Sistemi per monitoraggi
ambientali e telecontrolli

Atmospheric Pressure Sensor

Mod. BAR

Manual

Summary

1.1 Packaging and mounting

The sensor is placed in its original packaging already mounted.

1.2 Functioning and features

BAR sensor, to measure atmospheric pressure, in an **electronic barometer** with standard electrical output easily acquirable by a datalogger.

The **low consumption** (<2mA) and the compact size make it an **instrument suitable for meteorological applications**, **environmental monitoring** systems and data acquisition systems in **measurement campaigns**.

His **shape with small dimensions** allow an **easy installation both outside (IP65 box) and inside** cabinets or rooms.

It uses a piezoresistive bridge tranducer that provides atmospheric pressure measurement with high accuracy, excellent repeatability, low hysteresis and stable temperature behavior. The output signal is linearly proportional to atmospheric pressure. It's made in accordance to **WMO** norms (World Meteorological Organization). The sensor is available with **0÷2Vdc, 4÷20mA or RS485/Modbus outputs.**

Sensor type	***Wind speed***
Type	BAR
Compliance	WMO
Measuring range:	800 ÷ 1100 hPa (500-1100)
Transducer type	Piezoresistive
Supply	10÷30Vdc
Electrical output	0-2Vdc; 4-20mA; RS485; ModBus
Output impedance	100 Ohm
Protections	Electrical Discharger
Accuracy	0.3 hPa @ 20°C
Sensibility	0.05 hPa
Resolution	0.05 hPa
Time constant (dynamic characteristics)	< 2 sec
Operation intervals	-40 ÷ +60°C
Made of	ABS
Weight	270 g
Size	120x80 mm; h55 mm
Consumption (max)	<0.1W

Features written in the table can be modified. For updating always see the latest version of the datasheet.

1.3 Available electrical outputs and interfacing

The sensor is usually available with 4 different outputs (pre-configured in factory), that correspond to 4 order codes, respectively (named XXX the sensor code):

XXX – **A** : Sensor with voltage output 0-2Vdc = 800-1100hPa [**hPa = (V• 300)/2 + 800**]

XXX – **B** : Sensor with current output 4-20mA = 800-1100hPa not self-powered [**hPa = 300•(mA - 4)/16 + 800**]

XXX – **C** : Sensor with digital output RS485 o ModBus- see below.

For connections to IP68 connector, see the sensor datasheet. The supply includes a cable with ends for terminal block or PS2.

In case of sensors with digital output, there are two cases:

- ***RS845 Interface (Half duplex)***
  - Standard communication settings are:
    baudrate: **9600**
    parity: **N**
    data bit: **8**
    stop bit: **1**

  - Data request command is: **013CR** (xxx represents the sensor ID always expressed in 3 digits by putting 0 for numbers less than 100, or 10, example 013;
    CR = Carriage Return; if set at 000 answer all sensors on the same line 485, example 000CR). See § 1.8

  - The response to any sensor request is the measure value in the programmed engineering unit (es. °C o %Rh), so isn't necessary calculate the value again.

- ***RS845-MODBUS Interface (Half duplex)***
  - Standard communication settings are:
    baudrate: **9600**
    parity: **N**
    data bit: **8**
    stop bit: **1**

  - The sensor answers to MODBUS RTU command only with **FUNCTION CODE 0x03** (Read Holding Register), on the same ID of the RS485; the protocol allows the reading of the measure value, which is stored in two MODBUS registers with the **IEE754 representation.** The floating point value is represented with 32 bit, occupying two MODBUS registers of 16 bit.
  - Modbus addresses to be used are:

    40002 - 40003 (2 registers required with a single command)

1.4 Calibration

After having assembled the sensor, it is functionally tested, connecting It to the proper measurer, where there is also connected a precision barometer, used as a reference tool. The testing is made comparing various sensor measures in different conditions. The average deviation from the measurements made by the goniometer, mustn't differ of a value higher than the tested sensor accuracy.

1.5 Cleaning and maintenance

Periodically check that there aren't obstacles that block the metal measurement nozzle for the air transition.

1.6 Installation

The installation can be made both inside and outside a box, making sure that there is air circulation, to maintain internal pressure equal to the external one.

1.7 Validity of certificates

Unless otherwise indicated, the sensor warranty is 24 months from the manufacturing date, while the validity of the certification is 12 months from first use if stored in a depot suitably to the characteristics written on the datasheet.

1.8 ID's sensor for serial communication

ID for RS485*	Measure
1	Temperature
2	Humidity
3	Global Solar adiation
4	Wind Direction
5	Evaporation
6	Hydrometic Level
7	Phreatic Level
8	Battery Voltage
9	Wind Speed
10	Rain Fall
11	Net Solar Radiation
12	Snow Level
13	Pressure
14	Voltage
15	Evapotranspiration
16	Leaf wetness
17	pH
18	Conductivity
19	Counter (digital)
20	Cracks measure
21	Inclinometer
22	Load Cell
23	Redox
24	Oxygen Solution
25	Torbidity
26	Extensimeter
27	Linear Moving
28	Frequency
29	CH4

30	THC
31	NMHC
32	Current
33	Flow
34	CO
35	NO
36	NO_X
37	NO_2
38	O_3
39	SO_2
40	Energy

* Check if it is the latest table