

ELECTRIC AXIS BELT-DRIVEN RODLESS, SERIES ELEKTRO BK

Electric belt-drive rodless axis with a bearing structure made up of anodized extruded aluminium.

The typical V-Lock dovetail is fitted to the extruded side (opposite the slide), which facilitates the fixing using QS elements; at both sides there are grooves for the installation of the bracket fixing the proximity switch (optional), which detects the position of the slide.

The slide is moved by the polyurethane toothed belt with steel cables.

The parabolic profile of the belt tooth makes it possible to maintain a high efficiency level, contain the level of noise and vibration from transmission gears.

The axis is available in two sizes, BK-1 and BK-2.

The slide interface is characterised by the V-Lock profile complete with M5 threaded holes, pinholes and key seats, which guarantees numerous fixing options (not present in the BK-2 heavy XL version).

All the versions have in-line steel guides that are housed in an extruded structure. The BK-1 size is available in two variants: the "Medium" uses castors running along hardened and tempered guides with double-row ball bearings, and the more performing "Heavy" version consists of a guiding system with a rail and ball recirculation pads.

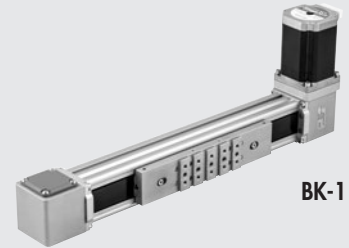
The BK-2 size is available in two variants, both with rail and ball recirculation pads, the "Heavy" type has two pads and the "Heavy XL" has a longer slide and four pads. In the BK-2 size, the belt has a special profile that, when coupled with the extruded profile, prevents any dirt or foreign bodies from entering inside. BRUSHLESS and STEPPING motors are available, with optional motor brake and/or built-in encoder.

The versions with a BRUSHLESS motor can be equipped with a toothed belt speed reducer or a planetary gearbox.

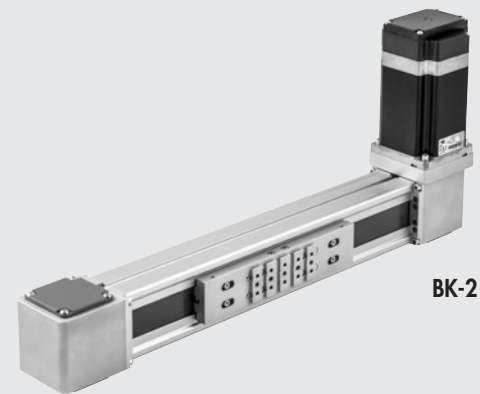
The electric axis can be ordered without drive or, on request, with modules for interfacing with motors available from the trade.

The motors can be installed on all the four hubs of the heads, and their position can be changed at any time, without requiring any additional operation.

Various accessory kits for the installation of a gantry system starting from one axis are also available.



BK-1



BK-2

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

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

■ Maximum load admissible on the belt: for the sizing, perform the checks as shown in the following pages.

▲ Compact configuration with the motor shaft partially inserted into the pulley axle.

◆ A different version of guide and recirculating pads are required for travels over 1800 mm, with reduced speed.

* Values referring to travels >1800

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

MASS AND MOMENT OF INERTIA		BK-1		BK-2	
		Medium	Heavy	Heavy	Heavy XL
Moving mass at stroke 0 (Mx)	g	570	625	1125	3038
Moving mass for each mm of stroke	g	0.22		0.33	
J ₀ at stroke 0	kg mm ²	72		411	
J ₁ each metre of stroke	kgmm ² /m	68		164	
J ₂ each kg of load	kgmm ² /kg	307		497	
J ₃ <small>belt transmission 1:2</small>	kg mm ²	32		130	

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

$$\tau = 1/u$$

u = Gearing ratio

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

$J_3 = J_{\text{gear ratio}}$ (to be used, if present)

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

$$K = \frac{J_{total}}{J_{motor}} \quad \begin{array}{ll} 1 < K < 15 & \text{with STEPPING motors} \\ 1 < K < 40 & \text{with BRUSHLESS motors} \end{array}$$

These figures apply to motors supplied by Metal Work. Motors of other makes could require different maximum values.

This limit also depends on the level of control of the required movement: e.g. if the movements need to be coordinated, the ratio between the inertias must be considerably reduced. Indicatively, it is **advisable NOT to exceed** the following values:

$$\begin{array}{ll} 1 < K < 5 & \text{with STEPPING motors} \\ 1 < K < 10 & \text{with BRUSHLESS motors} \end{array}$$

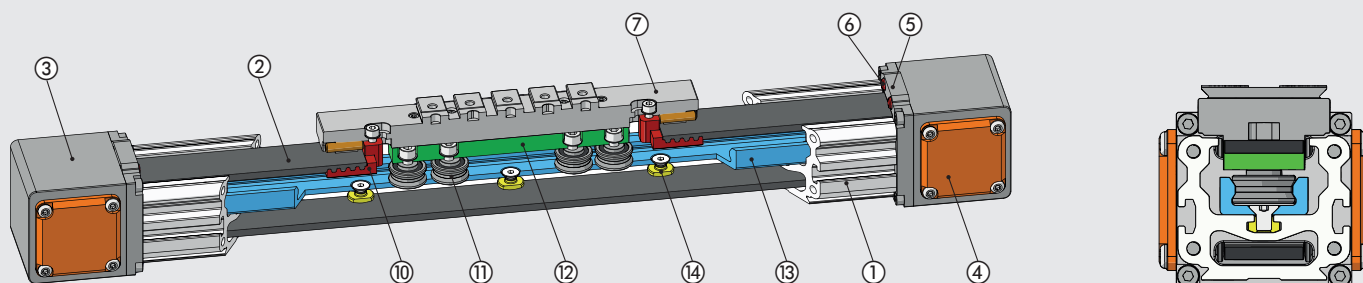
It is worth noting that system operation can be enhanced by varying the drive parameters.

For BRUSHLESS motors supplied by Metal Work, a "tuning" procedure is envisaged to optimise motor operation depending on the mechanics applied to the axle. For STEPPING motors, it is advisable to try to select a different step of rotation.

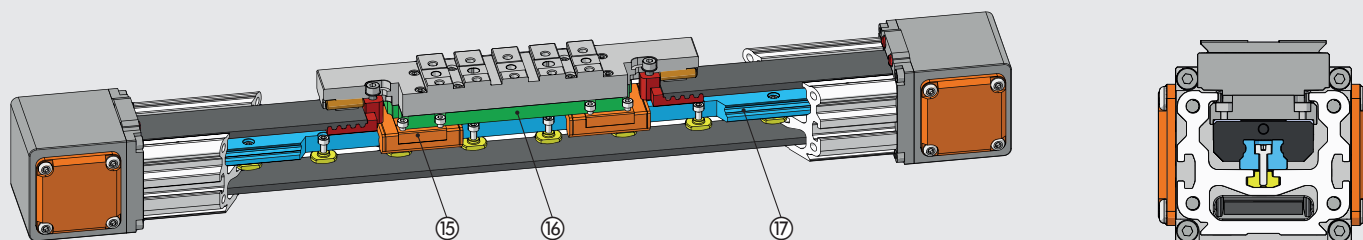
NOTES

COMPONENTS BK-1

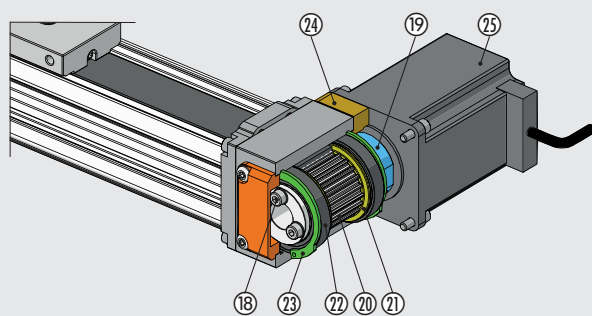
Medium (GUIDE AND STEEL WHEELS)



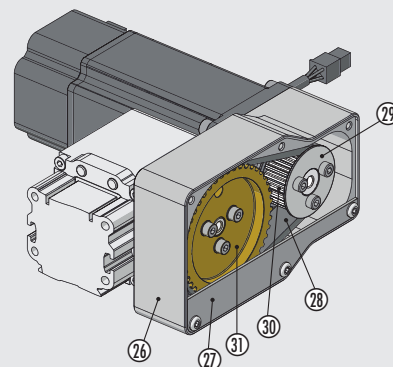
Heavy (STEEL GUIDE AND PADS BALL-RECIRCULATION)



VERSION WITH MOTOR



VERSION WITH 1:2 BELT GEARED MOTOR

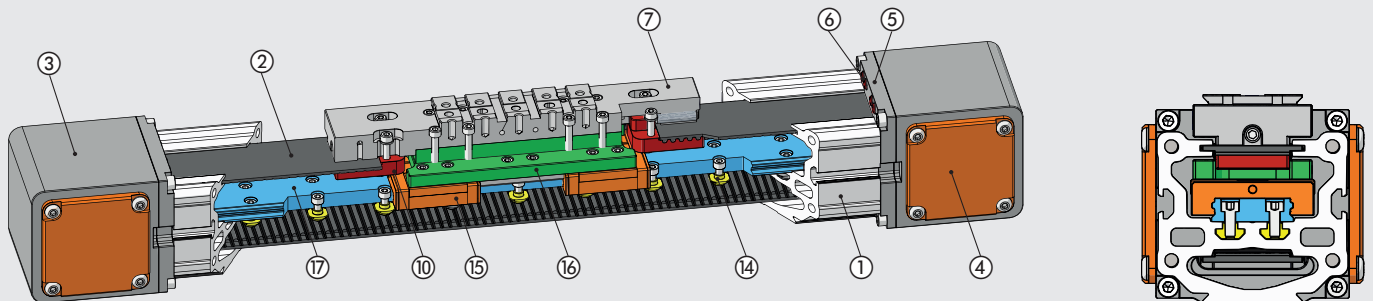


- ① BARREL: anodized aluminium
- ② TOOTHED BELT: polyurethane with steel cables
- ③ HEAD: anodized aluminium
- ④ COVER: painted aluminium
- ⑤ HEAD SUPPORT: anodized aluminium
- ⑥ BUFFER: polyurethane
- ⑦ SLIDE WITH V-LOCK INTERFACE: anodized aluminium
- ⑩ BELT-LOCKING PLATE: anodized aluminium
- ⑪ WHEEL WITH DOUBLE-ROW BALL BEARING: hardened steel
- ⑫ SLIDING BEARING SUPPORT: anodized aluminium
- ⑬ GUIDING RAIL FOR STEEL WHEELS: hardened steel
- ⑭ GUIDE-LOCKING INSERT: stainless steel
- ⑮ BALL RECIRCULATION PAD: stainless steel / technopolymer
- ⑯ PAD SUPPORT: anodized aluminium
- ⑰ GUIDING RAIL FOR PADS: hardened stainless steel

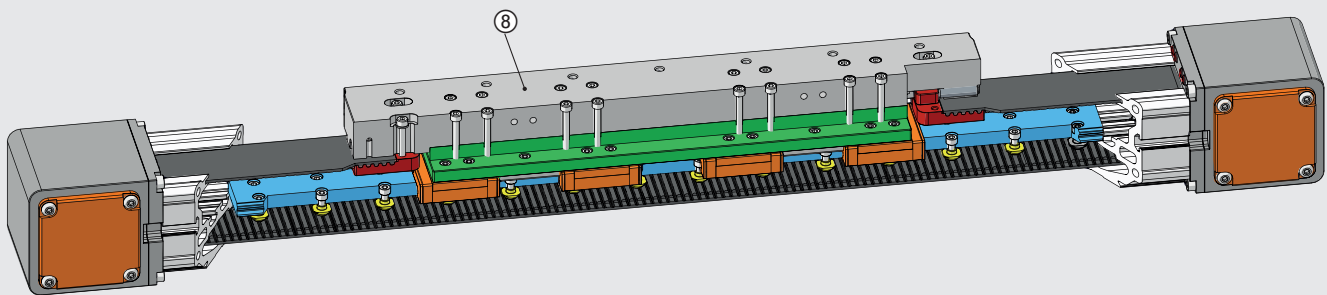
- ⑱ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
- ⑲ ELASTIC COLLAR: anodized aluminium
- ⑳ COG PULLEY: nickel-plated aluminium
- ㉑ BELT FLANGES: zinc-plated steel
- ㉒ SHIELDED BALL BEARING: hardened steel
- ㉓ BEARING-LOCKING SNAP RING: zinc-plated steel
- ㉔ MOTOR-FIXING FLANGE: anodized aluminium
- ㉕ MOTOR
- ㉖ GEARED MOTOR BEARING: anodized aluminium
- ㉗ TRANSMISSION GUARD: anodized aluminium
- ㉘ TOOTHED BELT: polychloroprene with glass fiber cables
- ㉙ BELT FLANGES: anodized aluminium
- ㉚ DRIVE PULLEY: nickel-plated aluminium
- ㉛ IDLE PULLEY: nickel-plated aluminium

COMPONENTS BK-2

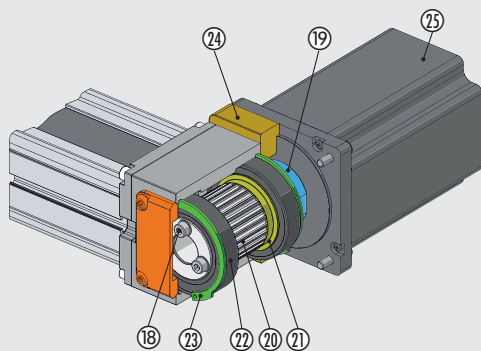
Heavy (STEEL GUIDE AND 2 PADS BALL-RECIRCULATION)



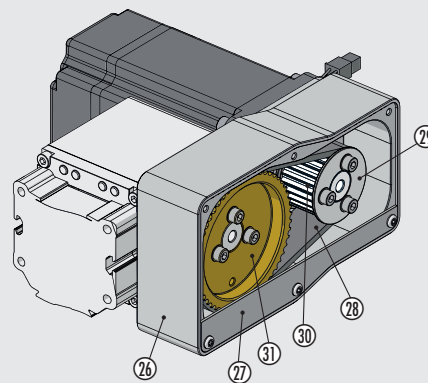
Heavy XL (LONG SLIDE, STEEL GUIDE AND 4 BALL RECIRCULATION PADS)



VERSION WITH MOTOR



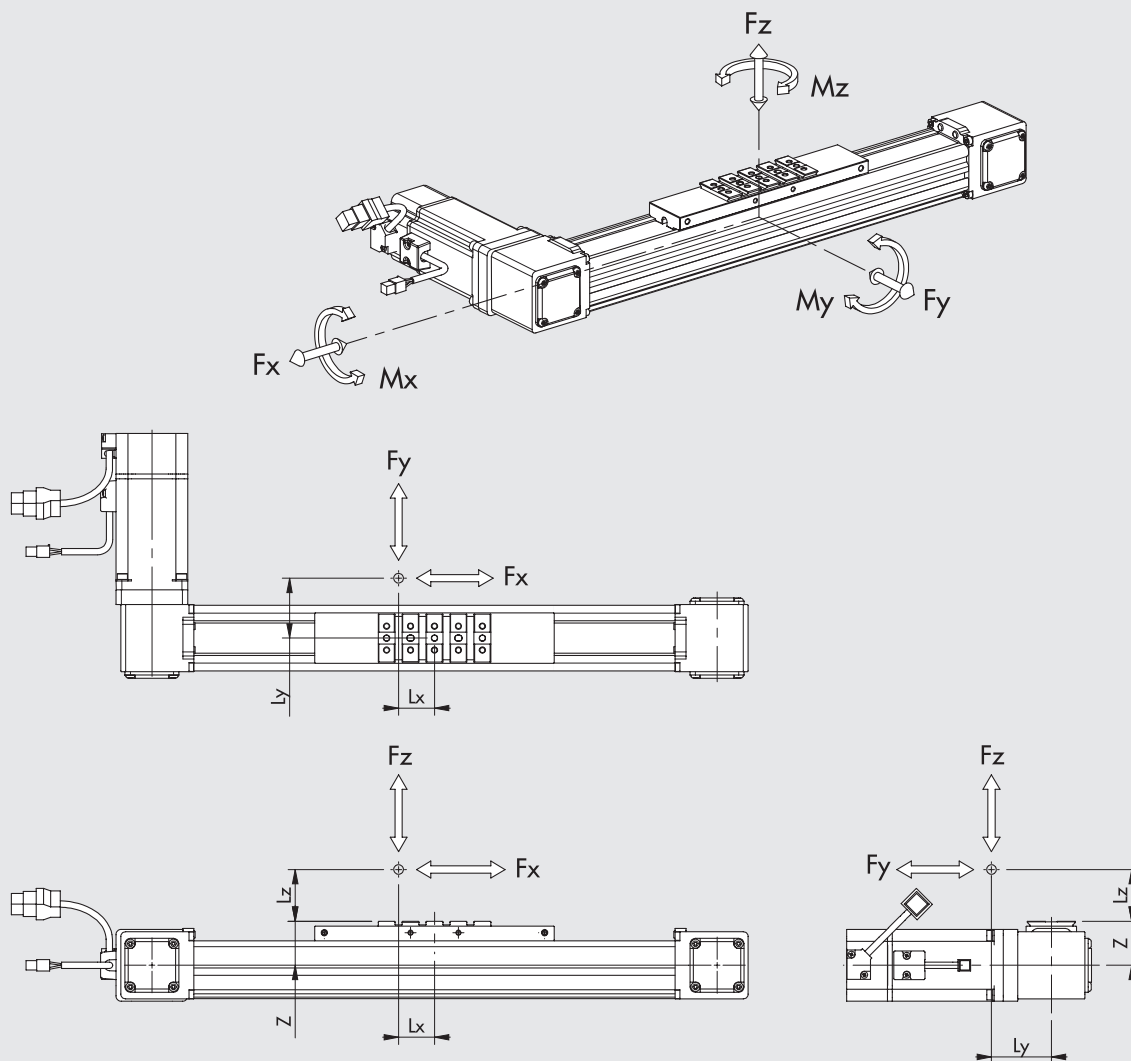
VERSION WITH 1:2 BELT GEARED MOTOR



- ① BARREL: anodized aluminium
- ② TOOTHED BELT: polyurethane with steel cables
- ③ HEAD: anodized aluminium
- ④ COVER: painted aluminium
- ⑤ HEAD SUPPORT: anodized aluminium
- ⑥ BUFFER: polyurethane
- ⑦ SLIDE WITH V-LOCK INTERFACE: anodized aluminium
- ⑧ LONG SLIDE WITH THREADED HOLES: anodized aluminium
- ⑩ BELT-LOCKING PLATE: anodized aluminium
- ⑭ GUIDE-LOCKING INSERT: stainless steel
- ⑮ BALL RECIRCULATION PAD: stainless steel / technopolymer
- ⑯ PAD SUPPORT: anodized aluminium
- ⑰ GUIDING RAIL FOR PADS: hardened stainless steel
- ⑱ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
- ⑲ ELASTIC COLLAR: anodized aluminium
- ⑳ COG PULLEY: nickel-plated aluminium

- ㉑ BELT FLANGES: zinc-plated steel
- ㉒ SHIELDED BALL BEARING: hardened steel
- ㉓ BEARING-LOCKING SNAP RING: zinc-plated steel
- ㉔ MOTOR-FIXING FLANGE: anodized aluminium
- ㉕ MOTOR
- ㉖ GEARED MOTOR BEARING: anodized aluminium
- ㉗ TRANSMISSION GUARD: anodized aluminium
- ㉘ TOOTHED BELT: polychloroprene with glass fiber cables
- ㉙ BELT FLANGES: anodized aluminium
- ㉚ DRIVE PULLEY: nickel-plated aluminium
- ㉛ IDLE PULLEY: nickel-plated aluminium

DIAGRAM OF FORCES AND MOMENTS



STATIC VERIFICATION

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

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

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

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

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

DYNAMIC VERIFICATION

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

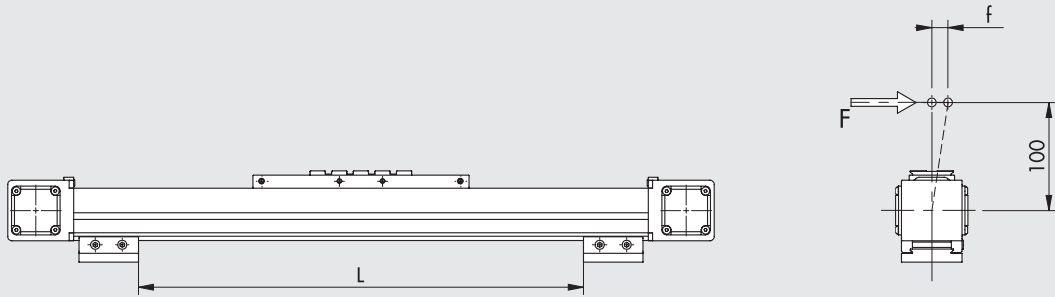
SIZE	VERSION	Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
BK-1	Medium	33	1000	600	12	40	90
	Heavy	35	2850	2850	20	285	285
BK-2	Heavy	45	4800	4800	75	485	485
	Heavy XL	45	9600	9600	150	1700	1700

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

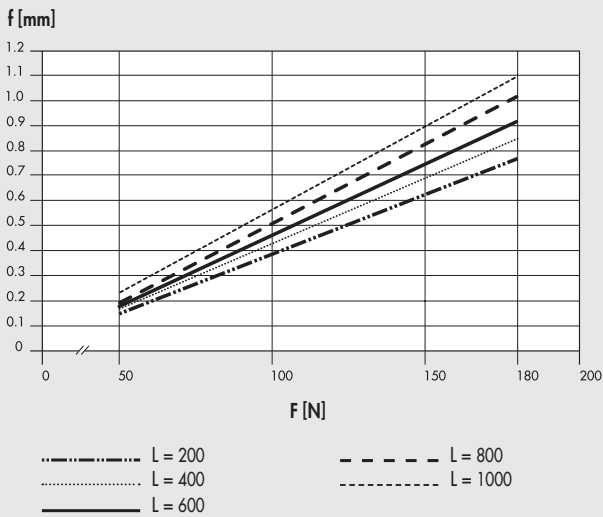
$$M_x = F_z \cdot L_y + F_y \cdot (L_z + z) \quad M_y = F_z \cdot L_x + F_x \cdot (L_z + z) \quad M_z = F_y \cdot L_x + F_x \cdot L_y$$

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

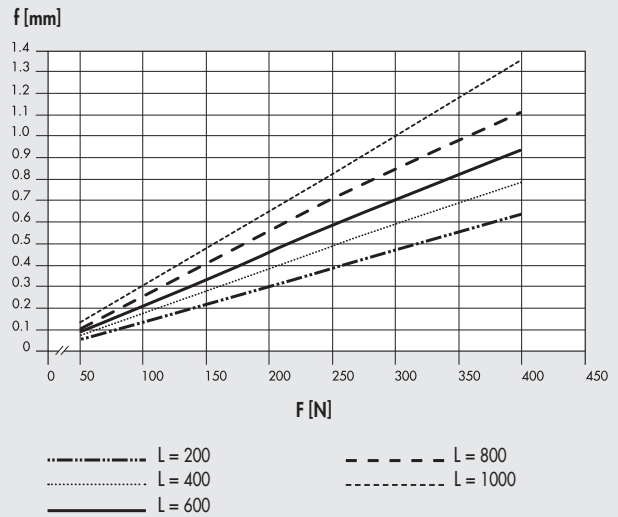
DEFORMATION ACCORDING TO LOAD WITH MISALIGNED LOAD



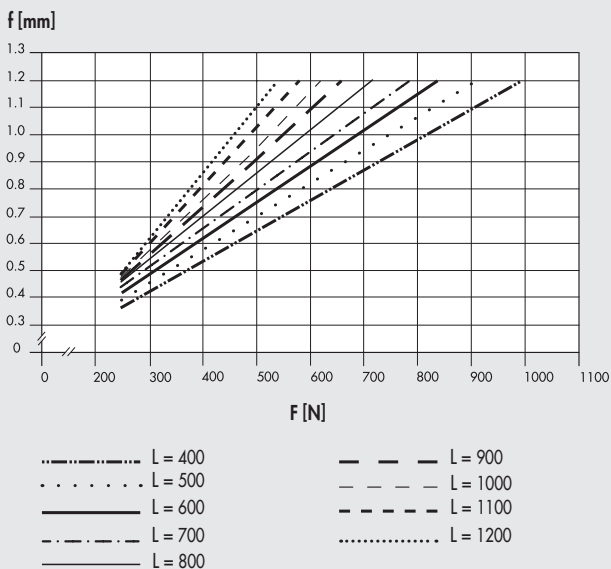
BK-1 Medium
(guide and steel wheels)



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

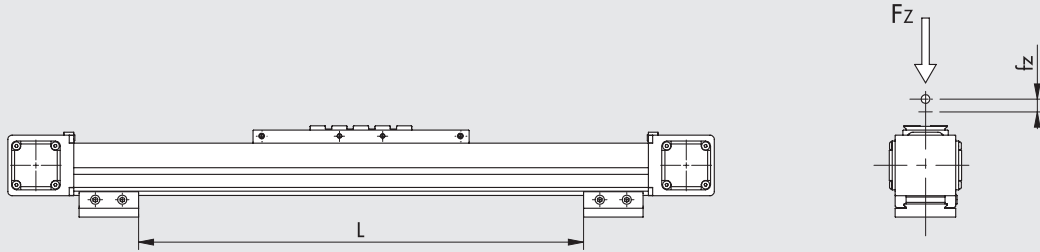


BK-2 Heavy and BK-2 Heavy XL

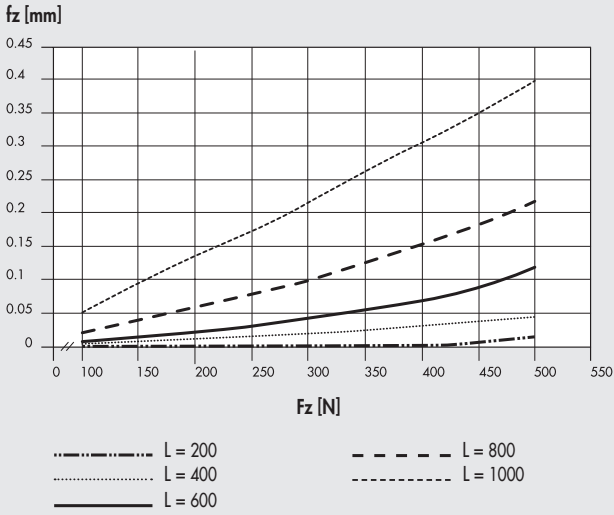


N.B.: The deformations shown in the graphs have been measured under static conditions.

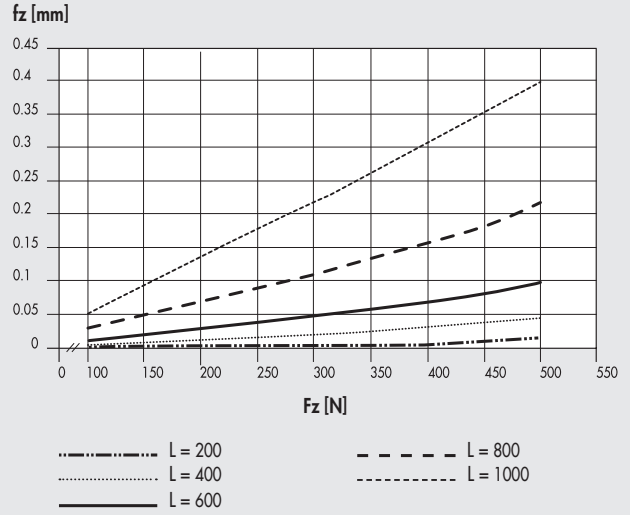
DEFORMATION ACCORDING TO LOAD WITH ALIGNED LOAD



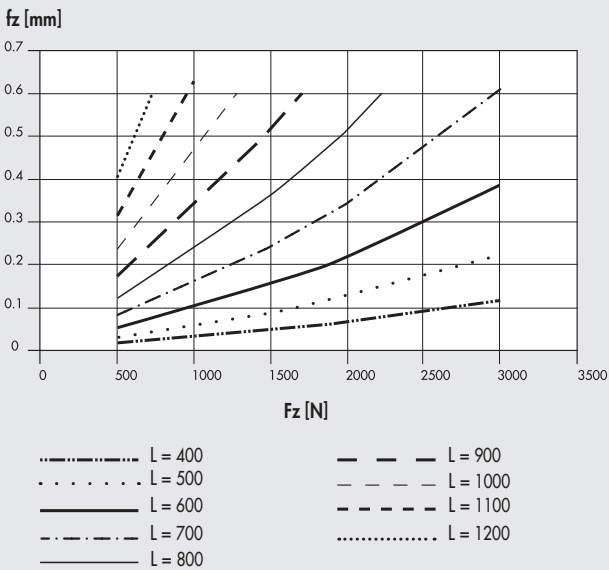
BK-1 Medium
(guide and steel wheels)



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

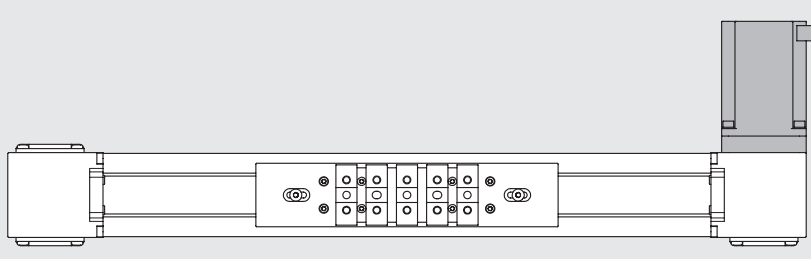


BK-2 Heavy and BK-2 Heavy XL

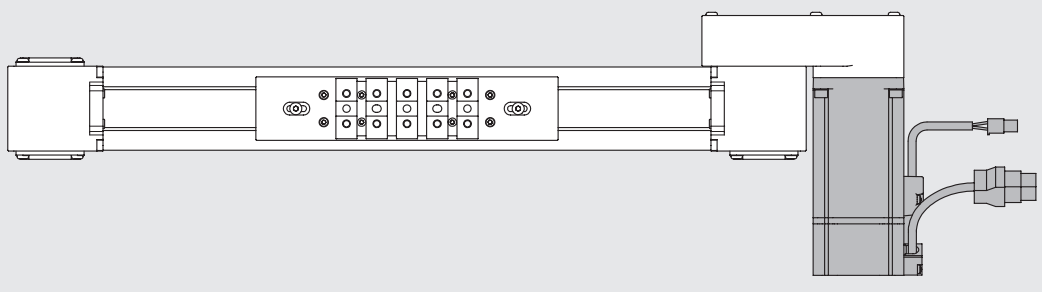


N.B.: The deformations shown in the graphs have been measured under static conditions.

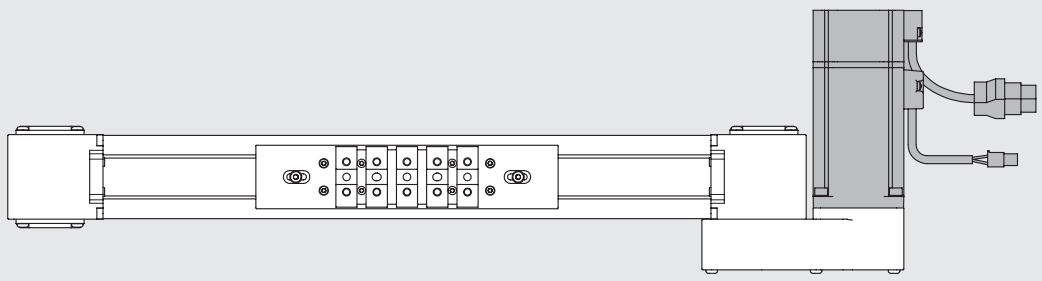
VERSIONS



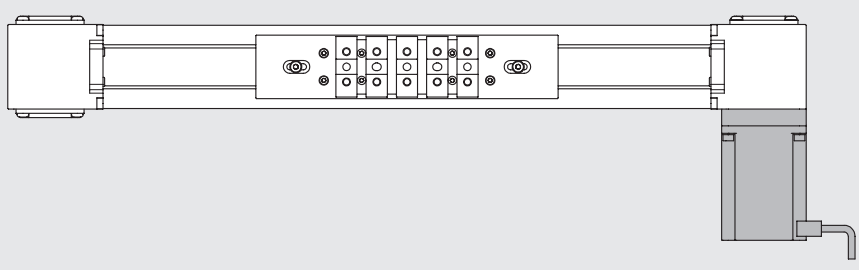
RIGHT MOTOR



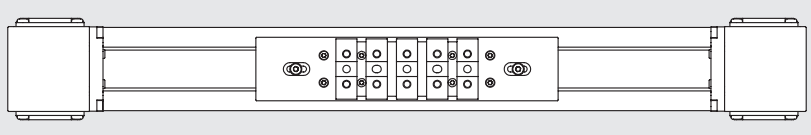
RIGHT GEARED MOTOR



LEFT GEARED MOTOR



LEFT MOTOR



WITHOUT MOTOR

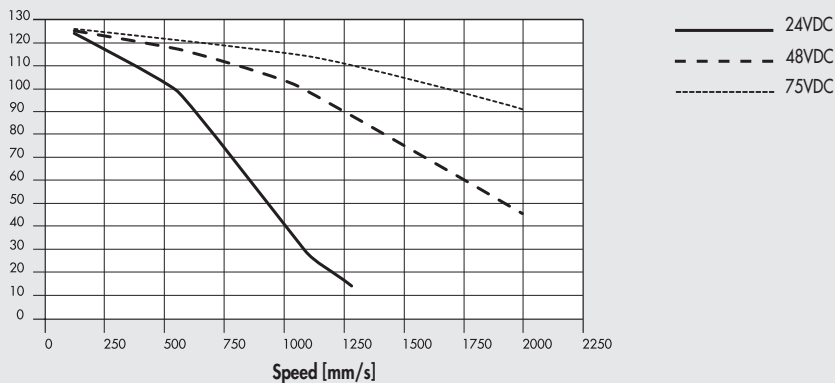
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (AXIS COMPELTE WITH MOTOR AND DRIVE) BK-1

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

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

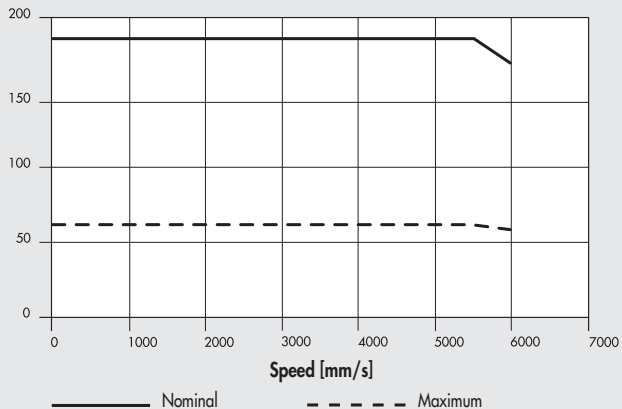
STEPPING motor code 37M1230000

Axial load [N]

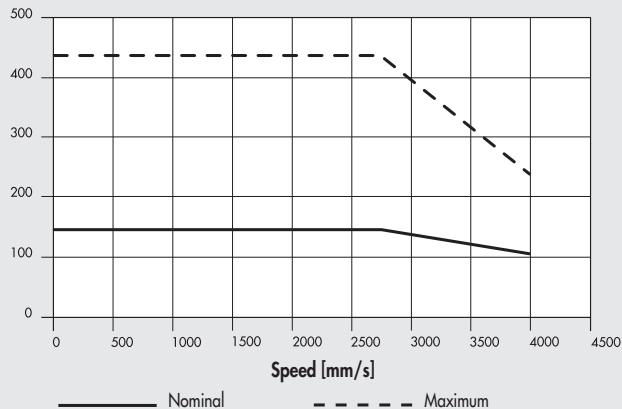


BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

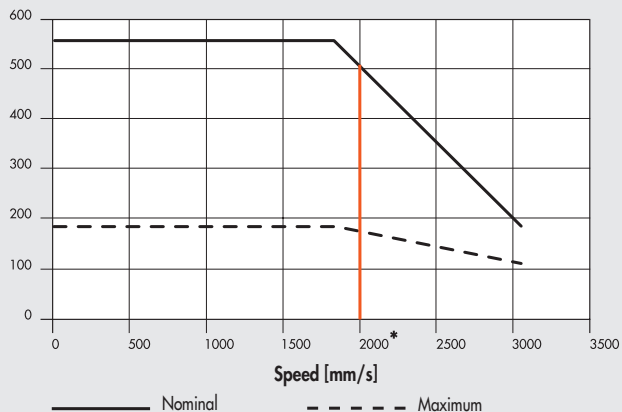
Direct type
 Axial load [N]



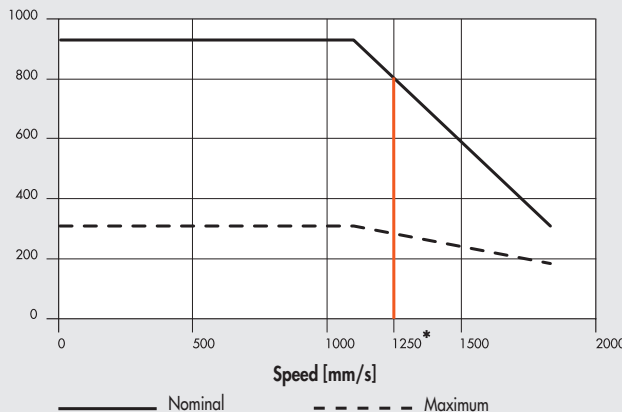
Belt reduction gear 1:2
 Axial load [N]



With 1:3 gearbox
 Axial load [N]



With 1:5 gearbox
 Axial load [N]



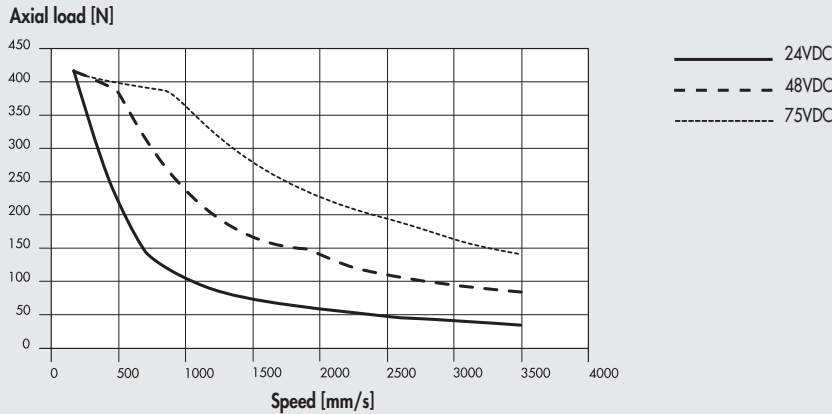
* = limit of gearbox continuous operation: higher speeds can be reached only for "duty cycle" ≤60% and for a maximum number of 1000 accelerations per hour.

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

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

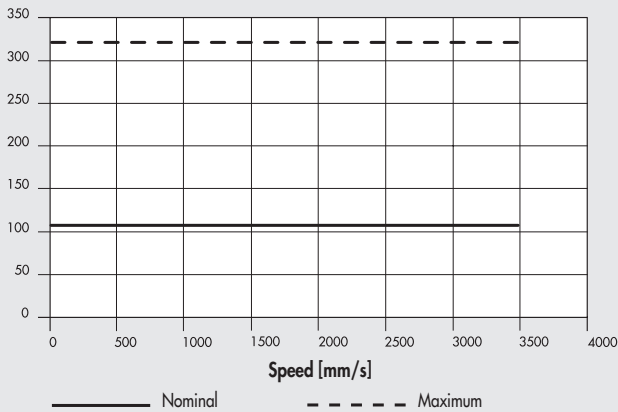
N.B.: The obtainable load values already take the efficiency of the system into account.
 For **STEPPING** motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

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

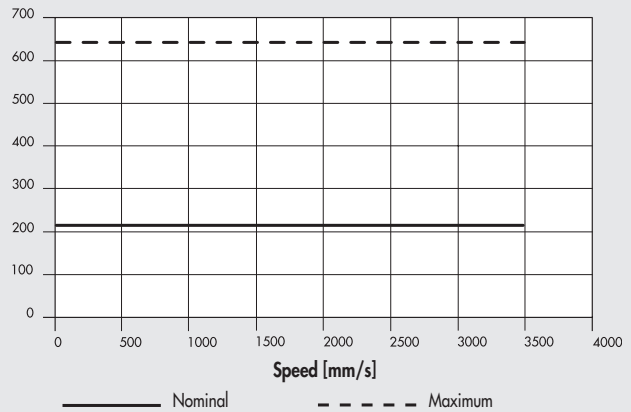


BRUSHLESS motors code 37M2330001 and code 37M4330001 (with brake)

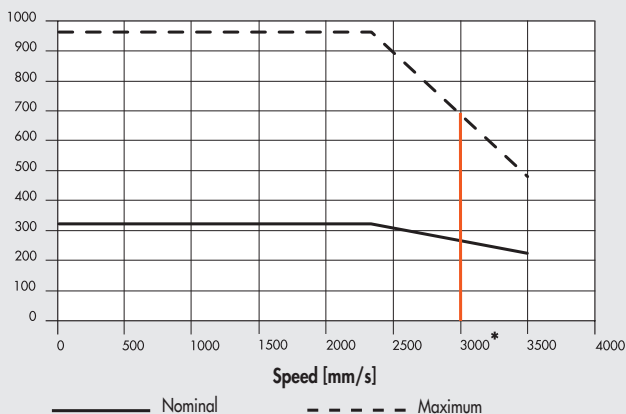
Direct type
 Axial load [N]



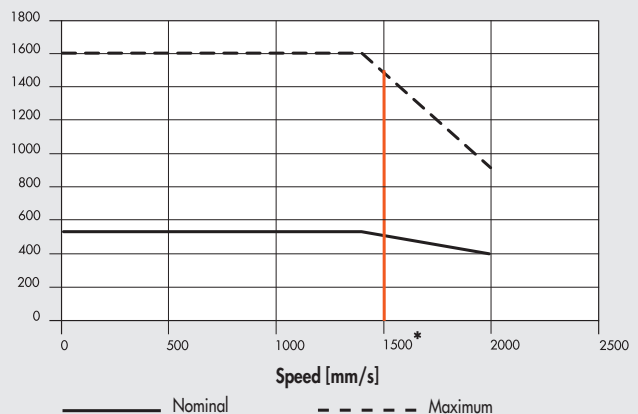
Belt reduction gear 1:2
 Axial load [N]



With 1:3 gearbox
 Axial load [N]

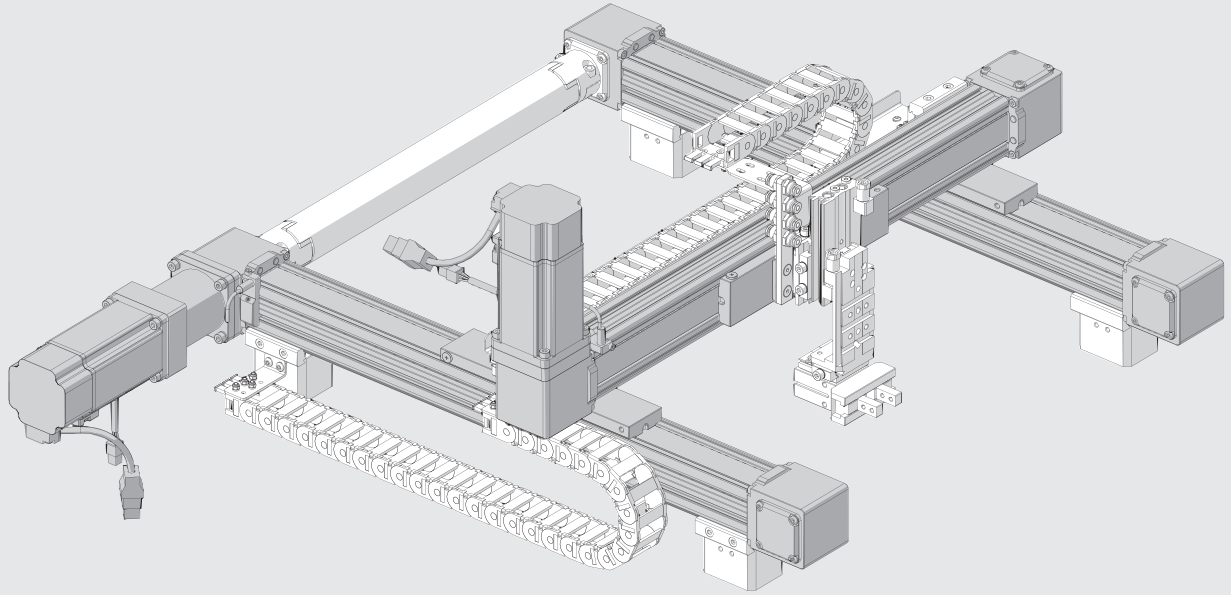


With 1:5 gearbox
 Axial load [N]



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

EXAMPLES OF APPLICATION

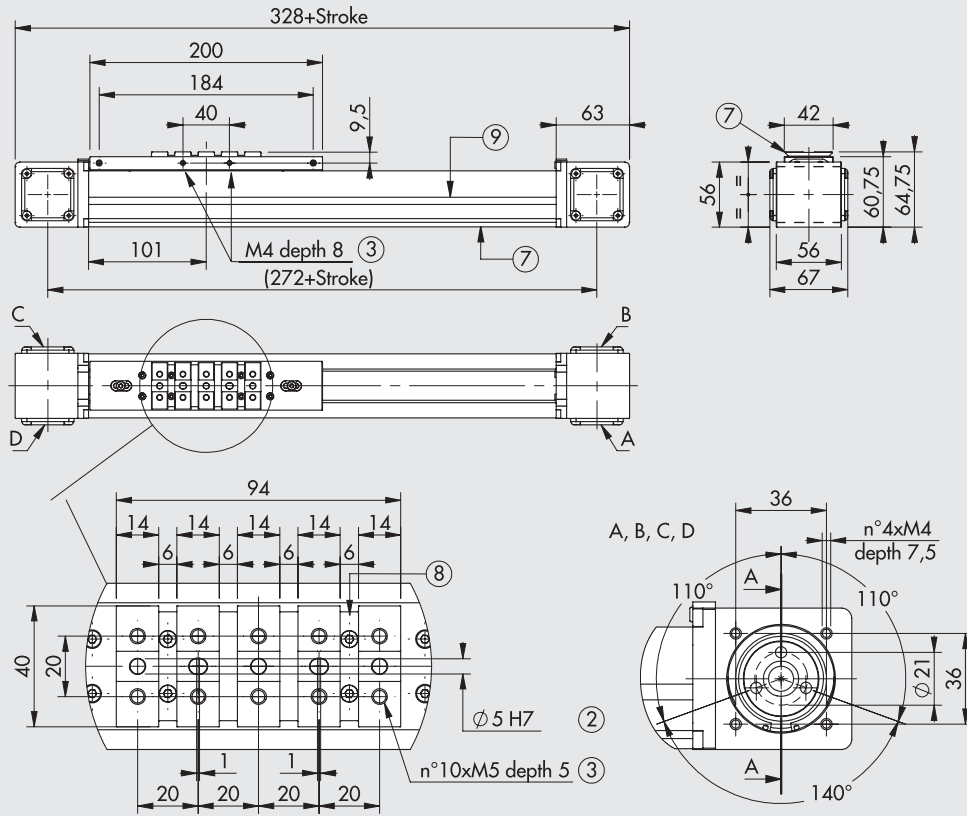


NOTES

Blank area for notes, consisting of horizontal lines.

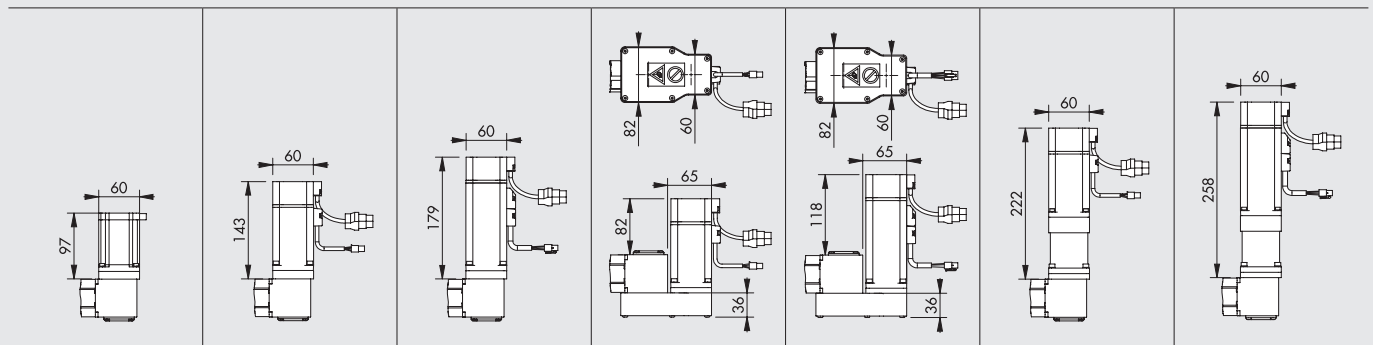
DIMENSIONS BK-1

Medium and Heavy VERSION WITHOUT MOTOR



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

Medium and Heavy VERSION WITH MOTOR



ORDERABLE CODES

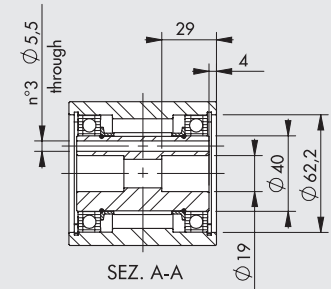
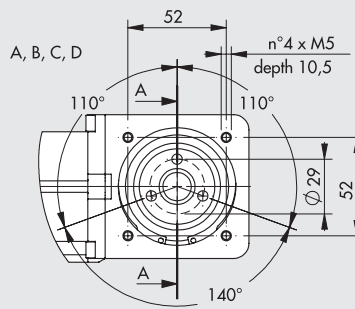
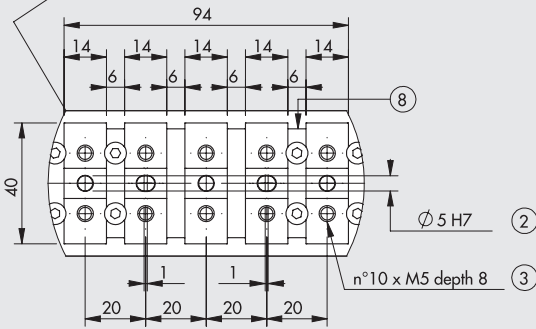
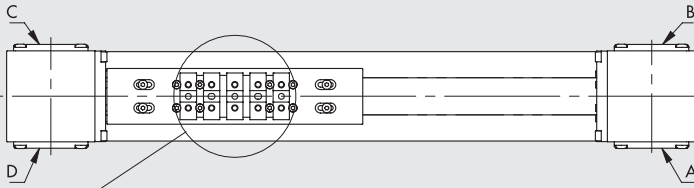
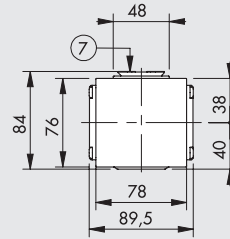
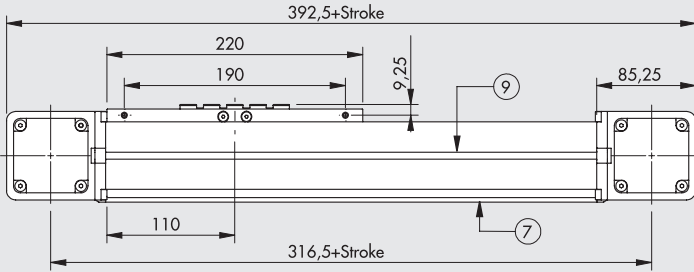
STEPPING MOTOR	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE	BRUSHLESS MOTOR WITH BELT TRANSMISSION Reduction 1:2	BRUSHLESS MOTOR + BRAKE WITH BELT TRANSMISSION Reduction 1:2	BRUSHLESS MOTOR WITH GEARBOX Reduction 1:3	BRUSHLESS MOTOR + BRAKE WITH GEARBOX Reduction 1:3
374011 _ _ _ 261230	374011 _ _ _ 262220	374011 _ _ _ 264220	374011 _ _ _ 26F220	374011 _ _ _ 26E220	374011 _ _ _ 266220	374011 _ _ _ 267220
374011 _ _ _ 291230	374011 _ _ _ 292220	374011 _ _ _ 294220	374011 _ _ _ 29F220	374011 _ _ _ 29E220	374011 _ _ _ 296220	374011 _ _ _ 297220
374011 _ _ _ 361230	374011 _ _ _ 362220	374011 _ _ _ 364220	374011 _ _ _ 36F220	374011 _ _ _ 36E220	374011 _ _ _ 366220	374011 _ _ _ 367220
374011 _ _ _ 391230	374011 _ _ _ 392220	374011 _ _ _ 394220	374011 _ _ _ 39F220	374011 _ _ _ 39E220	374011 _ _ _ 396220	374011 _ _ _ 397220
					Reduction 1:5	Reduction 1:5
					374011 _ _ _ 268220	374011 _ _ _ 269220
					374011 _ _ _ 298220	374011 _ _ _ 299220
					374011 _ _ _ 368220	374011 _ _ _ 369220
					374011 _ _ _ 398220	374011 _ _ _ 399220

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

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

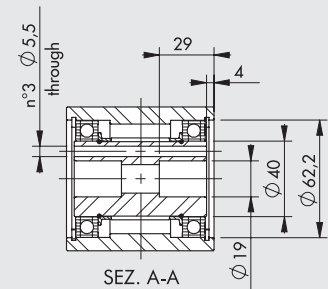
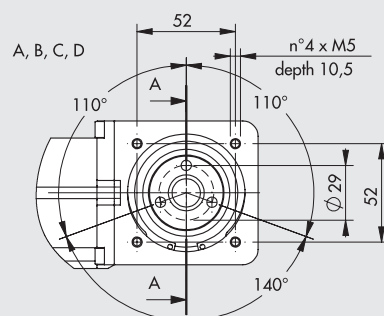
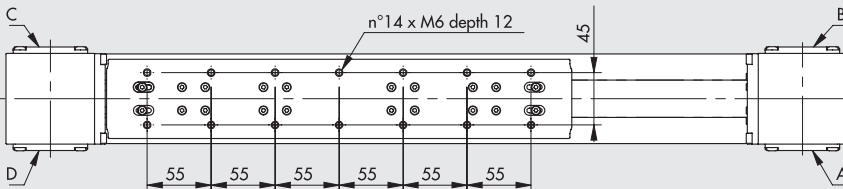
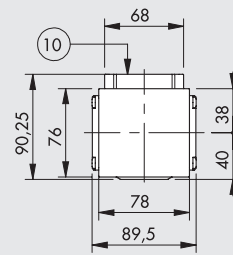
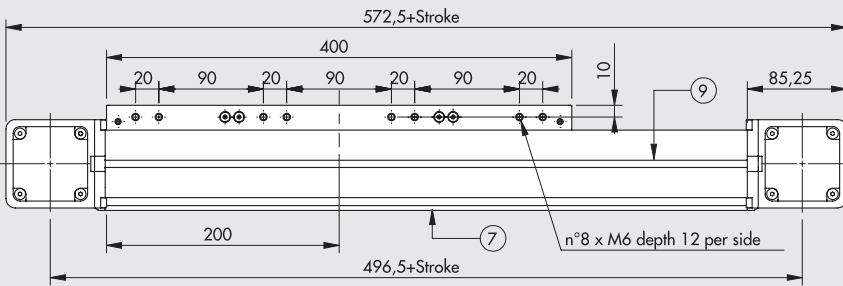
DIMENSIONS BK-2 VERSION WITHOUT MOTOR

Heavy



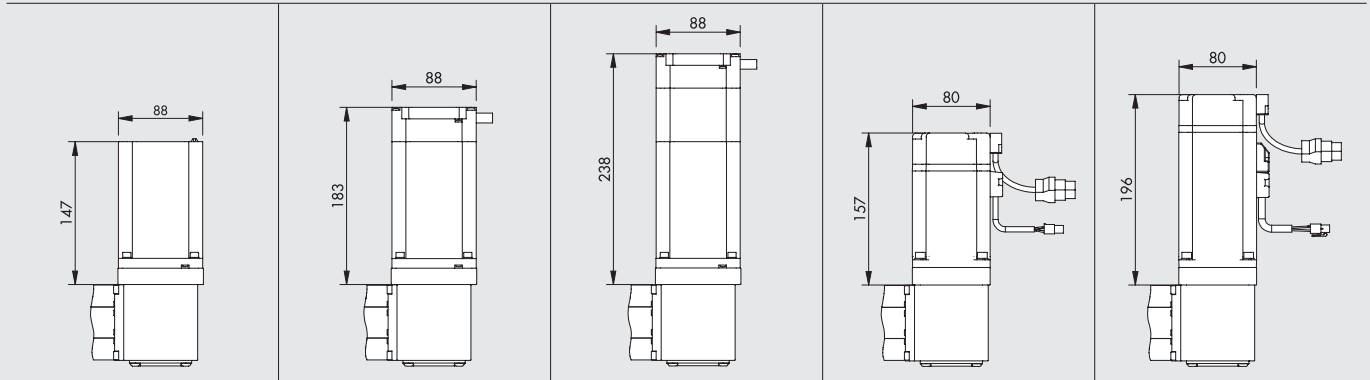
- ② = Holes for centring pins
- ③ = Threaded holes for fixing
- ⑦ = Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors.**
- ⑧ = Slot for "V-Lock" precision key
- ⑨ = Groove for proximity sensor bracket and fixing accessories
- ⑩ = "Flat" slide with a series of threaded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

Heavy XL



DIMENSIONS BK-2 VERSION WITH MOTOR

Heavy / Heavy XL

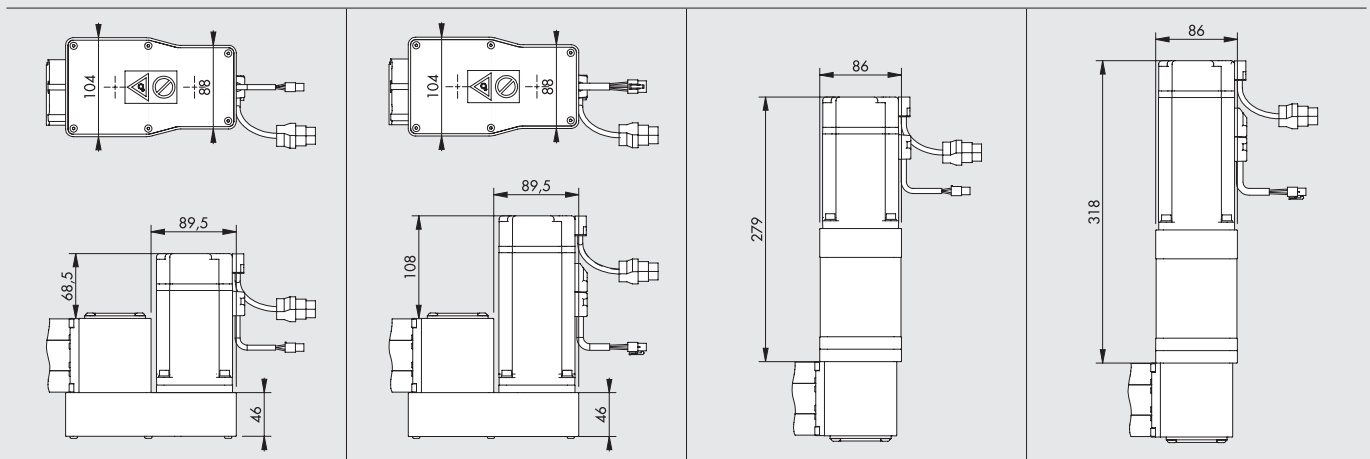


ORDERABLE CODES

STEPPING MOTOR	STEPPING MOTOR WITH ENCODER	STEPPING MOTOR + BRAKE WITH ENCODER	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE
374021 _ _ 361470	374021 _ _ 36C470	374021 _ _ 363470	374021 _ _ 362330	374021 _ _ 364330
374021 _ _ 391470	374021 _ _ 39C470	374021 _ _ 393470	374021 _ _ 392330	374021 _ _ 394330
374025 _ _ 361470	374025 _ _ 36C470	374025 _ _ 363470	374025 _ _ 362330	374025 _ _ 364330
374025 _ _ 391470	374025 _ _ 39C470	374025 _ _ 393470	374025 _ _ 392330	374025 _ _ 394330

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

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



ORDERABLE CODES

BRUSHLESS MOTOR WITH BELT TRANSMISSION Reduction 1:2	BRUSHLESS MOTOR + BRAKE WITH BELT TRANSMISSION Reduction 1:2	BRUSHLESS MOTOR WITH GEARBOX Reduction 1:3	BRUSHLESS MOTOR + BRAKE WITH GEARBOX Reduction 1:3
374021 _ _ 36F330	374021 _ _ 36E330	374021 _ _ 366330	374021 _ _ 367330
374021 _ _ 39F330	374021 _ _ 39E330	374021 _ _ 396330	374021 _ _ 397330
374025 _ _ 36F330	374025 _ _ 36E330	374025 _ _ 366330	374025 _ _ 367330
374025 _ _ 39F330	374025 _ _ 39E330	374025 _ _ 396330	374025 _ _ 397330
		Reduction 1:5	Reduction 1:5
		374021 _ _ 368330	374021 _ _ 369330
		374021 _ _ 398330	374021 _ _ 399330
		374025 _ _ 368330	374025 _ _ 369330
		374025 _ _ 398330	374025 _ _ 399330

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

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

MOTOR-DRIVE COUPLINGS



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

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

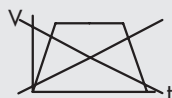
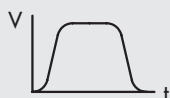
◆ Important! Limit current.

■ Important! Limit current and voltage.

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

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

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



KEY TO CODES AXIS ELECTRIC WITHOUT MOTOR

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

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

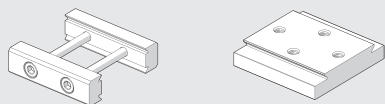
KEY TO CODES AXIS ELECTRIC MOTOR

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

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

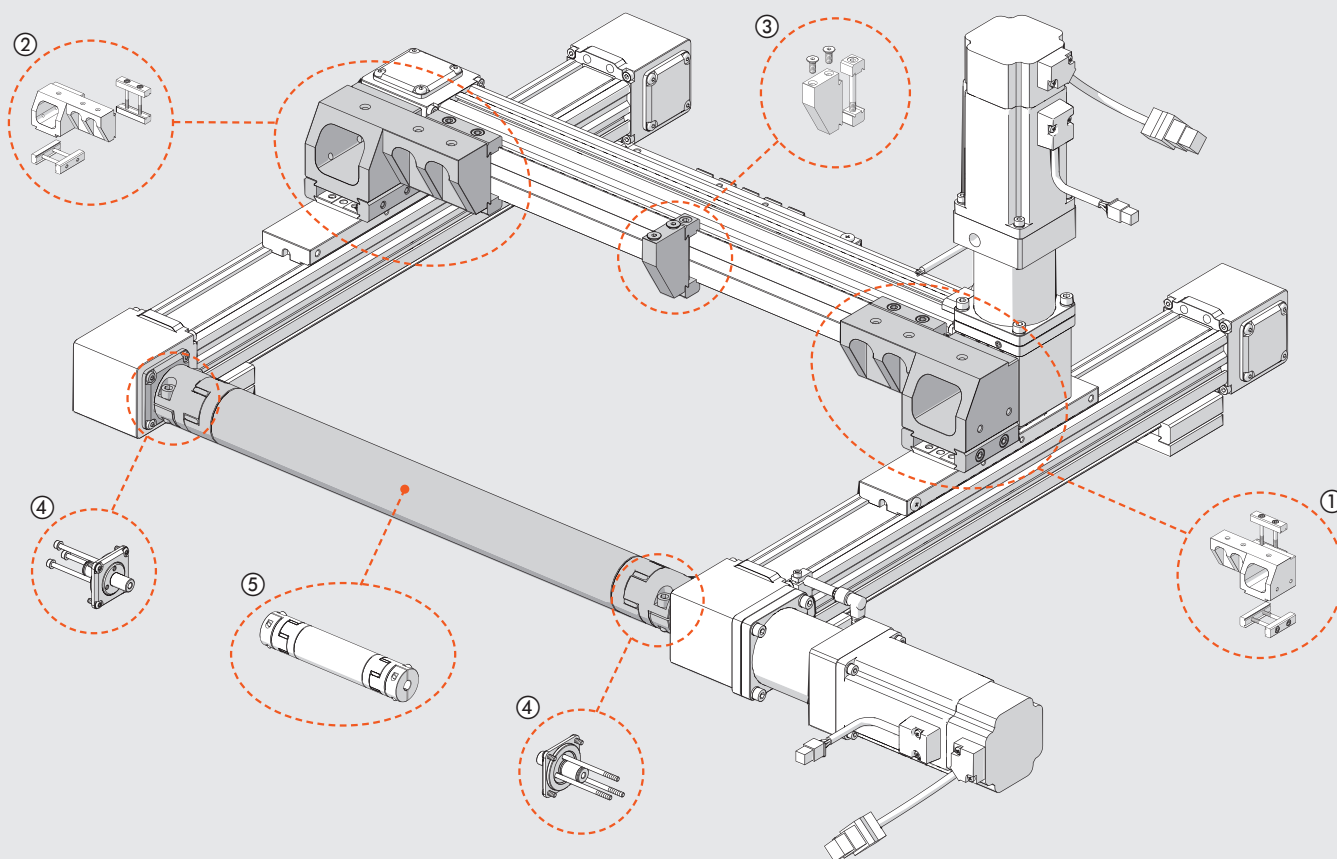
ACCESSORIES

FIXING ELEMENTS



See V-Lock family.

FIXING ELEMENTS FOR GANTRY SYSTEMS



① LEFT BRACKET

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

② RIGHT BRACKET

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

③ BRACKET CABLE CHAIN GIUDE

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

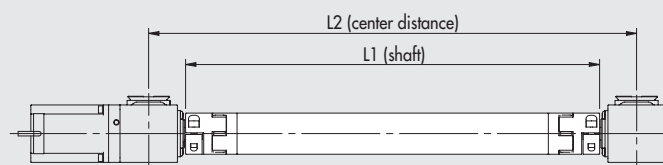
④ JOINT FOR TRANSMISSION SHAFT

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

⑤ TRANSMISSION SHAFT

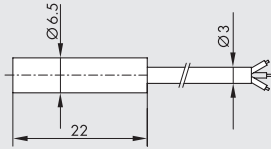
Code	Description
095TSV12_ _ _ _	Transmission shaft BK-1
095TSV15_ _ _ _	Transmission shaft BK-2

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



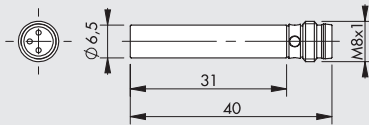
L1 min = 200 mm L1 BK-1 = L2 - 72 mm
 L1 max = 2500 mm L1 BK-2 = L2 - 95 mm

INDUCTION SENSOR Ø 6.5



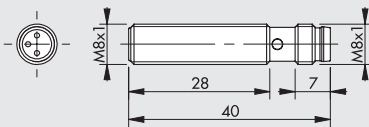
Code	Description
W095K030006	PNP Ø 6.5 PNP inductive sensor with LED 2 m

QUICK-FIT INDUCTIVE SENSOR Ø 6.5



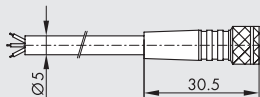
Code	Description
W095K030009	PNP Ø 6.5 inductive sensor with push-in LED

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



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

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

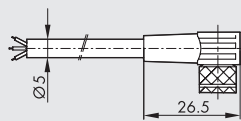


Pin	Cable color
1	Brown
3	Blue
4	Black

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

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

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

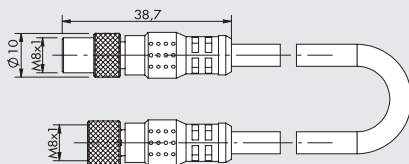


Pin	Cable color
1	Brown
3	Blue
4	Black

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

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

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

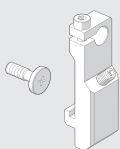


Code	Description
0240009009	M8-M8 3-pin straight connector with cable L = 3 m

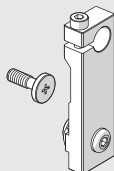
Note: Can be used for direct connection to the modules with digital INPUT of the EB 80 and CM valves

BRACKET FOR INDUCTION SENSOR

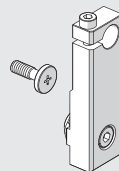
BK-1



BK-2



BK-2 XL



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

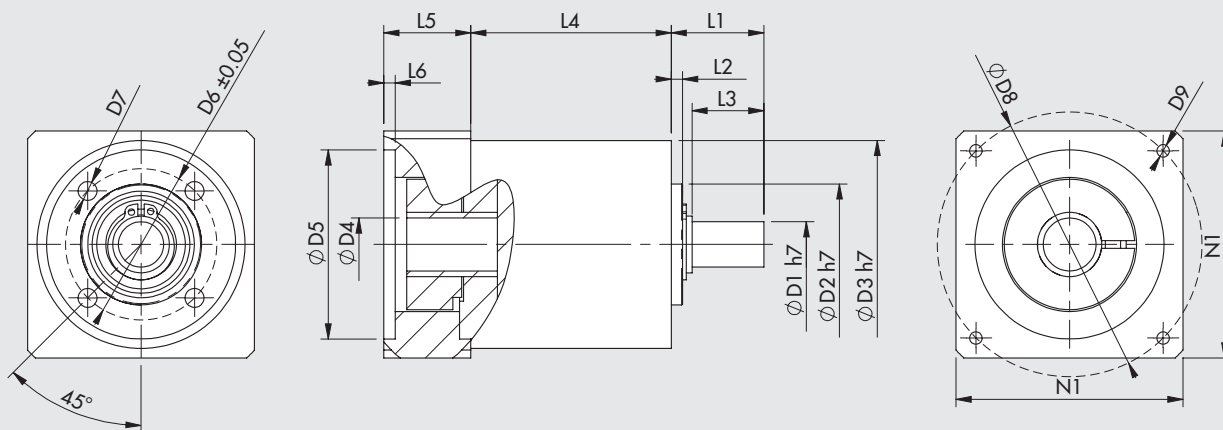
DRIVES



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

SPARE PARTS

BK GEARBOXES



Code	Description	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm ²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0341000	Gearbox MP053 1:3	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0541000	Gearbox MP053 1:5	15	3500	6	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0343000	Gearbox MP080 1:3	40	2900	59	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80
37R0543000	Gearbox MP080 1:5	50	3200	37	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80

C_{out} = rated output torque

N_{IN} = nominal input speed

J = mass moment of inertia of the gearhead

ELECTRIC MOTORS



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

NOTES