

MUV Air Quality Kit

Instructions:

18/02/19

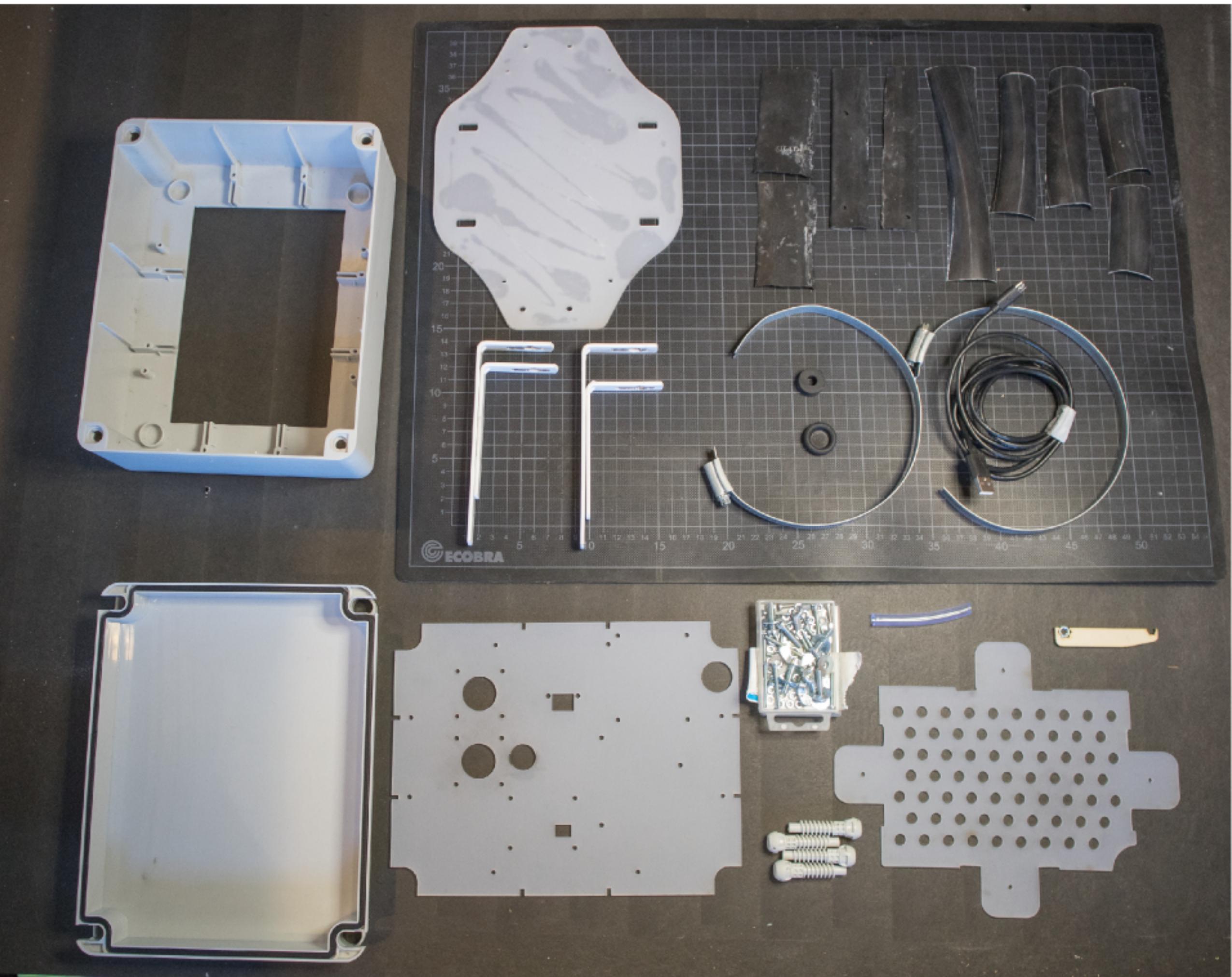
Conor Croasdell



Materials and Tools

Some of the parts shown here have been prepared, they are: the electronics enclosure, the mounting plate and the rubber grip pads. We will prepare these in the first steps below.

Parts needed:



The full parts list with links can be found in "[Bill of Materials](#)" on the MUV Github

Preparing the Grip Pads

Step 1:

Parts and Tools:

1 x Bike inner tube

1 x Ruler

1 x White marker

1 x Knife or scissors

1 x wet cloth

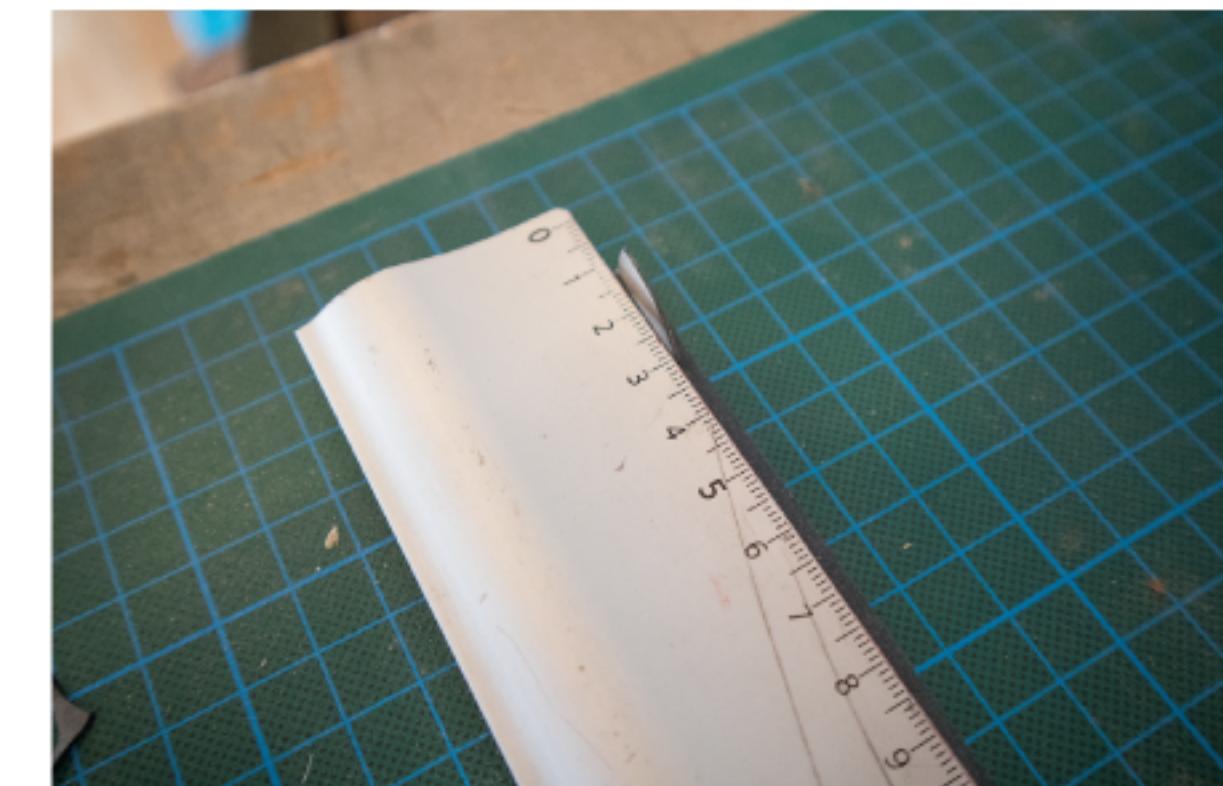
A cutting surface



1. Lay out the inner tube



2. Cut out the section with the valve



3. vFlatten the tube with the ruler and cut along its length so that the tube can be opened up and layed flat



4. Clean the powder from the inside of the tube with a wet cloth



5. Lay the tube flat on the cutting surface, you can use double sided tape to help secure it. Mark out the grip pads with a white marker. The measurements are:



6. Cut out the grip pads from the tube

Glueing the Mounting Plate

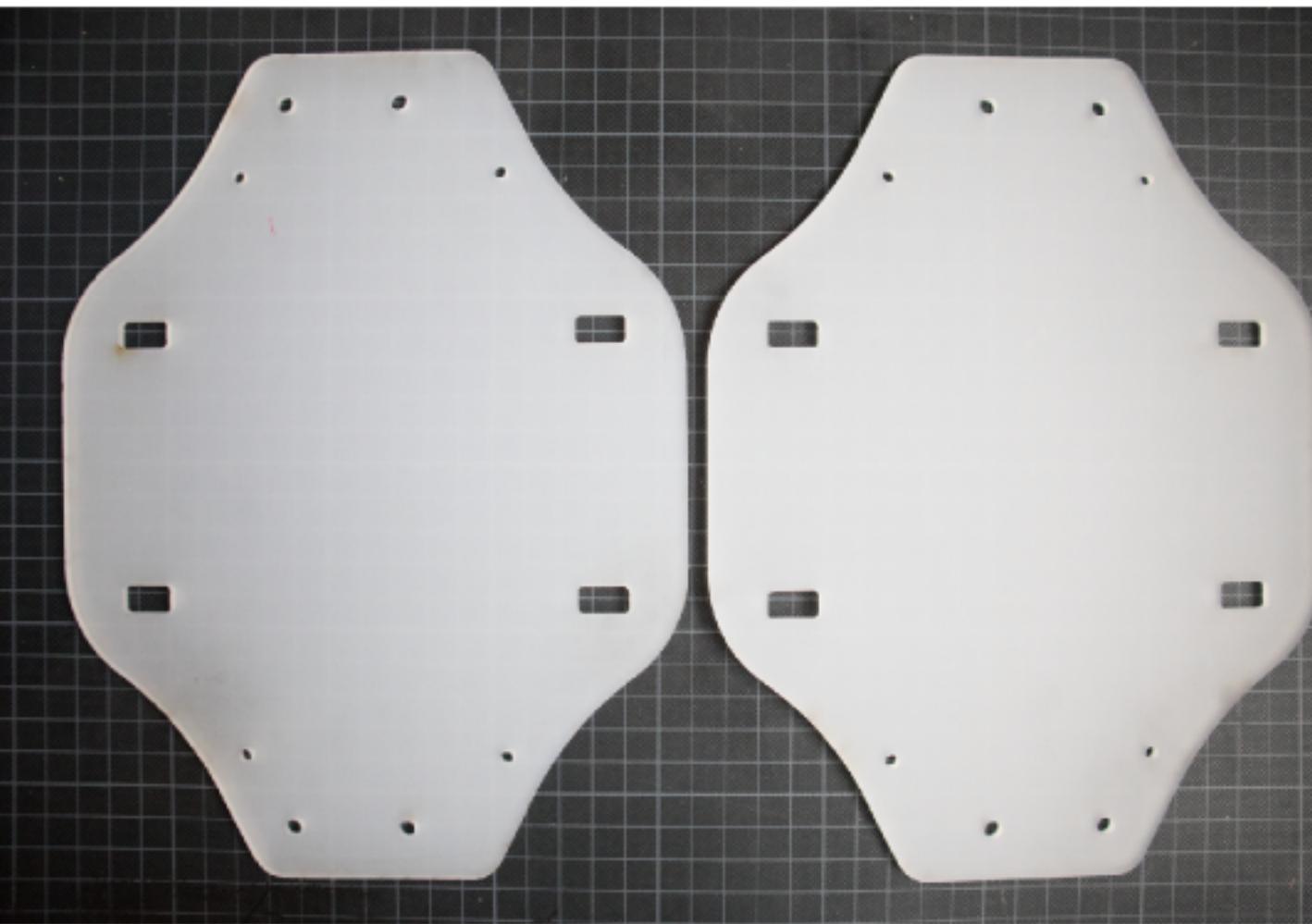
Step 2:

Parts and Tools:

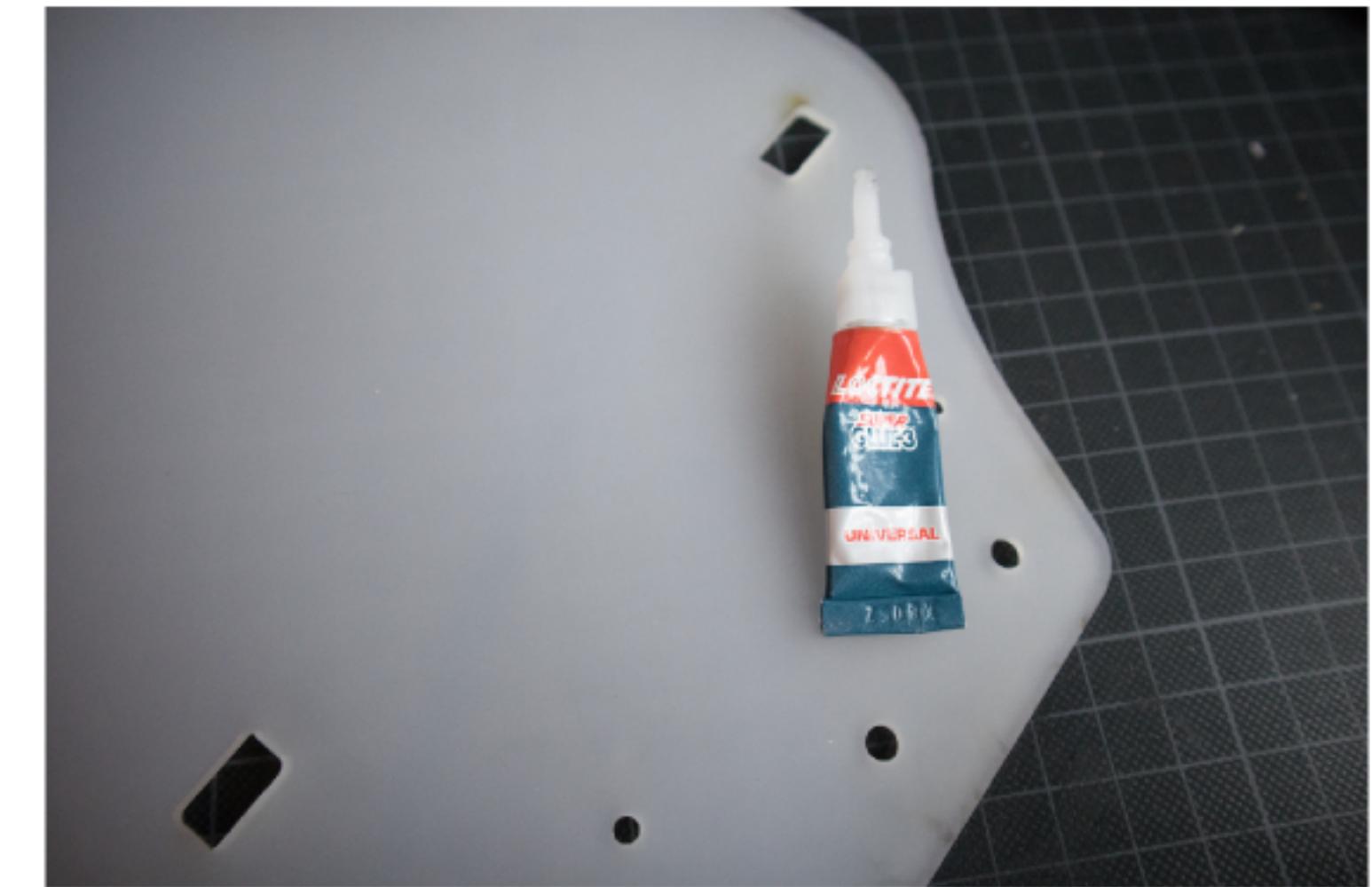
2 x 3mm acrylic mounting plates

CA glue

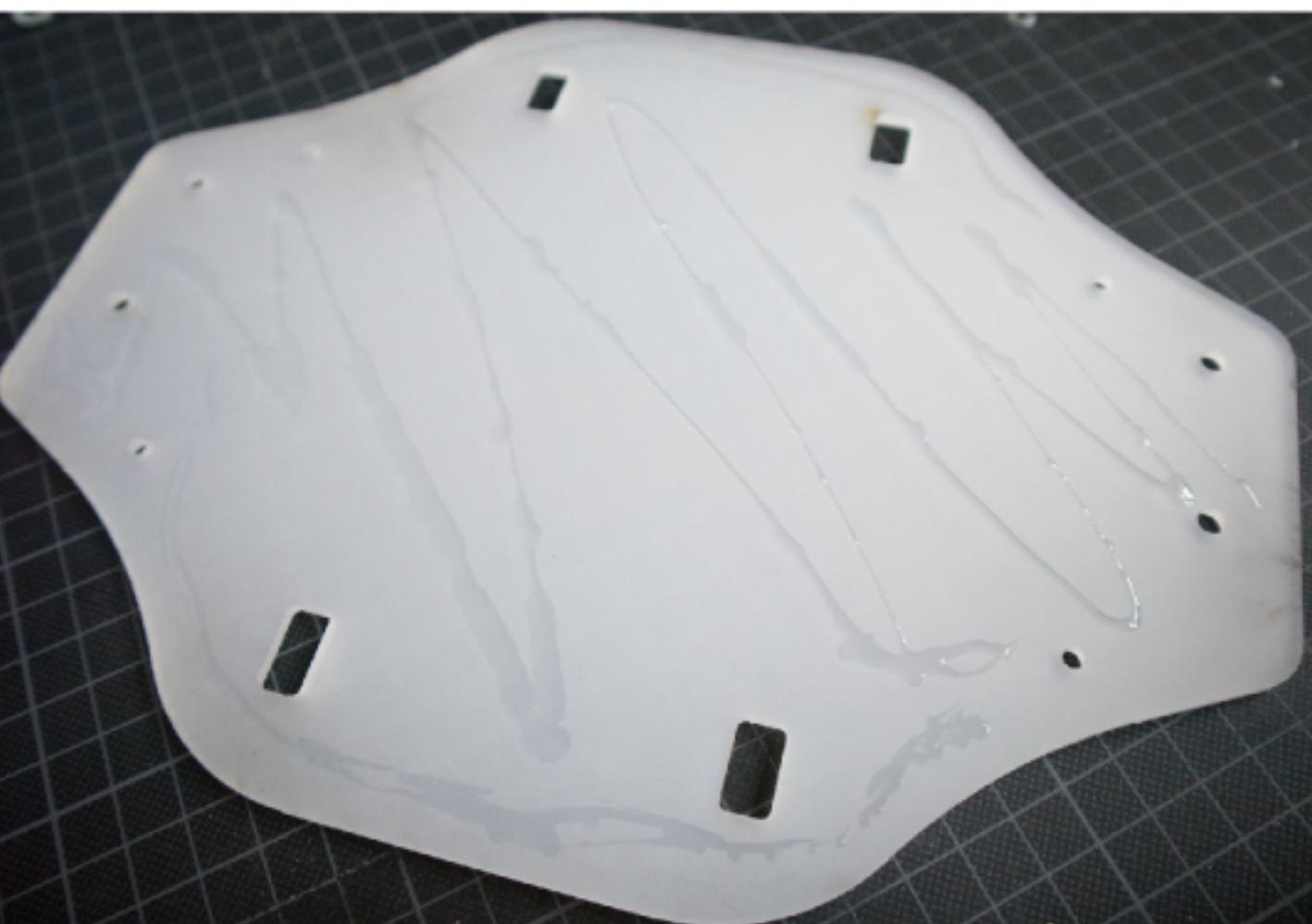
Clamps or a vice



Lay out the 2 mounting plates



CA glue can be used or acrylic cement. This tube doesn't have enough, you need more to be able to spread an even coating



Apply the glue as shown on one of the mounting plates



Join the 2 plates, using the bolts to align them. Make sure they are the right way round so the holes line up. Clamp the plates while the glue sets.

Glueing the Grip Pads

Step 3:

Parts and Tools:

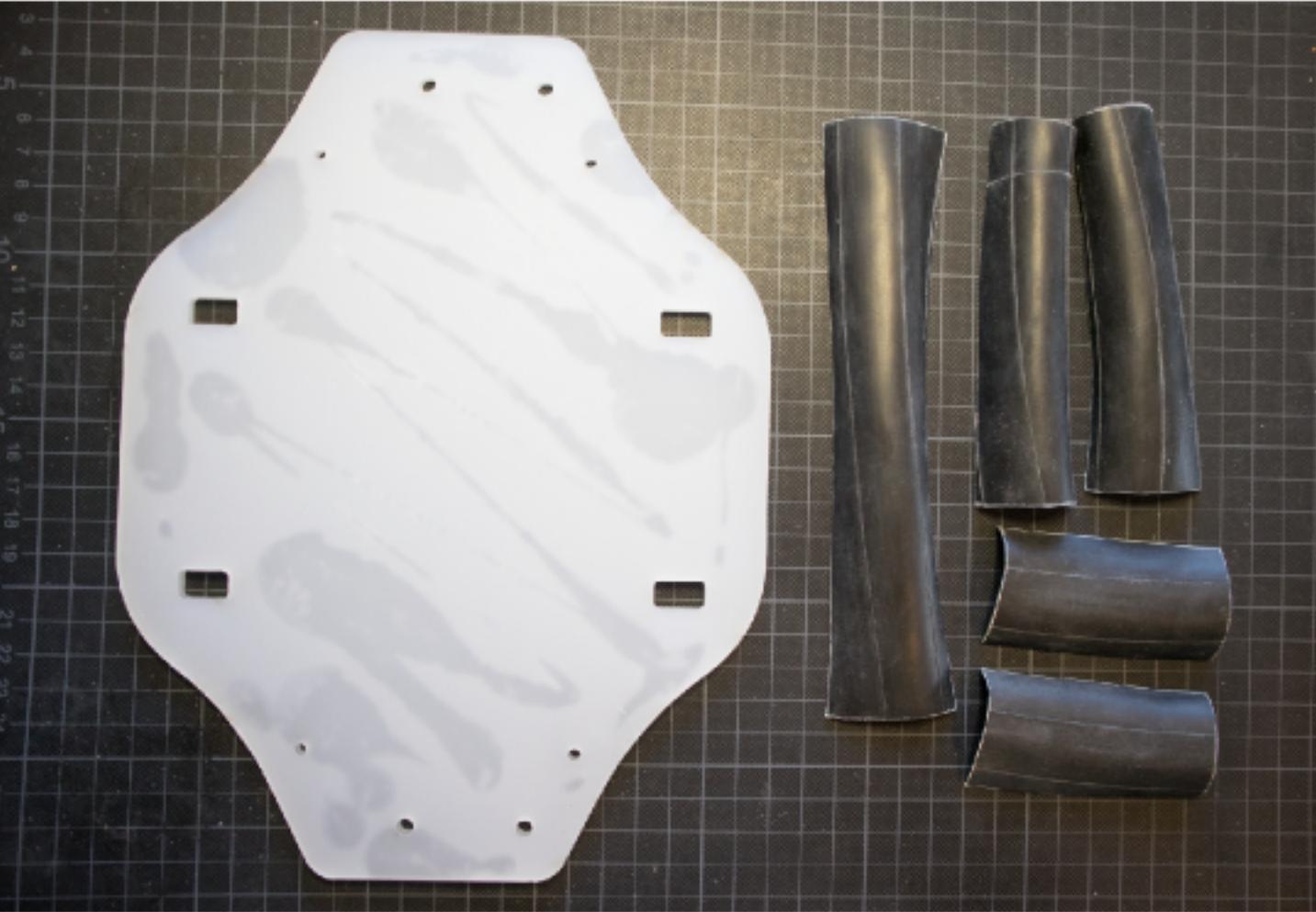
1 x glued mounting plate

2 x: 71 x 42 mm rubber strips

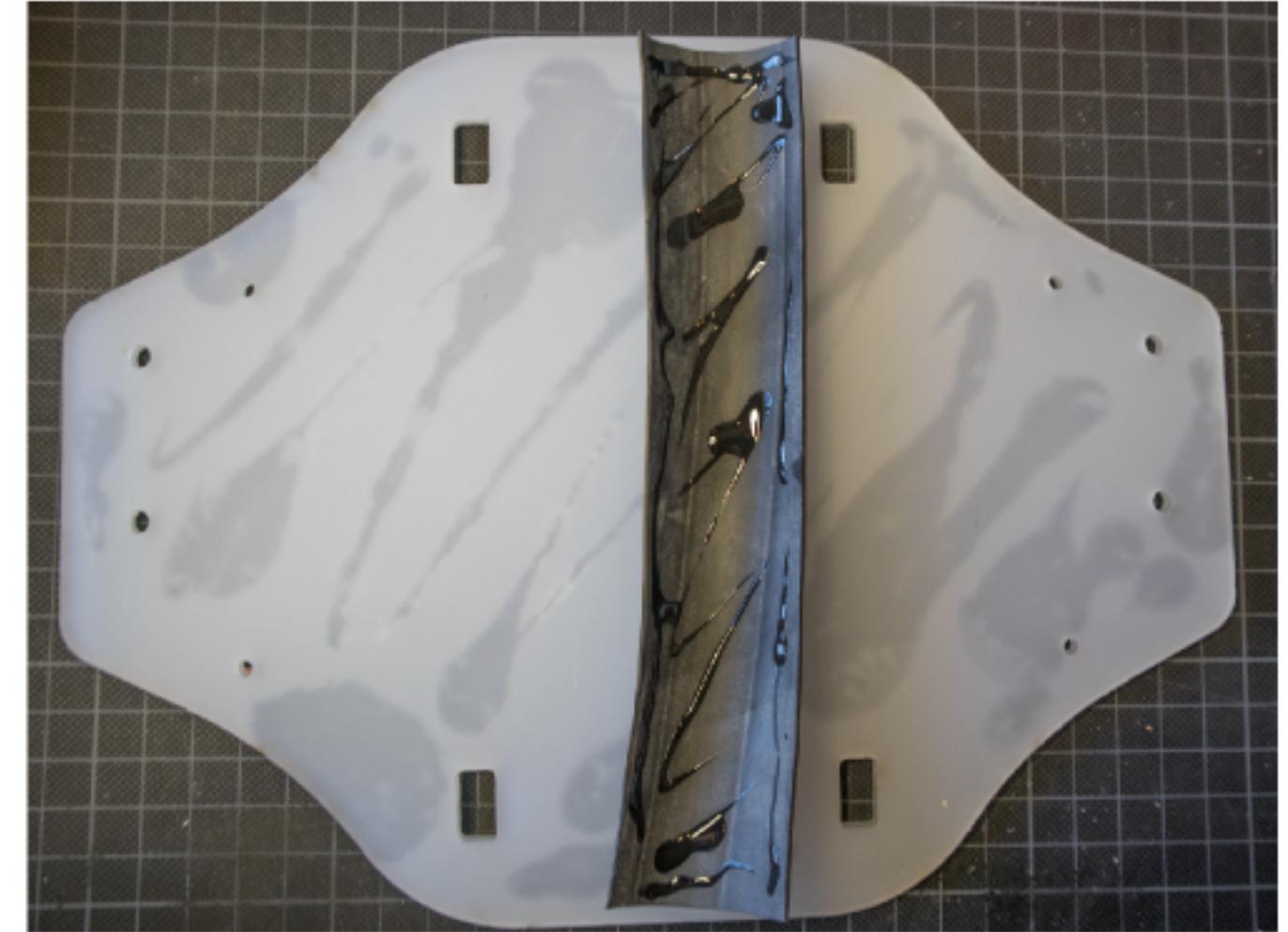
2 x: 135 x 40 mm rubber strips

1x: 180 x 40 mm rubber strip

CA glue

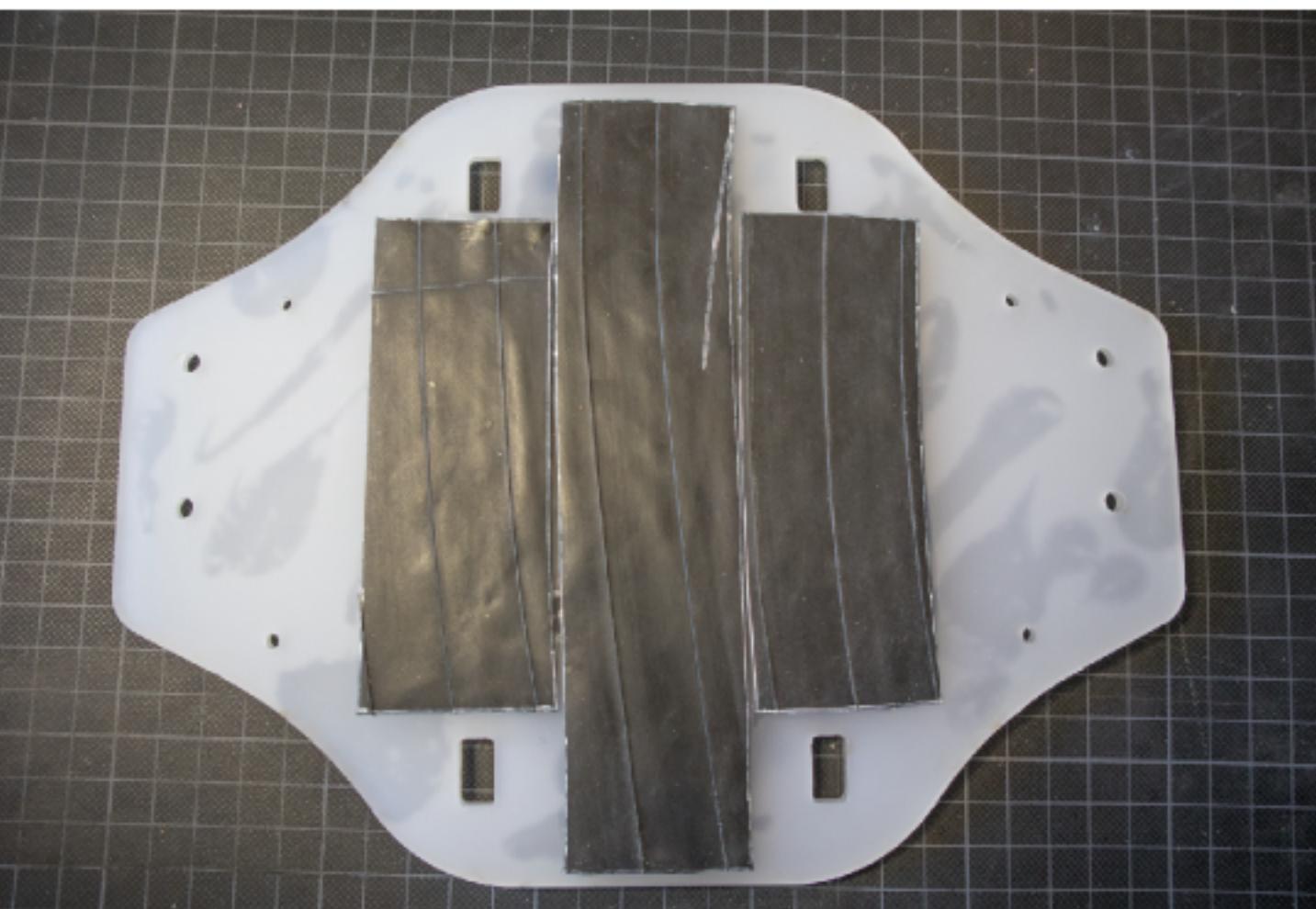


1. Collect the needed parts

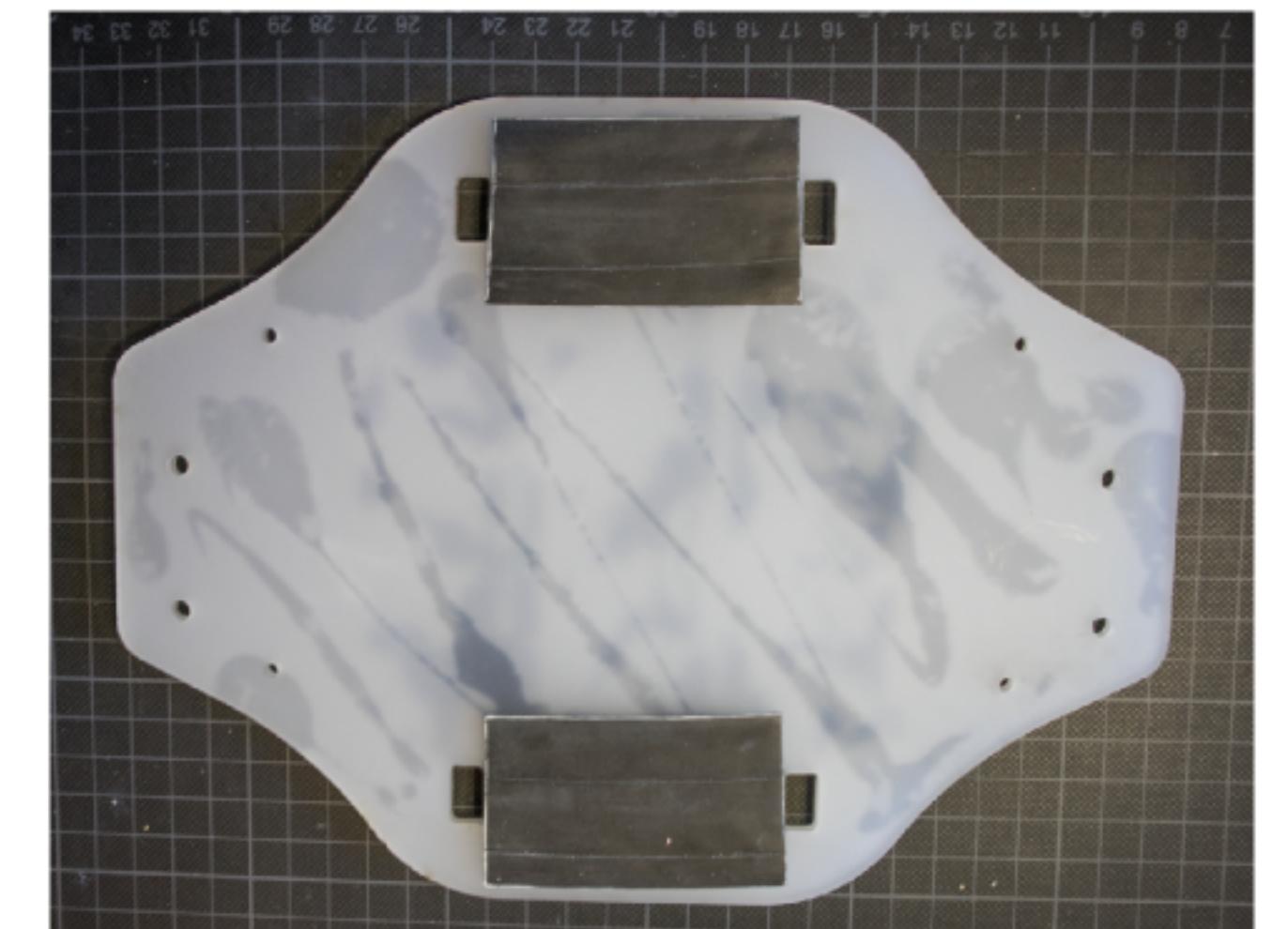


2. Apply the glue to the strips like above

Any extra glue can be cleaned up with alcohol and a cloth



3. Join the strips to the mounting plates. Align the strips carefully as shown above



4. Do the same for the 2 smaller rubber strips on the other side. These should fit between the slots cut for the hose clamps

Fitting the hooks

Step 8:

1. Fix the hook bolts to the baseplate using the huts and washers. Adjust the nuts so that the bolts only just stick out enough for the nuts on the other side of the base plate

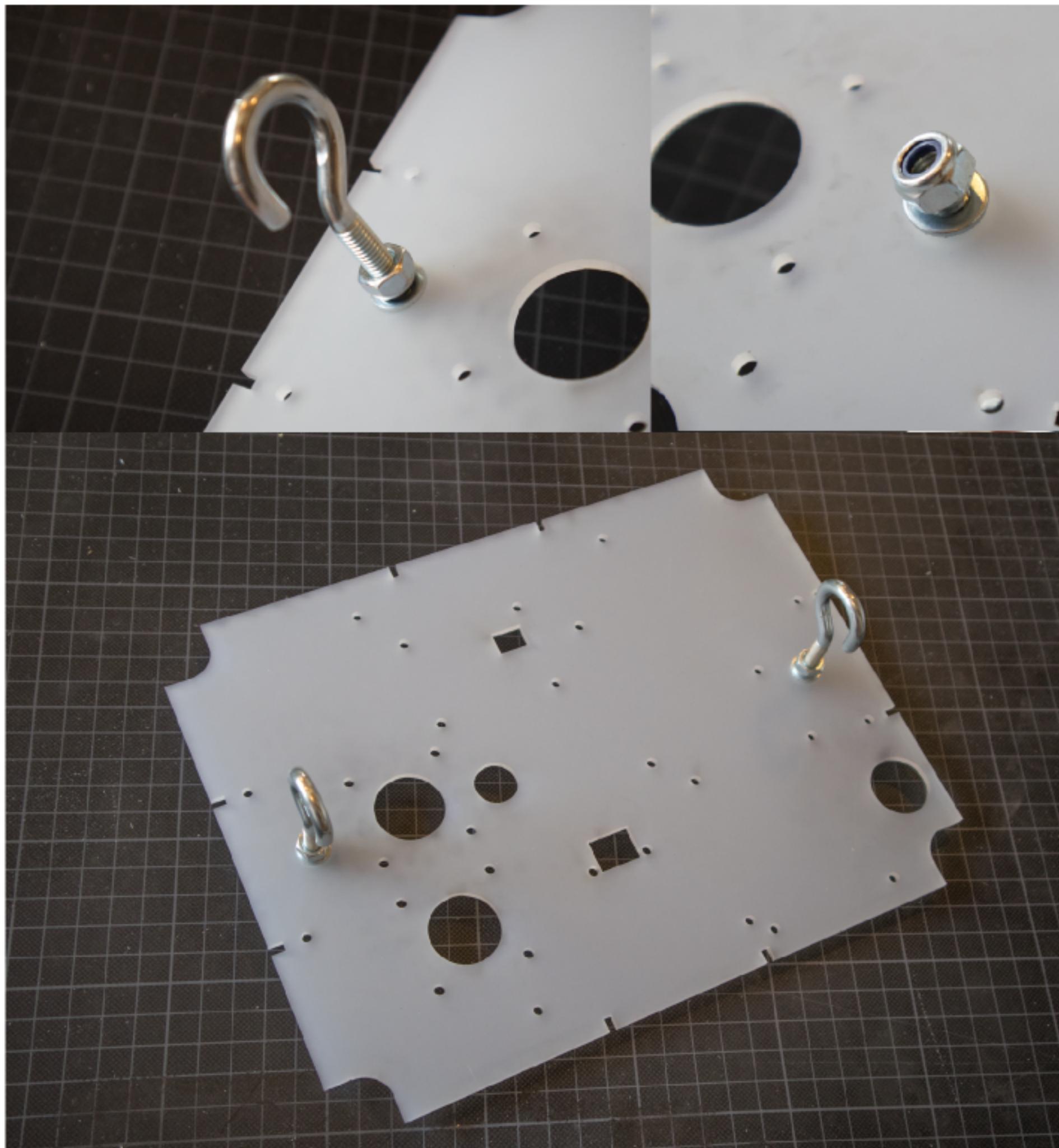
Needed:

1 x: Base plate

2 x: m6 x 25 hook bolt

4 x: m6 nuts

4 x: m6 washers



2. The hooks are used to insert and remove the press - fit base plate into and out of the enclosure

Fitting the Mounting Plate

Step 6:

Needed:

1 x Enclosure

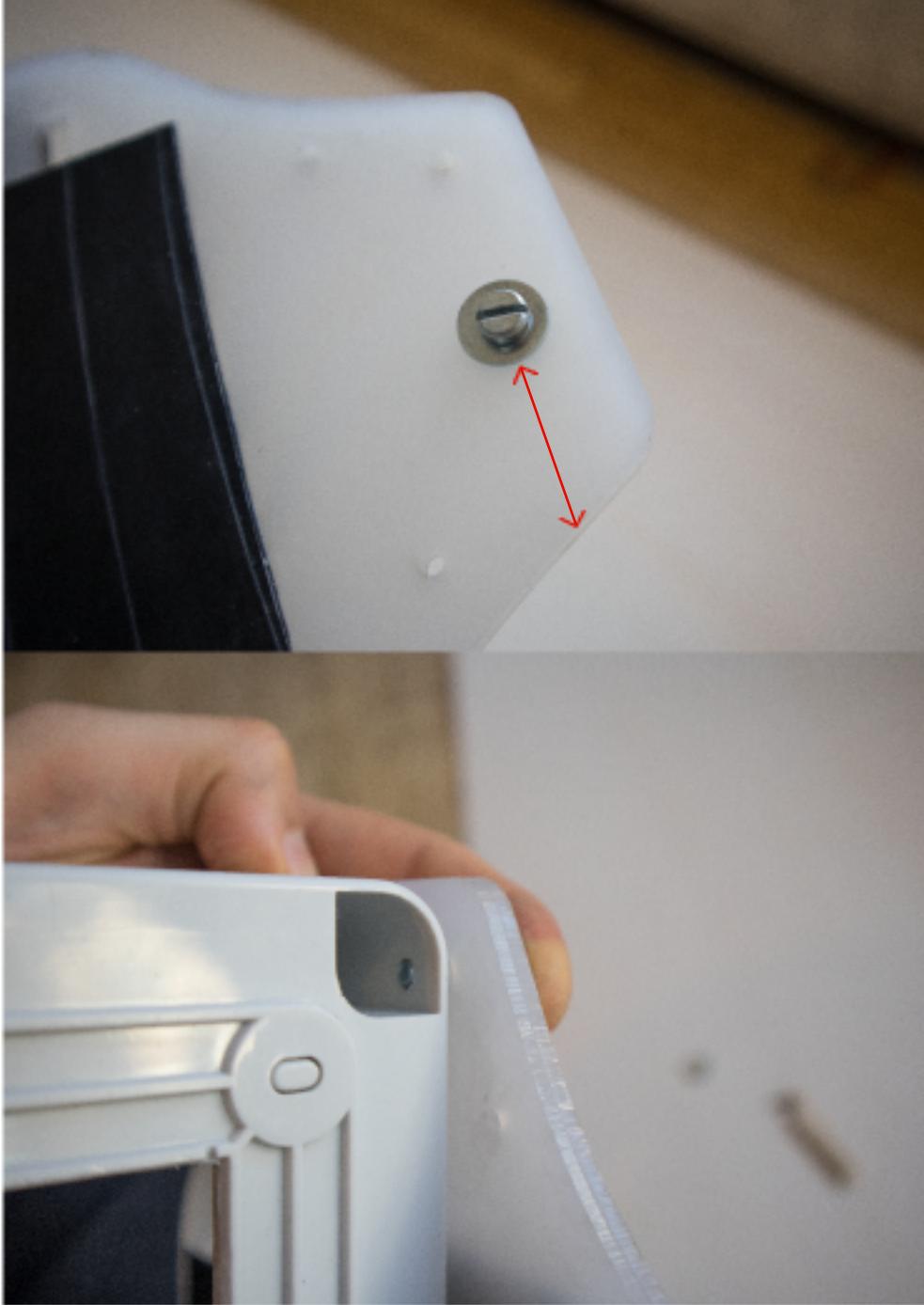
1 x Mounting plate

4 x m5 x 25mm bolts

4 x m5 washers

8 x m5 nuts

1. Add a washer and a bolt to the hole furthest away from the edge of the mounting plate



2. Add another washer and nut to the other side and don't tighten fully yet.



3. Hold the m3 nuts underneath the furthest in holes on both sides of the enclosure using the tool. Fully tighten as these will be inaccessible later. Tighten as per part 5. of this step.



4. Continue to do the same with the two lower holes

5. Tighten the nuts in this order

6. Tighten all the bolts and nuts

Fitting the Railing Mount

Step 7:

Needed:

- 2 x: 135 x 40mmx mm rubber strips
- 2 x: 83 x 40mm rubber strips
- 2 x: Large corner brackets
- 2 x: Small corner brackets
- 4 x: m3 x 12mm bolts
- 4 x: m3 nuts
- 2 x: m4.5 wing nuts
- 2 x: m4.5 wing bolts
- CA glue

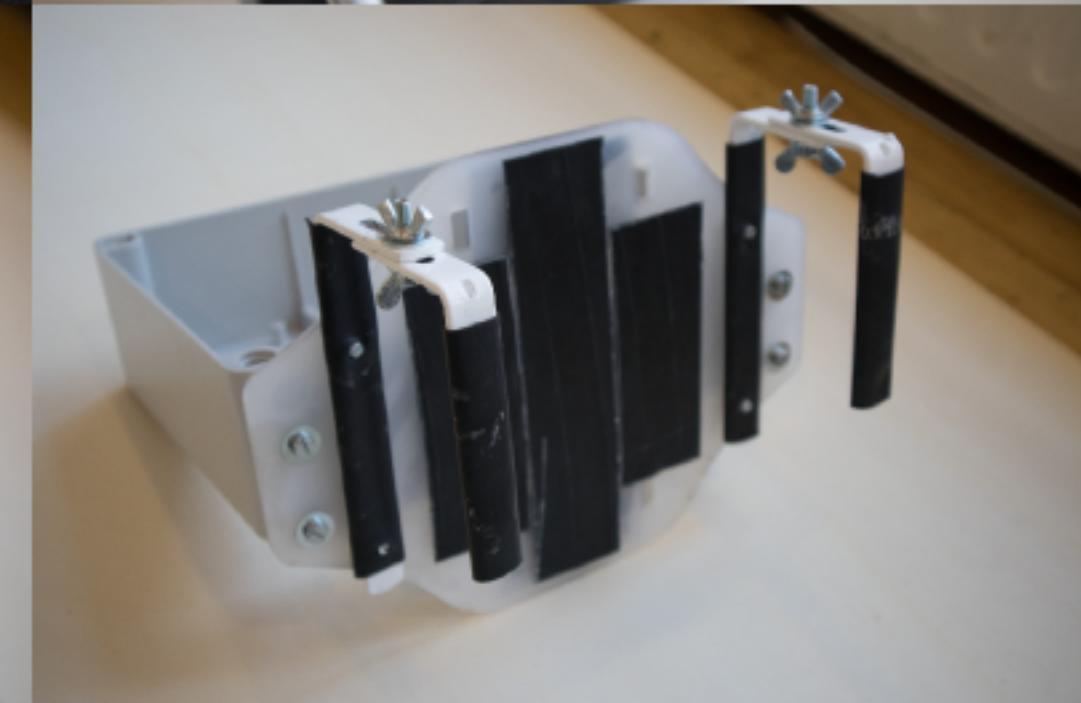
1. Wrap the rubber strips around the corner section tightly



2. Glue the ends of the strips together.



3. Make a hole though the rubber into the holes in the large corner brackets for the bolts to pass through



4. Attach the large corner brackets to the mounting plate

5. Use the wing nuts and bolts as well as the washers to join the 2 small corner brackets to the 2 large corner bracket as above

6. The wing nuts can be loosened and tightened to mount to different widths of railings

Preparing the Enclosure

Step 4:

Needed:

1 x Enclosure

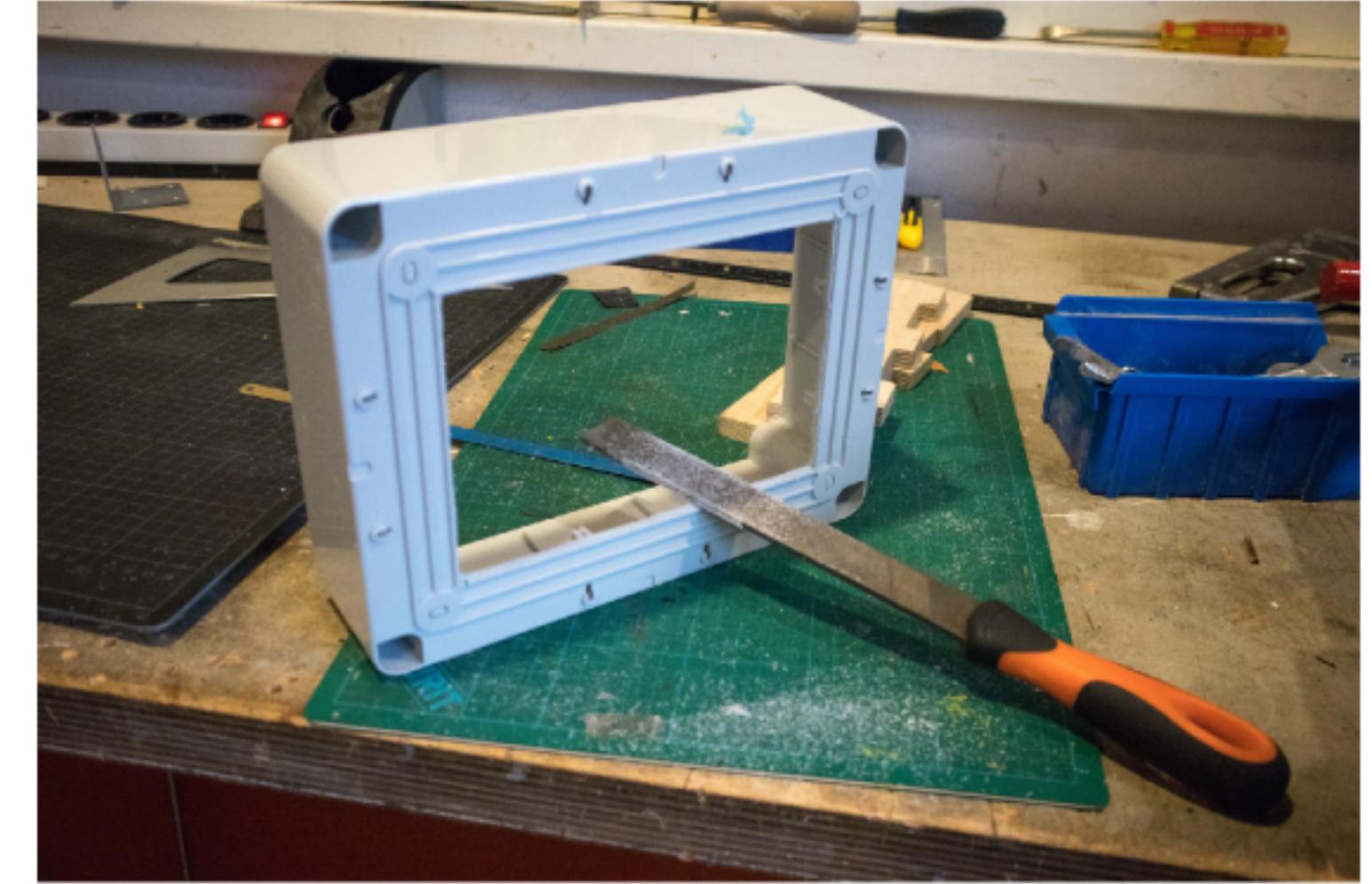
1 x Template mounting plate

1 x Rotary cutter/ some kind of saw



Carefully cut away the inner rectangle of the enclosure, using the first of the three ridges as a guide. A rotary cutter or some other saw can be used

Gradually increase the size of the drill bit to 4.8mm to avoid cracking of the enclosure.



Finish the rough edge of the cut with files and sandpaper



Line up the engraved lines on the mounting plate template ■ with the enclosure edge ■



Mark the centre of each of the holes ■ through the template. Drill the holes from the enclosure with a 4.8mm drillbit.

Attaching the Air Holes Plate

V

Step 5

Needed:

1 x Enclosure

1 x Air holes plate

1 x Drill

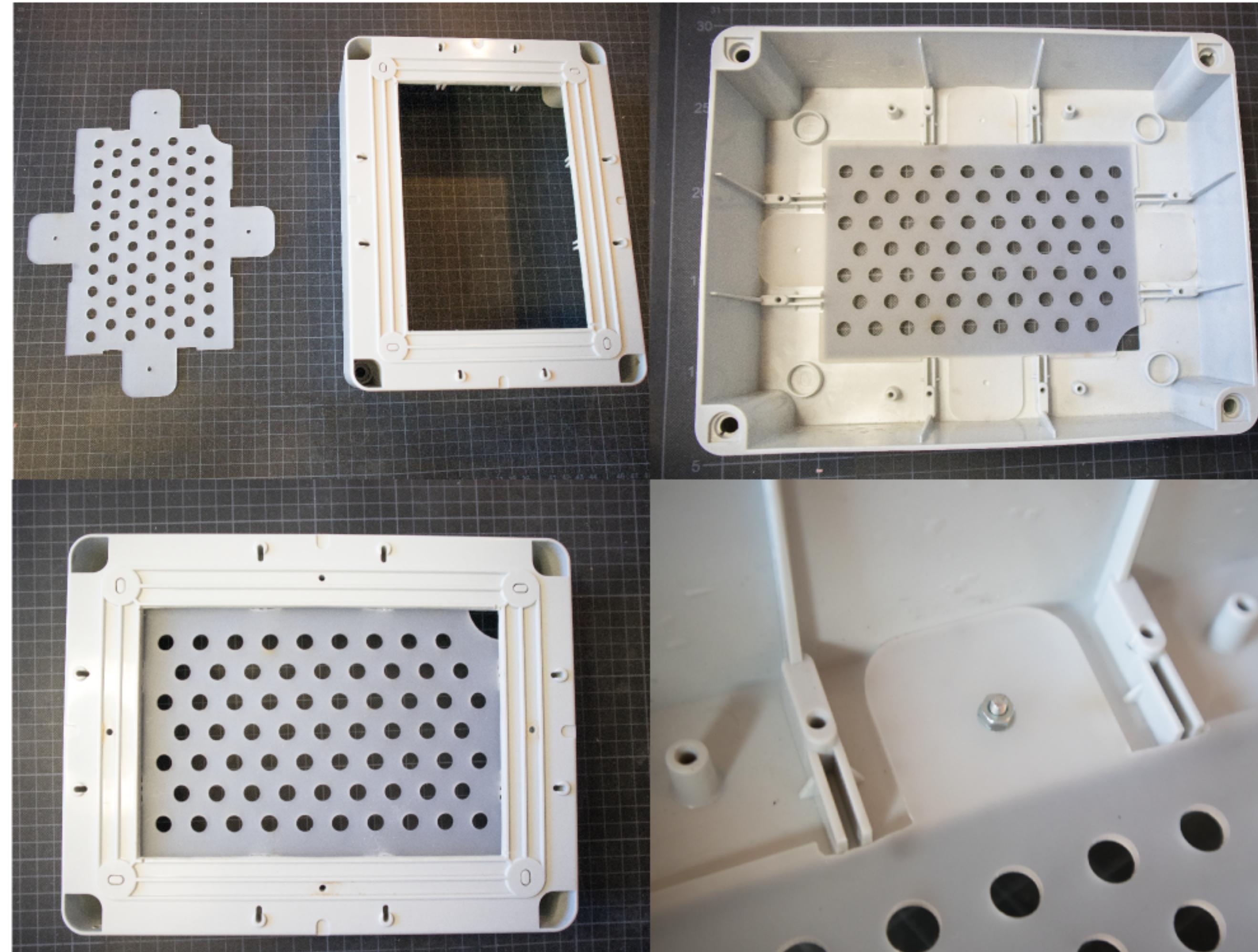
4 x m3 x 12mm bolts

4 x m3 washers

4 x m3 nuts

1. Gather the parts

2. Fit the air holes plate in the enclosure and use the holes in the plate as guides to drill through the enclosure



3. The holes should come out on the other side as shown above

4. Fix the air holes plate in place with the screws, washers and nuts

Fitting the Gas Sensor

Step 9:

Needed:

1 x Base plate

1 x Gas sensor

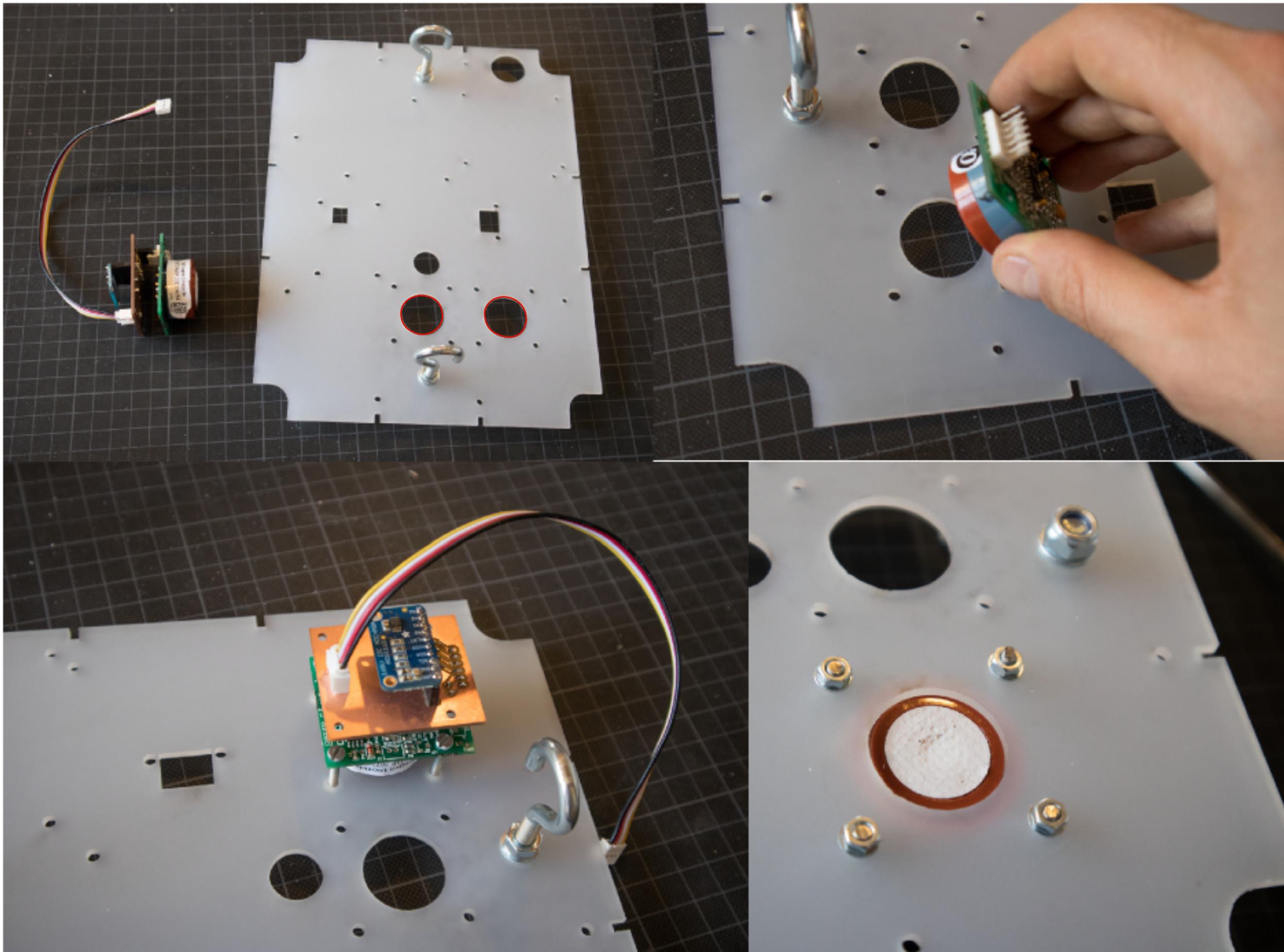
4 x: m3 x 25mm bolts

4 x: m3 nuts

4 x: m3 washerstt

1. The gas sensor mounts here ■ There is space for up to 2 gas sensors

2. Remove the top board of the gas sensor assembly and seat it in the hole



3. Join the gas sensor to the base plate with 4 bolts and replace the top board

4. Fix the gas sensor to the base plate with the nuts and spacers

Fitting the Sensors PCB & the Sound Sensor

Step 10:

Needed:

1 x Base plate

1 x Sensors PCB

1 x Sound sensor assembly

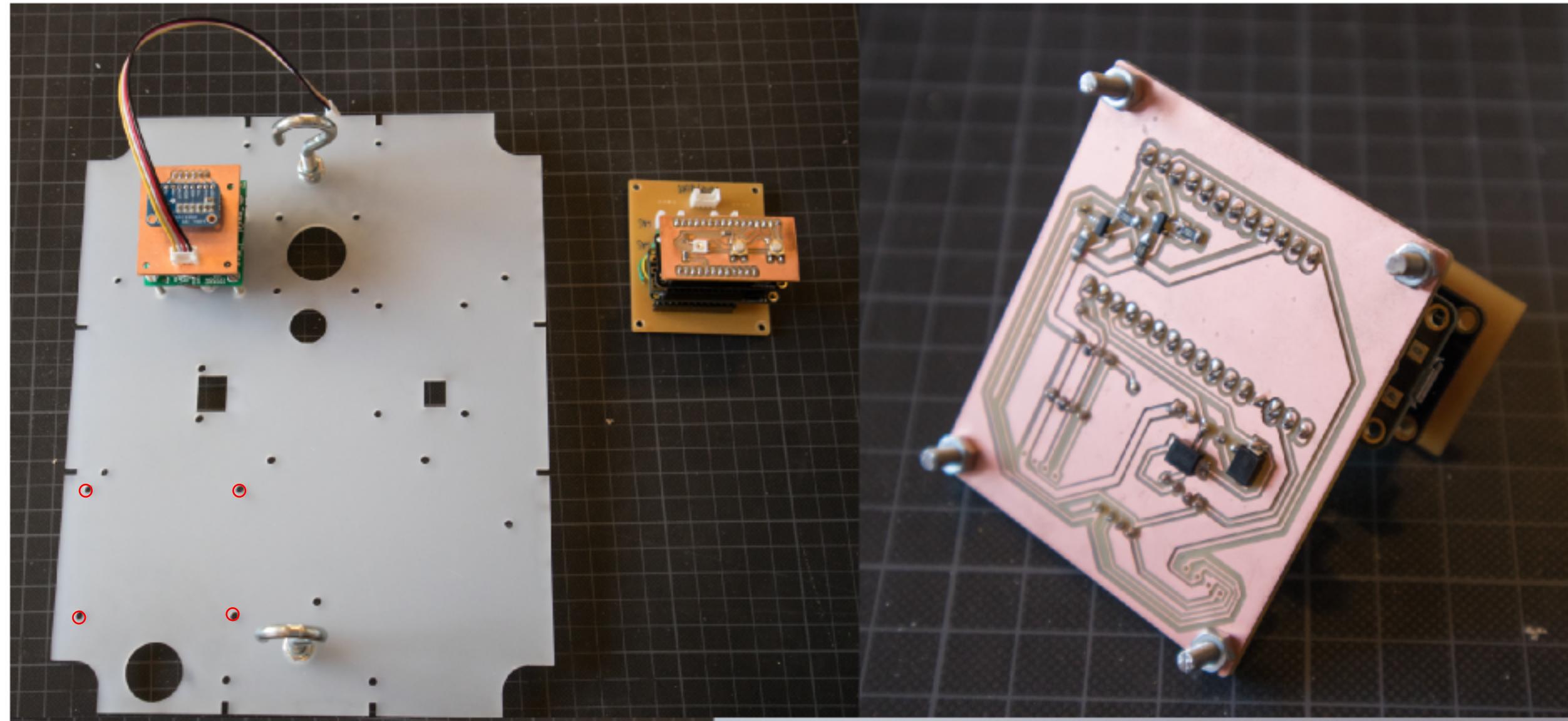
4 x: m3 x 30mm bolts

4 x: m3 x 25mm bolts

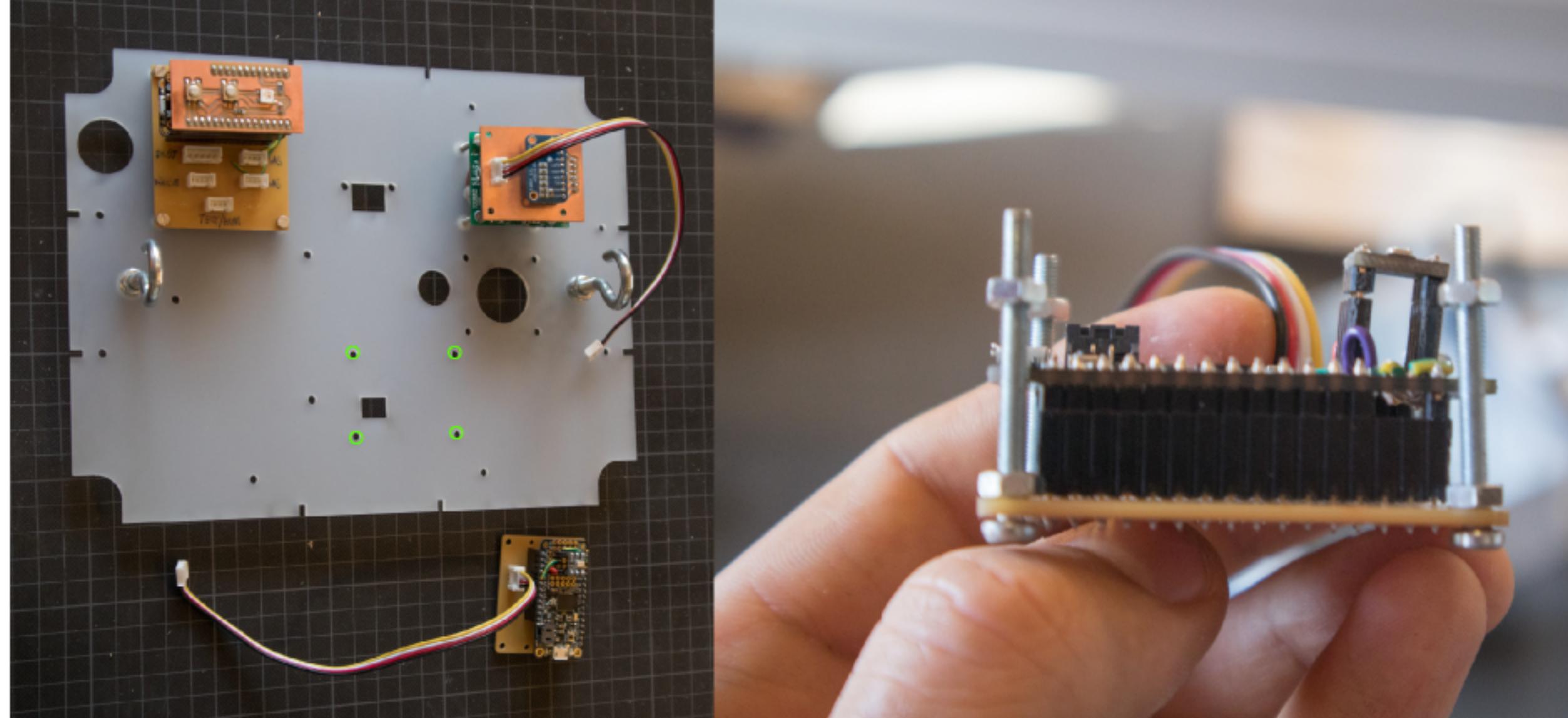
20 x m3 nut

8 x m3 washer

1. Fit the bolts and nuts to the sensors PCB as shown and mount on the ■ holes on the base plate, facing as shown.



2. Now do the same for the sound sensor assembly and the ■ holes. It only fits one way.



Adding the Rubber Seals

Step 11:

2. Cut the 22.23mm grommet for the USB cable with a cross to allow the cable to pass through, then fix it in the base plate

Needed:

1 x Base plate

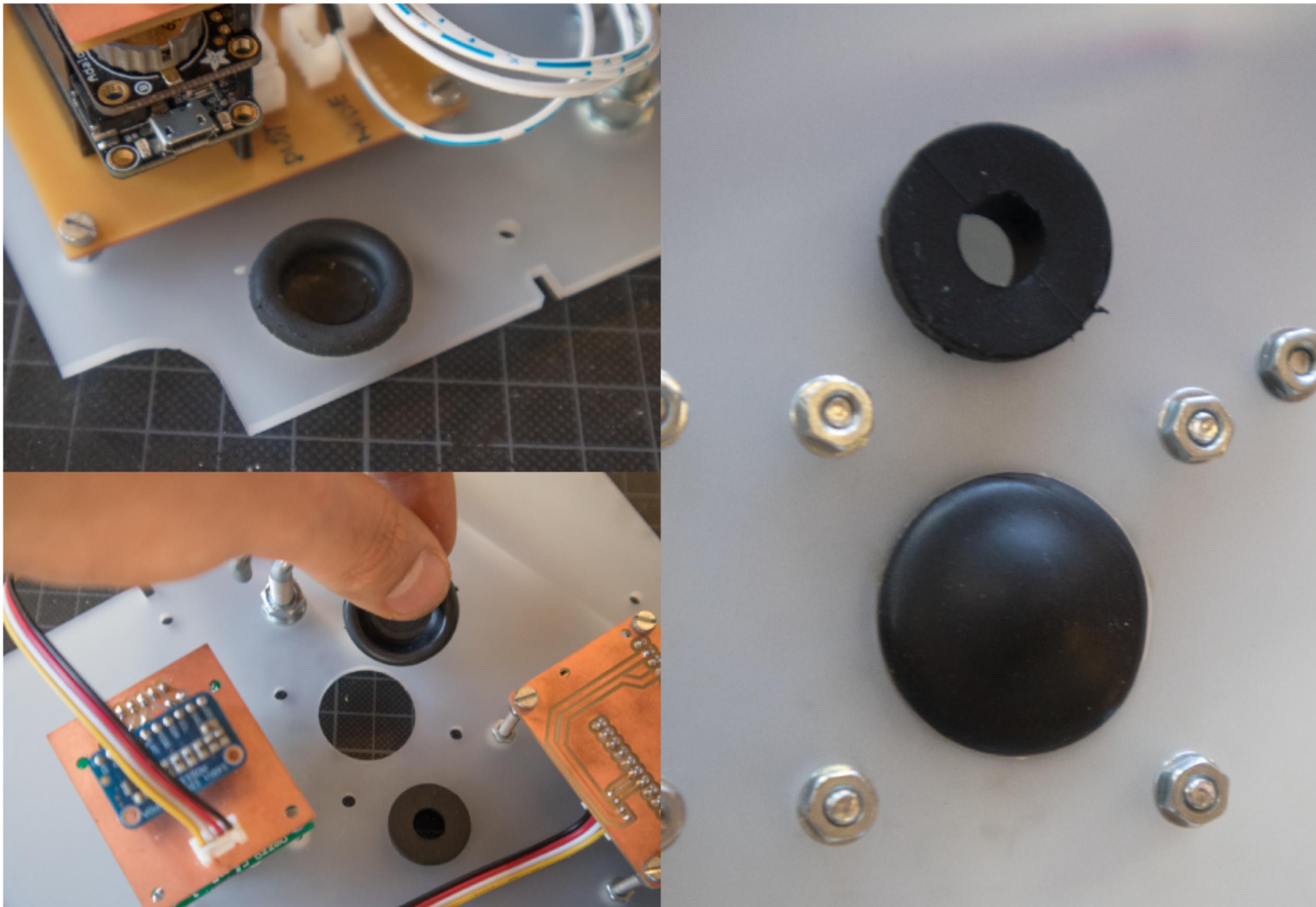
1 x: 19.05mm blind grommet

1 x: 22.23mm blind grommet

1 x: 14.29mm OD 7.94mm ID grommet

4 x m3 x 12mm bolts

4 x m3 nuts



2. If only one gas sensor is being used, the empty hole can be filled with a 19.05mm grommet

3. fit the 7.94mm ID grommet for the air hose to the hole near the 2 gas sensor holes

Fitting the Temp/Hu-midity/ Pressure Sensor

Step 12:

Needed:

1 x Base Plate

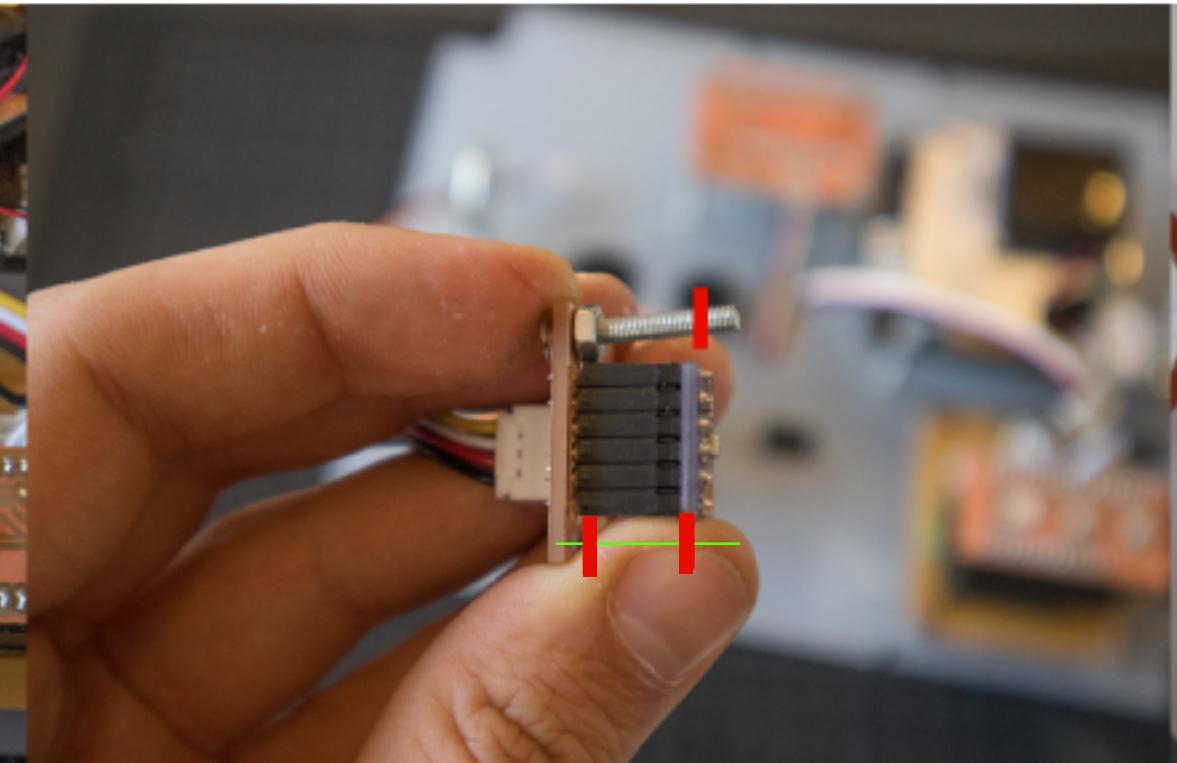
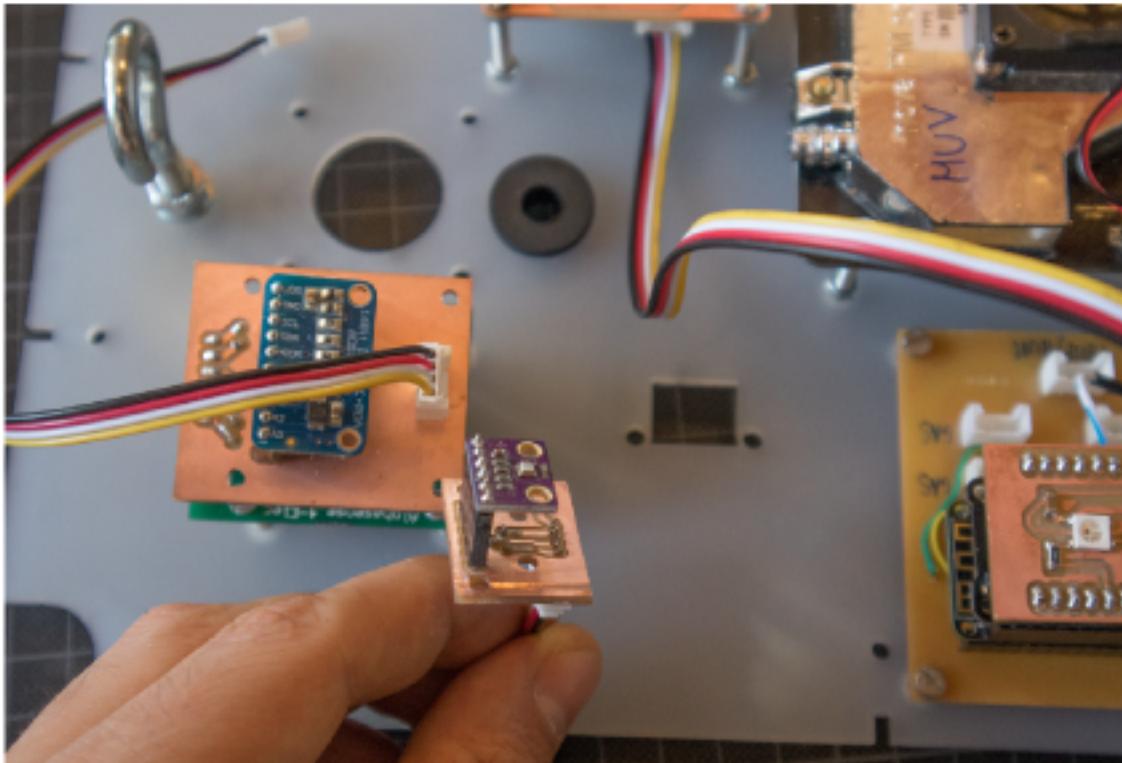
1 x Temp./humid./pres. sensor

2 x: m3 x 15mm bolts

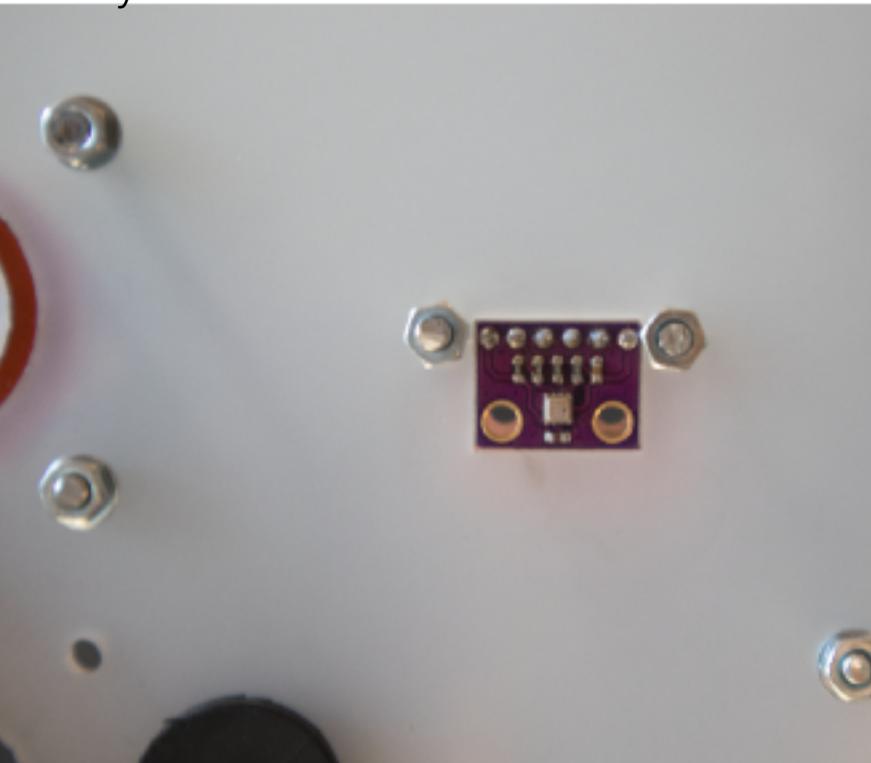
4 x: m3 nuts

2 x: m3 washerst

1. The sensor press fits in the base plate



3. Tighten the bolts carefully not to crack the acrylic as there isn't much material nearby them



2. Fix the nuts and bolt to the sensor as shown and do the same for the other 3 nuts ■ and the other ■

Glueing the Grip Pads

Step 13:

Needed:

1 x Mounting plate

1 x Dust sensor

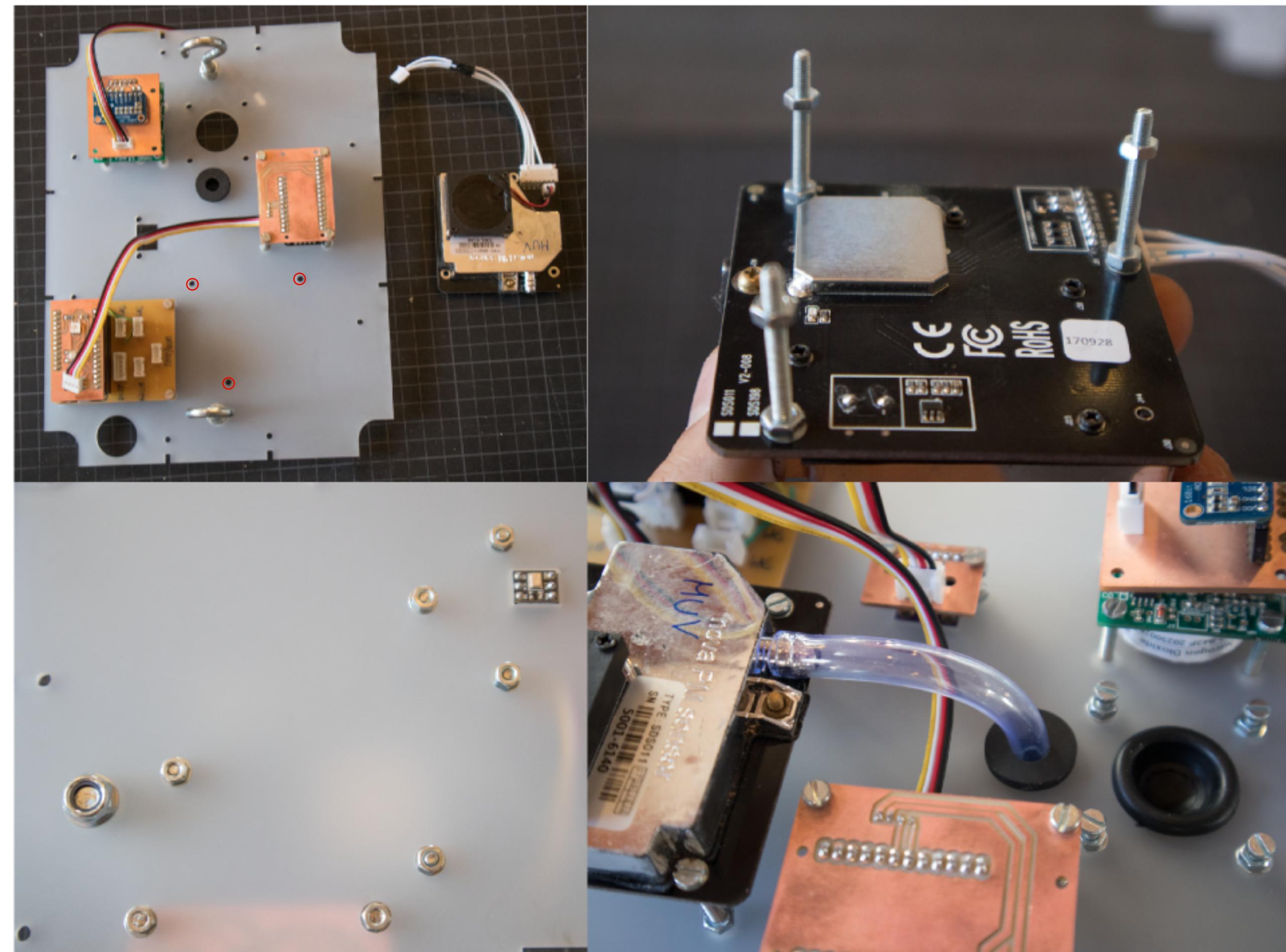
3 x: m3 x 30mm bolts

9 x: m3 nuts

1 x Air hose 6mm ID 8mm OD, 75mm long

3 x m3 washers

1. The dust sensor will mount to the ■holes. Arrange the nuts and bolts as shown below



2. Fix the dust sensor with the final nuts to the base plate

3. The dust sensor is raised above the base plate so that the angle of the tube is not too sharp. If it is, the tube will kink

Fitting the Base Plate

1. Thread the USB cable through the air holes plate and the grommet and plug it in to the sensors PCB

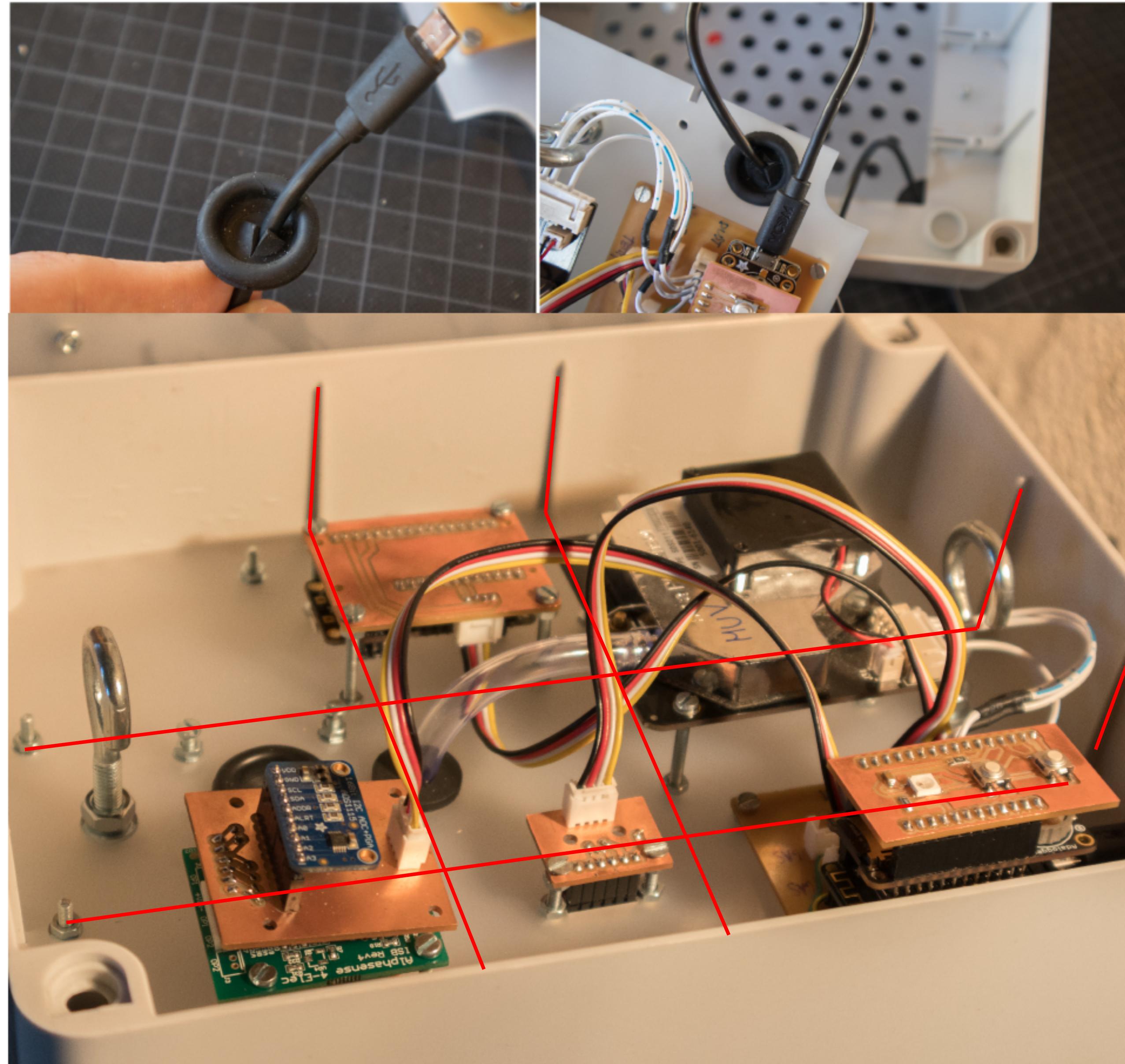
Step 14:

Needed:

1 x USB cable

1 X Enclosure

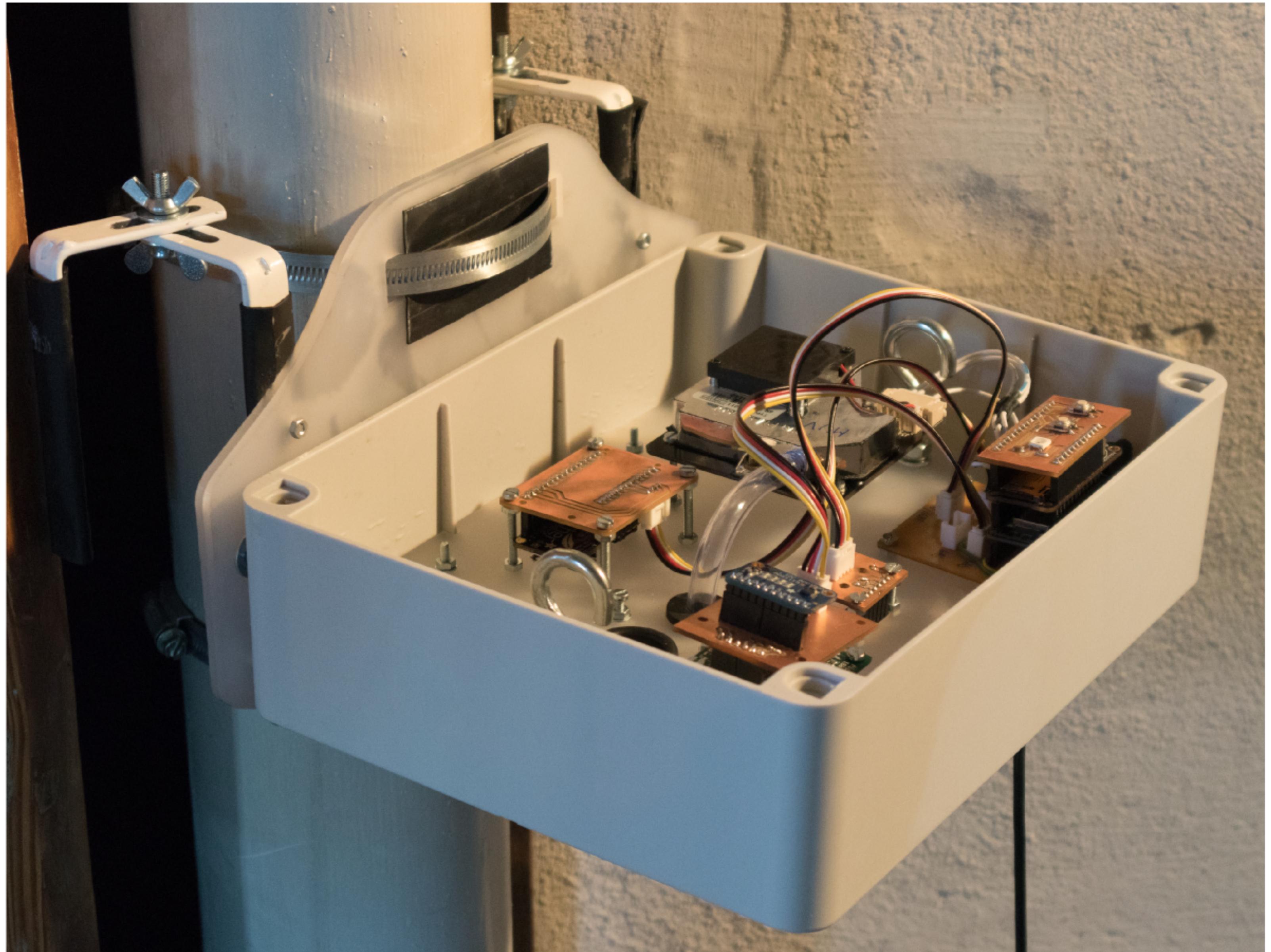
1 x prepared base plate



2. Fit the base plate into the enclosure with the hooks. Make sure the base plate is flat by pushing carefully over the rails of the enclosure ■

Mount the Sensor Kit

Finished!



The 2 hose clamps can be used to mount to vertical items such as drain pipes and the railing mount can be used to mount to horizontal items such as railings. Don't forget to put on the lid