

INVERTERS

What is an inverter?

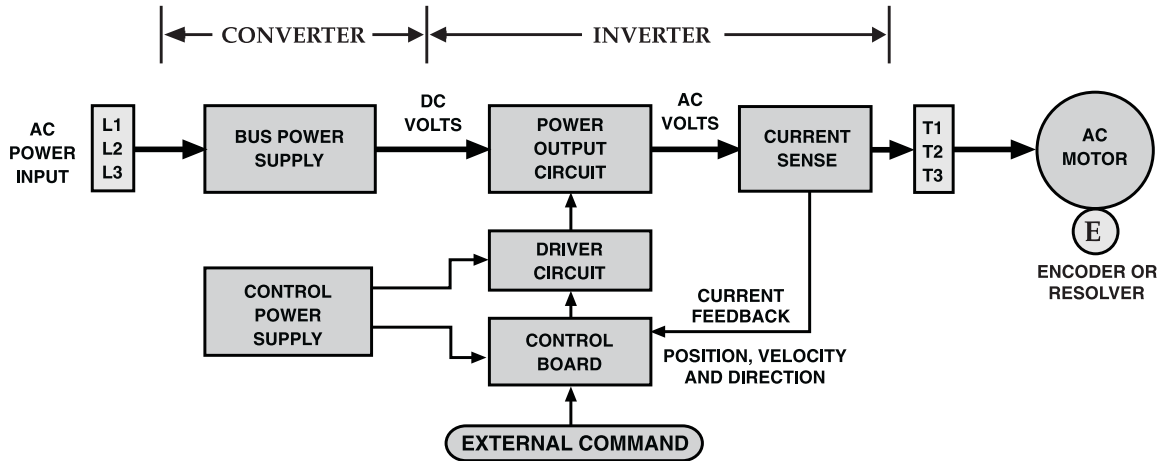
An inverter is a motor control that adjusts the speed of an AC induction motor. It does this by varying the frequency of the AC power to the motor. An inverter also adjusts the voltage to the motor.

This process takes place by using some intricate electronic circuitry that controls six separate power devices. They switch on and off to produce a simulated three phase AC voltage. This switching process is also called inverting DC bus voltage and current into the AC waveforms that are applied to the motor. This led to the name “inverter”. For the rest of this discussion, the term “**inverter**” will be used in place of **adjustable speed drive**.

How does an inverter work?

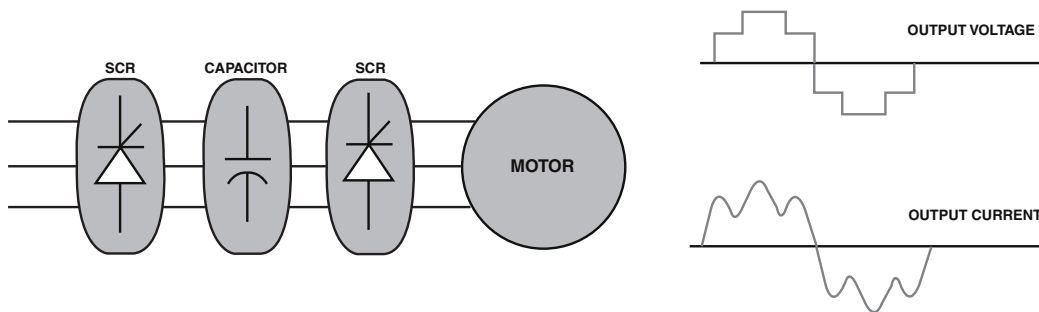
Most inverters are of the variable voltage, variable frequency design. They consist of a converter section, a bus capacitor section and an inverting section. The converter section uses semiconductor devices to rectify (convert) the incoming fixed voltage, fixed frequency 3-phase AC power to DC voltage which is stored in the bus capacitor bank. There it becomes a steady source of current for the power devices which are located in what is known as the inverting section. The inverting section absorbs power from the DC bus cap bank, inverts it back to simulated 3-Phase AC sinewaves of varying voltage and varying frequency that are typically used to vary the speed of a 3-phase induction motor.

Inverter Block Diagram



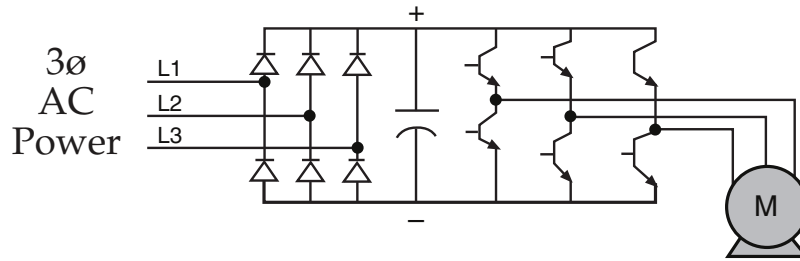
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Six Step Inverter



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Diode Bridge Rectification



60 Hz

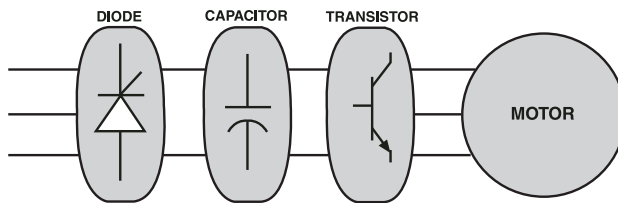


DC Ripple { - 360Hz 3ø Input Power
 - 120 Hz 1ø Input Power

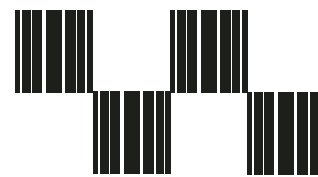


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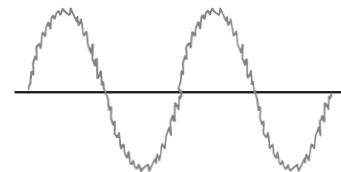
Diode Capacitor Input PWM Output



OUTPUT VOLTAGE

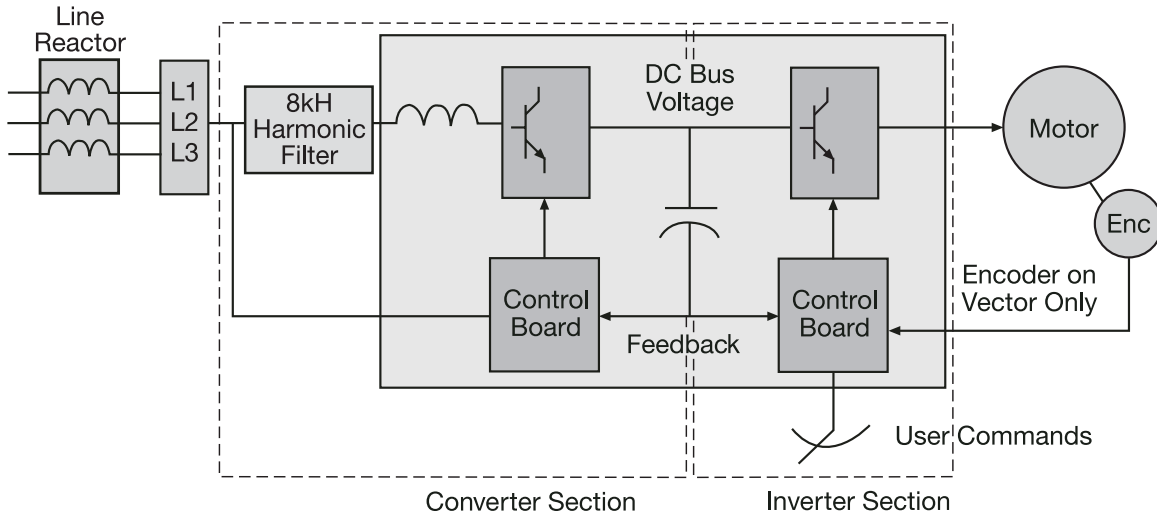


OUTPUT CURRENT



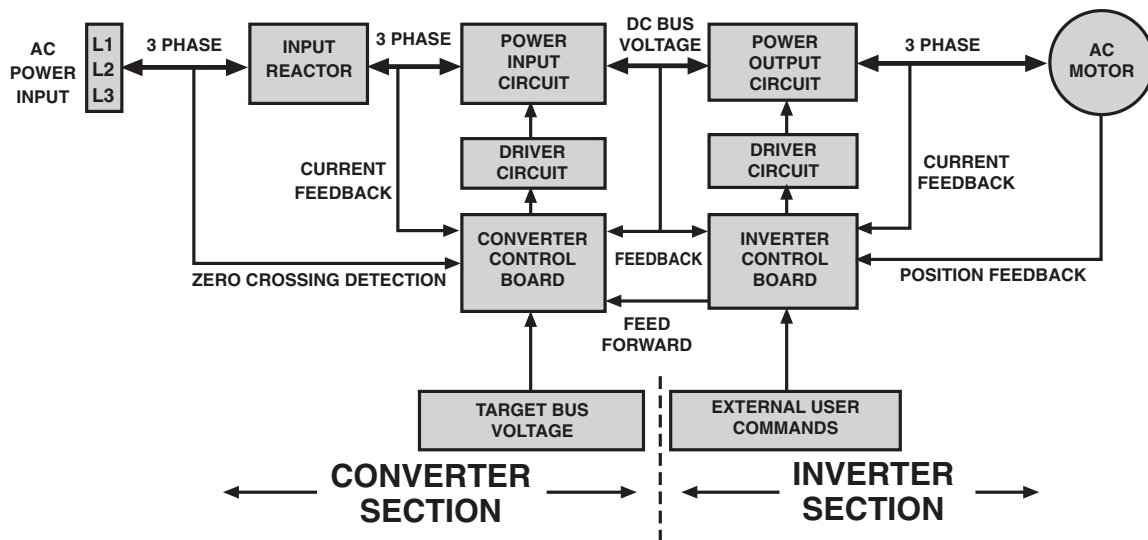
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Line Regen Drive



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Line Regen Control Block Diagram



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