MS-PRO Installation

WARNINGS:

- *This product should only be installed by qualified and trained HVAC/R Personnel!*
- *Disconnect supply voltage and discharge the system capacitors before proceeding!*
- *Follow all applicable electrical codes and safety standards!*
- *This device is **NOT** to be used on any equipment connected to 3-Phase power!*

How it works:

If incoming voltages remain normal, the *MS-PRO* simply allows them to pass through the unit unimpeded. However, if the voltage swings (or spikes) too high, the three solid-state devices in the *MS-PRO* act to clamp or clip off the excess voltage. Typical response time is 28ns - 30 ms. The excess voltage is converted to heat energy and is dissipated, if it is not too much. These protectors can dissipate up to about 8000v for one cycle, or 4000v for two cycles, etc, before being damaged. More voltage will cause the device's poles to short together permanently (often with an audible 'pop') and will cause the circuit breaker to trip - thereby protecting equipment from further damage. The protector's condition is then usually visible inside the clear shrink wrapping as a discoloration and the circuit breaker will continue to trip when power is restored. **REPLACE** the *MS-PRO* - do not just disconnect it - it has done its job protecting the unit's components!

Installing the *MS-PRO* on the Mini-Split Unit:

First - Disconnect all power to the system! Remove the cover on the outdoor unit where incoming power is connected. A terminal strip is almost always used to connect incoming wiring to the unit. There are three wires of interest: incoming power BLACK; incoming power WHITE (sometimes RED); and the BARE copper ground (but rarely a GREEN wire). Verify that you have identified the correct connections, because some units also use the terminal strip to make connections to the *indoor* unit; we will **not** be connecting to any of those leads.

- The *MS-PRO's* YELLOW/GREEN ground lead is very important: it is where excess voltage is sent to ground, so make sure that your connection to the incoming power's ground line is secure, and that the line is still secure to the unit as well. Do not neglect this!
- The BLUE wire from the *MS-PRO* is to be connected to the terminal where the incoming BLACK power wire is connected. Connect ring terminal under the screw at the terminal strip, and tighten securely. Make certain that all wires there are still secure and undisturbed. If needed, snip ring terminal to make a spade terminal and slip under the screw.
- The BROWN wire from the *MS-PRO* is to be connected to the terminal where the incoming WHITE (or incoming RED) power wire is connected. Connect in a similar manner as the BLUE wire, above.
- Finally, use zip ties to secure the *MS-PRO* away from any vibrating or rotating parts that may compromise it or its wires. Double check all 3 connections before replacing the cover and restoring power. Wait for any appointed delay time, then test cycle the unit.

The Yellow and Green Monitor LED's:

These monitoring LEDs indicate the voltage and protection status of the power line that they correspond to. The GREEN LED is for the BLUE power lead and the YELLOW LED is for the BROWN power lead. If the BROWN wire (WHITE or RED lead) is neutral (as would be the case if the unit were operating on 120V) the ***YELLOW LED WILL NEVER LIGHT!*** This is normal, because each LED only monitors the status if it is at LINE potential with respect to GROUND. Other than that exception, a dark LED indicates either a.) power loss, b.) loss of protection, or c.) loss of ground.

Notes:

- *A normal MS-PRO device measures near 'infinity' Ohms across **any** two leads.*
- *A failed device will measure LOW resistance between some of the leads.*
- *Visit* **ZebraInstruments.com** *to learn more about other devices that protect against surges and spikes in ECM motors.*