



R.M. Young Company
2801 Aero Park Drive
Traverse City, Michigan 49686 USA

CALIBRATION REPORT Wind Speed

Customer: **NOAA**

Test Number: 2322-03W
Test Date: 14 April 2022

Customer PO: (M Peperato)
Sales Order: 9441

<u>Instrument Under Test</u>	
Anemometer: 05106 Wind Monitor-MA Serial Number: WM183593	Propeller/Cup: 08234 Serial Number: 12278

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 its output. Indicated wind speed is calculated using anemometer's published formula.

<u>Wind Speed</u> According to Standard Anemometer		<u>Wind Speed</u> According to Instrument Under Test			
Model: 05103 / 08234 Serial #: 00005		Anem: 05106 Serial #: WM183593		Prop/Cup: 08234 Serial #: 12278	
Nominal Speed m/s	Actual Speed m/s (1)	100 Second Pulse Count	Output Frequency	Propeller RPM (2)	Indicated Speed m/s (3)
30.0	30.0	30452	304.5	6090	29.8
25.0	25.0	25371	253.7	5074	24.9
20.0	20.0	20252	202.5	4050	19.8
16.0	16.0	16184	161.8	3237	15.9
14.0	14.0	14154	141.5	2831	13.9
12.0	12.0	12134	121.3	2427	11.9
10.0	10.0	10118	101.2	2024	9.9
8.0	8.0	8082	80.8	1616	7.9
6.0	6.1	6064	60.6	1213	5.9
5.0	5.1	5044	50.4	1009	4.9
4.0	4.1	4047	40.5	809	4.0
3.0	3.1	3054	30.5	611	3.0
2.0	2.1	2034	20.3	407	2.0
1.0	1.1	982	9.8	196	1.0

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 (hPa): 1000
Temperature (C): 25.6
Relative Humidity (%): 20.4

- (1) Actual wind speed determined by relationship between tunnel fan rpm and NIST calibrated standard propeller rpm.
(2) Instrument Under Test output: $Rpm = Hz / 3 \text{ pulse(s) per revolution} \times 60 \text{ seconds.}$
(3) Published calibration: $Wind \text{ speed (m/s)} = 0.00490 \times \text{propeller rpm} + 0.0 \text{ m/s.}$
(4) NIST Calibration accuracy is within 1%.

Tested By D. Ochs



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Wind Speed (page 2)

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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: 0.00491 meters per second per RPM
Intercept: 0.10 meters per second
Pitch: 29.48 centimeters per revolution
Correlation Coefficient: 1.00000

Wind Speed =	Slope	x RPM +	Intercept	Slope	x Hz +	Intercept
m/s	= 0.00491	x RPM +	0.10	0.09826	x Hz +	0.10
mph	= 0.01099	x RPM +	0.23	0.21981	x Hz +	0.23
knots	= 0.00954	x RPM +	0.20	0.19088	x Hz +	0.20
km/hr	= 0.01769	x RPM +	0.37	0.35375	x Hz +	0.37

Threshold Measurements

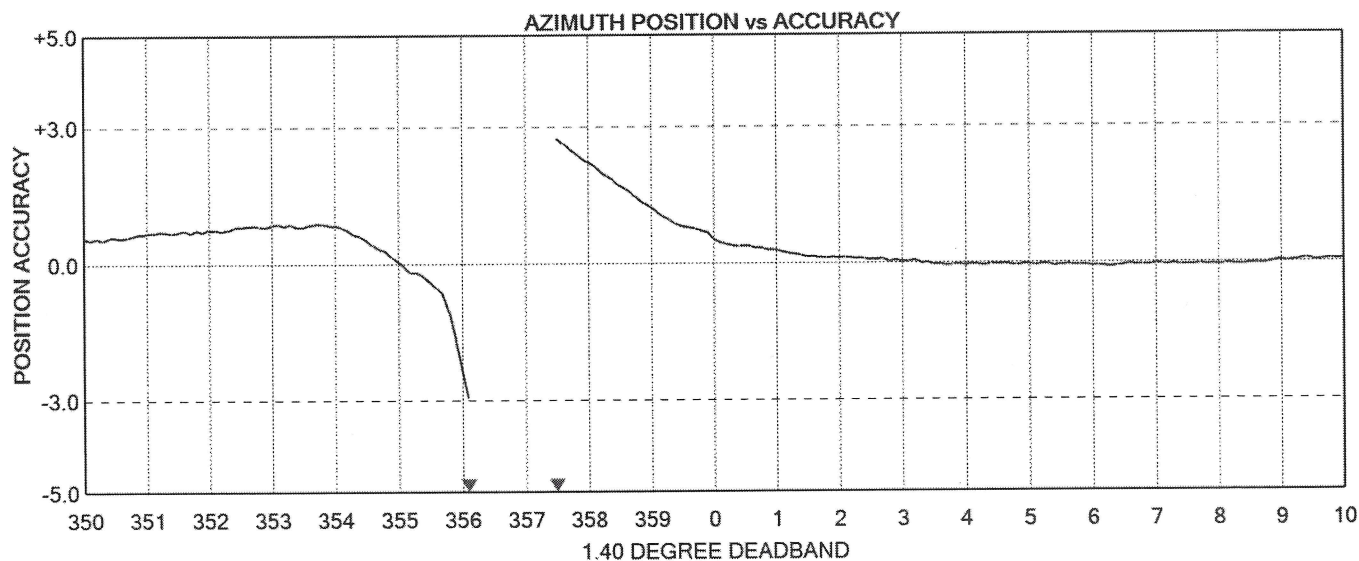
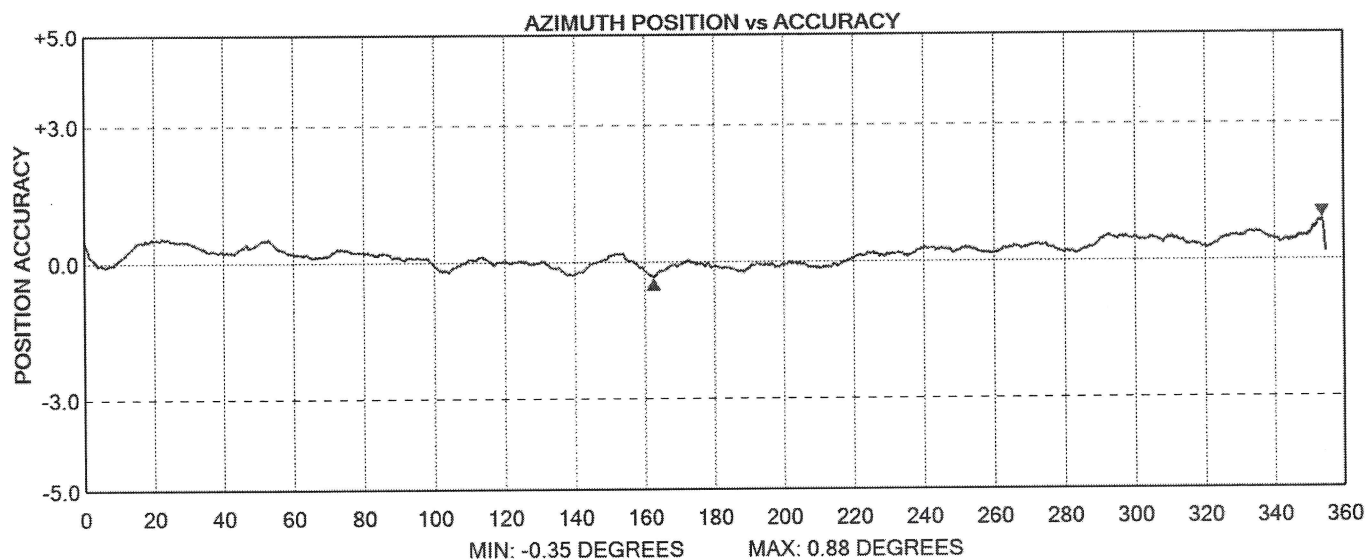
	New Instrument	As Found	As Left
Start:		0.5 m/s	0.5 m/s
	n/a		
Stop:		0.3 m/s	0.3 m/s



R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05106 WIND MONITOR-MA
SENSOR SERIAL NUMBER: WM183593
BEARINGS: CERAMIC
DATE: APRIL 14, 2022
WIND SPEED THRESHOLD: PASS
LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
VANE TORQUE TEST: PASS
SPECIAL NOTES:

Inspected By: DO



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).

R.M. YOUNG COMPANY 2801 Aero Park Dr, Traverse City, MI 49686 USA
Tel: 231-946-3980 Fax: 231-946-4772 Email: met.sales@youngusa.com Website: www.youngusa.com