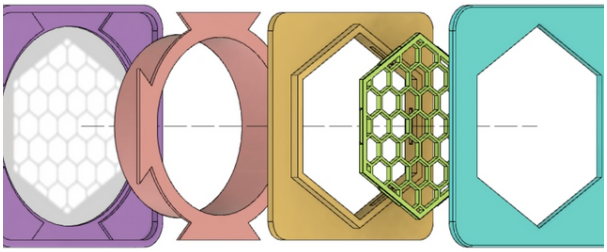


Original Prusa Enclosure Magnetic Exhaust Port System (No MMU Needed)

VisualReversal

VIEW IN BROWSER

updated 11. 12. 2023 | published 11. 12. 2023

Summary

Need to vent some fumes?

6.77 hrs	10 pcs	0.30 mm	0.40 mm	PET	139 g	Prusa MK4

3D Printers > Accessories

Tags: upgrade prusa hexagon multicolor magnet multicolour multicolored magnets magnetic ventilation exhaust competition fumeextractor nommu dovetail ventilationsystem fumes remixable exhaustduct nommurequired nommuneeded originalprusaenclusure

I needed a way to vent fumes for an upcoming project and that hexagonal cutout at the back of the Original Prusa Enclosure seemed like the perfect

spot for an exhaust port. I turned to Printables.com hoping to find my work done for me. There are quite a few good options, but I needed mine to be:

- Thin - Limited space behind the enclosure.
- Stylish - Things can be useful and still look good.
- Simple - Common, easily sourced materials. Few parts.
- Magnetic - Quick and easy. Quick to set up. Easy to remove.
- Adaptable - Accommodate different size exhaust hoses/ducts.
- Expandable - Future ability to add on a fan, filter, and/or damper.
- Non-destructive - Able to install without damaging the enclosure.

I may not have looked hard enough, but I didn't find anything that fit all of these requirements. And, since I love a challenge, I decided to make it myself. I started this project back in early May, 2023. The big issue was figuring out how to make the connectors easily exchangeable. After about 110 different versions, I'm happy to say, I finally nailed it. For more details on the design see the **Design** Section below.

What You'll Need

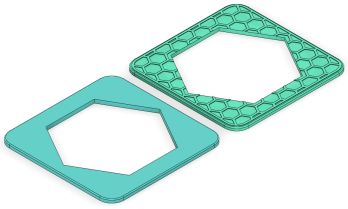
- Magnets
  - I used about twenty 10x3mm magnets (actual size is ~10x2.75mm - 25/64" x 7/64"). TRYMAG 50Pcs Strong Neodymium Magnets https://a.co/d/aNCFdB3 $7.55 US.
  - I found four connection points to not be strong enough and eight to be a very strong connection. The **.gcode** is loaded with 12, which is probably too many unless you're using some rather heavy materials.
  - If you're comfortable with using negative space modifiers in PrusaSlicer then you can tailor the system with whatever small magnets you have available or prefer. You can also reduce the number and placement of the magnetic connections as you see fit. See the **More Info** section below for details.
- Screws - Four M3x8 button head screws
- Nuts - Four M3nN nuts
- Ductwork - I used a Universal 8'x4" (101.6mm) Flexible Metal Clothes Dryer Transition Aluminum Duct, but any standard 4" diameter ductwork should do the job.
- Filament - Prusament PETG recommended
- Optional - 4" Dryer Vent Close Clearance 90° Elbow
- Crucially this system **does not** address fittings for the terminal end of the duct. You'll need to determine the best option for venting the exhaust based on your needs.

Printing

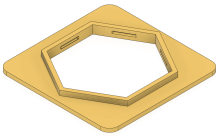
I used Prusa Orange and Jet Black Prusament PETG, with 0.4 nozzle, 0.30 DRAFT and 20% infill. Please keep in mind that the clearances in the files are specific to my printer. You may need to experiment a bit, especially with different sized magnets, to get the perfect fit. I purposely made the magnet recesses tight so I didn't need to use glue.

There are four main parts and two optional parts:

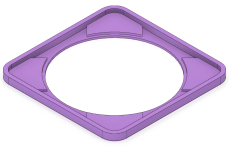
#1. Inside Cover - Print without supports. There are two versions; one with a hex pattern and one with no pattern.



#2. Hex Flange - Print with **organic** supports for the magnet and nut cutouts. Make sure to clean out the support material throughly so the magnets fit flush.



#3. Universal Flange Cap - No supports needed.

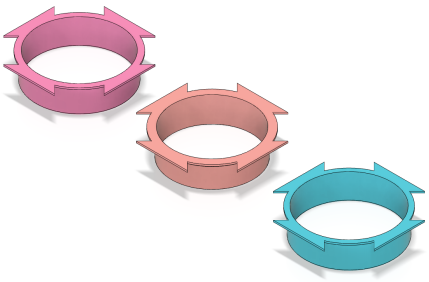


#4. 4" Connector - No supports needed. There are three versions:

- 4" Tapered Duct Connector - Outside tapers from 101mm - 104mm to tightly fit the **inside** of the flexible duct.
- 4" Elbow Connectors - If using the optional elbow, these connectors have a larger circumference to fit **over** the ends of the elbow.

4" Crimped Elbow Connector - Inside circumference tapers from 104mm at the base to 102mm at the end.

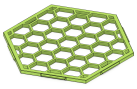
4" Slotted Elbow Connector - Inside circumference 104mm



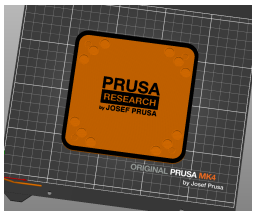
If you need a different size connector, let me know. I'd be happy to whip one up for you.

There are also a couple of optional parts.

#1. Hex SnapFit Insert - It's designed to fit quite tightly, but it can be easily removed.



#2. Vent Cover - Two Versions; one is blank, the other has the Prusa Research logo.



Note: These files were designed in Fusion 360 and sliced in PrusaSlicer 2.6. The **.gcode** files are set for the above settings for the MK4. I've also included a **.3MF** file containing all of the models so you can make adjustments and slice them to your specifications. To make the prints easier to adapt by the end user, I used negative space modifiers for the magnet cutouts, nut holes and screw holes. This means that you will likely need to use PrusaSlicer as many, less sophisticated, slicers will see the negative space modifiers as solid objects. For more information on

adjusting the negative modifiers for different magnets see the **More Info** section below.

Installation

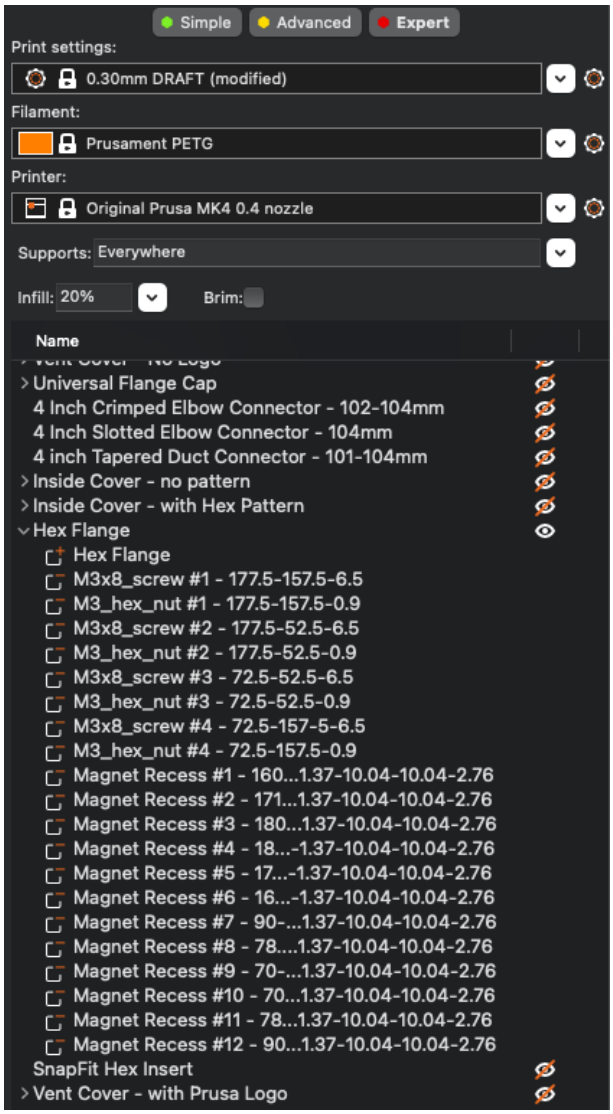
1. Remove the hex cutout in the back upper left corner of your Original Prusa Enclosure. Also, take care to remove the bits where the hex was connected. I used a heavy duty box cutter to remove it. It was much harder to remove than I expected, so I'm not sure that's the best method. **If you intend to use a blade, be very, very careful.** If you have a better method, please let me know and I'll update the instructions.
2. Determine the number of magnets you will need. This will largely depend on the magnets you intend to use. As designed, the magnet fittings are quite tight and require no glue. However, that means they don't come back out easily (if at all). So, **be sure to pay close attention to the magnet polarity when installing.** Install the magnets in both the Hex Flange and the Universal Flange Cap. If using the optional Vent Cover, also install two to four magnets in that part. Be sure to check alignment with the magnets in the Universal Flange Cap.
3. Screw the four M3x8 screws into the front cover and place over the cutout on the enclosure. The screws should fit in the provided holes in the acrylic.
4. Place the M3nN nuts in the corresponding spaces in the Hex Flange. If using the optional Hex SnapFit Insert, now is a good time to install that. Then place the hex portion of the flange through the cutout of the enclosure from behind. Tighten the screws.
5. Place the desired connector into the Universal Flange cap. Ensure the connector goes through the center of the Universal Flange Cap (away from the magnets). Connect the hose/elbow to the connector.
6. Hold the assembled Universal Flange Cap and connector near the back of the Hex Flange and watch the magic happen.

More Info

For those do-it-yourselfers out there (which is probably most of us) I specifically placed all of the holes using negative space modifiers in PrusaSlicer. The benefit is that you, the end user, can tailer the system to accommodate the magnets you want to use, rather than the magnets I used.

You can also reposition, delete, or add cutouts for more or different magnets. For each negative space in PrusaSlicer I named it according to its use and location. These locations are based on the specific part of the model being at the center build plate (coordinate 125/105) for the MK3

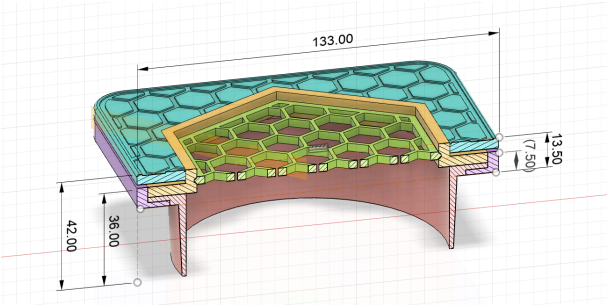
and MK4). Each magnet position is listed beginning with the upper right corner and then clockwise around the part. Variations in depth for specific parts are also noted.



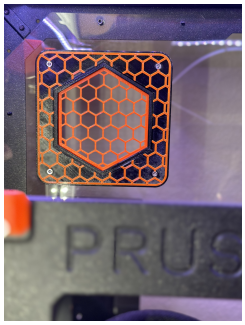
If you want to experiment with your own flange sizes, I recommend using the cutting tool to cut a few millimeters off the end of one of the connectors. That way you can resize it and try a test print. Once you find the perfect size, then just expand it's length to about 32mm. Then, cut off the dovetail part of the connector and stick it to the new part you just made.

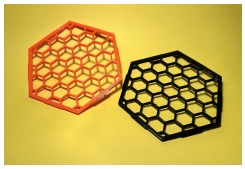
Design

The system is only 13.5mm thick (7.5mm of which sticks out behind the enclosure). With the flange attached it only sticks out 36mm. In contrast the PSU sticks out well over 50mm.



In addition to being useful I tried to make it look good, but I'll let you be the judge of that. I did include different options to keep it interesting. For example, there's a snap fit hex pattern insert you can print (in whatever color you like) that fits inside. You can also print a multi-colored hex pattern on the front. And, the rear cover even has the Prusa Research branding.





While this system currently uses passive venting, I'm planning on adding a dampers and a fan.

This modification does not damage or alter the Original Prusa Enclosure, except for removing the hexagonal acrylic piece from the back upper left corner. If however, you have buyers remorse, I also designed a Cutout Saver for those who want to put acrylic hex piece back down the road.

https://www.printables.com/model/540099-original-prusa-enclosure-cutout-saver)

Attribution

Although not required by the license, a bit thank you to @ToxicMaxi for creating and sharing the awesome Prusa Research logo.

Thank you for taking the time to check out my model. I've put a lot of hours into this project to get it just right. Please consider clicking the ❤ and/or leaving me an encouraging comment if you appreciate my effort.

If you print this model, please upload pictures of your new Original Prusa Enclosure Magnetic Exhaust Port System. Then, click here to post our make and leave a review.

If for some reason you don't think my model deserves five stars, please reach out to me with your feedback before leaving a negative rating so I can have an opportunity to address any issues. Often, problems encountered can be solved with some simple trouble shooting or a small redesign.

I will continue to update the model with new variants as long and often as needed to ensure it is the best possible quality. See the **Updates section** below with notes on changes to the models.

If you have suggestions on how the model could be better, please let me know. Along those lines, if you would like some adjustment to the model that you personally would find helpful, please reach out. I am more than happy to tweak the design to fit someone's needs if I can.

I'm always happy to share my designs with anyone who wants to use them. You're welcome to remix this model, but if it's something very simple, I would appreciate the opportunity to add it to my model first. Likewise, if you do share or remix it, I only ask that you give the appropriate attribution and use the same license with any remixes.

Be sure to check out my other enclosure mods here: @VisualReversal/models

If you really appreciate my work, you can also donate to my PayPal filament fund:

Updates

17August23 - Published Ver1.

Model files

original-prusa-enclosure-magnetic-exhaust-system-al... .3mf

Print files

inside-cover-with-hex-pattern-ver10_03mm_petg_mk4_1... .gcode

PET | 0.40 mm | 0.30 mm | 1.44 hrs | 30 g | Prusa MK4

inside-cover-no-pattern-ver10_03mm_petg_mk4_1h24m.gcode

PET | 0.40 mm | 0.30 mm | 1.39 hrs | 30 g | Prusa MK4

hex-flange-ver10_03mm_petg_mk4_1h53m.gcode

PET | 0.40 mm | 0.30 mm | 1.88 hrs | 35 g | Prusa MK4

universal-flange-cap-ver10_03mm_petg_mk4_1h27m.gcode

PET | 0.40 mm | 0.30 mm | 1.45 hrs | 31 g | Prusa MK4

4-inch-tapered-duct-connector-101-104mm-ver10_03mm_... .gcode

PET | 0.40 mm | 0.30 mm | 1.45 hrs | 35 g | Prusa MK4

4-inch-crimped-elbow-connector-102-104mm-ver10_03mm... .gcode

PET | 0.40 mm | 0.30 mm | 1.65 hrs | 37 g | Prusa MK4

4-inch-slotted-elbow-connector-104mm-ver10_03mm_pet... .gcode

PET | 0.40 mm | 0.30 mm | 1.55 hrs | 36 g | Prusa MK4

vent-cover-no-logo-ver10_03mm_petg_mk4_2h40m.gcode

PET | 0.40 mm | 0.30 mm | 2.66 hrs | 60 g | Prusa MK4

vent-cover-with-prusa-logo-ver10_03mm_petg_mk4_2h49m .gcode

PET 0.40 mm 0.30 mm 2.82 hrs 61 g Prusa MK4

hex-insert-ver10_03mm_petg_mk4_33m.gcode

PET 0.40 mm 0.30 mm 0.55 hrs 8 g Prusa MK4

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