

Digital Conductivity Sensor Operation Manual



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Chapter 1 Specification

Specification	BH3701D/BH3740D
Power supply	9-36VDC
Size	Diameter: 30mm* Length: 165mm
Weight	0.55KG (including 10m cable)
Material	Main: PP
	Cable: PVC
Waterproof Grade	IP68/NEMA6P
Scope of Measurement	$0 \sim 30000 \mu\text{S} \cdot \text{cm}^{-1}$; $0 \sim 500000 \mu\text{S} \cdot \text{cm}^{-1}$
	Temperature: $0 \sim 50^{\circ}\text{C}$
Display Accuracy	$\pm 1\% \text{F.S}$
	Temperature: $\pm 0.5^{\circ}\text{C}$
Output	MODBUS RS485 /4-20mA
Storage Temperature	0 to 45°C
Pressure Range	$\leq 0.3 \text{Mpa}$
Calibration	Calibration of standard fluids and Alignment
Length of Cable	10m cable, can be extended to 100m
Warranty	Subject warranty is one year

Table 1: Conductivity Sensor technical specifications

Description: Product specifications are subject to change without prior notice.

Chapter 2 Product Description

For continuous monitoring and control of conductivity / TDS and temperature values of aqueous solutions. Widely used in power plants, petrochemical, metallurgy, paper industry, environmental water treatment, light industrial electronics and other fields. For example, monitoring and control of raw water and water quality of water production equipment such as power plant cooling water, recharge water, saturated water, condensate water and furnace water, ion exchange, reverse osmosis EDL, seawater distillation.

The sensor appearance is shown in figure 1. the sensor dimensions are shown in figure 2.



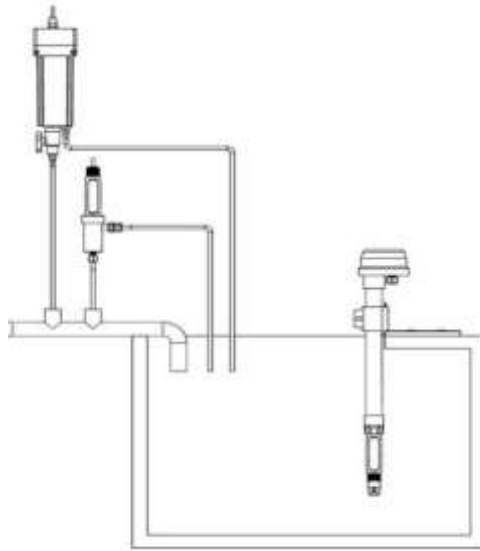
Figure 1: Conductivity Sensor appearance diagram

Chapter 3 Installation

3.1 Sensor installation

The specific installation steps are as follows:

Note: The plexiglass protection cap needs to be unscrewed before use to be able to measure.



Conductivity sensor installation schematic

3.2 Sensor connections

The sensor is properly connected according to the following wire core definition:

Core No.	1	2	3	4	5	6
Sensor wire	Transparent	Black	Red	Black	White	Green
Signal	+9-36VDC	AGND	RS485 A	RS485 B	4-20mA+	4-20mA-

Chapter 4 The Calibration of sensors

The conductivity sensor has been calibrated before leaving the factory, if you need self-calibration can be operated according to the communication protocol.

Chapter 5 Communications Agreements

The sensor is equipped with MODBUS RS485 communication function, communication wiring please refer to this specification 3.2. A specific MODBUS-RTU table is shown in the table below.

Communication configuration: 9600 N 8 1						
Postal address: 1 Can be modified by broadcasting address 255						
Communication protocol: MODBUS RTU; Salinity unit conversion: 1%=10PPT=10000PPM						
Function Code 03 Reading 06 Modify						
Address	Item	Default	Decimal	Range	Numeric data type	Permissions
0-1	Conductivity/us	-	1	uS	Long integer	Read-only
2-3	Temperature	-	1	℃	Long integer	Read-only
4-5	Electrode resistance	-		Ω	Long integer	Read-only
6-7	Temperature resistance	-		Ω	Long integer	Read-only
8-9	TDS		1	mg/L	Long integer	Read-only
10-11	Salinity			PPM	Long integer	Read-only
12	Conductivity calibration	1413	0		Signed integer	Read & Write
13	Buffer coefficient	10	0	0-50	Signed integer	Read & Write
14	Postal address	1		1-253	Signed integer	Read & Write
15	Temperature type	0	0	0: NTC10K 1: Manual	Signed integer	Read & Write
16	Manual temperature	250	1		Signed integer	Read & Write
17	temperature correction	0	1		Signed integer	Read & Write
18	Conductivity linear compensation	1000	3		Signed integer	Read & Write
19	Dynamic conductivity correction	0	2		Signed integer	Read & Write
20	Conductivity electrode constant	100	2		Signed integer	Read & Write
21	Conductivity temperature coefficient	200	2		Signed integer	Read & Write
22	Baud rate	0	0	0:9600 1:19200 2:38400		Read & Write
23	parity bit	0	0	0: no 1: odd number 2: even number		Read & Write
24-27	Reserved				Signed integer	Read & Write
28	Resistance 100K				Signed integer	Read & Write
29	Resistance 10K				Signed integer	Read & Write
30	Resistance 1K				Signed integer	Read & Write
31	Resistance 500K				Signed integer	Read & Write
32	Resistance 100K				Signed integer	Read & Write
33	Resistance 10K				Signed integer	Read & Write
34	Cond Calibrate button			0:Calibrate over 1:Calibrate start	Signed integer	Read & Write
35	Cond signal 1				Signed integer	Read & Write
36	Cond signal 2				Signed integer	Read & Write
37	Temp signal AD value				Signed integer	Read & Write

The following table shows the resistance versus conductivity (Set the “parameter”- “temperature coefficient”to 0.00%, “Temperature mode” is set to “NO”state; “electrode constant”represents K)

K=0. 01		K=0. 1		K=1	
Res	Con	Res	Con	Res	Con
50K	0. 200	50K	2. 000	50K	20. 00
40K	0. 250	40K	2. 500	40K	25. 00
30K	0. 333	30K	3. 333	30K	33. 33
20K	0. 500	20K	5. 000	20K	50. 00
10K	1. 000	10K	10. 00	10K	100. 0
5K	2. 000	5K	20. 00	5K	200. 0
2K	5. 000	2K	50. 00	2K	500. 0
1K	10. 00	1K	100. 0	1K	1000
500	20. 00	500	200. 0	500	2000

Res for Resistance; and Con for Conductivity

Chapter 6 Maintenance and Maintenance

Check the instrument once a year for the best, if the user unconditionally can be sent to our company to help check. The maintenance period of the cleaning electrode can be determined according to the cleanliness of the water sample, and the surface inside and outside the electrode should be free of fouling deposition. For stainless steel conductance electrode and platinum conductance electrode, if contamination is found, it should be cleaned in time, brushed with 50% warm detergent (or household soap powder) and nylon brush, and then washed inside the electrode with distilled water. Ensure no grease deposition on the surface of internal and external electrodes. Do not touch the electrode with your fingers; clean the deposit with strong adhesion with 2% dilute hydrochloric acid solution, then wash it with clean water; for platinum black conductance electrode, do not brush the electrode head with brush or other substances, just rinse the electrode head with clean water; keep the cable and plug dry to ensure reliable contact.

