

200-WS-23-DP

User Manual

200-WS-23-DP

Current Loop Wind Sensor with Display



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Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

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1 FORWARD

Thank you for purchasing NovaLynx products. NovaLynx has been designing and manufacturing weather instruments since 1988. NovaLynx represents several well-known brands of quality manufacturers, including Gill Instruments, RM Young, Kipp & Zonen, and Vaisala. It is our hope that our products will meet all your monitoring requirements.

2 INTRODUCTION

The **200-WS-23-DP Current Loop Wind Sensor** displays wind speed (in meters per second*) and wind direction (degrees) on two large 1-inch, 3 ½ digit LCD panel meters visible through the clear front cover of the control unit. Internal circuitry converts each measurement into a 4-20 mA output signal for use by process controls or monitoring systems. The system includes an AC adapter to power the system.

The **200-WS-02FA Wind Speed and Direction** sensor is ruggedly constructed using UV-resistant ABS plastic and anodized aluminum parts. The base of the anemometer mounts to a 1.07" (27 mm) diameter mast (sold separately). The cable is 40 feet (12 m) long and can be extended up to 250 feet (76 m).

Wind speed is sensed by rotating cups connected to a hub with 3 magnets. A reed switch in the base senses the magnets and closes briefly three times per revolution of the cups. The speed constant is 1.25 mph = 1 Hz (0.5588 m/s = 1 Hz).

Wind direction is sensed by a 20k ohm potentiometer mechanically connected to the wind vane. A small excitation voltage across the potentiometer generates a voltage on the wiper element proportional to wind direction. The anemometer must be installed with the North indicating label oriented to the North Pole in order for the measurements to be meaningful.

It is important to earth ground the anemometer using the shield wire included in the cable. A screw terminal in the display box is provided for connecting the shield wire, but it is up to the installer to provide a suitable wire from the screw terminal to an earth ground near the display box.

* May be scaled in miles per hour – specify at time of order.

3 SPECIFICATIONS

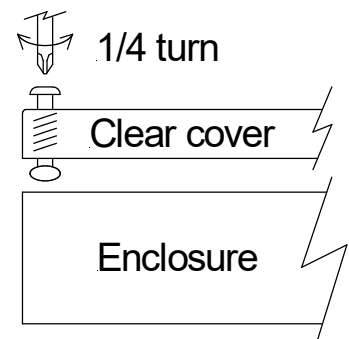
| Display Unit / Transmitter Specifications | |
|--|--|
| Display meters | 3 ½ digits, 1" (24.9 mm) 7 segment high contrast LCD |
| Wind Speed Transmitter Output | 4 mA = 0 m/s, 20 mA = 50 m/s standard (0-100 MPH scale optional) |
| Wind Direction Transmitter Output | 4 mA = 0 degrees, 20 mA = 360 degrees |
| Power supply | AC Adapter, 100-240 VAC input / 24 VDC output |
| Operating temperature range | -10 to +50°C |
| Storage temperature range | -40 to +75°C |
| Dimensions | 4.75" x 7.875" x 3.00" (121 x 200 x 76 mm) |
| Wind Speed Sensor | |
| Measurement range | 0-112 mph (0-50 m/s) |
| Speed Constant | 1.25 mph = 1 Hz (0.5588 m/s = 1 Hz) |
| Transducer type | Reed switch |
| Speed Threshold | 0.8 mph (0.4 m/s) |
| Accuracy | 1 mph or ± 3% |
| Wind Direction Sensor | |
| Range | 0-360 degrees azimuth |
| Transducer type | Potentiometer, 20k ohms, conductive plastic |
| Potentiometer gap | 5 degrees |
| Azimuth accuracy | ± 3 degrees |
| Threshold | 1.2 mph (0.5 m/s) |
| Bearings | Bushing |
| General | |
| Anemometer mount | 1.07" dia. (27 mm) |
| Anemometer cable | 5 conductor, 24 AWG, shielded, 40' length standard |

4 INSTALLATION

Please refer to the 200-WS-02FA Wind Speed and Direction Sensor user manual for information on installation and maintenance of the anemometer. Pay particular attention to the location of the sensor and align the wind vane to North for best results. Route the cable indoors to the location where the display unit will be installed.

Locate the display unit indoors near a power source. The unit may be fastened to a wall at a convenient height for easy viewing. Remove the clear front cover to access the mounting hole locations at the corners of the enclosure (Appendix A).

Mounting screws are not included; the installer will need to supply screws and wall anchors suitable for the wall material.



5 CONNECTIONS

WARNING: DISCONNECT THE AC POWER SUPPLY FROM THE DISPLAY UNIT BEFORE OPENING THE UNIT

Remove the clear cover of the display unit and set it aside. Remove the four nylon acorn nuts at the corners of the faceplate and carefully lift out the faceplate. Support the faceplate while working inside the enclosure, DO NOT ALLOW THE FACEPLATE TO HANG FROM THE WIRING HARNESS.

Insert the wind speed sensor cable through the center gland on the bottom of the enclosure. Follow the wire installation diagram (Appendix B) while connecting the wires. Be sure to connect the shield wire to the earth grounding terminal. Provide a suitable wire from the grounding terminal to an earth ground outside the enclosure.

5.1 Pre-test and Stand-alone Display Wiring

Do not remove the 100 ohm resistors from the 4-20mA Loop terminal block at this time*. Instead, put the faceplate assembly back on the support studs and use at least one acorn nut to keep it there. Connect the AC power supply to the barrel connector on the bottom of the enclosure, and then plug the adapter into a wall outlet.

Inspect the displays, which should now be showing wind speed and wind direction indications. The display should update every one second, so if there is a breeze the numbers should be changing frequently. If there is no wind it will be necessary to manually turn the wind vane and the cup assembly to verify that the display is changing and therefore the system is working.

5.2 Data Control System (DCS) Wiring

WARNING: DISCONNECT THE AC POWER SUPPLY FROM THE DISPLAY UNIT BEFORE OPENING THE UNIT

Perform the Section 5.1 pre-test to ensure proper operation before connecting your DCS. Review the wire diagram (Appendix B). Note that the **+Wind Speed** terminal is the 4-20 mA signal output, and the **–Wind Speed** terminal is the return to ground. The resistor allows the display to operate while the unit is not connected to your monitoring system. Remove the resistor before connecting to your monitoring equipment.

Repeat the above instructions for the **+Wind Direction** and **–Wind Direction** connections.

Install the faceplate assembly on the mounting studs and secure with at least one acorn nut. Apply power to your monitoring equipment, then connect the AC adapter to power the display unit. Verify that the wind speed and direction readings are visible and that they change when there is a breeze to move the anemometer.

****NOTE:** The system will not operate correctly without either the resistors or the DCS system connected. The displays will show maximum values if there is no resistance in the circuit between the + and – terminals.*

Calibrate your monitoring equipment so that it records the same information as the displays are indicating. The following table shows expected values.

| Loop Current | Wind Speed (m/s) | Wind Speed (MPH) | Wind Direction (Deg) | |
|--------------|------------------|------------------|----------------------|----|
| 4.0 | 0.00 | 0.00 | 0 | N |
| 6.0 | 6.25 | 12.50 | 45 | NE |
| 8.0 | 12.50 | 25.00 | 90 | E |
| 10.0 | 18.75 | 37.50 | 135 | SE |
| 12.0 | 25.00 | 50.00 | 180 | S |
| 14.0 | 31.25 | 62.50 | 225 | SW |
| 16.0 | 37.50 | 75.00 | 270 | W |
| 18.0 | 43.75 | 87.50 | 315 | NW |
| 20.0 | 50.00 | 100.00 | 360 | N |

5.3 Final Installation

Complete the installation by tightening the gland nuts to secure the cables where they enter the display enclosure. Install the faceplate and secure it with the four provided nylon acorn nuts. Replace the clear cover over the faceplate and secure it with the provided screws. Secure the cables and other wiring with cable ties or staples as required to complete the installation.

6 CALIBRATION

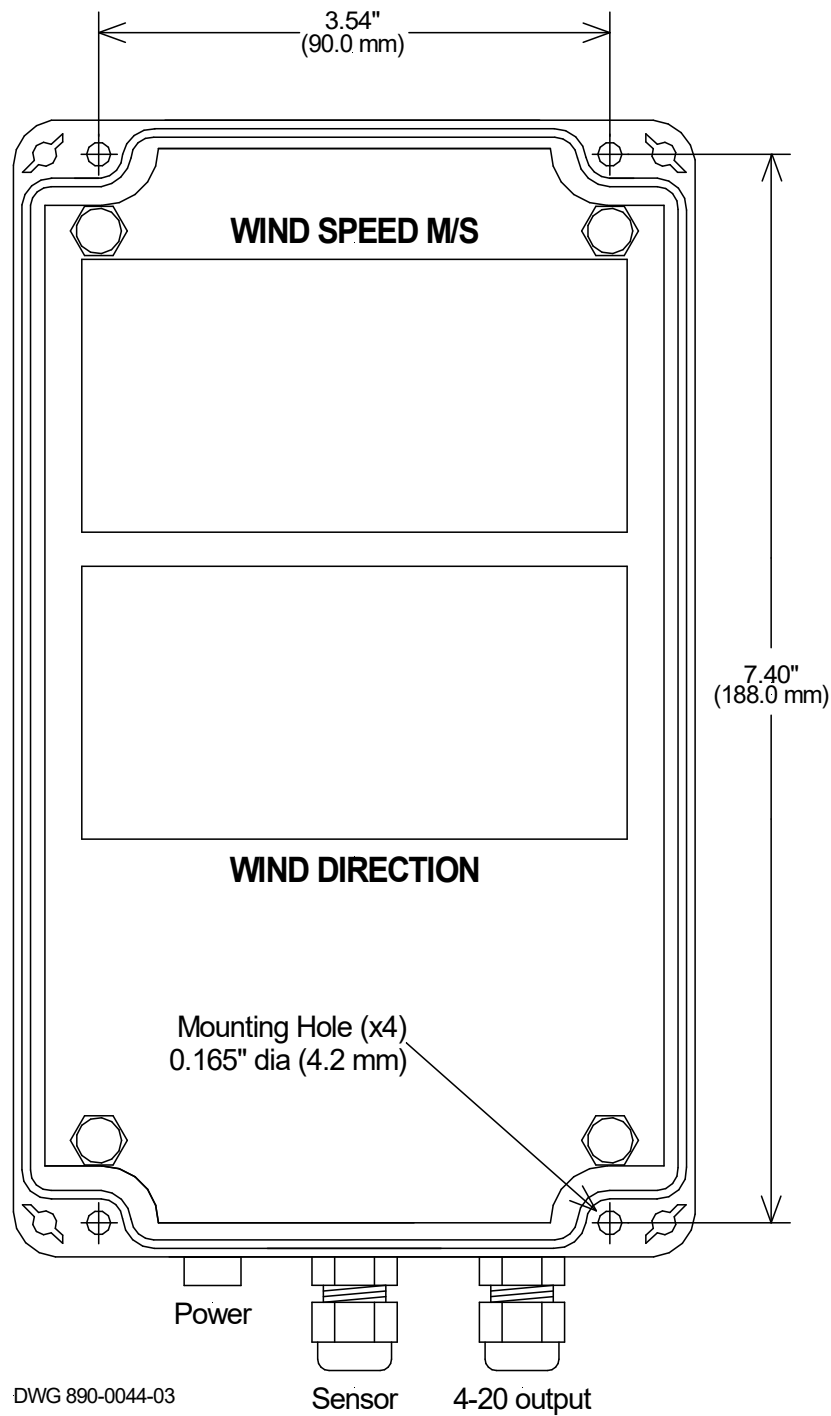
The **200-WS-23-DP Current Loop Wind Sensor** is pre-calibrated and should require no adjustment over its lifetime. However, if the cable from the sensor to the display unit is extended beyond the 40' (12 m) standard length, then resistance losses can introduce errors in the wind direction readings.

A calibration procedure is beyond the scope of this manual. However, for those with the technical expertise, the board can be adjusted by means of multi-turn potentiometers located on the 4-20 mA driver circuit board.

| | Offset | Span |
|----------------|--------|------|
| Wind Speed | R-33 | R-17 |
| Wind Direction | R-26 | R-28 |

APPENDIX A MOUNTING DIAGRAM

(Not to Scale)



APPENDIX B WIRE DIAGRAM

