ATO

Temperature and Humidity Detector

Manual

ATO

Copyright statement

1. This manual describes the use methods and technical parameters of the product in as much detail as possible, but the company reserves the right to modify this manual without further notice;

2. The appearance of the finished product in the manual may be slightly different from the actual product due to printing and other reasons, please refer to the actual product;

3. This information is for reference only and does not constitute any form of commitment;

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User Service Guidelines

1. Before using this product, please carefully check whether the accessories, product qualification certificate and user warranty card are complete according to the product factory list. If you find incomplete, please contact the seller or manufacturer immediately.

2. Within 12 months from the date of sale of this product, if the user complies with the storage, transportation and use requirements, and the product quality is lower than the technical index, you can

enjoy free replacement or repair with the warranty certificate.

3. This product can only be repaired by professionals. Please do not disassemble or install the internal circuit board or replace the components at will, otherwise our company will not bear any responsibility for any consequences caused by this.

Precautions for safe use

The detector can be installed in hazardous areas and non-explosion-proof areas in a Class II explosion-proof environment, and it is strictly forbidden to open the cover with electricity.

The service life of the sensor of the detector is 2 to 3 years under normal circumstances, and its service life may be reduced due to the different use environment, so it should be inspected and maintained regularly every year.

I.Overview

The temperature and humidity detector is a detection product independently developed by our company, with practical functions and easy operation. It can be installed in hazardous areas and non-explosion-proof areas in Class II explosion-proof environments.

Functional features：

☆ Real-time display of concentration, and display the current

alarm state;

☆ Color code breaking screen HD display, menu display;

☆ Output 4-20mA standard signal and RS485 communication;

☆ With high-performance microprocessor and remote control for easy operation;

☆ Level 2 alarm output, automatically open the fan and solenoid valve;

☆ Modular design, easy wiring and maintenance;

☆ Easy data backup, one-button restore factory Settings.

II.Technical features

Detection principle	Semiconductor capacitive humidity sensor element
Detection object	Temperature and humidity detection
Detection range	Temperature: -40℃~70℃ Humidity: 0~100%RH
Alarm set value	Low limit alarm 50℃ High limit alarm 60℃
Working voltage	DC24V power supply
Construction material	Die-cast aluminum
Connection thread	G1/2 (optional)
Explosion-proof mark	Ex db IIC T6 Gb/Ex tb ib IIIC T80℃ Db

| Protection grade	IP66
Product size	183.5*143*86mm
Output signal	RS485（Protocol：ModBus RTU） Passive switch output（Maximum capacity：250V 2A）
Operating environment	-40℃～+70℃ Relative humidity(10-93)％ RH(Non-condensing) Atmospheric pressure 86kPa~106kPa
Product weight	≤1.5kg
Sensor life	Clean air for 2~3 years

III．Installation and adjustment

III-i.　Applications

Heating ventilation air conditioning, dehumidifier, testing and inspection equipment, consumer products, automobiles, automatic control, data loggers, weather stations, home appliances, humidity control, medical and other related temperature and humidity detection and control.

### III-ii.　Installation location

The detector is installed in a place where the ventilation

temperature is stable, and the installation location is installed in a representative location in the room according to requirements, such as an area with a large temperature fluctuation range and relatively high humidity. Avoid placing the detector near the front window of the sun or heating, and should be more than one meter away from the ground, with the sensor position facing downwards.

Duty room

100cm

Floor

160cm
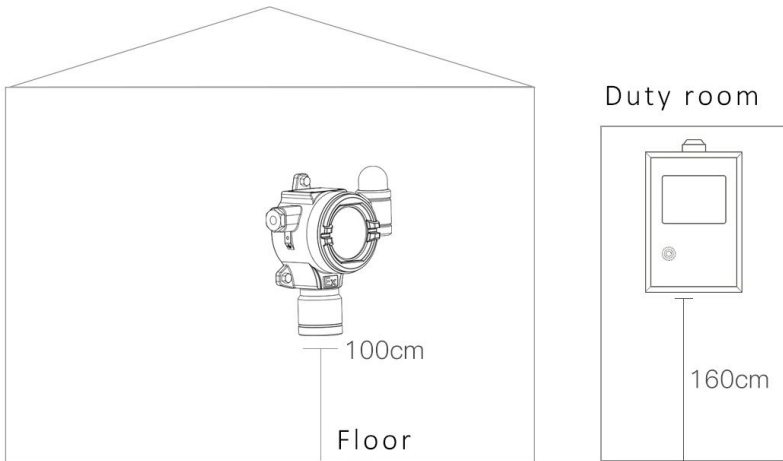
Note: The detector should be installed in a place where there is no impact, no vibration, no strong electromagnetic field interference, and easy to repair. There should be no less than 0.5m of clearance and access channels between the installation site and the surrounding pipelines or equipment.
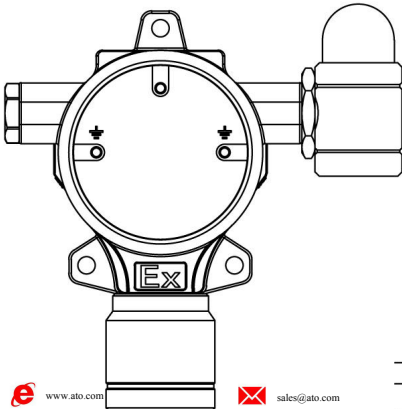
III-iii. Installation method
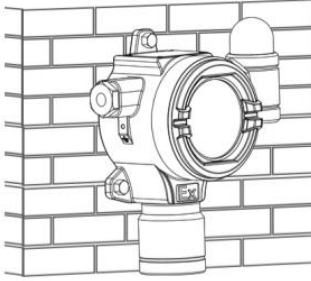
Wall mounted
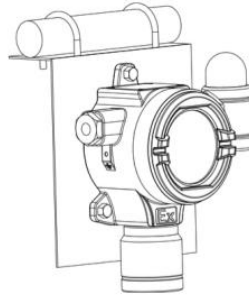
Tube holding installation
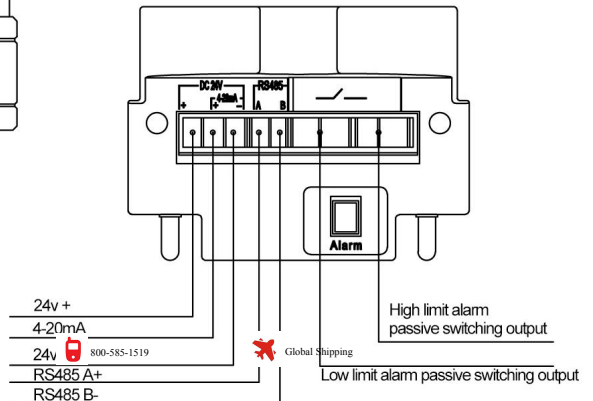
Mounting hole spacing: 48±3mm

IV.Product wiring

485 Adopts four-wire system (24V+ 24V-A + B-)

Baud rate 9600(4800 optional); No parity bit, data bit 8, stop bit 1.

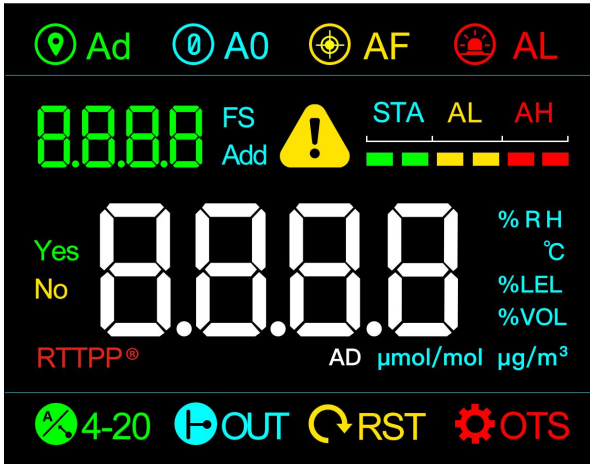DC24V   RS485
+   -   4-20mA   A   B

Alarm

24v +
4-20mA
24v
RS485 A+
RS485 B-

High limit alarm
passive switching output

Low limit alarm passive switching output

www.ato.com   sales@ato.com   800-585-1519   Global Shipping

V.Basic Operations

After the detector is powered on and running, it will display the range and version number when it is turned on. After entering the main interface, press and hold the 【MENU】 key for a long time, the menus are expanded from left to right. After fully expanded, release the button to enter the password input interface, and enter the password through the 【Numeric Keyboard】. The password is the current address code of the device. After entering the password, press the 【OK】 key again, and then the "Yes" and "No" options will pop up. Use the 【Left】 and 【Right】 keys to select, "Yes" to enter the setting interface, "No" to return to the main interface, and press 【OK】 Key to select. After entering the setting menu, you can switch the menu up

and down through the 【Left】 and 【Right】 keys. The menu is explained as follows:

Ad	485 Bus Address Setting
AF	Temperature and humidity calibration
AL	Alarm Limit Setting
OUT	Low/high limit alarm output mode setting
RST	Reset
OTS	Setting the number of calibration points
No	Exit the menu

Please note: do not operate A0 and AF at will. If you need to adjust, please contact us and adjust after guidance.

The icon flashing means entering the level 1 menu, the icon and the signal flashing together means entering the level 2 menu, and the blinking option means that it is in an adjustable state.

V-i. Ad

When in the "Address" option, press the 【OK】 key to enter the address. The default address of the detector is: 255, which can be set by direct input through the 【Increase】 and 【Decrease】 keys or through the 【Numeric keyboard】, such as the current display The

address is: 0255, press the 【Delete】 key to display 0000, you can enter the address, after the 【OK】 key again, the "Yes" and "No" options will pop up, select by pressing the 【Left】 and 【Right】 keys, "Yes" saves the current settings, "No" does not save the current settings, press the 【OK】 key again to exit.

V-ii.   AF

Temperature calibration

When in the "AF" option, after pressing the 【OK】 key, the calibration temperature value of the temperature calibration point (CAL1) will be displayed on the LCD screen. Press the 【OK】 key to enter the calibration calibration state, and the current sensor reading will be displayed on the LCD screen. Use the 【Left】 and 【Right】 keys to adjust the current calibration concentration for the obtained temperature value. Please put the detector into the standard temperature space and wait for the temperature to stabilize to the temperature you want to calibrate. After the 【OK】 key, "Yes" will pop up. "No" option, select by 【Left】 and 【Right】 keys, "Yes" saves the current settings, "No" does not save the current settings, press the 【OK】 key again to exit.

Humidity calibration:

When in the "calibration" option, after pressing the 【OK】 key, adjust to the humidity calibration point (CAL2) with the 【Left】 and

【Right】 keys, and press the 【OK】 key to enter the calibration state, the method is the same as above. Calibrate humidity. After the calibration is completed, select "Cancel" through the 【Left】 and 【Right】 keys, and then 【OK】 again to exit the current setting interface.

Note: After entering the calibration mode, the temperature calibration point (CAL1) or the humidity calibration point (CAL2) will display the corresponding value, which represents the temperature and humidity value of the ideal calibration environment.

V-iii.   AL

When in the "AL" option, after pressing the 【OK】 key, the low limit alarm (low alarm) setting value will be displayed on the LCD screen. Use the 【Increase】 and 【Decrease】 keys to adjust the current low alarm setting. Use 【Numeric Keyboard】 to adjust the low alarm setting value operation, if the current alarm value is 10, press 【Delete Key】 to display 0 on the screen, press 【Numeric Keyboard】 to complete the low alarm setting value input, press 【OK】 Press the key to save and enter the high limit alarm (high alarm) setting, the setting method is the same as above; after the 【OK】 key, the "Yes" and "No" options pop up, select by the 【Left】 and 【Right】 keys, and "Yes" to save the current settings , "No" does not save the current settings, and again press 【OK】 to exit.

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V-iv.　OUT

When in the "output" option, press the 【OK】 key to enter. At this time, the LCD screen displays the output mode of the low limit alarm output (low alarm) 1, "Stad" is the standard output, and the relay is closed after the alarm. Pass 【Left】【Right】 key to switch the output mode, "Puls" is pulse output, the relay is closed after the alarm, and disconnected after 3s. Press the 【OK】 key again and directly save the output mode setting of entering the high limit alarm output (high alarm) 2, switch the output mode through the 【Left】 and 【Right】 keys, and press the 【OK】 key to save and exit.

V-v.　RST

When in the "reset" option, press the 【OK】 key to enter the reset function. At this time, the LCD screen displays the configuration information storage operation. "LOAD" means to load the configuration information from the sensor module to the detector. Press the 【OK】 key to Load the configuration information from the detector module to the detector. Press the 【Left】 and 【Right】 keys to switch operations, "COPY" means to back up the configuration information from the detector to the sensor module. Via 【Left】, 【Right】 Press to select "No" to exit the current setting interface.

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V-vi.   OTS

When in the "Other" option, press the 【OK】 key to enter the other level 2 function settings. At this time, the LCD screen displays the first parameter configuration-the number of calibration points setting and the current set number, "CALn" is the number of calibration points .At this time, press the 【OK】 key to enter the adjustment of the calibration quantity, which supports two-point calibration at most (one for temperature and humidity). Press the 【OK】 key again, and the "Yes" and "No" options will pop up, and select by the 【Left】 and 【Right】 keys, "Yes" saves the current settings, "No" does not save the current settings, again 【OK】 key to exit the current level 2 function settings. Use the 【Left】 and 【Right】 keys to select "No" to return to the level 1 setting menu.

VI.Maintenance and repair

1. The detector has been rigorously calibrated before leaving the factory. After installation, please do not change the components at will. If you need to replace it, you must re-calibrate;

2. The service life of the sensor of the detector is 2 to 3 years under normal conditions, and its service life may be reduced due to the different use environment, so inspection and maintenance should

be carried out regularly every year;

3. It is forbidden to use high-concentration gas to impact the detector sensor to prevent the sensor from being damaged;

4. Avoid frequent power failure of the detector, which will cause unstable operation of the detection components;

5. In order to ensure the reliability and accuracy of the detector, it should be calibrated regularly, and the period should not exceed 1 year.

VII. Fault analysis and troubleshooting

Common malfunctions	Fault judgment	Approach
The power indicator does not light up	electricity failure	①Whether the power cord is loose ②Whether the power supply voltage is normal, normal 24V ③Re-power on and observe ④Return to the factory for repair and treatment

Temperature and humidity display no response	Sensor failure	①Check the sensor cable ②Check whether the sensor socket is loose ③Replace the protective cover to view ④Replace the sensor to check
The exclamation mark or yellow alarm light are displayed	Sensor failure	①Sensor recalibration ②Replace the sensor

VIII.Warranty Service Provisions

1. This product implements three guarantees services;

2. The free warranty period is one year (from the date of purchase), please follow the instructions and precautions for use, if the instrument fails, please contact the manufacturer;

3. During the warranty period, the following conditions will not be guaranteed:

① Equipment damage and malfunction caused by failure to follow the precautions in the instructions for use;

②Equipment failure and damage caused by self-disassembly, modification and maintenance;

4. The equipment sold is maintained for life, and only cost is charged for maintenance outside the warranty period;