

Rotor Verter energy saving applications Research and Development

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Efficiency-a : efficient operation b (1) : effective operation as measured by a comparison of production with cost (**as in energy, time, and money**) (2) : **the ratio of the useful energy delivered by a dynamic system to the energy supplied to it.**

This document will present lab tested results which verify the capacity the Roto Verter has for energy saving applications. No where in the world TODAY are their as efficient energy savings methods in electric 1-2 HP motors in comparison to the RV.

The authors, engineers and inventor are not for profit. For the experimenter wishing to replicate the RV please consult the RE-OU PDF file and or RV laymen's theory available from the **file sections** in these yahoo energy groups on the web.

EVGRAY@yahogroups.com

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Quote- In engineering OU (Over unity) the fundamentals must be enabled by an energy saving medium. What matters is quantification and method, the RV is primary an R&D tool which aims to educate the simple fact that the first energy you save is the one you don't waste. If you save it then you can transform it, and it is only in these conditions that it is logically permissible to assume OU can come into play, fundamentally OU must start from energy saving applications.

End quote

. – Hector inventor of the RV

Note: all enquiries and R and D questions are to be addressed formally by Hector on the EVGRAY and RVreplication yahoo energy groups, if he can not be reached contact Ashtweth and I will do to the best of my ability to aid. ashtweth@gmail.com

Some back round on Hector the inventor of the RV and TV (Trans-verter).

Out of ANY R&D Investigator or inventor apart from Tesla, Hector is the first to TEACH how to operate a device from Standard Off shelve parts from a basic set of instructions.

Hector is also the FIRST one to Directly RELATE RADIANT ENERGY with RF (radio frequency) in the operation of the RV alternator, and teaches a way to produce this radiant energy the same as EV gray did in an LRC circuit under resonance. Please consult the RE-OU compilation mentioned for more detail on this.

Hector has stated that he is willing to cooperate with University and Industry but will not be manipulated to let them Headhunt and shrink & dry brains hi and dry. Hector like Doug Konzen of the EVGRAY internet yahoo energy discussion groups are **open sourced** and discloses DIY R and D FREE for public knowledge.

Back round

The RV roto verter method is Statutory **Public copyright** (Other Rights Apply) under a local and international. (Publication) Scientific discovery, the Roto conversion Effect is covered by the publication statutory copyrights for 75 years. Further more upon the publication of the RV, up to 20,000 patents had Expired which may be technically paralleled or resemble the RV in any way.

These include the Add a phase patents. In fact CAREY, Otto smith, and latest MEG & Bedini patents fall within material published under the RV's related resonance & radiant energy issues. It should further be noted that when comparing Otto smith's patent to the method and operation of the RV, Otto smith works on a LOW impedance method as a VARIANT of magnetically current controlled add a phase concepts, and NOT in or in operation of the RV which is configured for freq matched HI impedance power on demand mode.

Smith's device can be evaluated here-
www.home.earthlink.net/~ojmsmith/indexd.html

The TV (a concept called the trans-verter also designed by Hector) & RV are a METHOD and discovery and are covered by the PUBLICATION statutory copyrights for 75 years.

A public warning is therefore expressed to any corporate or spurious group (same thing) intending on using ANY of the public's knowledge disclosed in the RV, TV or Doug Konzen disclosures from the EVGRAY yahoo internet group to subjugate others for money, when you LOOSE you run with expenses plus damages. Hector has done 5 years of PATENT R&D so it's advised that you **sell your house now**.

Further to those attempting to Hijack public open source disclosures and make it "proprietary". The impedance and tuning & recovery disclosed in RV mode, including the theories and definition of over unity comprising Pulse length and intensity to saturate a core to Extract OU CEMF is public knowledge and pre dates the current patent imitations. This can even be traced to Time Pulsed 3 phase Inverter and pulsing circuits have been public since 1960. The RV is public knowledge and pre dates since the 80's.

The RV is a free domain method discovery and invention as the diode plug recovery circuit of the RV and all its related work are covered by copyright and statutory copyright as published R&D free domain research.

Weapon is PUBLICATION

- Hector

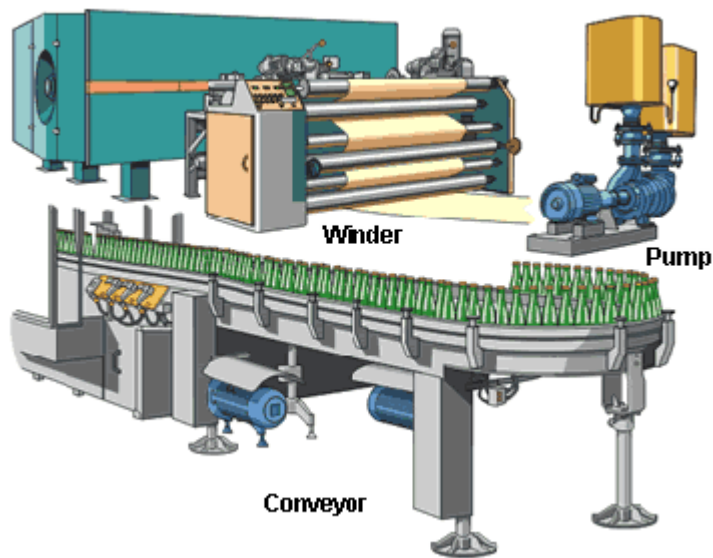
Quote:

After the basics are applied using the method of the RV we can go into higher level, using the RV as an ENERGY saver can't be denied, it's very hard to suppress as it can be constructed from OFF the shelf parts. The RV energy saver can also enable potential for an OU generator. After applying the fundamentals of the energy saving RV method and operation, by default looping and OU will be made by anyone, mean time the education of the RV has to GO first as Energy saver.

You can't have Over Unity in a system of WASTE, you need first to MANAGE power by minimal losses, managing power by the RV's HI efficiency will permit you to manage and transform an energy system towards OVER UNITY.

. - Hector, edited by Ashtweth

Introduction



A motor is a device which uses electrical energy to produce motion. AC one phase and three phase motors are used in many residential and industrial commercial utility applications, **examples can be found in pumps or fans, winders, conveyers, mixers, lathes, drills, saws, pumps and grain grinders.**

NEMA / IEC

The National Electrical Manufacturers Association, NEMA, sets standards for a wide range of electrical products, including motors. NEMA is primarily associated with motors used in North America. The standards represent general industry practices, and can be found in NEMA Standard Publication No. MG 1. Some large AC motors may not fall under NEMA standards, and are built to meet the requirements of a specific application. These are referred to as "above NEMA" motors.

The International Electrotechnical Commission (IEC) produces a group of recommended electrical practices developed by committees from participating IEC countries. These standards differ from NEMA standards, and they are associated with motors used in many countries, including North America. Motors which meet or exceed these standards are called IEC motors.

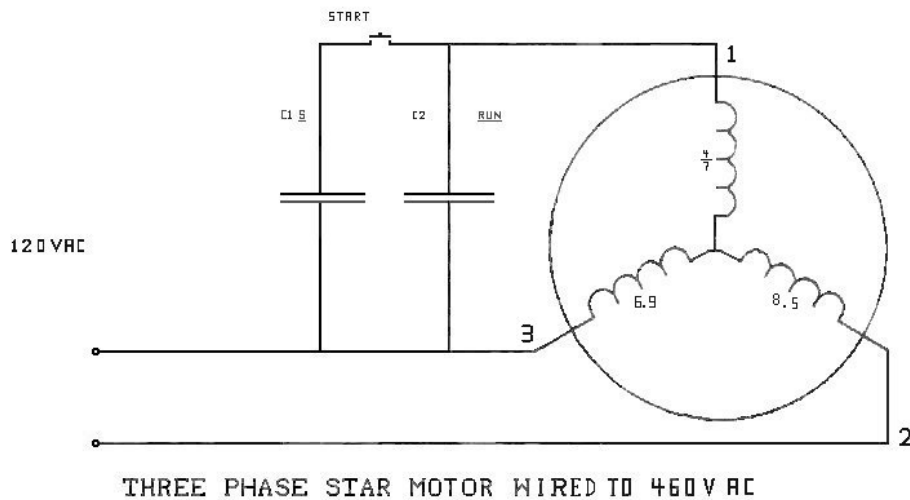


The Data presented in this compilation is relative to NEMA and Green politicians. Independent labs tests confirm that the energy savings available from running motors in RV mode is premise to mandate laws for no further energy wastage in variable load applications in the ranges of 1-2HP. And further that the RV shows conclusively that

running motors in **RV mode** is a superior energy saving incentive that's **NOT CURRENTLY UTILIZED IN MAINSTREAM INDUSTRY APPLICATIONS. ALL CURRENT 2HP AND 1HP MOTORS CAN BE UPGRADED VIA THE RV'S ENERGY SAVING APPLICATIONS.**

Technical explanation of operation in RV mode

Running three phase motors in RV mode is a method to operate a motor at HI impedance to its input source by using electrical resonant principles. In RV mode the three phase motor is wired to operate from single phase power by using the addition of start and run capacitors to generate the third phase.



Running 3 PH motors form 1PH power via start and run capacitors is nothing new, however the RV-mode is not like the common “add-a-phase” setup, but more related to impedance matching by tuning the voltage, frequency and pulse-width in advanced configurations.

The RV principle is by “matching the source to the needs of the load” [as referenced by Nicola Tesla] by tuning capacitors values to the load REQUIREMENTS. This will result in a yet unrecognised **superior power management with many other advantages.**

The process of electrical resonance in the process of the RV allows a lower reflective power loss/draw when the motor idles. When the motor is loaded, the RV functions the same as a true transformer does.

An electrical transformer uses minimal energy in its primary winding when unloaded. The RV functions the same by using minimal energy at its input when its MECHANICAL output is unloaded. This is the most efficient Power On demand process; Normal electric motor engineering design has an inefficient power management process.

The RV solves this design flaw and also makes practical solar cogeneration possible, where previously it would have been impossible. The benefit of running motors in RV mode results in superior energy savings when used in the role of industrial and commercial machinery, intermittently in rotary punch applications.

Even at this very early R and D stage all 1-2 horse powered motors run in RV mode can save energy in applications which employ **a lathe, a drill a grinder a rotary saw, a reciprocating pump, and also vacuum pumps. But this is only the beginning.**

Technically, when operating a motor in RV mode, at the start of the process the function is resonant; as the squirrel cage motor attains rotation the conditions allow an impedance match with the line input power source. As you load this tuned resonant state it tends to go back to a semi resonant state where the power can be used more efficiently than in a normal electrical motor design.

In the beginning the horse power of the motor in RV mode is re rated:

In 60 hertz 3 phase motors from a range of:

3 HP will give .5 to 1.8 HP
7.5 HP will give 2HP

In 50 hertz motors from a range of:

5 HP will give 1 - 1.25 HP
A 50 hertz 10 horse power motor can also be used in RV mode

It is possible to run 1 PH motors in RV mode however in single phase configuration it requires 200mF 370 VAC caps (as an average to go into resonance) at 12 Ohms impedance, but low Q, which varies a lot, and needs further lab experimentation. A single phase demands more to run in RV mode as is lower impedance than a normal 3PH motor.

The higher efficient 'down rated' horse power is not a fixed value; **the motor becomes more efficient and can still reach and exceed the HP rating of the motor via boasting the voltage or frequency.** This will give the process higher torque and preserve the efficiency.

In the RV's solar co-generation applications the difference compared to normal motors being used in an identical role from inverters is estimated to be 10 solar cells less you need to run your Solar shop lathe, drill or mill etc.

By Using a 3PH motor wired to run in RV will result in a draw of approx 40W from 3.5 amperes max, with a 90% eff inverter, compared to a normal 1 HP motor which draws 890W normally IN THE SAME ROLE, which would run down a battery using a constant 77.9 AMPERES at 12.7 VDC.

A Normal 1 HP motor as seen below on the RIGHT (black) uses a CONSTANT 880W to run with No load. Using the same application in RV mode (pictured LEFT),

a 3PH motor of 1 horse power uses as little as 40W idling with no load. A conventional motor at 1HP is 84% eff. The RV 1HP to 1.8+ (Re rated HP) is at 94+ eff when tuned to the load requirements.



RV motor is picture left; normal energy wasting motor is pictured right.

Example one

In a simple lawn mower application the draw is mathematically calculated to be 33 amps as opposed to normally 7.3 amps operating in RV mode. The RV's power on demand and electrical to mechanical transformation demands a power draw only as its cuts grass at 3450 RPM at a Constant speed, and is still more eff than a normal motor at that speed. Further tests of a lawn mower application converted to run in RV mode are included later in this document. The figures speak for them self and still can be improved with the proper R and D.

Just by lab experience alone we can conclude:

A 1 HP RV uses 40W< idling and 794 W when loaded (1HP) **94% eff constant**
A 1 HP (non RV) uses 888W>idling and 940W loaded (1HP) **79% eff constant**
Equalling- 848W wastage for normal motors compared to operating 3PH motors in RV mode.

As you can conceive, this gives premise for investigation of running motors in RV mode and demonstrates the fact that basic induction motor design can be enhanced using Hi impedance and capacitor phase generation vectoring (resonance).

Running motors in RV mode solves problems which lie in solar run mechanical energy conversions, and creates Power loss reduction which makes low power asynchronous solar cogeneration possible and practical. Running motors in RV mode completely permits the operation of other wise wasteful HI power implements with

cogeneration of the solar industry, and allows the use of HI power motors in a role of low power Solar systems that use intermittent loads extremely practical.

The method and operation of the RV shows essential waste management and is justified lab verifiable data to upgrade conventual electric motor applications. The RV proves via lab tests how the standard 1-2hp design is configured to waste energy.

Over view of the RV's energy saving applications.

Most induction motors are wired operate with both starts and run capacitors. Most saws, drills and lathes are also configured to run by the same operating principle. A typical example is this 1HP electric motor which is usually applied in the role of a PUMP, GENERATOR, LATHE, SAW or AIR COMPRESSOR.

ALUMINIUM FRAME ASYNCHRONOUS -INDUCTION MOTOR



The separate run and start capacitors are housed in the box on the top of the motor. The specifications of this motor are: 240 volt \ 4.78 amp \ 1400 RPM \ 1HP - 0.75kw \ 750WATT \ 13kg.

Here is another example of induction motors with start and run capacitors used in a SAW, DRILL and BRICK CUTTER role.



Brick cutter



BAND SAW, the run and start capacitors are housed left on the side of the motor.



DRILL PRESS, with run and start caps attached left and right side of the motor.

Running induction motors with start and run capacitors in these off the shelf items are chosen particularly for a power management role. However what designers for industry intermittent use applications fail to see is that by using start/run capacitors with resonance from bigger inductive windings (higher rated motors) tuned by a capacitor value to a specific load requirement, results in a higher efficiency and complete power savings in the idle and loaded states. This RV mode is a more efficient power on demand process. (Example of idle is in the drill press or a saw).

The above 1HP motor example was been chosen particularly as it is an all purpose motor typically used in the industry roles of a lathe, saw, air compressor, pump or generator, and is where the RV energy savings can be the most effective.



A 1 HP BALDORS RV motor modified for energy saving applications.

When applied in solar applications.

In Solar energy applications you can tune the RV motor to be a power on demand device, the RV motor will use 12-50W and enable the motor to deliver up to 1.8 HP with an effective efficiency of + 97%, this figure is estimated to have a 90% minimal energy savings capacity on the motors idling time (machine tools ,lawn mowers, Pumps ,saws , log splitters , (Solar Home workshop) drills, lathe.

This currently is Impossible with “standard” electric motor setups.

Guidelines for industry machinery conversion to run in RV mode

Use a Grain grinder and a step-down pulley for HI HP output into grinding grain as a BASIC use for SOLAR off the grid small farms and communities. Also **A well pump, a circular saw, a drill bench**, to compare with a normal motor for solar aeolic use run with Solar cells, regulator, battery and an inverter.

Guide line as follows.

The configuration varies from motor to motor that will be used.
Here are some general guidelines:

1) the RV power output is about 1/4 to 1/5 of the rated one on the motor plate. So check what power you need (in kW or HP) and then take a 3PH motor 4-5 times 'stronger'.(people will now say that they are fooled because you need a 5x bigger motor. The fact is in RV mode, the motor is much more efficient versus standard use, and also at idle consumes very little -energy savings!)

2) If you want to run it straight from the mains, then you need to select a motor with a voltage rating of about 2x that per winding (or 4x in WYE connected). Example: if you have 110V 60Hz mains, take a 230/460V dual winding 60Hz motor; connect windings in series and in WYE. ($460/4 = 115 =$ is close to mains) Example2: if you

have 230V 50Hz mains, take a 400/690V 50Hz motor, and connect in WYE ($800/4 = 200 =$ fairly close to mains - better is 220V) Alternatively, if you feed the motor from an inverter, then modify the inverter to set the correct voltage output for your RV motor (is relatively easy to do within a certain range).

3) In terms of speed, check the desired speed of your tool. If you can find a motor that is close to that speed, use that one.

The standard motor speeds are:
for 50Hz: 3000, 1500, 1000, 750 rpm (=2-4-6-8 poles)
for 60Hz: 3600, 1800, 1200, 900 rpm
(in fact about 3-5% less than that because of slip)

The speeds of 3000/3600 and 1500/1800 are most common. If you do not have a good match, you can use a reduction gear or pulley (but those have energy loss), you can also modify your inverter to alter the frequency, then no pulleys or gears needed. For more information on the RV's frequency adjustable power management please consult the index.

For the 60 hertz RV, it is optimal 1:4, i.e 120:480, 230:920 (grid 230VAC and motor wired to 920VAC). The latter requires rewinding the motor, but the positive side is that you need lower run capacitors as the inductance is much higher.

Note it is possible to build an advanced binary capacitor that is switched by CPU that senses the input current and auto-adjust capacitors for full Range load.

Running motors from 230VAC wired to 400VAC is also quite practical in terms of energy savings, something interesting happens when you decrease the input voltage, while maintaining the torque and optimal run capacitor. The Amperage remains roughly the same (all depending on circumstances), and you wonder where the energy was lost in higher voltage drive mode.

It is assumed the PF=1 on both HV (230VAC) and LV (120VAC), so we may have a 50W difference (this report was based on a real life example). Where did the energy go - heat? No, the current was only 0.5A that does not explain heat losses. The possible explanation is that energy has gained in high impedance mode (120VAC). You may use two 400VAC+ rated motors in series (WYE) on the same rotor and drive them from 230VAC to have 1:4 proportion.

Or increase the freq 2x ->100hz to have RV mode. When motor is wired to 460VAC (50hz), by increasing the freq 2x, it is virtually wired to 920VAC (100hz). So you need a 230VAC freq tuneable inverter. That is the whole idea to have the voltage and freq increased proportionally to have very powerful RV's. You may use low RPM motors (980RPM) and rotate those at 1960RPM

RV test of energy efficiency vs. energy waste

To allow a proper measurement accuracy and calculation of real power distribution, the motor used in the tests against the RV was power factor corrected with capacitors

to match the PF of the RV. This logical for many reasons, as power companies want better power factor in energy operation as industrial people will recognize. Power factor explains the true power and apparent power being consumed.

Power Factor Correction Makes Every Watt Count!

For some reason, a lot of engineers and technicians seem to have a problem with understanding power factor correction. However, not understanding what a power factor is and how to correct it can lead to overcharges on YOUR electric bill. An incorrect power factor is like driving a poorly tuned vehicle... the car moves, but you pay for a lot of extra gas! As your local utility distributes electricity over the grid, line losses occur, in other words, the voltage lags the current and the actual power available is not as great as electrical meters based on wattage claim.

Early efforts to correct this phase difference were centred on the fuse box. However, as power factor correction became popular with major companies, the utilities changed their meters from watt measurements to read the current consumption thus causing an actual increase in utility bills where the power factor was corrected at the fuse box.

This has forced power correction efforts to be decentralized and to be performed on individual motors. You must properly read a KVAR meter to measure how much your voltage is lagging your current. Baldors motors mention this very task of power factor correction in motors. Here is a direct exert from their energy efficiency document

■ **Misconception 2: "A more efficient motor also has higher power factor."** Many motor design modifications may be made to increase efficiency. Some of them will also increase the power factor, whereas others (such as a larger air gap) will decrease it. Comparing "energy efficient" machines with their less efficient predecessors shows that some do have higher power factor, some have lower power factor, and some exhibit no change. If power factor improvement is ever needed, an easy way to get it is with capacitors on the motor circuit—an economical corrective measure that isn't available to improve efficiency.

In Power Factor Correction the apparent power in an AC circuit has been described as the power the source "sees". As far as the source is concerned the apparent power is the power that must be provided to the circuit. You also know that the true power is the power actually used in the circuit.

The difference between apparent power and true power is wasted because, in reality, only true power is consumed. The ideal situation would be for apparent power and true power to be equal. If this were the case the power factor would be 1 (unity) or 100 percent.

There are 3 ways in which this condition can exist.

(1) If the circuit is purely resistive or

- (2) if the circuit "appears" purely resistive to the source.
- (3) The X and L cancel each other out

To make the circuit appear purely resistive there must be no reactance. So the current will not lag the voltage. Power factor correcting motors will optimise the measuring performance and show where the real power is being used or wasted. Also to present the watts hour savings benefits involved in the power factor correction of motors the tests will involve a kilowatt-hour meter and a power factor meter to show energy figures.

A motor with .1 power factor can only do 10% of the load of a PF1 motor. The PF .1 motor will not function if it tries to drive the same load as a fully-loaded PF of 1 motor.

The justification for this can be seen in the meter readings of the power factor corrected motor tests verses the RV. After a sample motor rated at 2HP was power factor corrected so that it was close to the power factor of the 7HP RV motor. The difference on the meters showed The RV costs \$12.00 per month with the load, where the non-RV motor costs \$55.00 per month with the same load.

With the power factor correction the non-RV motor, takes \$26 per month to run. Without the PF correction, the non-RV motor won't even drive the load correctly and still costs \$20 per month to run. For relative power figures and demonstration of the principle the power factor issues need to be addressed, this is where normal motors waste energy as opposed to where the RV saves it.

These Test results were confirmed by Matt an open sourced engineer evaluating the Roto Verter effect when comparing

A 7.5 HP RV run motor (down rated to give 2hp) against a 2hp non RV motor (PF corrected)

To PF correct the motor different size caps were attached across the incoming power. The caps are attached with one lead to the common and one lead to the hot wire.

The motor ended up with a 115MF cap. Then the experimenter checked PF was with a PF meter <https://www.doubleed.com/products.html>
Using this meter watts measurement meter



This device called watts up meter allows you to simply plug any device into Watts up, and the meter instantaneously displays the wattage being used, as well as the cost, in dollars and cents.

Watts up provides lots of information yet it is simple to use. Only 6 values are displayed in the main modes. The other information is available in the detail mode. Clear English wording (not abbreviations) on the LCD is used to describe what is displayed.

All 3 models display the same information on the LCD:

- | | | |
|------------------------------|------------------------|-----------------------|
| • Cost, in dollars and cents | • Average monthly cost | • Power factor |
| • True power | • Average monthly kwh | • Minimum RMS voltage |
| • Cumulative power (kwh) | • Maximum RMS voltage | • Minimum RMS current |
| • Time | • Maximum RMS current | • Minimum wattage |
| • RMS Voltage | • Maximum wattage | • Duty cycle |
| • RMS Current | • Power cycle (PRO) | |

It is further recommended that the best test is to run a tuned RV against a normal motor with equal watt HRS meters used in the utility line. Measure the device under load test only. RUN the 2 idling under the meter reading and read the effects on the line from a CONSTANT source.

The power FACTOR in itself can become trap if the power FACTOR is affecting negatively In INPUT; this effect increases the current logarithmically, there then is the loss increase. But in the RV such a loss does not represents the LINE loss and the 3rd phase reading exceeds the input any way you put it.

Phasing at 120Deg creates a PF of 1 in the source; the ABC phases are higher efficiency in average to input, whatever the Meters say go by the Scope reading and the BOOK formulas to define this truth. In fact the RV's application in power saving is FACTUAL in a DC sourced battery and inverter shunt set up. Verification of this can be done by going full solar and making the utilities obsolete.

In the input of a one phase RV the Power factor is irrelevant in 3 a phase relation by being relative to each 3 phase's interrelation, the angle of rotation is what matters and PF does not define that. But the CURRENT & voltage Phase does. This is in the same context of the book laws as in an LRC current where the PHASE is the constant VOLTAGE Phase and is the one that's shifting in components.

This is interesting and is the same as viewed from an RF antenna perspective. The components represent Voltage and Current nodes where the 0 points are present within these standing wave NODES.

The RV creates a BROADBANDED semi resonant condition at idling so it has a LEADING VAR relation to line input and a semi NUL vectoring of PF RF signal in SERIES LC identical motor where acting as an ALTERNATOR of the 3rd phase.

To avoid complications it is advised to design full solar applications for proof of principles comprising A DC battery with identical inverter fixtures with the exchangeable loads. (Eliminate voltage phase AC in accuracies)

They must be identical applications & loads, the purpose is to confirm and demonstrate the RV & alternate technology as SUPERIOR POWER MANAGEMENT towards the justification of creating new standards (which needs to be mandated by law) in electric motor design for GREENER higher efficiency.

A fact is that you can wire one phase motors to 460 VAC and you can run them in RV mode vectoring the START phase at the proper angle (45deg). It will however be a bit less effective than a 90DEG 3ph force vector but it will be effective, all 1 PH motors can be run RV mode.

Plus 120VAC motors can run in RV mode with 28VAC. It just requires x4 to x6 capacitance using oil run caps. Start caps can be lytic (to lower price cost). That means in 24 VOLT DC battery systems you can run a 120VAC motor DIRECTLY FROM THE BATTERY DRIVING IT with a IGBTs BIASED H network and thus lowering the cost of an integrated inverter system. The motor can also be run directly from DC as DC becoming a brushless RV motor direct motor driver.

This Data is applicable to

Industrial applications

With relevance in energy savings from the tested PF corrected motor versus the RV to operate industrial intermittent use applications in industry.

Solar "off-the-grid" systems

The relevance is contained in the efficiency of a solar battery-inverter setup.
The RV solar battery and inverter method guide lines are:

Equal rated batteries are obtained and connected with a hydrometer and tested to equal, and then match the two inverters RESISTIVE and Inductive reference loads, test and certify to equal. Tune the RV (via capacitors values) to an equal mechanical load and see what motor wins.

This will confirm the Basics hard postulates of the RV which show how the idling power savings saves the battery power needed to allow PRACTICAL solar cogeneration of electric motors.

The consumer

Relevance to a logical environmental responsibility the public has. Relevance to the money it will save them from the performance of the RV's energy savings. The collaboration of the open sourced engineers working on the RV technology also provides opportunity for social reform. The RV being disclosed open sourced aids the public by serving their needs in a non regulated non profit environmental role.

The public consolidating with open sourced engineers to produce open sourced energy technology into their daily applications is reform the public needs to assimilate to quell spurious non environmental money subjugating energy technology from their lives and keep it obsolete permanently.

Public grants for a non profit division to contract the already available open sourced engineers in a research and development centre can bring this genre of technology into public service. And resurrect the past suppressed energy technology and protect it.

The non profit organisation <http://www.panacea-bocaf.org> has to begun essential organisation to consolidate this into reality and produce open sourced free energy for the public.

Recommended cogeneration fusions running the RV

With solar cogeneration the power efficiency of RV is unable to be ignored. The RV Will provide the most efficient power on demand out put for the least amount of solar panels needed.

Normally by using a 1 HP motor you will use 880W minimal idling (constant). In a comparison using an optimal rated (RV) motor you can go down as much as 24W idling and under LOAD and have .5 to of 1.8 of HP when tuned to an optimal loaded condition. **The idling power will save the otherwise waste energy to charge the battery and allow PRACTICAL solar inverter cogeneration of power.**

In the application of a **POWER DRILL, A SAW or a LATHE** run with a 12V car battery connected with a 120W Solar cell, it means affording a situation to allow

Battery charging whilst the unit is idling. **In a NORMAL motor it would use 90% more energy using a 3000W Inverter draining your battery in minutes.**

Using a SOLAR Drill powered by a 120 WATT solar powered RV motor, the unit can run all day and permits drilling holes at a superior 96% efficient power management and power on demand operation.

The same concept can be applied to AC line power tools.

It is recommended that the RV run a Lathe, a milling machine, an industrial bench drill or any other load variable machine which it can run easily up to one to two HP from solar power (true free energy).

Here are harbour freight examples which are a perfect substitution and recommended by Hector to demonstrate the RV's power on demand energy savings. Check at the end of this compilation for the guide for choosing the right rating RV motor for down sizing to suit the horse power range and allow the proper efficiency.

[HORIZONTAL/VERTICAL METAL CUTTING BANDSAW](#)

Three speeds to cut everything from brass and aluminium to rugged alloy and tool steels! In horizontal position, use the gravity feed adjustment to increase or decrease cutting pressure. 6-3/4" x 6-3/4" table for use in vertical position. Blade and heavy duty stand included.

Cutting Capacity: 4" x 6" (rectangle), 4" (round)

Blade size: 1/2" x .025" x 64-1/2"

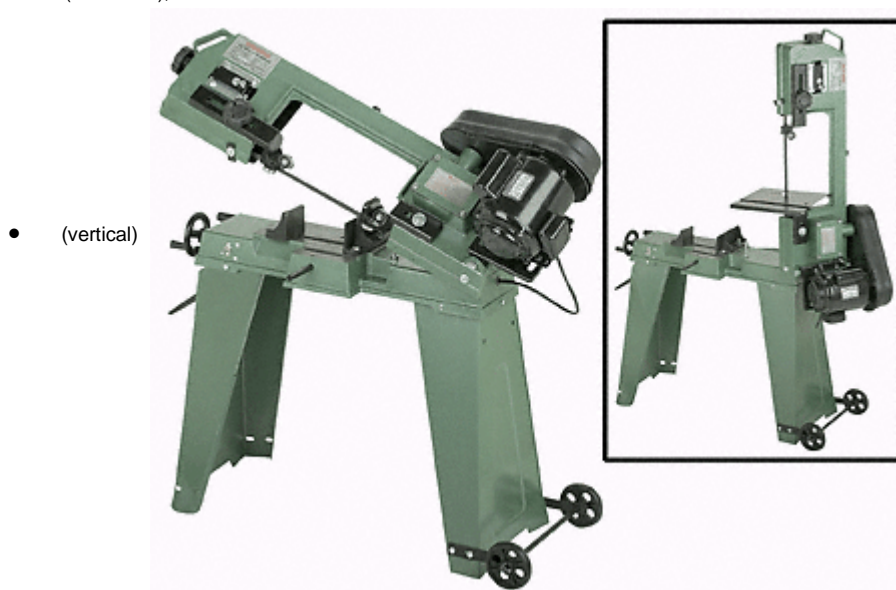
Blade speeds: 80, 120, 200 FPM

Bed width: 7-1/2"

Vise: 7-3/4" x 6-1/4"

Overall length: 37"

Height: 38" (horizontal); 54" (vertical)



Source

<http://www.harborfreight.com/cpi/ctaf/Category.taf?CategoryID=262&pricetype=>

Replace the motor pictured above with a motor running in RV mode.

12 SPEED FLOOR PRODUCTION DRILL PRESS



1-1/2 HP Motor

This professional-quality tool features rack-and-pinion table movement, heavy duty all ball bearing motor and an independently wired work lamp. Includes oiler.

Cast iron table rotates 360° and tilts left to right up to 45°

Motor: 1-1/2 HP; 1720 RPM; 120 volt; single phase

Precision 5mm to 20mm (.197" to .787")

capacity JT3 ball bearing geared key chuck

MT3 spindle taper

20" swing

Spindle stroke: 4"

Table size: 16-3/4" x 18-11/16"

Column diameter: 3-5/8"

Spindle speeds: 150-4200

Source

<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=39955>

In fact Whatever haves a removable RV replaceable motor you can have one NORMAL and one RV'd one.

<http://www.harborfreight.com/cpi/ctaf/Category.taf?f=displaysubcats&CategoryID=9&tab=8>

Other Examples with solar cogeneration or with line AC grid input. USE the RV to optimize a water pump impeller design by Ceramic low friction seals. This can be

experimented in hydroponic FARMING in a role of SOLAR POWERED water recirculation.

A BELT woodcutting saw with an installed **pulley** to your RV tuned by the run capacitor to the lowest draw is the most efficient motor in the world. That is the type of thought on PRACTICAL DO NOW applications. **With a band saw it is not logical to spend 800W instead of only using 50W with running in RV mode and 500 to 700 W on demand (Cutting big piece of wood).**

This application can be made even simpler with a current start switch to start RV automatically. The rest of Band saw is left as is.

Example of using a bench drill powered by the RV .5 to 1HP powered motor.

Try using the same drill bit size and drill 200 holes on a wood plank or metal piece, then compare the watt HRS used. This can be done with a 3hp motor wired to run in RV mode.

Another great power saving application can be demonstrated with a drill press. The concept is to fit the motor and belt pulley. Guidelines for this are stated in the next section. The belt and pulley system can ALSO be improved on using low friction segmented flexible belts, all ENERGY losses can be quantified and mitigated as the RV can function with REVERSE DYNAMOMETER CAPABILITY. (See index for explanation).

Comparison of efficiency by the Math is simple. 50% of actual motors work on intermittent use that represents 46% of US power usage. If you reduce that to 90% that means you can use 41% more power to do work as savings. If these intermittent use jobs amount to a 50% Duty cycle that means a 20.7 % NATIONWIDE of energy savings can be applied by using the RV in the US alone.

That is the BASIC math when going into POWER management; you can see the real power wasted in the US exceeds 95% especially in BADLY engineered electric motor power designs. If the RV principle is applied for power management this rational can SAVE 80% of the electrical power currently wasted actually in the US.

It means end to global warming energy crisis with energy savings and efficiency boasting from

Power on Demand
Power factor correction
Power management

this justification for running motors in RV mode is needed to be understood/ SOLD with public's motivation to apply the roto veter technology. The RV is a superior R&D tool & power saving Device. The Energy saving readings demonstrates that there is need to address the WASTE issue, politically and scientifically. THE RV'S ENERGY SAVING IGURES IS PREMISE for the public to lobby and mandate law for standards of power management and NO ENERGY WASTE.

You can sign petitions to address this at <http://www.panacea-bocaf.org>

Theory Comparison of bench drills efficiency

Obtain-2 bench drills

Compare and run a drill with a 1 HP standard motor and one with an RV motor being via a 7.5HP or 3HP motor tuned to hit the same 1HP at max loading. Measure the two readings by a cumulative Watt hour meters and compare after a day shift of drilling by the loads, then evaluate 2 readings.

Or obtain a single phase motor as comes with the off the shelf drill press. First part of the demonstration you run the drill press with it and measure its performance. The second motor is the 3PH motor to be used in RV mode. For the second part of the demonstration you mount the 3PH motor on the drill press, set it up in RV mode, and then take another set of performance data.

Evaluate by the classic A vs. B comparison. Try to find any old belt driven machine you can, something that looks easy to line up another motor and have clearance for an oversized belt.

On the drill use lowest friction belts (timing belts for best RV performance) and what matters is they have same RPM to be compared on performance , a 3600 RPM RV will move tons at 360 RPM wood drill with an efficient low loss down gearing .

It has since been advised that the lowest-loss you can do with belts is to use rubber toothed timing belts. Regular V-belts have to have too much tension just to get the belts to grip the pulleys and the teeth in rubber toothed belts means you don't need so much belt tension that way.

Timing belts are low friction:

http://www.dogpile.com/info.dogpl/search/web/low%252Bfriction%252Bpulleys/1/-/1/-/-/1/-/417/top/-/-/1

Timing belts from cars are standard also in industrial servomotor applications (less friction than V belts) also grooved V belts run better. Bench grinder 60 hertz 3PH 460VAC shop grinder can be made to run RV mode

For a test to confirm the RV's superior energy saving efficiency, one use the RV prime mover as a mechanical direct driver for a DRILL press. One drill with the RV, the other with issued stock motor as, both motors are then intermittently drilling holes while the watt hours can be recorded in a chart. To be further made simple the speed and torque must match the ones required for original operation or better, **a pulley down stepped 3450 RPM RV will definitely outperform any stock 1725 1/4 to .5 HP motor.**

A Basic example-1 HP RV is can be made from a 60 hertz 5 Or 7.5 HP 3PH motor, the then max load is to be calculated and the RUN capacitor can be set in a mid

adjustment range (broad banded), even though the Run cap wont be optimally tuned to the specific loaded condition, the RV will outperform the normal motor!!!

Baldor's motor's can also wind up 120,240,380,460 & up to 920VAC 3PH Motors which can be RV'ed anywhere from 100-120 200 240 VAC 47 -60cps with only needing to be using capacitors and centrifugal start switch.

For the RV drill load, later we can switch to an automatic computer controlled load sensor which can also utilize the RV's hidden OU component and operation. This method is the specific LOAD tuned Amplitude, frequency & pulse length. This is where Hector details the RV's relation to OU and ZPE.

Challenge the facts!!

$V \times I \times PF = \text{true power (theoretical)}$ **Further examples can extend to a coffee bean grinder; a grain mill is to grind grain into flower (dust) and can run with RV with SOLAR energy. This means a lot of savings using power milling not spinning with no load, same as a bench drill lathe, band saw, fence post drill, and a lawnmower. The ultimate application and capacity the RV has to save energy lies in the construction of a superior solar shop module.**

For example This 2 in one shop equipment module employs a lathe and drill which is powered by a 1hp motor, this all in one shop tool can be improved to not only operate as a solar work shop where previously it would be economically impractical, but can save energy and money in the line AC grid when power managed by the RV.



2 in one drill and lathe

Another example is this wood saw which is designed to idle and cut as unwanted debris or branches from the garden are broken down.

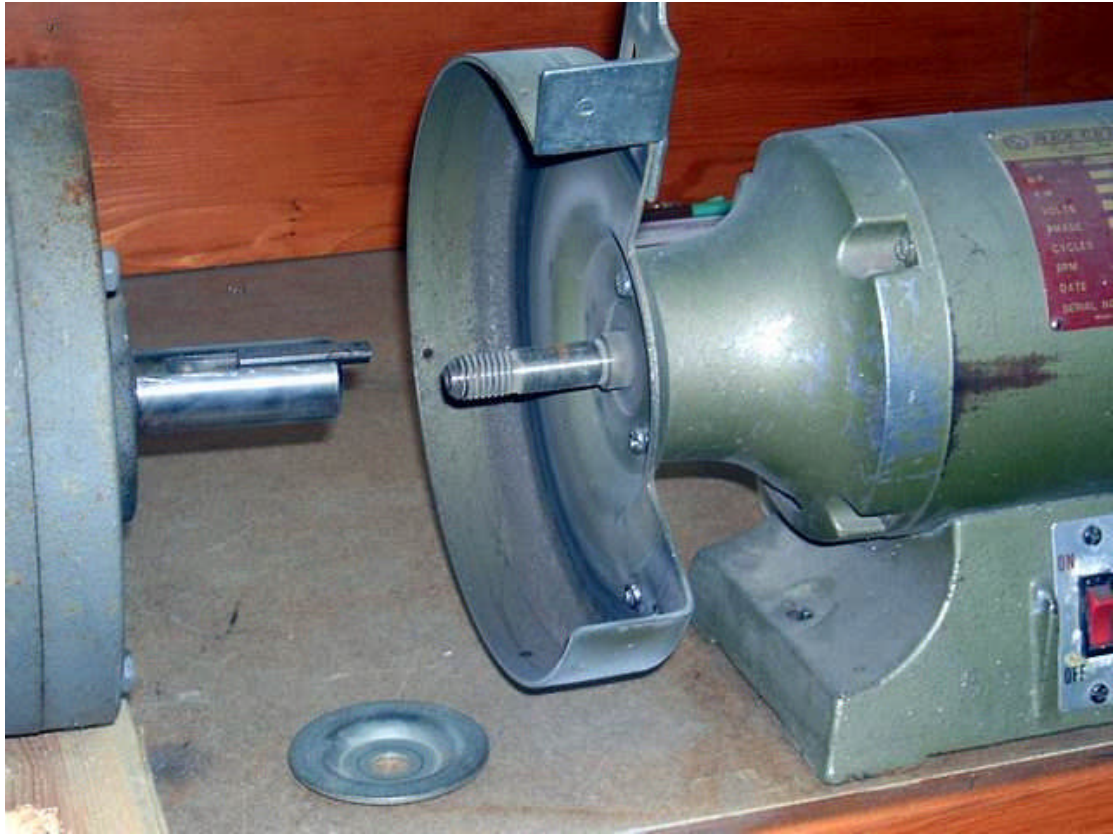


This is another application where the RV AC grid /solar cogeneration can set a standard in practical power management.

RV grinder

Credits to Ron for this.

Referring to this pic,



The gizmo on the right is a standard 8 inch bench grinder. Left is the RV motor.

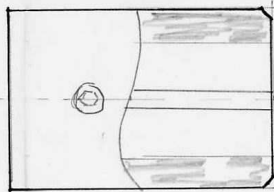
Note the small size of the spindle that sticks out and thread for the nut to hold the wheel on. Also note the small step at the motor end where the collar (laying on the bench) fits up against. Now if you look at the 3 hp shaft, on the left, you can see it has none of these features as its too big and too short (that's what all the girls say.)

So that's all the drawing presented, it's a sleeve that slips over the motor shaft and has a spindle that sticks out on which to mount the grinding wheel.

Imagine this hub slipped over the motor shaft. but having a shaft welded on, sticking out with a thread cut on it for the nut, two side collars to hold the grinding wheel, the nut tightened up, this would be a visual perspective of an RV grinder.

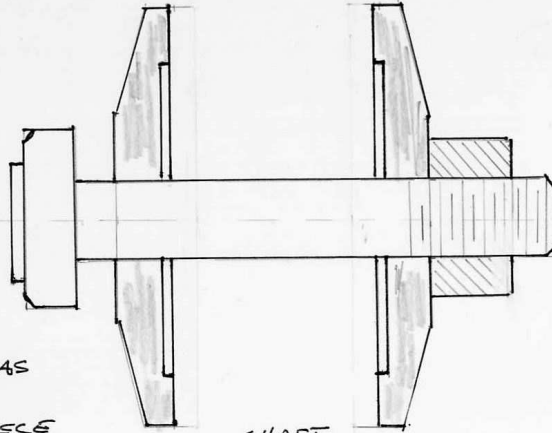
R.V. GRINDER

HUB BORE + KEYWAY
TO SUIT MOTOR USED.



CAN BE FABRICATED AS
A WELDMENT OR
MACHINED AS ONE PIECE

NOTE: PIN HUB TO MOTOR
SHAFT ON COMPLETION



SHAFT
LENGTH AND DIAMETER
TO SUIT GRINDING WHEEL

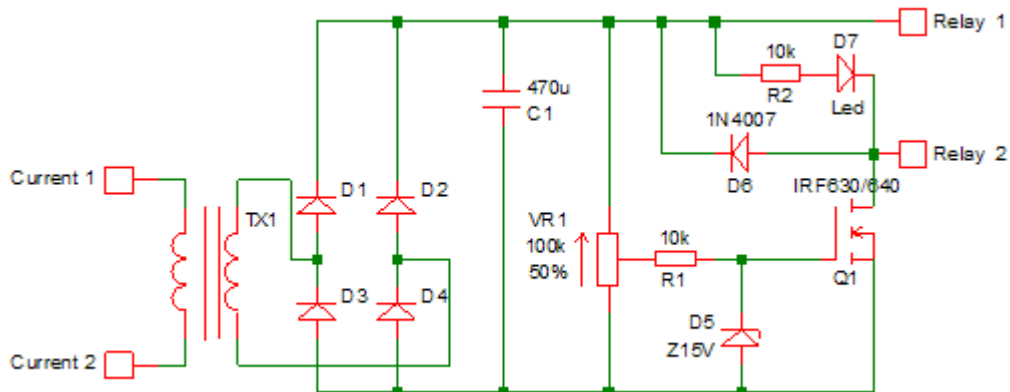
DRAWN BY: R. HAND

DEC 2005 MTS.

RV current relay

This is an example of a tuneable current relay put it inside a box.

Can be used to start RV automatically - (RV lathe,). Similar to
Circuit: using 5 turns as primary and 12V output as the secondary on
toroid transformer.



RV prime mover uses (as Reverse dynamometer)

When applied in the application of an airplane propeller design, the RV can be installed with a prop pulling motor set up for a rail pulling weight measuring device.

First you must hunt for the strongest pull and lowest drag electric power usage. Examples are in the Tesla pumps design. You must test the drag and pressure then optimize for the highest flow highest pressure - lowest power usage from the RV.

Other applications are in Low Lenz law generator design, hunt for the highest output lowest input. Other uses are, testing Lubricants, transmission energy loss, and monitoring the drag increase in mechanical systems with current limit alarm.

RV Lubrication testing and bearing testing for energy saving standards

The RV is also a practical base for starting in ENERGY saving and power MANAGEMENT from optimizing the motors ball bearing performance to quantify Pulley BELT friction losses , a generator design flaw (as permanent magnet alternators are)

One of best grease awakeners is transmission fluid. This needs to be applied to RV motor bearings as with time & storage the normal motors grease goes to sleep (turning to WAX) and literally becomes a "DRAG" in all sense. One solution is in the method of washing the Bearings in transmission fluid and then reviving and regreasing them with a low friction lube. That is part of the R&D to eliminate DRAG losses using the RV as a reverse dynamometer (Machine design) related to a power loss management.

REVERSE DYNAMOMETER CAPABILITY= the ability to test how much power a rotating piece of machinery is actually USING.

A Dynamometer is used to measure how much mechanical energy is being produced (transformed, actually) at the rotating shaft of a motor. Using logic and the context of Hectors posts, a Reverse dynamometer measures how much rotating mechanical energy is required to make something spin.

Since the RV only has the losses from its bearings, an increased load will be reflected by a linear increase in the amps driving the RV. A normal AC motor changes power factor and efficiency depending on the load put on it so it is virtually useless for evaluating the power usage or efficiency of the driven object.

One Method is to take a low friction bearing and normal drag grease and compare it being spun by the RV & take readings ,a new set of TESTING standards can be made for bearing replacement and lubrication, resulting in **PERFORMANCE and ENERGY savings in Shop Home or industry use.** The RV can be applied as A NEW R&D tool and POWER SAVING device.

This energy saving RV method may be verified also by using a Foot pound pony braking Torque measurement, using liquid drag clutch (that is a simple way) a rod exerts weight on measurement device, Torque measured in foot pounds.

Sugar cane mill

A 60 hertz 7.5 HP motor running in RV mode using up to 1HP in a power on demand sugar cane mill application will use only 35Watts idling. From a solar panel & 2000W inverter the system this system can operate all day idling by merely using a 120W solar cell to maintain the self sustaining battery charging. Upon loading the draw will be 600W, and then will revert back to 35W. This is estimated to be around 200% energy saving by a normal comparison to a standard system containing the 1HP motor.

A normal 1HP motor uses 890W constant power drawing. And could not run more than 2 Hrs without the battery running down, by the standard system, it would require

up to ten times the solar cells power to run it. Plus further complications exist with the Starting as it draws 30 amperes on a weakened battery which results to an inverter failure collapse.

Impeller design

The following is instruction on how to use the RV in an impeller design (Fan blades) for power saving applications. Starting from 0 based on your motor speed by an example of 1725 RPM; design a primary 0 pitch (0 angle variable pitch blades). Step one is to determine the resulting friction at a this 0 pitch and then lower it to the lowest watt usage reflected in the fan blade design, then determine the lowest drag of the fan blade.

The next step is to find the blade design needed to create the individual choice of required thrust or flow parameters you want. Your virtual perfect 0 reference is the spinning disc and creates an air flow principle (reference is Tesla turbine), as it spins, the resulting drag will reflect in power input.

The RV as first usage must be applied to quantify its own losses, **FIRST** determine the RV lubricant bearing drag, change the grease or bearings to low friction ones, the RV internal friction, fin and blades can be shaven to an optimal efficiency. When the flat internal fans are removed as such you must note the energy LOSS issues and quantify them (Use RV as lab tool to OPTIMIZE its own design).

Then optimize the FAN design on your intended power saving project, and ask yourself what parameters you need to optimize as to make best use in your application (as proper Fan blade design) **which are grossly overlooked in modern engineering practice. The RV can be utilized as a tool which permits you to quantify losses in those areas.** At same time by using minimal power to do it. Just refine your methods and apply variable options for improved fan design & applications. Variable pitch fans save more energy than fixed pitch ones, having them designed for lower drag and maximal air flow with minimal thrust and drag component.

For aircraft design this can be reversed towards a minimal drag and minimal flow for a maximal linear push force horizontal (Lift) force transferred to shaft as thrust.. (Same applies to watercraft props and water pump design, reversed for flow in pumps. "0" thrust. Construction of a redesign impeller for a Tesla type turbine (hi pressure) is also possible when calculating overall head pressure to optimize a vapour cavitation energy boost from water hydrates.

For Reference of Viktor Schauburger type turbine designs-
<http://www.frank.germano.com/index.htm>

Open sourced engineers really need resources to do TURBINE R&D with The RV prime mover, seal optimization, drag reducing impeller redesign for Tesla or vortex cavitation modes. You can support their research at <http://www.panacea-bocaf.org>

The VIKTOR SCHAUBERGER Implosion turbine concept is also possible in a cogeneration role having the RV Start such a turbine and then switch to generator

mode in a cheap Cost effective way. More related vortex technology cogenerations with the RV are described later in this compilation.

Theory Example of an RV power plant

A power plant bearing generator is obtained at a range of 10KW. Specs are 120/230/460 VAC 60CPS by a ring exited rotor (brush) bashler regulator of a /// 1600RPM 4 pole alternator. The regulator is substituted by manual or current regulated adjust EM excitation power.

The System is then wired to 460 VAC and a pony RV starts it towards a synchronous speed, once it is in a synchronous state it is then connected to the line were the excitation voltage and current magnetizes rotor and thus creates the RV power factor correction synchronous dynamotor result. If this is connected to your house it reduces the power factor loss to 0 with an adaptive sensing and adjusting. That is 40% energy savings Average.

If you Use a PM rotor this FEEDS EMA (electromagnetic amplification) OU (over unity!) power into your to home. Instructions are so far to use via series variac to regulate the KVARs or use a Magnetic current regulated amplifier to control the PM KVAR output .In places far away from a grid power source this can save 60% on your power bills by correcting the PF line loss. These are Solutions that can be implemented NOW in vitro (lab) using off shelve stuff.

Via this design super Efficient Electric turbines are possible. For cars the electric turbine RV is best as a 24,000 RPM 5 HP motor can put out 60 HP.

The RV motor housing can be made ultra light weight and at increase in speed their HP increases with size being same. A current model of a 3PH 7.5hp motor can as a sample with a modified rotor to with stand 38,000 RPM will give 80 Horsepower.

Declination plant with RV run Tesla pumps

Energy saving components included in this hypothetical analogy:

- 1) Running the current motors in RV (rotor verter) mode for higher efficiency and no energy waste
- 2) Utilization of the Tesla pump design allowing the most efficiency of the medium and to save energy U.S. patent #1,061,142
- 3) Inclusion of patent number NO: 2005904642 by Phil wood describing a desalination system to covert to solar renewable propagation and higher efficiency
- 4) An example of this RV system for use in Fijian resorts to illustrate an energy saving capacity.

On Fijian island resorts, they have old in-efficient water treatment and water pumping systems in place. Also there is an absence of solar cogeneration and other geothermal systems which is able to save them money and energy.

These in efficient systems are in place as a result of an economic preference. The following will be the example the use of a **Tesla pump which by proven patented function will half there energy consumption from what they have now**. Tesla pumps will pump very hard with much less energy compared too and off the shelf pump.

TESLA PUMP

Back round

On October 21st, 1909, Nikola Tesla (an inventor of many ingenious items) filed a patent for a pump which uses smooth rotating disks inside a volute casing. Tesla's novel method of "fluid propulsion" was based on two basic principals of physics: "adhesion and viscosity".

In the patent (which he received May 6th, 1913) Tesla began by pointing out the benefits of a smooth transition of energy:

"In the practical application of mechanical power based on the use of fluid as the vehicle of energy, it has been demonstrated that, **in order to attain the highest economy, the changes in velocity and direction of movement of the fluid should be as gradual as possible.**" His device accomplishes this by harnessing the "internal forces opposing molecular separation" and "the shock of the fluid against the asperities of the solid substance". (Asperities are surface deformities, which even the smoothest disk will have.)



Pictured above is the Current three phase 5 hp motor pump used on Matamanoa island resort located in Fiji.

Running the resorts electric motors in RV mode in any 1-2hp role will operate doing the same function but on a quarter of its rated energy draw. An advantage of running this RV system on Fijian island resorts is that normally a 1-2 horse power motor or any electric motor would require 10 times the solar panels to recharge the batteries, where in RV mode it will only require ONE.



RV motor courtesy of Dan

Above top left is the capacitor bank, and the 3PH motor running of grid power from a variac wired and tuned to run in RV mode.

EFF figures are

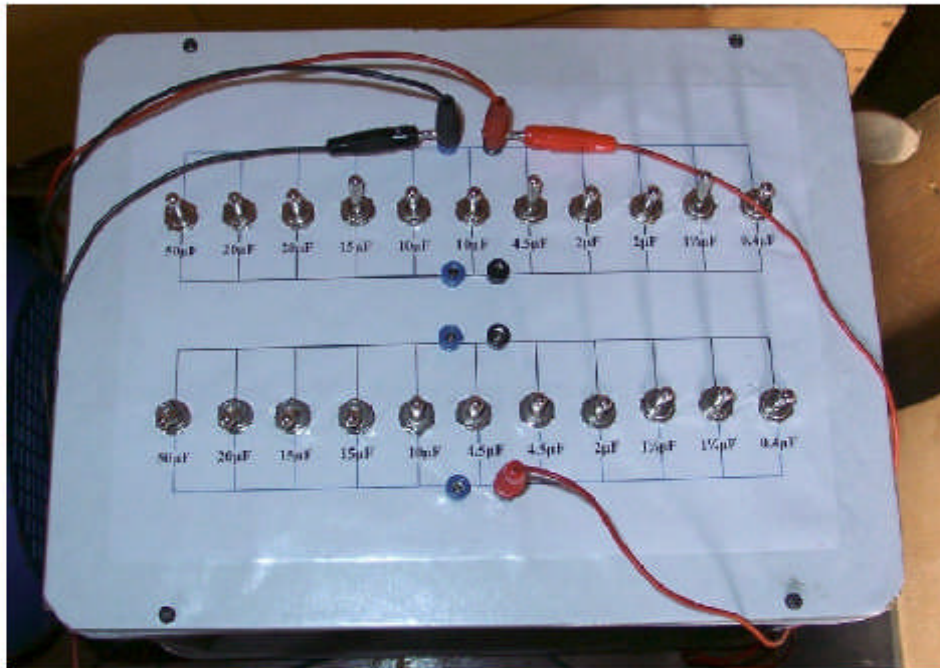
1.b. Variac

- 2kW
- input 230V - output 0-260V

1.c. Measuring equipment

- DMM Victor VC9808
- DMM Metex M-3800
- Scope Tektronix 2215

1.d. Capacitor bank



- Consists of 22 capacitor – all running oil caps – minimal 400VAC
- All switches are dual-pole ON-OFF-ON
- Wiring configuration as such that 2 dual banks can be used

2. Running Primemover unloaded

- Motor wired for 400V in WYE
- Input connected to L1 & L2
- Caps connected to L2 & L3
- Start capacitor: 100µF (see bank 50 + 20 + 15 + 15 µF)
- Run capacitors: 20.75 µF (see bank 15 + 4.5 + 1¼ µF)
- Start current about 6A
- Input power measurements – iddle running – no fan:
 - U = 80.1 VAC
 - I = 0.25 A
 - P = 20.03W consumed power - PF=1**
- With fan, the motor current is 0.66A;



SOLAR/RV SALT DECELENATION PLANT

All Fijian Resorts are armed with an abundant resource for Solar systems. However when this report was compiled in 2005, it showed that ALL Fijian resorts are with out the awareness of the RV energy savings and available efficient solar water desalination systems. The current patent addresses these issues along with methods which Fijian resorts can multiply the evaporation process involving the use of mirrors, and other implosion techniques.

The patent salt desalination process will remove all salts and chemicals in seconds with NO filters.



The water cooker pictured above works by a invention that super heats a disk too very high temperature, then because of the centrifugal force and other means, instantly evaporates the water but spins out the salts and other unwanted impurities.



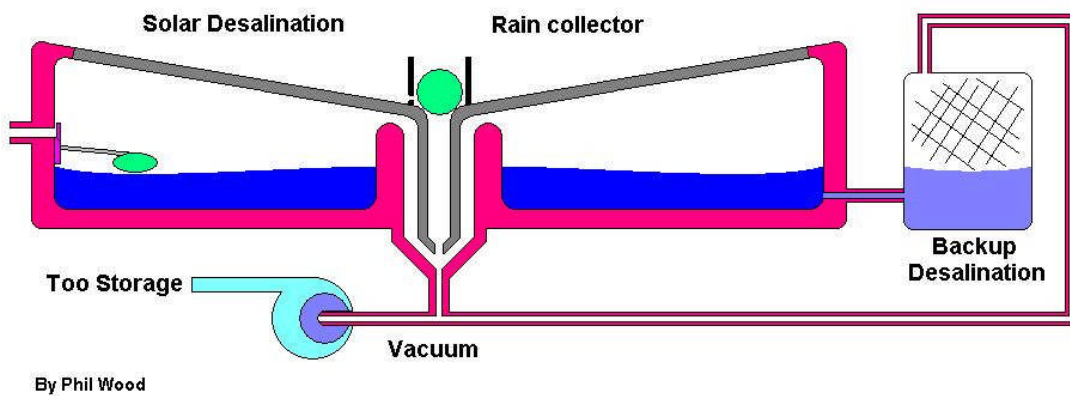
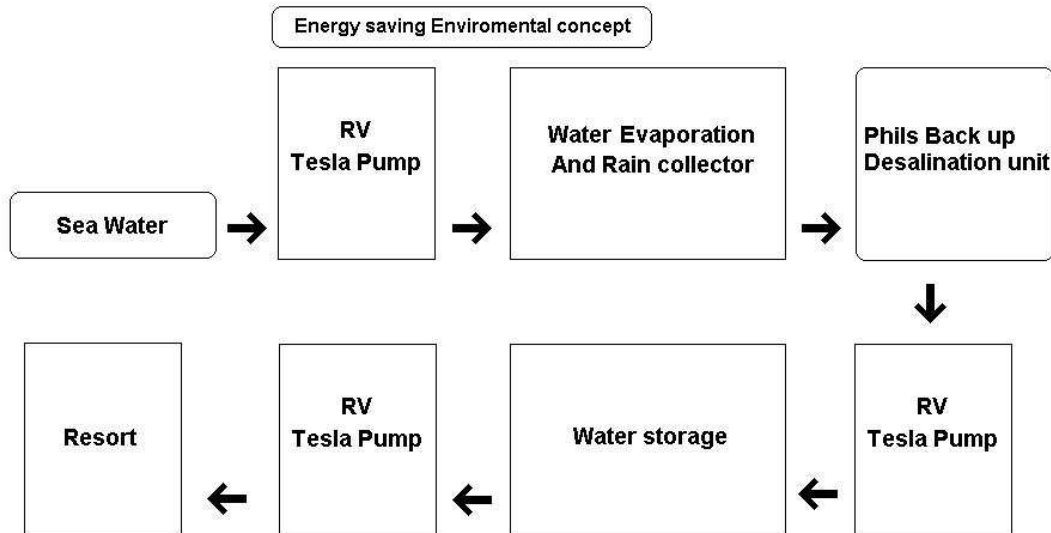
The steam is vacuumed gently upwards where it is condensed. Instead of boiling the water to remove contaminants as normally is employed in a conventional process, this unit has a secret ultra high efficient heating method where the water is injected carefully then there is instant evaporation. The air is regulated through a chamber.

Pat NO: 2005904642 cover this and other principles of the apparatus.

This system for the water unit is designed to generate 200deg C and water is injected where we get instant steam and salt separation. This unit consumes 400watts and showed by tests to get through 1.5 liters of water per minute. Please note there are no filters too clean and no waist of water as this is pure instant steam.

Also when ever we have something like this that generates heat, we have something that can generate cold which could be applied to refrigeration as a bonus by product of operation, perfect for the resorts function.

Below is a drawn diagram of a simple yet highly efficient concept where sea water can easily be purified. Periodic flushing would only be required once slat build up is too high. The desalination component is in the picture just for an emergency backup if water demands get high.



Big motor RV energy saving tests

Quote -Norman Wootan

I have a 30 HP Magnetek, Century E Plus Motor, 1760 RPM, 460 V. 35 A. running on 1.2 A @ 125 VAC input. I disassembled the motor and washed the grease out of the bearings and machined off the large aluminium cooling internal fan. Now the motor will free spool for a long time when power is turned off. Very little rolling friction.

Congratulations, Norman Wootan on your MOUSTER RV setup the standard book rules state you did the impossible. This will lead to rethink the ways motors are engineered, but are up to the group and all others to force this KNOWLEDGE into The media and petrol mafia cartel faces. One megawatt motors running with 10 amps! -Hector

Technical analysis-Hector

The 40KW motor is asynchronous operating by a squirrel caged motor as per a description contained in standard engineering protocol. The primary winding (stator) is connected to the power source and the shorted secondary (rotor) carries the induced secondary current.

The Torque is produced by the action of the rotor (secondary) currents on the rotary repulsion from the off phase 3 ph fields and capacitor vectored virtual 3rd phase.

The induction motor is a common form of asynchronous motor and is basically an AC transformer with a rotating secondary. The primary winding (stator) is connected to the power source and the shorted secondary (rotor) carries the induced secondary current. NOTE: An Ac transformer with a rotating secondary.

A motor as a transformer does not need to use POWER unloaded. Power engineering in the last hundred years totally misused power in 100% waste modes, a motor can work as a transformer unloaded with minimal power consumption.

RV working in real devices

Doug Conzen has been the first to benefit by applying the RV energy saving principle into real life applications, which saved him energy and money. **Doug likes to cut grass** ☺ and did so with this adaptation of a home depot lawn mower. This test clearly demonstrates the significant energy saving involved with the RV's capacity of power on demand, and how the use of this technology in intermittent roles works in making the energy consumption drop.

Quote:

Today I cut some grass with the RV lawnmower - it cut through it great, and it was wet and high grass too. **The amps went DOWN when cutting grass - started out at 1.4Aac and dropped to 1.2A while cutting.**

These Electric lawn mowers you can buy in stores like home depot and draw 15Amps so that is pretty good doing it RV instead at around 1.2A.

One thing I did is made my own aluminium-blade in it, this saves lots of watts as compared to the original heavy thick steel one.

1.2 A is 12.5 times less energy than the 15 amp HD ones

I Just spent around 3 hrs mowing a couple lawns with the red RV mower it bogged down in thick grass and I had to restart it a few times, but so does the gas mower too in same place. Anyways I used 19uf run cap, and 5uf more for start cap, for a time in the thick grass, I hooked up the start cap all the time and then the motor got hot a bit but not too hot. It would be nice to have a switch for easy adjusting of the cap-uf size, as at pure-idle mode, I could drop that run cap down to 10uf or even lower, but then when you hit the grass with it, there isn't enough power to cut it without bogging

down so you need a "load" cap as well as an "idle" and "start" cap too is what I would say for next lawn mowing job.

Also I ran the mower on a single half-charged up 7ah/12V battery not a coleman 400W inverter and then the inverter running the RV lawn mower. The speed and power seemed the same as when running direct 120VAC house power (with long cord) but the battery drained down pretty fast - I didn't look at the current-draw (didn't have meter that big) but assume it is around 12A X 12VDC as its 144W watts on 120VAC.

This lawn mower is a good demonstrator for sure - its very easy actually to do the conversion, my motor is only 1/2hp too, lots of them on e-bay for super cheap I would go up to 1hp rated AC motor next lawnmower project however.

One thing I did is made my own aluminium-blade in it, this saves lots of watts as compared to the original heavy thick steel one - you don't need all that blade to cut grass. In conclusion I'm using only 1.2A ac compare to "conventional mower" using 15 isn't a direct-comparison, since I changed the blade too maybe if the conventional electric lawnmower had a lightweight blade, it would then only draw 8 or 9 amps I would guess. -end quote

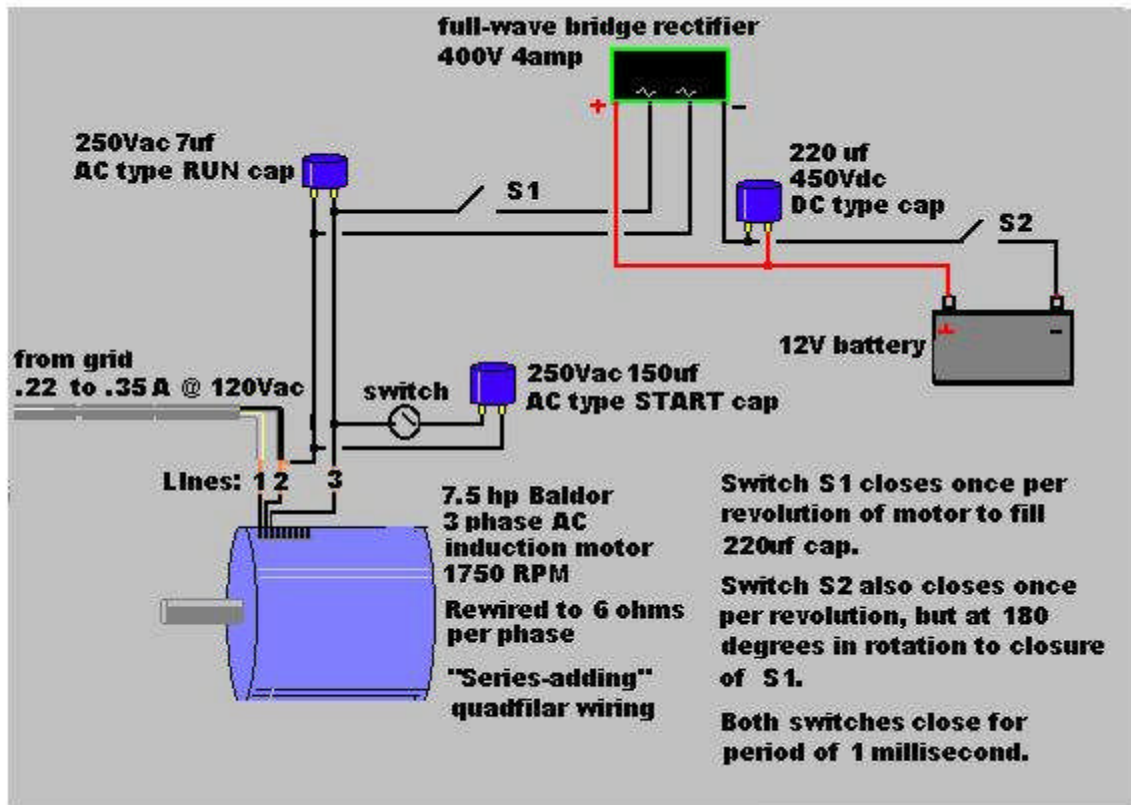


Dougs converted lawn mower to run in RV modes with motor attached on top.

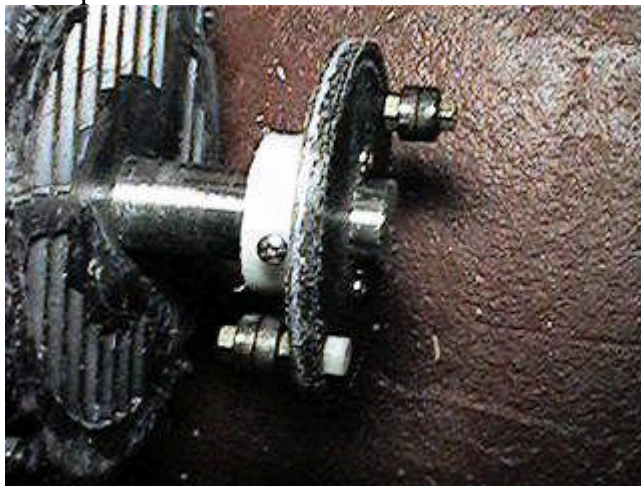
Simple RV battery charging

This is a very simple RV battery-charging circuit that anyone can try out on their RV Prime mover - now a switch fills a cap once per revolution, then other switch dumps this cap into battery to charge - tried this out already and it works good - for example within an hour 7ah 12V battery being charged had climbed to 12.71Vdc from 12.57Vdc...input draw to RV still surges every 6 seconds as the "mechanically timed" cap switches mounted to shaft "buzzsaw" through the motor's sine wave - .23A input

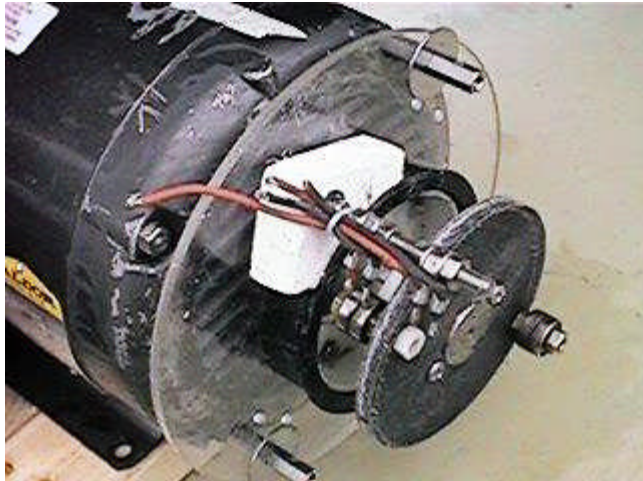
to motor at idle - input amps to 7.5hp Baldor while charging now stretch/cycle from .18 to .40amps



The disc on shaft with offset-rollers that hit brushes which work as the cap switches:



two pairs of brushes that hit the rollers (one pair fills 220uf cap, other pair dumps cap into battery to charge)



Clarification of the RV's engineering principles.

Related to the De-rated horse power issue

Question

If you run a high voltage motor with a very low voltage you will cut the current usage considerably down. Yes and by proper resonance you can tune this for better efficiency once more. But the bottom line here is: What is the power factor and what is the motor when loaded, able to deliver?

Answer:

The power factor in (semi)resonance looking from the side of line is 1.0. The Motor is able to deliver lets say 1.5-2HP by 5HP motor at its nominal RPM without falling off the RV mode. This is a trap in thinking here where 95% scientists fall here. Which is Why to use such a motor that can only gives a part of the HP power, There is no torque, therefore no use.

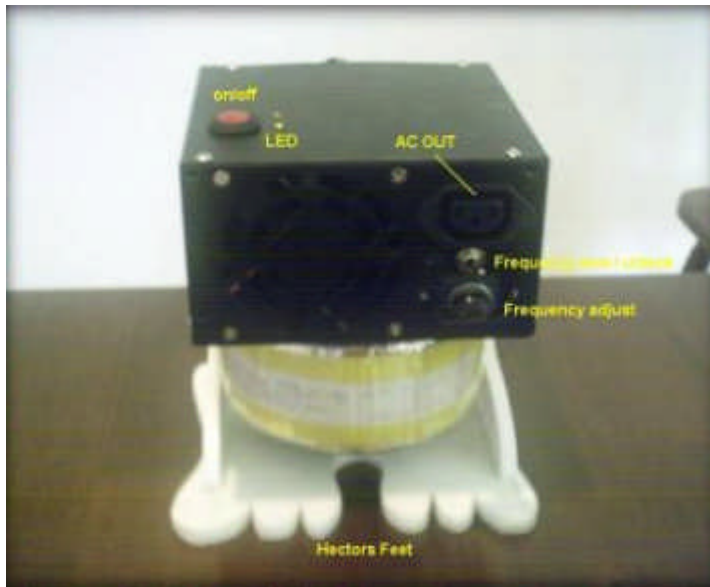
The answer is: efficiency will increase and in some motors over 100% (no spark gaps, no switching, no high voltage, no high freq). It is because you run a motor in high impedance mode that allows this thing to happen. How to make it more powerful at the same or higher eff% is to Design high RPM motor (car/boat/airplane), increase the voltage 4x and RPM 4x. You are still running it in RV mode!

A 5HP motor at RV mode at 60cps 1800RPM will give out 1.5HP. When you increase the speed 5x = 9000RPM you increase the voltage from 120V to 600V also 5x, **you'll get >6HP out of it.** RV mode is preserved as well as the **HIGHER EFFICIENCY.**

When operated with a custom designed inverter with a frequency lock and frequency adjust, one can increase the HP torque By increasing the AC frequency and still running in RV, mode making the motor reach its rated HP but with more efficiency.

As the frequency increases if USING a single phase POWER source the CAPACITANCE needed is LOWER the HP output is higher and eff% goes up.

A point of adjust is FOUND where consumption DROPS to ZERO and CURRENT reverses flow (OU)...This happens as frequency matches the optimal OU impedance region (52 to 520 Ohms) of a given broadband range of. 72 to 450 CPS



Frequency adjustable inverter built by Phil Wood.

An example in efficiency Tested by Doug konehedx

A normal 5hp AC motor: draws 3800watts input at idle or under load (under load maybe more maybe less depending on motor design)RV 5hp motor: draws 36watts input at idle. Under load watts goes up until slip range, then motor stops. (non-RV 5hp AC motor gets hot and melts windings when slip range is exceeded).

NOTE: a PM (permanent magnet) RV rotor eliminates the slips loss. This aimed to be demonstrated more in further RV R and D research, please consult the compilations mentioned at the start for more detail.

An RV 5hp motor is estimated to be de-rated to a HP rating of about 2hp, that's 1498 watts normally. The RV motor probably achieves this at around 250watts (2 amp input) **6 times more efficient**, as a basic estimate.

One point that many people miss: When you take a 480V motor and run it on 120V, you will not have the full rated horsepower – the objective is to get very efficient conversion energy from electrical to rotary mechanical.

A 5hp 3-phase motor run on 120V will be lucky to put out 1hp BUT it will do that with very little loss. (The only way to get more hp out would be to drive the motor at a higher speed -- something Hector calls an electric turbine.) Very low idle current (the amount of power it takes without a load) and tuneable for specific loads. Hector

calls it a reverse dynamometer. Which to my understanding means that the input current is fairly linear to the power output between idle and stall.

Weight issue

At this early stage of R and D it is recommended that Lighter aluminium motor casing are to be constructed for further elimination of power to weight ratios for applications of higher efficient motors. Also a 746 HP electric motor designed for aircraft use weighting under 100 pounds is possible by design. Hector states that with a design is very simple, and can eliminate 90% of current electric motor weight with no sacrifice in performance. Currently the heavy motors are only used as RV hosts to demonstrate the proof of principle.

Hector has stated that **if you look at a rotor 95% of its weight is useless as only the surface plays part as linear motor.** The lines do not really cross the squirrel cage inward carbon fibre composite or titanium Magnesium alloy shaft. Aluminium sodium wire alloy shaft coated and countered stator core integrated in magnalloy or composite casing for a car a motor can be designed to weight 20 pounds and deliver 250 HP in electric turbine mode (Easy having the resources.)

Rotors typically consist of a laminated, cylindrical iron core with slots for receiving the conductors. The most common type of rotor has cast-aluminium conductors and short-circuiting end rings. This "squirrel cage" rotates when the moving magnetic field induces a current in the shorted conductors. The speed at which the magnetic field rotates is the synchronous speed of the motor and is determined by the number of poles in the stator and the frequency of the power supply: $n_s = 120f/p$, where n_s = synchronous speed, f = frequency, and p = the number of poles.

Essence of the RV running minimal current on idle

The essence of RV is not actually running on minimal current if idle. The essence is to have 2 motors connected, one as motor and the other as generator. A load will be connected to generator (having it's dual windings in parallel, thus low Q, motor part has it's dual windings in series => high Q, (big inductivity) and only then the motor part's run cap is **TUNED to MINIMAL MOTOR CURRENT WITH DESIRED LOAD.**

Now we have a High Q narrowband motor part driving low Q wideband alternator part with desired load. Motor part will be tuned to resonance and this resonance will contribute a lot of mechanical power to the alternator part while consuming minimal power from the power supply. The motor part should have U voltage driving $4*U$ rated windings, this gives some headroom for resonant rise and resonant amplification effects without the irons saturating.

If run without load with the same run cap, the motor part will not have minimum current because C_{run} for loaded case is bigger than C_{run} for idle case. So in idle mode the RV primary's input current will be actually capacitive instead of inductive as with normal motors. **But when loaded, the sweet point is attained where the**

PF=1 and resonant current amplification occurs and motor torque will be much bigger than normally expected with this low input voltage.

Doctorated certified Bullshit

There is dis-info made into a "scientific Dogma. A DOCTOR in power engineering told Hector once that he needed 240AC volts as to have 2 phases to generate the 3rd. Point to point non grounded 240VAC is single phase 2 wire power .120VAC is same (1 phase power) and can be verified with a scope.

Test for Basic hard postulates

A goal any university power engineering R and D faculty may test from the publicly available plans and instructions to gain advanced knowledge in power engineering concepts is via the – roto conversion effect –

Goals:

University test –evaluation of the rotor conversion effect - driving (3-7HP) motors at 1/4 nominal voltage optimizing vectoring capacitance to the load, measuring power factors, rotation, input VxA, rotating VxA and PF, torque, eff%, magnet fields during semi-resonance.

For energy savings of 90% involving

Application in solar cogeneration/ grid power using RV mode to run a Lathe, a milling machine, an industrial bench drill or any other load variable machine which it can run easily up to one HP from the grid or solar power including a BELT woodcutting saw with an installed pulley to the RV prime mover.

To confirm the BASIC HARD postulates of

Postulate one: Normal motors waste 90% of their power with no load, RV saves 90% of this otherwise lost energy as a power on demand electrical transformer alike operation showing motors can be operated in resonance at a minimal Power draw, and supply power on demand Using Higher Impedance being 90% power savins idling 94% eff on loading at re rated HP.

There are many interesting R and D effects that are present in the RV mode of operation, what I have described are the basics for most instant practical roles. I have more energy transformation principles in need of exploration which can lead to a further upgrade the potential this learning tool has, but wish to keep the essential justification of the energy savings basic for now.

-measurement of 5 to 7.7 HP 3PH motors run in RV mode re-rated to 1 to 1.8 HP tuned at 749W per hp 97% eff as an approximate estimate tested by a method to measure foot pound torsion to HP to Watts conversion using a LAB volt Foot Pound torque meter or equivalent. To show and prove that under certain conditions of load & tuning conditions RV is OU (over unity).

Summery of postulates able to be tested and verified via the Roto conversion effect

The following will also mention far advanced power transformation concepts available to be LEARNED from the RV's configuration, being resonant conditions and out put of radiant energy and resonance collection. This area is for further advancement after energy saving applications are taught and constructed from the basic RV application operation FIRST, and shouldn't be considered in complete detail at this point.

Point 1:

To show motors can be operated as transformers at a minimal Power draw, and supply power on demand Using Higher Impedance. 90% power savins idling 94% eff on loading at re rated HP.

Point 2:

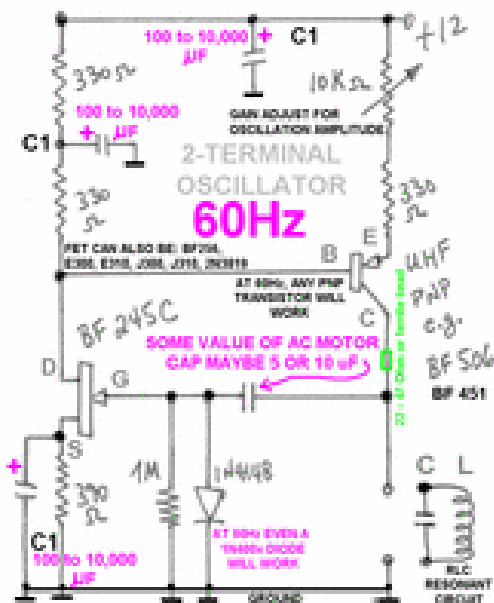
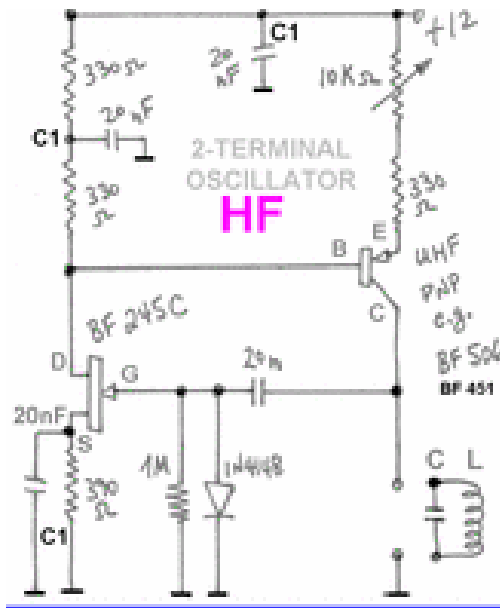
Uses the RV Rotor conversion effect as R&D tool "reverse Dynamometer" to engage in true energy savings development in all Areas of power engineering from generators to mechanical systems , aeronautics to civil engineering applications.

Demonstration of radiant energy semi resonant states and potential to cogeneration applications Solar Aeolic hydro with 50 to 90% Power savings Minimal in conversion dynamics. Development of power factor correction and magnetic amplification Systems for home & small business use... (Low cost).

Accurate debunking via test equipment

A ***start*** for basic research. By earl.

- 1) Measure the inductance of the winding to be resonated.
- 2) Couple the motor to a "rotary table" as the machinists call it. Rotate the motor in precise increments and note variations in inductance, including minimum and maximum.
- 3) Build a two-terminal oscillator with two transistors, a diode, couple of R's and C's. Cheap, easy, and simple. Below is a schematic.



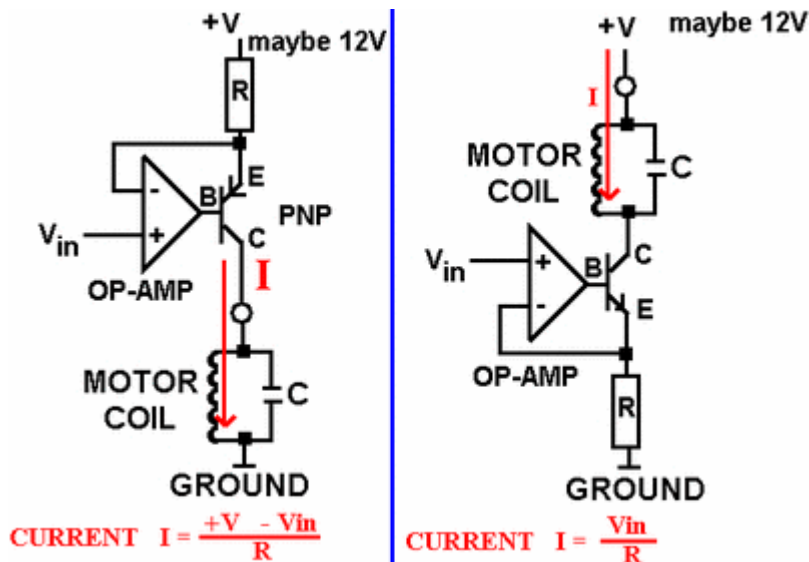
4) Connect the resonating capacitor to the motor coil, which in turn are connected to the oscillator.

5) Beg, borrow, or buy a frequency counter with "period measurement". It must be able to measure period because at 50/60 Hz the frequency is so low, normal frequency counter operation would take too long and be imprecise.

6) While turning the motor on a rotary table, protocol the rotor angle versus oscillation frequency.

This is the crux of the matter. You will see if you are anywhere near 50 or 60Hz and you will see how much the resonant frequency varies from the nominal AC line frequency over 360 degrees.

I would also monitor the waveform with an oscilloscope.



| elektor infocarte 51 | | composants discrets 11 | | | caractéristiques des transistors J-FET à canal N | | | |
|----------------------|--------------------------|--------------------------|------------------------|----------------------------------|--|--------------------------------------|-------------------------|--------------|
| Type | V _{DS} max en V | V _{GS} max en V | P _{max} en mW | Courant de repos de grille en nA | V _{GS} (OFF) en V | Courant de saturation de drain en mA | Fréquence limite en MHz | CASE Boîtier |
| BF 245A | ± 30 | -30 | 300 | 5 | -0.4 ... -2.2 | 2.0 ... 6.5 | 700 | I |
| BF 245B | ± 30 | -30 | 300 | 5 | -1.8 ... -3.8 | 6.0 ... 15 | 700 | I |
| BF 245C | ± 30 | -30 | 300 | 5 | -3.2 ... -7.5 | 12 ... 25 | 700 | I |
| BF 246A | ± 25 | -25 | 250 | 5 | -1.5 ... -4.0 | 30 ... 80 | 450 | II |
| BF 246B | ± 25 | -25 | 250 | 5 | -3.0 ... -7.0 | 60 ... 140 | 450 | II |
| BF 246C | ± 25 | -25 | 250 | 5 | -5.5 ... -12 | 110 ... 250 | 450 | II |
| BF 256A | ± 30 | -30 | 300 | 5 | | 3.0 ... 7.0 | 1000 | I |
| BF 256B | ± 30 | -30 | 300 | 5 | -0.5 ... -7.5 | 6.0 ... 13 | 1000 | I |
| BF 256C | ± 30 | -30 | 300 | 5 | | 11 ... 18 | 1000 | I |
| E 300 | - | -25 | 350 | 0.5 | -1.0 ... -6.0 | 6.0 ... 30 | 700 | III |
| E 310 | - | -25 | 350 | 1 | -2.0 ... -6.5 | 24 ... 60 | 700 | III |
| J 300 | - | -25 | 360 | 0.5 | -1.5 ... -7.0 | 4.0 ... 45 | 450 | IV |
| J 310 | - | -25 | 360 | 1 | -2.0 ... -6.5 | 24 ... 60 | 700 | IV |
| 2N3819 | ± 25 | -25 | 200 | 2 | -0.5 ... -8.0 | 2.0 ... 20 | - | II |

V_{DS} = tension continue Drain-Source
V_{GS} = tension continue Grille-Source
V_{GS}(OFF) = tension de blocage Grille-Source

Two further considerations provided by Phil Wood

First: and which is fool proof is run time. This is when you run a motor in RV mode compared to the same motor and batteries run through a conventional 3phase inverter. Second: is using computer software and monitor all resistance blocks at the, in and out, where an average recording is calculated over a period of time.

Phil states - I learnt something very important whilst going through professional 3rd party testing and that is, you can not fool or discredit run time with too 2 machines doing identical work with one having your concept and the other not. Then the motor and the batteries must be alternated and the same tests run again and again to eliminate any errors.

There is so much to learn (R and D is needed) and understand, as when hitting true resonance and operating within its realms, effects will not be what you expect. This is what I personally have witnessed thousands of times where the original energy consumption may appear the same, but where the load is doubling its energy output. Other effects are temperature changes as energy is compressed and released.

Recommended testing equipment for RV energy savings Tests

Two options will be recommended the most thorough recommended test is to use a prony brake to test the shaft power to watts used. The other option to test this same goal is to measure Volts AC with a true RMS volt meter preferred, an AC ammeter, and a wattmeter. Now compare the power reading on the watt meter and what is calculated after multiplying volts and amps. There is a calculation for those figures and you can find the power factor from those figures.

For mechanical power you need a dyno and an optical tachometer with a small piece of reflective tape on the output shaft.

Prony brake testing

Construction tips: A 1m tuneable prony break dynamometer where one side can be put onto the electronic scale can be constructed shaped like the following.

-----O

You can do also a balanced version:

-----O-----

By Reading the scale, and freq you can calculate the mechanical energy output. With this you can calculate the I/O. To make a screw-tuneable prony break (perhaps 1m long) to measure the mechanical power output on various loads. You can use car breaks if you want. The centre or middle is attached to the motor sides are equal, one side steps on the electronic scale. Power out = some magic fm (RPM, force/mass on scale, distance from centre to scale) this is the solid proof of OU.

Taken from Sample:

<http://www.geocities.com/koneheadx/measuringshaftpower.html>

MEASURING THE SHAFT POWER OF THE MOTOR

For small motors, this is best done with a tool called a "Prony Brake", which is named after a fellow called Prony who invented this.

It is simple; a one foot long bar (from center of shaft to tip of bar) is clamped around the motor shaft, the tension of the clamp gives it an adjustable resistance to test different RPMs and loads.

The formula to measure horsepower is this:

Foot-pounds X RPM / 5250 = Horsepower X 746 = WATTS

To calculate foot-pounds with the prony brake test, first let the bar rest on the scale, and measure what this weight is. Subtract this weight of the bar itself from the total weight shown when testing the motor while it runs.

Prony brake:



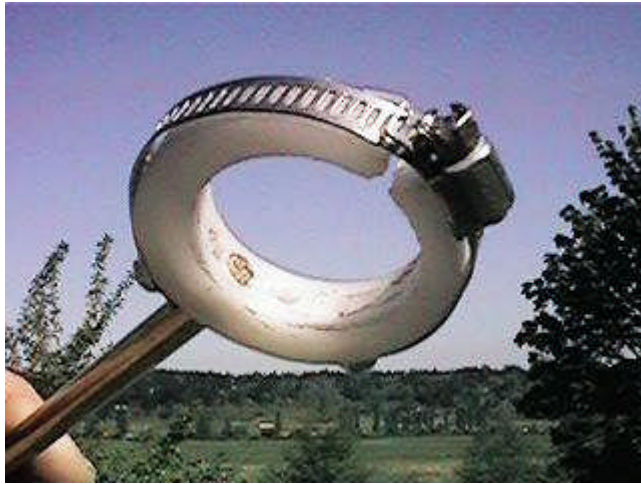
Resting on scale and around shaft:



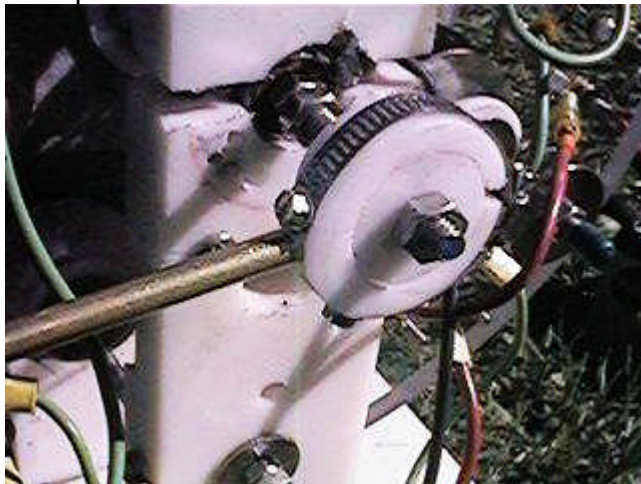
Close up of clamp:



Tensioner screw on clamp:



Clamped around shaft-disc:



Make it as light as possible - you don't need Teflon as the wrap around part; you could make it of aluminium or brass. All you need is a drill press and bit the diameter of your motor shaft. When you do your Prony brake tests, rest the arm on the scale with. The motor not running and the brake very loose on the shaft then see how much it weighs, then subtract this weight from what the brake pushes the scale when you do the testing with the motor running.

Hector says to make double-armed brake (two one foot arms at 180 degrees) , and have the other arm's purpose to be a perfect balance so that the arm resting on the scale will read 0 grams...this way you don't need to subtract the weight of the scale itself, and the reading should be more accurate since there would be less drag on the shaft too. I haven't made one like this yet, but it seems to be a better design.

When you test, the RPMS measurement must be very exact, (use scope) as well as the grams or ounces that you read on the scale. when you insert the numbers in the formula, if you miss getting it right by just a bit, it will tweak the formula into an unbelievable way over OU or unbelievable way under OU so do a lot of repeat-tests, so that you can do it anytime in a flash and the readings are always going to be predictable.

A lube on the shaft too will help keep the RPMS steady (hemp oil?) Also its an AC motor surfing on a AC sine wave, so don't over-brake it into heat build up and huge draw (what a debunker-lab would do like t) you'll find a certain RPM and shaft-loading that will be the best. I prony braked one of my kone-head motors way back in 99 at a FCC lab and what really made it better than normal motors is the lack of heat build up under heavy shaft loading, the draw was about 3 times less with same load on shaft.

Thus the opinion by many engineers experienced in ALT energy is the best way and most accurate to compare shaft power in motors is a PRONY BRAKE which is just a 1 foot arm on your shaft, with one end of arm resting on a scale measuring grams or ounces, and the other end is wrapped around the motor shaft, with this end "split" so that a screw can go through it so that it can be tightened or loosened for different amounts of tension on the arm (tighter will make more pressure on scale, looser will make for less pressure on scale)

Then calculate WATTS by knowing the RPMS (use scope) while pressure on scale is being measured, and knowing that you have a one foot long arm foot-pounds pressure is easy to see, then stick it all into the basic horsepower formula.

Doug kone head has been using Prony Brakes for 7 years on motors – the idea has also been endorsed by JL Naudin who acquired it from patent that Mr Prony made long ago...it works great.

Prony Formula by Raivo.

Here is the prony break formula I used once (in metric):

$$P = E / t = m * 9.8 * 2 * \text{PI}() * R * (\text{RPM} / 60)$$

$$\text{Simplified: } P = 1.026223 * m * R * \text{RPM}$$

$$\text{Oversimplified: } P = m * R * \text{RPM}$$

m - scale reading

R - distance from shaft to scale

RPM - rotations per minute

Output is in watts.

Another Simple way is to use DC car generator (not an alternator) older cars like a 67 fiat as example used generators, nowadays they are all alternators. Simply run one motor with the generator, then the other with same generator and see how much power you make in comparisons.

PROBLEMS anticipated with this: When doing true power tests, you need that capacitor, and the resistor, and your audience needs to UNDERSTAND how to measure true power (WATTS)...most people (actually maybe 1 out of 5 maybe) know that watts is volts X amps, and WATTS is true power, BUT the thing is, most people DONT UNDERSTAND that you need a resistive load (A RESISTOR) to check

power (WATTS) output from coils (what a generator has in it making that power) and also it should be rectified to DC too, to avoid meter errors and other problems....in fact I would say that if you put a thousand people who took science and electronics classes in high school in a room I would guess maybe 12 of those people understand how to check REAL POWER with a resistive load across your cap.

So to me this is your biggest hurdle to overcome when you do your demos - basically your audience will not know what you are talking about and you must teach them how to test power – make sure they understand you and don't think you are making it up..

Another solution is to use a PMI DC servo motors as your load on the shaft if you can't get a car generator or use both.

Hector the inventor will agree to use a car battery, and then put an ammeter on it feeding an inverter, then run the rotovertor or other motor with the inverter, and then run both types of motors and then compare how much they consume while using the drill press. A drill press is good because the IDLE power saving advantage can be shown.

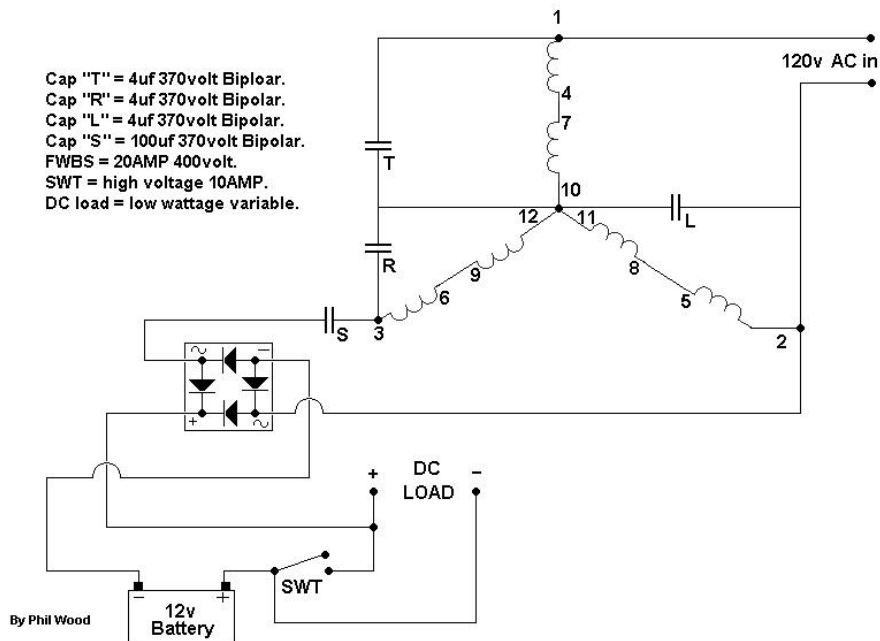
Phils DC to AC start with the BCSRC RV

The following picture is of running a 3phase with a 12volt DC motor coupled. This gives immediate start up with no starting caps required, and when the 3phase is heavily loaded the slip causes the DC motor too work harder pulling the 3phase back up to speed. After running many tests with this, the results show it is highly efficient with "power on demand" characteristics.



Both motors run cold, note a chain drive is too noisy, the advice is to go belt driven .
If you run the 3phase in RV with the following BCSRC circuit you won't be disappointed.

Battery Charge Start Resonance Collector



The circuit operation consists of the above mentioned components where the main driving coils in a 3phase motor are also tuned into a resonance condition.

This is achieved by connecting between 2uf and 4uf capacitors across each coil winding. The Starting capacitor "S" is engaged by closing the switch thus placing the battery in the circuit as too receive a fast charge from the starting current, but provide the necessary resistance too allow cap "S" too operate correctly.

Once the motor starts the switch must be immediately opened where a high resistive load is now operating in the loop.

With the battery also staying in the loop the resistive load is now in control of adjusting the phase angle of the resonance windings in the motor.

Any resistive load places a gentle charge on the battery at all times

The battery MUST NOT be running an inverter that is also connected to the motor unless it utilizes a step up transformer too provide an isolation from its main source.

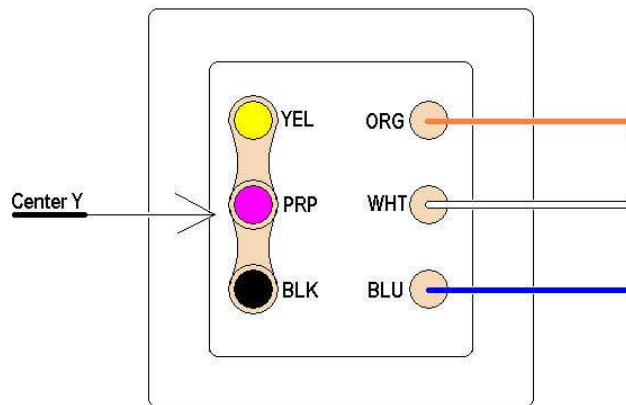
This circuit has been operated on a 5Hsp 3phase Baldors motor where the energy input is 26.4 watts whilst running on 240volts 50HTZ.

Further improvements are now expected with changes in capacitance values and by resistive load adjustments on the output.

Copy and enlarge for further detail. The instructions are to try 20UF caps on all phases for the 120volts 60 hertz motors. Note you may need to do some Digging to find the centre Y in some motors.

Australian motors are already setup for this configuration without hacking into the motor. All you do is connect the links as per this diagram.

Ausi 3phase wiring for Y connection.



The 3 Phase finally unlocked by Phillip wood

To simplify the 3phase operation, I [Phil] will work with one small part of the rotor and break the phase relationships into square pulsed segments so you can see how simple it really is.

The rotor consists of 2 dissimilar metals being Ferris and non-Ferris.

When a magnetic field is activated over or near Copper or Aluminium it repels this metal pushing it away. Especially with Aluminium as it has a high stored mass of energy that was used too manufacture the product. This means that lets stay with Aluminium; it is already saturated with energy and can not accept anymore charge. Also this is why these metals are used as conductors as the electrons travel around the metal and are not absorbed.

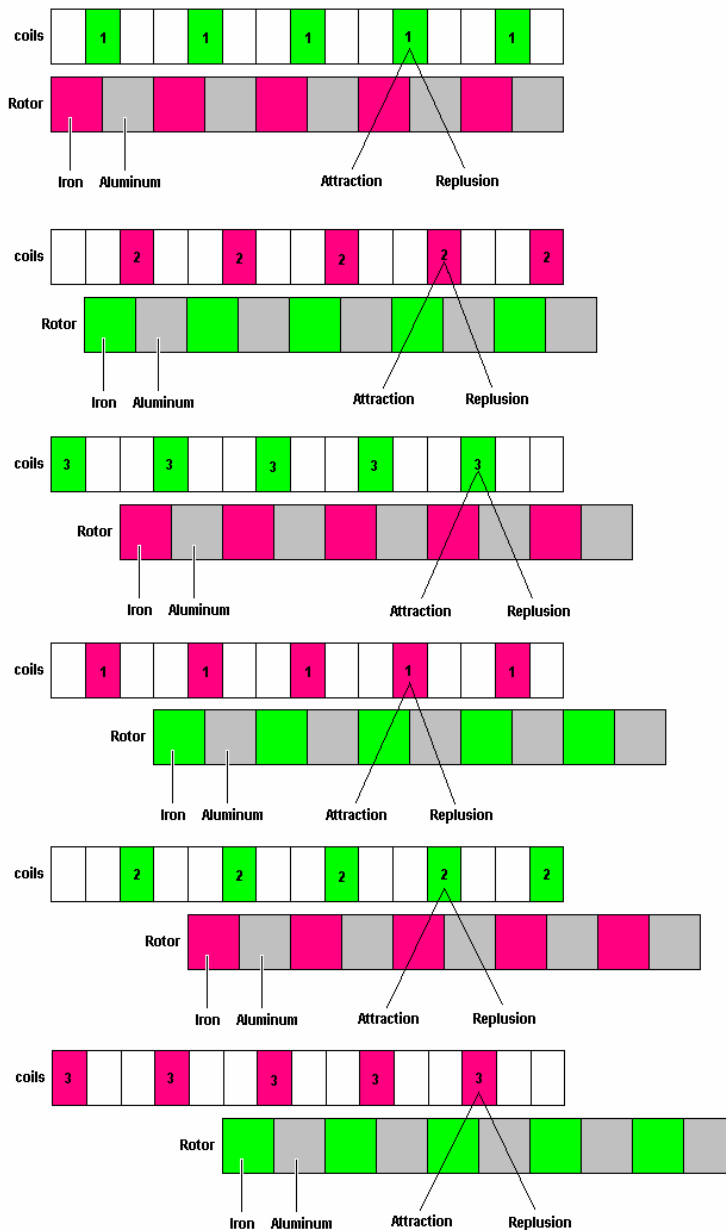
With alternating dissimilar metals surrounding the rotor diameter, and when a magnetic field is activated we have 2 forces that exist. First we have a push against the Aluminium or copper strip and a pull towards the iron strip.

The iron has a permeability enough too hold for the next polarity phase where the next magnetic field activated, not only forces against the Aluminium but pulls harder too the opposite polarity of the Iron magnetic field, until it becomes the same polarity as the magnetic field being activated. This is why a particular amount of slip is important too allowing enough time too cause saturation in the Iron of the coil polarity.

The next simplicity is the use of dissimilar metals known as the Peltier Effect and the Seebeck Effect, whereby at the junction of them touching we have a temperature of hot on one side and cold on the other side. This is generated from the magnetic field

working against the Aluminium (wrongly known as Eddy currents) but where if there is a temperature differential this generates a current. With this high current in place being generated, it amplifies the magnetic field within the Iron.

Overall it is obvious why the 3phase motor becomes more efficient when approximately 2/3 loaded, as the effects within the rotor are increased due too a longer time interaction from the working magnetic field windings. This is a simple diagram of how the Iron becomes charged with the coil polarity and enhances the next phase operation.



With all this stated I realized the motors can be powered with DC pulsing and hence tested a few circuits too prove the operation can be performed on a simple scale, of driving all 3 phases just of one voltage polarity.

The next thing that became obvious is that just like my Baldors motor it becomes 89.1% efficient when 75% loaded. Taking into consideration the power factor and the overall true wattage usage being paid for, it can be seen that a generator coupled too the motor that has an efficiency near the same as the motor used, will develop an efficiency exceeding COP1.

This means it is a motor generator doing real work generating real power as is, being off the shelf with no modification regarding resonance circuits.

However if the concept is too be used with a standard off the shelf inverter, the reflected power from the motor can cause much damage too these devices. But utilizing an inverter with step up transformers and H bridge drive circuits, all reflected power will naturally be directed too the battery source.

End

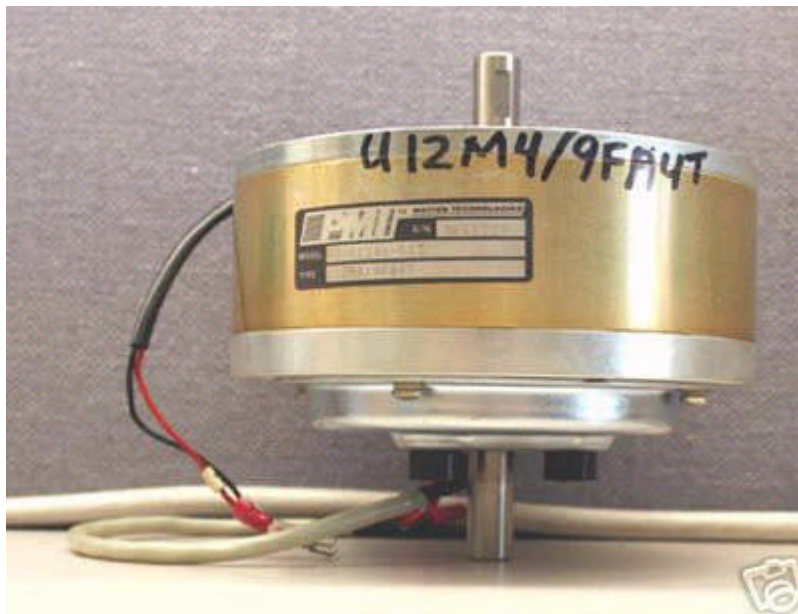
Anomaly readings from coupling the RV based on Hectors teachings

OU -RV coupled to a PMI disk PM, DC motor

From Norman Wotan (Mon, 25 Feb 2002 – on Keelynet-rotoverter)

Quote:

I built Hectors phase Roto Verter with the following results: Motor is 3HP, 3 Phase, 60HZ, 1725 RPM, wired for operation on 480V. Motor free running, tuned to minimum current draw from 120V line input required 20mfd 370V oil filled cap resulting with a current draw of .66 amps @ 120VAC input. Motor loaded with belt drive step-up 6:1 ratio to drive a PMI disk PM, DC motor acting as a generator.



PMI Kollmorgen U12M4/9AF4T ServoDisc DC Motor

□ Part Number: 00-01246-013

- Serial Number: 3K11227 or 3K11228
- Manufacturers Lead Time: 10 to 12 weeks
- Retail Price: \$1,708.00

Features:

- 38.3 to 402.5 oz-in. continuous torque
- Motor lengths less than 2"
- 4.37" to 7.37" OD Round Frame

U-Series ServoDisc™ DC motors employ the unique Kollmorgen/PMI flat disc armature. The ironless, low inertia armature delivers high acceleration and zero cogging in an exceptionally compact package.

- Extremely good speed control with zero cogging and low RFI
- Long Brush Life
- Flat ServoDisc™ motors are ideal for many applications:
 - Save space and weight in applications requiring a low profile motor
 - Large torsional stiffness for precision control of speed and acceleration

Specifications:

- Peak Torque: 1316 oz-in, 929 N-cm
- Rated Speed: 3000
- Rated Continuous Torque @ 25° Celsius: 128 oz-in, 91 N-cm
- Rated Continuous Torque @ 40° Celsius: 114 oz-in, 81 N-cm
- Rated Power Output: 284
- Maximum Recommended Speed: 6000
- Continuous Stall Torque: 122 oz-in, 86 N-cm
- Cogging Torque: 0 oz-in
- Rated Terminal Voltage: 43.4 Volts
- Rated Continuous Current: 8.8 Amps
- Peak Current: 85 Amps
- Continuous Stall Current: 8.1 Amps
- Terminal Resistance ±10%: 0.750 Ohms
- Armature Resistance ±10%: 0.610 Ohms
- Back EMF Constant ±10%: 11.55 V/KRPM
- Torque Constant ±10%: 15.63 oz-in/Amp, 11.04 N-cm/Amp
- Viscous Damping Constant: 1.8 oz-in/KRPM, 1.3 N-cm/KRPM
- Armature Inductance: <100
- Temperature Coefficient of KE: -0.02%/° Celsius Rise
- Number of Commutator Bars: 141
- Moment of Inertia: 0.0190 oz-in-sec², 1.34 kg-m²
- Static Friction Torque: 5.5 oz-in, 3.9 N-cm
- Weight: 10 lbs.
- Diameter: 5.50" in, 139.7 mm
- Length: 2.10" in, 53.3 mm
- Peak Acceleration: 69.2 kRad/s²
- Mechanical Time Constant: 6.68 ms
- Electrical Time Constant: <0.16 ms
- Continuous Power Rate: 6.1 kW/sec
- Thermal Resistance at Rated Speed: 1.27° Celsius/Watt
- Thermal Resistance at Stall: 1.90° Celsius/Watt
- Forced Air Thermal Resistance – with 2.0 lbs/min Forced Air: 0.23° Celsius/Watt

Type 9FA4T Low Cost Analog Tachometer Characteristics:

- Output Voltage: 2.50 V/KRPM

- Ripple Voltage Max (P-P) (1): 5.0% @ 1000 RPM, 5.0% @ 500 RPM, 5.0% @ 100 RPM
- Linearity of Output Voltage (Rated at 3600 RPM): .06%
- Bi-directional Tol (diff. in output V/KRPM): 3.0%
- Output Impedance (Resistive): 1.18 Ohms
- Temperature Coefficient Output Voltage: -.19%/° Celsius Rise
- Load Resistance (Recommended Min.): 1180 Ohms
- Tachometer Inertia: .0024
- Number of Commutator Bars: 117

(generator unloaded) required 30 mfd, 370V oil filled cap with a resulting current draw of .50 amps @ 120VAC input. Now I loaded the DC generator with 160-watt incandescent lamp load. Since I have two independent systems here, one being driven with 120VAC line input and the other system a belt driven DC generator being loaded with pure resistive load. Here are the numbers: Motor was retuned for minimum current draw which required 45 mfd, 370V oil filled cap with a resulting current draw of .15 amps @ 120VAC input. The independent generator put out .75 amps @ 74 VDC into a resistive load. The only thing that needs to be looked at on the input side of the equation is the power factor of the AC input.

I need to look at the current/ voltage phase relationship. I'm satisfied with the figures that I calculate which shows roughly 18 watts AC input with a DC output of 55.5 watts. What I find most interesting is the fact that the more load you put on the 3-phase motor the lower the input current draw and the motor gets colder.

The belt driven DC generator gets quite hot after about 30 minutes of running time. Go figure it out. I believe there is a lot to be learned about revolving magnetic fields in 3 phase motors and tuning the output via capacitors. This experiment is so easy to do everyone should seriously look at this phenomenon. My next step is to document PF on input and improve the DC side of the circuit to provide more loading. –End quote.

Asynchronous PM generator will put power into system as power factor correction from Over unity magnetic amplification. Extract: lower intensity attractor field is charged by the approaching higher intensity magnetic field one.

Lab test: a lab test indicates rotor lowers temperature at this state, indicating thermal energy transfer from electron spin to field induction one. (True magnetic amplification transformation) justified by book rules and thermodynamic law .

Synchronous speed is the absolute upper limit of motor speed. If the rotor turns exactly as fast as the rotating magnetic field, then no lines of force are cut by the rotor conductors, and torque is zero.

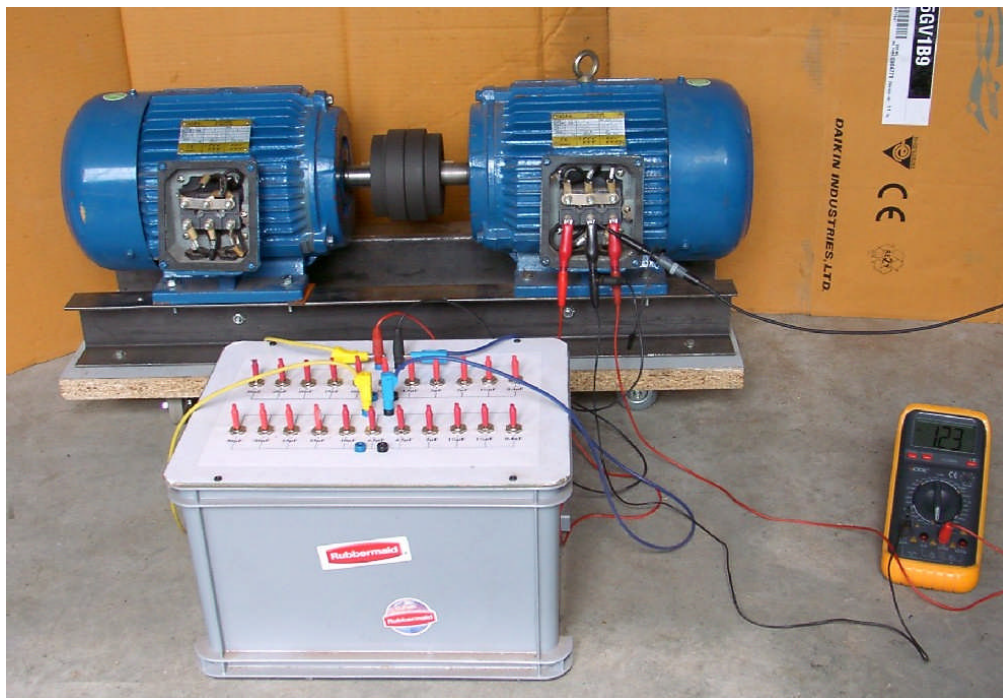
ZERO (ZERO point energy) (Note here that on 0 torque we have 0 power on a theoretical 0 current) being self induction NEGATIVE in relation to rotary field The VOLTAGE vector becomes a NEGATIVE resistance to line power contributing power to such source (seen as POWER factor correction on LOW impedance but as OU in matched hi impedance circuits.)

When running, the rotor always rotates slower than the magnetic field. The rotor speed is just slow enough to cause the proper amount of rotor current to flow, so that the resulting torque is sufficient to overcome windage and friction losses, and drive the load. The speed difference between the rotor and magnetic field, called slip, is normally referred to as a percentage of synchronous speed: $s = 100 (n_s - n_a)/n_s$, where s = slip, n_s = synchronous speed, and n_a = actual speed.

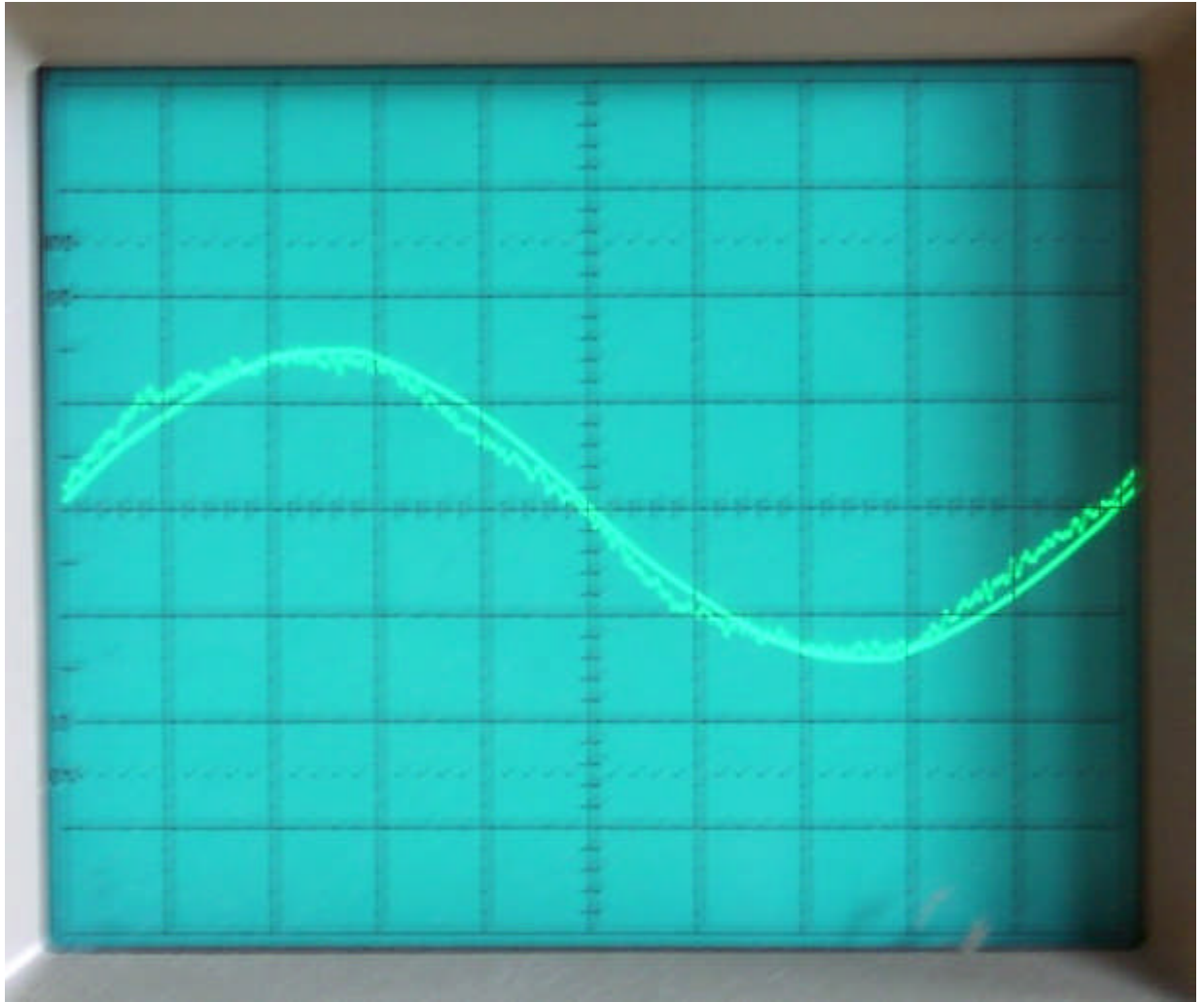
Dans tests

Basic tests with loading one phase of the alternator with caps. I've 2x 5.5HP motors 3000rpm (50Hz) connected 1:1.

This is a picture of the setup:



Here is a scope shot of the voltage and current in the PM (unloaded)
The 'clean' sine is the voltage. The 'dirty' sine is the current.



I did some basic tests with loading one phase of the alternator with caps. I've 2x 5.5HP motors 3000rpm (50Hz) connected 1:1.

The PM is wired in Y, with 120V input voltage (through variac as grid in 230V in EU).

The Alt is also wired in Y, so I have as possible connections L1, L2 and L3.

On the Alt, the caps are connected to L1 & L2.

- Voltmeter is connected over L1 & L2
- Current clamp meter in line to L1
- scope Ch1: voltage on L1
- scope Ch2: current probe in line to L1

I did measurements with several cap values:

- 1) 290V 2.5A 725VA 30 μ F
- 2) 380V 3.8A 1444VA 35 μ F
- 3) 435V 5.5A 2393VA 45 μ F
- 4) 444V 6.3A 2797VA 50 μ F

For the 1st and 4th, I made a small video of the scope measurements.

The current sine wave is more or less static. For the voltage sine, notice a changing phase shift from 70° to 160° (leading to the current), as well as an amplitude fluctuation. This is at about 0.6 Hz.

4th: Here also the current sine wave is more or less static. For the voltage sine, again a changing phase shift from 80° to 120° (less than video 1), as well as an amplitude fluctuation although less pronounced than the first test. This is about 3.6 Hz. Because of the higher load, the generated frequency has gone down to approx 46 Hz (likely 4% slip in PM and 4% slip in alternator...).

Recommended RV motor parameters

Whatever your motor voltage is, you need to apply 1/4 of that to the prime mover. So if you have a 230/400VAC 50Hz 3000rpm motor, this means technically it's a motor to connect in delta to 230V grid and in Y to 400V grid.

In fact each coil in the motor is rated for 230V, so if you connect the motor in Y, 2 of the coils are in series, so can handle 460V. That is the real technical voltage of the motor in Y. Of that you take 1/4, so feed about 115V to that motor (through variac or transformer). So with 50Hz 5HP motors commercial motors, this means about 4KW.

Here is an example with standard efficiency (85%): MM3613-56 to be found at http://www.baldor.com.au/product_view.php?PROD_ID=41 (the motors I use, have standard eff.)

Here is an example with high efficiency (89%): EMM3663-55 to be found at http://www.baldor.com.au/product_view.php?PROD_ID=31 I guess these are more expensive, but run better off of inverters

In both cases I took a 3000rpm motor (in practice 2900 rpm). You could also take a 4-pole motor (so 1450rpm) for your alternator. If you connect this in 1:1 to your prime mover, it will run at 2900rpm, and as such generating the double voltage and frequency.

Below is an extraction for the 4 and 5.5KW versions, which is the best range.

| | | | | | | | | | |
|-----|------|------|-------|------------|------|------|------|----|--------|
| 4 | 2900 | 112M | 0634M | EMM3663-55 | 6.1 | 89.3 | 0.95 | 46 | 394.80 |
| 4 | 1450 | 112M | 0643M | EMM3665-58 | 8.1 | 88.5 | 0.81 | 50 | 394.80 |
| 4 | 960 | 132M | 0750M | EMM3768-55 | 8.3 | 88.7 | 0.72 | 81 | 614.25 |
| 5.5 | 2900 | 132S | 0735M | EMM3769-55 | 9.8 | 90.2 | 0.92 | 70 | 570.15 |
| 5.5 | 1450 | 132M | 0740M | EMM3770-55 | 10.1 | 90.2 | 0.85 | 78 | 570.15 |

then further it is suggested that you take the 4KW version (=5.5 HP)

This should give you up to 1 - 1.25 HP in RV mode.

Web addy is http://www.baldor.com.au/product_view.php?PROD_ID=31

To summarise

EMM3663-55 4KW-50Hz - rated 415V in Delta

- so each winding is rated 415V
- if you run this as PM in delta, you need to feed it with about 100-115V
- if you run this as PM in Y, you need to feed it with about 205-230V
- as Alternator: wire in delta

Comparing the following 2 motors:

A) EMM3663-55

- * It is delta-Y 6-lead, 4KW (5.5HP), 230/414V, 50Hz, 89% eff.
- * is a very common motor around the 50Hz world (in EU, AU, etc...)
(I remember that the '55' suffix means it's an Aussi motor...)
- * as PM-RV, wire in Y (=414V) (BUT in RV-mode each phase sees 2 coils in series, and as each coil is rated 230V, the RV-mode 'sees' 460V),
and feed with 1/4 of that which is about 110-115V 50Hz * as Alt, wire in delta

B) M3613T-50

- * Is a dual coil motor 12-lead, 5HP, 220/380/440V, 50Hz, 85% eff.
- * is not a common motor in the 50Hz world (EU, AU)
- * can be wired in many ways

<https://vip.baldor.com/VIP/baldorProductPDFServlet?connection=CD0044>:

1- dual-Delta (means coils in parallel and in delta); so is wired for 220V, and feed with 55V NOT recommended for RV - too low V, too high current, too big caps needed
2- dual-Wye (means coils in parallel and in Wye); so is wired for 380V (in RV-mode is seen as 440V as coils are in series because of Wye)

Feed with 110V 50Hz - so good for use where grid is 110V or with +-110V inverter
3- single-Delta (means coils in series and in Delta); so is wired for 440V feed with 110V (see above) - between these 2 configs (2 & 3), best is dual-Wye
4- single-Wye (means coils in series and in Wye); so is wired for 760V (this mode in Unsupported by Baldor, but again they don't know RV mode)

RV-mode sees this as 880V; so feed with 220-230V 50Hz - so good for use where grid is around 230V or with +-230V inverter

In summary:

- Motor A is common to be found as surplus, and is an excellent choice for RV DEMO, where you can say to use a standard Wye/Delta motor (so does not have to be Baldor at all). This is the reason why I recommended this; Drawback is that this motor is less flexible in wiring options, and can only be fed with around 110V in RV-mode. So you need such a grid V, or inverter or transformer.

-Motor B is very UNCOMMON in the 50Hz world, so is difficult to find (cost?). Technically it is a better RV motor, as you can wire so to connect straight to a +-230/240V grid. If you want reliable input power measure, then you need to connect anyway to an inverter and measure the power from

the battery.

H's recommendation for motor B is also very right, but thinks about it being 'uncommon' if advertising the concept to the general public.

RV 60 Hertz range. Best motor performance tested so far is 230/460 VAC 7.5HP 3450- or 1725 RPM 3PH motors 184 TCH frame (with removable external fan
Specifications: baldors motor EM3770T

Catalogue Number: EM3770T
Specification Number: 07H002X790
Horsepower: 7 1/2
Voltage: 230/460
Hertz: 60
Phase: 3
Full Load Amps: 19/9.5
Usable at 208 Volts: N/A
RPM: 1770
Frame Size: 213T
Service Factor: 1.15
Rating: 40C AMB-CONT
Locked Rotor Code: J
NEMA Design Code: A
Insulation Class: F
Full Load Efficiency: 91.7
Power Factor: 81
Enclosure: TEFC
Baldor Type: 0735M
DE Bearing: 6307
ODE Bearing: 6206
Electrical Specification Number: 07WGX790
Mechanical Specification Number: 07H002
Base: RG
Mounting: F1

Bottom line is you need DOUBLE COIL motors - this means, that the motor should have 9 or 12 wire terminals and two identical motors. That's why Hector has stated that it should be 230/460V model - when the dual coils are connected in series, then it is 460V (good for RV prime mover), when in parallel, then it is a 230V motor with twice the amps capacity (excellent for RV alternator operation).

Such double coil motors might be a bit hard to find in Europe or in Australia. It is advisable to stick to the modelled guide and to order those US 230/460 motors.

The above is the motor that Hector recommended (it's a 1770RPM motor which is a bit more peaceful to operate - less vibration, especially when the coupling between motors is not very good)

current recommendations from EVGRAY on RV motors to use: NA: - DUAL

winding motors 230/460VAC 60Hz; 3 to 7.5HP - prime mover 3600rpm, wired for highest voltage (460V 'Y') and apply single-phase 110V

- alternator 3600rpm or lower, wired for lowest voltage (230V) EU: - WYE/Delta motors 230/400VAC 50Hz; 5 to 10 HP

- prime mover 3000rpm, wired for highest voltage ('Y') and apply single-phase 100-120VAC (through variac or transformer) - alternator 3000rpm or lower, wired for lowest voltage (in DELTA)

In any case the lowest HP is 5HP for 50Hz, as you need to have the same efficiency. (with 60Hz, you can go down to 3HP). So a 4KW motor will do

For Technical explanation on the RV alternator and more please consult Dans E-book RE-OU 6.1 available at the EVGRAY yahoo energy group or the RVreplication yahoo group in the files section.