CAMOZZI
Automation

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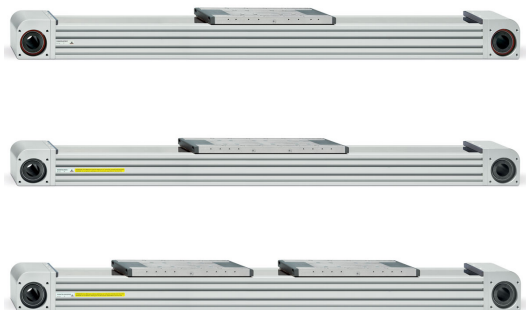# ELECTROMECHANICAL AXIS
SERIES 5ES...TBL

Sizes 50, 65, 80
Available versions: standard axis, support axis, reinforced axis

- Multiposition system with transmission of the movement with toothed belt

- Suitable for high dynamics

- Possibility to connect the motor on 4 sides

- Large range of motor interfaces

- Possibility to use magnetic proximity switches and/or inductive sensors

- IP 40

- Supplied with protection plugs for end caps and slider's cetering bushings

- Max stroke 6 meters

- Plates to realize multiaxis systems

- Presence of internal channels for re-lubrification

- Greasing nipples included

- Large range of axis mounting accessories

- Sliders available:

  - standard

  - long

  - double

Series 5E axes are mechanical linear actuators in which the rotary movement generated by a motor is converted into a linear movement by means of a toothed belt.
The Series 5E, available in 3 sizes, 50, 65 and 80, is realized by means of a special self-supporting square profile, in which the components have been completely integrated, assuring compactness and light weight.
The presence of a recirculating ball guide grants high stiffness and resistance to external loads.

 To protect the internal elements from potential contaminants from the external environment, the profile has been closed with a stainless steel plate. The axis is equipped with a magnet that makes it possible to use external proximity switches (Series CSH), allowing operations like homing or extra-stroke readings to be performed. Moreover, these actuators also have accessories in order to be used with inductive sensors.
The Series 5E is equipped with specific interface kits making it possible to connect the motor on 4 sides. The use with high dynamics and the possibility to realize multi-axis systems, make the Series 5E particularly suitable for the packaging and assembly sectors.

GENERAL DATA

Construction	electromechanical axis with toothed belt
Design	open profile with protection plate
Sizes	50, 65, 80
Strokes	50 ÷ 4000 mm for size 50; 50 ÷ 6000 mm for sizes 65 and 80
Type of guide	internal, with recirculating ball (cage type)
Fixing	by means of slots on the profile and special clamps
Mounting motor	on all 4 sides
Operating temperature	-10°C ÷ +50°C
Storage temperature	-20°C ÷ +80°C
Protection class	IP 40 (available for versions A and D only)
Lubrication	centralized lubrification by means of internal channels
Repeatability	± 0,05 mm
Duty cycle	100%
Use with external sensors	Series CSH magnetic switches in special slots or inductives by means of supports

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - CODING EXAMPLE

CODING EXAMPLE

5E	S	050	TBL	0200	A	S	2(500)

5E	**SERIES**
S	**PROFILE** S = square section
050	**FRAME SIZE** 050 = 50x50 mm 065 = 65x65 mm 080 = 80x80 mm
TBL	**TRANSMISSION** TBL = toothed belt
0200	**STROKE** 0050 ÷ 4000 mm for size 050 0050 ÷ 6000 mm for sizes 065 and 080
A	**VERSIONS** A = standard axis D = support axis H = reinforced axis (for sizes 65 and 80 only)
S	**TYPE OF SLIDER** S = standard L = long - only for standard axis (A version)
2(500)	**NUMBER OF SLIDERS** 1 = 1 slider 2(____) = 2 sliders at (____) mm step - only for standard axis (A) and standard slider (S)

SERIES 5ES...TBL MATERIALS
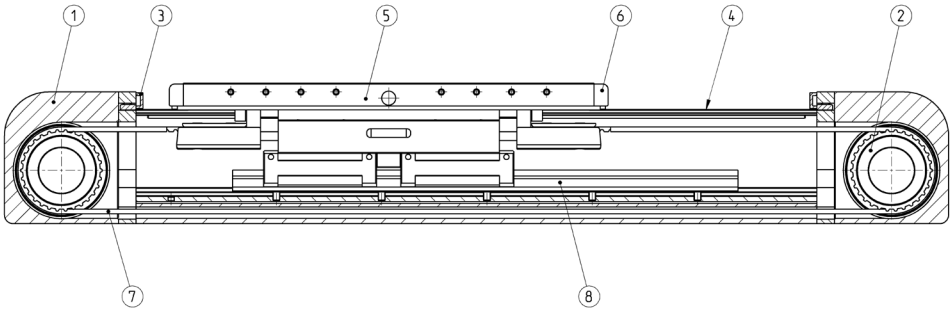
COMPONENTS	Materials
1. End cap	Aluminium alloy
2. Pulley	Steel
3. End cap bumper	Technopolymer
4. Protection plate	Steel
5. Slider	Aluminium alloy
6. Bumper	Technopolymer
7. Toothed belt	PU + Steel
8. Recirculating ball guide	Steel

MECHANICAL CHARACTERISTICS

SCREW AND GUIDE		Size 50	Size 50	Size 50
Version		A	A	D
Type of slider		S	L	S
Number of guides		1	1	1
Number of RDS blocks	pcs	2	3	2
$F_{y, eq}$ [A]	N	3400	5100	3400
$F_{z, eq}$ [A]	N	3400	5100	3400
$M_{x, eq}$ [A]	Nm	19,4	29	19,4
$M_{y, eq}$ [A]	Nm	91,7	183,5	91,7
$M_{z, eq}$ [A]	Nm	91,7	183,5	91,7
Max linear speed of mechanics (V_{max})	m/s	5	2,5[B]	5
Max linear acceleration of mechanics (a_{max})	m/s²	50	20[B]	50
PROFILE				
Moment of surface inertia I_y	mm⁴	$1,89 \cdot 10^5$	$1,89 \cdot 10^5$	$1,89 \cdot 10^5$
Moment of surface inertia I_z	mm⁴	$2,48 \cdot 10^5$	$2.48 \cdot 10^5$	$2.48 \cdot 10^5$
TOOTHED BELT				
Type		20 AT 5 HP	20 AT 5 HP	-
Pitch	mm	5	5	-
Max transmittable load	N	See the diagram	See the diagram	-
PULLEY				
Effective diameter of the pulley	mm	31,83	31,83	-
Number of teeth	z	20	20	-
Linear movement per pulley round	mm/round	100	100	-

SCREW AND GUIDE		Size 65	Size 65	Size 65	Size 65
Version		A	A	D	H
Type of slider		S	L	S	S
Number of guides		1	1	1	2
Number of RDS blocks	pcs	2	3	2	4
$F_{y, eq}$ [A]	N	8300	12450	8300	16600
$F_{z, eq}$ [A]	N	8300	12450	8300	16600
$M_{x, eq}$ [A]	Nm	47,7	71,6	47,7	234,7
$M_{y, eq}$ [A]	Nm	282,3	564,7	282,3	564,7
$M_{z, eq}$ [A]	Nm	282,3	564,7	282,3	564,7
Max linear speed of mechanics (V_{max})	m/s	5	2,5[B]	5	2,5[B]
Max linear acceleration of mechanics (a_{max})	m/s²	50	20[B]	50	20[B]
PROFILE					
Moment of surface inertia I_y	mm⁴	$4,94 \cdot 10^5$	$4,94 \cdot 10^5$	$4,94 \cdot 10^5$	$4,94 \cdot 10^5$
Moment of surface inertia I_{max}	mm⁴	$6,97 \cdot 10^5$	$6,97 \cdot 10^5$	$6,97 \cdot 10^5$	$6,97 \cdot 10^5$
TOOTHED BELT					
Type		32 AT 5 HP	32 AT 5 HP	-	32 AT 5 HP
Pitch	mm	5	5	-	5
Max transmittable load	N	See the diagram	See the diagram	-	See the diagram
PULLEY					
Effective diameter of the pulley	mm	47,75	47,75	-	47,75
Number of teeth	z	30	30	-	30
Linear movement per pulley round	mm/round	150	150	-	150

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ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - TECHNICAL DATA

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SCREW AND GUIDE		Size 80	Size 80	Size 80	Size 80
Version		A	A	D	H
Type of slider		S	L	S	S
Number of guides		1	1	1	2
Number of RDS blocks	pcs	2	3	2	4
Fy, eq [A]	N	13000	19500	13000	26000
Fz, eq [A]	N	13000	19500	13000	26000
Mx, eq [A]	Nm	106	160	106	454
My, eq [A]	Nm	626	1252	626	1252
Mz, eq [A]	Nm	626	1252	626	1252
Max linear speed of mechanics (V_{max})	m/s	5	2,5[B]	5	2,5[B]
Max linear acceleration of mechanics (a_{max})	m/s²	50	20[B]	50	20[B]
PROFILE					
Moment of surface inertia I_y	mm⁴	$1,23 \cdot 10^6$	$1,23 \cdot 10^6$	$1,23 \cdot 10^6$	$1,23 \cdot 10^6$
Moment of surface inertia I_z	mm⁴	$1,68 \cdot 10^6$	$1,68 \cdot 10^6$	$1,68 \cdot 10^6$	$1,68 \cdot 10^6$
TOOTHED BELT					
Type		32 AT 10 HP	32 AT 10 HP	-	32 AT 10 HP
Pitch	mm	10	10	-	10
Max transmittable load	N	See the diagram	See the diagram	-	See the diagram
PULLEY					
Effective diameter of the pulley	mm	63,66	63,66	-	63,66
Number of teeth	z	20	20	-	20
Linear movement per pulley round	mm/round	200	200	-	200

(A) Value refers to a covered distance of 2000 Km with fully supported system.
(B) The "suggested" speed is not the mechanical limit of the unit but represents the best compromise between high load applied and high dynamics. In case of particular requirements, please contact our technical assistance (service@camozzi.com).
1. Check the nominal admissible torque of the used motion transmission devices.
2. Details about directions of loads and moments can be found in the "EQUIVALENT LOAD" section.

HOW TO CALCULATE THE LIFE OF SERIES 5E AXIS

The correct dimensioning of the Series 5E axis, used individually or in a cartesian system with several axes, you need to consider some facts, both static and dynamic.

CALCULATION OF LIFE [km]

L_{eq} =Life of the axis [km]
f_l = load coefficient
f_w = safety coefficient according to the working conditions

The loads acting on the actuator (Fy, Fz, Mx, My and Mz) that appear in the fl calculation are the average ones on the cycle. These are calculated by averaging the loads of each single phase as indicated in the equation of P.
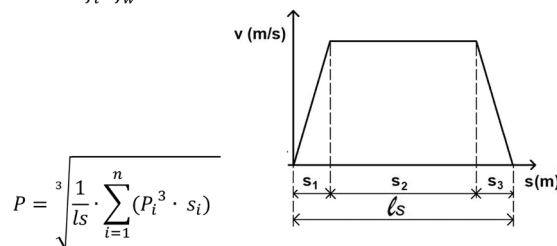
ls = stroke
s_1 = acc. phase;
s_2= constant speed phase;
s_3 = deceleration phase
P = Mx / My / Mz /Fy / Fz

$$f_l = \frac{|Fy|}{Fy,eq} + \frac{|Fz|}{Fz,eq} + \frac{|Mx|}{Mx,eq} + \frac{|My|}{My,eq} + \frac{|Mz|}{Mz,eq}$$

$$L_{eq} = \left(\frac{1}{f_l \cdot f_w}\right)^3 \cdot 2000$$

$$P = \sqrt[3]{\frac{1}{ls} \cdot \sum_{i=1}^{n}(P_i^3 \cdot s_i)}$$

$$P = \sqrt[3]{\frac{1}{ls} \cdot (P_1^3 \cdot s_1 + P_2^3 \cdot s_2 + P_3^3 \cdot s_3)}$$

EQUIVALENT LOAD

Fy = Force acting along the Y-axis [N]
Fz = Force acting along the Z-axis [N]
h = fixed distance for 5E axis [mm]
Mx = Moment along X-axis [Nm]
My = Moment along Y-axis [Nm]
Mz = Moment along Z-axis Z [Nm]

Here you can find the "h" values, valid for version A:
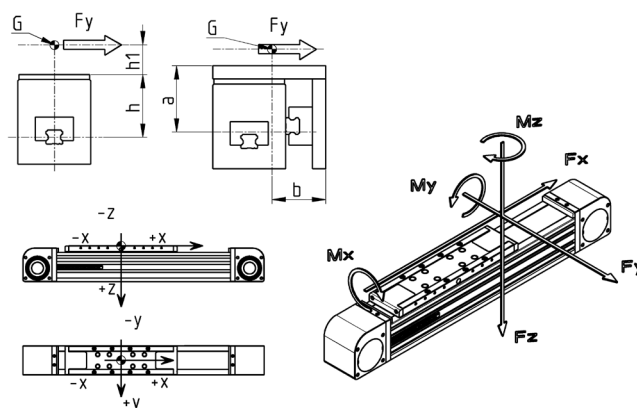- h = 45,5 mm (5ES050)
- h = 56,0 mm (5ES065)
- h = 69,5 mm (5ES080)

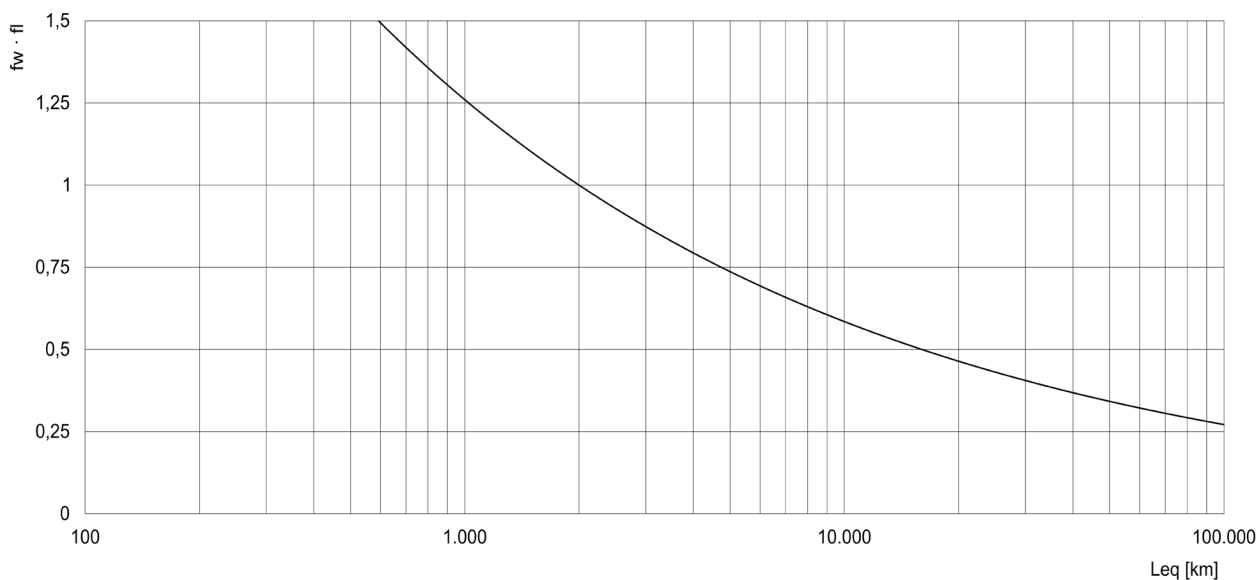Here you can find the "A" and "B" values, valid for version H:
"A" = 56,0 mm "B" 32,9 mm (5ES050)
"A" = 57,0 mm "B" 45,0 mm (5ES065)
"A" = 71,6 mm "B" 51,6 mm (5ES080)

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GRAPH OF THE SERVICE LIFE

APPLICATION	ACCELERATION [m/s²]	SPEED [m/s]	fw COEFFICIENT
light	< 10,0	< 1,0	1,0 ÷ 1,5
normal	10,0 ÷ 25,0	1,0 ÷ 2,0	1,5 ÷ 2,5
heavy	> 25,0	> 2,0	2,5 ÷ 3,5

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - APPLICATION EXAMPLE

HOW TO CALCULATE THE SERVICE LIFE OF 5ES050TBL0500AS1 - HORIZONTAL MOUNTING
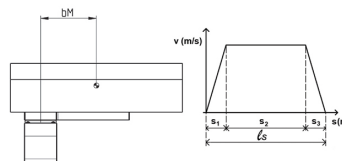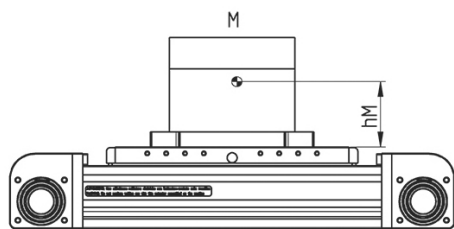
Application data:
M = 15 kg
bM = 86 mm
hM = 50 mm

acc = dec = 6 m/s$_2$
s$_1$ = s$_5$ = 30 mm
ls = 500 mm
f$_w$ = 1
v = 0,6 m/s

CALCULATION OF APPLIED LOADS

$F_y = 0$

$F_z = M \cdot g = 15 \cdot 9.81 = 147\ N$

$M_{x_{1,2,3}} = F_z \cdot b_M = 147 \cdot 0.086 = 12.7\ Nm$

$M_{y_{1,3}} = F_x \cdot (h_M + h) = M \cdot a \cdot (h_M + h) =$
$= 15 \cdot 6 \cdot (0.05 + 0.045) = 8.55\ Nm$

$M_{y_2} = F_x \cdot (h_M + h) = M \cdot a \cdot (h_M + h) =$
$= 15 \cdot 0 \cdot (0.05 + 0.045) = 0\ Nm$

$M_{z_{1,3}} = F_x \cdot b_M = M \cdot a \cdot b_M =$
$= 15 \cdot 6 \cdot 0.086 = 7.74\ Nm$

$M_{z_2} = F_x \cdot b_M = M \cdot a \cdot b_M =$
$= 15 \cdot 0 \cdot 0.086 = 0\ Nm$

$M_y = \sqrt[3]{\frac{1}{ls} \cdot (My_1^3 \cdot s1 + My_2^3 \cdot s2 + My_3^3 \cdot s3 + \cdots + My_n^3 \cdot sn)} =$

$= \sqrt[3]{\frac{1}{500} \cdot (8.55^3 \cdot 30 + 0 \cdot 440 + 8.55^3 \cdot 30)} = 4.22\ Nm$

$M_z = \sqrt[3]{\frac{1}{500} \cdot (7.74^3 \cdot 30 + 0 \cdot 440 + 7.74^3 \cdot 30)} = 3.82\ Nm$

$fl = \frac{|Fy|}{Fy,eq} + \frac{|Fz|}{Fz,eq} + \frac{|Mx|}{Mx,eq} + \frac{|My|}{My,eq} + \frac{|Mz|}{Mz,eq} =$

$= \frac{0}{3400} + \frac{147}{3400} + \frac{12.7}{19.4} + \frac{4.22}{91.7} + \frac{3.82}{91.7} = 0.785$
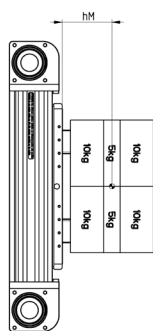

HOW TO CALCULATE THE SERVICE LIFE

Once the fl value has been calculated, the service life value can be obtained from the graph or by using the formula:

$$Leq = \left(\frac{1}{fl \cdot fw}\right)^3 \times 2000 = \left(\frac{1}{0.785 \cdot 1}\right)^3 \times 2000 = 4115\ km$$

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - APPLICATION EXAMPLE
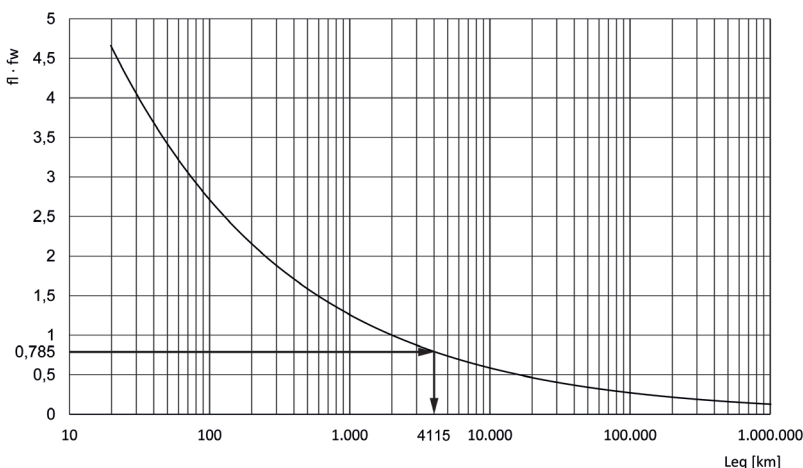
HOW TO CALCULATE THE SERVICE LIFE OF 5ES065TBL0750AS1 - VERTICAL MOUNTING
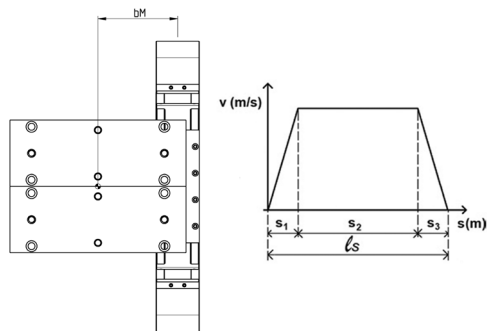
Application data:
M = 50 kg
bM = 120 mm
hM = 79,5 mm

acc = dec = 10 m/s$_2$
s$_1$ = s$_5$ = 32 mm
Ls = 750 mm
f$_w$ = 1,5
v = 0,8 m/s

CALCULATION OF APPLIED LOADS

$F_y = 0\ N$

$F_z = 0\ N$

$M_{x_{1;2;3}} = 0\ Nm$

$M_{y_1} = F_x \cdot (h_M + h) = M \cdot (g + a) \cdot (h_M + h) =$
$= 50 \cdot (9.81 + 10) \cdot (0.056 + 0.0795) = 134.2\ Nm$

$M_{y_2} = F_x \cdot (h_M + h) = M \cdot (g + a) \cdot (h_M + h) =$
$= 50 \cdot (9.81 + 0) \cdot (0.056 + 0.0795) = 66.5\ Nm$

$M_{y_3} = F_x \cdot (h_M + h) = M \cdot (g + a) \cdot (h_M + h) =$
$= 50 \cdot (9.81 - 10) \cdot (0.056 + 0.0795) = 1.3\ Nm*$

$M_{z_1} = F_x \cdot b_M = M \cdot (g + a) \cdot b_M =$
$= 50 \cdot (9.81 + 10) \cdot 0.12 = 118.9\ Nm$

$M_{z_2} = F_x \cdot b_M = M \cdot (g + a) \cdot b_M =$
$= 50 \cdot (9.81 + 0) \cdot 0.12 = 58.9\ Nm$

$M_{z_3} = F_x \cdot b_M = M \cdot (g + a) \cdot b_M =$
$= 50 \cdot (9.81 - 10) \cdot 0.12 = 1.14\ Nm*$

$M_y = \sqrt[3]{\frac{1}{750} \cdot (134.2^3 \cdot 32 + 66.5^3 \cdot 686 + 1.3^3 \cdot 32)} = 71.9\ Nm$

$M_z = \sqrt[3]{\frac{1}{750} \cdot (118.9^3 \cdot 32 + 58.9^3 \cdot 686 + 1.14^3 \cdot 32)} = 63.7\ Nm$

$fl = \frac{|Fy|}{Fy,eq} + \frac{|Fz|}{Fz,eq} + \frac{|Mx|}{Mx,eq} + \frac{|My|}{My,eq} + \frac{|Mz|}{Mz,eq} =$

$= \frac{0}{8300} + \frac{0}{8300} + \frac{71.9}{324} + \frac{63.7}{324} + \frac{0}{55} = 0.42$

HOW TO CALCULATE THE SERVICE LIFE

Once the fl value has been calculated, the service life value can be obtained from the graph or by using the formula:

$$Leq = \left(\frac{1}{fl \cdot fw}\right)^3 \times 2000 = \left(\frac{1}{0.42 \cdot 1.5}\right)^3 \times 2000 = 8013\ km$$

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For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

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ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - APPLICATION EXAMPLE

HOW TO CALCULATE THE DRIVING TORQUE [Nm]

F_A = Total force acting from outside [N]
F_E = Force to be applied externally [N]
g = Gravitational acceleration [9,81 m/s²]
m_E = Mass of the body to move [kg]
D_P = Pulley pitch diameter [mm]
C_{M1} = Driving torque due to external agents [Nm]

$$C_{TOT} = C_{M1} + C_{M2} + C_{M3}$$

$$F_A = F_E + m_E \cdot a$$

$$C_{M1} = \frac{F_A \cdot D_P}{2}$$

J_{TOT} = Moment of inertia of rotating components [kg·m²]
$\dot{\omega}$ = Angular acceleration [rad/s²]
a = Axis linear acceleration [m/s²]
C_{M2} = Driving torque due to rotating components [Nm]

$$\dot{\omega} = \frac{2 \cdot a}{D_P}$$

$$C_{M2} = J_{TOT} \cdot \dot{\omega}$$

F_{TT} = Force needed to move sliding components [N]
F_{TF} = Force needed to move fixed-length sliding components [N]
F_{TV} = Force needed to move variable-length sliding components [N]
m_{C1} = Mass of fixed-length sliding components [kg]
K_{TV} = Mass coefficient of variable-length sliding components [kg/mm]
C_{M3} = Driving torque due to sliding components [Nm]
K_{TI} = Mass coefficient of variable-length components with the interaxis [kg/mm]
C = Stroke [mm]
I = Interaxis [mm]

$$F_{TT} = F_{TF} + F_{TV}$$

$$F_{TF} = m_{C1} \cdot a$$

$$F_{TV} = K_{TV} \cdot C \cdot a$$

$$C_{M3} = \frac{F_{TT} \cdot D_P}{2}$$

Mod.	J_{TOT} [Kg·mm²]	m_{C1} [kg]	K_{TV} [Kg·m]	K_{TI} [Kg/m]
5E050...AS1	48,76	0,51	0,14	0,00
5E050...AL1	48,76	0,80	0,14	0,00
5E050...AS2	48,76	1,01	0,14	0,38
5E050...DS1	0,00	0,40	0,00	0,00
5E050...DS2	0,00	0,87	0,00	0,31
5E065...AS1	372,07	1,27	0,21	0,00
5E065...AL1	372,07	1,83	0,21	0,00
5E065...AS2	372,07	2,53	0,21	0,41
5E065...DS1	0,00	1,01	0,00	0,00
5E065...HS1	372,07	2,84	0,21	0,00
5E065...DS2	0,00	2,1	0,00	0,31
5E080...AS1	1130,28	2,69	0,34	0,00
5E080...AL1	1130,28	3,84	0,34	0,00
5E080...AS2	1130,28	5,38	0,34	0,48
5E080...DS1	0,00	2,15	0,00	0,00
5E080...HS1	1130,28	5,61	0,34	0,00
5E080...DS2	0,00	4,41	0,00	0,31

TRANSMISSIBLE FORCE
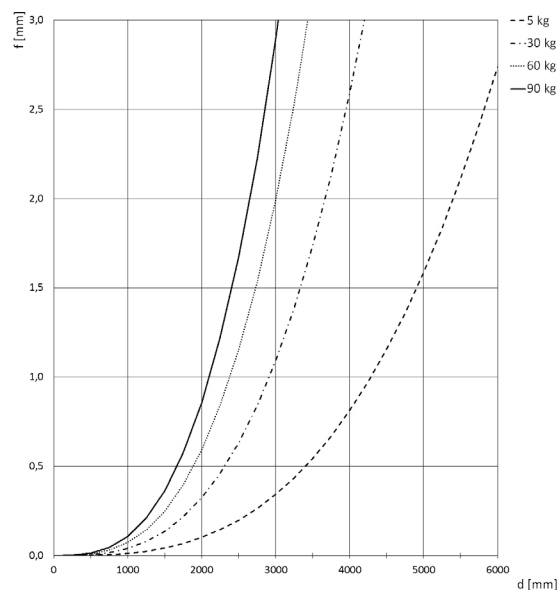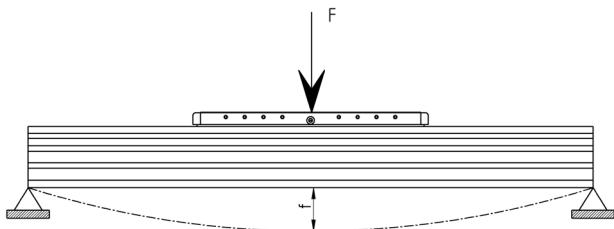
According to axis size and speeds chosen, force that can be transmitted from the toothed belt has these limits.

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - DIAGRAMS

Deflection according to the distance of the supports - Version A
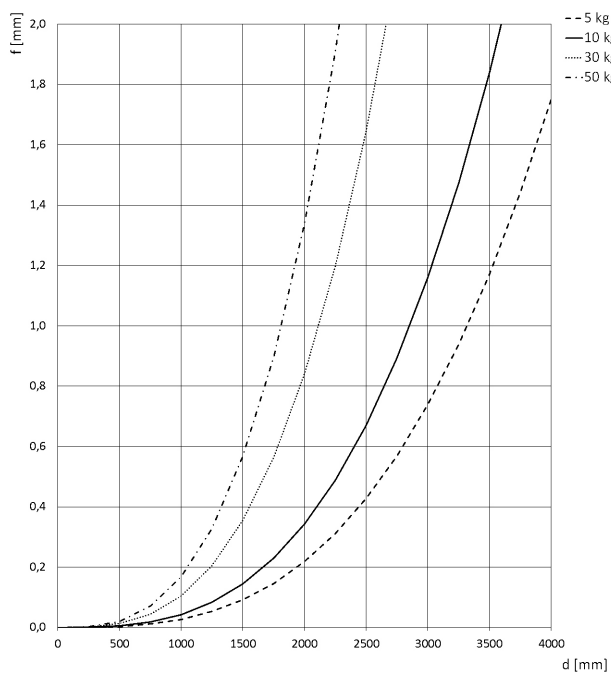

$$f_{max} = c_{max} \cdot 5 \cdot 10^{-4}$$

f_{max} = Maximum admissible deflection [mm]
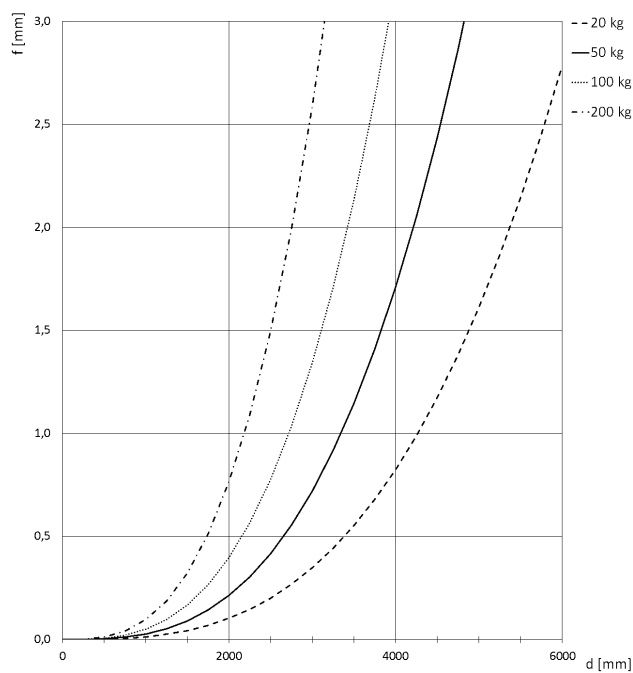c_{max} = Maximum stroke of axis 5E [mm]

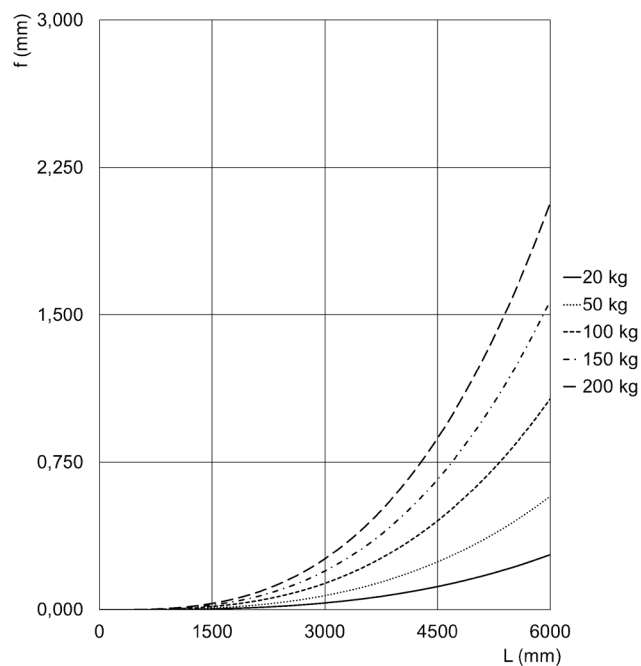**Size 065**

f = deflection generated between the supports [mm]
d = distance between the supports [mm]

Size 050

f = deflection generated between the supports [mm]
d = distance between the supports [mm]

Size 080

f = deflection generated between the supports [mm]
d = distance between the supports [mm]

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## Deflection according to the distance of the supports - Version H

$$f_{max} = c_{max} \cdot 5 \cdot 10^{-4}$$

f_{max} = Maximum admissible deflection [mm]
c_{max} = Maximum stroke of axis 5E [mm]

Size 065

f = deflection generated between the supports [mm]
d = distance between the supports [mm]

Size 050

f = deflection generated between the supports [mm]
d = distance between the supports [mm]

Size 080

f = deflection generated between the supports [mm]
d = distance between the supports [mm]

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - OVERVIEW ACCESSORIES

ELECTRIC ACTUATION

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ACCESSORIES FOR SERIES 5E

Side clamping bracket Mod. BGS

Perforated side clamping bracket Mod. BGA

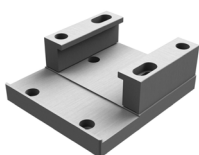**Interface plate - slider on slider**
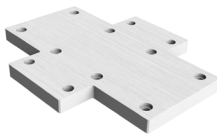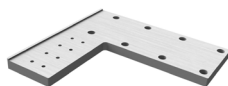

Interface plate - profile on slider
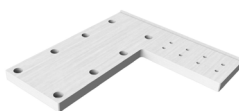

Interface plate - profile on slider - long arm

Interface plate - Series 6E cylinder on slider
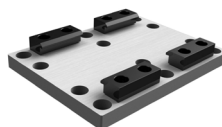

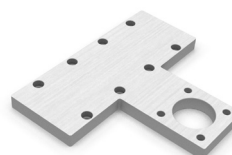**Interface plate - profile side on slider, left pos.**

Interf. plate - profile side on slider, right pos.
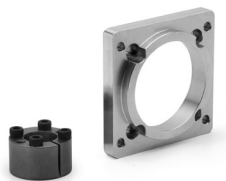

Fixed interface plate

Interface plate - Guide S. 45 / Cyl. S. 6E

Kit to fix the inductive sensor

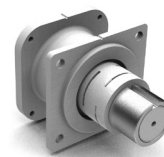**Kit to connect the gearbox GB Mod. FR**

Kit to connect the gearbox, enhanced series

Kit to connect the gearbox, enhanced series

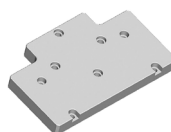**Direct connection kit for Stepper motor**
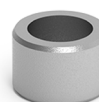

Parallel connection kit

Nuts for slots

Connection flange Mod. YZ
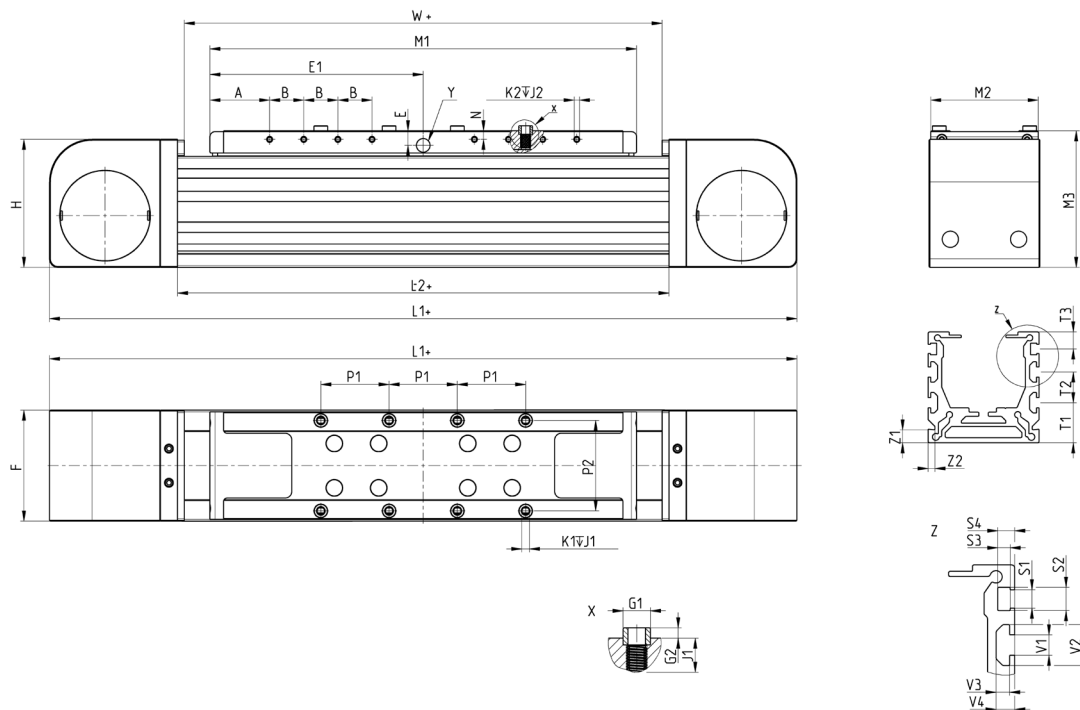

Centering sleeve Mod. TR-CG

Electromechanical axis Mod. 5E...AS1

Size	A	B	C	⌀C1	C2	⌀C3(h8)	C4	D1	D2	E	E1	F	⌀G1(h8)	G2	H	L1	L2	M1	M2	M3	N	P1	P2	K1 J1	K2 J2	K3 J3	T1	T2	T3	Y	X1	X2	W	Z1	Z2	S1	S2	S3	S4	V1	V2	V3	V4
50	32,5	15	37	37	4,5	20	2	17	32	8,5	100	50	6	2	60	354	238	200	48	65	5	30	40	M4 7	M3 5	M4 8	20	■	10	●	304	21,8	230	8	4	5,4	6,8	3,65	5	6	12	4	5,5
65	35	20	53	52	2	26	4,5	23,5	46	8,5	125	65	8	3	75	438	288	250	63	80	5	40	53	M5 8	M3 6	M5 10	23,5	18	10	●	373	30,5	280	8	4	5,4	6,8	3,65	5	6	12	4	5,5
80	35	30	68	68	6,5	38	6	30,5	60,5	11,5	165	80	10	3	95	548	368	330	78	100	8	55	64	M6 12	M4 8,5	M5 10	25	25	10	●	468	40,5	360	8	4	5,4	6,8	3,65	5	8	16,5	6,8	9

* We recommend a coupling with a shaft of tolerance h8.
■ Dimension T2 in size 50 is not indicated because there is only one slot.
● Dimension Y indicates the hole for centralized lubrication by means of grease.

Size	Weight stroke zero [kg]	Stroke weight per meter [kg/m]
50	2,15	3,35
65	4,6	5,4
80	8,9	5,9

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ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - DIMENSIONS

Electromechanical axis Mod. 5E...DS1

Size	A	B	E	E1	F	⌀G1	G2	H	L1	L2	M1	M2	M3	N	P1	P2	K1	J1	K2	J2	T1	T2	T3	Y	W	Z1	Z2	S1	S2	S3	S4	V1	V2	V3	V4
50	32,5	15	8,5	100	50	6	2	60	354	238	200	200	48	5	30	40	M4	7	M3	5	20	■	10	●	230	8	4	5,4	6,8	3,65	5	6	12	4	5,5
65	35	20	8,5	125	65	8	3	75	438	288	250	250	63	5	40	53	M5	8	M3	6	23,5	18	10	●	280	8	4	5,4	6,8	3,65	5	6	12	4	5,5
80	35	30	11,5	165	80	10	3	95	548	368	330	330	78	8	55	64	M6	12	M4	8,5	25	25	10	●	360	8	4	5,4	6,8	3,65	5	8	16,5	6,8	9

* We recommend a coupling with a shaft of tolerance h8.
■ Dimension T2 in size 50 is not indicated because there is only one slot.
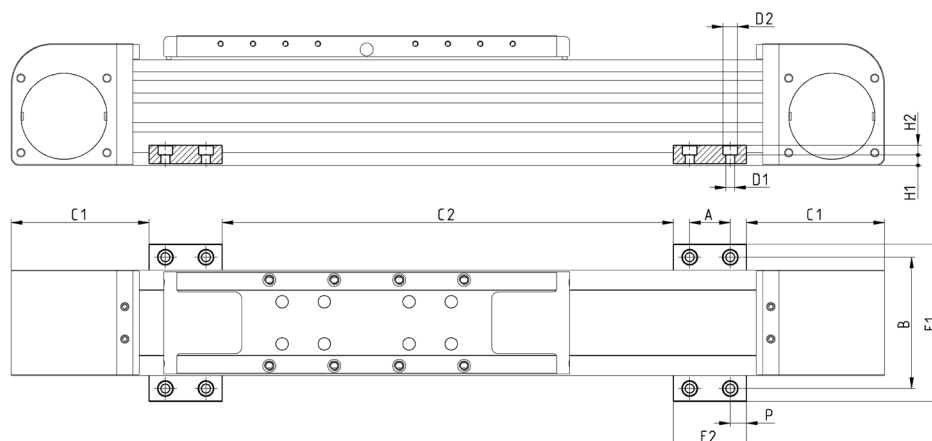● Dimension Y indicates the hole for centralized lubrication by means of grease.

Size	Weight stroke zero [kg]	Stroke weight per meter [kg/m]
50	1,81	3,00
65	3,58	4,88
80	7,05	5,31

ELECTRIC ACTUATION

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Electromechanical axis Mod. 5E...HS1
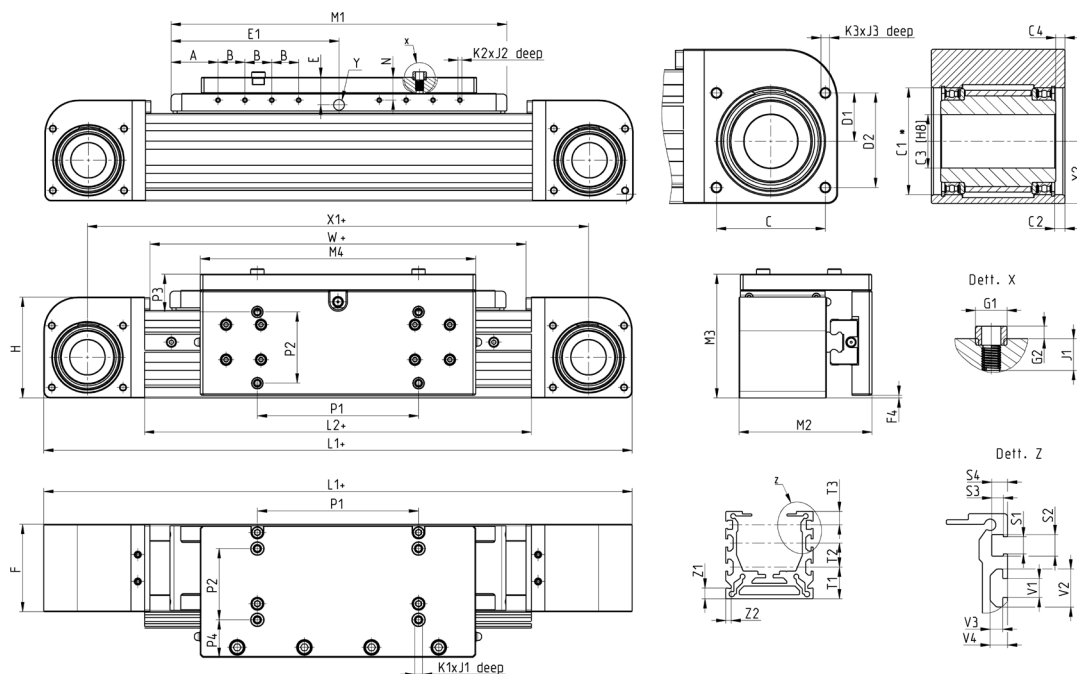
Size	A	B	C	₀C1	C2	₀C3	C4	D1	D2	E	E1	F	F4	₀G1	G2	H	L1	L2	M1	M2	M3	N	P1	P2	P3	P4	K1	J1	K2	J2	K3	J3	T1	T2	T3	Y	X1	X2	W	Z1	Z2	S1	S2	S3	S4	V1	V2	V3	V4
65	35	20	53	52	5	26	4,5	23,5	46	20,5	125	65	2	8	3	75	438	288	250	99	92	17	120	53	28	28	M5	8	M3	6		M5	10	23,5	18	10	●	373	30,5	280	8	4	5,4	6,8	3,65	5	6	12	4	5,5
80	35	30	68	68	6,5	38	6	30,5	60,5	26,5	165	80	1	10	3	95	548	368	330	119	115	23	165	64	31	33,5	M5	12	M4	8,5	M5	10	25		25	10	●	468	40,5	360	8	4	5,4	6,8	3,65	5	8	16,5	6,8	9

* We recommend a coupling with a shaft of tolerance h8.
● Dimension Y indicates the hole for centralized lubrication by means of grease.

Size	Weight stroke zero [kg]	Stroke weight per meter [kg/m]
65	7,08	6,86
80	14,86	8,34

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - DIMENSIONS

Electromechanical axis Mod. 5E...AL1
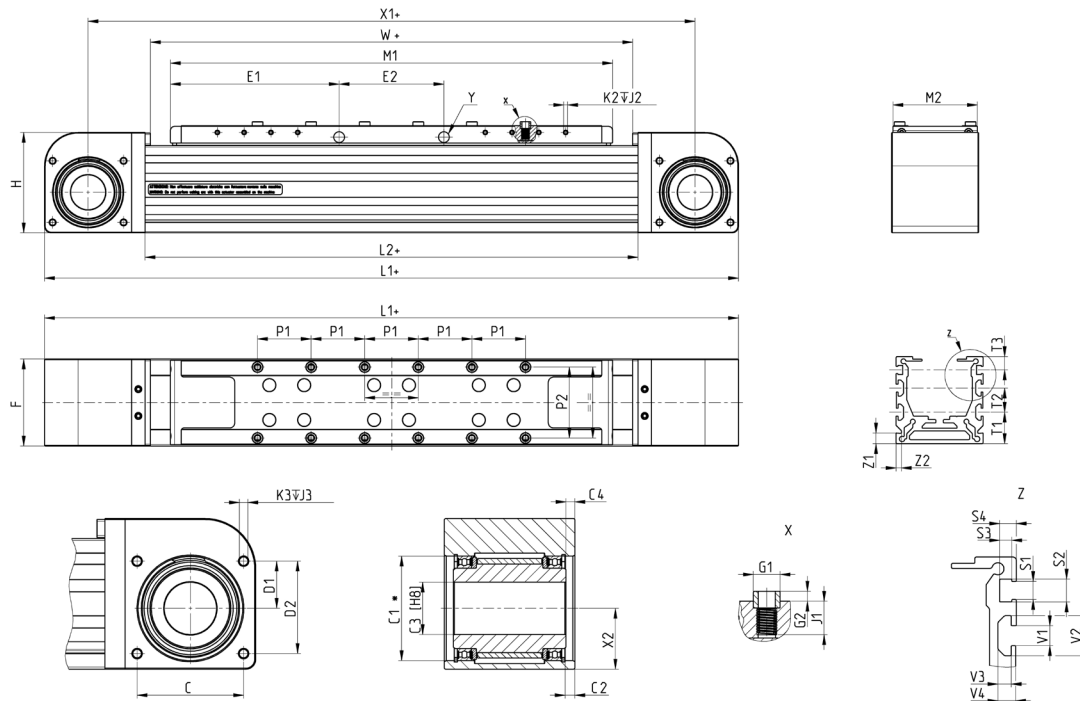
Size	A	B	C	₀C1	C2	₀C3(h8)	C4	D1	D2	E	E1	E2	F	₀G1(h8)	G2	H	L1	L2	M1	M2	M3	N	P1	P2	K1	J1	K2	J2	K3	J3	T1	T2	T3	Y	X1	X2	W	Z1	Z2	S1	S2	S3	S4	V1	V2	V3	V4
50	32,5	15	37	37	4,5	20	2	17	32	8,5	101,5	62	50	6	2	60	419	303	265	48	65	5	30	40	M4	7	M3	5	M4	8	20,0	▪	10	●	369	21,8	295	8	4	5,4	6,8	3,65	5	6	12	4	5,5
65	35,0	20	53	52	5	26	4,5	23,5	46	8,5	126,0	78	65	8	3	75	518	368	330	63	80	5	40	53	M5	8	M3	6	M5	10	23,5	18	10	●	453	30,5	360	8	4	5,4	6,8	3,65	5	6	12	4	5,5
80	37,5	30	68	68	6,5	38	6	30,5	60,5	11,5	167,5	110	80	10	3	95	663	483	445	78	100	8	55	64	M6	12	M4	8,5	M5	10	25,0	25	10	●	583	40,5	475	8	4	5,4	6,8	3,65	5	6	16,5	6,8	9

* We recommend a coupling with a shaft of tolerance h8.
▪ Dimension T2 in size 50 is not indicated because there is only one slot.
● Dimension Y indicates the hole for centralized lubrication by means of grease.

Size	Weight stroke zero [kg]	Stroke weight per meter [kg/m]
50	2,58	3,35
65	5,56	5,4
80	11,10	5,9

Electromechanical axis Mod. 5E...AS2

Size	A	B	C	₀C1	C2	₀C3(h8)	C4	D1	D2	E	E1	F	₀G1(h8)	G2	H	L1	L2	M1	M2	M3	N	P1	P2	K1	J1	K2	J2	K3	J3	T1	T2	T3	Y	X1	X2	W	Z1	Z2	S1	S2	S3	S4	V1	V2	V3	V4
50	32,5	15	37	37	4,5	20	2	17	32	8,5	100	50	6	2	60	604	488	200	48	65	5	30	40	M4	7	M3	5	M4	8	20	■	10	●	304	21,8	230	8	4	5,4	6,8	3,65	5	6	12	4	5,5
65	35	20	53	52	5	26	4,5	23,5	46	8,5	125	65	8	3	75	738	588	250	63	80	5	40	53	M5	8	M3	6	M5	10	23,5	18	10	●	373	30,5	280	8	4	5,4	6,8	3,65	5	6	12	4	5,5
80	35	30	68	68	6,5	38	6	30,5	60,5	11,5	165	80	10	3	95	948	768	330	78	100	8	55	64	M6	12	M4	8,5	M5	10	25	25	10	●	468	40,5	360	8	4	5,4	6,8	3,65	5	8	17	6,8	9

* We recommend a coupling with a shaft of tolerance h8.
■ Dimension T2 in size 50 is not indicated because there is only one slot.
● Dimension Y indicates the hole for centralized lubrication by means of grease

Size	CL min	CL max	Max applicable stroke	Weight stroke zero [kg]	WEIGHT PER METER [kg/m] (valid for stroke and interaxis increases)
50	250	2000	Smax = 4262 - CL	3,49	3,35
65	300	2000	Smax = 6212 - CL	7,35	5,4
80	400	2000	Smax = 6132 - CL	14,68	5,9

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ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - ACCESSORIES

Side clamping bracket Mod. BGS

Material:
aluminium

Supplied with:
2x clamps

Mod.	Size	A	B	C1	C2	⌀D1	⌀D2	E1	E2	H1	H2	P	Weight (g)
BGS-5E-M5	50	25	66	68	*	5,5	9	82	45	6,4	6	10	45
BGS-5E-M5	65	25	81	85	*	5,5	9	97	45	6,4	6	10	45
BGS-5E-M5	80	25	96	100	*	5,5	9	112	45	6,4	6	10	45
BGS-5E-M6	50	25	66	68	*	6,5	10,5	82	45	5,4	7	10	40
BGS-5E-M6	65	25	81	85	*	6,5	10,5	97	45	5,4	7	10	40
BGS-5E-M6	80	25	96	100	*	6,5	10,5	112	45	5,4	7	10	40

*according to the span (max admissible deflection) recommended value 500 mm

Perforated side clamping bracket Mod. BGA

Material:
aluminium

Supplied with:
2x clamps with perforation
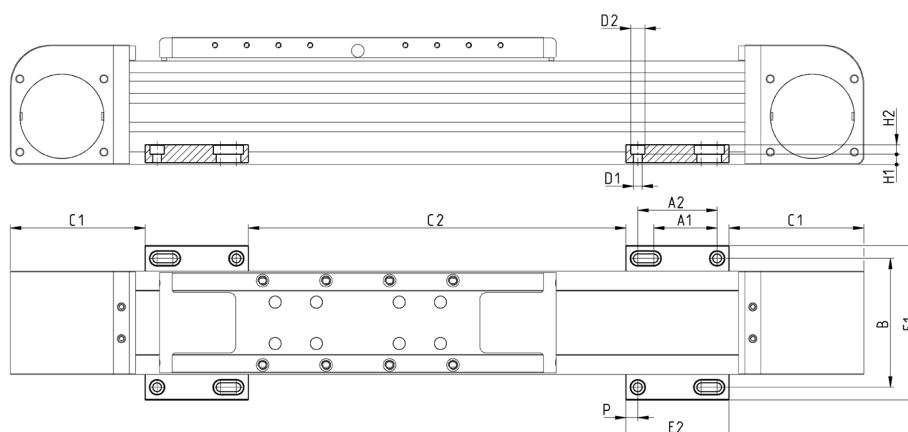
Mod.	Size	A1	A2	B	C1	C2	⌀D1	⌀D2	E1	E2	H1	H2	P	Weight (g)
BGA-5E-M5	50	40	50	66	68	*	5,5	9	82	65	6,4	6	7,5	60
BGA-5E-M5	65	40	50	81	85	*	5,5	9	97	65	6,4	6	7,5	60
BGA-5E-M5	80	40	50	96	100	*	5,5	9	112	65	6,4	6	7,5	60
BGA-5E-M6	50	40	50	66	68	*	6,5	10,5	82	65	5,4	7	7,5	55
BGA-5E-M6	65	40	50	81	85	*	6,5	10,5	97	65	5,4	7	7,5	55
BGA-5E-M6	80	40	50	96	100	*	6,5	10,5	112	65	5,4	7	7,5	55

*according to the span (max admissible deflection) recommended value 500 mm

Interface plate - slider on slider
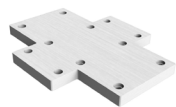
Supplied with:
1x interface plate
8x screws + 8x lock washers
to connect the plate on the
slider of the main axis
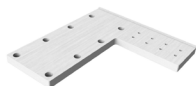4x screws + 4x lock washers
to connect the plate on the
slider of the secondary axis
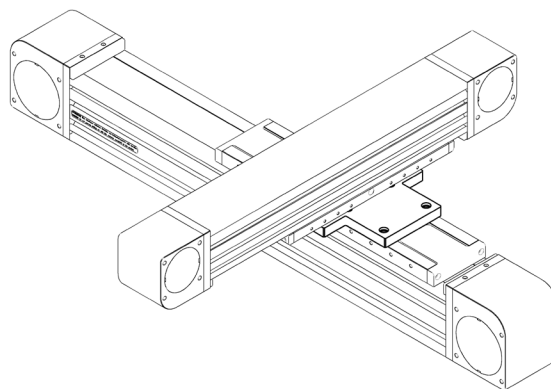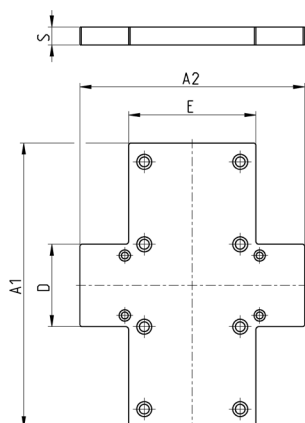
Mod.	Size	A1	A2	D	E	S	Weight [g]
XY-S65-S50	65	150	150	55	70	12	515
XY-S80-S50	80	190	150	55	85	12	690
XY-S80-S65	80	190	150	70	85	12	720

Interface plate - profile on slider

Supplied with:
1x interface plate
8x screws + 8x lock washers
to connect the plate on the
slider of the main axis
4x clamps
8x screws + 8x lock washers
to connect the secondary
axis on the plate by means
of clamps
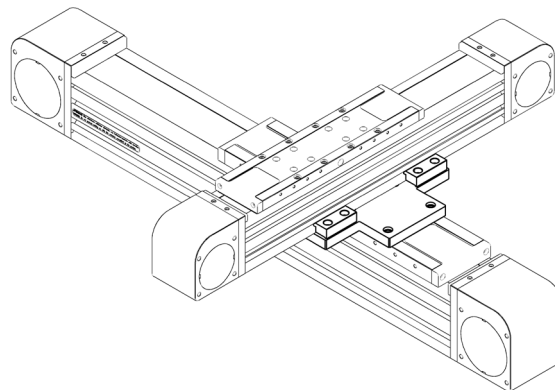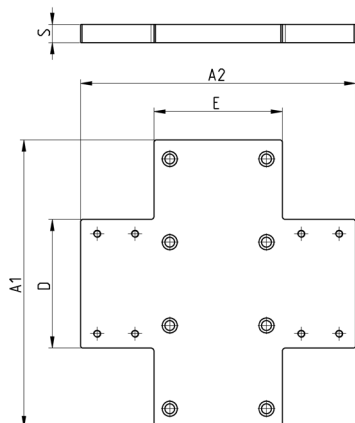
Mod.	Size	A1	A2	D	E	S	Weight [g]
XY-S65-P50	65	150	162	85	70	12	730
XY-S80-P50	80	190	182	85	85	12	945
XY-S80-P65	80	190	185	100	85	12	1000

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - ACCESSORIES

Interface plate - profile on slider - long arm
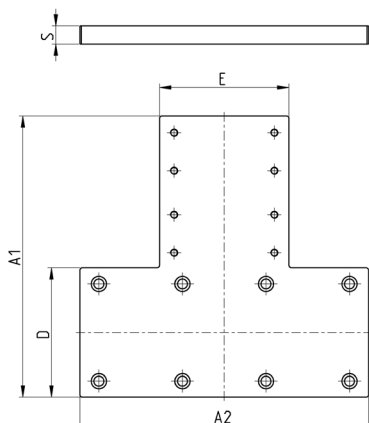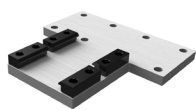
Supplied with:
1x interface plate
8x screws + 8x lock washers
to connect plate on the
slider of the main axis
4x clamps
8x screws + 8x lock washers
to connect plate on the
slider of the secondary axis
by means of clamps
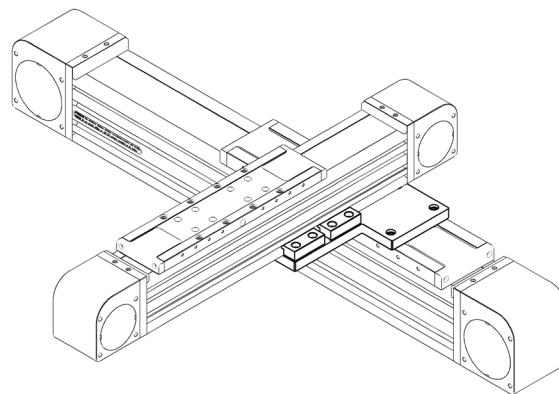
Mod.	Size	A1	A2	D	E	S	Weight [g]
XY-S50-P50-T	50	162	130	50	85	12	600
XY-S65-P50-T	65	170	150	65	85	12	750
XY-S65-P65-T	65	185	170	65	100	12	800
XY-S80-P50-T	80	185	190	85	85	12	960
XY-S80-P65-T	80	185	190	85	100	12	1010
XY-S80-P80-T	80	200	190	85	120	12	1100

Interface plate - Series 6E cylinder on slider
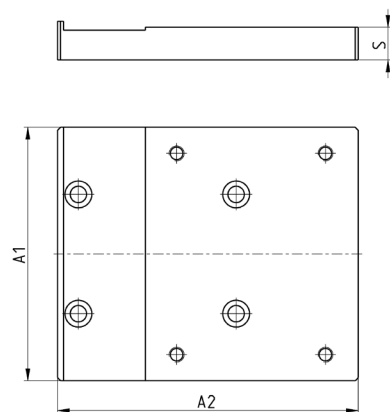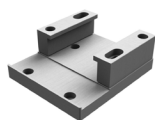
Supplied with:
1x interface plate
4x screws + 4x lock washers
to connect the plate on the
slider of the axis
2x clamps
4x screws + 4x lock washers
to fix the Series 6E cylinder
by means of clamps
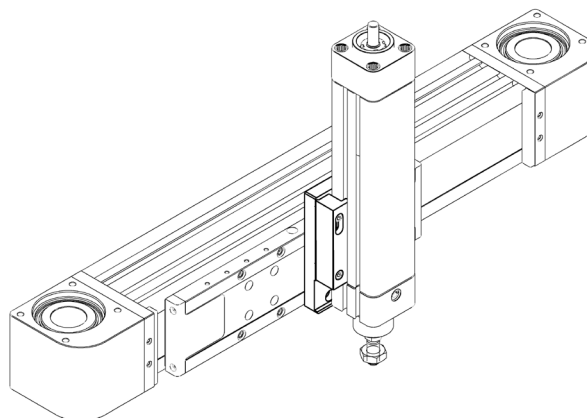
Mod.	Size	A1	A2	S	Weight [g]
XY S50-6E32	50	72	101	11	315
XY-S65-6E32	65	72	101	11	315
XY-S65-6E40	65	85	101	11	350
XY S65-6E50	65	95	110	12	510
XY-S80-6E32	80	75	101	12	385
XY-S80-6E40	80	85	101	12	410
XY-S80-6E50	80	95	110	12	510
XY S80-6E63	80	106	110	12	560

ELECTRIC ACTUATION

2

Interface plate - profile side on slider - left position

Supplied with:
1x interface plate
8x screws + 8x lock washers
to connect the plate on
the slider of the main axis,
screws and nuts for slot to
connect the plate on the
slider of the secondary axis
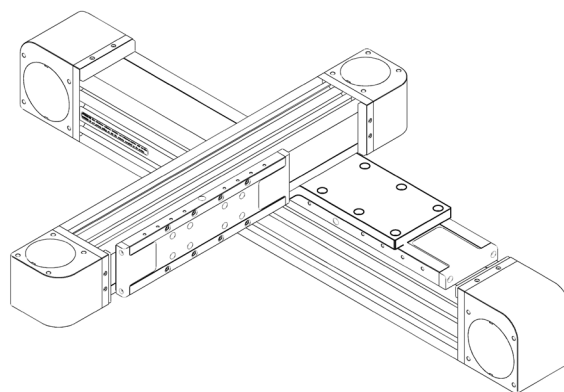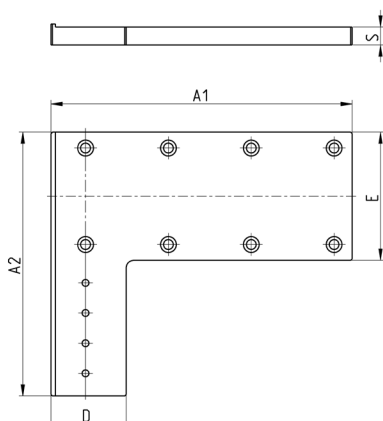
Mod.	Size	A1	A2	D	E	S	N° of holes	Weight [g]
XY-S50-LL50	50	130	145	50	55	11	4	450
XY-S65-LL50	65	160	160	50	70	11	4	500
XY-S65-LL65	65	170	180	65	70	12	8	550
XY-S80-LL50	80	200	175	50	85	12	4	750
XY-S80-LL65	80	210	195	65	85	12	8	870
XY-S80-LL80	80	210	195	80	85	12	8	900

Interface plate - profile side on slider - right position

Supplied with:
1x interface plate
8x screws + 8x lock washers
to connect the plate on
the slider of the main axis,
screws and nuts for slot to
connect the plate on the
slider of the secondary axis
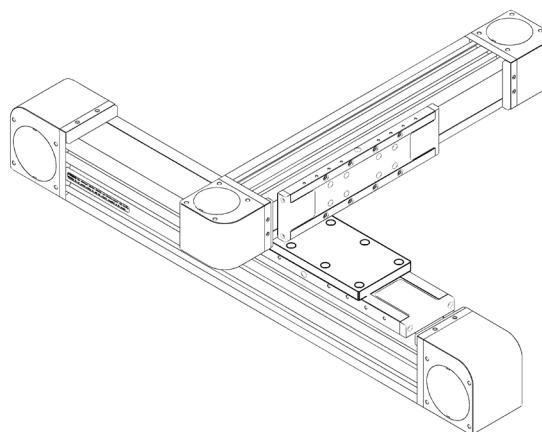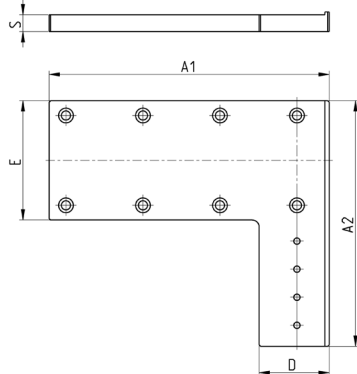
Mod.	Size	A1	A2	D	E	S	N° of holes	Weight [g]
XY-S50-LR50	50	130	145	50	55	11	4	450
XY-S65-LR50	65	160	160	50	70	11	4	500
XY-S65-LR65	65	170	180	65	70	12	8	550
XY-S80-LR50	80	200	175	50	85	12	4	750
XY-S80-LR65	80	210	195	65	85	12	8	870
XY-S80-LR80	80	210	195	80	85	12	8	900

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - ACCESSORIES

Interface plate - Anti-rotation guides S. 45 / Cylinders S. 6E on slider

Supplied with:
1x interface plate
8x screws + 8x lock washers
to connect the plate on
the slider
4x screws to connect the
cylinder
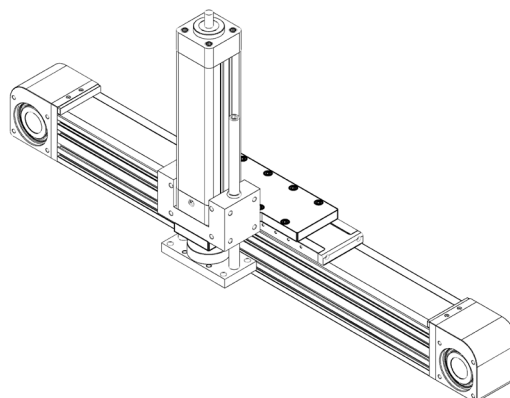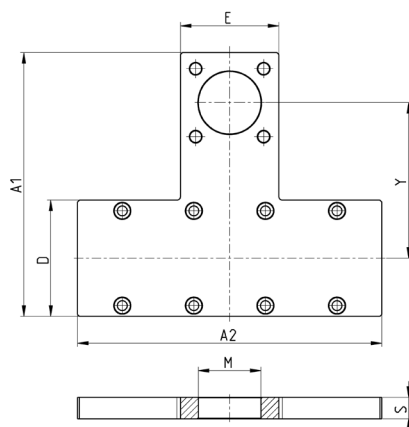
Mod.	Size	A1	A2	D	E	S	⌀M$^{(h10)}$	Y	Weight [g]
XY-S50-45N32	50	124	130	50	49	12	30	75	350
XY-S65-45N32	65	139	170	65	49	12	30	82,5	480
XY-S65-45N40	65	147,5	170	65	55	12	35	87	500
XY-S65-45N50	65	157	170	65	66,5	12	40	91,5	530
XY-S80-45N40	80	167,5	190	85	55	12	35	97	660
XY-S80-45N50	80	177	190	85	65	12	40	101,5	690
XY-S80-45N63	80	190,5	190	85	75	12	45	110	740

Fixed interface plate

Supplied with:
1x interface plate
4x clamps
8x screws to connect the
clamps on the plate
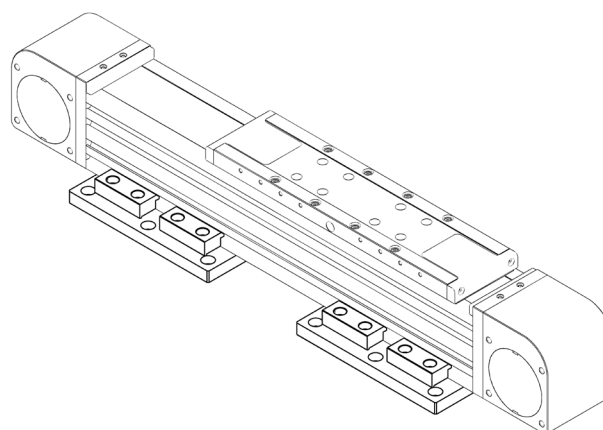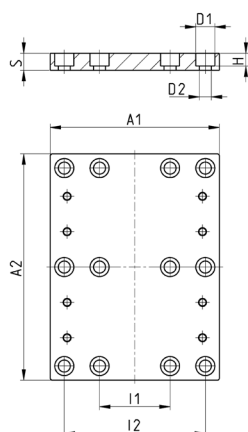
Mod.	Size	A1	A2	⌀D1	⌀D2	H	I1	I2	S	Weight [g]
X-P50	50	95	140	9	5,5	6	45	80	8	275
X-P65	65	120	140	10,5	6,5	7	50	100	10	430
X-P80	80	120	160	13,5	8,5	9	50	100	12	570

Connection flange
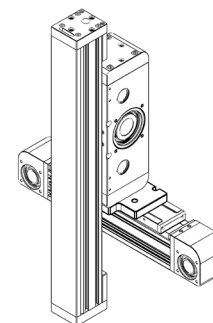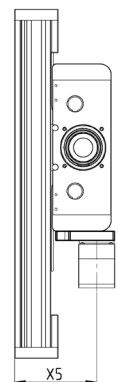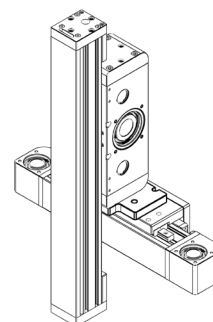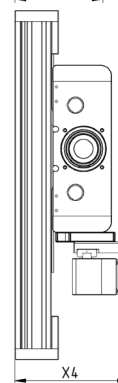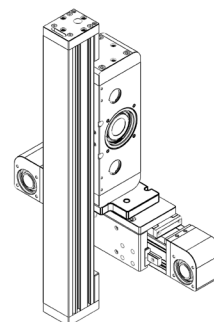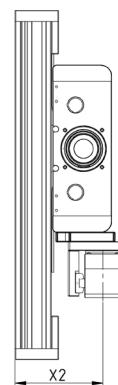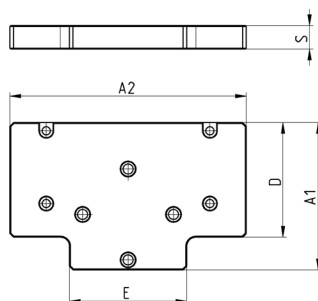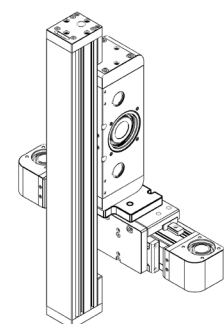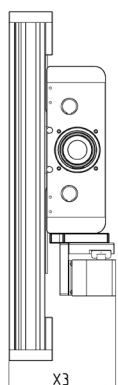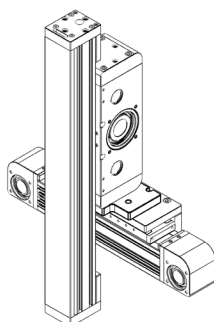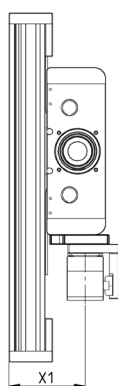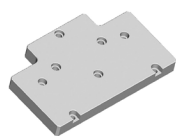
Mod.	Size	X1	X2	X3	X4	X5	A1	A2	E	D	S	Weight [g]
YZ-50-5V50	50	105	121	147	79	-	81	130	64,5	63	13	335
YZ-65-5V50	65	112,5	136,5	16	87	124,5	99,5	140	64,5	76,5	13	445
YZ-65-5V65	65	130	154	179,5	104,5	-	101,5	140	84,5	76,5	13	460
YZ-80-5V50	80	120,5	146,5	185,5	81,5	133,5	118	190	64,5	78	13	635
YZ-80-5V65	80	137,5	163,5	202,5	98,5	150,5	118	190	84,5	78	15	770
YZ-80-5V80	80	141	183,5	222,5	118,5	-	120	190	99,5	78	15	825

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - ACCESSORIES

Centring sleeve
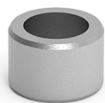
Supplied with:
2x centring rings in steel
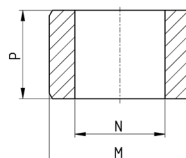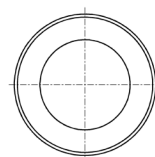
Mod.	M (h8)	N	P
TR-CG-04	Ø4	Ø2,6	2.5
TR-CG-05	Ø5	Ø3,1	3
TR-CG-06	Ø6	Ø4,1	4
TR-CG-08	Ø8	Ø5,1	5
TR-CG-10	Ø10	Ø6,1	6
TR-CG-12	Ø12	Ø8,1	6

Kit to fix the inductive sensor Mod. SIS

Supplied with:
1x sensor dog
2x screws to fix the sensor dog
1x sensor supporting plate
2x screws to connect the sensor supporting plate
2x nuts for the slot
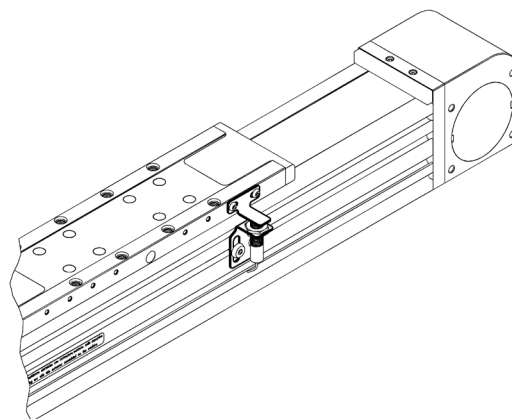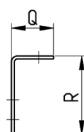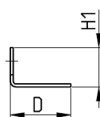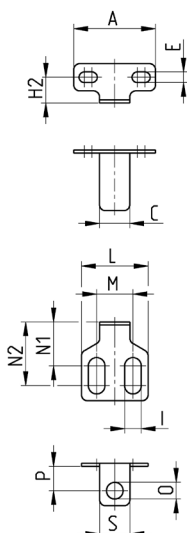
Mod.	Size	A	C	D	E	H1	H2	I	L	M	N1	N2	ØO	P	Q	R	S	Weight (g)
SIS-M5-50/65	50-65	27	10	20	3.5	13	8.5	5,5	22	12	14,5	21	5,5	8	14	26	10	10
SIS-M8-65	65	27	10	20	3.5	13	8.5	5,5	25	15	10,5	24	8,5	10	18,5	30	15	10
SIS-M5-80	80	45	15	20	4.5	16	10.5	5,5	22	12	14,5	21	5,5	8	14	26	10	15
SIS-M8-80	80	45	15	20	4.5	16	10.5	5,5	25	15	10,5	24	8,5	10	18,5	30	15	15

ELECTRIC ACTUATION

Kit to connect the gearbox Mod. FR-5E
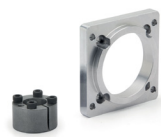
Supplied with:
1x connection flange
4x screws + 4x lock washers
to connect the flange
1x locking set
4x screws + 4x lock washers
to connect the gearbox
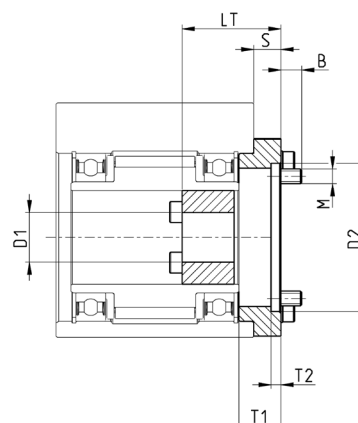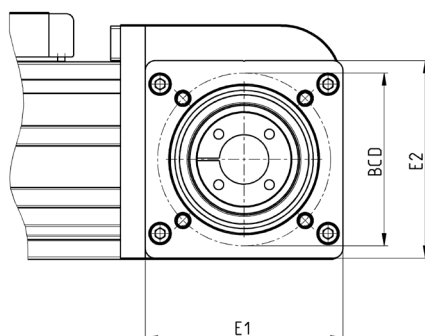
Mod.	Size	Gearbox	E1	E2	S	⌀D1	⌀D2(H7)	LT	BCD	T1	T2	M	B	Max torque [Nm](A)	J (Kgmm²)	Weight (g)
FR-5E-50	50	GB-040	48	43	6	10	26	26	34	10	10	4	5,5	14	1,50	85
FR-5E-65	65	GB-060	63	60	7	14	40	40	52	11	11	5	7,4	30	5,49	140
FR-5E-80	80	GB-080	80	80	11	20	60	60	70	17	4	6	8,4	125	31,20	325

(A) Value refers to ideal mounting and operating conditions. For further details, please contact service@camozzi.com

Kit to connect the gearbox - enhanced series (sizes 50, 65) Mod. FRH-5E

Supplied with:
1x connection flange
4x screws + 4x lock washers
to connect the flange
1x expansion coupling
4x screws + 4x lock washers
to connect the gearbox
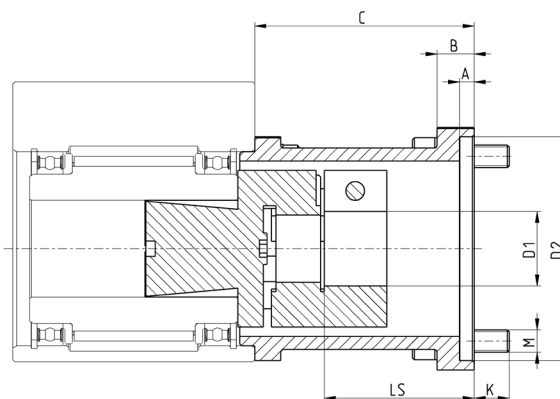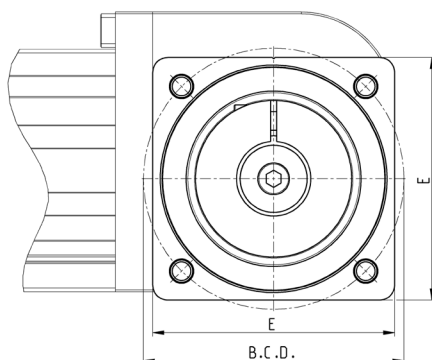
Mod.	Size	Gearbox	⌀D1	⌀D2(H7)	A	LS	⌀BCD	B	C	E	M	K	Nominal torque [Nm](A)	Max. torque [Nm](B)	J (Kgmm²)	Weight (g)
FRH-5E-50	50	GB-060	14	40	4	35,3	52	8	51	50	5	7,4	12,5	25	13	170
FRH-5E-65	65	GB-080	20	60	4	40,3	70	10	59	65	6	9,4	17	34	50	530

(A)Continuously applicable torque, under ideal mounting and operating conditions. For further details, please contact service@camozzi. com
(B)Torque applicable for short intervals, under ideal mounting and operating conditions. For further details, please contact service@ camozzi.com

Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
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For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

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ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - ACCESSORIES

Kit to connect the gearbox - enhanced series (size 80) Mod. FRH-5E-80

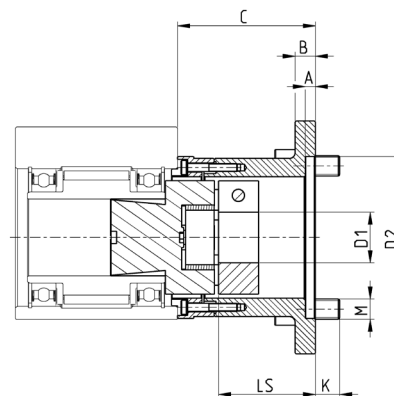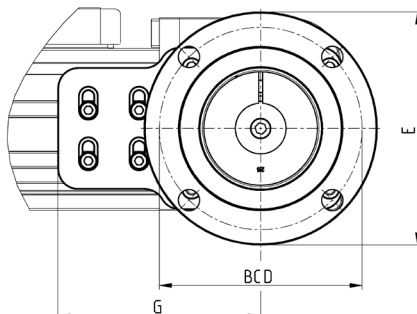**Supplied with:**
2x connection flanges
4x screws + 4x lock washers
1x expansion coupling
4x screws + 4x lock washers
to fix the axis
4x screws + 4x lock washers
to fix the profile
4x nuts + 4x screws to fix the
gearbox

Mod.	Size	Gearbox	ØD1(H7)	Ø D2	A	LS	ØBCD	B	C	ØE	K	G	Nominal torque [Nm](A)	Max. torque [Nm](B)	J [kg mm²]	Weight (g)
FRH-5E-80	80	GB-120	20	80	5	47,8	100	10	68	115	12	100	60	120	140	1000

(A)Continuously applicable torque, under ideal mounting and operating conditions. For further details, please contact service@camozzi. com
(B)Torque applicable for short intervals, under ideal mounting and operating conditions. For further details, please contact service@camozzi.com

Direct connection kit for Stepper motor Mod. FS-5E
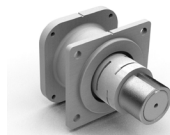
Supplied with:
1x MTS-24 connection
flange
4x screws + 4 lock washers
1x expansion coupling
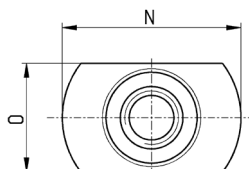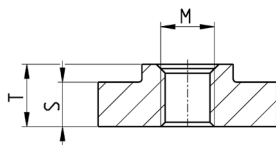1x bushing (not present in
FS-5E-50-0024)
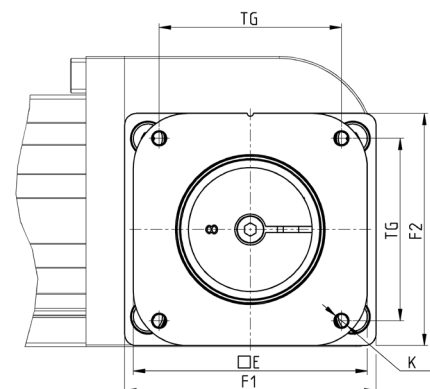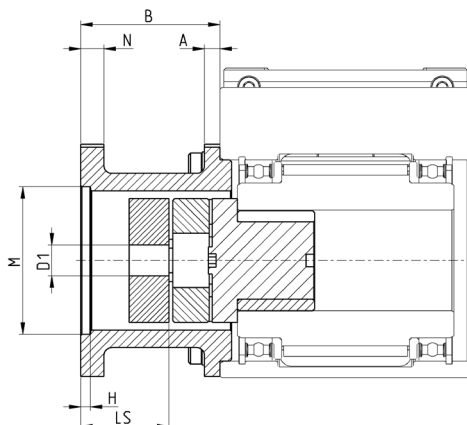
Mod.	Size	Motor	ØD1	A	B	F1	F2	E	LS	TG	K	ØM	H	N	Nominal torque (Nm)	Max torque (Nm)	Weight (g)	Weight (g)
FS-5E-50-0024	50	MTS-24-...	8	4	37	47	45	60,5	21,3	47,1	M4	38,1	2,5	2,5	12,5	25	13	125
FS-5E-65-0024	65	MTS-24-...	8	4	36	65	60	60,5	22,8	47,1	M4	38,1	2,5	2,5	12,5	25	13	200

ELECTRIC ACTUATION

2

Slot nut for sensor

Material:
steel

Supplied with:
2x nuts

Mod.	Size	M	N	O	S	T
PCV-5E-CS-M3	50 - 65 - 80	M3	10,3	6,1	2,5	3,5
PCV-5E-CS-M4	50 - 65 - 80	M4	10,3	6,1	2,5	3,5

Slot nut 6 - rectangular type

Material:
steel

Supplied with:
2x nuts
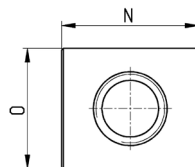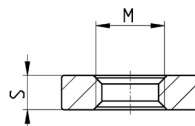
Mod.	Size	M	N	O	S
PCV-5E-C6-M4Q	50 - 65	M4	8	7	2

Slot nut 6 - front insertion

Material:
steel

Supplied with:
2x nuts
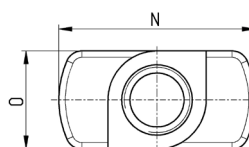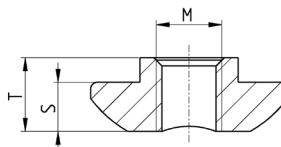
Mod.	Size	M	N	O	S	T
PCV-5E-C6-M4R	50 - 65	M4	12	6	3	4,5

ELECTROMECHANICAL AXIS
SERIES 5ES...TBL - ACCESSORIES

Slot nut 8 - flexible flap

Material:
steel

Supplied with:
2x nuts
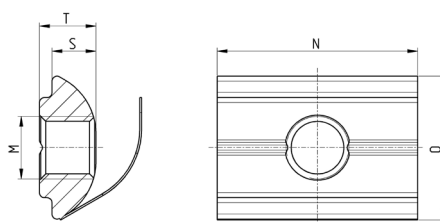
Mod.	Size	M	N	O	S	T
PCV-5E-C8-M5	80	M5	16	11,5	3,5	4,5
PCV-5E-C8-M6	80	M6	16	11,5	3,5	4,5

Parallel connection kit Mod. PS-5E

Supplied with:
1x parallel shaft
2x expansion couplings
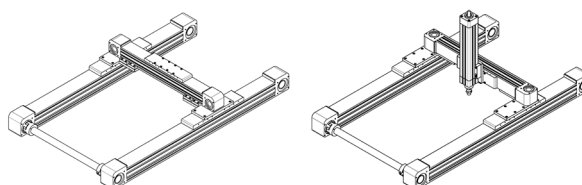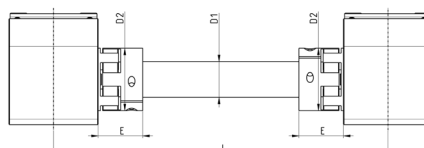
Mod.	Size	l min	l min	l max	$_{\emptyset}$D2	E	Transmission torque
PS-5E-50-0000	50	200	2000	22	32	26	see graph
PS-5E-65-0000	65	250	2000	25	42	35,5	see graph
PS-5E-80-0000	80	300	2000	30	56	40	see graph

EXAMPLE:
PS-5E-65-1400 corresponds to a parallel connection for axes positioned at interaxis l = 1400mm

ELECTRIC ACTUATION

2

INTERAXIS ACCORDING TO THE MAXIMUM ADMISSIBLE TORQUE
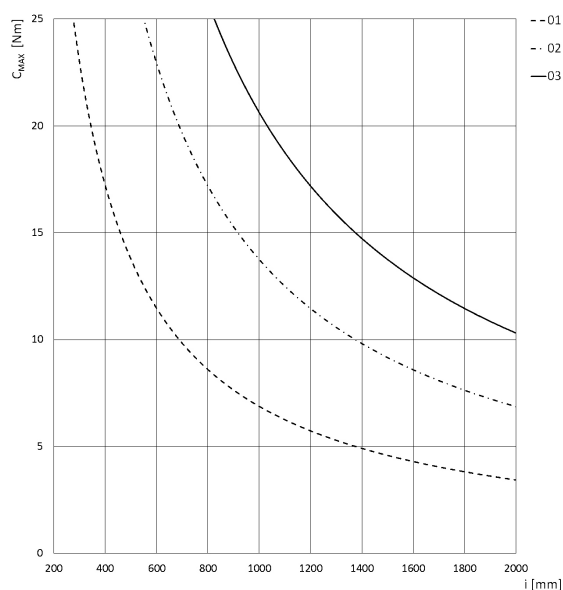
Size 50x50

Cmax = max applicable torque
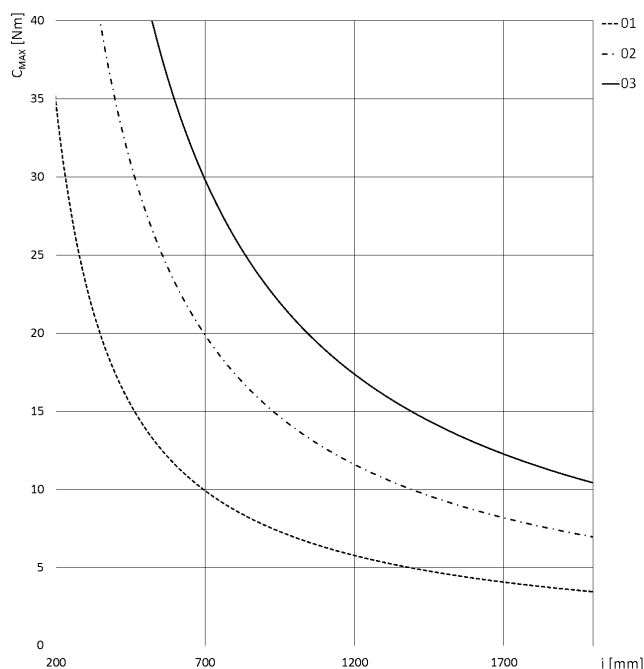i = interaxis between the two 5E axes

01 = lag error 0.1 mm
02 = lag error 0.2 mm
03 = lag error 0.3 mm
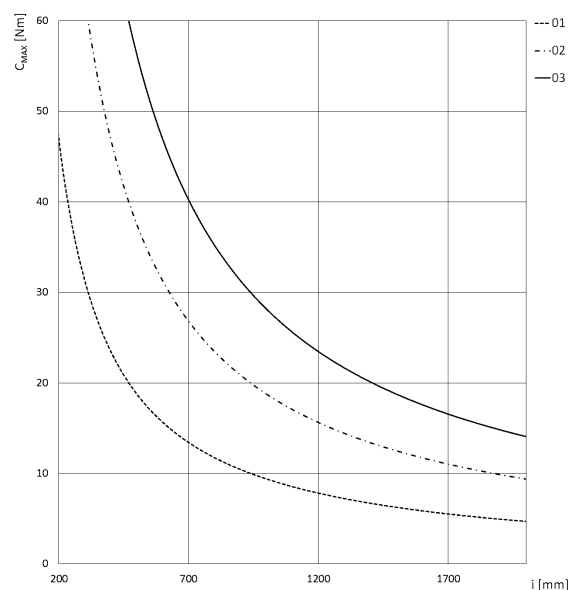
Size 80x80

Cmax = max applicable torque
i = interaxis between the two 5E axes

01 = lag error 0.1 mm
02 = lag error 0.2 mm
03 = lag error 0.3 mm

Size 65x65

Cmax = max applicable torque
i = interaxis between the two 5E axes

01 = lag error 0.1 mm
02 = lag error 0.2 mm
03 = lag error 0.3 mm