

CD SERIES**CD SERIES****Duct Mounted Environmental CO₂ Sensors****NOTICE**

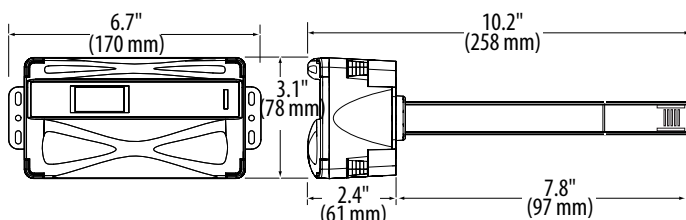
- This product is not intended for life or safety applications.
- Do not install this product in hazardous or classified locations.
- Read and understand the instructions before installing this product.
- Turn off all power supplying equipment before working on it.
- The installer is responsible for conformance to all applicable codes.

PRODUCT IDENTIFICATION**DELUXE MODEL:**

	RH Option	Temp	Sensor Type	Optional Cal Cert.
CDL	<input checked="" type="checkbox"/> S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	H = RH2% X = NO RH	T = Temp X = No Temp (Stop Here)	A = Transmitter B = 100R Platinum, RTD C = 1k Platinum, RTD D = 10k T2, RTD, Thermistor E = 2.2k, Thermistor F = 3k, Thermistor G = 10k CPC, Thermistor H = 10k T3, Thermistor J = 10k Dale, Thermistor K = 10k w/11k shunt, Thermistor M = 20k NTC, Thermistor N = 1800 ohm, Thermistor R = 10k US, Thermistor S = 10k 3A221, Thermistor T = 100k, Thermistor U = 20k "D", Thermistor	Blank = None 1 = 1 pt Temp Cert 2 = 2 pt Temp Cert

ECONOMY MODEL:

CDE (no options)

DIMENSIONS**Installer's Specifications**

Input Voltage	20 to 30VDC, 24AC
Analog Output	4-20mA, (clipped & capped)/0-10VDC (selectable)- CDE models 4-20mA, (clipped & capped)/0-5VDC/0-10VDC (selectable)- CDL models
Sensor Current Draw	100mA Maximum
Operating Temperature Range	0° to 50°C (32° to 122°F)
Housing Material	High impact ABS plastic

CO₂ Transmitter:

Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Measurement Range	0-2000 ppm or 0-5000 ppm, user selectable on CDL models, 0-2000 ppm on CDE models
Accuracy	±30 ppm ±2% of measured value*
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change

RH Transmitter:

HS Sensor	Digitally profiled thin-film capacitive (32-bit mathematics); U.S. Patent 5,844,138
Accuracy	±2% from 10 to 80% RH @ 25°C; Multi-point calibration NIST
Hysteresis	1.5% typical
Linearity	Included in Accuracy spec.
Stability	±1% @ 20°C (68°F) annually, for two years
Operating Humidity Range	0 to 100% RH
Operating Temperature Range	10° to 35°C (50° to 95°F)
Temperature Coefficient	±0.1% RH/°C above or below 25°C (typical)

Temperature (Transmitter):

Sensor Type	Solid-state, integrated circuit
Accuracy	±0.5°C (±1°F) typical
Resolution	0.1°C (0.2°F)
Range	10° to 35°C (50° to 95°F)

Relay Contacts:

1 Form C	1A@30VDC, resistive; 30W max.
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Note: Specified accuracy with 24VDC supplied power with rising humidity. RTD/Thermistors in wall packages are not compensated for internal heating of product.

EMC Conformance: EN 61000-6-3:2001 (Amended by A11:2004) Class B, EN 61000-6-1:2001

EMC Test Methods: CISPR 22:2006, IEC 61000-4-2:2001, IEC 61000-4-3:2006, IEC 61000-4-4:2004, IEC 61000-4-6:2006, IEC 61000-4-8:2001, IEC 61000-4-11:2004

EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper Surge protection (EN 61000-6-1:2001 specification requirements).

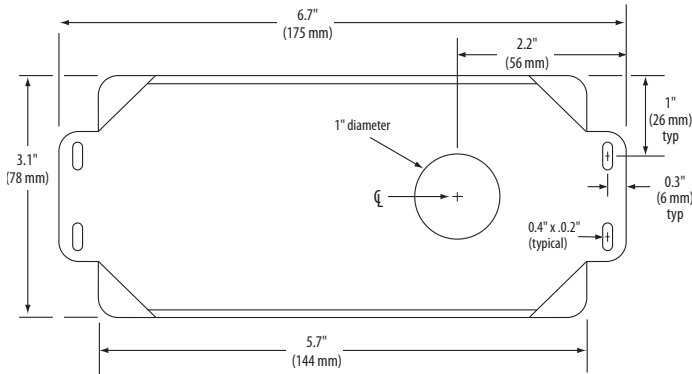
** Measured at NTP*

QUICK INSTALL

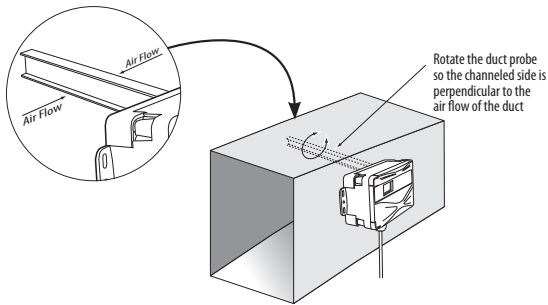
1. Mark and drill the three holes for the duct probe as shown. The centerline must be parallel to the air flow through the duct.
2. Rotate the duct probe so that its widest surface is perpendicular to the air flow in the duct.
3. Insert the probe and secure the sensor to the duct with sheet metal screws, making sure that the provided gasket material is compressed between the sensor housing and the air duct.
4. Wiring. See wiring diagrams on next page.

INSTALLATION

1. Choose a location to mount the sensor. The centerline of the housing must be parallel to the direction of air flow in the duct.
2. Use the mounting diagram to drill three holes in the duct for securing the sensor.



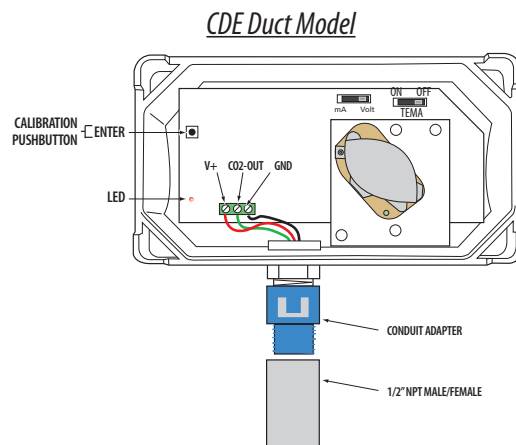
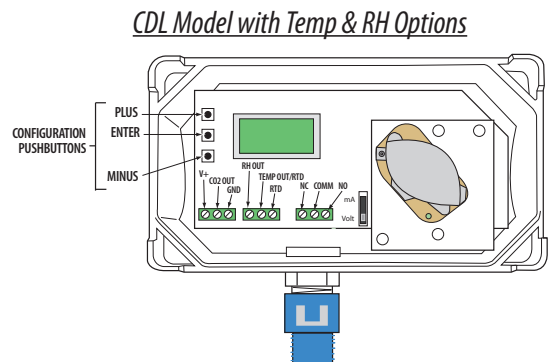
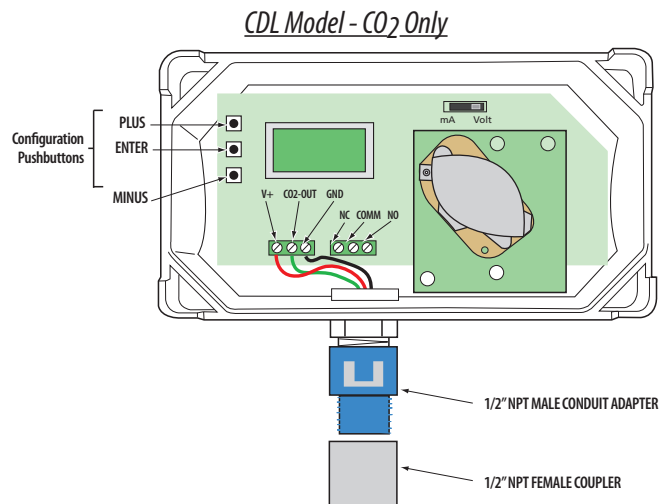
3. Insert the probe into the hole. Rotate the housing so that the widest surface is perpendicular to the air flow..



4. Attach the sensor to the duct using sheet metal screws. Make sure that the gasket on the back of the housing is compressed between the housing and the duct for a secure fit.
5. Wire the device. See Wiring section.
6. Configure the system using the menu (CDL only; see Configuration section).
7. Calibrate using 0 ppm CO2 gas (see Calibration section).

WIRING

1. Feed control wire through conduit adapter and grommeted compression fitting on the bottom of the housing.
2. Remove terminal blocks by pulling straight up on the green assemblies.
3. Connect wires as shown and push terminal blocks back in to black receptacles.
4. Tighten compression fitting around control wire until sealed.
5. Snap conduit adapter onto compression fitting.
6. Refer to specifications for power requirements and relay rating.
7. Select mA or Volt output using selector switch.



CONFIGURATION - CDL ONLY

RUN MODE:

1	0	0	0		P	P	M
		*			C	0	2

CO₂ ONLY MODEL
*INDICATES RELAY STATUS

1	0	0	0		P	P	M
5	0	.	0		%	R	H

CO₂/RH COMBO MODEL

1	0	0	0		P	P	M
7	0	.	0			°	F

CO₂/T COMBO MODEL

1	0	0	0		P	P	M
X	X	.	X		X	X	X

CO₂/RH/T COMBO MODEL
TOGGLE %RH AND DEGREES

CONFIGURATION MODE:

PRESS [ENTER] FOR CONFIGURATION MODE.
PRESS PLUS OR MINUS TO CHANGE SETTING.

S	E	T	P	O	I	N	T
C	0	2			8	0	0

RANGE 500 TO 1500
50PPM INCREMENT

D	E	A	D	B	A	N	D
C	0	2			1	0	0

RANGE 10 TO 500
5 PPM INCREMENT

R	A	N	G	E			
C	0	2		X	X	X	X

OPTIONS ARE 2000 OR 5000

A	B	C		M	O	D	E
-		X	X	X			+

OPTIONS ARE ON, LOW, OFF
SEE NEXT PAGE FOR EXPLANATION

U	N	I	T	S			
-			°	X			+

(TEMP MODELS ONLY)
OPTIONS ARE °F or °C

	O	U	T	P	U	T	
-	0	-	1	0	V		+

(VOLTAGE MODE ONLY)
OPTIONS: 0-10V OR 0-5V
DEFAULT IS 0-10V

	O	U	T	P	U	T	
	4	-	2	0	m	A	

(mA MODE ONLY)

CALIBRATION MODE:

PUSH AND HOLD PLUS AND MINUS FOR 5 SECONDS
TO ENTER MODE. PRESS ARROW TO CHANGE OPTION.
PUSH ENTER FOR NEXT SELECTION.

	S	E	R	I	A	L	
X	X	X	X	X	X	X	X

DISPLAYS SERIAL NUMBER

		X	X	X			
	X	X	X	X	X		

DISPLAYS MODEL NUMBER

O	F	F	S	E	T		
°	C				X	.	X

RANGE IS -5 TO 5°C
0.1°C INCREMENT
(CO₂/temp combo models)

O	F	F	S	E	T		
%	R	H		X	X	.	X

RANGE -10 TO 10%
0.1% INCREMENT
(CO₂/RH combo models)

C	0	2		C	A	L	?
-			X	X	X		+

OPTIONS ARE YES, NO

C	A	L		G	A	S	?
-			X	X	X	X	+

OPTIONS ARE NONE, 0, 400

W	O	R	K	I	N	G	
	*			5	:	0	0

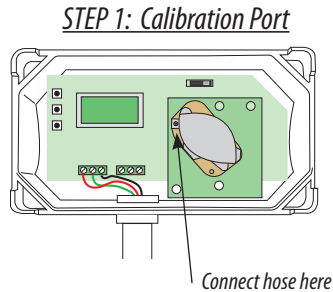
Unit will automatically return to run mode
when calibration is complete.

NOTE: This product is factory calibrated. The typical CO₂ sensor calibration interval is 5 years, dependent on specific site installation factors. As of the date of this document, compliance with ANSI/ASHRAE 62-2001 requires minimum on-site accuracy verification intervals of 6 months, or per the building operation and maintenance manual. Accuracy verification should be performed using a comparison to a known reference, or the CO₂ gas calibration kit available from Veris Industries as model AA01.

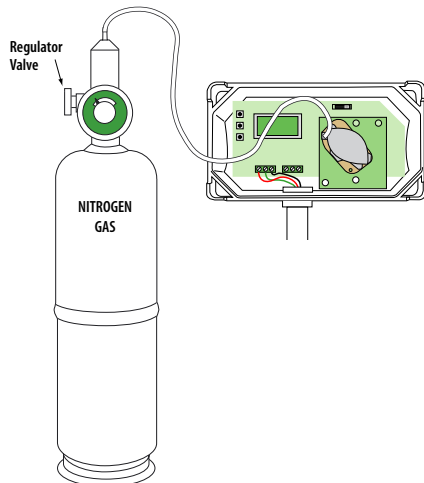
WARNING: CO₂ sensor calibration requires gas calibration kit. Performing calibration without gas kit will cause erroneous readings. Consult factory for calibration kit.

CALIBRATION PROCESS: CDL MODELS

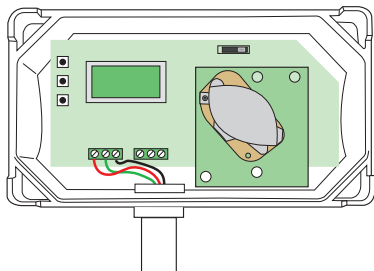
1. Hook up hose to plastic port located on sensing module.
2. Start flowing nitrogen gas (0 ppm only).
3. Enter Calibration mode as described on page 3.



STEP 2: Flow Nitrogen.

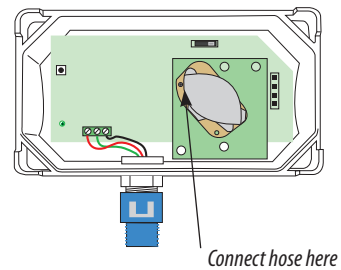


STEP 3: Calibrate for 5 min. Unit will return to working display when finished.

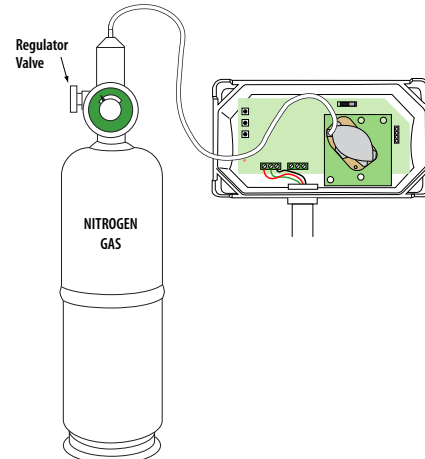
**CALIBRATION PROCESS: CDE MODELS**

1. Hook up hose to plastic port located on sensing module.
2. Start flowing (Nitrogen) 0 ppm Gas (0 ppm only).
3. Push and hold down calibration button until the LED illuminates.
4. Continue flowing gas through the sensor until the LED is off - estimated calibration time is 5 minutes.

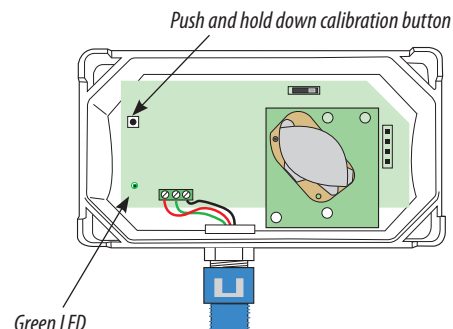
STEP 1: Calibration Port



STEP 2: Flow Nitrogen



STEP 3: Calibrate 5 min.

**ABC CALIBRATION ALGORITHM**

ABC (Automatic Baseline Calibration) is a patented self-calibration feature, which automatically adjusts the CO₂ sensor to compensate for drift. When ABC is enabled, the lowest reading within every 24-hour period is recorded and analyzed over a running 7 day or 28-day period. If a statistically significant amount of drift is detected, an automatic correction factor is applied. This enables the sensor to operate within specifications for the 5-year calibration interval.

NOTE: After changing the ABC settings, the unit will need to be power cycled to have ABC changes take effect.

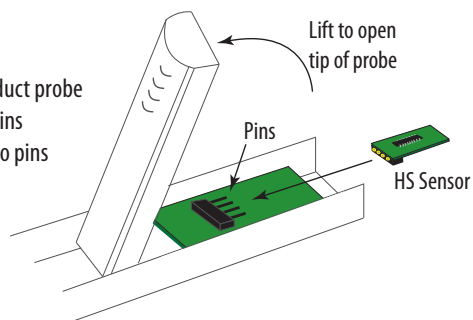
CDL MODEL ONLY

CDL versions have optional RH and temperature sensors.

To Replace Humidity Sensor:

Observe handling precautions for static sensitive devices to avoid damage to the circuitry which would not be covered under the factory warranty.

1. Power down unit
2. Open housing on tip of duct probe
3. Slide old RH sensor off pins
4. Slide new RH sensor onto pins
5. Power unit back on

**OUTPUT SCALING**

Output scaling: 0-2000 ppm

	CO ₂ ppm	0-5 Volt Output	0-10 Volt Output	mA Output
Outside	300-500	0.75 to 1.25	1.5 to 2.5	6.4 to 8
Over Ventilated	Under 600	under 1.5	Under 3	Under 8.8
Ideal Ventilation	600-900	1.5 to 2.25	3 to 4.5	8.8 to 11.2
Under Ventilated	Over 900	over 2.25	Over 4.5	Over 11.2