Datasheet

Single Channel Universal Controller

SUP-MDC-P1

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The MDC-P1 is an advanced, intelligent online multi-parameter controller. The channel's hybrid mode allows for the connection of either analog or digital sensors. This controller can measure a variety of parameters including pH, ORP, conductivity, dissolved oxygen, turbidity, sludge concentration, residual chlorine, ammonia nitrogen, nitrate nitrogen, COD, and more. Its continuous monitoring data can be transmitted to a DCS system via output transmission or communicated with a computer using the Modbus - RTU protocol via RS485 interface for remote monitoring and logging. It can also control cleaning systems or pumps. The controller offers an optional NB-IoT wireless transmission module, users can access real-time site conditions on mobile devices. This controller is widely used in various industries including thermal power, chemical fertilizers, metallurgy, environmental protection, pharmaceuticals, biochemistry, food, sewage, semiconductors, and tap water.

Applications

- Thermal power
- Chemical fertilizers
- Metallurgy
- Environmental protection
- Pharmaceuticals
- Biochemistry
- Food
- Sewage
- Semiconductors
- Tap water

Single Channel Universal Controller

Features

- IP66 ingress protection, suitable for more complex working conditions.
- Optional NB-IoT wireless communication and mobile APP for real-time data viewing.
- Power ground and signal ground design enhances anti-interference capabilities.
- 4.3-inch full-view color screen, with quick switching between digital display and real-time curve modes.

- high precision output circuit design, achieves 0.1% accuracy.
- Features manual and automatic temperature compensation.
- Current simulation function enhances the maintainability of the instrument.
- Optoelectronic isolated RS485 communication.
- Storage for up to 500,000 data records.
- High and low alarm functions, hysteresis amount and hysteresis time are adjustable.

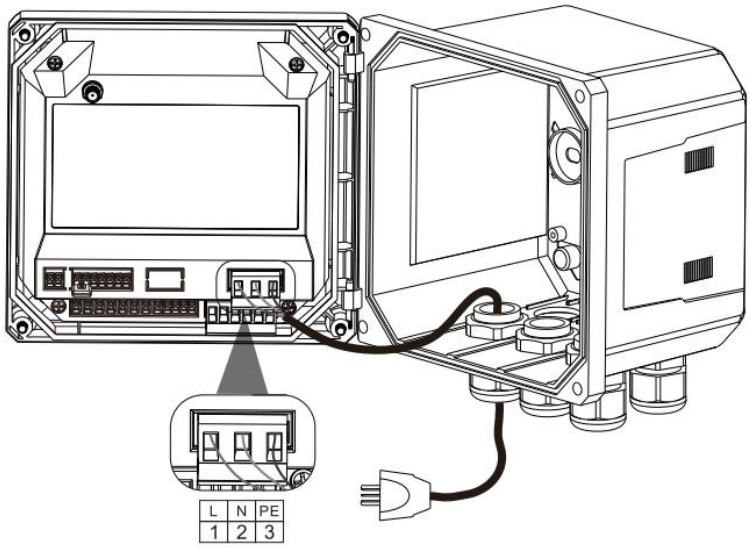
Principle

The controller collects process parameters such as temperature, pressure, flow rate, etc. from the site through sensors, transmitters and other devices, which are used as input signals to the controller. The acquired signals are processed and converted into digital signals for operation and processing by the controller. The controller analyzes and calculates the input signals according to the pre-set control algorithm to derive the control quantity. The controller outputs the calculated control quantities to the actuators, such as electric control valves, frequency converters, etc., to realize precise control of the control objects.

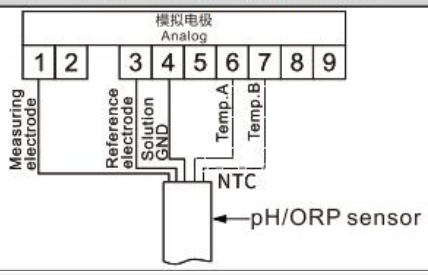
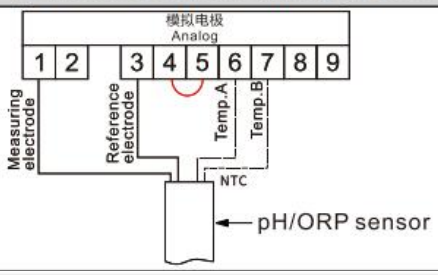
Parameters	
Measured variables	pH / ORP / Antimony
Measuring ranges	pH/Antimony：(-2.00 ~ 16.00) pH　　ORP：(-2000 ~ 2000) mV
Input impedance	⩾1012Ω
Temperature types	NTC10K，Pt1000，Pt100
Temperature range	(-10~130)℃
Accuracy	pH：±0.02pH Antimony：±0.2pH ORP：±2mV NTC10K：(-10~60)℃, accuracy: ±0.3℃ (60~130)℃, accuracy: ±2℃ Pt1000 accuracy: ±0.3℃ Pt100 accuracy: ±0.3℃
Resolution	pH/Antimony：0.01pH； ORP：1mV
Repeatability	0.02pH
Temperature compensation	Manual compensation; Automatic compensation: Linear, Acid, Base, Pure
Measured variables	pH/ORP/Conductivity/Dissolved Oxygen/Turbidity/Sludge Concentration/Inductive Conductivity/Residual

	Chlorine/Ammonia nitrogen/Nitrate nitrogen/COD, etc.
Measuring ranges	pH: (0.00 ~ 14.00) pH ORP: (-2000 ~ 2000) mV Dissolved oxygen: (0～40) mg/L Saturation: (0～200)% Conductivity: (0～500) mS/cm Turbidity: (0～4000) NTU Sludge concentration: (0～120000) mg/L Inductive conductivity: (0～2000) mS/cm Residual chlorine: (0~100) mg/L Ammonia nitrogen: (0~1000) mg/L Nitrate nitrogen: (0~1000) mg/L COD: (0~1500) mg/L Note: Actual measurement ranges should refer to the technical data of the connected sensors.
Current output	Isolated, 2-channel (0/4~20) mA configurable to corresponding measurement ranges, load capacity 750Ω, output accuracy ±0.1%FS, compliant with NAMUR NE 43standards.
Communication output	Isolated, RS485 interface, Modbus-RTU communication protocol.
Alarm output	3-channel SPST (2 alarms + 1 cleaning), NO/NC type, capacity 250VAC, 5A.
Alarm relay delay	0~9999 seconds, adjustable.
Power supply	AC：(85~265)V，50/60Hz DC：(21.6~26.4) V
Power consumption	≤28W
Cable entries	M20*1.5 cable gland
Cable specification	Spring terminals: suitable for AWG16~AWG24（0.2mm2~1.5mm2）cables； Plug-in terminals: suitable for AWG12~AWG28（1mm2~2.5mm2）cables；
Operating environment	Temperature：(0 ~ 60)℃ Relative Humidity：10 %~85%（non-condensing）
Storage environment	Temperature：(-15~65)℃ Relative Humidity：5%~95%（non-condensing） Altitude：<2000m
Ingress protection	IP66
Flame Retardancy	UL94V-0

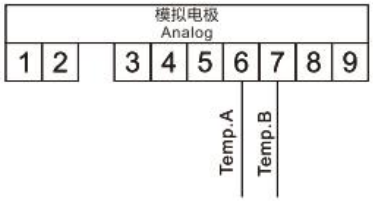
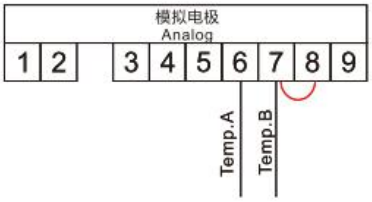
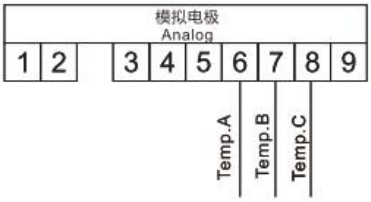
Wiring



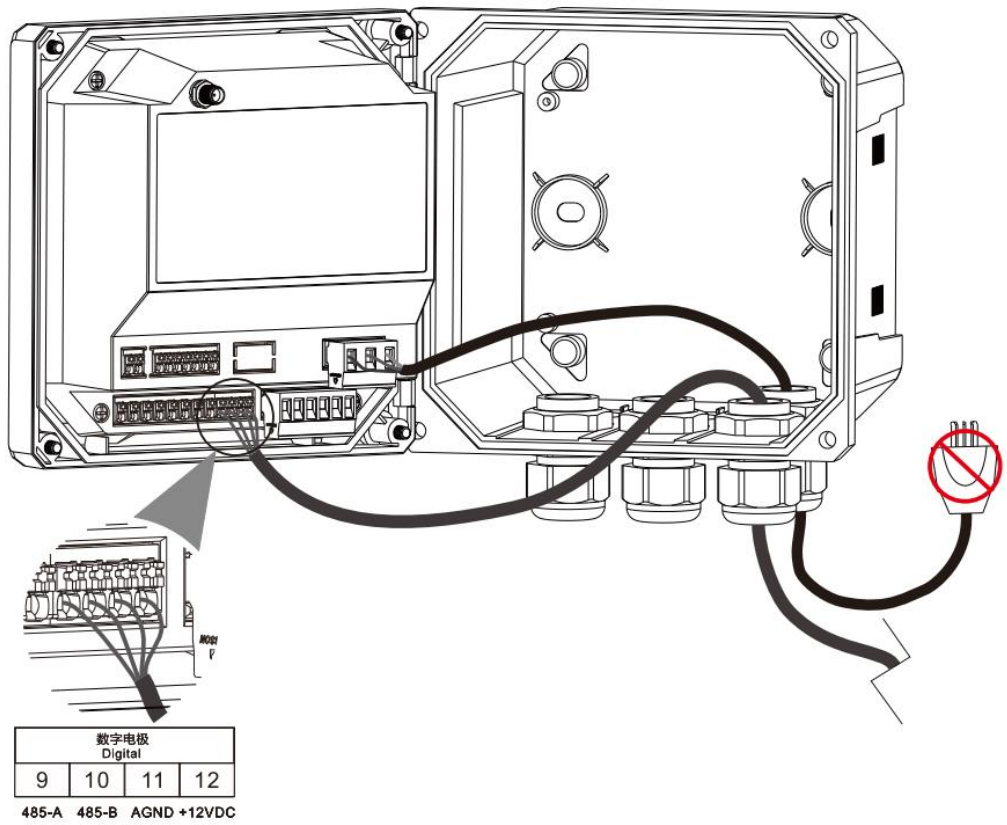
Power wiring schematic

3-wire: Sensor with SG	2-wire: Sensor without SG
	
3-wire: Sensor with SG	2-wire: Sensor without SG
pH/ORP sensor with SG directly connects to terminal 4	pH/ORP sensor without SG need to short terminals 4 and 5 (the controller comes with a short-wire, or users can use a wire to connect them)

Analog sensor wiring instructions

NTC TEMP.electrode	2-wire TEMP.electrode（Pt1000、Pt100）	2-wire TEMP.electrode（Pt1000、Pt100）
		
	2-wire TEMP.electrodes need to short terminals 7 and 8 (the controller comes with a short-wire, or users can use a wire to connect them)	

Temperature electrode wiring



Digital sensor wiring schematic

Ordering code

SUP-MDC-P1-5-D-5-5-6-E-P1															Description
SUP-MDC-P1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Input	5														Analog pH/Analog ORP/RS485
Output		D													2 channels 4-20mA+RS485
		F													2 channels 4-20mA+RS485 +wireless NB-IoT
Alarm output			5												2 channels SPST+1 channel time relay
Electrical interface				5											M20×1.5 cable gland
Protection level					6										IP66
Power supply						E									220VAC
						C									24VDC
Accessories							P1								304SS back panel mounting bracket