

*intelli*PTAC

INTELLIGENT SOLUTIONS FOR HEATING AND AIR



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Packaged Terminal Air Conditioners (PTAC) and **Packaged Terminal Heat Pumps (PTHP)** installed across the country outnumber all other HVAC systems combined. They are self-contained HVAC systems commonly found in hotels, motels, apartments, condos, schools, medical facilities and offices nationwide.

Installation of IntelliPTAC represents a cost effective measure to reduce energy consumption by these HVAC industry workhorses.



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IntelliHVAC-PTAC is a moisture proof PCBA with a combination of software, firmware and circuitry designed to optimize efficiency of operation of PTAC/PTHP units through intervening control of PTAC / PTHP system component activity. Subtle influences on system activity result in substantial savings in PTAC operating cost; usually about 10-15%.

PTAC/PTHP Control Panels usually have buttons or dials to set the machine to condition the air in a room to a desired temperature. When the room reaches the temperature set point, the PTAC heat exchanger unit / cooling compressor cycles off.



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The fan, however, continues to run for about sixty seconds. Studies show that PTAC / PTHP heat exchanger coils also retain energy after the compressor and fan rest. The heater remains hot or the coils remain cold and wet. It is the IntelliPTAC that initiates recovery of this otherwise wasted energy. The device works by extending the fan operation for a variable time period based on its assessment of current session activity. It takes advantage of system component heating/cooling energy that is, otherwise, lost.



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In most situations, the amount of time the fan continues to operate after the compressor shuts off varies with the amount of time the compressor has spent on and off during a service session as determined by the IntelliPTAC microprocessor and firmware. The additional fan run time indicates how much cold water is condensed on the evaporative coil and how much left over energy is stored in the heat exchanger when the compressor cycles down.

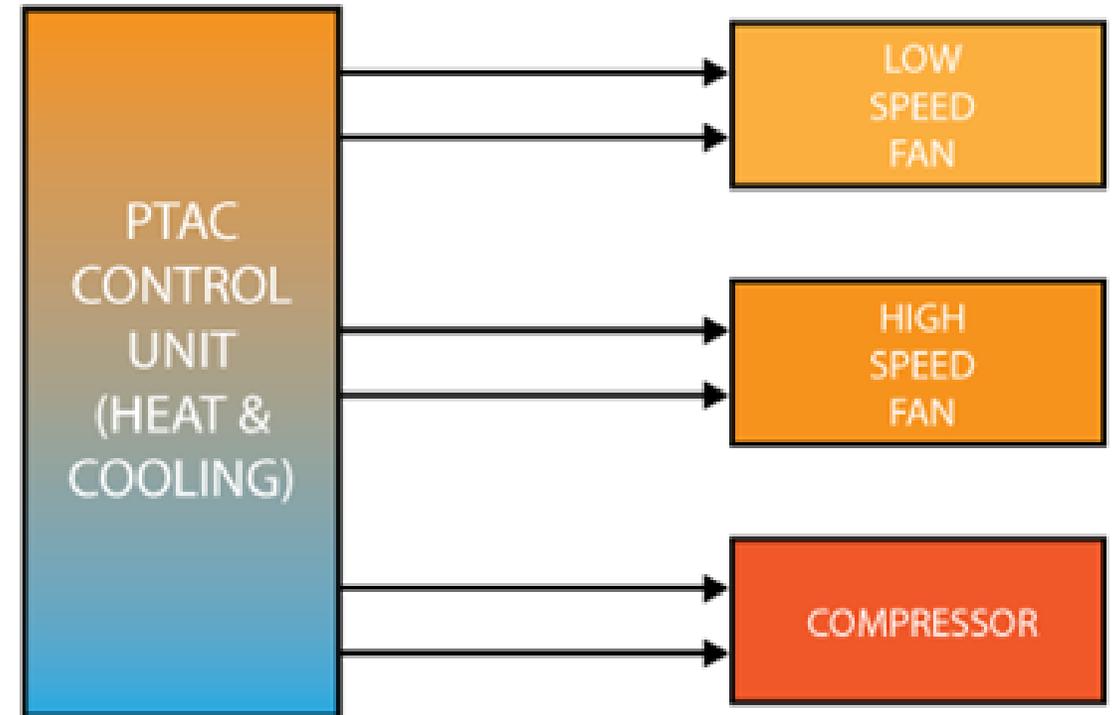
All things considered, IntelliPTAC recovers and delivers more heating and cooling energy to the conditioned room than is possible with original PTAC/PTHP. This device will improve the efficiency by delivering additional heating or cooling capacity for a reduced amount of additional electric energy (kWh). IntelliPTAC also extends the service life of the equipment through greater efficiency and fewer cycles.

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How It Works

The microprocessor controlled IntelliPTAC is installed at the output of the PTAC's high voltage control board. It has sensors that read the status of the compressor and the software controls the compressor and the fan.

PTAC Control Board Block Diagram to the right:





How It Works

The PTAC system has three relays; the first fan relay, the second fan relay and the compressor bypass relay.

The first fan relay of the IntelliPTAC is connected in parallel to the existing relay which controls the High Speed Fan of the PTAC unit.

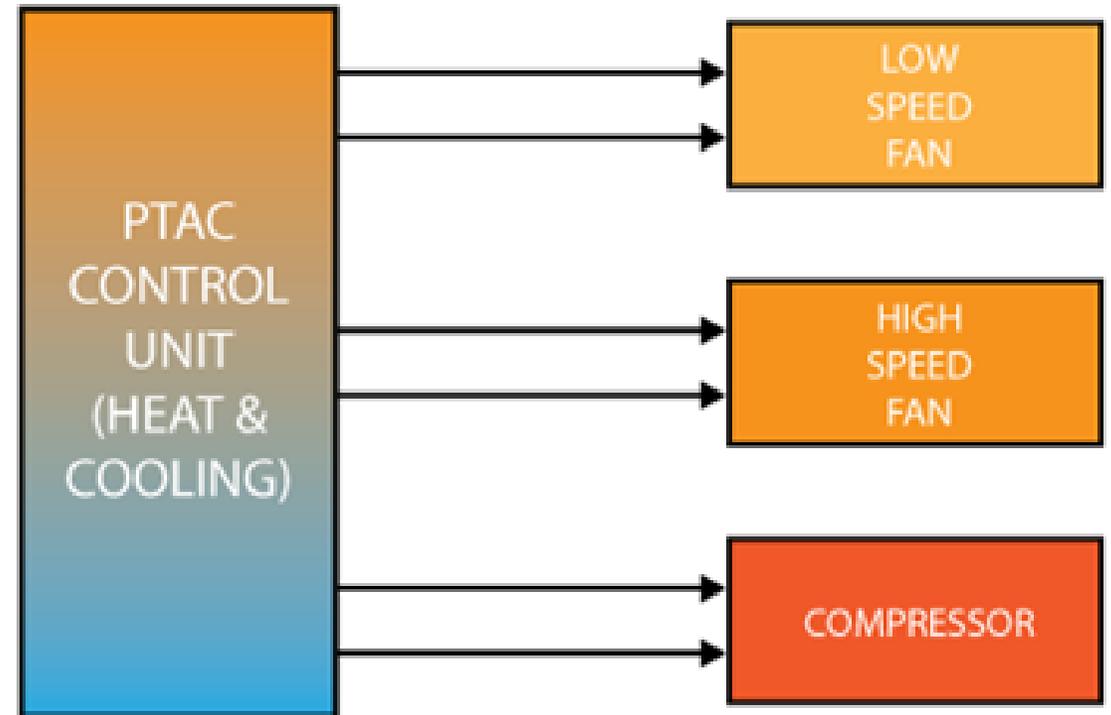
The second fan relay of the IntelliPTAC is connected in parallel to the existing relay which controls the Low Speed Fan of the PTAC unit.

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How It Works

The third relay, the compressor relay of the IntelliPTAC, is connected in series with the relay which controls the PTAC compressor (See "C" below). The block diagram shows connection details.

The IntelliPTAC has a power supply that accepts universal input range (90vac to 260vac, 60 Hz). It provides all the necessary power to the electronics and relays inside the PCBA.





How It Works

The internal power supply of the IntelliPTAC powers the control circuitry. There is a safety feature built in. If the internal power supply fails for any reason, the relays of the High Speed Fan, Low Speed Fan, and Compressor go back into normal default operation. The PTAC will then continue to run as if the IntelliHVAC-PTAC was never installed.

The IntelliPTAC senses the current flowing through the compressor line.

If the compressor is ON for less than 20 minutes the Extended Fan is 90 seconds.

If the compressor is ON for more than 20 minutes the internal circuit control turns the compressor OFF for 3 minutes.

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How It Works

Since the IntelliPTAC is installed at the high voltage output of the PTAC's control board, it will not affect the thermostat operations, and will not interfere with other energy management system such as remote thermostat control, motion detectors controls, etc.

The IntelliPTAC is CSA/UL listed.



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Proving our technology is an essential part of our process and we have streamlined our (pilot program) to one that can be done efficiently and effectively.

Using EKM meters, connected directly to the RTU, we are able to establish a baseline of energy consumption. The IntelliHVAC is then installed and a second week of data is recorded for performance. This provides a clear before and after picture of energy consumption.

Madison Energy uses an independent third party engineering firm to conduct the analysis and create detailed, transparent reports.



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Applications

IntelliPTAC applies to numerous applications:

Hotels

Motels

Medical Buildings

Office Buildings

Apartment Buildings





Benefit Summary

-  Average Reduction in Energy Consumption 10% to 15%
-  Average Return on Investment of approximately 12 months
-  Does Not Void any Manufacturer's Warranty
-  Extends the Life of Your System by Cutting Run Time
-  Lifetime Replacement Warranty
-  Hassle Free with No Recurring Cost
-  Compatible with Most Systems and Stats
-  Finance the Chip, Let Your Saving Cover the Cost
-  Reduce Your Carbon Footprint, Start Making a Difference Today



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