VAISALA Wind Set WA25

Features

- Non-freezing, high-performance wind set
- Cups and vane, sensor bodies and bearings are heated to prevent snow build-up and ice formation
- Accurate wind speed and direction measurement
- Low measurement starting threshold
- Conical anemometer cups provide excellent linearity

Vaisala Wind Set WA25 is a high-quality cup and vane wind measurement station designed for arctic conditions. WA25 consists of Vaisala Anemometer WAA252, Vaisala Wind Vane WAV252, an optional crossarm, a power supply, and cabling.

Heating Provides Resistance to Snow and Ice

Most of the heating power is consumed where it is needed most – in the cups and vane. Foil heaters, integrated into the cups and vane, prevent snow build-up and ice formation.

Heating power is also supplied to the sensor shafts, bearings, and bodies. This keeps the sensor bodies free of ice, which is important for maintaining the aerodynamic performance.

Anemometer with Excellent Linearity

WAA252 is a fast-response, low-threshold anemometer. Three lightweight, conical cups mounted on the cup wheel provide excellent linearity over the entire operating range, up to 75 m/s (168 mph).

A wind-rotated chopper disc attached to the shaft of the cup wheel cuts an infrared light beam 14 times per revolution. This generates a pulse output from a phototransistor.

The output pulse rate is directly proportional to wind speed (for example, 246 Hz = 24.6 m/s). However, for the highest accuracy, the characteristic transfer function must be used to compensate for starting inertia.

Sensitive Wind Vane

WAV252 is a counterbalanced, low-threshold, optoelectronic wind vane providing a 6-bit GRAY-coded message. Turned by the vane, the disc creates changes in the code received by the phototransistors. The code is changed in steps of 5.6°.

Complete Package Available

The anemometer and vane are designed to be mounted on Vaisala crossarms.

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Technical Data

WAA252 Measurement Performance

Measurement range	0.4 ... 75 m/s (0.9 ... 168 mph)
Starting threshold	< 0.5 m/s (1.1 mph) [1]
Distance constant	2.7 m (8 ft 10 in)
Characteristic transfer function	Uf (wind speed) = 0.328 + 0.101 × R (output pulse rate)
Transducer Output Level	
(I_{out} < +5 mA)	High state > 11 V
(I_{out} > -5 mA)	Low state < 1.5 V
Accuracy Within 0.4 ... 60 m/s (0.9 ... 134 mph)	
With characteristic transfer function (standard deviation)	±0.17 m/s (0.38 mph)
With simple transfer function U_f = 0.1 × R	±0.5 m/s (1.12 mph)[2]

1) *Measured with cup wheel in position least favored by the direction. Optimum position gives approx. 0.35 m/s (0.78 mph) threshold.*
2) *Typical error vs. speed with the simple transfer function used.*

WAA252 Operating Environment

Operating temperature	-55 ... +55 °C (-67 ... +131 °F)
Storage temperature	-60 ... +70 °C (-76 ... +158 °F)
Wind tunnel tests	ASTM standard method D5366-90
Exploratory vibration test	MIL-STD-167-1
Humidity test	MIL-STD-810E, Method 507.3
Salt fog test	MIL-STD-810E, Method 509.3
EMC compliance	EN/IEC 61326-1:1997 + Am1:1998; Generic Environment

WAA252 Mechanical Specifications

IP rating	IP65
Dimensions (H × Ø)	264 × 90 mm (10.39 × 3.54 in)
Swept radius of cup wheel	91 mm (3.58 in)
Weight	0.8 kg (1.76 lb)
Materials	Housing: AlMgSi, gray and black anodized Cup: PC, reinforced with glass fiber

WAA252 Inputs and Outputs

Operating power supply	U_{in} = 24 VDC ± 10%, max. 3.2 A
Typical Power Consumption (U_{in} = 24 VDC)	
Below +2 °C (+36 °F) (heating on)	72 W
Above +6 °C (+43 °F) (heating off)	1 W
Output	0 ... 750 Hz square wave
Recommended connector at cable end	SOURIAU MS3116F10-6P
Plug 6-PIN	MIL-C-26482 type

WAV252 Measurement Performance

Measurement range	0 ... 360°
Starting threshold	< 0.4 m/s (0.9 mph)
Resolution	±2.8°
Damping ratio	0.3
Overshoot ratio	0.4
Delay distance	< 0.5 m (1 ft 8 in)
Accuracy	Better than ±3°
Output	6-bit parallel GRAY code
Transducer Output Level	
(I_{out} < +3 mA)	High state > 11 V
(I_{out} > -3 mA)	Low state < 1.5 V

WAV252 Operating Environment

Operating temperature	-55 ... +55 °C (-67 ... +131 °F)
Storage temperature	-60 ... +70 °C (-76 ... +158 °F)
Wind tunnel tests	ASTM standard method D5366-93
Exploratory vibration test	MIL-STD-167-1
Humidity test	MIL-STD-810E, Method 507.3
Salt fog test	MIL-STD-810E, Method 509.3
EMC compliance	EN/IEC 61326-1:1997 + Am1:1998; Generic Environment

WAV252 Mechanical Specifications

IP rating	IP65
Dimensions (H × Ø)	355 × 90 mm (13.98 × 3.54 in)
Swept radius of vane	218 mm (8.58 in)
Weight	0.85 kg (1.87 lb)
Materials	Housing: AlMgSi, gray and black anodized Vane: Carbon fiber and glass fiber

WAV252 Inputs and Outputs

Operating power supply	U_{in} = 24 VDC ± 10%, max. 3.2 A
Typical Power Consumption (U_{in} = 24 VDC)	
Below +2 °C (+36 °F) (heating on)	50 W
Above +6 °C (+43 °F) (heating off)	1 W
Output code	6-bit parallel GRAY
Recommended connector at cable end	SOURIAU MS3116F12-10P
Plug 6-PIN	MIL-C-26482 type

WA25 Spare Parts and Accessories

Service kit for one WA15/25 sensor (set of bearings and gasket)	16644WA
Crossarm and serial RS-485 transmitter	WAC155
Component board for WAC155	WAC155CB
Heated cup assembly WAA252	WA35066
Heated tail assembly WAV252	WA35336
Connector WAA151, WAA252	230118
Connector WAV151, WAV252	230119
Crossarm and termination box	WAC151
16-lead signal cable (10 m) for WA15/25, open leads on both ends	ZZ45048
6-lead heating power cable (10 m) for WA15/25, open leads on both ends	ZZ45049
Special length 16-lead signal cable for WA15/25, open leads on both ends	ZZ45048SPEC
Special length 6-lead heating power cable for WA15/25, open leads on both ends	ZZ45049SPEC
Sensor cable for WAA151/252 0.8 m (31.5 in), open lead on one end (6 wires), connector 230118 on other end	ZZ45036
Sensor cable for WAV151/252 0.8 m (31.5 in), open lead on one end (6 wires), connector 230119 on other end	ZZ45037
Special length sensor cable for WAA151/252, open lead on one end (6 wires), connector 230118 on other end	ZZ45036SPEC
Special length sensor cable for WAV151/252, open lead in one side (6 wires) and connector 230119 in another side	ZZ45037SPEC
Crossarm and analog transmitter	WAT12
Component board for WAT12	16637WA
Attachment hardware for WAA151/252 and WAV151/252	16546WA
Power supply for WA25	WHP25
Power board for WHP25 power supply	WA35078

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