

# VAYU

## Anemometer



Reliable, sturdy and precise wind speed sensors used to measure wind and its direction. Designed for a wide range of industrial applications.

### FEATURES

- They consist of a rotor featuring a removable hat for the mechanical fixing of impact resistant nylon cups: rotating on ball bearings, they activate a cogwheel which, by means of an optical transducer (photodiode), generates a 12 pulses / revolution frequency signal.
- For measuring a max. speed of 200 Km/h, equal to 55 meter per second. They are also suitable to be adjusted for lower full scale.
- IP protection degree: VAYU are classified IP 65 / IP 66.
- Extreme temperature resistance: from -20°C to +85°C, from -40°C to +85°C (versions with heater).
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust: the body of the rotor is made of anodized aluminum or electropolished stainless steel AISI 316, the head rotates on double ball bearings and the cups (Ø 30 mm) are made of impact resistant nylon, protected against UV rays, low-temperature (max. -40°C) and hail, and easily interchangeable.

### OPTIONS

- Featuring frequency pulse output, 0-5 Vdc / 0-10 Vdc / 1-5 Vdc / 2-10 Vdc analogue voltage output or 0-20 mA / 4-20 mA current output.
- Ready to be connected, through the different outputs available depending on the model, directly to PLC and / or market electronic board and tachometers.
- Versions with 24 Vdc anti-icing heater available on request.
- Featuring M12 connector – 5 screw pins and a stainless steel fixing bracket.
- Wind tunnel tested and supplied with a calibration certificate. Periodic check of the product adjustment and calibration available on request.

### CERTIFICATIONS

- CE marking.

## VAYU V 1.1 ANODIZED ALUMINUM VAYU V 2.2 STAINLESS STEEL AISI 316

- Cups wind speed sensors with pulse frequency or mA or V analogue output, featuring the body of the rotor made of machined aluminum or AISI 316 stainless steel.
- They are designed for industrial applications such as cranes and crane trucks, telescopic cranes, buildings and structures in general, photovoltaic sails and solar trackers, wind turbines, weather stations, irrigation systems, automated greenhouses, ski resorts cableways, snow guns, auto-lifting platforms, structures for playgrounds, ornamental fountains, pressostatic structures, viaducts, and highway tunnels.
- AISI 316 stainless steel versions are particularly suitable for highly corrosive environment or in presence of saline fog such as on port or ship cranes.
- Through its output, it can be connected directly to devices with analogue input such as PLC, data loggers, 4-20mA display suitable for the visualization of the wind speed or to program alarm at alert wind value.



## VAYU V\_R STAINLESS STEEL WITH HEATERS

- Cups wind speed sensors with heater, featuring the body of the rotor made of machined aluminum or AISI 316 stainless steel. With frequency pulse output, 0-5 Vdc / 0-10 Vdc, 1-5 Vdc / 2-10 Vdc analogue output or 0-20 mA / 4-20 mA current output.
- They are designed for electronics use being equipped with its own programmable logic.
- Through its output, it can be connected directly to devices with analogue input such as PLC, data loggers, 4-20mA display suitable for the visualization of the wind speed or to program alarm at alert wind value.



## CERTIFICATIONS

### Conformity to CE Standards

EN 61000-6-2:2001 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

### Markings and homologations

EN 55022:2001, Class B Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement

CE

## GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature VAYU V1.1 and VAYU V2.2	Storage -40°C/+85°C Operational -20°C/+85°C
Ambient temperature VAYU V_R	Storage -40°C/+125°C Operational -40°C/+85°C
IP protection degree	IP 65 / IP 66
Material	VAYU V 1.1: Aluminium
	VAYU V 2.2: Stainless steel AISI316 Vayu V_R: Aluminium or stainless steel AISI316
Weight (No cable)	VAYU V 1.1: 300 g
	VAYU V 2.2: 700 g

## ELECTRICAL SPECIFICATIONS

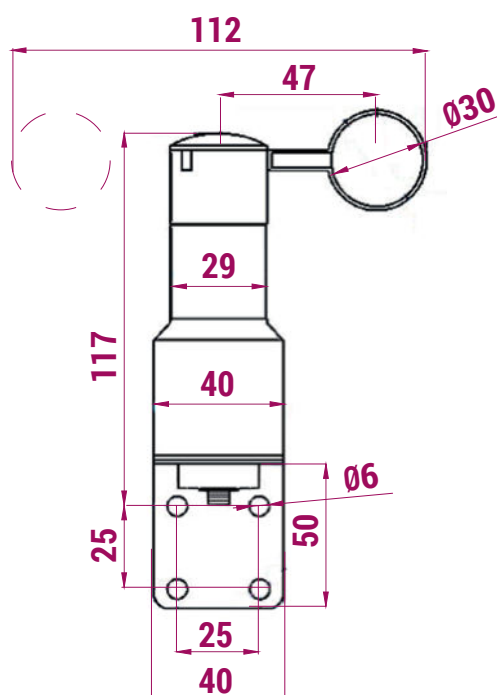
Power supply	10...30 Vdc
Max. Current	50 mA
Output	Frequency, Current, Volt
Type of contact	Photodiode - 12 pulses/rotation

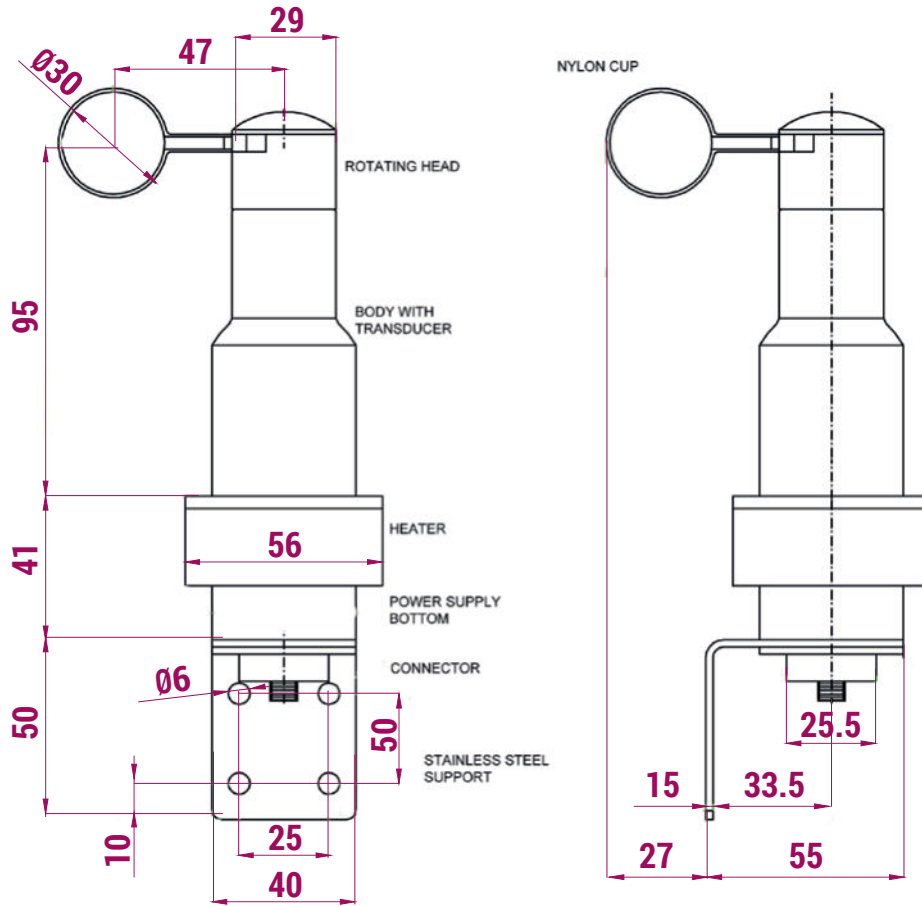
## MEASUREMENTS

Mechanical Range	2-200 km/h
Full-scale (km/h)	0-100, 0-120, 0-180, 0-200
Average Error	0.06%
Standard deviation error	1.01%
Output	Frequency, Voltage, Current

## OVERALL DIMENSIONS (mm)

VAYU V1.1 and VAYU V2.2

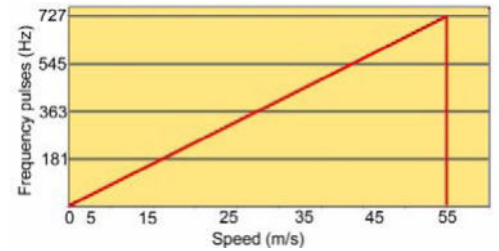




## APPLICATION

### VAYU V1.1 Hz - Frequency output

Relation between Wind Speed – Frequency output.  
The output pulses are proportional to the wind speed in relation with the graphic in the right column.



### VAYU V2.2 Vdc - Voltage output

Relation between Wind Speed – Voltage output. 9/11  
The voltage output is proportional to the wind speed in relation with the graphic in the right column.

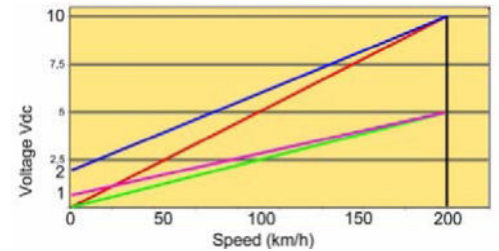
These follow are configurable sets:

0-5 / 1-5 / 0-10 / 2-10 Vdc

The graph to the side is represented in function of the maximum speed configurable = 200 km/h

Are available the follow Fullscale value:

200 km/h / 180 km/h / 120 km/h / 100 km/h



Scale 0-5 Vdc green line

Scale 1-5 Vdc lilac line

Scale 0-10 Vdc red line

Scale 2-10 Vdc blue line

**VAYU V2.2 mA - Current output**

Relation between Wind Speed – Current output.

The current output is proportional to the wind speed in relation with the graphic in the right column.

These follow are configurable sets:

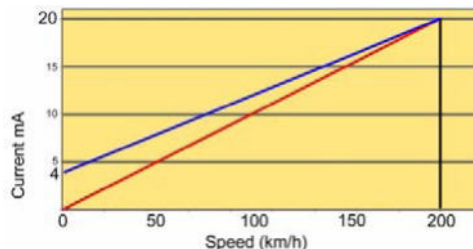
0-20 / 4-20 mA

The graph to the side is represented in function of the maximum speed configurable = 200 km / h

Are available the follow Fullscale value:

200 km/h / 180 km/h / 120 km/h / 100 km/h

Warning: 500 ohm maximum load



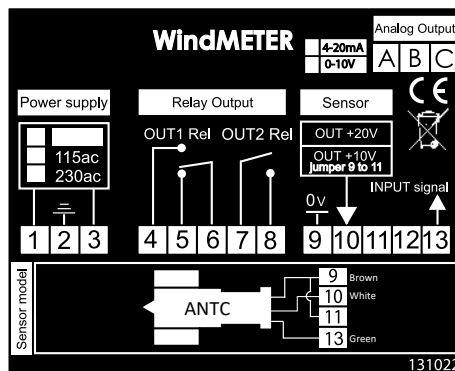
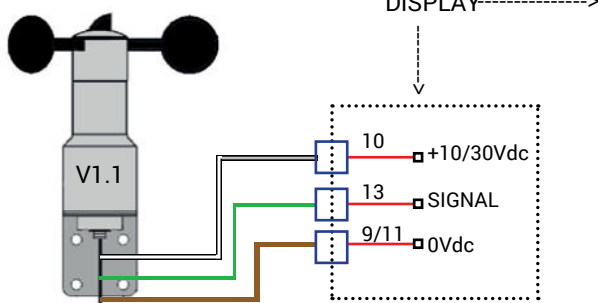
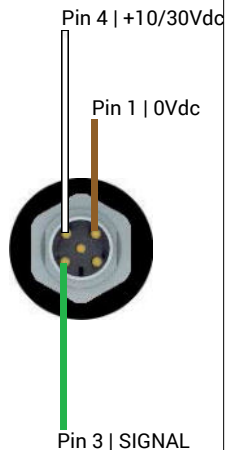
Scale 0-20 mA red line  
Scale 4-20 mA blue line

**CONNECTIONS VAYU V1.1 AND VAYU V2.2**

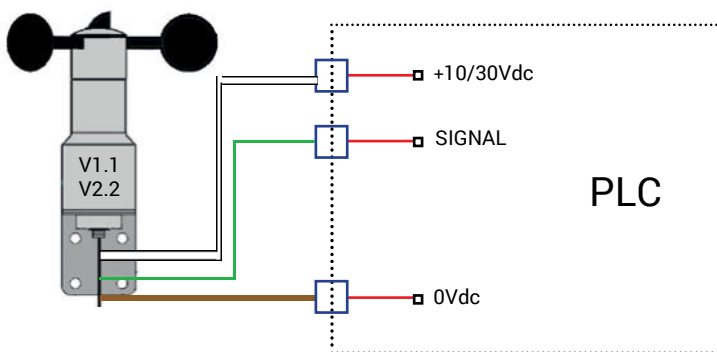
It is possible to combine the anemometer with a PLC or with a programmable display with two relay outputs to view the data immediately and give alarm signals.

3 Wires for WM44-P display connection

Note: Connection with display it's possible only for VAYU V1.1



3 Wires for PLC connection



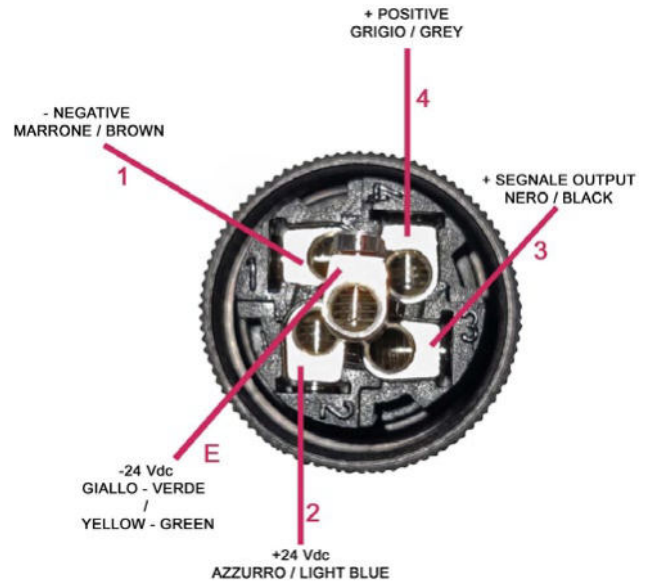
## VAYU V\_R CONNECTION

Vayu V\_R power supply must be 24 Vdc.

- Anemometer + Heater parallel 24VDC Power supply use shielded cable 3x0,5 sq mm - the braided shield **MUST NOT BE CONNECTED** to the ground connector but completely isolated. It should be connected to ground only from the connection to the PLC electronics, display or electronic VAYU.
- Anemometer and Heater separated Power supply use shielded cable 5x0,5 sq mm - the braided shield **MUST NOT BE CONNECTED** to the ground connector but completely isolated. It should be connected to ground only from the connection to the PLC electronics, display or electronic VAYU.

### Heater power supply:

- 24Vdc parallel to anemometer supply voltage if equal or more than 500 mA.
- 24Vdc 24Vdc Heater to be connected on pins 2 + E with separated cable if supply voltage if less than 500 mA.



## VAYU CODES AND MODELS

VAYU aluminium code	VAYU stainless steel code	Power supply	Description
VAYUV1.1	VAYUV1.1 INOX	12-24 Vdc	Pulse Hz output
VAYUV2.2_A02.1	VAYUV2.2_A02.2	10-30 Vdc	Voltage output 0-10 V, Km/h 0-100
VAYUV2.2_A03.1	VAYUV2.2_A03.2	10-30 Vdc	Voltage output 0-10 V, Km/h 0-120
VAYUV2.2_A04.1	VAYUV2.2_A04.2	10-30 Vdc	Voltage output 0-10 V, Km/h 0-180
VAYUV2.2_A05.1	VAYUV2.2_A05.2	10-30 Vdc	Voltage output 0-10 V, Km/h 0-200
VAYUV2.2_A06.1	VAYUV2.2_A06.2	10-30 Vdc	Voltage output 0-5 V, Km/h 0-100
VAYUV2.2_A07.1	VAYUV2.2_A07.2	10-30 Vdc	Voltage output 0-5 V, Km/h 0-120
VAYUV2.2_A08.1	VAYUV2.2_A08.2	10-30 Vdc	Voltage output 0-5 V, Km/h 0-180
VAYUV2.2_A09.1	VAYUV2.2_A09.2	10-30 Vdc	Voltage output 0-5 V, Km/h 0-200
VAYUV2.2_A10.1	VAYUV2.2_A10.2	10-30 Vdc	Voltage output 1-5 V, Km/h 0-100
VAYUV2.2_A11.1	VAYUV2.2_A11.2	10-30 Vdc	Voltage output 1-5 V, Km/h 0-120
VAYUV2.2_A12.1	VAYUV2.2_A12.2	10-30 Vdc	Voltage output 1-5 V, Km/h 0-180
VAYUV2.2_A13.1	VAYUV2.2_A13.2	10-30 Vdc	Voltage output 1-5 V, Km/h 0-200
VAYUV2.2_A14.1	VAYUV2.2_A14.2	10-30 Vdc	Voltage output 2-10 V, Km/h 0-100
VAYUV2.2_A15.1	VAYUV2.2_A15.2	10-30 Vdc	Voltage output 2-10 V, Km/h 0-120
VAYUV2.2_A16.1	VAYUV2.2_A16.2	10-30 Vdc	Voltage output 2-10 V, Km/h 0-180
VAYUV2.2_A17.1	VAYUV2.2_A17.2	10-30 Vdc	Voltage output 2-10 V, Km/h 0-200
VAYUV2.2_A18.1	VAYUV2.2_A18.2	10-30 Vdc	Current output 0-20 mA, Km/h 0-100
VAYUV2.2_A19.1	VAYUV2.2_A19.2	10-30 Vdc	Current output 0-20 mA, Km/h 0-120
VAYUV2.2_A20.1	VAYUV2.2_A20.2	10-30 Vdc	Current output 0-20 mA, Km/h 0-180
VAYUV2.2_A21.1	VAYUV2.2_A21.2	10-30 Vdc	Current output 0-20 mA, Km/h 0-200
VAYUV2.2_A22.1	VAYUV2.2_A22.2	10-30 Vdc	Current output 4-20 mA, Km/h 0-100
VAYUV2.2_A23.1	VAYUV2.2_A23.2	10-30 Vdc	Current output 4-20 mA, Km/h 0-120
VAYUV2.2_A24.1	VAYUV2.2_A24.2	10-30 Vdc	Current output 4-20 mA, Km/h 0-180
VAYUV2.2_A25.1	VAYUV2.2_A25.2	10-30 Vdc	Current output 4-20 mA, Km/h 0-200

## Display

Code	Power supply	Description
PAK0106030501	230 Vac (110 opt.)	WM44-P Display with 1 impulsive input / 2 programmable relay output
PAK0106030503	24 Vac	WM44-P Display with 1 impulsive input / 2 programmable relay output
PAK0106030504	24 Vdc	WM44-P Display with 1 impulsive input / 2 programmable relay output
PAK0106030505	12 Vdc	WM44-P Display with 1 impulsive input / 2 programmable relay output
PAK0106030601	24 Vac	WM44-SS Display with 1 impulsive input / 2 programmable relay output
PAK0106030701	230 Vac	WM44-DRM Display with 1 impulsive input / 2 programmable relay output
PAK0106030411	24 Vdc	WM44-EV011 IP65 Display with 1 impulsive input / 2 analog input / 1 analog output / 2 programmable relay output - wind speed alarm only
PAK0106030412	230 Vac	WM44-EV011 IP65 Display with 1 impulsive input / 2 analog input / 1 analog output / 2 programmable relay output - wind speed alarm only

## Accessories

Code	Description
VAYURISC_24 Vdc	Aluminium self-regulating heater integrated into the body
VAYURISC_24 Vdc INOX	Stainless steel self-regulating heater integrated into the body
CAVSCH3x0,5	Shielded cable connection anemometer and / or anemoscope
CAVSCH5x0,5	Shielded cable connection anemometer and / or anemoscope + heater module

## VAYU D2.2

- Advanced wind vane anemoscope, made of aluminum or AISI 316 stainless steel, featuring a 4-20 mA analogue output and magnetic sensor.
- It is designed for irrigation control systems, automated greenhouses, solar trackers, ski resorts cableways, tower cranes, wind turbines and weather stations.
- Through its output, it can be connected directly to devices with analogue input such as PLC, data loggers, 4-20mA display suitable for the visualization of the wind speed or to program alarm at alert wind value.



## CERTIFICATIONS

<b>Conformity to CE Standards</b>	EN 61000-6-2:2001 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
	EN 55022:2001, Class B Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
<b>Markings and homologations</b>	CE

## GENERAL TECHNICAL SPECIFICATIONS

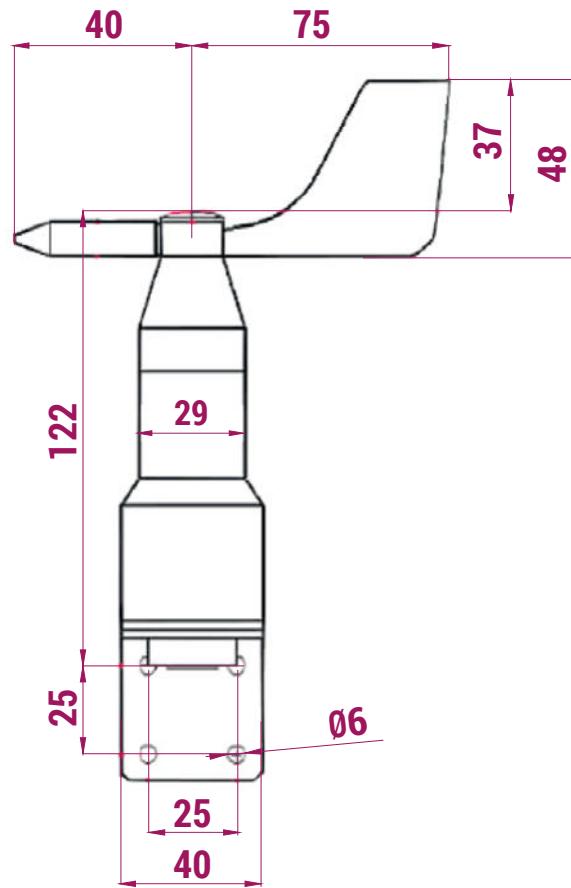
<b>Ambient temperature</b>	Storage -40°C/+125°C Operational (free of ice) -20°C/+85°C
<b>IP protection degree</b>	IP 65 / IP 66 (UNE 20324:1993)
<b>Connection</b>	M12 connector
<b>Material</b>	Aluminium Stainless steel AISI316
<b>Weight</b>	300 g

## ELECTRICAL SPECIFICATIONS

<b>Power supply</b>	10...30 Vdc
<b>Output</b>	Analog (4-20 mA)
<b>Starting speed</b>	3 Km/h
<b>Maximum measurable speed</b>	200 km/h
<b>Measurement field</b>	From 0° to 360°
<b>Resolution</b>	0.5°
<b>Accuracy</b>	± 1%
<b>Load impedance connectable</b>	Equal less than 500 ohms

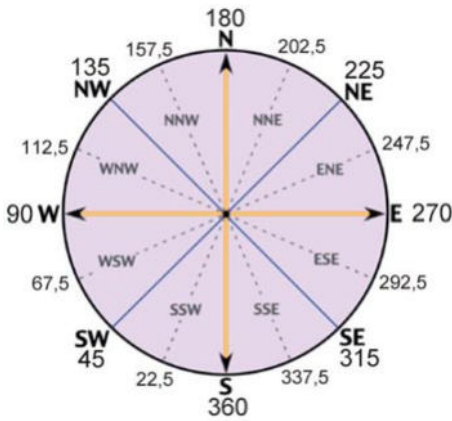


## OVERALL DIMENSIONS (mm)



## APPLICATION

Wind speed graphic report with analog output 4-20 mA

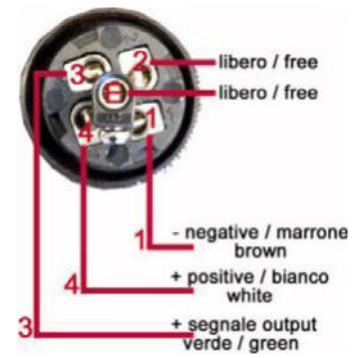


The wind vane must be oriented towards NORTH and its output signal corresponding to 12 mA will conform to the angles and directions of the board. To orient the wind vane towards NORTH, align the fixing bracket perpendicular to the NORTH.

Direction	Angole	Analog output
South - Southwest	22.5	19 mA
Southwest	45.0	18 mA
West - Southwest	67.5	17 mA
West	90.0	16 mA
West - Northwest	112.5	15 mA
Northwest	135.0	14 mA
North - Northwest	157.5	13 mA
North	180.0	12 mA
North - Northeast	202.5	11 mA
Northeast	225.0	10 mA
East - Northeast	247.5	9 mA
East	270.0	8 mA
East - Southeast	292.5	7 mA
Southeast	315.0	6 mA
Sud-Sudest	337.5	5 mA
South - Southeast	360.0	4 mA
Static wind	If the wind speed is less than or equal to 3km/h the angle will not be certain.	

## WIRING 4-20 mA

Type of connection	Function	Pin
3 wires – positive / negative / output signal	V+	4
	V-	1
	Output signal	3
	Free	2
	Free	E



## VAYU D2.2 CODES AND MODELS

Code	Power supply	Description
VAYUD2.2	10-30 Vdc	ANODIZED ALUMINIUM Anemoscope rotating with nylon weather vane. 10/30 Vdc power supply - analog voltage or current output. Stainless steel bracket + connector + 1 weather vane included.
VAYUD2.2 INOX	10-30 Vdc	Stainless Steel AISI 316 Anemoscope rotating with nylon weather vane. 10/30 Vdc power supply - analog voltage or current output. Stainless steel bracket + connector + 1 weather vane included.

## DISPLAY WM44-P V3 ANALOG INPUT

- 3-digit compact display, featuring 2 programmable alarm thresholds (pre-alarm and alarm), with a 4-20mA e 0-10 V analogue input and a 16Vdc power output.
- Equipped with 2 status alarm LED indicators (AL1 and AL2) and 1 indicator of units (Km/h, m/s or Mph).
- It can be easily assembled on instrument panels, on electric panel doors and on many different types of industrial cases.
- Compatible with a wide range of rotative sensors.



### CERTIFICATIONS

Conformity to CE Standards	EN 61000-6-2:2001 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
	EN 55022:2001, Class B Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
	Non-condensing relative humidity in accordance with IEC 68-2-3 / IEC 68-2-27
	Impact resistance in accordance with IEC 68-2-27
Markings and homologations	Vibrations in accordance with IEC 68-2-6
	CE

### GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -35°C/+70°C
	Operational -20°C/+70°C
IP protection degree	IP 50
Weight	350 g

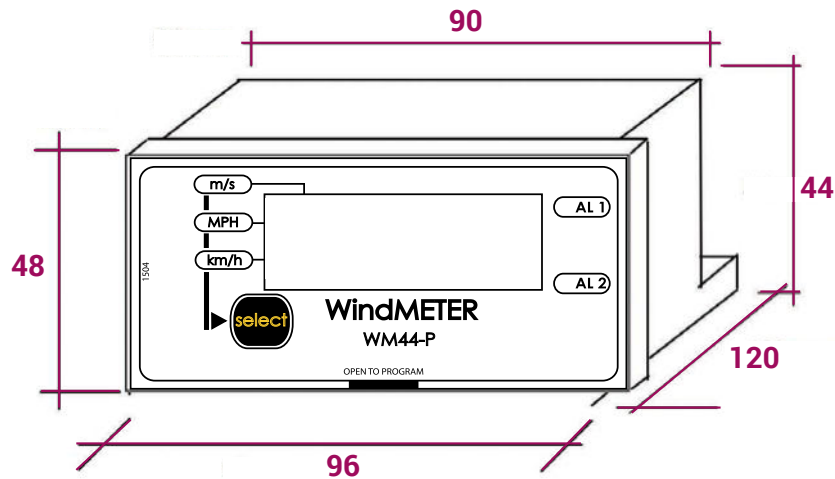
### ELECTRICAL SPECIFICATIONS

Power supply	230 Vac, 50-60 Hz
	24 Vdc
Power consumption	< 3.5 VA @ 230 Vac
	< 3 W @ 24 Vdc
Input type	Analog 4-20 mA
	Analog 0-10 V
Inputs impedance	150 Ω @ 4-20 mA
	6.9 kΩ @ 0-10 V
Full scale	120 km/h
	180 km/h
Power supply output for sensors	16 Vdc +10% 0.8 W
Relay output	2 relè (contatto pulito)
Relay contacts	4 A 250 Vac

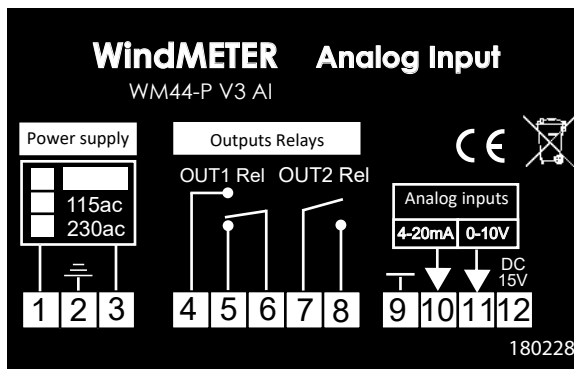
### MEASUREMENT

Accuracy	±1%
	999 km/h
Maximum display	999MPH
	99.9 m/s

## OVERALL DIMENSIONS (mm)



## CONNECTIONS



- In DC powered units:
  - Terminal 1: +Vdc (12Vdc or 24Vdc)
  - Terminal 3: 0V
- The 2 analog inputs can be displayed simultaneously, only can be displayed the selected in the P18 of programming.
- Alarms configuration: Trigger values, polarity, intermittent or continuous alarm, alarm latching (only ALARM2)  
Alarms outputs: Relays. Contacts "NO" and "NC" (ALARM1), contact "NO" (ALARM2). Dry contact relay contacts.

## CODES AND MODELS

Code	Power supply	Description
PAK0106030501	230 Vac (110 opt.)	WM44-P Display with 1 impulsive input / 2 programmable relay output
PAK0106030503	24 Vac	WM44-P Display with 1 impulsive input / 2 programmable relay output
PAK0106030504	24 Vdc	WM44-P Display with 1 impulsive input / 2 programmable relay output / not insulated
PAK0106030505	12 Vdc	WM44-P Display with 1 impulsive input / 2 programmable relay output / not insulated
PAK0106030601	24 Vac	WM44-SS Display with 1 impulsive input / 2 programmable relay output
PAK0106030701	230 Vac	WM44-DRM Display with 1 impulsive input / 2 programmable relay output / DIN 46 277 and DIN EN 50 022 rail mounting

## DISPLAY WM44-EVO11 V3

- Backlighted graphic liquid crystal display for wind speed and direction detection featuring adjustable wind speed alarms, for outdoor installation with 2 alarm relays and a power output for sensors.
- Suitable for wind sensors with frequency or analogue output.



### CERTIFICATIONS

Conformity to CE Standards	EN 61000-6-2:2001 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
	EN 55022:2001, Class B Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
Markings and homologations	CE

### GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -35°C/+70°C
	Operational -20°C/+70°C
IP protection degree	IP 65
Material	Polycarbonate
Weight	250 g
Display	Backlighted liquid crystal display 128x64 pix
Wind speed	3 digits. Units to choose from: km/h, mph and m/s
Wind direction	3 digits. Indication in degrees and cardinal points

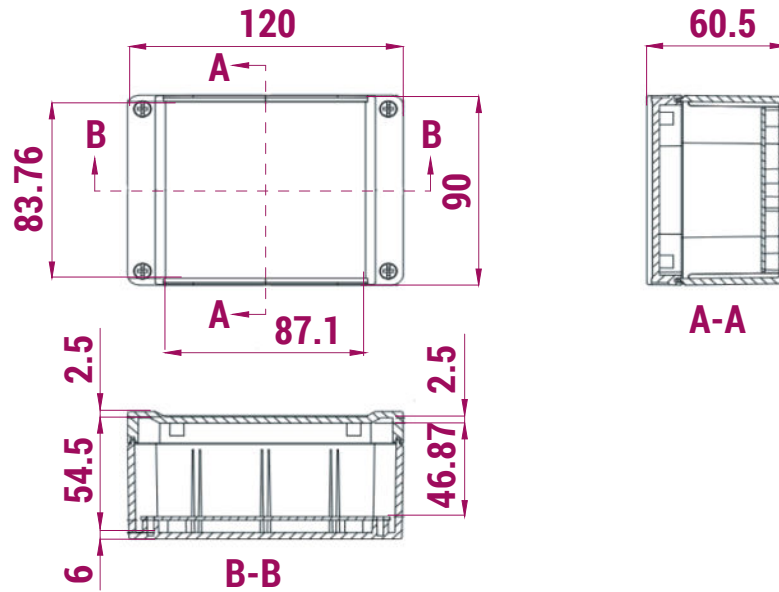
### ELECTRICAL FEATURES

Power supply	230 Vac, 50-60 Hz
	24 Vdc
Power consumption	< 3.5 VA @ 230 Vac
	< 3 W @ 24 Vdc
Type of input signal	Frequency, analogue (4-20mA) or RF
RF connectivity	IEEE 802.15.4. ISM 2.4GHz

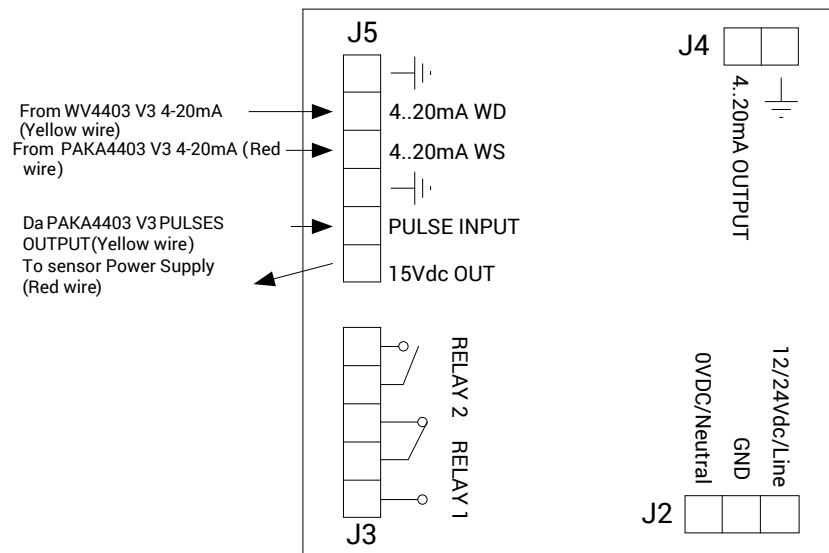
### OUTPUTS

Power output for sensors	15 Vdc
Analogue output	4-20 mA
Max. connectable impedance	500 Ohm
Analogue output resolution	10 bit
Analogue output accuracy	1.5%
Alarm relays	250 Vac, 8A

### OVERALL DIMENSIONS (mm)

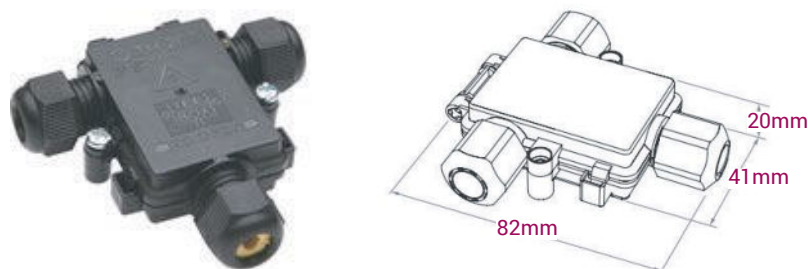


### WIRING



J3: Output relays connector.  
 J4: Analogue output connector  
 J5: Wind sensors connector\*.

\*Note: When using WM44-EV011 with two wired wind sensors, a T-Box is required.



## EXTERNAL ANTENNA

The units with an external connector have been designed for those situations where the display has been installed in a place with a poor RF communication signal. If the display must be installed in a metal box or similar, it will be necessary to use a unit with external antenna.

The units with an external antenna connector (see references) have the antenna included with a 3-meter cable and magnet fixation.

The antenna connector is at the bottom of the display where the glands are.



## CODES AND MODELS

Code	Power supply	Description
PAK0106030411	24 Vdc	WM44-EVO11 IP65 Display with 1 impulsive input / 2 analog input / 1 analog output / 2 programmable relay output - wind speed alarm only
PAK0106030412	230 Vac	WM44-EVO11 IP65 Display with 1 impulsive input / 2 analog input / 1 analog output / 2 programmable relay output - wind speed alarm only
PAK0106030419	24 Vdc	WM44-EVO11 IP65 Display with 1 impulsive input / 2 analog input / 1 analog output / 2 programmable relay output wind speed / direction alarm separate
PAK0106030420	230 Vac	WM44-EVO11 IP65 Display with 1 impulsive input / 2 analog input / 1 analog output / 2 programmable relay output wind speed / direction alarm separate

