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Hello,

In this manual I’ll show you **how to build your own silent air compressor.**

They are ideal if you need:
+ a silent compressor
+ a high pressure compressor
+ have little space and/or don't need a typical shop compressor

I have to say that I had no idea about compressors. That means it’s easy for everybody.

To build the compressor is not difficult but you’ll need some help from a local store that sells air valves and compressor parts.
The important thing is the main idea on how to build it.

Let’s begin!

1. **Air compressor**

   ![Air compressor image](image)

   This is the first and the basic thing that you’ll need.

   There are two ways to get a fridge compressor you want to turn into an air compressor:
   A) buy a salvaged compressor
   B) salvage one yourself from an old fridge

   In case you choose option B then you have to remove the compressor from the fridge yourself - that process is described in the next step. If you already have a salvaged compressor then go to step 2.
Typical fridge compressors are 100 - 300 watt units, deliver 0.7 - 1 CFM of air and can reach pressures over 500 psi. A label usually on the side says the power.
You’ll need 120w or more.

**CAUTION:** The fridge motor has to be degassed. It is extremely important to properly evacuate all refrigerant from your refrigerator's system. Many shops will do this for free (and add it to their inventory.) This is also a good time to make sure the compressor is working. If not an expert from a local store will help you.

Once all the gas is out of the system, cut the copper tubes. There's one going in & one going out of the sealed compressor module. Use a tubing cutter for the job. Note that when cutting, leave as much length of copper tubing as possible with compressor. Try not to turn the unit upside down.

The compressor will have 3 copper tubes:

a) The one that is sealed if for the refrigerant – leave it as it is
b) The one with the smaller intersection (size) is for the suction (the air comes in).
c) The other one is for the supply of compressed air (the air comes out).
If the compressor is old, put some very thin oil from any tube (mostly 200ml is full).

**NOTE:** Every time you’ll use the compressor a very small amount of oil will come out from the tube that supplies the air. So after a big amount of time you will need to add some oil again. (Don’t worry about the oil coming out. It’s good to have oil! I’ll show you later why).

There are two power wires. One for power and the other goes to the thermostat. Cut the wires that go to the thermostat.

Don’t forget to salvage the mains cable with the plug. Most fridges have a sort of junction box right on the side of the compressor as well as starting relay/PTC relay (all of it is housed in a rectangular plastic enclosure you find on the side of the compressor). There will be a wire running from the fridge compressor to the inside of the fridge - it goes to the thermostat and powers the light inside the fridge - again the longer the length that you salvage the better.

Remove the wiring and everything else except the capacitor and pump. Connect corresponding power cord wires to the capacitor and green ground wire to the base of the pump.

Test if the compressor works ok.

Put a filter on the tube that the air comes in (mostly for protection like a window screen).

Now that it’s all ok, we are ready to go on.

### 2) Air tank

Here is a variety of choices:

a) A cheap and loud as a jet engine compressor from a hardware store and just change the compressor unit
b) Fire extinguisher CO2 (only)
c) Portable air tank

d) Pure oxygen or nitrogen tank

e) Any other tank that can hold at least 10bar pressure.

I have an air tank from a truck! (From the airbrake system)

CAUTION: Do not use gas tank. It is not safe to use it.

NOTE: All air tanks must have at least 2 holes

If you choose the first option then the only thing that you’ll need is to remove the jet engine and adjust the fridge compressor on it.

If you choose the other ones then you have to make modifications.

Fire extinguisher CO2

This is the most difficult option you can choose because it doesn’t have 2 holes and you have to make the right thread.

a) Empty the extinguisher

b) Unscrew its lid

c) Wash and clean the inside of the bottle

d) Drill 1 or 2 holes 10mm diameter

CAUTION: Don’t drill holes empty extinguisher if you don’t remove firstly the lid.

e) Glues with electric welding 2 thick nuts ½ of an inch (1/2 inch is indicative, you
place the size that the pressure meters of the plugs will be

Usually the small fire extinguishers can hold up to 16-20 bar pressure but because we have drilled holes its pressure resistance has decreased.

Now hold!

*Portable air tank*
Ready to use

*Pure oxygen or nitrogen tank*
If it has holes then go on else see fire extinguisher.

3) Other basic parts

*Relief valve:* when the pressure goes over the limit of safety we want it “opens” and releases the extra pressure. It is for safety reasons but if you don’t have it you will definitely BREAK something. Adjust it to 9 - 9.5 bar.

*Air pressostat:* This is the brain or your compressor. Buy the one with the 4 outputs and can connect with a one way valve. The pressostat is being connected between the electric power and the air compressor. Adjust it to open at 5 Bar and close at 8 Bar. This means that when the pressure in the tanks reaches the 8 Bar the pressostat “cuts” the power to the compressor. When the air pressure falls to 5 Bar the pressostat give the power again to the compressor. Most of the parts connected here.

*Manometer 10 bar:* So you can see the tank pressure

*One way valve or check valve:* This goes between the air compressor and the air tank. For safety reasons the air compressor does not start if it indicates pressure inside it. So the one way valve pressure help the compressor by not letting the air goes back and went the pressostat stops it release the pressure inside the compressor. Without it the compressor will not start until the pressure goes to 0 bars.
e) **Pressure regulator**: Please buy a good one. This is one of the most important and useful thing you should have. This regulates the pressure you’ll have at the airbrush. The good one has also a manometer (must have) up to 3 bar and an air filter (must have) that traps the moisture and the oil.

f) **Drain valve**: This is used to drain the water and the oil that the air tank has trapped inside. Don’t freak out about the oil. It will prevent your air tank to rust and there is no way to reach at your airbrush.

g) **Spare parts**: like on-off small valve and connection parts like lot of teflon tape, rakors, a high pressure tube etc. Ask your local store who sells air compressor parts to help you.

h) **Base**: This is up to you. Use your imagination … your favorite tools and create one. Prefer adjust your air tank vertical and not horizontal. It is best for the rust.

4) **Assembly**
a) place the air compressor and the air tank to the base  
b) connect the air pressostat with the air tank  
c) connect the air pressostat with the power and with the compressor  
d) connect the one way valve with the compressor and the air pressostat  
e) plug relief valve to the air pressostat  
f) plug the 10 bar manometer to the air pressostat  
g) connect the pressure regulator to the air pressostat  
h) connect the pressure regulator with an on-off valve.  
i) Connect the air compressor to the air tank with the rakors or the high pressure tube.  
j) plug the drain valve to the air tank.

**NOTE**: use to connection lots of Teflon tape.

This is my draft sketch
This is the one way valve
Connect the air pressostat with the power and with the compressor.

On some compressors, the pressure switch is built into the power switch with a bleed off valve. Airflow from the fridge compressor may not be enough to engage the bleed valve causing it to leak as fast as it fills. Disabling the bleed valve will fix this issue, however it disables the pressure switch so I wouldn't recommend it. I recommend finding one with a separate pressure switch to the tank.
5) It’s ALIVE
This is the final stage!!!

a) Check that you have assemble the relief valve (VERY IMPORTANT)
b) close the on-off valve so as not to lose air pressure
c) turn on the air pressostat
d) try to hear air leaks
e) check the pressure if it stops at the 8 bar

Fixing Leaks:

I can't express, enough, how important it is to make sure you don't have any leaks. This is where the teflon tape comes in. Fridge comps. don't put out a lot of volume, so any leak, no matter how small can seriously impede it's fill time. Simply put, check every connection, and tape everything.

You're done. Everything else on the unit should stay the same and you can connect up to it as you normally would if it had a conventional compressor attached.

YOU’VE MADE IT