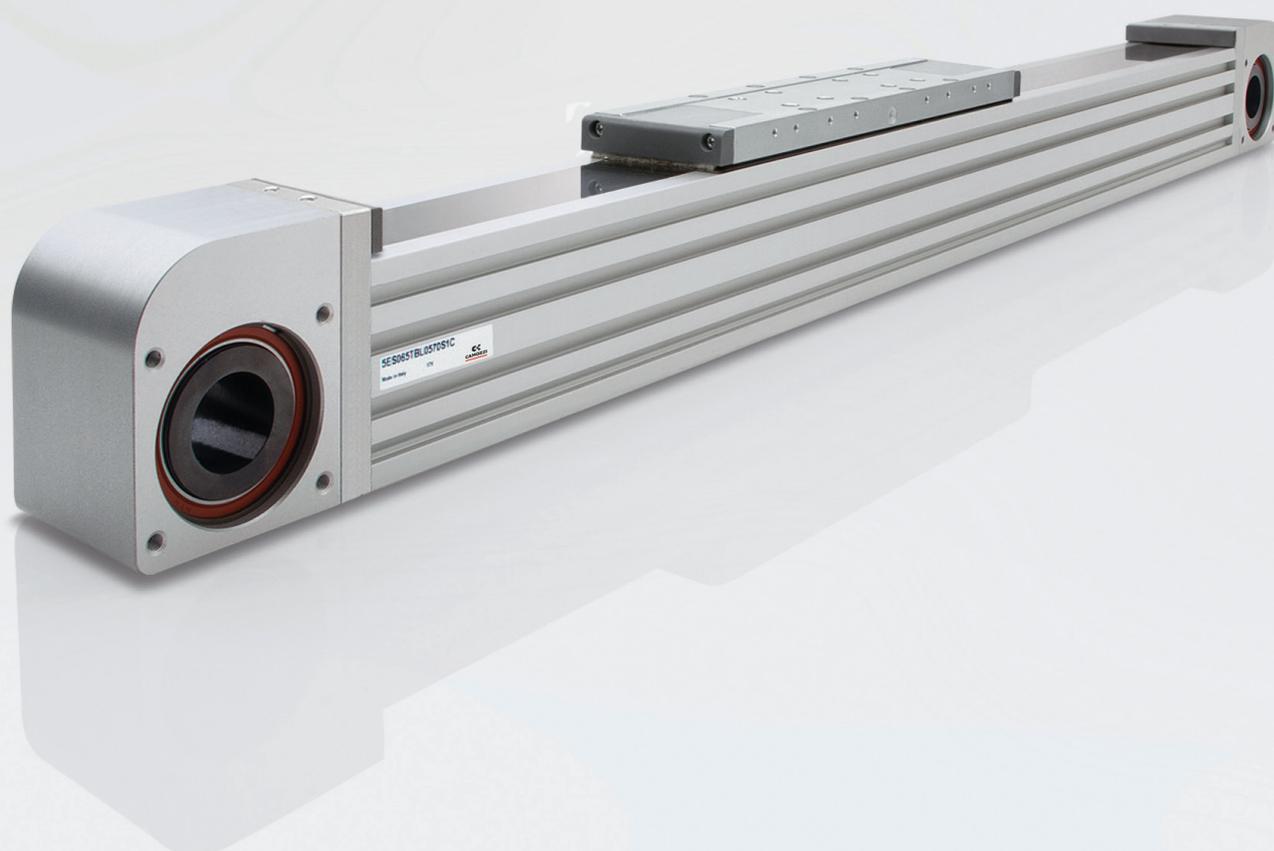


USE AND MAINTENANCE MANUAL



SERIES 5E
ELECTROMECHANICAL AXES



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i. Introduction

This user manual must be read in its entirety before beginning mounting and installation of the Series 5E electromechanical axis. This document provides guidance on some specific product features and does not provide guidance on the correct application of the product under certain conditions. The final user must perform the controls and assessments necessary to validate the use of the product.

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1. General safety warnings

- The locally valid provisions, laws and regulations for the destination of the product must always be respected.
- The Series 5E electromechanical axis must be used free from tampering or damage and in the original condition provided.
- The Series 5E general catalogue (available from our distributors and/or on our website) defines the usage limits within which the Series 5E electromechanical axis must be applied.
- The products indicated in this document are subject to performance loss due to wear or aging of components subjected to loads and planned works.
- This document provides warnings relating to the Series 5E electromechanical axis. Assessment of any interactions with other components, objects or persons within the machine or an application is to be carried out by the designer or installation engineer of the machine or application itself.
- Certain hazards are associated with the product only after it has been installed on the machine/equipment. It is the final user's responsibility to identify these hazards and reduce the associated risks.
- The Series 5E electromechanical axes are designed for industrial use, they are not suitable to be used in potentially explosive atmospheres or underwater.
- In case of using the Series 5E electromechanical axis in potentially corrosive atmospheres, please contact Camozzi Automation S.p.A.
- Do not cover the Series 5E electromechanical axis with paint or other substances, do not use in direct contact with corrosive gases, chemicals, acids, salted water or vapour.

2. Reference documents

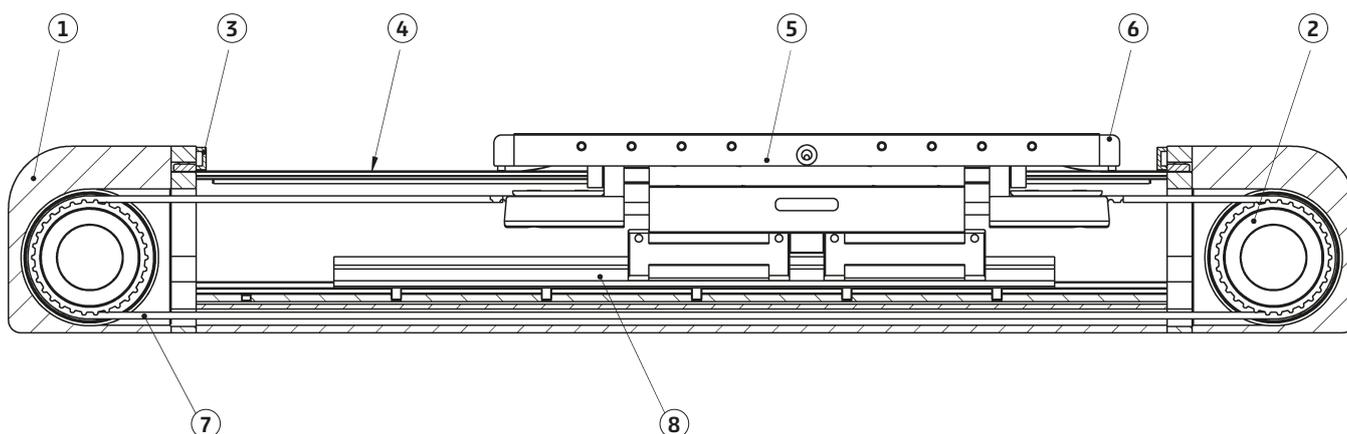
Before installation of the Series 5E electromechanical axis the installation engineer must ensure the following documentation is at disposal:

Document Title	Document Code	Application
Use and maintenance manual	93-7545-0010	Safety warnings
Instruction sheet (included in the package)	93-7545-0007	Basic information
Series 5E electromechanical axes	93-0518-0GB006	Electric actuation catalogue
Series DRCS and DRWB Drives for control of electrical actuation	93-0518-0GB006	Electric actuation catalogue
Series MTS and MTB motors for electrical actuation	93-0518-0GB006	Electric actuation catalogue
Series DRWB drives for brushless motors instruction sheet	93-7545-0001	Basic information
Series DRCS drives for stepper motors instruction sheet	93-7545-0006	Basic information
Declaration of incorporation for linear systems	86-4020-0003 [1]	Documentation to read and keep
Documentation relating to application in the system and instructions for the other components	[2]	-

(1) - Only in case of purchasing the unit supplied with an already installed motor.

(2) - Only in case of installation within a machine or application, make sure to have all documentation relating to the application at hand, in order to assess any risks to persons, animals or property.

3. Components and materials



PARTS	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



N.B.

- The 5E-SH1 version also includes two flanges in aluminium alloy and an external recirculating ball guide in steel.

- The 5E-DS1 version does not include the PU and steel toothed belt and the steel pulley.

4. Coding

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 [C]:
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)

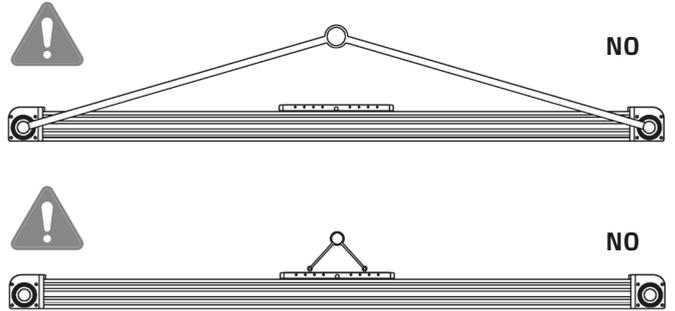
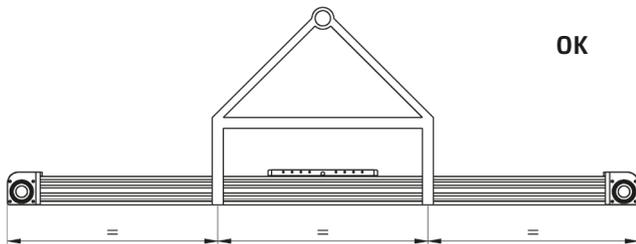
2(500)

NUMBER OF SLIDERS:
1 = 1 slider
2 (___) = 2 sliders at (___) mm step - only for standard axis (A) with standard slider (S)

5. Transport and packaging

The product packaging is suited to handling and lifting with warehouse equipment.
Check the integrity of the packaging before handling.

Accidental falling and/or crushing of the packaging may compromise the functionality of the product and cause serious injury to the handler. The lifting of the Series 5E electromechanical axis in at least two places as shown in the figure below (left) is recommended.



- The proper handling of the product should be carried out according to the figure above, raising the profile of the Series 5E electromechanical axis with appropriate means.
- It is forbidden to lift the Series 5E electromechanical axis using the end caps.
- It is forbidden to lift the Series 5E electromechanical axis using the slider.

- It is recommended to lift the Series 5E electromechanical axis by placing the slider/sliders between the hoisting gears.
- It is recommended, before lifting the axis, to consider the weight of the component as there may be unbalance in the version 5E-HS due to the presence of the external guide and the relative side plate connected.

6. Storage

- The product should be stored in dry environment protected from the weather and external corrosive agents.

- Storage temperatures should be between -20°C and +80°C.

7. Installation

The assembly of the Series 5E electromechanical axis should only be carried out by specialized or trained staff under the guidance and

supervision of qualified staff.

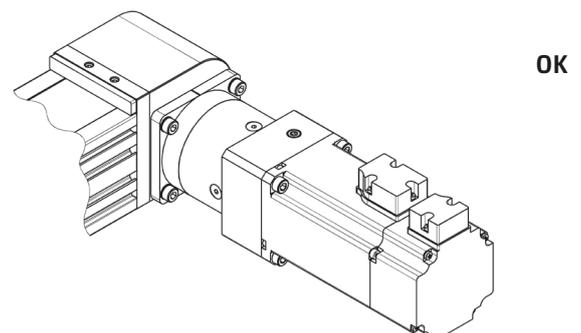
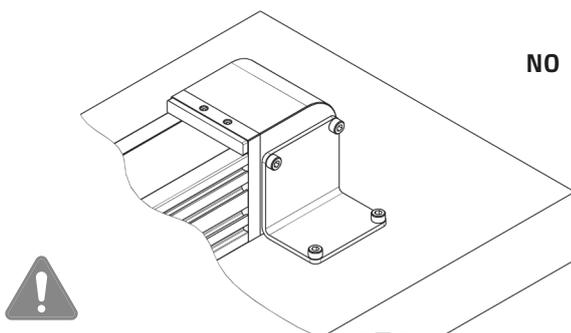
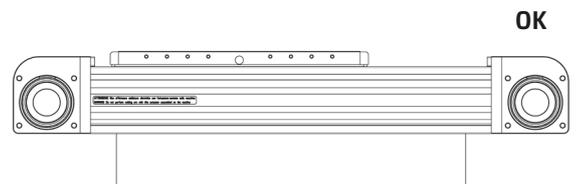
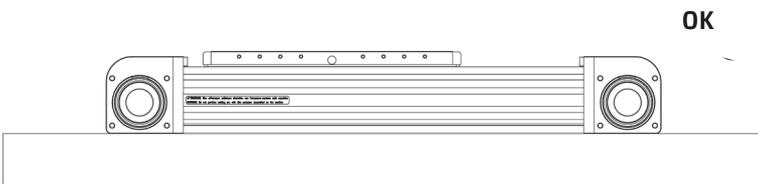
Fixing on a continuous surface

The Series 5E electromechanical axis may either be fixed on a continuous or contact surface.

In this particular case, the end caps of the Series 5E electromechanical axis lie on the same surface but must not be used for the fixing of the axis itself.

The drill holes on the sides of the end caps must only be used for the fixing of motor components (gearbox, motor and connection flanges).

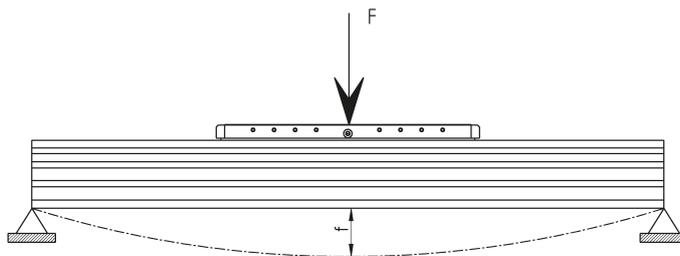
Mechanical properties and flatness of the base plane may influence the life and accuracy of the product.



Fixing on 2 or more supports

The Series 5E electromechanical axis may be mounted on two or more supports thanks to the self-supporting characteristics of the aluminium frame that forms its body.

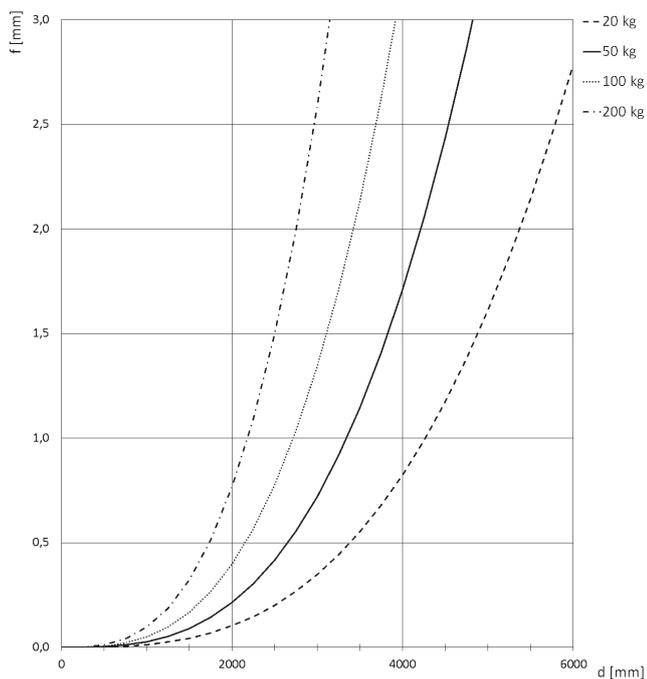
In this particular case, the deflection of the Series 5E electromechanical axis must be calculated on the basis of the distance between the supports and the loads applied to it.



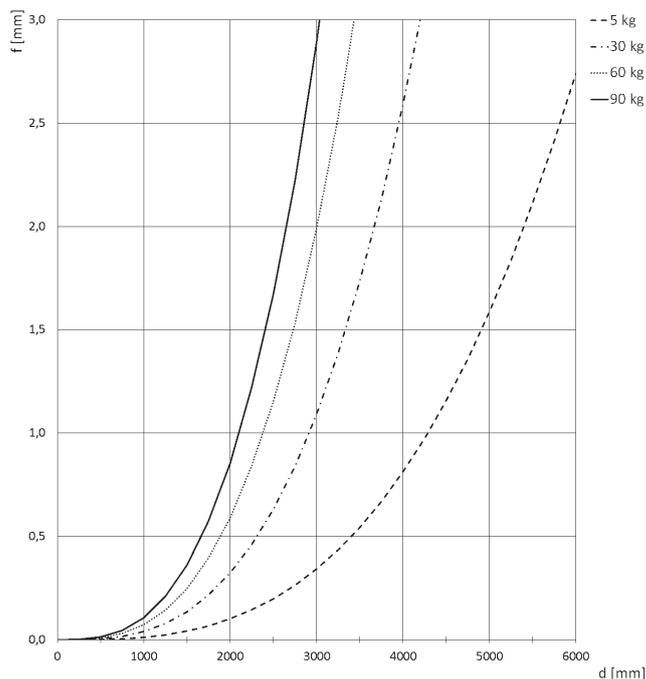
The following graphs indicate the deflection of the Series 5E electromechanical axis based on the distance between supports and the applied loads.

VERSION A

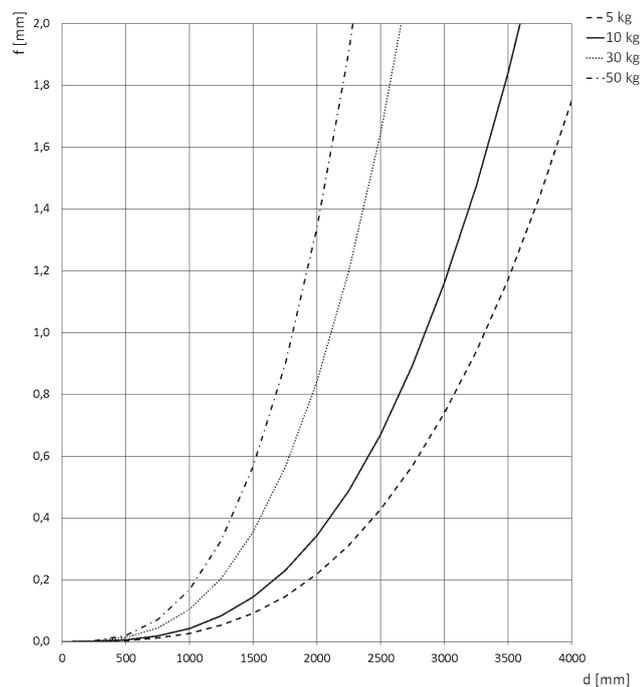
Series 5E size 50



Series 5E size 65

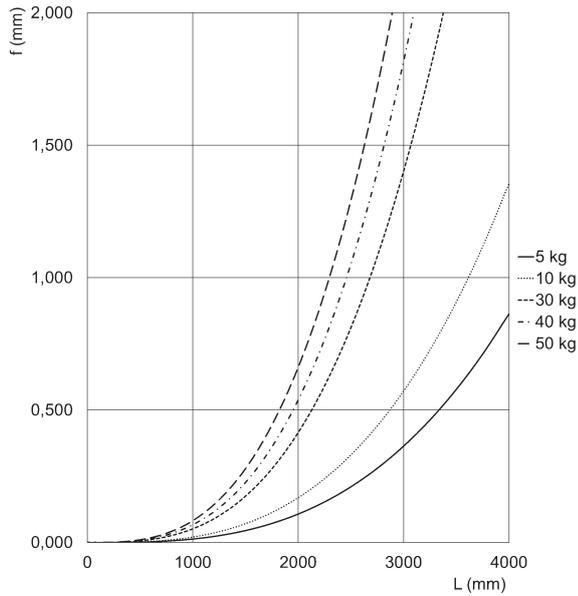


Series 5E size 80

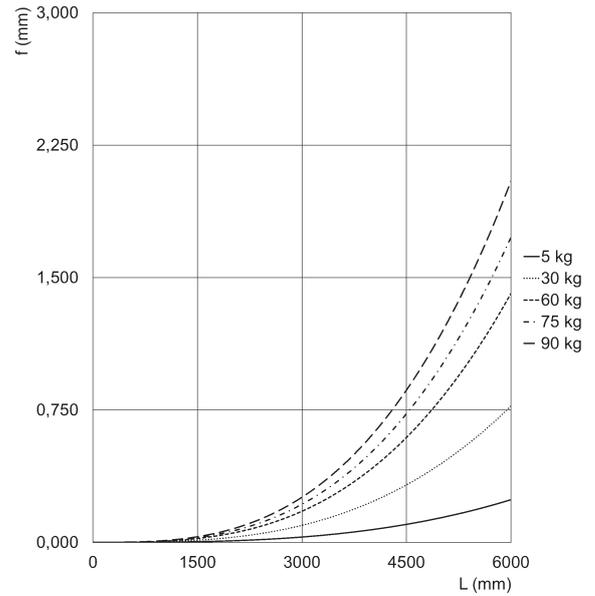


VERSION H

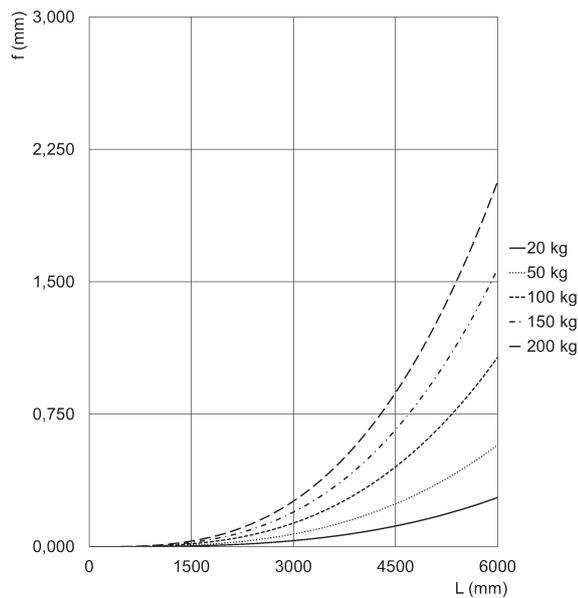
Series 5E size 50



Series 5E size 65



Series 5E size 80



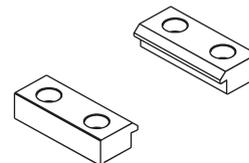
Fixing accessories

For the fixing of the Series 5E electromechanical axis several types of fixing elements are available:

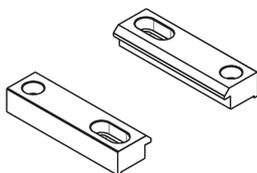
- BGS clamps (available in various versions)
- BGA clamps (available in various versions)
- PCV-5E slot nuts (available in various versions)

BGS clamps

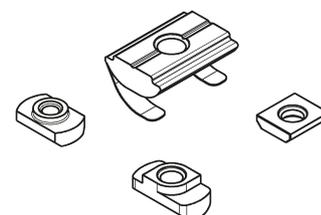
Mod. BGS clamps are ideal for quick fixing on plates and interfaces. Using constant pitch between drill holes allows dimensions to be reduced. Dimensions on electric actuation catalogue

**BGA clamps**

Mod. BGA clamps are ideal for quick fixing on modular profiles at variable distances. Dimensions on electric actuation catalogue

**PCV-5E slot nuts**

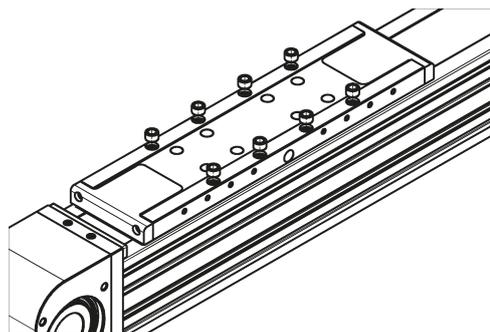
PCV-5E slot nuts are ideal for the side fixing of the axis or for connection of external accessories. Dimensions on electric actuation catalogue



Connections to the slider

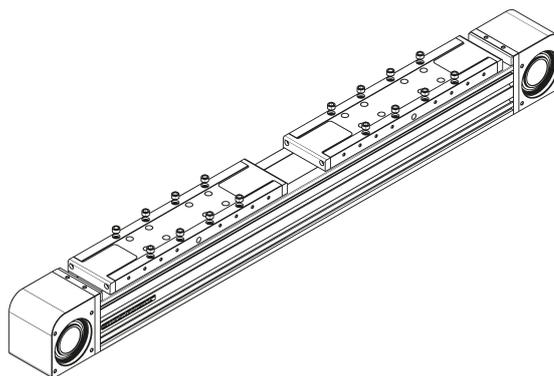
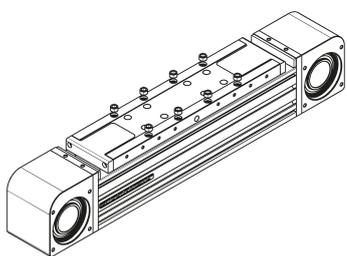
In order to guarantee the good positioning of any element attached to the slider, the use of the centring bushes provided with the Series 5E electromechanical axis is recommended.

Each interface in the Camozzi catalogue allows mounting through screws and centring bushes.



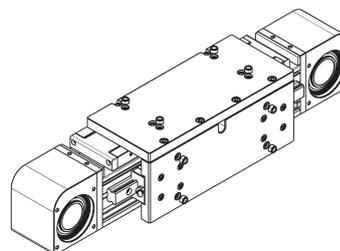
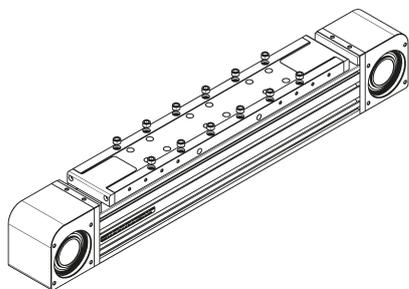
The slider of the Series 5E-AS1 (and 5E-DS1) electromechanical axis has 8 threaded holes (reinforced with steel threading) to fix the application.

Every slider of the Series 5E-AS2 electromechanical axis has the same type and number of holes as version 5E-AS1.



The slider of Series 5E-AL1 electromechanical axis has 12 threaded holes (reinforced with steel threading) to fix the application.

With the Series 5E-HS1 electromechanical axis it is possible to fix the application on both flanges (upper and side) by means of 4 threaded holes per flange (reinforced with steel threading).



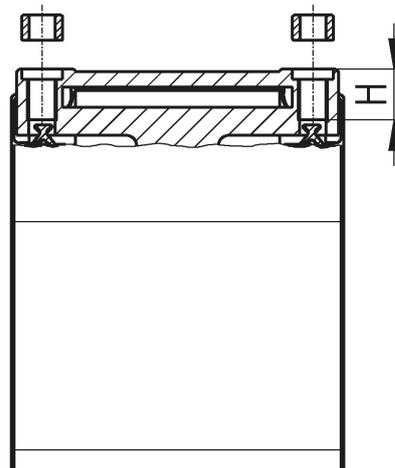
Pay particular attention to the maximum depth of the indicated threading (H).

SIZE	THREADING	H [mm]	C* [Nm]
50	M4x0.7	7	3.5
65	M5x0.8	8	5.5
80	M6x1	12	8

* Allowance of $\pm 5\%$



CAUTION: In the event of the indicated value (H) exceeded, this leads to product malfunctions.



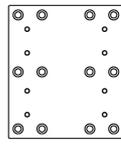
Interfaces for multi-axis mounting

The Series 5E electromechanical axis may be used for the execution of Cartesian robot systems. On both the slider and the interfaces there are places for the insertion of

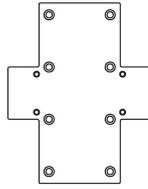
centring bushes to ensure orthogonality between the two elements. To configure the Cartesian robot system, assembly interfaces for all of the Series 5E electromechanical axis' sizes are available.

- A) connection to flat surface
- B) XY connection slider on slider
- C) XY connection profile on slider
- D) XY connection cantilever profile on slider
- E) XY connection hollow cantilever profile on L type LL slider
- F) XY connection hollow cantilever profile on L type LR slider
- G) XY connection for Series 6E
- H) XY connection on slider for Series 6E
- I) YZ connection on slider for Series 5V

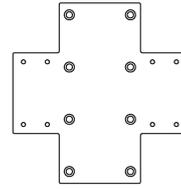
A)



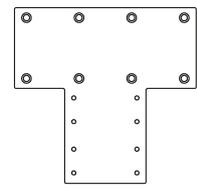
B)



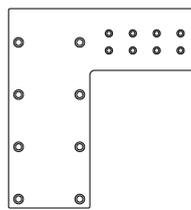
C)



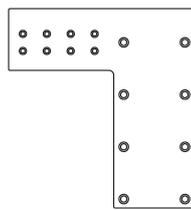
D)



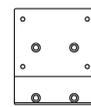
E)



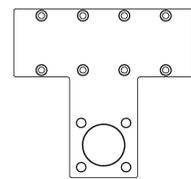
F)



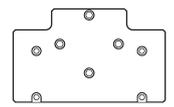
G)



H)



I)



Available on the catalogue



CAUTION: If there is connection between several Series 5E electromechanical axes in the various configurations shown

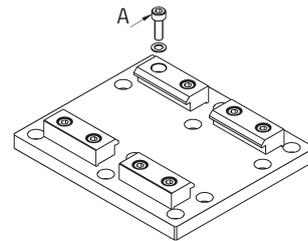
on the catalogue, it is the responsibility of the client to ensure the proper functioning and sizing of the created machine.

Instructions for multi-axis mounting

The following is an explanation of the screws used in the kits for the execution of multi-axis systems using the Series 5E.

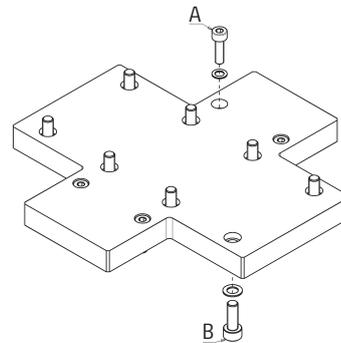
A) Connection to a flat surface

Mod.	A (DIN 912)
X-P50	M5x14
X-P65	M5x16
X-P80	M6x16



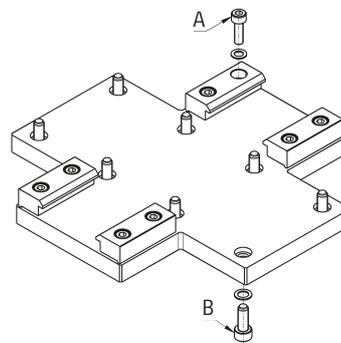
B) XY connection slider on slider

Mod.	A (DIN 912)	B (DIN 912)
XY-S65-S50	M4x14	M5x14
XY-S80-S50	M4x14	M6x16
XY-S80-S65	M5x14	M6x16



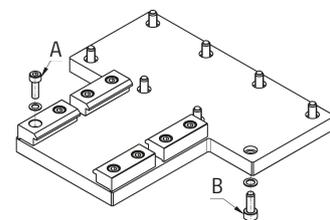
C) XY connection profile on slider

Mod.	A (DIN 912)	B (DIN 912)
XY-S65-S50	M5x16	M5x14
XY-S80-S50	M5x16	M6x16
XY-S80-S65	M5x16	M6x16



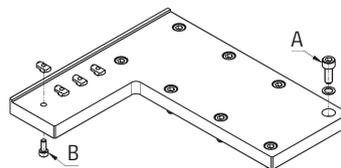
D) XY connection cantilever profile on slider

Mod.	A (DIN 912)	B (DIN 912)
XY-S65-P50-T	M5x16	M5x14
XY-S80-P50-T	M5x16	M6x16
XY-S80-P50-T	M5x16	M6x16



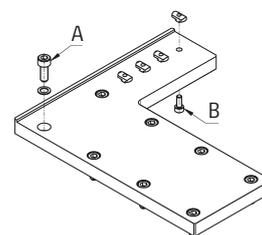
E) XY connection hollow cantilever profile on L type LL slider

Mod.	A (DIN 912)	B (DIN 912)
XY-S65-LL50	M5x14	M4x10
XY-S80-LL50	M5x16	M4x10
XY-S80-LL65	M5x16	M4x10



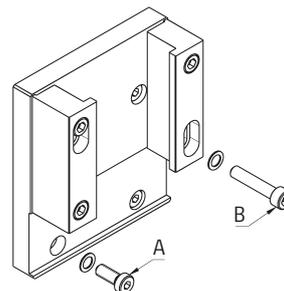
F) XY connection hollow cantilever profile on L type LR slider

Mod.	A (DIN 912)	B (DIN 912)
XY-S65-LR50	M5x14	M4x10
XY-S80-LR50	M5x16	M4x10
XY-S80-LR65	M5x16	M4x10



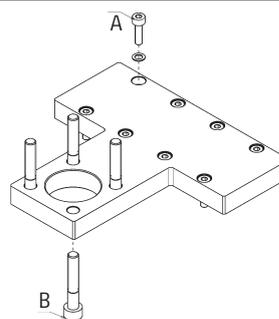
G) XY connection for Series 6E

Mod.	A (DIN 7984)	B (DIN 912)
XY-S65-6E32	M5x14	M4x22
XY-S65-6E40	M5x14	M5x25
XY-S80-6E32	M6x16	M4x25
XY-S80-6E40	M6x16	M5x25
XY-S80-6E50	M6x16	M6x30



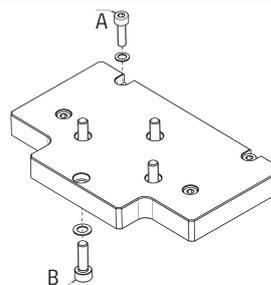
XY connection on slider for Series 6E

Mod.	A (DIN 912)	B (DIN 912)
XY-S50-45N32	M6x35	M4x14
XY-S65-45N32	M6x35	M5x14
XY-S65-45N40	M6x40	M5x14
XY-S65-45N50	M8x40	M5x14
XY-S80-45N40	M6x40	M6x16
XY-S80-45N50	M8x40	M6x16
XY-S80-45N63	M8x40	M6x16



I) YZ connection on slider for Series 5V

Mod.	A (DIN 912)	B (DIN 912)
YZ-50-5V50	M4x14	M5x16
YZ-65-5V50	M5x16	M5x16
YZ-65-5V65	M5x16	M6x18
YZ-80-5V50	M6x18	M5x16
YZ-80-5V65	M6x18	M6x18
YZ-80-5V80	M6x18	M8x20



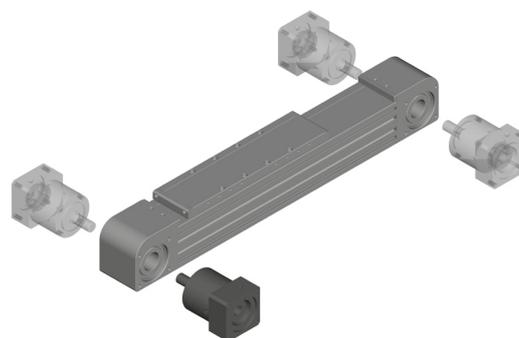
Motor connections

The Series 5E electromechanical axis' end caps are designed to permit the input of the motor connection on all sides. The image below shows possible connections on the Series 5E electromechanical axis' end caps.

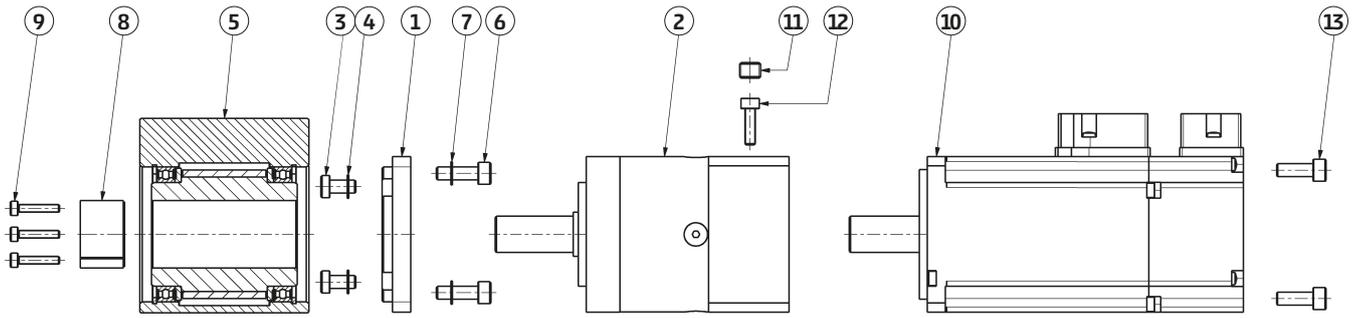
MOTOR CONFIGURATION TABLE			
SIZE	FLANGE	GEARBOX	MOTOR
50	FR-5E-50	GB-040-...	MTB-010-...
	FR-5E-50-GC	GB-040-...	MTB-010-...
	FR-5E-50	GB-040-...	MTS-24-...
	FRH-5E-50	GB-060-...	MTB-040-...
	FRH-5E-50	GB-060-...	MTS-24-...
	FS-5E-50-0024	-	MTS-24-...
65	FR-5E-65	GB-060-...	MTB-040-...
	FR-5E-65	GB-060-...	MTB-040-...
	FR-5E-65	GB-060-...	MTS-24-...
	FRH-5E-65	GB-080-...	MTB-075-...
	FRH-5E-65	GB-080-...	MTS-24-...
	FS-5E-65-0024	-	MTS-24-...
80	FR-5E-80	GB-080-...	MTB-075-...
	FR-5E-80-GC	GB-080-...	MTB-075-...
	FR-5E-80	GB-080-...	MTS-24-...
	FRH-5E-80	GB-120-...	MTB-100-...
	FRH-5E-80	GB-120-...	MTB-100-...
	FRH-5E-80	GB-120-...	MTB-100-...

Motion transmission is ensured through locking sets or couplings intended for the purpose. See **"Locking set"** and **"Elastic expansion coupling"** for more information.

In particular, a "standard" connection has been designed that allows a quick and compact assembly of several gearboxes, using the locking set. Additionally, other types of "High-Power" connections have been designed to allow the assembly of larger gearboxes and thus a more powerful engine, using the elastic expansion coupling.



FR-5E connection

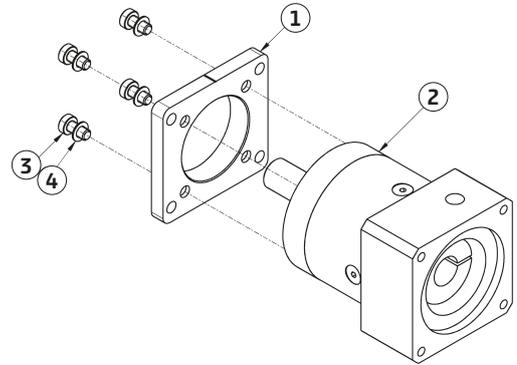


- | | |
|-------------------------------------|----------------------------|
| 1. Connection flange | 8. Locking set |
| 2. Planetary gearbox | 9. Locking set screws |
| 3. Gearbox screws | 10. Motor |
| 4. Lock washer | 11. Gearbox grub screw |
| 5. Series 5E electromechanical axis | 12. Gearbox clamping screw |
| 6. Flange fixing screws | 13. Motor fixing screws |
| 7. Lock washer | |

Mod.	Num.	
	3 (DIN 7984)	6 (DIN 912)
FR-5E-50	M4x8	M4x14
FR-5E-65	M5x10	M5x16
FR-5E-80	M6x14	M5x22

STEP 1

Mount the connection flange (1) on the planetary gearbox (2) with the appropriate screws (3), with lock washers in between (4).



STEP 2

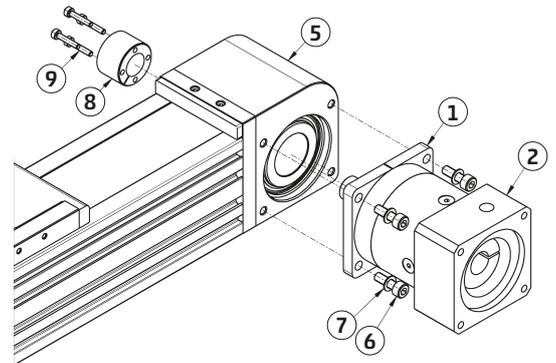
Couple the connection flange (1) with the Series 5E electromechanical axis (5) through the appropriate centring, making sure to keep the identification symbol on the connection flange pointing upwards.

Tighten the screws (6), with the lock washers in between (7), to keep the connection flange in position (1).

Couple the opposite side of the end cap to the locking set (8) within the pulley until the gearbox shaft (2) does not protrude.

Tighten the screws of the locking set (9) with the proper tightening torque: see the "Locking set" section.

Loosen and then tighten the screws (6) previously fitted on the connection flange (1).

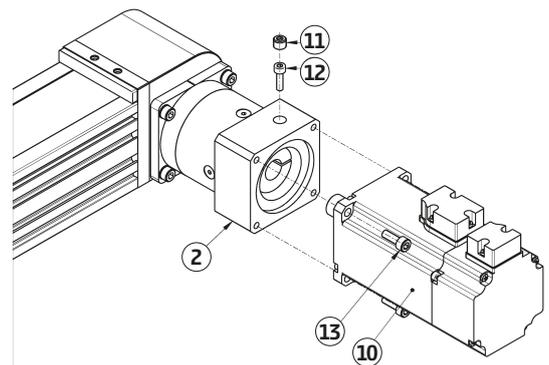


STEP 3

Couple the motor (10) with the gearbox (2), tightening the supplied screws (13).

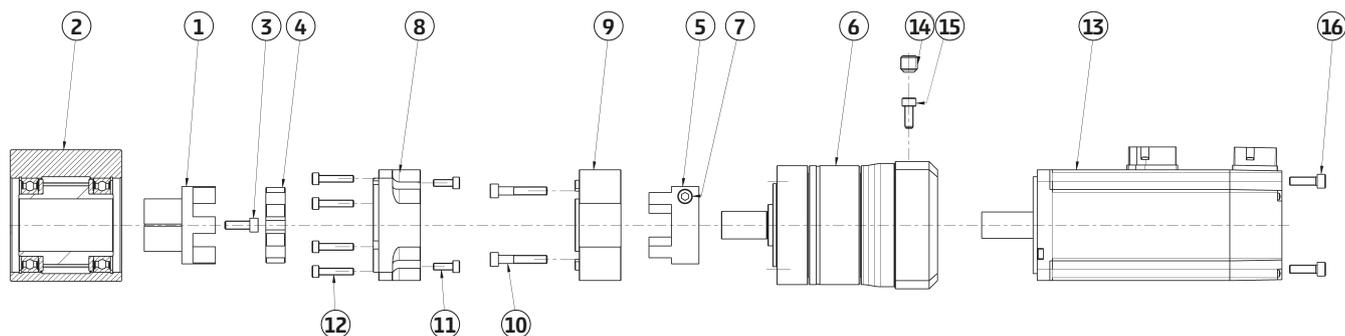
Remove the nut (11) on the flange of the gearbox (2) and tighten the screw (12) of the clamp with the tightening torque indicated in the table below, as specified by the gearbox manufacturer.

CH= hexagon-head screw size
CS=Tightening torque



Mod.	GB-040	GB-060	GB-080	GC-060			
CH [mm]	2.5	3	3	4	4	5	4
CS [Nm]	2	4.5	4.5	9.5	16.5	16.5	9.8

FR-5E-50-GC and FR-5E-80-GC connection

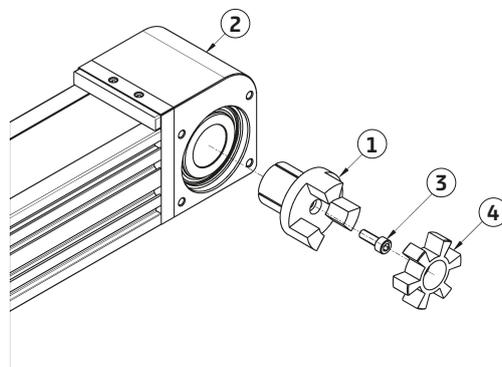


- | | |
|-------------------------------------|--------------------------------------|
| 1. Half coupling with spread shaft | 9. Connection adapter (gearbox side) |
| 2. Series 5E electromechanical axis | 10. Gearbox screw |
| 3. Expansion screw | 11. Adapter screw |
| 4. Elastomer | 12. Adapter connection screw |
| 5. Half coupling | 13. Motor |
| 6. Planetary gearbox | 14. Grub screw |
| 7. Half coupling screw | 15. Clamp screw |
| 8. Connection adapter (axis side) | 16. Motor screw |

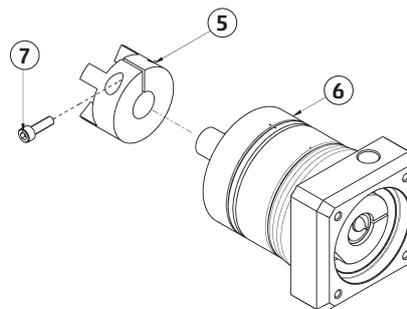
Mod.	Num.		
	10 (DIN 7984)	11 (DIN 912)	12 (DIN 912)
FR-5E-50-GB	M4x10	M4x14	M3x35
FR-5E-80-GB	M6x35	M5x14	M5x25

STEP 1

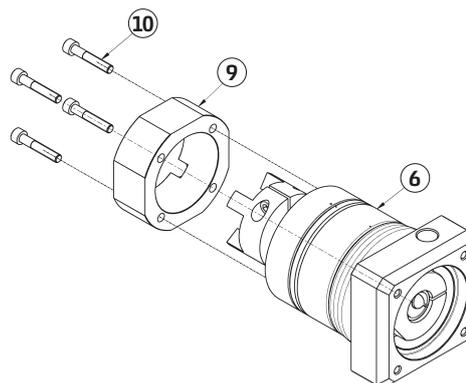
Mount the half coupling with spread shaft (1) within the Series 5E electromechanical axis' pulley (2), using the screw provided (3) to expand the shaft with the proper tightening torque, check the end stop on the pulley, see "**Elastic expansion coupling**", so that the motion transmission is guaranteed. Position the elastomer (4) in the appropriate space on the half coupling (1).

**STEP 2**

Assemble the second half coupling (5) on the shaft of the planetary gearbox (6) in its correct position and fix it with the screw provided (7) with the proper tightening torque: see "**Elastic expansion coupling**".

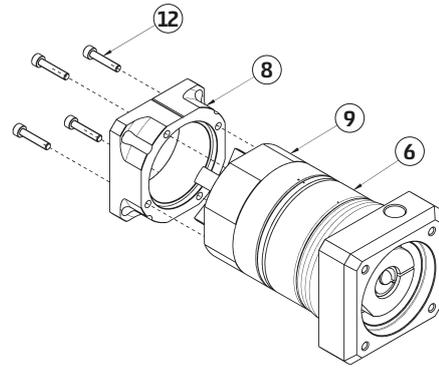
**STEP 3**

Couple the connection adapter (gearbox side - 9) to the gearbox (6) using the gearbox side connection screws (10).

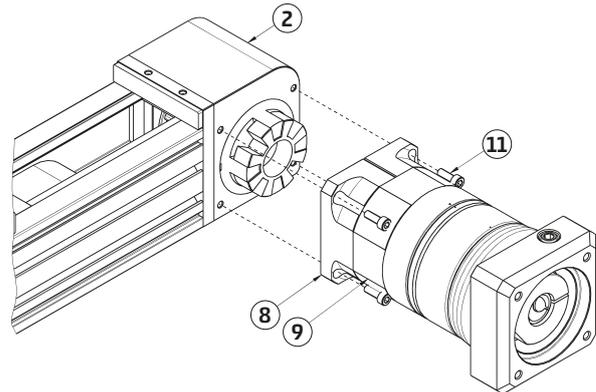


STEP 4

Couple the connection adapter (axis' side - **8**) with the connection adapter (gearbox side - **9**) using the connection adapter screws (**12**).

**STEP 5**

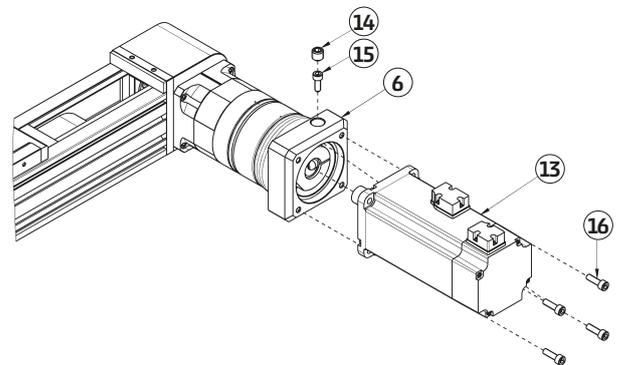
Assemble the previously mounted connection adapter (**8** and **9**) with the specific centring diameter on the Series 5E electromechanical axis' end cap (**2**), paying special attention to properly couple the half couplings (**1** and **5**) and to maintain the identification mark on the connection adapter in the upward position. Tighten with the appropriate screws (**11**) in order to restrain the adapter (**8**) on the end cap of the Series 5E electromechanical axis (**2**).

**STEP 6**

Couple the motor (**13**) to the planetary gearbox (**6**), tightening the screws provided.

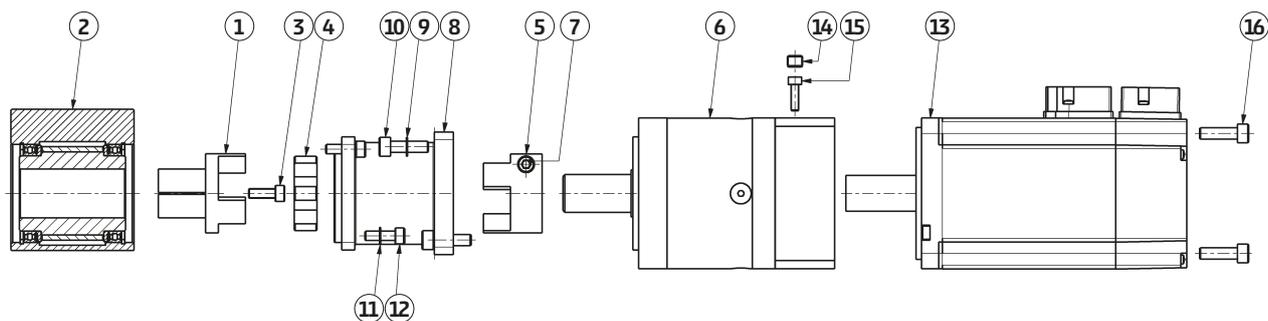
Remove the nut (**14**) from the flange of the gearbox (**6**) and tighten the screw (**15**) of the clamp on the drive shaft (**13**) with the tightening torque indicated in the table below as recommended by the gearbox' manufacturer.

CH = hexagon-head screw size
CS = tightening torque



Mod.	GC-040	GC-080
CH [mm]	4	6
CS [Nm]	9.8	41

FRH-5E-50 and FRH-5E-65 connection



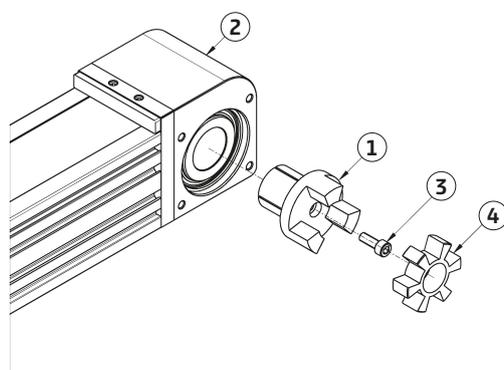
- | | |
|-------------------------------------|-------------------|
| 1. Half coupling with spread shaft | 9. Lock washer |
| 2. Series 5E electromechanical axis | 10. Gearbox screw |
| 3. Expansion screw | 11. Lock washer |
| 4. Elastomer | 12. Adapter screw |
| 5. Half coupling | 13. Motor |
| 6. Planetary gearbox | 14. Grub screw |
| 7. Half coupling screw | 15. Clamp screw |
| 8. Connection adapter | 16. Motor screw |

Mod.	Num.	
	10 (DIN 912)	12 (DIN 912)
FRH-5E-50	M5x8	M4x14
FRH-5E-65	M6x20	M5x16

STEP 1

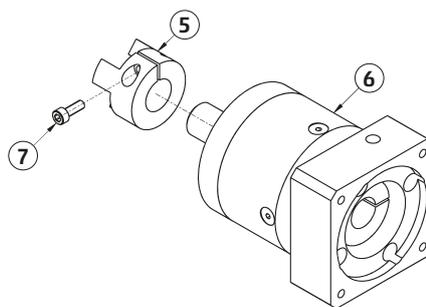
Mount the half coupling with spread shaft (1) within the Series 5E electromechanical axis' pulley (2), using the screw provided (3) to expand the shaft with the proper tightening torque, check the end stop on the pulley, see "Elastic expansion coupling", so that the motion transmission is guaranteed.

Position the elastomer (4) in the appropriate space on the half coupling (1).



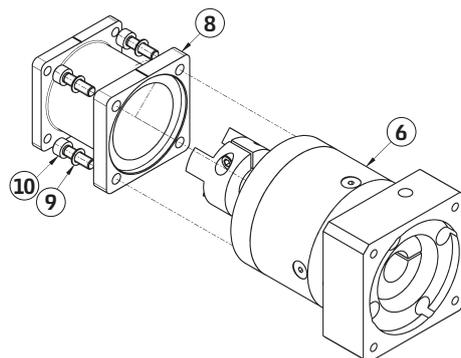
STEP 2

Assemble the second half coupling (5) on the shaft of the planetary gearbox (6) in its correct position and fix it with the screw provided (7) with the proper tightening torque: see "Elastic expansion coupling".



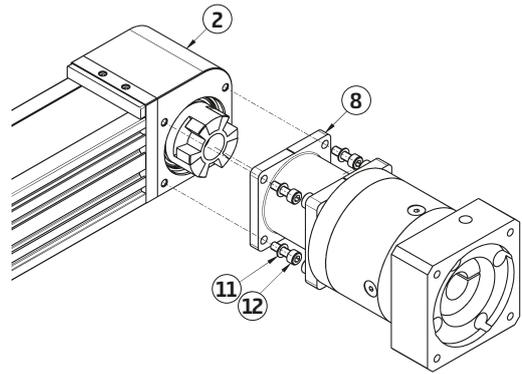
STEP 3

Couple the connection adapter (8) with the planetary gearbox (6) using the provided screws (10) and lock washers (9).



STEP 4

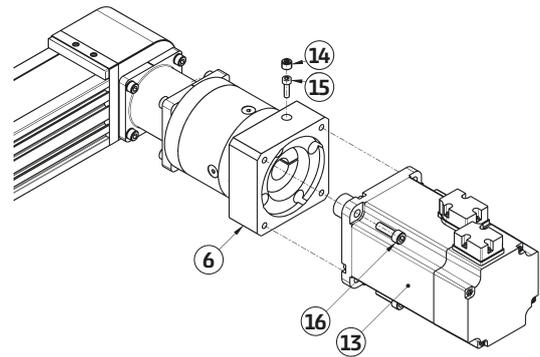
Assemble the connection adapter (8) with the specific centring diameter on the Series 5E electromechanical axis' end cap (2), paying special attention to properly couple the previously assembled half couplings (1 and 5) and to maintain the identification mark on the connection adapter in the upward position. Tighten the appropriate screws (12) with the lock washers in between (11), in order to restrain the adapter (8) on the end cap of the Series 5E electromechanical axis (2).

**STEP 5**

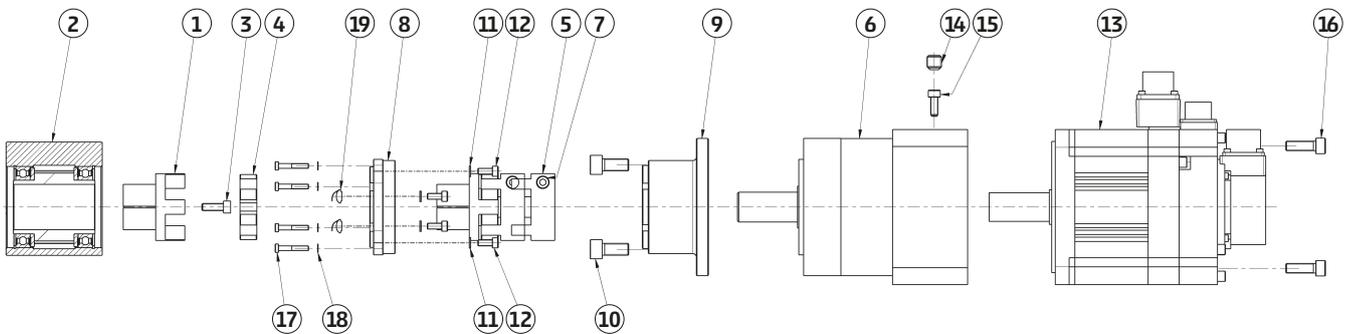
Couple the motor (13) to the planetary gearbox (6), tightening the screws provided.

Remove the grub screw (14) from the flange of the gearbox (6) and tighten the screw (15) of the clamp on the motor (13) with the tightening torque indicated in the table below as specified by the gearbox manufacturer.

CH = Hexagon head screw dimension
CS = Tightening torque



Mod.	GB-060	GB-080	GB-120	GC-060	GC-080	GC-120
CH [mm]	3 4	4 5	6 6	4	6	6
CS [Nm]	4.5 9.5	16.5 16.5	16.5 40	9.8	41	41

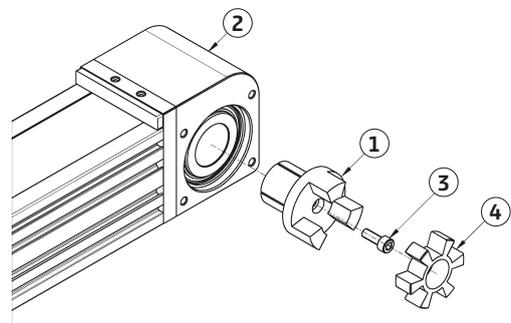
FRH-5E-80 connection

- | | |
|--------------------------------------|------------------------------|
| 1. Half coupling with spread shaft | 11. Lock washer |
| 2. Series 5E electromechanical axis | 12. Adapter screw |
| 3. Expansion screw | 13. Motor |
| 4. Elastomer | 14. Grub screw |
| 5. Half coupling | 15. Clamp screw |
| 6. Planetary gearbox | 16. Motor screw |
| 7. Half coupling screw | 17. Connection adapter screw |
| 8. Connection adapter (axis side) | 18. Lock washer |
| 9. Connection adapter (gearbox side) | 19. Slot nut |
| 10. Gearbox screw | |

Mod.	Num.		
	10 (DIN 912)	12 (DIN 912)	17 (DIN 7984)
FRH-5E-80	M5x12	M10x22	M4x25

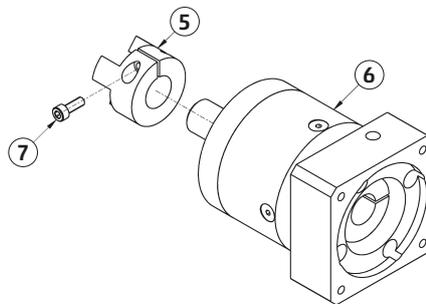
STEP 1

Mount the half coupling with spread shaft (1) within the Series 5E electromechanical axis' pulley (2), using the screw provided (3) to expand the shaft with the proper tightening torque, check the end stop on the pulley, see "Elastic expansion coupling", so that the motion transmission is guaranteed. Position the elastomer (4) in the appropriate space on the half coupling (1).

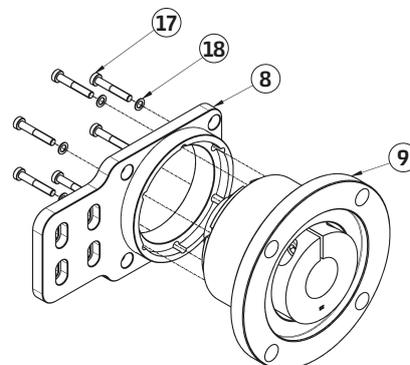


STEP 2

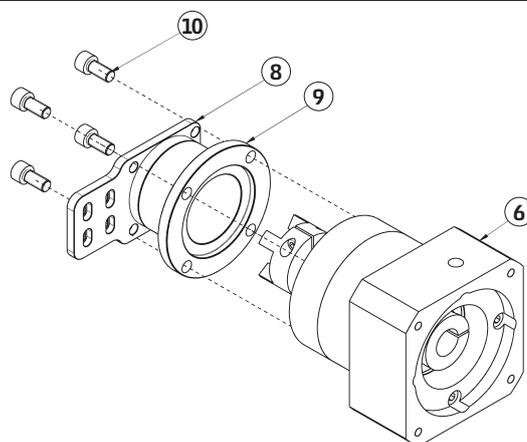
Assemble the second half coupling (5) on the shaft of the planetary gearbox (6) in its correct position and fix it with the screw provided (7) with the proper tightening torque: see "Elastic expansion coupling".

**STEP 3**

Couple the connection adapter (axis' side - 8) with the connection adapter (gearbox' side - 9) using the connection adapter screws (17) and the lock washers (18) provided.

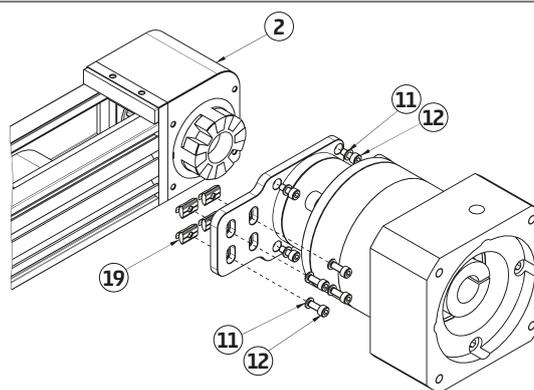
**STEP 4**

Couple the connection adapter (8 and 9) with the planetary gearbox (6) using the provided gearbox screws (10) and lock washers.

**STEP 5**

Insert the nuts (19) in the external slots of the axis' profile. Assemble the previously mounted connection adapter (8 and 9) with the specific centring diameter on the Series 5E electromechanical axis' end cap (2), paying special attention to properly couple the half couplings (1 and 5). Tighten with the appropriate screws (12) with lock washers (11) in between, in order to restrain the adapter (8 and 9) on the end cap of the Series 5E electromechanical axis (2). Tighten the screws (12) on the profile side, putting lock washers (11) in between, in order to restrain the adapter also on the profile of the Series 5E electromechanical axis.

N.B. In the HS version of the axis, the FRH-5E-80 adapter can only be mounted from the side without plate, due to interferences.

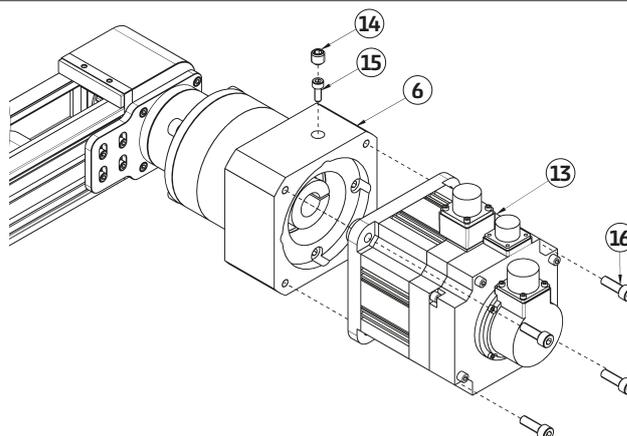
**STEP 6**

Couple the motor (13) to the planetary gearbox (6), tightening the screws provided.

Remove the grub screw (14) from the flange of the gearbox (6) and tighten the screw (15) of the clamp on the motor (13) with the tightening torque indicated in the table below as specified by the gearbox manufacturer.

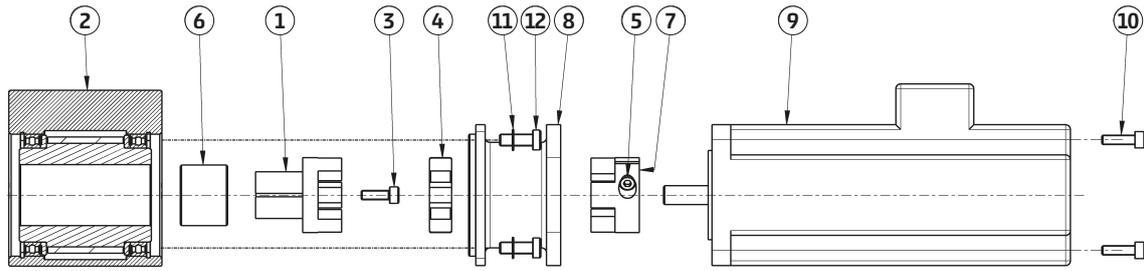
CH = Hexagon head screw dimension

CS = Tightening torque



Mod.	GB-120	GC-120
CH [mm]	6	6
CS [Nm]	16.5	41

FS-5E connection

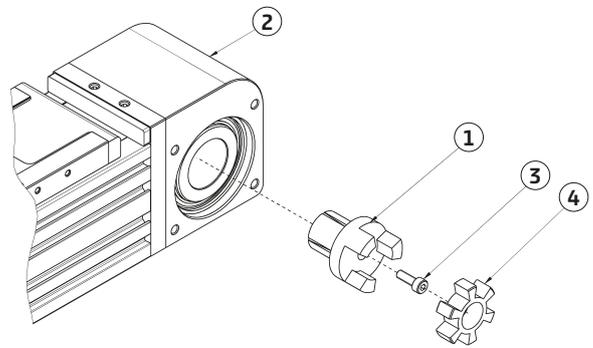


- | | |
|-------------------------------------|------------------------|
| 1. Half coupling with spread shaft | 7. Half coupling screw |
| 2. Series 5E electromechanical axis | 8. Connection adapter |
| 3. Expansion screw | 9. Motor |
| 4. Elastomer | 10. Motor screw |
| 5. Half coupling | 11. Lock washer |
| 6. Bushing | 12. Adapter screw |

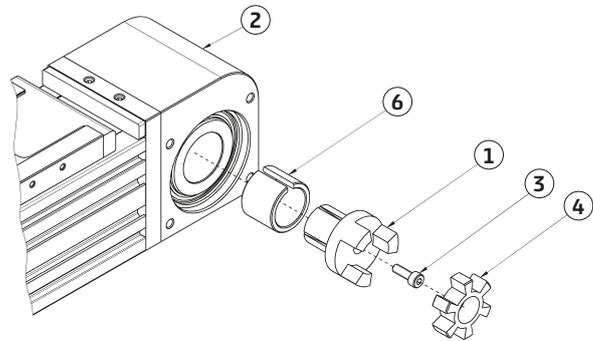
Mod.	Num.
FSH-5E-50	12 (DIN 7984) M5x14
FSH-5E-65	M4x10

STEP 1 (for FS-5E-50)

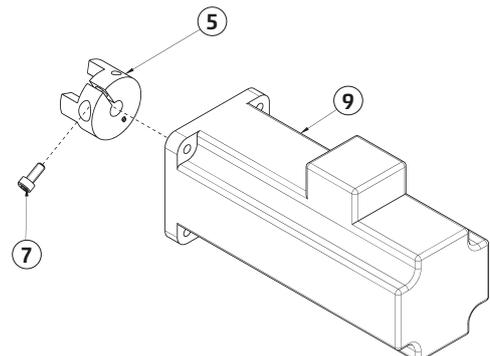
Mount the half coupling with spread shaft (1) within the Series 5E electromechanical axis' pulley (2), using the screw provided (3) to expand the shaft with the proper tightening torque, check the end stop on the pulley, see "**Elastic expansion coupling**", so that the motion transmission is guaranteed. Position the elastomer (4) in the appropriate space on the half coupling (1).

**STEP 1 (for FS-5E-65)**

Fit the bushing (6) into the half coupling with spread shaft (1) and mount it within the Series 5E electromechanical axis' pulley (2), using the screw provided (3) to expand the shaft with the proper tightening torque, check the end stop on the pulley, see "**Elastic expansion coupling**", so that the motion transmission is guaranteed. Position the elastomer (4) in the appropriate space on the half coupling (1).

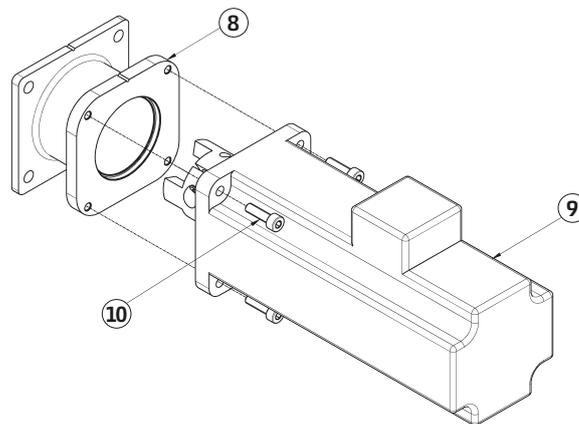
**STEP 2**

Assemble the second half coupling (5) on the shaft of the motor (9) in its correct position and fix it with the screw provided (7) with the proper tightening torque: see "**Elastic expansion coupling**".

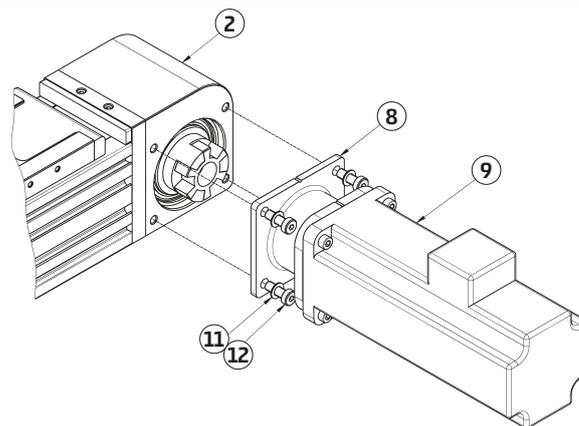
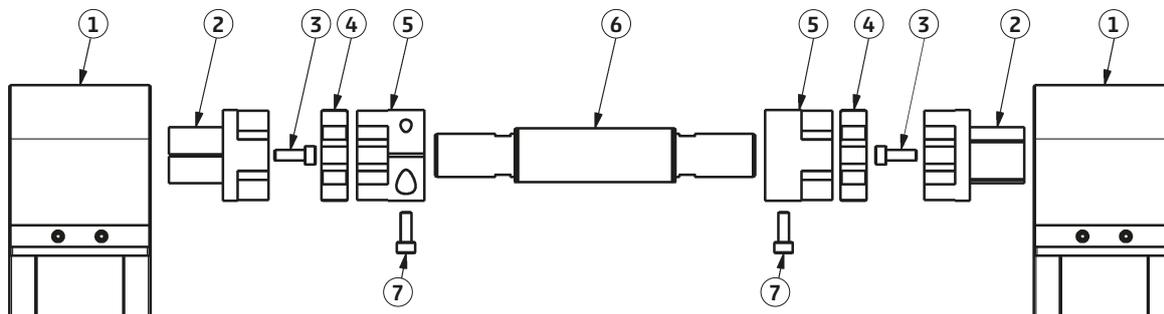


STEP 3

Couple the connection adapter (8) to the motor (9) using the screws (10) provided.

**STEP 4**

Assemble the connection adapter (8) and the motor (9) with the specific centring diameter on the Series 5E electromechanical axis' end cap (2), paying special attention to properly couple the previously assembled half couplings (1 and 5). Tighten the appropriate screws (12) with the lock washers in between (11), in order to restrain the adapter (8) on the end cap of the Series 5E electromechanical axis (2).

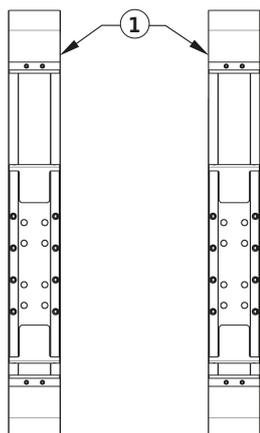
**Parallel shaft**

1. Series 5E electromechanical axis
2. Half coupling with spread shaft
3. Half coupling screw
4. Elastomer

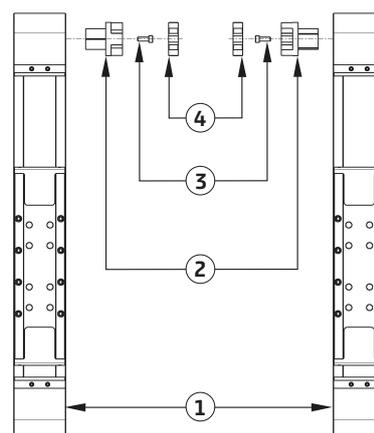
5. Half coupling
6. Parallel shaft
7. Half coupling screw

Parallel shaft connection**STEP 1**

Position two Series 5E electromechanical axes (1) paying particular attention to their parallel positioning.

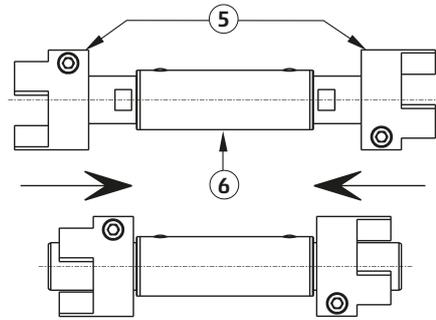
**STEP 2**

Assemble the half couplings with spread shaft (2), on the inside of the Series 5E electromechanical axes (1), on the pulleys, tightening the screws provided (3) with the proper tightening torque, checking the end stop on the pulley: see "Elastic expansion coupling". Couple the elastomers (4) to the half couplings.

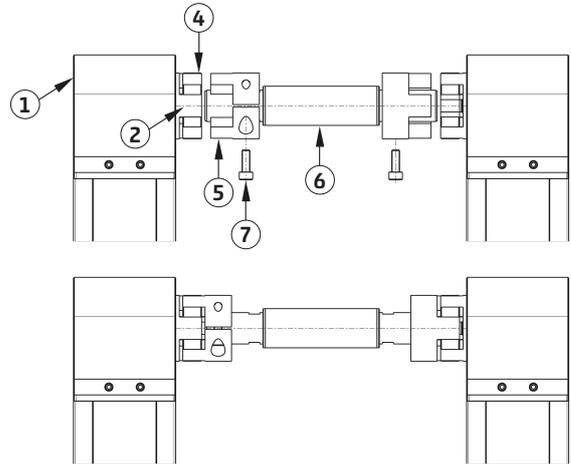


STEP 3

Assemble the remaining half couplings (5) on the pins of the parallel shaft (6) without tightening the screws, ensuring that the half coupling does not stick out from the shaft pin.

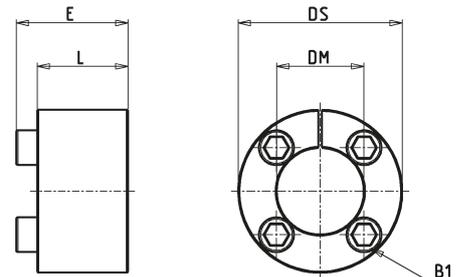
**STEP 4**

Align the parallel shaft (6) with the half couplings (2) previously assembled on the Series 5E electromechanical axes (1) and couple the half couplings (5) assembled on it with the elastomer (4). Now tighten the provided screws (7) with the proper tightening torque: see "Elastic expansion coupling".

**Locking Set**

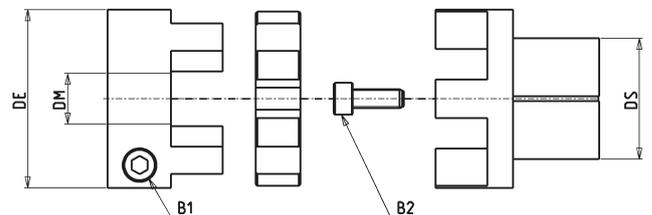
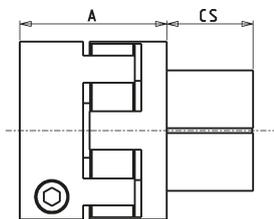
In order to transmit rotational movement, the Series 5E uses locking sets, available in different sizes depending on the size of the GB gearbox.

SIZE		50	65	80
FLANGE		FR-5E-50	FR-5E-65	FR-5E-80
GEARBOX		GB-040-...	GB-060-.../GC-060-...	GB-080-...
Length	L	13	17	21
Total size	E	32	42	56
Hole diameter	∅ DM	10	14	20
Outside diameter	∅ DS	20	26	38
Screw [ISO 4762]	B1	M2.5	M3	M5
Tightening Torque [Nm]	B1	1.2	2.1	10

**Elastic expansion coupling**

In order to transmit rotational movement, the Series 5E uses elastomer precision couplings with a spread shaft, available in different sizes

depending on the type and size of flange and gearbox.



SIZE		50	50	50	65	65	80	80
FLANGE		FRH-5E-50	FS-5E-50	FR-5E-50-GC	FRH-5E-65	FS-5E-65	FRH-5E-80	FR-5E-80-GC
GEARBOX		GB-060-...	-	GC-040-...	GB-080-...	-	GB-120-...	GC-080-...
Length	A	28	28	28	40	28	46	46
Outside diameter	∅ DE	32	32	32	42	32	56	56
Fitting length	CS	20	20	20	25	20	27	27
Hole diameter [H7]	∅ DM	14	8	10	20	8	25	20
Shaft diameter [h7]	∅ DS	20	20	20	26	20	38	38
Screw [ISO 4762]	B1	M4	M4	M4	M5	M4	M6	M6
Tightening Torque [Nm]	B1	4	4	4	8	4	15	15
Screw [ISO 4762]	B2	M5	M5	M5	M6	M5	M8	M8
Tightening Torque [Nm]	B2	9	9	9	12	9	32	32

Fixing of the sensors

On all sizes, the Series 5E electromechanical axis provides a slot for CSH sensors for front-feed insert (A). There is also an internal magnet in order to guarantee the sensors' reading.

The slider on the Series 5E electromechanical axis allows sensor



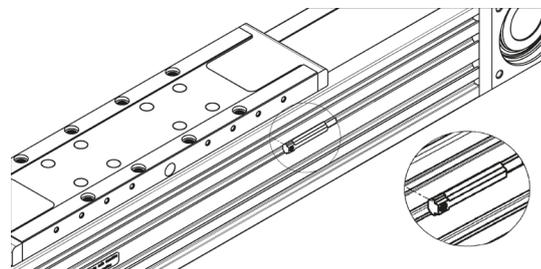
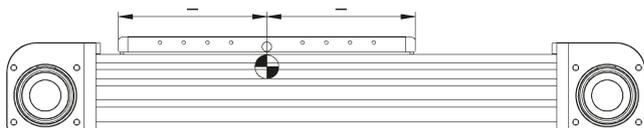
CAUTION: These holes may not be used for the lifting of the unit.

brackets to be mounted on its side panels (B). On each side of the slider, there are 8 threaded holes intended for this purpose.

These holes may also be used in order to attach other accessory types with light loads.

A)

The magnet for the CSH sensor on the inside of the Series 5E electromechanical axis is placed on both sides in the centre of the slider and close to the appropriate slot, as shown in the following image.



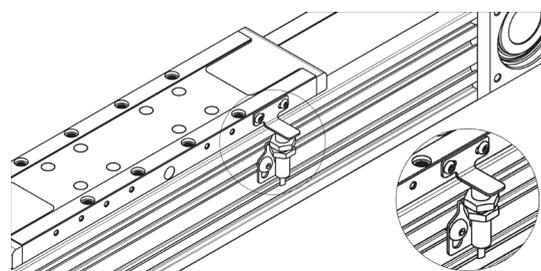
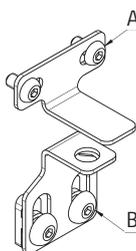
N.B.: With the Series 5E-HS axis version, it is preferable to position the sensor on the side without vertical flange.

B)



CAUTION: the inductive sensor is not included in the kit for the fixing of inductive sensors.

Mod.	A	B
SIS-M5-50/65	M3x6	M4x6
SIS-M5-80	M4x6	M5x6
SIS-M8-65	M3x6	M4x6
SIS-M8-80	M4x6	M5x6



N.B.: With the Series 5E-HS axis version, it is possible to position the sensor fixing kit only on the side without vertical flange.

8. Maintenance

Cleaning

For the cleaning of the Series 5E electromechanical axis, the use of solvents and aggressive cleaning products is forbidden, as they may damage seals or aluminium elements because of chemical

incompatibility. It is however possible to use mild water-soluble detergents (Nonetheless, check the compatibility of the unit's materials with such cleaning products.)



CAUTION: disconnect all electrical components from the electrical supply and suitably protect all connectors and electrical contacts against humidity.

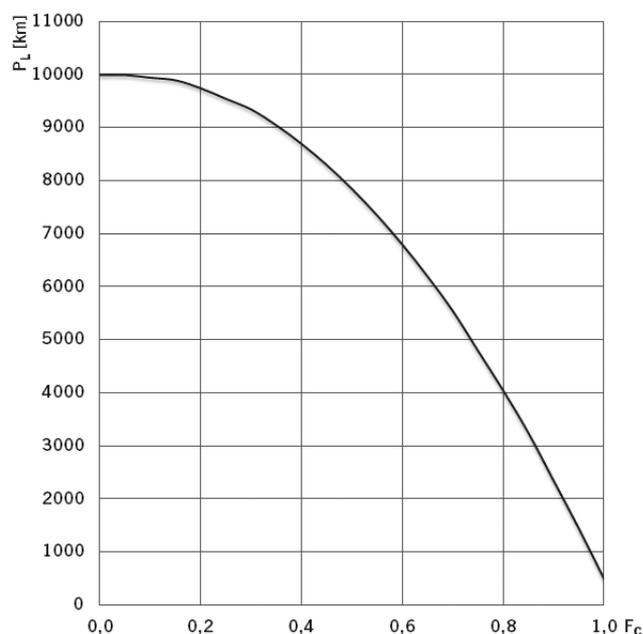
Lubrication

The Series 5E electromechanical axis is supplied with already-lubricated guides. With the lubrication nipple provided, it is possible to lubricate the blocks through a specifically-designed system, directly from the slider.

The chart below allows to determine the re-lubrication stroke "PL". The load factor (f_C) is obtained as follows:

$$f_C = \frac{C_{eq}}{C_{ma}}$$

C_{eq} and C_{ma} are values included in the catalogue.



APPLICATION	ACCELERATION [m/s ²]	SPEED [m/s]	WORK CYCLE	COEFFICIENT fw
Light weight	< 10	< 1.5	< 35%	1 ÷ 1.25
Normal	10 ÷ 25	1.5 ÷ 2.5	35% ÷ 65%	1.25 ÷ 1.5
Heavy duty	> 25	> 2.5	> 65%	1.5 ÷ 3

Once the PL value has been determined, it is necessary to evaluate the conditions of use "fw" and then calculate the re-lubrication interval with the following formula:

$$\Delta L = \frac{PL}{fw}$$

Type of lubricant

For the lubrication of the Series 5E electromechanical axis, the use of grease with added lithium soap and grade NLGI 1, that is compatible

with NYE Lubricant Rheolube 363 AX 1, is recommended. For lubrication, a grease-gun is available with the ordering code 70-7902-0029.

Quantity of lubricant

SIZE	INITIAL LUBRICATION [cm ³]	REPLENISHMENT [cm ³]
50	0.39	0.16
65	0.79	0.50
80	1.32	0.90

N.B.: With the Series 5E-HS axis version, due to the presence of another external recirculating ball guide, it is necessary to lubricate it with the quantity indicated in the table under "REPLENISHMENT".

9. Dismantling and parts replacement

In case of anomalies of the Series 5E electromechanical axis or if it is necessary to replace groups of internal components, contact the Camozzi Automation S.p.A. After-Sales Service that will evaluate the level of intervention and the appropriate counter-measures to take.

Disassembly and replacement of components should only be carried by Camozzi Automation S.p.A. staff. For any maintenance that involves opening the Series 5E electromechanical axis, please contact the technical assistance.

10. Disposal

in the Series 5E electromechanical axis there is:

- Aluminium alloy
- Steel
- Plastic material
- Grease
- Epoxy resin

Components must be disposed of in a compliance with current national and international standards and directives after having collected any lubricant present and disposing of it separately.

11. Technical information

According to Electric actuation catalogue

12. Resolution of any failure

FAILURE	POSSIBLE CAUSE	POSSIBLE SOLUTION
Slider does not move	The screw connection on the slider is too long	Check that the "H" value indicated in the manual " Connection on the slider " has been complied with.
	Incorrect configuration of the operating parameters	Check that the correct parameters, appropriate for the use of the Series 5E electromechanical axis have been entered
	Applied load heavier than that stated in the catalogue	Reduce the load or replace the unit with a bigger size that is able to support the load
	Breakage of the toothed belt	Return the Series 5E electromechanical axis to Camozzi Automation S.p.A. for repair or replacement
Positioning error	Slippage of motor connections	Check the tightening of the locking set and the clamp of the gearbox
	Wear	Return the Series 5E electromechanical axis to Camozzi Automation S.p.A. for repair or replacement
	Sensor not reading	Check that the positioning and connection of the sensors are correct, see manual
Protection plate has waves	Wear	Replace the protection plate
	Excessive vibrations	Manually and visually check that the plate is in place and is protected on its ends
Overheating of the unit	Excessive torque absorption because of incorrect fixings	Check that the fixings are not causing the misalignment or twisting of the unit



CAUTION: in case of fire in the surrounding area it is recommended to extinguish with carbon dioxide CO₂

Contacts

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Automation

