



Mounting Cover for Rosahl M-3M1R Electric Dehumidifier Membrane based Filament Drybox



ERIK3DP

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Summary

Build a filament storage drybox for multiple spools based on Rosahl dehumidifier membrane without the need for desiccant.



2.72 hrs



1 pcs



0.15 mm



0.40 mm



PLA



25 g



Prusa MINI /
MINI+

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Tags: [drybox](#) [filamentdrybox](#) [rosahl](#) [m3m1r](#)

This is a mounting cover/frame for a Rosahl M-3M1R electric dehumidifier membrane which can be used for a filament drybox of around 50-70l for multiple spools. 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-3M1R membrane is suitable for storing multiple filament spools in a storage box of around 50-70l. 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 picture with measurement.

Printing

The cover is just a single part and can be printed without any supports. An optional part is a protective grille for the inside. I printed with Overture PLA Professional on a Prusa Mini+. A .3mf file and pre-sliced .bgcode file is available along with the STL model.

Assembly/Mounting

The cover 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 3.5mm drill to compensate a bit of tolerance while drilling the holes.

Next the hole for the cables needs to be drilled. Its position is the center of the four surrounding mounting holes, see picture, hence it's easy to mark. Do not drill larger than 5mm to allow for proper sealing with the rubber sealing ring.

Finally the larger hole for the membrane has to be marked and cut out with e.g., a Dremel with a cutting disk.

The cover has a compartment for the USB-C power supply module. Solder two cables to the back side of the power supply module and feed them through the hole and sealing ring. Alternatively you can solder a pin header.

The contact terminals of the M-3M1R membrane are quite large and soldering directly to them is challenging. It's more convenient to use 90° flat connectors (see below list of parts). Those are originally made for crimping cables but small wires cannot be crimped well and cables which can be crimped well are too big to go through the cable hole and sealing

ring. Best is to solder the cables to the flat connectors which works way better than soldering directly to the membrane contact terminals.

Parts Needed

The Rosahl M-3M1R dehumidifier membrane is available [here](#), same for the USB-C power supply module [here](#).

- Sealing ring for cable feedthrough (10/6mm outer/inner diameter, 2mm width): <https://www.amazon.de/gp/product/B07JGCGQGT/>
- 50l storage box: <https://www.amazon.de/gp/product/B0CLDT4815/> (I prefer those over the often used Ikea Samla boxes because they come with a decent sealing/gasket.)
- 4.8mm flat connector: <https://www.amazon.de/gp/product/B07GRH2Y71/>
- 6.3mm flat connector: <https://www.amazon.de/gp/product/B07BDNR5CQ/>
- M3x20 screws plus nuts/washer (length would depend on the box wall thickness used)

Comments

Yeah, the Rosahl membranes are not cheap but they are crazy efficient when it comes to power consumption with less than 2W continuously. I leave them running 24/7 without the need for ever re-drying a spool in a conventional filament drying or oven which would require significantly more power.

Model files



m-3m1r_cover.stl



m-3m1r_protective_grille.stl



m-3m1r_cover.3mf

Print files



m-3m1r_cover_04n_015mm_pla_mini_2h43m.bgcode

⊗ PLA ⊕ 0.40 mm ≡ 0.15 mm ⌚ 2.72 hrs ⚖ 25 g 🖨 Prusa MINI / MINI+

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