



screw compressor - Rev B



MlePh

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Summary

Attempt to use a 3D printed screw compressor as ventilator to fight Covid-19.



57.17 hrs



4 pcs

f

0.20 mm

k

0.40 mm

h

8



560.00 g

d

Prusa
MK3/S/S+

[Healthcare](#) > [Medical Tools](#)

screwcompressor

screw

covid19

compressor

compressedair

Attempt to use a 3D printed screw compressor as ventilator to fight Covid-19.

I was thinking about a ventilator that can be controlled by the patients themselves. So good, high grade ventilators can be used for the critical cases, while mild ones use this one. Maybe even use it at home to keep the virus isolated. Only as a simple assistant for breathing. Instead of an ambu bag.

But thats just me thinking. I have no medical background and absolutely no experience in medical ventilation. I am just an engineer trying a different approach to a problem. I really don't know if this is any good. And

the last thing i want is that this thing harms somebody. So keep that in mind!

My design is open source. If you see potential, use it and adapt it to your needs.

Here is a video of the compressor design:

Here is a video of me testing my design:

Here are the Fusion 360 files:

<https://a360.co/3b4nH3q>

Here are the codes for the arduino:

<https://github.com/MlePh/3D-printed-screw-compressor>

Print instructions

With exception of the gears, all parts can be printed with standard settings. Gears with 100% infill. No support needed.

I used PETG. But PLA could also work.

Parts needed for the compressor:

- 5 pcs 608Z ball bearing (used for inlineskates - very common size)
- 2 pcs 8mm rods (steel, aluminium, cfk,...) -> cut to 130mm length
- 7 pcs M3x30 screws
- 10 pcs M3x10 screws
- 2 pcs potentiometers
- brushless DC motor (i used a MultiStar 2216-800kV motor)
- ESC for the DC motor
- arduino nano
- 5V BEC (if the ESC doesn't provide 5V power)
- DC power source with more then 12V (i used a 4S lipo battery)

If the screws have to much friction inside the cylinder, you may have to sand it. To do that, i designed a grinding tool, that fits the inner diameter of the two cylinders.

Parts needed for the grinding tool

- sand paper (400), cut to 20mm stripes
- M10 threaded rod with two screw nuts
- 4 pcs M3x10 screws

Print Files (.gcode)

[F3 3D DOWNLOAD ALL FILES](#)

grinding-tool_02mm_pet_mk3_11h44m.g 56.0 MB

updated 26. 11. 2020

🕒 11.74 hrs f 0.20 mm k 0.40 mm h PET ⚖️ 118.00 g d Prusa MK3/S/S+



compr-gears_02mm_pet_mk3_2h36m.gc 6.6 MB

updated 26. 11. 2020

🕒 2.60 hrs f 0.20 mm k 0.40 mm h PET ⚖️ 31.50 g d Prusa MK3/S/S+



compr-screws_02mm_pet_mk3_13h38m. 70.5 MB

updated 26. 11. 2020

🕒 13.64 hrs f 0.20 mm k 0.40 mm h PET ⚖️ 116.60 g d Prusa MK3/S/S+



compr-housing_02mm_pet_mk3_1d5h12i 84.7 MB

updated 26. 11. 2020

🕒 29.19 hrs f 0.20 mm k 0.40 mm h PET ⚖️ 294.10 g d Prusa MK3/S/S+



Model Files (.stl, .3mf, .obj, .amf)

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compr-housing-cylinders.stl 1.1 MB

updated 26. 11. 2020



compr-housing-middle-part.stl 214.9 KB

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compr-housing-motor-mount.stl 200.5 KB

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compr-housing-electronics.stl 406.7 KB

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compr-housing-top.stl

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530.7 KB



compr-housing-cable-holder.stl

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95.2 KB



potentiometer-knob.stl

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125.0 KB



spur-gear-8-teeth.stl

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278.3 KB



spur-gear-24-teeth.stl

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434.8 KB



spur-gear-20-teeth.stl

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395.8 KB



compr-screw-male.stl

updated 26. 11. 2020

6.8 MB



compr-screw-female.stl

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6.6 MB



grinding-tool-handle.stl

updated 26. 11. 2020

1.8 MB



grinding-tool-6180mm-bracket.stl

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160.8 KB



grinding-tool-4990mm-bracket.stl

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169.5 KB



grinding-tool-6180mm-cylinder.stl

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273.8 KB



grinding-tool-4990mm-cylinder.stl

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280.6 KB



[Find source .stl files on Thingiverse.com](#)

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