ION–XX–KIT
I/O/M Manual

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ION Kit Overview

Designed to provide the optimal amount of ionization to actively clean the air in a home or business environment and provide feedback through a closed contact closure. The Ion Kit will alarm if the ionization has stopped working in your HVAC system. This allows you to correct any issues immediately, ensuring that you will always have the comfort of knowing that the air in the space you live or work in is always being cleaned.

Ion Kit comes with ionization modules, sensing devices, a transformer for larger kits and feedback through a set of dry contacts to tell you the system is working. In a standard indoor air environment, size the Ion Kit to perform at 2500 CFM per block. However, if you are in a smoking or a fried food environment, each ionization block will only do 1,250 CFM/block.

Be sure to size your ionization system properly. The recommended kit size based on rooftop tonnage can be found on the following page

Tools/Parts Required

Tools/Parts (provided by contractor)
- Wire cutters / strippers
- Screwdriver (small flathead and philips)
- Needle nose pliers
- Drill with 5/16 nut driver bit, step bit and 1/2" drill bit for temperature probe holes
- Wire (thermostat wire) for VOC, CO2, ion generator, optional humidity, optional transformer, optional BACnet translator, optional actuator and/or mod power exhaust.

Hardware Included with controls package
(not shown on pg. 4). Reference pg. 4 for major components.
- Wire connectors (6)
- Screws (40 self tapping)
- Wire ties (5)

![iAIRE UltraPURE logo]

Product Data

Ionization Kits

Package Description

The iAIRE ionization kit provides a field installation kit for packaged and split systems. This allows you to provide ionization in new or existing units.

For the tonnage selected, the kits include the optimal amount of ionization devices, mounting brackets, VOC sensor and transformers*. The VOC sensor provides feedback with a contact closure to ensure that your ionization is always working.

*Note: A transformer is required with 4 or more Ion devices.

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File# 101141865COL-003

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Part Number

ION - ** - KIT**

Type	Unit Tonnage		Kit
ION - IONIZATION	26 - 2 to 6 tons	100 - 100 tons	Kit
	712 - 7 to 12 tons	125 - 125 tons	
	1525 - 15 to 25 tons	150 - 150 tons	
	3050 - 30 to 50 tons	175 - 175 tons	
	6075 - 60 to 75 tons	200 - 200 tons	

Package Matrix

	Part #	Quantities									
		ION-26-KIT	ION-712-KIT	ION-1525-KIT	ION-3050-KIT	ION-6075-KIT	ION-100-KIT	ION-125-KIT	ION-150-KIT	ION-175-KIT	ION-200-KIT
	Ion Generator mod. # ION-0A*00	1	2	4	8	12	16	20	24	28	32
	Ion Generator Mounting Kit mod. # UNV-0016-Kit	1	2	4	8	12	16	20	24	28	32
	VOC Sensor mod. # SEN-0071	1	1	1	1	1	1	1	1	1	1
	Transformer mod. # TRN-0005 Kit	0	0	1	1	1	2	2	2	2	3
Terminal Strip		1	1	1	1	2	2	3	3	4	4
Electrical Data	24v	0.27A	0.44A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	230v	N/A	N/A	0.08A	0.15A	0.22A	0.29A	0.36A	0.43A	0.50A	0.57A
	460v	N/A	N/A	0.04A	0.08A	0.11A	0.14A	0.18A	0.21A	0.25A	0.28A
CFM	Standard Conditions	2500	5000	10000	20000	30000	40000	50000	60000	70000	80000
	Smoking Conditions	1250	2500	5000	10000	15000	20000	25000	30000	35000	40000
	Total Weight	1.07 lbs	1.72 lbs	5.52 lbs	8.12 lbs	10.72 lbs	15.82 lbs	18.42 lbs	21.02 lbs	23.62 lbs	28.72 lbs

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ION Kit Installation

The Ion Kit comes with ion block(s), ion mounting bracket(s), a VOC sensor and a terminal strip that provides feedback through a dry contact closure. When there are 4 or more blocks in a kit, 24V power supplies are included to provide enough power to the system.

The first step is to mount the ion generator(s). Reference the ION-0A*00 install sheet provided at the end of this document for more information about installing the individual ion generators.

Ion Generator(s)

Position the ion generator(s) perpendicular to the air stream by mounting them to the inlet of the supply fan on the opposite side of the drive shaft and belt. See figure [1.3] below. This may require the removal of the top panel on the RTU. If multiple blowers exist, evenly distribute the number of ion generators between them.

If using multiple ion generators, tie the wires of each generator together after mounting (if using the mounting plate, mount the generators to the plate and tie the wires of each generator together before mounting each plate). Be sure to keep all wires away from the generator tips, moving objects and areas that may cause wires to be sucked into the blower.

Wiring

Once each ion generator is landed, the wires from each ion generator need to be run back and landed on the terminal strip. The Ion Kit gets power from the existing 24V power in the HVAC unit if there are 3 or less ion generators. If there are 4 or more ion generators, 24V power supplies are provided and need to be installed. Once the ion generators, VOC sensor, terminal strip and power supplies are mounted, tie the feedback from the unit to the monitoring devices you are using to ensure that the ionization is always working. Reference wiring schematic provided on the next page.
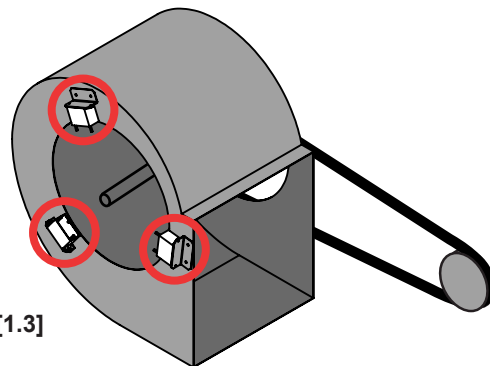

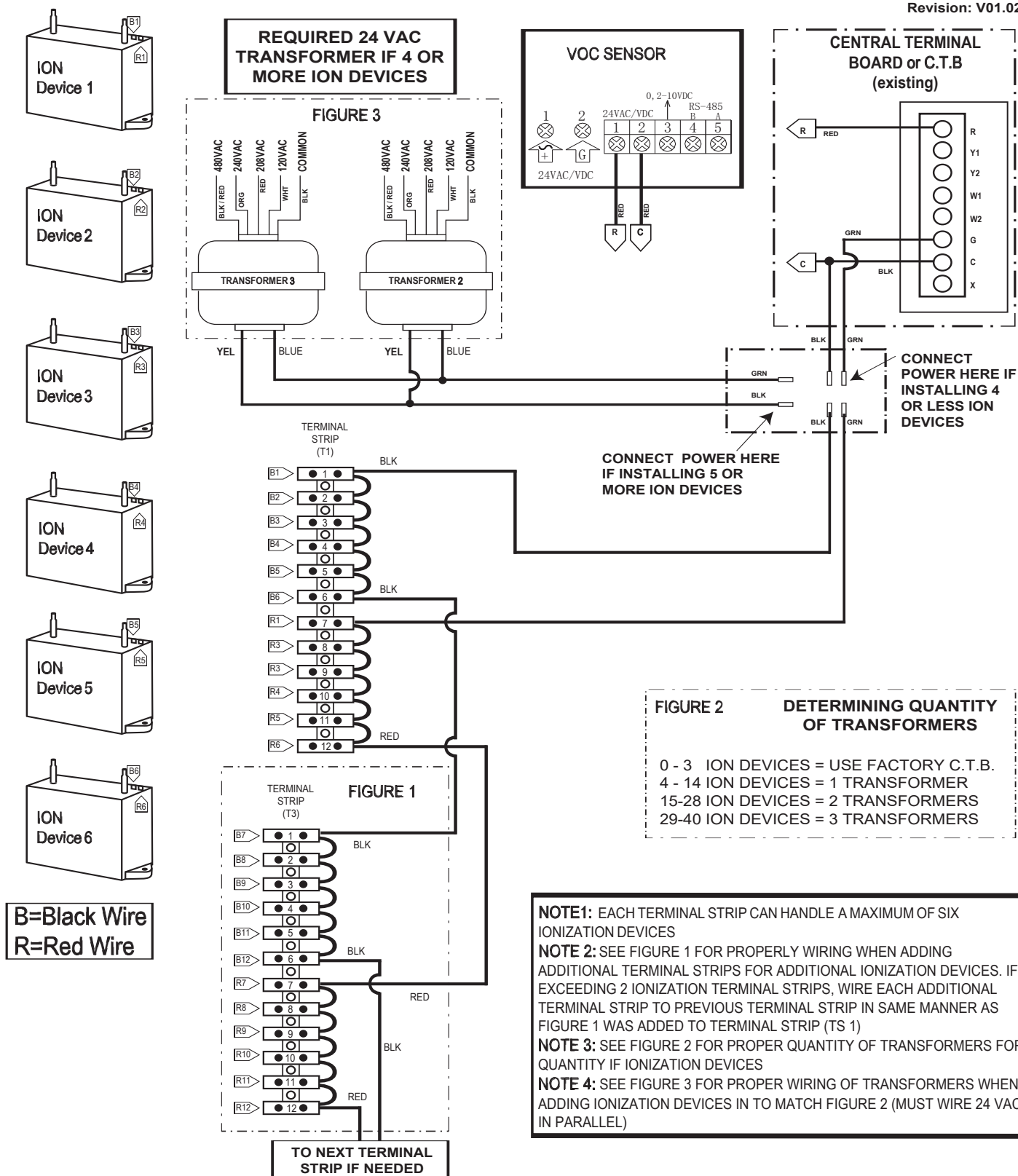**figure [1.3]**

ION Kit Operational Notes

Ionization can only clean the air when the fan on the HVAC unit is running. The thermostat fan setting should be put to "On" (not auto) to ensure the fan continually runs and that the air is constantly cleaned. If this is not done, the air cleaning done by ionization will be lower than expected.

ION FIELD INSTALL KIT WIRING

SCH-ION-0003

Revision: V01.02

ION Device 1

ION Device 2

ION Device 3

ION Device 4

ION Device 5

ION Device 6

B=Black Wire
R=Red Wire

REQUIRED 24 VAC TRANSFORMER IF 4 OR MORE ION DEVICES

FIGURE 3

480VAC | 240VAC | 208VAC | 120VAC | COMMON
BLK / RED | ORG | RED | WHT | BLK

TRANSFORMER 3

TRANSFORMER 2

YEL | BLUE | YEL | BLUE

VOC SENSOR

0, 2-10VDC

24VAC/VDC | RS-485 B A

1 | 2 | 3 | 4 | 5

24VAC/VDC

+ | G

RED | RED

R | C

CENTRAL TERMINAL BOARD or C.T.B (existing)

R | RED
R
Y1
Y2
W1
W2
G | GRN
C | BLK
X

C

BLK | GRN

GRN

BLK

CONNECT POWER HERE IF INSTALLING 4 OR LESS ION DEVICES

BLK | GRN

CONNECT POWER HERE IF INSTALLING 5 OR MORE ION DEVICES

TERMINAL STRIP (T1)

B1 | 1 | BLK
B2 | 2
B3 | 3
B4 | 4
B5 | 5
B6 | 6 | BLK
R1 | 7
R3 | 8
R3 | 9
R4 | 10
R5 | 11
R6 | 12 | RED

TERMINAL STRIP (T3) **FIGURE 1**

B7 | 1 | BLK
B8 | 2
B9 | 3
B10 | 4
B11 | 5
B12 | 6 | BLK
R7 | 7
R8 | 8
R9 | 9
R10 | 10
R11 | 11
R12 | 12 | RED

RED

BLK

TO NEXT TERMINAL STRIP IF NEEDED

FIGURE 2 **DETERMINING QUANTITY OF TRANSFORMERS**

0 - 3 ION DEVICES = USE FACTORY C.T.B.
4 - 14 ION DEVICES = 1 TRANSFORMER
15-28 ION DEVICES = 2 TRANSFORMERS
29-40 ION DEVICES = 3 TRANSFORMERS

NOTE1: EACH TERMINAL STRIP CAN HANDLE A MAXIMUM OF SIX IONIZATION DEVICES
NOTE 2: SEE FIGURE 1 FOR PROPERLY WIRING WHEN ADDING ADDITIONAL TERMINAL STRIPS FOR ADDITIONAL IONIZATION DEVICES. IF EXCEEDING 2 IONIZATION TERMINAL STRIPS, WIRE EACH ADDITIONAL TERMINAL STRIP TO PREVIOUS TERMINAL STRIP IN SAME MANNER AS FIGURE 1 WAS ADDED TO TERMINAL STRIP (TS 1)
NOTE 3: SEE FIGURE 2 FOR PROPER QUANTITY OF TRANSFORMERS FOR QUANTITY IF IONIZATION DEVICES
NOTE 4: SEE FIGURE 3 FOR PROPER WIRING OF TRANSFORMERS WHEN ADDING IONIZATION DEVICES IN TO MATCH FIGURE 2 (MUST WIRE 24 VAC IN PARALLEL)

The following are reference product installation sheets

![iAIRE UltraPURE logo]

Product Data

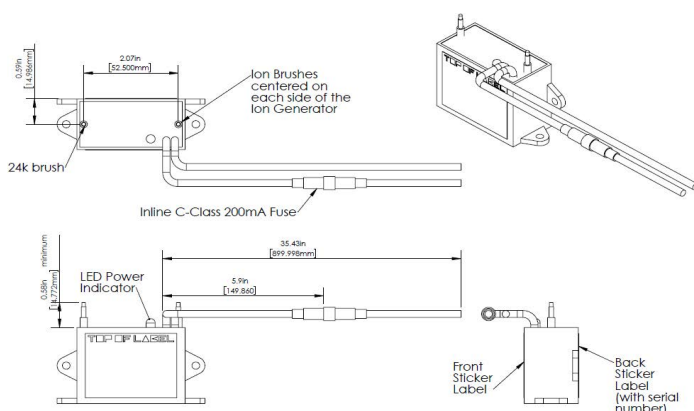## ION-0A * 00 | Ion Generator for AHUs, Heating and AC Units

Part Number

I O N - 0A * 00

VOLTAGE:
A - 24VAC / VDC, 1ϕ*
D - 115VAC, 1ϕ
G - 208/230VAC, 1ϕ

*Note: The 24V block can be utilized as a lower voltage block.

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Product Dimensions (inches [cm])

2.07in [52.500mm]
0.59in [14.986mm]
Ion Brushes centered on each side of the Ion Generator
24k brush
Inline C-Class 200mA Fuse

0.58in [14.772mm] minimum
LED Power Indicator
35.43in [899.998mm]
5.9in [149.860mm]
TOP OF LABEL
Front Sticker Label
Back Sticker Label (with serial number)

Product Application

Hospitals | Nursing Homes | Schools |
Animal Feeding and Processing Plants |
Shopping Malls | Laboratories | Veterinary Offices |
Restaurants and Food Preparation Areas | Zoos |
Casinos | Convention Centers and Arenas | Jails |
Museums | Health Clubs | Churches and Synagogues

Airflow
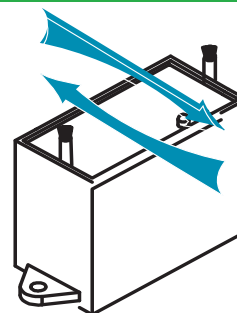
* bi-directional airflow

Technical Data

Part #	ION-0AA00	ION-0AD00	ION-0AG00	ION-0AA00*	
Power Supply	24V	115V	208/230V	12V	5V
Power Consumption	4W	1.8W	0.7W	0.7W	0.15W
Output Voltage	+/- 7.0kV			+/- 3.5kV	+/- 1.5kV
Ion Count (Per Polarity)	> 155 Million ions			> 110 Million ions	> 50 Million ions
Weight	.5 lbs (.25 kg)				
Power Wiring Leads	35 inches in length				
Mounting	Self tapping metal screws				
Dimensions	3.16" x 1.16" x 2.27"				
CFM	2,500 CFM				
Vibration Protection	If vibration of block occurs, 1/2" double sided foam tape (GNP-0176) can be used				

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ION-0A*00 INSTALL

Ion Generator for AHUs, Heating and AC Units

READ THESE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

INSTALLATION

The *iAIRE* ion generator is a versatile product and can be mounted in any type HVAC system. It is designed for airflows of up to 2,500 CFM and standard VOC loading. 1250 CFM in smoking environments.

MOUNTING

Find a suitable location in the air stream. The optimal location is at the inlet to the supply fan. Keep the carbon fiber needles far enough away from any conductive surface to prevent arcing.

The ion air purifier has two mounting flanges with a hole to accommodate 1/8" self tapping sheet metal screws [figure 1.1]. With the provided metal screws, mount the ion air purifier perpendicular to and in the middle of the air stream such that air will flow between the carbon fiber needles [figure 1.2]. The exposed end of the screw should not protrude from the unit where someone can be cut on the screw tip.

In some cases, to properly mount the ion air purifier, the optional mounting bracket (not included) is required [figure 1.3].

This bracket has (4) holes: (2) that accommodate mounting of the ion air purifier and (2) for mounting with #10 hardware to a surface so the air purifier is perpendicular to the air stream.
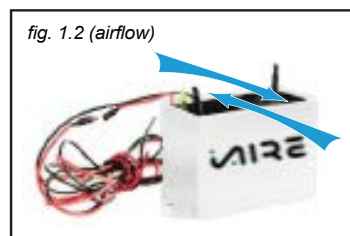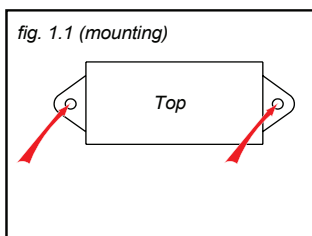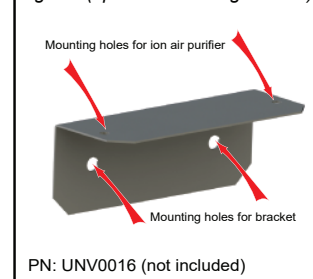

fig. 1.1 (mounting)

Top

fig. 1.2 (airflow)

fig. 1.3 (optional mounting bracket)

Mounting holes for ion air purifier

Mounting holes for bracket

PN: UNV0016 (not included)

MAINTENANCE

A small cleaning brush (GNP-0148) is included for easy, routine maintenance. This should be done as the ion brushes become dirty, usually once a month.

⚠ *(Be sure to follow all local and electrical codes. Turn off power to the unit before mounting or making any connections.)*
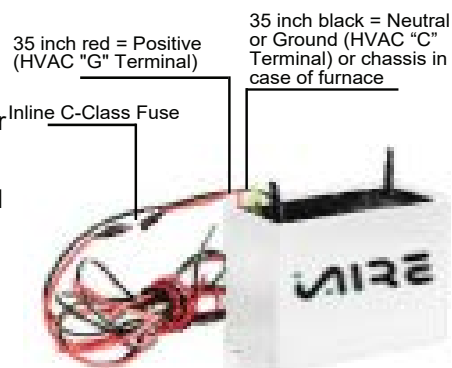
I O N - 0A * 00

VOLTAGE:
A - 24VAC / VDC, 1φ
D - 115VAC, 1φ
G - 208/230VAC, 1φ

- Verify the product will not overload the power requirement for the HVAC system before wiring.
- Check the label on the product and wire it only to the voltage range shown. The 24V product accepts VAC/VDC power and can be utilized as a lower voltage block with less output.
- Unit should be interlocked to fan operation ("G" terminal) or other similar control.
- Inline C-Class Fusing:

   500mA @ 24V; (FUS-0037)
   200mA @ 115V/208V/230V (FUS-0048)

- Green LED will illuminate when powered and operating.

Note: If vibration of block occurs, 1/2" double sided foam tape (GNP-0176) can be used.

35 inch red = Positive (HVAC "G" Terminal)

35 inch black = Neutral or Ground (HVAC "C" Terminal) or chassis in case of furnace

Inline C-Class Fuse

UL STD 867
CAN/CSA STD C22.2

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![iAIRE UltraPURE logo]

SEN-0071 INSTALL

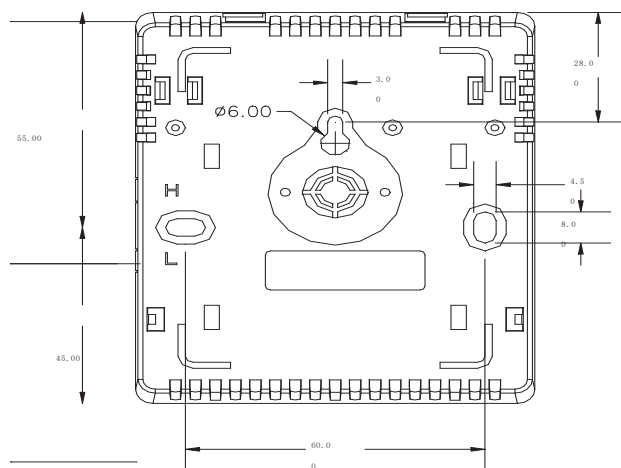**SEN-0071 - Indoor Air Quality Indicator & Transmitter**

READ THESE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

INSTALLATION

◆ Always cut off power before mounting, removing, or cleaning the monitor.

◆ Notice the supply power voltage of the transmitter: 24VAC/VDC. Do not install the transmitter on voltages higher than marked on the transmitter. 24VAC/VDC.
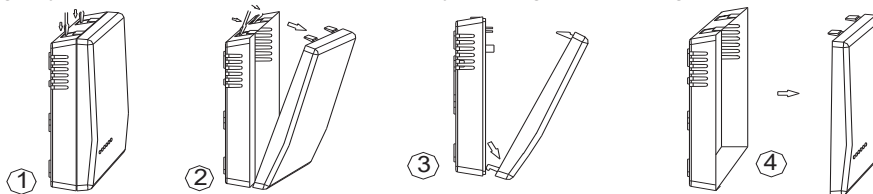
Figure.1

Mounting and Wire Connection

◆ With power off, put a flat head screwdriver deep inside of the hole on the top of the detector housing following step 1 in figure 2. Then slant the screwdriver and gently separate the cover from the wall plate by following steps 2 through 4.
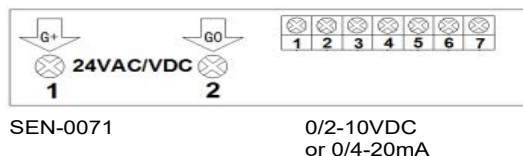
Figure.2
Opening steps

◆ The transmitter should be mounted near the place where you want to detect VOC level. However, do not mount the detector near a steam source, such as a diffuser, or in direct sunlight.

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◆ Mount the wall plate first. Place the detector against the wall at the desired location. The wires must be able to pass through the notch on the wall plate. Reference figure 1 for dimensions.

◆ Connect wires to terminal strips, (see the label on the wall plate and fig.3). Make sure wiring connection is correct and secure.

Figure.3 connection

SEN-0071   0/2-10VDC
                          or 0/4-20mA

Connection Terminal		Function	Electrical Data
1	G+	Power (+)	24VAC/24VDC +
2	G0	Power ground (-)	24VAC/24VDC
3	OUT	Analog output (+)	0~10VDC (default)
4	ON	Alarm output	
5	OP	Alarm Common	
6	B	RS485 interface	9600/14400/19200(default)/28800/38400bps (programmable selection), 15KV antistatic protection.
7	A		

◆ Follow the steps in figure 4 to close the cover.

Figure. 4 closing steps

⑤   ⑥   ⑦
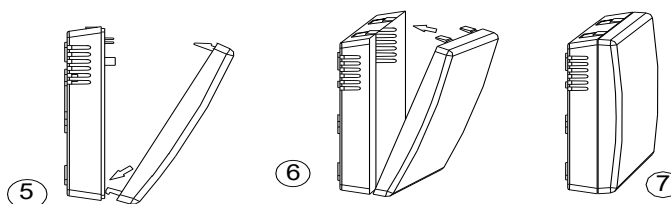
Select the Voltage of Output

The transmitter has been set at 0~10VDC analog output before leaving the factory. If you want to change the output voltage, please operate as noted in the table below: Cut off power and simultaneously depress the 2 clips on either of the sides of the transmitter to remove the faceplate from the wall plate. There are four jumpers on the top left of circuit (S1, S2, J1, J2) and choose a different output voltage through disconnection or connection as noted in the table below.

S2	S1	J1	J2	Analog Output
Upper two pins connection	Upper two pins connection	connection	Un-effective	4mA~20mA
Upper two pins connection	Upper two pins connection	disconnection	Un-effective	No analog output
Below two pins connection	Below two pins connection	connection	connection	1VDC~5VDC
Below two pins connection	Below two pins connection	connection	disconnection	2VDC~10VDC
Below two pins connection	Below two pins connection	disconnection	connection	0~5VDC
Below two pins connection	Below two pins connection	disconnection	disconnection	0~10VDC

Analog output and Corresponding VOC Values

0~10VDC Analog Output

10V

0V

0ppm 5ppm 10ppm 15ppm 20ppm 25ppm 30ppm   Indoor Air Quality
good   poor
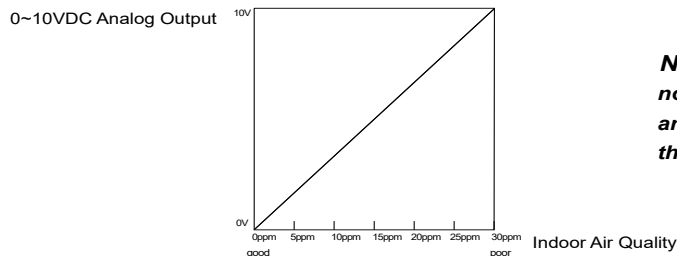
Note: *When you test and install the transmitter, please take notice that it should be placed perpendicular to the ground and keep head-on. Because the air hole is at the bottom of the product, incorrect placement can affect the test result.*

Specifications

Gas detected	Combustive gases and odorous gases within a room (smoke, body odor, timber dope and toluene emitted by other building materials), low concentration odorous gases (ammonia, H2S, CO, alcohol, and natural gas)
Sensing element	Semiconductor mixed gas sensor
Measuring range	1~30ppm
Power Supply	24VAC/24VDC
Consumption	2.5 Watt
Load (for analog output)	>5K
Sensor query frequency	Every 1 second
Warm up time	48 hours (first time); 10 minutes（operational）
Six indicator lights	1st green light on when VOC measurement ≤5ppm 1st and 2nd green lights on when 5ppm ＜VOC measurement ≤10ppm 1st yellow light on when 10ppm ＜VOC measurement ≤15ppm 1st and 2nd yellow lights on when 15ppm ＜VOC measurement ≤20ppm 1st red light on when 20ppm ＜VOC measurement ≤25ppm 1st and 2nd red lights on when VOC measurement ＞25ppm
Analog output	0～10VDC (default) or 4-20mA linear output
Output resolution	10Bit
Communication rate	RS485, 9600/14400/19200 (default), 28800, 38400 bps (programmable selection), 15KV antistatic protection, 3 independent base address, 64 max network nodes
Operation	0～50℃（32～122℉)/0-95%RH, noncondensing
Storage conditions	0～50℃ (32～122°F) /5~90%RH
Net weight/ Dimensions	190g/100mm×80mm×28mm
Installation standard	65mm×65mm or 2" × 4" wire box
Housing & IP class	PC/ABS, fireproof material/IP30
Version	V. E105
Listings & Certifications	CE