"THE DUCT-FREE ZONE"

By Gerry Wagner, Vice President HVAC Technical Training
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I have been concerned…VERY concerned…about what I call "mystery issues" which come up with inverter based mini splits more often than is acceptable. You all know what I'm taking about…erratic compressor operation, inaccurate setpoint maintenance, premature component failure and other issues which often times have no obvious cause. I see piles of control boards returned as defective that when replaced, still had the same phantom problem as before.

If you have attended my troubleshooting class you know how I feel about changing boards…it rarely is the answer.

Here is what my research has found…

The grounding system is the reference point for all computer logic based equipment…like inverter based mini splits! That board that we keep blaming…well it may indeed be the source of the problem but replacing is NOT the answer!

That board my friends is a micro-processor…YES…A COMPUTER! It has all the benefits of a computer but it also has all the vulnerabilities and weaknesses of a computer.

Within computers and computer based equipment, the internal computer circuits use the ground as the reference point for processing data. If the ground reference for these devices is not correct or "stable" then system reliability is compromised which can cause component failures and "mystery issues." The key issue related to grounding that most often cause problems which negatively impact system reliability is: Current is present on the home's grounding system…

This situation typically occurs when a wiring error is present within the electrical panel or a junction box such as the neutral and ground conductor wires are junctioned together, or worse yet, they are connected together on the same bar within the breaker panel. This ground current can cause system component failures and "mystery issues" from unstable ground reference conditions within the equipment.

Beyond the fact that the boards in inverter based mini splits are computer based, we also have to consider the inverter process that takes place.

I'm going to dumb this down…not for your sake but rather for mine!

Inverter equipment takes the Alternating Current AC that we provide to the L1 & L2 connections of the outdoor unit and converts it to a Direct Current DC voltage. In an AC circuit, NO current flows through the ground but in a DC circuit ALL current returns through the ground.

Because of this unique relationship between the AC and DC circuits within the inverter based mini split, the need for proper and stable ground has even more importance.

Perform an Ohms test across the ground wire from earth to the ground wire going to the equipment…this can be done at close proximity to the ground bar of the breaker panel. You want your test lead to be on the ground wire coming into the panel, (from earth) and the other to be on the ground wire going to the equipment. Be sure your test leads are on the ground wires and NOT on the ground bar of the panel.

If you read 3 Ohms or more, there is a poor ground.

If we start checking for proper ground BEFORE we install inverter based mini splits, I am optimistic that we can avoid a fair amount of "mystery issues" and take the mystery out of some.

Consider this; homes built prior to 1950 were NOT required to be grounded. Now consider where a fair amount of inverter mini splits are installed…in old homes!

ABOUT THE AUTHOR: Gerry Wagner is the Vice President of HVAC Technical Training for Tradewinds Climate Systems. He has 38 years in the HVACR industry working in manufacturing, contracting and now training. You can contact Gerry by email: gwagner@twclimate.com and also please visit our website: www.twclimate.com

New EPA Section 608 Certification Exam

Over the last few years, the EPA has been working to modernize the Section 608 Refrigerant Management Program. Because of their efforts, a new certification exam has been created that incorporates the new regulations and replaces the current exam.

The ESCO Institute has developed a new Section 608 EPA Certification program, that will be released in phases over the next several weeks.

To ensure a smooth transition to the new exam, both the old and new certification programs will be available concurrently online through August 31, 2018. ESCO Institute will continue to honor (old) paper exams until December 31, 2018. No old exams can be accepted for grading after December 31, 2018.

Where can I find the new regulations? Revisions to the Section 608 Refrigerant Management Program are available at https://www.gpo.gov/fdsys/pkg/FR-2016-11-18/pdf/2016-24215.pdf

AHRI Releases January 2018 U.S. Heating and Cooling Equipment Shipment Data

U.S. shipments of central air conditioners and air-source heat pumps totaled 482,671 units in January 2018, up 4.2 percent from 463,062 units shipped in January 2017. U.S. shipments of air conditioners decreased 1.9 percent to 266,857 units, down from 271,954 units shipped in January 2017. U.S. shipments of air-source heat pumps increased 12.9 percent to 215,814 units, up from 191,108 units shipped in January 2017.