

VFA ELEKTRONİK

pHG-2091Pro
Online pH Analyzer
User manual

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Product description

The PHG-2091Pro online pH ORP meter has a built-in A/D conversion module and is compatible with a variety of analog signal electrodes. Complete functions, stable performance, easy operation, low power consumption, safety and reliability are the outstanding advantages of this instrument. This instrument is equipped with RS485 transmission interface, which can be connected to the upper computer through ModbusRTU protocol to realize monitoring and recording.

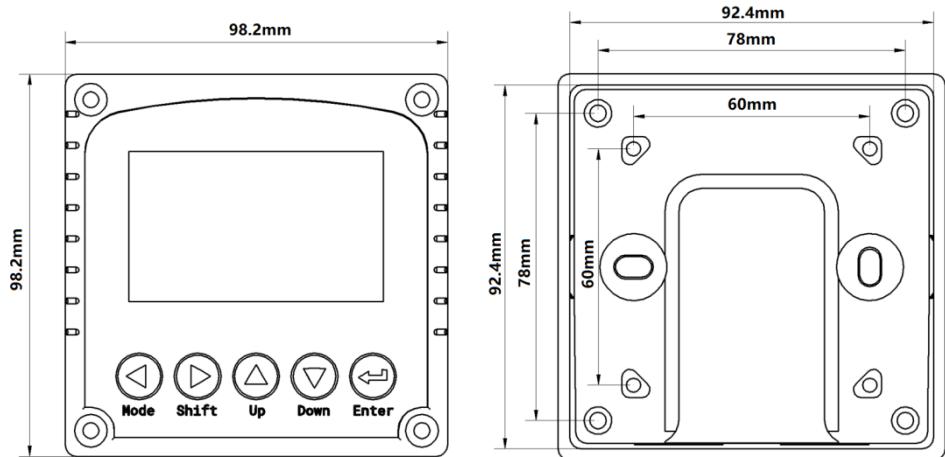
This meter uses a matching analog signal pH electrode (see appendix 2 for details), which can be widely used in solutions, wastewater pH or ORP values and temperatures in industrial occasions such as thermal power generation, chemical industry, metallurgy, environmental protection, pharmaceuticals, biochemical, food, and tap water. Continuous monitoring.

Product Specification Sheet

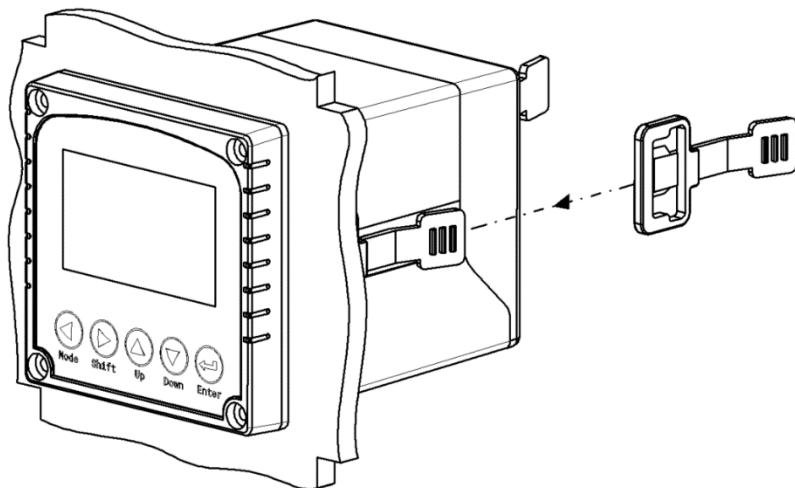
Specification	details
Name	Online pH/ORP meter
Shell material	ABS plastic
Power Supply	90 – 260V AC 50/60Hz
Power consumption	4W
Output method	Two 4-20mA outputs, RS485
Relay	5A/250V AC 5A/30V DC
Size	98.2×98.2×128.3mm
Weight	0.9kg
Communication	Modbus RTU
Measuring range	-2 ~16 pH -2000 ~2000 mV -30 ~130 
Measurement accuracy	±1%FS ±0.5
Waterproof level	IP65

Installation and wiring

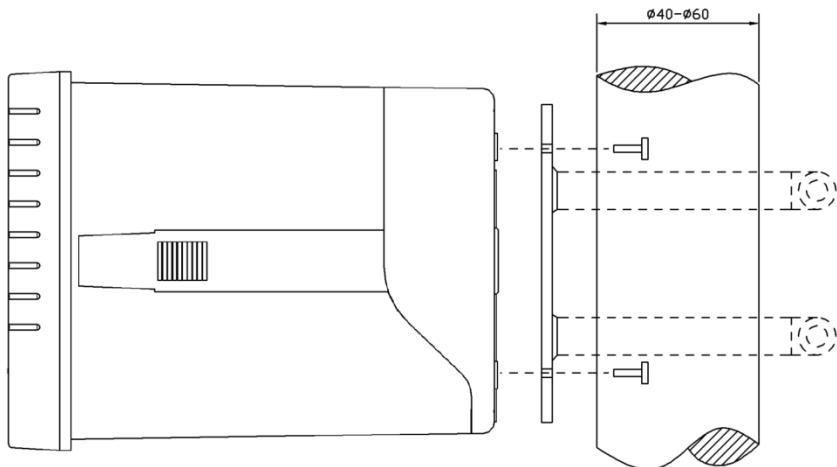
Instrument size chart



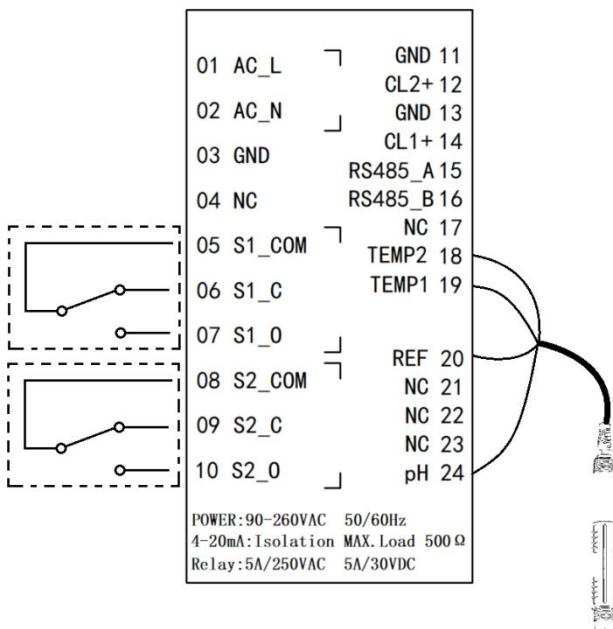
Embedded installation diagram



Pipeline installation diagram



Wiring diagram



1. Operation panel

The main panel of the pH controller has 2 modules, the LED LCD display module and the button module.

The user can set and adjust the parameters of the instrument through the 5 keys on the panel.

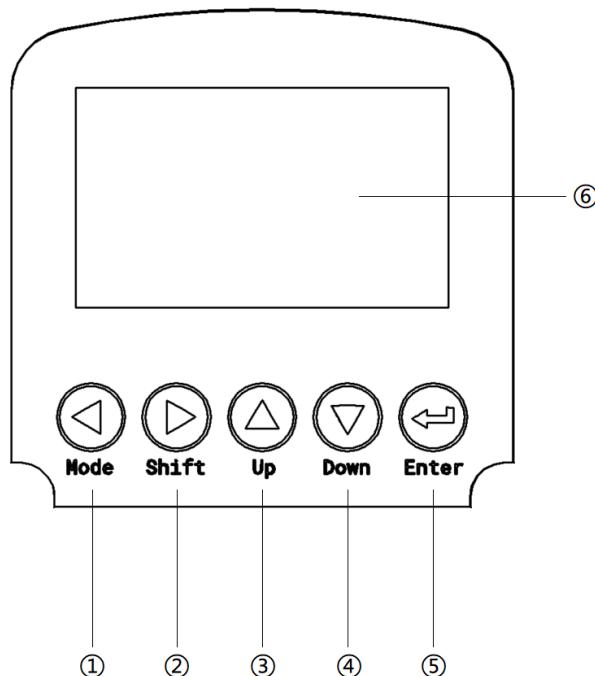


Figure 1 Measuring instrument operation panel

- ① Set/Exit button
- ② Select/change button
- ③ Up selection button
- ④ Down selection button
- ⑤ Confirm button
- ⑥ Instrument display

1. Measurement interface

After the start-up animation ends, enter the main measurement interface.

When the meter is working normally, the LED display shows the following contents.

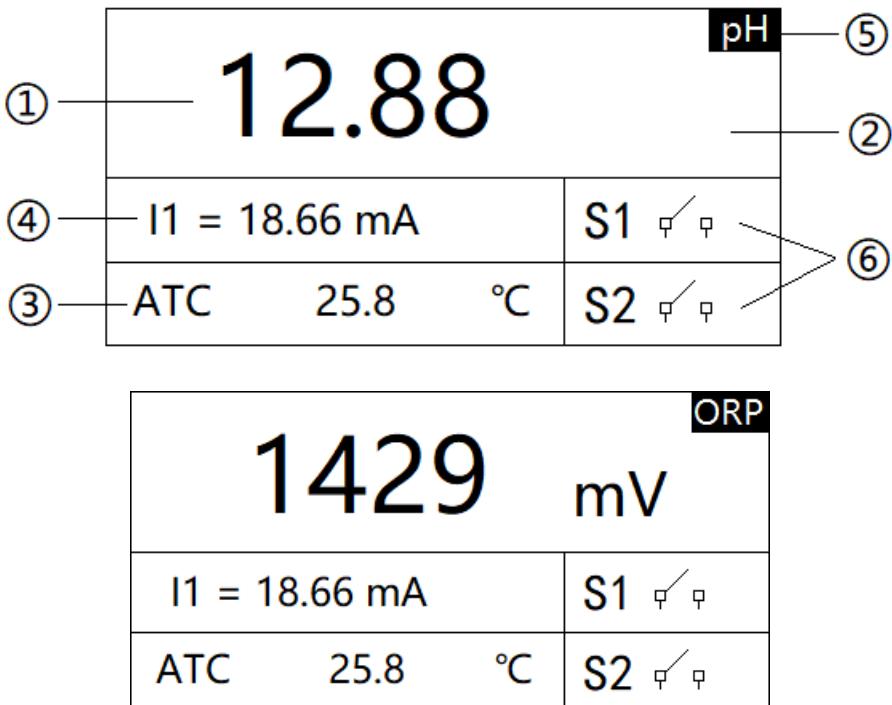


Figure 2 The main interface of measurement display

- ① Measurement reading
- ② Measurement unit
- ③ Measure temperature
- ④ pH/ORP The corresponding value of 4-20mA
- ⑤ Measurement mode
- ⑥ Over/low limit alarm prompt

Three, settings

Press the "Set/Exit button" to enter the password input interface.

PASSWORD
0000

Figure 3 Enter the password

Enter settings:

Enter the password "3700" to enter the setup menu.

SETUP	SETUP
1. Measure	3. RS485
2. 4-20mA	4. Temp

SETUP	SETUP
5. Relay1 Func.	7. Relay2
6. Relay1	8. Language

Factory Reset
► Yes
No

Figure 4 Setting menu

3.1 Measurement settings

Under this menu, the user can change the measurement method pH / ORP.

Measure
► pH
ORP

Figure 3.1 Measurement settings

3.2 4-20mA setting

In this menu, the user can change the corresponding value of 4-20mA and set the corresponding effective range.

4-20mA	
▶ Measure Value	
Temp	
Measure Value	Temp
4mA : 0000 pH 20mA : 1000 pH	4mA : +000 °C 20mA : +100 °C

Figure 3.2 4-20mA setting

3.3 Communication settings

In this menu, the user can change the communication address and communication speed.

RS485	
▶ Address	
B. R.	
Address	▶ 4800 bps 9600 bps 19200 bps
001	

Figure 3.3 Communication settings

3.4 Temperature setting

In this menu, the user can change the temperature compensation type and set the temperature manually.

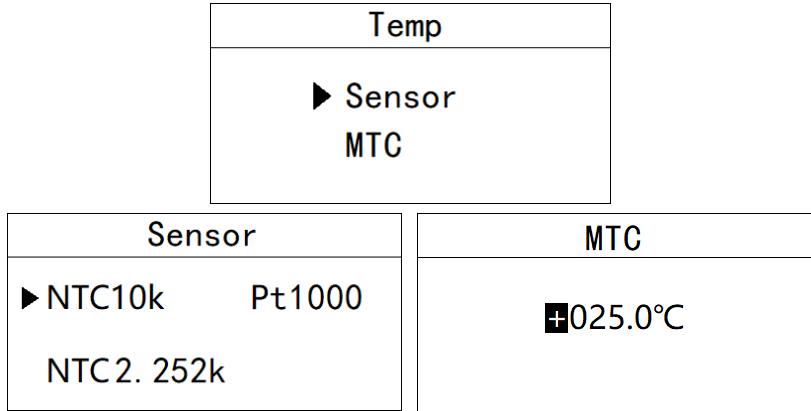


Figure 3.4 Temperature setting

3.5 Relay 1 setting

In this menu, the user can switch the relay 1 function, set the parameter alarm upper limit, alarm return difference, and alarm delay time.

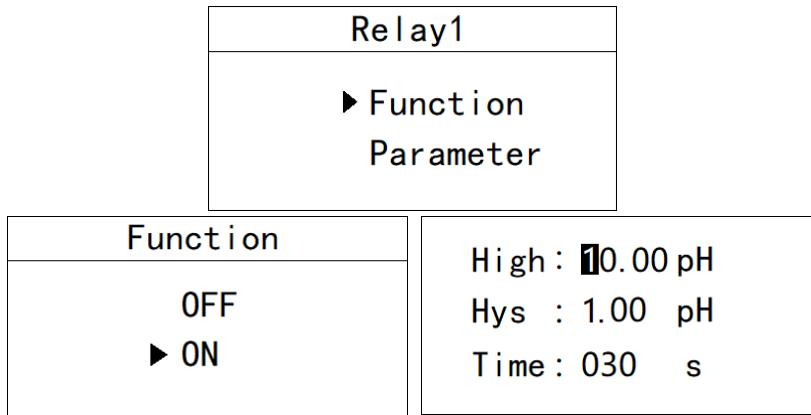
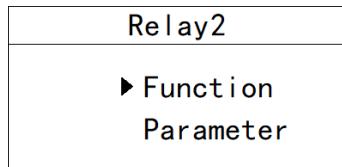


Figure 3.6 Relay 1 setting

3.6 Relay 2 setting

In this menu, the user can switch the relay 2 function, set the parameter alarm lower limit, alarm return difference, and alarm delay time.



Function	
OFF	Low : 10.00 pH
► ON	Hys : 1.00 pH Time : 030 s

Figure 3.7 Relay 2 setting

3.7 Language setting

In this menu, users can change the language of the system interface. Simplified Chinese and English are built-in.

Language
► 简体中文
English

Figure 3.11 Language setting

3.8 Backlight setting

In this menu, the user can change the backlight mode of the LCD screen, choose whether the backlight is always on or delay off (the default is delayed off), change the backlight brightness (brightness level 1-5, brightness increase), and change the contrast.

Backlight	
► Mode	
Parameter	
Mode	Parameter
► ON	Bright : 3
Delay 30s	Contrast : 2

Figure 3.12 Backlight setting

3.9 Restore factory settings

In this menu, users can restore all current output and relay parameters to factory parameters.

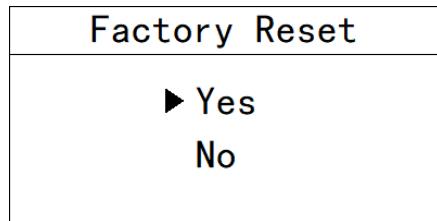


Figure 3.13 Restore factory settings

Four, calibration

Press the "Set/Exit button" to enter the password input interface.

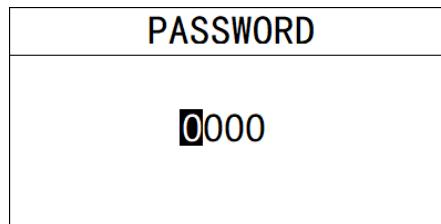


Figure 5 Enter the password

Enter calibration:

Enter the password "3900" to enter the calibration menu.

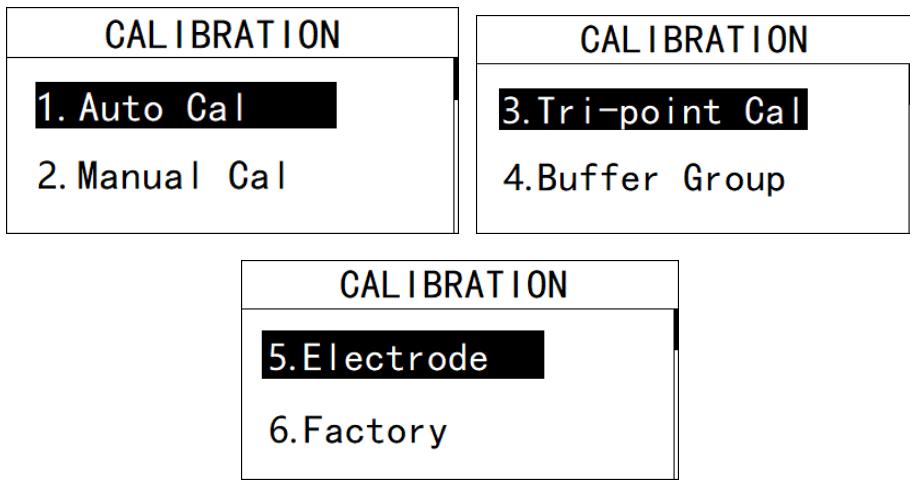


Figure 6 Calibration menu

4.1 Automatic calibration

In this menu, users can use standard solutions to calibrate the instrument at two points.

Auto Cal		1	Auto Cal		2
6.91 pH 23 mV 25.3 °C	► 6.86		4.08 pH 182 mV 25.3 °C	► 4.00 9.18	

Figure 4.1 Automatic calibration

4.2 Manual input calibration

In this menu, users can calibrate the pH of the known solution by themselves.

Manual Cal	
6.99 pH 46 mV 25.3 °C	07.00

Figure 4.2 Manual calibration

4.3 Three-point calibration

Put the electrodes into the standard solution of the specified concentration in order, and press the confirm key after the data is stable.

Tri-point Cal		1
9.12 pH -172 mV 25.3 °C	► 9.18	

Tri-point Cal		2	Tri-point Cal		3
6.91 pH 23 mV 25.3 °C	► 6.86		4.08 pH 182 mV 25.3 °C	► 4.00	

Figure 4.3 Three-point calibration

4.4 Buffer group

It is possible to modify the buffer standard set used in electrode calibration.

Buffer
► JJG
NIST
4.00 6.86 9.18

Figure 4.4 Buffer group

4.5 Electrode status

You can view the current zero potential millivolt value and slope of the electrode.

Electrode
Offset : 6.7 mV
Slope : 99%

Figure 4.5 Electrode status

4.5 Restore factory settings,

The calibration parameters can be initialized to factory parameters.

Factory Reset
► Yes
No

Figure 4.5 Restore factory settings

Appendix

1. Communication protocol

Communication parameters:

Baud rate: 4800, 9600, 19200 (default is 9600)

Serial data format: 8N1 (8 data bits, no parity, 1 stop bit)

Function code: 03

Device address: pH/ORP controller defaults to 1

Register definition:

Register address	Register definition	R/W	illustrate
0,1	Temp	R	Float CDAB
2,3	pH	R	Float CDAB
4,5	mV	R	mV,Float CDAB
7	Temperature mode	R/W	1:ATC 2:MTC
12	RTU Address	R/W	Modbus mailing address,pH/ORP Default is 1
11	Baud rate	R/W	4800,9600,19200,The default is 9600

Detailed example of communication format:

Data read instruction:

Address + function code + register start address + register read number + CRC check code (hexadecimal)

For example Tx: 02 03 00 02 00 02 65 F8

address	function code	Register start address	Number of read registers	CRC Check code
02	03	0002	0002	65F8

Data return instruction:

Address + function code + data length + data + CRC check code (hexadecimal)

For example, Rx: 02 03 04 40 0E B8 52 4E CD

address	function	Data length	Measured value	CRC Check code

	code			
02	03	04	400EB852	4ECD

Convert the hexadecimal number 400EB852 (note the data format) to decimal by a floating-point number converter, and get the value 2.23

HEX To DEC	
HEX :	400EB852
	\$40 \$0E \$B8 \$52
DEC :	2.23000001907349

2. Electrode parameter table for industrial online pH controller

Electrode type	pH/ORP				ORP		
Model	pH8012	pH8012F	pH8010	pH8010F	ORP8083		
Range	0.00~14.00pH			-1000~1000mV	-1000~1000mV		
Temp	0.0~80.0 $^{\circ}$ C						
Accuracy	2%, $\pm 0.5^{\circ}$ C		2%		2%		
Pressure	0.06MPa						
IP	IP68/NEMA6P						
Theoretical slope	$\geq 95\%$						

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