



## Outside Mounting Cover for Rosahl M-1J1R Electric Dehumidifier Membrane based Filament Drybox or Bambu Lab AMS



ERIK3DP

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### Summary

Mount a Rosahl M-1J1R membrane outside of a drybox or Bambu Lab AMS with minimal space requirements on the inside.



5.44 hrs



1 pcs



0.15 mm



0.40 mm



PLA



55 g



Prusa MINI /  
MINI+

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Tags: [drybox](#) [filamentdrybox](#) [bambulab](#) [ams](#) [x1c](#)  
[x1carbon](#) [p1p](#) [p1s](#) [rosahl](#) [m1j1r](#)

This is an alternative mounting cover/frame to the **original one** for a Rosahl M-1J1R electric dehumidifier membrane with a very low mounting profile on the inside. This makes it suitable for mounting to a Bambu Lab AMS and

hence turning the AMS into an electric dehumidifier without the need for any desiccant anymore. Along with a USB-C power supply module it's a convenient and low power consumption dry storage solution.

## **Operation Principle**

Rosahl dehumidifiers are based on a solid-state polymer membrane. When supplied with a 3V DC voltage, moisture on one side is being decomposed into Hydrogen ions and Oxygen, the Hydrogen ions pass the membrane and recombine with air Oxygen to moisture again on the other side and get discharged. The Rosahl dehumidifiers are compact, work fully maintenance-free and the power consumption is very low.

The Rosahl M-1J1R membrane is suitable for storing multiple filament spools in a storage box of around 20-30l. With pre-dried filament spools (especially spools made of cardboard contain quite high moisture) a continuous storage at approx. 15% rH and less is achievable. See diagram in pictures.

## **Bambu Lab AMS**

I found that the Bambu Lab AMS is not as well sealed as the manufacturer states. Compared to a 20l storage box with gasket, where I achieved 8% of end humidity inside, I was not able to get an AMS to below 20% of humidity, see picture. Note that the achievable humidity inside might be different for every AMS setup, region and outside humidity, hence it might be worth going for an M-3M1R membrane instead.

The Bambu Lab AMS sitting on top of the P1P/P1S/X1C printer gets passively heated a bit during print operation and hence further reduces relative humidity inside the AMS and makes the M-1J1R even more efficient!

## **Printing**

The mounting cover is made of three parts, see pictures. All can be printed without any supports needed. The inner fixture requires a bit of bridging, so please check in the slicer if it did chose the proper bridging direction.

I printed with Overture PLA Professional on a Prusa Mini+. A .3mf file and pre-sliced .bgcode file is available along with the STL models. Also prints well on a Bambu Lab P1S.

## **Assembly/Mounting**

The inner fixture can be held upside-down to desired mounting position for marking the mounting holes. I found it works best to drill a first hole and

then insert a screw into that hole to fix the position and then use the cover to drill the subsequent holes. I used a 3mm drill since the fixture has slightly larger holes and will hence compensate a bit of tolerance while drilling the holes.

Next the larger hole for the membrane has to be marked and cut out with e.g., a Dremel with a cutting disk. Alternatively a round hole could be drilled to the center of the membrane area with e.g., a step drill down to 20mm. The M-1J1R gasket is large enough. This works best on storage boxes with thin walls.

**When mounting to the Bambu Lab AMS** it's preferable to drill a row of 3mm holes around the membrane area and go with a small round file from hole to hole and finish with a flat file. See pictures for processing steps.

The inner fixture has two compartments, one for the M-1J1R membrane and one for the USB-C power supply module. The cables from the power supply to the membrane are routed through a hidden tube within the part. Feed the cables through that tube and solder the USB-C power supply on one end and 90° flat-connectors to the other end. Those are more convenient to solder than soldering directly to the membrane terminals. See below part list.

The USB-C power supply slides into a slot-like compartment, see pictures.

Before inserting the M-1J1R membrane make sure to insert a rubber sealing ring below the membrane into the recess.

When the membrane and the USB power supply module are inserted, the outer cover can be slid over the inner fixture. It holds the membrane in place.

Now the full part can be mounted to the enclosure with the original M-1J1R gasket going in between the part and the wall.

If the box wall is too soft and bends a bit away from the gasket you can add the back plate to the inside, which ensure proper sealing. This is not required for the Bambu Lab AMS, but it doesn't hurt adding it.

## Parts Needed

The Rosahl M-1J1R dehumidifier membrane is available [here](#), same for the USB-C power supply module [here](#).

- 20l storage box: <https://www.amazon.de/gp/product/B07P4SC8TQ/> (I prefer those over the often used Ikea Samla boxes because they come with a decent sealing/gasket.) or a **Bambu Lab AMS!**

- 1x 4.8mm flat connector: <https://www.amazon.de/gp/product/B07GRH2Y71/>
- 1x 6.3mm flat connector: <https://www.amazon.de/gp/product/B07BDNR5CQ/>
- Rubber sealing ring (30/26mm outer/inner diamer, 2mm thick): <https://www.amazon.de/gp/product/B07JG366NC/>
- 4x M3x30 screws plus nuts/washer (length would depend on the box wall thickness used). **For the Bambu Lab AMS use 4x M3x35!**
- optional hygrometer: <https://www.amazon.de/gp/product/B0BXRDWYG2/> (I prefer these over the commonly used cheaper black ones since they measure down to 10%RH and use an easier to source CR2032 battery instead of those LR-something silver oxide cells)

A kit with the M-1J1R membrane, USB-C module and above parts (except the storage box) are available [here](#).

## Comments

Yeah, the Rosahl membranes are not cheap but they are crazy efficient when it comes to power consumption with less than 1W continuously. I leave them running 24/7 without the need for ever re-drying a spool in a conventional filament drying oven which would require significantly more power.

## Model files



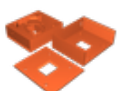
m-1j1r\_backplate.stl



m-1j1r\_outer\_frame.stl

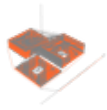


m-1j1r\_inner\_frame.stl



m-1j1r\_outside\_cover.3mf

# Print files



**m-1j1r\_outside\_cover\_04n\_015mm\_pla\_mini\_5h26m.bgcode**

PLA 0.40 mm 0.15 mm 5.44 hrs 55 g Prusa MINI / MINI+

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