

BT8003BARO

High-Precision Digital Atmospheric Pressure Gauge Instruction Manual



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The BT8003BARO is a high-precision digital atmospheric pressure gauge, featuring a built-in digital pressure sensor with high integration, low power consumption, and excellent long-term stability.

It is widely applied in measuring atmospheric pressure across various industries, including industrial processes, meteorology, hydrology and water conservancy, as well as geological exploration.

1. Main Features

High-quality, highly stable digital pressure sensor

Integrated measurement of pressure and temperature

Full-range digital calibration with temperature error compensation across the entire temperature range

RS485 interface and MODBUS-RTU standard communication protocol

Protection against reverse power connection and over-voltage

Resistance to surges and electromagnetic interference

Fully stainless steel sealed structure with IP68 protection rating

2. Technical Parameters

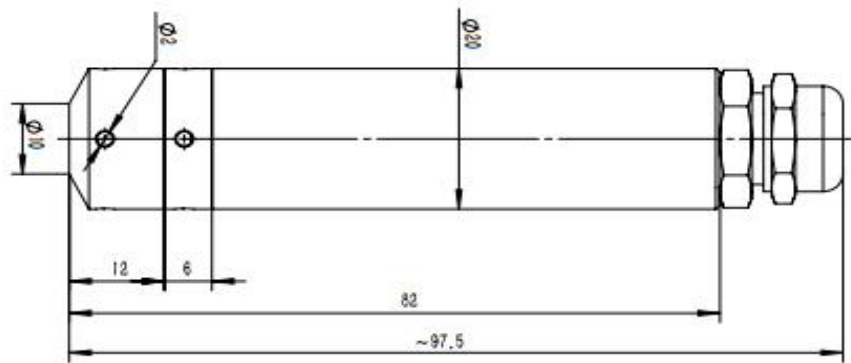
Main Performance Specifications	
Measurement Range	30KPa~110KPa
Accuracy	<±0.05% F·S
Long-term Stability	<0.05% F·S/year
Temperature Sensor	(Integrated within the pressure sensor): Temperature Measurement Range: -40~85℃
	Temperature Measurement Accuracy: ±0.8℃
Accuracy	< ±0.05% F · S
Long-term Stability	<0.05%F · S/year

Temperature Sensor (Integrated within the pressure sensor)	Temperature Measurement Range: -40~85℃
	Temperature Measurement Accuracy: $\pm 0.8^{\circ}\text{C}$
Temperature Characteristics	
Compensation Temperature	—40 to 85℃
Operating Temperature	—40 to 85℃
Storage Temperature	—40 to 125℃
Electrical Characteristics	
Power Supply Voltage	DC5~30V (typical 24V)
Power Supply/Protection	Reverse polarity protection, over-voltage protection
Output Method	RS485/MODBUS-RTU protocol
	Load Capacity: 128 transmitter nodes
Structural Characteristics	
Measuring Medium	Air
Housing Material	316L Stainless Steel
Cable Material	PVC or Polyurethane
Cable Specifications	Φ 6.3mm, 1 meter length or customized length
Environmental Characteristics	
Protection Rating	IP68

3. Power supply and RS485 wiring definitions

NO.	Color	Definition
1	Red	24V+
2	Blue	RS485+
3	Green	RS485-
4	Yellow	GND

4. Dimension (Unit: mm)



5. Instructions for Use

5.1 Power Supply

The instrument's external power supply can range from 5VDC to 30VDC and has reverse connection protection; it supports intermittent power supply operation.

5.2 Communication Interface

The instrument uses an industrial-grade RS485 communication interface, operating in half-duplex master-slave mode, with a transmission distance of up to 1200 meters. Baud rates supported are 9600, 19200, 38400, and 57600.

Serial port number: The serial port number of the communication port, default is COM1.

Set according to the actual serial port number connected to the computer.

Baud rate: The baud rate of the communication port, 9600, 19200, 38400, 57600 (Bit/s) are optional, default is 9600.

Parity bit: The parity method of the communication port: no parity, even parity, odd parity,

default is no parity.

Stop bits: The stop bits of the communication port, values 1, 2, default is 1 bit.

Data bits: The data bits of the communication port, fixed at 8 bits.

The supported communication protocol is the MODBUS-RTU protocol; after the external power supply is connected, the instrument can read atmospheric pressure values by sending commands through computer software or a MODBUS host (such as an RTU device).

5.3 Mounting

When used in conjunction with a water level gauge, the atmospheric pressure gauge is generally installed inside the RTU housing and must be open to the outside atmosphere.

6. Wiring

6.1 Instrument Wiring

The power and communication share a single four-core cable. The wires are red, yellow, blue, and green. Red and yellow are for positive and negative power, and blue and green are for positive and negative RS485 signals.

6.2 Connecting to a Computer

The following accessories are required to connect to a computer:

- RS232<->RS485 converter
- USB<->RS232 converter

or

- USB<->RS485 converter

Connection method: Connect the blue wire (RS485-A) of the cable to the RS485+ (T+) of the converter; connect the green wire (RS485-B) of the cable to the RS485- (T-) of the converter; plug the USB cable directly into the computer's USB port. The corresponding serial port number can be viewed in the Device Manager, and this serial port number should be used in the computer software.

7. Settings

7.1 Communication Settings

When using the instrument for the first time, ensure that the communication parameters are correct, mainly that the serial port settings of the computer or MODBUS host match the serial port settings of the instrument. The default serial port parameters of the instrument are: 9600, 8, n, 1; the default communication address is "1".

The instrument's communication parameters take effect immediately after being changed (no power cycle is required). At the same time, the communication parameters of the computer software must also be changed to match the instrument's parameters.

8. Reading Atmospheric Pressure

After connecting to a computer or RTU device, use the 03H function code in the MODBUS-RTU protocol within the software to collect the data; read two registers starting from register number 4, totaling 4 bytes, which correspond to the atmospheric pressure value.

Register Name	Register Address	Register Length	Data Type	Attributes	Description
Temperature	3	1	UINT	R	Temperature (° C), 2-byte integer, register value is signed data, actual temperature is the register value divided by 10. Example: 00 6C represents a temperature of 10.8° C FF 94 represents a temperature of -10.8° C

Atmospheric Pressure	4	2	ULONG	R	Atmospheric pressure (Pa), 4-byte long integer
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9. How to Use the MODBUS Protocol

9.1 Users connecting the instrument through software or dedicated equipment:

For detailed instructions on the MODBUS-RTU protocol, register read/write commands, and register definitions, please refer to the "Integrated Water Level and Temperature Recorder Communication Protocol V3.1".

9.2 Users connecting the instrument using a computer:

9.2.1 You can use serial port debugging software and refer to the calling methods in the "Communication Protocol" to operate the instrument;

9.2.2 You can use the manufacturer's debugging software for simple operations;

9.2.3 Users can develop their own dedicated operating software.