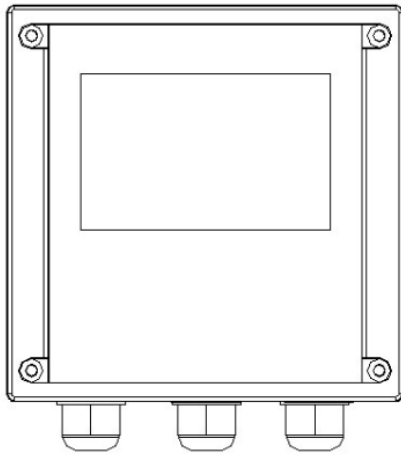


Dissolved Oxygen/Trace Oxygen Controller

溶氧/微量氧控制器



Original visual reference: page 1

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安全操作

使用前請詳細閱讀以下對於安全操作的說明

- 1. 使用前請先觀察儀器外觀是否有因為運送擠壓而造成損壞
- 2. 儀器須由受過訓練的專業技術人員操作
- 3. 使用前需熟讀操作手冊,避免錯誤的接線導致安全問題及儀器損壞
- 4. 所有接線完成後須仔細檢查無誤後才可以送電並確認所連接的設備是正確的
- 5. 請避開高溫,高濕及腐蝕環境安裝儀器,並避免陽光直射
- 6. 避免使用會產生突波干擾的電源,如有突波干擾,請將儀器電源和其他干擾設備電源分開

儀器使用

儀器用於工業上溶氧 %/ppm/mg/L/ug/L/ppb 及溫度的測量,如: 發酵,飲用水,鍋爐水,海水,養殖,水族館,地表水,工業污水,都市廢水,環境監測,食品生產過程等
儀器可以盤面安裝,壁掛安裝,管路安裝
儀器提供 2 路電流輸出,最大負載為 500Ω
儀器提供 3 路控制用繼電器,繼電器最大承受電壓及電流為 5A/250VAC 或 5A/30VDC

產品內容與保固

- 144 系列 : 產品包裝,包含 1 台儀器,1 本說明書,4 套支架 (螺絲,固定塊,固定棒)
- 96 系列 : 產品包裝,包含 1 台儀器,1 本說明書,二個支架

safe operation

Please read the following instructions for safe operation carefully before use.

- 1. Before use, please check the appearance of the instrument to see if there is any damage caused by extrusion during transportation.
- 2. The instrument must be operated by trained professional technicians
- 3. Read the operation manual carefully before use to avoid incorrect wiring that may cause safety problems and damage to the instrument.
- 4. After all wiring is completed, it must be carefully checked before power can be supplied and the connected equipment must be confirmed to be correct.
- 5. Please install the instrument away from high temperature, high humidity and corrosive environment, and avoid direct sunlight.
- 6. Avoid using power supplies that can cause surge interference. If there is surge interference, please disconnect the instrument power supply and other interfering equipment.

source separate

Instrument use

The instrument is used for measuring dissolved oxygen %/ppm/mg/L/ug/L/ppb and temperature in industry, such as: fermentation, drinking water, boiler water, sea water

Water, aquaculture, aquarium, surface water, industrial sewage, urban wastewater, environmental monitoring, food production process, etc.

The instrument can be installed on the panel, wall-mounted or pipe-mounted

The instrument provides 2 current outputs with a maximum load of 500Ω

The instrument provides 3-way control relays. The maximum voltage and current the relays can withstand is 5A/250VAC or 5A/30VDC.

Product Contents and Warranty

144 series: product packaging, including 1 instrument, 1 instruction manual, 4 sets of brackets (screws, fixing blocks, fixing rods)

96 Series: Product packaging, including 1 instrument, 1 instruction manual, and two stands

-2-

規格

功能	%sat	ppm mg/L ug/L ppb
測量範圍	0.0 到 400.0	0.00 到 40.00, 0.0 到 200.0 ug/L
測量解析度	0.1	0.01 / 0.1
測量精確度	±0.2	±0.02
溫度補償方式	Pt-1000/NTC22K	
溫度測量範圍	-10.0 到 +130.0℃	
溫度補償範圍	-10.0 到 +130.0℃	
溫度解析度	0.1℃	
溫度精確度	±0.2℃	
電極電流測量範圍	-2.0 到 +400 nA	
電極電流測量精確度	±0.005nA	
極化電壓	-0.675V	
壓力調整範圍	500 到 9999mBar	
鹽度補償範圍	0.00 到 50.00 ppt	
工作環境溫度	0 到 +70℃	
儲存環境溫度	-20 到 +70℃	
顯示	帶背光超大點陣 LCD	
溶氧電流輸出 1	隔離式 4 到 20mA 輸出,最大負載 500Ω	
溫度電流輸出 2	隔離式 4 到 20mA 輸出,最大負載 500Ω	
電流輸出精確度	±0.05 mA	
RS485	Modbus RTU 標準協定	
通訊速率	9600/19200/38400	
繼電器接點容量	5A/250VAC、5A/30VDC	
清洗設定	ON: 1 到 1000 秒、OFF: 0.1 到 1000.0 小時	
一路多功能繼電器	清洗/週期報警/錯誤報警	
繼電器延時動作	0-120 秒	
資料記錄	50 萬筆	
語言選擇	英語/繁體中文/簡體中文	
防護等級	IP65	
電源	90 到 260VAC,功耗<5 瓦	
安裝方式	盤面安裝/壁掛安裝/管路安裝	
重量	144 系列 0.85Kg, 96 系列 0.55Kg	

- 3 -

Specifications

Function %sat ppm mg/L ug/L ppb

Measuring range 0.0 to 400.0 0.00 to 40.00, 0.0 to 200.0 ug/L

Measurement resolution 0.1 0.01 / 0.1

Measurement accuracy ±0.2 ±0.02

Temperature compensation method Pt-1000/NTC22K

Temperature measurement range -10.0 to +130.0℃

Temperature compensation range -10.0 to +130.0℃

Temperature resolution 0.1℃

Temperature accuracy ±0.2℃

Electrode current measurement range -2.0 to +400 nA

Electrode current measurement accuracy ±0.005nA

Polarization voltage -0.675V

Pressure adjustment range 500 to 9999mBar

Salinity compensation range 0.00 to 50.00 ppt

Working environment temperature 0 to +70℃

Storage ambient temperature -20 to +70℃

Display Large dot matrix LCD with backlight

Dissolved Oxygen Current Output 1 Isolated 4 to 20mA output, maximum load 500Ω

Temperature current output 2 Isolated 4 to 20mA output, maximum load 500Ω

Current output accuracy ±0.05 mA

RS485 Modbus RTU standard protocol

Communication rate 9600/19200/38400

Relay contact capacity 5A/250VAC, 5A/30VDC

Cleaning settings ON: 1 to 1000 seconds, OFF: 0.1 to 1000.0 hours

One way multi-function relay cleaning/periodic alarm/error alarm

Relay delay action 0-120 seconds

500,000 data records

Language selection English/Traditional Chinese/Simplified Chinese

Protection grade IP65

Power supply 90 to 260VAC, power consumption <5 watts

Installation method: panel installation/wall installation/pipe installation

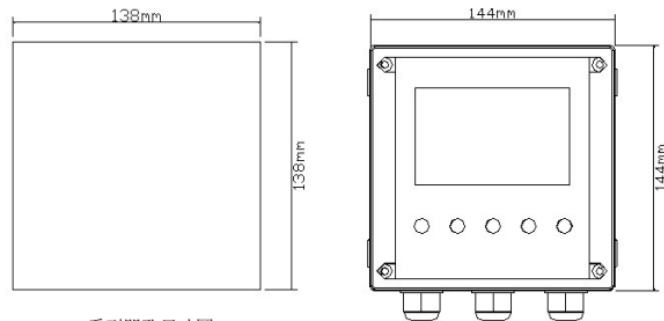
Weight 144 series 0.85Kg, 96 series 0.55Kg

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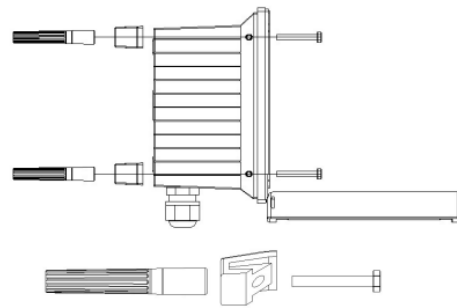
儀器安裝

144 系列：儀器可以盤面式安裝、管式安裝、壁掛式安裝

盤面式安裝：在配電箱面板上開 138mm X 138mm 的方孔，將儀器從配電箱面板正面放入，將螺絲從後蓋穿入，並從配電箱面板後方將固定塊和固定棒鎖上



144 系列開孔尺寸圖



144 系列支架安裝圖

- 4 -

Instrument installation

144 series: The instrument can be installed in panel, pipe or wall mounting

Panel installation: Open a 138mm

Put it in, insert the screws through the back cover, and lock the fixing block and fixing rod from behind the distribution box panel.

144 Series Hole Dimensions Drawing

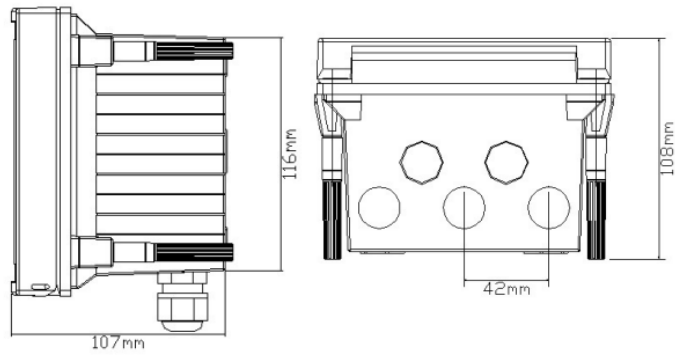
144 series bracket installation diagram

-4-

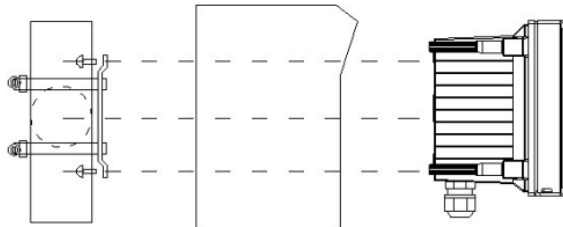
144 Series Dimensional Drawing

144 Series Wall Mounting and Pipe Mounting

-5-



144 系列外形尺寸圖

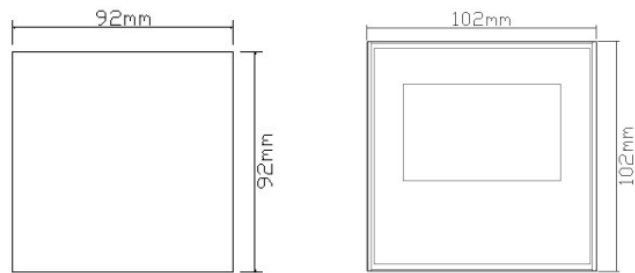


144 系列壁掛及管路安裝

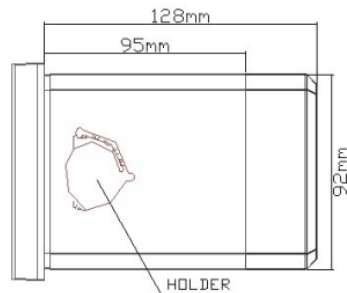
- 5 -

Original visual reference: page 6

96 系列：儀器可以盤面式安裝、管式安裝、壁掛式安裝
盤面式安裝：在配電箱面板上開 92mm X 92mm 的方孔，將儀器從配電箱面板正面放入，于機器二側裝上固定器。



96 系列開孔尺寸圖



96 系列外形尺寸圖

- 6 -

96 Series: The instrument can be installed in panel, pipe or wall mounting

Panel installation: Open a 92mm

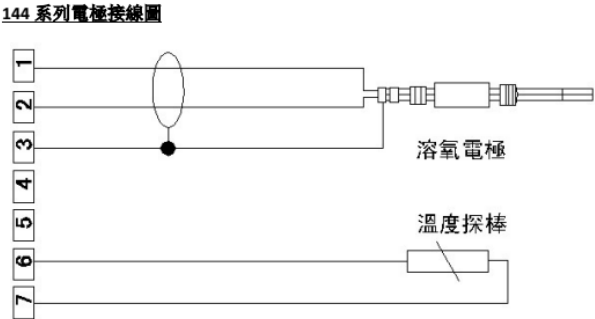
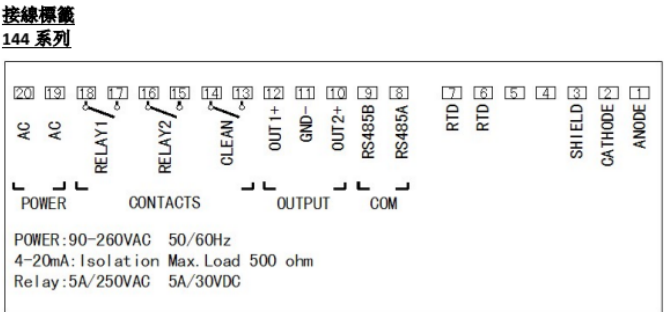
Install retainers on both sides of the machine.

96 Series Hole Dimensions Drawing

96 Series Dimensional Drawing

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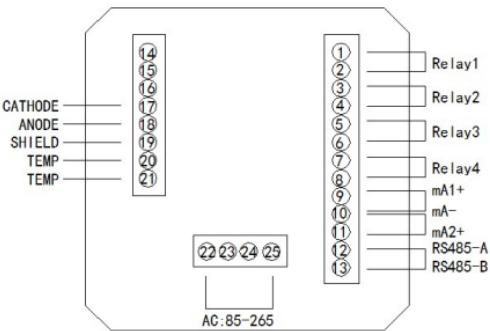
Wiring labels
144 series
144 Series Electrode Wiring Diagram
-7-



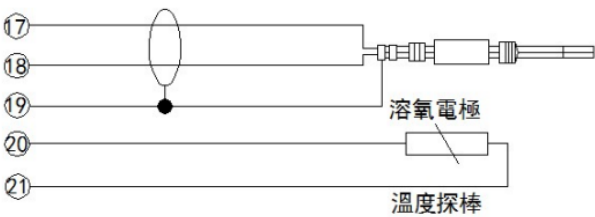
Original visual reference: page 8

96 series
96 Series Electrode Wiring Diagram
-8-

96 系列

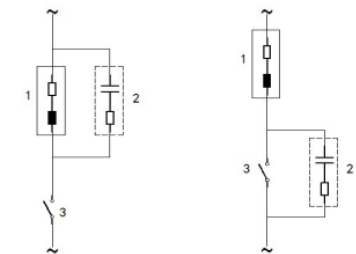


96 系列電極接線圖

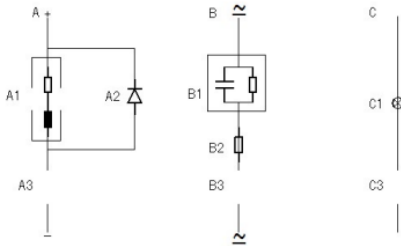


繼電器觸點保護圖

繼電器觸點受到電器火花會影響壽命,尤其在電感和電容性負載,為了抑制火花及電弧作用,應使用 RC 電路,延長繼電器壽命



- 交流保護,用於電感性負載
- 1. 負載
 - 2. RC 消除火花,用於 220VAC,R=100 歐姆 1 瓦,C=0.1uF630V
 - 3. 繼電器觸點



- A. 直流保護,A1: 電感式負載 A2: 1N4007,A3: 繼電器觸點
- B. 交直流保護,B1: 電容式負載,B2: 0.8 歐姆/1 瓦 (直流 24V 時) ,B3: 繼電器觸點
- C. 電阻式負載,C1: 燈泡,C3: 繼電器觸點

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- Relay contact protection diagram
- The service life of relay contacts will be affected by electrical sparks, especially in inductive and capacitive loads. In order to suppress sparks and electrical
- Arc action, RC circuit should be used to extend the life of the relay
- AC protection for inductive loads
- 1. Load
 - 2. RC spark elimination, for 220VAC, R=100 ohm 1 watt, C=0.1uF630V
 - 3. Relay contacts
- A. DC protection, A1: inductive load A2: 1N4007, A3: relay contact
- B. AC and DC protection, B1: capacitive load, B2: 0.8 ohm/1 watt (at 24V DC), B3: relay contact
- C. Resistive load, C1: light bulb, C3: relay contact
- 9-

顯示說明



1. 日期及時間
2. 主顯示
3. 單位
4. 溫度及單位
5. 第一路電流
6. 第二路電流
7. 測量狀態及錯誤指示,如果在保持模式,此處不顯示
8. 倒數計時器: 週期時間/清洗時間,當繼電器 3 有延遲時, 會顯示 Delay
9. 溫度補償: 自動溫補/手動溫補
10. 繼電器狀態指示

說明: 如果 DO 測量值超過正負範圍會顯示 0.0/999.9
 如果 ppm,mg/L 測量值超過正負範圍會顯示 0.00/99.99
 如果溫度超過正負範圍會顯示-99.9/999.9

show description

1. Date and time
 2. Main display
 3. Unit
 4. Temperature and units
 5. The first current
 6. Second current
 7. Measurement status and error indication, if in hold mode, will not be displayed here.
 8. Countdown timer: cycle time/cleaning time, when relay 3 has a delay, Delay will be displayed
 9. Temperature compensation: automatic temperature compensation/manual temperature compensation
 10. Relay status indication
- Note: If the DO measurement value exceeds the positive and negative range, 0.0/999.9 will be displayed.
 If the measured value of ppm, mg/L exceeds the positive and negative range, 0.00/99.99 will be displayed.
 If the temperature exceeds the plus or minus range, -99.9/999.9 will be displayed.

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按鍵說明

				
MODE	SHIFT	UP	DOWN	ENTER

按鍵	測量狀態	設定狀態	校正狀態	記錄狀態
MODE	進入密碼畫面	離開	離開	離開
SHIFT	無	移動數位位置	移動數位位置	移動數位位置
UP	進入記錄	增加數字	增加數字	增加數字
DOWN	無	減少數字	減少數字	減少數字
ENTER	開/關 背光	確認	確認	確認

保持模式

保持模式是一個安全模式,主要用於校正模式,設定模式,記錄查看模式及清洗繼電器模式,在保持模式下,繼電器是打開(不工作),電流依據設定(固定電流/最後電流),測量顯示值固定不改變

當進入上述四種模式時,就會進入保持模式
當離開上述四種模式回到測量模式時,約 10 秒後才會離開保持模式
儀器開機後,會進入保持模式,約 10 秒才會離開保持模式進入測量模式

保持模式下的輸出電流： 有二種模式可以選擇：固定電流輸出及最後電流輸出
固定電流：用戶可以設定 4.00-20.00mA 當成保持模式的輸出電流
最後電流：當進入保持模式時,電流會停止在最後的測量輸出電流
保持模式下的繼電器： 全部打開(不工作)

Button description
MODE SHIFT UP DOWN ENTER
Button Measurement status Setting status Calibration status Recording status
MODE Enter password screen Leave Leave Leave
SHIFT None Move digit position Move digit position Move digit position
UP Enter record Increase number Increase number Increase number
DOWN None Decrease number Decrease number Decrease number
ENTER On/Off Backlight Confirm Confirm Confirm
hold mode

Hold mode is a safety mode, mainly used for calibration mode, setting mode, record viewing mode and cleaning relay mode, in hold mode, the relay is open (not working), the current is measured according to the setting (fixed current/last current)
The displayed value is fixed and does not change
When entering the above four modes, it will enter the hold mode
When leaving the above four modes and returning to the measurement mode, it will take about 10 seconds before leaving the hold mode.

After the instrument is turned on, it will enter the hold mode, and it will take about 10 seconds to leave the hold mode and enter the measurement mode.
Output current in hold mode: There are two modes to choose from: fixed current output and final current output
Fixed current: User can set 4.00-20.00mA as hold mode
The output current
Last current: When entering hold mode, the current will stop at the last
Measure output current
Relays in Hold Mode: All open (not working)

設定

按下 MODE 鍵,使用 UP/DOWN 鍵及 SHIFT 鍵,輸入密碼 1200 後,按下 ENTER 鍵進入設定,也可以按下 MODE 鍵離開,如果超過 10 分鐘沒按鍵被按下,則會自動回到測量模式

密碼	密碼
0 0 0 0	1 2 0 0

主畫面

按 UP/DOWN 鍵選擇功能,按 ENTER 鍵進入功能設定

設定	設定
■ 電流1設定 ☐ 電流2設定 ☐ 繼電器1設定 ☐ 繼電器2設定 ☐ 繼電器3設定 ☐ 測量設定 ☐ 溫度設定 ☐ 通訊設定	■ 日期設定 ☐ 資料記錄設定 ☐ 輸出測試 ☐ 語言設定 ☐ 恢復出廠設定

第一頁

第二頁

- 說明:
1. 設定時,當輸入的數值不在指定的範圍內,則顯示幕的最上方會出現“錯誤”

2. 數值輸入後要按下 ENTER 鍵才會保存

3. 設定時,隨時可以按 MODE 鍵離開

4. 設定模式下,如果超過 10 分鐘未按下按鍵,則會自動回到測量模式

Settings

Press the MODE key, use the UP/DOWN key and SHIFT key, enter the password 1200, and press the ENTER key to enter the setting

You can also press the MODE button to leave. If no button is pressed for more than 10 minutes, it will automatically return to the measurement mode.

Home screen

Press the UP/DOWN key to select the function, press the ENTER key to enter the function setting

First page Second page

Description:

1. During setting, when the entered value is not within the specified range, "Error" will appear at the top of the display.

2. After inputting the value, you must press the ENTER key to save it.

3. During setting, you can press MODE key to leave at any time.

4. In setting mode, if the button is not pressed for more than 10 minutes, it will automatically return to measurement mode.

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電流 1 設定

電流1設定	
4.00 mA	= 000.0%
20.00 mA	= 100.0%
偏移量	= +0.00 mA
濾波時間	= 000 秒
保持模式	= ☐ 固定電流 04.00 mA ☐ 最後電流

1. 設定 4.00mA 輸出的%,ppm,mg/L,ug/L,ppb 對應值
2. 設定 20.00mA 輸出的%,ppm,mg/L,ug/L,ppb 對應值,4.00mA 和 20.00mA 之間的%值最少要有 10.0%的差距,ppm,mg/L 值最少要有 1.00ppm,mg/L 的差距, ug/L,ppb 值最少要有 10.0ugL 的差距
3. 設定%,ppm,mg/L,ug/L,ppb 電流的偏移量,範圍±1.00mA
4. 設定電流濾波時間 0-120 秒,當電流由一個點到另一個點的變化,經過一個軟體低通濾波器的介入,使電流呈現較為平滑的輸出,濾波時間越大,電流變化越慢
5. 設定電流的保持模式,UP/DOWN 鍵選固定電流或是最後電流,如果選了固定電流,按 ENTER 鍵後,則可以輸入固定電流

電流 2 設定

電流2設定	
4.00 mA	= +000.0℃
20.00 mA	= +100.0℃
偏移量	= +0.00 mA
濾波時間	= 000 秒
保持模式	= ☐ 固定電流 04.00 mA ☐ 最後電流

1. 設定 4.00mA 輸出的溫度對應值
2. 設定 20.00mA 輸出的溫度對應值,4.00mA 和 20.00mA 之間的溫度值最少要有 10.0℃ 的差距
3. 設定溫度的電流偏移量, 範圍±1.00mA
4. 設定電流濾波時間 0-120 秒,當電流由一個點到另一個點的變化,經過一個軟體低通濾波器的介入,使電流呈現較為平滑的輸出,濾波時間越大,電流變化越慢
5. 設定電流的保持模式,UP/DOWN 鍵選固定電流或是最後電流,如果選了固定電流,按 ENTER 鍵後,則可以輸入固定電流

Current 1 setting

1. Set the corresponding values of 4.00mA output in %, ppm, mg/L, ug/L, and ppb
 2. Set the corresponding value of 20.00mA output in %, ppm, mg/L, ug/L, ppb, and the % value between 4.00mA and 20.00mA
- There must be at least a 10.0% difference. The ppm and mg/L values must have at least a 1.00ppm and mg/L difference. The ug/L and ppb values must have a minimum difference of 1.00 ppm and mg/L.

There should be at least a 10.0ugL difference

3. Set %, ppm, mg/L, ug/L, ppb current offset, range ±1.00mA
 4. Set the current filter time to 0-120 seconds. When the current changes from one point to another, it passes through a software low-pass
- The intervention of the filter causes the current to present a smoother output. The longer the filtering time, the slower the current changes.
5. Set the current holding mode. Use the UP/DOWN button to select fixed current or final current. If fixed current is selected, After pressing the ENTER key, you can enter a fixed current

Current 2 setting

1. Set the temperature corresponding value of 4.00mA output
 2. Set the temperature corresponding value of 20.00mA output, 4.00mA
- The temperature value between and 20.00mA must be at least 10.0℃
- gap
3. Current offset at set temperature, range ±1.00mA
 4. Set the current filter time 0-120 seconds, when the current changes from
- The change from one point to another, through a software low pass
- The intervention of the filter makes the current appear smoother.
- Out, the larger the filter time, the slower the current changes.
5. Set the current holding mode. Use the UP/DOWN button to select fixed current or final current. If fixed current is selected, After pressing the ENTER key, you can enter a fixed current

繼電器 1 設定

繼電器1設定	
開關	= ☒ 開 ☐ 關
閉合點	= 0 8 0 . 0 %
釋放點	= 0 2 0 . 0 %
延遲時間	= 0 0 0 秒

繼電器1設定	
開關	= ☒ 開 ☐ 關
閉合點	= 0 8 . 0 0 mg/L
釋放點	= 0 2 . 0 0 mg/L
延遲時間	= 0 0 0 秒

1. 開關：按 UP/DOWN 鍵選擇開啟或是關閉,如果是關閉,則繼電器不會工作

2. 閉合點：繼電器%,ppm,mg/L,ug/L,ppb 的閉合點(動作)

3. 釋放點：繼電器%,ppm,mg/L,ug/L,ppb 的釋放點(不動作)

4. 延遲時間：0-120 秒,當繼電器達到閉合值時,要延遲一段時間後才動作
- 說明：如果希望 80.0%時加藥,20.0%時釋放（不加藥）,則閉合點設定為 80.0,釋放點設定為 20.0

繼電器 2 設定

繼電器2設定	
開關	= ☒ 開 ☐ 關
閉合點	= 0 2 0 . 0 %
釋放點	= 0 8 0 . 0 %
延遲時間	= 0 0 0 秒

繼電器2設定	
開關	= ☒ 開 ☐ 關
閉合點	= 0 2 . 0 0 mg/L
釋放點	= 0 8 . 0 0 mg/L
延遲時間	= 0 0 0 秒

1. 開關：按 UP/DOWN 鍵選擇開啟或是關閉,如果是關閉,則繼電器不會工作

2. 閉合點：繼電器%,ppm,mg/L,ug/L,ppb 的閉合點(動作)

3. 釋放點：繼電器%,ppm,mg/L,ug/L,ppb 的釋放點(不動作)

4. 延遲時間：0-120 秒,當繼電器達到閉合值時,要延遲一段時間後才動作
- 說明：如果希望 20.0%時加藥,80.0%時釋放（不加藥）,則閉合點設定為 20.0,釋放點設定為 80.0

Relay 1 settings

1. Switch: Press the UP/DOWN button to select on or off. If it is off, the relay will not work.

2. Closing point: closing point (action) of the relay in %, ppm, mg/L, ug/L, ppb

3. Release point: Relay %, ppm, mg/L, ug/L, ppb release point (no action)

4. Delay time: 0-120 seconds. When the relay reaches the closing value, it will delay for a period of time before acting.
- Note: If you want to add medicine at 80.0% and release at 20.0% (without adding medicine), then the closing point is set to 80.0 and the release point is

Set to 20.0

Relay 2 settings

1. Switch: Press the UP/DOWN button to select on or off. If it is off, the relay will not work.

2. Closing point: closing point (action) of the relay in %, ppm, mg/L, ug/L, ppb

3. Release point: Relay %, ppm, mg/L, ug/L, ppb release point (no action)

4. Delay time: 0-120 seconds. When the relay reaches the closing value, it will delay for a period of time before acting.
- Note: If you want to add medicine at 20.0% and release at 80.0% (without adding medicine), then the closing point is set to 20.0 and the release point is

Set to 80.0

繼電器 3 設定

繼電器3設定	
開關	= ☒ 開 ☐ 關
週期時間	= 0 0 0 1 . 0 時
清洗時間	= 0 0 1 0 秒
延遲時間	= 0 0 0 秒
功能	= ☐ 清洗 ☐ 週期報警 ☐ 錯誤報警

1. 開關：按 UP/DOWN 鍵選擇開啟或是關閉，如果是關閉，則繼電器不會工作
2. 週期時間：清洗週期或週期報警的時間
3. 清洗時間：當清洗週期到了後，開始清洗的時間
4. 延遲時間：當繼電器達到閉合值時，要延遲一段時間後才動作
5. 功能：按 UP/DOWN 鍵選擇清洗，週期報警，錯誤報警

說明：

1. 清洗：當週期時間到了後，繼電器閉合開始清洗，清洗時間到了，則重複開始週期

2. 週期報警：當週期時間到了後，繼電器閉合（報警），直到用戶重新進入並再次選擇週期報警，繼電器才會釋放，並重新計時

3. 錯誤報警：當測量時，出現任何錯誤都會使繼電器閉合（報警），直到錯誤被解決，錯誤報警沒有延時功能

測量設定

測量設定	
單位	= ☒ % ☐ mg/L ☐ ppm ☐ ug/L ☐ ppb
偏移量	= + 0 0 . 0 %
濾波	= 0 0

1. 測量單位選擇，按 UP/DOWN 鍵選擇，如果客戶選擇 ug/L 或 ppb，儀表測量時會自動換擋
2. 偏移量輸入，範圍±10.0%或±1.00mg/L 或 ±10.0ug/L
3. 濾波設定：範圍 0-10

說明：當發現讀值不穩定時，可以試著適當的調高濾波值，但是也會同時使得讀值變化緩慢

Relay 3 settings

1. Switch: Press the UP/DOWN button to select on or off.

If it is closed, the relay will not work

2. Cycle time: cleaning cycle or cycle alarm time
3. Cleaning time: When the cleaning cycle comes, start cleaning time
4. Delay time: When the relay reaches the closing value, it must be delayed

Take action after a delay

5. Function: Press the UP/DOWN button to select cleaning, periodic alarm alarm, error alarm

Description:

1. Cleaning: When the cycle time is up, the relay closes and starts cleaning. When the cleaning time is up, the cycle starts again.

2. Periodic alarm: When the period time is up, the relay is closed (alarm) until the user re-enters and Select periodic alarm, the relay will be released and the time will be restarted.

3. Error alarm: When measuring, any error will cause the relay to close (alarm) until the error is resolved.

There is no delay function for error alarms

Measurement settings

1. To select the measurement unit, press the UP/DOWN key to select. If The customer selects ug/L or ppb, and the meter will automatically shift gears

2. Offset input, range ±10.0% or ±1.00mg/L or ±10.0ug/L
3. Filter setting: range 0-10

Note: When you find that the reading value is unstable, you can try to increase the filter value appropriately, but it will also cause the reading value to change at the same time.

slow

溫度設定

溫度設定	
溫補方式	= ☒ 自動 = ☐ 手動
探棒種類	= ☐ Pt 1000 = ☐ NTC 22K
偏移量	= + 0.0 °C
手動溫度測量	= + 0 2 5.0 °C
手動溫度校正	= 2 5.0 °C

1. 自動/手動溫度補償選擇,按 UP/DOWN 鍵選擇
2. 溫度探棒種類,按 UP/DOWN 鍵選擇
3. 溫度偏移量,範圍±5.00°C (只用於自動)
4. 手動測量溫度
5. 手動校正溫度
6. 溫度顯示: 測量畫面是否顯示溫度

說明:

1. 當溫補選擇自動且儀器未接溫度探棒時,溫度輸出會不正確,所以當選擇自動時,一定要接上溫度探棒
2. 當選擇自動溫度補償時,要確認連接的溫度探棒和選擇的探棒種類是一致的
3. 手動溫度測量: 當選擇手動溫度補償時,測量的溫度補償採用這個溫度值
4. 手動溫度校正: 當選擇手動溫度補償時,校正的溫度補償採用這個溫度值

通訊設定

通訊設定	
通訊地址	= 0 0 1
通訊速率	☐ 9600 ☐ 19200 ☐ 38400

1. 通訊位址選擇: 1-255
2. 通訊速率,按 UP/DOWN 鍵選擇

Temperature setting

1. Automatic/manual temperature compensation selection, press the UP/DOWN button Choose
2. Temperature probe type, press the UP/DOWN button to select
3. Temperature offset, range ±5.00°C (only for automatic)
4. Manual temperature measurement
5. Manual temperature correction
6. Temperature display: whether the temperature is displayed on the measurement screen

Description:

1. When automatic temperature compensation is selected and the temperature probe is not connected to the instrument, The temperature output will be incorrect, so when Auto is selected, a Be sure to connect a temperature probe
2. When selecting automatic temperature compensation, confirm the connected temperature The probe type is consistent with the selected probe type
3. Manual temperature measurement: When selecting manual temperature compensation, The measured temperature compensation uses this temperature value
4. Manual temperature correction: When selecting manual temperature compensation, The corrected temperature compensation uses this temperature value

Communication settings

1. Communication address selection: 1-255
2. Communication rate, press UP/DOWN key to select

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Date setting

日期設定	
年	= 2 0 1 5
月	= 0 8
日	= 1 5
時	= 1 3
分	= 1 8
秒	= 1 1

按 UP/DOWN 鍵,設定日期及時間,斷電後,時間會保持二天左右

Data recording setting

資料記錄設定	
開關	= ☒ 開 ☐ 關
顯示方式	= ☐ 記錄 ☐ 圖形
清除記錄	= ☐ 是 ☐ 否
儲存間隔	= 0 6 0 秒

- 1. 記錄資料開/關,UP/DOWN 鍵選擇
- 2. 顯示方式,UP/DOWN 鍵選擇
- 3. 是否清除所有記錄,UP/DOWN 鍵選擇
- 4. 儲存間隔 5-120 秒

說明:

- 1. 當選擇資料記錄為開,在測量模式下則會依據儲存間隔的時間進行資料存儲
- 2. 記錄方式: 選擇記錄顯示 (每頁 5 筆資料) 或是圖形顯示 (每頁 150 筆資料)
- 3. 當選擇清除記錄時,要等待約 10 秒,才會清除所有記錄

Output test

輸出測試	
電流輸出1	= 0 4 . 0 0 mA
電流輸出2	= 0 4 . 0 0 mA
繼電器1	= ☐ 閉合點 ☐ 釋放點
繼電器2	= ☐ 閉合點 ☐ 釋放點
繼電器3	= ☐ 閉合點 ☐ 釋放點

- 1. 電流 1 輸出測試: 4.00-20.00mA
- 2. 電流 2 輸出測試: 4.00-20.00mA
- 3. 繼電器 1 測試,UP/DOWN 鍵選擇
- 4. 繼電器 2 測試,UP/DOWN 鍵選擇
- 5. 繼電器 3 測試,UP/DOWN 鍵選擇

說明: 此功能用於測試電流輸出及繼電器工作是否正常

date setting
Press the UP/DOWN button to set the date and time. After power failure, the time
It will last about two days

- Data logging settings
- 1. Record data on/off, UP/DOWN key selection
 - 2. Display mode, UP/DOWN key selection
 - 3. Whether to clear all records, press UP/DOWN key to select
 - 4. Storage interval 5-120 seconds

Description:

- 1. When the data recording is selected to be on, the data will be stored according to the storage interval time in the measurement mode.
- 2. Recording method: Choose record display (5 data per page) or graphic display (150 data per page)
- 3. When you choose to clear records, you have to wait for about 10 seconds before all records are cleared.

- Output test
- 1. Current 1 output test: 4.00-20.00mA
 - 2. Current 2 output test: 4.00-20.00mA
 - 3. Relay 1 test, UP/DOWN key selection
 - 4. Relay 2 test, UP/DOWN key selection
 - 5. Relay 3 test, UP/DOWN key selection

Description: This function is used to test current output and relay operation.
Is the operation normal?

語言設定

語言設定	
語言選擇	■ English □ 繁體中文 □ 简体中文

按 UP/DOWN 鍵,選擇英語,繁體中文,簡體中文顯示

恢復出廠設定

恢復出廠設定	
恢復設定	■ 電流 □ 繼電器1 □ 繼電器2 □ 繼電器3 □ 全部

按 UP/DOWN 鍵,選擇單獨恢復電流或是繼電器或是全部

說明：此處的恢復,不會影響%/ppm/mg/L/ppb 的校正值

Language settings
Press the UP/DOWN key to select English, Traditional Chinese, Simplified Chinese text display
Restore factory settings
Press the UP/DOWN key to select individual current recovery or relay device or all
Note: Restoration here will not affect the correction value of %/ppm/mg/L/ppb
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Original visual reference: page 19

記錄查詢

在測量畫面,按下 UP 鍵,進入記錄查詢

輸入起始記錄

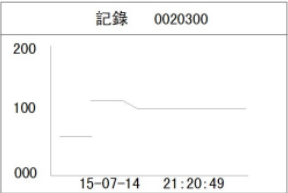
0 1 0 3 0

按 UP/DOWN 及 SHIFT 鍵,輸入要查詢的資料號碼,按下 ENTER 鍵進入,按下 MODE 鍵離開

DO 模式的記錄顯示,每次 5 筆

記錄 0020300		
15-08-14	100.0	%
21:20:49	025.0	°C
15-08-14	100.0	%
21:20:59	025.0	°C
15-08-14	099.9	%
21:21:09	025.0	°C
15-08-14	099.9	%
21:21:19	025.0	°C
15-08-14	100.0	%
21:21:29	025.0	°C

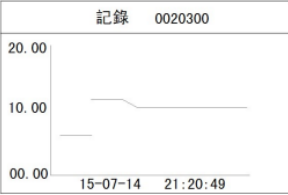
DO 模式的圖形顯示,每次 150 筆



ppm/mgL 模式的記錄顯示,每次 5 筆

記錄 0020300		
15-08-14	10.00	ppm
21:20:49	025.0	°C
15-08-14	10.00	ppm
21:20:59	025.0	°C
15-08-14	09.99	mg/L
21:21:09	025.0	°C
15-08-14	09.99	mg/L
21:21:19	025.0	°C
15-08-14	10.00	mg/L
21:21:29	025.0	°C

ppm/mgL 模式的圖形顯示,每次 150 筆



Record query

In the measurement screen, press the UP key to enter the record query

Press the UP/DOWN and SHIFT keys to enter the data number to be queried

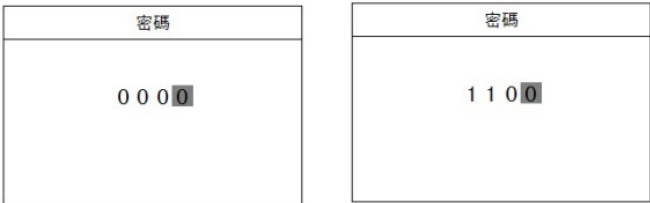
code, press the ENTER key to enter, press the MODE key to leave

Record display of DO mode, 5 pens each time Graphic display of DO mode, 150 pens each time

Record display in ppm/mg/L mode, 5 pens each time Graphical display in ppm/mg/L mode, 150 pens each time

校正

按下 MODE 鍵,使用 UP/DOWN 鍵及 SHIFT 鍵,輸入密碼 1100 後,按下確認鍵進入,也可以按下 MODE 鍵離開,如果超過 10 分鐘沒按鍵被按下,則會自動回到測量模式



主畫面

按 UP/DOWN 鍵選擇功能,按 ENTER 鍵進入校正

校正

■ 參數設定

☐ 零點校正

☐ 飽和校正

☐ 濃度校正

☐ 恢復出廠設定

1. 參數設定: 輸入校正相關參數

2. 零點校正: 校正零點值

3. 飽和校正: 校正飽和 100%

4. 濃度校正: 校正濃度 ppm/mg/L

5. 恢復出廠設定: 恢復出廠時的校正值

溶氧參數設定

參數設定

壓力 = 1013 mBAR

鹽度 = 00.0 ppt

膜溫係數 = 3.06 %

1. 壓力輸入範圍:500 到 9999 mBAR, 例如: 發酵中如果是 1KG 壓力下帶壓校正, 可以將壓力調為 2026mBAR

2. 鹽度輸入範圍:0.0 到 50.0 ppt

3. 膜溫係數輸入範圍:0.01 到 9.99%

說明:膜溫係數: 依據不同廠家生產的電極所提供的膜溫係數

Correction

Press the MODE key, use the UP/DOWN key and SHIFT key, enter the password 1100, and press the confirm key to enter, or you can

Press the MODE button to exit. If no button is pressed for more than 10 minutes, it will automatically return to the measurement mode.

Home screen

Press UP/DOWN key to select function, press ENTER key to enter calibration

1. Parameter setting: enter calibration related parameters
2. Zero point calibration: Calibrate the zero point value
3. Saturation correction: correct saturation 100%
4. Concentration calibration: Calibration concentration ppm/mg/L
5. Restore factory settings: restore factory calibration values

Dissolved oxygen parameter setting

1. Pressure input range: 500 to 9999 mBAR, e.g.

For example: if the pressure is calibrated under 1KG pressure during fermentation, Pressure can be adjusted to 2026mBAR

2. Salinity input range: 0.0 to 50.0 ppt
3. Film temperature coefficient input range: 0.01 to 9.99%

Note: Film temperature coefficient: based on electrodes produced by different manufacturers

Film temperature coefficient provided

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Dissolved oxygen zero point calibration

零點校正	1. 將電極放入飽和無水亞硫酸鈉或純氮氣中
+00.00 uA (25.0℃)	2. 等待讀值穩定後,按下 ENTER 鍵確認,或是按下 MODE 鍵放棄校正
28.2 ℃	說明:
讀值穩定後按下確認鍵	1. 零點電流的範圍為-2nA 到+10nA,如果超過這個範圍,請檢查電極是否出現故障
	2. 顯示的電流為經過溫度補償回 25℃ 及 1013 mBAR 的電極電流

Dissolved oxygen saturation correction

飽和校正	1. 將電極放入濕度飽和的校正瓶或是濕度飽和的空氣中
+066.00 uA (25.0℃)	2. 等待讀值穩定後,按下 ENTER 鍵確認進入飽和輸入,或是按下 MODE 鍵放棄校正
28.2 ℃	
讀值穩定後按下確認鍵	

飽和校正	1. 輸入理想飽和值,範圍: 50.0%到 400.0%
+066.00 uA (25.0℃)	2. 按下 ENTER 鍵確認,或是按 MODE 鍵放棄校正
28.2 ℃	
100.0 ppm	
輸入標準值	

- 說明:
- 飽和電流的範圍為+25nA 到+400nA,如果超過這個範圍,請檢查電極是否出現故障
 - 顯示的電流為經過溫度補償回 25℃ 及 1013mBAR 的電極電流

Dissolved oxygen zero point calibration

- Place the electrode into saturated anhydrous sodium sulfite or pure nitrogen in
- After waiting for the reading to stabilize, press the ENTER key to confirm, or Press MODE key to abort calibration

Description:

- The range of zero point current is -2nA to +10nA. If it exceeds exceeds this range, please check whether the electrode is faulty.
- The displayed current is after temperature compensation back to 25℃ and Electrode current of 1013 mBAR

Dissolved oxygen saturation correction

- Place the electrode into a humidity-saturated calibration bottle or humidity in saturated air
- After waiting for the reading to stabilize, press the ENTER key to confirm entry. Saturate the input, or press the MODE key to give up the correction.

- Enter the ideal saturation value, range: 50.0% to 400.0%

- Press the ENTER key to confirm, or press the MODE key to give up.

Correction

Description:

- The saturation current range is +25nA to +400nA. If it exceeds this range, please check whether the electrode is faulty.
- The current displayed is the electrode current after temperature compensation back to 25℃ and 1013mBAR.

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Dissolved oxygen concentration correction

濃度校正	1. 將電極放入濕度飽和的校正瓶或是濕度飽和的空氣中
+066.00 uA (25.0°C) 28.2 °C	2. 等待讀值穩定後,按下 ENTER 鍵確認進入飽和輸入,或是按下 MODE 鍵放棄校正
讀值穩定後按下確認鍵	
濃度校正	1. 輸入理想飽和值,範圍: 4.00 到 40.00ppm 之間
+066.00 uA (25.0°C) 28.2 °C 08.2 ppm	2. 按下 ENTER 鍵確認,或是按 MODE 鍵放棄校正
輸入標準值	

- 說明:
- 1. 濃度校正電流的範圍為+25nA 到+400nA,如果超過這個範圍,請檢查電極是否出現故障
 - 2. 顯示的電流為經過溫度補償回 25°C 的電極電流

Dissolved Oxygen Restore Factory Settings

恢復出廠設置	此功能會將校正值恢復到出廠狀態,包括鹽度,壓力,膜溫等
恢復中	

- Dissolved oxygen concentration correction
1. Place the electrode into a humidity-saturated calibration bottle or humidity in saturated air
 2. After waiting for the reading to stabilize, press the ENTER key to confirm entry. Saturate the input, or press the MODE key to give up the correction.
1. Enter the ideal saturation value, range: 4.00 to 40.00ppm between
2. Press the ENTER key to confirm, or press the MODE key to give up.

Correction

Description:

1. The concentration correction current range is +25nA to +400nA. If it exceeds this range, please check whether the electrode appears

Failure

2. The current displayed is the electrode current that has been temperature compensated back to 25°C.

Dissolved Oxygen Restore Factory Settings

This function will restore the correction values to the factory state, including salinity, pressure, film temperature, etc.

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出廠值

DO 20.00mA 對應值	100.0	%	範圍: 10.0 - 400.0%
DO 4.00mA 對應值	0.0	%	範圍: 0.0 - 390.0%
			高低之間差距至少 10.0%
ppm 20.00mA 對應值	10.00	ppm	範圍: 1.00-40.00ppm
ppm 4.00mA 對應值	0.00	ppm	範圍: 0.00-39.00ppm
			高低之間差距至少 1.00ppm
ppb 20.00mA 對應值	100.0	ppb	範圍: 10.0-200.0 ppb
ppb 4.00mA 對應值	0.0	ppb	範圍: 0.0-190.0 ppb
			高低之間差距至少 10.0 ppb
溫度 20.00mA 對應值	100.0	°C	範圍: 0.0 - 130°C
溫度 4.00mA 對應值	0.0	°C	範圍: -10.0 - 120.0°C
			高低之間差距至少 10.0°C
電流 1 輸出偏移量	0.00	mA	範圍: +/- 1.00mA
電流 2 輸出偏移量	0.00	mA	範圍: +/- 1.00mA
電流 1 濾波時間	0	秒	範圍: 0-120 秒
電流 2 濾波時間	0	秒	範圍: 0-120 秒
電流 1 固定輸出電流	4.00	mA	範圍: 4.00-20.00mA
電流 2 固定輸出電流	4.00	mA	範圍: 4.00-20.00mA
電流 1 保持模式	最後		範圍: 固定/最後
電流 2 保持模式	最後		範圍: 固定/最後
繼電器 1 DO 閉合點	80.0	%	範圍: 0.0-400.0%
繼電器 1 DO 釋放點	20.0	%	範圍: 0.0-400.0%
			二者最小差距 0.1%
繼電器 1 ppm 閉合點	8.00	ppm	範圍: 0.00-40.00ppm
繼電器 1 ppm 釋放點	2.00	ppm	範圍: 0.00-40.00ppm
			二者最小差距 0.01ppm
繼電器 1 ppb 閉合點	80.0	ppb	範圍: 0.0-200.0ppb
繼電器 1 ppb 釋放點	20.0	ppb	範圍: 0.0-200.0ppb
			二者最小差距 0.1ppb
繼電器 1 延遲時間	0	秒	範圍: 0-120 秒
繼電器 2 DO 閉合點	20.0	%	範圍: 0.0-400.0%
繼電器 2 DO 釋放點	80.0	%	範圍: 0.0-400.0%
			二者最小差距 0.1%
繼電器 2 ppm 閉合點	2.00	ppm	範圍: 0.00-40.00ppm
繼電器 2 ppm 釋放點	8.00	ppm	範圍: 0.00-40.00ppm
			二者最小差距 0.01ppm

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Factory value

DO 20.00mA corresponding value 100.0 % range: 10.0 - 400.0%

DO 4.00mA corresponding value 0.0 % range: 0.0 - 390.0%

The difference between high and low is at least 10.0%

ppm 20.00mA corresponding value 10.00 ppm range: 1.00-40.00ppm

ppm 4.00mA corresponding value 0.00 ppm range: 0.00-39.00ppm

The difference between high and low is at least 1.00ppm

ppb 20.00mA corresponding value 100.0 ppb Range: 10.0-200.0 ppb

ppb 4.00mA corresponding value 0.0 ppb Range: 0.0-190.0 ppb

The difference between high and low is at least 10.0 ppb

Temperature 20.00mA corresponding value 100.0 °C Range: 0.0 - 130°C

Temperature 4.00mA corresponding value 0.0 °C Range: -10.0 - 120.0°C

The difference between high and low is at least 10.0°C

Current 1 Output Offset 0.00 mA Range: +/- 1.00mA

Current 2 Output Offset 0.00 mA Range: +/- 1.00mA

Current 1 filter time 0 seconds Range: 0-120 seconds

Current 2 filter time 0 seconds Range: 0-120 seconds

Current 1 Fixed output current 4.00 mA Range: 4.00-20.00mA

Current 2 Fixed output current 4.00 mA Range: 4.00-20.00mA

Current 1 Hold Mode Last Range: Fixed/Last

Current 2 Hold Mode Last Range: Fixed/Last

Relay 1 DO closing point 80.0 % Range: 0.0-400.0%

Relay 1 DO release point 20.0 % Range: 0.0-400.0%

The minimum difference between the two is 0.1%

Relay 1 ppm Closing point 8.00 ppm Range: 0.00-40.00ppm

Relay 1 ppm Release point 2.00 ppm Range: 0.00-40.00ppm

The minimum difference between the two is 0.01ppm

Relay 1 ppb Closing point 80.0 ppb Range: 0.0-200.0ppb

Relay 1 ppb release point 20.0 ppb Range: 0.0-200.0ppb

The minimum difference between the two is 0.1ppb

Relay 1 delay time 0 seconds Range: 0-120 seconds

Relay 2 DO closing point 20.0 % Range: 0.0-400.0%

Relay 2 DO release point 80.0 % Range: 0.0-400.0%

The minimum difference between the two is 0.1%

Relay 2 ppm Closing point 2.00 ppm Range: 0.00-40.00ppm

Relay 2 ppm Release point 8.00 ppm Range: 0.00-40.00ppm

The minimum difference between the two is 0.01ppm

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Original page 24 - translation continued

繼電器 2 ppb 閉合點	20.0	ppb	範圍: 0.0-200.0 ppb
繼電器 2 ppb 釋放點	80.0	ppb	範圍: 0.0-200.0 ppb
			二者最小差距 0.1ppb
繼電器 2 延遲時間	0	秒	範圍: 0-120 秒
繼電器 3 週期時間	1.0	時	範圍: 0-1000.0 小時
繼電器 3 清洗時間	10	秒	範圍: 0-1000 秒
繼電器 3 延遲時間	0	秒	範圍: 0-120 秒
繼電器 3 功能	錯誤報警		範圍: 清洗,週期報警,錯誤報警
儲存間隔	60	秒	範圍: 5-120 秒
通訊 ID 地址	1		範圍: 1-255
通訊傳輸速率	9600		範圍: 9600,19200,38400
DO 偏移量	0.0	%	範圍: +/- 10.0%
ppm 偏移量	0.00	ppm	範圍: +/- 1.00ppm
ppb 偏移量	0.00	ppb	範圍: +/- 10.0ppb
測量單位	%		範圍: %,ppm,mg/L,ug/L
溫度偏移量	0.0	℃	範圍: +/- 5.0℃
手動測量溫度	25.0	℃	範圍: -10.0 - 130.0℃
手動校正溫度	25.0	℃	範圍: 0.0 - 60.0℃
顯示語言	繁體中文		範圍: 英文,繁體中文,簡體中文
濾波	1		範圍: 0-10
溫度補償方式	自動		範圍: 自動/手動
溫度探棒	NTC22K		範圍: Pt1000,NTC22K
記錄顯示方式	記錄		範圍: 記錄,圖形
大氣壓力	1013	mBAR	範圍: 500 - 9999 mBAR
鹽度	0.0	ppt	範圍: 0.0 - 50.0
膜溫係數	0.0306		範圍: 0.0001 to 3.0000
極化電壓	-675	mV	範圍: -675mV

密碼

按 MODE 鍵

1100: 用戶電極校正

1200: 功能設定: 如果 10 分鐘內沒有按鍵被按下,則會自動離開,離開前有更改的參數會儲存

錯誤碼

Error 01 儲存器錯誤

Error 02 測量值大於最大值

Error 03 測量值小於最小值

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Relay 2 ppb Closing point 20.0 ppb Range: 0.0-200.0 ppb

Relay 2 ppb release point 80.0 ppb Range: 0.0-200.0 ppb

The minimum difference between the two is 0.1ppb

Relay 2 delay time 0 seconds Range: 0-120 seconds

Relay 3 Cycle Time 1.0 hours Range: 0-1000.0 hours

Relay 3 cleaning time 10 seconds Range: 0-1000 seconds

Relay 3 delay time 0 seconds Range: 0-120 seconds

Relay 3 function error alarm range: cleaning, periodic alarm, error alarm

Storage interval 60 seconds Range: 5-120 seconds

Communication ID Address 1 Range: 1-255

Communication transmission rate 9600 Range: 9600,19200,38400

DO offset 0.0 % Range: +/- 10.0%

ppm offset 0.00 ppm range: +/- 1.00ppm

ppb offset 0.00 ppb range: +/- 10.0ppb

Measurement unit % Range: %, ppm, mg/L, ug/L

Temperature offset 0.0℃ Range: +/- 5.0℃

Manual temperature measurement 25.0℃ Range: -10.0 - 130.0℃

Manual calibration temperature 25.0℃ Range: 0.0 - 60.0℃

Display language Traditional Chinese Range: English, Traditional Chinese, Simplified Chinese

Filter 1 Range: 0-10

Temperature compensation mode automatic range: automatic/manual

Temperature probe NTC22K Range: Pt1000,NTC22K

Record display mode Record range: record, graphics

Atmospheric pressure 1013 mBAR Range: 500 - 9999 mBAR

Salinity 0.0 ppt Range: 0.0 - 50.0

Film temperature coefficient 0.0306 Range: 0.0001 to 3.0000

Polarization voltage -675 mV Range: -675mV

Password

Press MODE key

1100: User electrode calibration

1200: Function setting: If no button is pressed within 10 minutes, it will automatically leave if there are any parameters changed before leaving.

The data will be stored

error code

Error 01 Storage error

Error 02 The measured value is greater than the maximum value

Error 03 The measured value is less than the minimum value

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Original page 25 - translation continued

Error 04	溫度大於最大值
Error 05	溫度小於最小值
Error 06	第一路電流輸出高於 20.5 mA, 電流最高限制=22.00mA
Error 07	第一路電流輸出低於 3.8 mA, 電流最低限制=3.5mA
Error 08	第二路電流輸出高於 20.5 mA, 電流最高限制=22.00mA
Error 09	第二路電流輸出低於 3.8 mA, 電流最低限制=3.5mA
Error 10	記錄器故障
Error 11	ADC 故障
Error 99	工廠資料遺失

RS485 通訊

儀器採用標準 Modbus-RTU 協議,所有資料為雙位元組參數為 (-32767~32767) ,16 進制數表示,最高位為符號

上位機發送命令格式:

	儀器 ID 地址	命令	數據起始位置	數據數量	CRC16
長度	1 byte	1byte	2 byte	2 byte	2 byte
舉例	0x01	0x03	0x0001	0x0001	0xD5CA

此為讀取第一個資料,請參考下表

下位機回應格式:

	儀器 ID 地址	命令	數據數量	數據內容	CRC16
長度	1 byte	1 byte	1byte	N byte	2 byte
舉例	0x01	0x03	0x02	0x02 0xBC	0xB895

當機器回覆01,功能碼無法辨識
當機器回覆02,位址不正確
當機器回覆03,資料數量不正確

功能 03: 讀取設定值
功能 04: 讀取測量值

Error 04 The temperature is greater than the maximum value
Error 05 The temperature is less than the minimum value
Error 06 The first current output is higher than 20.5 mA, the maximum current limit=22.00mA
Error 07 The first power output is lower than 3.8 mA, the minimum current limit=3.5mA
Error 08 The second current output is higher than 20.5 mA, the maximum current limit=22.00mA
Error 09 The second power output is lower than 3.8 mA, the minimum current limit=3.5mA
Error 10 Recorder failure
Error 11 ADC failure
Error 99 Factory data is missing

RS485 communication

The instrument adopts the standard Modbus-RTU protocol. All data are in two-byte parameters. The parameters are (-32767~32767), 16

Hexadecimal number representation, the highest bit is the sign

The command format sent by the host computer:

Instrument ID Ground Command Data Start Bit Data Number CRC16

Address setting quantity

Length 1 byte 1byte 2 byte 2 byte 2 byte

Example 0x01 0x03 0x0001 0x0001 0xD5CA

This is the first data to be read, please refer to the table below

Response format of slave computer:

Instrument ID Ground Command Data Quantity Data CRC16

address content

Length 1 byte 1 byte 1byte N byte 2 byte

Example 0x01 0x03 0x02 0x02 0xB895

0xBC

When the machine replies 01, the function code cannot be recognized

When the machine replies 02, the address is incorrect

When the machine replies 03, the number of data is incorrect

Function 03: Read set value

Function 04: Read measured values

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04: 定義

位址

(00)	0x00	測量%/ ppm/ppb 值	讀值: %X0. 1, ppm X0.01, ppbX0.1
(01)	0x01	%/ppm/ppb 電流	讀值: X 0.01
(02)	0x02	溫度值	讀值: X 0.1
(03)	0x03	溫度電流	讀值: X 0.01
(04)	0x04	錯誤碼	讀值: X 1
(05)	0x05		
(06)	0x06		
(07)	0x07		
(08)	0x08		
(09)	0x09	機型	讀值: 固定 7

03: 定義

位址

(00)	0x00	DO 20.00mA 對應值(電流 1)	讀值: X 0.1
(01)	0x01	DO 4.00mA 對應值(電流 1)	讀值: X 0.1
(02)	0x02	ppm 20.00mA 對應值(電流 1)	讀值: X0.01
(03)	0x03	ppm 4.00mA 對應值(電流 1)	讀值: X 0.01
(04)	0x04	ppb 20.00mA 對應值(電流 1)	讀值: X0.1
(05)	0x05	ppb 4.00mA 對應值(電流 1)	讀值: X 0.1
(06)	0x06	溫度 20.00mA 對應值(電流 2)	讀值: X 0.1
(07)	0x07	溫度 4.00mA 對應值(電流 2)	讀值: X 0.1
(08)	0x08	電流 1 偏移量	讀值: X0.01
(09)	0x09	電流 2 偏移量	讀值: X0.01
(10)	0x0A	電流 1 濾波時間	讀值: X1
(11)	0x0B	電流 2 濾波時間	讀值: X1
(12)	0x0C	電流 1 固定電流	讀值: X0.01
(13)	0x0D	電流 2 固定電流	讀值: X0.01
(14)	0x0E	電流 1 保持模式	讀值: X1 0=固定電流,1=最後電流
(15)	0x0F	電流 2 保持模式	讀值: X1 0=固定電流,1=最後電流
(16)	0x10	繼電器 1 DO 閉合點	讀值: X0.1
(17)	0x11	繼電器 1 DO 釋放點	讀值: X0.1
(18)	0x12	繼電器 1 ppm 閉合點	讀值: X0.01
(19)	0x13	繼電器 1 ppm 釋放點	讀值: X0.01
(20)	0x14	繼電器 1 ppb 閉合點	讀值: X0.1
(21)	0x15	繼電器 1 ppb 釋放點	讀值: X0.1
(22)	0x16	繼電器 1 延遲時間	讀值: X1
(23)	0x17	繼電器 2 DO 閉合點	讀值: X0.1

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04: Definition

address

(00) 0x00 Measure %/ ppm/ppb value Reading value: %X0. 1, ppm X0.01, ppbX0.1

(01) 0x01 %/ppm/ppb current reading: X 0.01

(02) 0x02 Temperature value Reading value: X 0.1

(03) 0x03 Temperature current reading value: X 0.01

(04) 0x04 Error code Reading value: X 1

(05) 0x05

(06) 0x06

(07) 0x07

(08) 0x08

(09) 0x09 model reading value: fixed 7

03: Definition

address

(00) 0x00 DO 20.00mA corresponding value (current 1) Reading value: X 0.1

(01) 0x01 DO 4.00mA corresponding value (current 1) Reading value: X 0.1

(02) 0x02 ppm 20.00mA corresponding value (current 1) Reading value: X0.01

(03) 0x03 ppm 4.00mA corresponding value (current 1) Reading value: X 0.01

(04) 0x04 ppb 20.00mA corresponding value (current 1) Reading value: X0.1

(05) 0x05 ppb 4.00mA corresponding value (current 1) Reading value: X 0.1

(06) 0x06 Temperature 20.00mA corresponding value (current 2) Reading value: X 0.1

(07) 0x07 Temperature 4.00mA corresponding value (current 2) Reading value: X 0.1

(08) 0x08 Current 1 offset reading value: X0.01

(09) 0x09 Current 2 offset reading value: X0.01

(10) 0x0A current 1 filter time reading value: X1

(11) 0x0B Current 2 filter time reading value: X1

(12) 0x0C current 1 fixed current reading value: X0.01

(13) 0x0D current 2 fixed current reading value: X0.01

(14) 0x0E Current 1 hold mode reading value: X1 0=fixed current, 1=last current

(15) 0x0F current 2 hold mode reading value: X1 0=fixed current, 1=last current

(16) 0x10 Relay 1 DO closing point Reading value: X0.1

(17) 0x11 Relay 1 DO release point Reading value: X0.1

(18) 0x12 Relay 1 ppm closing point Reading: X0.01

(19) 0x13 Relay 1 ppm release point Reading value: X0.01

(20) 0x14 Relay 1 ppb closing point Reading: X0.1

(21) 0x15 Relay 1 ppb release point Reading: X0.1

(22) 0x16 Relay 1 delay time Reading value: X1

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(23) 0x17 Relay 2 DO closing point Reading value: X0.1
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(24)	0x18	繼電器 2 DO 釋放點	讀值: X0.1
(25)	0x19	繼電器 2 ppm 閉合點	讀值: X0.01
(26)	0x1A	繼電器 2 ppm 釋放點	讀值: X0.01
(27)	0x1B	繼電器 2 ppb 閉合點	讀值: X0.1
(28)	0x1C	繼電器 2 ppb 釋放點	讀值: X0.1
(29)	0x1D	繼電器 2 延遲時間	讀值: X1
(30)	0x1E	繼電器 3 週期週期	讀值: X0.1
(31)	0x1F	繼電器 3 清洗時間	讀值: X1
(32)	0x20	繼電器 3 延遲時間	讀值: X1
(33)	0x21	繼電器 3 功能	讀值: X1 0=清洗,1=週期報警,2=錯誤報警
(34)	0x22	記錄儲存間隔	讀值: X1
(35)	0x23	測量單位	讀值: X1 0=%,1=ppm,2=mg/L,3=ug/L
(36)	0x24	DO 偏移量	讀值: X0.1
(37)	0x25	ppm 偏移量	讀值: X0.01
(38)	0x26	ppb 偏移量	讀值: X0.1
(39)	0x27	溫度偏移量	讀值: X0.1
(40)	0x28	手動測量溫度	讀值: X0.1
(41)	0x29	手動校正溫度	讀值: X0.1
(42)	0x2A	溫度補償方式	讀值: X1 0=自動,1=手動
(43)	0x2B	探棒種類	讀值: X1 0=Pt1000,1=NTC22K
(44)	0x2C	語言選擇	讀值: X1 0=英文,1=繁體,2=簡體
(45)	0x2D	濾波	讀值: X1
(46)	0x2E	大氣壓力	讀值: X1
(47)	0x2F	鹽度	讀值: X0.1
(48)	0x30	膜溫係數	讀值: X0.01 %

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- (24) 0x18 Relay 2 DO release point Reading value: X0.1
 (25) 0x19 Relay 2 ppm closing point Reading: X0.01
 (26) 0x1A relay 2 ppm release point reading: X0.01
 (27) 0x1B Relay 2 ppb closing point Reading: X0.1
 (28) 0x1C Relay 2 ppb release point Reading: X0.1
 (29) 0x1D Relay 2 delay time Reading value: X1
 (30) 0x1E Relay 3 cycle period Reading value: X0.1
 (31) 0x1F Relay 3 cleaning time Reading value: X1
 (32) 0x20 Relay 3 delay time Reading value: X1
 (33) 0x21 Relay 3 function Reading value: X1 0=Cleaning, 1=Periodic alarm, 2=Error alarm
 (34) 0x22 Record storage interval Reading value: X1
 (35) 0x23 Measurement unit Reading value: X1 0=%,1=ppm,2=mg/L,3=ug/L
 (36) 0x24 DO offset reading value: X0.1
 (37) 0x25 ppm offset reading: X0.01
 (38) 0x26 ppb offset reading: X0.1
 (39) 0x27 Temperature offset reading value: X0.1
 (40) 0x28 Manual temperature measurement reading: X0.1
 (41) 0x29 Manual temperature correction Reading value: X0.1
 (42) 0x2A Temperature compensation mode Reading value: X1 0=automatic, 1=manual
 (43) 0x2B Probe type Reading value: X1 0=Pt1000,1=NTC22K
 (44) 0x2C Language selection Reading value: X1 0=English, 1=Traditional Chinese, 2=Simplified Chinese
 (45) 0x2D filter reading value: X1
 (46) 0x2E Atmospheric pressure reading: X1
 (47) 0x2F Salinity Reading value: X0.1
 (48) 0x30 Film temperature coefficient Reading value: X0.01 %

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