

# Orion 420™ Weather Station

Catalog Number: 9420-A-1



The Orion 420 Weather Station offers a complete weather station for industrial PLC interface, measuring wind speed, wind direction, temperature, relative humidity, barometric pressure and precipitation. With ultrasonic technology, the Orion 420 offers high accuracy and stability.

Users will be able to monitor weather data on their PLC plant software such as Wonderware®.

## Features

- Six most essential weather parameters measured in one instrument.
- 4-20 mA current output for all parameters.
- Triangular design ensures excellent data availability and 360° wind measurement accuracy.
- No moving parts make it superior to conventional mechanical wind sensors.
- Easy to install and requires no field calibration or maintenance.
- Compact and robust sensor in durable, corrosion-resistant housing.
- Starting threshold for both wind speed and direction is virtually zero.
- Heated model is available.

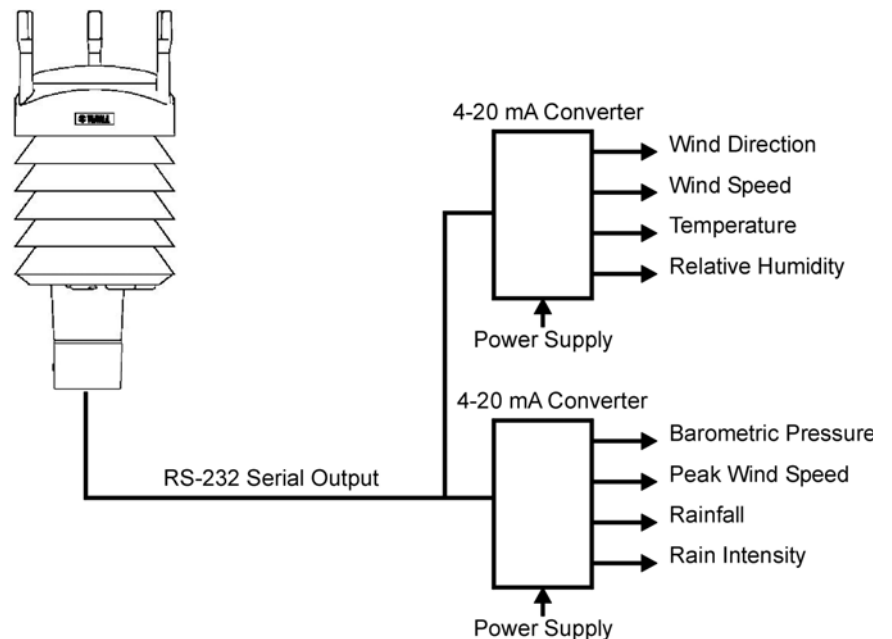
## Order Information

Catalog Numbers: 9420-A-1 (standard), 9421-A-1 (with Bird Spike Kit)

Standard system includes:

- Orion Sensor Transmitter with 50 foot cable and mounting adapter
- Weatherproof Enclosure with two 4-20 mA converter modules and power supply

(Optional: heaters for wind sensor)



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## Sensor Specifications

### Temperature

Range: -60 to 140°F (-52 to +60°C)  
Accuracy:  $\pm 0.5^\circ\text{F}$  ( $\pm 0.3^\circ\text{C}$ ) at 68°F (+20°C)  
Resolution: 0.1°F (0.1°C)  
Units Available: °F, °C

### Barometric Pressure

Range: 17.50 to 32.50 InHg (600 to 1100 mbar)  
Accuracy:  $\pm 0.015$  InHg (0.5 mbar) at +32 to 86°F (0 to 30°C)  
 $\pm 0.03$  InHg (1 mbar) at -60 to 140°F (-52 to 60°C)  
Resolution: 0.01 InHg (0.1 mbar)  
Units Available: Kpa, mbar, InHg

### Wind Speed

Range: 0 - 135 mph (0 - 60 m/s)  
Accuracy:  $\pm 0.7$  mph ( $\pm 0.3$  m/s)  
Resolution: 1 mph (1 m/s)  
Units Available: knots, mph, km/hr, m/s

### Wind Direction

Azimuth: 0 - 360°  
Accuracy:  $\pm 2^\circ$   
Resolution: 1°

### Relative Humidity

Range: 0 - 100%RH  
Accuracy:  $\pm 3\%$ RH (0-90%),  $\pm 5\%$  (90-100%)  
Resolution: 1%RH  
Units Available: %RH

### Rainfall

Range: cumulative  
Collection Area: 60 cm<sup>2</sup>  
Accuracy:  $\pm 5\%$  (spatial variations may exist)  
Resolution 0.01 in. (0.254mm)  
Units Available: mm, inches

## Wind Measurement

Both wind speed and direction are measured using advanced ultrasonic technology. The sensor utilizes ultrasound to determine horizontal wind readings. The array of three equally-spaced ultrasonic transducers on a horizontal plane is an ideal design that ensures accurate wind measurement from all directions, without blind angles or corrupted readings.

The wind sensor has no moving parts, which makes it virtually maintenance free.

## Rainfall Measurement

Rainfall is measured with an impact sensor, which detects the size and impact of individual rain drops. The signals resulting from the impacts are proportional to the volume of the drops. Hence, the signal from each drop can be converted directly to the accumulated rainfall.

This measurement method eliminates flooding and clogging, as well as wetting and evaporation losses.

## Barometric Pressure, Temperature, and Humidity

Barometric pressure, temperature, and humidity measurements are combined in an advanced sensor module utilizing a capacitive measurement method for each parameter.

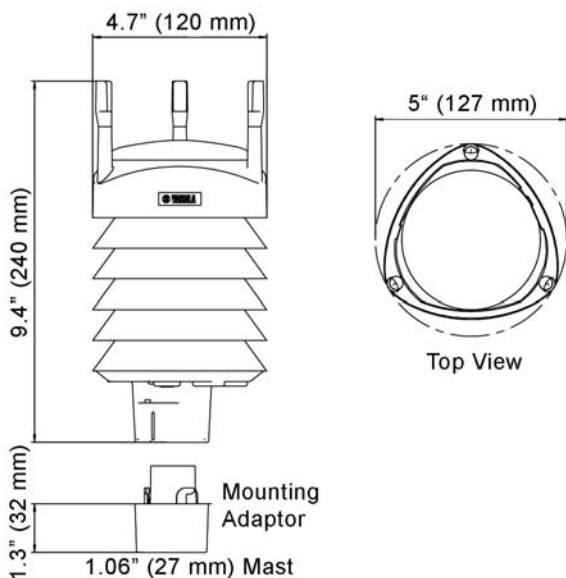
**Barometric pressure** is measured using a silicon-based sensor. The sensor has minimal hysteresis and excellent repeatability, as well as outstanding temperature and long-term stability.

**Temperature** is measured with a ceramic sensor.

**Relative humidity** measurement is based on capacitive technology. The sensor is highly accurate with negligible hysteresis and excellent long-term stability in a wide range of environments.

This module is mounted in a specially-designed radiation shield which protects the sensors from both scattered and direct sunlight and precipitation. The composite material in the plates offers excellent thermal characteristics and UV stabilized construction. The white outer surface reflects radiation, while the black inside absorbs accumulated heat.

The internal sensor module is easily replaceable and readily available as a spare component.



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