

Factual Report – Attachment 5

Showboat Branson Belle anemometer specifications and correspondence with the anemometer's manufacturer.

METEOROLOGY

DCA18MM028

*Submitted by: Mike Richards
NTSB, AS-30*

Anemometer

6410



Vantage Pro2™ Accessories

Includes both wind speed and wind direction sensors. Rugged components stand up to hurricane-force winds, yet are sensitive to a light breeze. Includes sealed bearings for long life. The range and accuracy specifications have been verified in wind-tunnel tests. In areas where icing of the anemometer is a problem, drip rings deflect water from the joint between moving parts.

General

Operating Temperature	-40° to +149°F (-40° to +65°C)
Sensor Type	
Wind Speed	Solid state magnetic sensor
Wind Direction	Wind vane and potentiometer
Attached Cable Length	40' (12 m)
Cable Type	4-conductor, 26 AWG
Connector	Modular connector (RJ-11)
Maximum Cable Length	240' (73 m)

Note: Maximum displayable wind speed decreases as cable increases. At 140' (42 m) of cable, maximum displayable wind speed is 135 mph (60 m/s); at 240' (73 m), maximum wind speed displayed is 100 mph (45 m/s).

Material	
Wind Vane and Control Head	UV-resistant ABS
Wind Cups	Polycarbonate
Anemometer Arm	Black-anodized aluminum
Dimensions (length x width x height)	15.0" x 1.5" x 18.0" (381 mm x 38 mm x 457 mm)
Weight	1 lbs. 4 oz. (1.332 kg)

Sensor Output

Wind Direction

Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Accuracy	±3°

Wind Speed

Resolution and Units	Measured in 1 mph. Other units are converted from mph and rounded to nearest 1 km/h, 0.1 m/s, or 1 knot
Range	1 to 200 mph, 1 to 173 knots, 0.5 to 89 m/s, 1 to 322 km/h
Accuracy	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Maximum Cable Length	240' (73 m). Maximum wind speed reading decreases as length of cable from Anemometer to ISS increases. At 140' (42 m), maximum speed is 135 mph (60 m/s). At 240', the maximum is 100 mph.

Input/Output Connections

Black	Wind speed contact closure to ground
Red	Ground
Green	Wind direction pot wiper (20KΩ potentiometer)
Yellow	Pot supply voltage
Wind Speed Translation Formula	1600 rev/hr = 1 mph $V = P(2.25/T)$ (V = speed in mph, P = no. of pulses per sample period T = sample period in seconds)
Wind Direction Translation	Variable resistance 0 - 20KΩ; 10KΩ = south, 180°

Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6410	17.75" x 10.50" x 3.00" (451 mm x 267 mm x 76 mm)	2.0 lbs. (.9 kg)	011698 00237 5

Richards Michael

From: Curtis Lawton <[REDACTED]@davisinstruments.com>
Sent: Tuesday, August 21, 2018 3:03 PM
To: Richards Michael [REDACTED]@ntsb.gov>
Cc: 'Kelsey Angle - NOAA Federal' <[REDACTED]@noaa.gov>
Subject: RE: question about anemometer

Hi Mike,

I'd ask that since this is an open investigation that you do not distribute this image to anyone.
[I will not share this information.](#)

I am reading this that the maximum wind magnitude observed by the anemometer on July 19 occurred at 7:07pm, and it was a wind of 73 mph.

[Yes you are correct](#)

This wind was an *instantaneous* wind calculation, and is not averaged over any sort of period using multiple observations.

[Correct the value of 73mph was instantaneous value. Correct, there is no average.](#)

With regard to direction and magnitude, I assume that the display presents true wind information, as opposed to relative wind information, which requires that the unit has some sort of knowledge of the vessel's heading and speed over ground. So that the "north" indication on the display means that the wind of 73mph measured at 7:07pm was from true north at 73 mph relative to the ground regardless of the vessel's speed and orientation at the time of observation.

[Yes](#)

Take care,
Curtis L