Sun Urja Energy Solution
A Complete Solar Solutions

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Datasheet & Installation Guide
Wind Direction Sensor [WD 150IN]

MODEL

WD 150IN

DATASHEET

Introduction

Wind Direction Sensor is designed with rugged components stand up to hurricane force winds, yet is sensitive to a light breeze. It includes sealed bearings for long life.

Theory of Operation
Wind direction is defined as the direction of the source of the wind flow measured in degrees from true north in a clockwise increasing angle.

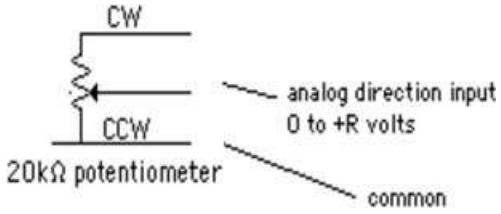
A potentiometer is mounted directly to the Vane shaft and rotates with the shaft. Changes in wind direction are sensed by a balanced vane assembly and this rotation moves the potentiometer. When a voltage (Vin) is connected across the potentiometer, the output from the wiper of the potentiometer is a voltage form 0 to Vin as a direct function of wind direction. This is converted to an analog signal by the internal electronics.

Specifications

Sensor Type	Wind Vane Potentiometer Type
Material	Control Head UV-resistant ABS
Wind Vane	Polycarbonate
Range	0 to 360 deg
Potentiometer Range	20 kΩ
Accuracy	± 3%
Output A, B, C are 3 different models	A. 0 – 5 V_{DC} B. 4-20ma C. MODBUS RTU
Supply	12 to 24 V_{DC}
Operating Temperature	- 40 ~ 75 ° C
Color Code	Brown: Supply Black: Ground Blue: Output
Sensor Cable Length	2m

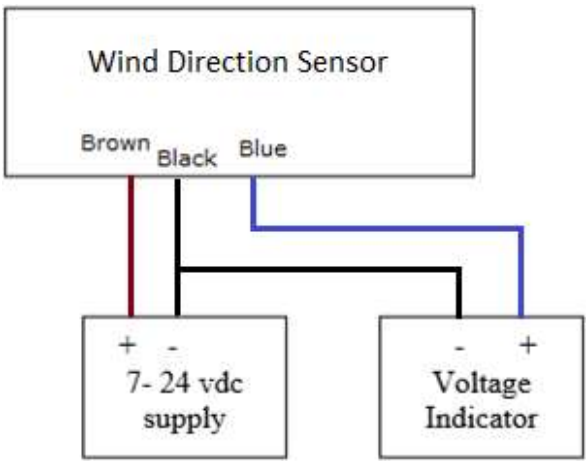
Wiring Diagram

Internal Circuit:



I/O Specifications for 0-5V Sensor Output

- Brown- Input 12VDC
- Black- Ground
- Blue- Output (0 to 5 VDC);



0-5 Vdc Sensor Output Wiring Diagram

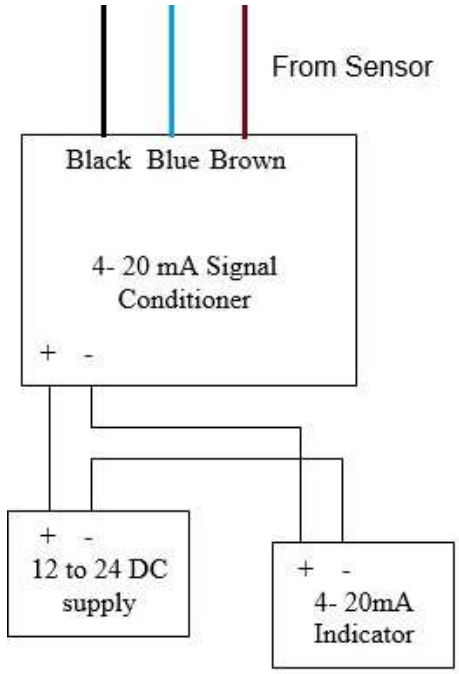
I/O Specifications for 4-20ma SensorW Output

Input
Raw Sensor Input

- Brown-, Black & Blue

Output

- + & - ports with 4-20ma Output



4-20ma Sensor Output Wiring Diagram

INSTALLATION

Guidelines

The wind direction sensor comes in two different parts. We have the sensor body and the vane which is to be mounted on the sensor body.

Tools and Materials Needed

Please make sure you have all the necessary material as mentioned below:

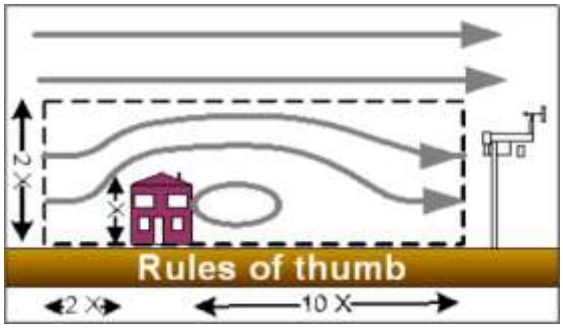
- Wire cutters and stripper
- Multi meter
- Electrical tapes to cover the wire
- Cable ties
- Adjustable Wrench
- Screwdriver

Location Recommendation

In order to report accurate weather information, you must take care in deciding where to place your weather station. The process of deciding how and where to install your weather station is called "Siting". Siting is the single most important factor in ensuring accurate readings. In fact, siting influences the accuracy of weather readings much more than the quality of the weather instruments themselves.

When selecting your mounting system, take into consideration that you will occasionally need to access the anemometer for preventive maintenance. Use the following guidelines to determine the best location for mounting the wind speed sensor

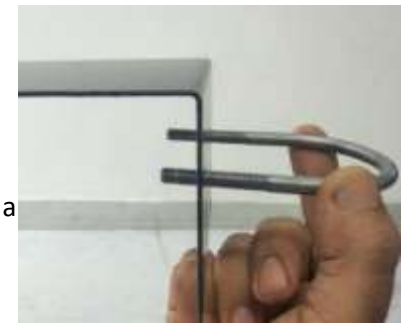
- Allow sufficient clearance for the wind direction sensor.
- Mount the vane leveled in unobstructed air on the north side (in the northern hemisphere) of your PV array
- Install the direction sensor in a location where wind flow is unobstructed by trees and nearby buildings.
- **Rule of Thumb-** Near a building, mount the sensors outside the zone of influence. Horizontally this extends roughly twice the height of the building upstream and ten times downstream. Vertically it extends to about twice the height of the structure



If the requirement is to measure the true local conditions

- Mount the sensor so that the wind vane is at least 7 feet (2.1 m) above obstructions such as trees or buildings that may obstruct wind flow
- Mount the sensor as the highest object for 50 feet in all directions.

The Wind Direction sensor contains a flat plate which helps to mount it on any flatLEVEL surface**.**



Steps for Mounting:

1. With the supplied U-bolt, the sensor suite can be mounted on a
2. While holding the mounting base of the sensor suite against the pole, place the two ends of the U-bolt around the pole and through the two holes in the C-shaped bracket on the base.
3. Mount the vane leveled in unobstructed air on the north side (in the northern hemisphere) of your PV array

4. Gently slide vane assembly down onto the stainless-steel shaft
5. Use the allen wrench provided to tighten the set screw slightly on the side of the wind vane.

NOTE: DO NOT PUT EXCESS PRESSURE ON THE ALLEN WRENCH AS THIS CAN DAMAGE THE SENSOR PERMANENTLY

6. Spin the wind vane, if they do not spin freely, loosen the set screw, then retighten the set screw.
7. Repeat above step until the wind vane spin freely
8. When the sensor is properly oriented, tighten the hex nuts with a wrench.

Local Testing: Spinning the wind vane assembly will produce an output. To verify sensor output, monitor this signal witheither a data logger or a multimeter.

Example:

- Sensor with output Type 0-5V should give 0 V output reading on a multimeter when pointed towards North.
- Sensor with output Type 4-20ma should give 4ma output reading on a multimeter when pointed towards North

Caution

Do not Open the sensor bottom. This can permanently damage the sensor and void warranty.

Guidelines for Securing Cables

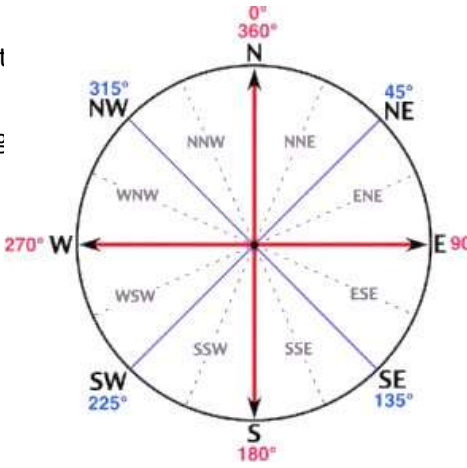
- To prevent fraying or cutting of cables, secure them so they will not whip about in the wind.
- Secure cable to a metal pole using cable ties or by wrapping tape around both the cables and the pole.
- Place clips or ties every 3' – 5' (1 – 1.6 m).

Calibration

- If using Modbus sensor then the Wind Direction Sensor is factory calibrated.

- If using analog output senor then use the following info to calibrat
  - **Output**: 0 - 5 V_{DC} (0 to 360 deg)
  - **Wind Direction** in degrees to North = 72*Sensor Output voltag

  - **Output:** 4-20mA (0 to 360 deg)
  - **Wind Direction** in degrees to North = 22.5 *(Output in mA - 4)



If the cable length is insufficient for the installation, additional cable can be added to the existing cable. If this is done, an accuracy de-rating factor must be added to the overall wind direction accuracy of this sensor.

It is highly recommended that the calibration be checked annually