

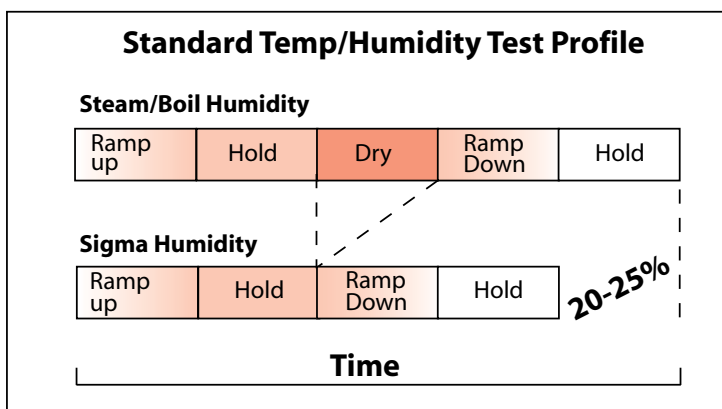
# Sigma Humidity Solution

## Humidity Testing without the <sup>Excess</sup> Water

Sigma Systems unique “Humidity Generator” enables humidity testing with minimal condensation or DUT contamination. Our patent pending design humidifies air from the chamber with treated water and returns it to the chamber at temperature. The Sigma design avoids super-heated steam injection and water sprays that cause temperature fluctuations and condensation of up to 40% of the water vapor.

### **The Sigma “Humidity Generator”:**

- **Minimizes condensation** to reduce testing errors, DUT failures, and safety exposures related to liquid water in and around the chamber
- **Eliminates DUT degradation** caused by super-heated organic compounds introduced by steam injection humidifiers
- **Provides consistent test results** by maintaining stable set points and creating smoother RH% and temperature transitions
- **Reduces test times** by actively reducing RH% during transitions to lower temperatures or RH% settings, as shown below.



**Legendary Performance,  
Quality, & Support**

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Traditional methods of creating humidity in a test chamber are to inject steam or water vapor directly into the chamber. Unfortunately, this approach creates dew point variations in the chamber that cause up to 40% of the water to either “rain” onto the DUT or condense on the walls of the chamber. **Problems caused by chambers that use steam or water vapor injection, that are eliminated with the Sigma design include:**

- Extended settling times
- Temperature variations beyond the test range
- Failure of electrical DUT components
- Water based safety hazards

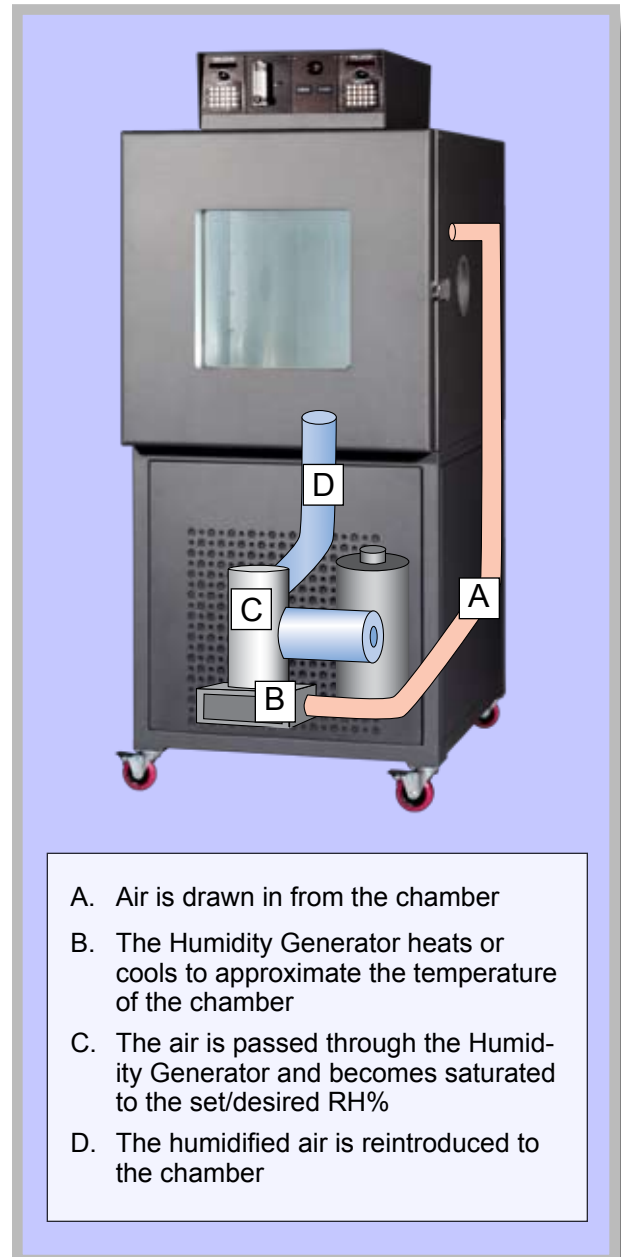
Sigma’s approach is to create a flow of humidified air that matches the temperature of the test chamber. The humidity in the chamber adjusts incrementally and stays below the effective dew point. This avoids pockets of excess saturation that cause condensation when increasing or decreasing relative humidity.

Because the Sigma Humidity Solution creates humidity using water that is consistent with the chamber temperature, any residual water impurities remain in the generator. In contrast, the super-heating required for steam humidification vaporizes residual contaminants and injects them into the test environment. Depending on the water source and filtration system, steam based systems may introduce compounds such as volatile organics, heavy metals, and chlorine derivatives. The Sigma methodology avoids these potential risks to testing and safety.

Sigma’s “Humidity Generator” also reduces cycle times in tests that include RH% ramp down periods. Because the humidity is actively removed by reversing the humidification process, both temperature and humidity can be ramped down simultaneously. Other humidity systems require a separate “drying” cycle to bake the humidity out of the chamber environment. Shorter test times result in higher productivity of both chamber operators and the chamber equipment.



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## Specifications

- Humidity temperature range +5°C to +98°C
- Dry temperature range -100°C to +170°C
- RH% range 5% to 95%
- Supports direct water source connection
- 100 hours operation on optional internal water supply (for units not direct connected)
- 5 micron, adsorptive, and absorptive water decontamination system
- Available in chambers from 5.8 to 15.6 cubic feet