

## ***ABSTRACT***

*Several humidity sensors at the same point often yield different outputs, necessitating calibration with this standard testing instrument. Humidity sensor measurements frequently reach saturation, emphasizing the importance of determining the time it takes for the sensor to reach a steady value. In this test, the Thermo Recorder TR72A-S served as the standard instrument, compared with the DHT22, BME280, HTU21, and AHT10 sensors in a assumed homogeneous chamber. Test results showed humidity values ranging from 35, 45, 60, 75, to 85%. The use of a blender fan led to a significant  $\pm 15\%$  humidity decrease, while the impact of 6mm and 16mm hose sizes showed no significant difference. Actuators such as fans and pumps helped distribute humid air. The nebulizer compressor's effect on temperature ( $< 1^\circ\text{C}$ ) differed from the ultrasonic mist maker ( $> 1^\circ\text{C}$ ). The successful method demonstrated steady values using a nebulizer compressor with a humidity control scheme, increasing by 5% before turning off. The results remained stable after two hours, serving as a reference for controlling humid air exposure. Compared to the Th Meter, errors were found: HTU21 16.25%, DHT22 9.56%, AHT10 16.25%, and BME280 7.8%. The sensors stabilized in 2 hours, serving as a reference for humid air exposure control. The congruence between the sensor's RH values and the Th Meter demonstrates the sensor's performance characteristics similar to the Thermo Recorder TR72A-S reference instrument.*

*Keywords: Chamber, Calibration, Humidity, Temperature.*