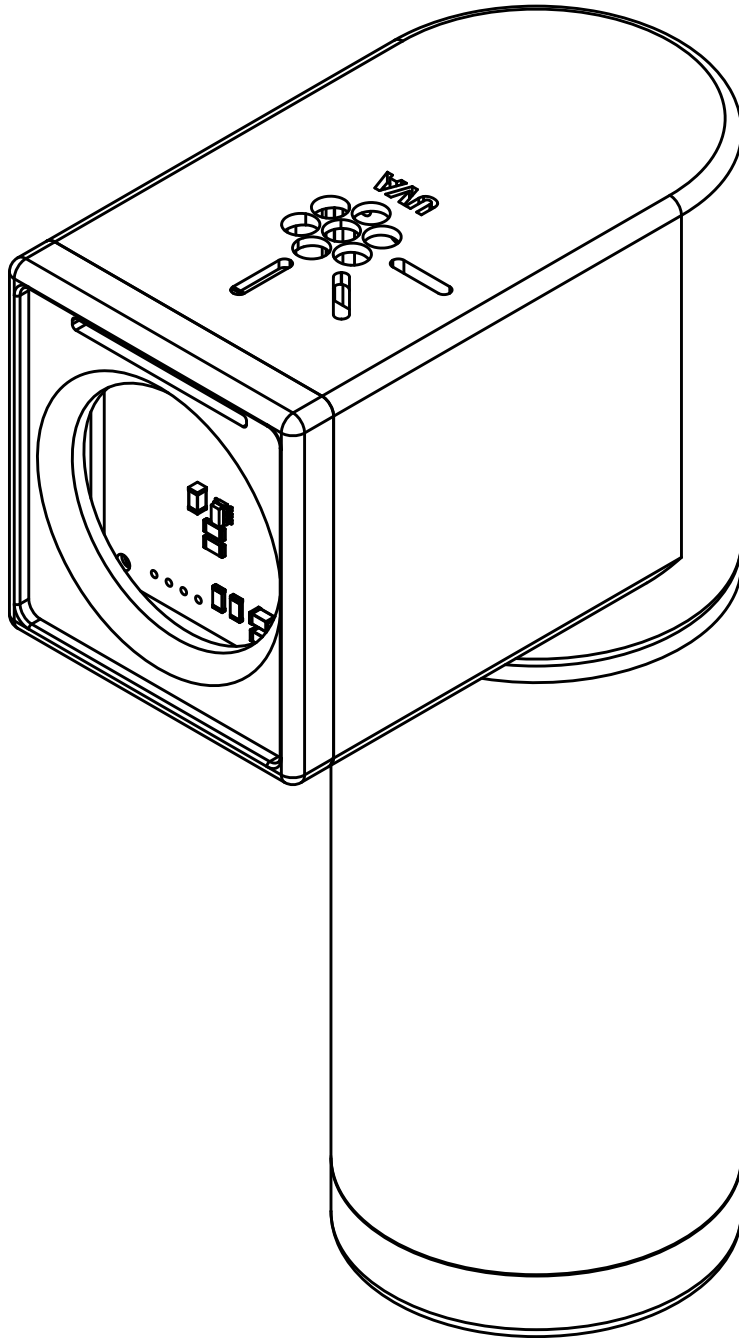**UVA**

Ultraviolet wand for adhesives curing
Multi-Tool kit
UVA - V1

FABRICATION AND ASSEMBLY

INDEX

**FOR FURTHER INFORMATION
YOU CAN ENTER TO THE
NEXT LINK**

https://hackaday.io/project/173560-uva

WARNINGS

You can find the detailed information about risks related to UVA on the link below.

https://hackaday.io/project/173560-uva/log/184556-risks-analysis

Sharp Elements

Flammable Materials
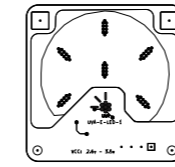
Battery charging

Hot Surface
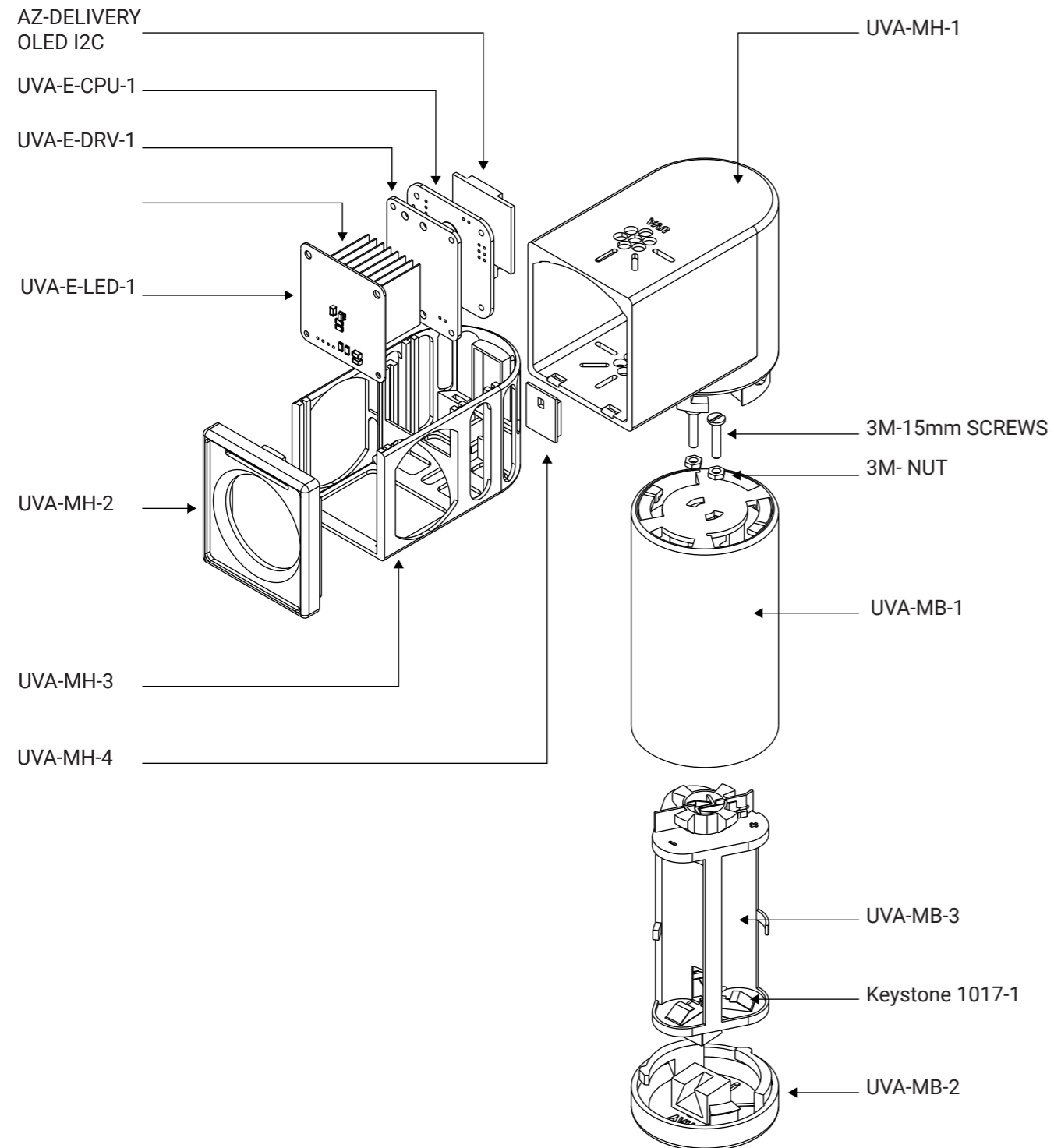
Arc Flash
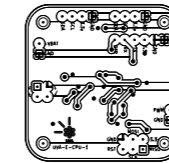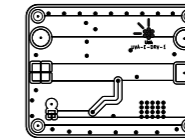
Optical Radiation

Poisoning
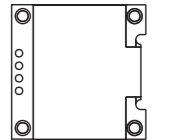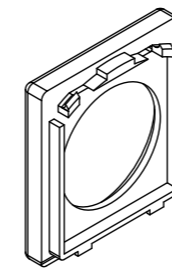
Corrosive Substance

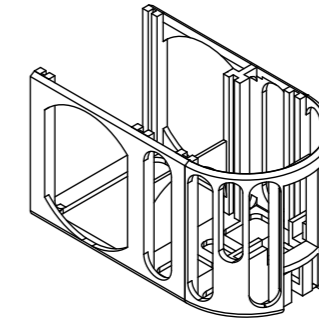Electricity

0. UVA OVERVIEW

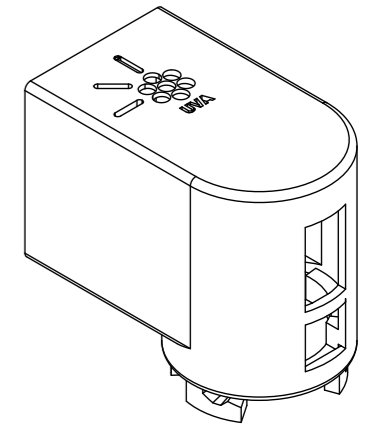UVA-E-LED-1(back)

UVA-E-CPU-1(back)

UVA-E-DRV-1(back)

AZ-DELIVERY
OLED I2C (front)
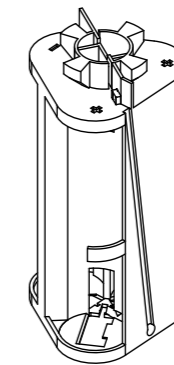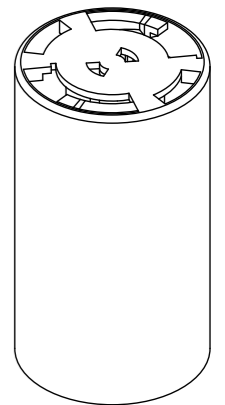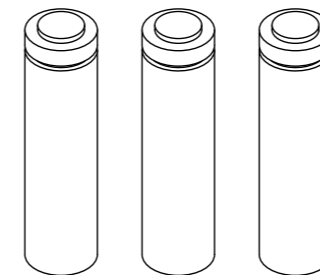
AZ-DELIVERY
OLED I2C

UVA-E-CPU-1

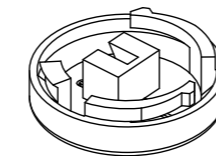UVA-E-DRV-1

UVA-E-LED-1

UVA-MH-1

UVA-MH-2

UVA-MH-3

UVA-MH-1

3M-15mm SCREWS
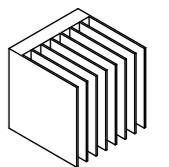
3M- NUT

UVA-MH-4

UVA-MB-1

UVA-MB-2

UVA-MB-3

UVA-MB-1

UVA-MH-3

UVA-MH-4

UVA-MB-3

SWITCH TL2230

HEATSINK
ATS-54250W-
C1-R0

Keystone 1017-1

UVA-MB-2

3X Keeppower 18650 3500mAh
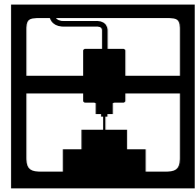
2X M3 - 15mm BOLTS
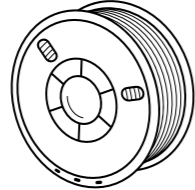WITH NUT
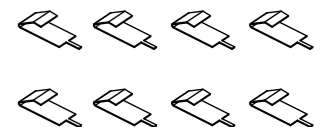
8X CONTACTS-
Keystone 1017-1

1. FABRICATION

1.1. 3D PRINTING

You will need for this task the follow materials and tools:

3D PRINTER

PLA FILAMENT

SNIP

ONE SHEET

SPATULA

You can find the .STL files and the recomended setup for printing (In Ultimaker Cura) on the next link.

https://www.thingiverse.com/thing:4613628/files
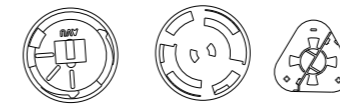
P1. LEVEL YOUR PRINTING BED

This is the most essential part of the process to achieve a good quality print. So, if it is necessary, repeat the process several times until you find a good result.

P2. PREHEAT THE PRINTER

We recommend preheating the printer before the printing process between 210 ºC and 213 ºC for PLA. If you have a heated bed (that is highly recommended) preheated at a temperature between 50 ºC and 60 ºC for PLA. Before printing and when the nozzle is already heated, we recommend extruding some filament to clean the nozzle.

P3. PRINT

In the link before you have two Cura projects with the recommended setup for printing UVA. We recommend printing the pieces separately or in a combo (the headpieces together and the battery pieces in another attempt). We worked with a Creality Ender 3, but the setup will change depending on the 3d printer that you are using, so we also recommend to make several tests to understand your machine before trying to print a finished object.

UVA-MB

70gr PLA

8h 15min
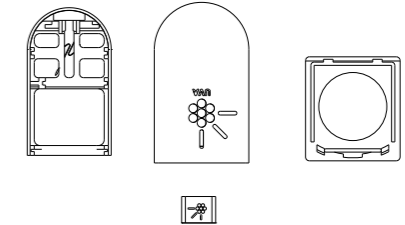
UVA-MH

78gr PLA

9h 54min

### P4. REMOVE THE PRINTS FROM THE PRINTER BED

Be careful with the printing bed and the prints, it is much better to have a flexible bed (even so this kind of beds are more difficult to level). You can use the spatula to help you separate the pieces from the plate.
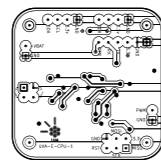
P5. REMOVE THE SUPPORTS

BE PATIENT, and careful because the snip that you should use to help you remove the supports is sharp. we also recommend using gloves for this part of the process.
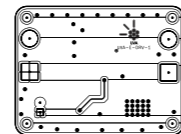
1.2. SMD REFLOW SOLDERING

You will need for this task the follow materials and tools:
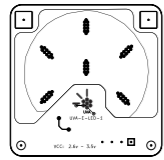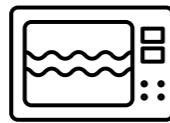

UVA-E-LED-1

UVA-E-CPU-1

UVA-E-DRV-1

SOLDER PASTE

REFLOW OVEN

ELECTRONIC COMPONETS

TWEEZERS

Follow the list of components and the PCBs diagrams in the next pages.

For further information about the SDM Reflow Soldering you can follow the tutorial in the next link

https://youtu.be/DYrucIWig24

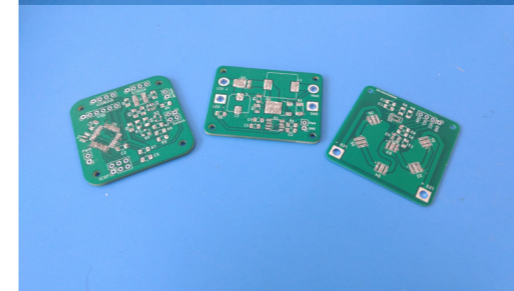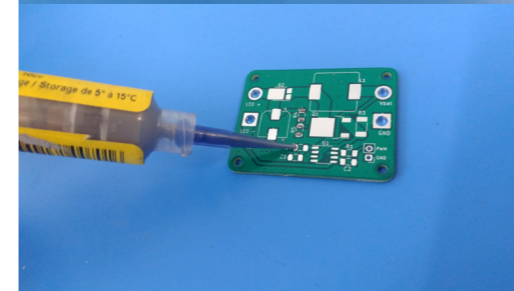# 1.2.1. WITH A REFLOW OVEN

P1. SET YOUR WORKSTATION

Prepare your tools, workspace, and PCB's for the process.
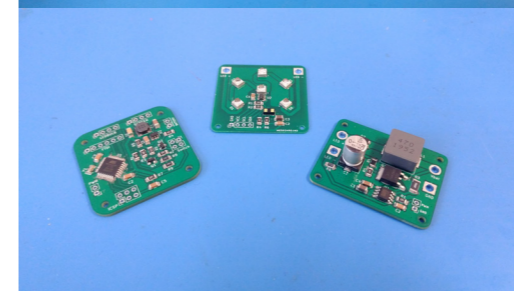
P2. APPLY THE SOLDER PASTE

Be careful to administer it precisely over the PCB solder pat.

P3. PLACE THE COMPONENTS

With the help of tweezers, place all the componentes on the solder pats following the circuit diagrams.
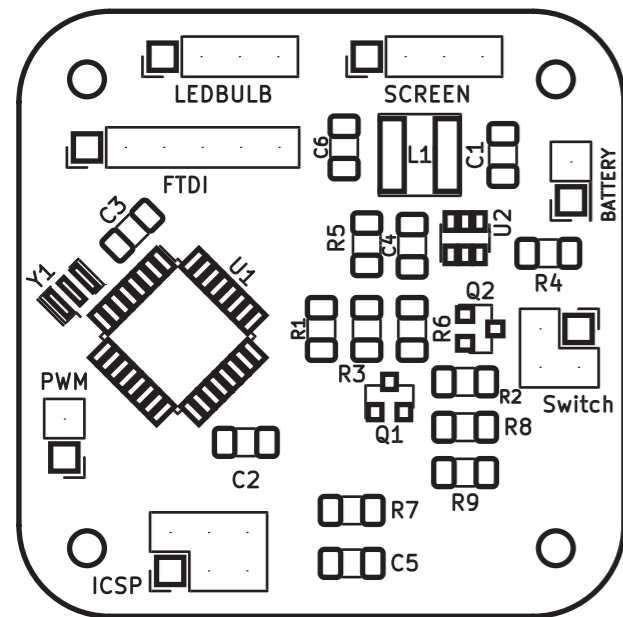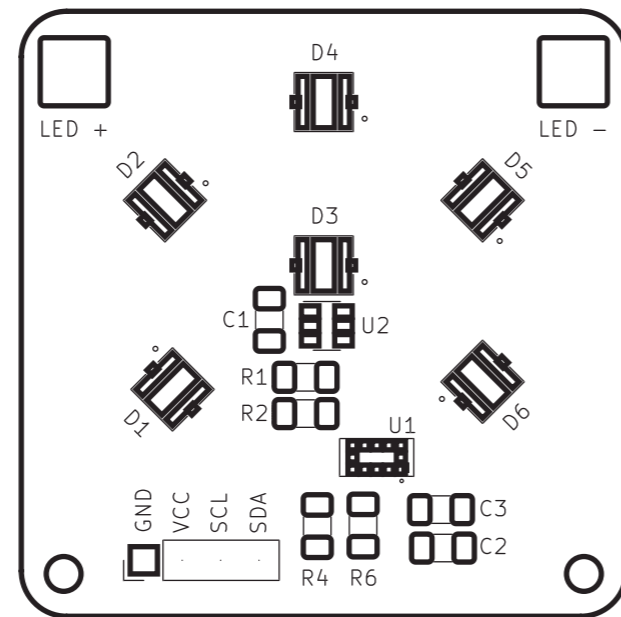
P4. COOKING TIME

Cook the PCB's following the instructions of the solder paste. (times and temperatures)
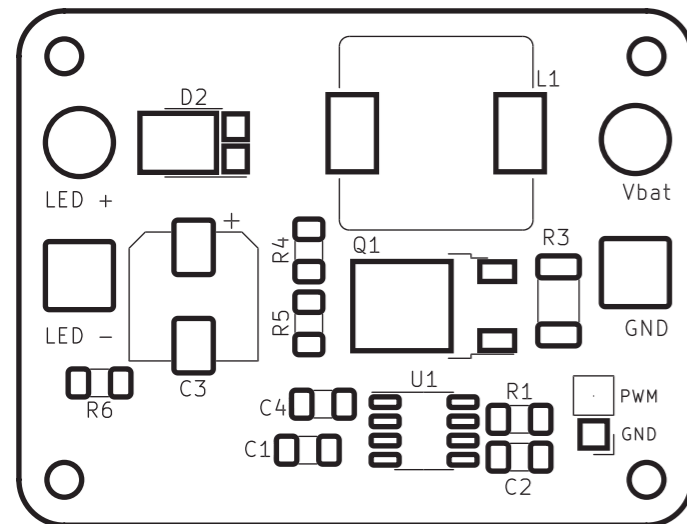
1.2.2. PCB'S DYAGRAMS

UVA-E-CPU-1(front)

UVA-E-LED-1 (front)

UVA-E-DRV-1 (front)

1.2.3. LIST OF COMPONENTS

UVA-E-CPU-1
https://saidalvarado.github.io/UVA_interactive_BOM/Arduino_CPU_Board_BOM.html

UVA-E-LED-1
https://saidalvarado.github.io/UVA_interactive_BOM/Inolux_led_bulb_BOM.html
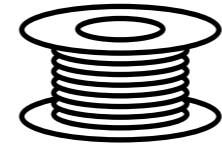
UVA-E-DRV-1
https://saidalvarado.github.io/UVA_interactive_BOM/AL8853_Led_driver_BOM.html
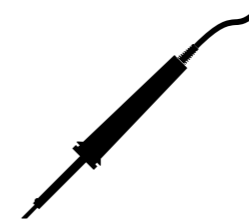
2. ASSEMBLY

2.1. CIRCUIT INTERCONECTION

UVA-MH
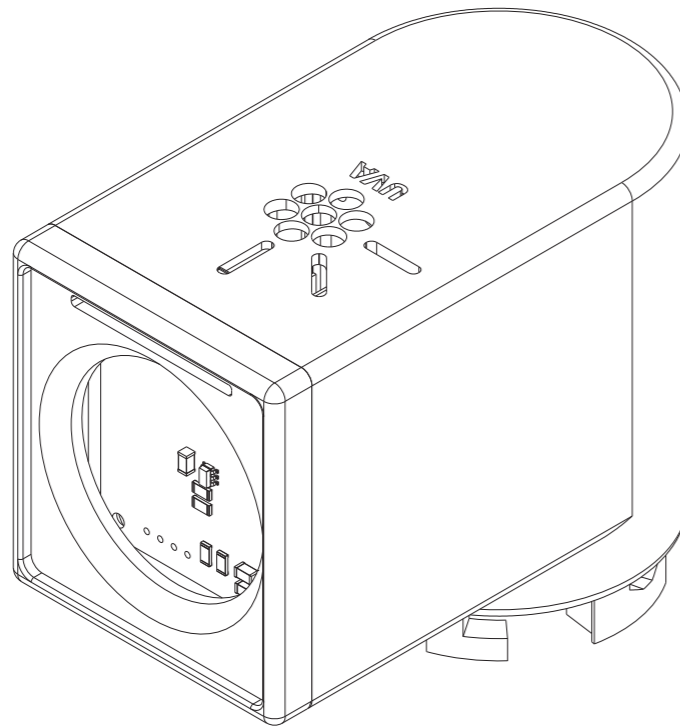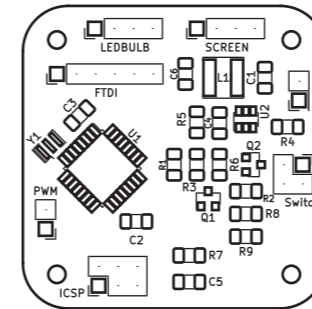
For this task you will need the follow materials and tools:

TIN

SOLDER

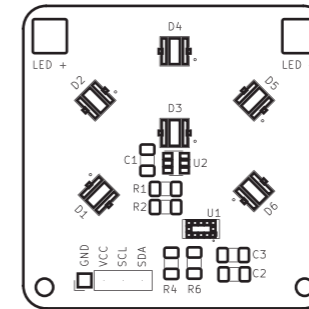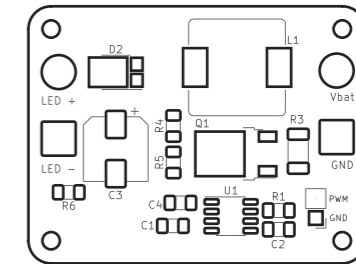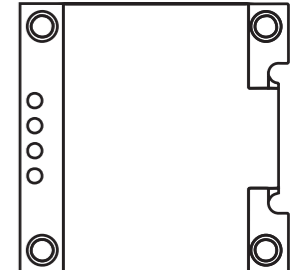WIRE TUOFENG 18 AWG Fil de Silicone (1M Aprox)
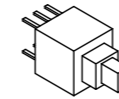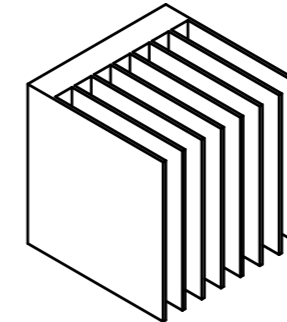
SNIP

UVA-E-CPU-1(front)

UVA-E-LED-1(front)
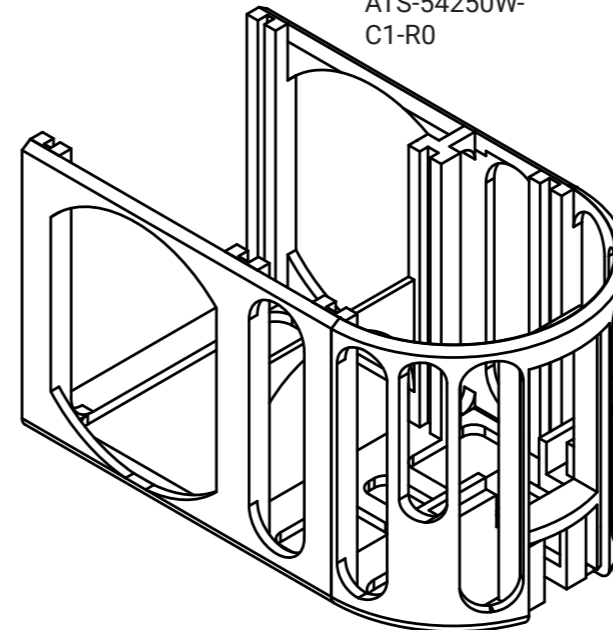
UVA-E-DRV-1(front)
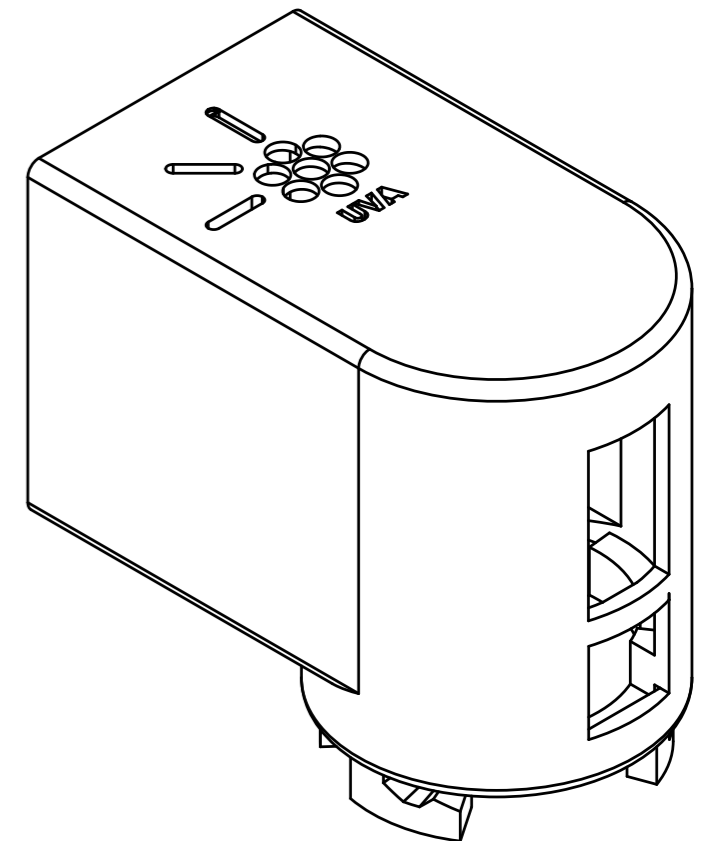
AZ-DELIVERY OLED I2C (Front)

SWITCH TL2230

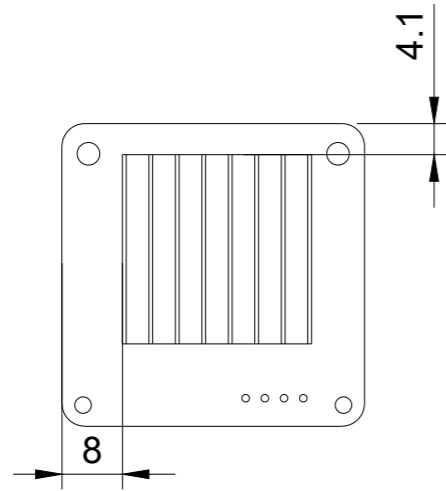HEATSINK ATS-54250W-C1-R0

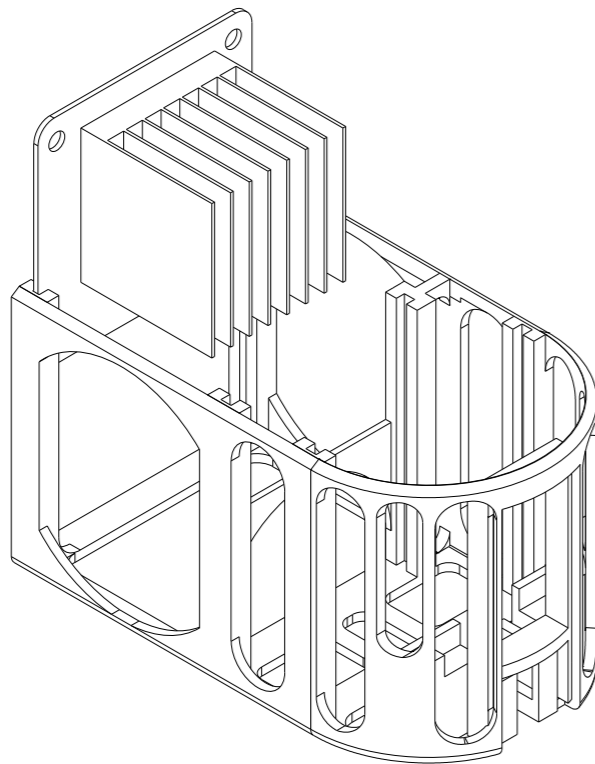2X M3 - 15mm BOLTS WITH NUT

UVA-MH-3
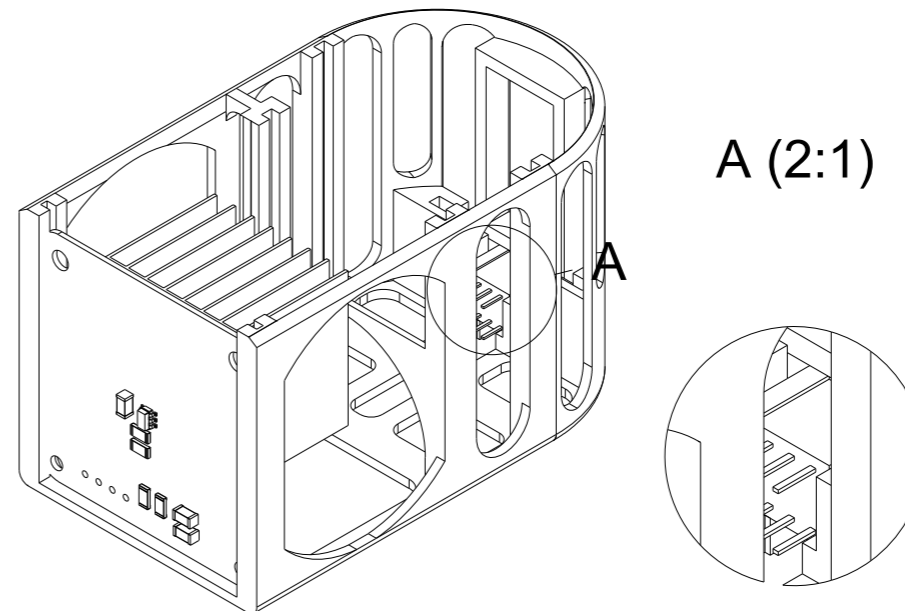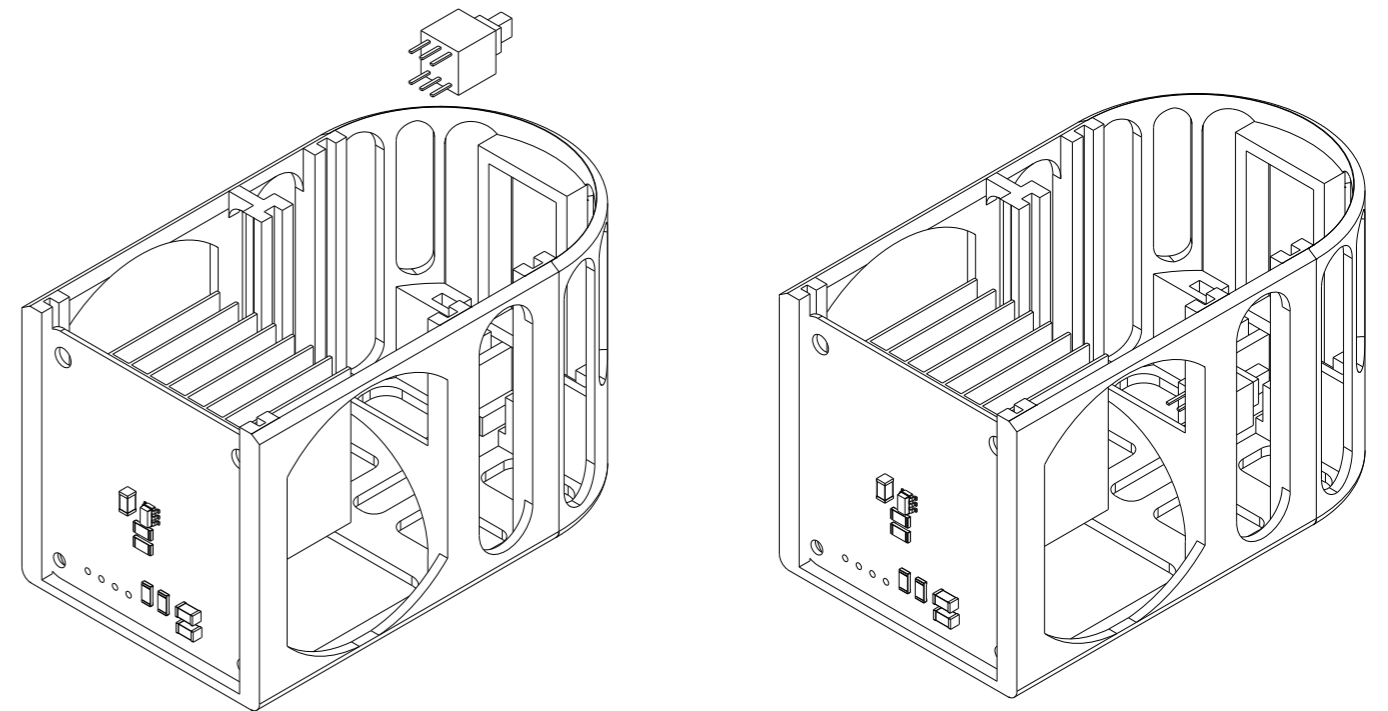
UVA-MH-1

P1. PLACE THE HEATSINK ON THE UVA-E-LED-1

With the doble tape that brings ATS Heatsink, Attache it to the back of the UVA-E-LED-1 PCB. It have to be centered horizontally (7.5 mm fom de sides) and and slightly high verticatly (14mm from the bottom). Follow the diagram.
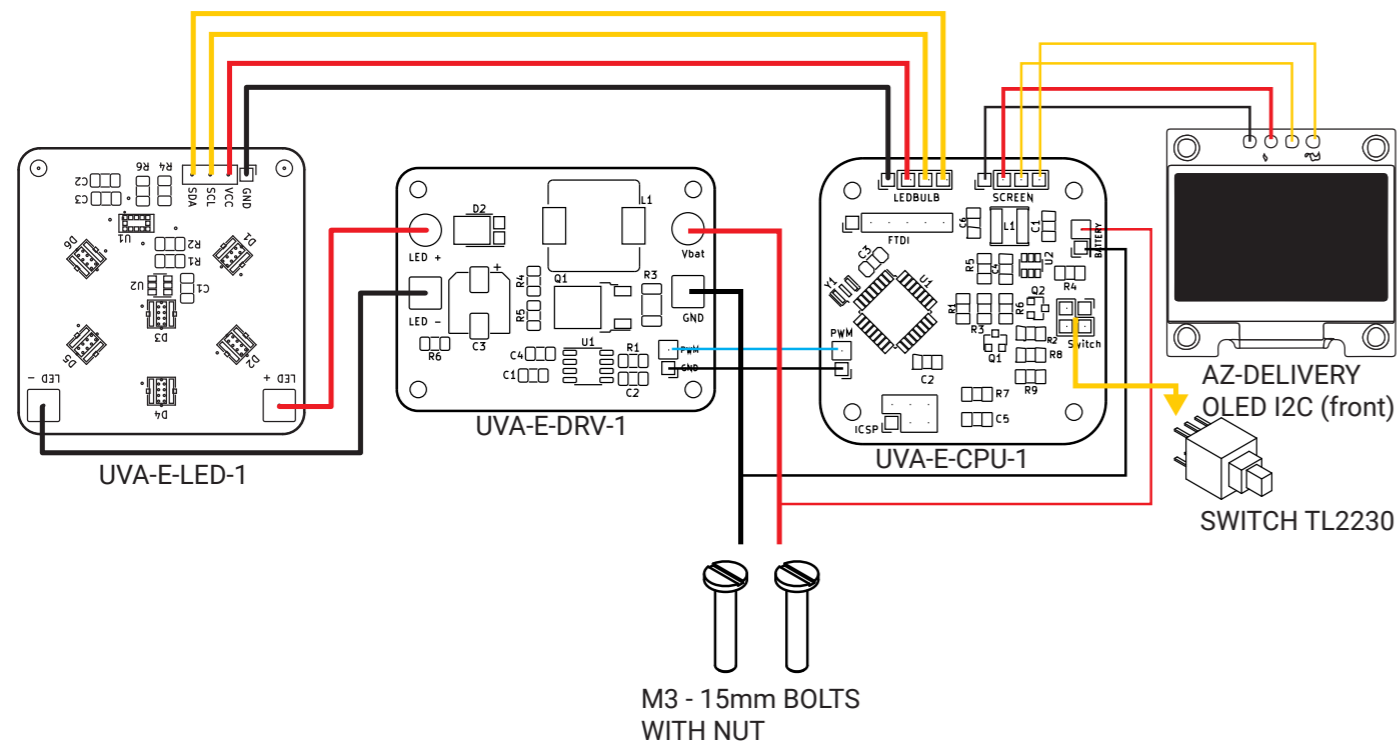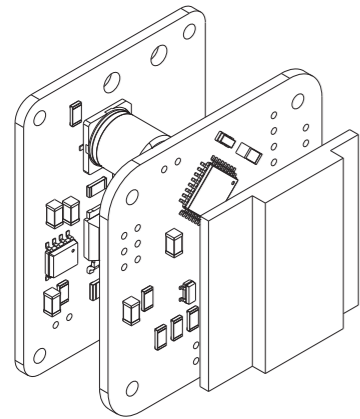
P3. INSERT SWITCH TL2230 INTO UVA-MH-3

P2. INSERT UVA-E-LED-1 INTO UVA-MH-3

A (2:1)

P4. INTERCONECT THE PCBs (UVA-E-DRV, UVA-E-CPU, Screen)

Follow the diagram below to interconect all the electronics. First wire UVA-E-DRV with UVA-E-CPU, then proceed with the OLED Screen and the Switch.

P5. INSERT PCBs INTO UVA-MH-3

Before incerting the PCBs interconected into UVA-MH-3, be sure that you already conected the switch to the UVA-E-CPU.
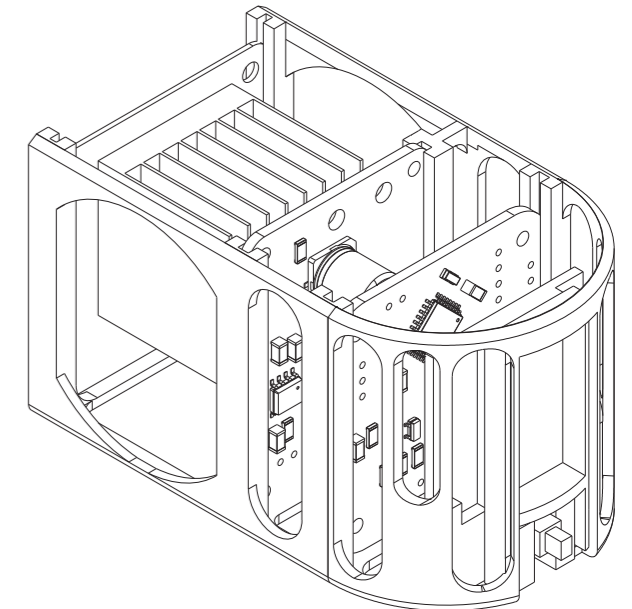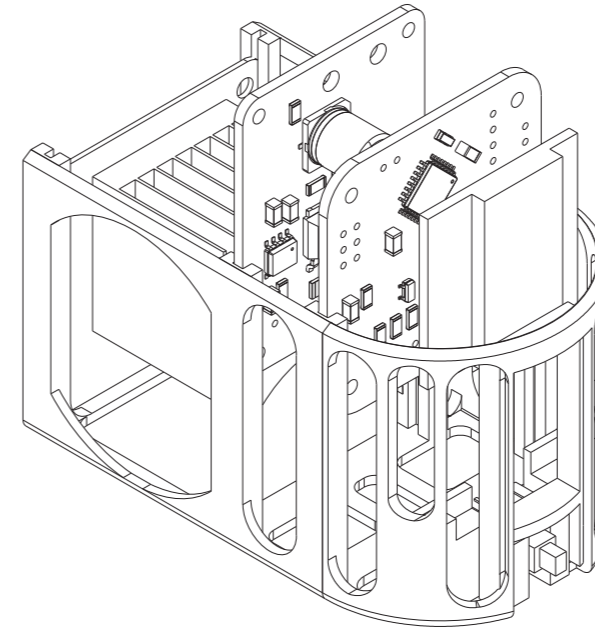
P6. CONECT UVA-E-LED + (UVA-E-DRV AND UVA-E-CPU)

Follow the previos diagram in P4

P7. UPLOAD THE SOFTWARE

After interconecting all the PCBs, conect to a power source and upload the software to the UVA-E-CPU.


UVA-E-LED-1

UVA-E-DRV-1

UVA-E-CPU-1

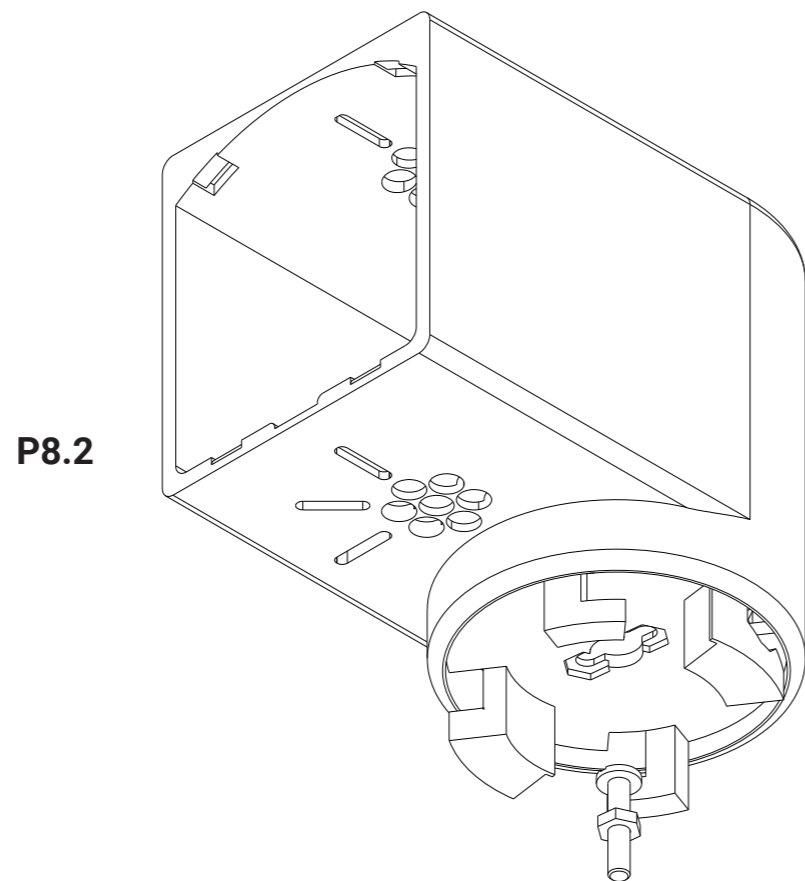AZ-DELIVERY
OLED I2C (front)

SWITCH TL2230

M3 - 15mm BOLTS
WITH NUT

Here you can find the software for UVA-1

https://hackaday.io/project/173560-uva/log/184557-software-repository
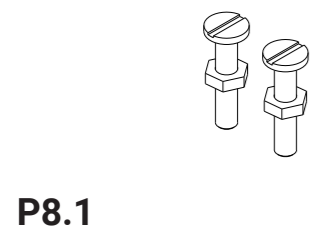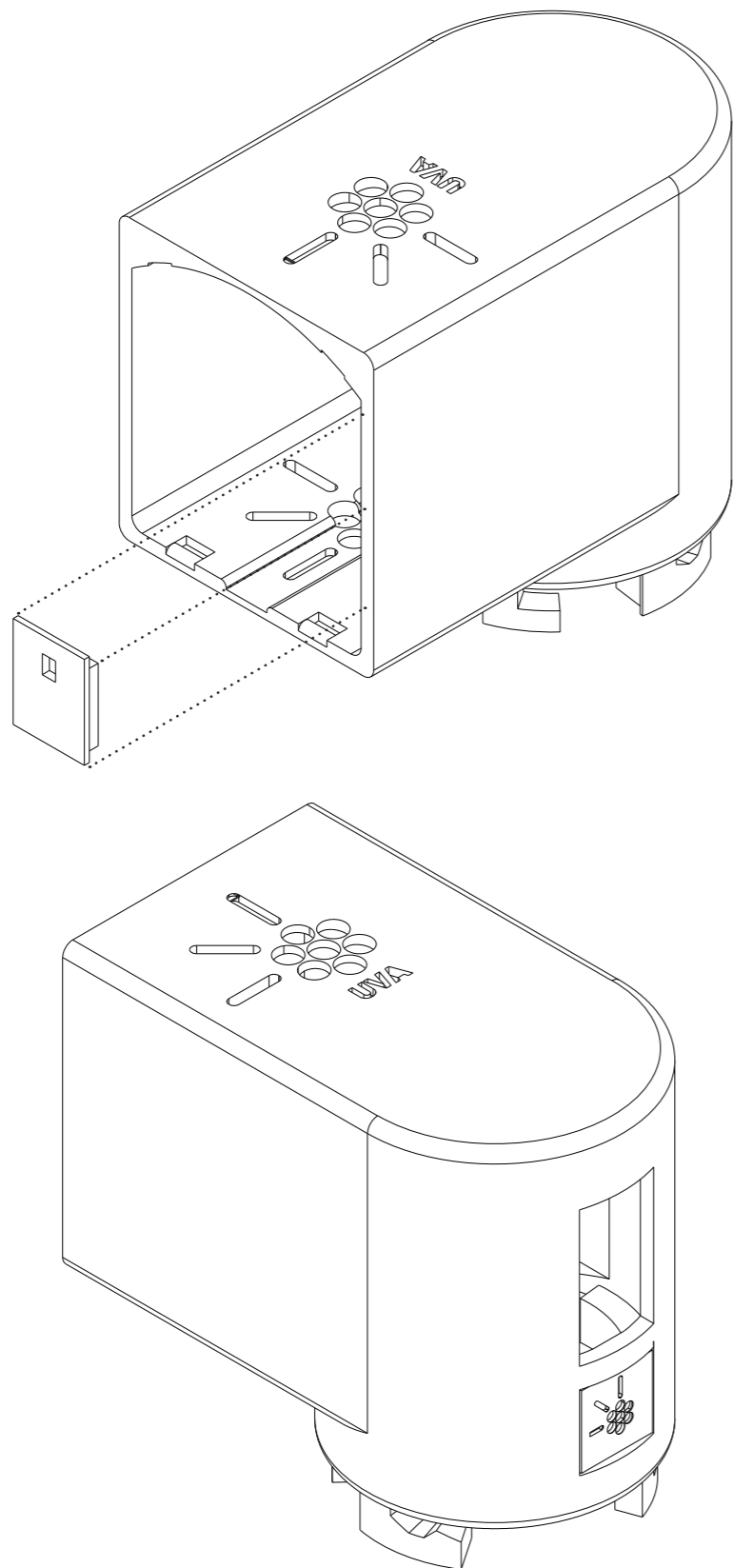
P8. INCERT M3 BOLTS INTO UVA-MH-1

Before incerting the bolts with the nuts, attach one cable to each bolt and incert the
cables before the bolts. Then follow the steps.

P8.1

P8.2

B (2:1)

P8.4

C (2:1)

P8.3

P8.5

P8.6
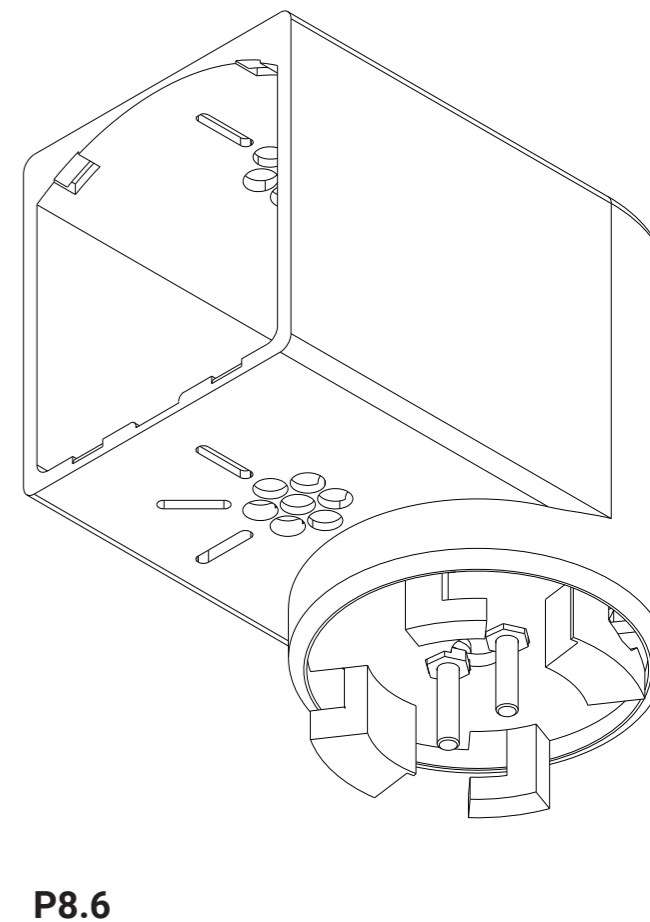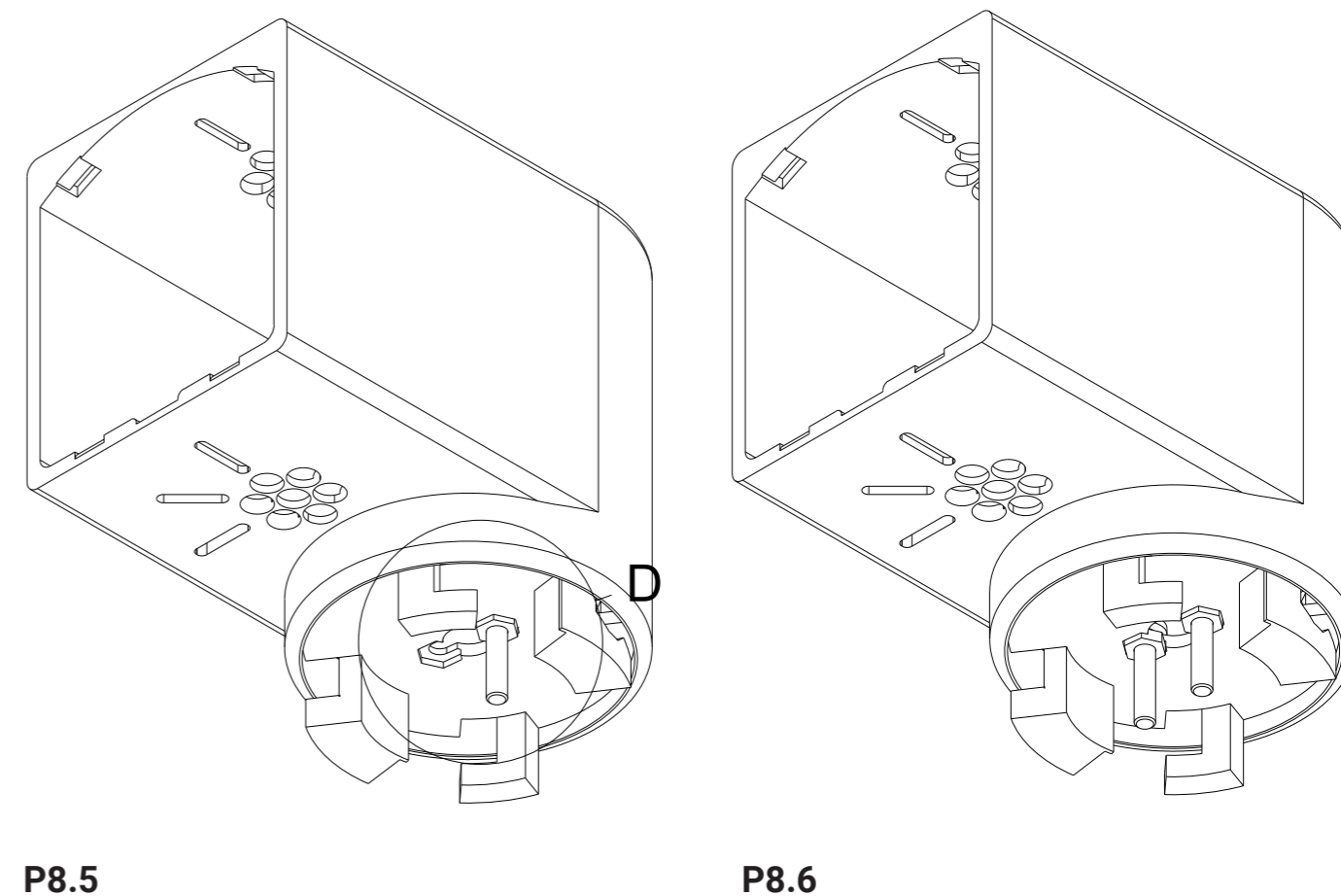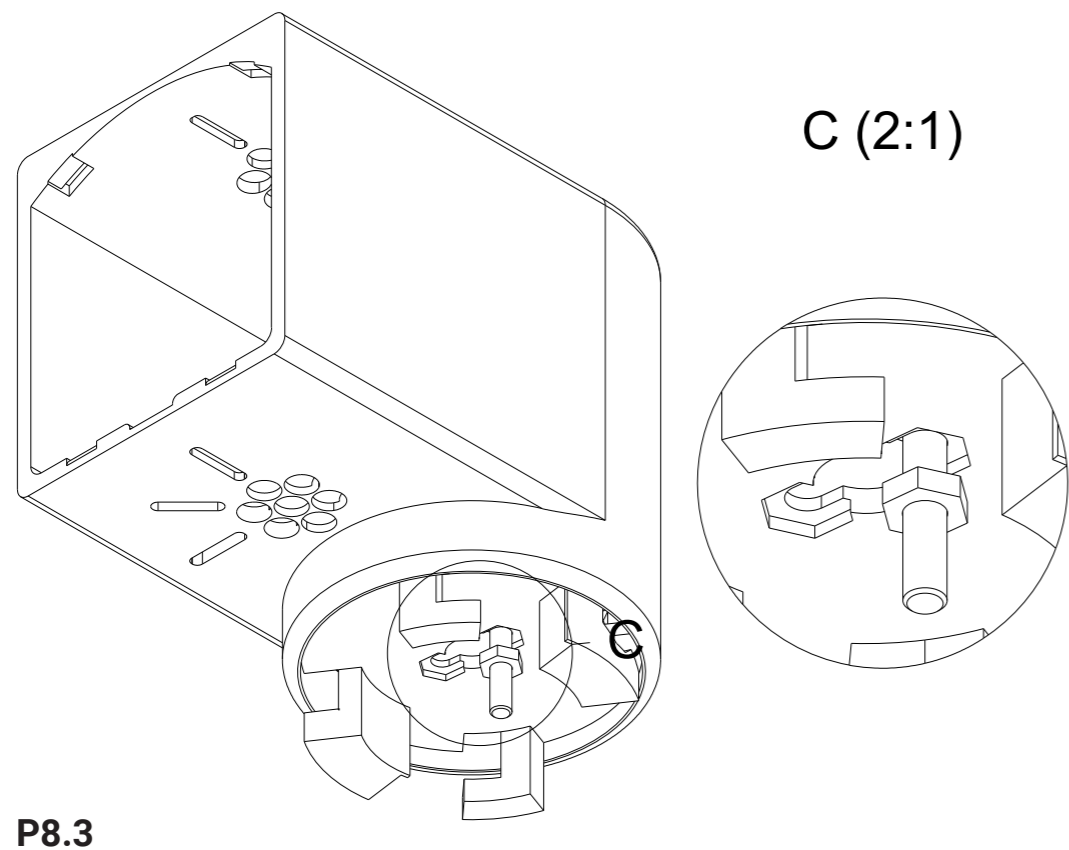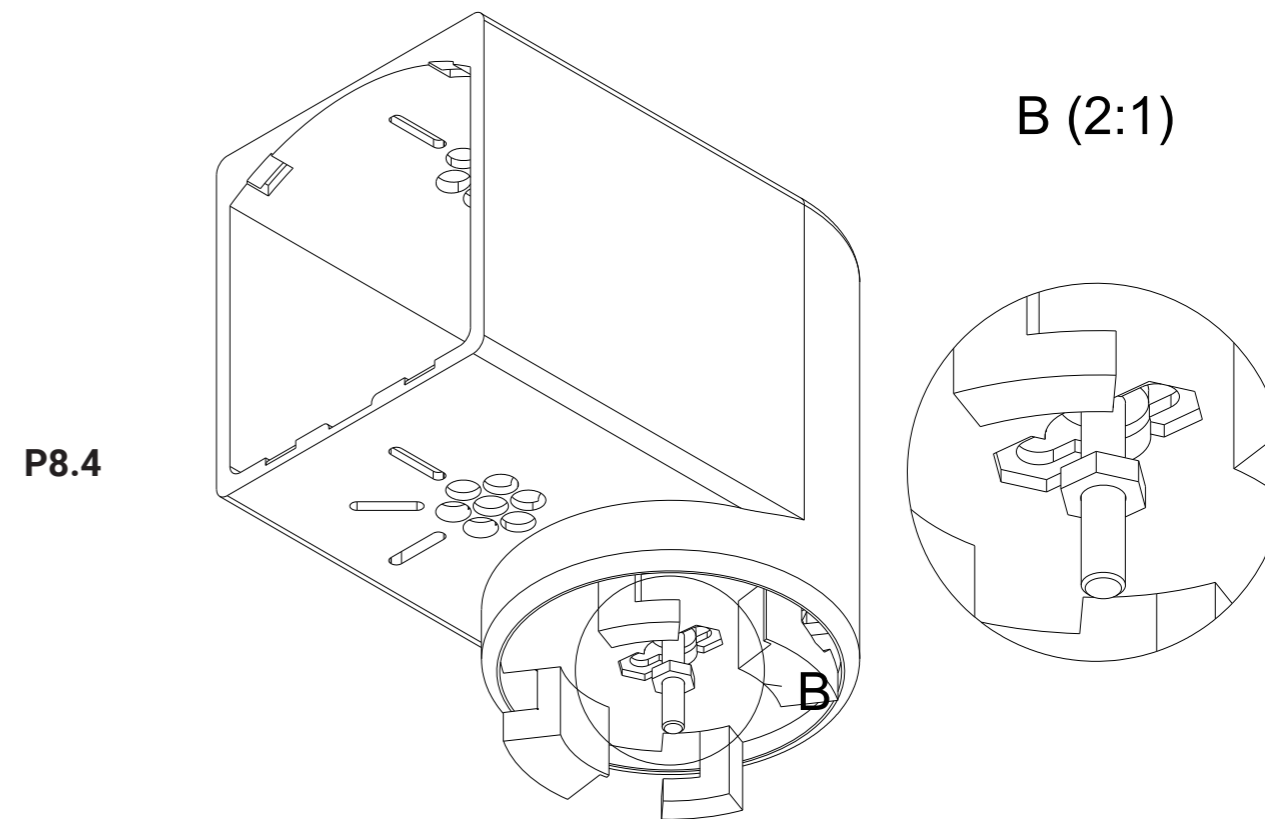
P9. INCERT UVA-MH-4 INTO UVA-MH-1

P10. INSERT UVA-MH-3 INTO UVA-MH-1

Before incerting UVA-MH-3 into UVA-MH-1 you have to conect the bolt wires to the PCBs following the diagram in P4. You should try to guide the bolt wires through the center channel in the UVA-MH-4.
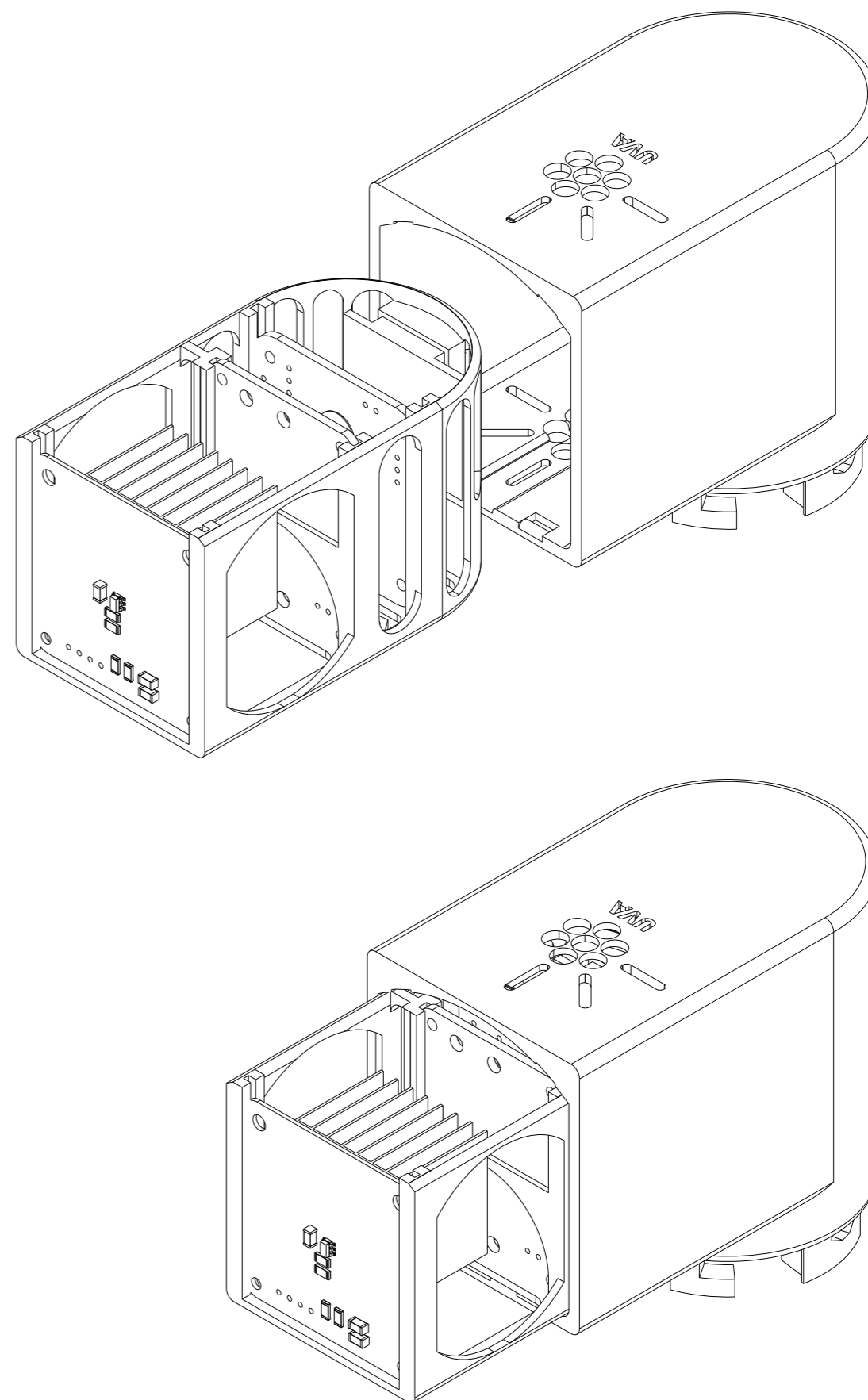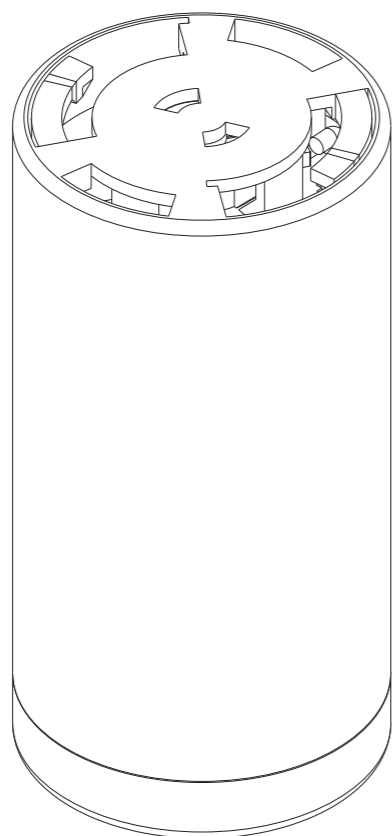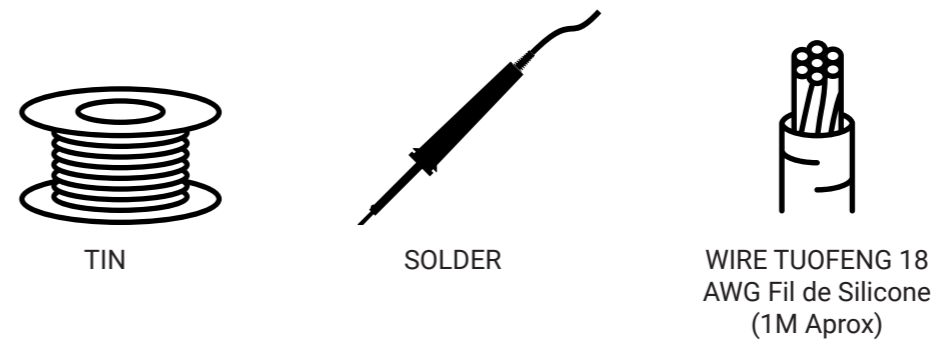
P11. PLACE AND CLICK UVA-MH-2

place on the marks and rotate the UVA-MH-2 until you feel and hear the cick.
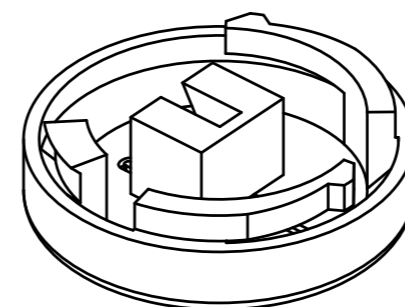
UVA-MH
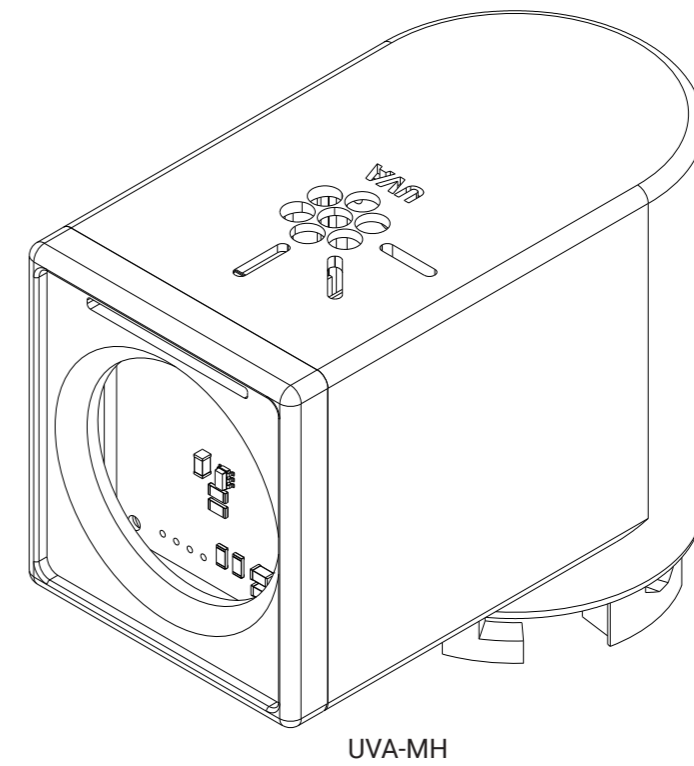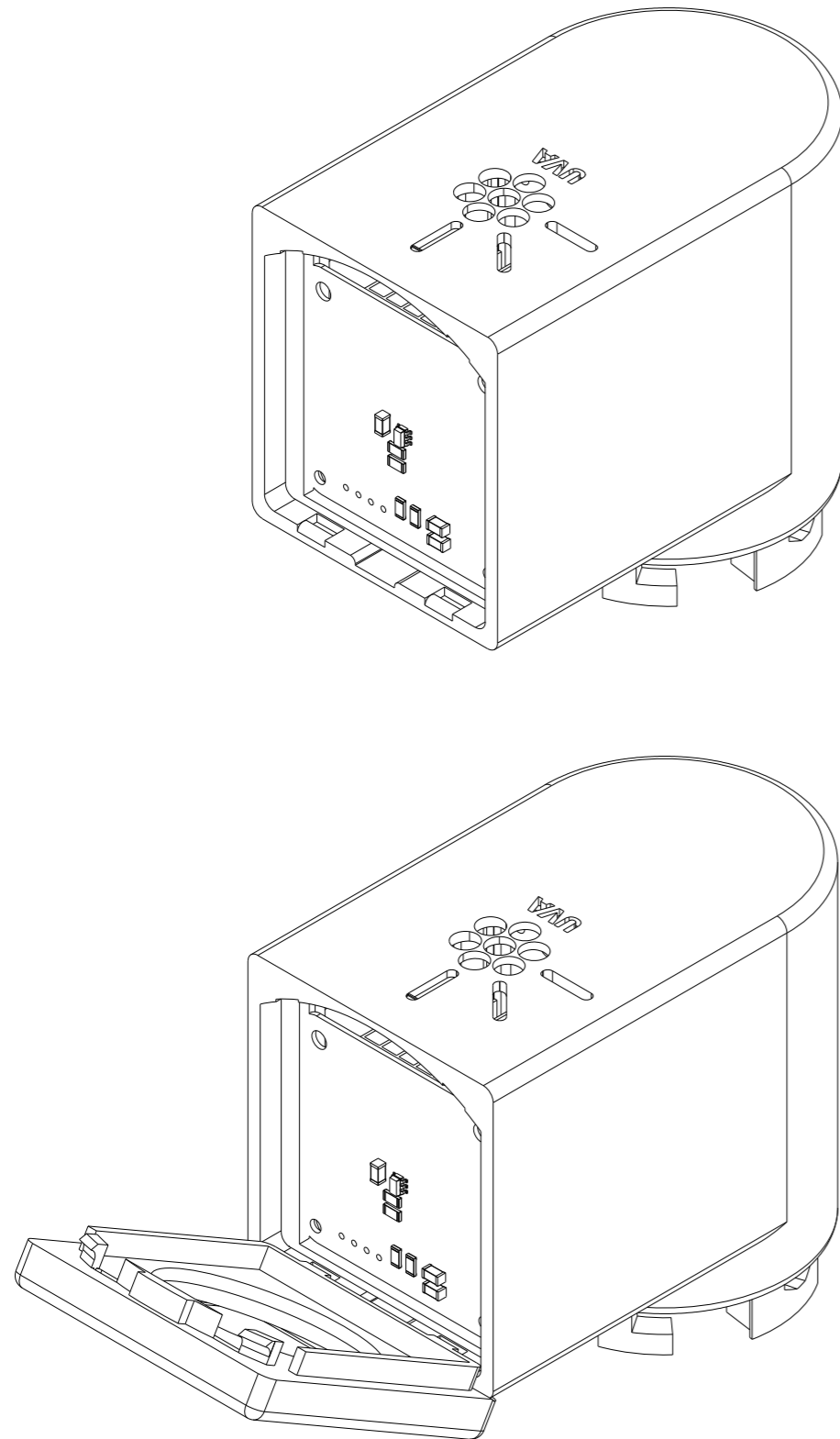
2.2. BATTERY PACK

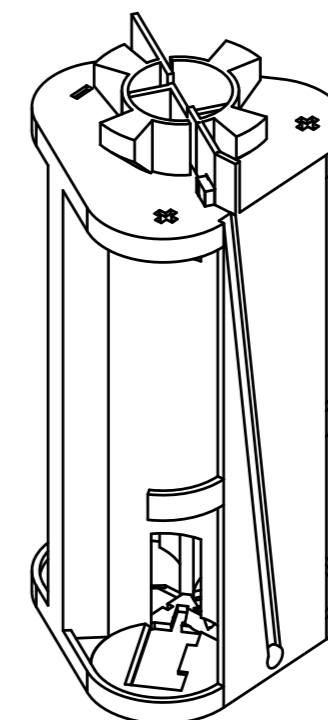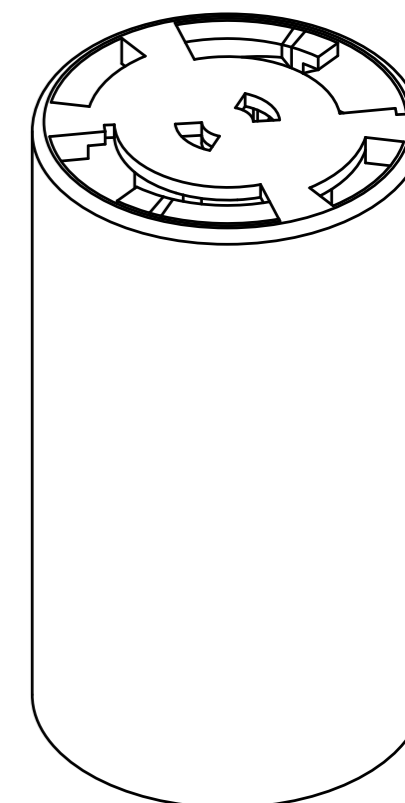For this task you will need the follow materials and tools:
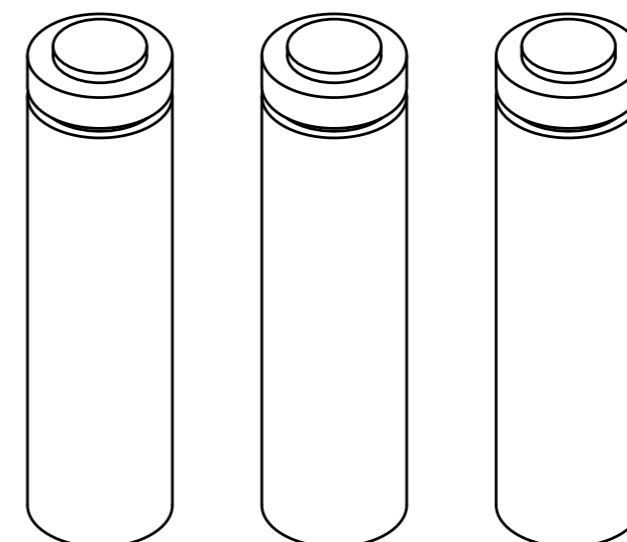
TIN

SOLDER

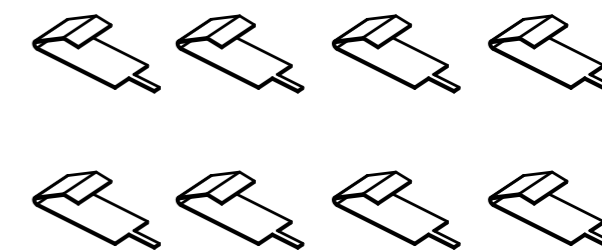WIRE TUOFENG 18 AWG Fil de Silicone (1M Aprox)
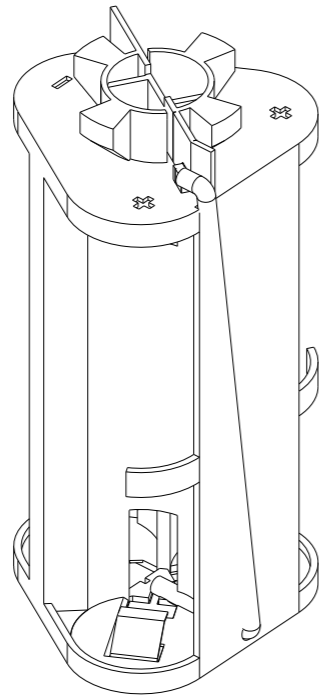
UVA-MB-2

UVA-MB-3

UVA-MB-1
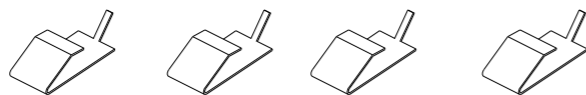
UVA-MB

3X Keeppower 18650 3500mAh

8X CONTACTS-Keystone 1017-1

P1. PLACE AND SOLDER THE FIRST CONTACT

Place the first contact in UVA-HB-3 as shown below and solder the wire afterpasing it through the hole. Then cover de conection with some insulating material as silicon.

P2. BEND THE CONTACT LEGS

Bend the legs of 4 contacts at 60 degrees as shown in the image below.

P3. PLACE THE BENDED CONTACTS

Take two contacts, place them in UVA-HB-3 in the empty spaces on the same side of the first placed contact. Solder the bent legs together and then insulate with silicon.
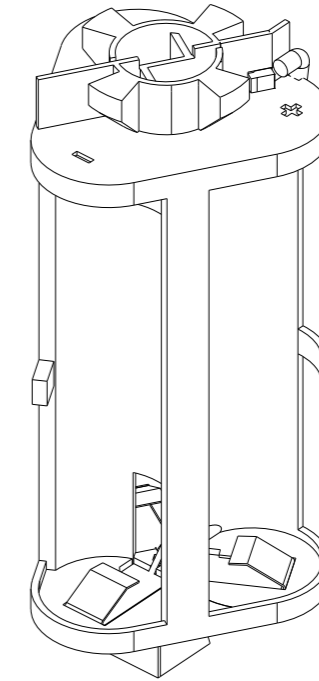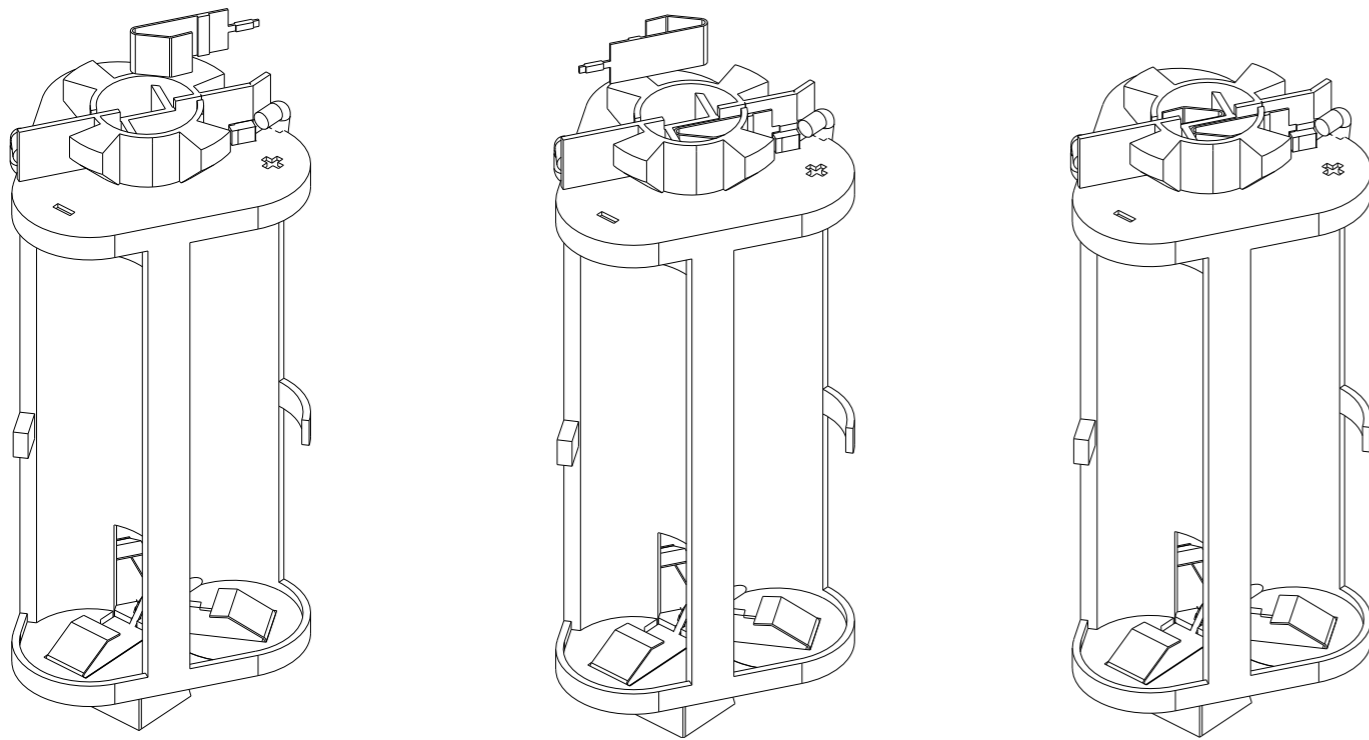

P4. INSULATE AND REPEAT

Solder the bent legs together and then insulate with silicon. Then repeat the phases P1, P2 and P3 on the free side of the UVA-HB-3.


E (4:1)

E
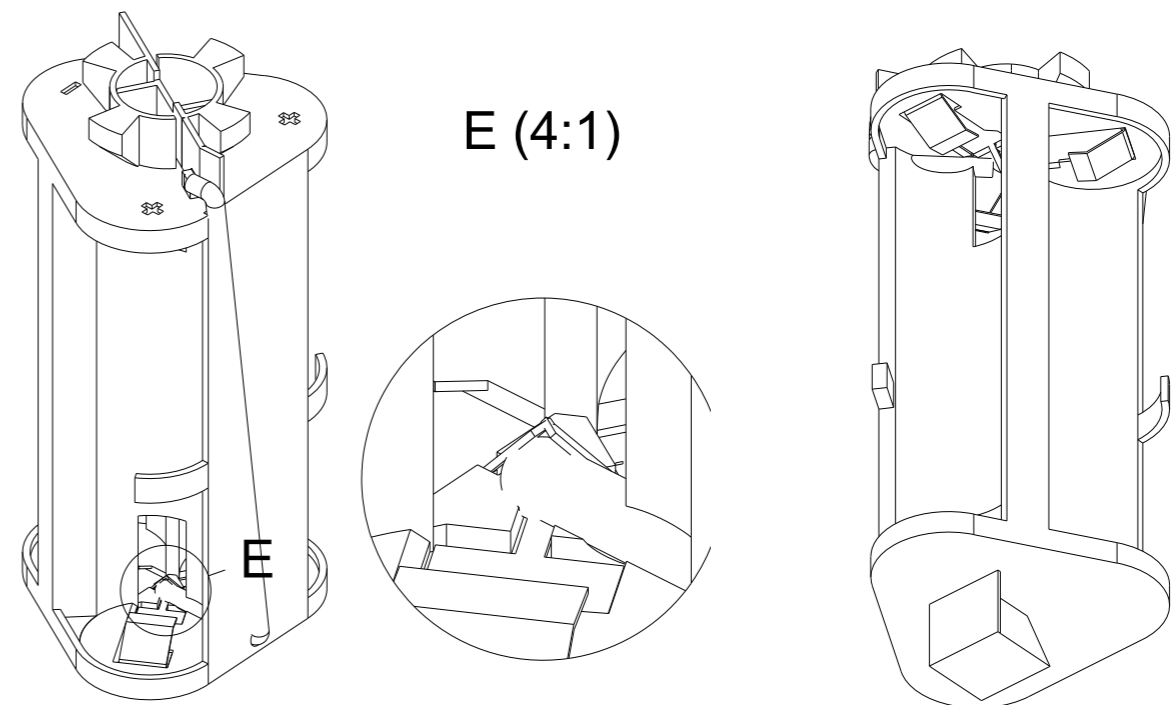
P5. INCERT THE ROTATIONAL CONTACTS AND SOLDER

Compress a little bit of the contacts before inserting them. the place them as shown in the image below. After placing them, solder them to their respective wires.
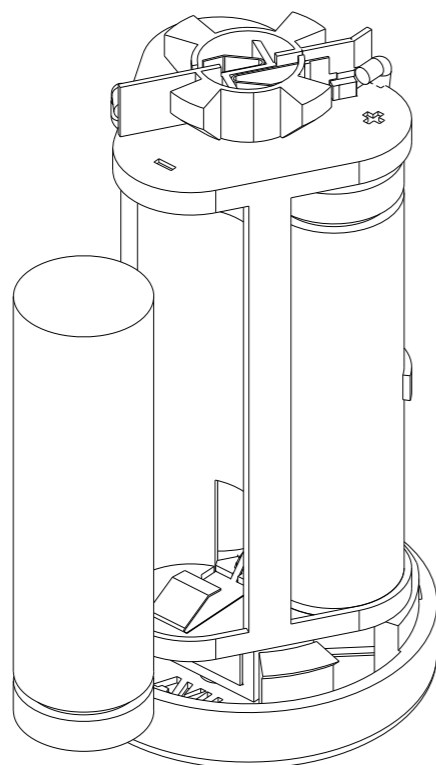
P7. JOIN UVA-HB-2 AND UVA-HB-3

Following the image below and taking into account the triangular form on the bottom of UVA-HB-3 slice the piece and apply force parallel to the insertion until you hear the click.
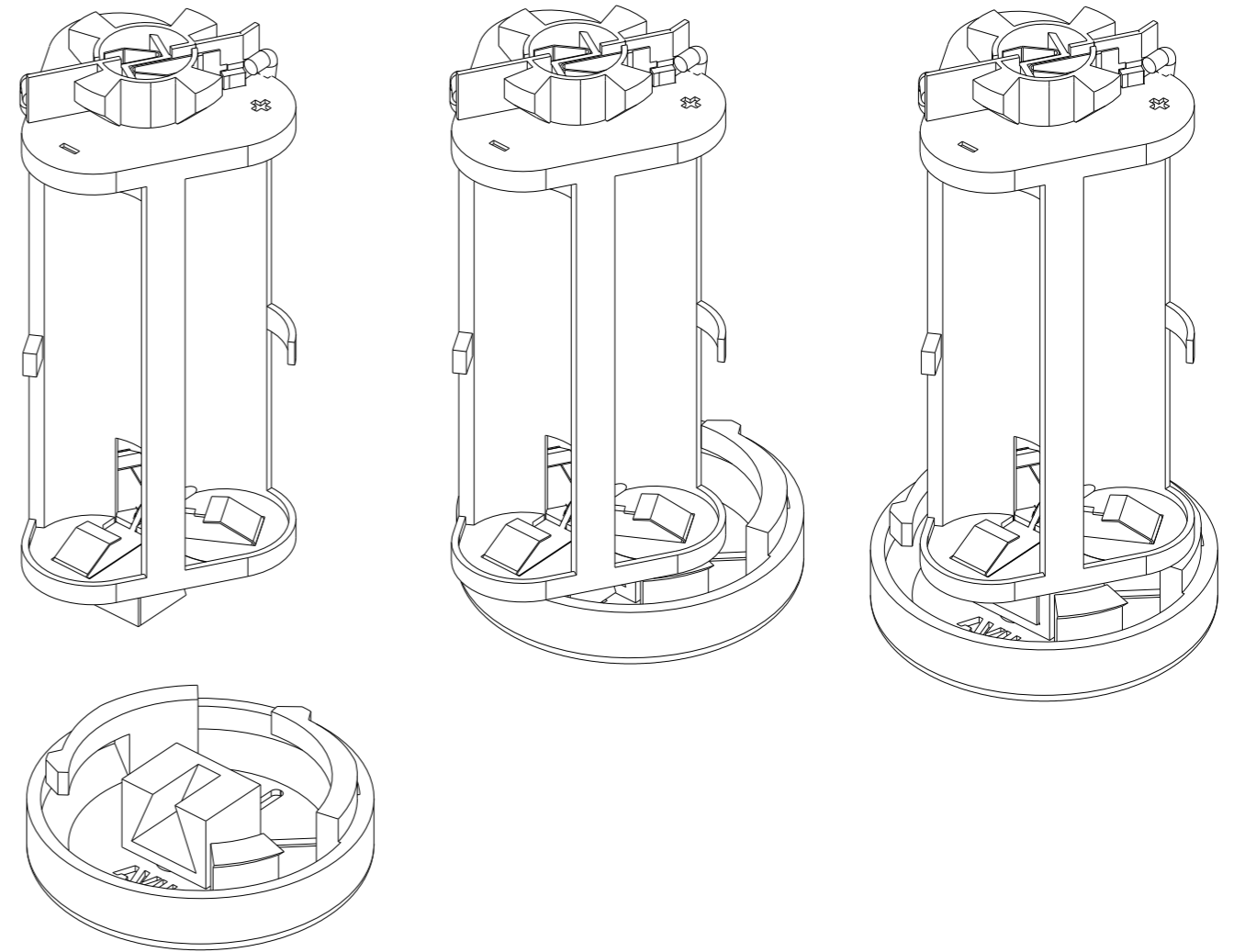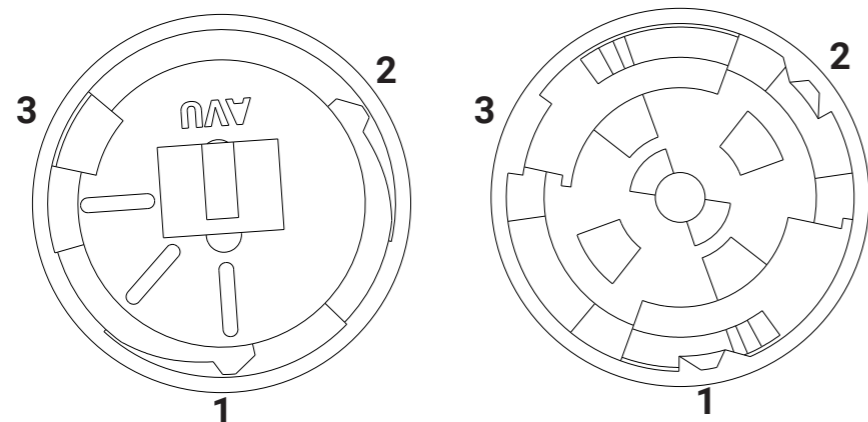
P8. INSERT THE BATTERY CELLS

ATTENTION. Follow the + - signals to insert the batteries.

P10. INSERT UVA-MB-3 INTO UVA-MB-1

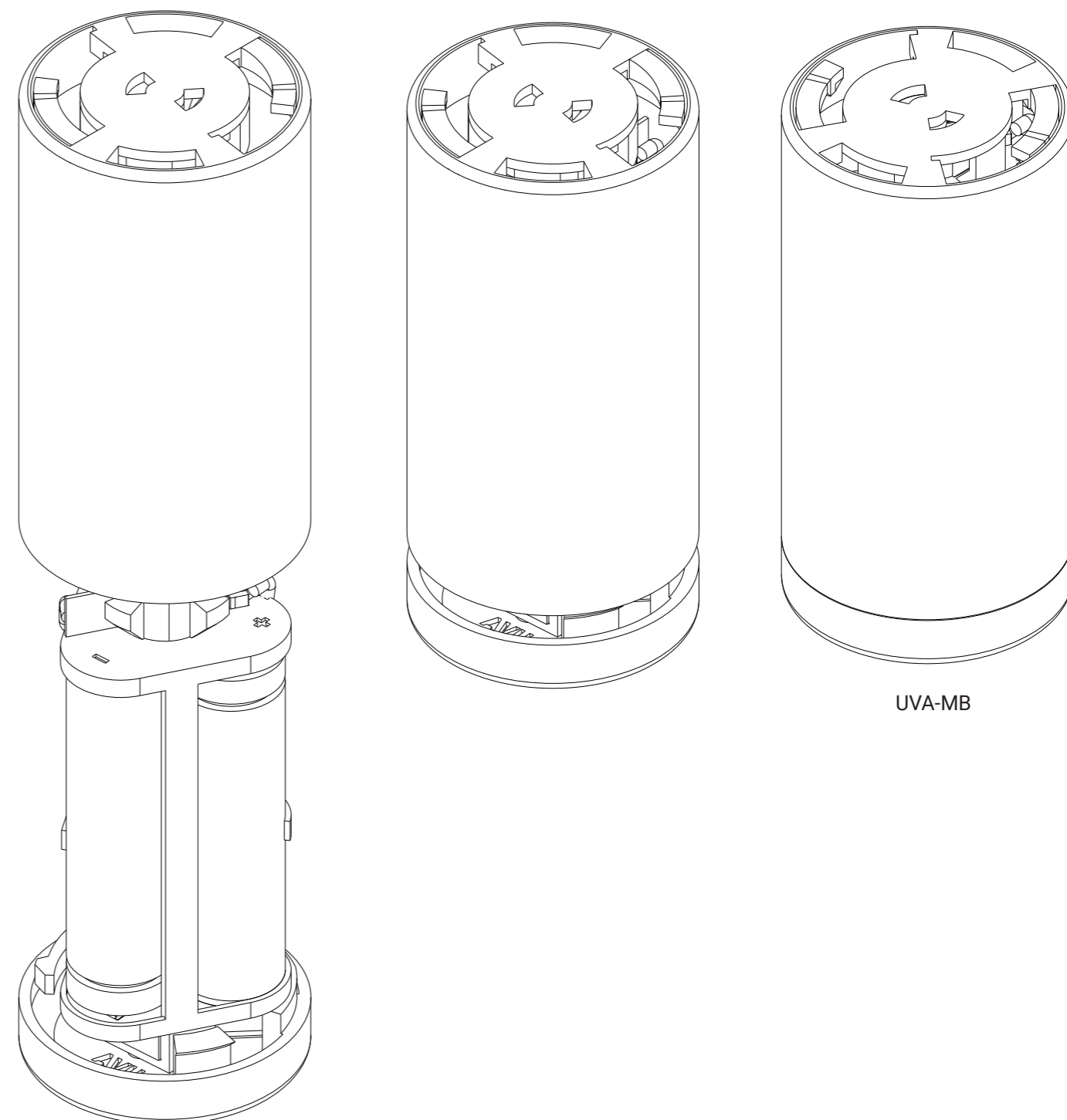Insert and then rotate until you listen to the click.

P9. PREPARE TO INCERT

Before inserting UVA-HB-3 into UVA-HB-1, take into account the position and considering that the pieces should rotate to be locked.
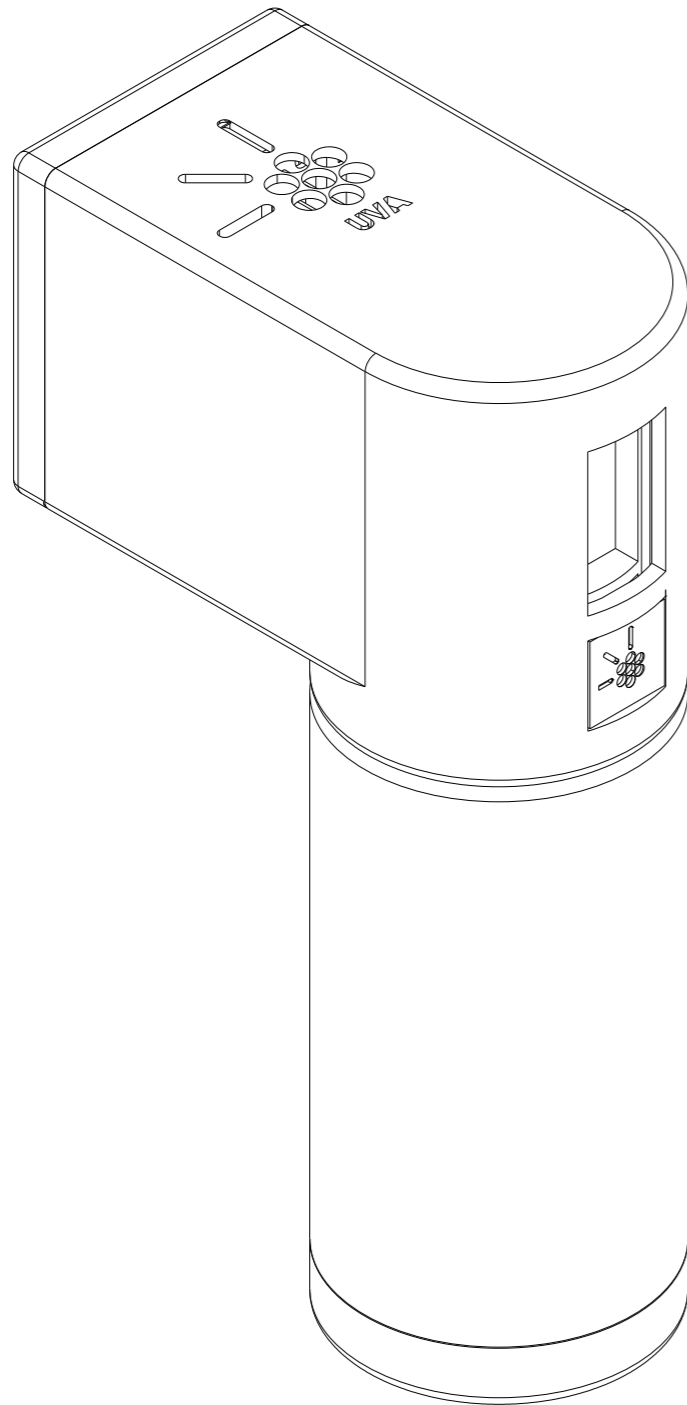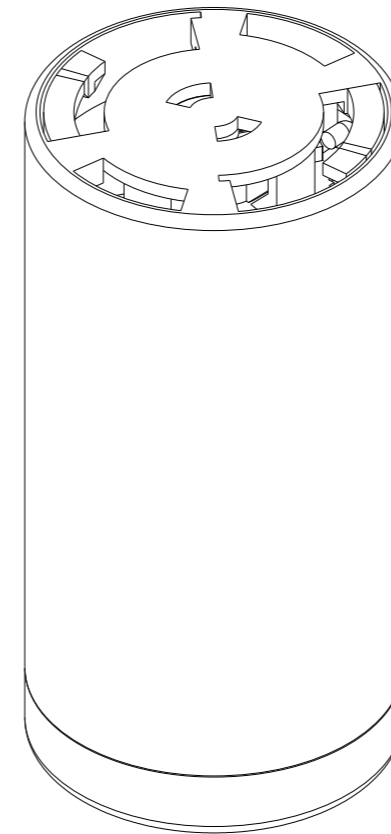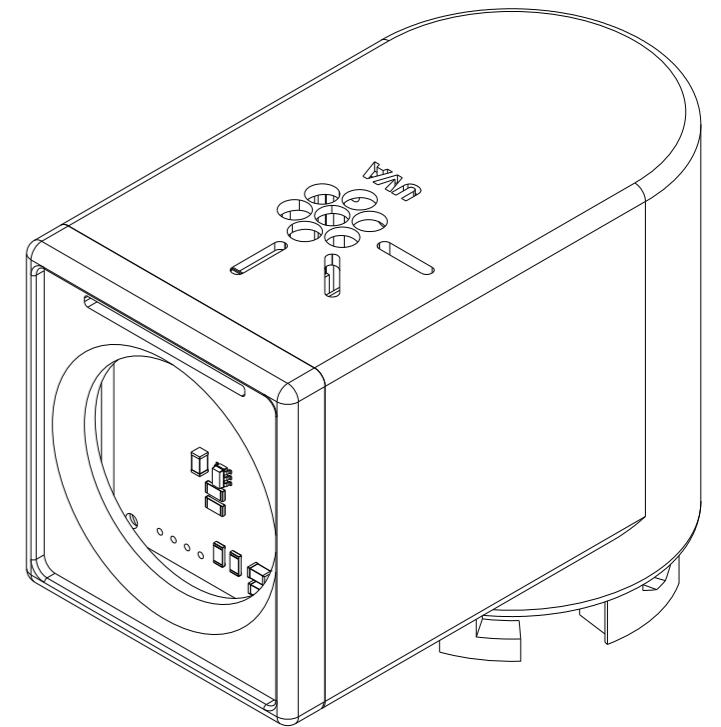
UVA-MB

2.3. FINAL ASSEMBLY UVA

You will need for this task the follow materials and tools:
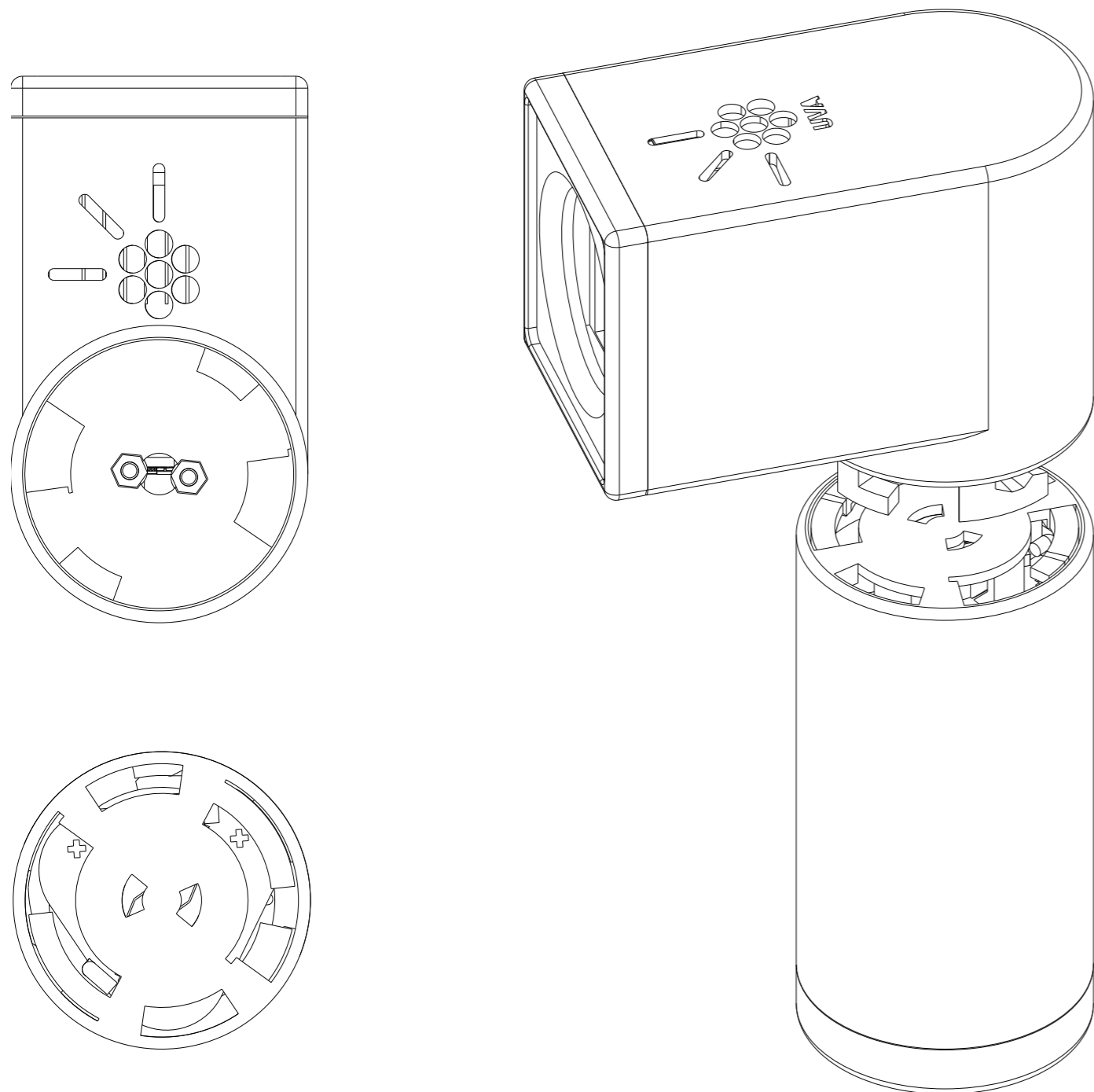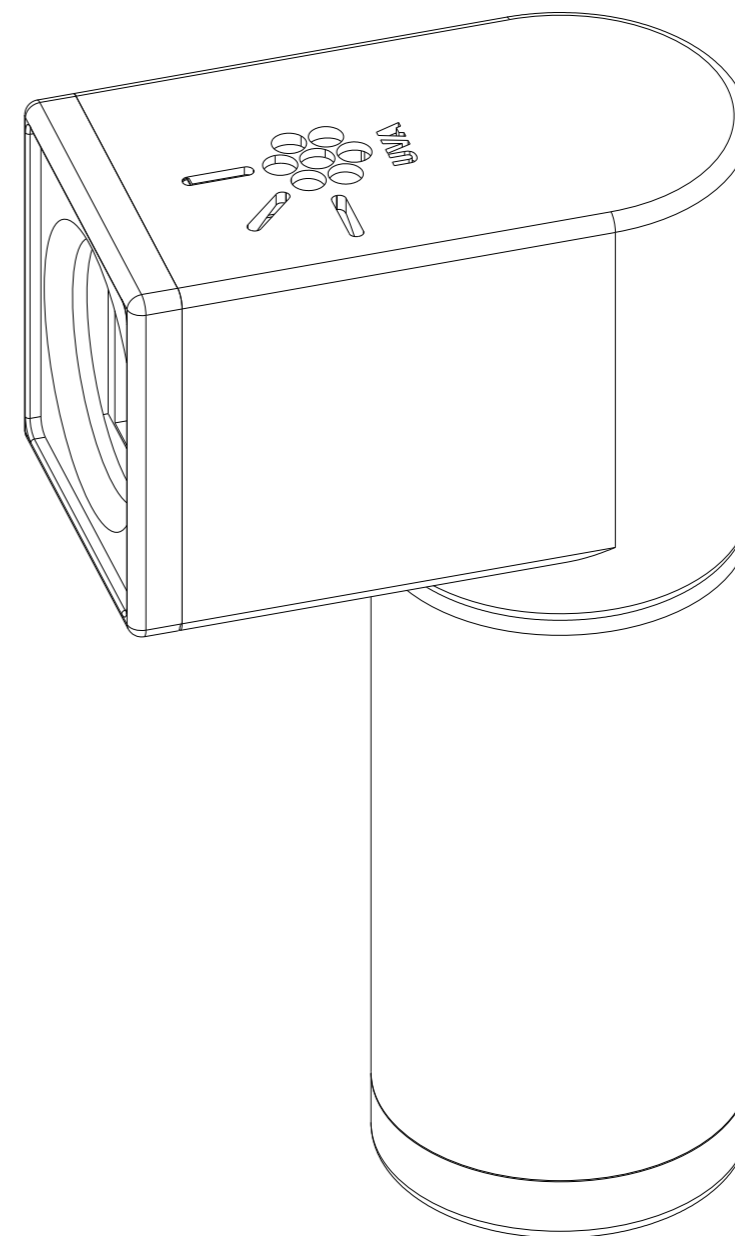

UVA-1

UVA-MB

UVA-MH

P1. ALING

ATTENTION. Pay attention to the legs (UVA-MH) and locks (UVA-MB) because there is only a way to introduce it. Align with the pieces before proceeding.

P2. INCERT AND ROTATE

Following the previous alienation, introduce the legs of UVA-MH into UVA-MB and rotate until you listen to the click. After the click UVA-1 is ready to use.

3. LICENCES

3.1. CREATIVE COMMON

- »   3d printer filament by Oleksandr Panasovskyi from the Noun
- »   soldering iron by Chris Pyper from the Noun Proje
- »   Wire by Nikita Kozin from the Noun Project
- »   sheet by Linseed Studio from the Noun Project
- »   Spatula by ATOM from the Noun Project
- »   Pliers by Kristina Margaryan from the Noun Project
- »   3D Printer by Franc from the Noun Project
- »   transistor by Adnen Kadri from the Noun Project
- »   Tweezers by Hoeda from the Noun Project
- »   glue by arie from the Noun Project
- »   Oven by Icongeek26 from the Noun Project
- »   Wire by priyanka from the Noun Project
- »   sheet by Linseed Studio from the Noun Project

All the hardware components of this project are licensed under a Creative Commons license

Creative Commons License
UVA by Said Alvarado, Miguel Fernandez is licensed under a Creative Commons Attribution 4.0 International License.

All the firmware of he project is licensed under the MIT license.

Ultraviolet wand for adhesives curing
Multi-Tool kit
UVA - V1
FABRICATION AND ASSEMBLY

UVA