

# PAKA

## Anemometer



Basic reliable and sturdy wind speed sensors for heavy use in many industrial sectors and in a wide range of applications. Featuring compact dimensions and aerodynamic shape, they are specially suitable for the detection of wind speed, as alarm indicator.

### FEATURES

- They consist of a impact resistant nylon rotor, which, rotating on ball bearings, drives a magnetic contact, generating 4 pulses / revolution.
- Suitable for measuring a max. speed of 200 Km/h, equal to 55 meter per second.
- IP protection degree: PAKA are classified IP 65.
- Extreme temperature resistance: from -20°C to +60°C and from -20°C to +80°C.
- 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 impact resistant plastic material, protected against UV rays, low-temperature and hail, the head rotates on stainless steel X65cr13 ball bearings.

### OPTIONS

- Ready to be connected, through the different outputs available depending on the model, directly to PLC and / or market electronic board and tachometers.
- Heated versions, suitable for low temperature applications (up to -20° C), and wireless ones with RF module. available on request.
- Versions with M12 connector.
- Featuring a fixing stainless steel bracket, with open slot in its lower part for the pre-wired cable passage, available on request.

### CERTIFICATIONS

- CE Marking.

# PAKA 4403 V3 PULSES OUTPUT

## PAKA 5H25 V3 PULSES OUTPUT HEATED

- Wind speed sensors with pulses output proportional to the wind speed given by a reed switch.
- Paka 4403 V3 and PAKA 5H25 V3 are designed for industrial applications such as viaducts, structures for playgrounds, snow guns, solar trackers, tower cranes, highway tunnels, auto-lifting platforms, irrigation systems, automated greenhouses, ski resorts cableways, pressostatic structures.
- PAKA 5H25 V3 incorporates a heater suitable to work at temperature lower than 0° C, which switches - on and off automatically at +6° C.
- Through their output, they can be connected directly to devices with analogue input such as PLC, data loggers, 4-20mA display suitable for visualizing 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
	EN 55022:2001, Class B Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
Markings and homologations	CE

### GENERAL TECHNICAL SPECIFICATIONS

Type	PAKA 4403 V3	PAKA 5H25 V3
Ambient temperature	Operational without ice -20°C/+80°C	Operational -20°C/+60°C
IP protection degree	IP 65 (UNE 20324:1993)	
Material	PA + FG	PA + FV
Bearings	Stainless steel X65Cr13	
Weight (with a 20m cable)	1425 g	-
Weight (without cable)	130 g	150 g
Dimensions	125 x 139 mm	125 x 155 mm

### ELECTRICAL SPECIFICATIONS

Power supply	3...24 Vdc
Max. Current	24 mA
Output	Frequency (pulses)
Type of contact	Reed

### HEATER ELECTRICAL SPECIFICATIONS

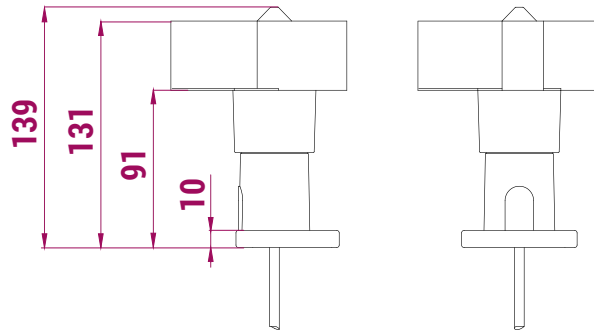
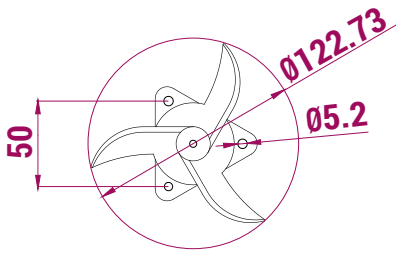
Power supply	15...24 Vdc
Consumption with heater T > 6°C (+/-3°C)	< 0.5 W
Average consumption with heater T < 6°C (+/-3°C)	< 17 W
Maximum current	1.8 A @ 24 Vdc
	1.2 A @ 15 Vdc

## MEASUREMENTS

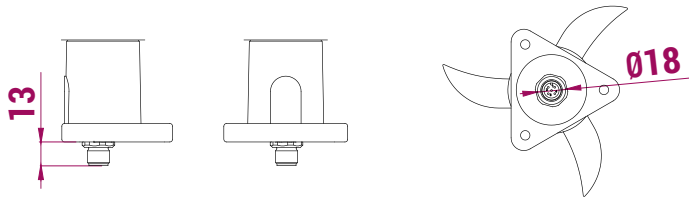
Range	3-180 km/h
Starting speed	8 km/h
Survival speed	200 km/h
Accuracy	1 km/h (3-15 km/h) 3% (15-180 km/h)
Speed-Hz ratio	$V \text{ (km/h)} = 0.8 * \text{Hz} + 3$

## OVERALL DIMENSIONS (mm)

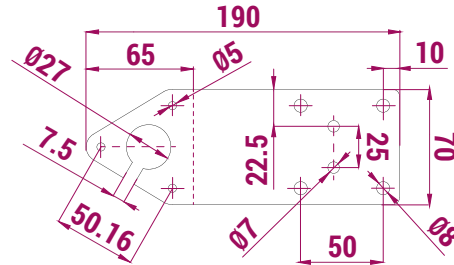
Paka 4403 V3 with cable



Paka 4403 V3 and Paka 5H25 V3 with M12 connector



Bracket (optional accessory)



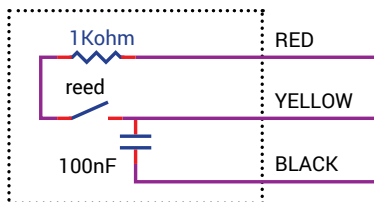
90-degree upward fold, along the dashed line. 2-mm-thick stainless steel.

## APPLICATION

### Outputs/Inputs

Output: Dry reed contact, with a series resistance which switches with a frequency proportional to the wind speed (see graphic). It includes an internal capacitor that can be used as a signal filter.

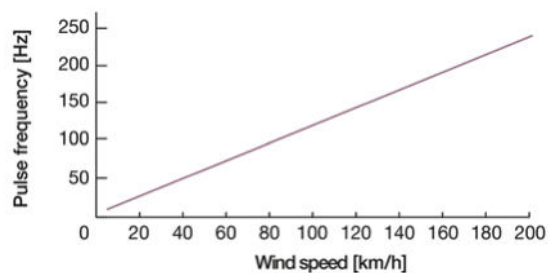
The wind sensor must be fixed on a vertical position.



### WIND SPEED: OUTPUT RATIO

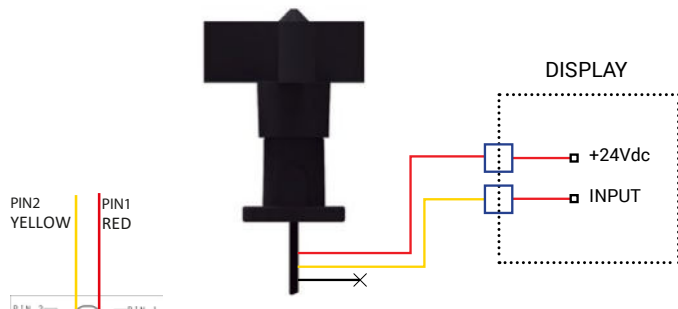
The wind speed is given by the function:

$$\text{Speed (km/h)} = 0.8 * \text{Hz} + 3$$

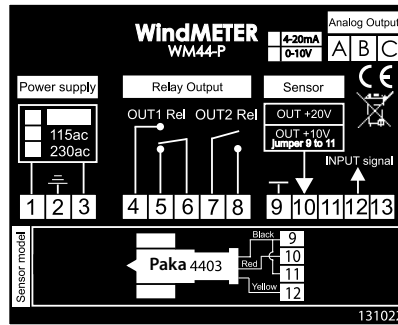


## PAKA 4403 V3 CONNECTIONS

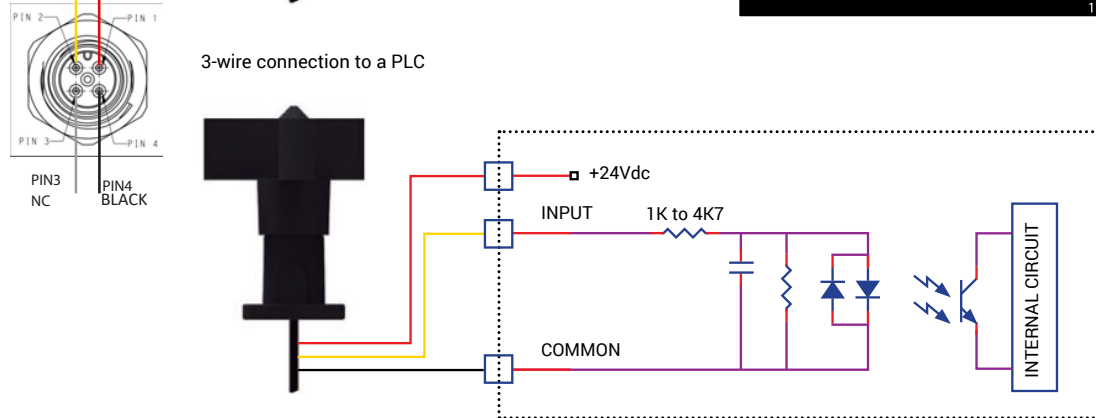
2-wire connection to a display



3-wire connection to WM44-P V3 display

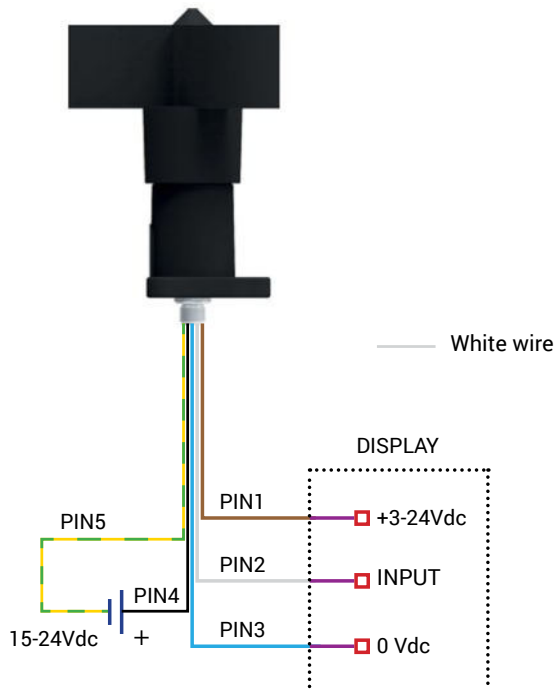


3-wire connection to a PLC

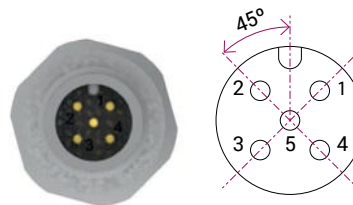


## PAKA 5H25 V3 CONNECTIONS

Blocks diagram



Male M12 connector



PIN	Description	Cable color
1	Contact	Brown
2	Contact	White
3	Filter. Destination device GND (if necessary)	Blue
4	Heater (+)	Black
5	Heater (-)	Yellow / Green

Colour wires referenced to the cable supplied.  
 Cable not included in any versions.  
 WM44-P cannot supply the heater, an external power supply is required.

## CODES AND MODELS

Code	Power supply	Description
PAK0103010804	5/24 Vdc	ANEMO4403 pulses output with 2,5 m pre-wired cable
PAK0103010806	5/24 Vdc	ANEMO4403 pulses output with 20 m pre-wired cable
PAK0103011302	24 Vdc	ANEMO5H25 heated - pulses output with underside M12 connector
PAK0103011303	24 Vdc	ANEMO5H25 heated - pulses underside output with 12 m pre-wired cable and M12 connector
PAK0103011304	24 Vdc	ANEMO5H25 heated - pulses underside output with 25 m pre-wired cable and M12 connector
PAK0103010812	3/24 Vdc	ANEMO4403 V3 pulses output with underside M12 connector

### 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 / 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
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
CAV_FROR3x0,5	3 poles cable
CAV_FROR5G0,5	5 poles cable
LGL_08	Stainless steel support for vertical / horizontal positioning
PAK0103010506	Stainless steel support for vertical positioning anemometer with connector on the bottom
NC_SCH	Transparent protective screen IP65 for display WM44-P
NC_CONT-PL2	Plastic external enclosure for WM44-P
NC_CONT-PL3	Plastic external enclosure for WM44-SS
NC_CONT-INOX	Stainless steel external enclosure for WM44-P / SS
NC_CONT-PL	Bigger plastic external enclosure for display + accessories
NC_CONT-CAB	Aluminium internal enclosure for display in cabin

# PAKA 4403 V3 4-20 mA ANALOGUE

## PAKA 5H25 V3 4-20 mA ANALOGUE HEATED

### PAKA 4403 V3 0-10 V ANALOGUE

- Wind speed sensors with 4-20mA or 0-10 V analogue output, proportional to the wind speed with a full scale of 120 km/h and 180 km/h.
- PAKA 5H25 V3 4-20mA analogue (heated) incorporates a heater suitable to work at temperature lower than 0° C, which switches - on and off automatically at +6° C.
- Designed for industrial applications such as viaducts, structures for playgrounds, snow guns, solar trackers, tower cranes, highway tunnels, auto-lifting platforms, irrigation systems, automated greenhouses, ski resorts cableways, pressostatic structures.
- Through their output, they can be connected directly to devices with analogue input such as PLC, data loggers, display suitable for visualizing 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 EN 55022:2001, Class B Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
Markings and homologations	CE

## GENERAL TECHNICAL SPECIFICATIONS

Type	PAKA 4403 V3	PAKA 5H25 V3
Ambient temperature	Operational -20°C/+70°C	Operational -20°C/+60°C
		Storage -35°C/+80°C
IP protection degree	IP 65 (UNE 20324:1993)	
Material	PA + FV	
Bearings	Stainless steel X65Cr13	
Weight (with 20m cable)	1425 g	-
Weight (without cable)	135 g	145 g
Dimensions	125 x 139 mm	125 x 155 mm

## PAKA 4403 V3 4-20 mA - ELECTRICAL SPECIFICATIONS

Power supply	12...30 Vdc
Max. Current	< 20 mA
Output	Analog (4-20 mA, 2 wires)
Minimum connectable impedance	$R_L < \frac{V_{cc} - 8V}{0.02 A} \Omega$

## PAKA 4403 V3 0-10 Vdc - ELECTRICAL SPECIFICATIONS

Power supply	15-24 Vdc
Max. Current	< 2.5 W
Output	Analog (0-10 V)
Minimum connectable impedance	4k6 $\Omega$

## PAKA 5H25 V3 - ELECTRICAL SPECIFICATIONS

Power supply	15...24 Vdc
Consumption with heater $t^a > 6^{\circ}\text{C}$ (+-3°C)	<1.5 W
Average consumption with heater $t^a < 6^{\circ}\text{C}$ (+-3°C)	<17 W
Maximum current	1.8 A @ 24 Vdc 1.2 A @ 15 Vdc
Uscita	Analogica (4-20 mA)
Maximum connectable impedance	<600 $\Omega$ @ 24Vdc <300 $\Omega$ @ 15Vdc

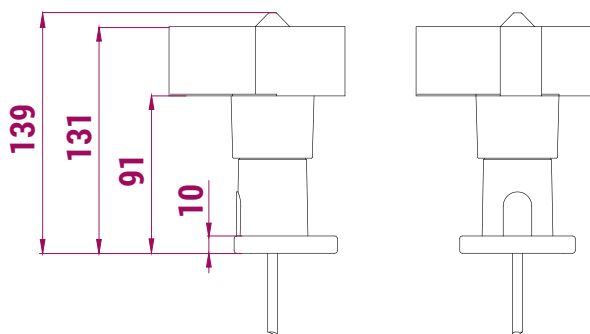
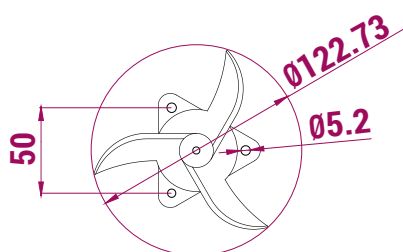
## MEASUREMENTS

Range	3-120 km/h* 3-180 km/h*
Starting speed	8 km/h
Survival speed	200 km/h 1km/h (3-15 km/h)
Accuracy	3% (15-120 km/h)* 3% (15-180 km/h)*

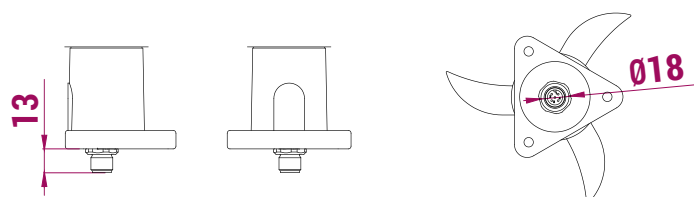
\* Depending on the version.

## OVERALL DIMENSIONS (mm)

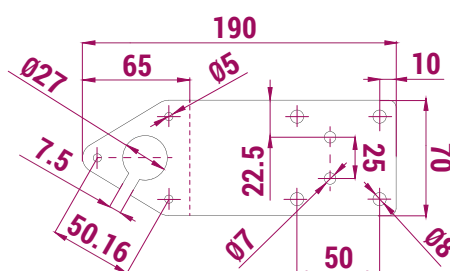
Paka 4403 V3 with cable



Paka 4403 V3 and Paka 5H25 V3 with M12 connector



Bracket (optional accessory)

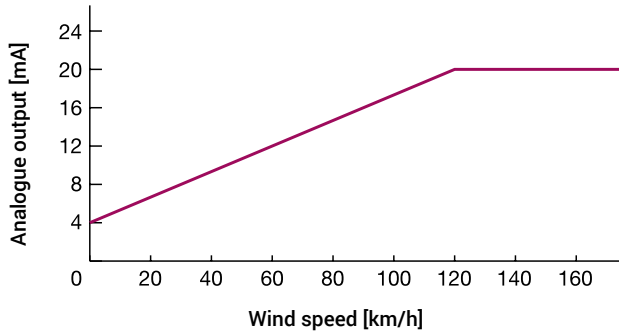


90-degree upward fold, along the dashed line.  
2-mm-thick stainless steel.

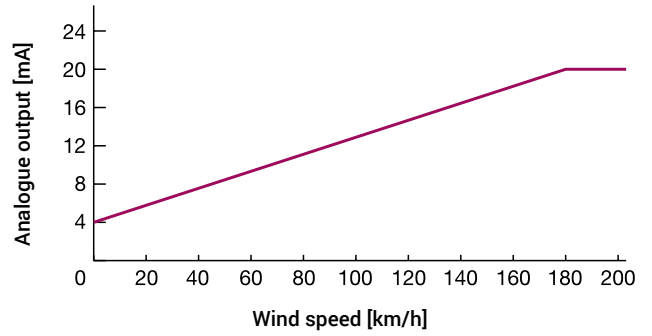
## WIND SPEED: OUTPUT RATIO

The output signal is proportional to the wind speed:

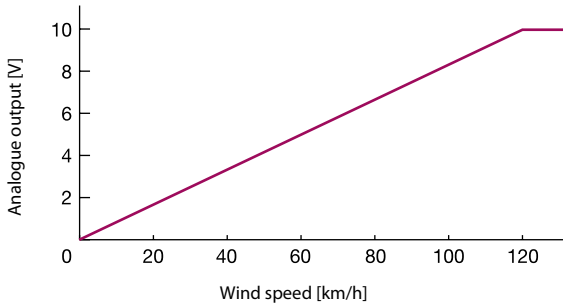
4...20 mA = 0...120 km/h



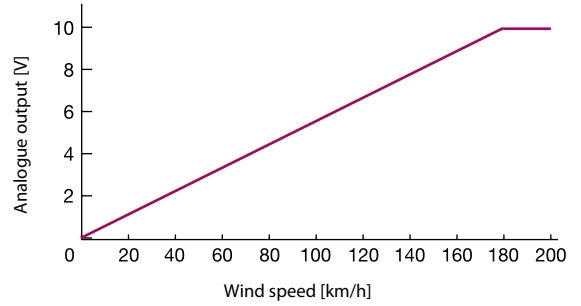
4...20 mA = 0...180 km/h



0...10 V = 0...120 km/h

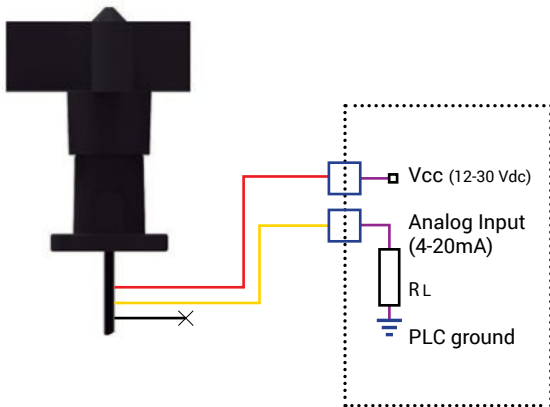


0...10 V = 0...180 km/h

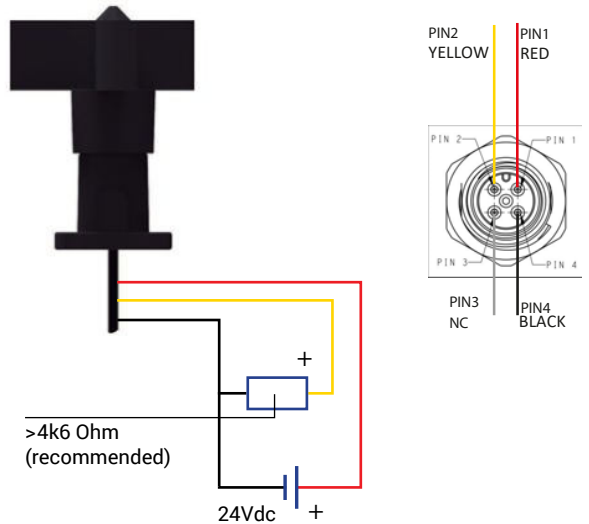


## PAKA 4403 V3 CONNECTIONS

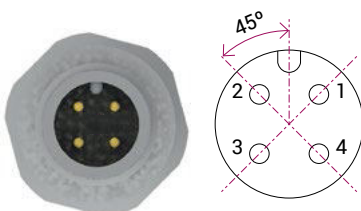
### Output 4...20 mA



### Output 0...10 V



### Output 4...20 mA with M12 connector

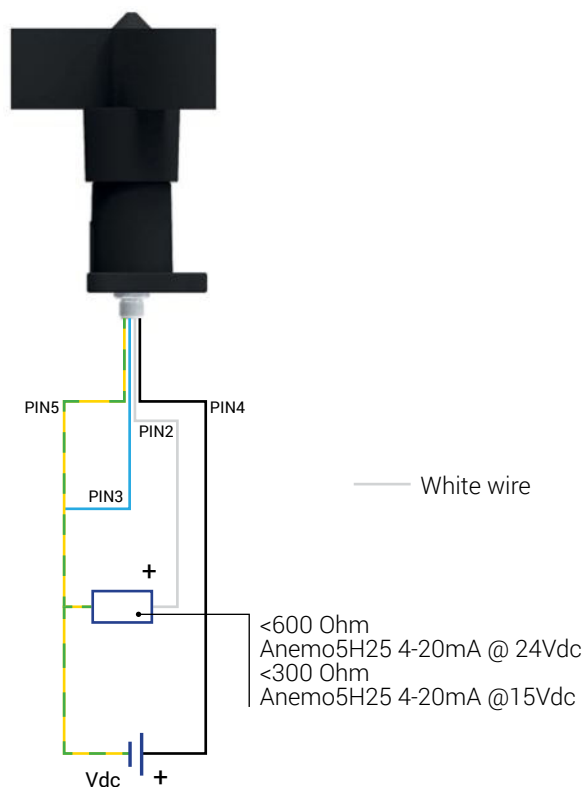


PIN	Description
1	+ Power supply
2	Output
3	NC
4	- Power supply



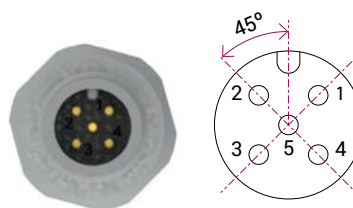
## PAKA 5H25 V3 CONNECTIONS

### Blocks diagram



Wires colours referenced to the cable suppli.  
Cable not included in any version.  
WM44-P cannot supply the heater, an external power supply is required.

### M12 male connector



PIN	Description	Cable color
1	NC	Brown
2	4-20 mA output (+)	White
3	4-20 mA output (-)	Blue
4	Heater (+)	Black
5	Heater (-)	Yellow / Green

## CODES AND MODELS

Code	Power supply	Description
PAK0103011003	12-24 Vdc	ANEMO4403 with 20 m pre-wired cable / 4-20 mA - 120 km/h
PAK0103011004	12-24 Vdc	ANEMO4403 with 20 m pre-wired cable / 4-20 mA - 180 km/h
PAK0103011406	24 Vdc	ANEMO5H25 heated with M12 connector / 4-20 mA - 180 Km/h
PAK0103011407	24 Vdc	ANEMO5H25 heated with 12 m cable + M12 connector / 4-20 mA - 180 Km/h
PAK0103011408	24 Vdc	ANEMO5H25 heated with 25 m cable + M12 connector / 4-20 mA - 180 Km/h
PAK0103010907	15-24 Vdc	ANEMO4403 V3 with vertical M12 connector / 0-10 Vdc - 180 Km/h
PAK0103011008	12-24 Vdc	ANEMO4403 V3 with vertical M12 connector / 4-20 mA - 120 Km/h
PAK0103011009	12-24 Vdc	ANEMO4403 V3 with vertical M12 connector / 4-20 mA - 180 Km/h

### Display

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

## Accessories

Code	Description
CAV_FROR3x0,5	3 poles cable
CAV_FROR5G0,5	5 poles cable
LGL_08	Stainless steel support for vertical / horizontal positioning
PAK0103010506	Stainless steel support for vertical positioning anemometer with connector on the bottom
NC_CONT-PL	Bigger plastic external enclosure for display + accessories
NC_CONT-CAB	Aluminium internal enclosure for display in cabin

## PAKA 4403 V3 RELAY - ALARM

- Wind speed sensor with up to 95 Km / h configurable reed contact relay output, which turns on at pre-configured speed limit by means of a trimmer.
- Designed for industrial applications such as viaducts, structures for playgrounds, snow guns, solar trackers, tower cranes, highway tunnels, auto-lifting platforms, irrigation systems, automated greenhouses, ski resorts cableways, pressostatic structures.



## 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/+80°C Operational -20°C/+70°C
IP protection degree	IP54 (UNE 20324:1993)
Material	PA+FV
Bearings	Stainless steel X65Cr13
Connection type	20 m cable (4x0.75 mm <sup>2</sup> )
Weight (without cable)	150 g
Weight (with 20 m cable)	1800 g
Dimensions	125 x 139 mm

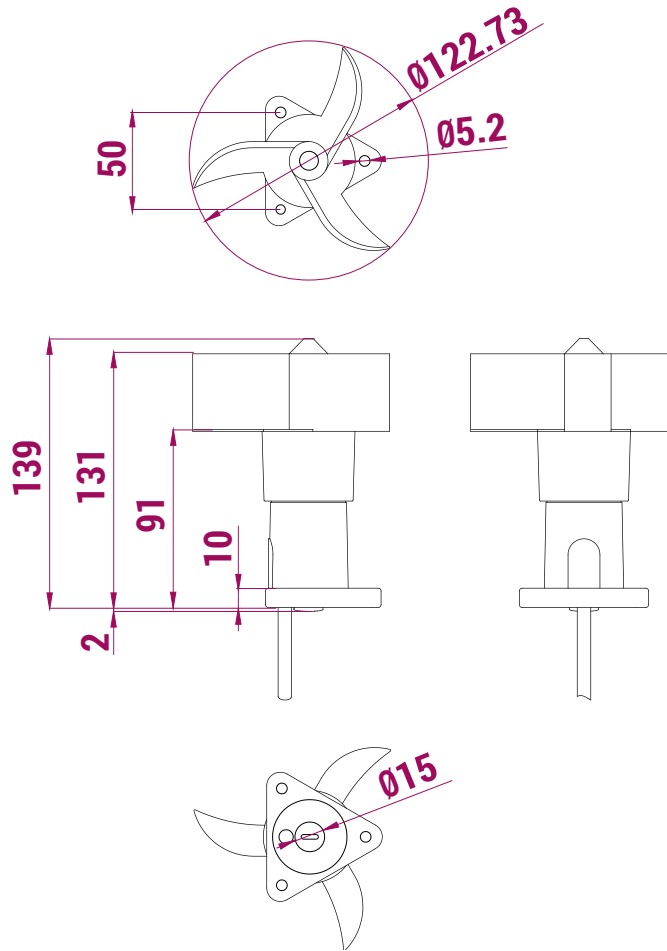
## ELECTRICAL FEATURES

Power supply	12...24 Vdc
Maximum power consumption	<1 W
Output type	Relay contact (NO dry contact)
Contact type	8 A 250 Vac

## MEASUREMENT

Range	3-180 km/h
Starting speed	8 km/h
Survival speed	200 km/h
Accuracy	1 km/h (3-15 km/h)
	3% (15-180 km/h)

## OVERALL DIMENSIONS (mm)

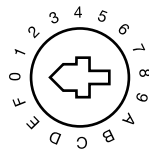


## OPERATING

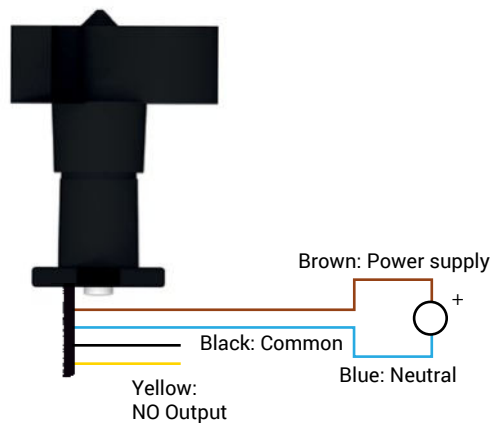
Up to 180 km/h of wind speed.  
 Output activation: After a second\*2 of wind speed over the set value.  
 Output deactivation: Wind speed 1km/h\*3 below the set value.  
 Minimum duration of the output pulse: 5 seconds.  
 The output is not latched.

Relay Output Configuration. Speed threshold.

- |            |            |
|------------|------------|
| 0 – 20km/h | 8 – 60km/h |
| 1 – 25km/h | 9 – 65km/h |
| 2 – 30km/h | A – 70km/h |
| 3 – 35km/h | B – 75km/h |
| 4 – 40km/h | C – 80km/h |
| 5 – 45km/h | D – 85km/h |
| 6 – 50km/h | E – 90km/h |
| 7 – 55km/h | F – 95km/h |



## CONNECTION



## CODES AND MODELS

Code	Power supply	Description
PAK0103011202	12-24 Vdc	ANEMO4403 configurable with 20 m cable pre-wired / output relay contact

### Accessori

Code	Description
PAK0103010506	Stainless steel support for vertical positioning anemometer with connector on the bottom

## PAKA 4403 V3 RS485 MODBUS PAKA 5H25 V3 RS485 MODBUS HEATED

- Digital output wind sensors with RS485 MODBUS, NPN or PNP signal.
- They detect the vane position by using magnetic sensors avoiding wear and tear or dead zones. It guarantees radio frequency (RFI) and electromagnetic interference (EMI) high resistance.
- PAKA 5H25 V3 Modbus (heated) incorporates a heater suitable to work at temperature lower than 0° C, which switches - on and off automatically at +6° C.
- Designed for irrigation control systems, automated greenhouses, solar trackers, ski resorts cableways, tower cranes, wind turbines and weather stations.



## 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

Type	PAKA 4403 V3	PAKA 5H25 V3
Ambient temperature	Storage -35°C/+80°C Operational without ice -20°C/+70°C	
IP protection degree	IP 65 (UNE 20324:1993)	
Connections	Cable 3x0.75 mm <sup>2</sup> (Paka NPN/PNP) 4x0.65 mm <sup>2</sup> (Paka RS485)	25 m cable 4x0.65 mm <sup>2</sup>
Material	PA + FV	
Bearings	Stainless steel X65Cr13	
Weight (without cable)	160 g	
Dimensions	125 x 139 mm	125 x 155 mm

## PAKA 4403 V3 ELECTRICAL SPECIFICATIONS

Power supply	9...30 Vdc
Max. Current	100 mA
Output	RS485 Modbus

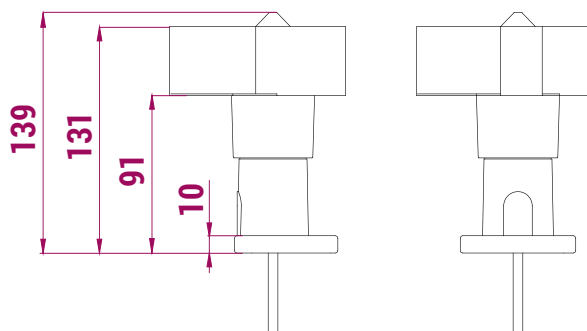
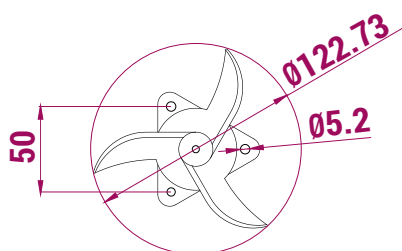
## PAKA 5H25 V3 ELECTRICAL SPECIFICATIONS

Power supply	15...24 Vdc
Consumption with heater $t^{\circ} > 6^{\circ}C$ (+-3°C)	<0.5 W
Average consumption with heater $t^{\circ} < 6^{\circ}C$ (+-3°C)	<17 W
Maximum current	1.8 A @ 24 Vdc 1.2 A @ 15 Vdc
Uscita	RS485 Modbus

## MEASUREMENTS

Range	3-180 km/h
Starting speed	8 km/h
Survival speed	200 km/h
Accuracy	1 km/h (3-15 km/h) 3% (15-180 km/h)

## OVERALL DIMENSIONS (mm)



## CONNECTIONS

### Paka 4403 V3 output RS485 Modbus with or without heater

Wire colors:

VCC: blue

GND: white

A: orange

B: yellow

Termination resistor included (120 Ω)

## PROTOCOL

Protocol features	
	1 start bit, 8 data bits and 1 stop bit
Data format	19200 baud
	Even parity
Protocol type	MODBUS RTU
Version	1.2

Frame example								
Addr	04	00	00	00	01	CRCH	CRCL	

The wind speed is stored in 2 registers: @30001 y @40001. The user can read this value by using any of the 2 available functions (Read Input Register and Read Holding Register).

Paka 4403 V3 RS485 default address is 244 <=> 0xF4. This value is stored in Holding Register @40002 and can be edited by the user. The user can configure any address in the range 1 (0x01) to 255 (0xFF).

## CODES AND MODELS

Code	Power supply	Description
PAK0103012202	9-30 Vdc	ANEMO4403 with 10 m cable pre-wired / output RS 485
PAK0103012206	9-30 Vdc	ANEMO4403 with 10 m cable pre-wired / output RS 485 - without final resistor closing
PAK0103012201	9-30 Vdc	ANEMO4403 with 25 m cable pre-wired / output RS 485
PAK0103012604	15-24 Vdc	ANEMO4403 with 25 m cable pre-wired / output RS 485 - without final resistor closing

### Accessories

Code	Description
PAK0103010506	Stainless steel support for vertical positioning anemometer with connector on the bottom

## PAKA 4403 V3 + RF MODULE V3 (WIRELESS)

- Wireless RF wind speed sensor compliant with 802.15.4 standard, 2.4 GHz, operating with no-risk of interference / interaction even in presence of several devices in the same area.
- PAKA 4403 V3+RF Module V3 works with lithium (up to 3 years battery life) or alkaline batteries (up to 12 months battery life).
- Designed for industrial applications such as viaducts, structures for playgrounds, snow guns, solar trackers, tower cranes, highway tunnels, auto-lifting platforms, irrigation systems, automated greenhouses, ski resorts cableways, pressostatic structures.



## 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/+80°C Operational -20°C/+60°C
IP protection degree	IP65 (UNE 20324:1993)
Material	PA+FG
Bearings	Stainless steel X65Cr13
Bracket material	Stainless steel AISI 304
Weight (with fixed bracket)	680 g
Weight (with self-leveling bracket)	900 g

## ELECTRICAL SPECIFICATIONS

Power supply	D battery 1.2-3.6 V
Power consumption	3.6 V: 0.6 mA 5Ah/year

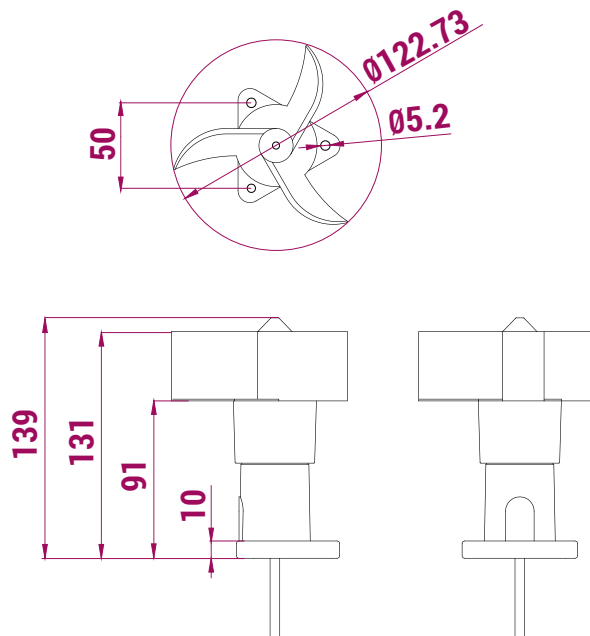
## COMMUNICATION

Type of communication	IEEE 802.15.4. ISM 2.4 GHz
Transmit power	10 mW (10 dBm)
Receiver Sensitivity	-100 dBm
Range	Indoor/urbane: 60 m max., 30 m typically Outdoor/direct line of sight: 750 m max, 200 m typically
Transmission period	2 s

## MEASUREMENTS

Range	4-180 km/h
Starting speed	8 km/h
Survival speed	200 km/h
Accuracy	1 km/h (4-15 km/h) 3% (15-180 km/h)

## OVERALL DIMENSIONS (mm)







## CODES AND MODELS

### Anemometer with standard display WM44-P

Code	Power supply	Description
PAK0103012001	24 Vdc	RF / WM44P RF / FB - Anemometer with fix support + standard display
PAK0103012002	230 Vac	RF / WM44P RF / FB - Anemometer with fix support + standard display
PAK0103012005	24 Vdc	RF / WM44P RF / F/SLB - Anemometer with swinging support + standard display
PAK0103012009	24 Vdc	RF / WM44P RF / FB / SMA - Anemometer with fix support + external antenna display
PAK0103012013	24 Vdc	RF / WM44P RF / F/SLB / SMA - Anemometer with swinging support + external antenna display
PAK0103012014	230 Vac	RF / WM44P RF / F/SLB / SMA - Anemometer with swinging support + external antenna display

### Anemometer with display WM44-EV011

Code	Power supply	Description
PAK0103012007	24 Vdc	RF / WM44 EVO11 RF / F/SLB - Anemometer with swinging support + display WM44-EV011
PAK0103012008	230 Vac	RF / WM44 EVO11 RF / F/SLB - Anemometer with swinging support + display WM44-EV011
PAK0103012015	24 Vdc	RF / WM44 EVO11 RF / F/SLB / RP-SMA - Anemometer with swinging support + external antenna display
PAK0103012016	230 Vac	RF / WM44 EVO11 RF / F/SLB / RP-SMA - Anemometer with swinging support + external antenna display

### Additional display

Code	Power supply	Description
ES_0106030806	230 Vac	WM44P RF additional display + antenna
ES_0106030416	230 Vac	WM44EVO11 RF additional display + antenna
ES_0106030430	230 Vac	WM44EVO11 RF additional display + antenna + (data logger)

## PAKA SAG105WR

- Wind speed sensor with light and sound integrated alarms, designed according to ITC MIE- AEM-2 requirements.
- Featuring intermittent pre-alarm activation at 50 Km/h (intermittent yellow beacon + alarm) and continuous alarm activation at 70 Km/h (red beacon + alarm).
- Compact and aerodynamic exclusive design, specially designed to prevent the formation of ice on the surface of the structure and around the rotor.
- Specially designed for tower cranes and suitable for harsh uses.



### 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	Operational without ice -20°C/+60°C
IP protection degree	IP 55 (UNE 20324:1993)
IK protection degree	IK 08 (UNE-EN 50102:1996)
Bearings	Stainless steel X65Cr13
Type of connection	Terminal connector for cable
Sound power level	115 dB
Yellow beacon luminous intensity	>100 cd
Red beacon luminous intensity	>80 cd
Magnet holding power	<90 kg
Weight (without cable)	600 g
Dimensions	195 x 150 x 270 mm

### ELECTRICAL SPECIFICATIONS

Power supply	48...400 Vac 50/60 Hz
Power consumption	6 VA: (0.5 VA without activated beacons)
Type of output	Frequency (pulses)
Relay output	250 Vac / 3A

### MEASUREMENTS

Range	3-180 km/h
Starting speed	8 km/h
Survival speed	200 km/h

## RELAYS ELECTRICAL FEATURES

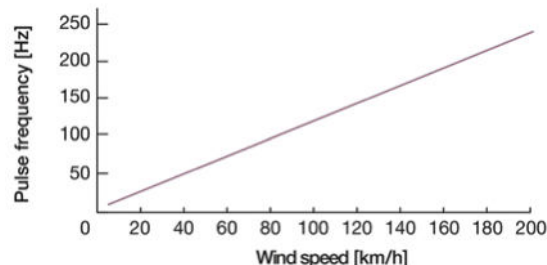
Number of relays	2
Contact type	Normally open, dry contact
Maximum voltage	250 Vac
Maximum current	3A

## PULSES OUTPUT

The pulses output of the SAG-105WR is an optocoupled open collector output. Relationship between wind speed and frequency:

$$V \text{ (km/h)} = 0.92 * \text{frequency (Hz)} + 3$$

An external power supply or the internal one can be used.



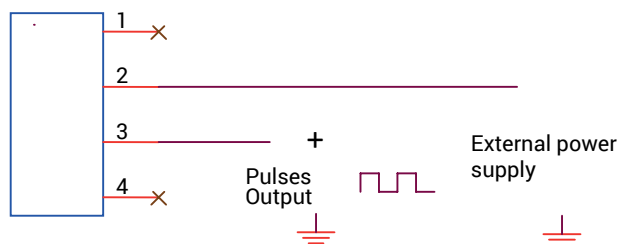
## USING AN EXTERNAL POWER SUPPLY

Positive external power supply is connected to terminal 2.

Pulses output signal is supplied between terminal 3 and negative of power supply.

### Electrical features

Maximum current	25 mA
Maximum voltage	24 V
Minimum impedance at 24 Vdc	1000 $\Omega$

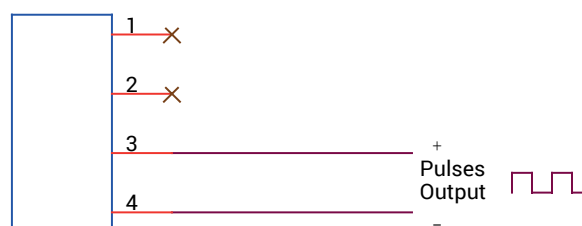


## USING THE INTERNAL POWER SUPPLY

If an external power supply is not available, the internal one can be used (+12 Vdc). The output signal is supplied between the terminal 3 (+) and 4 (-). This is the recommended connection to connect the WM44-P.

### Electrical features

Maximum current	25 mA
Maximum voltage	12 V
Minimum impedance	500 $\Omega$



## CODES AND MODELS

Code	Power supply	Description
PAK0106010217	48/400 Vac	SAG105WR incorporated alarm impulsive output + relay
PAK0106010217/A	24 Vdc	SAG105WR incorporated alarm impulsive output + relay

# PAKA WV4403/WV5H25 RS485 MODBUS - PAKA WV4403/WV5H25 4-20 mA

- Digital output wind sensors with RS485 MODBUS, NPN or PNP signal.
- They detect the vane position by using magnetic sensors avoiding wear and tear or dead zones. It guarantees radio frequency (RFI) and electromagnetic interference (EMI) high resistance.
- Paka 5H25 V3 Modbus (heated) incorporates a heater suitable to work at temperature lower than 0° C, which switches - on and off automatically at +6° C.
- Designed for irrigation control systems, automated greenhouses, solar trackers, ski resorts cableways, tower cranes, wind turbines and weather stations.



## 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 -35°C/+80°C Operational without ice -20°C/+60°C
<b>IP protection degree</b>	IP 65 (UNE 20324:1993)
<b>Material</b>	PA+FV / Aluminium
<b>Bearings</b>	Stainless steel X65Cr13
<b>Weight (without cable)</b>	170 g WV4403 4-20 mA 200 g WV5H25 4-20 mA
<b>Dimensions</b>	129 x 190 mm

## PAKA WV4403 4-20 mA ELECTRICAL SPECIFICATIONS

Power supply	12...30 Vdc
Maximum current	20 mA
Output	Analog (4-20 mA)
Maximum connectable impedance	$R_L < \frac{V_{cc} - 8V}{0.02 A} \Omega$

## PAKA WV5H25 4-20 mA ELECTRICAL SPECIFICATIONS

Power supply	15...24 Vdc
Consumption with heater (t <sup>a</sup> amb. >6°C + -3°C)	<0.5 W
Average consumption with heater (t <sup>a</sup> amb. >6°C + -3°C)	<17 W
Maximum current	1.2 A @ 15 V 1.8 A @ 24 V
Output	Analog (4-20 mA)
Maximum connectable impedance	$R_L < \frac{V_{cc} - 9V}{0.02 A} \Omega$

## PAKA WV4403 RS485 MODBUS ELECTRICAL SPECIFICATIONS

Power supply	9...30 Vdc
Maximum current	50 mA
Output	RS485
Protocol type	MODBUS RTU
Termination resistor	Not included

## PAKA WV5H25 RS485 MODBUS ELECTRICAL SPECIFICATIONS

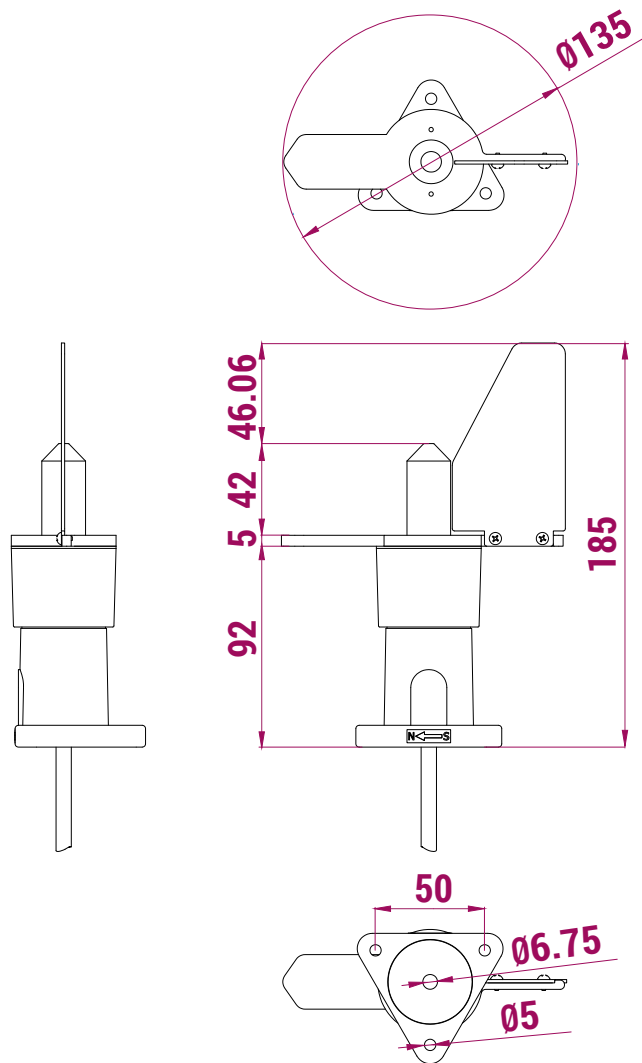
Power supply	15...24 Vdc
Consumption with heater (t <sup>a</sup> amb. >6°C + -3°C)	<0.5 W
Average consumption with heater (t <sup>a</sup> amb. >6°C + -3°C)	<17 W
Maximum current	1.2 A @ 15 V 1.8 A @ 24 V
Output	RS485
Protocol type	MODBUS RTU
Termination resistor	Not included

## MEASUREMENTS

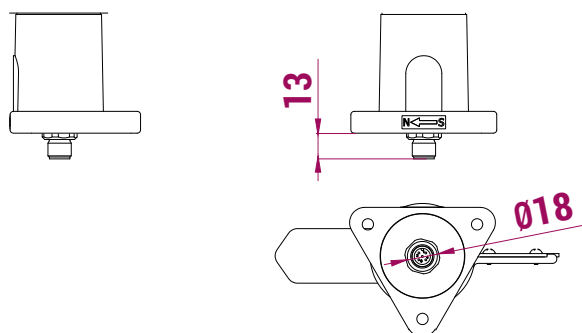
Range	0-360°
Starting speed	3 km/h
Survival speed	200 km/h
Resolution	All versions: 22.5° 1 second AVERAGE versions: Static position: 18° Non-static position: 1°
Accuracy	±3°

## OVERALL DIMENSIONS (mm)

Paka WV4403 with cable / WV5H25 RS485



Paka WV4403 / WV5H25 with M12 connector (underside)



## OPERATING

It gives a RS485 MODBUS signal or 4-20 mA analogue output which depends on the wind direction. (see graphic)

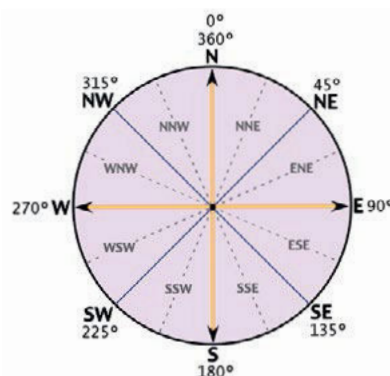
The vane must be orientated north as shown in the orientation section.

RS485 version gives the wind direction in degrees. It calculates the average position in the last second. In static position it has 20 positions of 18° each one.

The heater works from -20°C up to +6°C. Above this temperature, it switches itself off automatically to reduce the consumption. The wind vane must be fixed on a vertical position.

## WIND DIRECTION - OUTPUT RATIO TABLE

Direction	Angle	Analogue output	RS485 output
North	0.0	4 mA	00 00
North - Northeast	22.5	5 mA	00 16
Northeast	45.0	6 mA	00 2D
East - Northeast	67.5	7 mA	00 43
East	90.0	8 mA	00 5A
East - Southeast	112.5	9 mA	00 70
Southeast	135.0	10 mA	00 87
South - Southeast	157.5	11 mA	00 9D
South	180.0	12 mA	00 B4
South - Southwest	202.5	13 mA	00 CA
Southwest	225.0	14 mA	00 E1
West - Southwest	247.5	15 mA	00 F7
West	270.0	16 mA	01 0E
West - Northwest	292.5	17 mA	01 24
Northwest	315.0	18 mA	01 3B
Northwest - North	337.5	19 mA	01 51
Static wind	If the wind speed is below 3km/h, the angle will be uncertain		



- NOTES:
- There is no version with both outputs (analogue and RS485).
  - The output of the 1s AVERAGE versions when the vane is moving is a continuous analog output as result of the average of the last second. When the vane is static, the output has 20 positions of 18° each one.

## PROTOCOL

Protocol features	
Data format	1 start bit, 8 data bits and 1 stop bit
	19200 baud
	Even parity
Protocol type	MODBUS RTU
Version	1.2
WV4403 ID	0xF3 (Default)

Frame example:							
Addr	04	00	00	00	01	CRCH	CRCL

MODBUS map:

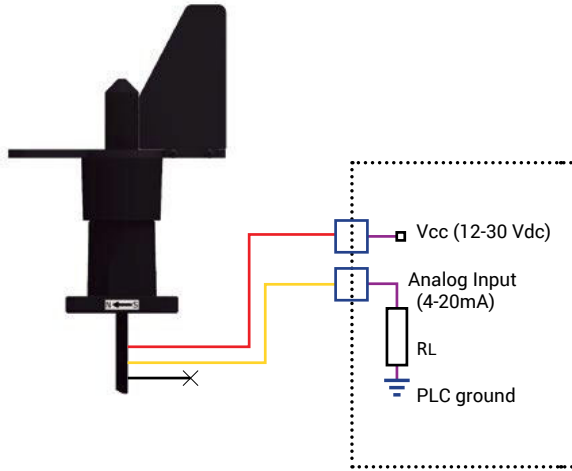
Direction	Field	Type	Values	Notes
30001	Wind direction value	Read	Degrees	-
40001	Wind direction value	Read	Degrees	-
40002	Slave ID configuration	Read/Write	1d (0x01) to 255d (0xFF)	Other values return error

The wind direction is stored in 2 registers: @30001 y @40001. The user can read this value by using any of the 2 available functions (Read Input Register and Read Holding Register).

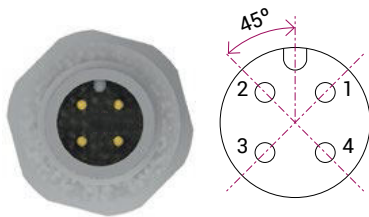
The WV4403 RS485 default address is 243 <=> 0xF3. This value is stored in Holding Register @40002 and can be edited by the user. The user can configure any adress in the range 1 (0x01) to 255 (0xFF).

## CONNECTION

### Paka WV4403 4-20 mA

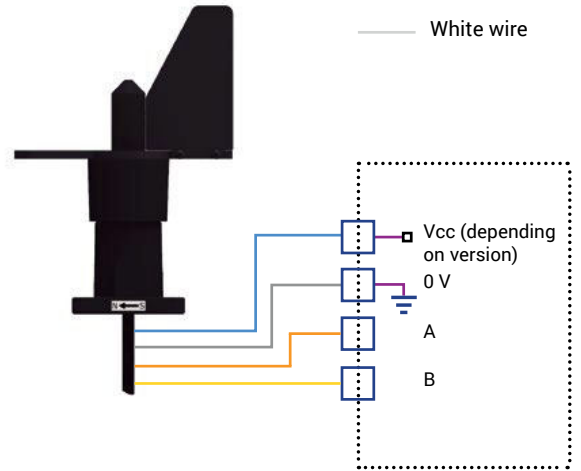


M12 CONNECTOR VERSION



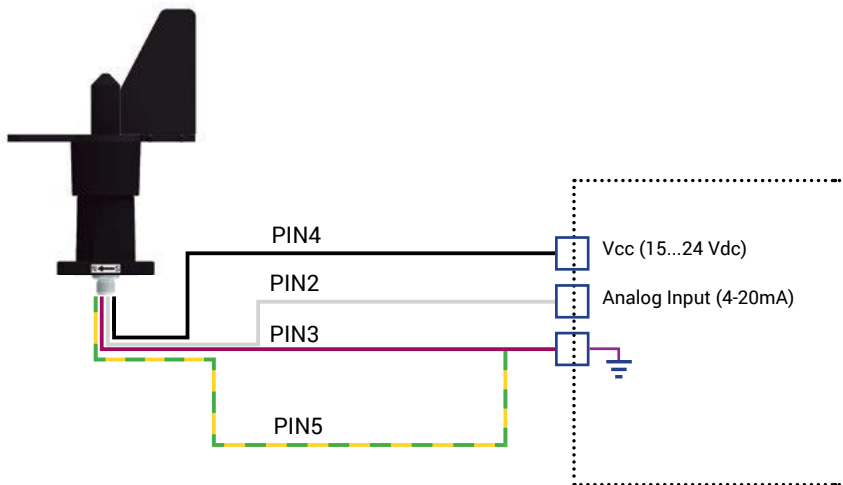
PIN	Description
1	Vcc
2	4-20 mA output
3	NC
4	NC

### Paka WV4403 / WV5H25 RS485 Modbus

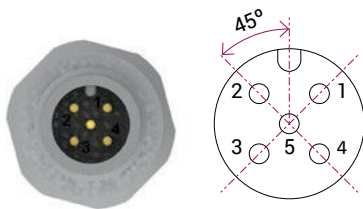


Note: Without termination resistor.

### Paka WV5H25 4-20 mA



PAKA WV5H25 MALE M12 CONNECTOR



PIN	Description
1	NC
2	4-20 mA output (+)
3	4-20mA output (-)
4	Heater (+)
5	Heater (-)

White wire

Cable not included in all versions.



## PAKA WV4403/WV5H25 RS485 MODBUS - PAKA WV4403/WV5H25 4-20 mA

### Output 4-20 mA

Code	Power supply	Description
PAK0103010711	12-24 Vdc	WV4403 with M12 connector - analog output 4-20 mA - 1/360°
PAK0103010712	12-24 Vdc	WV4403 with 2.5 m pre-wired cable - analog output 4-20 mA - 1/360°
PAK0103012102	24 Vdc	WV4403 heated - with M12 connector - analog output 4-20 mA - 1/360°
PAK0103012103	24 Vdc	WV4403 heated - with M12 connector + 12 m cable - analog output 4-20 mA - 1/360°
PAK0103012104	24 Vdc	WV4403 heated - with M12 connector + 25 m cable - analog output 4-20 mA - 1/360°

### Output RS485 MODBUS

Code	Power supply	Description
PAK0103010716	9-30 Vdc	WV4403 with 10 m pre-wired cable - output RS485 - 1/360°
PAK0103012701	15-24 Vdc	WV5H25 heated - with 10 m pre-wired cable - output RS 485 - 1/360°

### Display

Code	Power supply	Description
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
CAV_FROR3x0,5	3 poles cable
CAV_FROR5G0,5	5 poles cable
LGL_08	Stainless steel support for vertical / horizontal positioning
PAK0103010506	Stainless steel support for vertical positioning anemometer with connector on the bottom
NC_CONT-PL	Bigger plastic external enclosure for display + accessories
NC_CONT-CAB	Aluminium internal enclosure for display in cabin

## 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.
- Particularly suitable to be used together with PAKA sensors, it's 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

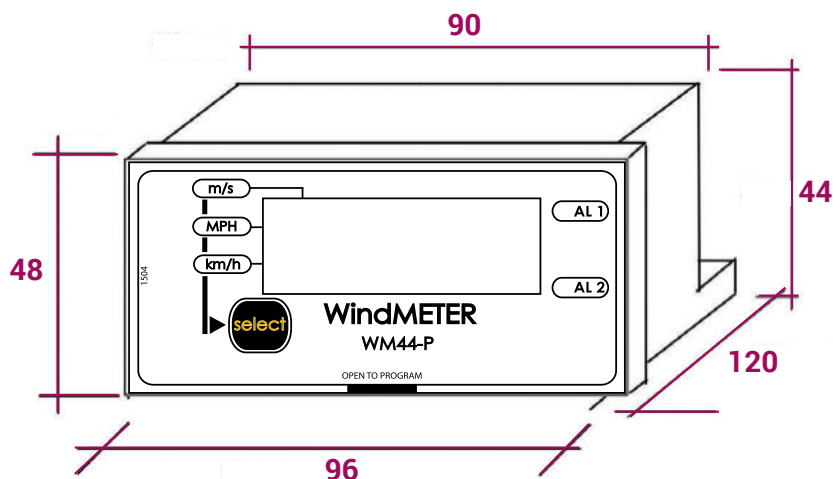
### ELECTRICAL SPECIFICATIONS

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

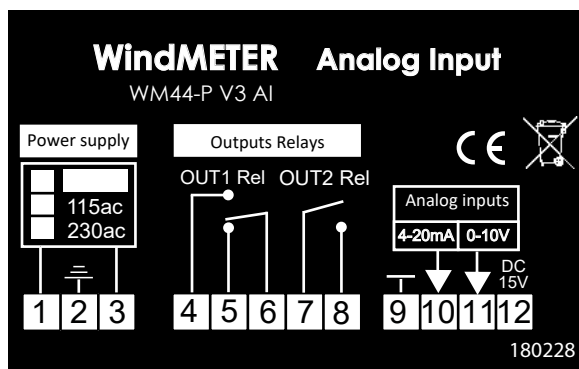
### MEASUREMENT

Accuracy	±1%
	999 km/h
	999MPH
Maximum display	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

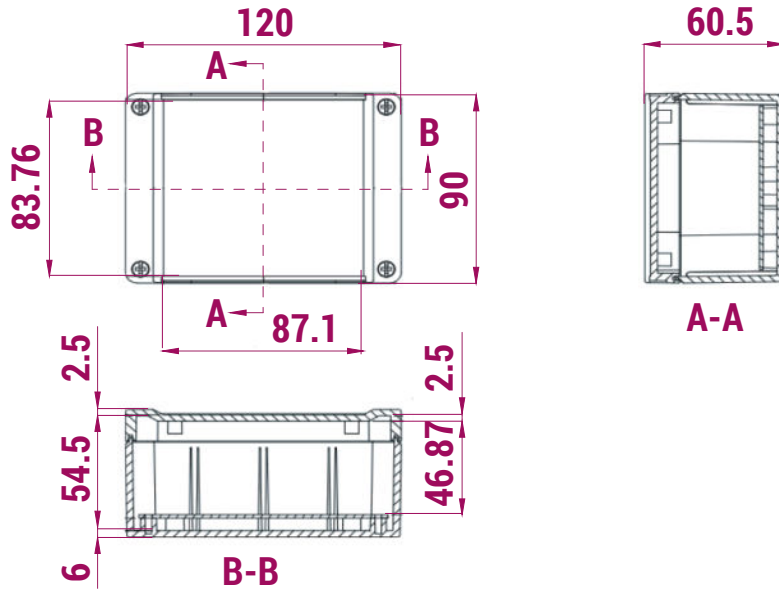
### ELECTRICAL SPECIFICATIONS

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

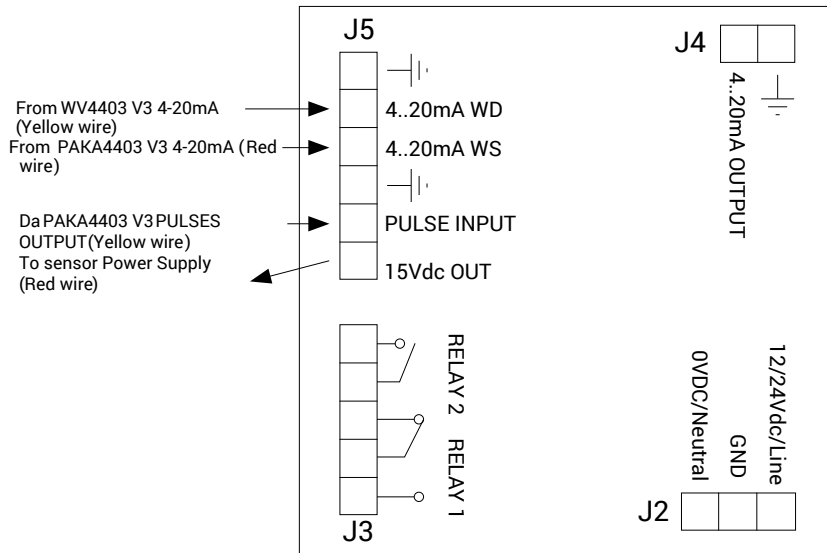
### OUTPUTS

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**

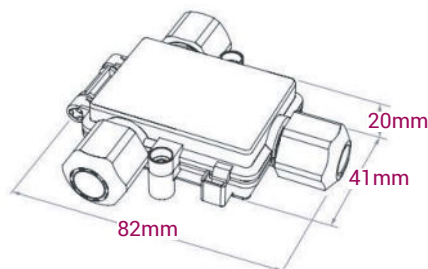


J3: Output relays connector.

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