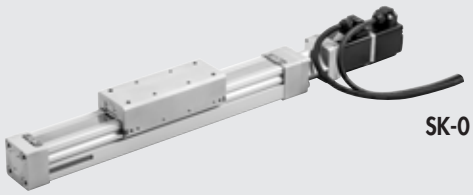
ELECTRIC AXIS - RODLESS SERIES ELEKTRO SK

Screw-driven rodless electric axis with a load-bearing frame made of anodised extruded aluminium, which gives the cylinder optimal torsional and flexural rigidity. It comes in two sizes, SK-0 and SK-2.

For the SK-0 size, two V-shaped guides run directly on the outer edge of the extruded section and support a moving carriage fitted with two wear-resistant acetal resin pads. The pad clearance can be adjusted by means of threaded grub screws placed to the side of the carriage that can be used to make up any play caused by wear. Due to pad support, the carriage only conveys axial forces to the feed system consisting of a self-lubricating techno-polymer nut and a lead stainless steel screw. Two slots are provided on each side of the liner for fixing magnetic sensors.



SK-0

Size SK-2 features a carriage driven by two sturdy preloaded ball recirculation pads that ensure great accuracy of movement.
Threaded holes for the lubrication of the guides and the 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. In order to reduce vibration, hence noise level, and increase the system useful life, the screw is pre-stressed with an elastic load device by means of cup springs.
The slots on both sides of the liner are provided for fixing magnetic sensors.
For size SK-2 only, the motors can be installed either in line with the liner or geared using toothed-belt transmission gears.

SK-2

The carriage features an interchangeable fixing interface plate, which can be ordered with such attachments as the axial V-Lock or orthogonal V-Lock ports or the blank type for custom solutions.

Various STEPPING and BRUSHLESS motor drives are available with optional motor brake and/or built-in encoder.
This axis can also be supplied without motor drive or, on request, with modules for interfacing with motors from the trade.

TECHNICAL DATA		SK-0	SK-2
Admissible ambient temperature for STEPPING motor	°C	from -10 to +50	
BRUSHLESS motor	°C	from 0 to +40	
Maximum relative humidity STEPPING		90% at 40°C; 57% at 50°C (no condensate)	
BRUSHLESS		90% (no condensate)	
Electrical protection rating with STEPPING motors		IP30	IP20/IP40 (see key to codes on page **A5**.137)
BRUSHLESS motors		IP30	IP40
Maximum duty cycle for STEPPING motor		25% *	50%
BRUSHLESS motor		25% *	100%
Minimum stroke	mm	50	100
Maximum stroke	mm	500	1200
Positioning repeatability	mm	± 0.15	± 0.02
Positioning accuracy	mm	± 0.4 **	± 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		Threaded holes	Axial V-Lock / Orthogonal V-Lock / Blank

* The axis must run within the specified duty cycle to allow the screw/nut to cool down.
** Indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc ...

MECHANICAL FEATURES		SK-0			SK-2	
Screw pitch	mm	5	12.7	25	4	10
Screw diameter	mm	12	12.7	12	12	
Static axial load ●	N	1135	1026	958	2800	
Dynamic axial load	N	600	300	150	5000	3600
Maximum number of revs	1/min	600	945	960	3000	4000
Maximum speed (V_{max})	mm/s	50	200	400	200	670
Maximum acceleration without load	m/s^2		-		5	
Maximum drive torque applicable to the worm screw shank	Nm		2.5		5	

● Static loads bearable without damage.
Calculate mean axial load and the calculate life: see graphs on page **A5**.127
N.B.: For the verification of the linear guide system and screw, see page **A5**.126

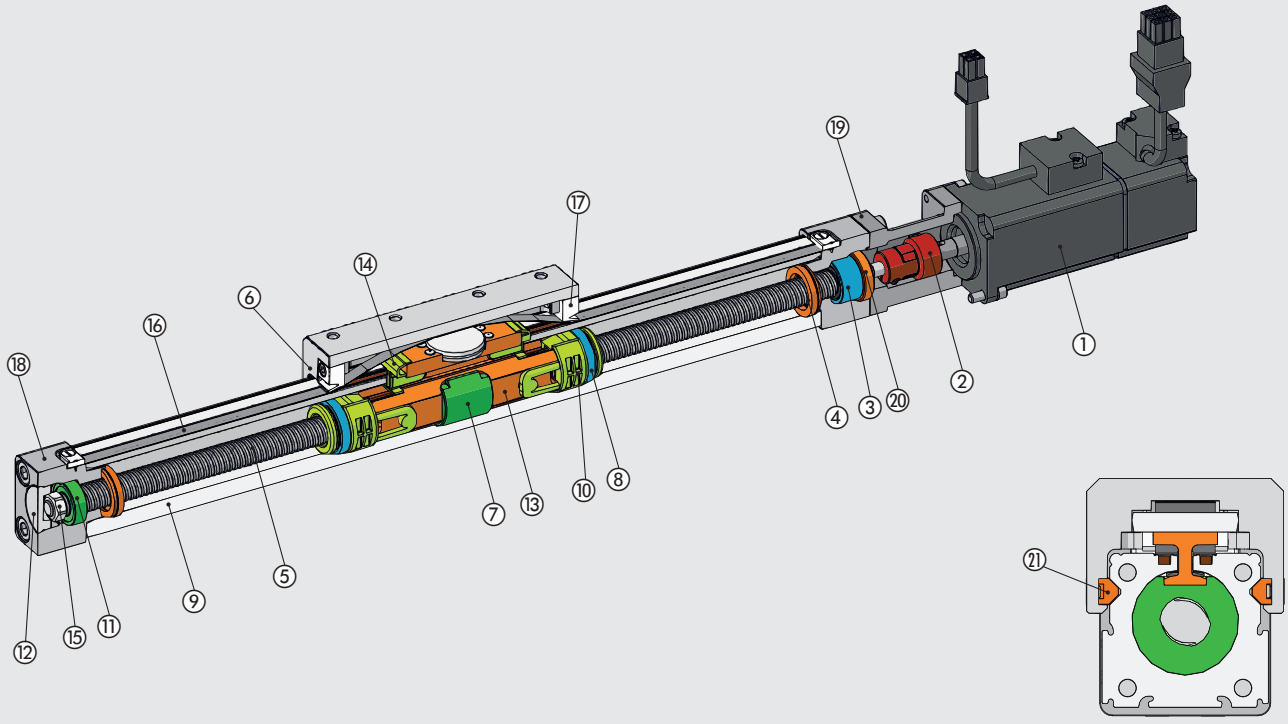
WEIGHTS		SK-0			SK-2	
Screw pitch	mm	5	12.7	25	4	10
Weight at stroke 0 (excluding the carriage fixing interface in the case of SK-2)	g		750		2990	3000
Additional weight each mm of stroke	g		2.6		7	
Weight of the in-line transmission (without motor)	g		120		400	
Weight of the geared transmission (without motor)	g		-		600	
Moving mass at stroke 0 (M0)	g		348		1050	

MASS MOMENTS OF INERTIA		SK-0			SK-2	
Worm screw pitch	mm	5	12.7	25	4	10
J0 at stroke 0	kg mm^2	2.15	2.539	2.008	2.5	2.6
J1 each metre of stroke	kg mm^2/m	12.3	14.7	11.6	12.24	12.8
J2 each kg of load	kg mm^2/kg	0.6332	4.0855	15.83	0.4053	2.5333
J3 in-line transmission	kg mm^2	0.0850	0.0850	0.085	5.2	
J3 geared transmission	kg mm^2				19	

The total mass moment of inertia (Jtot) reduced for the motor is: $Jtot = [J1 \cdot stroke\ [m] + J2 \cdot (M0 + load) + J0] \cdot \tau^2 + J3$

M0 is defined in the weight table.

COMPONENTS SK-0

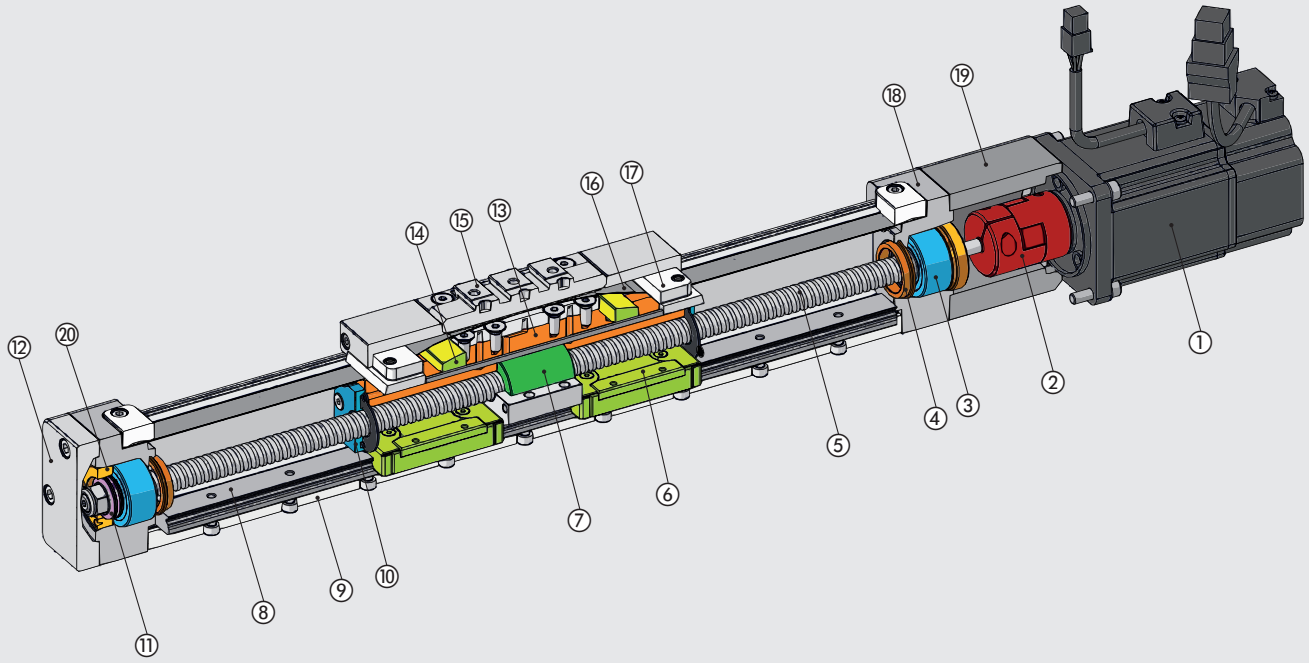


① MOTOR
② ELASTIC COUPLING: aluminium / polyurethane
③ DOUBLE-ROW ANGULAR BALL BEARING
④ BUFFER: polyurethane
⑤ LEAD SCREW: stainless steel
⑥ CARRIAGE WITH GUIDING SYSTEM: aluminium
⑦ NUT: technopolymer
⑧ MAGNET: plastoferrite
⑨ CYLINDER LINER: anodized aluminium
⑩ CARRIAGE LIMIT SWITCH: technopolymer
⑪ SINGLE-ROW BALL BEARING
⑫ HEAD COVER: anodized aluminium
⑬ CARRIAGE BODY: anodized aluminium
⑭ LOWER STRAP PAD: technopolymer
⑮ LOCKING NUT: zinc-plated steell
⑯ PROTECTIVE STRAP: stainless steel
⑰ UPPER STRAP PAD: technopolymer
⑱ HEAD: anodized aluminium
⑲ MOTOR BELL: anodized aluminium
⑳ BEARING LOCKING RING NUT: zinc-plated steel
㉑ "V" GUIDE PLATE: technopolymer

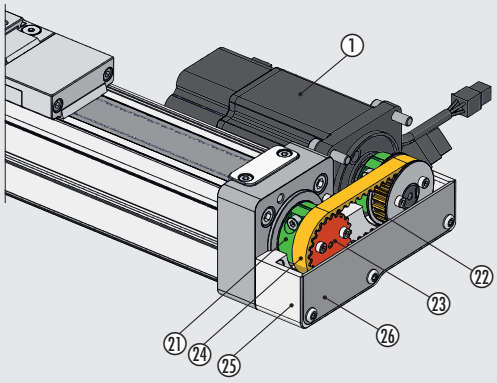
METAL WORK PNEUMATIC

COMPONENTS SK-2

ELECTRIC AXIS WITH IN-LINE MOTOR

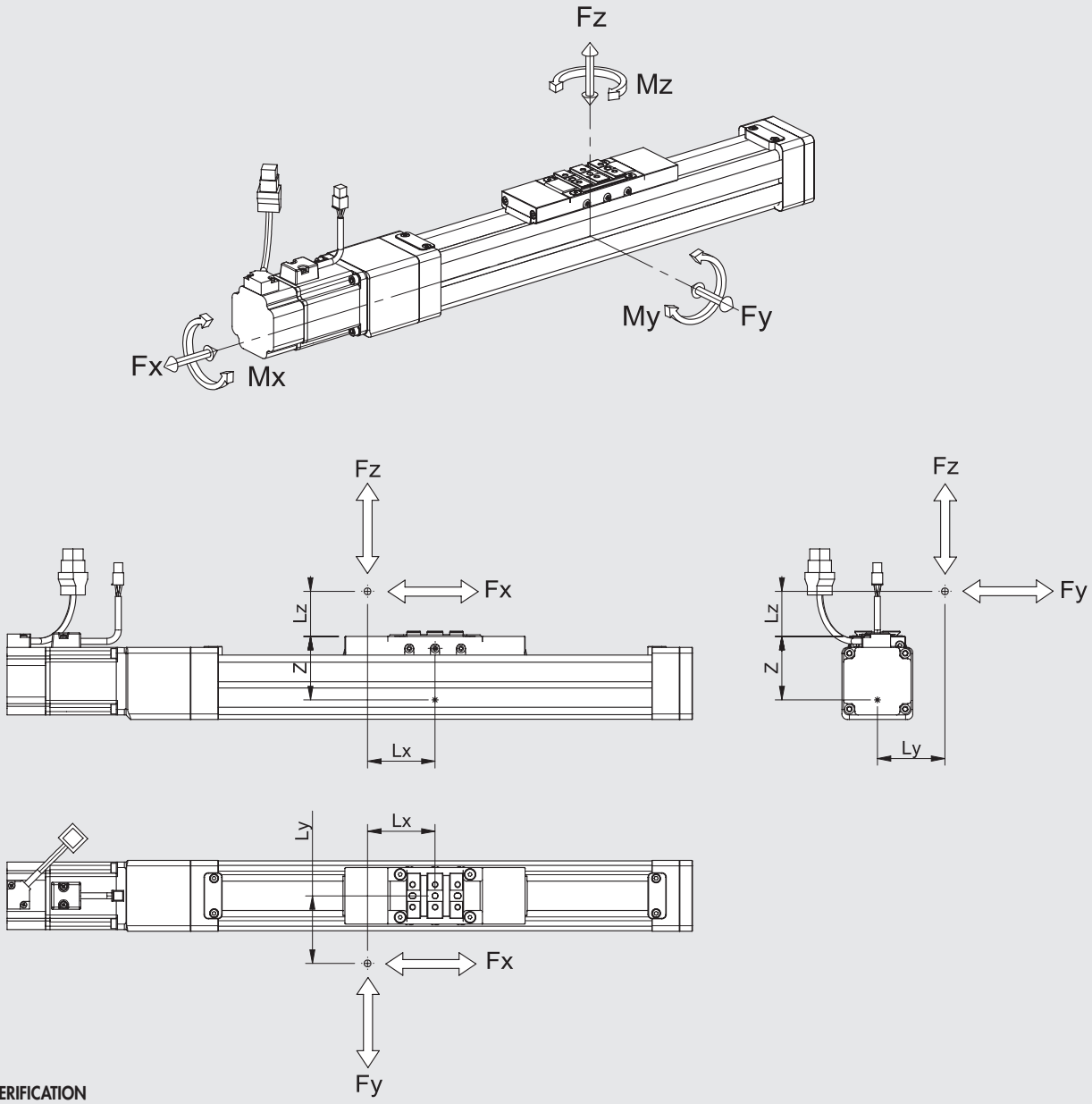


ELECTRIC AXIS WITH GEARED MOTOR



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.

SIZE	Z [mm]	Fy0 max [N]	Fz0 max [N]	Mx0 max [Nm]	My0 max [Nm]	Mz0 max [Nm]
SK-0	14	350	350	5	22	22
SK-2	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.

SIZE	Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
SK-0	-	-	-	-	-	-
SK-2	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

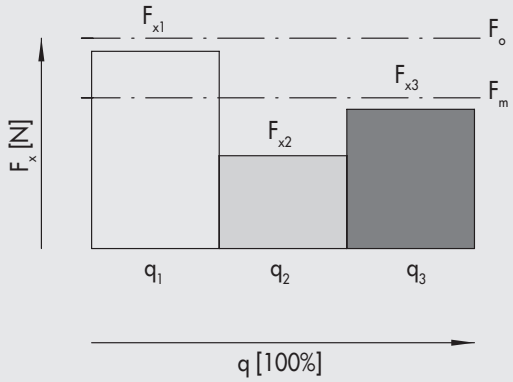
Peak axial load in a work cycle must not exceed the static axial load F_o.
The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

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_o = Static axial load
V_x = Speed in the phase x
F_m = Mean axial load during extension
q = Time segment
V_m = Average speed

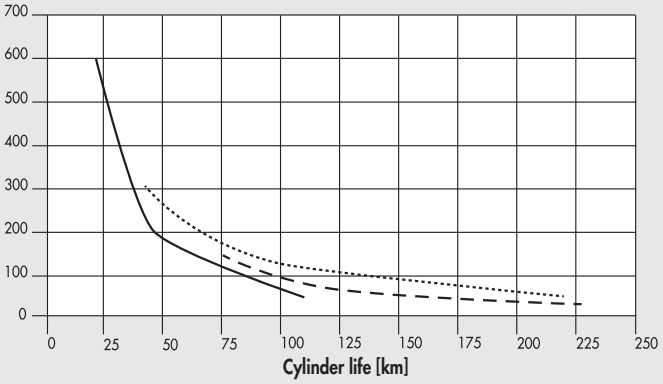


The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graph below shows the lifecycle of the screw as a function of F_m

LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD

SK-0

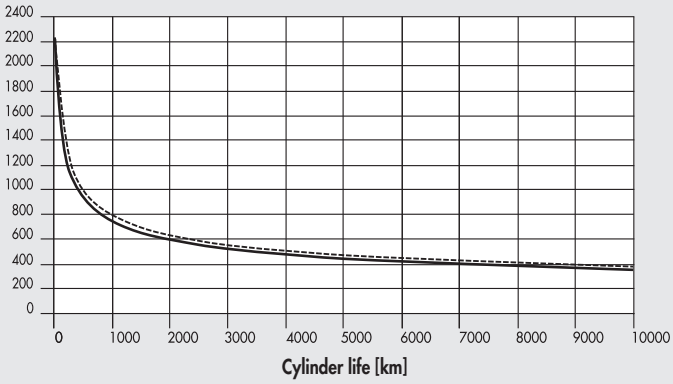
Mean axial load [N]



screw pitch 5 ---------- screw pitch 12.7 – – – screw pitch 25

SK-2

Mean axial load [N]

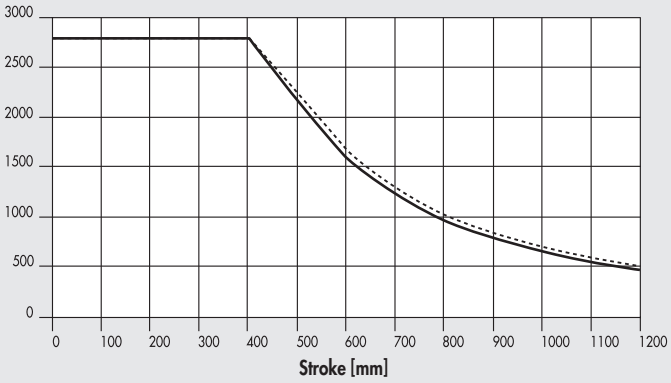


---------- screw pitch 4 ——— screw pitch 10

MAXIMUM AXIAL LOAD SK-2

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

Axial load [N]

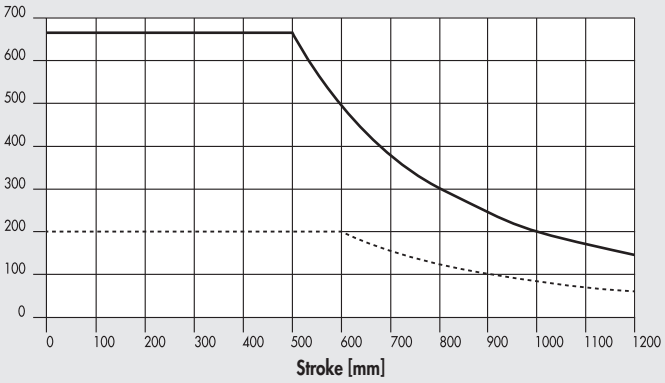


---------- screw pitch 4 ——— screw pitch 10

CRITICAL SPEED SK-2

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

Speed [mm/s]

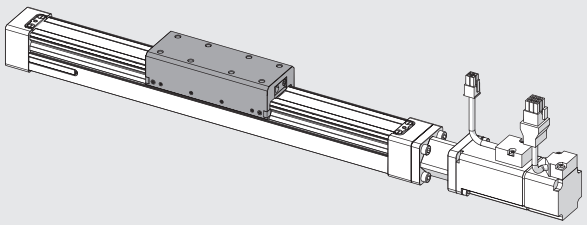


---------- screw pitch 4 ——— screw pitch 10

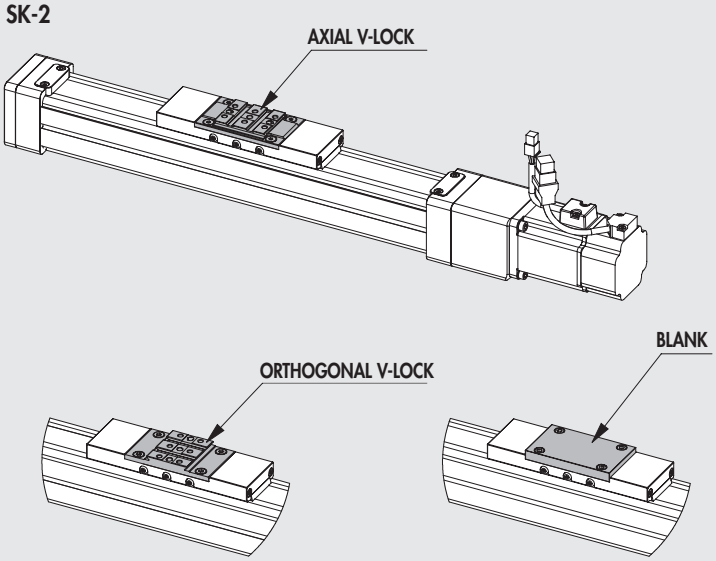
VERSIONS

TYPE OF CARRIAGE INTERFACE

SK-0



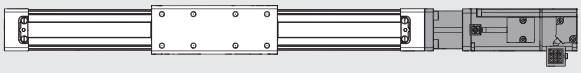
SK-2



MOTOR POSITIONING

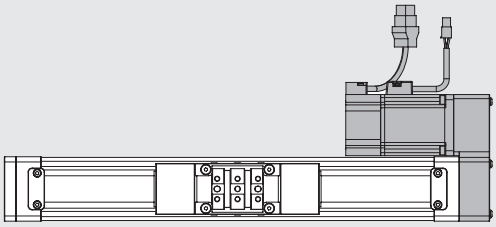
SK-0

IN-LINE MOTOR

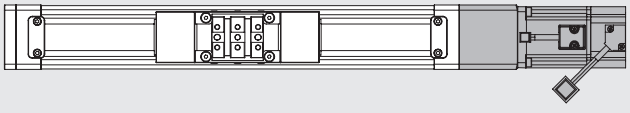


SK-2

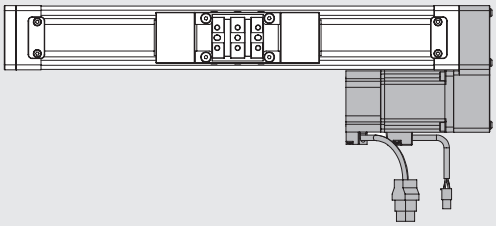
RIGHT GEARED MOTOR



IN-LINE MOTOR

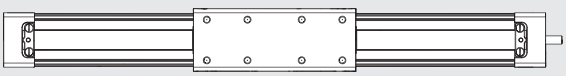


LEFT GEARED MOTOR

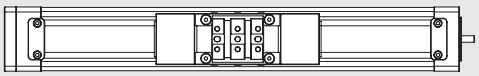


VERSION WITHOUT MOTOR

SK-0



SK-2



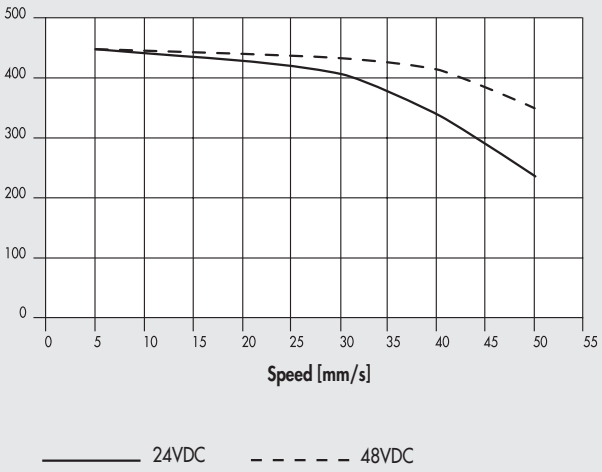
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE) SK-0

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.

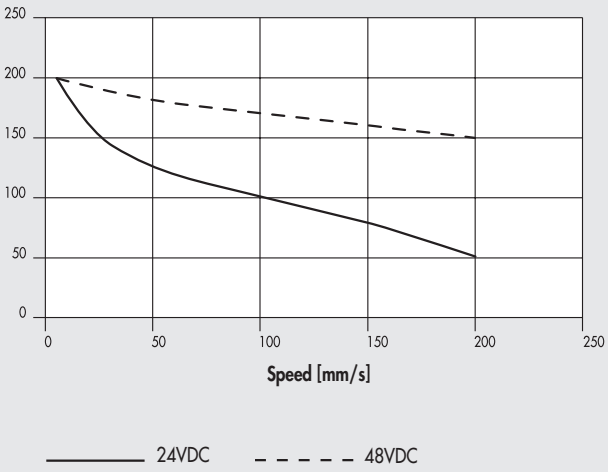
N.B.: The obtainable load values already take the efficiency of the system into account.
For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating.
Consequently, available axial load with the motor stopped is also reduced by 50%.

STEPPING motor code 37M1110000

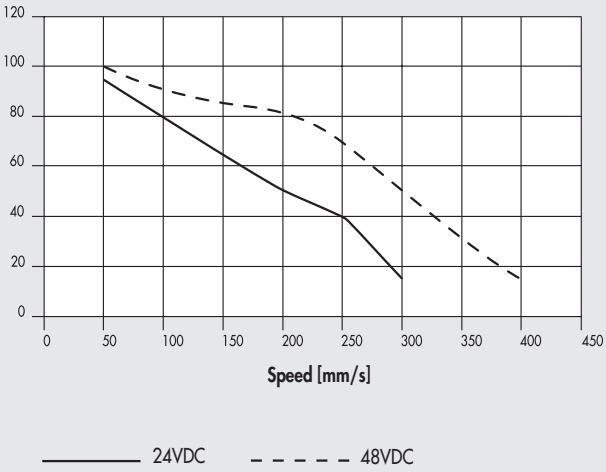
Electric axis with a 5 mm-pitch screw



Electric axis with a 12.7 mm-pitch screw



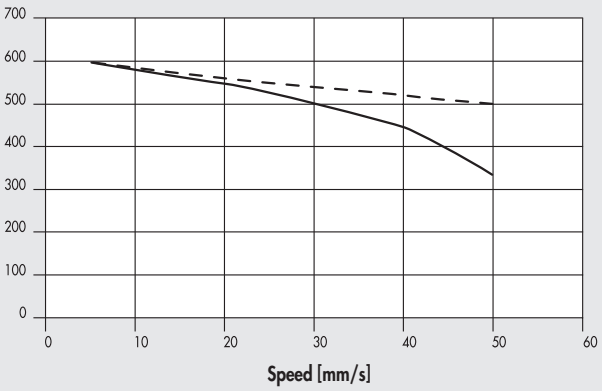
Electric axis with a 25 mm-pitch screw



STEPPING motor code 37M1820000 (with ENCODER) and code 37M1320000 (with BRAKE + ENCODER)

Electric axis with a 5 mm-pitch screw

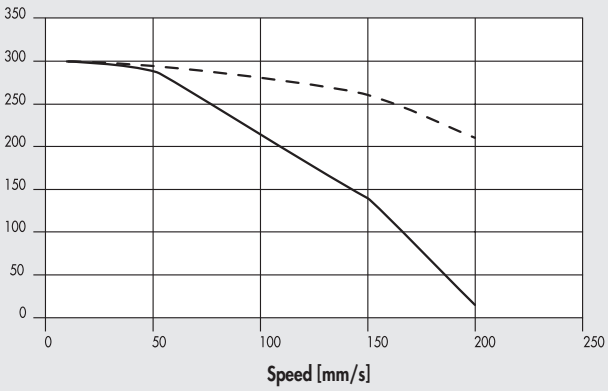
Axial load [N]



24VDC 48VDC

Electric axis with a 12.7 mm-pitch screw

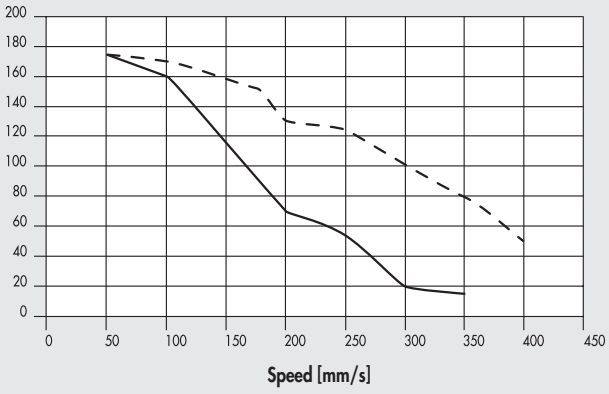
Axial load [N]



24VDC 48VDC

Electric axis with a 25 mm-pitch screw

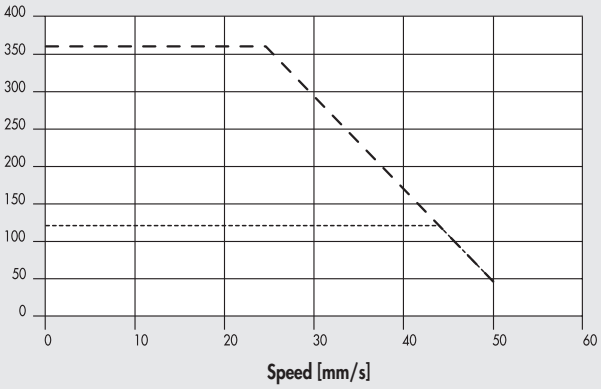
Axial load [N]



24VDC 48VDC

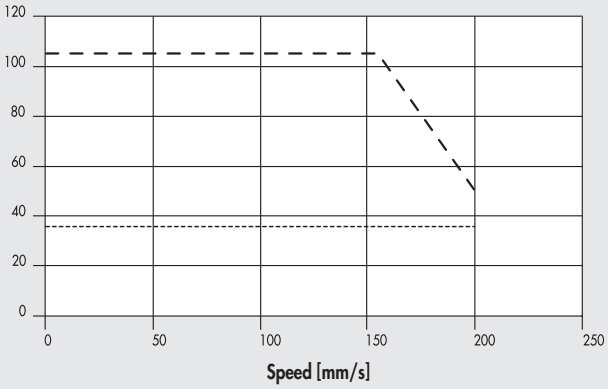
BRUSHLESS motor code 37M2000000 and code 37M4000000 (with BRAKE)

Electric axis with a 5 mm-pitch screw



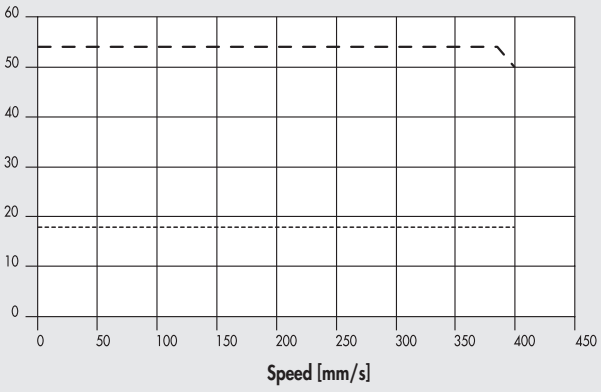
..... Nominal 100 W – – – – – Maximum 100 W

Electric axis with a 12.7 mm-pitch screw



..... Nominal 100 W – – – – – Maximum 100 W

Electric axis with a 25 mm-pitch screw



..... Nominal 100 W – – – – – Maximum 100 W

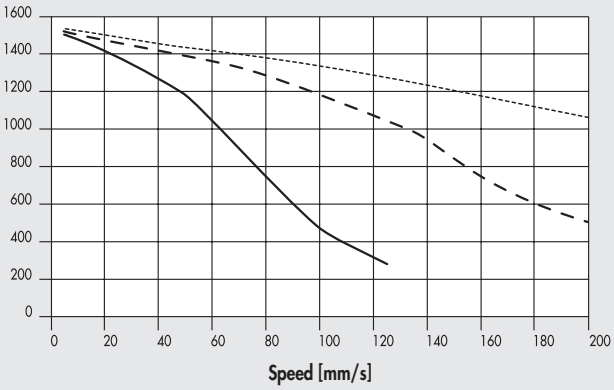
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE) SK-2

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%.

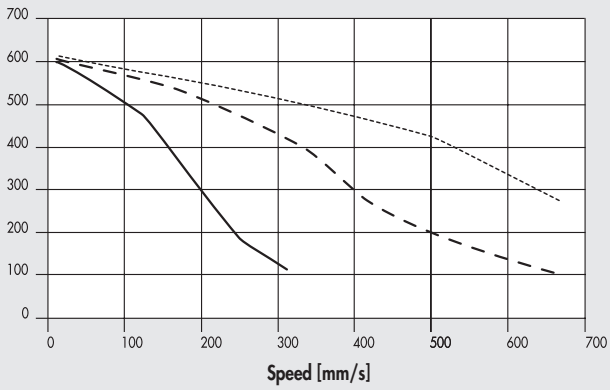
STEPPING motor code 37M1120001 (uprated revs)

Electric axis with a 4 mm-pitch screw



24VDC 48VDC 75VDC

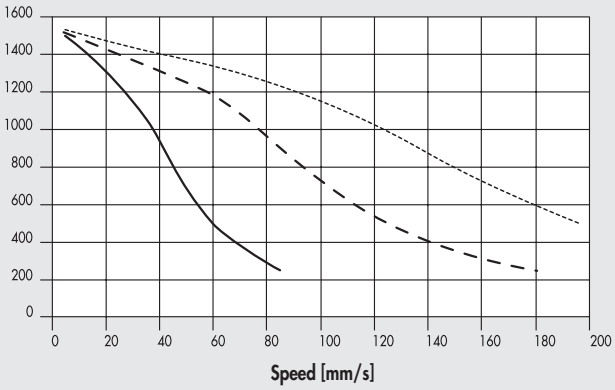
Electric axis with a 10 mm-pitch screw



24VDC 48VDC 75VDC

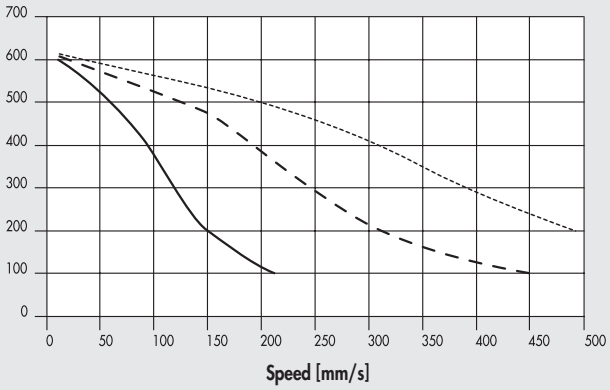
STEPPING motor code 37M5120000 (with brake)

Electric axis with a 4 mm-pitch screw



24VDC 48VDC 75VDC

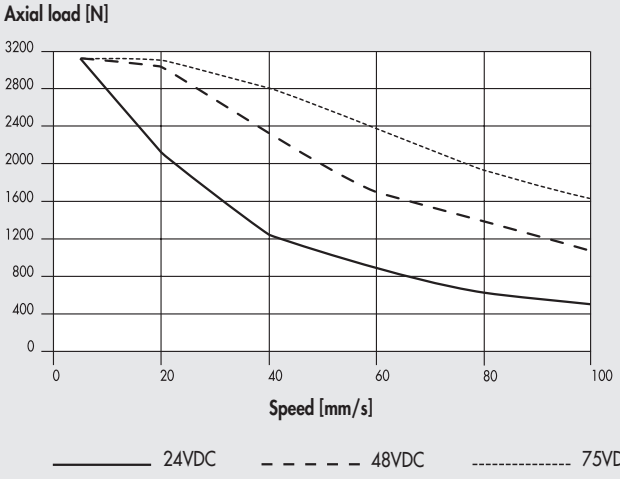
Electric axis with a 10 mm-pitch screw



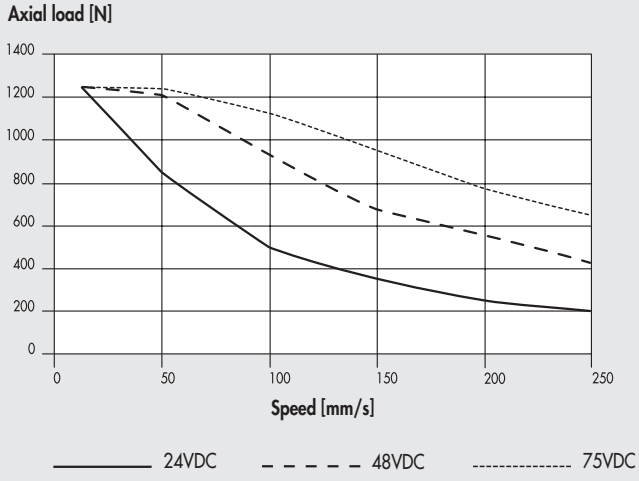
24VDC 48VDC 75VDC

STEPPING motor code 37M3230000 (with brake + encoder)

Electric axis with a 4 mm-pitch screw

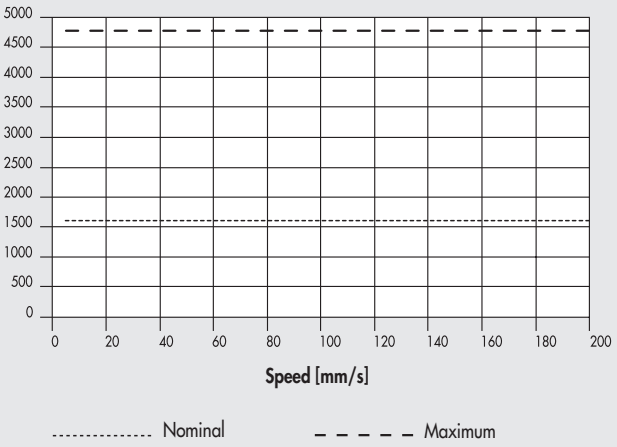


Electric axis with a 10 mm-pitch screw

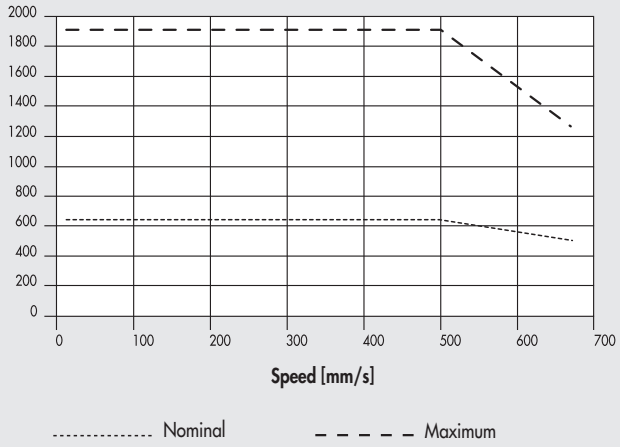


BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

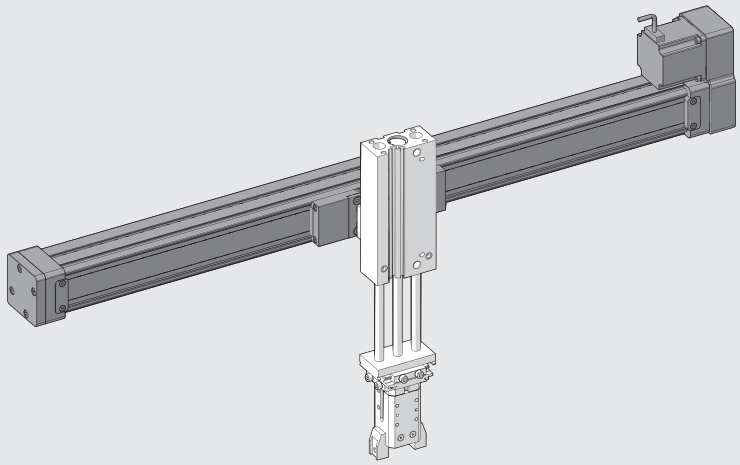
Electric axis with a 4 mm-pitch screw



Electric axis with a 10 mm-pitch screw



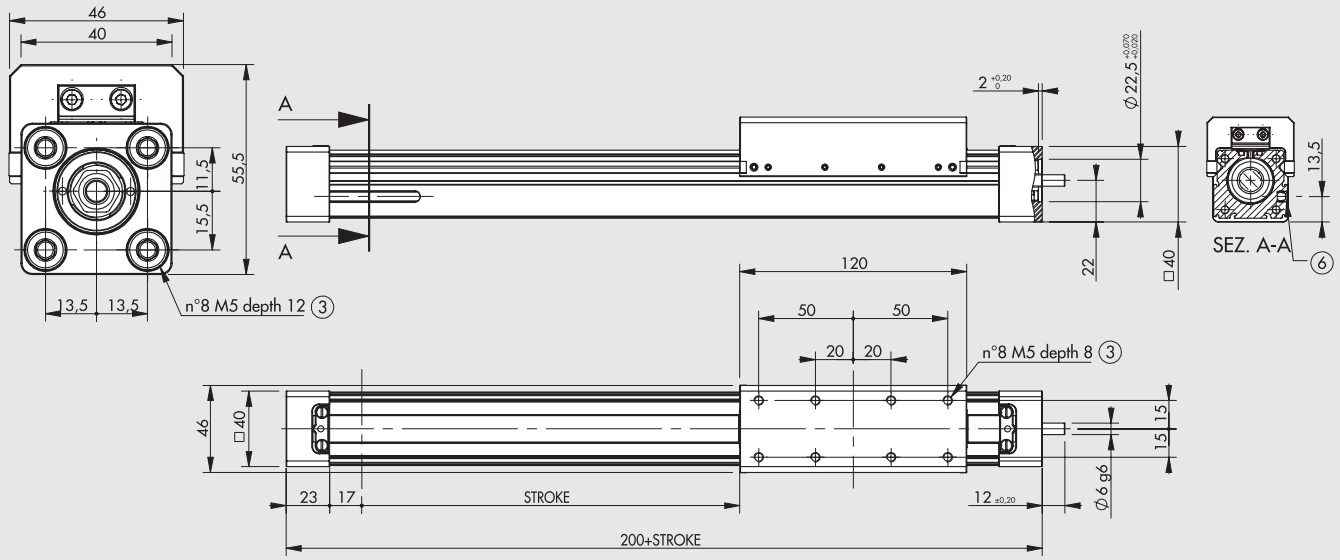
EXAMPLES OF APPLICATION



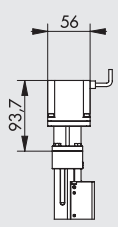
DIMENSIONS ELECTRIC AXIS SK-0

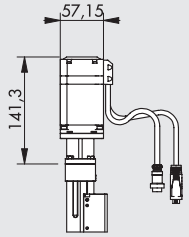
VERSION WITHOUT MOTOR

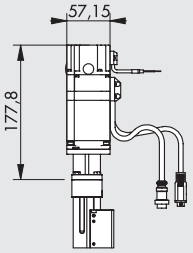
③ Threaded holes for fixing
⑥ Sensor fixing slots

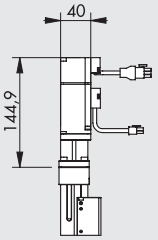


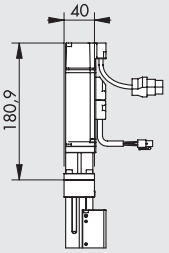
VERSION WITH MOTOR











ORDERABLE CODES

STEPPING MOTOR code 37M1110000	STEPPING MOTOR WITH ENCODER code 37M1820000	STEPPING MOTOR WITH ENCODER AND BRAKE code 37M1320000	BRUSHLESS MOTOR code 37M2000000	BRUSHLESS MOTOR WITH BRAKE code 37M4000000
373005_ _ _ _ 21120	373005_ _ _ _ 28120	373005_ _ _ _ 23120	373005_ _ _ _ 22000	373005_ _ _ _ 24000

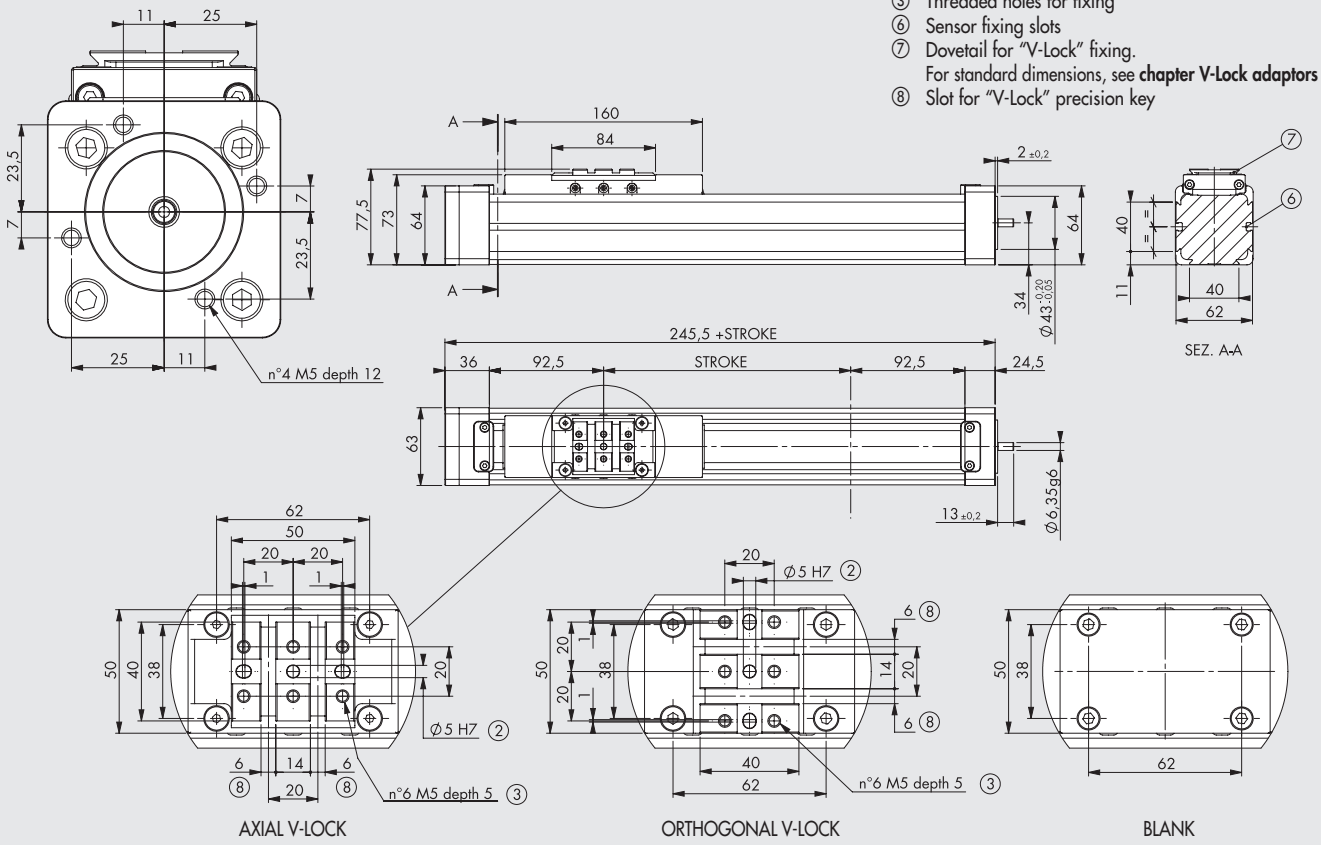
_ _ _ _ = Enter the stroke in mm to complete the code. See Key to Codes for an explanation of encoding.

METAL WORK PNEUMATIC

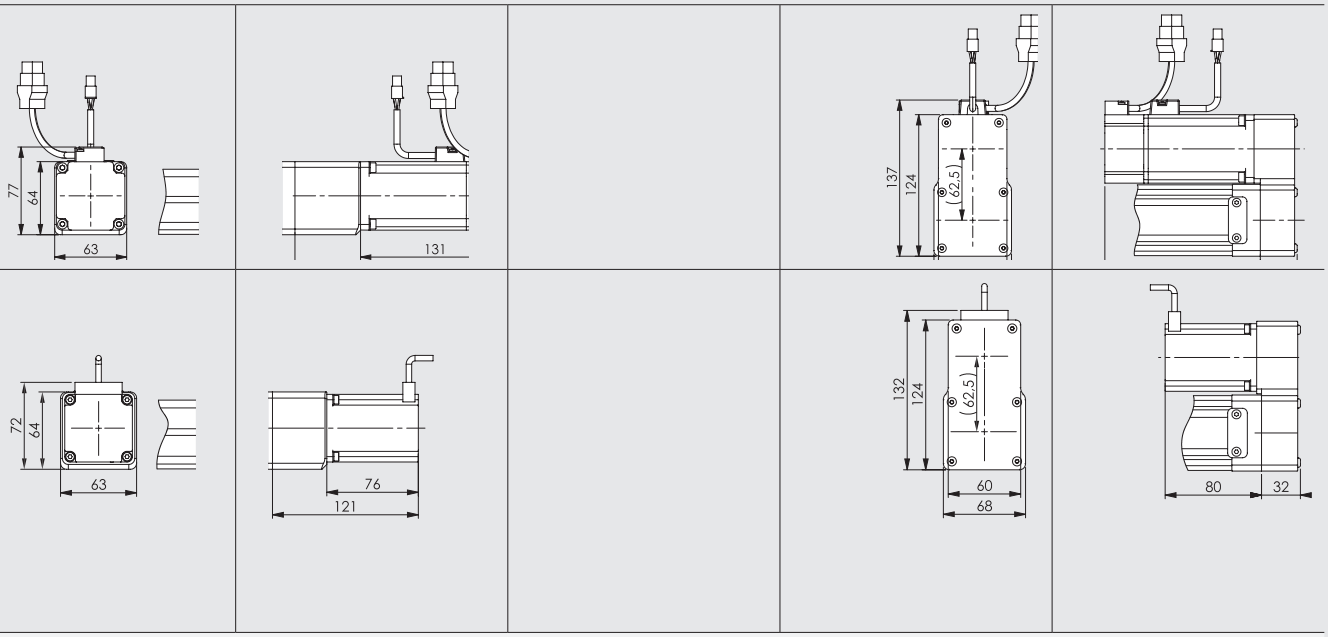
DIMENSIONS ELECTRIC AXIS SK-2

VERSION 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



VERSION WITH MOTOR

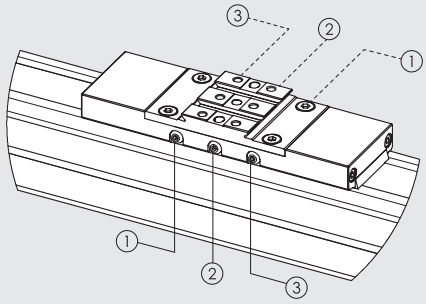


ORDERABLE CODES

STEPPING MOTOR code 37M1120001	STEPPING MOTOR WITH BRAKE code 37M5120000	STEPPING MOTOR WITH ENCODER AND BRAKE code 37M3230000	BRUSHLESS MOTOR code 37M2220001	BRUSHLESS MOTOR AND BRAKE code 37M4220001
37302_ _ _ _21121	37302_ _ _ _25120	37302_ _ _ _23230	37302_ _ _ _22220	37302_ _ _ _24220
37302_ _ _ _91121	37302_ _ _ _95120	37302_ _ _ _93230	37302_ _ _ _92220	37302_ _ _ _94220
37302_ _ _ _61121	37302_ _ _ _65120	37302_ _ _ _63230	37302_ _ _ _62220	37302_ _ _ _64220

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.

LUBRICATION DIAGRAM SK-2



		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.

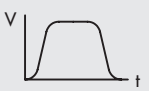
MOTOR-DRIVE COUPLINGS

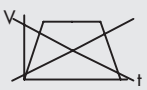
MOTOR CODES		DRIVES CODES			
	Metal Work	37D1222000 *	37D1332000 *	37D1552000	37D1442000
	Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS B7	RTA PLUS A4
Metal Work	Manufacturer	(4.4A 24-75VDC)	(6A 24-75VDC)	(10A 28-62VAC) ●	(6A 77-140VDC) ●
STEPPING MOTORS					
37M1110000	SANYO DENKI 103-H7123-1749 (4A 75V max)	SK-0	SK-0 ◆	SK-0 ■	-
37M1120001	SANYO DENKI 103-H7126-6640 (5.6A 75V max)	-	SK-2	SK-2 ■	-
STEPPING MOTORS WITH ENCODER					
37M1820000	STEPPERONLINE 23HS30-5004D-E1000 (5A 48V max)	-	SK-0 ■	SK-0 ■	-
STEPPING MOTORS WITH BRAKE					
37M5120000	SANYO DENKI 103-H7126-1710.B (4A 75V max)	SK-2	SK-2 ◆	SK-2 ■	-
STEPPING MOTORS WITH BRAKE + ENCODER					
37M1320000	STEPPERONLINE 23E1KBK20-20 (5A 48V max)	-	SK-0 ■	SK-0 ■	-
37M3230000	B&R 80MPF5.500D114-01 (5A 80V max)	-	SK-2 ◆	SK-2 ■	SK-2 ■

✱ 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	37D2100000	37D2300000
	Manufacturer	DELTA ASD-A2-0121-M	DELTA ASD-A2-0421-M
Metal Work	Manufacturer	(100W)	(400W)
BRUSHLESS MOTORS			
37M2000000	DELTA ECMA-C20401RS (100W)	SK-0	-
37M2220001	DELTA ECMA-C20604RS (400W)	-	SK-2
BRUSHLESS MOTORS WITH BRAKE			
37M4000000	DELTA ECMA-C20401SS (100W)	SK-0	-
37M4220001	DELTA ECMA-C20604SS (400W)	-	SK-2

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	3	0	2 SIZE	1 CARRIAGE TYPE	0300 STROKE	1 SCREW PITCH
	37 Electric actuators	**3** Electric axis rodless elektro SK	**0** STD	**0** Size 0	**5** With threaded holes	From 50 to 500 mm	**C** Pitch 5 **F** Pitch 12.7 **L** Pitch 25
				2 Size 2	**1** Axial V-lock **2** Orthogonal V-lock **3** Blank	From 100 to 1200 mm	**1** Pitch 4 **4** Pitch 10

KEY TO CODES AXIS ELECTRIC MOTOR

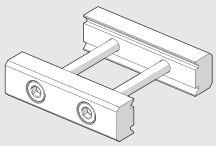
CYL	37 TYPE	3	0	2 SIZE	1 CARRIAGE TYPE	0300 STROKE	1 SCREW PITCH	2 VERSION	DRIVE 1 MOTOR	DRIVE 1 FLANGE	DRIVE 2 TORQUE	DRIVE 0
	37 Electric actuators	**3** Electric axis rodless elektro SK	**0** STD	**0** Size 0	**5** With threaded holes	From 50 to 500 mm	**C** Pitch 5 **F** Pitch 12.7 **L** Pitch 25	**2** In-line	**1** STEPPING **2** BRUSHLESS **3** STEPPING with BRAKE + Encoder **4** BRUSHLESS with BRAKE **5** STEPPING with BRAKE without Encoder **8** STEPPING with Encoder	**0** 40 **1** NEMA 23 **2** 60	**0** 0 - 0.79 Nm **2** 1.2 - 2.19 Nm **3** 2.2 - 3 Nm	**0** Base **1** Greater rpm
				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 ● **6** Geared right ● **9** Geared left				

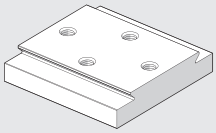
● Version IP40 available for all STEPPING and BRUSHLESS motors, with the exception of motor code 37M5120000 which it is IP20.
N.B.: The Orderable configurations are shown on the previous pages.

NOTES

ACCESSORIES

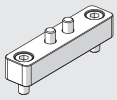
FIXING ELEMENTS

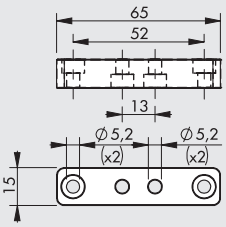


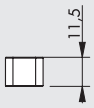


See V-Lock family.

FOOT SK-0



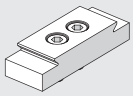


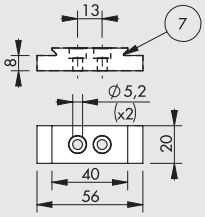


Code	Description	Weight [g]
0950T0R042	SK-0 flat foot	26

Note: Supplied complete with 4 screws

SK-0 V-LOCK FOOT WITH INTERFACE



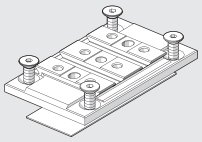


Code	Description	Weight [g]
0950T0R042K	V-Lock SK-0 foot	30

Note: Supplied complete with 2 screws

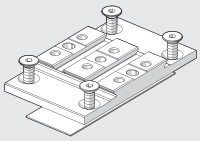
⑦ Dovetail for "V-Lock" fixing

CARRIAGE INTERFACE KIT SK-2



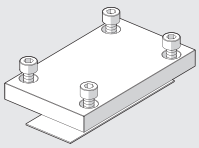
Code	Description	Weight [g]
0950T2R016K	V-Lock axial interface kit	95

Note: supplied complete with 4 screws, 1 adhesive pad



0950T2R017K	V-Lock orthogonal interface kit	91

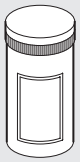
Note: supplied complete with 4 screws, 1 adhesive pad



0950T2R015	BLANK interface kit	127

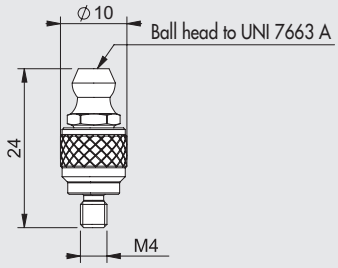
Note: supplied complete with 4 screws, 1 adhesive pad

GREASE SK-2



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

GREASE NIPPLE SK-2

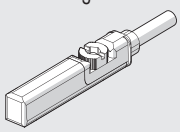


Code	Description
0950T2R108	Complete grease nipple for Elektro rodless SK cylinders

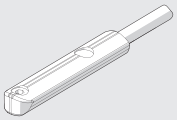
Note: Individually packed

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



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

DRIVES

For motor-drive couplings see table on page **A5**.136

SPARE PARTS

ELECTRIC MOTORS

For motor-drive couplings see table on page **A5**.136

NOTES

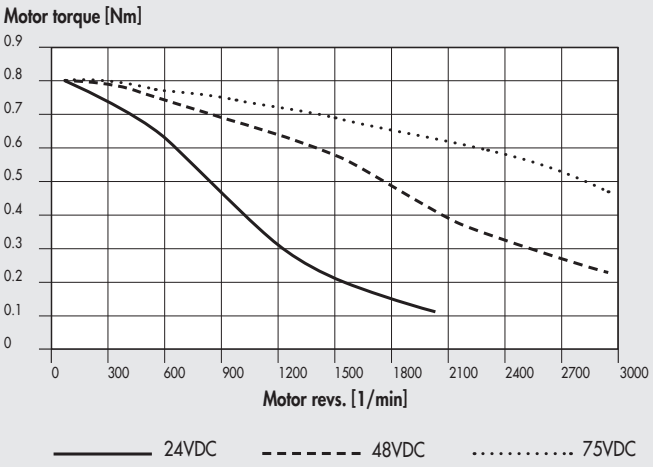
STEPPING MOTORS

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%.

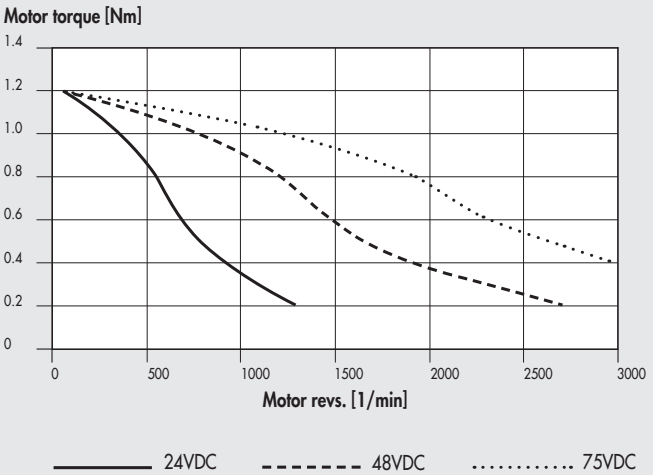
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS

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

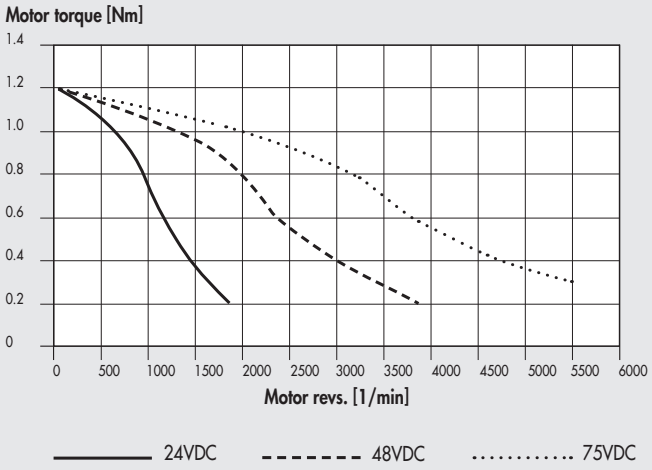
STEPPING motor code **37M1120000**



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

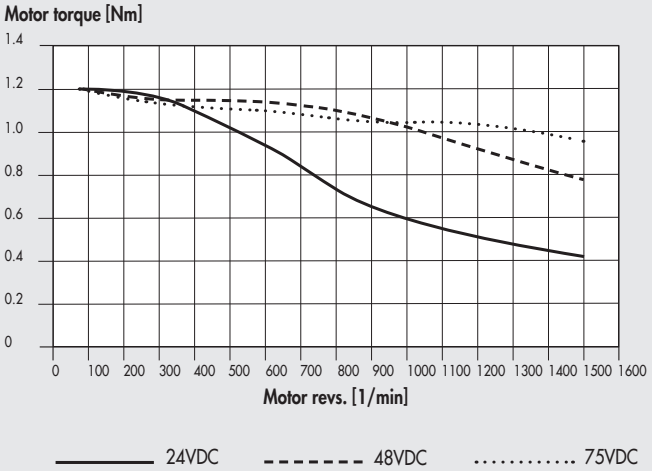
METAL WORK PNEUMATIC

STEPPING motor code **37M1120001**



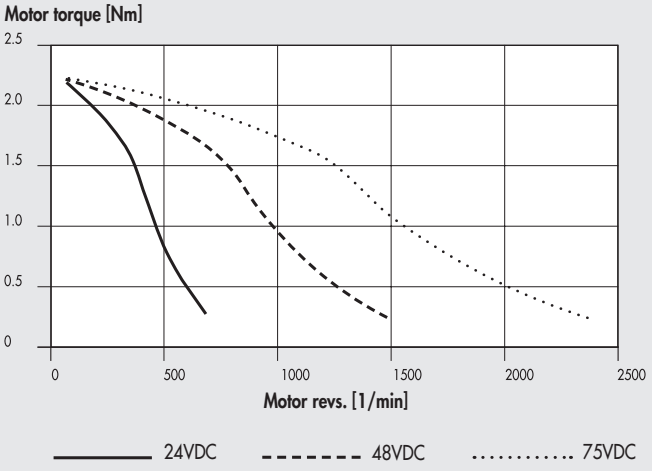
TECHNICAL DATA		MOTOR 37M1120001
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	5.6
Resistance	Ω	0.3
Inductance	mH	0.85
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm²	36
Theoretical acceleration	rad · s⁻²	45800
Back E.M.F.	V/krpm	23
Mass	kg	1
Degree of protection		IP43

STEPPING motor code **37M1220000**



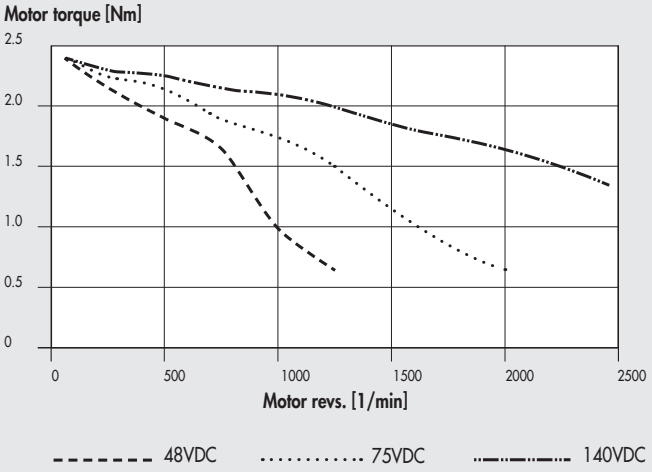
TECHNICAL DATA		MOTOR 37M1220000
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
CABLE		
Power cable for stepping motors with brake, 1 metre		supplied

STEPPING motor code **37M1230000**



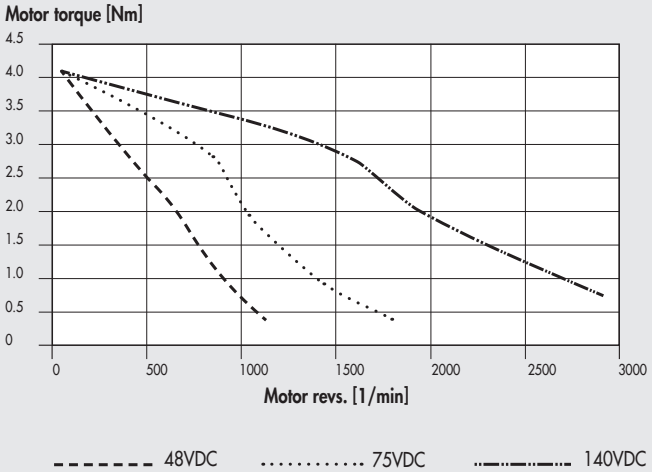
TECHNICAL DATA		MOTOR 37M1230000
Motor type		STEPPING
Nominal torque	Nm	**2.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.65
Inductance	mH	2.4
Bipolar holding torque	Nm	3
Rotor inertia	kgmm²	84
Theoretical acceleration	rad · s⁻²	35700
Back E.M.F.	V/krpm	75
Mass	kg	1.4
Degree of protection		IP40

STEPPING motor code **37M1430000**



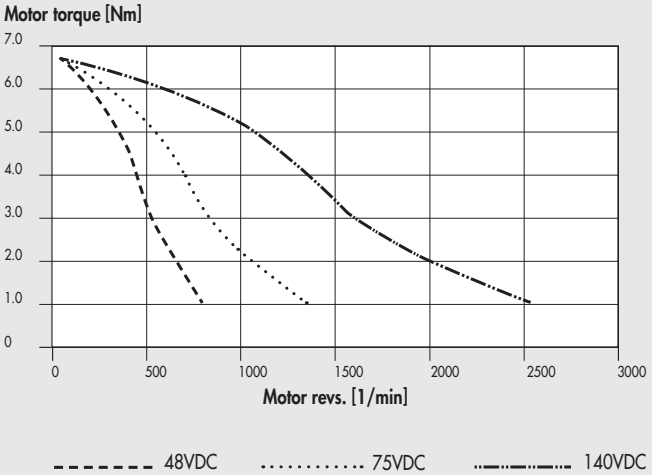
TECHNICAL DATA		MOTOR 37M1430000
Motor type		STEPPING
Nominal torque	Nm	**2.4**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.3
Inductance	mH	1.65
Bipolar holding torque	Nm	3
Rotor inertia	kgmm²	145
Theoretical acceleration	rad · s⁻²	20600
Back E.M.F.	V/krpm	50
Mass	kg	1.5
Degree of protection		IP43

STEPPING motor code **37M1440000**



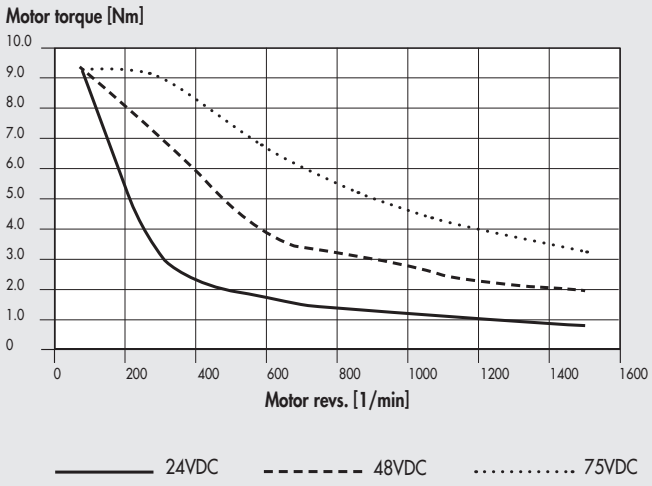
TECHNICAL DATA		MOTOR 37M1440000
Motor type		STEPPING
Nominal torque	Nm	**4.2**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.35
Inductance	mH	2.7
Bipolar holding torque	Nm	5.6
Rotor inertia	kgmm²	290
Theoretical acceleration	rad · s⁻²	19300
Back E.M.F.	V/krpm	93
Mass	kg	2.5
Degree of protection		IP43

STEPPING motor code **37M1450000**



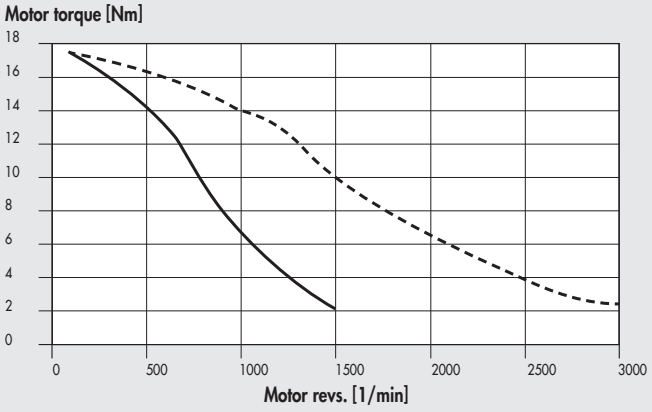
TECHNICAL DATA		MOTOR 37M1450000
Motor type		STEPPING
Nominal torque	Nm	**6.7**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current parallel	A	6
Resistance	Ω	0.46
Inductance	mH	3.8
Bipolar holding torque	Nm	9.2
Rotor inertia	kgmm²	450
Theoretical acceleration	rad · s⁻²	20500
Back 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**



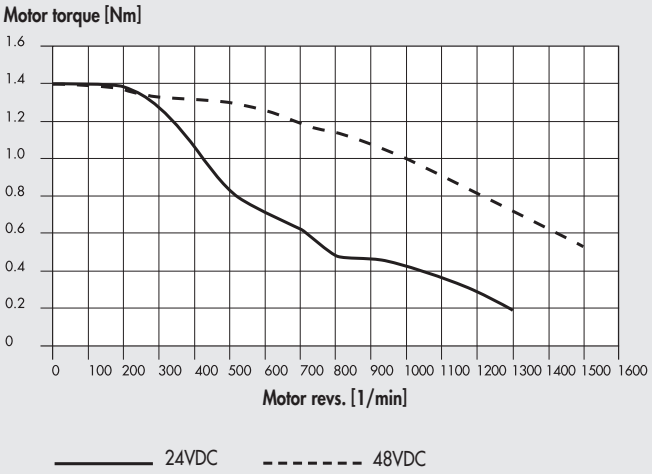
TECHNICAL DATA		MOTOR 37M1890000
Motor type		STEPPING
Nominal torque	Nm	**17.5**
Coupling flange		**NEMA 42**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.63
Inductance	mH	8
Bipolar holding torque	Nm	24.6
Rotor inertia	kgmm²	2200
Theoretical acceleration	rad · s⁻²	11100
Back E.M.F.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

NOTES

STEPPING MOTORS WITH ENCODER

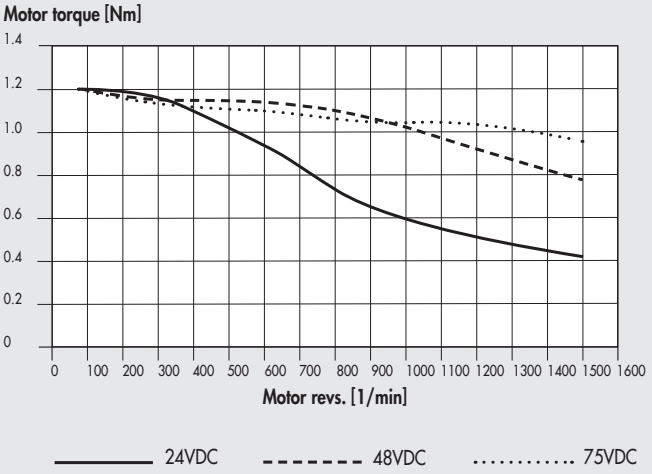
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH ENCODER

STEPPING motor + ENCODER code **37M1820000**



TECHNICAL DATA		MOTOR 37M1820000
Motor type		STEPPING + ENCODER
Nominal torque	Nm	**1.4**
Coupling flange (square)	mm	**NEMA 23**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.42
Inductance	mH	1.7
Bipolar holding torque	Nm	2
Rotor inertia	kgmm²	43
Mass	kg	1.4
Degree of protection		IP40
ENCODER		
Number of outputs		2 A / B (differential)
Resolution	positions per rev	1000
Supply voltage	VDC	5±10%
CABLES		
Encoder cable for stepping motors with brake, 5 metres		**37C1250001**
Power cable for stepping motors with brake, 5 metres		**37C1150000**
Encoder cable for stepping motors with brake, 10 metres		**37C1200003**
Power cable for stepping motors with brake, 10 metres		**37C1100000**

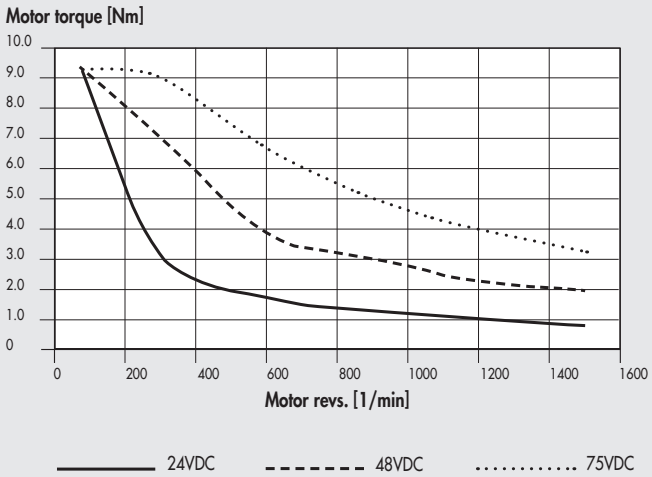
STEPPING motor + ENCODER code **37M8220000**



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**

METAL WORK PNEUMATIC

STEPPING motor with ENCODER code **37M8470000**



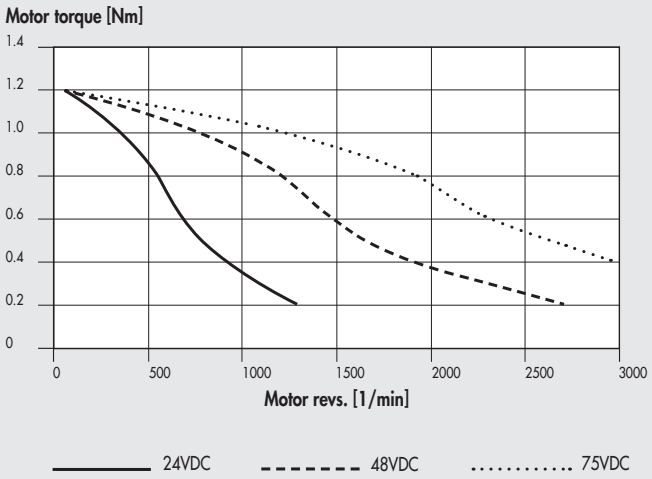
TECHNICAL DATA		MOTOR 37M8470000
Motor type		STEPPING with ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	$kgmm^2$	392
Mass	kg	4.3
Degree of protection		IP65
ENCODER		
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**

NOTES

STEPPING MOTORS WITH BRAKE

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE

STEPPING motor with BRAKE code **37M5120000**



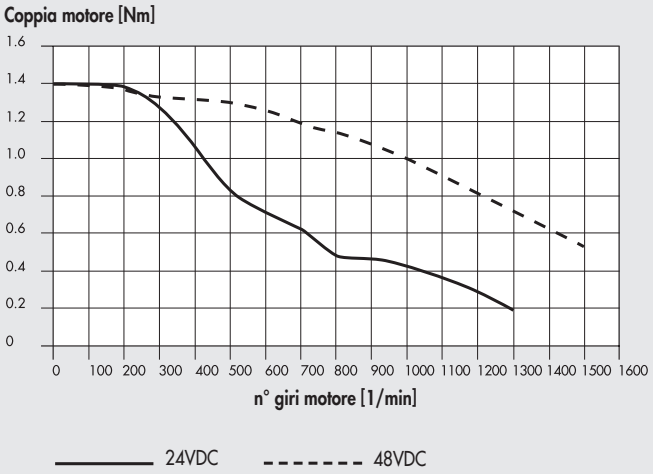
TECHNICAL DATA		MOTOR 37M5120000
Motor type		STEPPING with BRAKE
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	$kgmm^2$	36
Theoretical acceleration	$rad \cdot s^{-2}$	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

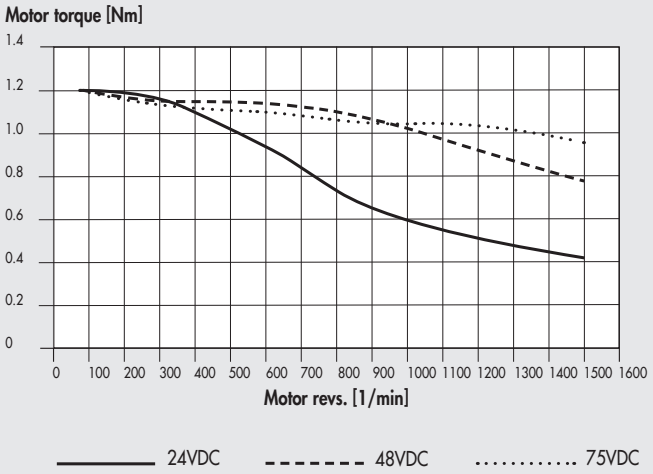
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE + ENCODER

STEPPING motor with BRAKE + ENCODER code **37M1320000**



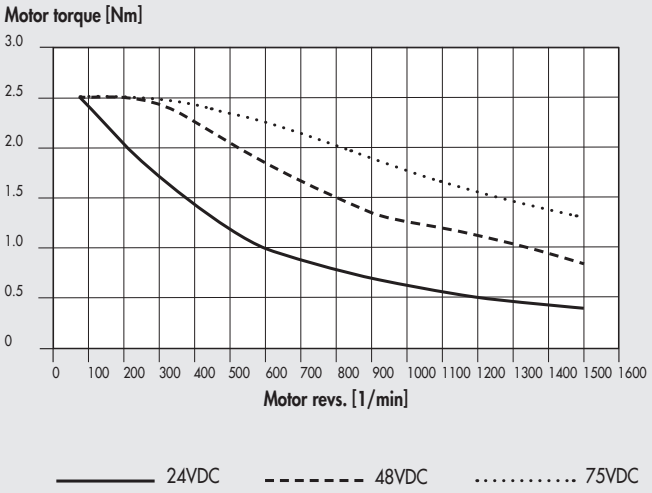
TECHNICAL DATA		MOTOR 37M1320000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**1.4**
Coupling flange (square)	mm	**NEMA 23**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.4
Inductance	mH	1.8
Bipolar holding torque	Nm	2
Rotor inertia	kgmm²	48
Mass	kg	1.8
Degree of protection		IP40
ENCODER		
Number of outputs		2 A / B (differential)
Resolution	positions per rev	1000
Supply voltage	VDC	5±10%
BRAKE		
Supply voltage	VDC	24±10%
Braking torque	Nm	2
Power consumption	W	11
CABLES		
Encoder cable for stepping motors with brake, 5 metres		**37C1250001**
Power cable for stepping motors with brake, 5 metres		**37C1150000**
Encoder cable for stepping motors with brake, 10 metres		**37C1200003**
Power cable for stepping motors with brake, 10 metres		**37C1100000**

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



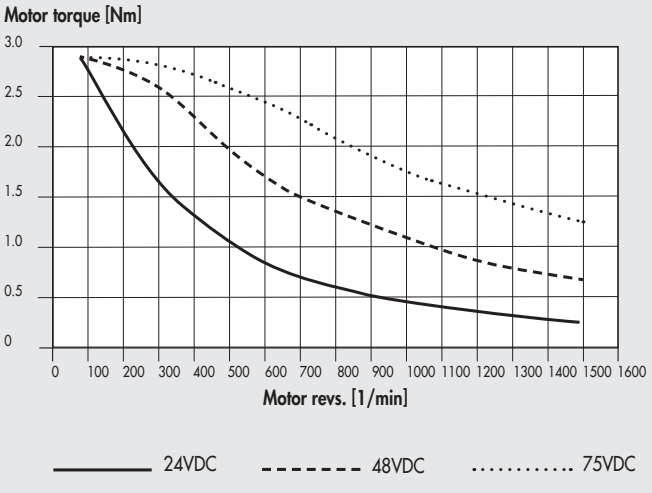
TECHNICAL DATA		MOTOR 37M3220000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
ENCODER		
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**

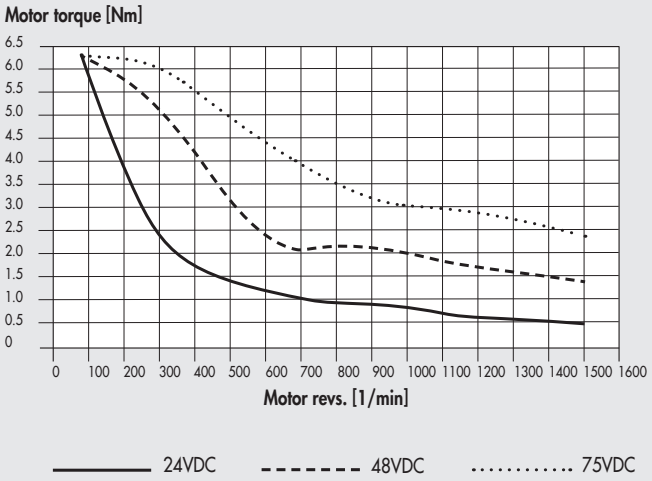
STEPPING motor with BRAKE + ENCODER code **37M3430000**



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**

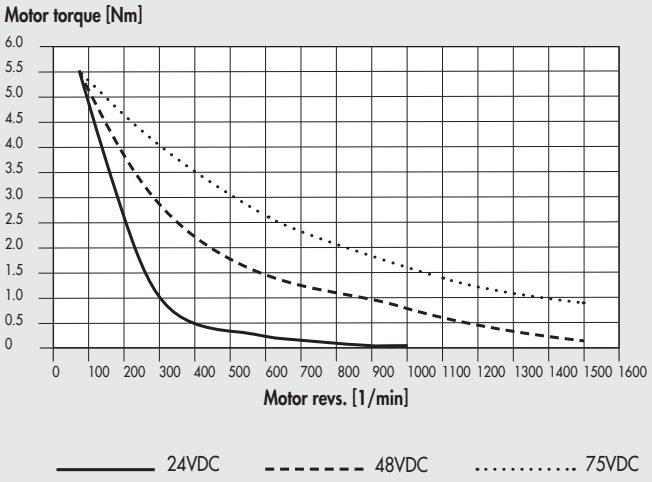
METAL WORK PNEUMATIC

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



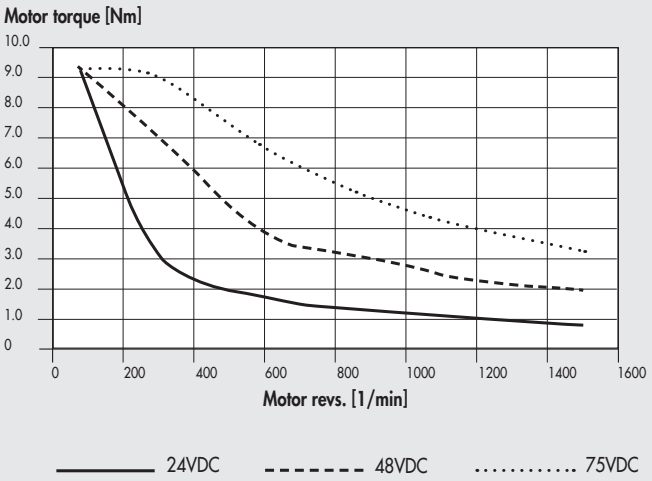
TECHNICAL DATA		MOTOR 37M3450000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**6.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.2
Inductance	mH	1.4
Bipolar holding torque	Nm	9.5
Rotor inertia	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65
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**



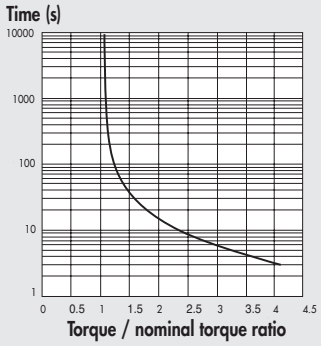
TECHNICAL DATA		MOTOR 37M3470000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	$kgmm^2$	392
Mass	kg	4.9
Degree of protection		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**

NOTES

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.

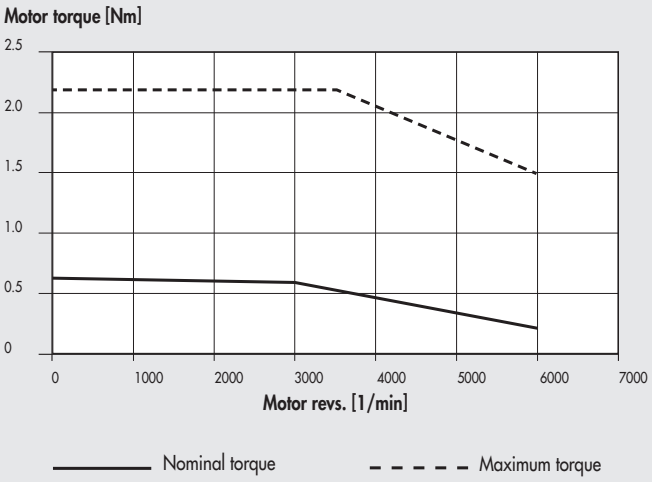


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

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

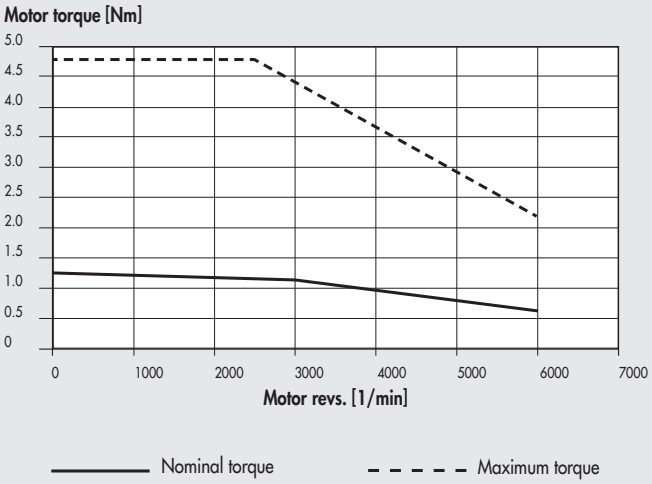
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



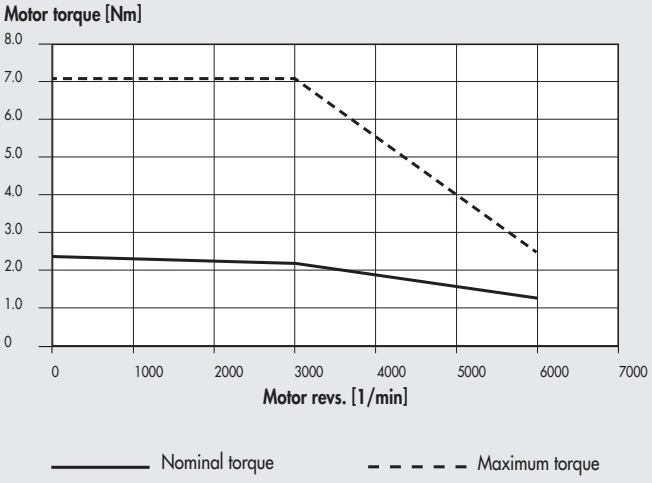
TECHNICAL DATA		MOTOR 37M2200000
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	21.9
Mass	kg	0.84
Encoder	pulse/rev	131072 (17 bit)
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)



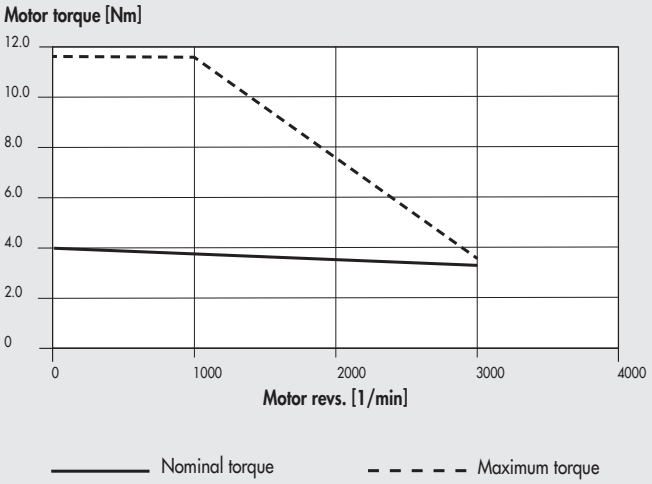
TECHNICAL DATA		MOTOR 37M2220000
Motor type		BRUSHLESS
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	41.2
Mass	kg	1.3
Encoder	pulse/rev	131072 (17 bit)
Degree 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**

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

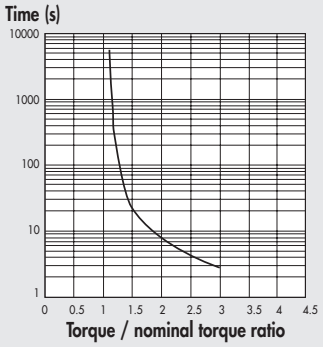


TECHNICAL DATA		MOTOR 37M2540000
Motor type		BRUSHLESS
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	$kgmm^2$	238.3
Mass	kg	3.5
Encoder	pulse/rev	131072 (17 bit)
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)

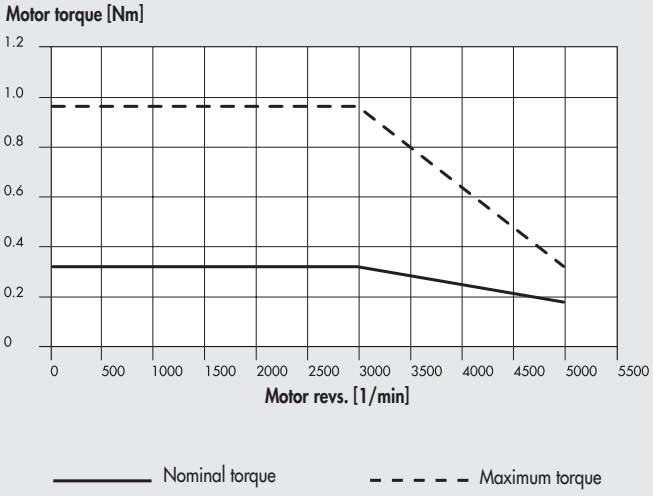
The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.



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%

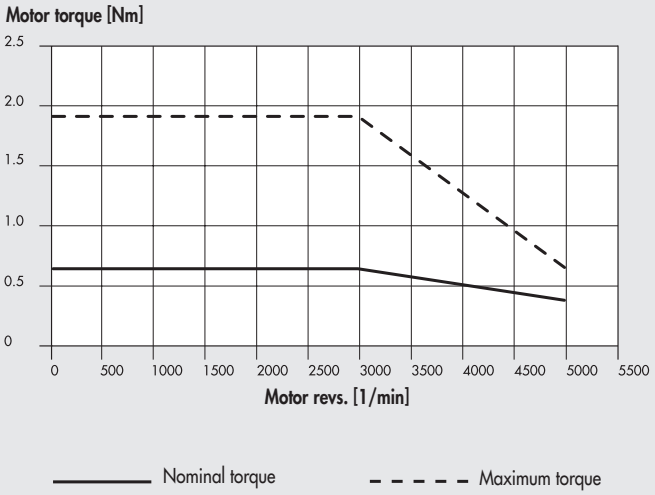
BRUSHLESS motor code **37M2000000** +
drive code **37D2100000** (100W)



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**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
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**

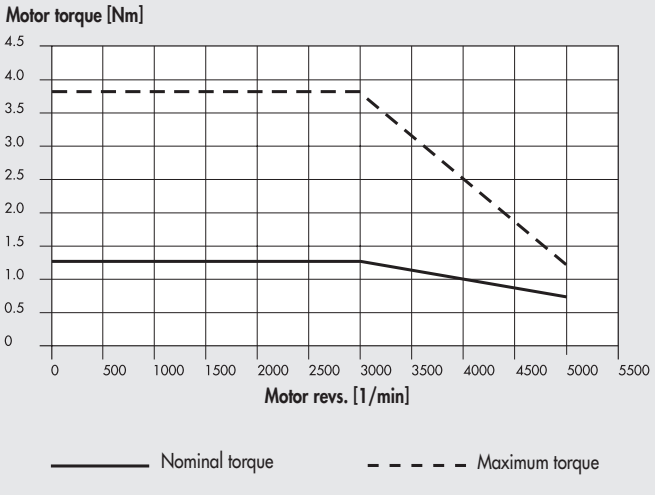
METAL WORK PNEUMATIC

BRUSHLESS motor code **37M2200001** +
drive code **37D2200001** (200W)



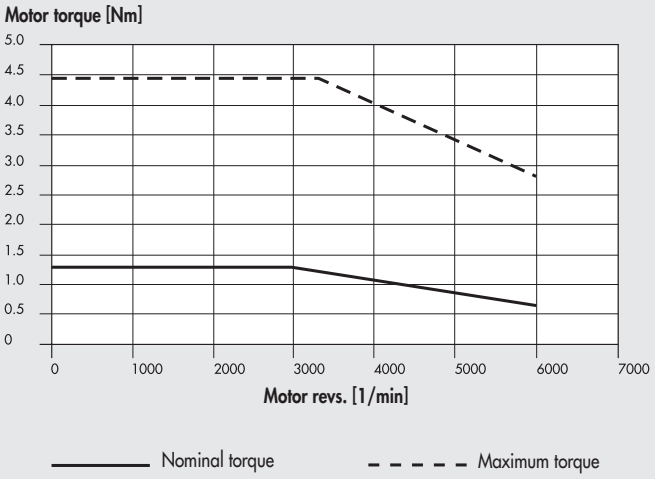
TECHNICAL DATA		MOTOR 37M2200001
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	kgmm^2	17.7
Mass	kg	1.2
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2200001**
CABLES		
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
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 **37M2220001** +
drive code **37D2300000** (400W)



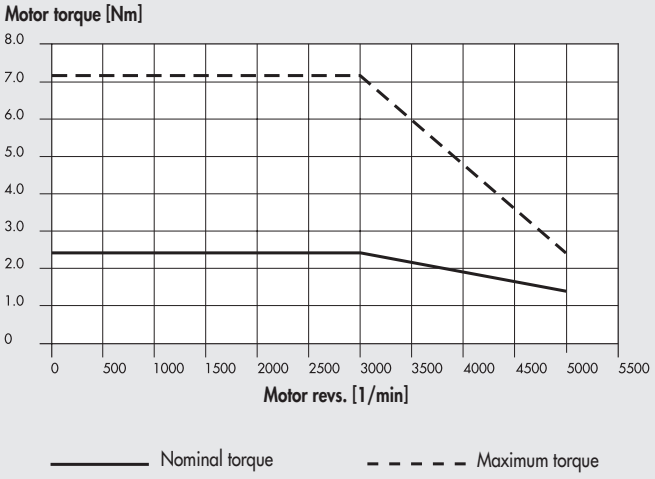
TECHNICAL DATA		MOTOR 37M2220001
Motor type		BRUSHLESS
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm^2	27.7
Mass	kg	1.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2300000**
CABLES		
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
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 **37M2220002** +
drive code **37D2300002** (400W)



TECHNICAL DATA		MOTOR 37M2220002
Motor type		BRUSHLESS B3
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	1.3
Maximum torque	Nm	4.45
Rotor inertia	kgmm²	25.4
Mass	kg	1.2
Encoder	pulse/rev	16777216 (24 bit)
Degree of protection		IP67
DRIVE	code	**37D2300002**
CABLES		
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230006**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150002**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250007**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200006**

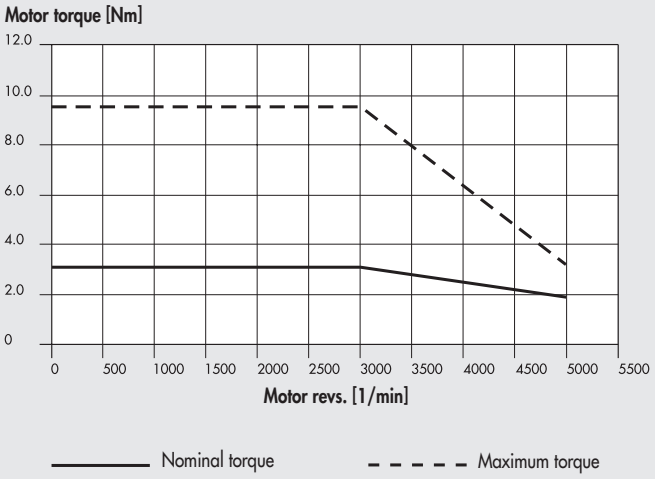
BRUSHLESS motor code **37M2330001** +
drive code **37D2400007** (750W)



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**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
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**

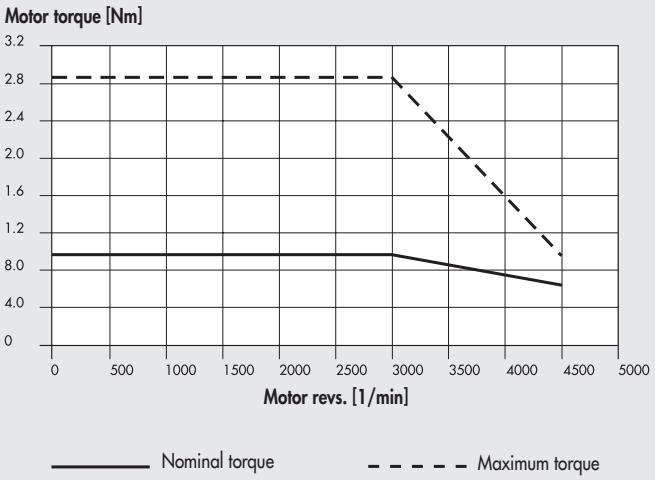
METAL WORK PNEUMATIC

BRUSHLESS motor code **37M2640000** +
drive code **37D2400006** (1000W)



TECHNICAL DATA		MOTOR 37M2640000
Motor type		BRUSHLESS
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**100**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	3.18
Maximum torque	Nm	9.54
Rotor inertia	kgmm²	265
Mass	kg	4.3
Encoder	pulse/rev	131072 (17bit)
Degree of protection		IP65
DRIVE	code	**37D2400006**
CABLES		
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130006**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230007**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150006**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250008**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100006**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200007**

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



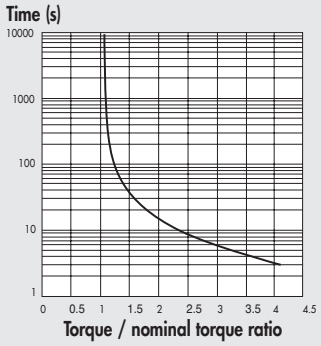
TECHNICAL DATA		MOTOR 37M2770000
Motor type		BRUSHLESS
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm²	1270
Mass	kg	7.8
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
DRIVE	code	**37D2600001**
CABLES		
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130006**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230007**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150006**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250008**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100006**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200007**

NOTES

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.

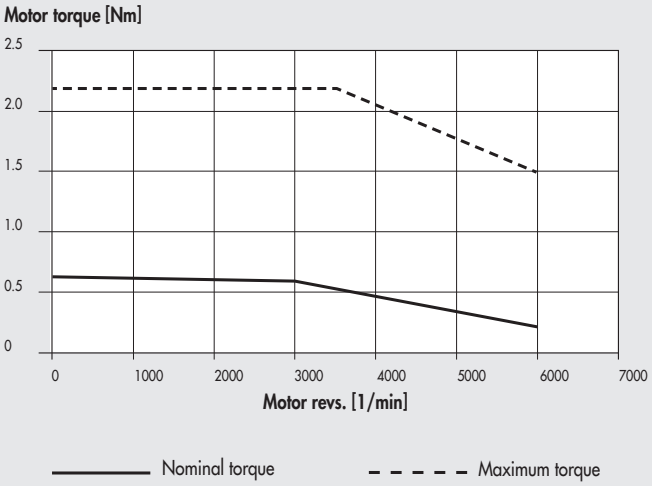


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (SANYO DENKI)

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

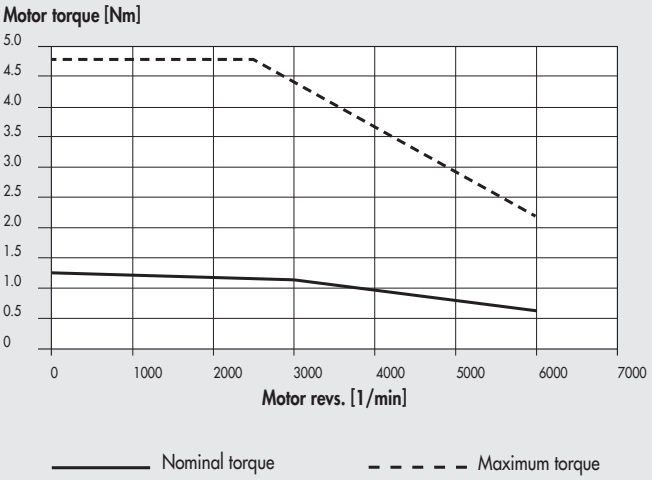
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



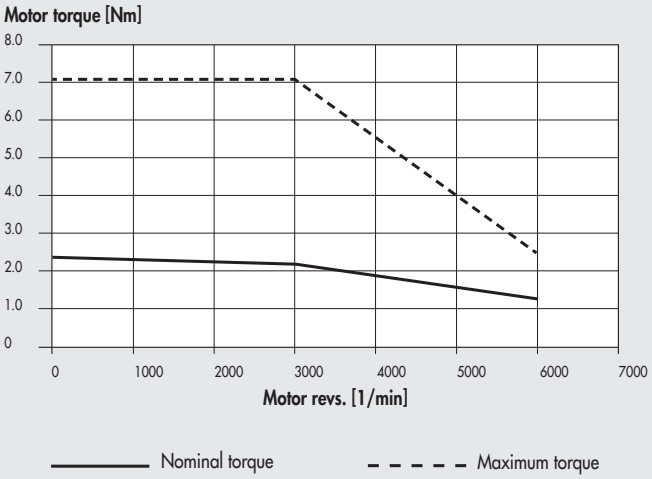
TECHNICAL DATA		MOTOR 37M4200000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	27.9
Mass	kg	1.23
Encoder	pulse/rev	131072 (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)



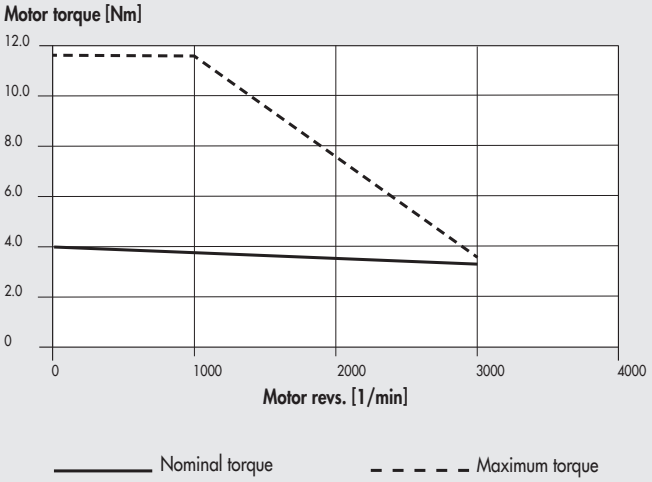
TECHNICAL DATA		MOTOR 37M4220000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	47.2
Mass	kg	1.69
Encoder	pulse/rev	131072 (17 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	7.1
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)

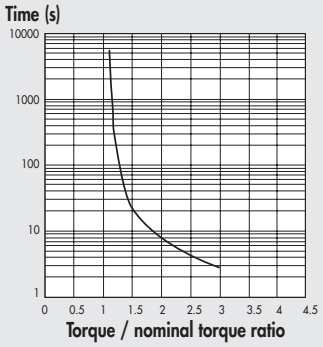


TECHNICAL DATA		MOTOR 37M4540000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	$kgmm^2$	272.6
Mass	kg	4.34
Encoder	pulse/rev	131072 (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.

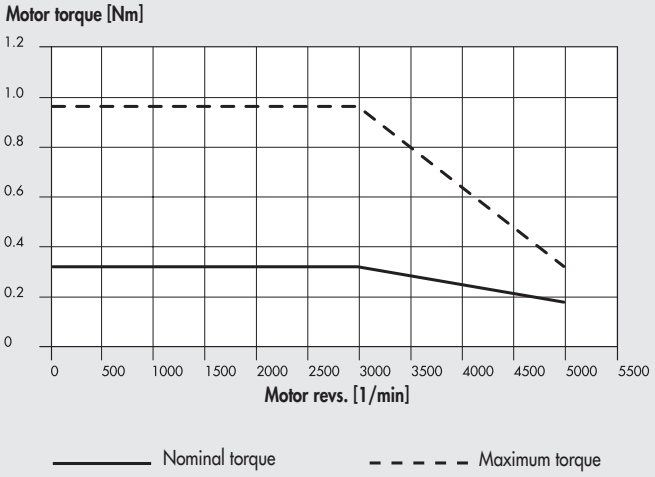


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (DELTA)

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

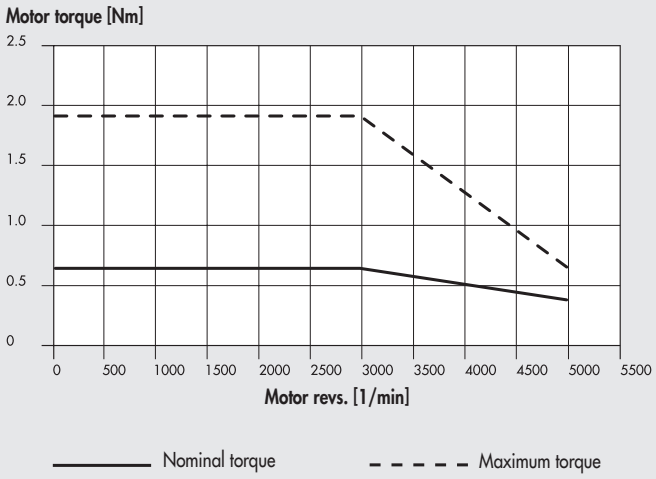
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



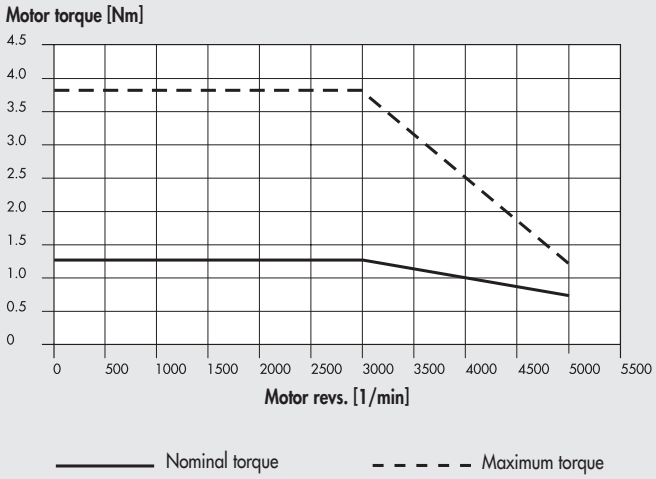
TECHNICAL DATA		MOTOR 37M4000000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.32**
Coupling flange (square)	mm	**40**
Nominal power	W	100
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.32
Maximum torque	Nm	0.96
Rotor inertia	kgmm^2	4
Mass	kg	0.8
Encoder	imp./giro	131072 (17 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 **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2230002**
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 **37M4200001** + drive code **37D2200001** (200W)



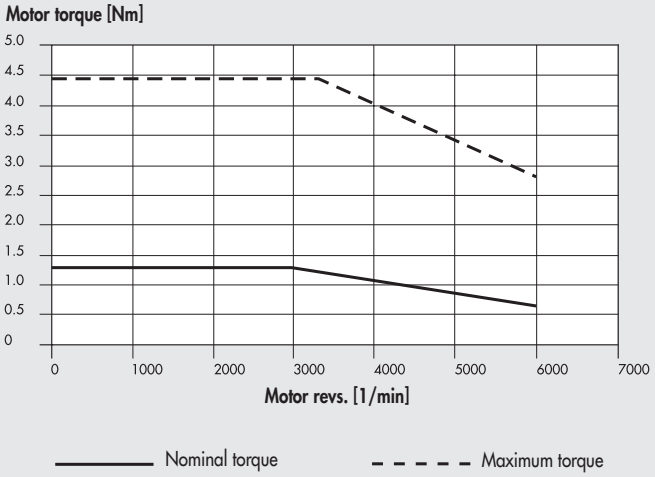
TECHNICAL DATA		MOTOR 37M4200001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	kgmm²	19.2
Mass	kg	1.5
Encoder	imp./giro	131072 (17 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 **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2230002**
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 **37M4220001** + drive code **37D2300000** (400W)



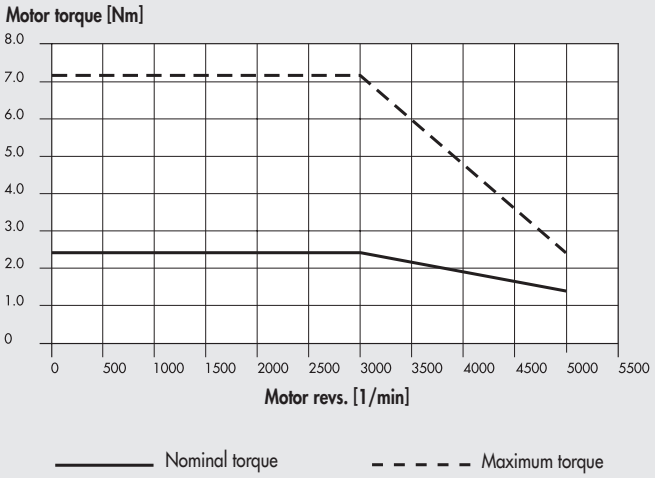
TECHNICAL DATA		MOTOR 37M4220001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm²	30
Mass	kg	2
Encoder	pulse/rev	131072 (17 bit)
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 **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2230002**
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 **37M4220002** + drive code **37D2300002** (400W)



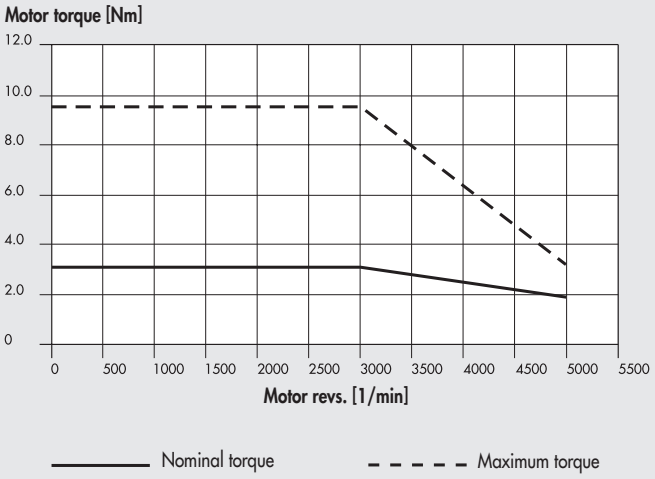
TECHNICAL DATA		MOTOR 37M4220002
Motor type		BRUSHLESS with BRAKE B3
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.3
Maximum torque	Nm	4.45
Rotor inertia	kgmm²	26.4
Mass	kg	1.6
Encoder	pulse/rev	16777216 (24 bit)
Degree of protection		IP67
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.3
Absorption	W	7.6
DRIVE	code	**37D2300002**
CABLES		
Brushless **motor-drive** with brake **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230006**
Brushless **motor-drive** with brake **dynamic** cable, 5 metres		**37C2750001**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250007**
Brushless **motor-drive** with brake **dynamic** cable, 10 metres		**37C2700001**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200006**

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



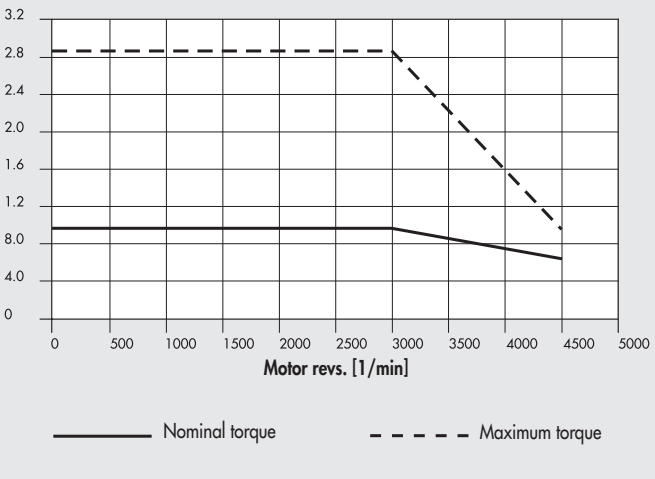
TECHNICAL DATA		MOTOR 37M4330001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	2.39
Maximum torque	Nm	7.17
Rotor inertia	kgmm²	113
Mass	kg	3
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	2.5
Absorption	W	6.5
DRIVE	code	**37D2400007**
CABLES		
Brushless **motor-drive** with brake **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
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 **37M4640000** + drive code **37D2400006** (1000W)



TECHNICAL DATA		MOTOR 37M4640000
Motor type		BRUSHLESS
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**100**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	3.18
Maximum torque	Nm	9.54
Rotor inertia	kgmm²	333
Mass	kg	4.7
Encoder	pulse/rev	131072 (17bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	10
Absorption	W	19
DRIVE	code	**37D2400006**
CABLES		
Brushless **motor-drive** with brake **dynamic** cable, 3 metres		**37C2730002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230007**
Brushless **motor-drive** with brake **dynamic** cable, 5 metres		**37C2750003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250008**
Brushless **motor-drive** with brake **dynamic** cable, 10 metres		**37C2700002**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200007**

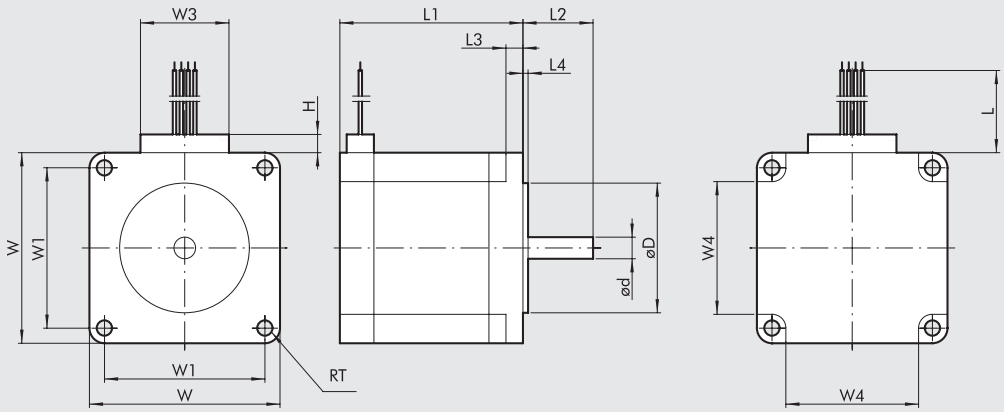
BRUSHLESS motor with BRAKE code **37M4770000** + drive code **37D2600001** (3000W)



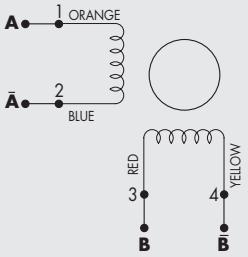
TECHNICAL DATA		MOTOR 37M4770000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm²	1400
Mass	kg	9.2
Encoder	pulse/rev	1048576 (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** with brake **dynamic** cable, 3 metres		**37C2730002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230007**
Brushless **motor-drive** with brake **dynamic** cable, 5 metres		**37C2750003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250008**
Brushless **motor-drive** with brake **dynamic** cable, 10 metres		**37C2700002**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200007**

NOTES

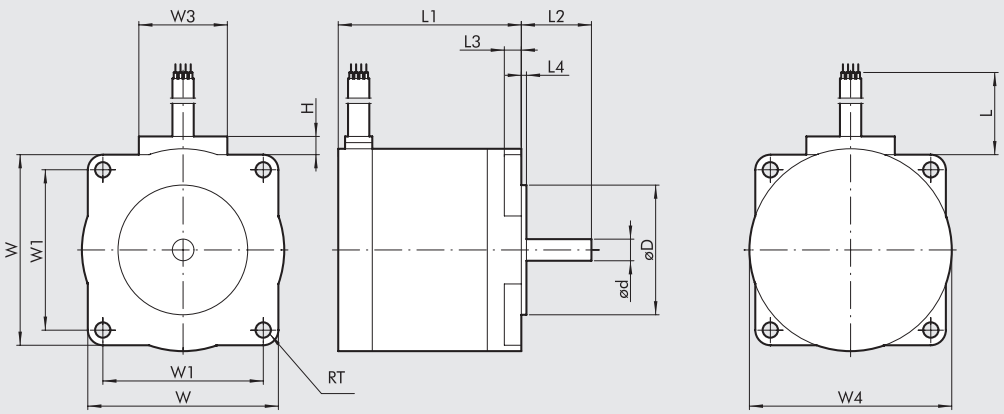
DIMENSIONS OF ELECTRIC MOTORS



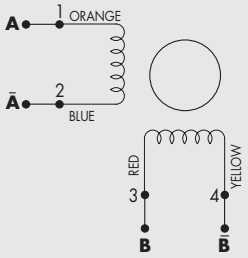
WIRING DIAGRAM



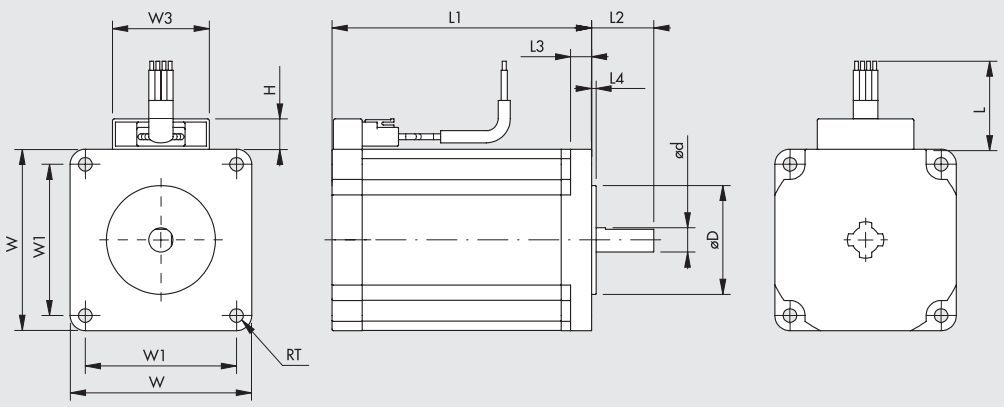
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5
STEPPING	37M1110000	0.8	NEMA 23	6.35	38.1	7	305	53.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120000	1.2	NEMA 23	6.35	38.1	7	305	75.8	20.6	5	1.5	4.5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



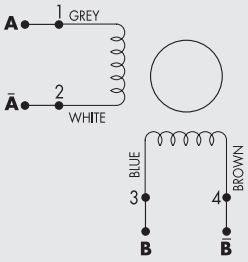
WIRING DIAGRAM



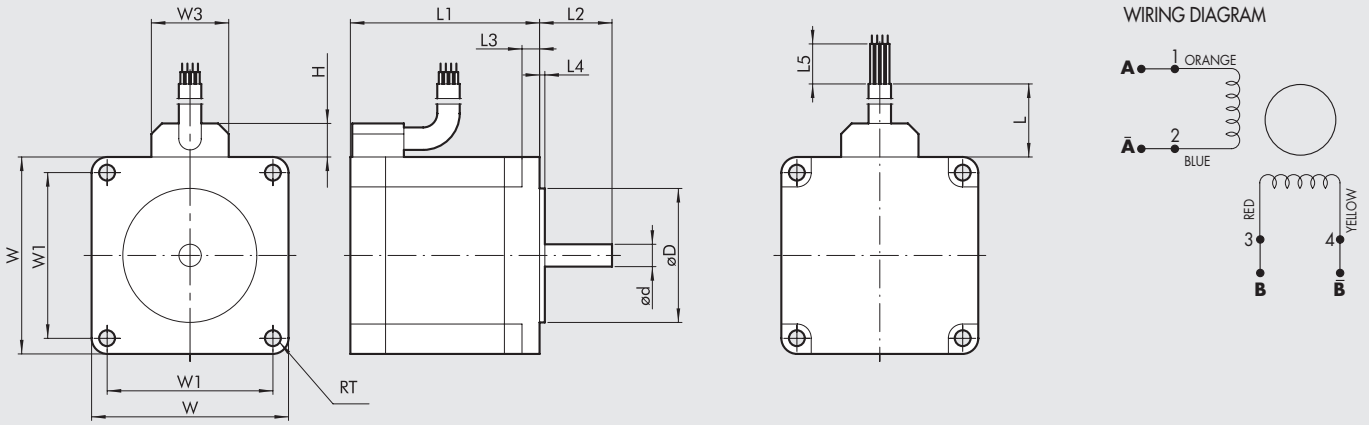
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H	L min	L1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.2	W3	W4 ±0.5
STEPPING	37M1430000	2.4	NEMA 34	9.525	73.02	10	305	62	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1440000	4.2	NEMA 34	12	73.02	10	305	92.2	30	4.8	1.5	5.4	82.5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



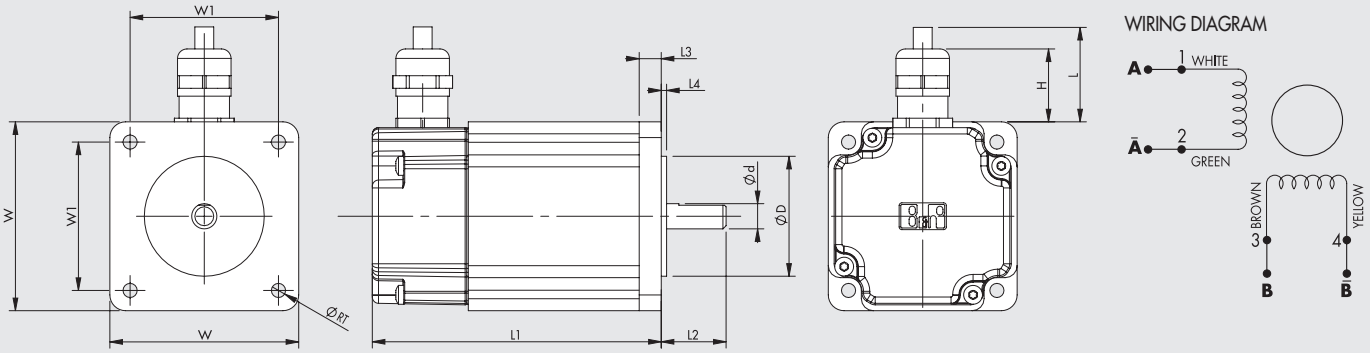
WIRING DIAGRAM



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

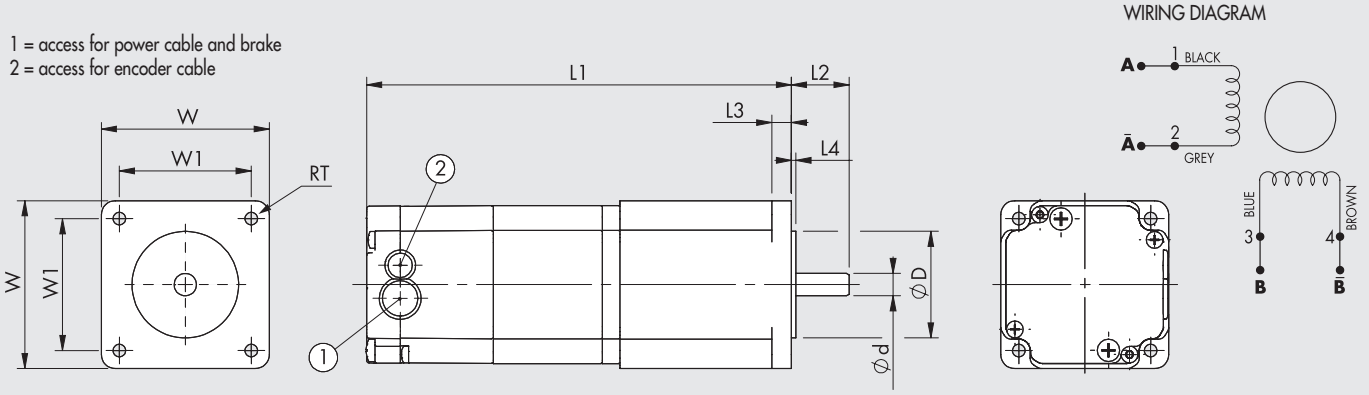


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	L5	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	**37M1450000**	**6.7**	**NEMA 34**	14	73.025	12	305	127	30	8	1.5	50	5.6	85.5	69.6	27



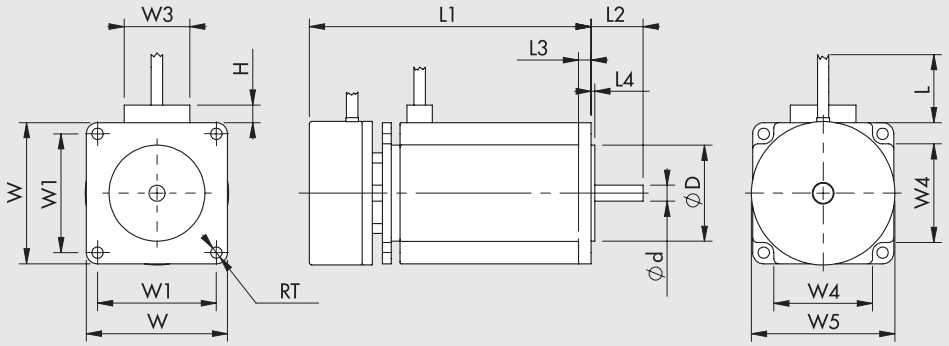
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.2	W ±0.5	W1 ±0.13
STEPPING	**37M1220000**	**1.2**	**60**	8	38.1	23	1023	91.8	20.6	7	1.6	4.5	60	47.14

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

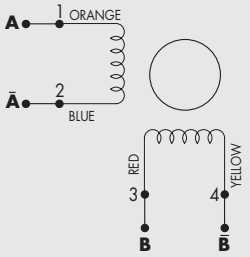


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	L1	L2 ±0.51	L3	L4	RT	W	W1 ±0.13
STEPPING	**37M1470000**	**9.3**	**NEMA 34**	12.7	73.025	130	31.75	9.91	2.03	5.6	86.6	69.6
STEPPING	**37M8220000**	**1.2**	**60**	8	38.1	106.6	20.6	7	1.6	4.5	60	47.14
+ ENCODER	**37M8470000**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

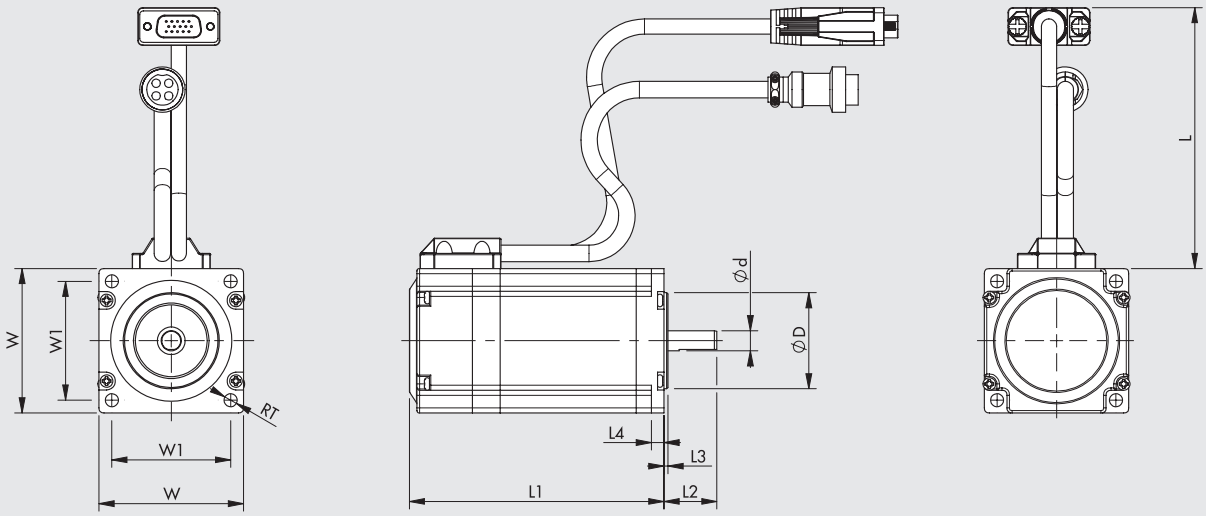
METAL WORK PNEUMATIC



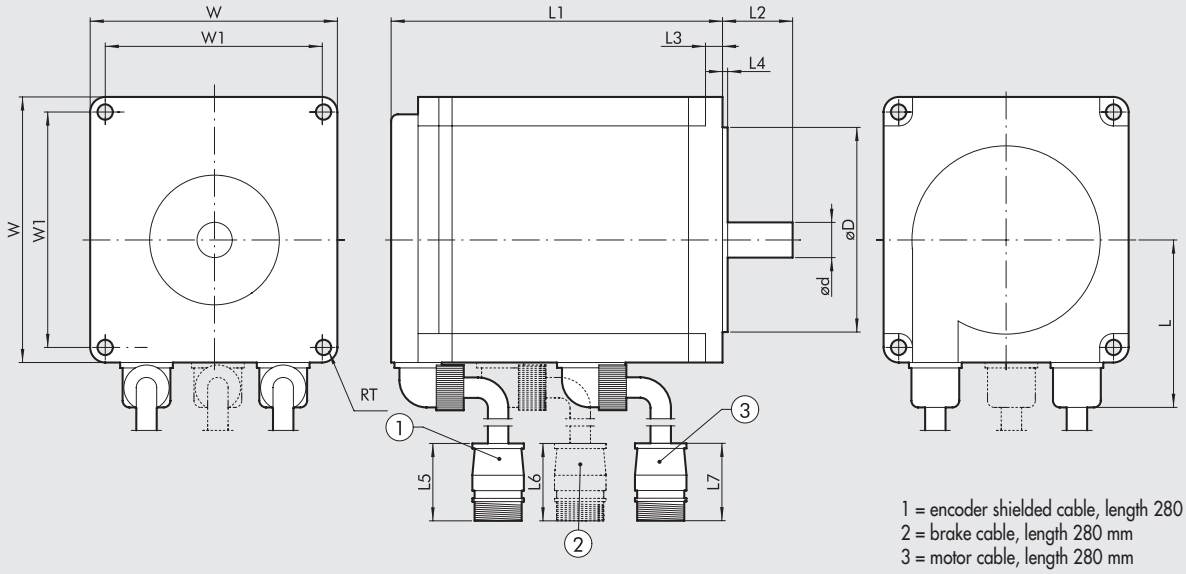
WIRING DIAGRAM



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

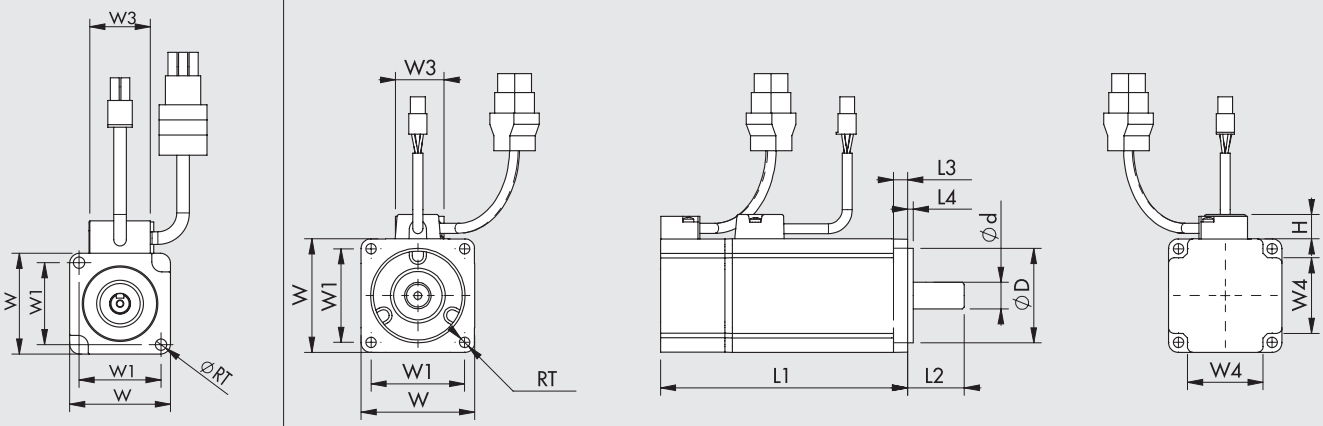


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD 0/-0.05	L	L1	L2	L3	L4	RT	W	W1 ±0.25
STEPPING + ENCODER	**37M1820000**	**1.4**	**NEMA 23**	8	38.1	300	101	21	1.6	5	5.15	56.4	47.14
STEPPING + BRAKE + ENCODER	**37M1320000**	**1.4**	**NEMA 23**	8	38.1	270	137.5	21	1.6	5	5.15	57.15	47.14



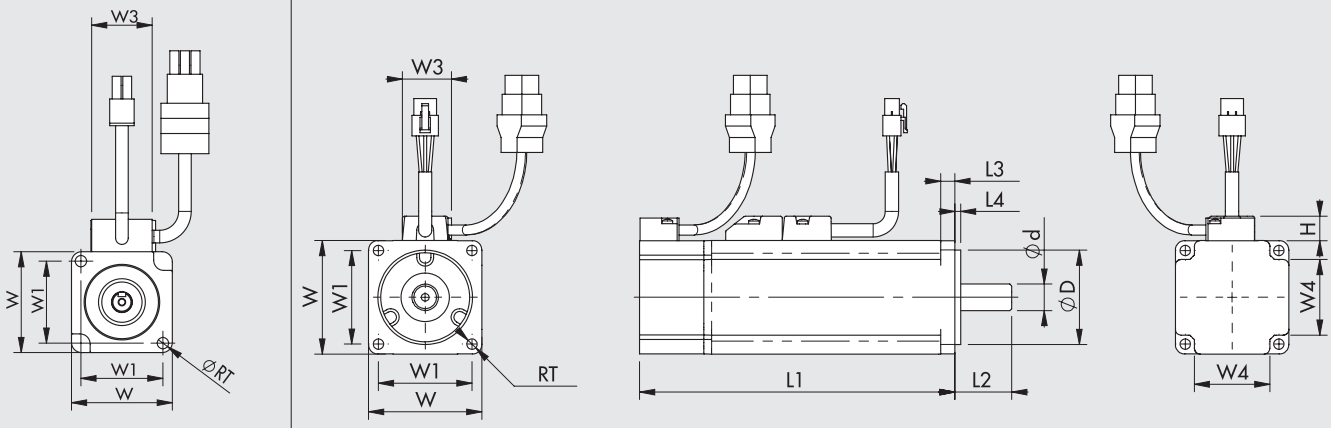
1 = encoder shielded cable, length 280 mm
2 = brake cable, length 280 mm
3 = motor cable, length 280 mm

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



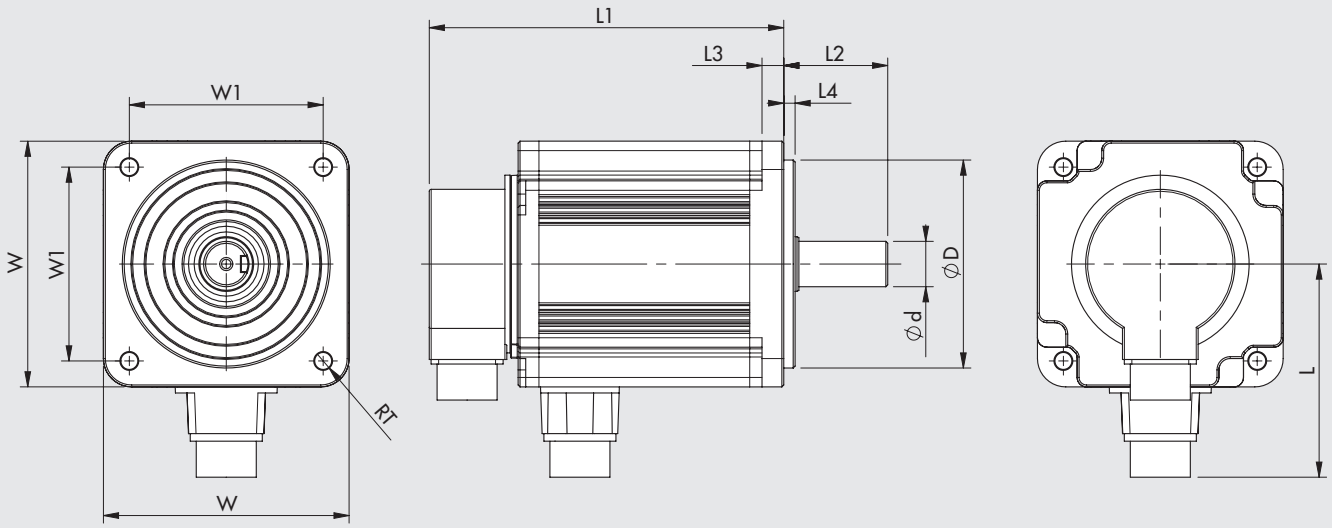
View for motor **37M2000000**

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

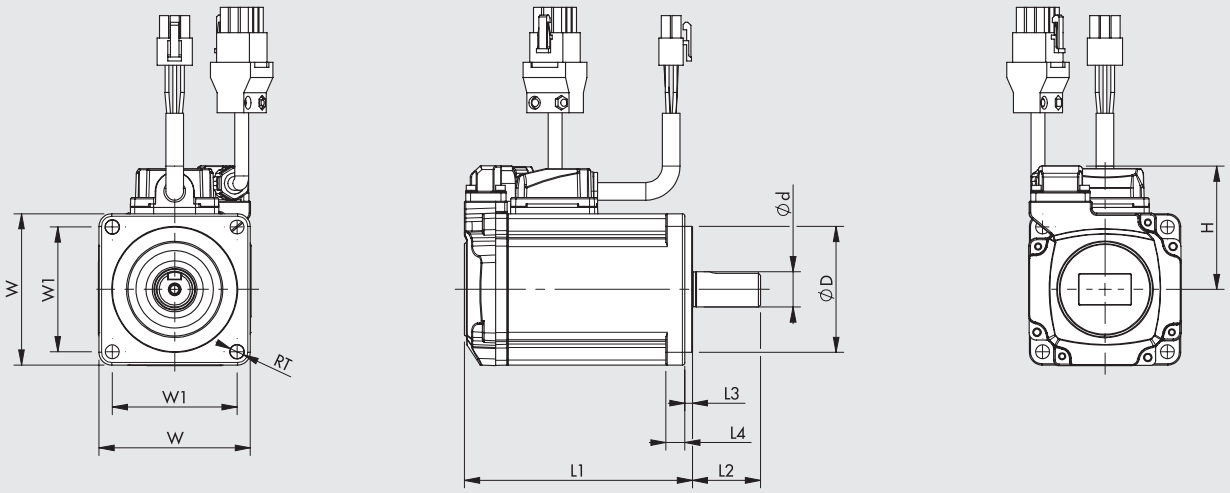


View for motor **37M4000000**

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)	**37M2640000**	**3.18**	**100**	19	95	97.75	153.25	45	12	5	9	100	81.32
	37M2770000	**9.55**	**130**	24	110	113	187.5	55	11.5	6	9	130	102.53
BRUSHLESS + BRAKE (DELTA)	**37M4640000**	**3.18**	**100**	19	95	98.05	192.5	45	12	5	9	100	81.32
	37M4770000	**9.55**	**130**	24	110	111	216	55	11.5	6	9	130	102.53



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD 0/-0.025	H	L1	L2	L3	L4	RT	W	W1
BRUSHLESS (DELTA B3)	**37M2220002**	**1.27**	**60**	14	50	48.5	91	30	3	7.5	5.5	60	49.5
BRUSHLESS + BRAKE (DELTA B3)	**37M4220002**	**1.27**	**60**	14	50	48.5	127.9	30	3	7.5	5.5	60	49.5

NOTES

METAL WORK PNEUMATIC

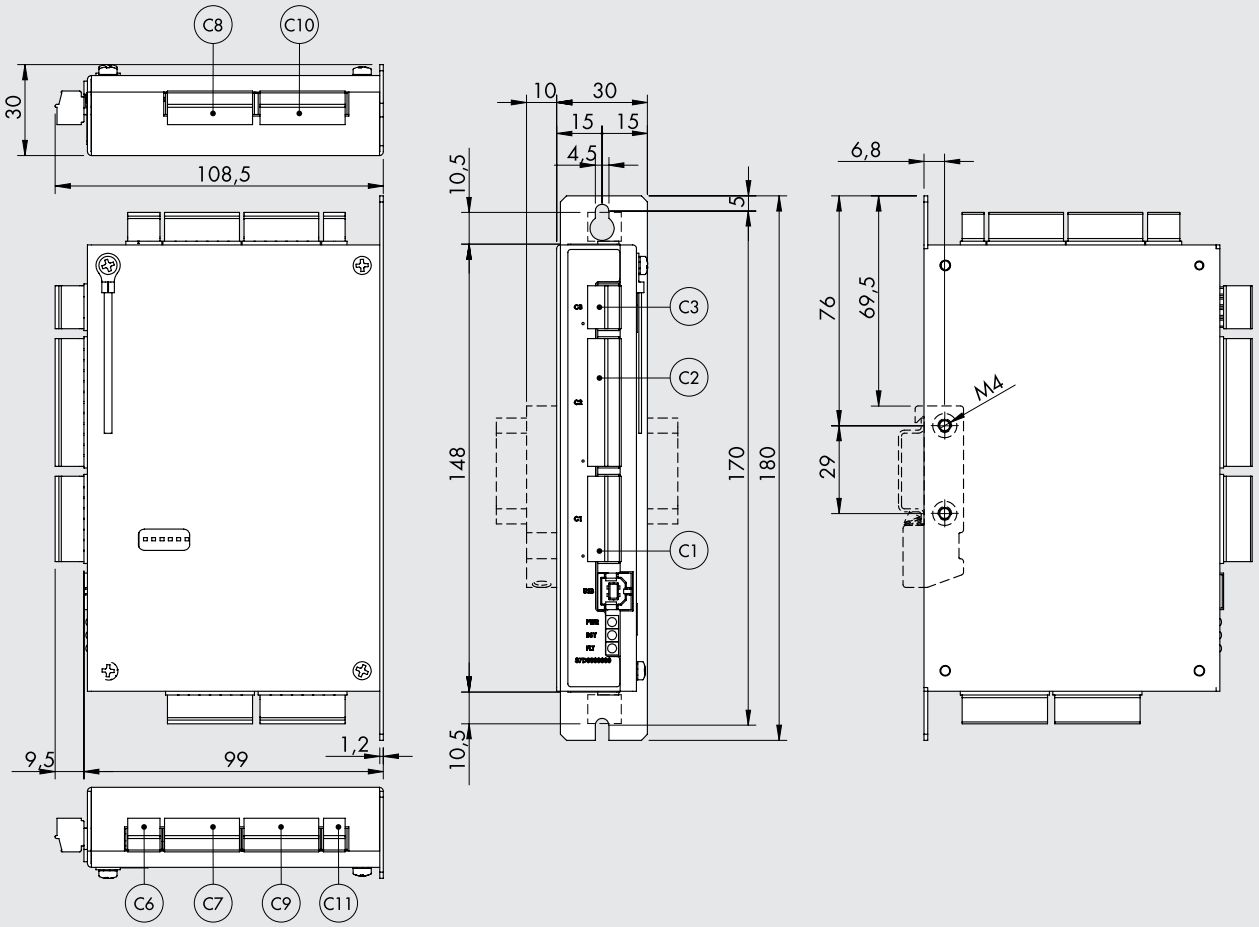
NOTES

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

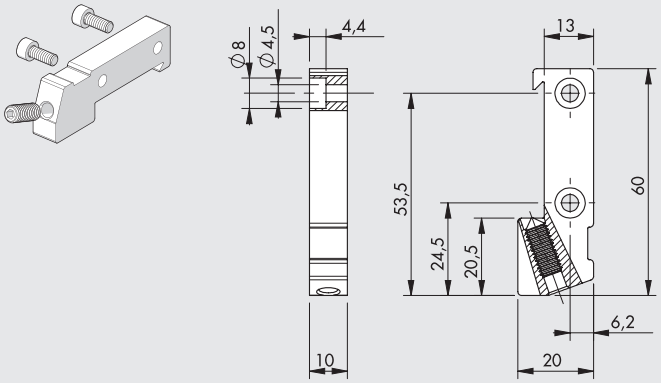


Below is a list of Phoenix Contact codes for the board connectors.

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

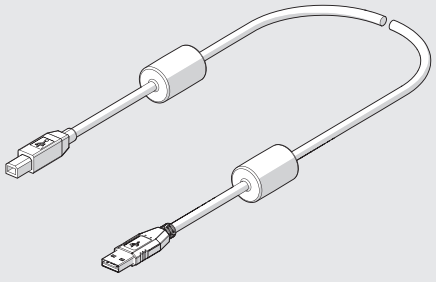
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



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

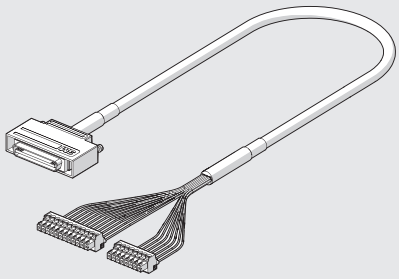
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

CABLE USB



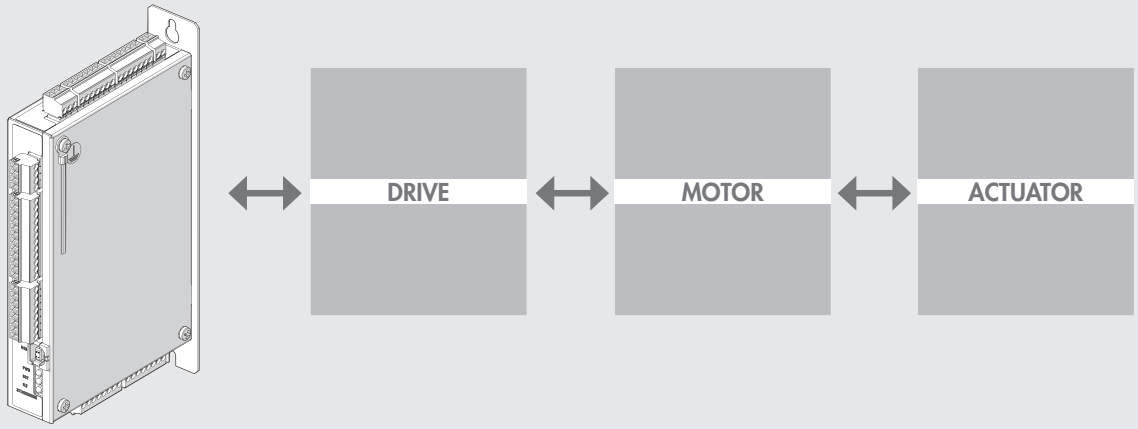
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the **e**.motion / **e**.drive board to a PC, 3 m	150

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



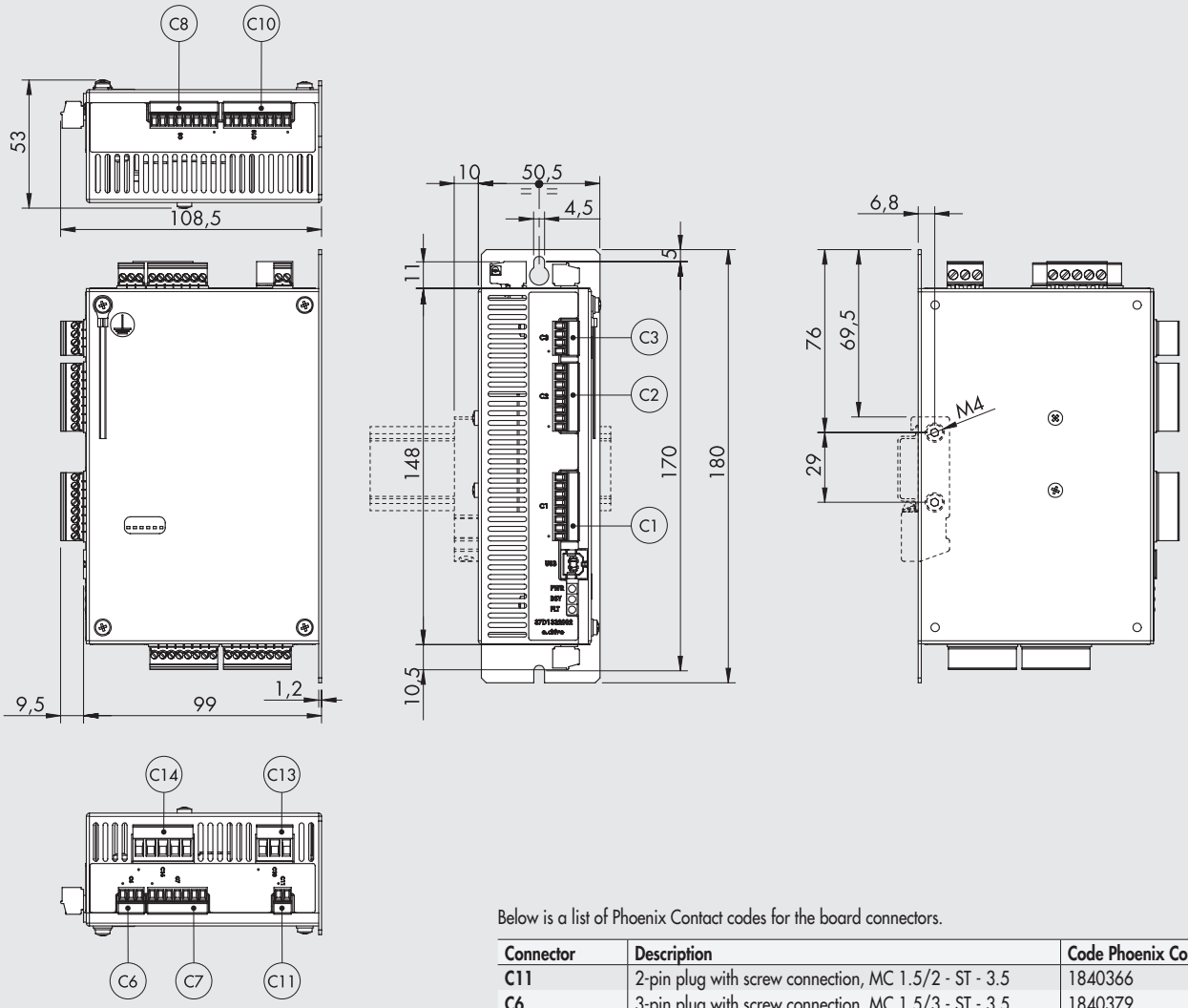
NOTES

PROGRAMMABLE STEPPING MOTOR DRIVE - *e*.drive

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

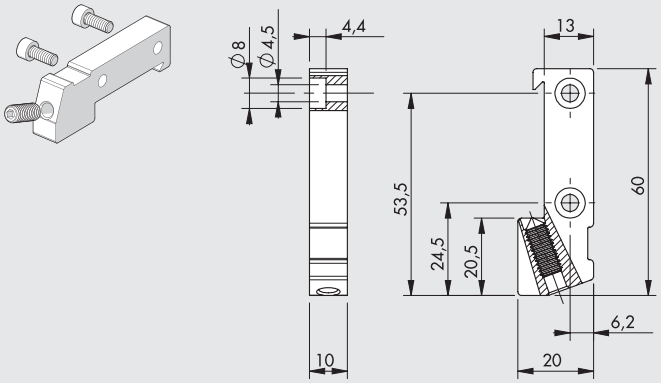


Below is a list of Phoenix Contact codes for the board connectors.

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

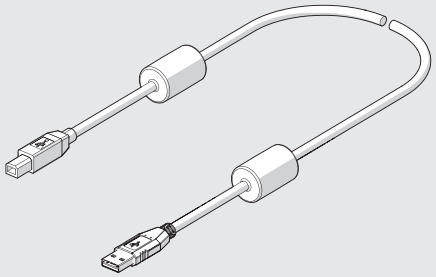
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



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

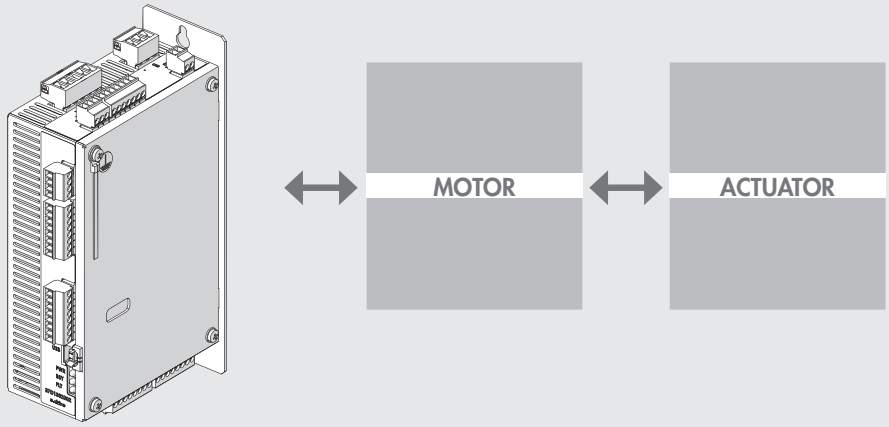
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

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

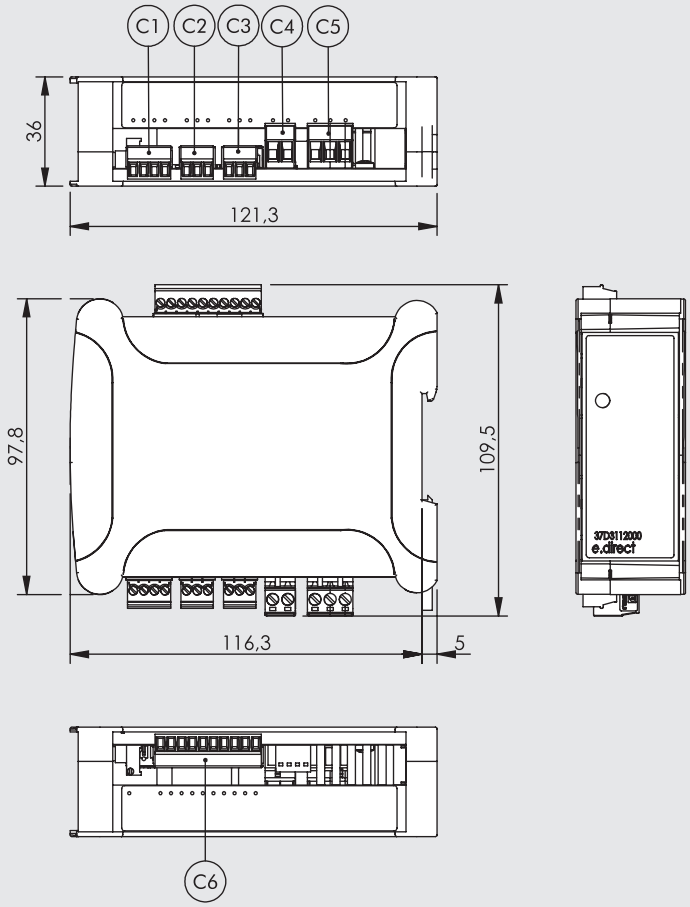
e.direct DRIVE
FOR DIRECT CURRENT MOTORS

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.

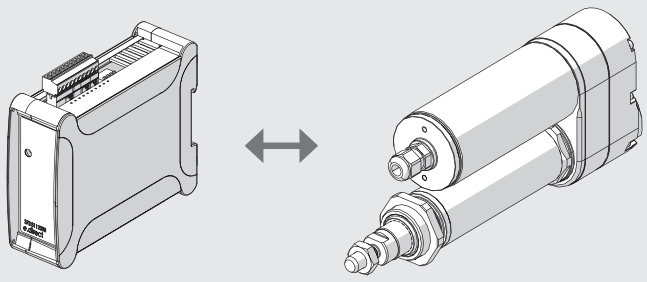
DIMENSIONS



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

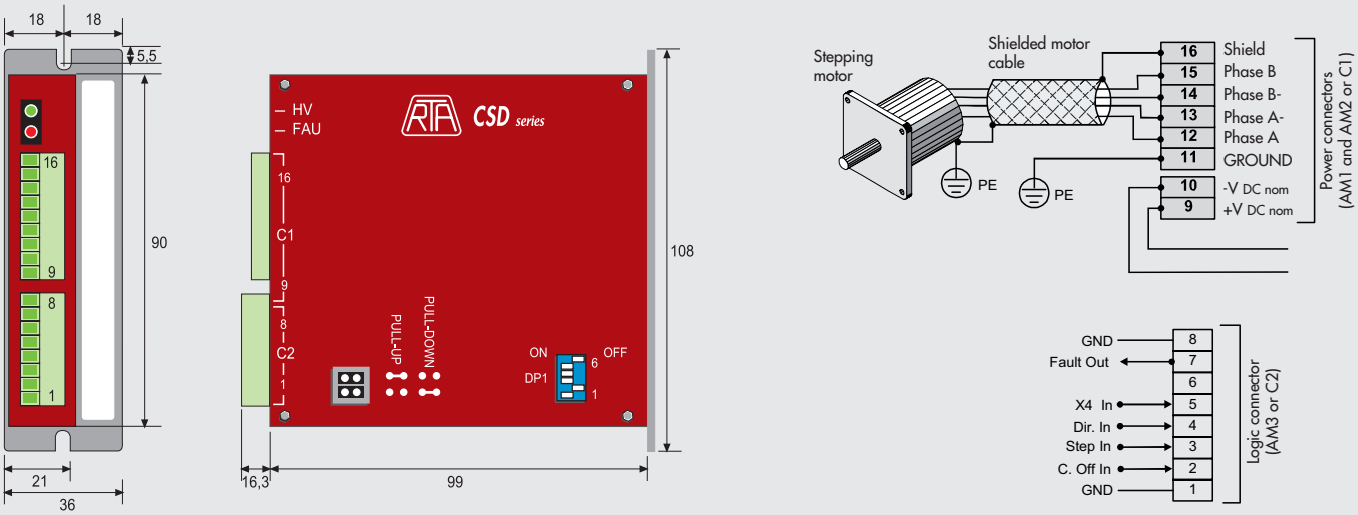
4.4A - 48VDC DRIVE FOR STEPPING MOTORS

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



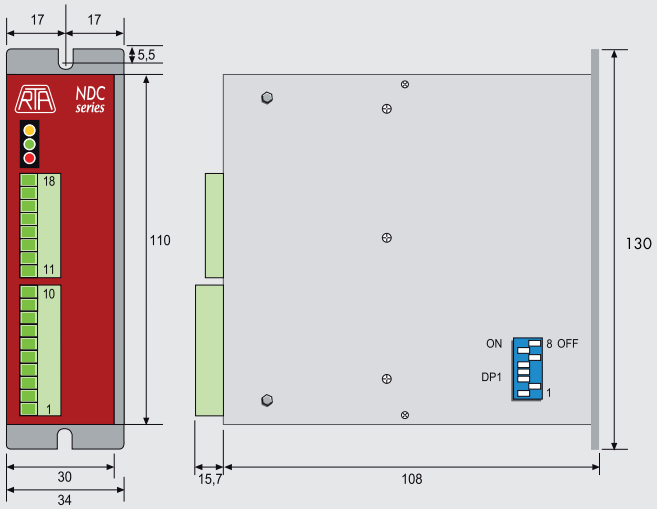
6A - 75VDC DRIVE FOR STEPPING MOTORS

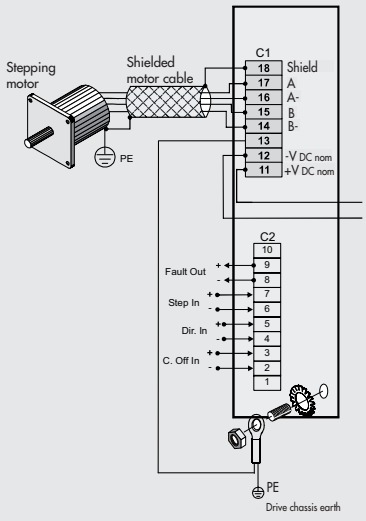
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 75VDC, compact dimensions and considerable operating flexibility. It consists 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





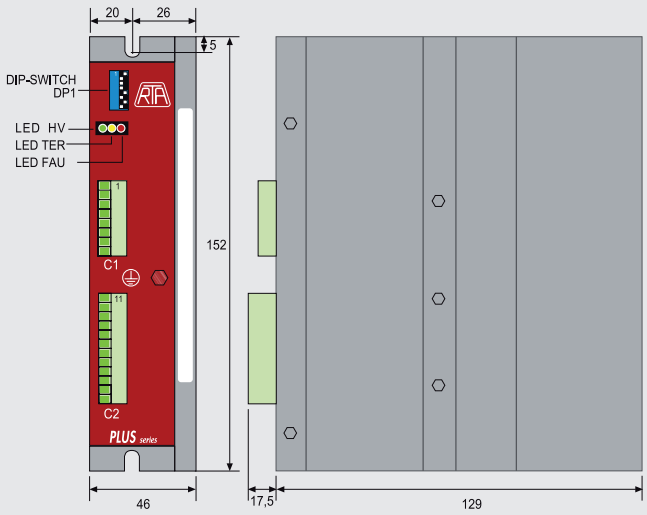
6A - 140VDC, 10A - 62VAC DRIVE FOR STEPPING MOTORS

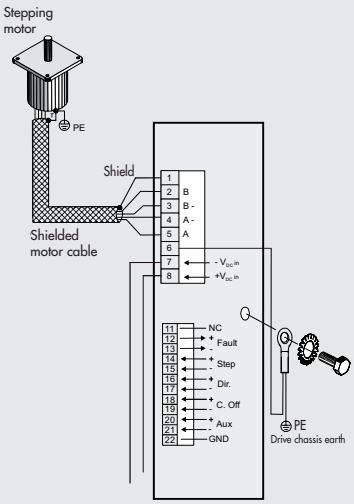
These are two ministep bipolar chopper drives made by RTA S.r.l.
They come with a STEP & DIRECTION interface for piloting medium/high-power two-stage STEPPING motors with four, six or eight terminals.
They consist of a board housed in a metal box, which does not require external ventilation, and come 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





METAL WORK PNEUMATIC

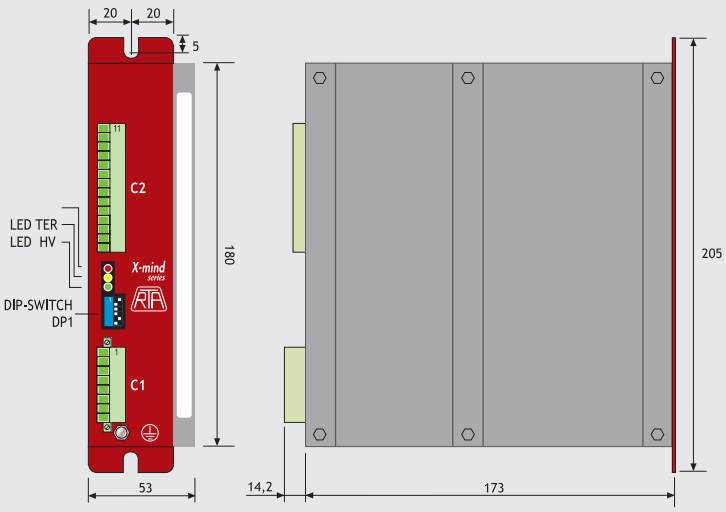
6A - 110 - 230VAC DRIVE FOR STEPPING MOTORS

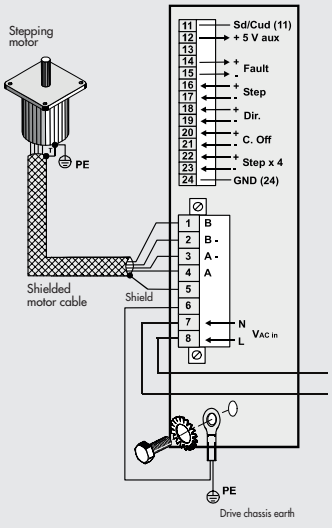
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 230VAC, compact dimensions and considerable operating flexibility. It consists 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.

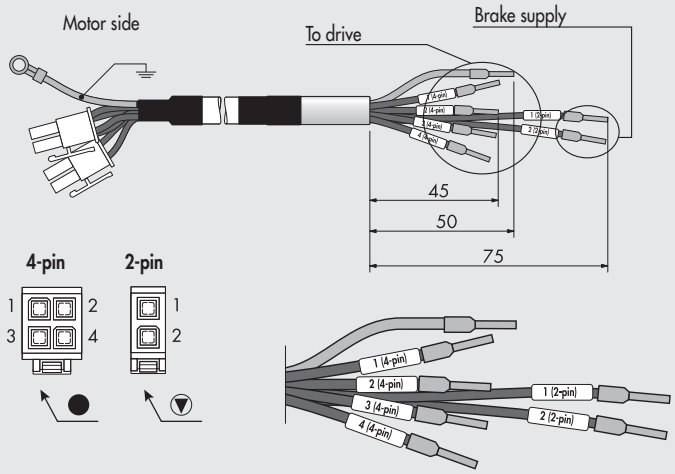
OVERALL DIMENSIONS AND WIRING DIAGRAM





CABLES FOR B&R STEPPING MOTORS

POWER CABLE FOR MOTOR WITH BRAKE

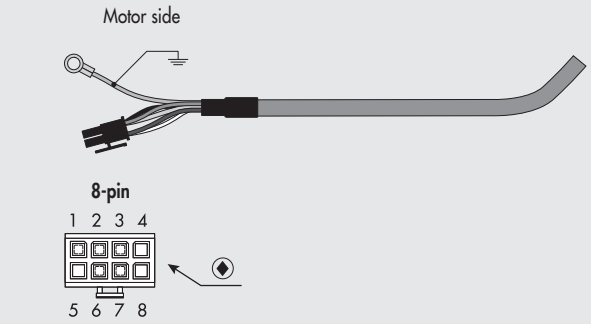


Code	Description
37C1330000	Power cable for stepping motor with brake, 3 metres
37C1350000	Power cable for stepping motor with brake, 5 metres

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.

Pin	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.

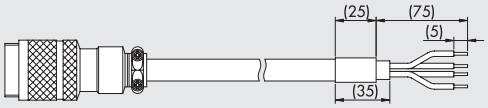
	Code Molex	Description
▼	**39-01-2020**	1 x 2 pin plug connector
	44476-1111	Crimping contacts
●	**39-01-2040**	1 x 4 pin plug connector
	44476-1111	Crimping contacts
◆	**43025-0800**	1 x 8 pin plug connector
	43030-0002	Crimping contacts

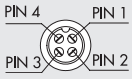
Special tools for crimping or pulling out contacts		
	Code Molex	**Description**
Crimping gripper	**0638190000**	For 8-pin connector
	0638190900	For 4-pin and 2-pin connectors
Contact pull-out tool	**0011030043**	For 8-pin connector
	0011030044	For 4-pin and 2-pin connectors

NOTES

CABLES FOR STEPPING MOTORS STEPPERONLINE

POWER CABLE FOR MOTOR WITH BRAKE

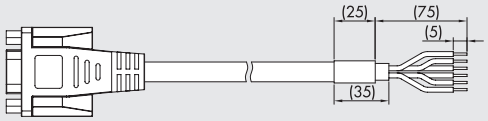


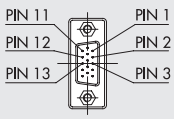


Code	Description
37C1150000	Power cable for stepping motor with brake, 5 metres
37C1100000	Power cable for stepping motor with brake, 10 metres

Pin	Function		Corresponding wire colour
1	A+	Motor phase A+	Black 1
2	A -	Motor phase A-	Black 2
3	B+	Motor phase B+	Black 3
4	B -	Motor phase B-	Black 4

ENCODER CABLE





Code	Description
37C1250001	Encoder cable for stepping motors with brake, 5 metres
37C1200003	Encoder cable for stepping motors with brake, 10 metres

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

Pin	Function		Corresponding wire colour
1	A+	Phase A+	Green
2	+24VDC	Encoder +24 V supply	Brown
3	COM	Encoder 0 V supply	White
4	-	NC	-
5	-	NC	-
6	-	NC	-
7	-	NC	-
8	-	NC	-
9	-	NC	-
10	-	NC	-
11	B+	Phase B+	Gray
12	B-	Phase B-	Pink
13	A-	Phase A-	Yellow
14	-	NC	-
15	-	NC	-

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.

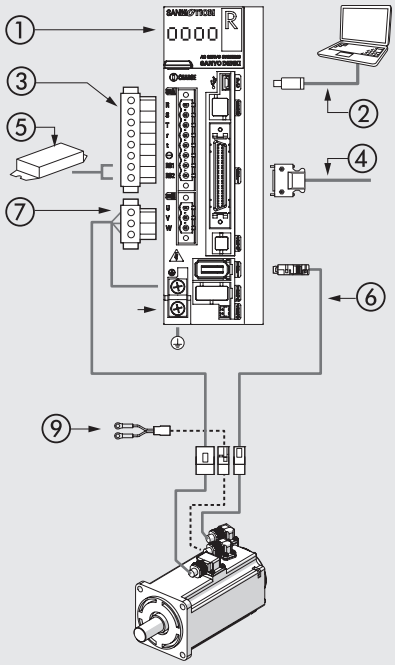
DRIVE TECHNICAL DATA		
Drive code		**37D2400008**
Nominal power		200 - 400 - 750 - 1000
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	50 x 160 x 130
Power connectors and motor power		Plug-type 3M
Encoder connectors and signals		Plug-type 3M
Max output current	A	30
Motor output stage		IGBT, 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

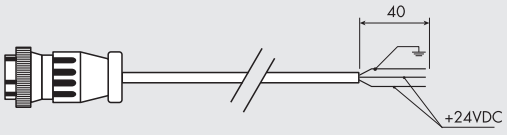
⑥ ENCODER CABLE

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

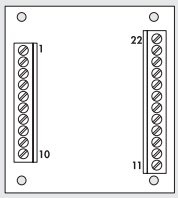
Code	Description
37C2130005	Brushless motor-drive connecting cable, 3 m
37C2150005	Brushless motor-drive connecting cable, 5 m
37C2130004	Brushless motor-drive connecting dynamic cable, 3 m
37C2150004	Brushless motor-drive connecting dynamic cable, 5 m
37C2100004	Brushless motor-drive connecting dynamic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

BRAKE CABLE



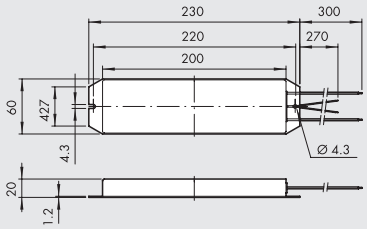
Code	Description
37C2330000	Brushless motor-brake connecting dynamic cable, 3 m
37C2350000	Brushless motor-brake connecting dynamic cable, 5 m
37C2310000	Brushless motor-brake connecting dynamic cable, 10 m

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

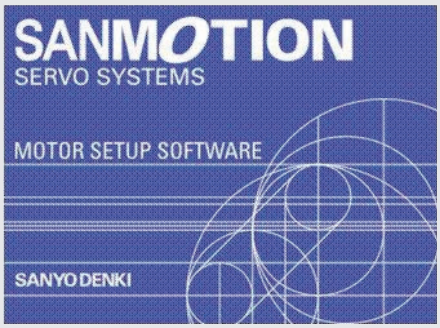
Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

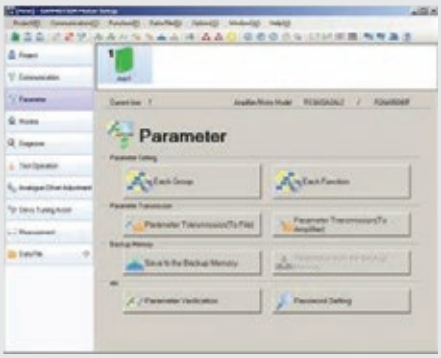
CONFIGURATION SOFTWARE

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.

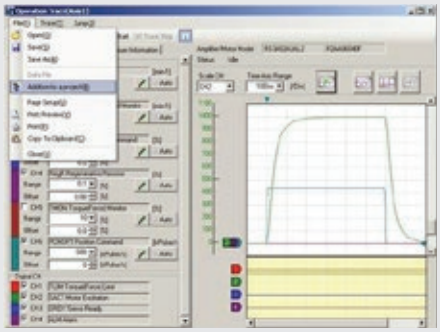
The software can freely be downloaded from Sanyo Denki website at the following link:
https://www.sanyodenki.com/products/sanmotion-softwareindex.html
file SANMOTION MOTOR Setup Software.





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

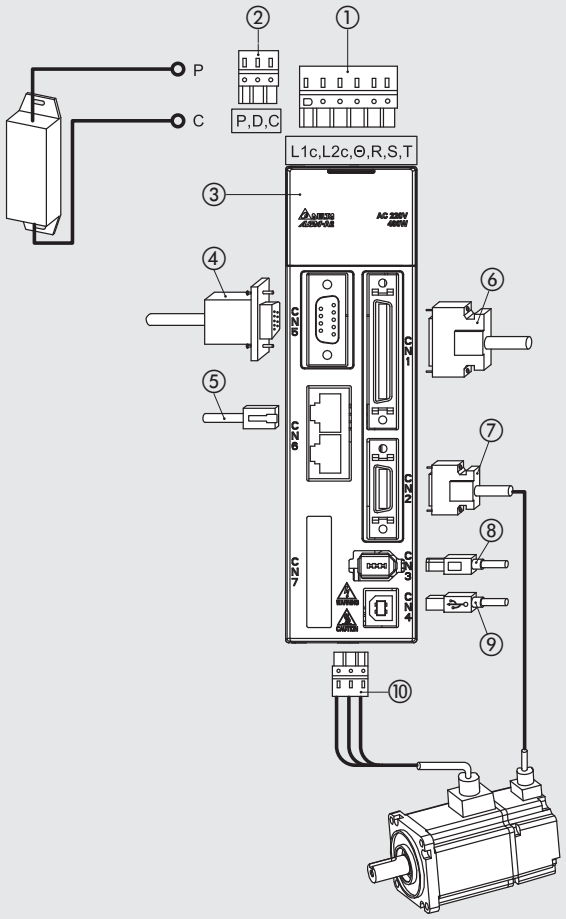
The DELTA ASD-A2-0121-M drive can only be used with a DELTA 100W motor, the DELTA ASDA-A2-0221-M drive can only be used with a DELTA 200W motor, the DELTA ASDA-A2-0421-M drive can only be used with the DELTA 400W motor, and the DELTA ASD-A2-0721-M drive can only be used with a DELTA 750W motor.
The drives 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.



NOTES

DRIVE FOR 1kW DELTA BRUSHLESS MOTORS

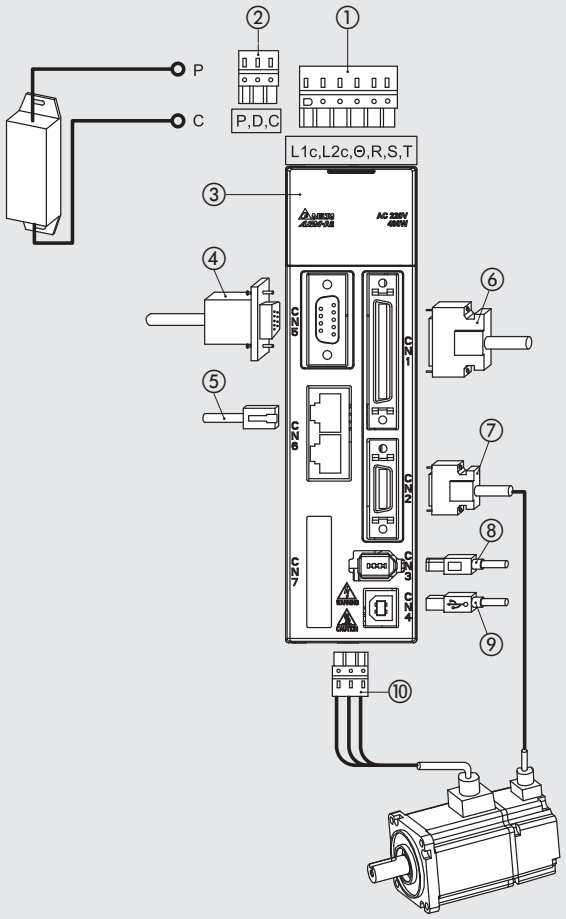
It is a DELTA ASDA-A2-1021-M drive to be used only with a DELTA 1kW motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

DRIVE TECHNICAL DATA		
Drive code		**37D2400006**
Nominal power		1kW
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	180 x 173 x 65
Power connectors and motor power		Screw type
Encoder connectors and signals		Plug-type 3M
Max output current	A	21.90
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		**37M2640000 - 37M4640000**
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 **dynamic** cable, 3 metres		**37C2130006**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 3 metres		**37C2230007**
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 3 metres		**37C2730002**
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**
Brushless **motor-drive** connecting **dynamic** cable, 5 metres		**37C2150006**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 5 metres		**37C2250008**
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 5 metres		**37C2750003**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100006**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 10 metres		**37C2200007**
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 10 metres		**37C2700002**

WIRING DIAGRAM FOR 1kW 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.



NOTES

DRIVE FOR 3kW DELTA BRUSHLESS MOTORS

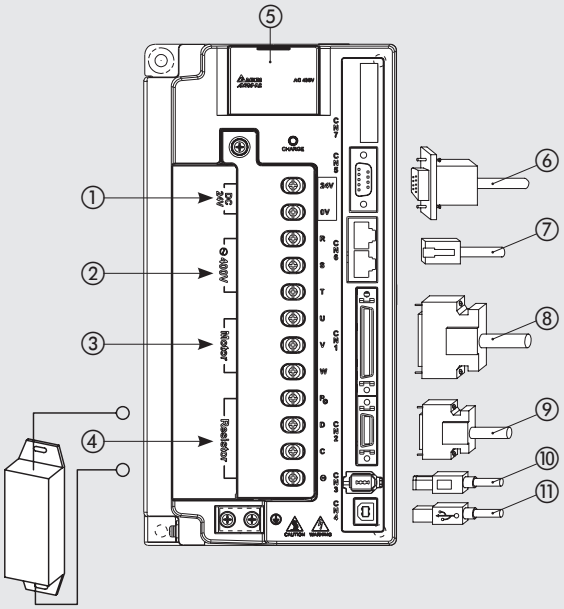
It is a DELTA ASDA-A2-3043-M drive to be used only with a DELTA 3kW motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

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 **dynamic** cable, 3 metres		**37C2130006**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 3 metres		**37C2230007**
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 3 metres		**37C2730002**
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**
Brushless **motor-drive** connecting **dynamic** cable, 5 metres		**37C2150006**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 5 metres		**37C2250008**
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 5 metres		**37C2750003**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100006**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 10 metres		**37C2200007**
Brushless **motor** with **brake-drive** connecting **dynamic** cable, 10 metres		**37C2700002**

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 ENCODER 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.



NOTES

DRIVE FOR B3 400W DELTA BRUSHLESS MOTORS

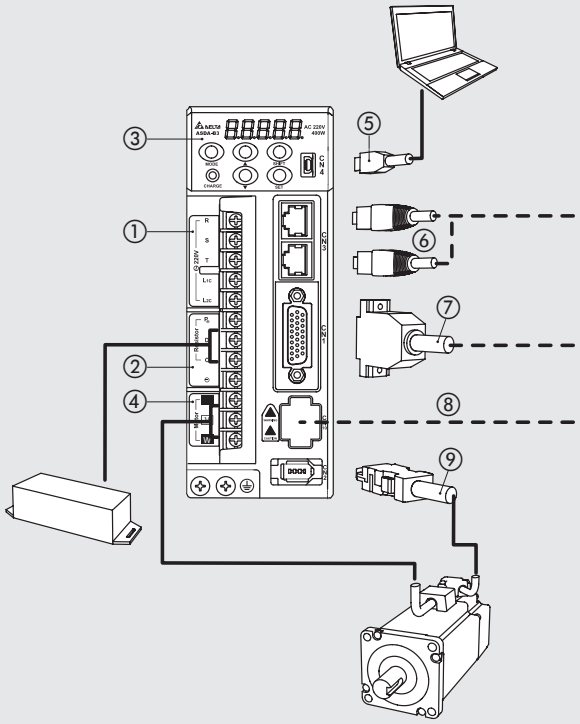
It is a DELTA ASD-B3A-0421-M drive to be used only with a DELTA B3 400W motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

DRIVE TECHNICAL DATA		
Drive code		**37D2300002**
Nominal power	W	400
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	60 x 162 x 156
Power connectors and motor power		Spring type
Encoder connectors and signals		Plug-type, D-Sub high density 26 poles
Max output current	A	10.6
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)
		fieldbus with "CANopen" communication protocol
		4 inputs and 2 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, STO (Safe Torque Off)
		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		**37M2220002 - 37M4220002**
Connecting cable:		
Brushless **motor-drive, dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive** with brake **dynamic** cable, 3 metres		**37C2230002**
Brushless **motor-drive-encoder, dynamic** cable, 3 metres		**37C2230006**
Brushless **motor-drive, dynamic** cable, 5 metres		**37C2150002**
Brushless **motor-drive** with brake **dynamic** cable, 5 metres		**37C2250002**
Brushless **motor-drive-encoder, dynamic** cable, 5 metres		**37C2250007**
Brushless **motor-drive, dynamic** cable, 10 metres		**37C2100003**
Brushless **motor-drive** with brake **dynamic** cable, 10 metres		**37C2200003**
Brushless **motor-drive-encoder, dynamic** cable, 10 metres		**37C2200006**

WIRING DIAGRAM FOR BRUSHLESS MOTOR DRIVES

① POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). Separate supply section for logic/signal and power electronics. Integrated circuits protecting against overloads and input extra-voltages.
② Braking resistor connection (optional).
③ 5-DIGIT DISPLAY and PROGRAMMING KEYPAD: to display and modify parameters and monitor system operation in real time.
④ BRUSHLESS motor power cable connection
⑤ Mini USB PC CONNECTOR: settings and monitor through personal computer (not included in the supply).
⑥ CANopen CONNECTOR (optional): this drive is designed for communication with other devices via CANopen Fieldbus.
⑦ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 4 inputs and 2 outputs, user configurable.
⑧ STO CONNECTOR: connector for functionality management safety Safe Torque Off
⑨ ENCODER CONNECTOR: connection for BRUSHLESS motor encoder.

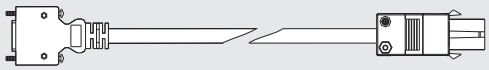
Log on to www.metalwork.it to view the instruction manual.



NOTES

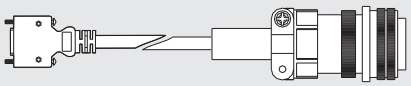
CABLES FOR DELTA BRUSHLESS MOTORS

ENCODER CABLE 100W - 750W



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

ENCODER CABLE 1kW - 3kW



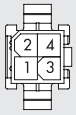
Code	Description
37C3230001	1kW - 3kW brushless motor-drive-encoder connecting cable, 3 m
37C3250001	1kW - 3kW brushless motor-drive-encoder connecting cable, 5 m
37C2230007	1kW - 3kW brushless motor-drive-encoder connecting dynamic cable, 3 metres
37C2250008	1kW - 3kW brushless motor-drive-encoder connecting dynamic cable, 5 metres
37C2200007	1kW - 3kW brushless motor-drive-encoder connecting dynamic cable, 10 metres

ENCODER CABLE B3 400W

Code	Description
37C2230006	B3 400W brushless motor-drive-encoder connecting dynamic cable, 3 metres
37C2250007	B3 400W brushless motor-drive-encoder connecting dynamic cable, 5 metres
37C2200006	B3 400W brushless motor-drive-encoder connecting dynamic cable, 10 metres

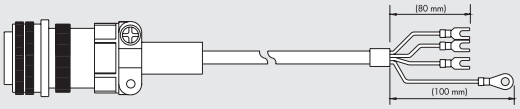
MOTOR POWER CABLE 100W - 750W

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



Pin	Function	Corresponding wire colour
1	Motor phase U	Black 1
2	Motor phase V	Black 2
3	Motor phase W	Black 3
4	GND	Yellow / Green

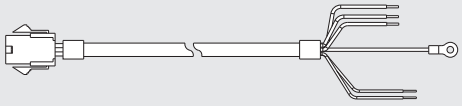
MOTOR POWER CABLE 1kW - 3kW



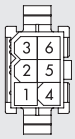
Code	Description
37C3130001	1kW - 3kW brushless motor-drive connecting cable, 3 m
37C3150001	1kW - 3kW brushless motor-drive connecting cable, 5 m
37C2130006	1kW - 3kW brushless motor-drive connecting dynamic cable, 3 metres
37C2150006	1kW - 3kW brushless motor-drive connecting dynamic cable, 5 metres
37C2100006	1kW - 3kW brushless motor-drive connecting dynamic cable, 10 metres

Pin	Function	Corresponding wire colour
A	-	-
B	Motor phase W	Black 4
C	-	-
D	-	-
E	GND	Yellow / Green
F	Motor phase U	Black 1
G	-	-
H	-	-
I	Motor phase V	Black 2

MOTOR POWER CABLE + BRAKE 100W - 750W

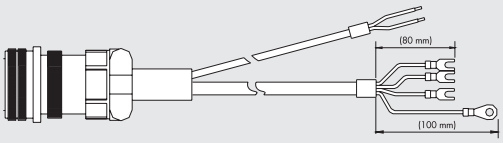


Code	Description
37C2730000	100W-750W brushless motor-drive connecting cable + brake, 3 metres
37C2750000	100W-750W brushless motor-drive connecting cable + brake, 5 metres
37C2730001	100W-750W brushless motor-drive connecting dynamic cable + brake, 3 metres
37C2750001	100W-750W brushless motor-drive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

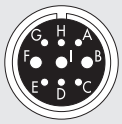


Pin	Function	Corresponding wire colour
1	Motor phase U	Black 1
2	Motor phase V	Black 2
3	24VDC brake	Black 3
4	Motor phase W	Black 4
5	GND	Yellow / Green
6	GND brake	Black 6

MOTOR POWER CABLE + BRAKE 1kW - 3kW



Code	Description
37C3730000	1kW - 3kW brushless motor drive connecting cable + brake, 3 m
37C3750000	1kW - 3kW brushless motor drive connecting cable + brake, 5 m
37C2730002	1kW - 3kW brushless motor-drive connecting dynamic cable + brake, 3 metres
37C2750003	1kW - 3kW brushless motor-drive connecting dynamic cable + brake, 5 metres
37C2700002	1kW - 3kW brushless motor-drive connecting dynamic cable + brake, 10 metres

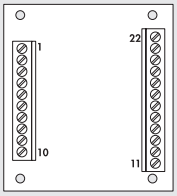


Pin	Function	Corresponding wire colour
A	-	-
B	Motor phase W	Black 4
C	-	-
D	-	-
E	GND	Yellow / Green
F	Motor phase U	Black 1
G	24VDC brake	Black 3
H	GND brake	Black 6
I	Motor phase V	Black 2

NOTES

ACCESSORIES FOR DELTA DRIVES

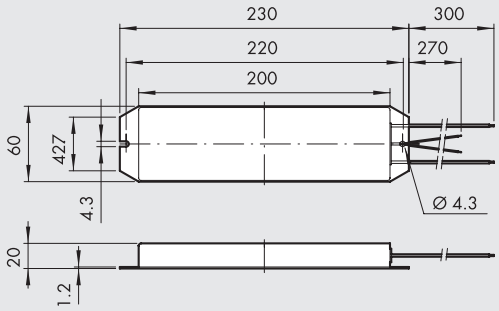
LINE-DRIVER INTERFACE BOARD



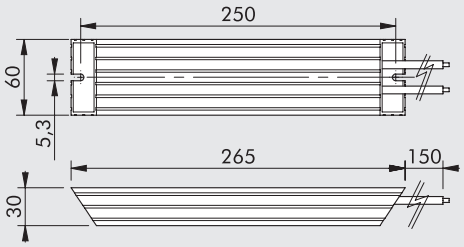
Code	Description
37D2000000	BRINT.A line driver interface board

EXTERNAL BRAKING RESISTANCES

220W



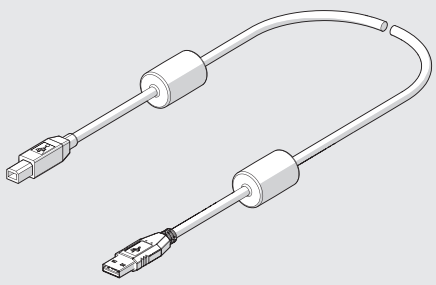
400W



Code	Description	For drive code
37D2R00000	220W 50 Ω braking resistance	37D2100000 - 37D2200001 37D2300000
37D2R00004	400W 40 Ω braking resistance	37D2300002 - 37D2400006 37D2400007 - 37D2600001

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



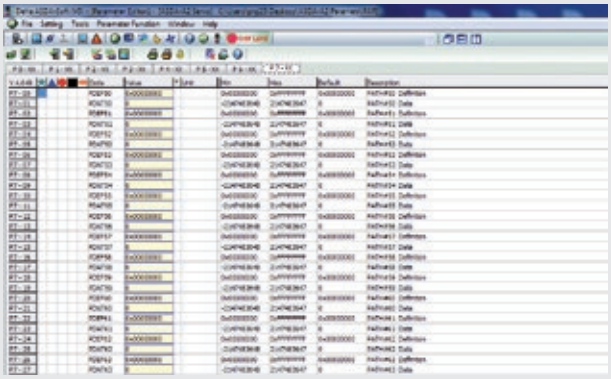
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the drive brushless to a PC, 3 m	150

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.

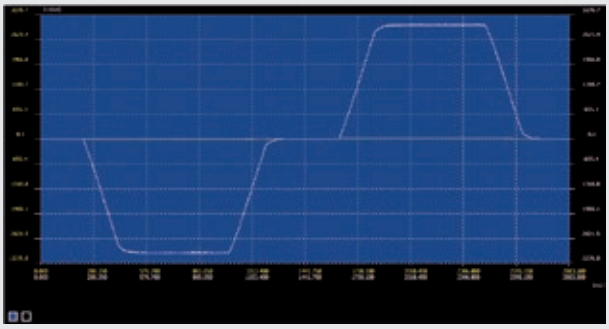
- Status Monitor: real-time display of all details about the system.
- Data Scope: a complete oscilloscope with 4 channels that can be selected as desired among analogue and digital signals.
- System Analisis: used to study the system's frequency response to identify and correct any mechancal resonance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