

VER-CW-T1 Series



Installer's Specifications

Input Voltage 20 to 30VDC, 24VAC
 Analog Output 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
 CO2 Transmitter:
 Sensor Type Non-dispersive infrared (NDIR), diffusion sampling
 Measurement Range CWL: 0-2000 ppm or 0-5000 ppm, user selectable
 Accuracy . . . ±30 ppm ±5% 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; Multi-point calibration NIST
 Reset Rate 24 hrs
 Hysteresis 1.5% typical
 Linearity Included in Accuracy spec.
 Stability ±1% @ 20°C (68°F) annually for two years

Notice:

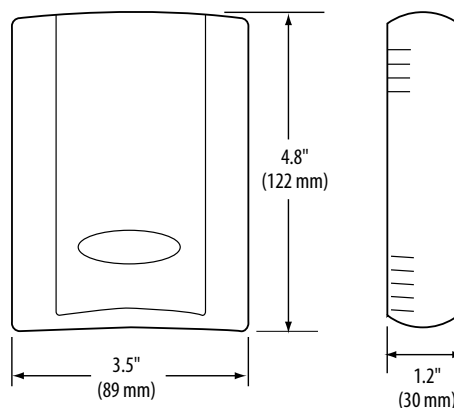
This product is not intended for life or safety applications.
 Do not install this product in hazardous or classified locations.
 Read and understand the instructions before installing this product.
 Turn off all power supplying equipment before working on it.
 The installer is responsible for conformance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

Wall Mounted Environmental CO² Sensors

Quick Install

1. Select a mounting location away from ventilation sources. The sensor should be mounted on a vertical wall, about 4 1/2 feet above the floor.
2. Affix the backplate to the wall.
3. Wire the device. Refer to wiring diagrams on page 2.

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.

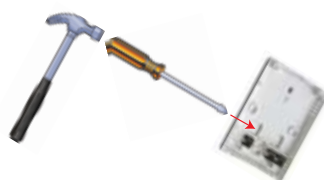


2. Remove the backplate by unfastening the sensor from the bottom of the backplate and pivoting the sensor outward.



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 1/2 feet above the floor.

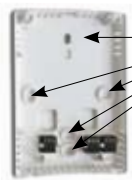


correct



incorrect

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

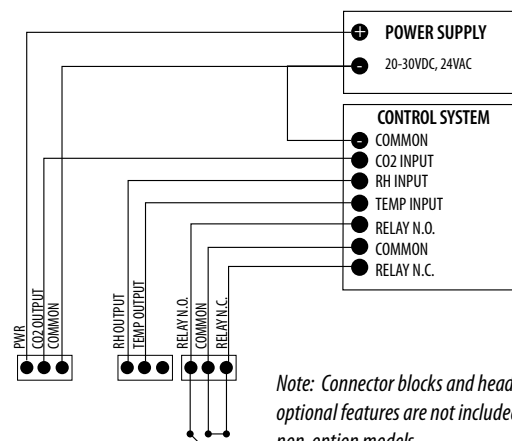


Five screwholes available; use a minimum of two for secure mounting.

All optional connector blocks are shown here for clarity.

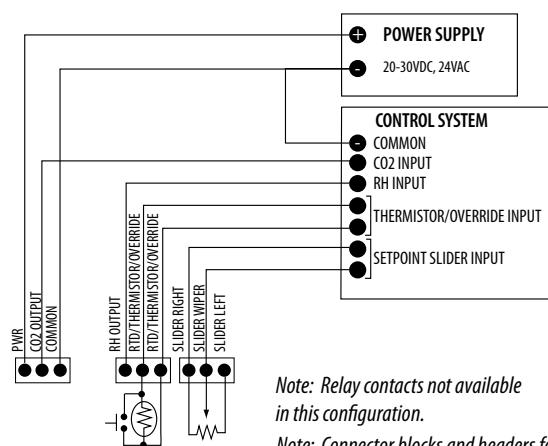
6. Wire the backplate.

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



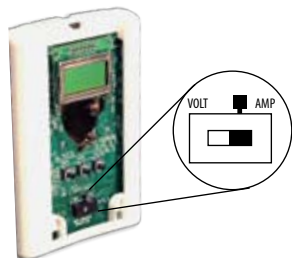
Note: Relay contacts not available in this configuration.

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

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 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.

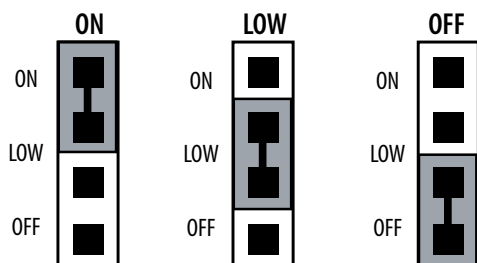
ON POSITION. *Recommended Setting.* Use the ON setting for applications where the building is unoccupied within a 24-hour timeframe. This setting runs the ABC for a 7-day average.

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

CO₂ - Carbon Dioxide Sensor

Output scaling: 0-2000ppm

	CO ₂ PPM	0-5 VOLT OUTPUT	0-10 VOLT OUTPUT	mA
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

Configuration

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

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.

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)

PTIONS ARE °F or °C

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

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

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

0	F	F	S	E	T		
°	C				X	.	X

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

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

RANGE -10 TO 10%, 0.1% INCREMENT
(CO₂/temp 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	+

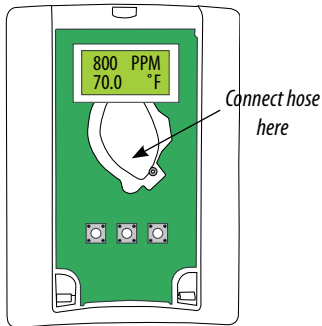
OPTIONS ARE NONE, 0, 400

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

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

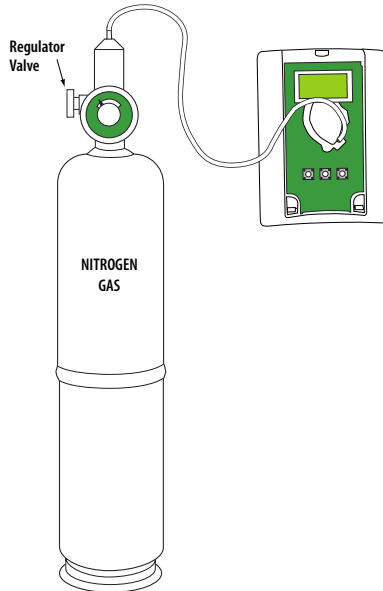
Calibration Process

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

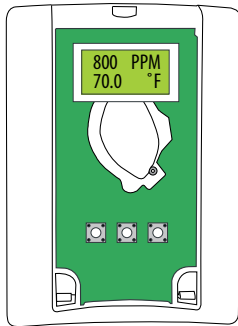


2. Enter Calibration Mode menu per directions on page 4. Choose 0 ppm calibration gas option.

3. Flow Nitrogen

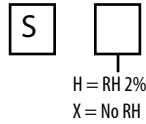


4. Calibrate for 5 minutes. Unit will return to run mode when calibration is complete.

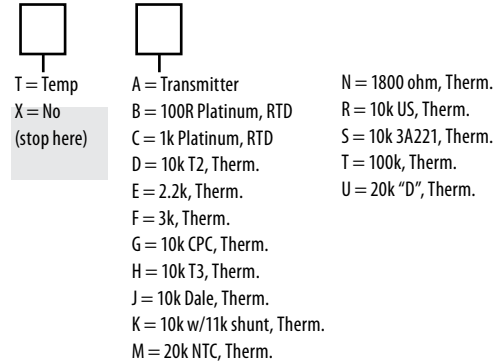


Product Identification

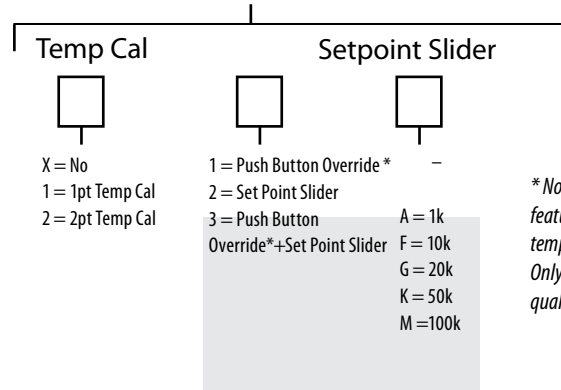
RH Op-



Sensor



Options



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

TABLE OF STANDARD RTD AND THERMISTOR VALUES

Class	Pt RTD		THERMISTOR									
Type	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k	20k "D"	100k
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult
Temp. Response*	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/50°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory
	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k	20k "D"	100k
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600
10	50	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006

Part Numbers

VER-CWE	
VER-CWESC	
VER-CWESD	
VER-CWESH	
VER-CWESJ	
VER-CWESK	
VER-CWESM	
VER-CWESN	
VER-CWLCHTA	
VER-CWLSHTA2	
VER-CWLSHTA-T1	
VER-CWLSHTC	
VER-CWLSHTCX1	
VER-CWLSHTD	
VER-CWLSHTH	
VER-CWLSHTHX1	
VER-CWLSHTHX2F	
VER-CWLSHTHX2G	
VER-CWLSHTHX3F	
VER-CWLSHTHX3G	
VER-CWLSHTJ	
VER-CWLSHTK-T1	
VER-CWLSHTM	
VER-CWLSHTN	
VER-CWLSHTNX1	
VER-CWLSHTR-T1	
VER-CWLSHX	
VER-CWLSHX-T1	
VER-CWLSXTA-T1	
VER-CWLSXTAX2F	
VER-CWLSXTC-T1	
VER-CWLSXTD	
VER-CWLSXTD2	
VER-CWLSXTDX1	
VER-CWLSXTDX2A	
VER-CWLSXTDX2F	
VER-CWLSXTH	
VER-CWLSXTHX1	
VER-CWLSXTHX3F	

