



# THE USE OF SURGE PROTECTION WITH AC.

## BENEFITS OF “TIME DELAY UPON RESTART”.

*The electrical power grid for the United States and Canada is a carefully designed network of generators, transmission lines, substations and distribution lines as power is transmitted to homes and businesses. Unexpected events can create opportunities for transient surge energy to adversely impact air conditioning and other high value appliances within a home or small business.*

This article is intended to help readers understand the benefits of installation of surge protection on outside air conditioning compressors. We will also share the benefits of installing a time-delay upon restart protection module on outdoor compressor units.

## PROTECTING OUTSIDE REFRIGERATION COMPRESSORS.

Most homes being built in southern regions of the country have central air conditioning systems installed. These systems are typically comprised of an “air handler” which circulates air to various rooms in the house, and an outdoor refrigeration condenser unit that houses the refrigeration compressor. Mini-split air conditioning systems are a relative new addition to the HVAC community and are considered quite efficient due to their not requiring duct work to cool smaller homes.

Both central air conditioning and mini-split air conditioning systems make use of a cooling

process that compresses refrigerant gas and then cools (or heats) the home via release of the high pressure refrigerant through the cooling (or heating) cycle.

Modern HVAC systems make use of microprocessor controls to “manage” the operation of the system and to ensure proper operation. Super high efficient systems must be carefully controlled to maintain their high efficiency ratings.

As a result of incorporation of microprocessor control technology into the HVAC market, customers will benefit greatly by having an



additional hard-wire surge protector installed at the 240 volt disconnect adjacent to the outdoor condenser /compressor unit. This device will complement the meter base surge protector by protecting from transient surge events that may occur outside.

In addition, customers should take extra steps to protect their HVAC refrigeration compressors from momentary power interruptions.

Here is why:

1. During their operation, refrigeration compressors “compress” the refrigerant to a high pressure and this high pressure gas flows through the outside condenser/ compressor unit to the indoor air handle and back to the outside unit as part of the “refrigeration cycle”.
  - ✔ During the cool mode, cold air is expelled from the cooling coils in the air handler and into the house and hot air is released from the outside compressor unit coils.
  - ✔ During the heat mode (for heat pump systems), the refrigeration cycle is reversed and hot air is expelled from the inside heating coils in the air handler and into the house and cold air is released from the outside compressor unit coils.

2. These systems operate in a very efficient manner until... the lights blink and the compressor stops... then the power returns a few seconds later and the compressor attempts to restart under high refrigerant pressure. This type of event is similar to starting off your car in 5th gear and can cause major stress on refrigeration compressor systems and can lead to premature failure of the compressor.

There is a simple solution that will protect outdoor refrigeration compressors from momentary power interruptions or blinks. This solution is to install a “time delay upon restart” protection module as part of the air conditioner control system.

Once installed, the protection module will hold the compressor off for 3 to 5 minutes following a momentary power interruption. This will allow the refrigerant gas pressure to reduce to a level that will allow for easy restart of the compressor.

While many HVAC systems have time delays installed and operational, we have found situations where the protection module is installed but not operational.

Having your HVAC service company check out the time delay on your HVAC compressor to confirm that it is functioning properly is highly recommended.

Combining the time delay protection module with surge protection at the outdoor disconnect will significantly extend the life of your HVAC system.

Questions? Feel free to reach out to the author of this article with questions.

## ABOUT KENICK, INC.

KENICK, Inc. has been providing surge protection products and solutions to the electric utility industry for over 32 years. Their manufacturing facility includes a state-of-the-art research laboratory, allowing them to test surge protection products to see how they respond to small, medium, large and “oh my gosh... what was that!!” transient surge events.

## ABOUT THE AUTHOR

Peter Jackson has been responding to the needs of electric utility clients and their customers for over 25 years. His knowledge and expertise in mitigating transient surge damage events has been gained through hundreds of field reviews and their successful outcomes.

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# Questions?

Please contact us if you have questions about this article or a particular issue that you need help with.

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