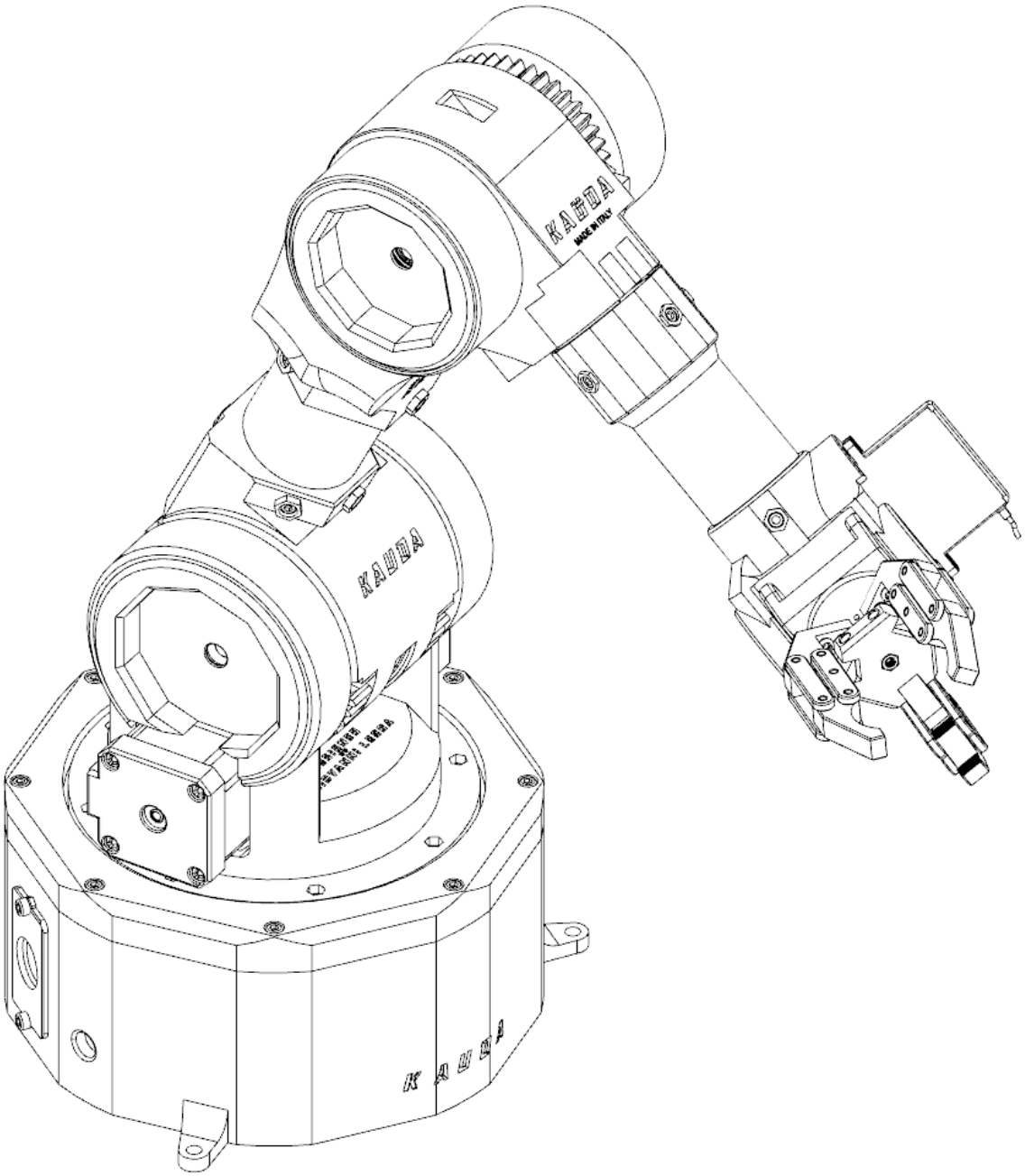
DIY TECH

KAUDA

ROBOTIC ARM

Giovanni Lerda



010

SUMMARY

PREMISE

This Manual covers the main mechanical checks, the essential checks and the assembly of components supplied in bulk, to carry out the delivery of the new factory product (the sequence of operations is not binding).

It is very important to strictly follow what has been described. Interventions superficially carried out or even omitted can generate personal damages to the buyer, to the product, etc ... or produce, in the simplest of hypotheses, unpleasant disputes.

Note:

For any request, further information, etc ... contact the product manufacturer.

GENERAL WORKING RULES

The following advice, recommendations and warnings guarantee rational interventions in the maximum operational safety, significantly reducing the probability of accidents, damage of any nature and downtime. Yes therefore, he advises to observe them scrupulously.

TIPS:

- Always use top quality equipment.
- Keep the tools close from hand during the operations, preferably according to a predetermined sequence and in any case never on the vehicle or in hidden or inaccessible positions.
- Keep the workplace tidy and clean.
- To tighten screws and nuts, start with those of larger diameter or internal ones, proceeding at "cross" with subsequent "pulls".

MATERIAL LIST

3D printed Parts:

QTTY	NAME	REF P.
1	BS-KRA	6
2	DR-2-KRA	22
1	RG-KRA	7
1	BS-RG-KRA	8
1	AX1	9
1	AX2	12
2	AX2-RD-KRA	12
1	RD-TNY-KRA	6
3	RD-STNY-KRA	9
1	AX3	13
1	AX4-RD-KRA	15
1	AX4	15
1	RT1-KRA	15
1	RT2-KRA	16
1	AX5	17
3	PZ1-KRA	18
6	PZ2-KRA	19
6	PZ3-KRA	19
3	PZ4-KRA	19
1	PZ5-KRA	20
3	PZ6-KRA	20

Hardware Parts:

QTTY	NAME	REF P.
2	Steel rod Ø8 x 80	12
40	Steel balls Ø8	7
1	Round tube Ø35 x 90	12
1	Round tube Ø40 x 110	15
1	Steel rod Ø8 x 15	16
/	M3 nut	/
/	M3 x 12 SHCS screw	/
/	M3 x 20 SHCS screw	/
/	M3 x 12 SHCS screw	/
18	Steel Rod Ø3 mm	19
8	M3x5,7 Insert	8

3D printed Parts (optional):

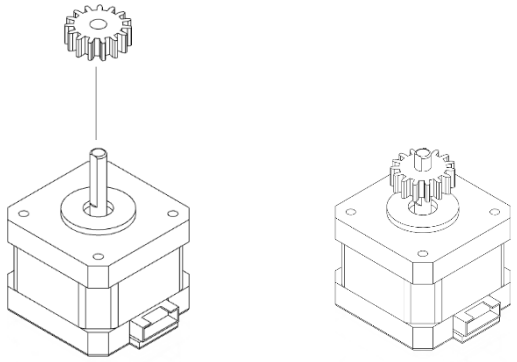
QTTY	NAME	REF P.
1	AX1-L-DEC-KRA	11
1	AX1-R-DEC-KRA	11
2	AX1-DEC-KRA	11
1	AX3-IDC-L-KRA	14
1	AX3-IDC-R-KRA	14
1	AX3-DEC-L-KRA	14
1	AX3-DEC-R-KRA	14
1	AX4-DEC-KRA	17

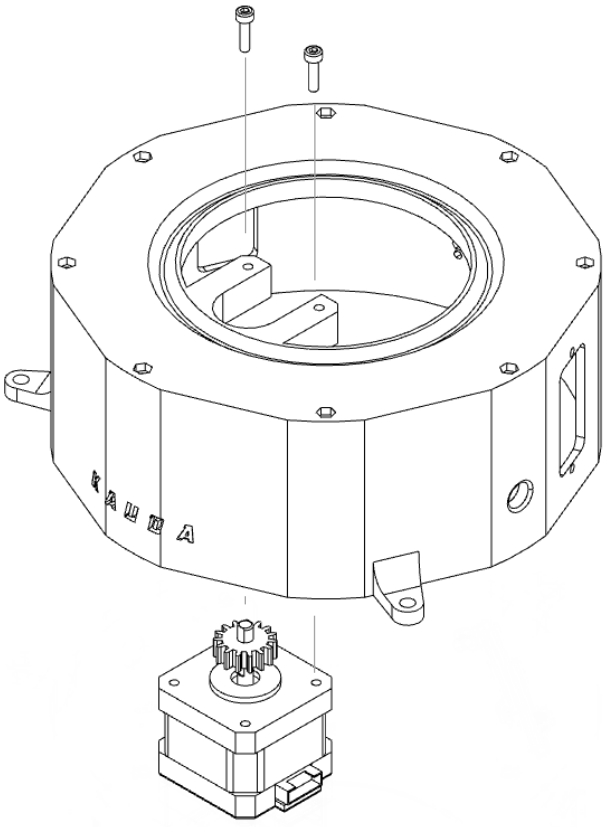
Electronics:

QTTY	NAME	REF P.
4	Nema 17 Stepper-M **0.42/0.59 Nm**	6
2	G16 - 8 Pin	22
1	G20 - 12 Pin	22
1	DC 6V Extended Gear Motor with Shaft	18
4	Nema 17 Cables	/
2	MG996R Servo-M	15

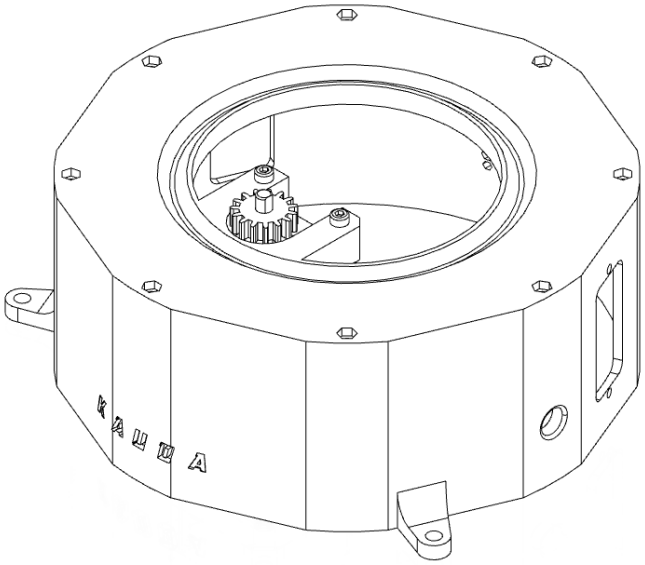
BASE

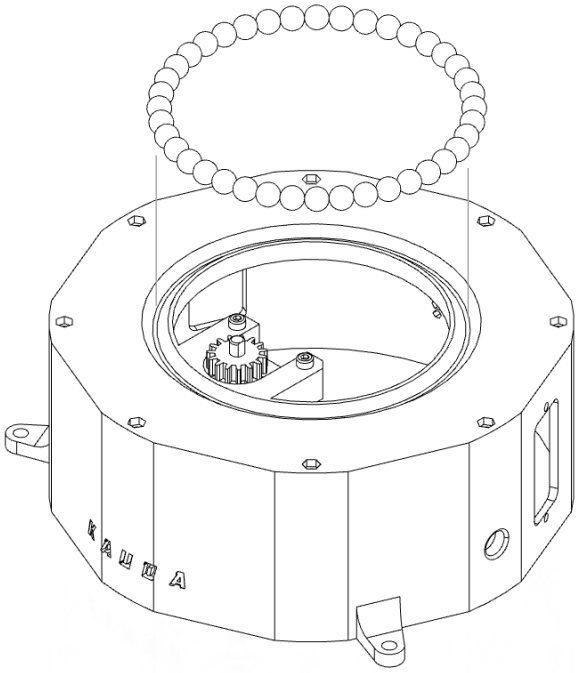
1 Insert the gear wheel (**"RD-TNY-KRA"**) on the shaft of the Nema-17 stepper motor.





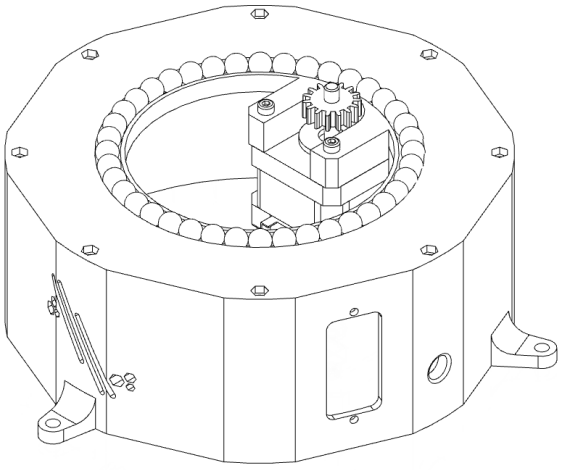
2 Insert the stepper motor in the space provided inside the Base (***"BS-KRA"***), anchoring it with 2 M3x20 screws



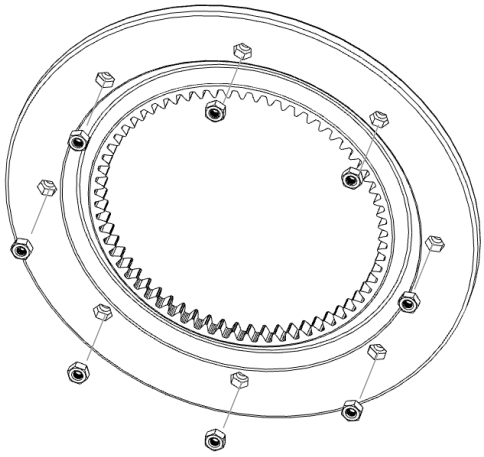


3 Insert the 8 mm diameter balls (**"Steel Balls"**) inside the appropriate cavity, for a total of 40 balls.

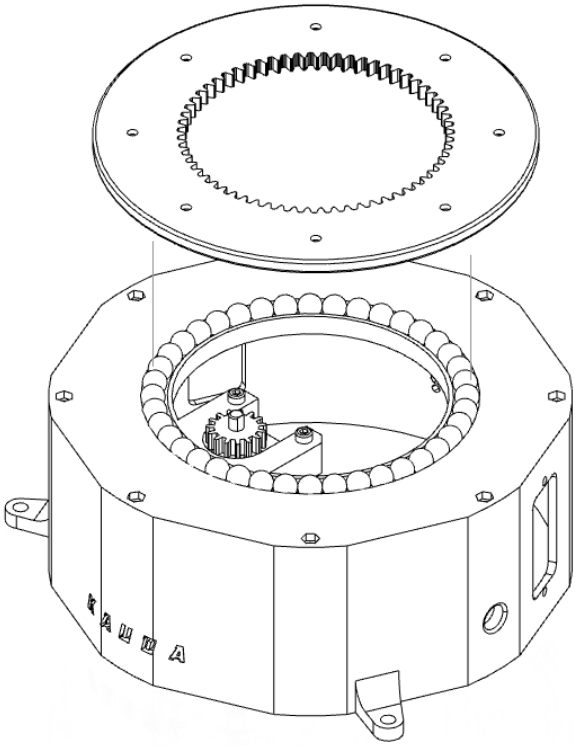
It's recommended to lubricate the balls to decrease friction.

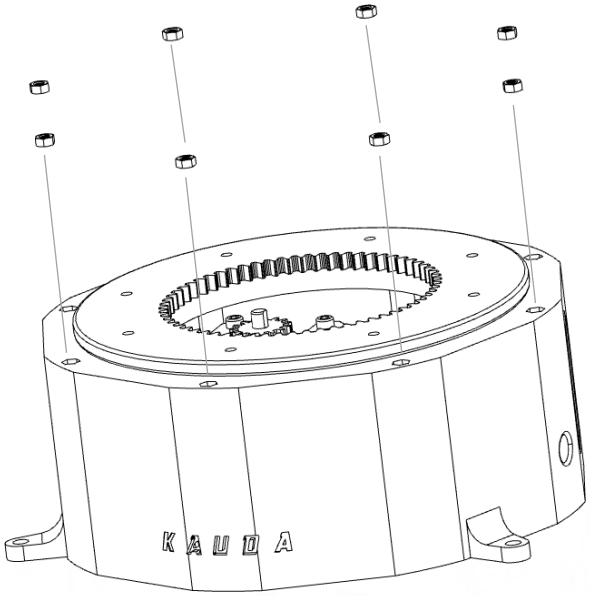


4 Insert the 8 M3 nuts inside the inner ring (**"RG-KRA"**).

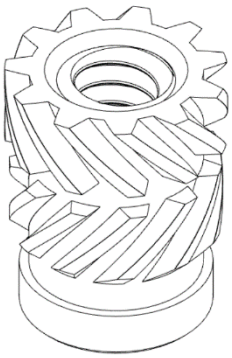


5 Rest the inner ring with the 8 M3 nuts inserted inside it on the balls, so that the cavity matches the position of the balls.



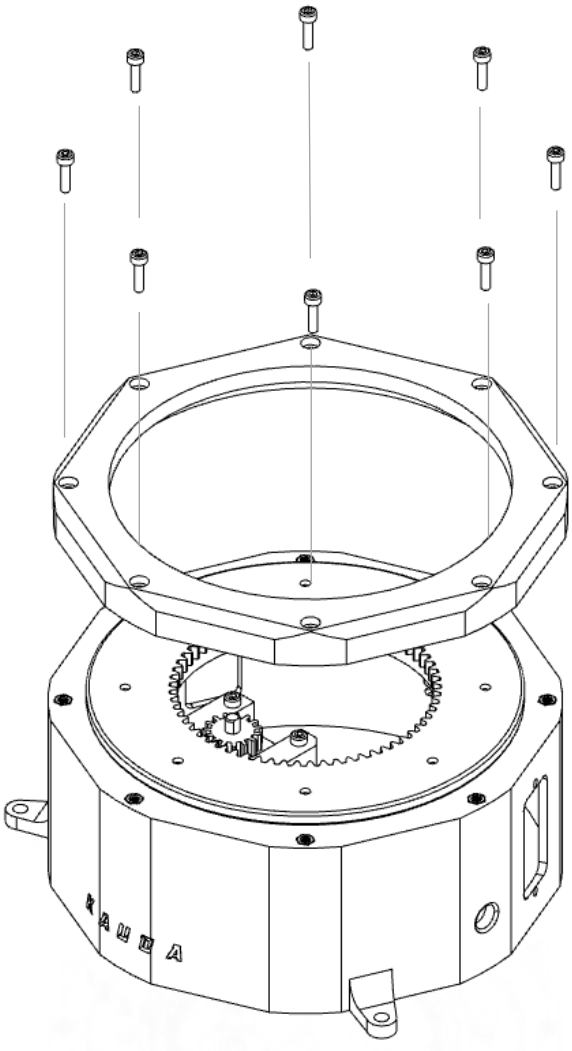


6 Insert the 8 M3 insert inside the Base (**“BS-KRA”**).

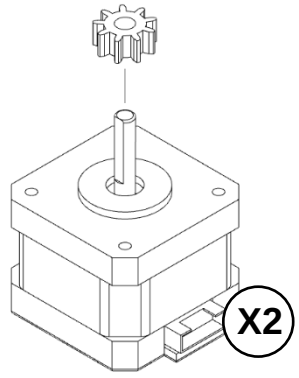


M3 insert

7 Anchor the outer ring (**“BS-RG-KRA”**) to the base with 8 M3 x 20 screws, making sure that once fixed, the inner ring (**“RG-KRA”**) rotates according to the correct movement.

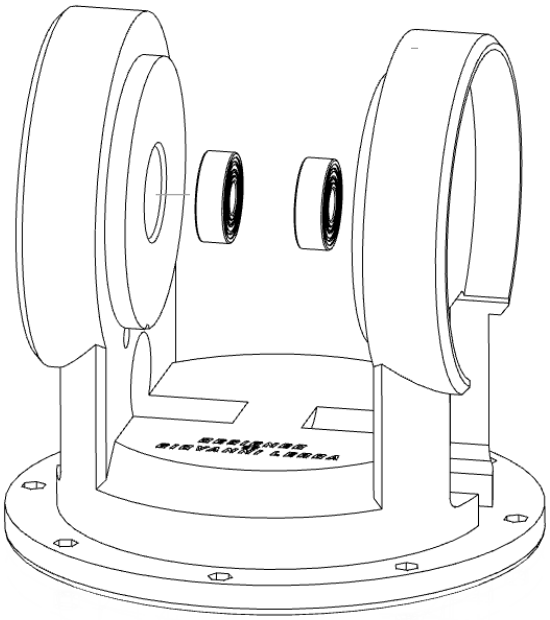


AXIS 1

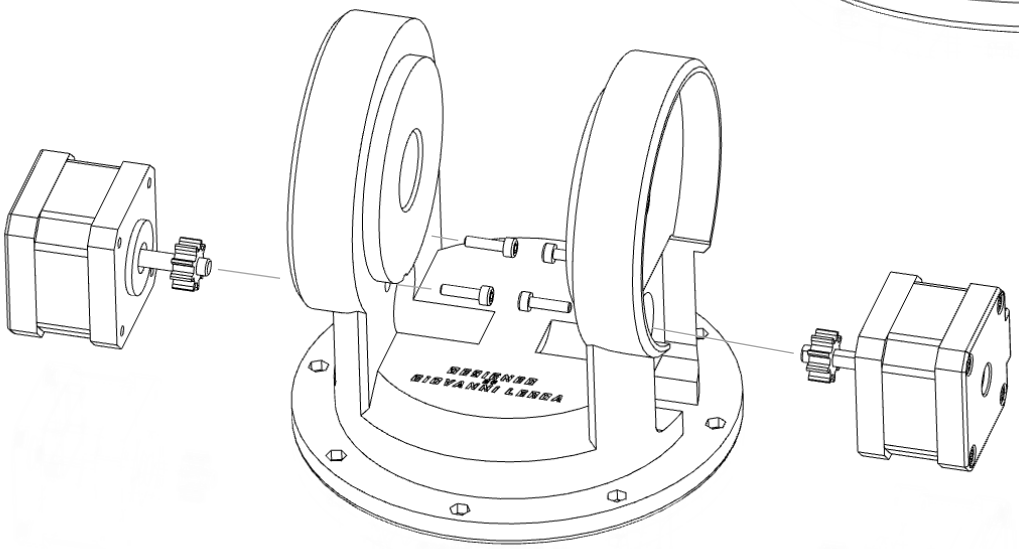


1 Insert the gear wheel (“**RD-STNY-KRA**”) on the shaft of the Nema-17 stepper motor.

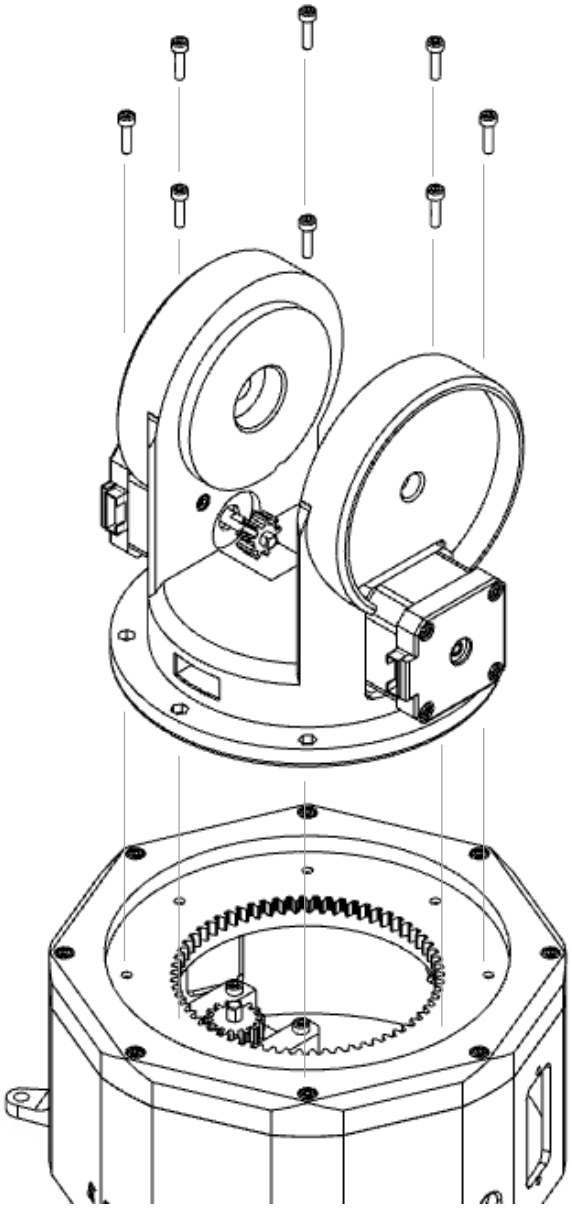
Perform the operation on two stepper motor.



2 Insert the two bearings (“**Bearing**”) in the appropriate cavities of axis 1 (“**AX1**”).

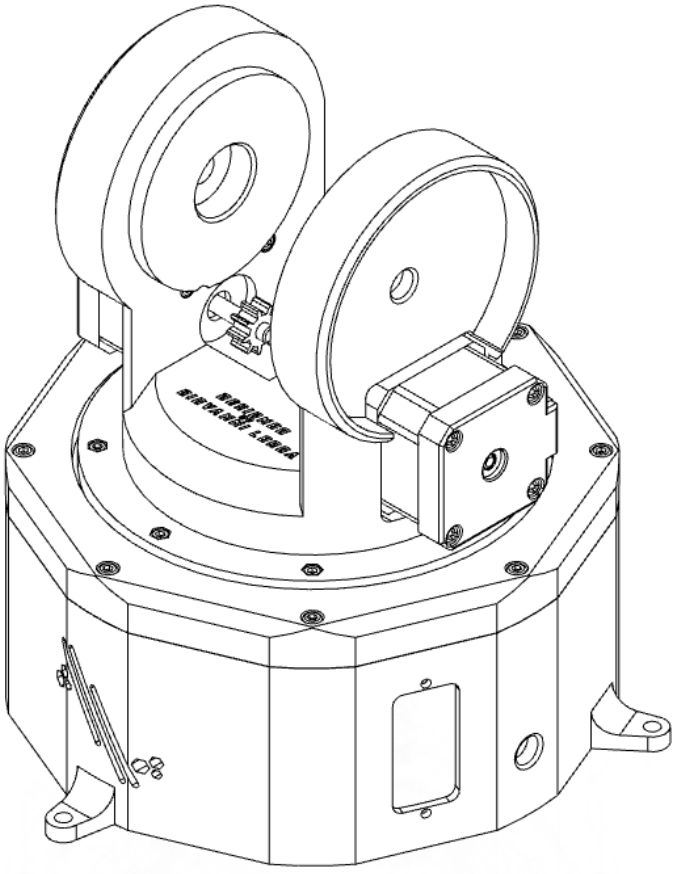


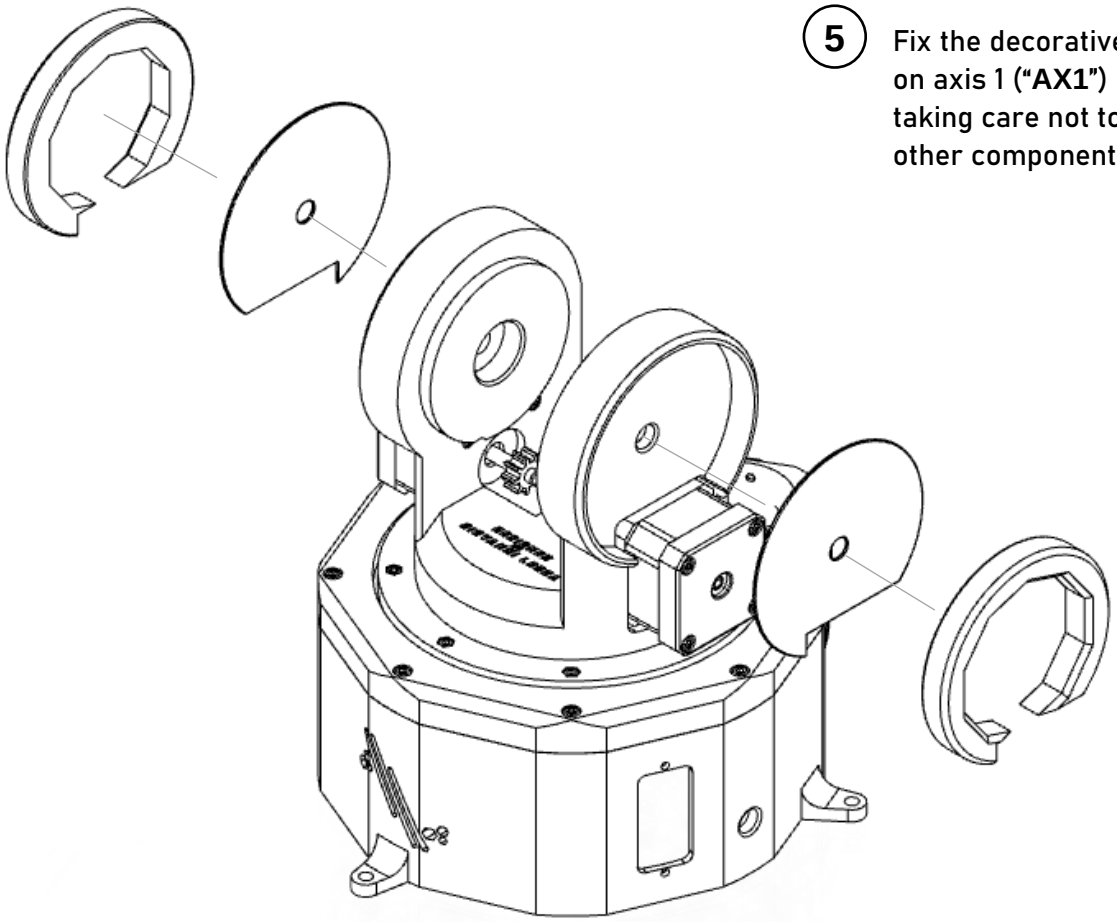
3 Insert the 2 stepper motor in the space provided inside the Axis 1 (“**AX1**”), anchoring it with 4 M3x12 screws



4 Fix the 8 M3 x 20 screws to join axis 1 (**“AX1”**) with the inner ring (**“RG-KRA”**), matching the holes as shown in the figure.

So as to allow the fixing of the screws with the nuts previously installed in the inner ring.

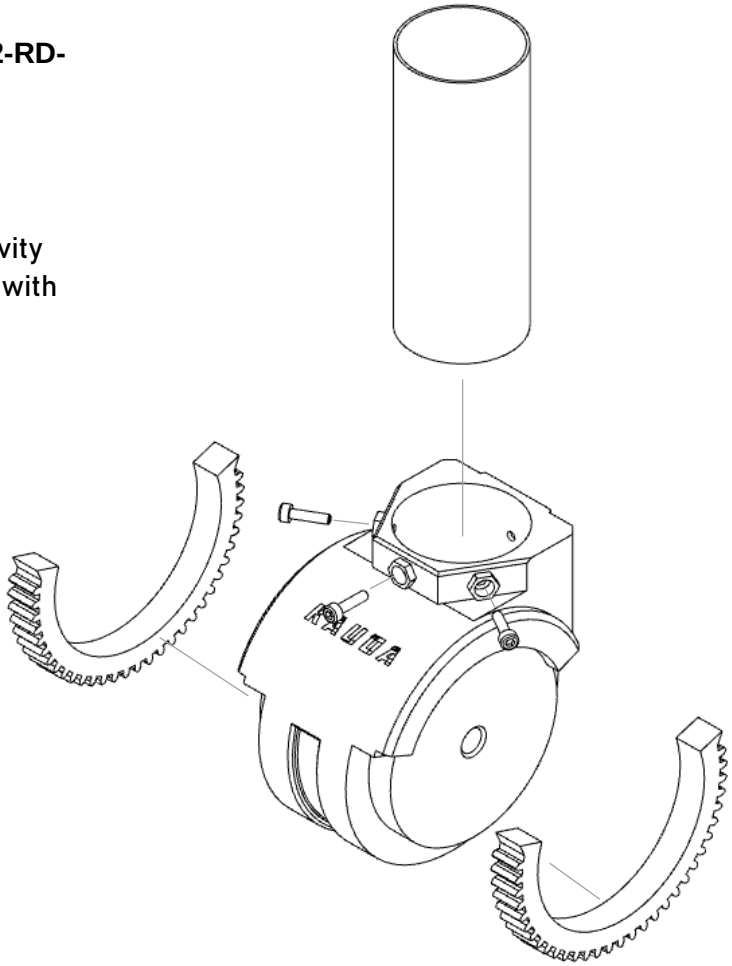




5 Fix the decorative components on axis 1 (“**AX1**”) as shown, taking care not to damage any other component.

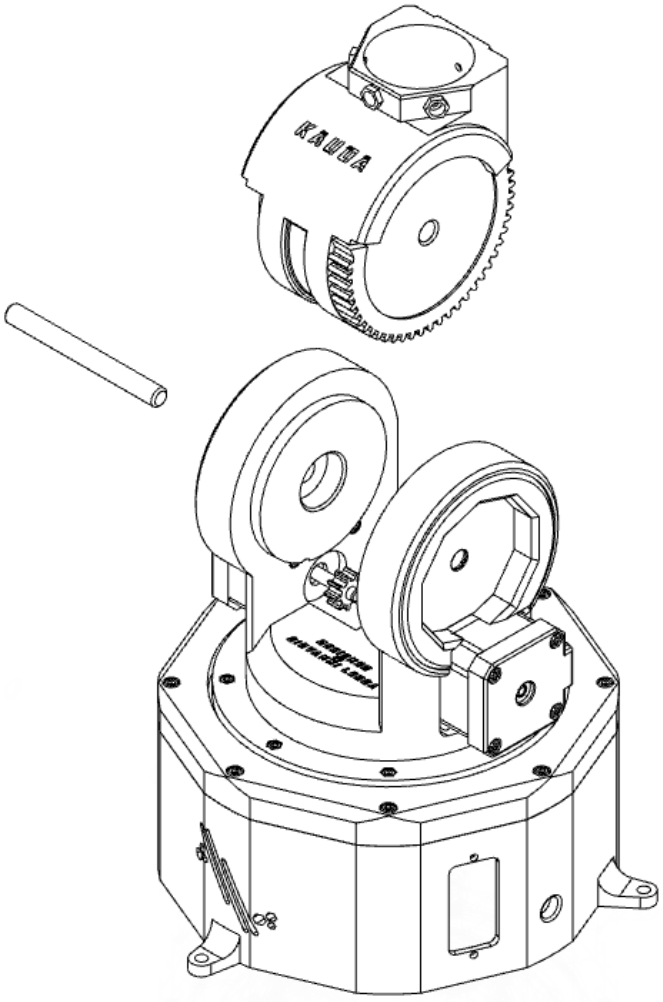
1 Fix the two half-toothed wheels (**"AX2-RD-KRA"**) with plastic glue.

Insert the Ø40 x 110 mm tube ("*Round aluminum tube Ø 40 x 110*") into the cavity of axis 2 (**"AX2"**), fixing it if necessary with screws M3 x 12



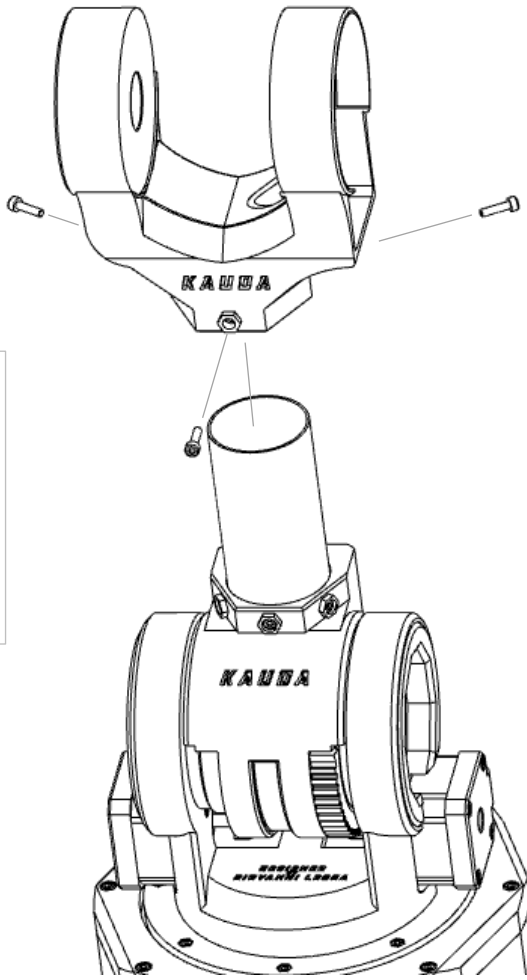
Note:

To fix the tube to axis 1 with M3 screws, it is necessary to make holes on the tube which are useful for fixing.



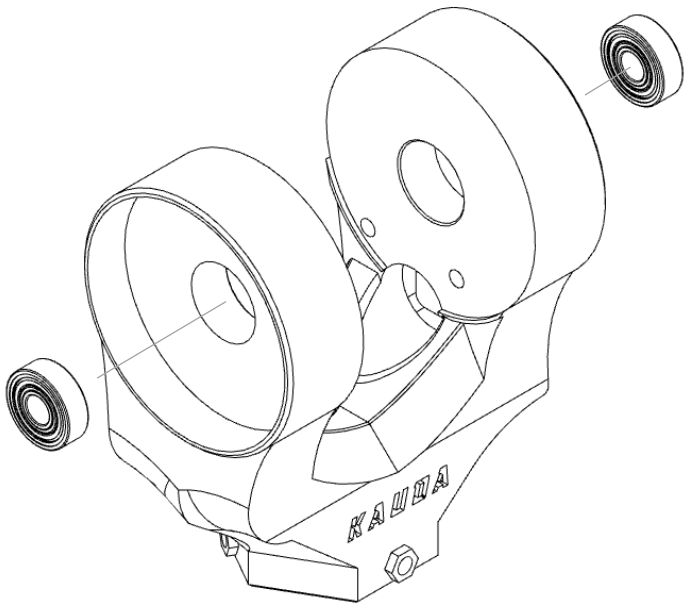
2 Join axis 2 (**"AX2"**) and axis 1 (**"AX1"**) with the relative components already installed by using an Ø8 mm tube (**"Steel rod Ø8 x 80"**) which allows movement of axis 2 on axis 1.

1 Fix axis 3 (**“AX3”**) in the correct position on the 40mm tube, inserting if necessary M3 screws in the appropriate cavities.

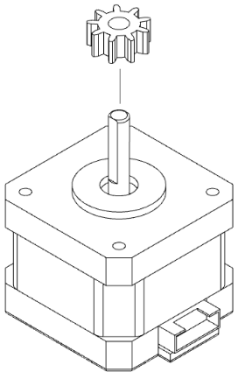


Note:

To fix the tube to axis 1 with M3 screws, it is necessary to
make holes on the tube which are useful for fixing.

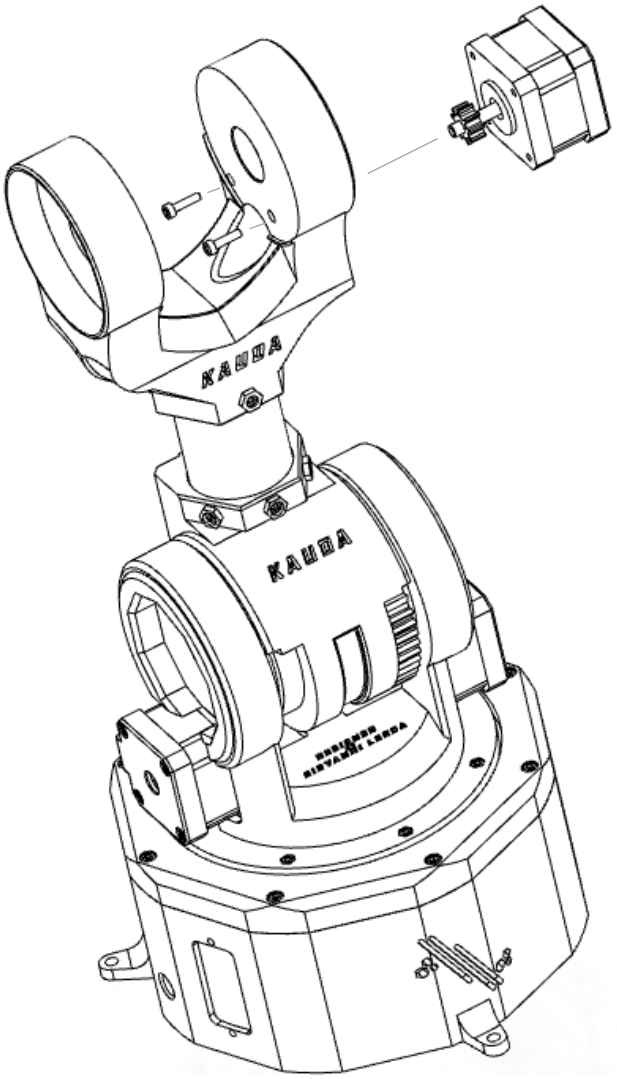


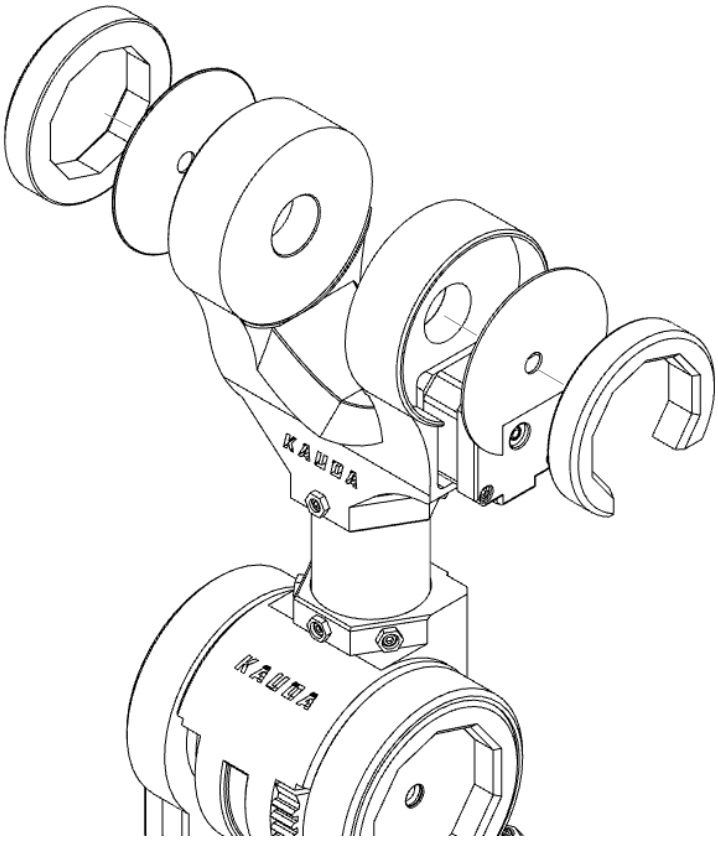
2 Insert the bearings (**“Bearing”**) in the appropriate cavities as shown in the figure.



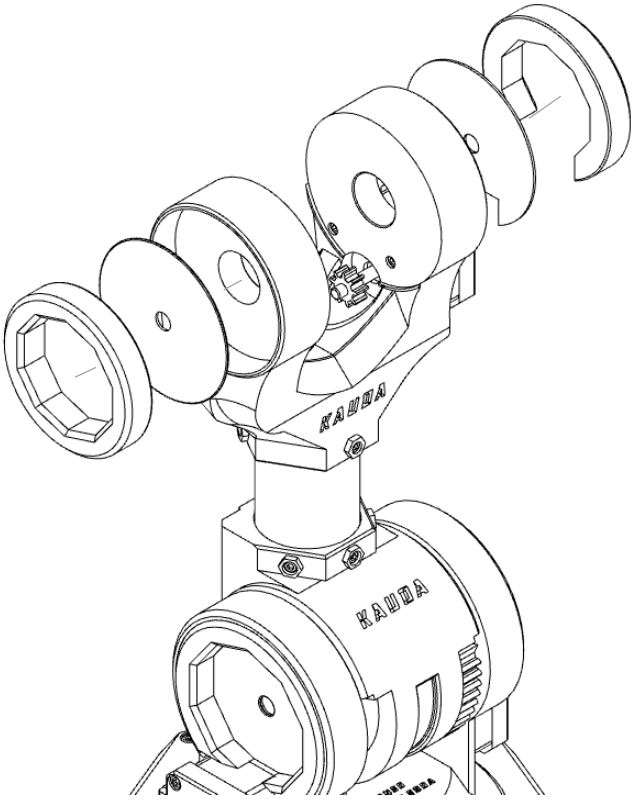
3 Insert the gear wheel (**"RD-STNY-KRA"**) on the shaft of the Nema-17 stepper motor.

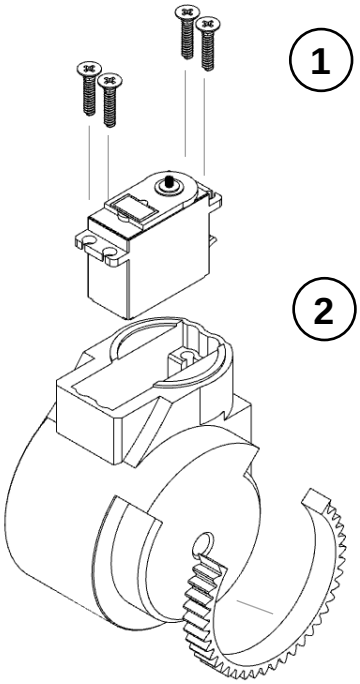
Insert the motor in the dedicated cavity on the right side of axis 3(**"AX3"**), fixing it with 2 M3 x 12 screws.





4 Fix the decorative components on axis 3 (**"AX3"**) as shown, taking care not to damage any other component.

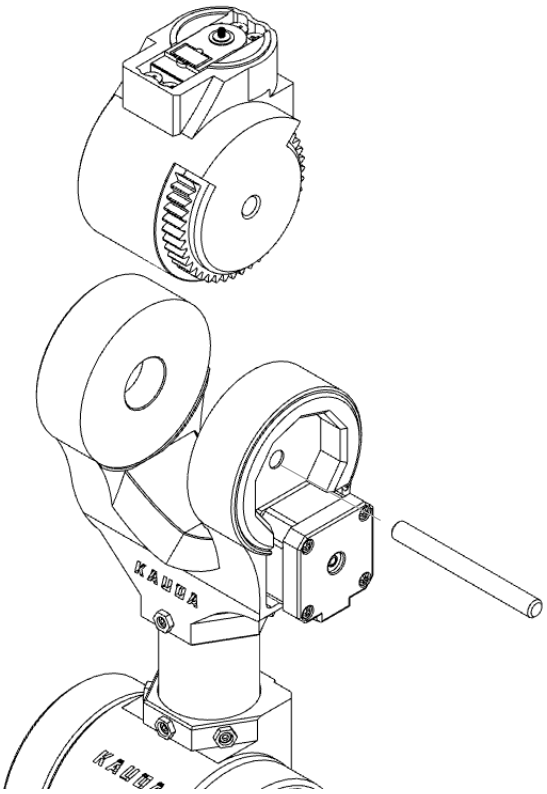




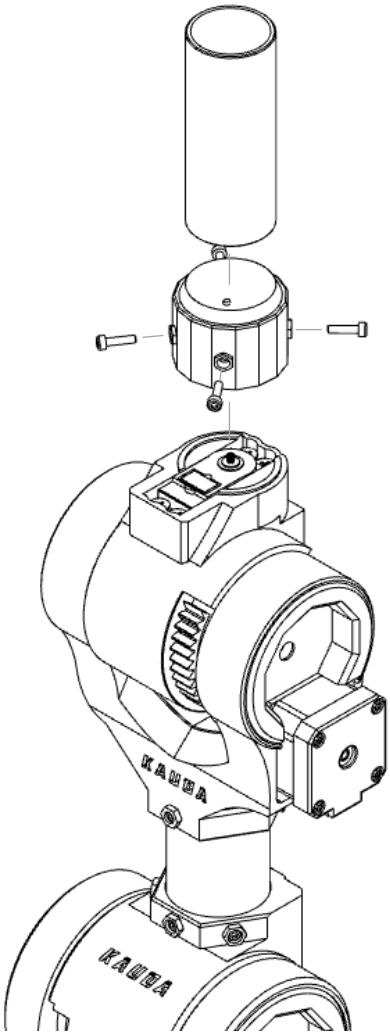
1 Insert the servo motor (“***MG996R Servo-M***”) inside the cavity in axis 4, fixing it with 4 M3 x 12 screws

It is important to pass the motor cables through the cavity inside the component

2 Fix the half-toothed wheel (“**AX4-RD-KRA**”) with plastic glue.



3 Join axis 4 (“**AX4**”) and axis 3 (“**AX3**”) with the relative components already installed by using an Ø8 mm tube (“**Steel rod Ø8 x 80**”) which allows movement of axis 4 or axis 3.

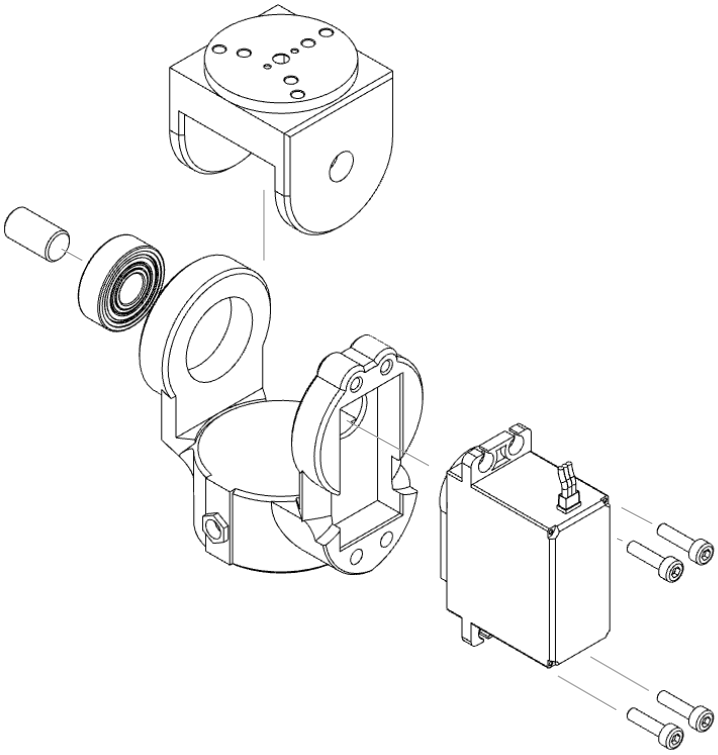


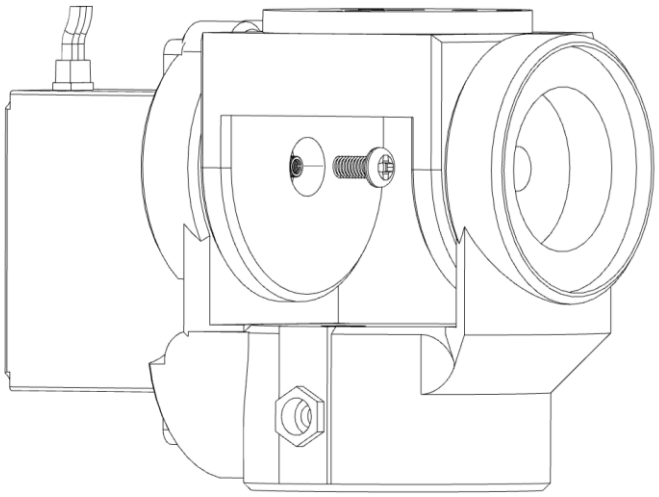
4 Fix the component (“**RT1-KRA**”) on the servo motor using the appropriate screw supplied with the motor, screwing it on the motor shaft fixing the component.

Insert the Ø35 x 90 mm tube(“**Round aluminum tube Ø 35 x 90**”) into the cavity of the component (“**RT1-KRA**”) fixing it if necessary with screws M3 x 12

1 Install axis 5 on the component (**“RT2-KRA”**).

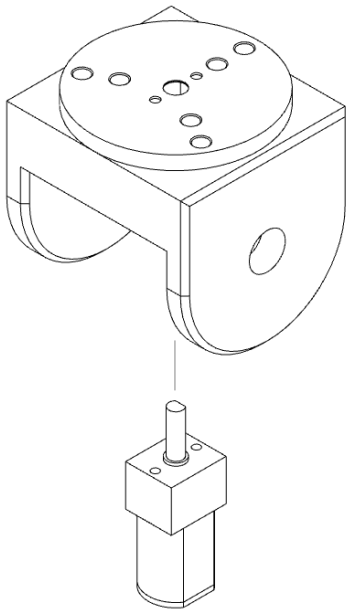
Insert the bearing (**“Bearing”**) in the cavity plus the Ø8 x 15 mm (**“Steel rod Ø8 x 15”**) rod and from the opposite side of it insert the servo motor (**“MG996R Servo-M”**) in the right direction, fixing it with 4 screws M3 x 12.

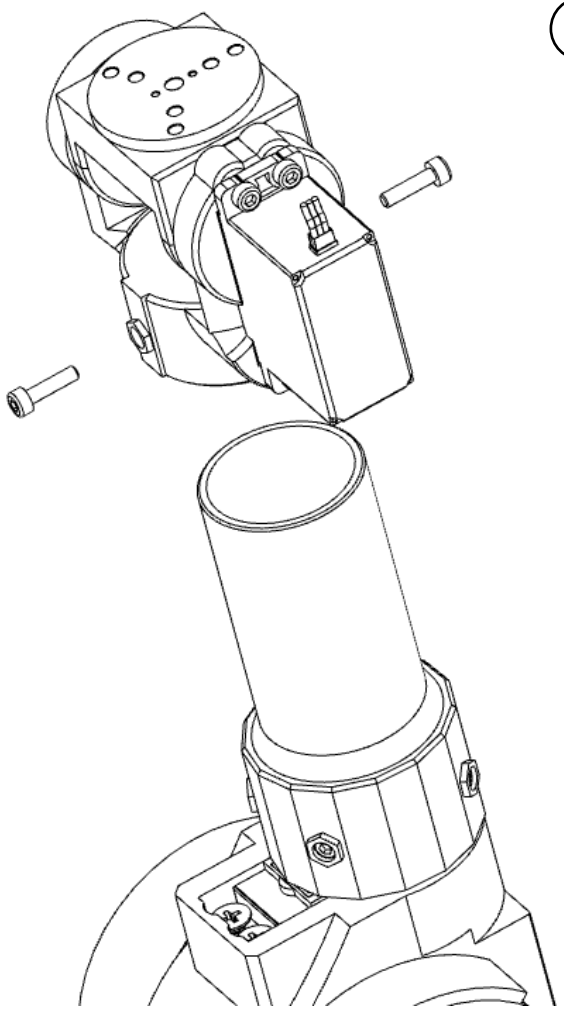




2 Secure the servo motor with the screw supplied with it.

3 Fix the DC motor (**“DC 6V Extended Gear Motor with Shaft”**) on axis 5.



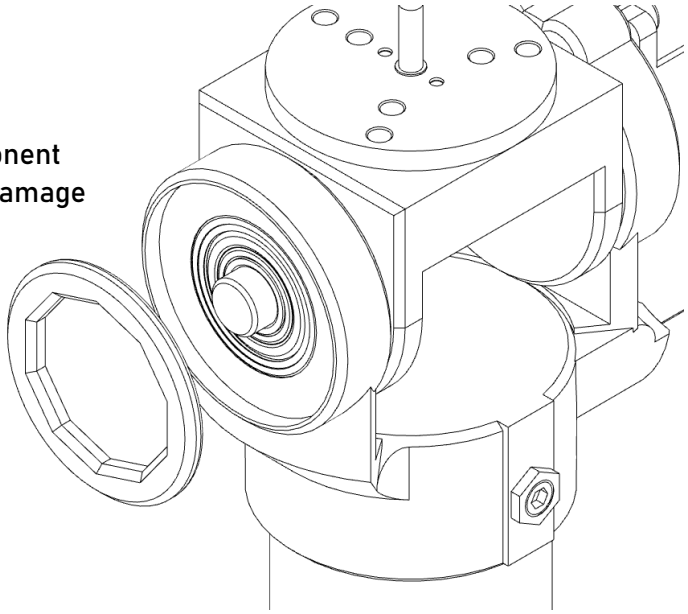


4 Fix axis 5 (**“AX5”**) in the correct position on the 35mm tube, inserting if necessary M3 screws in the appropriate cavities.

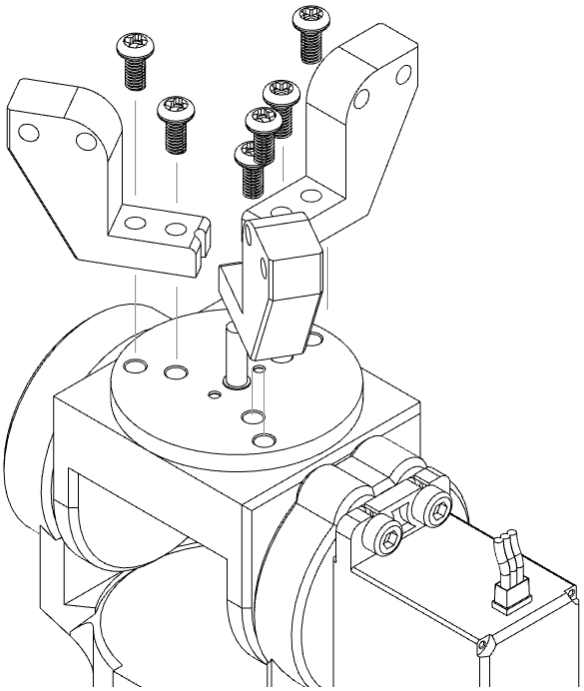
Note:

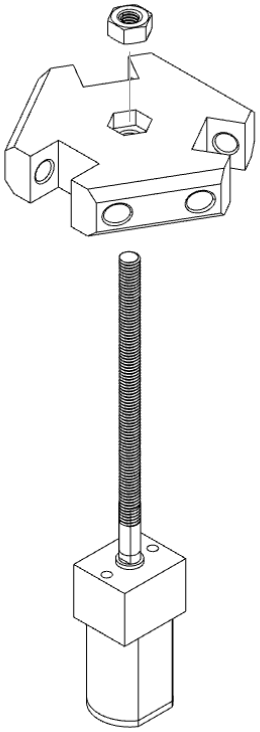
To fix the tube to axis 1 with M3 screws, it is necessary to make holes on the tube which are useful for fixing.

5 Fix the decorative component on the component (**“RT2-KRA”**) as shown, taking care not to damage any other component.

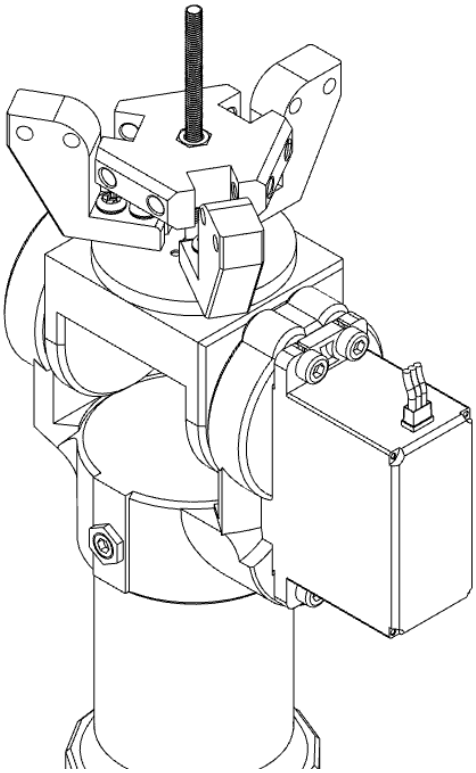


1 Fix the brackets (**"PZ1-KRA"**) on axis 5 with the M3x 10 screws as in the picture.

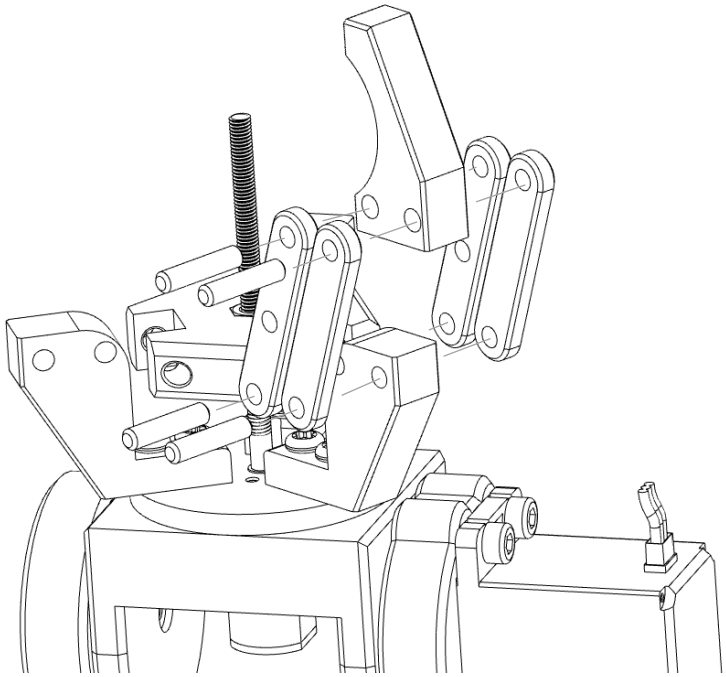


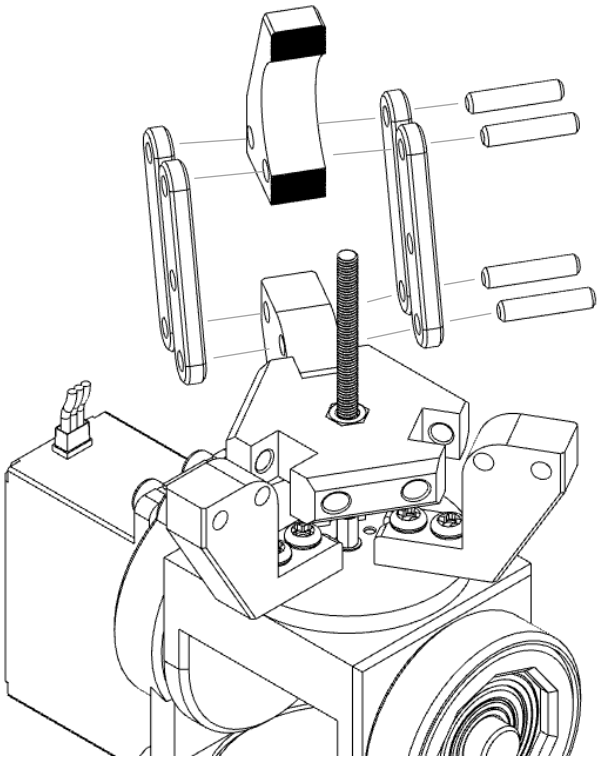


2 Insert an M3 nut inside the sliding bracket (**"PZ4-KRA"**).

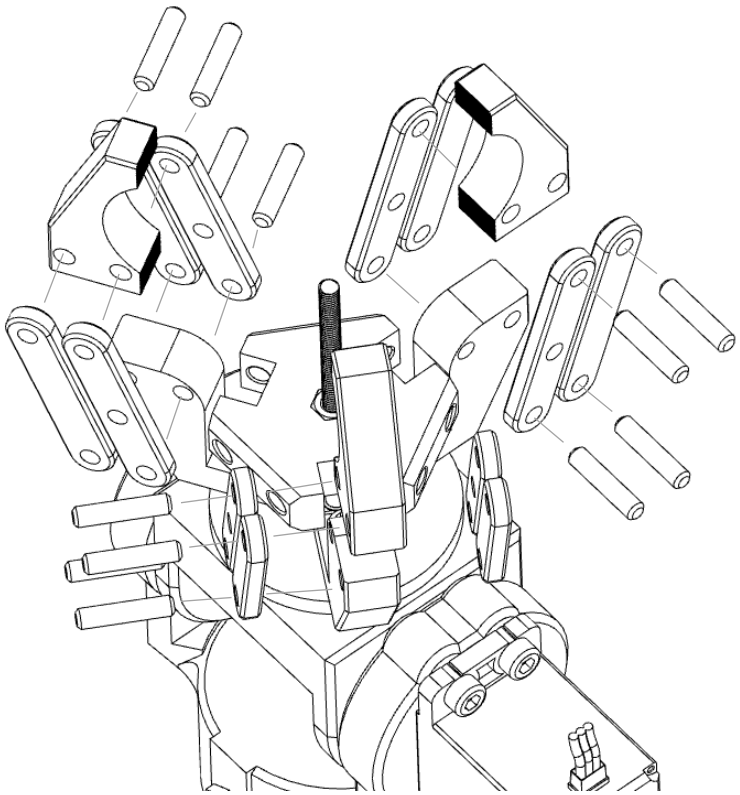


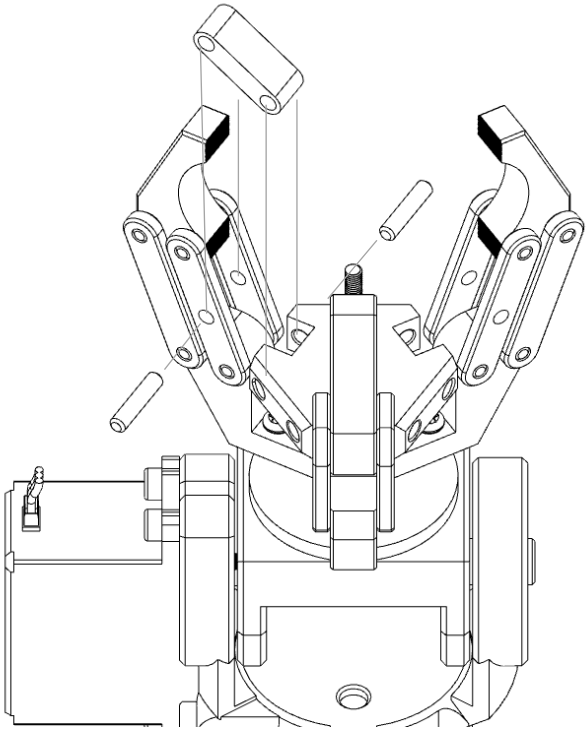
3 Insert the piece on the DC motor shaft (**"DC 6V Extended Gear Motor with Shaft"**) as shown in the correct position and with the M3 nut facing upwards.



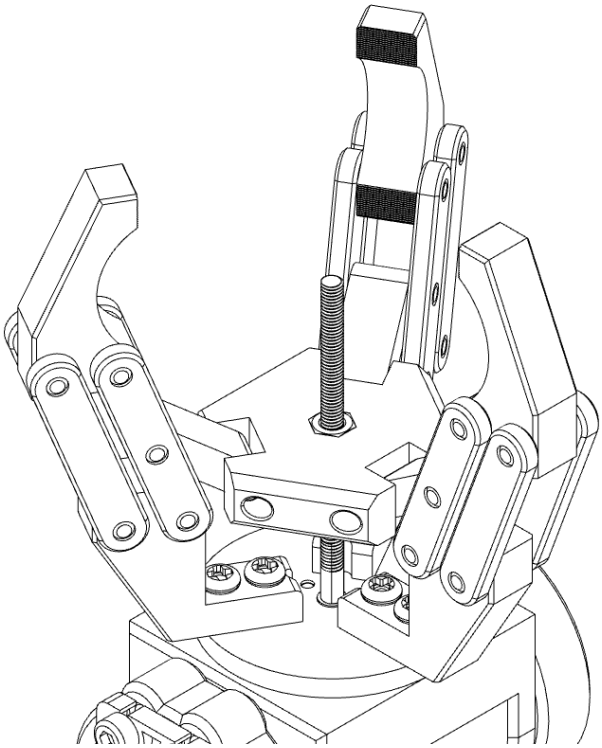


4 Assemble the remaining parts of the gripper (**“PZ2-KRA – PZ3-KRA - PZ4-KRA”**) as shown in the figure using the special cylinders (**“Steel Rod 3 mm”**) which allow the parts to slide between them.



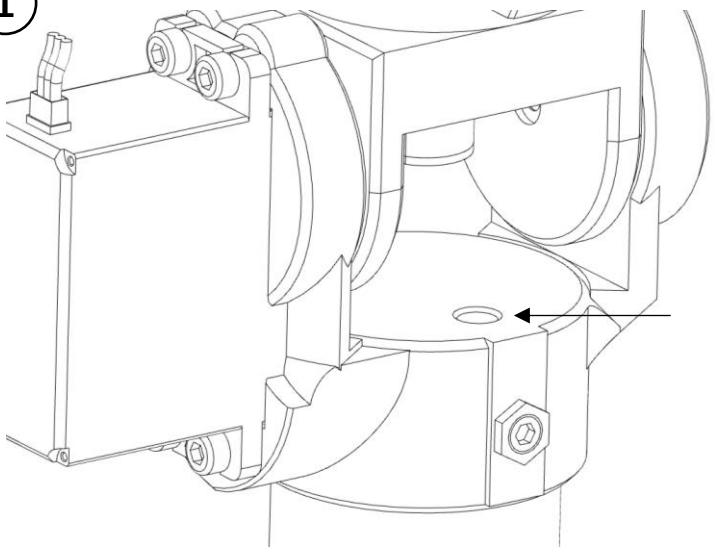


5 Install the last 6 mm rods (**"Steel Rod 3 mm"**) to connect the PZ3 with the PZ5 using the PZ6 (***"PZ6-KRA"***) as shown in the figure.



CABLES MANAGEMENT

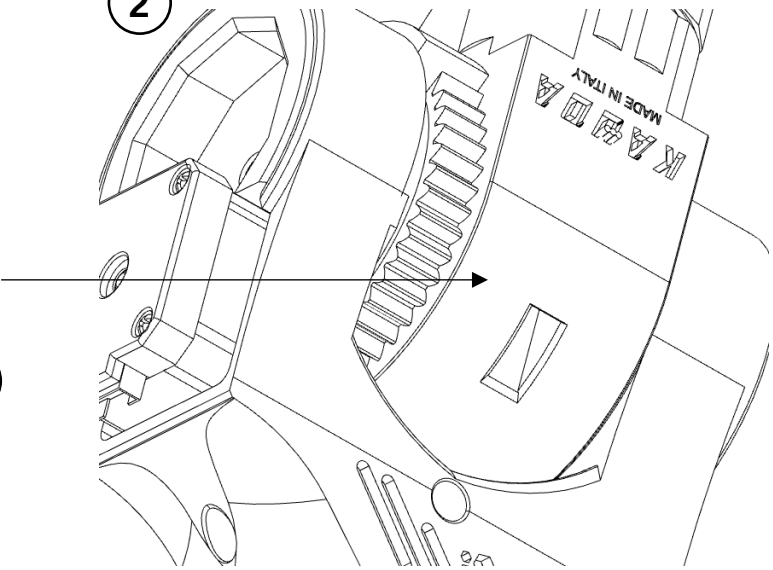
1



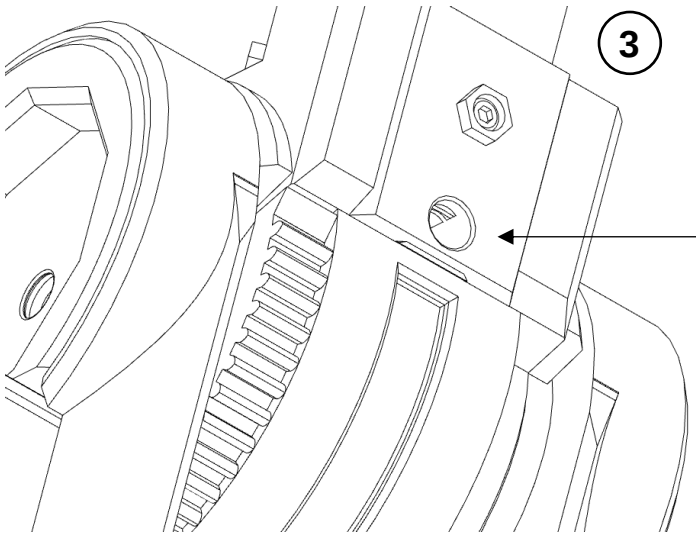
Note:

In many components it is possible to find holes and cavities useful for the passage of motor cables, therefore the **use** is **recommended**.

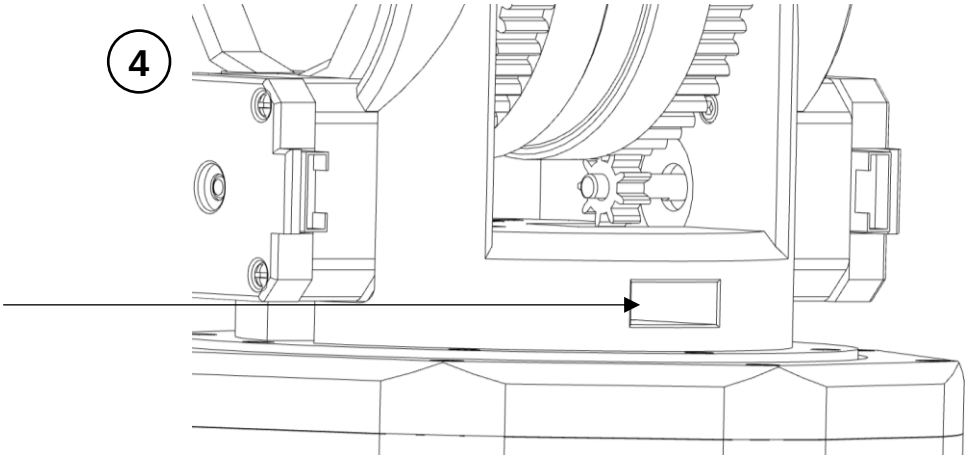
2



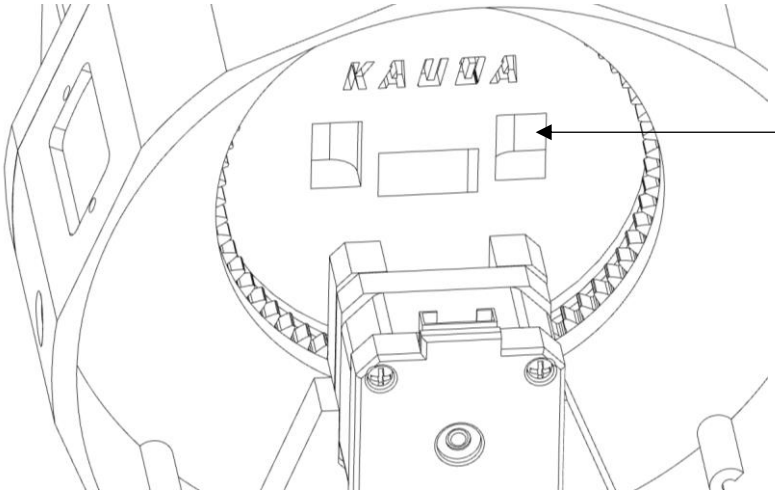
3



4



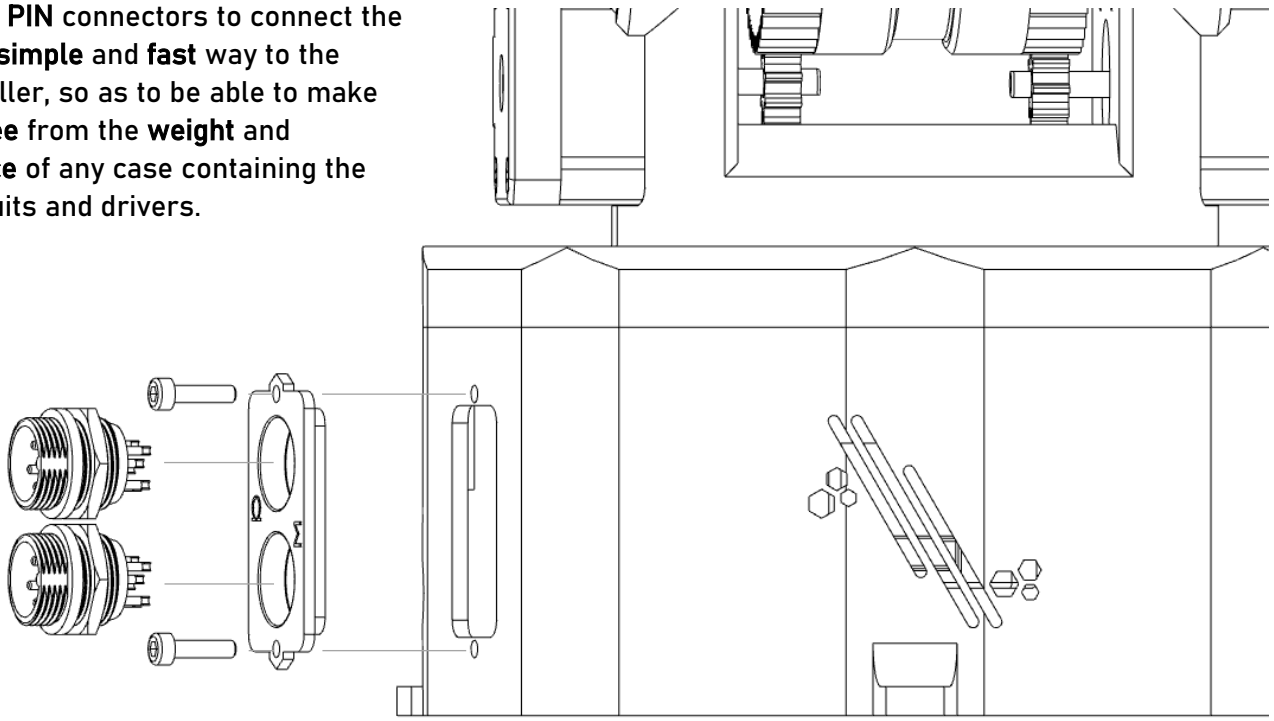
5



CONNECTORS

Note:

It is **recommended** to use the **G16 - 8 PIN** and **G20 - 12 PIN** connectors to connect the motors in a **simple** and **fast** way to the microcontroller, so as to be able to make the robot **free** from the **weight** and **encumbrance** of any case containing the control circuits and drivers.



1. Connect the component (**"DR-2-KRA"**) on Base with the M3x 10 screws as in the picture.

   Insert the connectors as shown in the picture.

Note:

It is **necessary** to solder the motor cables to the ends of the connectors.