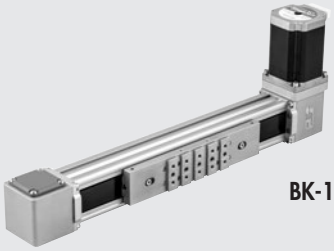
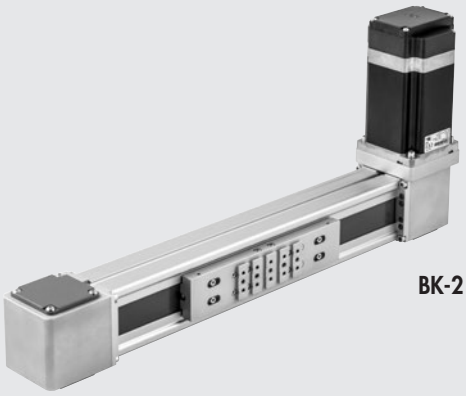
ELECTRIC AXIS BELT-DRIVEN RODLESS, SERIES ELEKTRO BK

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



BK-1



BK-2

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

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

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

METAL WORK PNEUMATIC

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

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

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

$\tau = 1/u$

u = Gearing ratio

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

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

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

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

1<K<15 with STEPPING motors

1<K<40 with BRUSHLESS motors

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

1<K<5 with STEPPING motors

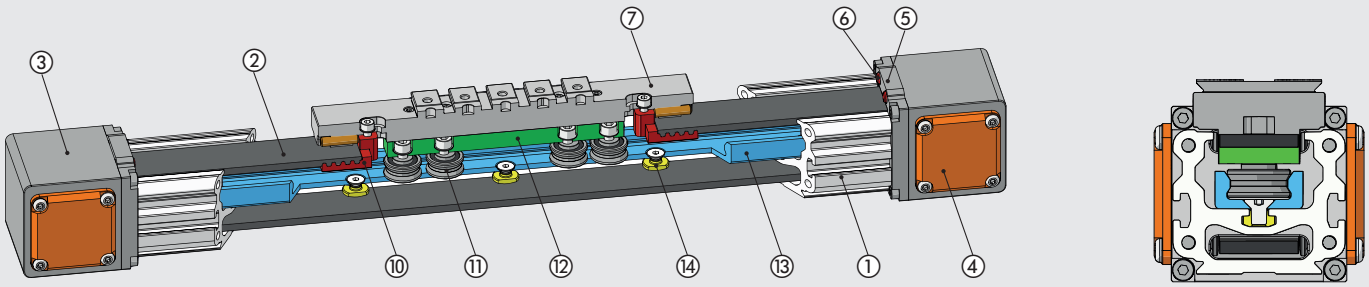
1<K<10 with BRUSHLESS motors

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

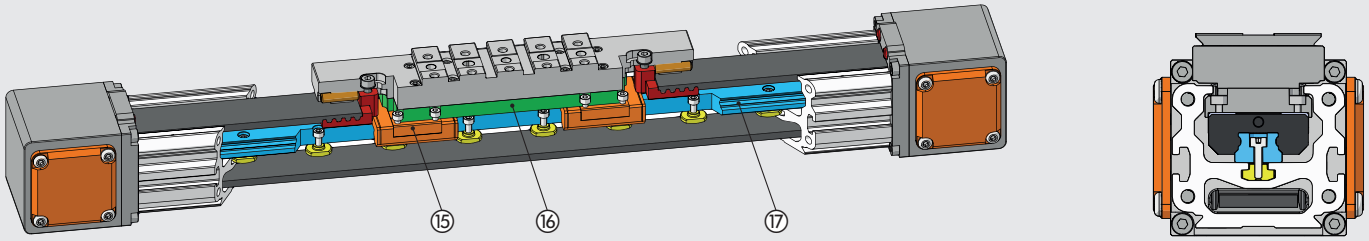
NOTES

COMPONENTS BK-1

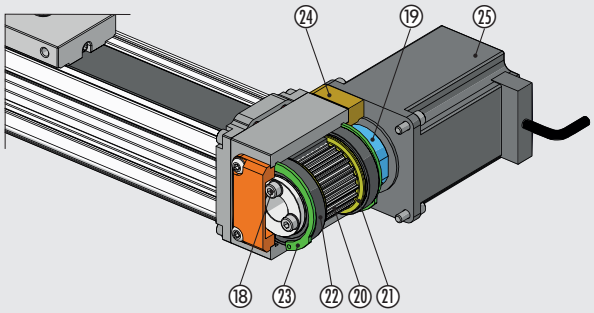
Medium (GUIDE AND STEEL WHEELS)



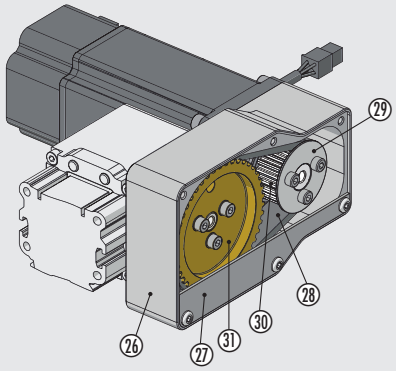
Heavy (STEEL GUIDE AND PADS BALL-RECIRCULATION)



VERSION WITH MOTOR



VERSION WITH 1:2 BELT GEARED MOTOR

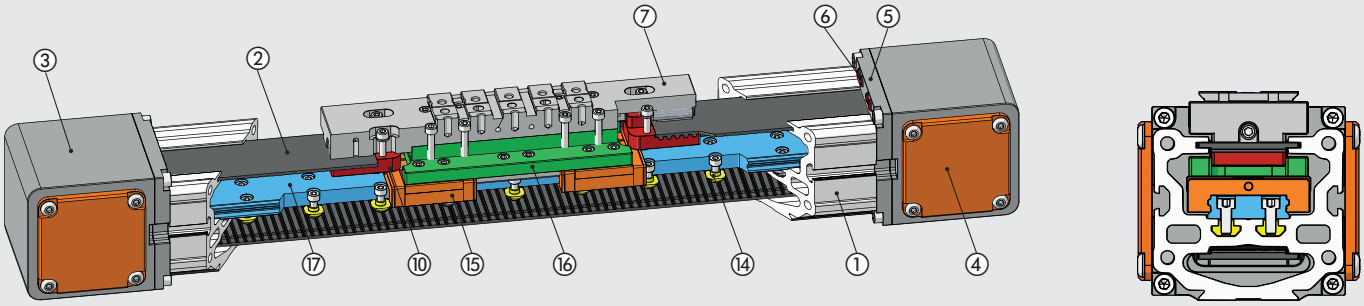


① BARREL: anodized aluminium
② TOOTHED BELT: polyurethane with steel cables
③ HEAD: anodized aluminium
④ COVER: painted aluminium
⑤ HEAD SUPPORT: anodized aluminium
⑥ BUFFER: polyurethane
⑦ SLIDE WITH V-LOCK INTERFACE: anodized aluminium
⑩ BELT-LOCKING PLATE: anodized aluminium
⑪ WHEEL WITH DOUBLE-ROW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

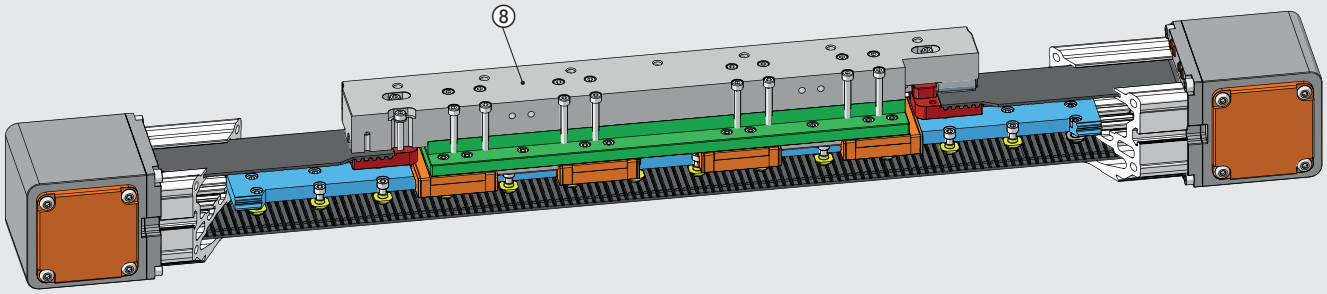
METAL WORK PNEUMATIC

COMPONENTS BK-2

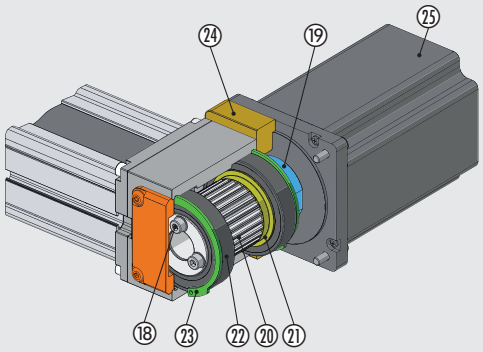
Heavy (STEEL GUIDE AND 2 PADS BALL-RECIRCULATION)



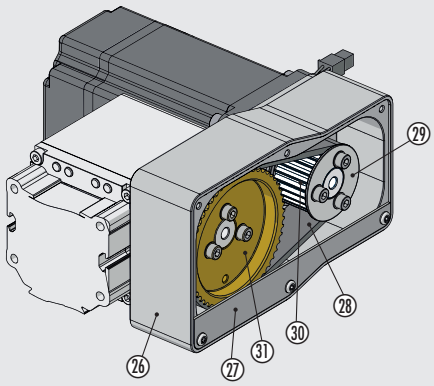
Heavy XL (LONG SLIDE, STEEL GUIDE AND 4 BALL RECIRCULATION PADS)



VERSION WITH MOTOR

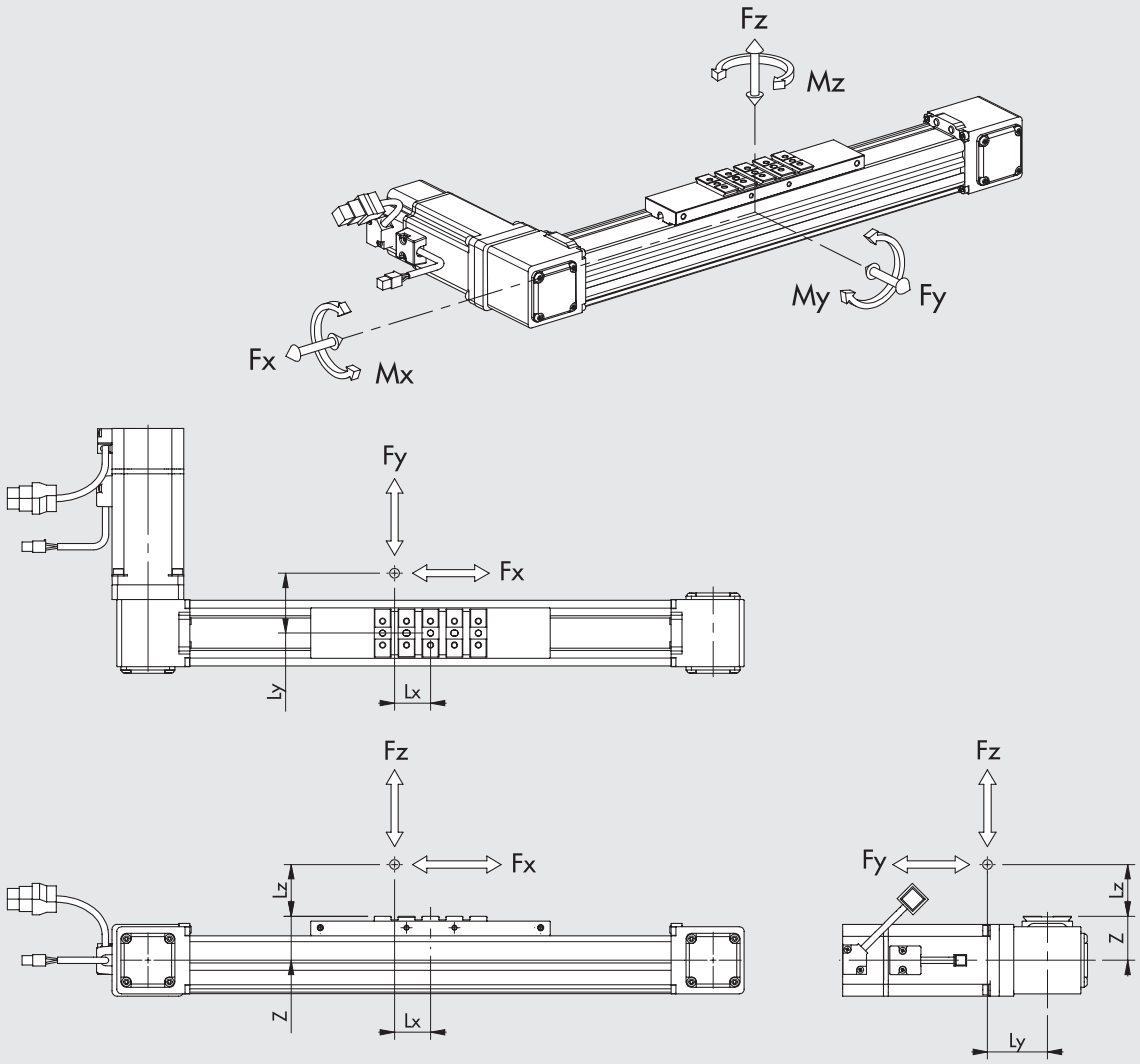


VERSION WITH 1:2 BELT GEARED MOTOR



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

DIAGRAM OF FORCES AND MOMENTS



STATIC VERIFICATION

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

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

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

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

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

DYNAMIC VERIFICATION

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

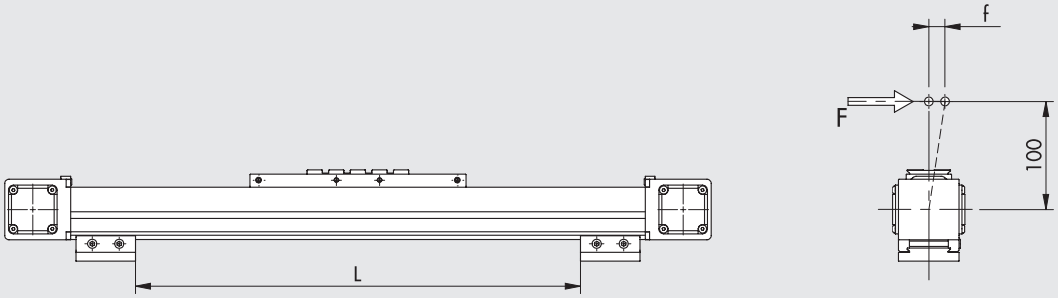
SIZE	VERSION	Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
BK-1	Medium	33	1000	600	12	40	90
	Heavy	35	2850	2850	20	285	285
BK-2	Heavy	45	4800	4800	75	485	485
	Heavy XL	45	9600	9600	150	1700	1700

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

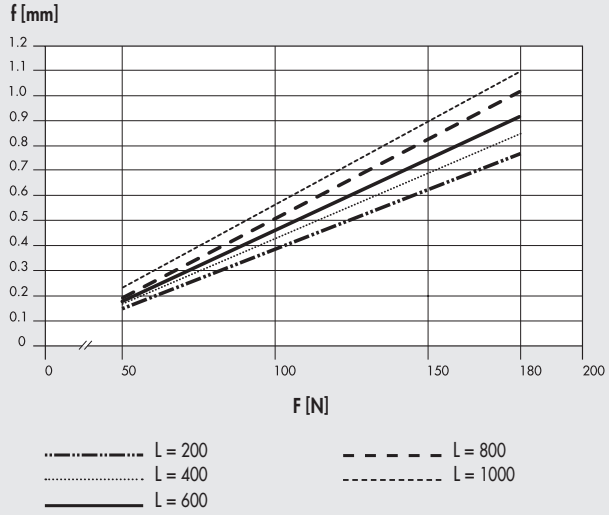
$Mx = Fz \cdot Ly + Fy \cdot (Lz + z)$ $My = Fz \cdot Lx + Fx \cdot (Lz + z)$ $Mz = Fy \cdot Lx + Fx \cdot Ly$

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

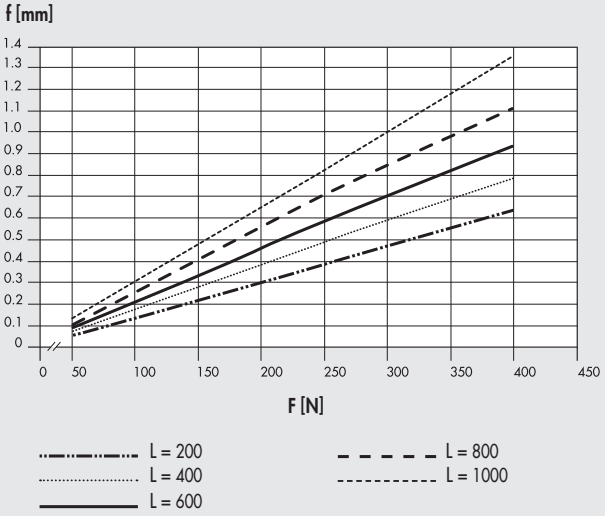
DEFORMATION ACCORDING TO LOAD WITH MISALIGNED LOAD



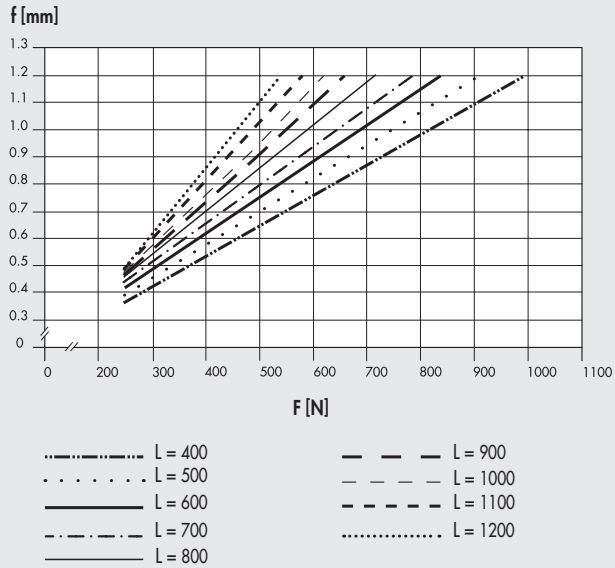
BK-1 Medium
(guide and steel wheels)



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

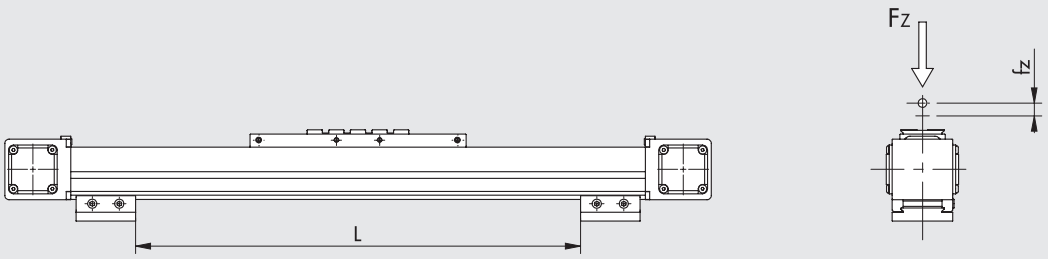


BK-2 Heavy and BK-2 Heavy XL

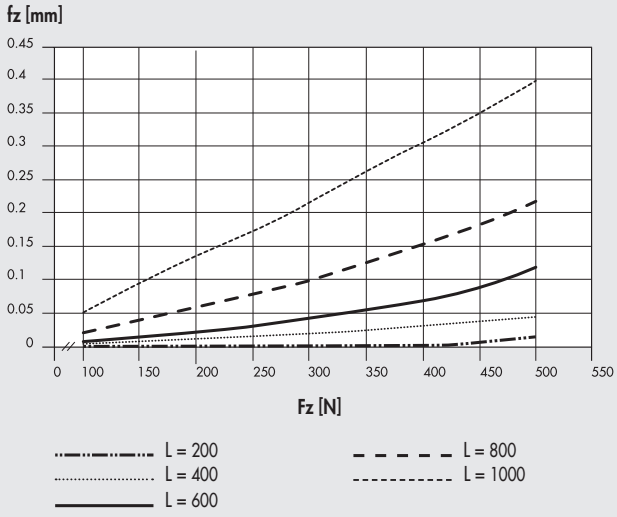


N.B.: The deformations shown in the graphs have been measured under static conditions.

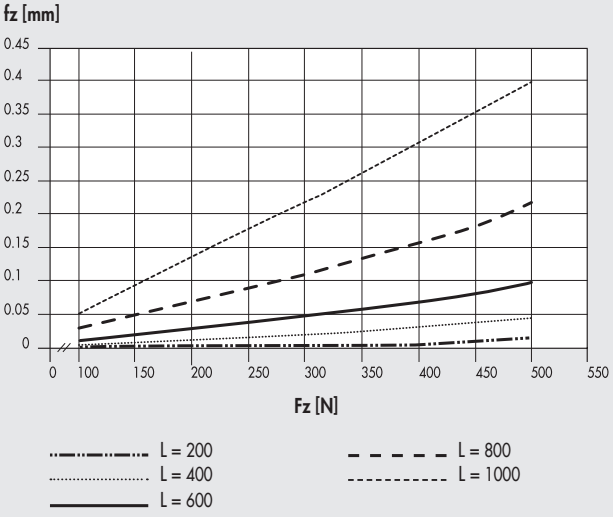
DEFORMATION ACCORDING TO LOAD WITH ALIGNED LOAD



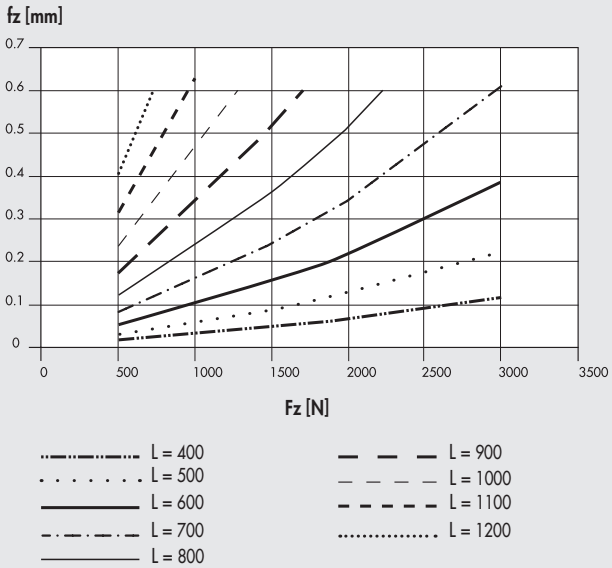
BK-1 Medium
(guide and steel wheels)



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



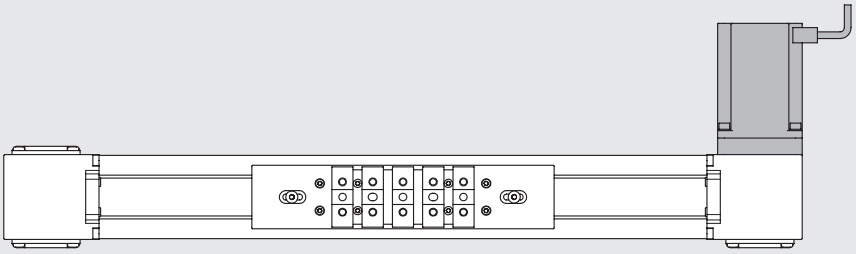
BK-2 Heavy and BK-2 Heavy XL



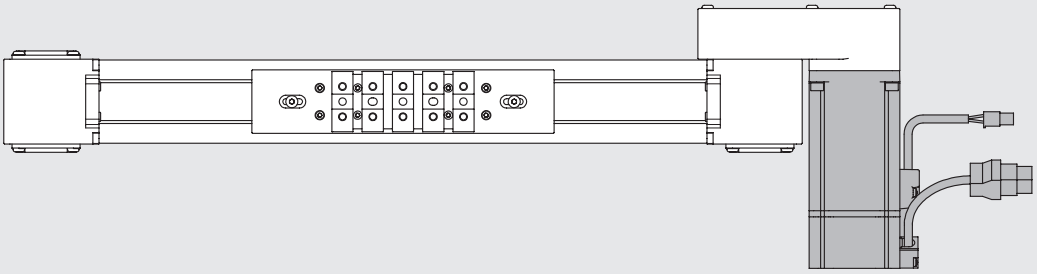
N.B.: The deformations shown in the graphs have been measured under static conditions.

METAL WORK PNEUMATIC

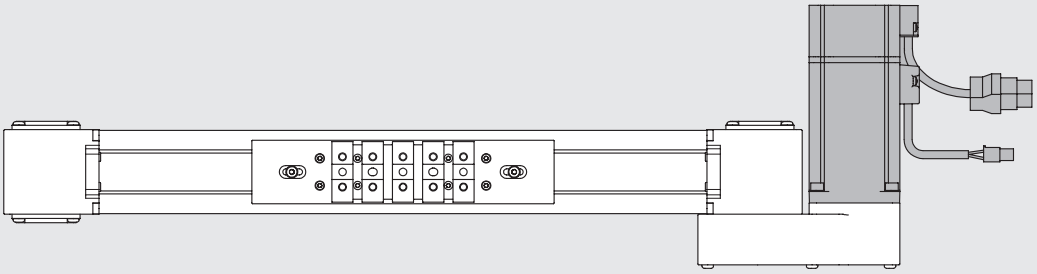
VERSIONS



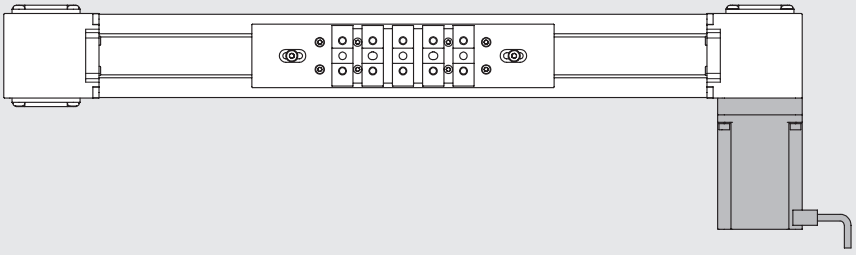
RIGHT MOTOR



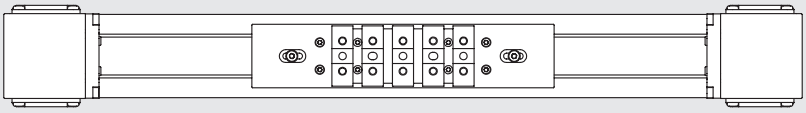
RIGHT GEARED MOTOR



LEFT GEARED MOTOR



LEFT MOTOR



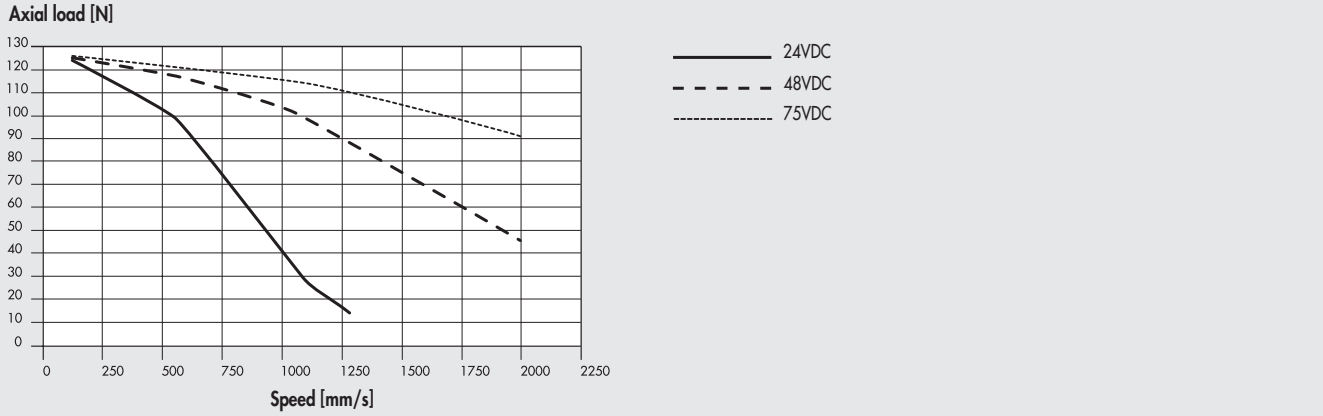
WITHOUT MOTOR

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

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

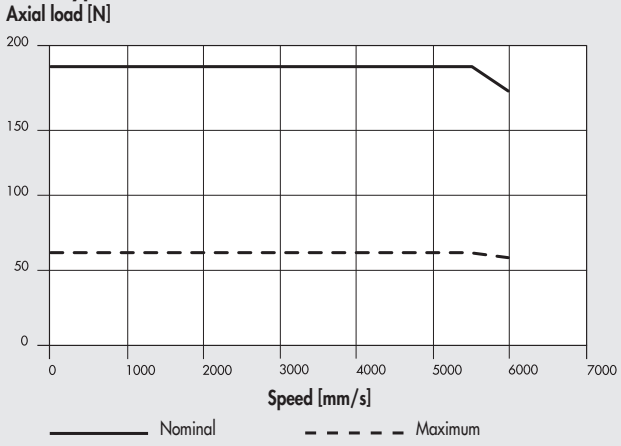
N.B.: The obtainable load values already take the efficiency of the system into account.
For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating.
Consequently, available axial load with the motor stopped is also reduced by 50%.

STEPPING motor code 37M1230000

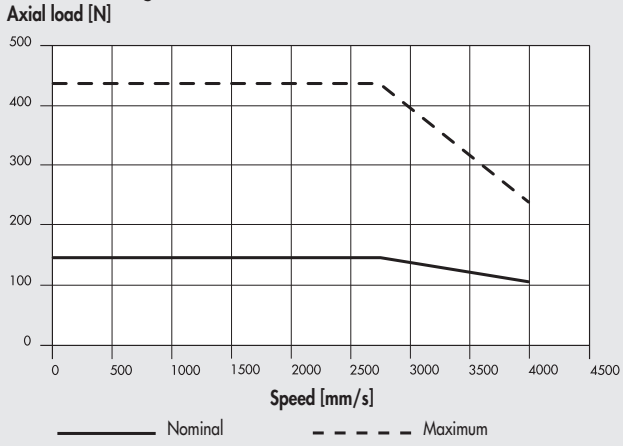


BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

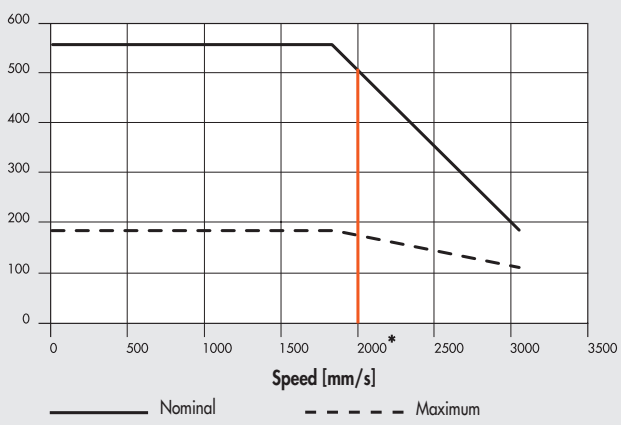
Direct type



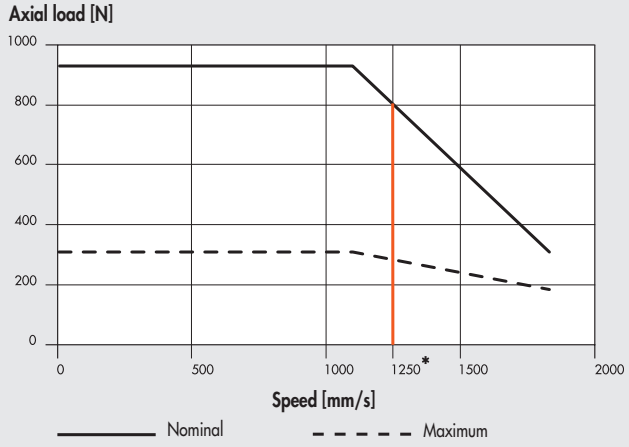
Belt reduction gear 1:2



With 1:3 gearbox



With 1:5 gearbox



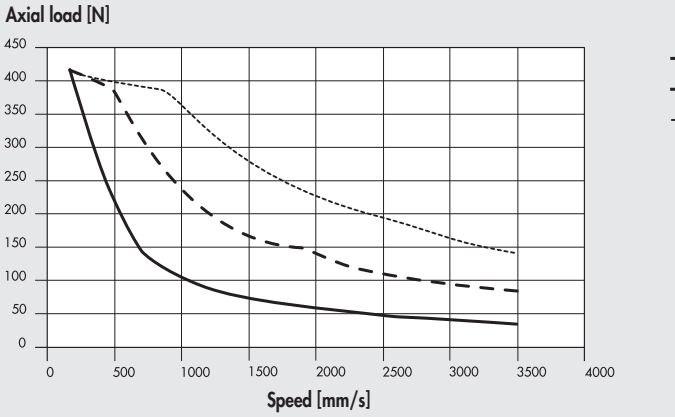
* = limit of gearbox continuous operation: higher speeds can be reached only for "duty cycle" ≤60% and for a maximum number of 1000 accelerations per hour.

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

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

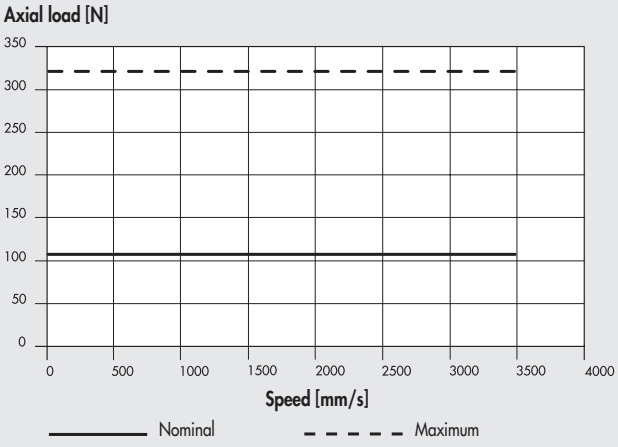
N.B.: The obtainable load values already take the efficiency of the system into account.
For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating.
Consequently, available axial load with the motor stopped is also reduced by 50%.

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

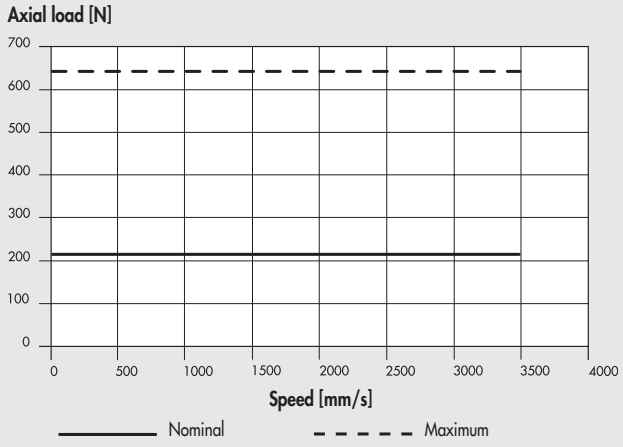


BRUSHLESS motors code 37M2330001 and code37M4330001 (with brake)

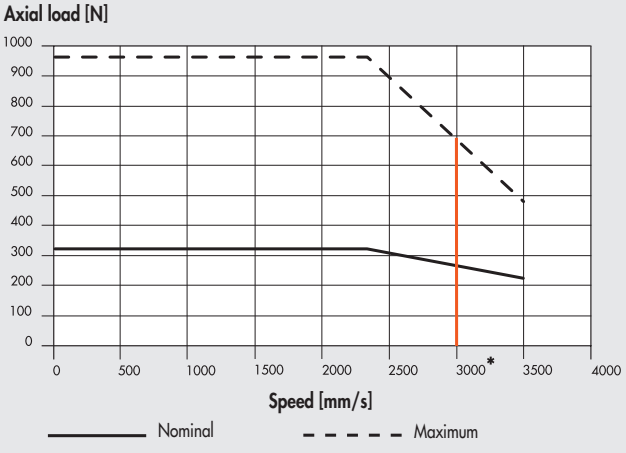
Direct type



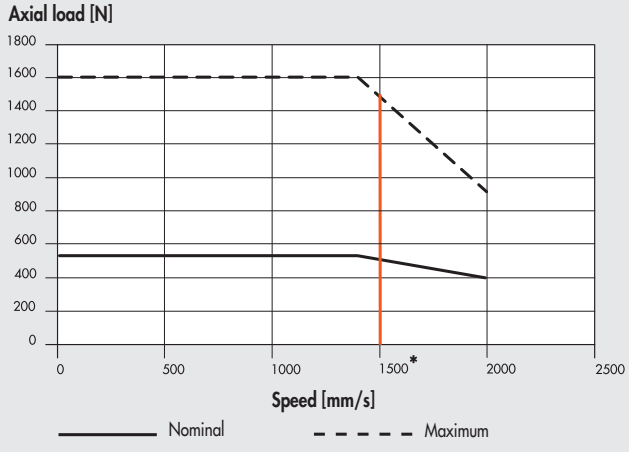
Belt reduction gear 1:2



With 1:3 gearbox



With 1:5 gearbox



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

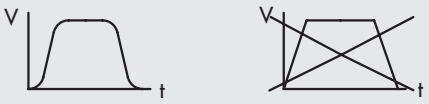
MOTOR-DRIVE COUPLINGS

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

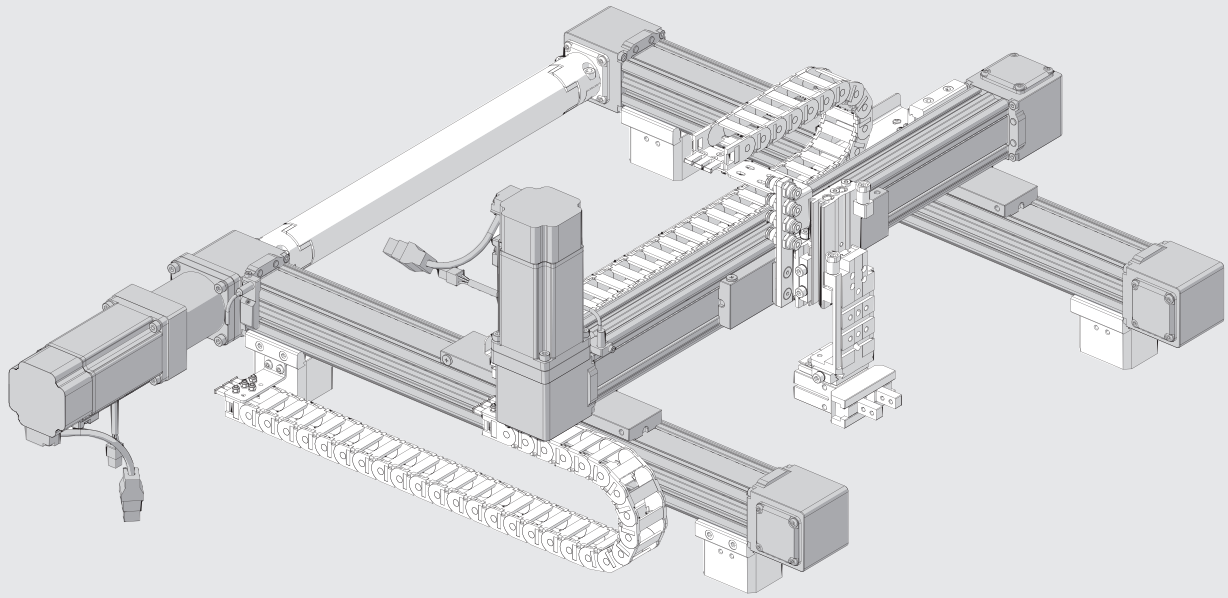
✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive ***e***.drive, code 37D1332002, can be used.
◆ **Important!** Limit current.
■ **Important!** Limit current and voltage.
● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$

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

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



EXAMPLES OF APPLICATION

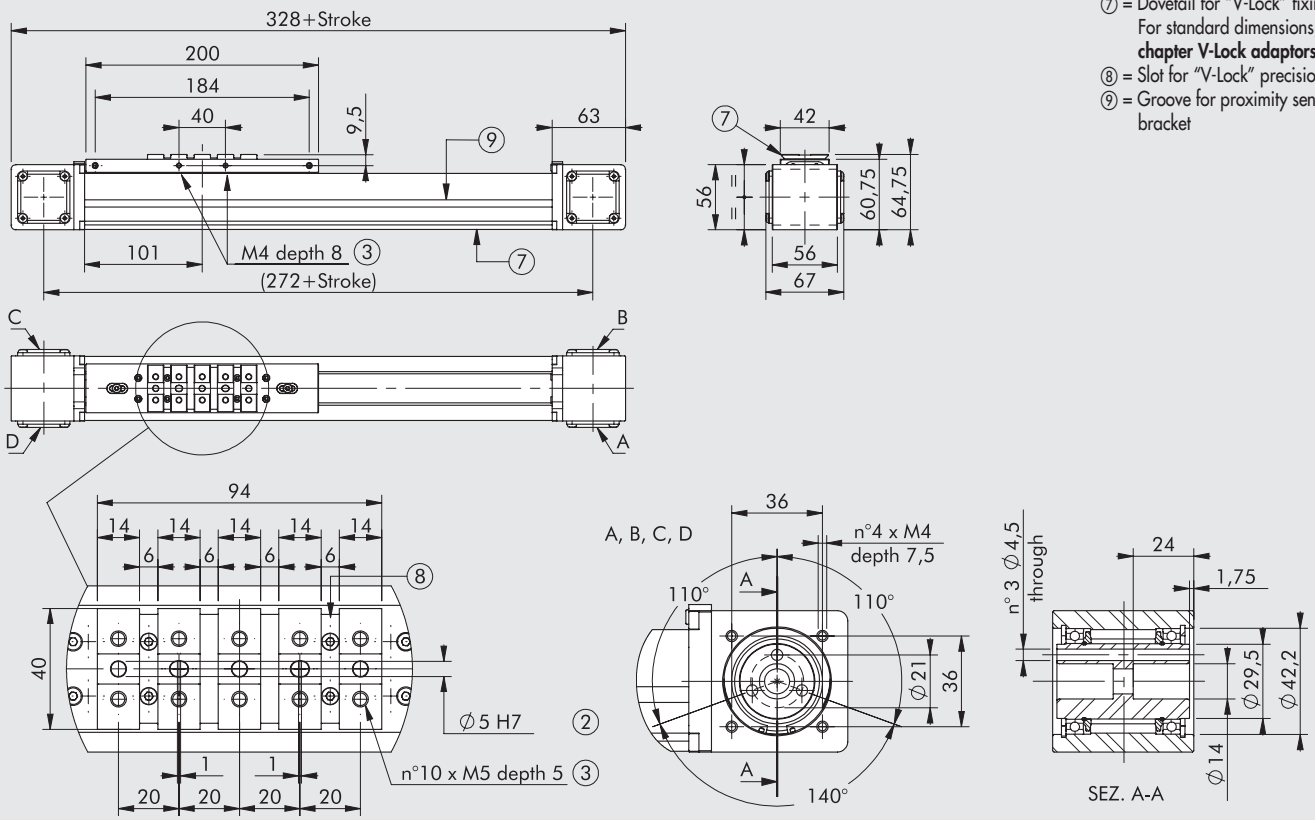


METAL WORK PNEUMATIC

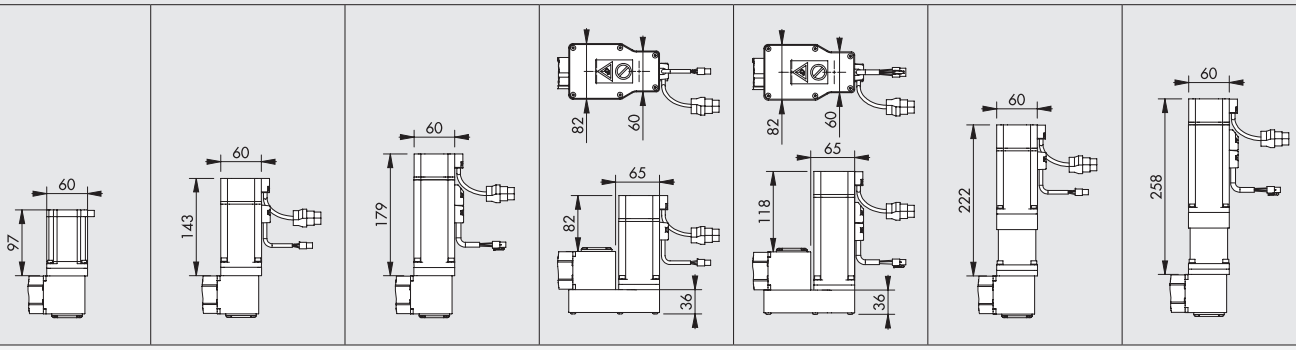
DIMENSIONS BK-1

Medium and Heavy VERSION WITHOUT MOTOR

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



Medium and Heavy VERSION WITH MOTOR



ORDERABLE CODES

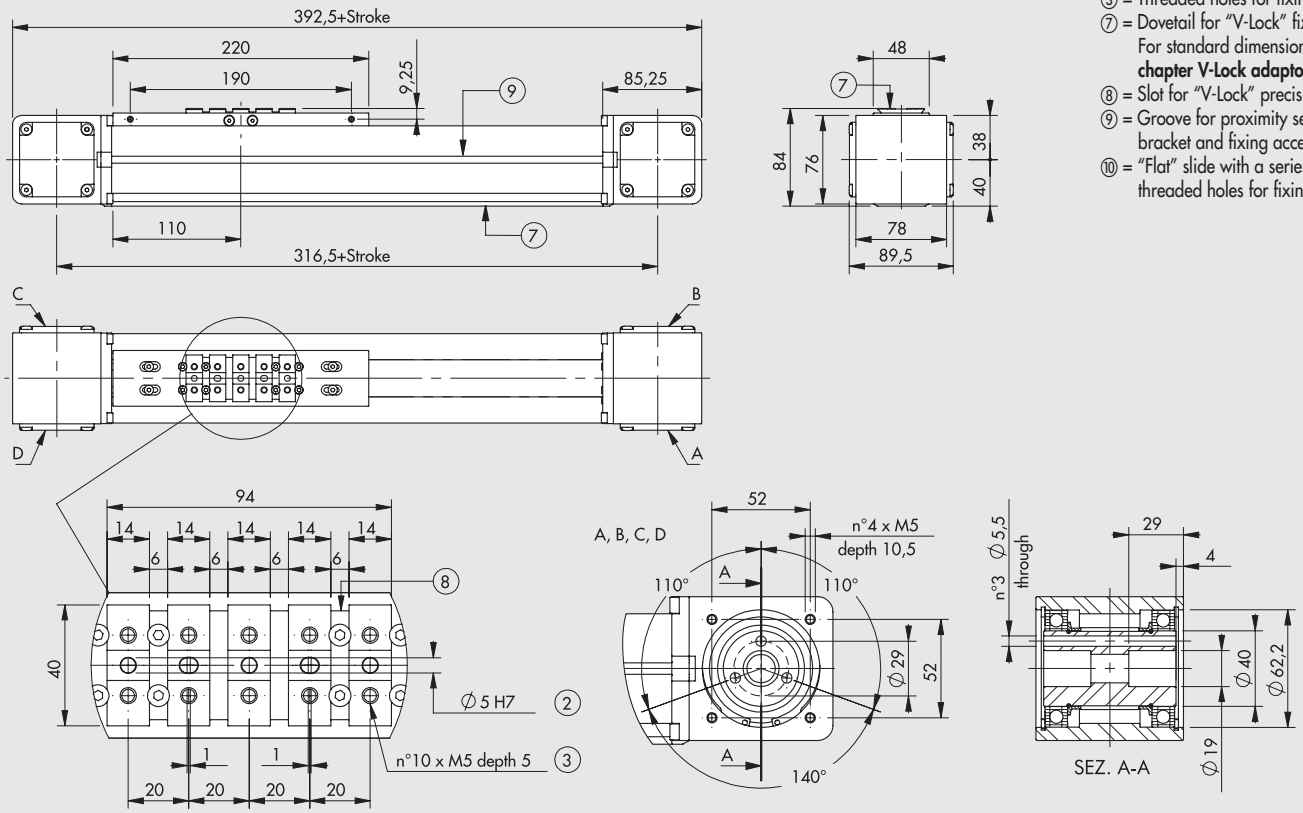
STEPPING MOTOR	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE	BRUSHLESS MOTOR WITH BELT TRANSMISSION	BRUSHLESS MOTOR + BRAKE WITH BELT TRANSMISSION	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR + BRAKE WITH GEARBOX
			Reduction 1:2	Reduction 1:2	Reduction 1:3	Reduction 1:3
374011____261230	374011____262220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

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

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

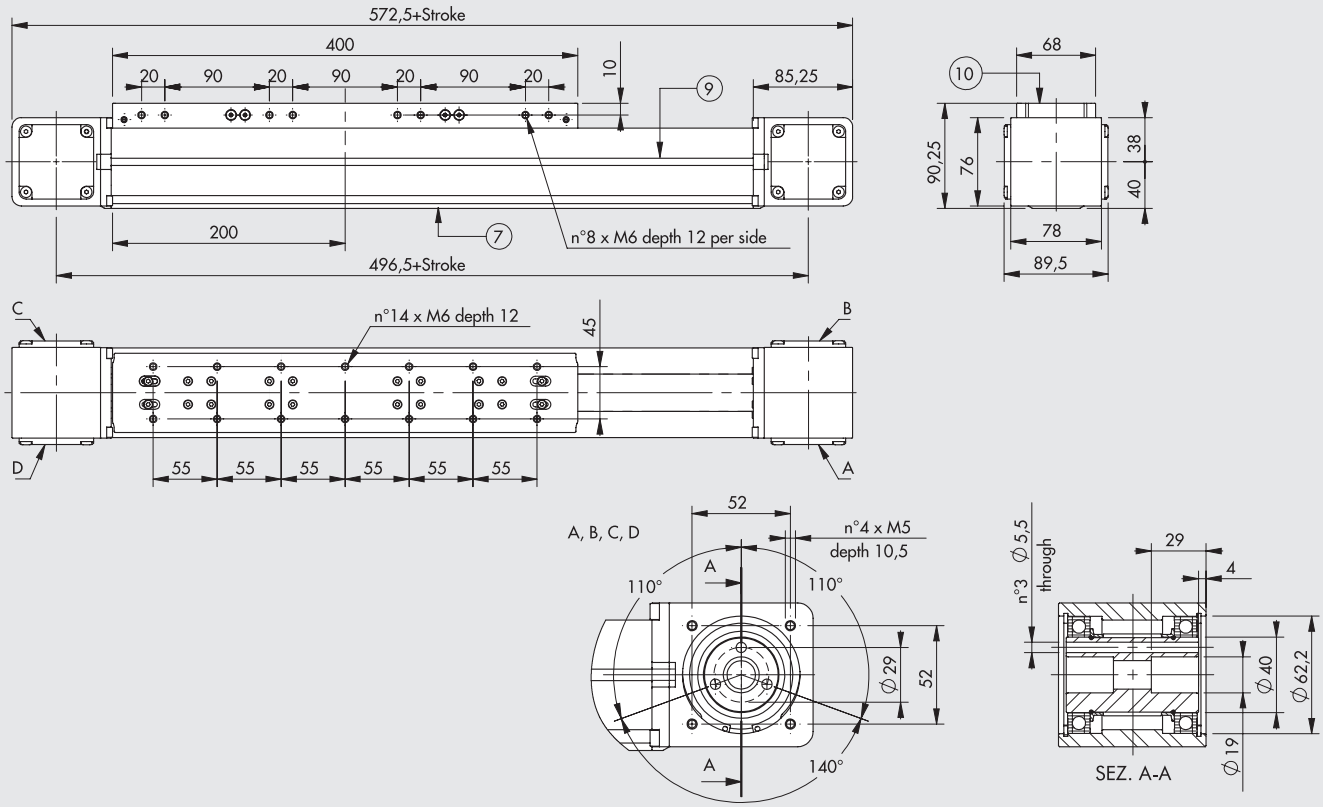
DIMENSIONS BK-2 VERSION WITHOUT MOTOR

Heavy



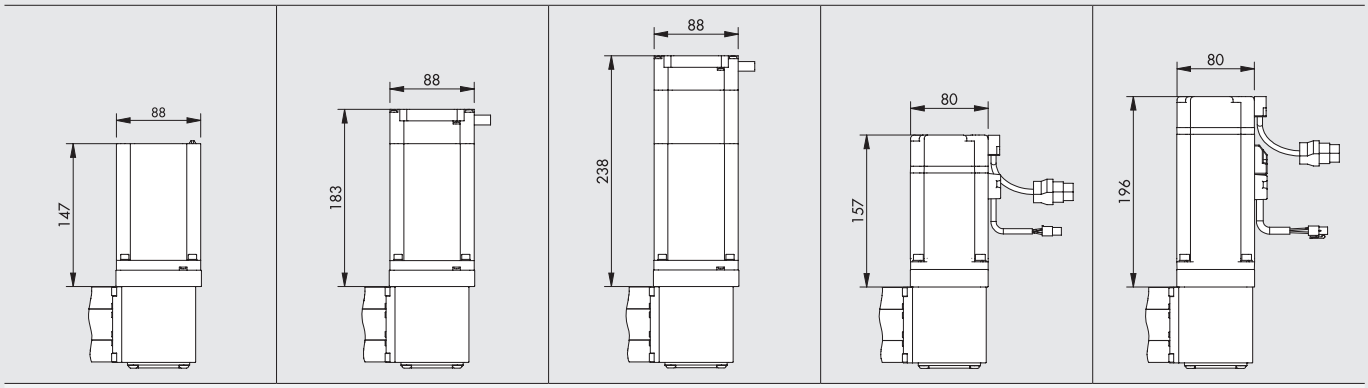
② = Holes for centring pins
③ = Threaded holes for fixing
⑦ = Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**..
⑧ = Slot for "V-Lock" precision key
⑨ = Groove for proximity sensor bracket and fixing accessories
⑩ = "Flat" slide with a series of threaded holes for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

Heavy XL



DIMENSIONS BK-2 VERSION WITH MOTOR

Heavy / Heavy XL

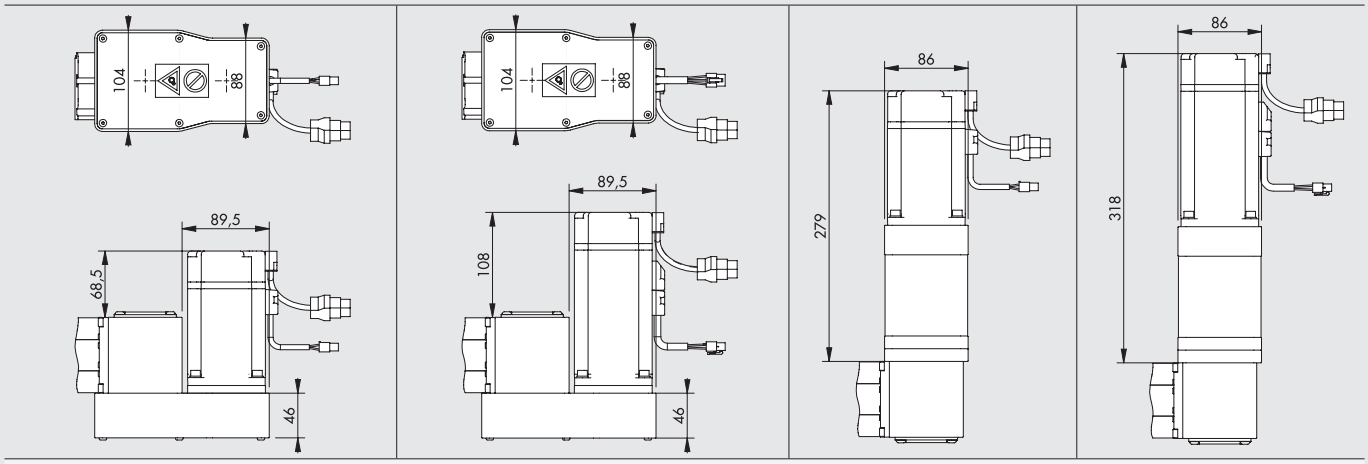


ORDERABLE CODES

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

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

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



ORDERABLE CODES

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

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

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

KEY TO CODES AXIS ELECTRIC WITHOUT MOTOR

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

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

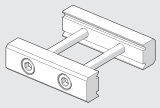
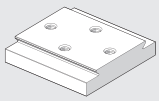
KEY TO CODES AXIS ELECTRIC MOTOR

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

● Only available for BK-2.
◆ Only available for BK-1.
■ The Orderable configurations of the motorizations are shown on on page **A5**.113 for the BK-1 and on page **A5**.115 for the BK-2.

ACCESSORIES

FIXING ELEMENTS

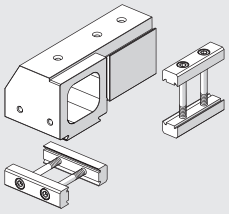



See V-Lock family.

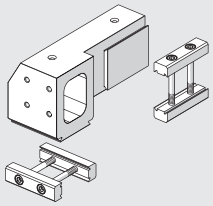
FIXING ELEMENTS FOR GANTRY SYSTEMS

LEFT BRACKET

BK-1



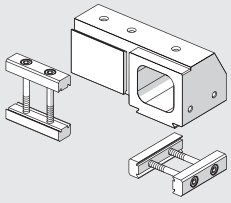
BK-2 / BK-2 XL



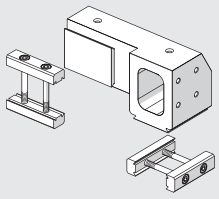
Code	Description
095BK1R003	Left bracket for Gantry BK-1
095BK2R003	Left bracket for Gantry BK-2 / BK-2 XL

RIGHT BRACKET

BK-1

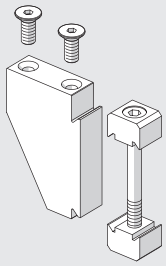


BK-2 / BK-2 XL



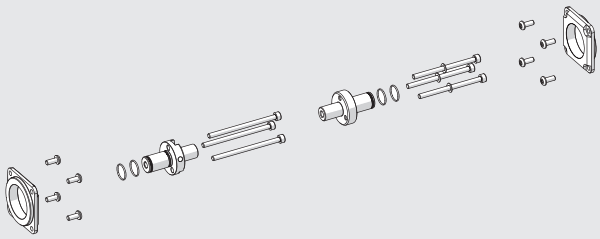
Code	Description
095BK1R002	Right bracket for Gantry BK-1
095BK2R002	Right bracket for Gantry BK-2 / BK-2 XL

BRACKET CABLE CHAIN GIUDE



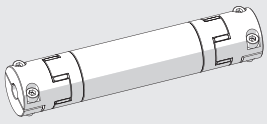
Code	Description
095BK2R004	Bracket cable chain giude for Gantry BK-1 / BK-2 / BK-2 XL

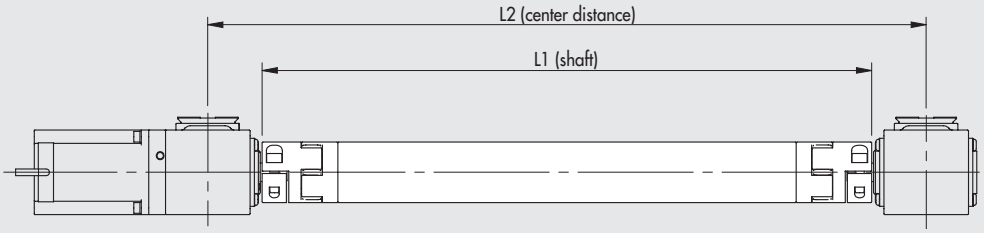
JOINT FOR TRANSMISSION SHAFT



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

TRANSMISSION SHAFT





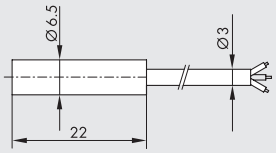
L1 min = 200 mm
L1 max = 2500 mm

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

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

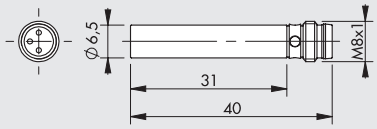
_ _ _ _ Enter the length L1 in mm to complete the code.
Example: 095TSV120800 = transmission shaft BK-1 L1 = 800 mm

INDUCTION SENSOR Ø 6.5



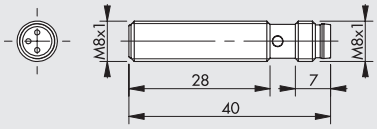
Code	Description
W095K030006	PNP Ø 6.5 PNP inductive sensor with LED 2 m

QUICK-FIT INDUCTIVE SENSOR Ø 6.5



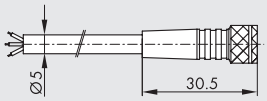
Code	Description
W095K030009	PNP Ø 6.5 inductive sensor with push-in LED

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



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

CABLE WITH STRAIGHT CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

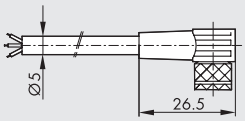


Pin	Cable color
1	Brown
3	Blue
4	Black

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

Note: Mobile laying cable, class 6 according to IEC 60228

CABLE WITH 90° CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

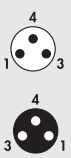


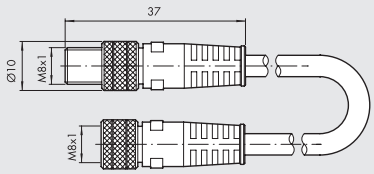
Pin	Cable color
1	Brown
3	Blue
4	Black

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

Note: Mobile laying cable, class 6 according to IEC 60228

M8 M – M8 F CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



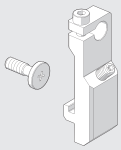


Code	Description
0240009009	M8-M8 3-pin straight connector with cable L = 3 m

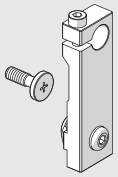
Note: Can be used for direct connection to the modules with digital INPUT of the EB 80 and CM valves

BRACKET FOR INDUCTION SENSOR

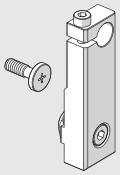
BK-1



BK-2



BK-2 XL



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

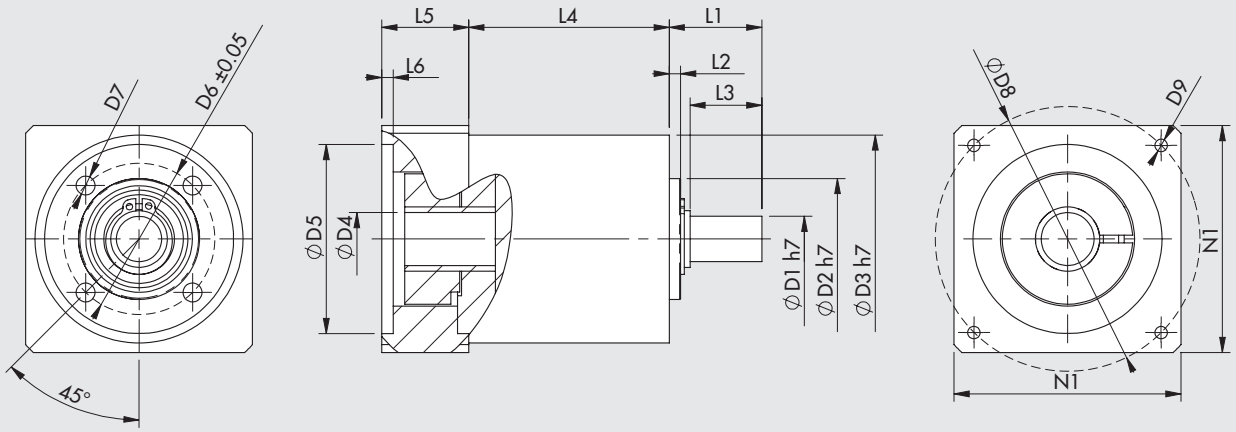
DRIVES

Code
37D1222000
37D1332000
37D1552000
37D2300000
37D2400007

For technical data see from page **A5**.150
For motor-drive couplings see page **A5**.112

SPARE PARTS

BK GEARBOXES



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

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

ELECTRIC MOTORS

Code
37M1230000
37M1470000
37M2220001
37M2330001
37M3470000
37M4220001
37M4330001
37M8470000

For technical data see from page **A5**.120
For motor-drive couplings see page **A5**.112

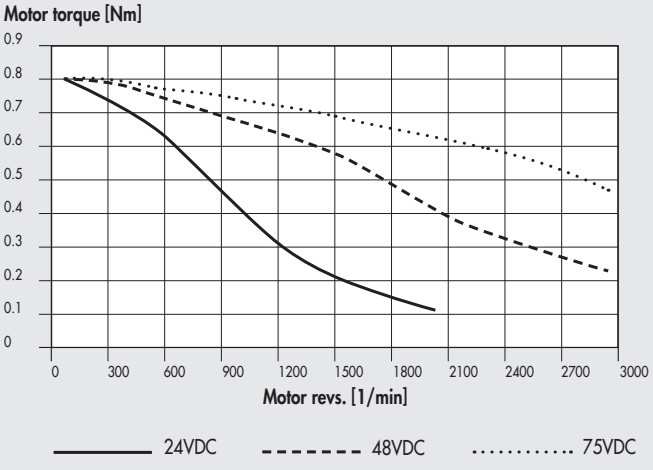
ELECTRIC MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO

STEPPING MOTORS

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

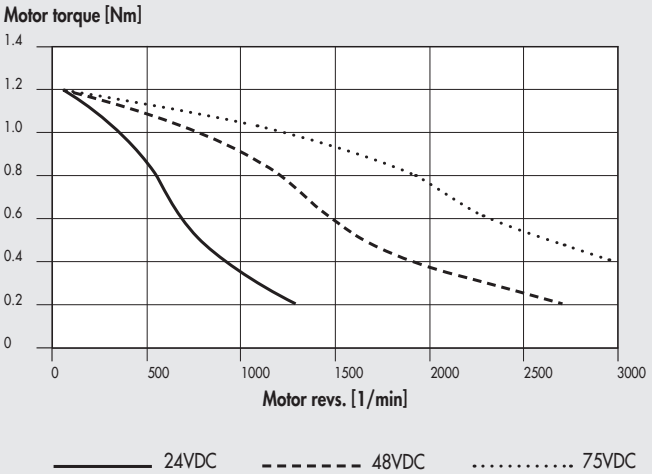
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS

STEPPING motor code **37M1110000**



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	kgmm²	21
Theoretical acceleration	rad · s⁻²	50000
Back E.M.F.	V/krpm	20
Mass	kg	0.65
Degree of protection		IP40

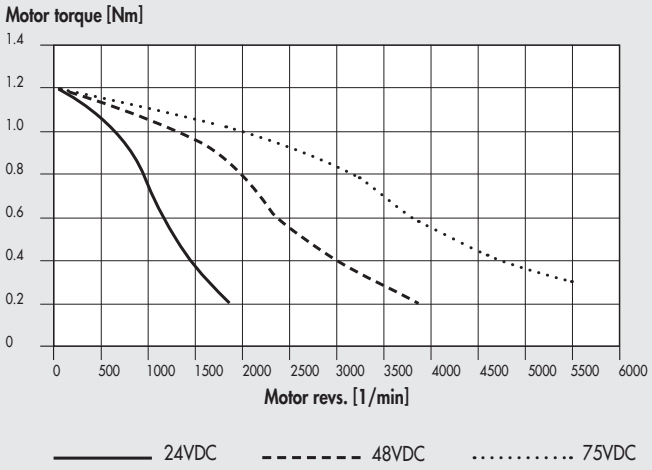
STEPPING motor code **37M1120000**



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	kgmm²	36
Theoretical acceleration	rad · s⁻²	45800
Back E.M.F.	V/krpm	31
Mass	kg	1
Degree of protection		IP40

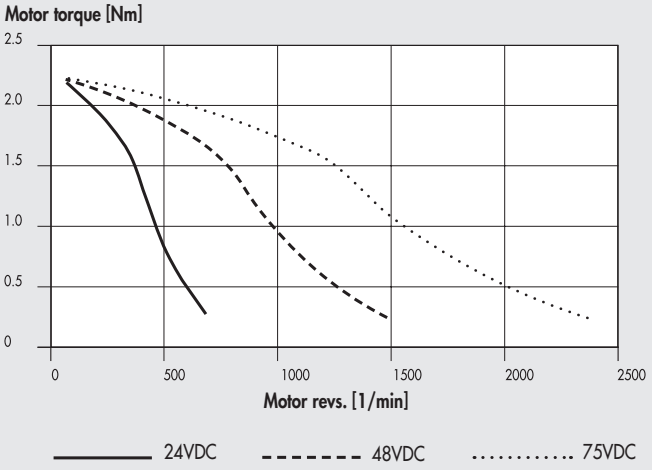
METAL WORK PNEUMATIC

STEPPING motor code **37M1120001**



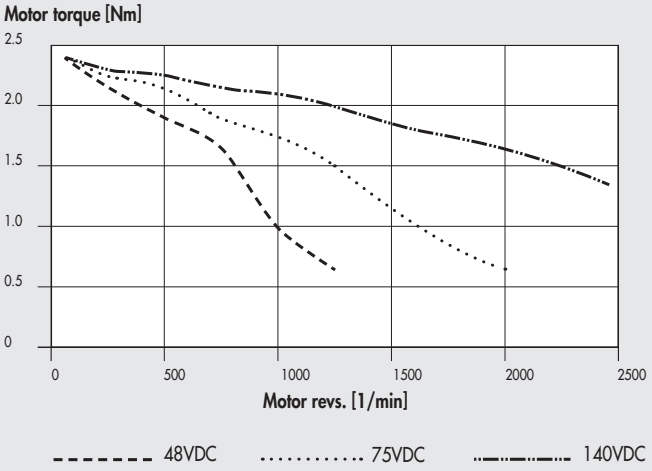
TECHNICAL DATA		MOTOR 37M1120001
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	5.6
Resistance	Ω	0.3
Inductance	mH	0.85
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm^2	36
Theoretical acceleration	rad · s^{-2}	45800
Back E.M.F.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

STEPPING motor code **37M1230000**



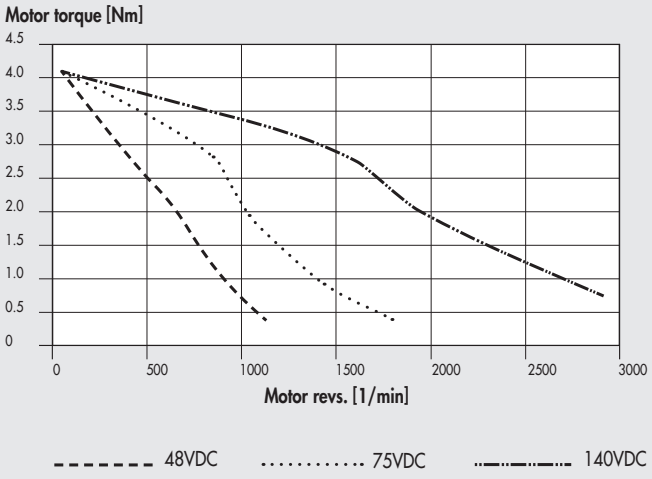
TECHNICAL DATA		MOTOR 37M1230000
Motor type		STEPPING
Nominal torque	Nm	**2.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.65
Inductance	mH	2.4
Bipolar holding torque	Nm	3
Rotor inertia	kgmm^2	84
Theoretical acceleration	rad · s^{-2}	35700
Back E.M.F.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

STEPPING motor code **37M1430000**



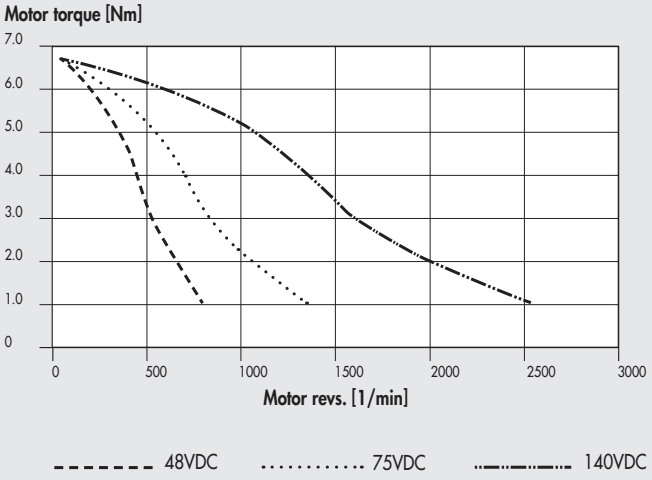
TECHNICAL DATA		MOTOR 37M1430000
Motor type		STEPPING
Nominal torque	Nm	**2.4**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.3
Inductance	mH	1.65
Bipolar holding torque	Nm	3
Rotor inertia	kgmm^2	145
Theoretical acceleration	rad · s^{-2}	20600
Back E.M.F.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

STEPPING motor code **37M1440000**



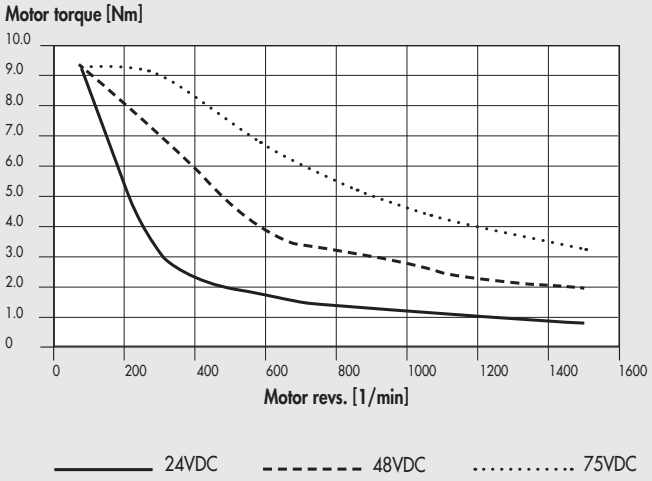
TECHNICAL DATA		MOTOR 37M1440000
Motor type		STEPPING
Nominal torque	Nm	**4.2**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.35
Inductance	mH	2.7
Bipolar holding torque	Nm	5.6
Rotor inertia	kgmm²	290
Theoretical acceleration	rad · s⁻²	19300
Back E.M.F.	V/krpm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

STEPPING motor code **37M1450000**



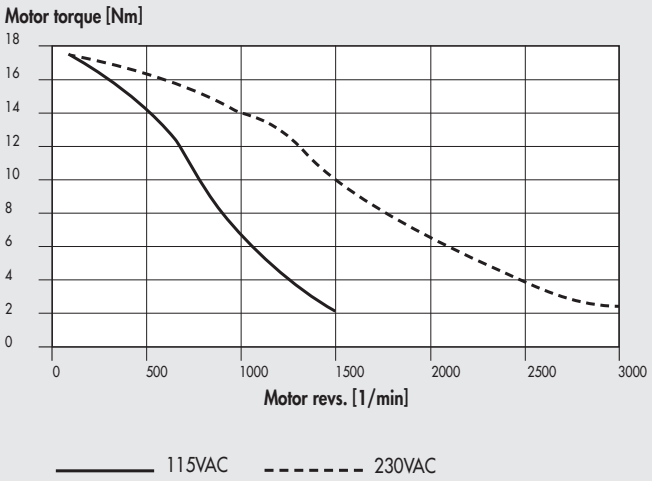
TECHNICAL DATA		MOTOR 37M1450000
Motor type		STEPPING
Nominal torque	Nm	**6.7**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current parallel	A	6
Resistance	Ω	0.46
Inductance	mH	3.8
Bipolar holding torque	Nm	9.2
Rotor inertia	kgmm²	450
Theoretical acceleration	rad · s⁻²	20500
Back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

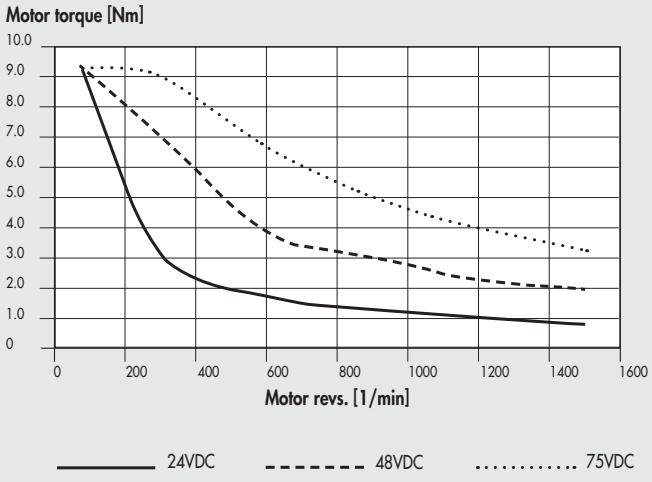


TECHNICAL DATA		MOTOR 37M1890000
Motor type		STEPPING
Nominal torque	Nm	**17.5**
Coupling flange		**NEMA 42**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.63
Inductance	mH	8
Bipolar holding torque	Nm	24.6
Rotor inertia	kgmm²	2200
Theoretical acceleration	rad · s⁻²	11100
Back E.M.F.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

STEPPING MOTORS WITH ENCODER

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH ENCODER

STEPPING motor with ENCODER code **37M8470000**

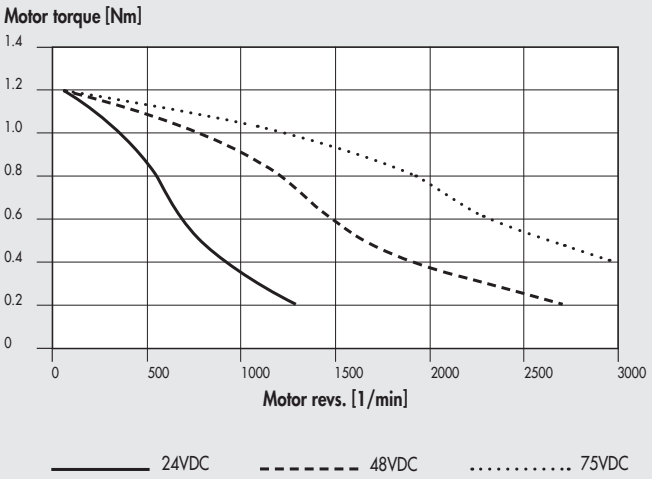


TECHNICAL DATA		MOTOR 37M8470000
Motor type		STEPPING with ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.3
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

STEPPING MOTORS WITH BRAKE

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE

STEPPING motor with BRAKE code **37M5120000**



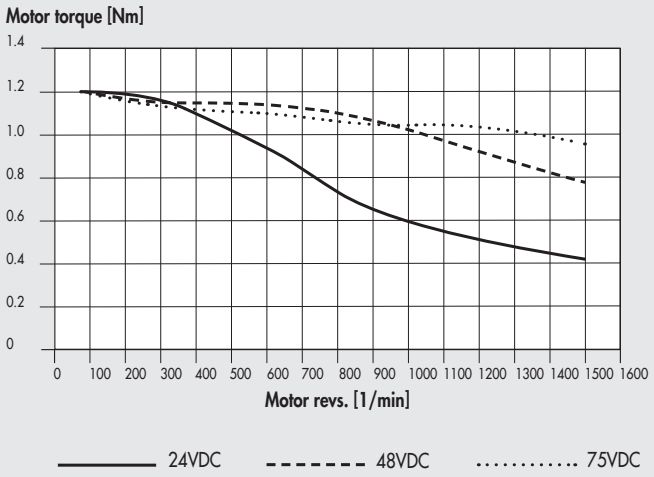
TECHNICAL DATA		MOTOR 37M5120000
Motor type		STEPPING with BRAKE
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	$kgmm^2$	36
Theoretical acceleration	$rad \cdot s^{-2}$	45800
Back E.M.F.	V/krpm	31
Mass	kg	1.5
Degree of protection		IP20
BRAKE		
Braking torque	Nm	3.3
Duty Cycle		50% max
Supply voltage	VDC	24
Power consumption	W	18
Connecting time	ms	300

NOTES

STEPPING MOTORS WITH BRAKE + ENCODER

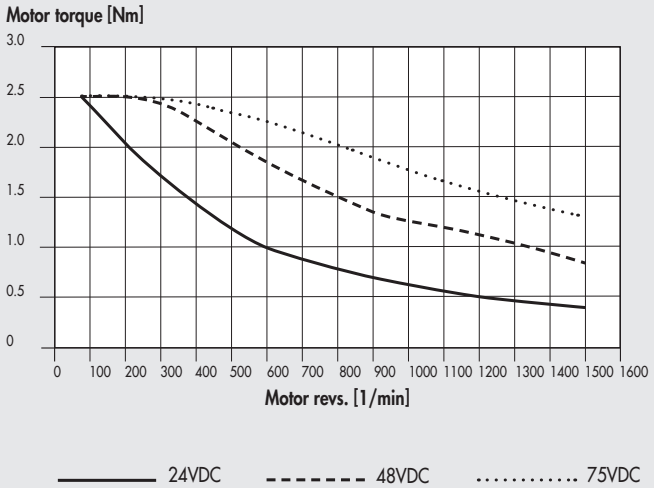
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE + ENCODER

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



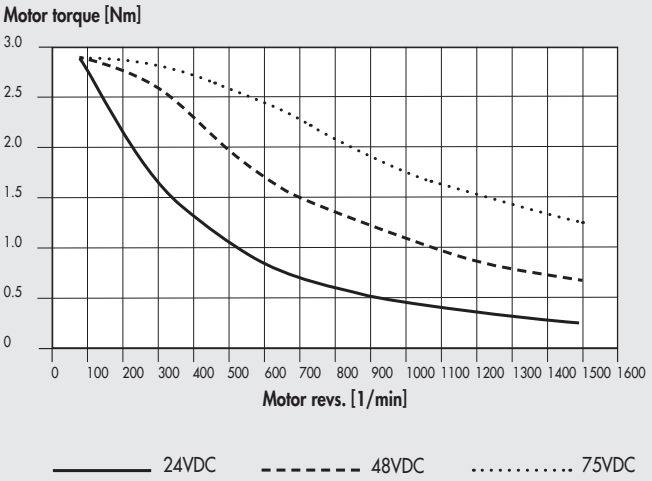
TECHNICAL DATA		MOTOR 37M3220000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	2
Power consumption	W	11
Connecting time	ms	6
Delay time	ms	2
Disconnection time	ms	25
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

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



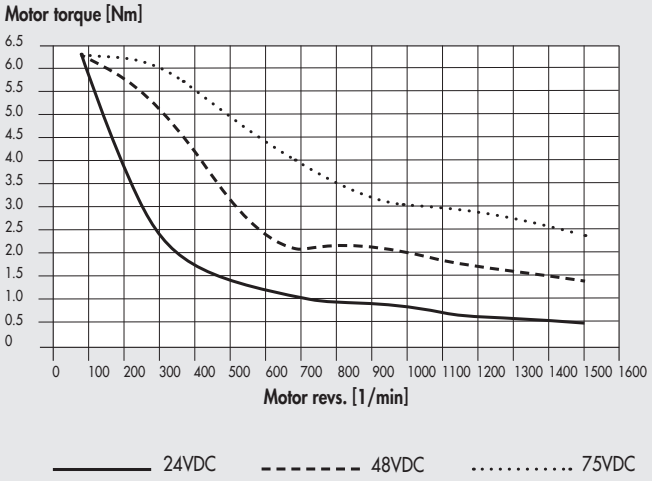
TECHNICAL DATA		MOTOR 37M3230000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.5**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Bipolar current	A	5
Resistance	Ω	0.6
Inductance	mH	2.8
Bipolar holding torque	Nm	3.5
Rotor inertia	kgmm²	92
Mass	kg	1.8
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	2
Power consumption	W	11
Connecting time	ms	6
Delay time	ms	2
Disconnection time	ms	25
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

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



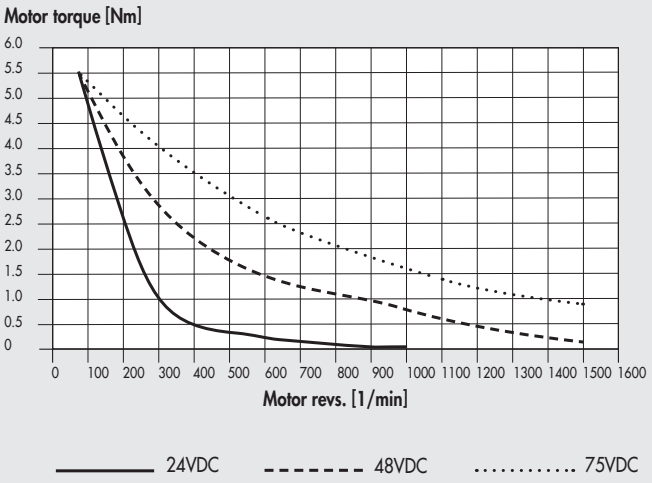
TECHNICAL DATA		MOTOR 37M3430000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.9**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.4
Inductance	mH	3.2
Bipolar holding torque	Nm	4
Rotor inertia	kgmm²	131
Mass	kg	2.5
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

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



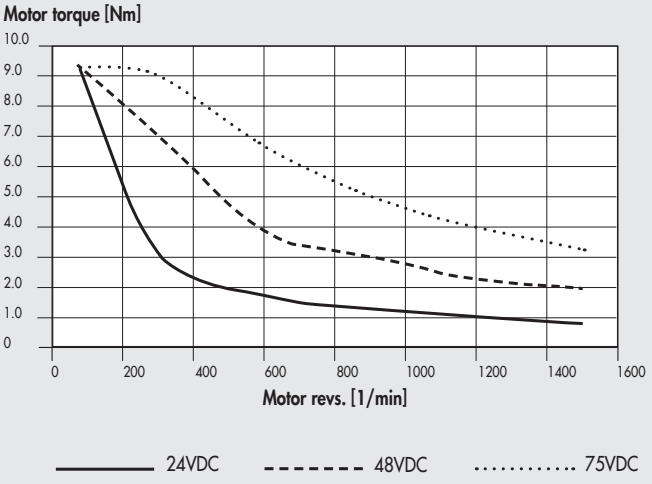
TECHNICAL DATA		MOTOR 37M3450000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**6.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.2
Inductance	mH	1.4
Bipolar holding torque	Nm	9.5
Rotor inertia	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

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



TECHNICAL DATA		MOTOR 37M3460000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**5.5**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.6
Inductance	mH	4.3
Bipolar holding torque	Nm	7.8
Rotor inertia	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

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

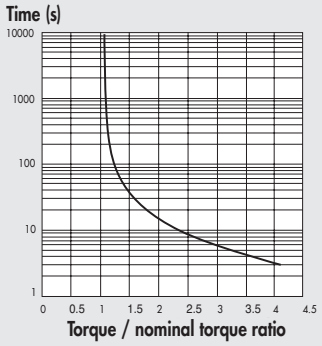


TECHNICAL DATA		MOTOR 37M3470000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.9
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

BRUSHLESS MOTORS

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

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

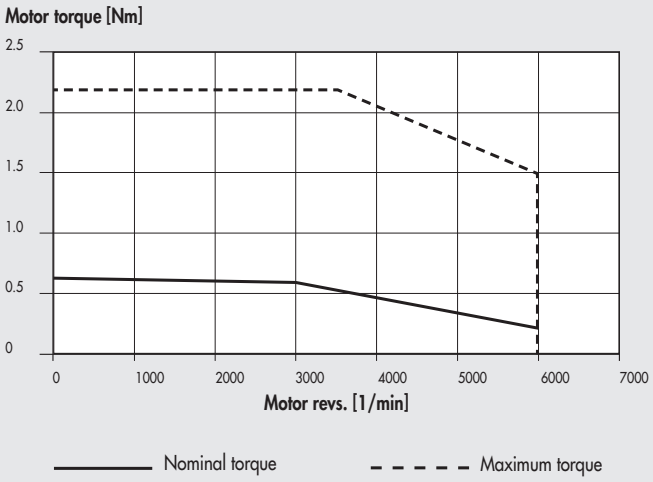


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

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

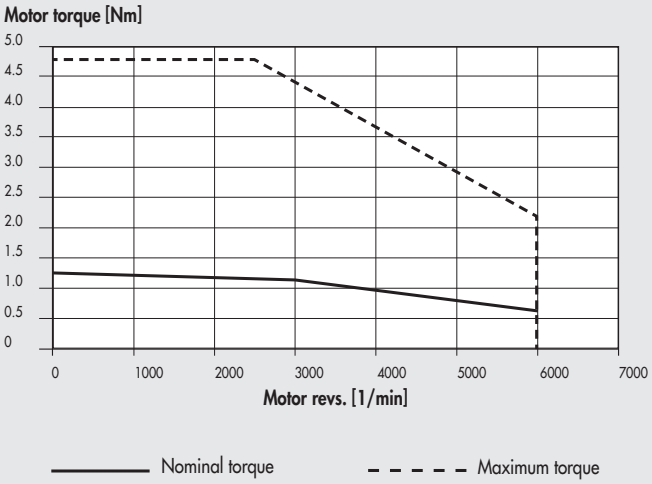
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



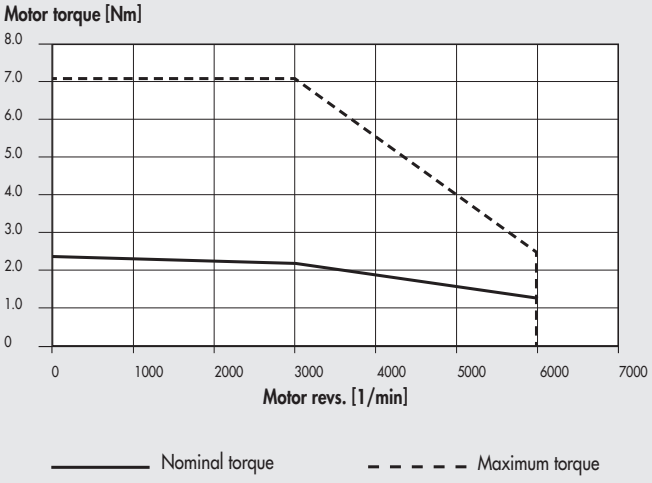
TECHNICAL DATA		MOTOR 37M2200000
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	21.9
Mass	kg	0.84
Encoder	pulse/rev	131072 (17 bit)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

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



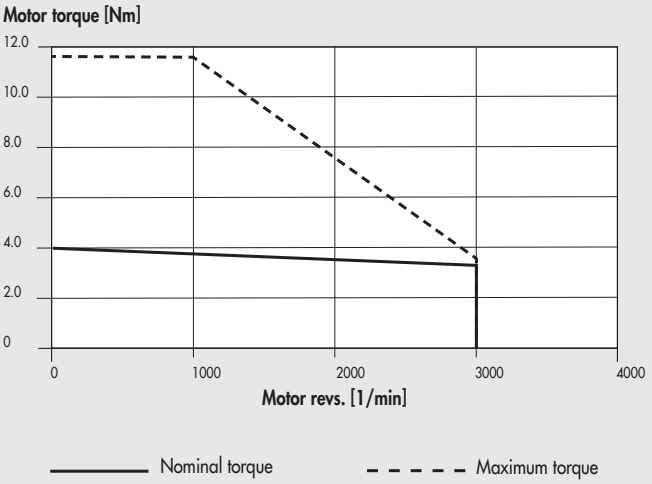
TECHNICAL DATA		MOTOR 37M2220000
Motor type		BRUSHLESS
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	41.2
Mass	kg	1.3
Encoder	pulse/rev	131072 (17 bit)
Degree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

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



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

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



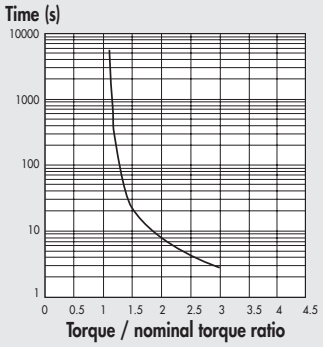
TECHNICAL DATA		MOTOR 37M2540000
Motor type		BRUSHLESS
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	$kgmm^2$	238.3
Mass	kg	3.5
Encoder	pulse/rev	131072 (17 bit)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

METAL WORK PNEUMATIC

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.

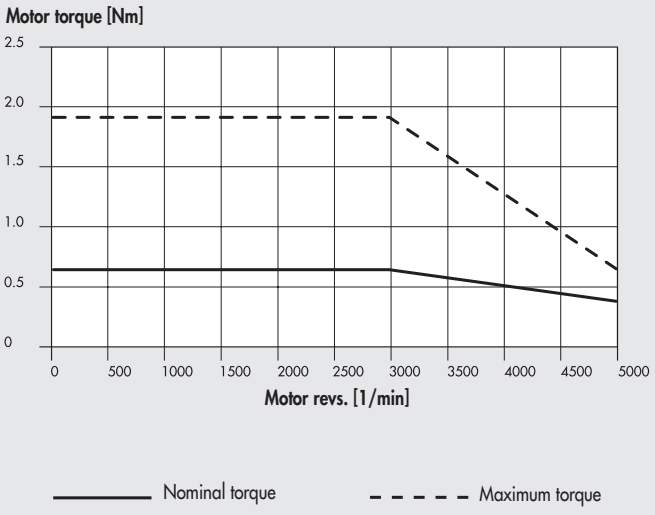


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (DELTA)

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

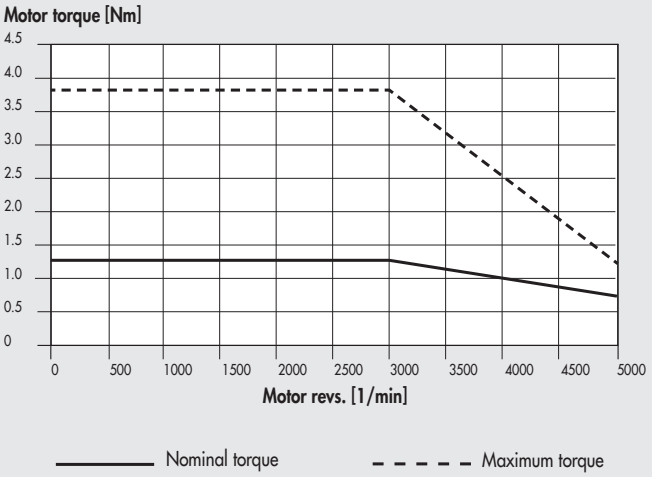
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



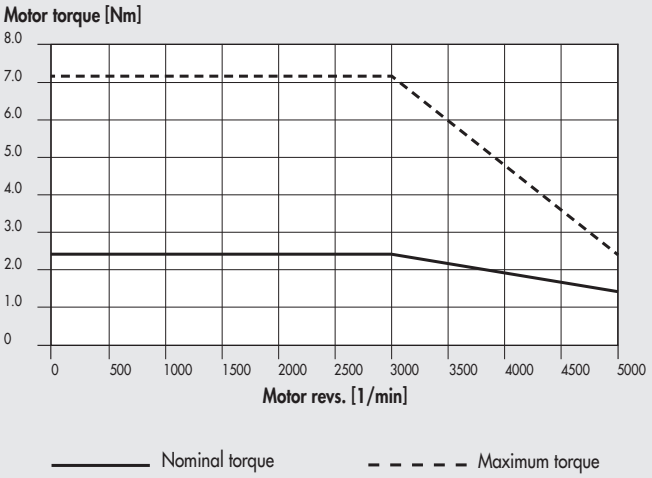
TECHNICAL DATA		MOTOR 37M2200001
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	$kgmm^2$	17.7
Mass	kg	1.2
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2200001**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130001**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive**, 5 metres		**37C2150001**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**

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



TECHNICAL DATA		MOTOR 37M2220001
Motor type		BRUSHLESS
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm²	27.7
Mass	kg	1.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2300000**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130001**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130002**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230002**
Brushless **motor-drive**, 5 metres		**37C2150001**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150002**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250002**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2100003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200003**

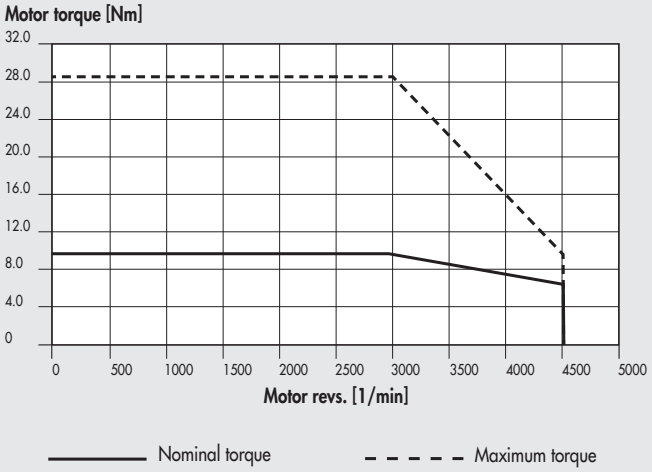
BRUSHLESS motor code **37M2330001** +
drive code **37D2400007** (750W)



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

METAL WORK PNEUMATIC

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



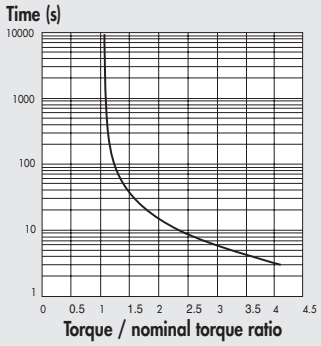
TECHNICAL DATA		MOTOR 37M2770000
Motor type		BRUSHLESS
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	$kgmm^2$	1270
Mass	kg	7.8
Encoder	pulse/rev	1048576 (20 bit)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

NOTES

BRUSHLESS MOTORS WITH BRAKE

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

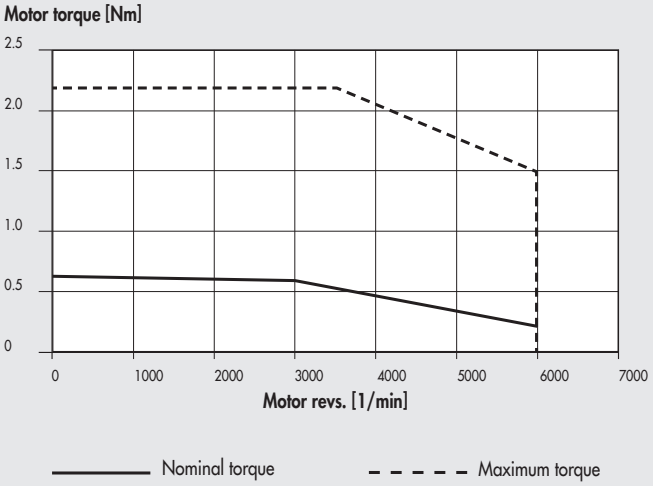
The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.



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

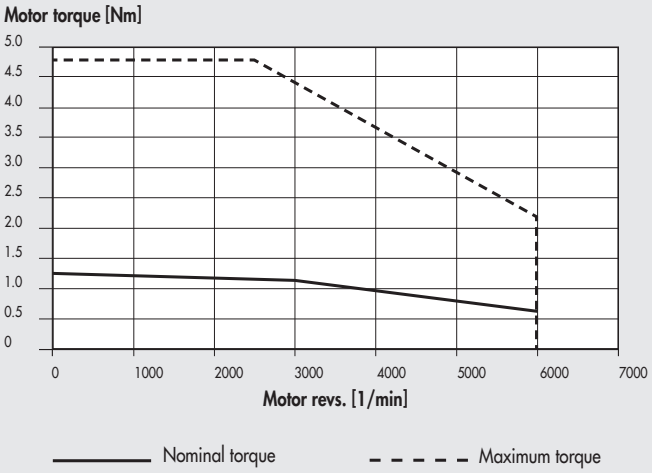
The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



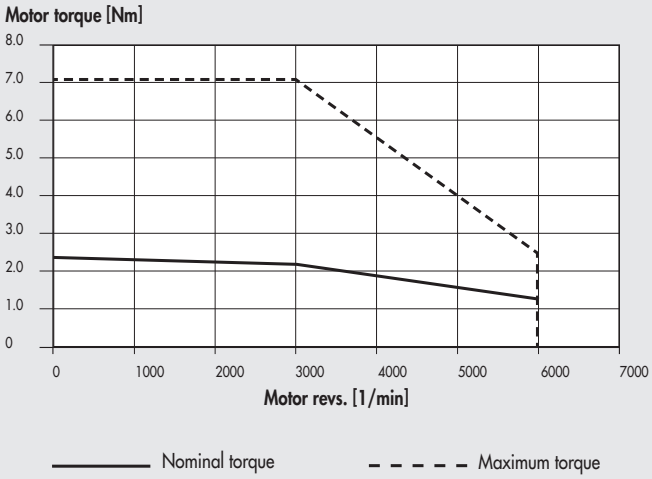
TECHNICAL DATA		MOTOR 37M4200000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	27.9
Mass	kg	1.23
Encoder	pulse/rev	131072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



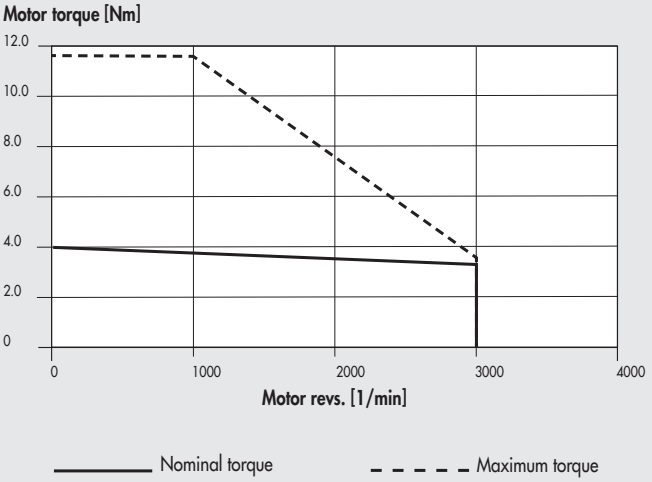
TECHNICAL DATA		MOTOR 37M4220000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	47.2
Mass	kg	1.69
Encoder	pulse/rev	131072 (17 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	8.5
Rotor inertia	kgmm²	207
Mass	kg	2.19
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	2.55 min
DRIVE	code	**37D2400008**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130005**
Brushless **motor-drive-encoder**, 3 metres		**37C2230005**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130004**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230004**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150005**
Brushless **motor-drive-encoder**, 5 metres		**37C2250005**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150004**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250006**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2100004**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200004**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**

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



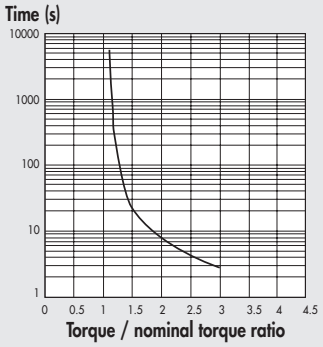
TECHNICAL DATA		MOTOR 37M4540000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	kgmm^2	272.6
Mass	kg	4.34
Encoder	pulse/rev	131072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

NOTES

METAL WORK PNEUMATIC

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.

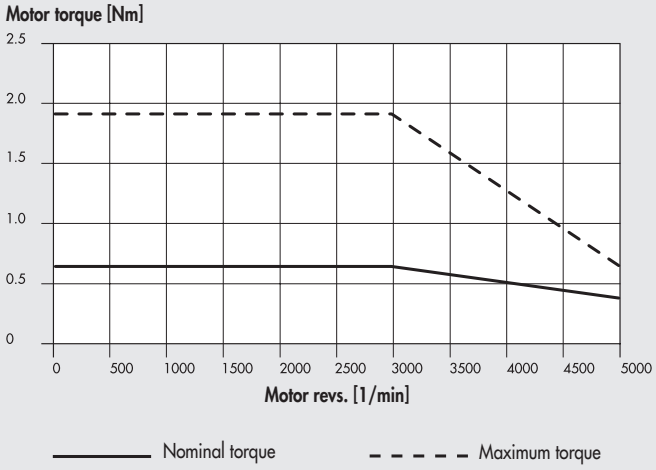


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (DELTA)

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

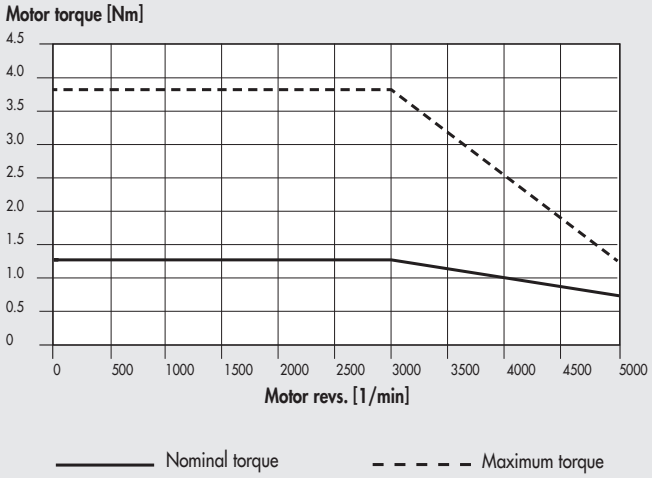
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



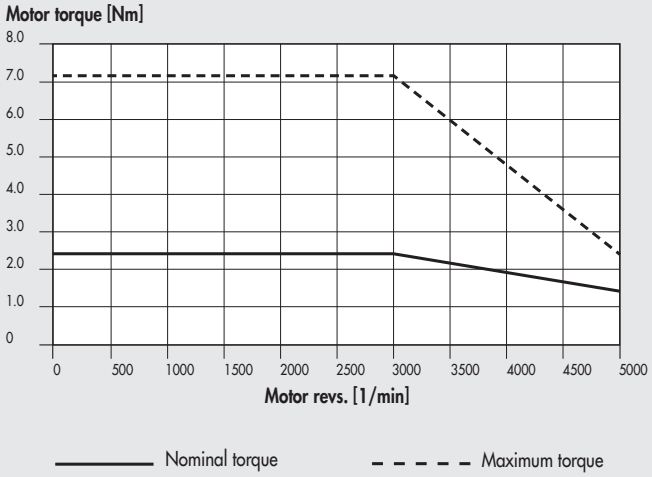
TECHNICAL DATA		MOTOR 37M4200001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	kgmm²	19.2
Mass	kg	1.5
Encoder	imp./giro	131072 (17 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.3
Absorption	W	6.5
DRIVE	code	**37D2200001**
CABLES		
Brushless **motor-drive** with brake, 3 metres		**37C2730000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive** with brake, 5 metres		**37C2750000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**

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



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

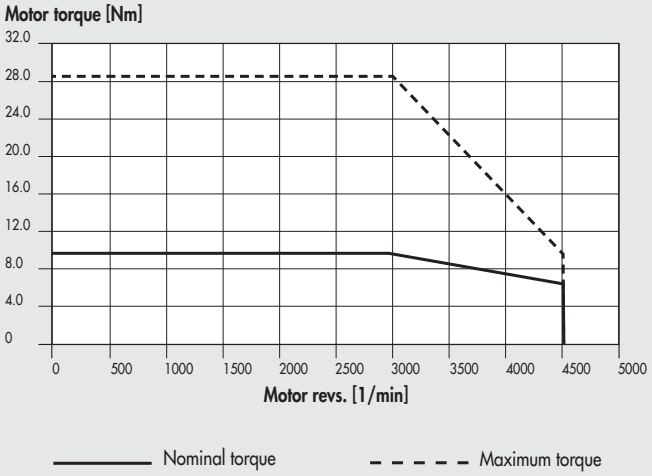
BRUSHLESS motor with BRAKE code **37M4330001** + drive code **37D2400007** (750W)



TECHNICAL DATA		MOTOR 37M4330001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	2.39
Maximum torque	Nm	7.17
Rotor inertia	kgmm²	113
Mass	kg	3
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.3
Absorption	W	6.5
DRIVE	Scode	**37D2400007**
CABLES		
Brushless **motor-drive** with brake, 3 metres		**37C2730000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive** with brake **dynamic** cable, 3 metres		**37C2730001**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2230002**
Brushless **motor-drive** with brake, 5 metres		**37C2750000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**
Brushless **motor-drive** with brake **dynamic** cable, 5 metres		**37C2750001**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250002**
Brushless **motor-drive** with brake **dynamic** cable, 10 metres		**37C2700001**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2200003**

METAL WORK PNEUMATIC

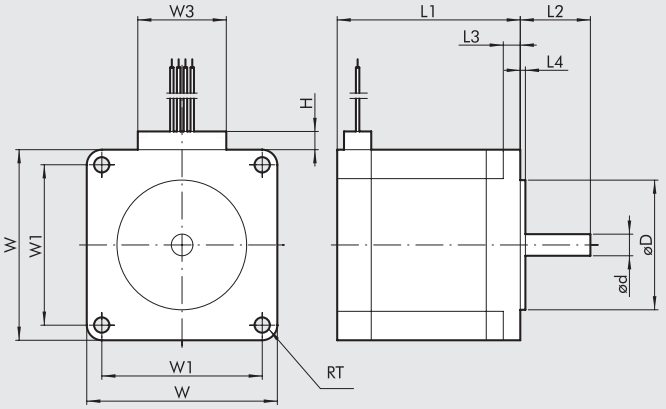
BRUSHLESS motor with BRAKE code **37M4770000** + drive code **37D2600001** (3000W)



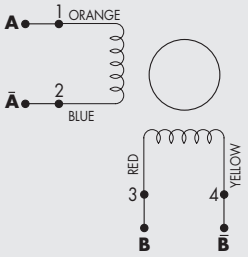
TECHNICAL DATA		MOTOR 37M4770000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm^2	1400
Mass	kg	9.2
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	10
Absorption	W	19
DRIVE	code	**37D2600001**
CABLES		
Brushless **motor-drive-encoder**, 3 metres		**37C3230001**
Brushless **motor-drive** with brake, 3 metres		**37C3730000**
Brushless **motor-drive-encoder**, 5 metres		**37C3250001**
Brushless **motor-drive** with brake, 5 metres		**37C3750000**

NOTES

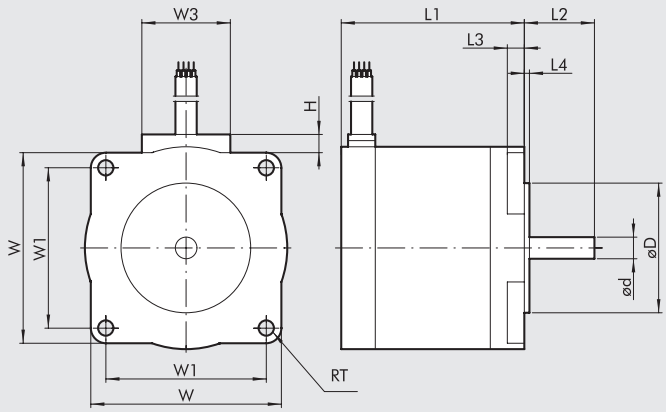
DIMENSIONS OF ELECTRIC MOTORS



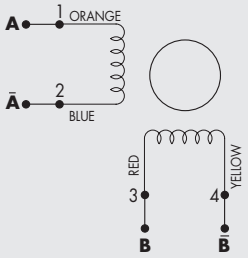
WIRING DIAGRAM



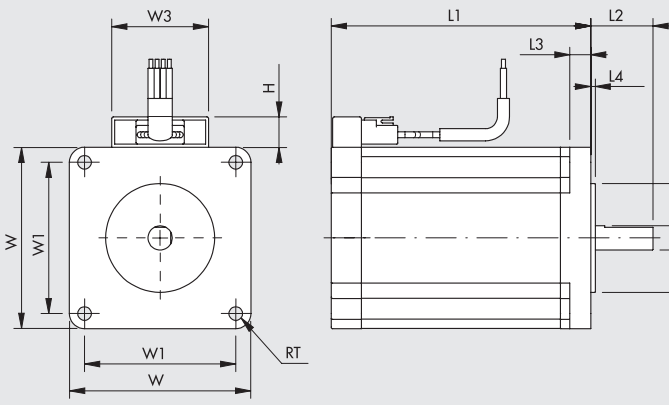
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5
STEPPING	**37M1110000**	**0.8**	**NEMA 23**	6.35	38.1	7	305	53.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120000	**1.2**	**NEMA 23**	6.35	38.1	7	305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



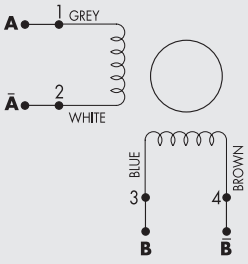
WIRING DIAGRAM



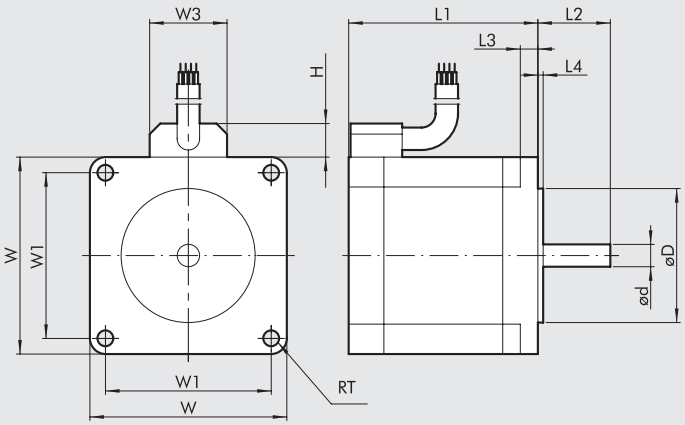
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H	L min	L1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.2	W3	W4 ±0.5
STEPPING	**37M1430000**	**2.4**	**NEMA 34**	9.525	73.02	10	305	62	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1440000	**4.2**	**NEMA 34**	12	73.02	10	305	92.2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

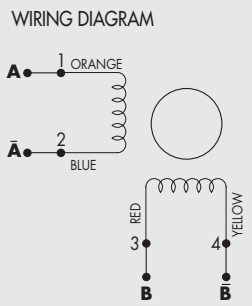


WIRING DIAGRAM



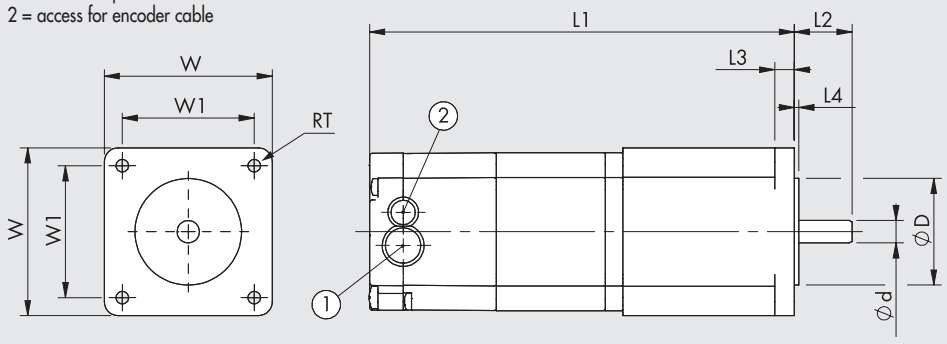
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	**37M1230000**	**2.2**	**60**	8	36	10	300	86	20.6	7	1.5	4.5	60	50	32

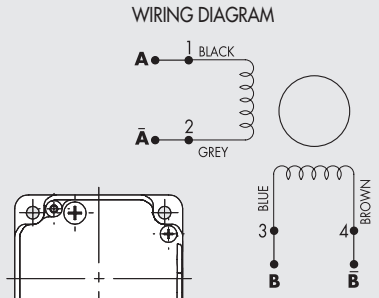




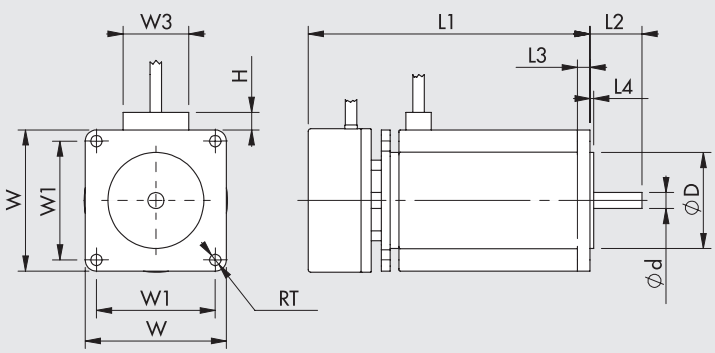
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	L5	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	**37M1450000**	**6.7**	**NEMA 34**	14	73.025	12	305	127	30	8	1.5	50	5.6	85.5	69.6	27

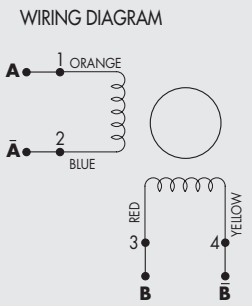
1 = access for power cable and brake
2 = access for encoder cable





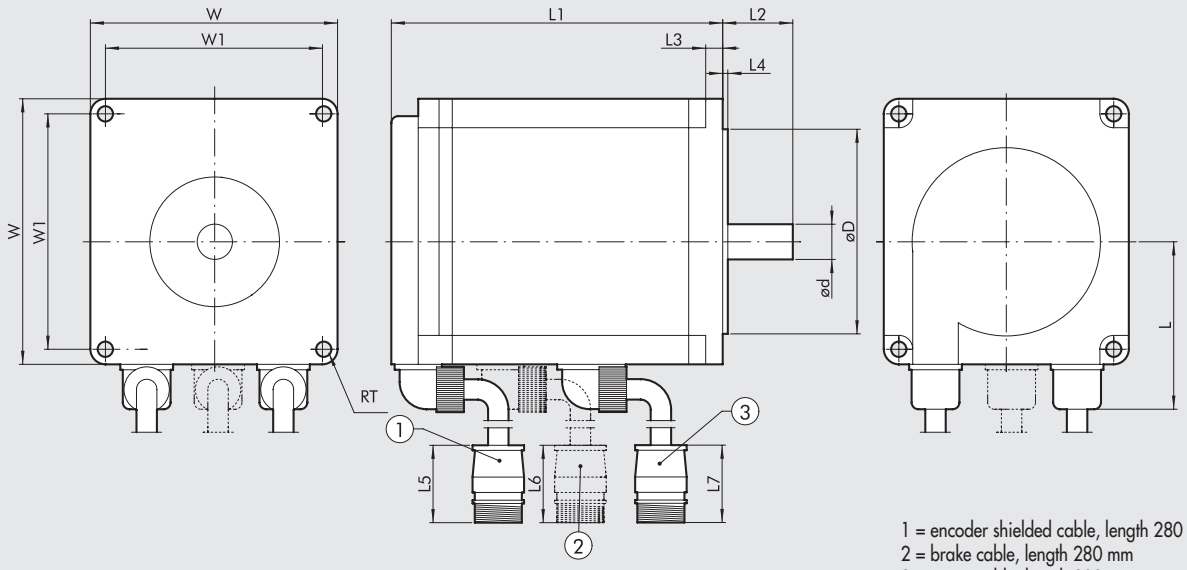
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	L1	L2 ±0.51	L3	L4	RT	W	W1 ±0.13
STEPPING	**37M1470000**	**9.3**	**NEMA 34**	12.7	73.025	130	31.75	9.91	2.03	5.6	86.6	69.6
STEPPING + ENCODER	**37M8470000**	**9.3**	**NEMA 34**	12.7	73.025	165.4	31.75	9.91	2.03	5.6	86.6	69.6
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





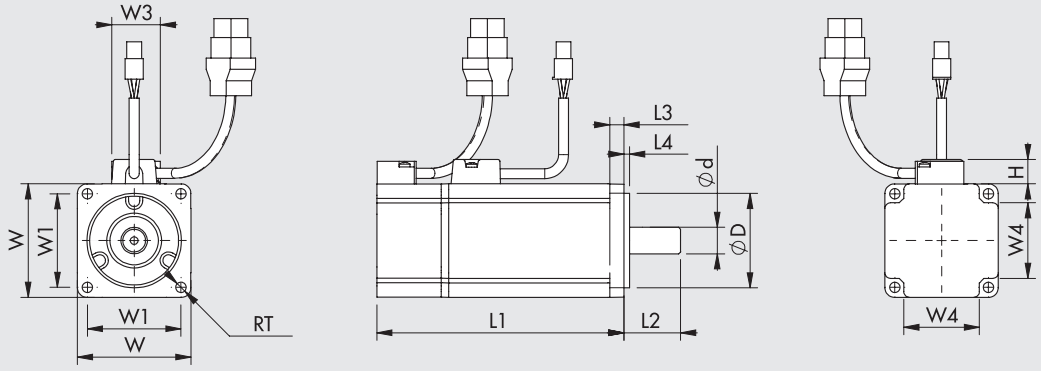
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5	W5 ±0.5
STEPPING + BRAKE	**37M5120000**	**1.2**	**NEMA 23**	6.35	38.1	7	305	111.8	20.6	5	1.5	4.5	56	47.14	26	39	56.9

DIMENSIONS OF ELECTRIC MOTORS

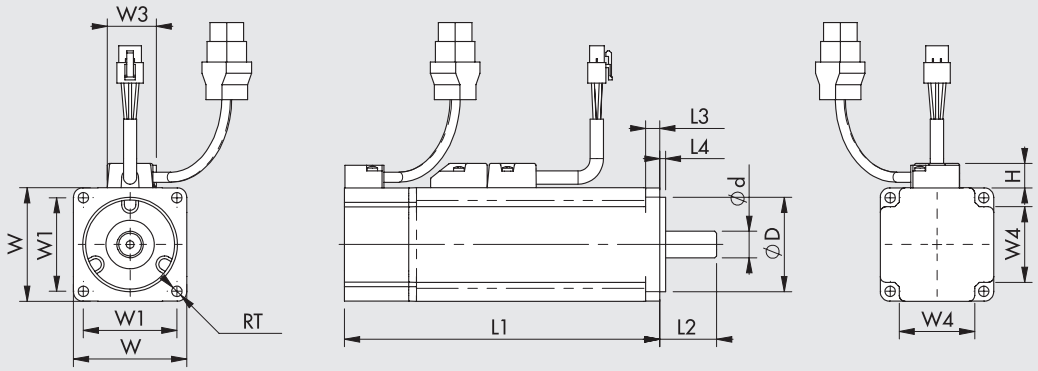


1 = encoder shielded cable, length 280 mm
2 = brake cable, length 280 mm
3 = motor cable, length 280 mm

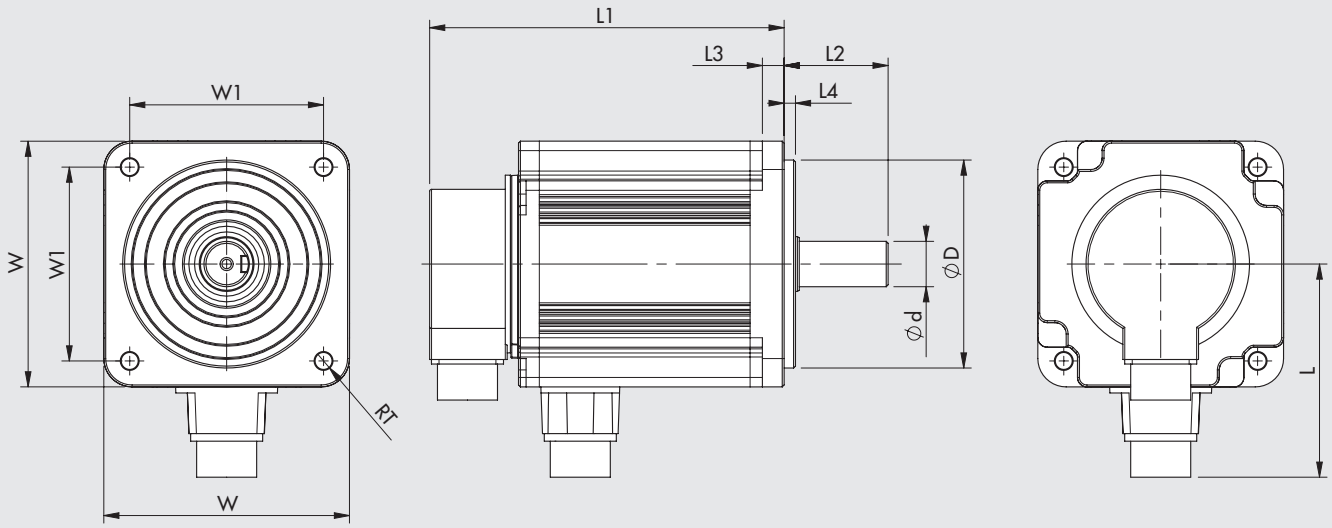
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD h7	L	L1 ±1	L2 ±1	L3	L4	L5	L6	L7	RT	W	W1
BRUSHLESS (SANYO DENKI)	**37M2200000**	**0.64**	**60**	14	50	44.6	69.5	30	6	3	55	-	58	5.5	60	49.5
	37M2220000	**1.27**	**60**	14	50	44.6	95.5	30	6	3	55	-	58	5.5	60	49.5
	37M2330000	**2.39**	**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



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)	**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



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)	**37M4200001**	**0.64**	**60**	14	50	13	141.6	30	7.5	3	5.5	60	49.5	25	40
	37M4220001	**1.27**	**60**	14	50	13	166.8	30	7.5	3	5.5	60	49.5	30	40
	37M4330001	**2.39**	**80**	19	70	13	178	35	8	3	6.6	80	63.64	30	52



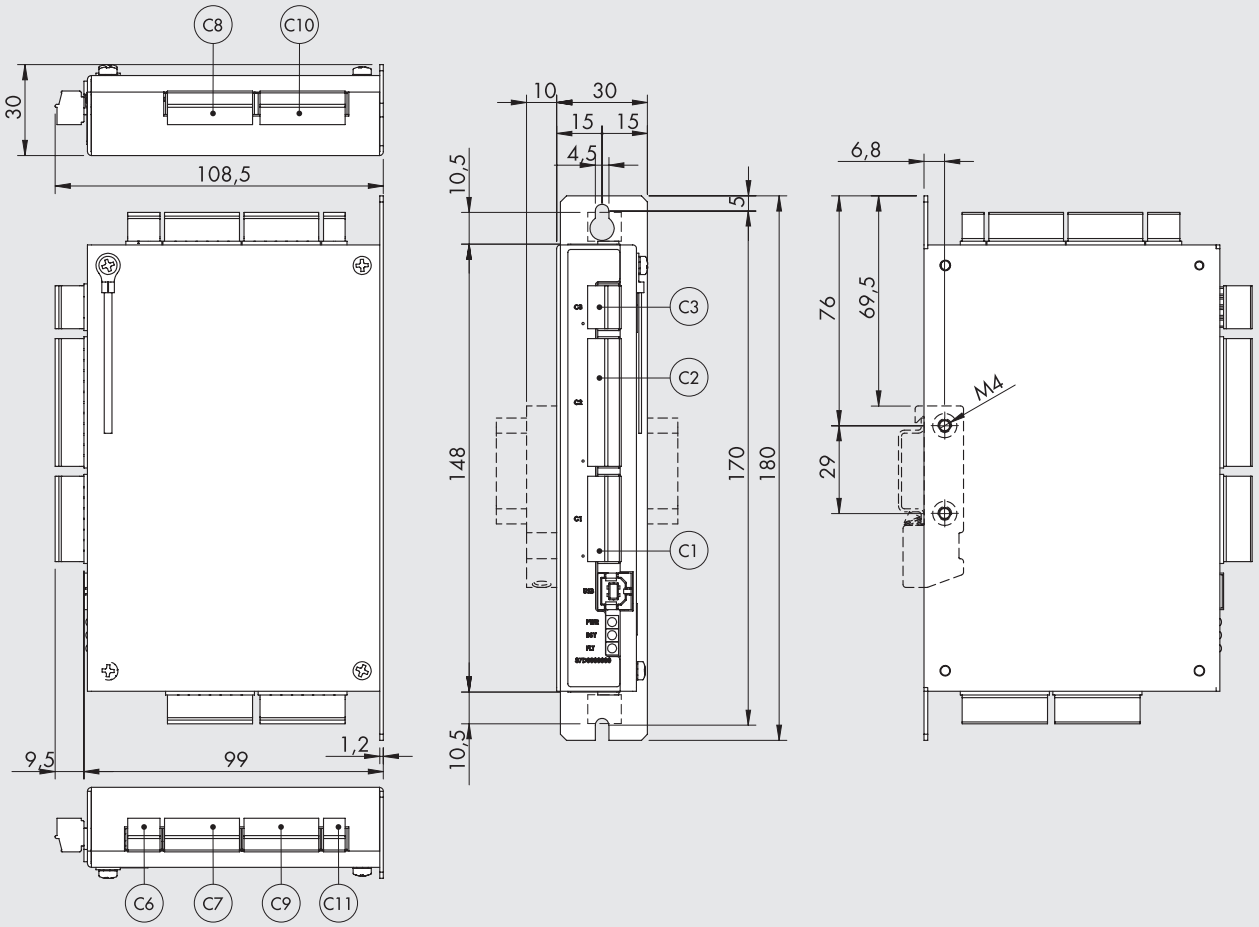
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD 0/-0.035	L	L1	L2	L3	L4	RT	W	W1
BRUSHLESS (DELTA)	**37M2770000**	**9.55**	**130**	24	110	113	187.5	55	11.5	6	9	130	102.53
BRUSHLESS + BRAKE (DELTA)	**37M4770000**	**9.55**	**130**	24	110	111	216	55	11.5	6	9	130	102.53

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

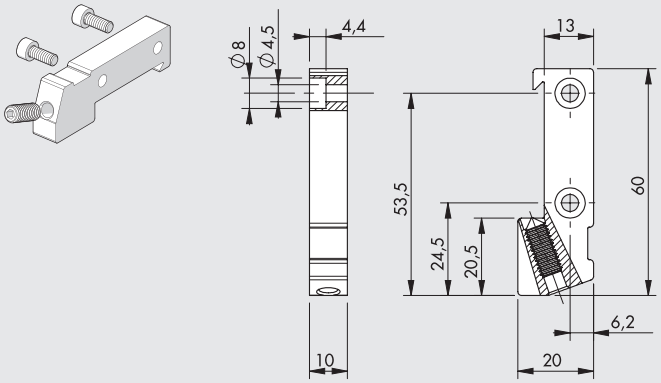


Below is a list of Phoenix Contact codes for the board connectors.

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

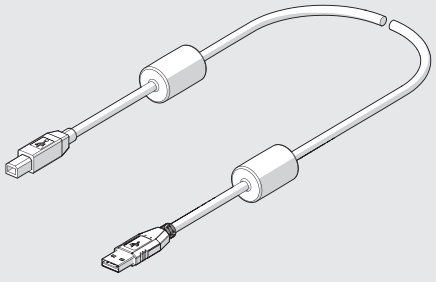
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



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

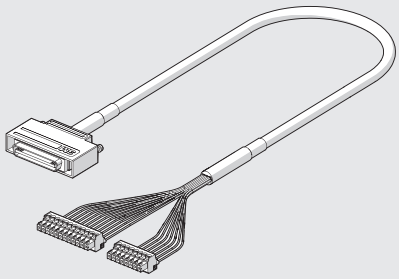
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

CABLE USB



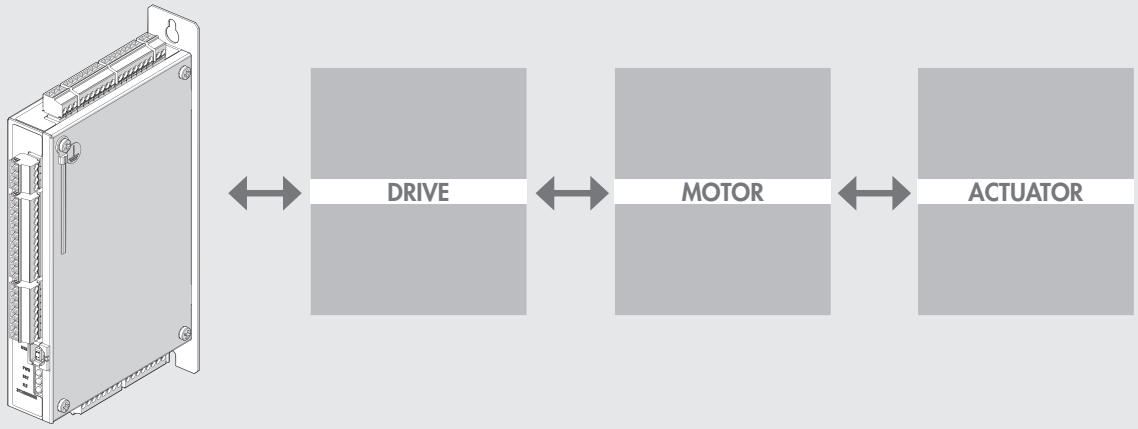
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the **e**.motion / **e**.drive board to a PC, 3 m	150

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



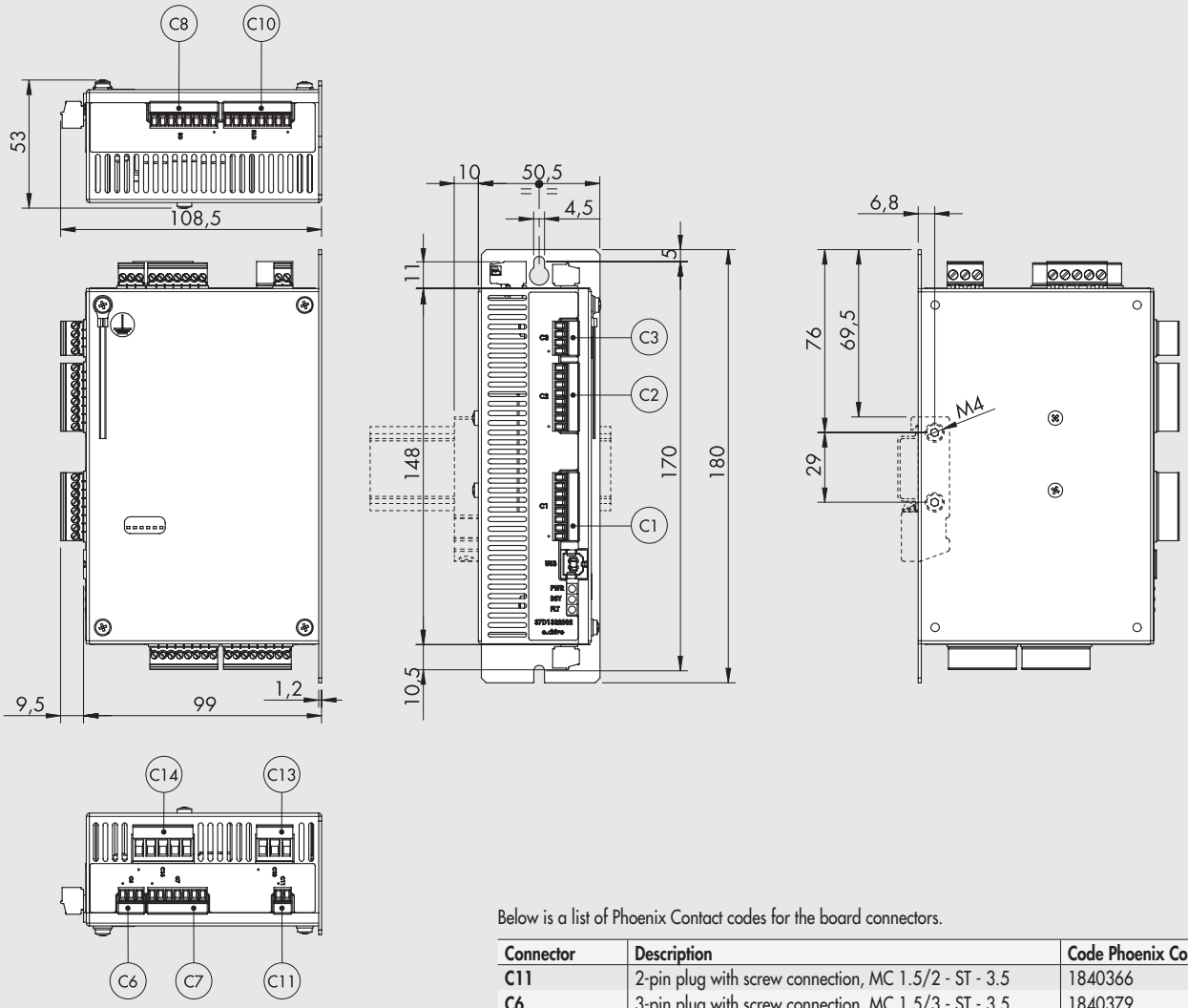
NOTES

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

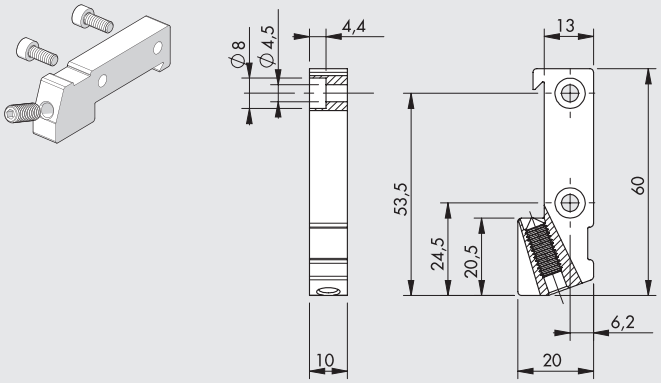


Below is a list of Phoenix Contact codes for the board connectors.

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

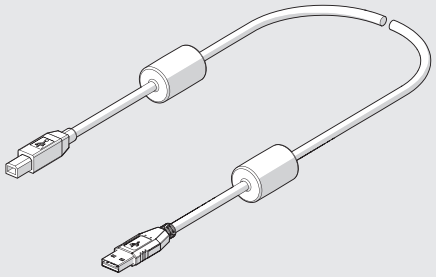
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



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

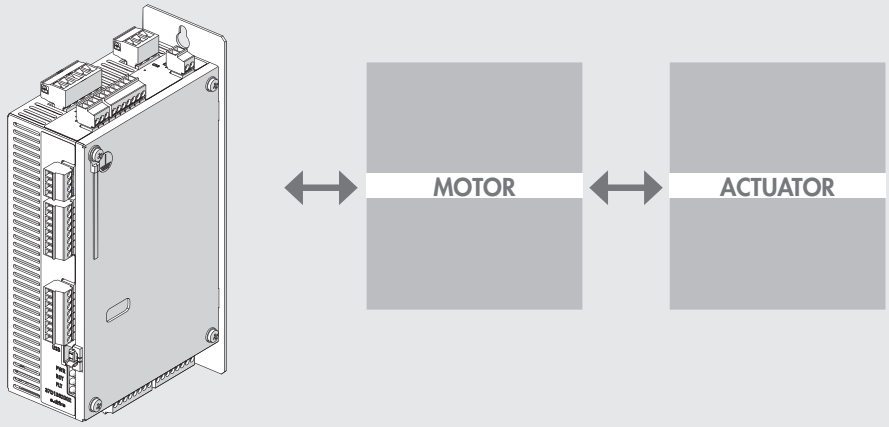
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

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

DRIVES FOR STEPPING MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO

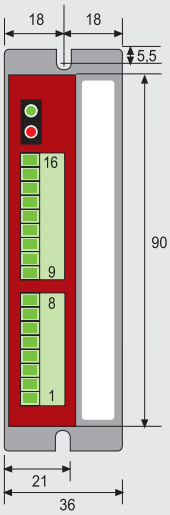
4.4A - 48VDC DRIVE FOR STEPPING MOTORS

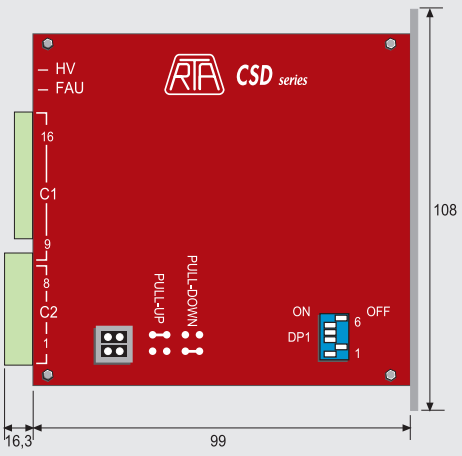
This is a ministep bipolar chopper drive made by RTA S.r.l. It comes with a STEP & DIRECTION interface for piloting low/medium-power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 48VDC, compact dimensions and considerable operating flexibility. It consists 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.

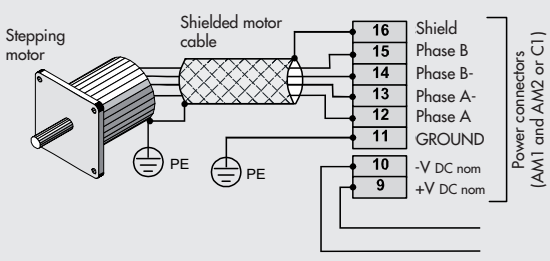
DRIVE TECHNICAL DATA

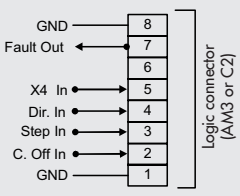
Drive code		**37D1222000**
Type of STEPPING motor drive		Metal box
Dimensions	mm	90 x 99 x 21
Connectors		Screw type
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VDC	24 - 48
Current range	A	2.6 - 4.4
Current values selected via a dip-switch		8
Pulses per rev values selected 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









METAL WORK PNEUMATIC

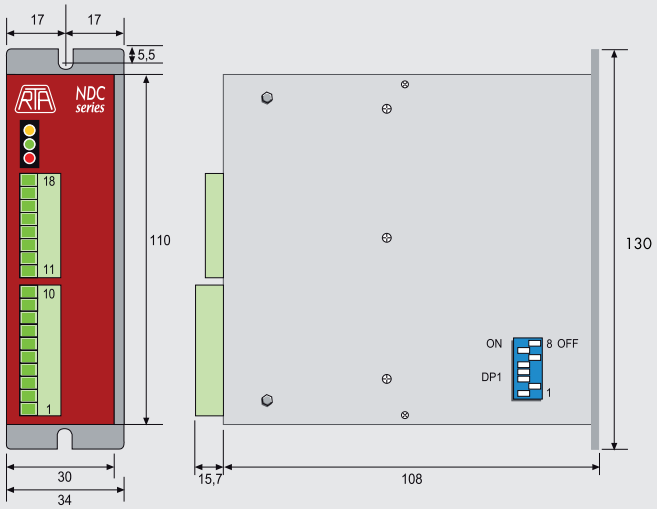
6A - 75VDC DRIVE FOR STEPPING MOTORS

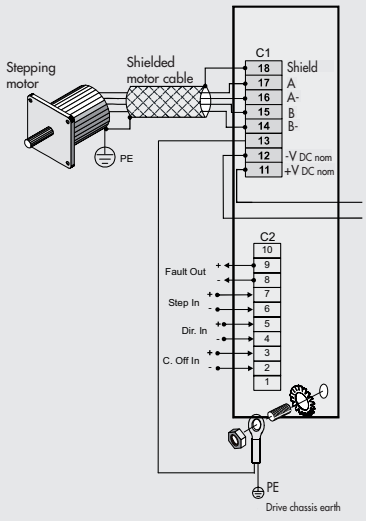
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 75VDC, compact dimensions and considerable operating flexibility. It consists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





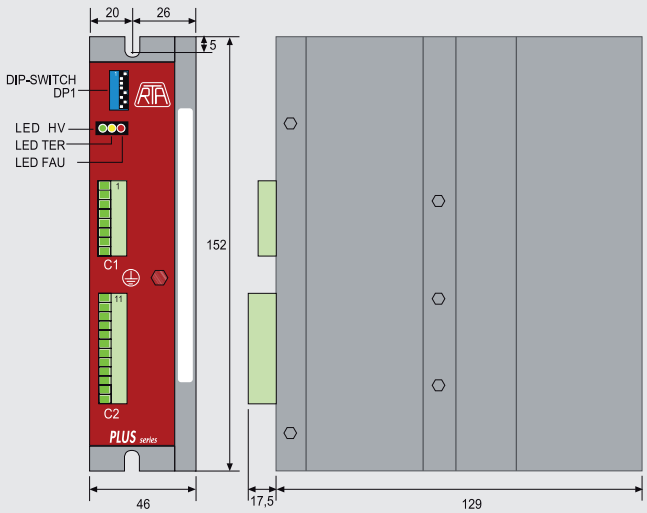
6A - 140VDC, 10A - 62VAC DRIVE FOR STEPPING MOTORS

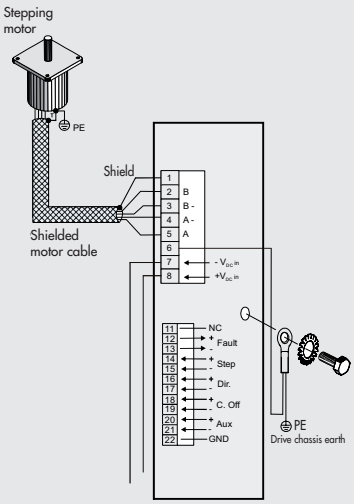
These are two ministep bipolar chopper drives made by RTA S.r.l.
They come with a STEP & DIRECTION interface for piloting medium/high-power two-stage STEPPING motors with four, six or eight terminals.
They consist of a board housed in a metal box, which does not require external ventilation, and come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

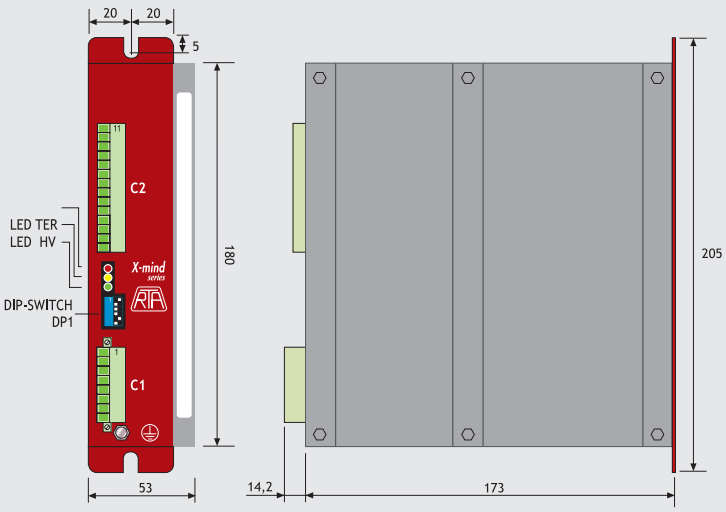
6A - 110 - 230VAC DRIVE FOR STEPPING MOTORS

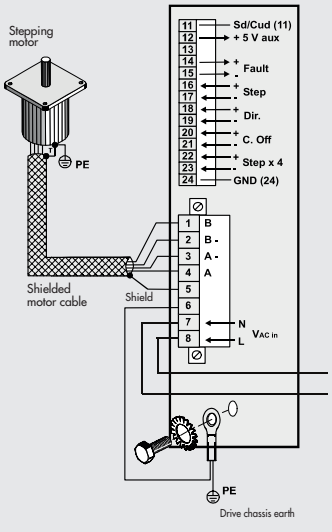
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 230VAC, compact dimensions and considerable operating flexibility. It consists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

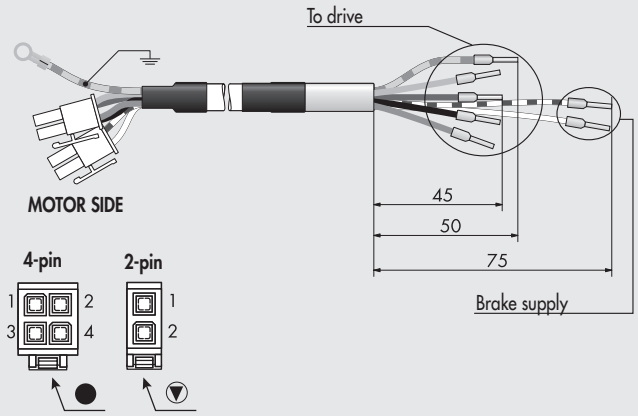
OVERALL DIMENSIONS AND WIRING DIAGRAM





ACCESSORIES

POWER CABLE FOR MOTOR WITH BRAKE

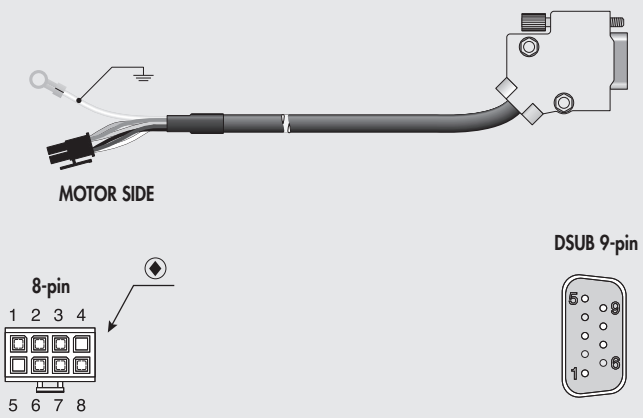


For use with stepping motors with brake and stepping motor code 37M1470000.

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

	Pin	Function	Corresponding wire colour
4-pin connector	1	A\	Gray
	2	B\	Blue
	3	A	Black
	4	B	Brown
2-pin connector	1	24VDC brake	White + red ring
	2	GND	White

ENCODER CABLE



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

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

8-pin connector	Function		DSUB 9-pin connector (6 pins used)	Corresponding wire colour
1	A	A	1	Green
2	B	B	3	Yellow
3	R	R	5	Gray
4	-	NC	-	-
5	-	NC	-	-
6	+ 24VDC	Encoder +24 V supply	8	Red
7	COM	Encoder 0 V supply	9	Black
8	Temp	Temperature	7	White

REFERENCES FOR THE CONNECTORS

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

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

SPECIAL TOOLS FOR CRIMPING OR PULLING OUT CONTACTS

	Code Molex	Description
Crimping gripper	0638190000	For 8-pin connector
	0638190900	For 4-pin and 2-pin connectors
Contact pull-out tool	0011030043	For 8-pin connector
	0011030044	For 4-pin and 2-pin connectors

NOTES

METAL WORK PNEUMATIC

NOTES

DRIVES FOR BRUSHLESS MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO

DRIVE FOR 200W, 400W, 750W, 1000W 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.

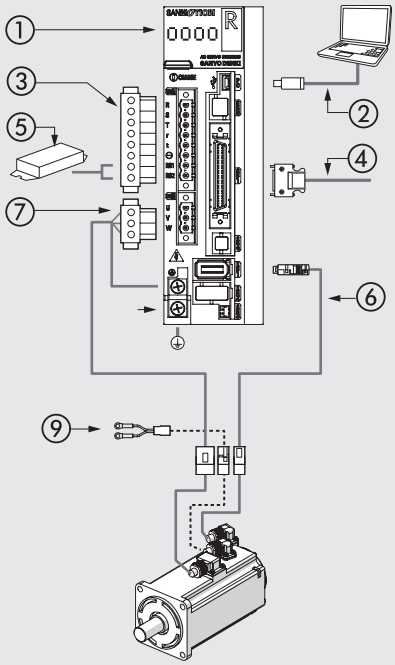
DRIVE TECHNICAL DATA		
Drive code		**37D2400008**
Nominal power		200 - 400 - 750 - 1000
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	50 x 160 x 130
Power connectors and motor power		Plug-type 3M
Encoder connectors and signals		Plug-type 3M
Max output current	A	30
Motor output stage		IGBT,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

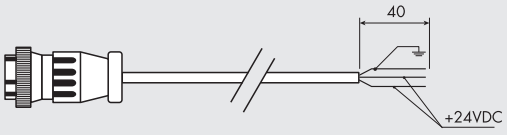
⑥ ENCODER CABLE

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

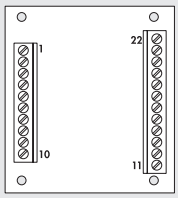
Code	Description
37C2130005	Brushless motor-drive connecting cable, 3 m
37C2150005	Brushless motor-drive connecting cable, 5 m
37C2130004	Brushless motor-drive connecting dynamic cable, 3 m
37C2150004	Brushless motor-drive connecting dynamic cable, 5 m
37C2100004	Brushless motor-drive connecting dynamic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

BRAKE CABLE



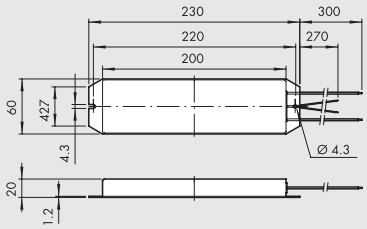
Code	Description
37C2330000	Brushless motor-brake connecting dynamic cable, 3 m
37C2350000	Brushless motor-brake connecting dynamic cable, 5 m
37C2310000	Brushless motor-brake connecting dynamic cable, 10 m

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

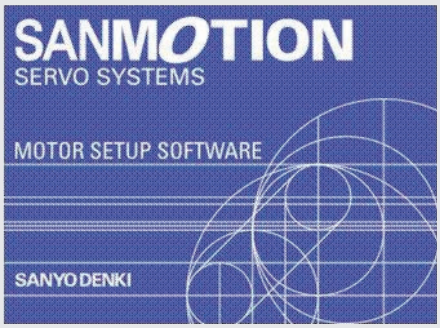
Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

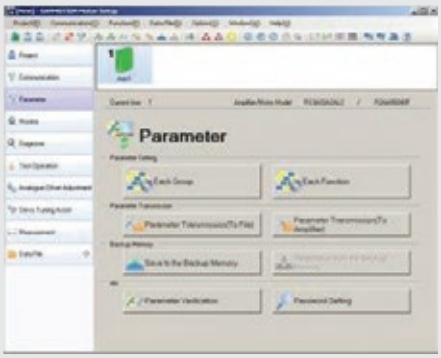
CONFIGURATION SOFTWARE

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.

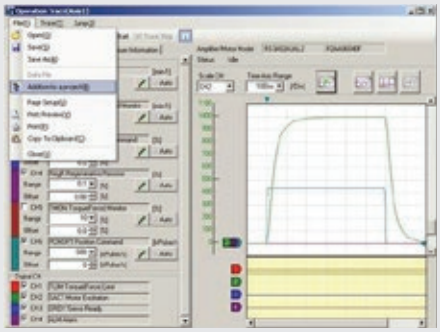
The software can freely be downloaded from Sanyo Denki website at the following link:
https://www.sanyodenki.com/products/sanmotion-softwareindex.html
file SANMOTION MOTOR Setup Software.





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.



METAL WORK PNEUMATIC

DRIVE FOR 200W, 400W, 750W BRUSHLESS MOTOR

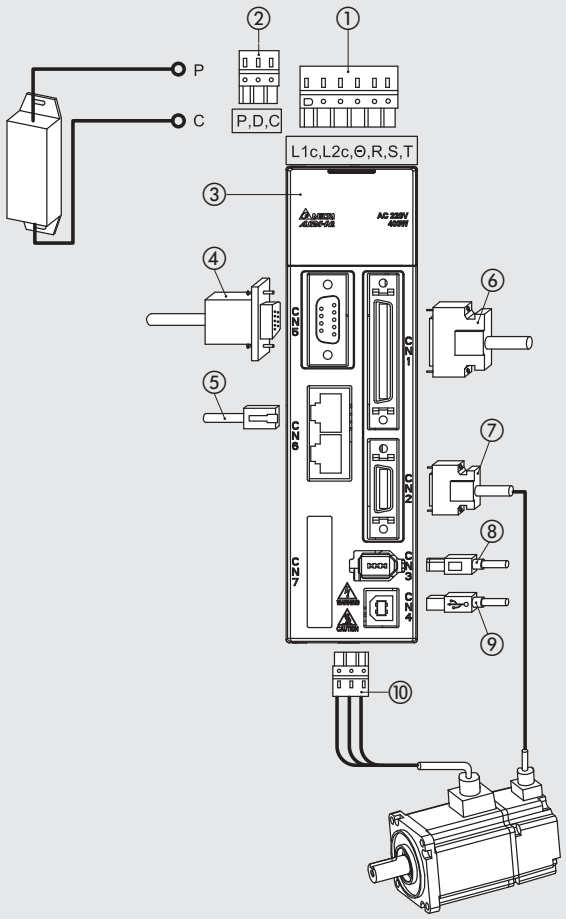
The DELTA ASDA-A2-0221-M drive can only be used with a DELTA 200W motor, while the DELTA ASDA-A2-0421-M drive can only be used with the DELTA 400W motor, and the DELTA ASD-A2-0721-M drive can only be used with a DELTA 750W motor.
The drives are characterized by overall contained dimensions and great 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		**37D2200001**	**37D2300000**	**37D2400007**
Nominal power	W	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	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.		
		Circuito automatico di frenatura dinamica in condizioni di allarme o power-off.		
		Connector for external braking resistance (optional).		
		Configuration and control software (optional).		
Suitable for motors code		**37M2200001 - 37M4200001**	**37M2220001 - 37M4220001**	**37M2330001 - 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 200W - 400W - 750W BRUSHLESS MOTOR DRIVES

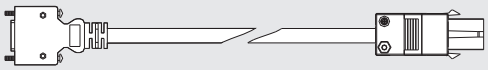
① POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). **Included in the supply**.
Separate supply section for logic/signal and power electronics.
Integrated circuits protecting against overloads and input extra-voltages.
② CONNECTOR: for external braking resistance code 37D2R00000 (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 200W - 400W - 750W BRUSHLESS motor encoder.
⑧ IEEE 1394 PC CONNECTOR: settings and possible connection to other devices via RS485 or RS232 (cable not included in the supply).
⑨ USB PC CONNECTOR: settings and monitor through personal computer (not included in the supply).
Data acquisition is only possible via this connection.
⑩ MOTOR POWER CONNECTOR

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



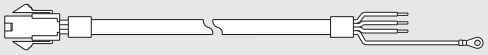
ACCESSORIES

⑦ ENCODER CABLE



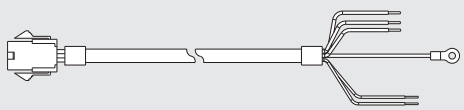
Code	Description
37C2230001	200W-750W brushless motor-drive-encoder connecting cable, 3 metres
37C2250001	200W-750W brushless motor-drive-encoder connecting cable, 5 metres
37C2230002	200W-750W brushless motor-drive-encoder connecting dynamic cable, 3 metres
37C2250002	200W-750W brushless motor-drive-encoder connecting dynamic cable, 5 metres
37C2200003	200W-750W brushless motor-drive-encoder connecting dynamic cable, 10 metres

⑩ MOTOR POWER CABLE



Code	Description
37C2130001	200W-750W brushless motor-drive connecting cable, 3 metres
37C2150001	200W-750W brushless motor-drive connecting cable, 5 metres
37C2130002	200W-750W brushless motor-drive connecting dynamic cable, 3 metres
37C2150002	200W-750W brushless motor-drive connecting dynamic cable, 5 metres
37C2100003	200W-750W brushless motor-drive connecting dynamic cable, 10 metres

MOTOR POWER CABLE + BRAKE



Code	Description
37C2730000	200W-750W brushless motor-drive connecting cable + brake, 3 metres
37C2750000	200W-750W brushless motor-drive connecting cable + brake, 5 metres
37C2730001	200W-750W brushless motor-drive connecting dynamic cable + brake, 3 metres
37C2750001	200W-750W brushless motor-drive connecting dynamic cable + brake, 5 metres
37C2700001	200W-750W brushless motor-drive connecting dynamic cable + brake, 10 metres

METAL WORK PNEUMATIC

DRIVE FOR 3kW BRUSHLESS MOTOR

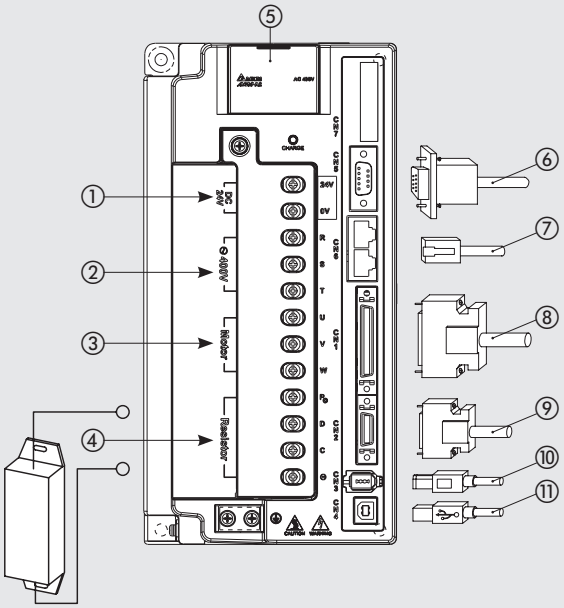
It is a DELTA ASDA-A2-3043-M drive to be used only with a DELTA 3kW motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

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.
		Circuito automatico di frenatura dinamica in condizioni di allarme o power-off.
		Connector for external braking resistance (optional).
		Configuration and control software (optional).
Suitable for motors code		**37M2770000 - 37M4770000**
Connecting cable:		
Brushless **motor-drive** connecting cable, 3 metres		**37C3130001**
Brushless **motor** with **brake-drive** connecting cable, 3 metres		**37C3730000**
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C3230001**
Brushless **motor-drive** connecting cable, 5 metres		**37C3150001**
Brushless **motor** with **brake-drive** connecting cable, 5 metres		**37C3750000**
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C3250001**

WIRING DIAGRAM FOR 3kW BRUSHLESS MOTOR DRIVES

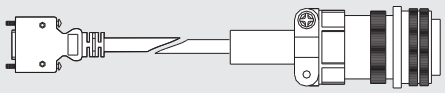
① LOGIC POWER CONNECTOR: 24VDC.
Included in the supply. Power section for logic electronics.
② POWER CONNECTOR: 400VAC, three-phase.
Included in the supply. Power signal supply section.
Integrated circuits protected against overload, input extra-voltages.
③ MOTOR POWER CONNECTOR
④ CONNECTOR: for external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

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



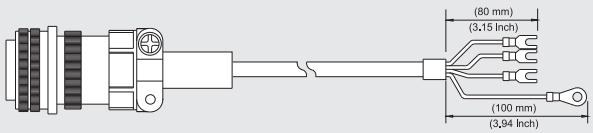
ACCESSORIES

⑥ CAVO ENCODER



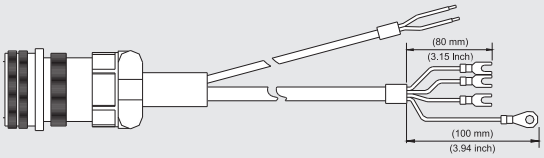
Code	Description
37C3230001	3kW Brushless motor-drive-encoder connecting cable, 3 m
37C3250001	3kW Brushless motor-drive-encoder connecting cable, 5 m

⑦ MOTOR POWER CABLE



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

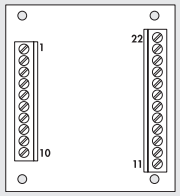
MOTOR POWER CABLE + BRAKE



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

METAL WORK PNEUMATIC

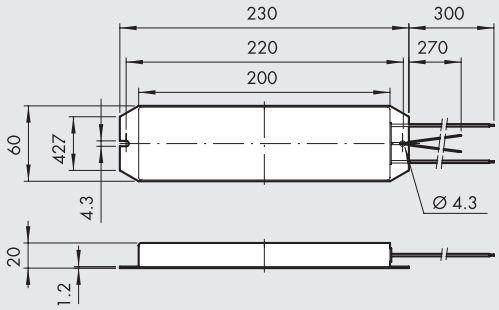
LINE-DRIVER INTERFACE BOARD



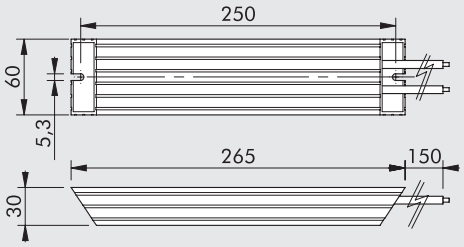
Code	Description
37D2000000	BRINT.A line driver interface board

EXTERNAL BRAKING RESISTANCES

220W



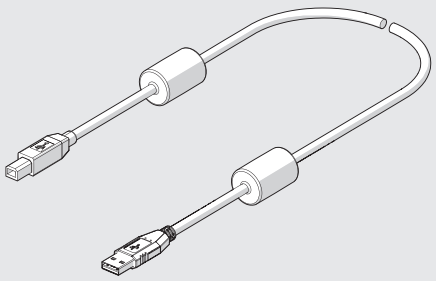
400W



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

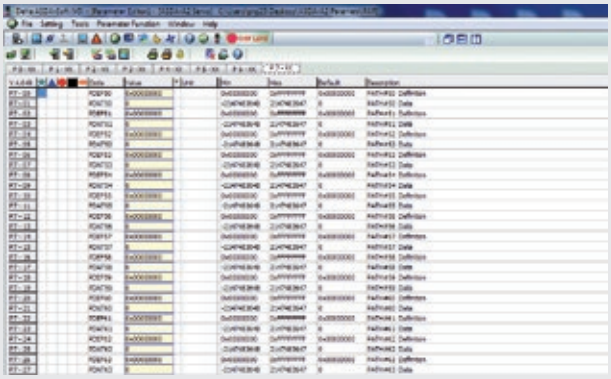
NOTES

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.

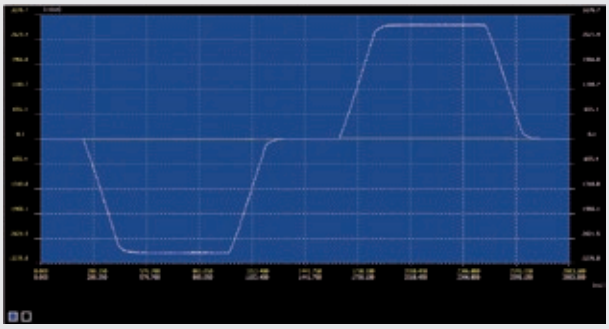
- Status Monitor: real-time display of all details about the system.
- Data Scope: a complete oscilloscope with 4 channels that can be selected as desired among analogue and digital signals.
- System Analisis: used to study the system's frequency response to identify and correct any mechancal resonance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



NOTES