Ozone Monitor, Temperature and Humidity Modbus, Analog, Relay Outputs

O3

Sep. 18

O_3 Desktop

O_3 Wall

Technical Data

Gas Detected	Ozone - O_3
Sensing Element	Electrochemical gas sensor
Sensor lifetime	>2 years, removable and easy to replace
Temperature Sensor	NTC 5K
Humidity Sensor	HS series capacitive sensor
Power Supply	24Vac/dc (power adaptor selectable)
Power Consumption	2.8W
Response Time	<50s @T90
Signal Update	1s
Warm up Time	<60 seconds
Ozone Measuring Range	0 to 5000ppb (0-5ppm) (0 to 9.81mg/m³)
Display Resolution	0 to 1000ppb (0 to 1 ppm) (0.01mg/m³) 1ppb (0,001ppm) (0,01mg/m³)
Accuracy	±0.01ppm + 10% reading
Nonlinear	<1%FS
Repeatability	<0.5%
Zero Drift	<1%
Sound	When LCD backlight is red the inner buzzer alarm will be activated
Display, LCD backlight	**Green - ozone level < 1500 ppb, Yellow - 1500 ppb <ozone level < 3500 ppb, Red - 3500ppb < ozone level (default)**
Temperature measurement	-20 to 50° C (-4 to 140° F)
Humidity measurement	5 to 99% rH
Analog Output	0 to 10Vdc (default) or 4 to 20mA linear output selectable
Analog Output Resolution	16Bit
Relay dry contact Output	Two dry-contact outputs Max, switching current 3A (220Vac/30Vdc), resistance Load

Features

- **Real time detection and monitoring ambiant ozone level**
- **Design for real time detecting and monitoring ambiance ozone level and temperature**
- **Electrochemical ozone sensor with high sensitivity**
- **Particular LCD display with three color backlights (Green/ Yellow/Red)**
- **Maximum ozone measuring range:
0 to 5000ppb (0 to 9.81mg/m³)**
- **Enables reset of measurement range by end user**
- **2 x On/Off dry contact outputs for two stages alarm device, or control a ozone generator or a ventilator**
- **Buzzer alarm and 3-color backlight LCD indication**
- **Preset two stage alarm points for ozone measurement**
- **Provide 1 x analog output (0,2 to 10Vdc/4 to 20mA) (can be used as transmitter)**
- **Modbus RS485 communication interface, 15 kV antistatic protection, individual IP address**
- **Easy way for calibration and setup alarm points via the RS 485 interface**
- **Temperature measurement and display**
- **Humidity measurement and display optional**
- **Multiple application, wall mounting type and desktop type**
- **Great performance with high quality**

Application

- Specially used for detecting indoor ambiance quality
- Real time measuring ozone level and analyzing:
alarm when ozone level is over proof, control ozone concentrations by controlling related devices in order to reach a certain level in some special places
- Portable type for real time measuring and analyzing
- Anti-epidemic and disease prevention, sanitary inspection, environment protection, health protection, etc.
- O3-5000 is the best device used to detect and analyze ozone concentration.

Ordering Codes

O3-5000	Ozone Monitor 0 - 5000ppb (0 - 5ppm), incl. remote control, desktop bracket and power supply.

Modbus Communication Interface	Modbus RTU protocol with 19200bps(default) Other bps rate selectable in order 15KV antistatic protection
Working Condition	-20 to 45° C (-4 to 113° F) / 0 to 95% rH
Storage Conditions	-40 to 70° C (-40 to 158° F)/ 0 to 95% rH
Net Weight	190g
Dimensions	130 × 85 × 36.5mm (H x W x D)
Mounting height	300 mm above floor
Installation Standard	65 × 65 mm or 85 x 85 mm or 2"×4" wire box
Interface Connection (Max)	9 terminals
Wiring Standard	Wire section area <1.5mm^2
Manufacturing Process	ISO 9001 Certified
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Compliance	EMC Directive 89/336/EEC
Version	A038

Ordering Codes - Alarm Units	
AAW	Warning Siren 24Vdc, 98 - 108 dB
AAW 230	Warning Siren 230Vac, 98 - 108 dB
OA 24	Red Flash Light, 24Vdc
OAW 24	Combined Warning Siren and Flash Light, 24Vdc
OAW 230	Combined Warning Siren and Flash Light, 240Vac
Warning Sign	
Gas Alarm	Warning Sign "**GAS ALARM**" 24Vac/dc

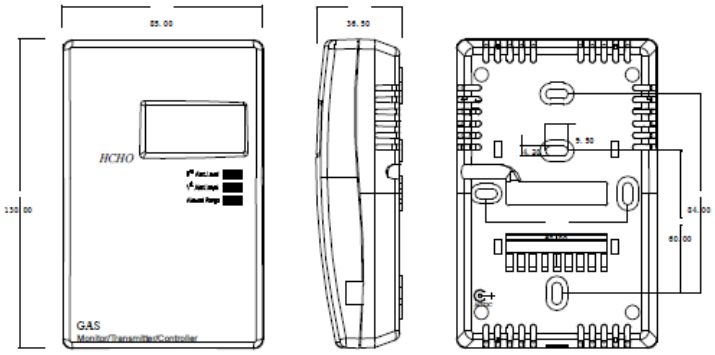
Control Output

Analog output	0 to 10Vdc output, or 4 to 20mA output) Voltage or current output is selected by jumpers
Relay output	2 dry contact output
Modbus RS485	RS485 with Modbus interface of RTU protocol
Ozone range	0 to 5000ppb

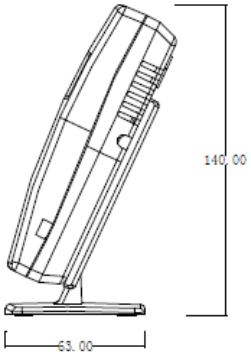
O3-5000 indicates the ozone detector with 2X on/off dry contact outputs and a Modbus RS485 interface, and the ozone range: 0-5000ppb.

O3-5000 indicates the ozone detector with 1X 0 to 10Vdc output and a Modbus RS485 interface, LCD display. Humidity sensor included.

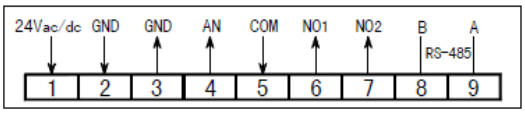
Mounting and Wiring Diagrams



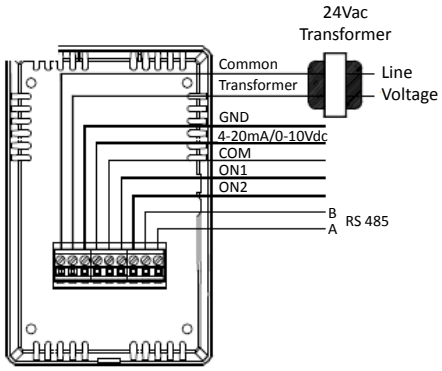
Wall mounting



Flat position



Wiring diagram



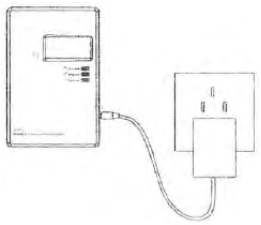
Important Safety Information

- Always turn off power before mounting, removing and clearing the alarm. Notice the supply power voltage: 24Vac/dc

Mounting and Wire Connection

- Do not mount it behind a door, in a corner or near a heat source, diffuser or any steam source or in direct sunlight.
- If the monitor uses the power adaptor to supply the 24Vac/dc power, plug the output end of the adaptor into the power socket.

Fig. 1 Adaptor power supply



For wall mounting:
Follow steps 1 - 3 in Figure 2.

Turn off power and put a flat head screwdriver deep inside the hole on the bottom of the alarm housing, then depress the clip slightly to remove the face plate from the wall plate.

Move the top of the house apart. Mount the unit on the wall.

Fig. 2

Operation
Turn on power. A red spotlight at a lower position on the cover can be seen. Meanwhile the LCD display in green is activated. Values for temperature and relative humidity are displayed on the upper line of the LCD. The second line showes the ozone level. See fig. 3.

Fig. 3 - LCD Display

Analog output selection
If you want to change the analogue output, please follow the following steps:

a. Turn the power off and remove the back cover. You can see two jumpers, S1 and S2, in the middle of the circuit board.
Connect the right two pins of the S1 and S2 - the analog output is voltage output.
Connect the leftmost two pins of S1 and S2 - the analog output is current output.

b. There are another two jumpers, J1 and J2, in the upper left of the circuit board.
When the J1 is connected the analog output is 2-10Vdc or 4-20mA output.
When the J1 is disconnected, the analog output is 0-10Vdc or 0-20mA output.

c. The J1 and J2 are just for testing before leaving the factory.
The default is 4-20mA. Do not change them!

Parameter Setup
Power off and remove the front cover. There is a set of 4 dip switches on the upper left corner on the circuit board.

DIP 1	OFF - Volume concentration	ON - Mass concentration	Leaving factory (default): OFF
DIP 2	OFF - Celcius	ON - Fahrenheit	Leaving factory: OFF
DIP 3	OFF - Relay 1 control valid at the first setpoint ON - Relay 1 control valid at the second setppoint		Leaving factory: OFF
DIP 4	OFF - Relay 2 control valid at the first setpoint ON - Relay 2 control valid at the second setpoint		

J1: connected (short circuit) - analog start value at 2V/4mA; disconnected - analog start value at 0V/mA
J2: connected - test of analog output bottom limit; disconnected - analog output works normally
J3: connected - test of analog output upper limit; relay outputs, backlights & buzzer alarm; disconnected - everything works normally
J4: connected - zero point calibration

After using the ozone sensor for more than one year, the sensor needs to be calibrated again. Put the monitor into the space zero ozone (make sure the ozone level in the space is zero).

Connect the jumper first and then disconnect the jumper when the buzzer stops alarming (about 30 seconds).

The ozone level at this time will be 0ppm.

J5: connected - single point calibration.
Connect the jumper first and then disconnect the jumper when the buzzer stops alarming (about 30 seconds).
The ozone level at this time will be the value showed in parameter 26.

Parameter Setup:

1. Parameters can be set through RS485 OR
2. Connect **J1 & J2** at the same, DIP 1 & 2 to ON.
   Parameters can be set through infrared remote controller
   (▼ ▲ keys to adjust values,
   MODE key to switch items)

Modbus Register

LCD Display	Parameter	Setting Range	Default
-01	Temperature differential value	±3.0°C/±6°F	0
-02	Manual humidity calibration	5~99%rH	50
-03	Real-time ozone value calibration	0~ upper limit of measuring range as 16ppm e.g. if set this value at 16 through RS485 or remote controller, the sensor will take the present ozone level"	0
-04	First setpoint of relay 1	1~ upper limit of measuring range	1000
-05	Second setpoint of relay 1	1~ upper limit of measuring range	2000
-06	First setpoint of relay 2	1~ upper limit of measuring range	3000
-07	Second setpoint of relay 2	1~ upper limit of measuring range	4000
-08	Relay differential value	1~1000	100
-09	Relay control mode	0: to increase ozone concentration 1: to decrease ozone concentration	1
-10	Demarcation point between green backlight and yellow backlight	1~ upper limit of measuring range	1500
-11	Demarcation point between yellow backlight and red backlight	1~ upper limit of measuring range	3500
-12	Buzzer alarm	0: invalid 1: valid	1
-13	Alarm setpoint	1~ upper limit of measuring range	3500
-14	Alarm differential value	1~1000	100
-15	Alarm song album	0: Tick-tick 1: Music-For Elise 2: Music-Mariage d`amour"	0
-16	Sensor warm-up time	1~ 600 seconds	120
-17	Display in ppm or ppb	1: ppm 2: ppb	2
-18	RS485 communication address	1~ 255	1
-19	RS485 Baud rate	1: 4800bps 2: 9600bps 3: 14400bps	4
-20	RS485 Parity bits and Stop bits selectable	1: None 1Stop; 2: None 2Stop 3: Odd 1 Stop 4:Even 1 Stop	1
-21	Sensor detection upper limit value	1~ upper limit of measuring range	5000
-22	Self calibration	0: invalid 1: valid	1
-23	Manual zero point calibration available	Adjust the setpoint from 0 to 1, the present ozone level is deemed as 0ppm	0
-24	Manual single point calibration available	Adjust the setpoint from 0 to 1, the present ozone level is deemed as the value in -26	0
-25	Manual vernier regulation of detection value (AD value calibration)	-9999~ 9999	--

LCD Display	Parameter	Setting Range	Default
-26	Sensor calibration, 1st detection point	0ppb~ upper limit of measuring range	0
-27	Sensor calibration, 1st AD value	0 ~ 32767	--
-28	Sensor calibration, 2nd detection point	0ppb~ upper limit of measuring range	2500
-29	Sensor calibration, 2nd AD value	0 ~ 32767	--
-30	Sensor calibration, 3rd detection point	0ppb~ upper limit of measuring range	5000
-31	Sensor calibration, 3rd AD value	0 ~ 32767	--

Notice: When relay 1 is activated, *ON will show* on the LCD. When relay 1 is deactivated, *ON will not show* on the LCD