Assembly guide:

MiKo-1

Version 1.0

Date: 20-7-2024

Revision:

REV	Date	Description
1	20-7-2024	First release

Index

1: Introduction

This document will describe how to assemble the Miko-1 robot arm. Because this is the first version of Miko-1, there may be some imperfections. We will try to resolve these as soon as possible. We apologize for any inconvenience you may encounter. If you find any mistakes in this document, please let us know by emailing info@mikobots.com.

Instructions on how to use the Miko-1 can be found in the manual of the Miko-1 robot arm. This manual is not ready at the time of this document's release. Using the robot before you have read the Miko-1 manual is at your own risk.

To ensure the safe operation of the robot arm, you need to have sufficient knowledge of electronics. If you are unsure how to proceed, please do not attempt it and ask a professional.

All measurements in this document are in millimeters (mm) or specified otherwise.

This document is not finished, we share it so you can start buying the parts needed.

2: Print files

In this chapter you will find all the parts that you need to print for the Miko-1 robot arm. We recommend using PETG filament because it has a higher glass transition temperature than PLA and is still easy to print.

The total amount of PETG needed is approximately 3 kg. If you print it in the same color configuration, you will need 1.6 kg of red filament and 1.4 kg of black filament.

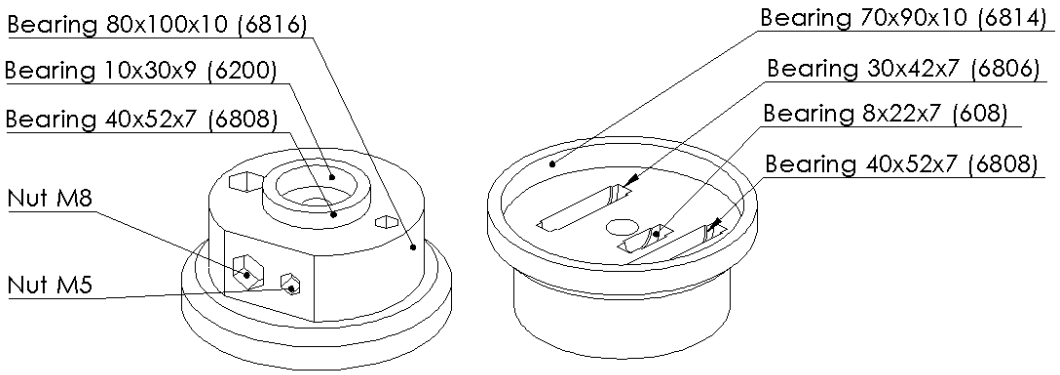
The general print settings that we have used for the parts are:

- Layer height: 0.2mm
- Walls: 3
- Infill: 20%

The tolerances used are as tight possible to achieve the best results. This means that sometimes you may need to use a little bit of force to assemble some parts. The given tolerance for certain parts, such as bearings, depends on the layer direction of the part. We have created a test part to check if your printer can print the parts with the given tolerances. If you encounter problems with the tolerance of any part, please let us know.

We will also release parts with larger tolerances if needed, as we want to ensure that almost every printer can print this robot arm.

If you want access to the 3D files you will have to buy the digital files, or a kit.

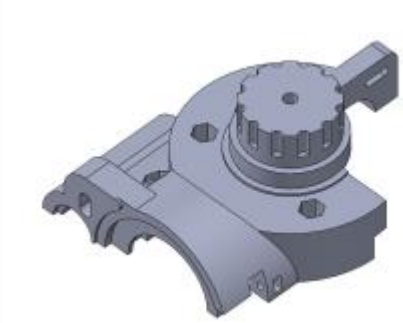


List 3d printed parts

Name: MiKo-1

Date: 26-6-2024

Revision: 000



Art. name: ROBOT_001

Revision: 000

Quantity: 1

Infill: 20%

Walls: 3

Comments:
Colour: Black

Art. name: ROBOT_002

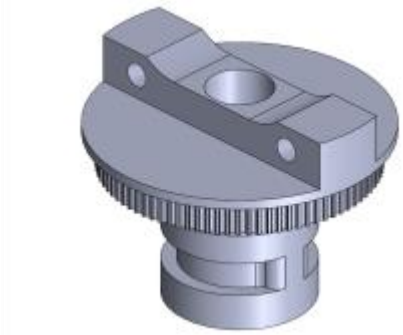
Revision: 000

Quantity: 1

Infill: 20%

Walls: 3

Comments:
Colour: Black



Art. name: ROBOT_003

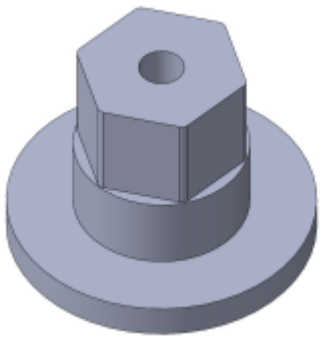
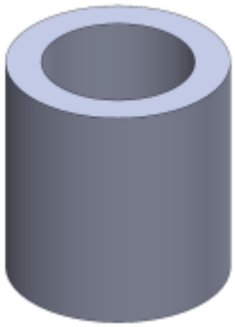
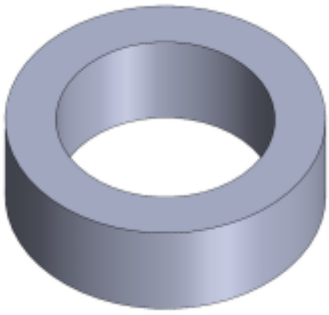
Revision: 000

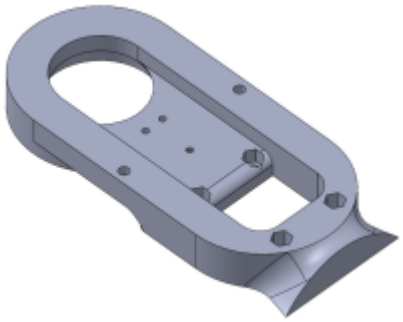
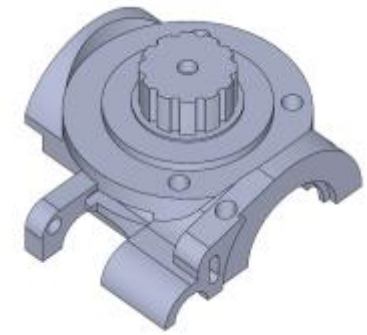
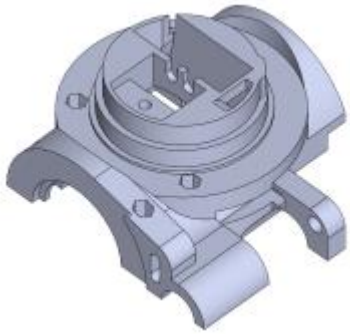
Quantity: 1

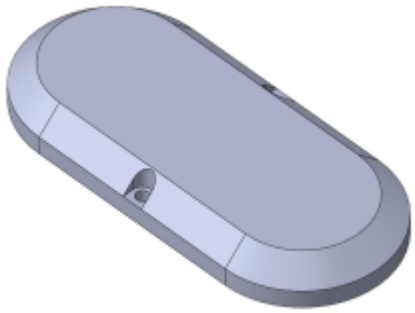
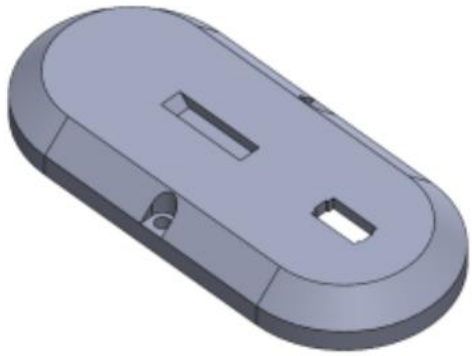
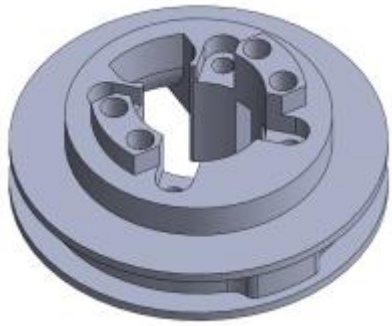
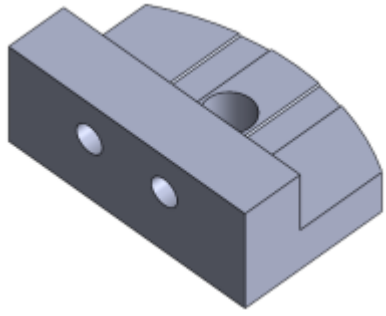
Infill: 20%

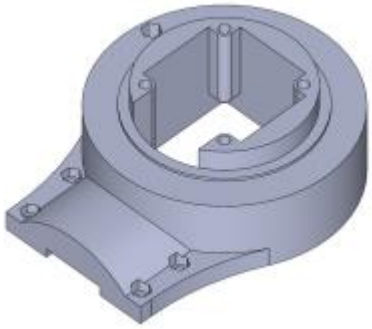
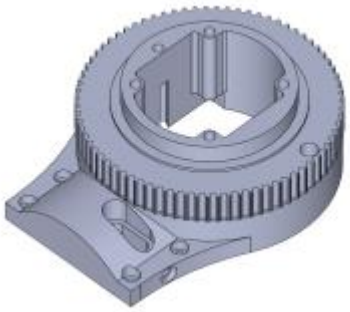
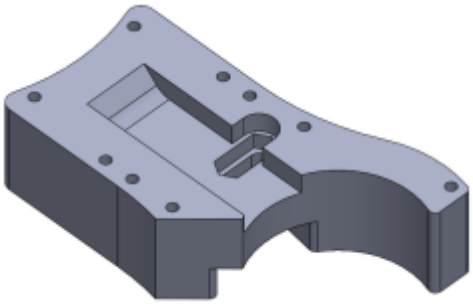
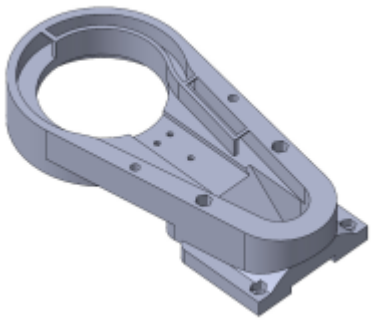
Walls: 3

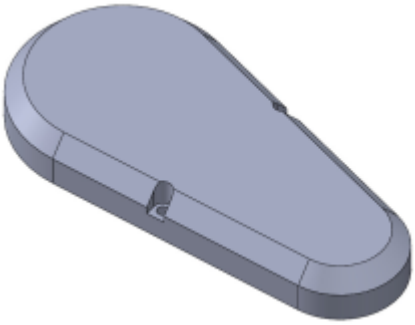
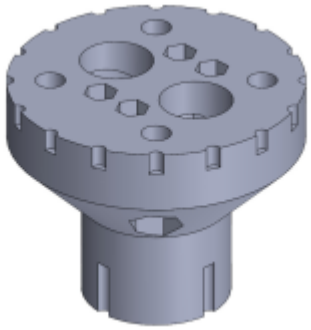
Comments:
Colour: Black

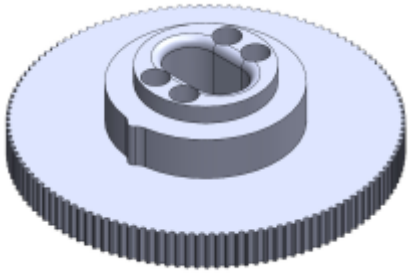
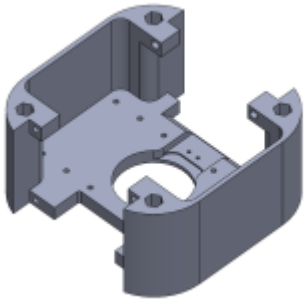
	**Art. name:** ROBOT_004 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_005 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_006 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_007 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red

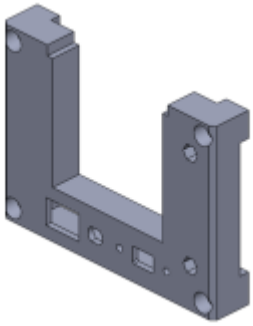
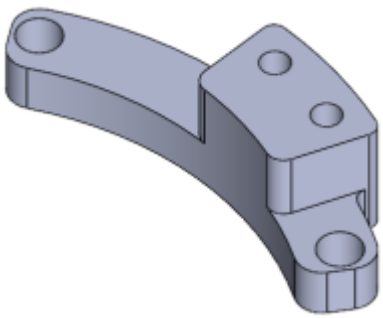
	**Art. name:** ROBOT_008 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_009 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_010 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_011 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red

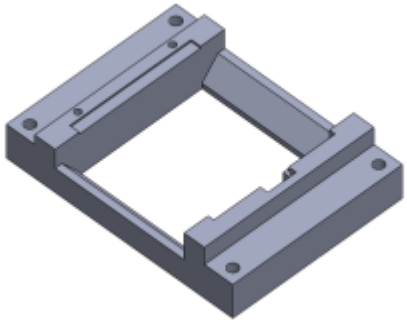
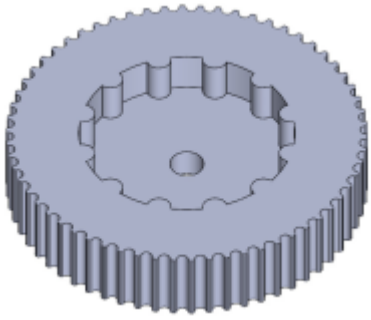
	**Art. name:** ROBOT_012 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_013 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red When using IO box use the part ROBOT_013_IO
	**Art. name:** ROBOT_014 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_015 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black

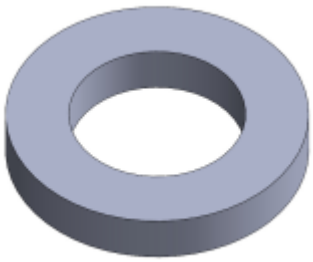
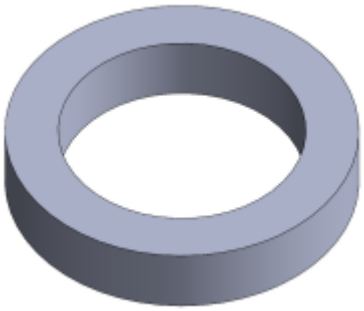
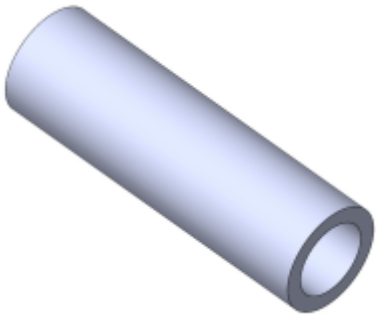
	**Art. name:** ROBOT_016 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_017 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_018 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_019 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black

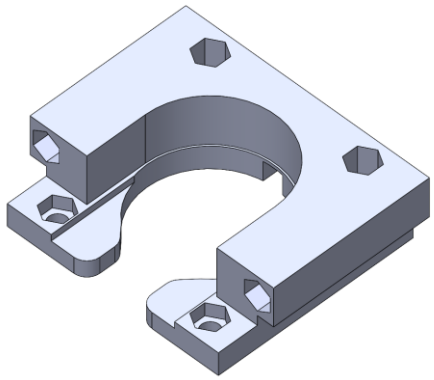
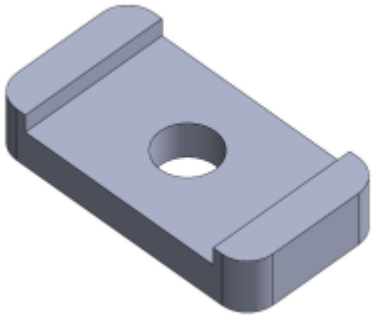
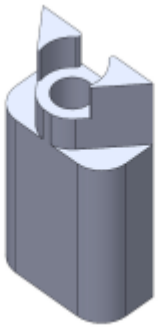
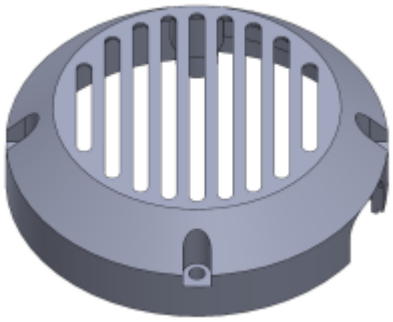
	**Art. name:** ROBOT_020 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_021 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_022 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 Colour: Red
	**Art. name:** ROBOT_023 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 Colour: Black/ Red

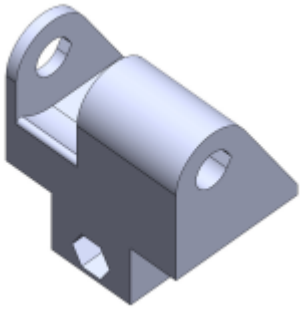
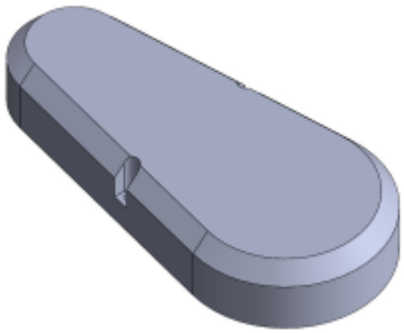
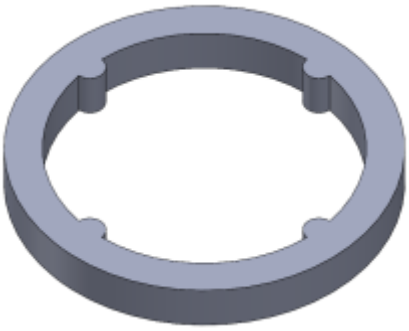
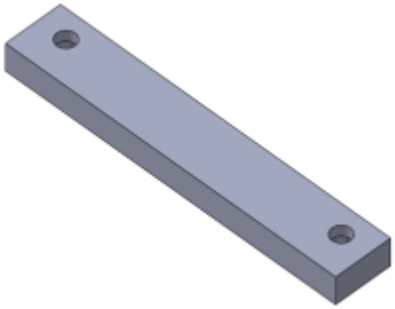
	**Art. name:** ROBOT_024 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_025 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_026 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black/ Red
	**Art. name:** ROBOT_027 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black

	**Art. name:** ROBOT_028 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_029 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_030 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_031 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red

	**Art. name:** ROBOT_032 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_033 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_034 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_035 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black

	**Art. name:** ROBOT_036 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black/ Red
	**Art. name:** ROBOT_037 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black/ Red
	**Art. name:** ROBOT_038 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black/ Red
	**Art. name:** ROBOT_039 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black/ Red

	**Art. name:** ROBOT_040 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Red
	**Art. name:** ROBOT_041 **Revision:** 000 **Quantity:** 3 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_042 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black
	**Art. name:** ROBOT_043 **Revision:** 000 **Quantity:** 1 **Infill:** 20% **Walls:** 3 **Comments:** Colour: Black

	**Art. name:** ROBOT_044
	Revision: 000
	Quantity: 1
	Infill: 20%
	Walls: 3
	Comments: Colour: Black
	**Art. name:** ROBOT_045
	Revision: 000
	Quantity: 1
	Infill: 20%
	Walls: 3
	Comments: Colour: Black
	**Art. name:** ROBOT_046
	Revision: 000
	Quantity: 1
	Infill: 20%
	Walls: 3
	Comments: Colour: Black
	**Art. name:** ROBOT_048
	Revision: 000
	Quantity: 1
	Infill: 20%
	Walls: 3
	Comments: Colour: Black
	Art. name: ROBOT_049

	**Revision:** 000
	Quantity: 1
	Infill: 20%
	Walls: 3
	Comments: Colour: Black/ Red

3: BOM

In this chapter, you will find all the parts that you need to buy for the robot arm. If you see any mistakes or have any questions, you can email us at info@mikobots.com or ask the question in the Discord server. We have tried to provide a link to a shop for each component, but these links could change or become invalid. We will try to update the links regularly.

Please remember that you are solely responsible for ensuring the parts meet the safety requirements for your country.

If you don't want to source the components yourself, you can buy one of our kits. The kits will be available on our web shop in September/October 2024. If you have bought the kit without motors and drivers you only have to buy the kit on stepper online (link).

Besides the parts in the BOM you also need some tyraps and some heat shrink tubing.

Before ordering the parts, it's recommended to first read the whole document.

Axis

Name	QTY.	Description	Shop
AXIS_01	1	Axis Ø8 L65	
AXIS_02	1	Axis Ø8 L85	
AXIS_03	1	Axis Ø10 L135	
AXIS_04	1	Axis Ø8 L145	
AXIS_05	1	Axis Ø10 L70	
AXIS_06	1	Axis Ø8 L40	

Bearings

Name	QTY.	Description	Shop
BEARING_01	26	Bearing 5x14x5 (605)	Link
BEARING_02	4	Bearing 10x30x9 (6200)	Link
BEARING_03	15	Bearing 8x22x7 (608)	Link
BEARING_04	6	Bearing 40x52x7 (6808)	Link
BEARING_05	1	Bearing 70x90x10 (6814)	Link
BEARING_06	3	Bearing 80x100x10 (6816)	Link
BEARING_07	2	Bearing 30x42x7 (6806)	Link
BEARING_08	5	Axial bearing 50x70x5 (AXK5070 2AS)	Link
BEARING_09	2	Axial bearing Ø52x35x4 (AXK3552 2AS)	Link
BEARING_10	1	Axial bearing 120x155x6 (AXK120155 2AS)	Link
BEARING_11	1	Axial bearing 20x35x4 (AXK2035 2AS)	Link

Coupling

Name	QTY.	Description	Shop
COUPLING_01 *	1	Coupler Ø 8 - Ø 5	Link
COUPLING_02 *	1	Coupler Ø 8 - Ø 8	Link

Electronics

Name	QTY.	Description	Shop
ELECTRONICS_001	6	Micro Limit Switch (Roller Lever)	Link
ELECTRONICS_002	1	On Off switch	Link
ELECTRONICS_003	1	Breakout board esp32	Link
ELECTRONICS_004	1	ESP32 38 pin	Link
ELECTRONICS_005	2	5,5 x 2,1 mm jack	Link
ELECTRONICS_007	1	USB connector 2 pin	Link
ELECTRONICS_008	1	micro usb to cable 90 degrees Down	Link
ELECTRONICS_009	1	24V to 5V DC converter	Link
ELECTRONICS_014	1	Power supply 24V 6A, jack 5,5x2,1	
ELECTRONICS_015	1	Micro usb cable 1.5m	
ELECTRONICS_020	2	Wago 221-415	Link
ELECTRONICS_021	1	Wago 221-2411	Link
ELECTRONICS_022	3	15EDGRK 3.81 03P Male and female screw	Link
ELECTRONICS_023	5	15EDGRK 3.81 04P Male and female screw	Link
ELECTRONICS_024	5	15EDGRK 3.81 02P Male and female screw	Link
ELECTRONICS_025	2	Terminal FDD1.25-187, 0.5-1mm2, 4.8x0.5	Link

Drivers

Name	QTY.	Description	Shop
DRIVER_01 *	3	Stepper motor driver DM332T	Link
DRIVER_02 *	3	Stepper motor driver DM320T	Link

Gearbox

Name	QTY.	Description	Shop
GEARBOX_01 *	1	Gearbox Nema 17 1:5	Link

Cables

Name	QTY.	Description	Shop
CABLE_01	5 m	Cable 2 wire, 22 AWG/ 0.34 mm2	Link
CABLE_02	1	3P Dupont cable male 100cm	Link
CABLE_03 **	3	Nema 17 cable 50 cm	Link
CABLE_04	4,5 m	Cable 4P 22 awg	Link
CABLE_05 ***	1 m	Cable 0,75 mm2	
CABLE_06 ***	1 m	Cable 0,75 mm2	

Fasteners

Name	QTY.	Description	Shop
DIN 912 M3x10	12	Hexagon socket Head Cap Screws M3x10	Link
DIN 912 M3x16	15	Hexagon socket Head Cap Screws M3x16	Link
DIN 912 M4x16	14	Hexagon socket Head Cap Screws M4x16	Link
DIN 912 M4x25	4	Hexagon socket Head Cap Screws M4x25	Link
DIN 912 M5x20	22	Hexagon socket Head Cap Screws M5x20	Link
DIN 912 M5x35	31	Hexagon socket Head Cap Screws M8x35	Link
DIN 912 M5x60	36	Hexagon socket Head Cap Screws M5x60	Link
DIN 912 M8x45	15	Hexagon socket Head Cap Screws M8x45	Link
DIN 912 M8x80	4	Hexagon socket Head Cap Screws M8x80	Link
DIN 913 M5 x 35	4	Set screw M5 x 35	Link
DIN 125 M3	8	Washer M4	Link
DIN 125 M5	10	Washer M5	Link
DIN 125 M8	4	Washer M8	Link
ISO 4032 M3	19	Hexagon regular nut M3	Link
ISO 4032 M4	14	Hexagon regular nut M4	Link
ISO 4032 M5	93	Hexagon regular nut M5	Link
ISO 4032 M8	11	Hexagon regular nut M8	Link
DIN 6334 M8	4	Hexagon coupling nut M8	Link

Motors

Name	QTY.	Description	Shop
MOTOR_01 *	2	Stepper motor Nema 17 L38	Link
MOTOR_02 *	2	Stepper motor Nema 23 L76	Link
MOTOR_03 *	1	Stepper motor Nema23 L56	Link
MOTOR_04 *	1	Stepper motor Nema 17 L48	Link

Belts

Name	QTY.	Description	Shop
BELT_01	1	Timing belt GT2 L200 W6	Link
BELT_02	1	Timing belt GT2 L158 W6	Link
BELT_03	1	Timing belt HTD 3M 294 W10	Link
BELT_04	1	Timing belt HTD5M L435 W15	Link
BELT_05	1	Timing belt HTD3M L393 W10	Link
BELT_06	1	Timing belt HTD5M L500 W15	Link
BELT_07	1	Timing belt HTD3M L345 W10	Link
BELT_08	1	Timing belt HTD3M L420 W15	Link
BELT_09	1	Timing belt HTD3M L426 W10	Link

Pulley

Name	QTY.	Description	Shop
PULLEY_01	2	Pulley GT2 20T W6 B8	Link
PULLEY_02	1	Pulley GT2 20T W6 B5	Link
PULLEY_03	2	Pulley HTD3M 16t W10 B8	Link
PULLEY_04	1	Pulley HTD3M 90t W10 B10	Link
PULLEY_05	1	Pulley HTD3M 60t W10 B10	Link
PULLEY_06	2	Pulley HTD5M 15T W15 B10	Link
PULLEY_07	3	Pulley HTD3M 12T W10 B6.35	Link

***** You can buy this as a kit on stepperonline

****** **I**ncluded with the stepper motor if you buy it from stepperonline

******* Make sure the cable can handle 6A; otherwise, choose a thicker cable

4: Modifications parts

Some parts need some modifications, you can find the drawings of the modifications in the appendix. This includes the modifications for the following parts:

- Axis
- Breakout board

5: Schematic and wiring

In this chapter, you will find all the information regarding the schematic and electronics of the robot arm.

Please remember that you are working with electronics, and even though the robot arm operates at only 24V, there are still potential dangers. Incorrect wiring or mishandling of components can lead to short circuits, electric shocks, or damage to the robot arm and its parts. Always double-check your connections and follow safety guidelines. If you are not confident in your knowledge of electronics, please seek assistance from a professional to ensure safe assembly and operation.

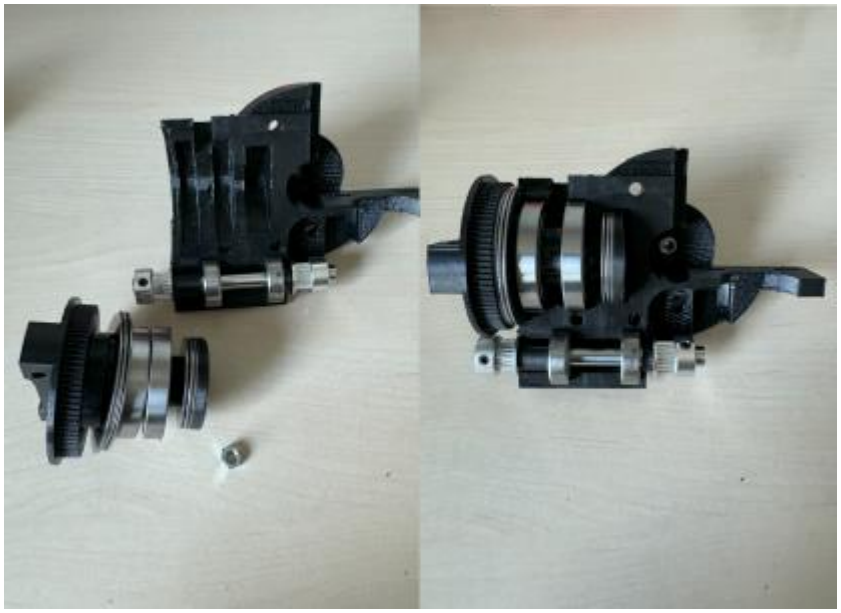
You can find the schematics in the appendix. Note there are two sechemtaics in the appendix, one without the IO box and one with the IO box.

6: Assembly instructions

The instructions are written with care to include every step of the assembly process. This chapter is not completely finished yet, and we will try to make some steps clearer for easier assembling.

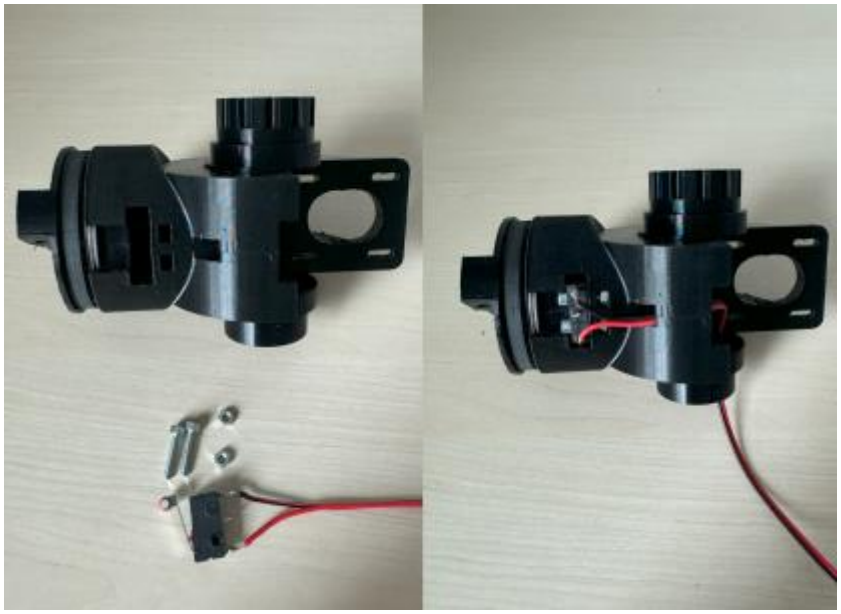
Items		Step 1
1x	ROBOT_001	Notice the position of the pulleys.
1x	ROBOT_006	
1x	ROBOT_005	
2x	BEARING_03	
2x	PULLEY_01	
1x	AXIS_02	

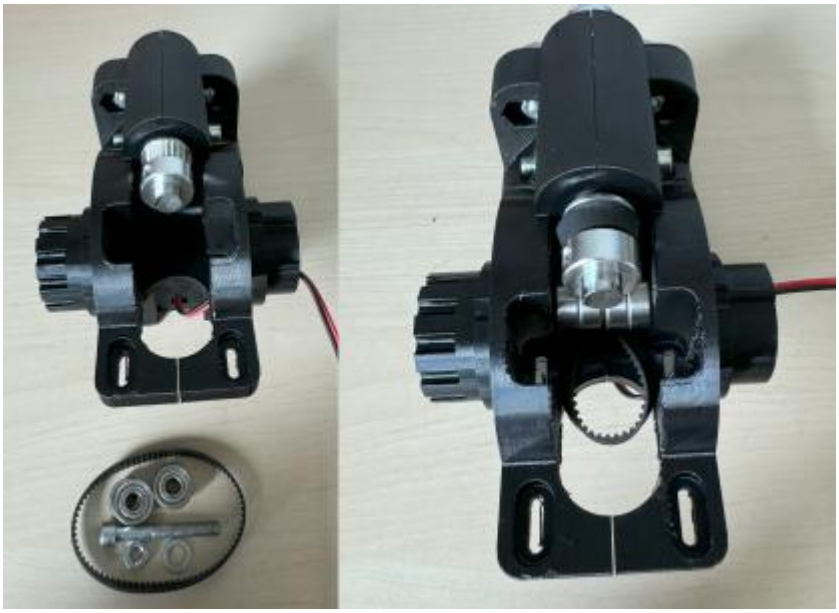
Items		Step 2
1x	ROBOT_003	Do not tighten the M5 bolt yet.
1x	ROBOT_004	
1x	BEARING_09	
1x	BEARING_11	
2x	BEARING_07	
1x	DIN 912 M5 x 35	
1x	ISO 4032 M5	

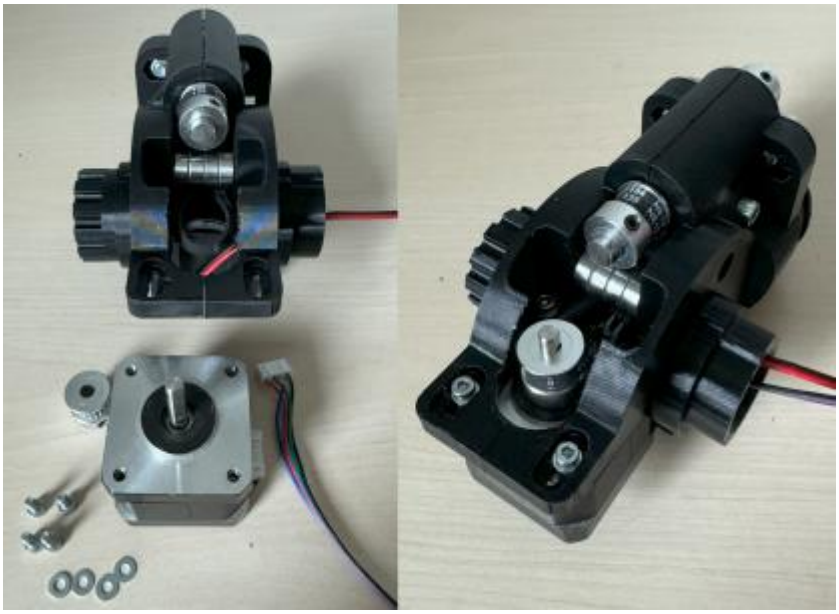
Items		Step 3
1x	ISO 4032 M5	
		

Items		Step 4
1x	ROBOT_002	Tighten the M5 bolt that is assembled in step 2. Make sure it still turns probably.
3x	DIN 912 M5 x 35	
3x	ISO 4032 M5	
		

Items		Step 5
2x	ISO 4032 M5	Make sure you put the washer behind the bearing against the 3d printed part. You can tension the belt by moving the bearing towards eachother.
2x	DIN 125 M5	
2x	DIN 912 M5 x 20	
2x	BEARING_01	
1x	BELT_01	

Items		Step 6
1x	LIM_SWITCH_06	
2x	DIN 912 M3 x 16	
2x	ISO 4032 M3	

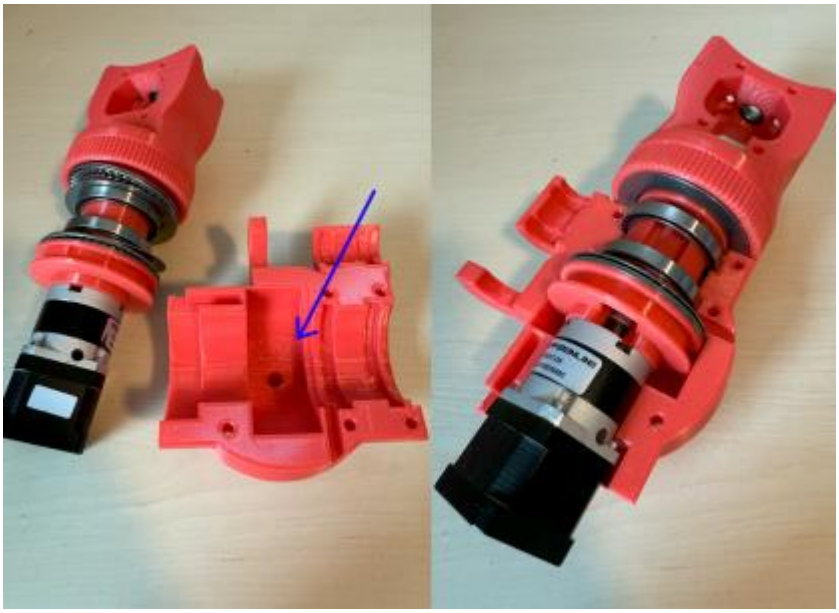
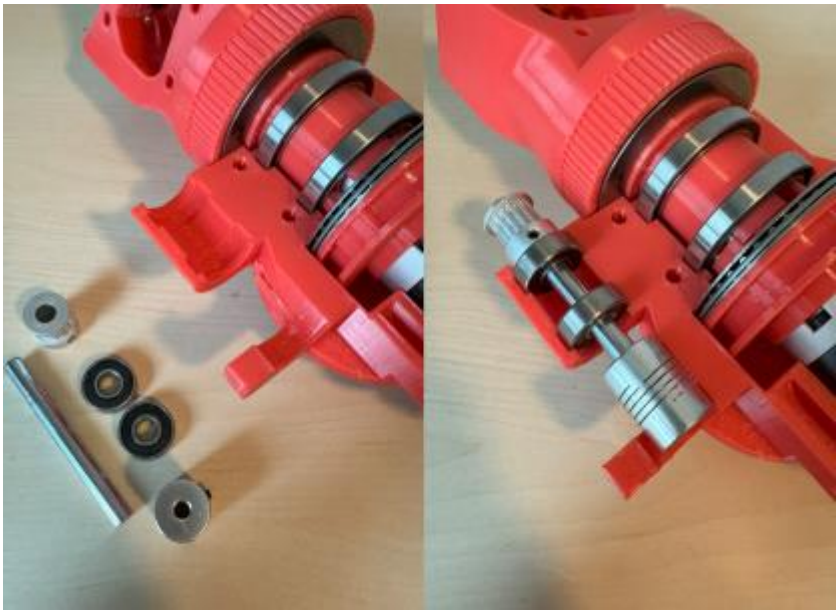
Items		Step 7
1x	BELT_02	The smooth side of the belt should be against the bearings
1x	DIN 912 M5 x 35	
1x	ISO 4032 M5	
1x	DIN 125 M5	
4x	BEARING_01	

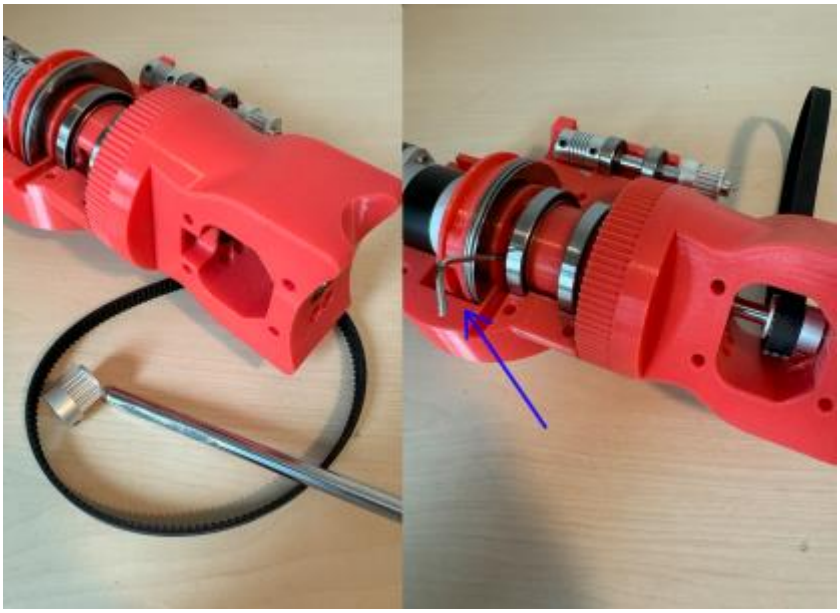
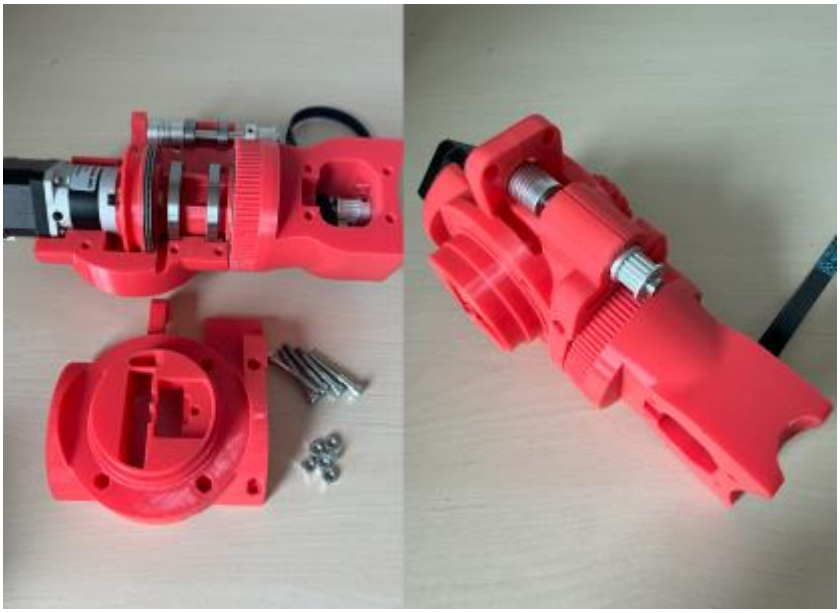
Items		Step 8
1x	MOTOR_01	
1x	PULLEY_02	
1x	CALBE_01	
4x	DIN 912 M3 x 10	
4x	ISO 4032 M3	

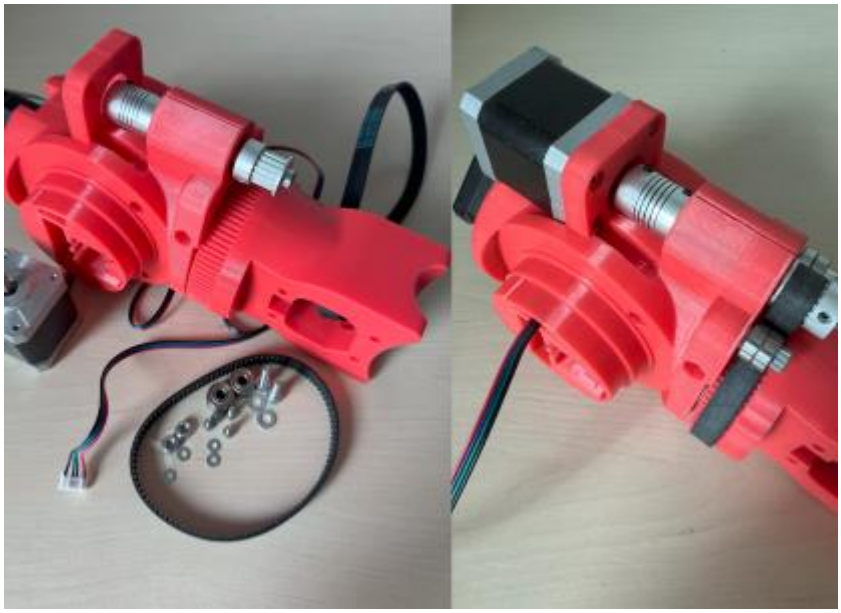
Items		Step 9
1x	ROBOT_009	
2x	BEARING_03	
		

Items		Step 10
1x	MOTOR_01	
1x	GEARBOX_01	
1x	COUPLING_02	
4x	DIN 912 M3 x 10	
		

Items		Step 11
1x 4x 4x	ROBOT_014 DIN 912 M4 x 25 ISO 4032 M5	Note the position of the coupling.
		
Items		**Step 12**
2x 2x 4x	BEARING_04 BEARING_08 DIN 912 M5 x 60	Do not yet tighten the bolts yet
		

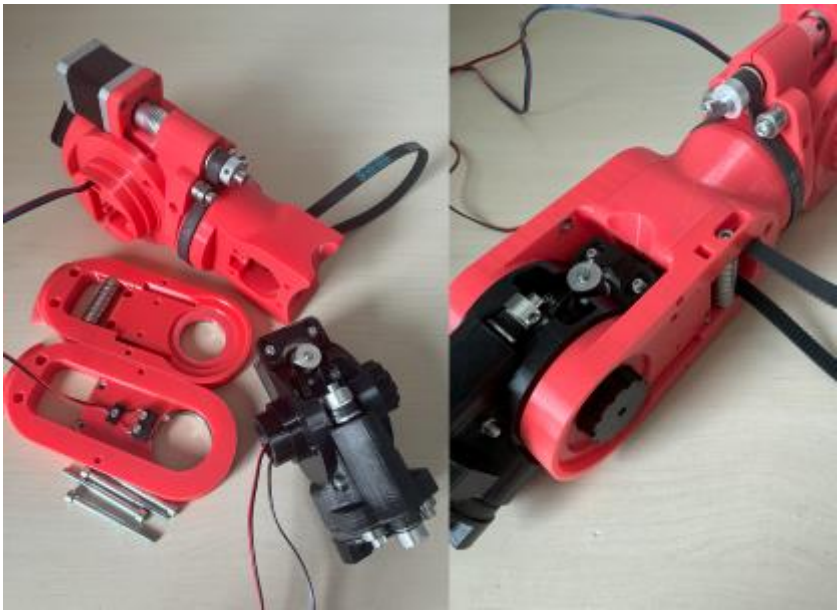
Items		Step 13
1x 1x	ROBOT_010 ISO 4032 M5	First put in the M5 nut, if the nut is to lose and is falling out use a bit of glue
		
Items		**Step 14**
2x 1x 1x 1x	BEARING_03 AXIS_01 COUPLING_01 PULLEY_03	
		

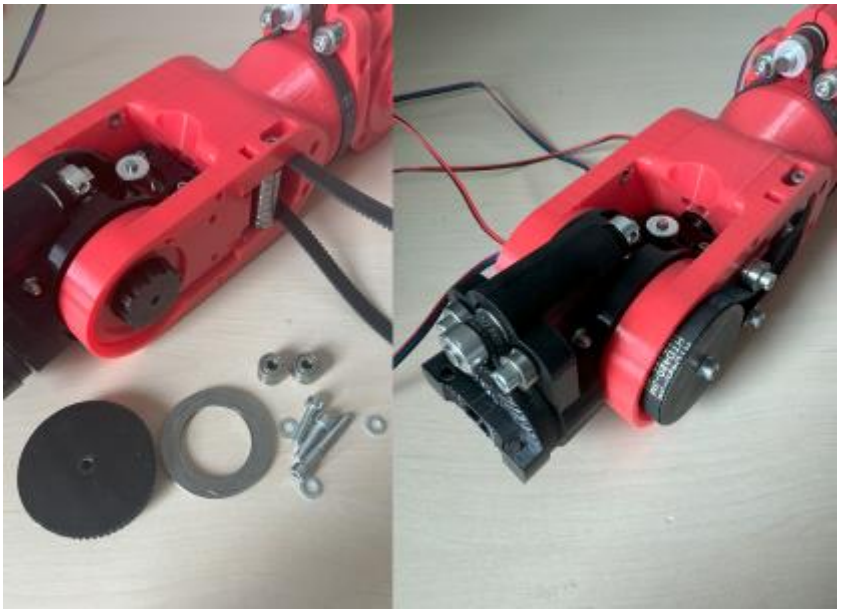
Items		Step 15
1x 1x 1x	AXIS_04 PULLEY_03 BELT_08	Note the position of the pulley, and do not tighten the pulley yet. But tighten the coupling.
		
Items		**Step 16**
1x 5x 6x	ROBOT_011 DIN 912 M5 x 35 ISO 4032 M5	
		

Items		Step 17
1x	BELT_03	
4x	BEARING_01	
4x	DIN 912 M3 x 10	
4x	DIN 125 M3	
2x	DIN 912 M5 x 20	
2x	ISO 4032 M5	
2x	DIN 125 M5	

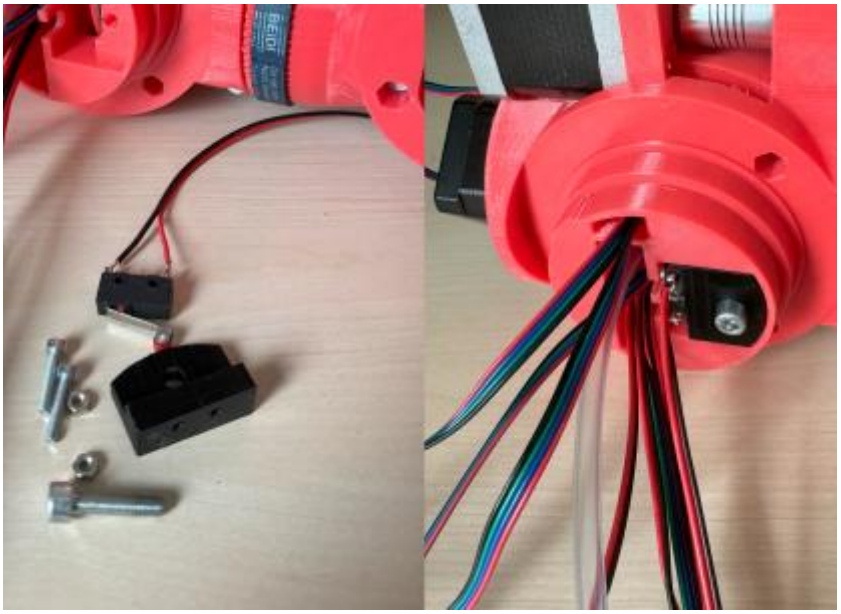
Items		Step 18
1x	ROBOT_008	
1x	ROBOT_041	
1x	BEARING_04	
1x	LIM_SWITCH_05	
6x	ISO 4032 M5	
3x	ISO 4032 M3	
1x	DIN 912 M3 x 10	
2x	DIN 912 M3 x 16	

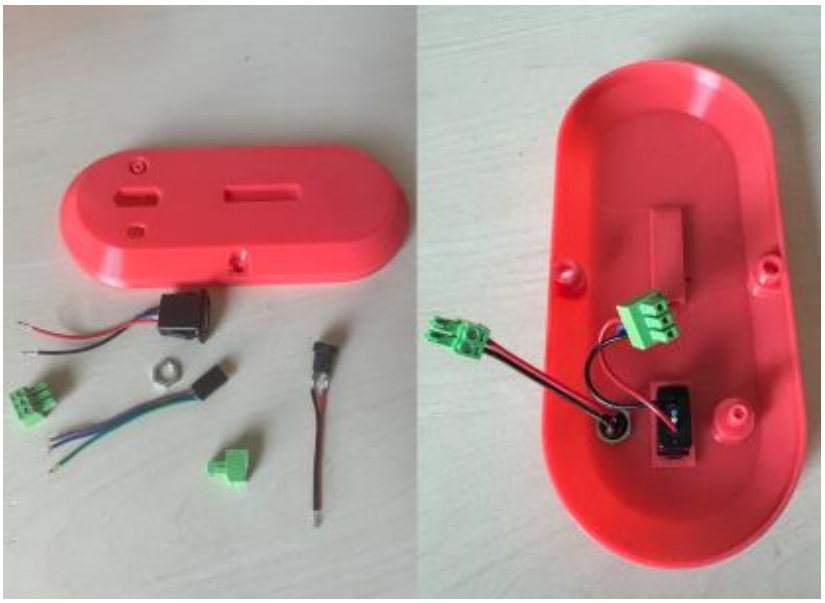
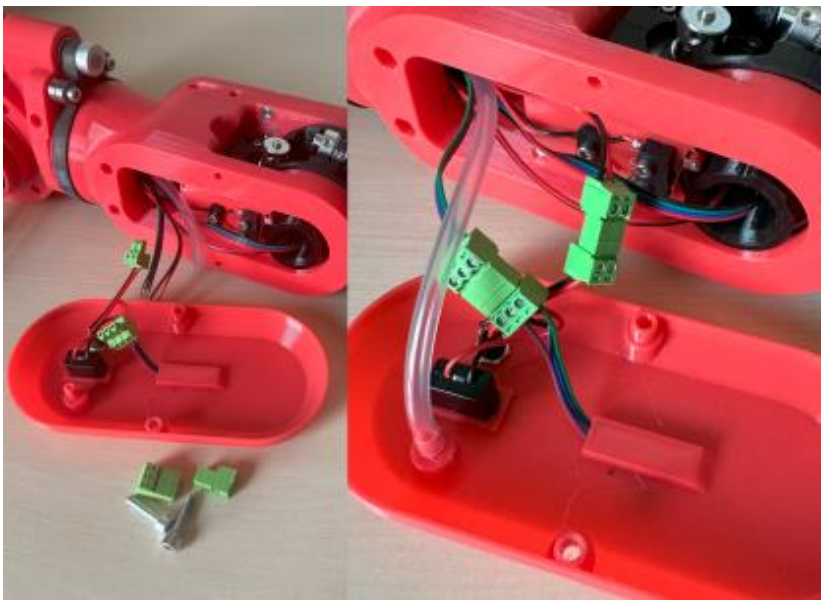
Items		Step 19
1x	ROBOT_007	
1x	BEARING_004	
8x	BEARING_001	
7x	ISO 4032 M5	
2x	DIN 913 M5 x 35	
1x	DIN 912 M5 x 60	

Items		Step 20
		

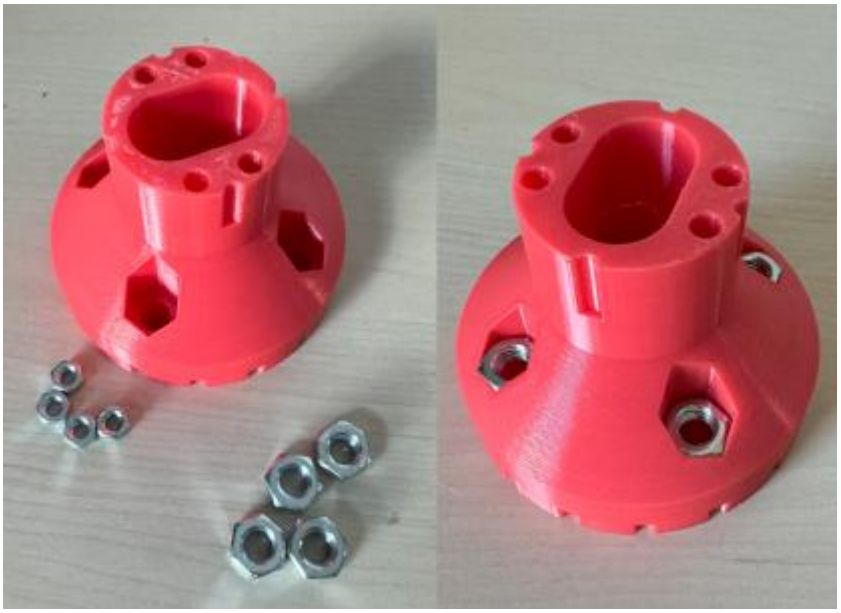
Items		Step 21
1x	ROBOT_035	
1x	BEARING_09	
4x	BEARING_01	
1x	DIN 912 M5 x 35	
2x	DIN 912 M5 x 20	
3x	DIN 125 M5	

Items		Step 22
1x	ROBOT_012	
2x	DIN 912 M5 x 20	

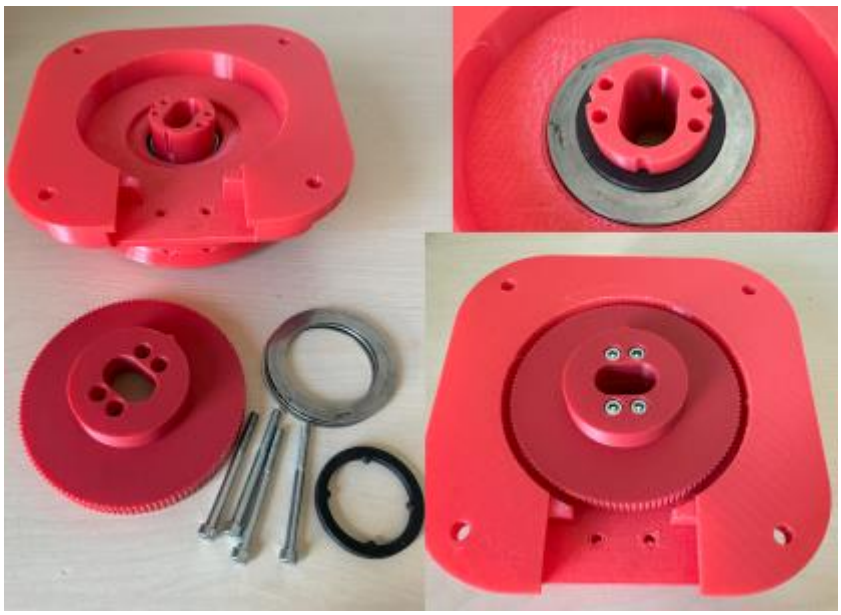
Items		Step 23
		Move the cable through the assembly, if you are also using the IO box you have to put another 2-wire cable and an air-tube
		
Items		**Step 24**
1x	LIM_SWITCH_04	
2x	ISO 4032 M3	
2x	DIN 912 M3 x 16	
1x	DIN 912 M5 x 20	

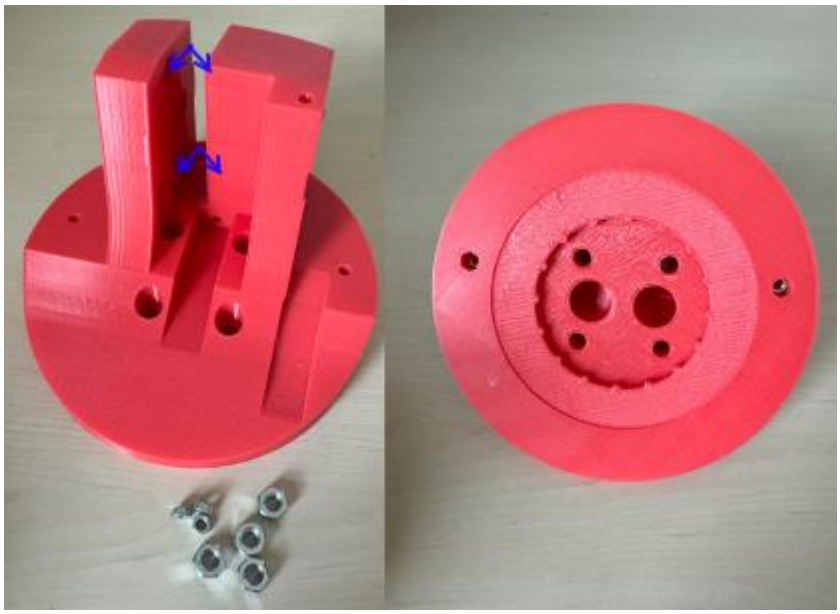
Items		Step 25
		
Items		**Step 26**
		

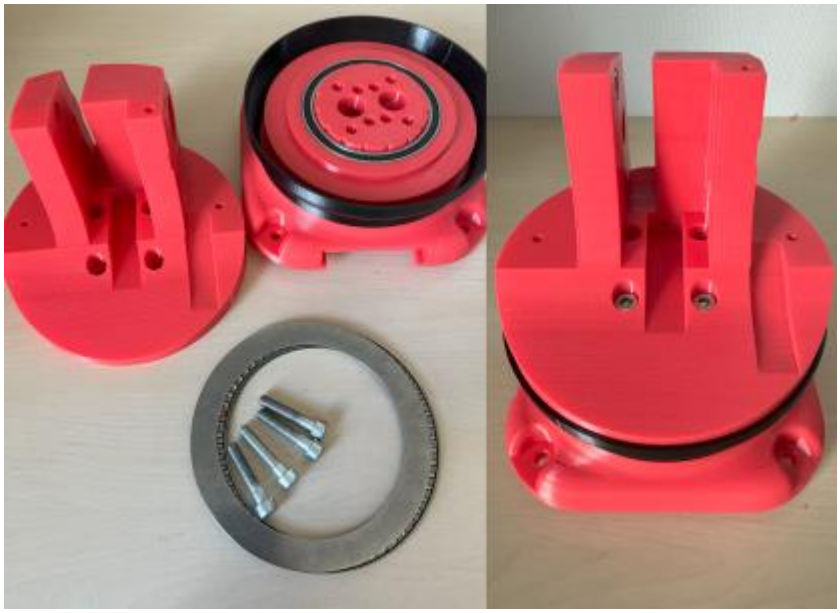
Items		Step 27
1x	ROBOT_025	Press the 2 bearings in place and insert the 2 nuts
1x	BEARING_04	
1x	BEARING_06	
2x	ISO 4032 M5	

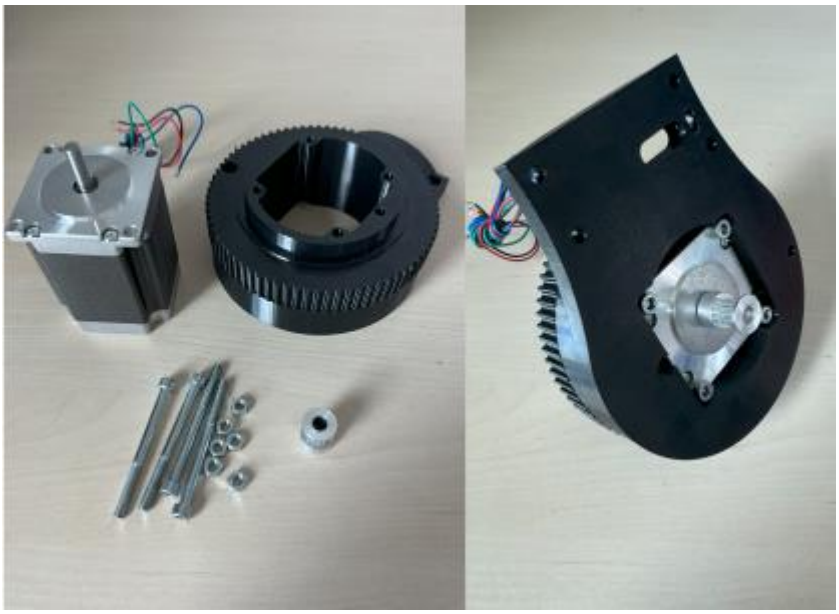
Items		Step 28
1x	ROBOT_023	Insert the nuts
4x	ISO 4032 M5	
4x	ISO 4032 M8	

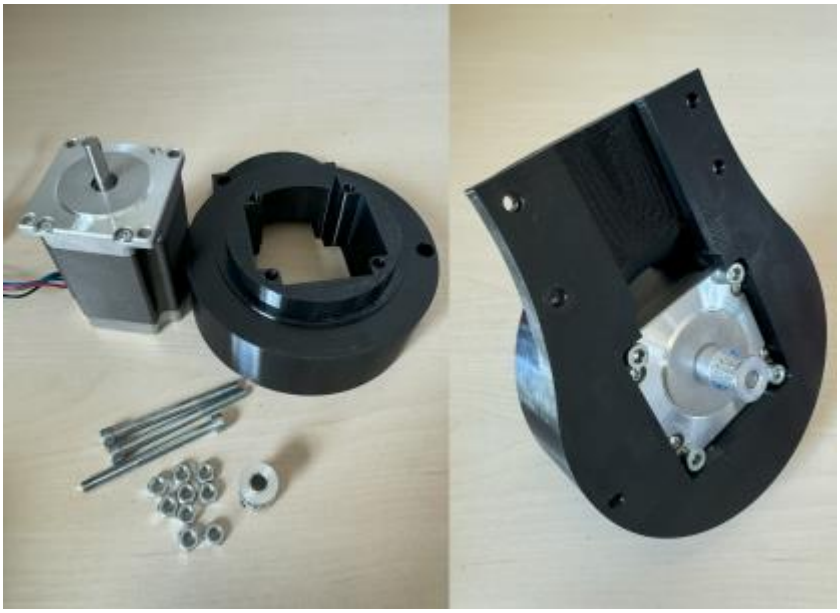
Items		Step 29
		

Items		Step 30
1x	ROBOT_046	Tighten the bolts completly
1x	ROBOT_026	
1x	BEARING_08	
4x	DIN 912 M5 x 60	

Items		Step 31
1x	ROBOT_025	
3x	ISO 4032 M5	
4x	ISO 4032 M8	

Items		Step 32
1x	ROBOT_024	When tightening the M8 bolts, make sure to not overtighten it.
1x	BEARING_10	
4x	DIN 912 M8 x 45	

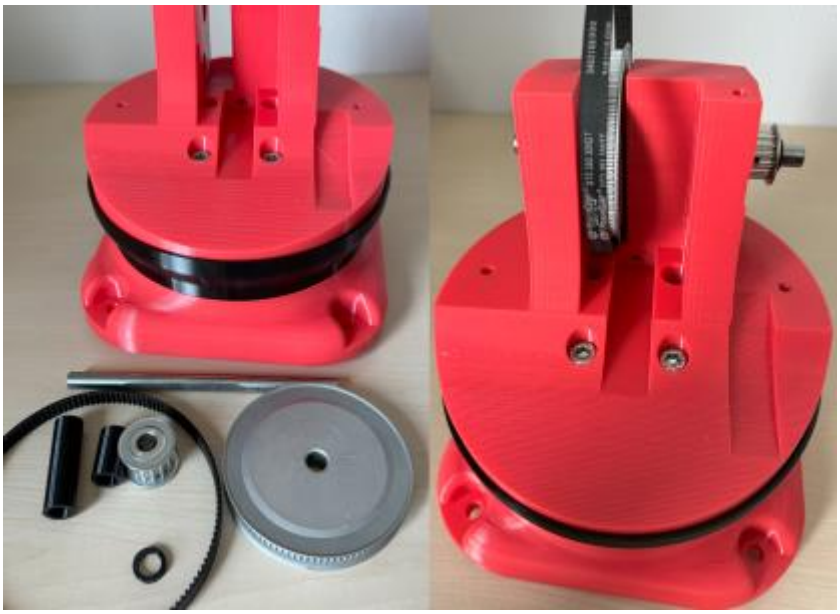
Items		Step 33
1x	ROBOT_017	Note the orientation of the pulley
1x	MOTOR_02	
1x	PULLEY_07	
4x	DIN 912 M5 x 60	
5x	ISO 4032 M5	

Items		Step 34
1x	ROBOT_016	Note the orientation of the pulley
1x	MOTOR_02	
1x	PULLEY_07	
4x	DIN 912 M5 x 60	
8x	ISO 4032 M5	

Items		Step 35
1x	ROBOT_031	Insert the bearings and the nuts
1x	BEARING_06	
1x	BEARING_02	
7x	ISO 4032 M5	
1x	ISO 4032 M3	

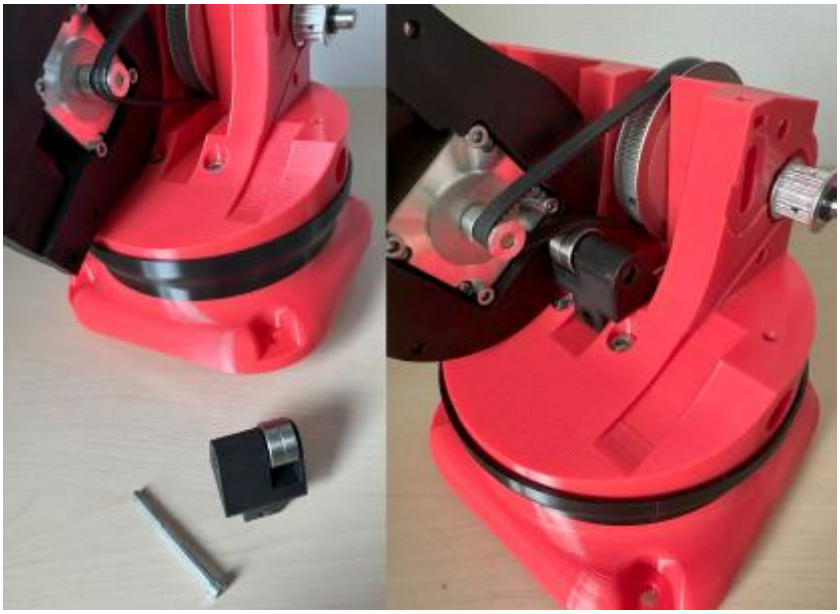
Items		Step 36
1x	ROBOT_028	Insert the bearings and the nuts
1x	BEARING_06	
1x	BEARING_02	
4x	ISO 4032 M5	

Items		Step 37
1x	ROBOT_039	
1x	ROBOT_038	
1x	ROBOT_037	
1x	PULLEY_04	
1x	PULLEY_06	
1x	BELT_05	
1x	AXIS_03	



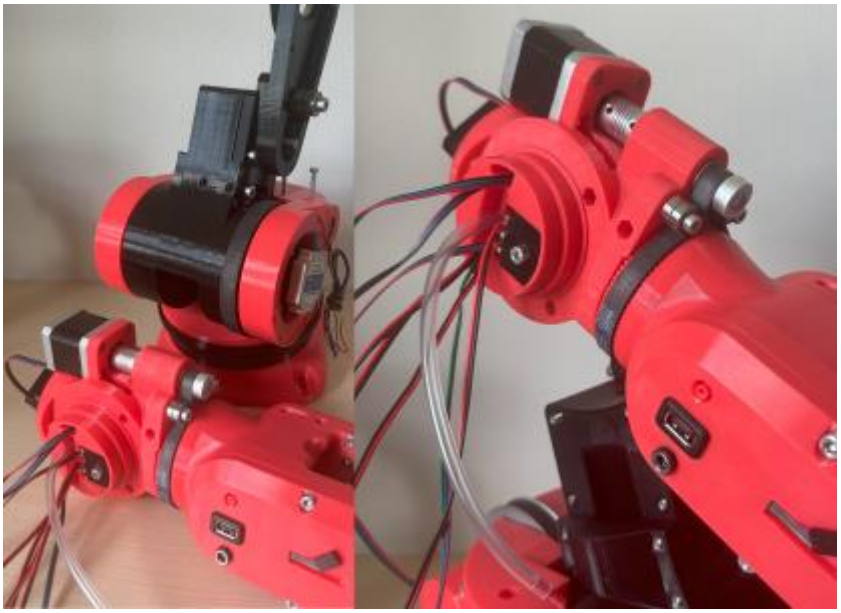
Items		Step 38
2x	DIN 912 M8 x 45	
1x	DIN 912 M5 x 60	

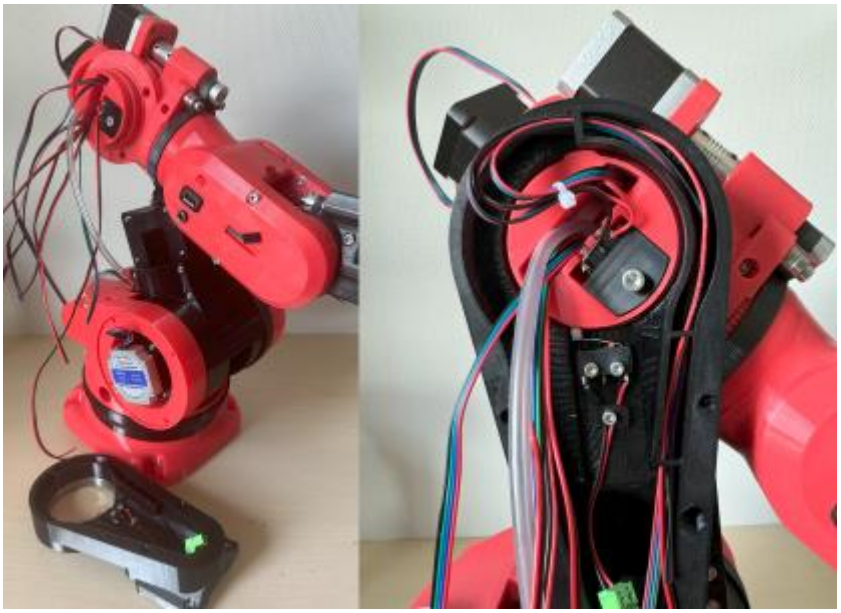
Items		Step 39
1x	ROBOT_044	
2x	BEARING_03	
1x	AXIS_06	
1x	ISO 4032 M5	

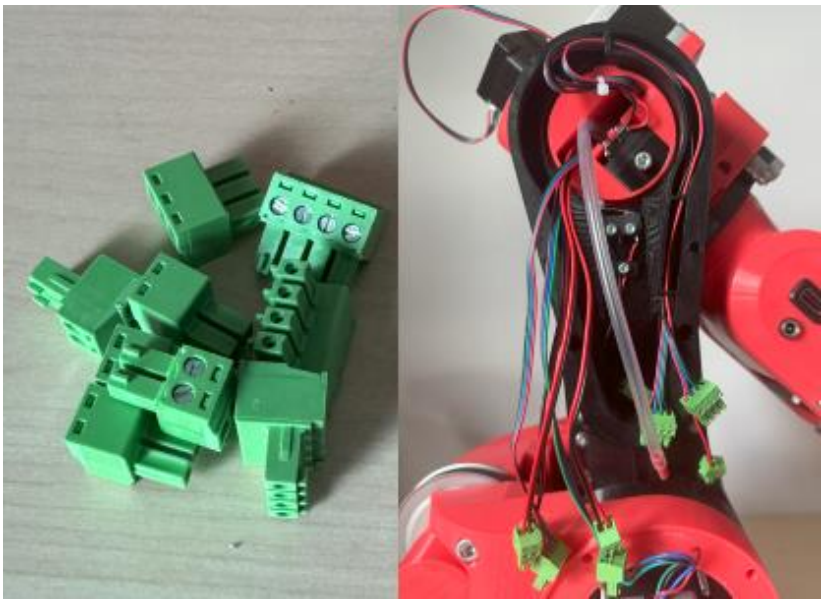
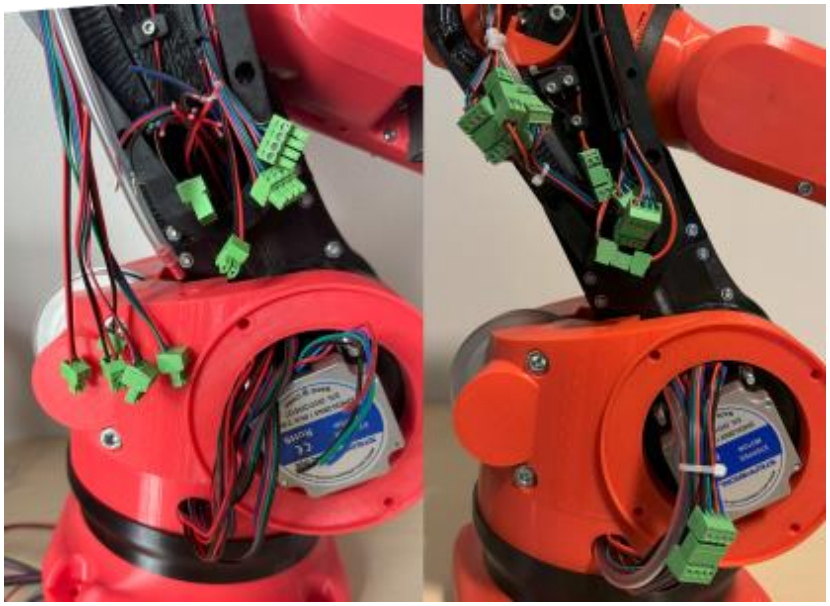
Items		Step 40
1x	DIN 912 M5 x 60	

Items		Step 41
1x	BELT_06	
2x	BEARING_03	
2x	DIN 912 M8 x 45	
1x	DIN 912 M5 x 60	
1x	ISO 4032 M8	
2x	DIN 125 M8	

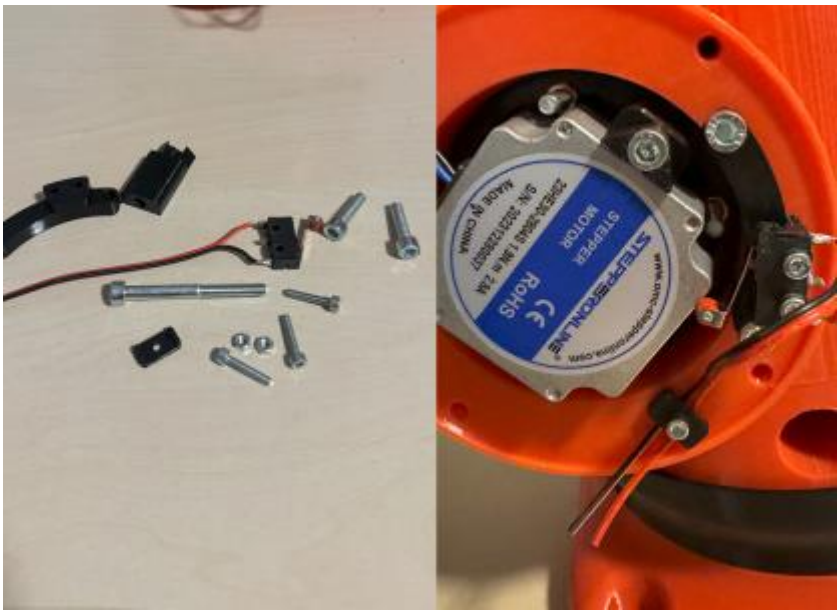
Items		Step 42
2	DIN 913 M5 x 35	The bolts used on the picture are not correct it should be DIN 913 M5 x 35 (set screw) 

Items		Step 43
		

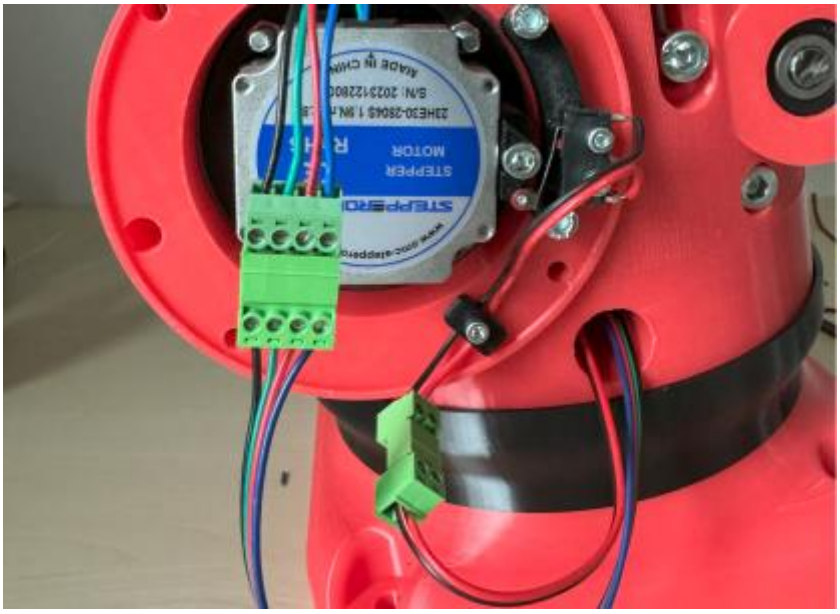
Items		Step 44
		

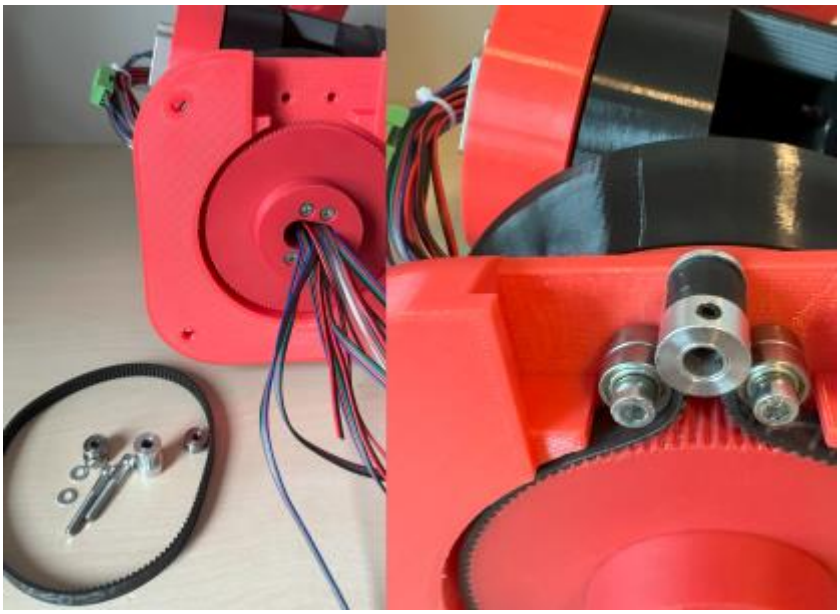
Items		Step 45
		
Items		**Step 46**
		

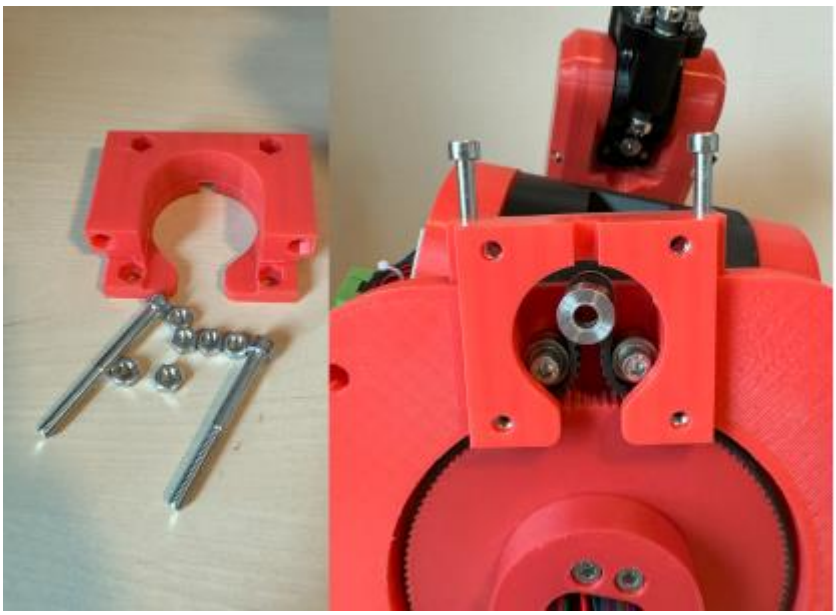
Items		Step 47
1x	ROBOT_030	
1x	ROBOT_041	
1x	ROBOT_042	
1x	LIM_SWITCH_02	
1x	DIN 912 M5 x 60	
2x	DIN 912 M5 x 20	
2x	DIN 912 M3 x 16	
2x	ISO 4032 M3	

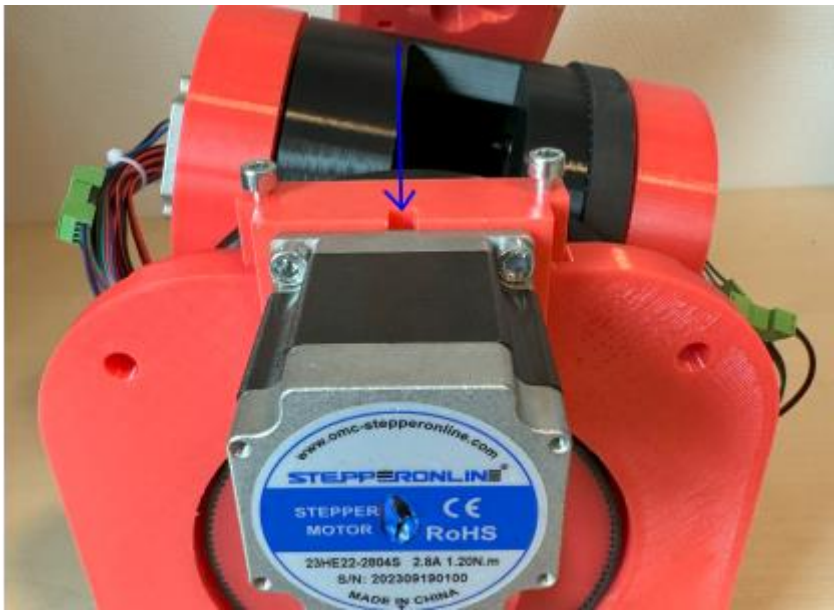


Items		Step 48

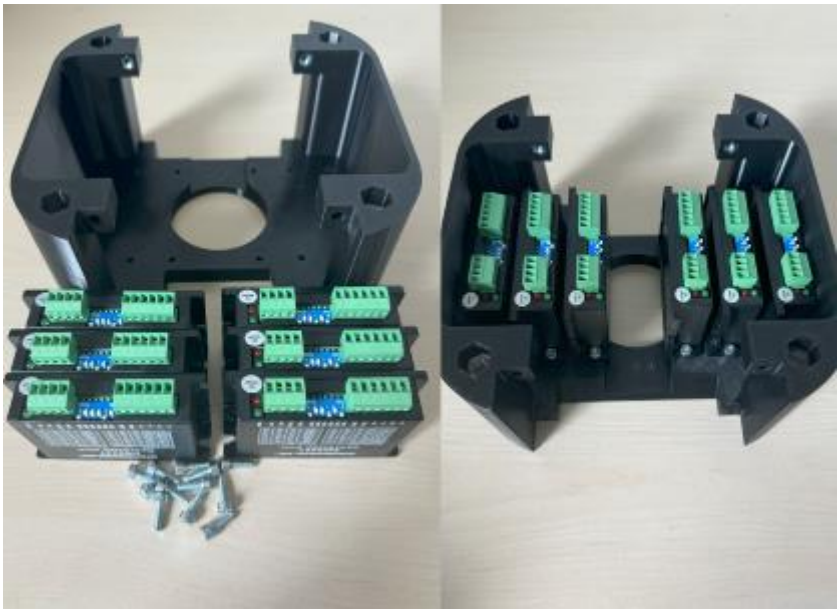


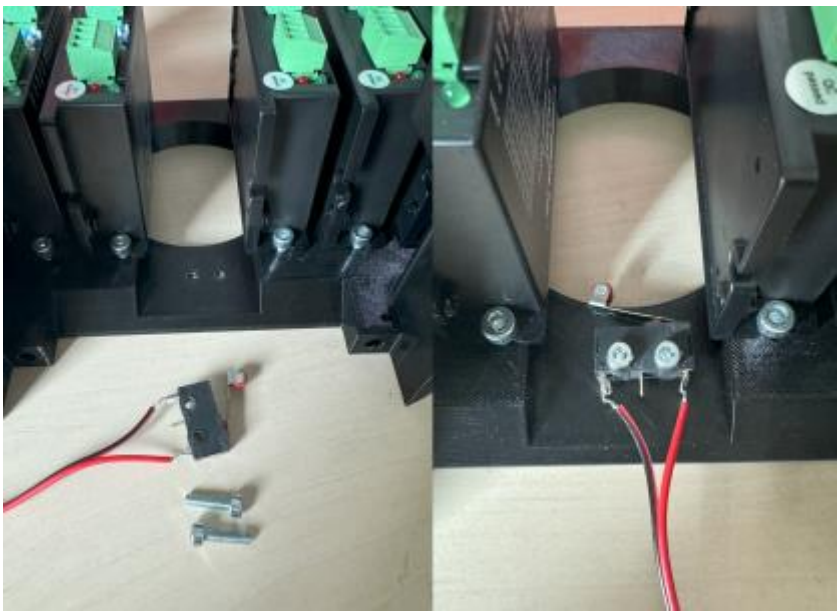
Items		Step 49
1x	BELT_09	
1x	PULLEY_07	
4x	BEARING_01	
2x	DIN 912 M5 x 35	
2x	DIN 125 M5	

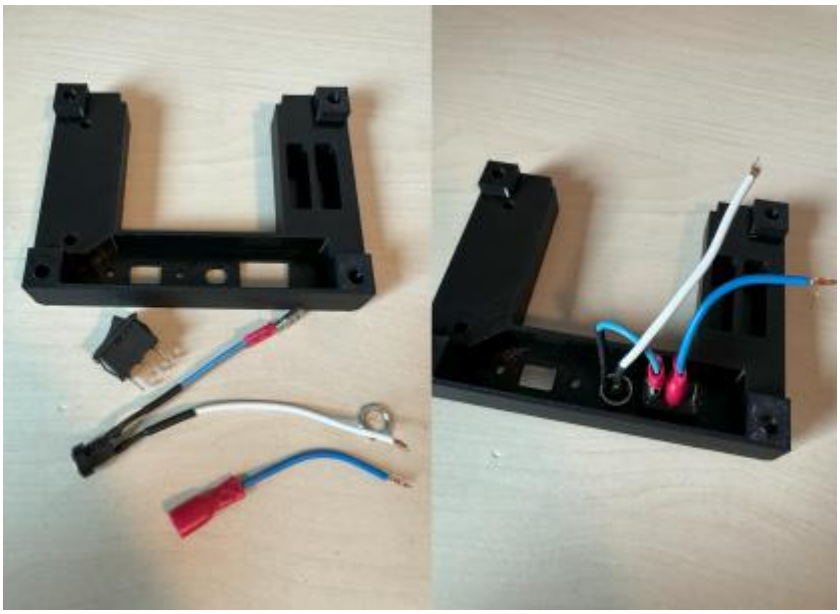
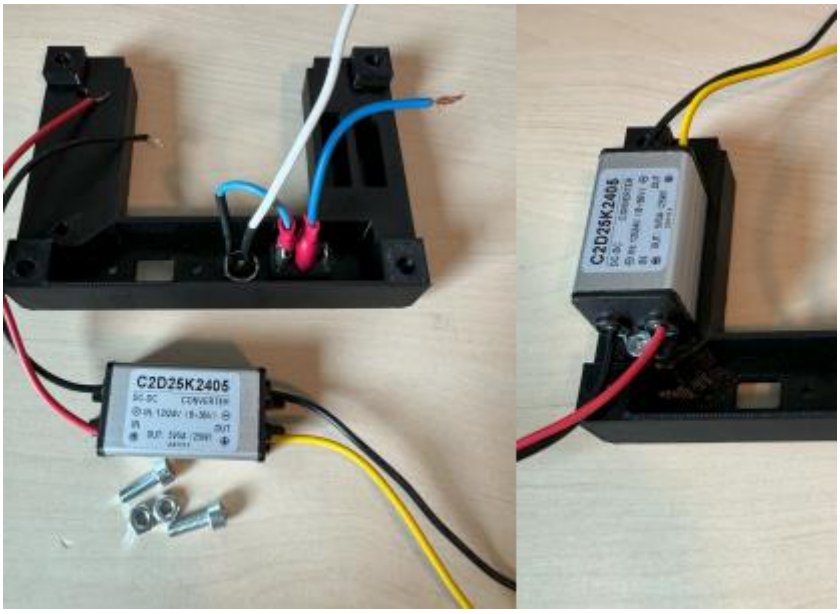
Items		Step 50
1x	ROBOT_040	
2x	DIN 912 M5 x 60	
6x	ISO 4032 M5	

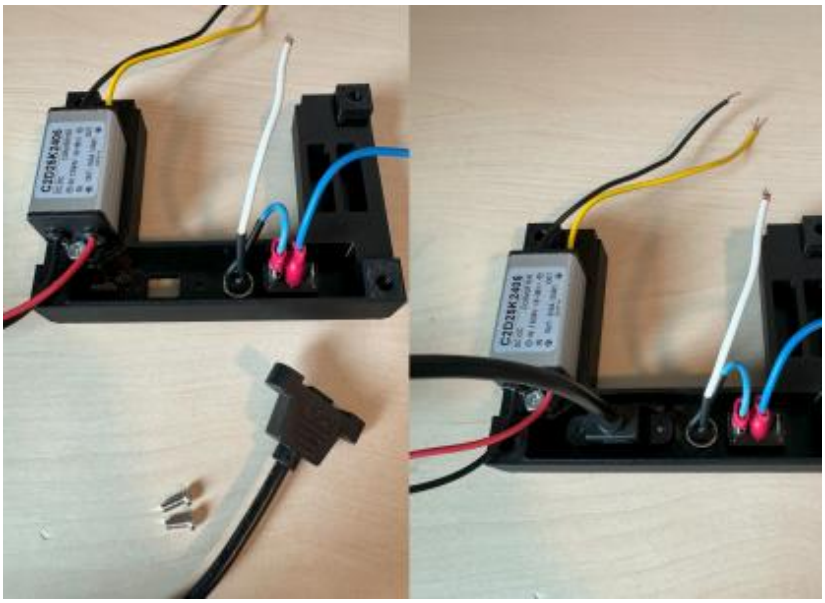
Items		Step 51
1x	MOTOR_03	Tighten the pulley
4x	DIN 912 M5 x 20	
		

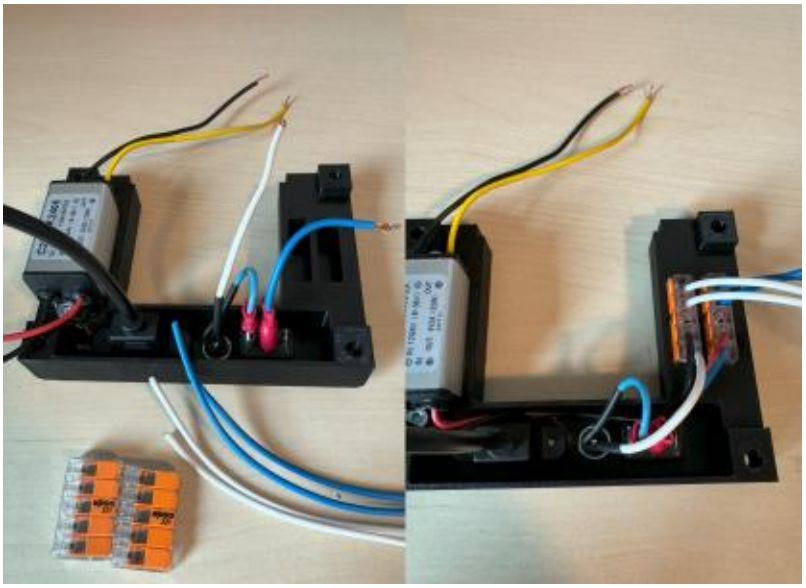
Items		Step 52
1x	ROBOT_027	Insert the nuts
4x	DIN 6334 M8	
8x	ISO 4032 M5	
12x	ISO 4032 M4	
2x	ISO 4032 M3	

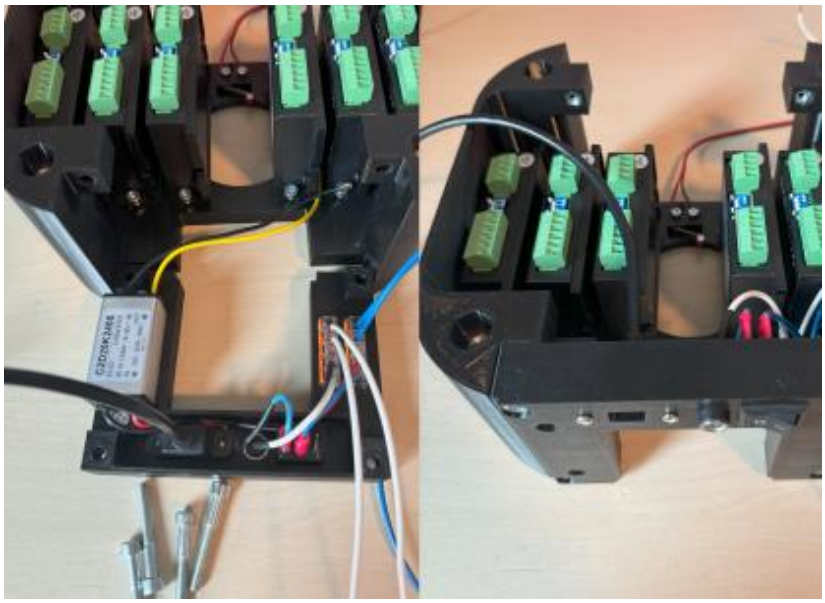
Items		Step 53
3x	DRIVER_01	Place the DRIVER_01 on the left side and DRIVER_02 on the right sidek
3x	DRIVER_02	
12x	DIN 912 M4 x 16	
		

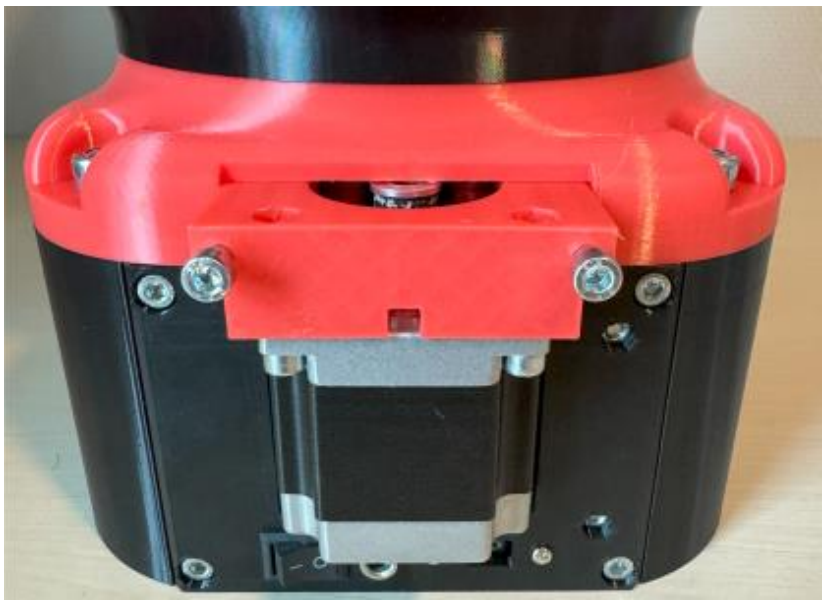
Items		Step 54
1x	LIM_SWITCH_01	
2x	DIN 912 M3 x 16	
		

Items		Step 55
1x	ROBOT_029	
1x	ELECTRONICS_002	
1x	ELECTRONICS_003	
		
Items		**Step 56**
1x	ELECTRONICS_009	
2x	DIN 912 M4 x 16	
2x	ISO 4032 M4	
		

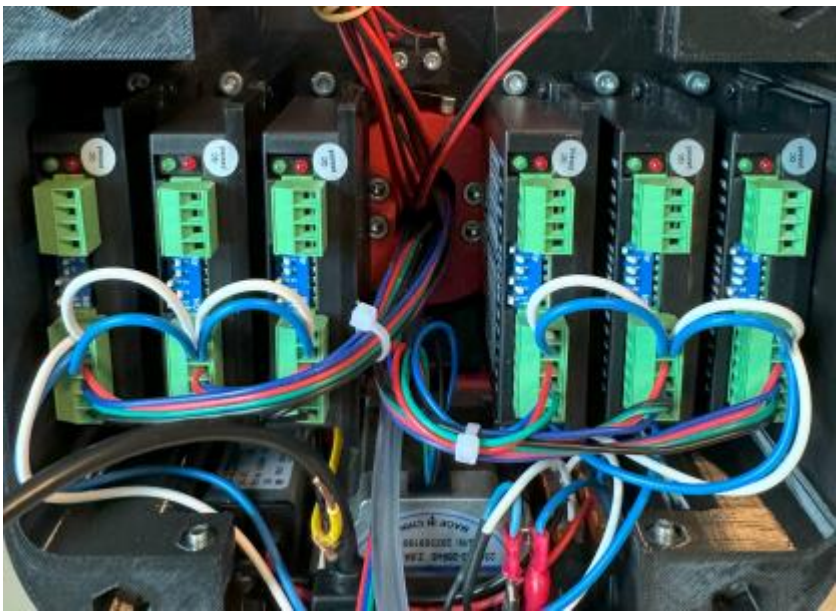
Items		Step 57
1x	ELECTRONICS_008	
		

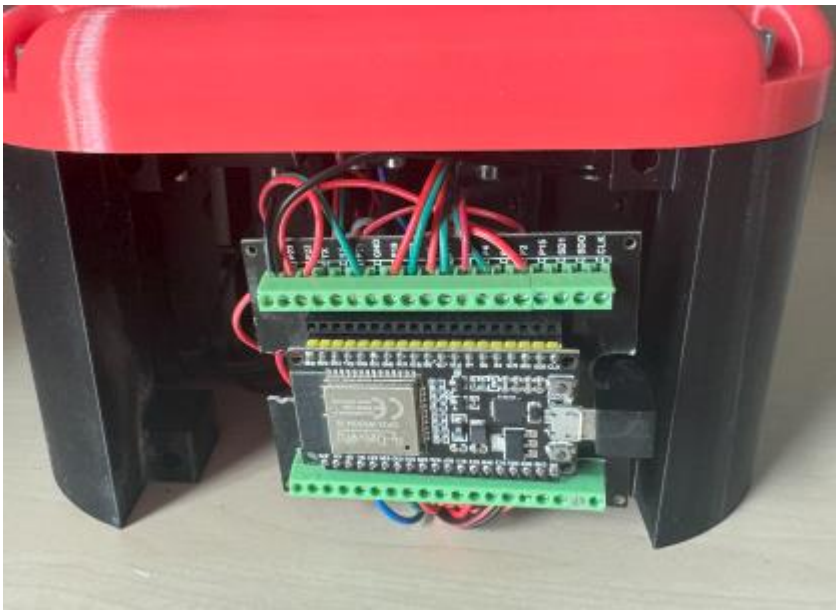
Items		Step 58
2x	ELECTRONICS_020	
		

Items		Step 59
4x	DIN 912 M5 x 35	
		

Items		Step 60
4x	DIN 912 M8 x 80	
		

Items		Step 61
		

Items		Step 62
		

Items		Step 63
1x	ELECTRONICS_003	
1x	ELECTRONICS_004	
		

Items		Step 64
1x	ROBOT_032	
1x	ROBOT_048	
2x	DIN 912 M3 x 16	
2x	ISO 4032 M3	
		

Items		Step 65
4x	DIN 912 M5 x 35	
		

Items		Step 66
1x	ROBOT_049	
		

Items		Step 67
8x	DIN 912 M5 x 35	
1x	ROBOT_034	
1x	ROBOT_043	
		

Items		Step 68
1x	ROBOT_021	
2x	DIN 912 M5 x 20	
		

Items		Step 69
1x 2x	ROBOT_045 DIN 912 M5 x 35	
		

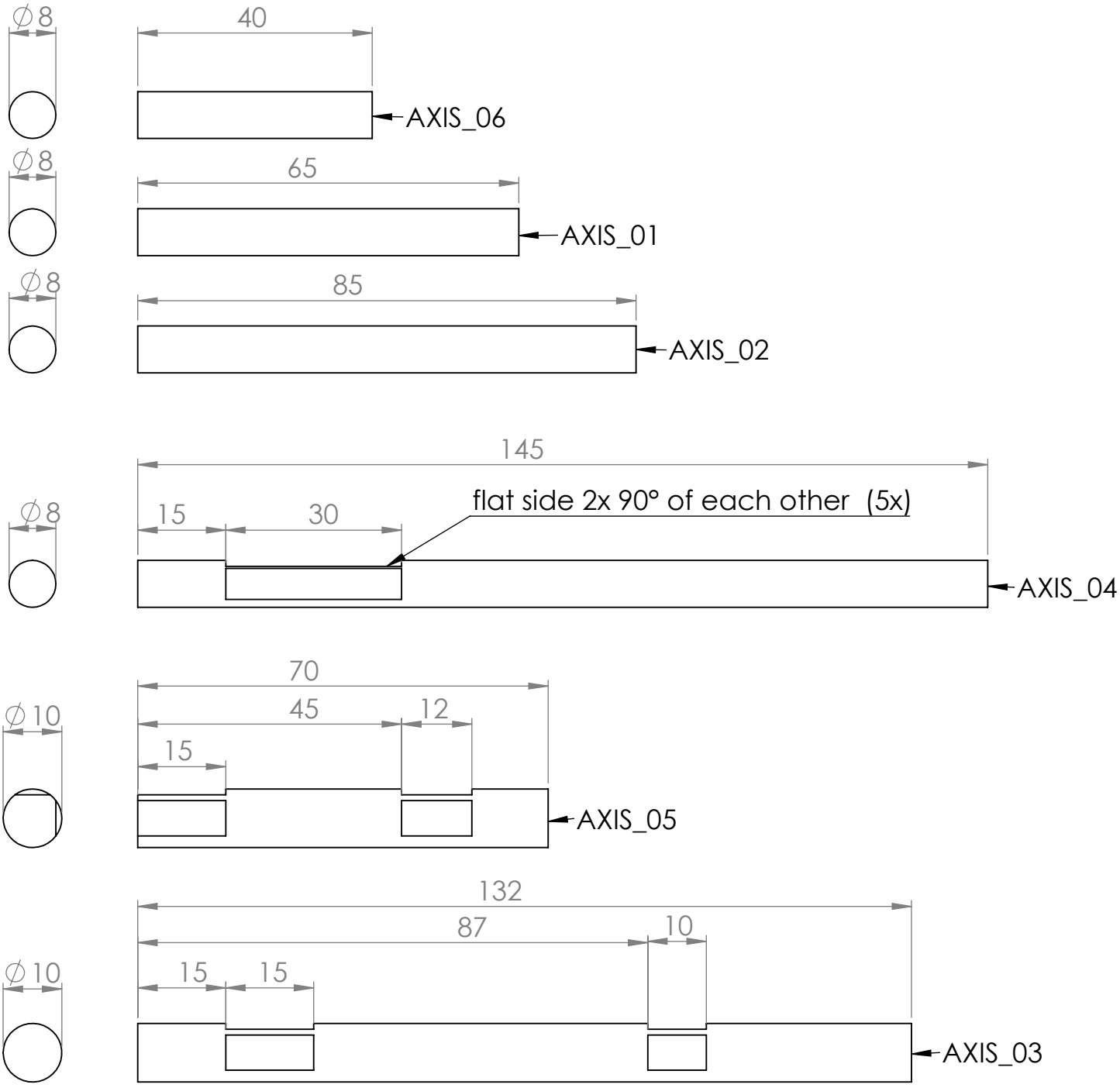
7: Firmware installation

Coming soon...

8: Appendix

In the appendix you can find the following documents.

- Axis
- Schematic of MiKo-1
- Schematic of Miko-1 with IO box
- Limit switch with cables

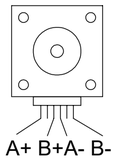


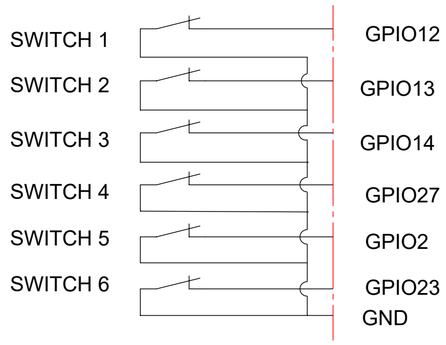
MiKoBots www.mikobots.com	TOLERANCE :	GENERAL TOLERANCE ACCORDING TO:	ISO 2768 T1: m ISO 2768 T2: m
	DISCRIPTION:		
	SCALE: 1:1	UNIT OF MEASURE : MM	Sheet 1 of 1
MASS (g) : 32.06 / GET. :	MATERIAL : / DATE :	FORMAT : A4	DRAWING NR. : Axis / REV: 000

0 MM 100 MM

GPIO	Comment	Robot
GPIO1		
GPIO2		SWITCH 6
GPIO3		
GPIO4		PUL 1
GPIO5		DIR 2
GPIO6		
GPIO7		
GPIO8		
GPIO9		
GPIO10		
GPIO11		
GPIO12		SWITCH 1
GPIO13		SWITCH 2
GPIO14		SWITCH 3
GPIO15		SERVO
GPIO16		DIR 1
GPIO17		PUL 2
GPIO18		PUL 3
GPIO19		DIR 3
GPIO20		
GPIO21		PUL 6
GPIO22		DIR 6
GPIO23		SWITCH 4
GPIO24		
GPIO25		PUL4
GPIO26		DIR 4
GPIO27		SWITCH 5
GPIO28		
GPIO29		
GPIO30		
GPIO31		
GPIO32		PUL 5
GPIO33		DIR 5
GPIO34		
GPIO35		
GPIO36		
GPIO37		
GPIO38		

Color code motors				
Motor	**A+**	**A-**	**B+**	**B-**
Nema 23 L56 - J1	Black	Green	Red	Blue
Nema 23 L76 - J2,3	Black	Green	Red	Blue
Nema 17 L45 - J4	Black	Blue	Green	Red
Nema 17 L45 - J4	Black	Blue	Green	Red





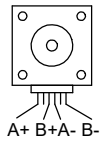
MiKoBots www.mikobots.com	TOLERANCE :	Algemene toleranties volgens ISO 2768-2	TOL. CLASS : m		
		Vormtoleranties volgens ISO 2768-1	TOL. CLASS : m		
	DISCRIPTION:	**Schematic MiKo-1**			
	SCALE: 1:2	UNIT OF MEASURE : MM	Sheet 1 of 1		
MASS (g) :	MATERIAL Material <not specified>	FORMAT : **A2**	DRAWING NR. : **Schematic**	REV: **000**	
GET. :	DATE :				

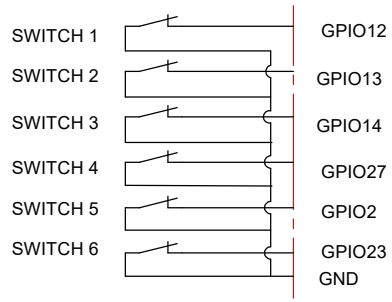
0 MM 100 MM

General Table		
GPIO	**Comment**	**Robot**
GPIO1		
GPIO2		SWITCH 6
GPIO3		
GPIO4		PUL 1
GPIO5		DIR 2
GPIO6		
GPIO7		
GPIO8		
GPIO9		
GPIO10		
GPIO11		
GPIO12		SWITCH 1
GPIO13		SWITCH 2
GPIO14		SWITCH 3
GPIO15		
GPIO16		DIR 1
GPIO17		PUL 2
GPIO18		PUL 3
GPIO19		DIR 3
GPIO20		
GPIO21		PUL 6
GPIO22		DIR 6
GPIO23		SWITCH 4
GPIO24		
GPIO25		PUL4
GPIO26		DIR 4
GPIO27		SWITCH 5
GPIO28		
GPIO29		
GPIO30		
GPIO31		
GPIO32		PUL 5
GPIO33		DIR 5
GPIO34		
GPIO35		
GPIO36		
GPIO37		
GPIO38		

Color code motors				
Motor	**A+**	**A-**	**B+**	**B-**
Nema 23 L56 - J1	Black	Green	Red	Blue
Nema 23 L76 - J2,3	Black	Green	Red	Blue
Nema 17 L45 - J4	Black	Blue	Green	Red
Nema 17 L45 - J4	Black	Blue	Green	Red

ESP 32



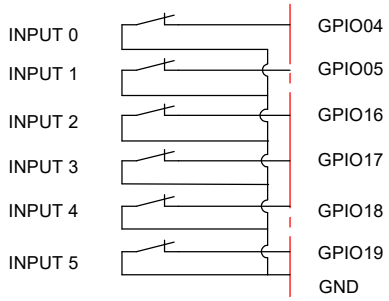


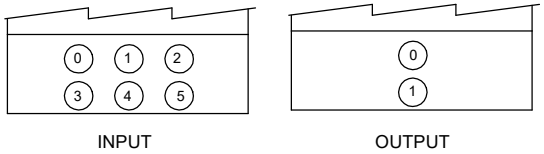
MiKoBots
www.mikobots.com

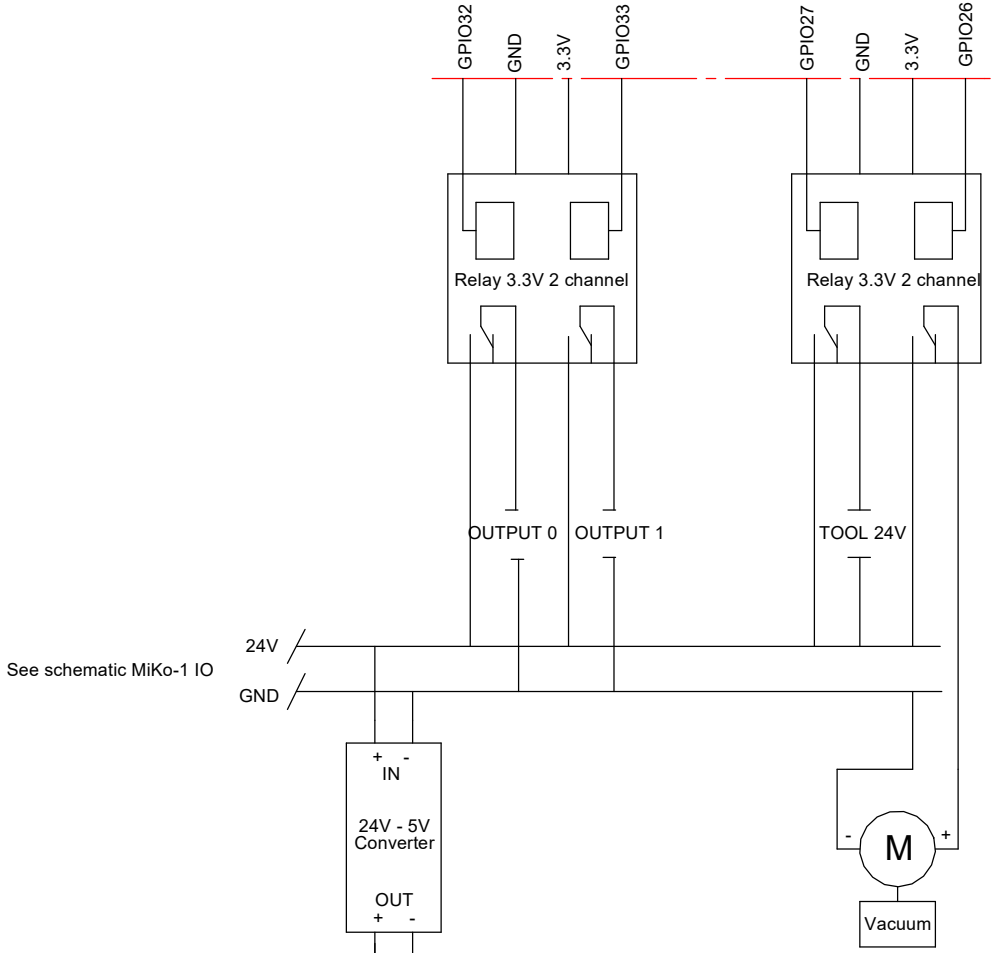
TOLERANCE :	Algemene toleranties volgens ISO 2768-2	TOL. CLASS : m	
	Vormtoleranties volgens ISO 2768-1	TOL. CLASS : m	
DISCRIPTION:	Schematic MiKo-1 with IO box		
SCALE: 1:2	UNIT OF MEASURE : MM	Sheet 1 of 2	
MASS (g) :	MATERIAL Material <not specified>	FORMAT : A2	DRAWING NR. : Schematic Miko-1 with IO
GET. :	DATE :		REV: 000

0 MM 100 MM

GPIO	Comment	Robot
GPIO1		
GPIO2		
GPIO3		
GPIO4		INPUT 0
GPIO5		INPUT 1
GPIO6		
GPIO7		
GPIO8		
GPIO9		
GPIO10		
GPIO11		
GPIO12		
GPIO13		
GPIO14		
GPIO15		
GPIO16		INPUT 2
GPIO17		INPUT 3
GPIO18		INPUT 4
GPIO19		INPUT 5
GPIO20		
GPIO21		
GPIO22		
GPIO23		
GPIO24		
GPIO25		SERVO
GPIO26		VACUUM
GPIO27		TOOL 24V
GPIO28		
GPIO29		
GPIO30		
GPIO31		
GPIO32		OUTPUT 0
GPIO33		OUTPUT 1
GPIO34		
GPIO35		
GPIO36		
GPIO37		
GPIO38		







MiKoBots www.mikobots.com	TOLERANCE :	Algemene toleranties volgens ISO 2768-2	TOL. CLASS : m
		Vormtoleranties volgens ISO 2768-1	TOL. CLASS : m
	DISCRIPTION:	Schematic MiKo-1 with IO box	
	SCALE: 1:2	UNIT OF MEASURE : MM	Sheet 2 of 2
MASS (g) :	MATERIAL Material <not specified>	FORMAT : A2	DRAWING NR. : Schematic Miko-1 with IO
GET. :	DATE :		REV: 000

0 MM 100 MM

6 x: ELECTRONICS_001 (Micro Limit Switch (Roller Lever))
2000 mm: CABLE_01 (red black cable, awg22 / 0.5 mm2)

Drill the holes to Ø3 mm

Switch 1

Wire length:
150 mm

Switch 2

Wire length:
150 mm

Switch 3

Wire length:
150 mm

Switch 4

Wire length:
150 mm

Switch 5

Wire length:
150 mm

Switch 6

Wire length:
150 mm

MiKoBots www.mikobots.com	TOLERANCE :	GENERAL TOLERANCE ACCORDING TO:		ISO 2768 T1: m ISO 2768 T2: m
	DISCRIPTION: **Micro Limit Switch (Roller Lever)**			
	SCALE: 1:1	UNIT OF MEASURE : MM		Sheet 1 of 1
MASS (g) : 1.31	MATERIAL : Material <not specified>		FORMAT : **A4**	DRAWING NR. : **ELECTRONICS_001** REV: **000**
GET. :	DATE :			

0 MM **100 MM**