CW SERIES

CWL

CWE

CE

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

WALL ECONOMY MODELS:

CWE [S] [ ] — *Sensor Type*

B = 100R Platinum, RTD	K = 10k w/11k shunt, Therm.
C = 1k Platinum, RTD	M = 20k NTC, Therm.
D = 10k T2, Therm.	N = 1800 ohm, Therm.
E = 2.2k, Therm.	R = 10k US, Therm.
F = 3k, Therm.	S = 10k 3A221, Therm.
G = 10k CPC, Therm.	T = 100k, Therm.
H = 10k T3, Therm.	U = 20k "D", Therm.
J = 10k Dale, Therm.	

WALL DELUXE MODELS:

CWL [S] [ ] [ ] [ ]

RH Option | *Temp* | *Sensor Type*

RH Option	Temp	Sensor Type	
H = RH 2%	T = Temp	A = Transmitter	J = 10k Dale, Therm.
X = No RH	X = No (stop here)	B = 100R Platinum, RTD	K = 10k w/11k shunt, Therm.
		C = 1k Platinum, RTD	M = 20k NTC, Therm.
		D = 10k T2, Therm.	N = 1800 ohm, Therm.
		E = 2.2k, Therm.	R = 10k US, Therm.
		F = 3k, Therm.	S = 10k 3A221, Therm.
		G = 10k CPC, Therm.	T = 100k, Therm.
		H = 10k T3, Therm.	U = 20k "D", Therm.

Options Available

[ ] [ ] [ ]

Temp Cal Cert | *Option* | *Setpoint Slider Value*

Temp Cal Cert	Option	Setpoint Slider Value	
X = No	1 = Push Button Override *	–	
1 = 1pt Temp Cal	2 = Set Point Slider	A = 1k	
2 = 2pt Temp Cal	3 = Push Button Override*+Set Point Slider	F = 10k	
		G = 20k	
		K = 50k	
		M =100k	

** Note: the Pushbutton Override feature is not available with temperature transmitter models. Only resistive temperature models qualify for this feature.*

CW SERIES

Wall Mounted Environmental CO_2 Sensors

Installer's Specifications

Input Voltage	20 to 30VDC, 24VAC
Analog Output	CWE: 4-20mA, 0-10VDC (selectable); CWL: 4-20mA (clipped and capped)/0-5VDC/0-10VDC (selectable)
Sensor Current Draw	100mA max.
Operating Temperature Range	0° to 50°C (32° to 122°F)
Housing Material	High impact ABS plastic
CO_2 Transmitter:	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Measurement Range	CWL: 0-2000 ppm or 0-5000 ppm, user selectable; CWE: 0-2000 ppm
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, noncondensing
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 (on models without setpoint slider option)	1A@30VDC, resistive; 30W max.

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 Class B, EN 61000-6-1:2001, EN 61000-3-2:2000, EN 61000-3-3:2001
EMC Test Methods: CISPR 22:1997(Amended A9:2000, A2:2002), IEC 61000-4-2:2001, IEC 61000-4-3:2002, IEC 61000-4-4:2004, IEC 61000-4-5:2001, IEC 61000-4-6:2004, 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. Select a mounting location away from ventilation sources. The sensor should be mounted on a vertical wall, about 4 ½ feet above the floor.
2. Affix the backplate to the wall.
3. Wire the device. Refer to wiring diagrams on page 2.
4. Install Cover.

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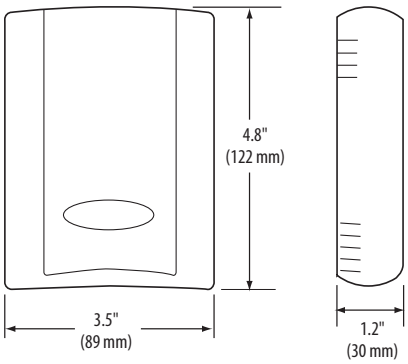
DIMENSIONS



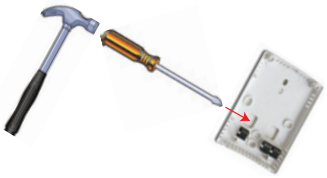
INSTALLATION

1. Remove the cover by pressing the tab at the top of the sensor while pulling outward from the top of the cover.

2. Remove the backplate by unfastening the sensor from the bottom of the backplate and pivoting the sensor outward.

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

3. Punch out openings in the backplate.



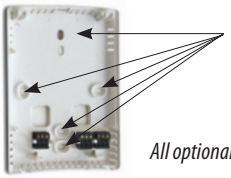
All optional connector blocks are shown here for clarity.

4. Position the sensor vertically on the wall, 4 ½ feet above the floor.

correct

incorrect

5. Mount the backplate onto the wall using the screws provided.

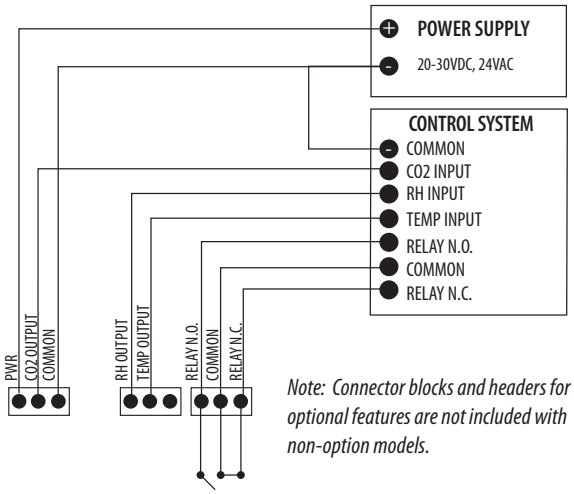


Five screwholes available; use a minimum of two for secure mounting.

All optional connector blocks are shown here for clarity.

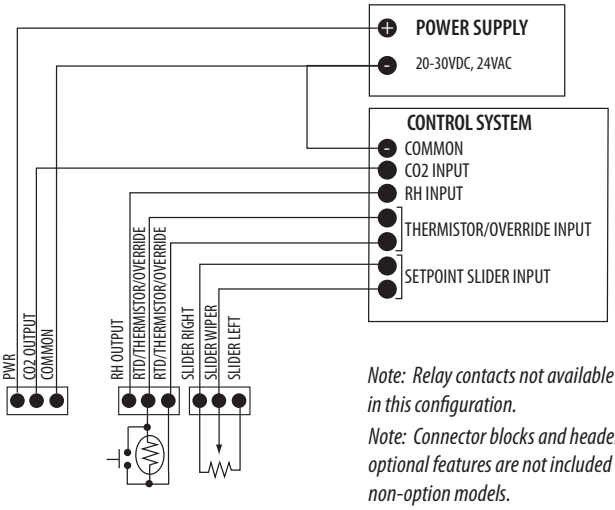
6. Wire the backplate.

CO2, RH, Temperature Transmitter Options



Note: Connector blocks and headers for optional features are not included with non-option models.

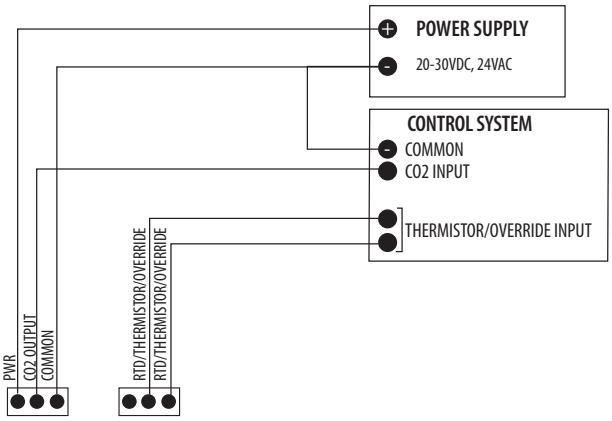
CO2, RH, Thermistor/RTD, Pushbutton Override, and Setpoint Slider Options



Note: Relay contacts not available in this configuration.

Note: Connector blocks and headers for optional features are not included with non-option models.

CO2, Economy Model



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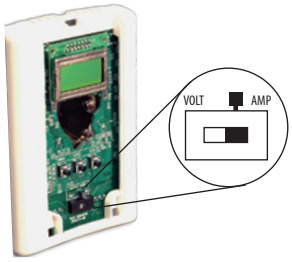
7. Install the sensor onto the backplate.

8. Use the switch to select voltage or current output. For CWL model, see Configuration section on page 4.



9. When installation is complete, install the cover and snap into place.

ABC CALIBRATION ALGORITHM

ABC (Automatic Baseline Calibration) is a patented self-calibration feature, which automatically adjusts the CO_2 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.

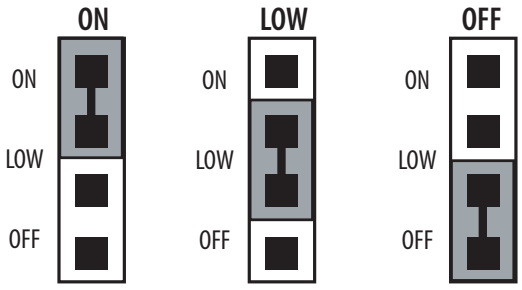
ON POSITION. *Recommended Setting.* Use the ON setting for applications where the building is unoccupied within a 24-hour timeframe. This setting runs the ABC for a 7-day average.

LOW POSITION. Use the LOW setting for buildings occupied 24 hours a day. This setting extends the ABC to a 28-day average.

OFF POSITION. Not Recommended.

Refer to Calibration Mode procedures on previous page to set desired ABC mode for CWL models.

ABC Settings (CWE only)



OUTPUT SCALING

CO_2 - Carbon Dioxide Sensor

Output scaling: 0-2000ppm

	CO2 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

RH - Relative Humidity Sensor

Output scaling: 0-100%

T - Temperature Transmitter

Output scaling: 10° to 35°C (50° to 95°F)
To determine temperature from output reading:

1) Compute Total Span from Temperature Range:
Maximum range - Minimum range = Total span
ex. 10° to 35°C range » 35 - 10 = 25 Total span

2) Compute Output % of Span from Reading:
(Reading - Minimum Output) / (Maximum output - Minimum output
ex. 11.10mA reading on 4-20mA output: (11.10-4)/(20-4)=7.10/16=0.444=44.4%
ex. 4.44v reading on 0-10v output: (4.44-0)/(10-0)=4.44/10=0.444=44.4%

3) Compute Temperature:
(Total span x Output % of Span) + Minimum range
ex. 44.4% Output, Total Span = 45, range = 50/95: (0.444 x 45) + 50 = 20 + 50 = 70°
Example outputs for selected temperatures:

Temp	4-20mA	0-10v	0-5v
65	9.33mA	3.33v	1.67v
70	11.10mA	4.44v	2.22v
75	12.89mA	5.56v	2.78v

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CONFIGURATION - CWL ONLY

RUN MODE:

1	0	0	0		P	P	M
		*			C	0	2

CO_2 ONLY MODEL
*INDICATES RELAY STATUS

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

CO_2/RH COMBO MODEL

1	0	0	0		P	P	M
7	0	.	0			°	F

CO_2/T COMBO MODEL

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

CO_2/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
(CO_2/temp combo models)

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

RANGE -10 TO 10%, 0.1% INCREMENT
(CO_2/temp combo models)

C	O	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

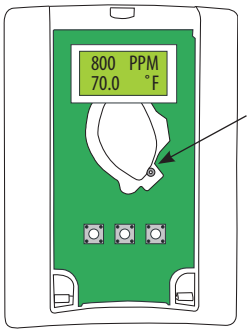
W	O	R	K	I	N	G	
	*			5	:	0	0

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

NOTE: This product is factory calibrated. The typical CO_2 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 CO_2 gas calibration kit available from Veris Industries as model AA01.
WARNING: CO_2 sensor calibration requires gas calibration kit. Performing calibration without gas kit will cause erroneous readings. Consult factory for calibration kit.

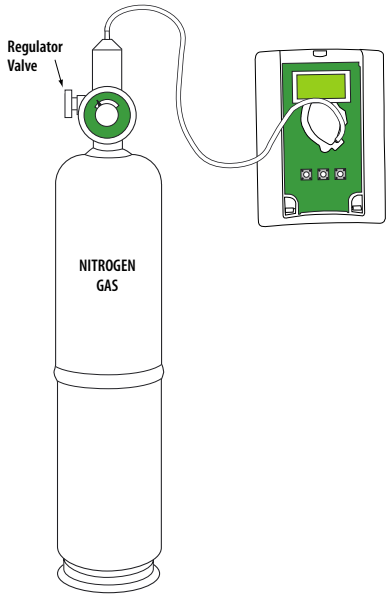
CALIBRATION PROCESS: CWL MODELS

1. Remove cover and connect gas hose to calibration port.

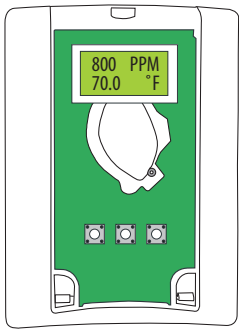


2. Enter Calibration Mode menu per directions on page 3. Choose 0 ppm calibration gas option.

3. Flow Nitrogen

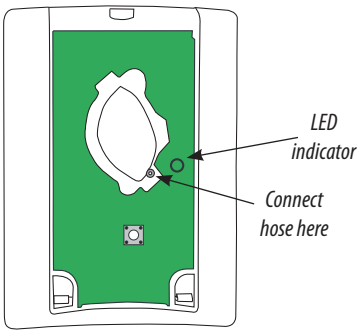


4. Calibrate for 5 minutes. Unit will return to run mode when calibration is complete.

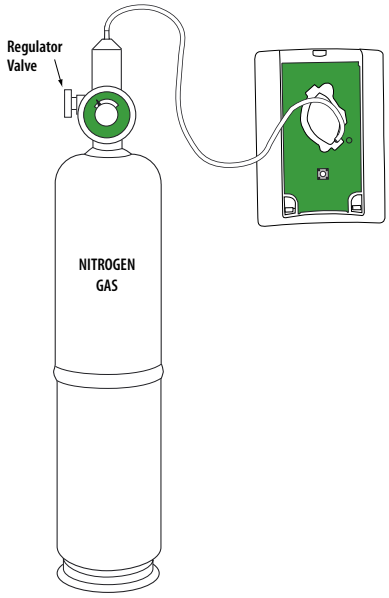


CALIBRATION PROCESS: CWE MODELS

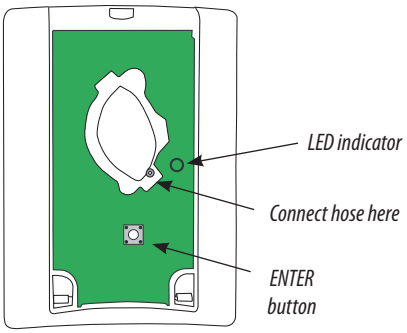
1. Remove cover and connect gas hose to calibration port.



2. Flow Nitrogen



3. Press and hold down the ENTER button until the green LED illuminates.



4. Continue flowing gas until the LED goes off.

