SpaceLogic Sensors
SCD2 Series Air Quality Sensors – Analog

Product Description

SpaceLogic SCD2 Series Air Quality Sensors are duct mount all-in-one sensors for monitoring air quality. The device combines CO_2, temperature, humidity, VOC and particulate matter (PM) sensing into a single unit to ensure a building's optimum air quality and energy efficiency.

Each device is an active sensor that converts a measurement into 4-20 mA, 0 to 5 Vdc or 0 to 10 Vdc analog output.

Different models are available based on application requirements for lower-cost installations.

Features

- Field calibratable, non-dispersive infrared CO_2 sensor
  - NDIR-based, dual-channel device compensates for drift and deterioration for high-accuracy output
- Solid state capacitive humidity sensor element recovers from 100% saturation
- Solid state temperature sensor provides high accuracy measurements
- Laser-scatter type PM sensor featuring innovative contamination resistance technology for highly accurate measurement of particulate matter
- Automatic Background Calibration for improved accuracy and field performance
- Easy to install:
  - Latch-on sensor cover
  - Screwless terminal block wiring with spring actuator
  - Rotating probe for best alignment with air flow
- Quick to commission with DIP switch selectable outputs
- 1% or 2% with NIST certificate, 2% RH module – replaceable in the field
- All passive temperature thermistor sensors include a 1-point measurement for offset correction
- 2-point calibration certificate available for humidity and temperature or temperature-only replaceable module
- Key component for the LEED green building program and WELL Building Standard*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

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Available Products

Model Number	2% RH Sensor	Temp. Transmitter	1000 PT RTD	10K T3	NDIR CO2	VOC
SCD2XA2ACX	X	X			X	
SCD2XA2CCX	X		X		X	
SCD2XA2HCX	X			X	X	
SCD2XAXACX		X			X	
SCD2XAXCCX			X		X	
SCD2XAXHCX				X	X	
SCD2XAXXVX					X	X

*Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Replaceable RH Elements & Temperature and Humidity Calibration Modules

Part Number	Description
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate
SLXRHS2N	Replaceable RH sensor, 2% with NIST certificate
SLXRHS2X	Replaceable RH sensor, 2%
SLXXT2*	Replaceable temperature module with 2-point calibration certificate
SLXRHT2*	Replaceable temperature and humidity module with 2-point calibration certificate

*For temperature transmitter models only.
Note: For instructions on installing replaceable elements, see Z207941, Replacement Humidity and Temperature Sensors Installation Guide.

Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special message may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

NOTICE

NOTICE is used to address practices not related to physical injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided **could result in** death or serious injury.

Please Note

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has the skills and knowledge related to the construction, installation and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

⚠ WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

Failure to follow these instructions can result in death, serious injury or equipment damage.

This product is intended for use in HVAC and building environmental control applications.

It is not intended for direct medical monitoring of patients.

Read and understand these instructions before installing this product.

The installer is responsible for all applicable codes.

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired. No responsibility is assumed by the manufacturer for any consequences arising out of the use of this material.

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Specifications

Operating and Storage Environment	
Operating temperature	0 to 50 °C (32 to 122 °F)
Operating humidity	0 to 95% RH (non-condensing)
Storage temperature	-25 to 70 °C (-13 to 158 °F)
Storage humidity	0 to 95% RH (non-condensing)
Power supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power consumption	See Maximum Power Consumption table, page 6
Tube length	200 mm
Medium	Neutral gas, air
Housing material	Polycarbonate; Flammability rating UL 94 V0
Mounting location	For indoor use only. Not suitable for wet locations.
IP rating	IP 65
Protection class	Class III
CO_2 Sensor	
Sensor type	Non-dispersive infrared (NDIR), diffusion sampling
Output range	0 to 2000/5000 ppm (selectable)
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response time	<60 seconds for 90% step change
Calibration	Field calibration support
VOC Sensor Option	
Sensor type	Solid state
Output range	0 to 100% AQI for VOC
Accuracy	±15% sensor-to-sensor variation

AQI table	Level	Ventilation Recommendation
	>61%	Greatly increased
	20 to 61%	Significantly increased
	10 to 20%	Slightly increased
	5 to 10%	Average
	0 to 5%	Target value

RH Sensor Option	
Sensor type	Solid state capacitive, replaceable
Accuracy*	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% replaceable models
Hysteresis	1.5% typical
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output range	0 to 100% RH
Temperature coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor Option	
Sensor transmitter type	Solid state, integrated circuit
Temp. sensing element**	10K T3 thermistor, 1000 PT RTD
Time constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy***	±0.2 °C (±0.4 °F) typical at 25 °C
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 131 °F)
PM Sensor Option	
Sensor type	Laser-scatter
Particulate size	PM1.0, PM2.5, PM4.0, PM10
Resolution	± 1 µg/m³
Mass concentration output range	0 to 1000 µg/m³
Accuracy	PM1 and PM2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM4 and PM10:**** 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)
Wiring	
Wiring	Screwless terminal block with spring actuator, 16-24 AWG
Warranty	
Limited warranty	2 years
Regulatory Information	
Agency approvals	UL 916 European conformance CE: EN61000-6-2, EN61000-6-3, EN61000 Series immunity, EN 61326-1 FCC Part 15 Class A Green Premium (REACH, RoHS), RoHS 2 (China), RCM (Australia), ICES-003 (Canada), UKCA (UK)

* Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability.
** See Standard RTD and Thermistor Values table on page 6 for accuracy.
*** ±0.5 °C over full operating range.
****PM4 and PM10 output values are calculated based on the distribution profile of all measured particles.

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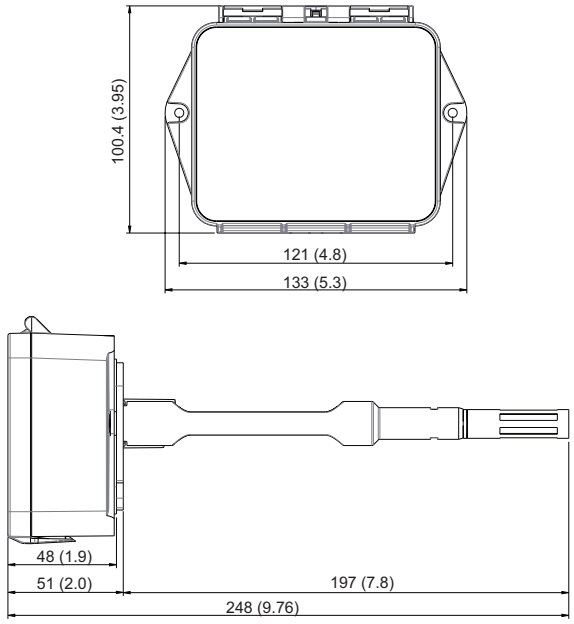
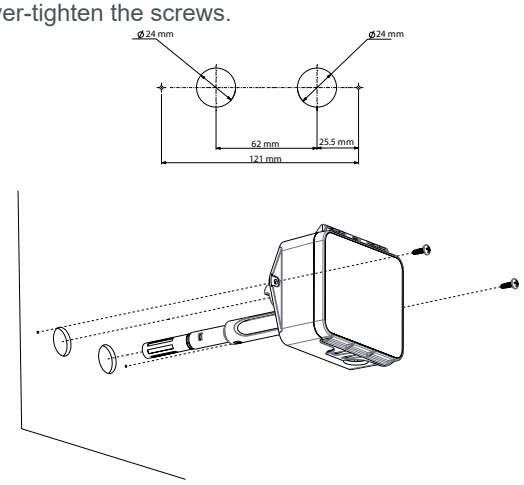
Dimensions mm (in.)

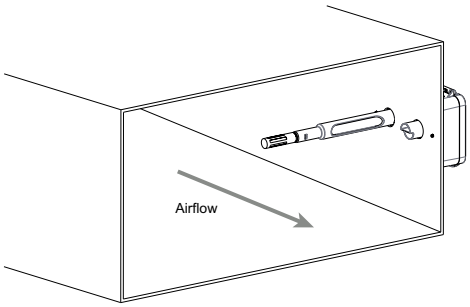


Installation

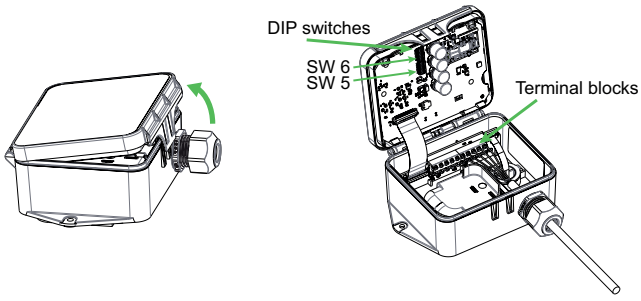
1. Prepare the duct for installation by drilling holes to accommodate the probe tubes for the PM sensor and CO_2/VOC intake. Ensure the gasket on the back is depressed to prevent leakage between the product and the duct. Do not over-tighten the screws.



2. Ensure the probes are installed in the direction of the air flow. Install the probe in the middle of the duct and away from any restrictions to allow proper air flow.



3. Release the latch on the lid to access the DIP switches and terminal block.



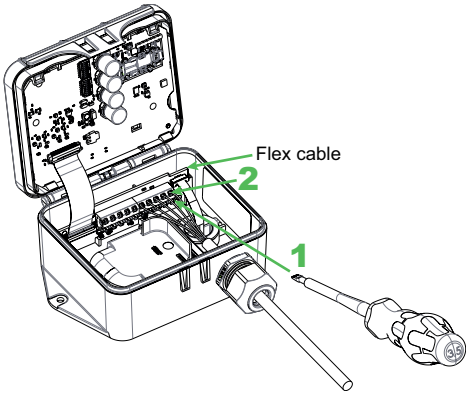
4. Wire the connections according to the diagram in the Wiring section. This device features spring terminals for screwless termination. Open the terminal point by inserting a screwdriver, then insert the wire above. Release the screwdriver to hold the wire in place. Details on wiring and configuration are contained in the next sections of this document.

NOTICE

MISSING TEMPERATURE & HUMIDITY READINGS

- Ensure flex cable is in place after wiring.

Failure to follow these instructions can result in no temperature or humidity readings.



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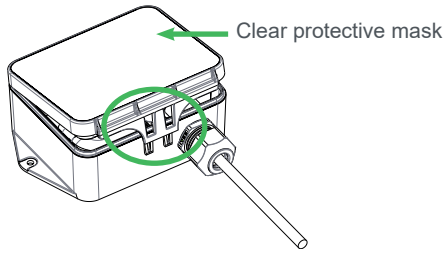
Installation (cont.)

5. Secure the latch-on cover in the closed position and remove the clear protective mask on the front label of the device.



Wiring

NOTICE

PRODUCT DAMAGE DUE TO ELECTRO-STATIC DISCHARGE

Circuit boards and components can be damaged by static electricity or electro-static discharge (ESD). Observe the following electro-static precautions when handling this product and cables and components connected to the product.

- Keep static-producing material such as plastic, upholstery, carpeting, etc. out of the immediate work area.
- Store the product in ESD-protective packaging when it is not installed in the panel
- When handling the product or a conductive cable/ESD-sensitive component connected to the product, wear a conductive wrist strap connected to ground through a minimum of 1 MΩ resistance
- Do not touch exposed conductors and component leads with skin or clothing.

Failure to follow these instructions can result in equipment damage.

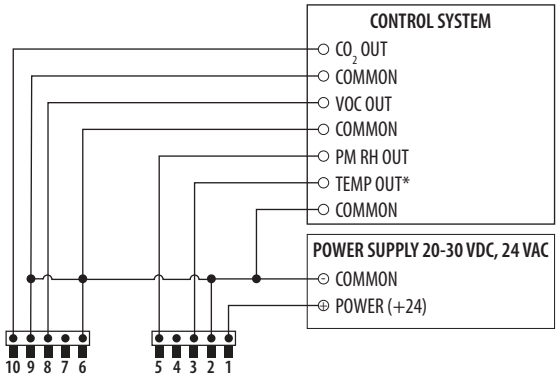
NOTICE

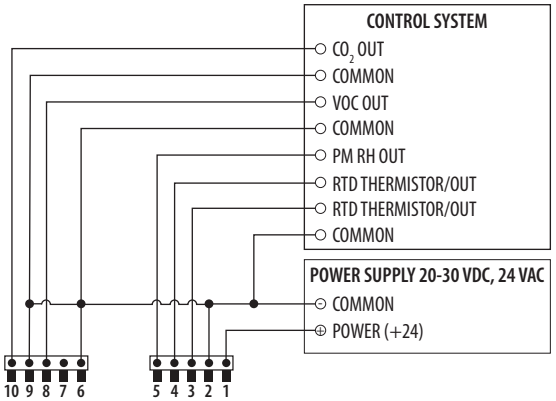
INACCURATE READINGS

- Do not run wiring in the same conduit as AC power wiring. Close proximity to AC power may influence accuracy.

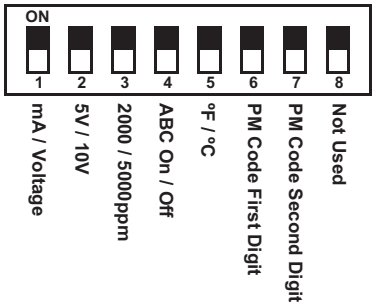
Failure to follow these instructions can result in reduced accuracy.

Wiring Diagrams





Set the DIP switches (SW5).



Switch	Function	Description
1	Output mode	ON - 4-20mA output mode enabled OFF - Voltage output mode enabled
2	Voltage output range	ON - 0-5V output range enabled OFF 0-10V output range enabled
3	CO_2 output range	ON - 0-2000 ppm CO_2 output range enabled OFF - 0-5000 ppm CO_2 output range enabled
4	Automatic Baseline Calibration (ABC) for CO_2	ON - ABC enabled OFF - ABC disabled
5	Temperature units displayed	ON - °F OFF - °C
6*	PM selection	00 - PM 2.5, 01 - PM 1.0, 10 - PM 4.0, 11 - PM 10
7*	PM selection	
8	Not used	Not used

*Use DIP switches 6 and 7 to designate the 2-digit code for PM selection. OFF = 0 and ON = 1. Example: PM4.0 code = '10'. Switch 6 must be set in the ON position ('1') and Switch 7 in the OFF position ('0').

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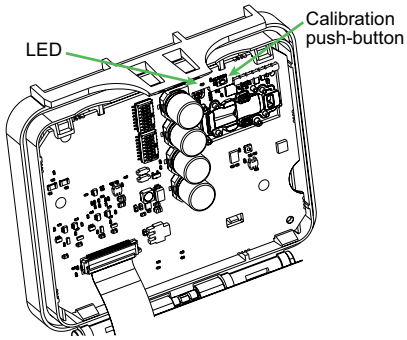
CO_2 Sensor Calibration

There are two methods for CO_2 calibration available: 400 ppm baseline calibration and automatic baseline calibration (ABC).

400 ppm Baseline Calibration

400 ppm baseline calibration allows the sensor to be set at 400 ppm. Push and hold the calibration button for 3 to 5 seconds. The LED will flash green. Once the button is released, calibration is complete and the LED switches off.



Automatic Baseline Calibration (ABC)

The ABC mode addresses the 400 ppm calibration. It allows turning on or off a background correction/recovery mode that will minimize any calibration error that has been caused by shock during handling and transportation or is caused by a long term shift in measurement. The ABC algorithm constantly keeps track of the sensor's lowest reading over a preconfigured time interval and slowly corrects for any long-term drift detected as compared to the expected fresh air value of 400 ppm. After initial startup, it is expected that the sensor reaches specified accuracy after 7 to 21 days.

Maximum Power Consumption

Series	LCD	CO_2/ VOC	PM	Temp./ RH	Max. Power
SCD2 Analog	No	Yes	Yes	Yes	9VA @ 24VAC
	No	Yes	No	Yes	8VA @ 24VAC
	No	No	Yes	Yes	7VA @ 24VAC
	No	Yes	No	Yes	6VA @ 24VAC
	No	Yes	No	No	4VA @ 24VAC

Standard RTD and Thermistor Values (Ω)

		1000 Ω	10k Type 3
°C	°F	RTD (PTC)	Thermistor (NTC)
-50	-58	803.06	441,300
-40	-40	842.71	239,800
-30	-22	882.22	135,200
-20	-4	921.6	78,910
-10	14	960.86	47,540
0	32	1,000.00	29,490
10	50	1,039.03	18,790
20	68	1,077.94	12,260
25	77	1,097.35	10,000
30	86	1,116.73	8,194
40	104	1,155.41	5,592
50	122	1,193.97	3,893
60	140	1,232.42	2,760
70	158	1,270.75	1,990
80	176	1,308.97	1,458
90	194	1,347.07	1,084
100	212	1,385.06	816.8
110	230	1,422.93	623.6
120	248	1,460.68	481.8
130	266	1,498.32	376.4
Sensor Codes		C	H

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China RoHS Compliance Information
Environment-Friendly Use Period (EFUP) Table

部件名称	有害物质 - Hazardous Substances					
Part Name	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电子件 Electronic	X	O	O	O	O	O

本表格依据SJ/T11364的规定编制。
O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
（企业可在此处，根据实际情况对上表中打 "X" 的技术原因进行进一步说明。）

This table is made according to SJ/T 11364.
O: indicates that the concentration of hazardous substance in all of the homogeneous materials for this part is below the limit as stipulated in GB/T 26572.
X: indicates that concentration of hazardous substance in at least one of the homogeneous materials used for this part is above the limit as stipulated in GB/T 26572

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