

TECHNICAL INFORMATION COMMUNICATION



**United
Technologies**

Building & Industrial Systems

Quality and Continuous Improvement

Number: TIC2015-0011

Date: 7/27/2015

Title: Côr™ / Housewise™

Product Category: Wall Controls

Products Affected

Côr™ (TP-WEM01) and Housewise™ (T6-WEM01)

Situation

The Côr™ / Housewise™ thermostats have experienced field failure rates that remain in-line with our mature thermostat products like the Infinity® control and Edge™ thermostat. As part of our continuous improvement process to reduce field failure rates, the factory has investigated the humidity accuracy issues reported by the field.

Technical Information

Our investigation of humidity accuracy has uncovered two issues – depicted graphically in Figure 1 for a thermostat running software v3.5:

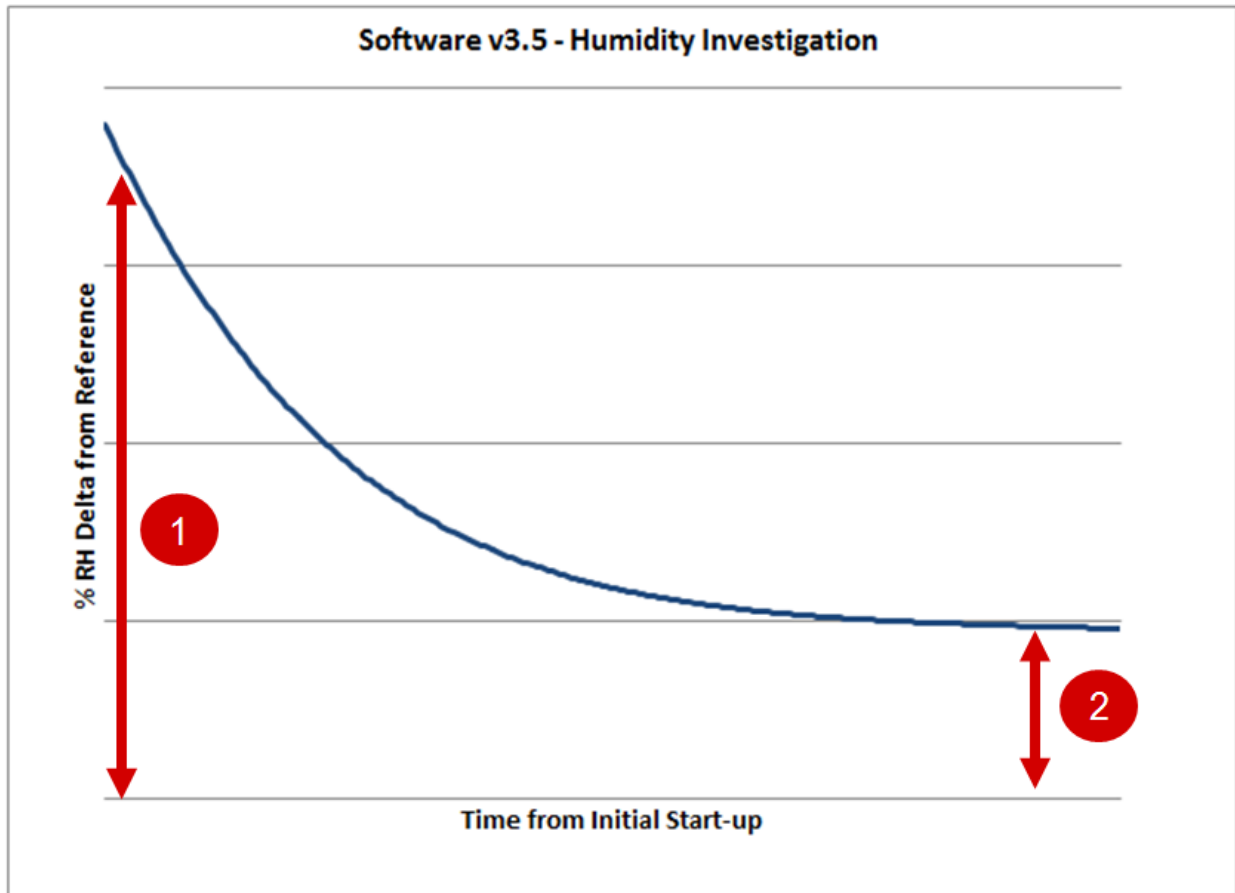


Figure 1: Humidity accuracy for a unit running software v3.5

ISSUE RESOLUTION

1. Issue 1 - Initial power-up

At initial power-up the thermostat humidity reading is starting out high causing concern about the humidity accuracy of the product. Additionally the reading does not reach steady-state for a few hours after installation. The initial power-up inaccuracy and settling time are related to the internal heat generated in the thermostat and the software algorithms used to compensate for that heat.

Solutions

- Software v3.6.0.947 – Includes improvements to the temperature compensation algorithms as shown in Figure 2. The software release reduces the initial power-up inaccuracy and improves the settling time. The software was released to the field mid-June.

Only trained and qualified personnel should design, install, repair and service HVAC systems and equipment. All national standards and safety codes must be followed when designing, installing, repairing and servicing HVAC systems and equipment. It is the responsibility of the Dealer to ensure local codes, standards, and ordinances are met.

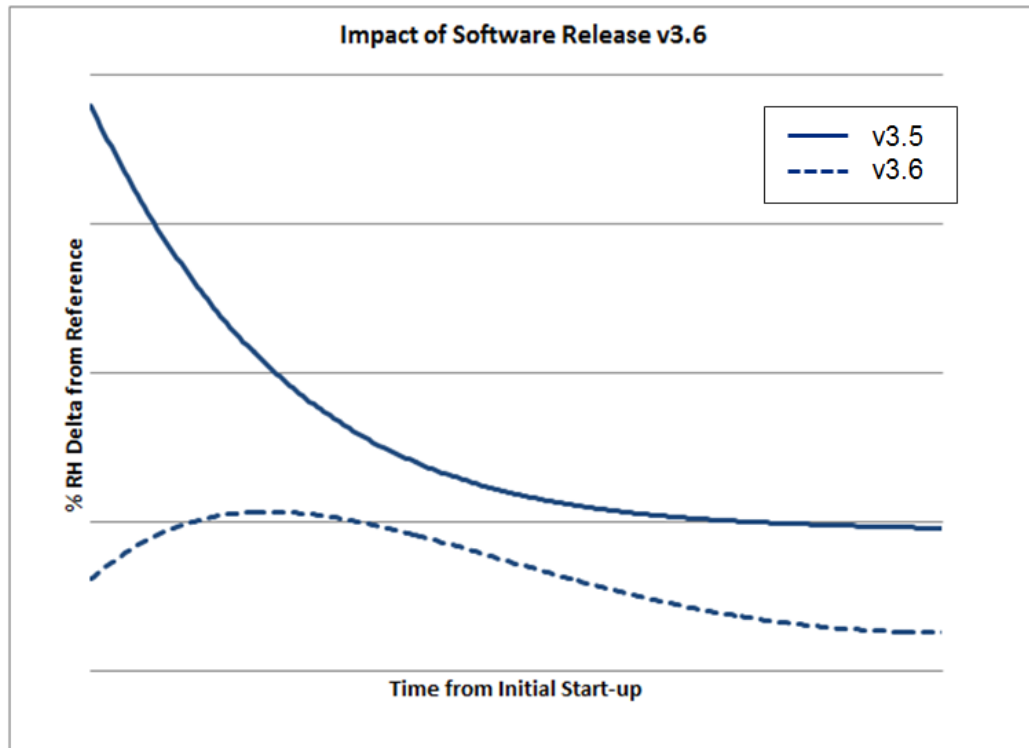


Figure 2: Humidity accuracy for a unit running v3.5 vs. v3.6

2. Issue 2 - Steady-state

After the initial settle-in time, the humidity reading may be off from the field reference measurement. This error is driven from a few factors:

- Our product's accuracy is limited by the sensor technology available in the market. Typical humidity sensors used in thermostat applications have an accuracy of range of several percentage points.
- For the same reasons, field measurements of relative humidity are also highly variable making establishing an accurate reference reading difficult. Inaccuracies in the field measurement compound the perception of the thermostat reading being inaccurate. Figure 3 shows an illustration of the impact of measurement variation. In the case shown, a low reference measurement leads to a higher %RH delta.
- The relative humidity reading is directly related to the temperature measurement. If the temperature is off by 1 degree F at normal room ambient it could result in a relative humidity inaccuracy of several percent. Temperature must be calibrated before an accurate humidity reading can be assessed.

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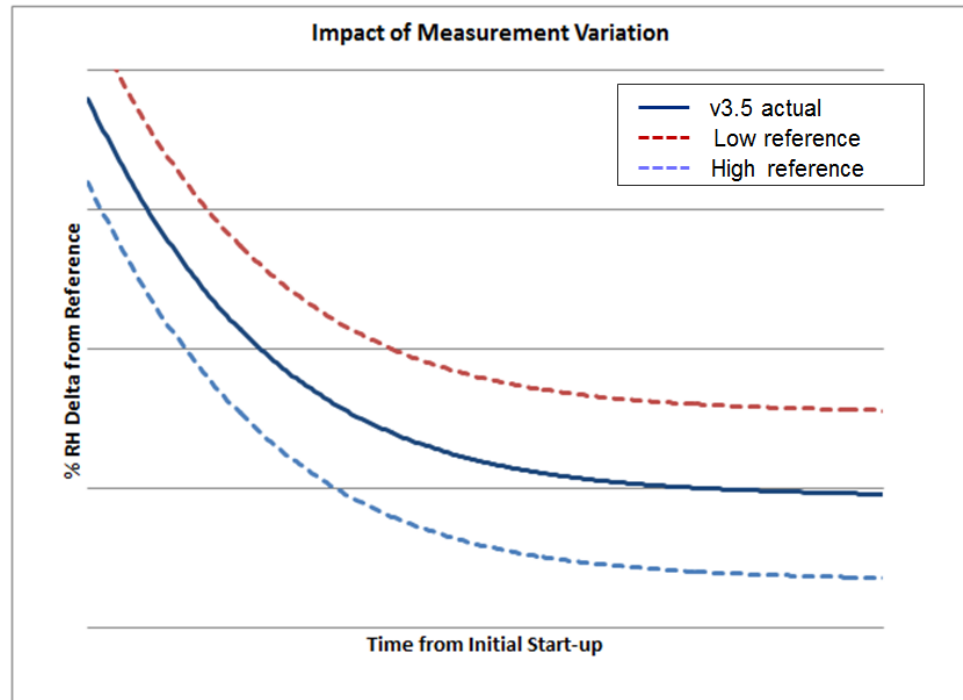


Figure 3: Impact of measurement variation

All of the factors above can lead to a “stack up” effect, creating readings in some cases that are outside of the thermostat sensor accuracy. Our previous products, such as Infinity and Edge, as well as competitive products all deal with this inaccuracy by providing a means to field calibrate the humidity reading using a humidity offset setting.

Solutions

- Software v3.6.0.980 – The next release of software will include a humidity offset option for the dealer to adjust the humidity reading to match their field measurement. The offset will have a range of +/- 10% RH with increments of 1%; this matches our current products. Version 3.6.0.980 will begin rolling out to the field the week of July 27, 2015 and will be included in units shipped after FW30.
 - Calibration best practices - Before checking the humidity accuracy, the installer must ensure that the thermostat is calibrated to the same temperature as the field measurement device that is providing the relative humidity reading. Once temperature is calibrated to the field measurement device, the humidity offset setting in v3.6.0.980 can be used to calibrate any remaining humidity difference.