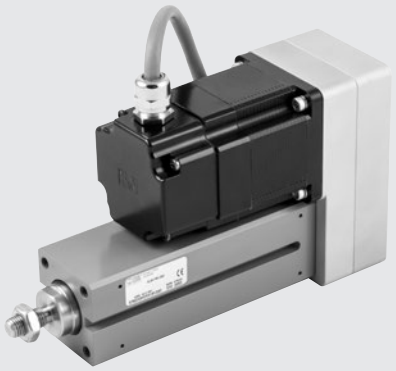
ELECTRIC CYLINDER SERIES ELEKTRO SSC

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

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

in-line version

geared version



TECHNICAL DATA		Ø 32
Piston rod thread	mm	M10x1.25
Environmental temperature range for STEPPING motors	°C	from -10 to +50
BRUSHLESS motors	°C	from 0 to +40
Electrical protection rating with STEPPING motors		IP55 or IP65 (see key to codes on page **A5**.63)
BRUSHLESS motors		IP65 (see key to codes on page **A5**.63)
Maximum relative humidity of the air for IP55 STEPPING motor		90% with 40°C; 57% with 50°C (no condensate)
IP65 BRUSHLESS motor		90% (no condensate)
Standard strokes (including 5 mm extra-stroke) for homing	mm	30
	mm	55
Positioning repeatability	mm	±0.02 with ball screw
		±0.15 with lead screw
Positioning accuracy	mm	±0.2 * with screw/ball screw nut
		±0.4 * with lead screw
Overall radial oscillation of the piston rod (without load) for 55 mm of stroke	mm	0.10
Versions		Ball screw;
		Lead screw
		With or without piston rod non-rotating
		In line or geared motor
Anti-rotation of the piston rod		YES (depending on the choice)
Uncontrolled impact at the end of stroke		NOT ALLOWED (for rear buffer ONLY)
Sensor magnet		YES
Maximum angle of twist of the piston rod for non-rotating version		0°30'
Work position		Any

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

MECHANICAL FEATURES		Ball screw		Lead screw	
Screw pitch (p)	mm	4	10	5	12.7
Screw diameter	mm	12	12	12	12.7
Static axial load (F_o)*	N	3000	3000	995	1155
Dynamic axial load (F)	N	5200	3160	600	300
		Calculate mean axial load and the calculate life (see graphs on page **A5**.56-57)			
				N.B: 25% duty cycle, i.e. the cylinder must work maximum 25% of time to allow the screw/ball screw nut to cool down.	
Maximum number of revs	1/min	3000	3000	600	940
Maximum speed (V_{max})	mm/s	200	500	50	200
"K" ratio of motor revs and piston rod speed	n/V	15	6	12	4.7

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

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

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

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

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

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

CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

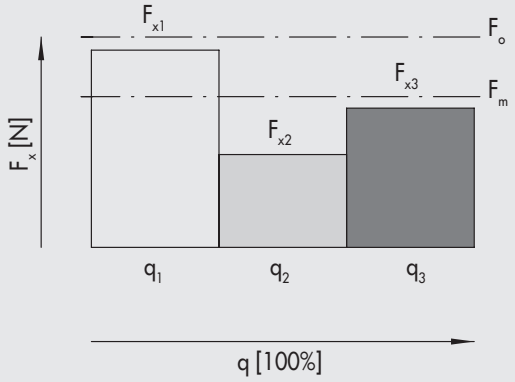
Peak axial load in a work cycle must not exceed the static axial load F_o.
The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

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

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

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

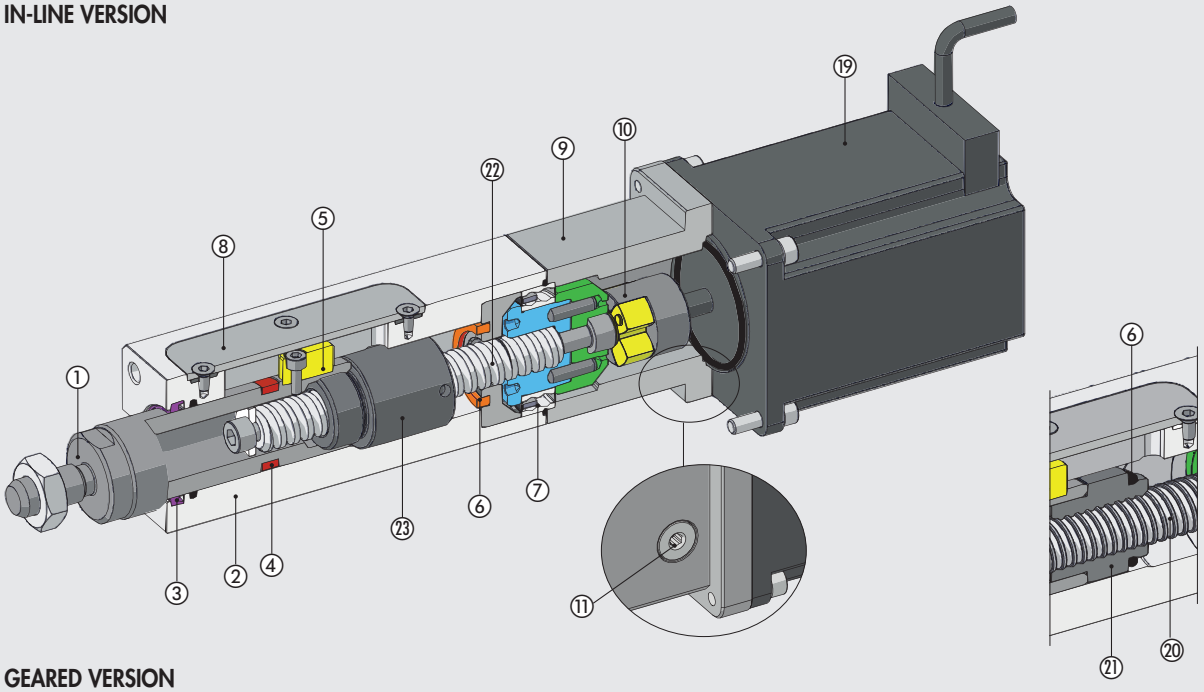


The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graphs on page **A5**.56-57, show screw life as a function of F_m

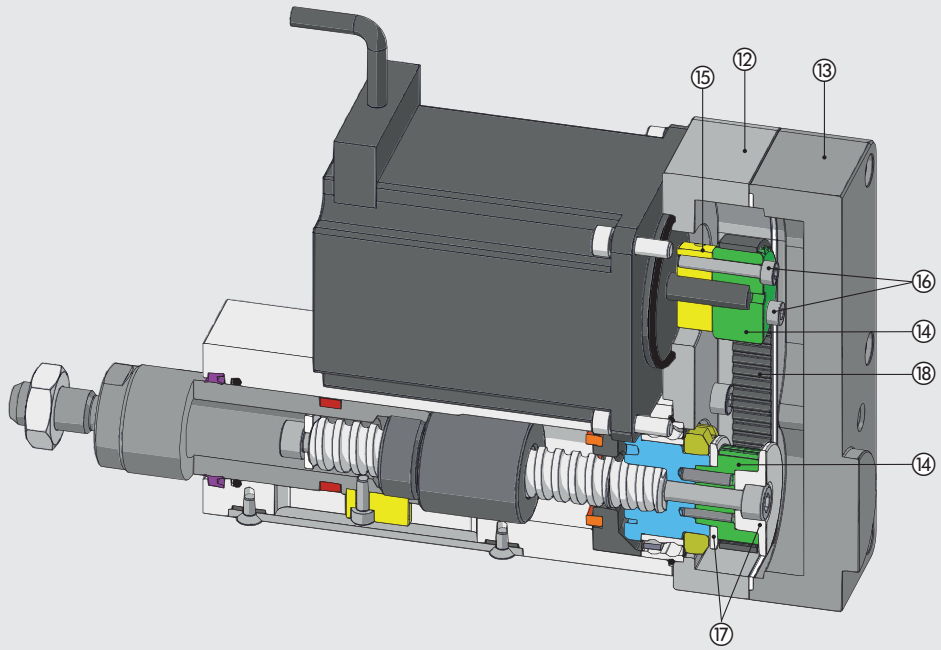
METAL WORK PNEUMATIC

COMPONENTS

IN-LINE VERSION



GEARED VERSION

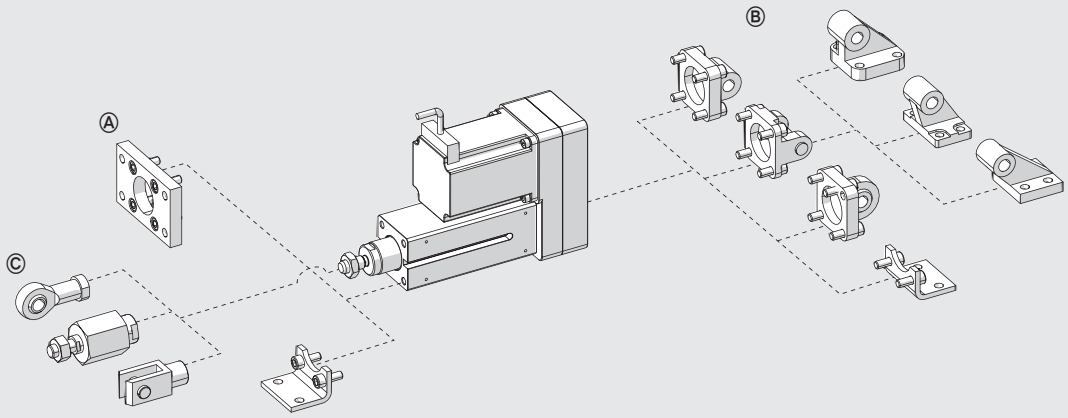


① PISTON ROD: stainless steel (AISI 316)
② BODY: aluminium alloy with wear-resistant coating
③ WIPER RING: polyurethane
④ MAGNET: plastoferrite (optional)
⑤ ANTI-ROTATION KEY: brass (optional)
⑥ BUFFER: polyurethane
⑦ BEARING: oblique with two ball rings
⑧ PLATE: stainless steel (AISI 304)
⑨ ADAPTOR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

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

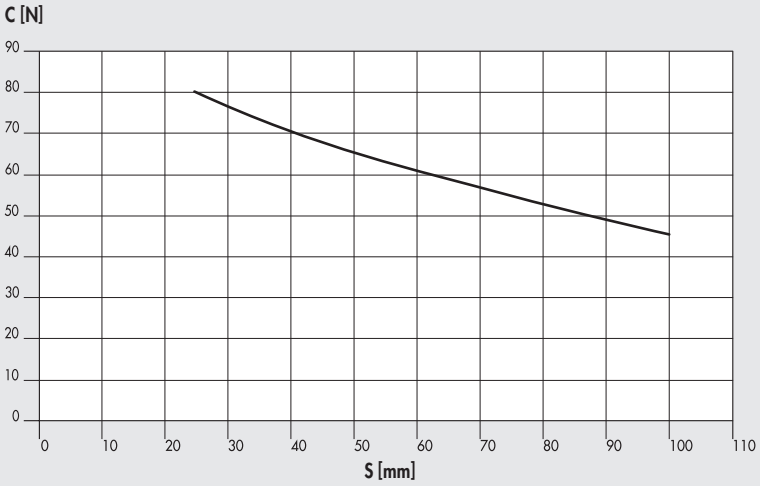
Version with ball screw:
㉒ SCREW: hardened and rolled steel
㉓ NUT: ball recirculating

FIXING OPTIONS

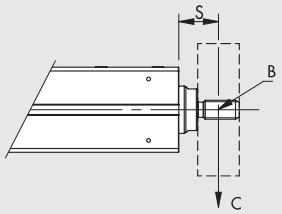


Ⓐ Fitted directly to the front of the cylinder body, using 4 threaded holes according to ISO 15552
Ⓑ Fitted to the rear (geared version only), using 4 threaded holes according to ISO 15552
Ⓒ Piston rod accessories.

MAXIMUM RADIAL LOADS ON PISTON ROD



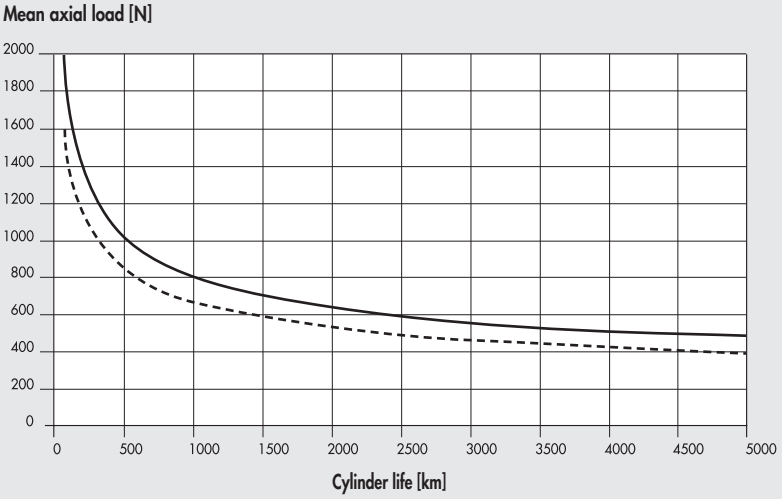
Radial loads can be applied to the piston rod.
They must not exceed the values in the adjacent chart, otherwise the guides on the rod and piston will be subjected to excessive wear.

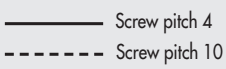


B = Barycentre;
S = Projection;
C = Radial load

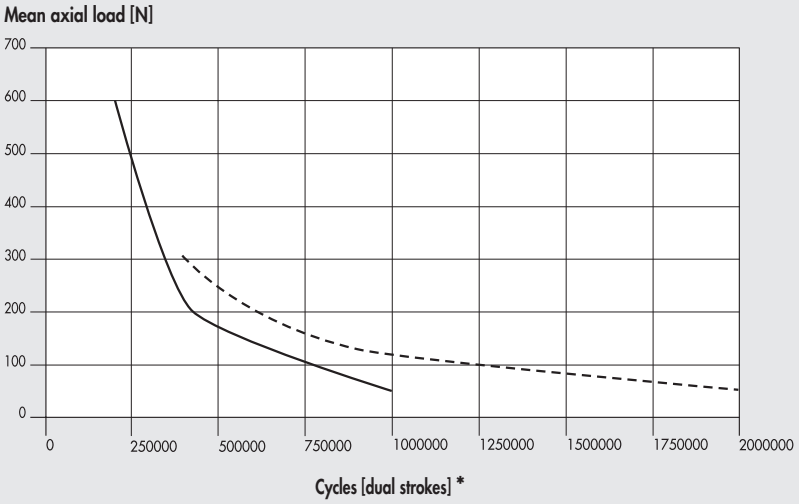
LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD, VERSION WITH BALL SCREW

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





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

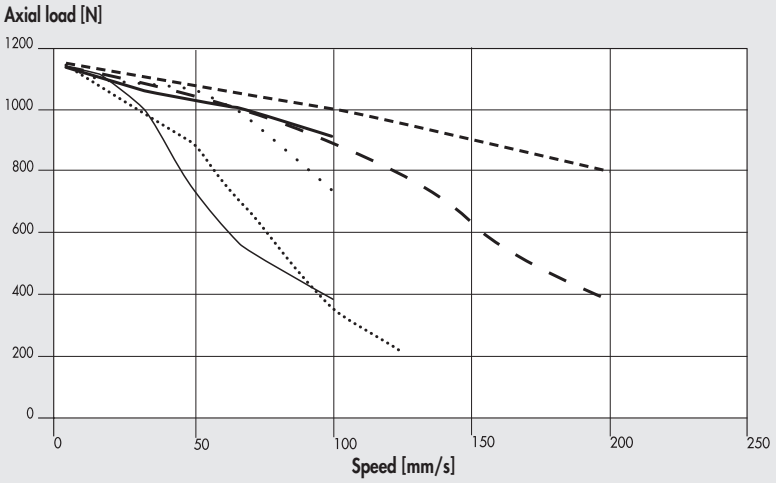


* Relative to cylinders stroke 55 mm. For 30 mm stroke cylinders, the data must be multiplied by 1.8

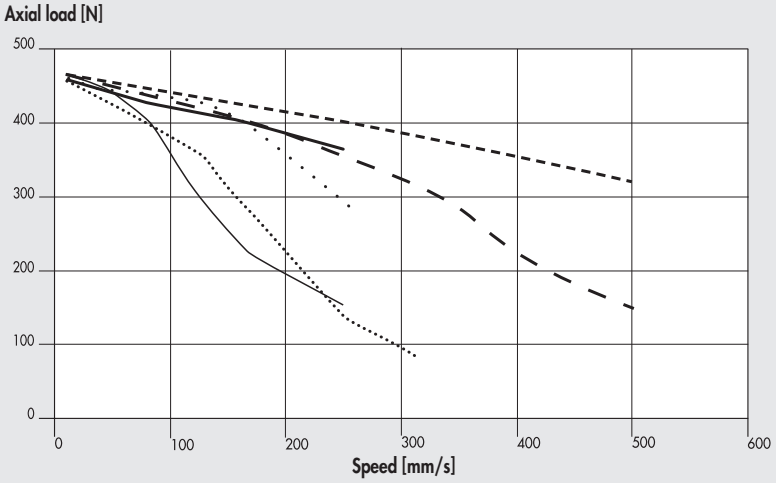
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPLETE WITH MOTOR AND DRIVE)

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

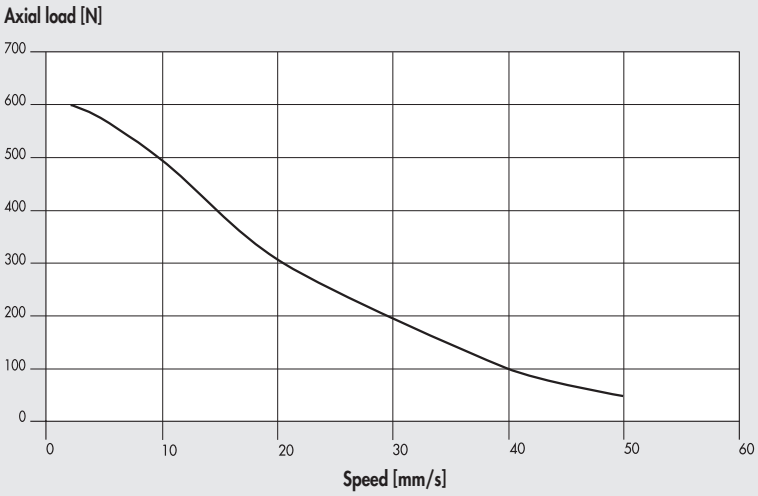
Ø 32 with pitch 4 ball screw, STEPPING motor, STEPPING motors with encoder, STEPPING motors with encoder + brake



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

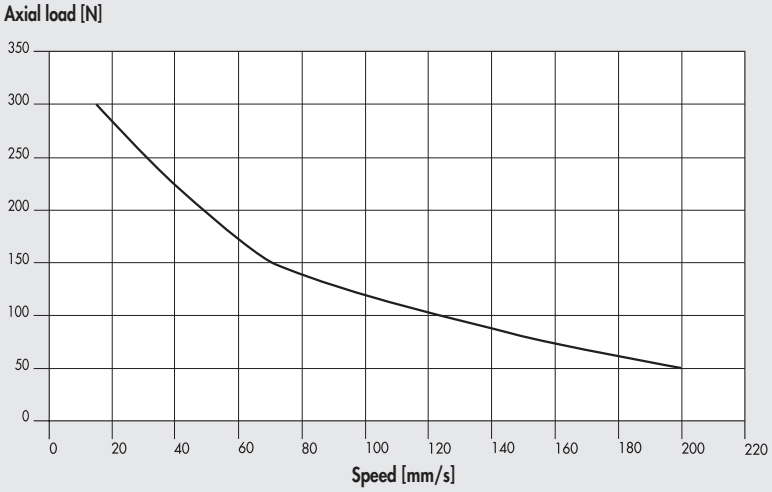


Ø 32 with pitch 5 lead screw, STEPPING motor



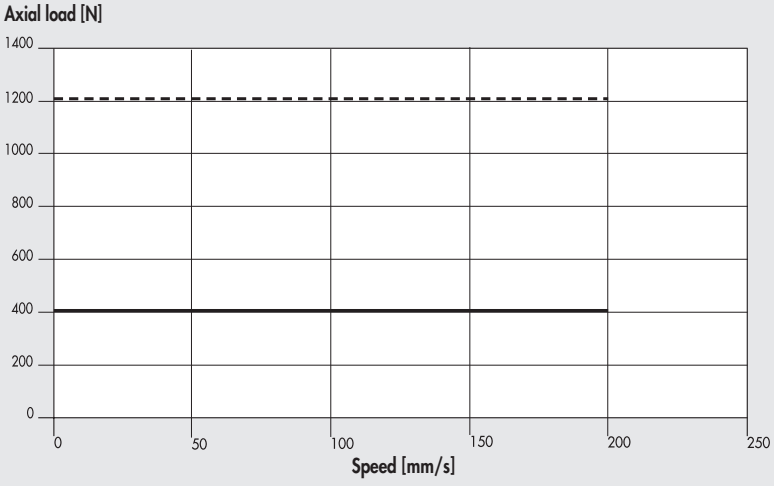
37M1120001 (24VDC)
or 37M1220000 (24VDC)
or 37M8220000 (with encoder, 24VDC)
or 37M3220000 (with encoder + brake, 24VDC)

Ø 32 with pitch 12.7 lead screw, STEPPING motor



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

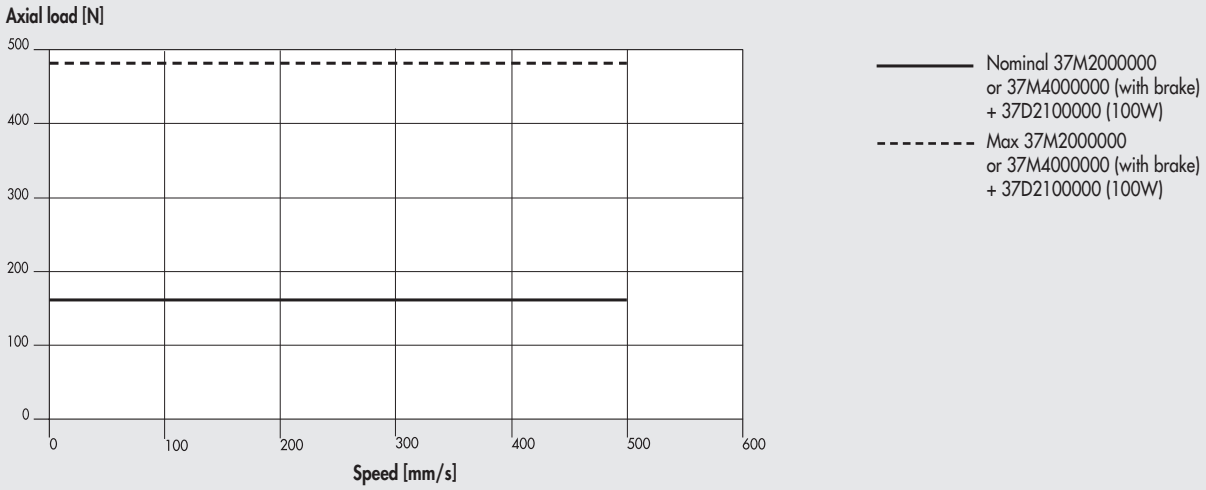
Ø 32 with pitch 4 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



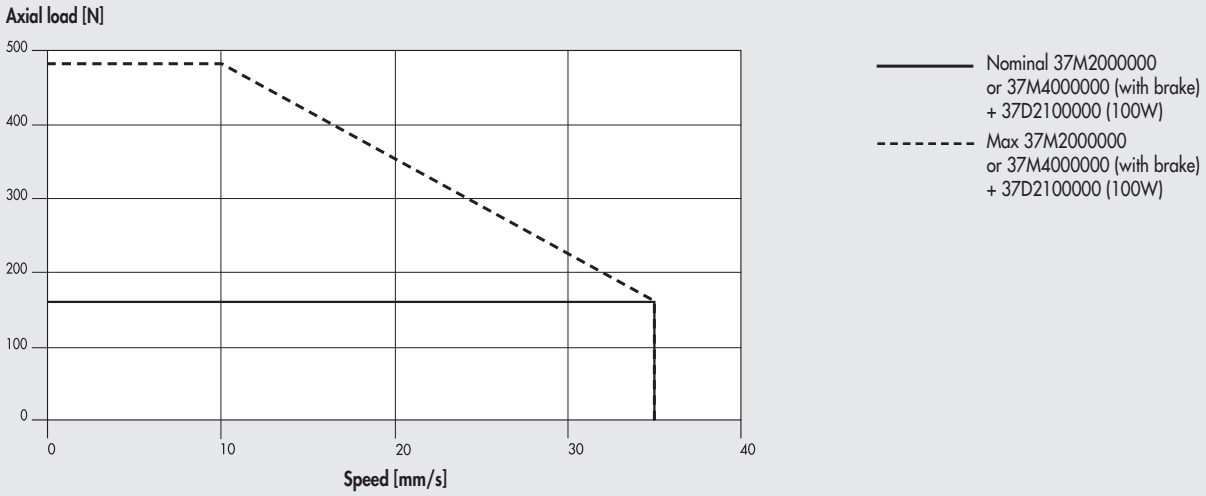
Nominal 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

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

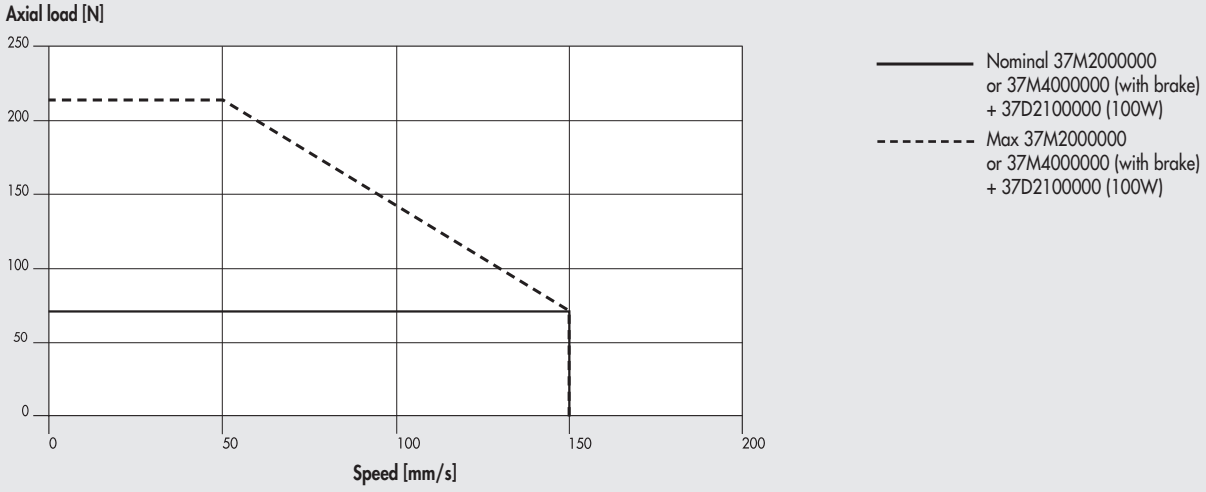
Ø 32 with pitch 10 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



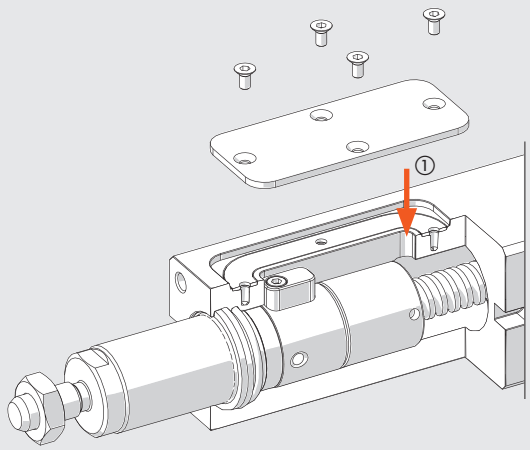
Ø 32 with pitch 5 lead screw, BRUSHLESS motor and BRUSHLESS motor with brake



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



LUBRICATION DIAGRAMS



① Greasing point

- Retract the piston rod towards the motor adapter plate until the piston rod/ball scroll system rests against the rear buffer.
- Move the piston rod at low speed and/or controlled torque forwards by a value corresponding to the cylinder total stroke.
- Remove the plate by unscrewing the 4 screws.
- Lubricate the screw using a food-grade grease pump (code 9910514), according to the quantities shown in the table.
- Make the piston rod perform four complete strokes. The piston rod should end up in the initial (retracted) position.
- Repeat the last two operations
- Refit the plate by tightening the 4 screws.
- The operation of re-greasing will have to be repeated every 200 km, approximately, at least once a year.

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

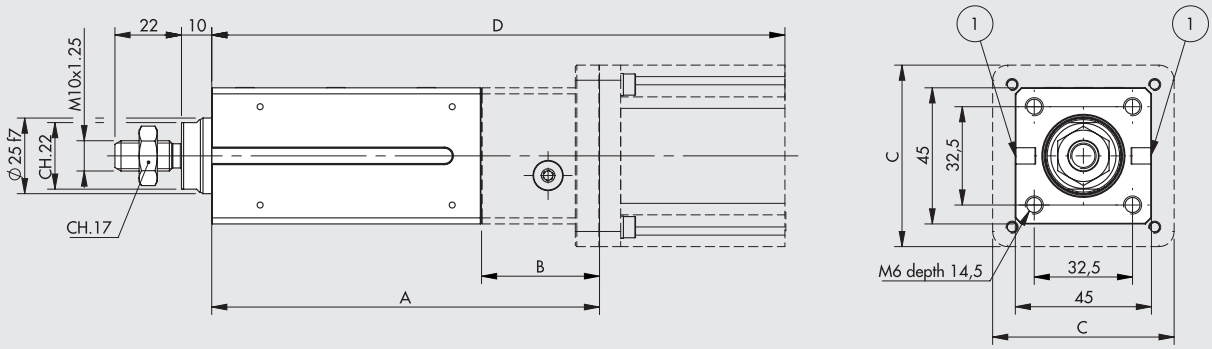
NOTES

METAL WORK PNEUMATIC

DIMENSIONS CYLINDER IN-LINE

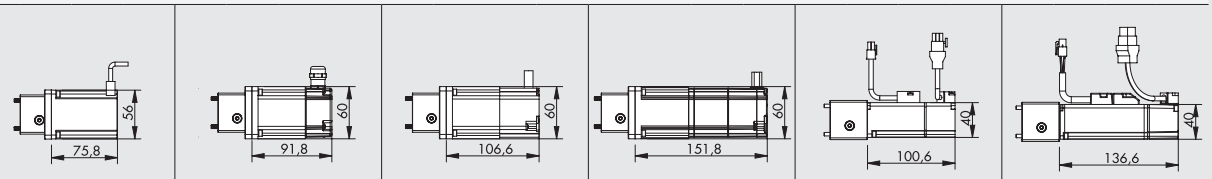
WITHOUT MOTOR

① = Slots for sensors



WITH MOTOR

CYLINDER WITH LEAD SCREW AND MOTOR

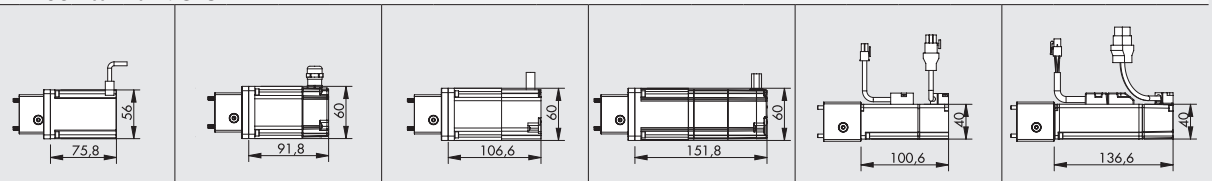


		1121				1220				8220				3220				2000				4000			
		STEPPING MOTOR code 37M1120001				STEPPING MOTOR code 37M1220000				STEPPING MOTOR + ENCODER code 37M8220000				STEPPING MOTOR + ENCODER + BRAKE code 37M3220000				BRUSHLESS MOTOR code 37M2000000				BRUSHLESS MOTOR + BRAKE code 37M4000000			
		A	B	C	D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

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

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

CYLINDER WITH BALL SCREW AND MOTOR



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

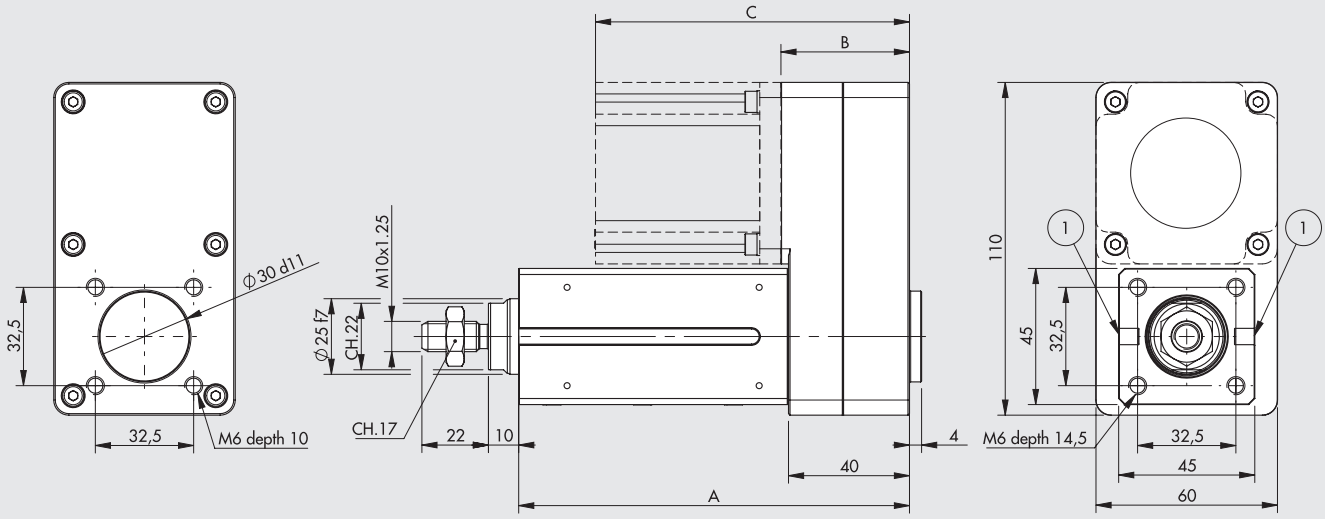
376032**0030**13 _ _ _ _ 376032**0030**14 _ _ _ _ 376032**0030**43 _ _ _ _ 376032**0030**44 _ _ _ _
376032**0055**13 _ _ _ _ 376032**0055**14 _ _ _ _ 376032**0055**43 _ _ _ _ 376032**0055**44 _ _ _ _

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

DIMENSIONS CYLINDER GEARED

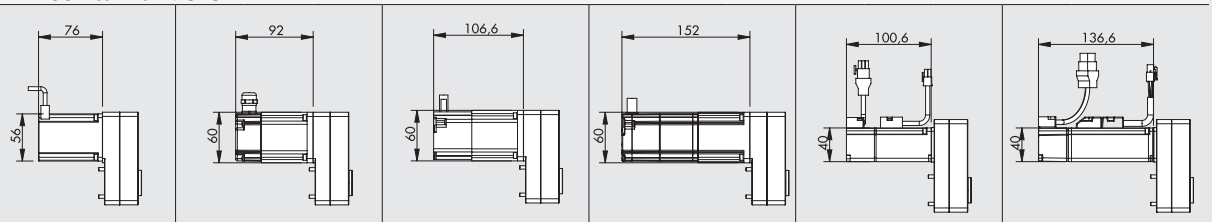
WITHOUT MOTOR

① = Slots for sensors



WITH MOTOR

CYLINDER WITH LEAD SCREW AND MOTOR

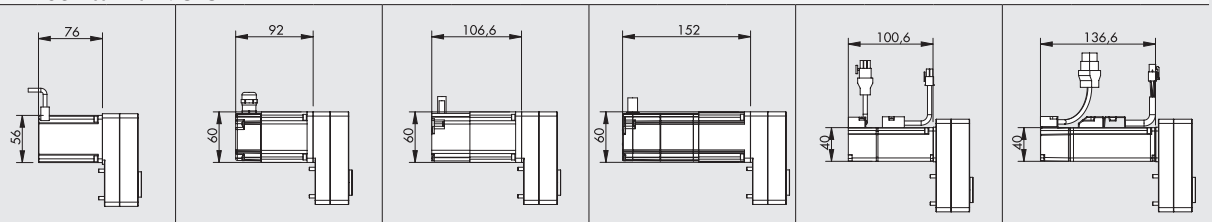


		1121			1220			8220			3220			2000			4000		
		STEPPING MOTOR code 37M1120001			STEPPING MOTOR code 37M1220000			STEPPING MOTOR + ENCODER code 37M8220000			STEPPING MOTOR + ENCODER + BRAKE code 37M3220000			BRUSHLESS MOTOR code 37M2000000			BRUSHLESS MOTOR + BRAKE code 37M4000000		
		A	B	C	A	B	C	A	B	C	A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

376032**0030**C7 _ _ _ _ 376032**0030**C8 _ _ _ _ 376032**0030**F7 _ _ _ _ 376032**0030**F8 _ _ _ _
376032**0055**C7 _ _ _ _ 376032**0055**C8 _ _ _ _ 376032**0055**F7 _ _ _ _ 376032**0055**F8 _ _ _ _

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

CYLINDER WITH BALL SCREW AND MOTOR



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

376032**0030**17 _ _ _ _ 376032**0030**18 _ _ _ _ 376032**0030**47 _ _ _ _ 376032**0030**48 _ _ _ _
376032**0055**17 _ _ _ _ 376032**0055**18 _ _ _ _ 376032**0055**47 _ _ _ _ 376032**0055**48 _ _ _ _

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

METAL WORK PNEUMATIC

MOTOR-DRIVE COUPLINGS

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

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

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

KEY TO CODES

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

● Version available for all drives, except for motor code 37M112001, which is IP55 protected.

POSSIBLE ORDERING CODES

Ø 32 with ball screw

Drive
Version
Screw pitch

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

_ _ _ _ = Enter the stroke in mm

Ø 32 with multi-step screw

Drive
Version
Screw pitch

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

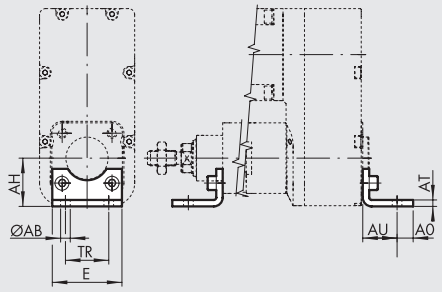
_ _ _ _ = Enter the stroke in mm

NOTES

ACCESSORIES FOR ELECTRIC CYLINDER SERIES ELEKTRO SSC

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

FOOT MODEL A

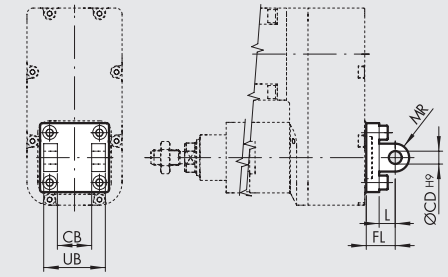


STEEL

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

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

FEMALE HINGE - MODEL B



ALUMINIUM

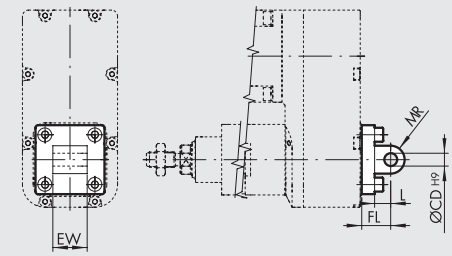
Code	Ø	UB	CB	FL	øCD	MR	L	Weight [g]	Fmax [N]
W0950322003	32	45	26	22	10	10	12	116	800

STEEL

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

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

MALE HINGE - MODEL BA



ALUMINIUM

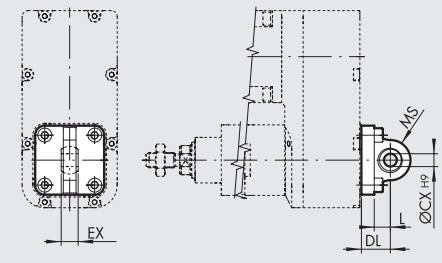
Code	Ø	EW	FL	MR	øCD	L	Weight [g]	Fmax [N]
W0950322004	32	26	22	11	10	12	94	800

STEEL

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

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

ARTICULATED MALE HINGE - MODEL BAS



ALUMINIUM

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

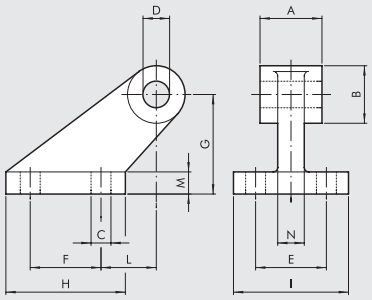
STEEL

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

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

METAL WORK PNEUMATIC

CETOP HINGE FOR MODEL B - MODEL GL

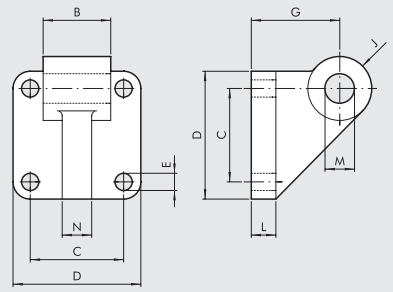


ALUMINIUM

Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]	Fmax [N]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96	800

Note: Supplied with 4 screws, 4 washers.

COUNTER-HINGE FOR MODEL B - MODEL GS

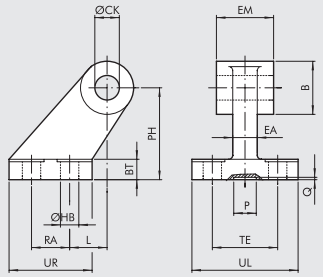


ALUMINIUM

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

Note: Supplied with 4 screws, 4 washers.

ISO 15552 COUNTER-HINGE FOR MODEL B - MODEL AB7



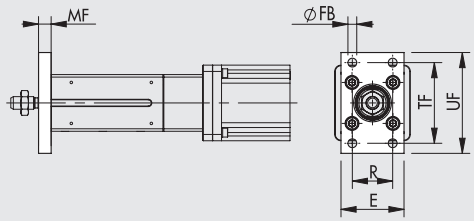
ALUMINIUM

Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]	Fmax [N]
W0950322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	21	3	60	800

STEEL

Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]	Fmax [N]
W095E322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	20	5	180	1600

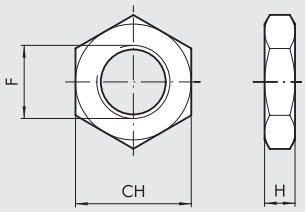
FRONT FLANGE - MODEL C



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

Note: Supplied with 4 screws.

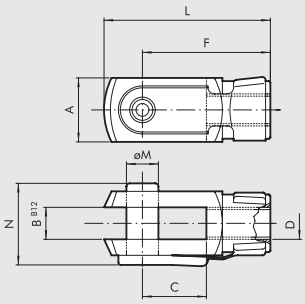
ROD NUT - MODEL S



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

Note: Individually packed.

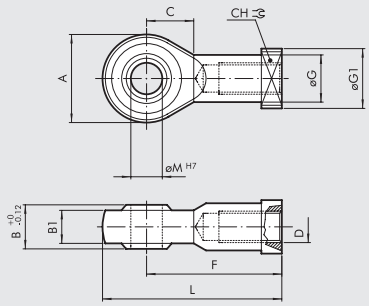
FORK MODEL GK-M



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

Note: Individually packed.

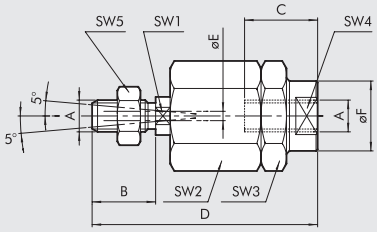
ROD EYE - MODEL GA-M



Code	Ø	øM	C	B1	B	A	L	F	D	øG	CH	øG1	Weight [g]
W0950322025	**32**	10	15	10.5	14	28	57	43	M10x1.25	15	17	19	78

Note: Individually packed.

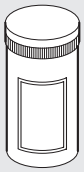
SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	øF	øE	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950322030	**32**	M10x1.25	20	20	71	22	4	12	30	30	19	17	216

Note: Individually packed.

GREASE

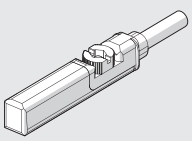


Code	Description	Weight [g]
9910514	Grease pipe ULTRAPLEX FG1 NSF CAT H1	400

RETRACTABLE SENSOR

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

SENSOR, SQUARE TYPE
Latest generation, secure fixing



DRIVES

Code
37D2100000
37D1332000
37D1442000
37D1552000

For technical data see from page **A5**.170
For motor-drive couplings see page **A5**.63

SPARE PARTS

ELECTRIC MOTORS

Code
37M1120001
37M1220000
37M2000000
37M3220000
37M4000000
37M8220000

For technical data see from page **A5**.138
For motor-drive couplings see page **A5**.63

NOTES

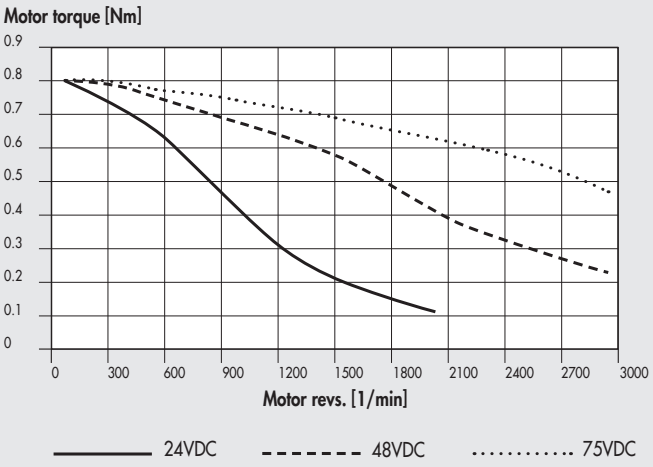
STEPPING MOTORS

STEPPING MOTORS

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

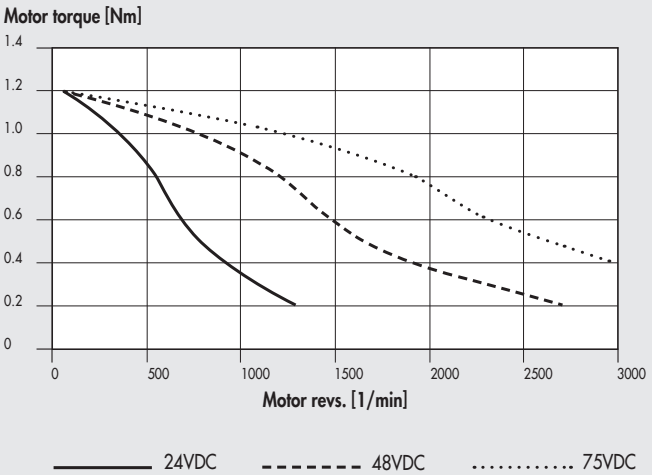
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS

STEPPING motor code **37M1110000**



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

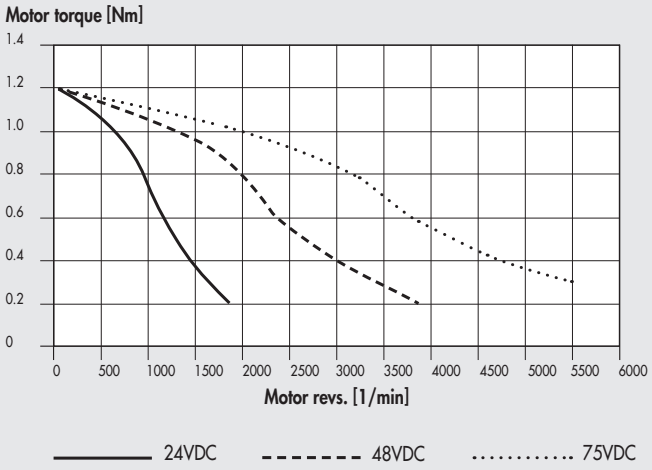
STEPPING motor code **37M1120000**



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

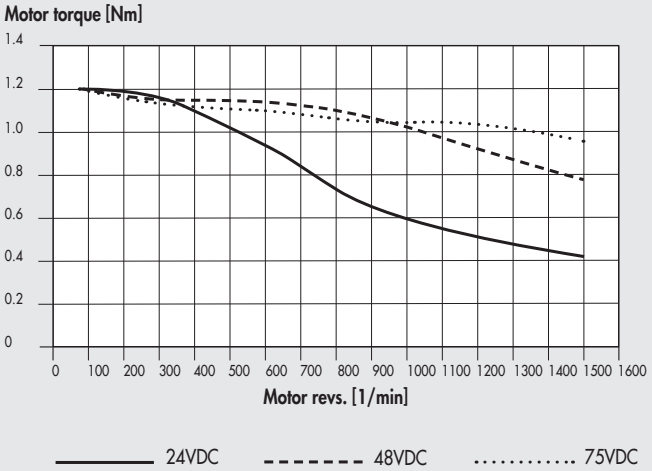
METAL WORK PNEUMATIC

STEPPING motor code **37M1120001**



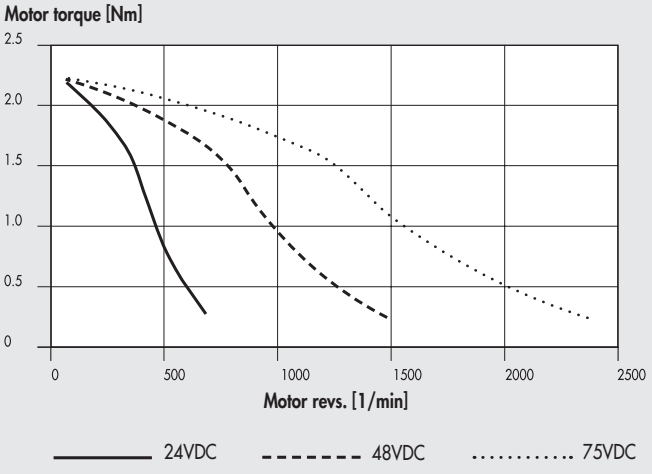
TECHNICAL DATA		MOTOR 37M1120001
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	5.6
Resistance	Ω	0.3
Inductance	mH	0.85
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm^2	36
Theoretical acceleration	rad · s^{-2}	45800
Back E.M.F.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

STEPPING motor code **37M1220000**



TECHNICAL DATA		MOTOR 37M1220000
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm^2	44
Mass	kg	1.28
Degree of protection		IP65
CABLE		
Power cable for stepping motors with brake, 1 metre		supplied

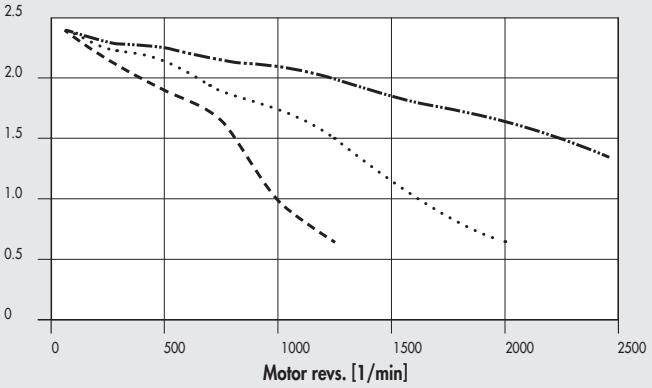
STEPPING motor code **37M1230000**



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

STEPPING motor code **37M1430000**

Motor torque [Nm]

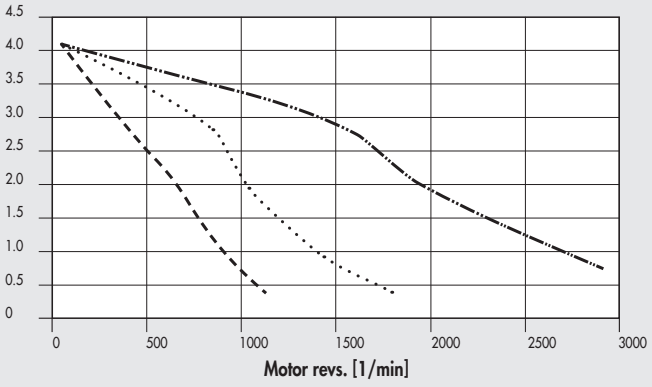


48VDC 75VDC 140VDC

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

STEPPING motor code **37M1440000**

Motor torque [Nm]

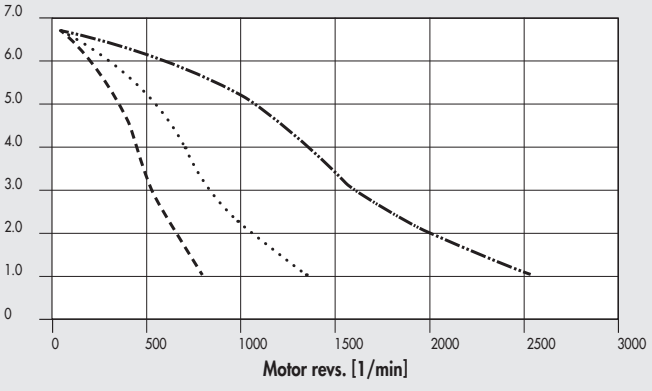


48VDC 75VDC 140VDC

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

STEPPING motor code **37M1450000**

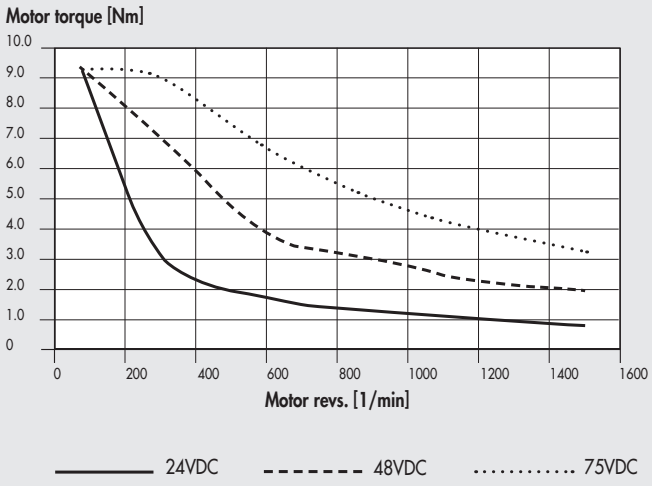
Motor torque [Nm]



48VDC 75VDC 140VDC

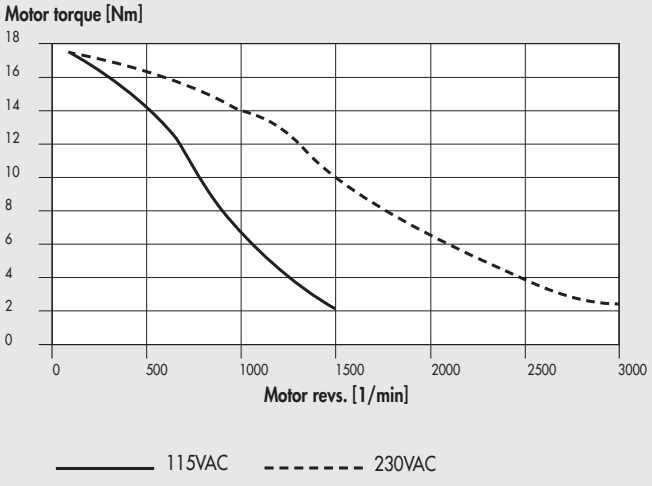
TECHNICAL DATA		MOTOR 37M1450000
Motor type		STEPPING
Nominal torque	Nm	**6.7**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current parallel	A	6
Resistance	Ω	0.46
Inductance	mH	3.8
Bipolar holding torque	Nm	9.2
Rotor inertia	kgmm²	450
Theoretical acceleration	rad · s⁻²	20500
Back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

STEPPING motor code **37M1470000**



TECHNICAL DATA		MOTOR 37M1470000
Motor type		STEPPING
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.2
Degree of protection		IP40

STEPPING motor code **37M1890000**



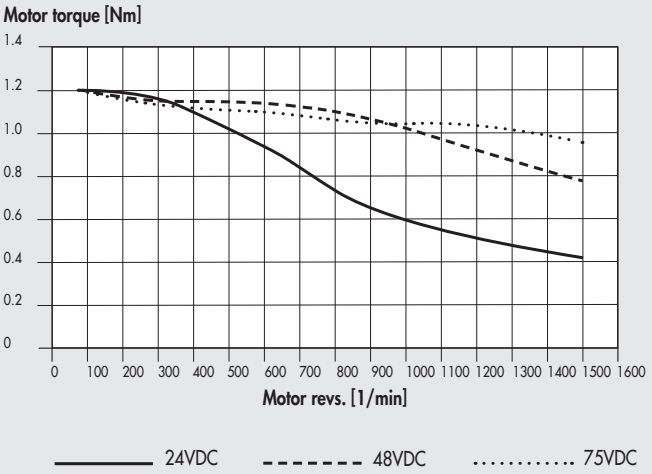
TECHNICAL DATA		MOTOR 37M1890000
Motor type		STEPPING
Nominal torque	Nm	**17.5**
Coupling flange		**NEMA 42**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.63
Inductance	mH	8
Bipolar holding torque	Nm	24.6
Rotor inertia	kgmm²	2200
Theoretical acceleration	rad · s⁻²	11100
Back E.M.F.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

NOTES

STEPPING MOTORS WITH ENCODER

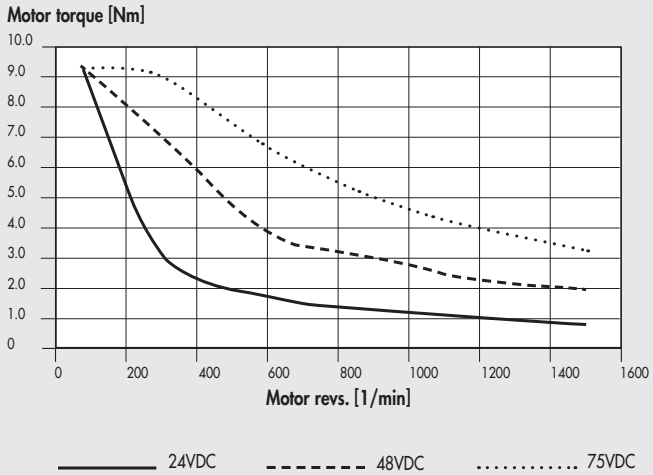
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH ENCODER

STEPPING motor + ENCODER code **37M8220000**



TECHNICAL DATA		MOTOR 37M8220000
Motor type		STEPPING + ENCODER
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
CABLES		
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

STEPPING motor with ENCODER code **37M8470000**

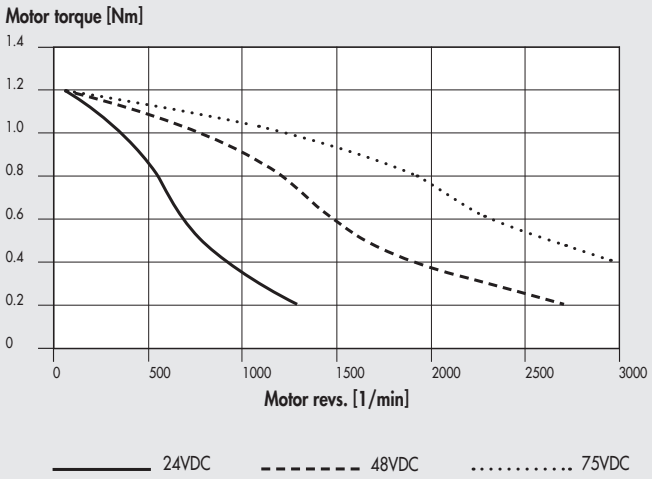


TECHNICAL DATA		MOTOR 37M8470000
Motor type		STEPPING with ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.3
Degree of protection		IP65
ENCODER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

STEPPING MOTORS WITH BRAKE

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE

STEPPING motor with BRAKE code **37M5120000**



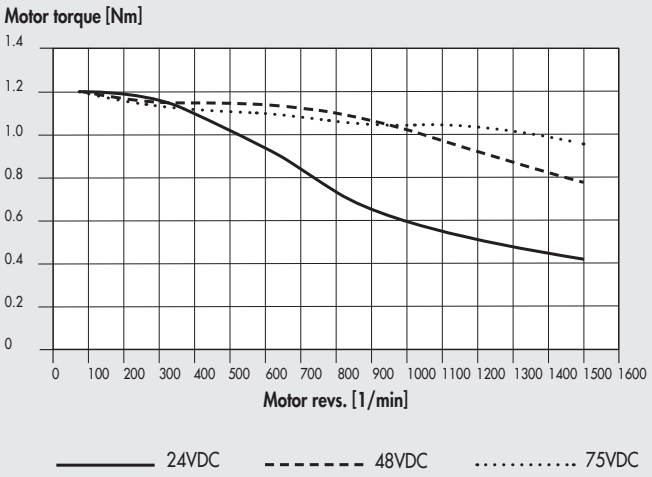
TECHNICAL DATA		MOTOR 37M5120000
Motor type		STEPPING with BRAKE
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	$kgmm^2$	36
Theoretical acceleration	$rad \cdot s^{-2}$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

NOTES

STEPPING MOTORS WITH BRAKE + ENCODER

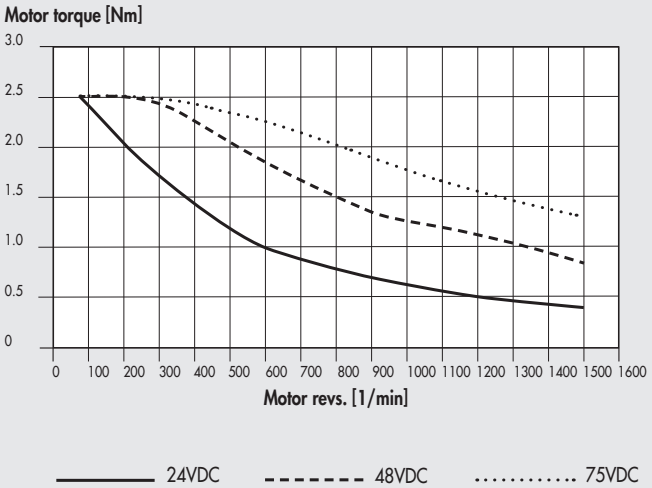
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE + ENCODER

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



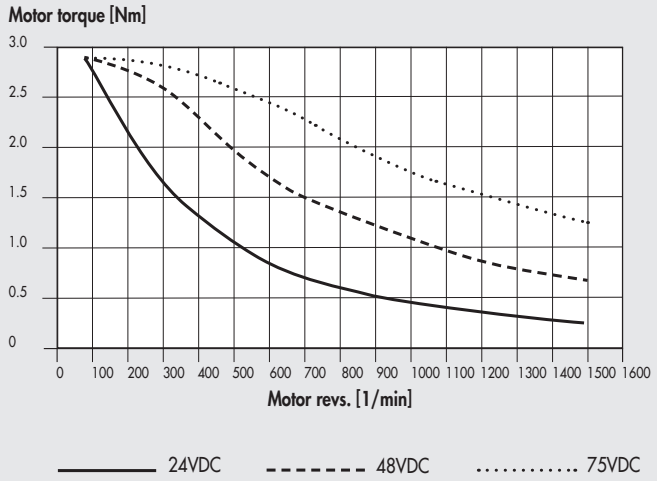
TECHNICAL DATA		MOTOR 37M3220000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
ENCODER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

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



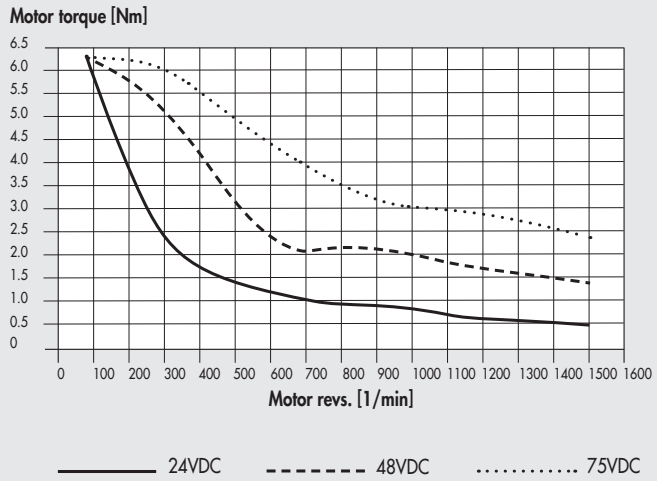
TECHNICAL DATA		MOTOR 37M3230000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.5**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Bipolar current	A	5
Resistance	Ω	0.6
Inductance	mH	2.8
Bipolar holding torque	Nm	3.5
Rotor inertia	kgmm²	92
Mass	kg	1.8
Degree of protection		IP65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

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



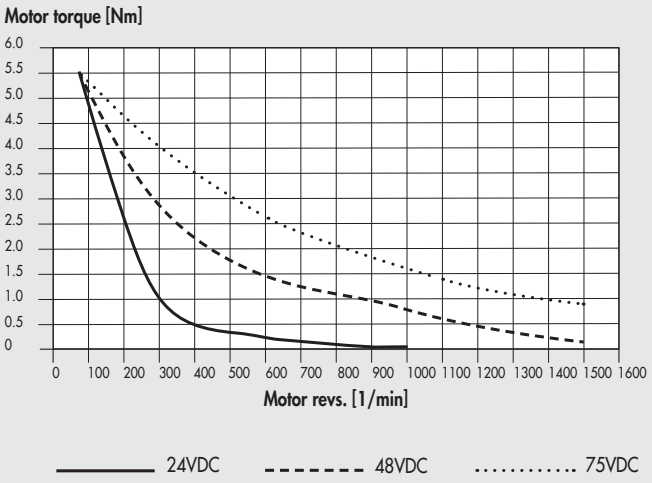
TECHNICAL DATA		MOTOR 37M3430000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.9**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.4
Inductance	mH	3.2
Bipolar holding torque	Nm	4
Rotor inertia	kgmm²	131
Mass	kg	2.5
Degree of protection		IP65
ENCODER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

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



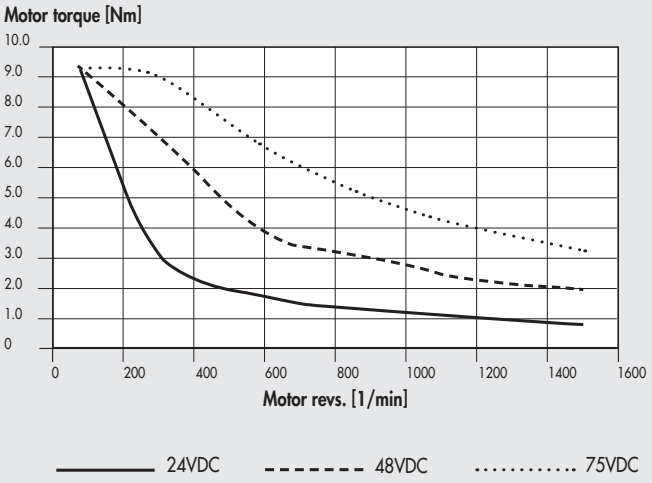
TECHNICAL DATA		MOTOR 37M3450000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**6.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.2
Inductance	mH	1.4
Bipolar holding torque	Nm	9.5
Rotor inertia	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65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

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



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

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

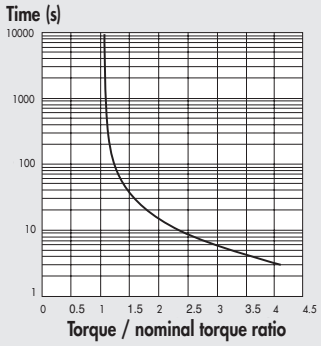


TECHNICAL DATA		MOTOR 37M3470000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.9
Degree of protection		IP65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

BRUSHLESS MOTORS

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

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

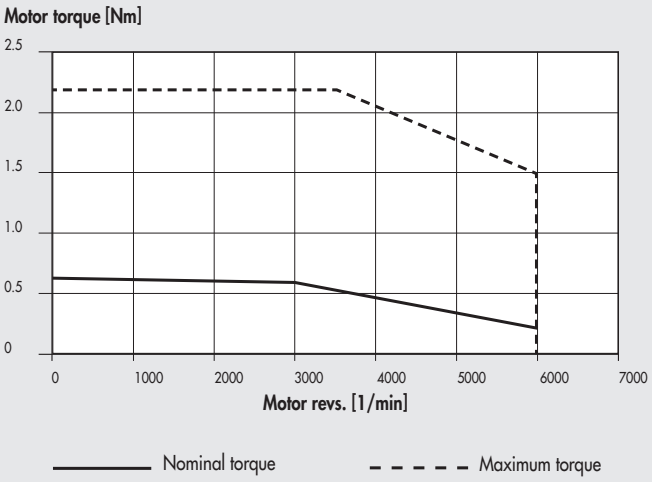


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

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

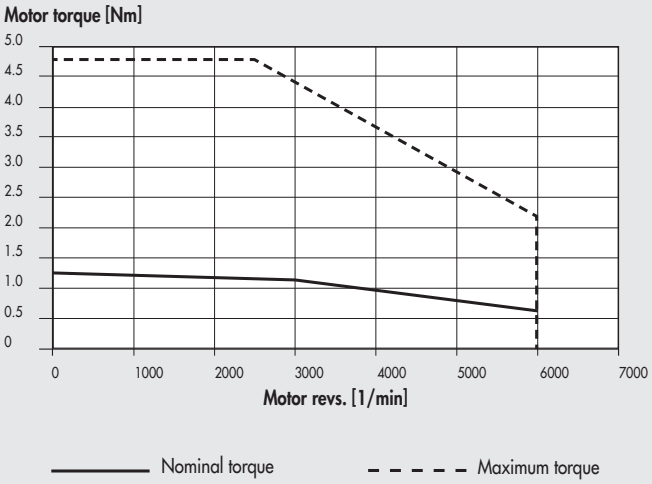
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



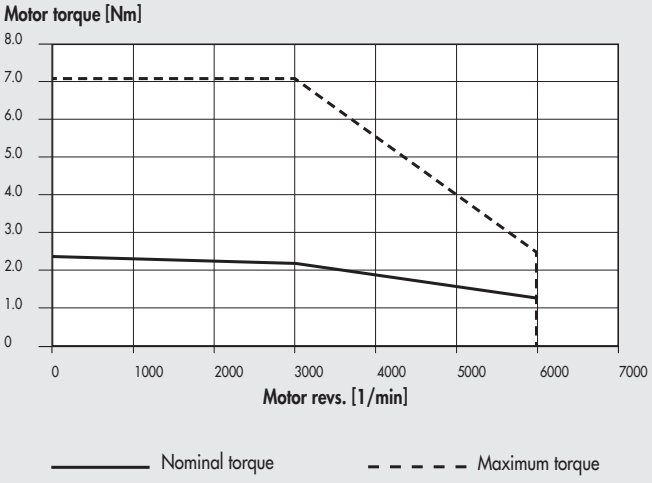
TECHNICAL DATA		MOTOR 37M2200000
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	21.9
Mass	kg	0.84
Encoder	pulse/rev	131072 (17 bit)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

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



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

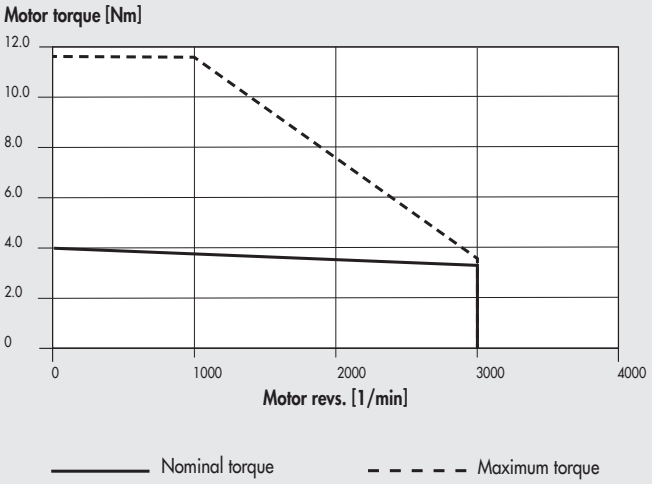
BRUSHLESS motor code **37M2330000** +
drive code **37D2400008** (750W)



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

METAL WORK PNEUMATIC

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

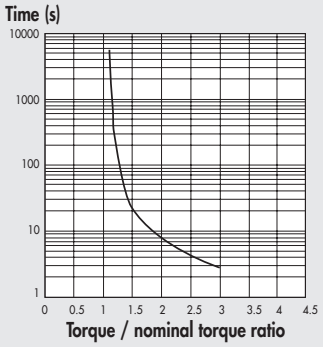


TECHNICAL DATA		MOTOR 37M2540000
Motor type		BRUSHLESS
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	$kgmm^2$	238.3
Mass	kg	3.5
Encoder	pulse/rev	131072 (17 bit)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

NOTES

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (DELTA)

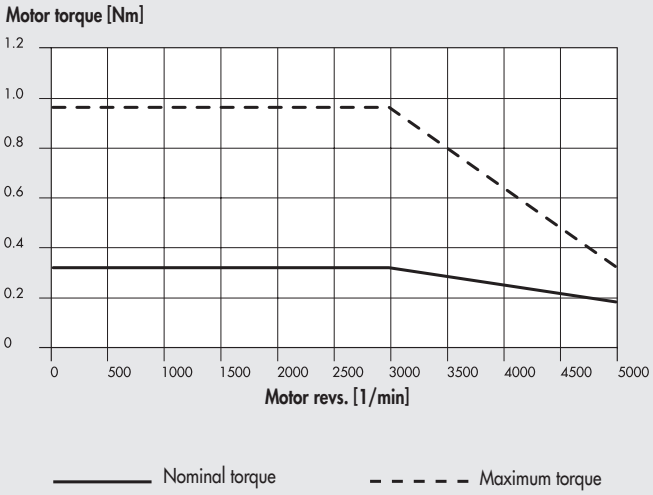
The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.



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

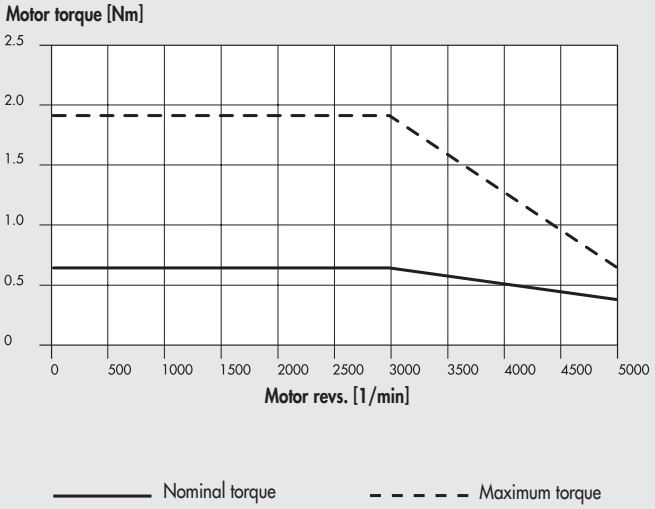
The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle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

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



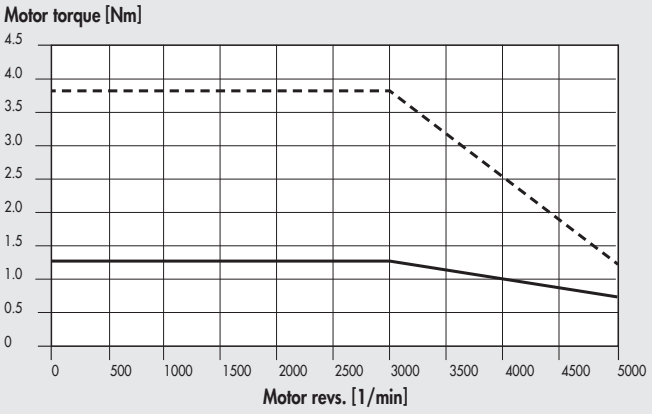
TECHNICAL DATA		MOTOR 37M2000000
Motor type		BRUSHLESS
Nominal torque	Nm	**0.32**
Coupling flange (square)	mm	**40**
Nominal power	W	100
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.32
Maximum torque	Nm	0.96
Rotor inertia	$kgmm^2$	3.7
Mass	kg	0.5
Encoder	imp./giro	131072 (17 bit)
Degree of protection		IP65
DRIVE	codice	**37D2100000**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130001**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive**, 5 metres		**37C2150001**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**

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



TECHNICAL DATA		MOTOR 37M2200001
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	kgmm²	17.7
Mass	kg	1.2
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
DRIVE	code	**37D2200001**
CABLES		
Brushless **motor-drive**, 3 metres		**37C2130001**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive**, 5 metres		**37C2150001**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**

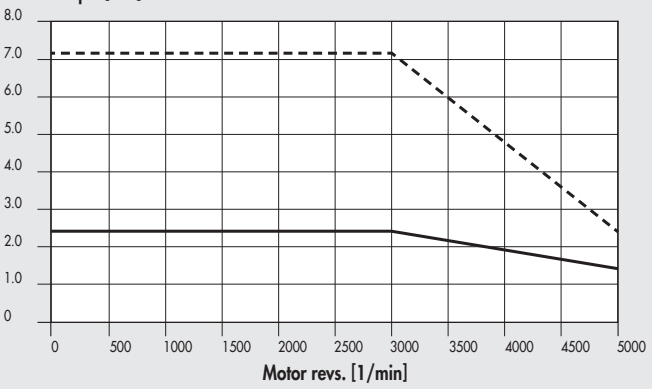
BRUSHLESS motor code **37M2220001** +
drive code **37D2300000** (400W)



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

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

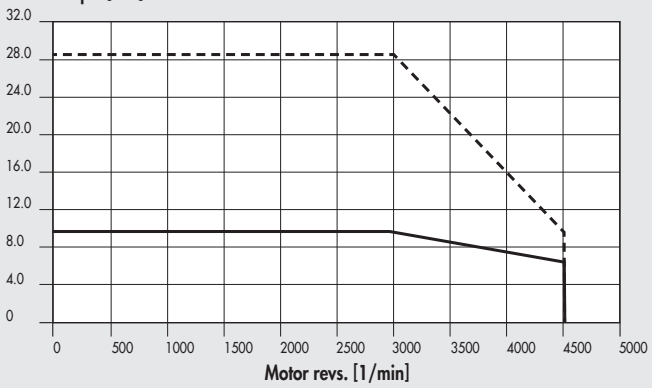
Motor torque [Nm]



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

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

Motor torque [Nm]

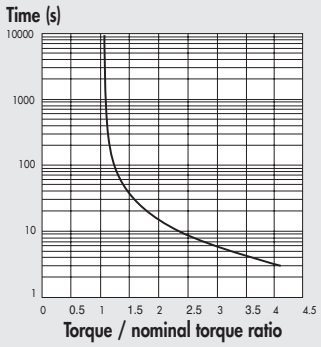


TECHNICAL DATA		MOTOR 37M2770000
Motor type		BRUSHLESS
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm²	1270
Mass	kg	7.8
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
DRIVE	code	**37D2600001**
CABLES		
Brushless **motor-drive**, 3 metres		**37C3130001**
Brushless **motor-drive-encoder**, 3 metres		**37C3230001**
Brushless **motor-drive**, 5 metres		**37C3150001**
Brushless **motor-drive-encoder**, 5 metres		**37C3250001**

BRUSHLESS MOTORS WITH BRAKE

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

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

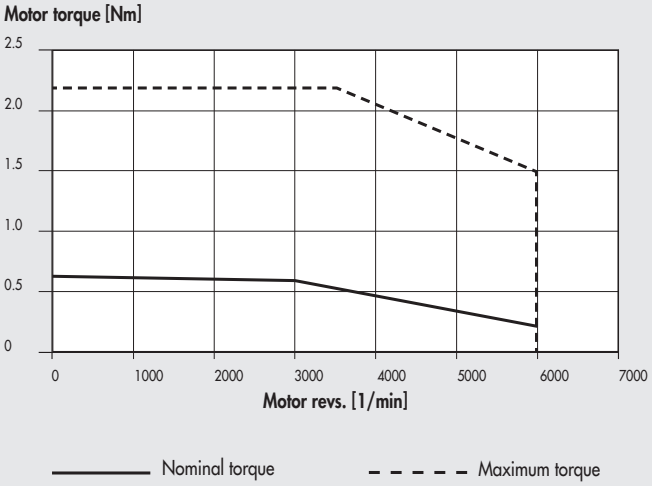


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (SANYO DENKI)

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

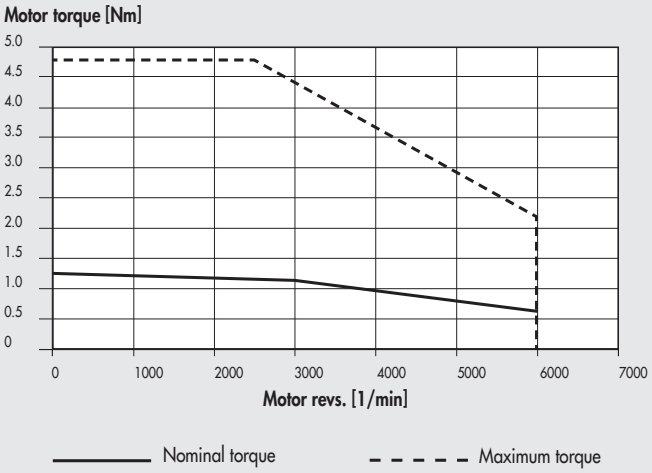
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



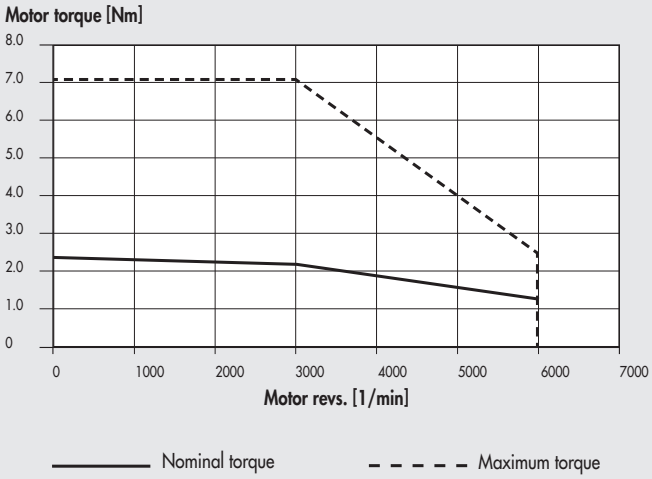
TECHNICAL DATA		MOTOR 37M4200000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	27.9
Mass	kg	1.23
Encoder	pulse/rev	131072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

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



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

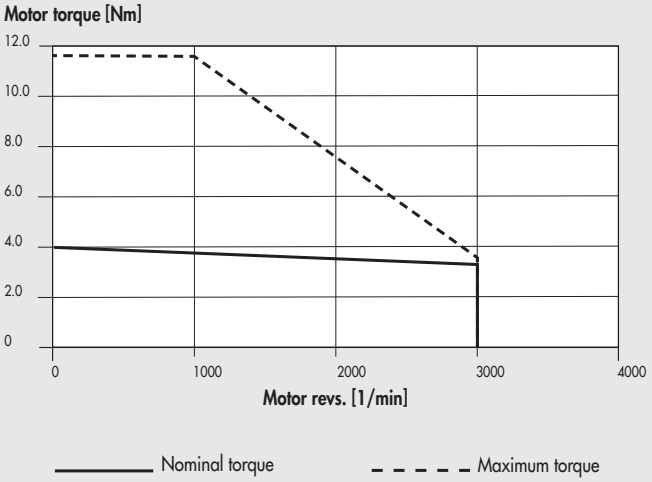
BRUSHLESS motor with BRAKE code **37M4330000** + drive code **37D2400008** (750W)



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

METAL WORK PNEUMATIC

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

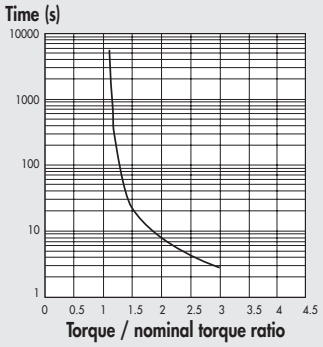


TECHNICAL DATA		MOTOR 37M4540000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	kgmm^2	272.6
Mass	kg	4.34
Encoder	pulse/rev	131072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

NOTES

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (DELTA)

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

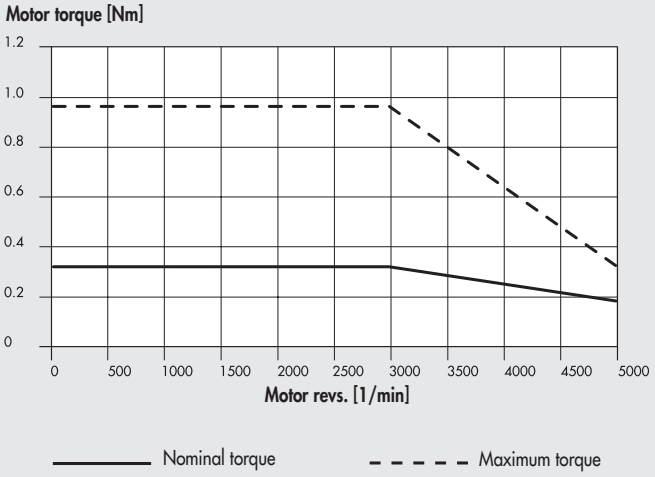


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (DELTA)

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

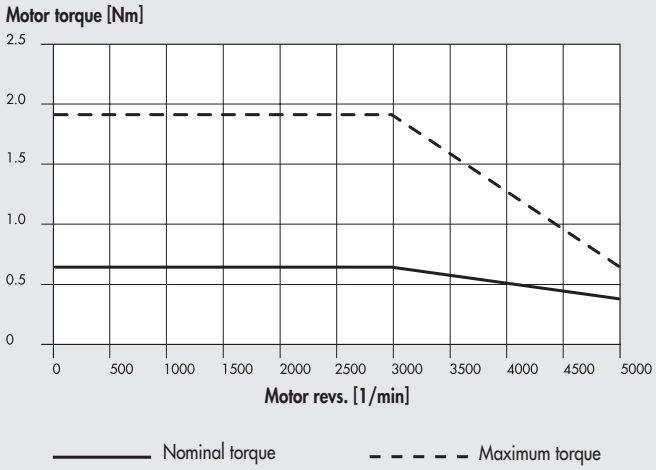
- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

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



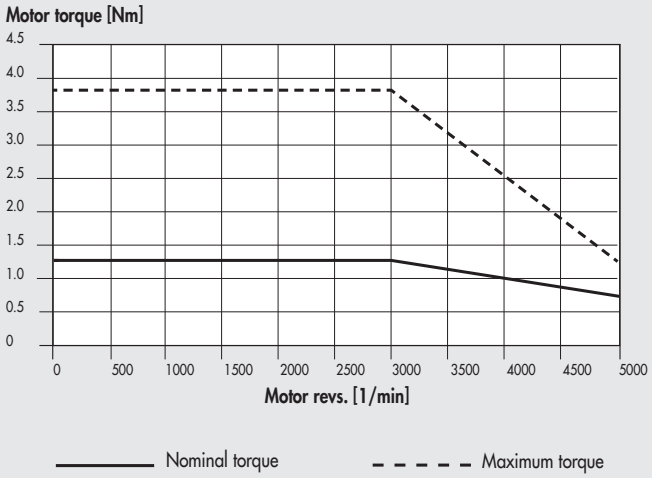
TECHNICAL DATA		MOTOR 37M4000000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.32**
Coupling flange (square)	mm	**40**
Nominal power	W	100
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.32
Maximum torque	Nm	0.96
Rotor inertia	kgmm^2	4
Mass	kg	0.8
Encoder	imp./giro	131072 (17 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	0.3
Absorption	W	7.2
DRIVE	code	**37D2100000**
CABLES		
Brushless **motor-drive** with brake, 3 metres		**37C2730000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive** with brake, 5 metres		**37C2750000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**

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



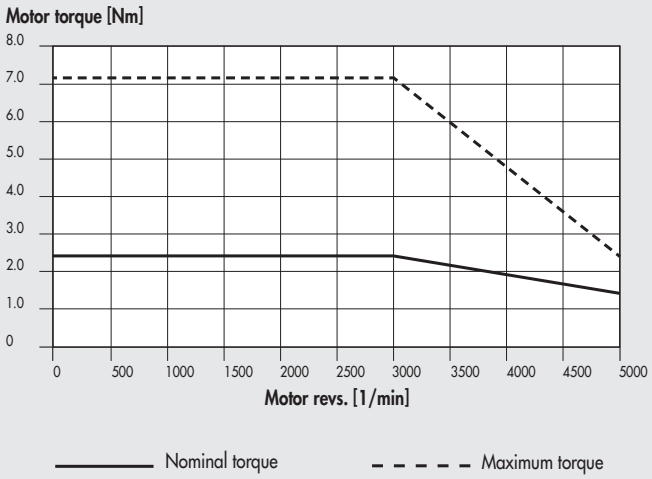
TECHNICAL DATA		MOTOR 37M4200001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	0.64
Maximum torque	Nm	1.92
Rotor inertia	kgmm²	19.2
Mass	kg	1.5
Encoder	imp./giro	131072 (17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

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



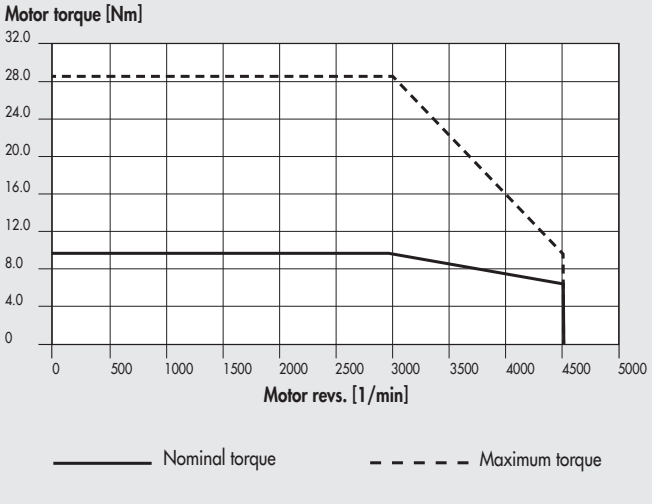
TECHNICAL DATA		MOTOR 37M4220001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm²	30
Mass	kg	2
Encoder	pulse/rev	131072 (17 bit)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

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



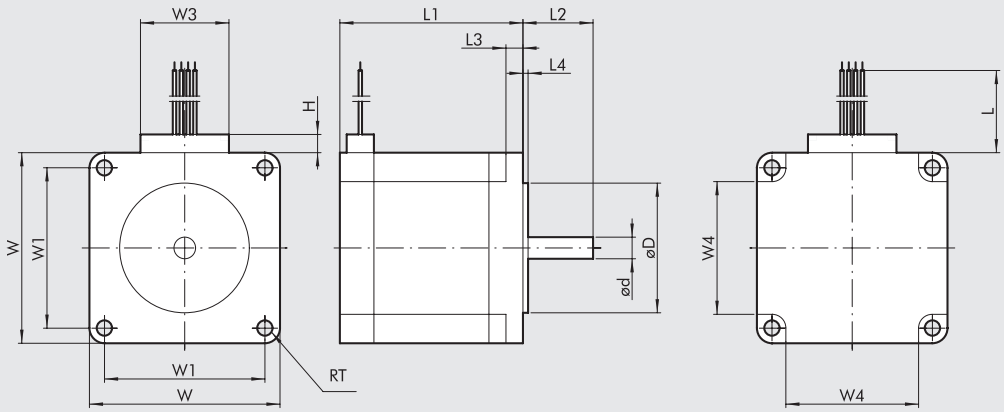
TECHNICAL DATA		MOTOR 37M4330001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	2.39
Maximum torque	Nm	7.17
Rotor inertia	kgmm²	113
Mass	kg	3
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP40
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	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**

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

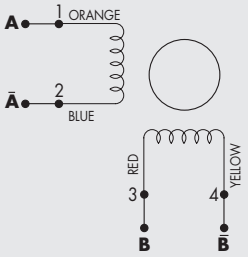


TECHNICAL DATA		MOTOR 37M4770000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm²	1400
Mass	kg	9.2
Encoder	pulse/rev	1048576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

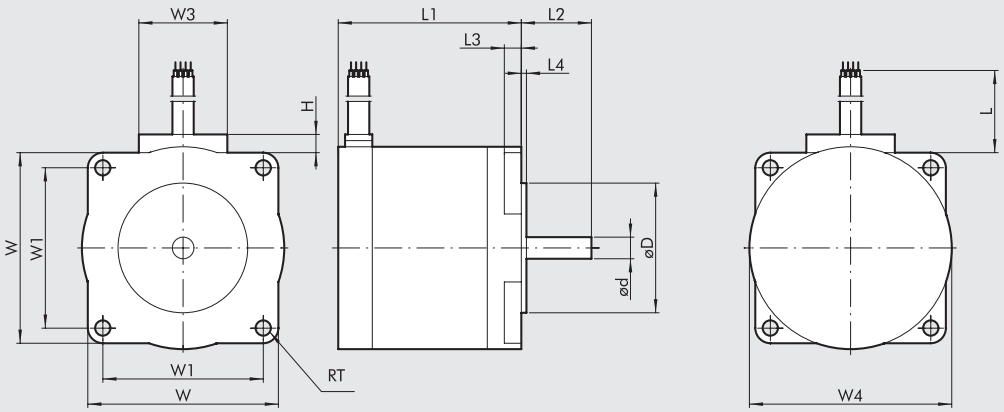
DIMENSIONS OF ELECTRIC MOTORS



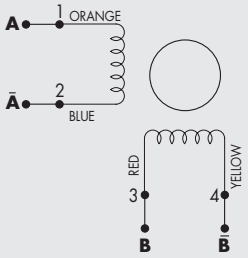
WIRING DIAGRAM



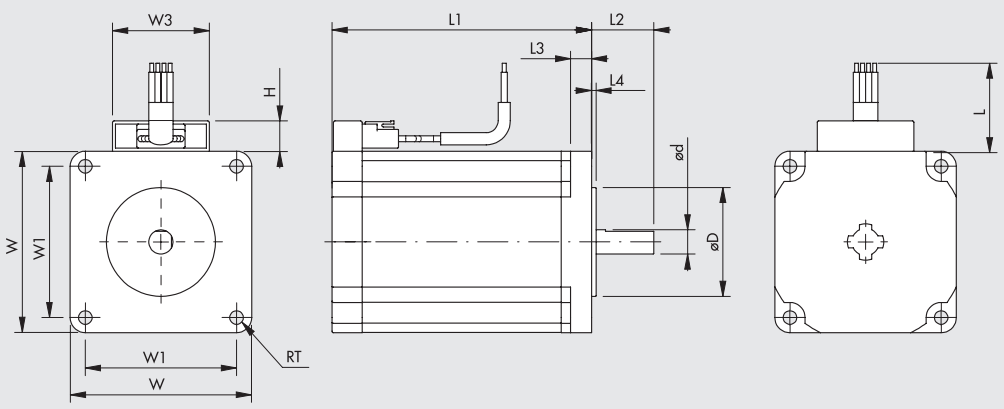
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5
STEPPING	37M1110000	0.8	NEMA 23	6.35	38.1	7	305	53.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120000	1.2	NEMA 23	6.35	38.1	7	305	75.8	20.6	5	1.5	4.5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



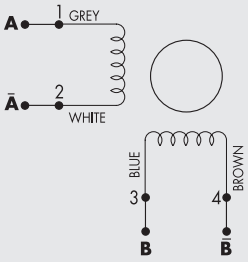
WIRING DIAGRAM



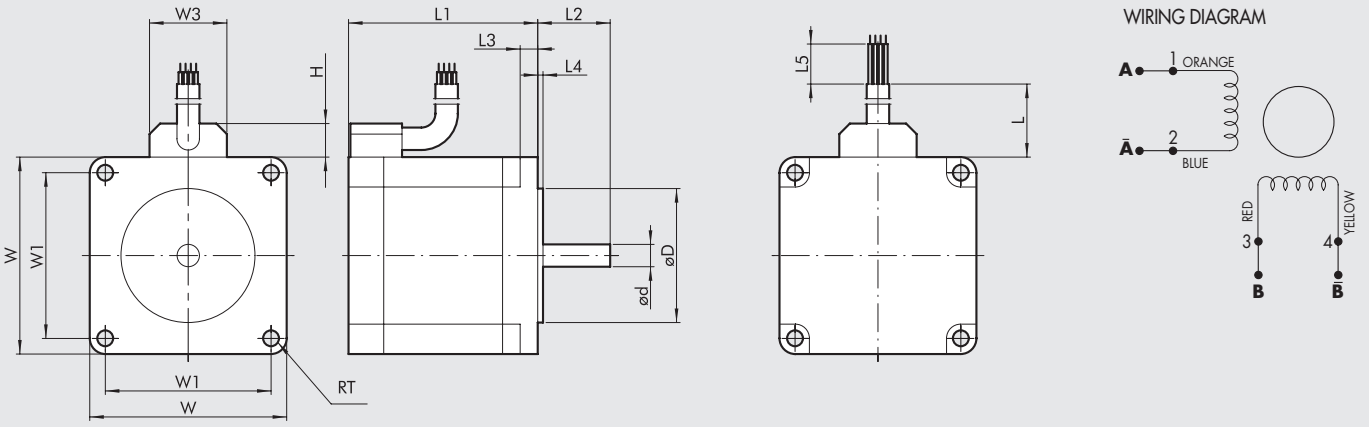
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H	L min	L1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.2	W3	W4 ±0.5
STEPPING	37M1430000	2.4	NEMA 34	9.525	73.02	10	305	62	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1440000	4.2	NEMA 34	12	73.02	10	305	92.2	30	4.8	1.5	5.4	82.5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



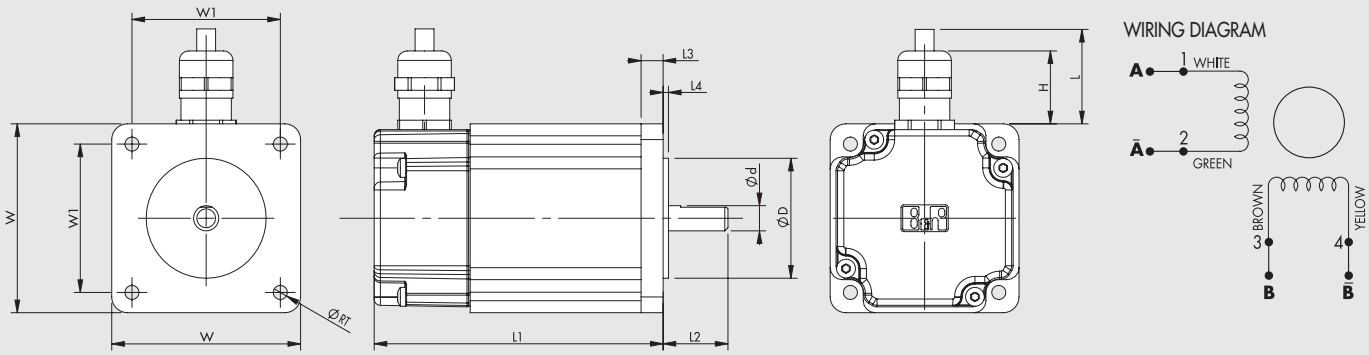
WIRING DIAGRAM



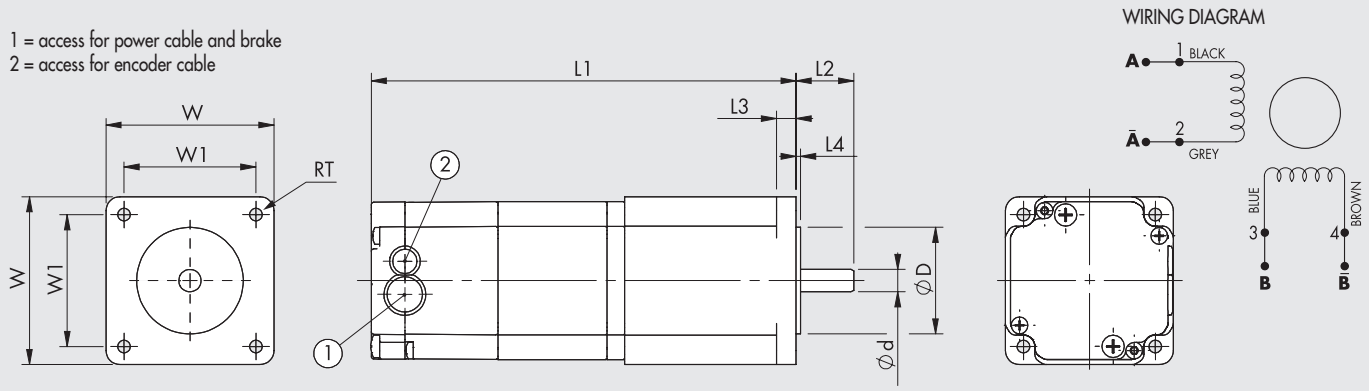
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	37M1230000	2.2	60	8	36	10	300	86	20.6	7	1.5	4.5	60	50	32



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

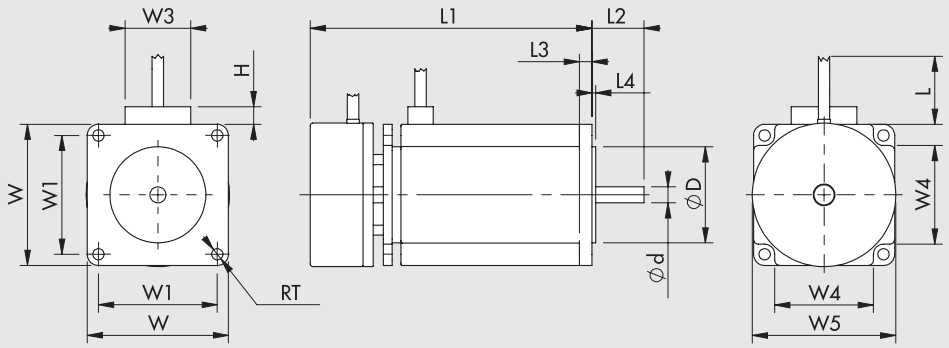


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.2	W ±0.5	W1 ±0.13
STEPPING	**37M1220000**	**1.2**	**60**	8	38.1	23	1023	91.8	20.6	7	1.6	4.5	60	47.14

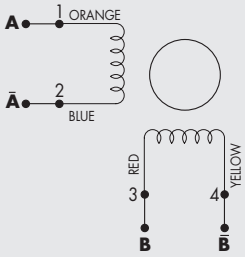


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	L1	L2 ±0.51	L3	L4	RT	W	W1 ±0.13
STEPPING	**37M1470000**	**9.3**	**NEMA 34**	12.7	73.025	130	31.75	9.91	2.03	5.6	86.6	69.6
	37M8220000	**1.2**	**60**	8	38.1	106.6	20.6	7	1.6	4.5	60	47.14
STEPPING + ENCODER	**37M8470000**	**9.3**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

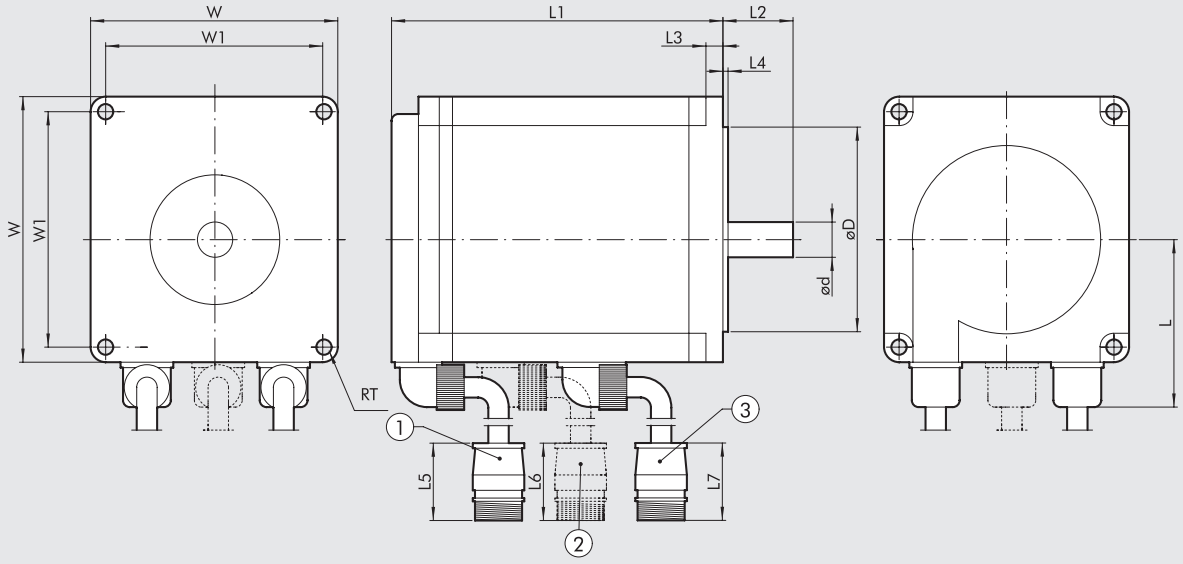
METAL WORK PNEUMATIC



WIRING DIAGRAM

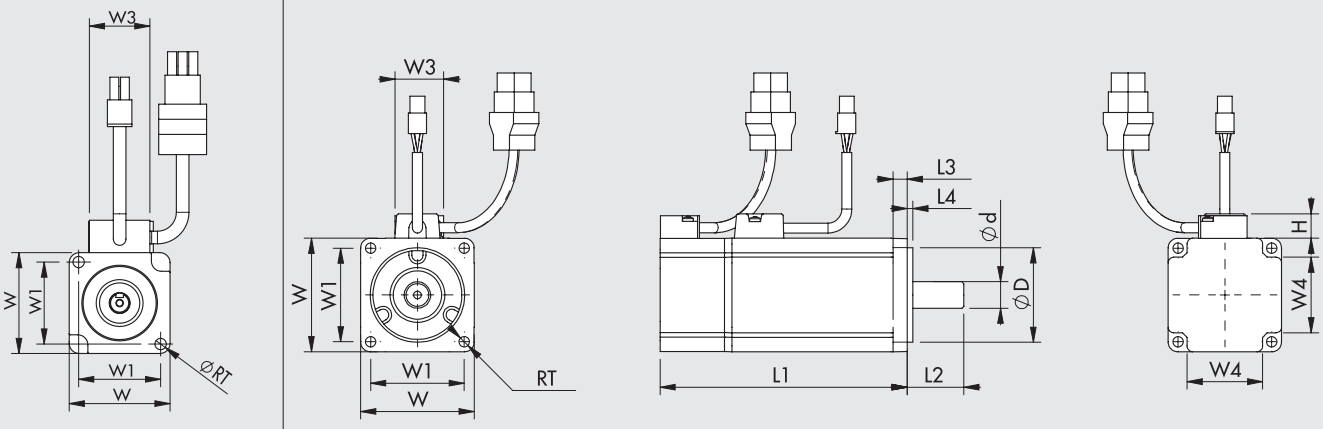


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5	W5 ±0.5
STEPPING + BRAKE	**37M5120000**	**1.2**	**NEMA 23**	6.35	38.1	7	305	111.8	20.6	5	1.5	4.5	56	47.14	26	39	56.9



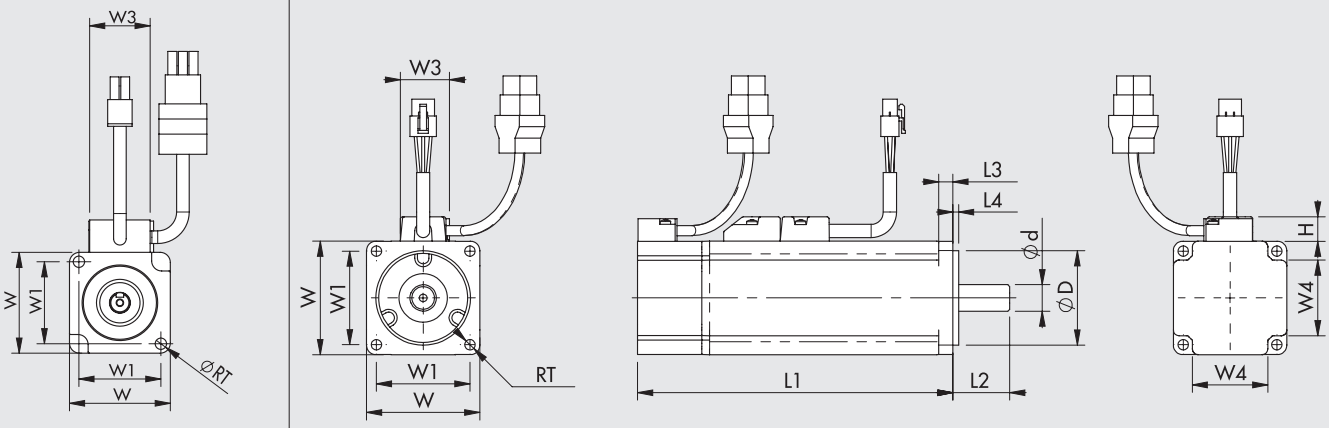
1 = encoder shielded cable, length 280 mm
2 = brake cable, length 280 mm
3 = motor cable, length 280 mm

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



View for motor **37M2000000**

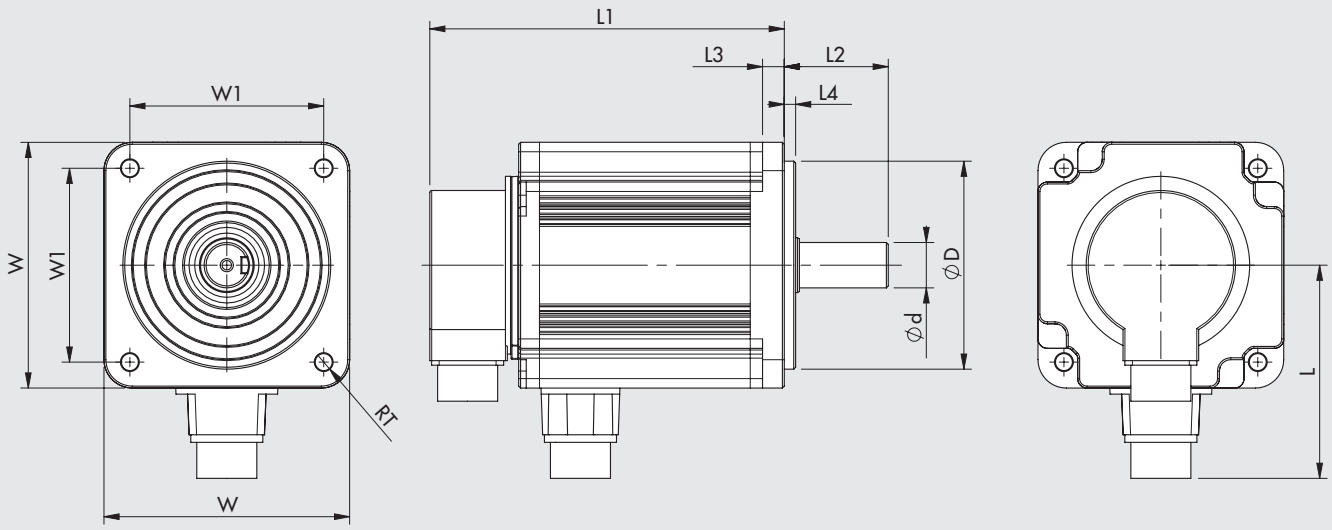
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD 0/-0.025	H max	L1 ±0.3	L2 ±0.2	L3 ±0.2	L4 ±0.2	RT ±0.2	W ±0.25	W1 ±0.2	W3 max	W4 ±0.2
BRUSHLESS (DELTA)	**37M2000000**	**0.32**	**40**	8	30	13	100.6	25	5	2.5	4.5	40	32.53	25	-
	37M2200001	**0.64**	**60**	14	50	13	105.5	30	7.5	3	5.5	60	49.5	25	40
	37M2220001	**1.27**	**60**	14	50	13	130.7	30	7.5	3	5.5	60	49.5	30	40
	37M2330001	**2.39**	**80**	19	70	13	138.3	35	8	3	6.6	80	63.64	30	52



View for motor **37M4000000**

Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD 0/-0.025	H max	L1 ±0.3	L2 ±0.2	L3 ±0.2	L4 ±0.2	RT ±0.2	W ±0.25	W1 ±0.2	W3 max	W4 ±0.2
BRUSHLESS + BRAKE (DELTA)	**37M4000000**	**0.32**	**40**	8	30	13	136.6	25	5	2.5	4.5	40	32.53	25	-
	37M4200001	**0.64**	**60**	14	50	13	141.6	30	7.5	3	5.5	60	49.5	25	40
	37M4220001	**1.27**	**60**	14	50	13	166.8	30	7.5	3	5.5	60	49.5	30	40
	37M4330001	**2.39**	**80**	19	70	13	178	35	8	3	6.6	80	63.64	30	52

METAL WORK PNEUMATIC



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

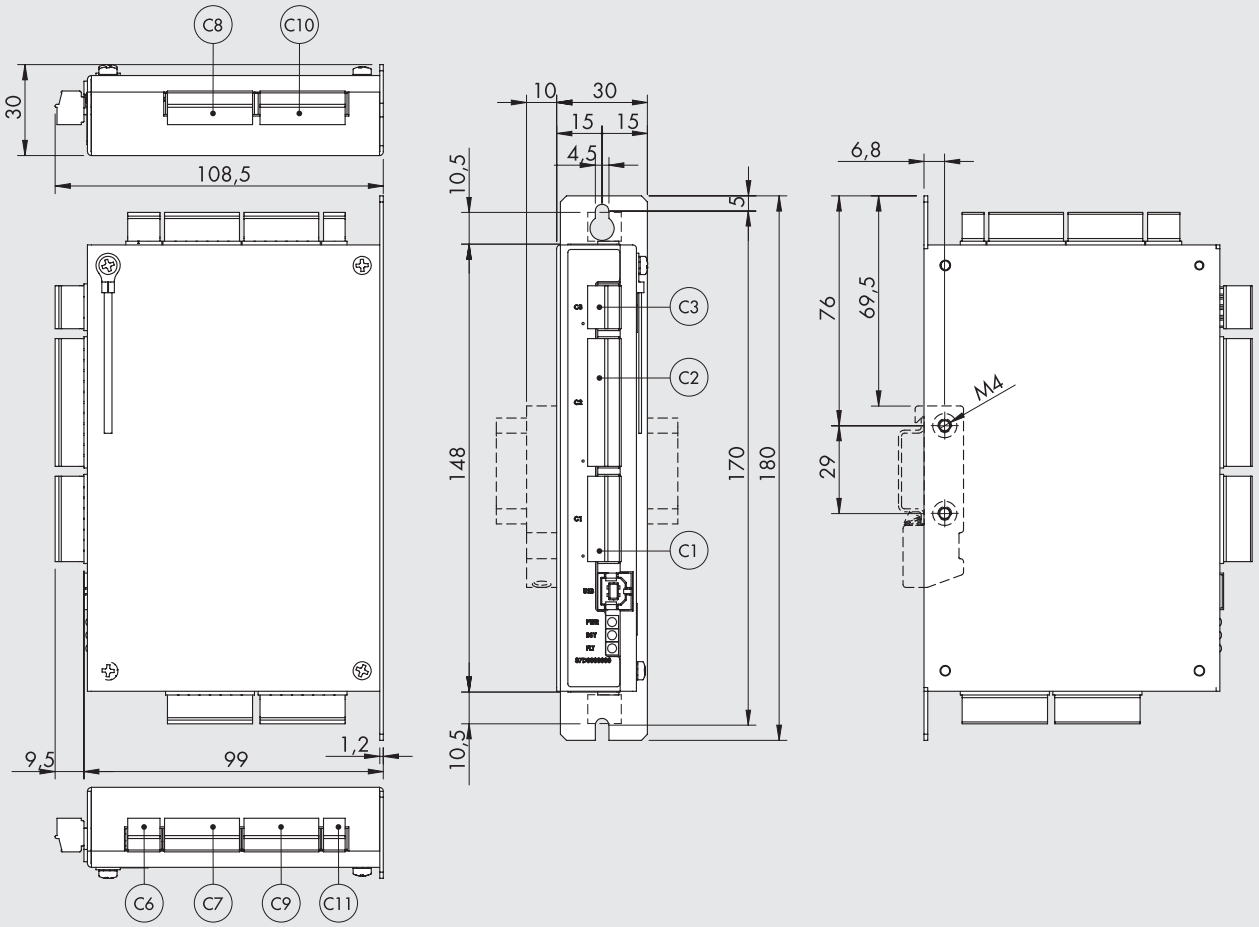
NOTES

PROGRAMMABLE UNIT
e.motion

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

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

DIMENSIONS

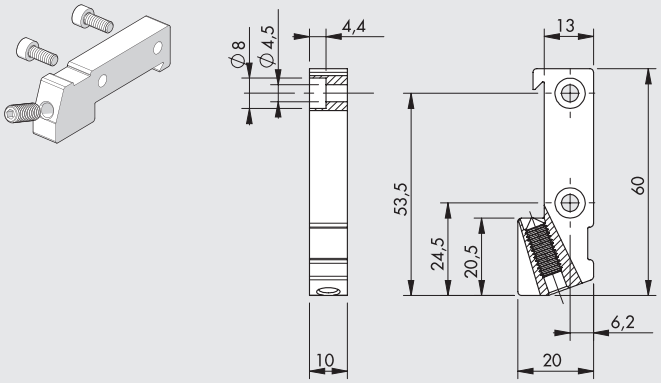


Below is a list of Phoenix Contact codes for the board connectors.

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

ACCESSORIES

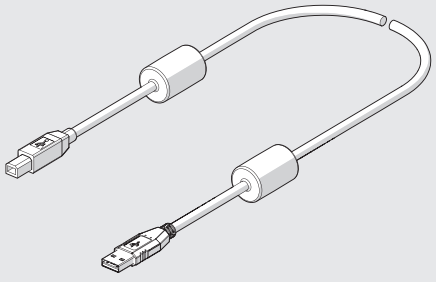
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



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

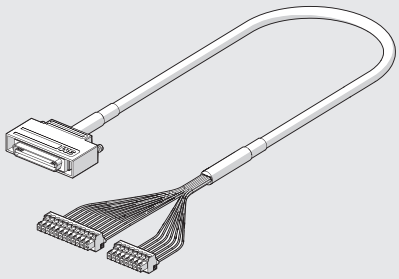
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

CABLE USB



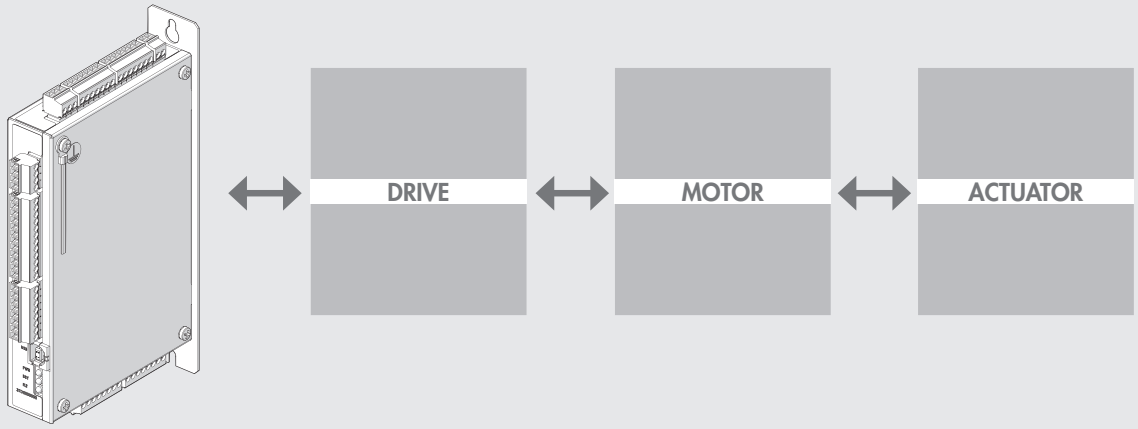
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the ***e***.motion / ***e***.drive board to a PC, 3 m	150

CABLE FOR BRUSHLESS DRIVERS



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

CONNECTION SCHEME



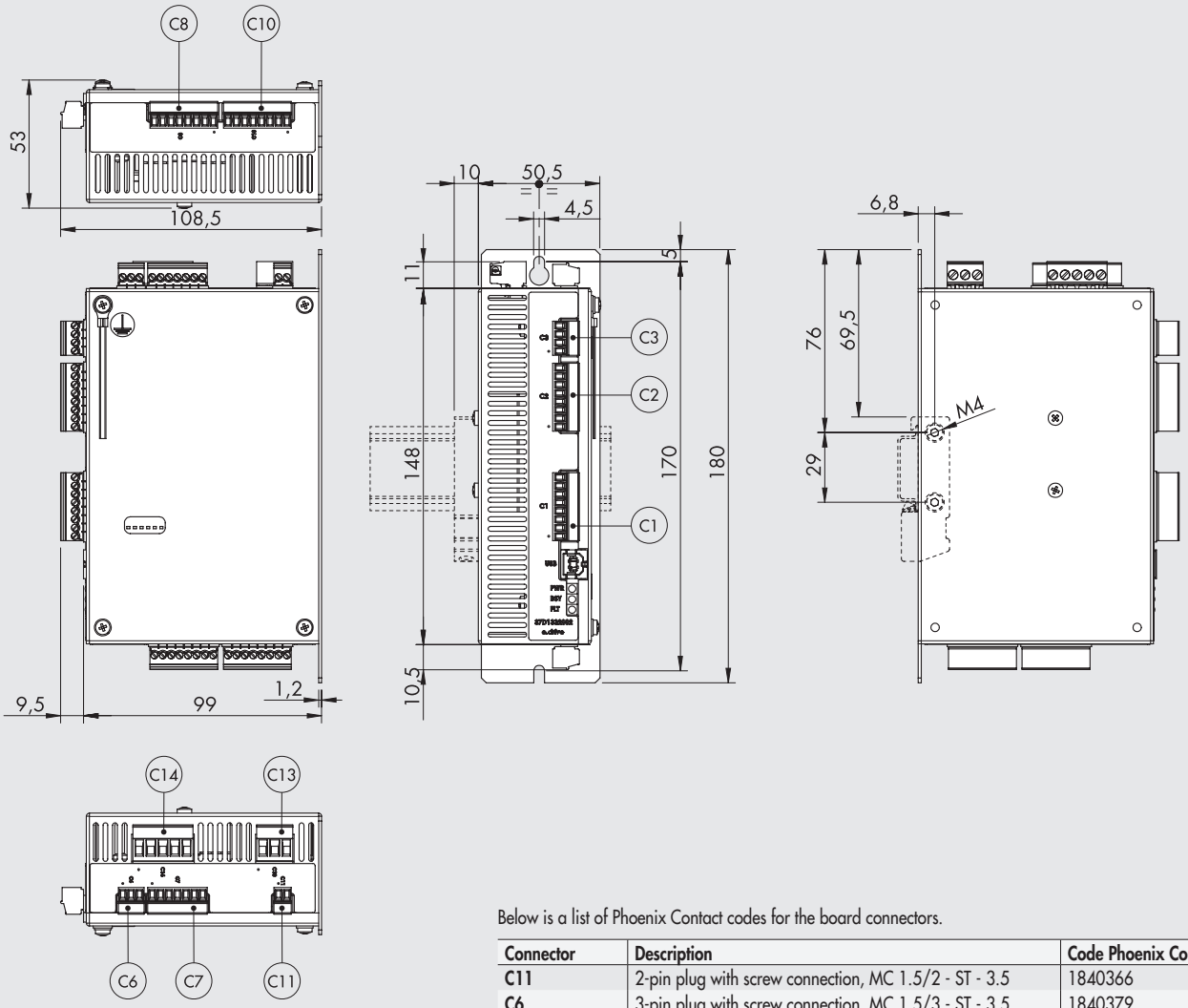
NOTES

PROGRAMMABLE STEPPING MOTOR DRIVE - *e*.drive

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

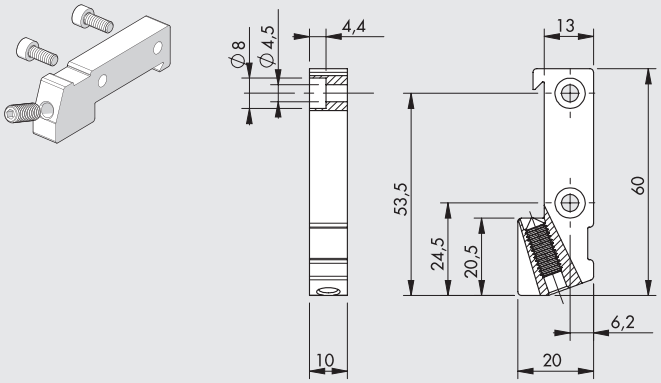


Below is a list of Phoenix Contact codes for the board connectors.

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

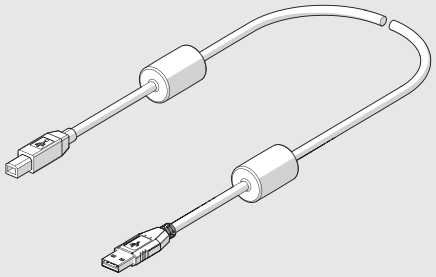
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



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

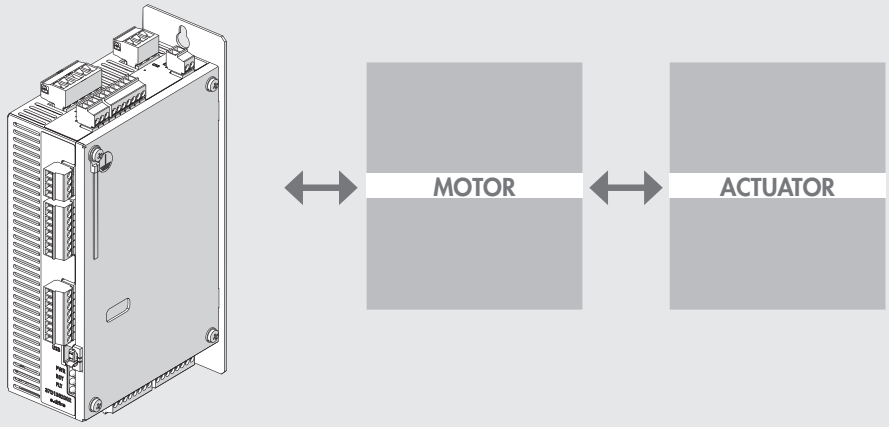
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

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

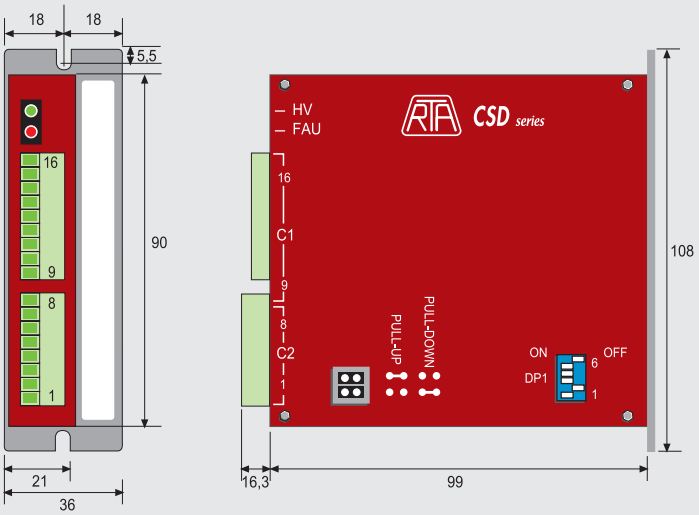
4.4A - 48VDC DRIVE FOR STEPPING MOTORS

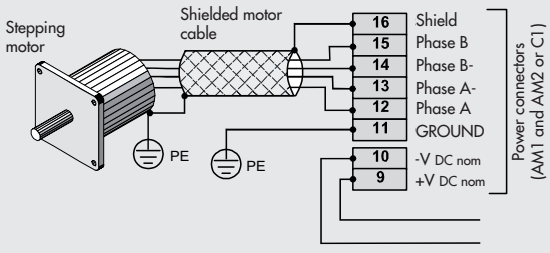
This is a ministep bipolar chopper drive made by RTA S.r.l. It comes with a STEP & DIRECTION interface for piloting low/medium-power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 48VDC, compact dimensions and considerable operating flexibility. It consists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

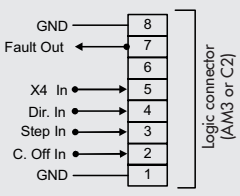
DRIVE TECHNICAL DATA

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

OVERALL DIMENSIONS AND WIRING DIAGRAM







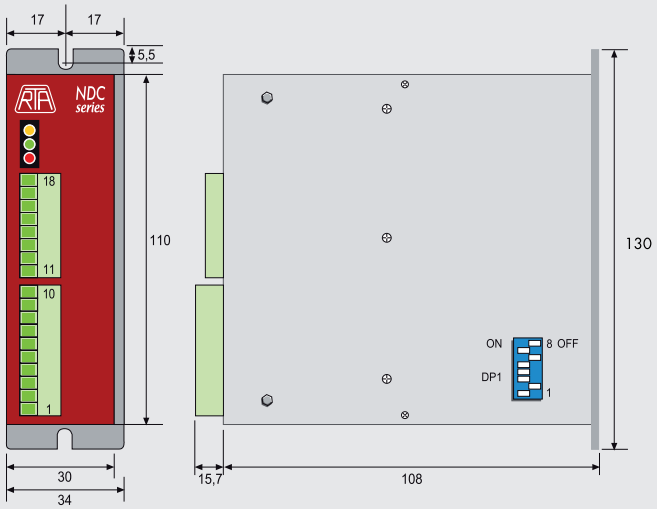
6A - 75VDC DRIVE FOR STEPPING MOTORS

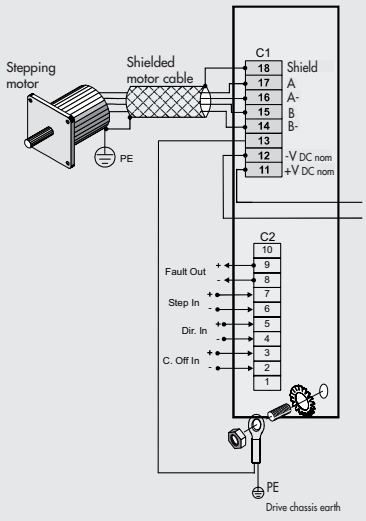
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 75VDC, compact dimensions and considerable operating flexibility. It consists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

DRIVE TECHNICAL DATA

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

OVERALL DIMENSIONS AND WIRING DIAGRAM





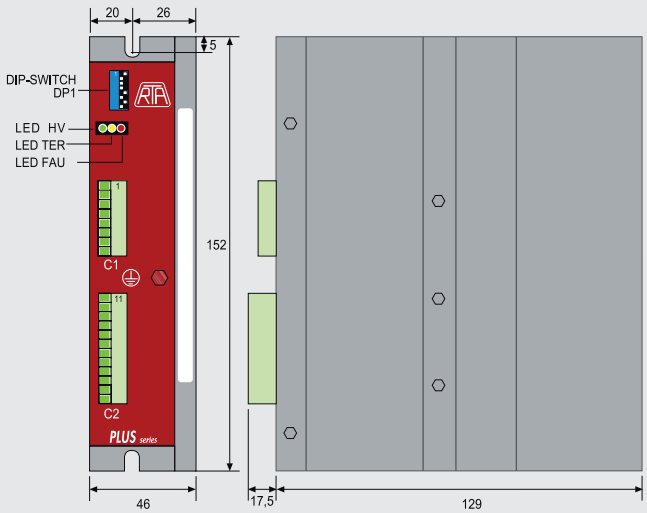
6A - 140VDC, 10A - 62VAC DRIVE FOR STEPPING MOTORS

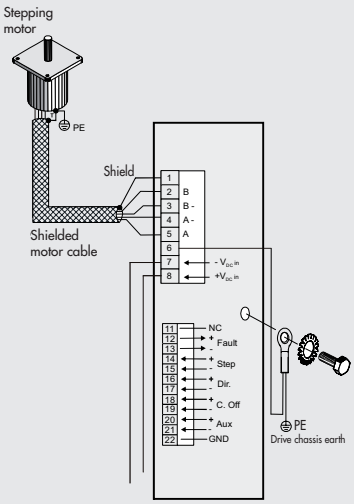
These are two ministep bipolar chopper drives made by RTA S.r.l.
They come with a STEP & DIRECTION interface for piloting medium/high-power two-stage STEPPING motors with four, six or eight terminals.
They consist of a board housed in a metal box, which does not require external ventilation, and come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

DRIVE TECHNICAL DATA

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

OVERALL DIMENSIONS AND WIRING DIAGRAM





METAL WORK PNEUMATIC

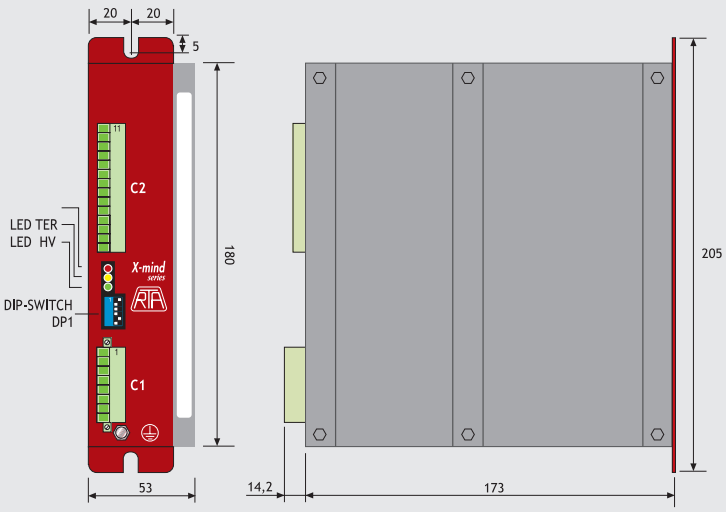
6A - 110 - 230VAC DRIVE FOR STEPPING MOTORS

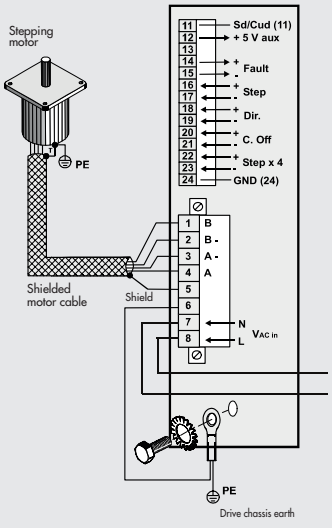
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 230VAC, compact dimensions and considerable operating flexibility. It consists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

DRIVE TECHNICAL DATA

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

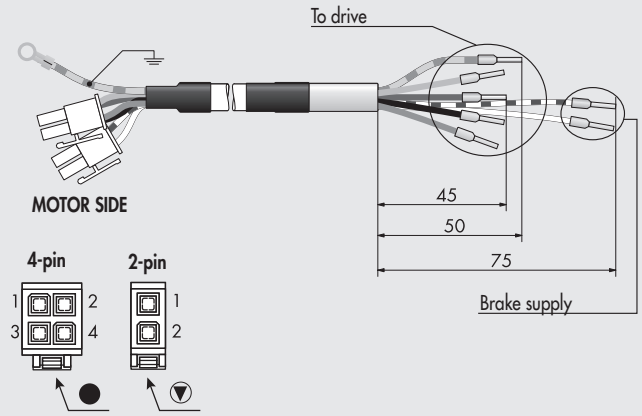
OVERALL DIMENSIONS AND WIRING DIAGRAM





CABLES FOR B&R MOTOR

POWER CABLE FOR MOTOR WITH BRAKE

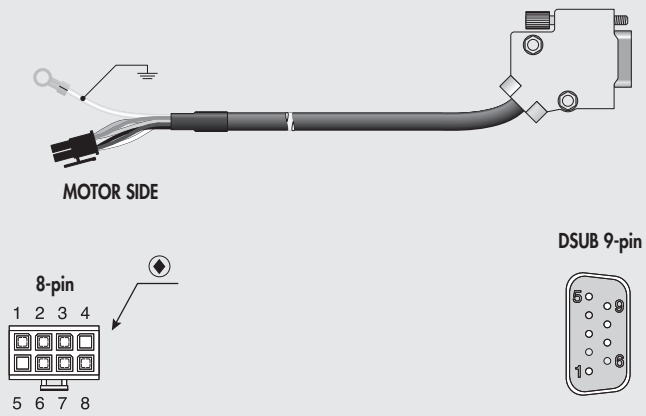


For use with stepping motors with brake and stepping motor code 37M1470000.

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

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

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

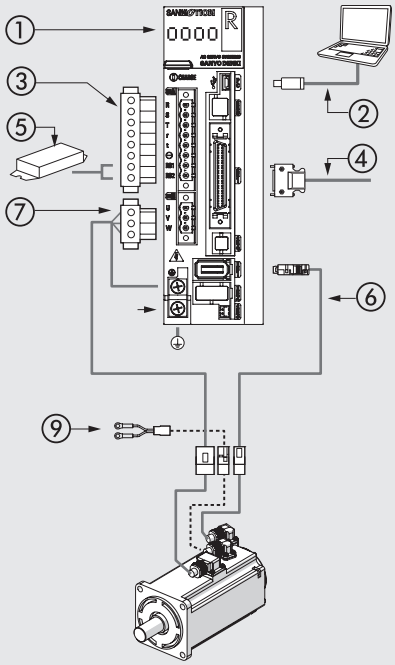
DRIVE TECHNICAL DATA		
Drive code		**37D2400008**
Nominal power		200 - 400 - 750 - 1000
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	50 x 160 x 130
Power connectors and motor power		Plug-type 3M
Encoder connectors and signals		Plug-type 3M
Max output current	A	30
Motor output stage		IGBT,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

METAL WORK PNEUMATIC

WIRING DIAGRAM FOR BRUSHLESS MOTOR DRIVES

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

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



ACCESSORIES

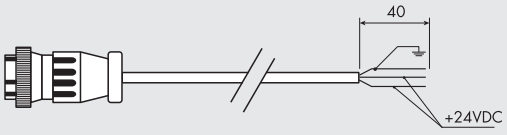
⑥ ENCODER CABLE

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

⑦ MOTOR POWER CABLE

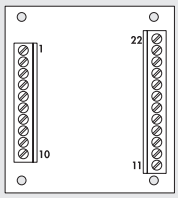
Code	Description
37C2130005	Brushless motor-drive connecting cable, 3 m
37C2150005	Brushless motor-drive connecting cable, 5 m
37C2130004	Brushless motor-drive connecting dynamic cable, 3 m
37C2150004	Brushless motor-drive connecting dynamic cable, 5 m
37C2100004	Brushless motor-drive connecting dynamic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

BRAKE CABLE



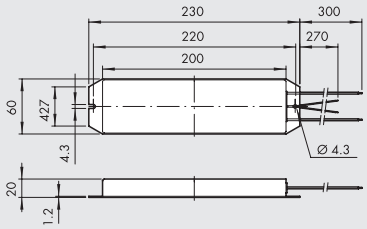
Code	Description
37C2330000	Brushless motor-brake connecting dynamic cable, 3 m
37C2350000	Brushless motor-brake connecting dynamic cable, 5 m
37C2310000	Brushless motor-brake connecting dynamic cable, 10 m

LINE-DRIVER INTERFACE BOARD



Code	Description
37D2000000	BRINT.A line driver interface board

EXTERNAL BRAKING RESISTANCES



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

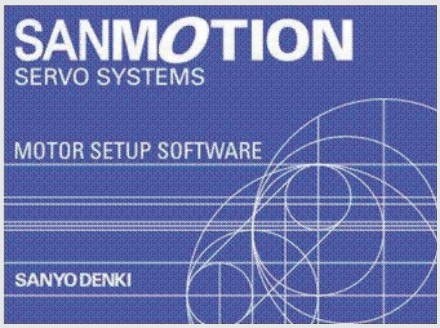
Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

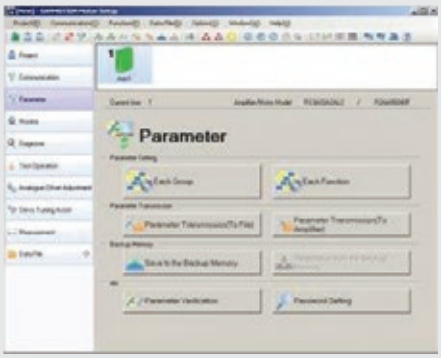
CONFIGURATION SOFTWARE

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

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

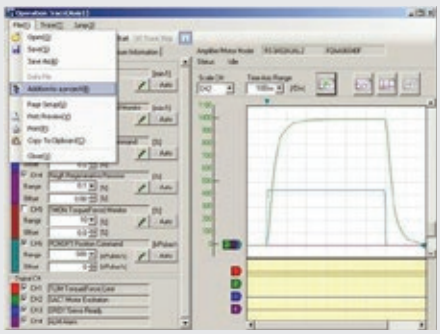
The software can freely be downloaded from Sanyo Denki website at the following link:
https://www.sanyodenki.com/products/sanmotion-softwareindex.html
file SANMOTION MOTOR Setup Software.





GRAPHIC MONITOR

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



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

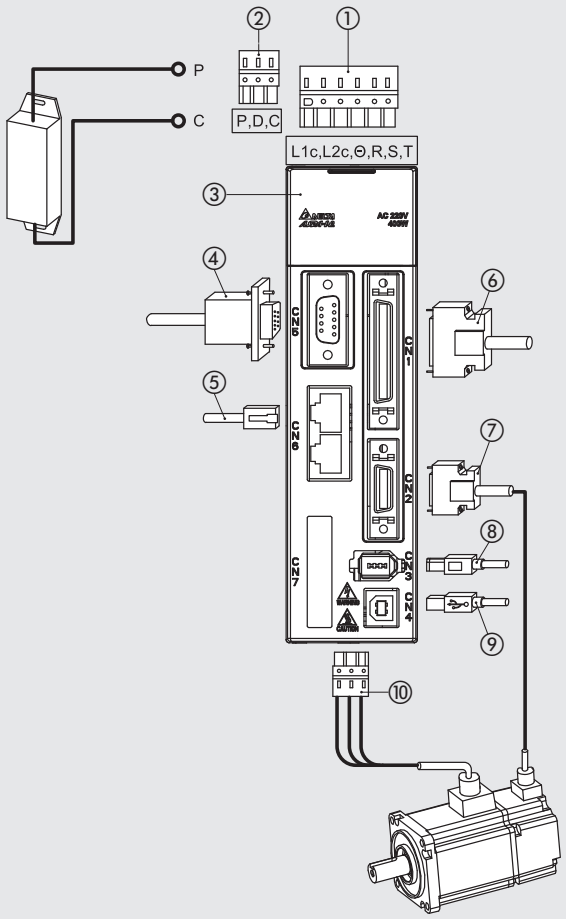
The DELTA ASD-A2-0121-M drive can only be used with a DELTA 100W motor, the DELTA ASDA-A2-0221-M drive can only be used with a DELTA 200W motor, the DELTA ASDA-A2-0421-M drive can only be used with the DELTA 400W motor, and the DELTA ASD-A2-0721-M drive can only be used with a DELTA 750W motor.
The drives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

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

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

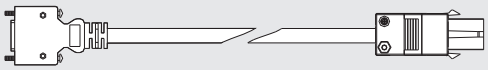
① POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). **Included in the supply**.
Separate supply section for logic/signal and power electronics.
Integrated circuits protecting against overloads and input extra-voltages.
② CONNECTOR: for external braking resistance code 37D2R00000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

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



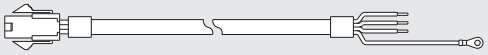
ACCESSORIES

⑦ ENCODER CABLE



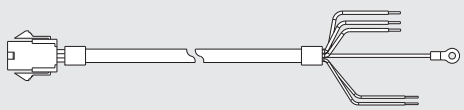
Code	Description
37C2230001	100W-750W brushless motor-drive-encoder connecting cable, 3 metres
37C2250001	100W-750W brushless motor-drive-encoder connecting cable, 5 metres
37C2230002	100W-750W brushless motor-drive-encoder connecting dynamic cable, 3 metres
37C2250002	100W-750W brushless motor-drive-encoder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

⑩ MOTOR POWER CABLE



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

MOTOR POWER CABLE + BRAKE



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

DRIVE FOR 3kW DELTA BRUSHLESS MOTORS

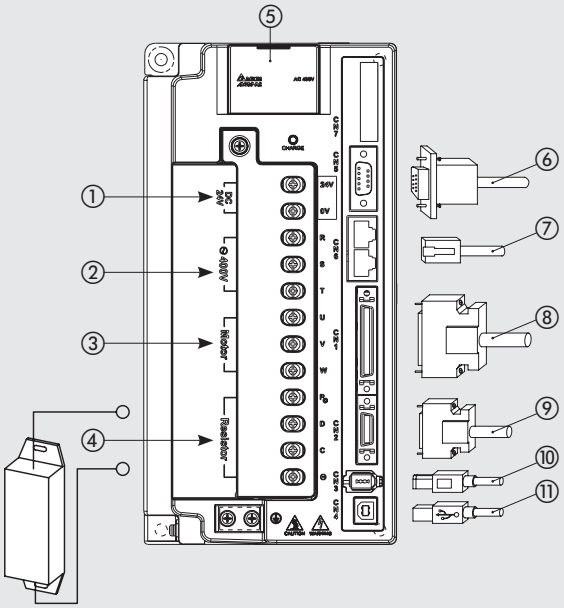
It is a DELTA ASDA-A2-3043-M drive to be used only with a DELTA 3kW motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

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

WIRING DIAGRAM FOR 3kW BRUSHLESS MOTOR DRIVES

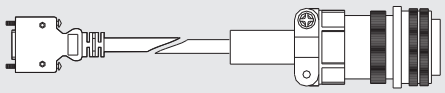
① LOGIC POWER CONNECTOR: 24VDC.
Included in the supply. Power section for logic electronics.
② POWER CONNECTOR: 400VAC, three-phase.
Included in the supply. Power signal supply section.
Integrated circuits protected against overload, input extra-voltages.
③ MOTOR POWER CONNECTOR
④ CONNECTOR: for external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

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



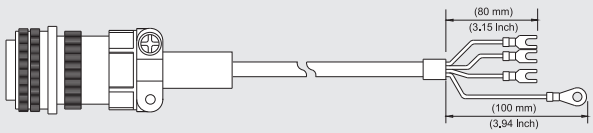
ACCESSORIES

⑥ CAVO ENCODER



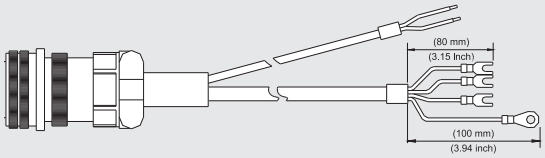
Code	Description
37C3230001	3kW Brushless motor-drive-encoder connecting cable, 3 m
37C3250001	3kW Brushless motor-drive-encoder connecting cable, 5 m

⑦ MOTOR POWER CABLE



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

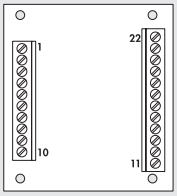
MOTOR POWER CABLE + BRAKE



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

ACCESSORIES FOR DELTA DRIVES

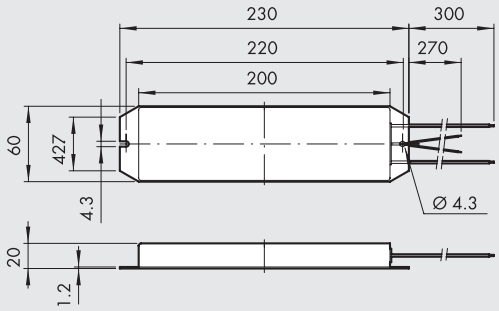
LINE-DRIVER INTERFACE BOARD



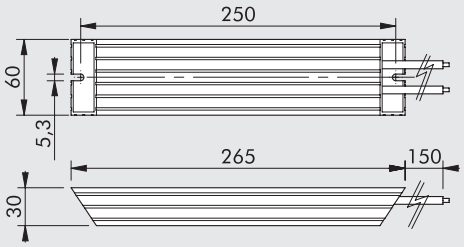
Code	Description
37D2000000	BRINT.A line driver interface board

EXTERNAL BRAKING RESISTANCES

220W



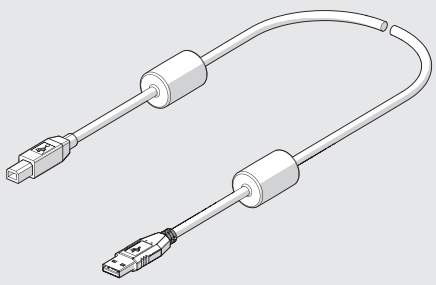
400W



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

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

CABLE USB



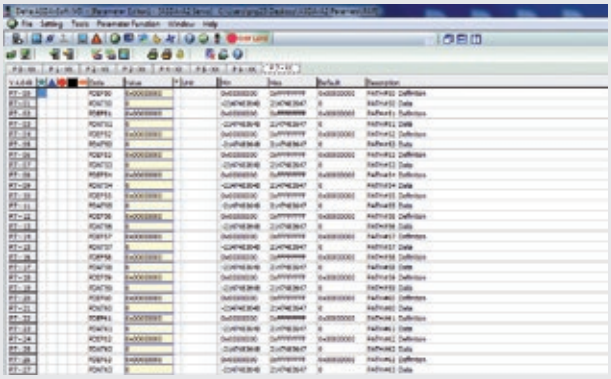
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the drive brushless to a PC, 3 m	150

CONFIGURATION SOFTWARE ASDASoft

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

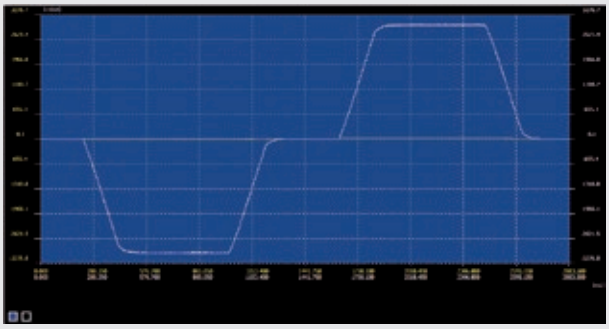
- Status Monitor: real-time display of all details about the system.
- Data Scope: a complete oscilloscope with 4 channels that can be selected as desired among analogue and digital signals.
- System Analisis: used to study the system's frequency response to identify and correct any mechancal resonance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

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



GRAPHIC MONITOR

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



NOTES