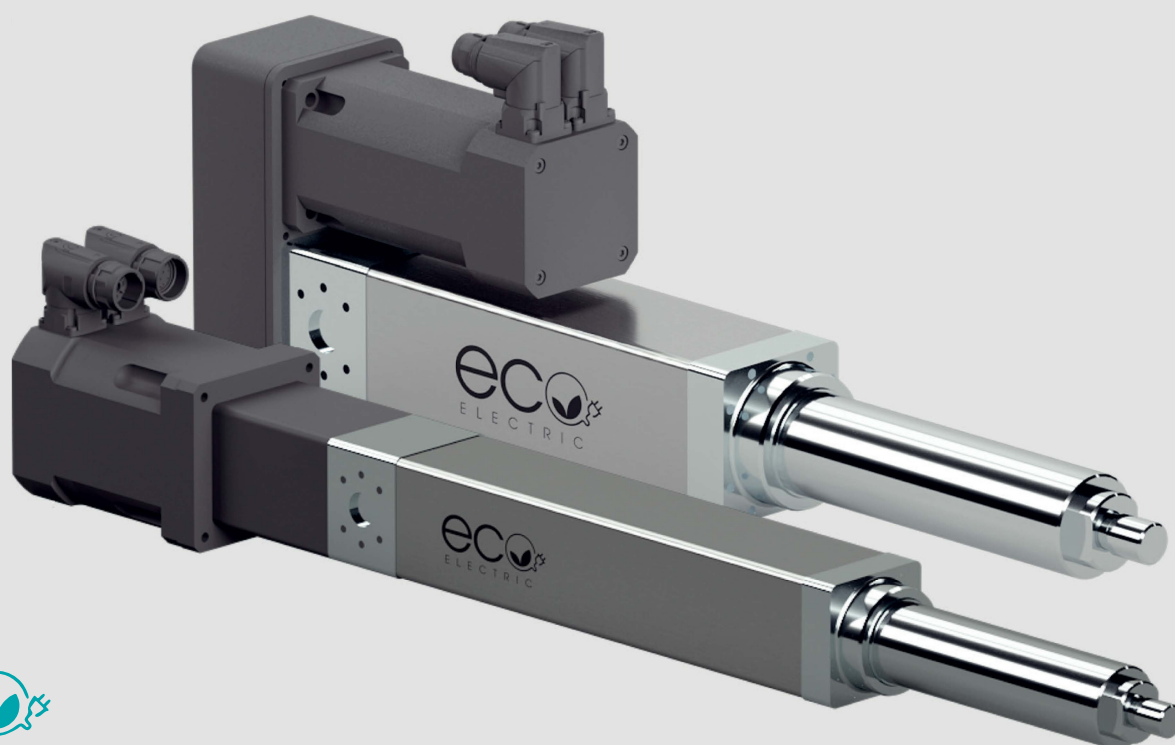


GTS ECO-ELECTRIC CYLINDER





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Eco-Electric Cylinder:
Green by choice

WHY SWITCH TO ELECTRIC?

The *electric cylinder* is a valid alternative to hydraulics and pneumatics, guaranteeing an **increase in productivity and simplification of design**.

It is widely recognised that modern automation, especially when linked to production and packaging, is undergoing

a radical transformation towards the minimization and cancellation of dead time delays. We therefore aim, in the case of possible displacements and movements, to continuously reduce such unproductive time, **increasing the dynamics of the system**.



FIELDS OF APPLICATION



FOOD



COSMETICS



AGRICULTURE



DIE CASTING

Eco-electric cylinders are suitable for multiple applications: **pushing, lifting, pressing, positioning** and **turning** are just some of the most common applications available through automation as well as through machine tools.



FILLING & CAPPING



MOULDING



MACHINE TOOLS

eco 
ELECTRIC

PRODUCT DESCRIPTION

Our *electric cylinders* have been developed through many years' experience in the linear motion sector.

The need to obtain a robust, reliable, simple and affordable product led to the birth of the GTS eco-electric cylinder.

A contained external geometry, thanks to the use of noble materials, in conjunction with the flexibility linked to the mounting configurations represents a real strength of the product.

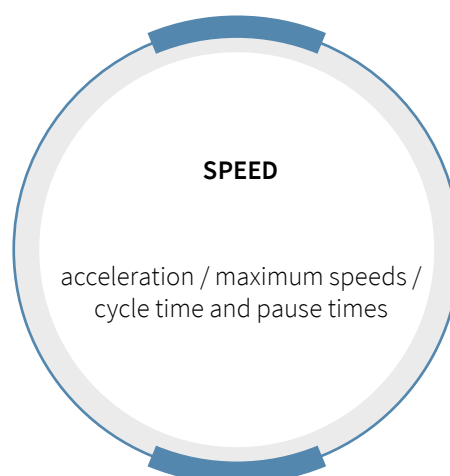
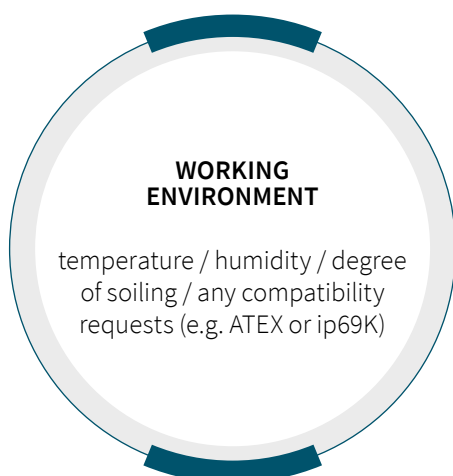
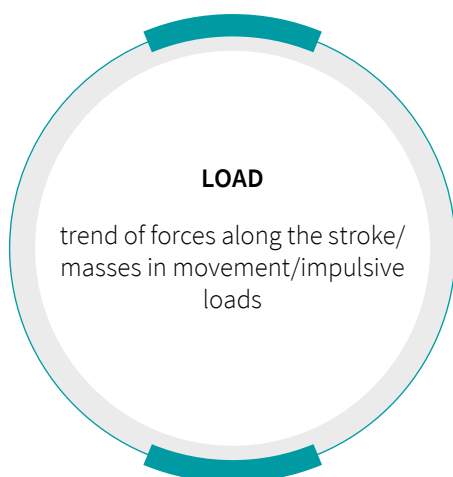


SELECTION CRITERIA

Tools for the optimal definition of the electric cylinder

In this section it is possible to choose and configure the electric cylinder size that best meets the needs of loads and speeds.

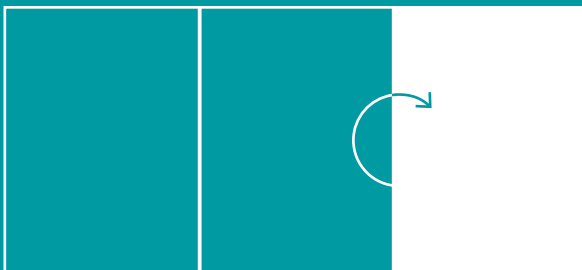
Before starting configuration it is useful to know the parameters influencing the appropriate choice of the actuator:



QUICK SETUP

By step

Our line of cylinders is divided into six sizes, designed in satin-finished 316 stainless steel square boxes. Note that **the designation of sizes does not follow ISO standardization** as our goal is to obtain **the best solution in terms of loads and speeds within the smallest possible footprint.**



• • • • • -

To obtain the code for your eco-electric cylinder, open the cover flap and fill in the fields marked at the top.

INTRODUCTION TO SIZES

To obtain a suitable nominal fatigue lifespan, the equivalent dynamic axial load should not exceed approximately 20% of the dynamic load factor of the screw. However, it is possible, through the wizard shown below, to calculate the useful life of the actuator, depending on the work cycle, in order to correctly determine the size.

For correct sizing, the following must not be exceeded:

- The maximum allowable drive torque
- The maximum permissible load
- The maximum permissible speed

SIZE 1
Fmax [N] up to 8000

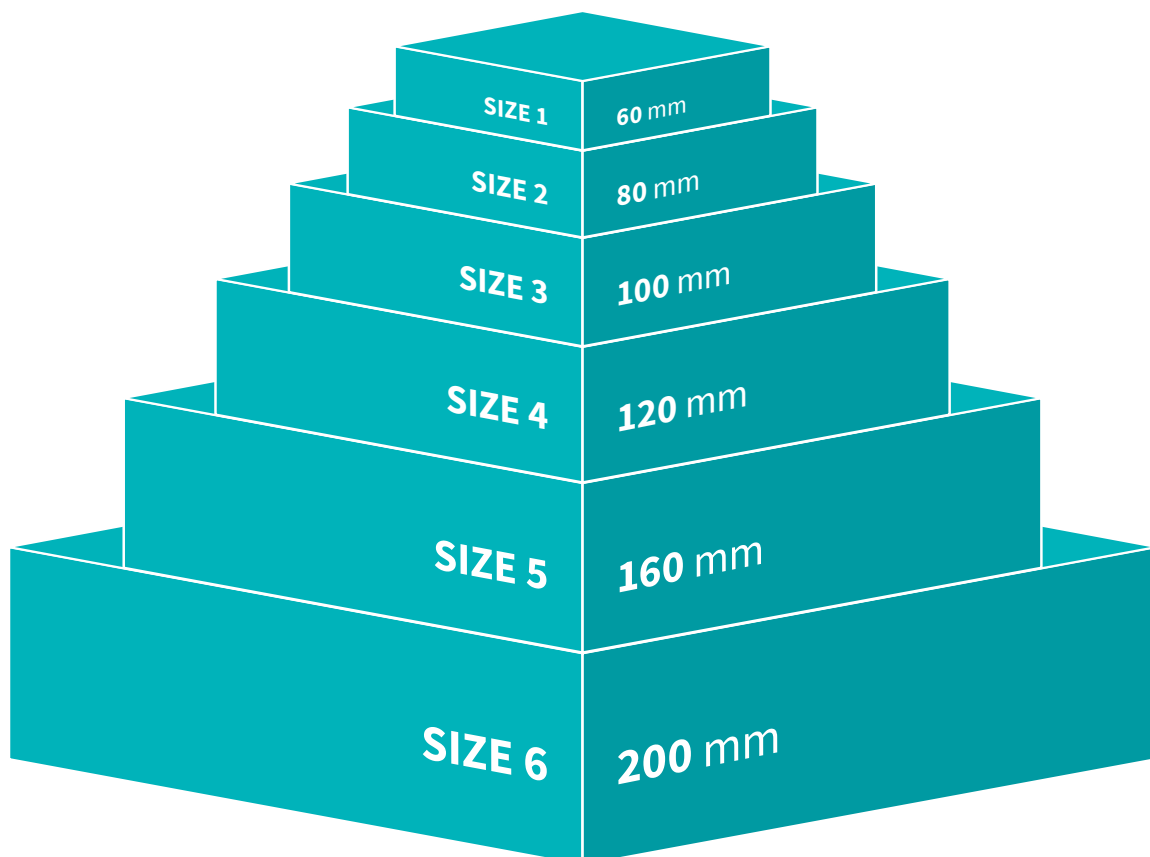
SIZE 2
Fmax [N] up to 20000

SIZE 3
Fmax [N] up to 40000

SIZE 4
Fmax [N] up to 65000

SIZE 5
Fmax [N] up to 90000

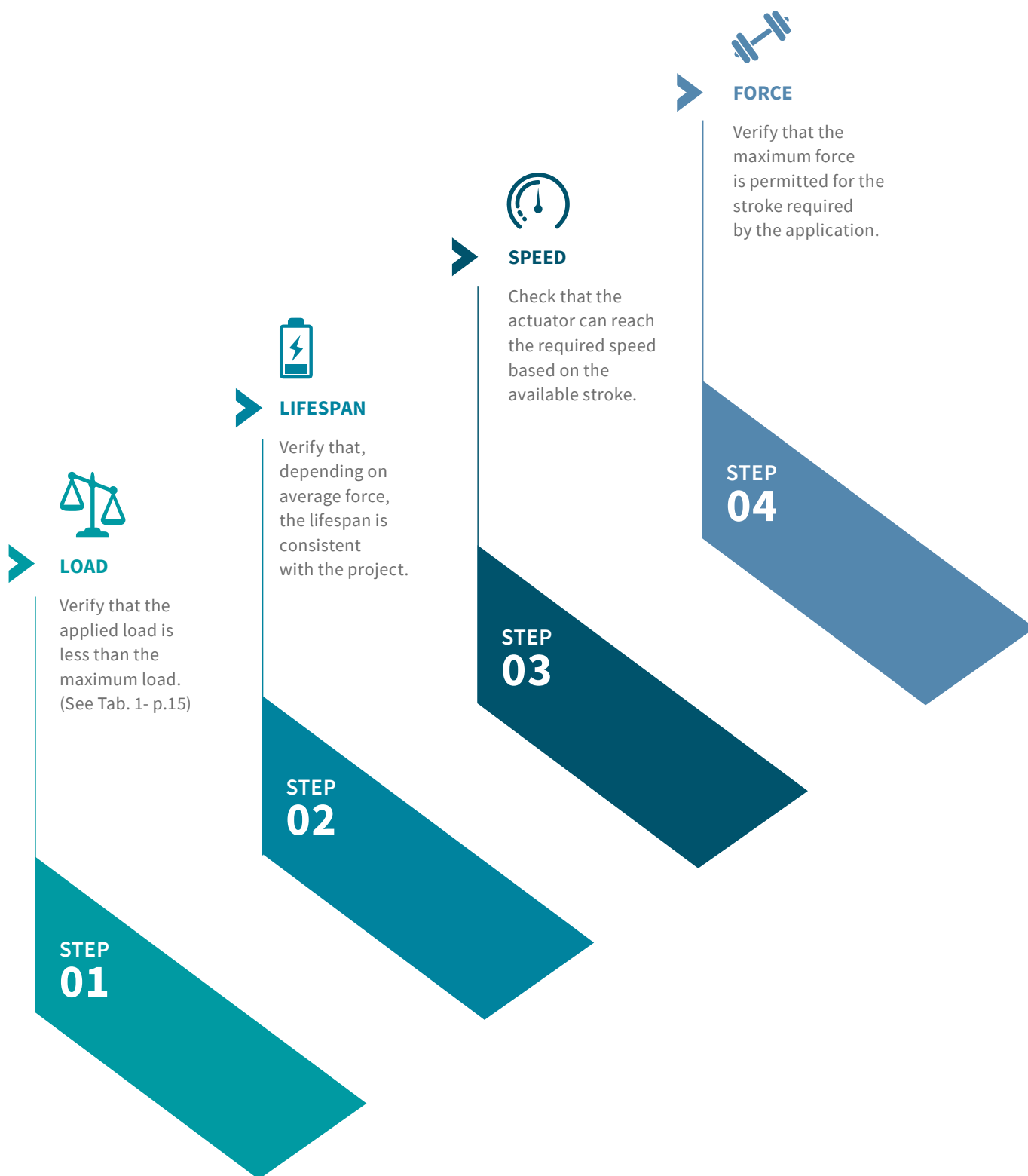
SIZE 6
Fmax [N] up to 130000



STEP BY STEP SELECTION

In order to facilitate selection, GTS provides graphs to quickly identify the actuator that best meets your needs.

It is therefore possible to select the actuator as follows:





STEP 01: Applied loads



- Verify that the **applied load** (i.e. the sum of weight, friction and force required for thrust) is **less than the maximum load**. See Tab.1

SIZE	SCREWS	Cdin [N]	Fmax [N]	VMAX [m/min]
SIZE 1 - 60x60	AA	14800	6000	18
	AB	11500	4500	35
	AC	7560	3800	50
	BA	21000	8000	18
	BB	10900	6500	35
	BD	18800	8000	60
	ZA	55000	8000	15
SIZE 2 - 80x80	DA	25900	13000	18
	DB	38000	19000	35
	DD	23600	12000	60
	CE	12100	6500	75
	DF	23400	12000	90
	VA	87000	20000	15
	VB	101000	20000	30
SIZE 3 - 100x100	EA	34900	18000	18
	EB	86500	40000	35
	ED	45500	23000	60
	EG	44400	23000	100
	UA	123000	40000	15
	UB	145000	40000	28
SIZE 4 - 120x120	FB	95600	50000	25
	FD	90800	45000	50
	FG	55800	30000	80
	TA	188000	65000	12
	TB	220000	65000	24
SIZE 5 - 160x160	GB	106600	60000	18
	GD	130000	65000	35
	GG	100000	50000	70
	SB	322000	90000	12
	SD	375000	90000	24
SIZE 6 - 200x200	HD	315220	130000	25
	RB	480000	130000	12
	RD	540000	130000	24

Tab. 1 – Sizes, dimensions, screws. For screw coding, see Tab. 5 - pag. 98

NOTE

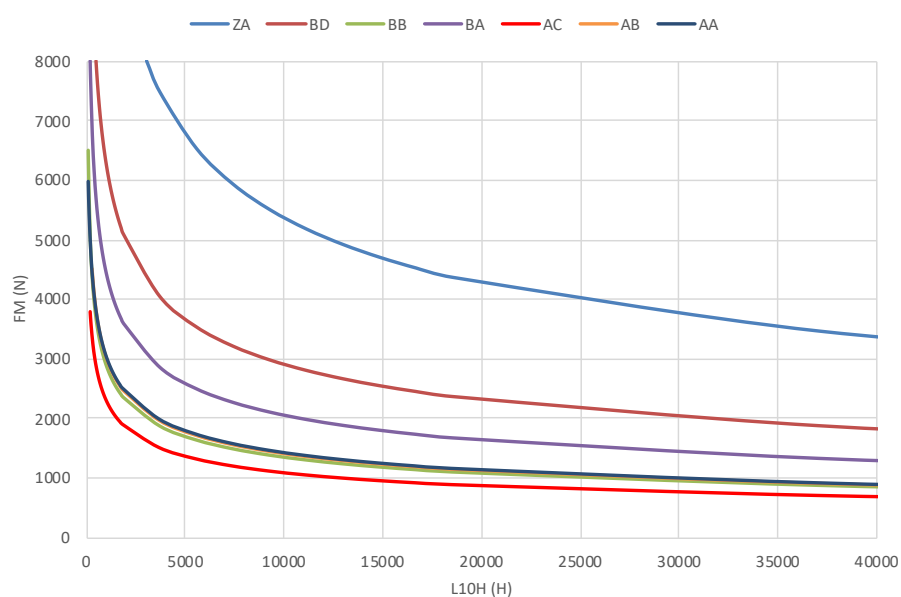
Maximum force and maximum speed are closely related to the stroke of the actuator. **The maximum values are calculated for a stroke of 100mm.** For longer strokes it is possible to refer to the graphs shown on page 16. However, it is possible to apply a force higher than that shown in the table depending on the type of application and how the actuator is constrained (such as, for example, a static force in case of a mould closure). *Contact the GTS Technical Office to request verification for forces greater than those shown in the table.*

STEP 02: Service lifespan based on average force

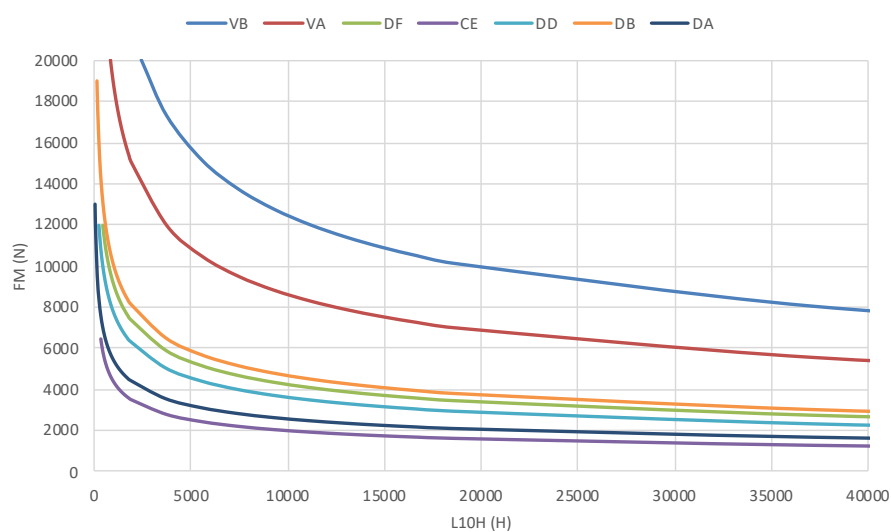
$F_{\text{average}} (FM) = \text{sum of all competing forces} / \text{No. of forces}$



SERVICE LIFESPAN (h)



SERVICE LIFESPAN (h)





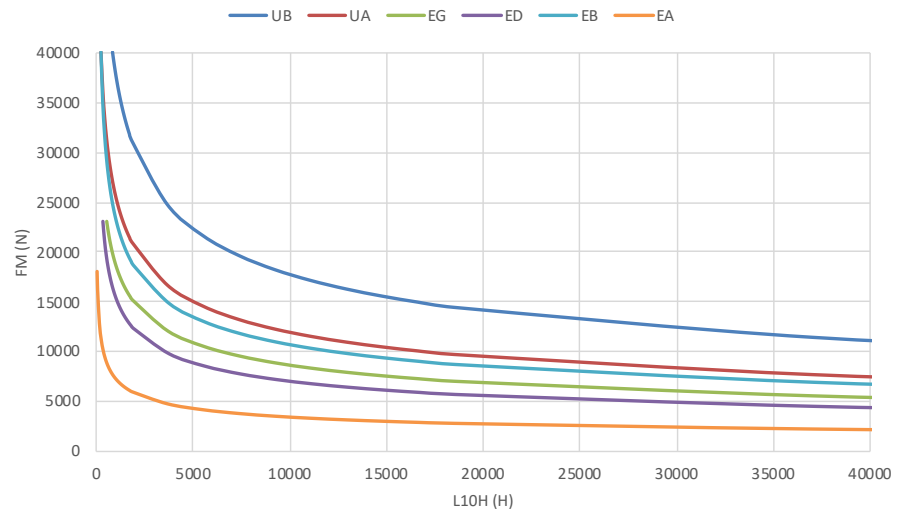
➤ Verify that, according to the average force, the useful **lifespan** is **consistent** with the project.



SIZE 3
100 x 100



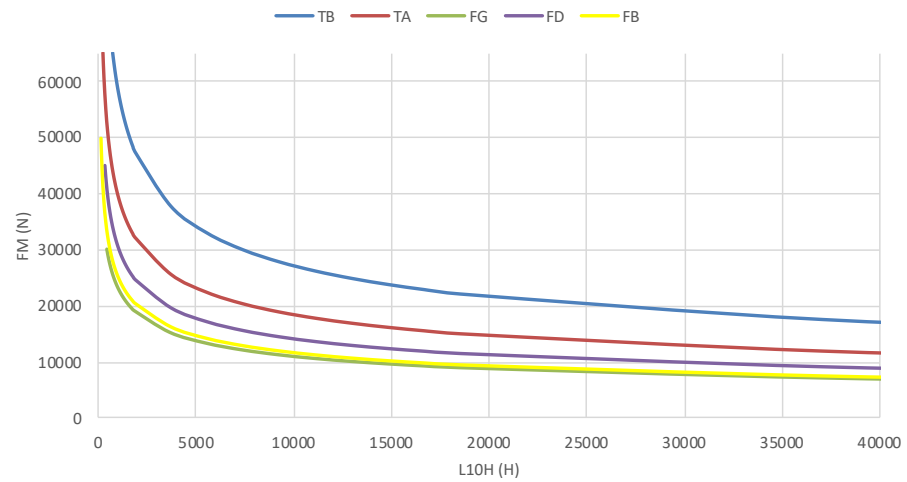
SERVICE LIFESPAN (h)



SIZE 4
120 x 120



SERVICE LIFESPAN (h)



STEP 02: Service lifespan based on average force



➤ Verify that, according to the average force, the useful **lifespan** is **consistent** with the project.

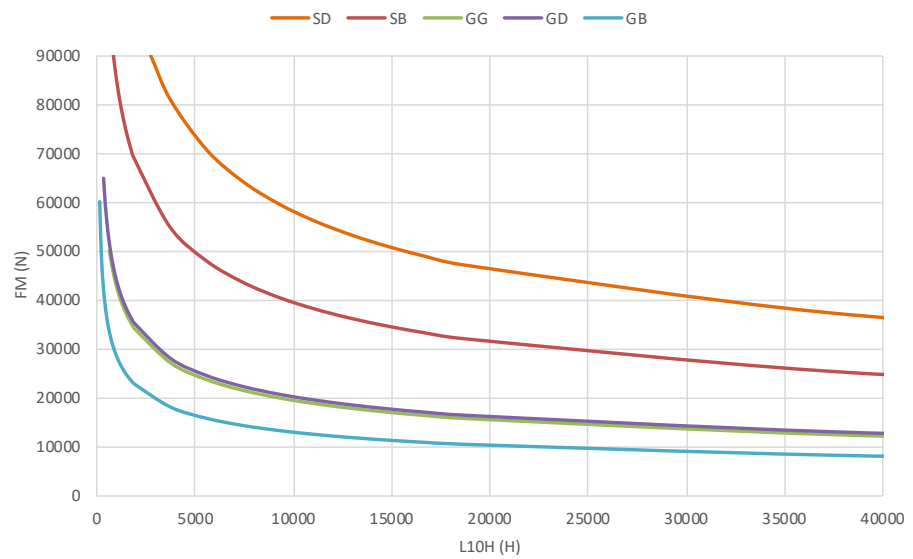


$F_{average} (FM) = \text{sum of all competing forces} / \text{No. of forces}$

SIZE 5
160 x 160



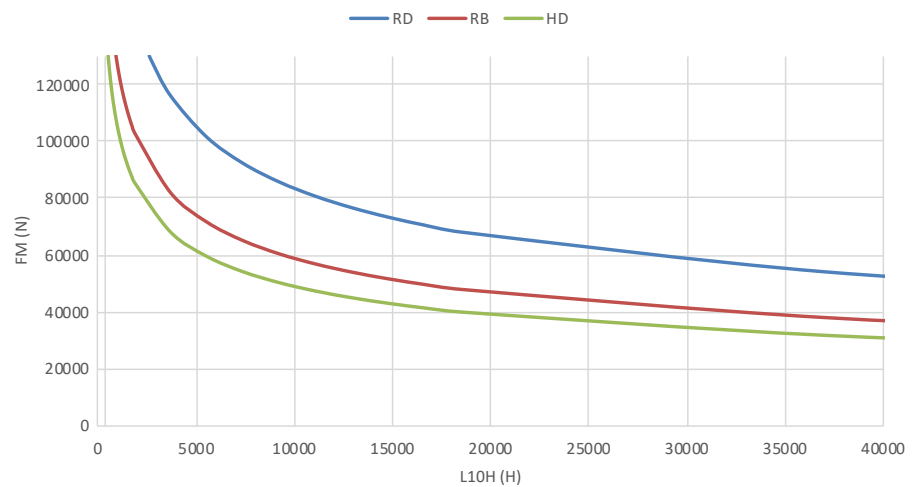
SERVICE LIFESPAN (h)



SIZE 6
200 x 200



SERVICE LIFESPAN (h)

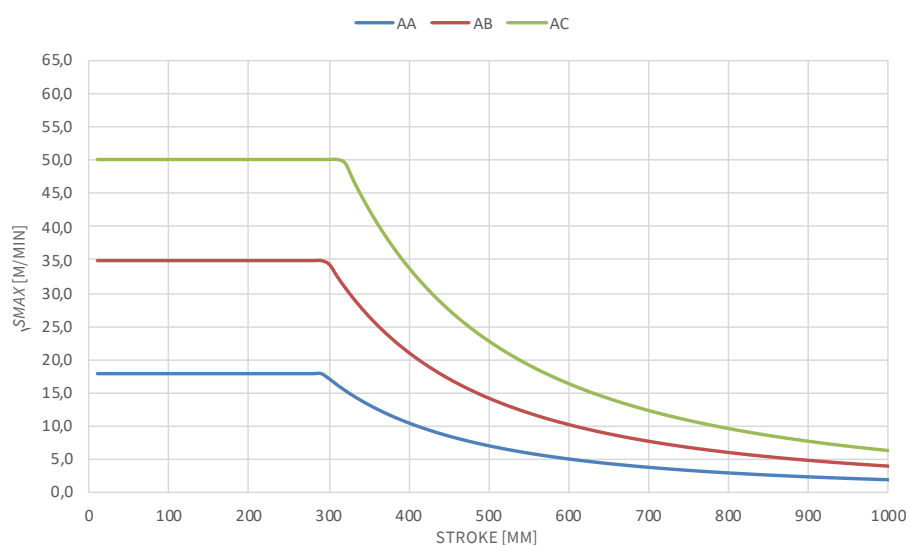


STEP 03: Maximum speed/strokes

SIZE 1
60 x 60



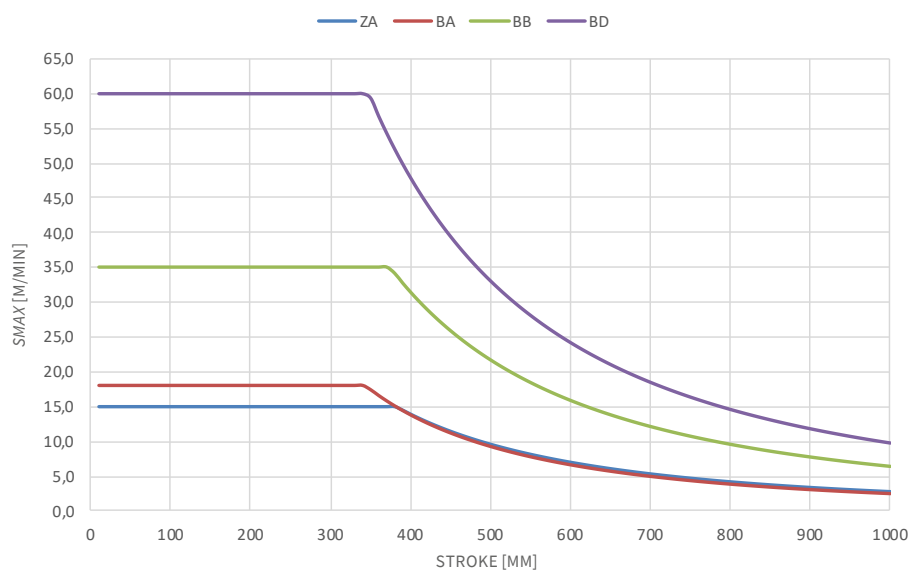
MAXIMUM SPEED (m/min)



SIZE 1
60 x 60



MAXIMUM SPEED (m/min)





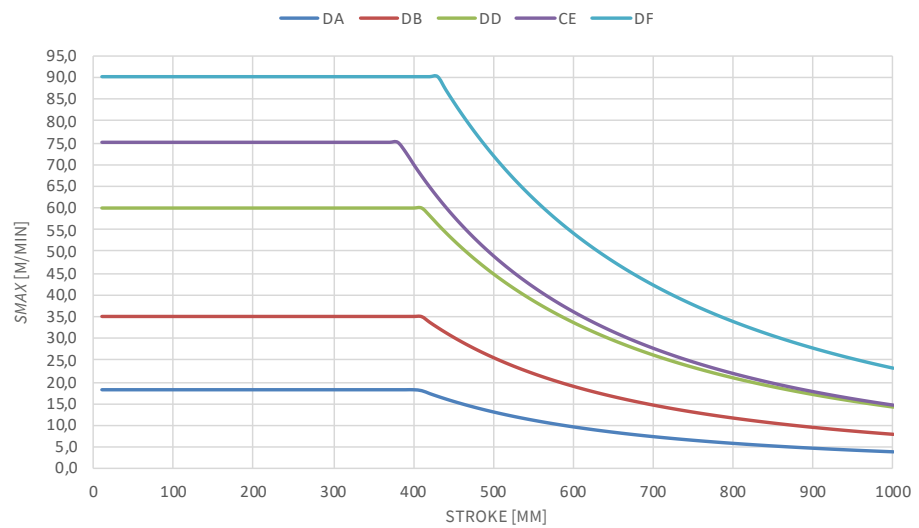
➤ Check that the actuator can reach the required **speed** based on the **available stroke**.



SIZE 2
80 x 80



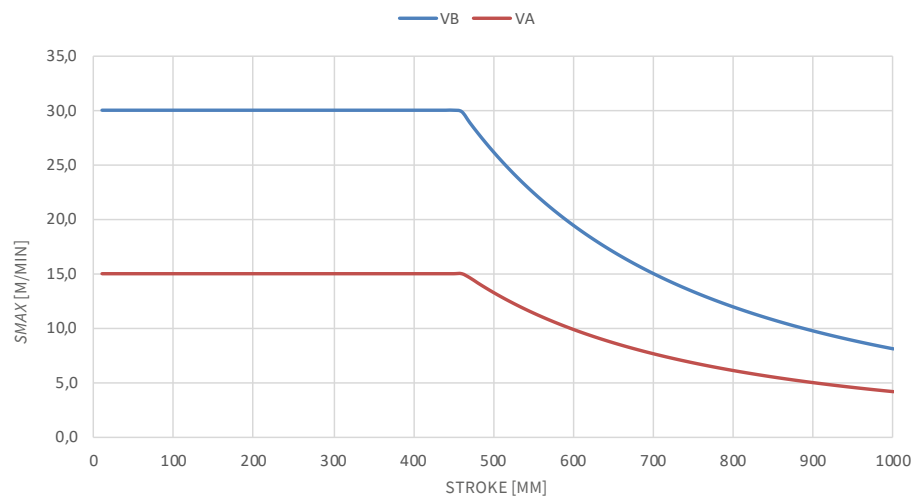
MAXIMUM SPEED (m/min)



SIZE 2
80 x 80



MAXIMUM SPEED (m/min)

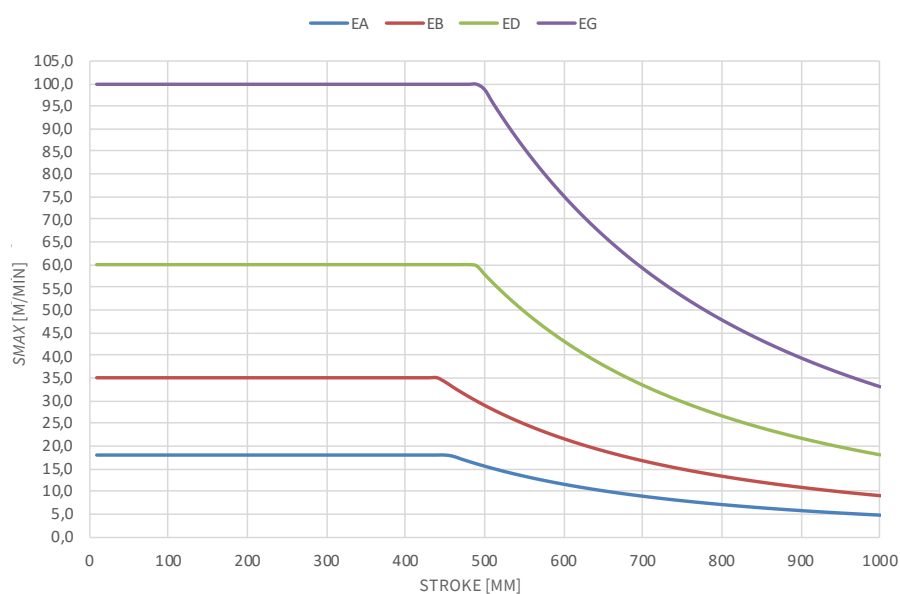


STEP 03: Maximum speed/strokes

SIZE 3
100 x 100



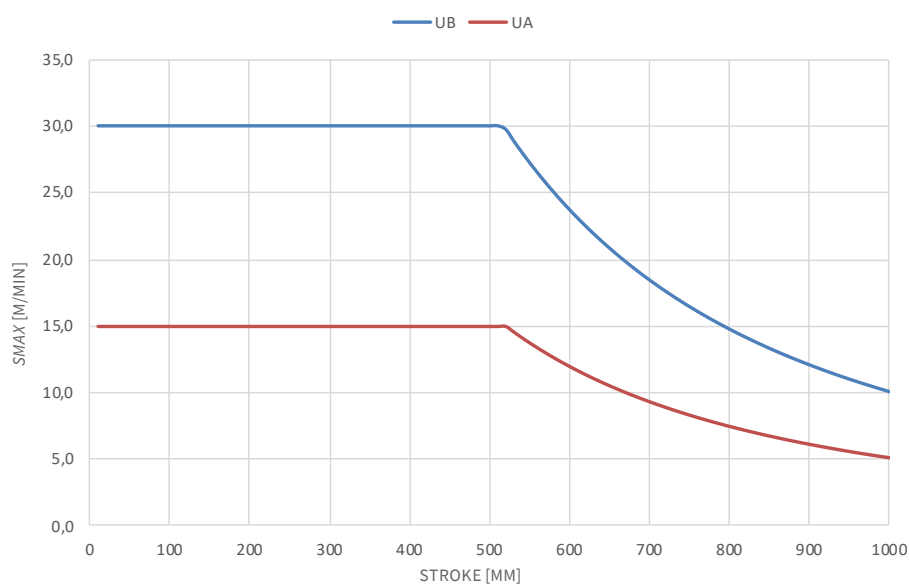
MAXIMUM SPEED (m/min)



SIZE 3
100 x 100



MAXIMUM SPEED (m/min)





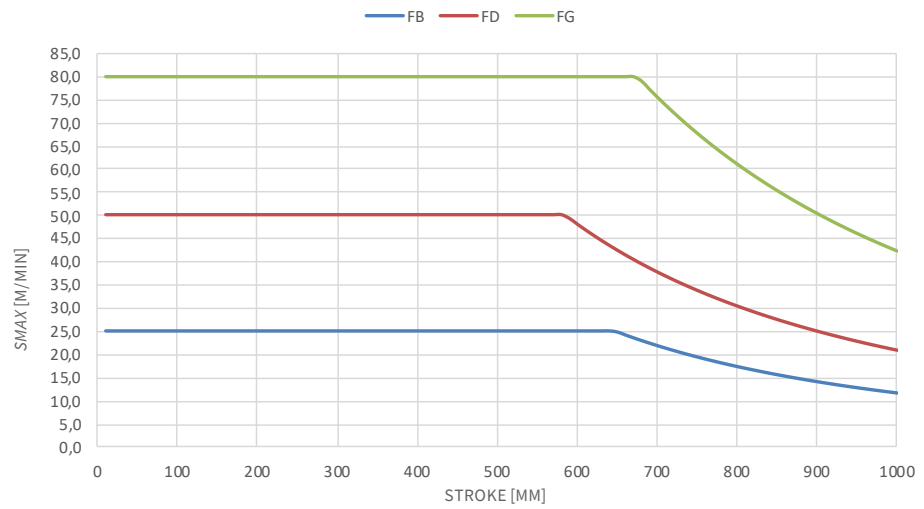
➤ Check that the actuator can reach the required **speed** based on the **available stroke**.



SIZE 4
120 x 120



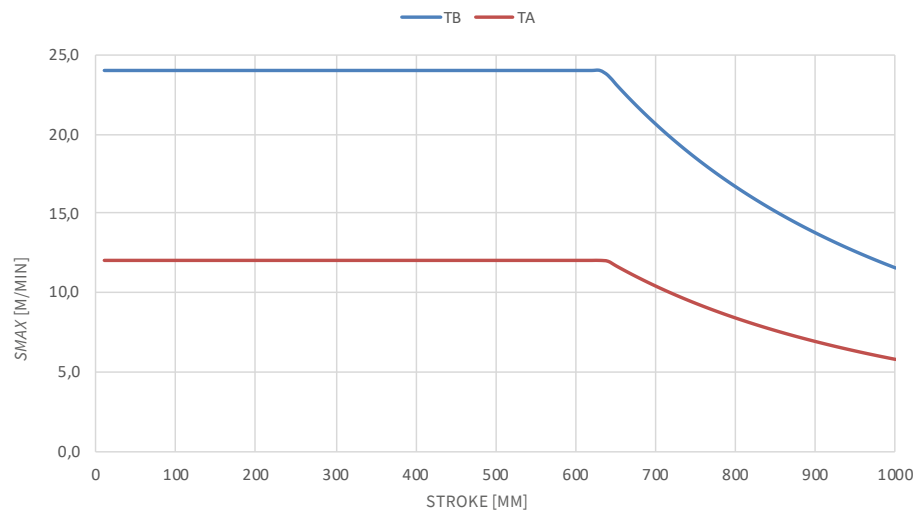
MAXIMUM SPEED (m/min)



SIZE 4
120 x 120



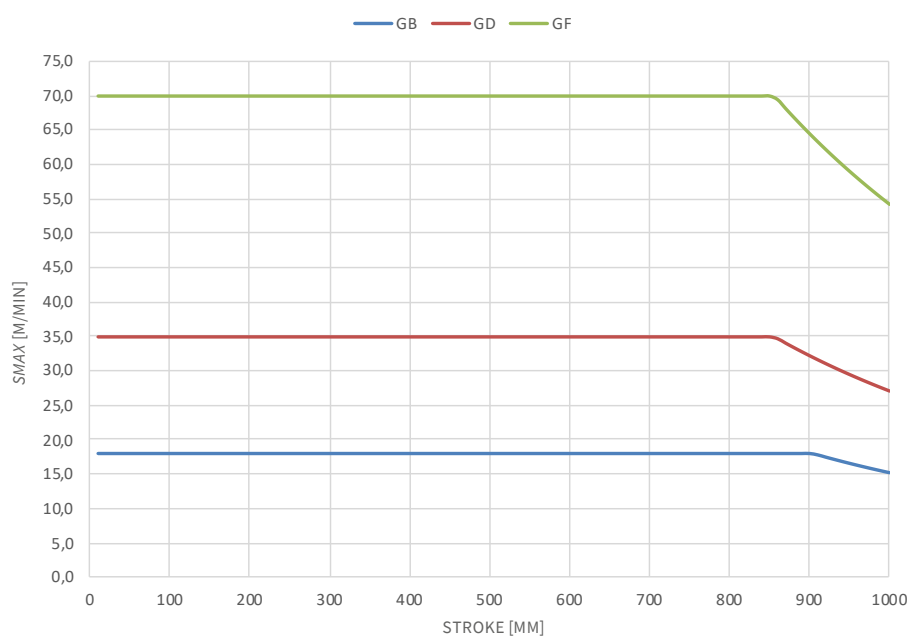
MAXIMUM SPEED (m/min)



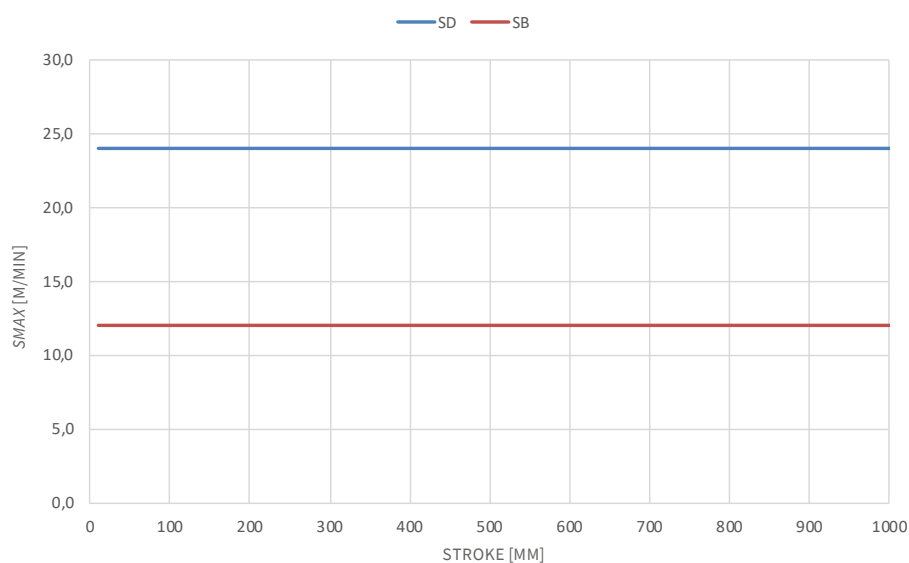
STEP 03: Maximum speed/strokes



MAXIMUM SPEED (m/min)



MAXIMUM SPEED (m/min)





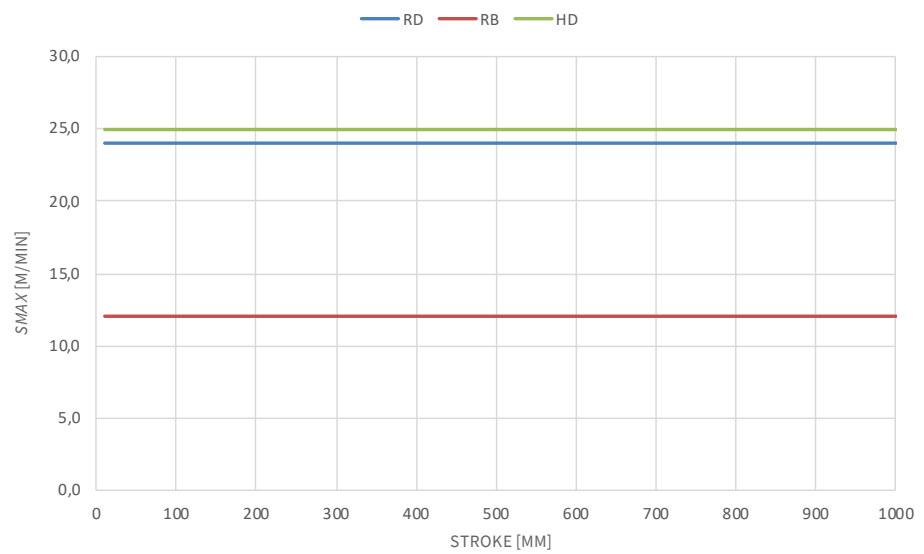
➤ Verify that the **maximum force** is allowed for the **strokes required by the application.**



SIZE 6
200 x 200



MAXIMUM SPEED (m/min)

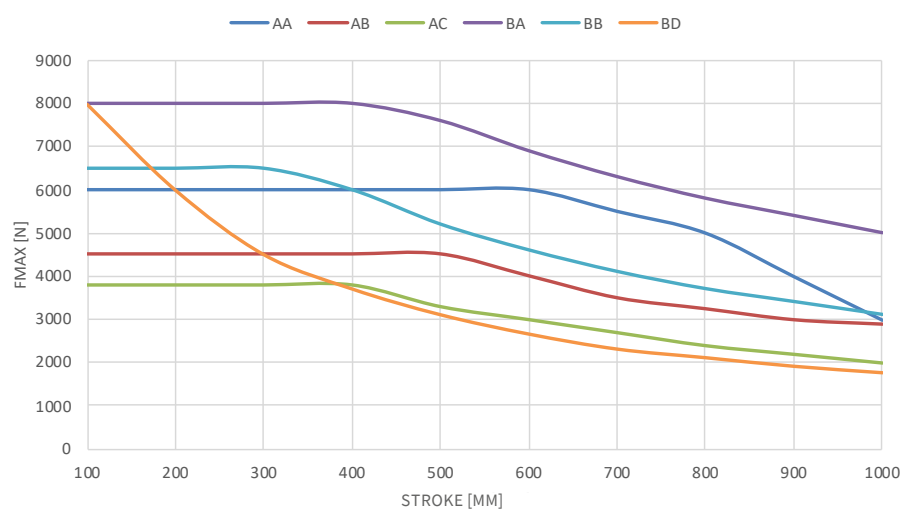


STEP 04: Maximum force/strokes

SIZE 1
60 x 60



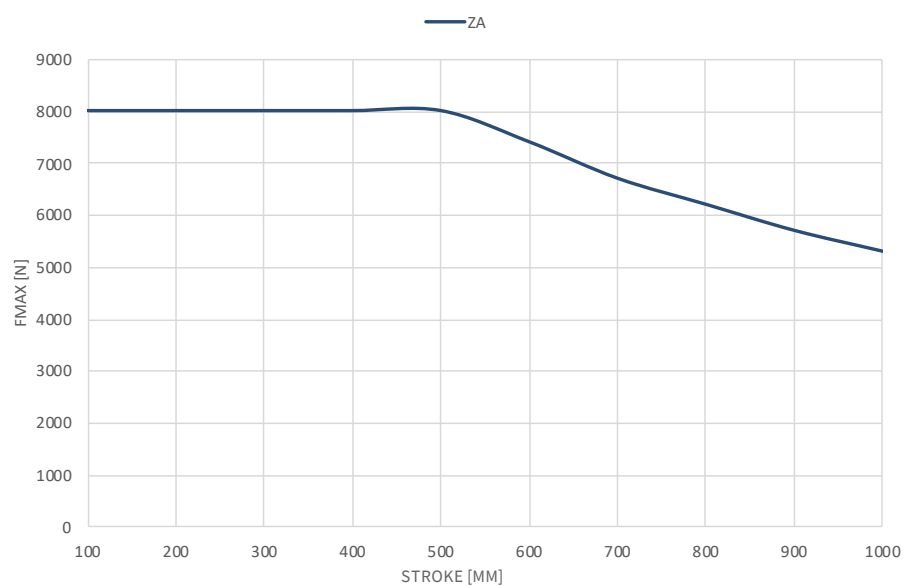
MAXIMUM FORCE (N)



SIZE 1
60 x 60



MAXIMUM FORCE (N)





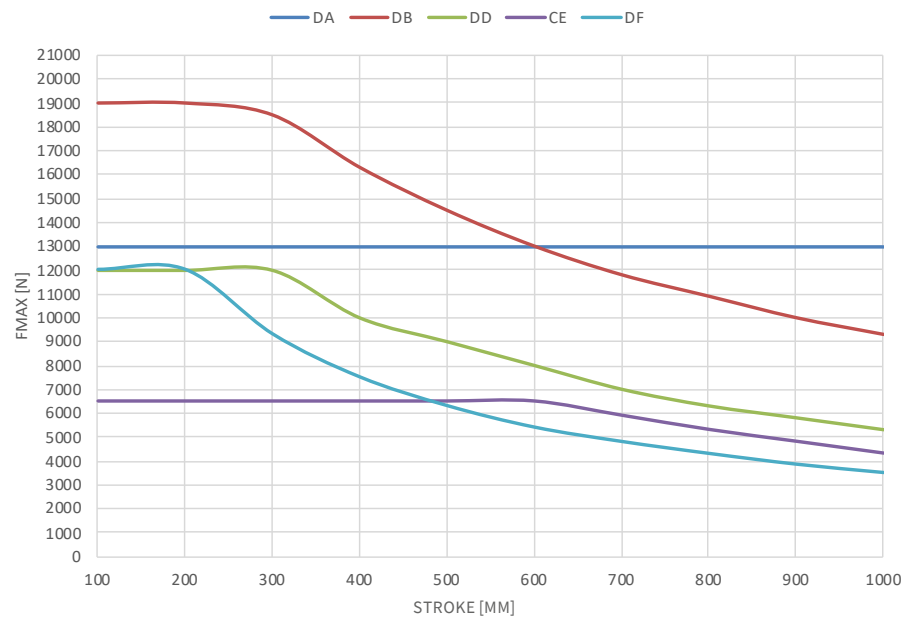
➤ Verify that the **maximum force** is allowed for the **strokes required by the application.**



SIZE 2
80 x 80



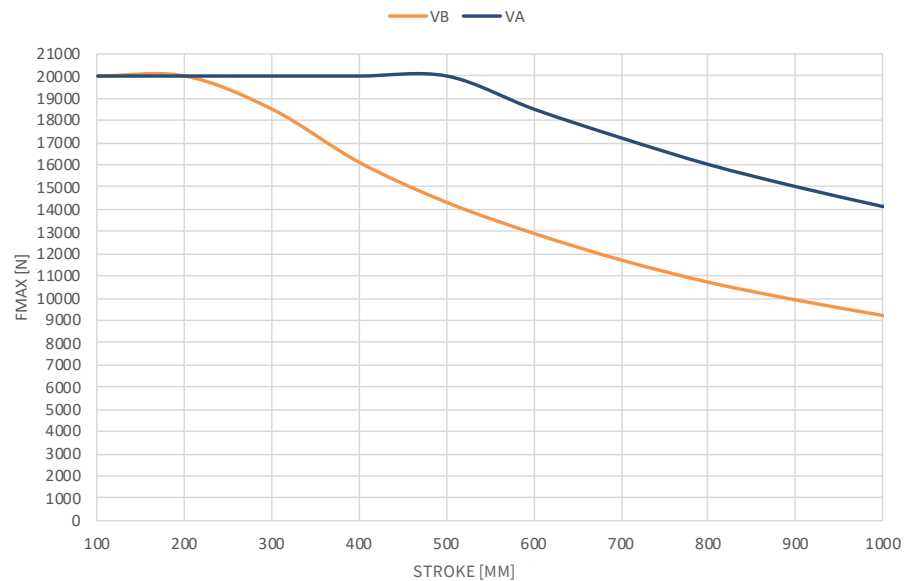
MAXIMUM FORCE (N)



SIZE 2
80 x 80



MAXIMUM FORCE (N)

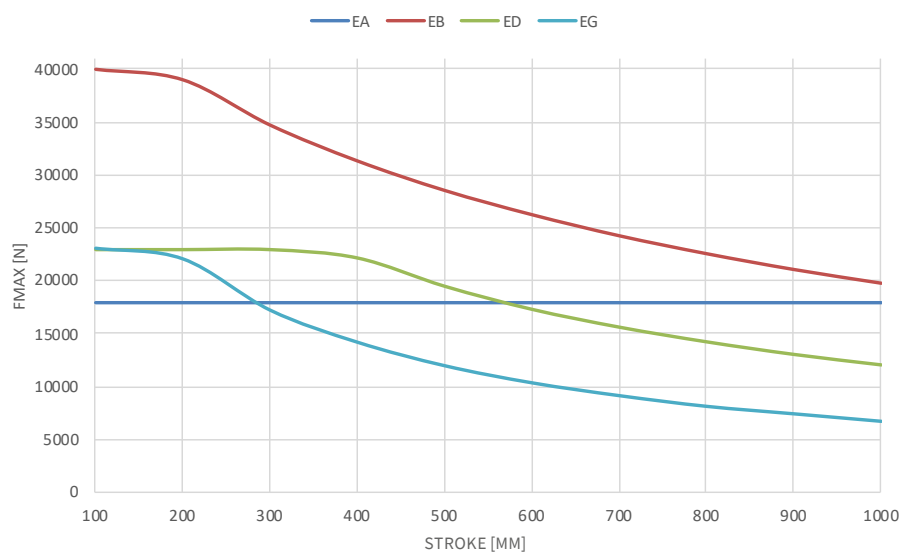


STEP 04: Maximum force/strokes

SIZE 3
100 x 100



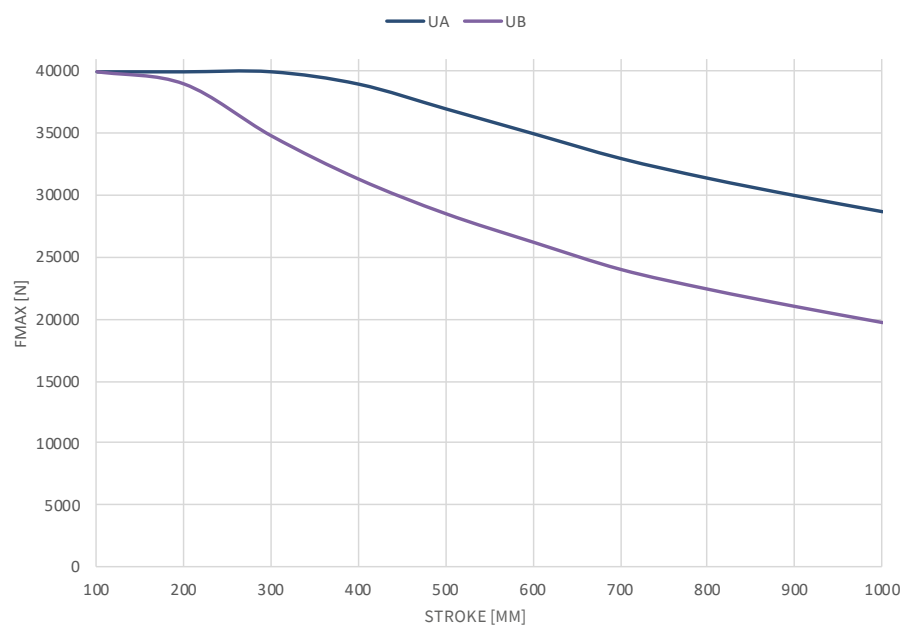
MAXIMUM FORCE (N)



SIZE 3
100 x 100



MAXIMUM FORCE (N)





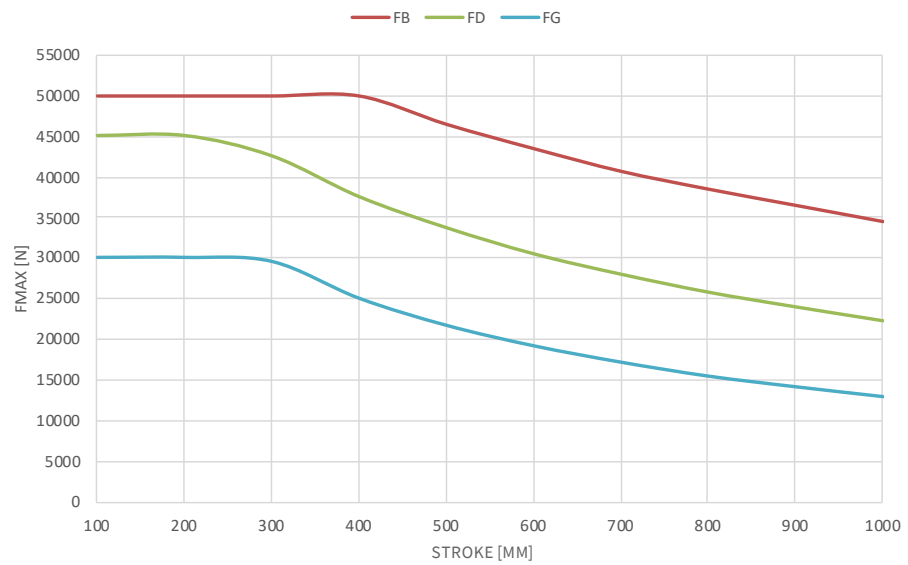
➤ Verify that the **maximum force** is allowed for the **strokes required by the application.**



SIZE 4
120 x 120



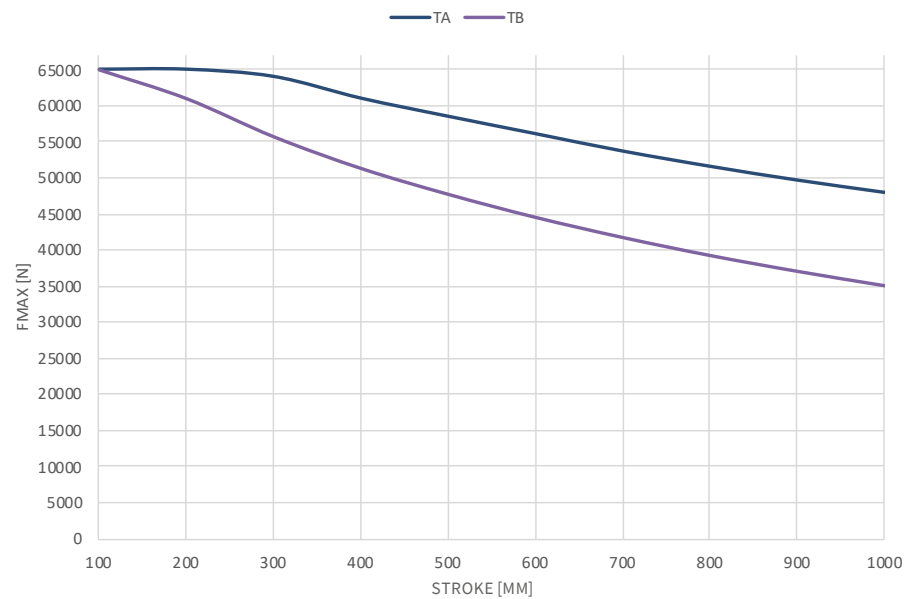
MAXIMUM FORCE (N)



SIZE 4
120 x 120



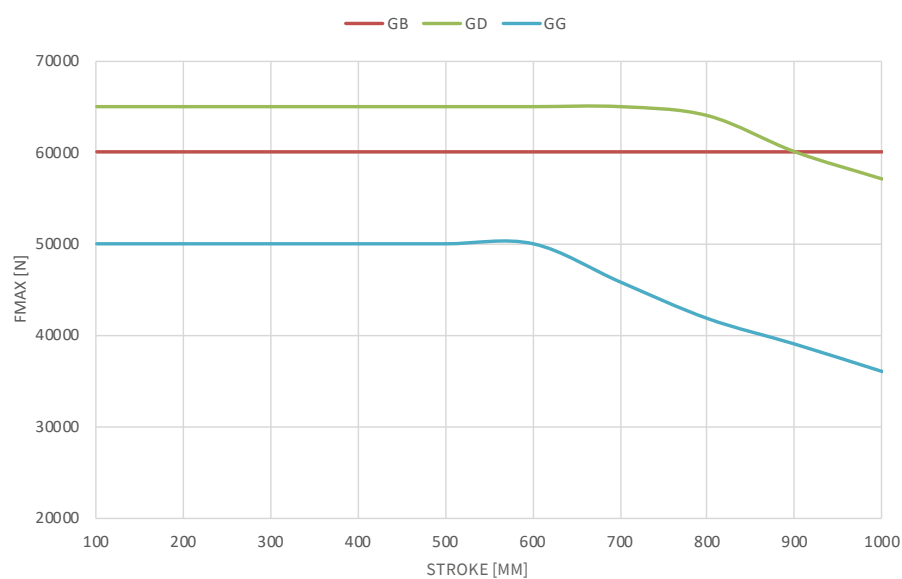
MAXIMUM FORCE (N)



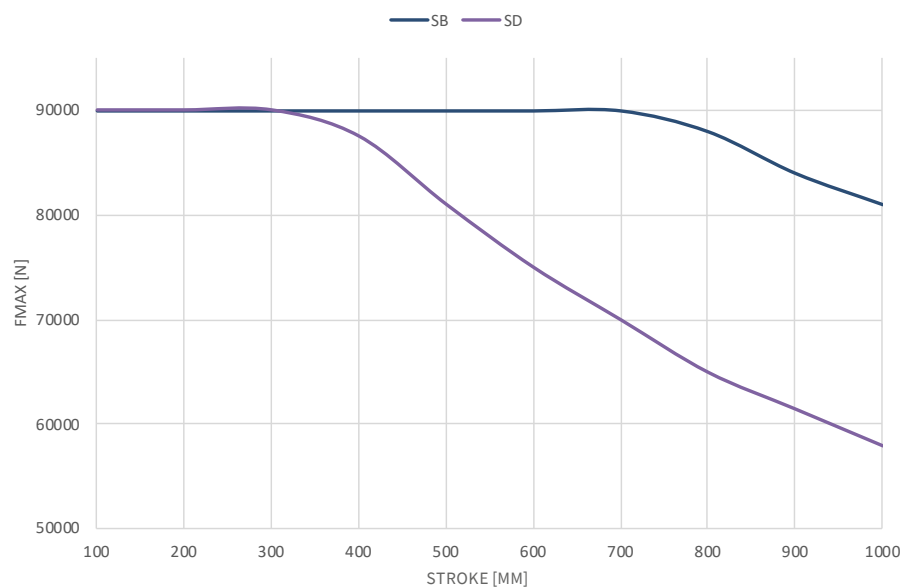
STEP 04: Maximum force/strokes



MAXIMUM FORCE (N)

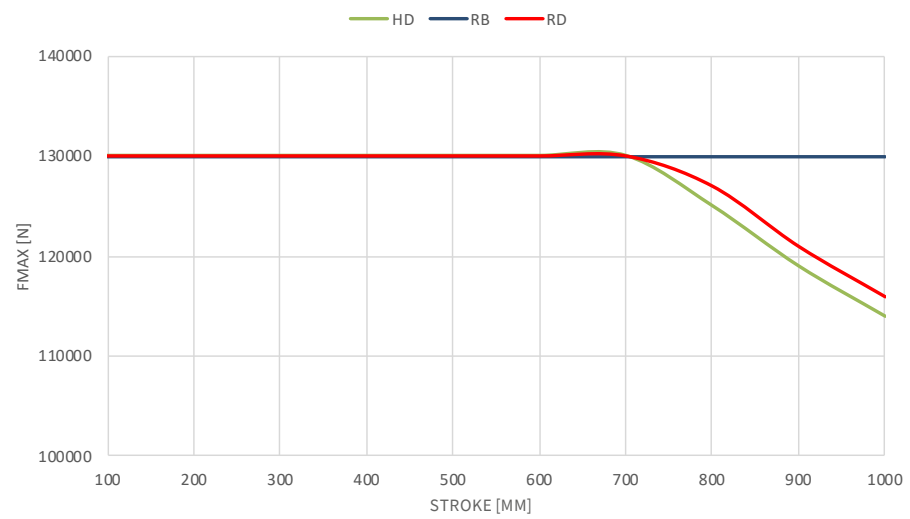


MAXIMUM FORCE (N)

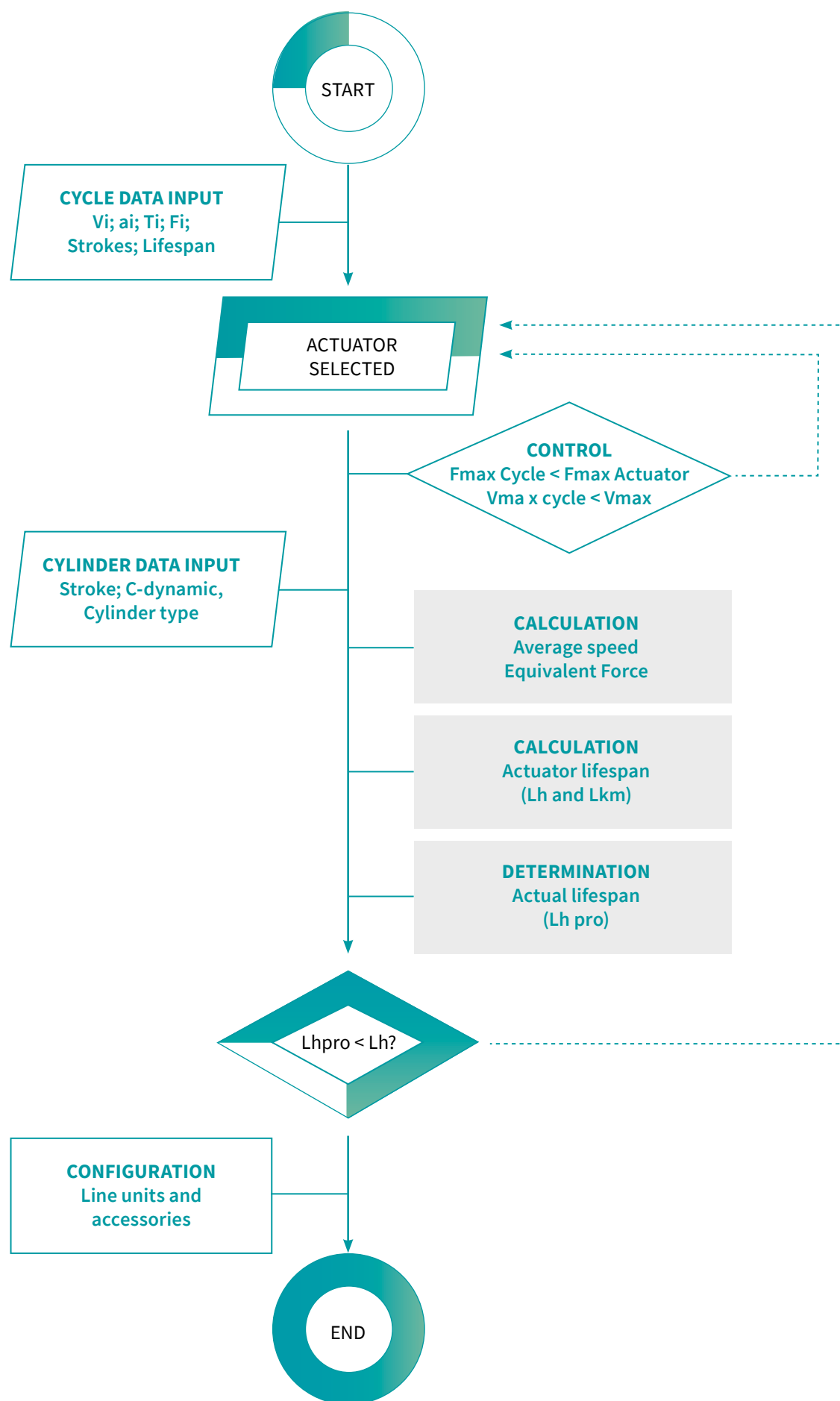




➤ Verify that the **maximum force** is allowed for the **strokes required by the application.**

**MAXIMUM FORCE (N)**

To obtain the code for your eco-electric cylinder, open the cover flap and fill in the fields marked at the top.



CHOOSING THE RIGHT ACTUATOR

Step by step guide to calculation and selection principles

01

CYCLOGRAM TIME
AND SPEED DEFINITION

02

CYCLOGRAM LOADING/MOVING AND LOADING
AXIAL EQUIPMENT DEFINITION

03

WORKING
ENVIRONMENT

04

ASSEMBLY
AND ACCESSORIES

05

LIFESPAN

01

CYCLOGRAM TIME AND SPEED
DEFINITION

In order to proceed, the **times and speeds necessary for handling mass must be identified**.

Handling must consider the accelerating and decelerating phase.

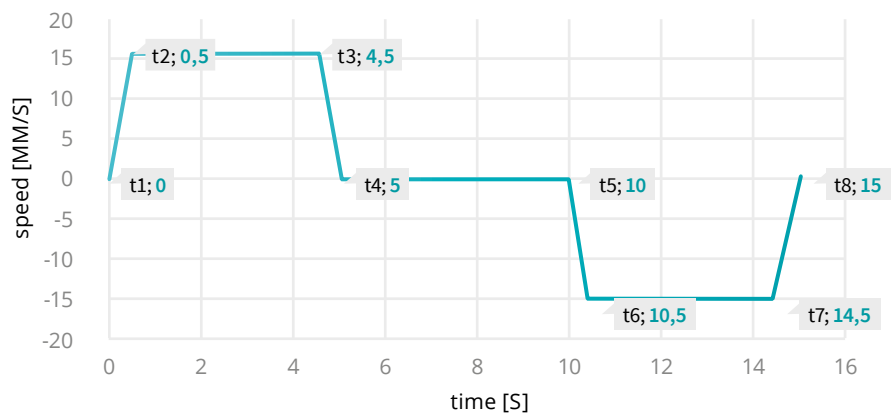
➤ It is therefore possible to calculate **acceleration** for a single phase of the cycle:

$$a_i = S_{i,max} / 1000 * t_i \left[\frac{m}{s^2} \right] \quad (1)$$

$S_{i,max}$ → maximum speed reached in a single interval [mm/s]

t_i → length of a single interval [s]

SPEED AND TIME



➤ The **average, linear or rotary speed** of the screw can on the other hand be calculated as follows:

$$S_{lin,average} = S_{tot} * 60 / T_{tot} * 1000 \left[\frac{m}{min} \right] \quad (2)$$

$$S_{rpm,average} = \frac{S_{lin,average} * 1000}{p} [rpm] \quad (3)$$

S_{tot} → total travelled (calculating round trip) in mm

p → travel in mm

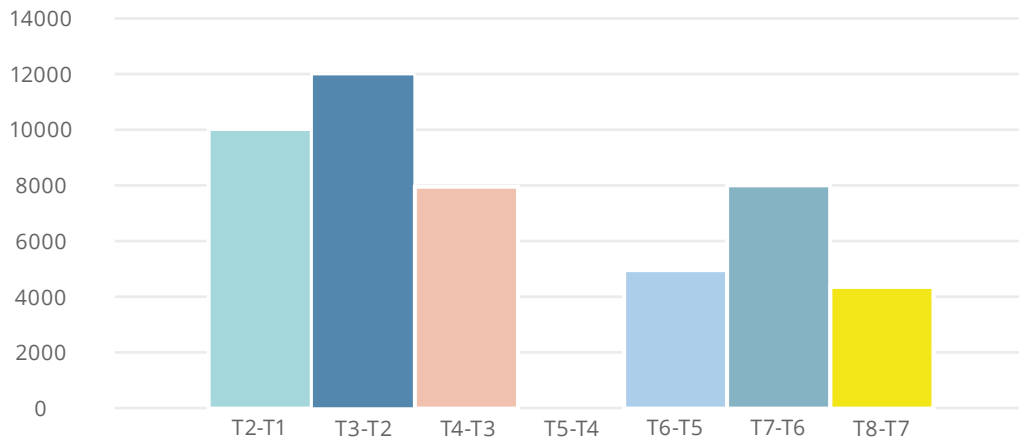
T_{tot} → total travel time (the time must NOT consider any pauses in seconds)

02

CYCLOGRAM LOADING/MOVING AND LOADING AXIAL EQUIPMENT DEFINITION

Understanding how the load is distributed along the stroke gives the **possibility of calculating an average load to avoid excessive oversizing of the axis**. This load average is the basis for calculating and verifying the life span.

LOAD PATTERNS



Above is an example of a cyclogram. Once this cycle has been defined, it is possible to define the AVERAGE LOAD.

➤ For a cyclogram composed of N parts, as in the figure, it is possible to define the following:

$$F_{eq} = \sqrt[3]{\frac{\sum_{i=1}^N F_i^3 * S_i}{\sum_{i=1}^N S_i}} \quad (4)$$

F_i → force developed for the relative interval

S_i → stroke relative to the interval

N.B. in the definition of forces the following should be considered.

The force acting in the interval consists of two inputs: the **force applied to the actuator + the inertias expressed by the translating masses**.

$$F_i = F_{i,app} + m_i * a_i \quad (5)$$

- F_i → force applied to the actuator in the single interval
- m_i → masses applied in the range of travel considered. For an initial check, the mass of the actuator itself should not be considered. However, subsequently, once the correct size has been established, the translating masses (see table 3) + masses of accessories must also be added
- a_i → acceleration of this interval calculated as in the previous point

➤ Having noted the force/velocity/displacement diagram, it is possible to **calculate the useful lifespan** of the actuator for this cycle:

LIFESPAN IN HOURS

$$L_H = 10^6 * \left(\frac{C_{din}}{F_{eq}} \right)^3 / 60 * S_{rpm,average} \quad [hours] \quad (6)$$

LIFESPAN IN KM

$$L_{km} = \left(\frac{C_{din}}{F_{eq}} \right)^3 * P \quad [km] \quad (7)$$

C_{din} →

See Tab.1, p.15

03

WORKING
ENVIRONMENT

The environment in which the cylinder is operated can have a great impact on its lifespan. Very high or very low temperatures can affect seals, lubrication and motor performance. Dirt, the presence of abrasives and chemicals can destroy seals and thereby damage screws over long periods. Check environmental conditions and contact the GTS Technical Office if necessary.

04

ASSEMBLY
AND ACCESSORIES

The assembly of an electric cylinder is one of the fundamental steps for guaranteeing the correct functioning of the actuator and its lifespan. A simple misalignment of the pusher rod can cause rapid wear of the tracks and ball screws. Furthermore, the presence of additional forces and inputs, induced during assembly or otherwise which are not in an axial direction, contribute to seizure and failure of the system. It is therefore necessary to appropriately choose the right section to be applied to the mobile section and the fixed part. GTS has developed a range of accessories that allow the actuator to be mounted safely, ensuring the tolerances required for assembly.

05

LIFESPAN

It is advisable to choose the actuator based on its useful lifespan. Inadequate verification may result in excessive over- or under-sizing.

The following should therefore be considered:

- How *many hours* a cylinder operates daily;
- Whether *breaks* occur between one cycle and another;
- How *many days* the cylinder operates weekly;
- How *many weeks* the cylinder operates yearly.

It is good practice to size the actuator for a useful lifespan that is not less than 20000H.

➤ However, for **non-strenuous and non-continuous** work cycles it is advisable to carry out checks taking breaks into consideration. The following should therefore be considered:

$$f_n = \frac{T_{tot}}{T_{pause} + T_{tot}} \quad (8)$$

f_n → service coefficient of the cycle used to identify to what extent the cylinder effectively works or not

T_{tot} → sum of the times in which the cylinder moves, between the outward and return journeys

T_{pause} → sum of the times in which the cylinder is immobile

➤ The **utilization factor** must then be determined:

$$f_{util} = \frac{(\text{hours per day})}{24} * \frac{(\text{days per week})}{7} * \frac{(\text{weeks per year})}{52} \quad (9)$$

➤ By doing so, the **lifespan of the installation** can be obtained:

$$L_{\text{installation}} = \frac{L_h}{f_n * f_{\text{util}}} \quad [h] \quad (10)$$

This parameter will be compared with the project duration, i.e. the actual duration from the installation of the machine.

MASS CALCULATION OF THE LINEAR UNIT

$$M_{\text{tot}} = M_{\text{fix}} + M_{\text{var}} * \text{stroke}$$

To this mass must be added the weight of:

- **Transmission**
- **Motor**
- **Epicyclic gear set** (where applicable)
- **Accessories**

TOTAL INERTIA TO BE CONSIDERED IN THE CALCULATION PHASE

The inertia to be considered is the result of four contributions:

- **lfix** = fixed inertia
- **stroke-dependent inertia** = $I_{\text{var}} * \text{stroke}$
- **load inertia** = **Icar** = transported load mass * transport coefficient
- **transmission inertia** = **Itrasm** = Gear set inertia (where applicable) + transmission inertia

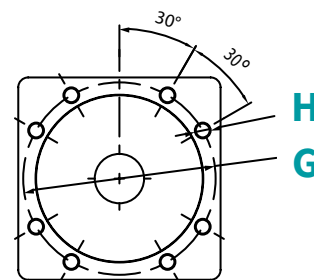
The *transport coefficient* is a parameter that allows for the determination of the torque needed to accelerate the load. It is a parameter that depends on the screw pitch and corresponds to:

screw pitch:	5	10	16	20	25	32	40
coefficient:	0.633	2.533	6.485	10.132	15.83	25.94	40.53

$$I_{\text{tot}} = I_{\text{fix}} + I_{\text{var}} * \text{stroke} + I_{\text{car}} + I_{\text{trasm}}$$

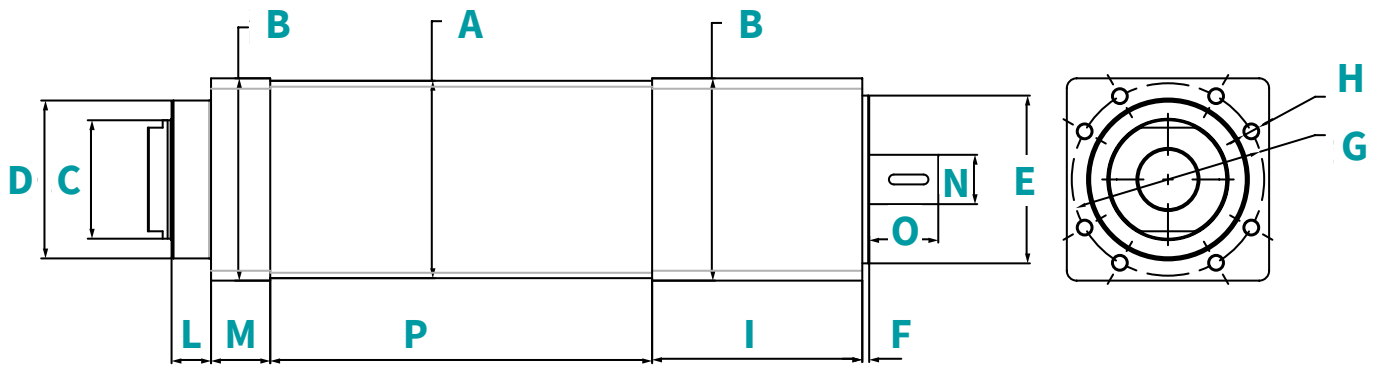
This value will be required for the purposes of calculating the motor.

LINEAR UNIT DIMENSIONS



SIZE SCREWS		A	B	C	D	E	F	G
		body	flange and bearing holder	ø pusher rod	ø front centering	ø rear centering	centering height rear	hole spacing fixing
SIZE 1 60X60	AA	60	61	40	53	50	7	62
	AB							
	AC							
	BA							
	BB							
	BD							
	ZA							
SIZE 2 80X80	DA	80	81	50	65	65	8	80
	DB							
	DD							
	CE							
	DF							
	VA							
	VB							
SIZE 3 100X100	EA	100	101	60	80	85	6	100
	EB							
	ED							
	EG							
	UA							
	UB							
SIZE 4 120X120	FB	120	122	80	95	100	5	116
	FD							
	FG							
	TA							
	TB							
SIZE 5 160X160	GB	160	165	100	130	130	7	156
	GD							
	GG							
	SB							
	SD							
SIZE 6 200X200	HD	200	205	120	160	170	7,5	195
	RB							
	RD							

Tab. 2 – Linear unit dimensions



H	I	L	M	N	O	P
fixing hole type	bearing carrier height	front centering height	front flange height	∅ transmission shaft	transmission shaft height	body height
M4	46	16	19	9	20	73 + stroke
				12	25	104 + stroke
						105 + stroke
M6	65	16	19	18	40	130 + stroke
						170 + stroke
						130 + stroke
						170 + stroke
						138 + stroke
M8	77	25	25	25	50	154 + stroke
						206 + stroke
						164 + stroke
M10	89	25	35	30	51	171 + stroke
						230 + stroke
					52	217 + stroke
M12	118	40	60	38	56	189 + stroke
						238 + stroke
				40	60	265 + stroke
m16	213	40	60	50	70	287 + stroke
						321 + stroke

Tab. 2 – Linear unit dimensions

TECHNICAL SPECIFICATIONS

SCREWS	Maximum force	Maximum speed	Admissible no. of revs
	Fmax [N]	Smax [m/min]	No. [rpm]
AA	6000	18	3600
AB	4500	35	3500
AC	3800	50	3125
BA	8000	18	3600
BB	6500	35	3500
BD	8000	60	3000
ZA	8000	15	3000
DA	13000	18	3600
DB	19000	35	3500
DD	12000	60	3000
CE	6500	75	3000
DF	12000	90	2813
VA	20000	15	3000
VB	20000	30	3000
EA	18000	18	3600
EB	40000	35	3500
ED	23000	60	3000
EG	23000	100	2500
UA	40000	15	3000
UB	40000	28	2800
FB	50000	25	2500
FD	45000	50	2500
FG	30000	80	2000
TA	65000	12	1200
TB	65000	24	1200
GB	60000	18	1800
GD	65000	35	1750
GG	50000	70	1750
SB	90000	12	1200
SD	90000	24	1200
HD	130000	25	1250
RB	130000	12	1200
RD	130000	24	1200

Tab. 3 – Summary of features

Fixed inertia	Variable inertia	Fixed mass	Variable mass
I _{fix} [kg*cm ²]	I _{var} [kg*cm ²]/100mm	M _{fix} [kg]	M _{var} [kg] /100mm
0,106	0,035	3,556	1,140
0,128	0,016	3,566	1,140
0,176	0,041	3,552	1,140
0,230	0,089	3,588	1,224
0,403	0,243	4,579	1,357
0,432	0,150	4,545	1,224
0,372	0,132	4,588	1,255
1,243	0,641	8,639	2,019
1,344	0,636	8,938	2,019
1,768	0,085	9,791	2,019
1,287	0,349	8,819	1,781
2,366	0,832	10,14	2,019
2,856	0,659	9,478	1,992
2,911	0,666	9,478	1,992
4,641	1,721	16,96	3,056
4,806	1,436	17,51	3,056
4,841	0,108	17,27	3,056
7,743	0,434	19,72	3,056
7,350	1,950	18,81	3,071
7,447	1,950	18,81	3,071
10,34	3,814	30,54	4,593
13,43	3,893	35,59	4,593
5,967	0,770	35,93	4,593
21,01	4,478	34,87	4,613
21,24	4,505	34,87	4,613
31,99	10,30	69,57	8,464
39,26	10,38	76,89	8,464
11,00	1,374	78,11	8,464
73,28	10,94	82,88	8,426
75,31	11,16	82,58	8,426
183,7	22,58	157,8	11,46
202,6	26,66	194,1	11,42
212,9	26,69	194,4	11,42

Tab. 3 – Summary of features

TRANSMISSION AND ACCESSORIES

Depending on the application, GTS provides the following solutions:

● **Linear unit without transmission** (the customer must oversee the appropriate mounting of motor attachments);

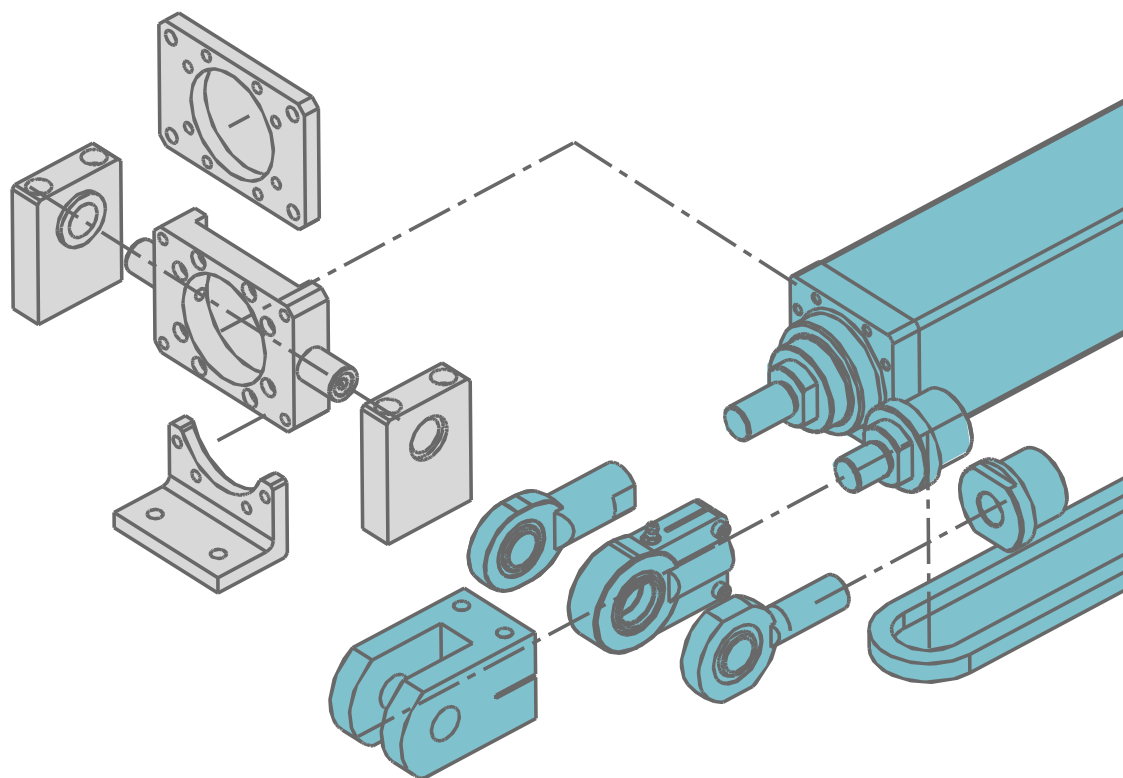
● **Inline transmission:** housing + coupling is supplied. An epicyclic gear set is also available on request (see table for technical characteristics);

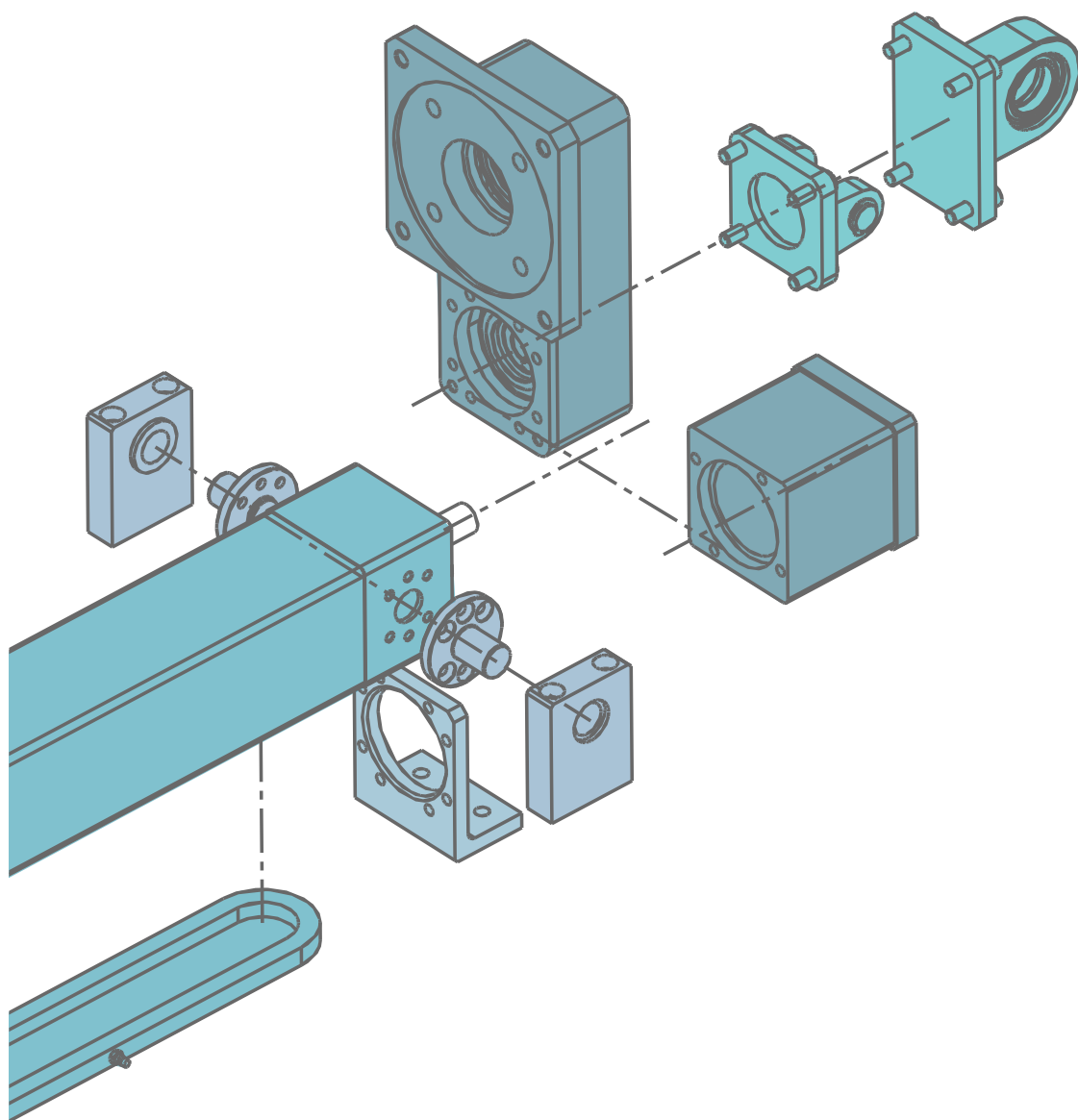
● **Returned transmission (two types):**

- belt-driven
- toothed wheels

The epicyclic gear set in line with the motor attachment is also available (see table for technical characteristics).

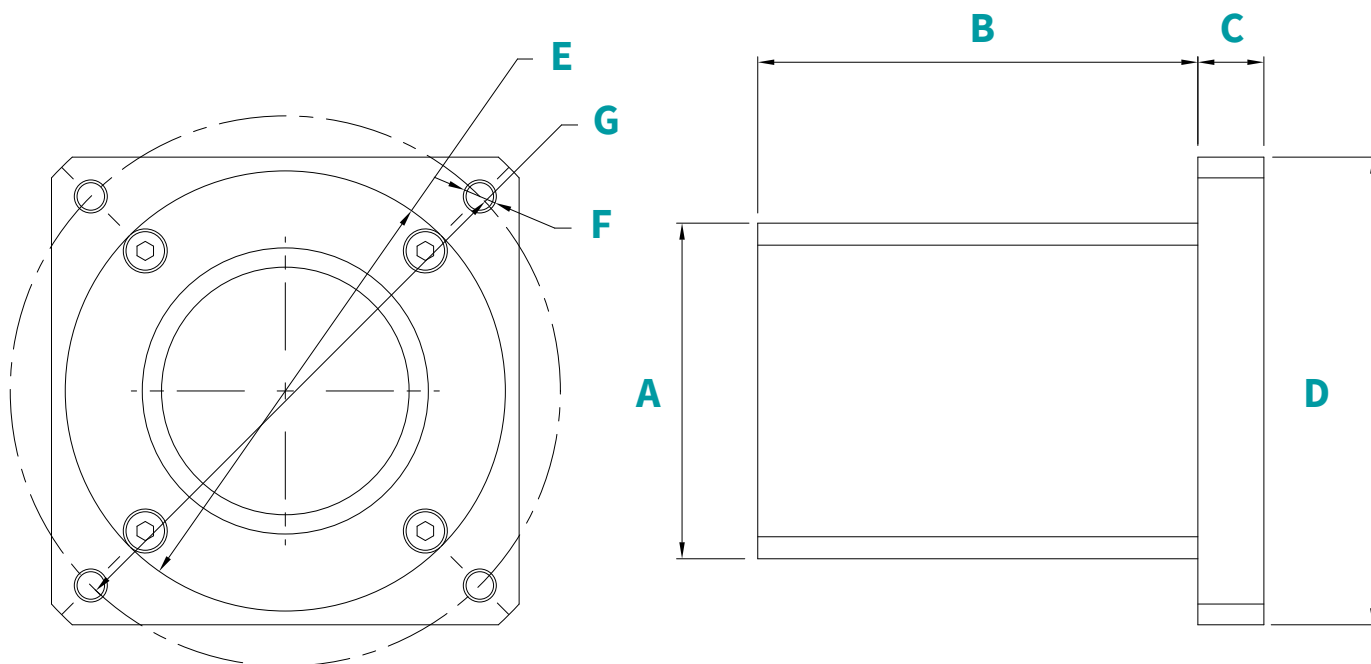
Technical characteristics and dimensions follow.

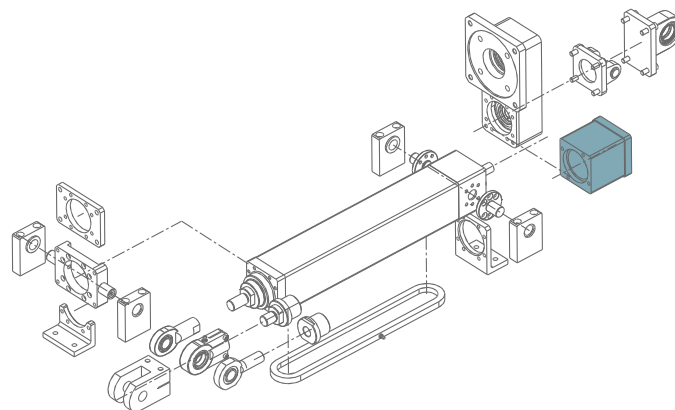




INLINE TRANSMISSION

With and without epicyclic gear set





SIZE	ORDER CODE	A	B	C	D	E	F	G
1	A	62	80	12	62	40 ↓4	4x M5	63
	B				85	80 ↓4	4x M6	100
2	A	82	80	12	85	80 ↓4	4x M6	100
	B			15	115	110 ↓4	4x M8	130
	C			18	142	130 ↓4	4x M10	165
3	A	101	100	15	115	110 ↓4	4x M8	130
	B			18	142	130 ↓4	4x M10	165
4	A	122	120	18	142	130 ↓4	4x M10	165
	B			22	190	180 ↓4	4x M12	215
5	A	165	160	22	190	180 ↓4	4x M12	215
	B			25	260	250 ↓4	4x M12	300
6	A	205	190	25	260	250 ↓4	4x M12	300

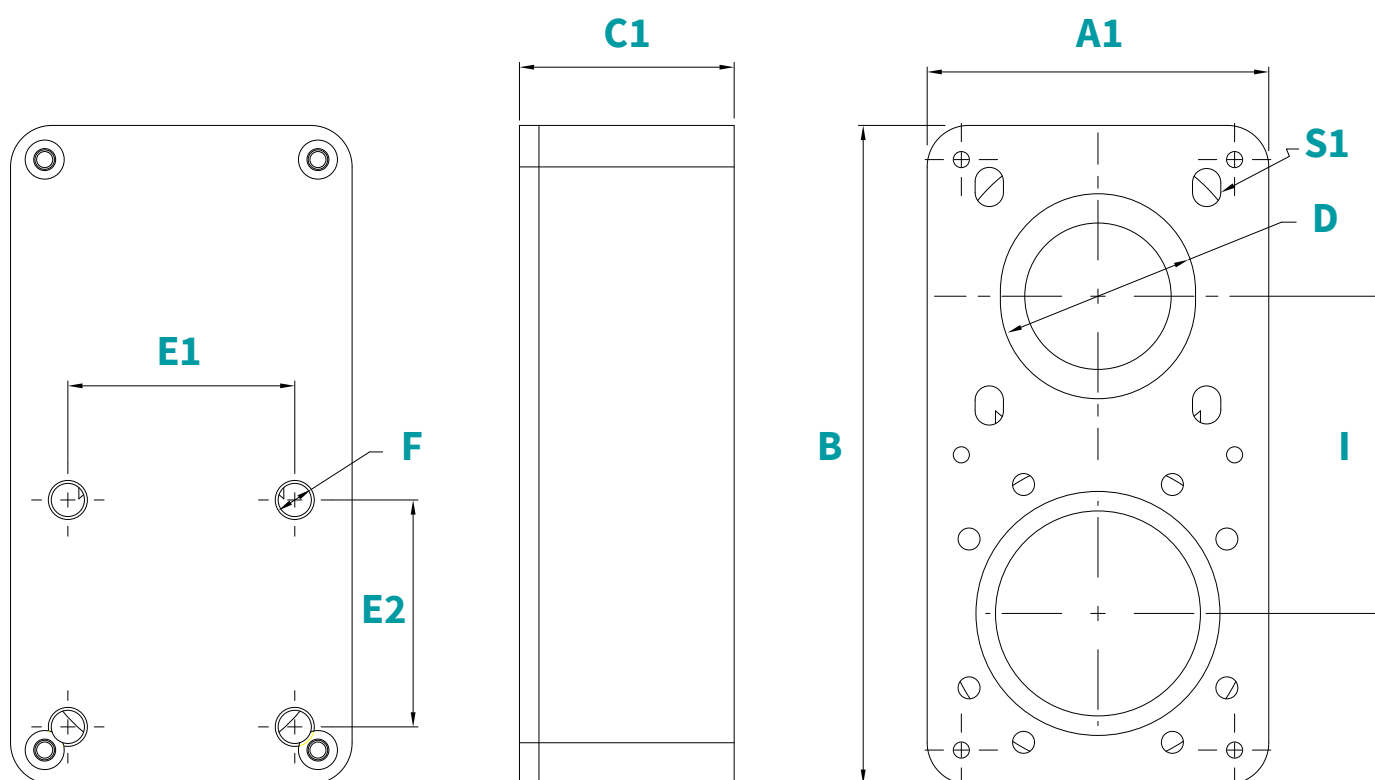
The actuator configured with inline transmission is supplied complete with a keyed joint.

INDICATE THE MOTOR FLANGE WITH THE APPROPRIATE CODE WHEN ORDERING. FOR SHAFTS DIFFERENT FROM THOSE PRESENT IN STANDARD MOTORS, INDICATE THE CRANKSHAFT DIAMETER SEPARATELY.

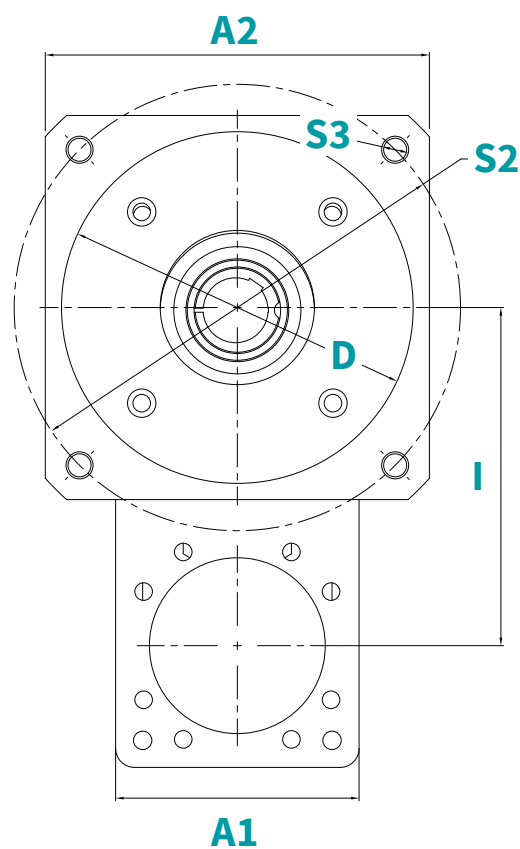
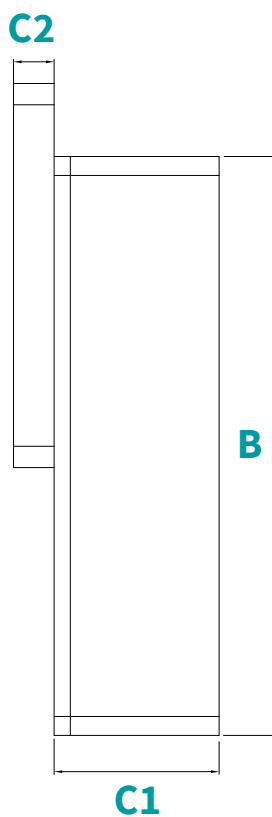
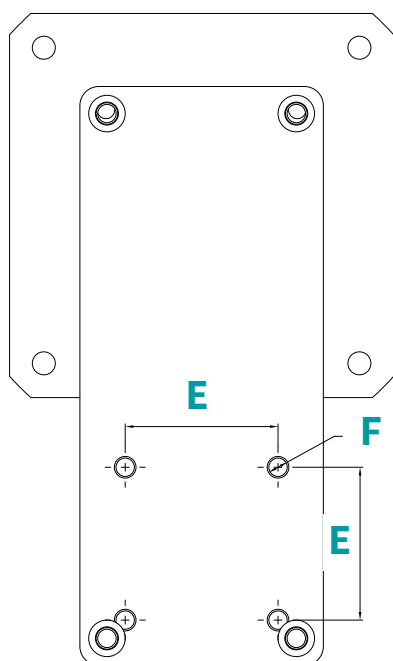
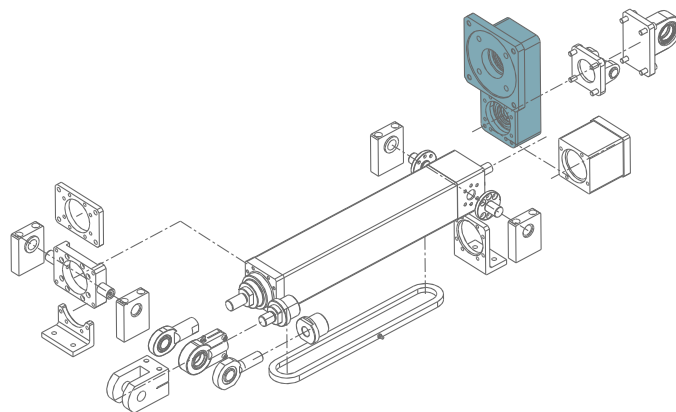
- Negligible joint inertia.
For the inertia values of the epicyclic gear set, refer to the specific EPICYCLIC GEAR SET SECTION.

BELT-DRIVEN TRANSMISSION

The actuator configured with belt-driven transmission is supplied complete with keyed pulleys and a transmission belt. **INDICATE THE MOTOR FLANGE WITH THE APPROPRIATE CODING WHEN ORDERING. FOR CRANKSHAFTS DIFFERENT FROM THOSE PRESENT IN STANDARD MOTORS, INDICATE THE SHAFT DIAMETER SEPARATELY.**



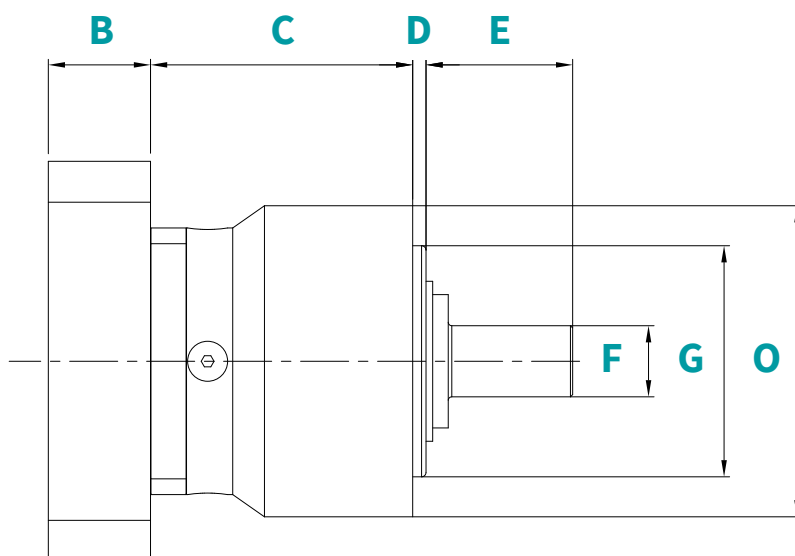
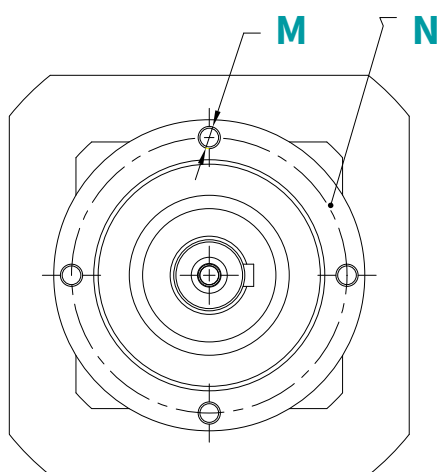
SIZE	HEIGHT OF MOTOR	ORDER CODE	A1	A2	B	C1	C2	D
1	32	D	70	-	135	44	-	40
	48	E		85	152,5		9,2	80
2	48	D	90	85	190	61	9,2	80
	63	E		115			12	110
	80	F		142			15	130
3	63	D	110	115	246	68	12	110
	80	E		142			15	130
4	80	D	130	142	294	71	15	130
	100	E		190				180
5	100	D	180	190	400	136	15	180
	130	E		260				250
6	130	D	220	260	476	145	15	250

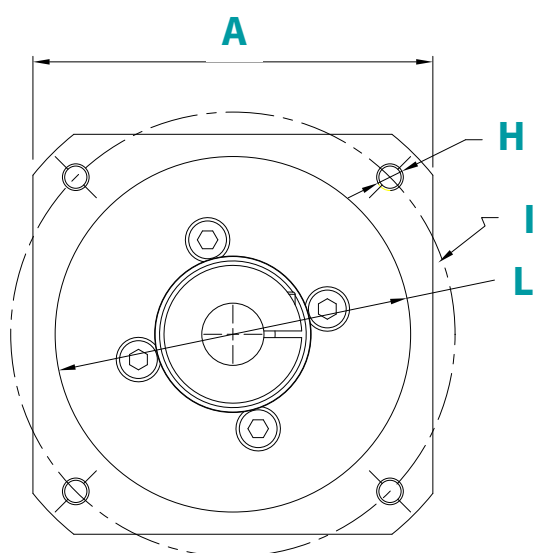
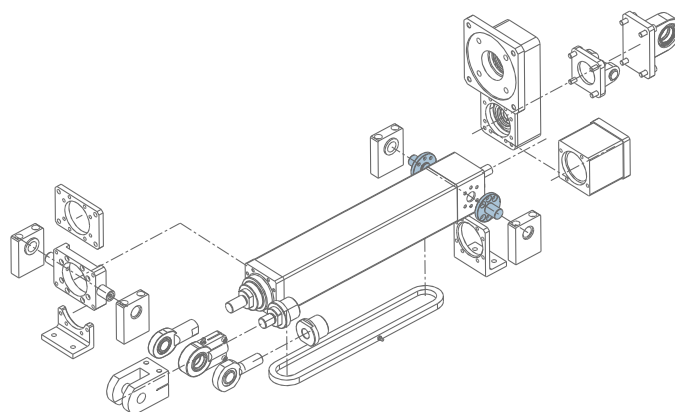


E1	E2	F	I	S1	S2	S3
46,5	46,5	4xM8	65	M5-Ø63	-	-
			82,5		100	4xM6
56,5	56,5	4xM8	100	-	100	4xM6
			125		130	4xM8
					165	4xM10
50	86,6	4xM8	136	-	130	4xM8
					165	4xM10
58	100,5	4xM10	164	-	165	4xM10
					180	4xM12
78	135,1	4xM12	220	-	180	4xM12
					250	4xM12
97,5	168,9	4xM16	256	-	250	4xM12

EPICYCLIC GEAR SET

Dimensions and characteristics





CODE	A	B	C	D	E	F	G	H	I	L	M	N	O	WEIGHT [kg]
PGII-60	90	23	55	3	32	14	40	M6	100	depht 4,1	M5	52	60	0,9
PEII-70	90	23	59	3	33	16	52	M6	100	depht 4,1	M5	62	70	1,5
PEII-90	115	31,5	79,5	4	42	22	68	M8	130	depht 5,3	M6	80	90	3
PEII-120	140	32	102	5	63	32	90	M10	165	depht 10,4	M8	108	120	7,5
PEII-155	190	108,5	100	8	89	40	120	M12	215	depht 6,25	M10	140	155	16,5
AF-180	190	102,5	138	6	84	55	160	M12	215	depht 6,25	13,5	215	182	30,5

G.T.S. S.r.l.

Type: 12-3210-0300AAM-G3428X1

S.N.: 7018-001-0003

Made in Italy





EPICYCLIC GEAR SET

Sizes and reduction ratios

SIZE 1 PGII-60	REDUCTION RATIO					
	3	4	5	7	8	10
INERTIA [Kg*cm ²]	0,128	0,092	0,08	0,069	0,067	0,065
Smax 50% Cnom, S1 [rpm]	4500	4500	4500	4500	4500	4500
Smax 100% Cnom, S1 [rpm]	4500	4500	4500	4500	4500	4500
Cnom [Nm]	28	38	40	25	18	15
Cmax [Nm]	45	61	64	40	29	24
Cemerg [Nm]	66	88	80	80	80	80
Backlash [arcmin]	< 10					
Weight [kg]	0,9					

SIZE 2 PEII-70	REDUCTION RATIO					
	3	4	5	7	8	10
INERZIA [Kg*cm ²]	0,174	0,117	0,095	0,078	0,074	0,069
Smax 50% Cnom, S1 [rpm]	4500	4500	4500	4500	4500	4500
Smax 100% Cnom, S1 [rpm]	3650	4100	4500	4500	4500	4500
Cnom [Nm]	28	33	30	25	18	15
Cmax [Nm]	45	53	48	40	29	24
Cemerg [Nm]	66	88	80	80	80	80
Backlash [arcmin]	< 10					
Weight [kg]	1,5					

EPICYCLIC GEAR SET

Sizes and reduction ratios

SIZE 3 PEII-90	REDUCTION RATIO					
	3	4	5	7	8	10
INERZIA [Kg*cm ²]	0,789	0,557	0,476	0,409	0,394	0,374
Smax 50% Cnom, S1 [rpm]	3250	3750	4000	4000	4000	4000
Smax 100% Cnom, S1 [rpm]	2300	2650	3200	4000	4000	4000
Cnom [Nm]	85	90	82	65	50	38
Cmax [Nm]	136	144	131	104	80	61
Cemerg [Nm]	180	240	220	178	190	200
Backlash [arcmin]	< 7					
Weight [kg]	3					

SIZE 4 PEII-120	REDUCTION RATIO					
	3	4	5	7	8	10
INERZIA [Kg*cm ²]	2,764	2,051	1,768	1,546	1,495	1,419
Smax 50% Cnom, S1 [rpm]	2650	2800	3100	3500	3500	3500
Smax 100% Cnom, S1 [rpm]	2050	2050	2200	3150	3500	3500
Cnom [Nm]	115	155	172	135	120	95
Cmax [Nm]	184	248	275	216	192	152
Cemerg [Nm]	390	520	500	340	380	480
Backlash [arcmin]	< 7					
Weight [kg]	7,5					



SIZE 5 PEII-155	REDUCTION RATIO		
	4	5	10
INERZIA [Kg*cm ²]	7,611	6,482	4,932
Smax 50% Cnom, S1 [rpm]	1800	2150	3000
Smax 100% Cnom, S1 [rpm]	1100	1350	3000
Cnom [Nm]	460	445	210
Cmax [Nm]	736	712	336
Cemerg [Nm]	920	890	420
Backlash [arcmin]	< 8		
Weight [kg]	16,5		

SIZE 6 AF180	REDUCTION RATIO					
	3	4	5	7	8	10
INERZIA [Kg*cm ²]	63,815	36,474	29,391	26,055	25	22,876
Smax 50% Cnom, S1 [rpm]	700	750	850	1200	1450	1900
Smax 100% Cnom, S1 [rpm]	500	550	550	850	1100	1550
Cnom [Nm]	1000	1300	1600	1300	1000	630
Cmax [Nm]	1600	2080	2560	2080	1600	1008
Cemerg [Nm]	2000	2700	3200	2600	2600	1350
Backlash [arcmin]	< 3					
Weight [kg]	30,5					



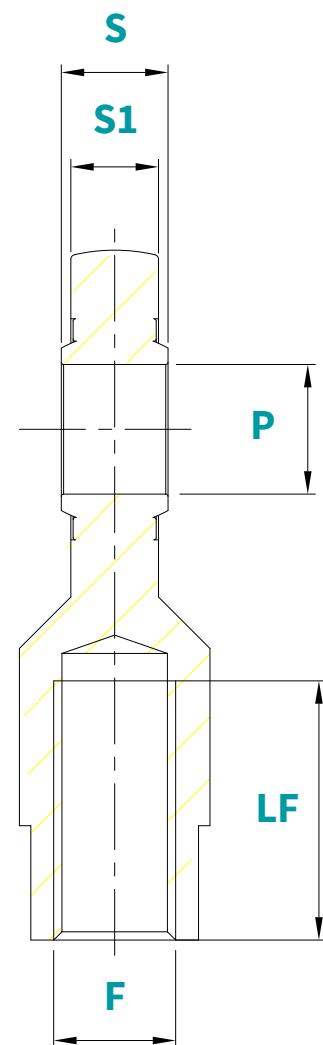
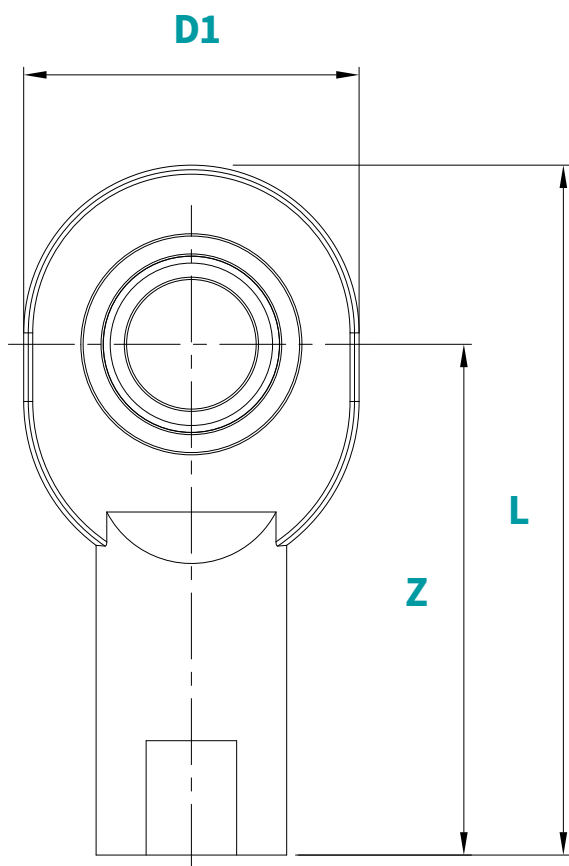
Accessories and screws

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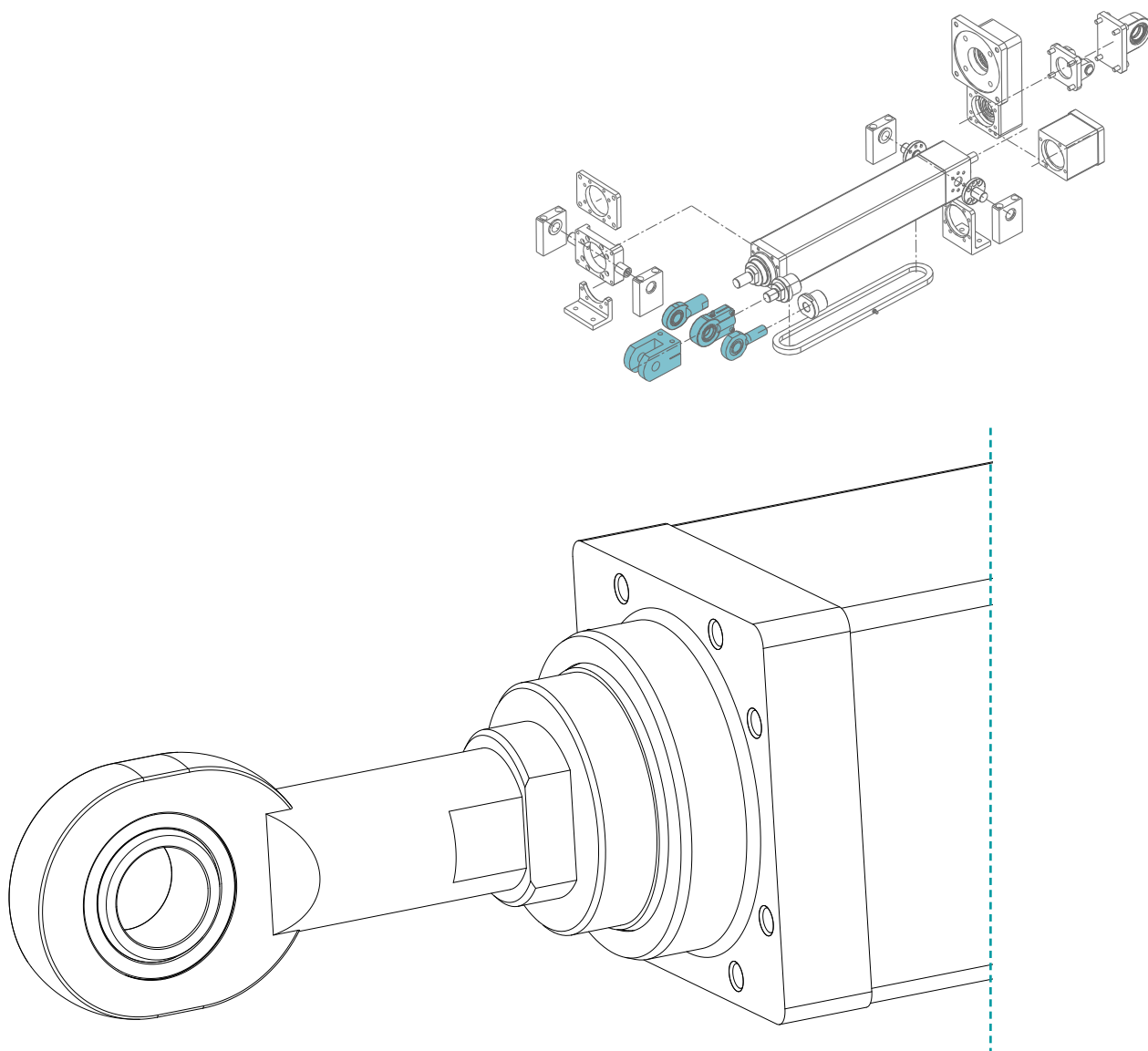
To obtain the code for your eco-electric cylinder, open the cover flap and fill in the fields marked at the top.

ROD ACCESSORIES

Standard male and female front joint



SECTION
A-A



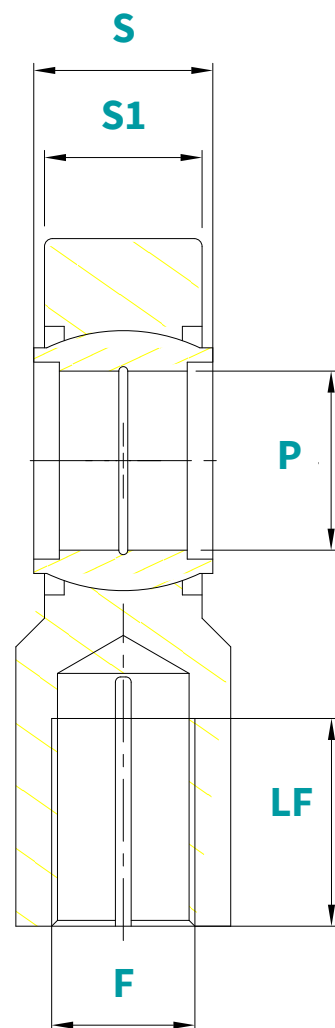
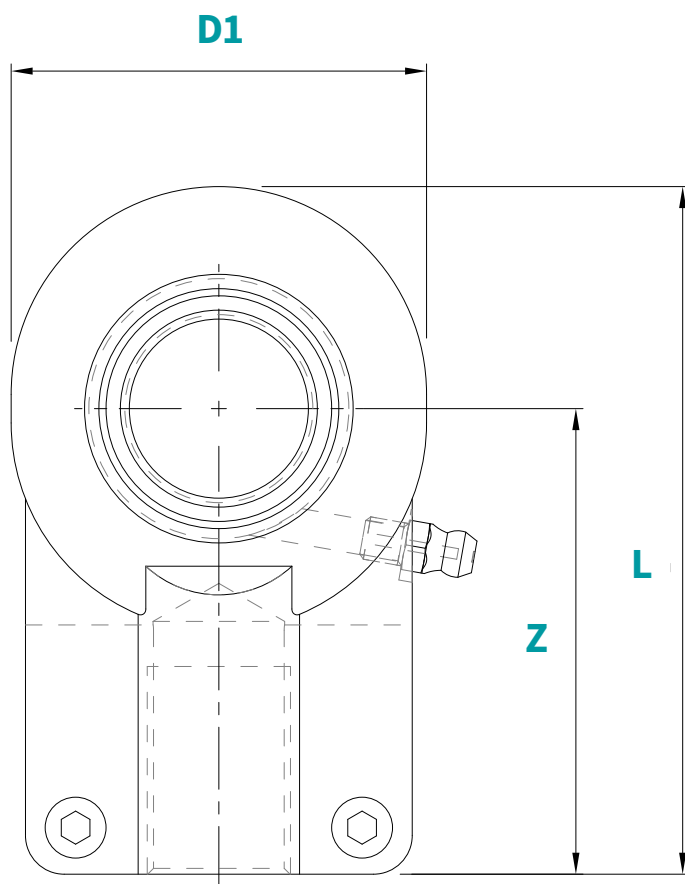
Material: carbon steel
(for stainless steel version contact our Technical Office)

Reference standard: ISO 12240-4 SERIE E TIPO M

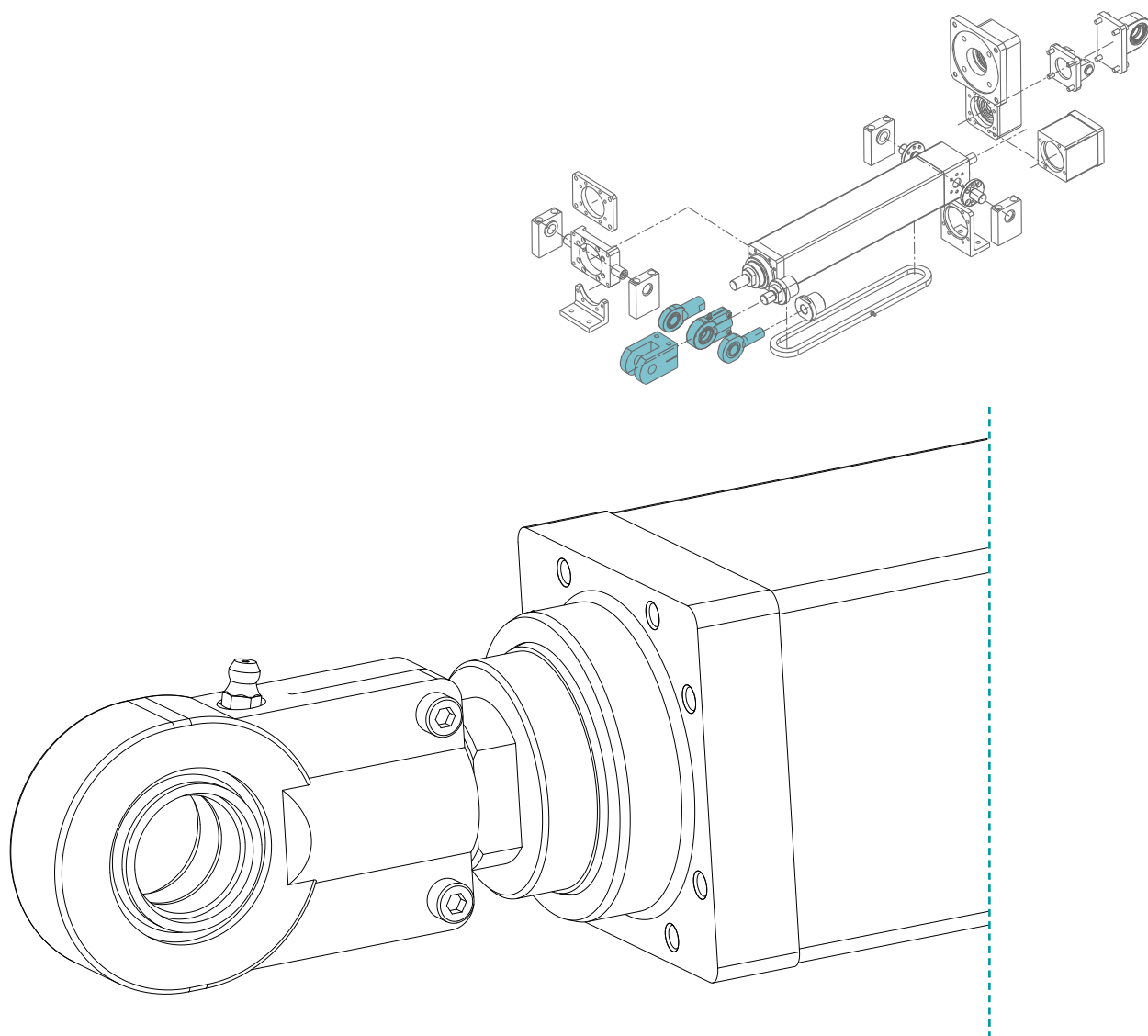
SIZE	ØP	Z	S	D1	S1	L	F	LF min	FC [kN]	weight [Kg]
1	17	67	14	46	11	90	M16x2	34	21,2	0,22
2	20	77	16	53	13	103,5	M20x1,5	40	30	0,35
3	30	110	22	73	19	146,5	M30x2	56	62	0,93
4	50	160	35	112	30	216	M45x3	69	156	3,5
5	60	175	44	135	38	242	M52x3	73	245	5,5
6	80	230	55	180	47	320	M64x4	85	400	12

ROD ACCESSORIES

Special female front joint



SECTION
A-A



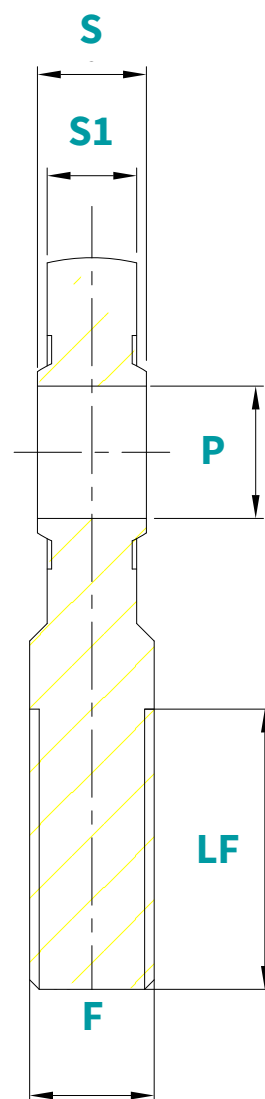
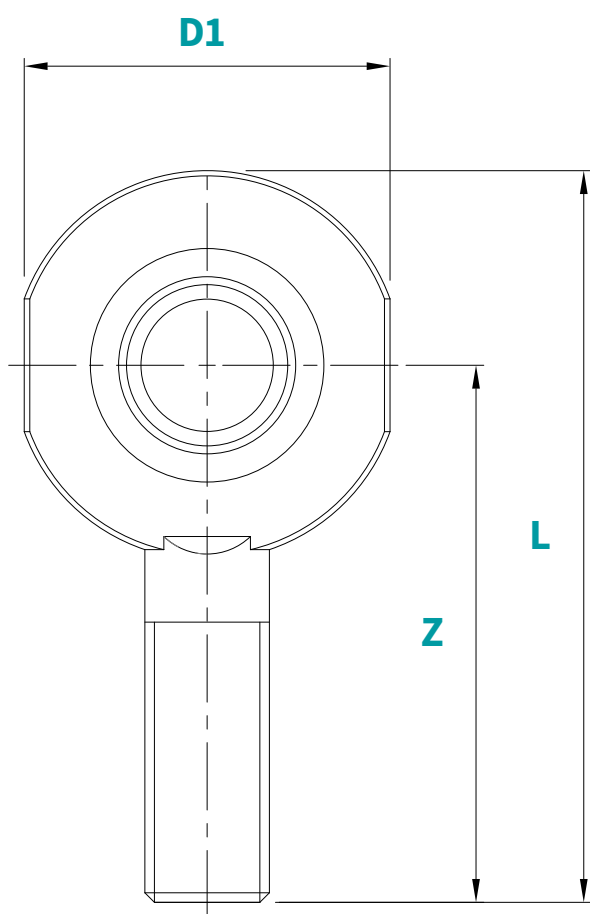
Material: carbon steel
(for stainless steel version contact our Technical Office)

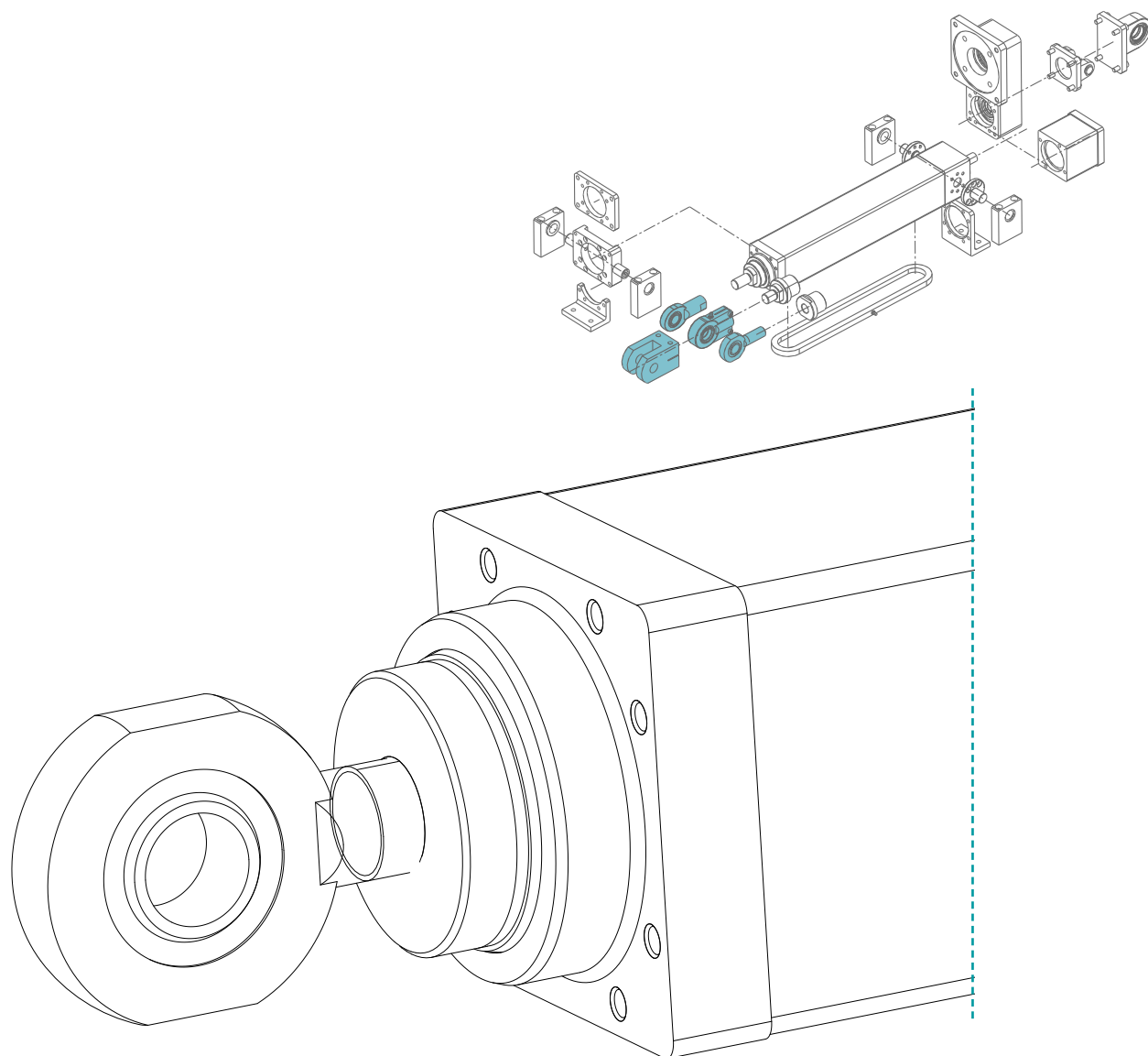
Reference standard: DIN 24338 – ISO 6982 – ISO 8132

SIZE	ØP	Z	S	D1	S1	L	F	LF min	FC [kN]	weight [Kg]
1	20	52	20	48	17,5	77	M16x1,5	23	30	0,35
2	25	65	25	59,5	22	96	M20x1,5	29	48	0,62
3	32	80	32	72	28	118	M27x2	37	67	1,15
4	50	120	50	110,5	42	179	M42x2	57	156	3,96
5	63	140	63	137,5	53,5	213	M48x2	64	255	6,8
6	80	180	80	171,5	68	270	M64x3	86	400	13

ROD ACCESSORIES

Standard male and female front joint





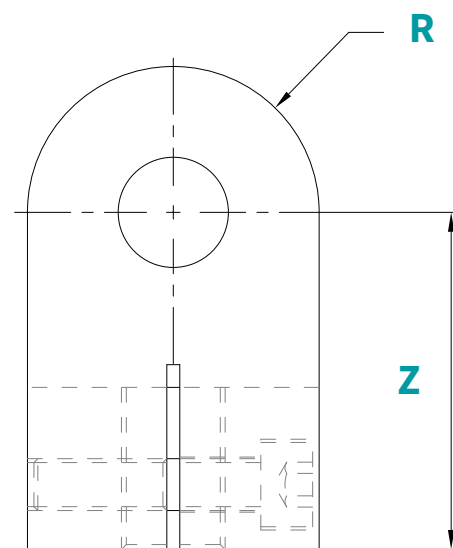
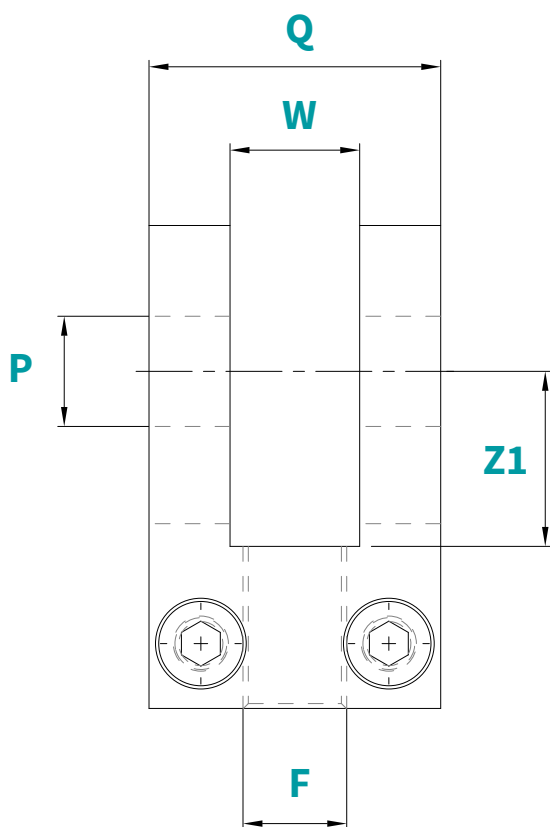
Material: carbon steel
(for stainless steel version contact our Technical Office)

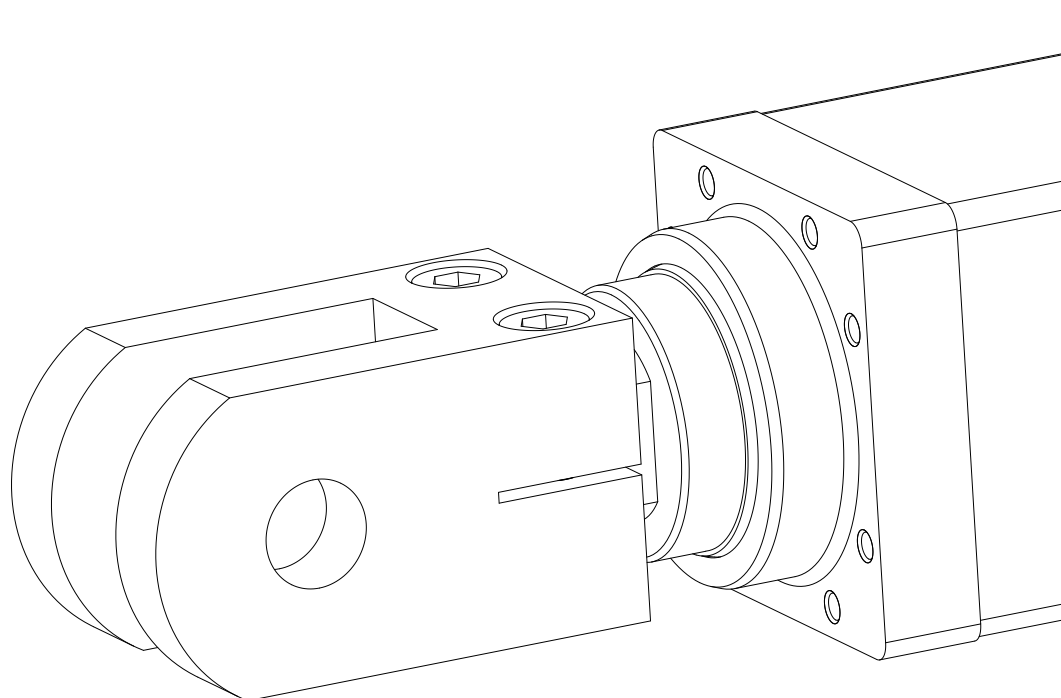
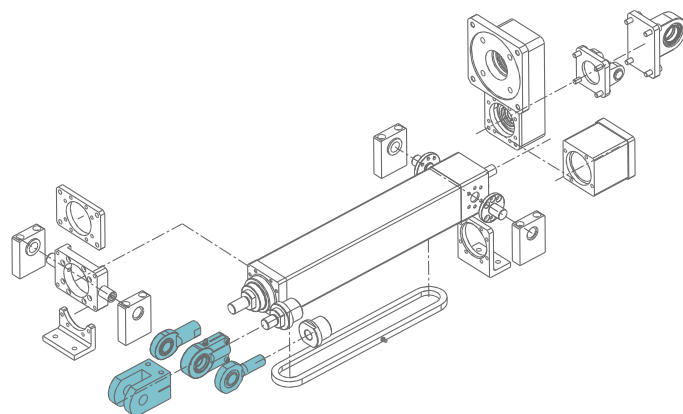
Reference standard: ISO 12240-4 SERIE E TIPO M

SIZE	ØP	Z	S	D1	S1	L	F	LF min	FC [kN]	weight [Kg]
1	17	69	14	46	11	92	M16x2	36	21,2	0,19
2	20	78	16	53	13	104,5	M20x1,5	43	30	0,31
3	30	110	22	73	19	146,5	M30x2	65	62	0,89
4	50	185	35	112	30	241	M45x3	106	156	3,4
5	60	210	44	135	38	277,5	M52x3	115	245	5,9
6	80	270	55	180	47	360	M64x4	140	400	13,1

ROD ACCESSORIES

Standard male and female front joint





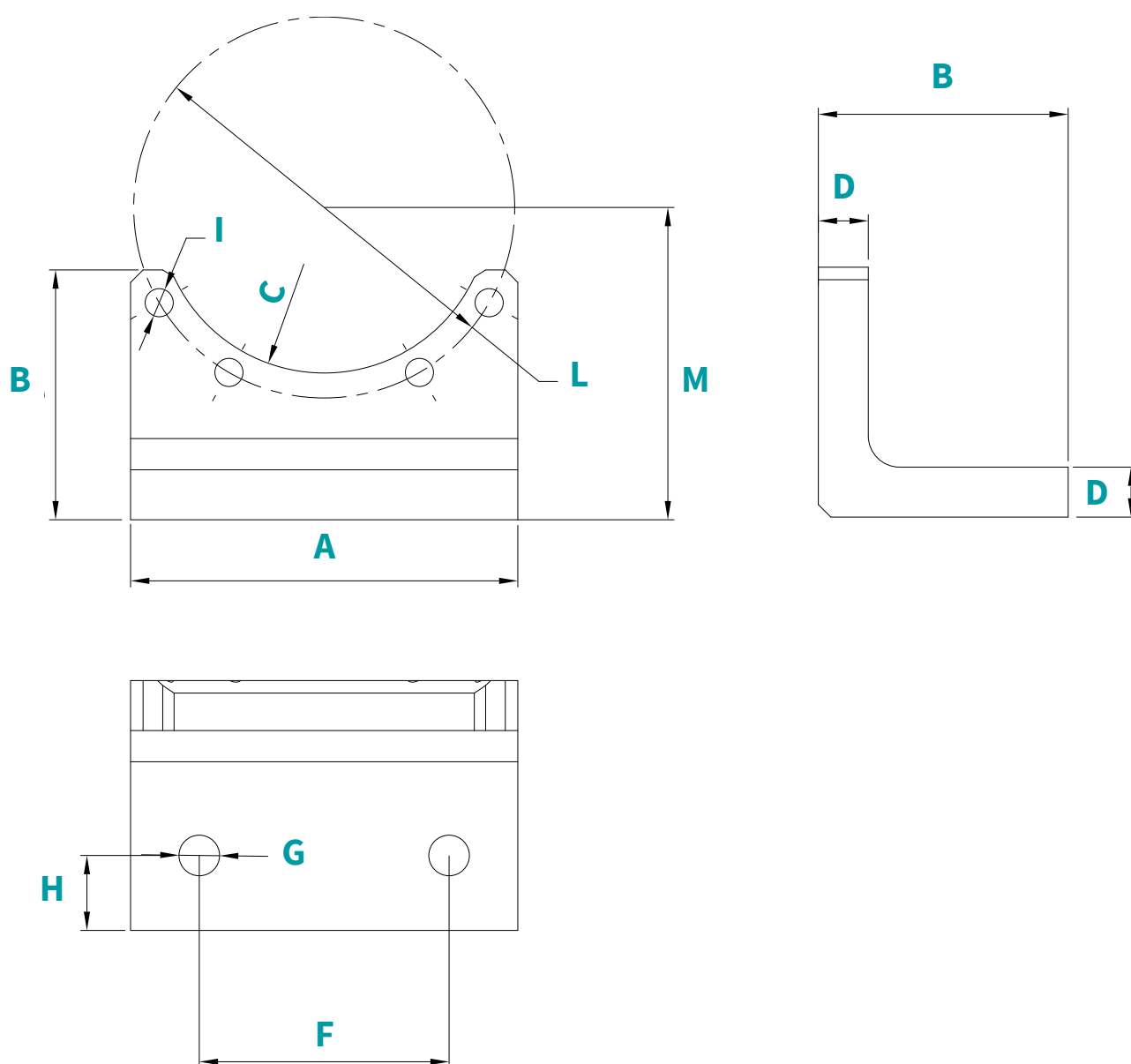
Material: carbon steel

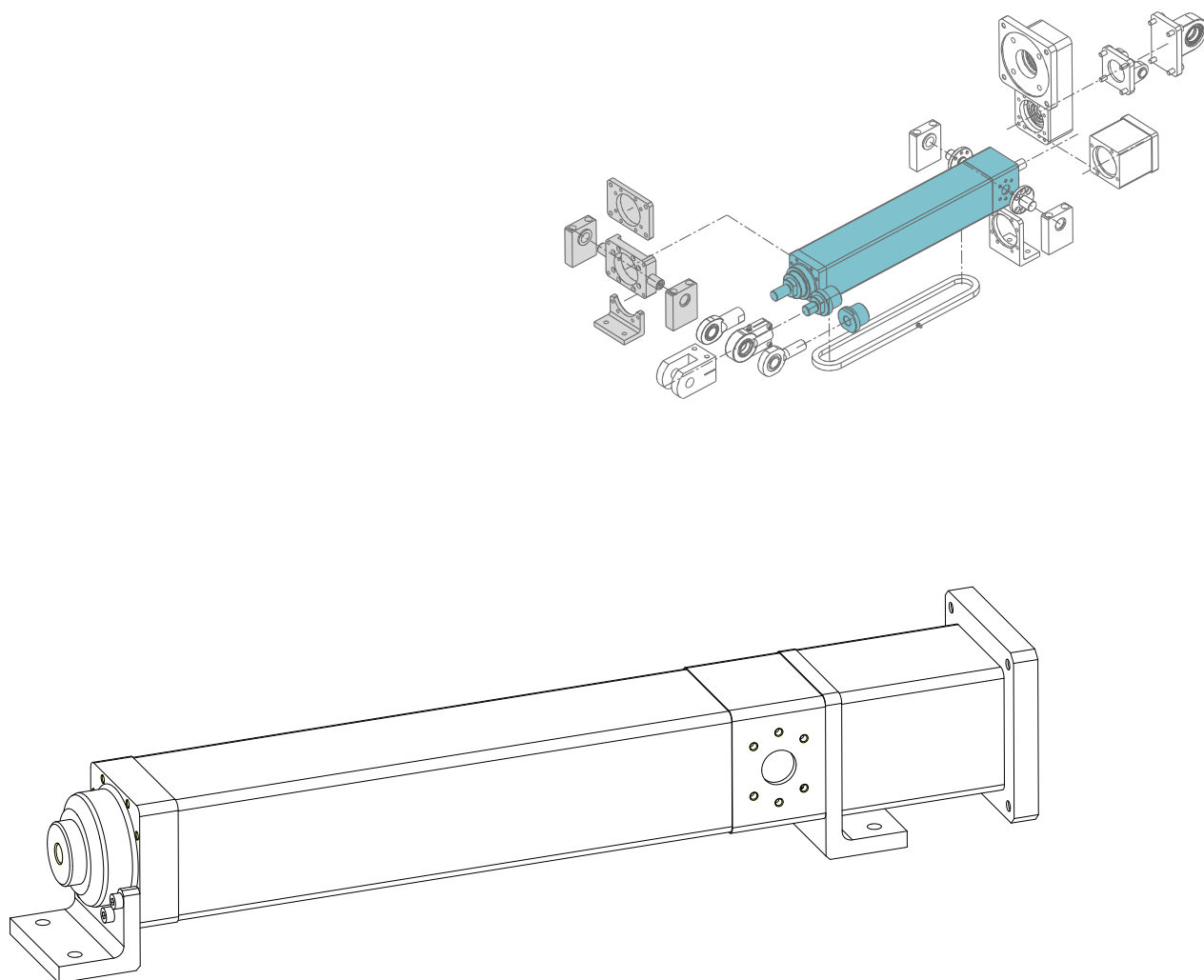
(for stainless steel version contact our Technical Office)

SIZE	ØP (H9)	Q	W	Z	Z1	F	R (max)	FC [kN]	FC [kN]	weight [Kg]
1	17	45	20	52	27	M16x2	25	20	0,53	0,22
2	20	56	25	65	34	M20x1,5	32	32	1,12	0,35
3	30	70	32	80	42	M30x2	40	50	2,18	0,93
4	50	110	50	120	64	M45x3	63	125	7,6	3,5
5	60	140	63	140	75	M52x3	71	200	17,7	5,5
6	80	170	80	180	94	M64x4	90	320	30,6	12

FRONT ACCESSORIES

Front and rear foot kit





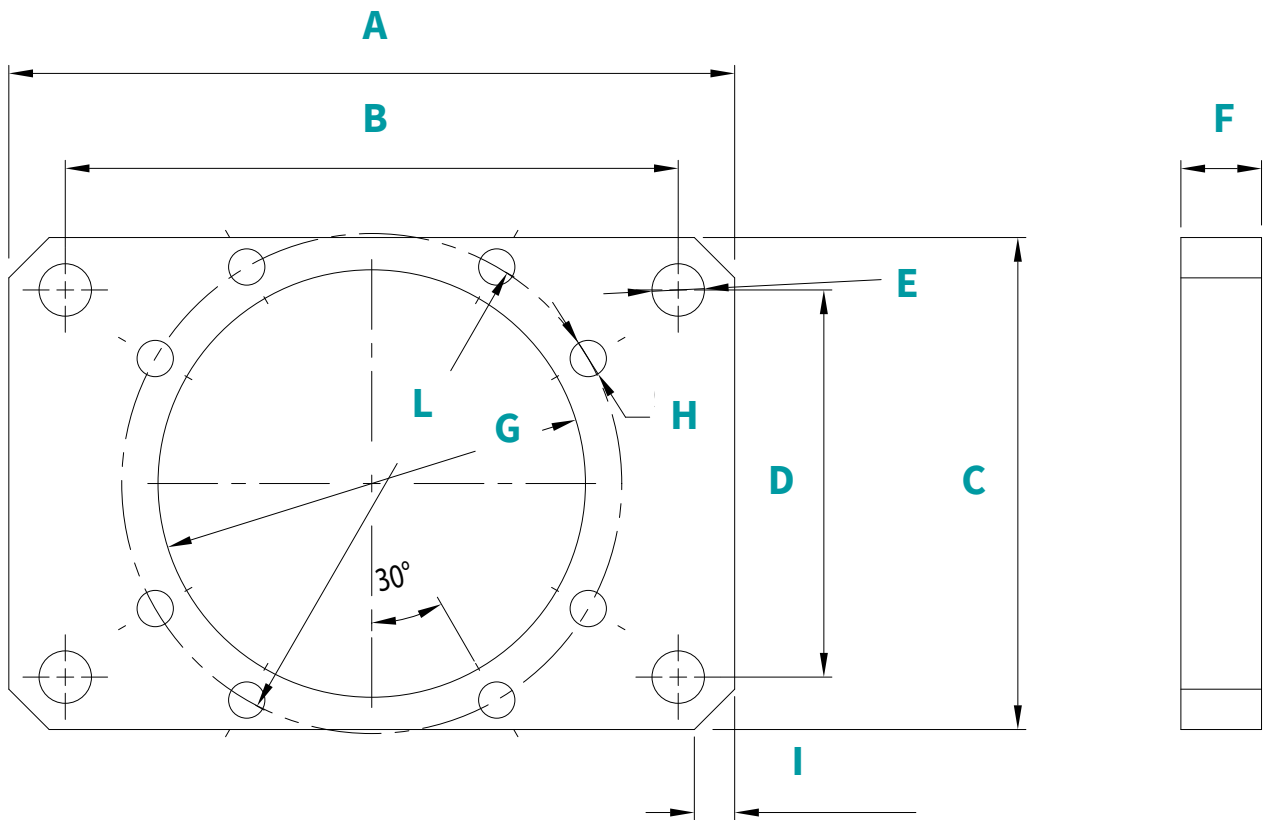
Material: carbon steel and 316 stainless steel

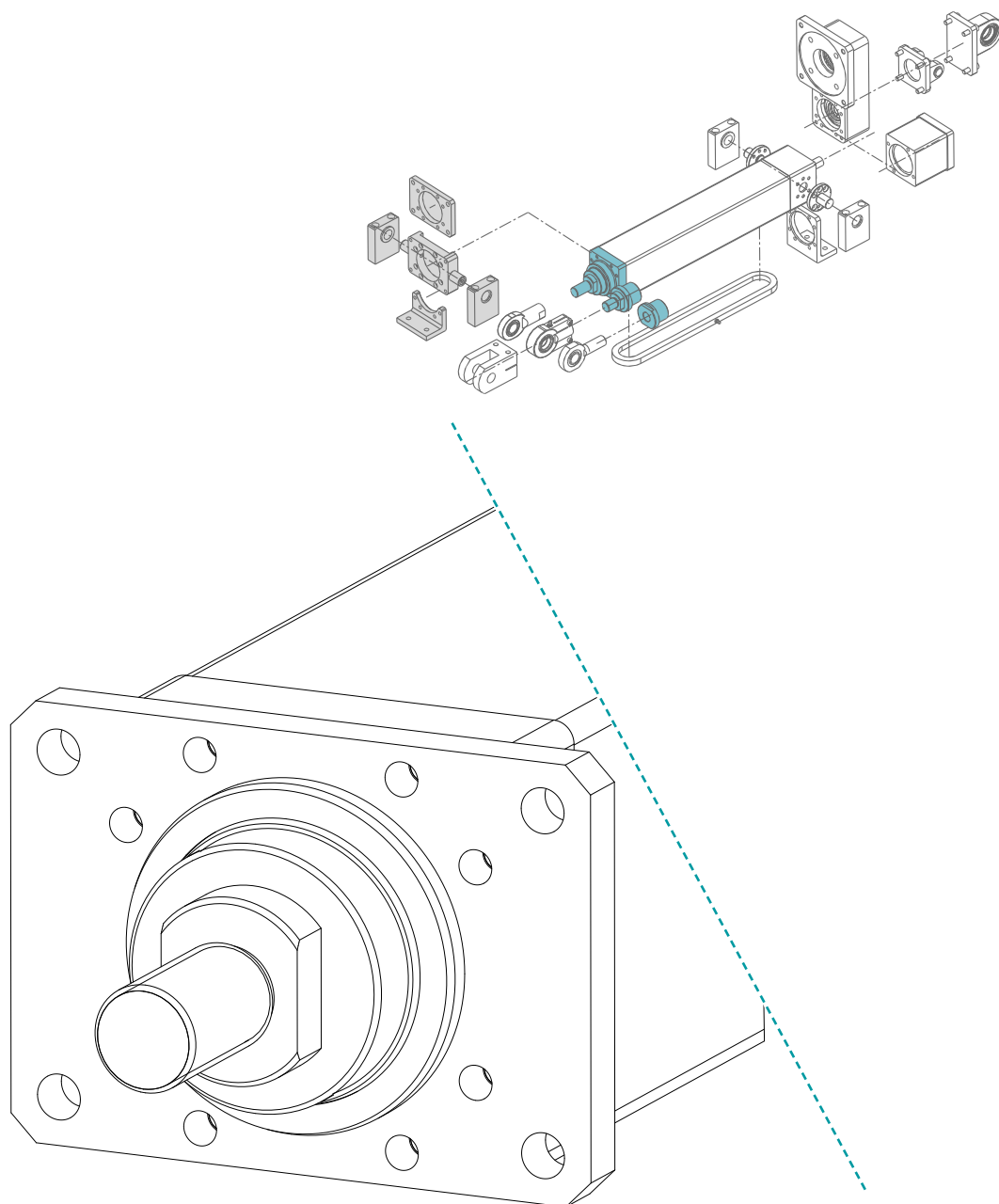
Reference standard: ISO 12240-4 SERIE E TIPO M

SIZE	A	B	r C	D	F	2x ØG	H	4x ØI	ØL	M	weight [Kg]
1	62	40	26.5	8	40	6.5	12	4.5	62	50	0.236
2	82	50	32.5	10	50	8.5	15	6.5	80	60	0.481
3	102	60	40	12	60	10.5	20	8.5	100	70	0.840
4	122	70	47.5	12	70	12.5	25	10.5	116	80	1.174
5	165	90	65	16	90	16.5	30	12.5	156	100	2.620
6	205	110	80	16	110	21	40	16.5	195	120	4

FRONT ACCESSORIES

Front flange without provision for rocker



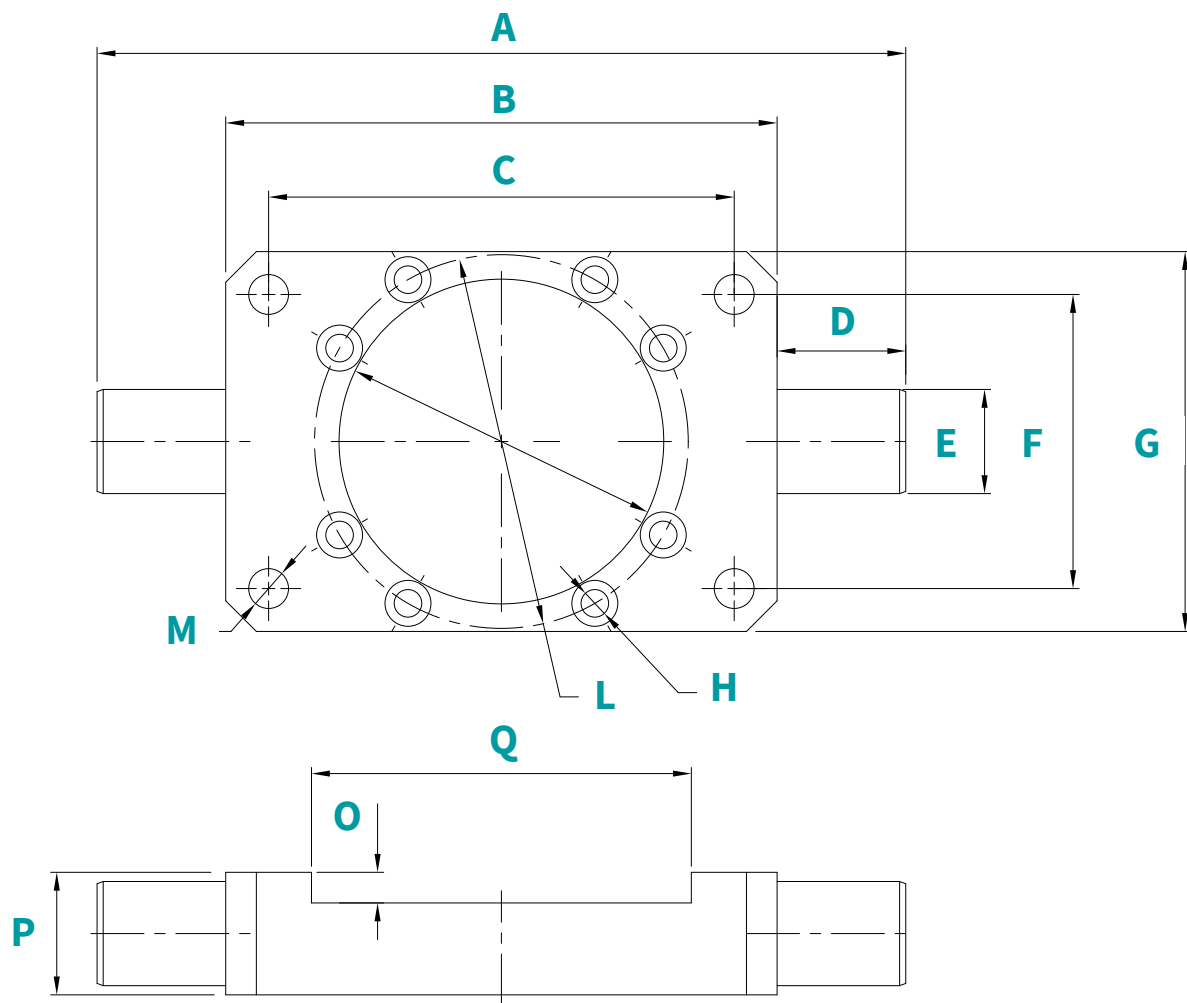


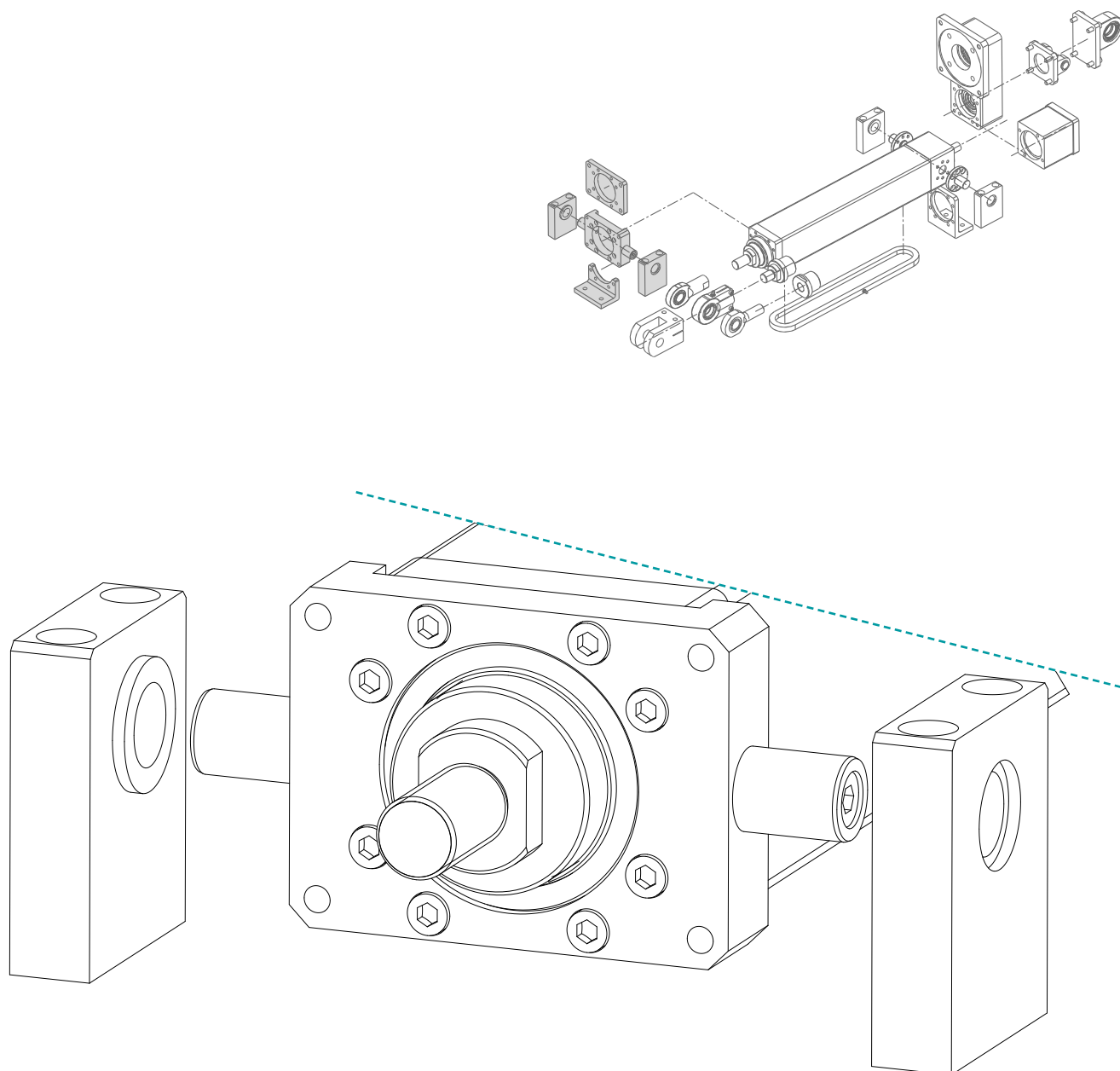
Material: carbon steel and AISI 316 stainless steel

SIZE	A	B	C	D	4x ØE	F	ØG (H7)	8x ØH	I	ØL	weight [Kg]
1	90	76	61	48	6.5	10	53	4.5	5	62	0,234
2	115	96	82	64	8.5	12	65	6.5	5	80	0,526
3	140	121	102	83	10.5	15	80	8.5	5	100	0,992
4	170	146	122	98	12.5	20	95	10.5	5	116	1,955
5	220	192	165	137	16.5	25	130	12.5	5	156	4.159
6	275	240	205	170	20.5	30	160	16.5	5	195	7.836

FRONT ACCESSORIES

Front flange with provision for rocker



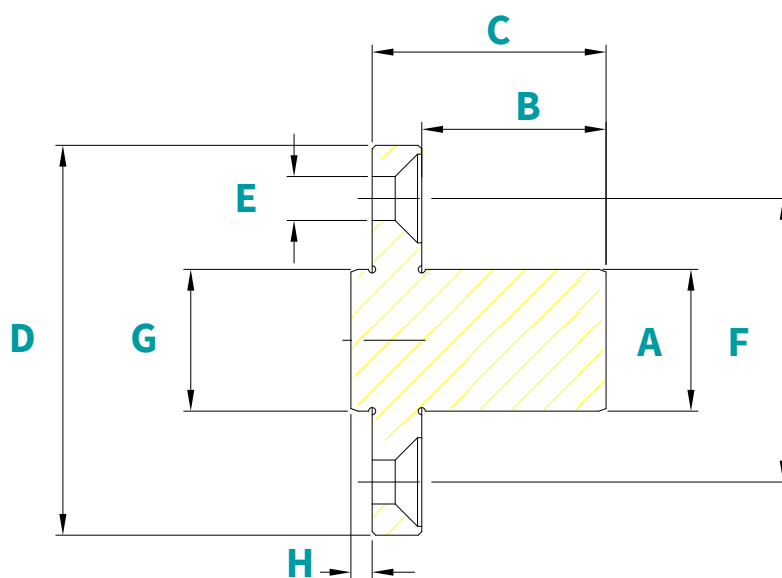
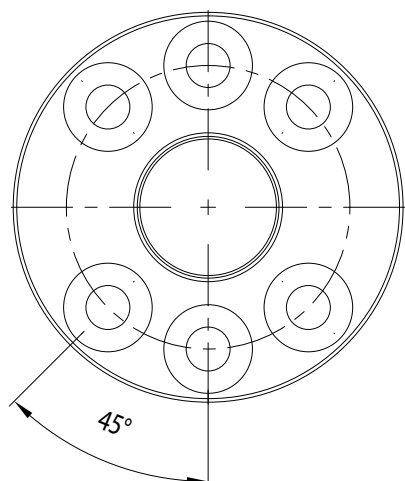
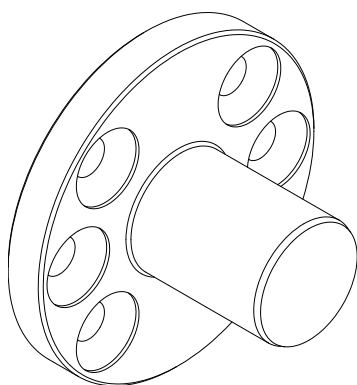


Material: carbon steel and AISI 316 stainless steel

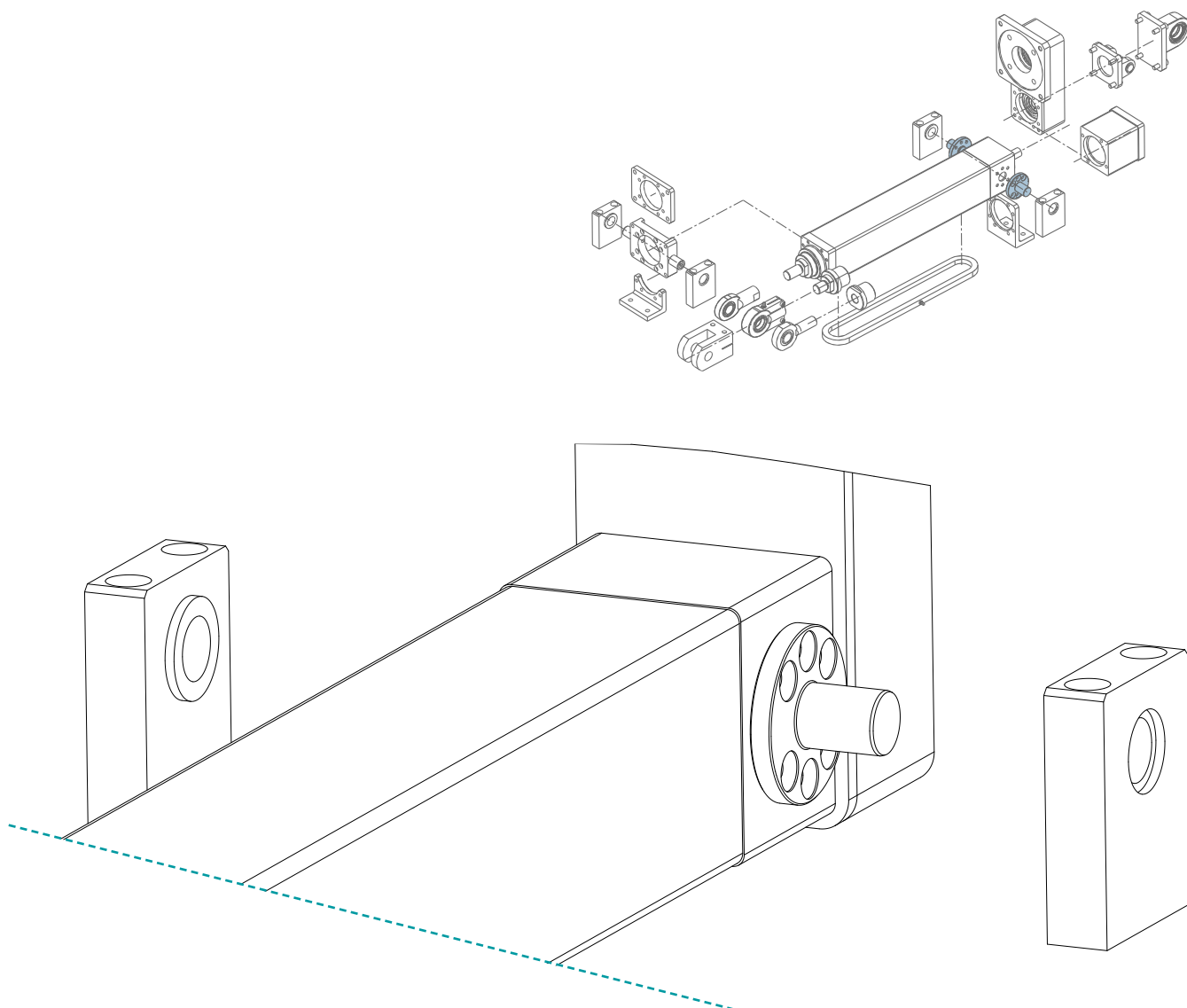
SIZE	A	B	C	D	ØE (f7)	F	G	8x ØH	ØI (H7)	ØL	4x ØM	O	P	Q	weight [Kg]
1	132	90	76	21	17	48	62	4,5	53	62	6,5	5	20	62	0,48
2	162	110	96	26	20	68	82	6,5	65	80	8,5	8	25	82	0,93
3	210	140	121	35	30	83	102	8,5	80	100	10,5	10	35	102	2,24
4	260	170	146	45	40	98	122	10,5	95	116	12,5	10	35	122	3,61
5	324	220	192	52	50	137	165	12,5	130	156	16,5	20	60	165	9,330
6	415	275	240	70	60	170	205	16,5	160	195	20,5	20	60	205	15,38

ACCESSORIES FOR REAR ATTACHMENT

Side rocker + foot kit



SEZIONE / SECTION
A-A

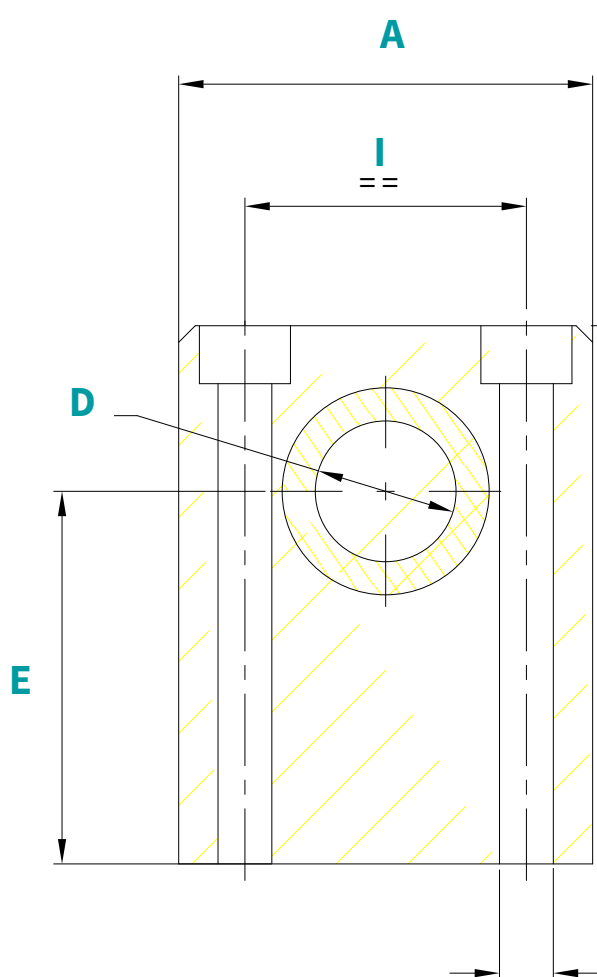
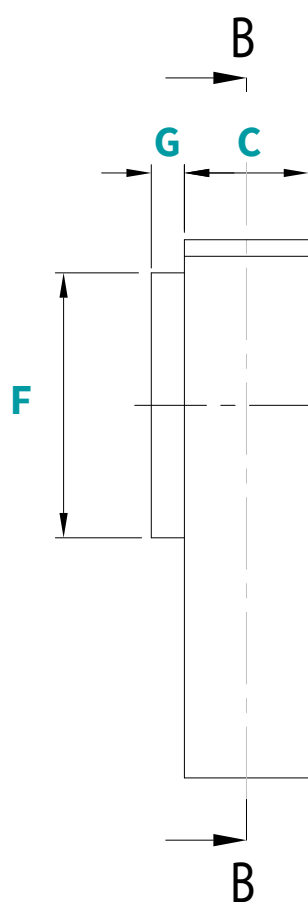


Material: carbon steel and AISI 316 stainless steel

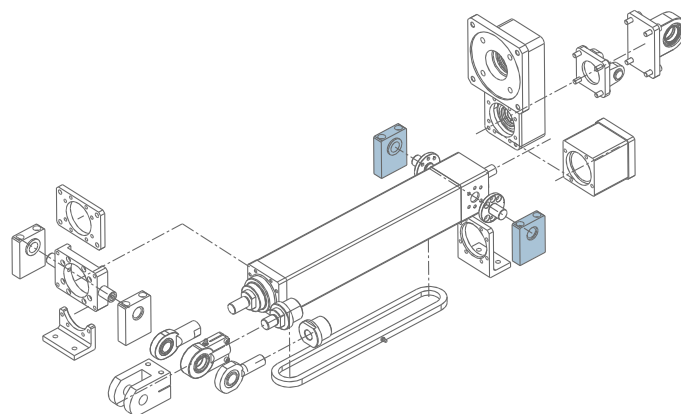
SIZE	ØA (g6)	B	C	ØD	ØE	ØF	weight [Kg]
1	17	21	27	45	4,2	35	0,110
2	20	26	33	55	6,2	45	0,183
3	30	35	45	72	8,2	54	0,484
4	40	45	61	90	10,2	65	1,179
5	50	52	70	110	12,2	80	2,057
6	60	70	93	140	16,2	100	4,161

ACCESSORIES FOR REAR ATTACHMENT

Side rocker + foot kit



SEZIONE / SECTION
B-B

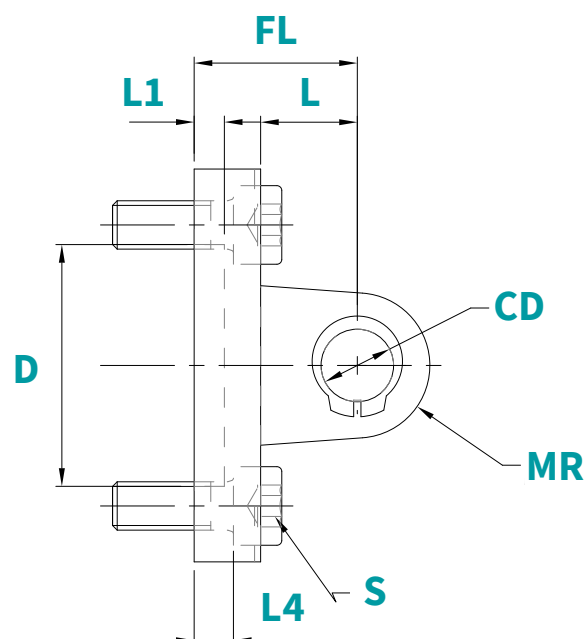
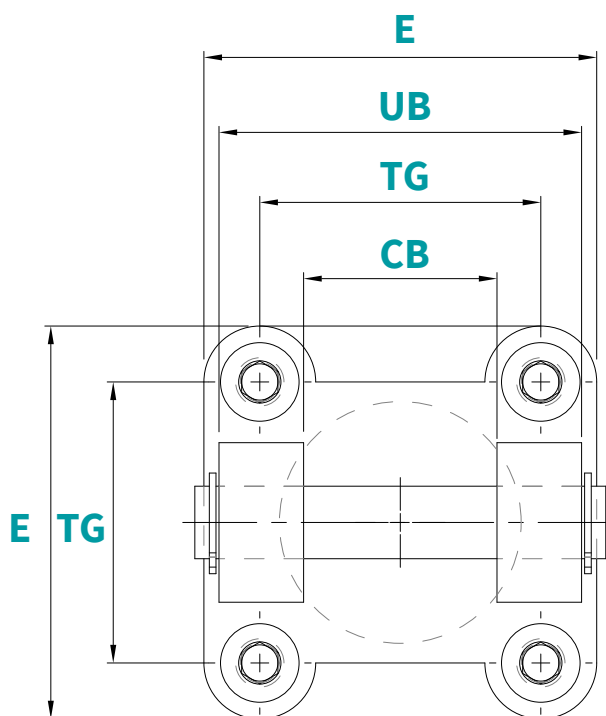
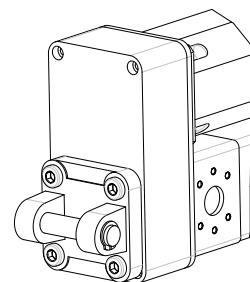


Material: carbon steel and AISI 316 stainless steel

SIZE	A	B	C	ØD (H7)	E	ØF	G	ØH	I	weight [Kg]
1	50	65	15	17	45	32	4	6,5	34	0,332
2	60	80	20	20	55	32	3	8,5	40	0,629
3	75	95	30	30	65	46	4	11	53	1,369
4	95	120	40	40	80	60	5	13	70	2,958
5	115	150	40	50	105	70	5	17	85	4,266
6	140	180	45	60	125	80	5	21	100	6,923

ACCESSORIES FOR REAR ATTACHMENT

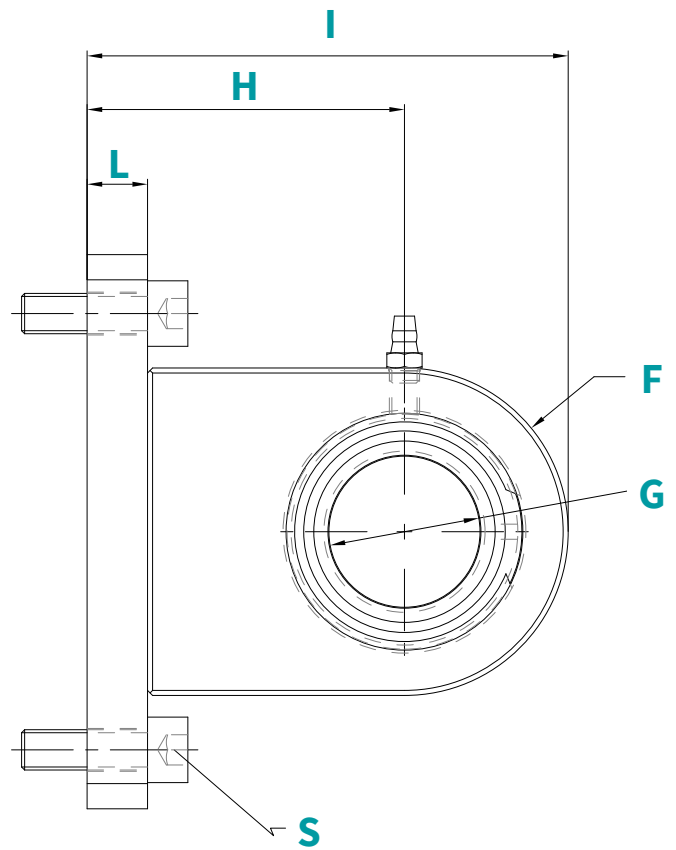
Rear hinge kit (belt-driven only)



Material: aluminium and AISI 316 stainless

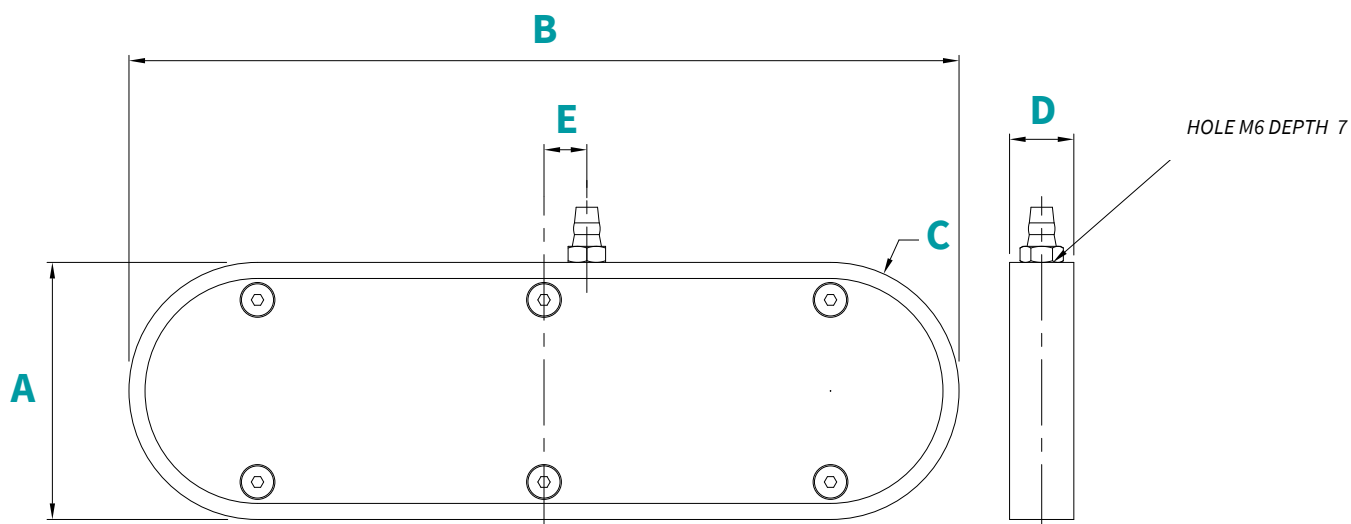
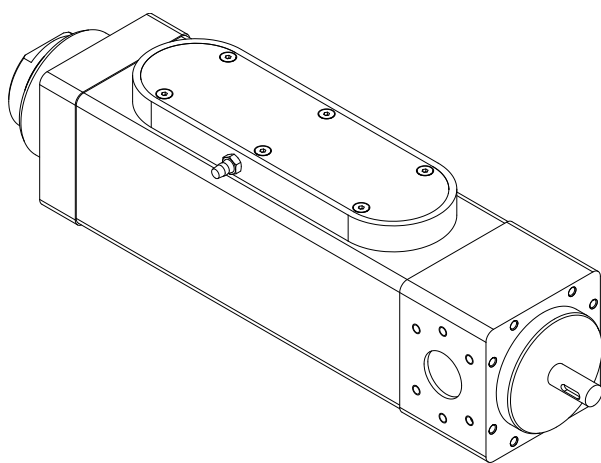
Size 1-2

SIZE	TG	CB	UB	ØCD	FL	L	ØD	L1	L4	S	MR	E	weight [Kg]
1	46.5	32	60	12	27	16	40	5	6.5	M8x16	12	65	0,4
2	56.5	40	70	16	32	21	45	5	6.5	M8x20	16	75	0,6

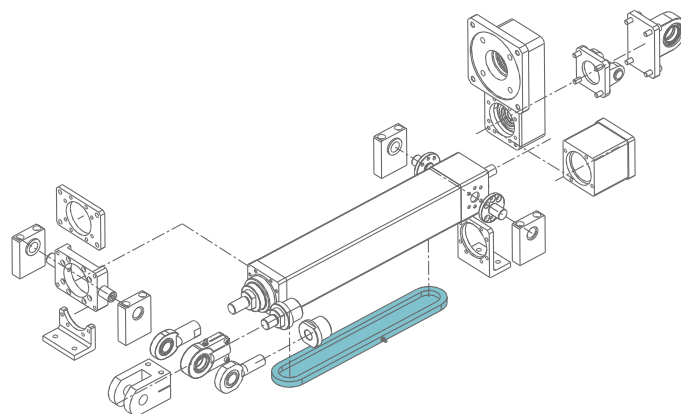


SIZE	A	B	C	D	E	F	ØG (H8)	H	I	L	S	weight [Kg]
3	70	50	110	86.6	28	32.5	30	63	95.5	12	M8x25	1,60
4	80	58	120	100.5	35	50	40	69	119	15	M10x30	3,65
5	110	78	180	135.1	40	61.5	50	108	169.5	20	M12X40	7,45
6	135	97.5	220	168.9	50	70	60	125	195	25	M16x50	11,6

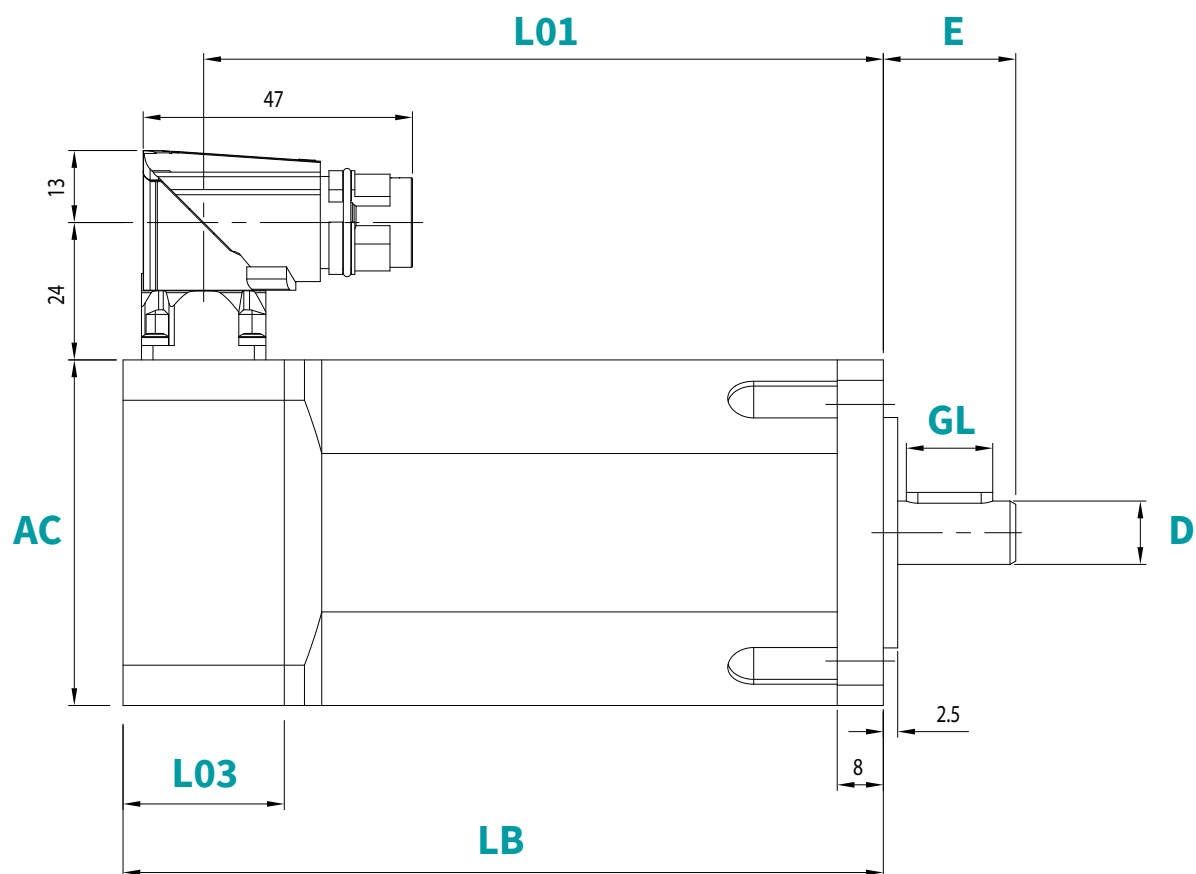
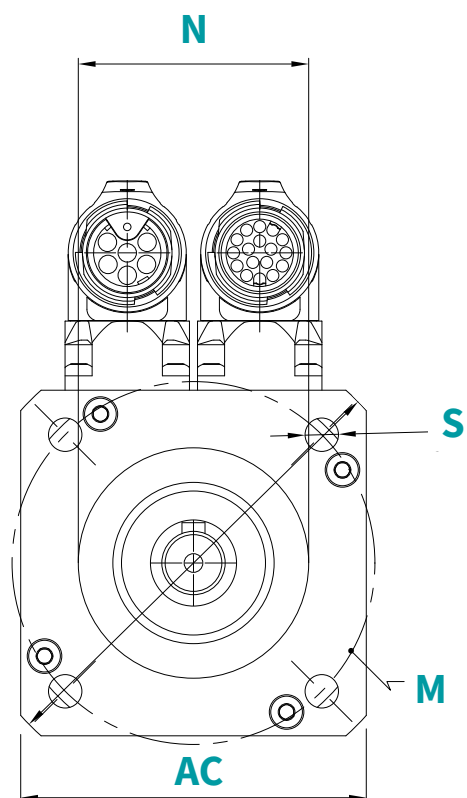
DIRECT FEED IN NUT FOR CENTRALIZED LUBRICATION



Material: aluminium and AISI 316 stainless steel



SIZE	SCREW	A	D	C	B
SIZE 1 60x60	AA	48	12	24	55 + stroke
	AB				
	AC				
	BA				85+ stroke
	BB				
	BD				
	ZA				
SIZE 2 80x80	DA	64	12	32	110 + stroke
	DB				150 + stroke
	DD				110 + stroke
	CE				150 + stroke
	DF				120 + stroke
	VA				
	VB				
SIZE 3 100x100	EA	80	15	60	135 + stroke
	EB				185 + stroke
	ED				145 + stroke
	EG				
	UA				
	UB				
SIZE 4 120x120	FB	96	15	48	150 + stroke
	FD				210 + stroke
	FG				195 + stroke
	TA				
	TB				
SIZE 5 160x160	GB	100	15	50	170 + stroke
	GD				215 + stroke
	GG				245 + stroke
	SB				
	SD				
SIZE 6 200x200	HD	100	15	50	265 + stroke
	RB				300 + stroke
	RD				



MOTORISATION

Through our partnership with a celebrated Italian manufacturer, GTS provides the possibility of combining a motor with the chosen linear unit. However, a third-party motor can be used. In this case, the customer is to ensure compatibility of the mounting flanges of the motor with the standard GTS connections and, if necessary, communicate the desired configuration.

Our motors are divided into five sizes, each with its own torque and speed variants.

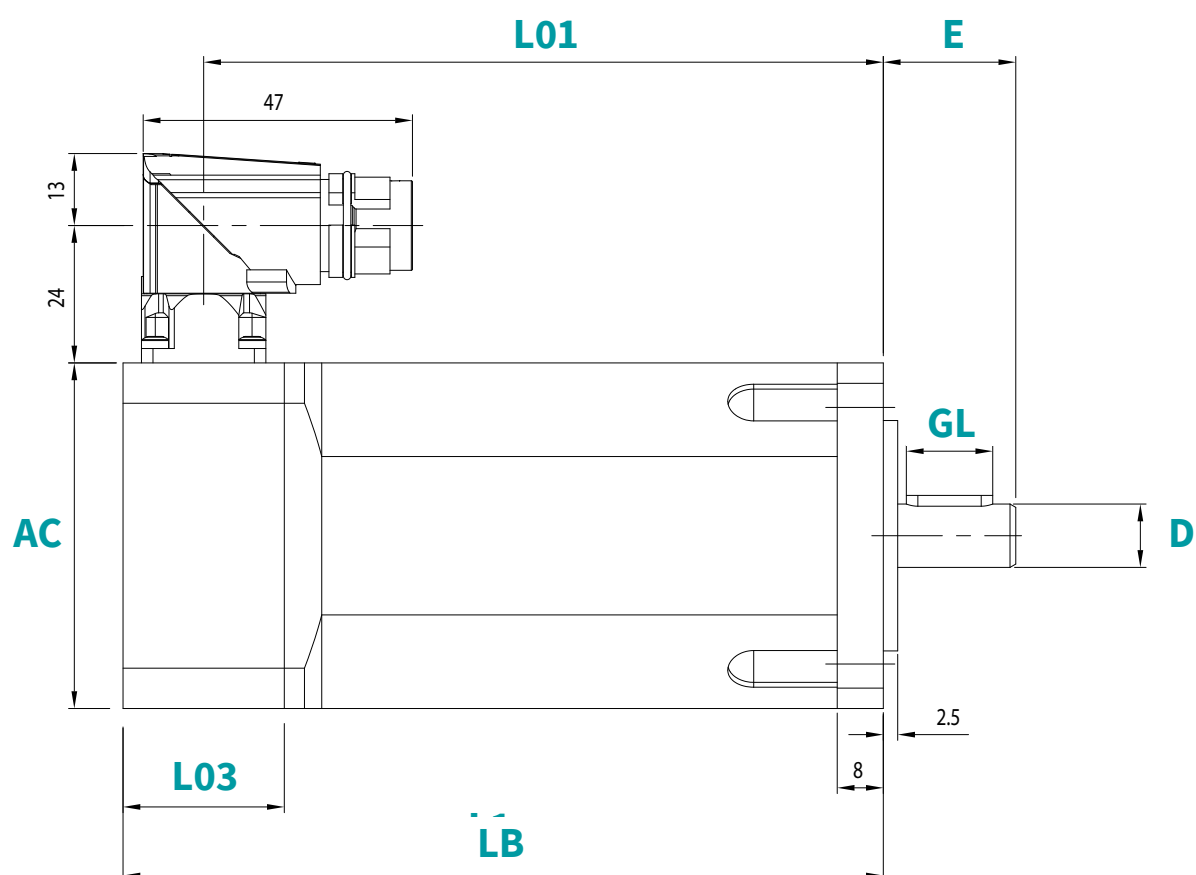
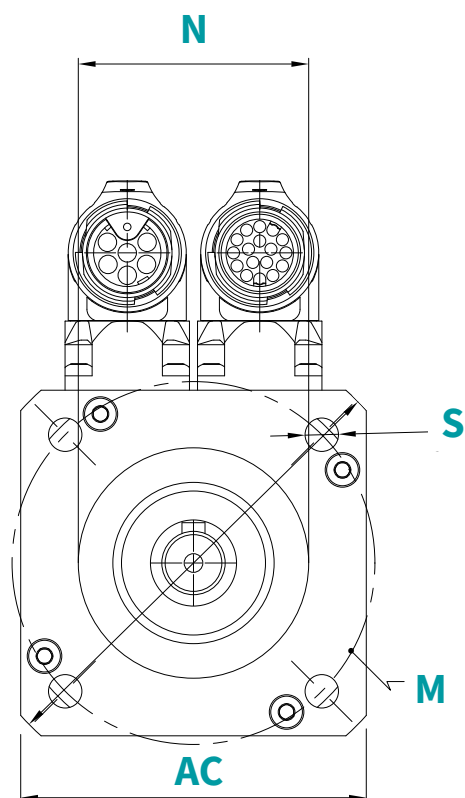
Note: **the similarity of the motor flange with the cylinder-side transmission flange does not assume that the motor has been checked for thermal and dynamic loads.**

Further verification that the torques involved are sufficiently supplied by the motor is therefore recommended. *Thermal and dynamic verification can be requested by contacting the GTS Technical Office.*

SERIES 2 - 60x60

MOTOR	LB	L01	L03	D	E	GL	GA	F	R	N	M	S	AC
GTSM.21	118	104	42	11	23	15	12,5	4	M4X10	40j6	63	5,8	60
GTSM.22	146	132											
GTSM.21 BRAKED	148,8	134,4											
GTSM.22 BRAKED	176,4	162,4											

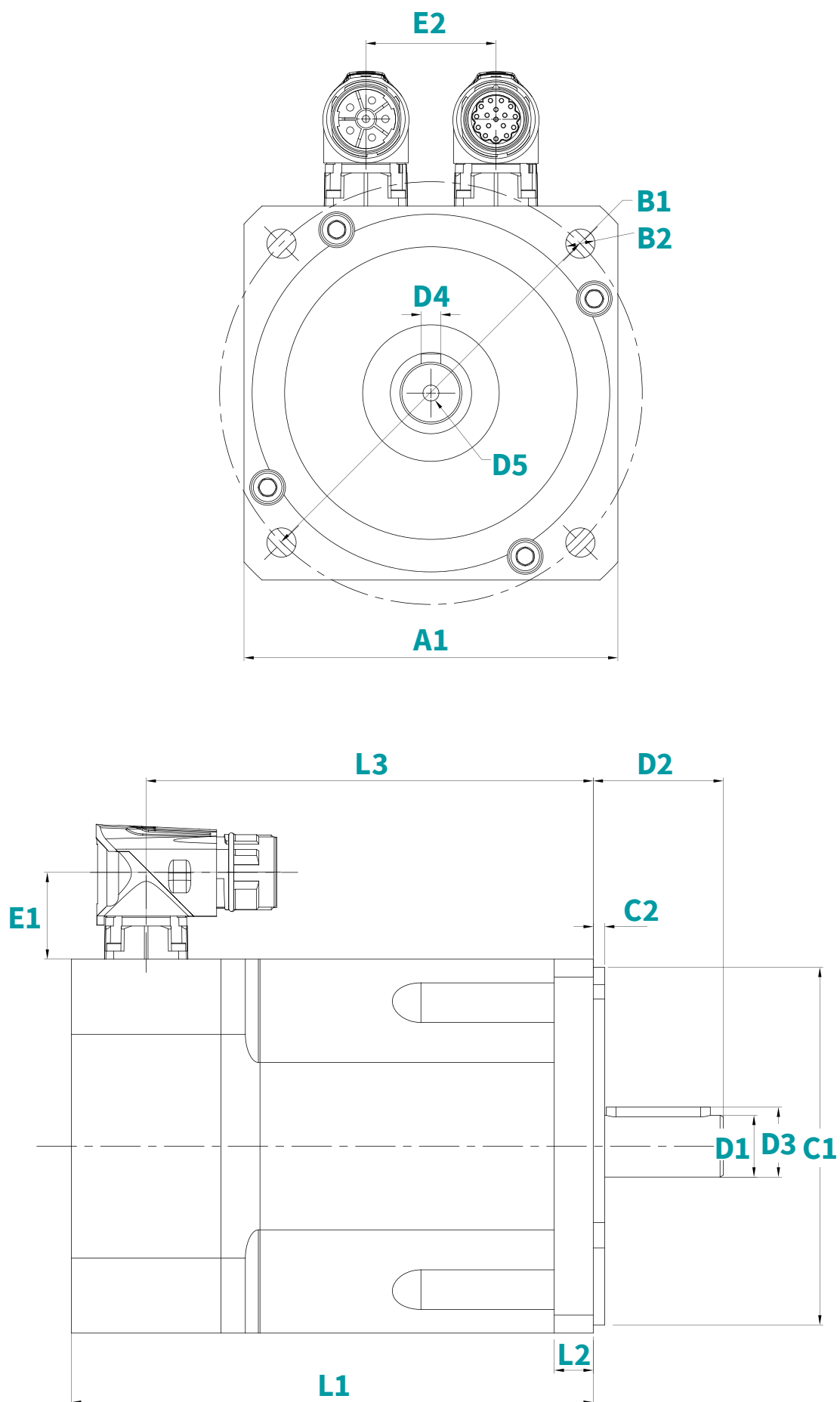
MOTOR TYPE	Symbol	Unit of measurement	Length 1		Length 2	
WINDING VARIANTS			1	2	1	2
stall torque	Mo	Nm	0,7		1,4	
stall current	Io	A	1,6	1	2,8	1,7
maximum mechanical revs	Nmec	rpm	8500		8500	
rotor inertia	Jr	kgcm ²	0,13		0,23	
maximum torque	Mpk	Nm	2,5		4,7	4,9
weight	m	kg	1,2		1,7	
maximum revs at 230v	Nmax	rpm	6200	3600	6300	3900
maximum revs at 400v	Nmax	rpm	8000	6000	8000	6000
peak current	l _{pk}	Arms	6,4	4	11,2	6,8
constant voltage	Ke	V/krpm	27	44	30	49
torque constant	Kt	Nm/A	0,45	0,73	0,5	0,81
resistance at 20	Ru-v	Ω	8,6	23	3,2	8,4
inductance at 1khz	Lu-v	mH	10	27	5,6	13
electric time constant	te	msec	1,16	1,17	1,75	1,55
thermal time constant	t1	min	16		19	
mechanical time constant	tm	msec	0,84	0,85	0,45	0,44
thermal capacity	Cth	J/K	425	444	576	557
heat resistance	Rth	K/W	2,26	2,16	1,98	2,04



SERIES 3 - 85x85

MOTOR	LB	L01	L03	D	E	GL	GA	F	R	N	M	S	AC
GTSM.31	130	116	46	14	30	20	16	5	m5X15	80j6	100	7	85
GTSM.32	160	146											
GTSM.33	190	176											
GTSM.34	220	206											
GTSM.31 BRAKED	178	164											
GTSM.32 BRAKED	208	194											
GTSM.33 BRAKED	238	224											
GTSM.34 BRAKED	268	254											

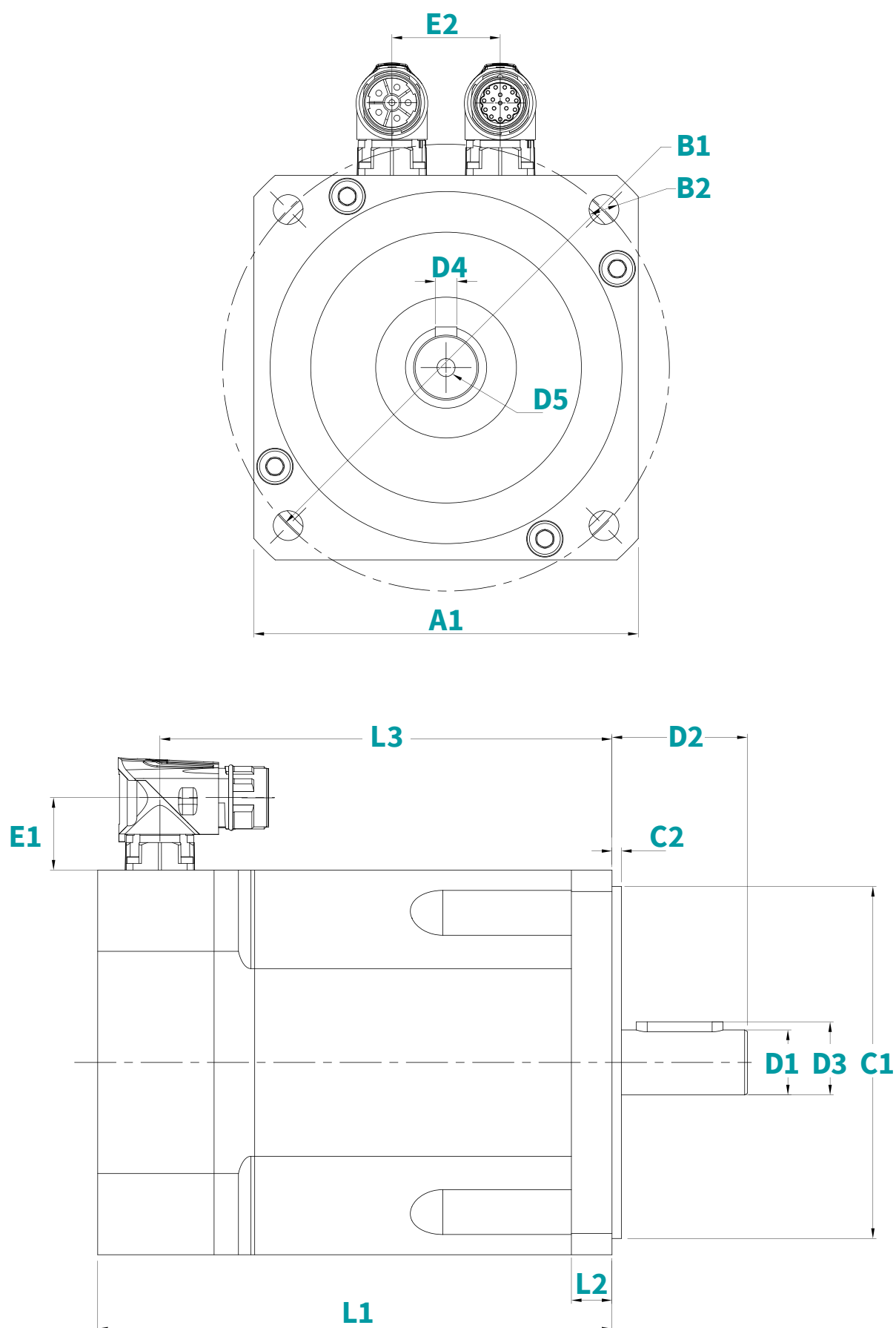
MOTOR TYPE	Symbol	Unit of measurement	Length 1		Length 2		Length 3		Length 4	
WINDING VARIANTS			1	2	1	2	1	2	1	2
stall torque	Mo	Nm	1,5		2,9		4,2		5,3	
stall current	Io	A	1,65	1,1	3,2	2	4,6	2,9	5,8	3,4
maximum mechanical revs	Nmec	rpm	7000		7000		7000		6000	
rotor inertia	Jr	kgcm ²	0,92		1,72		2,53		3,33	
maximum torque	Mpk	Nm	5,1		4,8	10	14		18	
weight	m	kg	2,4		3,5		4,6		5,7	
maximum revs at 230v	Nmax	rpm	3100	1800	3200	1900	3300	2000	3300	1900
maximum revs at 400v	Nmax	rpm	6000	3500	6000	3500	6000	3500	5000	3000
peak current	l _{pk}	Arms	6,6	4	12,8	8	18	12	23	14
constant voltage	Ke	V/krpm	52	86	55	88	55	88	55	93
torque constant	Kt	Nm/A	0,91	1,42	0,91	1,46	0,91	1,46	0,91	1,54
resistance at 20	Ru-v	Ω	9	23	3,4	8,3	1,9	5	1,4	4
inductance at 1khz	Lu-v	mH	16	35	7	18	4,5	12	3,5	11
electric time constant	te	msec	1,78	1,52	2,06	2,17	2,37	2,4	2,5	2,75
thermal time constant	t1	min	30		40		45		50	
mechanical time constant	tm	msec	1,5	1,57	1,06	1,01	0,87	0,9	0,85	0,84
thermal capacity	Cth	J/K	887	1008	1682	1603	2185	2285	2844	2792
heat resistance	Rth	K/W	2,03	1,78	1,83	1,43	1,23	1,18	1,05	1,07



SERIES 4 - 115X115

MOTOR	LB	L01	L03	D	E	GL	GA	F	R	N	M	S	AC
GTSM.41	160,5	137,5	46	19	40	32	21,5	6	M6x16	110	130	9	115
GTSM.42	200,5	177,5											
GTSM.43	240,5	217,5											
GTSM.41 BRAKED	209,5	186,5											
GTSM.42 BRAKED	249,5	226,5											
GTSM.43 BRAKED	289,5	246,5											

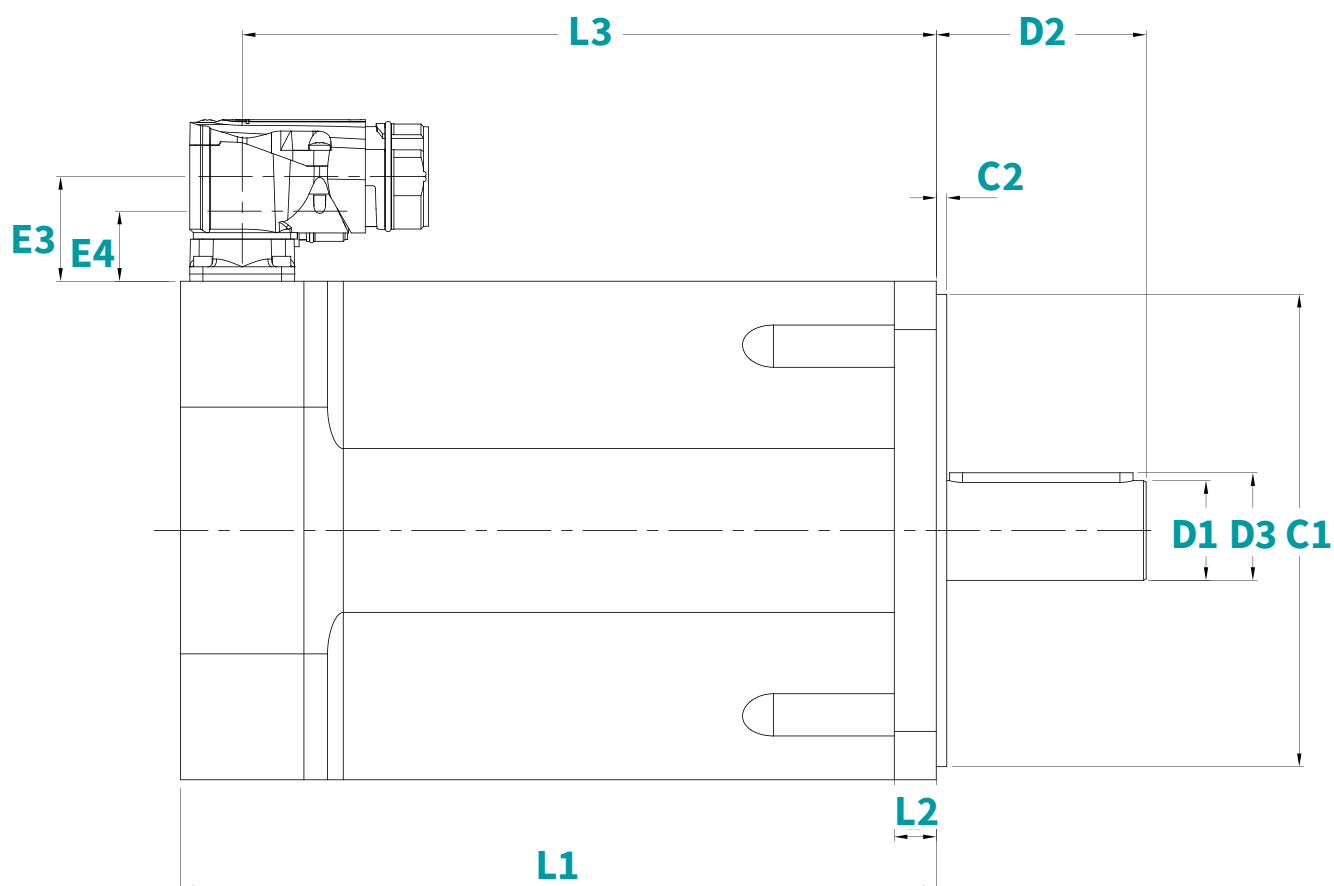
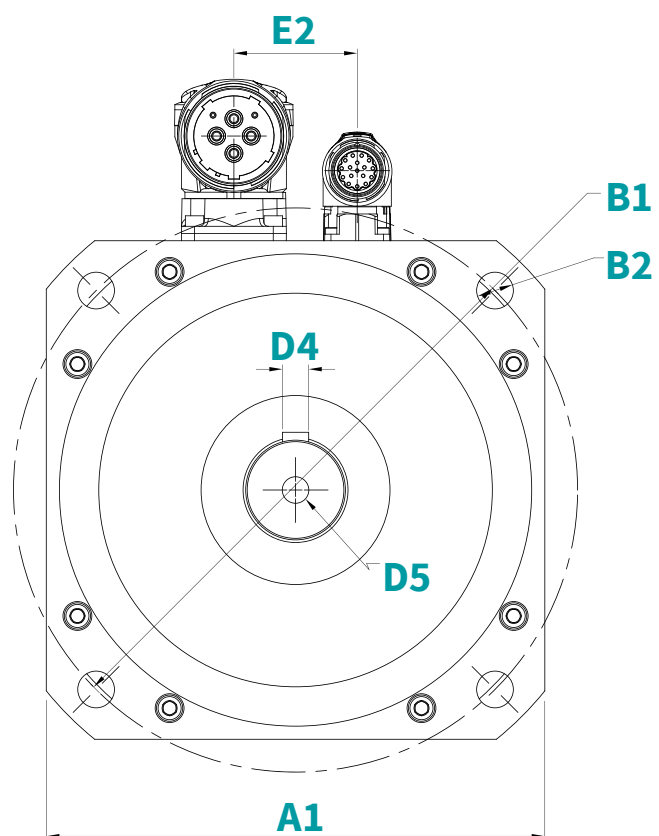
MOTOR TYPE	Symbol	Unit of measurement	Length 1		Length 2			Length 3	
WINDING VARIANTS			1	2	1	2	4	1	2
stall torque	Mo	Nm	4		7,6			11,3	
stall current	Io	A	4,4	2,5	7,8	4,7	2,8	11,9	7
maximum mechanical revs	Nmec	rpm	6500		6500			6500	
rotor inertia	Jr	kgcm ²	5		9,6			14	
maximum torque	Mpk	Nm	14		26			40	39
weight	m	kg	5,6		8,5			11,4	
maximum revs at 230v	Nmax	rpm	3200	1800	3100	1800	1000	3100	1800
maximum revs at 400v	Nmax	rpm	6000	3000	5000	3000	1900	5000	3000
peak current	Ipk	Arms	18	10	31	19	11	48	28
constant voltage	Ke	V/krpm	55	96	59	98	165	59	98
torque constant	Kt	Nm/A	0,91	1,59	0,98	1,62	2,73	0,98	1,62
resistance at 20	Ru-v	Ω	2,3	6,9	0,95	2,7	6,6	0,5	1,5
inductance at 1khz	Lu-v	mH	5,6	16	2,9	7,9	19	1,6	4,9
electric time constant	te	msec	2,43	2,32	3,05	2,78	2,88	3,2	3,27
thermal time constant	t1	min	40		54			65	64
mechanical time constant	tm	msec	2,08	2,05	1,44	1,48	1,28	1,1	1,2
thermal capacity	Cth	J/K	2151	2083	3769	3889	3374	5558	5770
heat resistance	Rth	K/W	1,11	1,15	0,86	0,83	0,96	0,7	0,67



SERIES 5 - 142X142

MOTOR	LB	L01	L03	D	E	GL	GA	F	R	N	M	S	AC
GTSM.51	190	167	43	24	50	32	27	8	M8x15	130	165	11	142
GTSM.52	240	217											
GTSM.53	290	267											
GTSM.54	340	317											
GTSM.51 BRAKED	243,5	220,5											
GTSM.52 BRAKED	293,5	270,5											
GTSM.53 BRAKED	343,5	320,5											
GTSM.53 BRAKED	393,5	370,5											

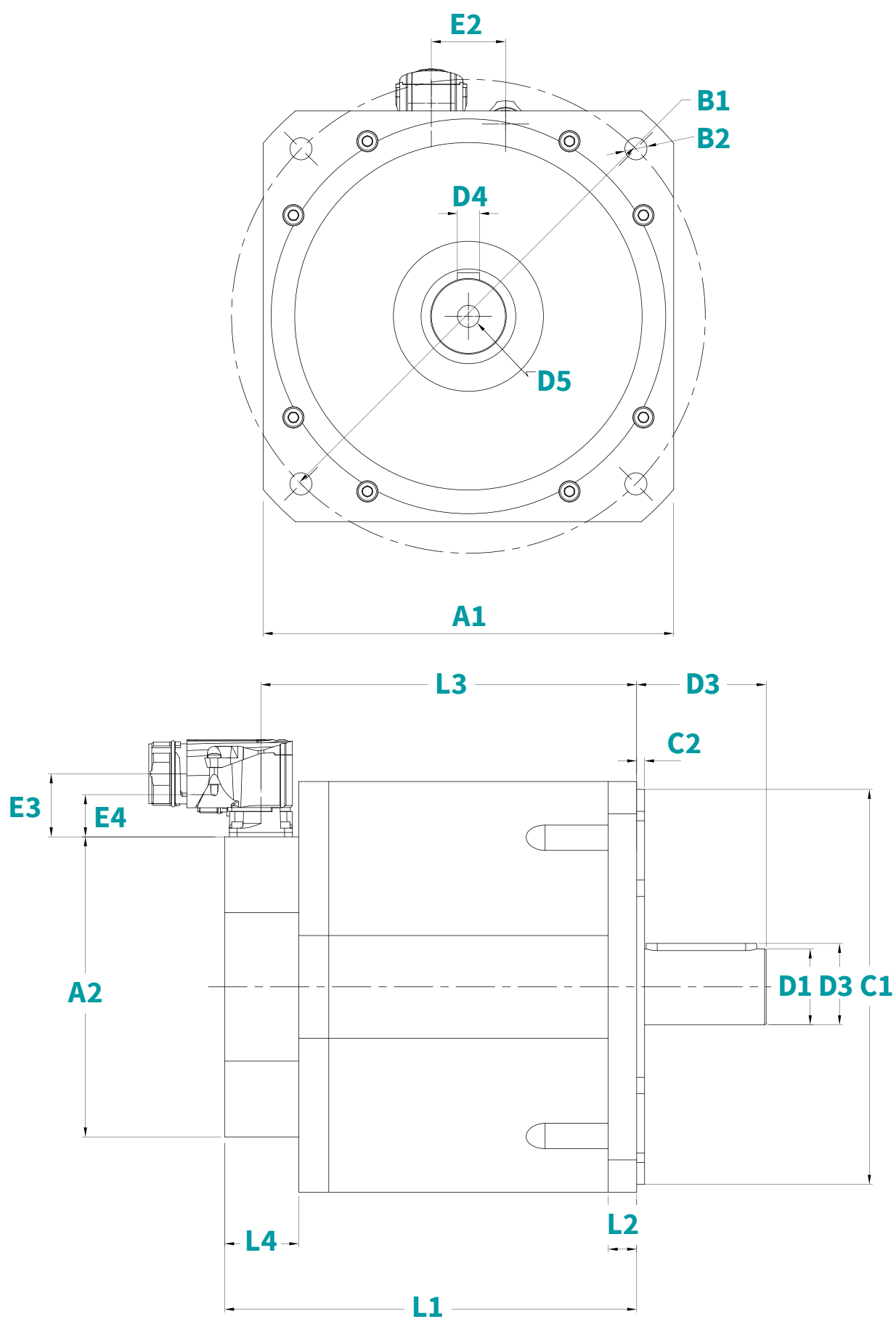
MOTOR TYPE	Symbol	Unit of measurement	Length 1		Length 2		Length 3			Length 4	
WINDING VARIANTS			1	2	1	2	1	2	3	1	2
stall torque	Mo	Nm	10		19		27			35	
stall current	Io	A	10,5	6,5	16	12,3	21	15,4	10,5	25	20
maximum mechanical revs	Nmec	rpm	6500		6500		5500			5500	
rotor inertia	Jr	kgcm ²	22		43		65			87	
maximum torque	Mpk	Nm	36	34	65	66	93		100	119	118
weight	m	kg	11		16		21			26	
maximum revs at 230v	Nmax	rpm	3000	1900	2600	2000	2400	1700	1000	2200	1800
maximum revs at 400v	Nmax	rpm	5000	3000	4500	3000	4500	3000	1900	4000	3000
peak current	l _{pk}	Arms	42	26	64	49	84	62	42	100	80
constant voltage	Ke	V/krpm	62	93	72	93	78	106	170	85	106
torque constant	Kt	Nm/A	1,03	1,54	1,2	1,54	1,29	1,75	2,81	1,41	1,75
resistance at 20	Ru-v	Ω	0,65	1,61	0,34	0,61	0,25	0,46	1	0,18	0,32
inductance at 1khz	Lu-v	mH	2,6	7	1,9	3,3	1,7	2,7	6,4	1,7	1,9
electric time constant	te	msec	4	4,35	5,6	5,4	6,8	5,9	6,4	9,4	5,9
thermal time constant	t1	min	62		72		85	84	85	96	94
mechanical time constant	tm	msec	2,04	2,25	1,55	1,66	1,46	1,46	1,23	1,19	1,36
thermal capacity	Cth	J/K	5366	5093	7569	8025	11318	11199	11318	13044	14841
heat resistance	Rth	K/W	0,69	0,73	0,57	0,54	0,45			0,44	0,38



SERIES 6 - 190X190

MOTOR	LB	L01	L03	D	E	GL	GA	F	R	N	M	S	AC
GTSM.61	183	159,5	47	32	58	45	35	10	M12x22	180	215	14	190
GTSM.62	218	194,5											
GTSM.63	288	264,5											
GTSM.64	358	334,5											
GTSM.61 BRAKED	253,5	230											
GTSM.62 BRAKED	288,5	265											
GTSM.63 BRAKED	358,5	335											
GTSM.64 BRAKED	428,5	405											

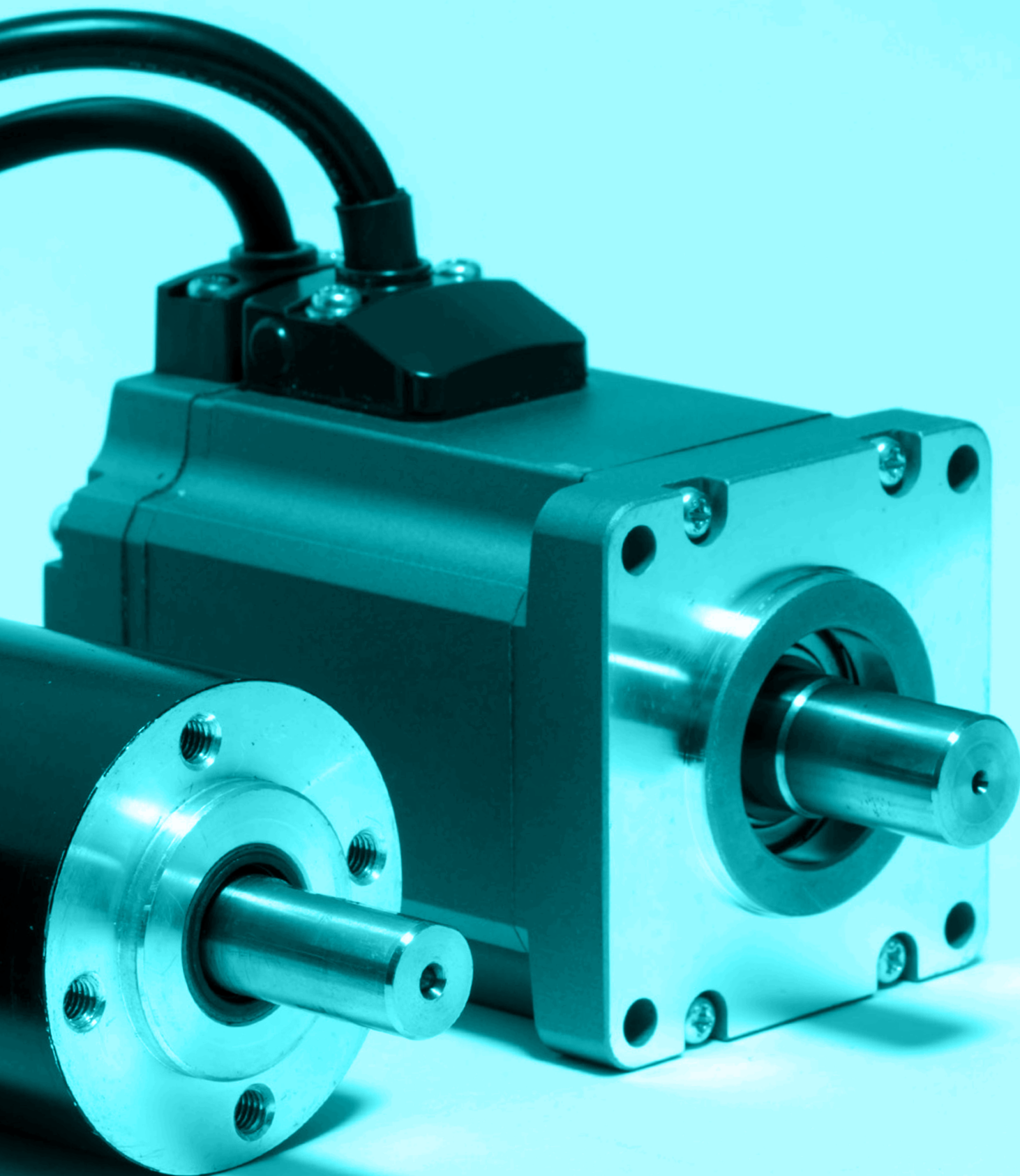
MOTOR TYPE	Symbol	Unit of measurement	Length 1		Length 2		Length 3		Length 4	
WINDING VARIANTS			1	2	1	2	1	2	1	2
stall torque	Mo	Nm	15		28		50		70	
stall current	Io	A	12	9	24	12,5	28	18	39	26
maximum mechanical revs	Nmec	rpm	5500		5500		4500		4500	
rotor inertia	Jr	kgcm ²	54		91		177		264	
maximum torque	Mpk	Nm	42	38	72		127	130	177	184
weight	m	kg	17		23		36		50	
maximum revs at 230v	Nmax	rpm	2300	1800	2400	1300	1800	1100	1800	1200
maximum revs at 400v	Nmax	rpm	4000	3000	4000	2500	3000	2000	3000	2000
maximum revs at 480v	Nmax	rpm	5000	3900	5000	3000	3800	2400	3900	2600
current	IpK	Arms	37	27	72	38	84	54	117	80
constant voltage	Ke	V/krpm	79	100	71	134	108	169	108	162
torque constant	Kt	Nm/A	1,31	1,65	1,17	2,22	1,79	2,8	1,79	2,7
resistance at 20°	Ru-v	Ω	0,6	0,95	0,18	0,74	0,16	0,36	0,09	0,16
inductance at 1khz	Lu-v	mH	3,4	6,5	1,2	5,3	1,3	3,2	0,8	1,8
electric time constant	te	msec	5,7	6,8	6,7	7,2	8,1	8,9	8,9	11,3
thermal time constant	t1	min	74	90	88	104	105	114	115	0,84
mechanical time constant	tm	msec	2,85	2,81	1,78	2,06	1,33	1,22	1,12	0,88
thermal capacity	Cth	J/K	7826	6970	16279	12568	16059	14933	19013	15023
heat resistance	Rth	K/W	0,57	0,64	0,33	0,42	0,39	0,42	0,36	0,46



SERIES 7 - 260x260

MOTOR	LB	L01	L03	D	E	GL	GA	F	R	N	M	S	AC
GTSM.71	261	214	47	48	82	70	51,5	14	M16x25	250	300	14	260
GTSM.72	341	294											
GTSM.73	421	374											
GTSM.71 BRAKED	314	267											
GTSM.72 BRAKED	394	347											
GTSM.73 BRAKED	474	427											

MOTOR TYPE	Symbol	Unit of measurement	Length 1		Length 2		Length 3	
WINDING VARIANTS			1	2	1	2	1	2
stall torque	Mo	Nm	76		147		230	
stall current	Io	A	37	25	70	41	104	65
maximum mechanical revs	Nmec	rpm	4000		4000		4000	
rotor inertia	Jr	kgcm ²	484		941		1398	
maximum torque	Mpk	Nm	210	203	408	399	618	632
weight	m	kg	52		83		114	
maximum revs at 230v	Nmax	rpm	1500	1000	1500	900	1400	900
maximum revs at 400v	Nmax	rpm	2600	1800	2600	1500	2500	1500
maximum revs at 480v	Nmax	rpm	3200	2200	3200	1900	3000	1900
current	Ip _k	Arms	111	75	210	123	312	195
constant voltage	Ke	V/krpm	126	183	126	216	135	216
torque constant	Kt	Nm/A	2,1	3	2,1	3,6	2,2	3,6
resistance at 20°	Ru-v	Ω	0,14	0,28	0,05	0,12	0,03	0,08
inductance at 1khz	Lu-v	mH	1,5	3,1	0,8	2,2	0,6	1,5
electric time constant	te	msec	11		16	18	20	19
thermal time constant	t1	min	100	122	137	1,48	1,1	1,2
mechanical time constant	tm	msec	2,34	2,22	1,62	1,33	1,26	1,31
thermal capacity	Cth	J/K	37500	33300	48800		82200	91300
heat resistance	Rth	K/W	0,16	0,18	0,15		0,1	0,09



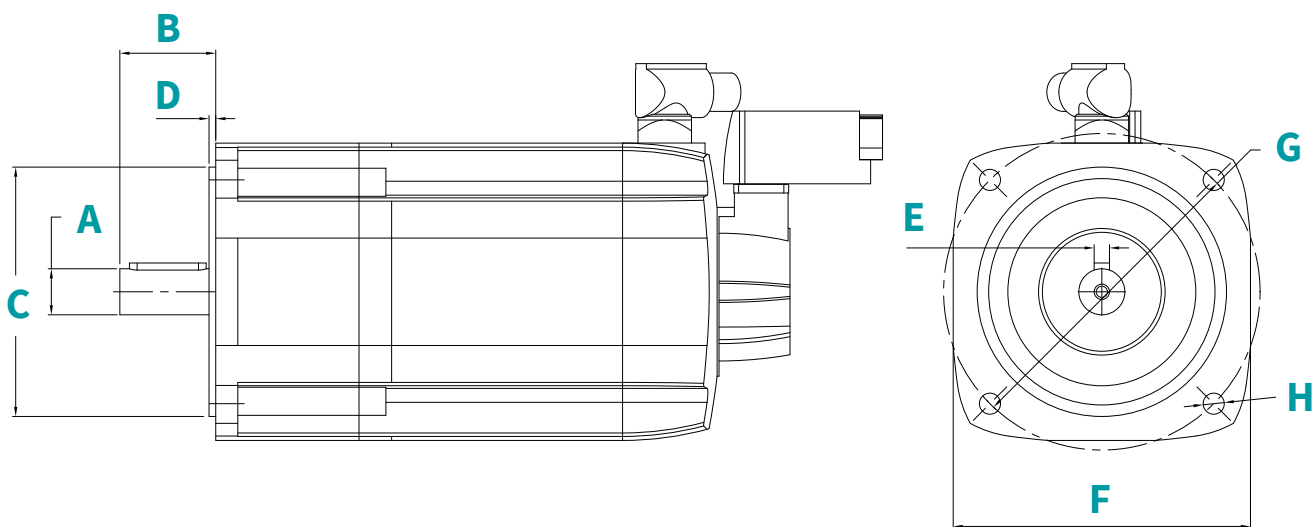
THIRD-PARTY MOTORS

Motor mounting kit on request

As noted above, the end-user can select a motor coupling made up of either a mounting kit with bell, flange and coupling (with the possible addition of a gear set) or a transmission with belt-pulley or gears (also in this case with the possible addition of a gear set). All available combinations can be viewed in previous sections.

However, GTS also provides the possibility of mounting third-party motors of any manufacturer, **by appropriately adapting the shaft and flange connections upon request.**

Customers can therefore provide motor geometry as indicated below, attaching the dimensional table.



ØA STEM (indicate tolerance)	B STEM LENGTH	ØC CENTERING (indicate tolerance)	D CENTERING HEIGHT	E TAB WIDTH	F FLANGE	ØH FIXING HOLES DIAMETER

LUBRICATION AND MAINTENANCE

Grease lubrication

Grease lubrication has the advantage of permitting a lengthy period between one lubrication and the next.

In the case that access to the cylinder for lubrication is challenging or impossible due to reasons of positioning of the machine or space, it is possible to use pumping cartridges for automatic timed lubrication in combination with the relative accessory for centralized lubrication. GTS actuators are always pre-greased with KLUBER BEM 41-132 grease.

In the case of applications such as food or pharmaceuticals, it is possible to replace the grease supplied with an alternative compatible with the relative environment.

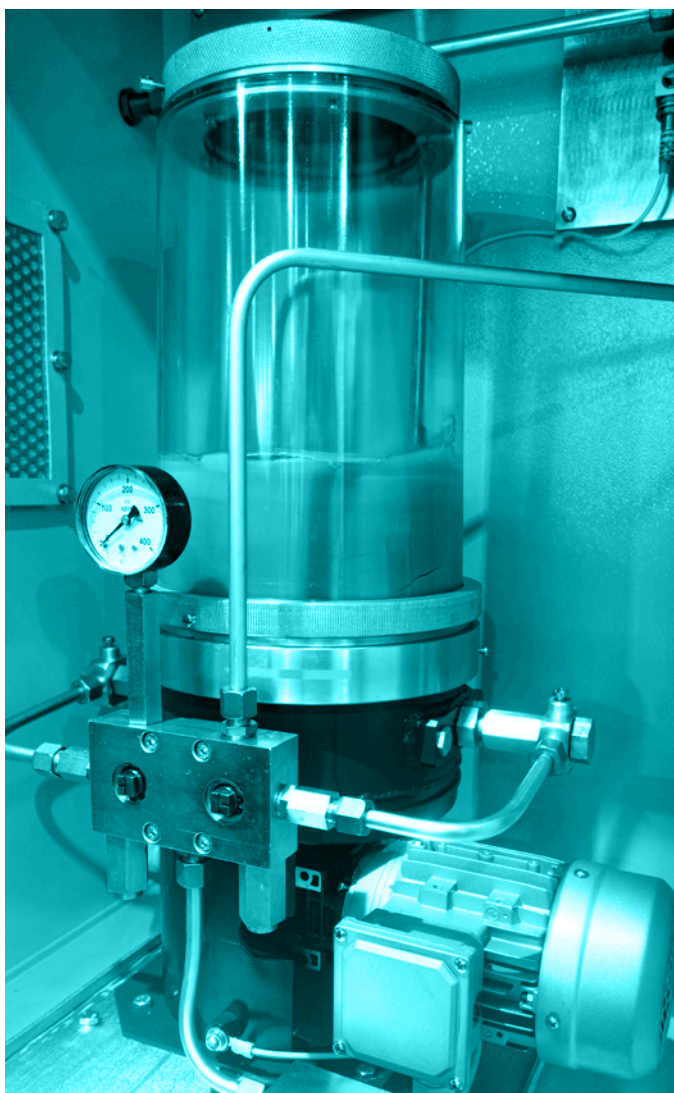
Contact the GTS Technical Office for further information.

The lubrication of the linear unit takes place using the appropriate grease nipples whose positions are indicated in the diagrams supplied. Frequency and quantity depend on the type and size of the actuator and are indicated in **Tab.4**

N.B. Frequency and quantity is valid for standard applications with this type of grease, as indicated below. In the case of alternative conditions and greases, contact the GTS Technical Office to verify parameters.

Notes on lubrication:

- Solid lubricants such as graphite and MoS₂ should not be used.
- The use of lubricants other than those specified may result in reduced re-lubrication intervals as well as lower performance of short stroke and load capacity. Please also note the possibility of chemical interactions between plastics, lubricants and anti-corrosion media.
- Should application involve complex environmental challenges (such as cleanrooms, vacuums, food use, the use of strong or aggressive fluids or extreme temperatures), please contact GTS. The greasing provided is not compatible with environments and conditions of this kind.
- Re-lubrication is required after two years of installation, including in the case of normal operating conditions, due to the aging of the grease.



SIZE	SCREWS	QUANTITY OF GREASE FOR RE-LUBRICATION cm3	RE-LUBRICATION FREQUENCY at 106 revs *
SIZE 1 60X60	AA	0,7	7,5
	AB	0,85	7,5
	AC	0,95	7,5
	BA	1	7,5
	BB	1,85	7,5
	BD	2,5	7,5
	ZA	5	0,3
SIZE 2 80X80	DA	2,2	7,5
	DB	3,05	7,5
	DD	3,55	7,5
	CE	3,45	7,5
	DF	5,45	7,5
	VA	10	0,3
	VB	10	0,3
SIZE 3 100X100	EA	3,35	7,5
	EB	6,65	7,5
	ED	9,35	7,5
	EG	14,3	7,5
	UA	17,5	0,3
	UB	17,5	0,3
SIZE 4 120X120	FB	10,75	7,5
	FD	17,35	7,5
	FG	20,5	7,5
	TA	25	0,3
	TB	25	0,3
SIZE 5 160X160	GB	12,15	7,5
	GD	15,45	7,5
	GG	25,4	7,5
	SB	75	0,1
	SD	75	0,1
SIZE 6 200X200	HD	65,5	7,5
	RB	125	0,1
	RD	125	0,1

Tab. 4 – recommended grease quantities

The following procedure should be followed for calculating the re-lubrication interval:

h (interval in hours) = (interval in revs * stroke [mm]) / (average speed [mm/sec]*3600)

Note: Re-lubrication timings are only *valid for Average force/Cdynamic values of <0.2*.

For higher values, consider the following:

Av. force/c_{din} = 0.3; interval = 2 * 10⁶

Av. force /c_{din} = 0.4; interval = 1 * 10⁶

Please contact the GTS Technical Office for an accurate analysis in the case of intervals longer than those illustrated above.

Oil lubrication

It is possible to carry out **lubrication by means of oil injection upon request**. It is necessary to specify this need when placing an order for the accurate provision of the actuator with appropriate drainage systems for exhausted oil.

Conditions of use

Working environmental temperature: from -10° to +50°

Type of protection: standard IP54; from IP65 to IP69K optional and upon request.

Maximum permissible humidity for storage: 75%

CODIFICA VITI

BALL SCREW CODING

BALL SCREW DIAMETERS	CODE	PITCH	CODE
16	A	5	A
20	B	10	B
25	C	16	C
32	D	20	D
40	E	25	E
50	F	32	F
63	G	40	G
80	H		
The coding includes: LETTER OF SCREW DIAMETER + LETTER OF PITCH			

Tab. 5 – Screw coding

PLANETARY ROLLER SCREW CODING

PLANETARY ROLLER SCREW DIAMETERS	CODE	PITCH	CODE
20	Z	5	A
30	V	10	B
39	U	16	C
48	T	20	D
60	S	25	E
75	R	32	F
		40	G
The coding includes: LETTER OF SCREW DIAMETER + LETTER OF PITCH			

Tab. 5 – Screw coding



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For further details we recommend consulting our website: www.gtsservice.net



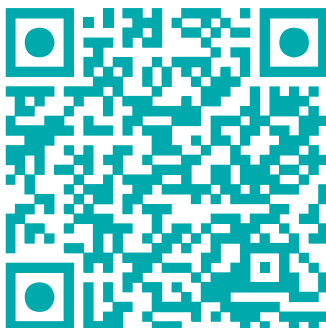
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Accessories Code



Material	
I	Stainless steel AISI 316
Basic linear module	
1	EE-60
2	EE-80
3	EE-100
4	EE-120
5	EE-160
6	EE-200
Screw	
-	-
See Tab. 5 - p. 98	
Corsa da 100-1000(mm) / Stroke from 100-1000(mm)	
1	9
0	1000
Z	Custom
Inline transmission (p. 46)	
A	Flange 1
B	Flange 2
C	Flange 3
Y	Custom
Belt-driven transmission (pp. 50-51)	
D	Belt-driven 1
E	Belt-driven 2
F	Belt-driven 3
Z	Custom
Epicyclic gear set	
I	Reduction ratio from 3-9
0	Without adaptor
C	Custom
Anti-rotation	
A	Integrated anti-rotation 3-9
N	Without anti-rotation
Rod end	
M	Male ISO 12552
N	Male Hydraulic ISO
F	Female ISO 12552
C	Custom (indicate drawing variation)
Rod accessories	
1	Front Female ball joint ISO 12240
2	Front female ball joint DIN E4338
3	Front male ball joint ISO 12240
4	Front fork
0	Non-standard accessory
N	No accessory
Front accessories	
1	L-shaped foot
2	Kit front flange
3	Front flange + Rocker kit
0	Non-standard accessory
N	No accessory
Rear accessories	
1	Side rocker kit
2	Rear hinge
0	Non-standard accessory
N	No accessory
Centralized Lubrication	
L	Yes
N	No



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