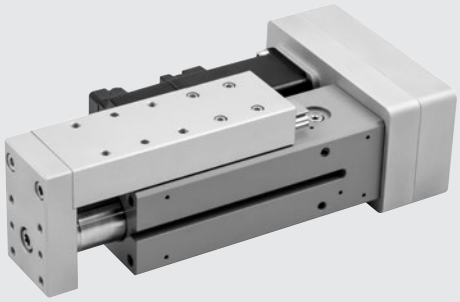
ELECTRIC SLIDE
SERIES ELEKTRO CS

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

in-line version

geared version



TECHNICAL DATA		Ø 32
Environmental temperature range for STEPPING motors	°C	from -10 to +50
BRUSHLESS motors	°C	from 0 to +40
Electrical protection rating with STEPPING motors		IP55 or IP65 (see key to codes on page **A5**.168)
BRUSHLESS motors		IP65 (see key to codes on page **A5**.168)
Maximum relative humidity of the air for IP55 STEPPING motor		90% with 40°C; 57% with 50°C (no condensate)
IP65 BRUSHLESS motor		90% (no condensate)
Standard strokes (including 5 mm extra-stroke) for homing	mm	55
Positioning repeatability	mm	±0.02
Positioning accuracy	mm	±0.2 *
Versions		Ball screw
		In line or geared motor
Anti-rotation of the piston rod		YES
Uncontrolled impact at the end of stroke		NOT ALLOWED (for rear buffer ONLY)
Sensor magnet		YES
Work position		Any
Interface for fixing on carriage		Standard / V-Lock

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

MECHANICAL FEATURES

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

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

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

WEIGHTS

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

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

MASS MOMENTS OF INERTIA

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

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

CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

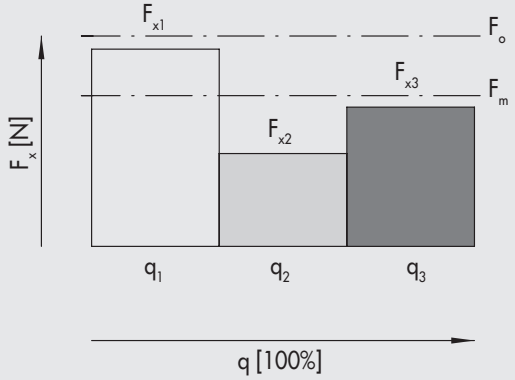
Peak axial load in a work cycle must not exceed the static axial load Fo.
The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

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

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

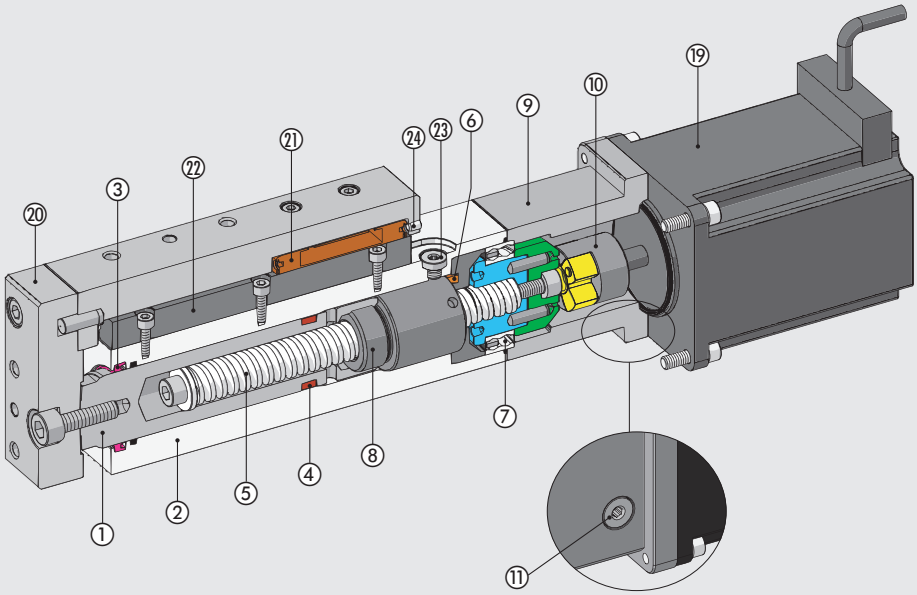
F_x = Axial load at stage x
F_m = Mean axial load during extension
F_o = Static axial load
q = Time segment
V_x = Speed in the phase x
V_m = Average speed



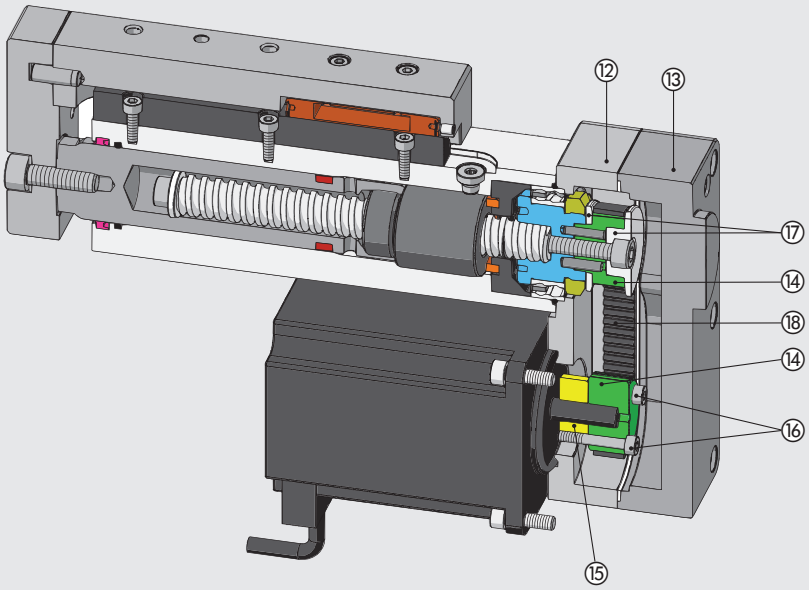
The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graphs on page **A5**.160, show screw life as a function of F_m

COMPONENTS

IN-LINE VERSION

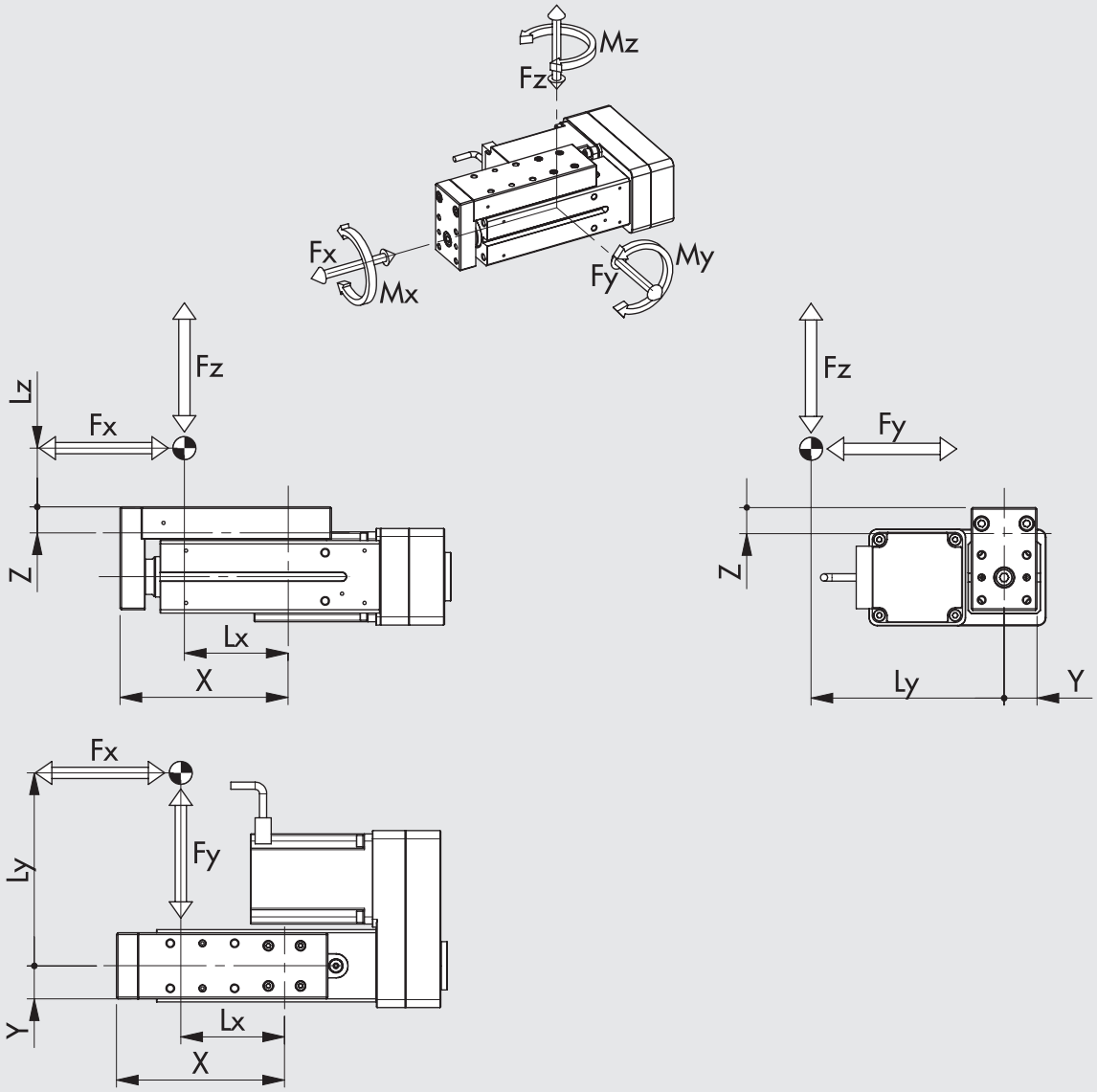


GEARED VERSION



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

DIAGRAM OF FORCES AND MOMENTS



STATIC VERIFICATION

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

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

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

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

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

DYNAMIC VERIFICATION

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

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

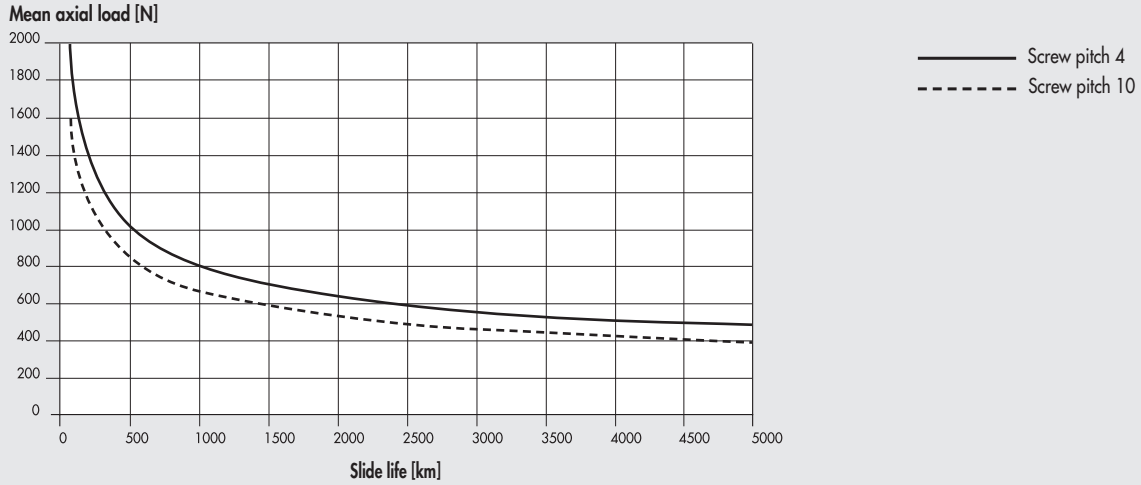
N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

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

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

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

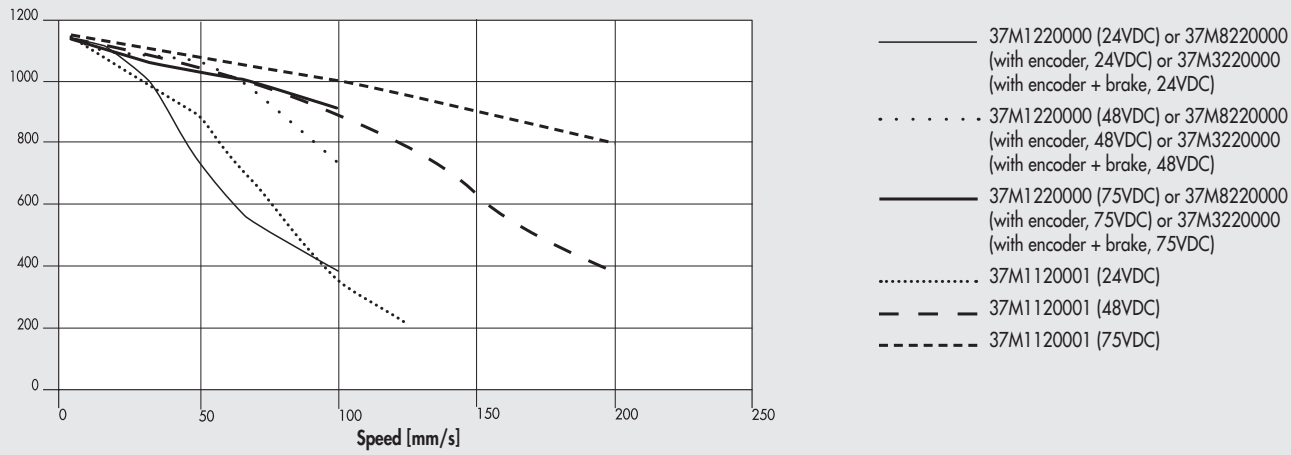
Life characteristics can vary considerably from those indicated in the graphs due to different operating conditions (radial loads, temperature, lubrication status, etc.).



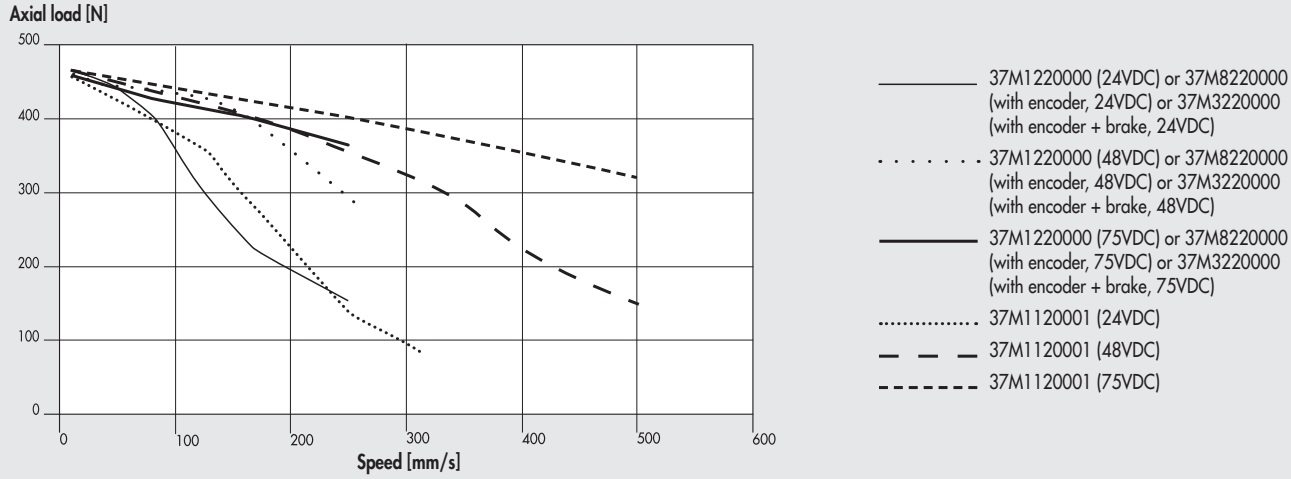
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (SLIDE COMPLETE WITH MOTOR AND DRIVE)

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

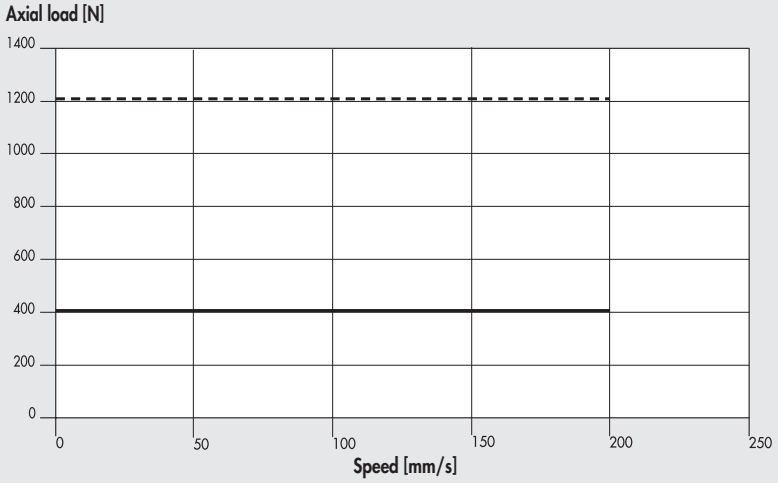
Ø 32 with pitch 4 ball screw, STEPPING motor, STEPPING motors with encoder, STEPPING motors with encoder + brake



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



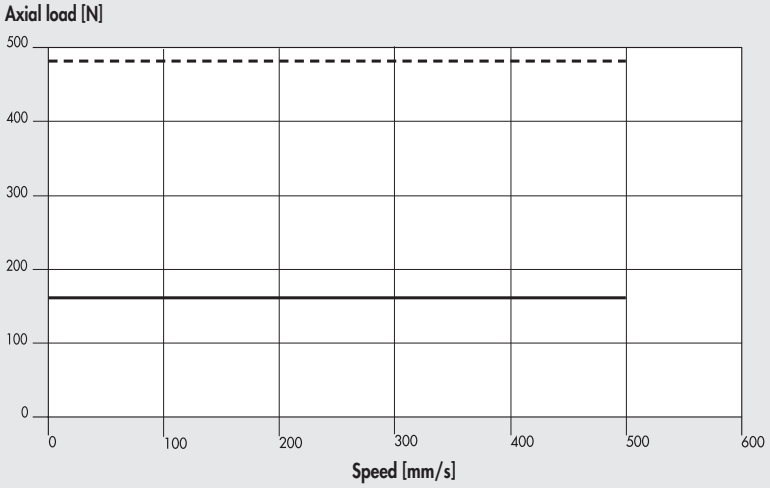
Ø 32 with pitch 4 ball screw, BRUSHLESS motor and BRUSHLESS motor with brake



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

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

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



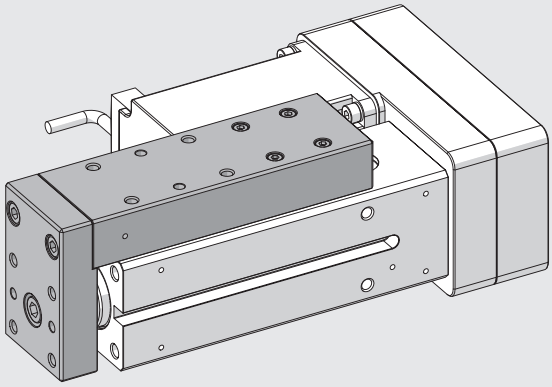
Nominal 37M2000000
or 37M4000000 (with brake)
+ 37D2100000 (100W)

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

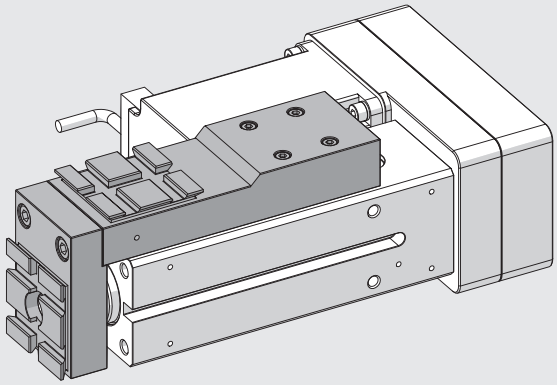
VERSIONS

TYPE OF CARRIAGE INTERFACE

STANDARD

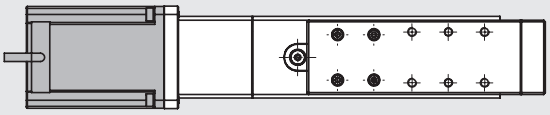


V-LOCK

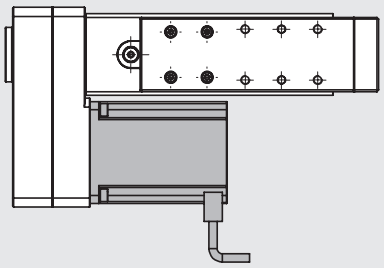


MOTOR POSITIONING

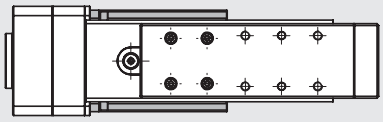
IN-LINE



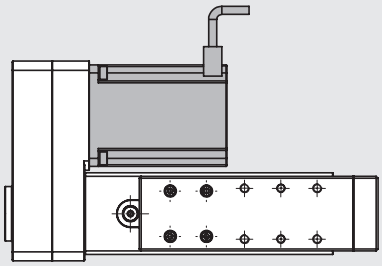
RIGHT GEARED



GEARED WITH MOTOR OPPOSITE TO THE SLIDE

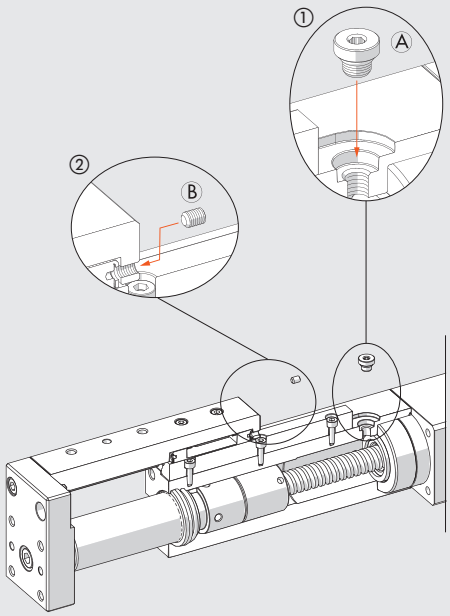


LEFT GEARED



METAL WORK PNEUMATIC

LUBRICATION DIAGRAMS



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

Follow the steps below:

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

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

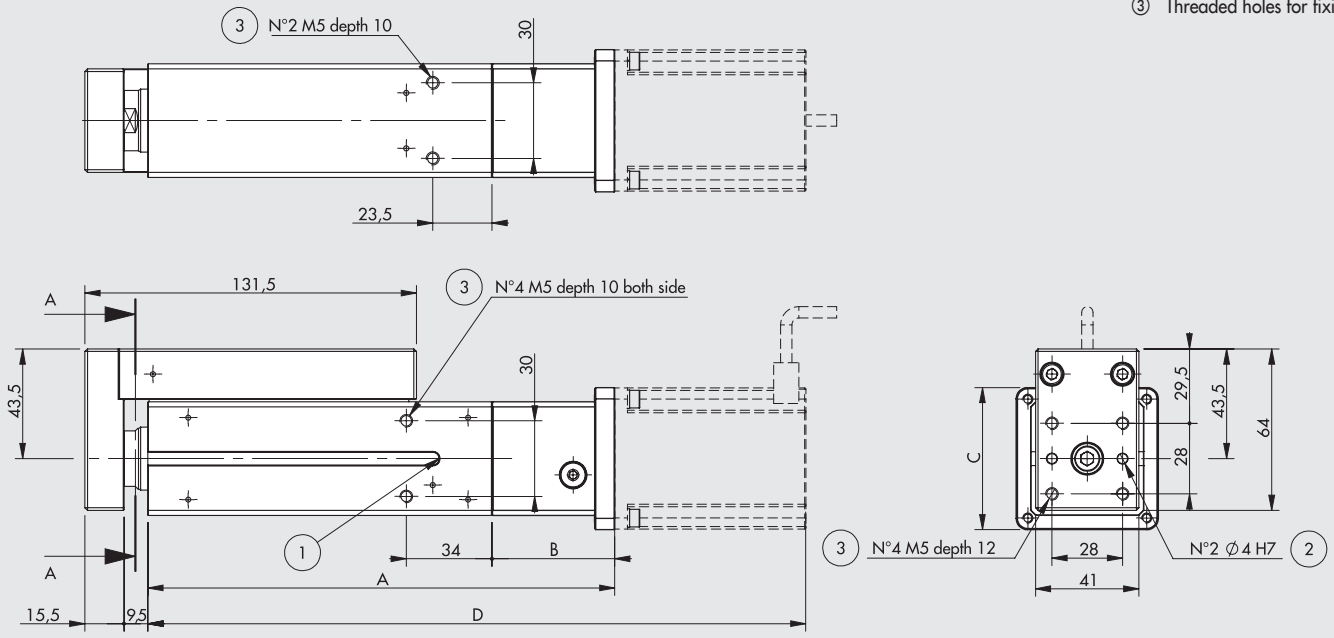
		Pad	Screw	
Pitch (p)	mm	-	4	10
Relube grease quantity	g	0.7	0.3	0.5
	cc	0.61	0.26	0.42

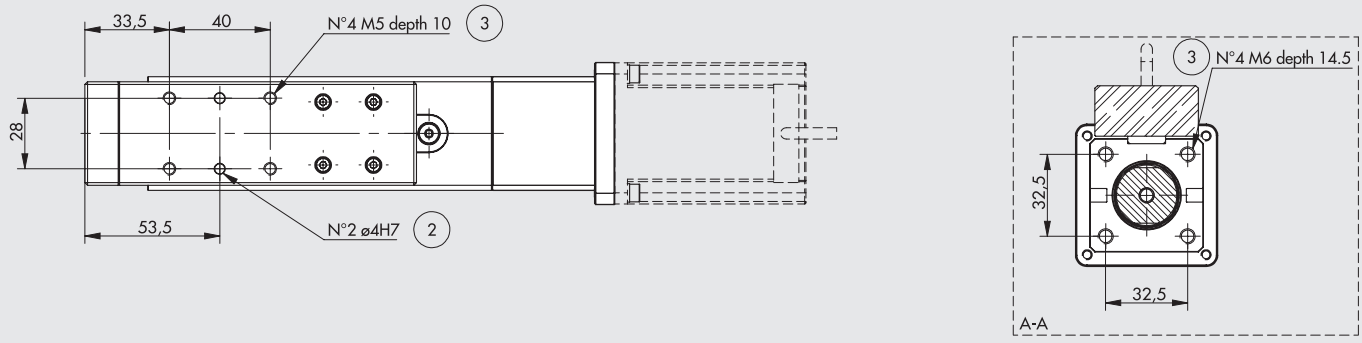
NOTES

DIMENSIONS SLIDE IN-LINE

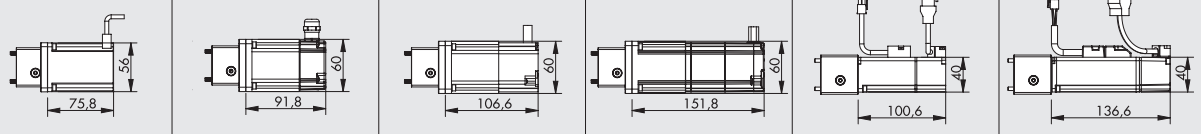
WITHOUT MOTOR

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





SLIDE WITH MOTOR



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

377032005512 _ _ _ _
377032005542 _ _ _ _

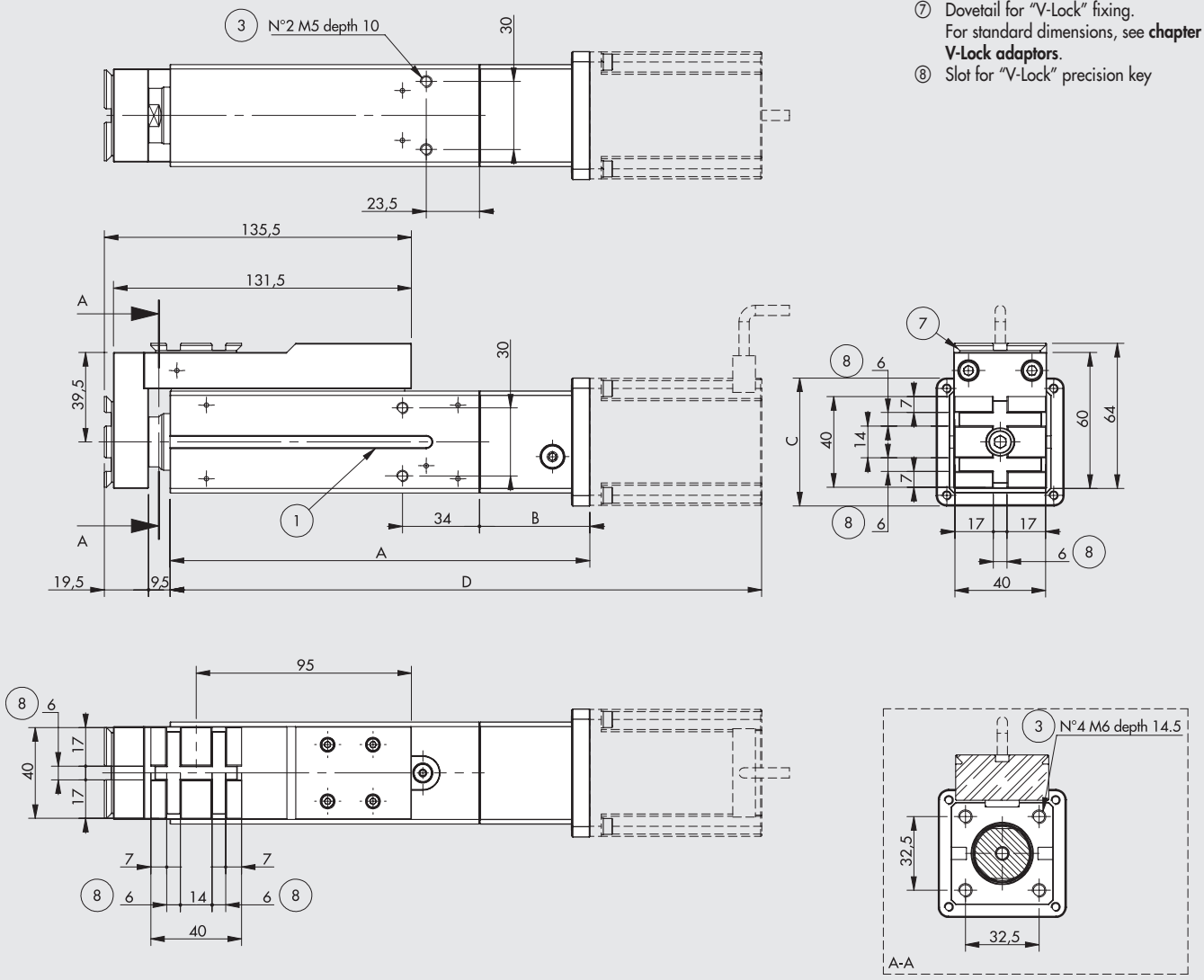
_ _ _ _ = Enter the type of drive to complete the code.

METAL WORK PNEUMATIC

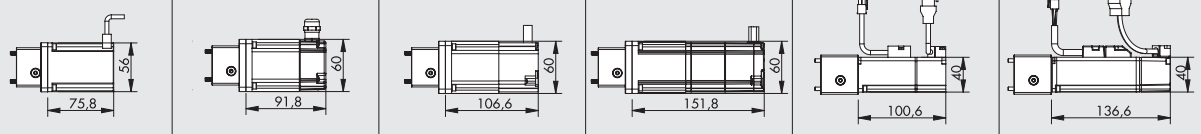
V-LOCK IN-LINE SLIDE DIMENSIONS

WITHOUT MOTOR

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



SLIDE WITH MOTOR



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

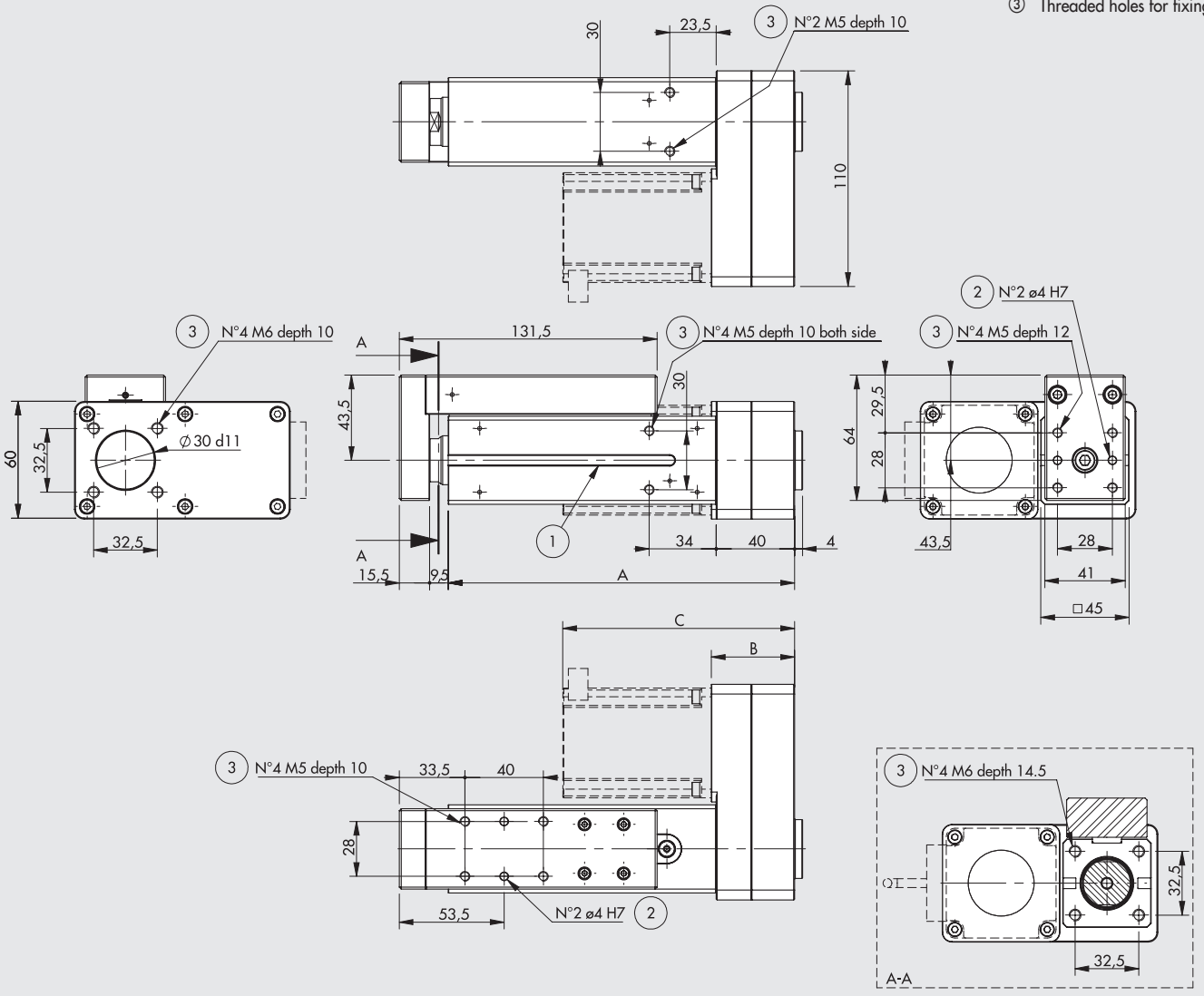
377K32005512 _ _ _ _
377K32005542 _ _ _ _

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

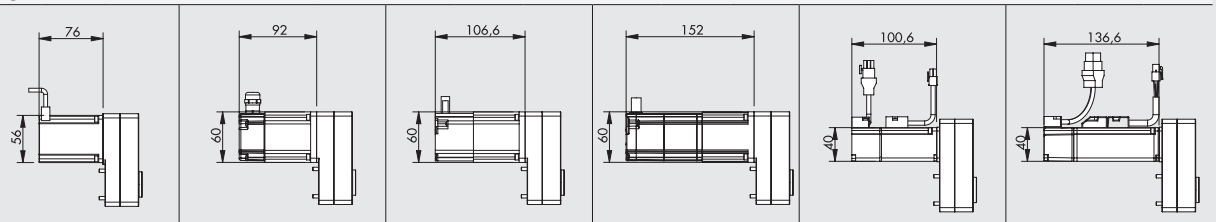
DIMENSIONS SLIDE GEARED

WITHOUT MOTOR

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



SLIDE WITH MOTOR



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

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

377032005516 _ _ _ _
377032005546 _ _ _ _

377032005519 _ _ _ _
377032005549 _ _ _ _

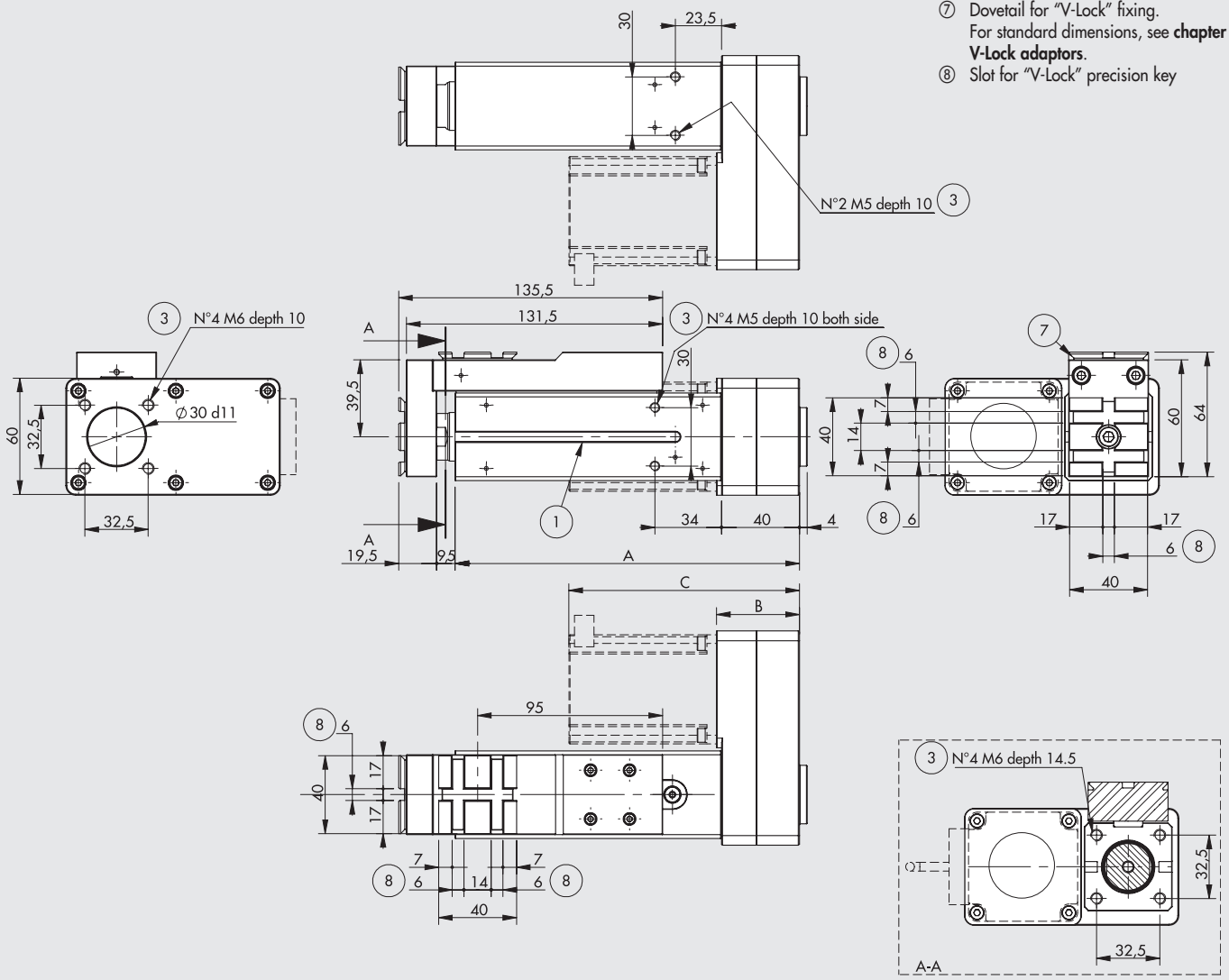
_ _ _ _ = Enter the type of drive to complete the code.

METAL WORK PNEUMATIC

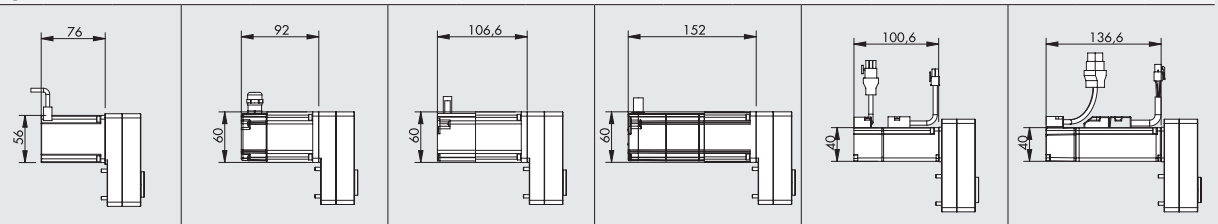
V-LOCK IN-LINE SLIDE DIMENSIONS

WITHOUT MOTOR

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



SLIDE WITH MOTOR



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

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

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

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

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

MOTOR-DRIVE COUPLINGS

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

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

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

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

KEY TO CODES

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

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

POSSIBLE ORDERING CODES

Drive
Version
Screw pitch

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

_ _ _ _ = enter the stroke in mm

* Only IP55 rating applies for this type of motor drive

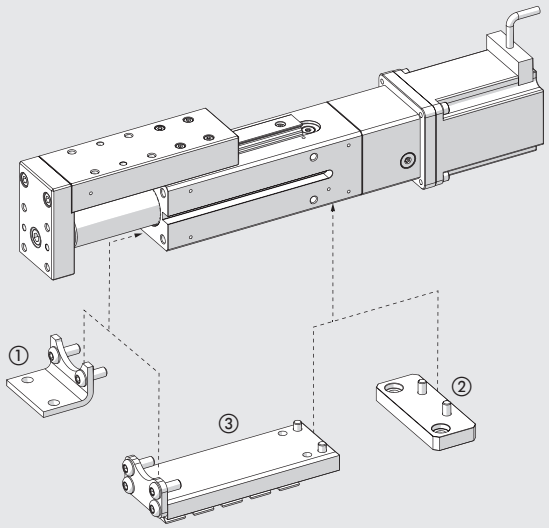
NOTES

ACCESSORIES FOR ELECTRIC SLIDE SERIES ELEKTRO CS

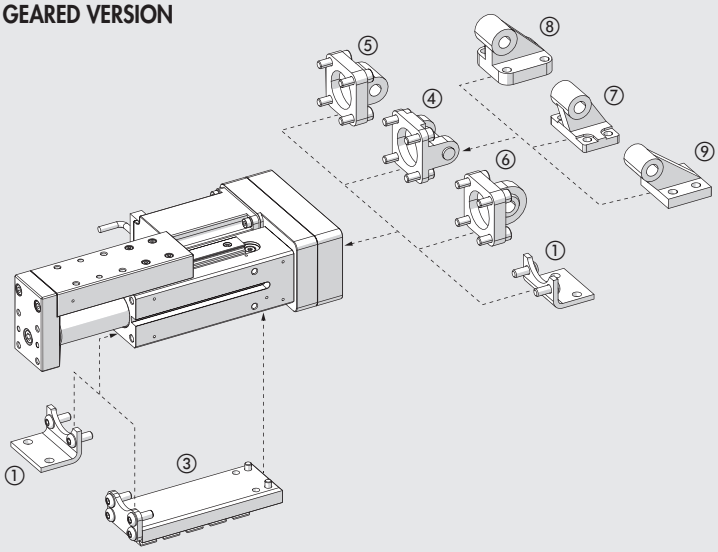
Note: Where specified, limit the maximum axial loads (Fmax) according to the electric slides.

FIXING OPTIONS

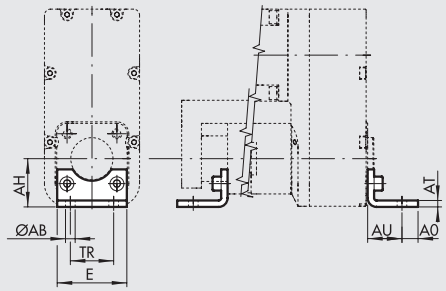
IN-LINE VERSION



GEARED VERSION



① FOOT MODEL A ELEKTRO CS

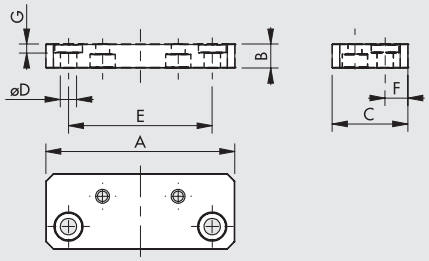


STEEL

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

Note: Individually packed with 2 screws.

② ELEKTRO CS IN-LINE BACK FOOT

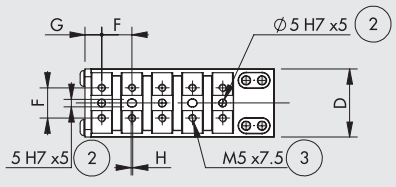


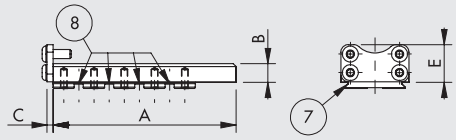
ALUMINIUM

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

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

③ ELEKTRO CS V-LOCK FITTING





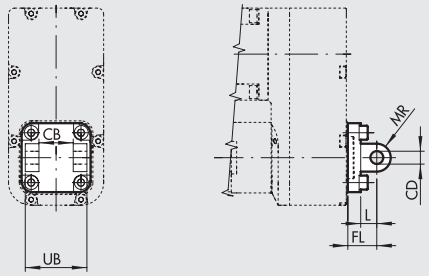
ALUMINIUM

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

Note: Individually packed with 6 screws.

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

④ FEMALE HINGE - MODEL B



ALUMINIUM

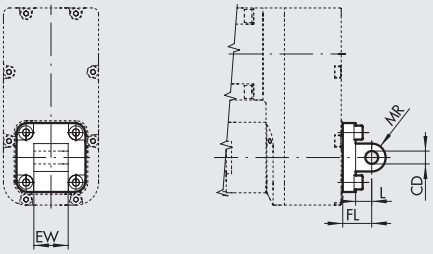
Code	Ø	UB	CB H14	FL	CD H9	MR	L	Weight [g]	Fmax [N]
W0950322003	32	45	26	22	10	10	12	116	800

STEEL

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

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

⑤ MALE HINGE - MODEL BA



ALUMINIUM

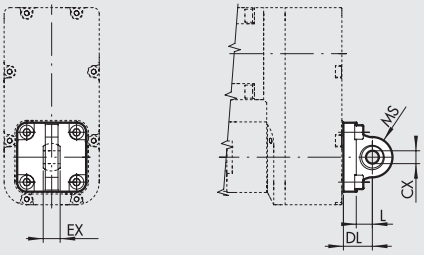
Code	Ø	EW	FL	MR	CD H9	L	Weight [g]	Fmax [N]
W0950322004	32	26	22	10	10	13	94	800

STEEL

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

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

⑥ ARTICULATED MALE HINGE - MODEL BAS



ALUMINIUM

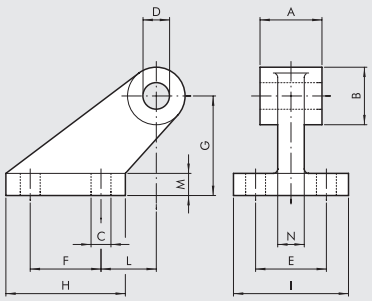
Code	Ø	DL	MS	L	CX H9	EX	Weight [g]	Fmax [N]
W0950322006	32	22	16	12	10	14	106	800

STEEL

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

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

⑦ CETOP HINGE FOR MODEL B - MODEL GL

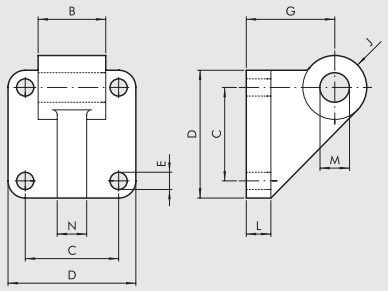


ALUMINIUM

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

Note: Supplied with 4 screws, 4 washers.

⑧ COUNTER-HINGE FOR MODEL B - MODEL GS

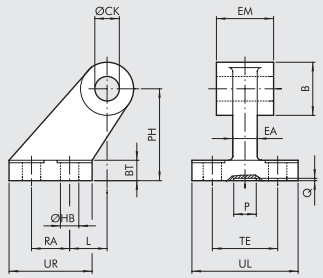


ALUMINIUM

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

Note: Supplied with 4 screws, 4 washers.

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



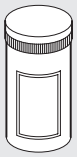
ALUMINIUM

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

STEEL

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

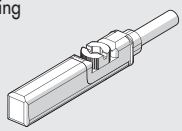
GREASE



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

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing



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

DRIVES

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

SPARE PARTS

ELECTRIC MOTORS

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