SUMMARY ELECTRICAL ACTUATORS

AXIS AND ELECTRIC CYLINDERS

ELECTRIC SLIDES

ELECTRIC MOTORS

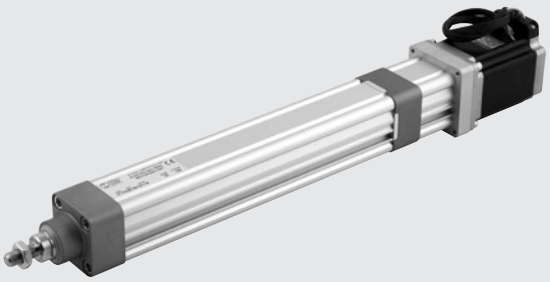
METAL WORK PNEUMATIC

DRIVES AND ACCESSORIES

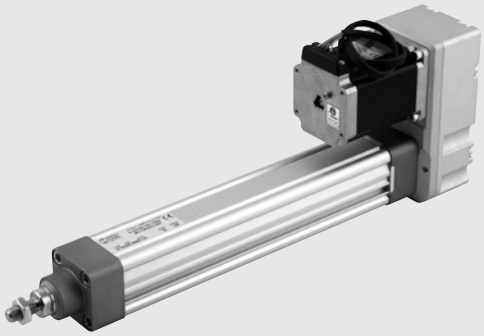
ELECTRIC CYLINDER
SERIES ELEKTRO ISO 15552

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.
Stepping 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 gearbox, 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.

in-line version



geared version



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.

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 **A5**.32)			IP55	
BRUSHLESS motors		IP40 or IP65 (see key to codes on page **A5**.32)			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	80 (in order to re-grease the screw)			125 (in order to re-grease the screw)	
Maximum stroke	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; wth or without planetary gearbox	
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 ...

N.B.: On request available with:
- piston rod in stainless steel (Ø32, Ø50 in AISI 316; Ø63, Ø63HD, Ø80, Ø100 in AISI 304), with limitations to the maximum stroke;
- head-sleeve fixing screws in AISI 316 stainless steel;
- lubrication grease compatible with the food industry, certified NSF Cat. H1 (accidental contact with food).

METAL WORK PNEUMATIC

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_o)*	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 **A5**.10)														
Maximum number of revs	1/min	4000		3000			2500			2500		2000			3000	2200
Maximum speed (V_{max})	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 **A5**.12 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
Weight of the in-line transmission (without motor)	g	300		900			1100			1700			2900	
Weight of the geared transmission (without motor)	g	1100		2000			3000			6300			8700	
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

N.B.: You get the total weight of a complete cylinder by adding: weight stroke 0 + stroke [mm] x weight for each mm of stroke + weight of the transmission + weight of the motor.

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	kgmm²	1.2407	2.4309	5.3455	6.1360	9.1113	12.4043	14.8767	23.5427
J1 each metre of stroke	kgmm²/m	12.2592	17.8468	35.2305	38.5264	49.1936	86.2990	96.6652	116.3671
J2 each kg of load	kgmm²/kg	0.4053	3.6476	0.6333	2.5332	6.4849	0.6333	2.5332	10.1327
J3 in-line transmission	kgmm²	5.2		5.2			36.2		
J3 geared transmission	kgmm²	53.2		126.5			237.7		

		Ø 80								
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		
J0 at stroke 0	kgmm²	430		420.3			438.8			
J1 each metre of stroke	kgmm²/m	688		608			753			
J2 each kg of load	kgmm²/kg	0.6333		2.5330			25.9382			
J3 in-line transmission	kgmm²	148.2	-	148.2	-	-	148.2	-		
J3 geared transmission	kgmm²	1041.7	388.3	1041.7	388.3	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	kgmm²	1357			1042.4		
J1 each metre of stroke	kgmm²/m	3984			1869.3		
J2 each kg of load	kgmm²/kg	2.5330			40.5284		
J3 in-line transmission	kgmm²	327.8	-	594.8	327.8	-	549.8
J3 geared transmission	kgmm²	1041.7	1161.1	-	1041.7	1161.1	-

● in line with gearbox

The total mass moment of inertia (Jtot) reduced for the motor is: Jtot = [J1 · Stroke [m] + J2 · (Load [kg] + Mx [kg]) + J0] · τ^2 + J3
Mx is defined in the weight table.

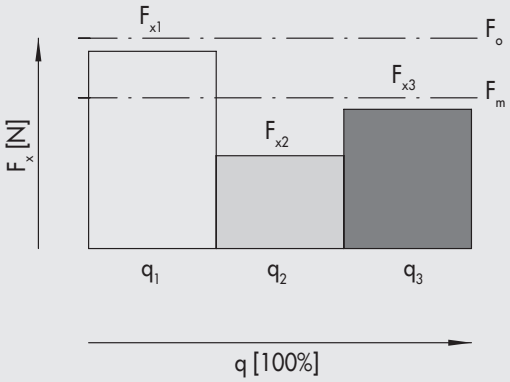
CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

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

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

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

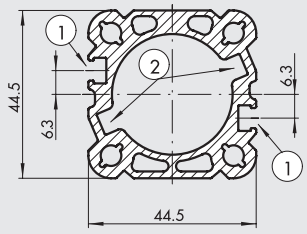


F_x = Axial load at stage x
F_m = Mean axial load during extension
F_o = Static axial load
q = Time segment
V_x = Speed in the phase x
V_m = Average speed

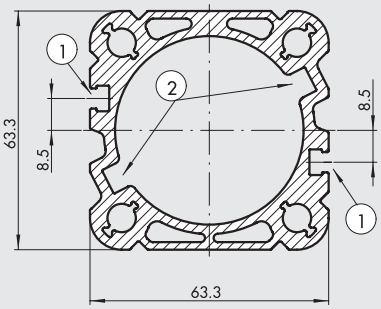
The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graphs on page **A5**.10 show screw life as a function of F_m

BARREL CROSS SECTION

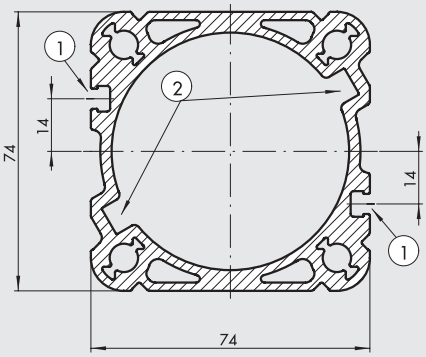
Ø 32



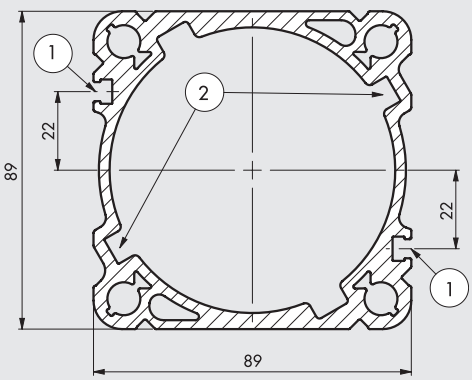
Ø 50



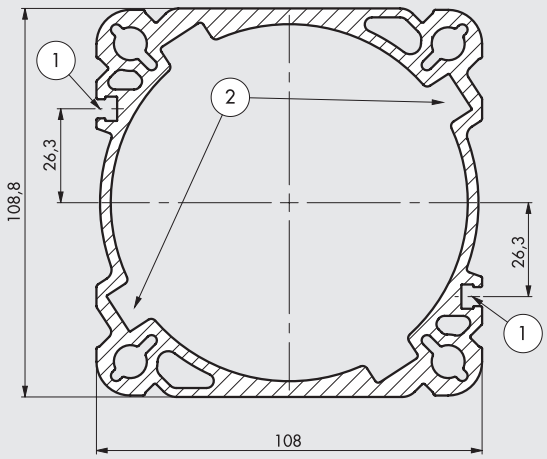
Ø 63



Ø 80



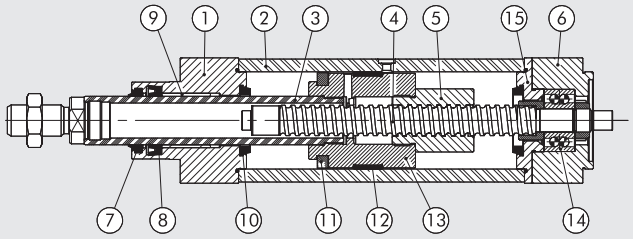
Ø 100



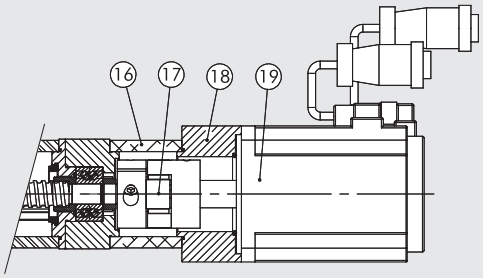
① Slots for sensors
② Slots for anti-rotation

COMPONENTS

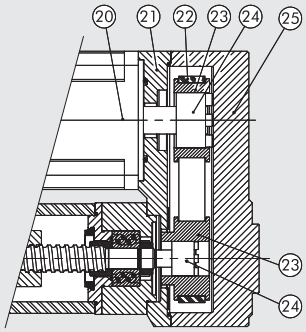
CYLINDER



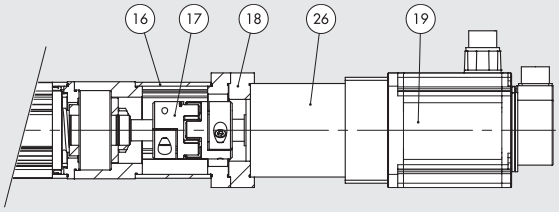
CYLINDER WITH IN-LINE MOTOR



CYLINDER WITH GEARED MOTOR



CYLINDER WITH MOTOR AND GEARBOX

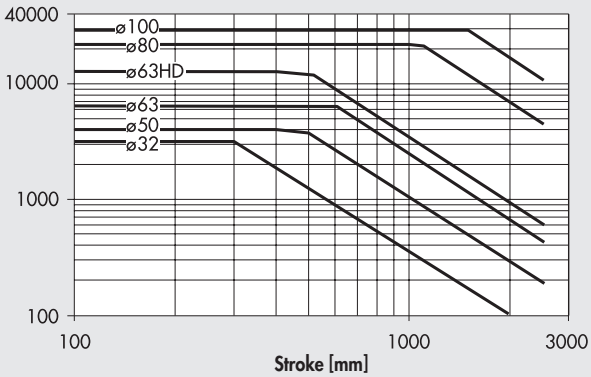


① FRONT CYLINDER HEAD: anodized aluminium
② BARREL: extruded and anodized aluminium alloy
③ PISTON ROD: grinded chromed steel
④ WORM SCREW: hardened steel
⑤ BALL SCREW NUT: steel
⑥ REAR CYLINDER HEAD: anodized aluminium
⑦ WIPER RING: polyurethane
⑧ PISTON ROD GASKET: NBR (IP55/ IP65 version only)
⑨ GUIDE 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: anodized aluminium
⑯ BELL: extruded and anodized aluminium alloy
⑰ COUPLING
⑱ ADAPTOR PLATE: anodized aluminium
⑲ ELECTRIC MOTOR
⑳ ELECTRIC MOTOR
㉑ TRANSMISSION PLATE: anodized aluminium
㉒ DRIVE BELT
㉓ PULLEY: steel
㉔ SHRINK DISC
㉕ COVER: anodized aluminium
㉖ PLANETARY GEARBOX

PEAK LOADS

The following load conditions applied to the piston rod must be met.

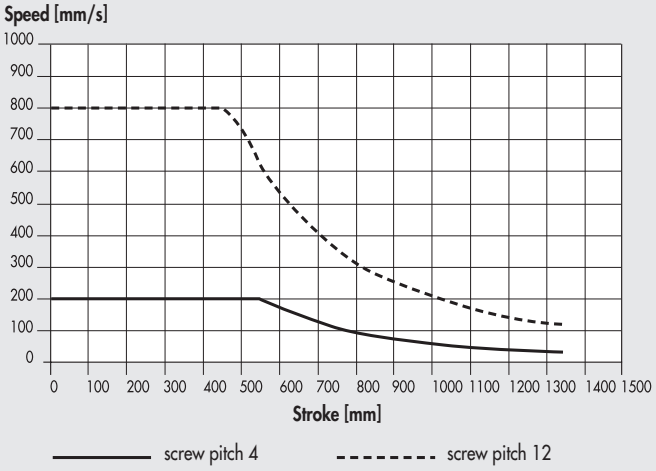
Axial load [N]



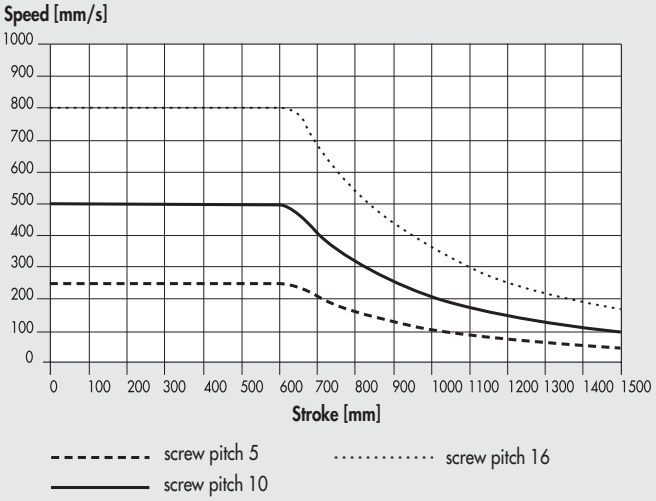
CRITICAL VELOCITY

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

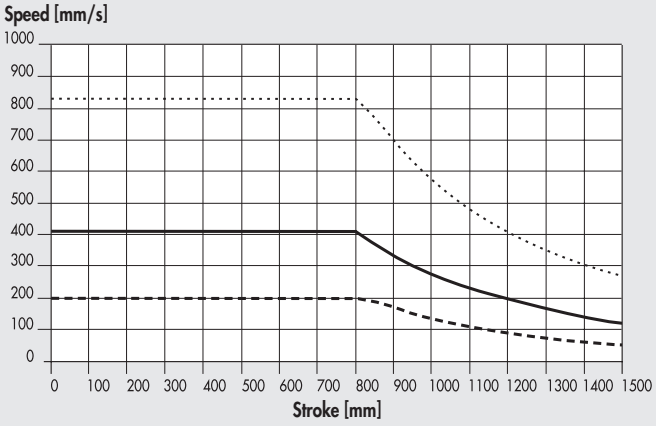
Ø 32



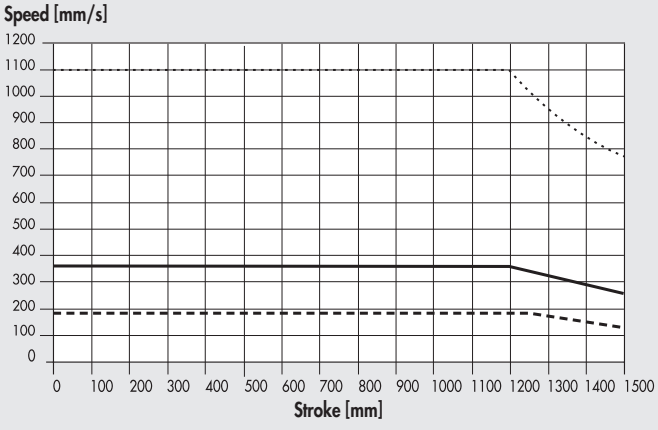
Ø 50



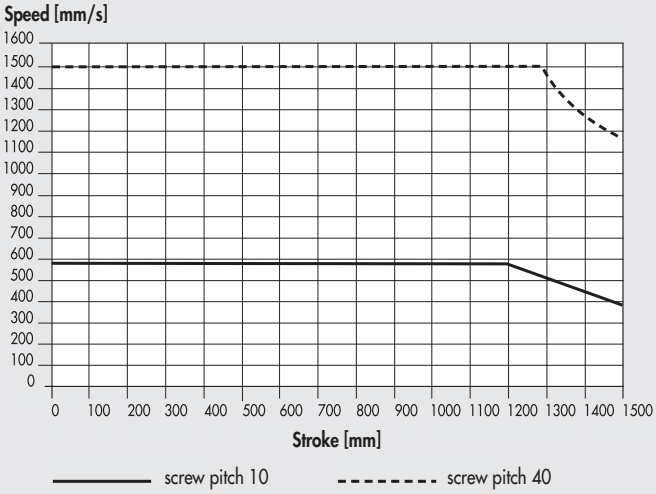
Ø 63 - Ø 63 HD



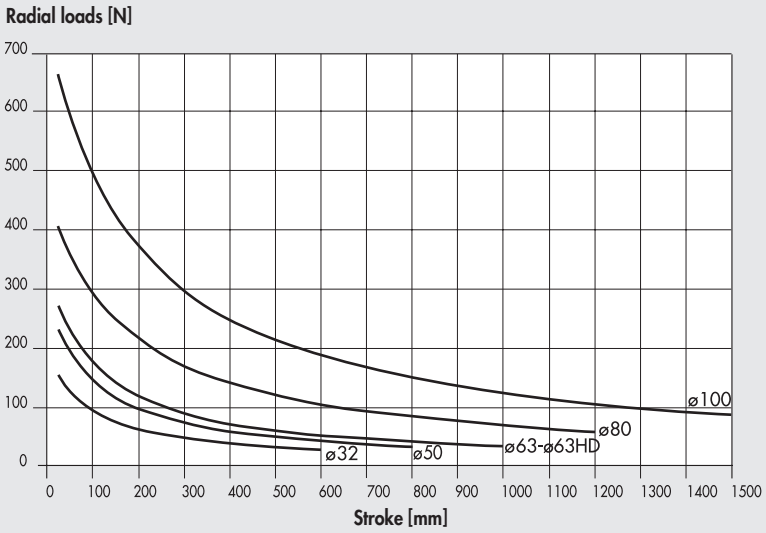
Ø 80



Ø 100



MAXIMUM RADIAL LOADS ON PISTON ROD



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

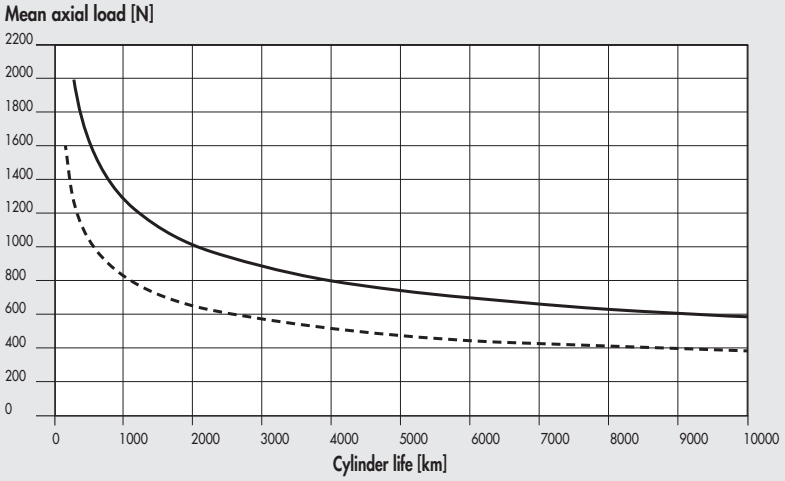
The friction generated in the mechanical system is taken into account.

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

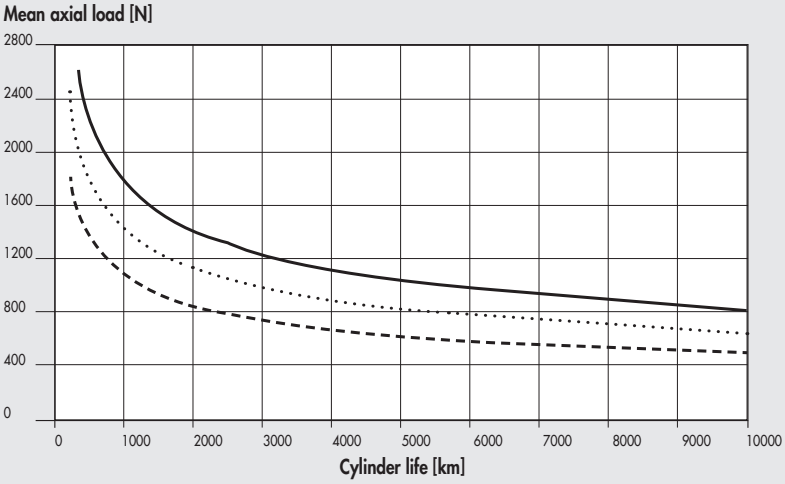
LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD

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

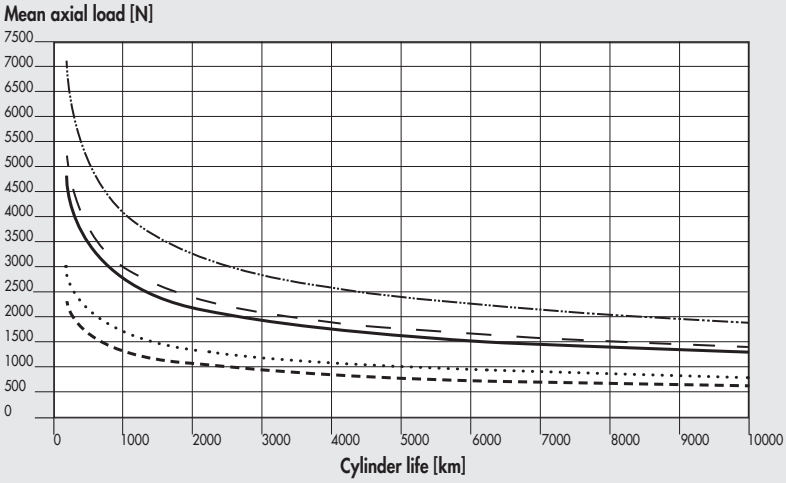
Ø 32



Ø 50

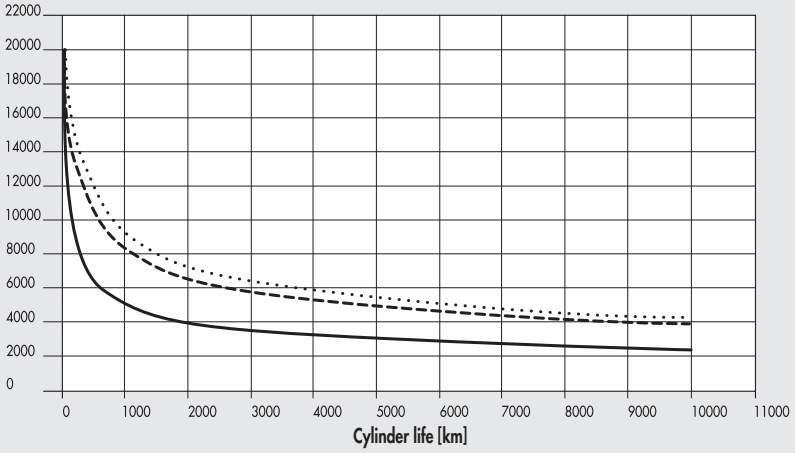


Ø 63 - Ø 63 HD



Ø 80

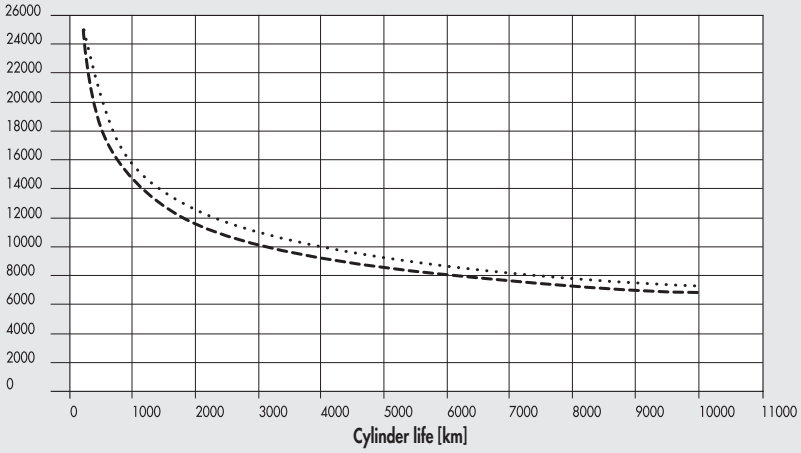
Mean axial load [N]



screw pitch 5
screw pitch 10
screw pitch 32

Ø 100

Mean axial load [N]



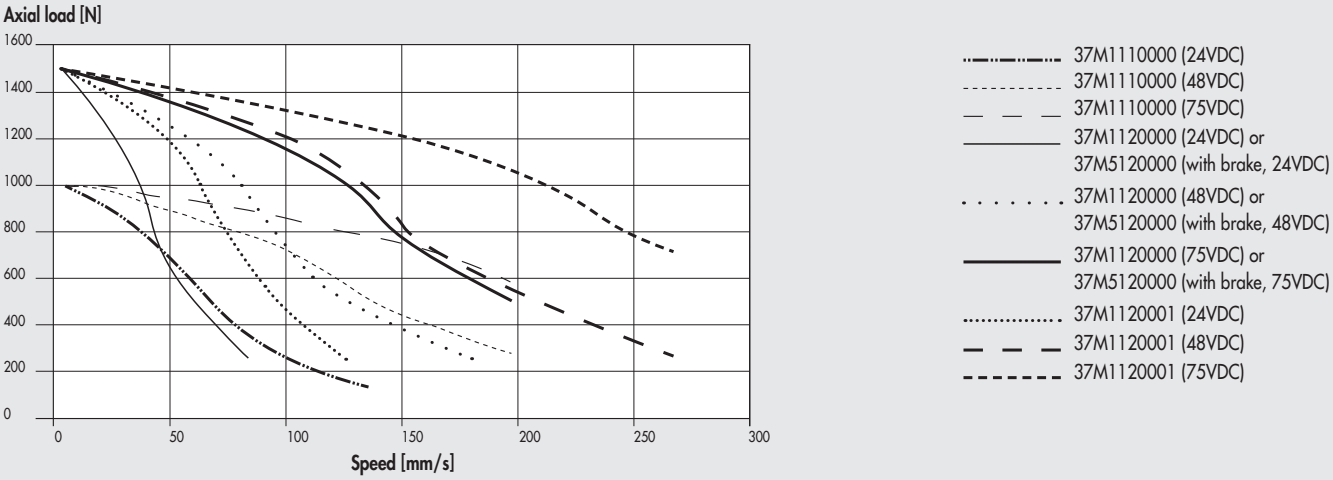
screw pitch 10
screw pitch 40

NOTES

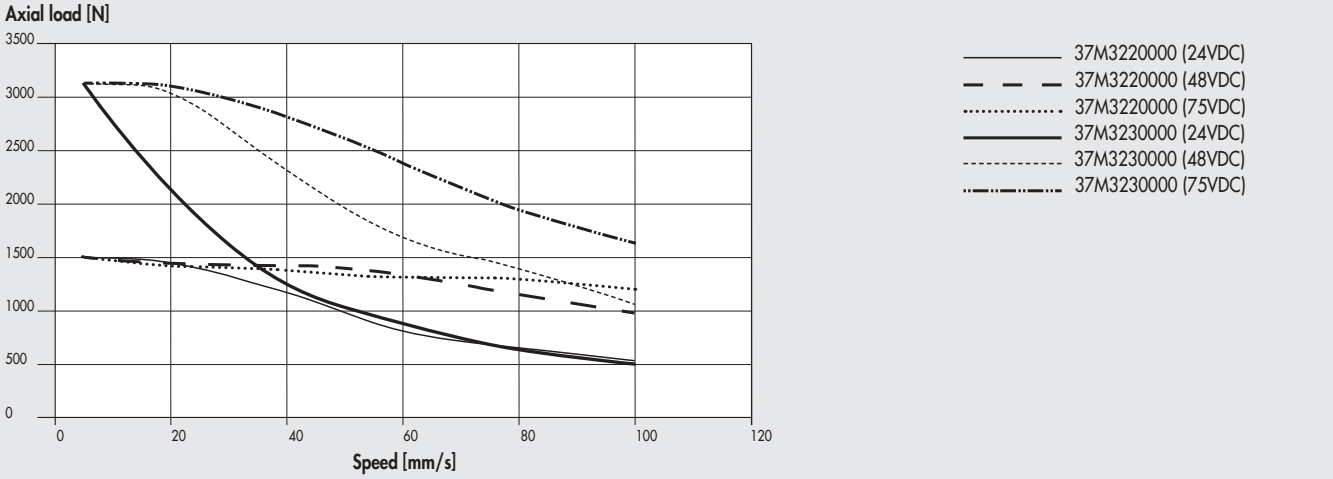
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE)

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%.

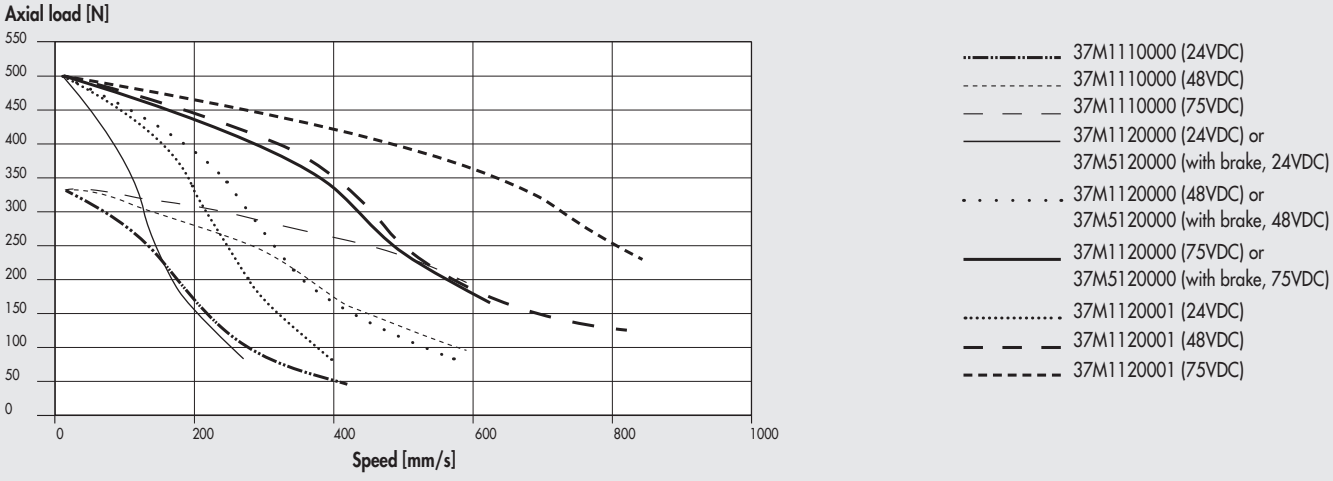
Ø 32 with pitch 4 screw, STEPPING motors and motor 1 STEPPING with BRAKE



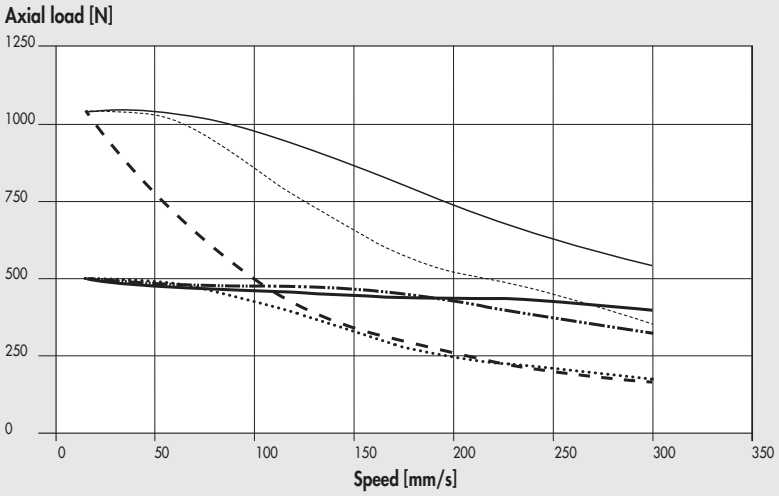
Ø 32 with pitch 4 screw, STEPPING motors with BRAKE + ENCODER



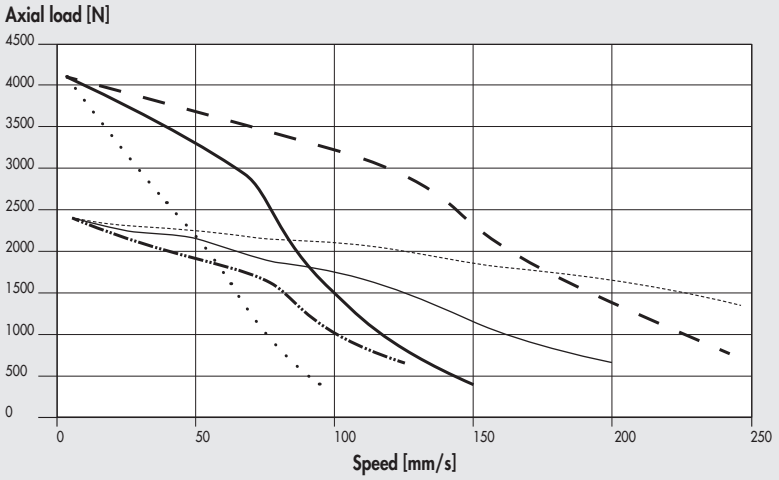
Ø 32 with pitch 12 screw, STEPPING motors and motor 1 STEPPING with BRAKE



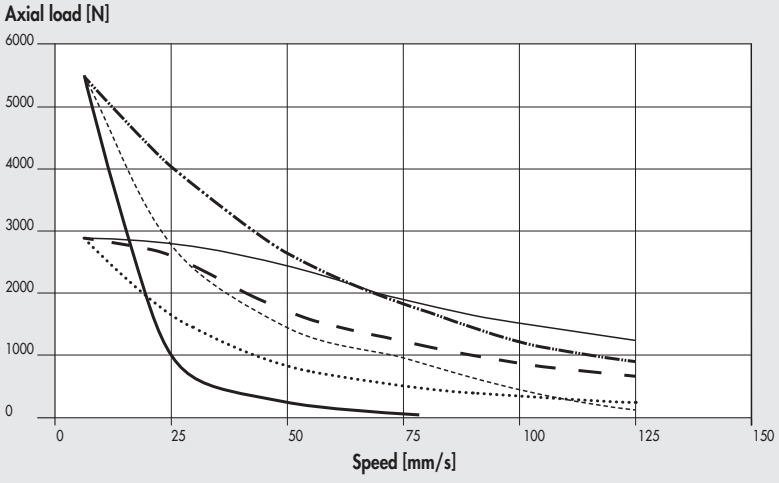
Ø 32 with pitch 12 screw, STEPPING motors with BRAKE + ENCODER



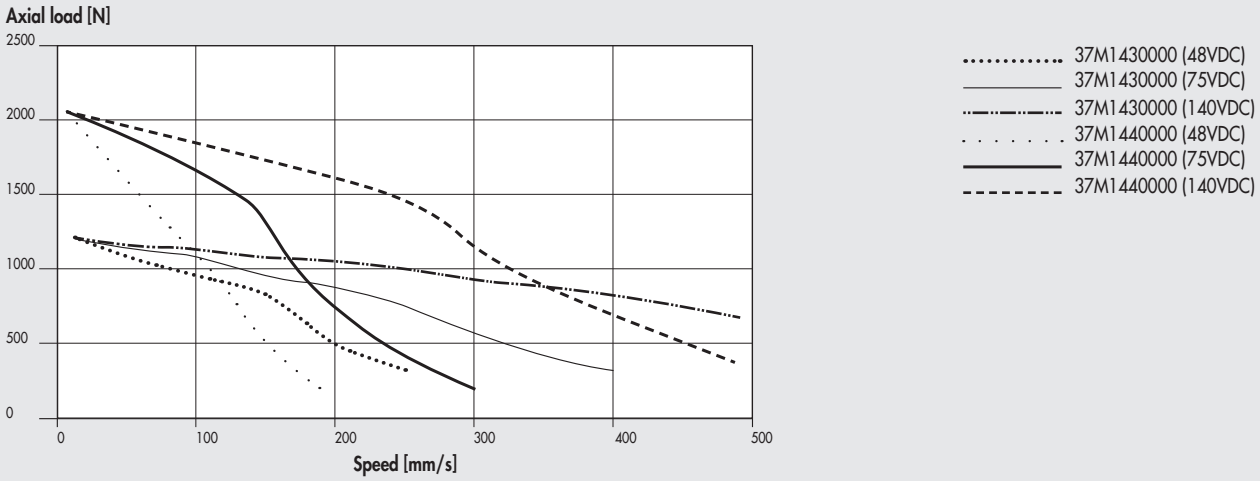
Ø 50 with pitch 5 screw, STEPPING motors



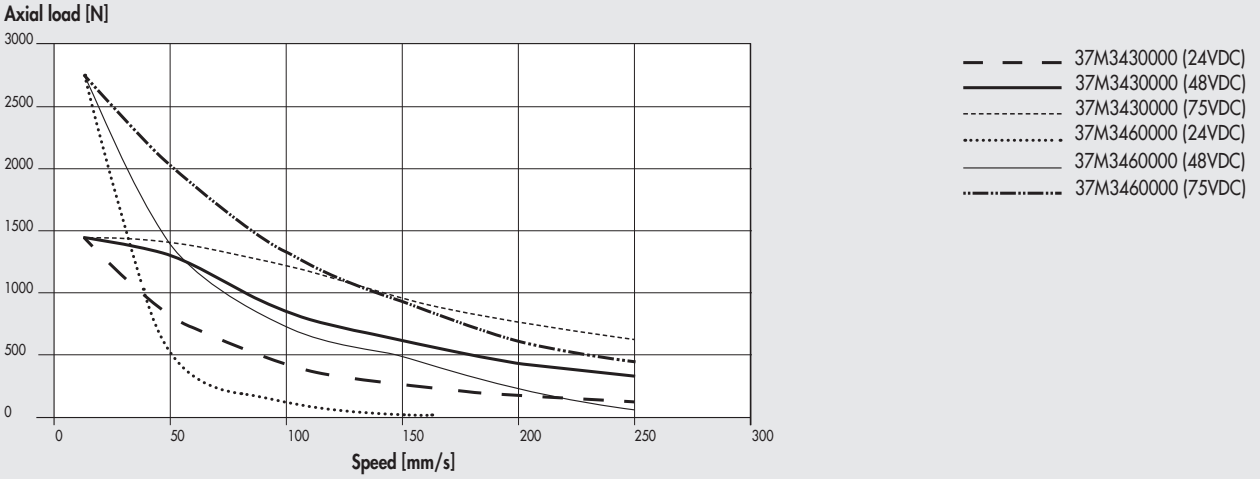
Ø 50 with pitch 5 screw, STEPPING motors with BRAKE + ENCODER



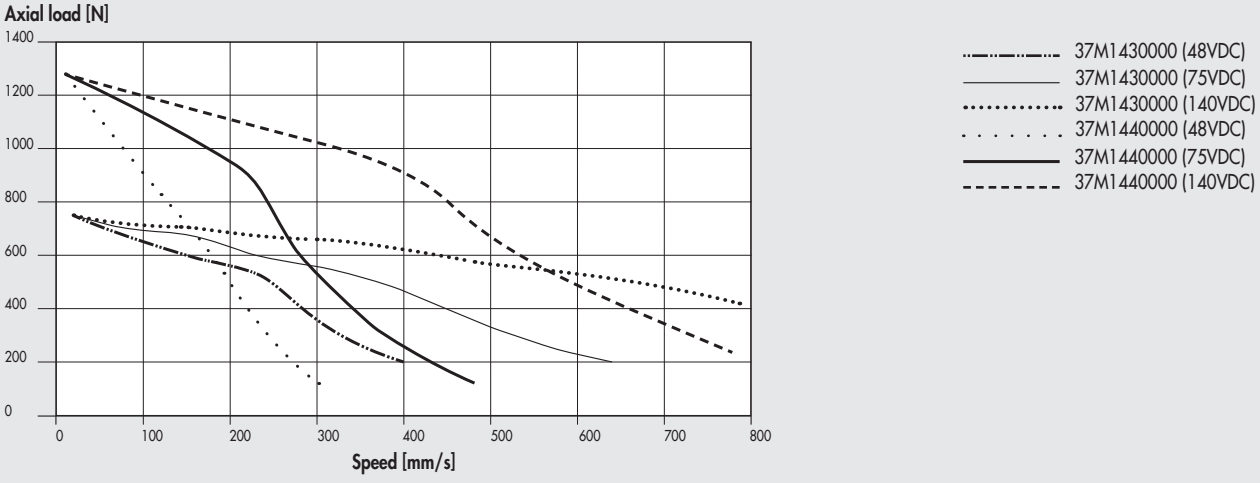
Ø 50 with pitch 10 screw, STEPPING motors



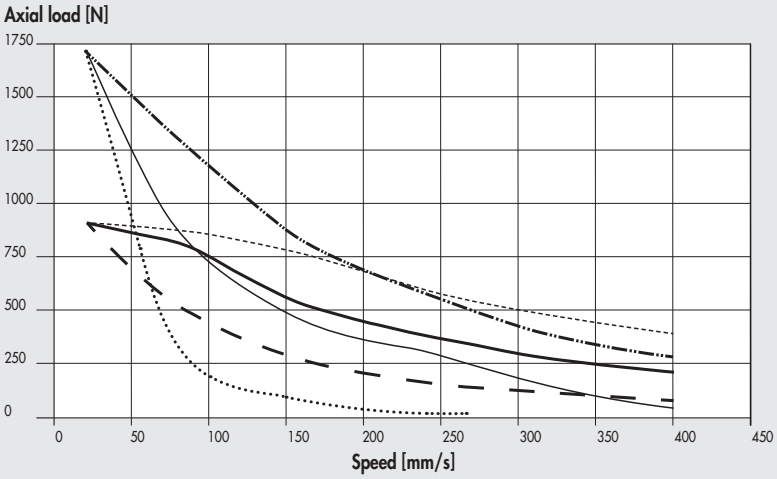
Ø 50 with pitch 10 screw, STEPPING motors with BRAKE + ENCODER



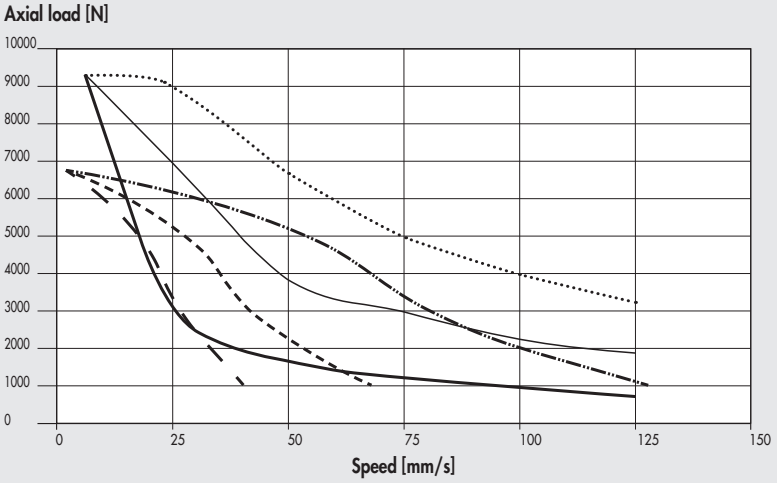
Ø 50 with pitch 16 screw, STEPPING motors



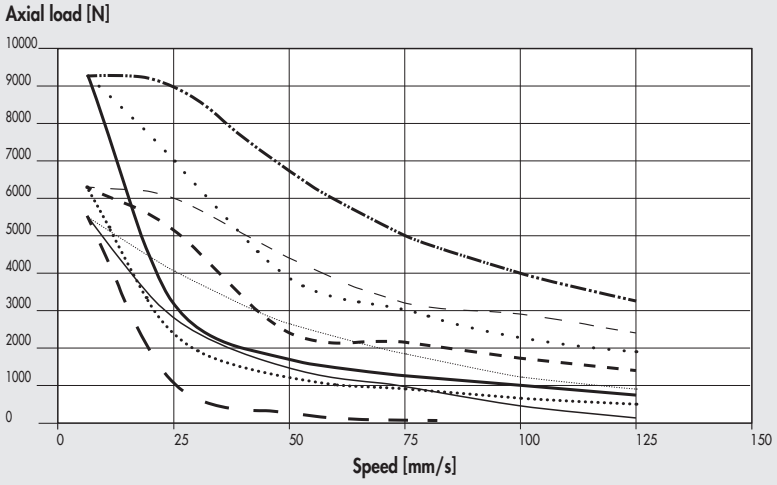
Ø 50 with pitch 16 screw, STEPPING motors with BRAKE + ENCODER



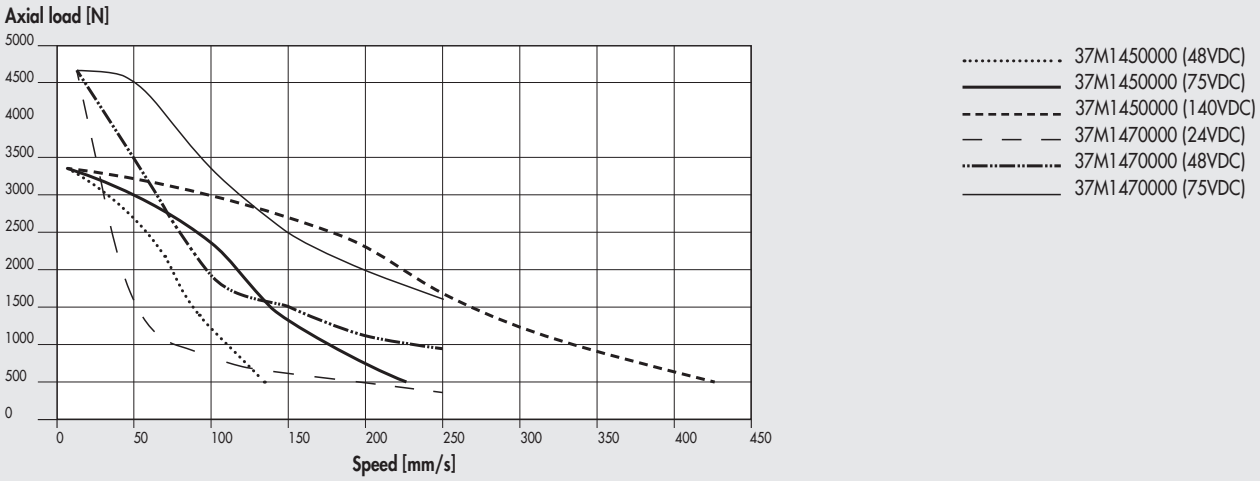
Ø 63 with pitch 5 screw, STEPPING motors



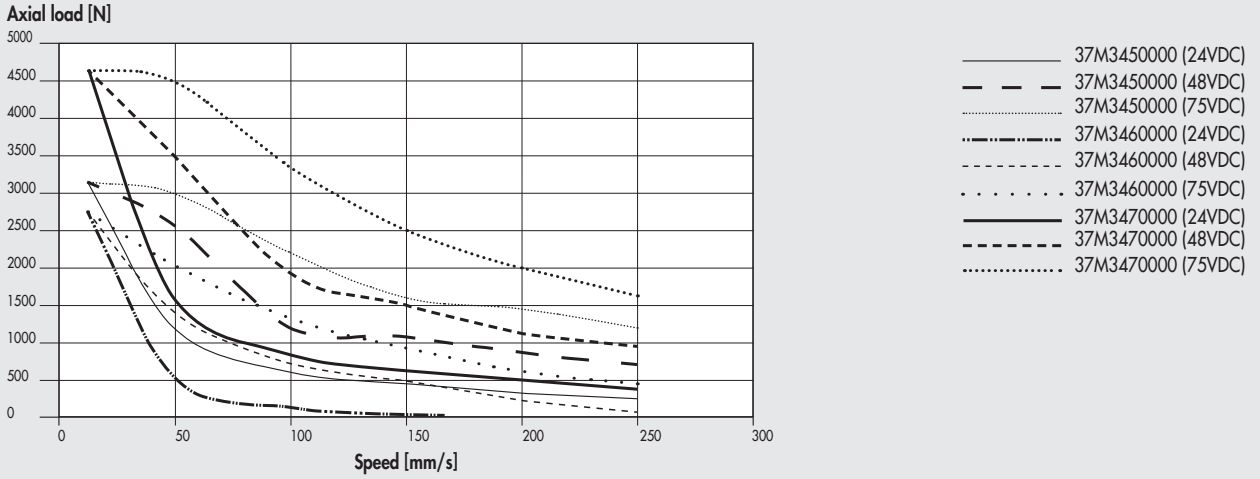
Ø 63 with pitch 5 screw, STEPPING motors with BRAKE + ENCODER



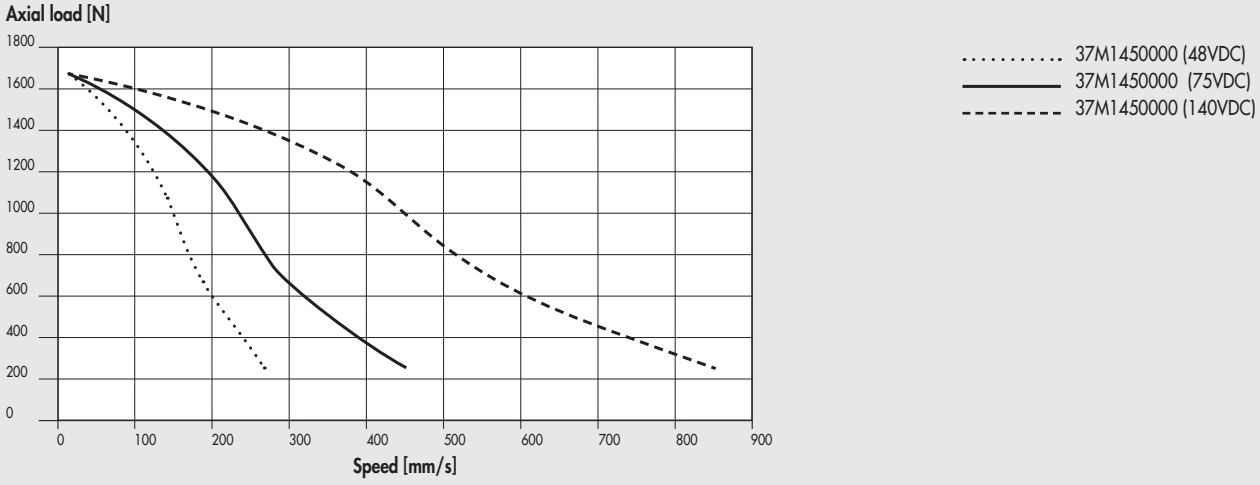
Ø 63 with pitch 10 screw, STEPPING motors



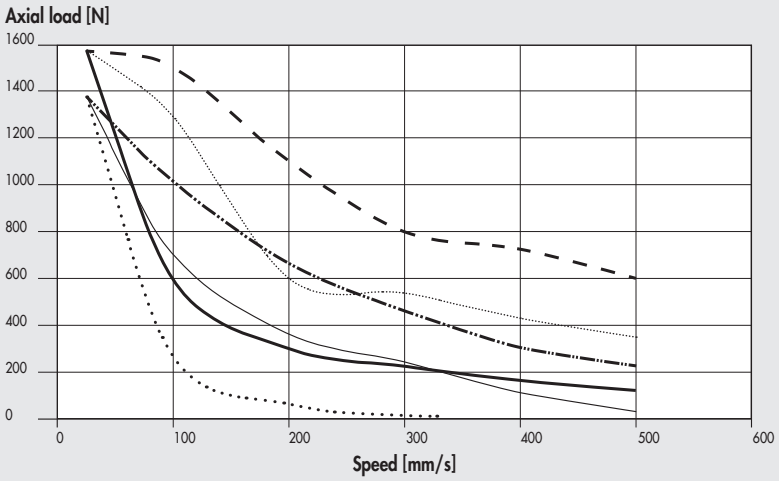
Ø 63 with pitch 10 screw, STEPPING motors with BRAKE + ENCODER



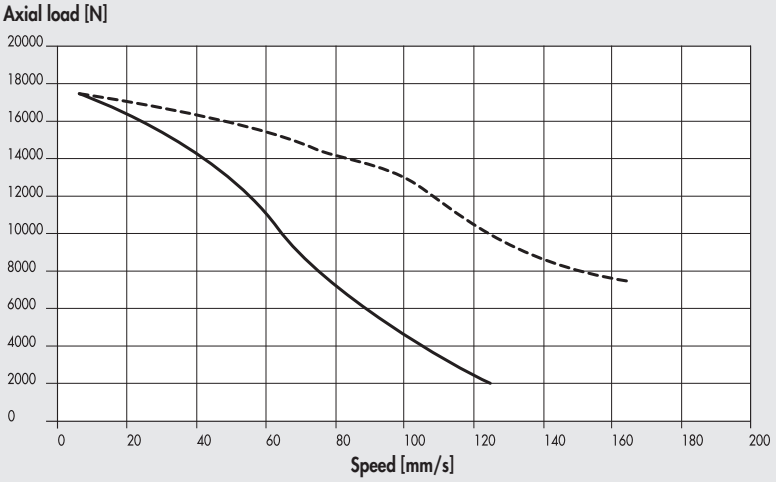
Ø 63 with pitch 20 screw, STEPPING motors



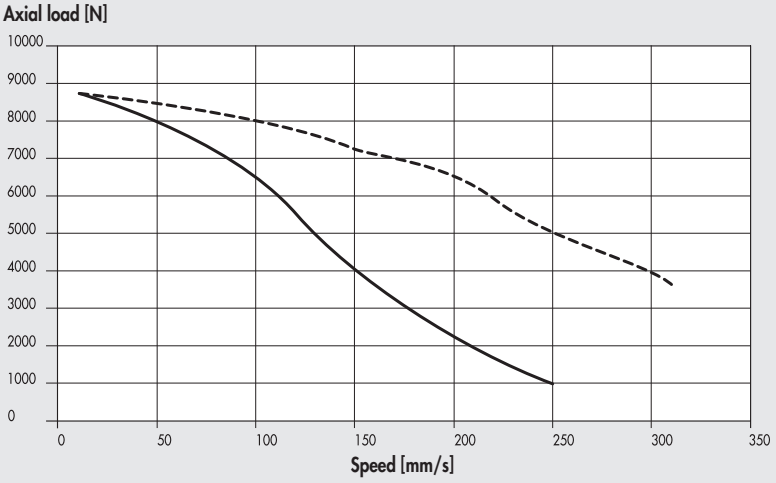
Ø 63 with pitch 20 screw, STEPPING motors with BRAKE + ENCODER



ø 80 with pitch 5 screw, STEPPING motors

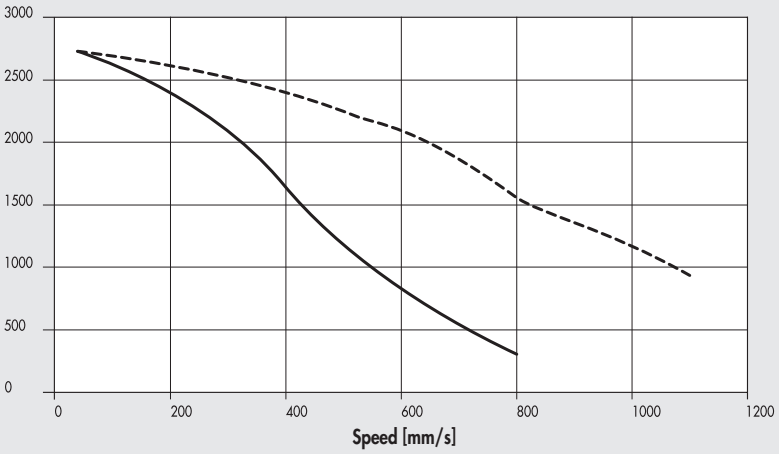


ø 80 with pitch 10 screw, STEPPING motors



Ø 80 with pitch 32 screw, STEPPING motors

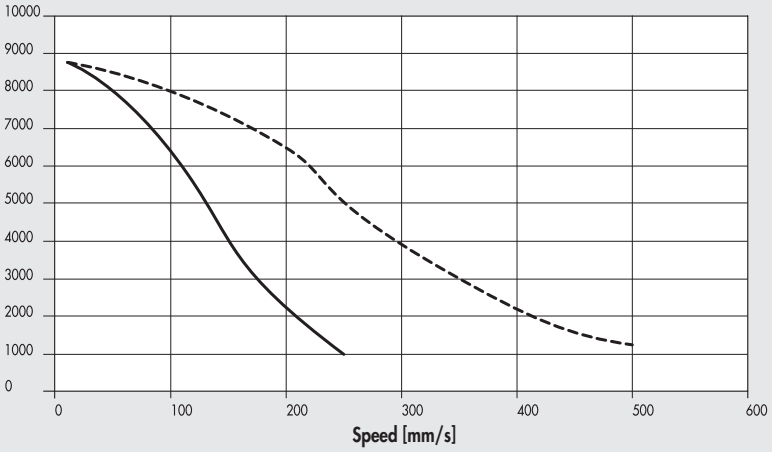
Axial load [N]



37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

Ø 100 with pitch 10 screw, STEPPING motors

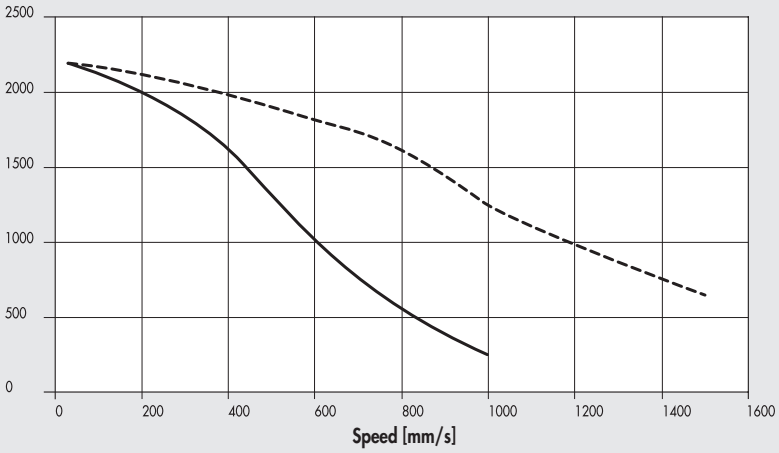
Axial load [N]



37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

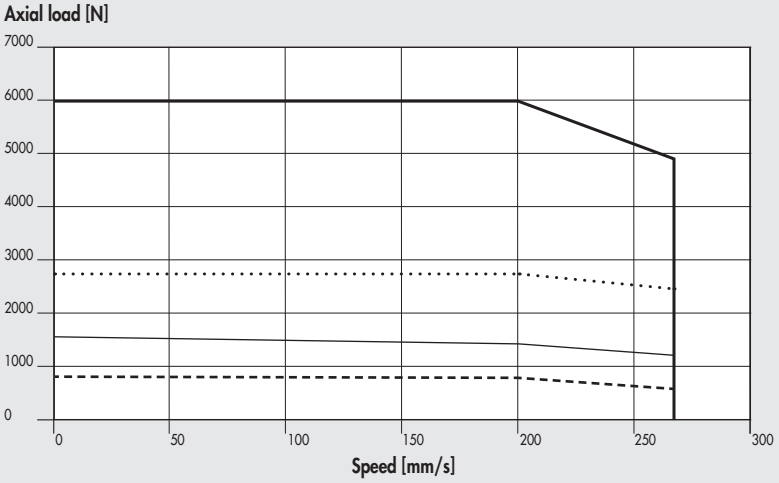
Ø 100 with pitch 40 screw, STEPPING motors

Axial load [N]



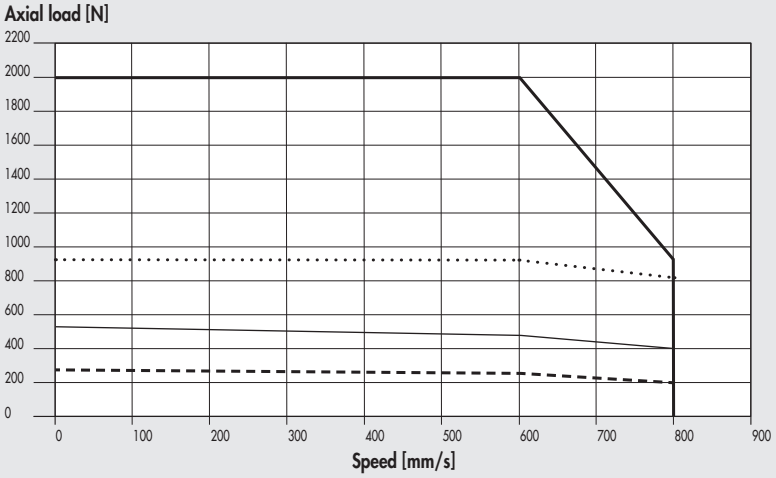
37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

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



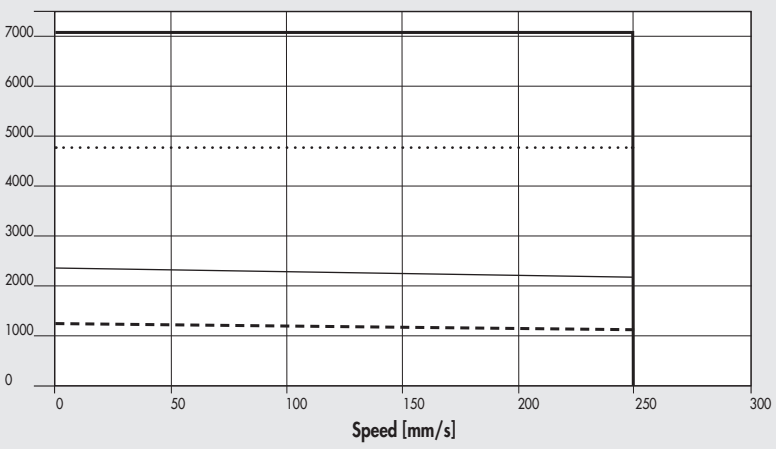
- Nominal 37M2200000 or 37M4200000 (with brake) + 37D2400008 (200W)
- Nominal 37M2220000 or 37M4220000 (with brake) + 37D2400008 (400W)
- Maximum 37M2200000 or 37M4200000 (with brake) + 37D2400008 (200W)
- Maximum 37M2220000 or 37M4220000 (with brake) + 37D2400008 (400W)

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



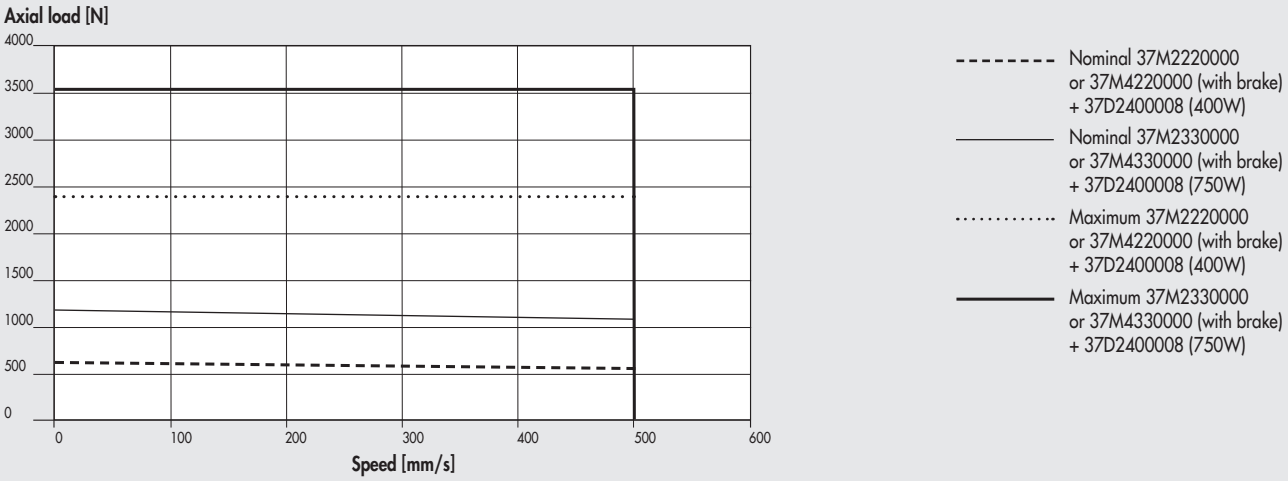
- Nominal 37M2200000 or 37M4200000 (with brake) + 37D2400008 (200W)
- Nominal 37M2220000 or 37M4220000 (with brake) + 37D2400008 (400W)
- Maximum 37M2200000 or 37M4200000 (with brake) + 37D2400008 (200W)
- Maximum 37M2220000 or 37M4220000 (with brake) + 37D2400008 (400W)

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

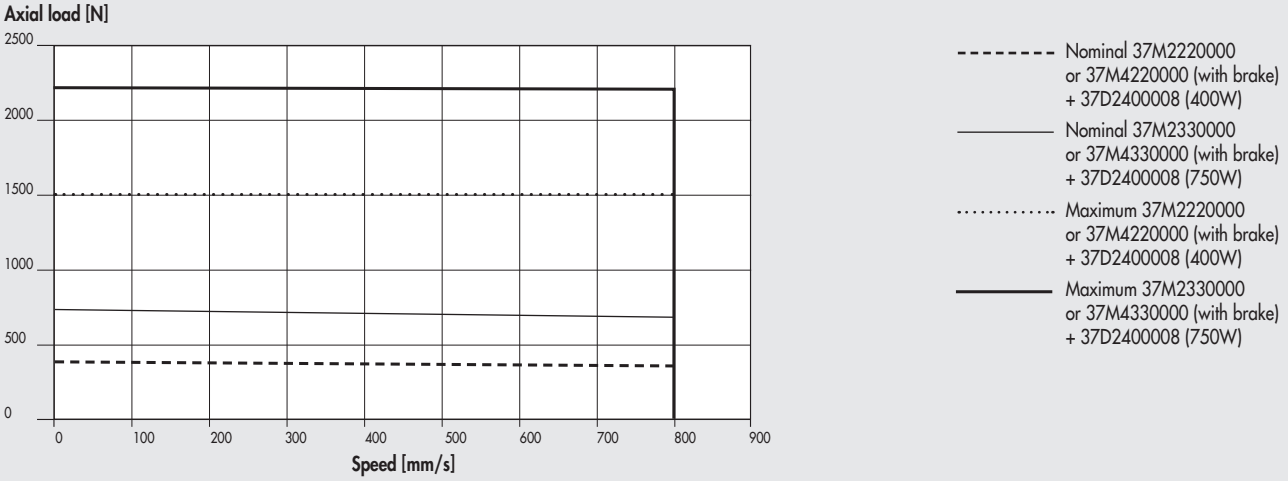


- Nominal 37M2220000 or 37M4220000 (with brake) + 37D2400008 (400W)
- Nominal 37M2330000 or 37M4330000 (with brake) + 37D2400008 (750W)
- Maximum 37M2220000 or 37M4220000 (with brake) + 37D2400008 (400W)
- Maximum 37M2330000 or 37M4330000 (with brake) + 37D2400008 (750W)

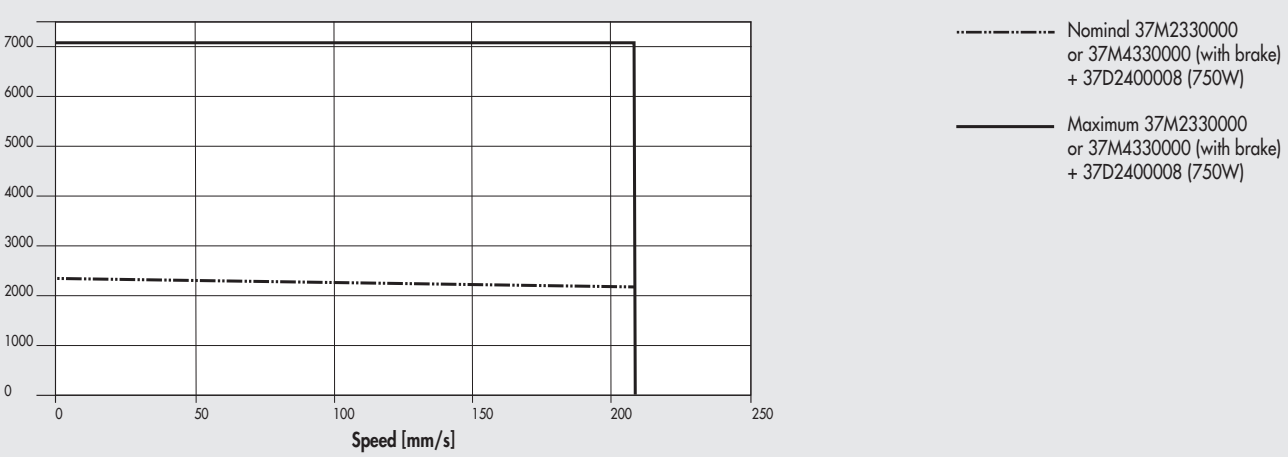
Ø 50 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE



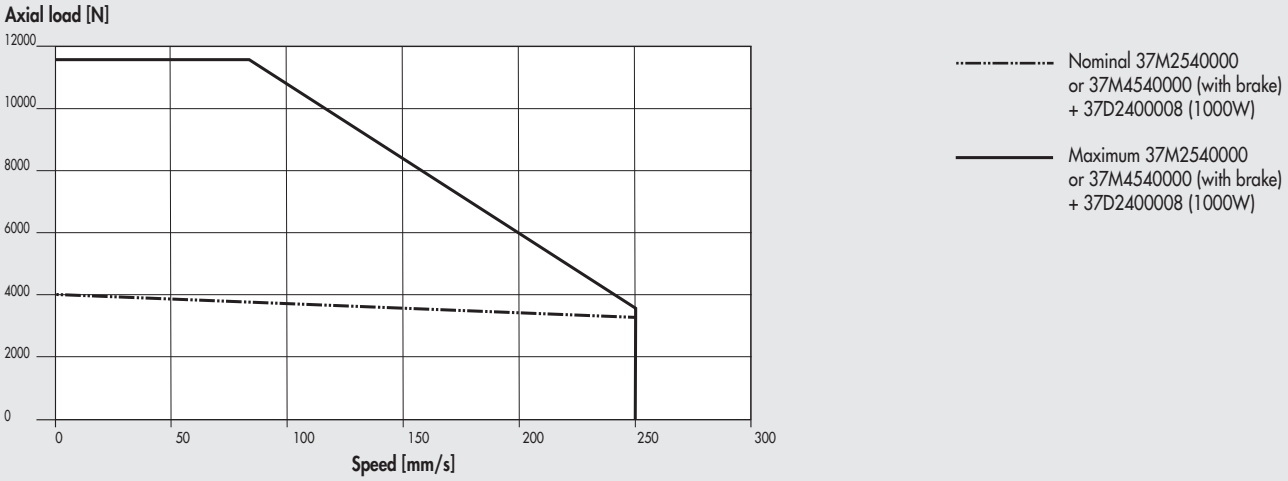
Ø 50 with pitch 16 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE



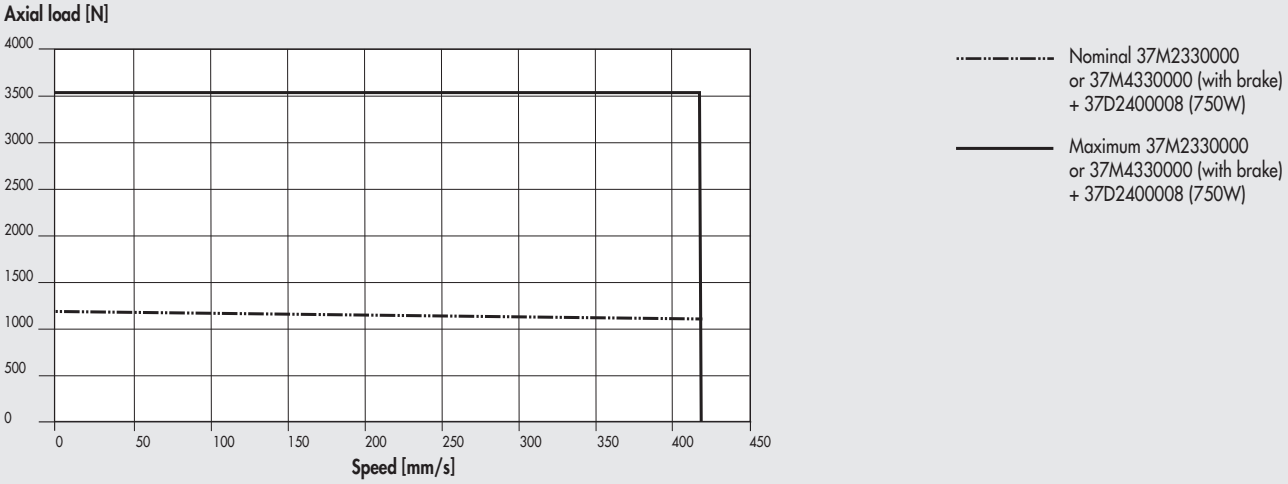
Ø 63 - Ø 63 HD with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (750 W)



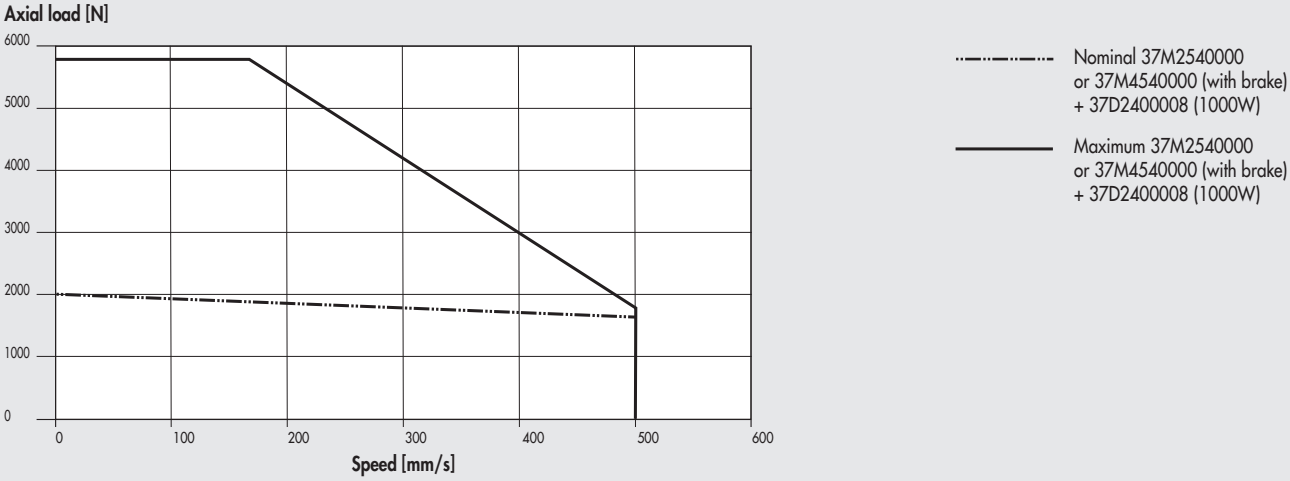
Ø 63 HD with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000 W)



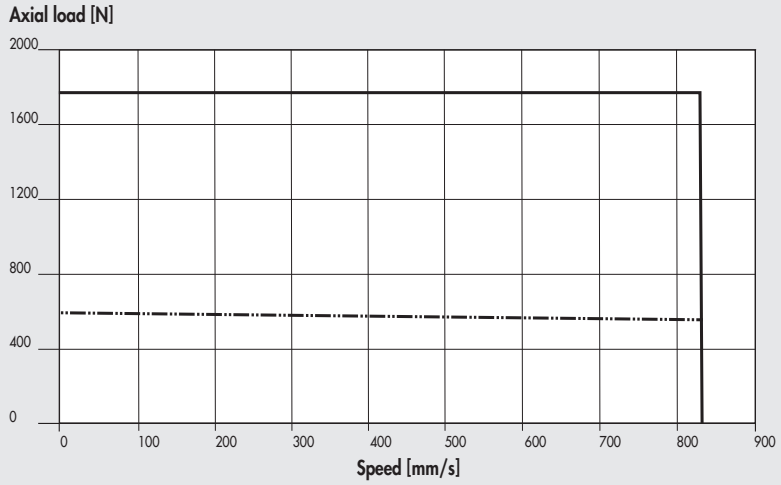
Ø 63 - Ø 63 HD with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (750 W)



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

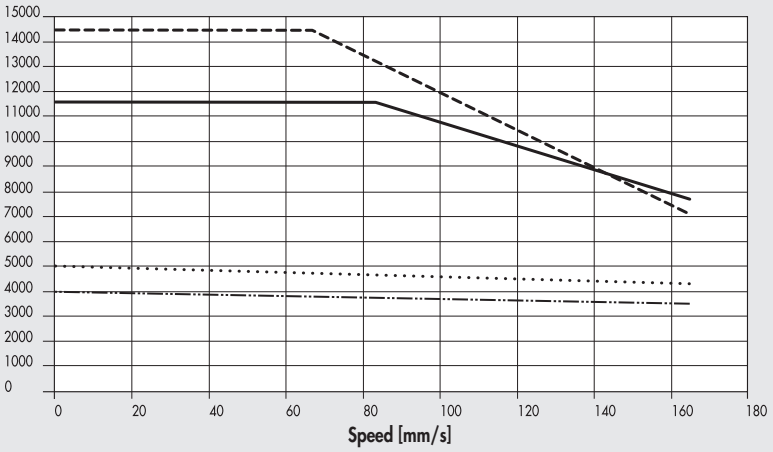


Ø 63 with pitch 20 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE



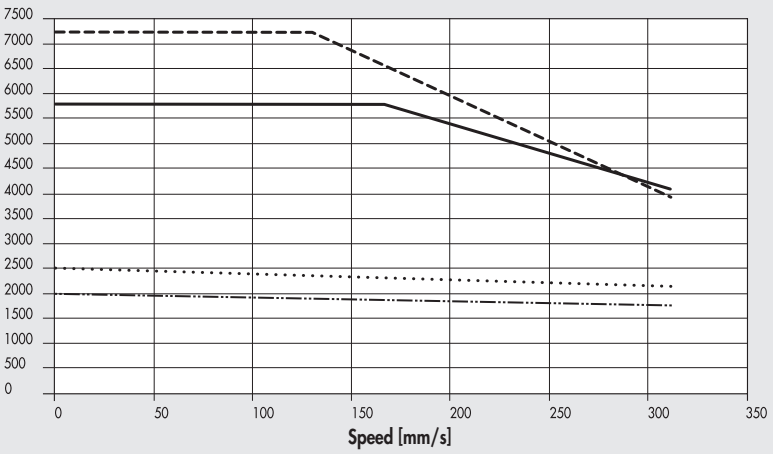
- Nominal 37M2330000 or 37M4330000 (with brake) + 37D2400008 (750W)
- Maximum 37M2330000 or 37M4330000 (with brake) + 37D2400008 (750W)

Ø 80 with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000W)



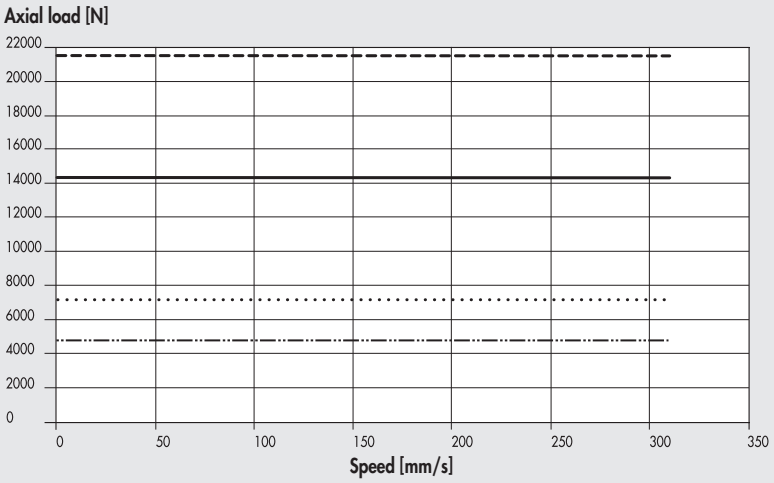
- Maximum 37M2540000 or 37M4540000 (with brake) + 37D2400008 (1000W) in-line version (1:1)
- Nominal 37M2540000 or 37M4540000 (with brake) + 37D2400008 (1000W) in-line version (1:1)
- Maximum 37M2540000 or 37M4540000 (with brake) + 37D2400008 (1000W) geared version (1:1.25)
- Nominal 37M2540000 or 37M4540000 (with brake) + 37D2400008 (1000W) geared version (1:1.25)

Ø 80 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000W)



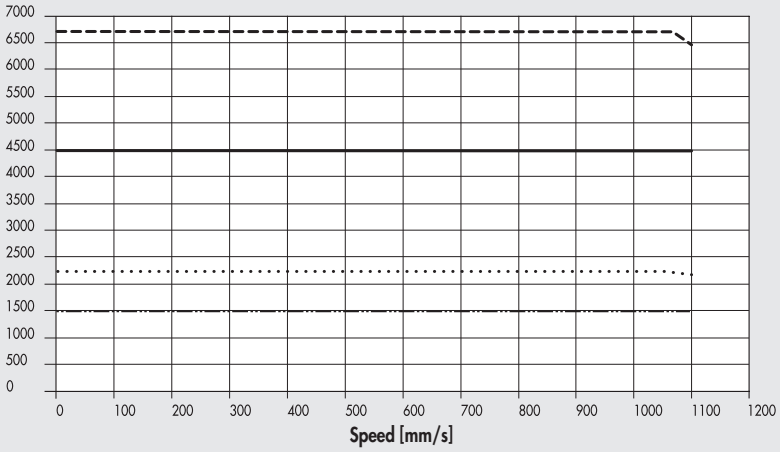
- Maximum 37M2540000 or 37M4540000 (with brake) + 37D2400008 (1000W) in-line version (1:1)
- Nominal 37M2540000 or 37M4540000 (with brake) + 37D2400008 (1000W) in-line version (1:1)
- Maximum 37M2540000 or 37M4540000 (with brake) + 37D2400008 (1000W) geared version (1:1.25)
- Nominal 37M2540000 or 37M4540000 with brake) + 37D2400008 (1000W) geared version (1:1.25)

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



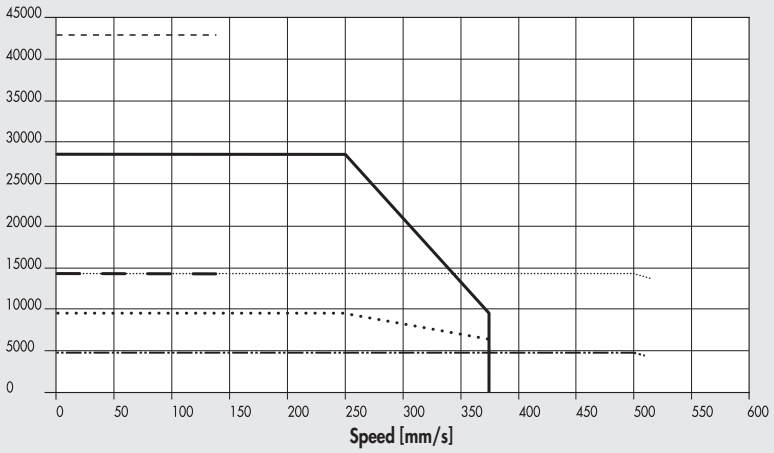
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:1.5)
- Nominal 37M2770000 or 37M4770000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

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



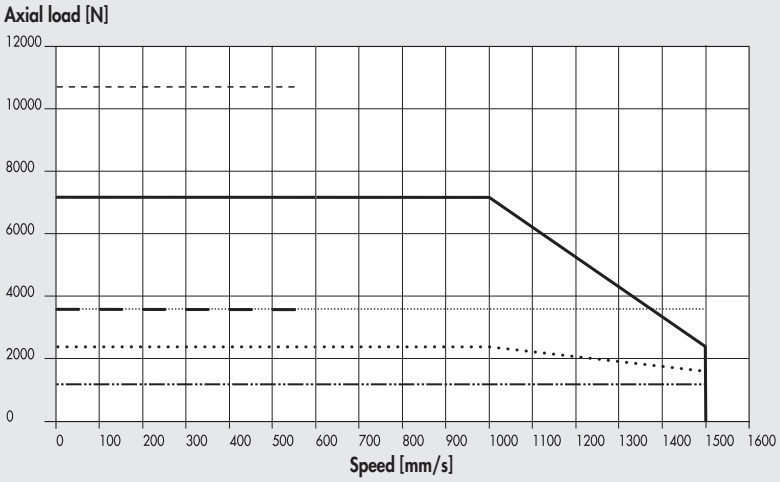
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:1.5)
- Nominal 37M2770000 or 37M4770000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

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



- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gearbox (1:3)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gearbox (1:3)
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)

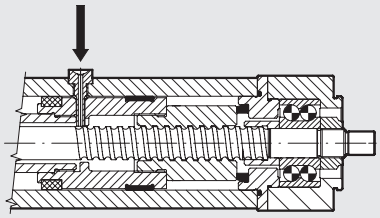
Ø 100 with pitch 40 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)



- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gearbox (1:3)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gearbox (1:3)
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- Maximum 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- Nominal 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)

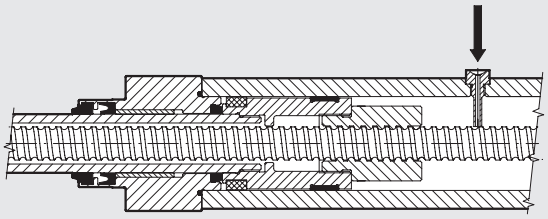
LUBRICATION DIAGRAMS

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 in the drawing on **next page**).
- Screw the lubricating pin (see accessory on page **A5**.37) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) using the suitable lubricator according to the quantity in table.
- 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 at least once a year.

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 in the drawing on **next page**).
- Screw the lubricating pin (see accessory on page **A5**.37) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) using the suitable lubricator according to the quantity in table.
- 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 at least once a year.

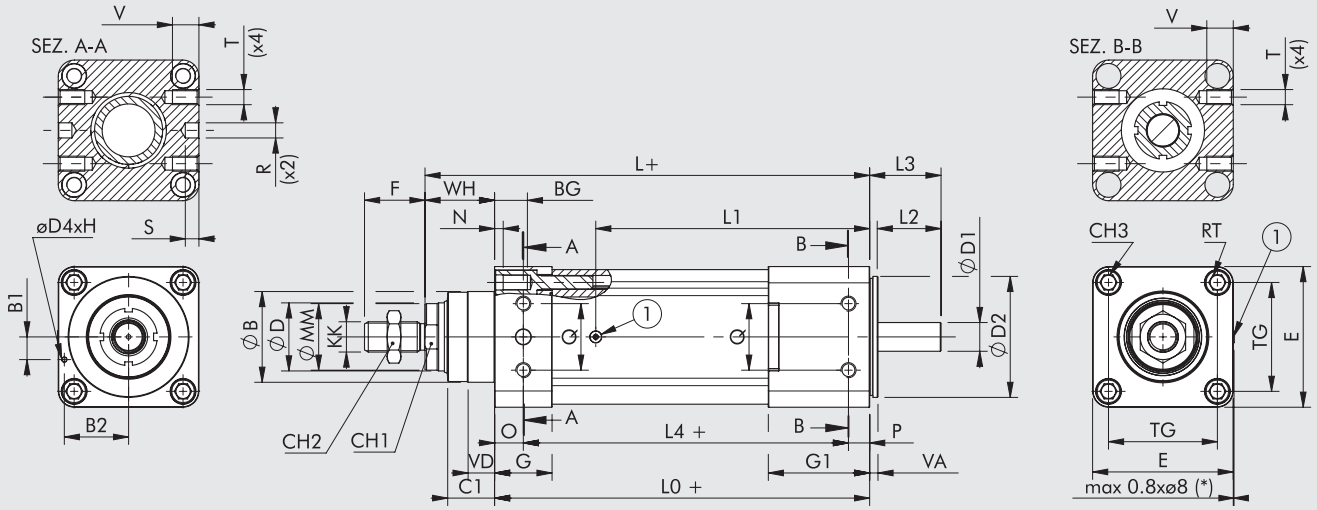
		Ø 32		Ø 50			Ø 63			Ø 63 HD		Ø 80			Ø 100	
Screw pitch (p)	mm	4	12	5	10	16	5	10	20	5	10	5	10	32	10	40
Relube grease quantity	g	0.3	0.6	0.9	1.5	2.1	1.5	1.8	3	1.5	1.8	2.1	3.3	4.8	7.2	12.9
	cc	0.26	0.52	0.77	1.30	1.81	1.30	1.55	2.60	1.30	1.55	1.81	2.84	4.13	6.20	11.10

N.B.: These are indicative values that can change as a function of the stroke

METAL WORK PNEUMATIC

DIMENSIONS

CYLINDER DIMENSIONS (WITHOUT MOTOR)



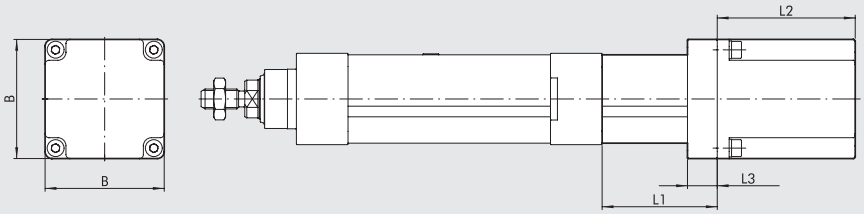
① = lubricator port
(*) = only for Ø 63 - Ø 80 - Ø 100
+ = add the stroke

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

DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR



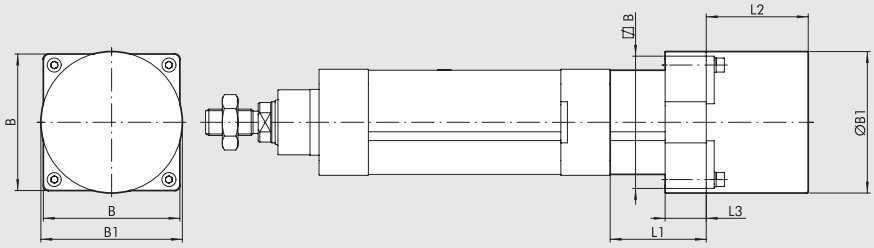
For any missing dimensions, please refer to page **A5**.25

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	6.3	NEMA 34	86.6	63.5	188.5	16
		371H63_ _ _ _ _3460	37M3460000	5.5	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



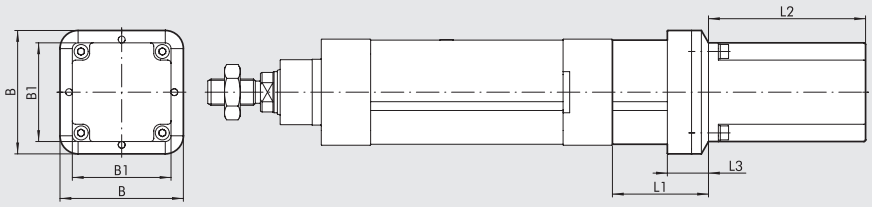
For any missing dimensions, please refer to page **A5**.25

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

METAL WORK PNEUMATIC

DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR



For any missing dimensions, please refer to page **A5**.25

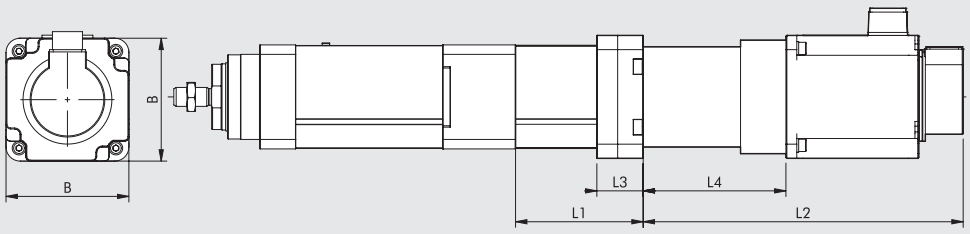
VERSION WITH MOTOR

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 GEARBOX



For any missing dimensions, please refer to page **A5**.25

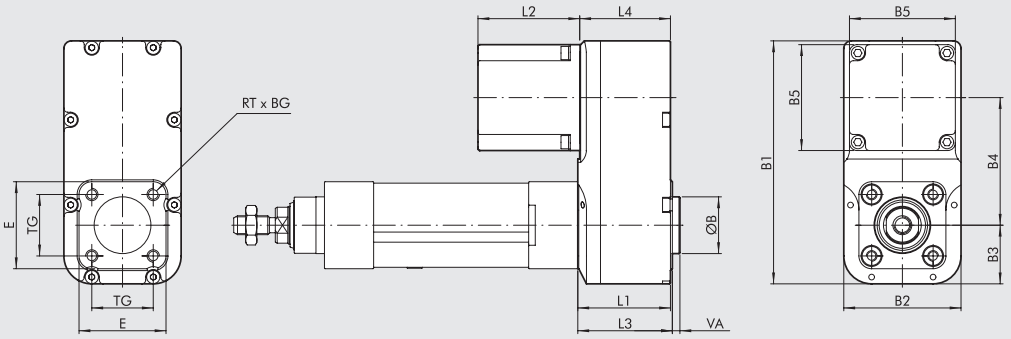
VERSION WITH MOTOR

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



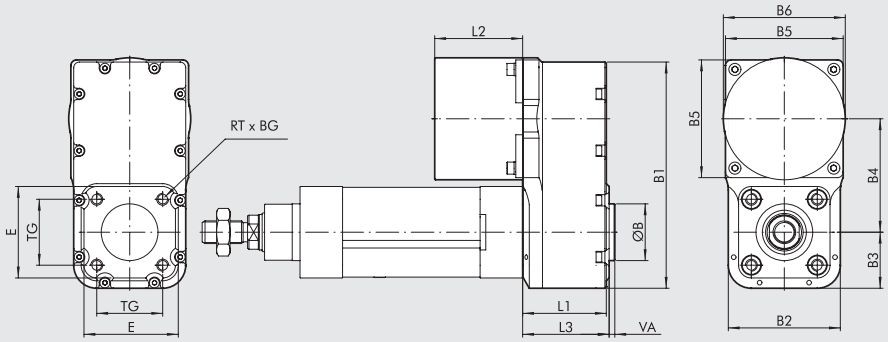
For any missing dimensions, please refer to page **A5**.25

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
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

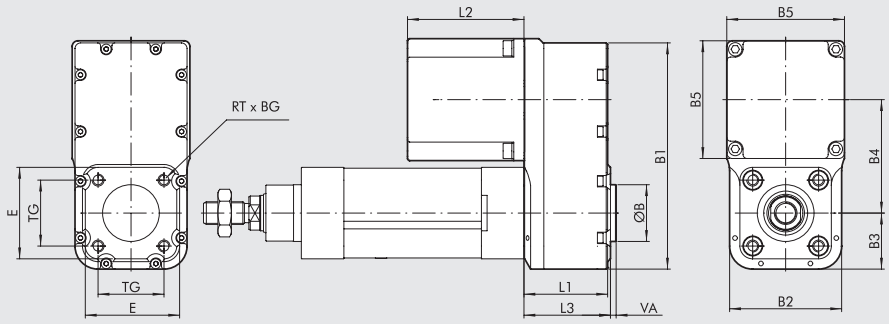


For any missing dimensions, please refer to page **A5**.25

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	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

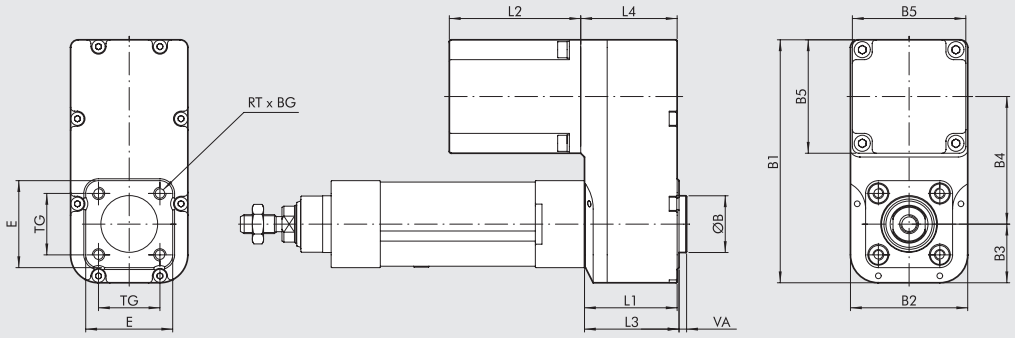
DIMENSIONS OF CYLINDERS WITH GEARED MOTOR



For any missing dimensions, please refer to page **A5**.25

VERSION WITH MOTOR AND BRAKE

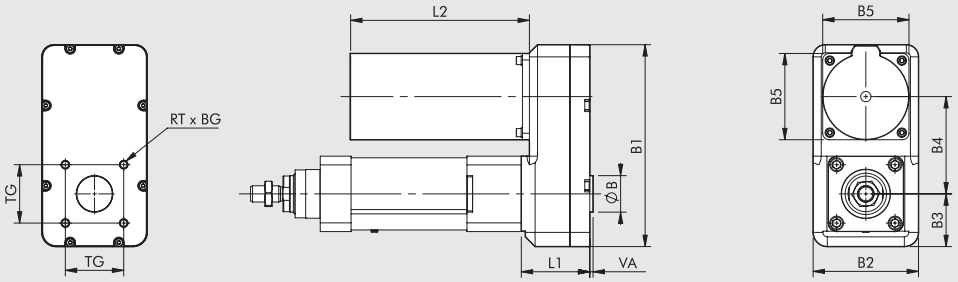
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	STEPPING	371050_ _ _ _ _ _3430	37M3430000	2.9	NEMA 34	40	159.5	79	39.5	80	86.6	17	64.5	59	156.5	61	46.5	M8	4
		371050_ _ _ _ _ _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



For any missing dimensions, please refer to page **A5**.25

VERSION WITH MOTOR

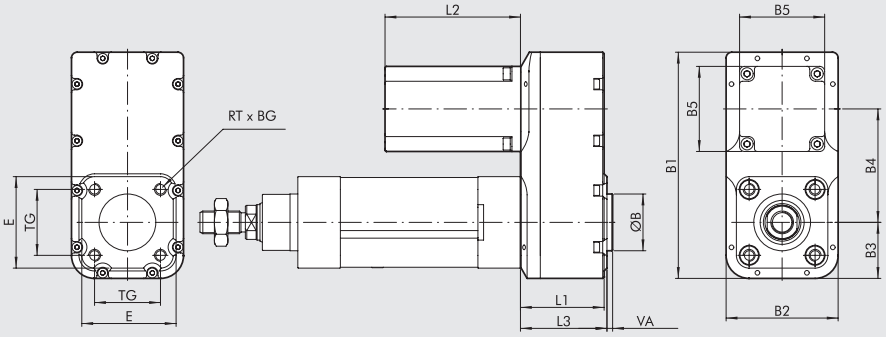
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	BRUSHLESS	371032_ _ _ _ _ _2200	37M2200000	0.64	60	30	128.5	62	31	67.5	60	15	46	49	69.5	50	51	32.5	M6	4
		371032_ _ _ _ _ _2220	37M2220000	1.27	60	30	128.5	62	31	67.5	60	15	46	49	95.5	50	51	32.5	M6	4



For any missing dimensions, please refer to page **A5**.25

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	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



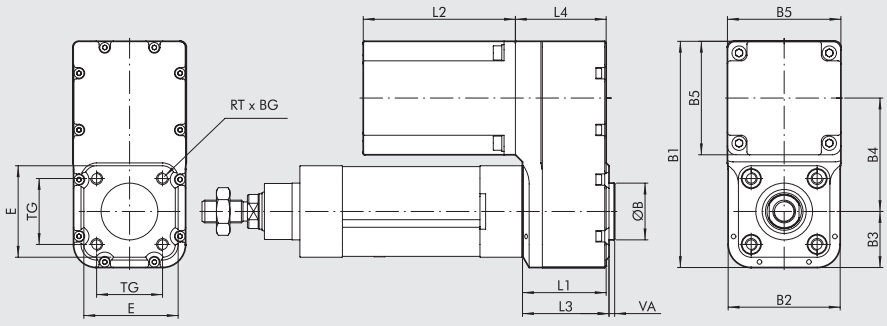
For any missing dimensions, please refer to page **A5**.25

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 **A5**.25

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

MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES				
Metal Work		37D1222000 *	37D1332000 *	37D1442000	37D1552000	37D1362001
Manufacturer		RTA CSD 94	RTA NDC 96	RTA PLUS A4	RTA PLUS B7	X-MIND B6
Metal Work	Manufacturer	(4.4A 24-48VDC)	(6A 2-75VDC)	(6A 77-140VDC)	(10A 28-62VAC) ●	(6A 110-230VAC) ●
STEPPING MOTORS						
37M1110000	SANYO DENKI 103-H7123-1749 (4A 75V max)	Ø32	Ø32 ◆	-	Ø32 ■	-
37M1120000	SANYO DENKI 103-H7126-1740 (4A 75V max)	Ø32	Ø32 ◆	-	Ø32 ■	-
37M1120001	SANYO DENKI 103-H7126-6640 (5.6A 75V max)	-	Ø32	-	Ø32 ■	-
37M1430000	SANYO DENKI 103-H8221-6241 (6A 140V max)	-	Ø50	Ø 50	Ø50 ◆	Ø50 ▲
37M1440000	SANYO DENKI 103-H8222-6340 (6A 140V max)	-	Ø50	Ø 50	Ø50 ◆	Ø50 ▲
37M1450000	SANYO DENKI SM-2863-5255 (6A 140V max)	-	Ø63 - Ø63 HD	Ø63 - Ø63 HD	Ø63 - Ø63 HD ◆	Ø63 - Ø63 HD ▲
37M1470000	B&R 80MPH6.101S000-01 (10A 80V max)	-	-	-	Ø63 HD	-
37M1890000	SANYO DENKI 103-H89223-6341 (6A 230V max)	-	-	-	-	Ø80 - Ø100
STEPPING MOTORS WITH BRAKE						
37M5120000	SANYO DENKI 103-H7126-1710B (4A 75V max)	Ø32	Ø32 ◆	-	Ø32 ■	-
STEPPING MOTORS WITH BRAKE + ENCODER						
37M3220000	B&R 80MPF3.500D114-01 (5A 80V max)	-	Ø32 ◆	Ø32 ■	Ø32 ■	
37M3230000	B&R 80MPF5.500D114-01 (5A 80V max)	-	Ø32 ◆	Ø32 ■	Ø32 ■	
37M3430000	B&R 80MPH1.600D114-01 (6A 80V max)	-	Ø50	Ø50 ▲	Ø50 ◆	
37M3460000	B&R 80MPH3.600D114-01 (6A 80V max)	-	Ø50 - Ø63 - Ø63 HD	Ø50 - Ø63 - Ø63 HD ▲	Ø50 - Ø63 - Ø63 HD ◆	
37M3450000	B&R 80MPH4.101D114-01 (10A 80V max)	-	-	-	Ø63 - Ø63 HD	
37M3470000	B&R 80MPH6.101D114-01 (10A 80V max)	-	-	-	Ø63 HD	

✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
◆ **Important!** Limit current
■ **Important!** Limit current and voltage
▲ **Important!** Limit voltage
● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$

MOTOR CODES		DRIVES CODES	
Metal Work		37D2400008	37D2600001
Manufacturer		SANYO DENKI RS3A03	DELTA ASD-A2-3043-M
Metal Work	Manufacturer	(30A 200-1000 W)	(3000W)
BRUSHLESS MOTORS			
37M2200000	SANYO DENKI R2AA06020FXH11M (200W)	Ø32	-
37M2220000	SANYO DENKI R2AA06040FXH11M (400W)	Ø32 - Ø50	-
37M2330000	SANYO DENKI R2AA08075FXH11M (750W)	Ø50 - Ø63 - Ø63 HD	-
37M2540000	SANYO DENKI R2AAB8100HXH29M (1000W)	Ø63 HD - Ø80	-
37M2770000	DELTA ECMA-J11330R4 (3000W)	-	Ø80 - Ø100
BRUSHLESS MOTORS WITH BRAKE			
37M4200000	SANYO DENKI R2AA06020FCH11M (200W)	Ø32	-
37M4220000	SANYO DENKI R2AA06040FCH11M (400W)	Ø32 - Ø50	-
37M4330000	SANYO DENKI R2AA08075FCH11M (750W)	Ø50 - Ø63 - Ø63 HD	-
37M4540000	SANYO DENKI R2AAB8100HCH29M (1000W)	Ø63 HD - Ø80	-
37M4770000	DELTA ECMA-J11330S4 (3000W)	-	Ø80 - Ø100

KEY TO CODES FOR ELECTRIC CYLINDER SERIE ELEKTRO ISO 15552

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 non-rotating IP40 **6** With non-rotating IP40 **7** Without non-rotating IP55/IP65 **8** With non-rotating 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.

KEY TO CODES CYLINDER WITH MOTOR

							DRIVE			
CYL	37 TYPE	1	032 SIZE	0100 STROKE	1 SCREW PITCH	1 VERSION	1 MOTOR ✱	2 FLANGE	2 TORQUE	0
	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	**IN-LINE** ● **1** Without non-rotating IP40/IP20 ● **2** With non-rotating IP40/IP20 ■ **3** Without non-rotating IP55/IP65 ■ **4** With non-rotating IP55/IP65 **GEARED** ● **5** Without non-rotating IP40/IP20 ● **6** With non-rotating IP40/IP20 ■ **7** Without non-rotating IP55/IP65 ■ **8** With non-rotating IP55/IP65	**1** STEPPING **2** BRUSHLESS **3** STEPPING with BRAKE + Encoder **4** BRUSHLESS with BRAKE **5** STEPPING with BRAKE without Encoder **6** BRUSHLESS with gearbox **7** BRUSHLESS with BRAKE + gearbox	**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.: The Orderable configurations are shown on 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).
✱ On request available versions with gearbox with reduction ratios other than those eventually foreseen as standard.

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.

METAL WORK PNEUMATIC

POSSIBLE ORDERING CODES

Ø 32

Drive	Version	Screw pitch
371032_ _ _ _	1	1	1110
		2	1120
		5	1121
		6	5120
			2200
			2220
			3220
			3230
			4200
			4220
	5	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		Transmission ratio ✱
371080_ _ _ _	2	3	1890	1
		4	2540	1
			4540	1
		7	1890	1
		8	2540	4/5
			4540	4/5
	4	3	1890	1
	8	4	2540	1
			2770	1
			4540	1
			4770	1
		7	1890	1
		8	2540	4/5
			2770	2/3
			4540	4/5
			4770	2/3

_ _ _ _ = Enter the stroke in mm

Ø 100

Drive	Version	Screw pitch		Transmission ratio ✱
371100_ _ _ _	4	3	1890	1
	9	4	2770	1
			4770	1
			6770	1/3
			7770	1/3
		7	1890	1
		8	2770	1/2
			4770	1/2

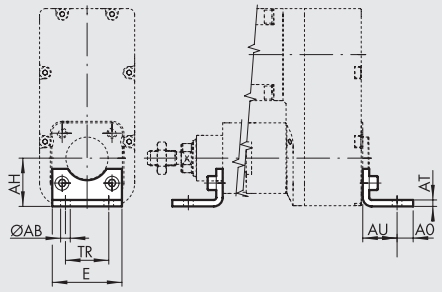
_ _ _ _ = Enter the stroke in mm

✱ For sizes Ø80 and Ø100 the standard transmission ratio depends on screw pitch, version and motorization.
For the other sizes the standard transmission ratio is 1.

ACCESSORIES FOR ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552

N.B.: Where specified, limit the maximum axial loads (Fmax) according to the electric cylinders

FOOT - MODEL A

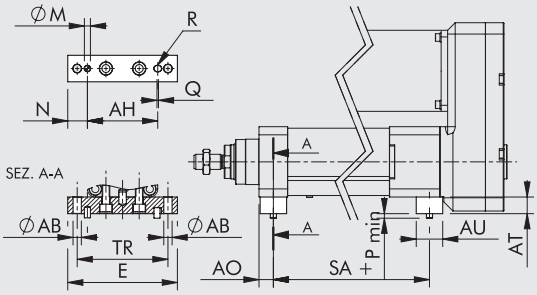


STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	Weight [g]	Fmax [N]
W0950322001	32	7	32	11	4	24	32	45	76	1600
W0950502001	50	9	45	15	5	32	45	65	162	4000
W0950632001	63	9	50	15	5	32	50	75	266	6000
W0950632001	63 HD	9	50	15	5	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

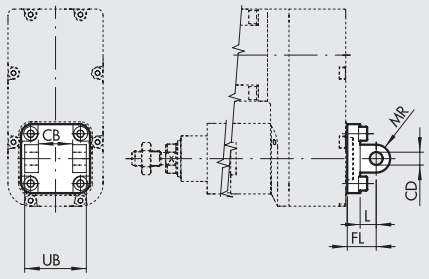


STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	ØM H7	N	P	Q	R H7	SA	Weight [g]	Fmax [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

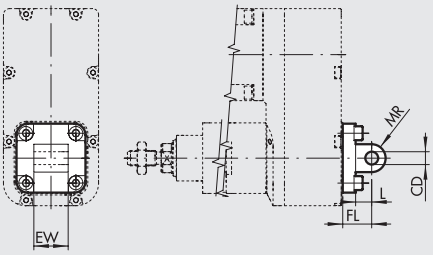
Code	Ø	UB	CB H14	FL	CD H9	MR	L	Weight [g]	Fmax [N]
W0950322003	32	45	26	22	10	10	12	116	800
W0950502003	50	60	32	27	12	12	15	252	2000
W0950632003	63	70	40	32	16	16	20	394	3000
W0950632003	63 HD	70	40	32	16	16	20	394	3000

STEEL

Code	Ø	UB	CB H14	FL	CD H9	MR	L	Weight [g]	Fmax [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	15	22	1182	6000
W095E632003	63 HD	70	40	32	16	15	22	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	CD H9	L	Weight [g]	Fmax [N]
W0950322004	32	26	22	10	10	13	94	800
W0950502004	50	32	27	12	12	16	220	2000
W0950632004	63	40	32	16	16	22	316	3000
W0950632004	63 HD	40	32	16	16	22	316	3000

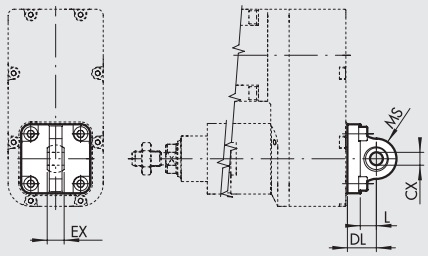
STEEL

Code	Ø	EW	FL	MR	CD H9	L	Weight [g]	Fmax [N]
W095E322004	32	26	22	10	10	13	282	1600
W095E502004	50	32	27	12	12	16	660	4000
W095E632004	63	40	32	16	15	22	948	6000
W095E632004	63 HD	40	32	16	15	22	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.

METAL WORK PNEUMATIC

ARTICULATED MALE HINGE - MODEL BAS



ALUMINIUM

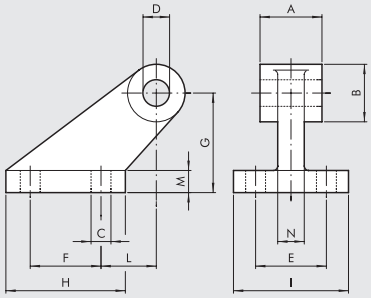
Code	Ø	DL	MS	L	CX H9	EX	Weight [g]	Fmax [N]
W0950322006	32	22	16	12	10	14	106	800
W0950502006	50	27	21	15	12	16	236	2000
W0950632006	63	32	23	20	16	21	336	3000
W0950632006	63 HD	32	23	20	16	21	336	3000

STEEL

Code	Ø	DL	MS	L	CX H9	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

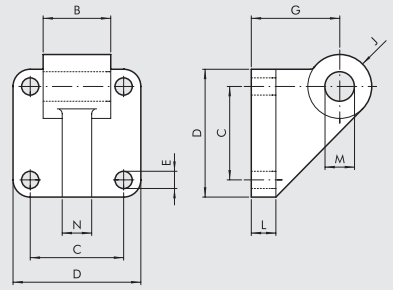


ALUMINIUM

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

COUNTER-HINGE FOR MODEL B - MODEL GS

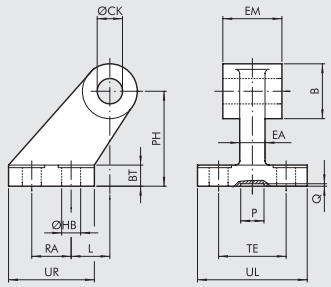


ALUMINIUM

Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]	Fmax [N]
W0950322108	32	26	32.5	45	7	32	11	10	10	10	106	800
W0950502108	50	32	46.5	65	9	45	13	12	12	12	252	2000
W0950632108	63	40	56.5	75	9	50	17	12	16	15	350	3000
W0950632108	63 HD	40	56.5	75	9	50	17	12	16	15	350	3000

Note: Supplied with 4 screws, 4 washers

ISO 15552 COUNTER-HINGE FOR MODEL B - MODEL AB7



ALUMINIUM

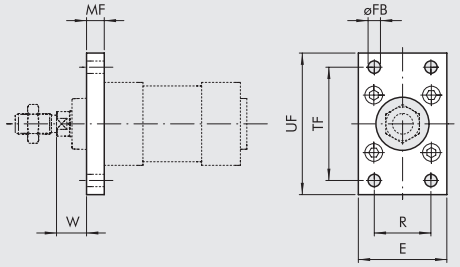
Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]	Fmax [N]
W0950322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	21	3	60	800
W0950502017	50	32	26	9	12	50	30	45	45	65	3	12	16	21	3	162	2000
W0950632017	63	40	30	9	16	52	35	50	50	67	2	14*16	21	3		191	3000
W0950632017	63 HD	40	30	9	16	52	35	50	50	67	2	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	20	5	180	1600
W095E502017	50	32	26	9	12	50	30	45	45	65	3	12	16	30	5	486	4000
W095E632017	63	40	30	9	16	52	35	50	50	67	2	12	16	35	5	573	6000
W095E632017	63 HD	40	30	9	16	52	35	50	50	67	2	12	16	35	5	573	6000
W095E802017	80	50	30	11	16	66	40	63	60	86	7	14	20	45	5	996	10000
W095EA12017	100	60	38	11	20	76	50	71	70	96	5	15	20	55	5	1566	16000

* Dimensions not to ISO 15552

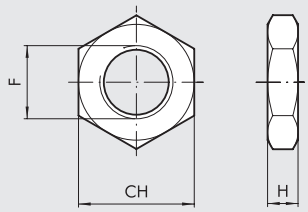
FRONT FLANGE - MODEL C



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

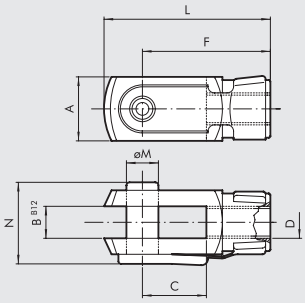
ROD NUT - MODEL S



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

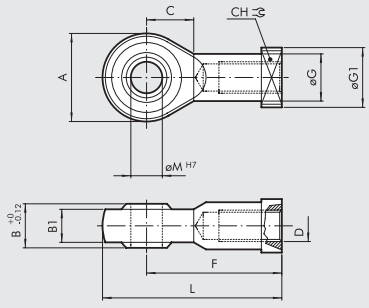
FORK MODEL GK-M



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

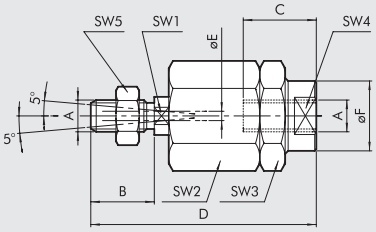
ROD EYE - MODEL GA-M



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



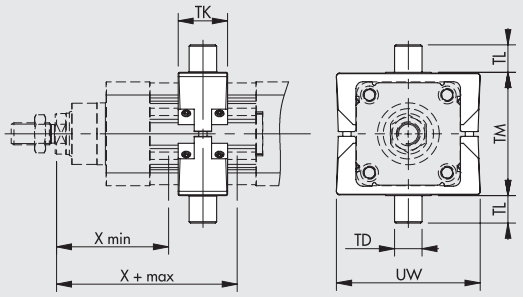
Code	Ø	A	B	C	D	øF	øE	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950322030	32	M10x1.25	20	20	71	22	4	12	30	30	19	17	216
W0950502030	50	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63 HD	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950802030	80	M20x1.5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

METAL WORK PNEUMATIC

INTERMEDIATE HINGE - MODEL EN

+ = ADD THE STROKE

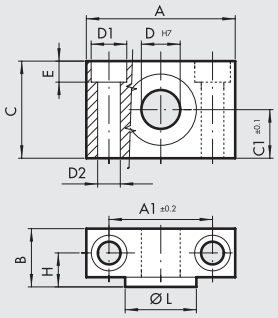


STEEL

Code	Ø	X (min)	X (max) IN LINE	X (max) GEARED	TM	TL	TD e9	TK	UW	Weight [g]	Fmax [N]	T [Nm] ◆
0950322107	**32**	63	123	*	50	12	12	22	65	170	500	2
0950502107	**50**	83	148	*	75	16	16	28	95	595	1200	6
0950632107	**63**	88	163	*	90	20	20	36	105	960	2000	10
0950632107	**63 HD**	88	163	*	90	20	20	36	105	960	2000	10

* Depending on motor length
◆ Reccommended tightening torque of grub screws
Note: Supplied with 8 grub screws, 2 pins

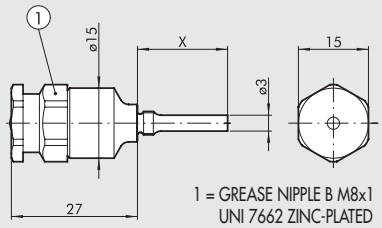
COUNTER-HINGE FOR MODEL EN - MODEL EL



Code	Ø	A	A_1	B	C	C_1	D_1	D_2	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

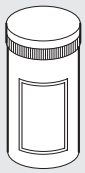


1 = GREASE NIPPLE B M8x1
UNI 7662 ZINC-PLATED

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

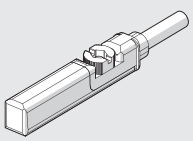


Code	Description	Weight [g]
9910506	Grease pipe RHEOLUBE 363 AX1	400

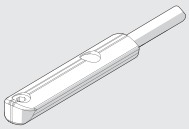
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

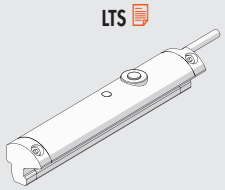


SENSOR, OVAL TYPE
Traditional

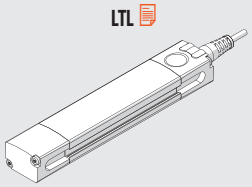


POSITION SENSORS

LTS

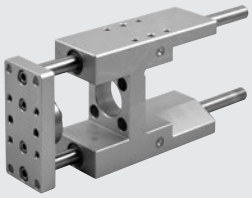
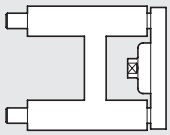
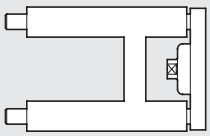


LTL



For technical data and usage strokes see chapter A6.

GUIDE UNIT

Version		Code	Bore	Type
	Sliding on bronze bushings (GDH) 	**W0700322...**	32*	UNIT MW DH 032...
		W0700502...	50	UNIT MW DH 050...
		W0700632...	63	UNIT MW DH 063...
		W0070E802...	80	UNIT MW DH 080...
		W070EA12...	100	UNIT MW DH 100...
		* Also available in V-Lock version (see **chapter A3**).		
		Note: The guide units must only be used with anti-rotation cylinders.		
		To complete the type and code, add the 3-digit stroke (e.g. 50=050)		
		For technical data and dimensions, see **chapter A1**.		
	Sliding on ball bearing (GDM) 	**W0700323...**	32*	UNIT MW DM 032...
		W0700503...	50	UNIT MW DM 050...
		W0700633...	63	UNIT MW DM 063...
		W0070E803...	80	UNIT MW DM 080...
		W070EA13...	100	UNIT MW DM 100...
		* Also available in V-Lock version (see **chapter A3**).		
		Note: The guide units must only be used with anti-rotation cylinders.		
		To complete the type and code, add the 3-digit stroke (e.g. 50=050)		
		For technical data and dimensions, see **chapter A1**.		

DRIVES

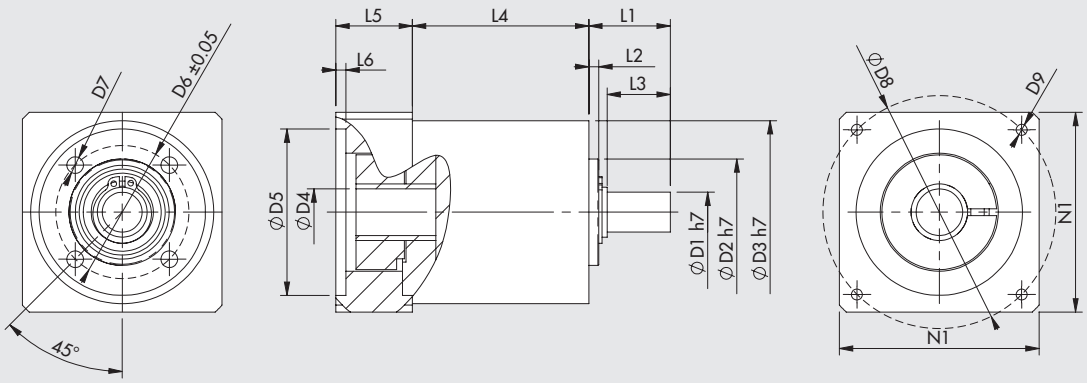
For motor-drive couplings see table on page **A5**.31

NOTES

METAL WORK PNEUMATIC

SPARE PARTS

ELEKTRO ISO 15552 Ø 100 GEARBOX



Code	Description	Application	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0364000	Gearbox MP105 1:3	Elektro ISO 15552 Ø 100	100	2500	222	6.5	25	70	106	24	110	85	M8	145	M8x20	57.5	5	50.5	107.5	48	6.5	120

C_{OUT} = rated output torque N_{IN} = nominal input speed J = mass moment of inertia of the gearhead

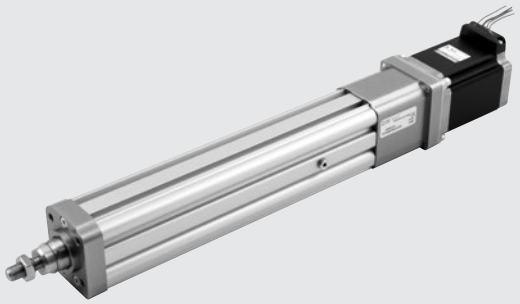
ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.31

NOTES

ELECTRIC CYLINDER
SERIES ELEKTRO ISO 15552 EK

An electric cylinder with a connection interface in accordance with ISO 15552.
The ELEKTRO ISO 15552 EK series stands out for some design choices that made it possible to reduce the length and cut costs, with a few different technical characteristics.
The piston rod moves forward by means of either a hardened and tempered screw and a ball recirculating screw nut or a trapezoidal screw (acme) and bronze bushing.
The cylinder comes with a built-in anti-rotation system obtained with two technopolymer pads that slide in the liner along two longitudinal groves.
The piston has a magnet and the liner has slots that accommodate magnetic sensors.
A greasing system is incorporated to lubricate the screw/ball screw nut.
Only a version with inline motor, which is shorter than the equivalent ELEKTRO ISO15552 cylinder, is provided. The version with geared motors is available on specific request.
A steel bracket to be fixed to the rear head, with an interface suitable for ISO 15552 cylinder accessories, is provided to be fixed to the cylinder from the rear side.
The cylinder can be supplied with a STEPPING or a BRUSHLESS motor, with or without parking brake.
Cylinders with a flange suitable for a motor brand that is most liked by the customer are available on request.



TECHNICAL DATA		Ø 32
Piston rod thread	mm	M10x1.25
Environmental temperature range for STEPPING motors	°C	from -10 to +50
BRUSHLESS motors	°C	from 0 to +40
Electrical protection rating with motors		IP40
Minimum stroke		Twice the screw pitch (to guarantee ball lubrication)
Maximum stroke	mm	500
Positioning repeatability	mm	± 0.02 with screw/ball screw nut; ± 0.15 with trapezoidal screw (acme)
Positioning accuracy	mm	± 0.2 **
Overall radial oscillation of the piston rod (without load) for 100 mm of stroke	mm	0.4
Versions		Ball screw; trapezoidal screw (acme) with bronze bushing
Anti-rotation of the piston rod		YES
Maximum angle of twist of the piston rod		1°30'
Motor layout		In line with piston rod axis
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)
Sensor magnet		YES
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		Ball screw		Trapezoidal screw (acme) with bronze bushing
Screw pitch (p)	mm	4	10	4
Screw diameter	mm	12	12	14
Static axial load (F_o)*	N	3000	3000	3000
Dynamic axial load (F)	N	5200	3160	see graph force/speed
		Calculate mean axial load and the calculate life (see graphs on page **A5**.43)		**N.B**: 40% duty cycle, i.e. the cylinder must work maximum 40% of time to allow the screw/ball screw nut to cool down.
Maximum number of revs	1/min	3000	3000	750
Maximum speed (V_{max})	mm/s	200	500	50
"K" ratio of motor revs and piston rod speed	n/V	15	6	15

Example: V = 100 mm/s; pitch = 10 → K=6 n= V x K = 100 x 6 = 600 rpm

* **N.B.:** Static loads bearable without damage. Payloads are shown in the diagrams on page **A5**.44 onwards.

WEIGHTS (ONLY CYLINDER)		Ball screw		Trapezoidal screw (acme) with bronze bushing
Screw pitch (p)	mm	4	10	4
Weight at stroke 0, without motor	g	610	620	720
Additional weight each mm of stroke	g	4.3	4.3	4.3
Moving mass at stroke 0 (Mx)	g	189.4	189.4	209.4
Additional moving mass each mm of stroke	g	1.3	1.3	1.3

N.B.: You get the total weight of a complete cylinder by adding: weight stroke 0 + stroke [mm] x weight for each mm of stroke + weight of the motor.

MASS MOMENTS OF INERTIA		Ball screw		Trapezoidal screw (acme) with bronze bushing
Screw pitch	mm	4	10	4
J0 at stroke 0	$kgmm^2$	9.9849	10.0979	10.2979
J1 each metre of stroke	$kgmm^2/m$	12.76	13.76	16.81
J2 each kg of load	$kgmm^2/kg$	0.4053	2.533	0.4053

The total mass moment of inertia (Jtot) reduced for the motor is: Jtot = J0 + J1 · stroke [m] + J2 · (load [kg] + Mx [kg])
Mx is defined in the weights table.

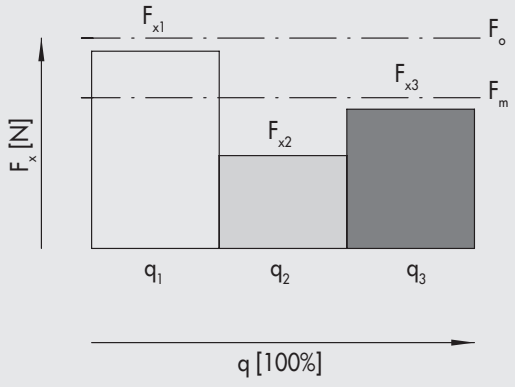
CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

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

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

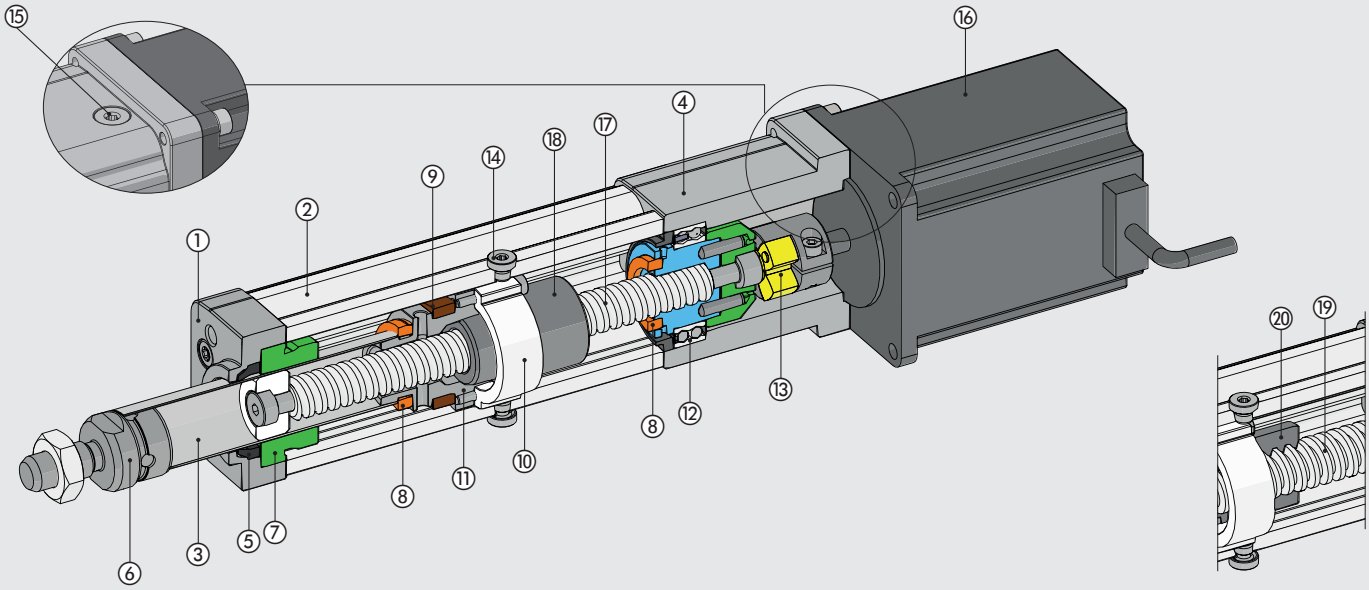
$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{x1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{x2}}{V_m} + \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{x3}}{V_m} \times \frac{q_3}{100} + \ldots}$$



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 **A5**.44 show screw life as a function of F_m

COMPONENTS

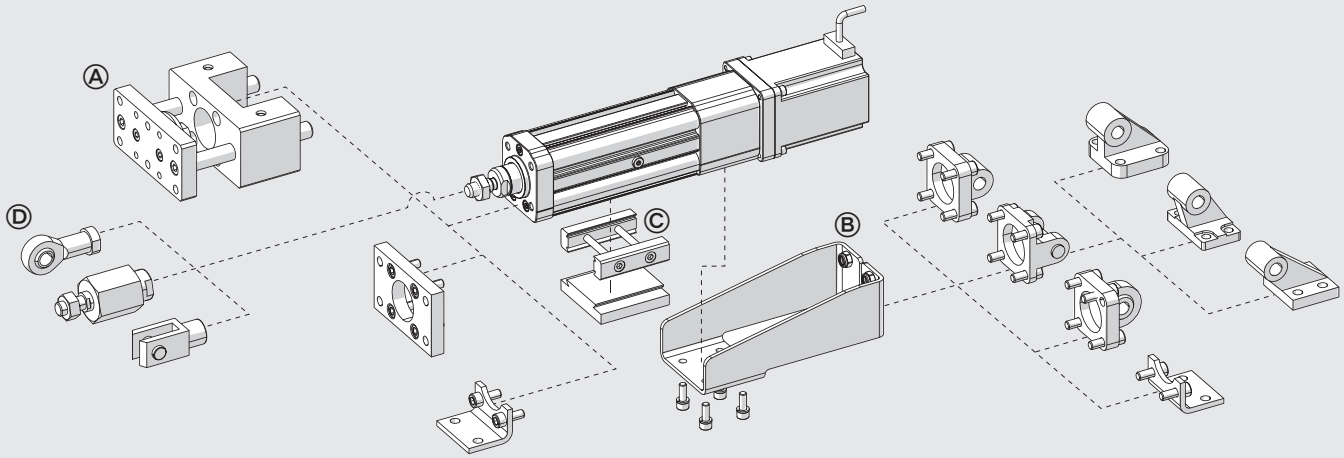


① FRONT CYLINDER HEAD: anodized aluminium
② BARREL: extruded and anodized aluminium alloy
③ PISTON ROD: stainless steel pipe
④ REAR CYLINDER HEAD: anodized aluminium
⑤ WIPER RING: polyurethane
⑥ NIPPLE: stainless steel
⑦ GUIDE BUSHING: technopolymer
⑧ BUFFER: polyurethane
⑨ MAGNET: plastoferrite
⑩ GUIDE AND ANTI-ROTATION RING: technopolymer
⑪ PISTON: aluminium
⑫ BEARING: oblique with two ball rings
⑬ ELASTIC COUPLING: aluminium / polyurethane
⑭ PLUG: remove it to insert the greaser
⑮ PLUG: for access to the elastic coupling screw
⑯ ELECTRIC MOTOR

Version with ball screw:
⑰ SCREW: hardened and rolled steel
⑱ NUT: ball recirculating

Version with trapezoidal screw (acme):
⑲ TRAPEZOIDAL SCREW (ACME): steel
⑳ NUT: bronze

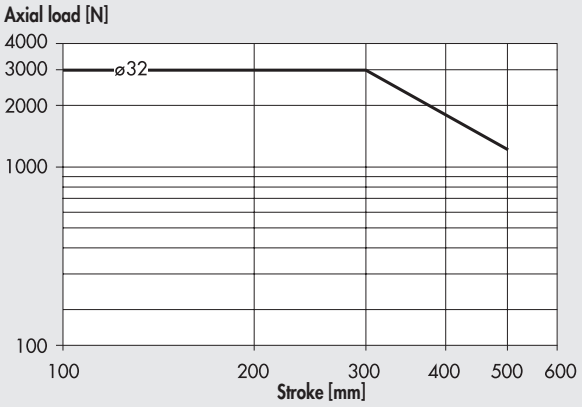
FIXING OPTIONS



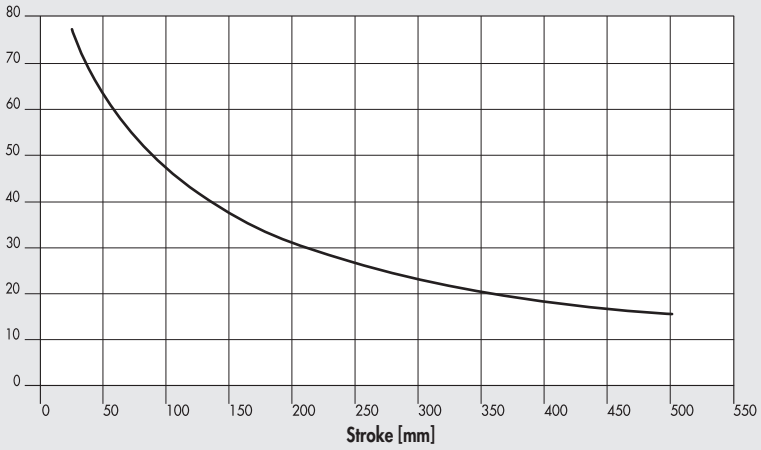
Ⓐ Fixing on the front head with 4 threaded holes according to ISO 15552 standard.
Ⓑ Fixing on the rear side, using the "rear fixing bracket". ISO 15552 accessories can be fitted onto this bracket.
Ⓒ Fixing on one side of the liner, using QS fixing elements. See page **A3**.15
Ⓓ Piston rod accessories.

PEAK LOADS

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



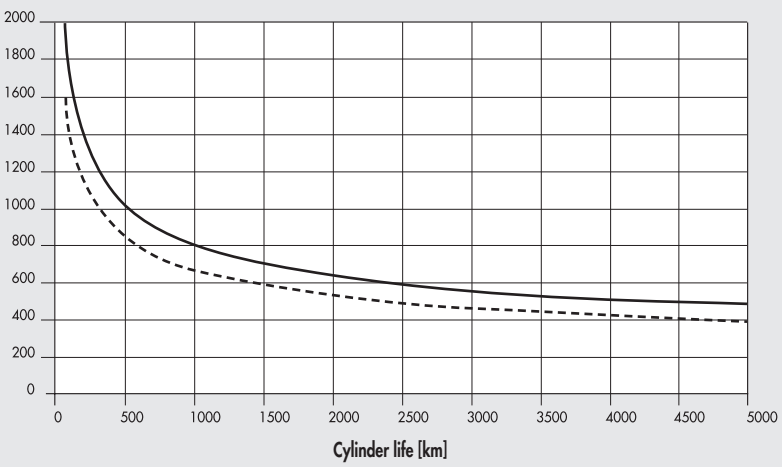
MAXIMUM RADIAL LOADS ON PISTON ROD



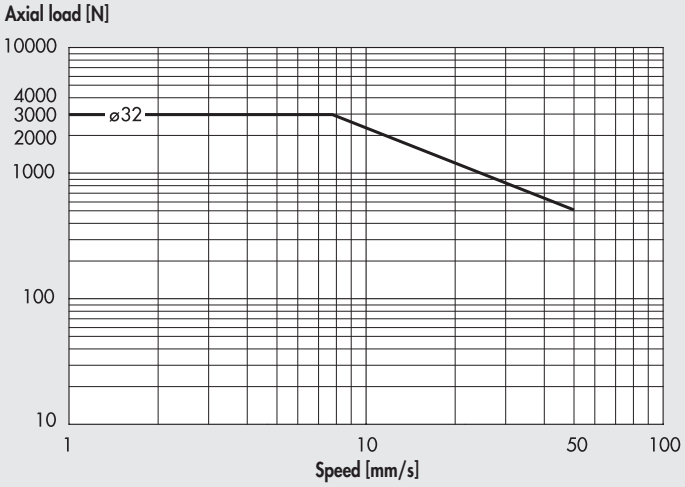
Radial loads can be applied to the piston rod.
They must not exceed the values in the adjacent chart, otherwise the guides on the rod and piston will be subjected to excessive wear.

LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD, BALL SCREW VERSION

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



MAX. FORCE/SPEED CHART FOR VERSION WITH TRAPEZOIDAL SCREW (ACME) WITH BRONZE BUSHING

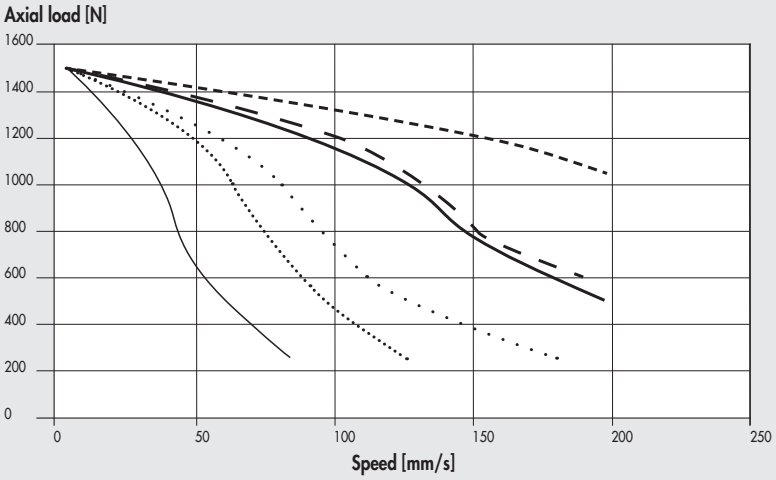


To prevent the bushing from excessive wear and tear, it is recommended to work below the curve indicated.

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

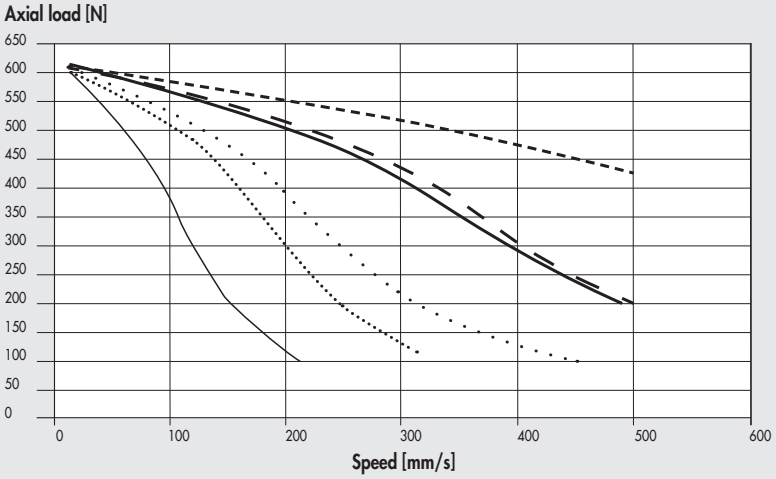
N.B.: The obtainable load values already take the efficiency of the system into account. For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

Ø 32 with pitch 4 ball screw, STEPPING motor and STEPPING motor with brake



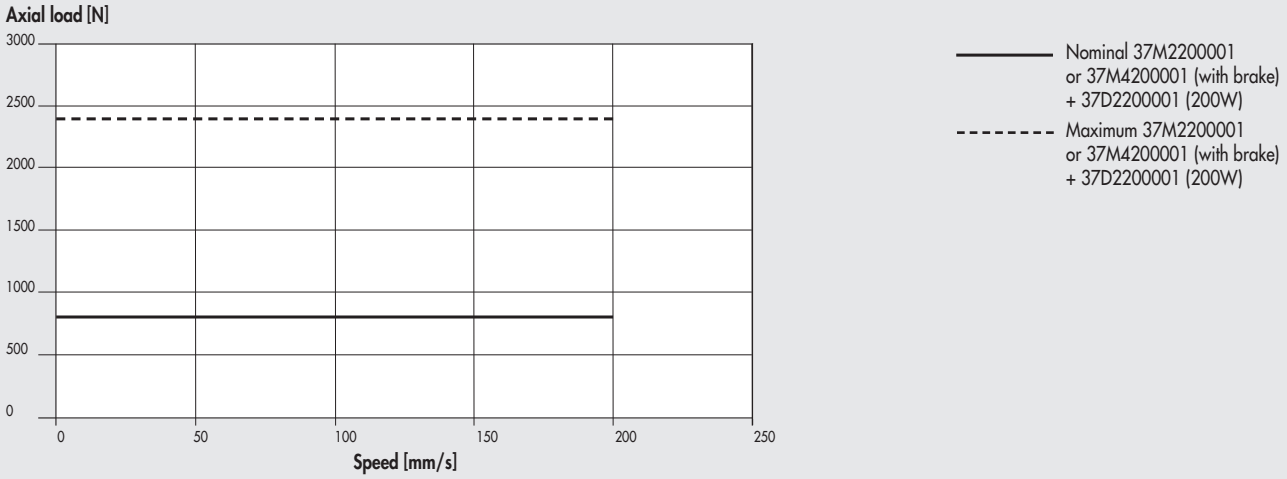
- 37M5120000 (with brake, 24VDC)
- 37M5120000 (with brake, 48VDC)
- 37M5120000 (with brake, 75VDC)
- 37M1120001 (24VDC)
- 37M1120001 (48VDC)
- 37M1120001 (75VDC)

Ø 32 with pitch 10 ball screw, STEPPING motor and STEPPING motor with brake

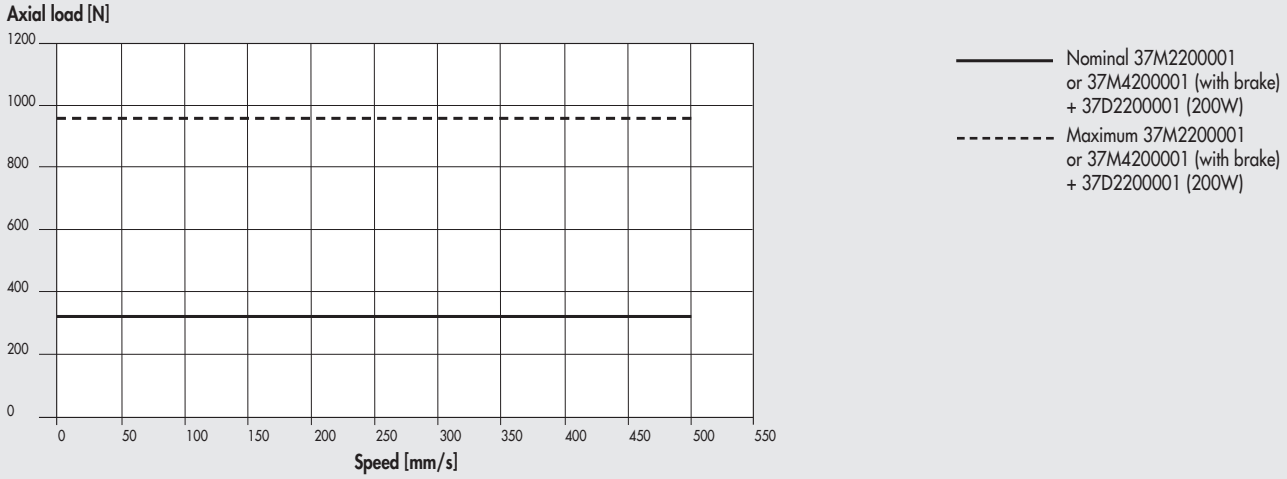


- 37M5120000 (with brake, 24VDC)
- 37M5120000 with brake, 48VDC)
- 37M5120000 (with brake, 75VDC)
- 37M1120001 (24VDC)
- 37M1120001 (48VDC)
- 37M1120001 (75VDC)

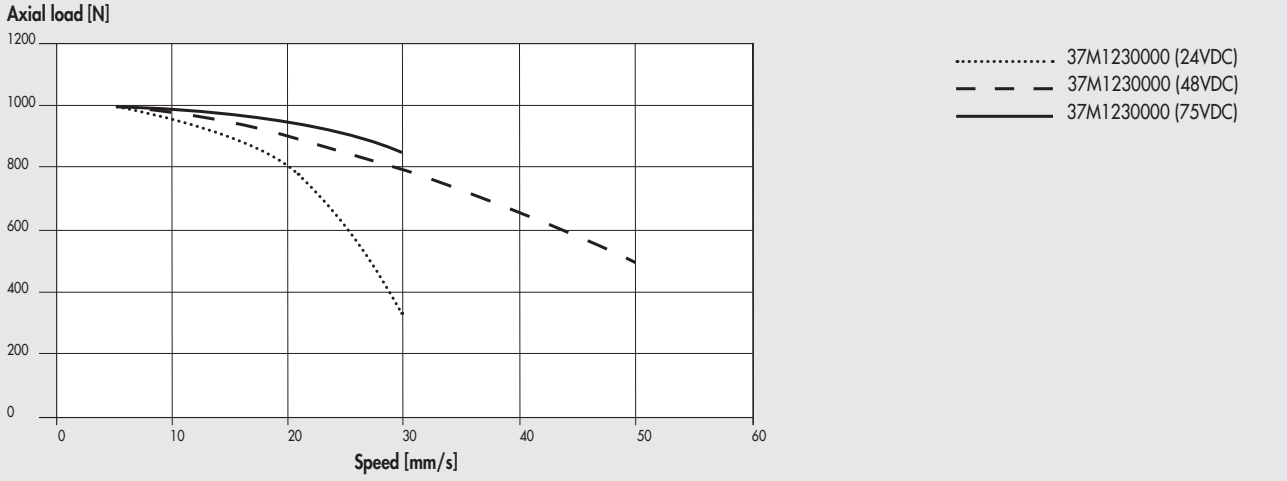
Ø 32 with pitch 4 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



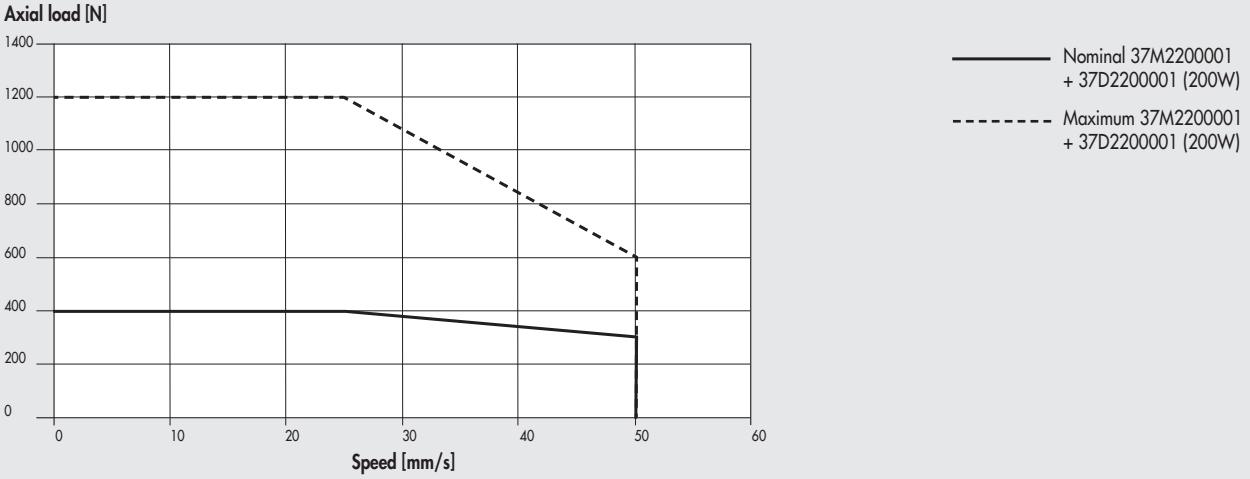
Ø 32 with pitch 10 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



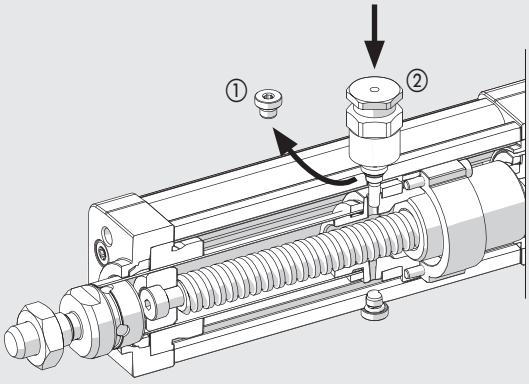
Ø 32 with pitch 4 trapezoidal screw (acme), STEPPING motor



Ø 32 with pitch 4 trapezoidal screw (acme), BRUSHLESS motor



LUBRICATION DIAGRAMS



- 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 ① on the lubricator port.
- Screw the lubricating pin ② (code 0950327108) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) using the suitable lubricator according to the quantity in table.
- 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 at least once a year.

		Ø 32	
Screw pitch (p)	mm	4	10
Relube grease quantity	g	0.3	0.5
	cc	0.26	0.42

N.B.: These are indicative values that can change as a function of the stroke

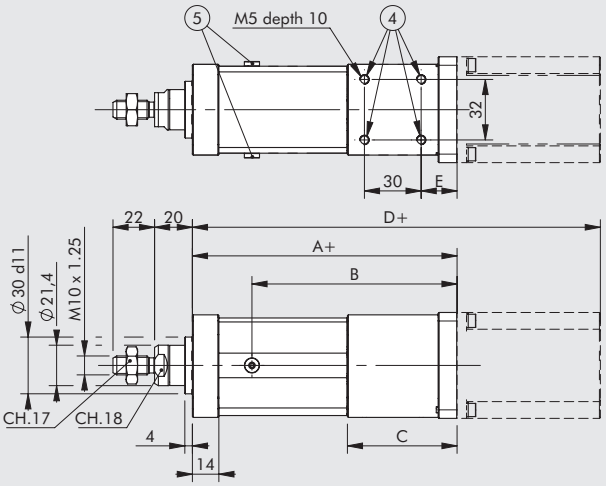
NOTES

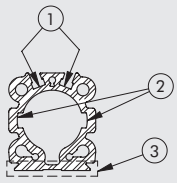
METAL WORK PNEUMATIC

DIMENSIONS

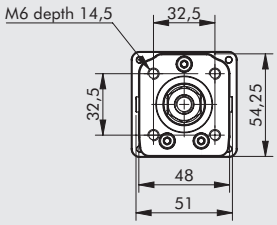
WITHOUT MOTOR

+ = Add the stroke
① = Slots for sensors
② = Slots for anti-rotation
③ = Dovetail for QS fixing
④ = Threaded holes for fixing brackets with ISO 15552 accessories
⑤ = Lubricator port



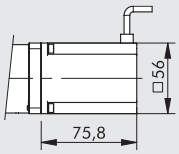


BARREL CROSS SECTION

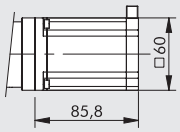


WITH MOTOR

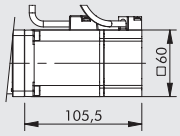
Overall dimensions for standard drive



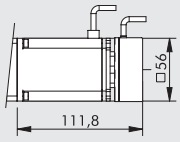
STEPPING MOTOR code 37M1120001				
A	B	C	D	E
140	108.5	58	215.8	19



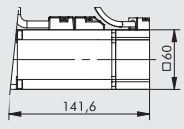
STEPPING MOTOR code 37M1230000				
A	B	C	D	E
141	109.5	59	226.8	20



BRUSHLESS MOTOR code 37M2200001				
A	B	C	D	E
150.5	119	68.5	256	20



STEPPING MOTORE WITH BRAKE WITHOUT ENCODER code 37M5120000				
A	B	C	D	E
140	108.5	58	251.8	19



BRUSHLESS MOTOR WITH BRAKE code 37M4200001				
A	B	C	D	E
150.5	119	68.5	292.1	20

NOTES

MOTOR-DRIVE COUPLINGS

MOTOR CODES			DRIVES CODES		
		Metal Work	37D1222000 *	37D1332000 *	37D1552000
		Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS B7
Metal Work	Manufacturer		(4.4A 24-48VDC)	(6A 24-75VDC)	(10A 28-62VAC) ●
STEPPING MOTORS					
37M1120001	SANYO DENKI 103-H7126-6640 (5.6A 75V max)		-	√	√ ■
37M1230000 ▲	SANYO DENKI 103-H7823-1740 (4A 75V max)		√	√ ◆	√ ■
STEPPING MOTORS WITH BRAKE					
37M5120000	SANYO DENKI 103-H7126-1710B (4A 75V max)		√	√ ◆	√ ■

✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
◆ **Important!** Limit current
■ **Important!** Limit current and voltage
● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$
▲ Used for trapezoidal screws only

MOTOR CODES			DRIVES CODES
		Metal Work	37D2200001
		Manufacturer	DELTA ASD-A2-0221-M
Metal Work	Manufacturer		(200W)
BRUSHLESS MOTORS			
37M2200001	DELTA ECMA-C20602RS (200W)		√
BRUSHLESS MOTORS WITH BRAKE			
37M4200001	DELTA ECMA-C20602SS (200W)		√

KEY TO CODES

CYL	37	1	E	32	0500	1	2	DRIVE 1	1	2	1
	TYPE	FAMILY	SERIES	SIZE	STROKE	SCREW PITCH	VERSION	MOTOR	FLANGE	TORQUE	
	37 Electric actuators	**1** ISO 15552 electric cylinder	**E** Elektro EK	**32** Ø32		**1** With pitch 4 ball screw **4** With pitch 10 ball screw **T** With pitch 4 trapezoidal screw (acme)	**2** With non-rotating, IP40	**1** STEPPING **2** BRUSHLESS **4** BRUSHLESS with BRAKE **5** STEPPING WITH BRAKE (without encoder)	**1** NEMA 23 **2** 60x60	**0** 0 - 0.79 Nm **2** 1.2 - 2.19 Nm **3** 2.2 - 3 Nm	**0** Base **1** Greater rpm

POSSIBLE ORDERING CODES

Ø 32 with ball screw

Drive
Version
Screw pitch

371E32_ _ _ _	1 4	2	1121 5120 2200 4200

_ _ _ _ = Enter the stroke in mm

Ø 32 with trapezoidal screw (acme)

Drive
Version
Screw pitch

371E32_ _ _ _	T	2	1230 2200

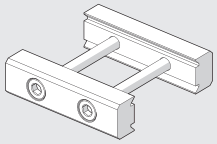
_ _ _ _ = Enter the stroke in mm

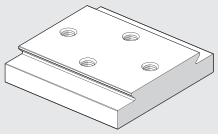
NOTE

ACCESSORIES FOR ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552 EK

Note: Where specified, limit the maximum axial loads (Fmax) according to the electric cylinders

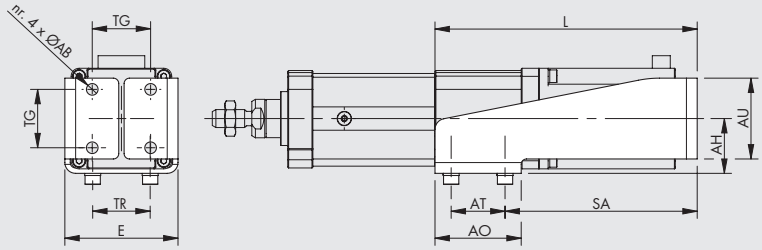
FIXING ELEMENTS QS





See V-Lock family.

BRACKET FOR REAR FIXING

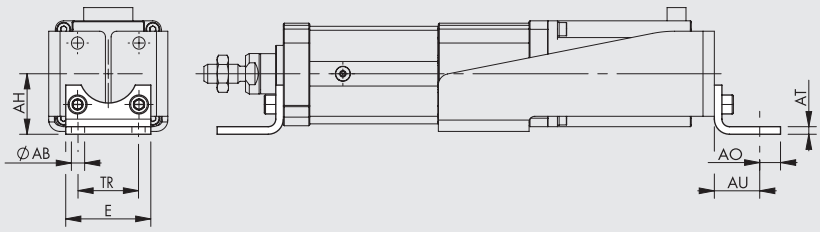


STEEL													
Code	**Ø**	**ØAB**	**TG**	**TR**	**E**	**AT**	**SA**	**AO**	**AU**	**AH**	**L**	**Weight [g]**	**Fmax [N]**
0950327090	**32**	6.5	32.5	32	63	30	107	48	45	30.5	146	375	1600
0950327091	**32**	6.5	32.5	32	67	30	144.5	48	45	30.5	183.5	445	1600

Note: Supplied complete with 4 screws and 4 washers for fixing to the cylinder, 4 self-locking nuts and 4 screws for fixing the anchor clamp.

N.B.: Code 0950327090 can be used with motor 37M1120001.
Code 0950327091 can be used with motors 37M2200001, 37M1230000 and 37M5120000.
A bracket suitable for motor 37M4200001 is not provided.

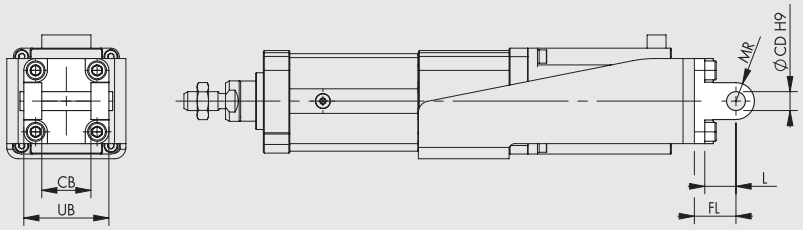
FOOT MODEL A



STEEL										
Code	**Ø**	**ØAB**	**AH**	**AO**	**AT**	**AU**	**TR**	**E**	**Weight [g]**	**Fmax [N]**
W0950322001	**32**	7	32	11	4	24	32	45	76	1600

Note: Individually packed with 2 screws.

FEMALE HINGE - MODEL B



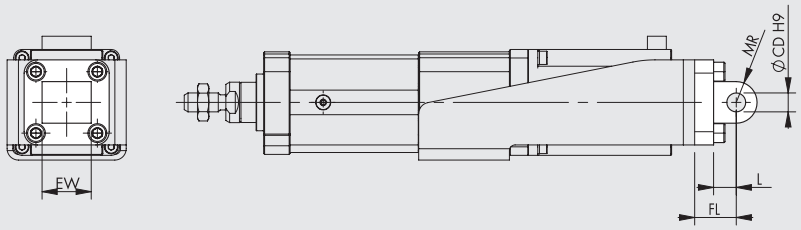
ALUMINIUM									
Code	**Ø**	**UB**	**CB**	**FL**	**ØCD**	**MR**	**L**	**Weight [g]**	**Fmax [N]**
W0950322003	**32**	45	26	22	10	10	12	116	800

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

STEEL									
Code	**Ø**	**UB**	**CB**	**FL**	**ØCD**	**MR**	**L**	**Weight [g]**	**Fmax [N]**
W095E322003	**32**	45	26	22	10	10	13	348	1600

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

MALE HINGE - MODEL BA



ALUMINIUM

Code	Ø	EW	FL	MR	ØCD	L	Weight [g]	Fmax [N]
W0950322004	32	26	22	10	10	13	94	800

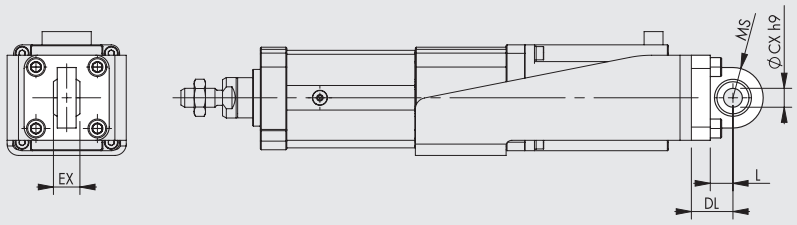
Note: Supplied with 4 screws.

STEEL

Code	Ø	EW	FL	MR	ØCD	L	Weight [g]	Fmax [N]
W095E322004	32	26	22	10	10	13	282	1600

Note: Supplied with 4 screws.

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

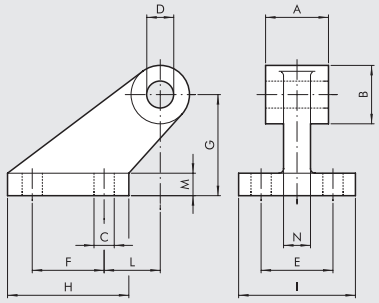
Note: Supplied with 4 screws, 4 washers.

STEEL

Code	Ø	DL	MS	L	ØCX	EX	Weight [g]	Fmax [N]
W095E322006	32	22	15	14	10	14	318	1600

Note: Supplied with 4 screws, 4 washers.

CETOP HINGE FOR MODEL B - MODEL GL

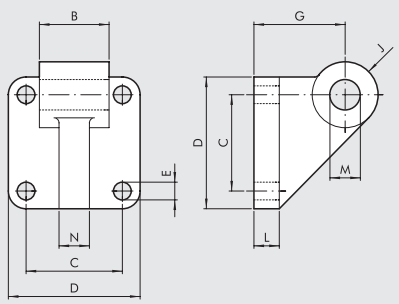


ALUMINIUM

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

Note: Supplied with 4 screws, 4 washers.

COUNTER-HINGE FOR MODEL B - MODEL GS



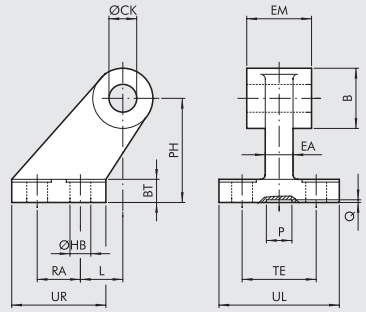
ALUMINIUM

Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]	Fmax [N]
W0950322108	32	26	32.5	45	7	32	11	10	10	10	106	800

Note: Supplied with 4 screws, 4 washers.

METAL WORK PNEUMATIC

ISO 15552 COUNTER-HINGE FOR MODEL B - MODEL AB7



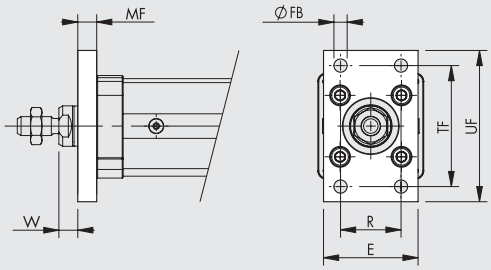
ALUMINIUM

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

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	20	5	180	1600

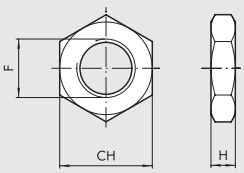
FRONT FLANGE - MODEL C



Code	Ø	TF	UF	E	MF	R	ØFB	W	Weight [g]	Fmax [N]
W0950322002	32	64	80	50	10	32	7	16	246	1600

Note: Supplied with 4 screws.

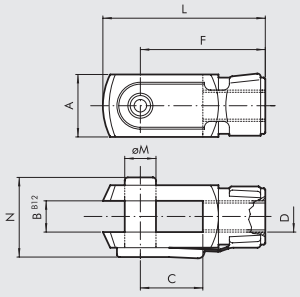
ROD NUT - MODEL S



Code	Ø	F	H	CH	Weight [g]
0950322010	32	M10x1.25	6	17	6

Note: Individually packed

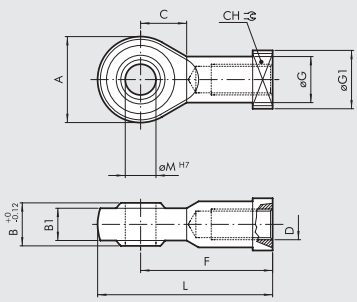
FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92

Note: Individually packed

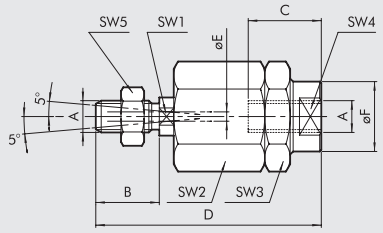
ROD EYE - MODEL GA-M



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

Note: Individually packed

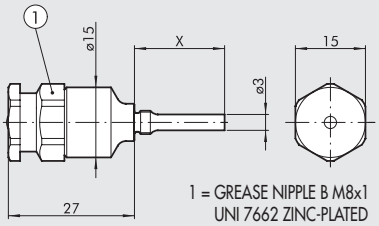
SELF ALIGNING ROD COUPLER - MODEL GA-K



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

Note: Individually packed

GREASING NEEDLE

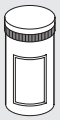


1 = GREASE NIPPLE B M8x1
UNI 7662 ZINC-PLATED

Code	Ø	X
0950327108	**32**	12

Note: Individually packed

GREASE

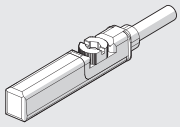


Code	Description	Weight [g]
9910506	Tube of RHEOLUBE 363 AX1 grease	400

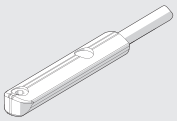
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



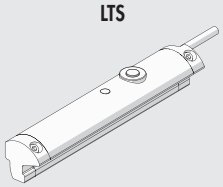
SENSOR, OVAL TYPE
Traditional



POSITION SENSORS

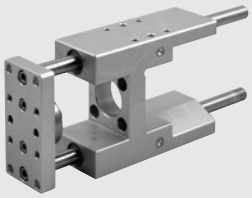
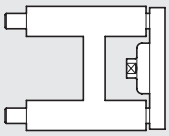
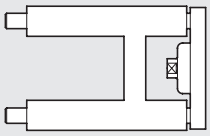
For technical data and usage strokes see **chapter A6**.

LTS



NOTES

GUIDE UNIT

Version		Code	Bore	Type
	Sliding on bronze bushings (GDH)	**W0700322...**	32	UNIT MW DH 032...
				
		Note: The guide units must only be used with anti-rotation cylinders.		
		To complete the type and code, add the 3-digit stroke (e.g. 50=050)		
		For technical data and dimensions, see **chapter A1**.		
	Sliding on ball bearing (GDM)	**W0700323...**	32	UNIT MW DM 032...
				
		Note: The guide units must only be used with anti-rotation cylinders.		
		To complete the type and code, add the 3-digit stroke (e.g. 50=050).		
		For technical data and dimensions, see **chapter A1**.		

DRIVES

For motor-drive couplings see table on page **A5**.48

SPARE PARTS

ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.48

NOTES

NOTES

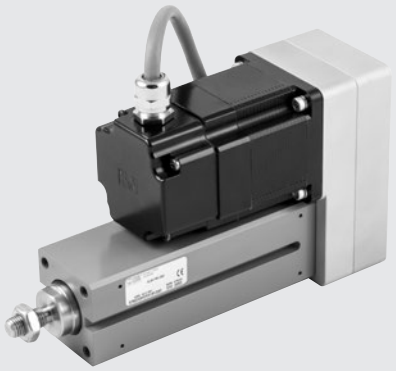
ELECTRIC CYLINDER SERIES ELEKTRO SSC

An electric cylinder with a connection interface in accordance with ISO 15552.
The ELEKTRO SSC series differs from the ISO 15552 ELEKTRO series in some design choices, including the absence of the front and rear heads.
The cylinder is available with two defined strokes, 30 mm and 55 mm respectively.
The piston rod moves forwards by either the hardened and tempered steel screw and a ball recirculating screw nut or a steel screw and technopolymer lead nut.
The cylinder is equipped with an anti-rotation system that can be easily removed as required.
A magnet is fitted to the piston rod to provide a limit switch signal and two separate lengthwise slots are provided on the cylinder body to accommodate the Square-type sensors.
An easily removable plate is attached to the cylinder body to facilitate re-lubrication of the screw.
The cylinder is available in either in-line or geared version.
The motor can be selected from among an optimized range, which includes both STEPPING and BRUSHLESS motors.
The most suitable drives for the motors are also provided.
Special flanges and couplings are provided on request when motors of a make or model other than those specified in the catalogue are used.

N.B: It is essential for the piston rod to be provided with an anti-rotation system. Therefore, if the piston rod is not secured firmly to a flange or a similar element that prevents rotation, the anti-rotation version of the cylinder must be chosen

in-line version

geared version



TECHNICAL DATA		Ø 32
Piston rod thread	mm	M10x1.25
Environmental temperature range for STEPPING motors	°C	from -10 to +50
BRUSHLESS motors	°C	from 0 to +40
Electrical protection rating with STEPPING motors		IP55 or IP65 (see key to codes on page **A5**.63)
BRUSHLESS motors		IP65 (see key to codes on page **A5**.63)
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)
Standard strokes (including 5 mm extra-stroke) for homing	mm	30
	mm	55
Positioning repeatability	mm	±0.02 with ball screw
		±0.15 with lead screw
Positioning accuracy	mm	±0.2 * with screw/ball screw nut
		±0.4 * with lead screw
Overall radial oscillation of the piston rod (without load) for 55 mm of stroke	mm	0.10
Versions		Ball screw;
		Lead screw
		With or without piston rod non-rotating
		In line or geared motor
Anti-rotation of the piston rod		YES (depending on the choice)
Uncontrolled impact at the end of stroke		NOT ALLOWED (for rear buffer ONLY)
Sensor magnet		YES
Maximum angle of twist of the piston rod for non-rotating version		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		Ball screw		Lead screw	
Screw pitch (p)	mm	4	10	5	12.7
Screw diameter	mm	12	12	12	12.7
Static axial load (F_o)*	N	3000	3000	995	1155
Dynamic axial load (F)	N	5200	3160	600	300
		Calculate mean axial load and the calculate life (see graphs on page **A5**.56-57)			
				N.B: 25% duty cycle, i.e. the cylinder must work maximum 25% of time to allow the screw/ball screw nut to cool down.	
Maximum number of revs	1/min	3000	3000	600	940
Maximum speed (V_{max})	mm/s	200	500	50	200
"K" ratio of motor revs and piston rod speed	n/V	15	6	12	4.7

Example: V = 100 mm/s; pitch = 10 → K = 6 n = V x K = 100 x 6 = 600 rpm

* **N.B.:** Static loads bearable without damage. Payloads are shown in the diagrams on page **A5**.57 onwards

WEIGHTS		Ball screw		Lead screw	
Screw pitch (p)	mm	4	10	5	12.7
Weight at stroke 0, in-line version	g	767	777	577	582
Weight at stroke 0, geared version	g	1077	1087	927	932
Additional weight each mm of stroke	g	7.6	7.6	7.6	7.6
Moving mass at stroke 0 (non-rotating version) Mx	g	199	209	140	145
Additional moving mass each mm of stroke	g	2.5	2.5	2.5	2.5

N.B.: You get the total weight of a complete cylinder by adding: weight stroke 0 + stroke [mm] x weight for each mm of stroke + weight of the motor.

MASS MOMENTS OF INERTIA		Ball screw		Lead screw	
Screw pitch	mm	4	10	5	12.7
Transmission ratio (τ)		1:1	1:1	1:1	1:1
J0 at stroke 0	$kgmm^2$	7.821	7.934	5.708	6.123
J1 each metre of stroke	$kgmm^2/m$	12.76	13.76	11.6	14.7
J2 each kg of load	$kgmm^2/kg$	0.4053	2.5330	0.6333	4.0855
J3 in-line transmission	$kgmm^2$	2.879	2.879	2.879	2.879
J3 geared transmission	$kgmm^2$	3.237	3.237	3.237	3.237

The total mass moment of inertia (Jtot) reduced for the motor is: Jtot = [J1 . stroke [m] + J2 . (load [kg] + Mx [kg]) + J0] . τ2 +J3
Mx is defined in the weights table.

CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

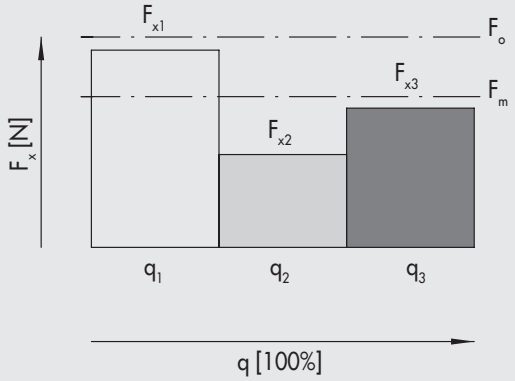
Peak axial load in a work cycle must not exceed the static axial load F_o.
The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

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

$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{X1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{X2}}{V_m} + \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{X3}}{V_m} \times \frac{q_3}{100} + \ldots}$$

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

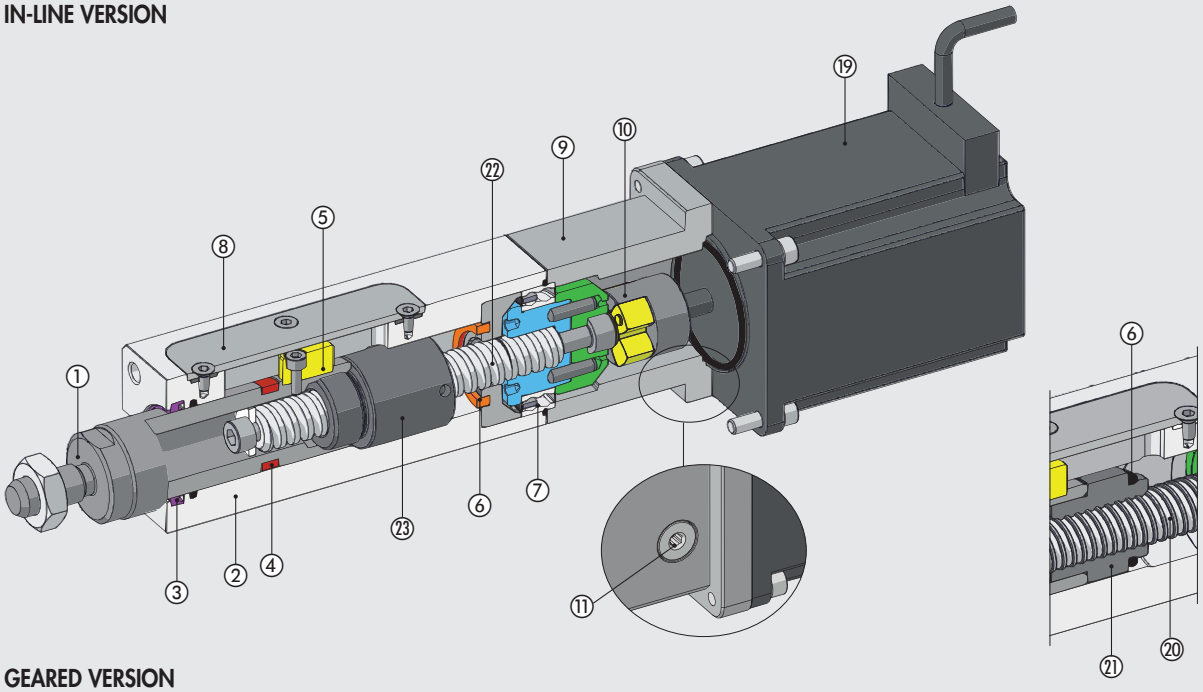


The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graphs on page **A5**.56-57, show screw life as a function of F_m

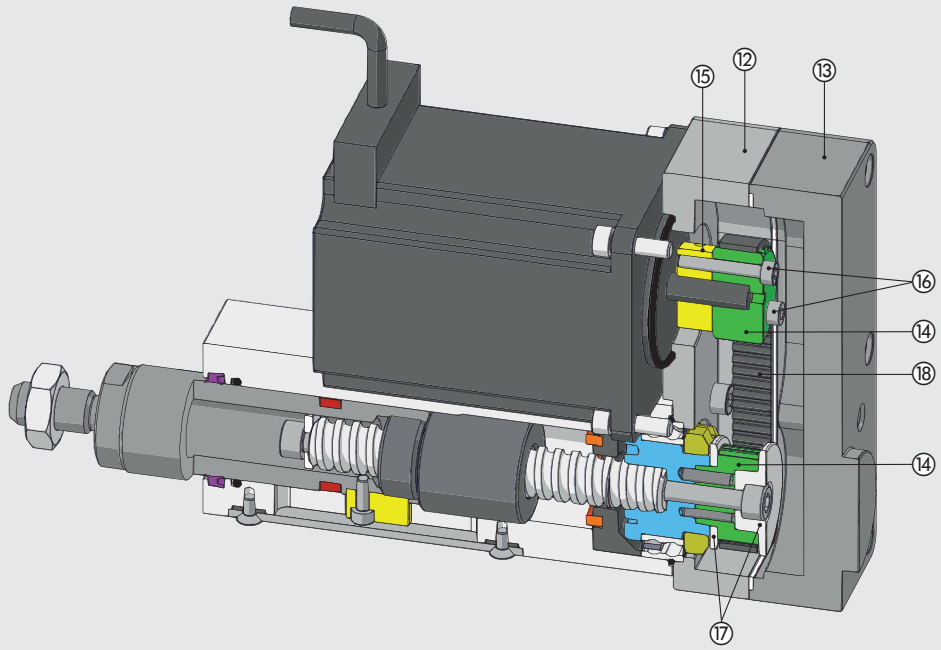
METAL WORK PNEUMATIC

COMPONENTS

IN-LINE VERSION



GEARED VERSION

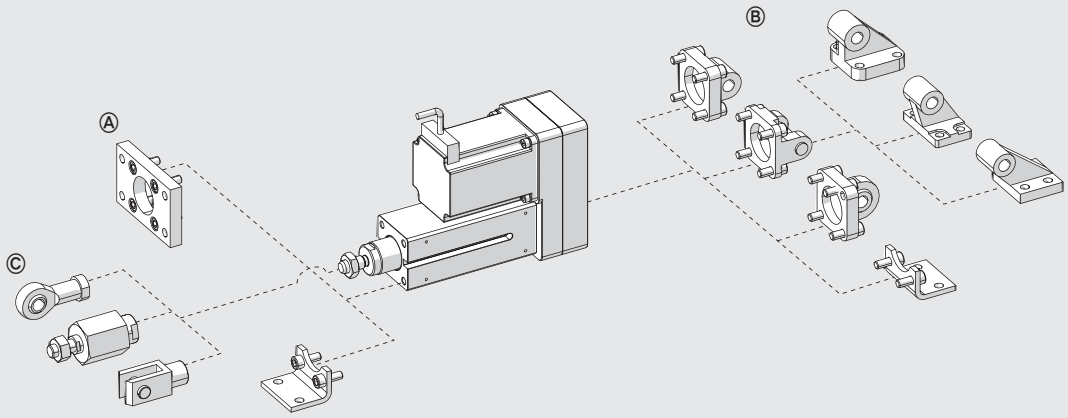


① PISTON ROD: stainless steel (AISI 316)
② BODY: aluminium alloy with wear-resistant coating
③ WIPER RING: polyurethane
④ MAGNET: plastoferrite (optional)
⑤ ANTI-ROTATION KEY: brass (optional)
⑥ BUFFER: polyurethane
⑦ BEARING: oblique with two ball rings
⑧ PLATE: stainless steel (AISI 304)
⑨ ADAPTOR PLATE: anodized aluminium
⑩ ELASTIC COUPLING: aluminium / polyurethane
⑪ PLUG: for access to the elastic coupling screw
⑫ TRANSMISSION PLATE: anodized aluminium
⑬ COVER: anodized aluminium
⑭ COG PULLEY: anodized aluminium
⑮ ELASTIC COLLAR: anodized aluminium
⑯ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
⑰ BELT FLANGES: anodized aluminium
⑱ TOOTHED BELT: polyurethane with steel cables
⑲ MOTOR

Version with lead screw:
⑳ SCREW: stainless steel (AISI 304)
㉑ NUT: technopolymer

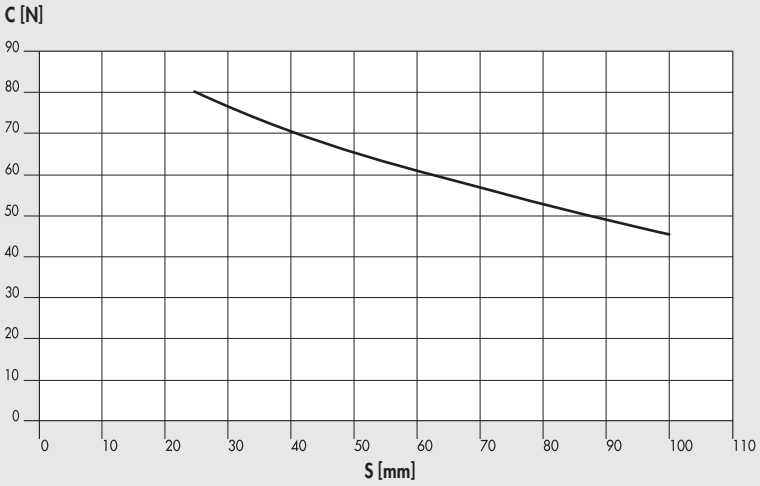
Version with ball screw:
㉒ SCREW: hardened and rolled steel
㉓ NUT: ball recirculating

FIXING OPTIONS

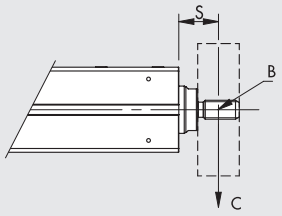


Ⓐ Fitted directly to the front of the cylinder body, using 4 threaded holes according to ISO 15552
Ⓑ Fitted to the rear (geared version only), using 4 threaded holes according to ISO 15552
Ⓒ Piston rod accessories.

MAXIMUM RADIAL LOADS ON PISTON ROD



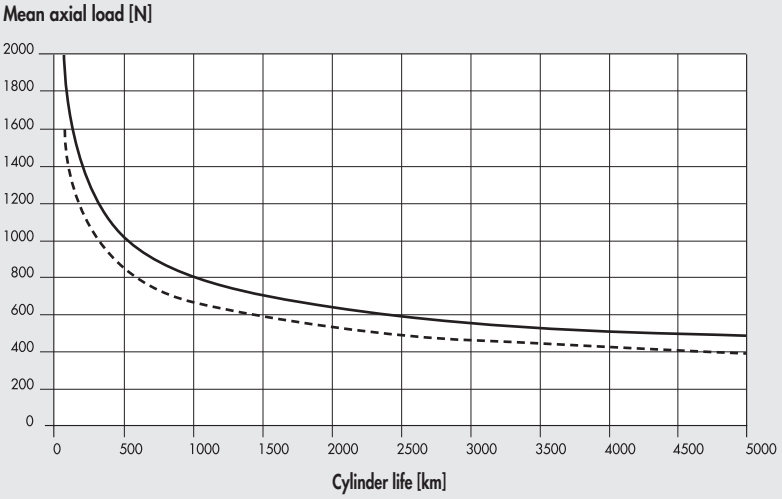
Radial loads can be applied to the piston rod.
They must not exceed the values in the adjacent chart, otherwise the guides on the rod and piston will be subjected to excessive wear.

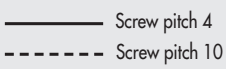


B = Barycentre;
S = Projection;
C = Radial load

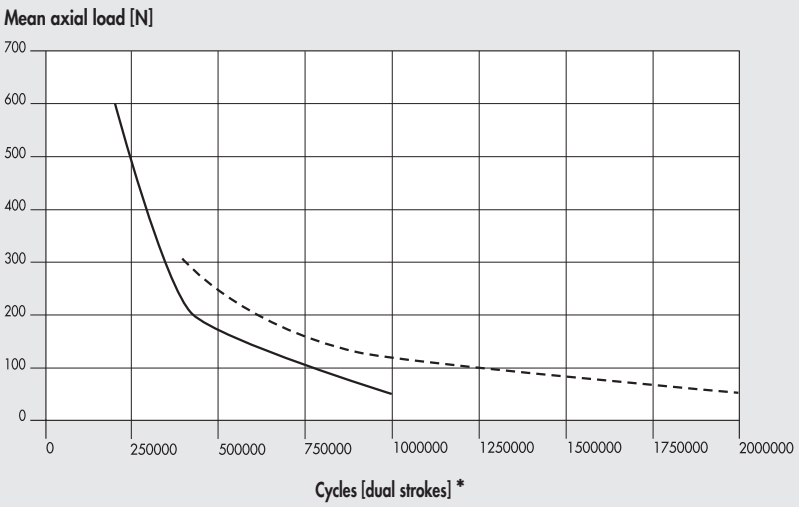
LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD, VERSION WITH BALL SCREW

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





LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD, VERSION WITH LEAD SCREW

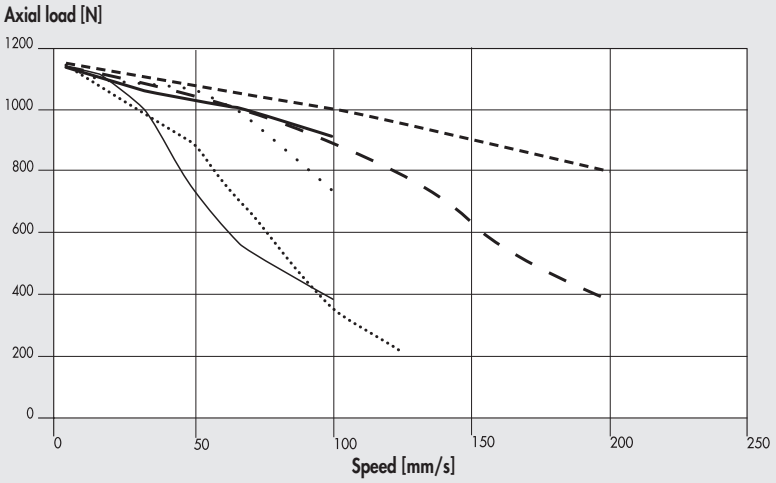


* Relative to cylinders stroke 55 mm. For 30 mm stroke cylinders, the data must be multiplied by 1.8

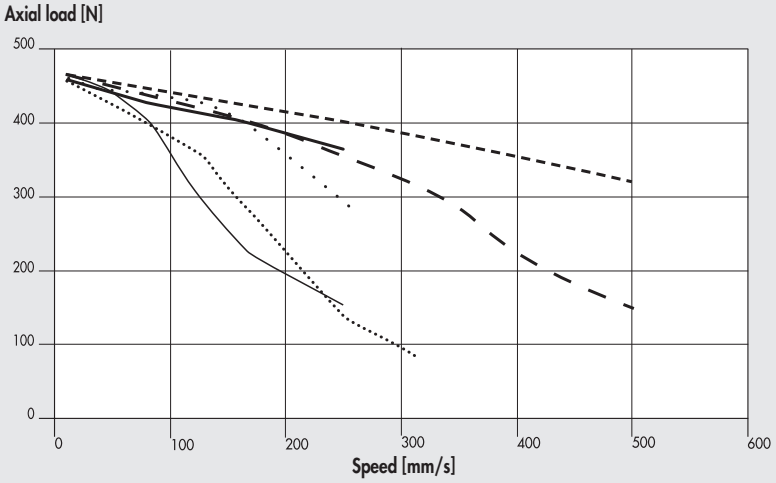
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPLETE WITH MOTOR AND DRIVE)

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%.

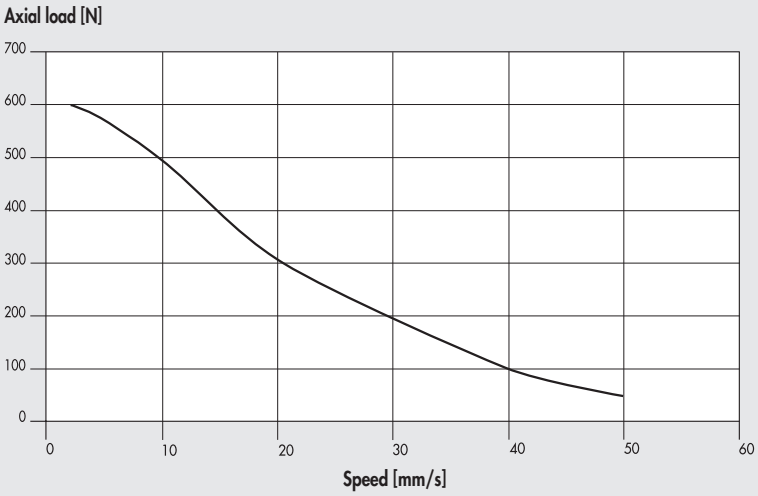
Ø 32 with pitch 4 ball screw, STEPPING motor, STEPPING motors with encoder, STEPPING motors with encoder + brake



Ø 32 with pitch 10 ball screw, STEPPING motor, STEPPING motors with encoder, STEPPING motors with encoder + brake

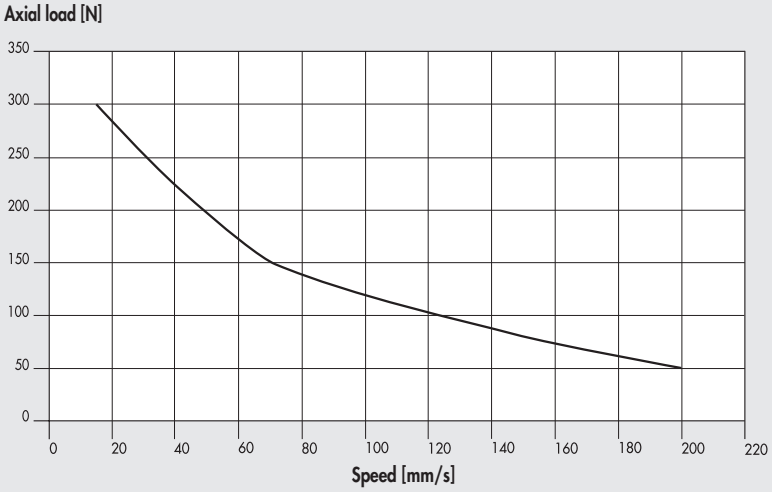


Ø 32 with pitch 5 lead screw, STEPPING motor



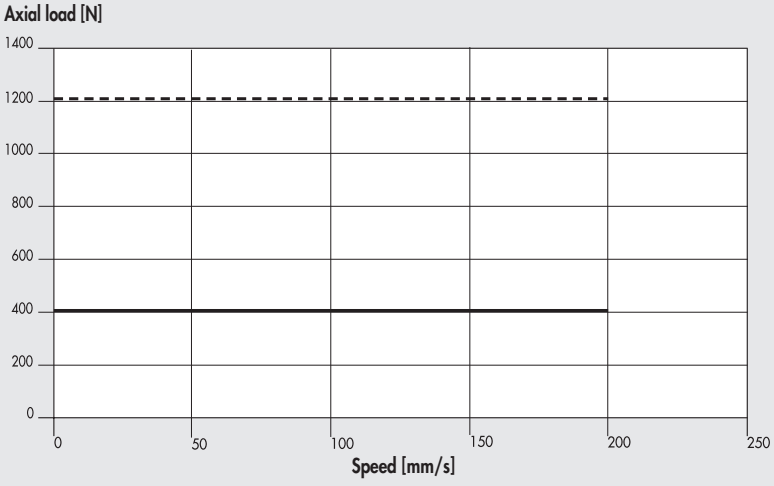
37M1120001 (24VDC)
or 37M1220000 (24VDC)
or 37M8220000 (with encoder, 24VDC)
or 37M3220000 (with encoder + brake, 24VDC)

Ø 32 with pitch 12.7 lead screw, STEPPING motor



37M1120001 (24VDC)
or 37M1220000 (24VDC)
or 37M8220000 (with encoder, 24VDC)
or 37M3220000 (with encoder + brake, 24VDC)

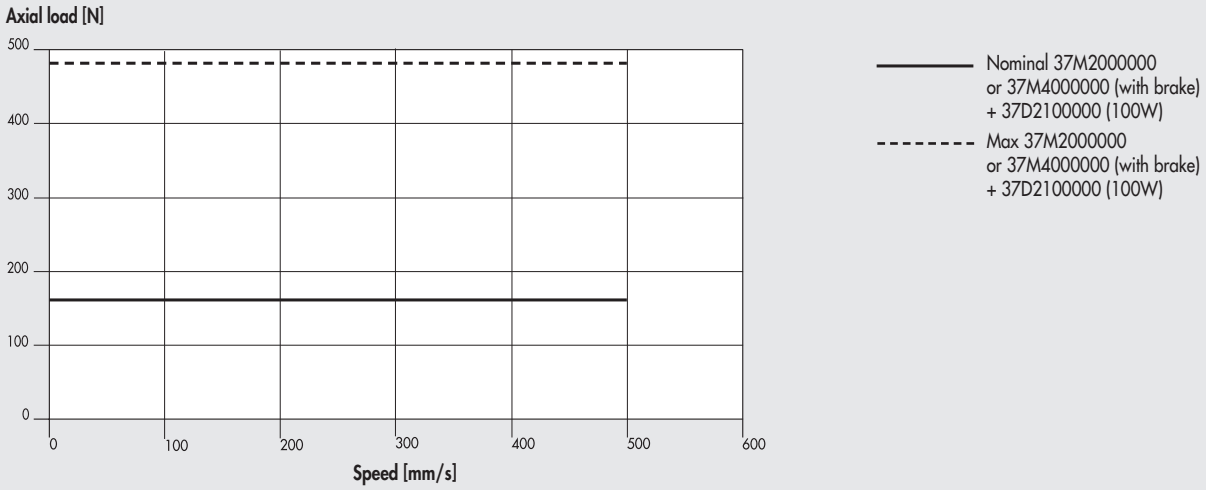
Ø 32 with pitch 4 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



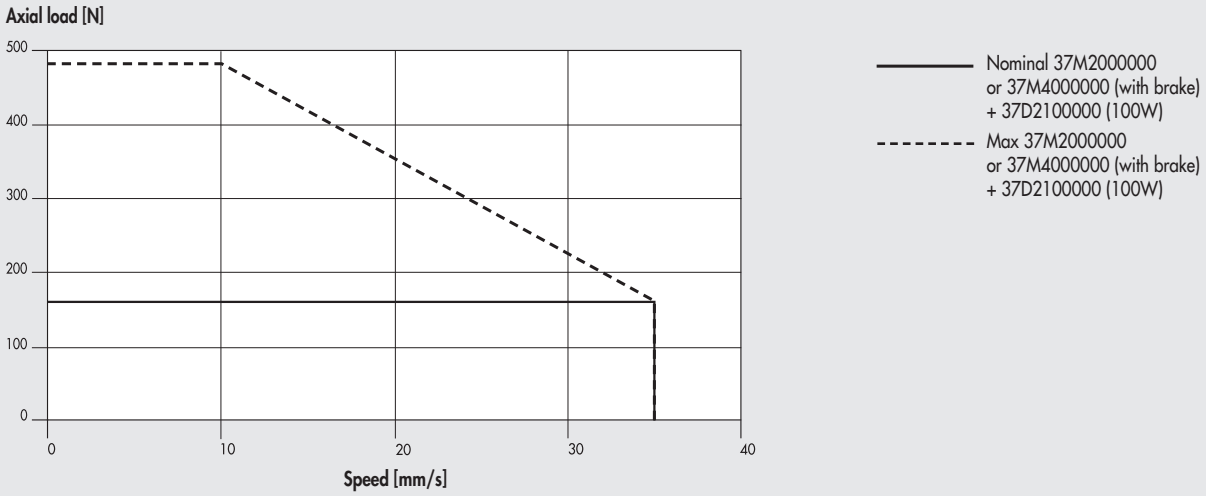
Nominal 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

Max 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

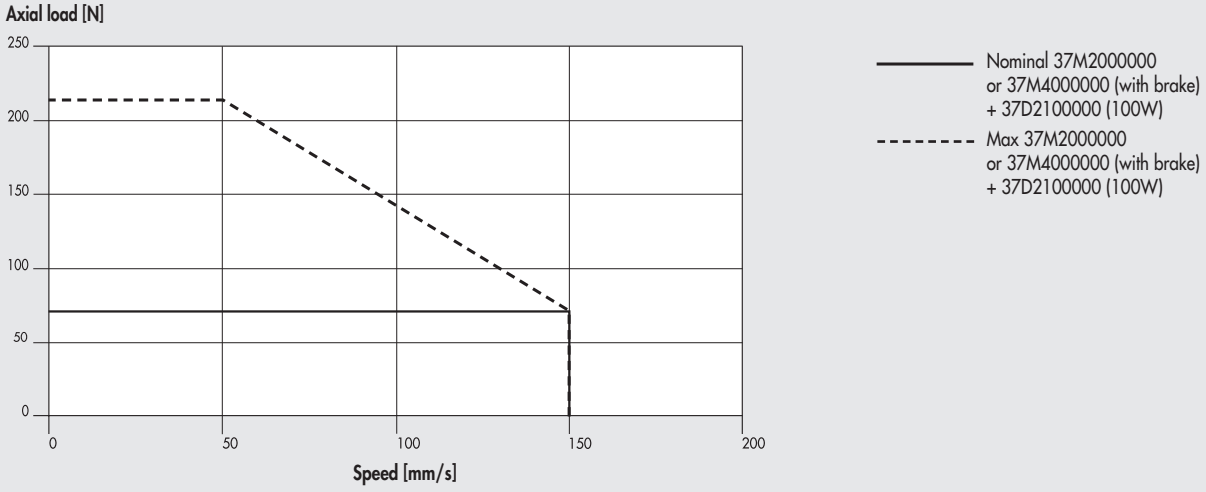
Ø 32 with pitch 10 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



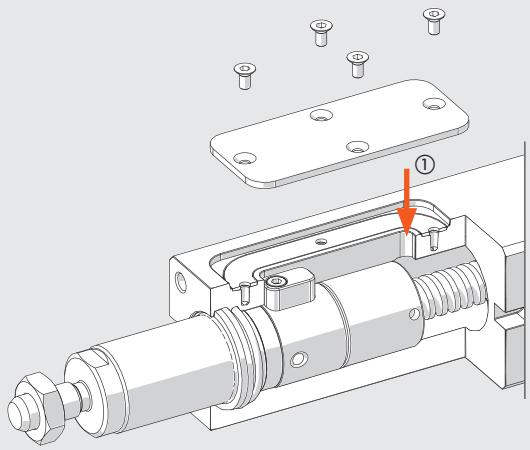
Ø 32 with pitch 5 lead screw, BRUSHLESS motor and BRUSHLESS motor with brake



Ø 32 with pitch 12.7 lead screw, BRUSHLESS motor and BRUSHLESS motor with brake



LUBRICATION DIAGRAMS



① Greasing point

- Retract the piston rod towards the motor adapter plate until the piston rod/ball scroll system rests against the rear buffer.
- Move the piston rod at low speed and/or controlled torque forwards by a value corresponding to the cylinder total stroke.
- Remove the plate by unscrewing the 4 screws.
- Lubricate the screw using a food-grade grease pump (code 9910514), according to the quantities shown in the table.
- Make the piston rod perform four complete strokes. The piston rod should end up in the initial (retracted) position.
- Repeat the last two operations
- Refit the plate by tightening the 4 screws.
- The operation of re-greasing will have to be repeated at least once a year.

		Ø 32			
Screw pitch (p)	mm	4	10	5	12.7
Relube grease quantity	g	0.3	0.5	0.3	0.5
	cc	0.26	0.42	0.26	0.42

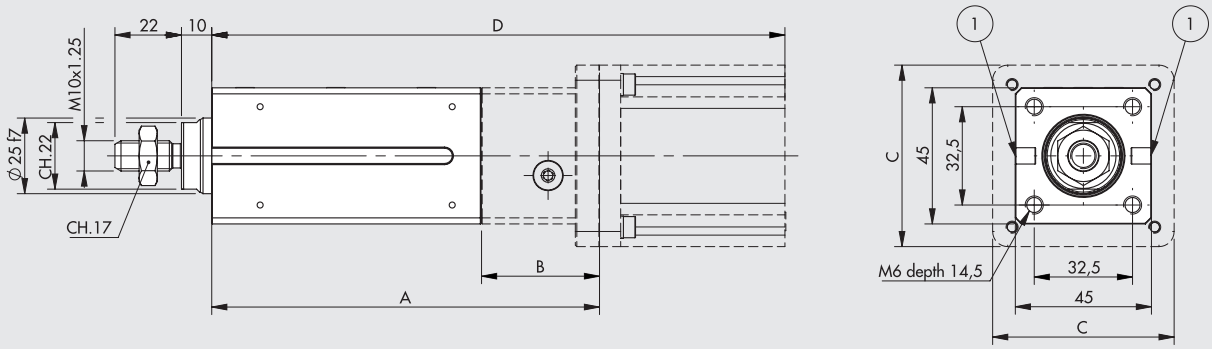
NOTES

METAL WORK PNEUMATIC

DIMENSIONS CYLINDER IN-LINE

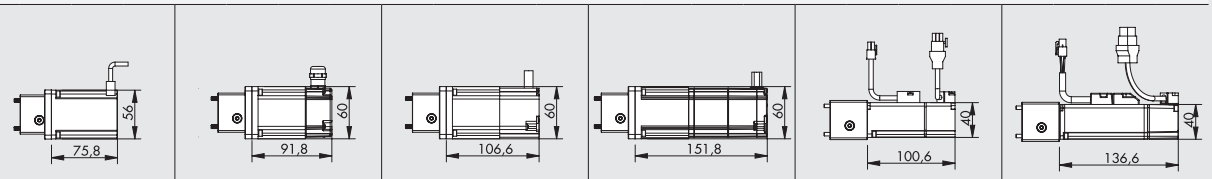
WITHOUT MOTOR

① = Slots for sensors



WITH MOTOR

CYLINDER WITH LEAD SCREW AND MOTOR

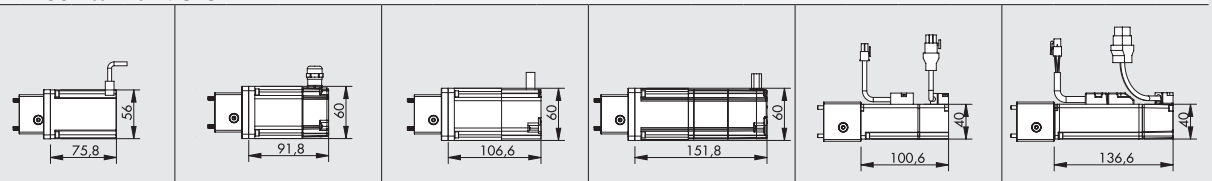


		1121				1220				8220				3220				2000				4000			
		STEPPING MOTOR code 37M1120001				STEPPING MOTOR code 37M1220000				STEPPING MOTOR + ENCODER code 37M8220000				STEPPING MOTOR + ENCODER + BRAKE code 37M3220000				BRUSHLESS MOTOR code 37M2000000				BRUSHLESS MOTOR + BRAKE code 37M4000000			
		A	B	C	D	A	B	C	E	A	B	C	E	A	B	C	E	A	B	C	E	A	B	C	E
STROKE	0030	125	36	56	201	128	39	60	220	128	39	60	235	128	39	60	280	132	43	45	233	132	43	45	269
	0055	150	36	56	226	153	39	60	245	153	39	60	260	153	39	60	305	157	43	45	258	157	43	45	294

376032**0030**C3 _ _ _ _ 376032**0030**C4 _ _ _ _ 376032**0030**F3 _ _ _ _ 376032**0030**F4 _ _ _ _
376032**0055**C3 _ _ _ _ 376032**0055**C4 _ _ _ _ 376032**0055**F3 _ _ _ _ 376032**0055**F4 _ _ _ _

_ _ _ _ = Enter the type of drive to complete the code.

CYLINDER WITH BALL SCREW AND MOTOR



		1121				1220				8220				3220				2000				4000			
		STEPPING MOTOR code 37M1120001				STEPPING MOTOR code 37M1220000				STEPPING MOTOR + ENCODER code 37M8220000				STEPPING MOTOR + ENCODER + BRAKE code 37M3220000				BRUSHLESS MOTOR code 37M2000000				BRUSHLESS MOTOR + BRAKE code 37M4000000			
		A	B	C	D	A	B	C	E	A	B	C	E	A	B	C	E	A	B	C	E	A	B	C	E
STROKE	0030	160	48.5	56	236	160	48.5	60	252	160	48.5	60	267	160	48.5	60	312	165	53.5	45	266	165	53.5	45	302
	0055	185	48.5	56	261	185	48.5	60	277	185	48.5	60	292	185	48.5	60	337	190	53.5	45	291	190	53.5	45	327

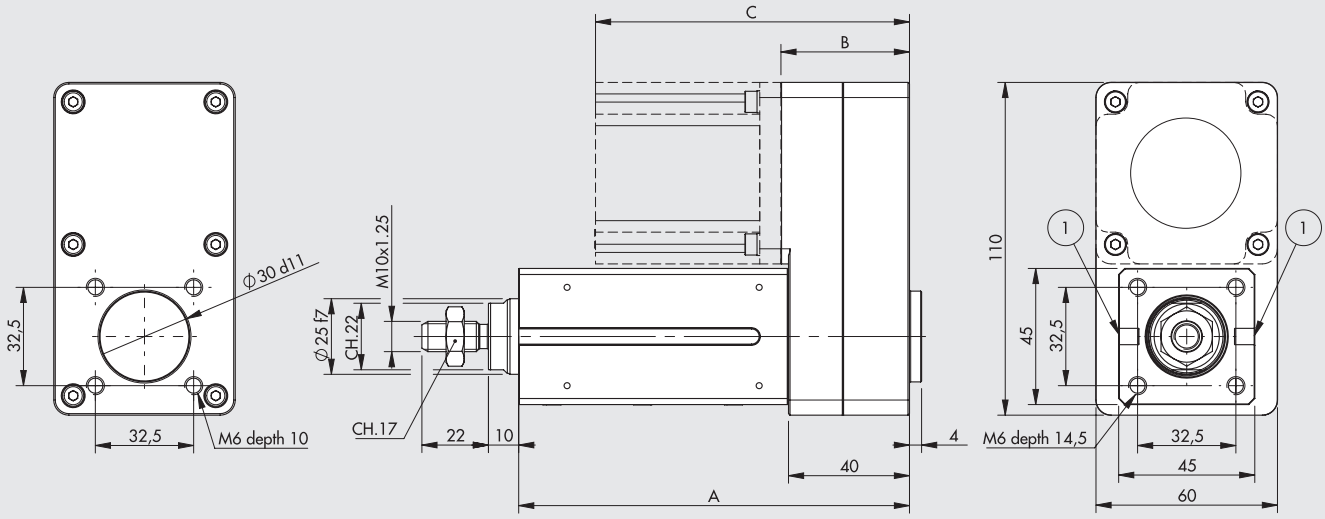
376032**0030**13 _ _ _ _ 376032**0030**14 _ _ _ _ 376032**0030**43 _ _ _ _ 376032**0030**44 _ _ _ _
376032**0055**13 _ _ _ _ 376032**0055**14 _ _ _ _ 376032**0055**43 _ _ _ _ 376032**0055**44 _ _ _ _

_ _ _ _ = Enter the type of drive to complete the code.

DIMENSIONS CYLINDER GEARED

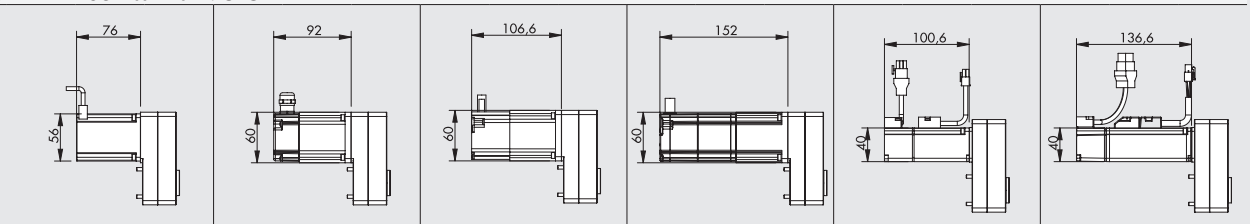
WITHOUT MOTOR

① = Slots for sensors



WITH MOTOR

CYLINDER WITH LEAD SCREW AND MOTOR

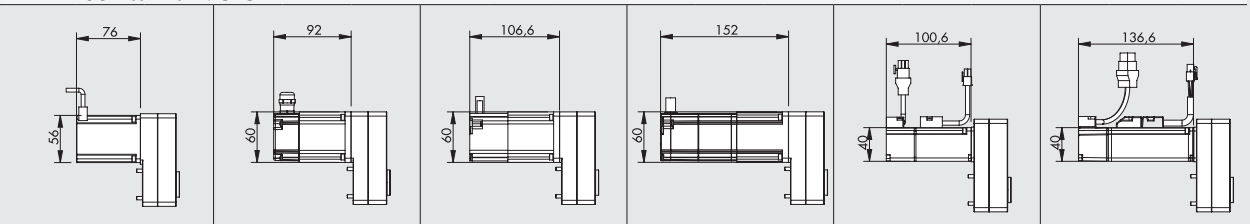


		1121 STEPPING MOTOR code 37M1120001			1220 STEPPING MOTOR code 37M1220000			8220 STEPPING MOTOR + ENCODER code 37M8220000			3220 STEPPING MOTOR + ENCODER + BRAKE code 37M3220000			2000 BRUSHLESS MOTOR code 37M2000000			4000 BRUSHLESS MOTOR + BRAKE code 37M4000000		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
STROKE	0030	129	42.5	118.5	129	42.5	134.5	129	42.5	149	129	42.5	194.5	129	43.5	144	129	43.5	180
	0055	154	42.5	118.5	154	42.5	134.5	154	42.5	149	154	42.5	194.5	154	43.5	144	154	43.5	180

3760320**0030**C7 _ _ _ _ 3760320**0030**C8 _ _ _ _ 3760320**0030**F7 _ _ _ _ 3760320**0030**F8 _ _ _ _
3760320**0055**C7 _ _ _ _ 3760320**0055**C8 _ _ _ _ 3760320**0055**F7 _ _ _ _ 3760320**0055**F8 _ _ _ _

_ _ _ _ = Enter the type of drive to complete the code.

CYLINDER WITH BALL SCREW AND MOTOR



		1121 STEPPING MOTOR code 37M1120001			1220 STEPPING MOTOR code 37M1220000			8220 STEPPING MOTOR + ENCODER code 37M8220000			3220 STEPPING MOTOR + ENCODER + BRAKE code 37M3220000			2000 BRUSHLESS MOTOR code 37M2000000			4000 BRUSHLESS MOTOR + BRAKE code 37M4000000		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
STROKE	0030	152	42.5	118.5	152	42.5	134.5	152	42.5	149	152	42.5	194.5	152	43.5	144	152	43.5	180
	0055	177	42.5	118.5	177	42.5	134.5	177	42.5	149	177	42.5	194.5	177	43.5	144	177	43.5	180

3760320**0030**17 _ _ _ _ 3760320**0030**18 _ _ _ _ 3760320**0030**47 _ _ _ _ 3760320**0030**48 _ _ _ _
3760320**0055**17 _ _ _ _ 3760320**0055**18 _ _ _ _ 3760320**0055**47 _ _ _ _ 3760320**0055**48 _ _ _ _

_ _ _ _ = Enter the type of drive to complete the code.

MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES		
Metal Work		37D1332000 *	37D1442000	37D1552000
Manufacturer		RTA NDC 96	RTA PLUS A4	RTA PLUS B7
Metal Work	Manufacturer	(6A 24-75VDC)	(6A 24-75VDC)	(10A 28-62VAC) ●
STEPPING MOTORS				
37M1120001	SANYO DENKI 103-H7126-6640 (5.6A 75V max)	√	-	√ ■
37M1220000	B&R 80MPF3.250S000-01 + kit IP65 (5A 80V max)	√ ◆	√ ■	√ ■
STEPPING MOTORS + ENCODER				
37M8220000	B&R 80MPF3.500S114-01 (5A 80V max)	√ ◆	√ ■	√ ■
STEPPING MOTORS WITH BRAKE + ENCODER				
37M3220000	B&R 80MPF3.500D114-01 (5A 80V max)	√ ◆	√ ■	√ ■

* In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$ ◆ **Important!** Limit current ■ **Important!** Limit current and voltage

MOTOR CODES		DRIVES CODES
Metal Work		37D2100000
Manufacturer		DELTA ASD-A2-0121-M
Metal Work	Manufacturer	(100W)
BRUSHLESS MOTORS		
37M2000000	DELTA ECMA-C20401RS (100W)	√
BRUSHLESS MOTORS WITH BRAKE		
37M4000000	DELTA ECMA-C20401SS (100W)	√

KEY TO CODES

							DRIVE		
CYL	37	6	032	0030	1	3	1	1	2	1
	TYPE	FAMILY	SIZE	STROKE	SCREW	VERSION	MOTOR	FLANGE	TORQUE	
	37 Electric actuators	**6** Electric cylinder SSC	**032** Ø32	**0030** 30 mm **0055** 55 mm	**1** With pitch 4 ball screw **4** With pitch 10 ball screw **C** With pitch 5 lead screw **F** With pitch 12.7 lead screw	**IN-LINE** ● **3** Without non-rotating IP55/IP65 ● **4** With antirotation, IP55/IP65 **GEARED** ● **7** Without non-rotating IP55/IP65 ● **8** With antirotation, IP55/IP65	**1** STEPPING **2** BRUSHLESS **3** STEPPING with BRAKE + encoder **4** BRUSHLESS with BRAKE **8** STEPPING + encoder	**0** 40x40 **1** NEMA 23 **2** 60x60	**0** 0 - 0.79 Nm **2** 1.2 - 2.19 Nm	**0** Base **1** Greater rpm

● Version available for all drives, except for motor code 37M1120001, which is IP55 protected.

POSSIBLE ORDERING CODES

Ø 32 with ball screw

Drive
Version
Screw pitch

376032_ _ _ _	1	3	1121
	4	4	1220
		7	8220
		8	3220
			2000
			4000

_ _ _ _ = enter the stroke in mm

Ø 32 with multi-step screw

Drive
Version
Screw pitch

376032_ _ _ _	C	3	1121
	F	4	1220
		7	8220
		8	3220
			2000
			4000

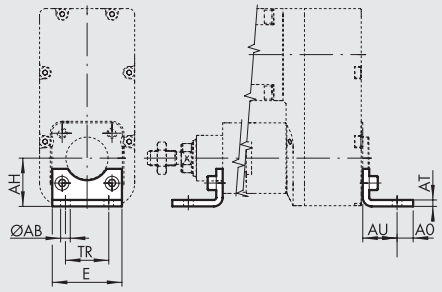
_ _ _ _ = enter the stroke in mm

NOTES

ACCESSORIES FOR ELECTRIC CYLINDER SERIES ELEKTRO SSC

Note: Where specified, limit the maximum axial loads (Fmax) according to the electric cylinders

FOOT MODEL A

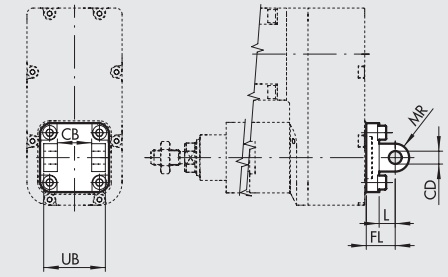


STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	Weight [g]	Fmax [N]
W0950322001	32	7	32	11	4	24	32	45	76	1600

Note: Individually packed with 2 screws.
N.B.: Rear mounting requires 2 M6x14 UNI 5931screws.

FEMALE HINGE - MODEL B



ALUMINIUM

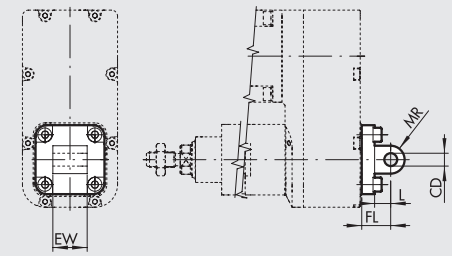
Code	Ø	UB	CB H14	FL	CD H9	MR	L	Weight [g]	Fmax [N]
W0950322003	32	45	26	22	10	10	12	116	800

STEEL

Code	Ø	UB	CB H14	FL	CD H9	MR	L	Weight [g]	Fmax [N]
W095E322003	32	45	26	22	10	10	13	348	1600

Note: Supplied with 4 screws, 4 washers, 2 snap rings and 1 pin.
N.B.: Rear mounting requires 4 M6x16 UNI 5931screws.

MALE HINGE - MODEL BA



ALUMINIUM

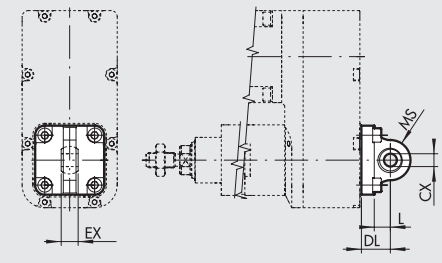
Code	Ø	EW	FL	MR	CD H9	L	Weight [g]	Fmax [N]
W0950322004	32	26	22	10	10	13	94	800

STEEL

Code	Ø	EW	FL	MR	CD H9	L	Weight [g]	Fmax [N]
W095E322004	32	26	22	10	10	13	282	1600

Note: Supplied with 4 screws.
N.B.: Rear mounting requires 4 M6x14 UNI 5931screws.

ARTICULATED MALE HINGE - MODEL BAS



ALUMINIUM

Code	Ø	DL	MS	L	CX H9	EX	Weight [g]	Fmax [N]
W0950322006	32	22	16	12	10	14	106	800

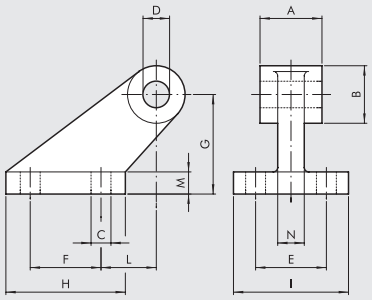
STEEL

Code	Ø	DL	MS	L	CX H9	EX	Weight [g]	Fmax [N]
W095E322006	32	22	15	14	10	14	318	1600

Note: Supplied with 4 screws, 4 washers.
N.B.: Rear mounting requires 4 M6x16 UNI 5931screws.

METAL WORK PNEUMATIC

CETOP HINGE FOR MODEL B - MODEL GL

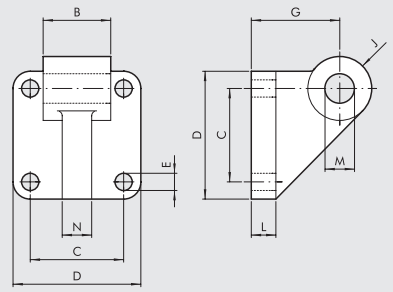


ALUMINIUM

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

Note: Supplied with 4 screws, 4 washers.

COUNTER-HINGE FOR MODEL B - MODEL GS

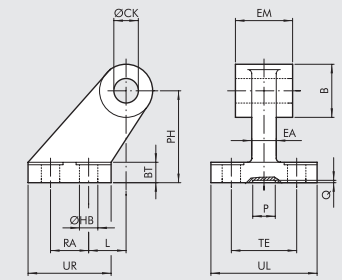


ALUMINIUM

Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]	Fmax [N]
W0950322108	32	26	32.5	45	7	32	11	10	10	10	106	800

Note: Supplied with 4 screws, 4 washers.

ISO 15552 COUNTER-HINGE FOR MODEL B - MODEL AB7



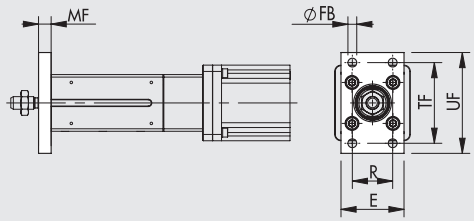
ALUMINIUM

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

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	20	5	180	1600

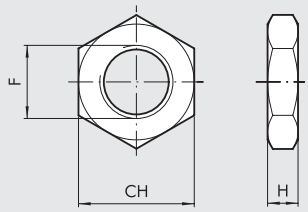
FRONT FLANGE - MODEL C



Code	Ø	TF	UF	E	MF	R	øFB	Weight [g]	Fmax [N]
W0950322002	32	64	80	50	10	32	7	246	1600

Note: Supplied with 4 screws.

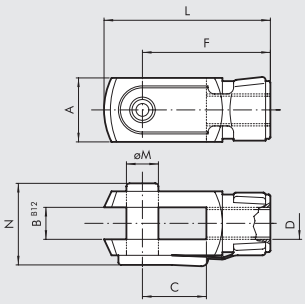
ROD NUT - MODEL S



Code	Ø	F	H	CH	Weight [g]
0950322010	32	M10x1.25	6	17	6

Note: Individually packed.

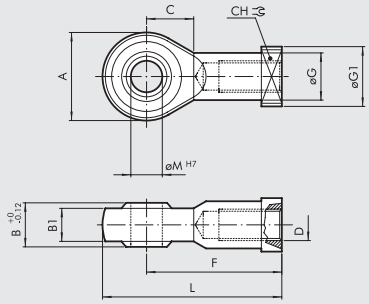
FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950322020	**32**	10	20	10	20	52	40	M10x1.25	26	92

Note: Individually packed.

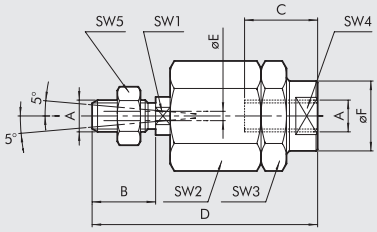
ROD EYE - MODEL GA-M



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

Note: Individually packed.

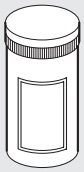
SELF ALIGNING ROD COUPLER - MODEL GA-K



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

Note: Individually packed.

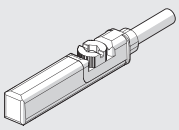
GREASE



Code	Description	Weight [g]
9910514	Grease pipe ULTRAPLEX FG1 NSF CAT H1	400

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing



For codes and technical data, see **chapter A6**.

DRIVES

For motor-drive couplings see table on page **A5**.65

SPARE PARTS

ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.65

NOTES

NOTES

ELECTRIC CYLINDER
SERIES ELEKTRO ROUND DC

In the ELEKTRO ROUND DC cylinder, the forward movement of the piston rod is obtained via trapezoidal (acme) or lead 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 24VDC direct current motor. The position of the motor can be controlled using an optional encoder. A resettable fuse is 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 belt and pulleys with a ratio of 1:1.

This cylinder is designed for use with IP65 protection rating.
The solutions with the trapezoidal screw (acme) 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-leadscrew assembly; wear over time does not create inconveniences, no high forces and speeds are required at the same time.

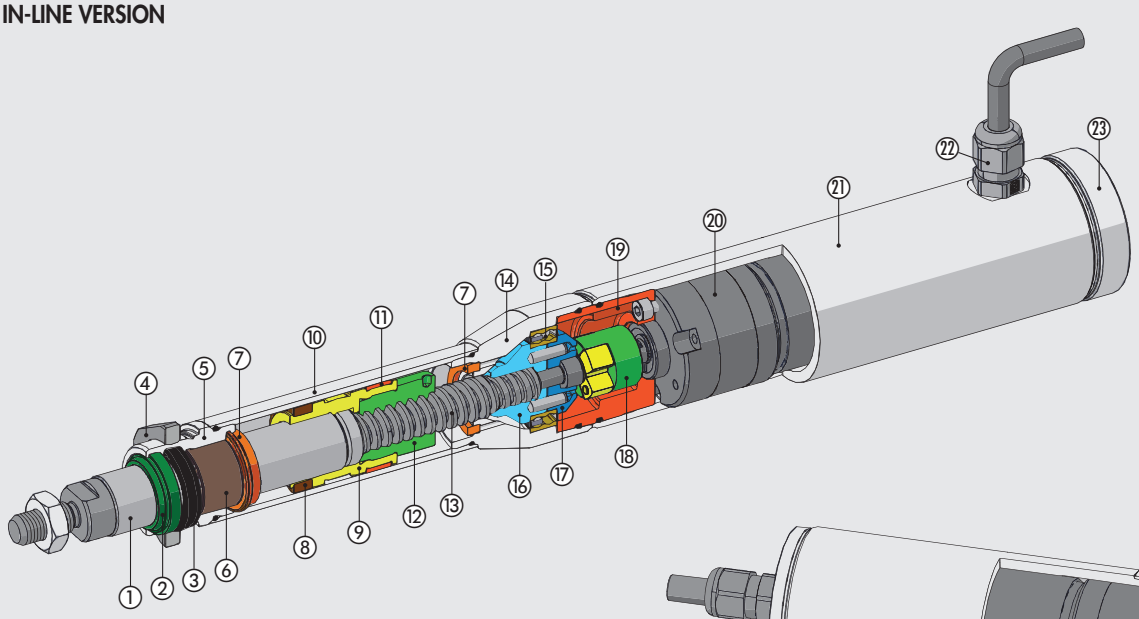
in-line version

geared version

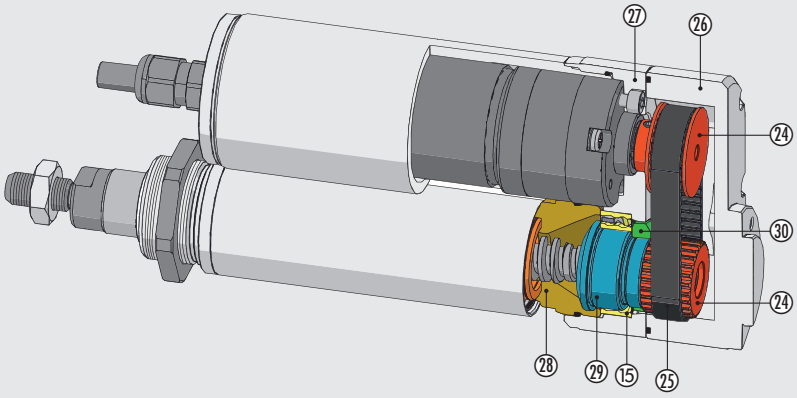
TECHNICAL DATA			Ø 32 pitch 4	Ø 32 pitch 25
Temperature range		°C	from -20 to +60	
Degree of protection			IP65	
Gearing ratio of the planetary gearbox		mm	1/13 or 1/25	
Minimum stroke		mm	30	
Maximum stroke		mm	1000	
Piston rod diameter		mm	20	
Maximum thrust		N	see graphs on page **A5**.73	
Maximum speed		mm/s	see graphs on page **A5**.73	
Maximum load in vertical position and motor powered off (reversibility)		N	irreversible (max recommended 1000)	70 with 1/25 gear ratio 20 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		mm	0.4	
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		VDC	24	
Input power with MAX torque		W	24	
Input current with MAX torque		A	1 (24VDC)	
Interference suppression			VDR and capacitors	
Direction of rotation			according to polarity	
Encoder (optional)			two channels, three pulses/motor rev for each channel, NPN	
Motor protection			Overload and short-circuiting protection using resettable fuse	
Power cable (length)		m	2	
Weight				
	at stroke 0, in-line version	g	1282	1256
	at stroke 0, geared version	g	1415	1389
	additional for each mm stroke	g	2.5	

COMPONENTS

IN-LINE VERSION



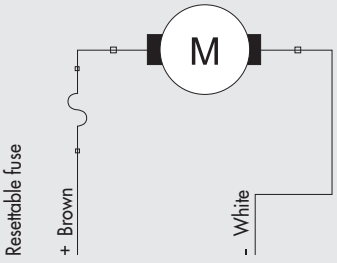
GEARED VERSION



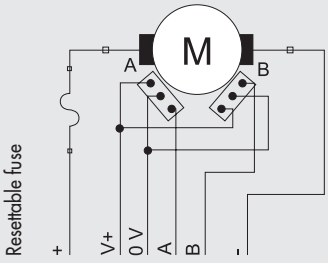
① PISTON ROD: ground chrome steel
② WIPER RING: polyurethane
③ PISTON ROD GASKET: NBR
④ FRONT FIXING RING NUT: anodized aluminium
⑤ FRONT CYLINDER HEAD: anodized aluminium
⑥ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑦ BUFFER: polyurethane
⑧ MAGNET: plastoferrite
⑨ PISTON: alumunium
⑩ BARREL: anodized aluminium alloy
⑪ GUIDE STRIP: self-lubricated calibrated technopolymer
⑫ BALL SCREW: technopolymer
⑬ SCREW (ACME): hardened steel
⑭ REAR CYLINDER HEAD: anodized aluminium
⑮ BEARING: oblique with two ball rings
⑯ BEARING ADAPTER 1: anodized aluminium
⑰ BEARING ADAPTER 2: anodized aluminium
⑱ COUPLING
⑲ MOTOR PLATE: anodized aluminium
⑳ GEARED MOTOR
㉑ MOTOR COVER PIPE: anodized aluminium
㉒ FAIRLEAD
㉓ MOTOR COVER PLUG: anodized aluminium
㉔ PULLEY: aluminium
㉕ DRIVE TOOTHED BELT
㉖ COVER: anodized aluminium
㉗ TRANSMISSION PLATE: anodized aluminium
㉘ THREADED RING: anodized aluminium
㉙ BEARING ADAPTER 3: anodized aluminium
㉚ RING NUT

CYLINDER CONNECTION AND WIRING DIAGRAM

WITHOUT ENCODER



WITH ENCODER



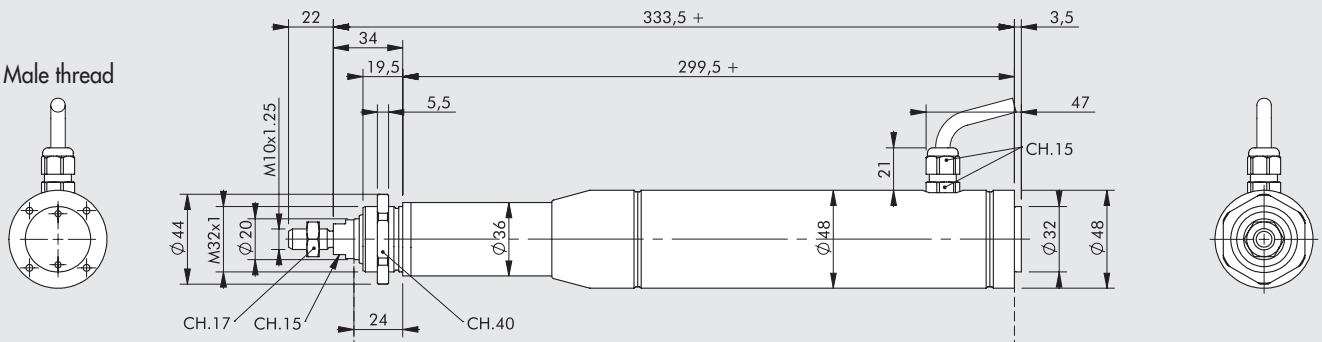
Function	Corresponding wire colour
Motor power supply +	Red
Motor power supply -	Black
ENCODER POWER SUPPLY V+ 5-24 VDC	Green
Encoder 0 V supply	Yellow
Encoder channel A (NPN)	White
Encoder channel B (NPN)	Brown

METAL WORK PNEUMATIC

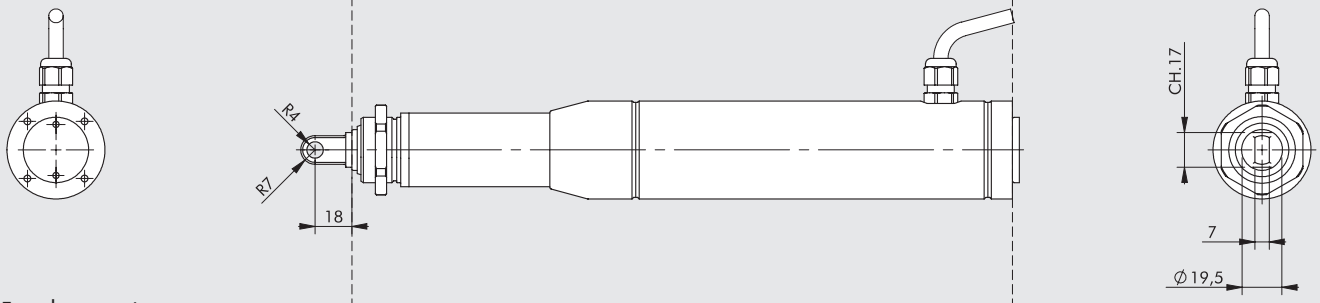
DIMENSIONS FOR IN-LINE VERSIONS

+ = ADD THE STROKE

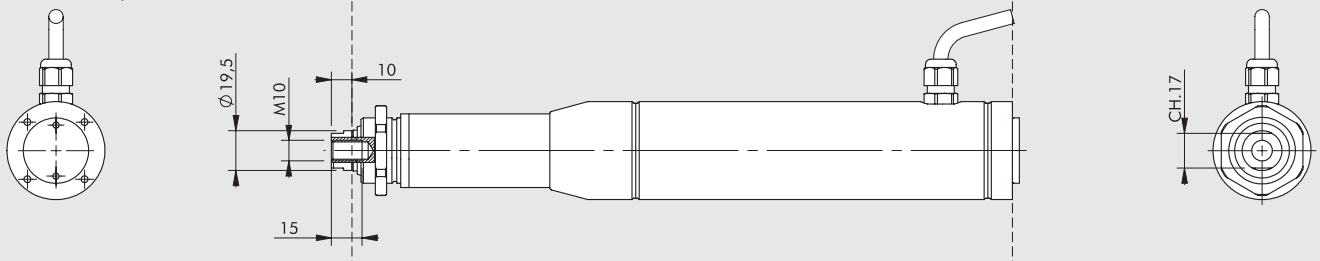
Male thread



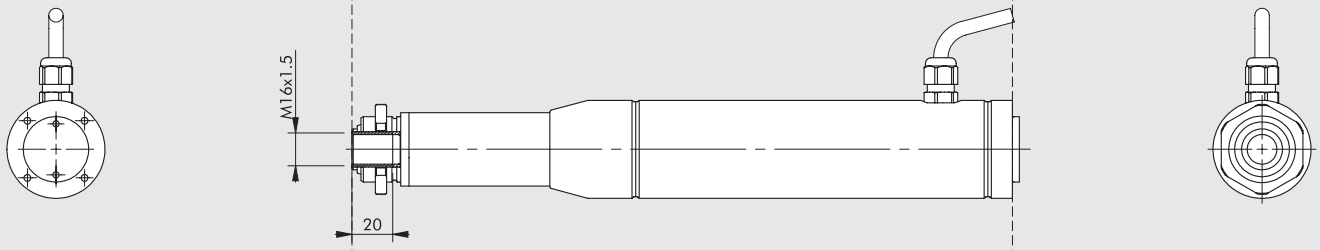
Drilled nose piece



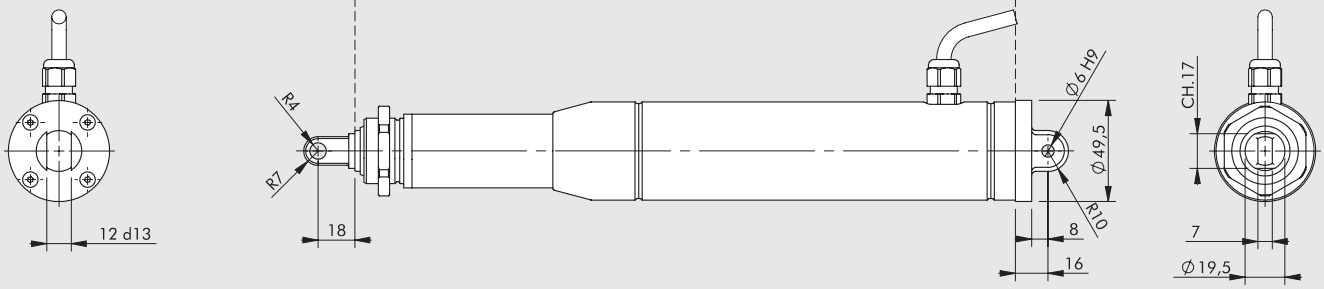
Female nose piece



Female piston rod



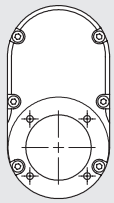
Drilled nose piece and rear hinge

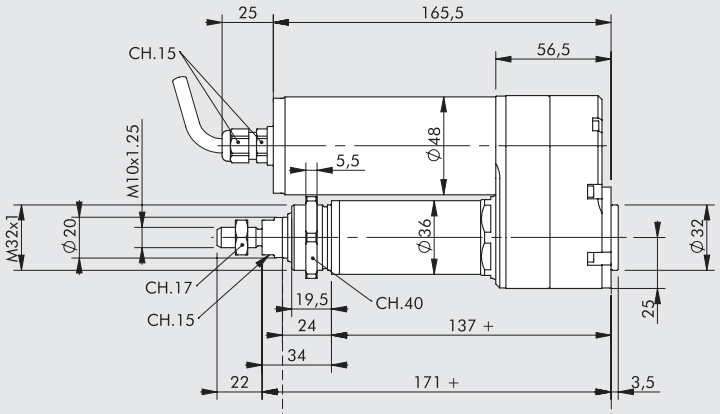


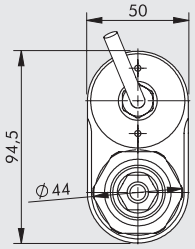
DIMENSIONS FOR GEARED VERSIONS

+ = ADD THE STROKE

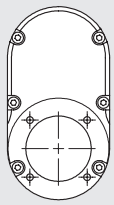
Male thread

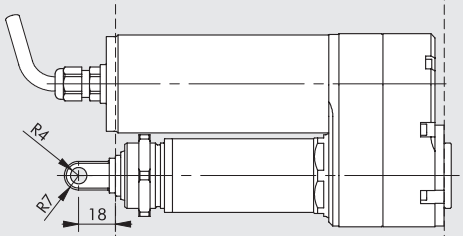


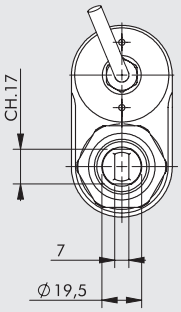




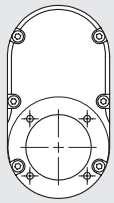
Drilled nose piece

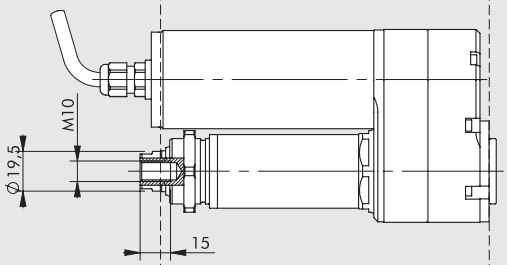


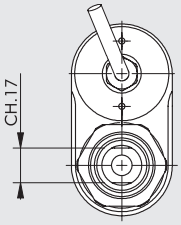




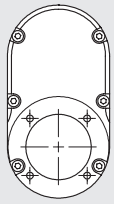
Female nose piece

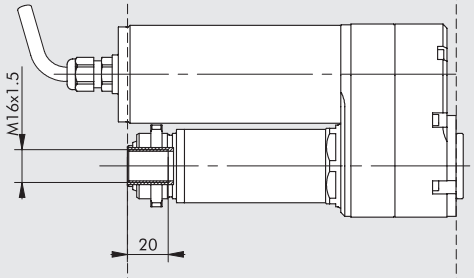


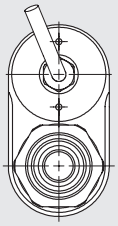




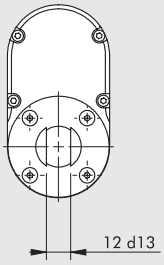
Female piston rod

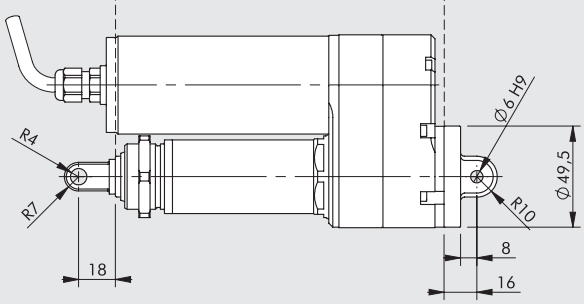


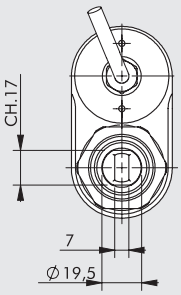




Drilled nose piece and rear hinge



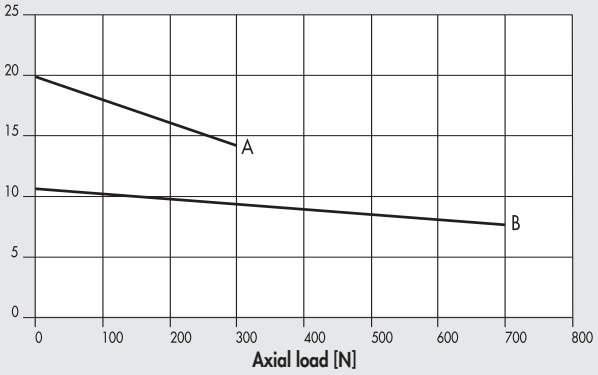




AXIAL LOAD CURVES AS A FUNCTION OF SPEED

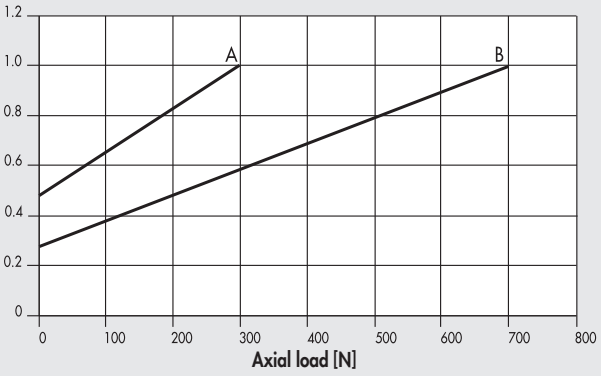
Ø32 WITH PITCH 4 WITH DC MOTOR

Speed [mm/s]



A = 372032___1_3_0_ (1/13 gear ratio) B = 372032___1_3_1_ (1/25 gear ratio)

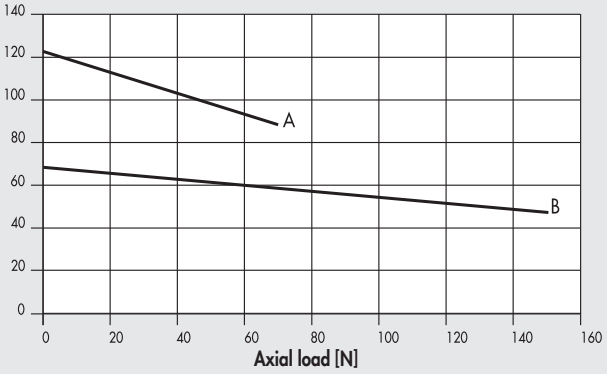
Current [A]



A = 372032___1_3_0_ B = 372032___1_3_1_

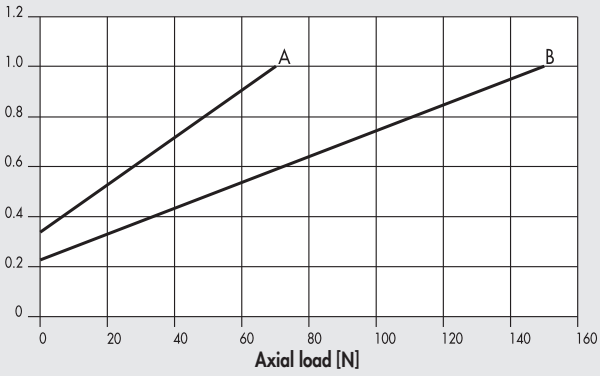
Ø32 PITCH 25 WITH DC MOTOR

Speed [mm/s]



A = 372032___L_3_0_ (1/13 gear ratio) B = 372032___L_3_1_ (1/25 gear ratio)

Current [A]



A = 372032___L_3_0_ B = 372032___L_3_1_

ACTUATOR-DRIVE COUPLING

ACTUATOR			DRIVE	
Code		Description	Code	Description
372032_____3___		ELECTRIC CYLINDER SERIES ELEKTRO ROUND DC	37D3112000	E.DIRECT DRIVE FOR DIRECT CURRENT MOTORS

N.B.: The Round DC cylinder needs no drive for "basic" operation.

KEY TO CODES

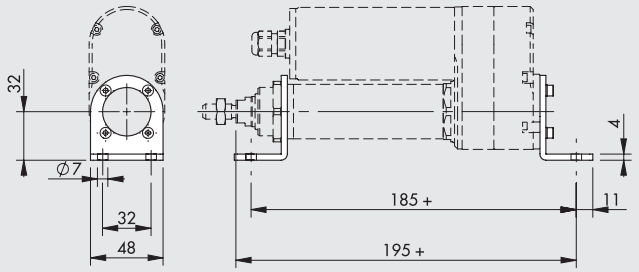
CYL	37	2	0	32	0100	1	3	3	6	0	1
	TYPE			BORE	STROKE	SCREW PITCH	VERSION	DRIVE	SUPPLY VOLTAGE	GEAR RATIO	CYLINDER END TYPES
	37 Electric actuators	**2** Cylinder Elektro Round DC	**0** STD	32		**1** Screw pitch 4 **L** Screw pitch 25	**3** In-line without non-rotating IP65 **7** Geared without non-rotating IP65	**3** Motor Direct current	**6** 24VDC + 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: FIXINGS

FOOT

+ = ADD THE STROKE

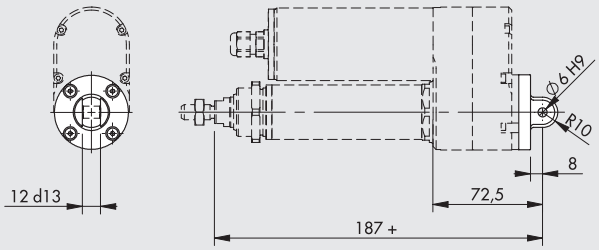


Code	Weight [g]
W095032C001	111

Note: 1 piece per pack complete with 4 screws and 4 roses

ARTICULATED MALE HINGE

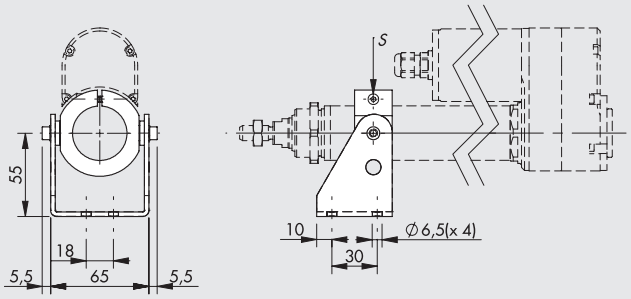
+ = ADD THE STROKE



Code	Weight [g]
W095032C006	41

Note: supplied complete with 4 screws and 1 dry bearing

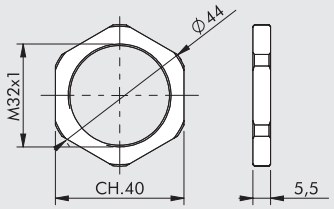
INTERMEDIATE HINGE



Code	Weight [g]
W095032C027	302

Note: supplied complete with 2 screws
IMPORTANT:: Screw tightening torque S: 2 Nm max

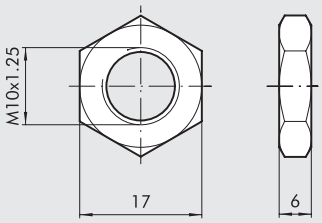
HEAD PIECE RING NUT



Code	Weight [g]
W095032C010	11

Note: individually packed

ROD NUT - MODEL S



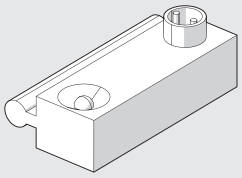
Code	Weight [g]
0950322010	6

Note: individually packed

NOTES

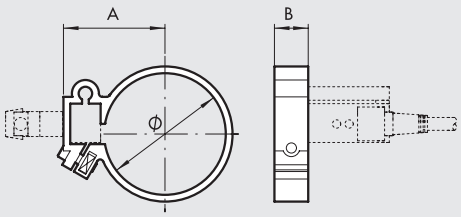
ACCESSORIES: MAGNETIC SENSORS

SENSOR SERIES DSM



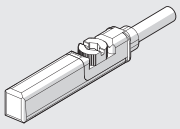
For codes and technical data, see **chapter A6**.

SENSOR BRACKET DSM



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

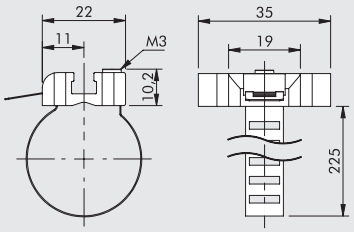
SENSOR, SQUARE TYPE



For codes and technical data, see **chapter A6**.

Note: Latest generation, secure fixing

SENSOR BRACKET, SQUARE TYPE



Code	Model
W0950001103	Sensor bracket 8 to 63

Note: Individually packed

MATERIAL

Bracket: stainless steel

Sensor holder: zamak

NOTES

ELECTRIC AXIS
SERIES ELEKTRO SHAK

Belt-driven rodless electric cylinder with V-Lock type interface.
The cylinder structure features a sturdy anodized 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 gearbox, 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
WITH STEPPING MOTORS			
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 gearbox	m/s	2.5	2
with brake and without gearbox	m/s	2	2
Maximum acceleration without load	m/s^2	50	50
Maximum admissible mass	kg	5	7.5
WITH BRUSHLESS MOTORS			
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 gearbox	N	70	80
with gearbox	N	600	700
Maximum speed without load			
without gearbox	m/s	5	5
with gearbox	m/s	2.4	2.7
Maximum acceleration without load	m/s^2	50	50
Maximum admissible mass			
without gearbox, vertical orientation	kg	3	3
with gearbox, vertical orientation	kg	15	25
without gearbox, horizontal orientation	kg	5	5
with gearbox, horizontal orientation	kg	15	25

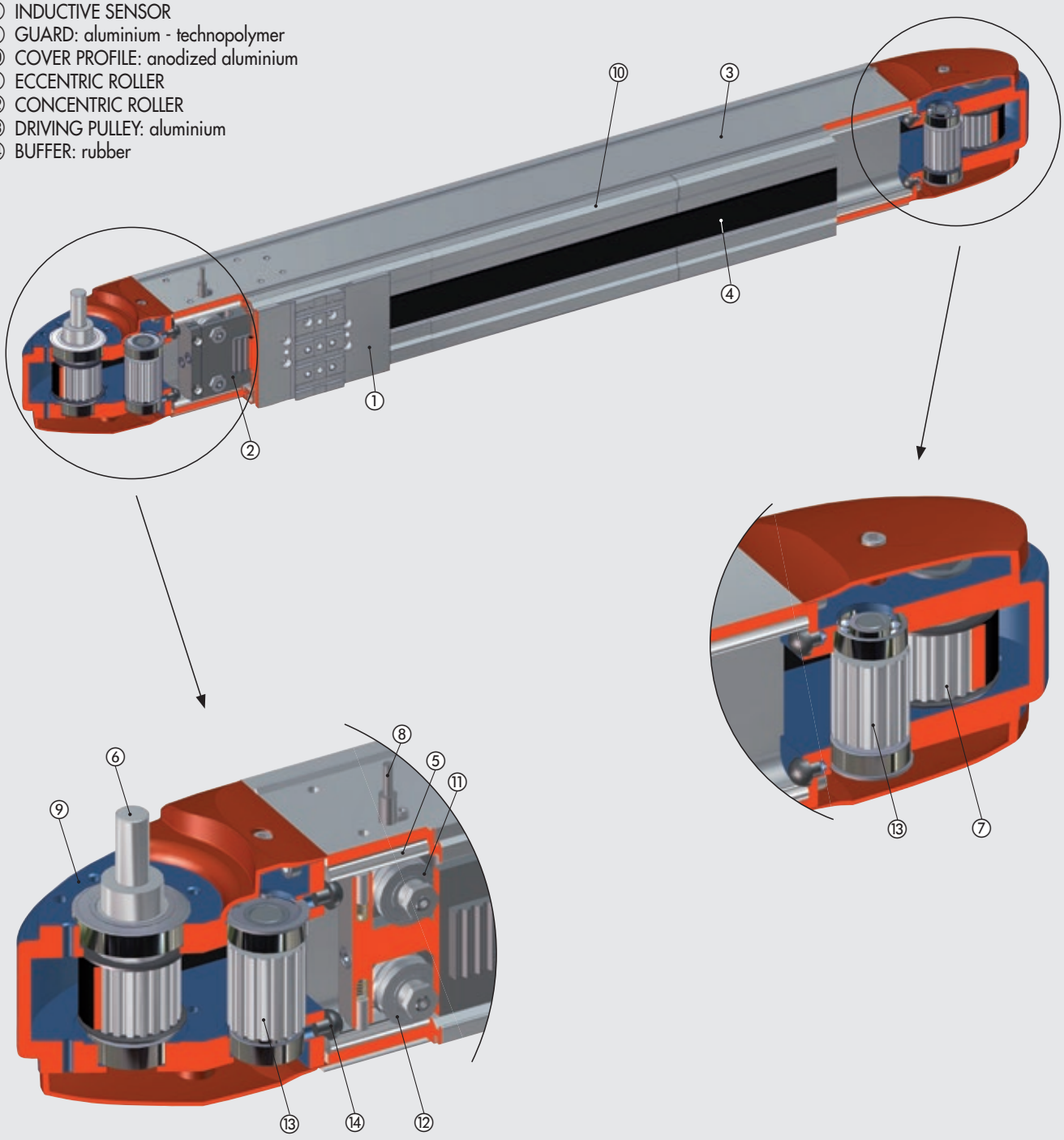
METAL WORK PNEUMATIC

MECHANICAL CHARACTERISTICS		SHAK 340	SHAK 470
Maximum movable mass	kg	15	25
Maximum speed (empty)	m/s	5	5
Maximum acceleration (empty)	m/s^2	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	800
		600	1200
		800	1600
		1000	2000
		1200	2400
Repetition accuracy	mm	±0.05	
Noise level	dBA	<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	

MASS AND MOMENT OF INERTIA		SHAK 340	SHAK 470
Weight without motor	kg	7.7 (stroke 400)	15.9 (stroke 800)
		9 (stroke 600)	19.8 (stroke 1200)
		10.4 (stroke 800)	23.6 (stroke 1600)
		11.7 (stroke 1000)	27.5 (stroke 2000)
		13 (stroke 1200)	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)	2.18 (stroke 800)
		1.32 (stroke 600)	2.28 (stroke 1200)
		1.36 (stroke 800)	2.38 (stroke 1600)
		1.40 (stroke 1000)	2.48 (stroke 2000)
		1.44 (stroke 1200)	2.58 (stroke 2400)
Gearbox weight	kg	0.8	4
Reduced inertia at motor (without load)	$kg\ mm^2$		
Versions without gearbox (without motor)		451 (stroke 400)	1414 (stroke 800)
		462 (stroke 600)	1467 (stroke 1200)
		474 (stroke 800)	1521 (stroke 1600)
		485 (stroke 1000)	1574 (stroke 2000)
		497 (stroke 1200)	1627 (stroke 2400)
Versions with gearbox (without motor)		58 (stroke 400)	216 (stroke 800)
		59 (stroke 600)	222 (stroke 1200)
		61 (stroke 800)	228 (stroke 1600)
		62 (stroke 1000)	234 (stroke 2000)
		63 (stroke 1200)	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

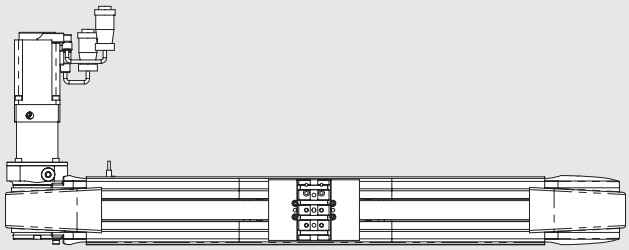


METAL WORK PNEUMATIC

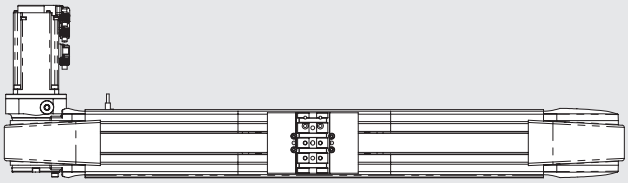
VERSIONS

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

VERSION WITH MOTOR AND GEARBOX

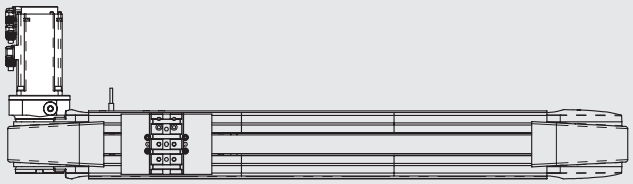


VERSION WITH MOTOR WITHOUT GEARBOX

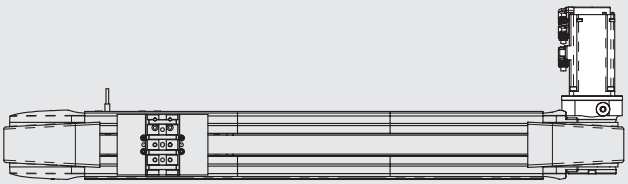


The versions supplied with **MOTOR** or with **MOTOR AND GEARBOX** are available in the following configurations:

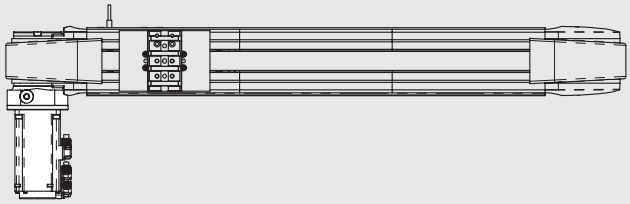
VERSION WITH MOTOR OR MOTOR AND GEARBOX TOP LEFT



VERSION WITH MOTOR OR MOTOR AND GEARBOX TOP RIGHT



VERSION WITH MOTOR OR MOTOR AND GEARBOX BOTTOM LEFT



VERSION WITH MOTOR OR MOTOR AND GEARBOX BOTTOM RIGHT

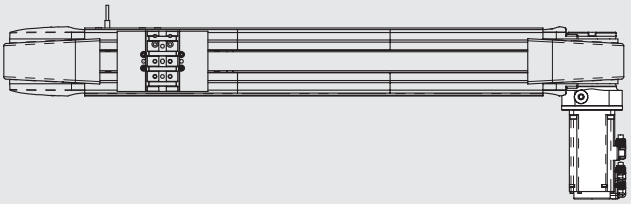
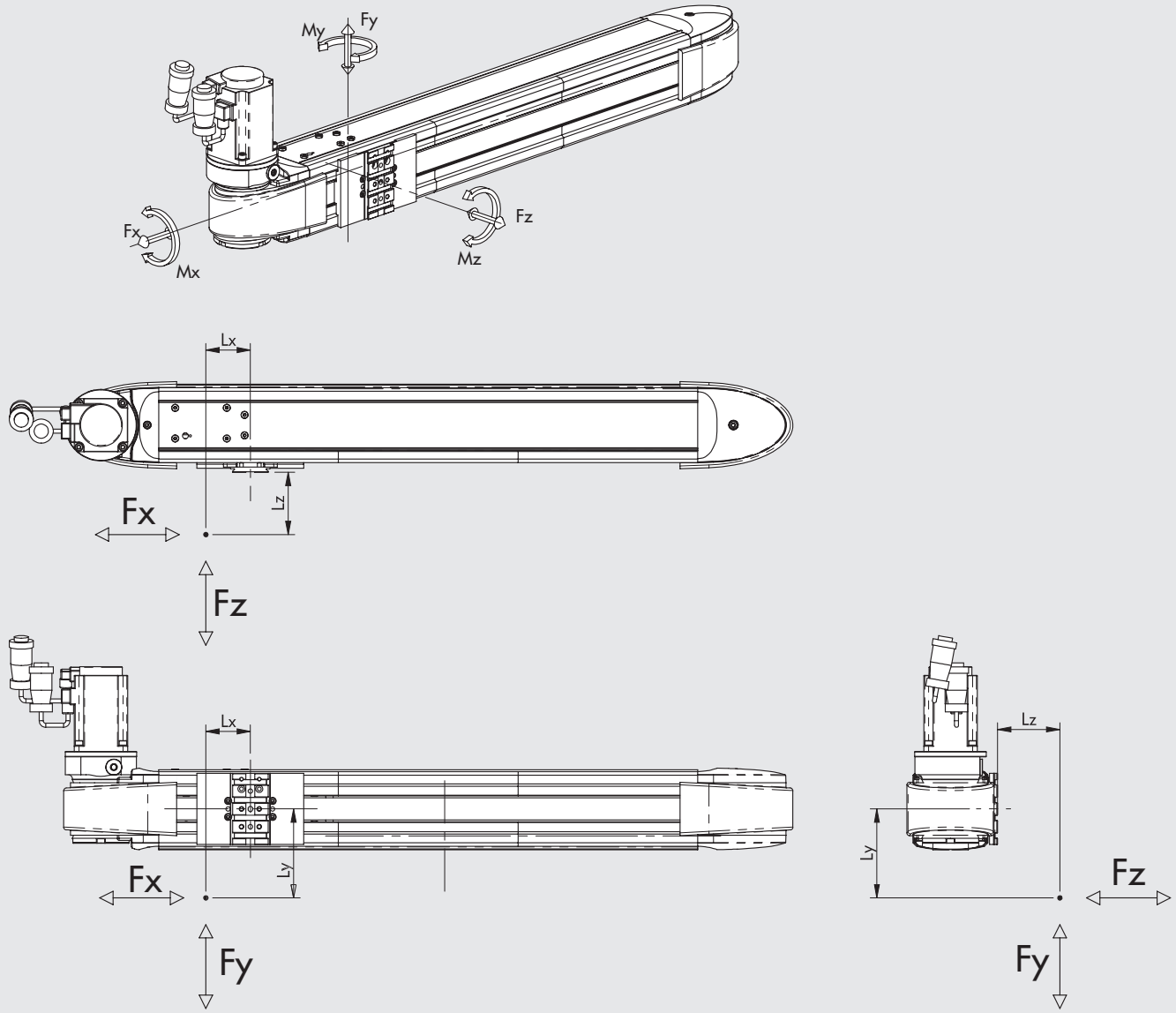


DIAGRAM OF FORCES AND MOMENTS



Size	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz 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 Fx see the general technical data and the axial load curves depending on the speed.

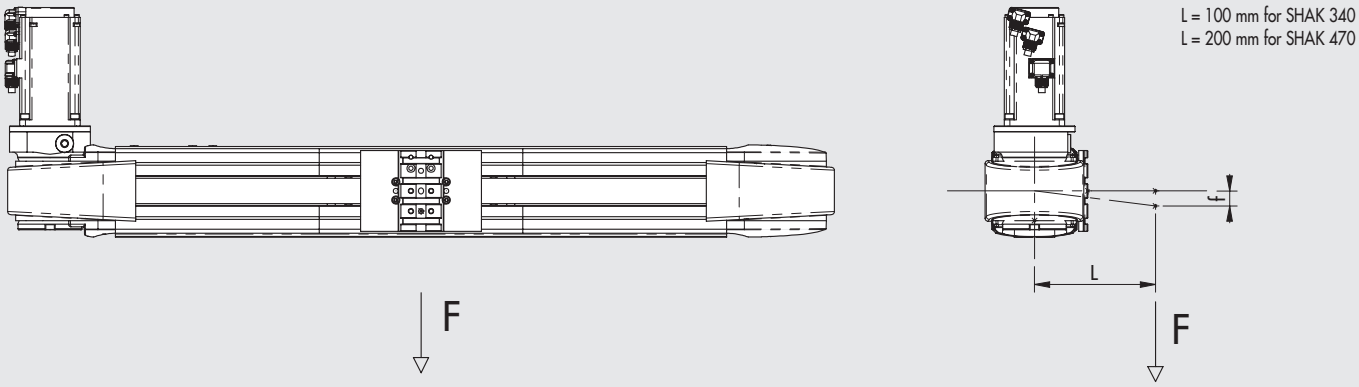
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where Lx, Ly and Lz have to be given in metre.

$Mx = Fz \cdot Ly + Fy \cdot Lz \qquad My = Fz \cdot Lx + Fx \cdot Lz \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$

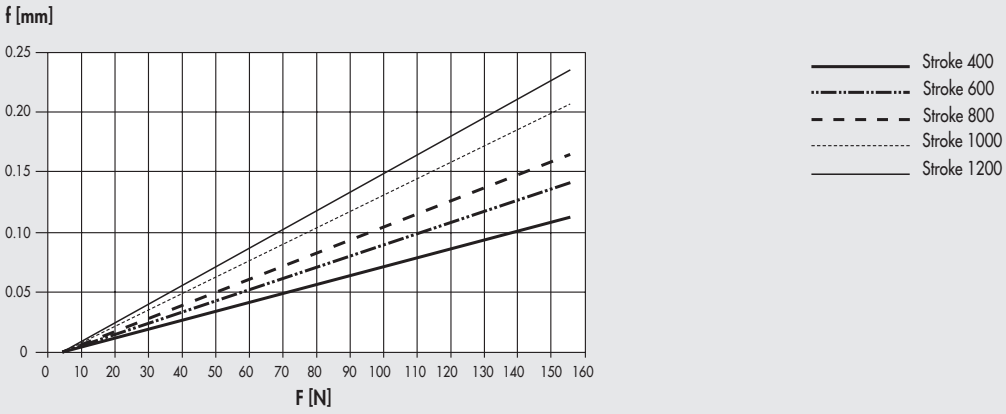
$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1$$

METAL WORK PNEUMATIC

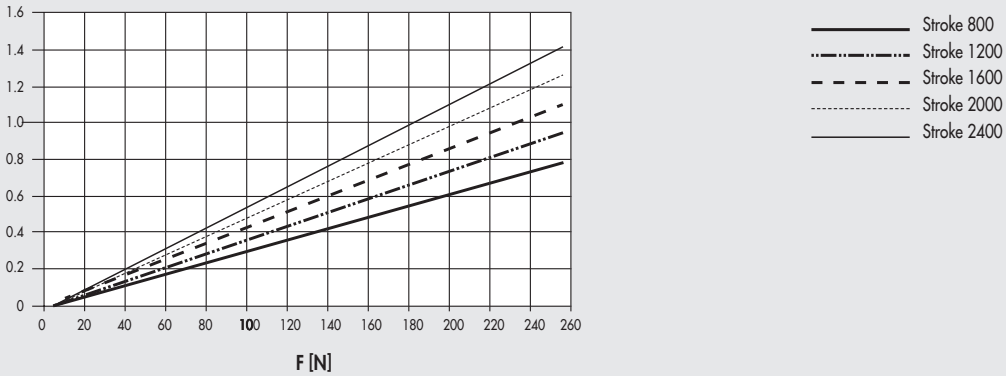
DEFORMATION ACCORDING TO LOAD



SHAK 340



SHAK 470

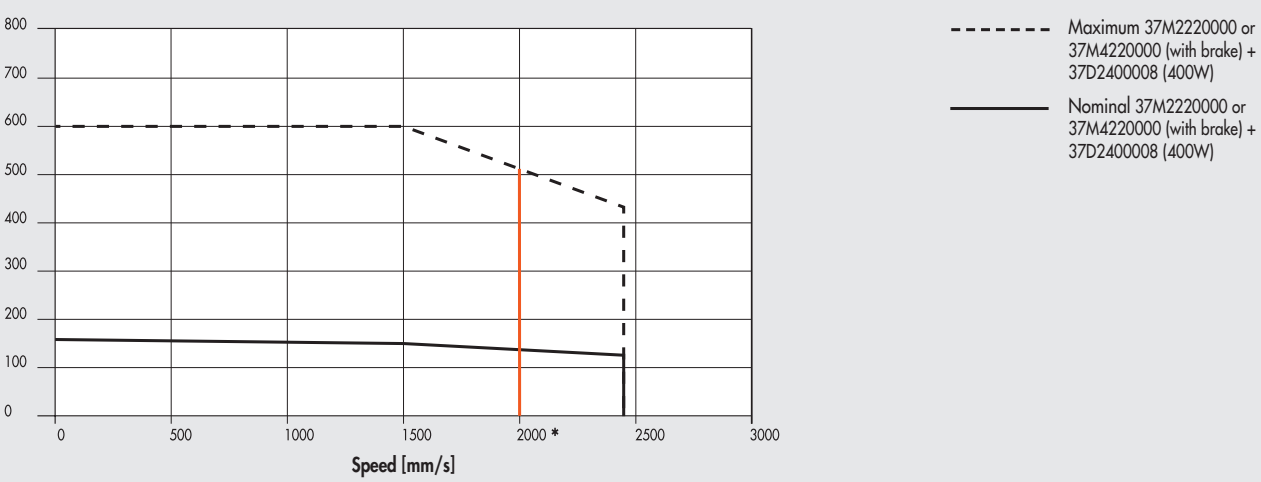


AXIAL LOAD-SPEED CURVES

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).

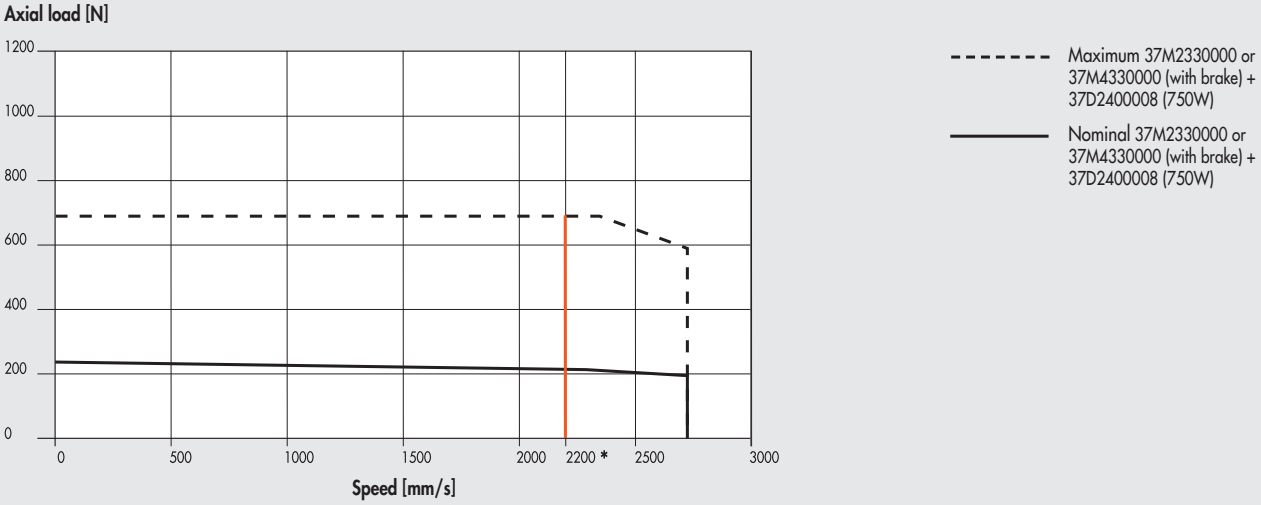
The following diagrams show the axial load with changing speed (mm/s). Each diagram shows two separate curves:
- **NOMINAL AXIAL LOAD** curve: the nominal axial load delivered by the motor with a duty cycle of 100%
- **MAXIMUM AXIAL LOAD** curve: the axial load delivered by the motor with a duty cycle of less than 100%.

SHAK 340
BRUSHLESS and BRUSHLESS with BRAKE drives (versions with 1:3 gearbox)



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

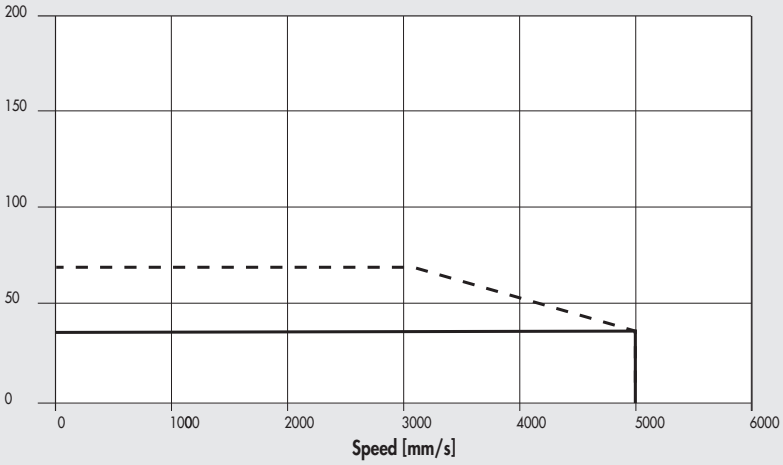
SHAK 470
BRUSHLESS and BRUSHLESS with BRAKE drives (versions with 1:3 gearbox)



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

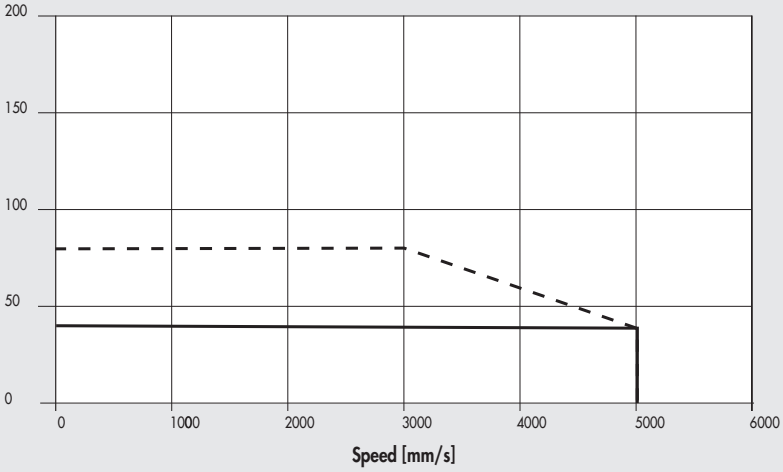
SHAK 340
BRUSHLESS and BRUSHLESS with BRAKE drives

Axial load [N]



SHAK 470
BRUSHLESS and BRUSHLESS with BRAKE drives

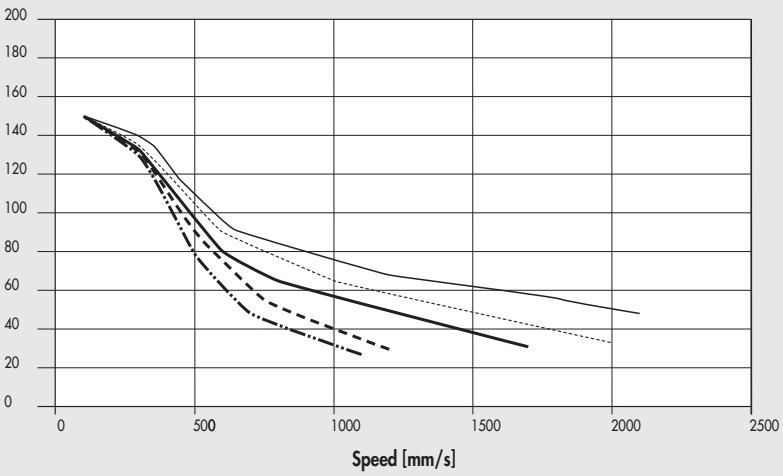
Axial load [N]



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%.

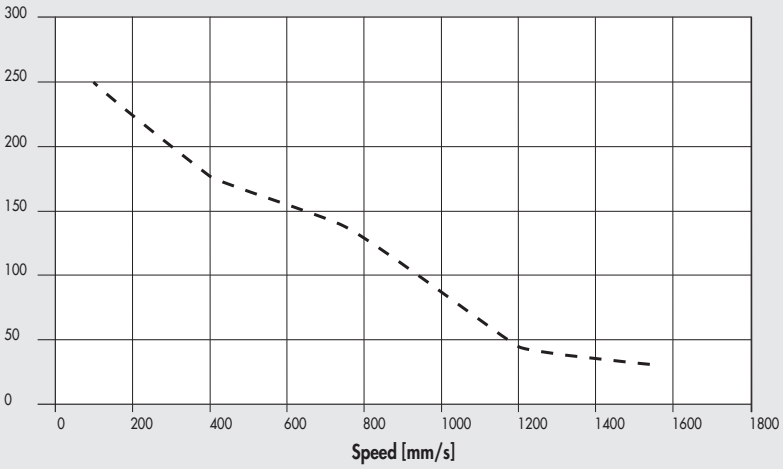
SHAK 340
STEPPING drives code 37M1440000

Axial load [N]



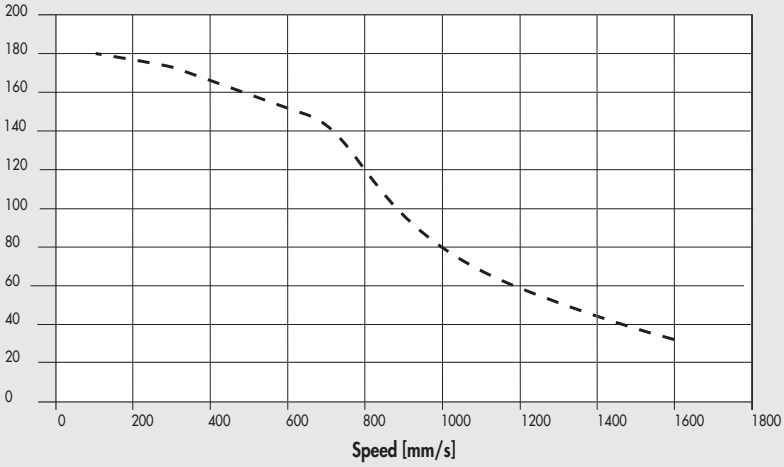
SHAK 470
STEPPING DRIVES code 37M1470000

Axial load [N]



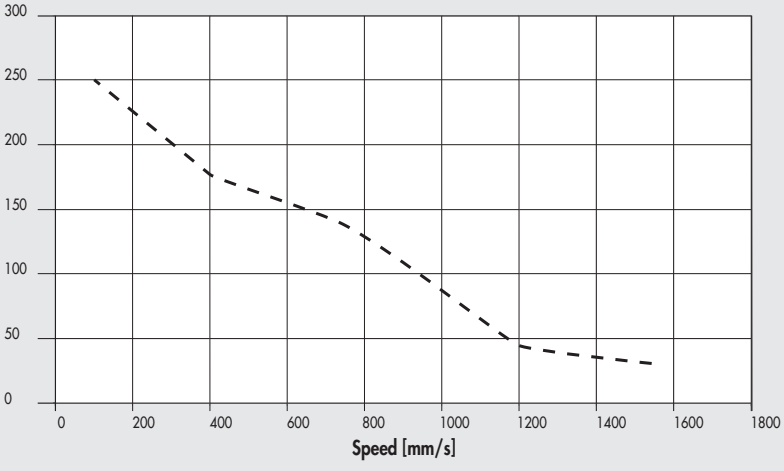
SHAK 340
STEPPING + BRAKE AND ENCODER DRIVES code 37M3450000

Axial load [N]



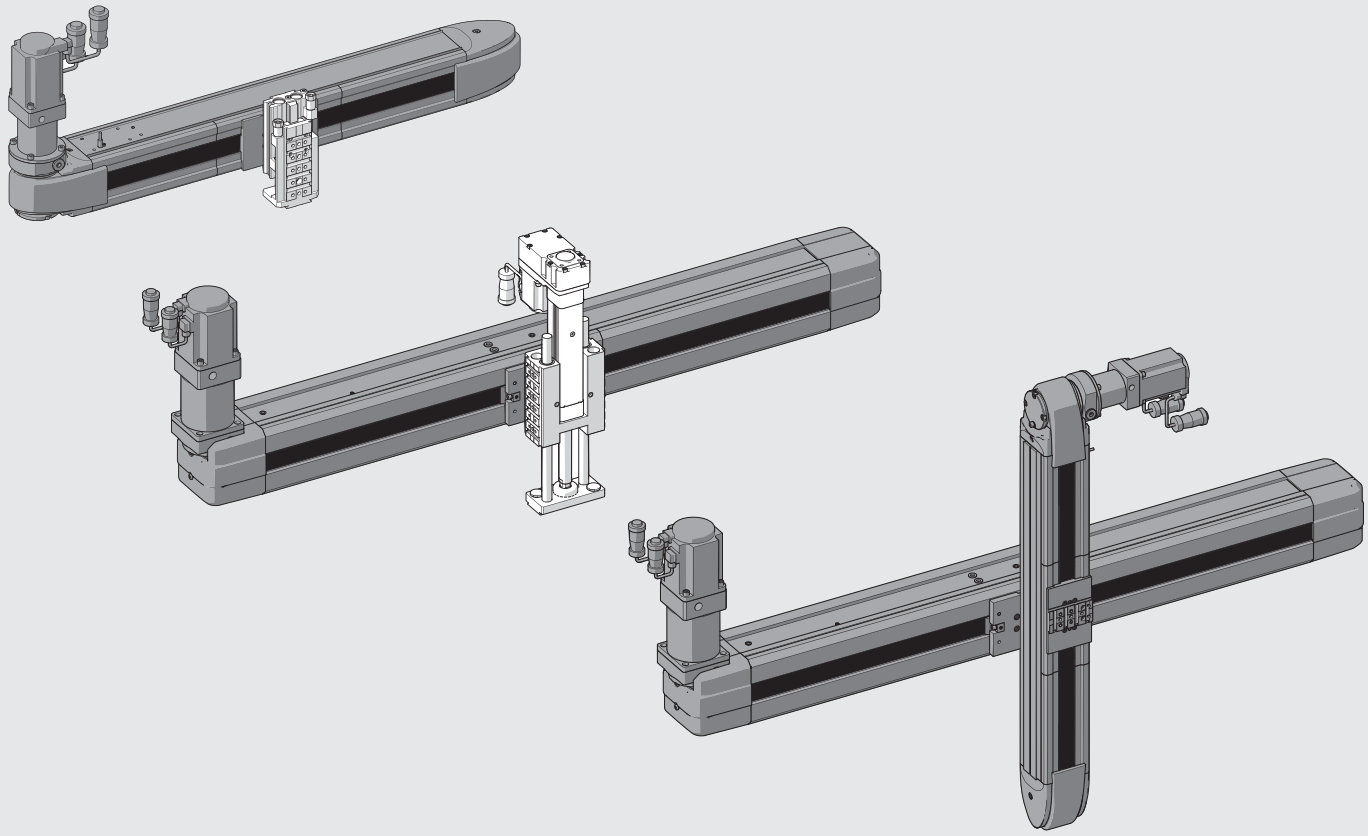
SHAK 470
STEPPING + BRAKE and ENCODER drives code 37M3470000

Axial load [N]



METAL WORK PNEUMATIC

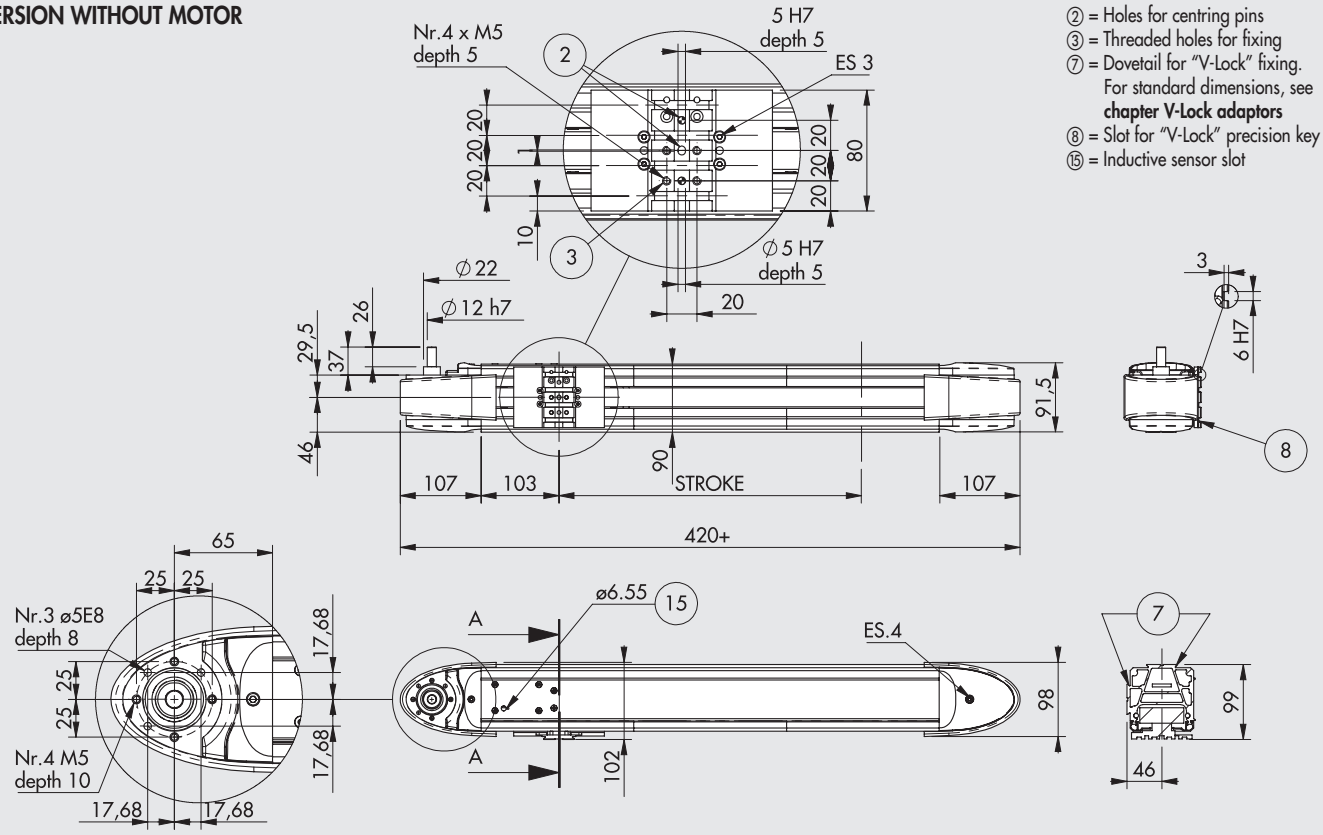
EXAMPLES OF APPLICATION



NOTES

DIMENSIONS SHAK 340

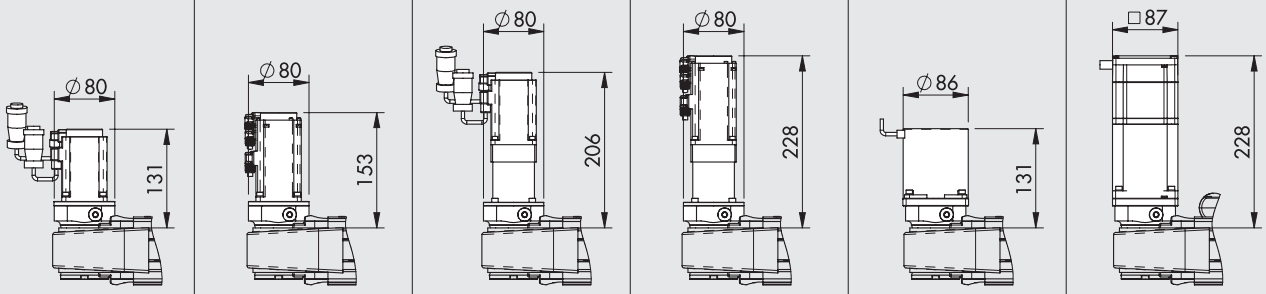
VERSION WITHOUT MOTOR



② = Holes for centring pins
③ = Threaded holes for fixing
⑦ = Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ = Slot for "V-Lock" precision key
⑮ = Inductive sensor slot

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.



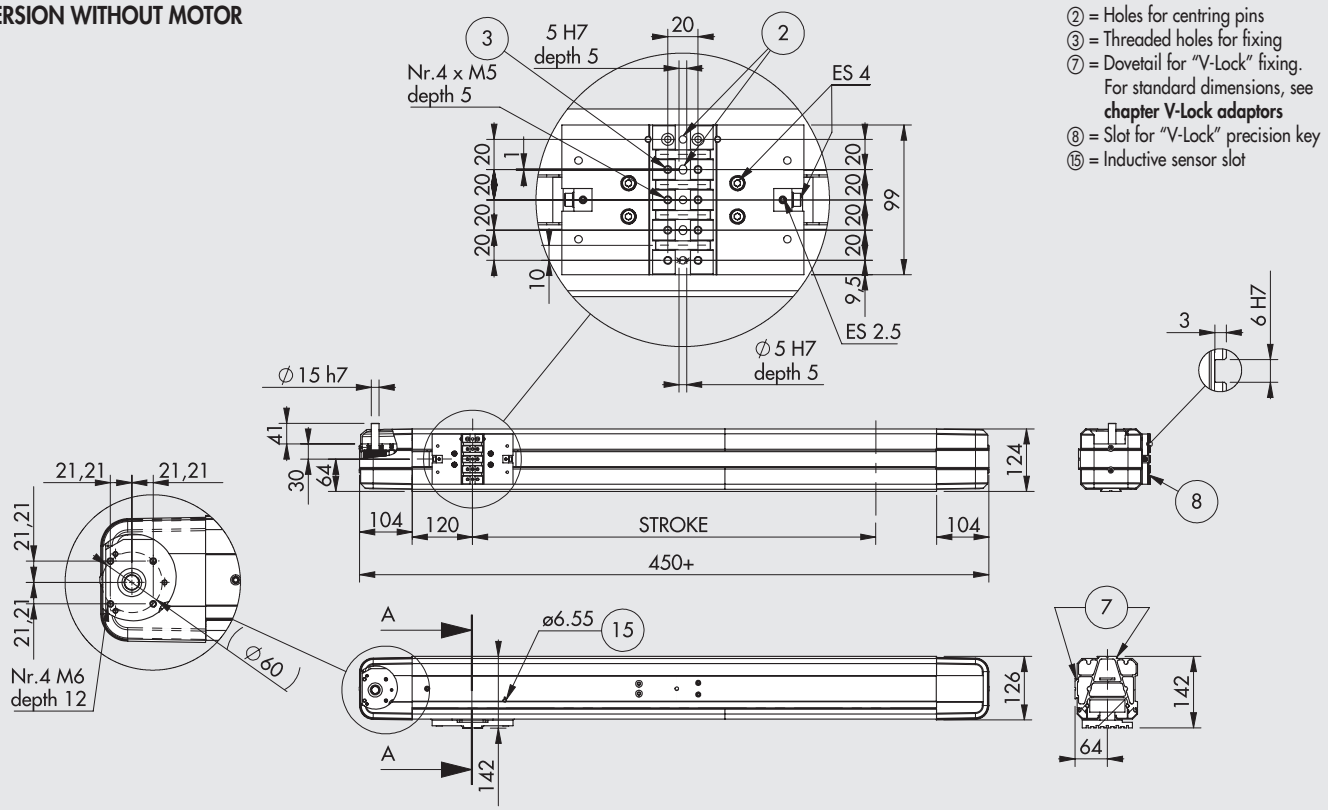
ORDERING CODES	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR WITH GEARBOX AND BRAKE	STEPPING MOTOR	STEPPING MOTOR WITH BRAKE
	375010_ _ _ _0002220	375010_ _ _ _0004220	375010_ _ _ _0102220	375010_ _ _ _0104220	375010_ _ _ _0001440	375010_ _ _ _0003450
	375010_ _ _ _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_ _ _ _0134220	375010_ _ _ _0031440	375010_ _ _ _0033450

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

METAL WORK PNEUMATIC

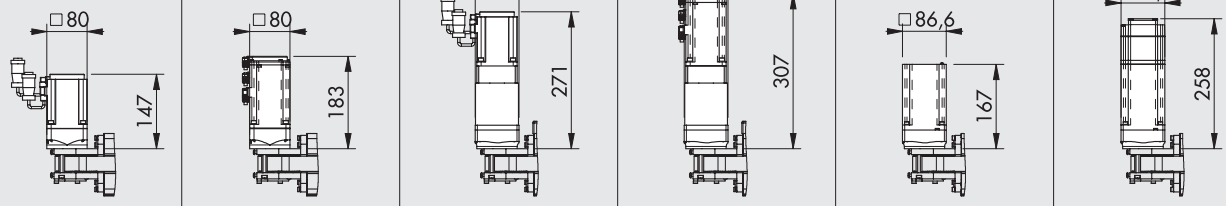
DIMENSIONS SHAK 470

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.



ORDERING CODES	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR WITH GEARBOX AND BRAKE	STEPPING MOTOR	STEPPING MOTOR WITH BRAKE
	375020_ _ _ _0002330	375020_ _ _ _0004330	375020_ _ _ _0102330	375020_ _ _ _0104330	375020_ _ _ _0001470	375020_ _ _ _0003470
	375020_ _ _ _0012330	375020_ _ _ _0014330	375020_ _ _ _0112330	375020_ _ _ _0114330	375020_ _ _ _0011470	375020_ _ _ _0013470
	375020_ _ _ _0022330	375020_ _ _ _0024330	375020_ _ _ _0122330	375020_ _ _ _0124330	375020_ _ _ _0021470	375020_ _ _ _0023470
	375020_ _ _ _0032330	375020_ _ _ _0034330	375020_ _ _ _0132330	375020_ _ _ _0134330	375020_ _ _ _0031470	375020_ _ _ _0033470

_ _ _ _ = Standard stroke (0800; 1200; 1600; 2000; 2400)

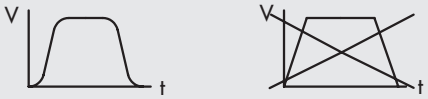
MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES		
Metal Work		37D1332000 *	37D1442000	37D1552000
Manufacturer		RTA NDC 96	RTA PLUS A4	RTA PLUS B7
Metal Work	Manufacturer	(6A 24-75VDC)	(6A 77-140VDC)	(10A 28-62VAC) ●
STEPPING MOTORS				
37M1440000	SANYO DENKI 103-H8222-6340 (6A 140V max)	SHAK 340	SHAK 340	SHAK 340 ◆
37M1470000	B&R 80MPH6.101S000-01 (10A 80V max)	-	-	SHAK 470
STEPPING MOTORS WITH BRAKE + ENCODER				
37M3450000	B&R 80MPH4.101D114-01 (10A 80V max)	-	-	SHAK 340
37M3470000	B&R 80MPH6.101D114-01 (10A 80V max)	-	-	SHAK 470

✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
◆ Important! Limit current
● Important! AC drive to continuous voltage VDC = VAC · $\sqrt{2}$

MOTOR CODES		DRIVES CODES
Metal Work		37D2400008
Manufacturer		SANYO DENKI RS3A03
Metal Work	Manufacturer	(30A 400-750 W)
BRUSHLESS MOTORS		
37M2220000	SANYO DENKI R2AA06040FXH11M (400W)	SHAK 340
37M2330000	SANYO DENKI R2AA08075FXH11M (750W)	SHAK 470
BRUSHLESS MOTORS WITH BRAKE		
37M4220000	SANYO DENKI R2AA06040FCH11M (400W)	SHAK 340
37M4330000	SANYO DENKI R2AA08075FCH11M (750W)	SHAK 470

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



KEY TO CODES (WITHOUT MOTOR)

CYL	37	5	0	1	0	0800	0
	TYPE			SIZE		STROKE ◆	
	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.

METAL WORK PNEUMATIC

KEY TO CODES AXIS ELECTRIC MOTOR

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

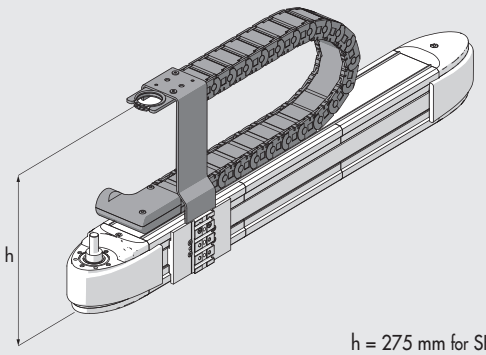
◆ Other strokes on request.
✱ On request, the versions with gearbox are available with reduction ratios other than those foreseen as standard.
N.B.: The Orderable configurations are shown on the previous pages.

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

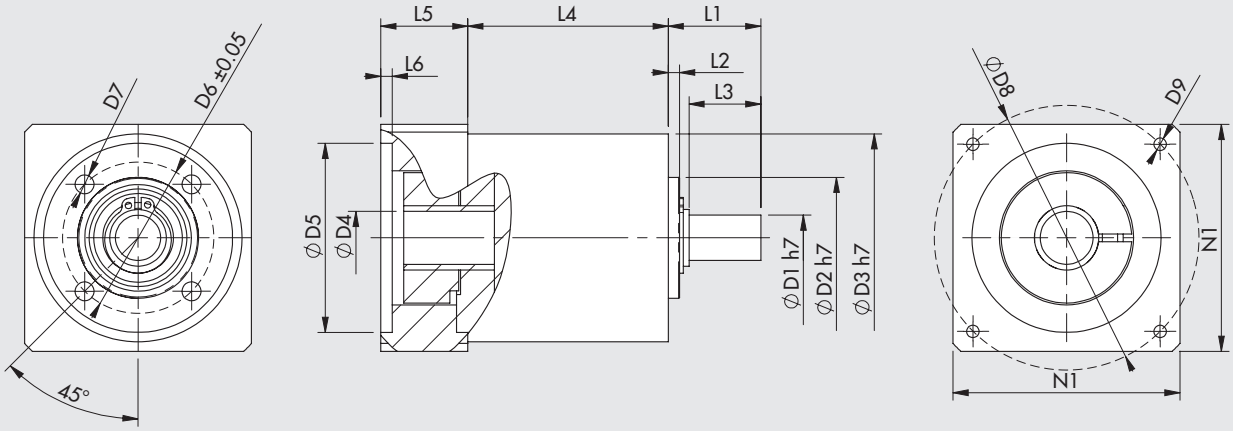
WARNING! You cannot mount the chain on versions with motor or gearmotor at the top right

DRIVES

For motor-drive couplings see table on page **A5**.90

SPARE PARTS

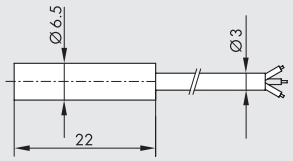
SHAK GEARBOXES



Code	Description	Application	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0341000	Gearbox 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	Gearbox 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_{OUT} = crated output torque N_{IN} = 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 motor-drive couplings see table on page **A5**.90

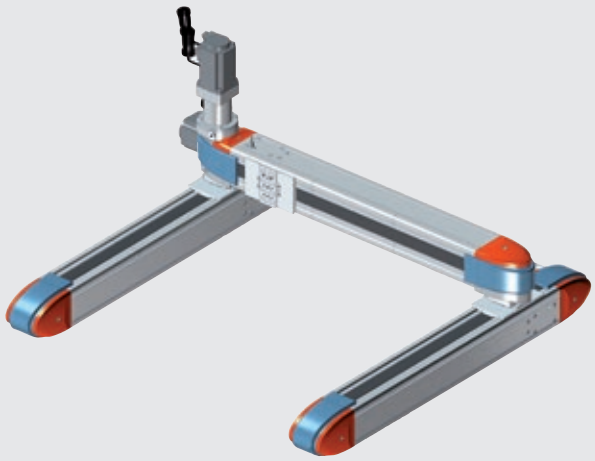
NOTES

METAL WORK PNEUMATIC

NOTES

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 gearbox 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^2	35	25
Maximum Y-axis empty acceleration	m/s^2	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)		**X-axis**	**Y-axis**	**X-axis**	**Y-axis**
(see dimensional drawings for standard combinations)	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			

METAL WORK PNEUMATIC

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 gearbox)	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		
Gearbox weight	kg			0.8					0.8		
Moving mass (without motor and gearbox)	kg	10.3	11.6	13.1	14.5	15.9	1.28	1.32	1.36	1.40	1.44
J_X Reduced inertia at motor	kg mm²	476	523	573	620	667			-		
J_y Reduced inertia at motor	kg mm²			-			99	101	102	103	104
J_T Inertia connection joint	kg mm²			-			238	306	374	442	510

MASS AND MOMENT OF INERTIA SHAK GANTRY 470		X-AXIS					Y-AXIS				
Strokes	mm	800	1200	1600	2000	2400	600	1000	1400	1800	2200
Weight (without motor and gearbox)	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		
Gearbox weight	kg			4					4		
Moving mass (without motor and gearbox)	kg	20.3	24.4	28.4	32.5	36.4	2.18	2.28	2.38	2.48	2.58
J_X Reduced inertia at motor	kg mm²	1759	1986	2207	2434	2650			-		
J_y Reduced inertia at motor	kg mm²			-			399	404	410	416	422
J_T Inertia connection joint	kg mm²			-			315	451	587	723	859

Size	d_P [mm]	τ	J_R [kg mm²]	J_M [kg mm²]
SHAK GANTRY 340	35.01	1:5	6	41.2
SHAK GANTRY 470	44.56	1:5	37	182

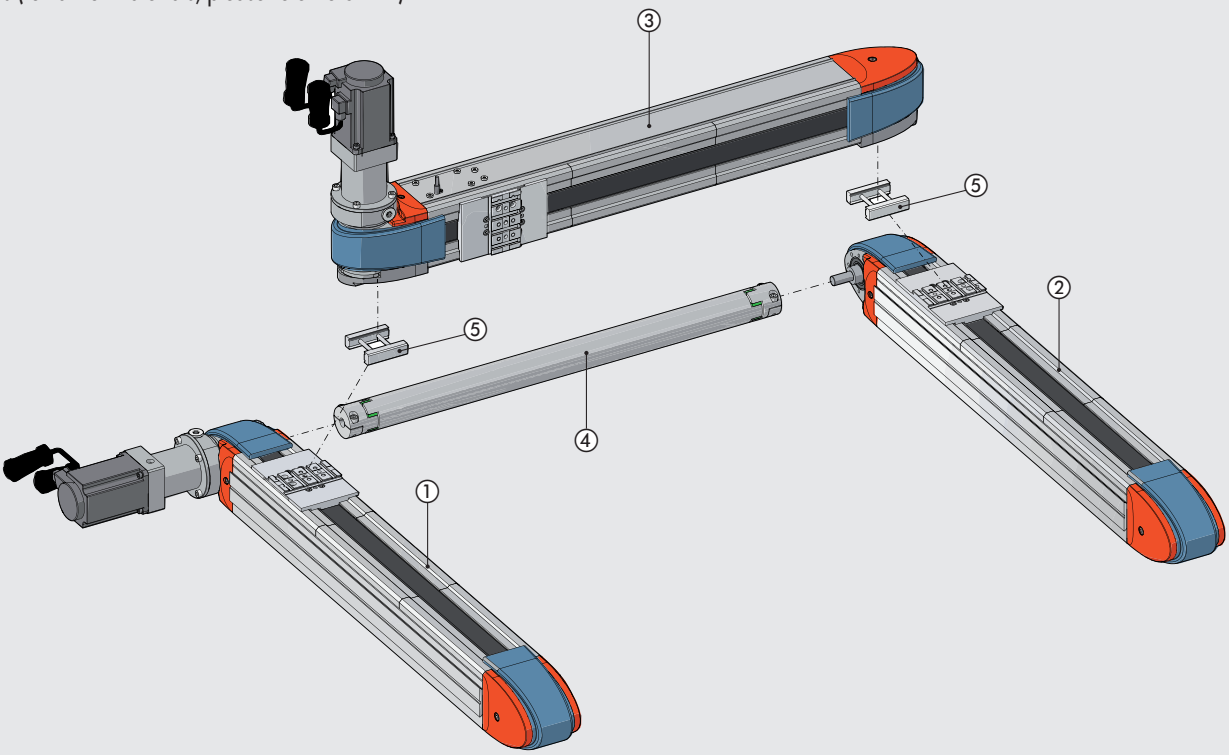
$$J_{tot} = [2 \cdot J_X + J_T + M \cdot (\frac{d_P}{2})^2] \cdot \tau^2 + J_R + J_M$$

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)

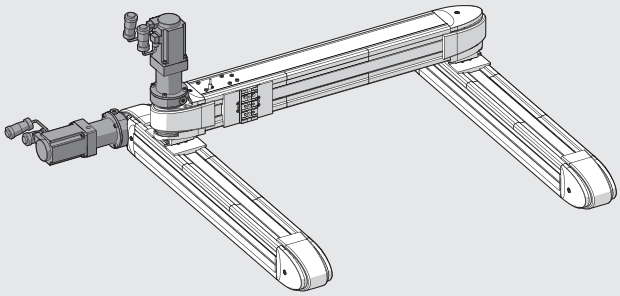
COMPONENTS

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

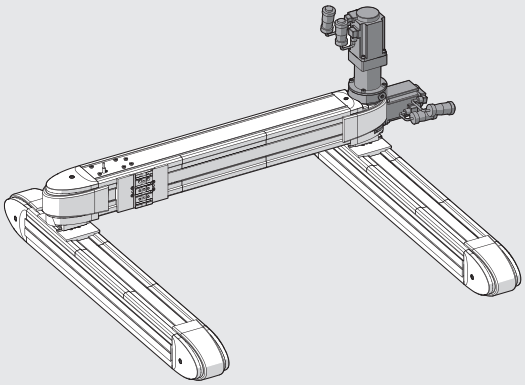
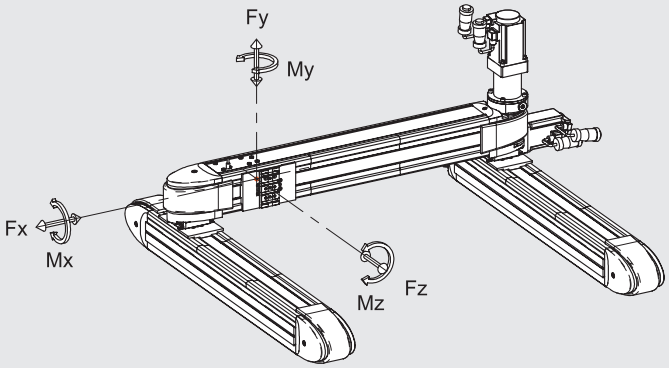
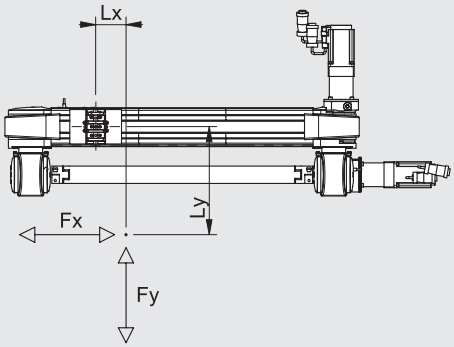
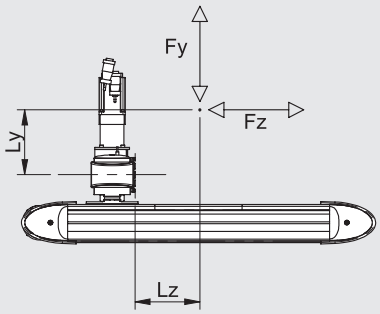
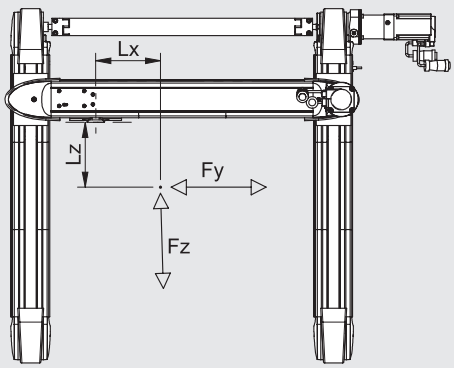


DIAGRAM OF FORCES AND MOMENTS









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.

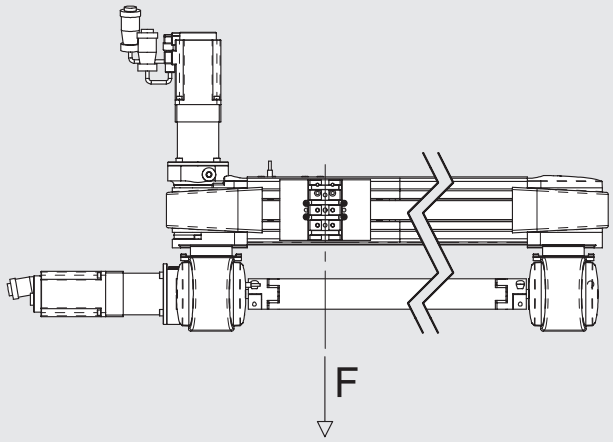
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where Lx, Ly and Lz have to be given in metre.

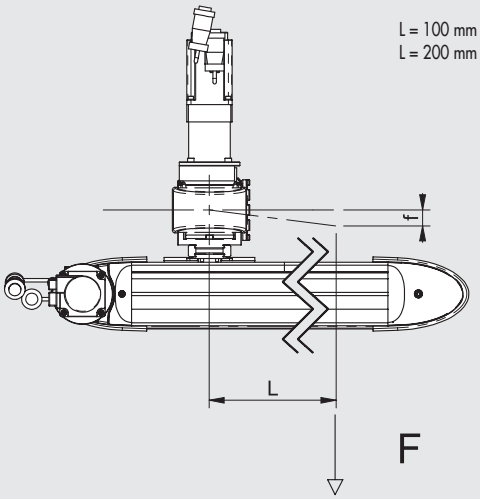
$$Mx = Fz \cdot Ly + Fy \cdot Lz \qquad My = Fz \cdot Lx + Fx \cdot Lz \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1 \quad e \quad \frac{(Fx)}{2Fy\ max} \leq 1$$

METAL WORK PNEUMATIC

DEFORMATION ACCORDING TO LOAD

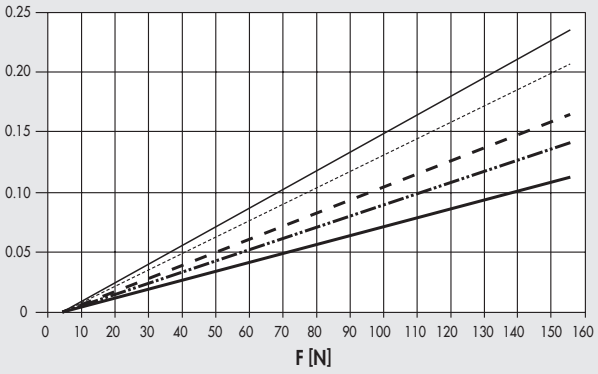




L = 100 mm for SHAK GANTRY 340
L = 200 mm for SHAK GANTRY 470

SHAK GANTRY 340

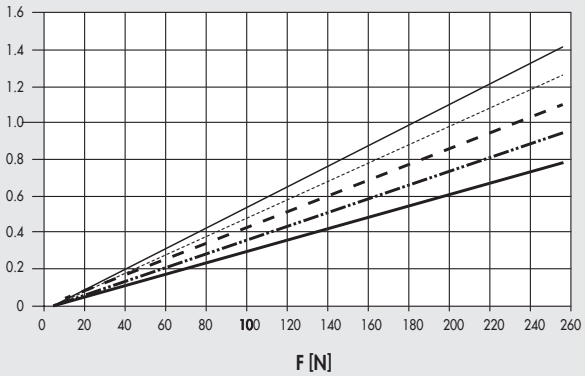
f [mm]



Stroke Y 400
Stroke Y 600
Stroke Y 800
Stroke Y 1000
Stroke Y 1200

SHAK GANTRY 470

f [mm]



Stroke Y 600
Stroke Y 1000
Stroke Y 1400
Stroke Y 1800
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

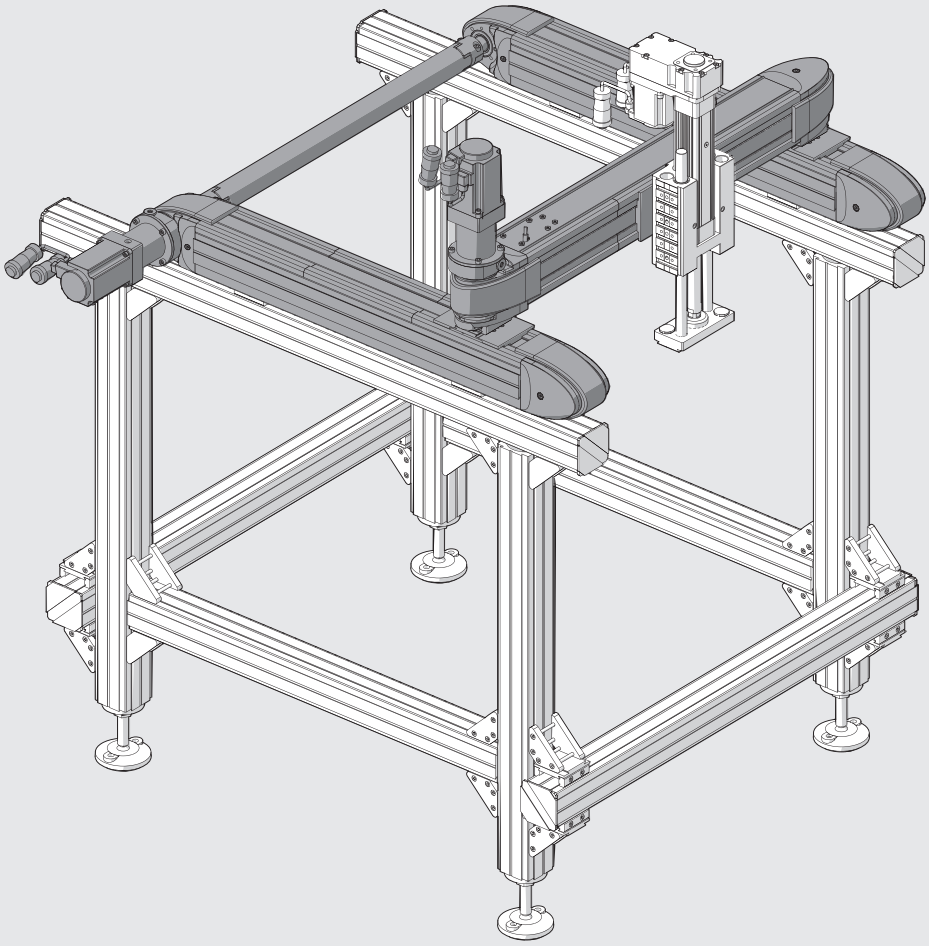
Traverse times relate to operation with motors supplied by Metal Work, using max. 200% of the rated torque.

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

NOTES

METAL WORK PNEUMATIC

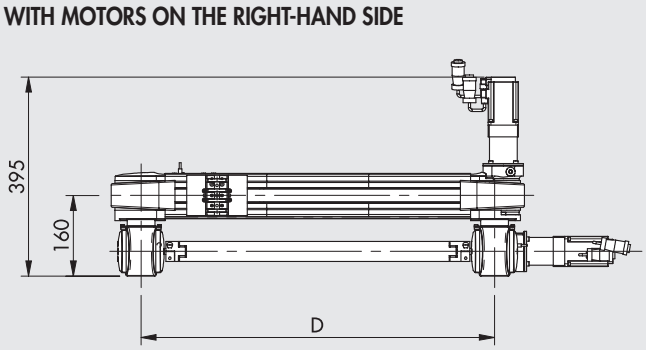
EXAMPLES OF APPLICATION

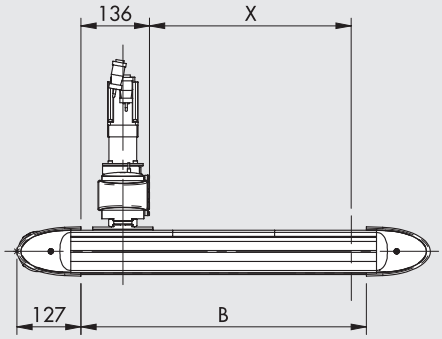


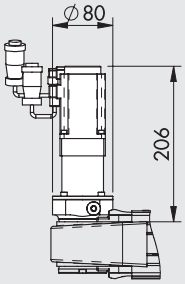
NOTES

DIMENSIONS SHAK GANTRY 340

VERSION WITH MOTORS ON THE RIGHT-HAND SIDE







BRUSHLESS MOTOR
WITH GEARBOX

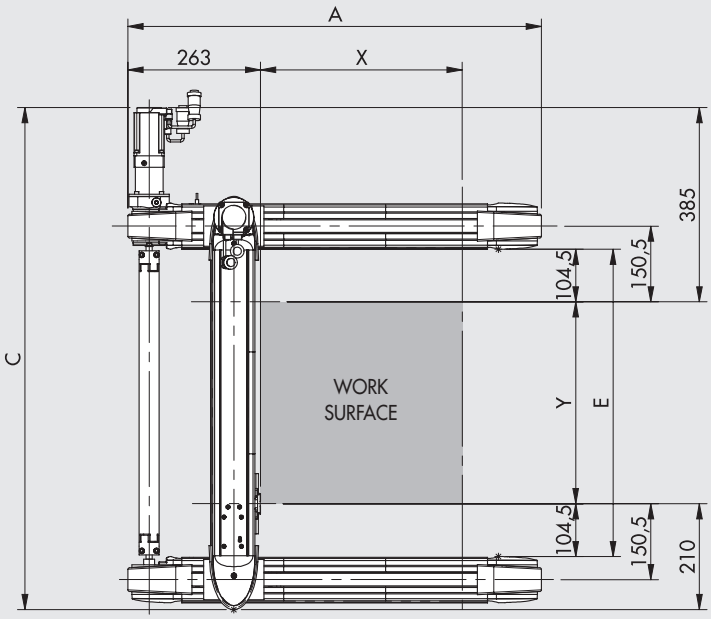


Table of dimensions referring to the version with motors on the right. The version with motor on the left is specular.

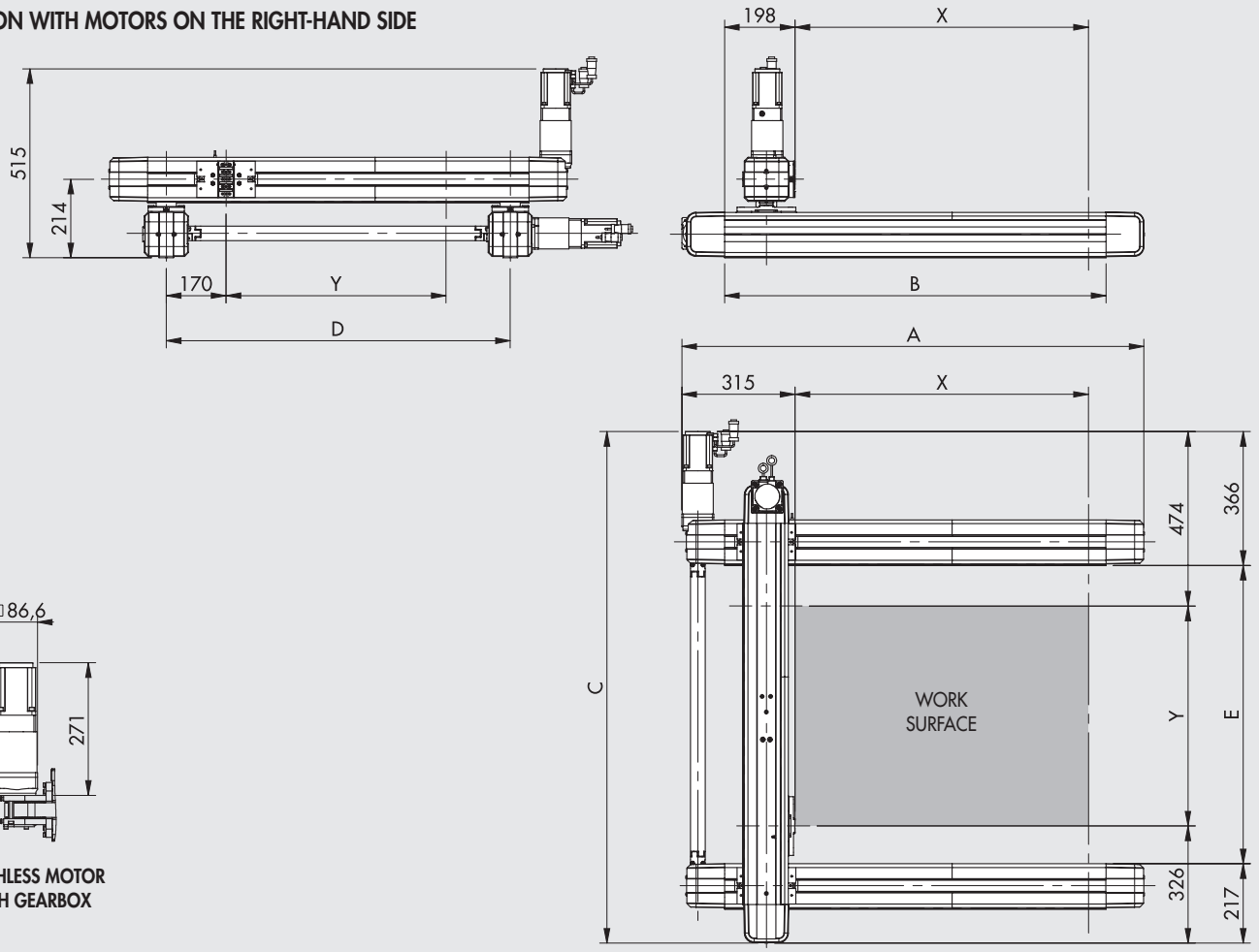
Code	Description	X	Y	A	B	C	D	E
375G1040004001_200	SHAK GANTRY-340-X400-Y400	400	400	820	566	996	701	609
375G1040006001_200	SHAK GANTRY-340-X400-Y600	400	600	820	566	1196	901	809
375G1040008001_200	SHAK GANTRY-340-X400-Y800	400	800	820	566	1396	1101	1009
375G1040010001_200	SHAK GANTRY-340-X400-Y1000	400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

METAL WORK PNEUMATIC

DIMENSIONS SHAK GANTRY 470

VERSION WITH MOTORS ON THE RIGHT-HAND SIDE



BRUSHLESS MOTOR
WITH GEARBOX

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

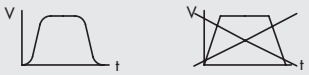
Code	Description	X	Y	A	B	C	D	E
375G2080006001_200	SHAK GANTRY-470-X800-Y600	800	600	1260	1040	1400	940	817
375G2080010001_200	SHAK GANTRY-470-X800-Y1000	800	1000	1260	1040	1800	1340	1217
375G2080014001_200	SHAK GANTRY-470-X800-Y1400	800	1400	1260	1040	2200	1740	1617
375G2080018001_200	SHAK GANTRY-470-X800-Y1800	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

MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES
	Metal Work	37D2400008
	Manufacturer	SANYO DENKI RS3A03
Metal Work	Manufacturer	(30A 400-750 W)
37M2220000	SANYO DENKI R2AA06040FXH11M (400W)	SHAK GANTRY 340
37M2330000	SANYO DENKI R2AA08075FXH11M (750W)	SHAK GANTRY 470

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



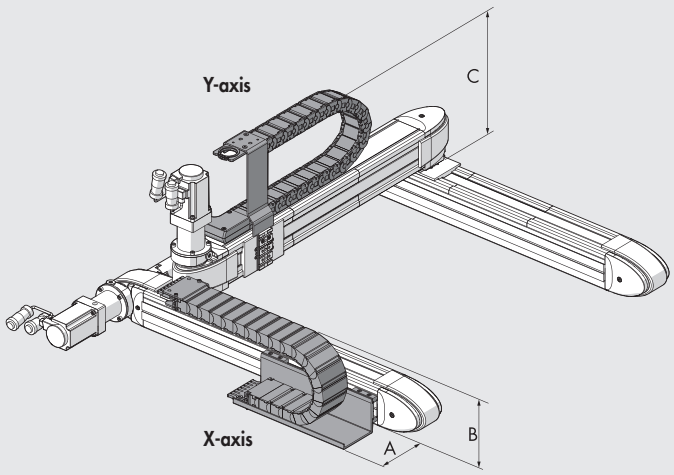
KEY TO CODES

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.
✱ On request, the versions with gearbox are available with reduction ratios other than those foreseen as standard.

ACCESSORIES

CABLE TRAY CHAIN



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

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

ASSE X

Code	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

ASSE Y

Code	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

DRIVES

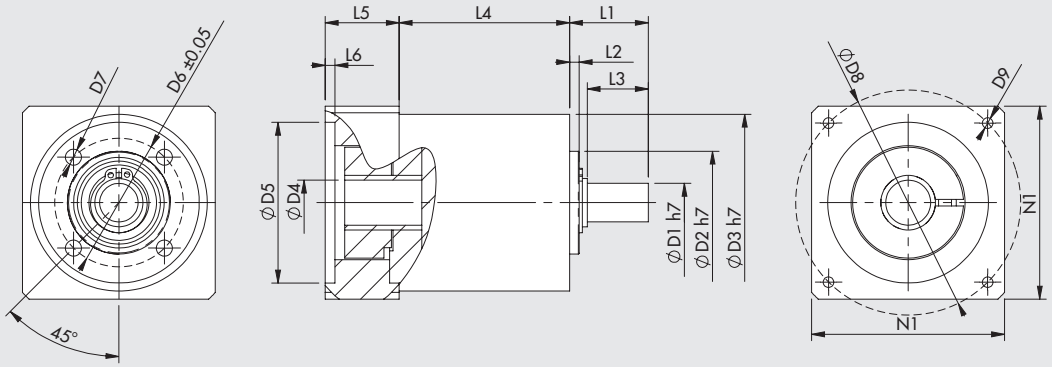
For motor-drive couplings see table on page **A5**.102

OIL

Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

SPARE PARTS

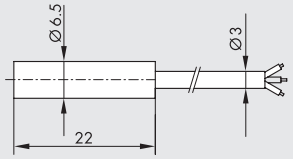
SHAK GANTRY GEARBOXES



Code	Description	Application	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0541000	Gearbox 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	Gearbox 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	Gearbox 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	Gearbox MP080 1:3	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_{OUT} = coppia nominale in uscita N_{IN} = velocità nominale in ingresso J = momento d'inerzia del riduttore

SHAK INDUCTIVE SENSOR



Code	Description
095340A0000	SHAK inductive sensor accessory kit

ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.102

ELECTRIC CANTILEVER AXIS

ELECTRIC AXIS
BELT-DRIVEN RODLESS, SERIES ELEKTRO VBK

Belt-driven rodless electric axis with load-bearing structure consisting of an anodized aluminum extruded profile and linear guide system comprising a rail and ball-recirculation pads.
The motor and gearbox unit is fixed to the central body (so-called "cantilever" solution).
The typical application foresees that the central body remains fixed and the extruded profile moves.
The VBK can be mounted in both horizontal and vertical orientations; for example can be used as a Z axis in a cartesian portal, typically with a BK Series Gantry.
Motion transmission is obtained by means of a polyurethane toothed belt reinforced with steel cables.
The parabolic profile of the belt tooth ensures high efficiency, reduced noise and vibrations.
The central body houses the transmission group consisting of a driving pulley and two idle rollers ("omega" configuration).
The axis, which can be ordered with a stroke per mm, comes complete with an adjustable belt-tensioning system and independent channels for pad re-lubrication.
Threaded and centering holes are present on the central body and on the heads allowing multiple mounting options.
The extrusion has the characteristic V-Lock profile as well as an internal opening where to pass cables and pipes.
It is possible to purchase the axis with or without drive. The standard drive includes a brushless motor with brake, combined with a precision planetary gearbox available in two different gear ratios.
The motor unit can be mounted on either side of the central body.

TECHNICAL DATA		
Admissible ambient temperature	°C	from 0 to +40
Maximum relative humidity		90% at 40°C; 57% at 50°C (no condensate)
Maximum duty cycle		100%
Minimum stroke	mm	110
Maximum stroke	mm	1000
Repeatability	mm	± 0.05
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 10 mm)
Homing position sensor		Inductive sensors
Work position		Any
Degree of protection		IP 20
Noise level	dBA	<66
Type belt		RPP 5 mm pitch in polyurethane with steel tensioning cables
Maximum belt extension		0.10%
Pulley feed/revolution	mm	110
Driving pulley pitch diameter	mm	35.01
Maximum axial force ■	N	550
Maximum number of revs	1/min	1000
Maximum speed (without load)	m/s	3
Maximum acceleration (without load)	m/s^2	30
Maximum driving torque applicable to the pulley	Nm	10
Maximum applicable motor shaft diameter ▲	mm	14

■ Maximum load admissible on the belt: for the sizing, perform the checks as shown in the following pages.
▲ Compact configuration with the motor shaft partially inserted into the pulley axle.

METAL WORK PNEUMATIC

MASS AND MOMENT OF INERTIA

Mass of carriage	kg	2.08
Moving mass at stroke 0 (Mx)	kg	1.46
Moving mass at stroke 0 (excluding drive)	kg	3.54
Moving mass of brushless motor with brake + gearbox + flange and screws	kg	3.18
Moving mass for each mm of stroke	g/mm	3.6
J_0 at stroke 0	kgmm^2	610
J_1 each metre of stroke	kgmm	1.1
J_2 each kg of load	mm^2	306.5
J_3 gearboxe 1:3	kgmm^2	8
J_3 gearboxe 1:5	kgmm^2	6

The reduced moment of inertia of total mass at the driving shaft is: $J_{tot} = [J_1 \cdot \text{Stroke [mm]} + J_2 \cdot \text{Load [kg]} + J_0] \cdot \tau^2 + J_3$

$\tau = 1/u$

u = Gearing ratio

$J_3 = J_{\text{gear ratio}}$

In order to ensure the proper functioning of the system and avoid instability, it is necessary to limit the ratio K between the reduced moment of inertia at the motor shaft $\mathbf{J_{total}}$ and the moment of inertia at the motor $\mathbf{J_{motor}}$

$1<K= J_{total} / J_{motor} <40$

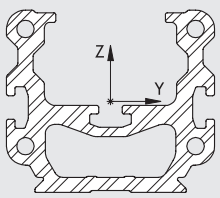
These figures apply to motors supplied by Metal Work. Motors of other makes could require different maximum values.
This limit also depends on the level of control of the required movement: e.g. if the movements need to be coordinated, the ratio between the inertias must be considerably reduced.
Indicatively, it is **advisable NOT to exceed** the following values:

1<K<10 with motors BRUSHLESS

It is worth noting that system operation can be enhanced by varying the drive parameters.
For BRUSHLESS motors supplied by Metal Work, a "tuning" procedure is envisaged to optimise motor operation depending on the mechanics applied to the axle.

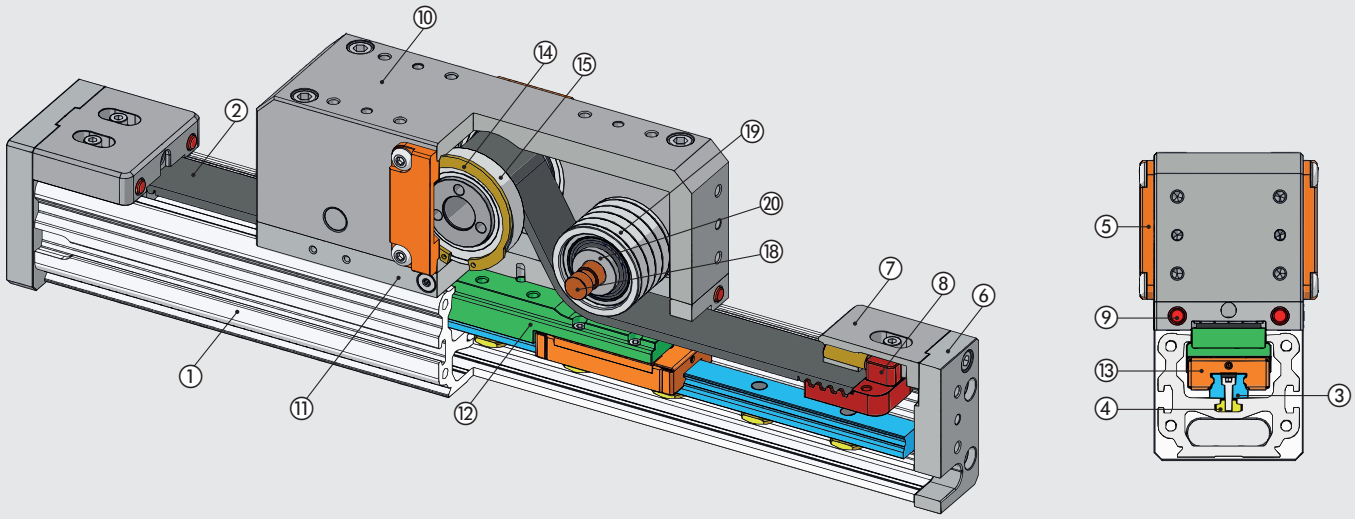
MOMENTS OF INERTIA – ALUMINIUM SECTION

Moment of inertia in relation to the Y-axis (Iy)	10^3 mm^4	176.52
Moment of inertia in relation to the Z-axis (Iz)	10^3 mm^4	323.34

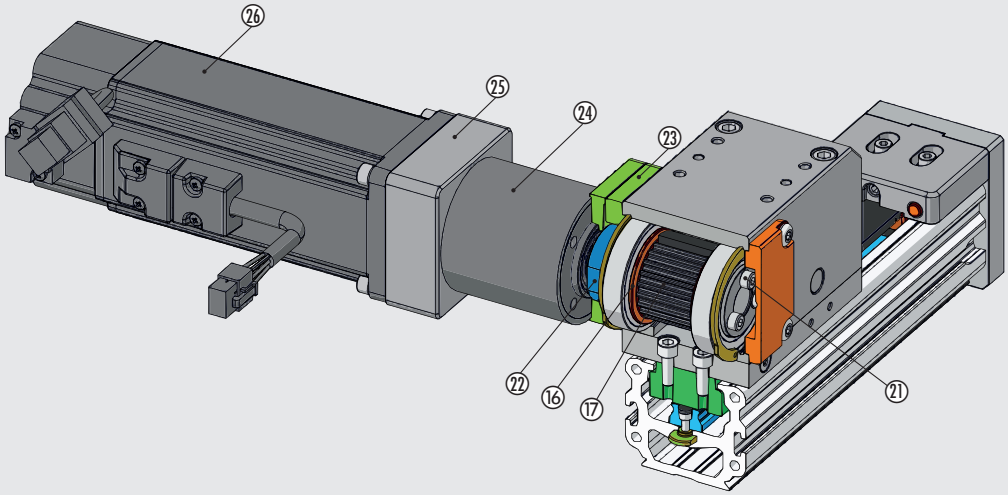


NOTES

COMPONENTS



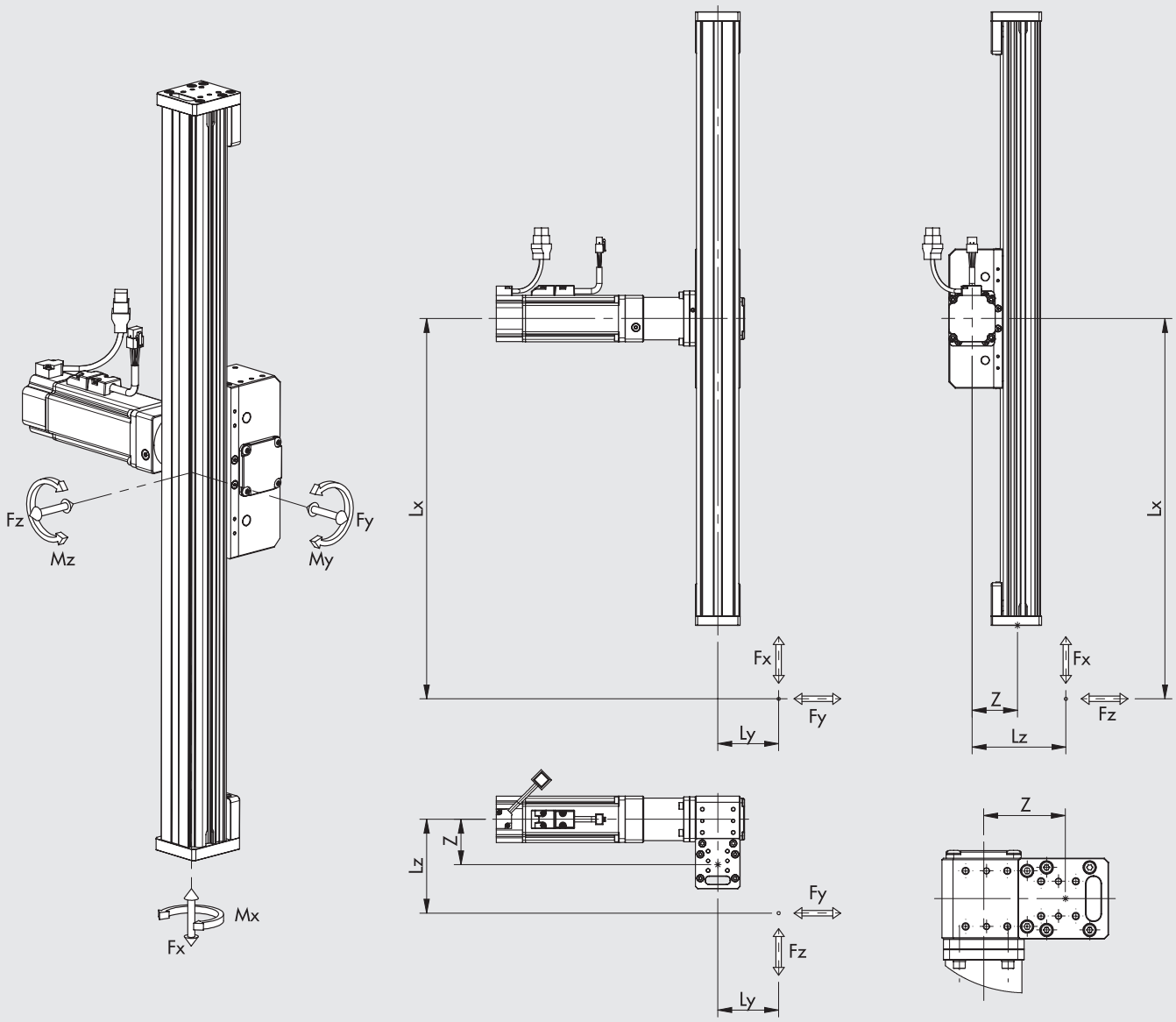
VERSION WITH MOTOR



① BARREL: anodized aluminium
② TOOTHED BELT: polyurethane with steel cables
③ GUIDING RAIL FOR PADS: hardened steel
④ GUIDE-LOCKING INSERTS: stainless steel
⑤ COVER: painted aluminium
⑥ HEAD: anodized aluminium
⑦ UPPER BELT-LOCKING PLATE: anodized aluminium
⑧ LOWER BELT-LOCKING PLATE: anodized aluminium
⑨ BUFFER: polyurethane
⑩ CENTRAL BODY: anodized aluminium
⑪ INTERMEDIATE PLATE: anodized aluminium
⑫ PAD SUPPORT: anodized aluminium
⑬ BALL RECIRCULATION PAD: stainless steel / technopolymer
⑭ BEARING-LOCKING SNAP RING: zinc-plated steel
⑮ HIELDED BALL BEARING: hardened steel
⑯ BELT FLANGES: zinc-plated steel
⑰ TOOTHED PULLEY: nickel-plated aluminium
⑱ FIXED PINS: stainless steel
⑲ DRIVEN ROLLERS: nickel-plated aluminium
⑳ BEARING CONTAINMENT BUSHES: anodized aluminium
㉑ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
㉒ ELASTIC COLLAR: anodized aluminium
㉓ MOTOR-FIXING FLANGE: anodized aluminium
㉔ GEARBOX
㉕ MOTOR INTERFACE FLANGE: anodized aluminium
㉖ MOTOR

METAL WORK PNEUMATIC

DIAGRAM OF FORCES AND MOMENTS



STATIC VERIFICATION

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

Z [m]	Fy0 max [N]	Fz0 max [N]	Mx0 max [Nm]	My0 max [Nm]	Mz0 max [Nm]
0.059	9080	9080	70	642	642

N.B.: The table shows the maximum loads applicable to the guide system beyond which serious damage could be caused. Refer to the Deformation/Load charts on the following pages to verify the axles load conditions.

$Mx = Fz \cdot Ly + Fy \cdot (Lz - Z)$ $My = Fx \cdot (Lz - Z) + Fz \cdot Lx$ $Mz = Fx \cdot Ly + Fy \cdot Lx$

$$\frac{|Mx|}{Mx0\ max} + \frac{|My|}{My0\ max} + \frac{|Mz|}{Mz0\ max} + \frac{|Fx|}{Fx0\ max} + \frac{|Fy|}{Fy0\ max} \leq 1$$

DYNAMIC VERIFICATION

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

Z [m]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
0.059	4540	4540	35	321	321

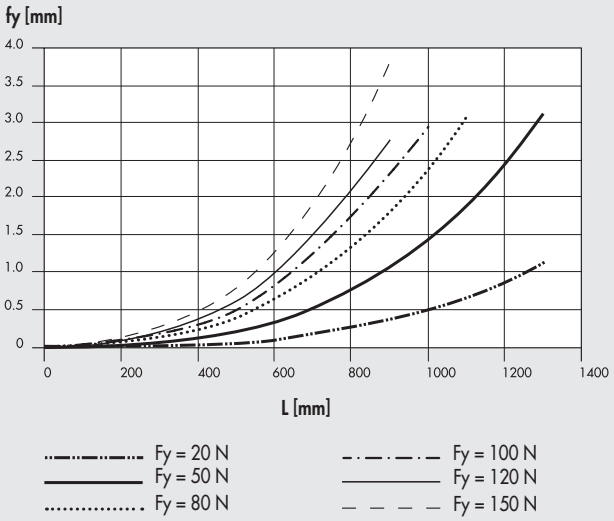
N.B.: The values in the table refer to the guide system and are calculated on the basis of a theoretical operating life of 10,000 km.

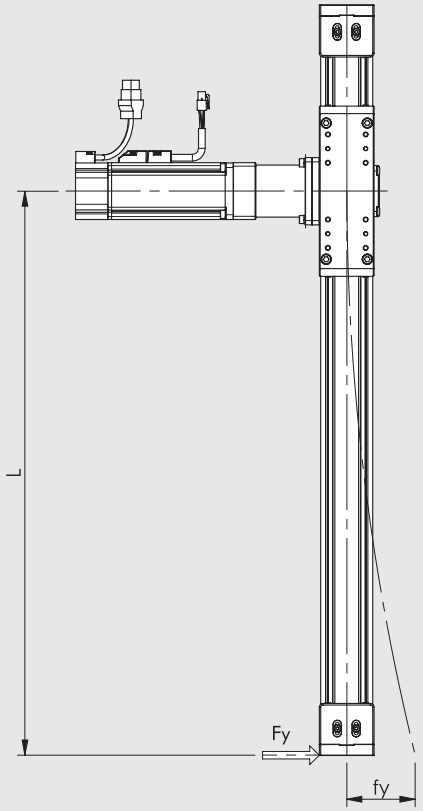
$Mx = Fz \cdot Ly + Fy \cdot (Lz - Z)$ $My = Fx \cdot (Lz - Z) + Fz \cdot Lx$ $Mz = Fx \cdot Ly + Fy \cdot Lx$

$$\frac{|Mx|}{Mx\ max} + \frac{|My|}{My\ max} + \frac{|Mz|}{Mz\ max} + \frac{|Fx|}{Fx\ max} + \frac{|Fy|}{Fy\ max} \leq 1$$

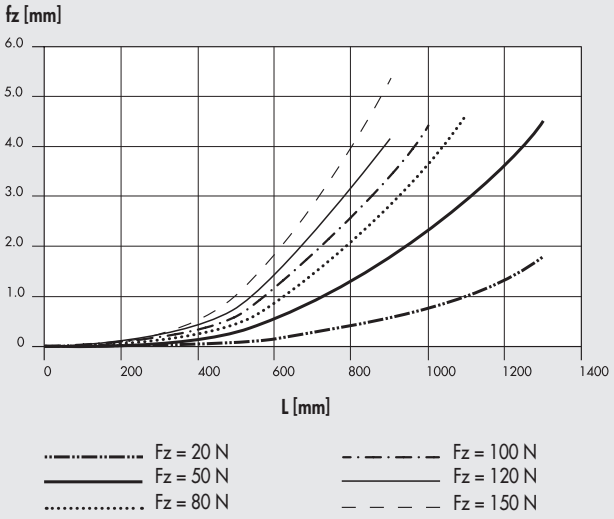
DEFORMATION ACCORDING TO LOAD AND DISTANCE

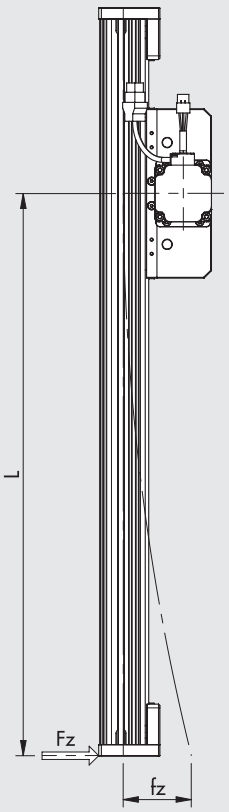
DEFLECTION IN Y DIRECTION





DEFLECTION IN Z DIRECTION



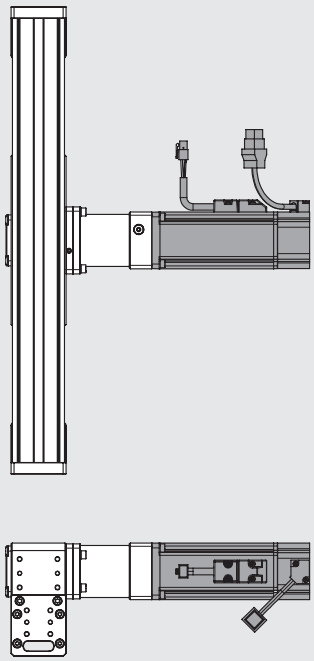


N.B.: The deformations shown in the graphs have been measured under static conditions.

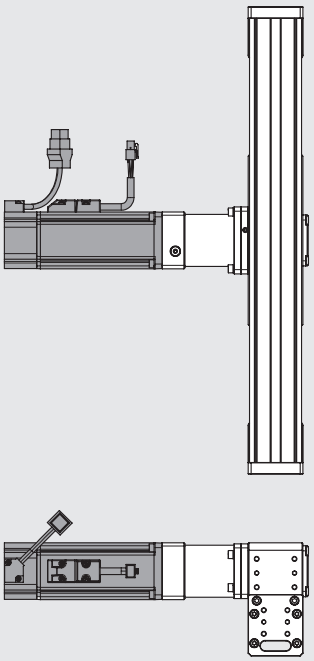
METAL WORK PNEUMATIC

VERSIONS

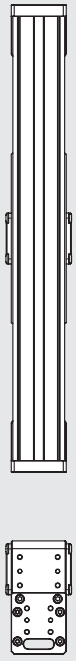
RIGHT MOTOR



LEFT MOTOR



WITHOUT MOTOR



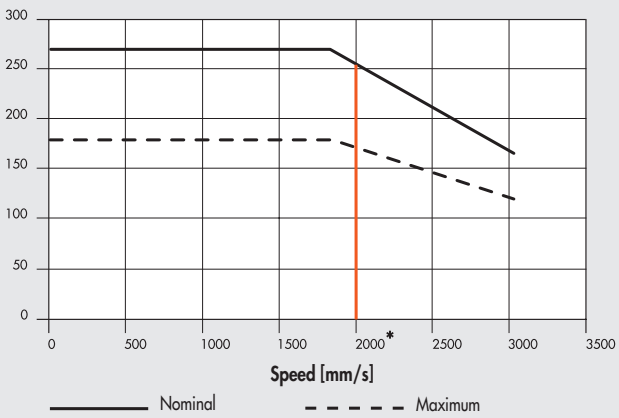
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (AXIS COMPELTE WITH MOTOR AND DRIVE)

N.B.: Check that the following constraints are met for each cycle phase:
- the maximum premissible load and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia).
- deformation according to load.

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%.

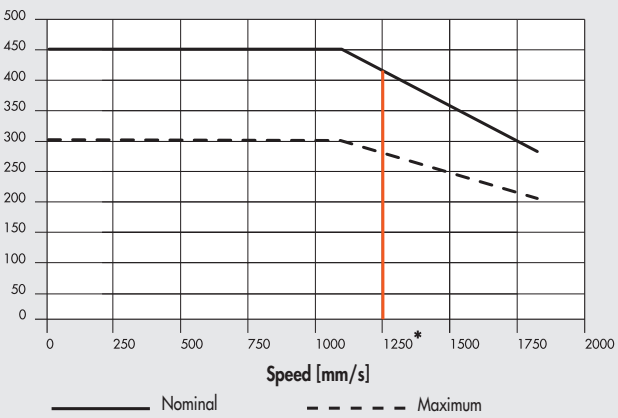
With 1:3 gearbox

Axial load [N]



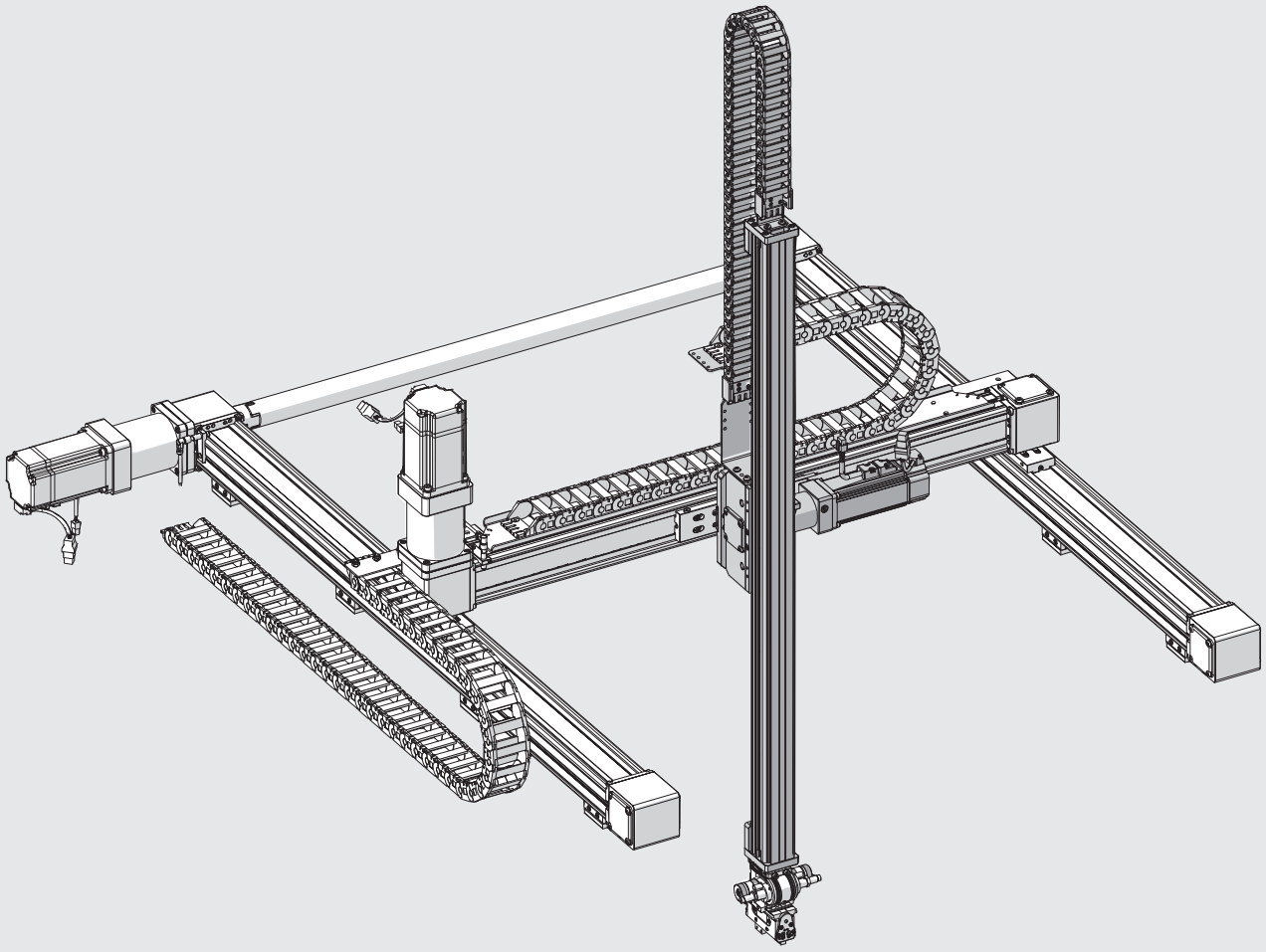
With 1:5 gearbox

Axial load [N]



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

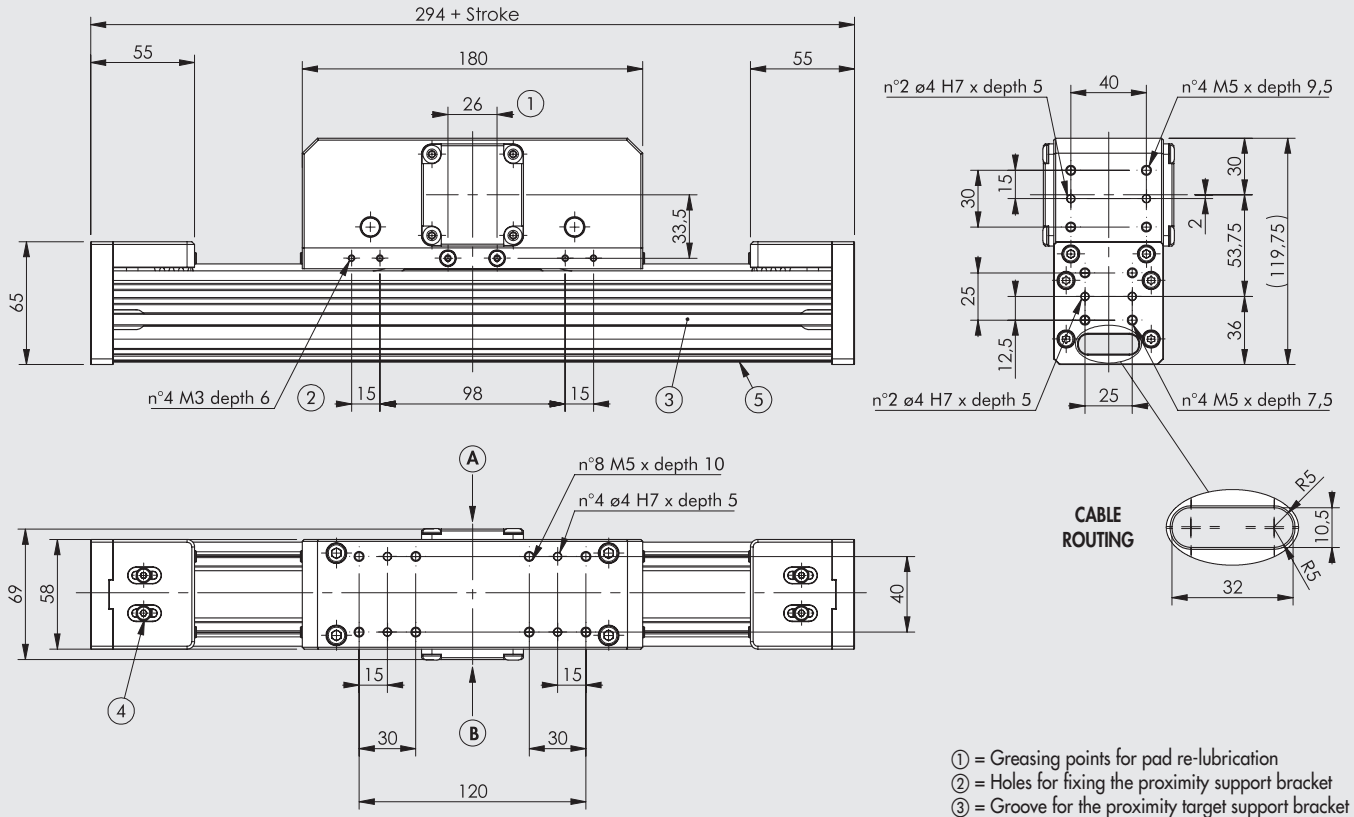
EXAMPLES OF APPLICATION



NOTES

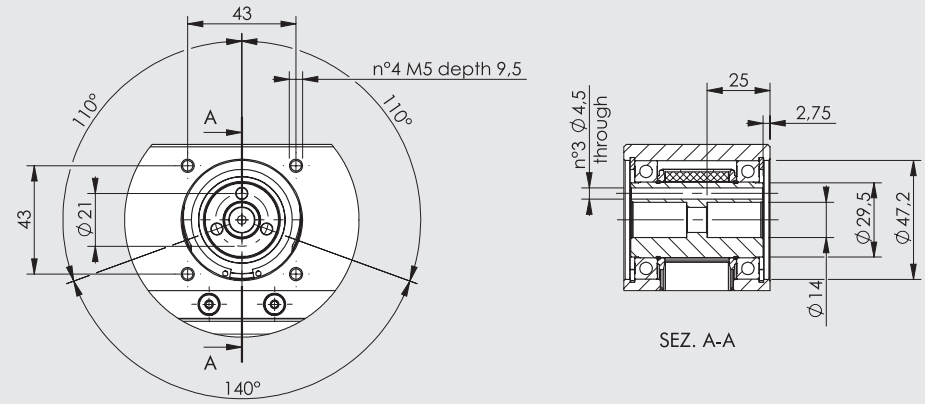
METAL WORK PNEUMATIC

DIMENSIONS VERSION WITHOUT MOTOR

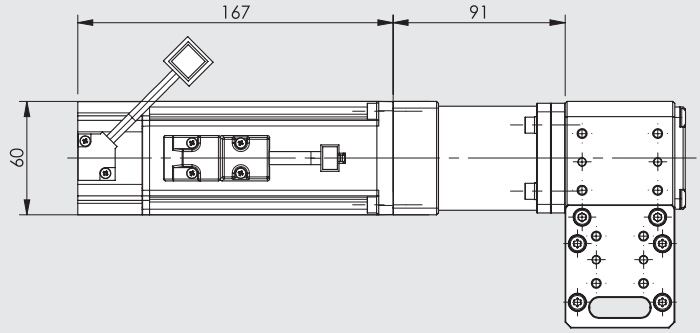


① = Greasing points for pad re-lubrication
② = Holes for fixing the proximity support bracket
③ = Groove for the proximity target support bracket
④ = Belt-tensioning screws
⑤ = Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**.

GEARBOX-MOTOR (A) - (B) INTERFACE



DIMENSIONS VERSION WITH MOTOR



N.B.: The indicated dimensions are valid for both versions with motor installed on the right and on the left.

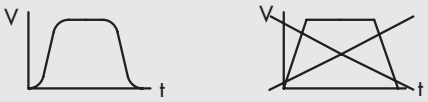
ORDERABLE CODES BRUSHLESS MOTOR + BRAKE WITH GEARBOX
Reduction 1:3
374V10_ _ _ _367220
374V10_ _ _ _397220
Reduction 1:5
374V10_ _ _ _369220
374V10_ _ _ _399220

_ _ _ _ = Enter the stroke in mm to complete the code.
See Key to Codes for an explanation of encoding.

MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES
	Metal Work	37D2300000
	Manufacturer	DELTA ASD-A2-0421-M
Metal Work Manufacturer		(400W)
BRUSHLESS MOTORS WITH BRAKE		
37M4220001	DELTA ECMA-C20604SS (400W)	√

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



KEY TO CODES AXIS ELECTRIC WITHOUT MOTOR

CYL	37 TYPE	4	V	1 SIZE	0 CARRIAGE TYPE	0500 STROKE	3 GUIDE TYPE	T
	37 Electric actuators	**4** Electric axis rodless elektro	**V** VBK	**1** VBK-1	**0** STD	from 110 to 1000 mm	**3** Heavy (steel guide and pads ball-recirculation)	**T** Without motor (plugged outlets)

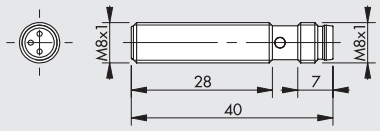
KEY TO CODES AXIS ELECTRIC MOTOR

CYL	37 TYPE	4	V	1 SIZE	0 CARRIAGE TYPE	0500 STROKE	3 GUIDE TYPE	6 MOTOR POSITION	DRIVE 9 MOTOR ◆	2 FLANGE	2 TORQUE	0
	37 Electric actuators	**4** Electric axis rodless elektro	**V** VBK	**1** VBK-1	**0** STD	from 110 to 1000 mm	**3** Heavy (steel guide and pads ball-recirculation)	**6** Right **9** Left	**7** Brushless with BRAKE + 1:3 gearbox **9** Brushless with BRAKE + 1:5 gearbox	**2** 60	**2** 1.2÷2.19 Nm	**0** Base

◆ On request available versions with gearbox with reduction ratios other than those eventually foreseen as standard.

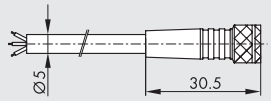
ACCESSORIES

QUICK-FIT INDUCTIVE SENSOR M8



Code	Description
W095K030010	PNP M8 inductive sensor with push-in LED

CABLE WITH STRAIGHT CONNECTOR FOR PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

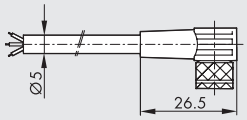


Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
02400A0100	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 1 m
02400A0250	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 2.5 m
02400A0500	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 5 m
02400A1000	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 10 m

Note: Very flexible cables, class 6 according to IEC 60228

CABLE WITH 90° CONNECTOR FOR PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

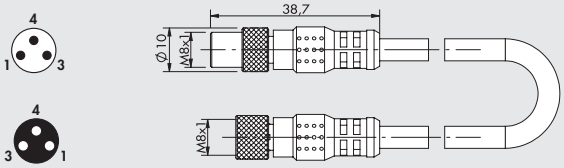


Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
02400B0100	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 1 m
02400B0250	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 2.5 m
02400B0500	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 5 m
02400B1000	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 10 m

Note: Very flexible cables, class 6 according to IEC 60228

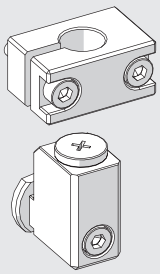
M8 M – M8 F CONNECTOR FOR PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



Code	Description
0240009009	M8-M8 3-pin straight connector with cable L = 3 m

Note: Can be used for direct connection to the modules with digital INPUT of the EB 80 and CM valves

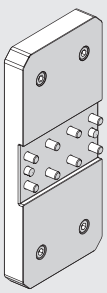
BRACKET FOR INDUCTIVE SENSOR

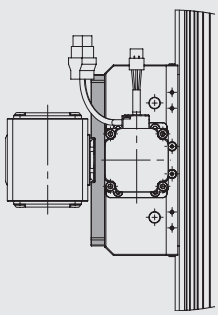


Code	Description
095BK1V001	Bracket for inductive sensor Ø8 VBK-1

Note: supplied complete with 1 sensor support, 1 support with target assembly screws and insert

FRONT FIXING BRACKET VBK-1 ON BK

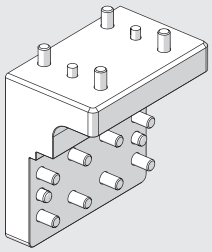


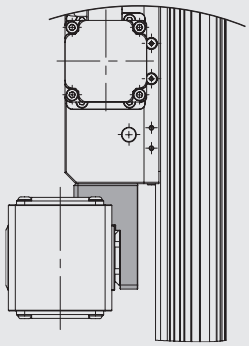


Code	Description	Weight [g]
095BK1V002	Front fixing bracket VBK-1 on BK	420

Note: supplied complete with n. 1 bracket, screws and pins for mounting

LATERAL FIXING BRACKET VBK-1 ON BK

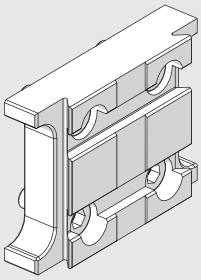


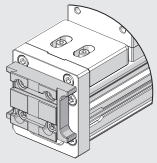


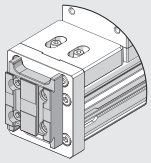
Code	Description	Weight [g]
095BK1V003	Lateral fixing bracket VBK-1 on BK	384

Note: supplied complete with n. 1 bracket, screws and pins for mounting

V-LOCK INTERFACE



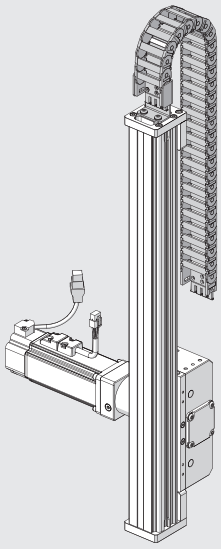


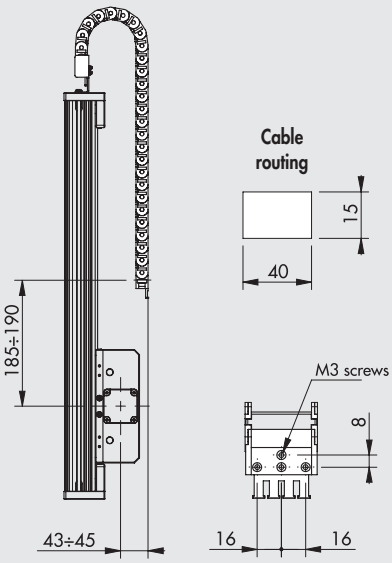


Code	Description	Weight [g]
095BK1V004	V-Lock interface VBK-1	65

Note: supplied complete with n. 1 V-Lock bracket, screws and pins for mounting
N.B. Can be mounted axially or at right angles

CABLE TRAY CHAIN





Code	Description
095BK1VC_ _ _ _	Cable tray chain kit for VBK-1

Note: Supplied complete with 1 bracket, 1 cable chain, screws and nuts for mounting

_ _ _ _ = to complete coding, enter the number of links, stroke function.

Use the following formula to identify the number of links required:

$$\textbf{no. of links} = \text{whole top}\left(\frac{10 + \underline{\text{stroke - 5}}}{20}\right)$$ (stroke is expressed in mm)

Example: stroke 350 mm → no. of links = 28 → ordering code 095BK1VC0028

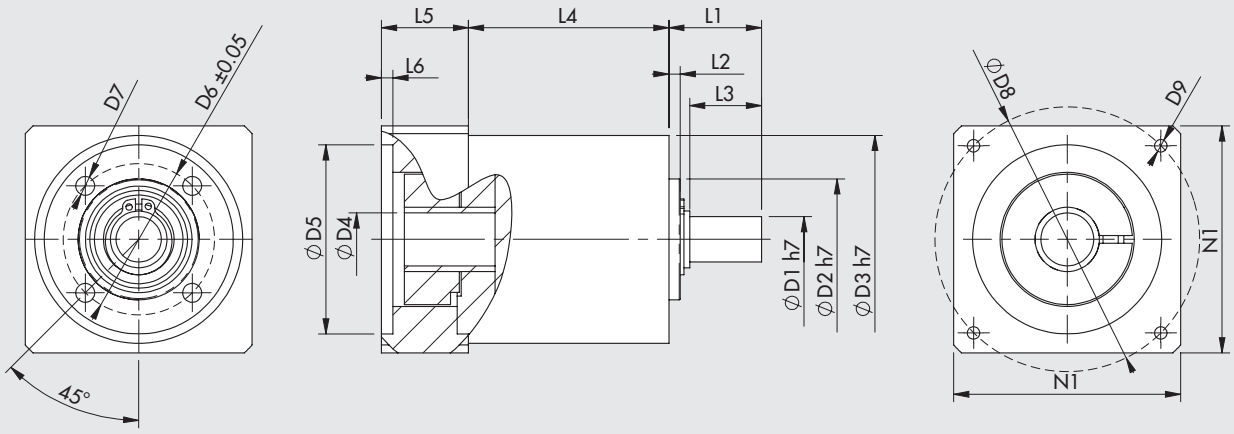
DRIVES

PFor motor-drive couplings see table on page **A5**.112

METAL WORK PNEUMATIC

SPARE PARTS

GEARBOXES



Code	Description	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0341000	Gearbox MP053 1:3	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M5x12	24.5	3	19	53	24	3	60
37R0541000	Gearbox MP053 1:5	15	3500	6	0.8	12	32	55	14	50	40	M5	70	M5x12	24.5	3	19	53	24	3	60

C_{OUT} = rated output torque N_{IN} = nominal input speed J = mass moment of inertia of the gearhead

ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.112

NOTES

ELECTRIC AXIS
SERIES ELEKTRO SVAK

This belt-driven rodless electric actuator is characterised by the fact that the motor and reducer unit is integral with the carriage, instead of being fitted to one end of the extruded section.
This solution is known as "cantilever". In the typical application the carriage is fixed while the extruded section moves.
The SVAK can be used either horizontally or vertically, but the most common use is in vertical applications, which explains why the motor is supplied complete with a brake that causes the axis to remain still even when it is not electrically powered.
The SVAK can be applied to the SHAK GANTRY series to obtain an X-Y-Z Cartesian manipulator robot featuring high performance and rigidity.
The SVAK uses the universal V-Lock modular system for fixing the carriage to external auxiliaries and the various components to one end of the extruded section.
The sides of the extruded section, which is made of anodized aluminium, houses two hardened and ground guides that slide on adjustable wheels that are integral with the carriage. The carriage is moved by a toothed belt, complete with a tensioning system. Guide lubrication nozzles are also provided on the carriage.
A BRUSHLESS motor with a toothed belt 1:2 gear speed reducer for the pulleys was also chosen. This design was opted for because it ensures excellent load capacities without sacrificing dynamics and the typical speed of this product. In addition to the standard drive proposed in the catalogue, it is also possible to customise the cylinder by using other motors.
The homing position is detected by an inductive proximity sensor included in the supply.
A cable guiding system with cable-carrying chain and mounting bracket is also available on request as an accessory.

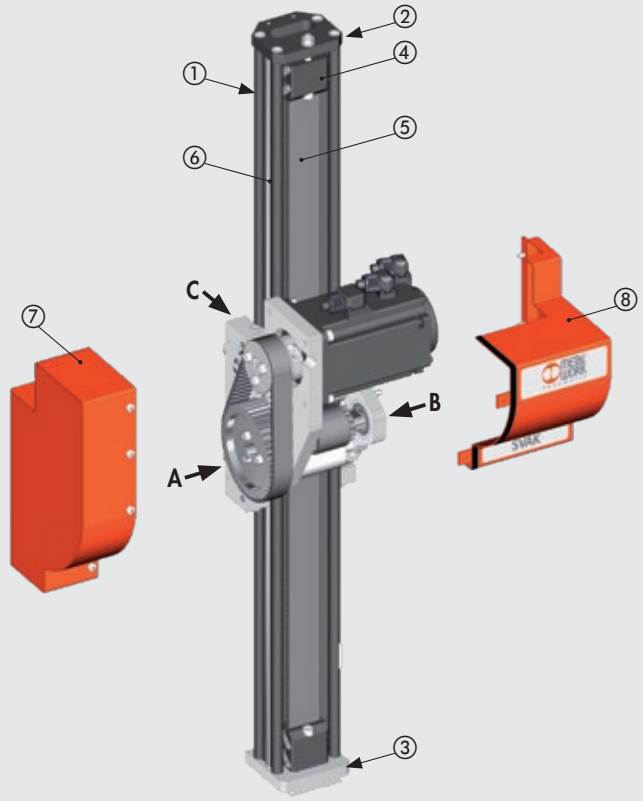
TECHNICAL DATA		
Ambient temperature	°C	from 0 to +40
Maximum relative humidity		90% (no condensate)
Maximum value of duty cycle		100%
Maximum speed without load	m/s	3.5
Maximum acceleration without load	m/s^2	50
Maximum additional load limit	kg	8
Maximum value of axial force available (with Metal Work motors)	N	300
Maximum axial force supportable by mechanical devices	N	600
Maximum torque applicable to the drive pulley	Nm	5
Standard strokes	mm	200
		400
		600
		800
Repetition accuracy	mm	± 0.05
Toothed belt reduction gear		1:2 ratio
Noise level	dBA	<66
Mounting position		Any
Degree of protection		IP30
Toothed belt pitch	mm	5
Type of belt		PowerGrip® LL GT 5MR 25 FV
Belt elongation at maximum load	mm	
Stroke 200		0.05
Stroke 400		0.06
Stroke 600		0.07
Stroke 800		0.08
Drive shaft pulley pitch diameter	mm	27.06
Stroke per motor rev.	mm/rev	42.5
Homing position sensor		Inductive sensor switch

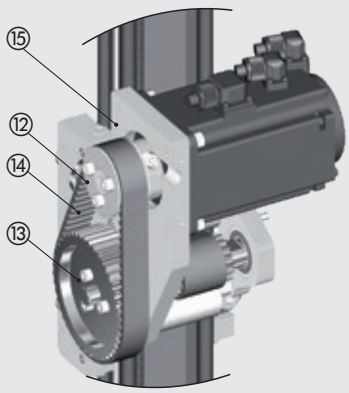
MASS AND MOMENT OF INERTIA

Stroke	mm	200	400	600	800
Weight without motor	kg	2.9	3.2	3.5	3.8
Weight of Brushless 200W motor with brake	kg	1.23			
Moving mass	kg	0.8	1.1	1.4	1.7
Reduced inertia at motor (without load)	kg mm^2	66	80	94	108
Moment of inertia reduced at motor for each kg of load	kg mm^2	45			

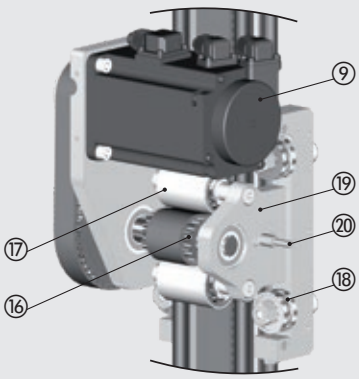
COMPONENTS

① EXTRUDED SECTION: anodized aluminium
② UPPER CLOSING PLATE: anodized aluminium
③ LOWER CLOSING PLATE: anodized aluminium
④ BELT TENSIONER: anodized aluminium
⑤ TOOTHED TRANSMISSION BELT: Polychloroprene (CR) loaded with fibreglass
⑥ HARDENED GUIDE: hardened ground chromed steel
⑦ LEFT-HAND GUARD: painted steel
⑧ RIGHT-HAND GUARD: painted steel
⑨ MOTOR: 200W BRUSHLESS with brake
⑩ FIXING PLATE: anodized aluminium
⑪ BUFFER: rubber
⑫ DRIVE PULLEY: hard-anodized aluminium
⑬ IDLE PULLEY: hard-anodized aluminium
⑭ REDUCTION BELT: loaded polychloroprene (CR)
⑮ LEFT-HAND PLATE: anodized aluminium
⑯ DRIVE SHAFT: steel
⑰ IDLE AXIS: steel
⑱ ROLLER
⑲ RIGHT-HAND PLATE: anodized aluminium
⑳ INDUCTION SENSOR

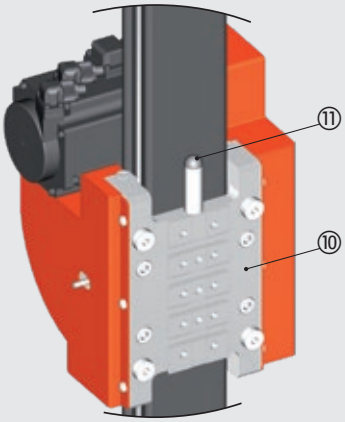




Viewed from A

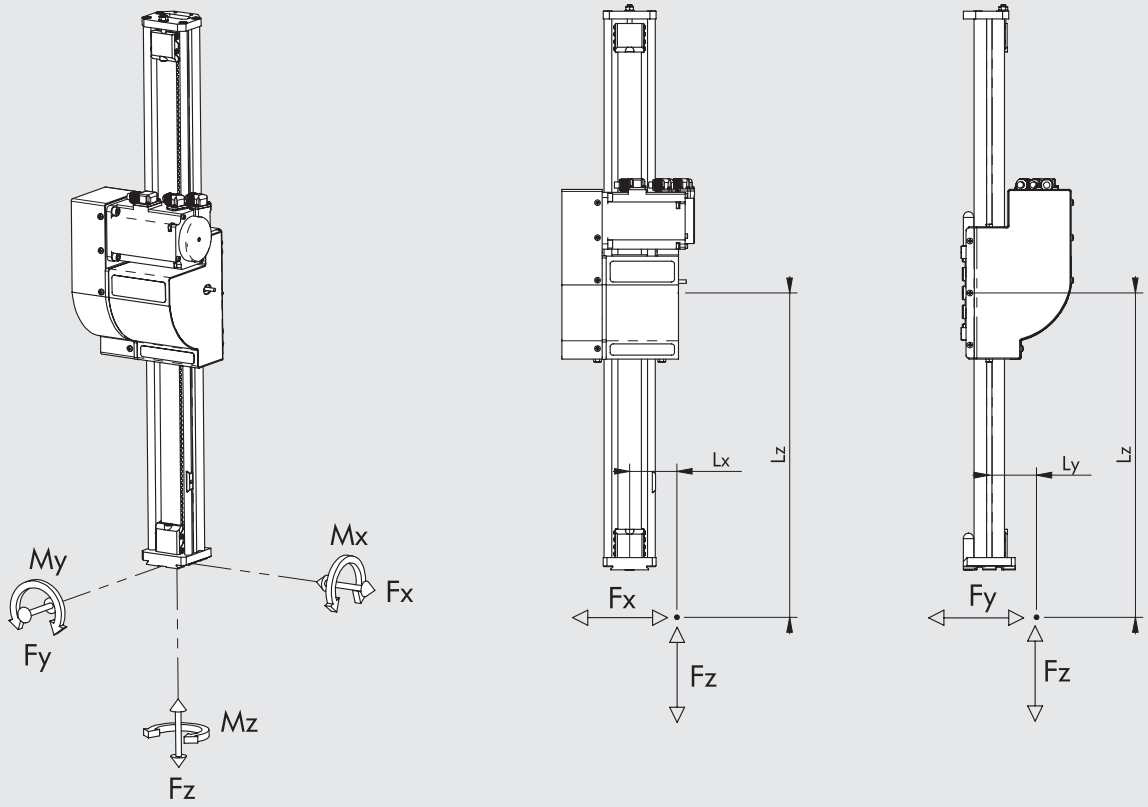


Viewed from B



Viewed from C

DIAGRAM OF FORCES AND MOMENTS



Fx max [N]	Fy max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
800	600	20	27	26

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

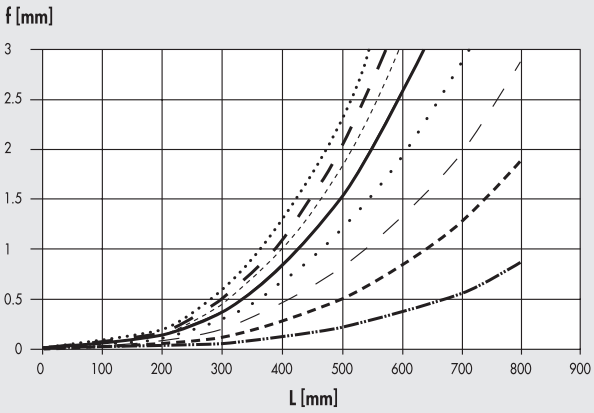
N.B.: For the maximum value of Fz see the general technical data and the axial load curves depending on the speed.

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

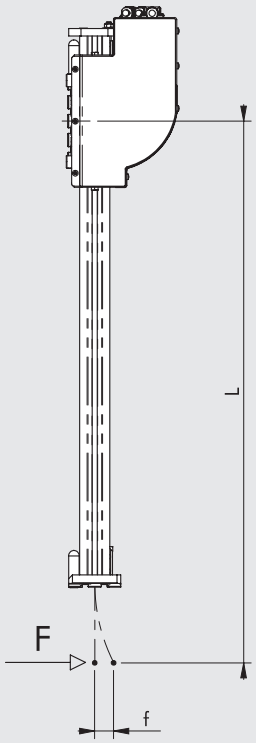
$Mx = Fz \cdot Ly + Fy \cdot Lz \qquad My = Fz \cdot Lx + Fx \cdot Lz \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fx)}{Fx\ max} + \frac{(Fy)}{Fy\ max} \leq 1$$

DEFORMATION ACCORDING TO LOAD



F = 10 N
F = 20 N
F = 30 N
F = 40 N
F = 50 N
F = 60 N
F = 70 N
F = 80 N

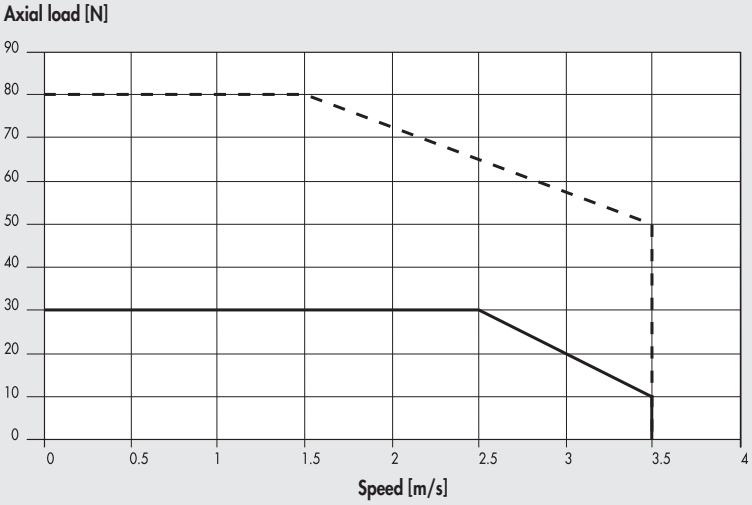


AXIAL LOAD-SPEED CURVES

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).
- deformation according to load.

The following diagrams show the axial load with changing speed (m/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%.

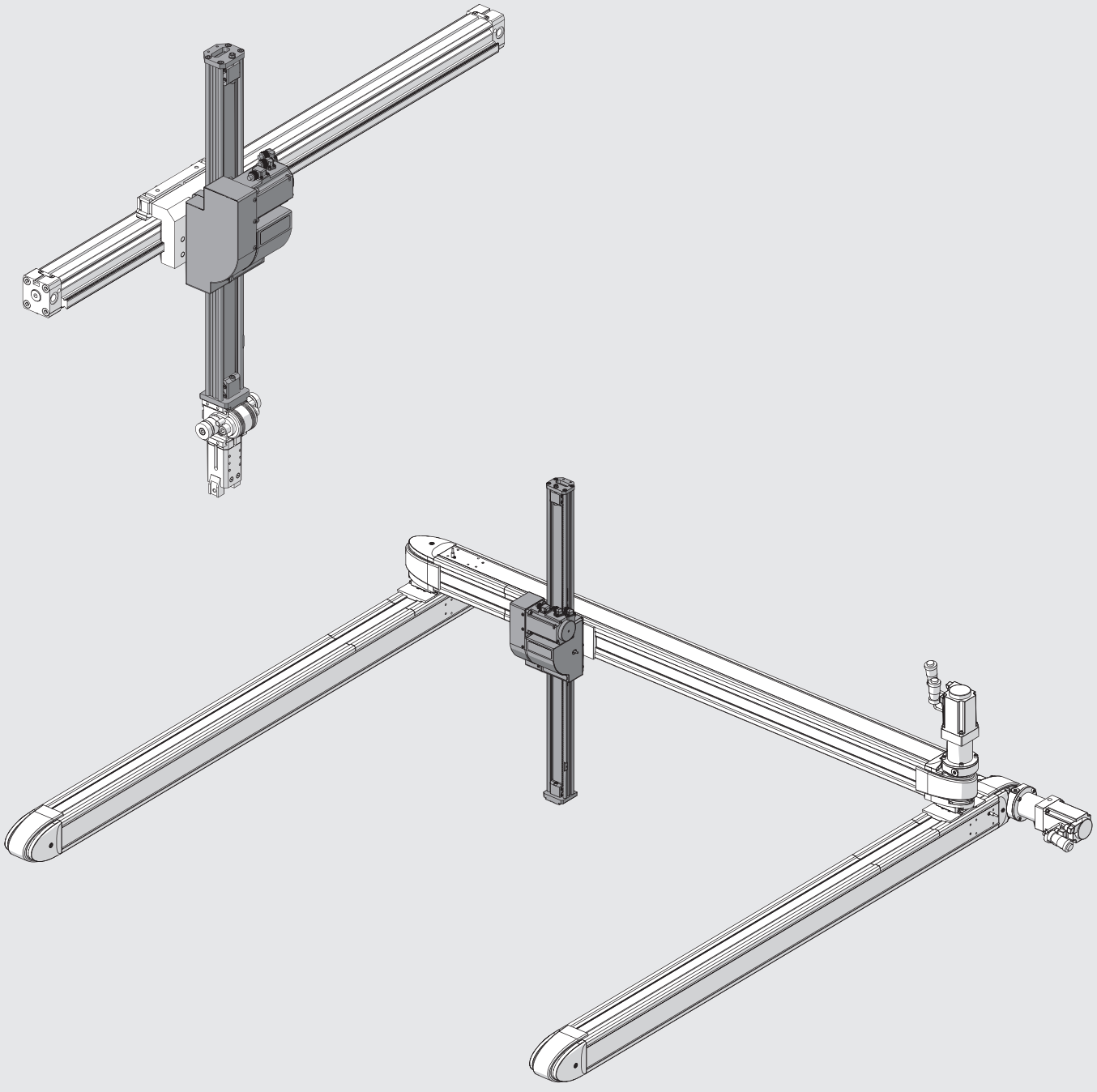
BRUSHLESS WITH BRAKE DRIVES



Maximum 37M4200000 (with brake) + 37D2400008 (200W)

Nominal 37M4200000 (with brake) + 37D2400008 (200W)

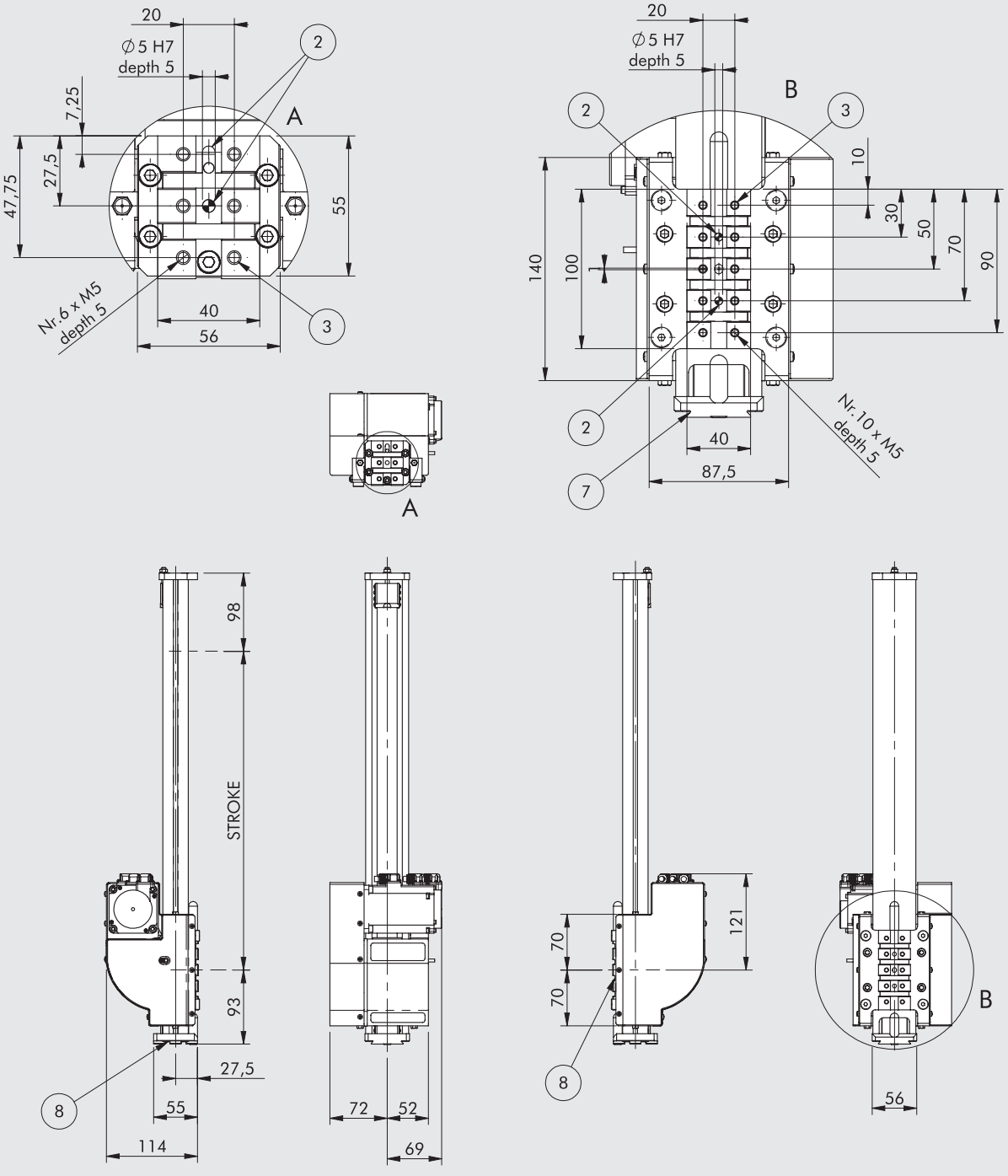
EXAMPLES OF APPLICATION



NOTES

METAL WORK PNEUMATIC

DIMENSIONS



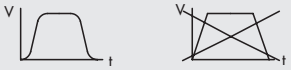
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

Code	Description
375V00020004200	SVAK stroke 200
375V00040004200	SVAK stroke 400
375V00060004200	SVAK stroke 600
375V00080004200	SVAK stroke 800

MOTOR-DRIVE COUPLINGS

BRUSHLESS MOTOR WITH BRAKE			DRIVES	
Code Metal Work		Manufacturer	Code Metal Work	Manufacturer
37M4200000		SANYO DENKI R2AA06020FCH11M (200W)	37D2400008	SANYO DENKI RS3A03

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



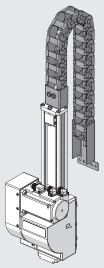
KEY TO CODES

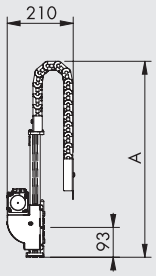
									DRIVE		
CYL	37	5	V	0	0	0200	0	4	2	0	0
	TYPE					STROKE ◆		MOTOR	FLANGE	TORQUE	
	37 Electric actuators	5 Belt-driven electric axes	V SVAK	0 STD	0 STD	0200 0400 0600 0800	0 STD	4 BRUSHLESS with BRAKE	2 60	0 0 - 0.79 Nm	0 STD

◆ Other strokes on request.

ACCESSORIES

CABLE TRAY CHAIN





Code	Description	A
095000C0200	Cable tray chain accessory kit SVAK stroke 200	~ 550
095000C0400	Cable tray chain accessory kit SVAK stroke 400	~ 750
095000C0600	Cable tray chain accessory kit SVAK stroke 600	~ 950
095000C0800	Cable tray chain accessory kit SVAK stroke 800	~ 1150

Note: suitable for connection with SHAK 340 and SHAK 470

OIL

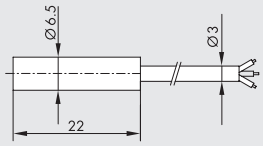
Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

DRIVES

For motor-drive couplings see the table above

SPARE PARTS

SHAK INDUCTIVE SENSOR



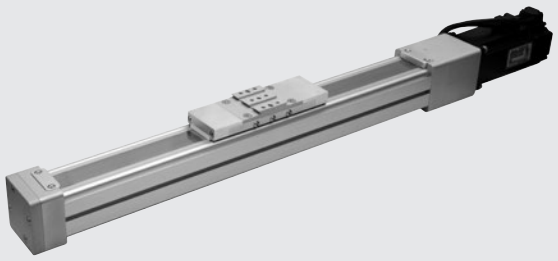
Code	Description
095340A0000	SHAK inductive sensor accessory kit

ELECTRIC MOTORS

For motor-drive couplings see the table above

ELECTRIC AXIS - RODLESS SERIES ELEKTRO SK

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 STEPPING 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 STEPPING motor	°C	from -10 to +50
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 STEPPING motor		50%
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_0)	N	2800	
Dynamic axial load	N	5200	3600
Maximum number of revs	1/min	3000	4000
Maximum speed (V_{max})	mm/s	200	670
Maximum acceleration without load	m/s^2	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 **A5**.125. For the verification of the screw, please refer to page **A5**.126

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	
Weight of the in-line transmission (without motor)	g	400	
Weight of the geared transmission (without motor)	g	600	
Moving mass	g	1050	

N.B.: You get the total weight of a complete cylinder by adding: weight stroke 0 + stroke [mm] x weight for each mm of stroke + weight of the transmission + weight of the motor

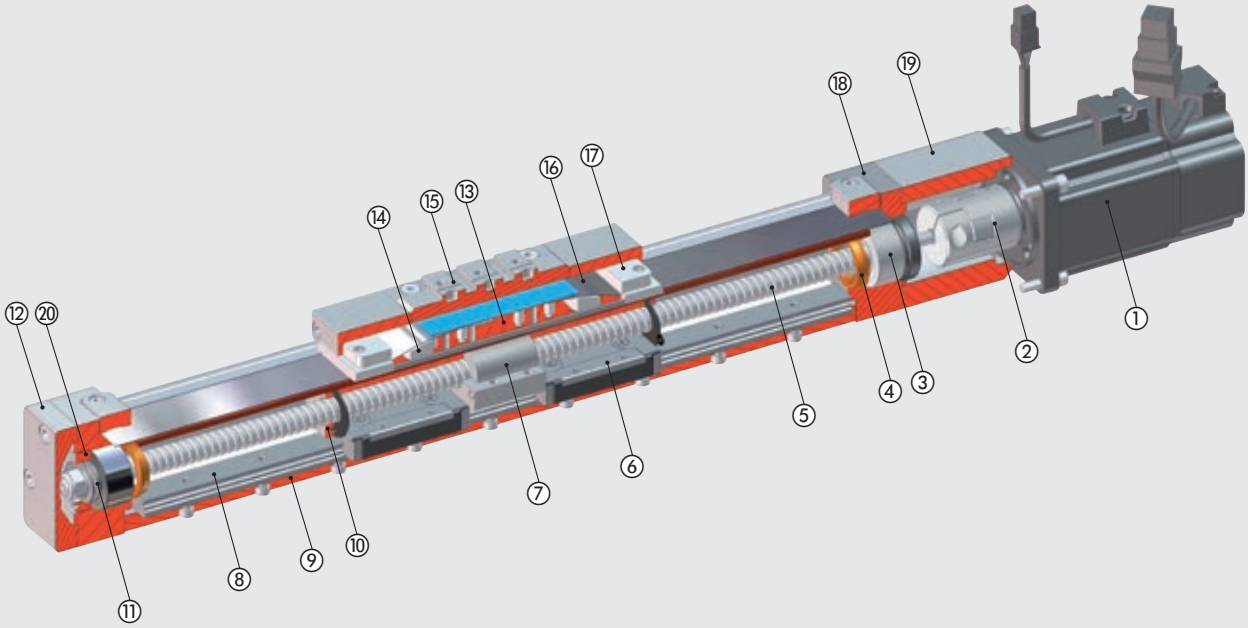
MASS MOMENTS OF INERTIA

Worm screw pitch	mm	4	10
J0 at stroke 0	kg mm²	2.7909	5.3633
J1 each metre of stroke	kg mm²/m	12.0259	17.3353
J2 each kg of load	kg mm²/kg	0.4056	2.5355
J3 in-line transmission	kg mm²	5.2	
J3 geared transmission	kg mm²	19	

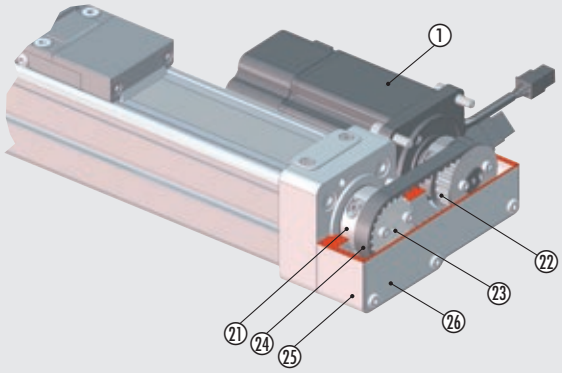
Total mass moment o inertia Jtot = J0 + J1 · stroke [m] + J2 · load [kg] + J3

COMPONENTS

ELECTRIC AXIS WITH IN-LINE MOTOR

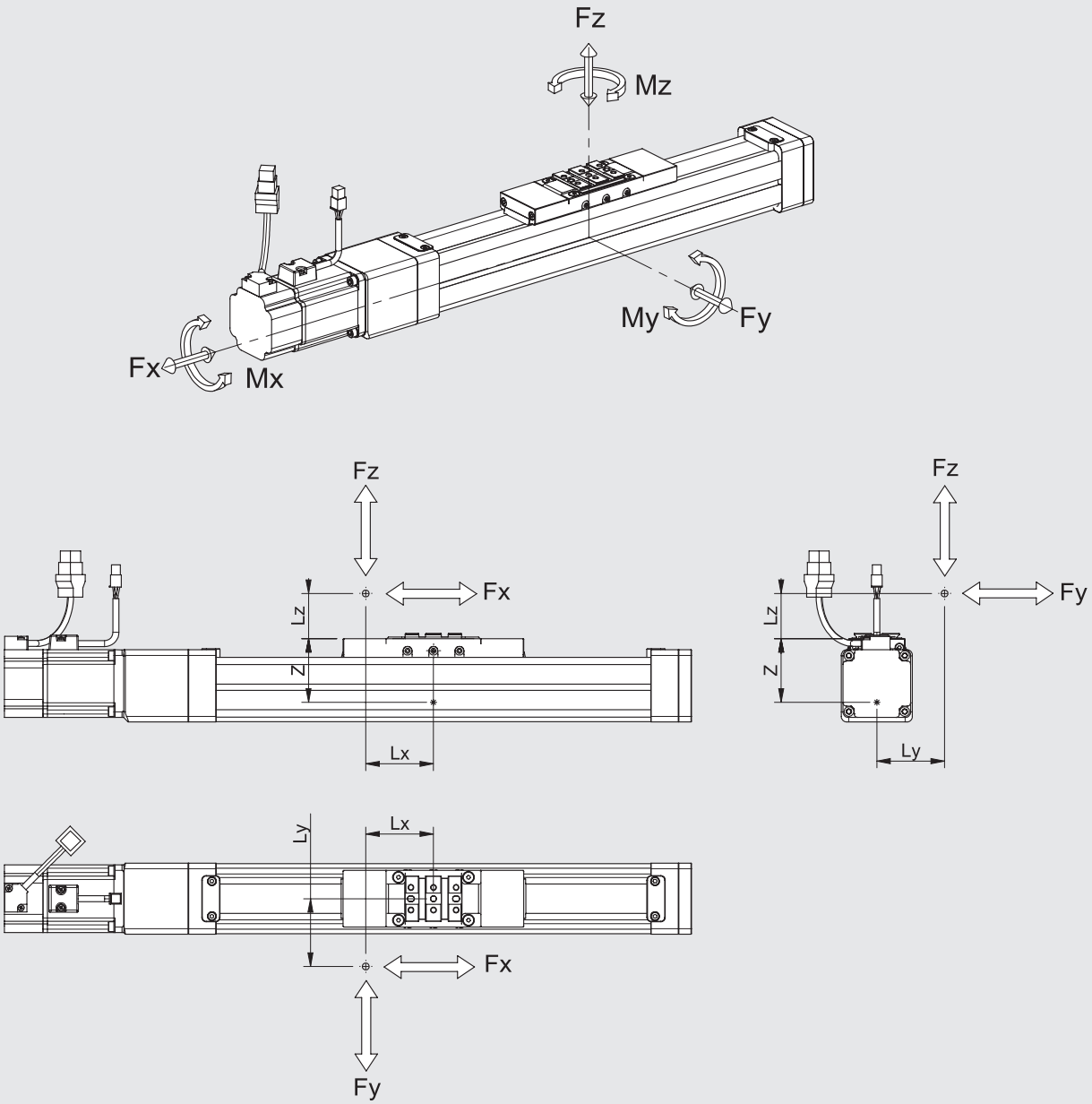


ELECTRIC AXIS WITH GEARED MOTOR



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 PAD: technopolymer
⑮ INTERFACE FOR FIXING: anodized aluminium
⑯ PROTECTIVE STRAP: stainless steel
⑰ UPPER STRAP PAD: 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.

$Mx = Fz \cdot Ly + Fy \cdot (Lz + z)$ $My = Fz \cdot Lx + Fx \cdot (Lz + z)$ $Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx0\ max} + \frac{(My)}{My0\ max} + \frac{(Mz)}{Mz0\ max} + \frac{(Fy)}{Fy0\ max} + \frac{(Fz)}{Fz0\ max} \leq 1$$

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.

$Mx = Fz \cdot Ly + Fy \cdot (Lz + z)$ $My = Fz \cdot Lx + Fx \cdot (Lz + z)$ $Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1$$

CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

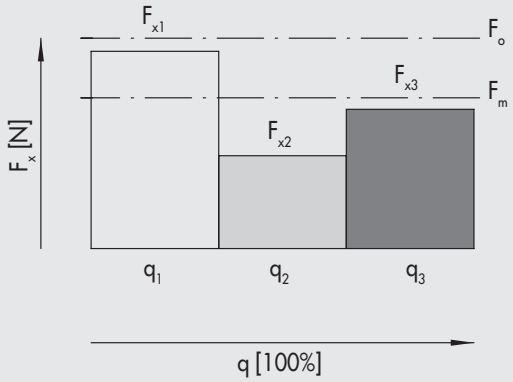
Peak axial load in a work cycle must not exceed the static axial load F_o. The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

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

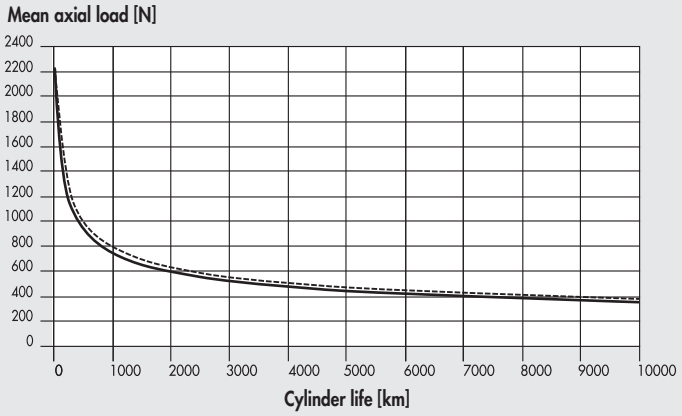
$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{X1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{X2}}{V_m} + \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{X3}}{V_m} \times \frac{q_3}{100} + \ldots}$$

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



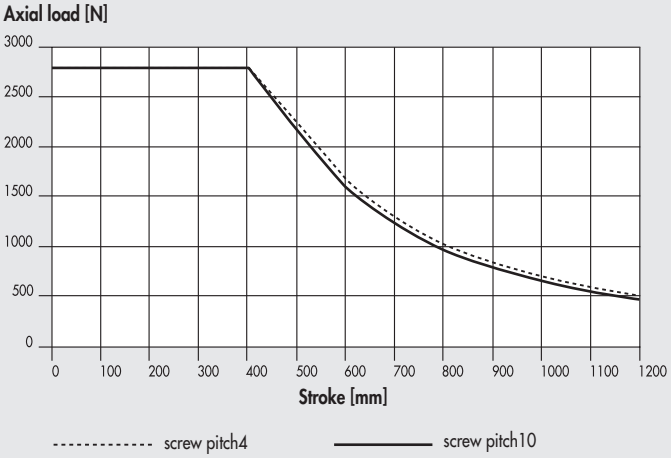
The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graph below shows the lifecycle of the screw as a function of F_m

LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD



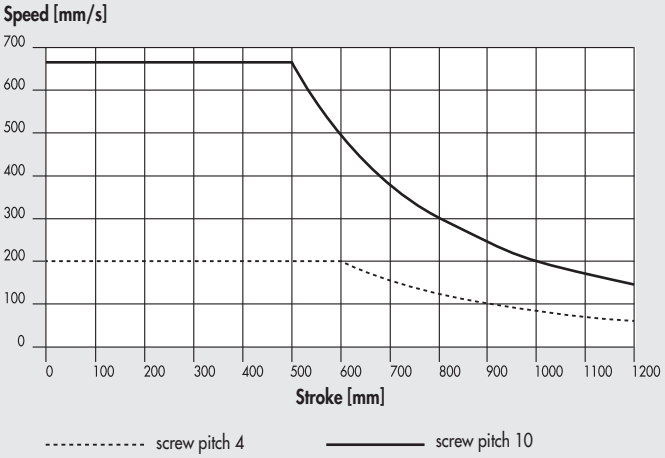
MAXIMUM AXIAL LOAD

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



CRITICAL SPEED

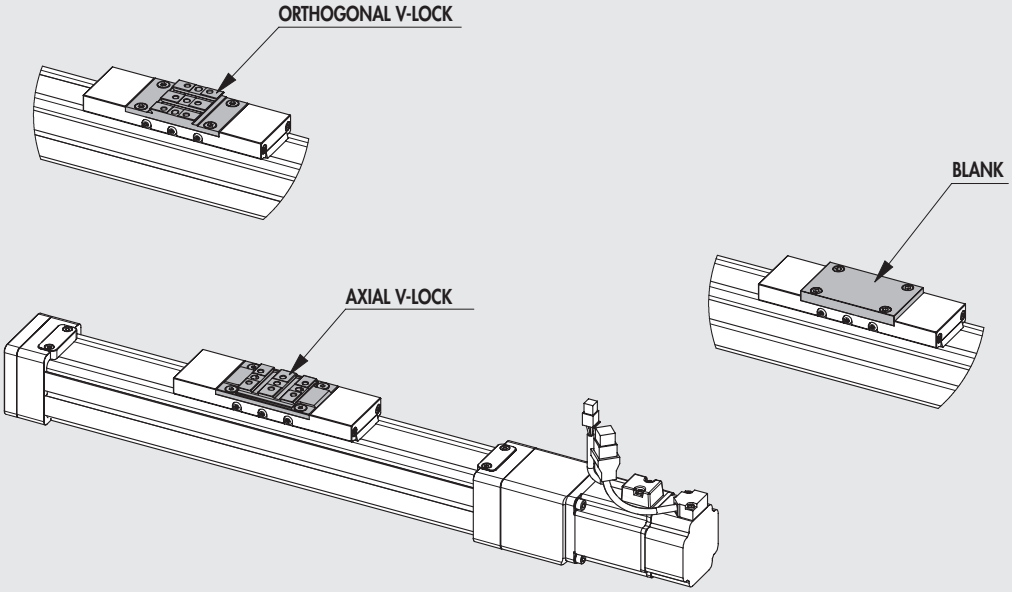
The two variables (axial load and stroke) must comply with the conditions indicated in the graph, otherwise this could trigger resonance phenomena that could impair the good functioning of the system.



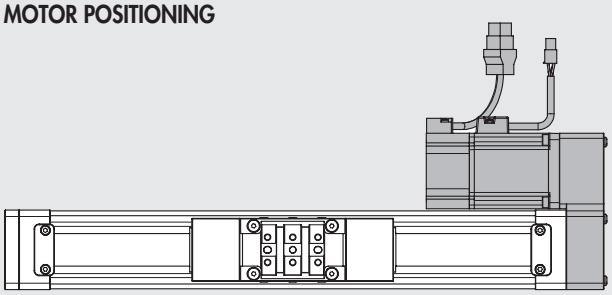
METAL WORK PNEUMATIC

VERSIONS

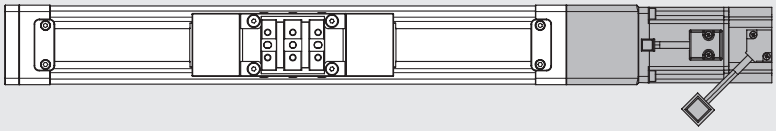
TYPE OF CARRIAGE INTERFACE



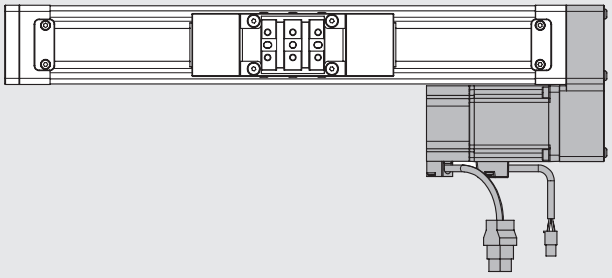
MOTOR POSITIONING



RIGHT GEARED MOTOR

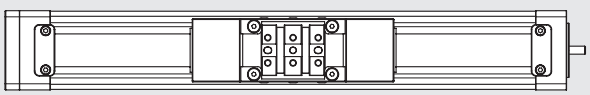


IN-LINE MOTOR



LEFT GEARED MOTOR

VERSION WITHOUT MOTOR



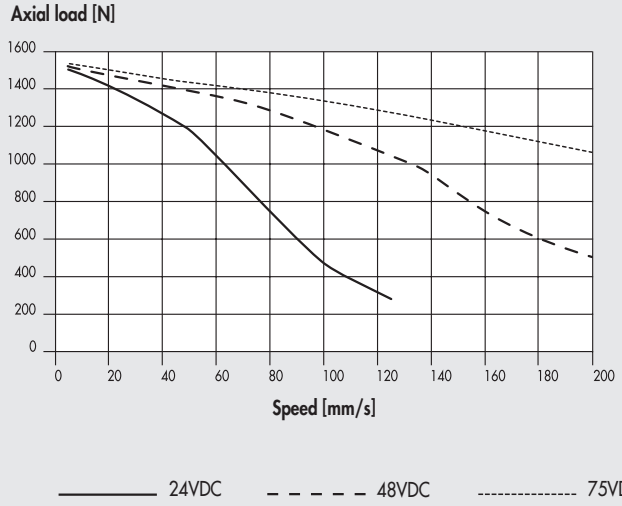
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE)

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%.

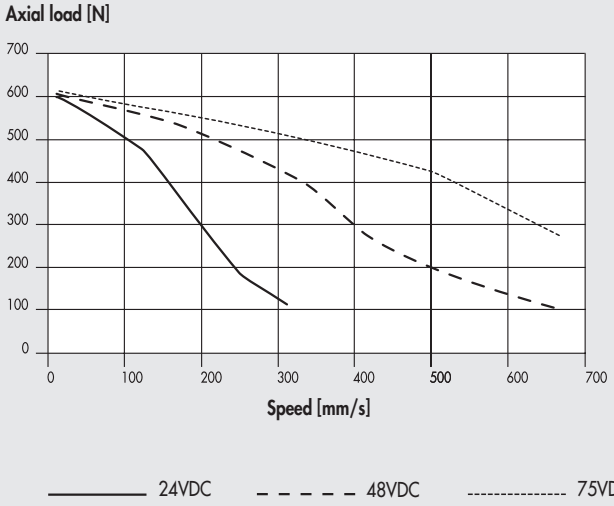
STEPPING motor code 37M1120001 (uprated revs)

Electric axis with a 4 mm-pitch screw



24VDC 48VDC 75VDC

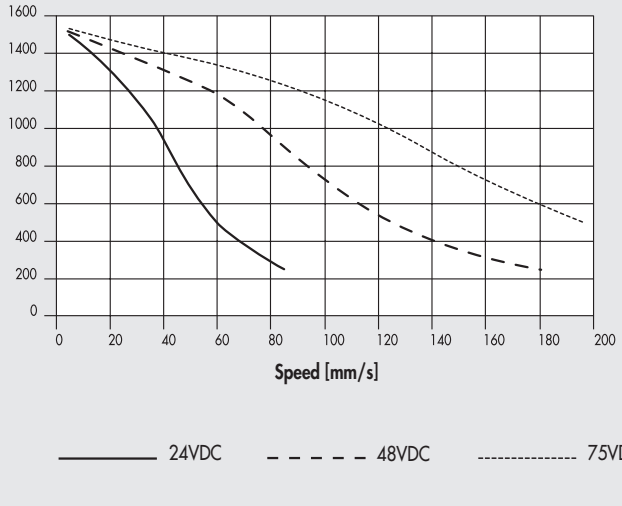
Electric axis with a 10 mm-pitch screw



24VDC 48VDC 75VDC

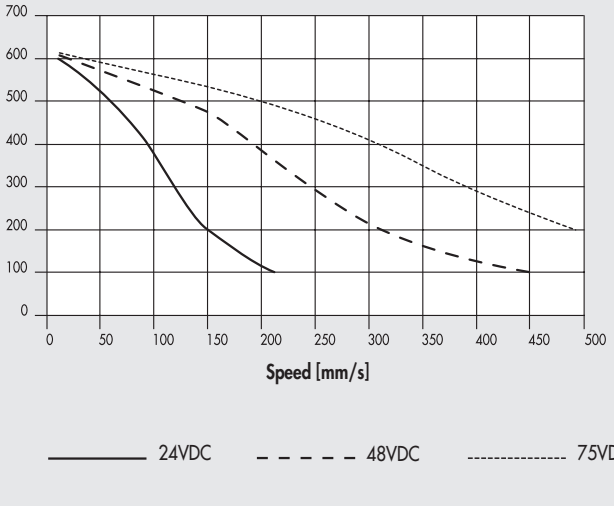
STEPPING motor code 37M5120000 (with brake)

Electric axis with a 4 mm-pitch screw



24VDC 48VDC 75VDC

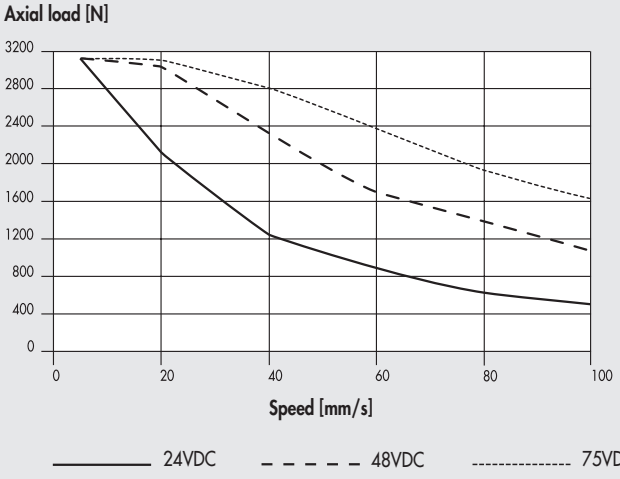
Electric axis with a 10 mm-pitch screw



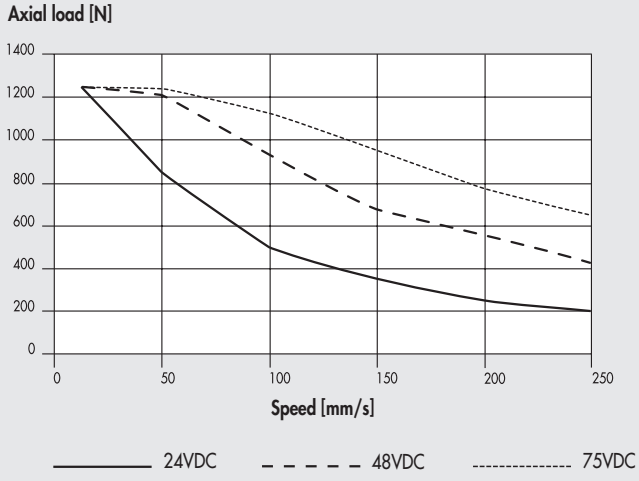
24VDC 48VDC 75VDC

STEPPING motor code 37M3230000 (with brake + encoder)

Electric axis with a 4 mm-pitch screw

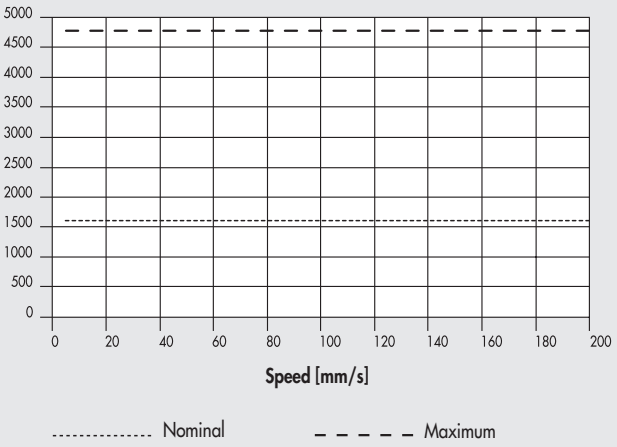


Electric axis with a 10 mm-pitch screw

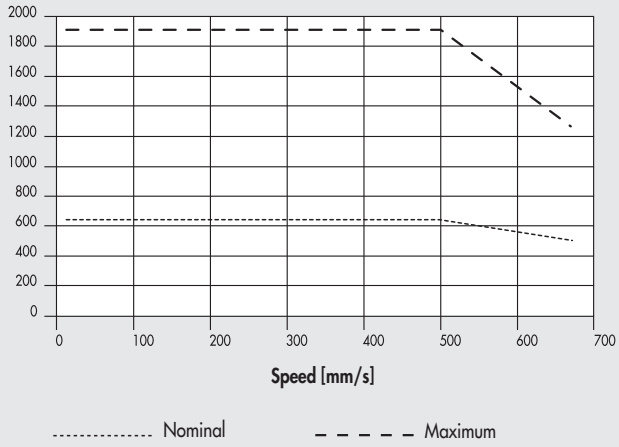


BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

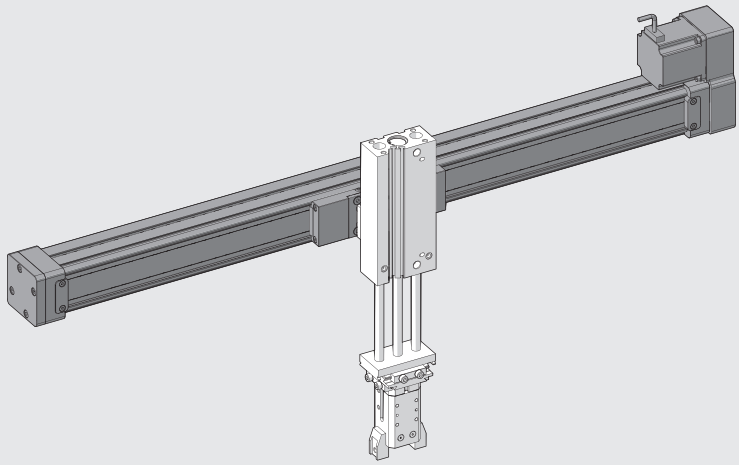
Electric axis with a 4 mm-pitch screw



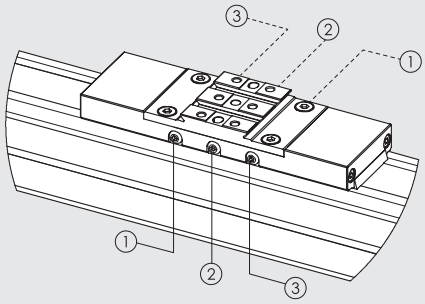
Electric axis with a 10 mm-pitch screw



EXAMPLES OF APPLICATION



LUBRICATION DIAGRAM



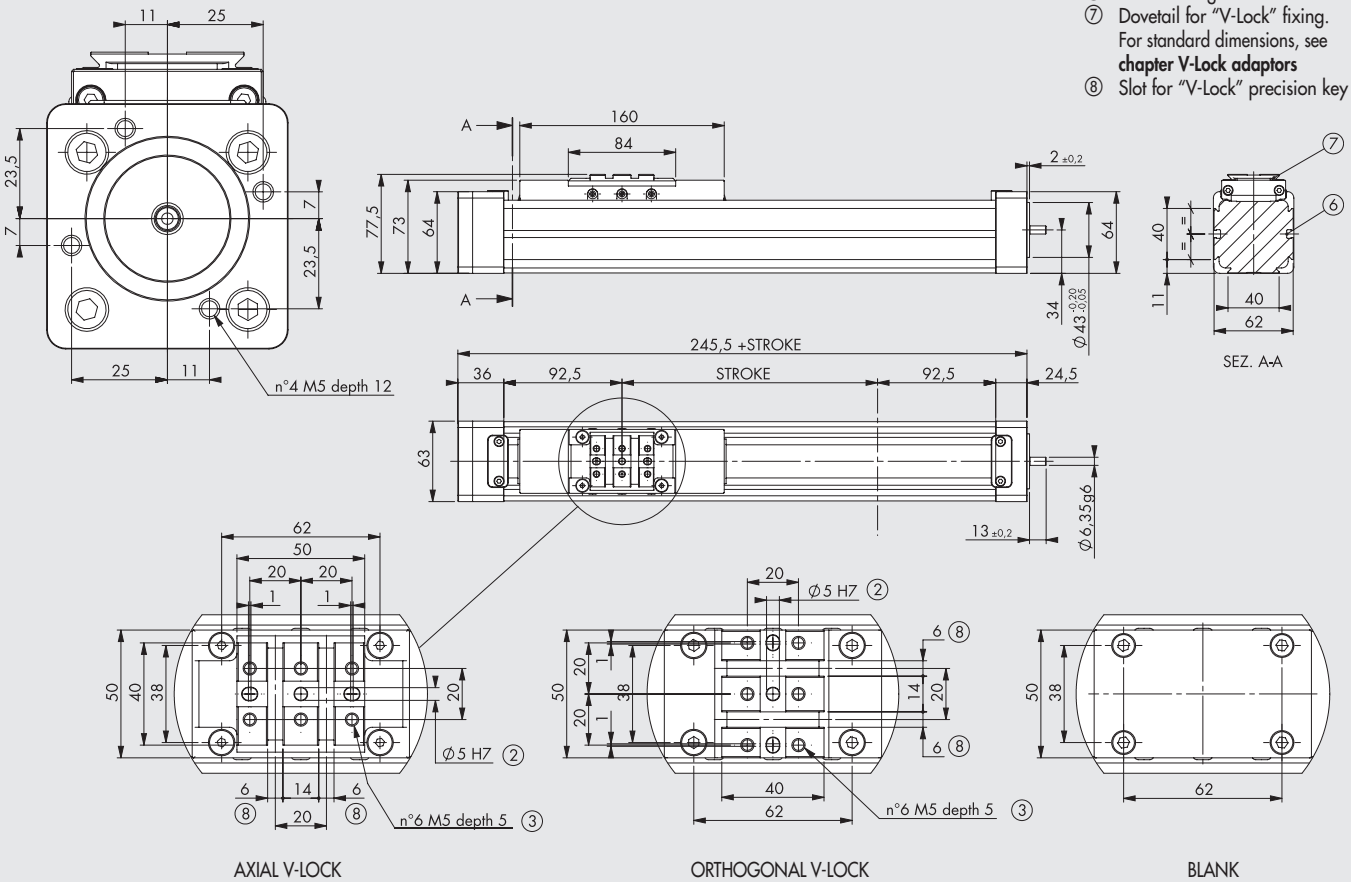
		① - ③	②	
Screw pitch (p)	mm	-	4	10
Relube grease quantity	g	0.7	0.3	0.5
	cc	0.61	0.26	0.43

The actuator is provided with a series of sealing passages - made in the carriage - which directly connect the lubrication points of the sliding blocks and of the ball bearing screw nut with the outside.
The lubrication points are 3, on both sides of the carriage, in order to ensure greater accessibility in case of maintenance, closed by M4 screws, so identified:
① Lubrication point for the left ball bearing sliding block.
② Lubrication point for the ball bearing screw nut.
③ Lubrication point for the right ball bearing sliding block.
It is recommended to use the provided accessory (code 0950T2R108), which has spherical head according to UNI 7663 A and RHEOLUBE 363 AX1 grease (code 9910506).

Once you identify the most accessible side on the carriage:
- Unscrew the screw that closes the grease nipple.
- Screw, in the same thread, the provided accessory (0950T2R108).
- Pump grease (code 9910506) using the suitable lubricator according to the quantity in table.
- Let the actuator effect 4 complete strokes.
- Repeat the last two operations.
- Remove the grease nipple and stop the thread.
- Switch to the next lubrication point.
- The operation of re-greasing will have to be repeated at least once a year.

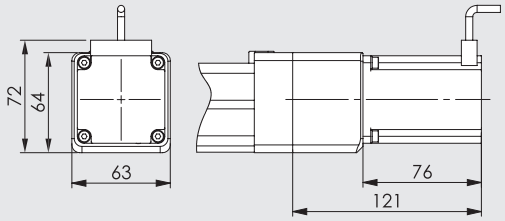
DIMENSIONS ELECTRIC AXIS (WITHOUT MOTOR)

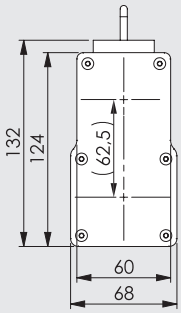
② Holes for centring pins
③ Threaded holes for fixing
⑥ Sensor fixing slots
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

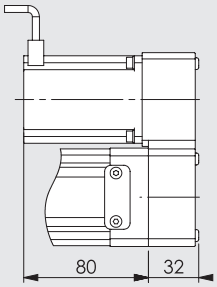


ELECTRIC AXIS DIMENSIONS WITH STEPPING MOTOR

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.

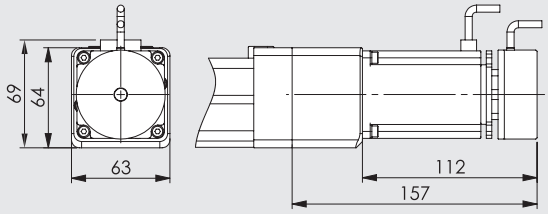


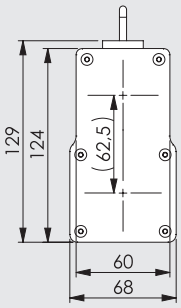


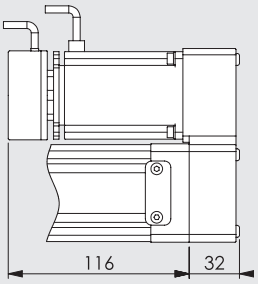


Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _21121	37M1120001

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

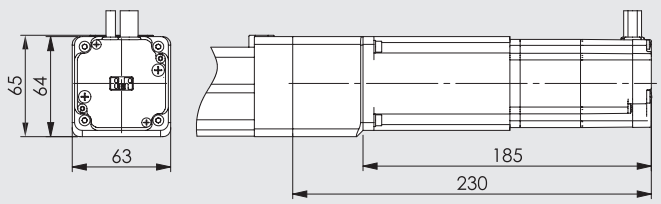


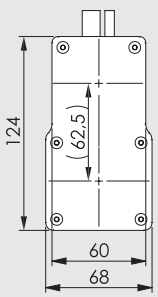


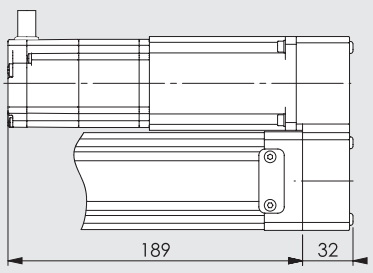


Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _25120	37M5120000

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





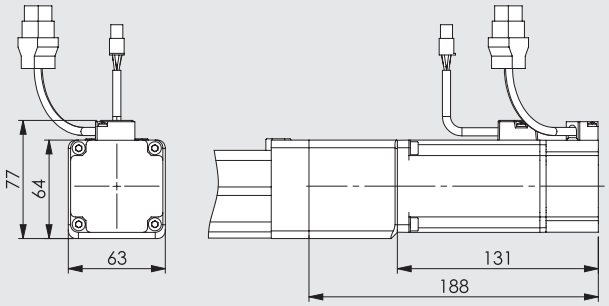


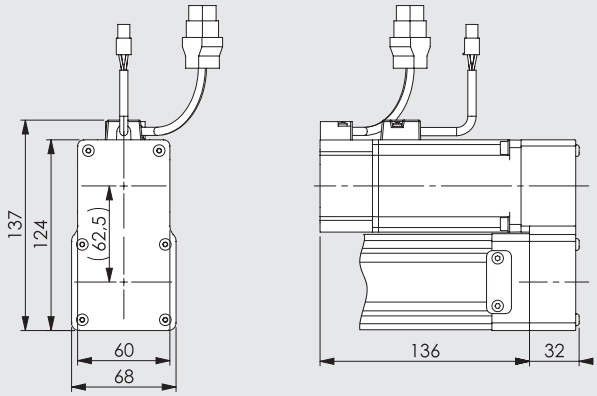
Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _23230	37M3230000

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

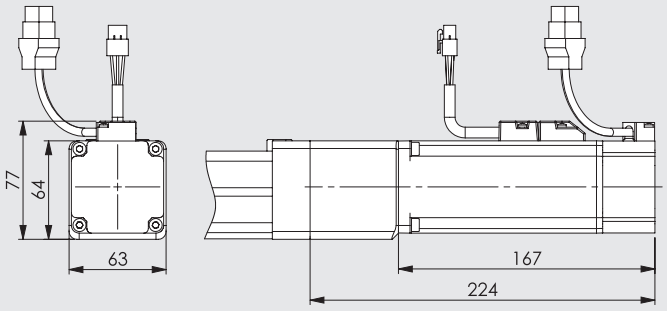
Overall dimensions referring to versions with standard drive.
The geared motor versions represent right-hand positioning, the overall dimensions apply to left-hand positioning as well.

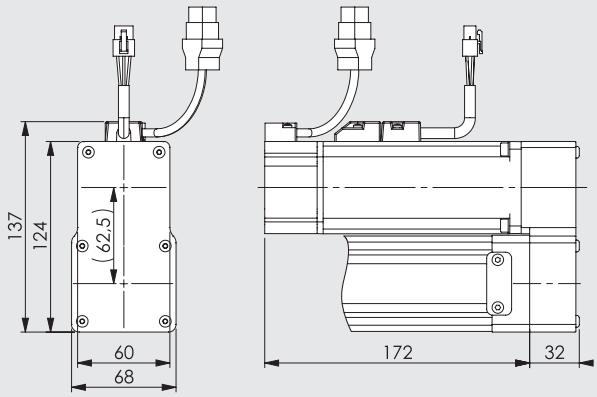




Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _22220	37M2220001

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

METAL WORK PNEUMATIC

MOTOR-DRIVE COUPLINGS

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

✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
◆ Important! Limit current
■ Important! Limit current and voltage
● Important! AC drive to continuous voltage VDC VDC = VAC · $\sqrt{2}$

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

KEY TO CODES AXIS ELECTRIC (WITHOUT MOTOR)

CYL	37	3	0	2	1	0300	1
	TYPE			SIZE	CARRIAGE TYPE	STROKE	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

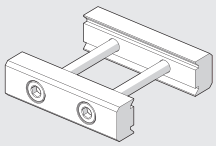
KEY TO CODES AXIS ELECTRIC MOTOR

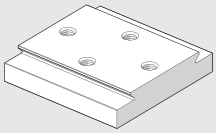
CYL	37	3	0	2	1	0300	1	2	DRIVE 1	DRIVE 1	DRIVE 2	DRIVE 0
	TYPE			SIZE	CARRIAGE TYPE	STROKE	SCREW PITCH	VERSION	MOTOR	FLANGE	TORQUE	
	37 Electric actuators	**3** Electric axis rodless elektro SK	**0** STD	**2** Size 2	**1** Axial V-lock **2** Orthogonal V-lock **3** Blank	From 100 to 1200 mm	**1** Pitch 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.
N.B.: The Orderable configurations are shown on the previous pages.

ACCESSORIES

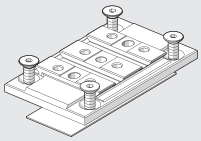
FIXING ELEMENTS





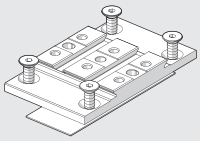
See V-Lock family.

CARRIAGE INTERFACE KIT



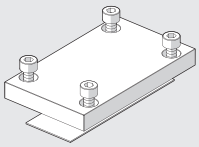
Code	Description	Weight [g]
0950T2R016K	V-Lock axial interface kit	95

Note: supplied complete with 4 screws, 1 adhesive pad



Code	Description	Weight [g]
0950T2R017K	V-Lock orthogonal interface kit	91

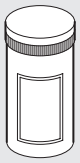
Note: supplied complete with 4 screws, 1 adhesive pad



Code	Description	Weight [g]
0950T2R015	BLANK interface kit	127

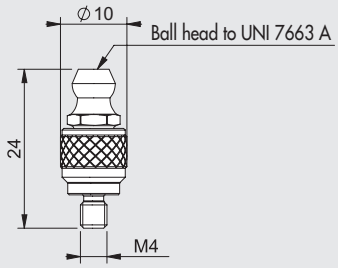
Note: supplied complete with 4 screws, 1 adhesive pad

GREASE



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

GREASE NIPPLE

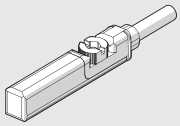


Code	Description
0950T2R108	Complete grease nipple for Elektro rodless SK cylinders

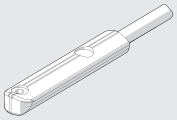
Note: Individually packed

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

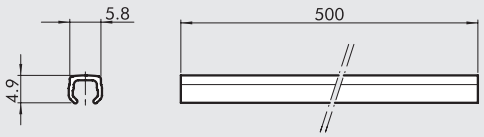


SENSOR, OVAL TYPE
Traditional



For codes and technical data, see **chapter A6**.

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.

DRIVES

For motor-drive couplings see table on page **A5**.133

SPARE PARTS

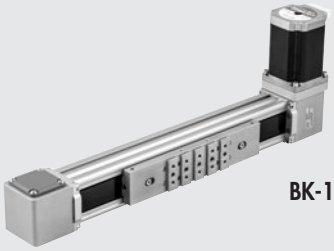
ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.133

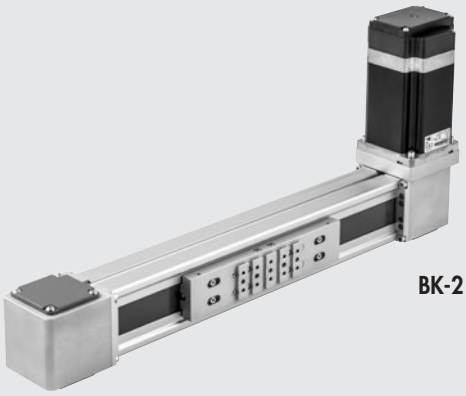
NOTES

ELECTRIC AXIS BELT-DRIVEN RODLESS, SERIES ELEKTRO BK

Electric belt-drive rodless axis with a bearing structure made up of anodized extruded aluminium.
The typical V-Lock dovetail is fitted to the extruded side (opposite the slide), which facilitates the fixing using QS elements; at both sides there are grooves for the installation of the bracket fixing the proximity switch (optional), which detects the position of the slide.
The slide is moved by the polyurethane toothed belt with steel cables.
The parabolic profile of the belt tooth makes it possible to maintain a high efficiency level, contain the level of noise and vibration from transmission gears.
The axis is available in two sizes, BK-1 and BK-2.
The slide interface is characterised by the V-Lock profile complete with M5 threaded holes, pinholes and key seats, which guarantees numerous fixing options (not present in the BK-2 heavy XL version).
All the versions have in-line steel guides that are housed in an extruded structure. The BK-1 size is available in two variants: the "Medium" uses castors running along hardened and tempered guides with double-row ball bearings, and the more performing "Heavy" version consists of a guiding system with a rail and ball recirculation pads.
The BK-2 size is available in two variants, both with rail and ball recirculation pads, the "Heavy" type has two pads and the "Heavy XL" has a longer slide and four pads. In the BK-2 size, the belt has a special profile that, when coupled with the extruded profile, prevents any dirt or foreign bodies from entering inside. BRUSHLESS and STEPPING motors are available, with optional motor brake and/or built-in encoder.
The versions with a BRUSHLESS motor can be equipped with a toothed belt speed reducer or a planetary gearbox.



BK-1



BK-2

The electric axis can be ordered without drive or, on request, with modules for interfacing with motors available from the trade.
The motors can be installed on all the four hubs of the heads, and their position can be changed at any time, without requiring any additional operation.
Various accessory kits for the installation of a gantry system starting from one axis are also available.

TECHNICAL DATA		BK-1		BK-2	
		Medium	Heavy	Heavy	Heavy XL
Admissible ambient temperature STEPPING motor	°C	from -10 to +50			
BRUSHLESS motor	°C	from 0 to +40			
Maximum relative humidity		90% at 40°C; 57% at 50°C (no condensate)			
Maximum duty cycle for STEPPING motor		50%			
BRUSHLESS motor		100%			
Minimum stroke	mm	110		140	
Maximum stroke	mm	3800	2800 ◆	3800	3600
Repeatability	mm	± 0.05			
Positioning accuracy ●	mm	± 0.4			
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)			
Homing position sensor		Inductive sensors			
Work position		Any			
Noise level	dBA	<66			
Type belt		RPP5 in polyurethane with steel tensioning cables		HTD5 in polyurethane with steel tensioning cables	
Maximum belt extension		0.1%			
Pulley feed/revolution	mm	110		140	
Pulley pitch diameter	mm	35.01		44.56	
Maximum axial force ■	N	800		1250	
Maximum number of revs	1/min	3500	3500 (2500 ✱)	1500	
Maximum speed (without load)	m/s	6	6 (4 ✱)	3.5	
Maximum acceleration (without load)	m/s^2	50		50	
Maximum driving torque applicable to the pulley	Nm	15		32	
Maximum applicable motor shaft diameter ▲	mm	14		19	

● Indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc.
■ Maximum load admissible on the belt: for the sizing, perform the checks as shown in the following pages.
▲ Compact configuration with the motor shaft partially inserted into the pulley axle.
◆ A different version of guide and recirculating pads are required for travels over 1800 mm, with reduced speed.
✱ Values referring to travels >1800

WEIGHTS		BK-1		BK-2	
		Medium	Heavy	Heavy	Heavy XL
Weight at stroke 0 (drive excluded)	g	2324	2325	5356	8628
Additional weight each mm of stroke	g	4	3.7	7.6	
Weight of standard motors with flange, joint and bolts and nuts	g				
STEPPING		1560		4632	
STEPPING with encoder		-		4732	
STEPPING with encoder + brake		-		5332	
BRUSHLESS		1750		3356	
BRUSHLESS with brake		2150		4156	
BRUSHLESS with belt transmission gear ratio1:2		2330		4455	
BRUSHLESS with brake + belt transmission gear ratio 1:2		2730		5255	
BRUSHLESS with 1:3 gearbox		2600		7980	
BRUSHLESS with brake + 1:3 gearbox		3000		8780	
BRUSHLESS with 1:5 gearbox		2600		7980	
BRUSHLESS with brake + 1:5 gearbox		3000		8780	

MASS AND MOMENT OF INERTIA		BK-1		BK-2	
		Medium	Heavy	Heavy	Heavy XL
Moving mass at stroke 0 (Mx)	g	570	625	1125	3038
Moving mass for each mm of stroke	g	0.22		0.33	
J_0 at stroke 0	kg mm^2	72		411	
J_1 each metre of stroke	kgmm^2/m	68		164	
J_2 each kg of load	kgmm^2/kg	307		497	
$J_{belt\ transmission\ 1:2}$	kg mm^2	32		130	

The reduced moment of inertia of total mass at the driving shaft is: $J_{tot} = [J_1 \cdot \text{Stroke [m]} + J_2 \cdot (\text{Load [kg]} + \text{Mx [kg]}) + J_0] \cdot \tau^2 + J_3$

$\tau = 1/u$

u = Gearing ratio

$J_3 = J_{belt\ transmission}$ (to be used, if present)

$J3 = J_{gear\ ratio}$ (to be used, if present)

In order to ensure the proper functioning of the system and avoid instability, it is necessary to limit the ratio K between the reduced moment of inertia at the motor shaft $\mathbf{J_{total}}$ and the moment of inertia at the motor $\mathbf{J_{motor}}$.

$$K = \frac{J_{total}}{J_{motor}}$$

1<K<15 with STEPPING motors

1<K<40 with BRUSHLESS motors

These figures apply to motors supplied by Metal Work. Motors of other makes could require different maximum values.
This limit also depends on the level of control of the required movement: e.g. if the movements need to be coordinated, the ratio between the inertias must be considerably reduced.
Indicatively, it is **advisable NOT to exceed** the following values:

1<K<5 with STEPPING motors

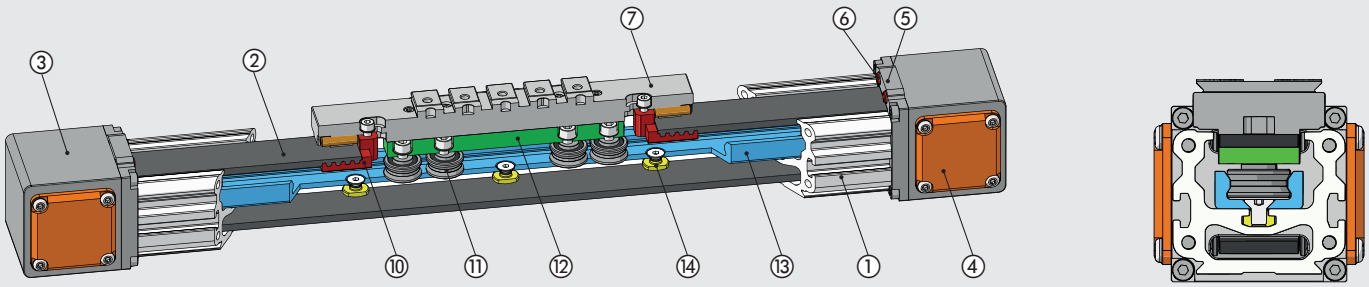
1<K<10 with BRUSHLESS motors

It is worth noting that system operation can be enhanced by varying the drive parameters.
For BRUSHLESS motors supplied by Metal Work, a "tuning" procedure is envisaged to optimise motor operation depending on the mechanics applied to the axle. For STEPPING motors, it is advisable to try to select a different step of rotation.

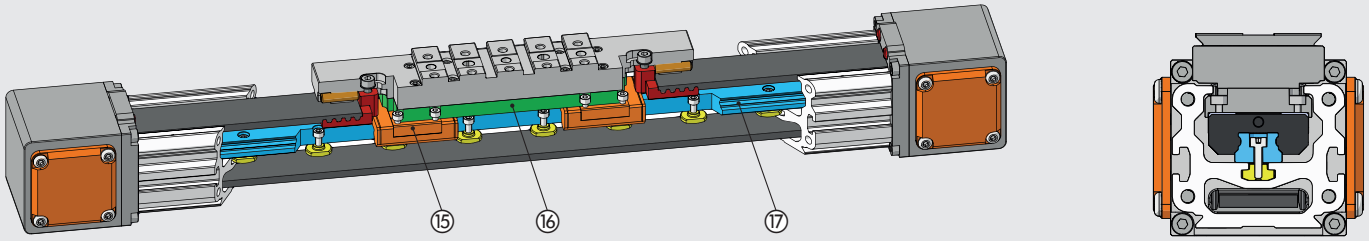
NOTES

COMPONENTS BK-1

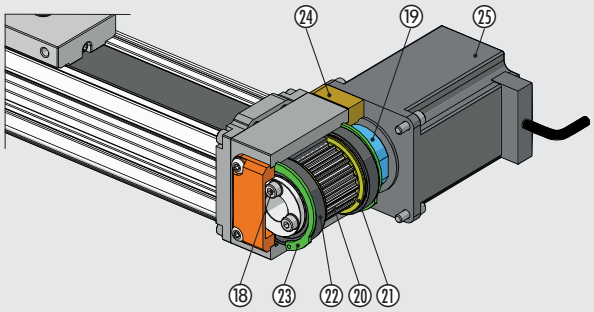
Medium (GUIDE AND STEEL WHEELS)



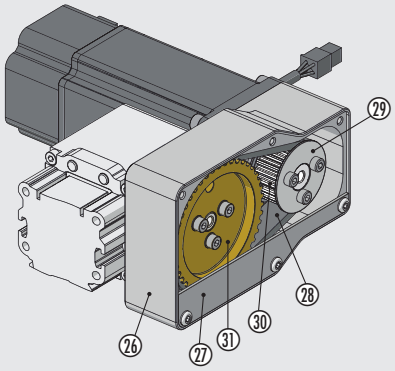
Heavy (STEEL GUIDE AND PADS BALL-RECIRCULATION)



VERSION WITH MOTOR



VERSION WITH 1:2 BELT GEARED MOTOR

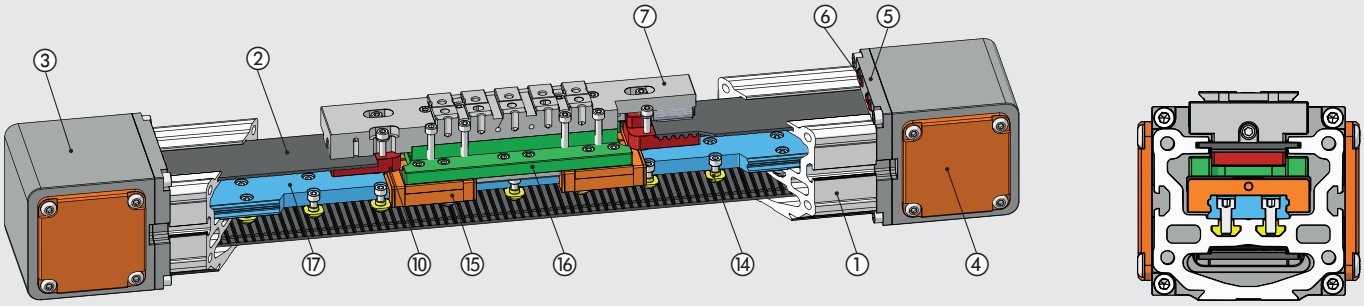


① BARREL: anodized aluminium
② TOOTHED BELT: polyurethane with steel cables
③ HEAD: anodized aluminium
④ COVER: painted aluminium
⑤ HEAD SUPPORT: anodized aluminium
⑥ BUFFER: polyurethane
⑦ SLIDE WITH V-LOCK INTERFACE: anodized aluminium
⑩ BELT-LOCKING PLATE: anodized aluminium
⑪ WHEEL WITH DOUBLE-ROW BALL BEARING: hardened steel
⑫ SLIDING BEARING SUPPORT: anodized aluminium
⑬ GUIDING RAIL FOR STEEL WHEELS: hardened steel
⑭ GUIDE-LOCKING INSERT: stainless steel
⑮ BALL RECIRCULATION PAD: stainless steel / technopolymer
⑯ PAD SUPPORT: anodized aluminium
⑰ GUIDING RAIL FOR PADS: hardened stainless steel
⑱ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
⑲ ELASTIC COLLAR: anodized aluminium
⑳ COG PULLEY: nickel-plated aluminium
㉑ BELT FLANGES: zinc-plated steel
㉒ SHIELDED BALL BEARING: hardened steel
㉓ BEARING-LOCKING SNAP RING: zinc-plated steel
㉔ MOTOR-FIXING FLANGE: anodized aluminium
㉕ MOTOR
㉖ GEARED MOTOR BEARING: anodized aluminium
㉗ TRANSMISSION GUARD: anodized aluminium
㉘ TOOTHED BELT: polychloroprene with glass fiber cables
㉙ BELT FLANGES: anodized aluminium
㉚ DRIVE PULLEY: nickel-plated aluminium
㉛ IDLE PULLEY: nickel-plated aluminium

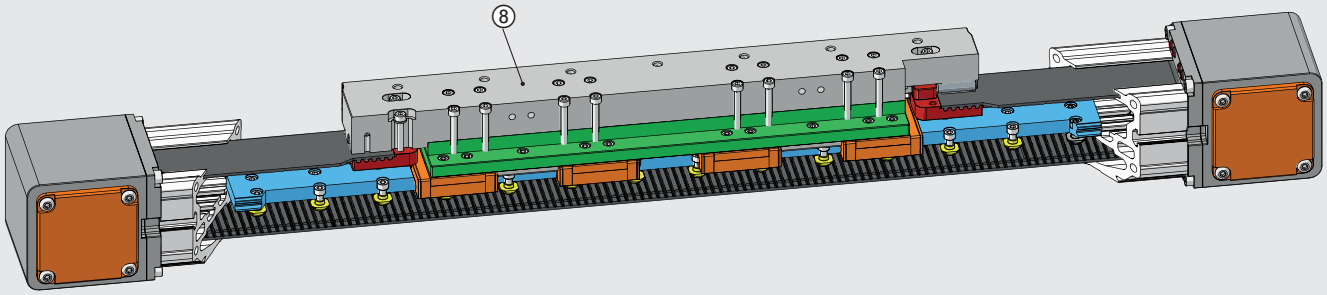
METAL WORK PNEUMATIC

COMPONENTS BK-2

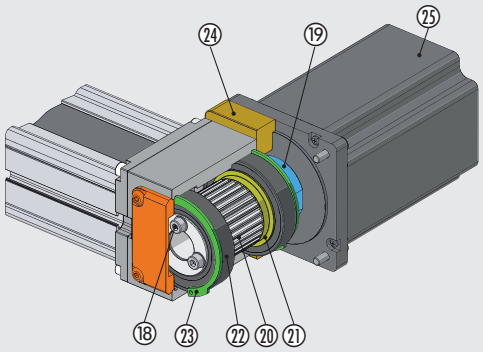
Heavy (STEEL GUIDE AND 2 PADS BALL-RECIRCULATION)



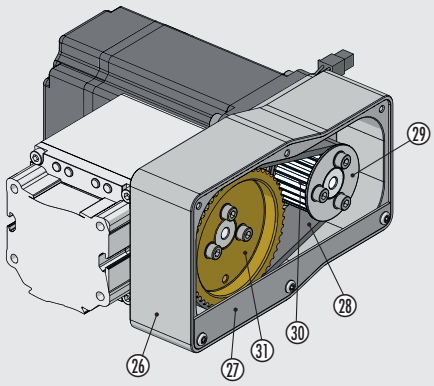
Heavy XL (LONG SLIDE, STEEL GUIDE AND 4 BALL RECIRCULATION PADS)



VERSION WITH MOTOR

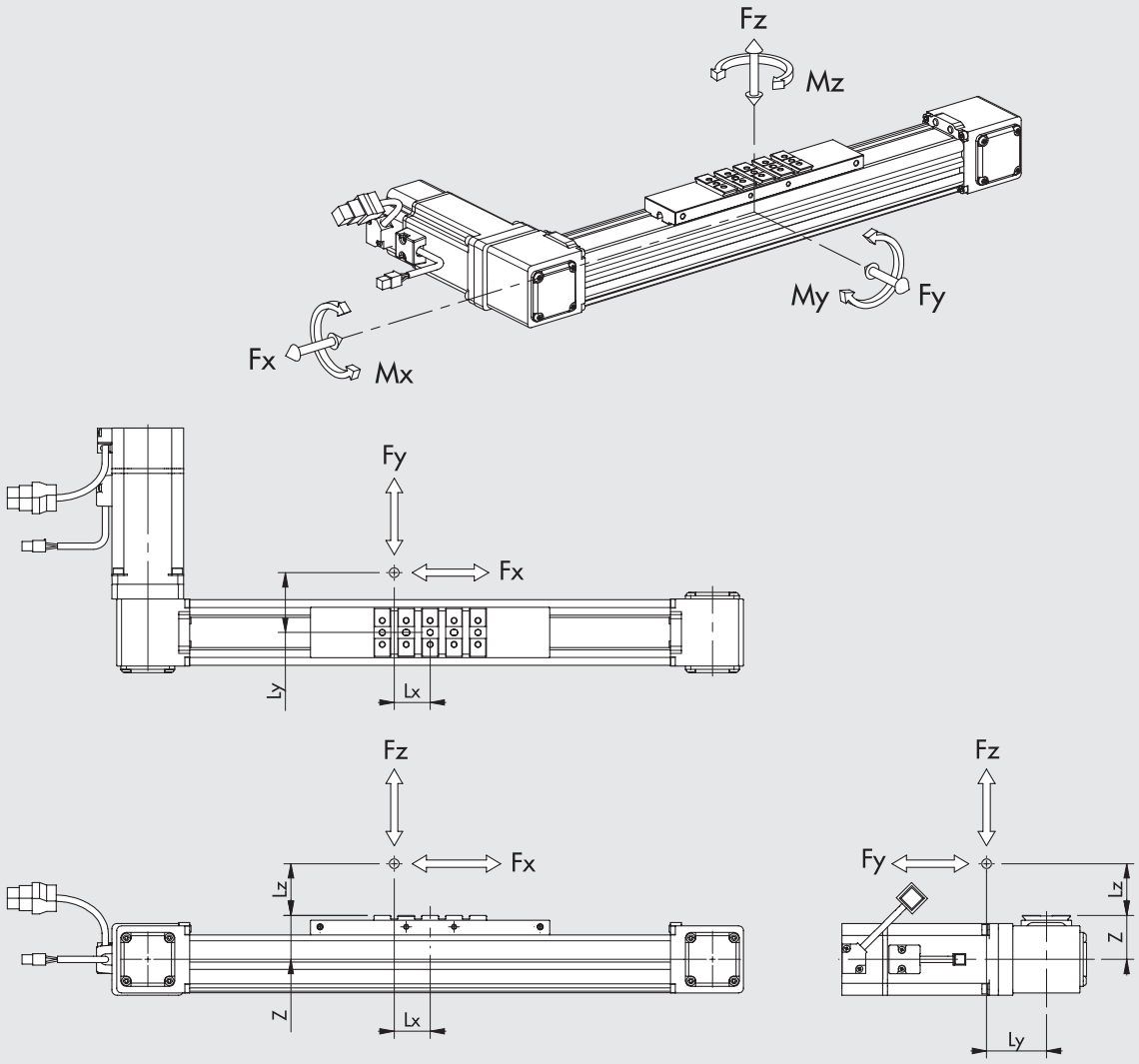


VERSION WITH 1:2 BELT GEARED MOTOR



① BARREL: anodized aluminium
② TOOTHED BELT: polyurethane with steel cables
③ HEAD: anodized aluminium
④ COVER: painted aluminium
⑤ HEAD SUPPORT: anodized aluminium
⑥ BUFFER: polyurethane
⑦ SLIDE WITH V-LOCK INTERFACE: anodized aluminium
⑧ LONG SLIDE WITH THREADED HOLES: anodized aluminium
⑩ BELT-LOCKING PLATE: anodized aluminium
⑭ GUIDE-LOCKING INSERT: stainless steel
⑮ BALL RECIRCULATION PAD: stainless steel / technopolymer
⑯ PAD SUPPORT: anodized aluminium
⑰ GUIDING RAIL FOR PADS: hardened stainless steel
⑱ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
⑲ ELASTIC COLLAR: anodized aluminium
⑳ COG PULLEY: nickel-plated aluminium
㉑ BELT FLANGES: zinc-plated steel
㉒ SHIELDED BALL BEARING: hardened steel
㉓ BEARING-LOCKING SNAP RING: zinc-plated steel
㉔ MOTOR-FIXING FLANGE: anodized aluminium
㉕ MOTOR
㉖ GEARED MOTOR BEARING: anodized aluminium
㉗ TRANSMISSION GUARD: anodized aluminium
㉘ TOOTHED BELT: polychloroprene with glass fiber cables
㉙ BELT FLANGES: anodized aluminium
㉚ DRIVE PULLEY: nickel-plated aluminium
㉛ IDLE PULLEY: nickel-plated 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.

SIZE	VERSION	Z [mm]	Fy0 max [N]	Fz0 max [N]	Mx0 max [Nm]	My0 max [Nm]	Mz0 max [Nm]
BK-1	Medium	33	1600	900	18	60	140
	Heavy	35	5700	5700	40	570	570
BK-2	Heavy	45	9600	9600	150	970	970
	Heavy XL	45	19200	19200	300	3400	3400

N.B.: The table shows the maximum loads applicable to the guide system beyond which serious damage could be caused.
Refer to the Deformation/Load charts on the following pages to verify the axles load conditions.

$Mx = Fz \cdot Ly + Fy \cdot (Lz + z)$ $My = Fz \cdot Lx + Fx \cdot (Lz + z)$ $Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx0\ max} + \frac{(My)}{My0\ max} + \frac{(Mz)}{Mz0\ max} + \frac{(Fy)}{Fy0\ max} + \frac{(Fz)}{Fz0\ max} \leq 1$$

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.

SIZE	VERSION	Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
BK-1	Medium	33	1000	600	12	40	90
	Heavy	35	2850	2850	20	285	285
BK-2	Heavy	45	4800	4800	75	485	485
	Heavy XL	45	9600	9600	150	1700	1700

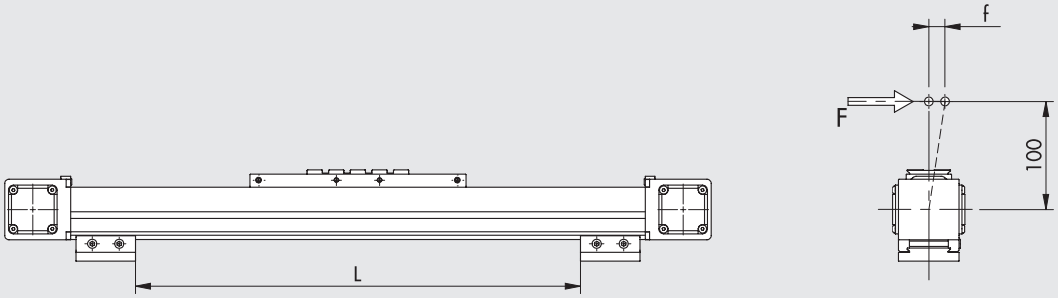
N.B.: The values in the table refer to the guide system and are calculated on the basis of a theoretical operating life of 10,000 km.

$Mx = Fz \cdot Ly + Fy \cdot (Lz + z)$ $My = Fz \cdot Lx + Fx \cdot (Lz + z)$ $Mz = Fy \cdot Lx + Fx \cdot Ly$

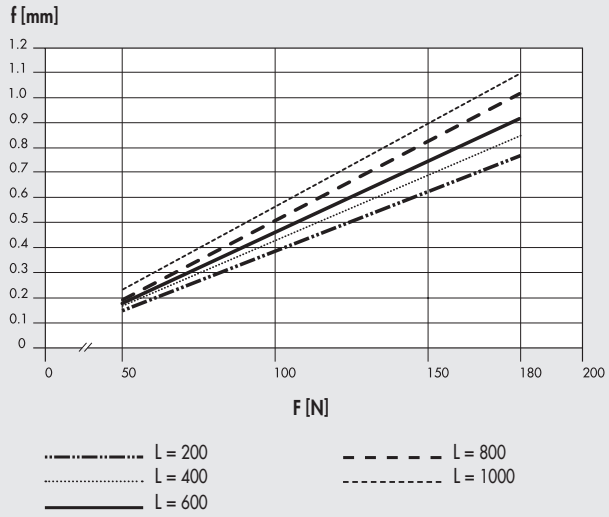
$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1$$

METAL WORK PNEUMATIC

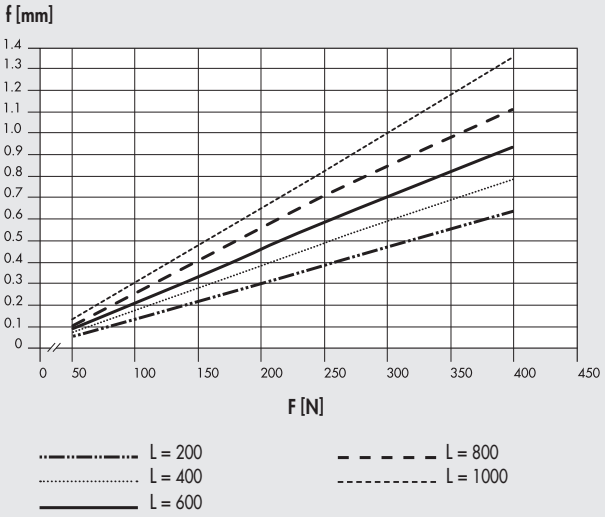
DEFORMATION ACCORDING TO LOAD WITH MISALIGNED LOAD



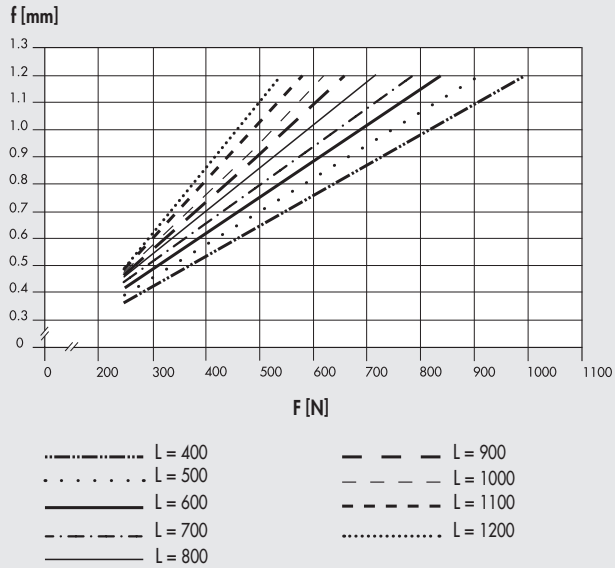
BK-1 Medium
(guide and steel wheels)



BK-1 Heavy
(steel guide and pads ball-recirculation)

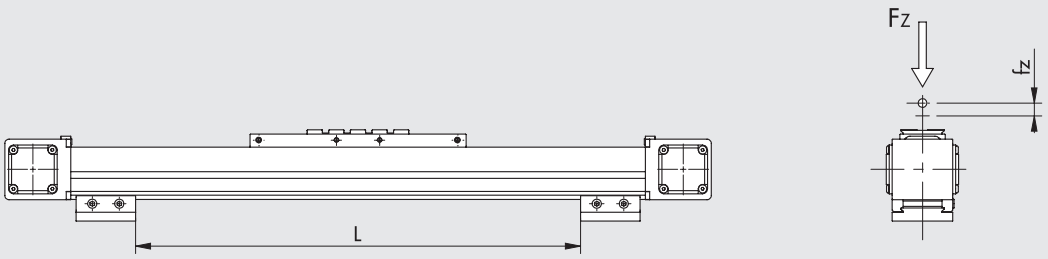


BK-2 Heavy and BK-2 Heavy XL

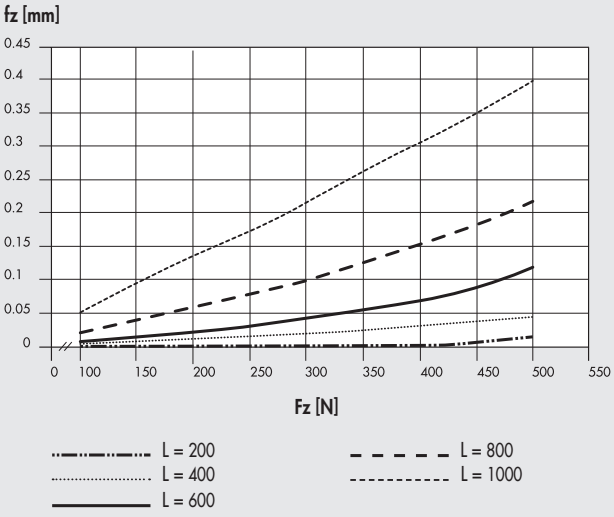


N.B.: The deformations shown in the graphs have been measured under static conditions.

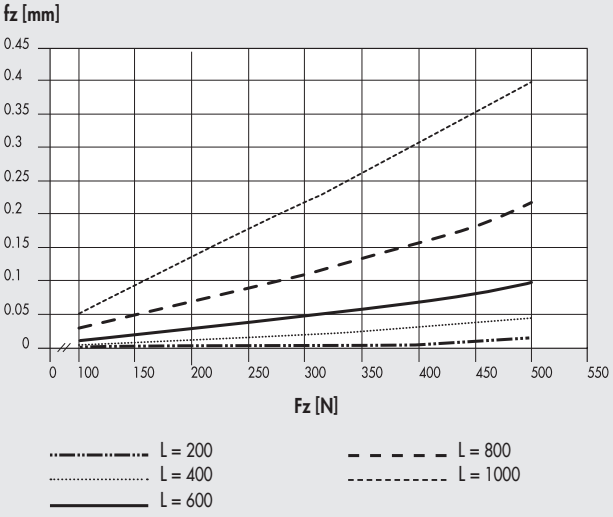
DEFORMATION ACCORDING TO LOAD WITH ALIGNED LOAD



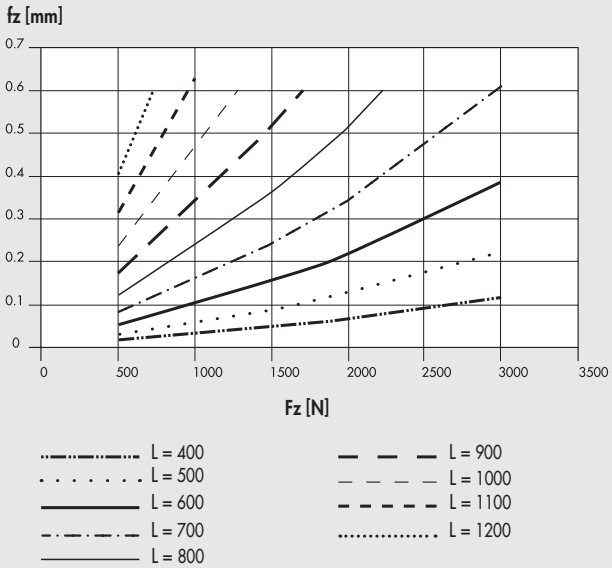
BK-1 Medium
(guide and steel wheels)



BK-1 Heavy
(steel guide and pads ball-recirculation)



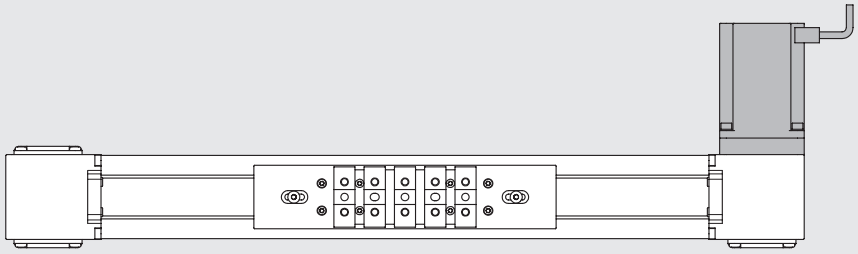
BK-2 Heavy and BK-2 Heavy XL



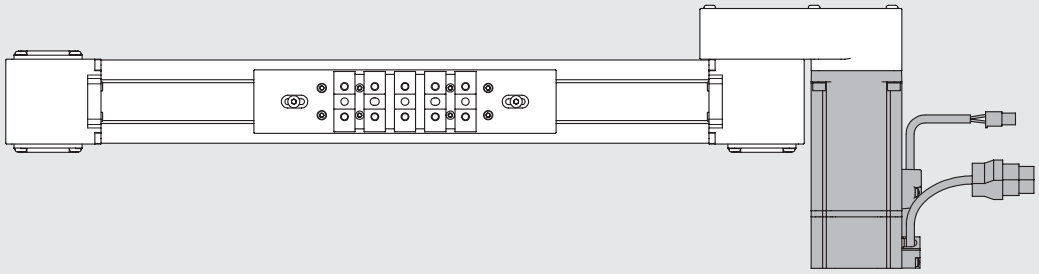
N.B.: The deformations shown in the graphs have been measured under static conditions.

METAL WORK PNEUMATIC

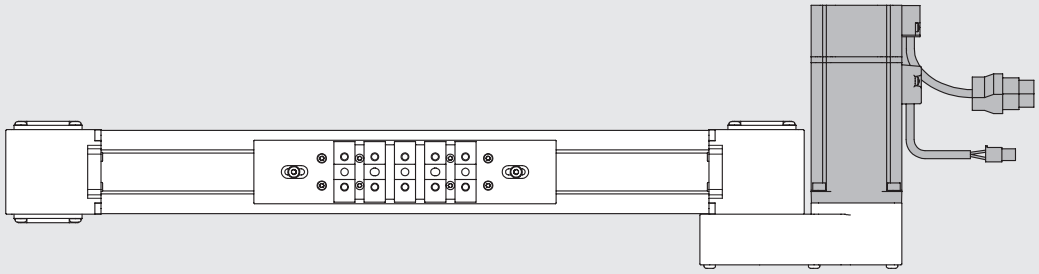
VERSIONS



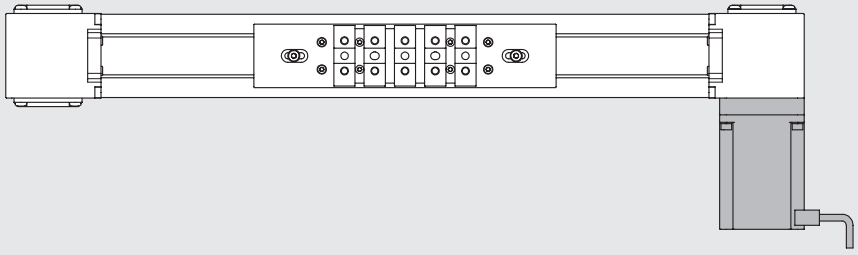
RIGHT MOTOR



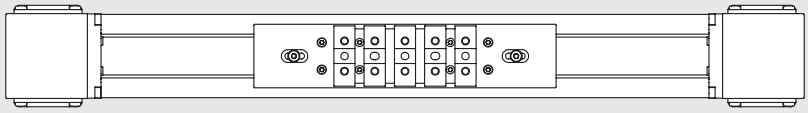
RIGHT GEARED MOTOR



LEFT GEARED MOTOR



LEFT MOTOR



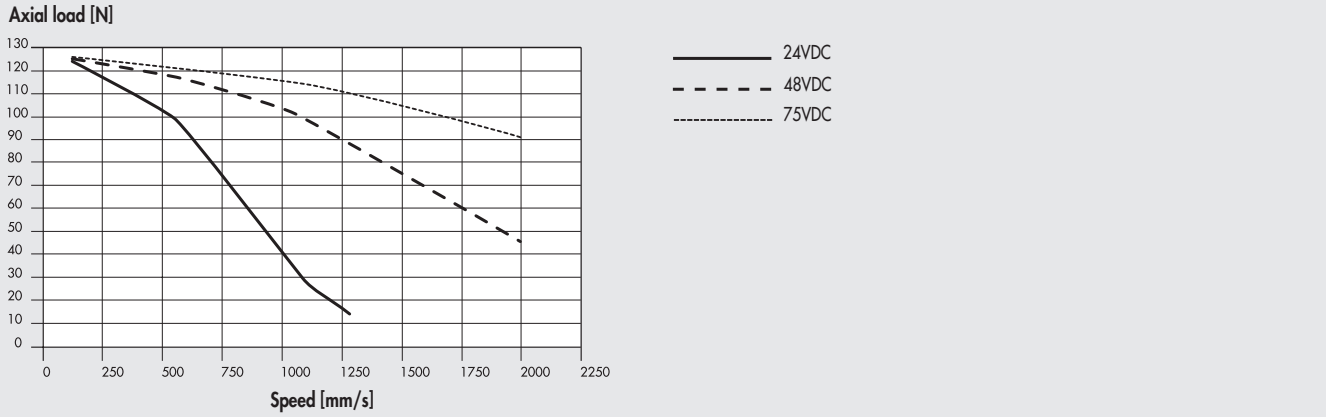
WITHOUT MOTOR

AXIAL LOAD CURVES AS A FUNCTION OF SPEED (AXIS COMPELTE WITH MOTOR AND DRIVE) BK-1

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 maximum axial load of the belt.

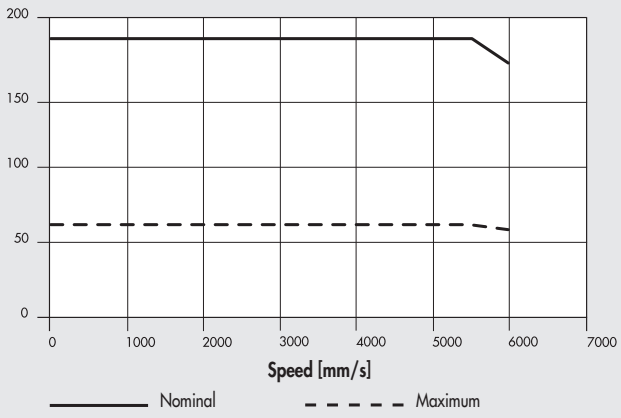
N.B.: The obtainable load values already take the efficiency of the system into account.
For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating.
Consequently, available axial load with the motor stopped is also reduced by 50%.

STEPPING motor code 37M1230000

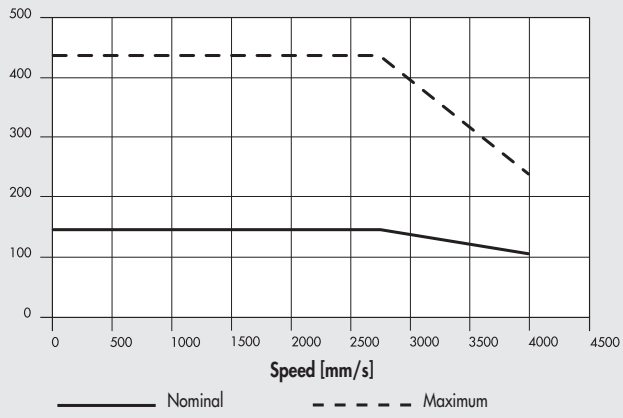


BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

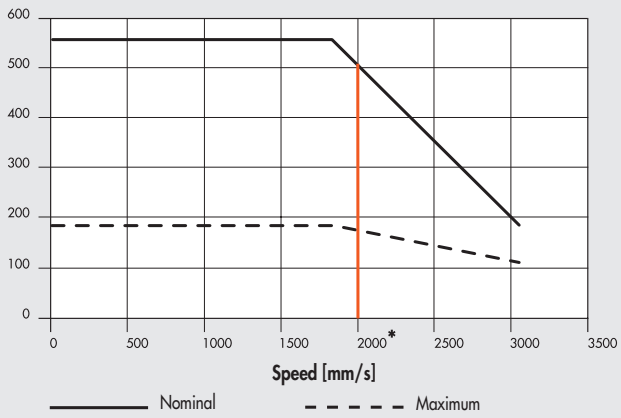
Direct type



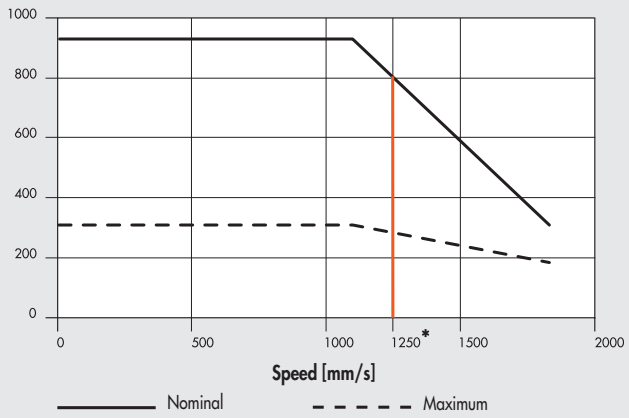
Belt reduction gear 1:2



With 1:3 gearbox



With 1:5 gearbox



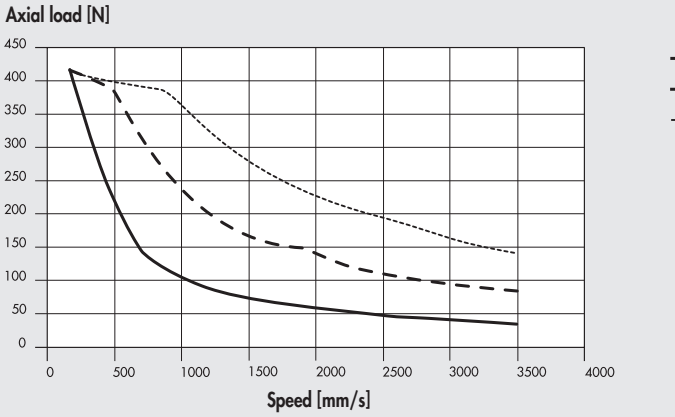
* = limit of gearbox continuous operation: higher speeds can be reached only for "duty cycle" ≤60% and for a maximum number of 1000 accelerations per hour.

AXIAL LOAD CURVES AS A FUNCTION OF SPEED (AXIS COMPELTE WITH MOTOR AND DRIVE) BK-2 / BK-2 XL

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 maximum axial load of the belt.

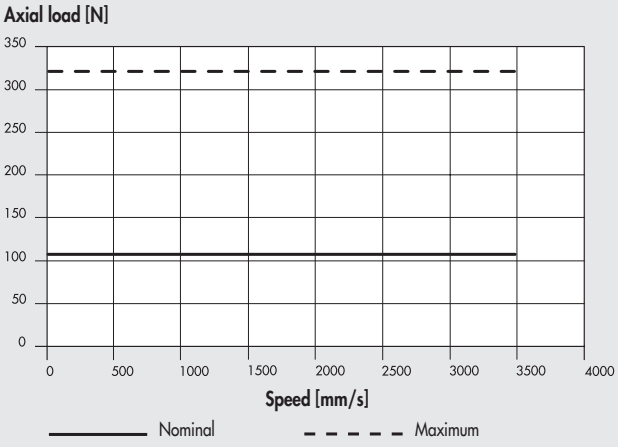
N.B.: The obtainable load values already take the efficiency of the system into account.
For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating.
Consequently, available axial load with the motor stopped is also reduced by 50%.

STEPPING motor code 37M1470000, code 37M8470000 (with encoder) e cod. 37M3470000 (with encoder and brake)

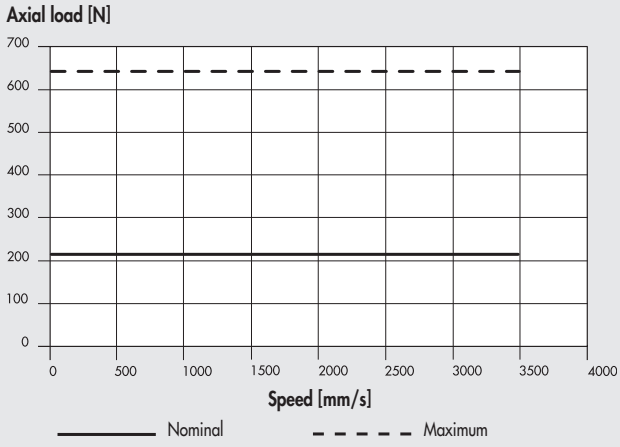


BRUSHLESS motors code 37M2330001 and code37M4330001 (with brake)

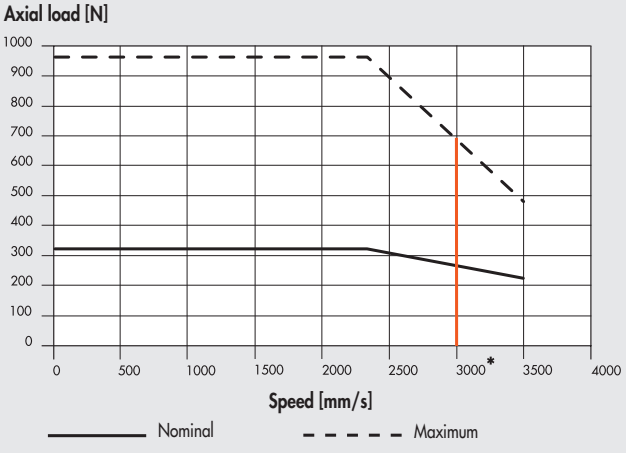
Direct type



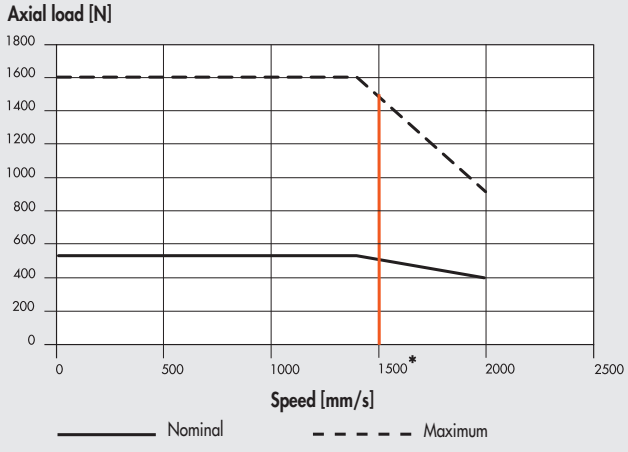
Belt reduction gear 1:2



With 1:3 gearbox

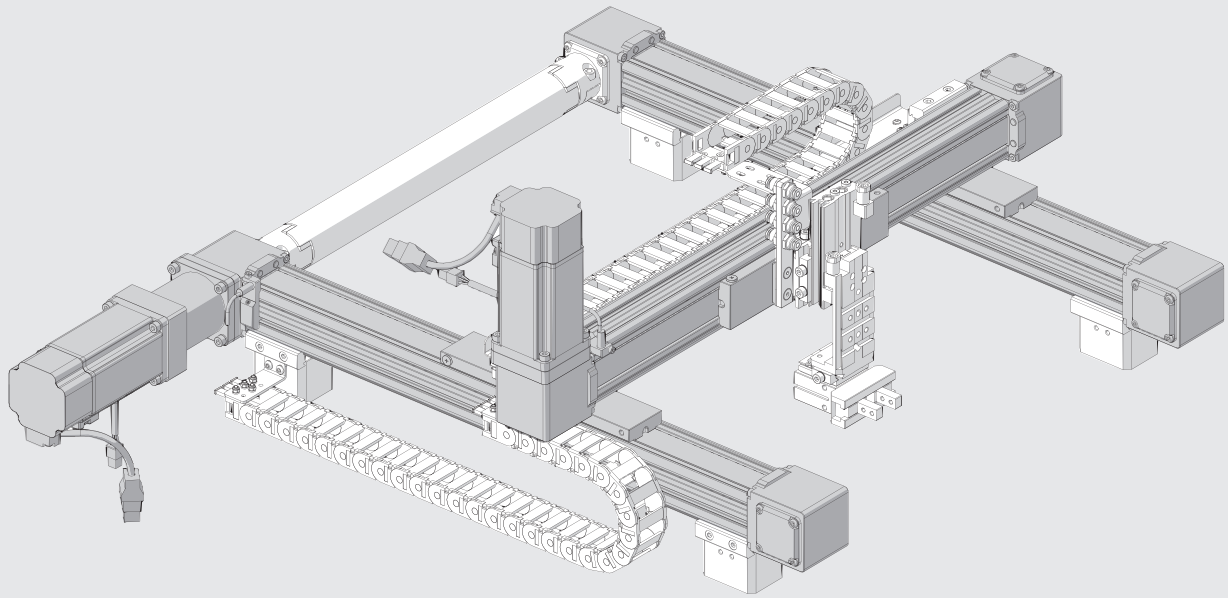


With 1:5 gearbox



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

EXAMPLES OF APPLICATION



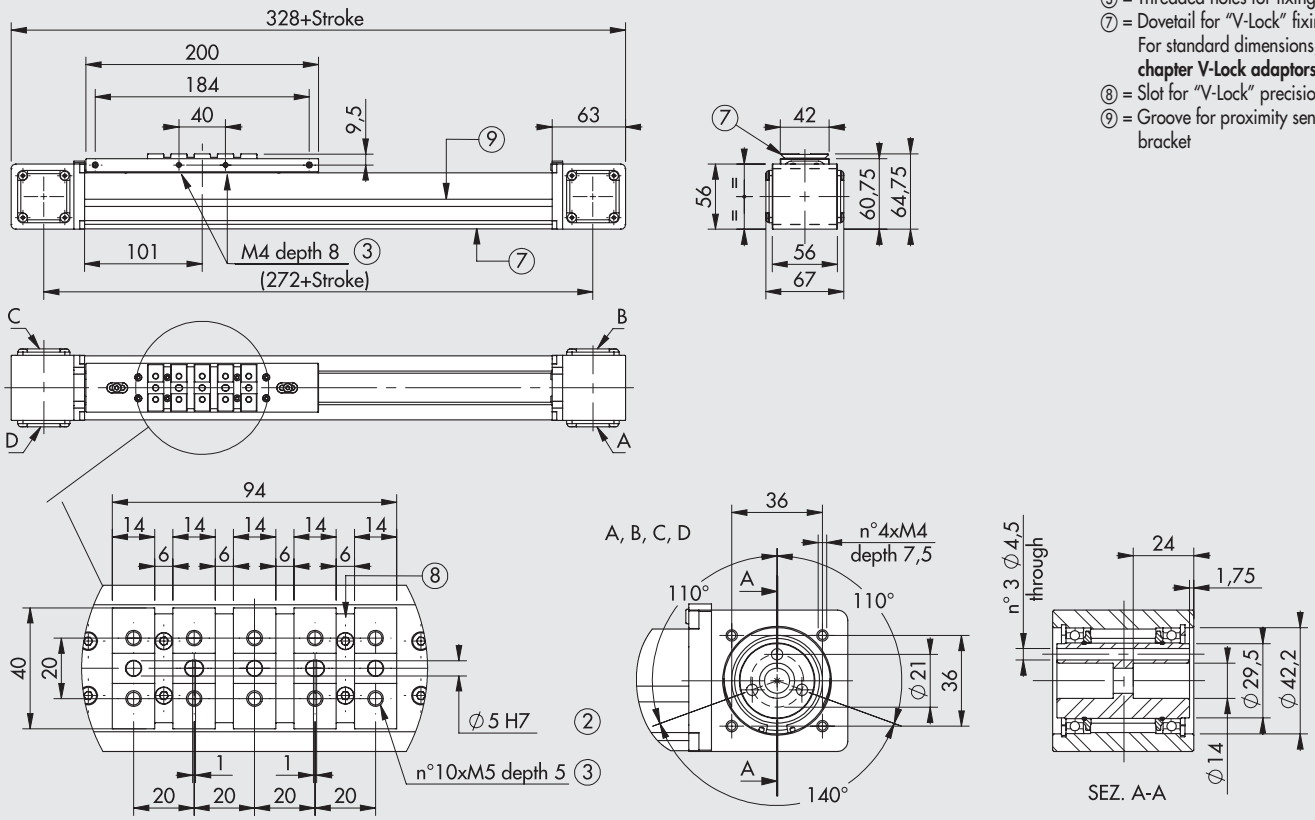
NOTES

METAL WORK PNEUMATIC

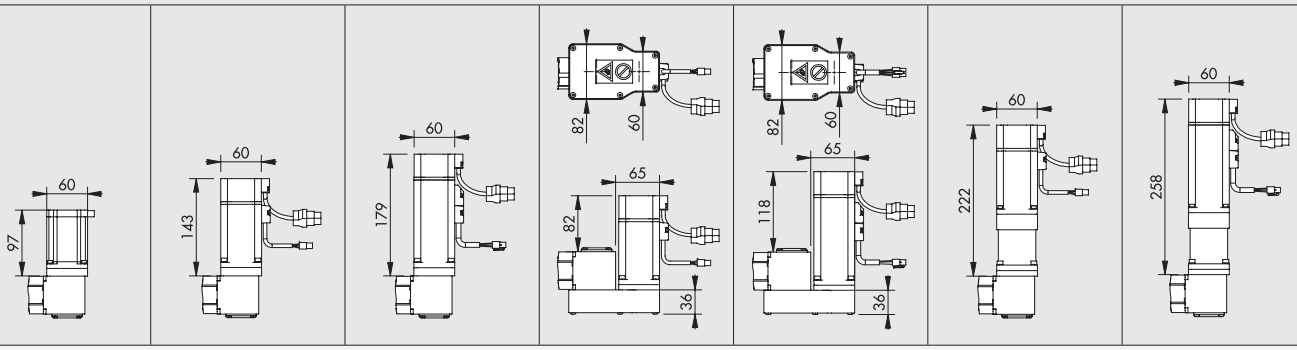
DIMENSIONS BK-1

Medium and Heavy VERSION WITHOUT MOTOR

② = Holes for centring pins
③ = Threaded holes for fixing
⑦ = Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**..
⑧ = Slot for "V-Lock" precision key
⑨ = Groove for proximity sensor bracket



Medium and Heavy VERSION WITH MOTOR



ORDERABLE CODES

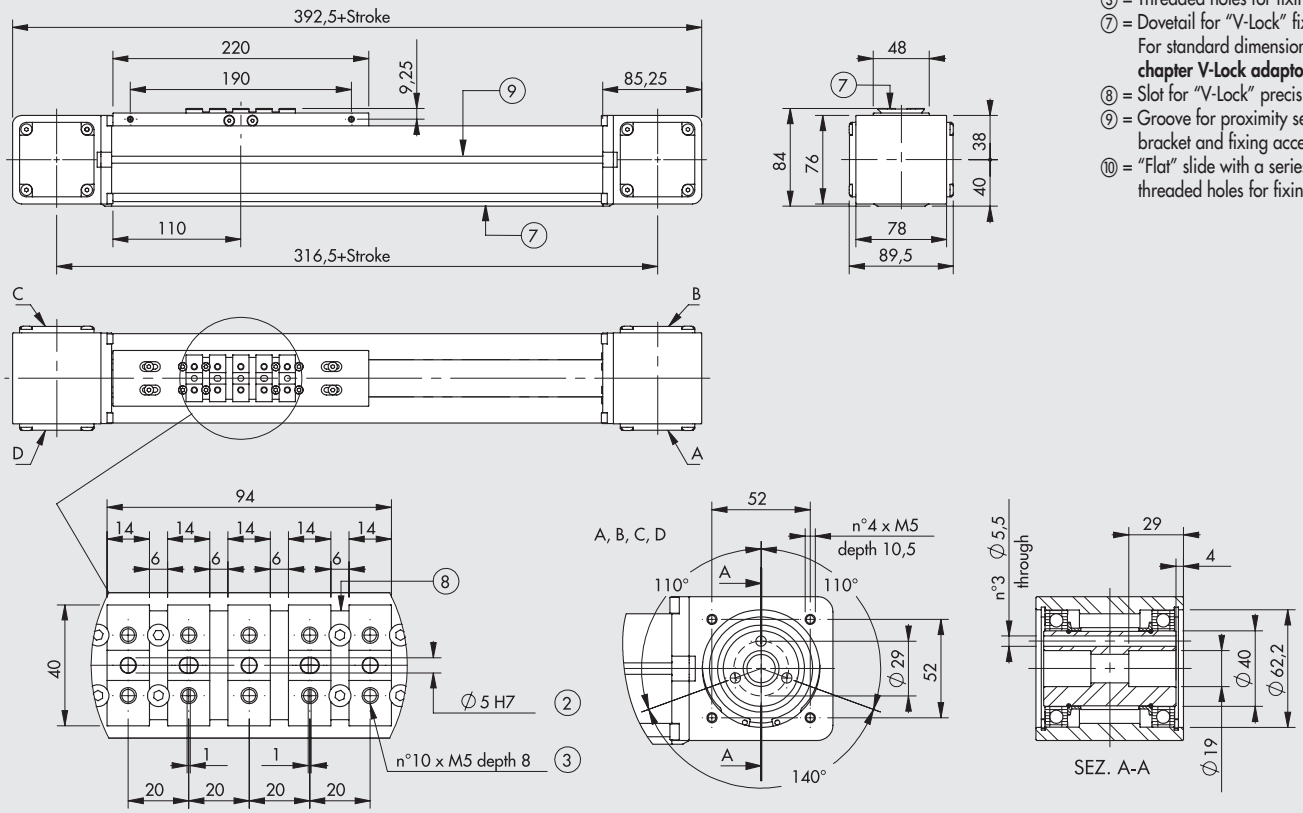
STEPPING MOTOR	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE	BRUSHLESS MOTOR WITH BELT TRANSMISSION	BRUSHLESS MOTOR + BRAKE WITH BELT TRANSMISSION	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR + BRAKE WITH GEARBOX
			Reduction 1:2	Reduction 1:2	Reduction 1:3	Reduction 1:3
374011____261230	374011____262220	374011____264220	374011____26F220	374011____26E220	374011____266220	374011____267220
374011____291230	374011____292220	374011____294220	374011____29F220	374011____29E220	374011____296220	374011____297220
374011____361230	374011____362220	374011____364220	374011____36F220	374011____36E220	374011____366220	374011____367220
374011____391230	374011____392220	374011____394220	374011____39F220	374011____39E220	374011____396220	374011____397220
					Reduction 1:5	Reduction 1:5
					374011____268220	374011____269220
					374011____298220	374011____299220
					374011____368220	374011____369220
					374011____398220	374011____399220

N.B.: The indicated dimensions are valid for both versions with motor installed on the right and on the left.

____ = Enter the stroke in mm to complete the code. See Key to Codes for an explanation of encoding.

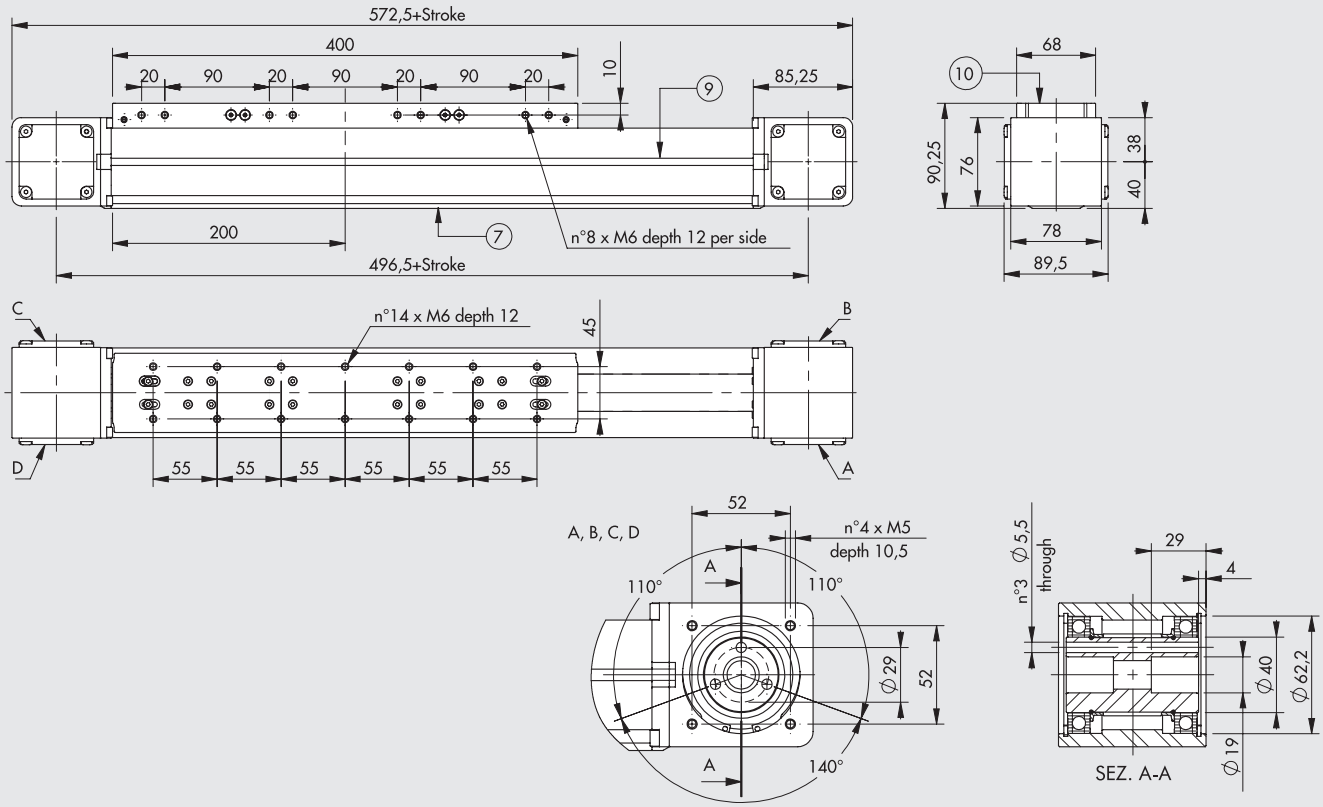
DIMENSIONS BK-2 VERSION WITHOUT MOTOR

Heavy



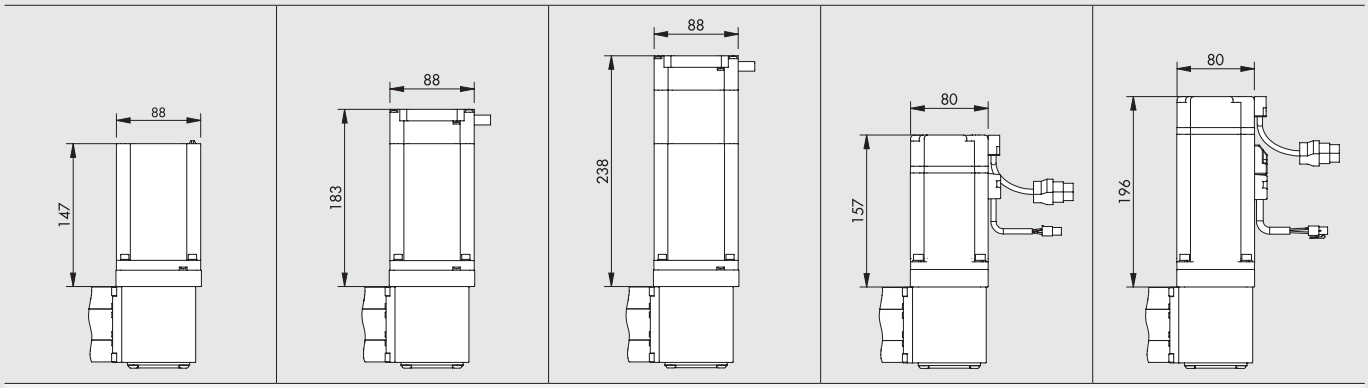
② = Holes for centring pins
③ = Threaded holes for fixing
⑦ = Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**..
⑧ = Slot for "V-Lock" precision key
⑨ = Groove for proximity sensor bracket and fixing accessories
⑩ = "Flat" slide with a series of threaded holes for fixing.

Heavy XL



DIMENSIONS BK-2 VERSION WITH MOTOR

Heavy / Heavy XL

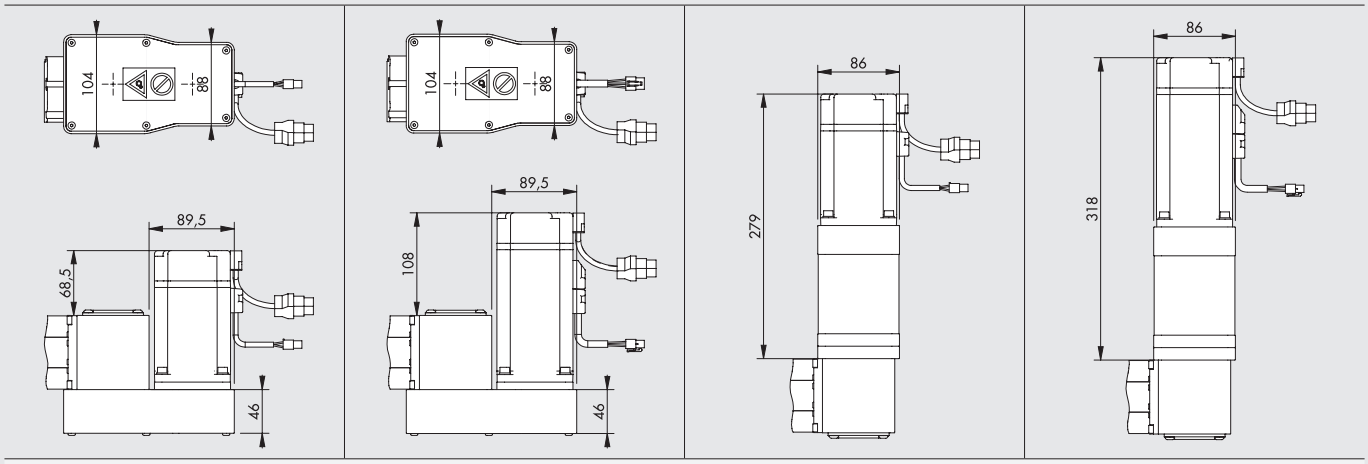


ORDERABLE CODES

STEPPING MOTOR	STEPPING MOTOR WITH ENCODER	STEPPING MOTOR + BRAKE WITH ENCODER	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE
374021_ _ _ _361470	374021_ _ _ _36C470	374021_ _ _ _363470	374021_ _ _ _362330	374021_ _ _ _364330
374021_ _ _ _391470	374021_ _ _ _39C470	374021_ _ _ _393470	374021_ _ _ _392330	374021_ _ _ _394330
374025_ _ _ _361470	374025_ _ _ _36C470	374025_ _ _ _363470	374025_ _ _ _362330	374025_ _ _ _364330
374025_ _ _ _391470	374025_ _ _ _39C470	374025_ _ _ _393470	374025_ _ _ _392330	374025_ _ _ _394330

N.B.: The indicated dimensions are valid for both versions with motor installed on the right and on the left.

_ _ _ _ = Enter the stroke in mm to complete the code. See Key to Codes for an explanation of encoding.



ORDERABLE CODES

BRUSHLESS MOTOR WITH BELT TRANSMISSION	BRUSHLESS MOTOR + BRAKE WITH BELT TRANSMISSION	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR + BRAKE WITH GEARBOX
Reduction 1:2	Reduction 1:2	Reduction 1:3	Reduction 1:3
374021_ _ _ _36F330	374021_ _ _ _36E330	374021_ _ _ _366330	374021_ _ _ _367330
374021_ _ _ _39F330	374021_ _ _ _39E330	374021_ _ _ _396330	374021_ _ _ _397330
374025_ _ _ _36F330	374025_ _ _ _36E330	374025_ _ _ _366330	374025_ _ _ _367330
374025_ _ _ _39F330	374025_ _ _ _39E330	374025_ _ _ _396330	374025_ _ _ _397330
		Reduction 1:5	Reduction 1:5
		374021_ _ _ _368330	374021_ _ _ _369330
		374021_ _ _ _398330	374021_ _ _ _399330
		374025_ _ _ _368330	374025_ _ _ _369330
		374025_ _ _ _398330	374025_ _ _ _399330

N.B.: The indicated dimensions are valid for both versions with motor installed on the right and on the left.

_ _ _ _ = Enter the stroke in mm to complete the code. See Key to Codes for an explanation of encoding.

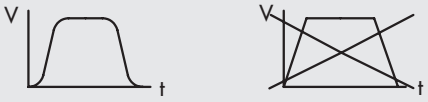
MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES		
	Metal Work	37D1222000 *	37D1332000 *	37D1552000
	Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS B7
Metal Work	Manufacturer	(4.4A 24-48VDC)	(6A 24-75VDC)	(10A 28-62VAC) ●
STEPPING MOTORS				
37M1230000	SANYO DENKI 103-H7823-1740 (4A 75V max)	√	√ ◆	√ ■
37M1470000	B&R 80MPH6.101S000-01 (10A 80V max)	-	-	√
STEPPING MOTORS WITH ENCODER				
37M8470000	B&R 80MPH6,101S114-01 (10A 80V max)	-	-	√
STEPPING MOTORS WITH ENCODER + BRAKE				
37M3470000	B&R 80MPH6.101SD114-01 (10A 80V max)	-	-	√

✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive ***e***.drive, code 37D1332002, can be used.
◆ **Important!** Limit current.
■ **Important!** Limit current and voltage.
● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$

MOTOR CODES		DRIVES CODES	
	Metal Work	37D2300000	37D2400007
	Manufacturer	DELTA ASD-A2-0421-M	DELTA ASD-A2-0721-M
Metal Work	Manufacturer	(400W)	(750W)
BRUSHLESS MOTORS			
37M2220001	DELTA ECMA-C20604RS (400W)	√	-
37M2330001	DELTA ECMA-C20807RS (750W)	-	√
BRUSHLESS MOTORS WITH BRAKE			
37M4220001	DELTA ECMA-C20604SS (400W)	√	-
37M4330001	DELTA ECMA-C20807SS (750W)	-	√

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



METAL WORK PNEUMATIC

KEY TO CODES AXIS ELECTRIC WITHOUT MOTOR

CYL	37 TYPE	4	0	1 SIZE	1 CARRIAGE TYPE	0300 STROKE	2 GUIDE TYPE	T
	37 Electric actuators	**4** Electric axis rodless elektro	**0** STD	**1** BK-1 **2** BK-2	**1** STD (Standard V-lock axial length) ● **5** XL (long with threaded holes)	**BK-1 Medium** from 110 to 3800 mm **BK-1 Heavy** from 110 to 2800 mm **BK-2 Heavy** from 140 to 3800 mm **BK-2 Heavy XL** from 140 to 3600 mm	◆ **2** Medium (guide and steel wheels) **3** Heavy - Heavy XL (steel guide and pads ball-recirculation)	**T** Without motor (plugged outlets)

● Only available for BK-2.
◆ Only available for BK-1.

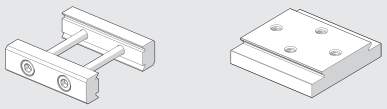
KEY TO CODES AXIS ELECTRIC MOTOR

CYL	37 TYPE	4	0	1 SIZE	1 CARRIAGE TYPE	0300 STROKE	2 GUIDE TYPE	6 MOTOR POSITION	■ DRIVE 1 MOTOR ✱	2 FLANGE	3 TORQUE	0
	37 Electric actuators	**4** Electric axis rodless elektro	**0** STD	**1** BK-1 **2** BK-2	**1** STD (Standard V-lock axial length) ● **5** XL (long with threaded holes)	**BK-1 Medium** from 110 to 3800 mm **BK-1 Heavy** from 110 to 2800 mm **BK-2 Heavy** from 140 to 3800 mm **BK-2 Heavy XL** from 140 to 3600 mm	◆ **2** Medium (guide and steel wheels) **3** Heavy - Heavy XL (steel guide and pads ball-recirculation)	**6** Right **9** Left	**1** Stepping **2** Brushless **3** Stepping with BRAKE + Encoder **4** Brushless with BRAKE **6** Brushless with 1:3 gearbox **7** Brushless with BRAKE + 1:3 gearbox **8** Brushless with 1:5 gearbox **9** Brushless with BRAKE + 1:5 gearbox **C** Stepping with Encoder **E** Brushless with BRAKE and reduction 1: 2 (toothed belt) **F** Brushless with reduction 1: 2 (toothed belt)	**2** 60 **3** 80 **4** NEMA 34	**2** 1.2 to 2.19 Nm **3** 2.2 to 3 Nm **7** 7.01 to 10 Nm	**0** Base

● Only available for BK-2.
◆ Only available for BK-1.
■ The Orderable configurations of the motorizations are shown on on page **A5**.147 for the BK-1 and on page **A5**.149 for the BK-2.
✱ On request available versions with gearbox with reduction ratios other than those eventually foreseen as standard.

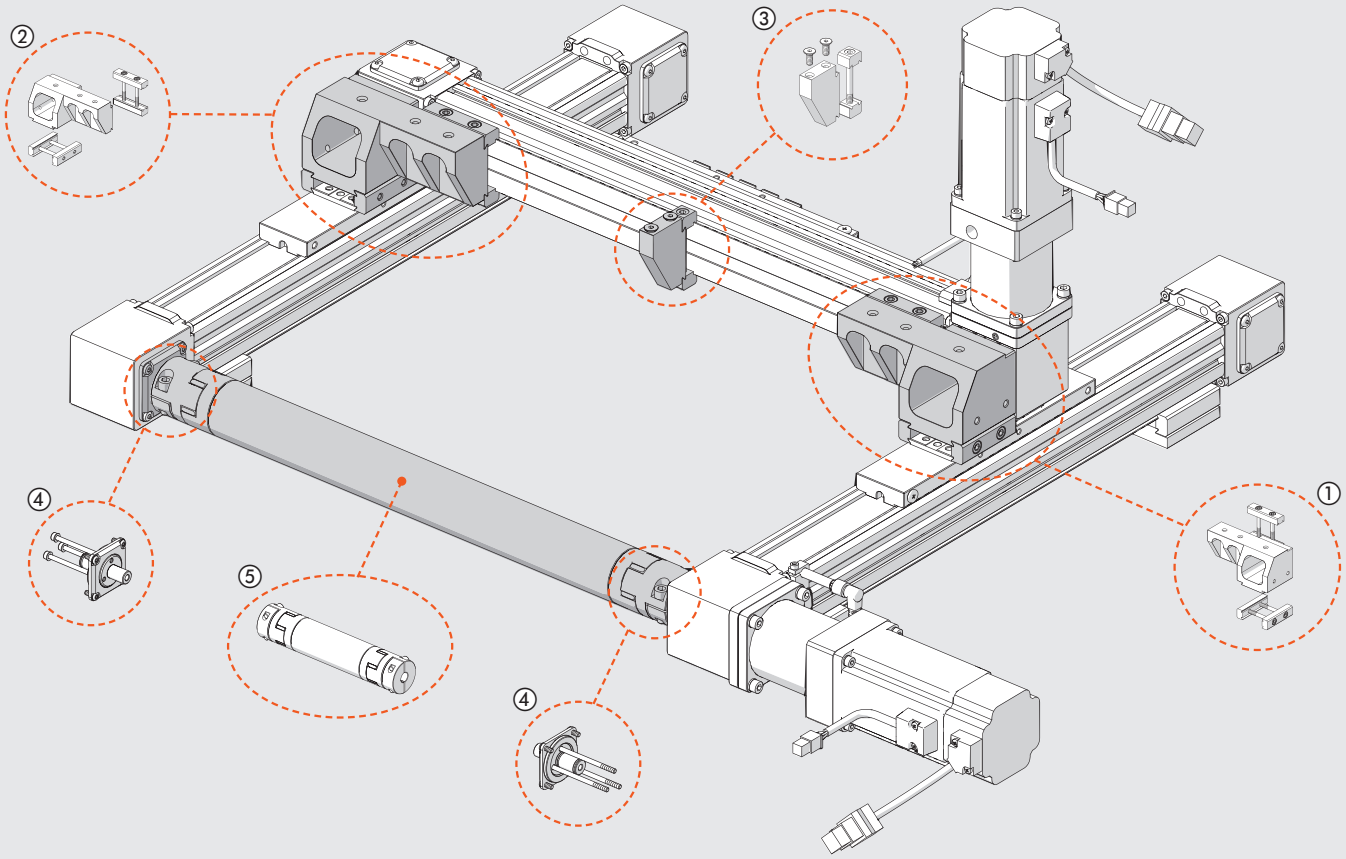
ACCESSORIES

FIXING ELEMENTS



See V-Lock family.

FIXING ELEMENTS FOR GANTRY SYSTEMS



① LEFT BRACKET

Code	Description
095BK1R003	Left bracket for Gantry BK-1
095BK2R003	Left bracket for Gantry BK-2 / BK-2 XL

② RIGHT BRACKET

Code	Description
095BK1R002	Right bracket for Gantry BK-1
095BK2R002	Right bracket for Gantry BK-2 / BK-2 XL

③ BRACKET CABLE CHAIN GIUDE

Code	Description
095BK2R004	Bracket cable chain giude for Gantry BK-1 / BK-2 / BK-2 XL

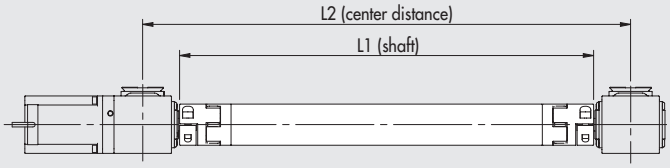
④ JOINT FOR TRANSMISSION SHAFT

Code	Description
095BK1R190	Joint for transmission shaft BK-1
095BK2R190	Joint for transmission shaft BK-2

⑤ TRANSMISSION SHAFT

Code	Description
095TSV12_ _ _ _	Transmission shaft BK-1
095TSV15_ _ _ _	Transmission shaft BK-2

_ _ _ _ Enter the length L1 in mm to complete the code.
Example: 095TSV120800 = transmission shaft BK-1 L1 = 800 mm

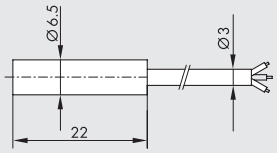


L1 min = 200 mm
L1 max = 2500 mm

L1 BK-1 = L2 - 72 mm
L1 BK-2 = L2 - 95 mm

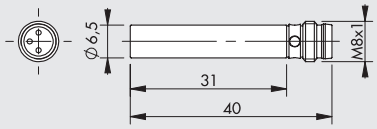
METAL WORK PNEUMATIC

INDUCTION SENSOR Ø 6.5



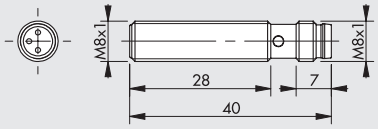
Code	Description
W095K030006	PNP Ø 6.5 PNP inductive sensor with LED 2 m

QUICK-FIT INDUCTIVE SENSOR Ø 6.5



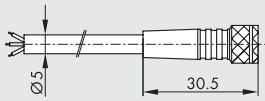
Code	Description
W095K030009	PNP Ø 6.5 inductive sensor with push-in LED

QUICK-FIT INDUCTIVE SENSOR M8 (ONLY FOR BK-2)



Code	Description
W095K030010	PNP M8 inductive sensor with push-in LED

CABLE WITH STRAIGHT CONNECTOR FOR PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

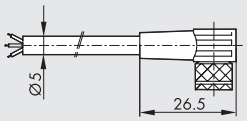


Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
02400A0100	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 1 m
02400A0250	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 2.5 m
02400A0500	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 5 m
02400A1000	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 10 m

Note: Very flexible cables, class 6 according to IEC 60228

CABLE WITH 90° CONNECTOR FOR PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

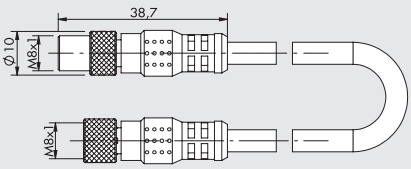


Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
02400B0100	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 1 m
02400B0250	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 2.5 m
02400B0500	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 5 m
02400B1000	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 10 m

Note: Very flexible cables, class 6 according to IEC 60228

M8 M – M8 F CONNECTOR FOR PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

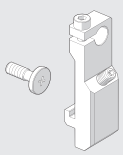


Code	Description
0240009009	M8-M8 3-pin straight connector with cable L = 3 m

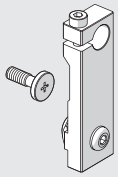
Note: Can be used for direct connection to the modules with digital INPUT of the EB 80 and CM valves

BRACKET FOR INDUCTION SENSOR

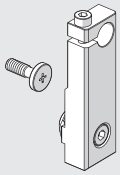
BK-1



BK-2



BK-2 XL



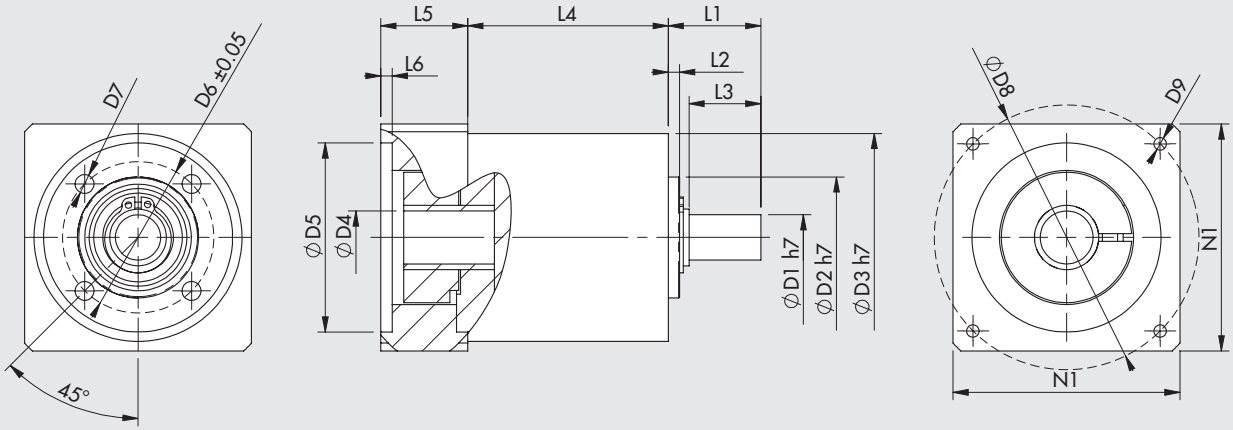
Code	Description
095BK1R001	Bracket for inductive sensor Ø 6.5 BK-1
095BK2R001	Bracket for inductive sensor Ø 6.5 BK-2
095BK2R006	Bracket for inductive sensor Ø 8 BK-2
095BK2R007	Bracket for inductive sensor Ø 6.5 BK-2 XL
095BK2R005	Bracket for inductive sensor Ø 8 BK-2 XL

DRIVES

For motor-drive couplings see table on page **A5**.150

SPARE PARTS

BK GEARBOXES



Code	Description	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0341000	Gearbox MP053 1:3	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0541000	Gearbox MP053 1:5	15	3500	6	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0343000	Gearbox MP080 1:3	40	2900	59	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80
37R0543000	Gearbox MP080 1:5	50	3200	37	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80

C_{OUT} = rated output torque N_{IN} = nominal input speed J = mass moment of inertia of the gearhead

ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.150

NOTES

METAL WORK PNEUMATIC

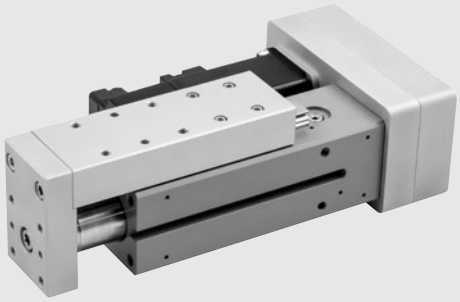
NOTES

ELECTRIC SLIDE
SERIES ELEKTRO CS

Compact electric slide, equipped with a guideway and a ball-recirculating pad capable of withstanding high radial loads on the piston rod.
Available in the 55 mm stroke, the slide in the ELEKTRO CS series features the same technical choices as those made in the ELEKTRO SSC series in terms of extreme compactness and pure design, including the wear-resistant aluminium body.
Driven by a hardened steel screw and recirculating ball screw nut, the stainless-steel piston rod is coupled, via a rigid aluminium structure, to a recirculating pad that runs along a guide rail integral with the main body. The coupling system prevents the piston rod from rotating.
A magnet is integral with the piston rod to ensure an end-stop signal, while two longitudinal slots are provided on the body to accommodate Square-type sensors.
For easy re-greasing of the screw and nut, the cylinder body comes with a special hole that is normally closed with a tight-fitting plug.
A wide range of standard pneumatic cylinder accessories as well as dedicated accessories can be used to fix the slide.
The ELEKTRO CS series slide is available in either a standard profile version or a V-Lock interface version.
The electric motor can be either connected in-line with the slide or by means of a transmission system; in the latter case, three different configurations are available.
The motor can be selected from an optimised range comprising both STEPPING and BRUSHLESS motors.
Drives most suitable for motor control are also provided. When using motors of a make or model other than those offered in the catalogue, special flanges and couplings can be made and supplied on request.

in-line version

geared version



TECHNICAL DATA		Ø 32
Environmental temperature range for STEPPING motors	°C	from -10 to +50
BRUSHLESS motors	°C	from 0 to +40
Electrical protection rating with STEPPING motors		IP55 or IP65 (see key to codes on page **A5**.168)
BRUSHLESS motors		IP65 (see key to codes on page **A5**.168)
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)
Standard strokes (including 5 mm extra-stroke) for homing	mm	55
Positioning repeatability	mm	±0.02
Positioning accuracy	mm	±0.2 *
Versions		Ball screw
		In line or geared motor
Anti-rotation of the piston rod		YES
Uncontrolled impact at the end of stroke		NOT ALLOWED (for rear buffer ONLY)
Sensor magnet		YES
Work position		Any
Interface for fixing on carriage		Standard / V-Lock

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

MECHANICAL FEATURES

Screw pitch (p)	mm	4	10
Screw diameter	mm	12	12
Static axial load (F_o) *	N	3000	3000
Dynamic axial load (F) **	N	5200	3160
Maximum number of revs	1/min	3000	3000
Maximum speed (V_{max})	mm/s	200	500
"K" ratio of motor revs and piston rod speed	n/V	15	6
Maximum acceleration without load	m/s^2	5	
Maximum driving torque applicable to the screw	Nm	2.5	

Example: V = 100 mm/s; pitch = 10 → K = 6 n = V · K = 100 · 6 = 600 rpm

* Static loads bearable without damage.
** Calculate mean axial load and the calculate life (see graphs on page **A5**.160).
N.B.: For the verification of the linear guide system, please refer to page **A5**.159. For the verification of the screw, see bottom of page.

WEIGHTS

Screw pitch (p)	mm	4	10
Weight at stroke 0, in-line version	g	1188	1198
Weight at stroke 0, geared version	g	1498	1508
Additional weight each mm of stroke	g	7.6	7.6
Moving mass at stroke 0 (M0)	g	546	553
Additional moving mass each mm of stroke (MX)	g	2.5	2.5

N.B.: You get the total weight of a complete slide by adding: weight stroke 0 + stroke [mm] · weight for each mm of stroke + weight of the motor.

MASS MOMENTS OF INERTIA

Screw pitch	mm	4	10
Transmission ratio (τ)		1:1	1:1
J0 at stroke 0	$kgmm^2$	7.821	7.934
J1 each metre of stroke	$kgmm^2/m$	12.76	13.76
J2 each kg of load	$kgmm^2/kg$	0.4053	2.5330
J3 in-line transmission	$kgmm^2$	2.879	2.879
J3 geared transmission	$kgmm^2$	3.237	3.237

The total mass moment of inertia (Jtot) reduced for the motor is: Jtot = {J1 · stroke [m] + J2 · [(MX · stroke) + M0 + load] + J0} · τ2 +J3
MX and M0 are defined in the WEIGHTS table.

CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

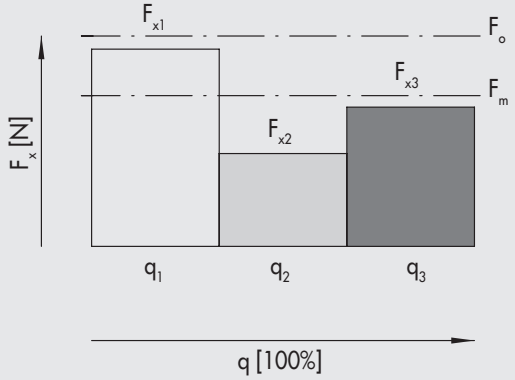
Peak axial load in a work cycle must not exceed the static axial load Fo.
The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

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

$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{X1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{X2}}{V_m} + \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{X3}}{V_m} \times \frac{q_3}{100} + \ldots}$$

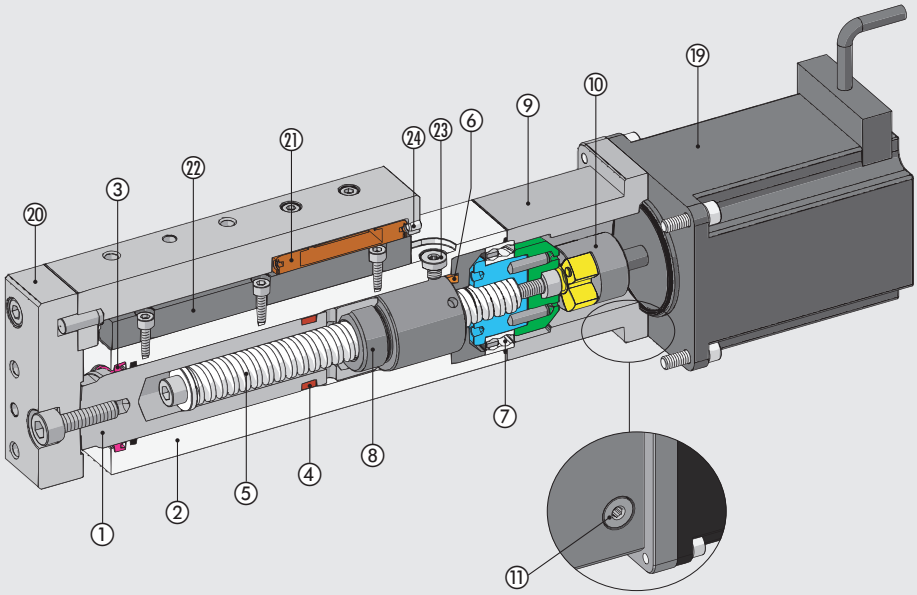
F_x = Axial load at stage x
F_m = Mean axial load during extension
F_o = Static axial load
q = Time segment
V_x = Speed in the phase x
V_m = Average speed



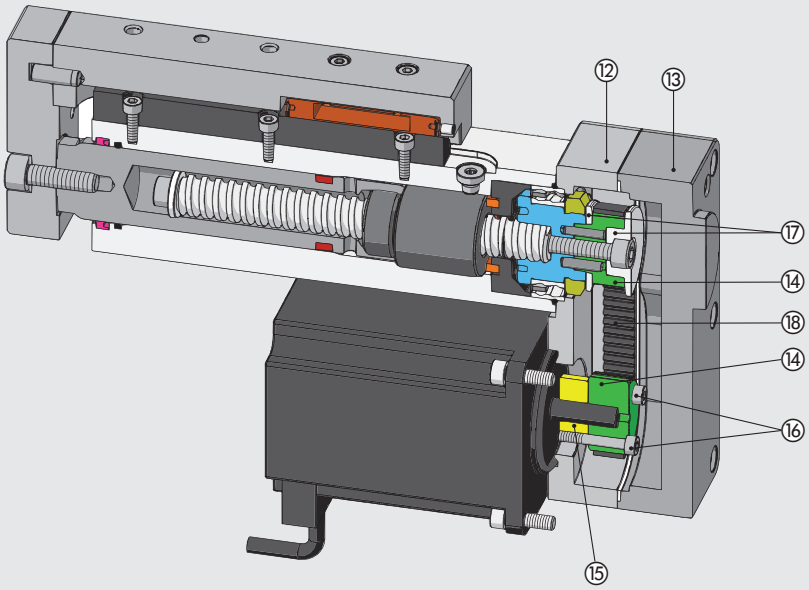
The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graphs on page **A5**.160, show screw life as a function of F_m

COMPONENTS

IN-LINE VERSION

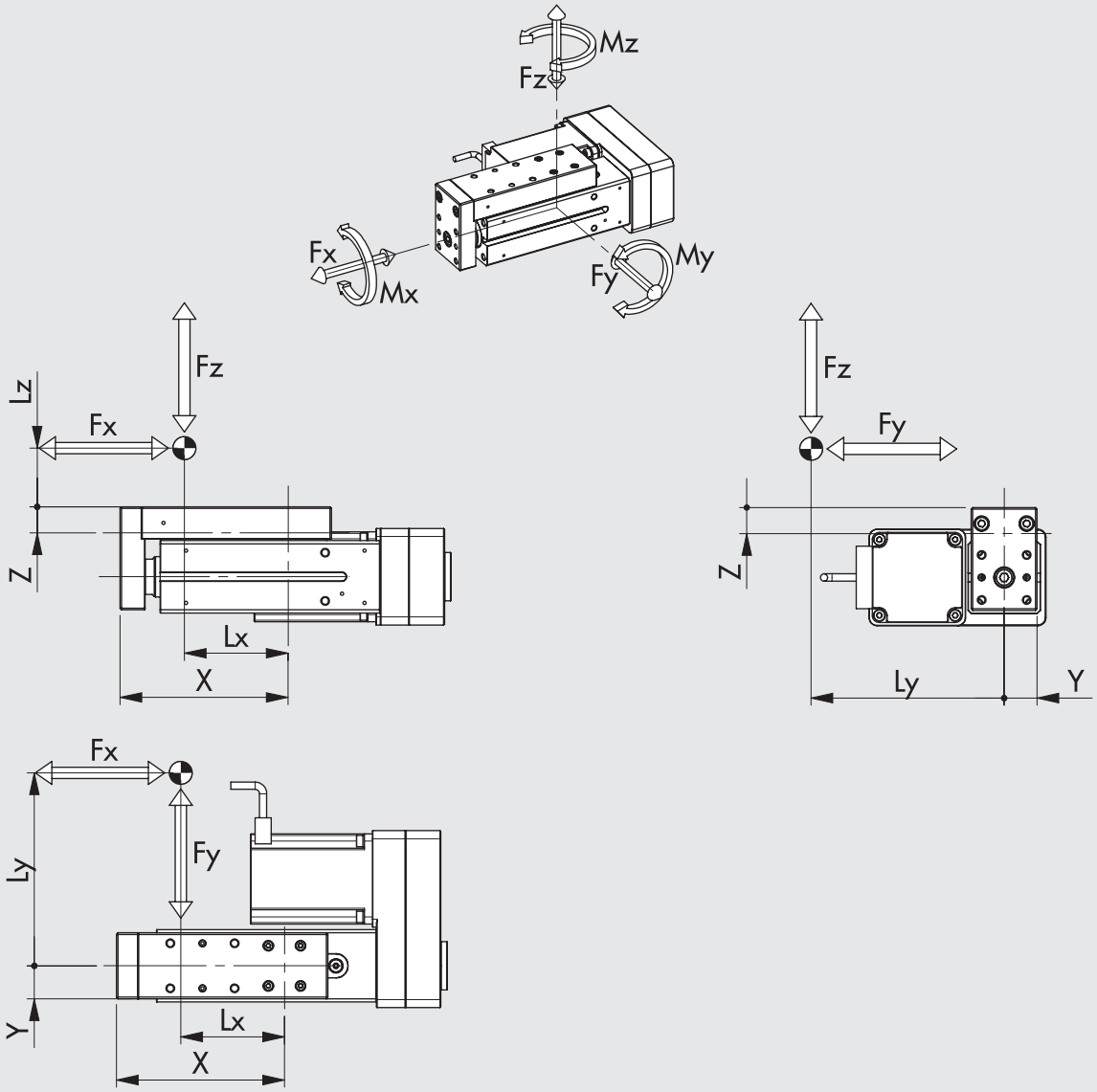


GEARED VERSION



① PISTON ROD: stainless steel (AISI 316)
② BODY: aluminium alloy with wear-resistant coating
③ WIPER RING: polyurethane
④ MAGNET: plastoferrite (optional)
⑤ RECIRCULATING BALL SCREW: hardened and rolled steel
⑥ BUFFER: polyurethane
⑦ BEARING: oblique with two ball rings
⑧ RECIRCULATING BALL SCROLL: steel
⑨ ADAPTOR PLATE: anodized aluminium
⑩ ELASTIC COUPLING: aluminium / polyurethane
⑪ PLUG: for access to the elastic coupling screw
⑫ TRANSMISSION PLATE: anodized aluminium
⑬ COVER: anodized aluminium
⑭ COG PULLEY: anodized aluminium
⑮ ELASTIC COLLAR: anodized aluminium
⑯ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
⑰ BELT FLANGES: anodized aluminium
⑱ TOOTHED BELT: polyurethane with steel cables
⑲ MOTOR
⑳ SLIDE: anodized aluminium
㉑ BALL RECIRCULATION PAD: stainless steel / technopolymer
㉒ GUIDING RAIL FOR PADS: hardened stainless steel
㉓ PLUG: for screw greasing
㉔ GRUB SCREW: for pad greasing

DIAGRAM OF FORCES AND MOMENTS



STATIC VERIFICATION

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

X [mm]	Y [mm]	Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
104.5	20.5	16.25	2790	2790	21.8	13.5	13.5

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

$Mx = Fy \cdot (Lz + z) + Fz \cdot Ly \qquad My = Fz \cdot Lx + Fx \cdot (Lz + z) \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx0\ max} + \frac{(My)}{My0\ max} + \frac{(Mz)}{Mz0\ max} + \frac{(Fy)}{Fy0\ max} + \frac{(Fz)}{Fz0\ max} \leq 1$$

DYNAMIC VERIFICATION

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

X [mm]	Y [mm]	Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
104.5	20.5	16.25	1395	1395	10.9	6.75	6.75

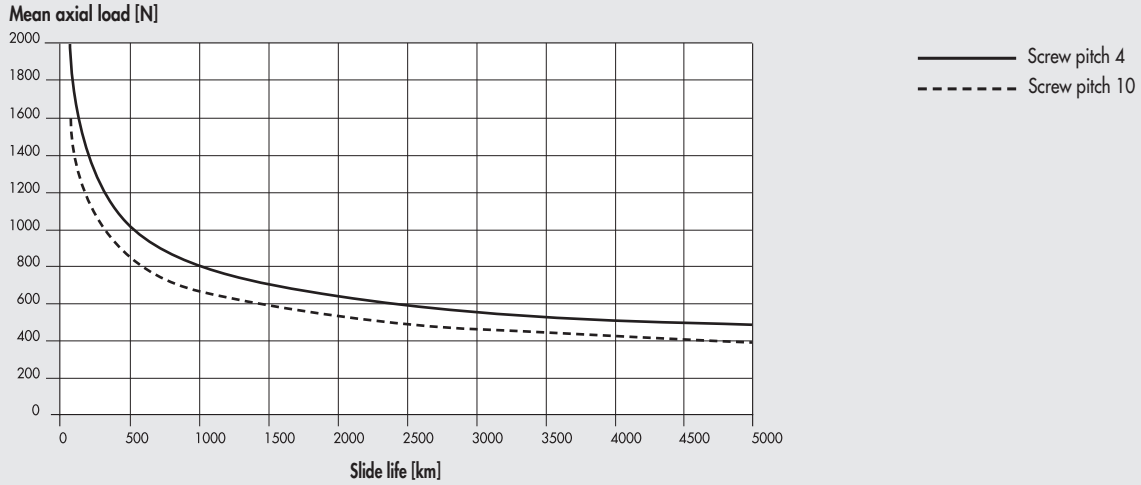
N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

$Mx = Fy \cdot (Lz + z) + Fz \cdot Ly \qquad My = Fz \cdot Lx + Fx \cdot (Lz + z) \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1$$

LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD, VERSION WITH BALL SCREW

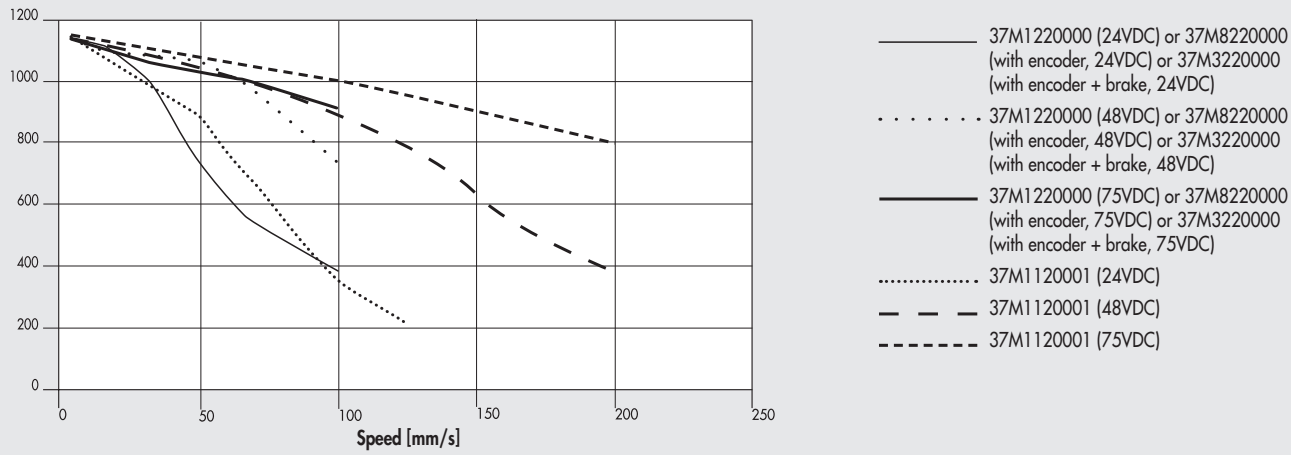
Life characteristics can vary considerably from those indicated in the graphs due to different operating conditions (radial loads, temperature, lubrication status, etc.).



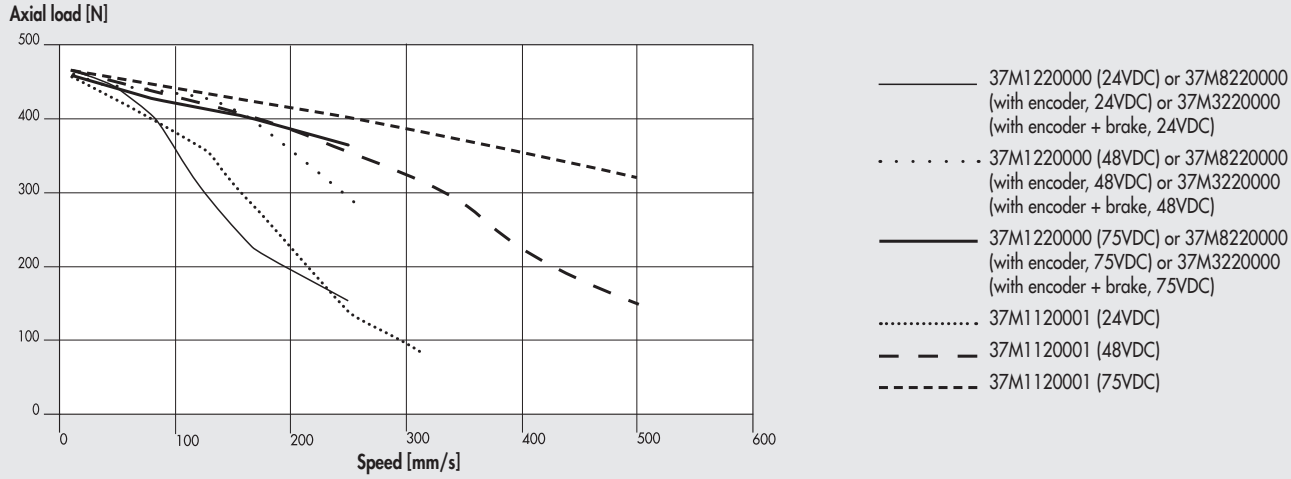
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (SLIDE COMPLETE WITH MOTOR AND DRIVE)

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%.

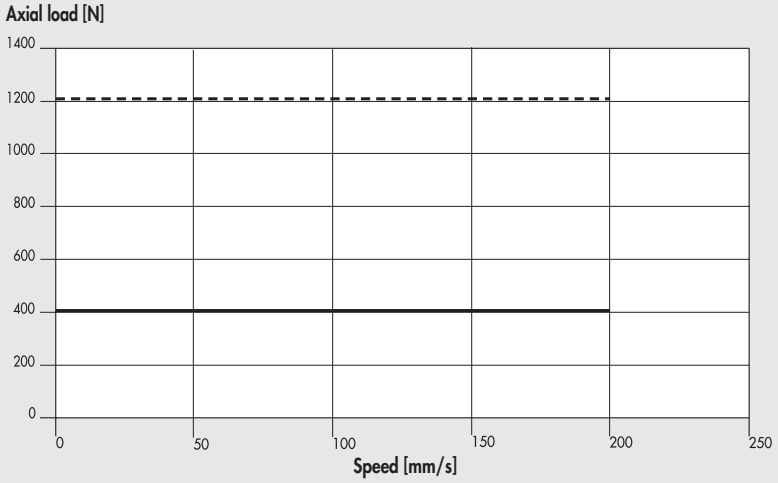
Ø 32 with pitch 4 ball screw, STEPPING motor, STEPPING motors with encoder, STEPPING motors with encoder + brake



Ø 32 with pitch 10 ball screw, STEPPING motor, STEPPING motors with encoder, STEPPING motors with encoder + brake



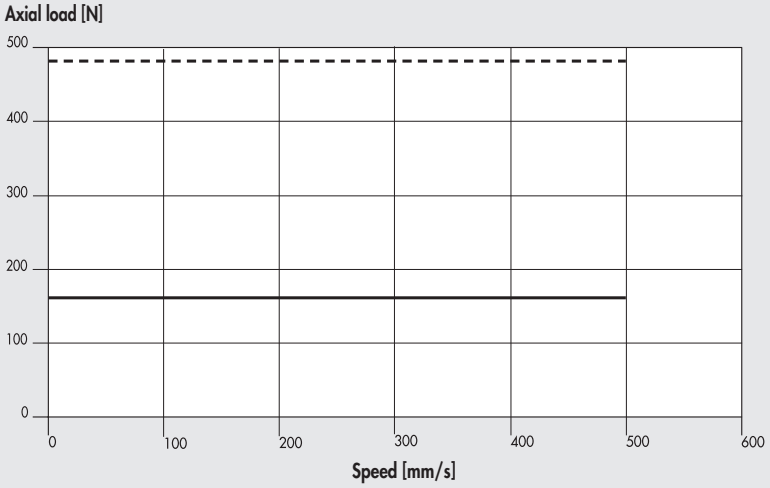
Ø 32 with pitch 4 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



Nominal 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

Max 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

Ø 32 with pitch 10 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



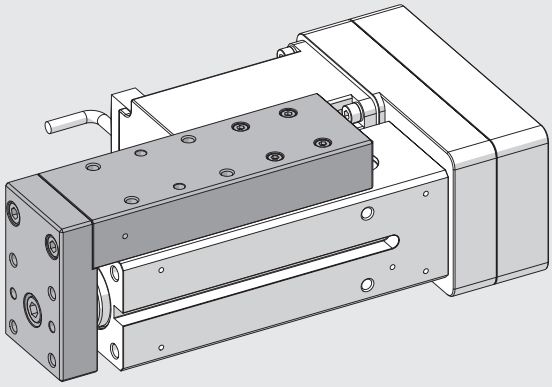
Nominal 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

Max 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

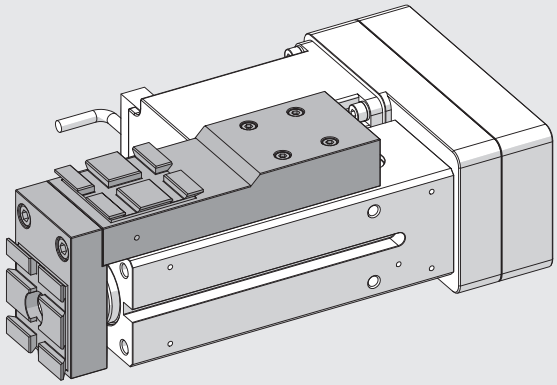
VERSIONS

TYPE OF CARRIAGE INTERFACE

STANDARD

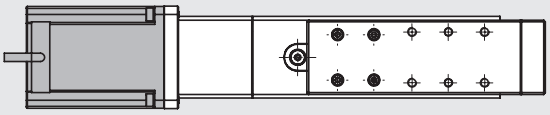


V-LOCK

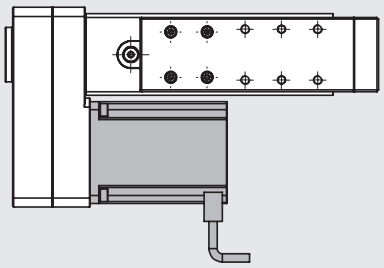


MOTOR POSITIONING

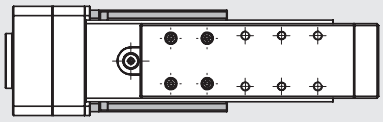
IN-LINE



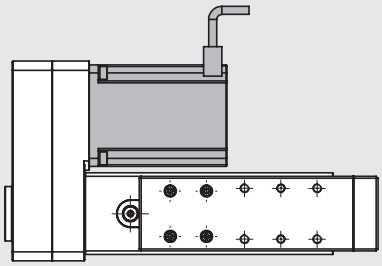
RIGHT GEARED



GEARED WITH MOTOR OPPOSITE TO THE SLIDE

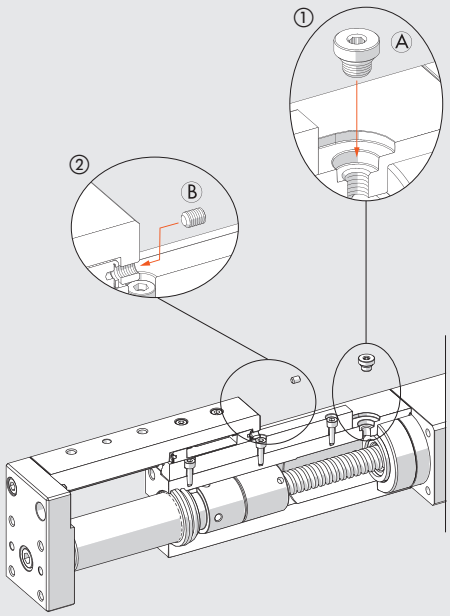


LEFT GEARED



METAL WORK PNEUMATIC

LUBRICATION DIAGRAMS



The slide features two specific lubrication zones:
① greasing point for the recirculating ball nut;
② greasing point for the recirculating ball pad.
Only use food-grade grease for re-greasing ULTRAPLEX FG1 NSF CAT H1 (code 9910514), according to the quantities indicated in the table.

Follow the steps below:

- retract the piston rod towards the motor adapter plate, as far as it will go;
- move the piston rod at low speed and/or controlled torque forwards by a value corresponding to the cylinder total stroke;
- remove plug A7 Ⓐ and grub screw Ⓑ;
- use a grease gun to pump grease into the two grease nipples;
- make the slide complete 4 strokes (at the end of which the piston rod will be back in its initial position);
- repeat the latter two steps;
- replace plug A7 Ⓐ grub screw Ⓑ;

The operation of re-greasing will have to be repeated at least once a year.

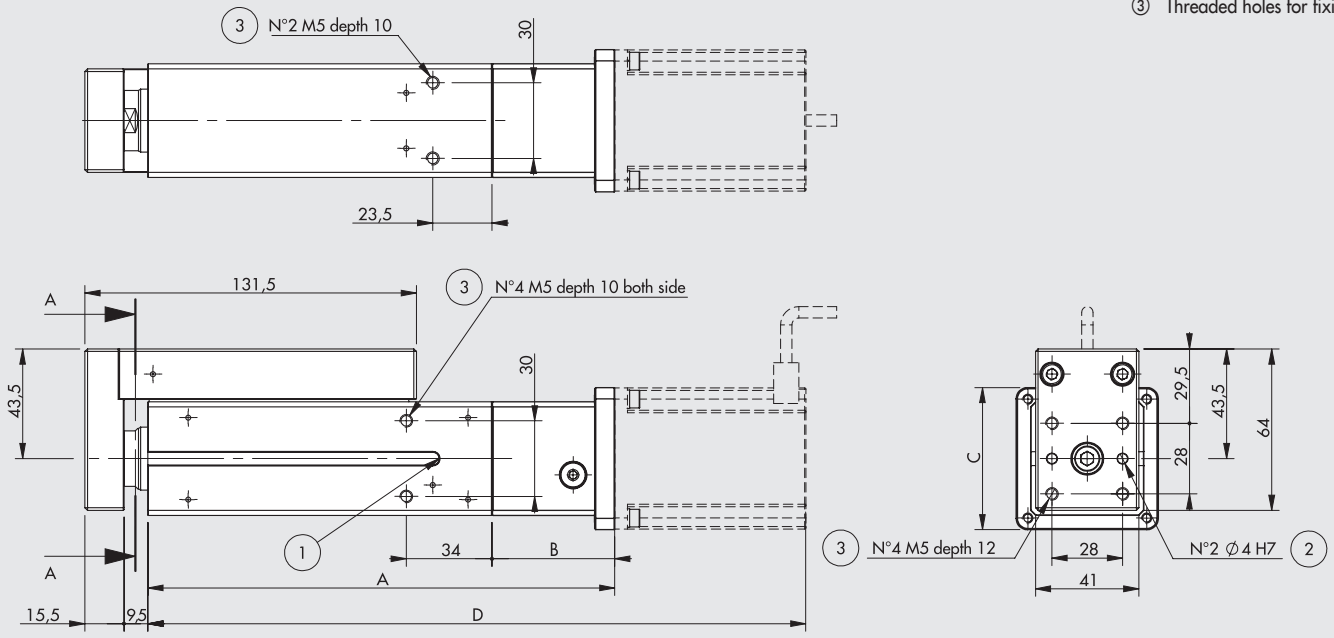
		Pad	Screw	
Pitch (p)	mm	-	4	10
Relube grease quantity	g	0.7	0.3	0.5
	cc	0.61	0.26	0.42

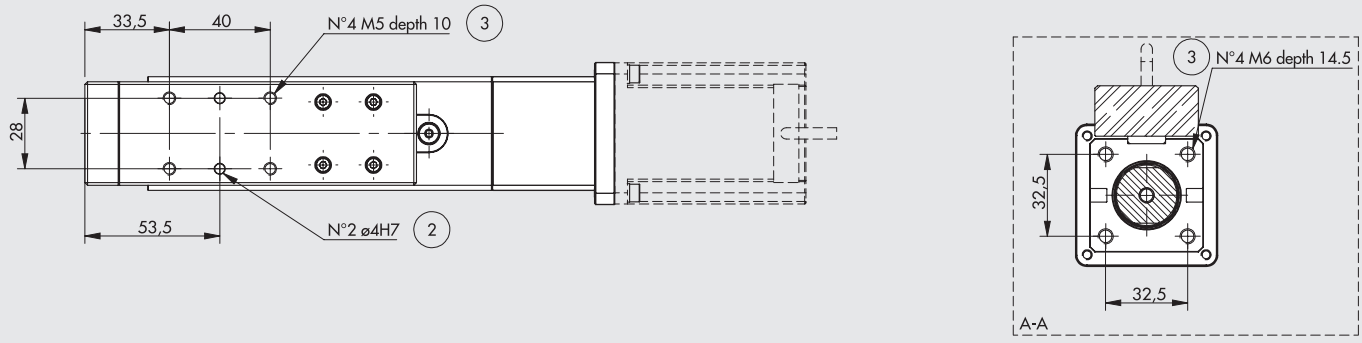
NOTES

DIMENSIONS SLIDE IN-LINE

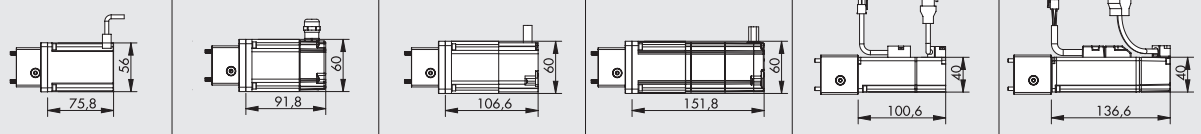
WITHOUT MOTOR

① N° 2 slots for sensors
② Holes for centring pins
③ Threaded holes for fixing





SLIDE WITH MOTOR



		1121				1220				8220				3220				2000				4000			
		STEPPING MOTOR code 37M1120001				STEPPING MOTOR code 37M1220000				STEPPING MOTOR + ENCODER code 37M8220000				STEPPING MOTOR + ENCODER + BRAKE code 37M3220000				BRUSHLESS MOTOR code 37M2000000				BRUSHLESS MOTOR + BRAKE code 37M4000000			
		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
STROKE	0055	185	48.5	56	261	185	48.5	60	277	185	48.5	60	292	185	48.5	60	337	190	53.5	45	291	190	53.5	45	327

377032005512 _ _ _ _
377032005542 _ _ _ _

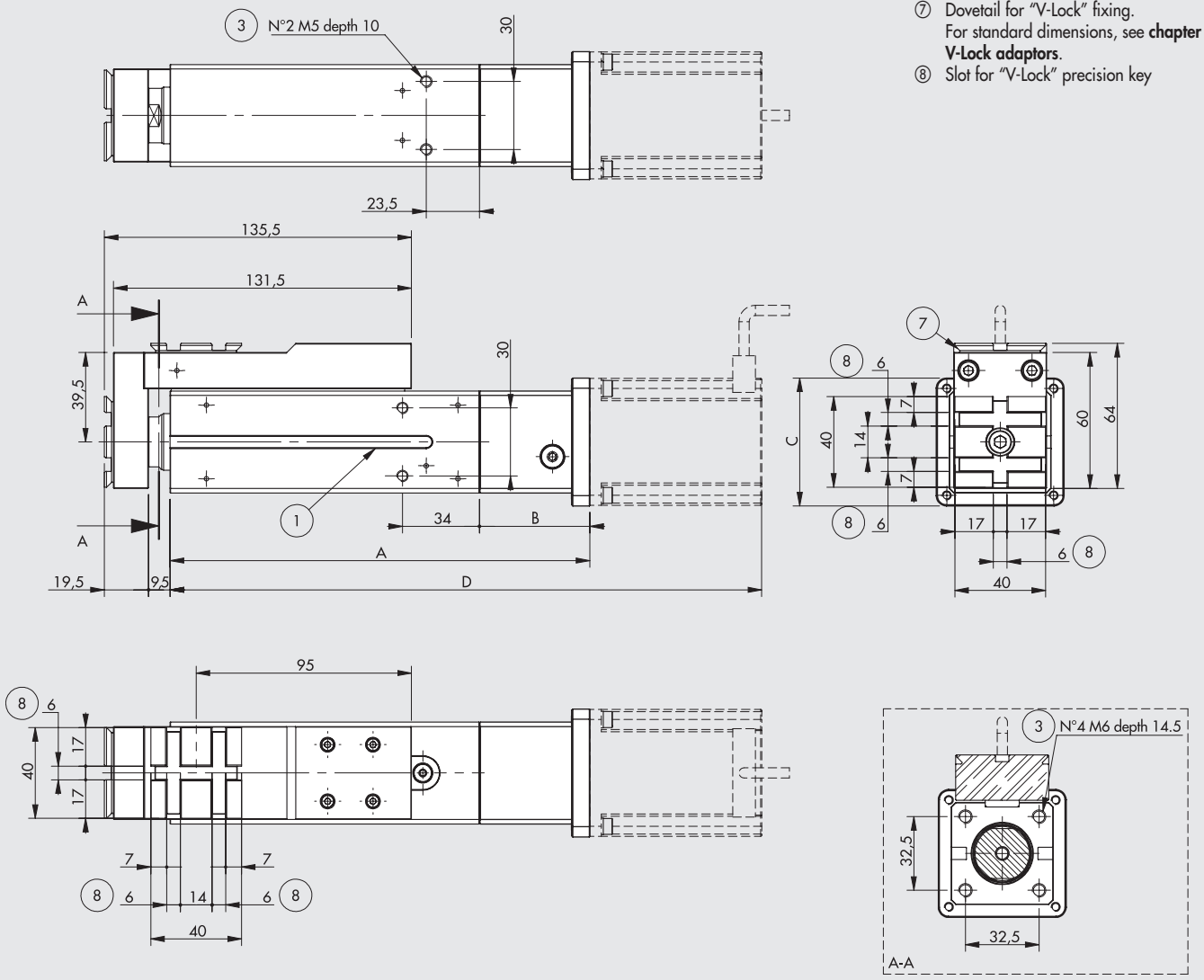
_ _ _ _ = Enter the type of drive to complete the code.

METAL WORK PNEUMATIC

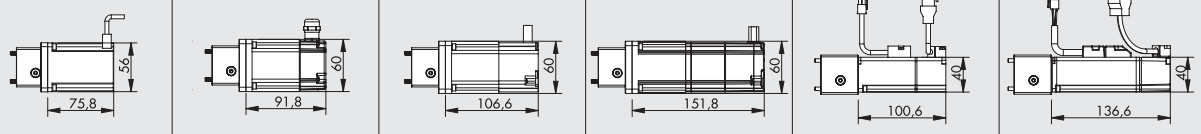
V-LOCK IN-LINE SLIDE DIMENSIONS

WITHOUT MOTOR

① N° 2 slots for sensors
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**.
⑧ Slot for "V-Lock" precision key



SLIDE WITH MOTOR



	1121				1220				8220				3220				2000				4000			
	STEPPING MOTOR code 37M1120001				STEPPING MOTOR code 37M1220000				STEPPING MOTOR + ENCODER code 37M8220000				STEPPING MOTOR + ENCODER + BRAKE code 37M3220000				BRUSHLESS MOTOR code 37M2000000				BRUSHLESS MOTOR + BRAKE code 37M4000000			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
STROKE 0055	185	48.5	56	261	185	48.5	60	277	185	48.5	60	292	185	48.5	60	337	190	53.5	45	291	190	53.5	45	327

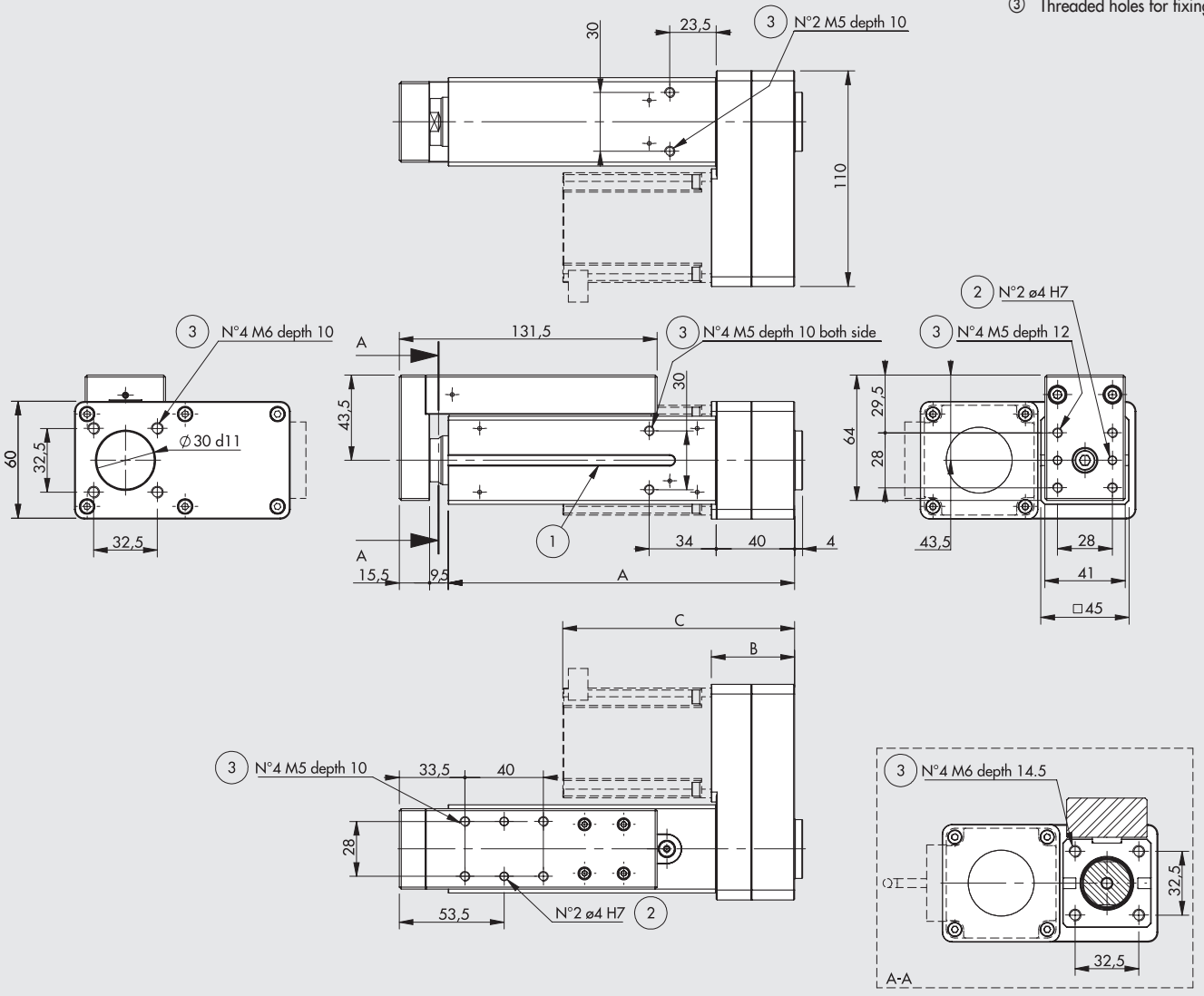
377K32005512 _ _ _ _
377K32005542 _ _ _ _

_ _ _ _ = Enter the type of drive to complete the code.

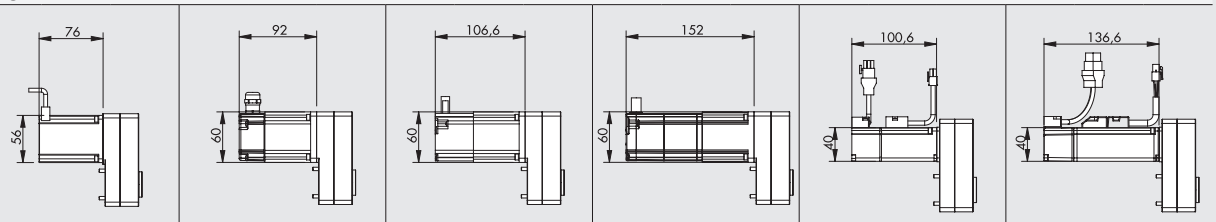
DIMENSIONS SLIDE GEARED

WITHOUT MOTOR

① N° 2 slots for sensors
② Holes for centring pins
③ Threaded holes for fixing



SLIDE WITH MOTOR



	1121	1220	8220	3220	2000	4000
	STEPPING MOTOR code 37M1120001	STEPPING MOTOR code 37M1220000	STEPPING MOTOR + ENCODER code 37M8220000	STEPPING MOTOR + ENCODER code 37M3220000	BRUSHLESS MOTOR code 37M2000000	BRUSHLESS MOTOR + BRAKE code 37M4000000
	A B C	A B C	A B C	A B C	A B C	A B C
STROKE 0055	177 42.5 118.5	177 42.5 134.5	177 42.5 149	177 42.5 194.5	177 43.5 144	177 43.5 180

37703200551N _ _ _ _
37703200554N _ _ _ _

377032005516 _ _ _ _
377032005546 _ _ _ _

377032005519 _ _ _ _
377032005549 _ _ _ _

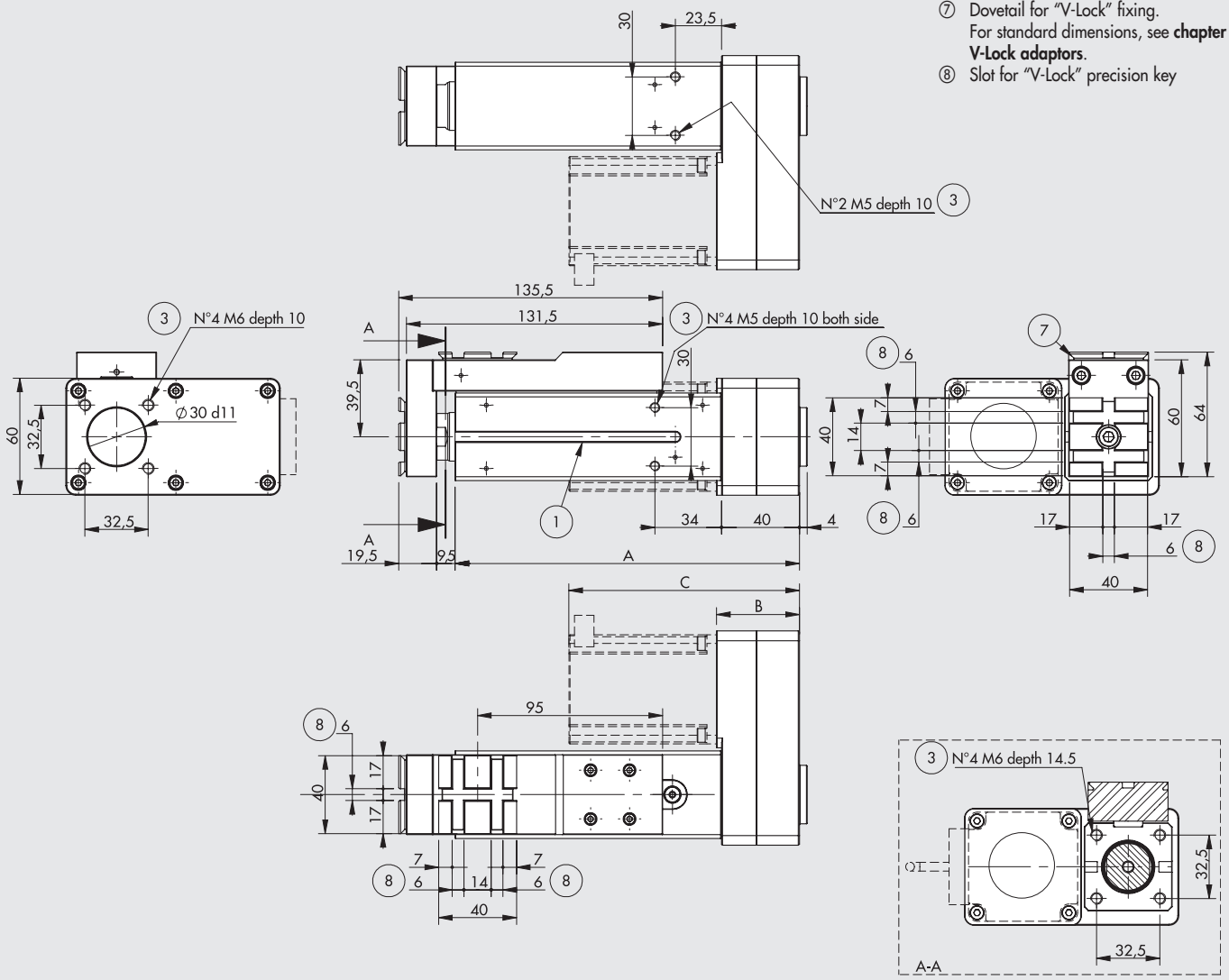
_ _ _ _ = Enter the type of drive to complete the code.

METAL WORK PNEUMATIC

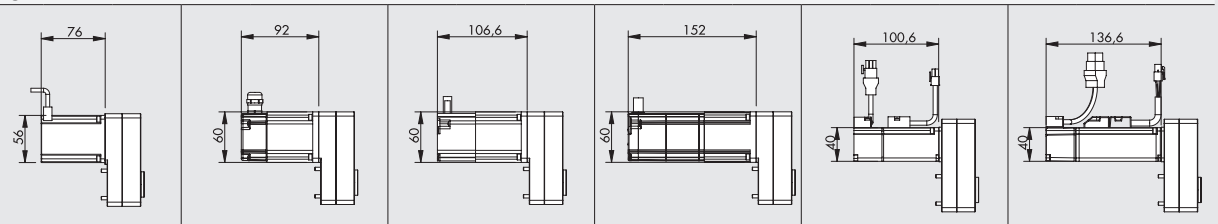
V-LOCK IN-LINE SLIDE DIMENSIONS

WITHOUT MOTOR

① N° 2 slots for sensors
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**.
⑧ Slot for "V-Lock" precision key



SLIDE WITH MOTOR



		1121			1220			8220			3220			2000			4000		
		STEPPING MOTOR code 37M1120001			STEPPING MOTOR code 37M1220000			STEPPING MOTOR + ENCODER code 37M8220000			STEPPING MOTOR + ENCODER + BRAKE code 37M3220000			BRUSHLESS MOTOR code 37M2000000			BRUSHLESS MOTOR + BRAKE code 37M4000000		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
STROKE	0055	177	42.5	118.5	177	42.5	134.5	177	42.5	149	177	42.5	194.5	177	43.5	144	177	43.5	180

377K3200551N _ _ _ _
377K3200554N _ _ _ _

377K32005516 _ _ _ _
377K32005546 _ _ _ _

377K32005519 _ _ _ _
377K32005549 _ _ _ _

_ _ _ _ = Enter the type of drive to complete the code.

MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES		
	Metal Work	37D1332000 *	37D1442000	37D1552000
	Manufacturer	RTA NDC 96	RTA PLUS A4	RTA PLUS B7
Metal Work / Manufacturer		(6A 24-75VDC)	(6A 24-75VDC)	(10A 28-62VAC) ●
STEPPING MOTORS				
37M1120001	SANYO DENKI 103-H7126-6640 (5.6A 75V max)	√	-	√ ■
37M1220000	B&R 80MPF3.250S000-01 + kit IP65 (5A 80V max)	√ ◆	√ ■	√ ■
STEPPING MOTORS + ENCODER				
37M8220000	B&R 80MPF3.500S114-01 (5A 80V max)	√ ◆	√ ■	√ ■
STEPPING MOTORS WITH BRAKE + ENCODER				
37M3220000	B&R 80MPF3.500D114-01 (5A 80V max)	√ ◆	√ ■	√ ■

✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive e.drive, code 37D1332002, can be used.

● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$ ◆ **Important!** Limit current ■ **Important!** lLimit current and voltage

MOTOR CODES		DRIVES CODES
	Metal Work	37D2100000
	Manufacturer	DELTA ASD-A2-0121-M
Metal Work / Manufacturer		(100W)
BRUSHLESS MOTORS		
37M2000000	DELTA ECMA-C20401RS (100W)	√
BRUSHLESS MOTORS WITH BRAKE		
37M4000000	DELTA ECMA-C20401SS (100W)	√

KEY TO CODES

									DRIVE		
CYL	37	7	0	32	0055	1	2	1	0	0	0
	TYPE	FAMILY	CARRIAGE TYPE	SIZE	STROKE	SCREW	VERSION	MOTOR	FLANGE	TORQUE	
	37 Electric actuators	**7** Electric slide CS	**0** Standard **K** V-Lock	**32** Ø32	**0055** 55 mm	**1** With pitch 4 ball screw **4** With pitch 10 ball screw	● **2** In-line IP55/65 ● **6** Geared right IP55/65 ● **9** Geared left IP55/65 ● **N** Geared with motor opposite to the slide IP55/65	**1** STEPPING **2** BRUSHLESS **3** STEPPING with BRAKE + encoder **4** BRUSHLESS with BRAKE **8** STEPPING + encoder	**0** 40x40 **1** NEMA 23 **2** 60x60	**0** 0 - 0.79 Nm **2** 1.2 - 2.19 Nm	**0** Base **1** Greater rpm

● Version available for all drives, except for motor code 37M1120001, which is IP55 protected.

POSSIBLE ORDERING CODES

Drive
Version
Screw pitch

377032_ _ _ _	1	2	1121*
377K32_ _ _ _	4	6	1220
		9	8220
		N	3220
			2000
			4000

_ _ _ _ = enter the stroke in mm

* Only IP55 rating applies for this type of motor drive

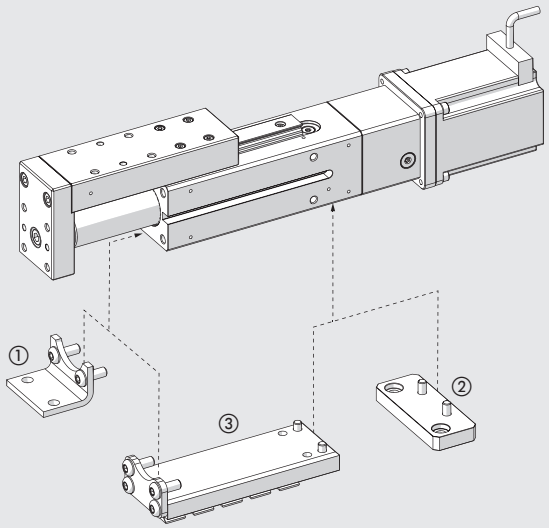
NOTES

ACCESSORIES FOR ELECTRIC SLIDE SERIES ELEKTRO CS

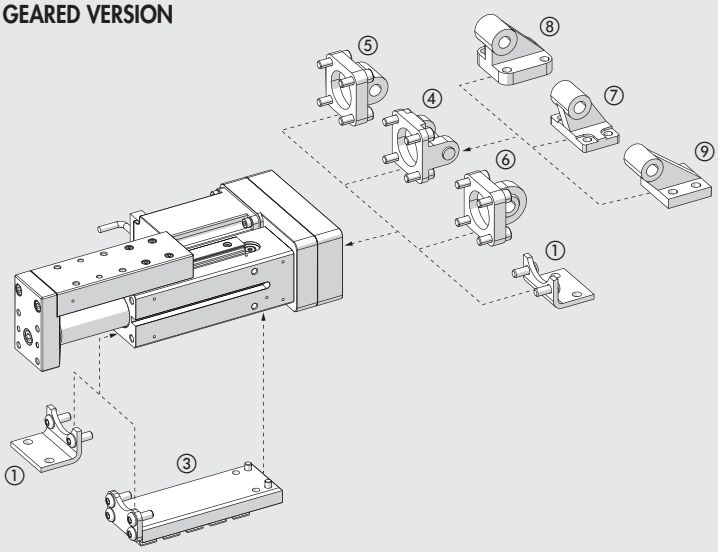
Note: Where specified, limit the maximum axial loads (Fmax) according to the electric slides.

FIXING OPTIONS

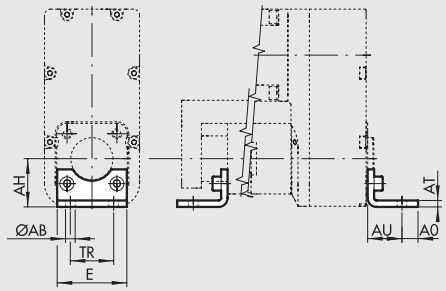
IN-LINE VERSION



GEARED VERSION



① FOOT MODEL A ELEKTRO CS

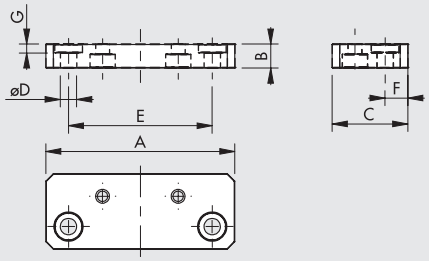


STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	Weight [g]	Fmax [N]
0950327111	32	7	32	11	4	24	32	45	76	1600

Note: Individually packed with 2 screws.

② ELEKTRO CS IN-LINE BACK FOOT

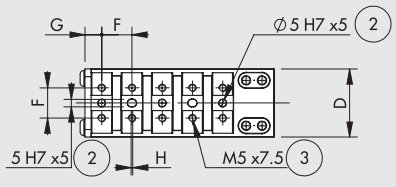


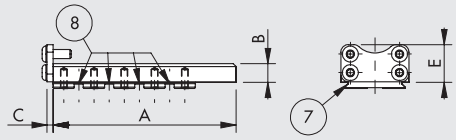
ALUMINIUM

Code	Ø	A	B	C	D	E	F	G	Weight [g]	Fmax [N]
0950327110	32	75	9.5	30	6.5	57	9	3.5	60	1600

Note: Individually packed with 2 screws.
N.B.: Use in the In-Line version only.

③ ELEKTRO CS V-LOCK FITTING





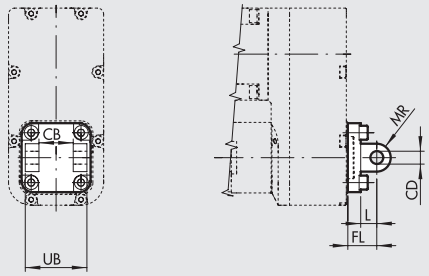
ALUMINIUM

Code	Ø	A	B	C	D	E	F	G	H	Weight [g]
0950327110K	32	121	13	4	45	25	20	11	1	740

Note: Individually packed with 6 screws.

② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**.
⑧ Slot for "V-Lock" precision key

④ FEMALE HINGE - MODEL B



ALUMINIUM

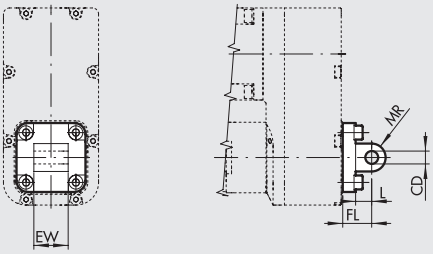
Code	Ø	UB	CB H14	FL	CD H9	MR	L	Weight [g]	Fmax [N]
W0950322003	32	45	26	22	10	10	12	116	800

STEEL

Code	Ø	UB	CB H14	FL	CD H9	MR	L	Weight [g]	Fmax [N]
W095E322003	32	45	26	22	10	10	13	348	1600

Note: Supplied with 4 screws, 4 washers, 2 snap rings and 1 pin.
N.B.: Mounting requires 4 M6x16 UNI 5931screws.

⑤ MALE HINGE - MODEL BA



ALUMINIUM

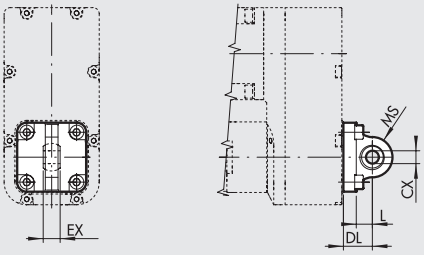
Code	Ø	EW	FL	MR	CD H9	L	Weight [g]	Fmax [N]
W0950322004	32	26	22	10	10	13	94	800

STEEL

Code	Ø	EW	FL	MR	CD H9	L	Weight [g]	Fmax [N]
W095E322004	32	26	22	10	10	13	282	1600

Note: Supplied with 4 screws.
N.B.: Mounting requires 4 M6x14 UNI 5931screws.

⑥ ARTICULATED MALE HINGE - MODEL BAS



ALUMINIUM

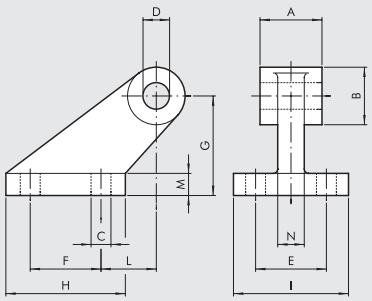
Code	Ø	DL	MS	L	CX H9	EX	Weight [g]	Fmax [N]
W0950322006	32	22	16	12	10	14	106	800

STEEL

Code	Ø	DL	MS	L	CX H9	EX	Weight [g]	Fmax [N]
W095E322006	32	22	15	14	10	14	318	1600

Note: Supplied with 4 screws, 4 washers.
N.B.: Mounting requires 4 M6x16 UNI 5931screws.

⑦ CETOP HINGE FOR MODEL B - MODEL GL

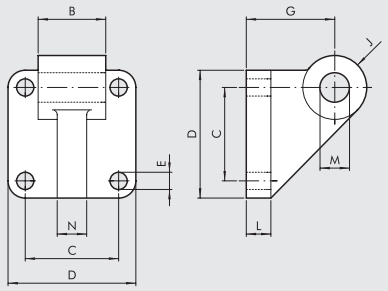


ALUMINIUM

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

Note: Supplied with 4 screws, 4 washers.

⑧ COUNTER-HINGE FOR MODEL B - MODEL GS

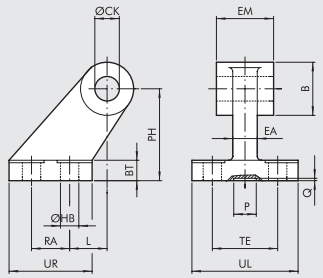


ALUMINIUM

Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]	Fmax [N]
W0950322108	32	26	32.5	45	7	32	11	10	10	10	106	800

Note: Supplied with 4 screws, 4 washers.

⑨ ISO 15552 COUNTER-HINGE FOR MODEL B - MODEL AB7



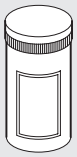
ALUMINIUM

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

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	20	5	180	1600

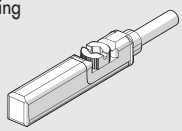
GREASE



Code	Description	Weight [g]
9910514	Grease pipe ULTRAPLEX FG1 NSF CAT H1	400

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing



For codes and technical data, see **chapter A6**.

DRIVES

For motor-drive couplings see table on page **A5**.168

SPARE PARTS

ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.168

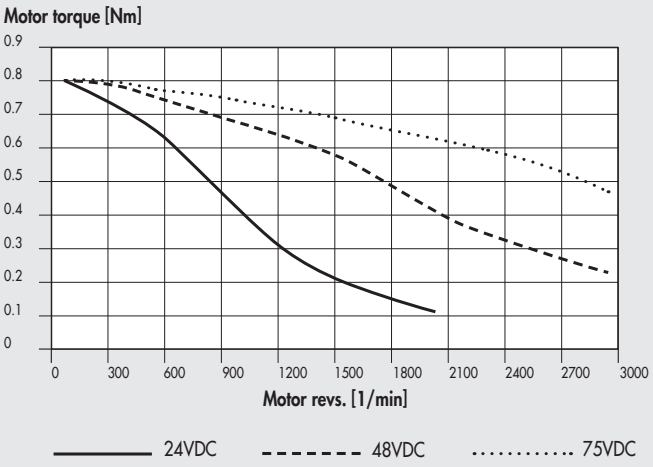
STEPPING MOTORS

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%.

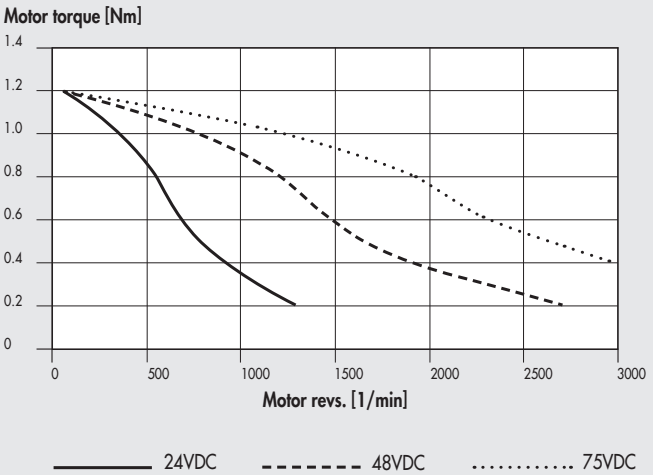
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS

STEPPING motor code **37M1110000**



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	$kgmm^2$	21
Theoretical acceleration	$rad \cdot s^{-2}$	50000
Back E.M.F.	V/krpm	20
Mass	kg	0.65
Degree of protection		IP40

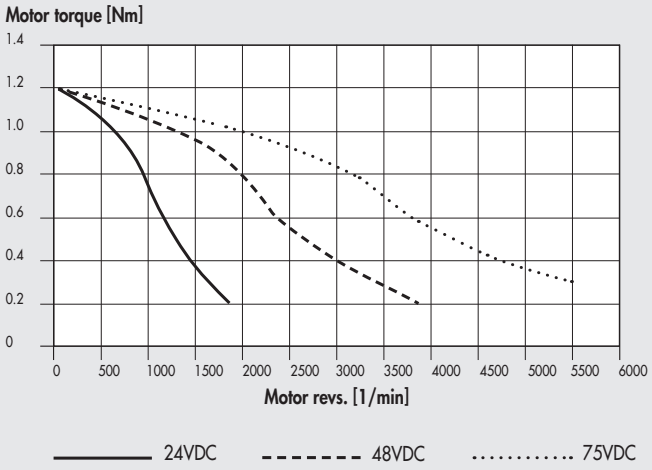
STEPPING motor code **37M1120000**



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	$kgmm^2$	36
Theoretical acceleration	$rad \cdot s^{-2}$	45800
Back E.M.F.	V/krpm	31
Mass	kg	1
Degree of protection		IP40

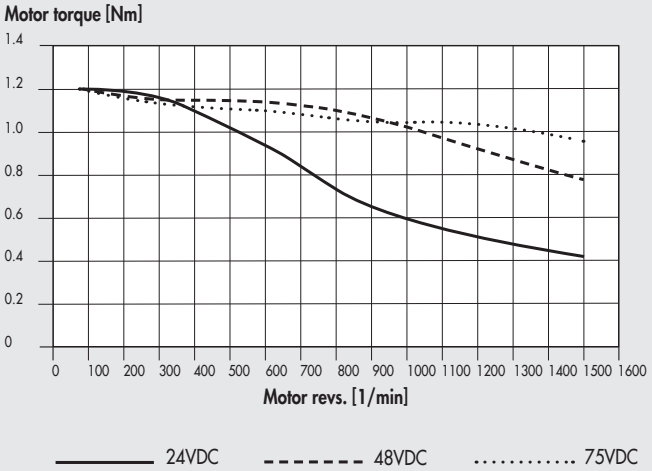
METAL WORK PNEUMATIC

STEPPING motor code **37M1120001**



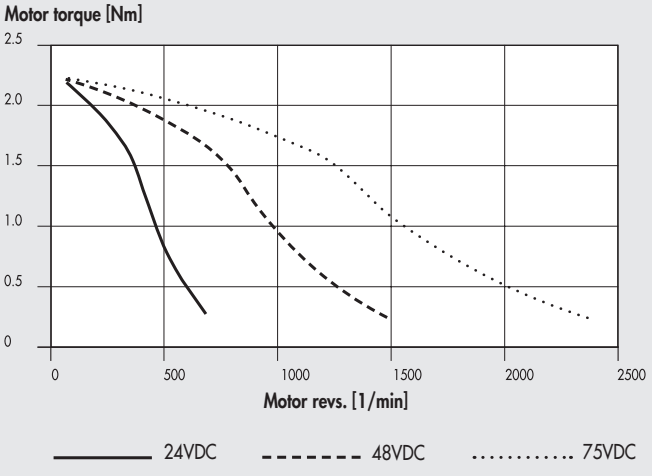
TECHNICAL DATA		MOTOR 37M1120001
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	5.6
Resistance	Ω	0.3
Inductance	mH	0.85
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm^2	36
Theoretical acceleration	rad · s^{-2}	45800
Back E.M.F.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

STEPPING motor code **37M1220000**



TECHNICAL DATA		MOTOR 37M1220000
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**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^2	44
Mass	kg	1.28
Degree of protection		IP65
CABLE		
Power cable for stepping motors with brake, 1 metre		supplied

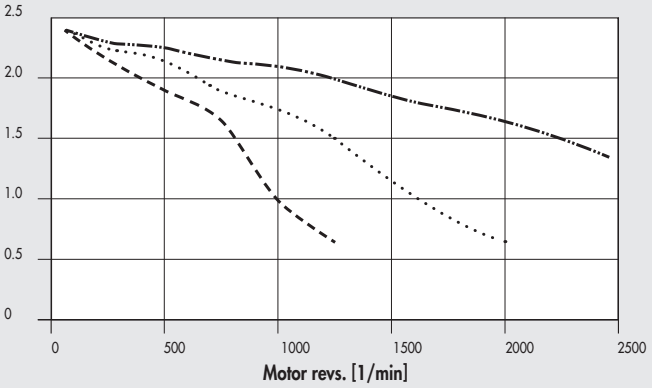
STEPPING motor code **37M1230000**



TECHNICAL DATA		MOTOR 37M1230000
Motor type		STEPPING
Nominal torque	Nm	**2.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.65
Inductance	mH	2.4
Bipolar holding torque	Nm	3
Rotor inertia	kgmm^2	84
Theoretical acceleration	rad · s^{-2}	35700
Back E.M.F.	V/krpm	75
Mass	kg	1.4
Degree of protection		IP40

STEPPING motor code **37M1430000**

Motor torque [Nm]

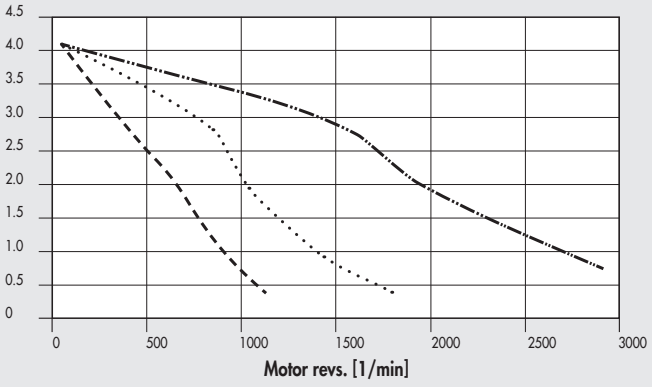


48VDC 75VDC 140VDC

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	kgmm²	145
Theoretical acceleration	rad · s⁻²	20600
Back E.M.F.	V/krpm	50
Mass	kg	1.5
Degree of protection		IP43

STEPPING motor code **37M1440000**

Motor torque [Nm]

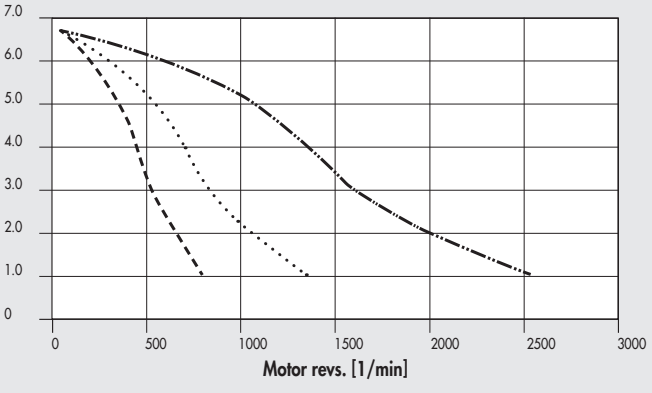


48VDC 75VDC 140VDC

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	kgmm²	290
Theoretical acceleration	rad · s⁻²	19300
Back E.M.F.	V/krpm	93
Mass	kg	2.5
Degree of protection		IP43

STEPPING motor code **37M1450000**

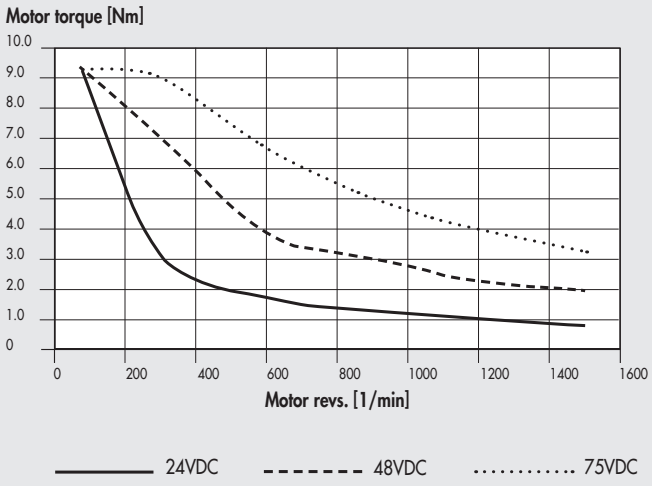
Motor torque [Nm]



48VDC 75VDC 140VDC

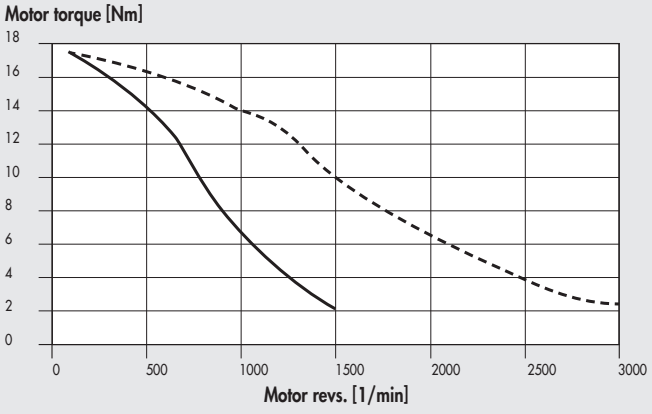
TECHNICAL DATA		MOTOR 37M1450000
Motor type		STEPPING
Nominal torque	Nm	**6.7**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current parallel	A	6
Resistance	Ω	0.46
Inductance	mH	3.8
Bipolar holding torque	Nm	9.2
Rotor inertia	kgmm²	450
Theoretical acceleration	rad · s⁻²	20500
Back E.M.F.	V/krpm	161
Mass	kg	4
Certifications		UL, CSA, CE, RoHS
Insulation voltage		250VAC (350VDC)
Degree of protection		IP43 - F

STEPPING motor code **37M1470000**



TECHNICAL DATA		MOTOR 37M1470000
Motor type		STEPPING
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	kgmm²	392
Mass	kg	4.2
Degree of protection		IP40

STEPPING motor code **37M1890000**



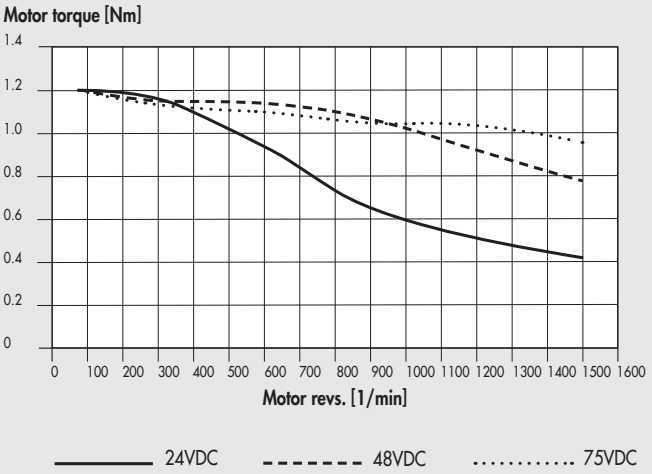
TECHNICAL DATA		MOTOR 37M1890000
Motor type		STEPPING
Nominal torque	Nm	**17.5**
Coupling flange		**NEMA 42**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.63
Inductance	mH	8
Bipolar holding torque	Nm	24.6
Rotor inertia	kgmm²	2200
Theoretical acceleration	rad · s⁻²	11100
Back E.M.F.	V/krpm	410
Mass	kg	10
Degree of protection		IP43

NOTES

STEPPING MOTORS WITH ENCODER

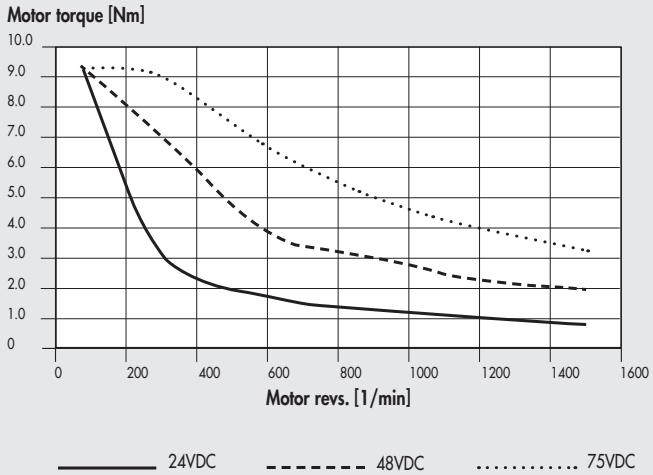
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH ENCODER

STEPPING motor + ENCODER code **37M8220000**



TECHNICAL DATA		MOTOR 37M8220000
Motor type		STEPPING + ENCODER
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**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	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
CABLES		
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**

STEPPING motor with ENCODER code **37M8470000**

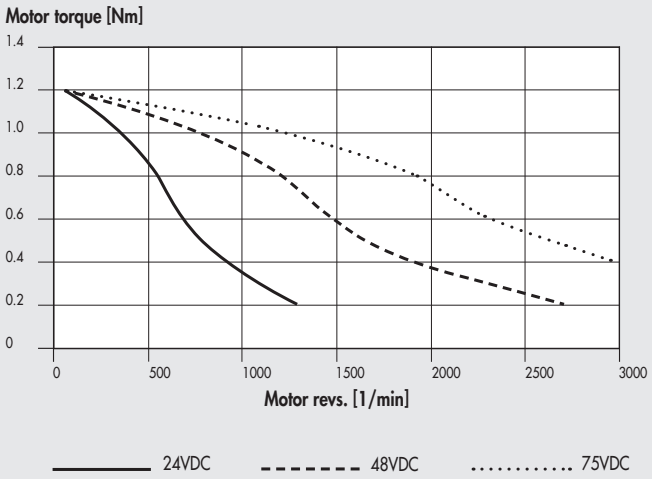


TECHNICAL DATA		MOTOR 37M8470000
Motor type		STEPPING with ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.3
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
CABLES		
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**

STEPPING MOTORS WITH BRAKE

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE

STEPPING motor with BRAKE code **37M5120000**



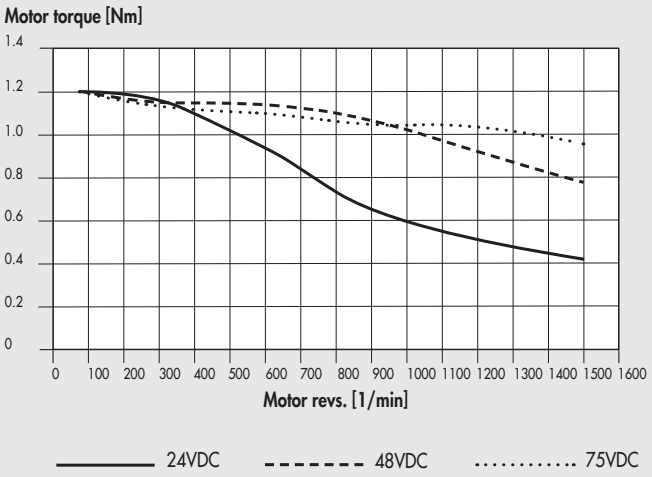
TECHNICAL DATA		MOTOR 37M5120000
Motor type		STEPPING with BRAKE
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	$kgmm^2$	36
Theoretical acceleration	$rad \cdot s^{-2}$	45800
Back E.M.F.	V/krpm	31
Mass	kg	1.5
Degree of protection		IP20
BRAKE		
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

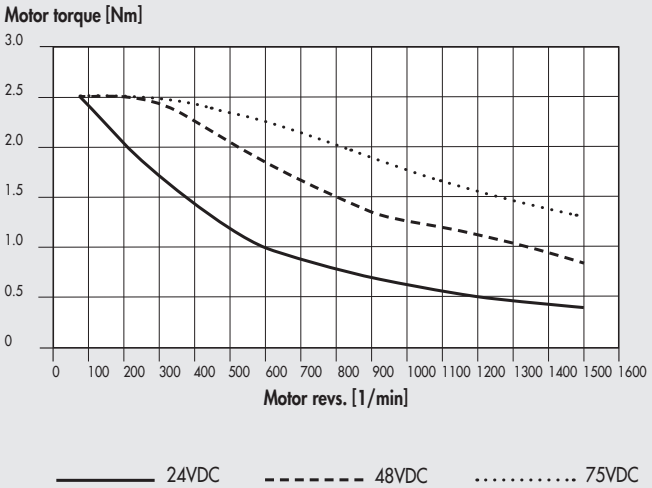
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE + ENCODER

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



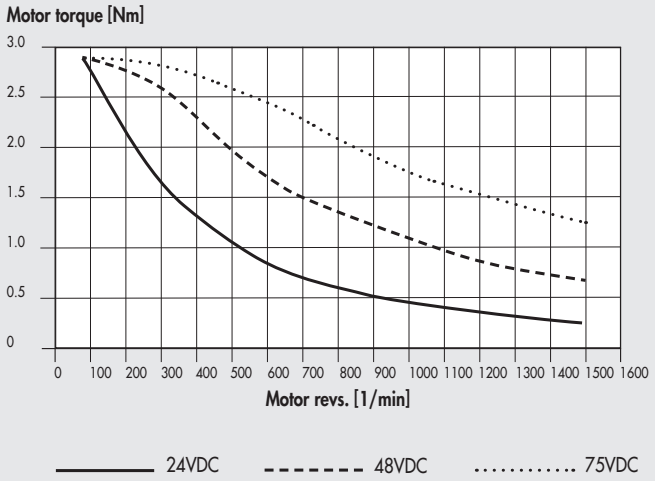
TECHNICAL DATA		MOTOR 37M3220000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
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
CABLES		
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**

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



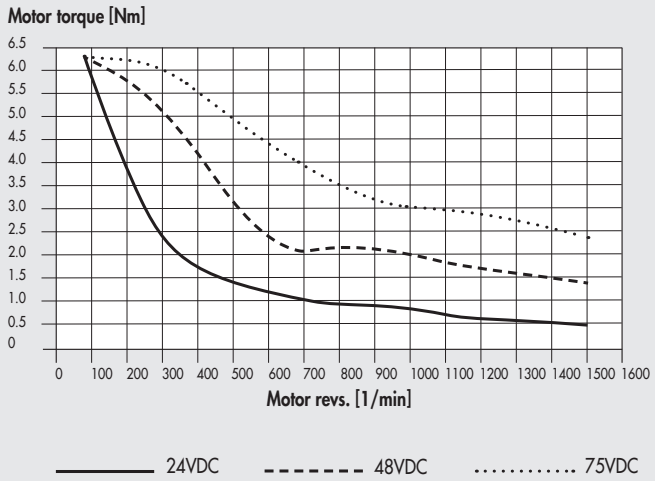
TECHNICAL DATA		MOTOR 37M3230000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.5**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Bipolar current	A	5
Resistance	Ω	0.6
Inductance	mH	2.8
Bipolar holding torque	Nm	3.5
Rotor inertia	kgmm²	92
Mass	kg	1.8
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
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
CABLES		
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**

STEPPING motor with BRAKE + ENCODER code **37M3430000**



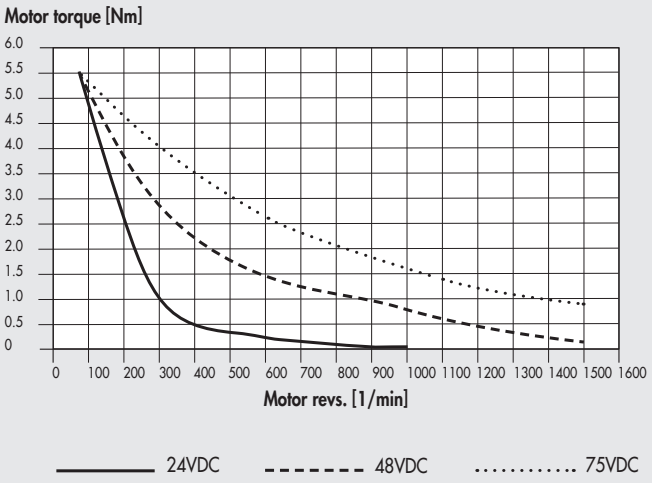
TECHNICAL DATA		MOTOR 37M3430000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.9**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.4
Inductance	mH	3.2
Bipolar holding torque	Nm	4
Rotor inertia	kgmm²	131
Mass	kg	2.5
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
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
CABLES		
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**

STEPPING motor with BRAKE + ENCODER code **37M3450000**



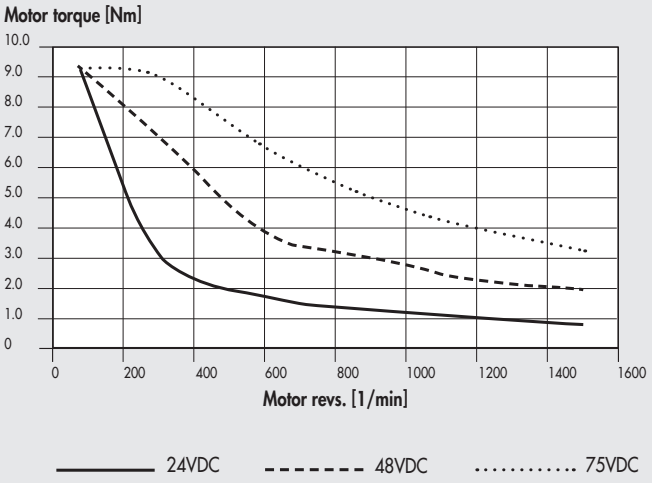
TECHNICAL DATA		MOTOR 37M3450000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**6.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.2
Inductance	mH	1.4
Bipolar holding torque	Nm	9.5
Rotor inertia	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
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
CABLES		
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**

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	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
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
CABLES		
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**

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

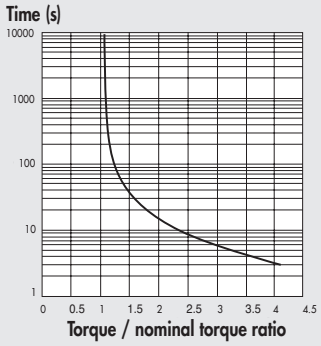


TECHNICAL DATA		MOTOR 37M3470000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.9
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
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
CABLES		
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**

BRUSHLESS MOTORS

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.

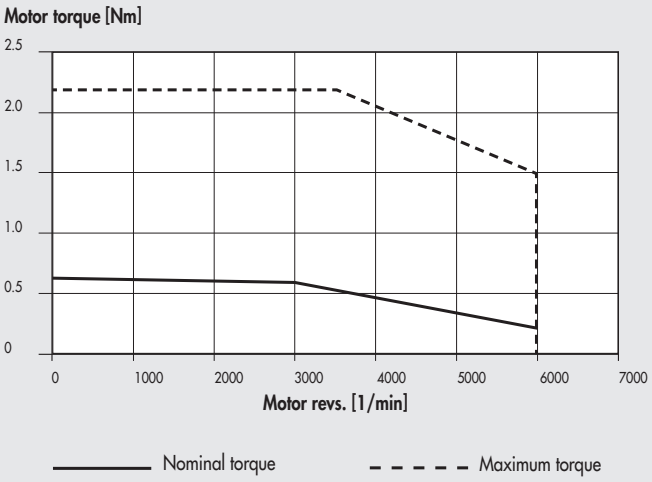


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

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

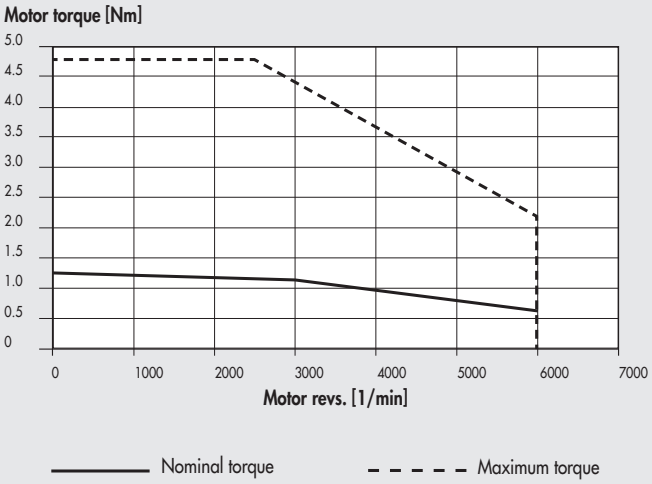
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor code **37M2200000** +
drive code **37D2400008** (200W)



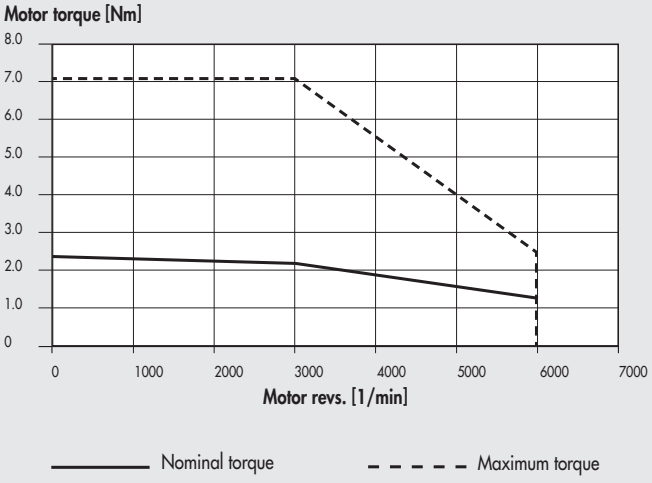
TECHNICAL DATA		MOTOR 37M2200000
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	21.9
Mass	kg	0.84
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**

BRUSHLESS motor code **37M2220000** +
drive code **37D2400008** (400W)



TECHNICAL DATA		MOTOR 37M2220000
Motor type		BRUSHLESS
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	41.2
Mass	kg	1.3
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**

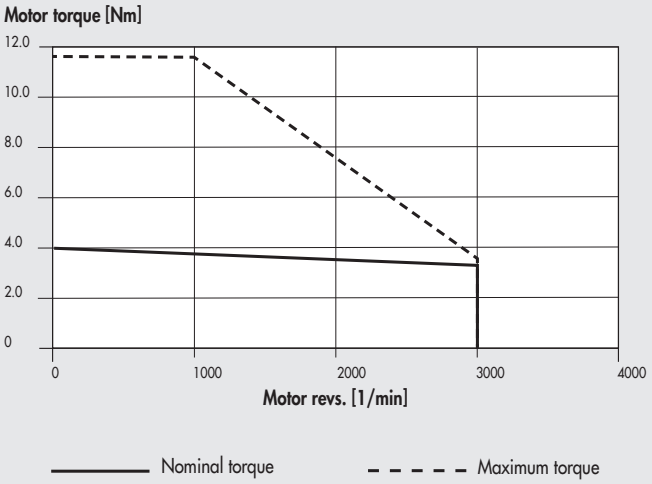
BRUSHLESS motor code **37M2330000** +
drive code **37D2400008** (750W)



DATI TECNICI		MOTORE 37M2330000
Motor type		BRUSHLESS
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	2.55
Maximum torque	Nm	7.1
Rotor inertia	kgmm²	182
Mass	kg	2.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**

METAL WORK PNEUMATIC

BRUSHLESS motor code **37M2540000** +
drive code **37D2400008** (1000W)

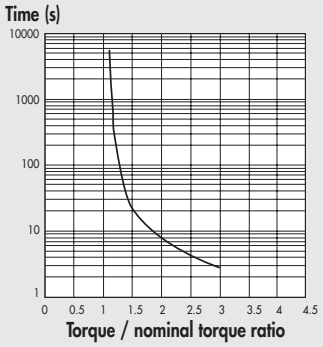


TECHNICAL DATA		MOTOR 37M2540000
Motor type		BRUSHLESS
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	$kgmm^2$	238.3
Mass	kg	3.5
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**

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.

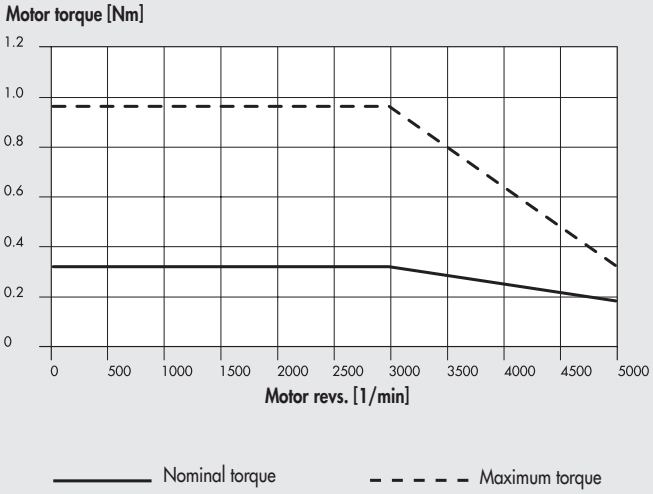


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (DELTA)

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

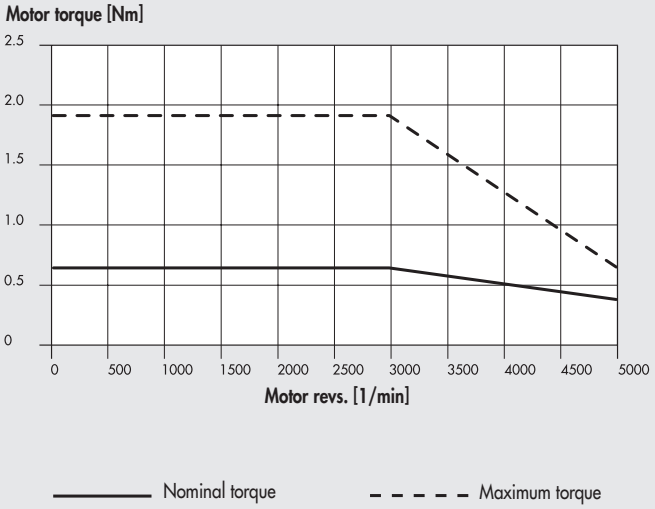
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor code **37M2000000** + drive code **37D2100000** (100W)



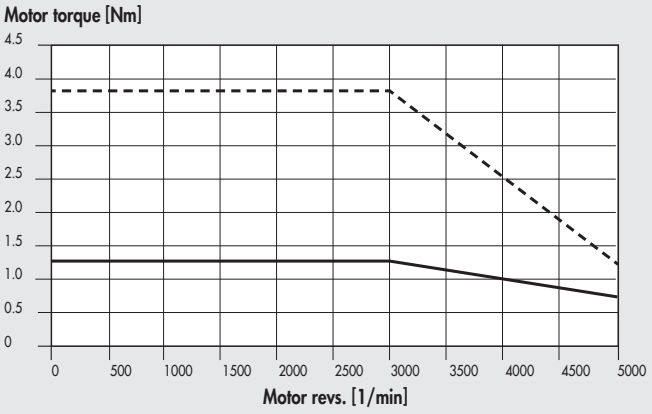
TECHNICAL DATA		MOTOR 37M2000000
Motor type		BRUSHLESS
Nominal torque	Nm	**0.32**
Coupling flange (square)	mm	**40**
Nominal power	W	100
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.32
Maximum torque	Nm	0.96
Rotor inertia	$kgmm^2$	3.7
Mass	kg	0.5
Encoder	imp./giro	131072 (17 bit)
Degree of protection		IP65
DRIVE	codice	**37D2100000**
CABLES		
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 **37M2200001** +
drive code **37D2200001** (200W)



TECHNICAL DATA		MOTOR 37M2200001
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	kgmm²	17.7
Mass	kg	1.2
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2200001**
CABLES		
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**

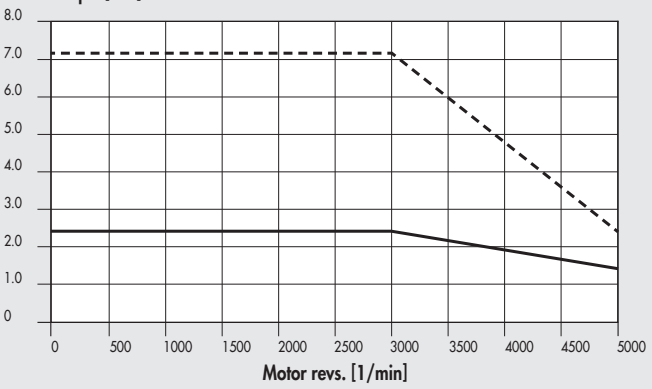
BRUSHLESS motor code **37M2220001** +
drive code **37D2300000** (400W)



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	kgmm²	27.7
Mass	kg	1.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2300000**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130001**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
Brushless **motor-drive**, 5 metres		**37C2150001**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150002**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250002**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200003**

BRUSHLESS motor code **37M2330001** +
drive code **37D2400007** (750W)

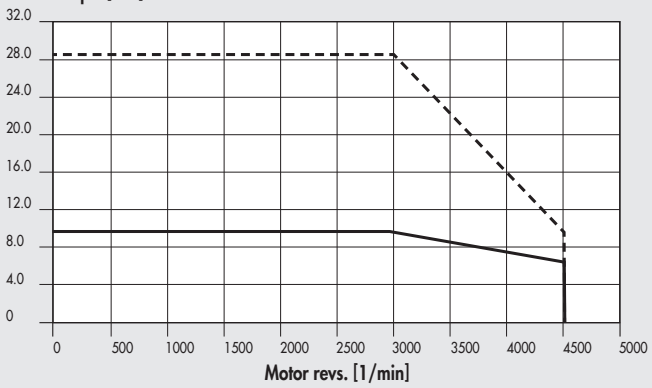
Motor torque [Nm]



TECHNICAL DATA		MOTOR 37M2330001
Motor type		BRUSHLESS
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	2.39
Maximum torque	Nm	7.17
Rotor inertia	kgmm²	113
Mass	kg	3
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
DRIVE	code	**37D2400007**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130001**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
Brushless **motor-drive**, 5 metresS		**37C2150001**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150002**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250002**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200003**

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

Motor torque [Nm]

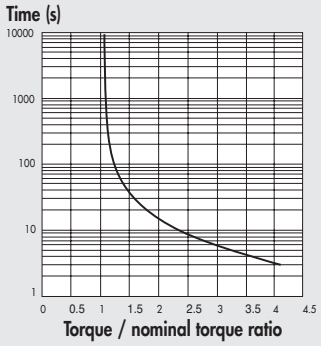


TECHNICAL DATA		MOTOR 37M2770000
Motor type		BRUSHLESS
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm²	1270
Mass	kg	7.8
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
DRIVE	code	**37D2600001**
CABLES		
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**

BRUSHLESS MOTORS WITH BRAKE

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.

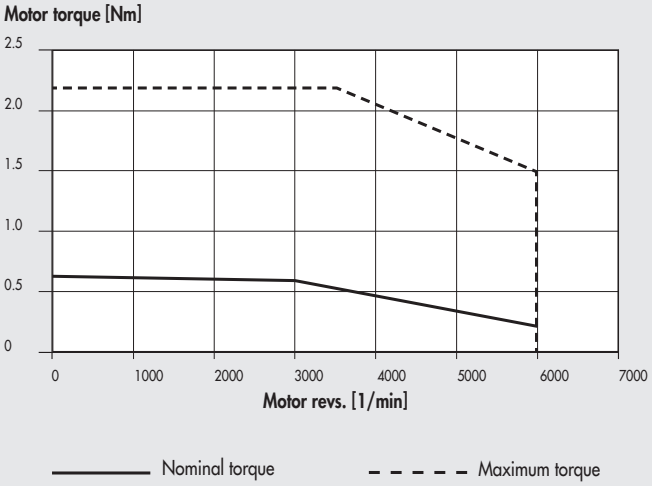


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (SANYO DENKI)

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

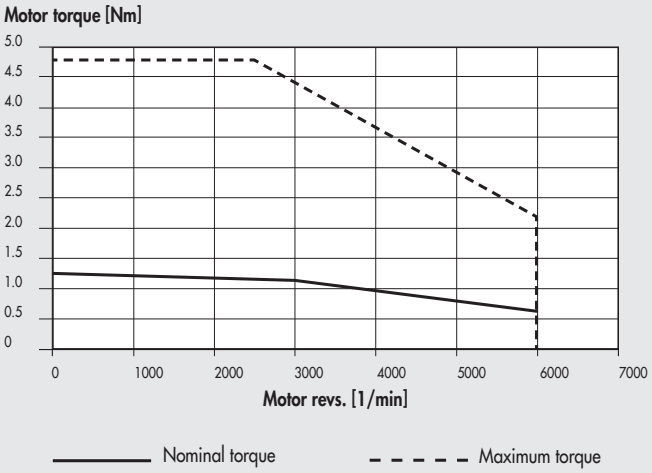
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor with BRAKE code **37M4200000** + drive code **37D2400008** (200W)



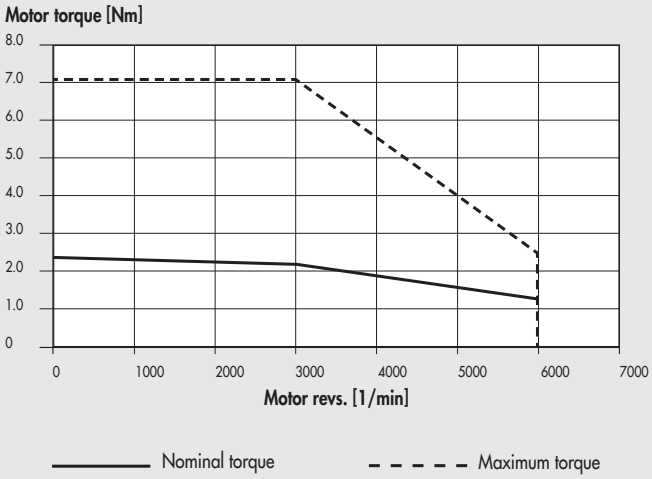
TECHNICAL DATA		MOTOR 37M4200000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	27.9
Mass	kg	1.23
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.37 min
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**

BRUSHLESS motor with BRAKE code **37M4220000** + drive code **37D2400008** (400W)



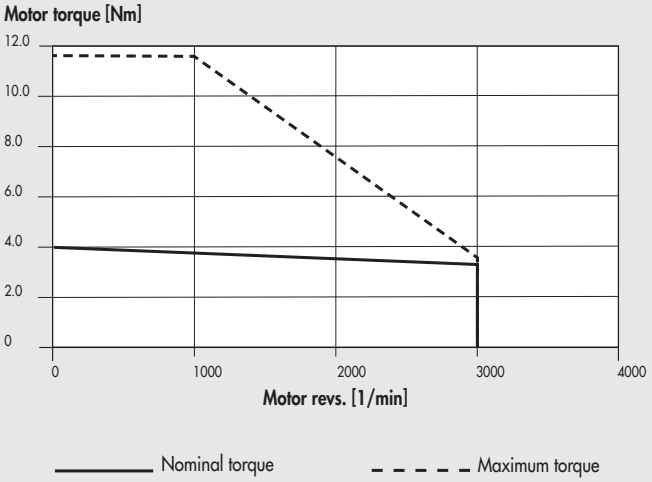
TECHNICAL DATA		MOTOR 37M4220000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	47.2
Mass	kg	1.69
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.37 min
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**

BRUSHLESS motor with BRAKE code **37M4330000** + drive code **37D2400008** (750W)



TECHNICAL DATA		MOTOR 37M4330000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	2.55
Maximum torque	Nm	8.5
Rotor inertia	kgmm²	207
Mass	kg	2.19
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	2.55 min
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**

BRUSHLESS motor with BRAKE code **37M4540000** + drive code **37D2400008** (1000W)

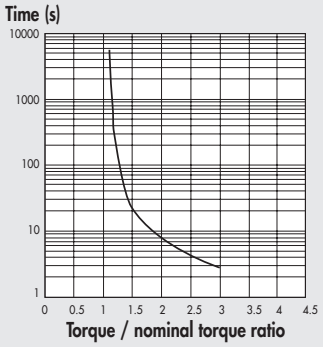


TECHNICAL DATA		MOTOR 37M4540000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	$kgmm^2$	272.6
Mass	kg	4.34
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	3.92 min
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**

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.

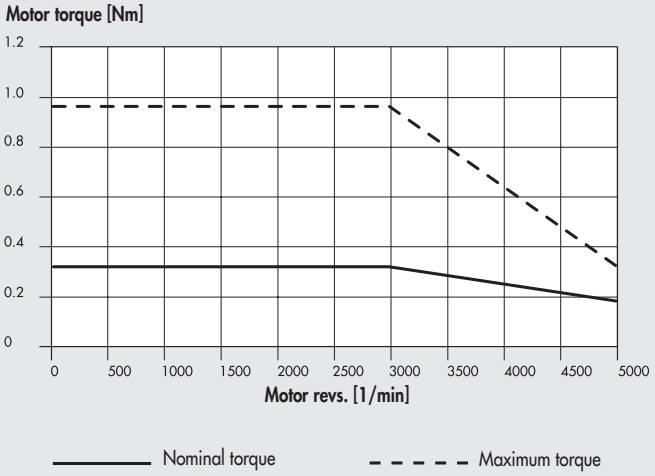


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (DELTA)

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

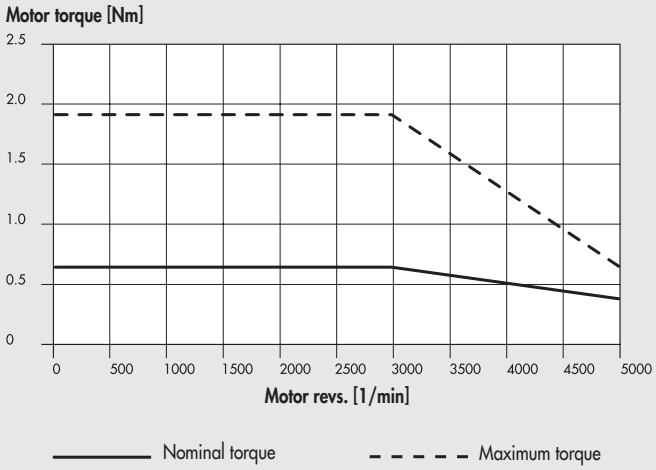
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor with BRAKE code **37M4000000** + drive code **37D2100000** (100W)



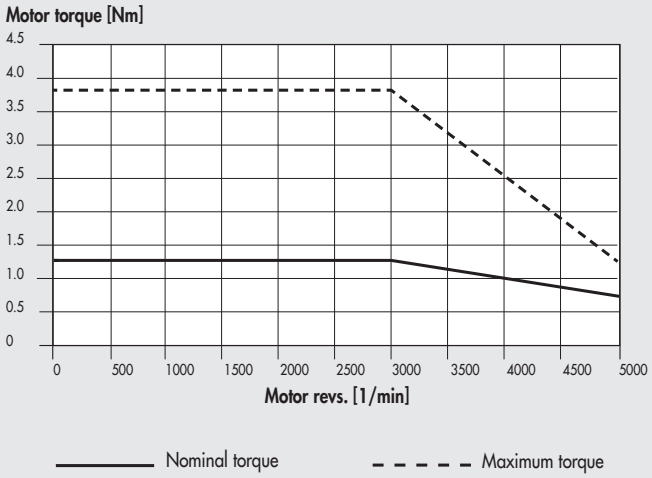
TECHNICAL DATA		MOTOR 37M4000000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.32**
Coupling flange (square)	mm	**40**
Nominal power	W	100
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.32
Maximum torque	Nm	0.96
Rotor inertia	kgmm^2	4
Mass	kg	0.8
Encoder	imp./giro	131072 (17 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	0.3
Absorption	W	7.2
DRIVE	code	**37D2100000**
CABLES		
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**

BRUSHLESS motor with BRAKE code **37M4200001** + drive code **37D2200001** (200W)



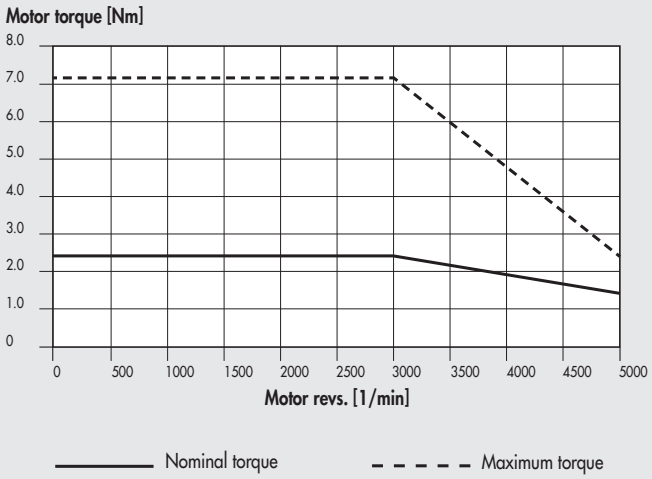
TECHNICAL DATA		MOTOR 37M4200001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	kgmm²	19.2
Mass	kg	1.5
Encoder	imp./giro	131072 (17 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.3
Absorption	W	6.5
DRIVE	code	**37D2200001**
CABLES		
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**

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



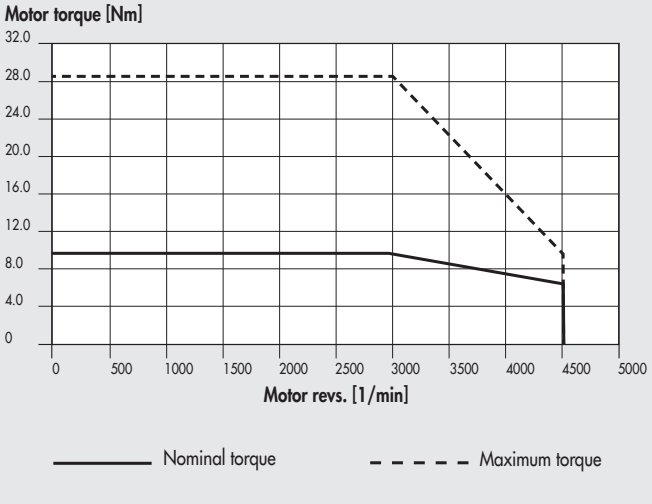
TECHNICAL DATA		MOTOR 37M4220001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm²	30
Mass	kg	2
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.3
Absorption	W	6.5
DRIVE	code	**37D2300000**
CABLES		
Brushless **motor-drive** with brake, 3 metres		**37C2730000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive** with brake **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive** with brake, 5 metres		**37C2750000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**
Brushless **motor-drive** with brake **dynamic** cable, 5 metres		**37C2750001**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250002**
Brushless **motor-drive** with brake **dynamic** cable, 10 metres		**37C2700001**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200003**

BRUSHLESS motor with BRAKE code **37M4330001** + drive code **37D2400007** (750W)



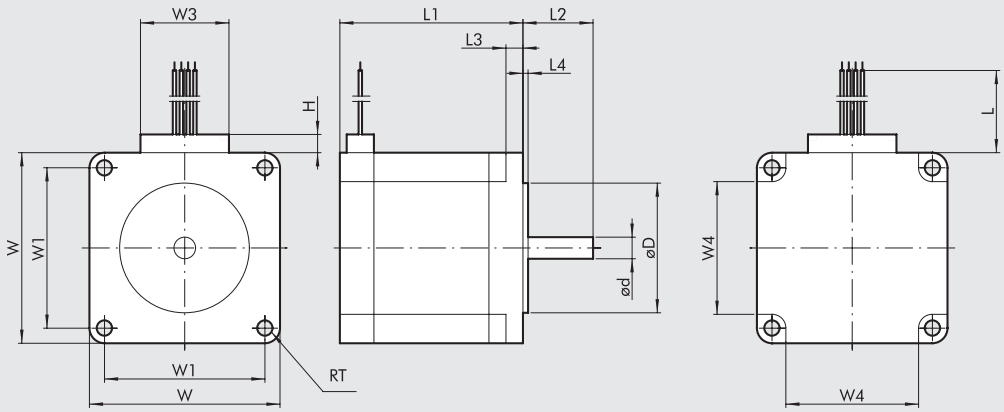
TECHNICAL DATA		MOTOR 37M4330001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	2.39
Maximum torque	Nm	7.17
Rotor inertia	kgmm²	113
Mass	kg	3
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	2.5
Absorption	W	6.5
DRIVE	Scode	**37D2400007**
CABLES		
Brushless **motor-drive** with brake, 3 metres		**37C2730000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive** with brake **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2230002**
Brushless **motor-drive** with brake, 5 metres		**37C2750000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**
Brushless **motor-drive** with brake **dynamic** cable, 5 metres		**37C2750001**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250002**
Brushless **motor-drive** with brake **dynamic** cable, 10 metres		**37C2700001**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200003**

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

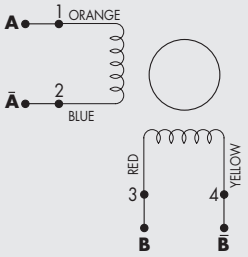


TECHNICAL DATA		MOTOR 37M4770000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm²	1400
Mass	kg	9.2
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	10
Absorption	W	19
DRIVE	code	**37D2600001**
CABLES		
Brushless **motor-drive-encoder**, 3 metres		**37C3230001**
Brushless **motor-drive** with brake, 3 metres		**37C3730000**
Brushless **motor-drive-encoder**, 5 metres		**37C3250001**
Brushless **motor-drive** with brake, 5 metres		**37C3750000**

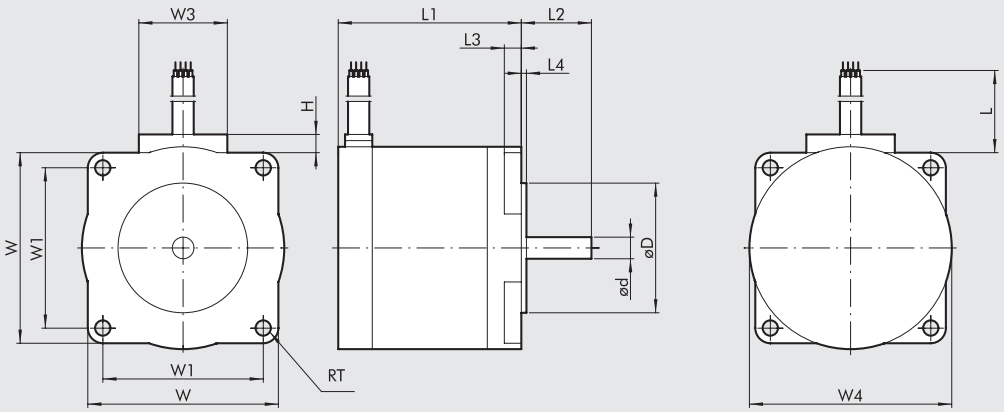
DIMENSIONS OF ELECTRIC MOTORS



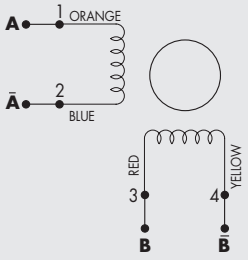
WIRING DIAGRAM



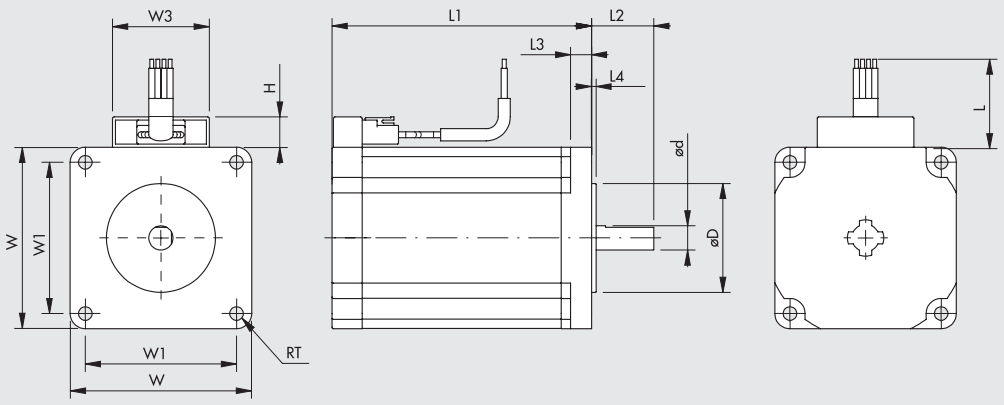
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5
STEPPING	37M1110000	0.8	NEMA 23	6.35	38.1	7	305	53.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120000	1.2	NEMA 23	6.35	38.1	7	305	75.8	20.6	5	1.5	4.5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



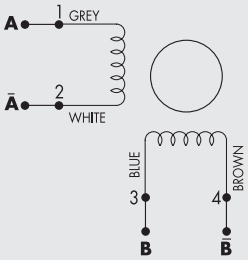
WIRING DIAGRAM



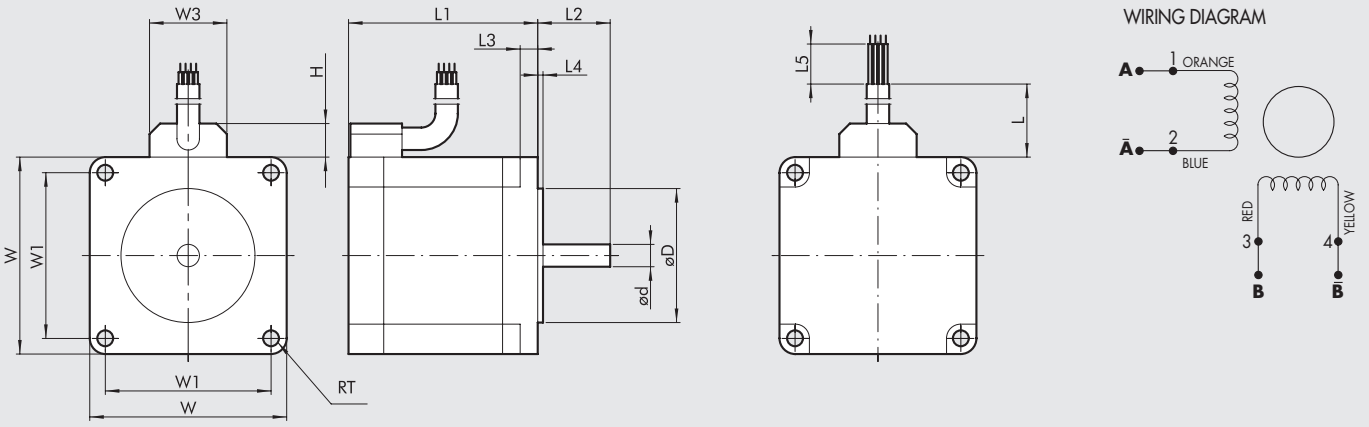
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H	L min	L1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.2	W3	W4 ±0.5
STEPPING	37M1430000	2.4	NEMA 34	9.525	73.02	10	305	62	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1440000	4.2	NEMA 34	12	73.02	10	305	92.2	30	4.8	1.5	5.4	82.5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



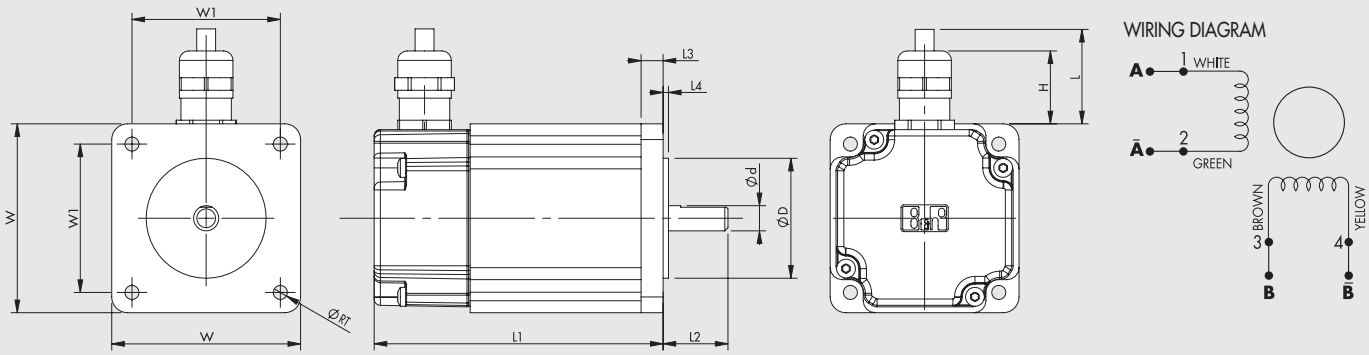
WIRING DIAGRAM



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	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	37M1230000	2.2	60	8	36	10	300	86	20.6	7	1.5	4.5	60	50	32

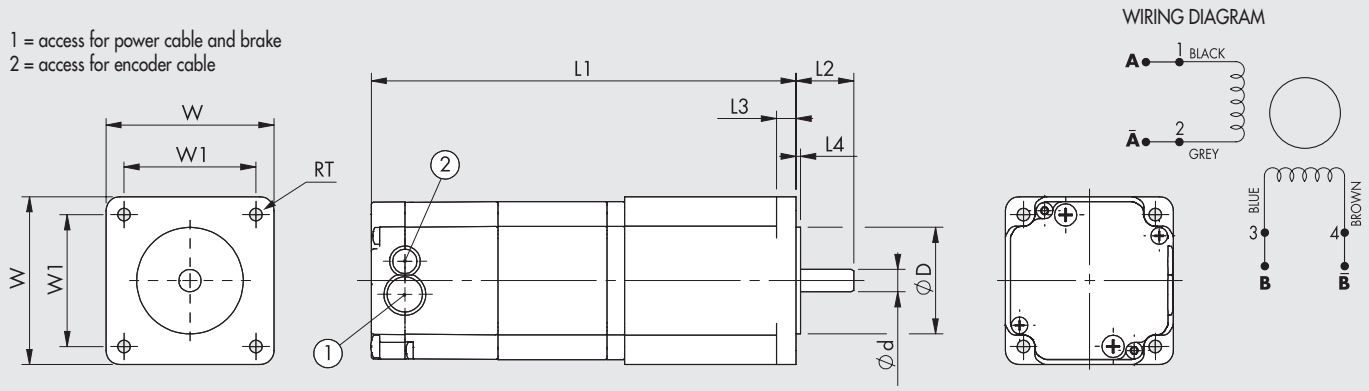


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	L5	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	**37M1450000**	**6.7**	**NEMA 34**	14	73.025	12	305	127	30	8	1.5	50	5.6	85.5	69.6	27



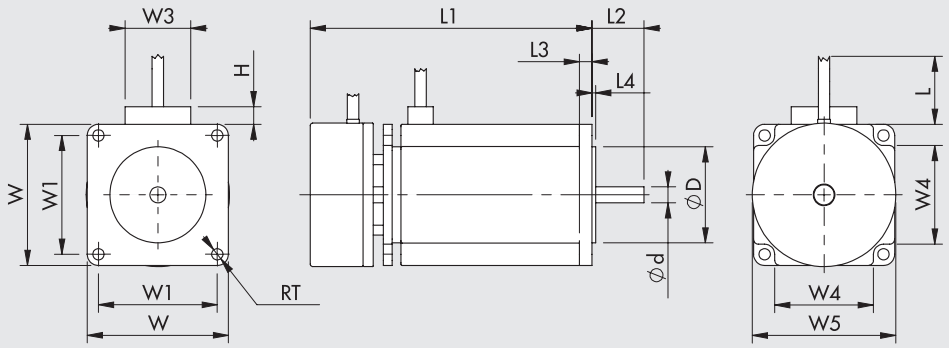
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.2	W ±0.5	W1 ±0.13
STEPPING	**37M1220000**	**1.2**	**60**	8	38.1	23	1023	91.8	20.6	7	1.6	4.5	60	47.14

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

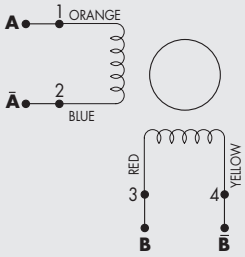


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	L1	L2 ±0.51	L3	L4	RT	W	W1 ±0.13
STEPPING	**37M1470000**	**9.3**	**NEMA 34**	12.7	73.025	130	31.75	9.91	2.03	5.6	86.6	69.6
STEPPING	**37M8220000**	**1.2**	**60**	8	38.1	106.6	20.6	7	1.6	4.5	60	47.14
+ ENCODER	**37M8470000**	**9.3**	**NEMA 34**	12.7	73.025	165.4	31.75	9.91	2.03	5.6	86.6	69.6
STEPPING	**37M3220000**	**1.2**	**60**	8	38.1	151.8	20.6	7	1.6	4.5	60	47.14
+ BRAKE	**37M3230000**	**2.5**	**60**	8	38.1	184.5	20.6	7	1.6	4.5	60	47.14
+ ENCODER	**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

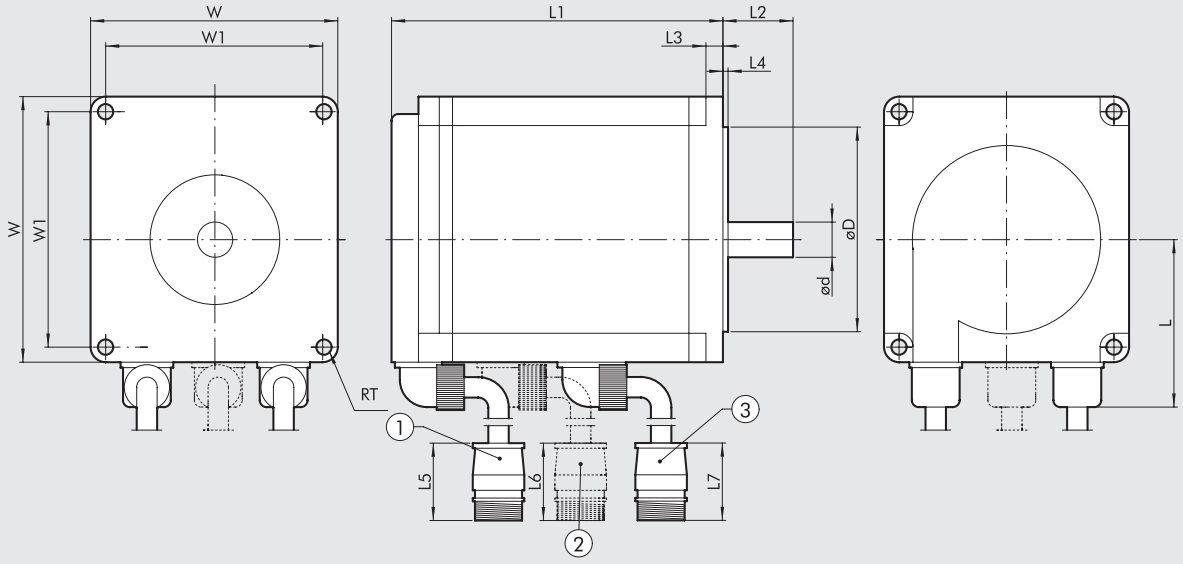
METAL WORK PNEUMATIC



WIRING DIAGRAM

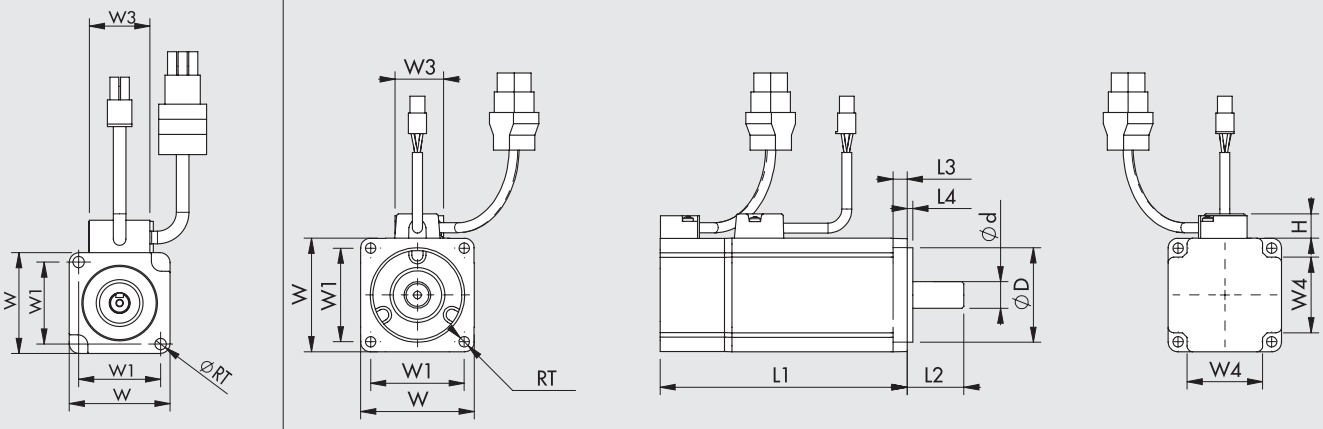


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5	W5 ±0.5
STEPPING + BRAKE	**37M5120000**	**1.2**	**NEMA 23**	6.35	38.1	7	305	111.8	20.6	5	1.5	4.5	56	47.14	26	39	56.9



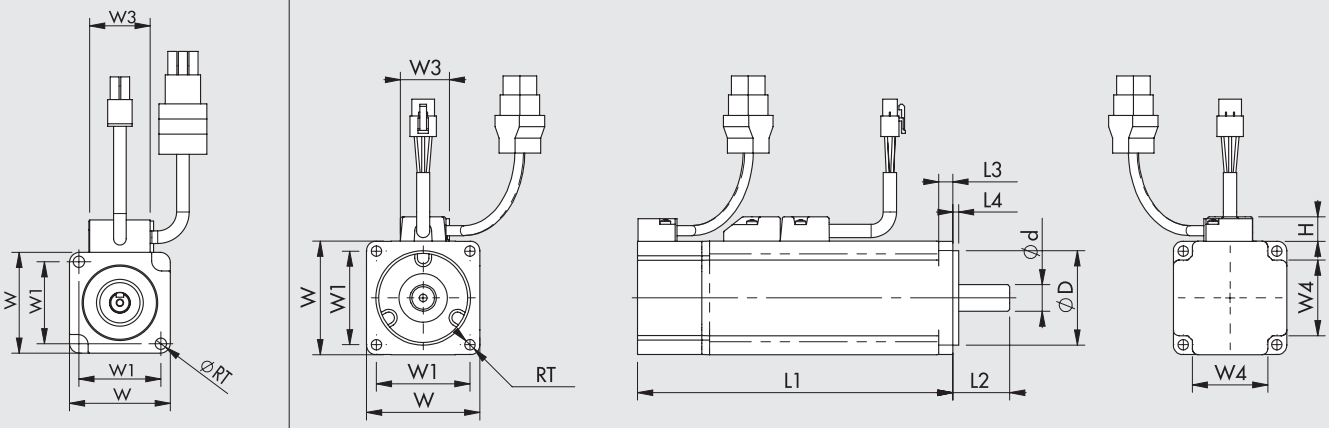
1 = encoder shielded cable, length 280 mm
2 = brake cable, length 280 mm
3 = motor cable, length 280 mm

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



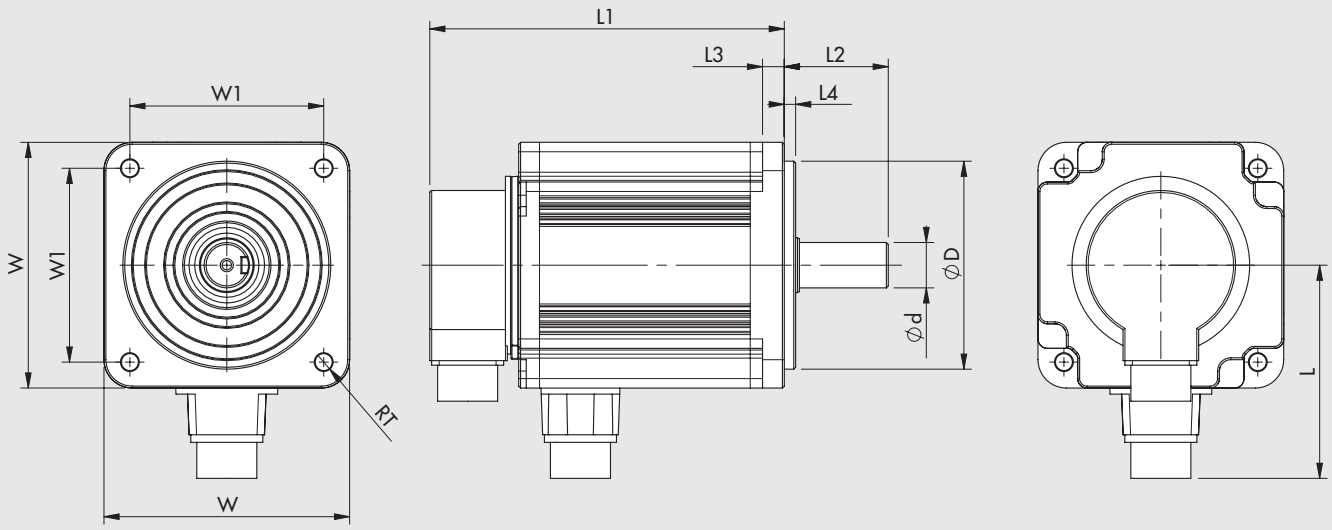
View for motor **37M2000000**

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)	**37M2000000**	**0.32**	**40**	8	30	13	100.6	25	5	2.5	4.5	40	32.53	25	-
	37M2200001	**0.64**	**60**	14	50	13	105.5	30	7.5	3	5.5	60	49.5	25	40
	37M2220001	**1.27**	**60**	14	50	13	130.7	30	7.5	3	5.5	60	49.5	30	40
	37M2330001	**2.39**	**80**	19	70	13	138.3	35	8	3	6.6	80	63.64	30	52



View for motor **37M4000000**

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 + BRAKE (DELTA)	**37M4000000**	**0.32**	**40**	8	30	13	136.6	25	5	2.5	4.5	40	32.53	25	-
	37M4200001	**0.64**	**60**	14	50	13	141.6	30	7.5	3	5.5	60	49.5	25	40
	37M4220001	**1.27**	**60**	14	50	13	166.8	30	7.5	3	5.5	60	49.5	30	40
	37M4330001	**2.39**	**80**	19	70	13	178	35	8	3	6.6	80	63.64	30	52



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD 0/-0.035	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

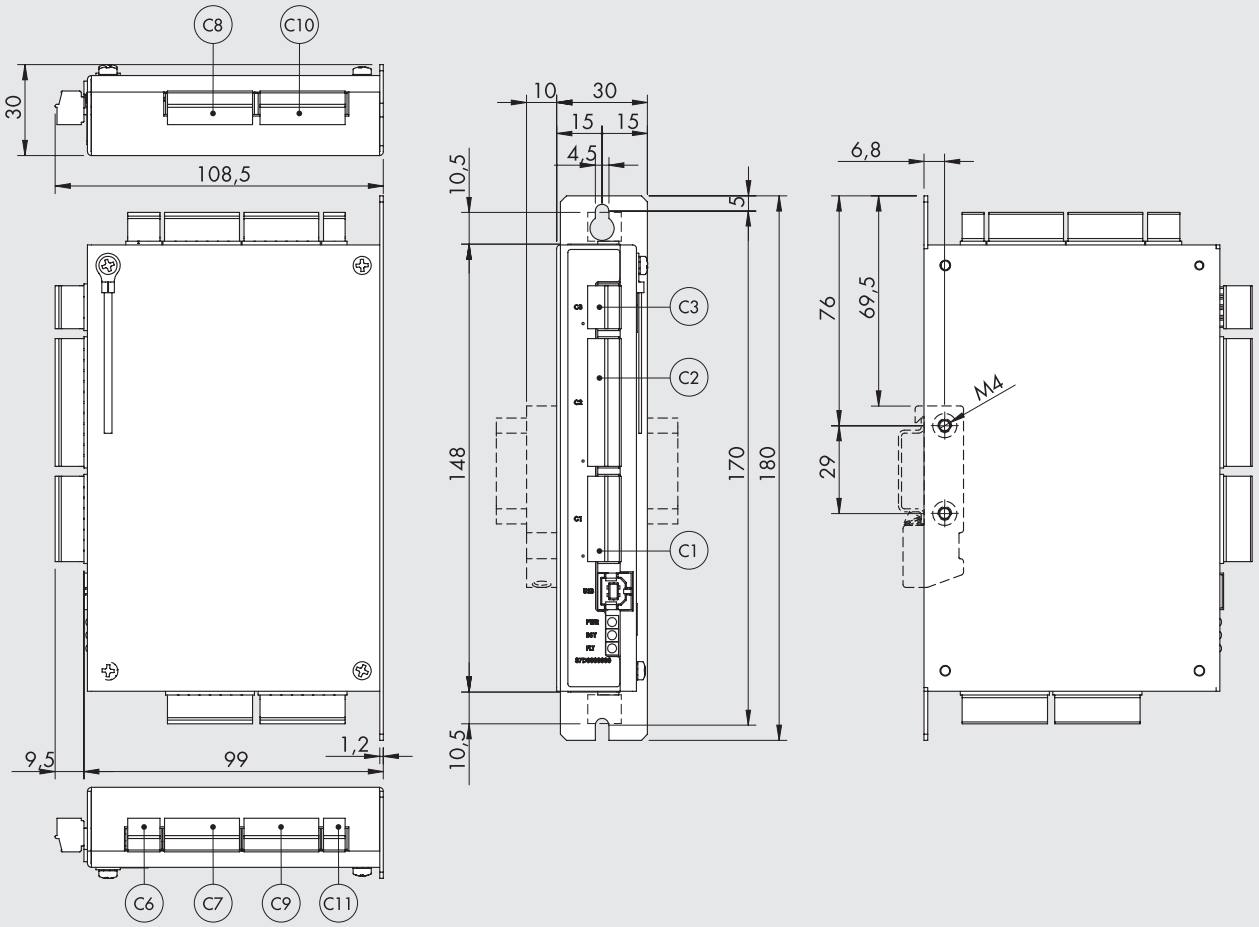
NOTES

PROGRAMMABLE UNIT
e.motion

An independent system, ideal for stand-alone applications not requiring the use of any PLC. It can control electric cylinders simply and intuitively, or any other electric actuator, using either a STEPPING MOTOR or a BRUSHLESS motor of any size and capacity, connected to the relevant drive with a STEP/DIRECTION interface. It is connected to PC via USB port, and the user has access to a motion-control configuration, programming and debug environment irrespective of the type of motor/drive/actuator chosen, which uses a user-friendly language (MW POS) and a set of simple instructions and functions to create work cycles, including complex ones as it can handle both digital and analogue inputs and outputs.
It consists of an electronic board housed in a metal box, which is designed for fixing to a wall or on a DIN bar with a fitting, and is equipped with removable screw connectors for wiring purposes.

TECHNICAL DATA		
Code		**37D0000000**
Stand-alone motion programming unit for motors-drives with a STEP/DIRECTION interface, type		Metal box
Dimensions	mm	148 x 99 x 30
Weight	g	460
Connectors		Screw type
Temperature range		0 to 50 °C – relative humidity 10-90%, non-condensing
Degree of protection		IP 20
Voltage		24VDC ±10%
Communication interface		Serial USB port for connection to PC
Configuration/programming/debug and diagnosis software		MW POS in Windows® environment
Dedicated signals		Encoder input (A + B + Z), Line Driver type
		STEP/DIRECTION outputs, with frequency up to 100 kHz, Line Driver type
Digital inputs		16, optoisolati, configurabili PNP o NPN, liberamente programmabili
Analogue inputs		2, from 0 to 10V, freely programmable
Digital outputs		15, Line Driver type, PNP, freely programmable
Analogue outputs		1, from 0 to 10V, freely programmable
Controls available		- Search for home position on the end stop, up against the stop, on the end stop and the encoder mark, up against the stop and the encoder zero mark; - Positioning in relative or absolute mode; - Force control; - Closed-loop motion control and step-loss control in the case of STEPPING motors with encoder; - Integrated brake control in the case of motors with a brake; - Possible control of multiple separate drivers in parallel for concurrent applications; - Complementary and logical instructions for complex work cycles, such as: timings; repetitions; analogue and digital I/O control; variables control; tests

DIMENSIONS

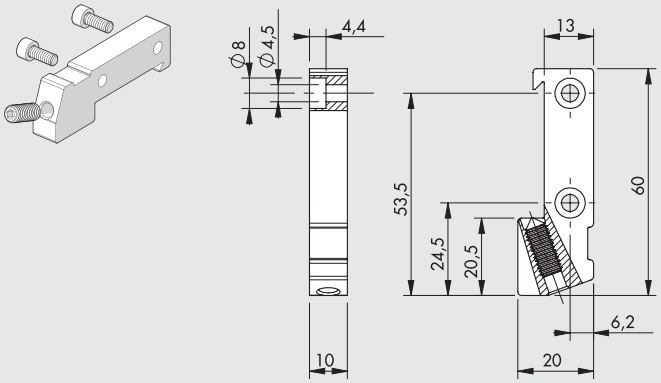


Below is a list of Phoenix Contact codes for the board connectors.

Connector	Description	Code Phoenix Contact
C11	2-pin plug with screw connection, MC 1.5/2-ST-3.5	1840366
C6	3-pin plug with screw connection, MC 1.5/3-ST-3.5	1840379
C3	4-pin plug with screw connection, MC 1.5/4-ST-3.5	1840382
C7, C9	7-pin plug with screw connection, MC 1.5/7-ST-3.5	1840418
C1, C8, C10	8-pin plug with screw connection, MC 1.5/8-ST-3.5	1840421
C2	12-pin plug with screw connection, MC 1.5/12-ST-3.5	1840463

ACCESSORIES

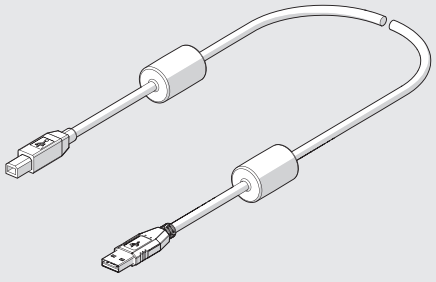
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



Code	Description	Weight [g]
095000M000	Bracket mountaing ***e***.motion / ***e***.drive on Omega bar (DIN EN 50022)	30

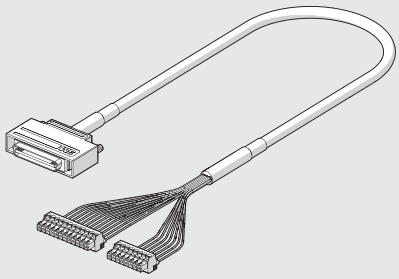
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

CABLE USB



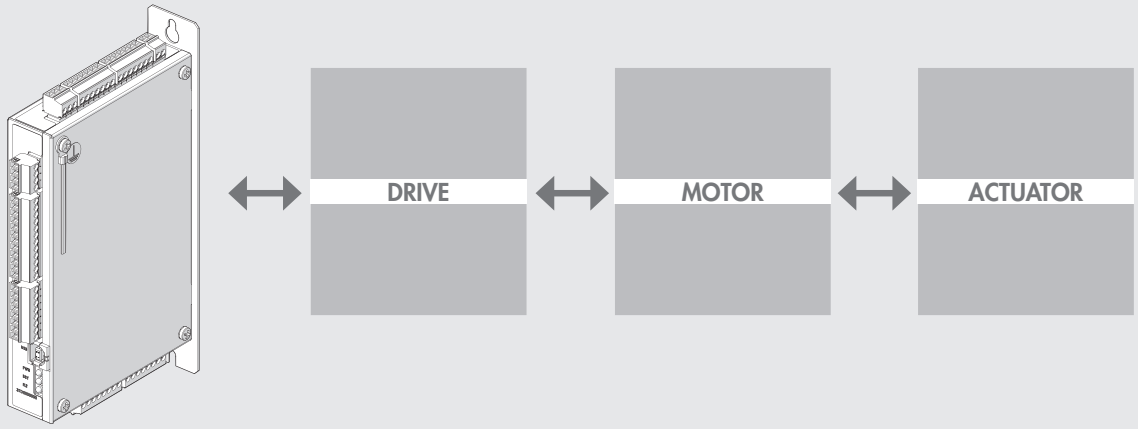
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the ***e***.motion / ***e***.drive board to a PC, 3 m	150

CABLE FOR BRUSHLESS DRIVERS



Code	Description	Weight [g]
37C2510000	Cable for connecting the ***e***.motion board to Sanyo Denki RS_A0_ driver, 1 m	130
37C2510001	Cable for connecting the ***e***.motion board to Delta ASDA A2 driver, 1 m	130

CONNECTION SCHEME



NOTES

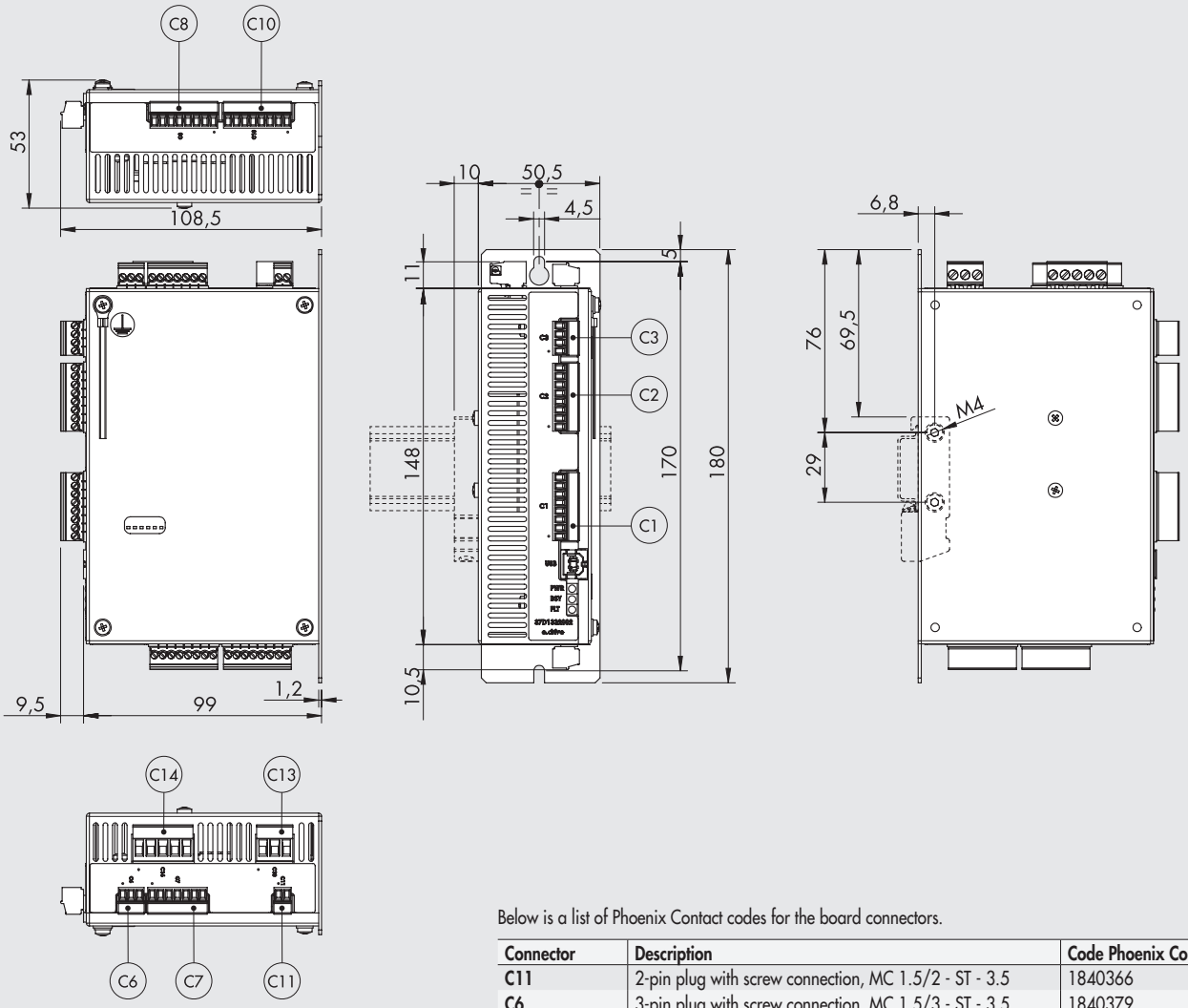
PROGRAMMABLE STEPPING MOTOR DRIVE - *e*.drive

METAL WORK PNEUMATIC

It can be used to control, easily and intuitively, electric cylinders that use a STEPPING motor with a rated current of up to 6A, two phases, with four, six or eight output wires. It connects up to a PC via a USB port and the user is provided with motion control configuration, programming and debugging environment, which allows you to create complex work cycles as it can handle both digital and analogue inputs and outputs, thanks to a user-friendly language (MW DRIVE) and a series of simple instructions and functions.
It consists of two electronic boards housed in a metal box that has been designed to be fixed onto a wall or to a DIN rail, using an accessory, and is equipped with removable screw connectors for wiring.
The electronic boards can control both the logic "motion control" stage and the power supply stage.
This independent system is ideal for use in stand-alone applications not requiring the use of any PLC.
The power stage consists of a ministep bipolar chopper drive. It is characterised by a supply voltage of up to 55VDC for the power supply side and 24VDC for the logic side, compact dimensions and great flexibility of use.

TECHNICAL DATA		
Code		**37D1332002**
Motion control logic power supply	VDC	24
Drive power supply	VDC	24 to 55
Motor phase peak current	A	1 to 6
Temperature range	°C	-20 to 40
Relative humidity (without condensation)	%	5 to 85
Bipolar motor inductance (1.8° angle)	mH	1 to 12
Dimensions	mm	148 x 99 x 50.5
Weight	g	790
Degree of protection		IP20
Communication interface		Serial USB port for connection to PC
Configuration/programming/debug and diagnosis software		MW DRIVE in Windows® environment
Dedicated signals		Encoder input (A + B + Z), 5V line driver or 24V Push-Pull/Open collector
Digital inputs		14
Digital outputs		7
Analogue inputs		2, from 0 to 10V, freely programmable
Analogue outputs		1, from 0 to 10V
Controls available		- Can be used with motors with a 1.8° base angle, 200 pulses/rev.; - Step Mode settable in various ways: Full Step, Half Step, 1/4, 1/8, 1/16 of step; - Integrated linear position transducer by connecting directly to the analogue output; - Automatic 60% reduction of the current supplied with motor stopped; - Possible dynamic regulation of the current supplied via cycle software instructions, for energy-saving purposes; - Home position search on limit switch, mechanical stop, encoder limit switch and zero mark, encoder mechanical stop and zero mark; - Positioning in relative or absolute mode; - Closed-loop motion control and step-loss control in the case of STEPPING motors with an encoder; - Integrated, automatic brake control via dedicated digital output in the case of motors with a brake; - Complementary and logical instructions for complex work cycles, such as: timings; variables control; test; analogue and digital I/O control

DIMENSIONS

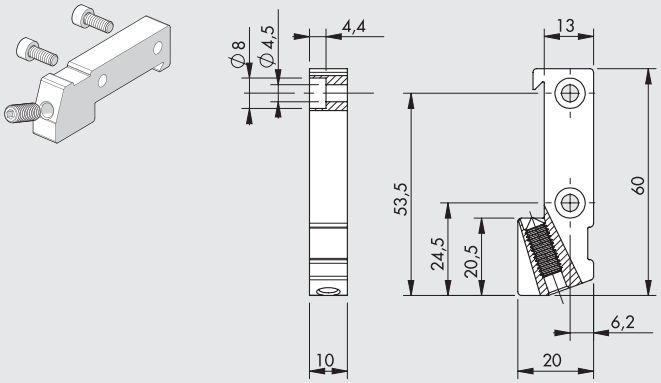


Below is a list of Phoenix Contact codes for the board connectors.

Connector	Description	Code Phoenix Contact
C11	2-pin plug with screw connection, MC 1.5/2 - ST - 3.5	1840366
C6	3-pin plug with screw connection, MC 1.5/3 - ST - 3.5	1840379
C3	4-pin plug with screw connection, MC 1.5/4 - ST - 3.5	1840382
C7	7-pin plug with screw connection, MC 1.5/7 - ST - 3.5	1840418
C1, C2, C8, C10	8-pin plug with screw connection, MC 1.5/8 - ST - 3.5	1840421
C13	3-pin plug with screw connection, MSTB 2.5/3 - ST - 5	1754465
C14	5-pin plug with screw connection, MSTB 2.5/5 - ST - 5	1754504

ACCESSORIES

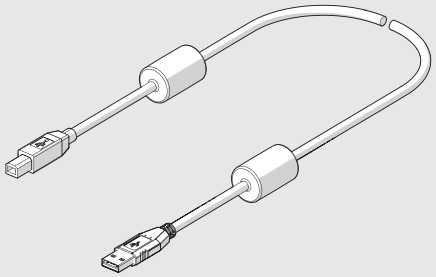
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



Code	Description	Weight [g]
095000M000	Bracket mountaing ***e***.motion / ***e***.drive on Omega bar (DIN EN 50022)	30

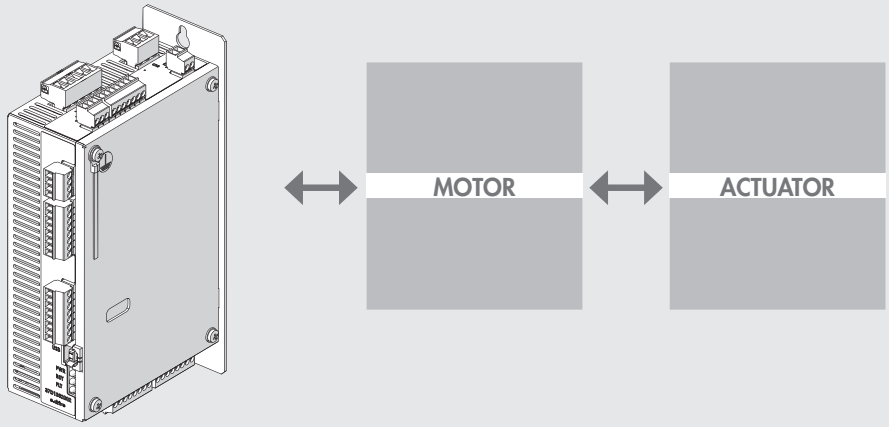
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

CABLE USB



Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the **e**.motion / **e**.drive board to a PC, 3 m	150

CONNECTION SCHEME



NOTES

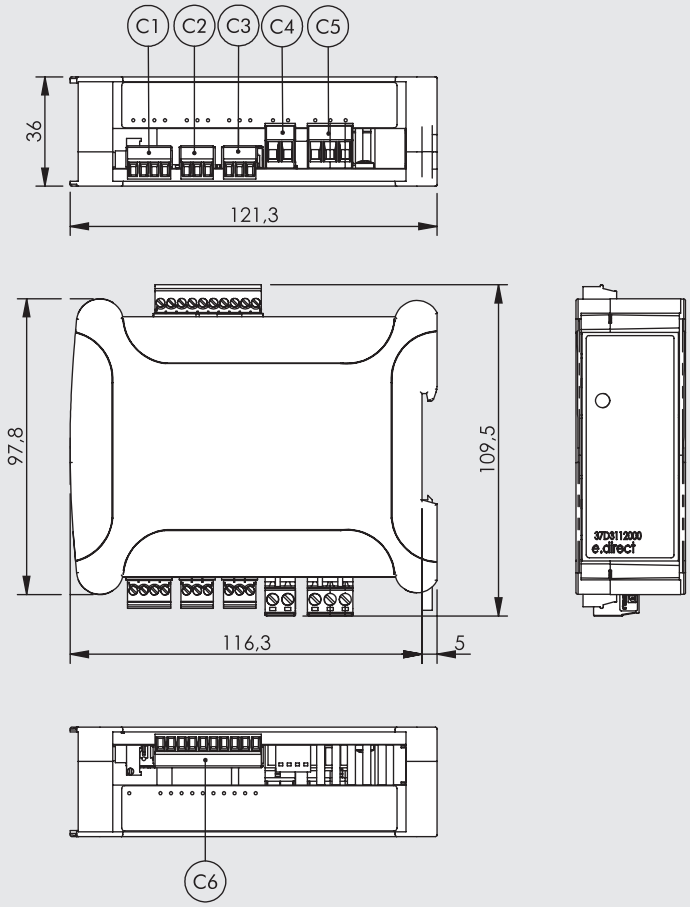
e.direct DRIVE
FOR DIRECT CURRENT MOTORS

With the e.direct drive for direct current motors, a 24VDC motor can be easily controlled and run. The electronic board is enclosed in a plastic housing designed for DIN rail mounting.
When activating the "CW" and "CCW" inputs, the motor starts running alternately clockwise and anticlockwise.
Two digital sensor inputs are provided to stop motor rotation upon activation.
The two stop signals are made available as outputs for possible connection to PLCs.
When activated, two digital sensor inputs are provided to stop motor rotation. The two stop signals are made available as outputs for possible connection to a PLC.
During acceleration and braking, the drive prevents mechanical stress on the motor and excessive energy regeneration.
Braking takes place dynamically, stopping the rotation immediately to avoid unwanted extra travel.
The rotation speed can be varied locally via the multi-turn trimmer installed on the board, or remotely, even continuously, via the analog input.
The board is equipped with 2 Hall sensor encoder inputs, NPN type and 5VDC power supply, which are fed back on two 24VDC encoder outputs, which adapt the signals coming from the Hall sensors to PLC inputs type OPEN DRAIN - PNP 24VDC.
The maximum current to be supplied to the motor can range between 1A, 2A, 3.5A and 5A via two DIP switch selectors.
When the board is not powered and the motor is stopped, the motor phases are short-circuited to increase braking torque.

TECHNICAL DATA		
Code		**37D3112000**
Motor and auxiliary power supply	VDC	24 ±15%
Maximum power voltage	VDC	30
Wattage	W	150
Current	A	1, 2, 3.5, 5 (Dip-switch selectable)
Temperature range	°C	-20 to 40
Relative humidity (without condensation)	%	5 to 85
Dimensions	mm	110 x 121 x 36
Weight	g	160
Degree of protection		IP20
Digital inputs		- no. 2, type PNP 24VDC motor rotation control (CW/CCW); - no. 2, type OPEN DRAIN - PNP 24VDC limit switch (LS); - no. 2, type NPN 5VDC for encoder (Hall sensors).
Digital outputs		- no. 2, type 24VDC OPEN DRAIN - PNP suitable for PNP 24VDC PLC for limit switch (LS); - no. 2, 24VDC: adapting signals from Hall sensors to PLC inputs type OPEN DRAIN - PNP 24VDC.
Analogue inputs		- no. 1, 0-10VDC speed adjustment from PLC or potentiometer (31400 Ω input impedance); - Internal trimmer for manual speed adjustment (0-100%).
Protections		- Motor output overcurrent protection; - Phase-to-phase short-circuit protection on motor; - Microprocessor over-temperature protection (150°C).
Signals		- Overvoltage (Vsupply>30VDC) - Under-voltage (Vsupply<18VDC); - With fault diagnostic output (OPEN DRAIN - PNP); - Active output corresponds to one of the FAULT statuses.

N.B.: A delayed, external fuse of a value appropriate to the set current must be provided in the system.
An appropriate external mains filter must be placed on the power supply to avoid disturbances generated by the drive.

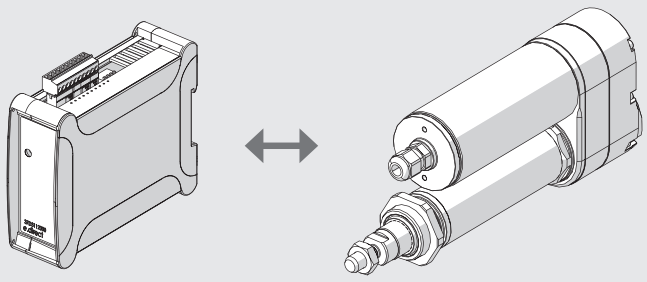
DIMENSIONS



Below is a list of Phoenix Contact codes for the board connectors.

Connector	Description	Code Phoenix Contact	Code Phoenix Contact BASIC LINE
C1	4-pin plug with screw connection, MC 1.5/4 - ST - 3.5	1840382	5441223
C2, C3	3-pin plug with screw connection, MC 1.5/3 - ST - 3.5	1840379	5441210
C4	2-pin plug with screw connection, MC 2.5/2 - ST - 5	1754449	5441171
C5	3-pin plug with screw connection, MC 2.5/3 - ST - 5	1754465	5448242
C6	10-pin plug with screw connection, MC 1.5/10 - ST - 3.5	1840447	5447560

EXAMPLE OF CONNCETION



DRIVES FOR STEPPING MOTORS

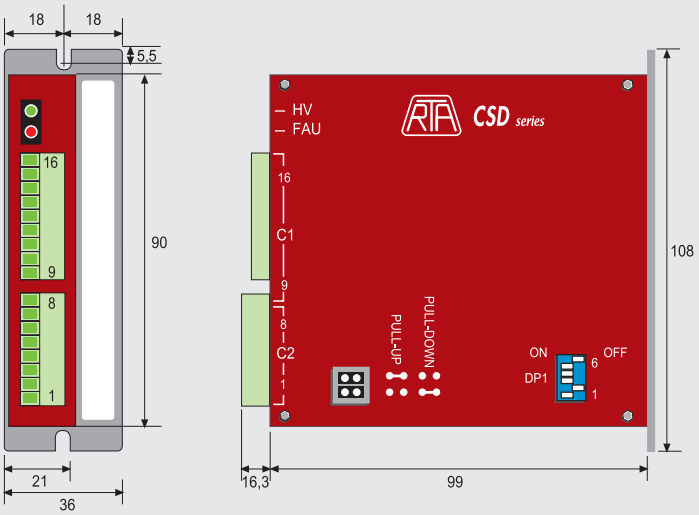
4.4A - 48VDC DRIVE FOR STEPPING MOTORS

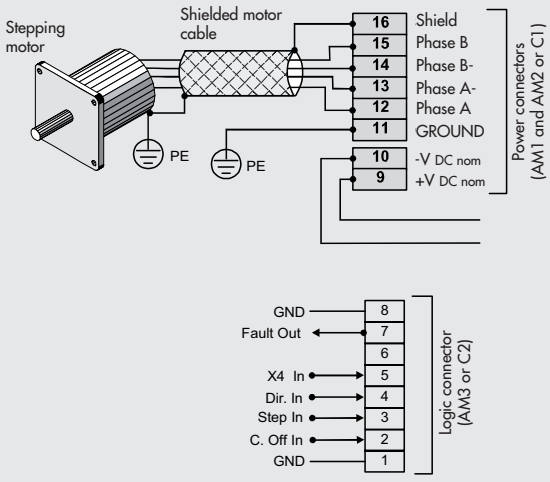
This is a ministep bipolar chopper drive made by RTA S.r.l. It comes with a STEP & DIRECTION interface for piloting low/medium-power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 48VDC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box, which does not require external ventilation, and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 4.4A, the perfect choice for low/medium-power applications using small motors.

DRIVE TECHNICAL DATA

Drive code		**37D1222000**
Type of STEPPING motor drive		Metal box
Dimensions	mm	90 x 99 x 21
Connectors		Screw type
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VDC	24 - 48
Current range	A	2.6 - 4.4
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 800, 1600, 3200
Automatic current reduction with motor off		YES (50%)
Type of inputs		Pull-up or Pull-down, settable
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection. Electronic damping circuit for maximum control of noise and vibration.

OVERALL DIMENSIONS AND WIRING DIAGRAM





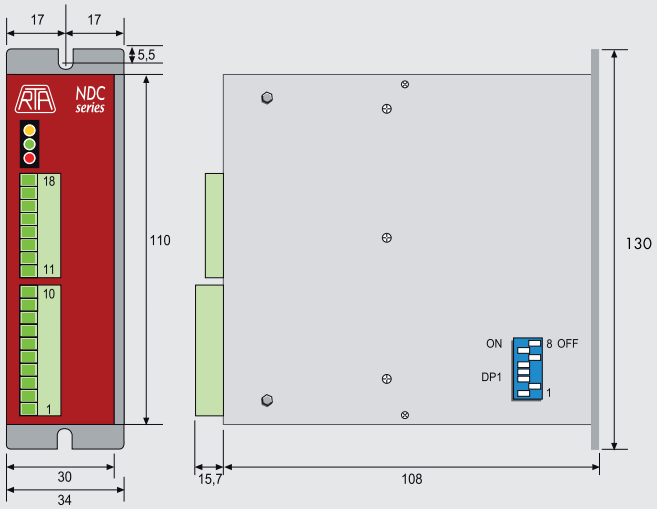
6A - 75VDC DRIVE FOR STEPPING MOTORS

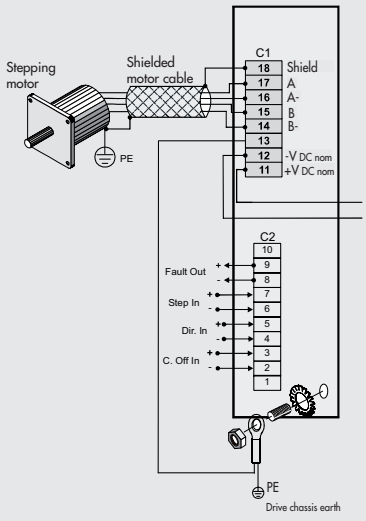
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 75VDC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium power applications using small and medium-size motors.

DRIVE TECHNICAL DATA

Drive code		**37D1332000**
Type of STEPPING motor drive		Metal box
Dimensions	mm	110 x 108 x 34
Connectors		Screw type
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VDC	24 - 75
Current range	A	1.9 - 6
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000
Automatic current reduction with motor off		YES (50%)
Type of inputs		Opto-isolated
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection. Electronic damping circuit for maximum control of noise and vibration.

OVERALL DIMENSIONS AND WIRING DIAGRAM





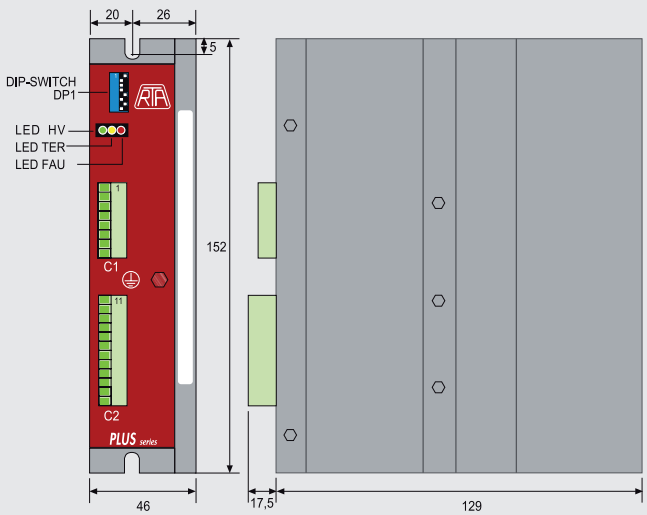
6A - 140VDC, 10A - 62VAC DRIVE FOR STEPPING MOTORS

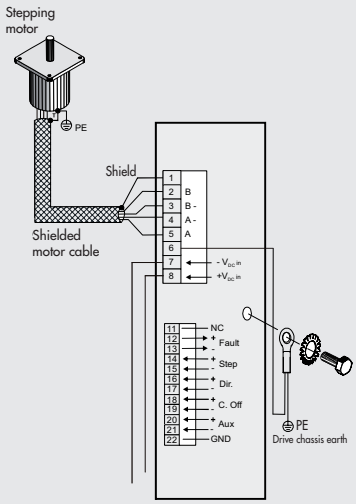
These are two ministep bipolar chopper drives made by RTA S.r.l.
They come with a STEP & DIRECTION interface for piloting medium/high-power two-stage STEPPING motors with four, six or eight terminals.
They consist of a board housed in a metal box, which does not require external ventilation, and come with separate logic and power pull-out screw connectors.
Drive code 37D1442000 is characterised by a voltage range up to 140VDC, compact dimensions and considerable operating flexibility.
This drive can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium-power applications requiring a DC supply.
Drive code 37D1552000 is characterised by a voltage range up to 62VAC, compact dimensions and considerable operating flexibility.
This drive can control STEPPING motors with a nominal current up to 10A, the perfect choice for medium-power applications requiring an AC supply.

DRIVE TECHNICAL DATA

Drive code		**37D1442000**	**37D1552000**
Type of STEPPING motor drive		Metal box	
Dimensions	mm	152 x 129 x 46	
Connectors		Screw type	
Onboard power supply		NO	
Control		Step and direction	
Operating voltage range		77 - 140 VDC	28 - 62 VAC
Current range	A	1.9 - 6	3 - 10
Current values selected via a dip-switch		8	
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000	
Automatic current reduction with motor off		YES (50%)	YES (50%)
Type of inputs		Opto-isolated	
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection. Electronic damping circuit for maximum control of noise and vibration.	

OVERALL DIMENSIONS AND WIRING DIAGRAM





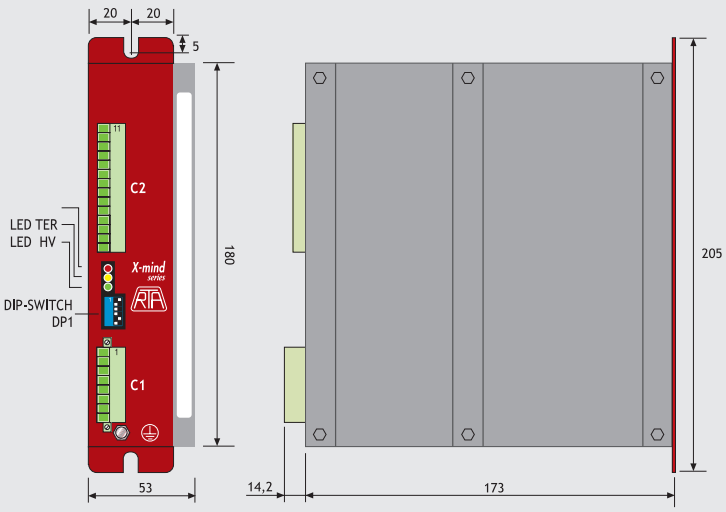
6A - 110 - 230VAC DRIVE FOR STEPPING MOTORS

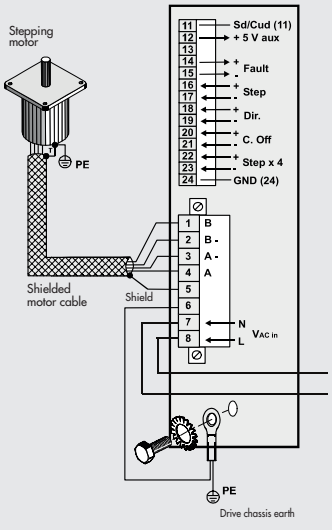
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 230VAC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium-high power applications using medium and big-size motors.

DRIVE TECHNICAL DATA

Drive code		**37D1362001**
Type of STEPPING motor drive		Metal box
Dimensions	mm	180 x 173 x 53
Connectors		Screw type
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VAC	Single-phase 110 - 230
Current range	A	3.4 - 6
Motor output stage		High-efficiency CHOPPER with IGBT final stage output
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000
Automatic current reduction with motor off		YES
Type of inputs		Opto-isolated
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection.
		Electronic damping circuit for maximum control of noise and vibration.
Standards		UL and CSA
Other features		Possibility to switch off motor current via an external logic control device.
		Electronic sound-damping circuit for enhanced reduced noise and mechanical vibration at low and medium speed.
		Storage and reporting of the intervention of protection circuits.
		It must be coupled with STEPPING motors designed for high-voltage rating and flanges not below 86 mm.
		No need for forced ventilation.

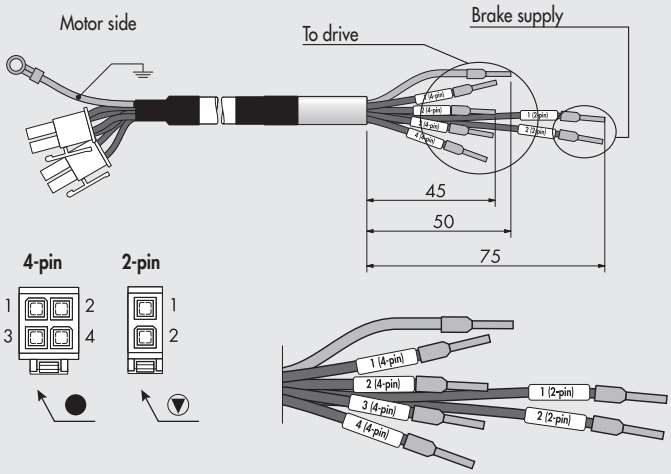
OVERALL DIMENSIONS AND WIRING DIAGRAM





CABLES FOR B&R MOTOR

POWER CABLE FOR MOTOR WITH BRAKE

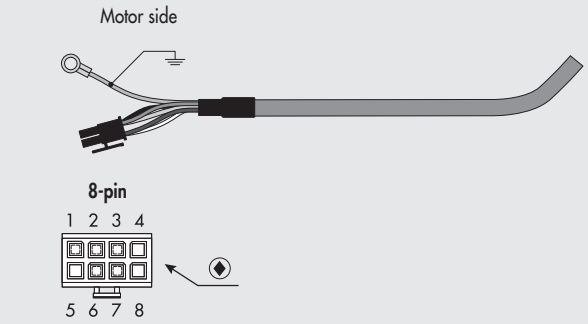


Code	Description
37C1330000	Power cable for stepping motor with brake, 3 metres
37C1350000	Power cable for stepping motor with brake, 5 metres

For use with STEPPING motors with brake and STEPPING motor code 37M1470000.

	Pin	Function	Corresponding wire colour
4-pin connector	1	A\	Black (1 4-pin)
	2	B\	Black (2 4-pin)
	3	A	Black (3 4-pin)
	4	B	Black (4 4-pin)
2-pin connector	1	24VDC brake	Black (1 2-pin)
	2	GND	Black (2 2-pin)

ENCODER CABLE



Code	Description
37C1230000	Encoder cable for stepping motors with brake, 3 metres
37C1250000	Encoder cable for stepping motors with brake, 5 metres

Optional – Can be used with STEPPING motor with encoder and brake.

8-pin connector	Function		Corresponding wire colour
1	A	A	Green
2	B	B	Yellow
3	R	R	Gray
4	-	NC	-
5	-	NC	-
6	+ 24VDC	Encoder +24 V supply	Red
7	COM	Encoder 0 V supply	Blue
8	-	NC	-

REFERENCES FOR THE CONNECTORS

Below you find the codes of Molex to allow the customer to manufacture cables.

	Code Molex	Description
▼	**39-01-2020**	1 x 2 pin plug connector
	44476-1111	Crimping contacts
●	**39-01-2040**	1 x 4 pin plug connector
	44476-1111	Crimping contacts
◆	**43025-0800**	1 x 8 pin plug connector
	43030-0002	Crimping contacts

Special tools for crimping or pulling out contacts		
	Code Molex	**Description**
Crimping gripper	**0638190000**	For 8-pin connector
	0638190900	For 4-pin and 2-pin connectors
Contact pull-out tool	**0011030043**	For 8-pin connector
	0011030044	For 4-pin and 2-pin connectors

NOTES

METAL WORK PNEUMATIC

NOTES

DRIVES FOR BRUSHLESS MOTORS

DRIVE FOR 200W, 400W, 750W, 1000W SANYO DENKI BRUSHLESS MOTORS

This drive made by SANYO DENKI is suitable for piloting BRUSHLESS motors.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.
It can control BRUSHLESS motors with a nominal current up to 30A.
All the system parameters can be configured and controlled using SANMOTION software.

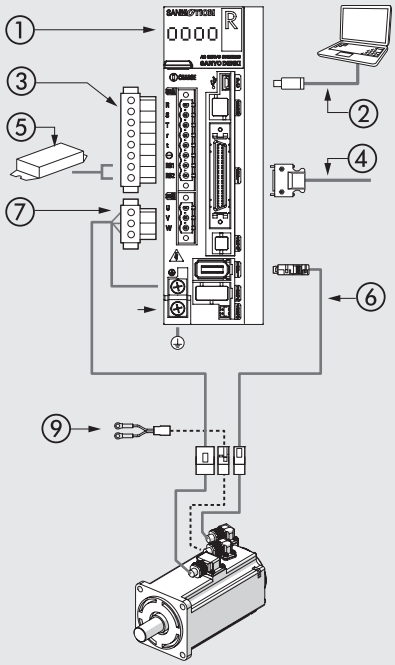
DRIVE TECHNICAL DATA		
Drive code		**37D2400008**
Nominal power		200 - 400 - 750 - 1000
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	50 x 160 x 130
Power connectors and motor power		Plug-type 3M
Encoder connectors and signals		Plug-type 3M
Max output current	A	30
Motor output stage		IGBT, PWM control, sinusoidal current
Power voltage		Single-phase or three-phase (user configurable) 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Logic voltage		Single-phase 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Control		With analogue signal (proportional to speed and torque).
		Pulse-train (clock + direction; forward + backward pulse; 90° phase difference)
		8 inputs and 8 outputs, user configurable.
		In the event of pulse-train command, the control system outputs should be the Line Driver type.
		If the outputs are the open-collector type, you can use a 37D2000000 board,
		which is sold separately (see accessories).
Auto-tuning		YES
Communication interface		Mini USB for settings and monitoring via a personal computer.
Protections		Integrated against overloads, input extra-voltages,
		incorporated filters for suppressing the system's own resonance frequencies
Standards		CE, UL and CSA.
Other features		5-digit display and programming keypad.
		Integrated closed-loop system with position, speed and torque control modes.
		Instant changeover option: position + speed; position + torque; speed + torque.
		Automatic dynamic braking circuit in a alarm and power-off conditions.
		Connector for external braking resistance (optional).
		Configuration and control software.
Connecting cable:		
Brushless **motor-drive** connecting cable, 3 metres		**37C2130005**
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C2230005**
Brushless **motor-drive** connecting **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-brake** connecting **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive** connecting cable, 5 metres		**37C2150005**
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C2250005**
Brushless **motor-drive** connecting **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-brake** connecting **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 10 metres		**37C2200004**
Brushless **motor-brake** connecting **dynamic** cable, 10 metres		**37C2310000**

METAL WORK PNEUMATIC

WIRING DIAGRAM FOR BRUSHLESS MOTOR DRIVES

① 5-DIGIT DISPLAY and PROGRAMMING KEYPAD:
to display and modify parameters and monitor system operation in real time.
② PC CONNECTOR: settings and monitoring by PC via mini USB
③ POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). **Included in the supply**.
Separate supply section for logic/signal and power electronics. Integrated circuits protecting against overloads and input extra-voltages.
④ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 8 inputs and 8 outputs, user configurable. **Included in the supply**.
⑤ CONNECTOR: for external braking resistance (optional)
⑥ ENCODER CONNECTOR
⑦ MOTOR POWER CONNECTOR
⑧ EARTH CONNECTION
⑨ MOTOR BRAKE CONNECTOR (only for version with brake)

Log on to www.metalwork.it to view the instruction manual.



ACCESSORIES

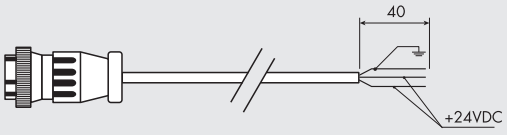
⑥ ENCODER CABLE

Code	Description
37C2230005	Brushless motor-drive-encoder connecting cable, 3 m
37C2250005	Brushless motor-drive-encoder connecting cable, 5 m
37C2230004	Brushless motor-drive-encoder connecting dynamic cable, 3 m
37C2250006	Brushless motor-drive-encoder connecting dynamic cable, 5 m
37C2200004	Brushless motor-drive-encoder connecting dynamic cable, 10 m

⑦ MOTOR POWER CABLE

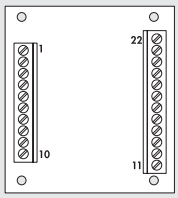
Code	Description
37C2130005	Brushless motor-drive connecting cable, 3 m
37C2150005	Brushless motor-drive connecting cable, 5 m
37C2130004	Brushless motor-drive connecting dynamic cable, 3 m
37C2150004	Brushless motor-drive connecting dynamic cable, 5 m
37C2100004	Brushless motor-drive connecting dynamic cable, 10 m

BRAKE CABLE



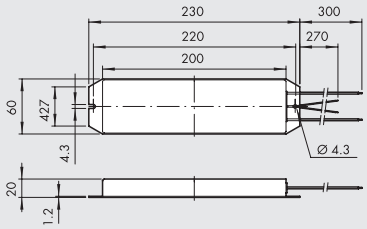
Code	Description
37C2330000	Brushless motor-brake connecting dynamic cable, 3 m
37C2350000	Brushless motor-brake connecting dynamic cable, 5 m
37C2310000	Brushless motor-brake connecting dynamic cable, 10 m

LINE-DRIVER INTERFACE BOARD



Code	Description
37D2000000	BRINT.A line driver interface board

EXTERNAL BRAKING RESISTANCES



Code	Description	For drive code
37D2R00000	220W 50 Ω braking resistance	37D2400008

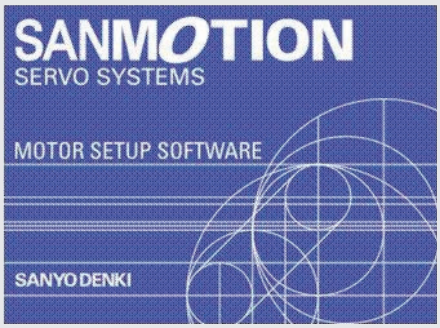
Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

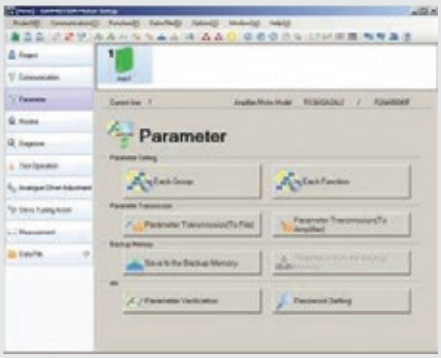
CONFIGURATION SOFTWARE

SANMOTION configuration software is used for parameter setting and complete control of all functions of the system.
The software includes a detailed description of each parameter.
In addition to parameter setting SANMOTION software can accurately analyze operation of the system via the following functions.

- Monitor: real-time display of all details about the system.
- Diagnosis: shows the state of servo amplifier, the type of alarms and the possible causes.
- Test operation: performs the velocity system test with JOG Operation, the positioning test with Positioning Operation, the detection of the origin signal and Serial Encoder Clear.
- Servo Tuning: performs auto-tuning notch filter and auto-tuning vibration suppression frequency.
- Operation Trace: this function shows operational state and parameters as speed and torque, in waveform display on an integrated oscilloscope.
- System Analysis: used to study the system's frequency response to identify and correct any mechanical resonance phenomena.

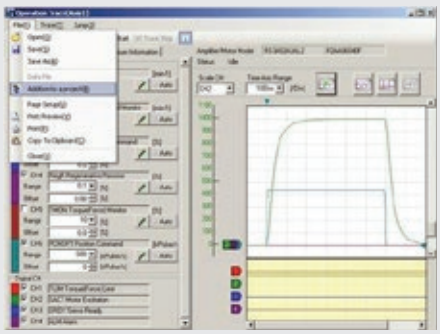
The software can freely be downloaded from Sanyo Denki website at the following link:
https://www.sanyodenki.com/products/sanmotion-softwareindex.html
file SANMOTION MOTOR Setup Software.





GRAPHIC MONITOR

Thanks to the integrated oscilloscope function, some important system parameters, such as speed and torque, can be displayed and saved on the PC monitor.
Data can be downloaded and saved in compatible Excel format.
The time setting range is 10 ms to 2 s.
Single values acquired and displayed can be read using the cursor.



DRIVE FOR 100W, 200W, 400W, 750W DELTA BRUSHLESS MOTORS

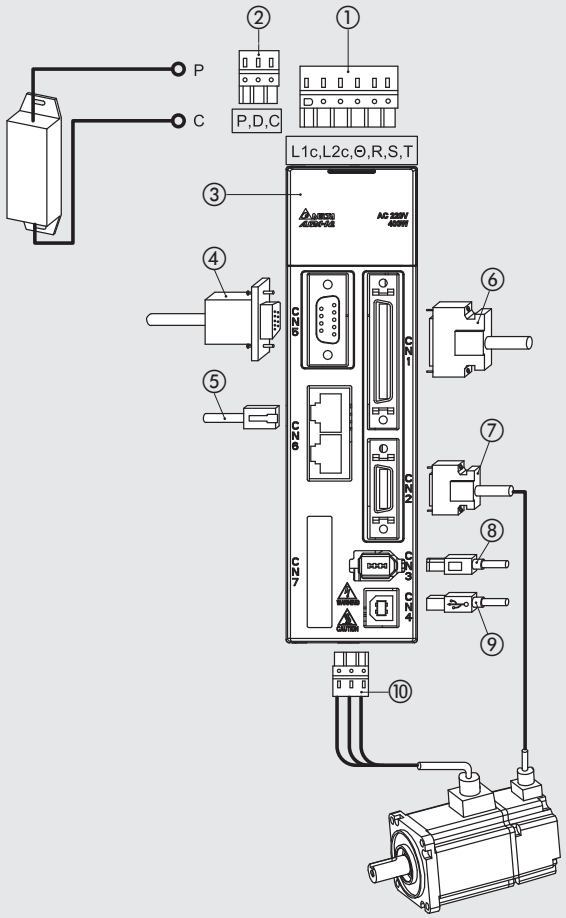
The DELTA ASD-A2-0121-M drive can only be used with a DELTA 100W motor, the DELTA ASDA-A2-0221-M drive can only be used with a DELTA 200W motor, the DELTA ASDA-A2-0421-M drive can only be used with the DELTA 400W motor, and the DELTA ASD-A2-0721-M drive can only be used with a DELTA 750W motor.
The drives are characterized by overall contained dimensions and great versatility of use. They consist of a circuit board situated in a metal box, complete with extractible power screw connectors and logics connectors.

DRIVE TECHNICAL DATA					
Drive code		**37D2100000**	**37D2200001**	**37D2300000**	**37D2400007**
Nominal power	W	100	200	400	750
Type of drive for BRUSHLESS motors		Metal box			
Dimensions	mm	170 x 173 x 45			180 x 173 x 65
Power connectors and motor power		Spring type			
Encoder connectors and signals		Plug-type 3M			
Max output current	A	2.7	4.65	7.80	15.30
Motor output stage		IGBT, PWM control, sinusoidal current			
Power voltage		Single-phase or three-phase (user configurable) 200VAC-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)			
Logic voltage		Single-phase 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)			
Control		With analogue signal (proportional to speed and torque).			
		Pulse-train (clock + direction; forward + backward pulse; 90° phase difference)			
		fieldbus with "CANopen" communication protocol			
		8 inputs and 5 outputs, user configurable.			
		In the event of pulse-train command, the control system outputs should be the Line Driver type.			
		If the outputs are the open-collector type, you can use a 37D2000000 board,			
		which is sold separately (see accessories).			
Auto-tuning		Yes			
Communication interface		Serial USB port for settings and monitoring via a personal computer			
Protections		Integrated against overloads, input extra-voltages,			
		incorporated filters for suppressing the system's own resonance frequencies.			
Standards		CE and UL			
Other features		5-digit display and programming keypad.			
		Integrated closed-loop system with position, speed and torque control modes.			
		Control mode: position + speed; position + torque; speed + torque.			
		Automatic dynamic braking circuit in a alarm and power-off conditions.			
		Connector for external braking resistance (optional).			
		Configuration and control software (optional).			
Suitable for motors code		**37M200000**	**37M2200001**	**37M2220001**	**37M2330001**
		37M400000	**37M4200001**	**37M4220001**	**37M4330001**
Connecting cable:					
Brushless **motor-drive** connecting cable, 3 metres		**37C2130001**			
Brushless **motor** with **brake-drive** connecting cable, 3 metres		**37C2730000**			
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C2230001**			
Brushless **motor-drive** connecting **dynamic** cable, 3 metres		**37C2130002**			
Brushless **motor-drive-encoder** connecting **dynamic** cable, 3 metres		**37C2230002**			
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 3 metres		**37C2730001**			
Brushless **motor-drive** connecting cable, 5 metres		**37C2150001**			
Brushless **motor** with **brake-drive** connecting cable, 5 metres		**37C2750000**			
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C2250001**			
Brushless **motor-drive** connecting **dynamic** cable, 5 metres		**37C2150002**			
Brushless **motor-drive-encoder** connecting **dynamic** cable, 5 metres		**37C2250002**			
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 5 metres		**37C2750001**			
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100003**			
Brushless **motor-drive-encoder** connecting **dynamic** cable, 10 metres		**37C2200003**			
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 10 metres		**37C2700001**			

WIRING DIAGRAM FOR 100W - 200W - 400W - 750W BRUSHLESS MOTOR DRIVES

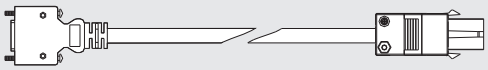
① POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). **Included in the supply**.
Separate supply section for logic/signal and power electronics.
Integrated circuits protecting against overloads and input extra-voltages.
② CONNECTOR: for external braking resistance code 37D2R00000 (optional).
③ 5-DIGIT DISPLAY and PROGRAMMING KEYPAD: to display and modify parameters and monitor system operation in real time.
④ EXTERNAL ENCODER CONNECTOR (optional): possibility of connecting an external encoder to create a feedback of the linear axis position. Can support encoders A, B, Z, supplied at 5VDC.
⑤ CANopen CONNECTOR (optional): this drive is designed for communication with other devices via CANopen Fieldbus.
⑥ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 8 inputs and 5 outputs, user configurable.
⑦ ENCODER CONNECTOR: connection for 100W - 200W - 400W - 750W BRUSHLESS motor encoder.
⑧ IEEE 1394 PC CONNECTOR: settings and possible connection to other devices via RS485 or RS232 (cable not included in the supply).
⑨ USB PC CONNECTOR: settings and monitor through personal computer (not included in the supply).
Data acquisition is only possible via this connection.
⑩ MOTOR POWER CONNECTOR

Log on to www.metalwork.it to view the instruction manual.



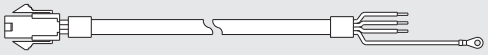
ACCESSORIES

⑦ ENCODER CABLE



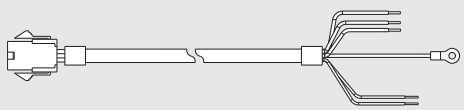
Code	Description
37C2230001	100W-750W brushless motor-drive-encoder connecting cable, 3 metres
37C2250001	100W-750W brushless motor-drive-encoder connecting cable, 5 metres
37C2230002	100W-750W brushless motor-drive-encoder connecting dynamic cable, 3 metres
37C2250002	100W-750W brushless motor-drive-encoder connecting dynamic cable, 5 metres
37C2200003	100W-750W brushless motor-drive-encoder connecting dynamic cable, 10 metres

⑩ MOTOR POWER CABLE



Code	Description
37C2130001	100W-750W brushless motor-drive connecting cable, 3 metres
37C2150001	100W-750W brushless motor-drive connecting cable, 5 metres
37C2130002	100W-750W brushless motor-drive connecting dynamic cable, 3 metres
37C2150002	100W-750W brushless motor-drive connecting dynamic cable, 5 metres
37C2100003	100W-750W brushless motor-drive connecting dynamic cable, 10 metres

MOTOR POWER CABLE + BRAKE



Code	Description
37C2730000	100W-750W brushless motor-drive connecting cable + brake, 3 metres
37C2750000	100W-750W brushless motor-drive connecting cable + brake, 5 metres
37C2730001	100W-750W brushless motor-drive connecting dynamic cable + brake, 3 metres
37C2750001	100W-750W brushless motor-drive connecting dynamic cable + brake, 5 metres
37C2700001	100W-750W brushless motor-drive connecting dynamic cable + brake, 10 metres

DRIVE FOR 3kW DELTA BRUSHLESS MOTORS

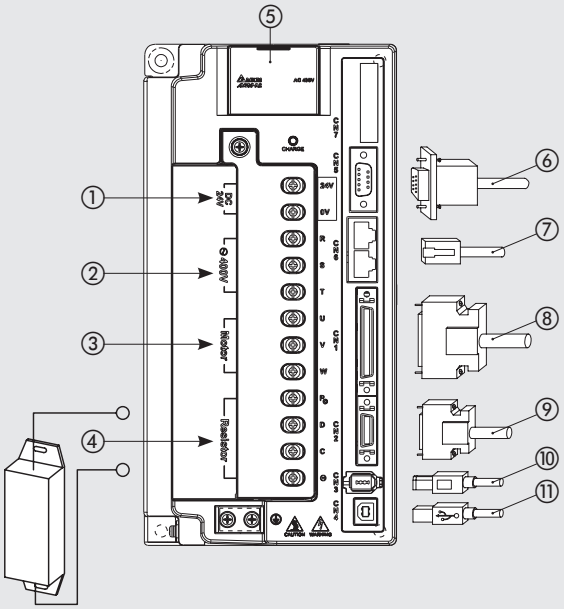
It is a DELTA ASDA-A2-3043-M drive to be used only with a DELTA 3kW motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

DRIVE TECHNICAL DATA		
Drive code		**37D2600001**
Nominal power		3kW
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	245 x 205.4 x 123
Power connectors and motor power		Screw type
Encoder connectors and signals		Plug-type 3M
Max output current	A	33.32
Motor output stage		IGBT, PWM control, sinusoidal current
Power voltage		Three-phase from 380VAC to 480VAC ±10% 50/60 Hz (± 3 Hz)
Logic voltage		24VDC ±10%
Control		With analogue signal (proportional to speed and torque).
		Pulse-train (clock + direction; forward + backward pulse; 90° phase difference)
		fieldbus with "CANopen" communication protocol
		8 inputs and 5 outputs, user configurable.
		In the event of pulse-train command, the control system outputs should be the Line Driver type.
		If the outputs are the open-collector type, you can use a 37D2000000 board,
		which is sold separately (see accessories).
Auto-tuning		Yes
Communication interface		Serial USB port for settings and monitoring via a personal computer
Protections		Integrated against overloads, input extra-voltages,
		incorporated filters for suppressing the system's own resonance frequencies.
Standards		CE and UL
Other features		5-digit display and programming keypad.
		Integrated closed-loop system with position, speed and torque control modes.
		Control mode: position + speed; position + torque; speed + torque.
		Automatic dynamic braking circuit in a alarm and power-off conditions.
		Connector for external braking resistance (optional).
		Configuration and control software (optional).
Suitable for motors code		**37M2770000 - 37M4770000**
Connecting cable:		
Brushless **motor-drive** connecting cable, 3 metres		**37C3130001**
Brushless **motor** with **brake-drive** connecting cable, 3 metres		**37C3730000**
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C3230001**
Brushless **motor-drive** connecting cable, 5 metres		**37C3150001**
Brushless **motor** with **brake-drive** connecting cable, 5 metres		**37C3750000**
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C3250001**

WIRING DIAGRAM FOR 3kW BRUSHLESS MOTOR DRIVES

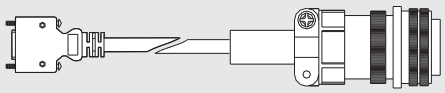
① LOGIC POWER CONNECTOR: 24VDC.
Included in the supply. Power section for logic electronics.
② POWER CONNECTOR: 400VAC, three-phase.
Included in the supply. Power signal supply section.
Integrated circuits protected against overload, input extra-voltages.
③ MOTOR POWER CONNECTOR
④ CONNECTOR: for external braking resistance code 37D2R00004 (optional).
⑤ 5-DIGIT DISPLAY and PROGRAMMING KEYPAD: to display and modify parameters and monitor system operation in real time.
⑥ EXTERNAL ENCODER CONNECTOR (optional): possibility of connecting an external encoder to create a feedback of the linear axis position. Can support encoders A, B, Z, supplied at 5VDC.
⑦ CANopen CONNECTOR (optional): this drive is designed for communication with other devices via CANopen Fieldbus.
⑧ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 8 inputs and 5 outputs, user configurable. **Included in the supply**.
⑨ CENCODER CONNECTOR: connection for 3kW BRUSHLESS motor encoder.
⑩ IEEE 1394 PC CONNECTOR: settings and possible connection to other devices via RS485 or RS232 (cable not included in the supply).
⑪ USB PC CONNECTOR: settings and monitor through personal computer (not included in the supply).
Data acquisition is only possible via this connection.

Log on to www.metalwork.it to view the instruction manual.



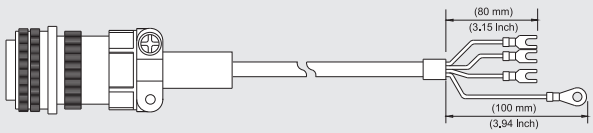
ACCESSORIES

⑥ CAVO ENCODER



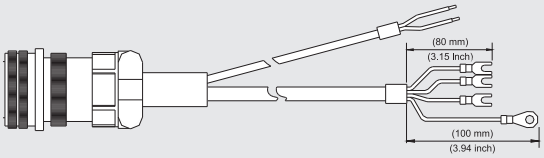
Code	Description
37C3230001	3kW Brushless motor-drive-encoder connecting cable, 3 m
37C3250001	3kW Brushless motor-drive-encoder connecting cable, 5 m

⑦ MOTOR POWER CABLE



Code	Description
37C3130001	3kW Brushless motor-drive connecting cable, 3 m
37C3150001	3kW Brushless motor-drive connecting cable, 5 m

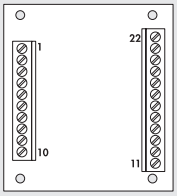
MOTOR POWER CABLE + BRAKE



Code	Description
37C3730000	3kW brushless motor drive connecting cable + brake, 3 m
37C3750000	3kW brushless motor drive connecting cable + brake, 5 m

ACCESSORIES FOR DELTA DRIVES

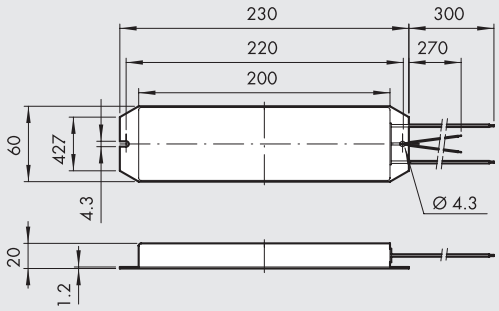
LINE-DRIVER INTERFACE BOARD



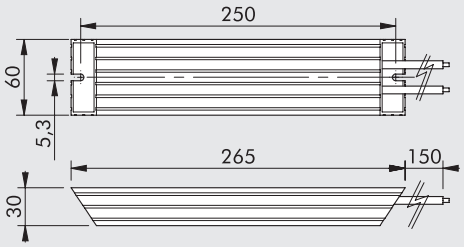
Code	Description
37D2000000	BRINT.A line driver interface board

EXTERNAL BRAKING RESISTANCES

220W



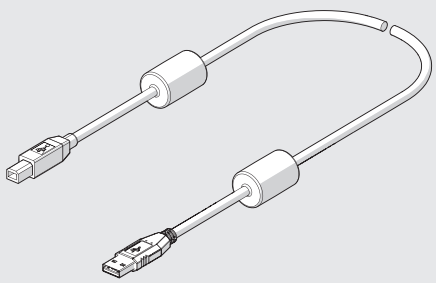
400W



Code	Description	For drive code
37D2R00000	220W 50 Ω braking resistance	37D2100000 - 37D2200001 37D2300000
37D2R00004	400W 40 Ω braking resistance	37D2600001 - 37D2400007

Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

CABLE USB



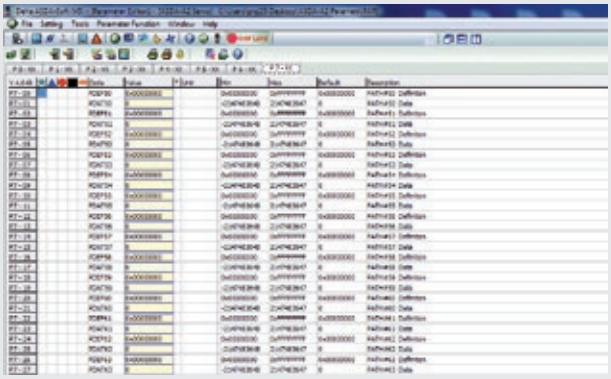
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the drive brushless to a PC, 3 m	150

CONFIGURATION SOFTWARE ASDASoft

ASDASoft communication software is used for parameter setting and complete control of all functions of the system.
The configuration software can be downloaded free from the website http://www.deltaww.com
Access to parameter setting is done through the setup menus.
The software includes a detailed description of each parameter.
In addition to parameter setting ASDASoft software can accurately analyse operation of the system via the following functions.

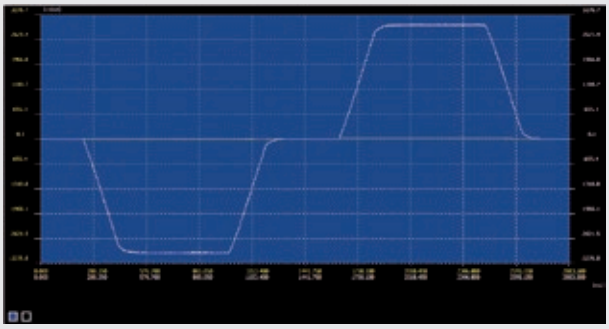
- Status Monitor: real-time display of all details about the system.
- Data Scope: a complete oscilloscope with 4 channels that can be selected as desired among analogue and digital signals.
- System Analisis: used to study the system's frequency response to identify and correct any mechancal resonance phenomena.

JOG speed modes are also available (Digital IO/Jog Control) and Gain Auto-Tuning.



GRAPHIC MONITOR

Thanks to the integrated oscilloscope function, some important system parameters, such as speed and torque, can be displayed and saved on the PC monitor.
Data can be downloaded and saved in compatible Excel format.
Displayed can be read using the cursor.



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