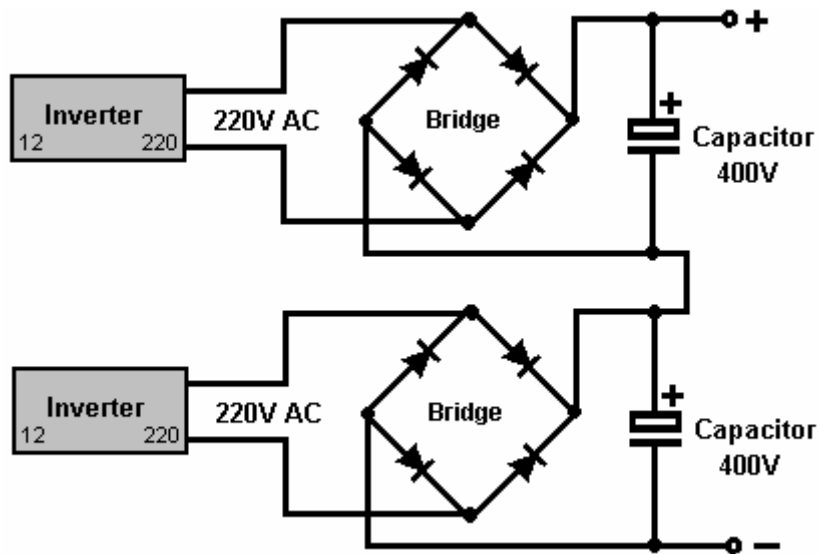


One possibility which avoids the need for a transformer and still provides a full wave rectified 440V output is to use two 220V inverters:



In this arrangement, both inverters are supplied by a single car battery and the output is 440 volts. Each inverter supplies only half of the wattage.

It is suggested that a method which skips both the inverter and the transformer would be to use a “DC chopper” circuit which could take the 12 volts from the car battery and produce a 400 volt 20 kHz output directly in one operation. A DC chopper of that type looks like this:



While a DC chopper power supply is not suitable for all applications, it is felt that this cheap unit costing US \$35 from <https://s.click.aliexpress.com/e/1rHgPQC> would be suitable for this generator project.

While the circuit wiring is shown above, we need a physical board with the electronic components attached to it. The wiring connections are normally soldered joints but making those joints can be quite

difficult as some of them are very close together. If you are experienced at soldering, then there should be no problem, but if you have not soldered before, then you should get an experienced friend to do the soldering for you. Here is a suggested board layout using stripboard often called "Veroboard".

No matter how the 400 volts is generated, it is necessary to feed some 70 amps back to the battery output and inverter input to sustain the motor indefinitely. While the diagram above just shows a battery charger, the level of feedback is much higher than any ordinary battery charger can supply. So, we are talking about a professional-level charger able to deliver some 700 watts of power continuously. This generator system has a Coefficient Of Performance greater than 14 but even with that high performance it needs an input of about 700 watts for an output of 10,000 watts. Consequently, this "battery charger" link is very important and commercial units which can do the job cost something like £150.

We come now to the alternator which produces the electrical output which is the whole point of the system. All of the components and methods described so far have the objective of spinning the alternator indefinitely in order to provide electrical power for a household. However, please understand clearly that your local power company is most unlikely to allow you to connect your generator up to their wiring which goes to your fuse box. Consequently, it is better if you use your new supply of electrical power as if it were an emergency back-up generator. That is, you connect it up to your appliances without connecting it to any external power supply or wall socket.

The system described so far is perfectly capable of driving an alternator of any power level up to ten kilowatts without altering any of the components. So, the size of the alternator which you buy is up to you. Personally, I would consider an output of five kilowatts as being adequate to excessive, but then my electrical needs are probably far lower than yours might be.

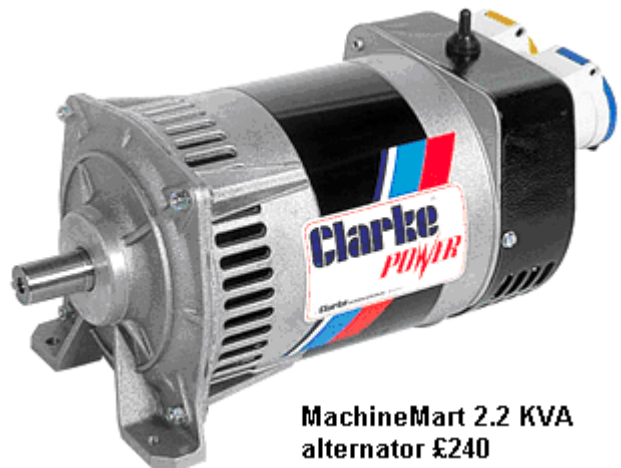
Anyway, in the UK one supplier is MachineMart and they offer three different alternators. They look like this and each needs to be driven at 3000 rpm:



MachineMart 6.5 KVA
alternator £324
Pulley £15



**MachineMart 3.5 KVA
alternator £288**



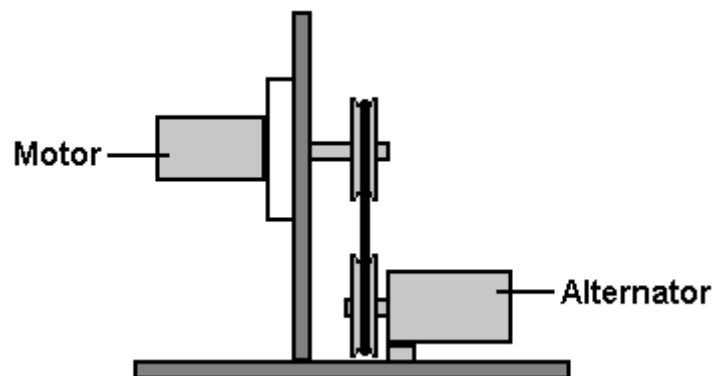
**MachineMart 2.2 KVA
alternator £240**



**118mm V-Belt Pulley
24/8mm £15**

Looking at the small price difference between the alternators, there seems to be very little reason not to pick the 6.5 KVA unit even if your expected current is likely to be well below that rating. The KVA rating is the same as kilowatts **IF** the power factor of the load is 1, that is just light bulbs. Generally speaking, a 6.5 KVA alternator is considered to be a 5 kilowatt unit for driving washing machines, vacuum cleaners or equipment like that.

The final step is to mount the motor unit and alternator unit together so that the motor can drive the alternator to provide the required electrical output:



Thanks is due to Thomas Buie for sharing his design freely. Thomas has joined with the Free Energy Special Interest Group ("FESIG") and they are preparing a series of instruction videos and actual physical construction of an a generator via the website <http://www.truevisionofpeace.com/fesig.html> and you can ask questions during the live sessions. Thomas' own website is <https://www.youtube.com/channel/UCDiOZIHfkioVtHfSzS2qPWq>.

The Arduino code file www.free-energy-info.com/Arduino.txt is a free download

There is one issue which needs to be dealt with and that is the plastic construction of parts of the motor. The motor was intended to power a washing machine and because that operation is slow and the

mechanical stresses involved are fairly low, plastic was used. In this application the stresses are much higher and the usage is all day every day as opposed to the occasional use of a washing machine (my apologies to mothers with children), it would be necessary to replace the plastic parts with mild steel, both for the hub of the rotor and the casing of the stator in order to drive the larger sizes of alternator. Machining by a local steel fabrication shop may be necessary unless you already own a lathe or have access to one. Alternatively, Gerard Morin offers those components although at what looks to me like rather large prices at <https://www.hyper-drive-hv.com/> the idea being that the existing plastic rotor boss:



is replaced with a metal unit:



and the motor effectively rebuilt until only the original coils and magnets remain:



While doing that adds considerable extra cost and effort, it does result in a very robust and powerful motor which is ready to drive a large alternator.

Let me stress that if you were to construct a generator system like this, you do not connect it to the wiring of the local electricity power supply company. For example, the electrical mains supply wiring will come into your household fuse box or contact breaker box. Do not connect your generator wiring to

that same box but instead treat your generator in the same way as an emergency generator, feeding the generator output directly to your washing machine, electric heater, vacuum cleaner or whatever through an extension cable and not through a wall socket.

If you are very keen to have your new generator connected to your fuse box, then be sure to install a "Break-before Make" heavy duty switch to disconnect the outside power supply cable before your generator output is connected to the fuse box. This is important because if a fault occurs in the mains wiring and they turn off the mains power while they fix it, the workmen might get a fatal shock from your generator even though their wiring is supposed to be switched off..

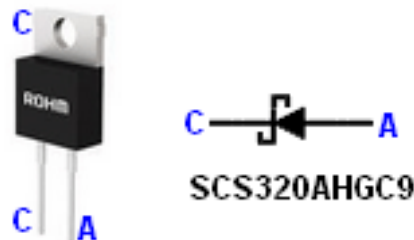
Update on 17th March 2019:

It has been pointed out that this possible version of the interface board which goes between the Arduino and the 400-volt drive to the 3-phase motor has one feature which could be considered to be a potential weakness. The three red arrows show a copper strip which passes from the 12-volt Arduino area into the 400-volt motor area and it is felt that there is the potential for a back-EMF voltage spike to be fed back along that copper track and damage the IR2104 chip or even the Arduino board itself. It is suggested that the introduction of a fast Schottky diode in those links would block that possibility. For that we would need a Schottky diode which can withstand the 400 to 500 volts which gets fed to the motor and the current needed by the motor.

The Mouser supplier of electronic components has a range of such diodes. For example:

SCS306AHGC9 rated at 650 volts, 6 amps and 46 watts, sells for £2.91
SCS308AHGC9 rated at 650 volts, 8 amps and 57 watts, sells for £3.47
SCS310AHGC9 rated at 650 volts, 10 amps and 71 watts, sells for £4.04
SCS312AHGC9 rated at 650 volts, 12 amps and 78 watts, sells for £4.76
SCS315AHGC9 rated at 650 volts, 15 amps and 93 watts, sells for £5.08
SCS320AHGC9 rated at 650 volts, 20 amps and 115 watts, sells for £6.17

The packaging is like this:



So, if we are to take the advice which recommends one of these diodes placed in line with lines which lead out to each phase of the motor, then the board layout would change to this: