







## ELECTRIC CYLINDER

	● <b>ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552</b>	PAGE	1-456
	● <b>ELECTRIC CYLINDER SERIES ELEKTRO ROUND DC</b>	PAGE	1-493
	● <b>ELECTRIC AXIS ELEKTRO SHAK SERIES</b>	PAGE	1-500
	● <b>ELECTRIC AXIS SERIES ELEKTRO SHAK GANTRY</b>	PAGE	1-514
	● <b>ELECTRIC AXIS - RODLESS ELEKTRO SK SERIES</b>	PAGE	1-524

## MOTORS AND DRIVES

	● <b>ELECTRIC MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO</b>	PAGE	1-538
	● <b>PROGRAMMING UNIT E.MOTION</b>	PAGE	1-558
	● <b>DRIVES FOR STEPPING MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO</b>	PAGE	1-561
	● <b>DRIVES FOR BRUSHLESS MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO</b>	PAGE	1-566

# ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552



An electric cylinder with a connection interface in accordance with ISO 15552.

The piston rod extension is controlled by a system with a hardened screw and recirculating ball screw nut. The piston has a guide strip calibrated to reduce to a minimum play with the barrel and hence vibration during ball screw rotation.

The cylinder can be equipped with a built-in non-rotating system featuring two opposing slides that run in separate longitudinal slots in the barrel.

The piston comes with magnets and the barrel has longitudinal slots for housing sensors. The piston rod has increased outside diameter and thickness to make it extra rigid and more resistant to radial and peak loads.

A system for greasing the screws is included. Numerous standard accessories for pneumatic cylinders, can be used for mounting the cylinder. Accessories made of aluminium, or made of steel for heavy-duty operations, can be used.

The motor can be selected from an optimised range, which encompasses both STEPPING and BRUSHLESS motors.

There is a version with a brake mounted on the motor.

Stepper motors are also available with a brake and encoder (all BRUSHLESS motors come with an encoder). It is important to remember that the brake is static type, so the motor must be stopped before the brake is engaged.

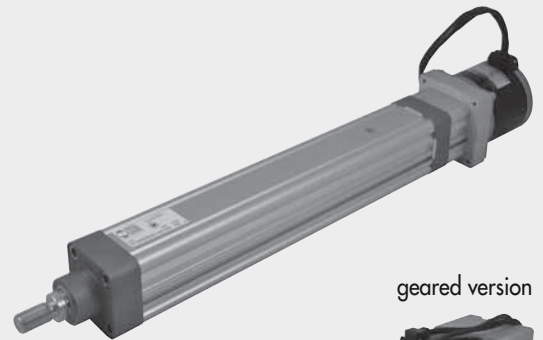
There is a version for in-line assembly, where the drive shaft is jointed directly onto the screw. There is also a geared motor version, where transmission is provided by pulleys and a cog belt with a transmission ratio of 1:1.

A planetary gear box, in the case of a Ø 100 in-line cylinder, and pulleys with a non-unitary gear ratio, in the case of a Ø 80 and Ø 100 cylinder, can be used to increase the torque. Suitable motor drives are provided.

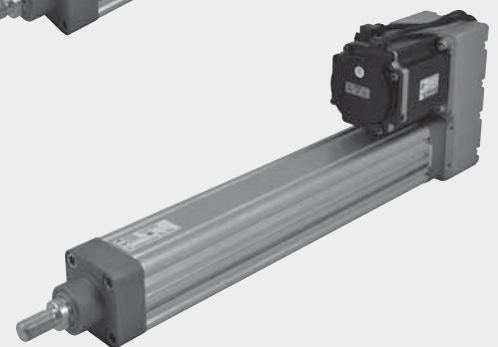
Special adaptor flanges and joints can be provided if the customer wishes to use a particular brand of motor.

**N.B.: A piston rod anti-rotation system must be used. If the piston rod is not fixed firmly to an element, a flange or to any other device preventing it from rotating, a cylinder in the anti-rotation version must be used.**

in-line version



geared version



TECHNICAL DATA	Ø 32	Ø 50	Ø 63 - 63 HD	Ø 80	Ø 100
Piston rod thread	M10x1.25	M16x1.5	M16x1.5	M20x1.5	
Environmental temperature range for STEPPING motors	°C			from -10 to +50	
BRUSHLESS motors	°C			from 0 to +40	
Electrical protection rating with STEPPING motors	IP20/IP40 or IP55 (see key to codes on page 1-484)			IP55	
BRUSHLESS motors	IP40 or IP65 (see key to codes on page 1-484)			IP65	
Maximum relative humidity of the air for IP55 STEPPING motor	90% with 40°C; 57% with 50°C (no condensate)				
IP65 BRUSHLESS motor	90% (no condensate)				
Minimum stroke for version with non-rotating	Twice the screw pitch (to guarantee ball lubrication)				
Minimum stroke for version without non-rotating	mm		mm		
	80 (in order to re-grease the screw)		125 (in order to re-grease the screw)		
Maximum stroke	mm		mm		
	1370		1500		
Positioning repeatability	mm		± 0.02		
Positioning accuracy	mm		± 0.2 **		
Overall radial oscillation of the piston rod (without load) for 100 mm of stroke	mm		0.4		
Versions	With or without piston rod non-rotating			With or without piston rod non-rotating; in line or geared motor; with or without planetary gear box	
Uncontrolled impact at the end of stroke	NOT ALLOWED (it provides an extra-stroke minimum 5 mm)				
Sensor magnet	YES				
Maximum angle of twist of the piston rod for non-rotating version	1°30'	1°	0°45'	0°35'	0°30'
Work position	Any				

\*\* indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc ...

MECHANICAL FEATURES		Ø 32		Ø 50			Ø 63			Ø 63 HD		Ø 80			Ø 100	
Screw pitch (p)	mm	4	12	5	10	16	5	10	20	5	10	5	10	32	10	40
Screw diameter	mm	12	12	16	16	16	20	20	20	20	20	32	32	32	50	40
Static axial load (F <sub>0</sub> )*	N	3300		4300			7500			12800		27150			36080	
Dynamic axial load (F)	N	5200	5600	10500	6670	4330	10010	12800	4880	17600	18980	30000	43000	26000	73000	43000
Calculate mean axial load and the calculate life (see graphs on page 1-462)																
Maximum number of revs	1/min	4000		3000			2500			2500		2000			2200	
Maximum speed (V <sub>max</sub> )	mm/s	267	800	250	500	800	208	417	833	208	417	165	310	1100	500	1500

\* N.B.: Static loads bearable without damage. Useful loads are shown in the diagrams on page 1-464 onwards.

WEIGHTS (ONLY CYLINDER)		Ø 32		Ø 50			Ø 63 - 63 HD			Ø 80			Ø 100	
Screw pitch (p)	mm	4	12	5	10	16	5	10	20	5	10	32	10	40
Weight at stroke 0	g	896	973	1990	2043	2086	2942	3209	3056	8658	8629	8650	15049	13719
Additional weight each mm of stroke	g	3.98	3.96	6.64	6.62	6.55	6.25	6.32	6.32	15.6	15.3	16	35.5	26
Moving mass at stroke 0 (non-rotating version) Mx	g	270	353	586	629	703	956	1215	1067	3709	3730	3667	6630	6171
Additional moving mass each mm of stroke	g	1.25		1.84			1.98			4.9			15	9.6

### MASS MOMENTS OF INERTIA

	Ø 32		Ø 50			Ø 63 - 63 HD				
Screw pitch	mm		4	12	5	10	16	5	10	20 (only Ø63)
Transmission ratio (τ)			1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
J0 at stroke 0	kgmm <sup>2</sup>		1.2407	2.4309	5.3455	6.1360	9.1113	12.4043	14.8767	23.5427
J1 each metre of stroke	kgmm <sup>2</sup> /m		12.2592	17.8468	35.2305	38.5264	49.1936	86.2990	96.6652	116.3671
J2 each kg of load	kgmm <sup>2</sup> /kg		0.4053	4.0858	0.6333	2.5332	6.4849	0.6333	2.5332	10.1327
J3 in-line transmission	kgmm <sup>2</sup>		0.42		2.6			18.1		
J3 geared transmission	kgmm <sup>2</sup>		53.2		126.5			237.7		

	Ø 80		Ø 100								
Screw pitch	mm		5			10			32		
Transmission ratio (τ)			1:1	1:1.25	1:1	1:1.25	1:1.5	1:1	1:1.5	1:1	1:1.5
J0 at stroke 0	kgmm <sup>2</sup>		430			420.3			438.8		
J1 each metre of stroke	kgmm <sup>2</sup> /m		688			608			753		
J2 each kg of load	kgmm <sup>2</sup> /kg		0.6333			2.5330			25.9382		
J3 in-line transmission	kgmm <sup>2</sup>		74.1	-	74.1	-	-	74.1	-	74.1	-
J3 geared transmission	kgmm <sup>2</sup>		1041.7	388.3	1041.7	388.3	1071.6	1041.7	1071.6	1041.7	1071.6

	Ø 100								
Screw pitch	mm			10			40		
Transmission ratio (τ)				1:1	1:2	1:3 ●	1:1	1:2	1:3 ●
J0 at stroke 0	kgmm <sup>2</sup>			1357			1042.4		
J1 each metre of stroke	kgmm <sup>2</sup> /m			3984			1869.3		
J2 each kg of load	kgmm <sup>2</sup> /kg			2.5330			40.5284		
J3 in-line transmission	kgmm <sup>2</sup>			163.9	-	385.9	163.9	-	385.9
J3 geared transmission	kgmm <sup>2</sup>			1041.7	1161.1	-	1041.7	1161.1	-

● in line with gear box

The total mass moment of inertia (J<sub>tot</sub>) reduced for the motor is: J<sub>tot</sub> = [J1 · corsa [m] + J2 · (Carico [kg] + Mx [kg]) + J0] · τ<sup>2</sup> + J3  
Mx is defined in the weight table.

## CALCULATION OF MEAN AXIAL LOAD $F_m$ AND VERIFICATION

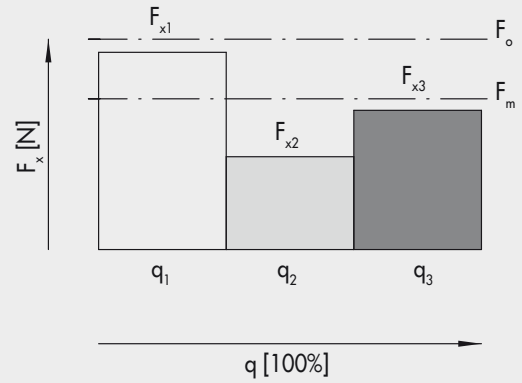
Peak axial load in a work cycle must not exceed the static axial load  $F_o$ . The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load  $F_m$

$$F_m = \sqrt[3]{\sum F_x^3 \times \frac{V_x}{V_m} \times \frac{q}{100}} =$$

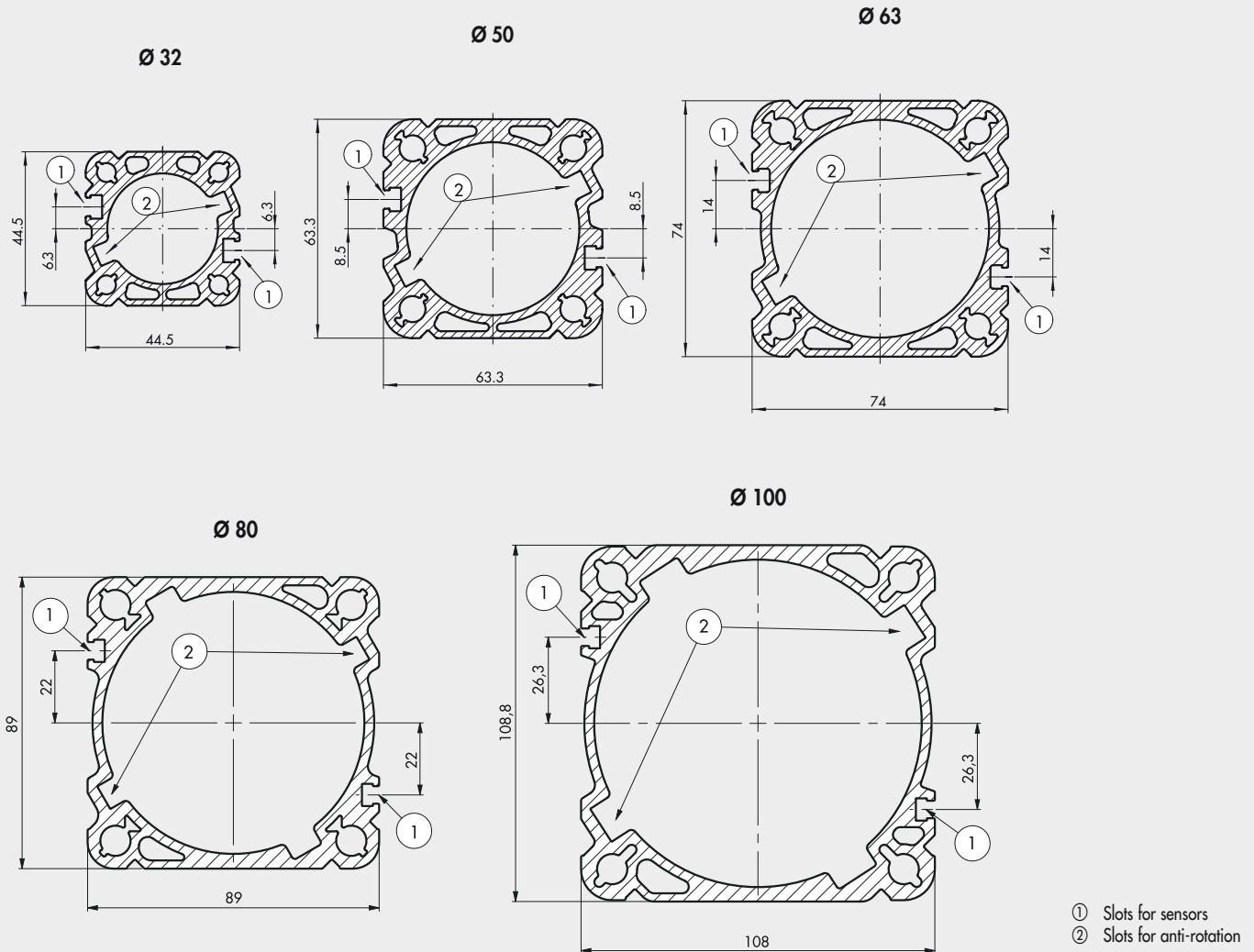
$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{x1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{x2}}{V_m} \times \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{x3}}{V_m} \times \frac{q_3}{100} + \dots}$$

- $F_x$  = Axial load at stage x
- $F_m$  = Mean axial load during extension
- $F_o$  = Static axial load
- q = Time segment
- $V_x$  = Speed in the phase x
- $V_m$  = Average speed



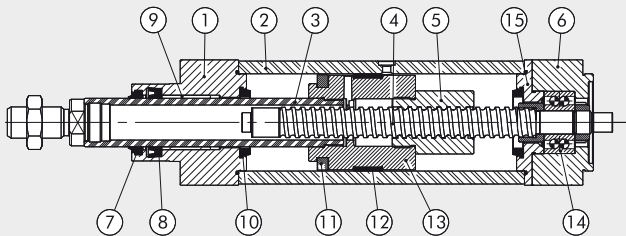
The mean axial load must not exceed the dynamic axial load:  $F_m \leq F$   
 The graphs on page 1-462 show screw life as a function of  $F_m$

## BARREL CROSS SECTION

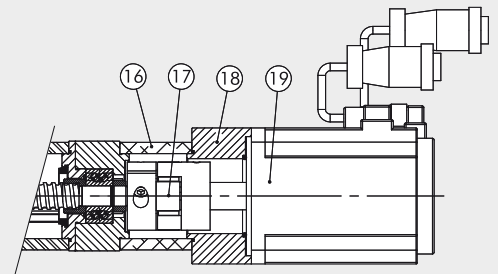


## COMPONENTS

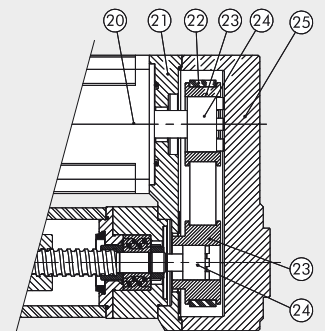
CYLINDER



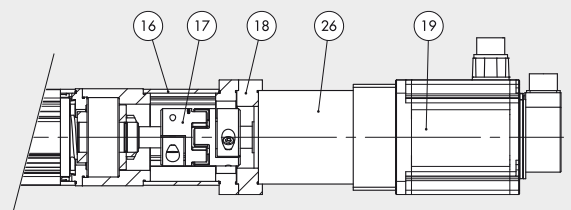
CYLINDER WITH IN-LINE MOTOR



CYLINDER WITH GEARED MOTOR



CYLINDER WITH MOTOR AND GEAR BOX

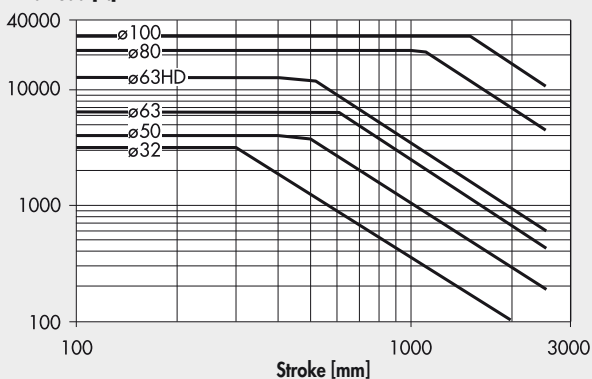


- ① FRONT CYLINDER HEAD: anodised aluminium
- ② BARREL: extruded and anodised aluminium alloy
- ③ PISTON ROD: grinded chrome steel
- ④ WORM SCREW: hardened steel
- ⑤ BALL SCREW: steel
- ⑥ REAR CYLINDER HEAD: anodised aluminium
- ⑦ WIPER RING: polyurethane
- ⑧ PISTON ROD GASKET: NBR (IP55/ IP65 version only)
- ⑨ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑩ BUFFER: technopolymer
- ⑪ MAGNET: plastoferrite
- ⑫ GUIDE STRIP: self-lubricated calibrated technopolymer
- ⑬ PISTON: aluminium
- ⑭ BEARING: oblique with two ball rings
- ⑮ BEARING LOCKING RING: anodised aluminium
- ⑯ BELL: extruded and anodised aluminium alloy
- ⑰ COUPLING
- ⑱ ADAPTOR PLATE: anodised aluminium
- ⑲ ELECTRIC MOTOR
- ⑳ ELECTRIC MOTOR
- ㉑ TRANSMISSION PLATE: anodised aluminium
- ㉒ DRIVE BELT
- ㉓ PULLEY: steel
- ㉔ SHRINK DISC
- ㉕ COVER: anodised aluminium
- ㉖ PLANETARY GEAR BOX

## PEAK LOADS

With vertical installations, the following load conditions applied to the piston rod must be met.

Axial load [N]

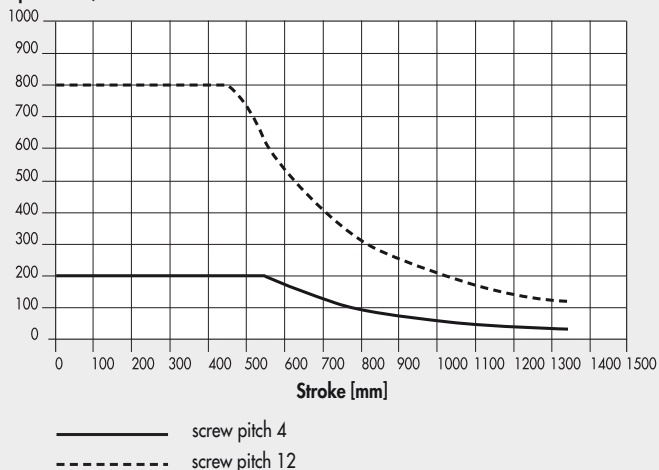


## CRITICAL VELOCITY

The two variables (stroke and linear speed) must meet the conditions in the graph below, otherwise resonance could be generated and affect the system.

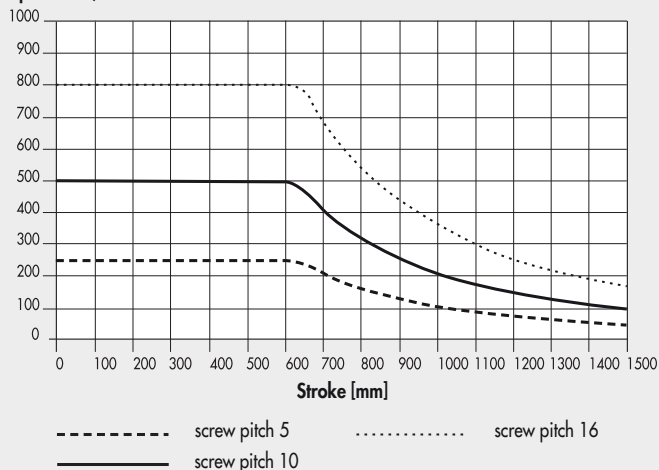
### Ø 32

Speed [mm/s]



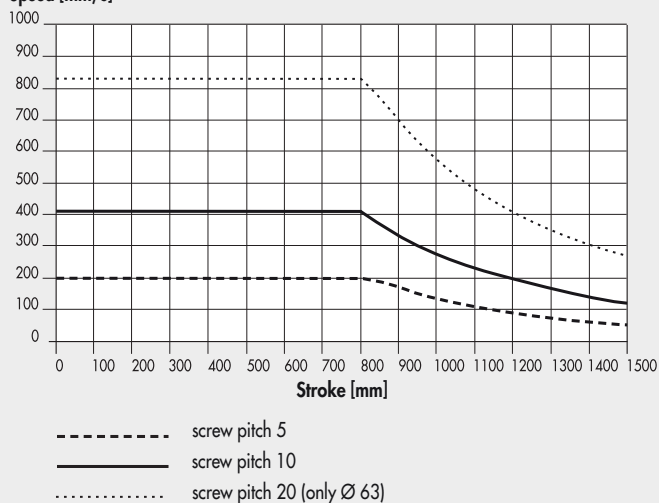
### Ø 50

Speed [mm/s]



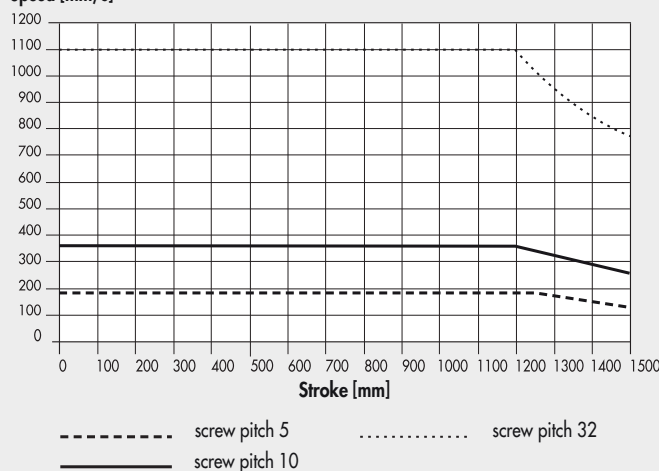
### Ø 63 - Ø 63 HD

Speed [mm/s]



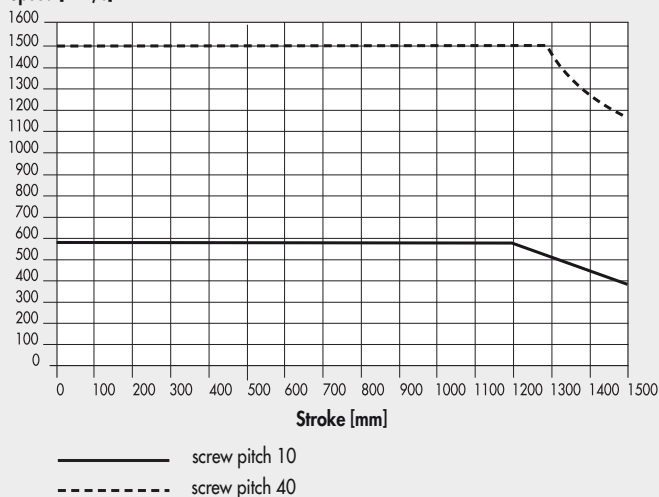
### Ø 80

Speed [mm/s]



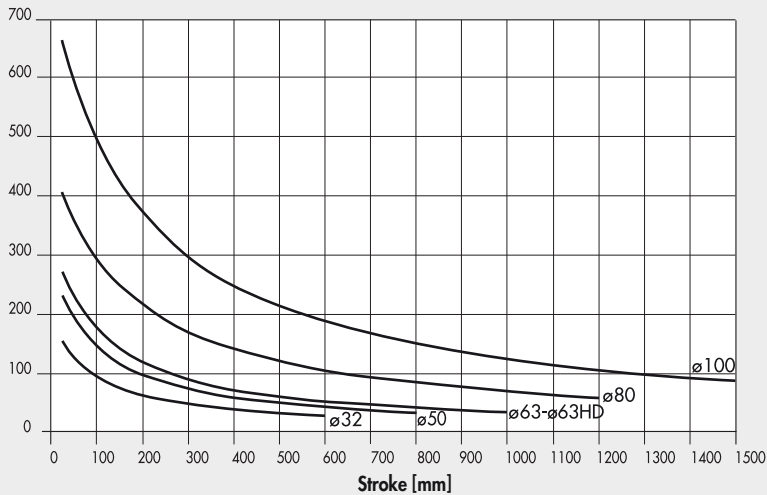
### Ø 100

Speed [mm/s]



## MAXIMUM RADIAL LOADS ON PISTON ROD

Radial loads [N]



Radial loads can be applied to the piston rod. They must not exceed the values in the adjacent chart, otherwise the guides on the rod and piston will be subjected to excessive wear.

## PISTON ROD SPEED DEPENDING ON THE NUMBER OF SCREW TURNS

SCREW PITCH	TRANSMISSION RATIO	K (n/V)
4	1:1	15
5	1:1	12
	1:1.25	15
10	1:1	6
	1:1.25	7.5
	1:1.5	9
	1:2	12
	1:3	18
12	1:1	5
16	1:1	3.75
20	1:1	3
32	1:1	1.87
	1:1.5	2.81
40	1:1	1.5
	1:2	3
	1:3	4.5

The table shows the direct correspondence between the number of turns (1/min) and the translation speed of the stem (mm/s). In any case all the other conditions and limitations of each specific cylinder will have to be complied.

**Example:**

V = 100 mm/s  
pitch = 10  
transmission ratio = 1:1.5  
K = 9  
n = V x K = 900 rpm

## DRIVE TORQUE AS A FUNCTION OF THE AXIAL LOAD APPLIED TO THE PISTON ROD

SCREW PITCH	TRANSMISSION RATIO	h (C/F)
4	1:1	0.0008
5	1:1	0.0010
	1:1.25	0.0008
10	1:1	0.0020
	1:1.25	0.0016
	1:1.5	0.0013
	1:2	0.0010
	1:3	0.0007
12	1:1	0.0024
16	1:1	0.0032
20	1:1	0.0040
32	1:1	0.0064
	1:1.5	0.0043
40	1:1	0.0080
	1:2	0.0040
	1:3	0.0027

The friction generated in the mechanical system is taken into account.

**Example:**

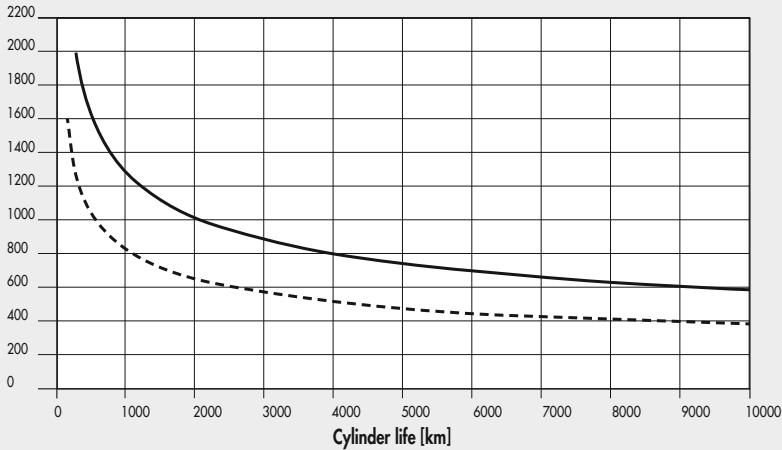
F = 1000 N  
pitch = 10  
transmission ratio = 1:1.5  
h = 0.0013  
C = F x h = 1.3 Nm

## LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD

Life characteristics can vary considerably from those indicated in the graphs due to different operating conditions (radial loads, temperature, lubrication status, etc.).

### Ø 32

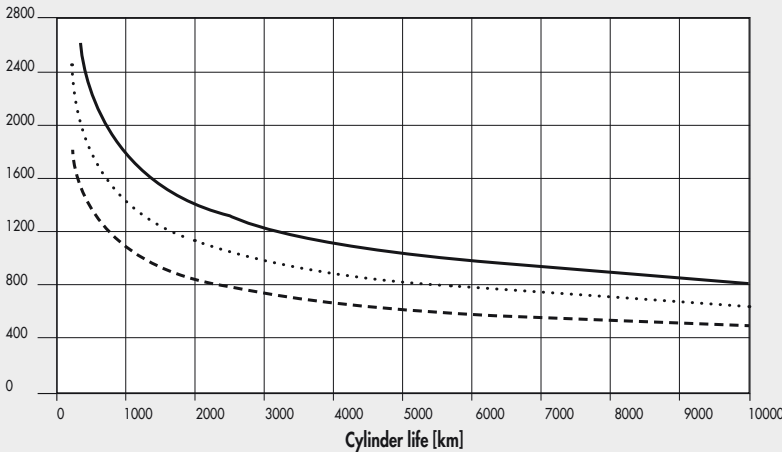
Mean axial load [N]



----- screw pitch 4  
 \_\_\_\_\_ screw pitch 12

### Ø 50

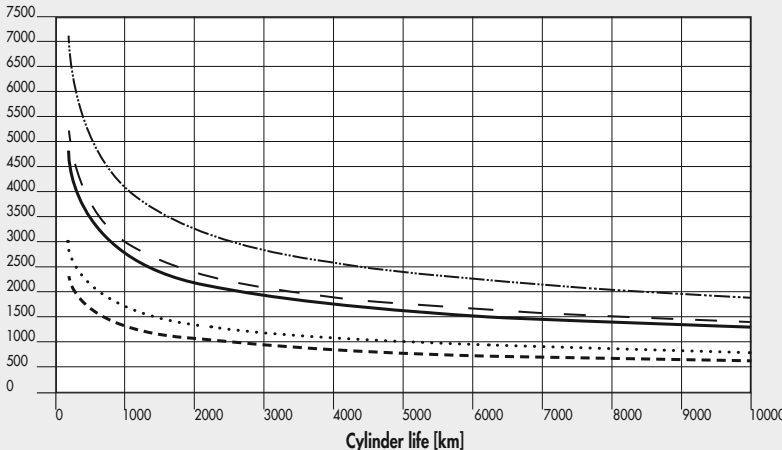
Mean axial load [N]



\_\_\_\_\_ screw pitch 5  
 ..... screw pitch 10  
 ----- screw pitch 16

### Ø 63 - Ø 63 HD

Mean axial load [N]

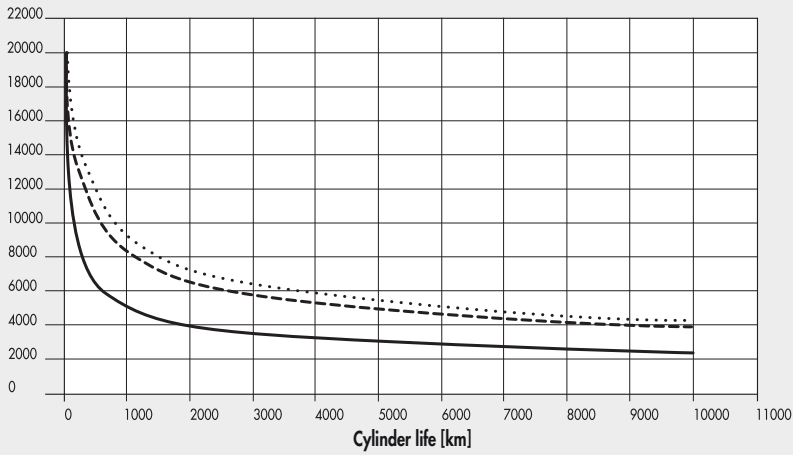


..... screw pitch 5  
 \_\_\_\_\_ screw pitch 10  
 ----- screw pitch 20  
 - - - - - screw pitch 5 HD  
 - · - · - screw pitch 10 HD



## Ø 80

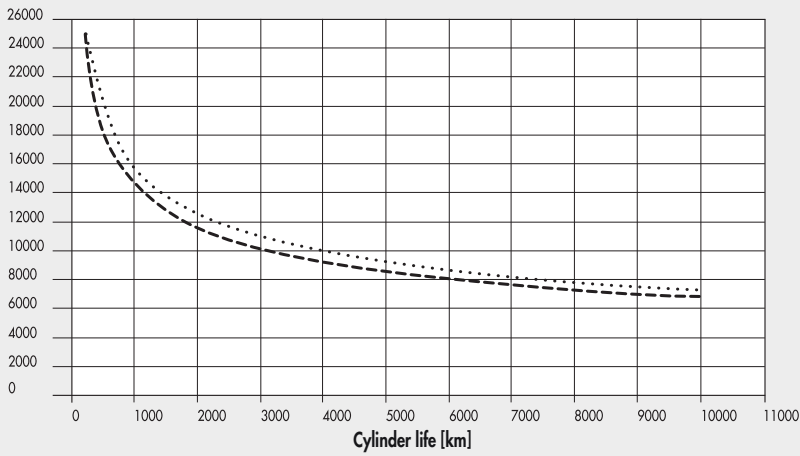
Mean axial load [N]



— screw pitch 5  
 ..... screw pitch 10  
 - - - screw pitch 32

## Ø 100

Mean axial load [N]



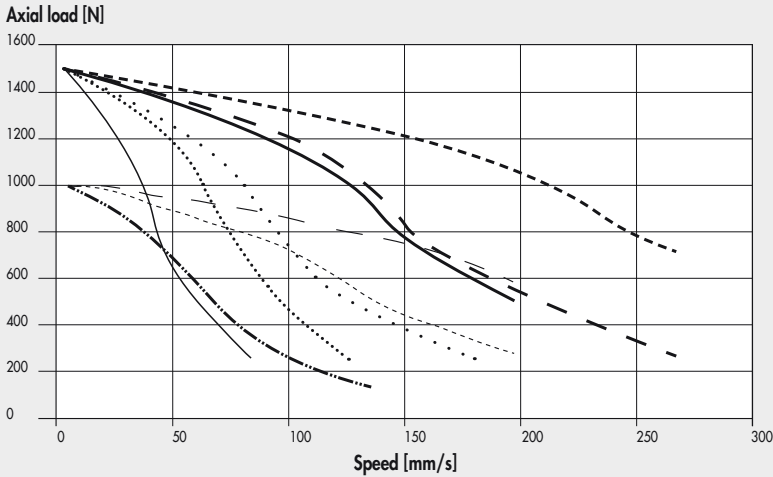
..... screw pitch 10  
 - - - screw pitch 40

## NOTES

## AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE)

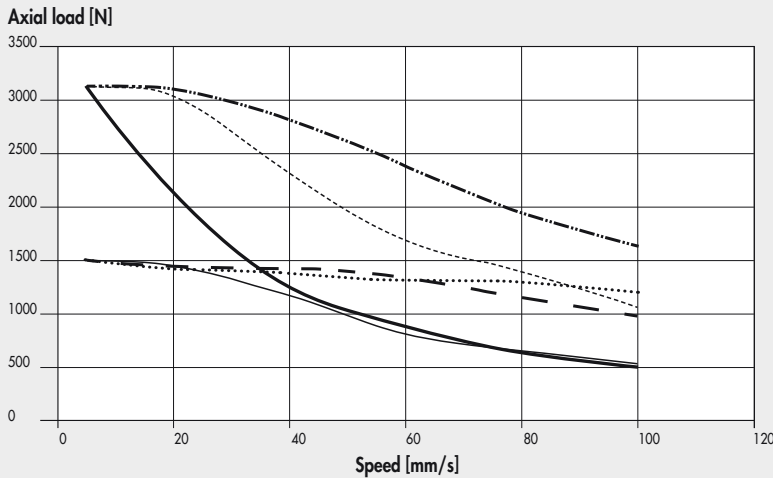
N.B.: The obtainable load values already take the efficiency of the system into account. For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

Ø 32 with pitch 4 screw, STEPPING motors and motor 1 STEPPING with BRAKE



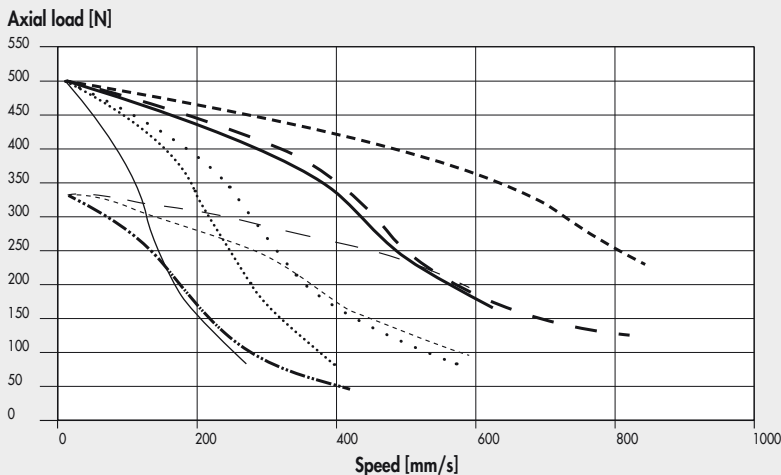
- 37M1110000 (24VDC)
- 37M1110000 (48VDC)
- 37M1110000 (75VDC)
- 37M1120000 (24VDC) or 37M5120000 (with brake, 24VDC)
- ..... 37M1120000 (48VDC) or 37M5120000 (with brake, 48VDC)
- 37M1120000 (75VDC) or 37M5120000 (with brake, 75VDC)
- ..... 37M1120001 (24VDC)
- 37M1120001 (48VDC)
- 37M1120001 (75VDC)

Ø 32 with pitch 4 screw, STEPPING motors with BRAKE + ENCODER



- 37M3220000 (24VDC)
- 37M3220000 (48VDC)
- ..... 37M3220000 (75VDC)
- 37M3230000 (24VDC)
- 37M3230000 (48VDC)
- ..... 37M3230000 (75VDC)

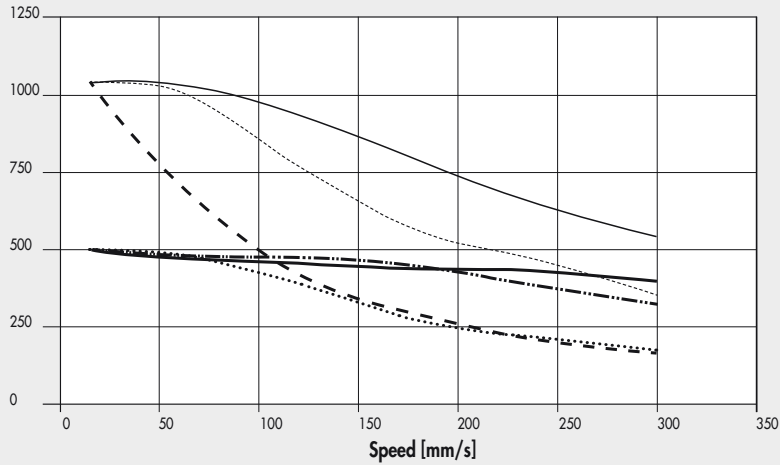
Ø 32 with pitch 12 screw, STEPPING motors and motor 1 STEPPING with BRAKE



- 37M1110000 (24VDC)
- 37M1110000 (48VDC)
- 37M1110000 (75VDC)
- 37M1120000 (24VDC) or 37M5120000 (with brake, 24VDC)
- ..... 37M1120000 (48VDC) or 37M5120000 (with brake, 48VDC)
- 37M1120000 (75VDC) or 37M5120000 (with brake, 75VDC)
- ..... 37M1120001 (24VDC)
- 37M1120001 (48VDC)
- 37M1120001 (75VDC)

Ø 32 with pitch 12 screw, STEPPING motors with BRAKE + ENCODER

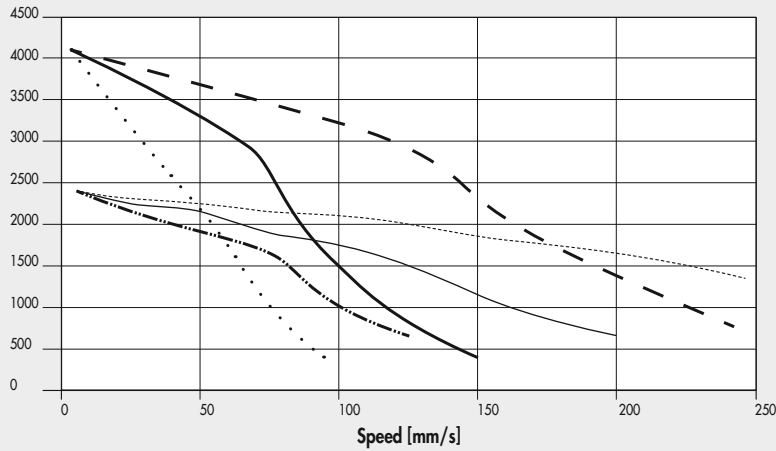
Axial load [N]



- ..... 37M3220000 (24VDC)
- 37M3220000 (48VDC)
- 37M3220000 (75VDC)
- 37M3230000 (24VDC)
- ..... 37M3230000 (48VDC)
- 37M3230000 (75VDC)

Ø 50 with pitch 5 screw, STEPPING motors

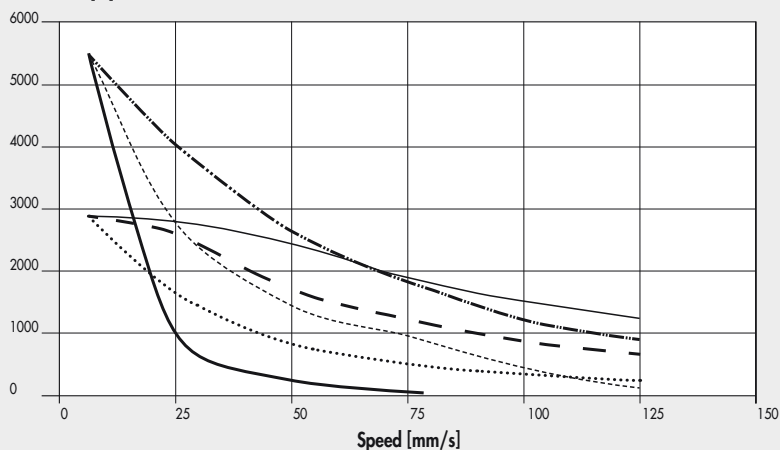
Axial load [N]



- 37M1430000 (48VDC)
- 37M1430000 (75VDC)
- ..... 37M1430000 (140VDC)
- ..... 37M1440000 (48VDC)
- 37M1440000 (75VDC)
- 37M1440000 (140VDC)

Ø 50 with pitch 5 screw, STEPPING motors with BRAKE + ENCODER

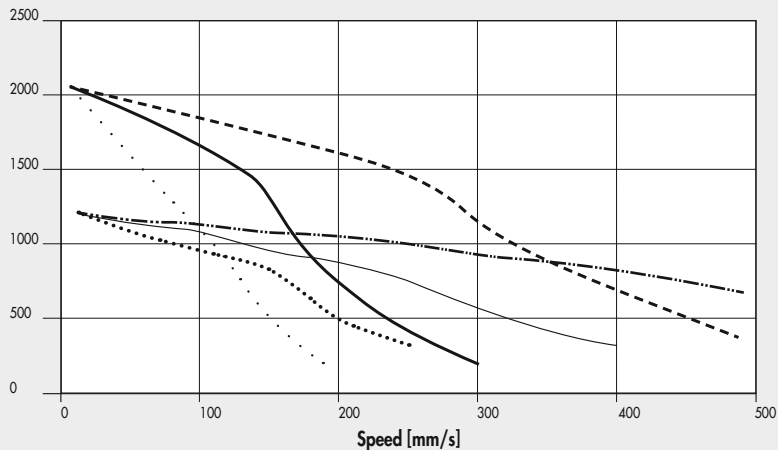
Axial load [N]



- ..... 37M3430000 (24VDC)
- 37M3430000 (48VDC)
- 37M3430000 (75VDC)
- 37M3460000 (24VDC)
- 37M3460000 (48VDC)
- 37M3460000 (75VDC)

Ø 50 with pitch 10 screw, STEPPING motors

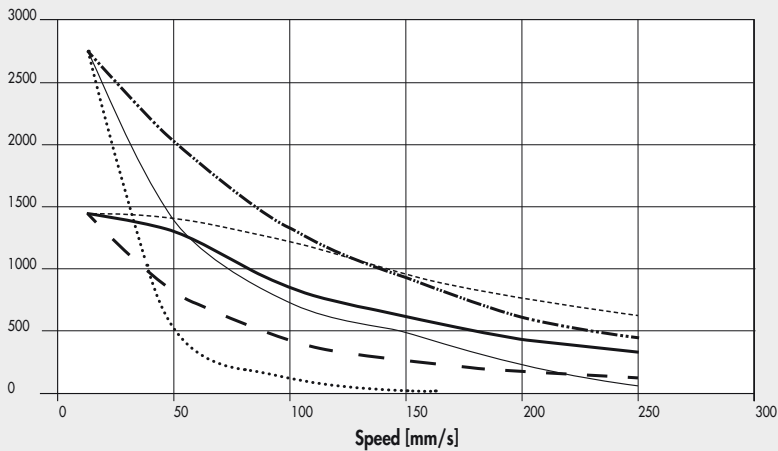
Axial load [N]



- ..... 37M1430000 (48VDC)
- 37M1430000 (75VDC)
- 37M1430000 (140VDC)
- ..... 37M1440000 (48VDC)
- 37M1440000 (75VDC)
- 37M1440000 (140VDC)

Ø 50 with pitch 10 screw, STEPPING motors with BRAKE + ENCODER

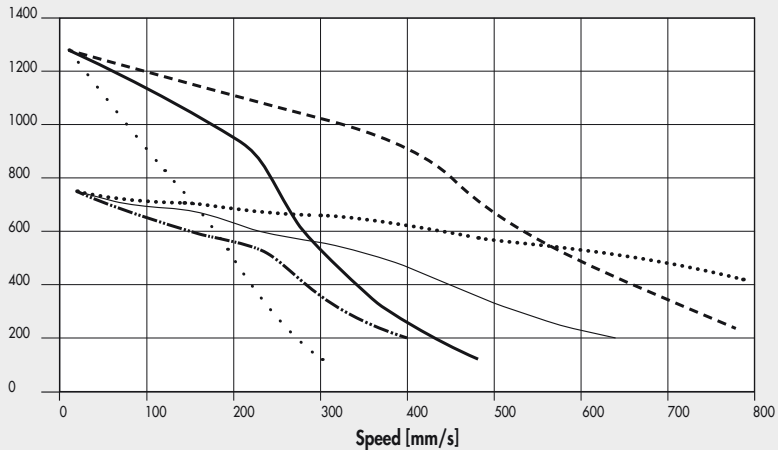
Axial load [N]



- 37M3430000 (24VDC)
- 37M3430000 (48VDC)
- ..... 37M3430000 (75VDC)
- ..... 37M3460000 (24VDC)
- 37M3460000 (48VDC)
- ..... 37M3460000 (75VDC)

Ø 50 with pitch 16 screw, STEPPING motors

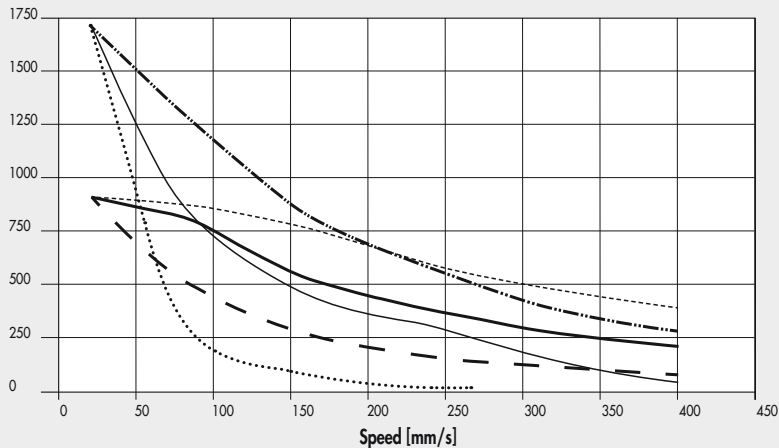
Axial load [N]



- ..... 37M1430000 (48VDC)
- 37M1430000 (75VDC)
- ..... 37M1430000 (140VDC)
- ..... 37M1440000 (48VDC)
- 37M1440000 (75VDC)
- ..... 37M1440000 (140VDC)

**Ø 50 with pitch 16 screw, STEPPING motors with BRAKE + ENCODER**

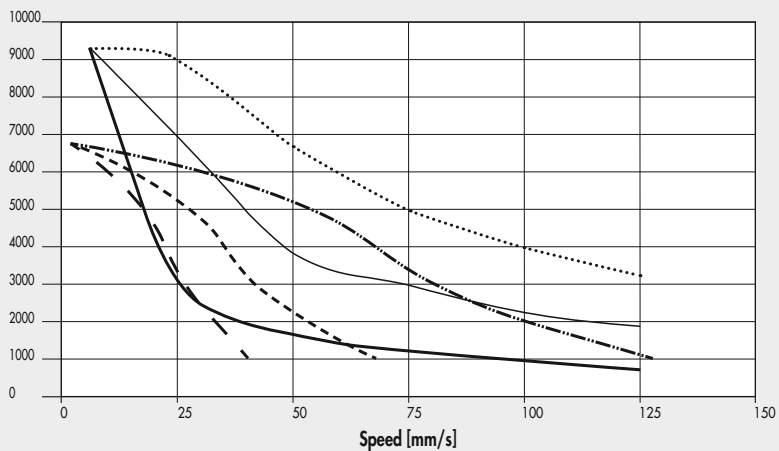
Axial load [N]



- 37M3430000 (24VDC)
- 37M3430000 (48VDC)
- 37M3430000 (75VDC)
- ..... 37M3460000 (24VDC)
- 37M3460000 (48VDC)
- 37M3460000 (75VDC)

**Ø 63 with pitch 5 screw, STEPPING motors**

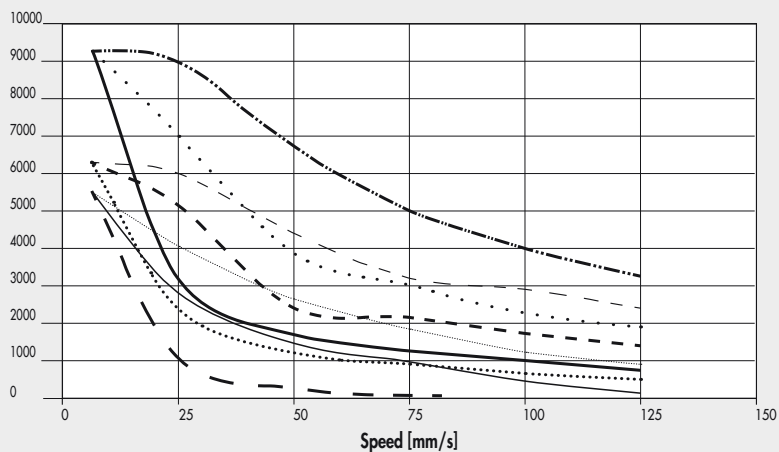
Axial load [N]



- 37M1450000 (48VDC)
- 37M1450000 (75VDC)
- 37M1450000 (140VDC)
- 37M1470000 (24VDC)
- 37M1470000 (48VDC)
- ..... 37M1470000 (75VDC)

**Ø 63 with pitch 5 screw, STEPPING motors with BRAKE + ENCODER**

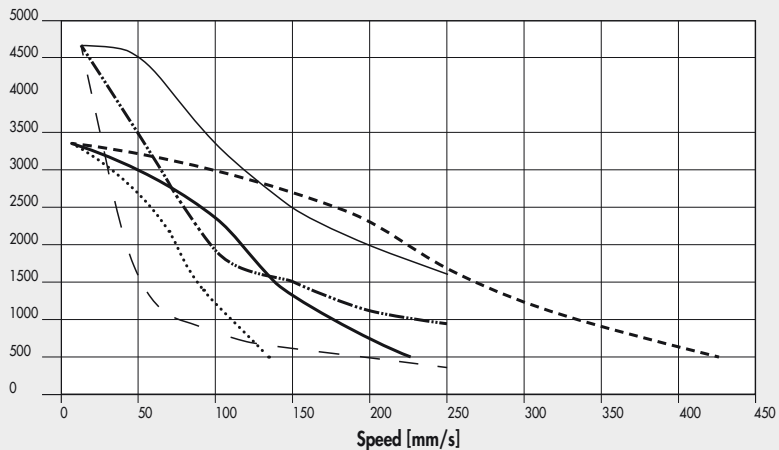
Axial load [N]



- ..... 37M3450000 (24VDC)
- 37M3450000 (48VDC)
- 37M3450000 (75VDC)
- 37M3460000 (24VDC)
- 37M3460000 (48VDC)
- 37M3460000 (75VDC)
- 37M3470000 (24VDC)
- ..... 37M3470000 (48VDC)
- 37M3470000 (75VDC)

Ø 63 with pitch 10 screw, STEPPING motors

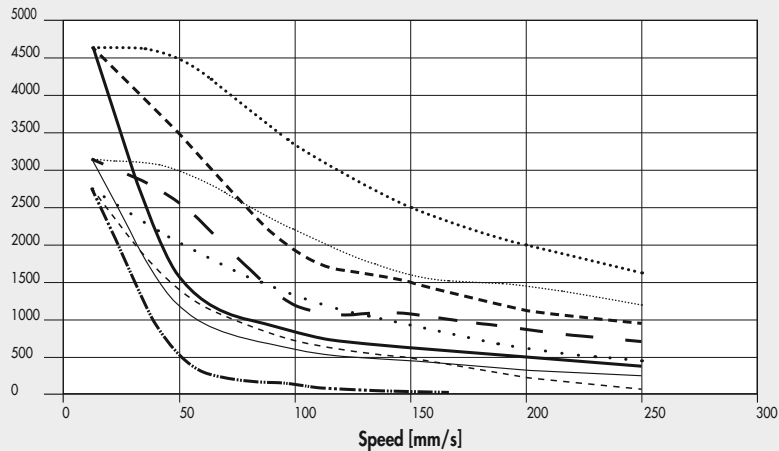
Axial load [N]



- ..... 37M1450000 (48VDC)
- 37M1450000 (75VDC)
- 37M1450000 (140VDC)
- - - - - 37M1470000 (24VDC)
- · · · · 37M1470000 (48VDC)
- 37M1470000 (75VDC)

Ø 63 with pitch 10 screw, STEPPING motors with BRAKE + ENCODER

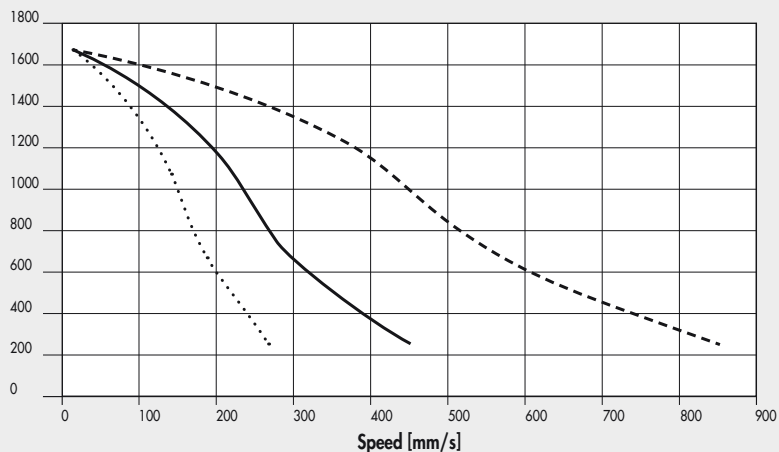
Axial load [N]



- 37M3450000 (24VDC)
- - - - - 37M3450000 (48VDC)
- ..... 37M3450000 (75VDC)
- · · · · 37M3460000 (24VDC)
- 37M3460000 (48VDC)
- · · · · 37M3460000 (75VDC)
- 37M3470000 (24VDC)
- - - - - 37M3470000 (48VDC)
- ..... 37M3470000 (75VDC)

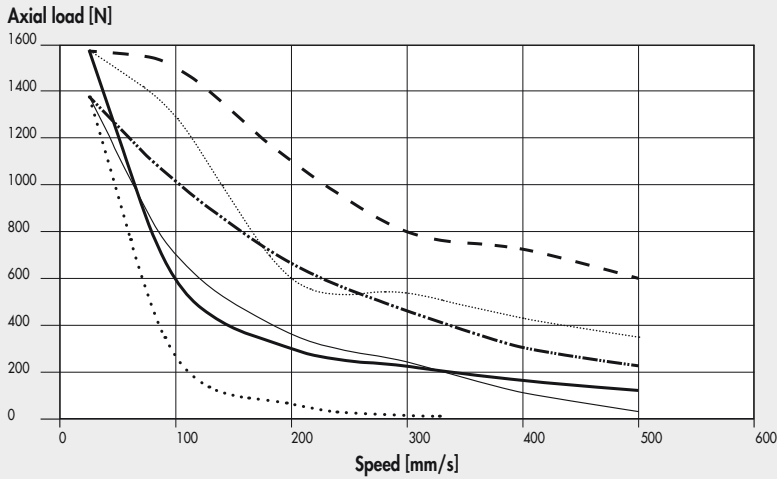
Ø 63 with pitch 20 screw, STEPPING motors

Axial load [N]



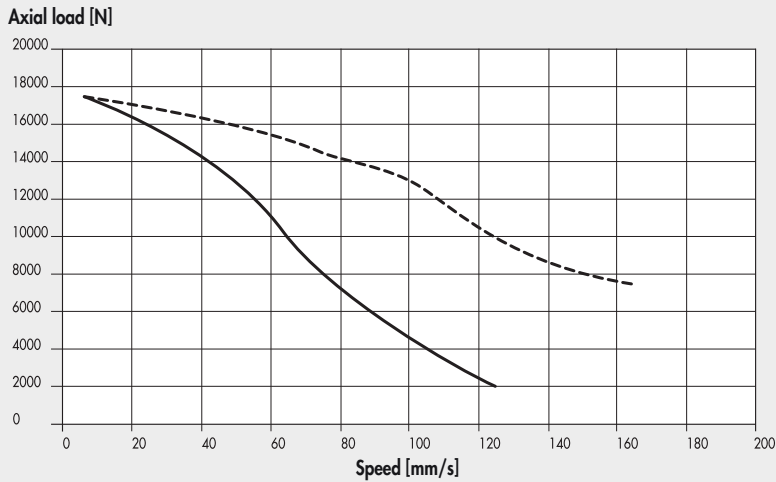
- ..... 37M1450000 (48VDC)
- 37M1450000 (75VDC)
- 37M1450000 (140VDC)

Ø 63 with pitch 20 screw, STEPPING motors with BRAKE + ENCODER



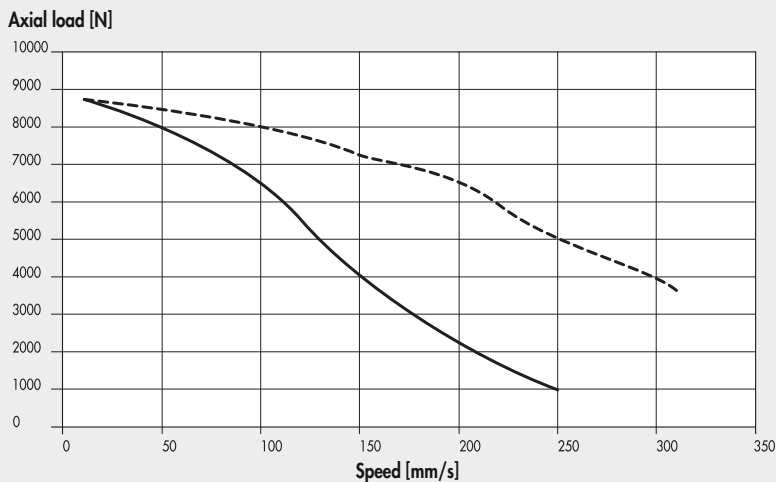
- 37M3450000 (24VDC)
- ..... 37M3450000 (48VDC)
- 37M3450000 (75VDC)
- ..... 37M3460000 (24VDC)
- 37M3460000 (48VDC)
- 37M3460000 (75VDC)

Ø 80 with pitch 5 screw, STEPPING motors



- 37M1890000 + 37D1362001 (230VDC)
- 37M1890000 + 37D1362001 (115VDC)

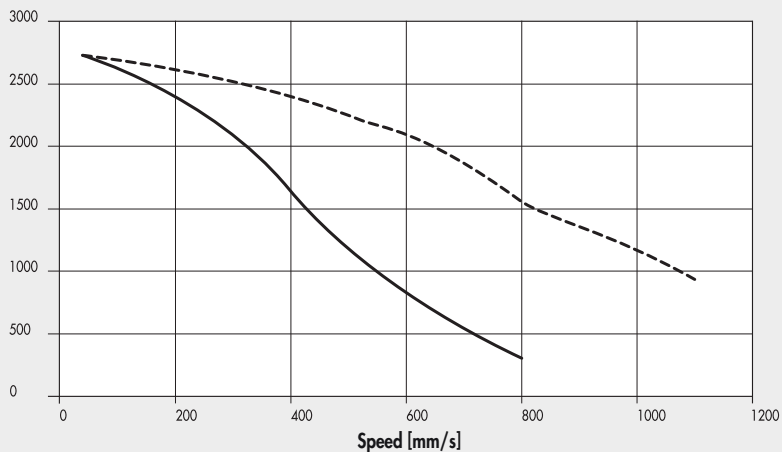
Ø 80 with pitch 10 screw, STEPPING motors



- 37M1890000 + 37D1362001 (230VDC)
- 37M1890000 + 37D1362001 (115VDC)

Ø 80 with pitch 32 screw, STEPPING motors

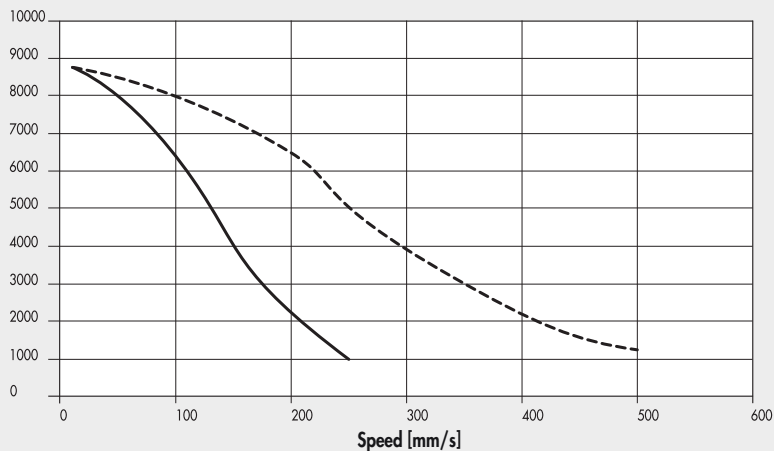
Axial load [N]



----- 37M1890000 + 37D1362001 (230VDC)  
 \_\_\_\_\_ 37M1890000 + 37D1362001 (115VDC)

Ø 100 with pitch 10 screw, STEPPING motors

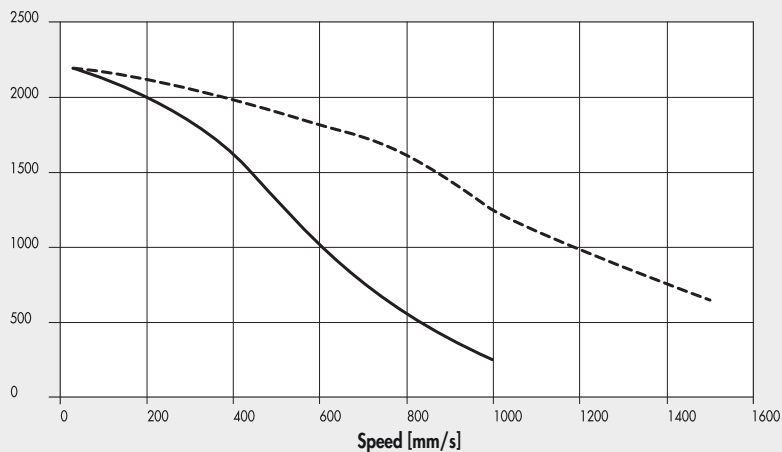
Axial load [N]



----- 37M1890000 + 37D1362001 (230VDC)  
 \_\_\_\_\_ 37M1890000 + 37D1362001 (115VDC)

Ø 100 with pitch 40 screw, STEPPING motors

Axial load [N]

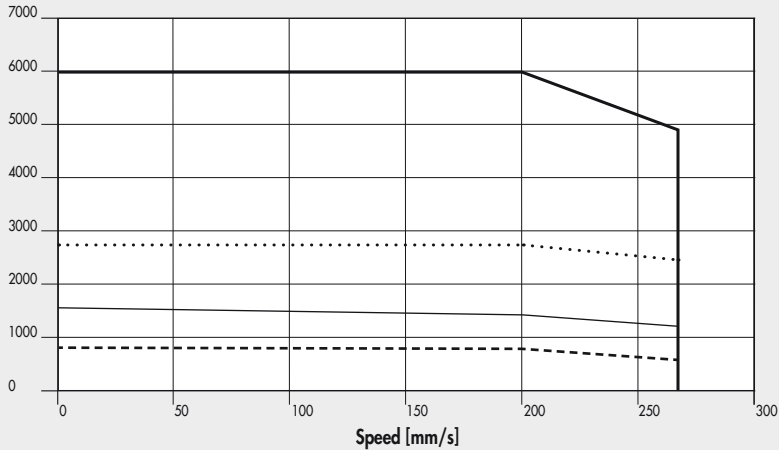


----- 37M1890000 + 37D1362001 (230VDC)  
 \_\_\_\_\_ 37M1890000 + 37D1362001 (115VDC)



**Ø 32 with pitch 4 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE**

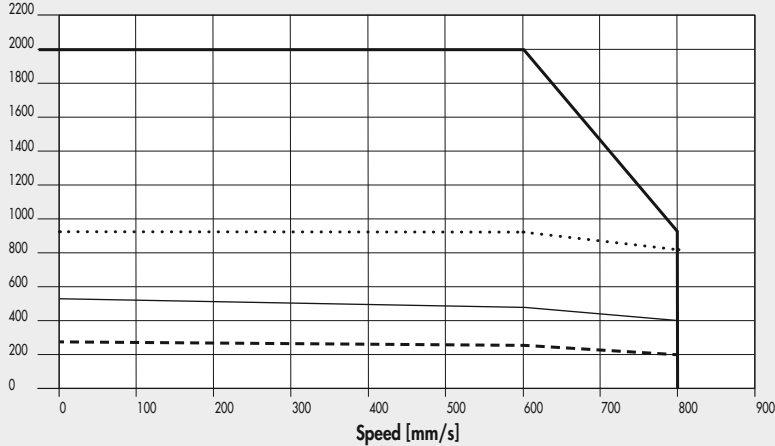
**Axial load [N]**



- Nominal torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- \_\_\_\_\_ Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- ..... Max torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

**Ø 32 with pitch 12 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE**

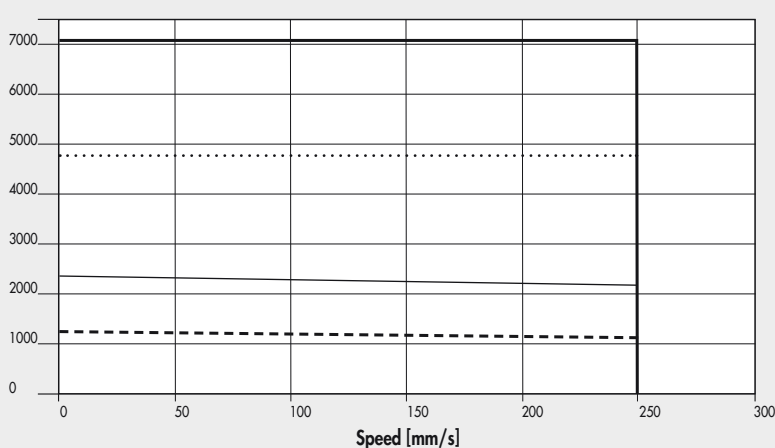
**Axial load [N]**



- Nominal torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- \_\_\_\_\_ Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- ..... Max torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

**Ø 50 with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE**

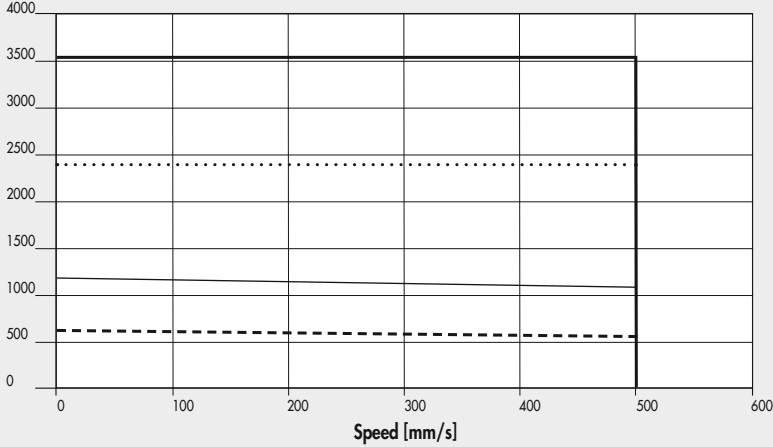
**Axial load [N]**



- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- \_\_\_\_\_ Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- ..... Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

**Ø 50 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE**

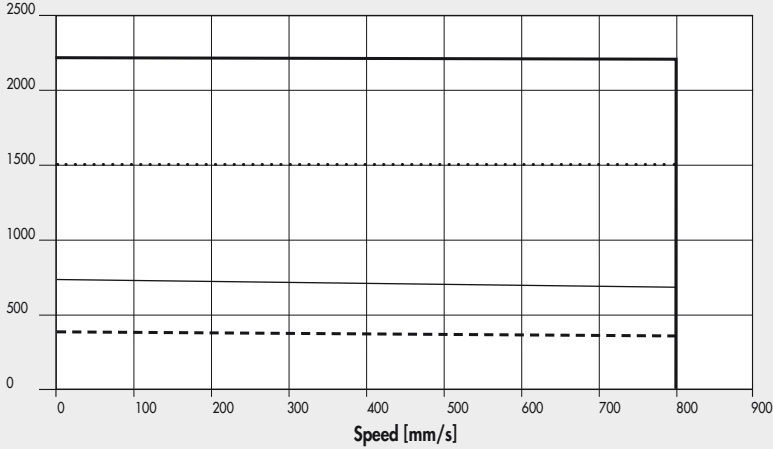
Axial load [N]



- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- ..... Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

**Ø 50 with pitch 16 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE**

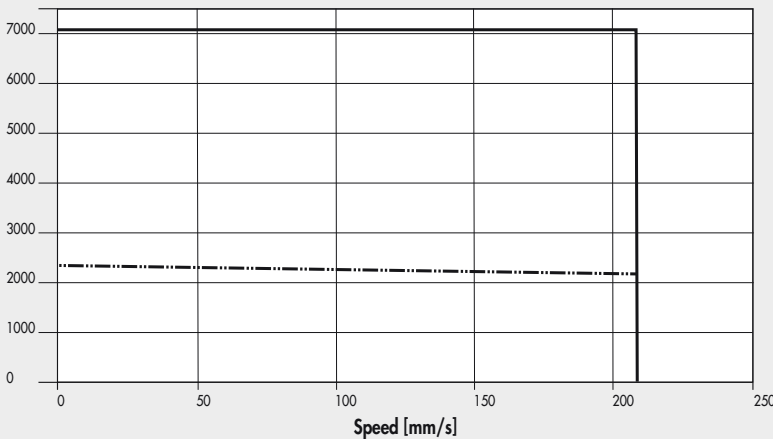
Axial load [N]



- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- ..... Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

**Ø 63 - Ø 63 HD with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (750 W)**

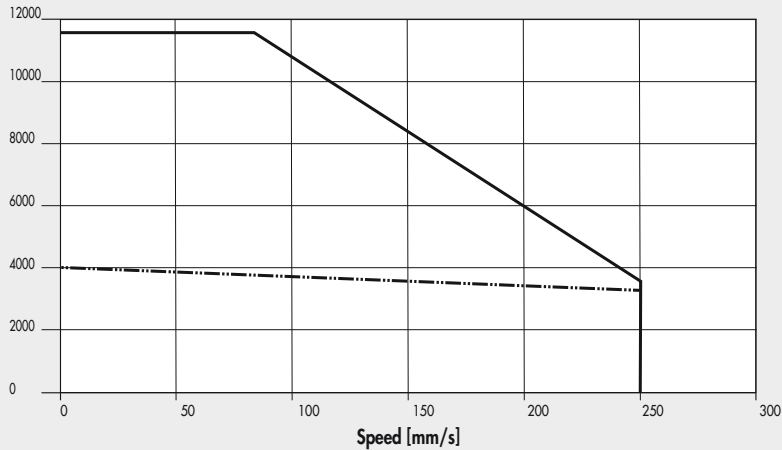
Axial load [N]



- ..... Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Ø 63 HD with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000 W)

Axial load [N]

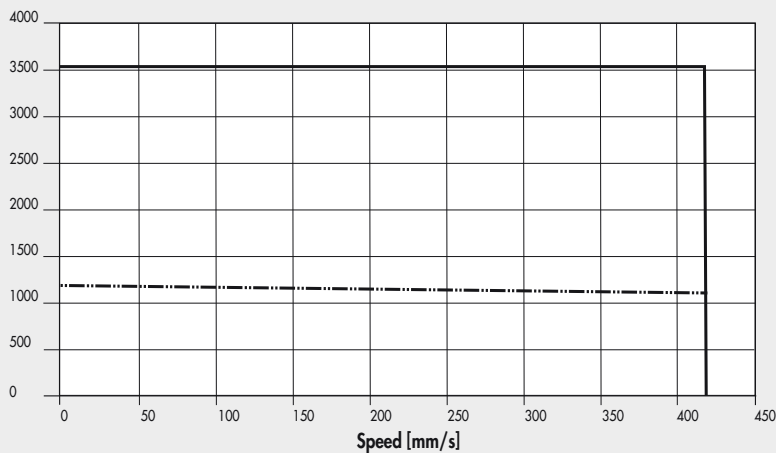


--- Nominal torque 37M2540000  
or 37M4540000 (with brake)  
+ 37D2400000 (1000W)

— Max torque 37M2540000  
or 37M4540000 (with brake)  
+ 37D2400000 (1000W)

Ø 63 - Ø 63 HD with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (750 W)

Axial load [N]

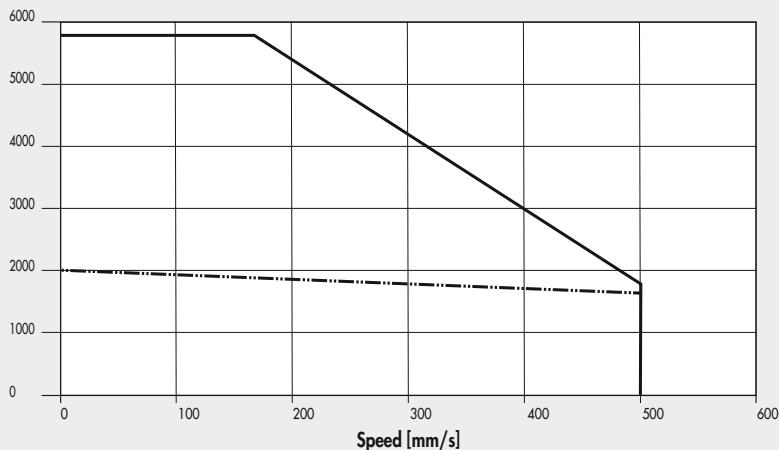


--- Nominal torque 37M2330000  
or 37M4330000 (with brake)  
+ 37D2400000 (750W)

— Max torque 37M2330000  
or 37M4330000 (with brake)  
+ 37D2400000 (750W)

Ø 63 HD with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000 W)

Axial load [N]



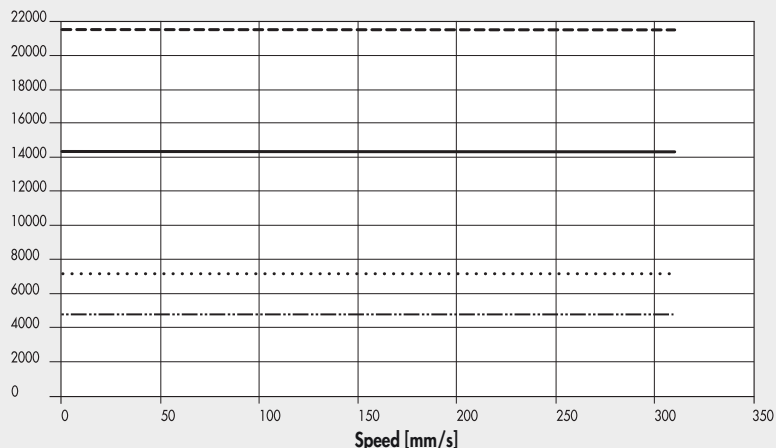
--- Nominal torque 37M2540000  
or 37M4540000 (with brake)  
+ 37D2400000 (1000W)

— Max torque 37M2540000  
or 37M4540000 (with brake)  
+ 37D2400000 (1000W)



## Ø 80 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)

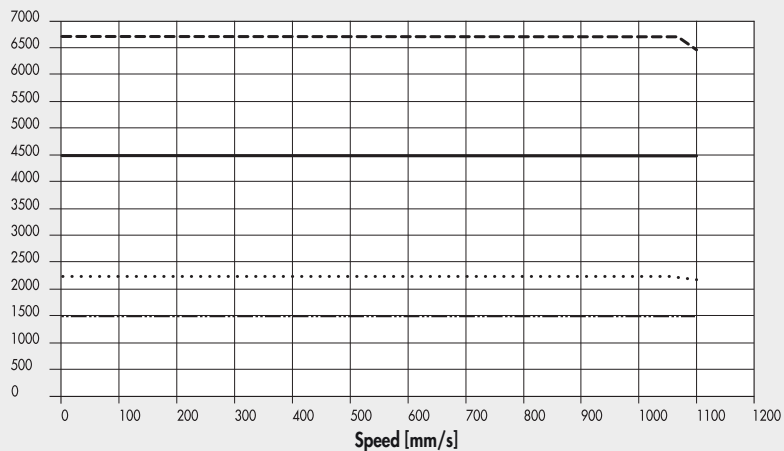
Axial load [N]



- Max torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) in-line version (1:1)
- ..... Nominal torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) in-line version (1:1)
- Max torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) geared version (1:1.5)
- ..... Nominal torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) geared version (1:1.5)

## Ø 80 with pitch 32 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)

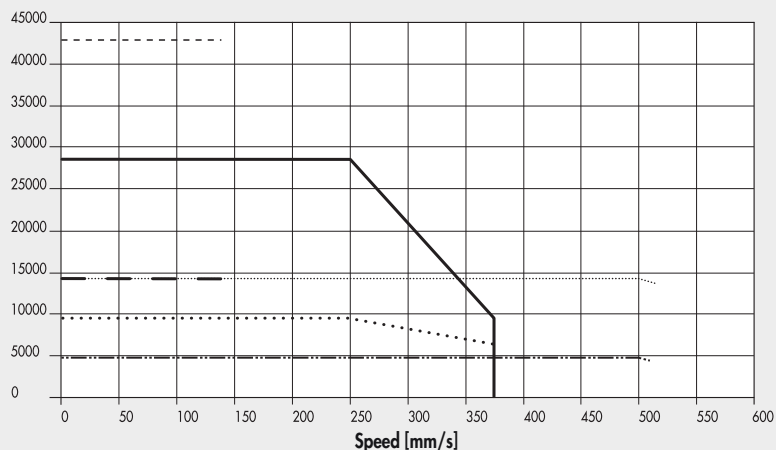
Axial load [N]



- Max torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) in-line version (1:1)
- ..... Nominal torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) in-line version (1:1)
- Max torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) geared version (1:1.5)
- ..... Nominal torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) geared version (1:1.5)

## Ø 100 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)

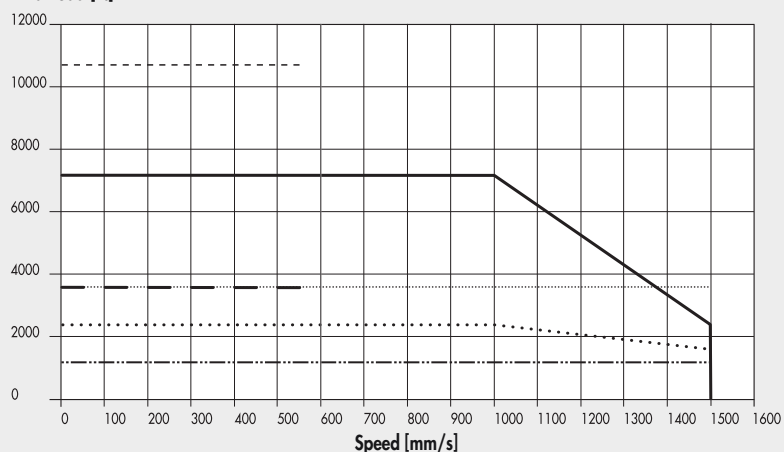
Axial load [N]



- Max torque 37M2770000  
or 37M4770000 (with brake) + 37D2600001  
(3000W) in-line version with gear box (1:3)
- - - - - Nominal torque 37M2770000  
or 37M4770000 (with brake) + 37D2600001  
(3000W) in-line version with gear box (1:3)
- Max torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) geared version (1:2)
- ..... Nominal torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) geared version (1:2)
- ..... Max torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) in-line version (1:1)
- ..... Nominal torque 37M2770000  
or 37M4770000 (with brake)  
+ 37D2600001 (3000W) in-line version (1:1)

Ø 100 with pitch 40 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)

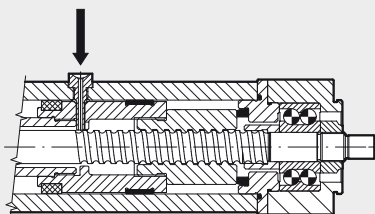
Axial load [N]



- Max torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gear box (1:3)
- - - - - Nominal torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gear box (1:3)
- \_\_\_\_\_ Max torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- ..... Nominal torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- ..... Max torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- ..... Nominal torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)

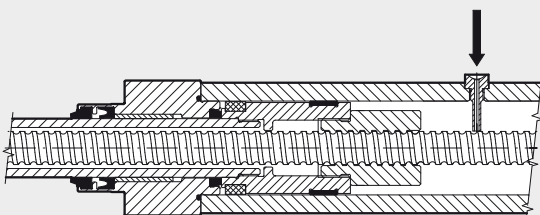
## LUBRICATION DIAGRAMS

### LUBRICATION OF VERSION WITH NON-ROTATING PISTON ROD



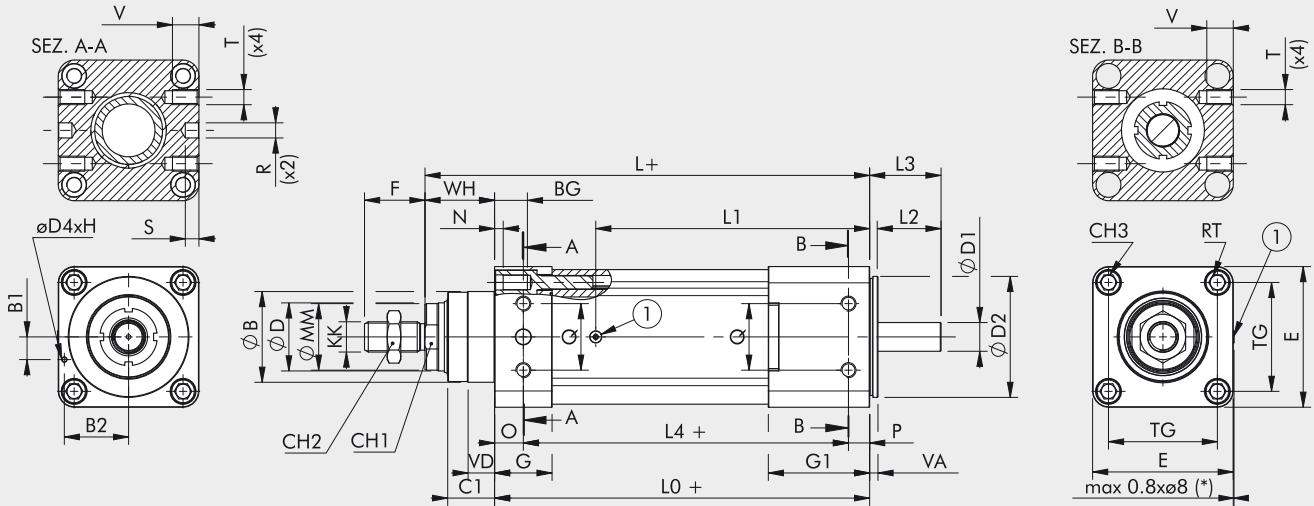
- Retract the piston rod towards the rear head. The piston rod/piston ball screw/system must rest against the buffer of the rear head
- Unscrew the cap on the lubricator port (see note 1 to the drawing on page 1-477)
- Screw the lubricating pin (see accessory on page 1-489) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) in 4-5 times using a suitable lubricator
- Unscrew the lubricating pin and make the piston rod perform four complete strokes. The piston rod should end up in the initial (retracted) position
- Repeat the last two operations
- The operation of re-greasing will have to be repeated every 200 km, approximately.

### LUBRICATION OF VERSION WITHOUT NON-ROTATING PISTON ROD



- Extend the piston rod completely. The piston rod/piston/ball screw system must rest against the buffer of the front head
- Unscrew the cap on the lubricator port (see note 1 to the drawing on page 1-477)
- Screw the lubricating pin (see accessory on page 1-489) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) in 4-5 times using a suitable lubricator
- Unscrew the lubricating pin and make the piston rod perform four complete strokes. The piston rod should end up in the initial (extended) position
- Repeat the last two operations
- The operation of re-greasing will have to be repeated every 200 km, approximately.

### CYLINDER DIMENSIONS (WITHOUT MOTOR)



① = lubricator port  
 (\*) = only for Ø 63 - Ø 80 - Ø 100  
 + = add the stroke

Ø	ØB (d11)	B1	B2	BG	C1	CH1	CH2	CH3	ØD (f7)	ØD1 (h7)	ØD2	ØD4 (h7)	E	F	G	G1	H	KK	L	L0
32	30	7	19.5	14.5	16	17	17	6	20	6.35	32	3	46	22	26	26	9	M10x1.25	160	134
50	40	7	28	17.5	25	21	24	8	25	10	50	3	64.5	32	30	30	9	M16x1.5	194	157
63	45	9	34.5	17.5	25	26	24	8	30	12	63	3	75.5	32	32	32	9	M16x1.5	210	173
63 HD	45	9	34.5	17.5	25	26	24	8	30	12	63	3	75.5	32	32	46	9	M16x1.5	230	193
80	60	15	42.5	21	31	41	30	10	45	19	80	3	93	40	38	67	9	M20x1.5	294	248
100	90	25	21	21	34	65	30	10	70	24	100	5	110	40	38	77	9	M20x1.5	321.5	270.5

Ø	L1	L2	L3	L4	ØMM	N	O	P	Q	R (h7)	S	T	V	RT	TG	VA	VD	WH
32	86.3	23	27	-	19	4.5	-	-	-	-	-	-	-	M6	32.5	3	4.5	26
50	100.8	24	28.4	-	24	5.5	-	-	-	-	-	-	-	M8	46.5	5.5	5.5	37
63	112.3	34	39.5	-	29	5.5	-	-	-	-	-	-	-	M8	56.5	5.5	6.5	37
63 HD	132.3	34	39.5	-	29.5	5.5	-	-	-	-	-	-	-	M8	56.5	5.5	6.5	37
80	181.1	41.7	47.2	215	42	5	19	14	44	10	9	M10	17.5	M10	72	5.5	17.5	46
100	200.6	46.9	54.9	232.5	69	5	19	19	58	12	9	M12	20	M10	89	8	20	51

### NOTES

## MOTOR-DRIVE COUPLINGS FOR VARIOUS CYLINDER BORES

MOTOR CODES		DRIVES CODES					
		Metal Work	37D1222000	37D1332000	37D1442000	37D1552000	37D1362001
Metal Work	Manufacturer	Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS A4	RTA PLUS B7	X-MIND B6
			(4.4A 24÷48VDC)	(6A 24÷75VDC)	(6A 77÷140VDC)	(10A 28÷62VAC) ●	(6A 110÷230VAC) ●
<b>STEPPING</b>							
37M1110000	Motor SANYO DENKI 103-H7123-1749 (4A 75V max)		Ø32	Ø32 ◆	-	Ø32 ■	-
37M1120000	Motor SANYO DENKI 103-H7126-1740 (4A 75V max)		Ø32	Ø32 ◆	-	Ø32 ■	-
37M1120001	Motor SANYO DENKI 103-H7126-6640 (5.6A 75V max)		-	Ø32	-	Ø32 ■	-
37M1430000	Motor SANYO DENKI 103-H8221-6241 (6A 140V max)		-	Ø50	Ø 50	Ø50 ◆	Ø50 ▲
37M1440000	Motor SANYO DENKI 103-H8222-6340 (6A 140V max)		-	Ø50	Ø 50	Ø50 ◆	Ø50 ▲
37M1450000	Motor SANYO DENKI SM-2863-5255 (6A 140V max)		-	Ø63 - Ø63 HD	Ø63 - Ø63 HD	Ø63 - Ø63 HD ◆	Ø63 - Ø63 HD ▲
37M1470000	Motor B&R 80MPH6.101S000-01 (10A 80V max)		-	-	-	Ø63 HD	-
37M1890000	Motor SANYO DENKI 103-H8223-6341 (6A 230V max)		-	-	-	-	Ø80 - Ø100
<b>STEPPING WITH BRAKE</b>							
37M5120000	Motore SANYO DENKI 103-H7126-1710B (4A 75V max)		Ø32	Ø32 ◆	-	Ø32 ■	-
<b>STEPPING WITH BRAKE + ENCODER</b>							
37M3220000	Motor B&R 80MPF3.500D114-01 (5A 80V max)		-	Ø32 ◆	Ø32 ■	Ø32 ■	-
37M3230000	Motor B&R 80MPF5.500D114-01 (5A 80V max)		-	Ø32 ◆	Ø32 ■	Ø32 ■	-
37M3430000	Motor B&R 80MPH1.600D114-01 (6A 80V max)		-	Ø50	Ø50 ▲	Ø50 ◆	-
37M3460000	Motor B&R 80MPH3.600D114-01 (6A 80V max)		-	Ø50 - Ø63 - Ø63 HD	Ø50 - Ø63 - Ø63 HD ▲	Ø50 - Ø63 - Ø63 HD ◆	-
37M3450000	Motor B&R 80MPH4.101D114-01 (10A 80V max)		-	-	-	Ø63 - Ø63 HD	-
37M3470000	Motor B&R 80MPH6.101D114-01 (10A 80V max)		-	-	-	Ø63 HD	-

MOTOR CODES		DRIVES CODES			
		Metal Work	37D2200000	37D2400000	37D2600001
Metal Work	Manufacturer	Manufacturer	SANYO DENKI RS1A01	SANYO DENKI RS1A03	DELTA ASD-A2-3043-M
			(15A 200W)	(30A 400÷750÷1000 W)	(3000W)
<b>BRUSHLESS</b>					
37M2200000	Motor SANYO DENKI R2AA06020FXH11M (200W)		Ø32	-	-
37M2220000	Motor SANYO DENKI R2AA06040FXH11M (400W)		-	Ø32 - Ø50	-
37M2330000	Motor SANYO DENKI R2AA08075FXH11M (750W)		-	Ø50 - Ø63 - Ø63 HD	-
37M2540000	Motor SANYO DENKI R2AAB8100HXH29M (1000W)		-	Ø63 HD - Ø80	-
37M2770000	Motor DELTA ECMA-J11330R4 (3000W)		-	-	Ø80 - Ø100
<b>BRUSHLESS WITH BRAKE</b>					
37M4200000	Motor SANYO DENKI R2AA06020FCH11M (200W)		Ø32	-	-
37M4220000	Motor SANYO DENKI R2AA06040FCH11M (400W)		-	Ø32 - Ø50	-
37M4330000	Motor SANYO DENKI R2AA08075FCH11M (750W)		-	Ø50 - Ø63 - Ø63 HD	-
37M4540000	Motor SANYO DENKI R2AAB8100HCH29M (1000W)		-	Ø63 HD - Ø80	-
37M4770000	Motor DELTA ECMA-J11330S4 (3000W)		-	-	Ø80 - Ø100

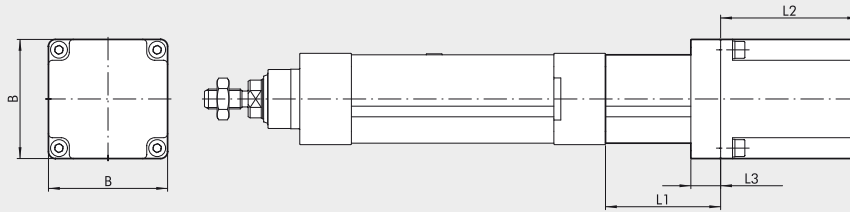
- ◆ Important! Limit current
- Important! Limit current and voltage

- ▲ Important! Limit voltage
- Important! AC drive to continuous voltage  $VDC = VAC \cdot \sqrt{2}$

## NOTES



## DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR



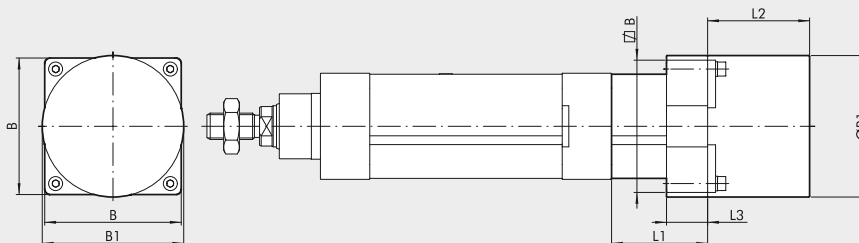
For any missing dimensions, please refer to page 1-477.

### VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3
32	BRUSHLESS	371032 _____ 2200	37M2200000	0.64	60	60	62	69.5	15
		371032 _____ 2220	37M2220000	1.27	60	60	62	95.5	15
	STEPPING	371032 _____ 1110	37M1110000	0.8	NEMA 23	56	45	53.8	12
		371032 _____ 1120	37M1120000	1.2	NEMA 23	56	45	75.8	12
		371032 _____ 1121	37M1120001	1.2	NEMA 23	56	45	75.8	12
50	BRUSHLESS	371050 _____ 2330	37M2330000	2.39	80	80	77.4	107.3	35
63	STEPPING	371063 _____ 1450	37M1450000	6.7	NEMA 34	85.5	63.5	127	16
63 HD	STEPPING	371H63 _____ 1450	37M1450000	6.7	NEMA 34	85.5	63.5	127	16
		371H63 _____ 1470	37M1470000	9.3	NEMA 34	86.6	63.5	130	16
80	BRUSHLESS	371080 _____ 2770	37M2770000	9.5	130	130	120	187.5	26
100	BRUSHLESS	371100 _____ 2770	37M2770000	9.5	130	130	126	187.5	40

### VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3
32	BRUSHLESS	371032 _____ 4200	37M4200000	0.64	60	60	62	97.5	15
		371032 _____ 4220	37M4220000	1.27	60	60	62	123.5	15
	STEPPING	371032 _____ 3220	37M3220000	1.2	60	60	45	151.8	7
		371032 _____ 3230	37M3230000	2.5	60	60	45	184.5	7
		371032 _____ 5120	37M5120000	1.2	NEMA 23	56	45	112	12
50	BRUSHLESS	371050 _____ 4330	37M4330000	2.39	80	80	77.4	143	35
	STEPPING	371050 _____ 3430	37M3430000	2.9	NEMA 34	86.6	63.4	156.5	9.9
		371050 _____ 3460	37M3460000	5.5	NEMA 34	86.6	63.4	188.5	9.9
63	STEPPING	371063 _____ 3460	37M3460000	5.5	NEMA 34	86.6	63.5	188.5	9.9
		371063 _____ 3450	37M3450000	6.3	NEMA 34	86.6	63.5	188.5	9.9
63 HD	STEPPING	371H63 _____ 3450	37M3450000	5.5	NEMA 34	86.6	63.5	188.5	16
		371H63 _____ 3460	37M3460000	6.3	NEMA 34	86.6	63.5	188.5	16
		371H63 _____ 3470	37M3470000	9.3	NEMA 34	86.6	63.5	220.5	16
80	BRUSHLESS	371080 _____ 4770	37M4770000	9.5	130	130	120	216	26
100	BRUSHLESS	371100 _____ 4770	37M4770000	9.5	130	130	126	216	40

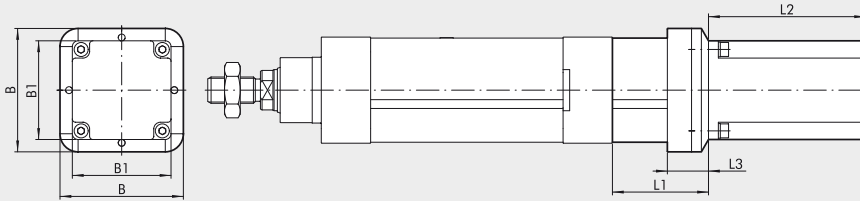


For any missing dimensions, please refer to page 1-477.

### VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	Ø B1	L1	L2	L3
50	STEPPING	371050 _____ 1430	37M1430000	2.4	NEMA 34	83	86	61.4	62	25
		371050 _____ 1440	37M1440000	4.2	NEMA 34	83	86	61.4	92.2	25
80	STEPPING	371080 _____ 1890	37M1890000	17.5	NEMA 42	106.4	106.4	102	221	35
100	STEPPING	371100 _____ 1890	37M1890000	17.5	NEMA 42	110	106.4	109	221	35

## DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR



For any missing dimensions, please refer to page 1-477.

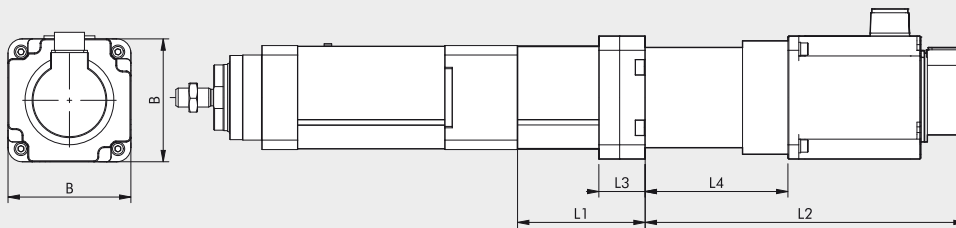
### VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	B1	L1	L2	L3
50	BRUSHLESS	371050_2220	37M2220000	1.27	60	74.5	60	61.4	95.5	25
63	BRUSHLESS	371063_2330	37M2330000	2.39	80	94	80	78.5	107.3	25
63 HD	BRUSHLESS	371H63_2330	37M2330000	2.39	80	94	80	78.5	107.3	25
		371H63_2540	37M2540000	3.18	86	94	84.4	78.5	137.1	25
80	BRUSHLESS	371080_2540	37M2540000	3.18	86	93	84.4	102	137.1	35

### VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	B1	L1	L2	L3
50	BRUSHLESS	371050_4220	37M4220000	1.27	60	74.5	60	61.4	123.5	25
63	BRUSHLESS	371063_4330	37M4330000	2.39	80	94	80	78.5	143	25
63 HD	BRUSHLESS	371H63_4330	37M4330000	2.39	80	94	80	78.5	143	25
		371H63_4540	37M4540000	3.18	86	94	84.4	78.5	163	25
80	BRUSHLESS	371080_4540	37M4540000	3.18	86	93	84.4	102	163	35

## DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR AND GEAR BOX



For any missing dimensions, please refer to page 1-477.

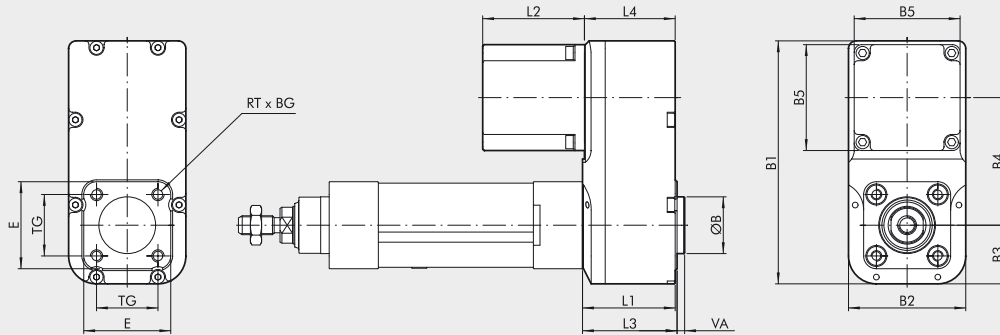
### VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Code for gear mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3	L4
100	BRUSHLESS	371100_6770	37M2770000	37R0364000	9.5	130	130	135	338.5	49	151

### VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Code for gear mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3	L4
100	BRUSHLESS	371100_7770	37M4770000	37R0364000	9.5	130	130	135	367	49	151

## DIMENSIONS OF CYLINDERS WITH GEARED MOTOR



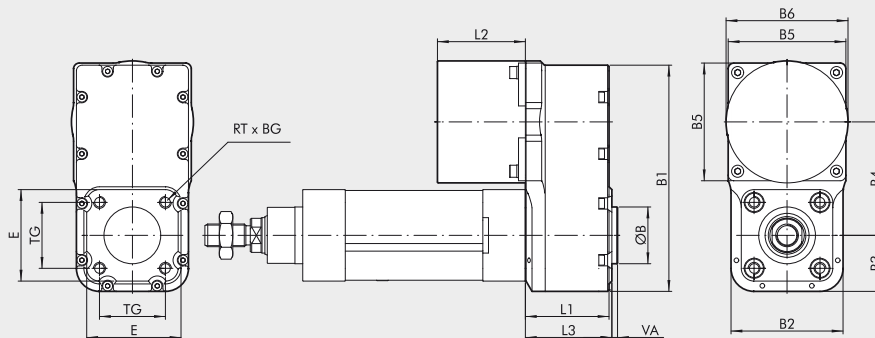
### VERSION WITH MOTOR

For any missing dimensions, please refer to page 1-477.

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	STEPPING	371032_1110	37M1110000	0.8	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	53.8	50	48	32.5	M6	4
		371032_1120	37M1120000	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	75.8	50	48	32.5	M6	4
		371032_1121	37M1120001	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	75.8	50	48	32.5	M6	4
63	STEPPING	371063_1450	37M1450000	6.7	NEMA 34	45	179.5	92	46	87.5	84.5	17	75.5	70	127	72	68	56.5	M8	4
63 HD	STEPPING	371H63_1450	37M1450000	6.7	NEMA 34	45	179.5	92	46	87.5	85.5	17	75.5	70	127	72	68	56.5	M8	4
80	BRUSHLESS	371080_2540	37M2540000	3.18	86	45	204.5	115	57	97.5	86	21	-	80.5	137.1	-	-	72	M10	4

### VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	STEPPING	371032_3220	37M3220000	1.2	60	30	128.5	62	31	67.5	60	15	46	49	151.8	50	48	32.5	M6	4
		371032_3230	37M3230000	2.5	60	30	128.5	62	31	67.5	60	15	46	49	184.5	50	48	32.5	M6	4
		371032_5120	37M5120000	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	112	50	48	32.5	M6	4
80	BRUSHLESS	371080_4540	37M4540000	3.18	86	45	204.5	115	57	97.5	86	21	-	80.5	163	-	-	72	M10	4

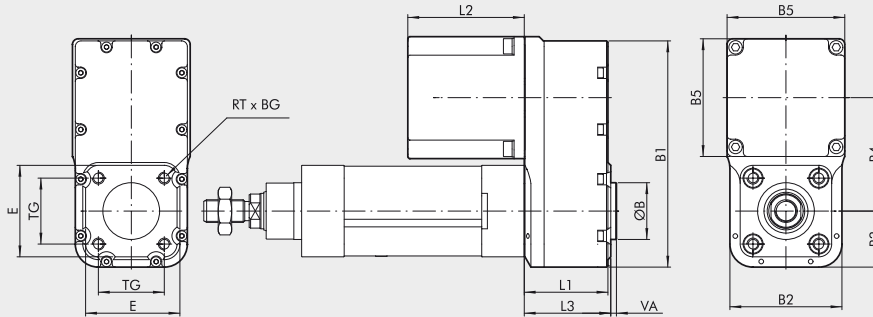


### VERSION WITH MOTOR

For any missing dimensions, please refer to page 1-477.

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	ØB6	BG	E	L1	L2	L3	TG	RT	VA
50	STEPPING	371050_1430	37M1430000	2.4	NEMA 34	40	159.5	79	39.5	80	80	86	17	64.5	59	62	61	46.5	M8	4
		371050_1440	37M1440000	4.2	NEMA 34	40	159.5	79	39.5	80	83	86	17	64.5	59	92.2	61	46.5	M8	4

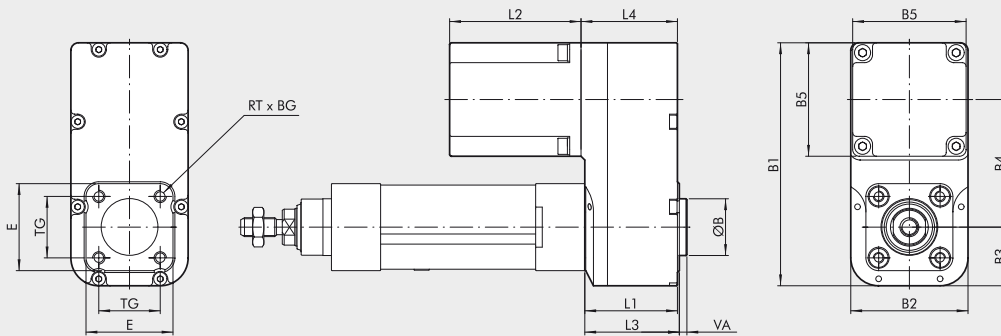
## DIMENSIONS OF CYLINDERS WITH GEARED MOTOR



### VERSION WITH MOTOR AND BRAKE

For any missing dimensions, please refer to page 1-477.

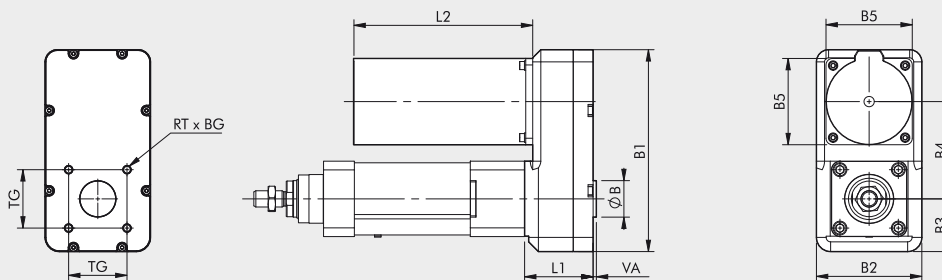
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	STEPPING	371050 _____ 3430	37M3430000	2.9	NEMA 34	40	159.5	79	39.5	80	86.6	17	64.5	59	156.5	61	46.5	M8	4
		371050 _____ 3460	37M3460000	5.5	NEMA 34	40	159.5	79	39.5	80	86.6	17	64.5	59	188.5	61	46.5	M8	4



### VERSION WITH MOTOR

For any missing dimensions, please refer to page 1-477.

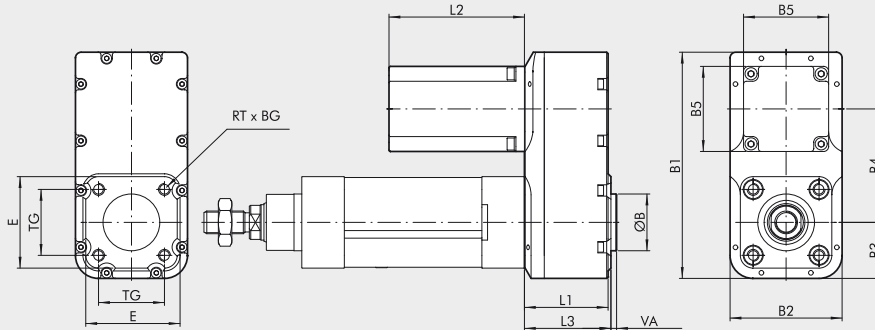
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	BRUSHLESS	371032 _____ 2200	37M2200000	0.64	60	30	128.5	62	31	67.5	60	15	46	49	69.5	50	51	32.5	M6	4
		371032 _____ 2220	37M2220000	1.27	60	30	128.5	62	31	67.5	60	15	46	49	95.5	50	51	32.5	M6	4



### VERSION WITH MOTOR

For any missing dimensions, please refer to page 1-477.

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	L1	L2	TG	RT	VA
80	STEPPING	371080 _____ 1890	37M1890000	17.5	NEMA 42	45	249	130	65	120	106.4	21	84.5	221	72	M10	4
100	STEPPING	371100 _____ 1890	37M1890000	17.5	NEMA 42	55	285	150	75	120	106.4	21	91.5	221	89	M10	4



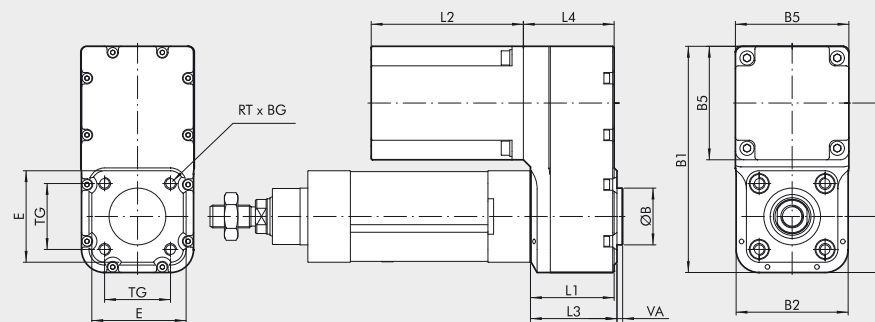
For any missing dimensions, please refer to page 1-477.

### VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	BRUSHLESS	371050_2220	37M2220000	1.27	60	40	159.5	79	39.5	80	60	17	64.5	59	95.5	61	46.5	M8	4
63	BRUSHLESS	371063_2330	37M2330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	107.3	72	56.5	M8	4
63 HD	BRUSHLESS	371H63_2330	37M2330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	107.3	72	56.5	M8	4
		371H63_2540	37M2540000	3.18	86	45	179.5	92	46	87.5	86	17	75.5	70	137.1	72	56.5	M8	4
	STEPPING	371H63_1470	37M1470000	9.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	130	72	56.5	M8	4

### VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	BRUSHLESS	371050_4220	37M4220000	1.27	60	40	159.5	79	39.5	80	60	17	64.5	59	123.5	61	46.5	M8	4
63	BRUSHLESS	371063_4330	37M4330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	143	72	56.5	M8	4
	STEPPING	371063_3460	37M3460000	5.5	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4
		371063_3450	37M3450000	6.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4
63 HD	BRUSHLESS	371H63_4330	37M4330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	143	72	56.5	M8	4
		371H63_4540	37M4540000	3.18	86	45	179.5	92	46	87.5	86	17	75.5	70	163	72	56.5	M8	4
	STEPPING	371H63_3470	37M3470000	9.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	220.5	72	56.5	M8	4
		371H63_3450	37M3450000	6.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4
		371H63_3460	37M3460000	5.5	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4



For any missing dimensions, please refer to page.

### VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
50	BRUSHLESS	371050_2330	37M2330000	2.39	80	40	159.5	79	39.5	80	80	17	64.5	59	107.3	61	64	46.5	M8	4
80	BRUSHLESS	371080_2770	37M2770000	9.5	130	45	249	130	65	119	130	21	-	84.5	187.5	-	-	72	M10	4
100	BRUSHLESS	371100_2770	37M2770000	9.5	130	55	285	150	75	145	130	21	-	91.5	187.5	-	-	89	M10	4

### VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	BRUSHLESS	371032_4200	37M4200000	0.64	60	30	128.5	62	31	67.5	60	15	46	49	67.5	50	51	32.5	M6	4
		371032_4220	37M4220000	1.27	60	30	128.5	62	31	67.5	60	15	46	49	123.5	50	51	32.5	M6	4
50	BRUSHLESS	371050_4330	37M4330000	2.39	80	40	159.5	79	39.5	80	80	17	64.5	59	143	61	64	46.5	M8	4
80	BRUSHLESS	371080_4770	37M4770000	9.5	130	45	249	130	65	119	130	21	-	84.5	216	-	-	72	M10	4
100	BRUSHLESS	371100_4770	37M4770000	9.5	130	55	285	150	75	145	130	21	-	91.5	216	-	-	89	M10	4

### KEY TO CODES CYLINDER WITHOUT MOTOR

CYL	37 TYPE	1	032 SIZE	0100 STROKE	1 SCREW PITCH	5 VERSION
37	Electric actuators	1 ISO 15552 electric cylinder	032 32 050 50 063 63 ◆ H63 63 Heavy Duty ◀ 080 80 ◀ 100 100		1 Pitch 4 2 Pitch 5 4 Pitch 10 5 Pitch 12 6 Pitch 16 7 Pitch 20 8 Pitch 32 9 Pitch 40	5 Without antirotation IP40 6 With antirotation IP40 7 Without antirotation IP55/IP65 8 With antirotation IP55/IP65

N.B.: For the possible ordering codes, please refer to the next page.

- ◆ Only for Ø63 with screw pitch 5 or pitch 10
- ◀ Only for versions 7 and 8

N.B.: An piston rod anti-rotation system must be used. If the piston rod is not fixed firmly to an element, a flange or to any other device preventing it from rotating, a cylinder in the anti-rotation version must be used.

ELECTRIC CYLINDER SERIE E

### KEY TO CODES CYLINDER WITH MOTOR

CYL	37 TYPE	1	032 SIZE	0100 STROKE	1 SCREW PITCH	1 VERSION	1	2	2	0
						DRIVE				
						MOTOR	FLANGE	TORQUE		
37	Electric actuators	1 ISO 15552 electric cylinder	032 32 050 50 063 63 ◆ H63 63 Heavy Duty ◀ 080 80 ◀ 100 100		1 Pitch 4 2 Pitch 5 4 Pitch 10 5 Pitch 12 6 Pitch 16 7 Pitch 20 8 Pitch 32 9 Pitch 40	<b>IN-LINE</b> ● 1 Without antirotation IP40/IP20 ● 2 With antirotation IP40/IP20 ■ 3 Without antirotation IP55/IP65 ■ 4 With antirotation IP55/IP65  <b>GEARED</b> ● 5 Without antirotation IP40/IP20 ● 6 With antirotation IP40/IP20 ■ 7 Without antirotation IP55/IP65 ■ 8 With antirotation IP55/IP65	1 STEPPING 2 BRUSHLESS 3 STEPPING with BRAKE + Encoder 4 BRUSHLESS with BRAKE 5 STEPPING with BRAKE without Encoder 6 BRUSHLESS with gear box 7 BRUSHLESS with BRAKE + gear box	1 NEMA 23 2 60 3 80 4 NEMA 34 5 86 7 130 8 NEMA 42	0 0÷0.79 Nm 1 0.8÷1.19 Nm 2 1.2÷2.19 Nm 3 2.2÷3 Nm 4 3.01÷5 Nm 5 6.21÷7 Nm 6 5.01÷6.2 Nm 7 7.01÷10 Nm 9 15.01÷25 Nm	0 Base 1 Greater rpm

N.B.: For the possible ordering codes, please refer to the next page.

- ◆ Only for Ø63 with screw pitch 5 or pitch 10
- ◀ Only for versions 3, 4, 7 and 8
- Version IP40 available for all STEPPING and BRUSHLESS motors, for only the sizes 32, 50 and 63, with the exception of motor code 37M5120000 which it is IP20;
- Version IP55 available for STEPPING motors, for only the sizes 50, 63, 80 and 100 all the motors, with the exception of motor code 37M1470000; for Ø 32 only for motor code 37M1120001; version IP65 available for BRUSHLESS motors, BRUSHLESS with BRAKE and STEPPING with BRAKE + ENCODER motors (all sizes).

N.B.: An piston rod anti-rotation system must be used. If the piston rod is not fixed firmly to an element, a flange or to any other device preventing it from rotating, a cylinder in the anti-rotation version must be used.

## POSSIBLE ORDERING CODES

### Ø 32

Drive	Version	Screw pitch			
371032_	---	---	1	1	1110
			5	2	1120
			5		1121
			6		5120
					2200
					2220
					3220
					3230
					4200
					4220
			3		1121
			4		2200
			7		2220
			8		3220
					3230
					4200
					4220

----- = Enter the stroke in mm

### Ø 50

Drive	Version	Screw pitch			
371050_	---	---	2	1	1430
			4	2	1440
			6	3	2220
				4	2330
				5	3430
				6	3460
				7	4220
				8	4330

----- = Enter the stroke in mm

### Ø 63

Drive	Version	Screw pitch			
371063_	---	---	2	1	1450
			4	2	2330
			7	3	3450
				4	3460
				5	4330
				6	
				7	
				8	

----- = Enter the stroke in mm

### Ø 63 HD

Drive	Version	Screw pitch			
371H63_	---	---	2	1	1450
			4	2	1470
			5		2330
			6		2540
					3450
					3460
					3470
					4330
					4540
			3		1450
			4		2330
			7		2540
			8		3450
					3460
					3470
					4330
					4540

----- = Enter the stroke in mm

### Ø 80

Drive	Version	Screw pitch			
371080_	---	---	2	3	1890
			4	4	2540
			7		4540
			8		
			4	3	1890
				4	2540
				7	2770
				8	4540
					4770
			8	3	1890
				4	2770
				7	4770
				8	

----- = Enter the stroke in mm

### Ø 100

Drive	Version	Screw pitch			
371100_	---	---	4	3	1890
			9	4	2770
					4770
					6770
					7770
			7		1890
			8		2770
					4770

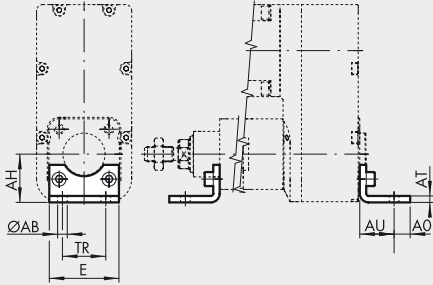
----- = Enter the stroke in mm

## NOTES

## ACCESSORIES FOR ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552

N.B.: Where specified, limit the maximum axial loads (F<sub>max</sub>) according to the electric cylinders

### FOOT - MODEL A



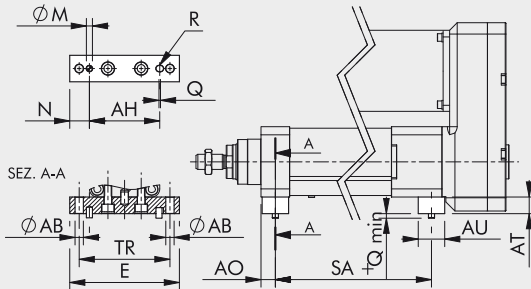
#### STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	Weight [g]	F <sub>max</sub> [N]
W0950322001	32	7	32	11	4	24	32	45	76	1600
W0950502001	50	9	45	15	4	32	45	65	162	4000
W0950632001	63	9	50	15	6	32	50	75	266	6000
W0950632001	63 HD	9	50	15	6	32	50	75	266	6000
W095E802001	80	12	68.5*	20	6	41	63	95	414	10000
W095EA12001	100	14	79*	25	6	41	75	115	518	16000

\* Dimensions not to ISO 15552

Note: Individually packed with 2 screws

### FOOT ON CYLINDER HEADS

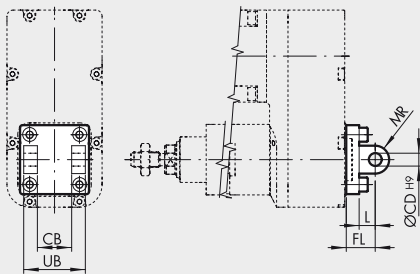


#### STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	ØM <sup>H7</sup>	N	P	Q	R <sup>H7</sup>	SA	Weight [g]	F <sub>max</sub> [N]
0950807042	80	11	93	19	22	35	120	145	8	26	6	2	8	215	770	10000
0951007042	100	13	111	19	24	35	140	165	8	27	6	2	8	232.5	945	16000

Note: Individually packed with 2 screws, 3 pins

### FEMALE HINGE - MODEL B



#### ALUMINIUM

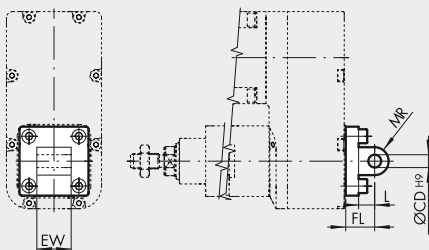
Code	Ø	UB	CB	FL	øCD	MR	L	Weight [g]	F <sub>max</sub> [N]
W0950322003	32	45	26	22	10	10	12	116	800
W0950502003	50	60	32	27	12	12	15	252	2000
W0950632003	63	70	40	32	16	16	20	394	3000
W0950632003	63 HD	70	40	32	16	16	20	394	3000

#### STEEL

Code	Ø	UB	CB	FL	øCD	MR	L	Weight [g]	F <sub>max</sub> [N]
W095E322003	32	45	26	22	10	10	13	348	1600
W095E502003	50	60	32	27	12	12	16	756	4000
W095E632003	63	70	40	32	16	16	21	1182	6000
W095E632003	63 HD	70	40	32	16	16	21	1182	6000
W095E802003	80	90	50	36	16	16	22	2010	10000
W095EA12003	100	110	60	41	20	20	27	3255	16000

Note: Supplied with 4 screws, 4 washers, 2 snap-rings, 1 pin

### MALE HINGE - MODEL BA



#### ALUMINIUM

Code	Ø	EW	FL	MR	øCD	L	Weight [g]	F <sub>max</sub> [N]
W0950322004	32	26	22	11	10	12	94	800
W0950502004	50	32	27	13	12	15	220	2000
W0950632004	63	40	32	17	16	20	316	3000
W0950632004	63 HD	40	32	17	16	20	316	3000

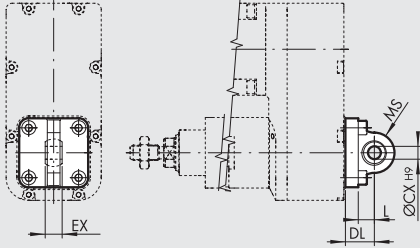
#### STEEL

Code	Ø	EW	FL	MR	øCD	L	Weight [g]	F <sub>max</sub> [N]
W095E322004	32	26	22	10	10	13	282	1600
W095E502004	50	32	27	12	12	16	660	4000
W095E632004	63	40	32	16	16	21	948	6000
W095E632004	63 HD	40	32	16	16	21	948	6000
W095E802004	80	50	36	16	16	22	1734	10000
W095EA12004	100	60	41	20	20	27	2550	16000

Note: Supplied with 4 screws, 4 washers



### ARTICULATED MALE HINGE - MODEL BAS



#### ALUMINIUM

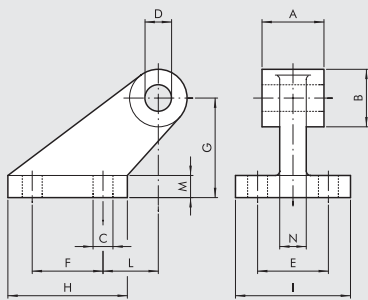
Code	Ø	DL	MS	L	øCX	EX	Weight [g]	Fmax [N]
W0950322006	32	22	16	12	10	14	106	800
W0950502006	50	27	21	15	12	16	236	2000
W0950632006	63	32	23	20	16	21	336	3000
W0950632006	63 HD	32	23	20	16	21	336	3000

#### STEEL

Code	Ø	DL	MS	L	øCX	EX	Weight [g]	Fmax [N]
W095E322006	32	22	15	14	10	14	318	1600
W095E502006	50	27	20	17	16	21	708	4000
W095E632006	63	32	23	22	16	21	1008	6000
W095E632006	63 HD	32	23	22	16	21	1008	6000
W095E802006	80	36	27	23	20	25	1716	10000
W095EA12006	100	41	30	28	20	25	2520	16000

Note: Supplied with 4 screws, 4 washers

### CETOP HINGE FOR MODEL B - MODEL GL

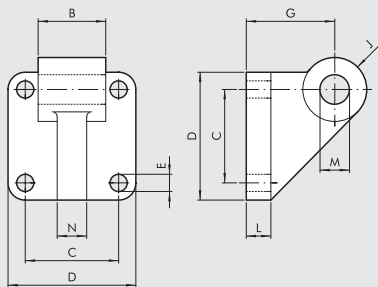


#### ALUMINIUM

Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]	Fmax [N]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96	800
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212	2000
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440	3000
W0950632008	63 HD	40	33	11	16	40	50	63	75	63	32	12	15	440	3000

Note: Supplied with 4 screws, 4 washers

### ISO HINGE FOR MODEL B - MODEL GS

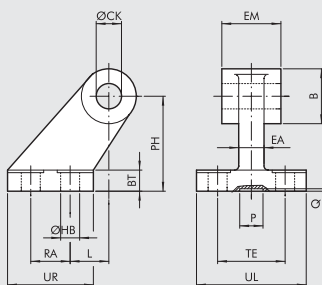


#### ALUMINIUM

Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]	Fmax [N]
W0950322108	32	25.5	32.5	45	7	32	11	10	10	10	106	800
W0950502108	50	31.5	46.5	65	9	45	13	12	12	12	252	2000
W0950632108	63	39.5	56.5	75	9	50	17	12	16	15	350	3000
W0950632108	63 HD	39.5	56.5	75	9	50	17	12	16	15	350	3000

Note: Supplied with 4 screws, 4 washers

### ISO 1552 HINGE FOR MODEL B - MODEL AB7



#### ALUMINIUM

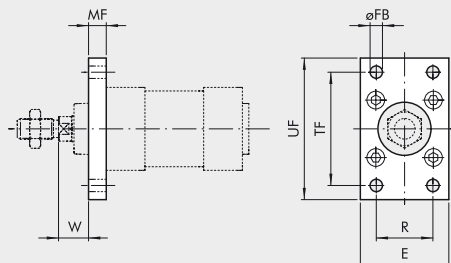
Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]	Fmax [N]
W0950322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	21	3	60	800
W0950502017	50	32	26	9	12	50	30	45	45	65	3	12	16	21	3	162	2000
W0950632017	63	40	30	9	16	52	35	50	50	67	2	14*16	21	3	191	3000	
W0950632017	63 HD	40	30	9	16	52	35	50	50	67	2	14*16	21	3	191	3000	

#### STEEL

Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]	Fmax [N]
W095E322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	21	3	180	1600
W095E502017	50	32	26	9	12	50	30	45	45	65	3	12	16	21	3	486	4000
W095E632017	63	40	30	9	16	52	35	50	50	67	2	12	16	21	3	573	6000
W095E632017	63 HD	40	30	9	16	52	35	50	50	67	2	12	16	21	3	573	6000
W095E802017	80	50	30	11	16	66	40	63	60	86	7	14	20	21	3	996	10000
W095EA12017	100	60	38	11	20	76	50	71	70	96	5	15	20	11	3	1566	16000

\* Dimensions not to ISO 1552

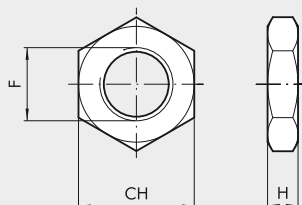
## FRONT FLANGE - MODEL C



Code	Ø	TF	UF	E	MF	R	øFB	W	Weight [g]	Fmax [N]
W0950322002	32	64	80	50	10	32	7	16	246	1600
W0950502002	50	90	110	65	12	45	9	25	522	5000
W0950632002	63	100	120	75	12	50	9	25	670	7000
W0950632002	63 HD	100	120	75	12	50	9	25	670	7000

Note: Supplied with 4 screws

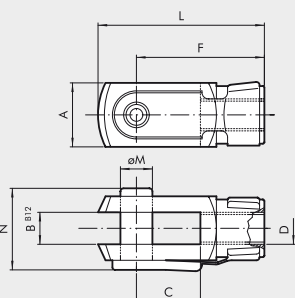
## ROD NUT - MODEL S



Code	Ø	F	H	CH	Weight [g]
0950322010	32	M10x1.25	6	17	6
0950502010	50	M16x1.5	8	24	20
0950502010	63	M16x1.5	8	24	20
0950502010	63 HD	M16x1.5	8	24	20
0950802010	80	M20x1.5	9	30	32
0950802010	100	M20x1.5	9	30	32

Note: Individually packed

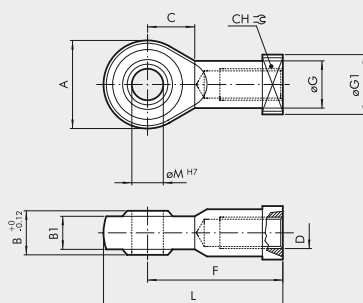
## FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92
W0950502020	50	16	32	16	32	83	64	M16x1.5	40	340
W0950502020	63	16	32	16	32	83	64	M16x1.5	40	340
W0950502020	63 HD	16	32	16	32	83	64	M16x1.5	40	340
W0950802020	80	20	40	20	40	105	80	M20x1.5	40	690
W0950802020	100	20	40	20	40	105	80	M20x1.5	48	690

Note: Individually packed

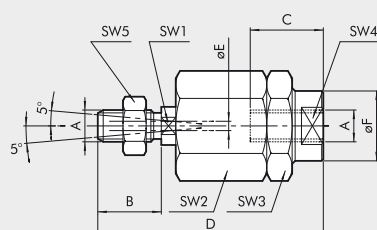
## ROD EYE - MODEL GA-M



Code	Ø	øM	C	B1	B	A	L	F	D	øG	CH	øG1	Weight [g]
W0950322025	32	10	15	10.5	14	28	57	43	M10x1.25	15	17	19	78
W0950502025	50	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950502025	63	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950502025	63 HD	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950802025	80	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404
W0950802025	100	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404

Note: Individually packed

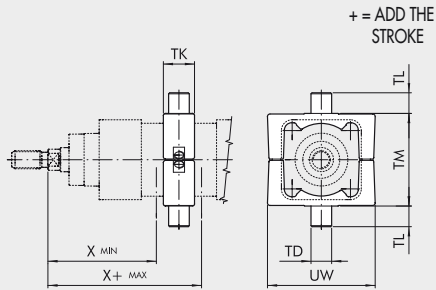
## SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	øF	øE	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950322030	32	M10x1.25	20	20	71	22	4	12	30	30	19	17	216
W0950502030	50	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63 HD	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950802030	80	M20x1.5	40	40	119	32	4	20	41	41	30	30	680
W0950802030	100	M20x1.5	40	40	119	32	4	20	41	41	30	30	680

Note: Individually packed

### INTERMEDIATE HINGE - MODEL EN



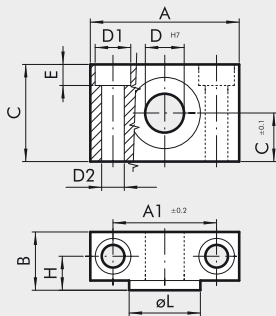
#### STEEL

Code	Ø	X <sub>(min)</sub>	X <sub>(max)</sub>		TM	TL	TD <sub>e9</sub>	TK	UW	Weight [g]	Fmax [N]
			IN LINE	GEARED							
0950322107	32	63	123	*	50	12	12	22	65	170	500
0950502107	50	83	148	*	75	16	16	28	95	580	1200
0950632107	63	88	163	*	90	20	20	36	105	950	2000
0950632107	63 HD	88	163	*	90	20	20	36	105	950	2000

\* Depending on motor length

Note: Supplied with 8 grub screws, 2 pins

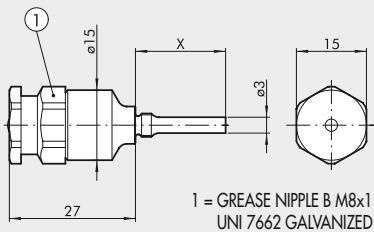
### COUNTER-HINGE FOR MODEL EN - MODEL EL



Code	Ø	A	A <sub>1</sub>	B	C	C <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D	E	H	øL	Weight [g]
W0950322009	32	46	32	18	30	15	11	7	12	6.5	10.5	22	162
W0950402009	50	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950632009	63	65	42	23	40	20	18	11	20	10.5	13	35	414
W0950632009	63 HD	65	42	23	40	20	18	11	20	10.5	13	35	414

Note: 2-pieces pack with 4 screws

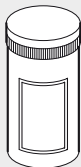
### GREASING NEEDLE



Code	Ø	Pitch	X
0950327108	32	-	12
0950507108	50	-	19.3
0950637108	63	-	23.6
0950637108	80	-	23.6
0950637108	100	10	23.6
0951007108	100	40	28.6

Note: Individually packed

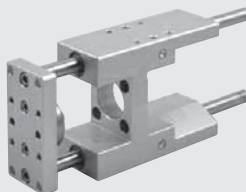
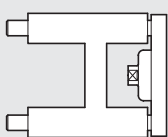
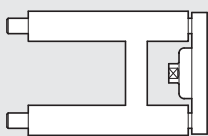
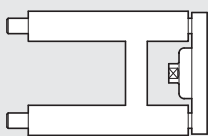
### GREASE



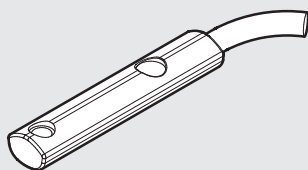
Code	Description	Weight [g]
9910506	Grease pipe RHEOLUBE 363 AX1	400

### NOTES

## GUIDE UNIT

Version		Code	Bore	Type
		W0700322...	32*	UNIT MW DH 032...
		W0700502...	50	UNIT MW DH 050...
		W0700632...	63	UNIT MW DH 063...
		W070E802...	80	UNIT MW DH 080...
		W070EA12...	100	UNIT MW DH 100...
		* V-Lock version also available.		
<b>Note: The guide units must only be used with anti-rotation cylinders.</b>				
To complete the type and code, add the 3-digit stroke (e.g. 50=050)				
For technical data and dimensions see page 1-42				
		W0700323...	32*	UNIT MW DM 032...
		W0700503...	50	UNIT MW DM 050...
		W0700633...	63	UNIT MW DM 063...
		W070E803...	80	UNIT MW DM 080...
		W070EA13...	100	UNIT MW DM 100...
		* V-Lock version also available.		
<b>Note: The guide units must only be used with anti-rotation cylinders.</b>				
To complete the type and code, add the 3-digit stroke (e.g. 50=050)				
For technical data and dimensions see page 1-42				

## RETRACTABLE SENSOR WITH INSERTION FROM ABOVE

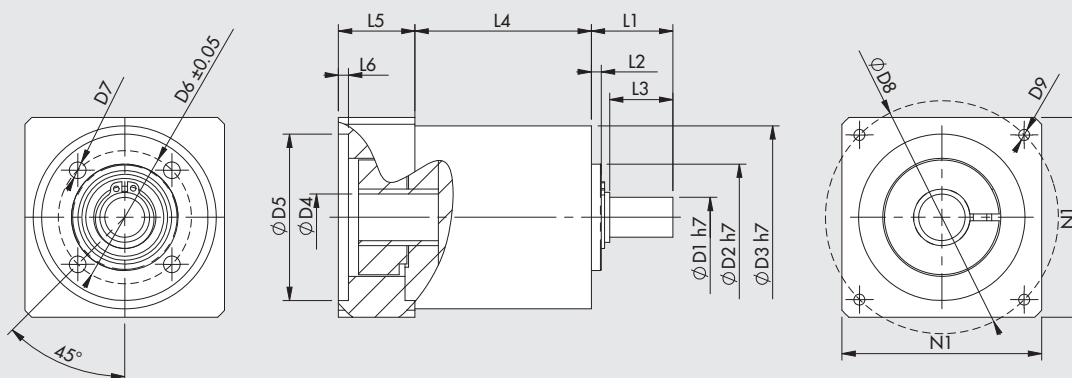


Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952225390	HALL N.O. sensor, vertical insertion 2.5 m robotics
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8 robotics
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952222180	REED N.O. sensor, vertical insertion 2.5 m robotics
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8 robotics
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

\* For use when standard sensors do not detect the magnet, e.g. near metal masses.  
Note: Individually packed. For technical data see page 1-580.

## SPARE PARTS

### ELEKTRO ISO 15552 Ø 100 GEAR BOX



Code	Description	Application	C <sub>OUT</sub> nominal [Nm]	N <sub>IN</sub> nominal [1/min]	J reduced to motor shaft [kgmm <sup>2</sup> ]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0364000	Gear box MP105 1:3	Elektro ISO 15552 Ø 100	100	2500	222	6.5	25	70	106	24	110	85	M8	14.5	M8x20	57.5	5	50.5	107.5	48	6.5	120

C<sub>OUT</sub> = rated output torque

N<sub>IN</sub> = nominal input speed

J = mass moment of inertia of the gearhead

# ELECTRIC CYLINDER SERIES ELEKTRO ROUND DC



In the ELEKTRO ROUND DC cylinder, the forward movement of the piston rod is obtained via an acme screw and a self-lubricating technopolymer nut. This piston has a guide ring that is calibrated to minimize the backlash with the cylinder liner and reduce vibration during rotation of the screw. The piston also comes with a magnet for magnetic sensors.

The system is driven by a direct current motor available in two versions, 12 and 24VDC. The position of the motor can be controlled using an optional encoder. A resettable optional fuse can be inserted in the cylinder for motor thermal overload protection. The motor used has a planetary gearbox with a 1/13 or 1/25 ratio.

Depending on the configuration (screw pitch and gear ratio), this cylinder can be either irreversible (supporting the load with the motor off) or reversible under load.

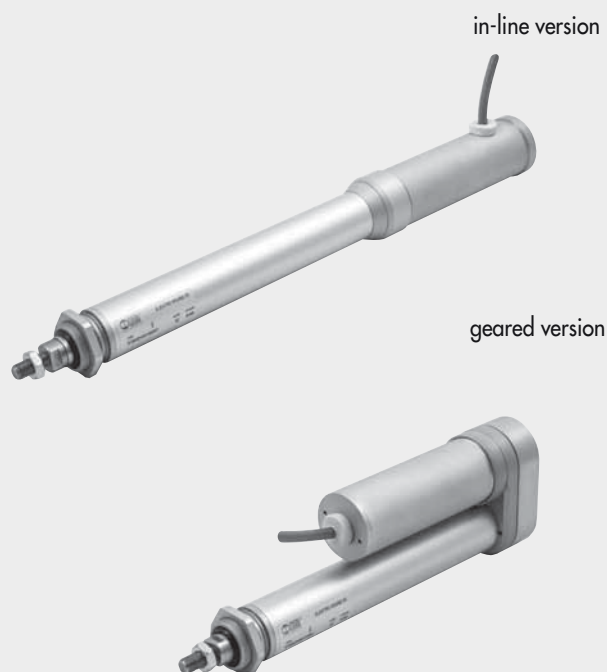
Both versions are supplied without piston rod anti-rotation device, which will be provided by the customer outside the cylinder.

It is available in two versions:

- with an in-line motor, where the motor shaft is connected directly to the screw via a coupling.
- with a geared motor, where the transmission of motion is ensured by three cogwheels with a ratio of 1:1.

This cylinder is designed for use with IP65 protection rating.

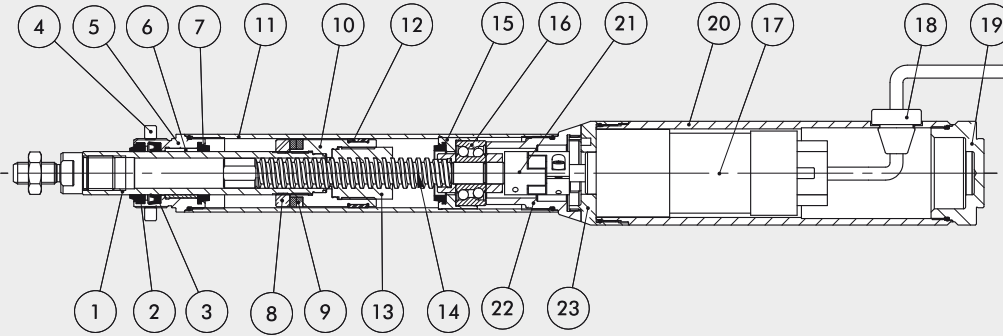
The solutions with the acme screw are generally suitable for applications where the number of operations per time unit is reduced; the degree of accuracy is not particularly high due to heating of the screw-lead screw assembly; wear over time does not create inconveniences, no high forces and speeds are required at the same time.



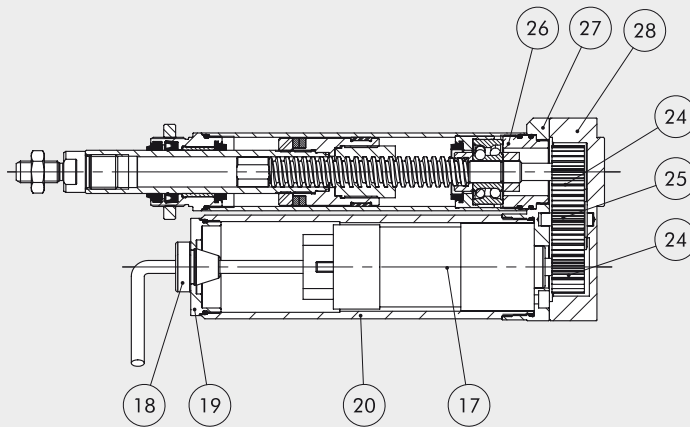
TECHNICAL DATA	Ø 32 pitch 4		Ø 32 pitch 20	
	Temperature range	from -20 to +60 °C		
Degree of protection	IP65			
Gearing ratio of the planetary gear unit	1/13 or 1/25			
Minimum stroke	25			50
Maximum stroke	1000			
Piston rod diameter	20			
Maximum thrust	see graphs on page 1-497			
Maximum speed	see graphs on page 1-497			
Maximum load in vertical position and motor powered off (reversibility)	irreversible (max recommended 1000)		90 with 1/25 gear ratio	40 with 1/13 gear ratio
Work cycle at 25°C (duty cycle)	20 (example: 2 min. ON 8 min. OFF) %			
Overall radial oscillation of the piston rod (without load) for 100 mm of stroke	0.4 mm			
Versions	In-line or geared			
Uncontrolled impact at the end of stroke	NOT ALLOWED (it provides an extra-stroke minimum 5 mm)			
Sensor magnet	YES			
Work position	Any			
Motor	Direct current DC			
Supply voltage	12 or 24 VDC			
Input power with MAX torque	24 W			
Input current with MAX torque	2 (12VDC) 1 (24VDC) A			
Interference suppression	VDR and capacitors			
Direction of rotation	according to polarity			
Encoder (optional)	two channels, three pulses per rev for each channel			
Motor protection	Overload and short-circuiting protection using resettable fuse (optional)			
Power cable (length)	2 m			
Weight at stroke 0, in-line version	1247			1224 g
Weight at stroke 0, geared version	1461			1437 g
Additional weight for each mm stroke	1.4 g			

## COMPONENTS

### IN-LINE CYLINDER



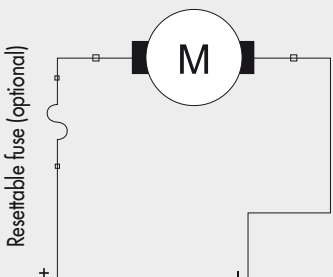
### GEARED CYLINDER



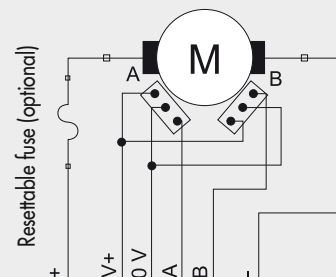
- |  |  |
|--|--|
| ① PISTON ROD: ground chrome steel                        | ⑮ REAR CYLINDER HEAD: anodised aluminium |
| ② WIPER RING: polyurethane                               | ⑯ BEARING: oblique with two ball rings   |
| ③ PISTON ROD GASKET: NBR                                 | ⑰ GEARED MOTOR                           |
| ④ FRONT FIXING RING NUT: anodised aluminium              | ⑱ CABLE GLAND RUBBER                     |
| ⑤ FRONT CYLINDER HEAD: anodised aluminium                | ⑲ MOTOR COVER PLUG: anodised aluminium   |
| ⑥ GUIDE BUSHING: steel strip with bronze and PTFE insert | ⑳ MOTOR COVER PIPE: anodised aluminium   |
| ⑦ BUFFER: polyurethane                                   | ㉑ COUPLING                               |
| ⑧ MAGNET LOCKING RING NUT: aluminium                     | ㉒ MOTOR 1 PLATE: anodised aluminium      |
| ⑨ MAGNET: plastoferrite                                  | ㉓ MOTOR 2 PLATE: anodised aluminium      |
| ⑩ PISTON: aluminium                                      | ㉔ COGWHEEL: steel                        |
| ⑪ BARREL: anodized aluminium alloy                       | ㉕ COGWHEEL: technopolymer                |
| ⑫ GUIDE STRIP: self-lubricated calibrated technopolymer  | ㉖ THREADED RING: aluminium               |
| ⑬ BALL SCREW: technopolymer                              | ㉗ TRANSMISSION PLATE: anodised aluminium |
| ⑭ ACME SCREW: hardened steel                             | ㉘ COVER: anodised aluminium              |

## CYLINDER CONNECTION AND WIRING DIAGRAM

### WITHOUT ENCODER



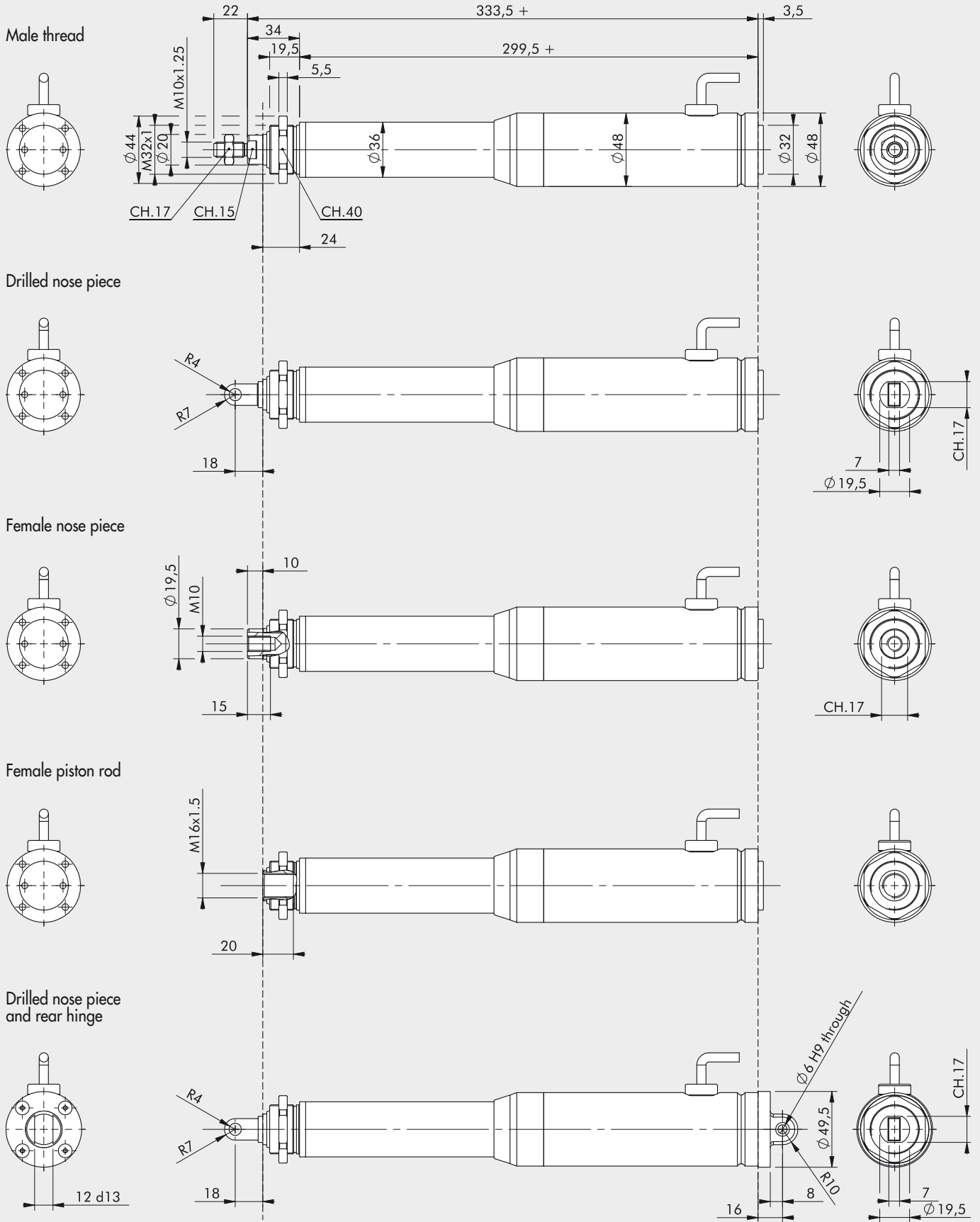
### WITH ENCODER



Function	Corresponding wire colour
Motor power supply +	Brown
Motor power supply -	Blue
ENCODER POWER SUPPLY V+ 5-24 VDC	Red
Encoder 0 V supply	Black
Encoder channel A (NPN)	Green
Encoder channel B (NPN)	Yellow
N/A	White
N/A	Gray

**DIMENSIONS FOR IN-LINE VERSIONS**

+ = add the stroke



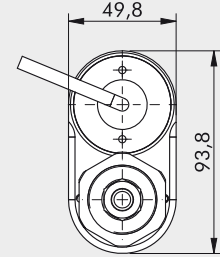
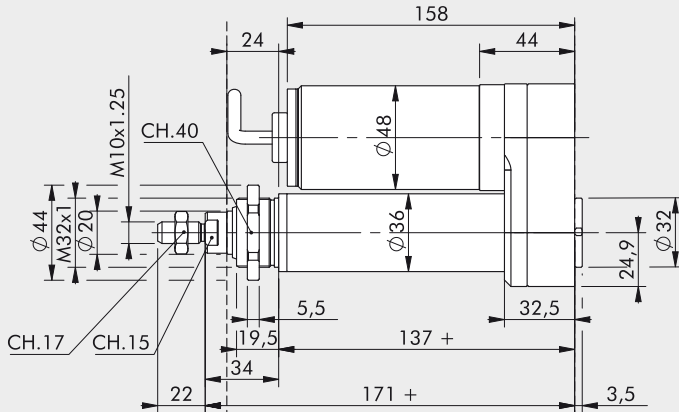
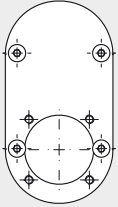
## DIMENSIONS FOR GEARED VERSIONS

+ = add the stroke

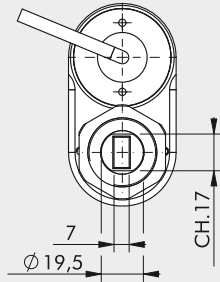
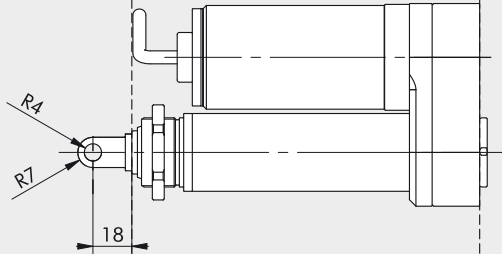
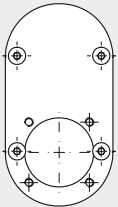
ACTUATORS

ELECTRIC CYLINDER SERIES ELEKTRO ROUND DC

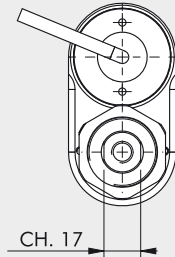
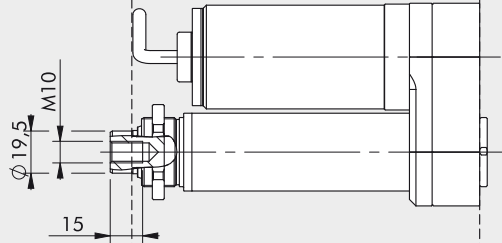
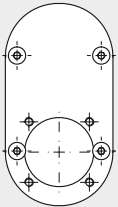
Male thread



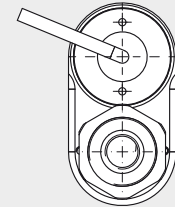
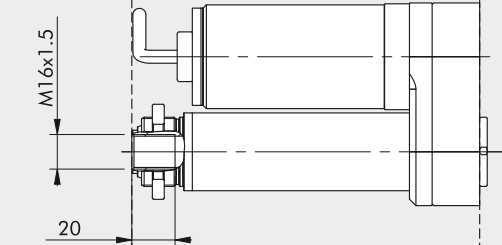
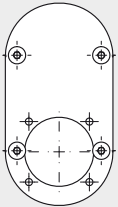
Drilled nose piece



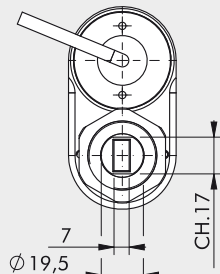
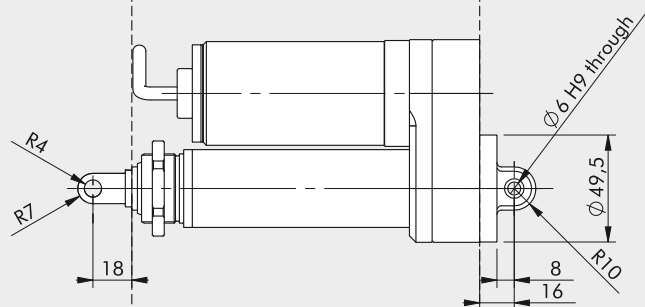
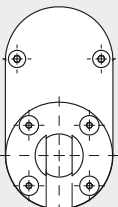
Female nose piece



Female piston rod

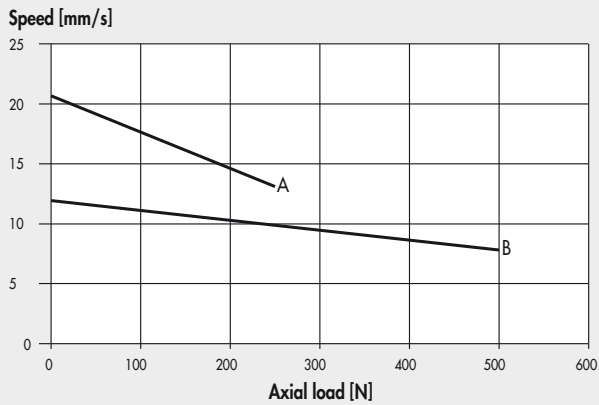


Drilled nose piece and rear hinge

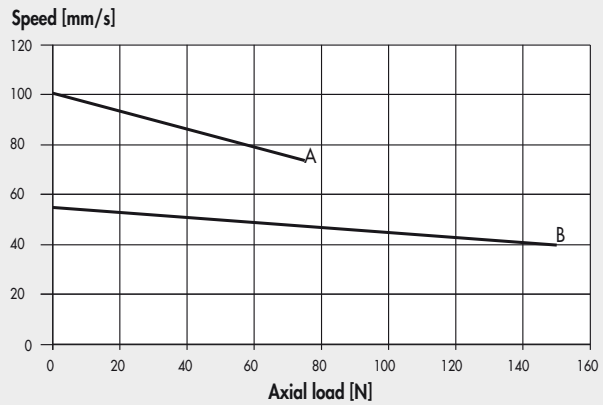


2 d13

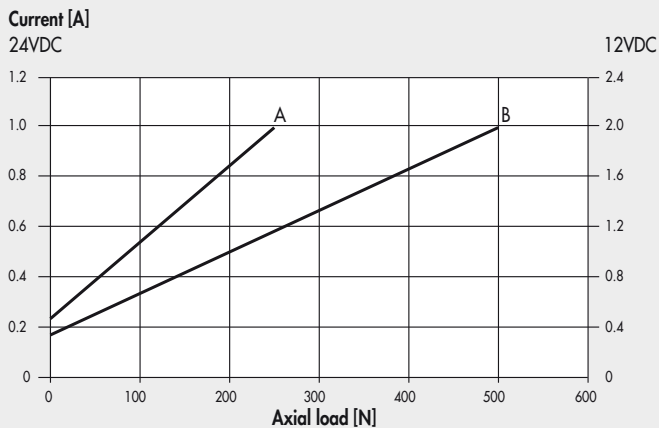


**AXIAL LOAD CURVES AS A FUNCTION OF SPEED**
**Ø32 WITH PITCH 4 WITH DC MOTOR**


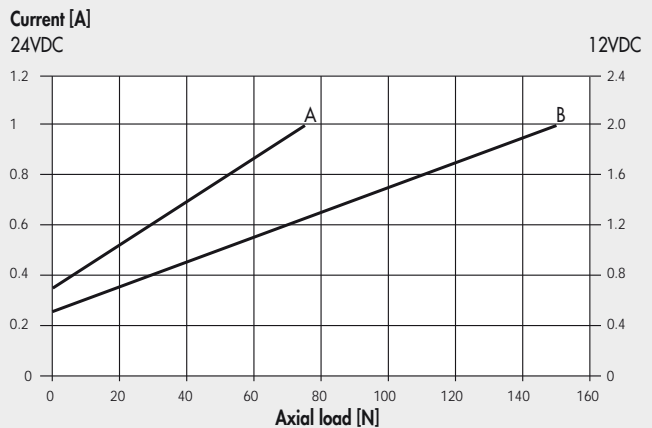
A = 372032\_\_1\_3\_0\_ (1/13 gear ratio)  
 B = 372032\_\_1\_3\_1\_ (1/25 gear ratio)

**Ø32 PITCH 20 WITH DC MOTOR**


A = 372032\_\_7\_3\_0\_ (1/13 gear ratio)  
 B = 372032\_\_7\_3\_1\_ (1/25 gear ratio)



A = 372032\_\_1\_3\_0\_  
 B = 372032\_\_1\_3\_1\_



A = 372032\_\_7\_3\_0\_  
 B = 372032\_\_7\_3\_1\_

**KEY TO CODES**

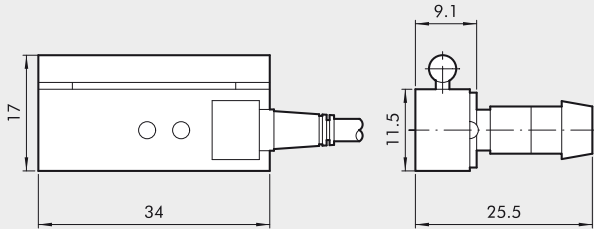
CYL	37 TYPE	2	0	32 BORE	0100 STROKE	1 SCREW PITCH	3 VERSION	3 DRIVE	2 SUPPLY VOLTAGE	0 GEAR RATIO	1 CYLINDER END TYPES
	37 Electric actuators	2 Cylinder Elektro Round DC	0 STD	32		1 Screw pitch 4 7 Screw pitch 20	3 In-line without antirotation IP65 7 Geared without antirotation IP65	3 Motor Direct current	1 12VDC 2 24VDC 3 12VDC + Encoder 4 24VDC + Encoder 5 12VDC + fuse 6 24VDC + fuse 7 12VDC + Encoder + fuse 8 24VDC + Encoder + fuse	0 1/13 1 1/25	1 Thread male 2 Nose piece drilled 3 Nose piece female 4 Piston rod female 5 Nose piece drilled and rear hinge

◆ For the version with a female piston rod, a cap must be provided on the piston rod to ensure IP65 protection.



## ACCESSORIES: MAGNETIC SENSORS

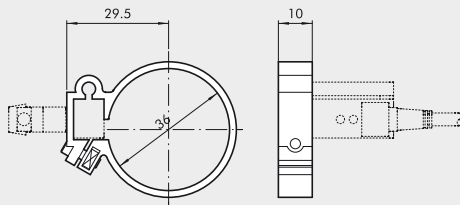
### SENSOR SERIES DSM



Code	Description
W0950000201	REED sensor DSM2-C525 HS
W0950000222	EFFECT HALL PNP sensor DSM3-N225
W0950000232	EFFECT NPN sensor DSM3-M225

For technical data see page 1-583

### SENSOR CIRCLIP



Code	Bore	Model	Ø	A	B
W0950000132	32	Circlip DXF 36-32	36	29.5	10

### NOTES

# ELECTRIC AXIS ELEKTRO SHAK SERIES



Belt-driven rodless electric cylinder with V-Lock type interface.

The cylinder structure features a sturdy anodised aluminium extruded profile to ensure optimal rigidity. The typical V-Lock dovetail (no grooves) is provided for easy installation using QS elements. The V-Lock interface with a dovetail and standard grooves is mounted on the moving plate to fix the other components using K or QS elements. The slide is moved by means of adjustable casters running along hardened and tempered guides inserted into the extruded profile, to obtain a rigid system with adjustable clearance. Guide lubrication nipples are also mounted on the slide plate. The slide is driven by a reinforced belt that is in turn operated by a pulley keyed onto the motor; a mechanical belt-tensioning system is mounted on the cylinder.

Different drives are available, both brushless and stepping. The versions with a brushless motor can be equipped with a 1:3 speed gear unit, when you want to make the most of the available torque.

In addition to the standard drives included in the catalogue, custom cylinder can also mount other types of motor. The homing position is identified by a inductive sensor included in the supply.

Two different size are available, SHAK 340 and SHAK 470, with pre-set standard strokes. For each size it is possible to choose side on which to mount the motor (4 positions). A version with a smooth tree-type output, mounted in a pre-set position, is also available. The SHAK cylinder can be mounted both horizontally and vertically. With vertical installation, it is advisable to use motors with a holding brake that only activates in the event of a power failure but not when there is a motor overload. For the correct operation of the brake, it is necessary to meet the limits required by the axial load curves according to the speed. Among the accessories available there is a cable guiding system with a handy cable channel and bracket.

## SHAK 340



## SHAK 470



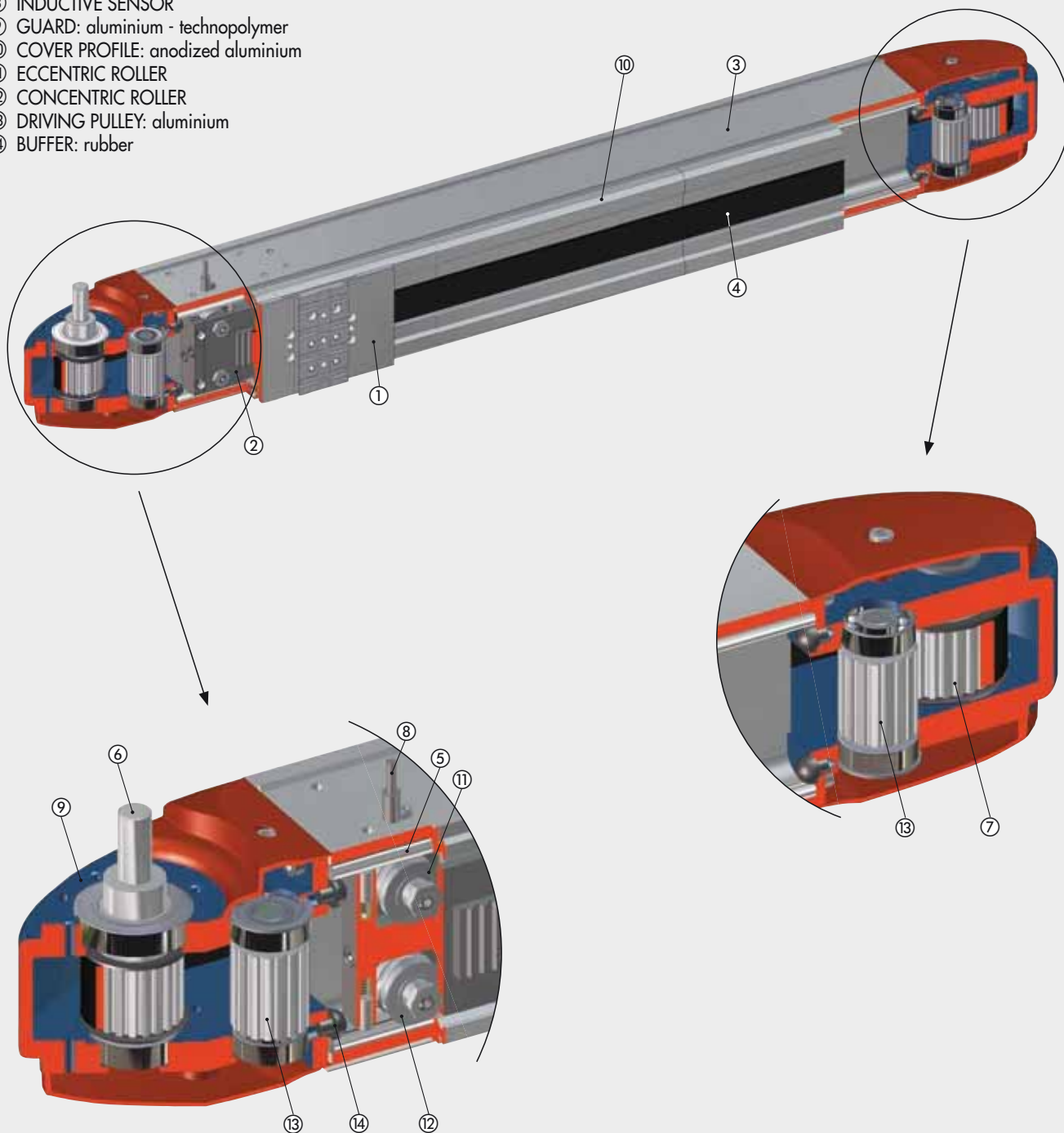
TECHNICAL DATA	SHAK 340	SHAK 470
<b>WITH STEPPING MOTORS</b>		
Ambient temperature	°C from -10 to +50	
Maximum relative humidity	90% at 40°C / 57% at 50°C (no condensate)	
Maximum value of duty cycle	50%	
Maximum value of axial force available (with Metal Work motors)		
without brake	N 150	250
with brake	N 180	250
Maximum speed without load		
without brake and without gear unit	m/s 2.5	2
with brake and without gear unit	m/s 2	2
Maximum acceleration without load	m/s <sup>2</sup> 50	50
Maximum admissible mass	kg 5	7.5
<b>WITH BRUSHLESS MOTORS</b>		
Ambient temperature	°C from 0 to +40	
Maximum relative humidity	90% (no condensate)	
Maximum value of duty cycle	100%	
Maximum value of axial force available (with Metal Work motors)		
without gear unit	N 70	80
with gear unit	N 600	700
Maximum speed without load		
without gear unit	m/s 5	5
with gear unit	m/s 2.4	2.7
Maximum acceleration without load	m/s <sup>2</sup> 50	50
Maximum admissible mass		
without gear unit, vertical orientation	kg 3	3
with gear unit, vertical orientation	kg 15	25
without gear unit, horizontal orientation	kg 5	5
with gear unit, horizontal orientation	kg 15	25

<b>MECHANICAL CHARACTERISTICS</b>		<b>SHAK 340</b>	<b>SHAK 470</b>
Maximum movable mass	kg	15	25
Maximum speed (empty)	m/s	5	5
Maximum acceleration (empty)	m/s <sup>2</sup>	50	50
Maximum axial force	N	800	1000
Maximum force applicable on the pulley	Nm	15	25
Standard strokes (special execution on request)	mm	400 600 800 1000 1200	800 1200 1600 2000 2400
Repetition accuracy	mm		±0.05
Noise level	dB(A)		<66
Mounting position			Any
Protection level			IP30
Toothed belt pitch	mm		5
Type of belt		PowerGrip® LL GT 5MR 25 FV	PowerGrip® LL GT 5MR 30 ST
Belt elongation at maximum load		0.15%	0.25%
Pulley pitch diameter	mm	35.01	44.56
Stroke / Revolution	mm/rev	110	140
Homing position sensor		Inductive sensor switch	

<b>MASS AND MOMENT OF INERTIA</b>		<b>SHAK 340</b>	<b>SHAK 470</b>
Weight without motor	kg	7.7 (stroke 400) 9 (stroke 600) 10.4 (stroke 800) 11.7 (stroke 1000) 13 (stroke 1200)	15.9 (stroke 800) 19.8 (stroke 1200) 23.6 (stroke 1600) 27.5 (stroke 2000) 31.2 (stroke 2400)
Motor weight	kg		
Stepping motor without brake		2.5	4.2
Stepping motor with brake		3.7	4.5
Brushless motor without brake		1.3	2.6
Brushless motor with brake		1.7	2.2
Moving mass	kg	1.28 (stroke 400) 1.32 (stroke 600) 1.36 (stroke 800) 1.40 (stroke 1000) 1.44 (stroke 1200)	2.18 (stroke 800) 2.28 (stroke 1200) 2.38 (stroke 1600) 2.48 (stroke 2000) 2.58 (stroke 2400)
Gear unit weight	kg	0.8	4
Reduced inertia at motor (without load)	kg mm <sup>2</sup>		
Versions without gear unit (without motor)		451 (stroke 400) 462 (stroke 600) 474 (stroke 800) 485 (stroke 1000) 497 (stroke 1200)	1414 (stroke 800) 1467 (stroke 1200) 1521 (stroke 1600) 1574 (stroke 2000) 1627 (stroke 2400)
Versions with gear units (without motor)		58 (stroke 400) 59 (stroke 600) 61 (stroke 800) 62 (stroke 1000) 63 (stroke 1200)	216 (stroke 800) 222 (stroke 1200) 228 (stroke 1600) 234 (stroke 2000) 240 (stroke 2400)

## COMPONENTS

- ① INTERFACE PLATE: anodized aluminium
- ② SLIDE: aluminium
- ③ BODY: anodized aluminium
- ④ TOOTHED TRANSMISSION BELT: loaded polychloroprene (CR)
- ⑤ HARDENED GUIDE: hardened ground chromed steel
- ⑥ DRIVE PULLEY: steel
- ⑦ IDLE PULLEY: aluminium
- ⑧ INDUCTIVE SENSOR
- ⑨ GUARD: aluminium - technopolymer
- ⑩ COVER PROFILE: anodized aluminium
- ⑪ ECCENTRIC ROLLER
- ⑫ CONCENTRIC ROLLER
- ⑬ DRIVING PULLEY: aluminium
- ⑭ BUFFER: rubber

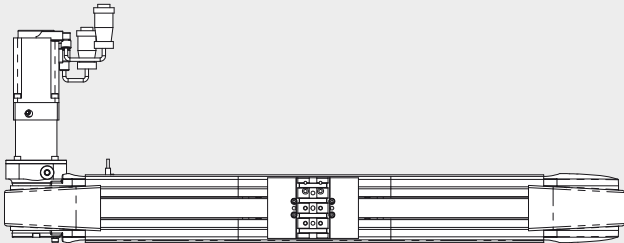


**VERSIONS**

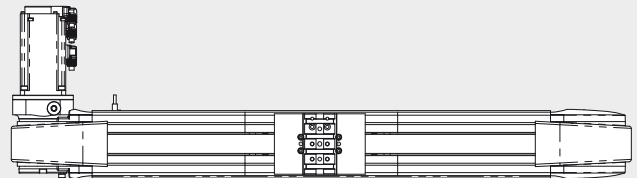
**VERSION WITHOUT MOTOR (attachment on the top left side only)**



**VERSION WITH MOTOR AND GEAR UNIT**



**VERSION WITH MOTOR WITHOUT GEAR UNIT**



The versions supplied with **MOTOR** or with **MOTOR AND GEAR UNIT** are available in the following configurations:

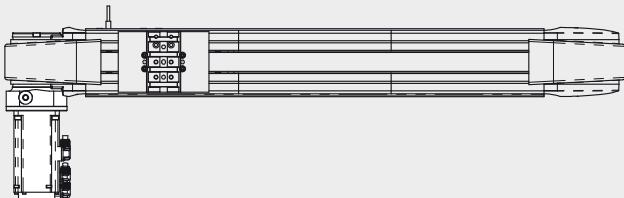
**VERSION WITH MOTOR OR MOTOR AND GEAR UNIT TOP LEFT**



**VERSION WITH MOTOR OR MOTOR AND GEAR UNIT TOP RIGHT**



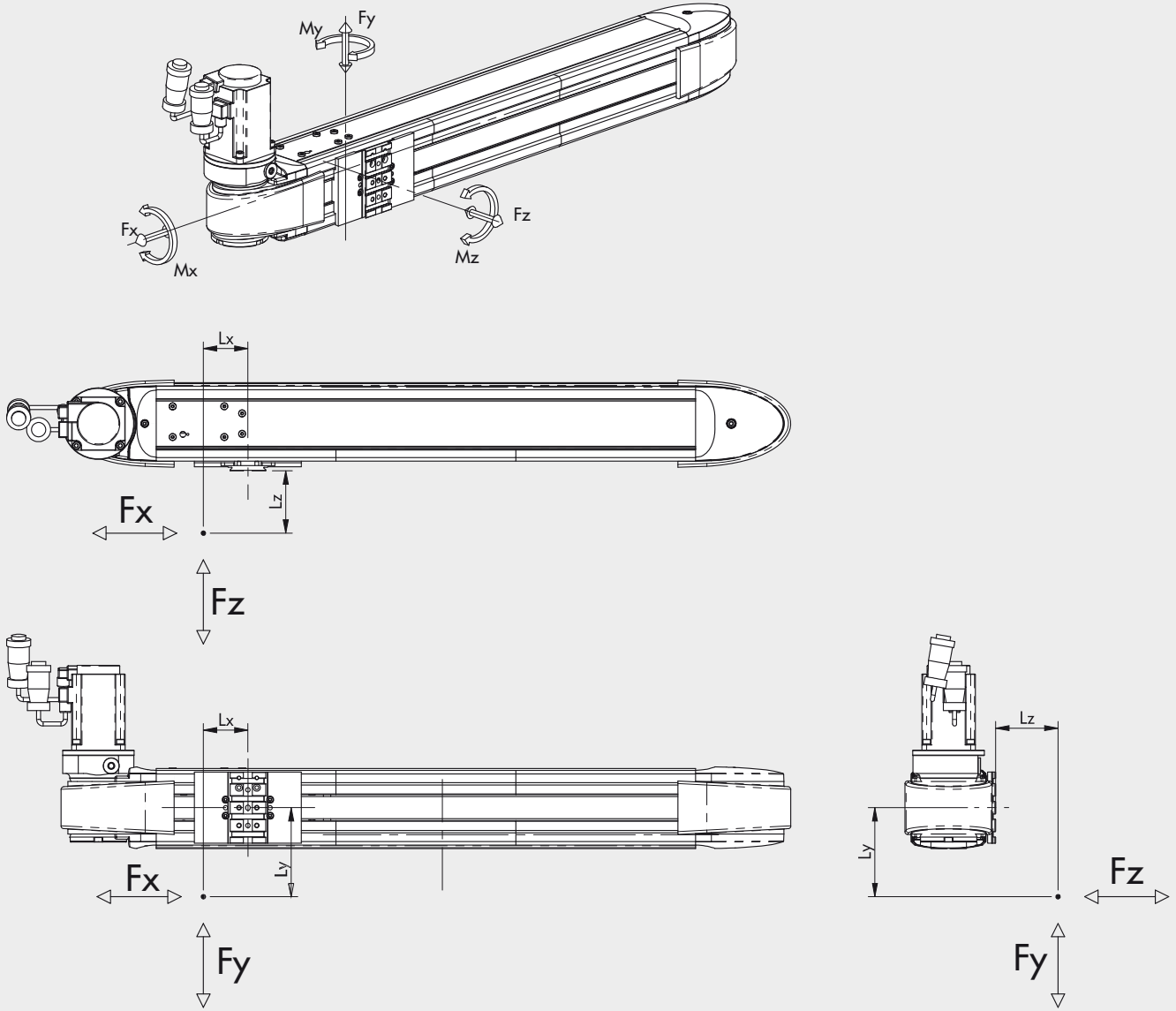
**VERSION WITH MOTOR OR MOTOR AND GEAR UNIT BOTTOM LEFT**



**VERSION WITH MOTOR OR MOTOR AND GEAR UNIT BOTTOM RIGHT**



## DIAGRAM OF FORCES AND MOMENTS



Size	$F_y$ max [N]	$F_z$ max [N]	$M_x$ max [Nm]	$M_y$ max [Nm]	$M_z$ max [Nm]
SHAK 340	800	600	24	42	52
SHAK 470	1000	800	32	50	70

**N.B.:** The values are calculated on the basis of theoretical useful life of 10000 km.

**N.B.:** For the maximum value of  $F_x$  see the general technical data and the axial load curves depending on the speed.

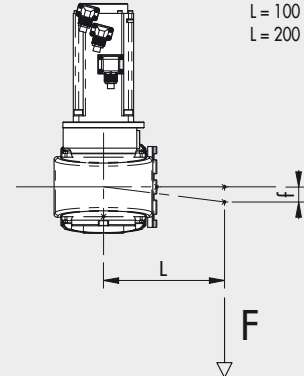
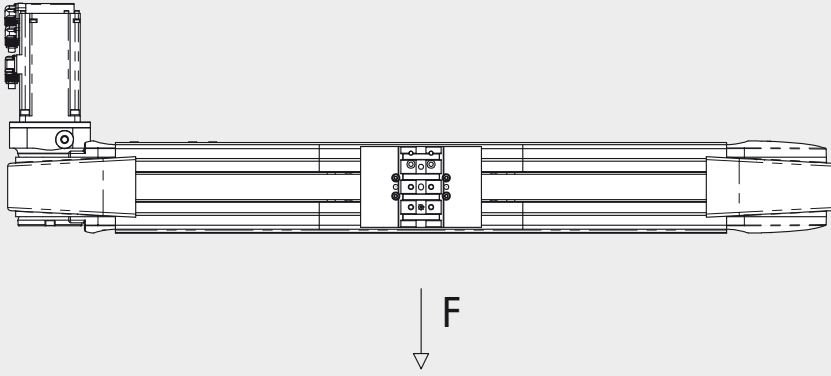
**N.B.:** When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where  $L_x$ ,  $L_y$  and  $L_z$  have to be given in metre.

$$M_x = F_z \cdot L_y + F_y \cdot L_z \quad M_y = F_z \cdot L_x + F_x \cdot L_z \quad M_z = F_y \cdot L_x + F_x \cdot L_y$$

$$\frac{(M_x)}{M_x \text{ max}} + \frac{(M_y)}{M_y \text{ max}} + \frac{(M_z)}{M_z \text{ max}} + \frac{(F_y)}{F_y \text{ max}} + \frac{(F_z)}{F_z \text{ max}} \leq 1$$



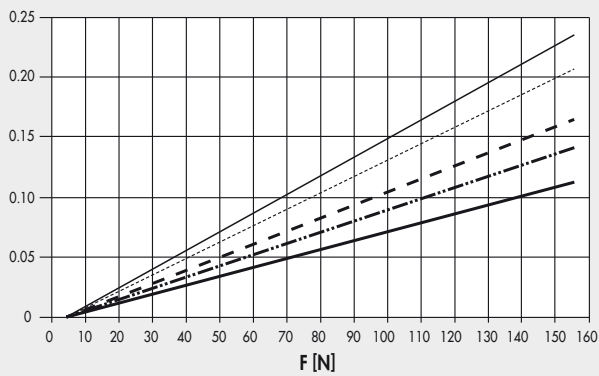
## DEFORMATION ACCORDING TO LOAD



L = 100 mm for SHAK 340  
L = 200 mm for SHAK 470

### SHAK 340

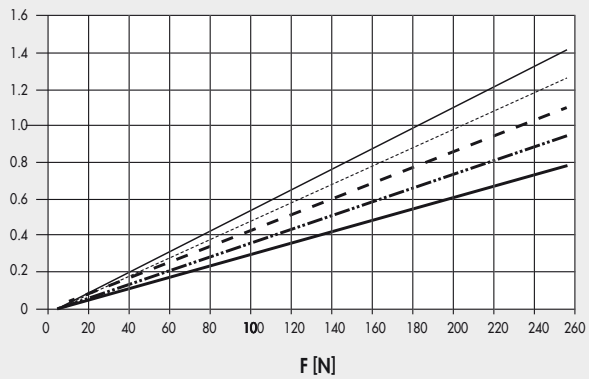
f [mm]



- SHAK 340 Stroke 400
- - - - - SHAK 340 Stroke 600
- · — · — SHAK 340 Stroke 800
- · · · · SHAK 340 Stroke 1000
- SHAK 340 Stroke 1200

### SHAK 470

f [mm]



- SHAK 470 Stroke 800
- - - - - SHAK 470 Stroke 1200
- · — · — SHAK 470 Stroke 1600
- · · · · SHAK 470 Stroke 2000
- SHAK 470 Stroke 2400

## AXIAL LOAD-SPEED CURVES

**N.B.:** Check that the following constraints are met for each cycle phase:

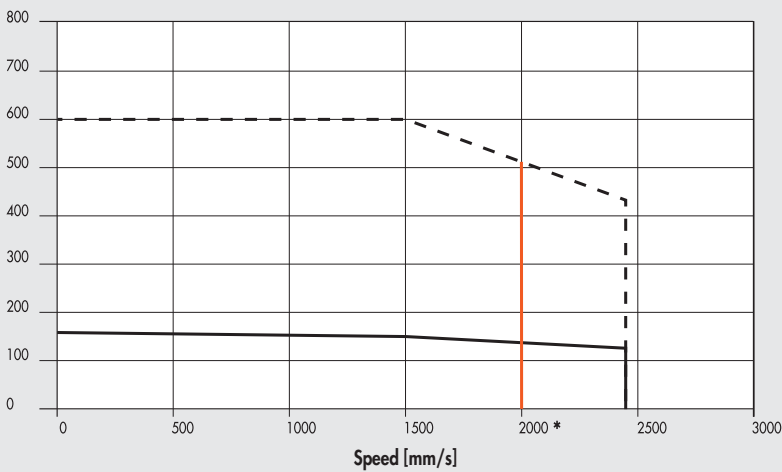
- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia).

The following diagrams show the axial load with changing speed (mm/s). Each diagram shows two separate curves:

- **NOMINAL AXIAL LOAD** curve: the nominal axial load delivered by the motor with a duty cycle of 100%
- **MAXIMUM AXIAL LOAD** curve: the axial load delivered by the motor with a duty cycle of less than 100%.

### SHAK 340 BRUSHLESS and BRUSHLESS with BRAKE drives (versions with 1:3 gear unit)

Axial load [N]

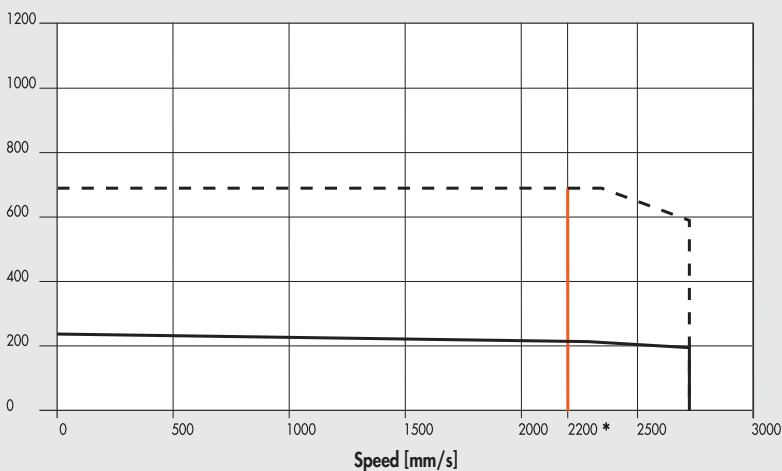


- Force load with maximum torque load  
37M2220000 or 37M4220000 (with brake)  
+ 37D2400000 (400W)
- Force load with nominal torque load  
37M2220000 or 37M4220000 (with brake)  
+ 37D2400000 (400W)

\* = limit of gear unit continuous operation: higher speeds can be reached only for "duty cycle"  $\leq 60\%$  and for a maximum number of 1000 accelerations per hour.

### SHAK 470 BRUSHLESS and BRUSHLESS with BRAKE drives (versions with 1:3 gear unit)

Axial load [N]

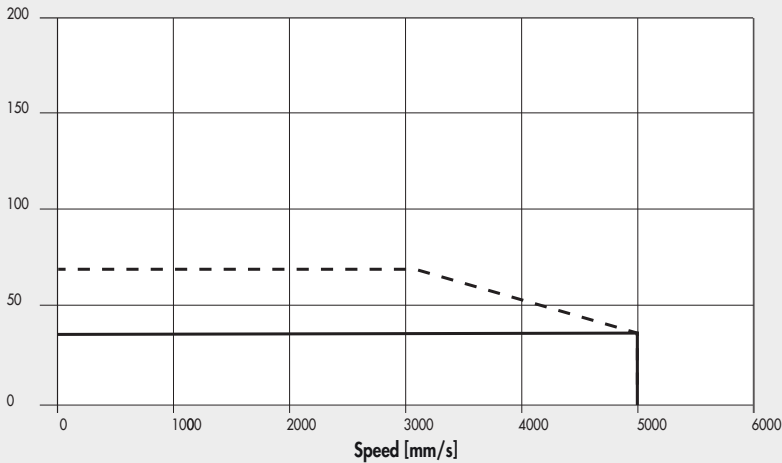


- Force load with maximum torque load  
37M2330000 or 37M4330000 (with brake)  
+ 37D2400000 (750W)
- Force load with nominal torque load  
37M2330000 or 37M4330000 (with brake)  
+ 37D2400000 (750W)

\* = limit of gear unit continuous operation: higher speeds can be reached only for "duty cycle"  $\leq 60\%$  and for a maximum number of 1000 accelerations per hour.

**SHAK 340**  
BRUSHLESS and BRUSHLESS with BRAKE drives

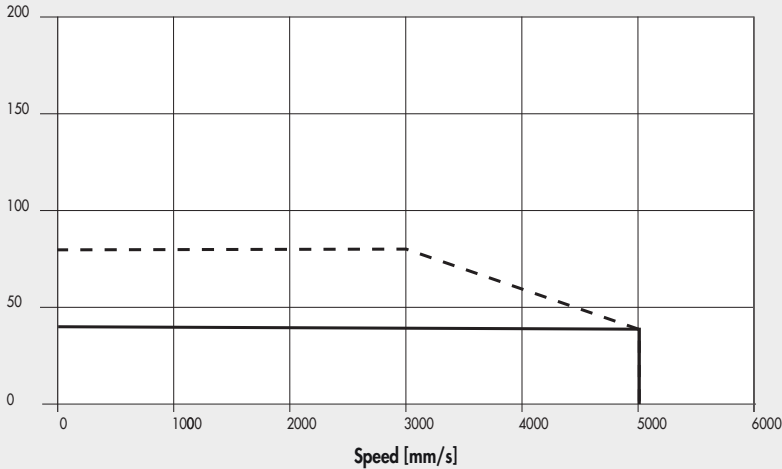
Axial load [N]



- Force load with maximum torque load  
37M2220000 or 37M4220000 (with brake)  
+ 37D2400000 (400W)
- Force load with nominal torque load  
37M2220000 or 37M4220000 (with brake)  
+ 37D2400000 (400W)

**SHAK 470**  
BRUSHLESS and BRUSHLESS with BRAKE drives

Axial load [N]

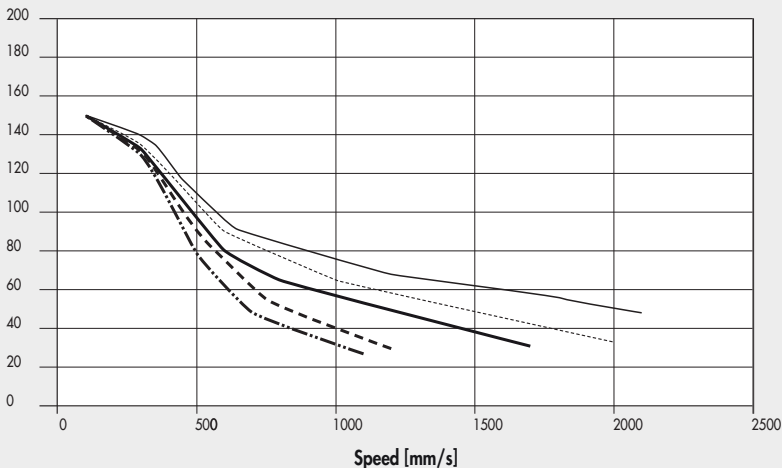


- Force load with maximum torque load  
37M2330000 or 37M4330000 (with brake)  
+ 37D2400000 (750W)
- Force load with nominal torque load  
37M2330000 or 37M4330000 (with brake)  
+ 37D2400000 (750W)

**N.B.:** The obtainable load values already take the efficiency of the system into account. For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

**SHAK 340**  
STEPPING drives

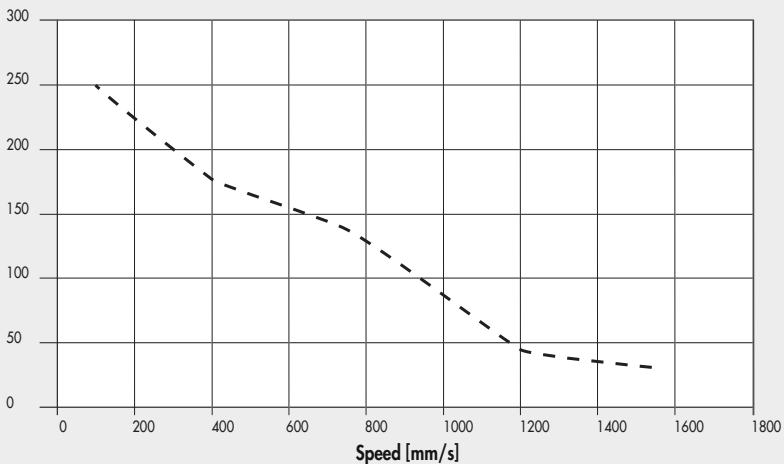
Axial load [N]



- 37M1440000 (24 VDC)
- 37M1440000 (48 VDC)
- 37M1440000 (75 VDC)
- 37M1440000 (100 VDC)
- 37M1440000 (140 VDC)

**SHAK 470**  
STEPPING drives

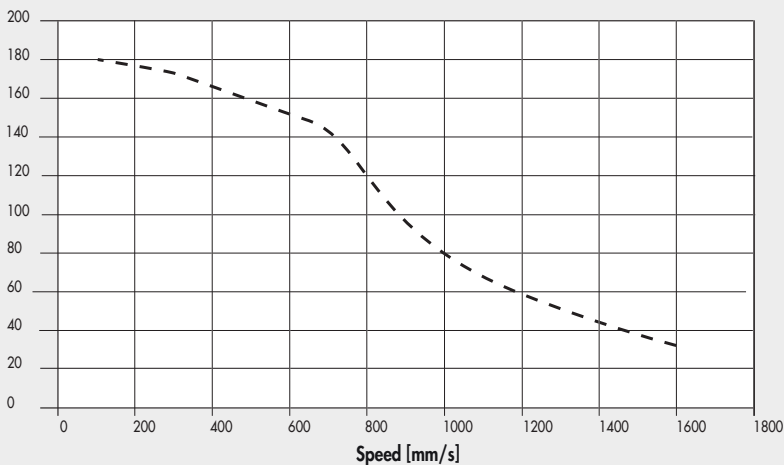
Axial load [N]



----- 37M1470000 (80 VDC - 55 VAC)

**SHAK 340**  
STEPPING + BRAKE and ENCODER drives

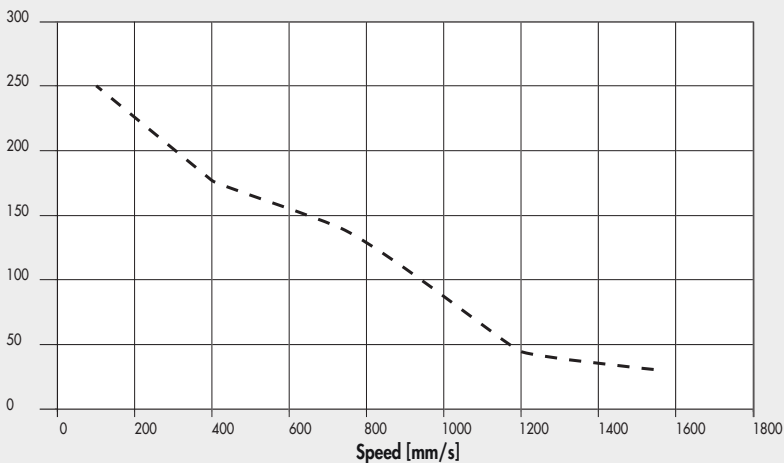
Axial load [N]



----- 37M3450000 (80 VDC - 55 VAC)

**SHAK 470**  
STEPPING + BRAKE and ENCODER drives

Axial load [N]



----- 37M3470000 (80 VDC - 55 VAC)

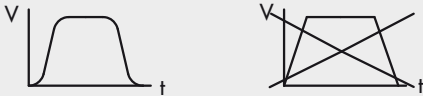
## MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES		
Metal Work	Manufacturer	37D1332000	37D1442000	37D1552000
		RTA NDC 96	RTA PLUS A4	RTA PLUS B7
		(6A 24÷75VDC)	(6A 77÷140VDC)	(10A 28÷62VAC) ●
<b>STEPPING</b>				
37M1440000	Motor SANYO DENKI 103-H8222-6340 (6A 140V max)	SHAK 340	SHAK 340	SHAK 340 ◆
37M1470000	Motor B&R 80MPH6.101S000-01 (10A 80V max)	-	-	SHAK 470
<b>STEPPING WITH BRAKE + ENCODER</b>				
37M3450000	Motor B&R 80MPH4.101D114-01 (10A 80V max)	-	-	SHAK 340
37M3470000	Motor B&R 80MPH6.101D114-01 (10A 80V max)	-	-	SHAK 470
MOTOR CODES		DRIVES CODES		
Metal Work	Manufacturer	37D2400000		
		SANYO DENKI RS1A03		
		(30A 400÷750 W)		
<b>BRUSHLESS</b>				
37M2220000	Motor SANYO DENKI R2AA06040FXH1 1M (400W)		SHAK 340	
37M2330000	Motor SANYO DENKI R2AA08075FXH1 1M (750W)		SHAK 470	
<b>BRUSHLESS WITH BRAKE</b>				
37M4220000	Motor SANYO DENKI R2AA06040FCH1 1M (400W)		SHAK 340	
37M4330000	Motor SANYO DENKI R2AA08075FCH1 1M (750W)		SHAK 470	

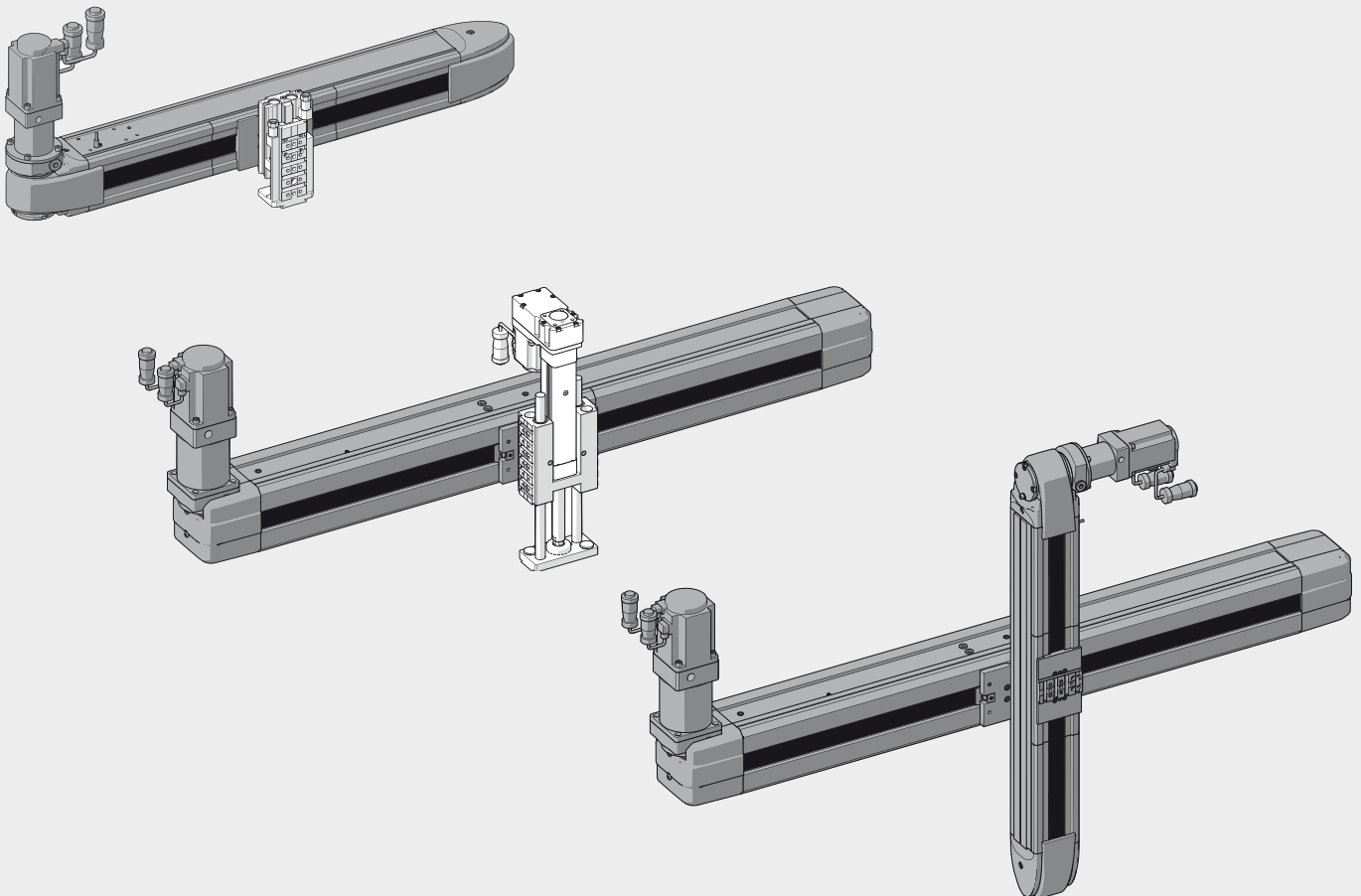
◆ Important! Limit current

● Important! AC drive to continuous voltage  $VDC = VAC \cdot \sqrt{2}$

The motor must be controlled in such a way as to avoid sudden changes in speed.

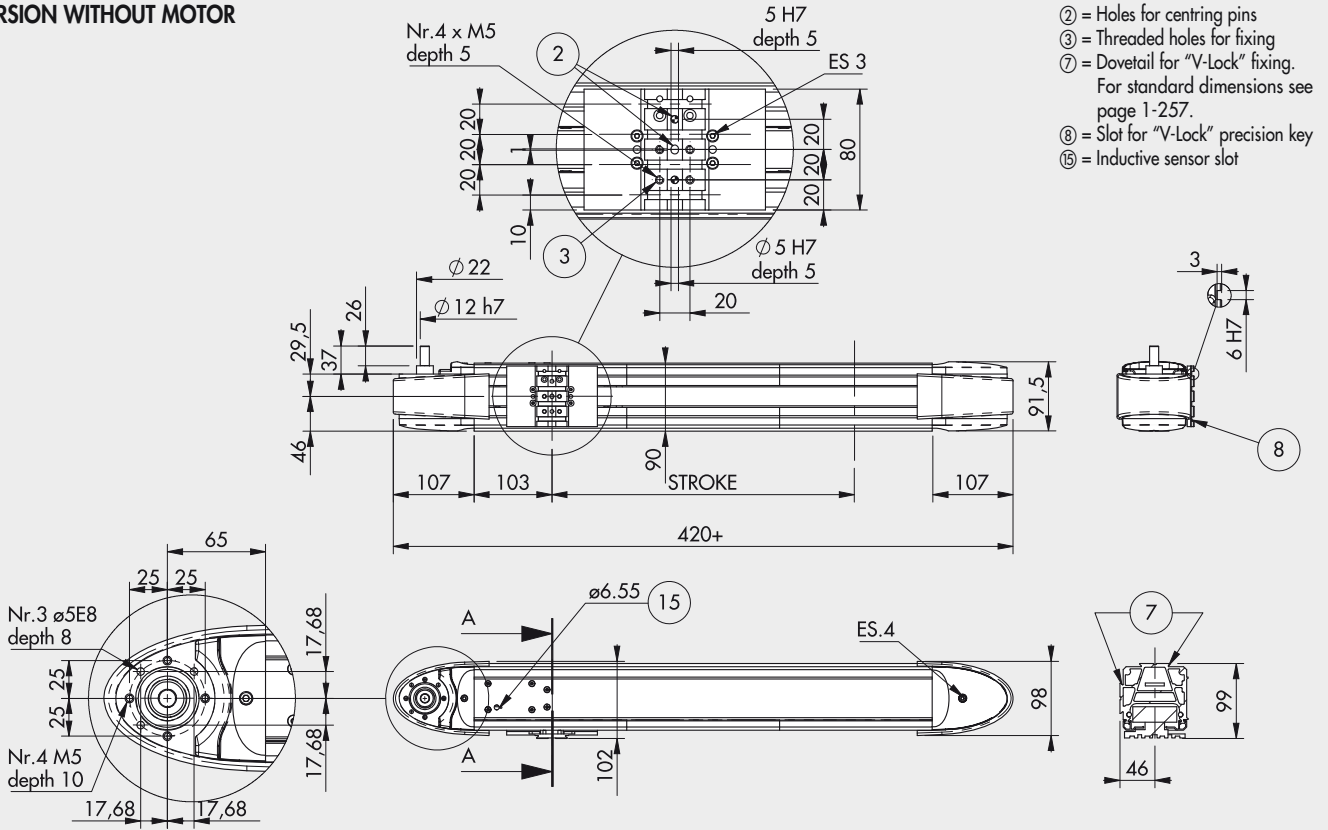


## EXAMPLES OF APPLICATION



## DIMENSIONS SHAK 340

### VERSION WITHOUT MOTOR



### VERSION WITH MOTOR

Examples of overall dimensions referring to the version with motor on the top left; these values apply to the other versions as well.

<b>ORDERING CODES</b>	<b>BRUSHLESS MOTOR</b>	<b>BRUSHLESS MOTOR WITH BRAKE</b>	<b>BRUSHLESS MOTOR WITH GEAR UNIT</b>	<b>BRUSHLESS MOTOR WITH GEAR UNIT AND BRAKE</b>	<b>STEPPING MOTOR</b>	<b>STEPPING MOTOR WITH BRAKE</b>
	375010 ___ 0002220	375010 ___ 0004220	375010 ___ 0102220	375010 ___ 0104220	375010 ___ 0001440	375010 ___ 0003450
	375010 ___ 0012220	375010 ___ 0014220	375010 ___ 0112220	375010 ___ 0114220	375010 ___ 0011440	375010 ___ 0013450
	375010 ___ 0022220	375010 ___ 0024220	375010 ___ 0122220	375010 ___ 0124220	375010 ___ 0021440	375010 ___ 0023450
	375010 ___ 0032220	375010 ___ 0034220	375010 ___ 0132220	375010 ___ 0031440	375010 ___ 0033450	

\_\_\_ = Standard stroke (0400; 0600; 0800; 1000; 1200)



## KEY TO CODES (WITHOUT MOTOR)

CYL	37 TYPE	5	0	1 SIZE	0	0800 STROKE ◆	0
	37 Electric actuators	5 SHAK electric axes	0 STD	1 Size 340	0 STD	400 600 800 1000 1200	0 STD
				2 Size 470		800 1200 1600 2000 2400	

◆ Other strokes on request.

## KEY TO CODES AXIS ELECTRIC MOTOR

CYL	37 TYPE	5	0	1 SIZE	0	0800 STROKE ◆	0	0 REDUCTION	0 MOTOR POSITION	2	2 DRIVE	2	0
	37 Electric actuators	5 SHAK electric axes	0 STD	1 Size 340	0 STD	400 600 800 1000 1200	0 STD	0 No reduction 1 1:3 ratio	0 Top left 1 Bottom left 2 Top right 3 Bottom right	1 STEPPING motor 2 BRUSHLESS motor 3 STEPPING motor with BRAKE (+ Encoder) 4 BRUSHLESS motor with BRAKE	2 Flange 60 3 Flange 80 4 NEMA Flange 34	2 Torque 1.2÷2.19 Nm 3 Torque 2.2÷3 Nm 4 Torque 3.01÷5 Nm 5 Torque 6.21÷7 Nm 7 Torque >7 Nm	0 STD
				2 Size 470		800 1200 1600 2000 2400							

◆ Other strokes on request.

N.B.: The available configurations are shown on pages 1-510 and 1-511.

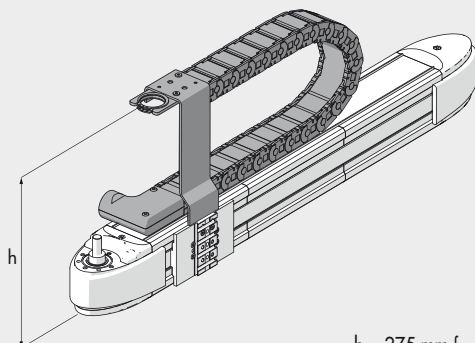
## ACCESSORIES

### OIL



Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

### CABLE TRAY CHAIN



h = 275 mm for SHAK 340  
h = 310 mm for SHAK 470

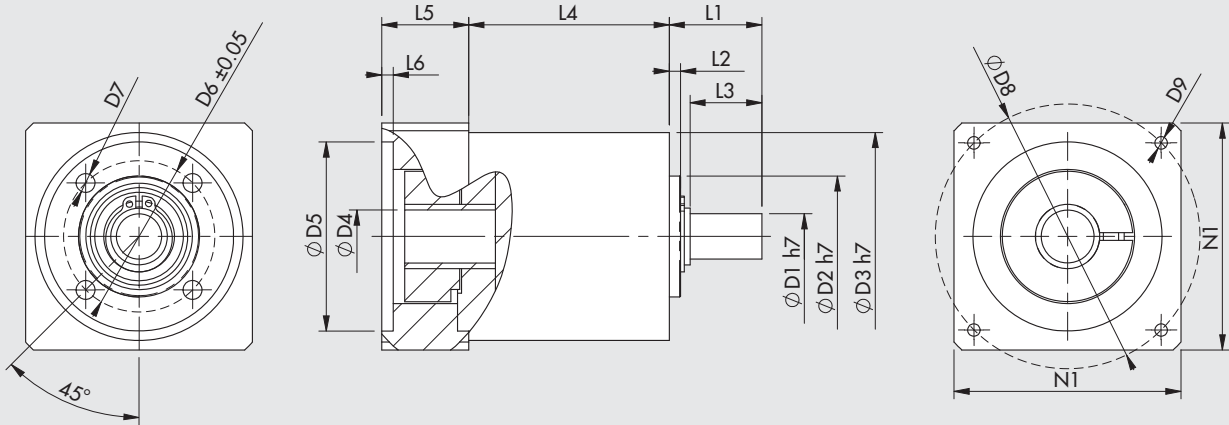
Code	Description
095340A0400	Cable tray chain accessory kit SHAK-340-400
095340A0600	Cable tray chain accessory kit SHAK-340-600
095340A0800	Cable tray chain accessory kit SHAK-340-800
095340A1000	Cable tray chain accessory kit SHAK-340-1000
095340A1200	Cable tray chain accessory kit SHAK-340-1200
095470A0800	Cable tray chain accessory kit SHAK-470-800
095470A1200	Cable tray chain accessory kit SHAK-470-1200
095470A1600	Cable tray chain accessory kit SHAK-470-1600
095470A2000	Cable tray chain accessory kit SHAK-470-2000
095470A2400	Cable tray chain accessory kit SHAK-470-2400

**WARNING!** You cannot mount the chain on versions with motor or gearmotor at the top right



# SPARE PARTS

## SHAK GEAR UNITS



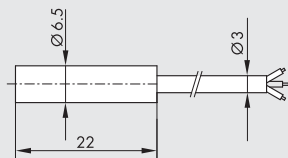
Code	Description	Application	C <sub>OUT</sub> nominal [Nm]	N <sub>IN</sub> nominal [1/min]	J reduced to motor shaft [kgmm <sup>2</sup> ]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0341000	Gear box MP053 1:3	SHAK 340	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0343000	Gear box MP080 1:3	SHAK 470	40	2900	59	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80

C<sub>OUT</sub> = rated output torque

N<sub>IN</sub> = nominal input speed

J = mass moment of inertia of the gearhead

## SHAK INDUCTIVE SENSOR



Code	Description
095340A0000	SHAK inductive sensor accessory kit

## ELECTRIC MOTORS



See page 1-538.

## DRIVES



See page 1-561.

# ELECTRIC AXIS SERIES ELEKTRO SHAK GANTRY



ACTUATORS

ELECTRIC AXIS SERIES ELEKTRO SHAK GANTRY

The gantry consists of two parallel belt-driven axes, of which one acts as drive axis (drive X-axis) and the other as driven axis (geared X-axis). Both axes are connected one to the other by means of an anodized aluminium shaft and two flexible couplings that compensate for any minor misalignments between the axes caused by the support base. The shape of both coupling and drive shaft is designed to facilitate disassembly.

The carriages of the drive axis and the driven axis (both with a V-Lock interface featuring a typical shape and grooves) move synchronously thanks to the drive shaft. On the extruded body of both axes, on the side opposite to the carriages, the typical (no grooves) V-Lock dovetail is provided for easy fixing to the support to the support structure using QS elements. On the carriages of the X-axes another SHAK electric axis (Y-axis) is mounted transversally.

The motion is the same as for the single axis and has the same advantages: rigid structure, movement of the carriage with adjustable clearance, the presence of guide lubrication nozzles, the possibility of adjusting belt tensioning.

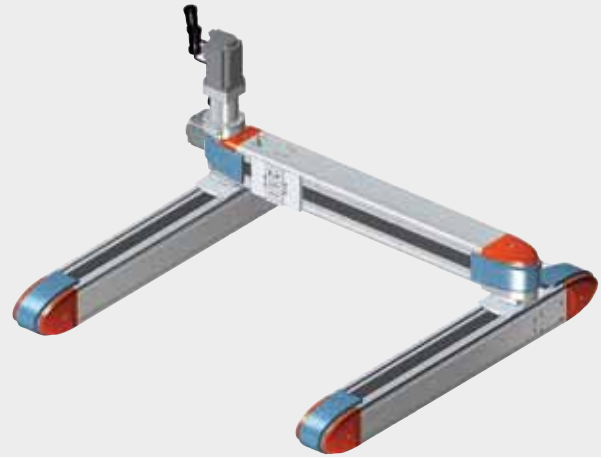
A BRUSHLESS motor with a 1:5 speed gear unit has been adopted as it ensures optimal load capacity without sacrificing the dynamic and speed performance typical of this product.

In addition to the standard drives proposed in the catalogue, the cylinder can be customised with the installation of other motors.

The homing position is identified by an inductive proximity sensor included in the supply.

Two sizes are available, SHAK-GANTRY 340 and SHAK-GANTRY 470, with standard pre-set strokes. For each size, it is also possible to choose on which side to mount the motors (right- or left-hand).

The Elektro SHAK-GANTRY was designed and optimized for horizontal installation. On request, the motors can be supplied with a holding brake, which activates only in the event of a power failure but not when there is a motor overload. For correct operation of the brake, it is important to comply with the limits required by the axial load curves according to speed. Among the accessories available there is a cable-guiding system with a handy cable channel and bracket (in the version with motors on the left-hand side).



TECHNICAL DATA		SHAK GANTRY 340		SHAK GANTRY 470	
Ambient temperature	°C	from -10 to +50			
Maximum relative humidity		90% (no condensate)			
Maximum value of duty cycle		100%			
Maximum X-axis empty speed	m/s	1.8		2.1	
Maximum Y-axis empty speed	m/s	2.4		2.7	
Maximum X-axis empty acceleration	m/s <sup>2</sup>	35		25	
Maximum Y-axis empty acceleration	m/s <sup>2</sup>	50		50	
Maximum admissible mass	kg	15		25	
MECHANICAL CHARACTERISTICS		SHAK GANTRY 340		SHAK GANTRY 470	
Maximum axial force	N	800		1000	
Maximum force applicable on the pulley	Nm	15		25	
Standard strokes (special execution on request) (see dimensional drawings for standard combinations)	mm	<b>X-axis</b>	<b>Y-axis</b>	<b>X-axis</b>	<b>Y-axis</b>
	mm	400	400	800	600
	mm	600	600	1200	1000
	mm	800	800	1600	1400
	mm	1000	1000	2000	1800
	mm	1200	1200	2400	2200
Repetition accuracy	mm	±0.05			
Noise level	dBA	<66			
Mounting position		Horizontal			
Planarity required for the support surface	mm/m	0.1			
Protection level		IP30			
Toothed belt pitch	mm	5			
Type of belt		PowerGrip® LL GT 5MR 25 FV		PowerGrip® LL GT 5MR 30 ST	
Belt elongation at maximum load		0.15%		0.25%	
Pulley pitch diameter	mm	35.01		44.56	
Stroke / Revolution	mm/rev	110		140	
Homing position sensor		Inductive sensor switch			

MASS AND MOMENT OF INERTIA SHAK GANTRY 340			X-AXIS					Y-AXIS				
Strokes	mm		400	600	800	1000	1200	400	600	800	1000	1200
Weight (without motor and gear unit)	kg		16.2	19	21.9	24.6	27.5	7.7	9	10.4	11.7	13
Motor weight	kg		1.3					1.3				
Gear unit weight	kg		0.8					0.8				
Moving mass (without motor and gear unit)	kg		10.3	11.6	13.1	14.5	15.9	1.28	1.32	1.36	1.40	1.44
J <sub>x</sub> Reduced inertia at motor	kg mm <sup>2</sup>		476	523	573	620	667	-				
J <sub>y</sub> Reduced inertia at motor	kg mm <sup>2</sup>		-					99	101	102	103	104
J <sub>i</sub> Inertia connection joint	kg mm <sup>2</sup>		-					238	306	374	442	510

MASS AND MOMENT OF INERTIA SHAK GANTRY 470			X-AXIS					X-AXIS				
Strokes	mm		800	1200	1600	2000	2400	600	1000	1400	1800	2200
Weight (without motor and gear unit)	kg		32.7	40.9	48.8	56.9	64.6	15.9	19.8	23.6	27.5	31.2
Motor weight	kg		2.6					2.6				
Gear unit weight	kg		4					4				
Moving mass (without motor and gear unit)	kg		20.3	24.4	28.4	32.5	36.4	2.18	2.28	2.38	2.48	2.58
J <sub>x</sub> Reduced inertia at motor	kg mm <sup>2</sup>		1759	1986	2207	2434	2650	-				
J <sub>y</sub> Reduced inertia at motor	kg mm <sup>2</sup>		-					399	404	410	416	422
J <sub>i</sub> Inertia connection joint	kg mm <sup>2</sup>		-					315	451	587	723	859

Size	d <sub>p</sub> [mm]	τ	J <sub>R</sub> [kg mm <sup>2</sup> ]	J <sub>M</sub> [kg mm <sup>2</sup> ]
SHAK GANTRY 340	35.01	1:5	6	41.2
SHAK GANTRY 470	44.56	1:5	37	182

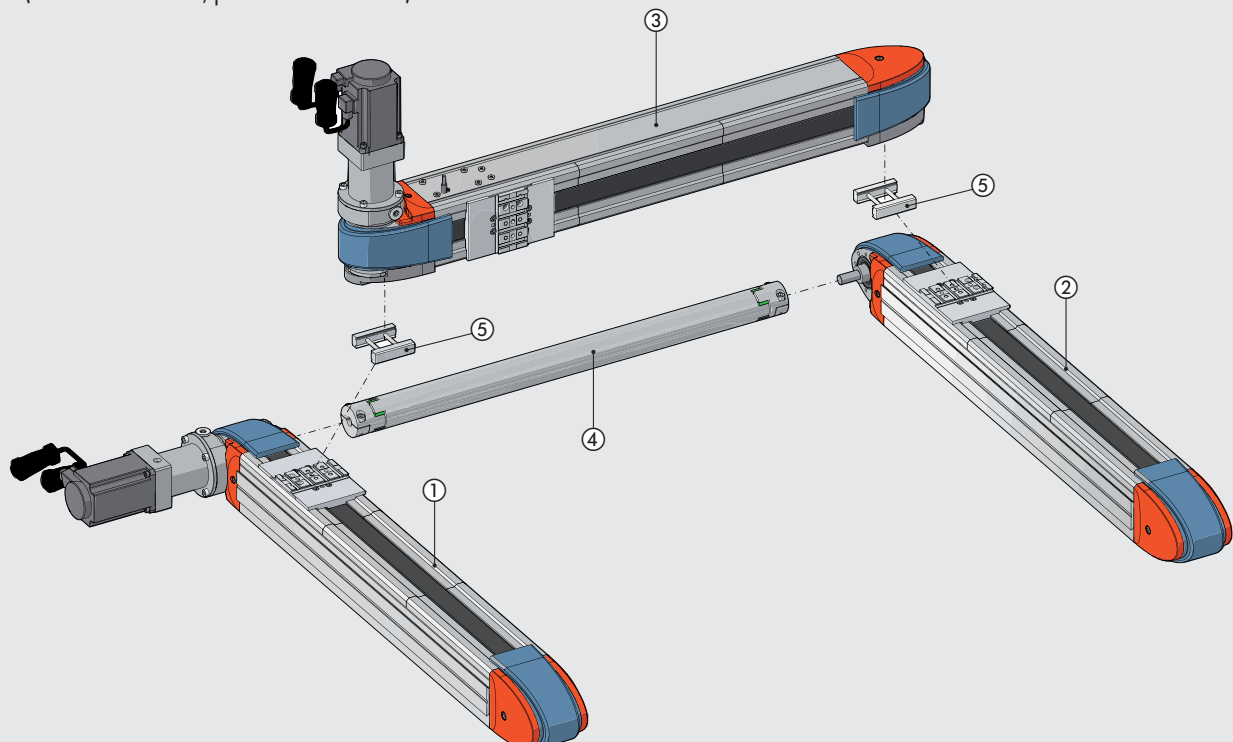
$$J_{tot} = [2 \cdot J_x + J_i + M \cdot (\frac{d_p}{2})^2] \cdot \tau^2 + J_R + J_M$$

**N.B.:** M = weight axis Y + mass applied on Y axis

CONNECTION JOINT		SHAK GANTRY 340 Y-AXIS	SHAK GANTRY 470 Y-AXIS
Max. number of revs	rpm	2000 (all strokes)	2000 (stroke 600/1000/1400) 1400 (stroke 1800) 1000 (stroke 2200)
Maximum transmissible torque	Nm	25 (hole Ø12)	32 (hole Ø15)

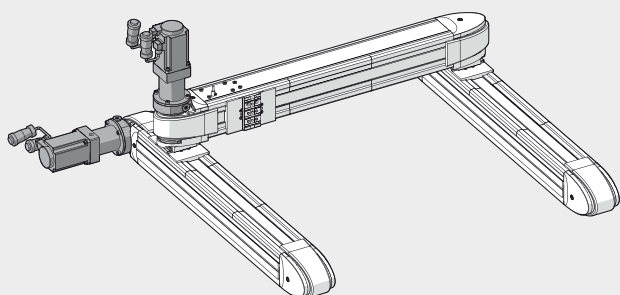
### COMPONENTS

- ① Drive X-axis (for bill of materials, please refer to SHAK)
- ② Driven X-axis (for bill of materials, please refer to SHAK)
- ③ Y-axis (for bill of materials, please refer to SHAK)
- ④ Connection joint (aluminium and polyurethane)
- ⑤ QS fixing elements

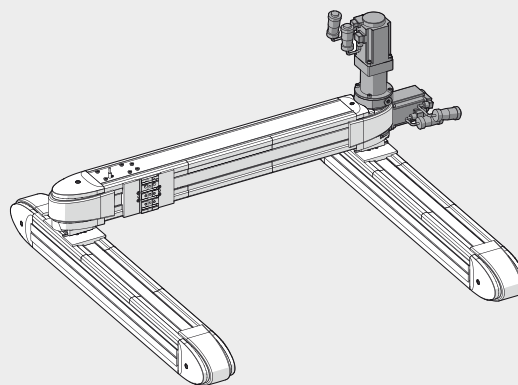


## VERSIONS

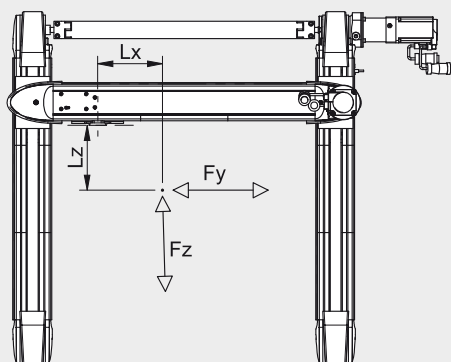
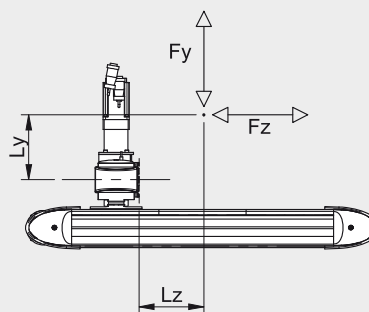
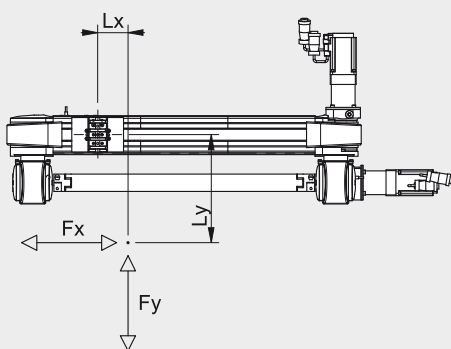
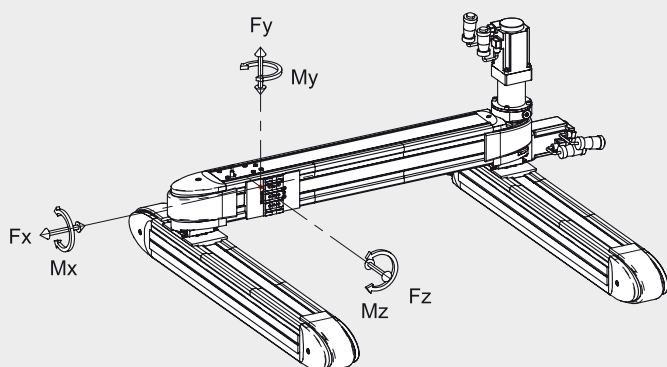
### VERSION WITH MOTORS ON THE LEFT-HAND SIDE



### VERSION WITH MOTORS ON THE RIGHT-HAND SIDE



## DIAGRAM OF FORCES AND MOMENTS



Size	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
SHAK GANTRY 340	800	600	24	42	52
SHAK GANTRY 470	1000	800	32	50	70

**N.B.:** The values are calculated on the basis of theoretical useful life of 10000 km.

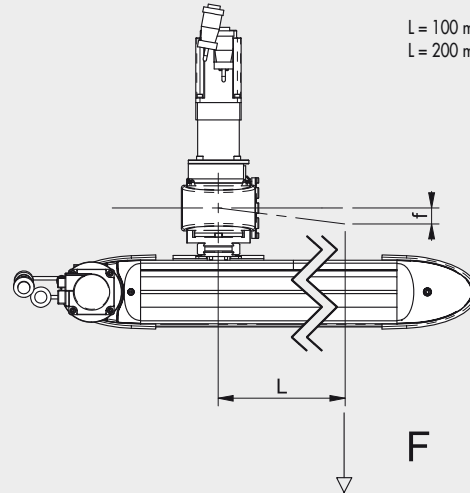
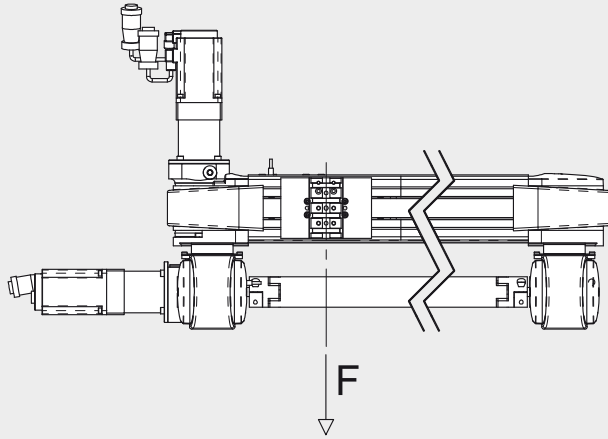
**N.B.:** For the maximum value of Fx see the general technical data and the axial load curves depending on the speed for SHAK single axes. For the maximum value of Fz, please also refer to general technical data and axial load curves, depending on the speed for SHAK portal axes.

**N.B.:** When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where Lx, Ly and Lz have to be given in metre.

$$M_x = F_z \cdot L_y + F_y \cdot L_z \quad M_y = F_z \cdot L_x + F_x \cdot L_z \quad M_z = F_y \cdot L_x + F_x \cdot L_y$$

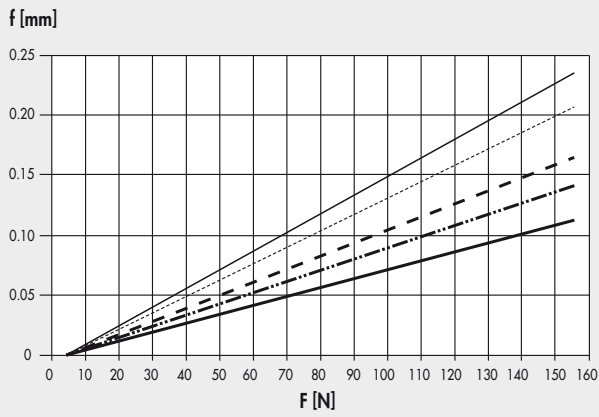
$$\frac{(M_x)}{M_{x \max}} + \frac{(M_y)}{M_{y \max}} + \frac{(M_z)}{M_{z \max}} + \frac{(F_y)}{F_{y \max}} + \frac{(F_z)}{F_{z \max}} \leq 1 \quad e \quad \frac{(F_x)}{2F_{y \max}} \leq 1$$

## DEFORMATION ACCORDING TO LOAD



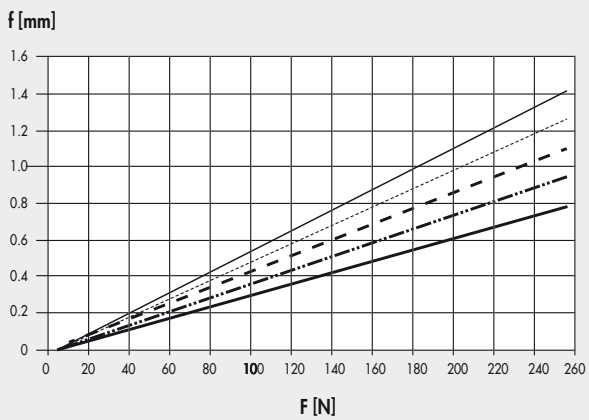
L = 100 mm for SHAK GANTRY 340  
L = 200 mm for SHAK GANTRY 470

### SHAK GANTRY 340



- SHAK GANTRY 340 Stroke Y 400
- · - · - SHAK GANTRY 340 Stroke Y 600
- SHAK GANTRY 340 Stroke Y 800
- ..... SHAK GANTRY 340 Stroke Y 1000
- SHAK GANTRY 340 Stroke Y 1200

### SHAK GANTRY 470



- SHAK GANTRY 470 Stroke Y 600
- · - · - SHAK GANTRY 470 Stroke Y 1000
- SHAK GANTRY 470 Stroke Y 1400
- ..... SHAK GANTRY 470 Stroke Y 1800
- SHAK GANTRY 470 Stroke Y 2200

## AVERAGE TRAVERSE TIMES

**N.B.:** Check that the following constraints are met for each cycle phase:

- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia).

### SHAK GANTRY 340 TRAVERSE TIMES

Size	Stroke X - Stroke Y	t X [s]	t Y [s]
340	400 - 400	0.50	0.45
	400 - 600		0.50
	400 - 800		0.60
	400 - 1000		0.70
	400 - 1200		0.80
	600 - 400	0.60	0.45
	600 - 600		0.50
	600 - 800		0.60
	600 - 1000		0.70
	600 - 1200		0.80
	800 - 400	0.70	0.45
	800 - 600		0.50
	800 - 800		0.60
	800 - 1000		0.70
	800 - 1200		0.80
	1000 - 400	0.80	0.45
	1000 - 600		0.50
	1000 - 800		0.60
	1000 - 1000		0.70
	1000 - 1200		0.80
1200 - 400	0.90	0.45	
1200 - 600		0.50	
1200 - 800		0.60	
1200 - 1000		0.70	
1200 - 1200		0.80	

**N.B.:** Maximum moving mass 15 kg

### SHAK GANTRY 470 TRAVERSE TIMES

Size	Stroke X - Stroke Y	t X [s]	t Y [s]
470	800 - 600	0.90	0.55
	800 - 1000		0.75
	800 - 1400		0.90
	800 - 1800		1.00
	800 - 2200		1.20
	1200 - 600	1.20	0.55
	1200 - 1000		0.75
	1200 - 1400		0.90
	1200 - 1800		1.00
	1200 - 2200		1.20
	1600 - 600	1.40	0.55
	1600 - 1000		0.75
	1600 - 1400		0.90
	1600 - 1800		1.00
	1600 - 2200		1.20
	2000 - 600	1.75	0.55
	2000 - 1000		0.75
	2000 - 1400		0.90
	2000 - 1800		1.00
	2000 - 2200		1.20
2400 - 600	2.00	0.55	
2400 - 1000		0.75	
2400 - 1400		0.90	
2400 - 1800		1.00	
2400 - 2200		1.20	

**N.B.:** Maximum moving mass 25 kg

Traverse times relate to operation with motors supplied by Metal Work, using max. 200% of the rated torque.

### EXAMPLE:

Average traverse times with SHAK GANTRY 340, 800-1200.

The following can be obtained from the tables: tX = 0.7 and tY = 0.80

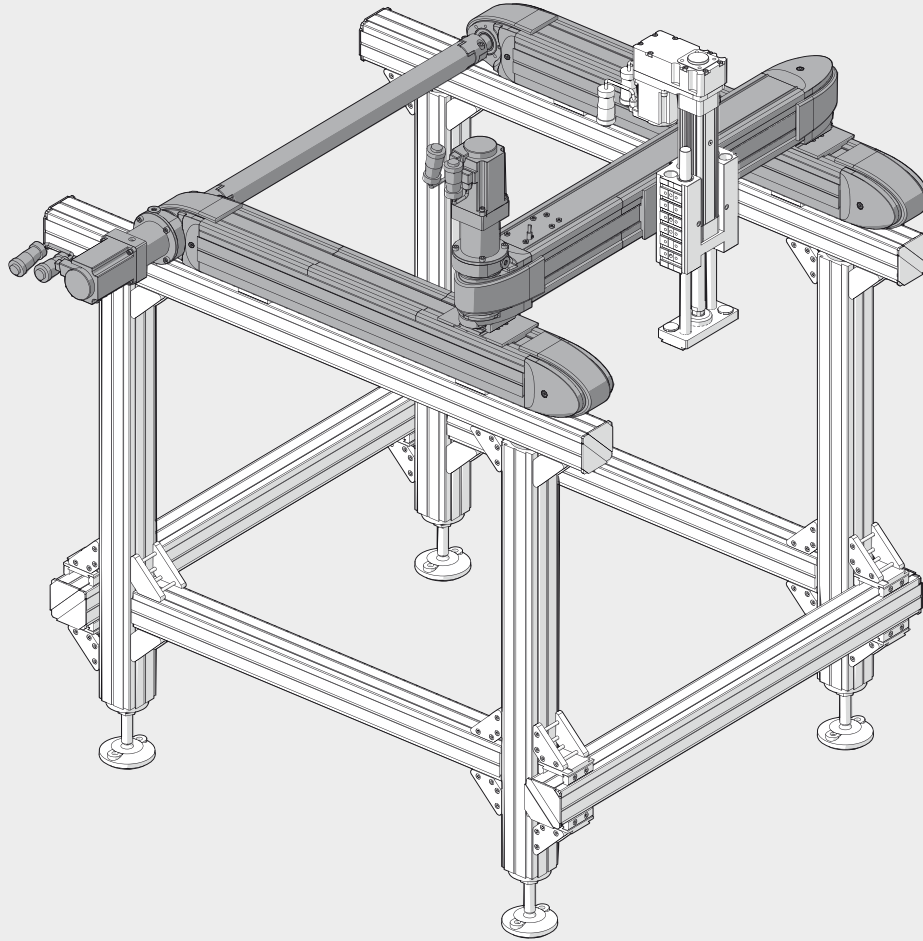
## MOTOR-DRIVE COUPLINGS

MOTOR CODES		Metal Work	DRIVES CODES
		Manufacturer	37D2400000
			SANYO DENKI R51A03
			(30A 400÷750 W)
Metal Work	Manufacturer		SHAK GANTRY 340
37M2220000	Motor SANYO DENKI R2AA06040FXH1 1M (400W)		SHAK GANTRY 470
37M2330000	Motor SANYO DENKI R2AA08075FXH1 1M (750W)		

The motor must be controlled in such a way as to avoid sudden changes in speed.



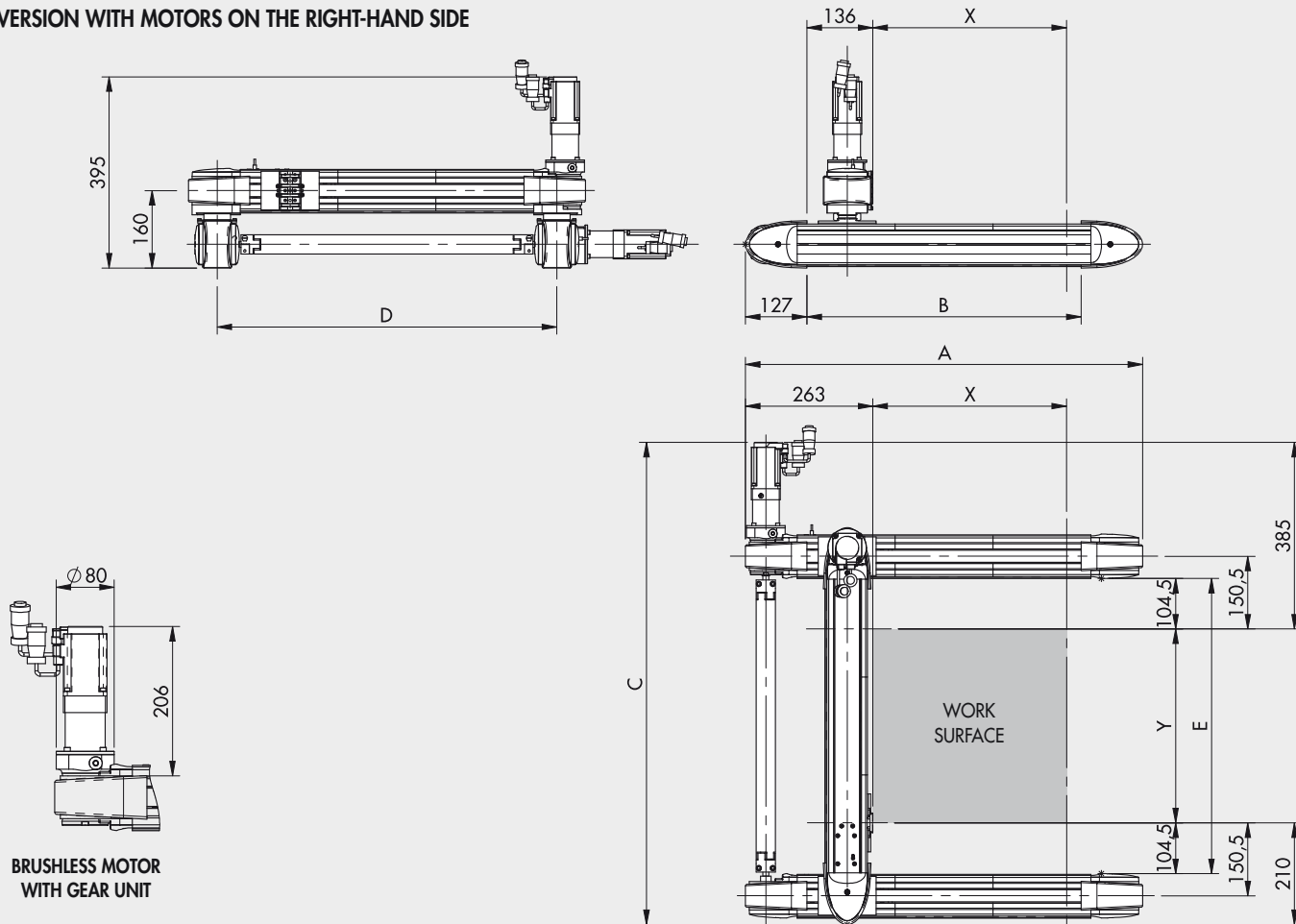
EXAMPLES OF APPLICATION



NOTES

## DIMENSIONS SHAK GANTRY 340

### VERSION WITH MOTORS ON THE RIGHT-HAND SIDE



BRUSHLESS MOTOR WITH GEAR UNIT

Table of dimensions referring to the version with motors on the right. The version with motor on the left is specular.

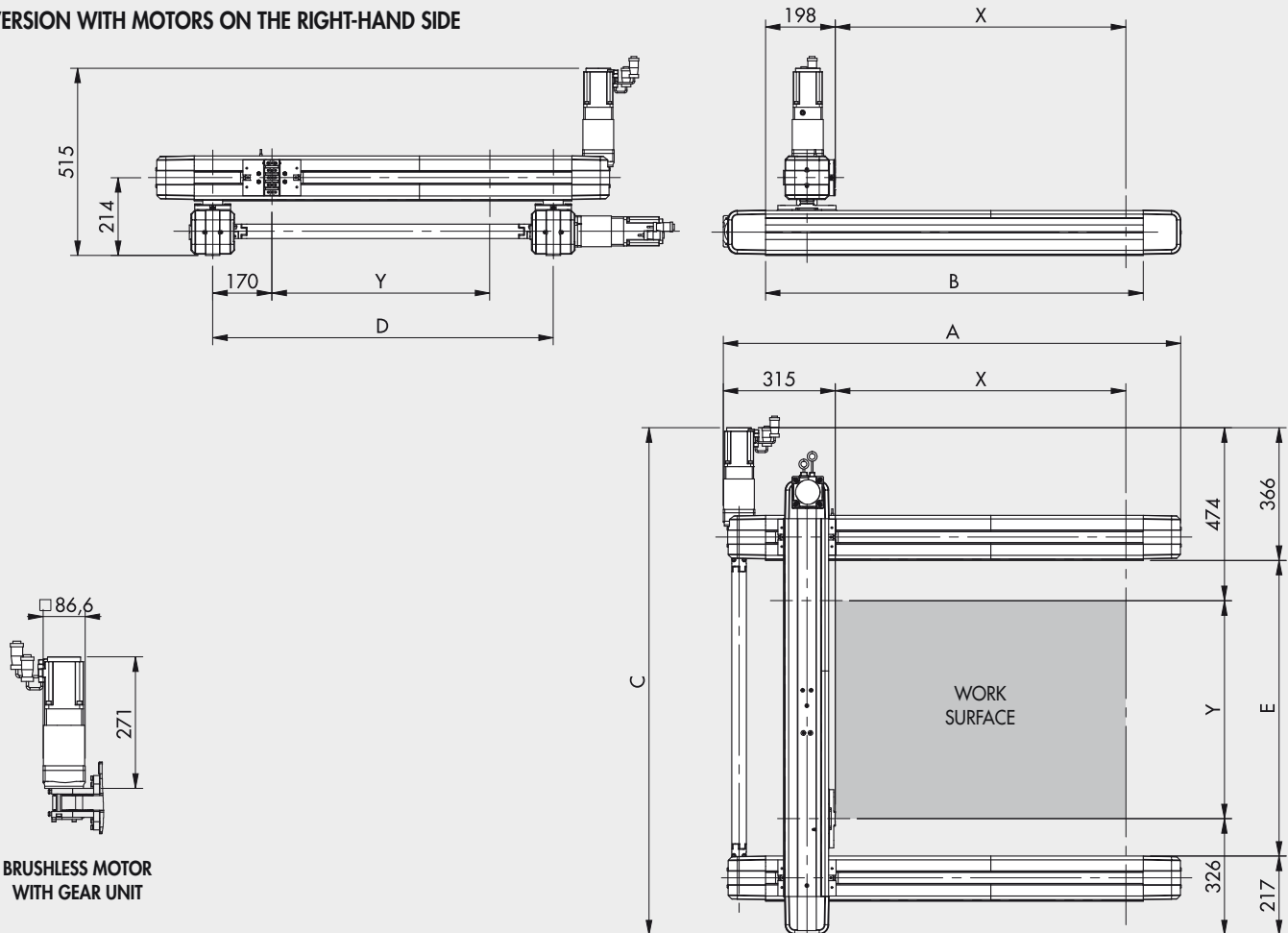
Code	Description	X	Y	A	B	C	D	E
375G1040004001_200	SHAK GANTRY-340-X400-Y400	400	400	820	566	996	701	609
375G1040006001_200	SHAK GANTRY-340-X400-Y600	400	600	820	566	1196	901	609
375G1040008001_200	SHAK GANTRY-340-X400-Y800	400	800	820	566	1396	1101	609
375G1040010001_200	SHAK GANTRY-340-X400-Y1000	400	1000	820	566	1596	1301	609
375G1040012001_200	SHAK GANTRY-340-X400-Y1200	400	1200	820	566	1796	1501	609
375G1060004001_200	SHAK GANTRY-340-X600-Y400	600	400	1020	766	996	701	809
375G1060006001_200	SHAK GANTRY-340-X600-Y600	600	600	1020	766	1196	901	809
375G1060008001_200	SHAK GANTRY-340-X600-Y800	600	800	1020	766	1396	1101	809
375G1060010001_200	SHAK GANTRY-340-X600-Y1000	600	1000	1020	766	1596	1301	809
375G1060012001_200	SHAK GANTRY-340-X600-Y1200	600	1200	1020	766	1796	1501	809
375G1080004001_200	SHAK GANTRY-340-X800-Y400	800	400	1220	966	996	701	1009
375G1080006001_200	SHAK GANTRY-340-X800-Y600	800	600	1220	966	1196	901	1009
375G1080008001_200	SHAK GANTRY-340-X800-Y800	800	800	1220	966	1396	1101	1009
375G1080010001_200	SHAK GANTRY-340-X800-Y1000	800	1000	1220	966	1596	1301	1009
375G1080012001_200	SHAK GANTRY-340-X800-Y1200	800	1200	1220	966	1796	1501	1009
375G1100004001_200	SHAK GANTRY-340-X1000-Y400	1000	400	1420	1166	996	701	1209
375G1100006001_200	SHAK GANTRY-340-X1000-Y600	1000	600	1420	1166	1196	901	1209
375G1100008001_200	SHAK GANTRY-340-X1000-Y800	1000	800	1420	1166	1396	1101	1209
375G1100010001_200	SHAK GANTRY-340-X1000-Y1000	1000	1000	1420	1166	1596	1301	1209
375G1100012001_200	SHAK GANTRY-340-X1000-Y1200	1000	1200	1420	1166	1796	1501	1209
375G1120004001_200	SHAK GANTRY-340-X1200-Y400	1200	400	1620	1366	996	701	1409
375G1120006001_200	SHAK GANTRY-340-X1200-Y600	1200	600	1620	1366	1196	901	1409
375G1120008001_200	SHAK GANTRY-340-X1200-Y800	1200	800	1620	1366	1396	1101	1409
375G1120010001_200	SHAK GANTRY-340-X1200-Y1000	1200	1000	1620	1366	1596	1301	1409
375G1120012001_200	SHAK GANTRY-340-X1200-Y1200	1200	1200	1620	1366	1796	1501	1409

N.B.: \_ To complete the code, enter 1 for motors on the left and 2 for motors on the right



## DIMENSIONS SHAK GANTRY 470

### VERSION WITH MOTORS ON THE RIGHT-HAND SIDE



BRUSHLESS MOTOR  
WITH GEAR UNIT

Table of dimensions referring to the version with motors on the right. The version with motor on the left is specular.

Code	Description	X	Y	A	B	C	D	E
375G208006001_200	SHAK GANTRY-470-X800-Y600	800	600	1260	1040	1400	940	817
375G2080010001_200	SHAK GANTRY-470-X800-Y1000	800	1000	1260	1040	1800	1340	1217
375G2080014001_200	SHAK GANTRY-470-X800-Y1400	800	1400	1260	1040	2200	1740	1617
375G2080018001_200	SHAK GANTRY-470-X800-Y1800	800	1800	1260	1040	2600	2140	2017
375G2080022001_200	SHAK GANTRY-470-X800-Y2200	800	2200	1260	1040	3000	2540	2417
375G2120006001_200	SHAK GANTRY-470-X1200-Y600	1200	600	1660	1440	1400	940	817
375G2120010001_200	SHAK GANTRY-470-X1200-Y1000	1200	1000	1660	1440	1800	1340	1217
375G2120014001_200	SHAK GANTRY-470-X1200-Y1400	1200	1400	1660	1440	2200	1740	1617
375G2120018001_200	SHAK GANTRY-470-X1200-Y1800	1200	1800	1660	1440	2600	2140	2017
375G2120022001_200	SHAK GANTRY-470-X1200-Y2200	1200	2200	1660	1440	3000	2540	2417
375G2160006001_200	SHAK GANTRY-470-X1600-Y600	1600	600	2060	1840	1400	940	817
375G2160010001_200	SHAK GANTRY-470-X1600-Y1000	1600	1000	2060	1840	1800	1340	1217
375G2160014001_200	SHAK GANTRY-470-X1600-Y1400	1600	1400	2060	1840	2200	1740	1617
375G2160018001_200	SHAK GANTRY-470-X1600-Y1800	1600	1800	2060	1840	2600	2140	2017
375G2160022001_200	SHAK GANTRY-470-X1600-Y2200	1600	2200	2060	1840	3000	2540	2417
375G2200006001_200	SHAK GANTRY-470-X2000-Y600	2000	600	2460	2240	1400	940	817
375G2200010001_200	SHAK GANTRY-470-X2000-Y1000	2000	1000	2460	2240	1800	1340	1217
375G2200014001_200	SHAK GANTRY-470-X2000-Y1400	2000	1400	2460	2240	2200	1740	1617
375G2200018001_200	SHAK GANTRY-470-X2000-Y1800	2000	1800	2460	2240	2600	2140	2017
375G2200022001_200	SHAK GANTRY-470-X2000-Y2200	2000	2200	2460	2240	3000	2540	2417
375G2240006001_200	SHAK GANTRY-470-X2400-Y600	2400	600	2860	2640	1400	940	817
375G2240010001_200	SHAK GANTRY-470-X2400-Y1000	2400	1000	2860	2640	1800	1340	1217
375G2240014001_200	SHAK GANTRY-470-X2400-Y1400	2400	1400	2860	2640	2200	1740	1617
375G2240018001_200	SHAK GANTRY-470-X2400-Y1800	2400	1800	2860	2640	2600	2140	2017
375G2240022001_200	SHAK GANTRY-470-X2400-Y2200	2400	2200	2860	2640	3000	2540	2417

N.B.: \_ To complete the code, enter 1 for motors on the left and 2 for motors on the right

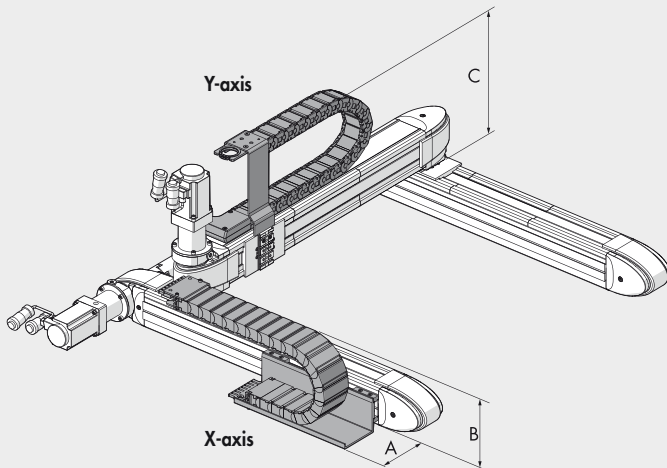
## KEY TO CODES

CYL	37 TYPE	5	G	1 SIZE	0800 X-AXIS STROKE ◆	0600 Y-AXIS STROKE ◆	1 REDUCTION	1 MOTORS POSITION	200 DRIVE
	37 Electric actuators	5 SHAK electric axes	G GANTRY	1 Size 340	400 600 800 1000 1200	400 600 800 1000 1200	1 1:5 ratio (X axis) 1:3 ratio (Y axis)	1 Left 2 Right	2 BRUSHLESS motor 0 Standard 0 Standard
				2 Size 470	800 1200 1600 2000 2400	600 1000 1400 1800 2200			

◆ For standard combinations, please refer to dimensional drawings.

## ACCESSORIES

### CABLE TRAY CHAIN



	SHAK GANTRY 340	SHAK GANTRY 470
A	95	120
B	180	182
C	275	310

#### X AXIS

Codice	Description
095340B0400	Cable tray chain kit, SHAK GANTRY 340 - X400 X-axis
095340B0600	Cable tray chain kit, SHAK GANTRY 340 - X600 X-axis
095340B0800	Cable tray chain kit, SHAK GANTRY 340 - X800 X-axis
095340B1000	Cable tray chain kit, SHAK GANTRY 340 - X1000 X-axis
095340B1200	Cable tray chain kit, SHAK GANTRY 340 - X1200 X-axis

095470B0800	Cable tray chain kit, SHAK GANTRY 470 - X800 X-axis
095470B1200	Cable tray chain kit, SHAK GANTRY 470 - X1200 X-axis
095470B1600	Cable tray chain kit, SHAK GANTRY 470 - X1600 X-axis
095470B2000	Cable tray chain kit, SHAK GANTRY 470 - X2000 X-axis
095470B2400	Cable tray chain kit, SHAK GANTRY 470 - X2400 X-axis

#### Y AXIS

Codice	Description
095340A0400	Cable tray chain kit, SHAK GANTRY 340 - Y400 Y-axis
095340A0600	Cable tray chain kit, SHAK GANTRY 340 - Y600 Y-axis
095340A0800	Cable tray chain kit, SHAK GANTRY 340 - Y800 Y-axis
095340A1000	Cable tray chain kit, SHAK GANTRY 340 - Y1000 Y-axis
095340A1200	Cable tray chain kit, SHAK GANTRY 340 - Y1200 Y-axis

095470A0800	Cable tray chain kit, SHAK GANTRY 470 - Y600 Y-axis
095470A1200	Cable tray chain kit, SHAK GANTRY 470 - Y1000 Y-axis
095470A1600	Cable tray chain kit, SHAK GANTRY 470 - Y1400 Y-axis
095470A2000	Cable tray chain kit, SHAK GANTRY 470 - Y1800 Y-axis
095470A2400	Cable tray chain kit, SHAK GANTRY 470 - Y2200 Y-axis

**WARNING!** The chain cannot be mounted on versions with motor or geared motor on the right

### DRIVES AND CABLE

See drive code 37D2400000 page 1-553



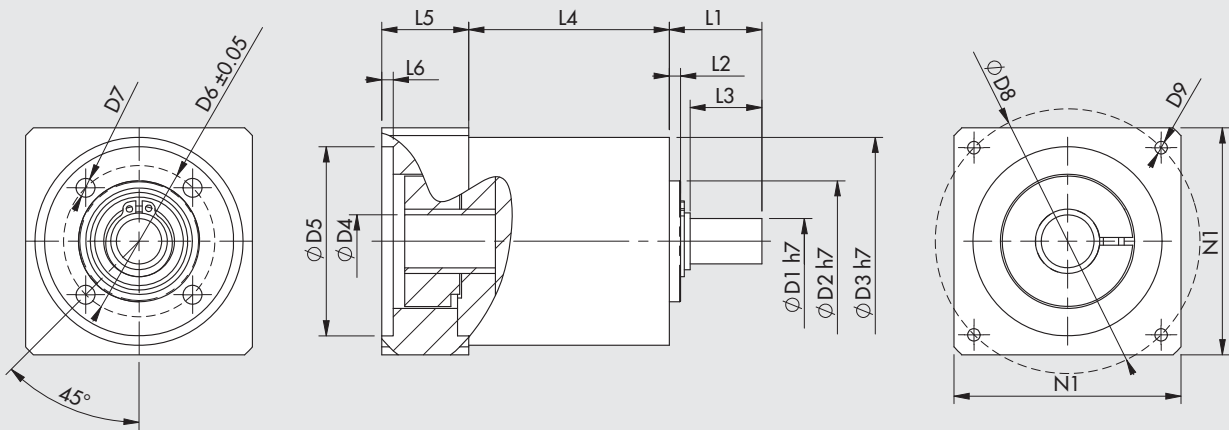
**OIL**



Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

**SPARE PARTS**

**SHAK GANTRY GEAR UNITS**



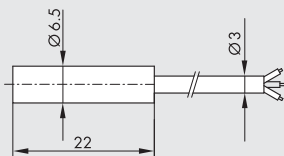
Code	Description	Application	C <sub>OUT</sub> nominal [Nm]	N <sub>IN</sub> nominal [1/min]	J reduced to motor shaft [kgmm <sup>2</sup> ]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0541000	Gear box MP053 1:5	SHAK GANTRY 340 (X axis)	15	3500	6	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0543000	Gear box MP080 1:5	SHAK GANTRY 470 (X axis)	50	3200	37	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80
37R0341000	Gear box MP053 1:3	SHAK GANTRY 340 (Y axis)	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0343000	Gear box MP0801:3	SHAK GANTRY 470 (Y axis)	40	2900	59	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80

C<sub>out</sub> = rated output torque

N<sub>in</sub> = nominal input speed

J = mass moment of inertia of the gearhead

**SHAK INDUCTIVE SENSOR**



Code	Description
095340A0000	SHAK inductive sensor accessory kit

**ELECTRIC MOTORS**



For SHAK GANTRY 340, please refer to motor code 37M2220000 page 1-556  
 For SHAK GANTRY 470, please refer to motor code 37M2330000 page 1-556

# ELECTRIC AXIS - RODLESS ELEKTRO SK SERIES



Electric axis without screw piston rod, with V-Lock interface. The cylinder frame is made of anodized extruded solid aluminium, which gives the cylinder optimal torsional and flexural rigidity. The typical V-Lock dovetail is provided on three sides of the channel for easy fixing with QS elements.

The carriage features an interchangeable fixing interface plate, which is available with V-Lock axial or V-Lock orthogonal ports or in the blank type for custom solutions.

The carriage is driven by two sturdy pre-loaded ball recirculation bearings that ensure great accuracy of movement.

Threaded holes for the lubrication of the guides and ball recirculation screws are provided on both sides of the carriage.

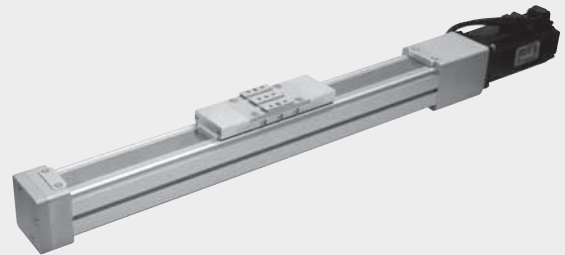
The carriage is driven by a system consisting of a hardened and tempered screw and a ball recirculation lead nut. The screw is pre-stressed with an elastic load device by means of cup springs in order to reduce vibration and hence noise level and the useful life of the system.

A series of slots for the fixing of magnetic sensors are provided on the two sides of the liner.

Various BRUSHLESS and STEPPER motor drives are available with optional motor brake and/or built-in encoder.

The cylinder can also be supplied without motor drive or, on request, with modules for interfacing with motors from the trade.

The motors can be installed in line with the liner or geared using toothed belt transmission gears.



## TECHNICAL DATA

Admissible ambient temperature for STEPPER motor	°C	from -10 to +50
Admissible ambient temperature for BRUSHLESS motor	°C	from 0 to +40
Maximum relative humidity (IP40)		90% at 40°C; 57% at 50°C (no condensate)
Maximum duty cycle for STEPPER motor		50%
Maximum duty cycle for BRUSHLESS motor		100%
Minimum stroke	mm	100
Maximum stroke	mm	1200
Positioning repeatability	mm	± 0.02
Positioning accuracy	mm	± 0.2 **
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)
Sensor magnet		YES
Work position		Any
Interface for fixing on carriage		Axial V-Lock / Orthogonal V-Lock / Blank
Noise level	dBA	<66

\*\* indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc ...

## MECHANICAL FEATURES

Worm screw pitch	mm	4	10
Worm screw diameter	mm		12
Maximum static axial load* (F <sub>0</sub> )	N		2800
Dynamic axial load	N	5200	3600
Maximum number of revs	1/min	3000	4000
Maximum speed (V <sub>max</sub> )	mm/s	200	670
Maximum acceleration without load	m/s <sup>2</sup>		5
Maximum drive torque applicable to the worm screw shank	Nm		5

\* Maximum admissible static load without causing damage.

**N.B.:** For the verification of the linear guide system, please refer to page 1-526. For the verification of the screw, please refer to page 1-527.

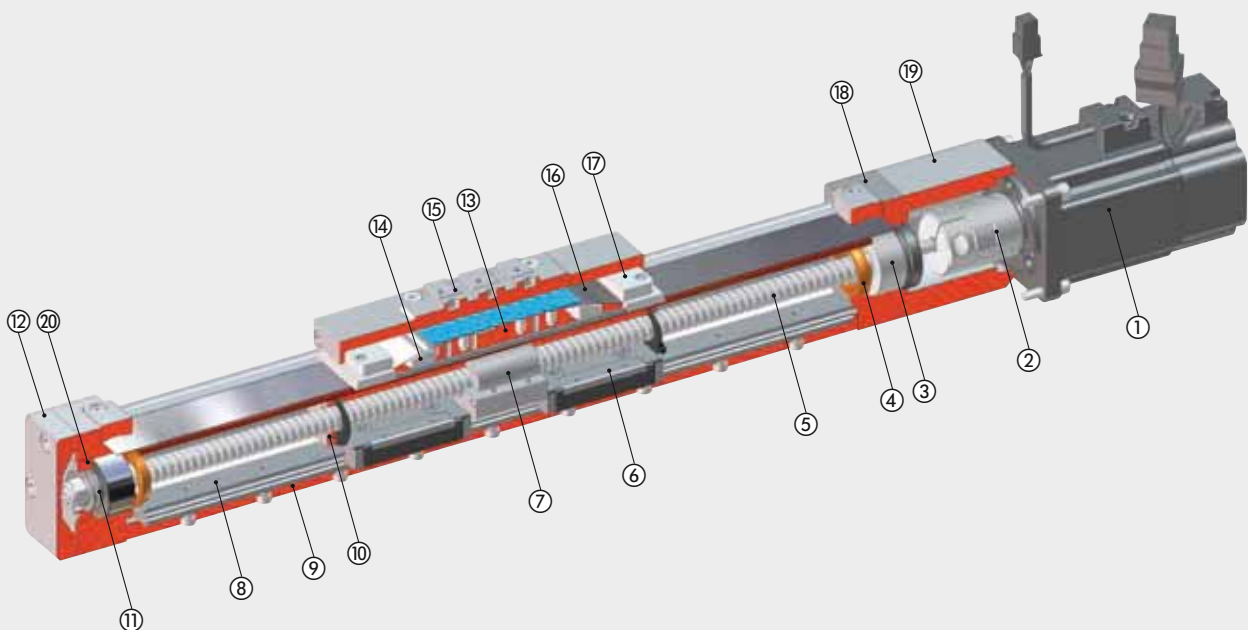
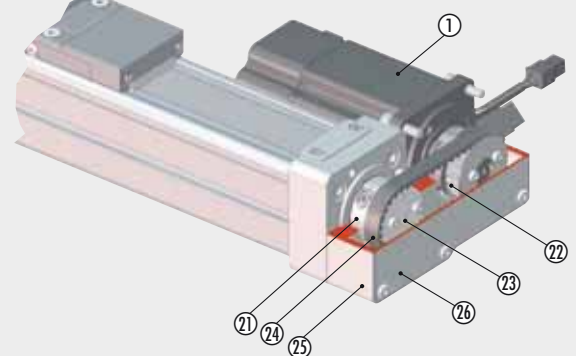
## WEIGHTS

Worm screw pitch (p)	mm	4	10
Weight at stroke 0 (excluding the carriage fixing interface)	g	2990	3000
Additional weight each mm of stroke	g		7
Moving mass	g		1050

**MASS MOMENTS OF INERTIA**

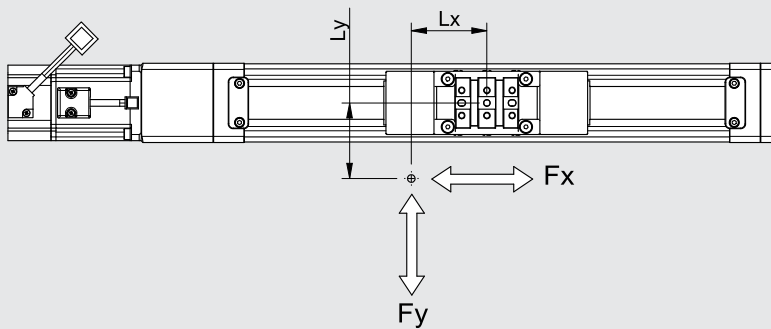
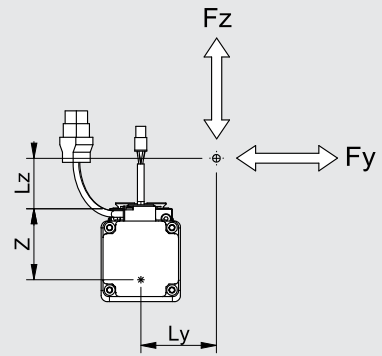
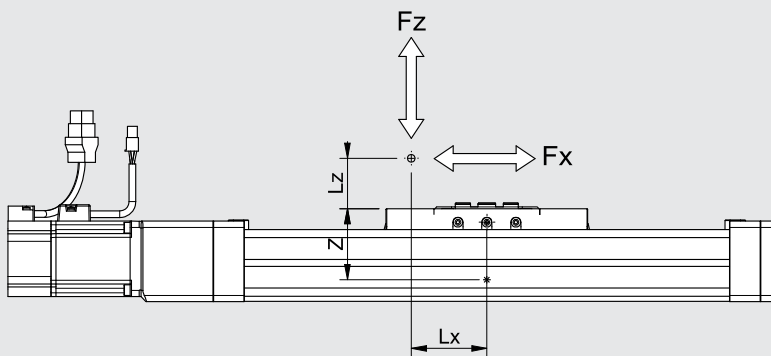
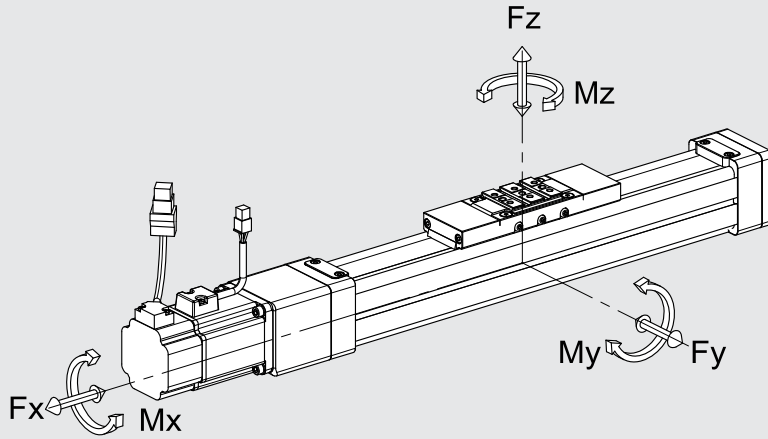
Worm screw pitch	mm	4	10
J0 at stroke 0	kg mm <sup>2</sup>	2.7909	5.3633
J1 each metre of stroke	kg mm <sup>2</sup> /m	12.0259	17.3353
J2 each kg of load	kg mm <sup>2</sup> /kg	0.4056	2.5355

Total mass moment o inertia  $J_{tot} = J_0 + J_1 \cdot \text{stroke [m]} + J_2 \cdot \text{load [kg]}$

**COMPONENTS**
**ELECTRIC AXIS WITH IN-LINE MOTOR**

**ELECTRIC AXIS WITH GEARED MOTOR**


- ① MOTOR
- ② ELASTIC COUPLING: aluminium / polyurethane
- ③ DOUBLE-ROW ANGULAR BALL BEARING
- ④ BUFFER: polyurethane
- ⑤ RECIRCULATING BALL SCREW: hardened steel
- ⑥ BALL RECIRCULATION PAD: stainless steel / technopolymer
- ⑦ RECIRCULATING BALL SCROLL: hardened steel
- ⑧ RAIL: hardened steel
- ⑨ CYLINDER LINER: anodized aluminium
- ⑩ CARRIAGE LIMIT SWITCH: anodized aluminium
- ⑪ PRETENSIONING CUP SPRING: hardened steel
- ⑫ HEAD COVER: anodized aluminium
- ⑬ CARRIAGE BODY: anodized aluminium
- ⑭ LOWER STRAP SHOE: technopolymer
- ⑮ INTERFACE FOR FIXING: anodized aluminium
- ⑯ PROTECTIVE STRAP: stainless steel
- ⑰ UPPER STRAP SHOE: technopolymer
- ⑱ HEAD: anodized aluminium
- ⑲ MOTOR BEARING: anodized aluminium
- ⑳ BEARING LOCKING RING NUT: zinc-plated steel
- ㉑ ELASTIC COLLAR: aluminium
- ㉒ DRIVE GEAR PULLEY: aluminium
- ㉓ DRIVEN GEAR PULLEY: aluminium
- ㉔ TOOTHED TRANSMISSION BELT: reinforced rubber
- ㉕ GEARED MOTOR BEARING: aluminium
- ㉖ TRANSMISSION GUARD: aluminium

## DIAGRAM OF FORCES AND MOMENTS



### STATIC VERIFICATION

When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

Z [mm]	Fy0 max [N]	Fz0 max [N]	Mx0 max [Nm]	My0 max [Nm]	Mz0 max [Nm]
57	4500	4500	70	450	450

**N.B.:** The values in the table relates to the maximum admissible loads beyond which serious damage is likely to occur.

$$M_x = F_z \cdot l_y + F_y \cdot (L_z + z) \quad M_y = F_z \cdot L_x + F_x \cdot (L_z + z) \quad M_z = F_y \cdot L_x + F_x \cdot l_y$$

$$\frac{(M_x)}{M_{x0 \max}} + \frac{(M_y)}{M_{y0 \max}} + \frac{(M_z)}{M_{z0 \max}} + \frac{(F_y)}{F_{y0 \max}} + \frac{(F_z)}{F_{z0 \max}} \leq 1$$

### DYNAMIC VERIFICATION

When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
57	2500	2500	35	250	250

**N.B.:** The values are calculated on the basis of theoretical useful life of 10000 km.

$$M_x = F_z \cdot l_y + F_y \cdot (L_z + z) \quad M_y = F_z \cdot L_x + F_x \cdot (L_z + z) \quad M_z = F_y \cdot L_x + F_x \cdot l_y$$

$$\frac{(M_x)}{M_{x \max}} + \frac{(M_y)}{M_{y \max}} + \frac{(M_z)}{M_{z \max}} + \frac{(F_y)}{F_{y \max}} + \frac{(F_z)}{F_{z \max}} \leq 1$$

### CALCULATION OF MEAN AXIAL LOAD $F_m$ AND VERIFICATION

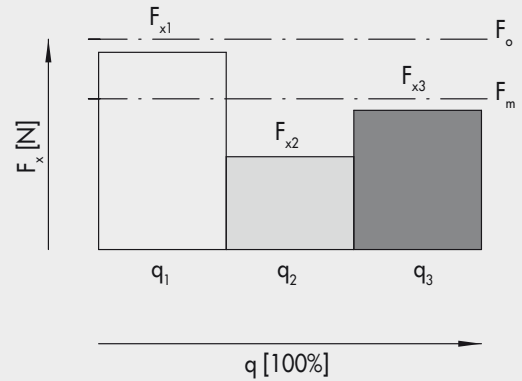
Peak axial load in a work cycle must not exceed the static axial load  $F_o$ . The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

#### Mean axial load $F_m$

$$F_m = \sqrt[3]{\sum F_x^3 \times \frac{V_x}{V_m} \times \frac{q}{100}} =$$

$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{x1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{x2}}{V_m} \times \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{x3}}{V_m} \times \frac{q_3}{100} + \dots}$$

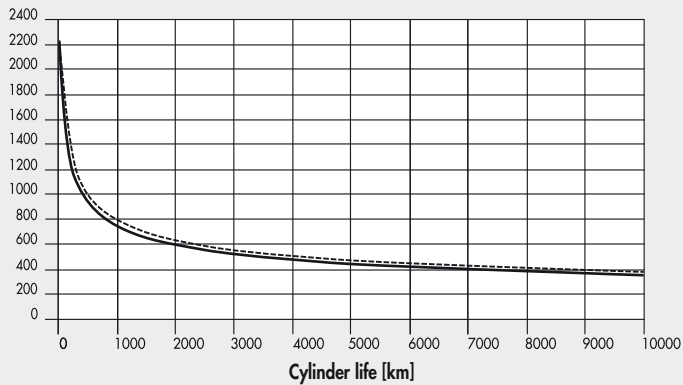
- $F_x$  = Axial load at stage x
- $F_m$  = Mean axial load during extension
- $F_o$  = Static axial load
- q = Time segment
- $V_x$  = Speed in the phase x
- $V_m$  = Average speed



The mean axial load must not exceed the dynamic axial load:  $F_m \leq F$   
 The graph below shows the lifecycle of the screw as a function of  $F_m$

### LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD

#### Mean axial load [N]

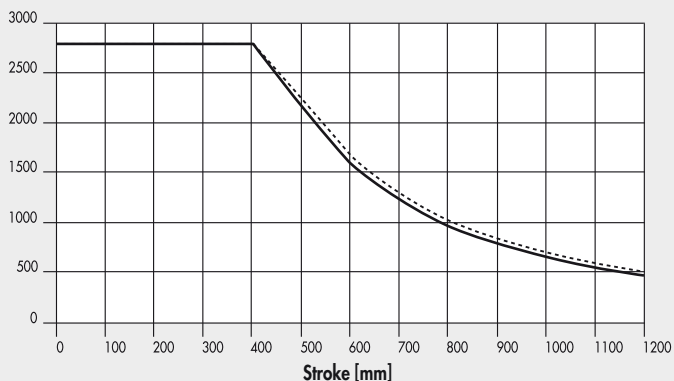


- screw pitch 4
- screw pitch 10

### MAXIMUM AXIAL LOAD

The two variables (axial load and stroke) must comply with the conditions indicated in the graph, otherwise this could cause a serious damage.

#### Axial load [N]

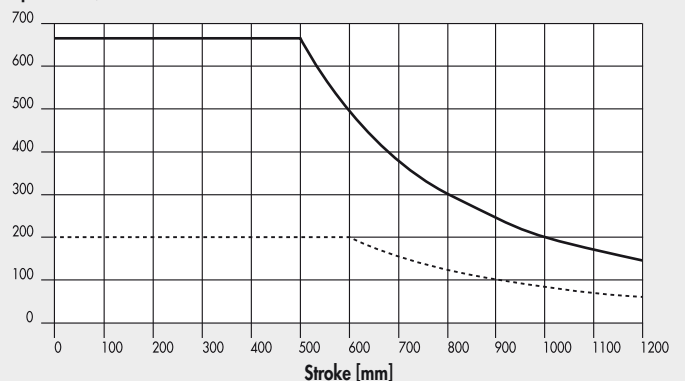


- screw pitch 4
- screw pitch 10

### CRITICAL SPEED

The two variables (axial load and stroke) must comply with the conditions indicated in the graph, otherwise this could trigger resonance phenomena that could impair the good functioning of the system.

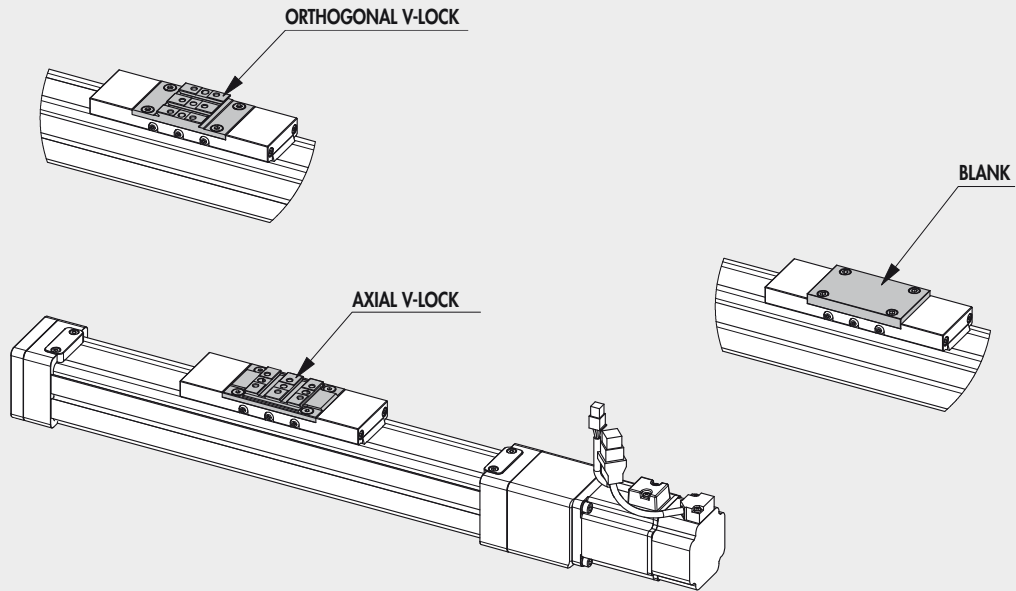
#### Speed [mm/s]



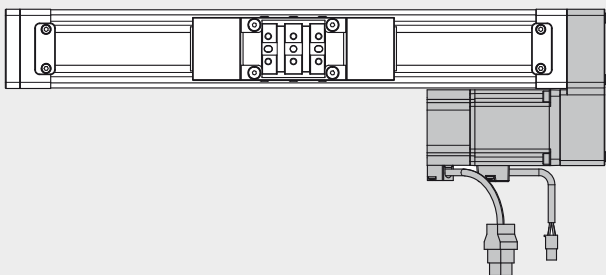
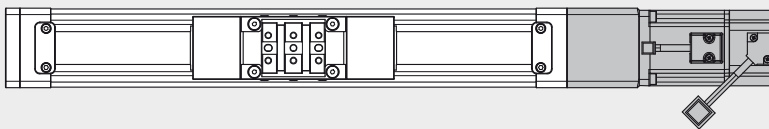
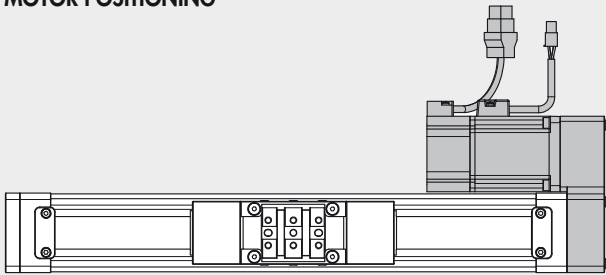
- screw pitch 4
- screw pitch 10

## VERSIONS

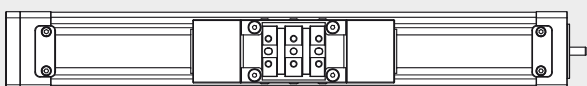
### TYPE OF CARRIAGE INTERFACE



### MOTOR POSITIONING



### VERSION WITHOUT MOTOR





**AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE)**

**N.B.:** Check that the following constraints are met for each cycle phase:

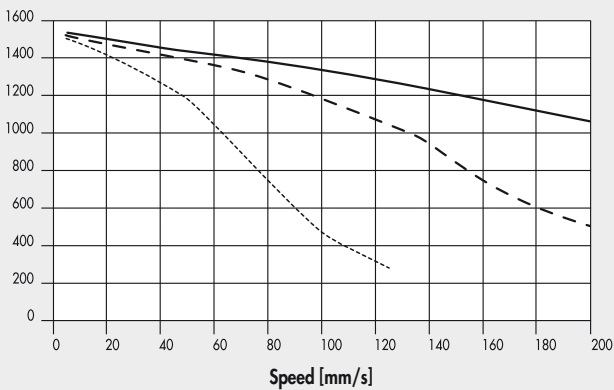
- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia);
- calculation of average axial load and peak axial load.

**N.B.:** The obtainable load values already take the efficiency of the system into account. For **STEPPING** motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

**STEPPING motor code 37M1120001 (uprated revs)**

Electric axis with a 4 mm-pitch screw

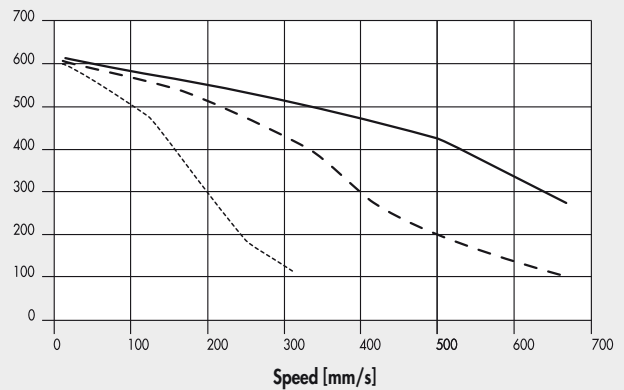
Axial load [N]



- 37M1120001 (24VDC)
- - - - - 37M1120001 (48VDC)
- \_\_\_\_\_ 37M1120001 (75VDC)

Electric axis with a 10 mm-pitch screw

Axial load [N]

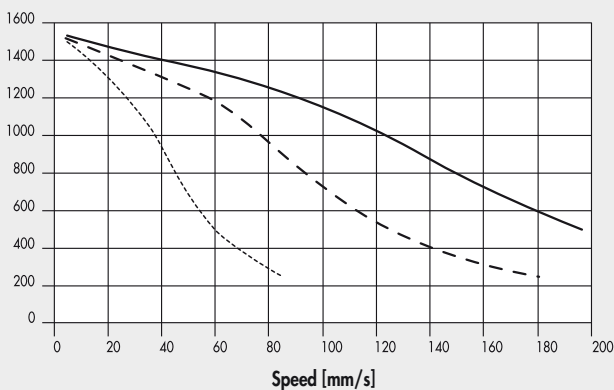


- 37M1120001 (24VDC)
- - - - - 37M1120001 (48VDC)
- \_\_\_\_\_ 37M1120001 (75VDC)

**STEPPING motor code 37M5120000 (with brake)**

Electric axis with a 4 mm-pitch screw

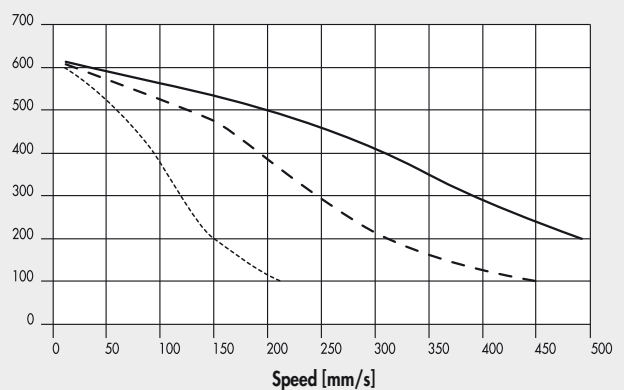
Axial load [N]



- 37M5120000 (24VDC)
- - - - - 37M5120000 (48VDC)
- \_\_\_\_\_ 37M5120000 (75VDC)

Electric axis with a 10 mm-pitch screw

Axial load [N]

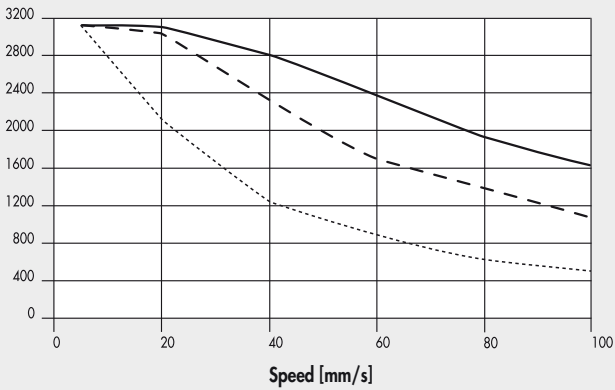


- 37M5120000 (24VDC)
- - - - - 37M5120000 (48VDC)
- \_\_\_\_\_ 37M5120000 (75VDC)

## STEPPING motor code 37M3230000 (with brake + encoder)

Electric axis with a 4 mm-pitch screw

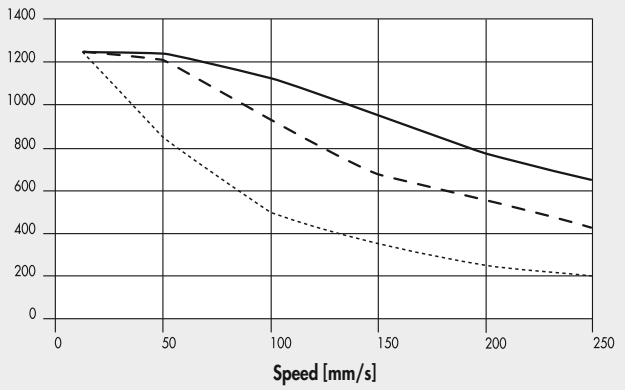
Axial load [N]



----- 37M3230000 (24VDC)  
 - - - - - 37M3230000 (48VDC)  
 \_\_\_\_\_ 37M3230000 (75VDC)

Electric axis with a 10 mm-pitch screw

Axial load [N]

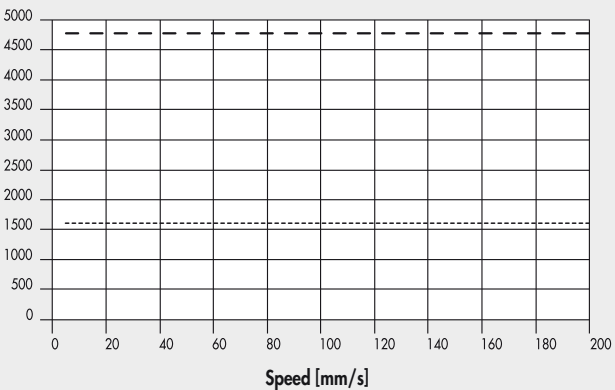


----- 37M3230000 (24VDC)  
 - - - - - 37M3230000 (48VDC)  
 \_\_\_\_\_ 37M3230000 (75VDC)

## BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

Electric axis with a 4 mm-pitch screw

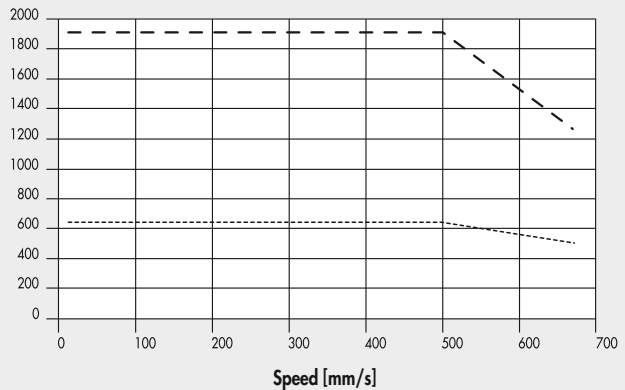
Axial load [N]



----- NOMINAL  
 - - - - - MAXIMUM

Electric axis with a 10 mm-pitch screw

Axial load [N]



----- NOMINAL  
 - - - - - MAXIMUM

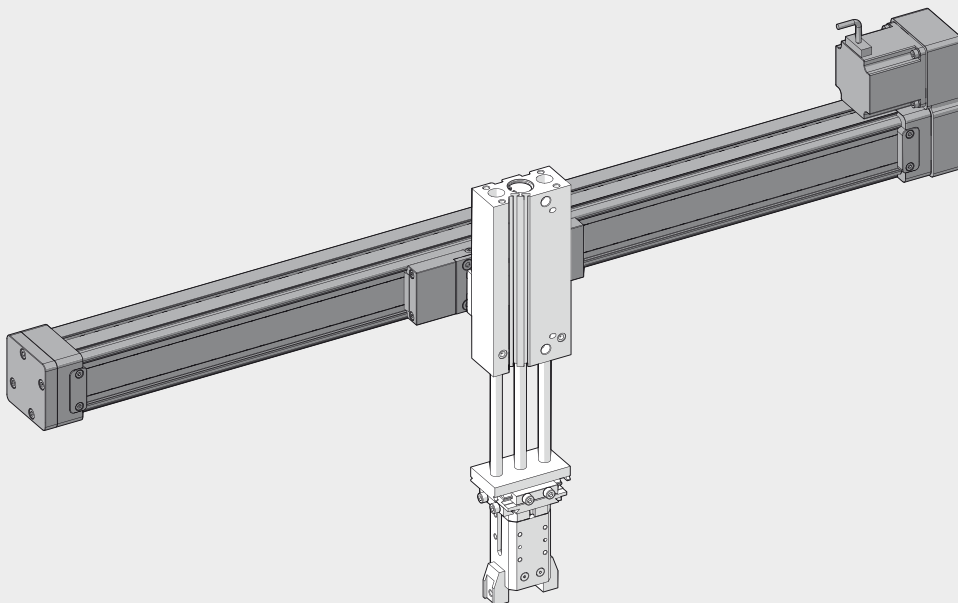
## MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES				
		Metal Work	37D1222000	37D1332000	37D1442000	37D1552000
Metal Work	Manufacturer	Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS A4	RTA PLUS B7
			(4.4A 24÷48VDC)	(6A 24÷75VDC)	(6A 77÷140VDC)	(10A 28÷62VAC) ●
<b>STEPPING</b>						
37M1120001	Motor SANYO DENKI 103-H7126-6640 (5.6A 75V max)	-	√	-	√	■
<b>STEPPING WITH BRAKE</b>						
37M5120000	Motor SANYO DENKI 103-H7126-1710.B (4A 75V max)	√	√◆	-	√	■
<b>STEPPING WITH BRAKE + ENCODER</b>						
37M3230000	Motor B&R 80MPF5.500D114-01 (5A 80V max)	-	√◆	√	■	■

- ◆ Important! Limit current
- Important! Limit current and voltage
- Important! AC drive to continuous voltage  $VDC = VAC \cdot \sqrt{2}$

MOTOR CODES		DRIVES CODES	
		Metal Work	37D2300000
Metal Work	Manufacturer	Manufacturer	DELTA ASD-A2-0421-M
			(400W)
<b>BRUSHLESS</b>			
37M2220001	Motor DELTA ECMA-C20604RS (400W)		√
<b>BRUSHLESS WITH BRAKE</b>			
37M4220001	Motor DELTA ECMA-C20604SS (400W)		√

## EXAMPLES OF APPLICATION

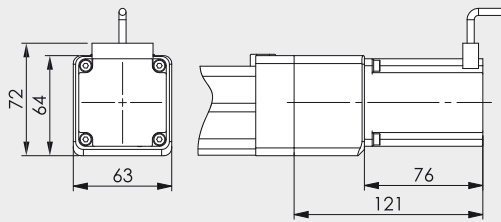




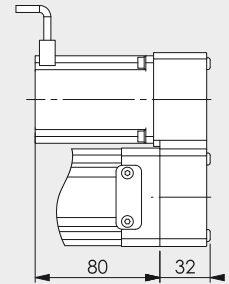
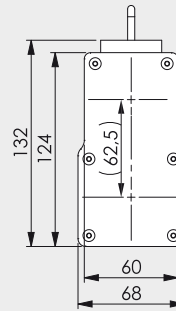
**ELECTRIC AXIS DIMENSIONS WITH STEPPER MOTOR**

Overall dimensions referring to versions with standard drive.

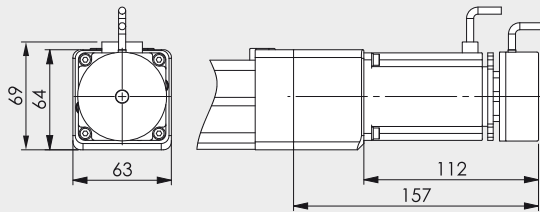
The geared motor versions represent right-hand positioning, the overall dimensions apply to left-hand positioning as well.



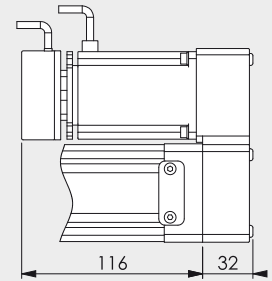
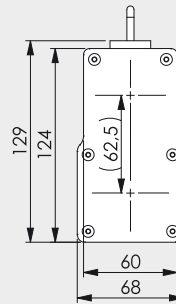
Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302 _ _ _ _ 21121	37M1120001



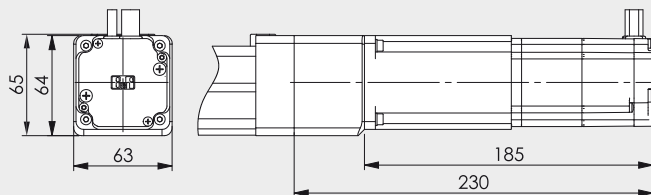
Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302 _ _ _ _ 91121	37302 _ _ _ _ 61121	37M1120001



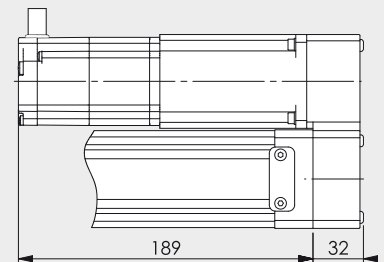
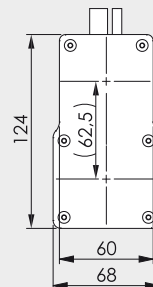
Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302 _ _ _ _ 25120	37M5120000



Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302 _ _ _ _ 95120	37302 _ _ _ _ 65120	37M5120000



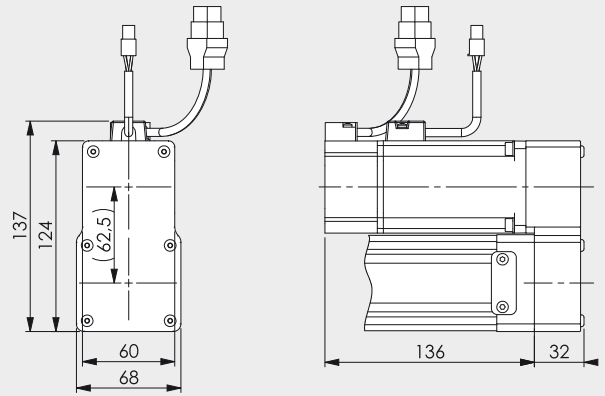
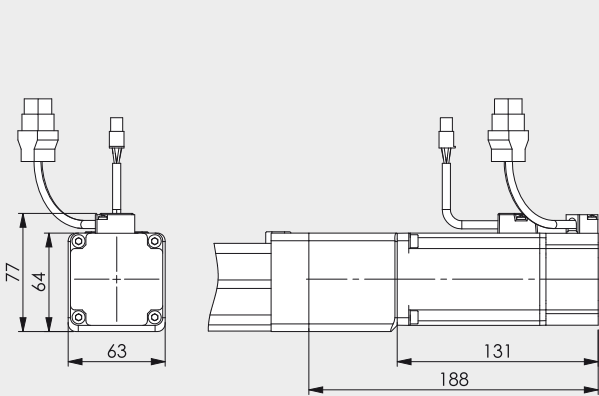
Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302 _ _ _ _ 23230	37M3230000



Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302 _ _ _ _ 93230	37302 _ _ _ _ 63230	37M3230000

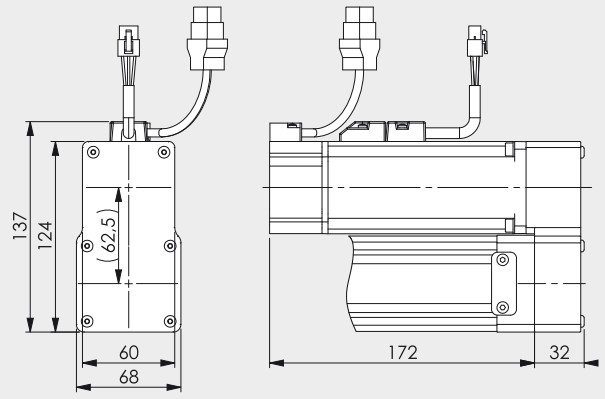
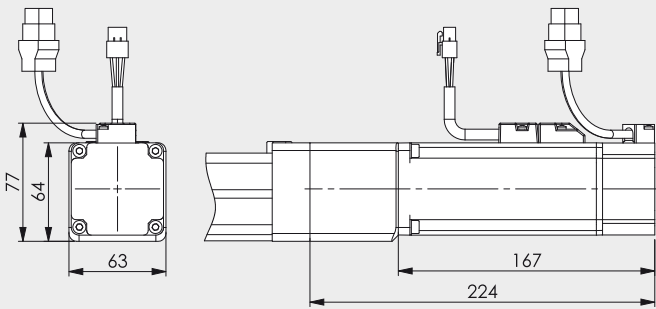
## ELECTRIC AXIS DIMENSIONS WITH BRUSHLESS MOTOR

Overall dimensions referring to versions with standard drive.  
The geared motor versions represent right-hand positioning, the overall dimensions apply to left-hand positioning as well.



Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_..._22220	37M2220001

Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302_..._92220	37302_..._62220	37M2220001



Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_..._24220	37M4220001

Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302_..._94220	37302_..._64220	37M4220001

### NOTES

**KEY TO CODES AXIS ELECTRIC (WITHOUT MOTOR)**

CYL	37 TYPE	3	0	2 SIZE	1 INTERFACE	0300 STROKE	1 SCREW PITCH
	37 Electric actuators	3 Electric axis rodless elektro SK	0 STD	2 Size 2	1 Axial V-lock 2 Orthogonal V-lock 3 Blank	From 100 to 1200 mm	1 Screw pitch 4 4 Screw pitch 10

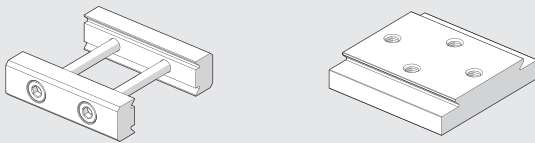
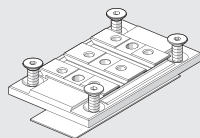
**KEY TO CODES AXIS ELECTRIC MOTOR**

CYL	37 TYPE	3	0	2 SIZE	1 INTERFACE	0300 STROKE	1 SCREW PITCH	2 VERSION	1 MOTOR	1 FLANGE	2 DRIVE TORQUE	0
	37 Electric actuators	3 Electric axis rodless elektro SK	0 STD	2 Size 2	1 Axial V-lock 2 Orthogonal V-lock 3 Blank	From 100 to 1200 mm	1 Pitch 4 4 Pitch 10	2 In-line IP20/ IP40 6 Geared IP20/ IP40 right 9 Geared IP20/ IP40 left	1 STEPPING 2 BRUSHLESS 3 STEPPING with BRAKE + Encoder 4 BRUSHLESS with BRAKE 5 STEPPING with BRAKE without Encoder	1 NEMA 23 2 60	2 1.2÷2.19 Nm 3 2.2÷3 Nm	0 Base 1 Greater rpm

● Version IP40 available for all STEPPING and BRUSHLESS motors, with the exception of motor code 37M5120000 which it is IP20

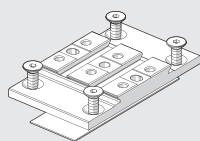
**ACCESSORIES**
**FIXING ELEMENTS**

See V-Lock family.


**CARRIAGE INTERFACE KIT**


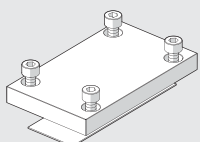
Code	Description	Weight [g]
0950T2R016K	V-Lock axial interface kit	95

Note: supplied complete with 4 screws, 1 adhesive shoe



0950T2R017K	V-Lock orthogonal interface kit	91
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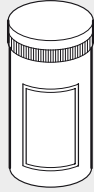
Note: supplied complete with 4 screws, 1 adhesive shoe



0950T2R015	BLANK interface kit	127
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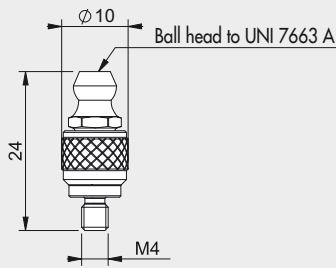
Note: supplied complete with 4 screws, 1 adhesive shoe

## GREASE



Code	Description	Weight [g]
9910506	Tube of RHEOLUBE 363 AX1 grease	400

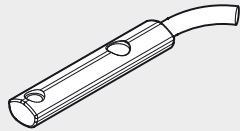
## GREASE NIPPLE



Code	Description
0950T2R108	Complete grease nipple for Elektro rodless SK cylinders

Note: Individually packed

## RETRACTABLE SENSOR WITH INSERTION FROM ABOVE

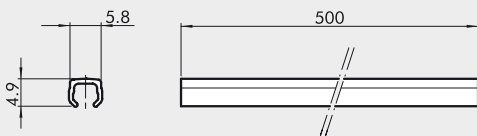


Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952225390	HALL N.O. sensor, vertical insertion 2.5 m robotics
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8 robotics
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W095222180	REED N.O. sensor, vertical insertion 2.5 m robotics
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8 robotics
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

\* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-580.

## BAR FOR GROOVING



Code	Description
W0950000160	Bar for grooving L = 500 mm

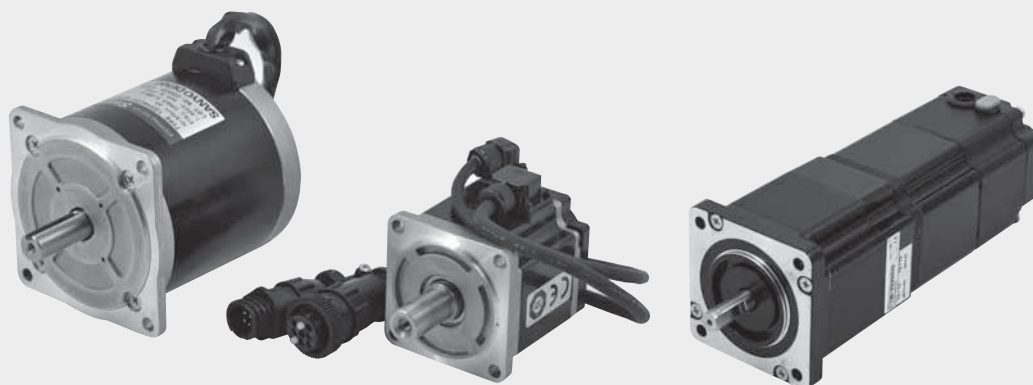
Note: The code corresponds to 1 piece.

Note: It is a plastic strap acting as dirt barrier and/or sensor wire protector to be fitted snugly into the section grooves

## NOTES



# ELECTRIC MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO



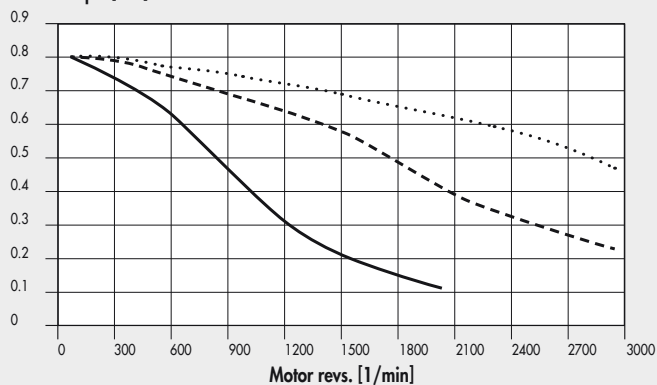
## STEPPING MOTORS

**N.B.:** With motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available torque with the motor stopped is also reduced by 50%.

### TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS

STEPPING motor code **37M1110000**

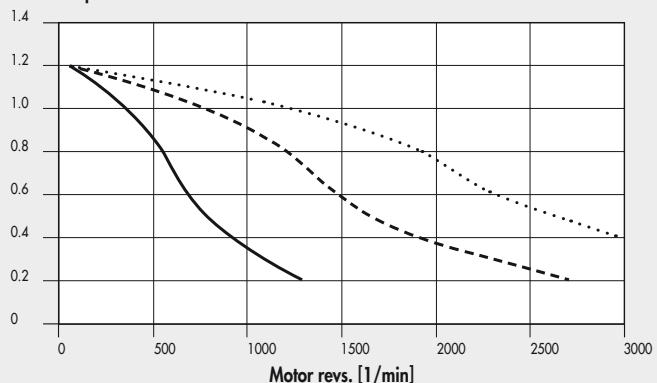
Motor torque [Nm]



— 37M1110000 (24VDC)      ····· 37M1110000 (75VDC)  
 - - - 37M1110000 (48VDC)

STEPPING motor code **37M1120000**

Motor torque [Nm]



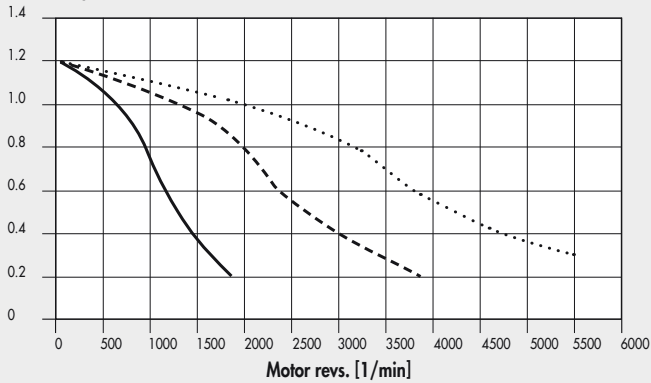
— 37M1120000 (24VDC)      ····· 37M1120000 (75VDC)  
 - - - 37M1120000 (48VDC)

TECHNICAL DATA		MOTOR 37M1110000
Motor type		STEPPING
Nominal torque	Nm	0.8
Coupling flange		NEMA 23
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.41
Inductance	mH	1.6
Bipolar holding torque	Nm	1.1
Rotor inertia	kgmm <sup>2</sup>	21
Theoretical acceleration	rad · s <sup>-2</sup>	50000
Back E.M.F.	V/krpm	20
Mass	kg	0.65
Degree of protection		IP40

TECHNICAL DATA		MOTOR 37M1120000
Motor type		STEPPING
Nominal torque	Nm	1.2
Coupling flange		NEMA 23
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm <sup>2</sup>	36
Theoretical acceleration	rad · s <sup>-2</sup>	45800
Back E.M.F.	V/krpm	31
Mass	kg	1
Degree of protection		IP40

STEPPING motor code **37M1120001**

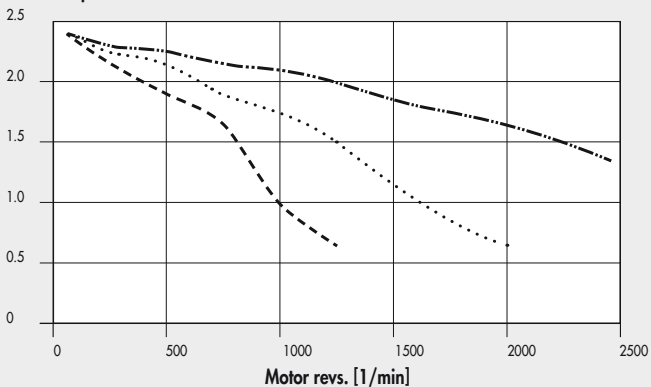
Motor torque [Nm]



- 37M1120001 (24VDC)
- - - 37M1120001 (48VDC)
- ..... 37M1120001 (75VDC)

STEPPING motor code **37M1430000**

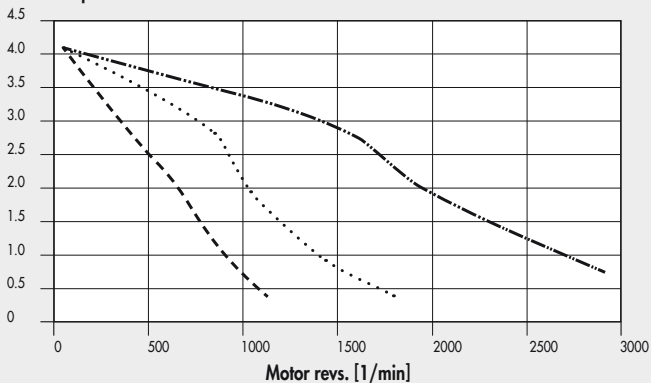
Motor torque [Nm]



- - - 37M1430000 (48VDC)
- ..... 37M1430000 (75VDC)
- · - · 37M1430000 (140VDC)

STEPPING motor code **37M1440000**

Motor torque [Nm]



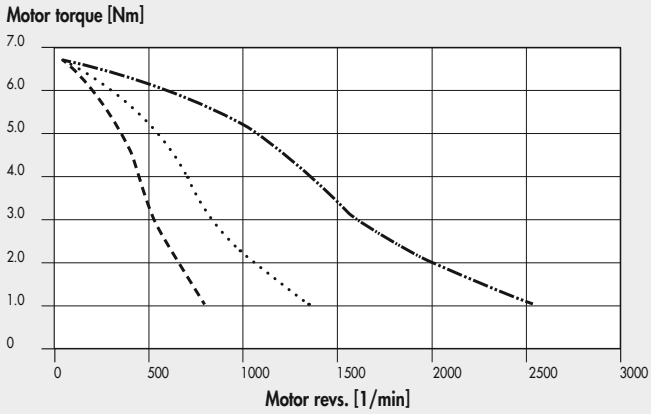
- - - 37M1440000 (48VDC)
- ..... 37M1440000 (75VDC)
- · - · 37M1440000 (140VDC)

TECHNICAL DATA		MOTOR 37M1120001
Motor type		STEPPING
Nominal torque	Nm	1.2
Coupling flange		NEMA 23
Base step angle		1.8°±0.09°
Bipolar current	A	5.6
Resistance	Ω	0.3
Inductance	mH	0.85
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm <sup>2</sup>	36
Theoretical acceleration	rad · s <sup>-2</sup>	45800
Back E.M.F.	V/krpm	23
Mass	kg	1
Degree of protection		IP43

TECHNICAL DATA		MOTOR 37M1430000
Motor type		STEPPING
Nominal torque	Nm	2.4
Coupling flange		NEMA 34
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.3
Inductance	mH	1.65
Bipolar holding torque	Nm	3
Rotor inertia	kgmm <sup>2</sup>	145
Theoretical acceleration	rad · s <sup>-2</sup>	20600
Back E.M.F.	V/krpm	50
Mass	kg	1.5
Degree of protection		IP43

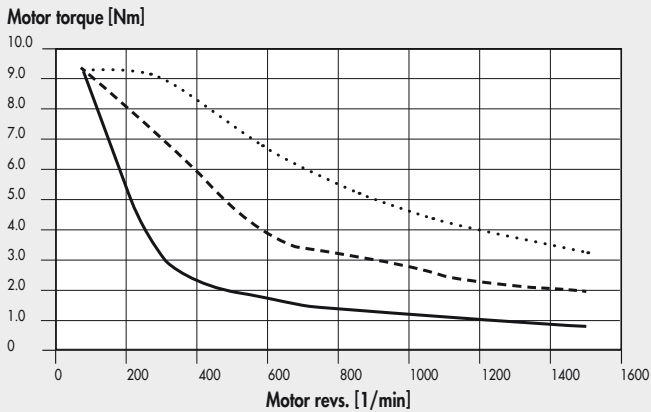
TECHNICAL DATA		MOTOR 37M1440000
Motor type		STEPPING
Nominal torque	Nm	4.2
Coupling flange		NEMA 34
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.35
Inductance	mH	2.7
Bipolar holding torque	Nm	5.6
Rotor inertia	kgmm <sup>2</sup>	290
Theoretical acceleration	rad · s <sup>-2</sup>	19300
Back E.M.F.	V/krpm	93
Mass	kg	2.5
Degree of protection		IP43

STEPPING motor code **37M1450000**



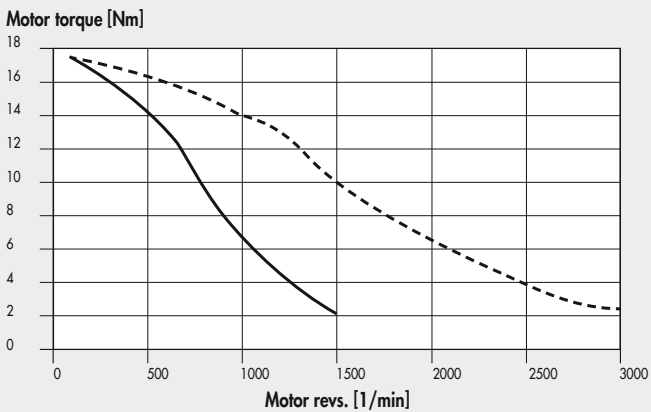
- 37M1450000 (48VDC)
- .... 37M1450000 (75VDC)
- .-.- 37M1450000 (140VDC)

STEPPING motor code **37M1470000**



- 37M1470000 (24VDC)
- 37M1470000 (48VDC)
- .... 37M1470000 (75VDC)

STEPPING motor code **37M1890000**



- 37M1890000 (230VAC)
- 37M1890000 (115VAC)

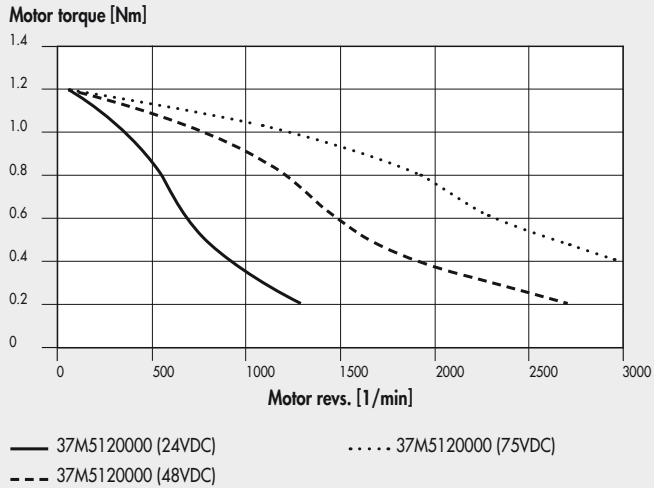
TECHNICAL DATA		MOTOR 37M1450000
Motor type		STEPPING
Nominal torque	Nm	<b>6.7</b>
Coupling flange		<b>NEMA 34</b>
Base step angle		1.8°±0.09°
Bipolar current parallel	A	6
Resistance	Ω	0.46
Inductance	mH	3.8
Bipolar holding torque	Nm	9.2
Rotor inertia	kgmm <sup>2</sup>	450
Theoretical acceleration	rad · s <sup>-2</sup>	20500
Back E.M.F.	V/krpm	161
Mass	kg	4
Certifications		UL, CSA, CE, RoHS
Insulation voltage		250VAC (350VDC)
Degree of protection		IP43 - F

TECHNICAL DATA		MOTOR 37M1470000
Motor type		STEPPING
Nominal torque	Nm	<b>9.3</b>
Coupling flange		<b>NEMA 34</b>
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm <sup>2</sup>	392
Mass	kg	4.2
Degree of protection		IP40
Power cable for stepping motors with brake, 3 metres		<b>37C1330000</b>
Power cable for stepping motors with brake, 5 metres		<b>37C1350000</b>

TECHNICAL DATA		MOTOR 37M1890000
Motor type		STEPPING
Nominal torque	Nm	<b>17.5</b>
Coupling flange		<b>NEMA 42</b>
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.63
Inductance	mH	8
Bipolar holding torque	Nm	24.6
Rotor inertia	kgmm <sup>2</sup>	2200
Theoretical acceleration	rad · s <sup>-2</sup>	11100
Back E.M.F.	V/krpm	410
Mass	kg	10
Degree of protection		IP43

### TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE

STEPPING motor with BRAKE code 37M5120000



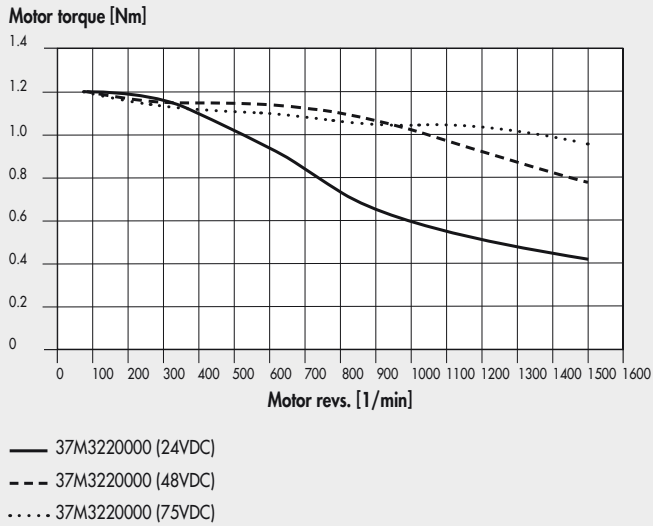
TECHNICAL DATA		MOTOR 37M5120000
Motor type		STEPPING with BRAKE
Nominal torque	Nm	1.2
Coupling flange		NEMA 23
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm <sup>2</sup>	36
Theoretical acceleration	rad · s <sup>-2</sup>	45800
Back E.M.F.	V/krpm	31
Mass	kg	1 - 5
Degree of protection		IP20
<b>BRAKE</b>		
Braking torque	Nm	3.3
Duty Cycle		50% max
Supply voltage	VDC	24
Power consumption	W	18
Connecting time	ms	300

### NOTES

# STEPPING MOTORS WITH BRAKE + ENCODER

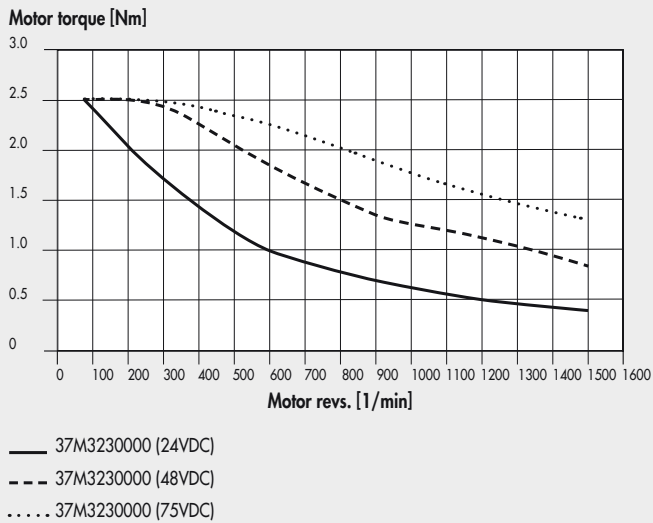
## TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE + ENCODER

STEPPING motor with BRAKE + ENCODER code **37M3220000**



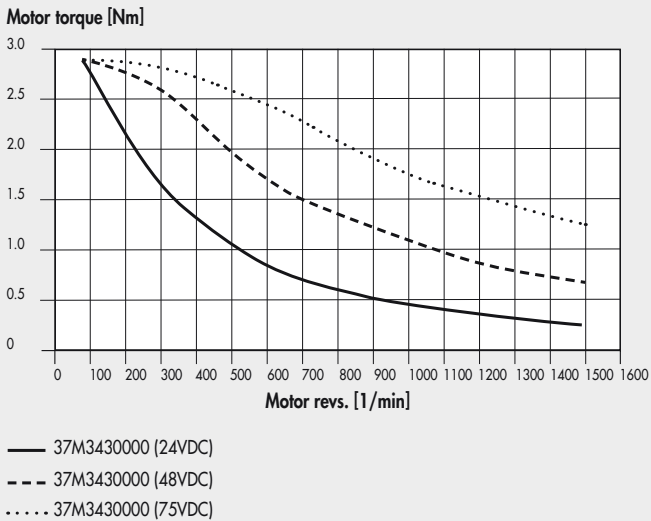
TECHNICAL DATA		MOTOR 37M3220000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	1.2
Coupling flange		60
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm <sup>2</sup>	44
Mass	kg	1.28
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		37C1230000
Power cable for stepping motors with brake, 3 metres		37C1330000
Encoder cable for stepping motors with brake, 5 metres		37C1250000
Power cable for stepping motors with brake, 5 metres		37C1350000
<b>ENCODER</b>		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
<b>BRAKE</b>		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	2
Power consumption	W	11
Connecting time	ms	6
Delay time	ms	2
Disconnection time	ms	25

STEPPING motor with BRAKE + ENCODER code **37M3230000**

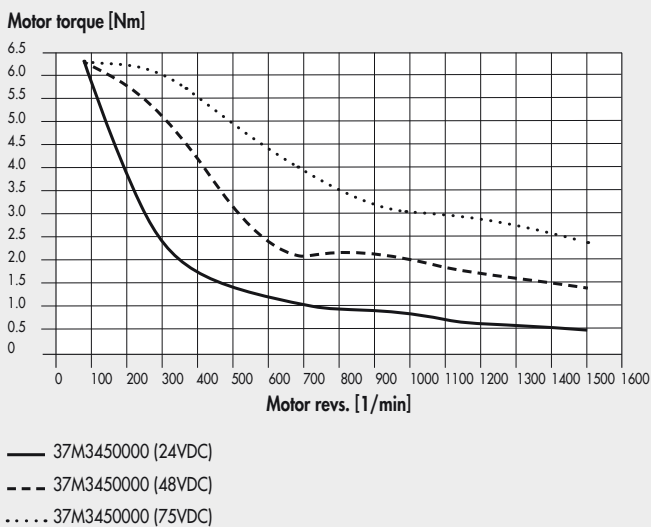


TECHNICAL DATA		MOTOR 37M3230000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	2.5
Coupling flange		60
Base step angle		1.8°
Bipolar current	A	5
Resistance	Ω	0.6
Inductance	mH	2.8
Bipolar holding torque	Nm	3.5
Rotor inertia	kgmm <sup>2</sup>	92
Mass	kg	1.8
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		37C1230000
Power cable for stepping motors with brake, 3 metres		37C1330000
Encoder cable for stepping motors with brake, 5 metres		37C1250000
Power cable for stepping motors with brake, 5 metres		37C1350000
<b>ENCODER</b>		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
<b>BRAKE</b>		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	2
Power consumption	W	11
Connecting time	ms	6
Delay time	ms	2
Disconnection time	ms	25

## STEPPING motor with BRAKE + ENCODER code 37M3430000



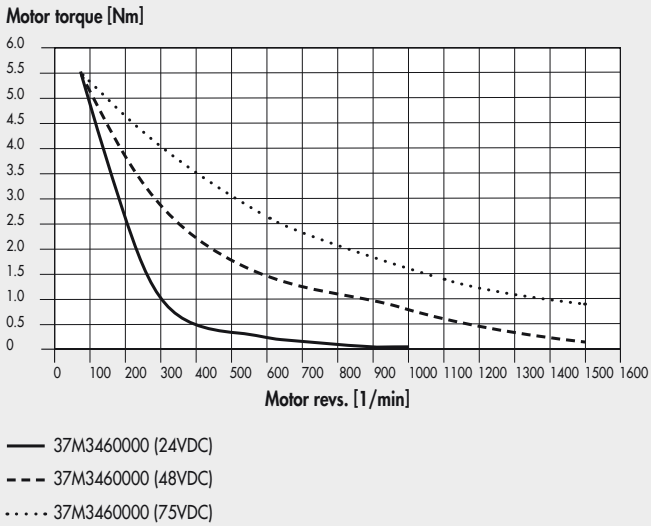
## STEPPING motor with BRAKE + ENCODER code 37M3450000



TECHNICAL DATA		MOTOR 37M3430000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	2.9
Coupling flange		NEMA 34
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.4
Inductance	mH	3.2
Bipolar holding torque	Nm	4
Rotor inertia	kgmm <sup>2</sup>	131
Mass	kg	2.5
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		37C1230000
Power cable for stepping motors with brake, 3 metres		37C1330000
Encoder cable for stepping motors with brake, 5 metres		37C1250000
Power cable for stepping motors with brake, 5 metres		37C1350000
<b>ENCODER</b>		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
<b>BRAKE</b>		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

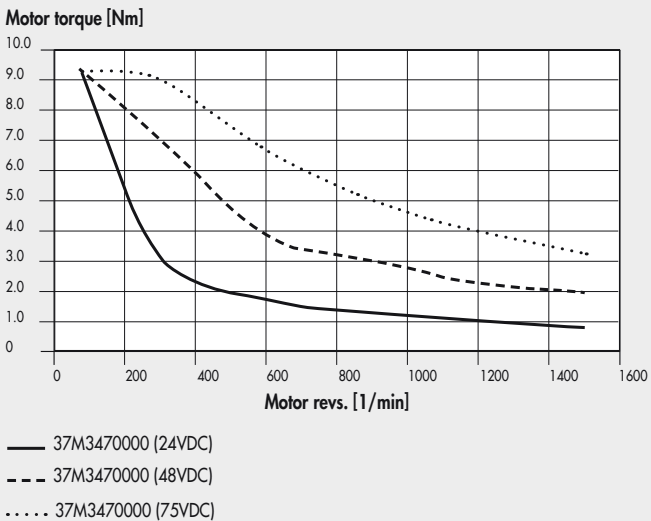
TECHNICAL DATA		MOTOR 37M3450000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	6.3
Coupling flange		NEMA 34
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.2
Inductance	mH	1.4
Bipolar holding torque	Nm	9.5
Rotor inertia	kgmm <sup>2</sup>	261
Mass	kg	3.7
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		37C1230000
Power cable for stepping motors with brake, 3 metres		37C1330000
Encoder cable for stepping motors with brake, 5 metres		37C1250000
Power cable for stepping motors with brake, 5 metres		37C1350000
<b>ENCODER</b>		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
<b>BRAKE</b>		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

STEPPING motor with BRAKE + ENCODER code **37M3460000**



TECHNICAL DATA		MOTOR 37M3460000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	5.5
Coupling flange		NEMA 34
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.6
Inductance	mH	4.3
Bipolar holding torque	Nm	7.8
Rotor inertia	kgmm <sup>2</sup>	261
Mass	kg	3.7
Degree of protection		IP65
Encoder cable for stepping motors with brake,		<b>37C1230000</b>
3 metres		
Power cable for stepping motors with brake,		<b>37C1330000</b>
3 metres		
Encoder cable for stepping motors with brake,		<b>37C1250000</b>
5 metres		
Power cable for stepping motors with brake,		<b>37C1350000</b>
5 metres		
<b>ENCODER</b>		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
<b>BRAKE</b>		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

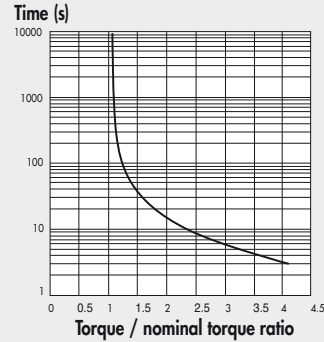
STEPPING motor with BRAKE + ENCODER code **37M3470000**



TECHNICAL DATA		MOTOR 37M3470000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	9.3
Coupling flange		NEMA 34
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm <sup>2</sup>	392
Mass	kg	4.2
Degree of protection		IP65
Encoder cable for stepping motors with brake,		<b>37C1230000</b>
3 metres		
Power cable for stepping motors with brake,		<b>37C1330000</b>
3 metres		
Encoder cable for stepping motors with brake,		<b>37C1250000</b>
5 metres		
Power cable for stepping motors with brake,		<b>37C1350000</b>
5 metres		
<b>ENCODER</b>		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
<b>BRAKE</b>		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

## OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.

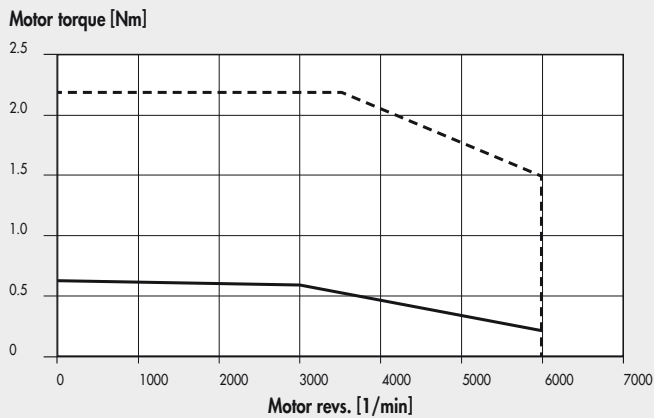


## TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:

- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor code **37M2200000** + drive code **37D2200000** (200W)



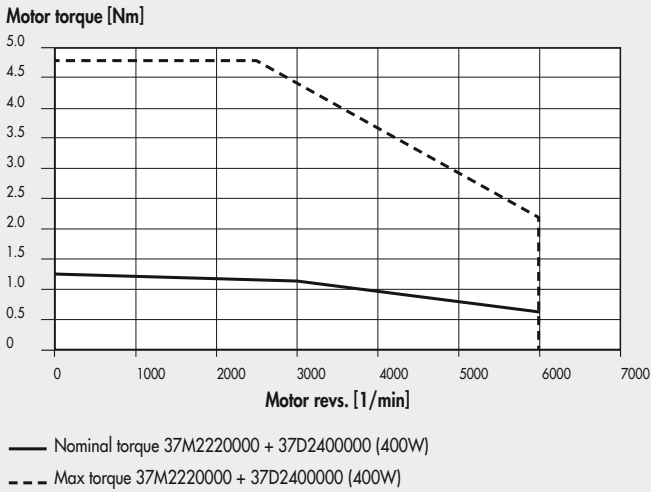
— Nominal torque 37M2200000 + 37D2200000 (200W)

- - - Max torque 37M2200000 + 37D2200000 (200W)

TECHNICAL DATA	MOTOR 37M2200000
Motor type	BRUSHLESS
Nominal torque	Nm <b>0.64</b>
Coupling flange (square)	mm <b>60</b>
Nominal power	W 200
Nominal speed	rpm 3000
Maximum speed	rpm 6000
Stall torque	Nm 0.686
Maximum torque	Nm 2.2
Rotor inertia	kgmm <sup>2</sup> 21.9
Mass	kg 0.84
Encoder	pulse/rev 131072 (17 bit)
Degree of protection	IP65
Drive code	<b>37D2200000</b>
Connecting cable:	
Brushless motor-drive, 3 metres	<b>37C2130000</b>
Brushless motor-drive-encoder, 3 metres	<b>37C2230000</b>
Brushless motor-drive, dynamic cable, 3 metres	<b>37C2130003</b>
Brushless motor-drive-encoder, dynamic cable, 3 metres	<b>37C2230003</b>
Brushless motor-drive, 5 metres	<b>37C2150000</b>
Brushless motor-drive-encoder, 5 metres	<b>37C2250000</b>
Brushless motor-drive, dynamic cable, 5 metres	<b>37C2150003</b>
Brushless motor-drive-encoder, dynamic cable, 5 metres	<b>37C2250003</b>
Brushless motor-drive, dynamic cable, 10 metres	<b>37C2110003</b>
Brushless motor-drive-encoder, dynamic cable, 10 metres	<b>37C2210003</b>

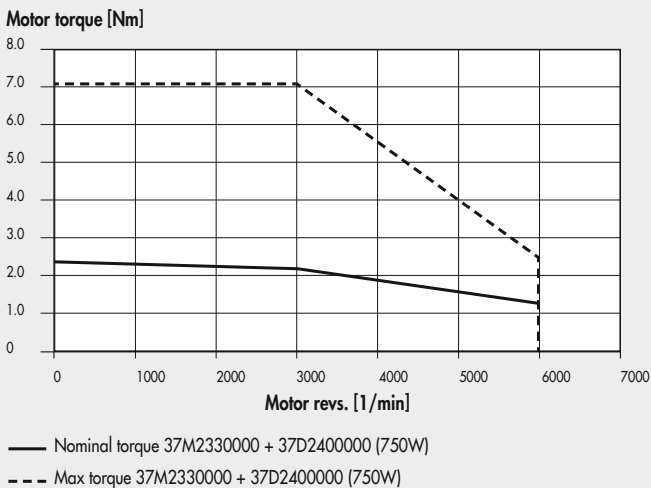


BRUSHLESS motor code **37M2220000** + drive code **37D2400000** (400W)



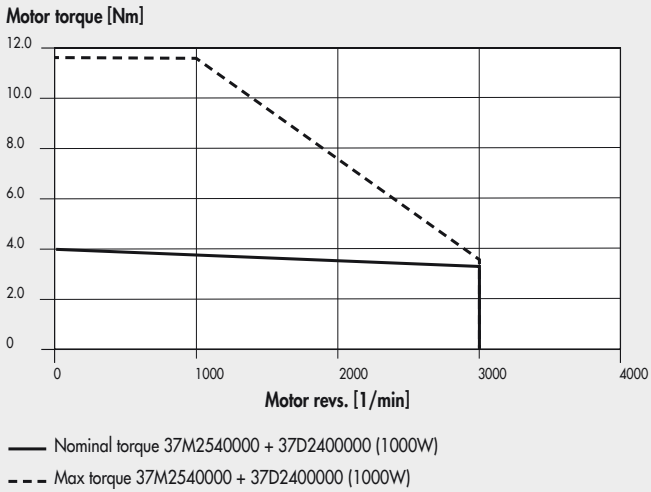
TECHNICAL DATA		MOTOR 37M2220000
Motor type		BRUSHLESS
Nominal torque	Nm	<b>1.27</b>
Coupling flange (square)	mm	<b>60</b>
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm <sup>2</sup>	41.2
Mass	kg	1.3
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		<b>37D2400000</b>
Connecting cable:		
Brushless motor-drive, 3 metres		<b>37C2130000</b>
Brushless motor-drive-encoder, 3 metres		<b>37C2230000</b>
Brushless motor-drive, dynamic cable, 3 metres		<b>37C2130003</b>
Brushless motor-drive-encoder, dynamic cable, 3 metres		<b>37C2230003</b>
Brushless motor-drive, 5 metres		<b>37C2150000</b>
Brushless motor-drive-encoder, 5 metres		<b>37C2250000</b>
Brushless motor-drive, dynamic cable, 5 metres		<b>37C2150003</b>
Brushless motor-drive-encoder, dynamic cable, 5 metres		<b>37C2250003</b>
Brushless motor-drive, dynamic cable, 10 metres		<b>37C2110003</b>
Brushless motor-drive-encoder, dynamic cable, 10 metres		<b>37C2210003</b>

BRUSHLESS motor code **37M2330000** + drive code **37D2400000** (750W)



DATI TECNICI		MOTORE 37M2330000
Motor type		BRUSHLESS
Nominal torque	Nm	<b>2.39</b>
Coupling flange (square)	mm	<b>80</b>
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	2.55
Maximum torque	Nm	7.1
Rotor inertia	kgmm <sup>2</sup>	182
Mass	kg	2.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		<b>37D2400000</b>
Connecting cable:		
Brushless motor-drive, 3 metres		<b>37C2130000</b>
Brushless motor-drive-encoder, 3 metres		<b>37C2230000</b>
Brushless motor-drive, dynamic cable, 3 metres		<b>37C2130003</b>
Brushless motor-drive-encoder, dynamic cable, 3 metres		<b>37C2230003</b>
Brushless motor-drive, 5 metres		<b>37C2150000</b>
Brushless motor-drive-encoder, 5 metres		<b>37C2250000</b>
Brushless motor-drive, dynamic cable, 5 metres		<b>37C2150003</b>
Brushless motor-drive-encoder, dynamic cable, 5 metres		<b>37C2250003</b>
Brushless motor-drive, dynamic cable, 10 metres		<b>37C2110003</b>
Brushless motor-drive-encoder, dynamic cable, 10 metres		<b>37C2210003</b>

BRUSHLESS motor code **37M2540000** + drive code **37D2400000** (1000W)

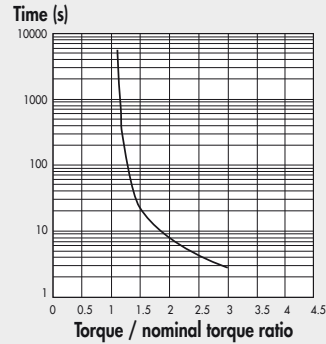


TECHNICAL DATA		MOTOR 37M2540000
Motor type		BRUSHLESS
Nominal torque	Nm	<b>3.18</b>
Coupling flange (square)	mm	<b>86</b>
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	kgmm <sup>2</sup>	238.3
Mass	kg	3.5
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		<b>37D2400000</b>
Connecting cable:		
Brushless <b>motor-drive</b> , 3 metres		<b>37C2130000</b>
Brushless <b>motor-drive-encoder</b> , 3 metres		<b>37C2230000</b>
Brushless <b>motor-drive, dynamic</b> cable, 3 metres		<b>37C2130003</b>
Brushless <b>motor-drive-encoder, dynamic</b> cable, 3 metres		<b>37C2230003</b>
Brushless <b>motor-drive</b> , 5 metres		<b>37C2150000</b>
Brushless <b>motor-drive-encoder</b> , 5 metres		<b>37C2250000</b>
Brushless <b>motor-drive, dynamic</b> cable, 5 metres		<b>37C2150003</b>
Brushless <b>motor-drive-encoder, dynamic</b> cable, 5 metres		<b>37C2250003</b>
Brushless <b>motor-drive, dynamic</b> cable, 10 metres		<b>37C2110003</b>
Brushless <b>motor-drive-encoder, dynamic</b> cable, 10 metres		<b>37C2210003</b>

## NOTES

**OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (DELTA)**

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.

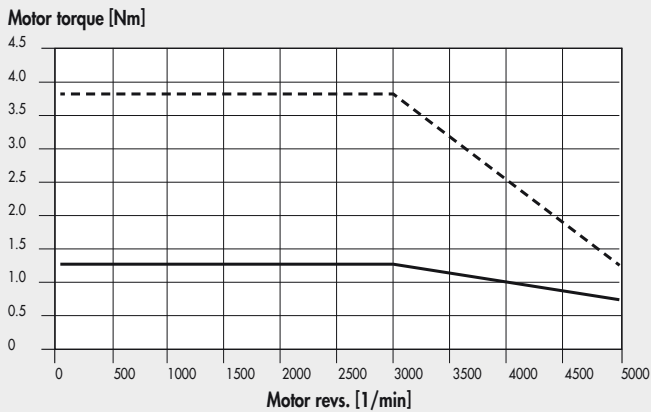


**TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (DELTA)**

The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:

- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

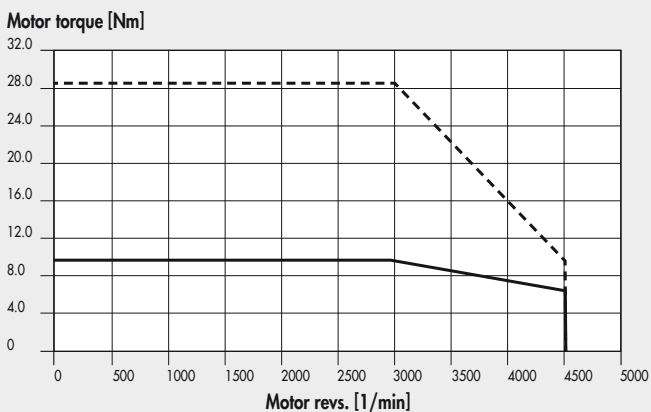
BRUSHLESS motor code **37M2220001** + drive code **37D2300000** (400W)



— Nominal torque 37M2220001 + 37D2300000 (400W)  
 - - - Max torque 37M2220001 + 37D2300000 (400W)

TECHNICAL DATA		MOTOR 37M2220001
Motor type		BRUSHLESS
Nominal torque	Nm	1.27
Coupling flange (square)	mm	60
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm <sup>2</sup>	27.7
Mass	kg	1.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP40
Drive code		37D2300000
Connecting cable:		
Brushless motor-drive, 3 metres		37C2130001
Brushless motor-drive-encoder, 3 metres		37C2230001
Brushless motor-drive, 5 metres		37C2150001
Brushless motor-drive-encoder, 5 metres		37C2250001

BRUSHLESS motor code **37M2770000** + drive code **37D2600001** (3000W)

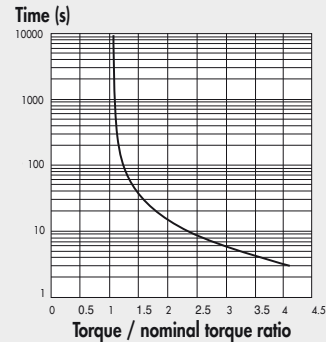


— Nominal torque 37M2770000 + 37D2600001 (3000W)  
 - - - Max torque 37M2770000 + 37D2600001 (3000W)

TECHNICAL DATA		MOTOR 37M2770000
Motor type		BRUSHLESS
Nominal torque	Nm	9.55
Coupling flange (square)	mm	130
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm <sup>2</sup>	1270
Mass	kg	7.8
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
Drive code		37D2600001
Connecting cable:		
Brushless motor-drive, 3 metres		37C3130001
Brushless motor-drive-encoder, 3 metres		37C3230001
Brushless motor-drive, 5 metres		37C3150001
Brushless motor-drive-encoder, 5 metres		37C3250001

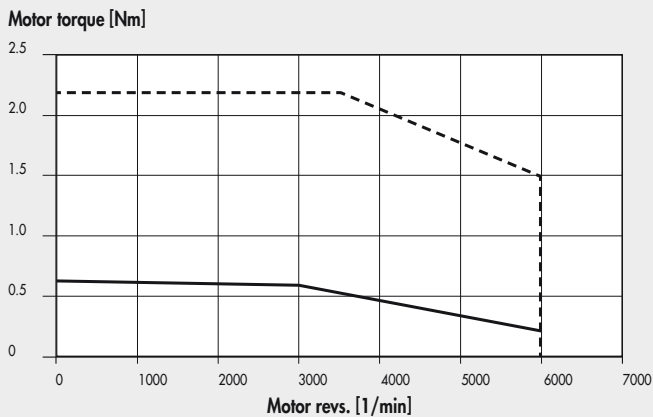
### OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.



### TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (SANYO DENKI)

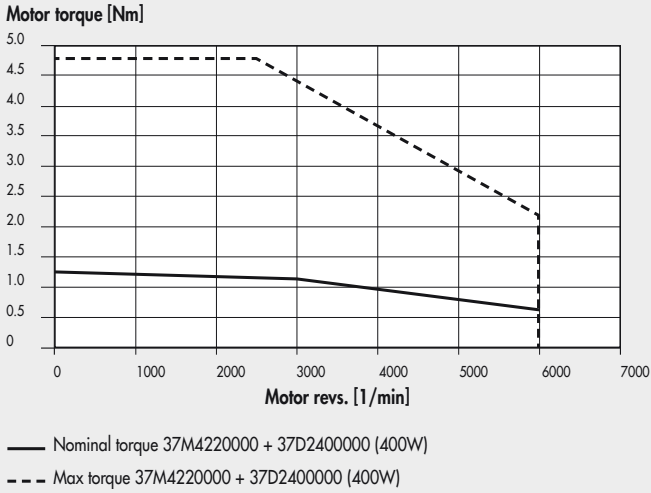
BRUSHLESS motor with BRAKE code **37M4200000** + drive code **37D2200000** (200W)



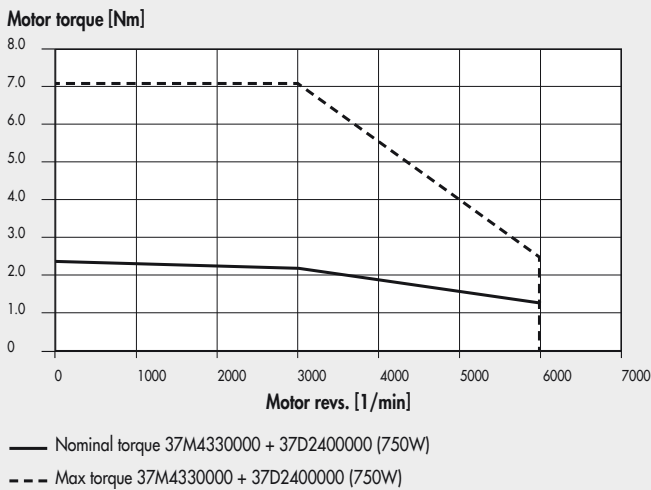
— Nominal torque 37M4200000 + 37D2200000 (200W)  
 - - - Max torque 37M4200000 + 37D2200000 (200W)

TECHNICAL DATA		MOTOR 37M4200000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	<b>0.64</b>
Coupling flange (square)	mm	<b>60</b>
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	kgmm <sup>2</sup>	27.9
Mass	kg	1.23
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		<b>37D2200000</b>
Connecting cable:		
Brushless motor-drive, 3 metres		<b>37C2130000</b>
Brushless motor-drive-encoder, 3 metres		<b>37C2230000</b>
Brushless motor-drive, dynamic cable, 3 metres		<b>37C2130003</b>
Brushless motor-drive-encoder, dynamic cable, 3 metres		<b>37C2230003</b>
Brushless motor-brake, dynamic cable, 3 metres		<b>37C2330000</b>
Brushless motor-drive, 5 metres		<b>37C2150000</b>
Brushless motor-drive-encoder, 5 metres		<b>37C2250000</b>
Brushless motor-drive, dynamic cable, 5 metres		<b>37C2150003</b>
Brushless motor-drive-encoder, dynamic cable, 5 metres		<b>37C2250003</b>
Brushless motor-brake, dynamic cable, 5 metres		<b>37C2350000</b>
Brushless motor-drive, dynamic cable, 10 metres		<b>37C2110003</b>
Brushless motor-drive-encoder, dynamic cable, 10 metres		<b>37C2210003</b>
Brushless motor-brake, dynamic cable, 10 metres		<b>37C2310000</b>
<b>BRAKE</b>		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.37 min

BRUSHLESS motor with BRAKE code **37M4220000** + drive code **37D2400000** (400W)



BRUSHLESS motor with BRAKE code **37M4330000** + drive code **37D2400000** (750W)

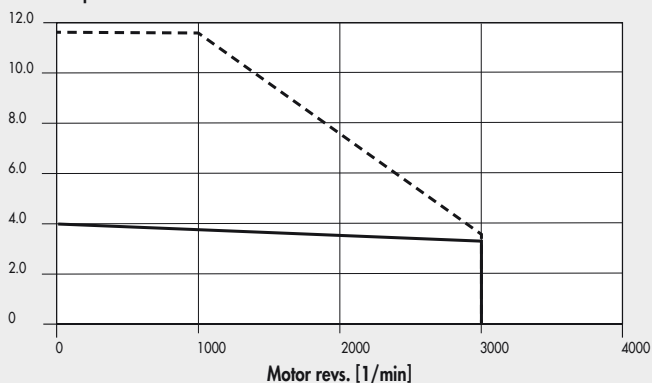


TECHNICAL DATA		MOTOR 37M4220000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	<b>1.27</b>
Coupling flange (square)	mm	<b>60</b>
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm <sup>2</sup>	47.2
Mass	kg	1.69
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		<b>37D2400000</b>
Connecting cable:		
Brushless motor-drive, 3 metres		<b>37C2130000</b>
Brushless motor-drive-encoder, 3 metres		<b>37C2230000</b>
Brushless motor-drive, dynamic cable, 3 metres		<b>37C2130003</b>
Brushless motor-drive-encoder, dynamic cable, 3 metres		<b>37C2230003</b>
Brushless motor-brake, dynamic cable, 3 metres		<b>37C2330000</b>
Brushless motor-drive, 5 metres		<b>37C2150000</b>
Brushless motor-drive-encoder, 5 metres		<b>37C2250000</b>
Brushless motor-drive, dynamic cable, 5 metres		<b>37C2150003</b>
Brushless motor-drive-encoder, dynamic cable, 5 metres		<b>37C2250003</b>
Brushless motor-brake, dynamic cable, 5 metres		<b>37C2350000</b>
Brushless motor-drive, dynamic cable, 10 metres		<b>37C2110003</b>
Brushless motor-drive-encoder, dynamic cable, 10 metres		<b>37C2210003</b>
Brushless motor-brake, dynamic cable, 10 metres		<b>37C2310000</b>
<b>BRAKE</b>		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.37 min

TECHNICAL DATA		MOTOR 37M4330000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	<b>2.39</b>
Coupling flange (square)	mm	<b>80</b>
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	2.55
Maximum torque	Nm	8.5
Rotor inertia	kgmm <sup>2</sup>	207
Mass	kg	2.19
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		<b>37D2400000</b>
Connecting cable:		
Brushless motor-drive, 3 metres		<b>37C2130000</b>
Brushless motor-drive-encoder, 3 metres		<b>37C2230000</b>
Brushless motor-drive, dynamic cable, 3 metres		<b>37C2130003</b>
Brushless motor-drive-encoder, dynamic cable, 3 metres		<b>37C2230003</b>
Brushless motor-brake, dynamic cable, 3 metres		<b>37C2330000</b>
Brushless motor-drive, 5 metres		<b>37C2150000</b>
Brushless motor-drive-encoder, 5 metres		<b>37C2250000</b>
Brushless motor-drive, dynamic cable, 5 metres		<b>37C2150003</b>
Brushless motor-drive-encoder, dynamic cable, 5 metres		<b>37C2250003</b>
Brushless motor-brake, dynamic cable, 5 metres		<b>37C2350000</b>
Brushless motor-drive, dynamic cable, 10 metres		<b>37C2110003</b>
Brushless motor-drive-encoder, dynamic cable, 10 metres		<b>37C2210003</b>
Brushless motor-brake, dynamic cable, 10 metres		<b>37C2310000</b>
<b>BRAKE</b>		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	2.55 min

BRUSHLESS motor with BRAKE code **37M4540000** + drive code **37D2400000** (1000W)

Motor torque [Nm]



— Nominal torque 37M4540000 + 37D2400000 (1000W)

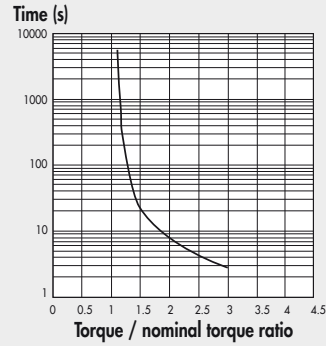
- - - Max torque 37M4540000 + 37D2400000 (1000W)

TECHNICAL DATA		MOTOR 37M4540000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	<b>3.18</b>
Coupling flange (square)	mm	<b>86</b>
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	kgmm <sup>2</sup>	272.6
Mass	kg	4.34
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		<b>37D2400000</b>
Connecting cable:		
Brushless <b>motor-drive</b> , 3 metres		<b>37C2130000</b>
Brushless <b>motor-drive-encoder</b> , 3 metres		<b>37C2230000</b>
Brushless <b>motor-drive, dynamic cable</b> , 3 metres		<b>37C2130003</b>
Brushless <b>motor-drive-encoder, dynamic cable</b> , 3 metres		<b>37C2230003</b>
Brushless <b>motor-brake, dynamic cable</b> , 3 metres		<b>37C2330000</b>
Brushless <b>motor-drive</b> , 5 metres		<b>37C2150000</b>
Brushless <b>motor-drive-encoder</b> , 5 metres		<b>37C2250000</b>
Brushless <b>motor-drive, dynamic cable</b> , 5 metres		<b>37C2150003</b>
Brushless <b>motor-drive-encoder, dynamic cable</b> , 5 metres		<b>37C2250003</b>
Brushless <b>motor-brake, dynamic cable</b> , 5 metres		<b>37C2350000</b>
Brushless <b>motor-drive, dynamic cable</b> , 10 metres		<b>37C2110003</b>
Brushless <b>motor-drive-encoder, dynamic cable</b> , 10 metres		<b>37C2210003</b>
Brushless <b>motor-brake, dynamic cable</b> , 10 metres		<b>37C2310000</b>
<b>BRAKE</b>		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	3.92 min

## NOTES

**OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (DELTA)**

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.

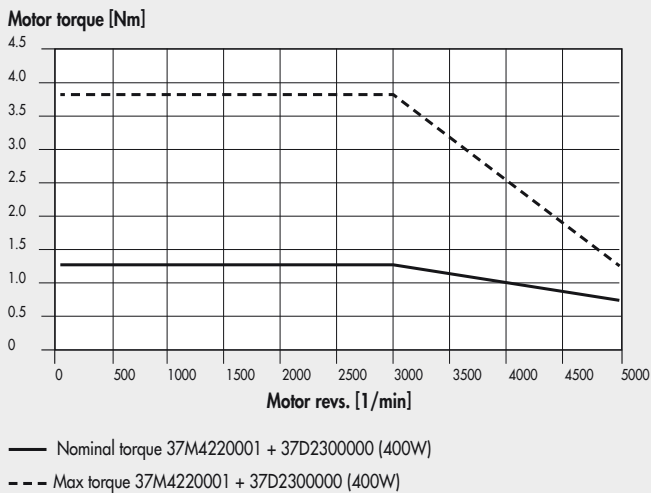


**TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (DELTA)**

The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:

- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

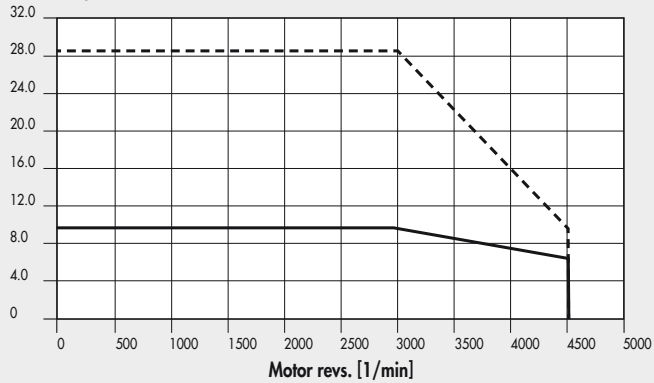
BRUSHLESS motor with BRAKE code **37M4220001** + drive code **37D2300000** (400W)



TECHNICAL DATA		MOTOR 37M4220001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	1.27
Coupling flange (square)	mm	60
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm <sup>2</sup>	30
Mass	kg	2
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP40
Drive code		37D2300000
Connecting cable:		
Brushless motor-drive with brake, 3 metres		37C2730000
Brushless motor-drive-encoder, 3 metres		37C2230001
Brushless motor-drive with brake, 5 metres		37C2750000
Brushless motor-drive-encoder, 5 metres		37C2250001
<b>BRAKE</b>		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.3
Absorption	W	6.5

BRUSHLESS motor with BRAKE code **37M4770000** +  
drive code **37D2600001** (3000W)

### Motor torque [Nm]



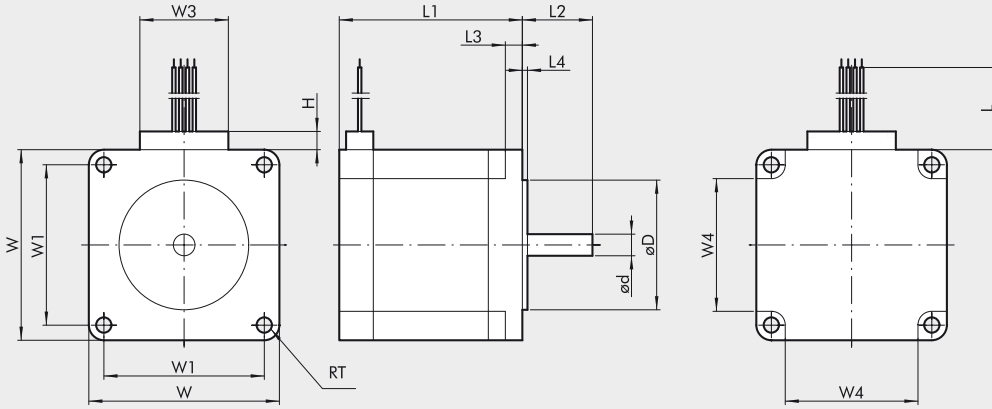
— Nominal torque 37M4770000 + 37D2600001 (3000W)  
- - - Max torque 37M4770000 + 37D2600001 (3000W)

TECHNICAL DATA		MOTOR 37M4770000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	9.55
Coupling flange (square)	mm	130
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm <sup>2</sup>	1400
Mass	kg	9.2
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
Drive code		<b>37D2600001</b>
Connecting cable:		
Brushless motor-drive-encoder, 3 metres		<b>37C3230001</b>
Brushless motor-drive with brake, 3 metres		<b>37C3730000</b>
Brushless motor-drive-encoder, 5 metres		<b>37C3250001</b>
Brushless motor-drive with brake, 5 metres		<b>37C3750000</b>
<b>BRAKE</b>		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	10

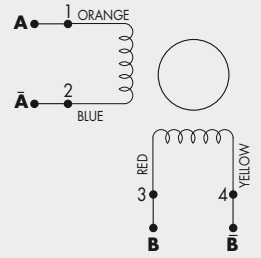
### NOTES



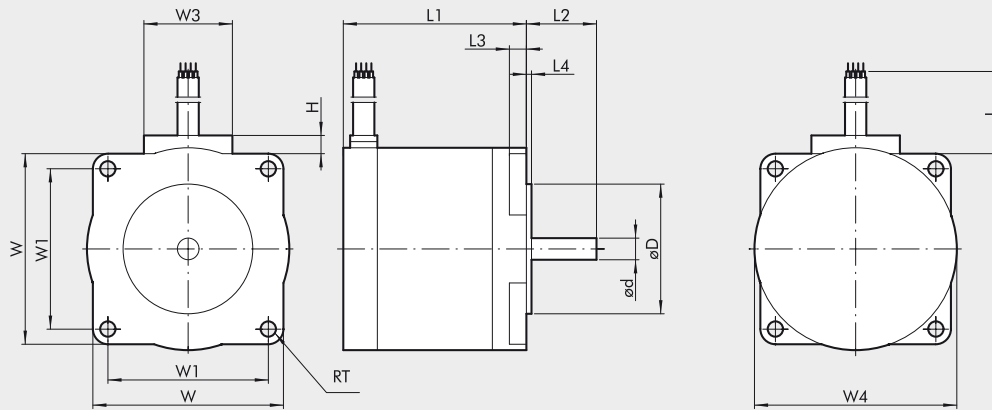
DIMENSIONS OF ELECTRIC MOTORS



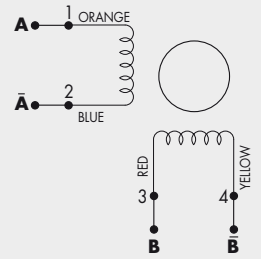
WIRING DIAGRAM



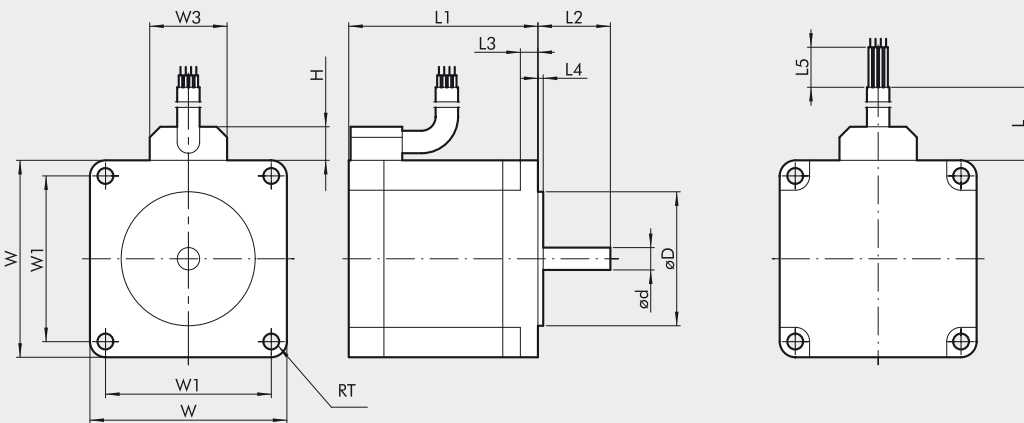
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5
STEPPING	37M1110000	0.8	NEMA 23	6.35	38.1	7	305	53.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120000	1.2	NEMA 23	6.35	38.1	7	305	75.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120001	1.2	NEMA 23	6.35	38.1	10	305	75.8	20.6	5	1.5	4.5	56	47.14	39	39



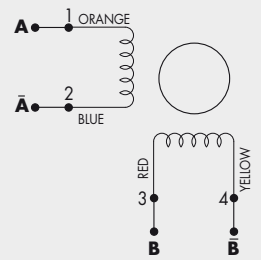
WIRING DIAGRAM



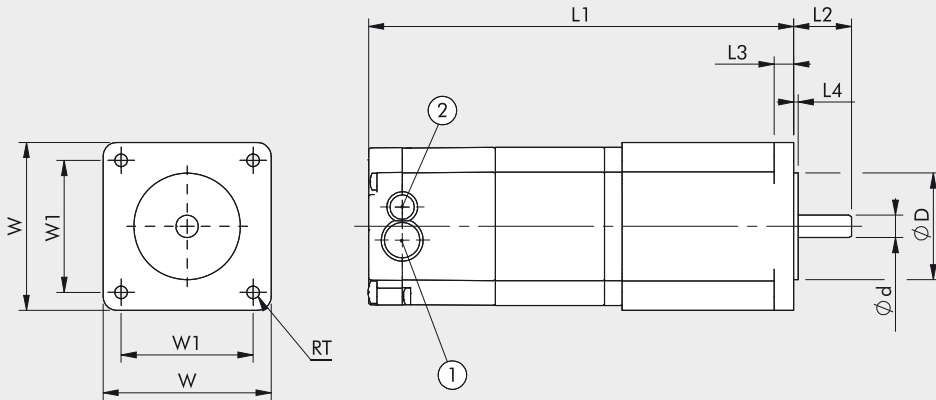
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H	L min	L1 ±0.5	L2 ±0.50	L3 ±0.25	L4 ±0.5/0	RT +0.5/0	W ±0.5	W1 ±0.2	W3	W4 ±0.5
STEPPING	37M1430000	2.4	NEMA 34	9.525	73.02	10	305	62	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1440000	4.2	NEMA 34	12	73.02	10	305	92.2	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1890000	17.5	NEMA 42	16	55.52	10	305	221	35	8.6	1.5	6.9	106.4	88.9	37	106.4



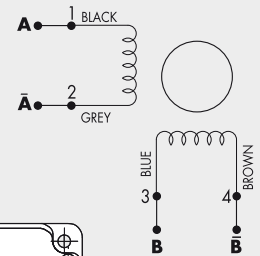
WIRING DIAGRAM



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	L5	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	37M1450000	6.7	NEMA 34	14	73.02	12	305	127	30	8	1.5	50	5.6	85.5	69.6	27

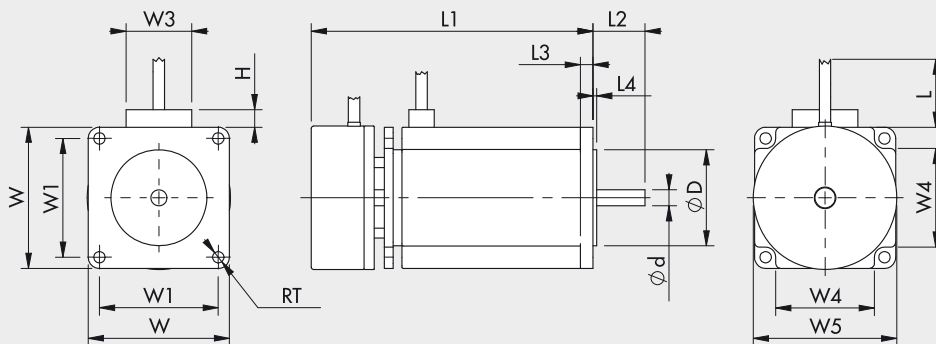


WIRING DIAGRAM

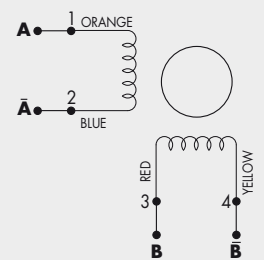


1 = access for power cable and brake  
2 = access for encoder cable

Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.25	L1	L2 ±0.51	L3	L4	RT	W	W1 ±0.13
STEPPING	37M1470000	9.3	NEMA 34	12.7	73.02	130	31.75	9.91	2.03	5.6	86.6	69.6
STEPPING + BRAKE	37M3220000	1.2	60	8	38.1	151.8	20.6	7	1.6	4.5	60	47.14
+ ENCODER	37M3230000	2.5	60	8	38.1	184.5	20.6	7	1.6	4.5	60	47.14
	37M3430000	2.9	NEMA 34	12.7	73.02	156.5	31.75	9.9	2	5.6	86.6	69.6
	37M3460000	5.5	NEMA 34	12.7	73.02	188.5	31.75	9.9	2	5.6	86.6	69.6
	37M3450000	6.3	NEMA 34	12.7	73.02	188.5	31.75	9.9	2	5.6	86.6	69.6
	37M3470000	9.3	NEMA 34	12.7	73.02	220.5	31.75	9.9	2	5.6	86.6	69.6

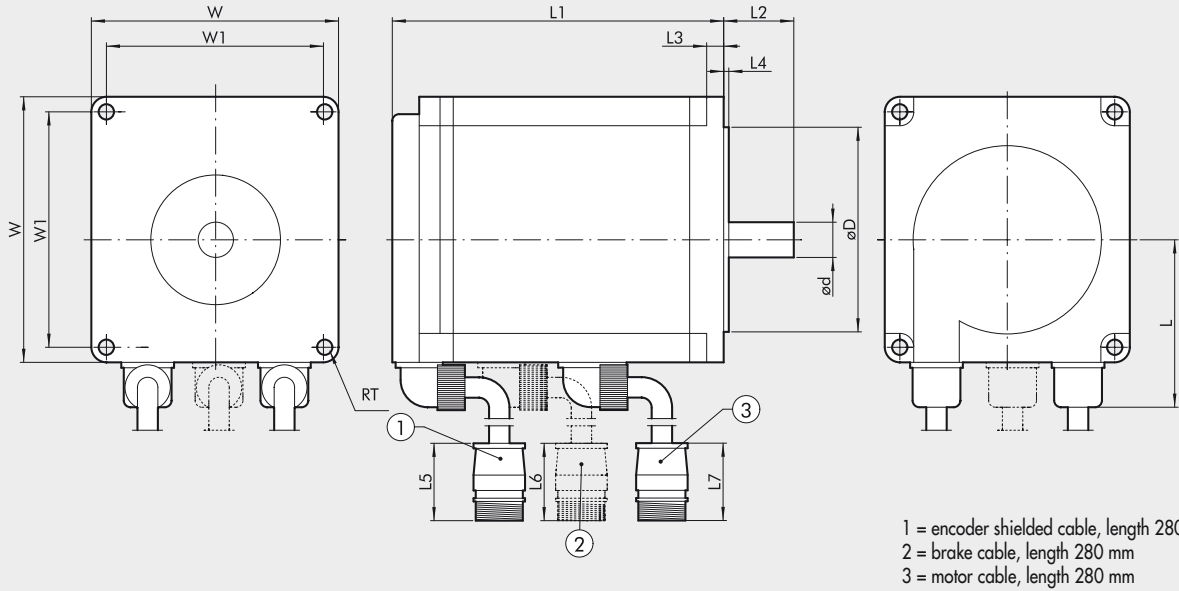


WIRING DIAGRAM

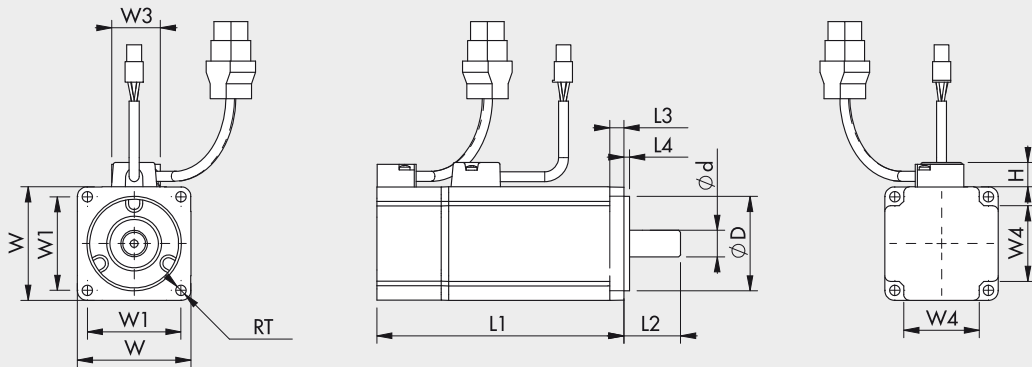


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5	W5 ±0.5
STEPPING + BRAKE	37M5120000	1.2	NEMA 23	6.35	38.1	7	305	111.8	20.6	5	1.5	4.5	56	47.14	26	39	56.9

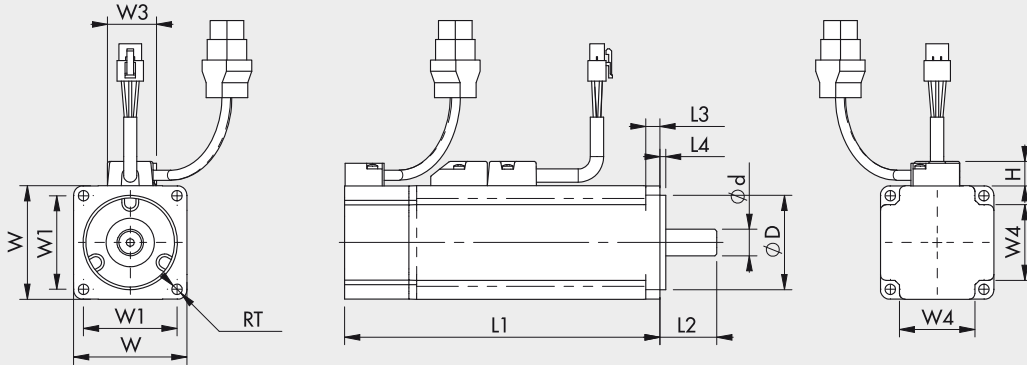
DIMENSIONS OF ELECTRIC MOTORS



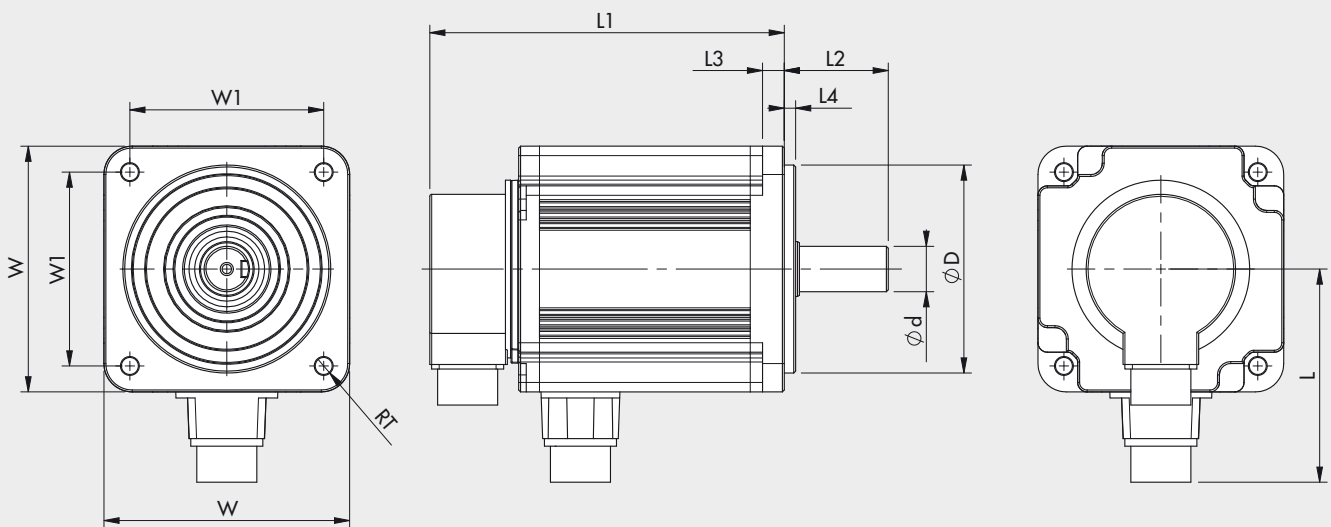
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD h7	L	L1 ±1	L2 ±1	L3	L4	L5	L6	L7	RT	W	W1
BRUSHLESS (SANYO DENKI)	37M2200000	0.64	60	14	50	44.6	69.5	30	6	3	55	-	58	5.5	60	49.5
	37M2220000	1.27	60	14	50	44.6	95.5	30	6	3	55	-	58	5.5	60	49.5
	37M2330000	2.39	80	16	70	54.4	107.3	40	8	3	55	-	58	6.6	80	63.6
	37M2540000	3.18	86	16	80	59.55	137.1	35	8	3	55	-	58	6.6	86	70.7
BRUSHLESS + BRAKE (SANYO DENKI)	37M4200000	0.64	60	14	50	44.6	97.5	30	6	3	55	55	58	5.5	60	49.5
	37M4220000	1.27	60	14	50	44.6	117.5	30	6	3	55	55	58	5.5	60	49.5
	37M4330000	2.39	80	16	70	54.4	143	40	8	3	55	55	58	6.6	80	63.4
	37M4540000	3.18	86	16	80	59.55	162.95	35	8	3	55	55	58	6.6	86	70.7



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD 0/-0.025	H max	L1 ±0.3	L2 ±0.2	L3 ±0.2	L4 ±0.2	RT ±0.2	W ±0.25	W1 ±0.2	W3 max	W4 ±0.2
BRUSHLESS (DELTA)	37M2220001	1.27	60	14	50	13	130.7	30	7.5	3	5.5	60	49.5	30	40



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød	øD	H max	L1	L2	L3	L4	RT	W	W1	W3 max	W4
BRUSHLESS + BRAKE (DELTA)	37M4220001	1.27	60	14	50	13	166.8	30	7.5	3	5.5	60	49.5	30	40



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød	øD	L	L1	L2	L3	L4	RT	W	W1
BRUSHLESS (DELTA)	37M2770000	9.55	130	24	110	113	187.5	55	11.5	6	9	130	102.53
BRUSHLESS + BRAKE (DELTA)	37M4770000	9.55	130	24	110	111	216	55	11.5	6	9	130	102.53