



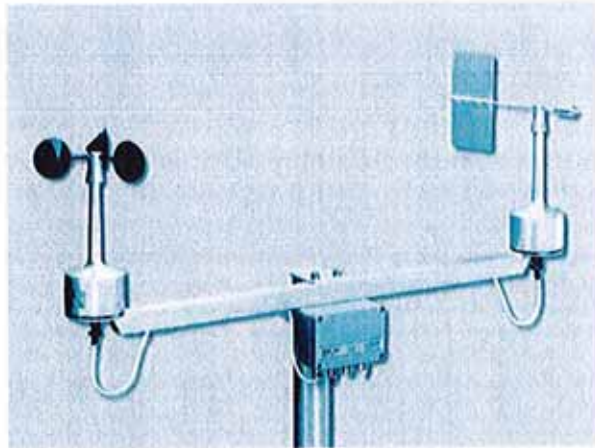






## **WEATHER MONITORING SYSTEM**

## 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

### 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

per revolution. This generates a pulse output from the 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 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	ZZ15018
6-lead power cable	ZZ15019
Crossarm and analog transmitter	WAT12
6-lead cable for signal and power	ZZ15019
Crossarm and serial RS485 transmitter	WAC155
Serial RS485 transmitter card	WAC155CB
Power supply	WHP151
Set of bearings and gasket	16644WA
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 µs
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) × 90 (Ø) 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	3.0	10.17	17.21	24.31	31.37	37.41	43.51	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	± 2.8°
Damping ratio	0.19
Overshoot ratio	0.55
Delay distance	0.4 m
Accuracy	better than ± 3°

### 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 µs
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) × 90 (Ø) mm
Swept radius of vane	172 mm
Weight	660 g

### Test compliance

Wind tunnel tests	ASTM standard method D 5366-93 (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

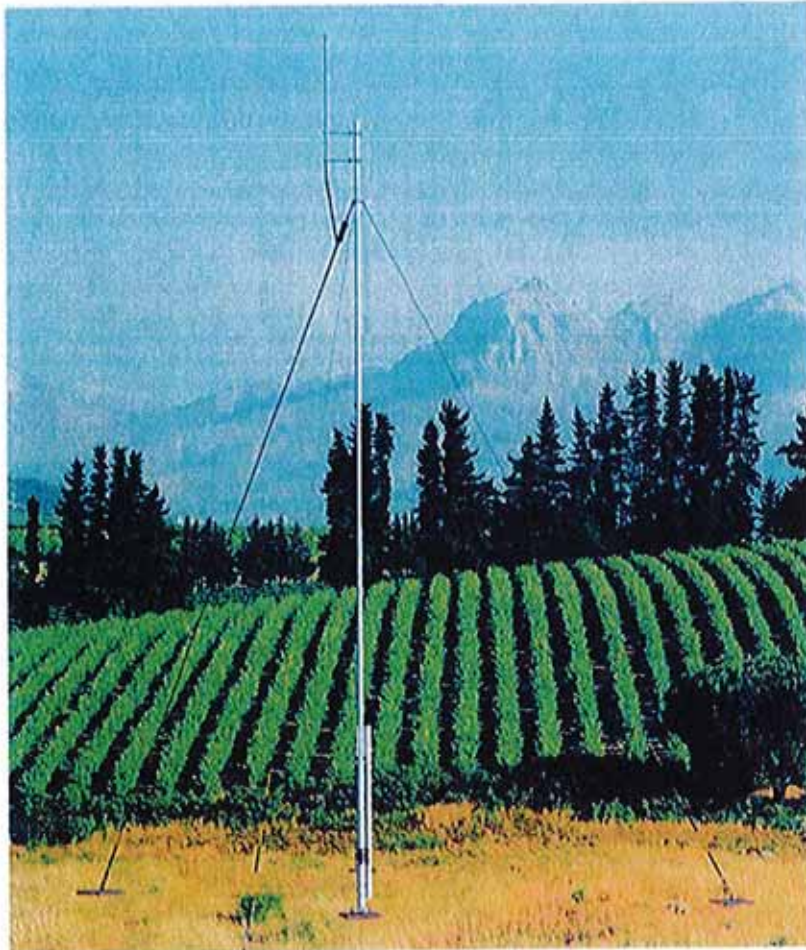
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For more information, visit  
www.vaisala.com or contact  
us at sales@vaisala.com



## Vaisala Tiltable Masts DKP206W and DKP210W



### Features/Benefits

- Easily tilted down by one person for equipment installation and maintenance
- Insulated guy wire and lightning rod provide maximum lightning safety
- Can withstand winds of up to 50 m/s; up to 75 m/s with two sets of guy wires
- Suitable for wide range of meteorological and climatological automatic weather station applications
- Foundation set includes all the necessary parts for quick and easy installation



The Vaisala Tiltable Masts DKP206W (6 m high) and DKP210W (10 m high) are suitable for a wide range of surface weather and climatological applications. The mast tubes are made of anodized aluminum. The remaining parts of the main assembly are made of stainless steel to resist weathering. The mast is painted white. One maintenance person can effortlessly tilt the mast with the optional, easily detached winch to maintain the sensors and other equipment installed on the upper mast assembly. This significantly

reduces the costs associated with maintaining the automatic weather station.

The basic mast delivery includes the lightning rod with the grounding cable, one set of guy wires, the lifting rod and the foundation set. All the components are packed in durable cardboard boxes that are suitable for airfreight.

The lightning rod protects the sensors and other equipment by means of non-conductive holders and grounding via one of the three guy wires which is totally isolated from the mast. The

equipment is always grounded to a separate grounding point.

With one standard set of guy wires, the mast can easily withstand winds of up to 50 m/s when the weather station enclosure, solar panel and sensors are installed on it. The optional second guy wire set enables the DKP210W to withstand winds of up to 75 m/s.

The foundation set includes all the parts needed for constructing a steady and correctly oriented base for the mast. The only additional item needed at the installation site is concrete or an existing concrete block.





# Technical data

## Main mast assembly

Height	
DKP206W	6 m
DKP210W	10 m
Maximum wind speed (DKP210W)	
With one set of guy wires	50 m/s
With two sets of guy wires	75 m/s
Diameter	
Lowest section (0 ... 1.9 m)	100 mm
Second section (1.9 ... 4.9 m)	75 mm
Third section	63 mm
Highest section	50/60 mm
Top of the mast	60 mm
Tube material	Aluminum alloy
Base and hinge	Stainless steel
Other parts, e.g. bolts	Stainless steel

## Guy wires

Material	Stainless steel
Breaking strength	28 kN
Marking	Black and yellow cable shrouds to a height of 2 meters above the ground

## Foundation set

Material	Galvanized steel
Thread of foundation bolts	M20
Length of foundation bolts	300 mm
Wedge bolts	Cast or drilled into concrete using the template provided

## Mast concrete base

Soil bearing capacity must exceed 45 kPa

## Coating/Painting

Aluminum parts	Anodized and painted
Steel parts	Galvanized
Stainless steel parts	
Base and hinge	Painted
Other parts	Uncoated

## Packages

Material	Cardboard
Weight	
(packaged with DKF200, DKL200, DKW200)	
DKP206W	105 kg
DKP210W	125 kg
Maximum length	< 3.1 m, suitable for airfreight

## Order information

DKP210W	10 m mast with guy wire set and basic accessories
DKP206W	6 m mast with guy wire set and basic accessories
Basic accessories	
DKF200-1	Foundation set
DKL200	Passive lightning rod
DKP200LR	Lifting rod
Options	
DKW200	Winch
DKP200TS	Tilting support
DKP210GW-2	Additional guy wire set for DKP210W

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For more information, visit  
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 us at [sales@vaisala.com](mailto:sales@vaisala.com)



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