



PHASE CHANGE CONVERTERS

FREQUENTLY ASKED QUESTIONS ABOUT 3 PHASE POWER CONVERTERS

1. How big does a converter need to be for my application?

This depends upon the largest 3 phase load you need to operate. For example, if the largest machine or combination of machines adds up to 4kw, (5.5Hp) then a PC4 converter would be the best match. To be sure, check the electrical compliance plate on your machinery and consult with a *Phase Change Converter* sales representative.

2. Who can install a Power Converter?

Smaller converters such as the PC2 and PC3 can plug directly into existing domestic power outlets. (The PC3 requires a 15amp outlet) Larger converters draw more current than can be supported by domestic power outlets and these converters will need to be wired back to the electrical switchboard where a separate circuit breaker can be fitted. A qualified electrician should carry out this work.

3. Does a 3 Phase Power Converter cost much to run?

While under load, Power Converters will typically use an additional 5% of energy beyond the power normally consumed by the customer machinery. All power converters have an internal pilot motor which require a small but constant standby current to run. This standby power drain varies with the size of the converter unit. An information table with precise values may be obtained from a *Phase Change Converter* sales representative. Standby power drain may be eliminated entirely by turning the Converter unit off when 3 phase power is not required. (This may be done at a circuit breaker switch or by using a 'remote start' option.)

4. Can I use a Power Converter on more than one Machine?

Yes, any combination of 3 phase machinery may be connected to a Power Converter at the same time, provided the total power does not exceed the maximum rating of the converter. For example, two 5.5kw motors could simultaneously operate from one 11kw converter. (although if the loads are of a type that are hard to get started, it could be useful to ensure that both motors do not try start at exactly the same time.) This is an important difference between rotary converters and electronic Variable Speed Drive' systems where each motor requires a separate controller unit.

5. Do your converters comply with Electrical regulations?

Yes, The *Phase Change Converter* series has both European CE approval and Australian C-tick approval. All units comply with stringent Australian electrical safety standards. Details of this certification appear on the *Phase Change Converter* web site.

6. Is the output of a Converter stable?

Yes, The electronic control system continuously monitors the voltages between the 3-phase outputs and ensures that voltage of all three phases are within 5% of each other. The red LED display on the side of the converter shows the present voltage balancing level from 0 to 8, so that this figure is an approximate reading of how hard the converter is working at any given moment. It is important to note that the output of a converter unit is simply a direct conversion from the utility supply, so that if the supply voltage is low, then all three output phases of the standard converter will fall by a corresponding voltage amount.

7. Is a Power Converter noisy to run?

No, while running the converter will only produce a quiet fan noise from it's pilot motor.

8. Will a Power Converter cause electrical and radio interference?

No. Because the three phase is generated using the rotary transformer method, the output waveform is clean and free of nearly all harmonics. This ensures that there is no impact on nearby radio or sound equipment. Unlike common 'Variable Speed drives' which create much noise and require special filters to operate them.

9. Can a Power Converter operate from a Single Phase generator set?

No, The *Phase Change Converter* systems are designed to operate on exactly 50Hz AC from utility power sources. Unless they are very large units, most generator sets will vary in both voltage and frequency when loads are applied. This effect makes generator sets inappropriate for driving converter systems

10. What information comes with a new Converter Unit?

Each new *Phase Change Power Converter* comes with a comprehensive Operator User Guide and a separate Installation guide (for the new owner to pass on to installation technicians). These manuals will provide ample information for customers to learn about their new product.

11. Is the Power Converter waterproof?

The converter units come in a powder coated steel enclosure which is designed for minor air ventilation. While this will provide some resistance to falling drips of water, but not from driving rain or a hose down. Where a converter unit must be located in harsh environments, then the customer must provide an external cover or shelter for the unit.

12. How heavy is a Power Converter?

By their nature, power converters are heavy as each unit contains a power transformer and a pilot motor inside. Smaller converters like the PC3 can weigh as much as 50-60 kilograms and must be handled by two people. Larger converters, like the PC8 weigh approximately 160 kg and should be moved with the help of hand trolleys and other mechanical aids.

13. Are there any adjustments to make?

No, The *Phase Change Converters* series of power converters automatically manage whatever loads are connected. As power demand changes with different customer loads, the electronic controller checks this ten times each second and re-balances the output to match the load.

14. What are your converters like on Hard-to-Start loads, such as air compressors?

Not a problem. Our converters feature a special 'hard start' facility where large loads are immediately detected and an extra boost of energy is provided until the successful operation of the customer load has been completed.

15. What happens if my three phase motor is jammed, like a rock has become stuck in a pump?

There are two levels of protection here. If a complete stall is detected for more than a few seconds, then circuit breakers will trip and isolate the defective load. If only a partial stall is detected and the 'Hard Start' feature has been unsuccessful in starting the load, the electronics will attempt a start **five times** at approximately 5 second intervals. If this does not start the customer load, the converter will shut down and flash a fault code on the display

16. Will your converter unit provide the same amount of power as a utility supply?

Yes, provided the right sized converter has been connected to your equipment and the cables within the building have been fitted to normal electrical standards, then the converter unit will operate 3 Phase machinery with as much power and energy as it would receive from a utility power company.

17. Does a power converter need to run all of the time?

No, it can be turned off whenever 3 phase power is not required. We recommend that if 3 phase power is not needed for an hour or more, then the converter should be turned off. It is possible to fit a temperature or pressure sensor to a special *Remote Start* option so that the power converter can be automatically 'woken up' by another system when three phase power is needed. For example, a tyre service centre may have a big air compressor that will automatically start the converter and compressor when tank pressure has fallen to a low value.

18. Can a converter be installed some distance from the machine it must operate?

Yes, Naturally, cable sizes must be rated to match the load, but the Remote Start option allows a converter to be stopped and started on a low current 2-wire circuit up to 200 metres away.

19. Does your Power Converter need regular servicing?

No, with a design based around minimal moving components it will not require regular servicing.

20. Is a Phase Changer going to take up much space?

No, models up to 8kw (PC8) have a foot print of less than a 1/4m². See our specifications table for exact dimensions.

21. Can I use a power converter if I have a 3-phase oven or heater to run?

While it is possible, generally it is not recommended; most heating elements can be re-configured to operate from a 220-240V single phase supply and it is better to do this than to convert the power to 3 Phase first. Where commercial ovens also have 3 phase fans and carousel motors, these devices may be run via a power converter, while the heater elements are reconnected to connect directly to the single phase utility supply.

22. Can a Power Converter run my Plasma Cutter or Welder (Mig, Tig, Stick)?

Yes, Because the converter electronics respond very quickly, welding equipment will work fine. Work out the maximum welding current that is likely to be used and consult a *Phase Change Converter* sales representative to select the right size converter for your needs.

23. What does the display on the side of the Converter show?

This red display shows how much load is presently placed on the converter. '0' means no load, '7' means maximum load. Brief displays of '8' shows when the 'Hard Start' function has briefly been engaged to accommodate larger motors being started. This display can also be used to identify installation problems by flashing special fault codes.

24. Why is the *Phase Change Converters* system any different or better than other power converters on the market?

There are several other types of converter being sold around Australia and overseas that use the basic Rotary Converter system. Most of these do not use multi-stage balancing systems and rely upon having a very large pilot motor to maintain stable output voltages. (With most converters, 4kw loads would need to use a large 8kw pilot motor, whereas the *Phase Change Converter* series have pilot motors approximately the same size as the load.)

Along with the nine levels of load balancing, the *Phase Change Converters* series use electronic solid-state switches for engaging internal capacitor banks in exact synchronisation with AC power. This makes them very fast to respond to loads like motors and welders. Many other companies use large contactors (relays) to turn capacitors on and off. Feedback from customers who have used these contactor based systems show that both capacitor and contactor failure is very common, as this technique puts a large amount of stress on these components. Numerous customers have abandoned their converters using these techniques and have now replaced them with *Phase Change Converter* systems.
