

Wall Mount Multi-Sensing Transmitter with Relay

AQM-200(LG)



AQM-200(G)



AQM-200(LG)



RoHS



U.S. or KR

Europe

Locking nut joint

• General

AQM-200(LG) series C.E. and FCC certified-the world's largest kinds of sensors integrated Air Quality Monitor and Transmitter, They could detect CO₂, CO, and various Volatile Organic Compounds, Temperature, Humidity. They are equipped with Locking nut joint and mounting holes for Europe or US as well as Korea.

• Feature

- 15years knowhow based multiplied compensation algorithms keep accuracy and longterm stabilization throughout full operating Temperature and Concentration range.
- Long lifecycle CO₂ (NDIR, > 10 years CO (Chemical type, > 5 years) sensors are integrated Transmitter.
(> 8 years lifecycle model is option for CO)
- Besides LCD-display, RS-485Modbus or analog output can be chosen on purchase:
4~20mA/0~20mA/2~10V/0~10V.
- All units verification in factory before delivery.
- Easier mgmt with auto-Zero calibration mode for CO sensor, Auto or Manual calibration for CO₂ sensor.
- Size : 85 X 136 X 24 (mm), ? grams

※ Design or Specification of AQM-200(LG) series might be changed without notice.

AQM-200(LG)

Application

Boiler room, parking lot or stores in basement, kitchen, fire detection in mansions and offices, restaurants and stores.

General Performance

Operating Temperature range

0°C ~ 50°C

Operating Humidity range

10 ~ 90% RH (Non-condensing)

('G' option: operatable upto 10~95% RH with Non-Condensing and protect from rustness)

Storage Temperature

0°C ~20°C (Higher temp. shorten sensor life.)

Measurement

Sensing Method

CO : Chemical type, CO₂ : NDIR type, VOCs,Temp,Humid.:Semiconductor type

Accuracy with Measurement Range

CO: ±3% of F.S (0~250ppm, Option:1,000ppm),

CO₂: 30ppm ±3% of Reading (0~10,000ppm)

VOCs: ±15% of (0~30ppm=30,000ppb)

Temp: ± 0.5°C at 0~60°C, ? -40~0,61~100°C

Humid: ± 2% at 0~100% RH

Response Time

T₉₀ : < 30sec, T₆₀ : < 9sec

Sampling Interval

CO₂: 3 seconds, other sensors: 1 second

Life Cycle

CO₂: 15years, VOCs, Temp, Humidity: 10 years

CO: 5 years. (option: 8 years)

Electrical Data

Input Power

24VDC± 20%, (3-Wired)

Power Consumption.

24V: 1.3Watt (12V: 1 Watt)

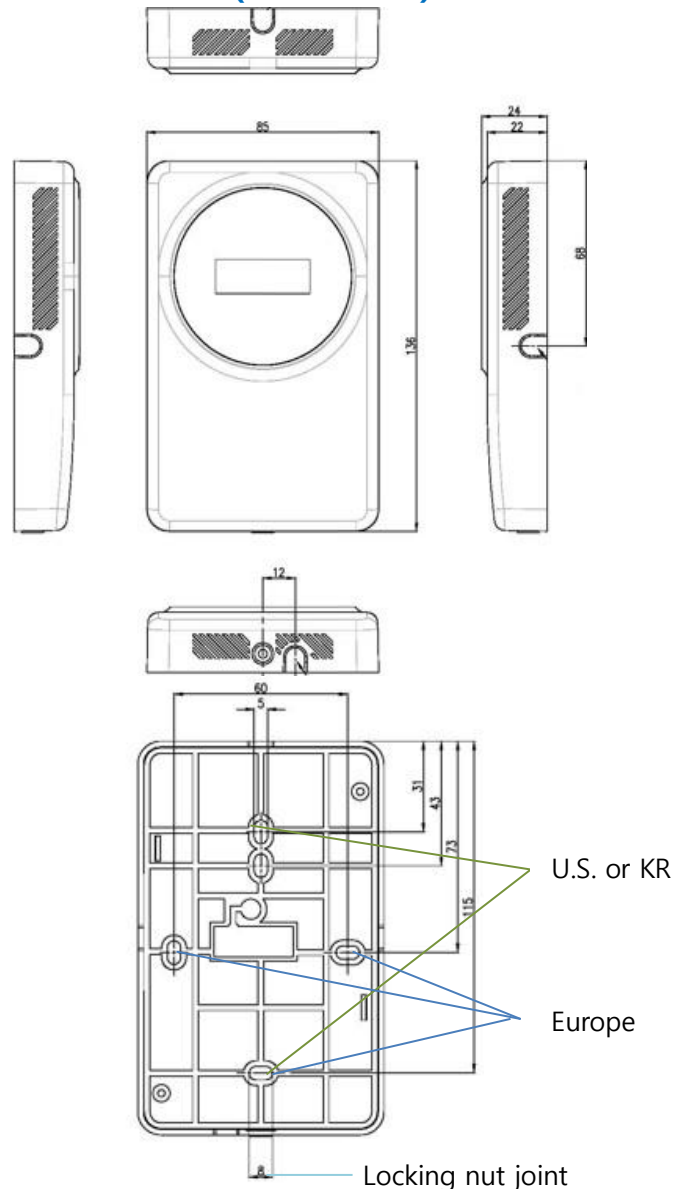
Wiring Method

1. VIN+: 24VDC+

2. VIN-: Common-GND

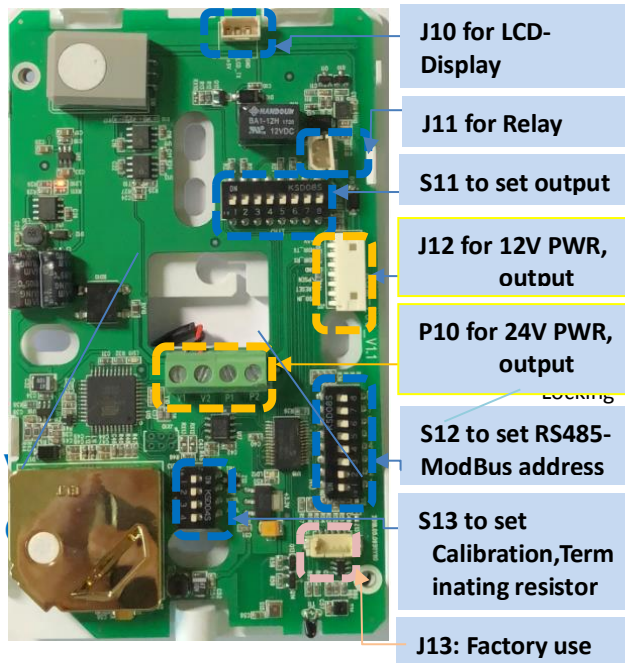
3. A-OUT: Output Signal (Voltage or Current)

Dimensions (unit : mm)



Picture1. Mounting screw position.

Configuration with components



Picture2. Components on Main-board.

1. Display CO₂, CO, Temp, Humid, VOCs

Measure and display 5 parameters on LCD-display unit every 3 seconds.

No	Measure	Format	Displayed image updated every 3 seconds
1	CO ₂	xxxx ppm	
2	CO	xxxx ppm	
3	Temp.	xx.xx°C	
4	Humid.	H xx%	
5	VOC	dxxxx	

Table 1. Display for 5 kinds measured data every 3 sec..

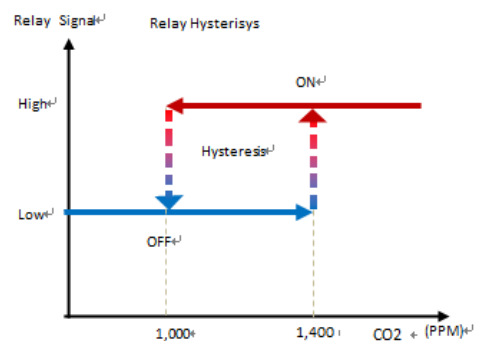
2. Relay-output for CO or CO₂ (VOCs, Temp, Humidity is option)

Relay-signal could out on P1 and P2 of green-terminal block, of which on/off range is set as

P10	Pin	DC	AC
1	V1	GND	24VAC-
2	V2	12~24VDC	24VAC+
3	P1	Relay+	
4	P2	Relay-	

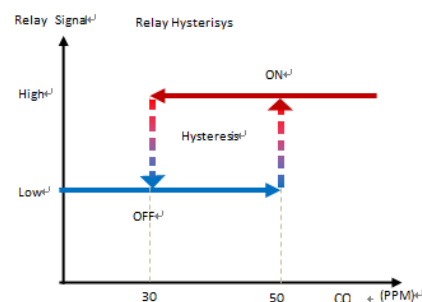
Table 2. Available Relay signal output for P1

CO₂: On > 1,400ppm, Off < 1,000ppm



Picture3. Relay Hysteresis for CO₂

CO : On > 50ppm, Off < 30ppm,



Picture4. Relay Hysteresis for CO

The set could be changed by user's designation on purchase.

※Alternative Relay from J11 is available when p1&p2 is occupied by analog or RS485.

Switch	Pins-UP	Alarm
S11	7 th , 8 th	
J11	ROUT1, ROUT2	

Table 3. Available Relay signal output on J11

3. Analog-output (current/voltage)

Measure and send analog-current or voltage corresponding CO₂ measurement. 4 ~ 20mA is default (2 ~ 10VDC or 0 ~ 20mA or 0 ~ 10VDC is selectable with switch-11).

P10	Pin	DC	AC
1	V1	GND	24VAC-
2	V2	12~24VDC	24VAC+
3	P1	Aout+	
4	P2	GND	

Table 4. Available analog signal output for P1

No	S11	Pins-UP	Set image
1	0~20 mA	3 rd , 4 th	
2	4~20 mA	3 rd , 4 th , 6 th	
3	0~10V	3 rd , 4 th , 5 th	
4	0~10V	3 rd , 4 th , 5 th , 6 th	

※Warning : Please careful not to wire power cable into P1 which are for analog signal output position of terminal block, which leads to damage sensors .

4. RS-485ModBus with Address

To measure and send signal using RS485Modbus, 1st and 2nd pin of S11 switch should be up.

Switch	Pins-UP	ModBus
S11	UP: 1 st , 2 nd	

Table 5. RS485ModBus setting

P10	Pin	DC	AC
1	V1	GND	24VAC-
2	V2	12~24VDC	24VAC+
3	P1	RS485+	
4	P2	RS485-	

➤ RS-485ModBus Protocol

2 wired Half-Duplex typed Modicon Mod-Bus RTU mode is supported.

Parameters	Descriptions
Baud rate	9,600 BPS
Data bit	8 Bits
Parity bit	None
Stop bit	1

Table 5-1. Parameter setting

➤ Modbus Address should be designated among 1~255, as an example for ID #1, 1st pins of Dip-switch 12 should be up.

Switch	Setting example #1	ID range
S12		1 ~255

Table 5-2. Address setting

➤ Hold Register Specification.

- Mapping Base Address: 0x0050
- Hold Register. Max. Read Size: 5

Addr.	Value	Type	Unit	AC
0x0050	CO2	Word	PPM	Ex) 800 -> 800ppm
0x0051	CO	Word	PPM	Ex) 30 -> 30ppm
0x0052	VOCs	Word	PPB	Ex) 100 -> 100ppb
0x0053	Temp.	Word	°C	Ex) 255->255 /10: 25.5°C
0x0054	Humid.	Word	%	Ex 25 -> 25%

Table 5-3. Hold Resistor setting

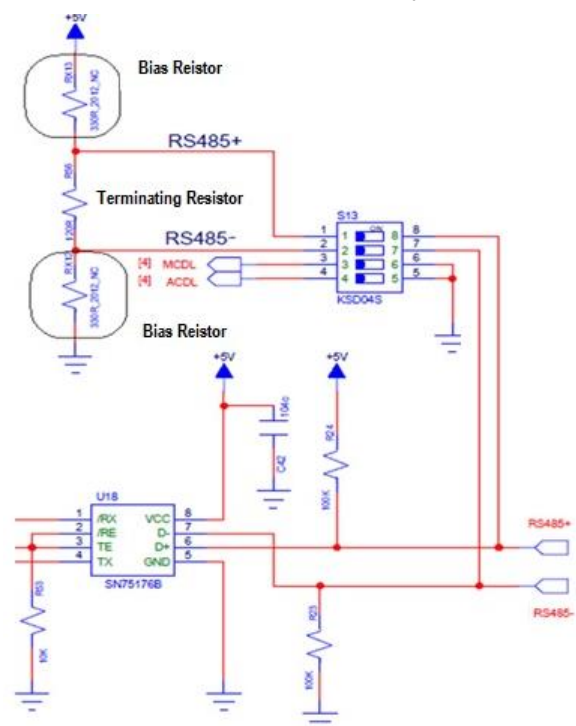
➤ Supported Function Code

- Currently supported only code 03 and exception responses.
- Error code 0x83 or other (CODE + 0x80)

Exception code	Descriptions
01	Exceptions of Function code
02	Exception of Starting Address
03	Exceptions of Quantity of Registers

Table 5-4. Hold Resistor setting

➤ Termination Resistor enable/disable.



120ohms terminating Resistors could be activated by 1st and 2nd pins of S13-switch up.



Switch	Pins-UP	ModBus
S13	Terminating Resistor: ON	
S13	Terminating Resistor: OFF	

Table 5-5. Terminating resistor enable/disable

Calibrations for AQM-200

For indoor residential application, CO, VOCs Sensors are designed to do self-calibration.

So does CO2 sensor, it calibrate every week after first 2days, second 5 days since power on; according to CO2 sensor operating as 'ACDL' mode below.

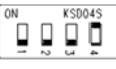
S13	Mode	CO2 calibration
4 th pin up	'A':Automatic Calibration	

Table 6. Automatic calibration setting for CO2 sensor.

As alternative, CO2 sensor can operate as factory calibration mode with Manual calibration, enabling users to fix in 10 minutes as needed; Users can do 10 minutes manual calibration (MCDL) when sensors face 400ppm of fresh air. The sensor measure 10 minutes CO2 values and regards the lowest CO2 measurement to be 400ppm when user return switch to NORMAL position again.



S13	Pins-UP	ModBus
All down	Normal mode (last calibrated status since after calibrated in factory)	
3 rd pin up	'M':Manual Calibration	

Table 7. Manual calibration and Factory calibration mode

Ordering Guide

AQM-200 (LG)-	CO2	CO	VOC S (V)	TEMP (T)	HUMID (H)	ANALOG (N)	RS485 (M)	RELAY (R)
1	●					●		
2	●						●	
3	●							●
4	●			●			●	
5	●			●	●		●	
6	●			●		●		
7	●		●	●	●		●	
8		●				●		
9		●					●	
10		●						●
11	●	●					●	
12		●		●	●		●	
13	●	●				●		
14	●	●	●	●	●		●	

Table 8. Ordering table with configuration

'L' : 'LCD-Display' : show each sensor values in turn.

'G' : 0~99% RH operation is recommended for Agricultural application.

CO2 range: 0~10,000 ppm (option: 30,000ppm)
ACDL set is default for Indoor residential application while as normal mode (Factory calibrated status) for Agricultural usage.

CO range: 0~250ppm, (option: 1,000 ppm)

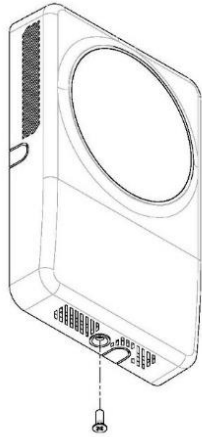
5years Life cycle (8years Life cycle)

Ex1) AQM-200-1 = AQM-200-CO2-N = CO2, analog-output (4~20mA is default)

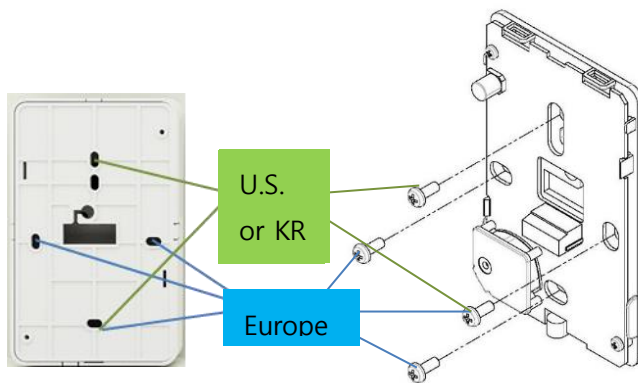
Ex2) AQM-200LG-14 = AQM-200(LG)-CO2-CO-V-TH-M = LCD, 'G' option, CO2, CO, V, T, H.485ModBus.

Installation Guide

- I. Unscrew to loosen the locking-nut-joint and open front-case. Un-plug LCD connector from main-board for LCD-Display models.



- II. Fix AQM-200 with mounting screws on right position of wall, referring to Picture-1 (Europe or US).



- III. Wire two power-lines (V1, V2) and the other two communication lines/Analog lines/alarm lines (P1, P2).

P10	Pin	DC		AC	
1	V1	GND		24VAC-	
2	V2	12 or 24VDC		24VAC+	
3	P1	Aout+	RS485+	Relay+	
4	P2	GND	RS485-	Relay-	

- IV. Cover front-cover and lock with joint-nut.

- V. Turn on Power and check if sensors give measurements on LCD-display or thru analog output measurement or RS484ModBus protocol.

Cautions

- I. Please make sure if wired power lines into right positions, V1, V2; wrong wiring into P1, P2 leads to burn-out or severe breakage.
- II. Chemical sensors should be kept 0~20°C and better to be installed within 6 months from purchase not to shorten their lifecycle.
- III. Install near to nose height of 1.2~1.8m is desirable to measure CO gas and CO2 gas.
- IV. Sensors are designed to keep lifecycle when installed normal living condition unless effected physically, mechanically or chemically. Sensor-detection part or PCB part should be kept from dirties, water or oil spraying which cause damage and keep Sensors away from the solvent or high concentration organic gas existence or continuous vibration, or impulse from.
- V. Power should be selected within tolerance and wired into right position, Sensor get damaged when 24V power is inserted into output.

- VI. Chemical sensor modules replacement

should be done careful not to pluck way sensor modules; Please grip the upside and downside of PCB, arrow-direction of picture, between 4-pins and 10pins connectors on unplugging sensor-module from main-board little by little, left and right in turn. Vice versa on plugging the sensor-module into main-board.

VII. Please install or keep sensors away from the places where electro-static or induced electro-magnetic field exists.

VIII. Please make sure to use air-based

standard gas on Test Sensor performance.

IX. The sensors components should NOT be departed or replaced, or manipulated unless request or agree by vendor, Please don't touch electrolyte leaked from sensor when it is damaged or broken. Wash out skins with running water when wet by leaked electrolyte.

X. CO2 sensor could be calibrated on clean air with reference to Table 6 and Table 7.



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