available on request.
 - The travel length performed by an actuator equipped with FCM is reduced compared to an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimal retracted length. Therefore the actuator in retracted position is longer.

ELECTRIC STROKE LIMIT DEVICE FCE

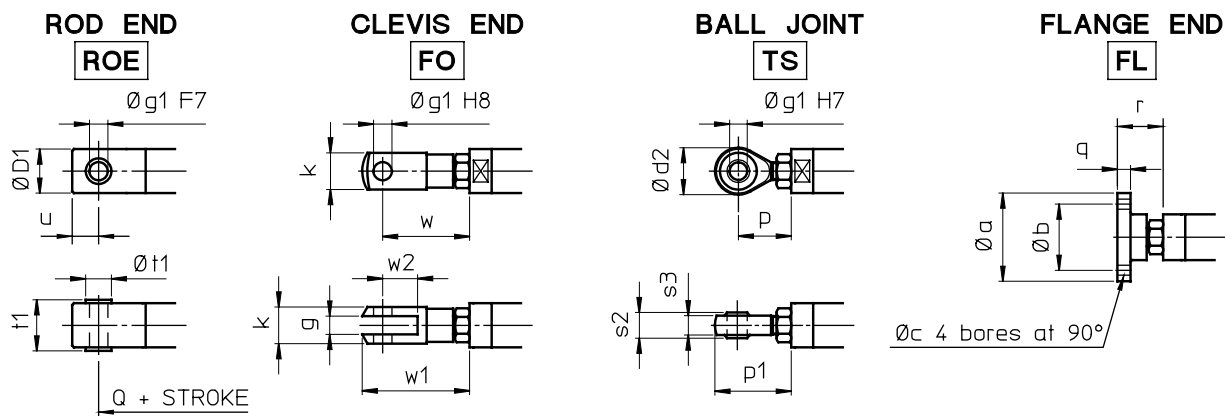
Features, operation, adjustment and wiring diagrams: on page 94



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

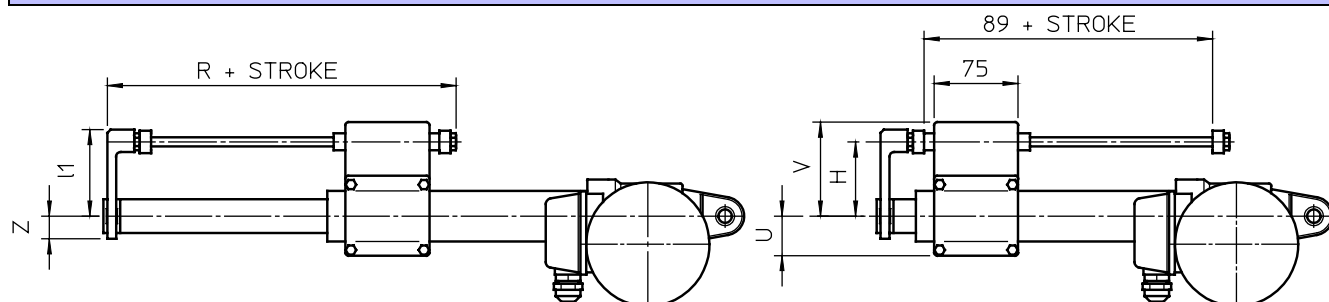


FRONT ATTACHMENTS



ELECTRIC STROKE LIMIT DEVICE FCE

Features, operation, adjustment and wiring diagrams: on page 94



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

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash is necessary to increase the guided length between push rod and protective tube. Dimensions **S** and **T** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
ATL 20	69	54	110	45	22	25	36	65	17	50	80	25	225	251	17
ATL 25	69	54	110	45	27	30	45	65	17	50	80	25	225	251	17
ATL 30	76	62	115	50	30	35	55	78	20	60	92	30	255	291	18
ATL 40	104	78	124	57	36	40	60	92	24	50	115	40	284	373	28

	S	T	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
ATL 20	183	152	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	190	155	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	218	180	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	275	225	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q
ATL 20	55	40	5,5	25	28	10	10	20	31	45	198
ATL 25	60	45	6,5	30	32	12	12	24	36	52	207
ATL 30	65	50	6,5	35	36	14	14	27	36	54	238
ATL 40	80	60	8,5	40	50	20	20	40	53	78	300

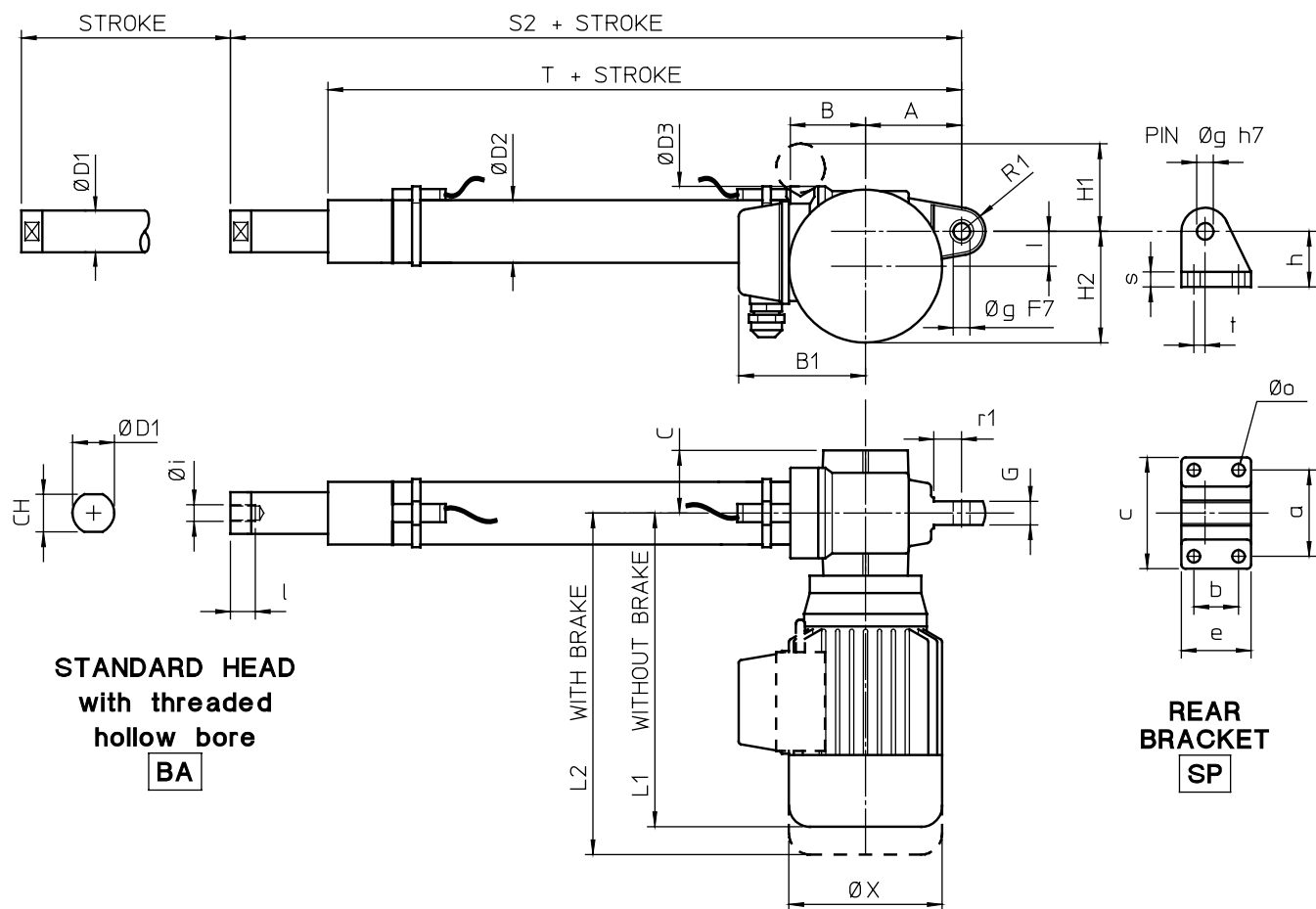
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
ATL 20	8	27	14	11	26	14	15	49	61	20
ATL 25	9	28	16	12	32	16	18	56	70	24
ATL 30	9	32	19	14	36	18	21	65	81	28
ATL 40	10	42	25	18	42	25	27	90	115	40

ELECTRIC STROKE LIMIT DEVICE FCE DIMENSIONS

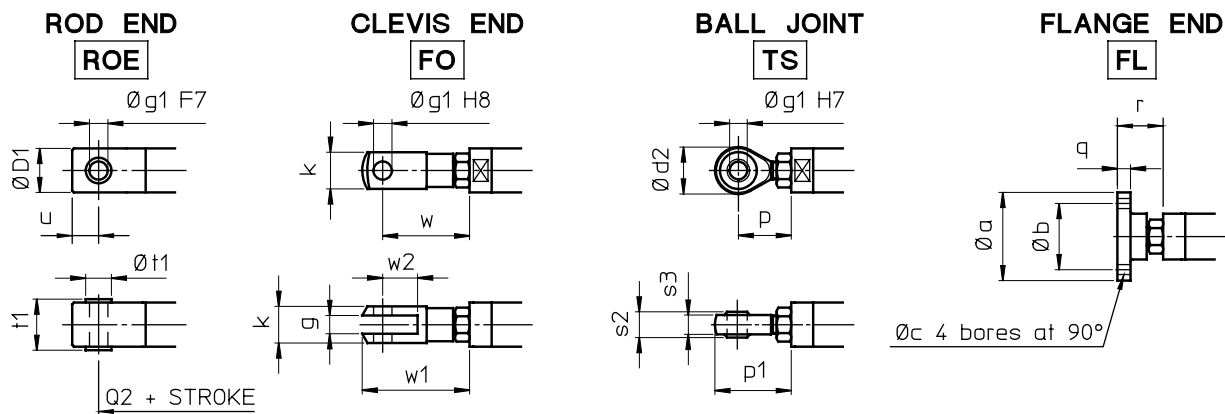
	H	R	U	V	Z	I1
ATL 20	62	144	30	80	18	72
ATL 25	67	146	35	85	20	77
ATL 30	71	147	38	90	23	82
ATL 40	75	163	43	93	25	85

Note: Over-all dimensions in millimetres (mm).

7.2 ACME SCREW LINEAR ACTUATORS Series ATL 20 – 25 – 30 – 40
AC 3 - phase or 1-phase MOTOR – with Magnetic Stroke Limit Device FCM



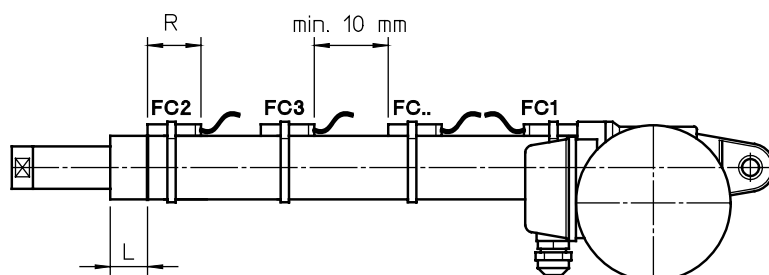
FRONT ATTACHMENTS



MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

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



Note: Over-all dimensions in millimetres (mm).

7.2 ACME SCREW LINEAR ACTUATORS Series ATL 20 – 25 – 30 – 40
AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Device FCM

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE		C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	ATL 20	72	172	272	372	472	572	672	772
	ATL 25	66	166	266	366	466	566	666	766
	ATL 30	68	168	268	368	468	568	668	768
	ATL 40	63	163	263	363	463	563	663	763

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
ATL 20	69	54	110	45	22	25	36	65	17	50	80	25	225	251	17
ATL 25	69	54	110	45	27	30	45	65	17	50	80	25	225	251	17
ATL 30	76	62	115	50	30	35	55	78	20	60	92	30	255	291	18
ATL 40	104	78	124	57	36	40	60	92	24	50	115	40	284	373	28

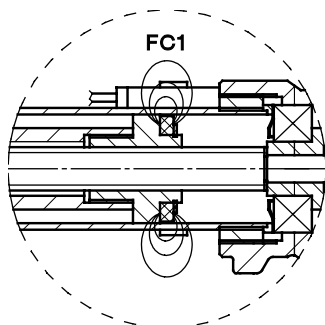
	S2	T	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
ATL 20	235	180	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	252	189	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	276	212	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	339	262	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
ATL 20	55	40	5,5	25	28	10	10	20	31	45	235
ATL 25	60	45	6,5	30	32	12	12	24	36	52	255
ATL 30	65	50	6,5	35	36	14	14	27	36	54	282
ATL 40	80	60	8,5	40	50	20	20	40	53	78	351

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

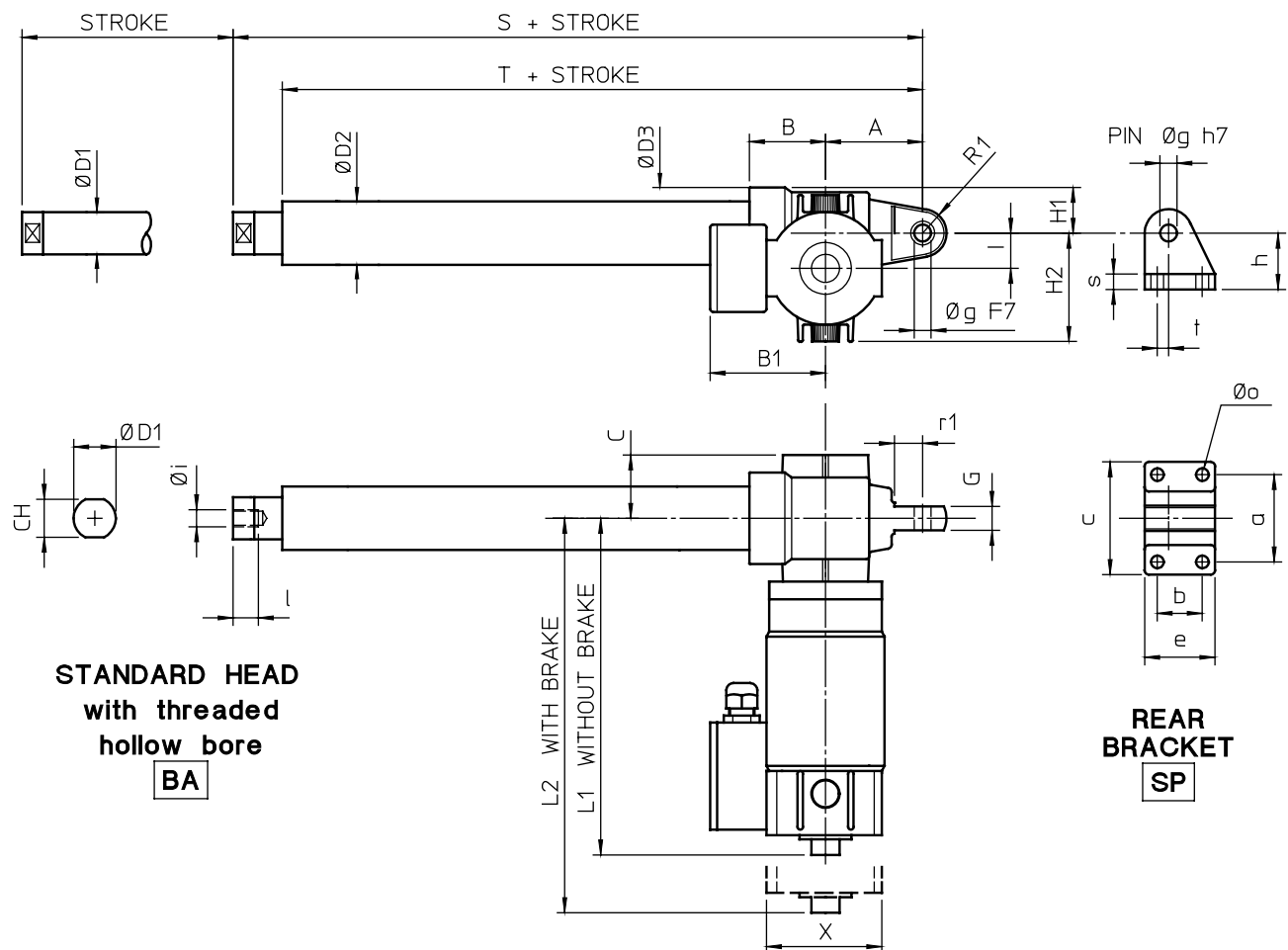
MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES



Note: - The travel length performed by an actuator equipped with FCM is reduced compared to an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimal retracted length. Therefore the actuator in retracted position is longer.

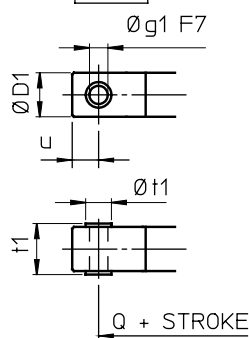
- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimal distance between the REED SWITCHES must be of at least 10 mm.
- REED SWITCH Normally Closed (NC) R = 39 mm
- REED SWITCH Change-over (NC+NO) R = 39 mm
- REED SWITCH Normally Open (NO) R = 29 mm

7.2 ACME SCREW LINEAR ACTUATORS Series ATL 20 – 25 – 30 – 40
DC MOTOR – with Electric Stroke Limit Device FCE

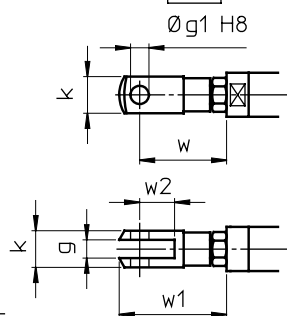


FRONT ATTACHMENTS

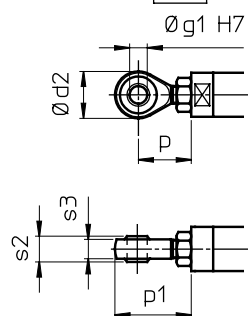
ROD END
ROE



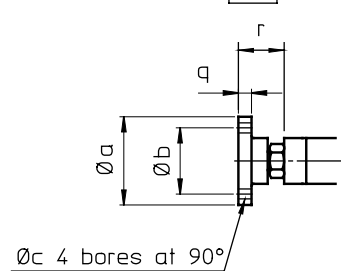
CLEVIS END
FO



BALL JOINT
TS

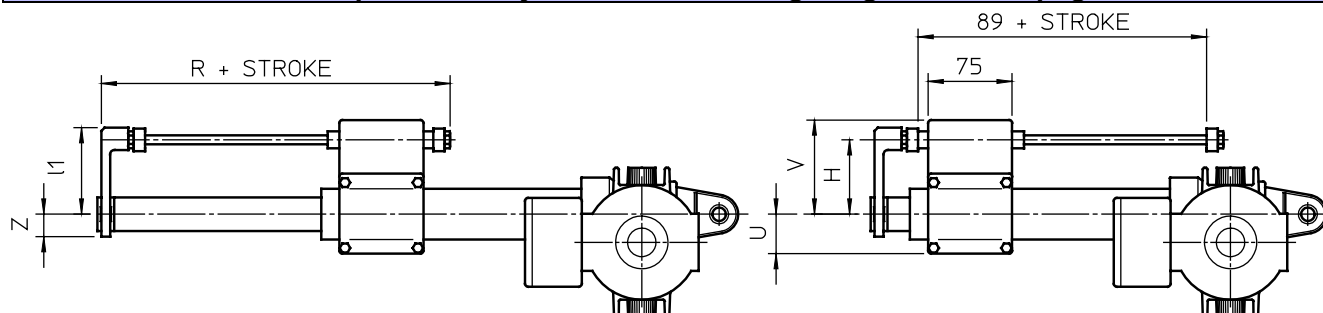


FLANGE END
FL



ELECTRIC STROKE LIMIT DEVICE FCE

Features, operation, adjustment and wiring diagrams: on page 94



7.2 ACME SCREW LINEAR ACTUATORS Series ATL 20 – 25 – 30 – 40

DC MOTOR – with Electric Stroke Limit Device FCE

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
ATL 20	69	54	80	45	22	25	36	65	17	33	79	25	202	243	17
ATL 25	69	54	80	45	27	30	45	65	17	33	79	25	235	276	17
ATL 30	76	62	80	50	30	35	55	78	20	39	84	30	291	332	18
ATL 40	104	78	80	57	36	40	60	92	24	46	94	40	391	432	28

	S	T	X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
ATL 20	183	152	107	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	190	155	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	218	180	107	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	275	225	107	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q
ATL 20	55	40	5,5	25	28	10	10	20	31	45	198
ATL 25	60	45	6,5	30	32	12	12	24	36	52	207
ATL 30	65	50	6,5	35	36	14	14	27	36	54	238
ATL 40	80	60	8,5	40	50	20	20	40	53	78	300

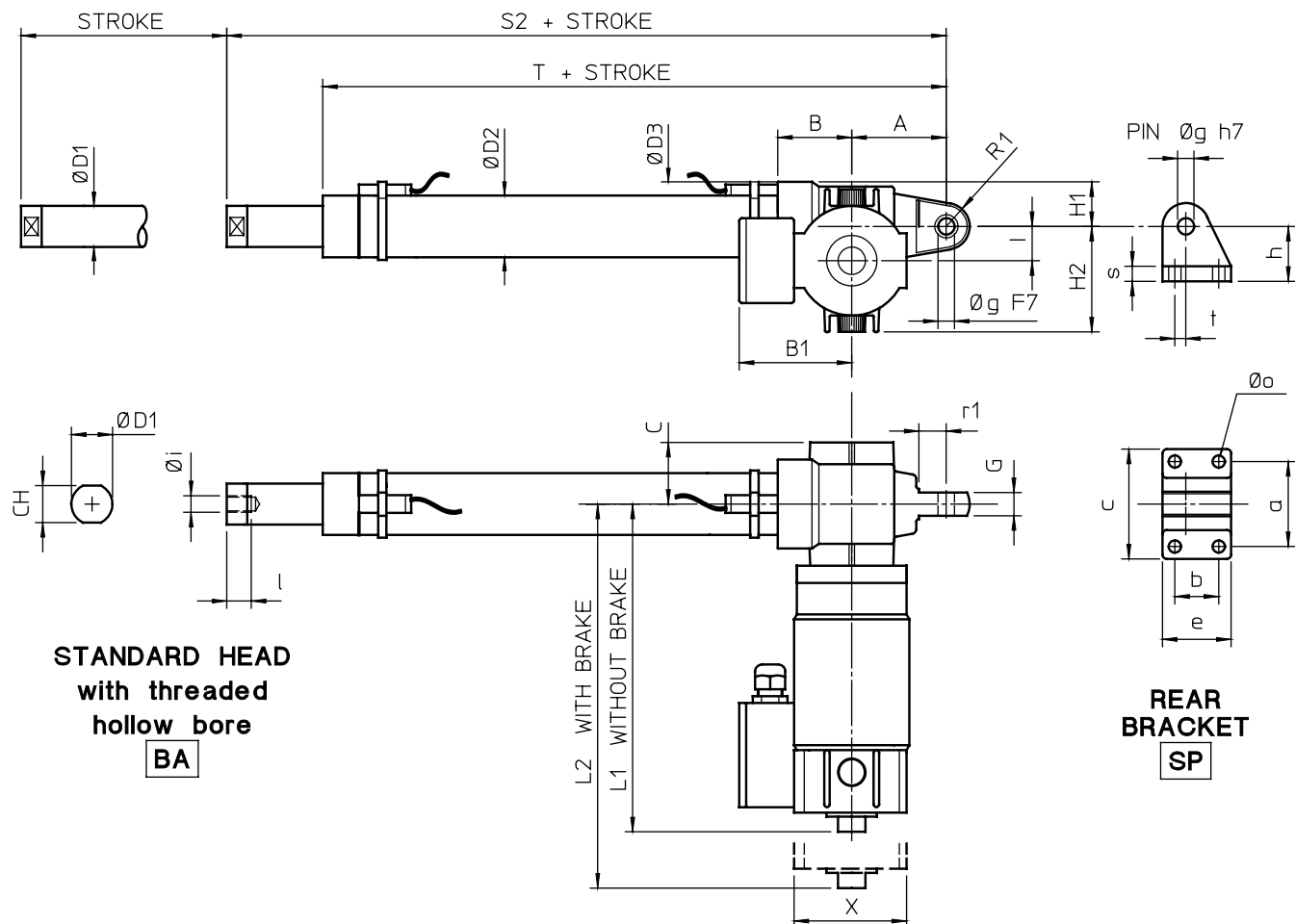
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
ATL 20	8	27	14	11	26	14	15	49	61	20
ATL 25	9	28	16	12	32	16	18	56	70	24
ATL 30	9	32	19	14	36	18	21	65	81	28
ATL 40	10	42	25	18	42	25	27	90	115	40

ELECTRIC STROKE LIMIT DEVICE FCE DIMENSIONS

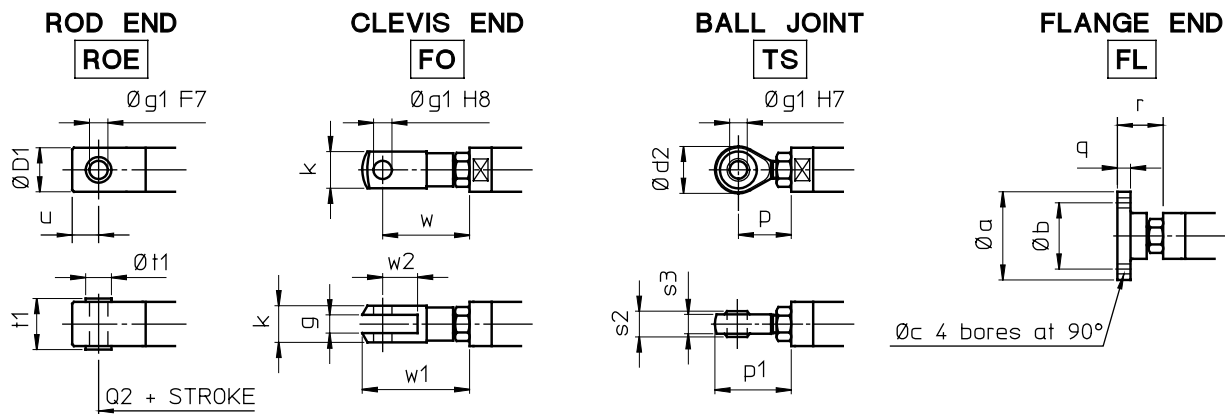
	H	R	U	V	Z	l1
ATL 20	62	144	30	80	18	72
ATL 25	67	146	35	85	20	77
ATL 30	71	147	38	90	23	82
ATL 40	75	163	43	93	25	85

Note: Over-all dimensions in millimetres (mm).

7.2 ACME SCREW LINEAR ACTUATORS Series ATL 20 – 25 – 30 – 40
DC MOTOR –. with Magnetic Stroke Limit Device FCM



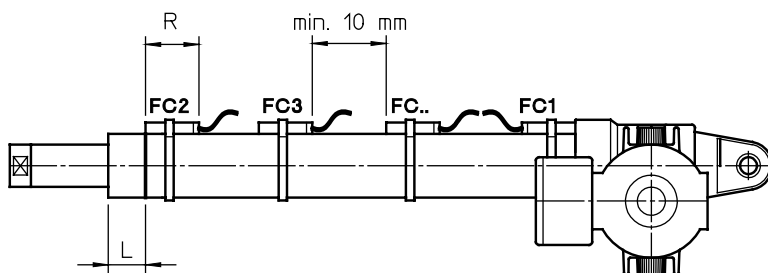
FRONT ATTACHMENTS



MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

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



Note: Over-all dimensions in millimetres (mm).

7.2 ACME SCREW LINEAR ACTUATORS Series ATL 20 – 25 – 30 – 40

DC MOTOR – with Magnetic Stroke Limit Device FCM

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE		C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	ATL 20	72	172	272	372	472	572	672	772
	ATL 25	66	166	266	366	466	566	666	766
	ATL 30	68	168	268	368	468	568	668	768
	ATL 40	63	163	263	363	463	563	663	763

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
ATL 20	69	54	80	45	22	25	36	65	17	33	79	25	202	243	17
ATL 25	69	54	80	45	27	30	45	65	17	33	79	25	235	276	17
ATL 30	76	62	80	50	30	35	55	78	20	39	84	30	291	332	18
ATL 40	104	78	80	57	36	40	60	92	24	46	94	40	391	432	28

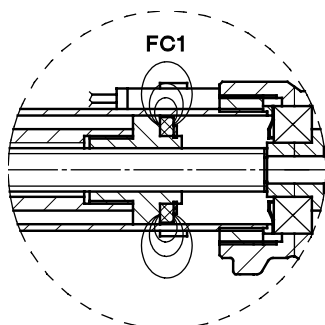
	S2	T	X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
ATL 20	235	180	107	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
ATL 25	252	189	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
ATL 30	276	212	107	72	38	90	58	14	45	M14×2	24	9	20	12	8
ATL 40	339	262	107	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
ATL 20	55	40	5,5	25	28	10	10	20	31	45	235
ATL 25	60	45	6,5	30	32	12	12	24	36	52	255
ATL 30	65	50	6,5	35	36	14	14	27	36	54	282
ATL 40	80	60	8,5	40	50	20	20	40	53	78	351

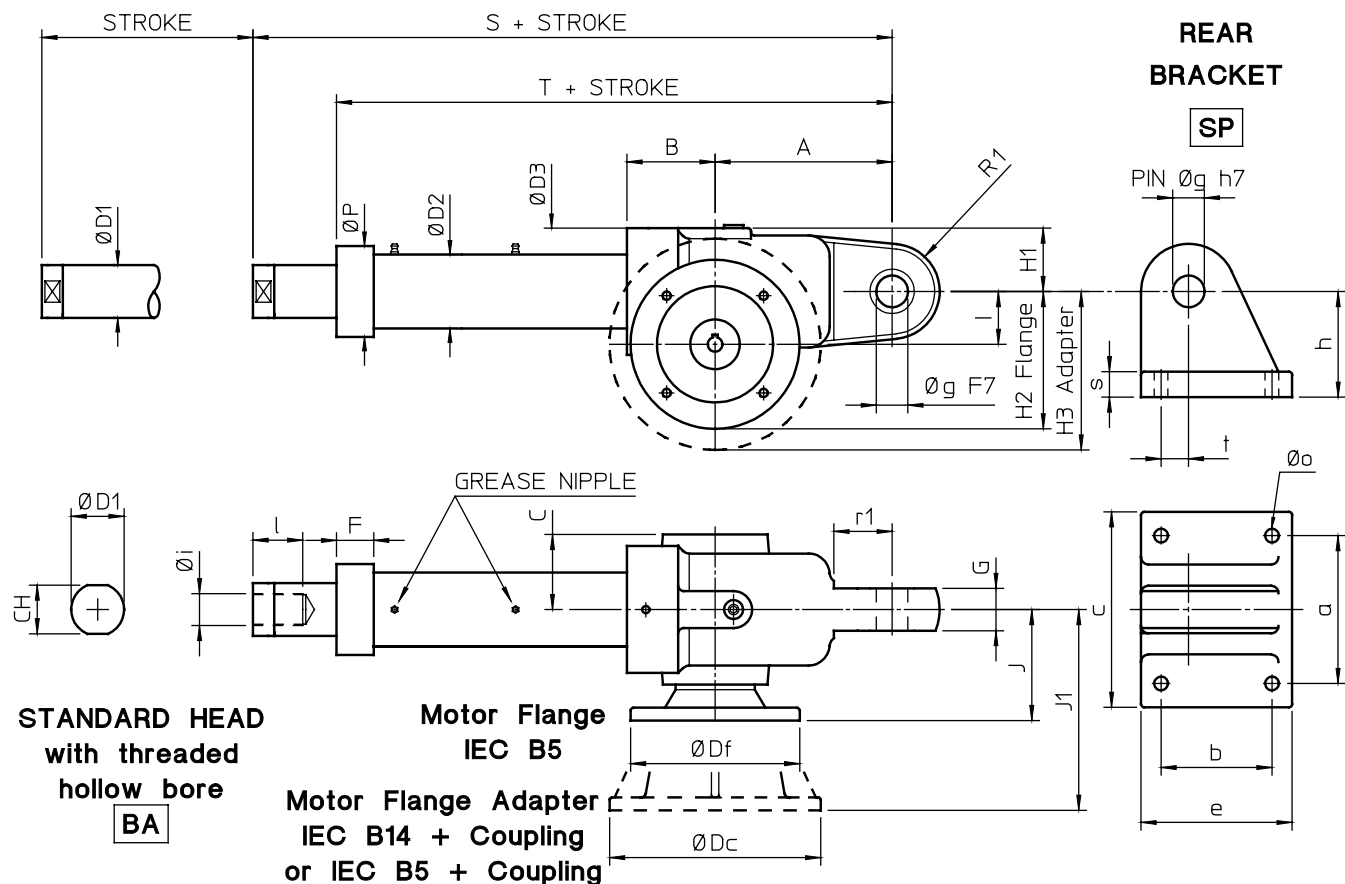
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
ATL 20	8	27	14	11	26	14	15	49	61	20
ATL 25	9	28	16	12	32	16	18	56	70	24
ATL 30	9	32	19	14	36	18	21	65	81	28
ATL 40	10	42	25	18	42	25	27	90	115	40

MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES

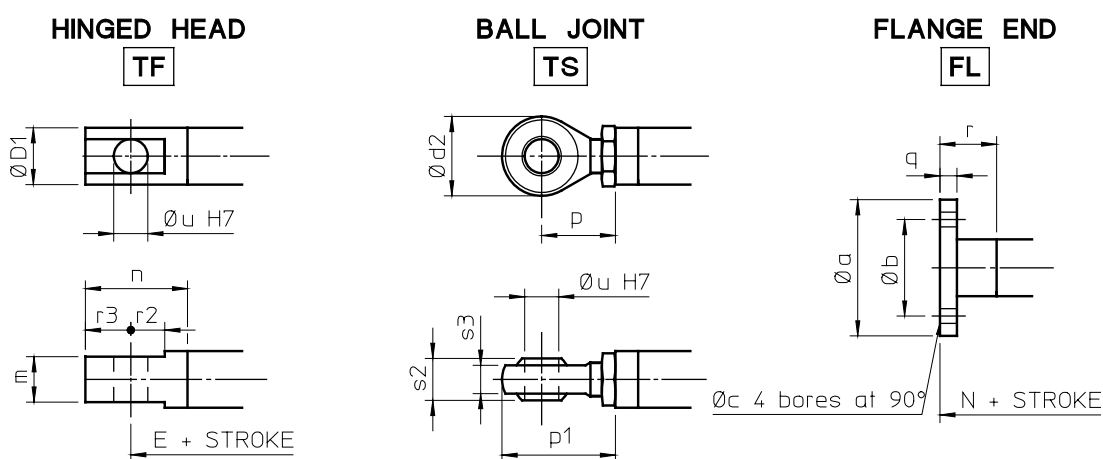


Note: - The travel length performed by an actuator equipped with FCM is reduced compared to an actuator without FCM because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimal retracted length. Therefore the actuator in retracted position is longer.

- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimal 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

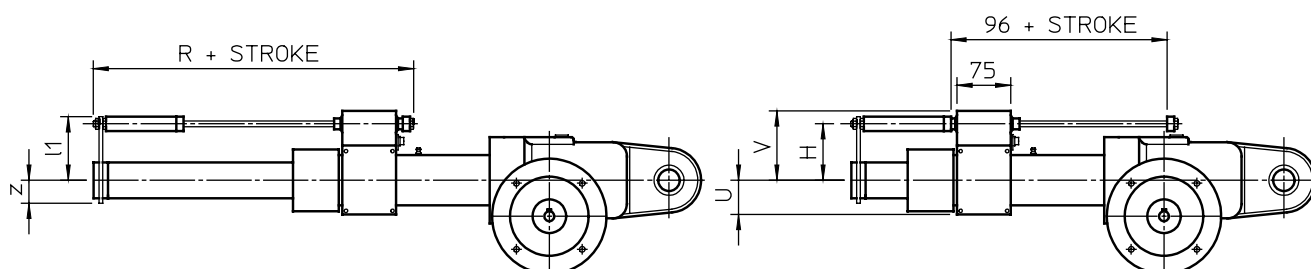


FRONT ATTACHMENTS



ELECTRIC STROKE LIMIT DEVICE FCE

Features, operation, adjustment and wiring diagrams: on page 94



7.3
ACME SCREW LINEAR ACTUATORS Series ATL 50 – 63 – 80
AC 3-phase MOTOR – with Electric Stroke Limit Device FCE
STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash is necessary to increase the guided length between push rod and protective tube. Dimensions **S** and **T** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	C	CH	Ø D1	Ø D2	Ø D3	F	G	H1	I	Ø P	R1	S
ATL 50	168	84	68	46	50	70	120	–	40	63	50	–	45	405
ATL 63	206	96	83	–	60	90	140	37	50	70	63	95	50	516
ATL 80	240	119	103	–	90	115	180	40	60	90	80	125	60	603

	T	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
ATL 50	326	140	105	185	143	30	100	M30×2	45	13	55	20	30
ATL 63	419	180	120	228	160	35	120	M36×2	55	17	58	30	30
ATL 80	509	210	122	278	180	40	130	M42×2	65	21	62	35	32

	Flange IEC	Ø Df	H2	J	Adapter+Coupling IEC	Ø 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
					100/112 B14 – B5	160 – 250	143 – 188	220
ATL 80	80 B5; 90 B5	200	180	119	100/112 B14 – B5	160 – 250	160 – 205	240

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	E	m	n	N
ATL 50	120	85	13	50	70	435	40	80	415
ATL 63	140	100	17	60	80	546	50	85	526
ATL 80	170	130	21	90	90	638	50	100	623

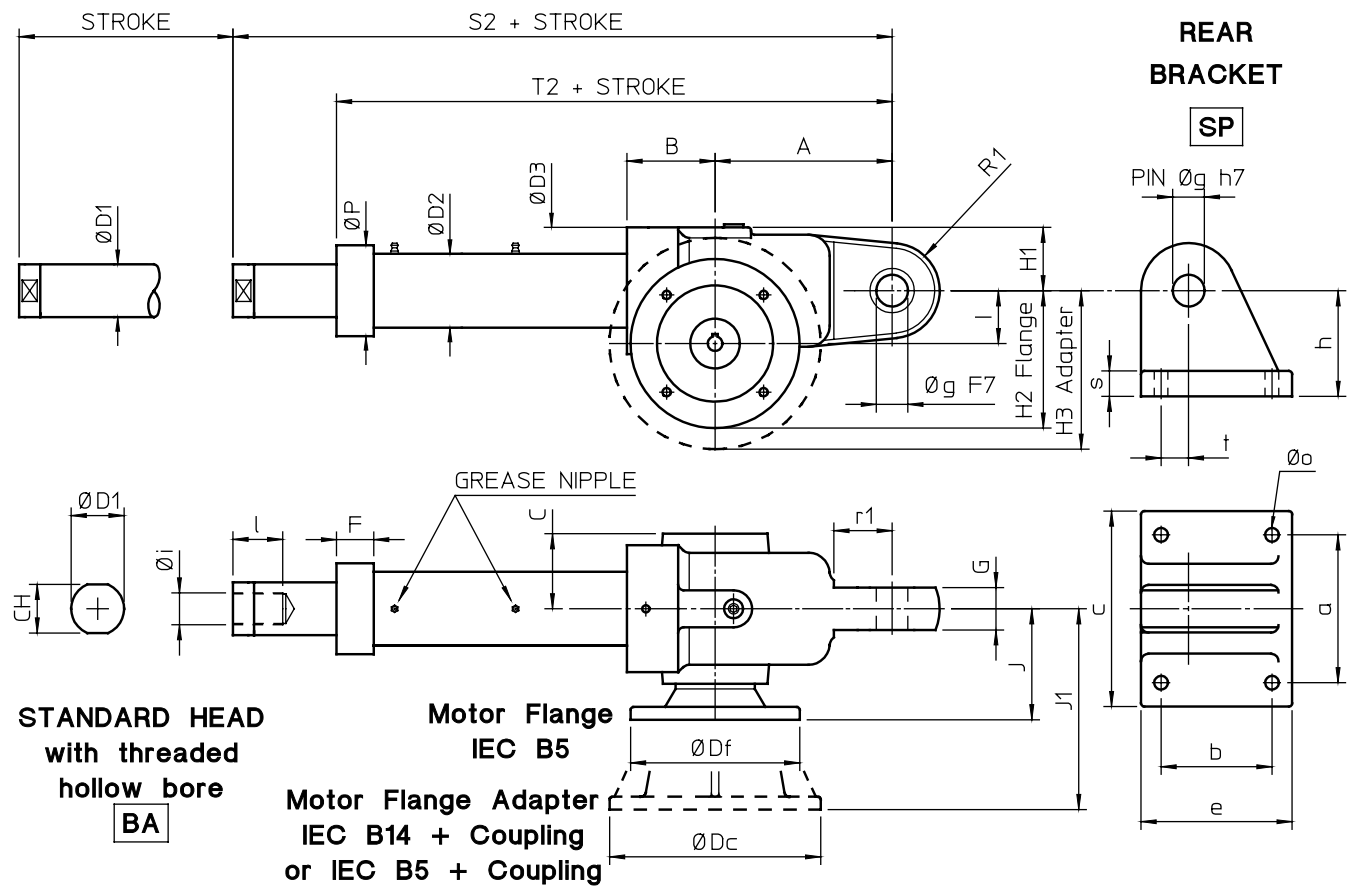
	p	p1	q	r	r2	r3	s2	s3	Ø u
ATL 50	65	100	15	30	30	30	37	25	30
ATL 63	86	126	15	30	30	35	43	28	35
ATL 80	85	130	20	40	35	45	49	33	40

ELECTRIC STROKE LIMIT DEVICE FCE DIMENSIONS

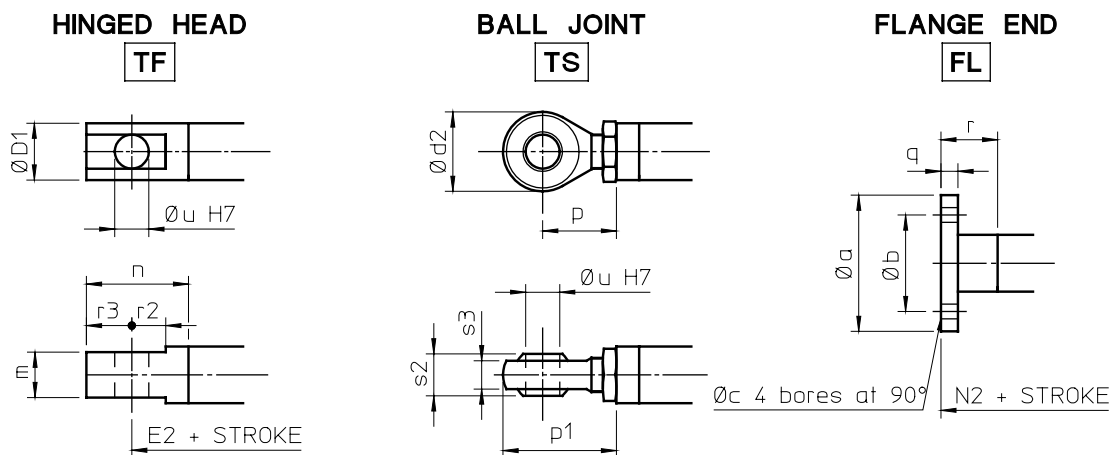
	H	R	U	V	Z	I1
ATL 50	79	188	50	97	32	89
ATL 63	89	237	60	107	37	100
ATL 80	101	237	73	119	55	113

Note: Over-all dimensions in millimetres (mm).

7.3 ACME SCREW LINEAR ACTUATORS Series ATL 50 – 63 – 80
AC 3-phase MOTOR – with Inductive Proximity Stroke Limit Device FCP



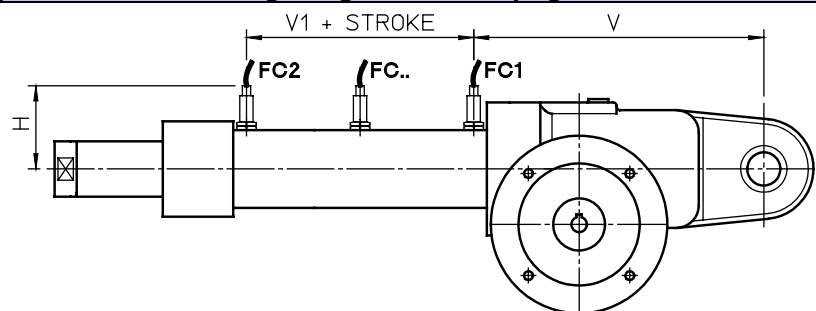
FRONT ATTACHMENTS



INDUCTIVE PROXIMITY STROKE LIMIT DEVICE FCP DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 97

	H	V	V1
ATL 50	76.5	263	15
ATL 63	86.5	314	40
ATL 80	99	371	40



Note: Over-all dimensions in millimetres (mm).

7.3

ACME SCREW LINEAR ACTUATORS Series ATL 50 – 63 – 80

AC 3-phase MOTOR – with Inductive Proximity Stroke Limit Device FCP

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T2** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	C	CH	Ø D1	Ø D2	Ø D3	F	G	H1	I	Ø P	R1	S2
ATL 50	168	84	68	46	50	70	120	–	40	63	50	–	45	443
ATL 63	206	96	83	–	60	90	140	37	50	70	63	95	50	554
ATL 80	240	119	103	–	90	115	180	40	60	90	80	125	60	647

	T2	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
ATL 50	345	140	105	185	143	30	100	M30×2	45	13	55	20	30
ATL 63	438	180	120	228	160	35	120	M36×2	55	17	63	30	30
ATL 80	531	210	122	278	180	40	130	M42×2	65	21	62	35	32

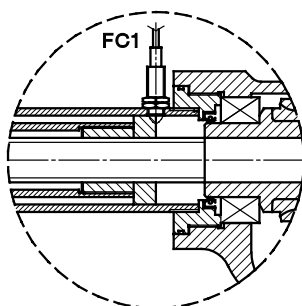
	Flange IEC	Ø Df	H2	J	Adapter+Coupling IEC	Ø Dc	H3	J1
ATL 50	63 B5	140	120	102	80 B14 – 80 B5	120 – 200	110 – 150	176 – 182
	71 B5	160	130	102	90 B14 – 90 B5	140 – 200	120 – 150	182
ATL 63	80 B5	200	163	100	90 B14 – 90 B5	140 – 200	133 – 163	200
					100/112 B14 – B5	160 – 250	143 – 188	220
ATL 80	80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

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	E2	m	n	N2
ATL 50	120	85	13	50	70	473	40	80	453
ATL 63	140	100	17	60	80	584	50	85	564
ATL 80	170	130	21	90	90	682	50	100	667

	p	p1	q	r	r2	r3	s2	s3	Ø u
ATL 50	65	100	15	30	30	30	37	25	30
ATL 63	86	126	15	30	30	35	43	28	35
ATL 80	85	130	20	40	35	45	49	33	40

INDUCTIVE PROXIMITY STROKE LIMIT DEVICE FCP FEATURES



Note: The PROXIMITY SWITCH FC1, when activated, gives a signal to stop the motor by means of electric relays. FC1 stops the motor before the actuator reaches its minimal retracted length. Actuators equipped with FCP device have retracted and extended dimensions longer than actuators equipped with FCE (electric stroke limit device).

- Additional extra PROXIMITY SWITCHES are available for intermediate positions.
- The minimal distance between the PROXIMITY SWITCHES must be of at least 25 mm.

Compact acme screw linear actuator with integral electric motor suitable for push and pull motions.
D.C. motor available with or without brake.
Rear fixing attachment can be also supplied mounted at 90° with respect to the motor axis.

ACCESSORIES	Magnetic stroke limit device FCM	Wide range of front attachments
	Rear bracket SP	

PERFORMANCE with: Duty Cycle Fi = 30 % over 10 min. at 25 °C environment

Max. static push and pull load admitted: 3000 N.

The linear speeds and dynamic loads stated below are performances achievable both at the same time during a working condition.

PERFORMANCE WITH DC MOTOR 24 V or 12 V					
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	RUNNING CURRENT [A]		SELF-LOCKING COEFFICIENT
400	120	RV2	4 A (24 V)	9 A (12 V)	0.51
200	230	RN2	4 A (24 V)	9 A (12 V)	0.51
150	260	RV1	4 A (24 V)	9 A (12 V)	0.32
75	470	RN1	4 A (24 V)	9 A (12 V)	0.32

DC MOTOR 24 V or 12 V FEATURES

DC motor, without fan cooling, with permanent magnet, available with or without brake. Long-life brushes easy to replace.

Power supply cable 1.5 m length and wires 2 × 1 mm². Motor weight: 1.3 kg.

Output power	70 W		Rated speed	3000 rpm	
Rated current	3.7 A (24 V)	8.4 A (12 V)	Rated torque	0.22 Nm	
Peak current	18 A (24 V)	30 A (12 V)	Peak torque	1.1 Nm	
Armature resistance	0.85 Ω (24 V)	0.23 Ω (12 V)	Inductance	1.34 mH (24 V)	0.36 mH (12V)
Protection	IP 54		Insulation class	F	

MOTOR BRAKE: On request normally closed emergency brake for positioning, activated by direct current DC electromagnet. Brake with independent power supply line with cable 1 m length and wires 2 × 1 mm². Motor with brake total weight 1.8 kg.

Power supply	0.4 A (24 V)	0.85 A (12 V)	Braking torque	0.5 Nm
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WARNING! The brake is normally closed: independent power supply line with the rated voltage is required to open it. With lower voltage the brake does not open completely.

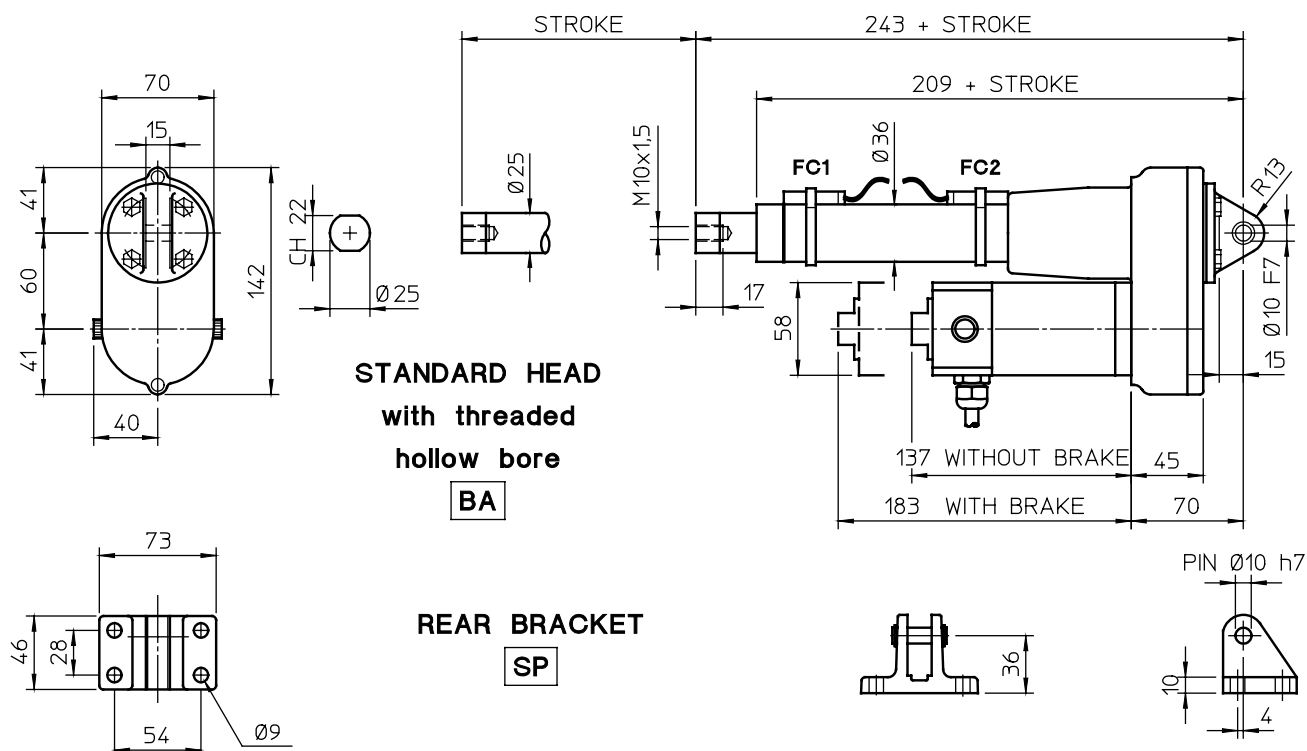
STROKE LENGTHS AVAILABLE IN STOCK WITH MAGNETIC STROKE LIMIT DEVICE FCM

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

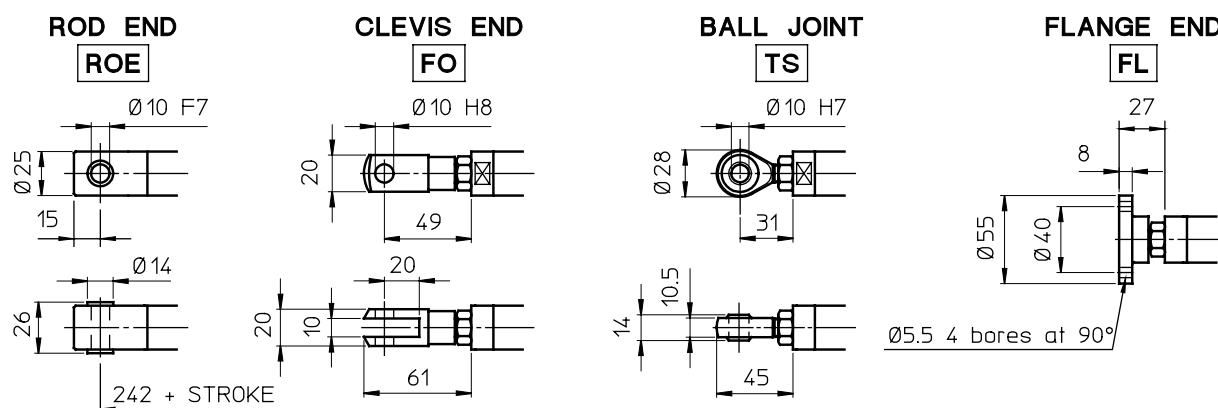
Note: - Special stroke lengths available on request.
- Over-all dimensions in millimetres (mm).

DIMENSIONS WITH MAGNETIC STROKE LIMIT DEVICE FCM

Features, operation, adjustment and wiring diagrams: on page 95



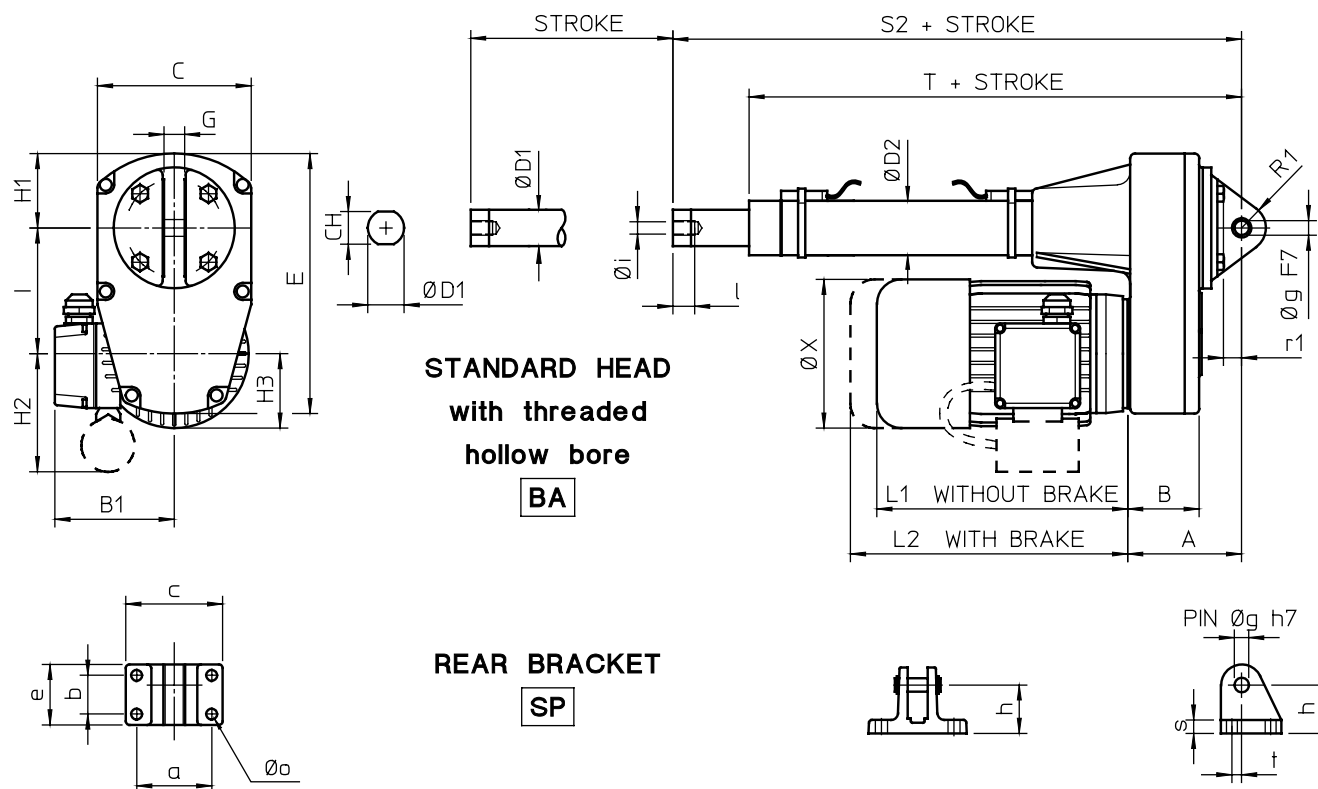
FRONT ATTACHMENTS



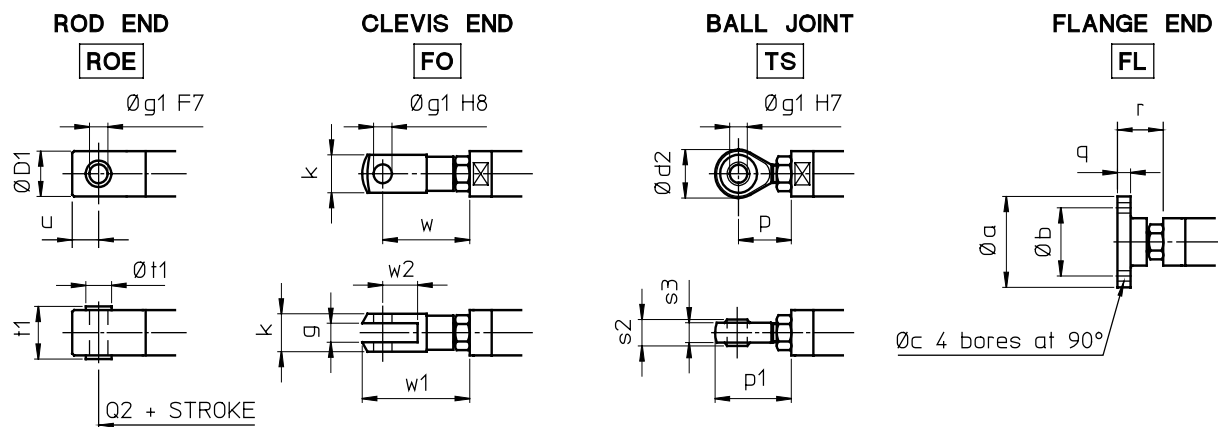
7.5

ACME SCREW LINEAR ACTUATORS Series UAL 1-2-3-4

AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Device FCM



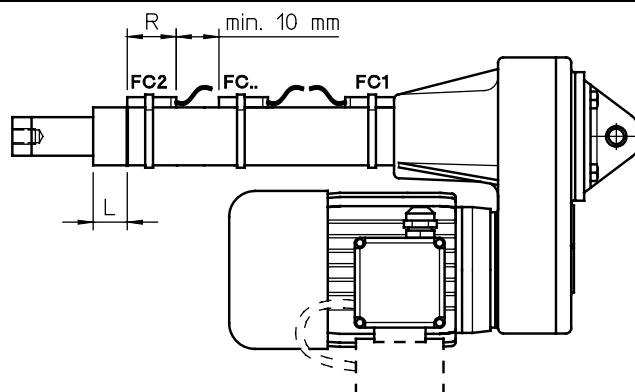
FRONT ATTACHMENTS



MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

	REED SWITCHES	
	NC o (NC+NO)	NO
	L	L
UAL 1	24	29
UAL 2	32	37
UAL 3	37	42
UAL 4	40	45



7.5
ACME SCREW LINEAR ACTUATORS Series UAL 1 – 2 – 3 – 4
AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Device FCM
STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

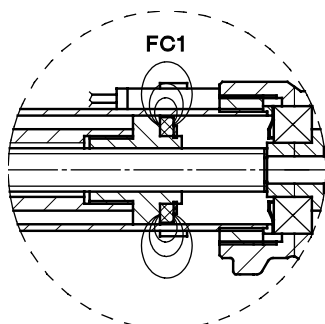
	A	B	B1	C	CH	Ø D1	Ø D2	E	G	H1	H2	H3	I	L1	L2	R1
UAL 1	85	52	110	114	22	25	36	189	15	58	75	55	90	167	193	17
UAL 2	94	60	115	127	27	30	45	217	17	64	90	62	104	193	229	20
UAL 3	106	71	124	135	30	35	55	247	20	68	90	75	121	215	304	20
UAL 4	120	77	141	161	36	40	60	293	24	81	95	85	138,5	235	340	22

	S2	T	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
UAL 1	265	232	110	54	28	73	46	10	36	M10×1.5	17	9	18	10	4
UAL 2	284	244	123	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
UAL 3	317	274	150	72	38	90	58	14	45	M14×2	24	9	22	12	8
UAL 4	377	323	170	85	55	110	81	20	58	M20×1.5	27	11	29	15	15

FRONT ATTACHMENTS DIMENSIONS

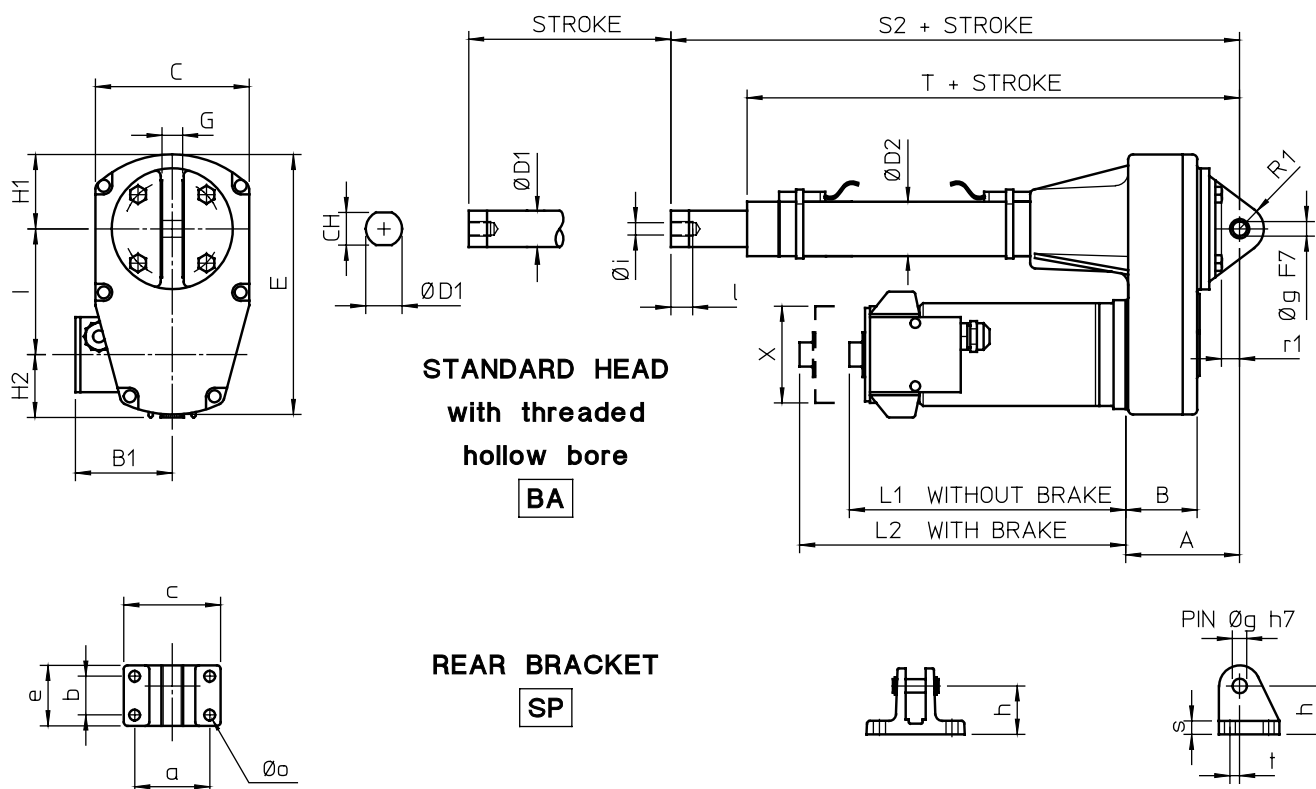
	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
UAL 1	55	40	5,5	25	28	10	10	20	31	45	265
UAL 2	60	45	6,5	30	32	12	12	24	36	52	287
UAL 3	65	50	6,5	35	36	14	14	27	36	54	324
UAL 4	80	60	8,5	40	50	20	20	40	53	78	389

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

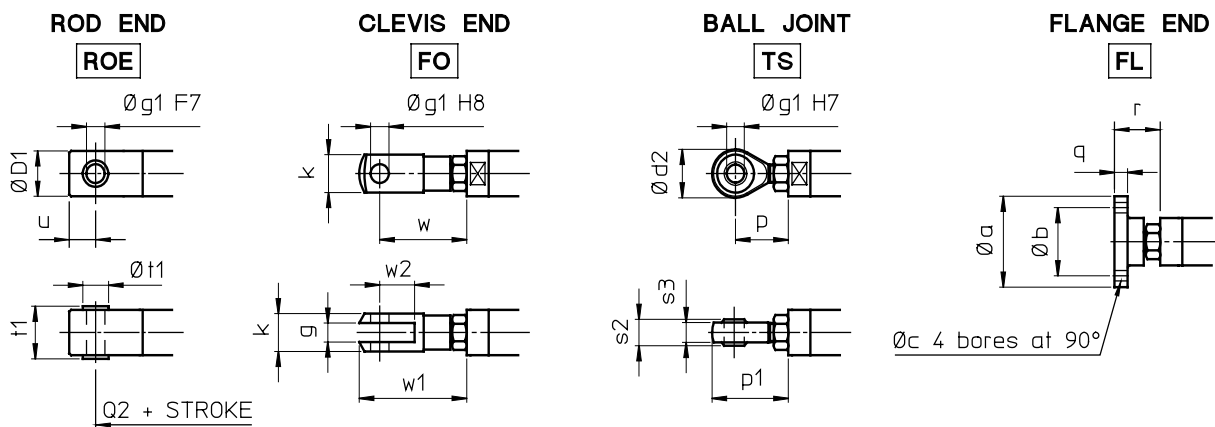
MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES


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

Note: Over-all dimensions in millimetres (mm).



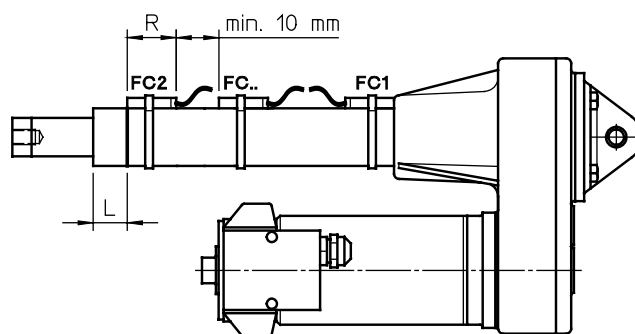
FRONT ATTACHMENTS



MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

	CONTACT REED	
	NC or (NC+NO)	NO
	L	L
UAL 1	24	29
UAL 2	32	37
UAL 3	37	42
UAL 4	40	45



7.5

ACME SCREW LINEAR ACTUATORS Series UAL 1 – 2 – 3 – 4

DC MOTOR – with Magnetic Stroke Limit Device FCM

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	E	G	H1	H2	I	L1	L2	R1
UAL 1	85	52	80	114	22	25	36	189	15	58	54	90	177	218	17
UAL 2	94	60	80	127	27	30	45	217	17	64	54	104	229	270	20
UAL 3	106	71	80	135	30	35	55	247	20	68	54	121	322	364	20
UAL 4	120	77	118	161	36	40	60	293	24	81	69	138.5	461	503	22

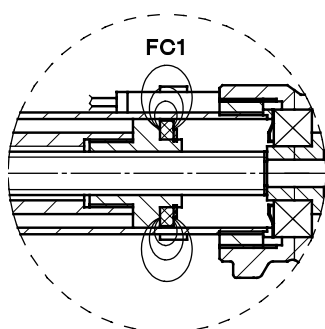
	S2	T	X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
UAL 1	265	232	107	54	28	73	46	10	36	M10×1.5	17	9	18	10	4
UAL 2	284	244	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
UAL 3	317	274	107	72	38	90	58	14	45	M14×2	24	9	22	12	8
UAL 4	377	323	138	85	55	110	81	20	58	M20×1.5	27	11	29	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
UAL 1	55	40	5,5	25	28	10	10	20	31	45	265
UAL 2	60	45	6,5	30	32	12	12	24	36	52	287
UAL 3	65	50	6,5	35	36	14	14	27	36	54	324
UAL 4	80	60	8,5	40	50	20	20	40	53	78	389

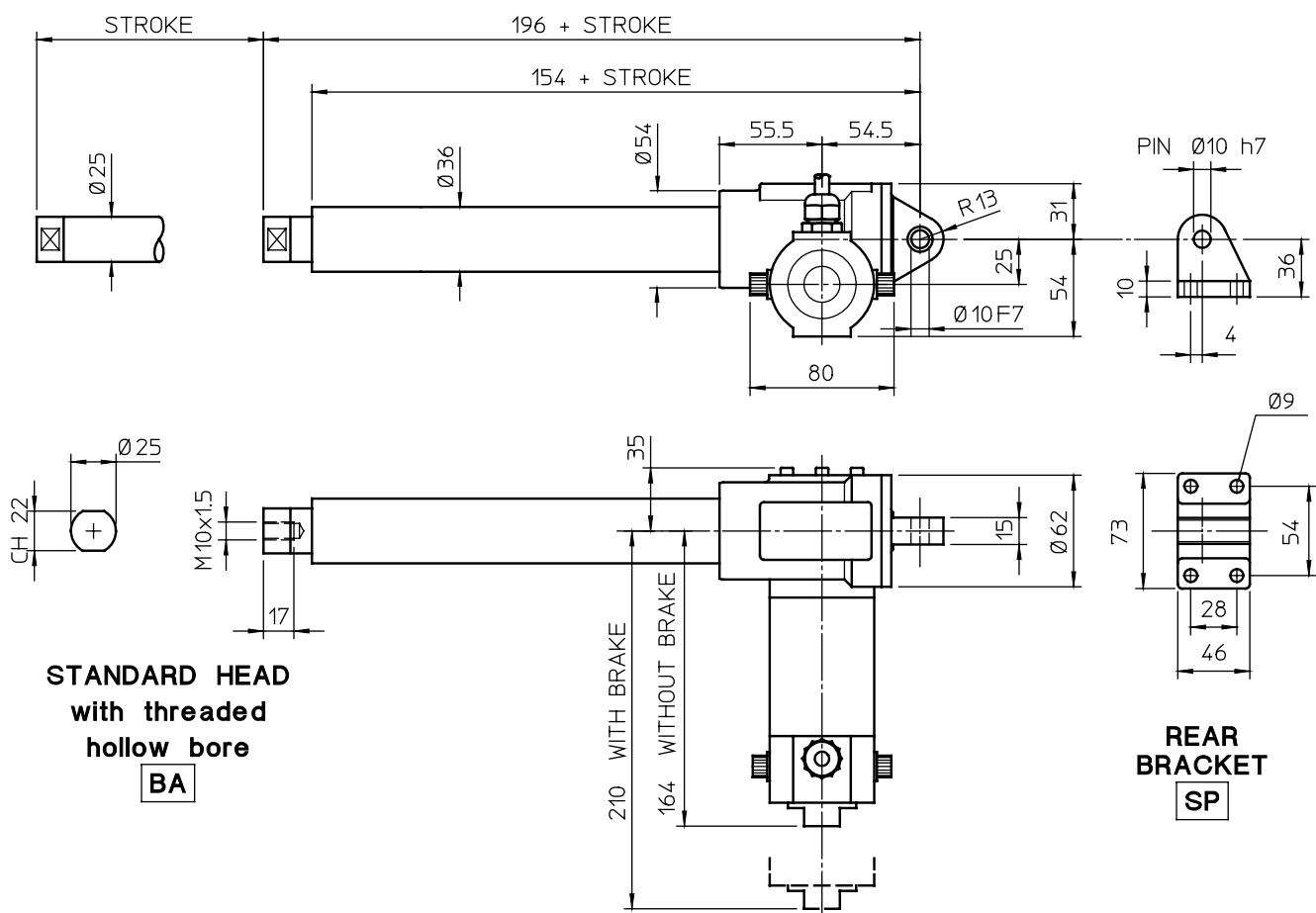
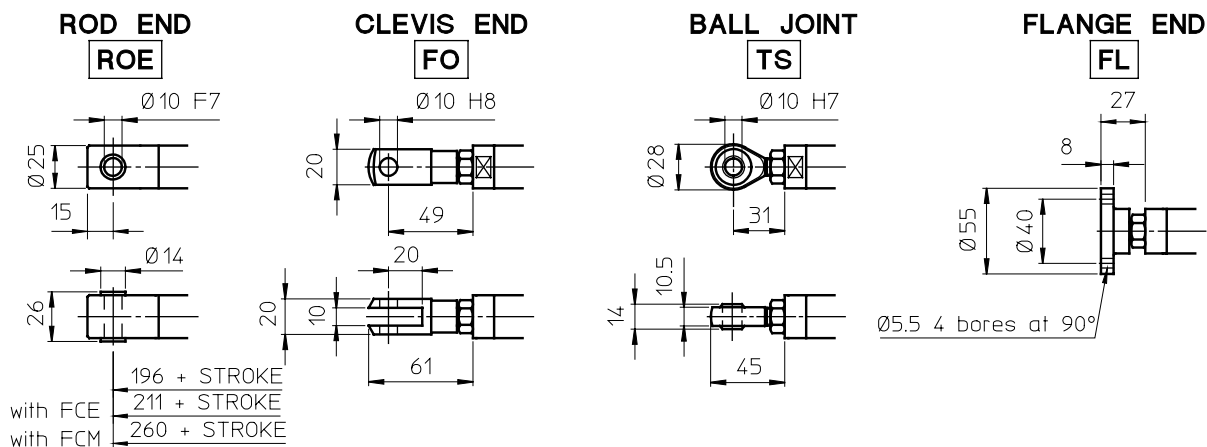
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
UAL 1	8	27	14	11	26	14	15	49	61	20
UAL 2	9	28	16	12	32	16	18	56	70	24
UAL 3	9	32	19	14	36	18	21	65	81	28
UAL 4	10	42	25	18	42	25	27	90	115	40

MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES



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

Note: Over-all dimensions in millimetres (mm).

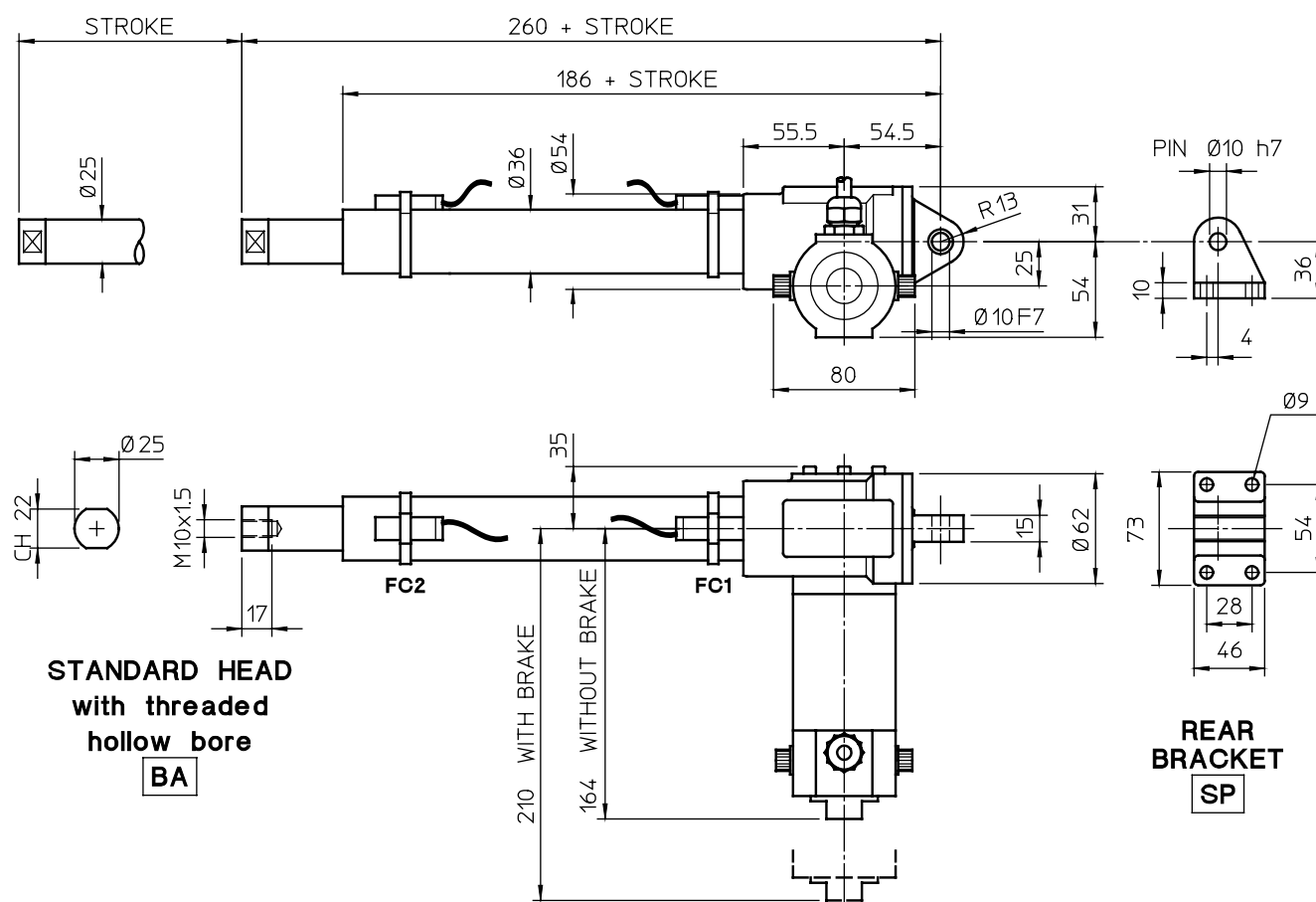

FRONT ATTACHMENTS

**STROKE LENGTHS AVAILABLE IN STOCK
WITH OR WITHOUT ELECTRIC STROKE LIMIT DEVICE FCE**

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	85	185	285	385	485	585	685	785

- Note:
- Special stroke lengths available on request.
 - DC motor features on page 101.
 - Over-all dimensions in millimetres (mm).

DIMENSIONS WITH MAGNETIC STROKE LIMIT DEVICE FCM

Features, operation, adjustment and wiring diagrams: on page 95

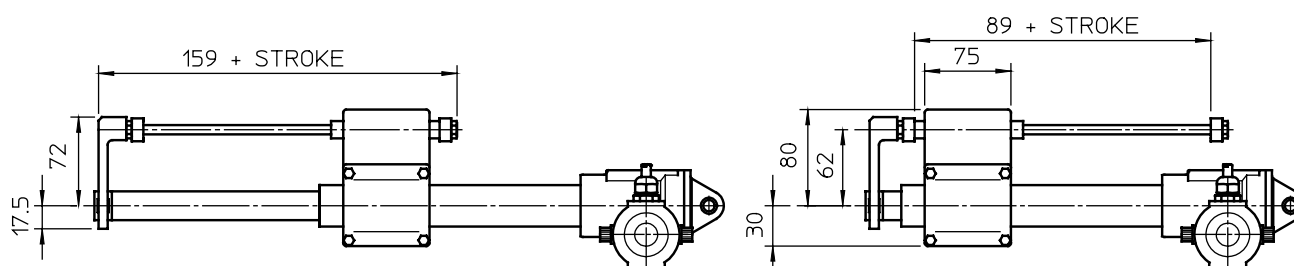

STROKE LENGTHS AVAILABLE IN STOCK WITH MAGNETIC STROKE LIMIT DEVICE FCM

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	53	153	253	353	453	553	653	753

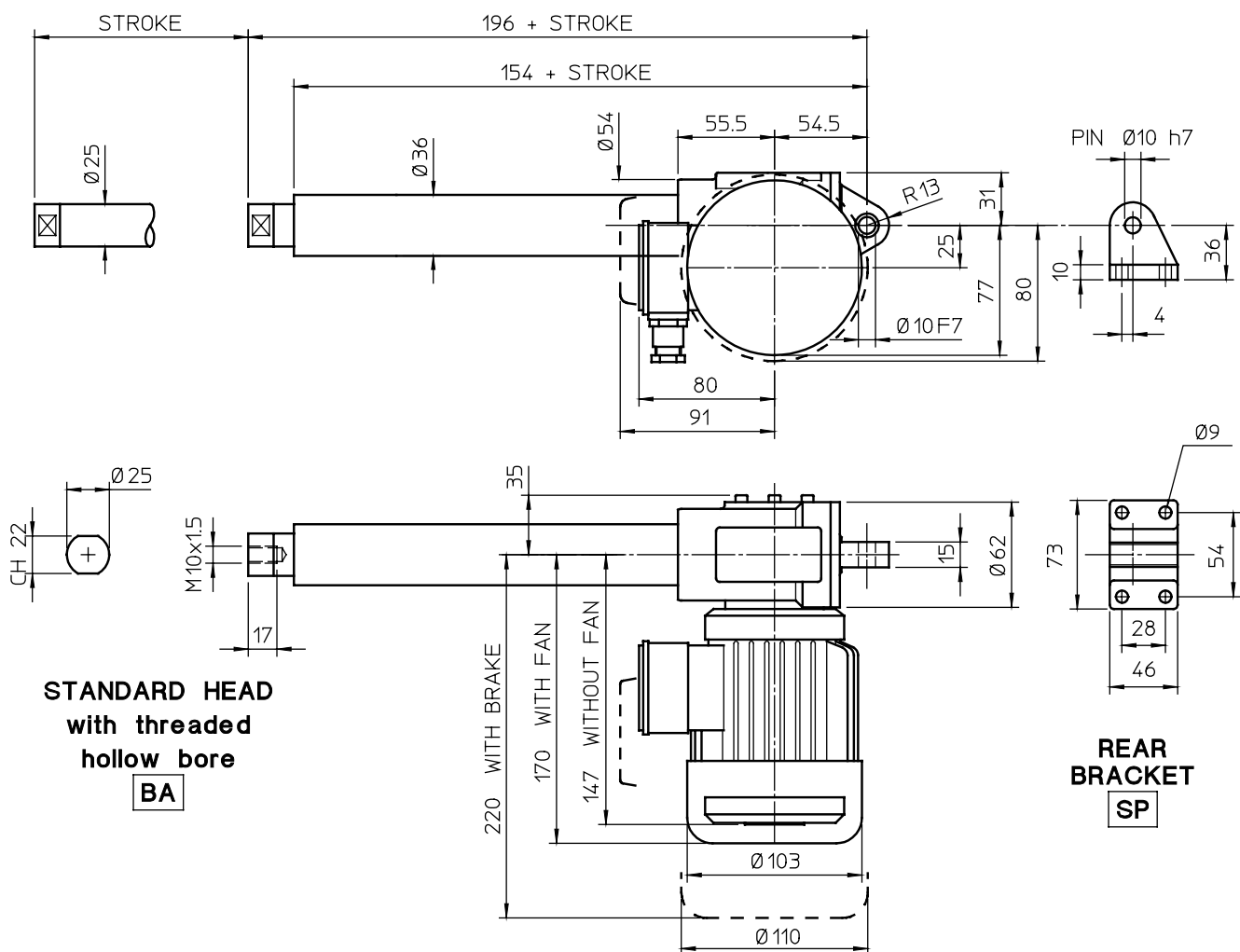
- Note:
- Special stroke lengths available on request.
 - The travel length performed by an actuator equipped with FCM is reduced compared to an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimal retracted length. Therefore the actuator in retracted position is longer.

ELECTRIC STROKE LIMIT DEVICE FCE

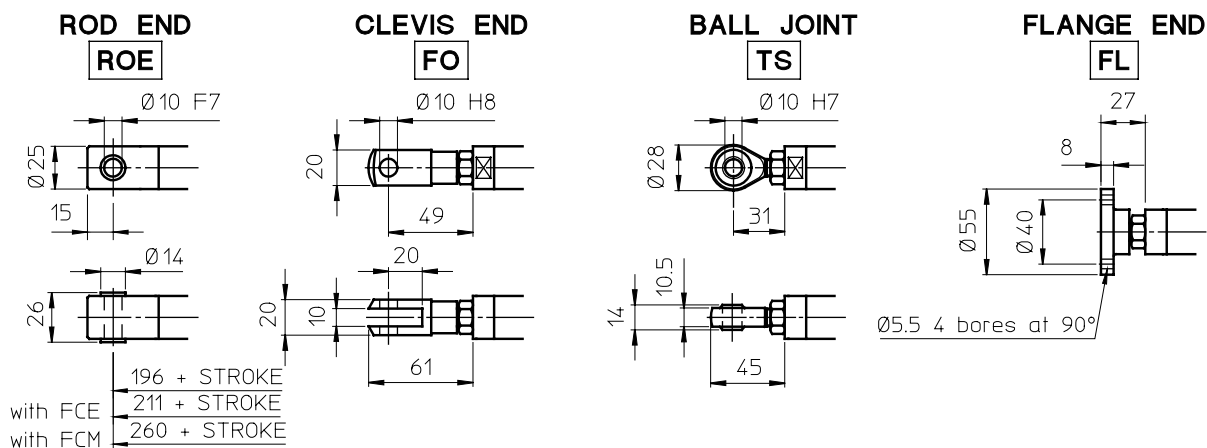
Features, operation, adjustment and wiring diagrams: on page 94



7.6 BALL SCREW LINEAR ACTUATOR BSA 10 WITH AC 3-PHASE MOTOR



FRONT ATTACHMENTS



STROKE LENGTHS AVAILABLE IN STOCK WITH OR WITHOUT ELECTRIC STROKE LIMIT DEVICE FCE

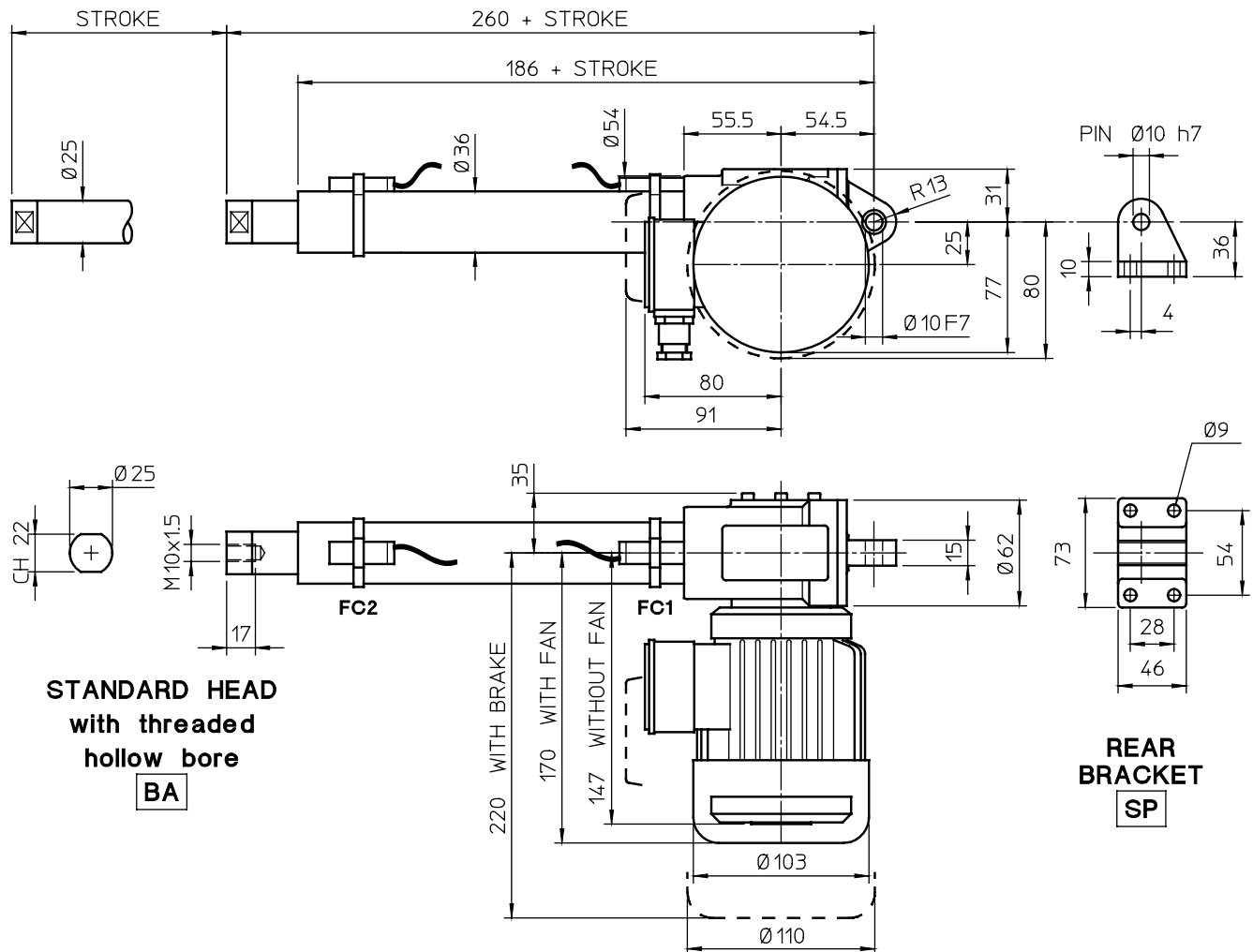
STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	85	185	285	385	485	585	685	785

- Note:
- Special stroke lengths available on request.
 - AC 3-phase motor features on page 101.
 - Over-all dimensions in millimetres (mm).

BALL SCREW LINEAR ACTUATOR BSA 10 WITH AC 3-PHASE MOTOR

DIMENSIONS WITH MAGNETIC STROKE LIMIT DEVICE FCM

Features, operation, adjustment and wiring diagrams: on page 95



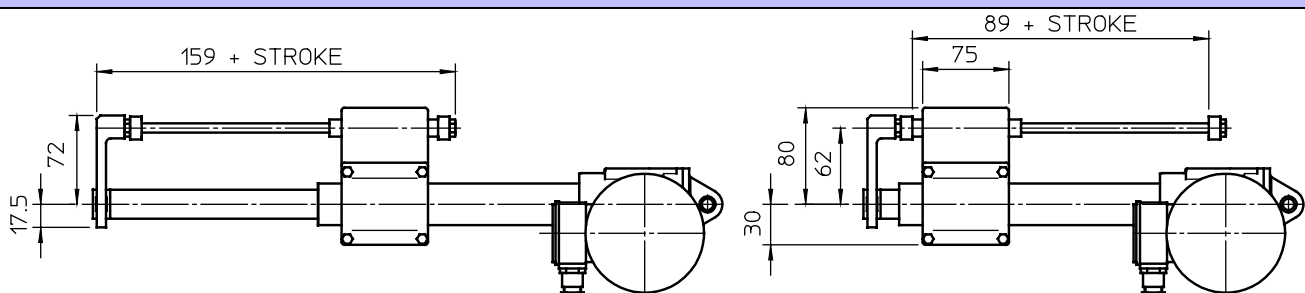
STROKE LENGTHS AVAILABLE IN STOCK WITH MAGNETIC STROKE LIMIT DEVICE FCM

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	53	153	253	353	453	553	653	753

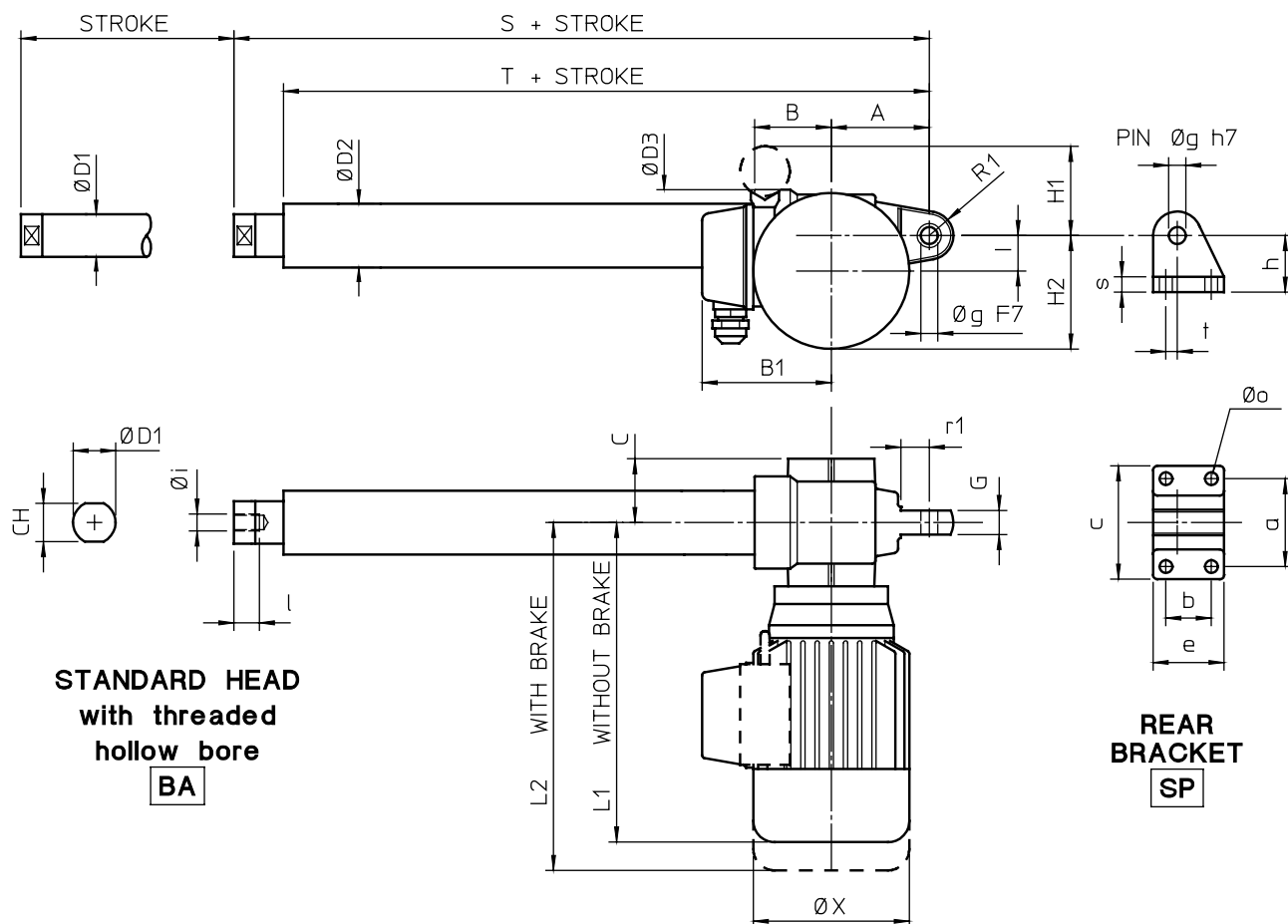
- Note:
- Special stroke lengths available on request.
 - The travel length performed by an actuator equipped with FCM is reduced compared to an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimal retracted length. Therefore the actuator in retracted position is longer.

ELECTRIC STROKE LIMIT DEVICE FCE

Features, operation, adjustment and wiring diagrams: on page 94

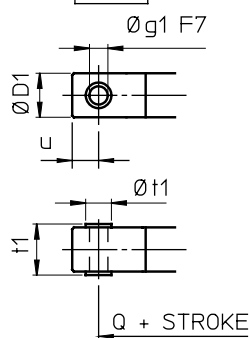


7.7 BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40
AC 3-phase or 1-phase MOTOR – with Electric Stroke Limit Device FCE

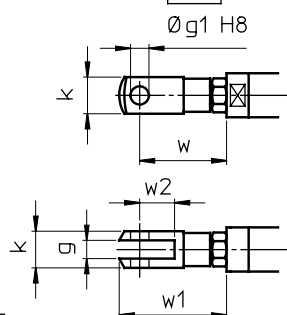


FRONT ATTACHMENTS

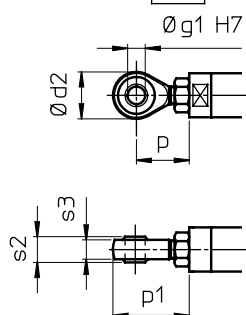
ROD END
ROE



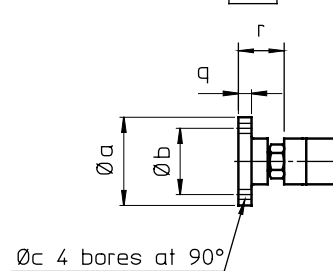
CLEVIS END
FO



BALL JOINT
TS

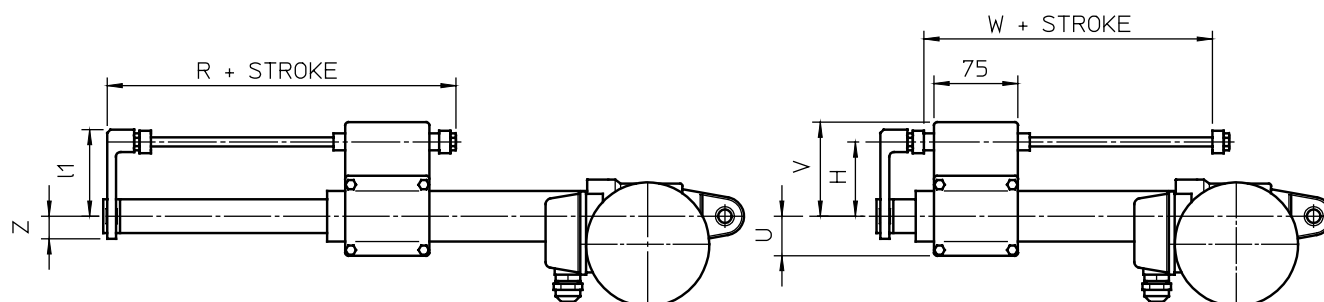


FLANGE END
FL



ELECTRIC STROKE LIMIT DEVICE FCE

Features, operation, adjustment and wiring diagrams: on page 94



7.7
BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40
AC 3-phase or 1-phase MOTOR – with Electric Stroke Limit Device FCE
STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE		C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	BSA 20	86	186	286	386	486	586	686	786
	BSA 25	84	184	284	384	484	584	684	784
	BSA 30	90	190	290	390	490	590	690	790
	BSA 40	90	190	290	390	490	590	690	790

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash is necessary to increase the guided length between push rod and protective tube. Dimensions **S** and **T** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
BSA 20	69	54	110	45	22	25	36	65	17	50	80	25	225	251	17
BSA 25	69	54	110	45	27	30	45	65	17	50	80	25	225	251	17
BSA 30	76	62	115	50	30	35	55	78	20	60	92	30	255	291	18
BSA 40	104	78	124	57	36	40	60	92	24	50	115	40	284	373	28

	S	T	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
BSA 20	211	166	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
BSA 25	222	171	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
BSA 30	238	190	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
BSA 40	295	235	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q
BSA 20	55	40	5,5	25	28	10	10	20	31	45	226
BSA 25	60	45	6,5	30	32	12	12	24	36	52	239
BSA 30	65	50	6,5	35	36	14	14	27	36	54	258
BSA 40	80	60	8,5	40	50	20	20	40	53	78	320

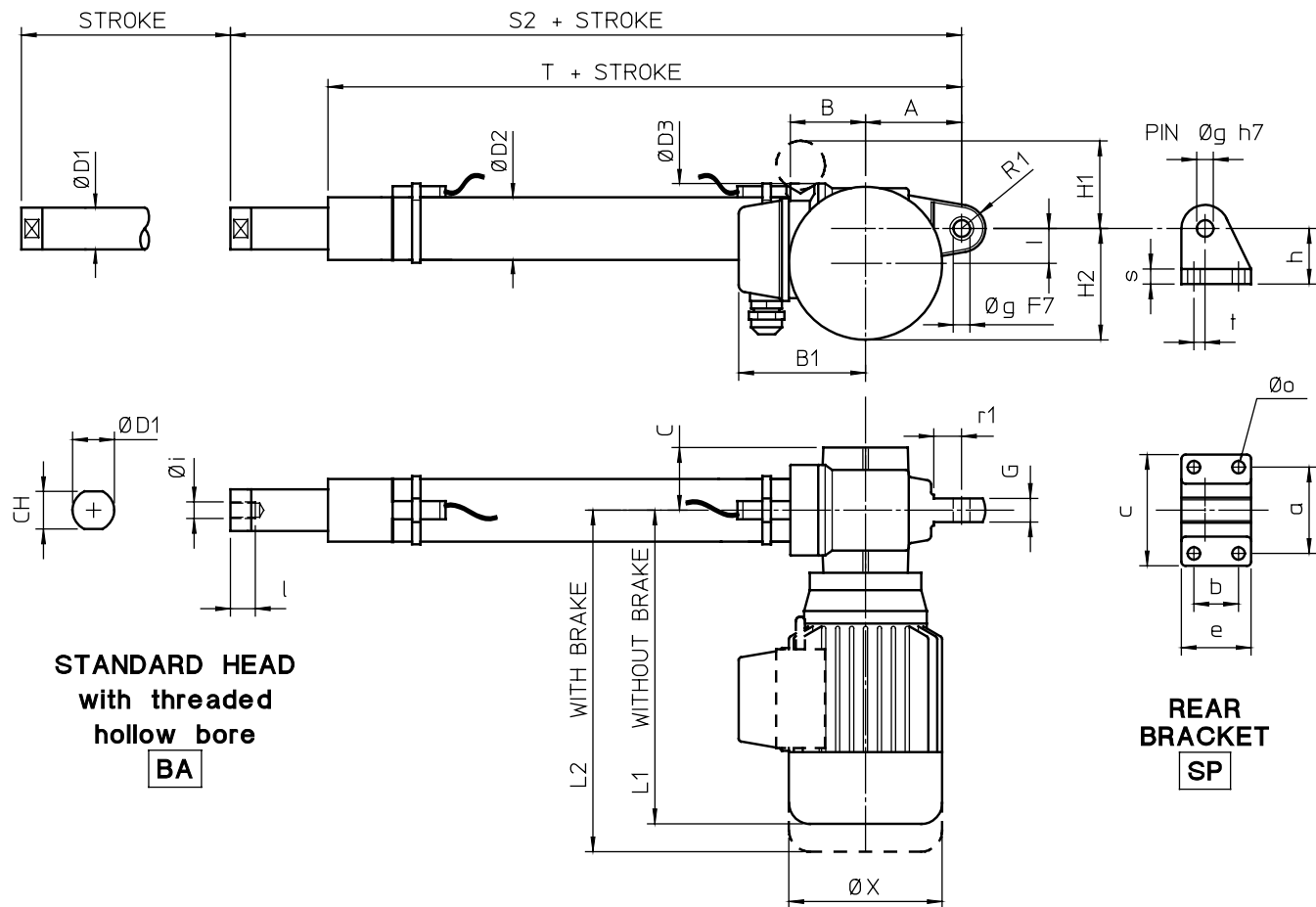
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
BSA 20	8	27	14	11	26	14	15	49	61	20
BSA 25	9	28	16	12	32	16	18	56	70	24
BSA 30	9	32	19	14	36	18	21	65	81	28
BSA 40	10	42	25	18	42	25	27	90	115	40

ELECTRIC STROKE LIMIT DEVICE FCE DIMENSIONS

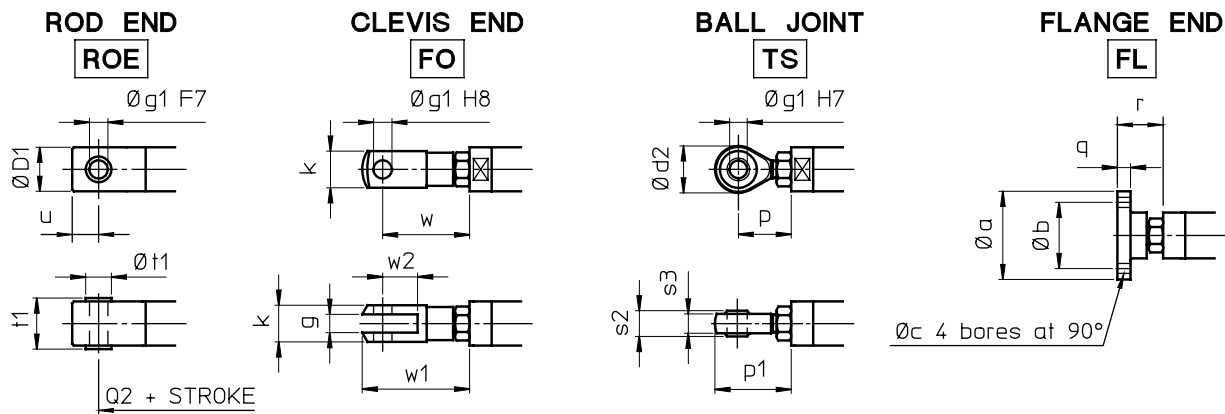
	H	R	U	V	W	Z	I1
BSA 20	62	158	30	80	74	18	72
BSA 25	67	162	35	85	74	20	77
BSA 30	71	157	38	90	79	23	82
BSA 40	75	173	43	93	79	25	85

Note: Over-all dimensions in millimetres (mm).

7.7 BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40
AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Device FCM



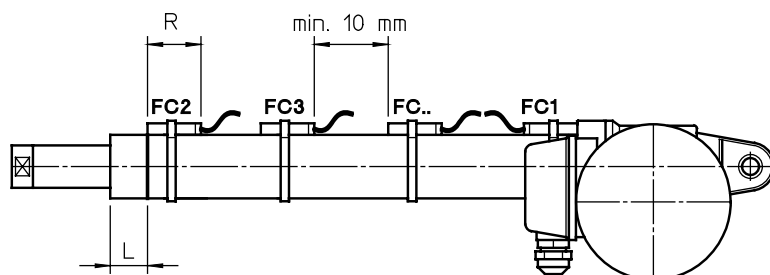
FRONT ATTACHMENTS



MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

	REED SWITCHES	
	NC or (NC+NO)	NO
	L	L
BSA 20	40	43.5
BSA 25	48	51
BSA 30	58	60.5
BSA 40	66	82.5



Note: Over-all dimensions in millimetres (mm).

7.7

BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40

AC 3-phase or 1-phase MOTOR – with Magnetic Stroke Limit Device FCM

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE		C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	BSA 20	54	154	254	354	454	554	654	754
	BSA 25	47	147	247	347	447	547	647	747
	BSA 30	46	146	246	346	446	546	646	746
	BSA 40	37	137	237	337	437	537	637	737

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
BSA 20	69	54	110	45	22	25	36	65	17	50	80	25	225	251	17
BSA 25	69	54	110	45	27	30	45	65	17	50	80	25	225	251	17
BSA 30	76	62	115	50	30	35	55	78	20	60	92	30	255	291	18
BSA 40	104	78	124	57	36	40	60	92	24	50	115	40	284	373	28

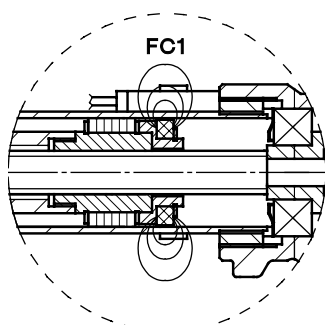
	S2	T	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
BSA 20	275	198	110	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
BSA 25	296	208	110	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
BSA 30	326	234	123	72	38	90	58	14	45	M14×2	24	9	20	12	8
BSA 40	401	288	150	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
BSA 20	55	40	5,5	25	28	10	10	20	31	45	275
BSA 25	60	45	6,5	30	32	12	12	24	36	52	299
BSA 30	65	50	6,5	35	36	14	14	27	36	54	332
BSA 40	80	60	8,5	40	50	20	20	40	53	78	413

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

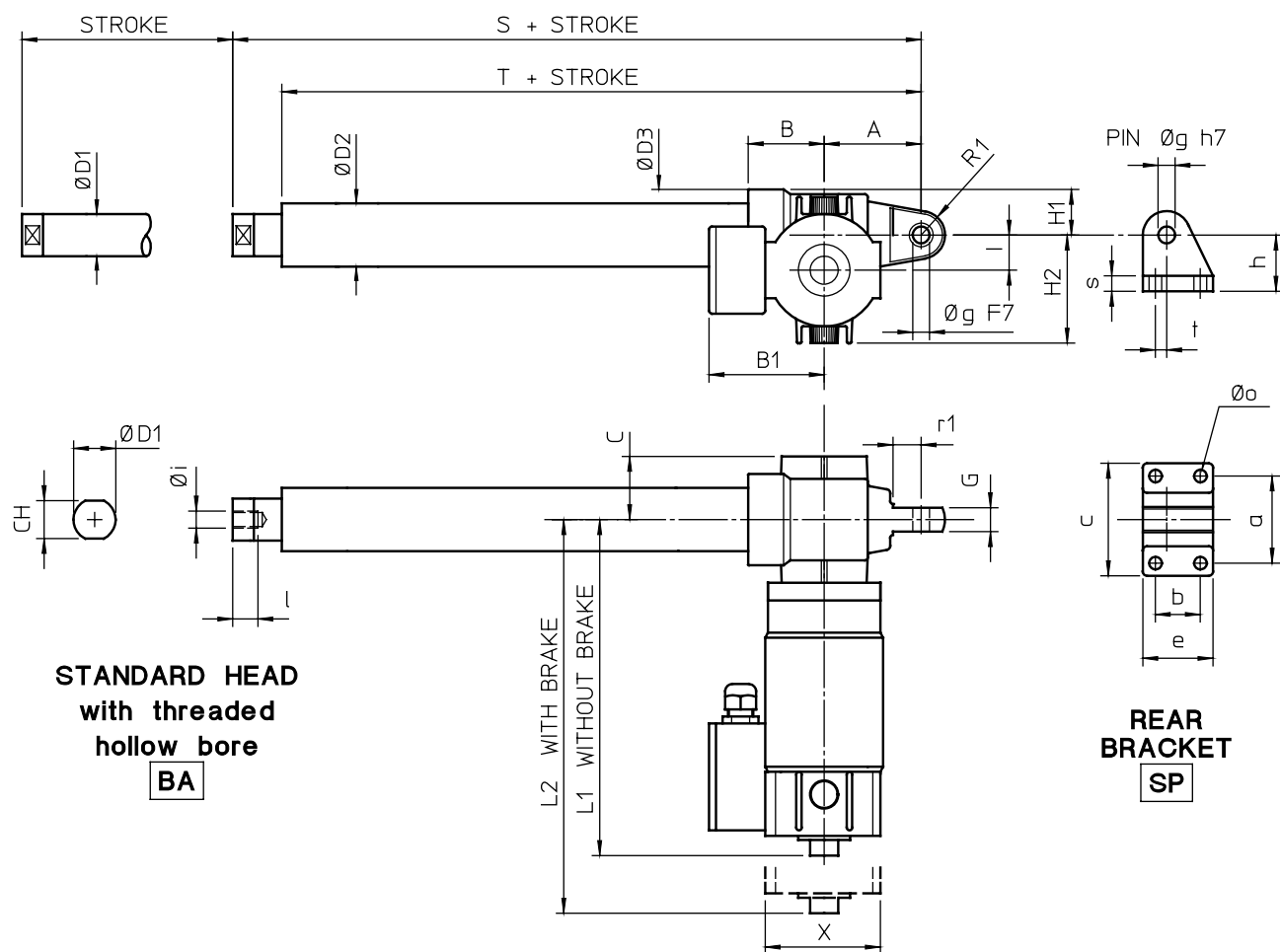
MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES



Note: - The travel length performed by an actuator equipped with FCM is reduced compared to an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimal retracted length. Therefore the actuator in retracted position is longer.

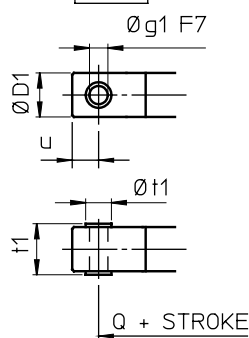
- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimal distance between the REED SWITCHES must be of at least 10 mm.
- REED SWITCH Normally Closed (NC) R = 39 mm
- REED SWITCH Change-over (NC+NO) R = 39 mm
- REED SWITCH Normally Open (NO) R = 29 mm

7.7 BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40
DC MOTOR – with Electric Stroke Limit Device FCE

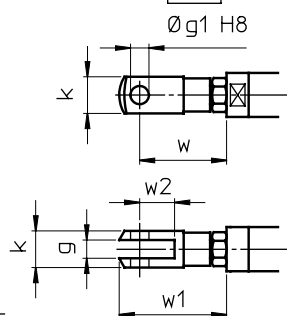


FRONT ATTACHMENTS

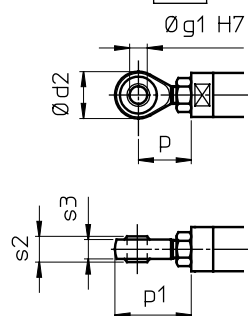
**ROD END
ROE**



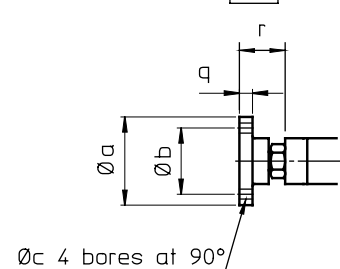
**CLEVIS END
FO**



**BALL JOINT
TS**

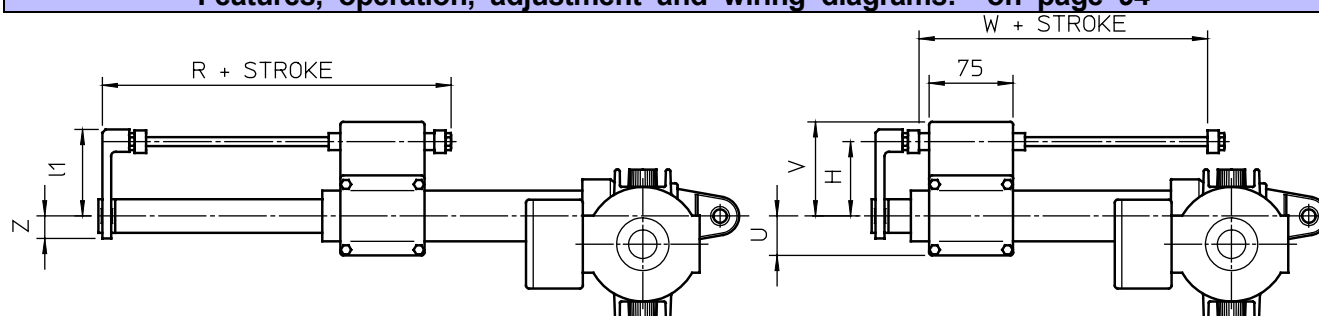


**FLANGE END
FL**



ELECTRIC STROKE LIMIT DEVICE FCE

Features, operation, adjustment and wiring diagrams: **on page 94**



7.7
BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40
DC MOTOR – with Electric Stroke Limit Device FCE
STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE		C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	BSA 20	86	186	286	386	486	586	686	786
	BSA 25	84	184	284	384	484	584	684	784
	BSA 30	90	190	290	390	490	590	690	790
	BSA 40	90	190	290	390	490	590	690	790

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
BSA 20	69	54	80	45	22	25	36	65	17	33	79	25	202	243	17
BSA 25	69	54	80	45	27	30	45	65	17	33	79	25	235	276	17
BSA 30	76	62	80	50	30	35	55	78	20	39	84	30	291	332	18
BSA 40	104	78	80	57	36	40	60	92	24	46	94	40	391	432	28

	S	T	X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
BSA 20	211	166	107	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
BSA 25	222	171	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
BSA 30	238	190	107	72	38	90	58	14	45	M14×2	24	9	20	12	8
BSA 40	295	235	107	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q
BSA 20	55	40	5,5	25	28	10	10	20	31	45	226
BSA 25	60	45	6,5	30	32	12	12	24	36	52	239
BSA 30	65	50	6,5	35	36	14	14	27	36	54	258
BSA 40	80	60	8,5	40	50	20	20	40	53	78	320

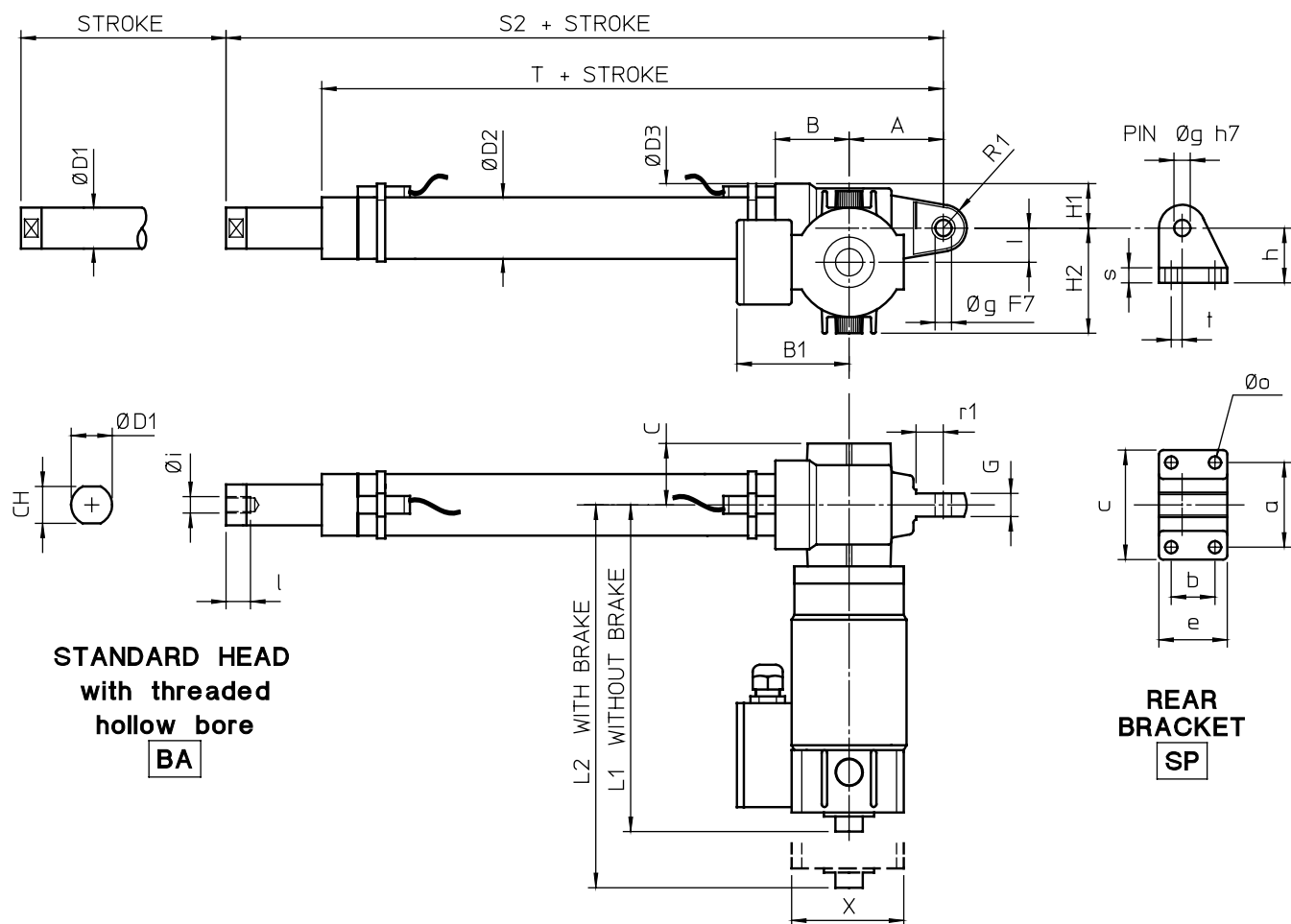
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
BSA 20	8	27	14	11	26	14	15	49	61	20
BSA 25	9	28	16	12	32	16	18	56	70	24
BSA 30	9	32	19	14	36	18	21	65	81	28
BSA 40	10	42	25	18	42	25	27	90	115	40

ELECTRIC STROKE LIMIT DEVICE FCE DIMENSIONS

	H	R	U	V	W	Z	I1
BSA 20	62	158	30	80	74	18	72
BSA 25	67	162	35	85	74	20	77
BSA 30	71	157	38	90	79	23	82
BSA 40	75	173	43	93	79	25	85

Note: Over-all dimensions in millimetres (mm).

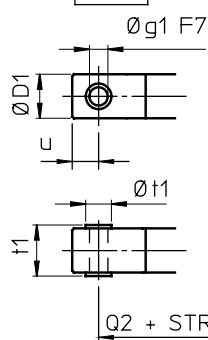
7.7 BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40
DC MOTOR –. with Magnetic Stroke Limit Device FCM



FRONT ATTACHMENTS

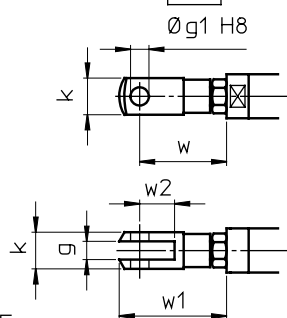
ROD END

ROE



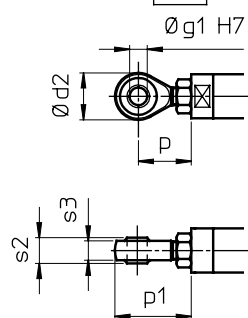
CLEVIS END

FO



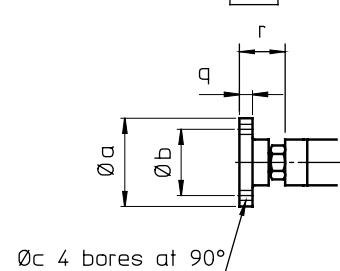
BALL JOINT

TS



FLANGE END

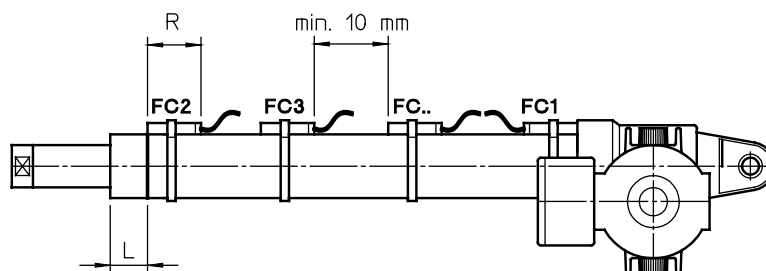
FL



MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

	REED SWITCHES	
	NC or (NC+NO)	NO
	L	L
BSA 20	40	43.5
BSA 25	48	51
BSA 30	58	60.5
BSA 40	66	82.5



Note: Over-all dimensions in millimetres (mm).

7.7

BALL SCREW LINEAR ACTUATORS Series BSA 20 – 25 – 30 – 40

DC MOTOR – with Magnetic Stroke Limit Device FCM

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE		C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	BSA 20	54	154	254	354	454	554	654	754
	BSA 25	47	147	247	347	447	547	647	747
	BSA 30	46	146	246	346	446	546	646	746
	BSA 40	37	137	237	337	437	537	637	737

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash, it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	Ø D3	G	H1	H2	I	L1	L2	R1
BSA 20	69	54	80	45	22	25	36	65	17	33	79	25	202	243	17
BSA 25	69	54	80	45	27	30	45	65	17	33	79	25	235	276	17
BSA 30	76	62	80	50	30	35	55	78	20	39	84	30	291	332	18
BSA 40	104	78	80	57	36	40	60	92	24	46	94	40	391	432	28

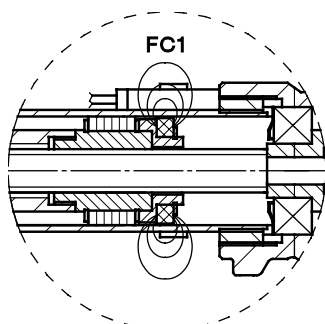
	S2	T	X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
BSA 20	275	198	107	62	32	80	50	12	40	M10×1.5	17	9	20	11	8
BSA 25	296	208	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
BSA 30	326	234	107	72	38	90	58	14	45	M14×2	24	9	20	12	8
BSA 40	401	288	107	85	55	110	81	20	58	M20×1.5	27	11	32	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
BSA 20	55	40	5,5	25	28	10	10	20	31	45	275
BSA 25	60	45	6,5	30	32	12	12	24	36	52	299
BSA 30	65	50	6,5	35	36	14	14	27	36	54	332
BSA 40	80	60	8,5	40	50	20	20	40	53	78	413

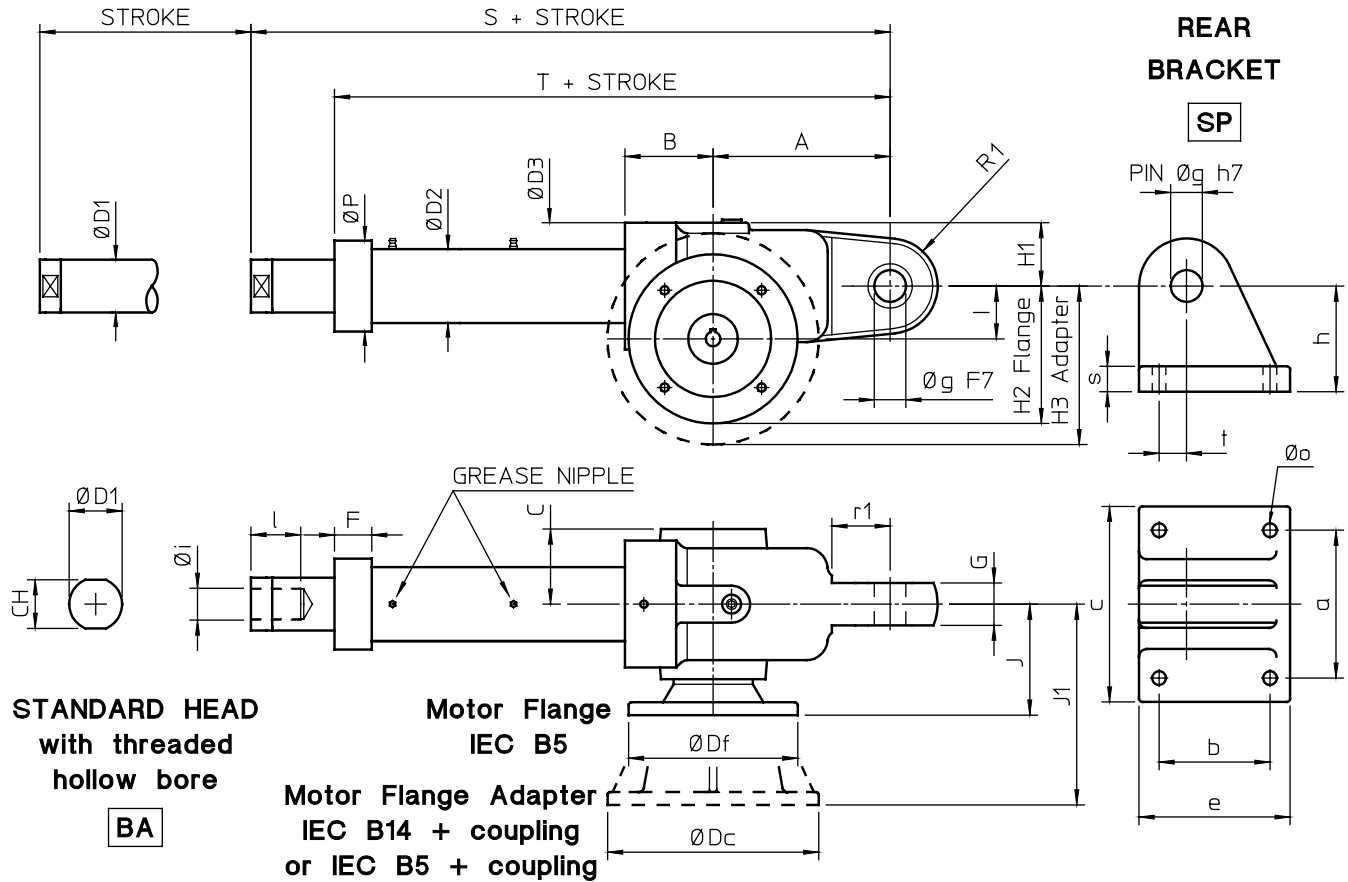
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
BSA 20	8	27	14	11	26	14	15	49	61	20
BSA 25	9	28	16	12	32	16	18	56	70	24
BSA 30	9	32	19	14	36	18	21	65	81	28
BSA 40	10	42	25	18	42	25	27	90	115	40

MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES

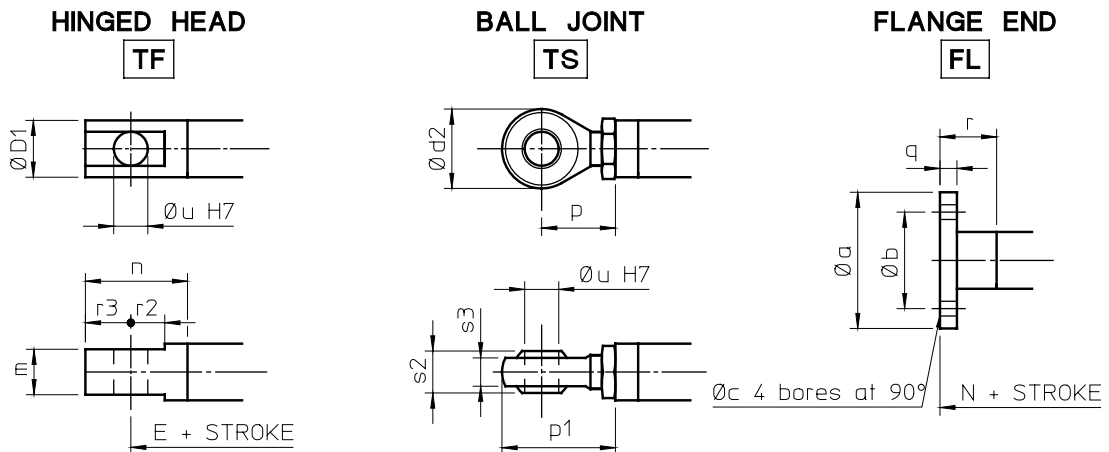


Note: - The travel length performed by an actuator equipped with FCM is reduced compared to an actuator without FCM, because the REED SWITCH FC1 gives the stopping signal to the motor before the actuator reaches its minimal retracted length. Therefore the actuator in retracted position is longer.

- Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimal 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

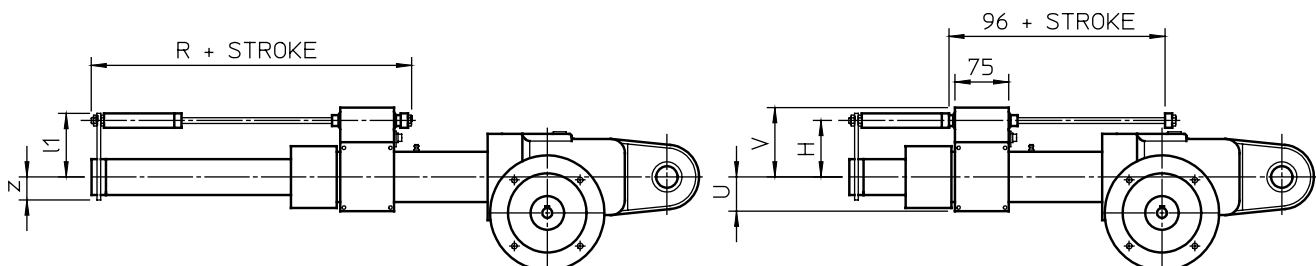


FRONT ATTACHMENTS



ELECTRIC STROKE LIMIT DEVICE FCE

Features, operation, adjustment and wiring diagrams: on page 94



STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash, it is necessary to increase the guided length between push rod and protective tube. Dimensions **S** and **T** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt

	A	B	C	CH	Ø D1	Ø D2	Ø D3	F	G	H1	I	Ø P	R1	S
BSA 50	168	84	68	46	50	70	120	–	40	63	50	–	45	481
BSA 63	206	96	83	–	60	90	140	37	50	70	63	95	50	571
BSA 80	240	119	103	–	90	115	180	40	60	90	80	125	60	708

	T	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
BSA 50	394	140	105	185	143	30	100	M30×2	45	13	55	20	30
BSA 63	467	180	120	228	160	35	120	M36×2	55	17	58	30	30
BSA 80	611	210	122	278	180	40	130	M42×2	65	21	62	35	32

	Flange IEC	Ø Df	H2	J	Adapter+Coupling IEC	Ø 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
					100/112 B14 – B5	160 – 250	143 – 188	220
BSA 80	80 B5; 90 B5	200	180	119	100/112 B14 – B5	160 – 250	160 – 205	240

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	E	m	n	N
BSA 50	120	85	13	50	70	511	40	80	491
BSA 63	140	100	17	60	80	601	50	85	581
BSA 80	170	130	21	90	90	743	50	100	728

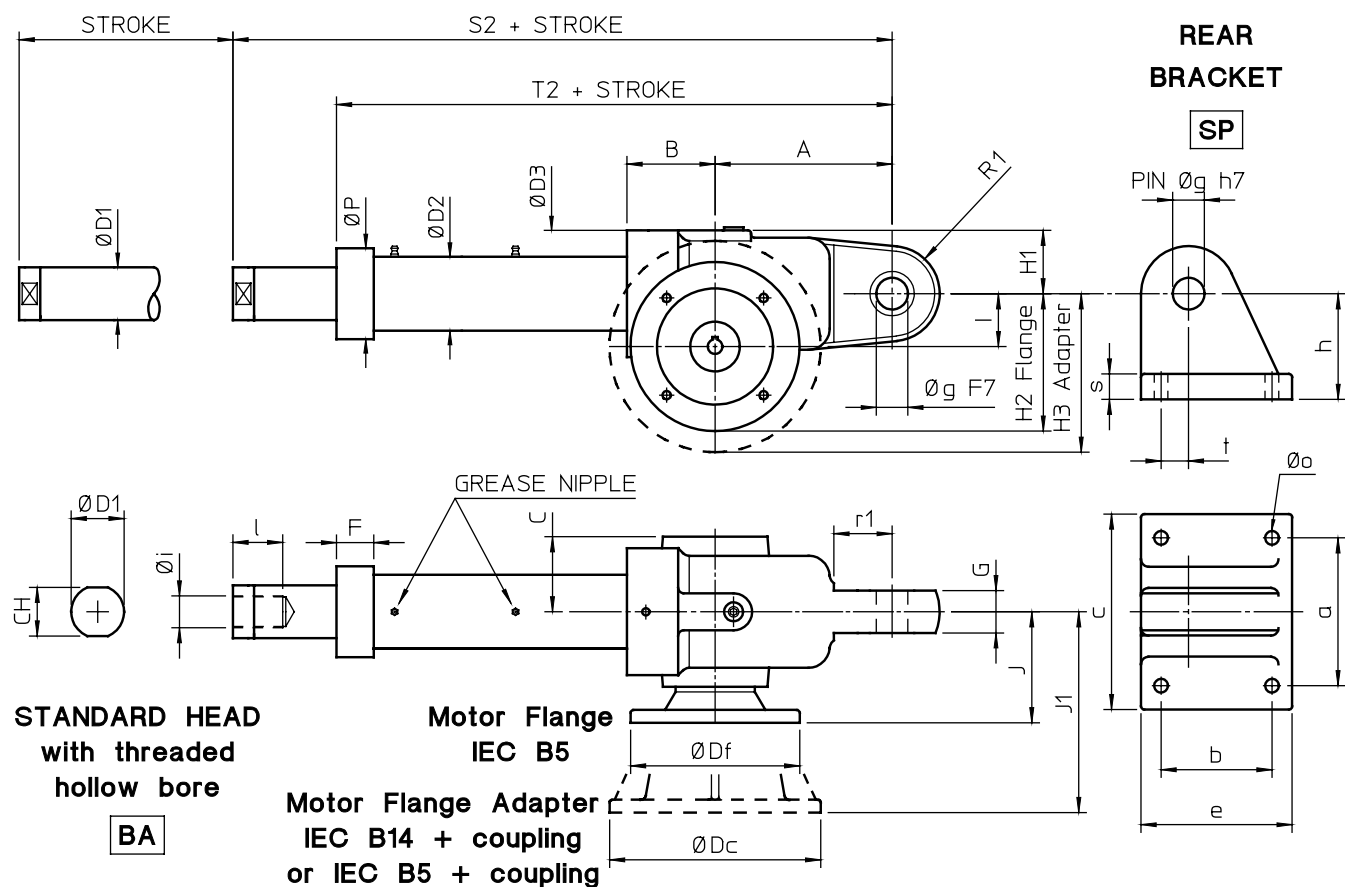
	p	p1	q	r	r2	r3	s2	s3	Ø u
BSA 50	65	100	15	30	30	30	37	25	30
BSA 63	86	126	15	30	30	35	43	28	35
BSA 80	85	130	20	40	35	45	49	33	40

ELECTRIC STROKE LIMIT DEVICE FCE DIMENSIONS

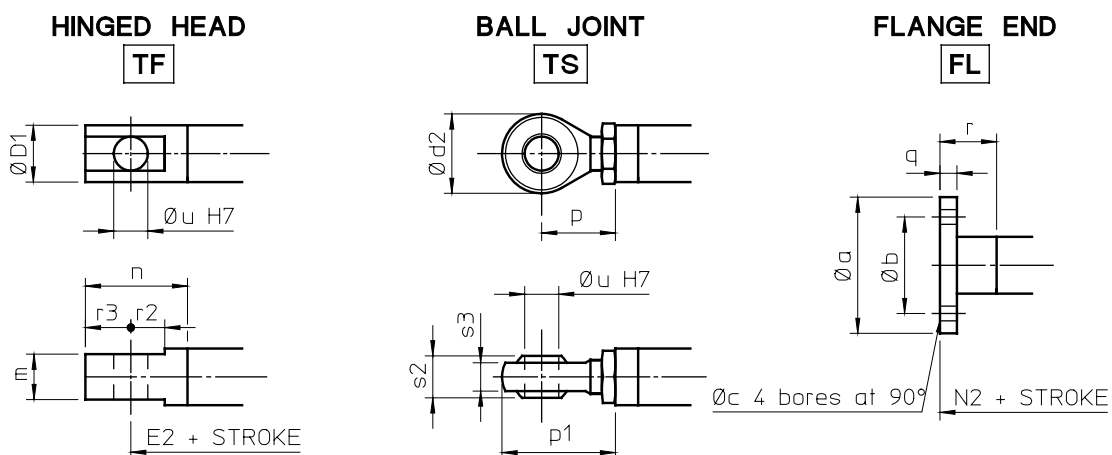
	H	R	U	V	Z	I1
BSA 50	79	196	50	97	32	89
BSA 63	89	244	60	107	37	100
BSA 80	101	240	73	119	55	113

Note: Over-all dimensions in millimetres (mm).

7.8 BALL SCREW LINEAR ACTUATORS Series BSA 50 – 63 – 80
AC 3-phase MOTOR – with Inductive Proximity Stroke Limit Device FCP



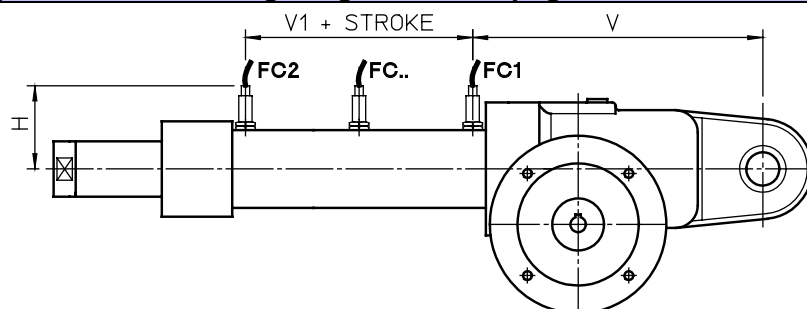
FRONT ATTACHMENTS



INDUCTIVE PROXIMITY STROKE LIMIT DEVICE FCP DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 97

	H	V	V1
BSA 50	76.5	263	70
BSA 63	86.5	314	71
BSA 80	99	375	113



Note: Over-all dimensions in millimetres (mm).

7.8

BALL SCREW LINEAR ACTUATORS Series BSA 50 – 63 – 80

AC 3-phase MOTOR – with Inductive Proximity Stroke Limit Device FCP

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T2** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	C	CH	Ø D1	Ø D2	Ø D3	F	G	H1	I	Ø P	R1	S2
BSA 50	168	84	68	46	50	70	120	–	40	63	50	–	45	497
BSA 63	206	96	83	–	60	90	140	37	50	70	63	95	50	579
BSA 80	240	119	103	–	90	115	180	40	60	90	80	125	60	708

	T2	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
BSA 50	402	140	105	185	143	30	100	M30×2	45	13	55	20	30
BSA 63	471	180	120	228	160	35	120	M36×2	55	17	63	30	30
BSA 80	611	210	122	278	180	40	130	M42×2	65	21	62	35	32

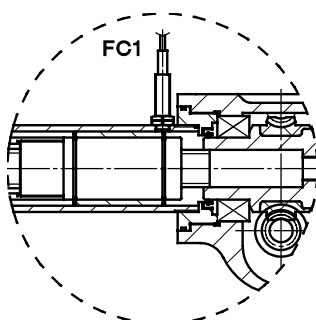
	Flange IEC	Ø Df	H2	J	Adapter+Coupling IEC	Ø Dc	H3	J1
BSA 50	63 B5	140	120	102	80 B14 – 80 B5	120 – 200	110 – 150	176 – 182
	71 B5	160	130	102	90 B14 – 90 B5	140 – 200	120 – 150	182
BSA 63	80 B5	200	163	100	90 B14 – 90 B5	140 – 200	133 – 163	200
					100/112 B14 – B5	160 – 250	143 – 188	220
BSA 80	80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

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	E2	m	n	N2
BSA 50	120	85	13	50	70	527	40	80	507
BSA 63	140	100	17	60	80	609	50	85	589
BSA 80	170	130	21	90	90	743	50	100	728

	p	p1	q	r	r2	r3	s2	s3	Ø u
BSA 50	65	100	15	30	30	30	37	25	30
BSA 63	86	126	15	30	30	35	43	28	35
BSA 80	85	130	20	40	35	45	49	33	40

INDUCTIVE PROXIMITY STROKE LIMIT DEVICE FCP FEATURES



- Note:
- The PROXIMITY SWITCH FC1, when activated, gives a signal to stop the motor by means of electric relays. FC1 stops the motor before the actuator reaches its minimal retracted length. Actuators equipped with FCP device have retracted and extended dimensions longer than actuators equipped with FCE (electric stroke limit device) even with same stroke length.
 - Additional extra PROXIMITY SWITCHES are available for intermediate positions.
 - The minimal distance between the PROXIMITY SWITCHES must be of at least 25 mm.

Compact ball screw linear actuator with integral electric motor suitable for push and pull motions.

D.C. motor available with or without brake.

Rear fixing attachment can be also supplied mounted at 90° with respect to the motor axis.

ACCESSORIES	Magnetic stroke limit device FCM	Wide range of front attachments
	Rear bracket SP	

PERFORMANCE with: Duty Cycle Fi = 100 % at 25 °C environment temp.

Max. static push and pull load admitted: 3000 N.

The linear speeds and dynamic loads stated below are performances achievable both at the same time during a working condition.

PERFORMANCE WITH D.C. MOTOR 24 V or 12 V					
LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	CURRENT [A]		BALL SCREW d × P
635	85	RV2	4 A (24 V)	9 A (12 V)	12.7 × 12.7
317	170	RN2	4 A (24 V)	9 A (12 V)	12.7 × 12.7
250	210	RV1	4 A (24 V)	9 A (12 V)	14 × 5
125	420	RN1	4 A (24 V)	9 A (12 V)	14 × 5

DC MOTOR 24 V or 12 V FEATURES

DC motor, without fan cooling, with high coercive ferrite permanent magnet field, available without or with brake. Long-life brushes easy to replace.

Power supply cable 1.5 m length with wires 2 × 1 mm². Motor weight: 1.3 kg.

Output power	70 W		Rated speed	3000 rpm	
Rated current	3.7 A (24 V)	8.4 A (12 V)	Rated torque	0.22 Nm	
Peak current	18 A (24 V)	30 A (12 V)	Peak torque	1.1 Nm	
Armature resistance	0.85 Ω (24 V)	0.23 Ω (12 V)	Inductance	1.34 mH (24 V)	0.36 mH (12V)
Protection	IP 54		Insulation class	F	

MOTOR BRAKE: On request normally closed emergency brake for positioning, activated by direct current DC electromagnet. Brake with independent power supply line with cable 1 m length with wires 2 × 1 mm². Motor with brake total weight: 1.8 kg.

Power supply	0.4 A (24 V)	0.85 A (12 V)	Braking torque	0.5 Nm
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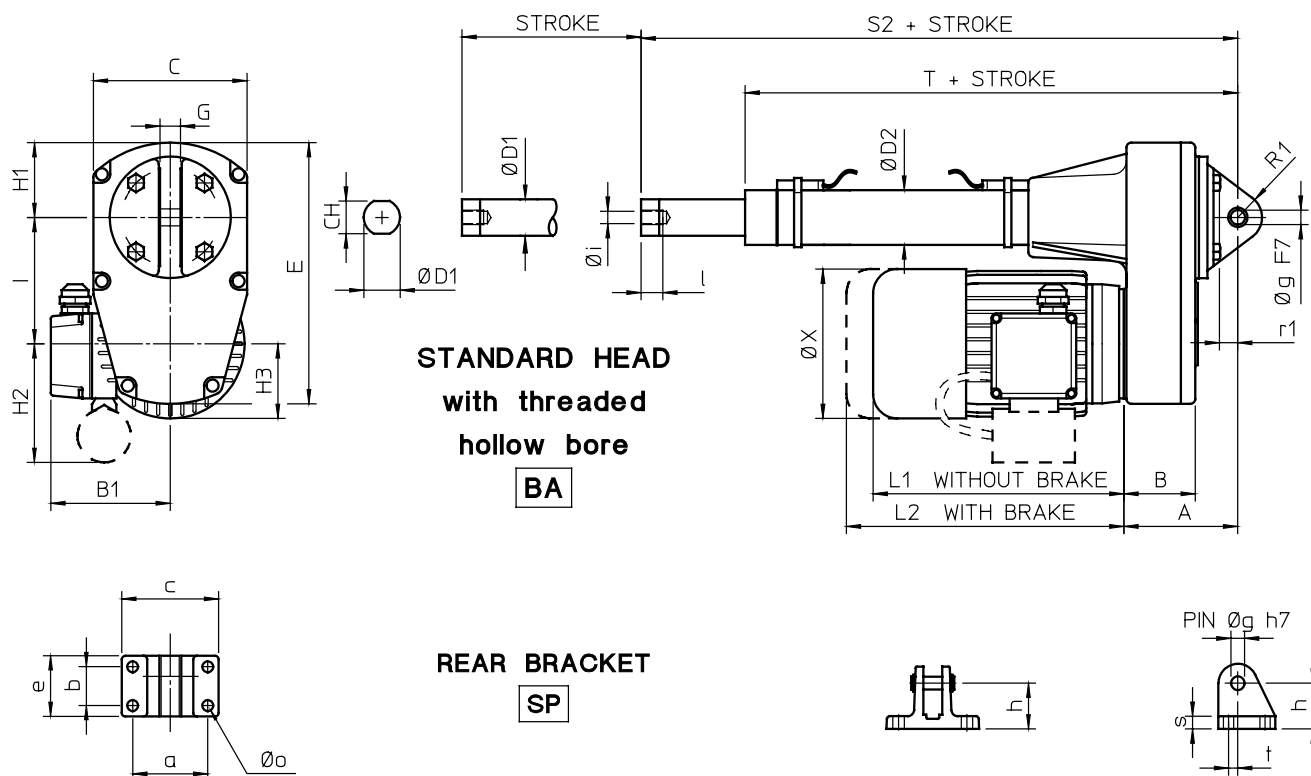
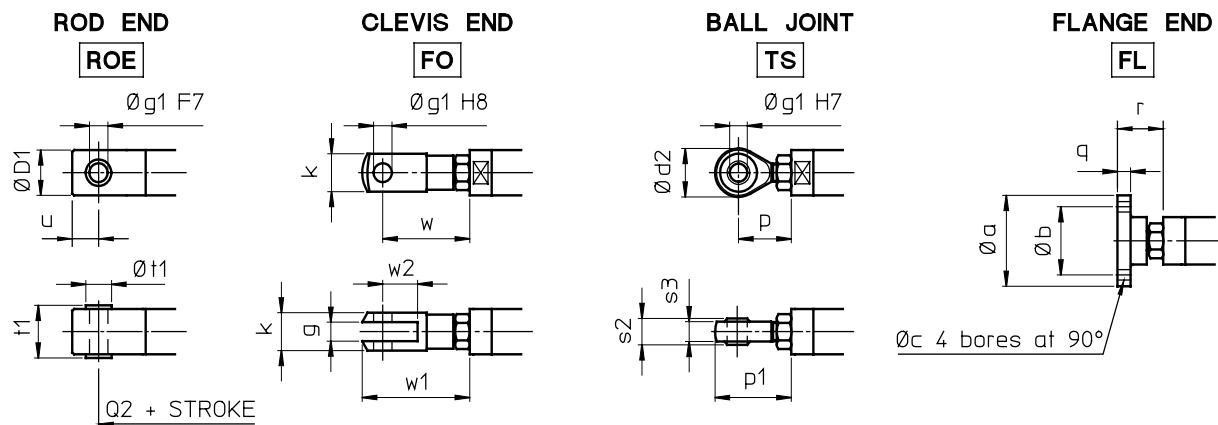
WARNING! The brake is normally closed: independent power supply line with the rated voltage is required to open it.

Feed the brake before switching on the motor.

STROKE LENGTHS AVAILABLE IN STOCK WITH MAGNETIC STROKE LIMIT DEVICE FCM

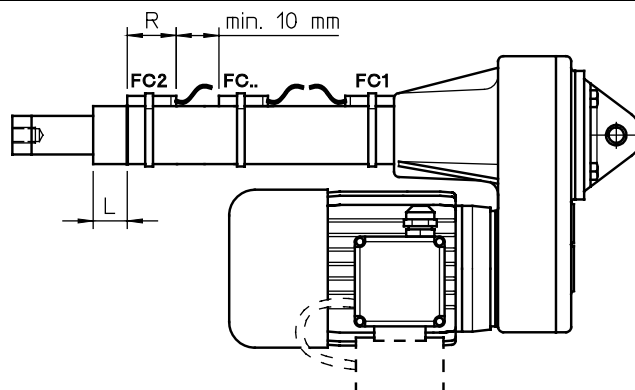
STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - Actuators with Ratio RV1 and RN1 have outer tube dimension different from actuators with Ratio RV2 and RN2 (refer to page 85).
 - Magnetic stroke limit device FCM:
Features, operation, adjustment and wiring diagrams: on page 95.
 - Over-all dimensions in millimetres (mm).


FRONT ATTACHMENTS

MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

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



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

STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

	A	B	B1	C	CH	Ø D1	Ø D2	E	G	H1	H2	H3	I	L2	R1
UBA 1	85	52	110	114	22	25	36	189	15	58	75	55	90	193	17
UBA 2	94	60	115	127	27	30	45	217	17	64	90	62	104	229	20
UBA 3	106	71	124	135	30	35	55	247	20	68	90	75	121	304	20
UBA 4	120	77	141	161	36	40	60	293	24	81	95	90	138,5	340	22

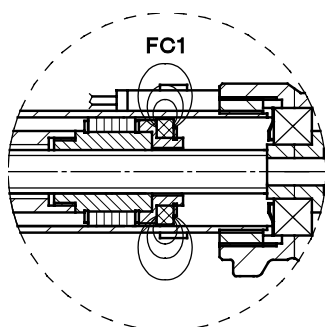
	S2	T	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
UBA 1	287	250	110	54	28	73	46	10	36	M10×1.5	17	9	18	10	4
UBA 2	307	263	123	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
UBA 3	342	296	150	72	38	90	58	14	45	M14×2	24	9	22	12	8
UBA 4	406	352	170	85	55	110	81	20	58	M20×1.5	27	11	29	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
UBA 1	55	40	5,5	25	28	10	10	20	31	45	287
UBA 2	60	45	6,5	30	32	12	12	24	36	52	310
UBA 3	65	50	6,5	35	36	14	14	27	36	54	348
UBA 4	80	60	8,5	40	50	20	20	40	53	78	418

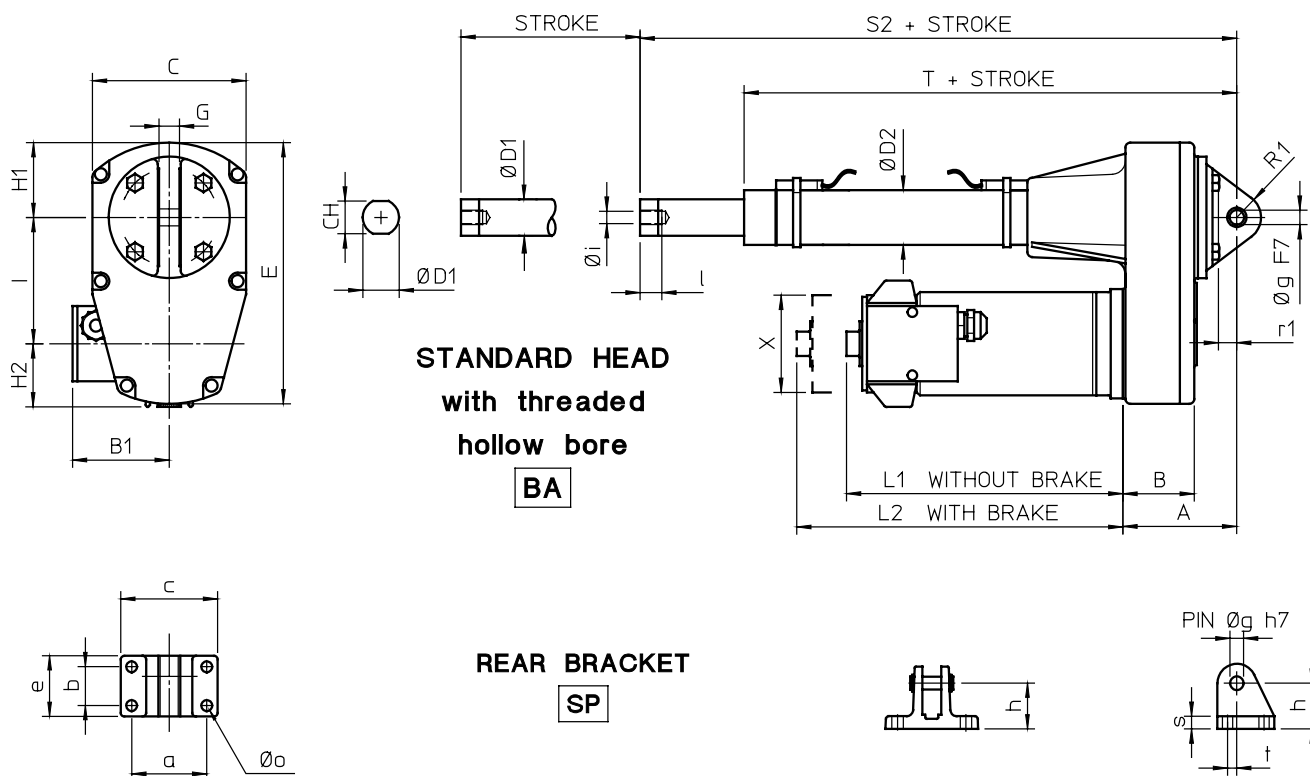
	q	r	s2	s3	t1	Ø t1	u	w	w1	w2
UBA 1	8	27	14	11	26	14	15	49	61	20
UBA 2	9	28	16	12	32	16	18	56	70	24
UBA 3	9	32	19	14	36	18	21	65	81	28
UBA 4	10	42	25	18	42	25	27	90	115	40

MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES

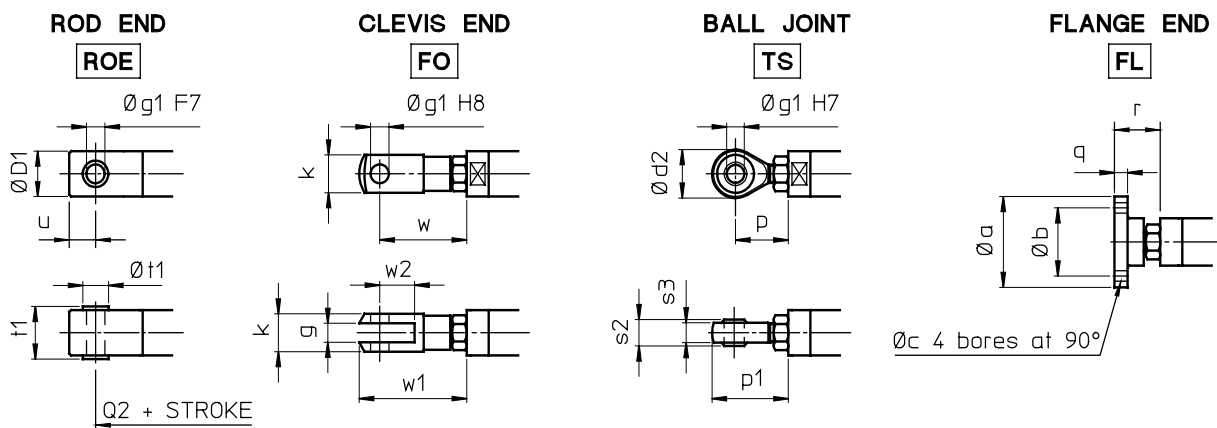


- Note:
- Additional extra magnetic REED SWITCHES are available for intermediate positions.
 - The minimal distance between the REED SWITCHES must be of at least 10 mm.
 - REED SWITCH Normally Closed (NC) R = 39 mm
 - REED SWITCH Change-over (NC+NO) R = 39 mm
 - REED SWITCH Normally Open (NO) R = 29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

Note: Over-all dimensions in millimetres (mm).



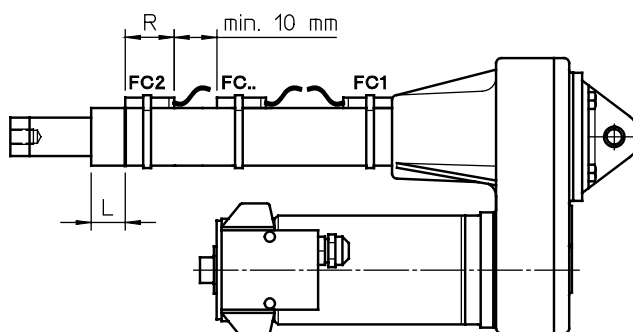
FRONT ATTACHMENTS



MAGNETIC STROKE LIMIT DEVICE FCM DIMENSIONS

Features, operation, adjustment and wiring diagrams: on page 95

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



7.10
BALL SCREW LINEAR ACTUATORS Series UBA 1 – 2 – 3 – 4
DC MOTOR – with Magnetic Stroke Limit Device FCM
STROKE LENGTHS AVAILABLE IN STOCK

STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800
STROKE LENGTH [mm]	100	200	300	400	500	600	700	800

- Note:
- Special stroke lengths available on request.
 - For stroke lengths longer than 800 mm, to avoid radial backlash it is necessary to increase the guided length between push rod and protective tube. Dimensions **S2** and **T** must be considered increased by 200 mm for stroke lengths up to 1500 mm.
 - For stroke lengths longer than 1500 mm contact SERVOMECH Technical Dpt.

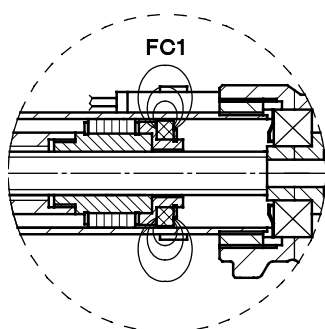
	A	B	B1	C	CH	Ø D1	Ø D2	E	G	H1	H2	I	L2	R1
UBA 1	85	52	80	114	22	25	36	189	15	58	54	90	218	17
UBA 2	94	60	80	127	27	30	45	217	17	64	54	104	270	20
UBA 3	106	71	80	135	30	35	55	247	20	68	54	121	364	20
UBA 4	120	77	118	161	36	40	60	293	24	81	69	138.5	503	22

	S2	T	Ø X	a	b	c	e	Ø g	h	Ø i	l	Ø o	r1	s	t
UBA 1	287	250	107	54	28	73	46	10	36	M10×1.5	17	9	18	10	4
UBA 2	307	263	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
UBA 3	342	296	107	72	38	90	58	14	45	M14×2	24	9	22	12	8
UBA 4	406	352	138	85	55	110	81	20	58	M20×1.5	27	11	29	15	15

FRONT ATTACHMENTS DIMENSIONS

	Ø a	Ø b	Ø c	Ø D1	Ø d2	g	Ø g1	k	p	p1	Q2
UBA 1	55	40	5,5	25	28	10	10	20	31	45	287
UBA 2	60	45	6,5	30	32	12	12	24	36	52	310
UBA 3	65	50	6,5	35	36	14	14	27	36	54	348
UBA 4	80	60	8,5	40	50	20	20	40	53	78	418

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

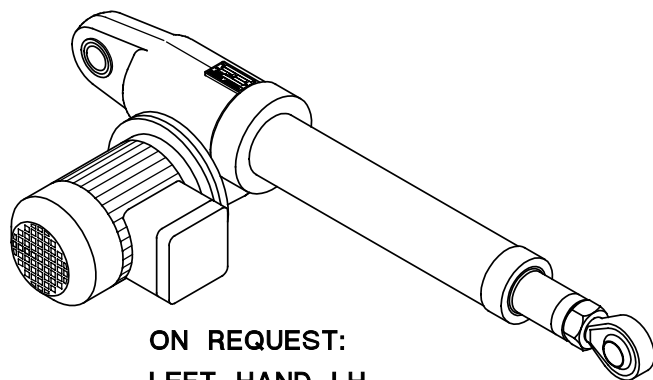
MAGNETIC REED SWITCHES FCM DIMENSIONS AND FEATURES


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

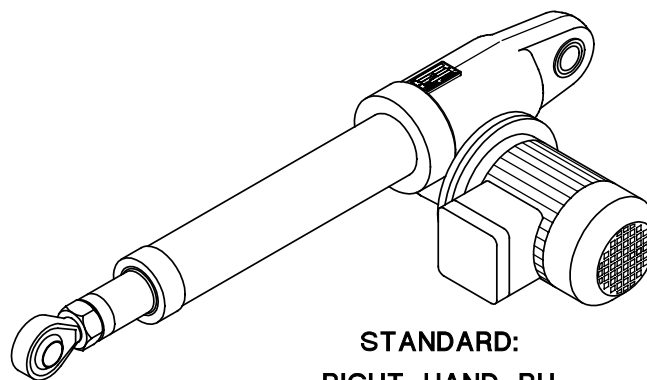
Note: Over-all dimensions in millimetres (mm).

8.1

ELECTRIC MOTOR POSITIONS

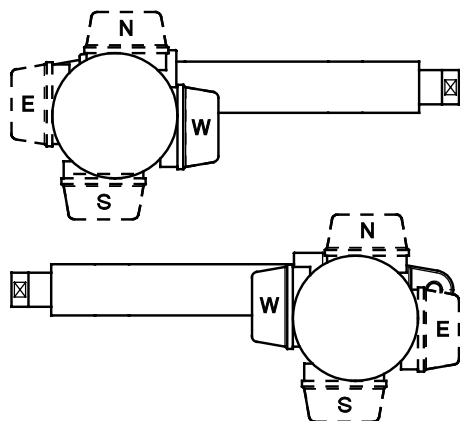


**ON REQUEST:
LEFT HAND LH**

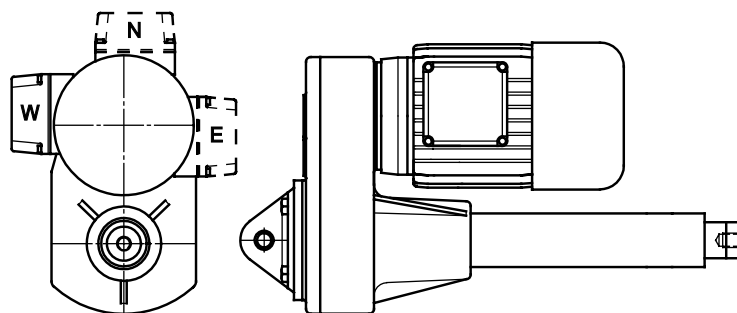


**STANDARD:
RIGHT HAND RH**

ELECTRIC MOTOR TERMINAL BOX POSITION
Series ATL and series BSA **Series UAL and Series UBA**



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



STANDARD SIDE: W
ON REQUEST SIDES E ; N

8.2

REAR FIXING ATTACHMENT PIVOT

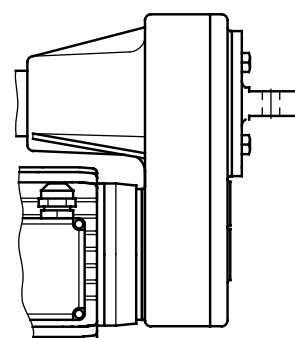
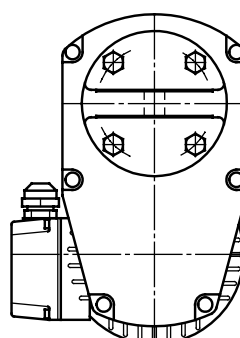
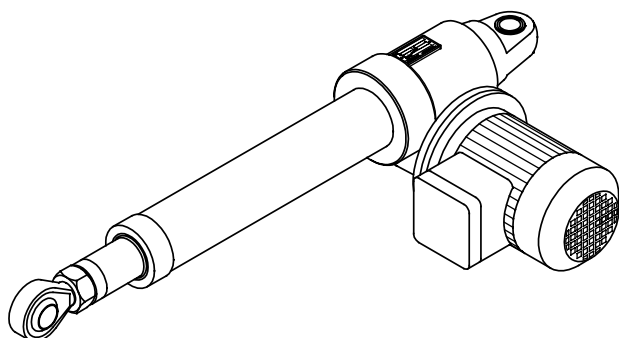
On request rear fixing attachments turned at 90° are available **ORDERING CODE RPT 90°**

Series ATL – BSA

Sizes: 10 – 20 – 25 – 30 – 40

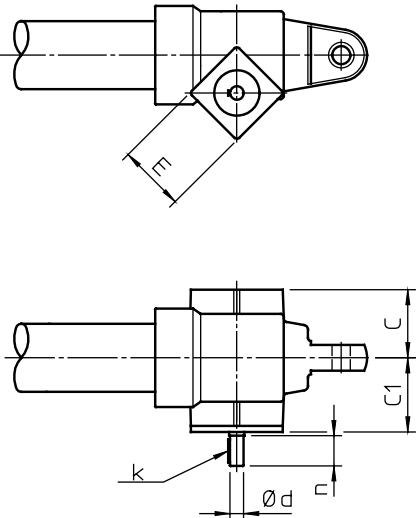
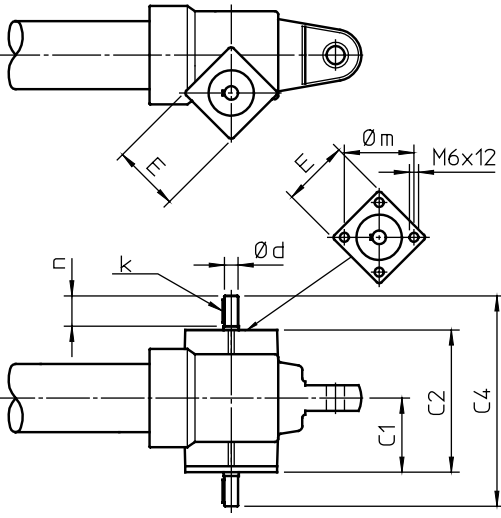
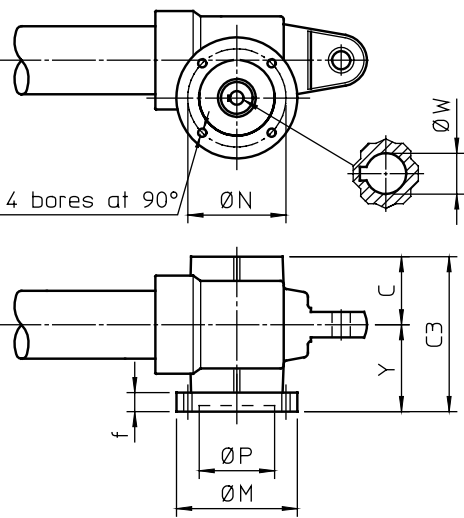
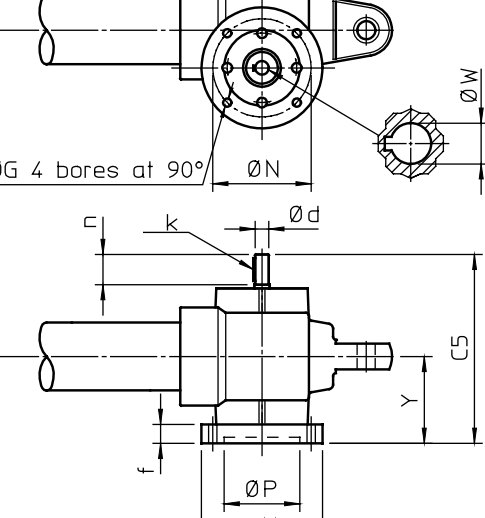
Series UAL – UBA

All sizes



8.3
LINEAR ACTUATORS INPUT VERSIONS

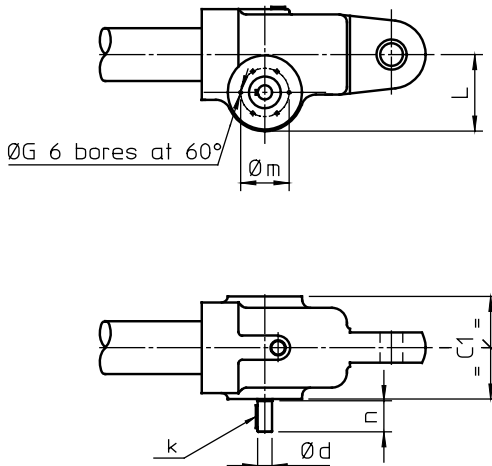
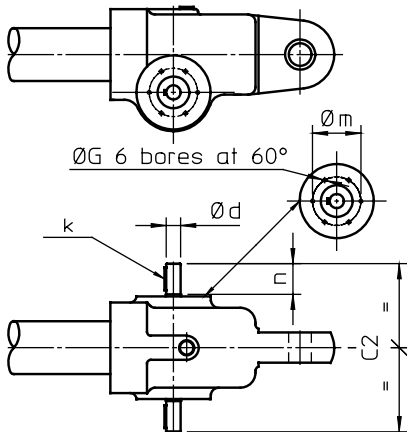
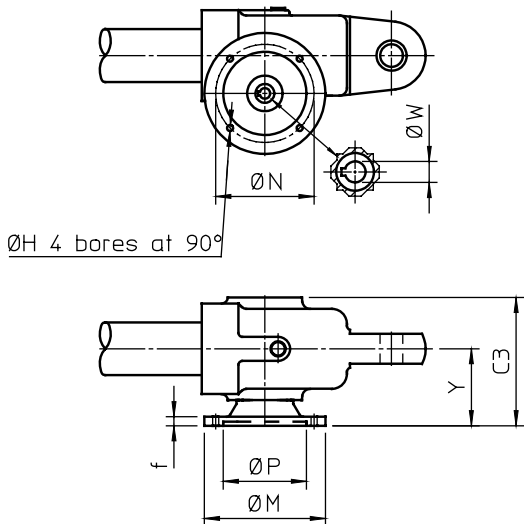
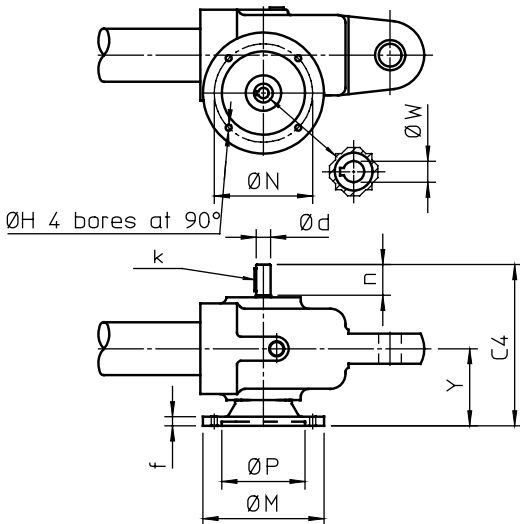
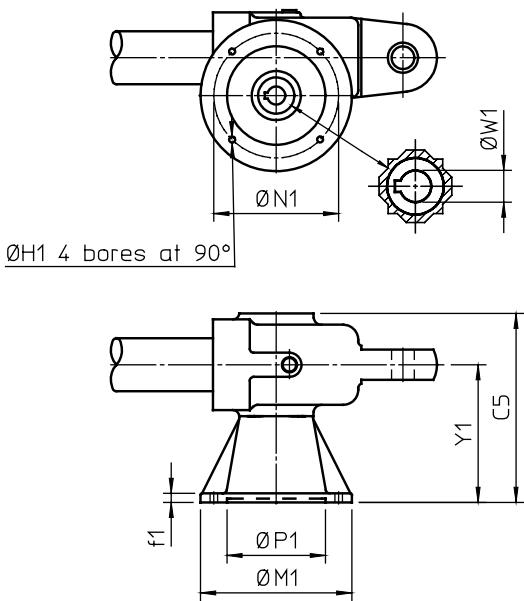
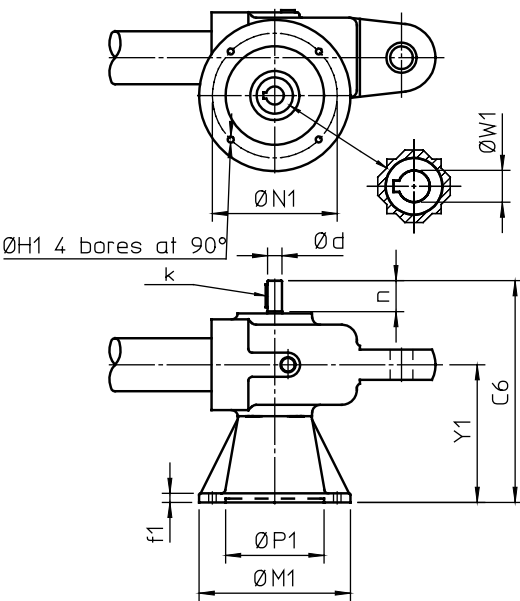
Series ATL 20 – 25 – 30 – 40 — Series BSA 20 – 25 – 30 – 40

CODE	DESCRIPTION	CODE	DESCRIPTION
Vers.1	Single input shaft	Vers.2	Double input shaft
			
Vers.3	Motor flange European standard (IEC B14)	Vers.4	Motor flange European standard (IEC B14) and extended input shaft
			

Note: Over-all dimensions in millimetres (mm).

	C	C1	C2	C3	C4	C5	E	k	Y	Ød j6	Øm	n
ATL/BSA 20	45	49	94	103	135	125	44	3×3×15	58	9	46	20
ATL/BSA 25	45	49	94	103	135	125	44	3×3×15	58	9	46	20
ATL/BSA 30	50	54	104	112	149	137	52	3×3×15	62	10	54	22
ATL/BSA 40	57	61	118	126	179	159	53	5×5×20	69	14	54	30

	MOTORE FLANGE IEC	ØG	ØM	ØN	ØP	ØW F7	f
ATL/BSA 20	56 B14	5,5	80	65	50	9	12,5
ATL/BSA 25	56 B14	5,5	80	65	50	9	12,5
ATL/BSA 30	63 B14	5,5	90	75	60	11	12
ATL/BSA 40	71 B14	6,5	105	85	70	14	12

CODE	DESCRIPTION	CODE	DESCRIPTION
Vers.1	Single input shaft	Vers.2	Double input shaft
	 <p>ØG 6 bores at 60° Øm</p> <p>C1 C k Ød</p>		 <p>Øm ØG 6 bores at 60° Ød k C C2 C</p>
Vers.3	Moto flange European standard (IEC B5)	Vers.4	Motor flange european standard (IEC B5) and extended input shaft.
	 <p>ØW ØN ØH 4 bores at 90° C3 Y f ØP ØM</p>		 <p>ØW ØN ØH 4 bores at 90° Ød k C C4 Y f ØP ØM</p>
Vers.5	Motor flange adapter + coupling IEC B14 or IEC B5	Vers.6	Motor flange adapter IEC B14 or IEC B5 and extended input shaft
	 <p>ØW1 ØN1 ØH1 4 bores at 90° C5 Y1 f1 ØP1 ØM1</p>		 <p>ØW1 ØN1 ØH1 4 bores at 90° Ød k C C6 Y1 f1 ØP1 ØM1</p>

8.3

LINEAR ACTUATORS INPUT VERSIONS

Series ATL 50 – 63 – 80 — Series BSA 50 – 63 – 80

	C1	C3	C4	C5	C6	Y	Y1
ATL/BSA 50	136	170	213	250	293	102	182
ATL/BSA 63	165	182	234	303	356	100	220
ATL/BSA 80	205	221	284	343	405	119	240

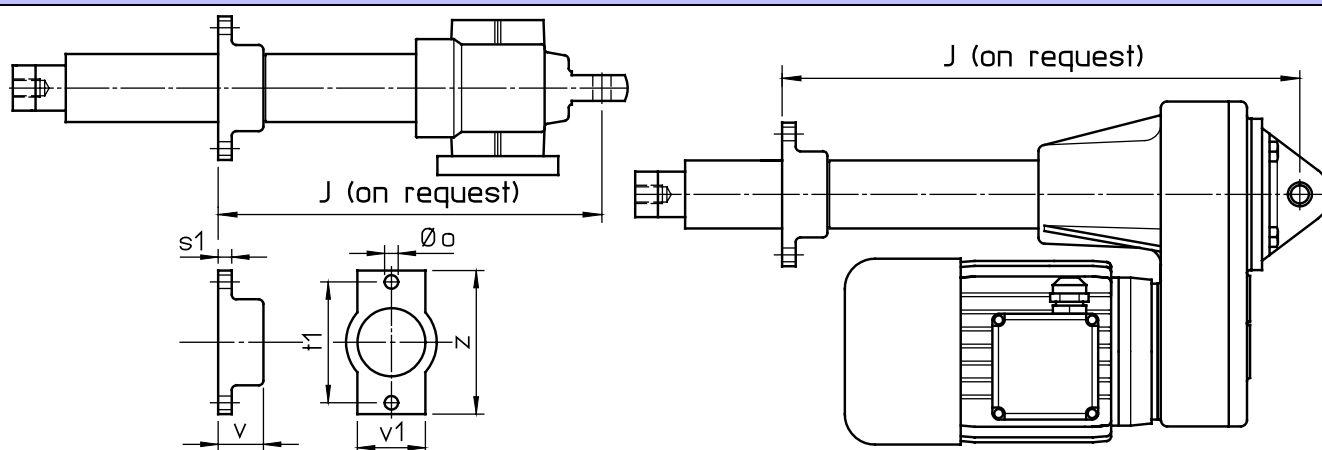
	C2	Ø G	L	k	Ø d j6	Ø m	n
ATL/BSA 50	222	M5×0.8	102	6×6×30	19	64	40
ATL/BSA 63	269	M6×1	125	8×7×40	24	63	50
ATL/BSA 80	330	M6×1	143	8×7×40	28	74	60

	Motor Flange IEC		Ø H	Ø M		Ø N		Ø P		Ø W		f
ATL/BSA 50	63 B5	71 B5	M8×1.25	140	160	115	130	95	110	11	14	12
ATL/BSA 63	80 B5		M10×1.5	200		165		130		19		12
ATL/BSA 80	80 B5	90 B5	M10×1.5	200		165		130		19	24	12

	Motor Flange adapter IEC	Ø H1	Ø M1	Ø N1	Ø P1	Ø W1	f1
ATL/BSA 50	80 B14 – 80 B5	Ø6.5 – M10×1.5	120 – 200	100 – 165	80 – 130	19	10 – 12
ATL/BSA 63	90 B14 – 90 B5	Ø8.5 – M10×1.5	140 – 200	115 – 165	95 – 130	24	10 – 12
ATL/BSA 80	100 B14 – 100 B5	Ø8.5 – M12×1.75	160 – 250	130 – 215	110 – 180	28	15 – 17

	Motor flange adapter IEC	Ø H1	Ø M1	Ø N1	Ø P1	Ø W1	f1
ATL/BSA 50	90 B14 – 90 B5	Ø8.5 – M10×1.5	140 – 200	115 – 165	95 – 130	24	10 – 12
ATL/BSA 63	100/112 B14 – B5	Ø8.5 – M12×1.75	160 – 250	130 – 215	110 – 180	28	15 – 17
ATL/BSA 80	112 B14 – 112 B5	Ø8.5 – M12×1.75	160 – 250	130 – 215	110 – 180	28	15 – 17

SUPPORT FLANGE FI



	t1	Øo	S1	v	v1	z
ATL/BSA 10	70	9	9	30	40	85
ATL/BSA 20 UAL/UBA 1	70	9	9	30	40	85
ATL/BSA 25 UAL/UBA 2	80	9	9	30	45	95
ATL/BSA 30 UAL/UBA 3	85	9	10	35	50	100
ATL/BSA 40 UAL/UBA 4	100	11	12	45	60	120

Note: Over-all dimensions in millimetres (mm).

The ELECTRIC STROKE LENGTH LIMIT DEVICE FCE allows the actuator to stop before reaching the extreme position (mechanical stop) and preventing damage. It is simple, strong and reliable, suitable for indoor and outdoor environments; it is available for all standard stroke lengths and for special stroke lengths up to 1 meter length on request.

The FCE device consists of 2 normally closed electric switches installed inside a sealed aluminum alloy box. 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. Sealing scrapers 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 moving with the push rod. The stainless steel rod slides inside the collar activating it when the adjustable ring #1 or #2 pushes the collar.

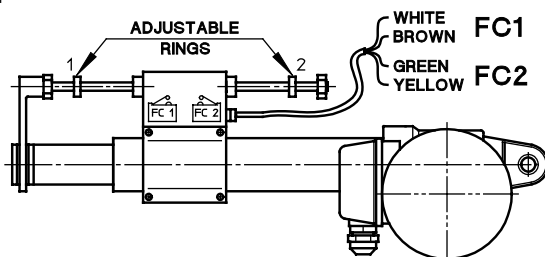
The stop position is easy to adjust: ring #1 fixes the actuator retracted stop position, ring #2 fixes the actuator extended stop position. The adjustments of rings #1 and #2 refer directly to the actuator cylinder axis, so it is very easy to set the actuator stop position.

The total actuator stroke length can be performed fixing the rings #1 and #2 in their extreme positions. Even in this condition there is an extra safety stroke length on both sides before reaching the mechanical stops.

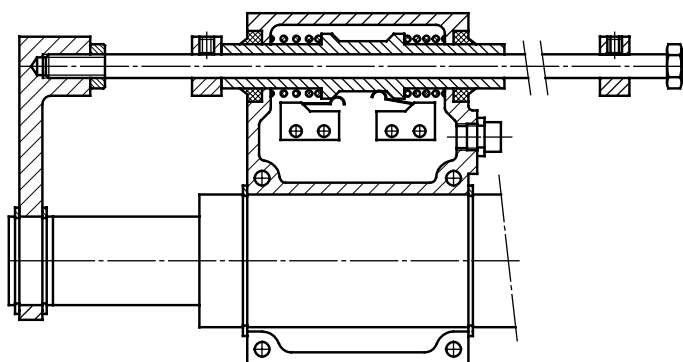
NOTE: The given extra safety stroke length cannot be used! If the application requires an extra stroke length to stop the actuator, it should be agreed with SERVOMECH Technical Dpt.

WARNING: Compare the stroke length required by the application to the actuator dimensions (refer to TECHNICAL 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 with it and cannot be longer!

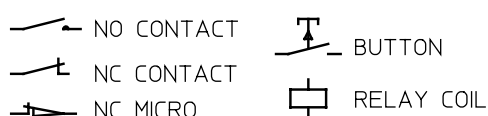
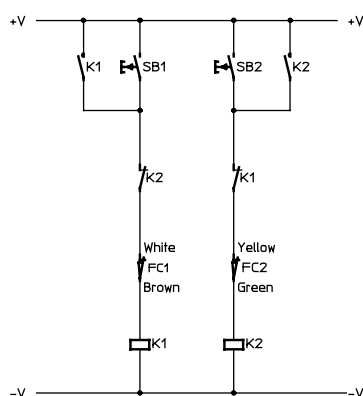
The FCE device must be connected to the electric control circuit as shown in the following WIRING DIAGRAM to guarantee the motor switch off and to prevent damage to the actuator and the application equipment.



Referring to the FCE box position with cable towards the actuator housing:
MINIMUM RETRACTED LENGTH is adjusted by RING 1 and controlled by SWITCH FC1
MAXIMUM EXTENDED LENGTH is adjusted by RING 2 and controlled by SWITCH FC2



CONTROL CIRCUIT



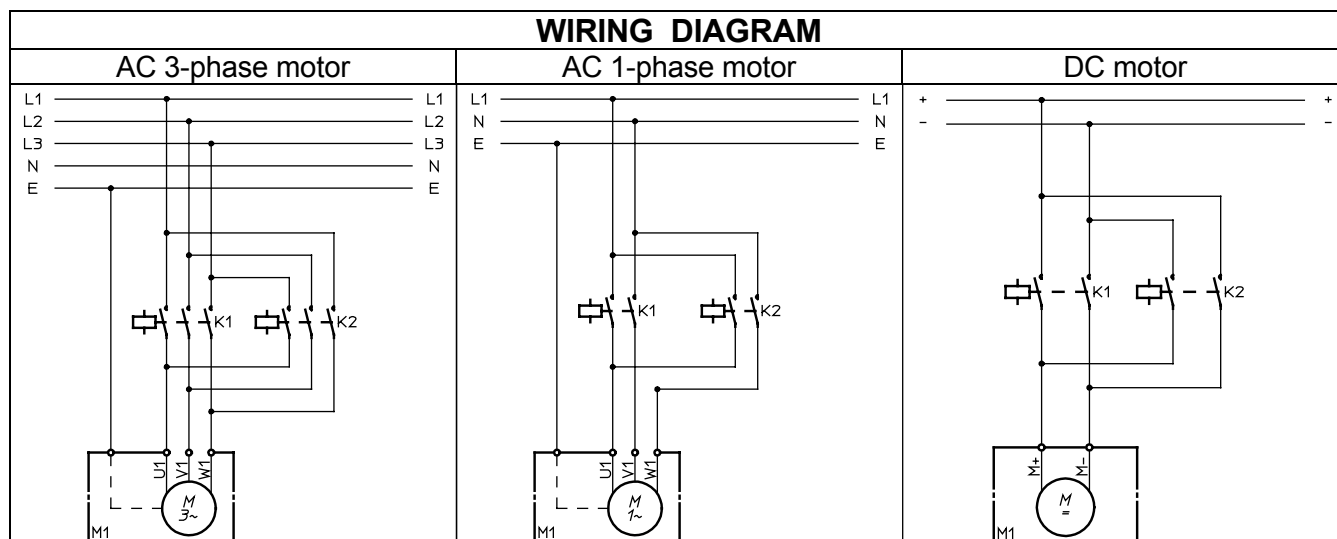
The FCE device is recommended for linear speeds up to about 30 mm/sec. For higher speeds it is better to use magnetic or inductive proximity switches because when switching off the motor, due to inertial reasons, the actuator could travel over and damage the FCE device breaking the front lever. The stop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

RATED VALUES

Voltage	Resistive load	Inductive load
250 V AC	5 A	3 A
30 V DC	5 A	0.1 A
125 V DC	1.4 A	—

The FCE device is equipped with cable standard length 1.5 m and wires 4 × 0.75 mm².

On request longer cables and 10 Amps electric switches available.



9.2

MAGNETIC STROKE LIMIT DEVICE "FCM"

The MAGNETIC STROKE LENGTH LIMIT DEVICE FCM allows the actuator to stop before reaching the extreme positions (mechanical stops) and avoiding damage.

More reed-switches can be used to give more intermediate positions along the stroke length.

These reed-switches can be used to stop the actuator or just to know its position during the linear travelling.

A magnetic ring fixed on the travelling push rod creates around the outer protective tube a toroidal magnetic field with value 100 Gauß.

The reed-switches fixed with clamps on the outer tube are activated by the toroidal magnetic field independently from their angular fixing position.

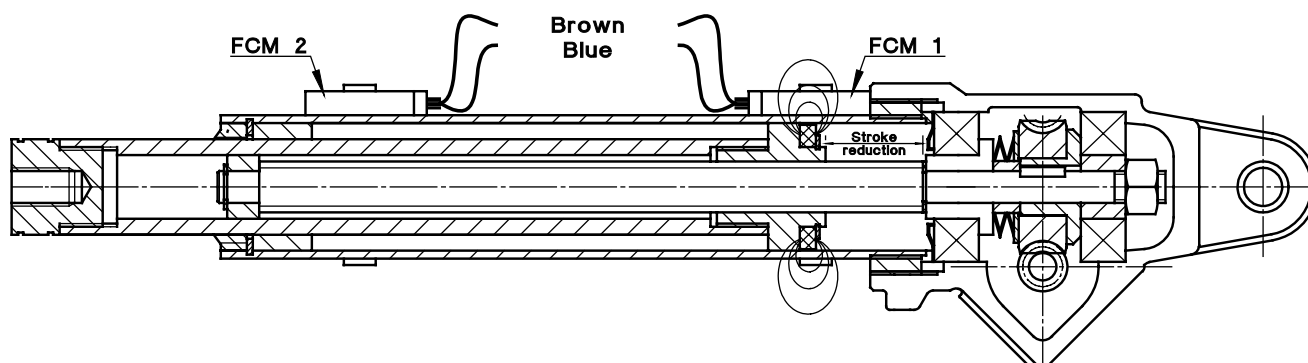
Outer tubes in non-magnetic material, such as aluminium alloy or stainless steel, are used to enable the magnetic field to activate the reed-switches.

The actuator standard equipment with FCM is with outer tube in anodized aluminium alloy; on request stainless steel tubes are available.

The reed-switches shall be fixed with clamps in non-magnetic material and, to be activated, they have to be mounted with the side where the code number is written in up position (the code number must be visible).

WARNING: Do not exceed the max. performances stated in this catalogue and on the technical sheet supplied with the actuator to avoid damages and wrong functioning!

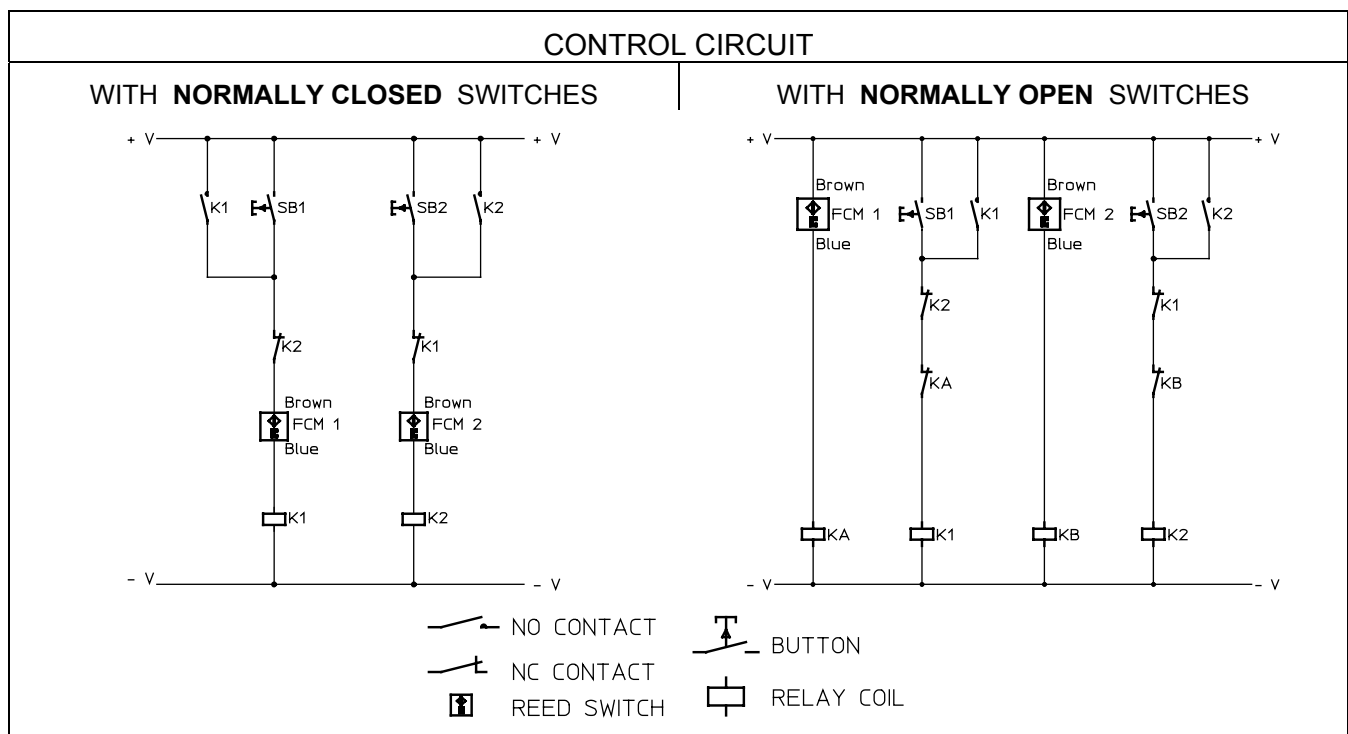
The reed-switches can work only if connected to wiring control circuits to activate electric relay. Do not connect them in series between the power supply and the electric motor!



Actuators equipped with reed-switches FCM perform a linear travel shorter than their stroke length code. The performed travel is shorter than the stroke length stated with the stroke code because the reed switch FCM1 gives the stopping signal to the actuator before the actuator has travelled the total stroke length. To know the difference refer to the tables of STROKE LENGTHS AVAILABLE IN STOCK WITH FCM on OVER-ALL DIMENSIONS pages.

The toroidal magnetic field created by the internal magnetic ring has an arch-like form referred to the reed-switch main axis. When using more contact reeds to have intermediate positions, consider 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 contact SERVOMECH Technical Dpt.

The reed switches position is easily adjustable changing the clamps position on the outer tube.



The reed-switches position limits are the following:

- MIN. RETRACTED POSITION:** the reed switch can be fixed on the tube up to the actuator housing.
- MAX. EXTENDED POSITION:** the reed-switch cannot exceed the limit marked on the outer tube.

This limit position is stated on actuators "Over-all dimensions" pages for stroke lengths up to 800 mm.

For special stroke lengths longer than 800 mm, the limit position can be known in advance: ask SERVOMECH Technical Dpt. (also in this case it is marked on the actuator).

NOTE: Anti-turn device AR is not available when the actuator is equipped with FCM.

RATED VALUES		
	DC	AC
Rated voltage	3 ... 130 Vdc	3 ... 130 Vac
Max. Power	20 W	20 VA
Max. Current	300 mA (resistive load)	
Max. inductive load	3 W	

The reed-switches are supplied with cable standard length 2 m and wires $2 \times 0.25 \text{ mm}^2$.

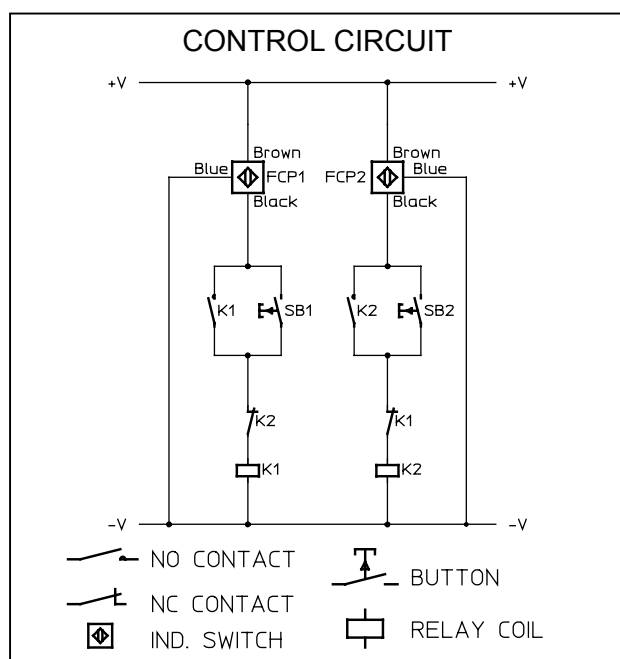
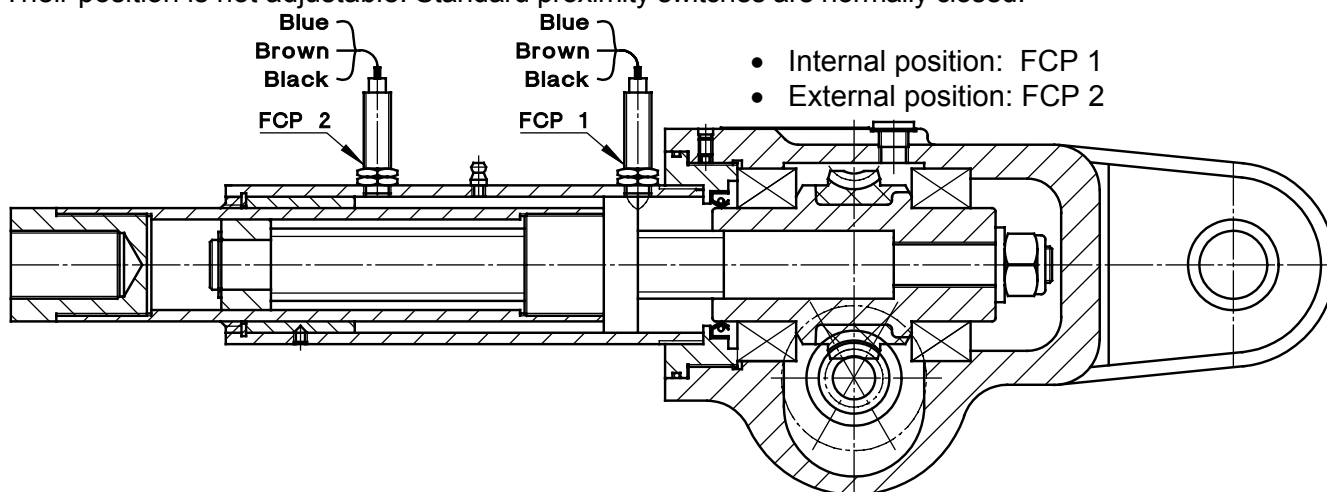
9.3

INDUCTIVE PROXIMITY STROKE LENGTH LIMIT DEVICE "FCP"

The INDUCTIVE PROXIMITY STROKE LIMIT DEVICE FCP allows the actuator to stop before reaching the extreme positions (mechanical stops) and avoiding damage.

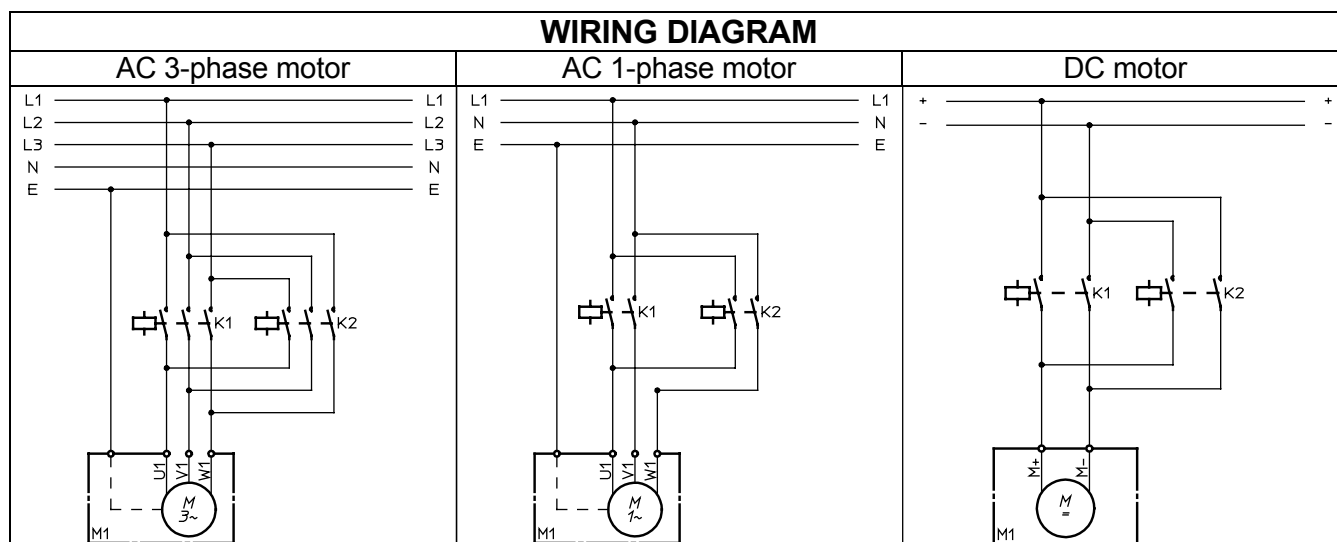
It also allows to fix intermediate positions along the actuator stroke length.

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



Rated voltage	10 ... 30 Vdc
Max. output current	200 mA
Voltage drop	< 1.8 V

The proximity switches are supplied with cable standard length 2 m and wires 3 x 0.2 mm².

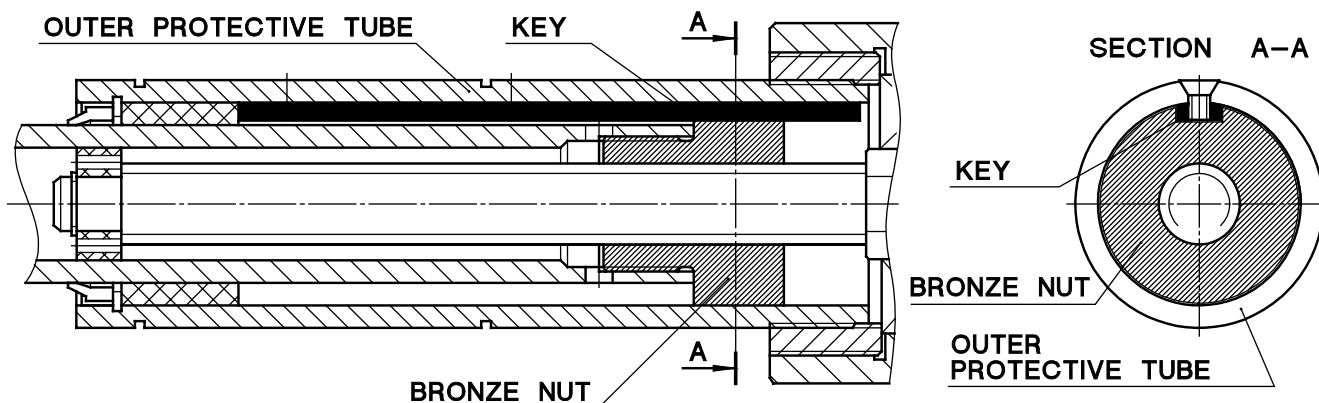


10.

ACCESSORIES

10.1

ANTI-TURN DEVICE code AR



To have a linear motion it is necessary to prevent the rotary movement of the nut and of the push rod connected with it. In some applications it is the structure itself which is connected to the push rod preventing the rotation and therefore allowing the linear motion.

In some applications 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 the 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 (ordering code **AR**).

Actuators which can be equipped with anti-turn device are:

- ATL 25, ATL 30, ATL 40, ATL 50, ATL 63
- UAL 2, UAL 3, UAL 4

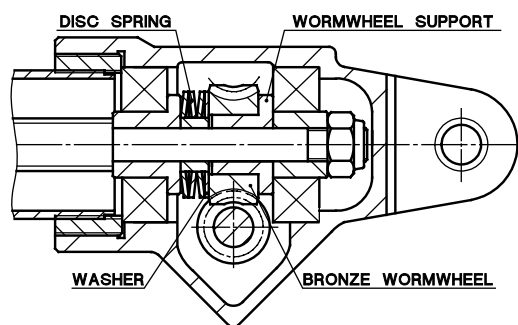
It is not available for:

- All series of ball screw linear actuators
- ATL 10, ATL 20, ATL 80
- UAL 0, UAL 1
- All actuators equipped with magnetic stroke length limit device FCM

The anti-turn device shown in the above picture is made of a steel key fixed and aligned all along the outer tube length. On this key the bronze nut keyway slides moving the push rod.

10.2

SAFETY CLUTCH Code FS



The safety clutch is a device able to protect the actuator and the machinery where it is installed, from unexpected dynamic overloads during the linear travel and from wrong 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 the assembling. The preload is fixed and it is related to each actuator with ratio and performances as stated on the "Performances Tables" in this catalogue.

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

If an overload is applied on the actuator, the safety clutch starts slipping, the push rod stops travelling while the motor is still running.

When the overload decreases up to the rated load value or less, the safety clutch FS 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 slipping stroke limit device! If it is frequently activated it wears rapidly, the preload is reduced and consequently also the actuator load performance is reduced.

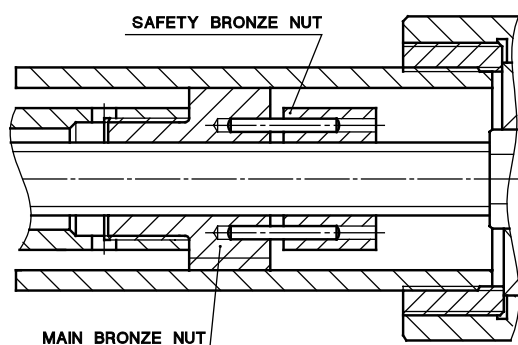
The safety clutch FS can be supplied for actuators with wormgear drive Series ATL and BSA for sizes 10 - 20 - 25 - 30 - 40.

10.

ACCESSORIES

10.3

SAFETY NUT Code MSB



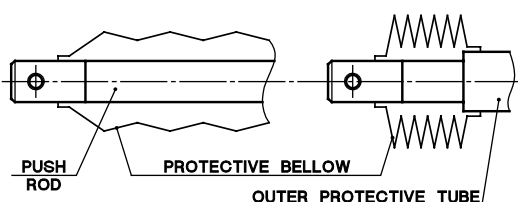
The safety nut is an auxiliary bronze nut leaded with 2 pins by the working bronze nut. The distance between the two nuts, for unused actuators, is equal to half screw pitch lead. If the working nut wears up to the half of the screw pitch lead or crashes, the safety nut supports the load avoiding its fall down.

The safety nut is a one-direction safe device. Its position with respect to the working 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 Technical Dpt..

10.4

PROTECTIVE BELLOW Code B

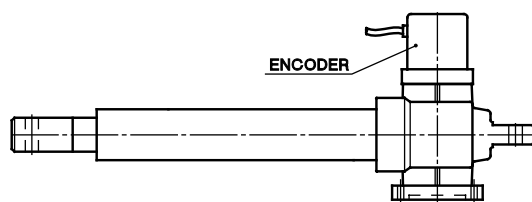


When the actuators are used in particular environment conditions with dust, humidity, etc. that can damage the seal scraper between the outer protective tube and the push rod, bellow protections can be useful.

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

10.5

INCREMENTAL ROTATIVE ENCODER



EH 53 ENCODER FEATURES

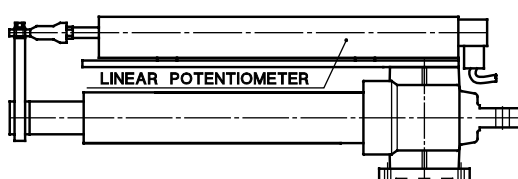
- Bi-directional rotative incremental encoder with zero set pulse
- 100 or 500 pulses/turn
- Push-Pull
- Power supply 5 Vdc or 8 ÷ 24 Vdc

Incremental rotative encoders on the input shaft are available for positioning control. Encoders EH 53 are available in stock for all actuators types except for ATL 10, BSA 10, UAL 0, UBA 0.

For these types the encoder EH 38 mounted only on DC motors is available.

WARNING: The rotative encoder on the input shaft cannot be used with actuators equipped with the safety clutch FS, because the positioning control would be lost due to the FS slipping.

POSITIONING CONTROL DEVICES



On request different positioning control devices are available:

- Linear potentiometer
- Absolute linear encoder
- Tacho generator
- Absolute rotative encoder

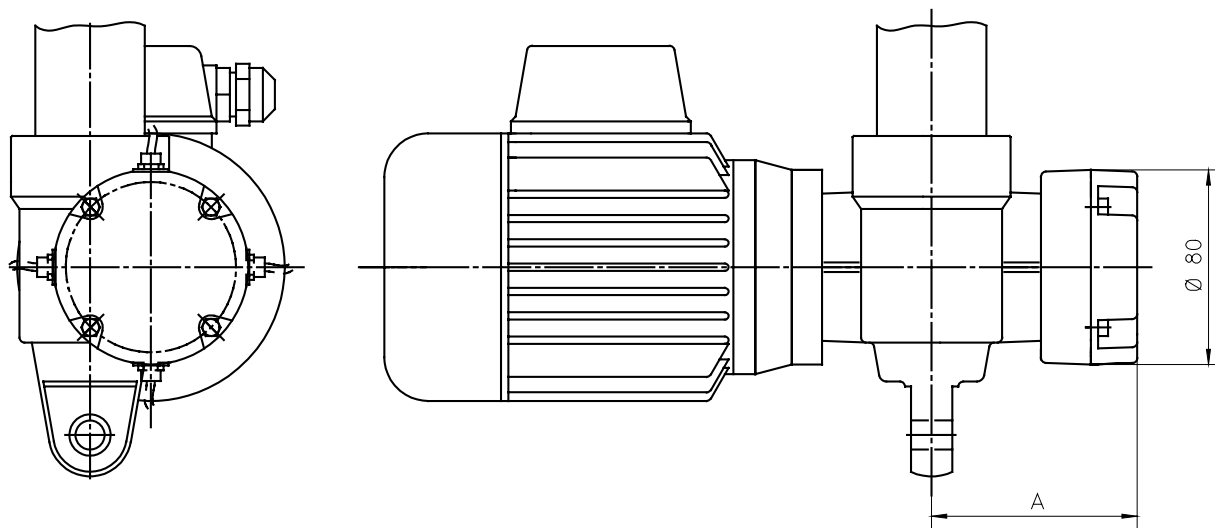
For further information contact SERVOMECH Technical Dpt.

Available for linear actuators ATL/BSA 20, 25, 30, 40

Mounting: on second input shaft

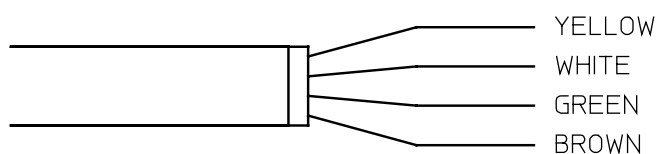
Performances

- Hall effect encoder
- Resolution: 4 pulses per revolution
- Phase difference: 90°
- Input voltage: 8 ÷ 32 Vdc
- Max. output current: $I_{out} = 100 \text{ mA}$ per channel
- PUSH – PULL
- Max. frequency: 3.3 kHz
- Max cable length: 10 m
- Protected against short circuit
- Protected against polarity inversion
- Protected against any incorrect connection
- Max output voltage drop (with load connected to 0 and $I_{out} = 100 \text{ mA}$): 4.6 V
- Max output voltage drop (with load connected to +V and $I_{out} = 100 \text{ mA}$): 2 V
- Max continuous speed: 5000 rpm
- Working temperature: 0 ÷ 80 °C
- Protection: IP 55
- Box material: aluminium alloy
- In compliance with EMC specifications



ACTUATOR	ATL/BSA 20	ATL/BSA 25	ATL/BSA 30	ATL/BSA 40
A [mm]	89	89	97	113

WIRING DIAGRAM



YELLOW	WHITE	GREEN	BROWN
+ V	0 V	A	B

Cable length: 1.3 m

11.1

ATL 10 – BSA 10 MOTORS FEATURES

AC 3-PHASE MOTORS

Asynchronous three-phase motors AC totally enclosed, with cage rotor dynamically balanced. For actuator ATL 10 standard motor available without fan for service factor S3 30%; on request available fan cooled with or without brake. For actuator BSA 10 motor with brake and fan is suggested.

High pressure die-casting housing with fins, aluminium alloy made.

FEATURES	MOTOR WITHOUT BRAKE	MOTOR WITH BRAKE
Multivoltage winding	230/400 V 50Hz	– 255/440 V 60Hz
Number of poles and rated speed	2 poles 2740 rpm	2 poles 2830 rpm
Output power	0.06 kW	0.09 kW
Rated current at 400 V	0.25 A	0.42 A
Rated torque	0.25 Nm	0.31 Nm
Starting torque	0.8 Nm	1.27 Nm
Protection – Insulation class	IP 55 - F	IP 54 - F
Weight	2.4 kg	3.4 kg

MOTOR BRAKE: normally closed mechanical brake activated by direct current electromagnet 205 V DC. The electromagnet is internally, on the motor terminal box, powered by rectifier from AC 230 V to DC 205 V.

Braking torque:	1.7 Nm	Current:	0.05 A	Protection	IP 44
-----------------	--------	----------	--------	------------	-------

AC 1-PHASE MOTOR

Asynchronous single-phase motors AC totally enclosed, with cage rotor dynamically balanced. For actuator ATL 10 standard motor available without fan for service factor S3 30%; on request available fan cooled with or without brake. For actuator BSA 10 motor with brake and fan is suggested.

High pressure die-casting housing with fins, aluminium alloy made.

Balanced windings for clockwise and anti-clockwise running without vibrations. Condenser, supplied with motor, with capacity 12.5 μ F for increased starting torque.

Winding	230 V 50 Hz	Number of poles	– Rated speed	2 poles – 2710 rpm
Output power	0.09 kW	Starting current	– Rated current	3.2 A – 2.2 A
		Starting torque	– Rated torque	0.73 Nm – 0.32 Nm
Weight	3 kg	Protection	– Insulation class	IP 55 – F

MOTOR BRAKE: normally closed mechanical brake activated by direct current elettromagnet 205 V DC. The electromagnet is internally, on the motor terminal box, powered by rectifier from AC 230 V to DC 205 V. Motor with brake total weight 3.6 kg.

Braking torque:	1.7 Nm	Current:	0.05 A	Protection:	IP 44
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DC MOTOR 24 V OR 12 V

Dc motor with high coercive ferrite permanent magnet field, available without fan; with or without brake. Long-life brushes easy to replace.

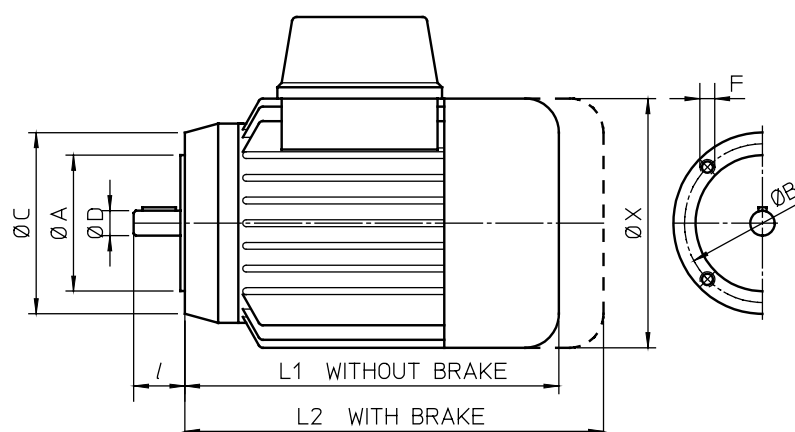
Power supply cable 1.5 m length with wires 2 \times 1 mm². Motor weight: 1.3 kg.

Output power	70 W		Rated speed	3000 rpm
Rated current	3.7 A (24 V)	8.4 A (12 V)	Rated torque	0.22 Nm
Peak current	18 A (24 V)	30 A (12 V)	Peak torque	1.1 Nm
Armature resistance	0.85 Ω (24 V)	0.23 Ω (12 V)	Inductance	1.34 mH (24 V) 0.36 mH (12 V)
Protection	IP 54		Insulation class	F

MOTOR BRAKE: On request normally closed emergency brake for positioning, activated by direct current DC electromagnet. Brake with independent power supply line with cable 1 m length and wires 2 \times 1 mm². Motor with brake totale weight: 1.8 kg.

Power supply	0.4 A (24 V)	0.85 A (12 V)	Braking torque	0.5 Nm
--------------	--------------	---------------	----------------	--------

WARNING! The brake is normally closed: independent power supply line with the rated voltage is required to open it. Feed the brake before switching on the motor.



MOTOR SIZE IEC	ØA	ØB	ØC	ØD	L	F	L1	L2	ØX
56 B14	50	65	80	9	20	M5	167	193	110
63 B14	60	75	90	11	23	M5	193	229	123
71 B14	70	85	105	14	30	M6	215	304	138
80 B14	80	100	120	19	40	M6	235	340	156
90 B14	95	115	140	24	50	M8	250	355	176

AC 3-PHASE MOTOR WITHOUT BRAKE

Asynchronous three-phase motors AC totally enclosed fan cooled, with cage rotor dynamically balanced. Available with multivoltage 230/400 V 50 Hz – 255/440 V 60 Hz, on request different voltage and frequency.

Standard motors insulation class F and protection IP 55.

On request insulation class H and higher protections are available.

Klixons thermal protection devices available on request.

Performance with 400 V 50 Hz.

POWER [kW] N° of poles	RATED CURRENT [A]	RATED TORQUE [Nm]	STARTING CURRENT [A]	STARTING TORQUE [Nm]	WEIGHT [kg]
0.09 kW 4 poles	0.45	0.66	1.3	1.9	2.9
0.12 kW 2 poles	0.46	0.46	1.5	1.5	3
0.18 kW 4 poles	0.80	1.3	2.2	3.9	4.4
0.25 kW 2 poles	0.74	0.88	3.6	2.8	4.6
0.37 kW 4 poles	1.2	2.6	4.8	6.4	6.1
0.55 kW 2 poles	1.9	1.8	10.7	7.2	6.3
0.75 kW 4 poles	2	5	9.4	12.5	10
1.1 kW 2 poles	3	3.7	17.1	13.7	10.1

AC 3-PHASE MOTORS WITH BRAKE

- ① – AC 3-phase brake-motors available with multivoltage 230/400 V 50 Hz – 255/440 V 60 Hz, Motor: protection IP 55, insulation Class F; brake protection IP 44
- ② – AC 3-phase brake-motors available with multivoltage 230/400 V 50 Hz – 277/480 V 60 Hz, Motor: protection IP 54, insulation Class F; brake protection IP 54

On request different voltage and frequency available.

On request insulation class H and higher protections are available.

Klixons thermal protection devices available on request.

Performance with 400 V 50 Hz:

POWER [kW] N° of poles	RATED CURRENT [A]	RATED TORQUE [Nm]	STARTING CURRENT [A]	STARTING TORQUE [Nm]	WEIGHT [kg]	NOTE
0.09 kW 4 poles	0.45	0.66	1.3	1.9	3.5	①
0.12 kW 2 poles	0.46	0.46	1.5	1.5	3.7	①
0.18 kW 4 poles	0.73	1.26	2.1	3.2	5	②
0.25 kW 2 poles	0.71	0.85	3	2.5	4.9	②
0.37 kW 4 poles	1.2	2.5	4.5	6.6	9.4	②
0.55 kW 2 poles	1.4	1.9	6.8	5	9.1	②
0.75 kW 4 poles	2	5.1	9.8	14.3	14	②
1.1 kW 2 poles	2.7	3.7	13.5	10	14	②

11.2 AC 3-PHASE AND AC 1-PHASE MOTORS FEATURES

MOTOR BRAKE 0.09 kW 4 poles – 0.12 kW 2 poles:

normally closed mechanical brake activated by direct current electromagnet 205 V DC. The electromagnet is internally, on the motor terminal box, powered by rectifier from AC 230 V to DC 205 V.

Rated braking torque:	1.7 Nm	Current:	0.05 A
-----------------------	--------	----------	--------

MOTOR BRAKE 0.18 kW 4 poles – 0.25 kW 2 poles:

normally closed mechanical brake activated by direct current electromagnet 104 V DC. The electromagnet is internally, on the motor terminal box, powered by rectifier from AC 230 V to DC 104 V.

Rated braking torque:	2.5 Nm	Current:	0.17 A
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MOTOR BRAKE 0.37 kW 4 poles – 0.55 kW 2 poles:

normally closed mechanical brake activated by alternate current electromagnet AC 230/400 V 50 Hz. The electromagnet is internally, on motor terminal box, wired.

Rated braking torque:	7 Nm	Max. braking torque:	10 Nm	Current at 400 V 50 Hz:	0.15 A
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MOTOR BRAKE 0.75 kW 4 poles – 1.1 kW 2 poles:

normally closed mechanical brake activated by alternate current electromagnet AC 230/400 V 50 Hz. The electromagnet is internally, on the motor terminal box, wired.

Rated braking torque:	14 Nm	Max. braking torque:	20 Nm	Current at 400 V 50 Hz:	0.27 A
-----------------------	-------	----------------------	-------	-------------------------	--------

NOTE: On request all frame sizes brake motors are available with brake activation from separate power supply. Suggested solution for frequency inverter driver application.

AC 1-PHASE MOTORS WITHOUT BRAKE

Asynchronous single-phase motors AC totally enclosed fan cooled, with cage rotor dynamically balanced. High pressure die-casting housing with fins, aluminum alloy made.

Balanced windings for clockwise and anti-clockwise running without vibrations. Condenser with increased capacity, supplied with motor, for higher starting torque.

Standard motor insulation class F and protection IP 55.

On request insulation class H and higher protections are available.

Klixons thermal protection devices available on request.

Performances with 230 V 50 Hz:

POWER [kW] N° of poles	RATED CURRENT [A]	RATED TORQUE [Nm]	STARTING CURRENT [A]	STARTING TORQUE [Nm]	CAPAC. [μF]	WEIGHT [kg]
0.09 kW 4 poles	1.6	0.64	1.9	1.03	12.5	3
0.12 kW 2 poles	2.6	0.43	3.7	0.71	12.5	4
0.18 kW 4 poles	1.9	1.31	3.2	1.37	16	4.2
0.25 kW 2 poles	2.1	0.84	6.3	0.97	20	5
0.37 kW 4 poles	2.8	2.64	6.1	2.82	25	7.2
0.55 kW 2 poles	3.9	1.88	11.2	1.66	30	7
0.75 kW 4 poles	5.6	5.20	15.7	3.40	30	10.3
1.1 kW 2 poles	8.8	3.90	29	9.85	40	13.4

AC 1-PHASE MOTORS WITH BRAKE

Asynchronous single-phase brake-motors AC totally enclosed fan cooled, with cage rotor dynamically balanced. High pressure die-casting housing with fins, aluminium alloy made.

Balanced windings for clockwise and anti-clockwise running without vibrations. Condenser with increased capacity, supplied with motor, for higher starting torque.

Standard motor insulation class F and protection IP 55. Brake protection IP 44.

On request insulation class H and higher protections are available.

Klixons thermal protection devices available on request.

11.2

AC 3-PHASE AND AC 1-PHASE MOTORS FEATURES

Performance with 230 V 50 Hz:

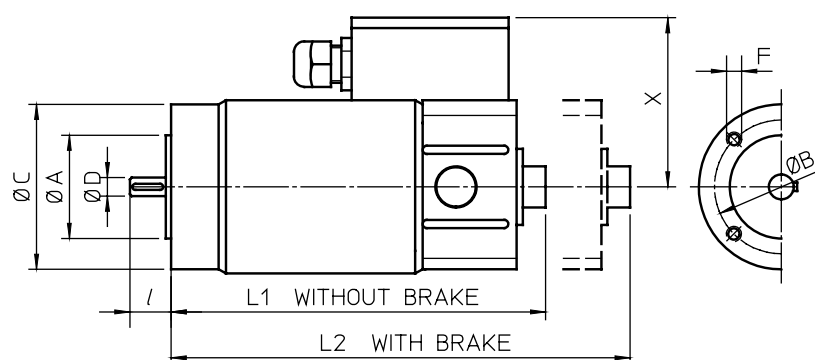
POWER [kW] N° of poles	RATED CURRENT [A]	RATED TORQUE [Nm]	STARTING CURRENT [A]	STARTING TORQUE [Nm]	CAPAC. [μF]	WEIGHT [kg]
0.09 kW 4 poles	1.6	0.64	1.9	1.03	12.5	3.6
0.12 kW 2 poles	2.6	0.43	3.7	0.71	12.5	4.6
0.18 kW 4 poles	1.9	1.31	3.2	1.37	16	5.4
0.25 kW 2 poles	2.1	0.84	6.3	0.97	20	8.5
0.37 kW 4 poles	2.8	2.64	6.1	2.82	25	10.2
0.55 kW 2 poles	3.9	1.88	11.2	1.66	30	13.2
0.75 kW 4 poles	5.6	5.20	15.7	3.40	30	16.2
1.1 kW 2 poles	8.8	3.90	29	9.85	40	18.3

MOTOR BRAKE: normally closed mechanical brake activated by direct current electromagnet 205 V DC. The electromagnet is internally, on the motor terminal box, powered by rectifier from AC 230 V to DC 205 V.

MOTOR	BRAKING TORQUE [Nm]	CURRENT [A]
0.09 kW 4 poles	1.7	0.05
0.12 kW 2 poles	1.7	0.05
0.18 kW 4 poles	4	0.09
0.25 kW 2 poles	4	0.09
0.37 kW 4 poles	5	0.09
0.55 kW 2 poles	5	0.09
0.75 kW 4 poles	8	0.12
1.1 kW 2 poles	16	0.15

11.3

DC MOTORS



MOTOR	ØA	ØB	ØC	ØD	I	F	L1	L2	X
100 W	50	65	80	9	20	M5	144	185	80
150 W	50	65	80	9	20	M5	177	218	80
300 W	60	75	90	11	23	M5	229	270	80
500 W	70	85	105	14	40	M6	322	364	80
750 W	80	100	118	19	40	M6	317	359	118

As standard, the permanent magnets DC motors are supplied without fan. On request they can be supplied also with brake without fan.

Standard motors winding: insulation class F and protection IP 54.

On request higher protections are available.

Long-life brushes easy to replace.

11.3

DC MOTORS

Performances at rated voltage:

	100 W	150 W	300 W	500 W	750 W
RATED SPEED [rpm]	3000	3000	3000	3000	3000
RATED VOLTAGE [V]	24	24	24	24	90
RATED TORQUE [Nm]	0.32	0.48	0.96	1.6	2.4
RATED CURRENT [A]	5.5	8.3	15.6	25	10.6
PEAK TORQUE [Nm]	1.6	2.4	4.8	5.7	12
PEAK CURRENT [A]	27.7	41.7	78	89	53
ARMATURE RESISTANCE [Ω]	0.4	0.29	0.16	0.1	0.71
INDUCTANCE [mH]	0.8	0.73	0.32	0.13	4.6
WEIGHT [kg]	2.9	3.5	5.3	8	9.4

MOTOR BRAKE: On request normally closed mechanical brake, activated by direct current electromagnet, is available. Brake with independent power supply line.

MOTOR	BRAKING TORQUE [Nm]	CURRENT at 24 V [A]
100 W	1.7	0.5
150 W	1.7	0.5
300 W	1.7	0.5
500 W	2	0.7
750 W	8	1

WARNING! The brake is normally closed: independent power supply line with the rated voltage is required to open it. Feed the brake before switching on the motor.

BRAKE MOTOR: WHEN IT IS NECESSARY

- Series UBA Actuators: brake motor standard supplied
- Series BSA Actuators: brake motor available on request (always recommended)
- Series UAL Actuators: brake motor available on request
 - To ensure the stop position
 - To guarantee positioning accuracy
 - To sustain the static load with self-locking coefficient > 0.35
- Series ATL Actuators: brake motor available on request
 - To guarantee positioning accuracy
 - To sustain the static load with self-locking coefficient > 0.35

1. The linear actuators must be installed to work only with axial push or pull load.
No lateral radial loads are admitted.
Front and rear fixing attachments must be evaluated carefully when projecting and developing the application. Ball joint **TS** front attachment is recommended when the alignment of the upper and bottom fixing points is not guaranteed.
A right fixing alignment prevents lubricant leakage and actuator damage.
2. The actuator minimum retracted length (Lc) and maximum extended length (La) are the operation limits. Make sure that the application does not require a linear travel longer than the length fixed by these limits.
3. Before using the linear actuator, the following checks must be done:
 - verify the motor shaft turning direction and the related push rod linear motion direction
 - check the stroke length limit switches position: they cannot exceed the given limits (see pag. 96)
 - make sure that the electric motor and the limit switches wiring are connected correctly and that the right voltage is used.
4. For further information about INSTALLATION refer to the Installation – Use and Maintenance Manual:
 - Cod. 20.I.01 Series ATL / BSA 10
 - Cod. 20.I.02 Series ATL / BSA 20 – 25 – 30 – 40
 - Cod. 20.I.04 Series UAL / UBA
 - Cod. 20.I.03 Series ATL / BSA 50 – 63 – 80

SERVOMECH linear actuators are maintenance-free and are supplied with long-life lubricant.

Maintenance is necessary only in case of lubricant leakage or damages.

Used lubricants:

- worm gearbox (Series ATL/BSA actuators) : SHELL RETINAX EPX 2
or : SHELL TVX COMPOUND B;
- bearings (Series UAL/UBA actuators): SHELL ALVANIA R2
- acme screw and nut: SHELL RETINAX EPX 2
- ball screw and nut: KLÜBER ISOFLEX NBU 15

The following table states the required lubricant quantity for each actuator size and stroke length:

ACTUATOR SIZE	INPUT DRIVE		LEADSCREW		
	LUBRICANT	Q.TY	LUBRICANT	QUANTITY	
				FOR THE FIRST 100 mm STROKE [g]	FOR EACH ADDITIONAL 100 mm STROKE [g]
ATL 10	RETINAX EPX 2	20 g	SHELL RETINAX EPX 2	15	15
ATL 20	SHELL TVX COMPOUND B	30 g		15	15
ATL 25		30 g		25	20
ATL 30		40 g		30	25
ATL 40		50 g		40	30
ATL 50	SHELL TVX COMPOUND B	0.25 kg	SHELL RETINAX EPX 2	55	40
ATL 63		0.5 kg		70	55
ATL 80		1 kg		100	80
BSA 10	RETINAX EPX 2	20 g	KLÜBER ISOFLEX NBU 15	10	10
BSA 20	SHELL TVX COMPOUND B	30 g		10	10
BSA 25		30 g		15	12
BSA 30		40 g		20	15
BSA 40		50 g		25	20
BSA 50	SHELL TVX COMPOUND B	0.25 kg	KLÜBER ISOFLEX NBU 15	40	30
BSA 63		0.5 kg		50	40
BSA 80		1 kg		80	60

12.

INSTALLATION – LUBRICATION – MAINTENANCE

ACTUATOR SIZE	BEARINGS		LEADSCREW		
	LUBRICANT	Q.TY [g]	LUBRICANT	QUANTITY	
				FOR THE FIRST 100 mm STROKE [g]	FOR EACH ADDITIONAL 100 mm STROKE [g]
UAL 0	SHELL ALVANIA GREASE R2	30	SHELL RETINAX EPX 2	15	15
UAL 1		30		15	15
UAL 2		30		25	20
UAL 3		40		30	25
UAL 4		50		40	30
UBA 0	SHELL ALVANIA GREASE R2	30	KLÜBER ISOFLEX NBU 15	10	10
UBA 1		30		10	10
UBA 2		30		15	12
UBA 3		40		20	15
UBA 4		50		25	20

In case a lubricant addition is required because of leaking problems, we recommend to follow carefully the instructions stated in the INSTALLATION, USE AND MAINTENANCE MANUAL.

The actuators ATL 30 – 40 – 50 – 63 – 80, BSA 30 – 40 – 50 – 63 – 80 and UAL 3 – 4 are equipped with lubricator on the outer protective tube. We recommend to fill the proper lubricant only in case of need. **Too much lubricant causes overloads during the travel and lubricant leakage!**

SPECIAL VERSIONS AND OPTIONS

On request, special actuators are available, according to specific application requirements. SERVOMECH, with its experience in this field, is able to support customers in selecting the right actuator version and accessories suitable for environment and installation conditions.

Following special options are available:

- stainless steel AISI 304 push rod
- stainless steel AISI 304 outer protective tube
- special lubricants for environment with high or low temperature
- special lubricants for food industry
- double lips scrapers on push rod (ice scrapers)
- Viton seals for high temperature or silicon seals for low temperature
- special seals for heavy duty conditions

13.

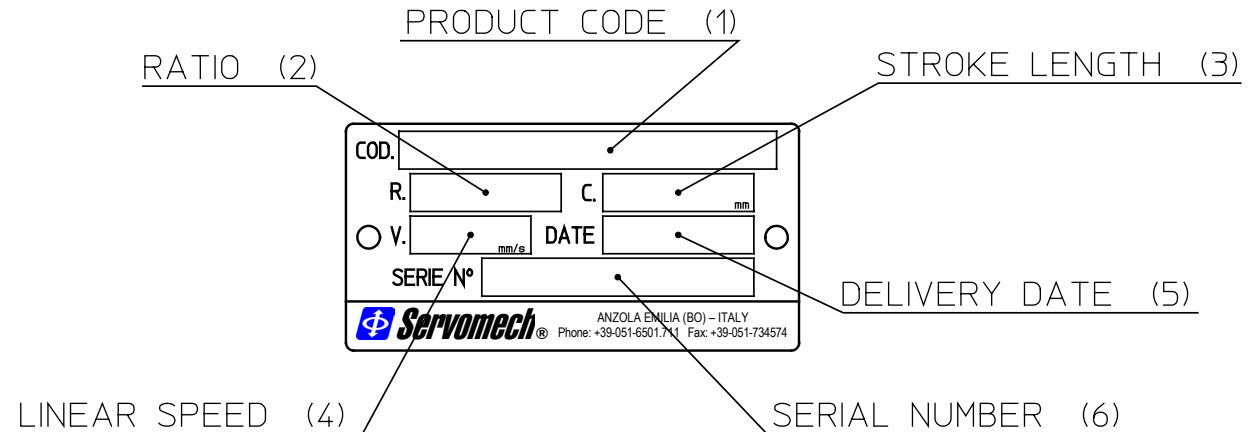
TECHNICAL SHEETS OVER-ALL DIMENSIONS CHECK SHEET and ENQUIRY SHEET

13.1

TRADEMARK PRODUCT LABEL

Every SERVOMECH linear actuator is provided with a trademark product label, which allows the unit identification and gives technical information about the product.

The label shown in the picture below states following data:



- 1. Product code :** is an alphanumeric code stating the type, size, ratio, input version and stroke limit device of the unit.
- 2. Ratio:** is the ratio of wormgear or timing belt pulleys.
- 3. Stroke length:** is the stroke length in millimetres (mm) achievable by the actuator.
- 4. Linear speed:** is the actuator linear speed in millimetres/second (mm/sec) when the actuator is supplied with electric motor. If the motor is not supplied this field is blank.
- 5. Delivery date:** is the week/year of assembly (ex.: 37/99 = week 37/year 1999) which usually is also the delivery date. This date is considered as warranty reference.
- 6. Serial number:** is the number related to the unit and assures the exact identification of the products even after a long time: the serial number must be given as reference while ordering spare parts for a unit.

13.2

OVER-ALL DIMENSIONS CHECK SHEET

Finale inspection and testing is carried out on every finished linear actuator. An “**OVER-ALL DIMENSIONS CHECK SHEET**” (see page 112-113) is issued and supplied with the goods, where following information is stated:

1. Product code
2. Product serial number
(both 1. and 2. are stated also on the trademark product label)
3. Actuator retracted length
4. Actuator extended length
5. Actuator stroke length
6. Motor type and motor mounting position
7. Front and rear fixing attachments
8. Stroke limit device: electric switches, or magnetic reed-switches or proximity switches
9. Lubricants

The Check Sheet is a WARNING for the operators before installing and using the linear actuator to prevent wrong use or damage.

The compliance failure of the instructions stated on the CHECK SHEET implies the lost of warranty!

Acme screw actuators **Series ATL** ☐

Ball screw actuators **Series BSA** ☐

SIZE: 10 ☐ 20 ☐ 25 ☐ 30 ☐ 40 ☐ 50 ☐ 63 ☐ 80 ☐

BA <input type="checkbox"/>			
ROE <input type="checkbox"/>			SP <input type="checkbox"/>
FO <input type="checkbox"/>			
TS <input type="checkbox"/>			
FL <input type="checkbox"/>			
TF <input type="checkbox"/>			
BA <input type="checkbox"/>			

FI ☐

Left hand LH ☐

Right hand RH ☐

Vers. 1 ☐ Vers. 2 ☐

Vers. 3 ☐ Vers. 4 ☐

MOTOR

☐ AC 3-PHASE

☐ AC 1-PHASE

☐ DC

BRAKE

YES ☐

NO ☐

Acme screw actuators **Series UAL** ☐

Ball screw actuators **Series UBA** ☐

SIZE: 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

APPLICATION: _____

DYNAMIC PULL LOAD: _____ N DYNAMIC PUSH LOAD: _____ N AT TRAVEL EXTENSION _____ mm

STATIC PULL LOAD: _____ N STATIC PUSH LOAD: _____ N AT TRAVEL EXTENSION _____ mm

LOAD IS GUIDED? YES ☐ NO ☐ VIBRATIONS: YES ☐ NO ☐ SHOCK LOADS: YES ☐ NO ☐

OPERATING TRAVEL: _____ mm

TRAVELLING TIME: _____ s REQUESTED SPEED: _____ mm/s RATIO: RH ☐ RV ☐ RN ☐ RL ☐ RXL ☐

ENVIRONMENT: DUSTY ☐ HUMIDITY _____ % TEMPERATURE: _____ °C (Celsius) OTHER: _____

_____ WORKING CYCLES/HOUR _____ WORKING HOURS/DAY EXPECTED LIFE: _____

POSITIONING ACCURACY: ± _____ mm POSITION CONTROL: INCREMENTAL ENCODER ☐ LINEAR POTENTIOMETER ☐

STROKE LIMIT DEVICE: ELECTRIC FCE ☐ MAGNETIC FCM ☐ PROXIMITY FCP ☐ SAFETY CLUTCH FS ☐

ANTI-TURN DEVICE AR ☐ SAFETY NUT MSB ☐ PUSH ROD STAINLESS STEEL ☐ OUTER TUBE STAINLESS STEEL ☐

SERVOMECH Phone: + 39 051 6501711 Fax: + 39 051 734574 E-mail: info@servomech.it

APPLICATION DATA SHEET TO SELECT SERVOMECH LINEAR ACTUATORS

Please fill in as many details as possible and fax back to +39-051-734574

Company: _____ Name: _____
 Address: _____ Date: _____
 Phone: _____ Fax: _____

FORCE:

Max. dynamic force: (push) _____ N (pull) _____ N

Max. static force: (push) _____ N (pull) _____ N

Radial loads on push rod, please detail if present: _____

Shock loads, please detail if present: _____ N; Frequency _____

If loads vary throughout stroke, indicate where maximums are present.

LINEAR SPEED

Linear speed required: Max.: _____ mm/s Min.: _____ mm/s

If the required speed is not constant, please represent it on the Speed - Time diagram.

STROKE

Stroke required: _____ mm Time to
 complete stroke: _____ s

Maximum retracted length admissible: _____ mm Stopping accuracy: ± _____ mm

DUTY CYCLE

Duty cycle: _____ % / 10 min $\frac{\text{Time working over 10 min period [s]}}{600} \times 100 = \text{Duty over 10 min [\%]}$

If duty cycle varies, please represent it in the Load - Cycle and Speed - Cycle diagrams.

ELECTRIC MOTOR

AC 3-phase Motor _____ V, _____ Hz DC Motor 24 V ☐ ; 12 V ☐

AC 1-phase Motor _____ V, _____ Hz Other: _____

Motor IP rating: IP _____ Motor insulation class: _____

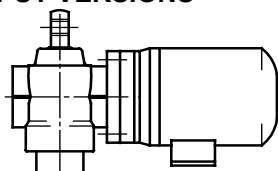
BRAKEMOTOR ☐

- Brake motor is suggested for ball screw actuators to guarantee self locking.
- Brake motor is suggested for positioning accuracy applications.
- Special features required for brake motor: _____

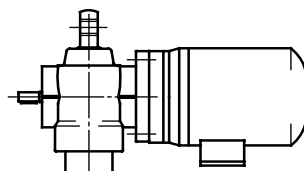
ENVIRONMENT

Temperature: _____ °C Humidity: _____ % Powder: _____ Other: _____

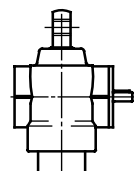
INPUT VERSIONS



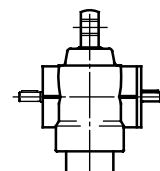
Vers. 3 ☐



Vers. 4 ☐

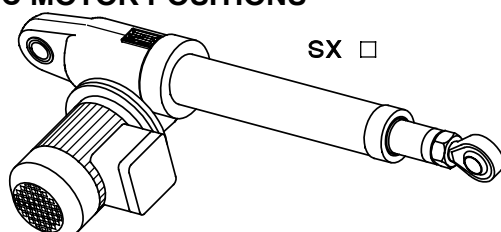


Vers. 1 ☐

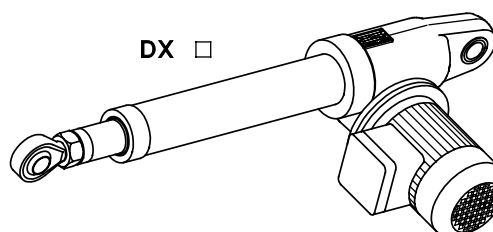


Vers. 2 ☐

ELECTRIC MOTOR POSITIONS



SX ☐



DX ☐

LIMIT SWITCHES

Adjustable electrical limit switches FCE ☐
 Adjustable magnetic limit switches FCM ☐ N° of switch positions: _____
 Normally closed ☐ Normally open ☐
 Not adjustable Proximity switches FCP ☐ N° of switch positions: _____

FRONT AND REAR FIXING ATTACHMENTS

- Threaded end (standard) ☐ Rod end ☐ Hinged head ☐
 - Clevis end ☐ Ball joint ☐ Flange end ☐
 - Rear bracket ☐ Intermediate flange ☐
 - Housing with rear fixing attachment turned at 90° ☐ (on request Cod. RPT 90°)

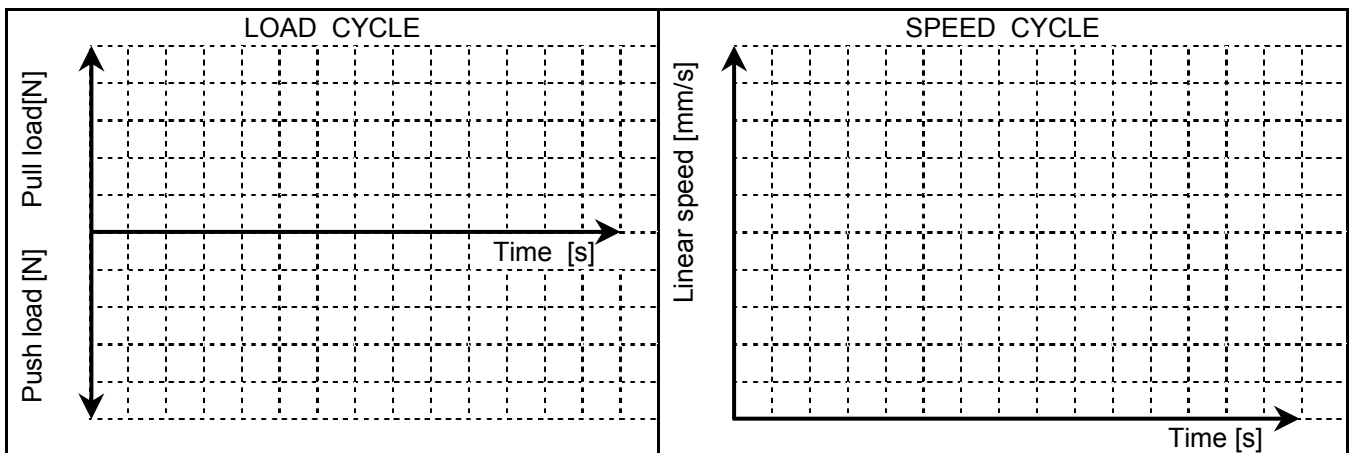
OTHER ACCESSORIES AND OPTIONS

Anti-turn device ☐ Safety nut ☐ Safety clutch ☐ Bellows ☐
 Incremental encoder ☐ Rotative potentiometer ☐ Linear potentiometer ☐
 Stainless steel push rod AISI 304 ☐ Stainless steel outer tube AISI 304 ☐

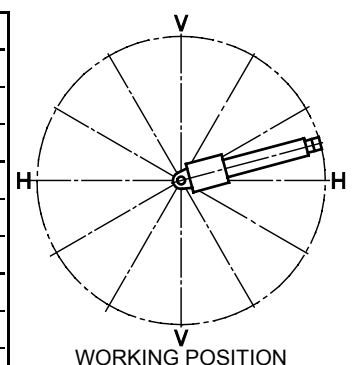
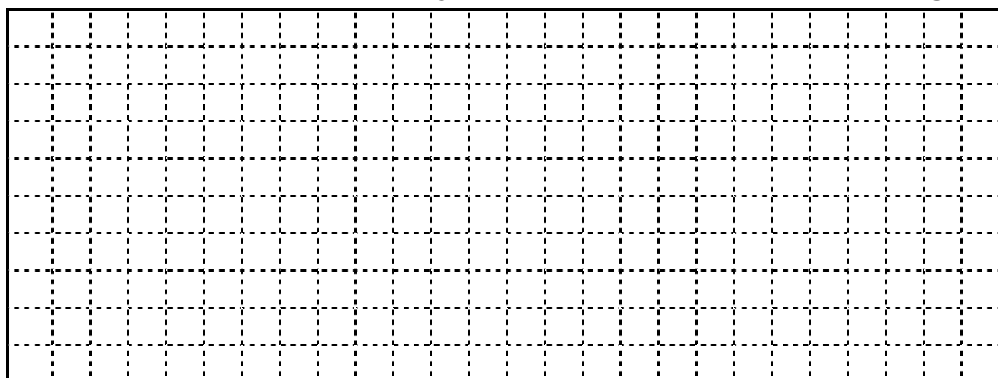
Application: _____ Quantity of actuators required: _____

Description of function/operation: _____

Work cycle diagram



Sketch of application (show any side load and method of end fixing)



Note: Please send sketches or drawings together with detailed description of the application.

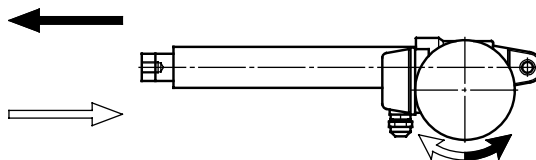


CODE: _____

SERIAL N°: _____

STANDARD
HEAD

BA ☐

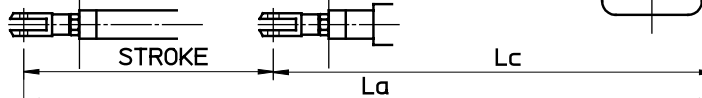


☐ ATL Series
☐ BSA Series

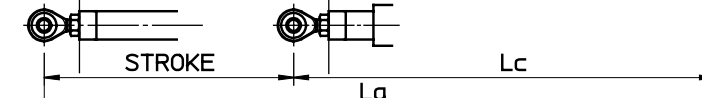
☐ LEFT-HAND
LH

☐ RIGHT-HAND
RH

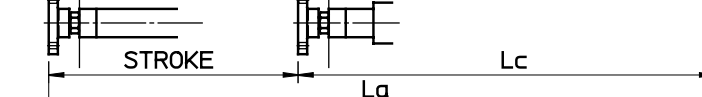
CLEVIS END FO ☐



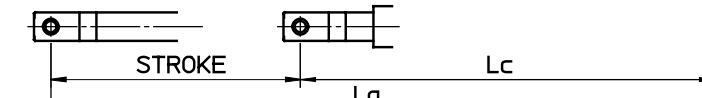
BALL JOINT TS ☐



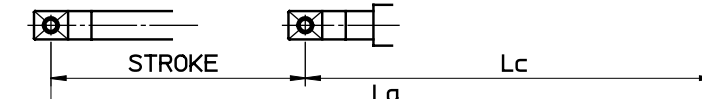
FLANGE END FL ☐



ROD END ROE ☐

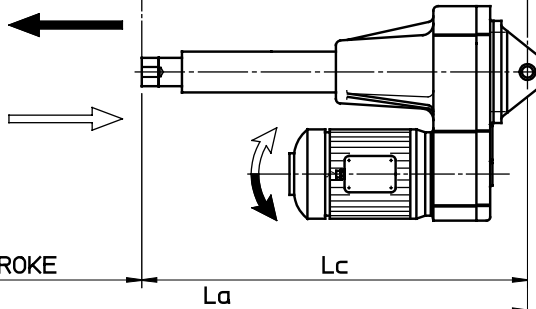


HINGED HEAD TF ☐



STANDARD
HEAD

BA ☐



☐ UAL Series
☐ UBA Series

MOTOR

- ☐ AC 3-PHASE
☐ AC 1-PHASE
☐ DIRECT CURRENT

☐ WITHOUT BRAKE
☐ WITH BRAKE
○ DIRECTLY WIRED
○ SEPARATELY WIRED

Servomech QC
PASSED

Date: _____

Signature: _____

WORKING RANGE

RETRACTED POSITION: $L_c =$ _____ mm

EXTENDED POSITION: $L_a =$ _____ mm

WORKING STROKE ($L_a - L_c$): $C =$ _____ mm

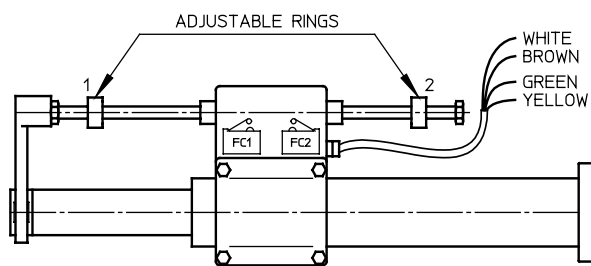
LIMIT POSITIONS (internal mechanical stop)

MIN. RETRACTED LENGTH: _____ mm

MAX. EXTENDED LENGTH: _____ mm

ELECTRIC STROKE LIMIT DEVICE

FCE 



The ELECTRIC STROKE LIMIT DEVICE (FCE) has

two normally closed switches:

- MAX. SUPPLY VOLTAGE: 250 V AC / 30 V DC
- MAX. CURRENT: 5 A (resistive load)
3 A (inductive load)

The "RETRACTED ACTUATOR" position is adjusted by RING 1 and controlled by switch FC1.

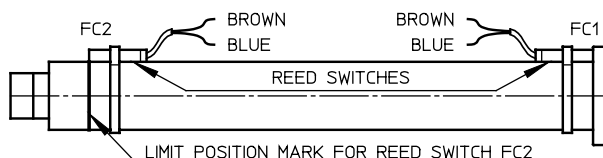
The "EXTENDED ACTUATOR" position is adjusted by RING 2 and controlled by switch FC2.

Switch FC1 – WHITE and BROWN wires

Switch FC2 – GREEN and YELLOW wires

MAGNETIC STROKE LIMIT DEVICE

FCM 



The "RETRACTED ACTUATOR" position is adjusted and controlled by FC1.

The "EXTENDED ACTUATOR" position is adjusted and controlled by FC2.

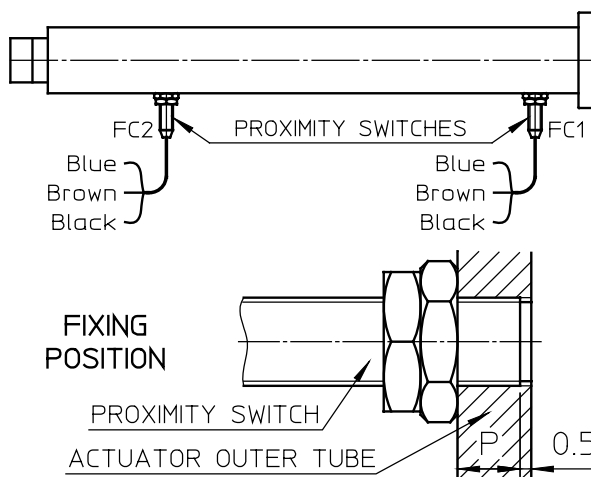
Reed switch wires are BROWN and BLUE (and the third, BLACK, for changeover contact).

Rated electric values stated on switch top side.

For DC control circuit: connect the BROWN wire to \oplus .

PROXIMITY STROKE LIMIT DEVICE

FCP 



The PROXIMITY STROKE LIMIT DEVICE (FCP) has two normally closed proximity switches (PNP contact):

- MAX. SUPPLY VOLTAGE: (10 ÷ 30) V DC
- MAX. OUTPUT CURRENT: 200 mA
- VOLTAGE DROP (activated sensor): < 1.8 V

FC1 – sensor for "RETRACTED ACTUATOR" position

FC2 – sensor for "EXTENDED ACTUATOR" position

For control circuit connect:

- BROWN wire to \oplus ;
- BLUE wire to \ominus ;
- BLACK wire to TRIPPING COIL RELAY.

ACTUATOR	P [mm]
ATL/BSA 50	4.5
ATL/BSA 63	
ATL/BSA 80	
ATL 100	9.5

WARNING!

1. The values **Lc** (retracted position length), **La** (extended position length) and **C** (working stroke) are the extreme permissible values.
2. Before using the linear actuator, make following checks:
 - verify the motor shaft turning direction and the related linear motion direction;
 - check the switches position: they must not exceed the given position limits;
 - make sure that the motor and the limit switches are connected correctly and that the right voltage is used.
3. Brake motor features:
 - the brake is **NORMALLY CLOSED**. When the motor is switched off, the brake is engaged. The brake opens only when power is supplied;
 - if the brake is wired directly by the connecting pins of the terminal box, it does not require any power supply;
 - if the brake is wired separately, make sure that the right 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 lateral radial loads are admissible.

WORMGEAR LUBRICANT: _____

SCREW – NUT LUBRICANT: _____

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