

HOW COOLNOMIX WORKS: A SIMPLE AUTOMOBILE ANALOGY

In 2012 we launched **COOLNOMIX** as an artificial intelligence (AI) based energy saving technology for air conditioning and refrigeration systems. With an input from family members the name **COOLNOMIX** was chosen to represent COOL (as in sexy) and ECONOMICS (to indicate a significant financial value); terms that we felt reflected the OPTIMIZED REFRIGERANT SUPPLY (ORS) nature of our internationally patented **COOLNOMIX** design.

Air conditioning and refrigeration systems

The technology of direct, compressor driven air conditioning has changed little since it was invented by Willis Carrier in 1903 (see Fig 1 below).

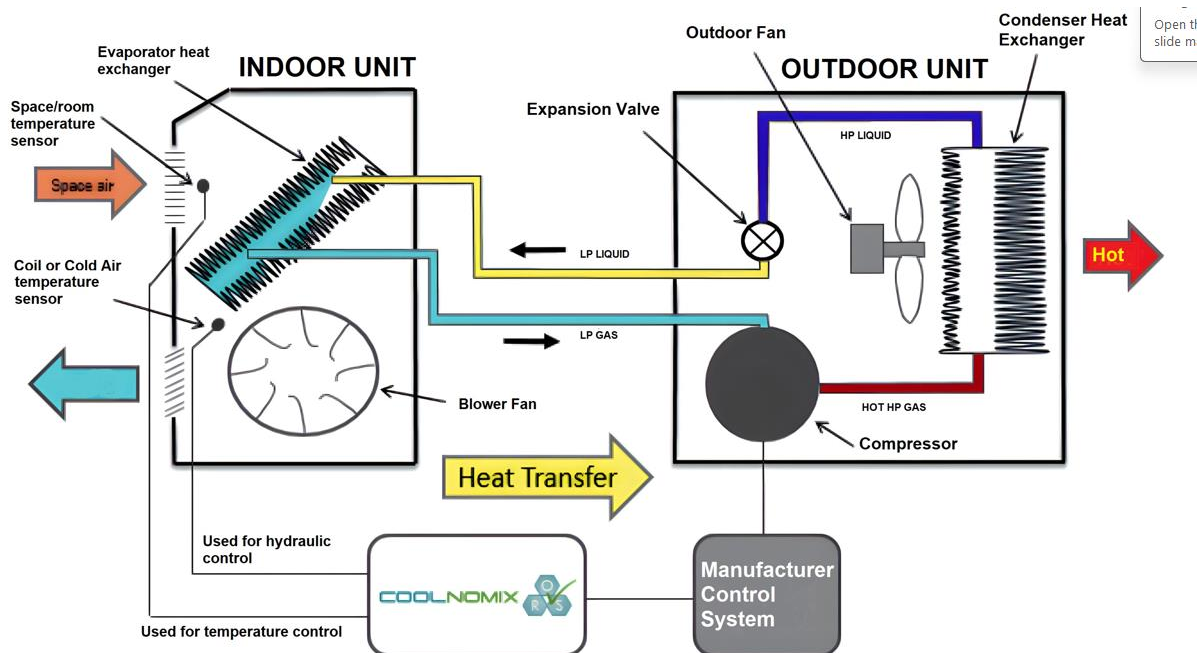


Fig 1. Air Conditioning or Refrigeration Cycle

In this, a compressor is used to fill an energy supply 'tank' of high-pressure liquid refrigerant that is available for cooling (shown as Dark Blue in Figure 1). For the purposes of this analogy this refrigerant 'tank' can be compared to the energy supply tank of gasoline for your automobile. As liquid cannot be compressed once the refrigerant or gasoline tank is full attempting to overfill serves no purpose. In fact, continuing to run an aircon compressor with a full refrigerant tank causes the refrigerant to boil which reduces the supply of low pressure liquid refrigerant available for cooling. This can waste 30% or more of the useful energy work done in compression.

The secret in managing **COOLNOMIX** energy supply is all down to sensors

Just as your automobile level gauge is used as a sensor to measure your supply of gasoline and trigger your next visit to the gas station, **COOLNOMIX** uses two temperature sensors and our Optimized Refrigerant Supply (ORS) algorithm to optimize the supply of liquid refrigerant to an aircon or refrigeration system.

Like your air conditioning system one **COOLNOMIX** temperature sensor is used to focus on comfort levels; ensuring that room temperature cooling or heating is supplied at the right temperature. Unlike your air conditioning system **COOLNOMIX** uses a second temperature sensor to measure the cold or hot (in winter) supply air temperature entering the room. This second **COOLNOMIX** supply air temperature sensor is in effect like your automobile gasoline level gauge:

In **cooling mode** a maximum **COOLNOMIX** supply air temperature value indicates that the liquid refrigerant tank is empty and that the compressor should start up filling operations. Likewise, a minimum **COOLNOMIX** supply air temperature indicates that the refrigerant tank is full and that the compressor should take a rest.

In winter **heating mode** the **COOLNOMIX** supply air temperature signals are reversed.

COOLNOMIX energy saving results

All aircon and refrigeration units have a cold sensor attached to the coil of the indoor unit. This merely acts as a switch to shut down or defrost units if icing is detected. However, **COOLNOMIX** uses the dynamics of the supply air temperature to reduce compressor energy consumption by 20%-40% with all known units. In effect, using our automobile analogy no known air conditioning or refrigeration manufacturer currently has a workable refrigerant tank level gauge.

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