

MESA

Ultrasonic Anemometer WNT

TECHNICAL DESCRIPTION

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Congratulations on your new **Ultrasonic Anemometer WNT!** You have made an excellent choice in buying this innovative technology which offers a variety of advantages in its use. In order to avoid handling errors you should take a few minutes and read these operating instructions carefully. When you have read these instructions you should keep them safely at a place where they can be easily accessed so that you can refer to them again at any time.

The information and data contained in these Operating Instructions may be modified without prior notice. No part of this documentation may be reproduced or transmitted for any purpose whatsoever, regardless of the mode or the means, electronically or mechanically, without the prior permission in writing of MESA Systemtechnik GmbH.

Please do not try to open the housing of the anemometer. There are no parts inside which you could maintain.

All data in this publication have been compiled and checked with utmost diligence, nevertheless errors and mistakes cannot be totally excluded.

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1.0 Introduction

The WNT Ultrasonic Anemometer operates on the principle of differential propagation measurement. The device determines the wind speed and wind direction without being influenced by air pressure, relative humidity and temperature. The measurement data is outputted serially and via an analog interface. As soon as the operating voltage is applied, the WNT is ready to operate in accordance with the selected configuration.

For the evaluation of wind values, "WindDisplay" monitoring software can be offered as an option. This displays the instantaneous wind speed and wind direction values outputted via a serial interface on the PC screen and graphically represents the course of the current day's values. For storing the day's values, the software generates a text file for further evaluation. This can be opened in Excel without problem.

1.1 Measuring parameters

Winds arise through horizontal differences in atmospheric pressure, which in turn are primarily due to temperature differences. Temperature and pressure differences between various areas are caused above all through dissimilar insolation and differences in the thermal qualities of land and water surfaces. High volume winds occurring in this manner are as a rule influenced by the rotation of the earth.

The WNT Ultrasound Anemometer determines the horizontal wind speed and wind direction components of the three-dimensional wind vector, i.e. the parallel flow to the surface of the earth.

1.2 Packaging list

Please assure that after opening the WNT packaging, the following items are enclosed:

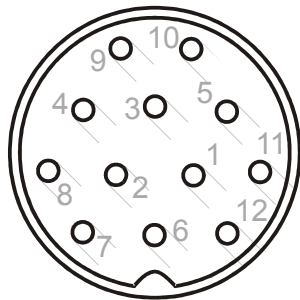
- WNT Ultrasonic Anemometer
- WNT Ultrasonic Anemometer Technical Description
- Euchner cable connector BS12K
- Euchner cable connector SS12K
- Monitoring Software „Winddisplay“ (optional)

1.2 Technical data

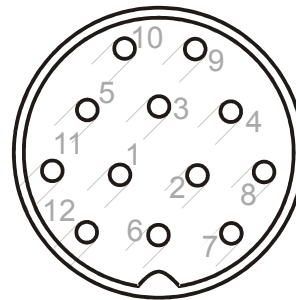
Measurement range:	wind velocity	0..40m/s*
	wind direction	0..60m/s*
		0..359°
Resolution:	wind velocity	0,1m/s
	wind direction	1°
Accuracy:	wind velocity	± 0.2m/s (at v 10m/s)
		± 2% (at v 10m/s)
	wind direction	± 2°, measured at v > 0.3m/s)
Sample rate		>1Hz
Power supply:	DC	9..33VDC
Power consumption:	typical	0,3A (12VDC)
Operating temperature:		-40°..+60°C
Enclosure rating:		IP67
Dimensions:	(inclusive mast mount)	Ø 290mm, Height 320mm
Weight:		3,6kg
Mounting:	with clamping screw	Ø 42 or 48mm mast mount
Interface:		RS232/RS422/RS485 *
Analog output:	wind velocity	0..1/5/10V/ 0 or 0/4..20mA*
	wind direction	0..1/5/10V/ 0 or 0/4..20mA*
	R _{load} output voltage	2K Ω
	R _{load} output current	250Ohms

* The exact configuration or design can be taken from the part number or the identification label of the respective device.

2.0 Pin connection



J1 (BS12K)

Cable connector
solder side viewing

J2 (SS12K)

2.1 J1 12-pin Euchner Type SD12K (Pin connector)

Cable connector (female) BS12K

Pin	Signal	Signal description	Remarks
1	N.C.	-	-
2	N.C.	-	-
3	GND	Power supply ground	-
4	Vcc	Power supply	9..33VDC
5	TxD1	RS232 Transmit Data	RS232/channel 1
6	RxD1	RS232 Receive Data	RS232/channel 1
7	SGND	RS232 Serial ground	RS232/channel 1
8	TxD2+	RS422 transmit +	RS422/channel 2 *
9	TxD2-	RS422 transmit -	RS422/channel 2 *
10	RxD2+	RS422 receive +	RS422/channel 2 *
11	RxD2-	RS422 receive -	RS422/channel 2 *
12	N.C.	-	-

For RS485 connect Pin 8 with 10 and Pin 9 with 11.

Attention: Serial ground (SGND) is not identical with Power supply ground (GND).

2.2 J2 12-pin Euchner Type BD12K (Socket connector)

Cable connector SS12K

Pin	Signal	Signal description	Remarks
1	N.C.	-	-
2	N.C.	-	-
3	N.C.	-	-
4	N.C.	-	-
5	N.C.	-	-
6	AGND	Analog ground	-
7	AGND	Analog ground	-
8	Vw	Analog output 1	wind velocity*
9	Vd	Analog output 2	wind direction*
10	N.C.	-	N.C.
11	N.C.	-	N.C.
12	AGND	Analog ground	-

Attention: Analog ground (AGND) is not identical with Power supply ground (GND).

* The exact configuration or design can be taken from the part number or the identification label of the respective device.

If socket connector (J2) is not in use, a protection cap should be mounted. An Aluminium protection cap (Id.-N° 31400009) can be supplied by MESA Systemtechnik GmbH.

3.0 Interface configuration

3.1 RS232 interface

The WNT can easily be linked with a PC by using the integrated RS232 interface (COM)

Baud rate:	4800 Baud	Parity:	None
Data length:	8 Bit/character	Stop-Bit:	1

In the standard configuration, data is outputted every 3 seconds via the RS232 interface. An interface setting is optionally available with which the WNT Ultrasonic Anemometer outputs its data via the interface only after receipt of the request character string "M <CRLF>". Likewise optionally available is an RS422/RS485 interface with unsolicited data output or with data output on request.

3.2 Start RS232

While commissioning the RS232 interface, it should be noted that a PC interface handshake signal is required. For this, the PC connecting cable must be wired on the computer side as follows:

25-pin SUB-D connector:	9-pin SUB-D connector:
Pin 4 to Pin 5	Pin 1 to Pin 4 to Pin 6
Pin 6 to Pin 8 to Pin 20	Pin 7 to Pin 8

3.3 RS 422/RS485 Party Line Operation

Using this mode of operation, several MESA METEO sensors such as the Computerized Solidstate Solar Sensor and Computerized Climate Measurement Module can be interconnected as a measuring network. The METEO sensors communicate via an RS422/485 interface. With this, one device is configured as the bus master device and all other sensors are set as SLAVES. The bus master device now continuously selects all sensors one after the other and collects data from each. Each addressed measuring device places its standard data protocol onto the RS422/RS485 bus. The sensor data collected in this way can be requested block by block by the user by sending the request character string "M <CRLF>" via the RS232 interface.

A WNT cannot be used as the bus master device.

When operating a measuring network or a weather station, it should be noted that sensors may be fitted or removed only with power switched off.

3.4 Data protocol

Serial data format: "#Zx.y,Vxx.x,DxxxCRLF"

#	Address code ultrasonic anemometer
Z	Key code "Status"
x	Status code (4 and 6) see below
y	Error code (1 and 5) see below
V	Key code "wind velocity"
xx.x	Wind velocity (m/s)
D	Key code "wind direction"
xxx	Wind direction (°)
Cr	Carriage Return
Lf	Line Feed

Status code X

4	Correct measurement value
6	measuring track disturbed

Service code Y

1	not relevant (for MESA internal use only)
5	not relevant (for MESA internal use only)

3.5 Analog output

Voltage: 0..10V
Current: 0/4..20mA (live zero)

Channel 1	wind velocity	0..40m/s	= 0..10V, 0 or 0/4..20mA
		0..60m/s	= 0..10V, 0 or 0/4..20mA
Channel 2	wind direction	0..359°	= 0..10V, 0 or 0/4..20mA

Attention: Analog out is always related to analog ground.

If WNT is configured for 4..20mA output, the read out value will be set to 0mA under following circumstances:

- System failure
- Status code 6 - measuring track disturbed

4.0 Installation information

For installation, the device is to be aligned in accordance with the North arrow which is located laterally on the black plastic plate. The connectors point to the South. The device is secured with a clamping screw (5 mm hexagon socket). An earth cable must be connected to the chassis connection screw (wrench size 10). An installation location should be selected for the Ultrasound Anemometer at which winds can freely circulate around the WNT and where no unwanted eddying will occur, for example due to house walls, masts, etc.

5.0 WNT configuration / Part Number and accessories

Id.	Description
	Ultrasonic Anemometer WNT electronically controlled transducer heating included, wind velocity 0..40/60m/sec., direction 0..359°, die-cast aluminium housing, protection rating IP67, RS232 interface 4800 Baud, operating temperature -40°..+60°C, fixing via mast mount Ø 42 mm, power supply 9..36VDC/0,6A max., 12-pin Euchner mating connector
01000010	Analog interface: 0..40m/s = 0..10V wind velocity 0..359° = 0..10V wind direction = 0..10V wind direction
01000015	Analog interface: 0..60m/s = 0..10V wind velocity 0..359° = 0..10V wind direction
01000020	Analog interface: 0..40m/s = 0/4..20 mA wind velocity 0..359° = 0/4..20 mA wind direction
01000025	Analog interface: 0..60m/s = 0/4..20 mA wind velocity 0..359° = 0/4..20 mA wind direction
01000060	Shock absorber (B11 adapter) To be mounted between top of pole and mast mount flange of WNT/RSS/RKM sensor, reduces schock/vibration to the sensor
31400002	BS12K cable connector for WNT, RKM, RSS (J1) 69,-
31400006	SS12K cable connector for WNT, RKM, RSS (J2) 62,-
31400009	aluminium protection cap ST-622/12 for WNT, RKM, RSS (J2)

6.0 Mechanical dimensions

