Electronic Supplementary Material (ESI) for Reaction Chemistry & Engineering.
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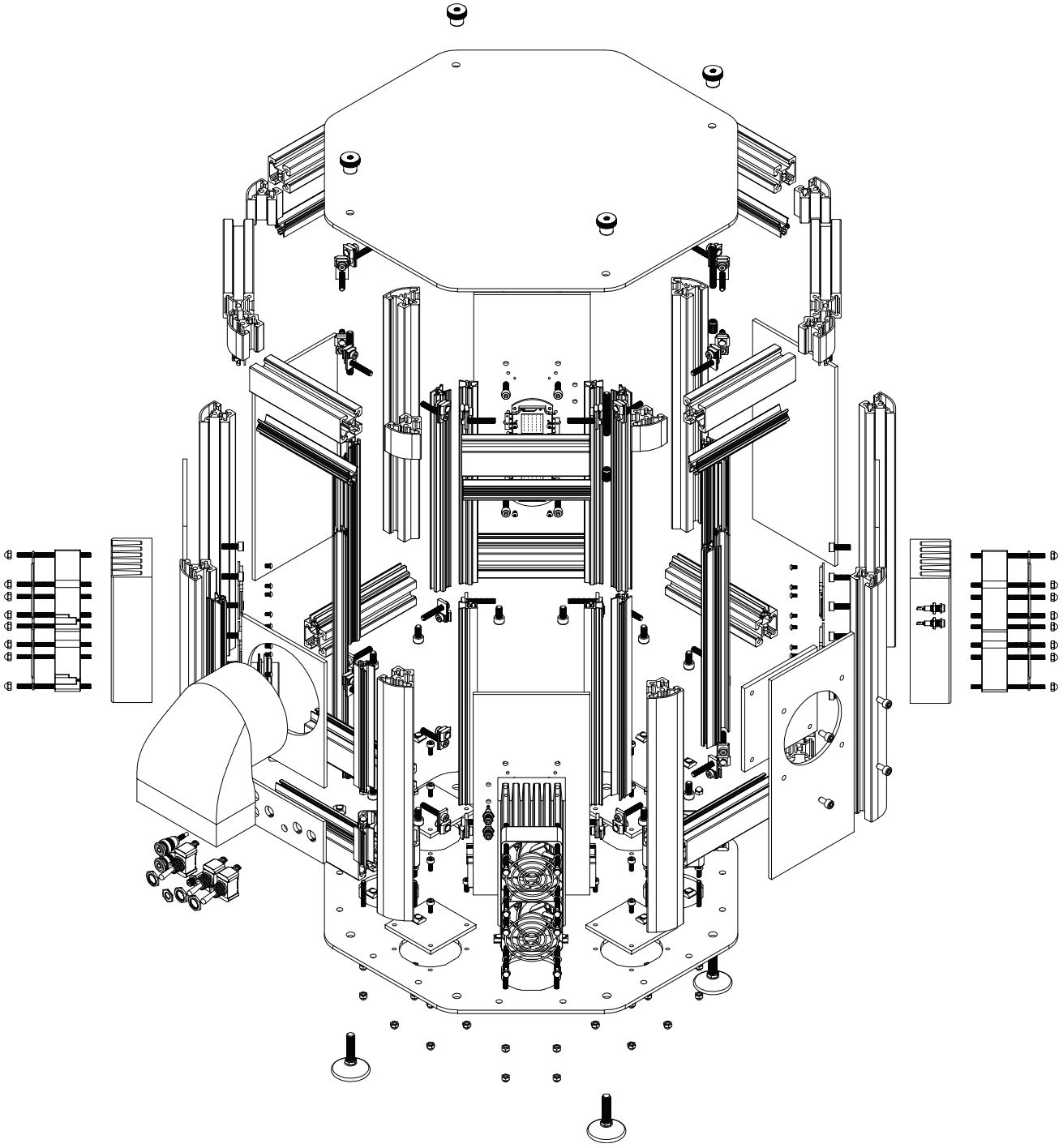
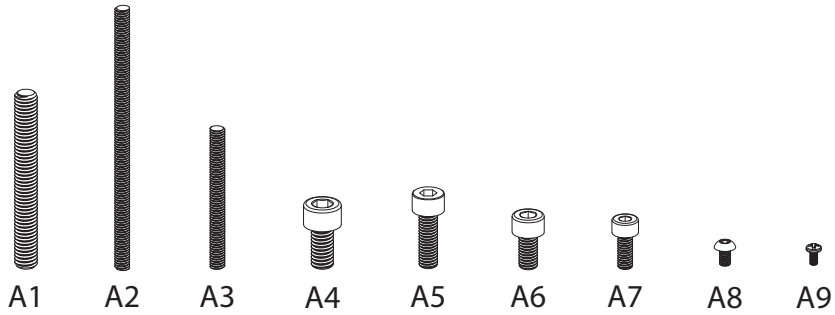
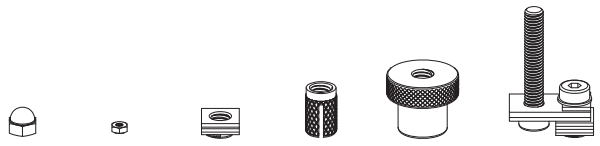
Construction Manual OctoColor



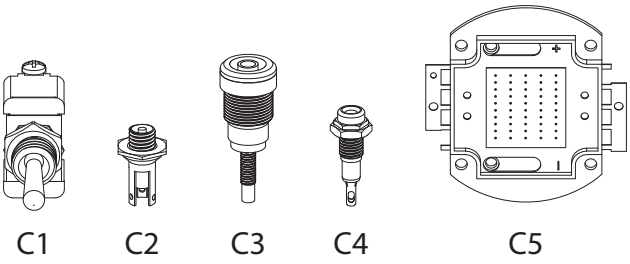
Parts



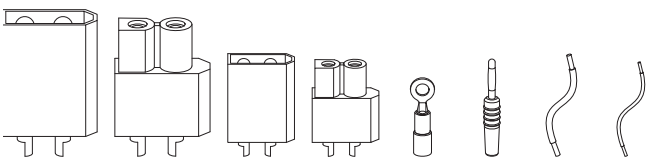
#	Description	
A1	M6 x 50 mm rod	x4
A2	M4 x 70 mm rod	x32
A3	M4 x 50 mm rod	x16
A4	M6 x 12 mm hex screw	x16
A5	M5 x 16 mm hex screw	x24
A6	M5 x 10 mm hex screw	x4
A7	M4 x 10 mm hex screw	x16
A8	M3 x 5 mm hex screw	x32
A9	M2 x 4 mm screw	x16

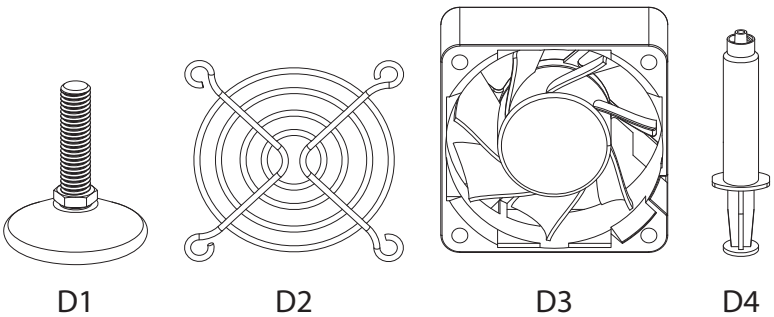


#		
B1	M4 Acorn nut	x80
B2	M2 nut	x16
B3	BLOCAN® T-Slot M6 - 4006712	x16
B4	Brass insert nut M6	x4
B5	Knob M6	x4
B6	BLOCAN® Bracket Short 30x30 - 4106702	x34

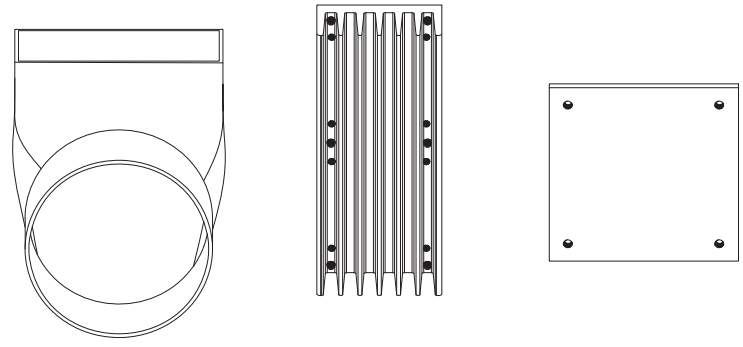


#		
C1	SCI R13-29A-01A-HWH Toggleswitch 250 V/AC 10 A	x3
C2	BKL Electronic 072335 DC-connector Bus	x1
C3	Stäubli SLB4-G, female Bus (1x Red and 1x Black)	
C4	SKS Hirschmann MBI 1, Ø: 2 mm (4x Red and 4x Black)	
C5	HotRed Official Store 50W Led Light (AliExpress)	x8
C6	Reely Bus XT60	x20
C7	Reely Plug XT60	x20
C8	Reely Bus XT30	x20
C9	Reely Plug XT30	x20
C10	TE Connectivity 34140 Ring Terminals	x40
C11	Stäubli SLS205-L plug, Ø: 2 mm (4x Red and 4x Black)	
C12	Copper Wire 16 AWG (Red and Black)	
C13	Copper Wire 22 AWG (Red and Black)	





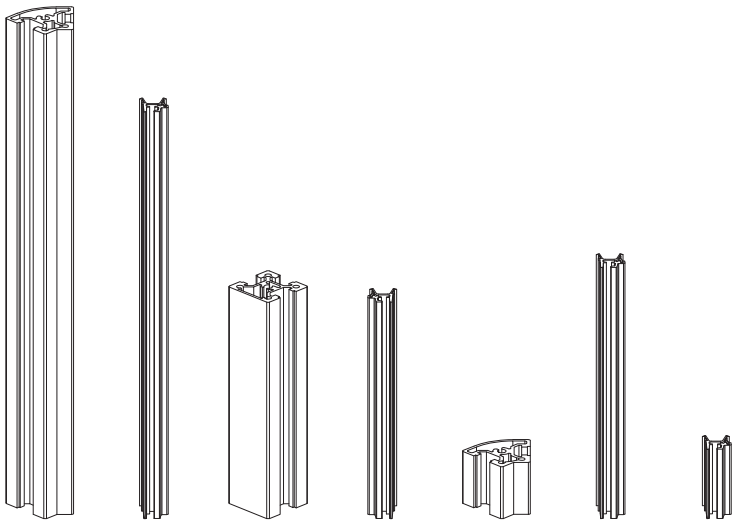
#		
D1	Feet M8	x4
D2	SEPA FG60 Fan Finger Guard 60x60 mm	x12
D3	Sunon 171056 Axiaalfan12 V/DC (l x b x h) 60 x 60 x 25 mm	x12
D4	Gelid GC-Pro Thermal Paste 7 W/mK 7 g	x4



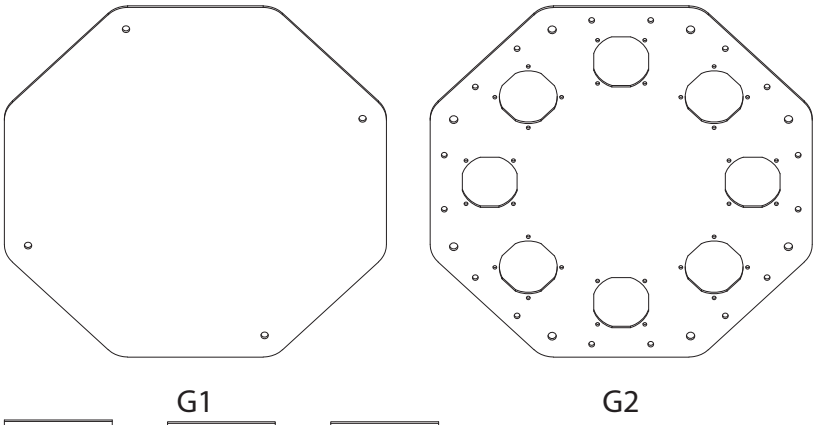
#		
E1	ROTHEIGNER Diverter 90° Round Square Flat 111 x 54 mm, Ø 100 mm, ROTHEIGNER Hoseconnector plastic white Ø 100 mm	x1
E2	Heatsink DEF76 - 150 mm https://www.deltourheatsinks.com/	x4
E3	Plexiglass tinted blue† 100x100x8 mm	x1

†) This is depending on the color of your LEDS, choice the opposite color for the Plexiglass. So for red LEDS take blue tinted Plexiglass for blue LEDS you take dark red/orange Plexiglass.

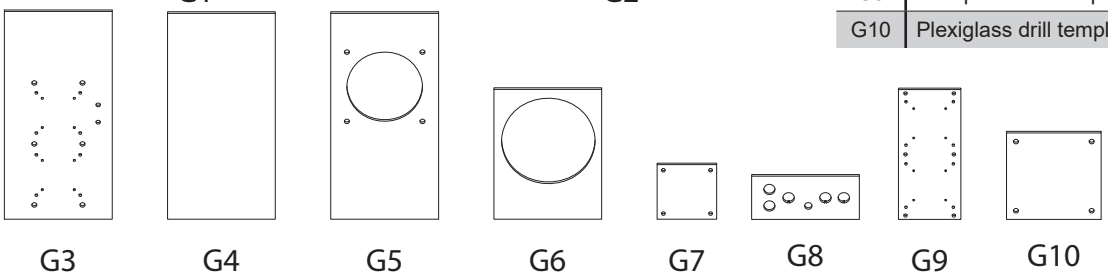
More parts



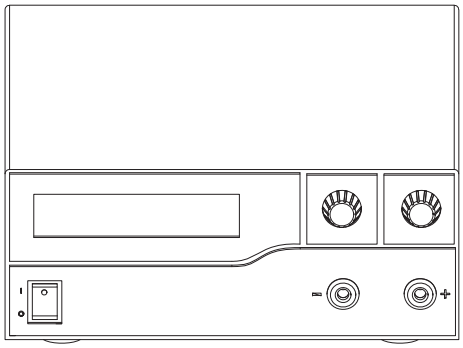
#	Description	
F1	BLOCAN® Aluminium Profiel W 30-45 - 4735001 - 280 mm	x8
F2	BLOCAN® 2-piece framing profile 4mm - 4018556 - 235 mm	x14
F3	BLOCAN® Aluminium Profiel F-G 30x30 - 4535001 - 125 mm	x17
F4	BLOCAN® 2-piece framing profile 4mm - 4018556 - 125 mm	x18
F5	BLOCAN® Aluminium Profiel W 30-45 - 4735001 - 30 mm	x8
F6	BLOCAN® 2-piece framing profile 4mm - 4018556 - 145 mm	x2
F7	BLOCAN® 2-piece framing profile 4mm - 4018556 - 40 mm	x2



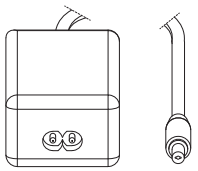
#		
G	Aluminium 1050a 4mm thick	
G1	Top plate 404x404x4mm	x1
G2	Bottom plate 404x404x4mm	x1
G3	LED plate 240x114x4mm	x4
G4	Blank plate 240x114x4mm	x2
G5	Viewport plate 240x114x4mm	x1
G6	Air plate 146x114x4mm	x1
G7	Fan cover plate 63x63x4mm	x4
G8	Utility plate 50x114x4mm	x1
G9	LED plate drill template 150x66x4mm	x1
G10	Plexiglass drill template 100x100x4mm	x1



Equipment



H1



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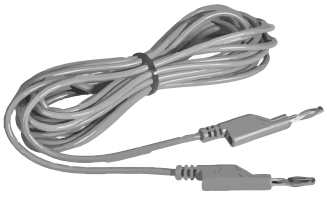
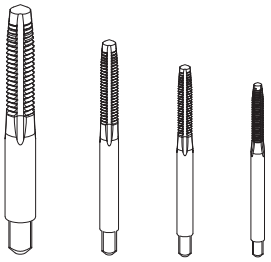


H3

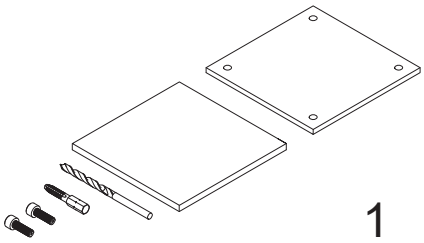


H4

#	Description	
H1	VOLTCRAFT DPPS-32-30 Bench PSU 1 - 32 V DC 0 - 30 A 960 W	x1
H2	Dehner Elektronik ATS 036T-A120 power-supply 12V/DC 3A 36W	x1
H3	Safety laboratory cables, Red and Black	
H4	Thread Taps, 8mm, 5mm, 4mm, 3mm	

Viewport plate assembly

To assemble the view-port plate first we need to drill and tap the Plexiglass plate by using the template (G10), if you already performed this then excellent! Go to step 8, if not start at step 1.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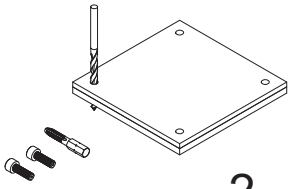
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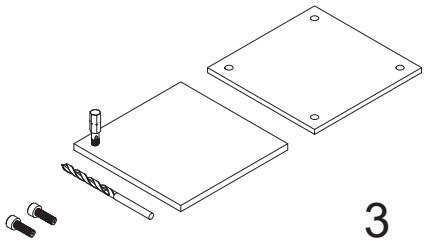
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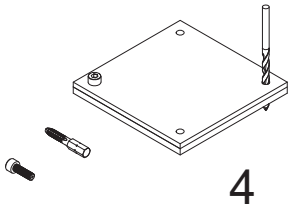
1. Tools required for this operation are a M5 thread tap, a 4.5 mm drill, and 2 M5x10mm hex screws.
2. Add the template (G10) on top of the Plexiglass square and drill the first hole through the plastic.
3. Remove the template and thread the hole with the M5 thread tap.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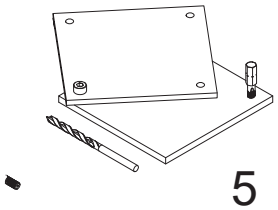
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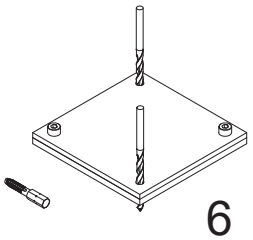
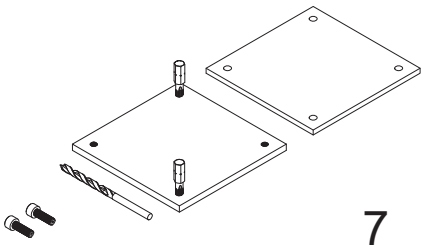

6

4. Add the template back on the plexiglass and secure the plate by the use of a M5 hex screw, drill now the second hole on the opposite side of the first hole.
5. Slide the template to the side but keep the screw in place. Thread the second hole with M5 thread tap.
6. Add the template back and secure the plate by adding the second screw, This will prevent the template from shifting. Drill now the two remaining holes.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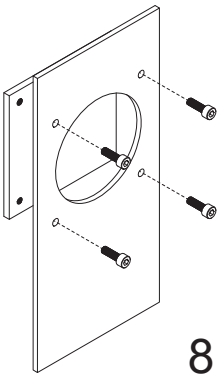
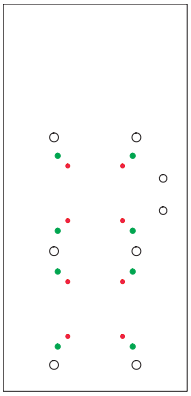

8

9

7. Remove the template and thread tap the remaining holes.
8. Attach the Plexiglass to the view-port plate by using 4x M5x10mm hex screws.
9. Finished product.

LED plate assembly



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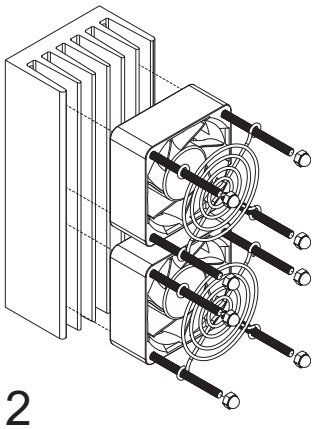

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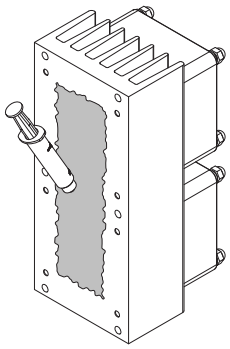

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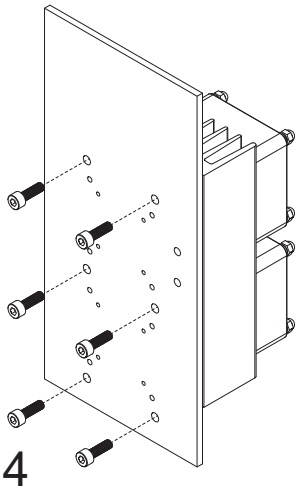
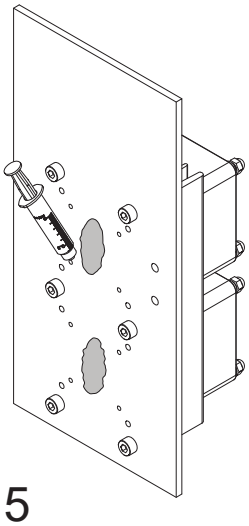


4

1. Thread the red highlighted holes of the led plate (G3) with a M3 thread tap and the green highlighted holes with a M4 thread tap.
2. Attach the fan finger guard and the fans on the heat sink by screwing in the M4x70mm rods with M4 acorn nuts as the cap. Make sure the fan's arrow is pointed towards the heat sink.
3. Apply thermal paste on the heat sink side, the amount should be enough to cover the area where the powerleds are going to be placed.
4. Attach the led plate (G3) to the heat sink assembly with the M5x12mm hex screws.



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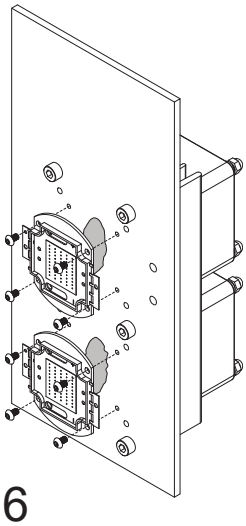

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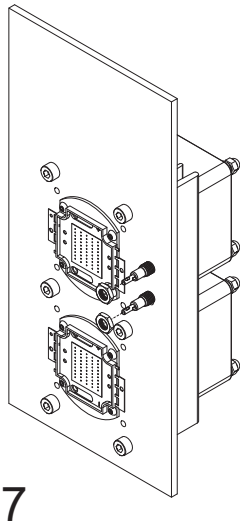

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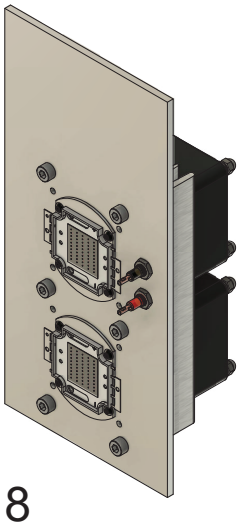
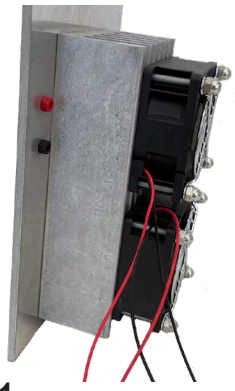


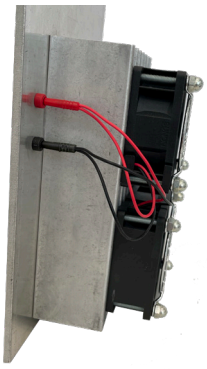
8

5. Apply also here thermal paste, enough to cover the surface of the powerled.
6. Attach the powerleds on the led plate with the M3x5mm hex screw. Excess thermal paste squeezed out under the powerled can be cleaned with isopropanol.
7. Insert and attach the two jacket busses (2 mm diameter, C4).
8. Final assembly, continue to LED plate wiring assembly.

LED plate wiring assembly



1



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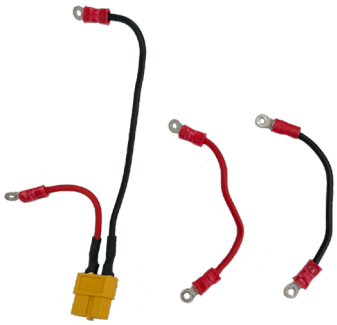
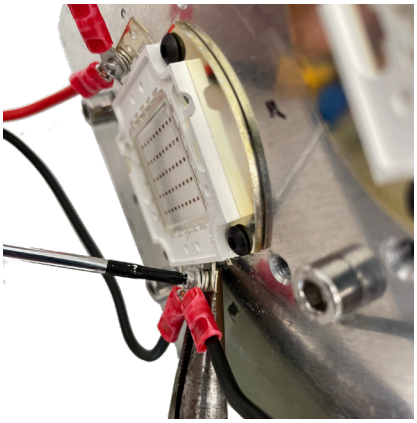


3

1. Wires of the fans should stick to the side of the LED plate with the connectors.
2. Combine the red and the black wires and solder them to the red and black 2mm banana plugs (C11).
3. Use a XT60 plug and attach a red and black 16 AWG wire. Cut on length and crimp the ring terminals on the end wires. Make also a red and black wire with on both ends crimped ring terminals



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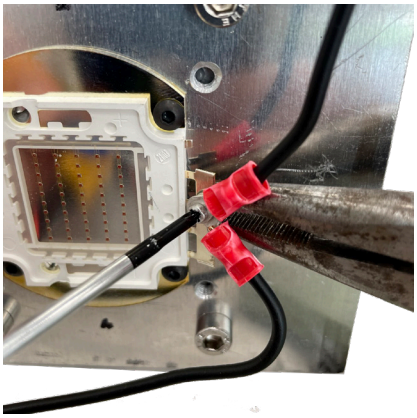
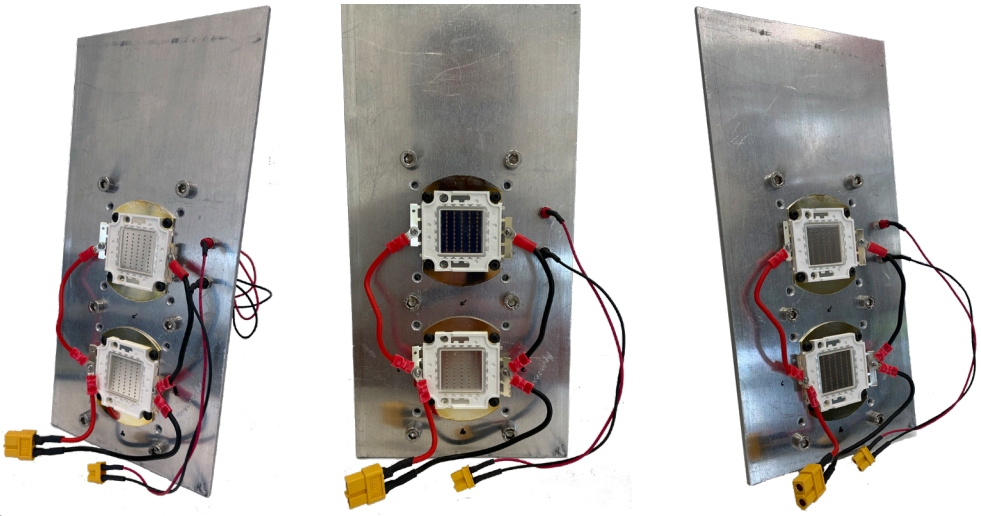


5

4 and 5. Connect the red and black wires together with the powerled by using a 2Mx4mm screw and nut. Alternatively you can solder directly the wires to the powerleds.

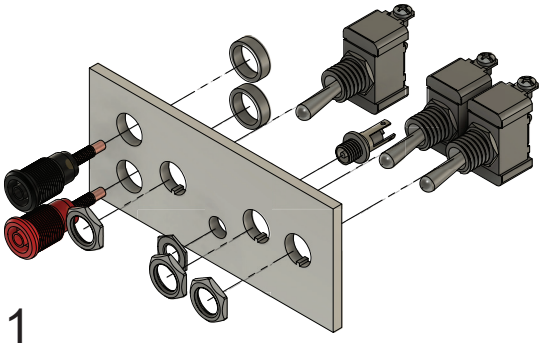


6

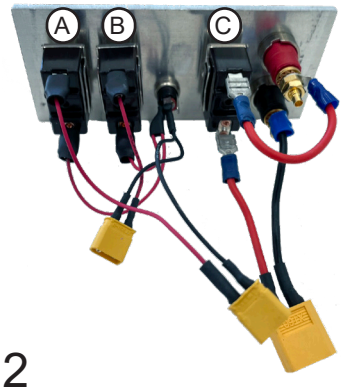
6. Solder 22 AWG red and black wire and connect this to a XT30 plug. Connect the red and black wire to the 2mm banana plug bus (C4). LED plate is completed.

Due to the modularity of the design other colored LED plates can also of course be made. The example we are showing here is the creation of red light LED plates. Blue light LED plates have also been made in the exactly the same way.

Utility plate assembly

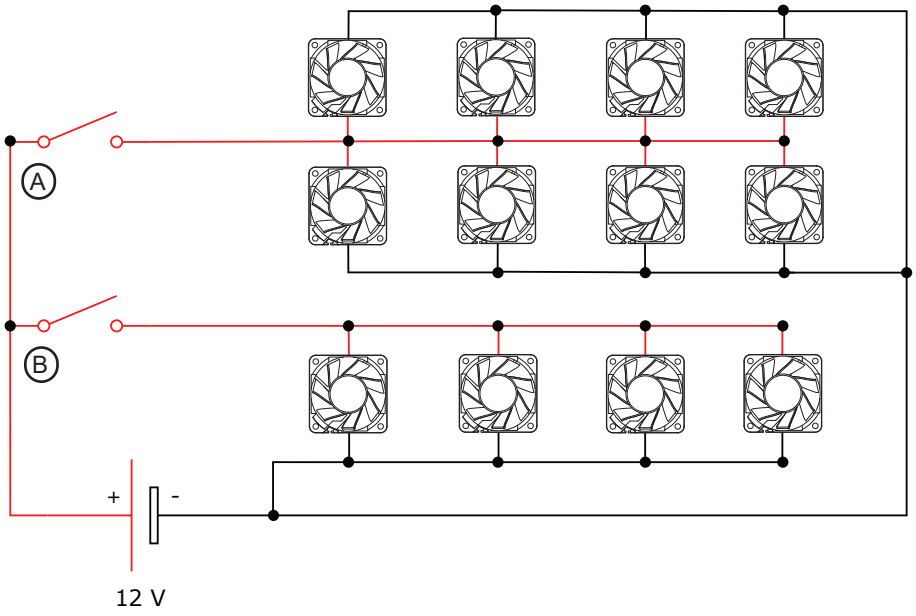


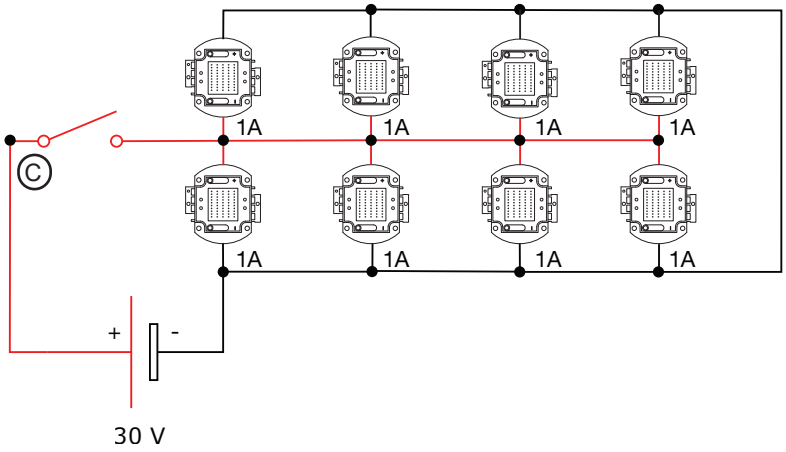
1



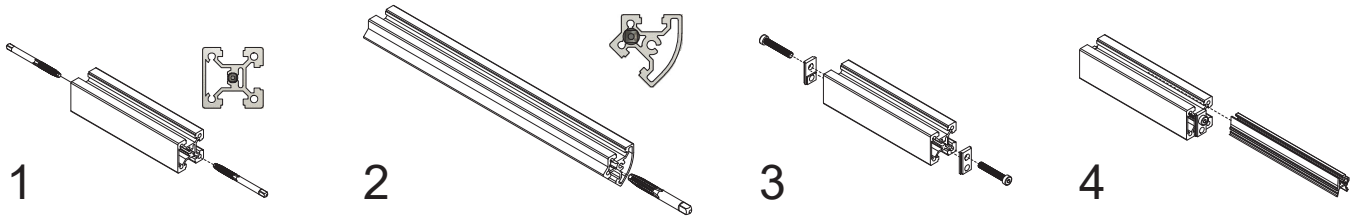
2

1. Assemble the utility plate with the banana plugs, DC bus and the switches.
2. Add the wires in the order shown here for a parallel connection of the switches and the power. See the diagram below for the connection wiring. For both A and B a XT30 bus is needed and 22 AWG wire, for C a XT60 bus and 16 AWG wire.

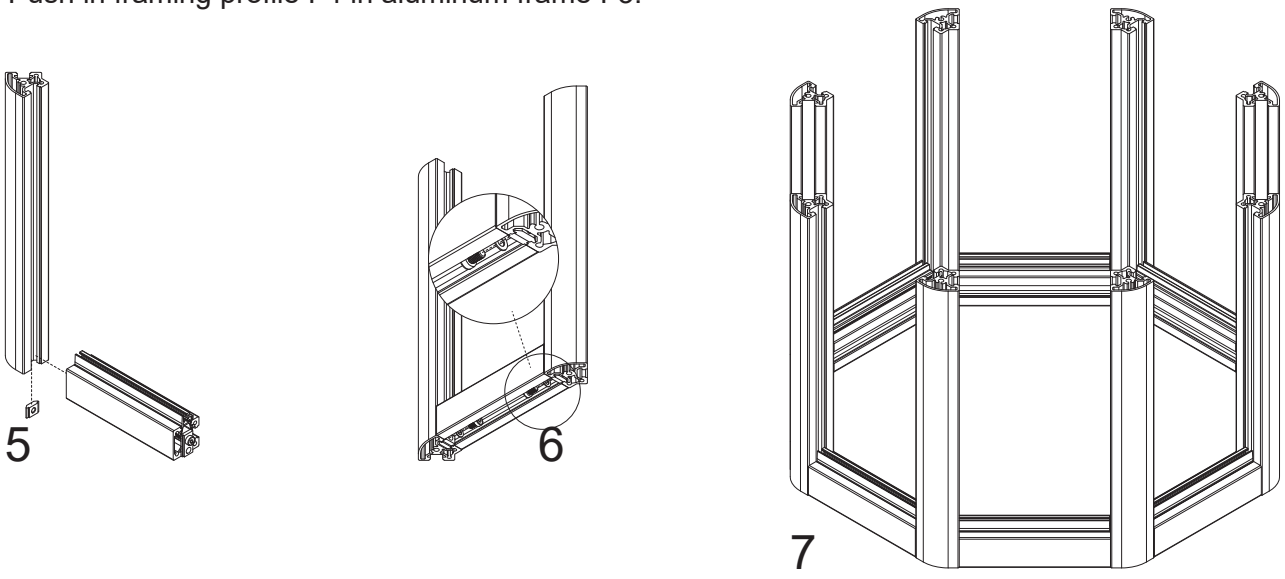




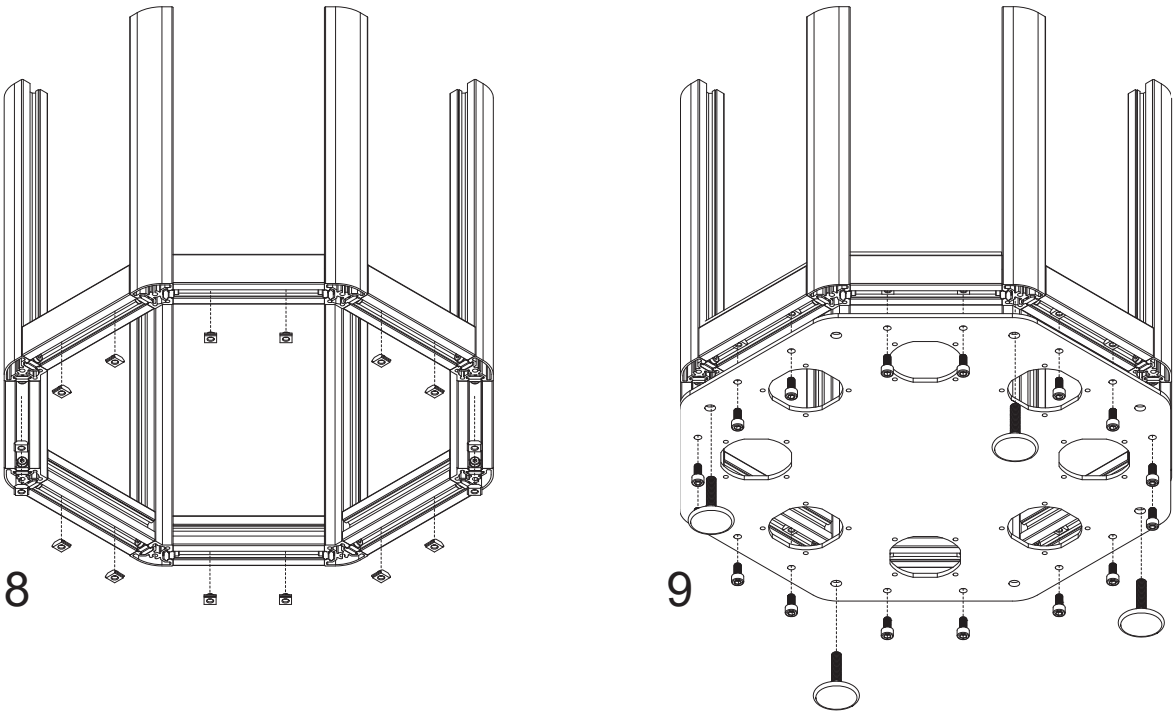
Main body assembly



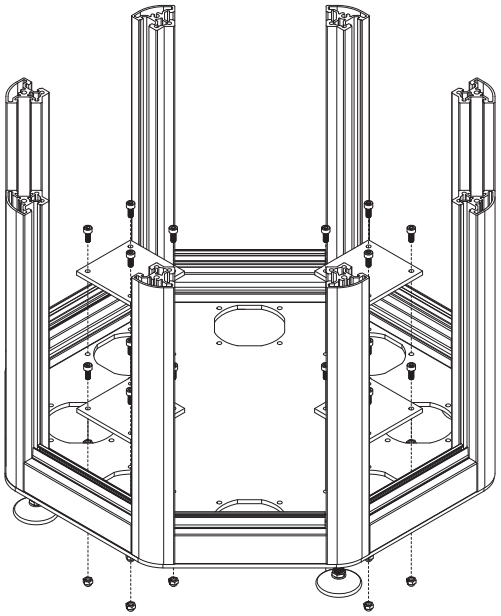
1. Tap M5 thread in aluminum frame F3.
2. Tap M8 thread in aluminum frame F1.
3. Screw in plate from bracket short (B6) on both side of F3.
4. Push in framing profile F4 in aluminum frame F3.



5. Slide T-slot from B6 into aluminum frame F1
6. Attach F3 to F1 with ring and hex socket screw from B6, repeat on other side of F3
7. Repeat step 3 till 6 for fully assembled frame



8. Insert T-slot M6 (B3) by pushing them in the frame, make use of paper or cardboard template to place them correctly for the next step.
9. Add aluminum bottom plate (G2) and attach it to the frame with M6x12 mm hex screw (A4) and screw in the feet (D1).



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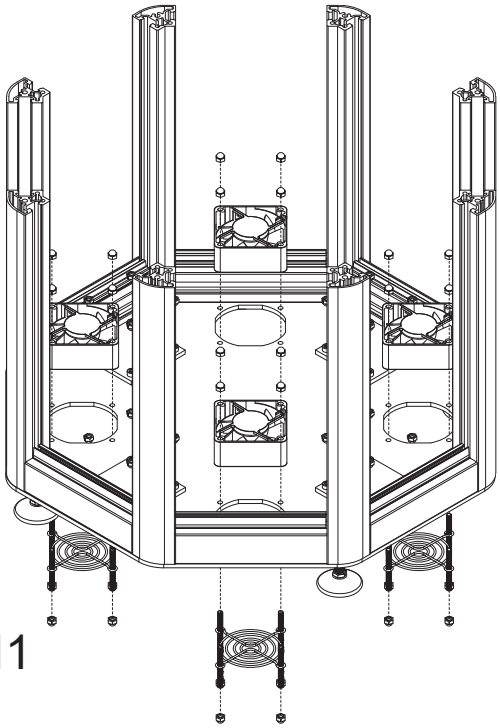
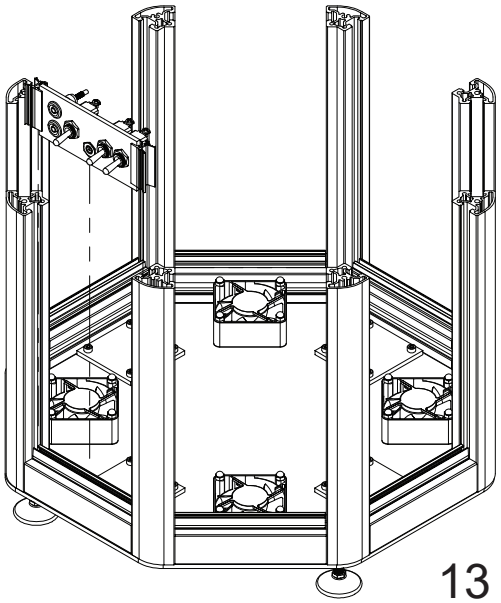


11

10. Close of any unused fan holes with the fan cover plates (G7) by using M4x10 mm hex screw and the M4 acorn nut (A7 en B1 respectively)
11. Add the fans, with the arrow pointing into the reactor, on top and the fan finger guard on the bottom of the bottom plate by inserting the M4 x 50 mm rods and capping both sides with an M4 acorn nut.

12



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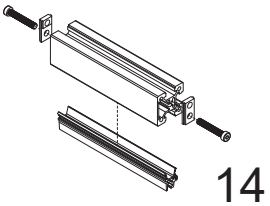

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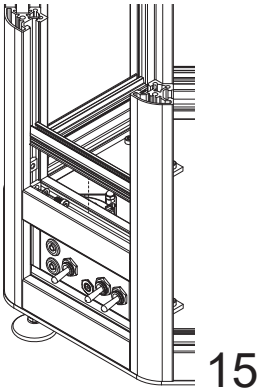
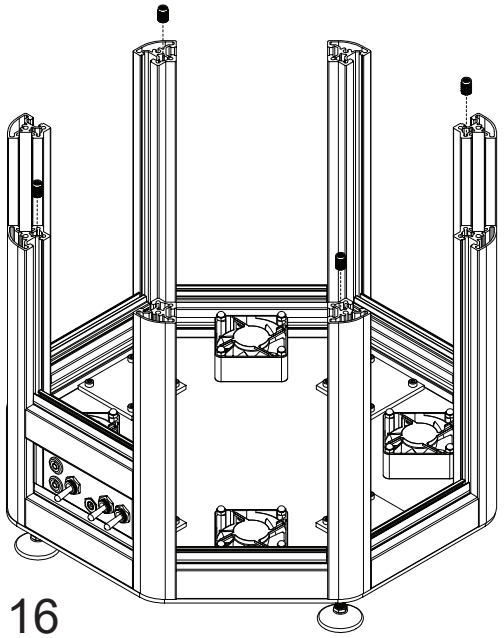


15

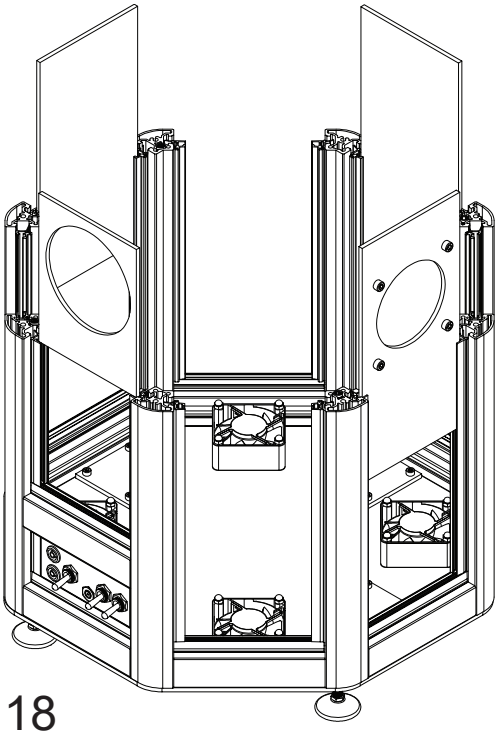
12. Render of the assembly of the bottom frame.
13. Add assembled utility plate to the frame with the side profiles (F7)
14. Assemble the utility top frame
15. Add utility top frame in the main frame



16

17

16. Hamer in brass screw on top of the side frames.
17. Add the remaining profiles



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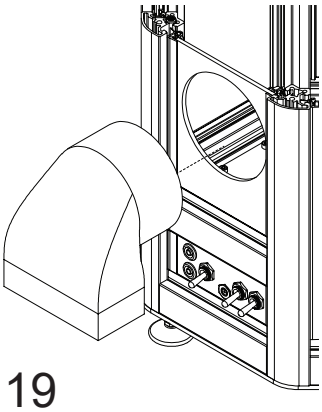

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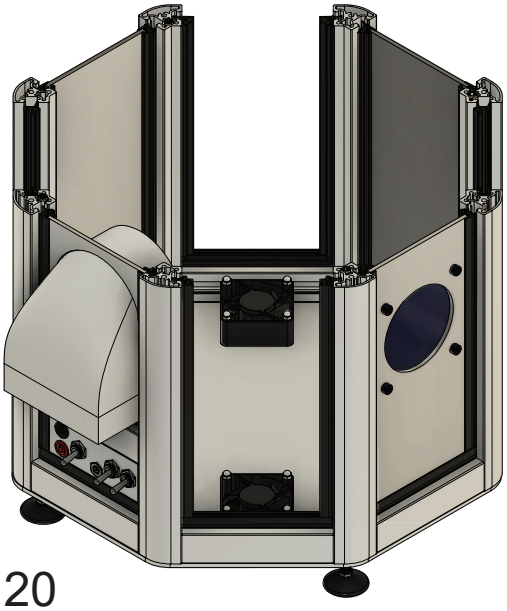
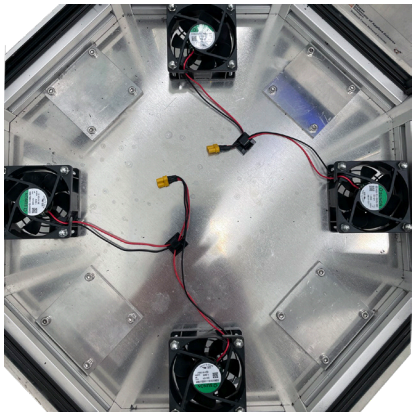


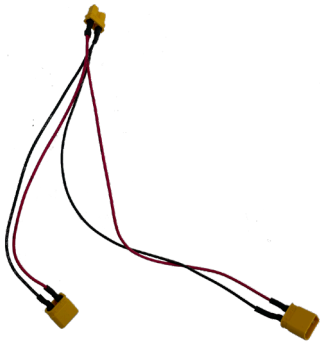
20

18. Insert the cooling plate (G6), the 2 blank plates (G4), and the view port assembly.
19. Add E1 in the cooling plate.
20. Render of half way complete assembly, continue to wiring.

Wiring assembly



1



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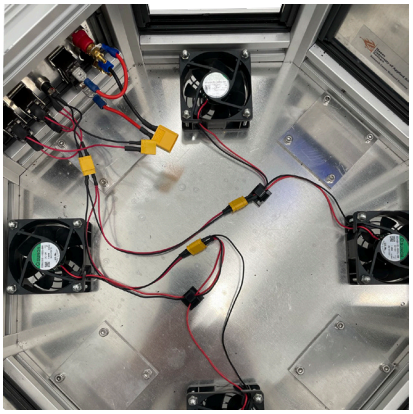
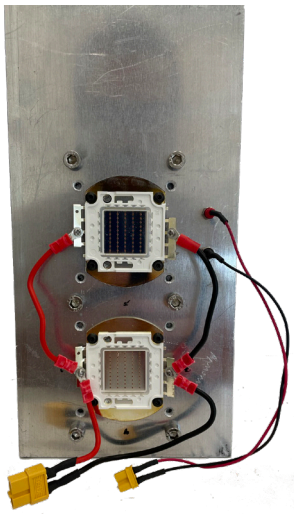


3

1. Connect the bottom plate ventilators in pairs, and add an XT30 plug on each end.
2. Make a parallell connector with 2 XT30 busses connected to 1 XT 30 plug with 22 AWG wire.
3. Connect the bottom plate ventilators to the utility plate. Test the setup.



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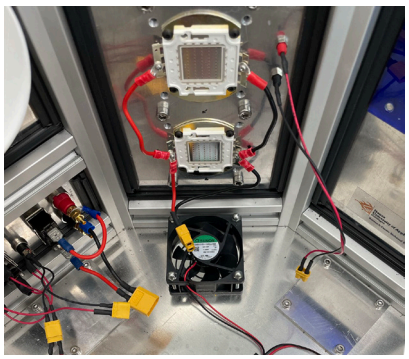
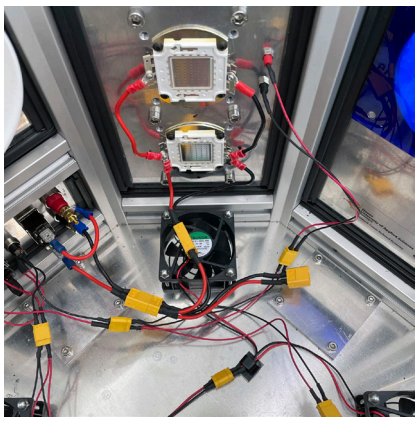
5



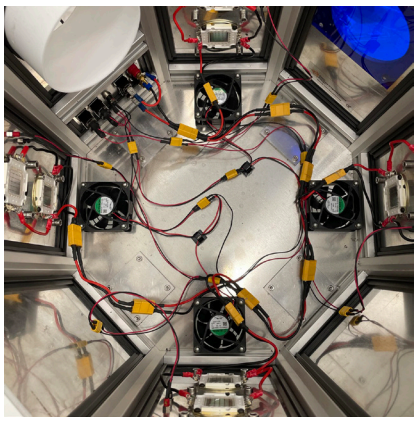
6

4. Take a fully assembled LED plate.
5. Make a parallell connector with 2 XT60 busses connected to 1 XT 60 plug with 16 AWG wire and a parallel wire like in step 2.
6. Slide in the fully assembled LED plate.



7

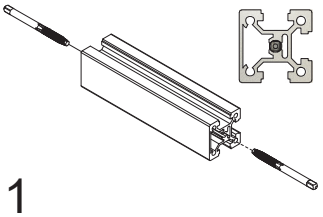
8



9

7. Connect the LED power connector and the ventilator connector to the utility plate.
8. Test the setup, make sure that the ventilators of the LED plate are working. DO NOT LOOK IN THE LIGHT, and wear protective colored glasses.
9. Repeat process till everything is connected.

Lid and final assembly



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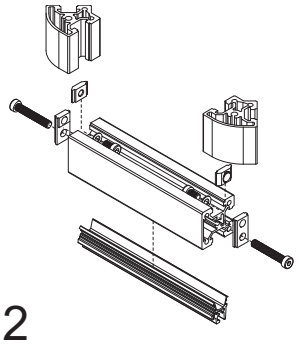

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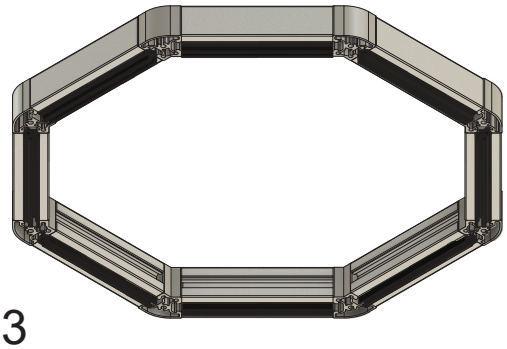
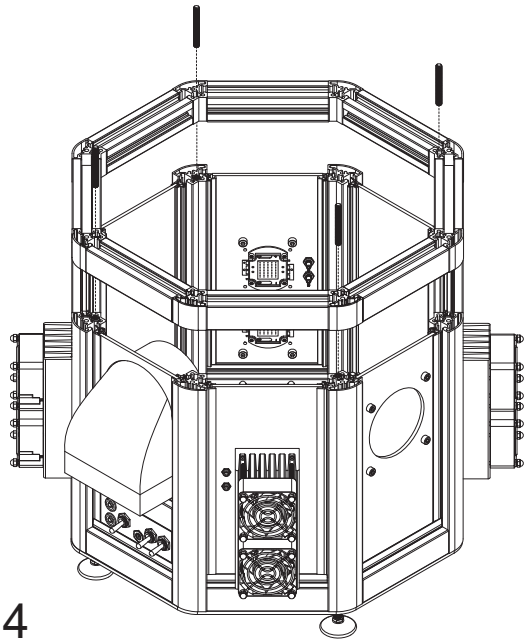


3

1. Tap M5 thread in aluminum frame F3.
2. Add framing profile F4 and screw in plate (B6) on both side of F3, and attach F5 with the T-slot and hex screws, continue till it looks like picture 3.



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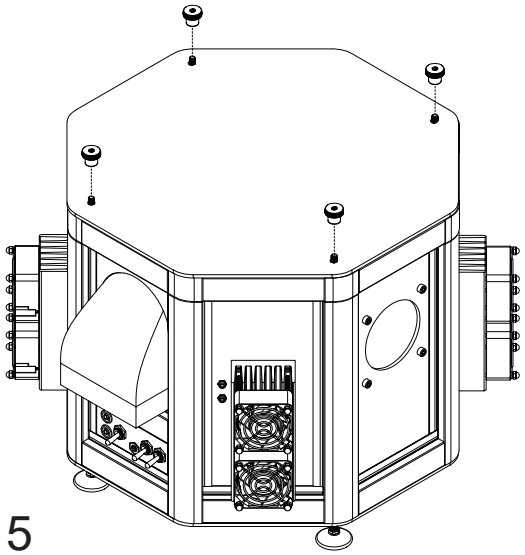
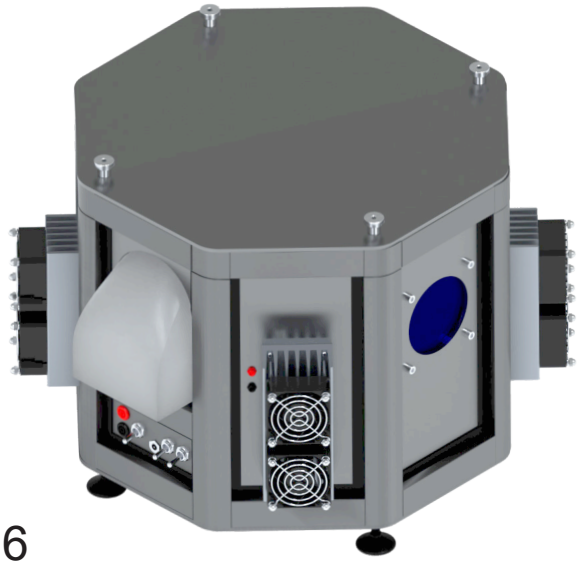


5

1. Add M6 rods (A1) in the brass screws and overlay the assembled ring (3).
2. Add top plate (G1) and screw in the knobs (B5).



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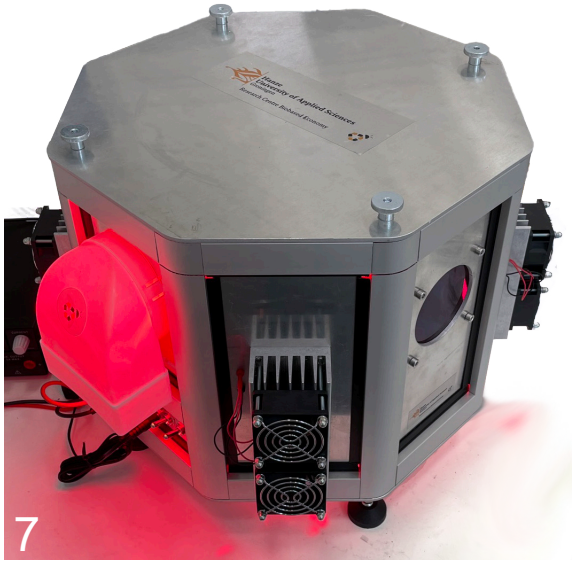
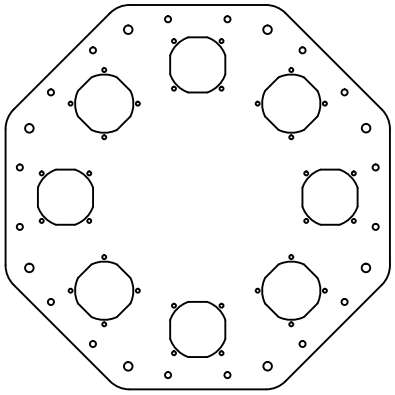


7

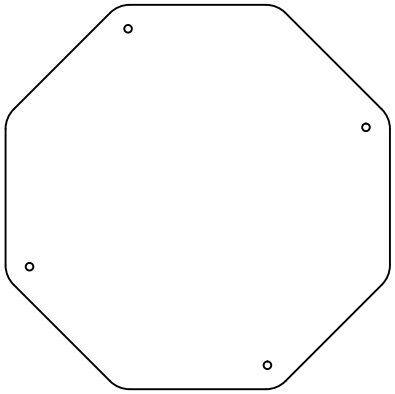
6. Render of final assembly
7. Picture of final assembly the octoColor with red lights working.

OctoColor Cutouts DXF content

Bottom plate

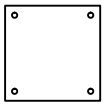


Top plate

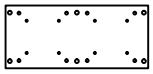


Fan plate

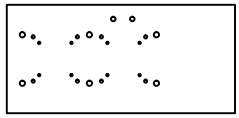
Plexiglass drill template



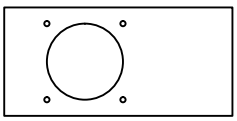
Led plate drill template



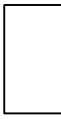
Air plate



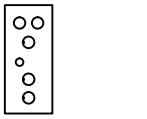
Utility plate

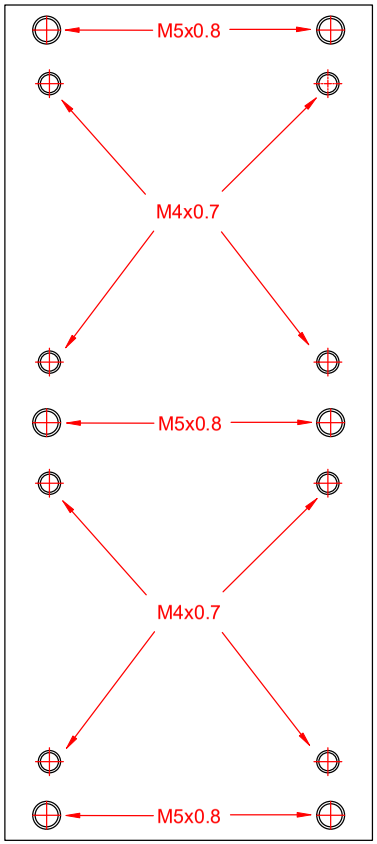
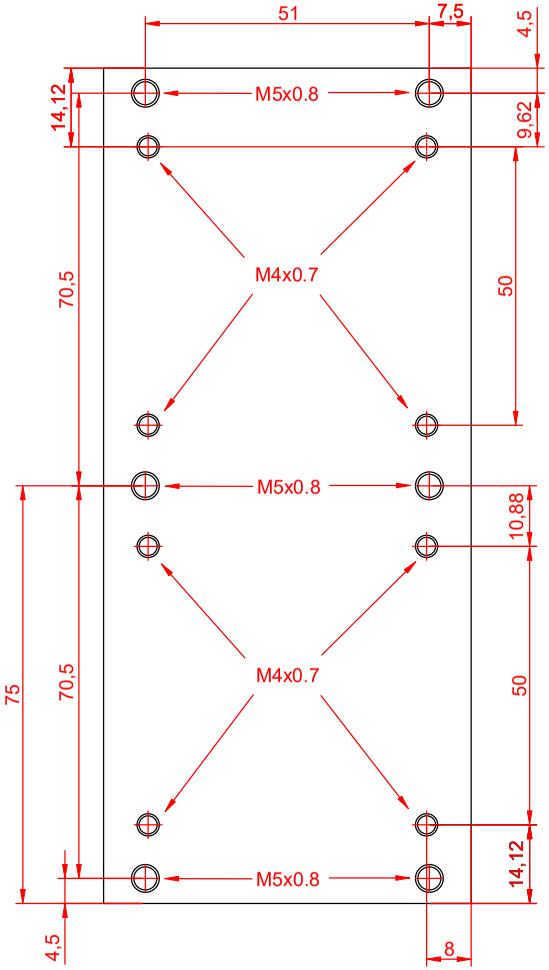
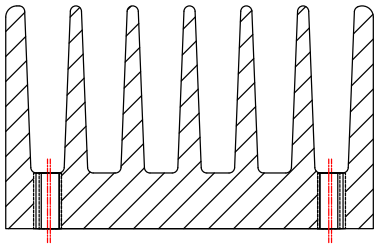
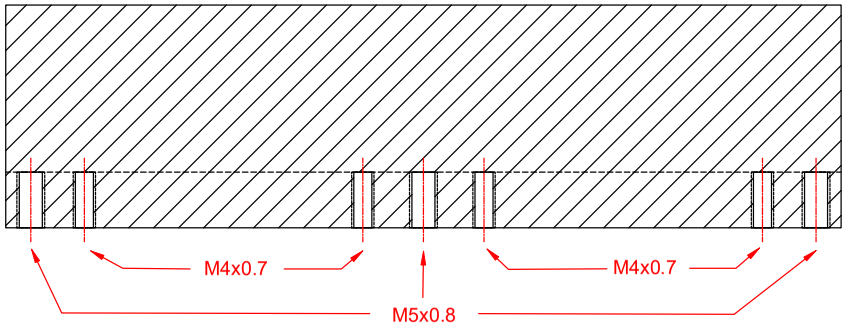


Blank plate



View plate



LED plate

Heat sink deltour DEF76 DXF content