Sontay®

Four Elms Road - Edenbridge
Kent - TN8 6AB - UK

Features and Benefits

- Supplied with mounting bracket

- Wind speed accuracy ±2%

- Anodized aluminium housing

- Ideal for naturally ventilated building applications

- Easy installation

Technical Overview

The AV-W series accurately measures the wind speed and direction (AV-WAD only), providing output signals compatible with most BEMS controllers. Intended for applications where external weather conditions influence the building control strategy, such as for the automatic closing of windows in high wind conditions.

Mounting arm and U bolts for pole mounting included.

Product Codes

AV-W-S   Wind Speed Sensor

AV-W-AD   Wind Speed & Direction Sensor

Specification

Speed sensor	Magnetically operated reed switch
Output	1 contact closure per 1.493 meters
Read detector	Bench tested to a speed of 90m/s
Min. start speed	0.5m/s (98ft/min) typically
Accuracy	±2%
Contact rating:	
Power	50W max. (dc resistive)
Voltage	100Vdc max.
Current	1A max.

NB The total power switched must not exceed 50W

AV-W-AD only:

Direction sensor	360° endless travel
Electrical travel	357° (±2°)
Output	0-1KΩ for 357° @ 80Vdc max.
Resistance tolerance	±3%
Linearity tolerance	±0.5%

Common Specification:

Electrical conns.	Flying lead (3m long)
Ambient range	-20 to +70°C
Dimensions:	
Height	280mm
Max. arc	120mm
Mounting	Arm & clamp for fixing to mast & poles up to 50mm diameter max.
Protection	IP65
Country of origin	UK
Conformity	EMC, CE & UKCA Marked

CE UKCA

## Installation Position & Alignment

It is important to choose a site carefully to mount the unit. Sheltered sites should be avoided if possible, as should exposed sites unless there is a requirement to measure wind speed under exposed conditions. Mounting on the wall of a building may also shelter the unit, leading to inaccurate readings.

It should be noted that wind speed increases exponentially with height above ground, for the first 20 metres. It follows that mounting on a tall mast will lead to higher wind speeds. A good recommended height is between 2 & 9 metres above ground, where possible.

Mounting on a flat roof should also be avoided as this can lead to inaccurate readings due to turbulence and eddies.

If the unit is to be mounting near to the ground, anti-vandalism measures may be required. Any protection of this nature should not obstruct the wind flow to the unit.

Using a compass the elbow of the mast must be aligned to point to the north. This method is usually accurate enough (± 5°); however, for better accuracy then an alternative is to lightly hold the wind vane pointing in the direction of North and rotate the elbow until North is displayed on the controller.
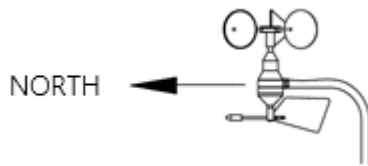
The cable ties should be fitted to ensure a tidy cable run down the mast. Try to keep the cable following around the outside bend of the elbow, to present as clean a profile to the wind vane as possible. Also note that flapping of cables in the wind is a very common source of sensor failures.

Cable

Cable supplied as standard is 3 meters in length and may be shortened or lengthened as required. If the cable is lengthened, please ensure a good quality environmental connector, or suitable waterproof junction box, is used. Extension cables used must be of a similar specification; however, separate cables for the speed and the direction components could be run.

The cable sheathing is of halogen-free polyolefin, which is flame retardant to BS 4066 and IEC 322 Part 3. The conductors are 7/0.2mm (24awg) stranded tinned copper, polyolefin insulated twisted pairs (3 pairs). A similar size drain wire is included with overall foil wrap screen.
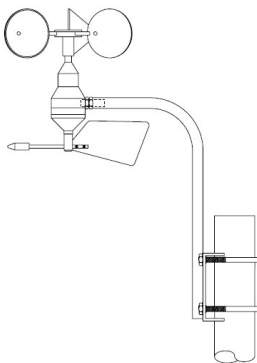
Installation

⚠ The unit should be mounted with the direction vane at the bottom and the speed cups at the top. The unit mounting arm should be pointing North.

1. Fit the 2 washers to the M6 bolts, and pass bolts through the bracket plate, and screw them into the threaded holes of the elbow mount. (Do not over tighten).

2. Screw the AV-W into the threaded end of the elbow mount, and while keeping the AV-W head perpendicular to the elbow mount tighten the locknut to fix the AV-W head in position.

3. The U-bolts are now fitted through the bracket plate and the nuts and washers fitted.

4. This completed assembly is simply fitted by slackening or removing the U-clamps and placing the V-section against the chosen mast; then replace the clamps. When fitting ensure the elbow mount is aligned north.

Example ways of pole mounting: Alternative horizontal mounting:
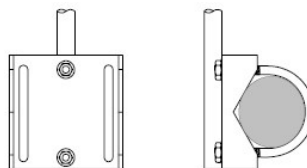
Connections

The cable supplied with the sensor head consists of three twisted pairs of inner conductors plus a screen. The screen is NOT connected within the head. A pair of conductors consists of one colour plus it's associated black. This means that there are three blacks within the cable, and care must be taken to ensure that the user does not confuse these. To help in this regard each conductor has been labelled with a heat shrink marker.
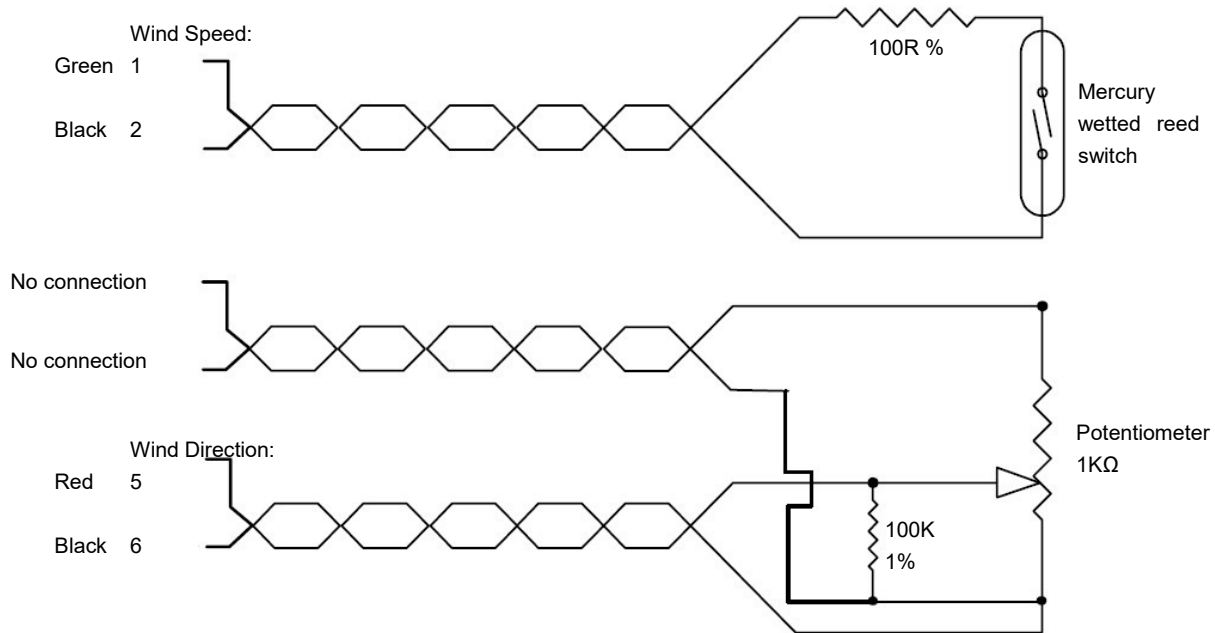
It will be noticed in the circuit diagram that a 100 ohm resistor is fitted into the wiring. This is because in long cable runs the capacitance between conductors is appreciable. When the switch closes the capacitance is discharged across the contacts; without the resistor fitted this could lead not only to shortening of switch life but also to the generation of tran-sients within the other wires. Although only needed in longer cable runs, this resistor is fitted as standard within the AV-x head.

Wind Speed Pulse Calculation:

Converting pulses to m/s
The pulse output from the wind speed sensor has a value of 1.493 – meaning that 1.493 m of air has passed over the sensor. A normal given time period would be 1 minute (or 60 seconds).

Air Velocity (in m/s) = (number of pulses counted in 1 minute / 60) * 1.493

Example, if you count 56 pulses in 1 minute, the formula becomes; AV = (56/60)*1.493 = 1.39 m/s

Pulse Duration
In any full revolution of the wind cup assembly the pulse is active for 43% of the revolution and inactive for 53%. The actual duration of the pulse will therefore depend on the wind speed.

For example at a speed of 10m per sec the duration of the pulse is 10 divided by 1.493 (our constant) = 6.7 revolutions per second = (43 divided by 100) multiplied by (1 divided by 6.7) = 64.2m/seconds.

Tel: +44 (0)1732 861200 - E-mail: sales@sontay.com - Web: www.sontay.com