

BSA, BSA1 – Multiparametric Biaxial sonic anemometers (Rev.3 140121)



Description

BSA Sensors are sonic static biaxial anemometers for the measure of the following parameters:

- Wind speed and direction, U-V Cartesian components of wind speed (Basic version models: BSA and BSA1); only for BSA model it's possible add the following parameters:
- Air temperature and humidity (option "T");
- Global solar radiation (option "S") or Atmospheric precipitation (option "P");
- Atmospheric pressure (option "B")
- Heater (option "R")

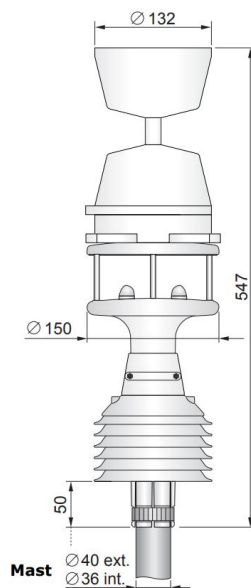
All models are provided of compass that allow to install the anemometer in any mobile application without the need to orient the wind direction element. BSA are available with RS232, RS485 and SDI12 serial ports with NMEA, MODBUS-RTU and SDI-12 communication protocols. All versions have two analog outputs, for wind speed and direction measures, configurable in factory from 4...20mA (standard), 0...1Vdc, 0...5Vdc, 0...10Vdc (to specify at the order). Optionally, you can calibrate the sensor with reference to Ilac-MRA (ACCREDIA) laboratory.

Advantages

- ✓ The absence of moving parts minimizes the maintenance of the instrument;
- ✓ High sensitivity for very low speed detection, not detectable by traditional methods;
- ✓ Low power consumption of the instrument allows installation on remote sites, with power from photovoltaic panel and buffer battery;
- ✓ The heating option "R" (only for BSA model) prevents snow accumulation and ice formation, allowing accurate measurements in all environmental conditions;
- ✓ Fast and easy installation (pole mounting diameter 40mm), integrated alignment facilitated alignment;
- ✓ The available measurement options combine in a single, compact and lightweight instrument, the principal magnitudes of interest in weather stations;
- ✓ The MODBUS-RTU output allows the creation of instrument networks.

Main applications

- ✓ Portable Weather stations;
- ✓ Mobile laboratory for environmental monitoring;
- ✓ Marine buoys
- ✓ Highways, tunnels, undergrounds and runways
- ✓ Renewable energies
- ✓ Building automation



Note: DeltaOhm product with customized Geoves configuration

Technical features

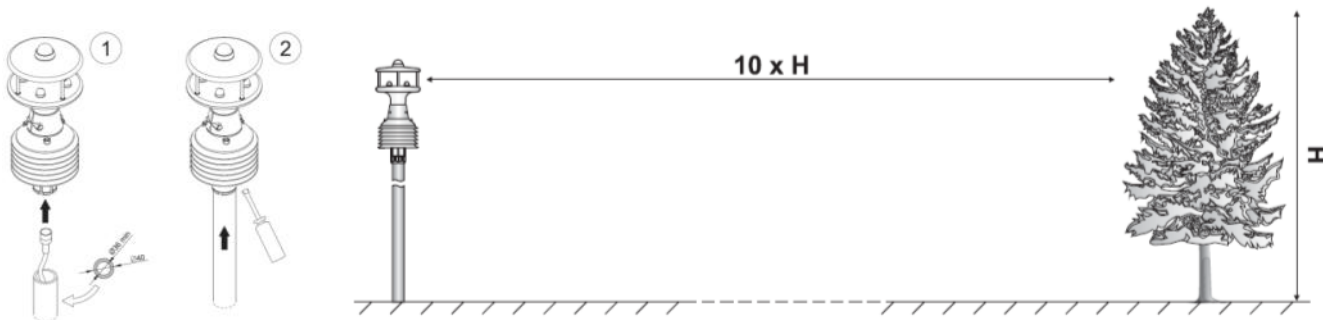
Modello BSA Measurement:	Wind speed	Wind direction	Temperature (option T)	Rel. humidity (option T)	Pressione atm. (option B)	Solar radiation (option S)	or Rainfall (option P)
Transducer	Ultrasuoni	Ultrasuoni	Pt100	Capacitivo	Piezoresistivo	Termopila	Tilting bucket and 127cm ² collector
BSA range	0...60 m/s	0...360°	-40...+60 °C	0...100%UR	600...1100 hPa	0...2000 W/m ²	0...2000mm/h
BSA1 range	0...50 m/s	0...360°	/	/	/	/	/
Resolution	0,01 m/s	0,1°	0,1 °C	0,1%	0,1 hPa	1 W/m ²	0.2mm
Accuracy	± 2% @0...35 m/s ± 3% @ > 35 m/s	±2° RMSE da 1m/s	± 0,1% v.m.	± 2%UR (media)	±0,5 hPa@20°C	2^ classe ISO9060	<2% up to 120mm/h

General features

Compass	Magnetic Transducer, range 0...360°, resolution 0,1°, accuracy ± 1°
Power supply	10...30Vdc (12Vdc with heating)
Absorbed power	26mA @ 12Vdc without heating, 6W with heating
Serial outputs	BSA: RS232, RS485, RS422 and SDI-12; BSA1: only RS485 Modbus-RTU
Communication protocols	NMEA, MODBUS-RTU, SDI-12
Analog outputs and versions	-I (standard): n.2 4...20mA outputs (n.1 for wind speed e n.1 for wind direction) On demand: -V1: 0...1V, -V2: 0...5V e -V3: 0...10V (power 15...30Vdc)
Working Temperature	-40...+80 °C (tip. -40...+60°C. Note: the continue h24@80°C working can deteriorate electronic equipment faster)
Mounting	On vertical pipe (øemax40mm øimin36mm)
Protection	IP66
Housing	AISI 316 and plastic LURAN®S (ASA)
Dimensions and weight	Basic Vers.: ø150 x h180 mm, 600g Multiparametric versions only for BSA model (with options T-B-P(or S)): ø150 x h547 mm, 1.000g

Mounting

The instrument must be installed in the exactly vertical position and open field, away from surrounding objects that can alter the natural airflow. Any surrounding objects (buildings, trees, trellises, etc.) must be at a distance of at least 10 times their height. In the presence of surrounding objects it is advisable to install the instrument at about 10m in height. The support pole, with a maximum outer diameter of 40mm and a minimum inner diameter of 36mm, must be placed on a stable surface.



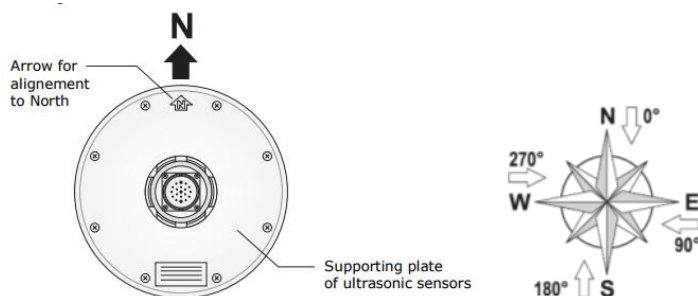
Installation in base of the application

Application	Installation height	Localization and orientation
Meteorology (ref. WMO Annex 8)	2...10m from the ground	Installation in open field, at the top of the pole and in any case not exceeding 10m in height, away from vertical obstacles at least 10 times the height of the obstacle. The sensor should be installed on a cantilever support at least 4 times the diameter of the main support pole. Installation on top of hills where turbulence may be present is not recommended.

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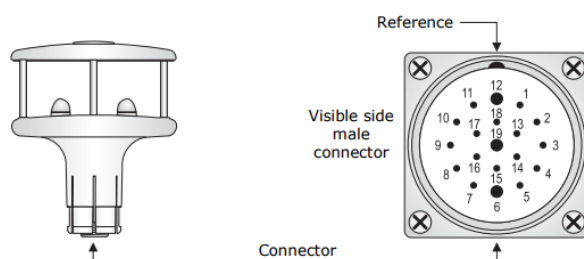
Instrument orientation

The instrument is equipped with a magnetic compass and the speed and wind direction measurements are automatically compensated and referenced to the magnetic North, even if the instrument orientation is not compared to the North. This allows for correct measurements even in the case of mobile installations. If you still want to orient the instrument during installation, the container has arrows to facilitate the operation. To perform an accurate alignment, connect the instrument to the PC (see the following chapters for communication protocols), then rotate the instrument on its vertical axis until the compass measurement is $0.0^\circ \pm 0.1^\circ$. When assessing wind direction, please note that the geographic North differs from the magnetic north indicated by the compass. The difference, called magnetic declination, depends on the area where the instrument is installed (eg about 15° in North America and less than 3° in Europe). If speed and wind direction measurements are provided in polar coordinates, the 0° angle corresponds to wind blowing from the North.



Electrical connection

All connections are made via the 19-pin Male Connector M23 located at the bottom of the instrument. The figure and table below show the numbering and the function of the contacts of the connector:



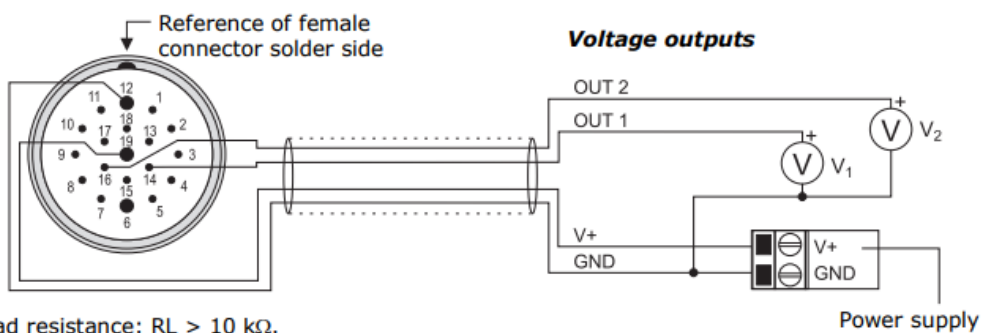
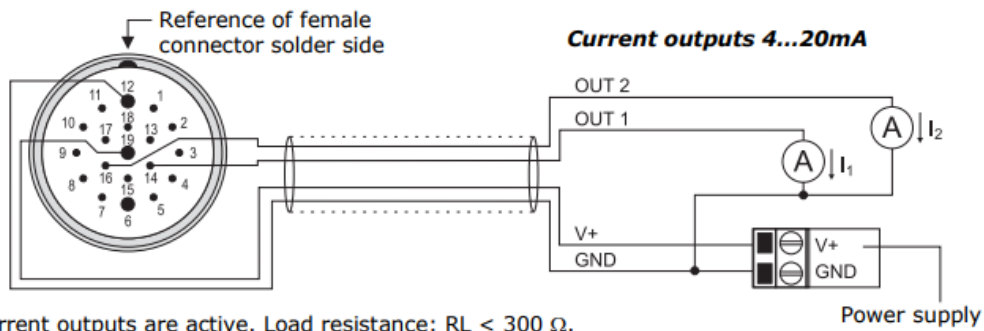
N. Contact	Symbol	Description
1		Not connected
2	RX SDI	Data line for SDI-12 connection
3	RX +	Serial receive (input) positive
4	HEAT -	Heater power supply negative
5	HEAT +	Heater power supply positive
6	HEAT -	Heater power supply negative
7	HEAT +	Heater power supply positive
8	GND	Serial ground
9	TX -	Serial transmission (output) negative
10		Not connected
11		Not connected
12	GND	Instrument power supply negative
13	RX -	Serial receive (input) negative
14	OUT 1	Analog output 1 positive
15	GND	Analog ground
16	OUT 2	Analog output 2 positive
17	TX +	Serial transmission (output) positive
18	V +	Instrument power supply positive
19	V +	Instrument power supply positive

The BSA sensor requires a power supply voltage of 10...30Vdc. The heating system, if present, requires a voltage of 12Vdc.

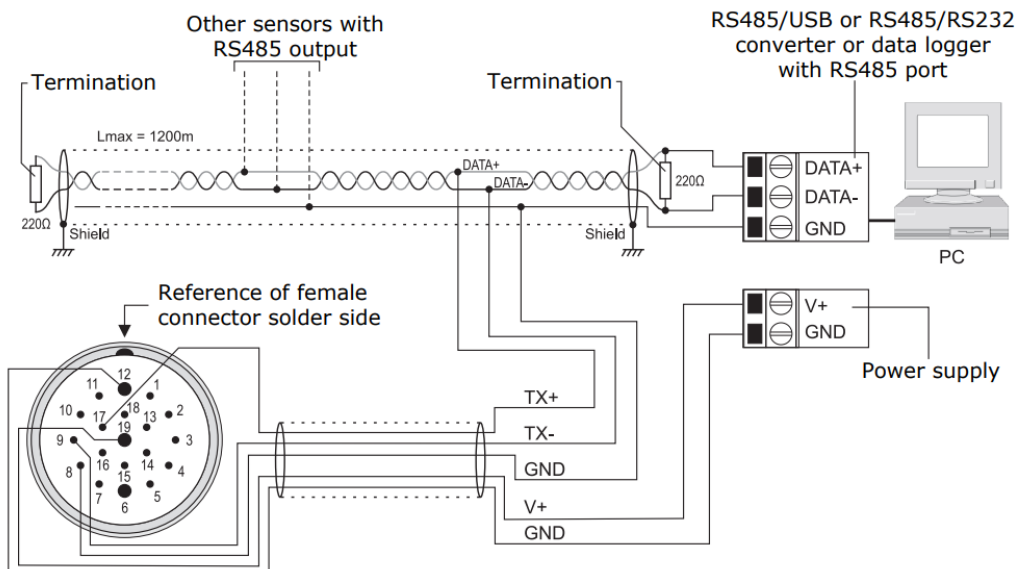
The TX and RX signal connection depends on the chosen serial type connection.

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Wiring of analogic outputs



Wiring of RS485 Modbus RTU serial output



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