

# ANEMOMETER CALIBRATION REPORT

**Customer: NRG Systems, Inc.**

*This document reports that a wind tunnel test was performed for the anemometer listed below in accordance with transfer function protocols defined by ASTM D 5096-02, ISO 17713-1, and IEC 61400-12-1. The following data and transfer function is the relationship between the reference wind speed measurement in the wind tunnel test section and the unadjusted signal output from the instrument under test (IUT) given the prescribed speed range.*

**IUT Model No: NRG #40**  
**IUT Serial No: 179500046313**  
**IUT Output: AC Sine Wave**

**Test Date and Time: 9/19/07 4:57 PM**  
**Test Speed Range: 4 - 26 m/s**

**Wind Tunnel Test Facility**

Otech Tunnel ID: WT2B  
 Type: Eiffel (open circuit, suction)  
 Test Section Size: 0.61 m x 0.61 m x 1.22 m  
 Manufacturer: Engineering Laboratory Design, Inc.

**Data Acquisition**

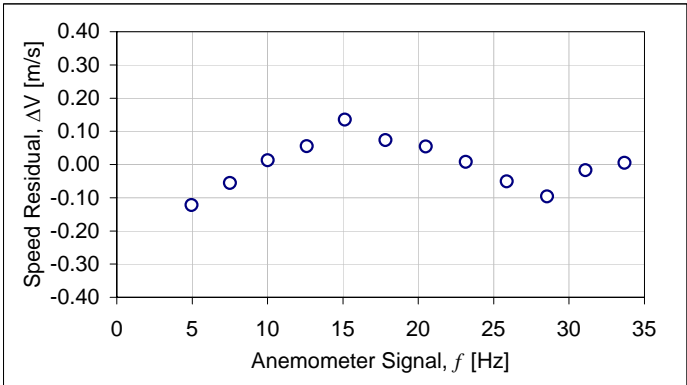
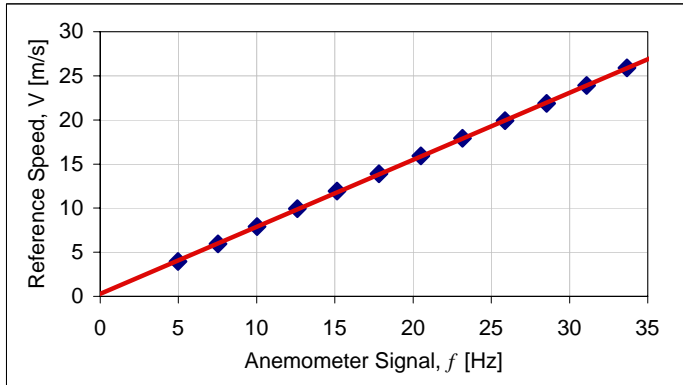
Hardware: National Instruments CDAQ-9172 USB 2.0 chassis  
 with NI 9205 32-chan 16-bit AI module  
 Software: National Instruments LabVIEW 8.2.1  
 Signal Reduction Method for IUT: FFT to determine frequency

**Measuring Equipment**

Reference Speed: Four United Sensor Type PA Pitot-static tubes sensed by an MKS Barotron Type 220D Differential Pressure Transducer (NIST traceable)  
 Amb. Pressure: Setra Model 270 Barometer (NIST traceable)  
 Amb. Temperature: OMEGA HX94 SS Probe (NIST traceable)  
 Relative Humidity: OMEGA HX94 SS Probe (NIST traceable)

**Test Conditions**

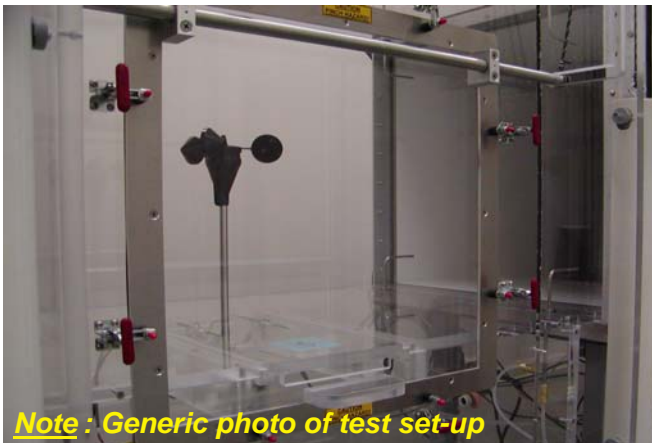
Reference Speed Position Correction = 1  
 Reference Speed Blockage Correction = 1  
 Mean Ambient Pressure = 100378 Pa  
 Mean Ambient Temperature = 25.9 deg C  
 Mean Relative Humidity = 37.8% RH  
 Mean Density = 1.1641 kg/cubic meter



**Transfer Function**  
**Test Results:**

**$V \text{ [m/s]} = 0.76 f \text{ [Hz]} + 0.3$**

$r = 0.99995$        $\text{std. err. estimate} = 0.0774 \text{ m/s}$



**Note: Generic photo of test set-up**

Reference Speed [m/s]	Anemometer Output [Hz]	Residual [m/s]	Ref. Speed Uncertainty
3.948	4.967	-0.122	0.521%
7.924	10.022	0.012	0.500%
11.933	15.135	0.134	0.488%
15.929	20.498	0.054	0.477%
19.906	25.871	-0.051	0.484%
23.904	31.087	-0.017	0.492%
25.892	33.674	0.005	0.475%
21.889	28.539	-0.096	0.474%
17.906	23.162	0.008	0.480%
13.911	17.819	0.073	0.480%
9.925	12.598	0.055	0.478%
5.956	7.522	-0.056	0.503%