

# Vantage Vue® Weather Station



6250 6357  
6351

VANTAGE VUE®

The Vantage Vue® (#6250) wireless weather station includes two components: the Integrated Sensor Suite (ISS) (#6357) which houses and manages the external sensor array, and the console (#6351) which provides the user interface, data display, and calculations. The Vantage Vue ISS and console communicate via an FCC-certified, license-free frequency-hopping transmitter and receiver. Frequency-hopping spread-spectrum (FHSS) technology provides greater communication strength over longer distances and areas of weaker reception. User-selectable transmitter ID codes allow up to eight stations to coexist in the same geographic area. (The Vantage Vue console can also receive and display data from any Vantage Pro2™ or Vantage Pro2 Plus ISS. The Vantage Pro2 Plus includes two additional sensors: the UV sensor and the solar radiation sensor.) The console may be powered by batteries or by the included AC-power adapter. The wireless ISS is solar-powered with a battery backup. Use WeatherLink™ for Vantage Vue to let your weather station interface with a computer, to log weather data, and upload weather information to the internet.

The Vantage Vue station relies on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings.

## Integrated Sensor Suite (ISS)

Operating Temperature .....	-40° to +150°F (-40° to +65°C)
Non-operating (Storage) Temperature .....	-40° to +158°F (-40° to +70°C)
Current Draw .....	0.20 mA (average), 30 mA (peak) at 3.3 VDC
Solar Power Panel .....	0.5 Watts
Battery .....	CR-123 3-Volt Lithium cell
Battery Life (3-Volt Lithium cell) .....	8 months without sunlight - greater than 2 years depending on solar charging
Wind Speed Sensor .....	Wind cups with magnetic switch
Wind Direction Sensor .....	Wind vane with magnetic encoder
Rain Collector Type .....	Tipping spoon, 0.01" per tip (0.2 mm with metric rain cartridge, Part No. 7345.319), 18.0 in <sup>2</sup> (116 cm <sup>2</sup> ) collection area
Temperature Sensor Type .....	PN Junction Silicon Diode
Relative Humidity Sensor Type .....	Film capacitor element
Housing Material .....	UV-resistant ABS & ASA plastic
ISS Dimensions .....	12.95" x 5.75" x 13.40" (329 mm x 146 mm x 340 mm)
Package weight: .....	5.44 lbs (2.47 kg)

## Console Specifications

Console Operating Temperature .....	+32° to +140°F (0° to +60°C)
Non-Operating (Storage) Temperature .....	+14° to +158°F (-10° or +70°C)
Console Current Draw .....	0.9 mA average, 30 mA peak, (add 120 mA for display lamps, add 0.125 mA for each transmitter station received by console) at 4.4 VDC
Power Adapter .....	5 VDC, 300 mA
Battery Backup .....	3 C-cells
Battery Life (no AC power) .....	Up to 9 months (approximately)
Housing Material .....	UV-resistant ABS plastic
Console Display Type .....	LCD Transflective
Display Backlight .....	LEDs
Dimensions:	
Console (with antenna) .....	7.5" x 5.75" x 4.5" (190 mm x 146 mm x 114 mm)
Console (with antenna) mounted on wall .....	7.5" x 7.0" x 3.0" (190 mm x 178 mm x 76 mm)
Display .....	4.13" x 3.0" (105 mm x 76 mm)
Weight (with batteries) .....	1.48 lbs. (.67 kg)

## Data Displayed on Console

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Data display categories are listed with General first, then in alphabetical order.

### General

Historical Data .....	Includes the past 25 values plus the current value listed unless otherwise noted; all can be cleared and all totals reset
Daily Data .....	Includes the earliest time of occurrence of highs and lows; period begins/ends at 12:00 am
Monthly Data .....	Period begins/ends at 12:00 am on the first of the month
Yearly Data .....	Period begins/ends at 12:00 am on the first of January unless otherwise noted
Current Data .....	Current data appears in the right most column in the console graph and represents the latest value within the last period on the graph; totals can be set or reset
Graph Time Interval .....	10 min., 1 hour, 1 day, 1 month, 1 year (user-selectable, availability depends upon variable selected) (2.5 seconds for Last 25 Wind Speeds)
Graph Time Span .....	26 Intervals (Current Interval plus 25 past values included; see Graph Intervals to determine time span)
Graph Variable Span (Vertical Scale) .....	Automatic (varies depending upon data range); Maximum and Minimum value in range appear in Weather Center
Alarm Indication .....	Alarms sound for only 2 minutes (except for time) if operating on battery power. Alarm message is displayed in Weather Center as long as threshold is met or exceeded. Alarms can be silenced (but not cleared) by pressing the DONE key.
Transmission Interval .....	Varies with transmitter ID code from 2.25 seconds (#1=shortest), to 3 seconds (#8=longest)
Update Interval .....	Varies with sensor - see individual sensor specs

### Barometric Pressure

Resolution and Units .....	0.01" Hg, 0.1 mm Hg, 0.1 hPa/mb (user-selectable)
Range .....	16.00" to 32.50" Hg, 410 to 820 mm Hg, 540 to 1100.0 hPa/mb
Elevation Range .....	-999' to +15,000' (-600 m to +4570 m). (Note that console screen limits entry of lower elevation to -999' when using feet as elevation unit.)
Uncorrected Reading Accuracy .....	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb) (at room temperature)
Sea-Level Reduction Equations Used .....	United States Method employed prior to use of current "R Factor" method ("NOAA"), Altimeter Setting
NOAA Equation Source .....	Smithsonian Meteorological Tables
NOAA Equation Accuracy .....	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa/mb)
NOAA Elevation Accuracy Required .....	±10' (3m) to meet equation accuracy specification
Overall Accuracy .....	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb)
Trend (change in 3 hours) .....	Change 0.06" (2 hPa/mb, 1.5 mm Hg) = Rapidly Change 0.02" (.7hPa/mb, .5 mm Hg)= Slowly
Trend Indication .....	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval .....	1 minute
Current Data .....	Instant and Hourly Reading; Daily, Monthly, Yearly High and Low; Barometer change 24-hour
Historical Data .....	15-min. and Hourly Reading; Daily, Monthly Highs and Lows
Alarms .....	High Threshold from Current Trend for Storm Clearing (Rising Trend) Low Threshold from Current Trend for Storm Warning (Falling Trend)
Range for Rising and Falling Trend Alarms .....	0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa/mb)

### Clock

Resolution .....	1 minute
Units .....	Time: 12 or 24 hour format (user-selectable)
Date .....	US or International format (user-selectable)
Accuracy .....	±8 seconds/month
Adjustments .....	Time: Automatic Daylight Savings Time (for users in North America and Europe that observe it in AUTO mode, MANUAL setting available for all other areas) Date: Automatic Leap Year
Alarms .....	Once per day at set time when active

**Dewpoint (calculated)**

Resolution and Units .....	1°F or 1°C (user-selectable)
Range .....	-105° to +130°F (-76° to +54°C)
Accuracy .....	±3°F (±1.5°C) (typical)
Update Interval.....	10 to 12 seconds
Source .....	World Meteorological Organization (WMO)
Equation Used .....	WMO Equation with respect to saturation of moist air over water
Variables Used.....	Instant Outside Temperature and Instant Outside Relative Humidity
Current Data .....	Instant Calculation; Daily, Monthly High and Low
Historical Data .....	Hourly Calculations; Daily, Monthly, Yearly Highs and Lows
Alarms .....	High and Low Threshold from Instant Calculation

**Evapotranspiration (calculated, requires Vantage Pro2 ISS with solar radiation sensor)**

Resolution and Units .....	0.01" or 0.1 mm (user-selectable)
Range .....	Daily to 32.67" (999.9 mm); Monthly & Yearly to 199.99" (1999.9 mm)
Accuracy .....	Greater of 0.01" (0.25 mm) or ±5%, Reference: side-by-side comparison against a CIMIS ET weather station
Update Interval.....	1 hour
Calculation and Source .....	Modified Penman Equation as implemented by CIMIS (California Irrigation Management Information System) including Net Radiation calculation
Current Data .....	Latest Hourly Total Calculation, Daily, Monthly, Yearly Total
Historical Data .....	Hourly, Daily, Monthly, Yearly Totals
Alarm .....	High Threshold from Latest Daily Total Calculation

**Forecast**

Variables Used.....	Barometric Reading & Trend, Wind Speed & Direction, Rainfall, Temperature, Humidity, Latitude & Longitude, Time of Year
Update Interval.....	1 hour
Display Format.....	Icons on top center of display; displays weather conditions that may occur for the next 12 hours.
Variables Predicted .....	Sky Condition, Precipitation

**Heat Index (calculated)**

Resolution and Units .....	1°F or 1°C (user-selectable)
Range .....	-40° to +165°F (-40° to +74°C)
Accuracy .....	±3°F (±1.5°C) (typical)
Update Interval.....	10 to 12 seconds
Source .....	United States National Weather Service (NWS)/NOAA
Formulation Used.....	Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used.....	Instant Outside Temperature and Instant Outside Relative Humidity
Current Data .....	Instant Calculation; Daily, Monthly High
Historical Data .....	Hourly Calculations; Daily, Monthly, Yearly Highs
Alarm .....	High Threshold from Instant Calculation

**Humidity**

## Inside Relative Humidity (sensor located in console)

Resolution and Units.....	1%
Range.....	1 to 100% RH
Accuracy.....	±3% (0 to 90% RH), ±4% (90 to 100% RH)
Update Interval .....	1 minute
Current Data .....	Instant (user adjustable) and Hourly Reading; Daily, Monthly High and Low
Historical Data .....	Hourly Readings; Daily, Monthly, Yearly Highs and Lows
Alarms .....	High and Low Threshold from Instant Reading

## Outside Relative Humidity (sensor located in ISS)

Resolution and Units.....	1%
Range.....	1 to 100% RH
Accuracy.....	±3% (0 to 90% RH), ±4% (90 to 100% RH)
Temperature Coefficient .....	0.03% per °F (0.05% per °C), reference 68°F (20°C)
Drift .....	±0.5% per year

Update Interval .....	50 seconds to 1 minute
Current Data .....	Instant (user adjustable) and Hourly Reading; Daily, Monthly, Yearly High and Low
Historical Data .....	Hourly Readings; Daily, Monthly Highs and Lows
Alarms .....	High and Low Threshold from Instant Reading

### Moon Phase

Console Resolution .....	1/8 (12.5%) of a lunar cycle, 1/4 (25%) of lighted face on console
WeatherLink Resolution .....	0.09% of a lunar cycle, 0.18% of lighted face maximum (depends on screen resolution)
Range .....	New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter, Waning Crescent
Accuracy .....	±38 minutes

### Rainfall

Resolution and Units .....	0.01" or 0.2 mm (user-selectable) (1 mm at totals ≥ 2000 mm)
Range .....	0 to 199.99" (0 to 6553 mm)
Rain Rate .....	0 to 40"/hr (0 to 1016 mm)
Accuracy .....	Greater of 4% or 1 tip
Update Interval .....	20 to 24 seconds
Storm Determination Method .....	0.02" (0.5 mm) begins a storm event, 24 hours without further accumulation ends a storm event
Current Data .....	Totals for Past 15-min, Past 24-hour, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin date); Umbrella is displayed when 15 minute total exceeds zero
Historical Data .....	Totals for 15-min, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin and end dates)
Alarms .....	High Threshold from Latest Flash Flood (15-min. total, default is 0.50", 12.7 mm), 24-hour Total, Storm Total,
Range for Rain Alarms .....	0 to 99.99" (0 to 999.7 mm)

### Rain Rate

Resolution and Units .....	0.01" or 0.1 mm (user-selectable) at typical rates (see Fig. 3 and 4)
Range .....	0, 0.04"/hr (1 mm/hr) to 40"/hr (0 to 1016 mm/hr)
Accuracy .....	±5% when rate is under 5"/hr (127mm/hr)
Update Interval .....	20 to 24 seconds
Calculation Method .....	Measures time between successive tips of rain collector. Elapsed time greater than 15 minutes or only one tip of the rain collector constitutes a rain rate of zero.
Current Data .....	Instant and Hourly, Daily, Monthly and Yearly High
Historical Data .....	Hourly, Daily, Monthly and Yearly Highs
Alarm .....	High Threshold from Instant Reading

### Solar Radiation (requires Vantage Pro2 ISS with solar radiation sensor)

Resolution and Units .....	1 W/m <sup>2</sup>
Range .....	0 to 1800 W/m <sup>2</sup>
Accuracy .....	±5% of full scale (Reference: Eppley PSP at 1000 W/m <sup>2</sup> )
Drift .....	up to ±2% per year
Cosine Response .....	±3% for angle of incidence from 0° to 75°
Temperature Coefficient .....	-0.067% per °F (-0.12% per °C); reference temperature = 77°F (25 °C)
Update Interval .....	50 seconds to 1 minute (5 minutes when dark)
Current Data .....	Instant Reading and Hourly Average; Daily, Monthly High

### Sunrise and Sunset

Resolution .....	1 minute
Accuracy .....	±1 minute
Reference .....	United States Naval Observatory

### Temperature

Inside Temperature (sensor located in console)	
Resolution and Units .....	Current Data: 0.1°F or 1°F or 0.1°C or 1°C (user-selectable)

	Historical Data and Alarms: 1°F or 1°C (user-selectable)
Range .....	+32° to +140°F (0° to +60°C)
Sensor Accuracy .....	±1°F (±0.5°C)
Update Interval .....	1 minute
Current Data .....	Instant Reading (user adjustable); Daily, Monthly, Yearly High and Low
Historical Data .....	Hourly Readings; Daily and Monthly Highs and Lows; Highs and Lows for Last 25 Days; Temp change per hour, Temp change for last 24 hours.
Alarms .....	High and Low Thresholds from Instant Reading
<b>Outside Temperature (sensor located in ISS)</b>	
Resolution and Units .....	Current Data: 0.1°F or 1°F or 0.1°C or 1°C (user-selectable) nominal (see Fig. 1) Historical Data and Alarms: 1°F or 1°C (user-selectable)
Range .....	-40° to +150°F (-40° to +65°C)
Sensor Accuracy .....	±1°F (±0.5°C) above +20°F (-7°C); ±2°F (±1°C) under +20°F (-7°C) (see Fig. 2)
Radiation Induced Error (Passive Shield) .....	+4°F (2°C) at solar noon (insolation = 1040 W/m <sup>2</sup> , avg. wind speed ≤ 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Update Interval .....	10 to 12 seconds
Current Data .....	Instant Reading (user adjustable); Daily, Monthly, Yearly High and Low
Historical Data .....	Hourly Readings; Daily, Monthly, Yearly Highs and Lows
Alarms .....	High and Low Thresholds from Instant Reading

### Ultra Violet (UV) Radiation Index (requires Vantage Pro2 ISS with UV sensor)

Resolution and Units .....	0.1 Index
Range .....	0 to 16 Index
Accuracy .....	±5% of full scale (Reference: Yankee UVB-1 at UV index of 10 (Extremely High))
Cosine Response .....	±4% (0° to 65° incident angle); 9% (65° to 85° incident angle)
Update Interval .....	50 seconds to 1 minute (5 minutes when dark)
Current Data .....	Instant Reading

### Wind

#### Wind Chill (Calculated)

Resolution and Units .....	1°F or 1°C (user-selectable)
Range .....	-110° to +135°F (-79° to +57°C)
Accuracy .....	±2°F (±1°C) (typical)
Update Interval .....	10 to 12 seconds
Source .....	United States National Weather Service (NWS)/NOAA
Equation Used .....	Osczevski (1995) (adopted by US NWS in 2001)
Variables Used .....	Instant Outside Temperature and 10-min. Avg. Wind Speed
Current Data .....	Instant Calculation; Hourly, Daily, Monthly, Yearly Low
Historical Data .....	Hourly, Daily and Monthly Lows
Alarm .....	Low Threshold from Instant Calculation

#### Wind Direction

Display Resolution .....	16 points (22.5°) on compass rose, 1° in numeric display
Range .....	0-360°
Accuracy .....	±3°
Update Interval .....	2.5 to 3 seconds
Current Data .....	Instant Reading (user adjustable); 10-min. Dominant; Hourly, Daily, Monthly Dominant
Historical Data .....	Past 6 10-min. Dominants on compass rose only; Hourly, Daily, Monthly Dominants

#### Wind Speed

Resolution and Units .....	1 mph, 1 km/h, 0.5 m/s, or 1 knot (user-selectable)
Range .....	2 to 180 mph, 2 to 156 knots, 1 to 80 m/s, 3 to 290 km/h
Update Interval .....	Instant Reading: 2.5 to 3 seconds, 10-minute Average: 1 minute
Accuracy .....	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Current Data .....	Instant Reading; 10-minute and Hourly Average; 10-minute High Gust with Direction of Gust; 2-minute Average; Hourly High; Daily, Monthly and Yearly High with Direction of High; Beaufort Scale

Historical Data ..... 2.5 sec., 10 min. and Hourly Averages; Hourly Highs; Daily, Monthly and Yearly Highs with Direction of Highs  
 Alarms ..... High Thresholds from Instant Reading and 10-minute Average

## Wireless Communication Specifications

Transmit/Receive Frequency ..... US Models: 902 - 928 MHz FHSS  
 Overseas Models: 868.0 -868.6 MHz FHSS  
 ID Codes Available ..... 8  
 Output Power ..... 902 - 928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required  
 868.0 -868.6 MHz FHSS: CE-compliant, less than 8 mW, no license required  
 Range:  
 Line of Sight ..... up to 1000 feet (300 m)  
 Through Walls ..... 200 to 400 feet (60 to 120 m)

## Sensor Charts

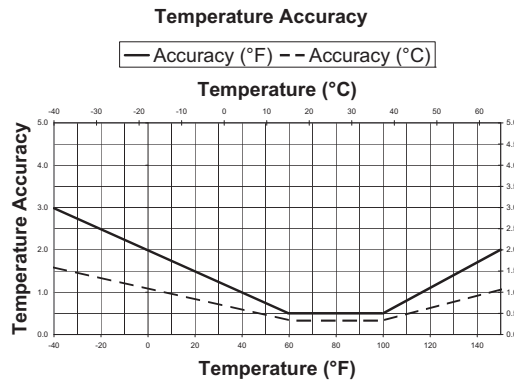


Figure 2. Temperature Accuracy

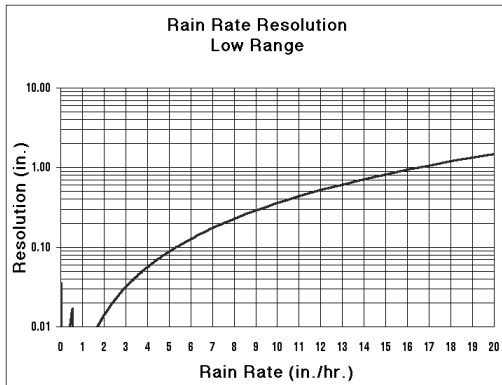


Figure 3. Low Range Rain Rate Resolution

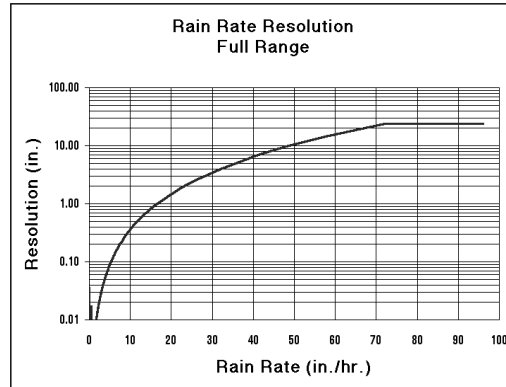


Figure 4. Full Range Rain Rate Resolution

## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6250 Complete Station	18.25" x 7.25" x 15.25" (46.4 cm x 18.4 cm x 18.7 cm)	6.88 lbs (3.12 kg)	0 11698 00912 1
6351 Console	8.0" x 8.0" x 4.0" (20.3 cm x 20.3 cm x 10.1 cm)	1.76 lbs .80 kg	0 11698 00913 8
6357 ISS	18.25" x 7.25" x 15.25" (46.4 cm x 18.4 cm x 38.7 cm)	5.44 lbs (2.47 kg)	0 11698 00914 5