

Calibration Report: Wind Sensor

S/N: 8042

26 March 2003

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Summary

Calibration date: 26 March 2003 Next calibration date: 26 March 2005

A collection, analysis and calibration of data from a Wind Sensor instrument, S/N 8042, has been completed. The calibration was performed by the Wind Sensor manufacturer, R.M. Young, Inc. These data were collected by R.M. Young on 26 March 2003.

Model : 05103 Wind Monitor
Serial Number : 8042

The test data presented in chart and graphical format show the sensor to be within ± 3 degrees in determining wind direction and azimuth. The report also states that the sensor is within ± 3 m/s.

The following pages provide more detail into the calibration process and results.



Wind Speed Calibration Report

Customer: Wyle Labs

Test Number: 33910 Customer PO: HMP013162
Test Date: 26 March 2003 Sales Order: 6460

Test Sensor:
Anemometer: 05103 Wind Monitor Propeller: 08234
Serial Number: 8042 Serial Number: 34545

Report of calibration comparison with National Institute of Standards and Technology calibrated anemometer in the R.M. Young Company 50 x 75 cm rectangular test section open return wind tunnel. The following data describe the relationship between test section wind speed, as determined by the NIST calibrated standard anemometer, and test anemometer rpm, as determined by it's output. Indicated wind speed is calculated using anemometer's published formula.

Table with 6 columns: Wind Speed According to Standard Anemometer (Nominal Speed m/s, Actual Speed m/s), and Wind Speed According to Test Anemometer (100 Second Pulse Count, Output Frequency, Propeller RPM, Indicated Speed m/s). Rows range from 30 m/s down to 1 m/s.

National Institute of Standards and Technology Reference

Calibrated Standard Anemometer (4)
Test #: TN251034
Date: 9 Nov 1992
Model: 08234 Serial #: 00005

Environmental Conditions

Barometric Pressure (mm Hg) 743
Temperature (C): 26.5
Relative Humidity (%): 47.0

- (1) Actual wind speed determined by relationship between tunnel fan rpm and NIST calibrated standar propeller rpm.
(2) Wind Monitor output is three (3) pulses per revolution: Rpm = Hz / 3 x 60 sec.
(3) Published calibration: Wind speed (m/s) = 0.00490 x propeller rpm.
(4) NIST Calibration accuracy is within 1%.

Tested By E. Chensong



Wind Speed Calibration Report (page 2)

Test Number: 33910

Linear Regression

A linear regression is performed on the calibration data to determine the best fit straight line representing the relationship between propeller rpm and actual wind speed as determined by the NIST calibrated standard anemometer

Slope: 0.00507 meters per second per RPM
 Intercept: 0.12 meters per second
 Pitch: 30.44 centimeters per revolution
 Correlation Coefficient: 1.00000

Wind Speed =	Slope	x RPM +	Intercept	Slope	x Hz +	Intercept
m/s	= 0.00507	x RPM +	0.12	0.10146	x Hz +	0.12
mph	= 0.01135	x RPM +	0.26	0.22697	x Hz +	0.26
knots	= 0.00985	x RPM +	0.23	0.19709	x Hz +	0.23
km/hr	= 0.01826	x RPM +	0.42	0.36527	x Hz +	0.42

Threshold Measurements

	New Instrument	As Found	As Left
Start:		0.5 m/s 1.2 mph	0.5 m/s 1.2 mph
	n/a		
Stop:		0.3 m/s 0.7 mph	0.3 m/s 0.7 mph

R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05103 WIND MONITOR
SENSOR SERIAL NUMBER: 8042

BEARINGS: SEALED/GREASE LUBE

DATE: MAR 26 2003

WIND SPEED THRESHOLD TEST: PASS

LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS

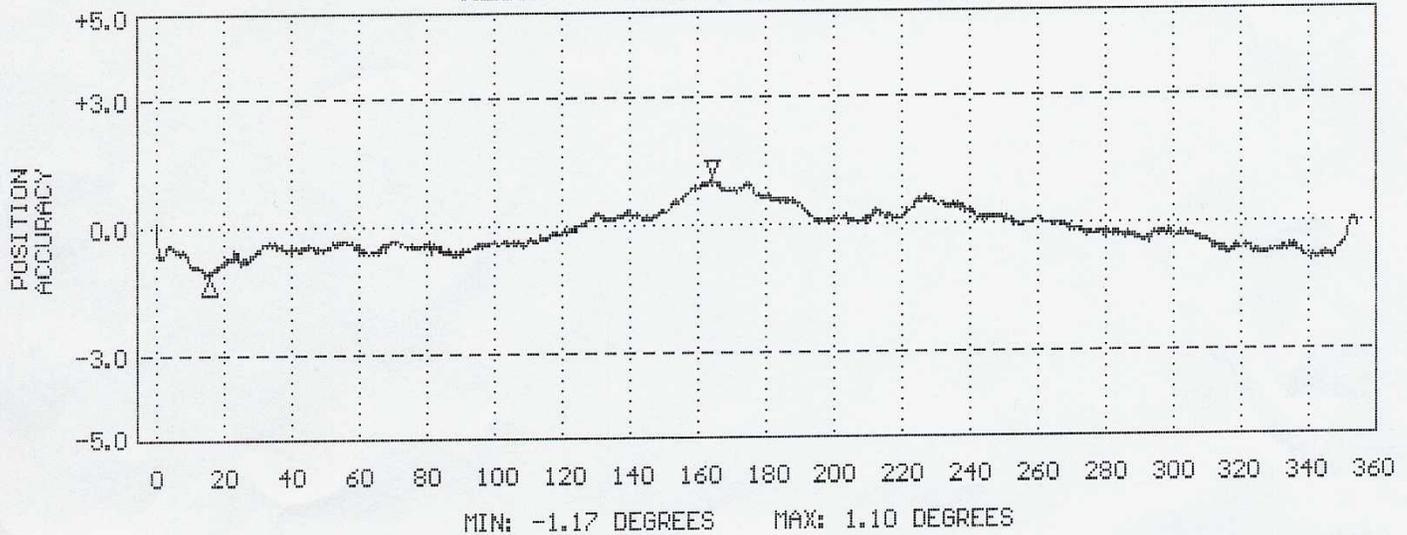
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS

VANE TORQUE TEST: PASS

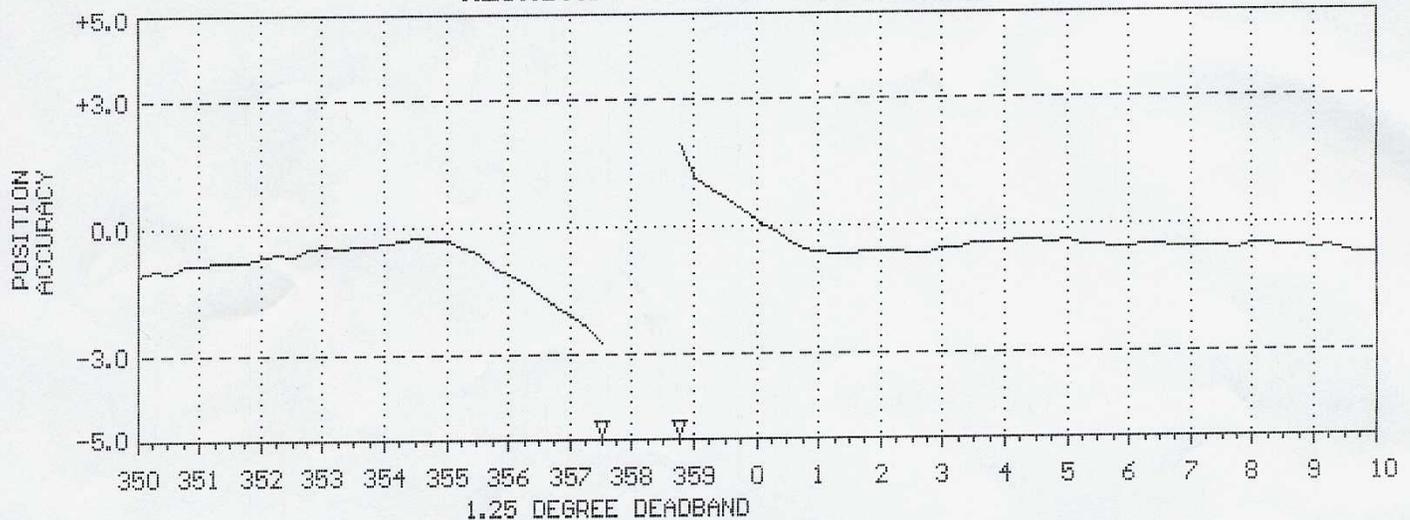
SPECIAL NOTES:

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AZIMUTH POSITION vs ACCURACY



AZIMUTH POSITION vs ACCURACY



NOTE: Azimuth Position vs Accuracy graphs are accurate to within 0.5 degrees. The accuracy shown in the potentiometer deadband region between 355 and 0 degrees is the result of no resistance change while position changes. The gap represents the actual deadband (open circuit).