

АНЕМОМЕТРЫ

WA 15, 25

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

По вопросам продаж и поддержки обращайтесь:

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WA15 Wind Set for High Performance Wind Measurement



The WA15 is based on accurate sensors installed on a large crossarm. It is designed for demanding wind measurement applications.

With a proven track record of successful installations, the Vaisala Wind Set WA15 has earned its reputation as the industry standard in the wind sensor market.

The WA15 consists of a Vaisala Anemometer WAA151, a Vaisala Wind Vane WAV151, an optional crossarm, a power supply and cabling.

Anemometer with Excellent Linearity

The WAA151 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.

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 the phototransistor.

Features/Benefits

- High-performance wind measurement set
- Long and successful track record in meteorological applications
- Accurate wind speed and direction measurement
- Low measurement starting threshold
- Conical anemometer cups provide excellent linearity
- Heated shaft prevents bearings from freezing

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

Sensitive Wind Vane

The WAV151 is a counter-balanced, low-threshold, optoelectronic wind vane. Infrared LEDs and phototransistors are mounted on six orbits on each side of a 6-bit GRAY-coded disc. Turned by the vane, the disc creates changes in the code received by the phototransistors. The output code resolution is $\pm 2.8^\circ$.

Heated Bearings Withstand Cold Weather

Heating elements in the shaft tunnels of both the anemometer and vane keep the bearings above freezing in cold climates.

Complete Package Available

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

The WHP151 power supply provides the operating and heating power needed for the WA15. The power supply, as well as the signal and power cables are available as options.

Technical Data

Vaisala Wind Set WA15

Options and Accessories

Crossarm and termination box	WAC151
16-lead signal cable	ZZ45048
6-lead power cable	ZZ45049
Crossarm and analog transmitter	WAT12
6-lead cable for signal and power	ZZ45049
Crossarm and serial RS485 transmitter	WAC155
Serial RS485 transmitter card	WAC155CB
Power supply	WHP151
Set of bearings and gasket	16644WA
Dimensions	
Junction box	125 x 80 x 57 mm
Crossarm length	800 mm
Mounting to a pole mast with a nominal outside diameter	60 mm
Cup assembly	7150WA
Tail assembly	6389WA

Technical Data

Vaisala Anemometer WAA151

Wind Speed

Measurement range	0.4 ... 75 m/s
Starting threshold	< 0.5 m/s *
Distance constant	2.0 m
Characteristic transfer function	$U = 0.328 + 0.101 \times R$ (where U = wind speed [m/s], R = output pulse rate [Hz])
Accuracy (within range 0.4 ... 60 m/s)	
with characteristic transfer function	± 0.17 m/s **
with transfer function $U = 0.1 \times R$	± 0.5 m/s***

General

Operating power supply	$U_{in} = 9.5 \dots 15.5$ VDC, 20 mA typical
Heating power supply	AC or DC 20 V, 500 mA nominal
Output	0 ... 750 Hz square wave
Transducer output level	
with $I_{out} < +5$ mA	high state $> U_{in} - 1.5$ V
with $I_{out} > -5$ mA	low state < 2.0 V
Settling time after power turn-on	< 30 μ s
Plug 6-PIN	MIL-C-26482 type
Cabling	6-wire cable through crossarm
Recommended connector at cable end	SOURIAU MS3116F10-6P
Operating temperature with heating	-50 ... +55 °C (-58 ... +131 °F)
Storage temperature	-60 ... +70 °C (-76 ... +158 °F)
Material	
housing	AlMgSi, grey anodized
cups	PA, reinforced with carbon fibre
Dimensions	240 (h) \times 90 (\varnothing) mm
Swept radius of cup wheel	91 mm
Weight	570 g

Test Compliance

Wind tunnel tests	ASTM standard method D5096-90
Exploratory vibration test	MIL-STD-167-1
Humidity test	MIL-STD-810E, Method 507.3
Salt fog test	MIL-STD-810E, Method 509.3

Complies with EMC standard EN61326-1:1997 + Am1:1998 + Am2:2001; Generic Environment

* Measured with cup wheel in position least favoured by flow direction. Optimum position gives approx. 0.35 m/s threshold.

** Standard Deviation

*** Typical error vs. speed with the "simple transfer function" used.

RANGE (m/s)	0-3	3-10	10-17	17-24	24-31	31-37	37-44	44-51	51-58	58-65
ERROR (m/s)	-0.4	-0.3	-0.2	-0.1	0.0	+0.1	+0.2	+0.3	+0.4	+0.5

Vaisala Wind Vane WAV151

Wind Direction

Measurement range at wind speed 0.4 ... 75 m/s	0 ... 360°
Starting threshold	< 0.4 m/s
Resolution	$\pm 2.8^\circ$
Damping ratio	0.19
Overshoot ratio	0.55
Delay distance	0.4 m
Accuracy	better than $\pm 3^\circ$

General

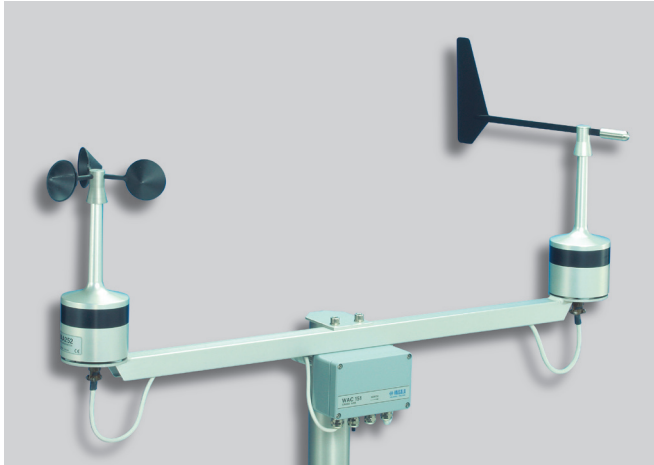
Operating power supply	$U_{in} = 9.5 \dots 15.5$ VDC, 20 mA typical
Heating power supply	AC or DC 20 V, 500 mA nominal
Output code	6-bit parallel GRAY
Output levels	
With $I_{out} < +5$ mA	high state $> U_{in} - 1.5$ V
With $I_{out} > -5$ mA	low state < 1.5 V
Settling time after power turn-on	< 100 μ s
Plug 10-PIN	MIL-C-26482 type
Cabling	10-wire cable through crossarm
Recommended connector at cable end	SOURIAU MS3116F12-10P
Operating temperature with heating	-50 ... +55 °C (-58 ... +131 °F)
Storage temperature	-60 ... +70 °C (-76 ... +158 °F)
Material	
housing	AlMgSi, grey anodized
wave	Alsi 12 anodized
Dimensions	300 (h) \times 90 (\varnothing) mm
Swept radius of vane	172 mm
Weight	660 g

Test Compliance

Wind tunnel tests	ASTM standard method D5366-93 (for starting threshold, distance constant, transfer function)
Exploratory vibration test	MIL-STD-167-1
Humidity test	MIL-STD-810E, Method 507.3
Salt fog test	MIL-STD-810E, Method 509.3

Complies with EMC standard EN61326-1:1997 + Am1:1998; Am2:2001; Generic Environment

WA25 Wind Set



The WA25 resists snow build-up and ice formation. The result is accurate wind measurement in cold environments.

The Vaisala Wind Set WA25 is a high-quality cup and vane wind measurement station designed for arctic conditions.

The WA25 consists of a Vaisala Anemometer WAA252, a 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 buildup and ice formation.

Features/Benefits

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

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

The 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.

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 (e.g., 246 Hz = 24.6 m/s). However, for the highest accuracy, the characteristic transfer function should be used to compensate for starting inertia.

(See technical data.)

Sensitive wind vane

The 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.

Technical data

Vaisala Wind Set WA25

Options and accessories

Crossarm and termination box	WAC151
16-lead signal cable	ZZ45048
6-lead power cable	ZZ45049
Crossarm and analog transmitter	WAT12
6-lead cable for signal and power	ZZ45049
Power supply	WHP25
Set of bearings and gasket	16644WA
Heated cup assembly	WA35066
Heated tail assembly	WA35336

Technical data

Vaisala Anemometer WAA252

Wind speed

Measurement range	0.4 ... 75 m/s
Starting threshold	< 0.5 m/s *
Distance constant	2.7 m
Characteristic transfer function	$U = 0.39 + 0.10 \times R$ (where U = wind speed [m/s], R = output pulse rate [Hz])
Accuracy (within range 0.4 ... 60 m/s)	
with characteristic transfer function	± 0.17 m/s **
with transfer function $U = 0.1 \times R$	± 0.5 m/s ***

General

Operating power supply	$U_{in} = 24$ VDC $\pm 10\%$, max. 3.2 A
Typical power consumption ($U_{in} = 24$ VDC)	
72 W below +2 °C (+36 °F) (heating on)	
1 W above +6 °C (+43 °F) (heating off)	
Output	0 ... 750 Hz square wave
Transducer output level	
with $I_{out} < +5$ mA	high state > 11V
with $I_{out} > -5$ mA	low state < 1.5V
Plug 6-PIN	MIL-C-26482 type
Recommended connector at cable end	SOURIAU MS3116F10-6P
Operating temperature	-55 ... +55 °C (-67 ... +131 °F)
Storage temperature	-60 ... +70 °C (-76 ... +158 °F)
Material	
housing	AlMgSi, grey&black anodized
cups	PC, reinforced with glassfibre
Dimensions	264 (h) \times 90 (Ø) mm
Swept radius of cup wheel	91 mm
Weight	800 g

Test compliance

Wind tunnel tests	ASTM standard method D5096-90
Exploratory vibration test	MIL-STD-167-1
Humidity test	MIL-STD-810E, Method 507.3
Salt fog test	MIL-STD-810E, Method 509.3

Complies with EMC standard EN61326-1:1997 + Am1:1998;
Generic Environment

* Measured with cup wheel in position least favoured by flow direction. Optimum position gives approx. 0.35 m/s threshold.

** Standard deviation

***Typical errors vs. speed with "the simple transfer function" used.

RANGE (m/s)	0-5	5-10	10-15	15-20	20-24	24-29	29-34	34-39	39-44	44-48	48-58
ERROR (m/s)	-0.2	-0.1	± 0.0	+0.1	+0.2	+0.3	+0.4	+0.5	+0.6	+0.7	+0.8

Vaisala Wind Vane WAV252

Wind direction

Measurement range	0 ... 360°
Starting threshold	< 0.4 m/s
Resolution	$\pm 2.8^\circ$
Damping ratio	0.3
Overshoot ratio	0.4
Delay distance	< 0.5 m
Accuracy	better than $\pm 3^\circ$

General

Operating power supply	24 VDC $\pm 10\%$, max. 2.1 A
Typical power consumption ($U_{in} = 24$ VDC)	
50 W below +2 °C (+36 °F) (heating on)	
1 W above +6 °C (+43 °F) (heating off)	
Output code	6-bit parallel GRAY
Output levels	
With $I_{out} < +3$ mA	high state > 11V
With $I_{out} > -3$ mA	low state < 1.5V
Plug 10-PIN	MIL-C-26482 type
Recommended connector at cable end	SOURIAU MS3116F12-10P
Operating temperature	-55 ... +55 °C (-67 ... +131 °F)
Storage temperature	-60 ... +70 °C (-76 ... +158 °F)
Material	
housing	AlMgSi, grey&black anodized
vane	carbon fibre + glassfibre
Dimensions	355 (h) \times 90 (Ø) mm
Swept radius of vane	218 mm
Weight	850 g

Test compliance

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

Complies with EMC standard EN61326-1:1997 + Am1:1998;
Generic Environment

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