2017-2018 ENGINEERING CATALOG

. And



#### SUPERIOR BUILDING AUTOMATION SENSORS

### Higher Reliability Faster Installation Superior Accuracy



Sense the Difference

# Higher Reliability, Faster Installation, Superior Accuracy Sense the Difference

### We Promise

#### SAME DAY SHIPPING

Place your order prior to 3 pm PST, and it's on the way

#### EASY TO ORDER 866-660-8864

5 am to 5 pm PST (8AM-8PM EST) or online 24/7!

#### **7 YEAR LIMITED WARRANTY**

We stand behind our quality. See terms and conditions. Warranty varies for certain items.

#### FAST ACCOUNT APPROVAL

Instant \$1000 credit limit.

### Our Purpose

Build a great company in which our competitive spirit thrives. Our growth will provide personal, professional, and financial opportunity for our team. We will innovate automation systems, conserving energy, increasing efficiency, and enhancing the quality of life.

### SENVA Core Values

#### PROVIDE SUPERIOR CUSTOMER SERVICE

Be easy to do business with and impress the customer

#### **RAPID INNOVATION**

 Get customer inspired solutions to market quickly

#### **ACT WITH INTEGRITY**

• Our actions are guided by honesty, consistency of character, and good faith

#### **EXPECT EXCELLENCE**

- Recognize and reward performance; never tolerate mediocrity
- Invest in people
- Compete to win

### The industry's best!

CUSTOM ORDERS

LIVE TECHNICAL SUPPORT

We go the extra mile—Have a special requirement? Just ask!

#### **ONLINE ORDERING** Our online web store lets you manage all your Senva business.

#### **MAINTAIN A HIGH SENSE OF URGENCY**

- The market belongs to the aggressive and the swift
- Be lean and results oriented
- Encourage risk taking

#### **STAND FOR QUALITY**

- Quality is each employees job
- Be consistent in our communications and environment
- Establish clear standards and methods for quality

#### **HAVE FUN**

- Celebrate victory, learn from defeat
- Be positive and enthusiastic

### What We Do

Senva provides superior sensors that make even the most challenging installation operate more reliably, accurately, and profitably.

We do this from deep customer involvement that begins by listening to application problems, possessing the insight to understand them, and then to effectively create relevant and technically superior products.

We are empathetic to both our customers' project needs and committed to their personal success. We are passionate about excellent service, high integrity and character.

### ISO Certification

As part of enhancing our management systems with the collaboration of our entire staff and Orion Registrar, Inc., we are pleased to announce our ISO 9001:2008 registration.

To view our certificate, please visit our website www.senvainc.com under the documents section or email our team at sales@senvainc.com

#### **Designed and Assembled**



This classification of manufacturing is our promise that this product was designed and assembled from top to bottom in our Beaverton, OR facility. Senva sensors are built with a commitment to superior quality that Senva has been known for since 2008.













### Featured Product Highlights



#### **EM Series Energy Meters**

We set out to make the easiest to install, most accurate meter. We started with flexible Rogowski CTs because they're compact, lightweight, and split-core for easy installation. But we didn't like their accuracy. So we gave them a brain so they can digitally communicate with our meter. And then it dawned on us you'd appreciate not having high voltage at the meter where you make your digital connections. So we made the voltage connection at the CT itself. Suddenly, we were measuring current and voltage in a current transducer. We named it the Current/Voltage Transducer<sup>™</sup> (CVT<sup>™</sup>) and called the patent attorney. To complement the CVT<sup>™</sup>, our metering platform offers two meter options (EM-PULSE & EM-RS485) which are small enough to fit in the palm of your hand, yet powerful enough to self-configure during install removing all manual configuration! *Get in. Get out. Get data*.

(EM Series - Page 24)



#### TG (Toxic Gas) Series

To continually meet the demands and requirements of monitoring parking structures and loading bays, we've expanded our gas monitoring line to include both carbon monoxide and nitrogen dioxide options. The TG Series sensors can be ordered as individual CO or NO2 sensors or as a combination CO/NO2 sensor in a shared enclosure. Available with an analog output that supports daisy chain wiring or a protocol version that supports both BACnet MS/TP and Modbus network communications for cost effective coverage of large areas. Standard features include field replaceable elements, element lifetime clock, programmable fan relay, LED indicators, integrated display and audible alarm.

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**TG Analog Series** 



**TG Protocol Series** 



### Senva sensors are engineered to reduce installation time and be trouble-free

#### **TO ORDER**

Ph: 866-660-8864 Fax: 503-296-2529 sales@senvainc.com





#### **FREE SHIPPING** via UPS Ground on your first order OR any qualifying\* order placed online at senvainc.com

\*Online orders of \$300 or more ship free in the contiguous 48 states. Online orders of \$500 or more ship free to Alaska, Hawaii and Canada. Online orders including 3 or more transformers do not qualify for free shipping.

**Warning:** This catalog is designed for reference only. Refer to installation instructions that accompany product and heed all safety instructions. Never rely on current status LED to indicate presence of power. Product improvement is a continuing process at Senva. Changes may occur to products without prior notice.

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Reduce the risk of arc flash with Senva.



No guesswork. Multi-turn adjustments are a thing of the past.

### If you're calibrating current sensors in energized enclosures, you're wasting time and money.

Worse, you should be suiting up for arc flash protection (yes, it's OSHA code). If you're not, you're exposed to injury and liability. Senva makes it safe, simple, and profitable.

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Patent Pending

"

The safest, most cost-effective proof of flow for fans and pumps is with Senva Sensors.



Save over 1/2 hour per sensor install.



OSHA requires protection when working in energized enclosures; just use Senva never calibrate live again!

### Thanks to PRESET™ you'll never calibrate in live enclosures again!

PreSet<sup>™</sup> sensors let you set the dial to the motor amperage. You can install the sensor and never return back to calibrate. Installers tell us they save over ½ hour per sensor. Plus, they're safe. You do the math.

Never calibrate live again!



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Split Core Mini now available!





Set the sensor to motor full load amps—never return to calibrate!



### CURRENT



#### **CURRENT**

PreSet <sup>™</sup> Series	8
AutoSet <sup>™</sup> VFD Series	10
AutoSet <sup>™</sup> Series	12
Fixed Go/No Series	14
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### ECM Certified fixed current sensors

Electronically commutated motors (ECMs) can be a challenge to monitor with fixed current sensors. That is until Senva created the industry's first ECM Certified fixed current sensor line. See page 22 for insight on the challenges with monitoring ECMs and how Senva can help prevent false trips in the field.



### Let AUTOSET<sup>™</sup> do the calibrating for you!



### <mark>AutoSet</mark>™

AutoSet<sup>™</sup> sensors take it a step further, by automatically adjusting to the motor load. So smart, they even take into account effects of air

balancing without false trips. We also have models for variable frequency drives—and they require no trained "learning".

Our standard split core lets you snap on a control relay to get start/stop/status in a single labor and space saving device.

Automatically adjusts without training and even takes into account air balancing.



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### PreSet<sup>™</sup> Adjustable Current Switch

Scaled calibration for proof of flow set-point Split and solid core models to 150A N.O. 30VAC/DC or 120VAC output Optional command relay

#### Patent Pending

#### DESCRIPTION

PreSet<sup>™</sup> allows for matching sensor set-point to the motor nameplate, eliminating the need to calibrate in energized enclosures and reducing installation time. Sensor will detect motor undercurrent conditions such as belt loss, coupling shear, and mechanical failure on fans and pumps.

#### **APPLICATIONS**

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- Detecting belt loss, coupling shear, and mechanical failure on fans and pumps
- Monitoring status of industrial processes
- Monitoring status of critical motors

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#### **FEATURES**

#### Save time and money while eliminating calibration inside energized enclosures

- Preset<sup>™</sup> scaled calibration enables set-point adjustment for proof of flow by simply matching dial to motor full load amps (FLA) nameplate
- Safer: Eliminates calibration in energized enclosures, reduces arc flash hazard
- No need to return to calibrate—saves time and money
- Super low turn-on

**SET-POINT OPERATION** 

Off

Calibrated Trip Point

#### Maintenance-free—no call backs

Superior to traditional adjustable CTs and pressure switches

Fan/pump On

**Electrical Failure** 

Off

Industry leading 7 year warranty

**Detects Belt Loss/Coupling Shear!** 





No hazardous guesswork. Multi-turn adjustments are a thing of the past.





Reduce the risk of arc flash because sensor is calibrated to motor FLA nameplate



Save over 1/2 hour per sensor install—based on field productivity tests.

Now you can easily detect when drive belts slip, break, or pump coupling shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

Loss of Belt/Coupling Shear



ORDERING INFORMATION



S	PLIT CORE	Min (on)	Max A	N.O. Output*	Trip LED	Power LED
	C-2320-L	0.45A	50A	1.0A@30VAC/DC	•	•
	C-2320	0.50A	100A	1.0A@30VAC/DC	•	•
	C-2320-H LOWER TURN-ONI	0.50A	150A	1.0A@30VAC/DC	•	•
	C-2320HV	0.50A	100A	0.2A@120VAC	•	•
	C-2320HV-L	0.45A	50A	0.2A@120VAC	•	•
S	PLIT CORE - MINI					
	C-2220	1.00A	50A	1.0A@30VAC/DC	•	
S	OLID CORE					
	C-1320	0.75A	50A	1.0A@30VAC/DC	•	
S	OLID CORE - MINI					
	C-1220-L	0.75A	5A	1.0A@30VAC/DC	•	
	C-1220	0.75A	50A	1.0A@30VAC/DC	•	
	C-1220HV-L	0.75A	5A	0.2A@120VAC	•	

COMMAND RELAY	Contact rating	Coil
CR3-24	N.O. 10A @ 125VAC	24VAC/DC 15mA nom.
CR4-24	N.C. 10A @ 125VAC	24VAC/DC 15mA nom.
CR3-12	N.O. 10A @ 125VAC	9-12VDC 30mA nom.
CR4-12	N.C. 10A @ 125VAC	9-12VDC 30mA nom.

50A

Other coil voltages available—consult factory

0.75A



C-1220HV

**Ordering tip:** For best resolution, choose the sensor lowest maximum amperage which accomodates your motor (e.g. 0-50A us -L, 50-100A use standard, 100 to 150A use -H

0.2A@120VAC

SPECIFICATIONS	
Standard Output Rating	1.0A@30VAC/DC
Line Voltage Output Rating	0.2A@120VAC (-HV ONLY)
Output Type	NO, solid-state FET
Temperature Rating	-15-60 ° C
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Sensor Power	Induced
Frequency Range	50/60Hz

#### **TYPICAL WIRING**





*Warning:* Refer to installation instructions that accompany product and heed all safety instructions. Do not rely on current status LED to indicate presence of power.





### AutoSet<sup>™</sup> VFD Split Core Current Switch

Self-calibrating for proof of flow 0.5-135A range N.O. 30VAC/DC or 120VAC output Optional command relay

#### Patent Pending

#### DESCRIPTION

The AutoSet<sup>™</sup> VFD line self-calibrates to detect belt loss on motors operated by a variable frequency drive. The C-2350VFD line's microprocessors automatically set the proper threshold - no false alarms with varying frequencies. Sensor will detect motor undercurrent conditions such as belt loss, coupling shear, and mechanical failure on fans and pumps while reducing installation time.



#### **APPLICATIONS**

 Detecting belt loss, coupling shear, and mechanical failure on variable frequency drives

#### FEATURES AND BENEFITS

#### Self calibration for proof of flow on fans and pumps

- Works without costly 'training" of sensor—our sensors are just plain smarter!
- No need to open hot starter enclosures—save on labor as well as improve safety
- Only VFD sensor line capable of functioning on VFDs to 0.5A
- Sensor is always properly adjusted—no call backs
- Push-button and LED interface:
  - Slow blink = normal operation
  - Fast blink = alarm
  - Fast learn mode (optional): Press/hold button 1 second, LED makes 2 fast blinks.
  - Go/No mode (optional) : Press/hold button 5 seconds, LED makes 3 fast blinks.

#### Split-core with optional command relay

 Easy installation and provides stop/start/status in a unitary device—saves component and installation space/cost

#### Maintenance-free—no call backs



#### Save time and money



Save up to 15 minutes per sensor install (based on field productivity tests.)

#### SET POINT OPERATION

Positive proof of flow for VFD driven fans and pumps





#### SPLIT CORE C-2350VFD



L: 2.5" H: 0.57" W: 2.23" A: 0.75"x 0.75"

- Mount sensor without removing conductor for installation savings
- Clamp on conductor with iris, or use detachable base to screw or DIN mount
- Larger 0.75" aperture accomodates oversize conductors

#### OPTIONAL RELAY



L: 0.84" H: 0.72" W: 2.06"

- Add to 2350 series to get start/stop/ status in a single device
- Reduces the number of installed components... saves time and space
- Removable relay facilitates service

ORDERING INFORMATION					
SPLIT CORE	Min (on)	Max A	Output*	Sensor Power	
C-2350VFD-L	0.5A	15 A	1.0A@30VAC/	DC 12 to 30VDC/ 24VAC	
C-2350VFD	3.5A	135A	1.0A@30VAC/	DC Induced	
C-2350VFD-HV	3.5A	135A	0.2A@120VA	C Induced	
COMMAND RE	LAY	Cont	act rating	Coil	
CR3-24		N.O.	10A @ 125VAC	24VAC/DC 15mA nom.	
CR4-24		N.C.	10A @ 125VAC	24VAC/DC 15mA nom.	
CR3-12		N.O.	10A @ 125VAC	9-12VDC 30mA nom.	
CR4-12		N.C.	10A @ 125VAC	9-12VDC 30mA nom.	

SPLIT CORE

C-2350VFD-L

Note: 3-wire device

for fractional and small HP VFDs

#### SPECIFICATIONS

Standard Output Rating	1.0A@30VAC/DC
Line Voltage Output Rating	0.2A@120VAC (-HV MODEL ONLY)
Output Type	NO, solid-state FET
Temperature Rating	-15-60 ° C
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Frequency Range (C-2350VFD)	20-60Hz; proof of flow loss alarm at 50Hz+
Frequency Range (C-2350VFDHV)	20-60Hz; proof of flow loss alarm at 50Hz+
Frequency Range (C-2350VFD-L)	5-60Hz; proof of flow loss alarm at 50Hz+

#### 2350VFD-L 3-WIRE FOR MICRO VFD APPLICATIONS





**Warning:** Refer to installation instructions that accompany product and heed all safety instructions. Do not rely on current status LED to indicate presence of power.

#### WIRING FOR C-2350VFD





### AutoSet™ Split Core Current Switch

Self-calibrating for proof of flow 2.5-135A range N.O. 30VAC/DC or 120VAC output Optional command relay



#### DESCRIPTION

The AutoSet<sup>™</sup> line offers unparalleled installation ease for proof of flow status applications for constant volume motors and pumps. Sensor automatically adjusts to detect motor undercurrent conditions such as belt loss, coupling shear, and mechanical failure on fans and pumps. Eliminates the need to calibrate in energized enclosures while reducing installation time.

#### APPLICATIONS

- Detecting belt loss, coupling shear, and mechanical failure on fans and pumps
- Monitoring status of industrial processes
- Monitoring status of critical motors

#### FEATURES AND BENEFITS

#### Self calibration for proof of floor on fans and pumps

- Safer: Eliminates calibration in energized enclosures, reduces arc flash hazard
- No need to return to calibrate—saves time and money
- Sensor is always properly adjusted—no call backs
- Proprietary design dynamically adjusts, eliminating call backs due to air balancing
- Self learning--no time consuming training required
- Push-button and LED interface:
  - Slow blink = normal operation
  - Fast blink = alarm
  - Fast learn mode (optional): Press/hold button 1 second, LED makes 2 fast blinks.
  - Go/No mode (optional) : Press/hold button 5 seconds, LED makes 3 fast blinks.

#### Split-core with optional command relay

 Easy installation and provides stop/start/status in unitary device—saves component and installation space/ cost

#### Maintenance-free—no call backs



### Save time and money by eliminating hazardous calibration energized enclosures



No hazardous guesswork. Multi-turn adjustments are a thing of the past; no time consuming "training!"



Reduce the risk of arc flash as sensor adjusts set-point automatically



Save up to 1/2 hour per sensor install (based on field productivity tests.)

#### SET-POINT OPERATION



Positive proof of flow for constant volume fans and pumps



Aperture (A)

### SPLIT CORE C-2330

#### OPTIONAL RELAY



#### L: 2.5" H: .57" W: 2.23" A: 0.75"x 0.75"

- Mount sensor without removing conductor for installation savings
- Clamp on conductor with iris, or use detachable base to screw or DIN mount
- Larger 0.75" aperture accomodates oversize conductors

L: 0.84" H: .72" W: 2.06"

- Add to 2330 series to get start/stop/status in a single device
- Reduces the number of installed components; saves time and space
   Removable relay
- facilitates service

#### Next time, I'm using Senva.



OSHA requires protection when working in energized enclosures; just use Senva never calibrate live again!

#### **ORDERING INFORMATION**

SPLIT CORE	Min (on)	Max A	N.O. Output*	Sensor Power
C-2330	2.5A	135A	1.0A@30VAC/DC	Induced
C-2330HV	2.5A	135A	0.2A@120VAC	Induced

COMMAND RELAY	Contact rating	Coil
CR3-24	N.O. 10A @ 125VAC	24VAC/DC 15mA nom.
CR4-24	N.C. 10A @ 125VAC	24VAC/DC 15mA nom.
CR3-12	N.O. 10A @ 125VAC	9-12VDC 30mA nom.
CR4-12	N.C. 10A @ 125VAC	9-12VDC 30mA nom.

#### **TYPICAL WIRING**



**Warning:** Refer to installation instructions that accompany product and heed all safety instructions. Do not rely on current status LED to indicate presence of power.

#### SPECIFICATIONS

Standard Output Rating 1.0A@30VAC/DC

Line Voltage Output Rating 0.2A@120VAC (-HV MODEL ONLY)

Output Type NO, solid-state FET

Temperature Rating -15-60 ° C

600V RMS. For use on insulated Insulation Class conductors only! Use minimum 75 ° C insulated conductor

Frequency Range 50/60Hz



### Fixed Setpoint Current Switches

Go/No status 0.25-200A range Split and solid core models N.O. 30VAC/DC or 120VAC output Optional command relay

# 

#### DESCRIPTION

Fixed threshold trip point detects the presence of current above low trip point to provide cost-effective status monitoring unit vents, exhaust fans, recirculation pumps, and other fixed loads where belt loss is not a concern.

#### **APPLICATIONS**

- Monitoring on/off status of electrical loads
- Monitoring direct-drive units, exhaust fans, and other fixed loads
- Verifying lighting run times

#### FEATURES

#### **Ideal for ECM motors**

 Trip point operation is tuned to prevent false trips when used with electronically commutated motors

#### **Reliable and cost-effective**

- Solid-state—no moving parts to fail
- Less expensive than 277V relays for lighting status
- More reliable for status than relays across auxiliary contacts
- Industry leading 7 year limited warranty



Run status based on current



The go/no series output changes state whenever current above the minimum turn-on is present. This provides "go/no" status on loads that are not subject to mechanical failures.

#### **TYPICAL WIRING**



**Warning:** Refer to installation instructions that accompany product and heed all safety instructions.





ORDERING INFORM	ATION		
SPLIT CORE	Min (on)	Max A	N.O. Output
C-2300	0.35A	200A	1.0A@30VAC/DC
C-2300HV	0.35A	100A	0.2A@120VAC
SPLIT CORE - MINI			
C-2200	0.5A	50A	1.0A@30VAC/DC
SOLID CORE			
C-1300	0.25A	50A	1.0A@30VAC/DC
SOLID CORE - MINI			
C-1200	0.25A	50A	1.0A@30VAC/DC
C-1200HV	0.25A	50A	0.2A@120VAC

COMMAND RELAY	Contact rating	Coil
CR3-24	N.O. 10A @ 125VAC	24VAC/DC 15mA nom.
CR4-24	N.C. 10A @ 125VAC	24VAC/DC 15mA nom.
CR3-12	N.O. 10A @ 125VAC	9-12VDC 30mA nom.
CR4-12	N.C. 10A @ 125VAC	9-12VDC 30mA nom.

SPECIFICATIONS	
Standard Output Rating	1.0A@30VAC/DC
Line Voltage Output Rating	0.2A@120VAC (-HV MODELS ONLY)
Output Type	NO, solid-state FET
Temperature Rating	-15-60 ° C
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Sensor Power	Induced
Frequency Range	50/60Hz



### Analog Current Sensors

0-5VDC, 0-10VDC, 4-20mA outputs Multiple selectable range split-cores Optional command relay Fixed ranges on solid-cores



#### DESCRIPTION

Senva analog transducers measure AC current and provide a proportional output for load trending and control. Choose from easy to install split-core or compact solid core. Selectable ranges and optional command relay make for a versatile transducer.

#### APPLICATIONS

- Load trending
- Motor control
- Process control
- Fan/Pump status
- Motor load jamming
- Lighting load levels

#### FEATURES

### Split-core switch selectable ranges (30, 60, 120A or 5, 10, 20A full scale ranges)

- Makes scaling easy
- Reduces inventory
- No call backs due to mis-sizing

#### 0-5VDC, 0-10VDC, 4-20mA loop powered versions

Versions compatible with any system

#### Superior split core design for easy installation

- Mount sensor without removing conductor for installation savings
- Clamp on conductor with iris or use detachable base to screw or DIN mount
- Larger 0.75" aperture accomodates oversize conductors

#### Snap-on command relay for unitary start/ stop/status

- Reduces the number of installed components... saves time and space
- Removable relay facilitates service

#### **Reliable and cost-effective**

Industry leading 7 year limited warranty



#### SET-POINT OPERATION- MODELS C-2343, C-2344, C-2345



SPECIFICATIONS	
Temperature Rating	-15-60 ° C
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Frequency Range	50/60Hz



#### SPLIT CORE C-234X



#### L: 2.5" H: 0.57" W: 2.23" A: 0.75"x. 0.75"

- Mount sensor without removing conductor for installation savings
- Clamp on conductor with iris, or use detachable base toscrew or DIN mount
   Larger 0.75" apeture
- accomodates oversize conductors

#### ORDERING INFORMATION



Contact rating	Coil
N.O. 10A @ 125VAC	24VAC/DC 15mA nom.
N.C. 10A @ 125VAC	24VAC/DC 15mA nom.
N.O. 10A @ 125VAC	9-12VDC 30mA nom.
N.C. 10A @ 125VAC	9-12VDC 30mA nom.
	Contact rating N.O. 10A @ 125VAC N.C. 10A @ 125VAC N.O. 10A @ 125VAC N.O. 10A @ 125VAC N.C. 10A @ 125VAC

#### TYPICAL WIRING 0-5/10VDC OUTPUT



#### OPTIONAL RELAY



L: 0.84" H: .72" W: 2.06"

- Add to 234X series to get start/stop/status in a single device
- Reduces the number of installed components... saves time and space
   Removable relay facilitates service



#### L: 1.78" H: .88" W: 1.31" A: 0.30" diameter

- Super small—fits
  - anywhere Low cost



#### L: 2.27" H: 1.04" W: 1.6" A: 0.52" diameter

- Compact design
- Aperture accomodates spade terminals

#### TYPICAL WIRING LOOP 4-20 MA



*Warning:* Refer to installation instructions that accompany product and heed all safety instructions.



### Fixed Setpoint Multipoint Current Switch

Go/no status for six points 0.3-50A range per point



#### DESCRIPTION

This multipoint sensor provides cost-effective control panel mount monitoring for 6 loads. Fixed threshold trip point detects the presence of current above low trip point to provide cost-effective status monitoring unit vents, exhaust fans, recirculation pumps, and other fixed loads where belt loss is not a concern.

#### APPLICATIONS

Output

- Fan wall and other multi-motor installations
- Monitoring on/off status of electrical loads
- Monitoring direct-drive units, exhaust fans, and other fixed loads
- Verifying lighting run times

#### FEATURES

#### **Reliable and cost-effective**

- Compact design conserves panel space
- Great for fan wall applications
- Solid-state—no moving parts to fail
- Less expensive than 277V relays for lighting status
- More reliable for status than relays across auxiliary contacts
- Industry leading 7 year limited warranty

#### **Ideal for ECM motors**

• Trip point operation is tuned to prevent false trips when used with electronically commutated motors



Run status based on current for six points

The go/no series output changes state whenever current above the minimum turn-on is present. This provides "go/no" status on loads that are not subject to mechanical failures.



### SEUV

#### ORDERING INFORMATION

6 POINT SENSOR	Min (on)	Max A	Output*
C-1500-6	0.3 A	50A	1.0A@30VAC/DC

#### SPECIFICATIONS

Amperage Range	.3A (on)-50A (50A max per sensor)
Output Type	NO, solid-state FET
Standard Output Rating	1.0A@30VAC/DC
Temperature Rating	-15-60 ° C, Maximum surrounding air ambient, 60 ° C. For use in Pollution Degree 2 Environment.
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Sensor Power	Induced
Dimensions (L-W-H)	5.8″ l x 1.7″ w x 1.45″ h
Sensor Aperture	0.38"
Frequency Range	50/60Hz

#### TYPICAL WIRING



**Warning:** Refer to installation instructions that accompany product and heed all safety instructions. Do not rely on current status LED to indicate presence of power.

#### DIMENSIONS



### SENVA

### Ratio Monitoring Fanwall Current Switch

Go/no status for fan walls up to 18 motors 0.1-50A per current transformer Operates on VFD driven fan walls

Patent Pending

#### DESCRIPTION

The C-1550 provides load-side "go/no" status for fan walls up to 18 equally sized motors. Using just two CTs, this microprocessor based sensor is able to detect the loss of any one or more motors from the fan array. The unit learns ratio of current A to current B. Ratio is continuously monitored. Output alarms (opens) when measured current ratio is 10% or more different than learned ratio or current is not present. Operation is based on a ratio of load--therefore this sensor is intended for a fanwall installation or section thereof in which a single variable speed drive is utilized. The sensor will also work with non-VFD motor loads.

#### **APPLICATIONS**

- Fan wall and other multi-motor installations

#### FEATURES

#### Simple and effective fan wall status

- Designed for direct coupled fans
- Works on load side of VFDs
- Solid-state—no moving parts to fail
- Industry leading 7 year limited warranty

#### **Easy installation**

- One device takes the place of up to 18 individual CTs
- Saves panel space and installation time
- Microprocessor monitors motor currents regardless of operating frequency

#### LED for operational feedback

- Green solid = ready
- Green slow blink = current present and monitoring
- Green fast blink = learning in process
- Red solid = alarm, output open, motor failure detected

### Run status based on current for up to 18 motors with a single unit



Two CTs measure the load differential between two groups of motors loads; when a motor is lost, the differential increases and the sensor alarms.



### SEnva

#### ORDERING INFORMATION

FANWALL SENSOR	Min (on)	Max A	Output*
C-1550	0.1 A	50A	0.1A@30VAC/DC

#### SPECIFICATIONS

Amperage Range	0.1A (on)-50A (50A max per sensor)
Output Type	NO, solid-state FET
Standard Output Rating	0.1A@30VAC/DC
Temperature Rating	-15-60 ° C, Maximum surrounding air ambient, 60 ° C. For use in Pollution Degree 2 Environment.
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Sensor Power	12-24VDC/24VAC, 50mA max
Dimensions (L-W-H)	3.86″ l x 1.31″ w x 1.85″ h
Sensor Aperture	0.58″
Frequency Range	15-60Hz

#### **TYPICAL WIRING**



**Warning:** Refer to installation instructions that accompany product and heed all safety instructions. Do not rely on current status LED to indicate presence of power.

#### DIMENSIONS



### What are ECMs?

Electronically Commutated Motors (ECMs) are brushless DC motors that function using a built-in inverter and a magnet rotor, and as a result are able to achieve greater efficiency in air-flow systems than some kinds of AC motors. ECMs are also relatively low-maintenance; the use of true ball bearings reduces the need for oiling and varied start-up speeds reduce

### Why are ECMs gaining momentum?

ECMs are cost and energy efficient and can reduce operating costs. They maintain a high level (65 to 75 percent) of efficiency at a variety of speeds. In comparison, AC motors can be inefficient when used in air control systems because the fan motor noise can require the motor to run at less than a full load. When turned down, AC motor efficiency suffers in comparison to ECMs.

## What are the challenges with monitoring an ECM with digital current sensors?

ECMs draw a small amount of AC current to the inverter, up to 120mA, when the motor isn't running. If you're using a fixed current sensor with a extremely low trip-point, it may falsely indicate the motor is running when in fact it is only passive current draw from the inverter.

### How can Senva current sensors prevent false trips on ECMs.

Choosing a current sensor with a fixed setpoint above the 120mA threshold will help avoid false trips. Senva has adjusted the setpoint across the fixed current sensor line above the ECM threshold. This includes options in our solid-core and split-core lines.



The Senva go/no series output changes state whenever current above the minimum turn-on is present. This provides "go/no" status on ECMs without false trips due to the inverter current.



Typical go/no sensors with lower trip points may not change output as they are prone to false trips from the inverter current. The end result is a sensor that cannot distinguish when the ECM is loaded or unloaded.

ORDERING INFORMATION					
SPLIT CORE	Min (on)	Max A	N.O. Output*		
C-2300	0.35A	200A	1.0A@30VAC/DC		
SPLIT CORE - MINI					
C-2200	0.5A	50A	1.0A@30VAC/DC		
SOLID CORE					
C-1300	0.25A	50A	1.0A@30VAC/DC		
SOLID CORE - MINI					
C-1200	0.25A	50A	1.0A@30VAC/DC		
6 POINT SENSOR					
C-1500-6	0.3A	50A	1.0A@30VAC/DC		









#### IEC-Style Contactors and Starters Selection Guide Average Amperages for Given Horsepower Motor Ratings

The table below provides the average full-load currents of squirrel cage motors based on NEC (National Electrical Code) Tables 430-148, 149, and 150. These values are given only as a guide - they may vary depending on the type of motor and manufacturer. Refer to the actual motor nameplate for full-load current values.

	110 to 120 VAC			220 to 240 VAC			440 to 480 VAC		
шр	Single	Two	Three	Single	Two	Three	Single	Two	Three
nr	Phase	Phase	Phase	Phase	Phase	Phase	Phase	Phase	Phase
1/10	3.0			1.5			-	·	-
1/8	3.8	-		1.9			-		-
1/6	4.4	-		2.2	- 14 A		-		-
1/4	5.8	-	1.2	2.9		1.1	-		-
1/3	7.2			3.6		100 A.	-	-	
1/2	9.8	4.0	4.4	4.9	2.0	2.2	2.5	1.0	1.1
3/4	13.8	4.8	6.4	6.9	2.4	3.2	3.5	1.2	1.6
1	16.0	6.4	8.4	8.0	3.2	4.2	4.0	1.6	2.1
1 1/2	20.0	9.0	12.0	10.0	4.5	6.0	5.0	2.3	3.0
2	24.0	11.8	13.6	12.0	5.9	6.8	6.0	3.0	3.4
3	34.0	16.6	19.2	17.0	8.3	9.6	8.5	4.2	4.8
5	56.0	26.4	30.4	28.0	13.2	15.2	14.0	6.6	7.6
7 1/2	80.0	38.0	44.0	40.0	19.0	22.0	21.0	9.0	11.0
10	100.0	48.0	56.0	50.0	24.0	28.0	26.0	12.0	14.0
15	135.0	72.0	84.0	68.0	36.0	42.0	34.0	18.0	21.0
20	-	94.0	108.0	88.0	47.0	54.0	44.0	23.0	27.0
25	-	118.0	136.0	110.0	59.0	68.0	55.0	29.0	34.0
30		138.0	160.0	136.0	69.0	80.0	68.0	35.0	40.0
40	-	180.0	208.0	176.0	90.0	104.0	88.0	45.0	52.0
50	-	226.0	260.0	216.0	113.0	130.0	108.0	56.0	65.0
60	-	-	-	-	133.0	154.0	-	67.0	77.0
75		-		-	166.0	192.0	-	83.0	96.0
100	-	-		-	218.0	248.0	-	109.0	124.0
125		-				312.0	-	135.0	156.0
150		-	-		-	360.0	-	156.0	180.0
200	-	-				480.0	-	208.0	240.0
250	-	-	1.0		-	602.0	-		302.0
300	-				-		-		361.0
350		-		-			-		414.0
400				i	-		-		477.0
500	-	-	-	-			-	-	590.0



#### Tech tip for smaller motors and loads

For small motors: If the sensor you have will not turn on due to low amperage, wrap the conductor through the aperture. Each wrap will increase the amperage by 1x. For best resolution, choose the currents sensor that most closely matches your maximum motor or load full load amps (FLA)



Cnet

odbus

### *The ultimate energy meter from Senva*

### Get in. Get out. Get data.

We set out to make the easiest to install, most accurate meter. We started with flexible Rogowski CTs because they're compact, lightweight, and split-core for easy installation. But we didn't like their accuracy. So we gave them a brain so they can digitally communicate with our meter. And then it dawned on us you'd appreciate not having high voltage at the meter where you make your digital connections. So we made the voltage connection at the CT itself. Suddenly, we were measuring current and voltage in a current transducer.

### We christened it the "CVT" and called the patent attorney...



The Current/Voltage Transducer<sup>™</sup> (CVT<sup>™</sup>) measures both voltage and current, communicating the data digitally to the meter via plug-in low voltage connections.

#### Smart microprocessor enabled CVTs<sup>™</sup> boast numerous benefits:

- Digitally calibrated CVTs<sup>™</sup> are extremely accurate
- The accuracy is as high as a calibrated system, yet different CVTs<sup>™</sup> can be changed from meter to meter and the accuracy is maintained. A big advantage for auditing, since your meter is not size specific.
- Plug and play installation— individual CVTs<sup>™</sup> are digitally recognized by the meter base and outputs are automatically scaled—no user set up is required.
- Digital communication offers superior noise immunity compared to traditional induced low-signal Rogowskis
- All the high voltage connections are at the CVT<sup>™</sup>
- Rogowski CVTs<sup>™</sup> are available in 4 sizes from 9" to 36" in circumference and include several rating options from 300A to 6000A and are universally rated for 90-600V



### ENERGY MONITORING

#### **ENERGY METERS**

EM Series

26

### Intelligent Meter Technology auto-detects and self configures on each installation!

The meter recognizes the CVT<sup>™</sup> sensors and then scales itself accordingly. If you're using BACnet or Modbus versions (EM-RS485), it even self-configures its baud rate, eliminating additional configuration steps to provide a full data stream of power variables. Two pulse inputs allows aggregation of additional EM-PULSE meters. With the EM-RS485, the on-board inputs can connect to a variety of pulse output meters (water, gas, steam, etc.) for increased flexibility.

The entire assembly is easily mounted inside the electrical panel. Multiple mounting options including DIN rail adapter, snap-in mounting ears and integrated rare earth magnets to instantly secure on any ferrous enclosure or surface.

Additional features include diagnostics for assistance during installation. User programmable pulse scales, pulse width/alarm options, energy type, balanced load multipliers and PowerPrint power quality alarm.



The most compact meter ever! Simply plug in CVT<sup>™</sup> connections for easy installation

It all adds up to ease of installation and higher accuracy. Just what you'd expect from Senva.



Flexible Rogowski CVT<sup>™</sup> sensors are available in four sizes from 9" to 36" in circumference (approximately 2.8" to 11.4" in diameter) and include rating options from 300A to 6000A



Flexible split-core CVT<sup>™</sup> sensors are easy to install and more accurate than traditional CTs

BACnet<sup>®</sup> is a registered trademark of ASHRAE.



### EM Series Energy Meters

Pulse Version: kWh, KVAR, kVA Protocol Version: BACnet & Modbus Flexible Split-core Rogowski CVT<sup>™</sup> Sensors Monitor loads from 30-6000A & 90-600V



#### DESCRIPTION

The EM Series is the safest and fastest meter to install on the market. The perfect product for retrofits as the high voltage components are embedded in the Current/Voltage Transducer<sup>™</sup> (CVT<sup>™</sup>). The entire assembly is easily mounted inside the electrical panel eliminating labor and space required to install a separate transducer box. Each CVT<sup>™</sup> uses digital communication with the meter for superior noise immunity--ideal for applications where accuracy matters! The CVTs<sup>™</sup> are individually calibrated and measurement accuracy is independent of the transducer. To complement the CVT<sup>™</sup>, our metering platform offers two meter options (EM-PULSE & EM-RS485) which are small enough to fit in the palm of your hand, yet powerful enough to selfconfigure during install, removing all manual configuration!

#### **APPLICATIONS**

- Energy Management and performance contracting
- Monitoring for commercial tenants
- Activity-based costing in commercial and industrial facilities
- Real-time power monitoring
- Load shedding
- Audits/temporary monitoring
- Distributed generation



#### FEATURES

#### **Intelligent Meter Technology**

- EM Series meters auto-detect and self configure for electrical service, CVT<sup>™</sup> size, communication protocol (BACnet/Modbus), baud rate and more for simple and efficient installation
- Calibration is at the CVT<sup>™</sup> level so any CVT<sup>™</sup> from the product family will maintain its accuracy with any EM Series meter

#### **Ultimate Flexibility**

- One universal meter supports all CVT<sup>™</sup> options in the product family
- 2 pulse inputs for summing multiple meters on the EM-PULSE or for general (configurable) pulse counting on the EM-RS485 (from any pulse meter - water, gas, steam, etc.)
- 2 pulse outputs on the EM-PULSE for separately tracking positive and negative energy usage, additional power metrics or power quality alarms
- Flexible Mounting Options
  - Supports mounting on either horizontal or vertical PR30 (TS 35/F6) DIN rail
  - Snap-in mounting ears allow screwing to any suitable surface
  - Integrated rare earth magnets secure the EM meter to any ferrous enclosure or surface-- Get In. Get Out. Get Data.



#### Split-core Rogowski CVT™

- Easiest in the industry to install
- Senses both voltage & current
- High accuracy...digitally calibrated; interchangeable
- Available in multiple sizes & ratings to meet any project requirements

#### **Quick Start Auto-detection**

- Meter base recognizes the CVT<sup>™</sup> sensors and scales itself accordingly
- No manual configuration necessary

#### **Compact Size**

 Most compact meter ever fits in the palm of your hand!



#### **METER ORDERING**



#### **CVT ORDERING**

coil clr len CVT- F Туре F = Flex Rogowski

#### Coil (Amps/Size)

03S = 300A/Small 08S = 800A/Small 08M = 800A/Medium 15S = 1500A/Small 15M = 1500A/Medium 24M = 2400A/Medium 24L = 2400A/Large 60G = 6000A/Grande

#### Lead Length

Blank = 3' (default)L06 = 6'L10 = 10'

#### Lead Color

**FUSE ORDERING** 

Blank = black (default)

Color

C2 = RedC6 = Blue

Blank = Black (default) C2 = RedC6 = Blue3PH = Three CVT Kit (1 Black, 1 Red, 1 Blue)

	Power Supply Input		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
		Dual Outputs	Import and Export Energy Outputs
	Pulso Outputs	Туре	Solid state dry contact
	Fuise Outputs	Specifications	N.O., 300mA max, 40V max
		Pulse scaling	0.01, 0.1, 1, 10, 100, 1k Wh/Pulse
		RS-485	2-wire, BACnet MS/TP, Modbus RTU
	RS-485 Output	Baud Rates	9600, 19200, 38400, 57600, 76800, 115200
		RS-485 Loading	1/4 unit
		Dual Inputs	3.5 +/- 0.5 VDC, short circuit current is 10mA max
		Pulse Rate	50 Hz (default), configurable up to 500 Hz
	Pulse Inputs <sup>(2)</sup>	Pulse active	<100 ohms
		Pulse Undefined	100-1000 ohms
		Pulse Idle	>1000 ohms
		Configurations	1Ph, 2Ph, 3Ph Wye (4-Wire), 3Ph Delta (3-Wire)
	Service Types	Voltages	90VL-N through 600VL-L
		Frequency	45-65 Hz
	Performance	Accuracy	1% for V, A, kW, kVAR, kVA
		Small Rope Circumference Medium Rope Circumference Large Rope Circumference Grande Rope Circumference	9" 15" 24" 36"
	Current/Voltage Transducer™	300A Operating Range <sup>(3)</sup> 800A Operating Range <sup>(3)</sup> 1500A Operating Range <sup>(3)</sup> 2400A Operating Range <sup>(3)</sup> 6000A Operating Range <sup>(3)</sup>	+/-1% 30-300A (+/-3% >10A) +/-1% 30-800A (+/-3% >10A) +/-1% 30-1500A (+/-3% >10A) +/-1% 50-2400A (+/-3% >15A) +/-1% 120-6000A (+/-3% >40A)
	Operating Environment	Temperature	-4 to 140°F (-20 to 60°C)
	Operating Environment	Humidity	0-95% non-condensing
	Mater Fralesure	Material	Polycarbonate/ABS
	Meter Enclosure	Dimensions	4.1"h x 1.8"w x 0.9"d
		Material	Polycarbonate/ABS
	CVI Enclosure	Enclosure Dimensions	3.5″h x 1.6″w x 0.8″d

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended. (2) PULSE Meter: Pulse Inputs must have same scale as the Pulse Outputs for accurate accumulation.

RS485 Meter: Pulse Inputs are configurable to users needs.

(3) CVT<sup>™</sup> Accuracy based on reading, not full scale.

SPECIFICATIONS (METER AND CVT™)

#### **SPECIFICATIONS (FUSES)** 1/2 Amp, 600VAC slow blow, 200kA AC Interrupting rating Fuse Color Wire 18AWG, 18" lead on each end of fuse pack, 600VAC rating **CVT-FUSE-**3PH = Three Fuse Kit (1 Black, 1 Red, 1 Blue) )us C E Ű CVT-FUSE-3PH pictured

#### BACnet® is a registered trademark of ASHRAE.

**EM** Series



The install was great, no need for copper and a pipe fitter to finish it; plus it's the best instrument I have used in the last 20 years.



Built-in snubbers are standard in every PWS and PWC element to protect them from permanent damage due to water hammer (high pressure spikes)



Standard LCD on every PW transmitter simplfies installation and toggles between PSID, supply and return pressures!

### Save time and money by eliminating costly plumbing with our new wet-wet pressure transducer!

Our PW Wet-Wet Series revolutionary design eliminates costly field plumbing. Simply run wires to sensors instead of costly plumbing! Also eliminates the need for costly bypass assemblies.

Each PW transmitter features a standard LCD for ease of installation and remote sensing elements that tap directly into the supply and return lines. Startup time is also reduced since purging air out of the lines is not necessary. Project call for conduit? Order the PW Series with armored cable to save even more time or specify our conduit mounted sensors to run your own wire on site. The PW Wet-Wet Series is a game changer, so what are you waiting for?

Eliminates costly plumbing and bypass assemblies



Wire leads--not pipe!





### **PRESSURE SENSORS**

#### PRESSURE

PDP3 Series 0-2"	32
PDP3 Series 0-10", 0-25"	34
PG Gauge Series	36
PW Wet-Wet Series (Cable Version)	38
PW Wet-Wet Series (Conduit Version)	40
PW Series Ordering Guidance	42

Selectable ranges and an LCD are a technician's best friend, that's why we make them standard on every dry media differential pressure sensor!



Selectable pressure ranges, output type and uni/bi-directional settings (on 002-A models) for easy installation

#### Three installation friendly packages

Choose from our open frame panel mount, NEMA4 with integral duct probe, or NEMA4 with brass hose barb fittings. Each model offers the standard LCD and selectable range selector for ease of installation.

Dual outputs on every device save time when ordering and all low pressure models offer uni/bi-directional modes. Available in inches of water column or pascals models.





# Probe, duct, panel Low Differential Pressure

0-2" W.C., 0-500Pa version All-in-one Zero-drift sensing technology Standard LCD display Dual 0-5/10VDC and 4-20mA outputs



#### DESCRIPTION

This PDP series dry media pressure sensors cover up to 0-2" (0-500Pa) and offers industry-leading long-term stability thanks to a fully calibrated and temperature compensated application specific integrated circuit (ASIC) in the piezoresistive silicon pressure sensor. The sensor features five field selectable ranges in both inches of WC and pascals, dual 0-5/0-10VDC and 4-20mA outputs, uni/bi-directional modes, and LCD readout for ease of installation.

#### **APPLICATIONS**

- Ideal for clean rooms, hospitals, fume hoods, computer rooms, and other very low differential pressure applications
- Static pressure in duct or room, variable air volume system control, and filter status monitoring

#### FEATURES

#### Industry-leading long-term stability

- On-board application specific integrated circuit (ASIC)
- Fully calibrated and temperature compensated for sensor offset, sensitivity, temperature effects, and non-linearity

#### Easy to install and maintain

- Mount in any position. No gravity effect
- LCD display for easy setup and commissioning

#### Push button selectable ranges, outputs, and modes

- One model with five ranges: 0-2" (0.1, 0.25, 0.5, 1.0, 2.0) and 0-500Pa (.025, .062, .125, .250, .500kPa)
- Jumper selectable uni- or bi-directional
- Dual outputs 4-20mA and jumper selectable 0-5V or 0-10V

#### Three Versatile package styles:

- Open Frame: Panel mount DIN or screw-mount model
- Probe: NEMA 4 with integral duct probe
- Duct: NEMA 4 with brass hose barb fittings



Push button Selectable ranges for high resolution Select output type and uni/ bi-directional modes



Select output type and uni/ bi-directional modes

Push button Selectable ranges for high resolution





#### ORDERING

# PDP3 -002-A

0 = Open Frame1 = NEMA 4

2 = NEMA 4 / duct probe

(Write your selected Package number in the box above)

SPECIFICATIONS		
Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 30mA max. 15-30VDC/24VAC Required for 10V F.S. Output
Output Type	Dual	3-wire 0-5/10VDC and 3-wire 4-20mA
		0-2" (0.1/0.25/0.5/1.0/2.0"W.C.)
Output scaling	Model PDP3X-002-A, selectable ranges	0-500Pa (.025/.062/.125/.250/.500kPa)
		uni or bi-directional (jumper selectable)
Operating Environment	Temperature range	32 to 122 F (0-50C)
Operating Environment	Humidity range	0-95% RH
Media compatibility		Dry, oil-free air. Nitrogen
Sensor Type		Silicon Ceramic Diaphragm
	Position effects	None - position insensitive
	Zero Drift	None
	Accuracy	+/-0.25% of full scale BFSL
Sonsor Porformanco	Total Band Error	+/-2.5% of full scale
Sensor renormance	Maximum Working Pressure	135″W.C.
	Maximum Over Pressure	270″ W.C.
	Burst Pressure	415″W.C.
	Maximum Common Mode Pressure	1400″W.C.
	PDP30-002-A (Panel Mount)	Open frame, 35mm DIN rail or screw mount
Enclosure	PDP31-002-A (Duct or Panel Mount)	IP65, screw mount, brass hose barb fittings
	PDP32-002-A (Duct Mount w/pickup tube)	IP65, screw mount, brass hose barb fitting and static pickup tube

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended.

#### **TYPICAL WIRING**

#### ⊕ WC kPa 1 1.8.8.8 $\bigcirc$ $\oplus$ SET 32 10v + 5v +/-WIRING: 5 0.10" 25Pa 0.25" 62Pa 0.50" 125Pa 1.00" 250Pa 2.00" 500Pa PWR = Power Supply + PWR $\bigcirc$ GND ④ $\bigcirc$ GND = Common (power & signal) 0-10V = Voltage output 5v/10vdc 0-10V Ο 4-20mA = Current output 4-20mA 4-20mA $\bigcirc$ 6 (PWR and GND required for ⊕ $\bigcirc$ both Voltage and Current ()Ð $\oplus$ output operation) $(\mathbf{+})$ ⊕



POWER = Power Supply + GND/COM = Common (power & signal) 0-10V OUT = Voltage output 5v/10vdc 4-20mA OUT = Current output 4-20mA

(PWR and GND required for both Vdc and mA operation)



### Probe, duct, panel Static - Differential Pressure

0-25", 0-7000 Pa versions Accurate silicon piezoresistive sensor LCD display (WC or pascal models) Dual 0-5/10VDC and 4-20mA outputs

> NEMA 4 Duct Probe PDP32



NEMA 4 PDP31 Panel Mount PDP 30

#### DESCRIPTION

This PDP series dry media pressure sensors cover up to 0-25" (0-7000pA). The transmitter features field selectable pressure ranges LCD readout for ease of installation. Piezoresistive sensor chip provides accurate and reliable sensing.

#### APPLICATIONS

 Static pressure in duct or room, variable air volume system control, and filter status monitoring

#### FEATURES

### Integrated, micromachined silicon piezoresistive sensor

Outstanding sensitivity, linearity, and hysteresis

#### Switch-selectable ranges

- Three WC models with three ranges each: 0-10" (Selectable 2.5, 5.0, 10.0"WC) or 0-25" (Selectable 10, 15, 25"WC)
- Three Pa modelswith three ranges each: 0-2500Pa (0-2500/1250/250"Pa uni-directional only) or 0-7000Pa (Selectable 0-7000 (7000/5000/2500 Pa uni-directional)
- Dual outputs 4-20mA and jumper selectable 0-5V or 0-10V

#### Easy to install and maintain

- LCD display for easy setup and commissioning
- Auto zero push button input and auto zero control contact for system accuracy
- Dual outputs: 4-20mA and jumper selectable 0-5V or 0-10V

#### Three Versatile package styles:

- Open Frame: Panel mount DIN or screw-mount model
- Probe: NEMA 4 with integral duct probe
- Duct: NEMA 4 with brass hose barb fittings





Selectable ranges for high resolution



#### ORDERING



#### Package

0 = Panel Mount

1 = NEMA 4

2 = NEMA 4 with duct probe

#### **Pressure Range**

-010 = 0-10" (Selectable 2.5,5,10"WC) -025 = 0-25" (Selectable 10,15,25"WC) -2500Pa (Selectable 2500, 1250, 250 Pa) -7000Pa (Selectable 7000, 5000, 2500 Pa)

(Write your selected Package and Pressure Range numbers in the boxes above)

#### SPECIFICATIONS

			_
SPECIFICATIONS			PRE
Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 30mA max. (13VDC min for 10V f.s. output)	SSUF
Output type	Dual outputs	3-wire 0-5/10VDC and 3-wire 4-20mA	Ĩ
Output scaling	Model PDP[XX]-010	0-10″ (Selectable 2.5, 5, 10"WC)	
Output scaling	Model PDP[XX]-025	0-25″ (Selectable 10, 15, 25"WC)	PDP
	PDP[XX]-2500Pa	0-2500Pa (Selectable 2500, 1250, 250 Pa)	Se Se
	PDP[XX]-7000Pa	0-7000Pa (Selectable 7000, 5000, 2500 Pa)	eries
Operating Environment	Calibrated temperature range	50 to 140 F (10-60C)	0-1
Operating Environment	Humidity range	0-90% RH	0", C
Media compatibility		Dry, oil-free air, N2	-25
Sensor Type		Integrated, micromachined silicon piezoresistive	-
Company Dayfayyaanaa	Accuracy (Linearity, hysteresis, temperature)	2.5% f.s.	
Sensor Performance	Auto-zero input	Push-button and contact closure input provided	
	PDP30-XXX (Duct or Panel Mount)	IP65, screw mount, brass hose barb fittings	
Le ele euro	PDP31-XXX (Duct or Panel Mount)	IP65, screw mount, brass hose barb fittings	
Enclosure	PDP32-XXX (Duct Mount w/pickup tube)	IP65, screw mount, brass hose barb fitting and static pickup tube	

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended.

#### **TYPICAL WIRING**



#### WIRING:

POWER = Power Supply + GND/COM = Common (power & signal) 0-10V OUT = Voltage output 5v/10vdc 4-20mA OUT = Current output 4-20mA ZERO = Contact closure input

(PWR and GND required for both Vdc and mA operation)



# Stainless thread mount Gauge Pressure Transducer

Stainless Steel Wet Media 1/4" MNPT 0-5VDC or 4-20mA outputs



#### DESCRIPTION

This PG Series is a rugged and accurate gauge pressure sensor. It is compatible with a wide variety of liquids and gases. The MEMS technology gives the PG series flexibility to be used in virtually any OEM application. Whether measuring hydraulic pressure in a manifold or corrosive liquids and gases such as sea water or hydrogen, the PG series industrial pressure sensor provides a thick diaphragm to maintain long-term stability.

#### APPLICATIONS

- Refrigeration Pump Controls
- Chillers
- Freon and Ammonia Cooling Systems
- CO2 Systems
- Building Controls
- Water Pressure Systems
- Boiler Controls
- Environmental Test Chambers

#### FEATURES

#### Versatile

- Compact, Robust Package
- 48" wire leads; 1/4" MNPT
- Chemical Compatibilities: Any gas or liquid compatible with 17-4 stainless steel.

#### High Reliability...fewer call backs

- Burst pressure 5X full scale
- Reverse voltage protected
- Rugged stainless steel construction
- UL508 Certified
- No oil, welds or internal o-rings

#### Superb Accuracy

< ±0.5% BFSL @ room temperature (Accuracy includes non-linearity, hysteresis & non-repeatability)</p>

### SEUV

#### ORDERING

C = 4-20 mA



ELECTRICAL DATA		
Output	4-20mA	0-5VDC
Power Supply	10-28VDC	10-28VDC
Output Impedance	>10k Ohms	<100 Ohms, Nominal
Current Consumption	20mA, typical	<10mA
Bandwidth	(-3dB): DC to 250 Hz	(-3dB): DC to 1kHz
Output Noise	-	<2mV RMS
Zero Offset	<±1% of FS	<±1% of FS
Span Tolerance	<±1.5% of FS	<±1.5% of FS
Output Load	0-800 Ohms @ 10-28VDC	10k Ohms, min
Reverse Polarity Protection	Yes	Yes

ENVIRONMENTAL DATA		
Temperature		
Operating	-40 to 85°C (-40 to 185°F)	
Storage	-40 to 100°C (-40 to 212°F)	
Thermal Limits		
Compensated Range	0 to 55°C (32 to 132°F)	
TC Zero	<±1.5% of FS	
TC Span	<±1.5% of FS	
Other		
Shock	EN 60068-2-27	
Vibration	EN 60068-2-6, 60068-2-64, and IEC 68-2-32	
EMI/RFI Protection	Yes	
Rating	IP-66 (housing only)	

PERFORMANCE @ 25°C (77°F)		
Accuracy <sup>(1)</sup>	<±0.5% BFSL	
Stability (1 year)	±0.25% FS, typical	
Over Range Protection	2X Rated Pressure	
Burst Pressure	5X or 20,000 PSI (whichever is less)	
Pressure Cycles	> 100 Million	
(1) Accuracy includes non-linearity, hysteresis & non-repeatability		

WIRING CONNECTIONS	
0-5 VDC Models	3-wire voltage
4-20mA Models	2-wire loop powered

### Remote cable mounted sensors Wet-wet Differential Pressure

Prefabricated cables design 0 to 5~500 PSID (0 to 273~3447 kPa) Revolutionary design eliminates plumbing LCD display (PSID or kPa jumper selectable) Dual 0-5/10VDC and 4-20mA outputs





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#### DESCRIPTION

The PW Cable Wet-Wet series remote sensors are installed directly into the pipe and electrical connection is made between the PWS remote sensors and the PW transmitter via cables. This dramatically reduces labor cost by eliminating plumbing/piping to a traditional trandsucer. Startup time is reduced since purging air out of the lines is not necessary. Traditional plumbed bypass assemblies are no longer required. Choose between the PW10 and PW20 model based on your anticipated PSID range.

#### APPLICATIONS

- Ideal for monitoring pumps and load differential pressures in HVAC systems and processes where local indication is needed.
- Process control systems
- Flow measurement of various gases or liquids
- Liquid level measurement of pressurized vessels

#### **FEATURES**

#### **Versatile Universal Transmitter**

- Three selectable PSID ranges per sensing element
- Low and standard PSID range transmitter models
- 500 PSIG is ideal for high rise applications
- User friendly LCD displays in PSID or kPa

#### Jumper selectable features for easy installation

- Absolute mode outputs absolute value of difference
- Port swap corrects plumbing errors
- Fast/slow to select desired response time
- Uni/bi directional
- Display units in PSI/kPa
- Test mode—forces full-scale output
- Over range icon flashes if differential pressure is overrange, alerting technician to move range switch to next higher dp setting and rescale panel
- Switch selectable outputs: 2-wire 4-20mA, 3-wire 0-5V or 0-10V

#### **High Reliability**

- Standard built-in snubbers protect sensing elements from water hammer damage
- MEMS sensor technology

#### Snap on deutsch sensor connection

- Allows for mounting sensor and quick connection of wire later
- Eliminates wire twisting when tightening sensors in pipe fitting

#### Save time and money--pull wires, not pipe!



Revolutionary design eliminates costly field plumbing. Simply run wires to sensors instead of costly plumbing! Also eliminates the need for costly bypass assemblies.

Don't waste time and money on plumbing like this ever again!





Cables are prefabricated and snap onto sensors with industrial deutsch connectors. This eliminates wire twisting when tightening sensors. IP65 rated for outdoor use when armored.


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**Ordering sensors:** Order elements based on expected maximum PSIG. Order quantity of (2) PWSxxx sensors of same pressure range per (1) PW transmitter. The PW cables are prefabricated and cut to custom lengths at the factory. **Need further explanation:** Turn to page 40 element number

			range	length	type	
UNIVEF	RSAL TRAN	ISMITTER	R: PW			
Transm	itter Rang	jes		T	T	
10 = Low PSID selectable ranges 20 = Standard PSID selectable ranges						
Sensor	Cable Len	igth (feet	)			
A = 3' B = 6' C = 9' D = 15' Sensor	E = 20' F = 25' G = 30' H = 35' <b>Cable Typ</b>	I = 40' J = 45" K = 50' L = 75'	M = 100'			

REMOTE SENSORS: PWS					
Element Number	Element Range	PW10 Selectable Ranges	PW20 Selectable Ranges		
025	25 PSIG	5/10/25 PSID	5/10/25 PSID		
050	50 PSIG	5/10/25 PSID	10/25/50 PSID		
100	100 PSIG	10/20/40 PSID	50/75/100 PSID		
250	250 PSIG	25/50/100 PSID	75/150/250 PSID		
500	500 PSIG	50/100/150 PSID	100/250/500 PSID		

#### PRESSURE SENSOR SERVICE VALVE: PWBV

Optional service valve PWBV for live sensor swap

A = Armored plenum cable Blank = Standard plenum cable

	Voltage output mode 0-5V	12-30VDC/24VAC <sup>(1)</sup> , 20mA max.			
Power Supply	Voltage output mode 0-10V	15-30VDC/24VAC required for 10V full scale output			
	Current (4-20 mA) output mode	12-30VDC, 20mA max.			
Output type	Switch selectable	3-wire 0-5/10VDC and 2-wire 4-20mA			
	Model PWS025	025 25 PSIG (Select 5/10/25 PSID)			
Prossure Papage	Model PWS050	50 PSIG (Select 5/10/25 or 10/25/50 PSID based on PW Model)			
Flessure haliges	Model PWS100	100 PSIG (Select 10/20/40 or 50/75/100 PSID based on PW Model)			
	Model PWS250	250 PSIG (Select 25/50/100 or 75/150/250 PSID based on PW Model)			
	Model PWS500	500 PSIG (Select 50/100/150 or 100/250/500 PSID bas	ed on PW Model)		
Operating Temperature	Transmitter	32 to 140F (0-60°C)			
Media compatibility	Туре	Water; other 17-4 SS compatible media			
media compationity	Temperature	32 to 250°F (0-125°C)			
Zero Adjustment	Automatic	Push-button, terminal block switch input, Push button re-zero. Hold for 10-seconds to restore factory settings	for 5-seconds to		
		Range A B/C			
<b>T D</b> (	PW10 Accuracy	25 PSI Element ±2% FS ±1% FS			
Transmitter Performance (2)		Bange A B/C			
	PW20 Accuracy	All PSIG Elements $\pm 2\%$ FS $\pm 1\%$ FS			
Sensor Type		Micro-machined silicon strain gauge			
	Accuracy	< ±0.5% BFSL			
	Zero Offset	< ±2%			
	Span Tolerance	< ±2%			
	Stability (1 Year)	±0.25%FS, typ			
	Overange Protection	2X Rated Pressure			
	Burst Pressure	5X or 20,000 psi (whichever is less)			
Sensor Performance	Pressure Cycles	> 100 Million			
	Compensated Range	0 to 55°C (30 to 130°F)			
	Temperature Compensation	Zero, <±1.5% of FS Span, <±1.5% of FS			
	Shock	100G, 11 msec, 1/2 sine			
	Vibration	10G peak, 20 to 2000 Hz.			
	EMI/RFI Protection	Yes			
Enclosure PW20 Transmitter	Construction	Powdered coated steel			
LICIOSULE, F WZO HAISHILLER	Sealing	IP65 (when installed with water-tight fittings)			
Enclosure DWS (vvv) Sensor	Construction	Stainless Steel 17-4, 1/4" MNPT, Deutsch DT series con	nector		
LICIOSULE, F VV3 (XXX) SELISOL	Sealing	IP65 (when installed with armored cable option)			
Enclosure, PWBV Service Valve	Construction	Chrome-plated brass, 1/4" NPT Female x Male			

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended.

(2) FS is defined as the full scale of the selected range in bi-directional mode.

# Remote conduit mounted sensors Wet-wet Differential Pressure

Conduit adapter design 0 to 5~500 PSID (0 to 273~3447 kPa) Revolutionary design eliminates plumbing LCD display (PSID or kPa jumper selectable) Dual 0-5/10VDC and 4-20mA outputs





#### DESCRIPTION

The PW Conduit Wet-Wet series remote sensors are installed directly into the pipe and electrical connection is made between the PWC remote sensors and PW transmitter via 4-conductor shielded cable run through conduit. This dramatically reduces labor cost by eliminating plumbing/piping to a traditional transducer. Startup time is reduced since purging air out of the lines is not necessary. Traditional plumbed bypass assemblies are no longer required. Choose between the PW10 and PW20 model based on your anticipated PSID range.

#### APPLICATIONS

- Ideal for monitoring pumps and load differential pressures in HVAC systems and processes where local indication is needed.
- Process control systems
- Flow measurement of various gases or liquids

### FEATURES

#### **Conduit ports on transmitter and elements**

- Run conduit and 4-conductor shielded cable from transmitter to elements to wire in the field
- Eliminates costly plumbing and by-pass manifolds

#### **Versatile Universal Transmitter**

- Three selectable PSID ranges per sensing element
- Low and standard PSID range transmitter models
- 500 PSIG is ideal for high rise applications
- User friendly LCD displays in PSID or kPa

#### Jumper selectable features for easy installation

- Absolute mode outputs absolute value of difference
- Port swap corrects plumbing errors
- Fast/slow to select desired response time
- Uni/bi directional
- Test mode—forces full-scale output
- Over range icon flashes if differential pressure is overrange, alerting technician to move range switch to next higher dp setting and rescale panel
- Switch selectable outputs: 2-wire 4-20mA, 3-wire 0-5V or 0-10V

#### **High Reliability**

- Standard built-in snubbers protect sensing elements from water hammer damage
- MEMS sensor technology

#### Save time and money - pull wires, not pipe!

 Run 4-conductor shielded cable in conduit from PW transmitter to PWC elements



# Don't waste time and money on plumbing like this ever again!

 Revolutionary design eliminates costly field plumbing. Simply run wires to sensors instead of costly copper tubing! Also eliminates the need for expensive bypass assemblies.





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**Ordering sensors:** Order elements based on expected maximum PSIG. Order quantity of (2) PWCxxx sensors of same pressure range per (1) PW transmitter. Conduit, conduit connectors and 4-conductor shielded cable not provided.

Need further explanation: Turn to page 41

# range

# UNIVERSAL TRANSMITTER: PW

#### **Transmitter Ranges**

10 = Low PSID selectable ranges

20 = Standard PSID selectable ranges

#### PRESSURE SENSOR SERVICE VALVE: PWBV



Optional service valve PWBV for live sensor swap. Order 1 PWBV service valve for each PWCxxx element.

#### element number

# REMOTE SENSORS: PWC

Element Number	Element Range	PW10 Selectable Ranges	PW20 Selectable Ranges
025	25 PSIG	5/10/25 PSID	5/10/25 PSID
050	50 PSIG	5/10/25 PSID	10/25/50 PSID
100	100 PSIG	10/20/40 PSID	50/75/100 PSID
250	250 PSIG	25/50/100 PSID	75/150/250 PSID
500	500 PSIG	50/100/150 PSID	100/250/500 PSID

#### **SPECIFICATIONS**

	Voltage output mode 0-5V	12-30VDC/24VAC <sup>(1)</sup> , 20mA max.			
Power Supply	Voltage output mode 0-10V	15-30VDC/24VAC required for 10V full scale output			
	Current (4-20 mA) output mode	12-30VDC, 20mA max.			
Output type	Switch selectable	3-wire 0-5/10VDC and 2-wire 4-20mA			
	Model PWC025	25 PSIG (Select 5/10/25 PSID)			
Prossure Pangas	Model PWC050	50 PSIG (Select 5/10/25 or 10/25/50 PSID based on PW Model)			
Flessure hanges	Model PWC100	100 PSIG (Select 10/20/40 or 50/75/100 PSID based on PW Model)			
	Model PWC250	250 PSIG (Select 25/50/100 or 75/150/250 PSID based on PW Model)			
	Model PWC500	500 PSIG (Select 50/100/150 or 100/250/500 PSID based on PW Model)			
Operating Temperature	Transmitter	32 to 140F (0-60°C)			
Madia compatibility	Туре	Water; other 17-4 SS compatible media			
Media compatibility	Temperature	32 to 250°F (0-125°C)			
Zero Adjustment	Automatic	Push-button, terminal block switch input, Push button for 5-seconds to re-zero. Hold for 10-seconds to restore factory settings			
		Range A B/C			
	PW10 Accuracy	25 PSI Element ±2% FS ±1% FS			
Transmitter Performance <sup>(2)</sup>		50-500 PSI Element ±4% FS ±2% FS			
	PW20 Accuracy	A B/C A B/C A A B/C A A A A A A A A A A A A A A A A A A A			
Sensor Type		Micro-machined silicon strain gauge			
	Accuracy	< ±0.5% BFSL			
	Zero Offset	< ±2%			
	Span Tolerance	< ±2%			
	Stability (1 Year)	±0.25%FS, typ			
	Overange Protection	2X Rated Pressure			
	Burst Pressure	5X or 20,000 psi (whichever is less)			
Sensor Performance	Pressure Cycles	> 100 Million			
	Compensated Range	0 to 55°C (30 to 130°F)			
	Temperature Compensation	Zero, <±1.5% of FS Span, <±1.5% of FS			
	Shock	100G, 11 msec, 1/2 sine			
	Vibration	10G peak, 20 to 2000 Hz.			
	EMI/RFI Protection	Yes			
Enclosuro DW/20 Transmitter	Construction	Powdered coated steel			
enciosure, Pw20 fransmitter	Sealing	IP65 (when installed with water-tight fittings)			
Enclosure DWC (vvv) Concer	Construction	Stainless Steel 17-4, 1/4" MNPT, 1/2" Conduit Fitting			
Enclosure, PWC (XXX) Sensor	Sealing	IP65 (when installed with water tight fittings)			
Enclosure, PWBV Service Valve	Construction	Chrome-plated brass, 1/4" NPT Female x Male			

PRESSURE PW Conduit Wet-Wet Series

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended. (2) FS is defined as the full scale of the selected range in bi-directional mode.

# First time ordering our PW cable series? Let us help step by step!

# What do I need?



#### **PWS Sensing Elements**

Order (2) PWS sensing elements for every (1) PW transmitter. Each PWS element connects to the PW transmitter cables via snap-on deutsch connectors.

# PW Cable Wet-Wet Series

**PW Transmitter** 

The configuration of the unit including powering the device, output, jumpers and PSID range selection is done inside of the PW transmitter. Cable length and type must be specificed upon ordering.

#### **On/Off Service Valve**

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Optional service valve (PWBV) for live sensor swap. Order 1 PWBV service valve for each PWS element.

#### **ORDERING SENSING ELEMENTS**

### Step 1

Element connection type This guide is for units that include prefabricated cables with deutsch connectors cut to a custom length at the factory. (If running your own 4-conductor shielded cable through conduit is desired, see page 37 of the catalog)

# Step 2

#### Element pressure (PSIG) range

Each sensing element has a maximum PSIG rating. Ensure that your system will not exceed this rating to avoid clipping any readings before the device calculates the differential pressure.

element number

#### **REMOTE SENSORS: PWS**

#### **Element Number**

025 = 25 PSIG **050** = 50 PSIG 100 = 100 PSIG

- 250 = 250 PSIG
- **500** = 500 PSIG

# Step 3



How many PWS sensing elements do I need? It takes a pair (2) of PWS elements with the same PSIG rating per (1) PW transmitter.

#### **OPTIONAL SERVICE VALVES**

### Step 4



Do you need optional on/off service valves?

Optional service valves (PWBV) are recommended for live sensor swap and also protecting the sensing elements from debris if the system needs to be flushed.

Order (2) PWBV service valves for each (1) PW transmitter.

#### ORDERING TRANSMITTER

### Step 5



#### **Transmitter range**

After selecting the proper pair of PWS elements, select the PW10 or PW20 transmitter based on the PSID selectable range scale that best fits your application. (Use the cross reference table below)

Element Number	Element Range	PW10 Selectable Ranges	PW20 Selectable Ranges
025	25 PSIG	5/10/25 PSID	5/10/25 PSID
050	50 PSIG	5/10/25 PSID	10/25/50 PSID
100	100 PSIG	10/20/40 PSID	50/75/100 PSID
250	250 PSIG	25/50/100 PSID	75/150/250 PSID
500	500 PSIG	50/100/150 PSID	100/250/500 PSID

#### Step 6

#### Cable length and type

The PW cables are prefabricated and cut to custom lengths at the factory. (Tip: For outdoor installations order the armored plenum cable)

				range	length	type
UNIVER	SAL TRA	NSMITTER	≹: PW			
Transmi	itter Ran	ges		T	T	
10 = Low F 20 = Stand <b>Sensor</b> (	PSID selecta lard PSID se <b>Cable Le</b>	able ranges electable rang <b>ngth (feet</b> )	jes )	_		
A = 3' B = 6' C = 9' D = 15' <b>Cable Ty</b>	E = 20' F = 25' G = 30' H = 35' <b>/pe</b>	I = 40' J = 45" K = 50' L = 75'	M =	: 100′		

A = Armored plenum cable Blank = Standard plenum cable

#### FURTHER ASSISTANCE

Call us at (866) 660-8864 or email sales@senvainc.com

# SEnva

# First time ordering our PW conduit series? Let us help step by step!

# What do I need?





### **PWC Sensing Elements**

Order (2) PWC sensing elements for every (1) PW transmitter. Each PWC element has a 1/2" conduit adapter on top.



### **PW Transmitter**

The configuration of the unit including powering the device, output, jumpers and PSID range selection is done inside of the PW transmitter.

#### **On/Off Service Valve**

Optional service valve (PWBV) for live sensor swap. Order 1 PWBV service valve for each PWC element.

#### **ORDERING SENSING ELEMENTS**

## <u>Step 1</u>

#### Element connection type

This guide is for units that will require the installer to provide conduit and 4-conductor shielded cable. (If prefabricated cables are desired, please see page 36 of the catalog)

# <u>Step 2</u>

#### Element pressure (PSIG) range

Each sensing element has a maximum PSIG rating. Ensure that your system will not exceed this rating to avoid clipping any readings before the device calculates the differential pressure.

element number

#### **REMOTE SENSORS: PWC**

#### **Element Number**

**025** = 25 PSIG **050** = 50 PSIG

- **100** = 100 PSIG
- 250 = 250 PSIG
- **500** = 500 PSIG

# <u>Step 3</u>



*How many PWC sensing elements do I need?* It takes a pair (2) of PWC elements with the same PSIG rating per (1) PW transmitter.

#### **OPTIONAL SERVICE VALVES**

### <u>Step 4</u>



**Do you need optional on/off service valves?** Optional service valves (PWBV) are recommended for live sensor swap and also protecting the sensing elements from debris if the system needs to be flushed.

Order (2) PWBV service valves for each (1) PW transmitter.

#### ORDERING TRANSMITTER

### <u>Step 5</u>



#### Transmitter range

After selecting the proper pair of PWC elements, select the PW10 or PW20 transmitter based on the PSID selectable range scale that best fits your application. (Use the table below to cross reference the PSID ranges associated with each PWC element)



10 = Low PSID selectable ranges

20 = Standard PSID selectable ranges

# Transmitter PSID selectable ranges

Element Number	Element Range	PW10 Selectable Ranges	PW20 Selectable Ranges
025	25 PSIG	5/10/25 PSID	5/10/25 PSID
050	50 PSIG	5/10/25 PSID	10/25/50 PSID
100	100 PSIG	10/20/40 PSID	50/75/100 PSID
250	250 PSIG	25/50/100 PSID	75/150/250 PSID
500	500 PSIG	50/100/150 PSID	100/250/500 PSID

#### FURTHER ASSISTANCE

### Still have questions?

Don't hesitate to call us at (866) 660-8864 or email sales@senvainc.com



# Field adjustability simplifies commissioning. Institutional customers have their own metrics and they want them matched.

# It's only perfect if the customer says so.

We're familiar with that facilities manager whose antiquated humidity instrument "may" or may not be as accurate as our NIST traceable chamber. So we added provisions for you to quickly rescale our sensor to match their reference points. It doesn't make us wrong; the customer is always right.





Rescale our transducers in seconds to meet customer requirements



State of the art Testing Facilities. 8-point NIST Certification Options, consult factory



Field replaceable RH element on the HD Series

### Changing the game with microsensing

Senva's element features two calibrated micro-sensors for relative humidity and temperature coupled on the same integrated circuit. As such, they're optimized, not for signal strengths, but long-term stability.

Forming a single unit, they enable precise determination of dew point. Condensation

or even immersions present no problems whatsoever. But, let's be honest. It doesn't mean you'll never ever have a problem. We all know swimming pools and nitrogen rich agriculture applications can oxidize anything—our sensors included. That's why our sensor element is conveniently replaced without disturbing the installation. No field calibration is required.



# HUMIDITY/TEMPERATURE



# **HUMIDITY/TEMP**

Humidity Temperature (AQW) Series	44
Slimline Humidity (HR) Series	46
Duct Mount Humidity (HD) Series	48
Outside Air Humidity (HO) Series	50
Wireless Outside Air (WO) Series	52
Surface Mount Temp (TRWL) Series	54
Flush Mount Temp (TR) Series	56



The "Triple Threat Combo": CO2, RH, and temp in a compact unit with optional BACnet in the **AQW Series.** This customizable sensor allows you to specify RH, CO2 or both to meet project requirements!



Wireless units for rooftop applications reduces installation time and permits proper location. Solar Powered—save hundreds on your install.



Our microsensors are optimized for precision relative humidity and temperature measurement

# When it comes to humidity, we're not perfect. Just better.

Conventional capacitive sensors have large elements that absorb or release water proportional to the relative environmental humidity. But they also absorb contaminants. And their bulky materials age haphazardly. Long term stability is the casualty. We set out to change that paradigm—and did.

# How about the world's first solar power wireless outside air station?

Outside air is one of the most challenging installations going. First, you have to get to the roof top. Then you have conduit. Then someone figures out it's not really in the shade. Like moving that conduit again? We just had a notion that a solar-powered wireless humidity temp transmitter would be a better idea.

BACnet<sup>®</sup> is a registered trademark of ASHRAE.



11111

# Wall Humidity Sensors CO2/Humidity/Temp

Available with analog outputs or protocol for BACnet RS-485 Integrated set-point relay Optional field replaceable NDIR CO2 and RH elements

#### DESCRIPTION

The AQW series design allows customization for a sensor that meets project requirements for monitoring temperature, CO2 and relative humidity. The sensor can be ordered as stand alone temperature, CO2/Temp, RH/Temp or all-in-one CO2/RH/Temp with a 0-5/10V analog or BACnet RS485 output. Lower material costs and installation time by combining multiple sensors into a single sensor housing with standard LCD and optional add-on features.

#### **APPLICATIONS**

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Offices, conference rooms, and public assembly areas

#### FEATURES

#### **Customize to meet project requirements**

- Standard LCD and temperature on each device
- Options to add CO2 and/or RH sensing elements
- Field replaceable elements for CO2 and RH
- Available with 0-5/10V Analog or BACnet protocol communication

#### **Protocol Version**

- BACnet RS-485 ready
- Auto-configuration wizard detects baud rate and MAC address
- Adjustable set-point using button menu or optional 10k slider

#### **Analog Version**

- LCD for easy setup of all parameters (concealment cover included)
- Programmable set-points for complete control
- Provision to offset CO2 reading
- Optional thermistors, sliders and override button

#### High performance field replaceable NDIR CO2 element

 Selectable auto-calibration mode returns sensor to baseline values

#### 2% RH field replaceable sensor

- On-board temperature compensation for RH eliminates temp coefficient errors achieving excellent measurement accuracy, high repeatability and offset stability.
- State of the art testing facilities. 8-point NIST traceable certification available—consult factory

#### Quality

 Industry leading 7-year limited warranty/ 2-year RH element, 3-year CO2 element limited warranties



BACnet

#### **ORDERING INFORMATION**



\*Add-on RTD/Thermistor not readable via BACnet; Temperature output is standard on AQW devices, Add-on RTD/Thermistor is option for Analog.



(AQW sensor with BACnet RS-485, Temp, CO2, 2% RH, no set-point slide, no user push button, no RTD/thermistor, white color)



SPECIFICATIONS		
Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
	Temperature	05/10V standard, Scaling 50°F to 95°F (10°C to 35°C); thermistor/RTD values optional
Analog Outputs	CO2 and RH	0-5/10V
Analog Outputs	Update Rate	Continuous
	Programmable Relay	Solid-state output, 1A @ 30VAC/DC, N.O.
	5PE, Set point, Hi (On)	Sets relay turn-on threshold (800ppm default)
	5Ph, Set point, hysteresis (Off)	Sets the relay turn-off hysteresis (100ppm default)
	5EL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)
Analog LCD Menu	RdJ, Adjustment	CO2 Offset adjustment +/-250ppm (0 default)
Parameters (2)	ERL, Auto Calibration Period	Off, 7 days, 14 days, 30 days, 60 days (14 days default)
	PFE, Displayed Temp Unit	₽₣ degrees fahrenheit (default), ₽Ĺ degrees celsius
	LuL Analog Output Scale	5ມ 5.0V full scale,  ມີມ 10.0V full scale (default)
	רעה, Run Mode	Displays temp and optional CO2 and RH
	Protocol	BACnet (Isoloated)
	Connection	3-wire RS-485, with isolated ground
Protocol Output	Data Rate	Locally set baud rate up to 115200 (9600, 19200, 28800, 38400, 57600, 76800, 115200)
	Address Range	0-127
		Solid-state output. 1A @ 30VAC/DC. N.O.
Protocol Relay Set-point	Programmable	Source selectable: CO2 RH Temperature
	т. не -	Non-disnersive Infrared (NDIR)
	Туре	+40ppm $\pm 3\%$ of reading (400-2000ppm)
(0)	Accuracy	-2000/5000 nm Programmable up to 10 000 nm
002	Range	60 seconds to 90% reading
	Response time	a seconds
	Sample rate	
	Туре	Digital Civics $20^{\circ}$ module $1/20^{\circ}$ over 10 to $200^{\circ}$ Difference
	Accuracy	2% models, +/-2% over 10 to 90%KH range
	Kesolution	
	Hysteresis	+/-170NN
Relative Humidity		Compensated on-board
	Kesponse time (3)	5US
	Sample rate	35
	Operating range/Output Scale	U to TUU%RH (non-condensing)
	Long term drift	
	Operating conditions (4)	-2υ C t0 ου C @ KH>90%; -20° C t0 80° C @ KH=50% Silicon Randgan
	Iype	$(0.2^{\circ}C)$
	Nominal Accuracy	$\pm 1/0.5 \in (\text{operating range})$
Temperature	Maximal Accuracy	$\tau_{1}$ -0.5 C (at 25 C), $\pm$ /-1.0 C (operating range)
(with RH option)	Resolution	
	Repeatability	+/-U.I C
	Response time (3)	3US
	Sample rate	35
	Iype	
Temperature	Nominal Accuracy	+/-U.S C (operating range)
(without RH option)	Maximal Accuracy	+/-1.0° C (at 25° C), +/-2.0° C (operating range)
	Resolution	0.05° C
	Repeatability	+/-0.2° C
	Sample Rate	100 milliseconds
Operating Environment	Temperature	32 to 122F (0 to 50C)
,	Humidity	0-95% non-condensing
Enclosure	Material	ABS Plastic
(1) One side of transformer second	Dimensions	4.85"h x 3.25"w x 1.19"d
(1) One side of transformer, secondary is co	onnected to signal common. Dedicated transfo	ineris recommended.

(1) One sade of ranksonner, secondary is connected to signal commission bearcated transmission in its recommended.
 (2) Quick Start Menu parameters shown, for additional capabilities see installation manual.
 (3) Time for reaching 63% of reading at 25°C and 1 m/s airflow
 (4) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

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# Recessed Wall Humidity/Temperature

2% or 3% accuracy 0-5/10V RH/Temp (thermistors optional) Field-calibration potentiometer Durable and attractive low-profile design



#### DESCRIPTION

The HR series is designed for use in energy management systems in buildings. They combine excellent stability with reliable operation and the provision to offset the RH reading +/-5% for in-field calibration. Thermistor options accommodate any installation. Housing is offered in multiple color choices to match any decor.

#### APPLICATIONS

- HVAC room humidity and temperature measurement and control
- Energy management/building control

### FEATURES

### Attractive recessed design is attractive and durable

- Match colors and existing interior decor
- Fits in most standard wall plates
- No exposed screws; unobtrusive tamper resistant design
- Ideal for schools

### Field calibration poteniometer

- Field calibration scaled adjustment allows easy adjustment of calibrated RH value as needed to maintain certification.
- 0-5V/0-10V output—jumper selectable

### Choose from a range of accuracy and options

- 2% and 3% RH accuracy options
- Thermistor outputs for temperature optional

### **Superior RH sensing**

 On-board temperature compensation for RH. Eliminates temperature coefficient errors and achieves an excellent measurement accuracy as well as high repeatability and offset stability.





#### Slimline enclosure

 Tamper resistant design allows the sensor to mount flush with the wall for a clean, low-profile appearance



Optional Trim Ring for surface mount applications or mis-sized j-boxes









S

#### L = 100k **Color**

K = 20k



PECIFICATIONS			
Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 15mA max.	
Outputs RH% and Temperature		3-wire 0-5/10V <sup>(4)</sup> (jumper selectable)	
	RH%	0-100% RH	
Output scaling	Temperature	50-95° F (10-35° C)	
Thermistor Options		Yes, see ordering table below	
Media filter		PTFE membrane, IP54 protection	
	Accuracy	2% models, +/-2% over 10 to 90%RH range	
	Accuracy	3% models, +/-3% over 20 to 80%RH range	
	Resolution	0.05%RH	
	Hysteresis	+/-1%RH	
	Non-Linearity	factory linearized <1%RH	
Polotivo Humiditu	Temperature coefficient	fully compensated by on-board temp sensor	
Relative Humidity	Response time (2)	30s	
	Output update rate	2s	
	Operating range	0 to 100%RH (non-condensing)	
	Long term drift	<0.5%RH per year	
	Operating conditions <sup>(3)</sup>	-20° C to 60° C @ RH>90%	
		-20° C to 80° C @ RH=50%	
	$\Lambda_{\rm CCUPACY}$ (-20° C to 70° C range)	2% models, <+/-1° C; 0.5° C typ @ 25° C	
		3% models, <+/-2° C; 0.5° C typ @ 25° C	
	Resolution	0.01° C	
Tomporaturo	Repeatability	+/-0.1° C	
lemperature	Response time (2)	30s	
	Temperature Scaling	50-95° F (10-35° C)	
	Output update rate	2s	
	Operating range	-40° C to 120° C	

(1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended. (2) Time for reaching 63% of reading at 25° C and 1 m/s airflow.

(3) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours).

(4) 15-30VDC/24VAC power supply voltage required for 10 volt output.

#### DIMENSIONS





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1.239



#### Optional #Trim Ring for surface mount applications or mis-sized j-boxes

#### **TYPICAL WIRING**



# Duct Humidity/Temperature

2% or 3% accuracy (NIST certification options) 0-5V/10V and 4-20mA RH/Temp (thermistors optional) LCD display with field calibration menu Field replaceable element



#### DESCRIPTION

The HD Series is designed with both the engineer and field technician in mind. The HD Series combines excellent stability with reliable operation in 2% or 3% RH accuracy options. Optional temperature transmitters, RTDs and thermistors add further flexibility when ordering. The standard LCD and field replaceable elements make the intitial installation and future service a breeze.

#### **APPLICATIONS**

- HVAC room humidity and temperature measurement and control
- Replaceable element is ideal for difficult environments such as swimming pools

#### **FEATURES**

#### Versatile

- 2% or 3% RH versions with field replaceable sensor
- Switch selectable 5V/10V and 4-20mA RH/T transmitter outputs
- Thermistor outputs for temperature optional

#### **Easy to maintain**

- Field calibration. LCD and push-button menu allows easy adjustment of calibrated RH value as needed to maintain certification.
- Field replaceable sensor—without disturbing conduit

#### **Superior RH sensing**

- On-board temperature compensation for RH. Eliminates temperature coefficient errors and achieves an excellent measurement accuracy as well as high repeatability and offset stability.
- State of the art testing facilities. 8-point calibration certificate available (NIST traceability—consult factory)

#### Quality

 Industry leading 7-year warranty/ 2-year replaceable element warranty





#### Field replaceable element

- Ideal for harsh environments
- Accurate dual RH/Temp IC sensing



#### LCD with menu

- Easier commissioning
- Re-scale to field metrics if required
- LCD cover provided



#### **NIST traceable**

 8-point calibration certification options. Consult factory.





ORDERING	SPECIFICATIONS		
accy temp	Davies Course by	3-wire voltage mode (0-5/10V)	12-30VDC/24VAC <sup>(1)</sup> , 15mA max.
	Power Supply	2-wire current mode (4-20mA)	12-30VDC, 30mA max.
	Outputs	RH and Temperature (option)	3-wire 0-5/10V <sup>(4)</sup> or 2-wire 4-20mA
Accuracy		RH	0-100% RH
2 = 2% 3 = 3%	Output scaling	Temperature (jumper)	32-122° F (0-50°C) or -40-140° F (-40-60°C)
Tomporaturo	Thermistor/RTD	Optional	See ordering table
	Media filter		PBT with water-vapor permeable membrane
B = Transmitter C = 100Pt (385)		Accuracy	2% models, +/-2% over 10 to 90%RH range 3% models, +/-3% over 20 to 80%RH range
D = 1000Pt (385) F = 10k type 2		Resolution	0.05%RH
F= 10k type 3		Hysteresis	+/-1%RH
G = 10k type 3 w/11k shunt H = 3k	Relative Humidity	Non-Linearity	factory linearized <1%RH
I = 2k2		Temperature coefficient	fully compensated by on-board sensor
J = 1k8 $K = 20k$		Response time <sup>(2)</sup>	30s
L = 100k		Output update rate	2s
Replacement Sensor Elements		Operating range	0 to 100%RH (non-condensing)
HSD-2 = 2% accuracy		Long term drift	<0.5%RH per year
HSD-3 = 3% accuracy Consult factory for certification and point calibration options		Operating conditions (3)	-20° C to 60° C @ RH>90% -20° C to 80° C @ RH=50%
(Write your selected Accuracy, Temperature, and Replacement Sensor Elements numbers/		Accuracy (-20° C to 70° C range)	2% models, <+/-1° C; 0.5° C typ @ 25° C 3% models, <+/-2° C; 0.5° C typ @ 25° C
		Resolution	0.01° C
	Temperature	Repeatability	+/-0.1° C
		Response time (2)	30s
		Output update rate	2s
		Operating range	-40° C to 120° C
	Enclosuro	Materials	ABS/Polycarbonate
	ETCIOSUTE	Dimensions	4.0"h x 4.4"w x 2.1"d (+6.8" probe)

(1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.

(2) Time for reaching 63% of reading at 25° C and 1 m/s airflow.

(3) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

(4) 15-30VDC/24VAC power supply voltage required for 10 volt output.

#### DIMENSIONS





#### **TYPICAL WIRING**



V OUT = Voltage output, 0-5 or 10VDC V- COM = Ground/Common V+ PWR = Power supply voltage

# Outside Air Humidity/Temperature

2% or 3% accuracy (NIST certification options) 0-5V/10V and 4-20mA RH/Temp (thermistors optional) LCD display with field calibration menu Field replaceable element



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#### DESCRIPTION

The HO Series is designed to be mounted on the building exterior to provide outside air RH measurement. The HO Series combines excellent stability with reliable operation in 2% or 3% RH accuracy options. Optional temperature transmitters, RTDs and thermistors add further flexibility when ordering. The standard LCD, gasketed lid and field replaceable elements make the intitial installation and future service a breeze.

#### **APPLICATIONS**

 Outdoor humidity and temperature measurement for building control

### FEATURES

#### Versatile

- 2% or 3% Rh versions with field replaceable sensor
- Switch selectable 5V/10V and 4-20mA RH/T transmitter outputs
- Thermistor/RTD output for temperature optional

#### **Easy to maintain**

- Field calibration. LCD and push-button menu allows easy adjustment of calibrated RH value as needed to maintain certification
- Replace a sensor without disturbing conduit

#### **Superior RH sensing**

- On-board temperature compensation for RH. Eliminates temperature coefficient errors and achieves an excellent measurement accuracy as well as high repeatability and offset stability
- State of the art testing facilities. 8-point calibration certificate available (NIST traceability—consult factory)

#### Quality

 Industry leading 7-year warranty/ 2-year replaceable element warranty





#### Field replaceable element

- Ideal for harsh environments
- Accurate dual RH/Temp IC sensing



#### LCD with menu

- Easier commissioning
- Re-scale to field metrics if required



### NIST traceable

 8-point calibration certification options. Consult factory.



RDERING	SPECIFICATIONS		
accy temp	Derver Greenler	3-wire voltage mode (0-5/10V)	12-30VDC/24VAC <sup>(1)</sup> , 15mA max
	Power Supply	2-wire current mode (4-20mA)	12-30VDC, 30mA max.
)	Outputs	RH and Temperature (option)	3-wire 0-5/10V <sup>(4)</sup> or 2-wire 4-20mA
uracy T T	Output cooling	RH	0-100% RH
19%	Output scaling	Temperature (jumper)	32-122°F (0-50°C) or -40-140°F (-50-60°C)
%	Thermistor/RTD	Optional	See ordering table
ıperature	Media filter		Sintered stainless steel
None Fransmitter		Accuracy	2% models, +/-2% over 10 to 90%RH range 3% models, +/-3% over 20 to 80%RH range
1000Pt (385)		Resolution	0.05%RH
10k type 2	Relative Humidity	Hysteresis	+/-1%RH
10k type 3 w/11k shunt		Non-Linearity	Factory linearized <1%RH
3k k2		Temperature coefficient	Fully compensated by on-board sensor
k8		Response time <sup>(2)</sup>	30s
20k 100k		Output update rate	25
		Operating range	0 to 100%RH (non-condensing)
		Long term drift	<0.5%RH per year
-2 = 2% accuracy -3 = 3% accuracy		Operating conditions <sup>(3)</sup>	-20° C to 60° C @ RH>90% -20° C to 80° C @ RH=50%
		Accuracy (-20° to 70°C range)	2% models, <+/-1° C; 0.5° C typ @ 25° C 3% models, <+/-2° C; 0.5° C typ @ 25° C
		Resolution	0.01° C
	Temperature	Repeatability	+/-0.1° C
	·	Response time <sup>(2)</sup>	30s
		Output update rate	2s
		Operating range	-40° to 70° C
	Fu da suma	Materials	ABS/Polycarbonate
	Enclosure	Dimensions	4.0"h x 4.4"w x 2.1"d (+2.8" solar shield)

(1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.
 (2) Time for reaching 63% of reading at 25° C and 1 m/s airflow.

(3) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

(4) 15-30VDC/24VAC power supply voltage required for 10 volt ouput.

#### **TYPICAL WIRING**



### DIMENSIONS







# Wireless Outside Air Humidity/Temperature

2.4 GHz ZigBee<sup>™</sup> wireless for easy installation 2% or 3% accuracy LCD display with field calibration Field replaceable element



#### DESCRIPTION

The WO outside air series consists of a labor saving solar powered wireless temp/humidity transmitter with a remote receiver. This eliminates costly conduit, roof penetrations, and allows for easy repositioning should conditions warrant. Excellent stability with reliable operation.

#### APPLICATIONS

- Outdoor humidity and temperature measurement for building control
- Eliminate costly conduit runs and relocation

#### FEATURES

#### **Breakthrough wireless labor savings**

- 2.4 GHz ZigBee<sup>™</sup> wireless for super fast installation—save hours on conduit and allows for flexible repositioning.
- Solar-powered for long, reliable transmission; works even in cloudy areas

#### Versatile

- 2% or 3% RH versions with field replaceable sensor
- 3-wire 0-10V output

#### **Easy to maintain**

Field replaceable sensor—without disturbing installation

#### **Superior RH sensing**

 On-board temperature compensation for RH. Eliminates temperature coefficient errors and achieves an excellent measurement accuracy as well as high repeatability and offset stability.

#### Quality

 Industry leading 7-year warranty/ 2-year replaceable element warranty



# Solar powered with integral battery

 Trouble-free operation without changing batteries or pulling conduit



#### Field replaceable element

- Ideal for harsh environments
- Accurate dual RH/Temp IC sensing





# ассу WO-Accuracy 2 = 2%

3 = 3%

#### **Replacement Sensor Elements**

HSO-2 = 2% accuracy HSO-3 = 3% accuracy



SPECIFICATIONS

(Write your selected Accuracy and Replacement Sensor Element numbers/ *letters in the boxes above)* 

	Power Supply	Transmitter	Long life battery with integral solar charger
	Power Supply	Receiver	12-30VDC/12VAC <sup>(1)</sup> , 45mA max
		Frequency/Power	2.4GHz unlicensed ISM band, ZigBee™, 60mW
	Padia	Range	300' line-of-sight
	Naulo	FCC id	OUR24XBEE
		Broadcast interval	Daylight, 5-min; Dark, 30-min
	Outputs	RH% and Temperature	3-wire 0-10VDC
	Output scaling	RH%	0-100% RH
	Output scaling	Temperature	-40 to 140° F
	Media filter		Sintered Stainless Steel
		A	2% models, +/-2% over 10 to 90%RH range
		Accuracy	3% models, +/-3% over 20 to 80%RH range
		Resolution	0.05%RH
		Hysteresis	+/-1%RH
		Non-Linearity	factory linearized <1%RH
	Deletive Uveridity	Temperature coefficient	fully compensated by on-board temp sensor
	Relative Humidity	Response time <sup>(2)</sup>	30s
		Output update rate	2s
		Operating range	0 to 100%RH (non-condensing)
		Long term drift	<0.5%RH per year
			-20° C to 60° C @ RH>90%
		Operating conditions (3)	-20° C to 80° C @ RH=50%
		A	2% models, <+/-1° C; 0.5° C typ @ 25° C
		Accuracy (-20° C to 70° C range)	3% models, <+/-2° C; 0.5° C typ @ 25° C
		Resolution	0.01° C
	Temperature	Repeatability	+/-0.1° C
		Response time (2)	30s
		Output update rate	2s

(1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.

Operating range -40° C to 120° C

(2) Time for reaching 63% of reading at 25°C and 1 m/s airflow

(3) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)



# RH = RH Voltage output, 0-10vdc TEMP = Temperature output, 0-10vdc

![](_page_53_Picture_2.jpeg)

# Wall Temperature Sensors CO2/Humidity/Temp

Available with analog outputs or protocol for BACnet RS-485 Integrated set-point relay Optional field replaceable NDIR CO2 and RH elements

ASHRAE)

### DESCRIPTION

The AQW series design allows customization for a sensor that meets project requirements for monitoring temperature, CO2 and relative humidity. The sensor can be ordered as stand alone temperature, CO2/Temp, RH/Temp or all-in-one CO2/RH/Temp with a 0-5/10V analog or BACnet RS485 output. Lower material costs and installation time by combining multiple sensors into a single sensor housing with standard LCD and optional add-on features.

### APPLICATIONS

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Offices, conference rooms, and public assembly areas

#### FEATURES

#### **Customize to meet project requirements**

- Standard LCD and temperature on each device
- Options to add CO2 and/or RH sensing elements
- Field replaceable elements for CO2 and RH
- Available with 0-5/10V Analog or BACnet protocol communication

#### **Protocol Version**

- BACnet RS-485 ready
- Auto-configuration wizard detects baud rate and MAC address
- Adjustable set-point using button menu or optional 10k slider

#### **Analog Version**

- LCD for easy setup of all parameters (concealment cover included)
- Programmable set-points for complete control
- Provision to offset CO2 reading
- Optional thermistors, sliders and override button

#### High performance field replaceable NDIR CO2 element

 Selectable auto-calibration mode returns sensor to baseline values

#### 2% RH field replaceable sensor

- On-board temperature compensation for RH eliminates temp coefficient errors achieving excellent measurement accuracy, high repeatability and offset stability.
- State of the art testing facilities. 8-point NIST traceable certification available—consult factory

#### Quality

 Industry leading 7-year limited warranty/ 2-year RH element, 3-year CO2 element limited warranties

![](_page_53_Picture_33.jpeg)

#### ORDERING INFORMATION

![](_page_53_Figure_35.jpeg)

\*Add-on RTD/Thermistor not readable via BACnet; Temperature output is standard on AQW devices, Add-on RTD/Thermistor is option for Analog.

![](_page_53_Picture_37.jpeg)

(AQW sensor with BACnet RS-485, Temp, CO2, 2% RH, no set-point slide, no user push button, no RTD/thermistor, white color)

![](_page_54_Picture_0.jpeg)

SPECIFICATIONS		
Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
	Temperature	05/10V standard, Scaling 50°F to 95°F (10°C to 35°C); thermistor/RTD values optional
Analog Outputs	CO2 and RH	0-5/10V
Analog Outputs	Update Rate	Continuous
	Programmable Relay	Solid-state output, 1A @ 30VAC/DC, N.O.
	5PE, Set point, Hi (On)	Sets relay turn-on threshold (800ppm default)
	5Ph, Set point, hysteresis (Off)	Sets the relay turn-off hysteresis (100ppm default)
	5EL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)
Analog LCD Menu	RdJ, Adjustment	CO2 Offset adjustment +/-250ppm (0 default)
Parameters (2)	ERL, Auto Calibration Period	Off, 7 days, 14 days, 30 days, 60 days (14 days default)
	<sup>o</sup> FC, Displayed Temp Unit	<sup>o</sup> F degrees fahrenheit (default), <sup>o</sup> E degrees celsius
	LuL Analog Output Scale	5ມ 5.0V full scale, ມີມ 10.0V full scale (default)
	กับก, Run Mode	Displays temp and optional CO2 and RH
	Protocol	BACnet (Isoloated)
	Connection	3-wire RS-485, with isolated ground
Protocol Output	Data Rate	Locally set baud rate up to 115200 (9600, 19200, 28800, 38400, 57600, 76800, 115200)
	Address Range	0-127
		Solid-state output 1A @ 30VAC/DC_N O
Protocol Relay Set-point	Programmable	Source celectable: CO2 BH Temperature
	Tupo	Non disparsive Infrared (NDIP)
	Туре	+40 npm +3%  of reading (400-2000 npm)
(0)	Pango	2000/5000 ppm; Programmable up to 10 000 ppm
02	Doctoonse time	60 seconds to 00% reading
	Sample rate	ou seconds
	Sample Tate	Disting
	Туре	Digital Civios $\frac{20}{1000}$ aver 10 to $\frac{200}{1000}$ H range
	Accuracy	
	Resolution	
	Tomporaturo coefficient	+/-1%RT
Relative Humidity		
	Response time (5)	305
	Sample fale	ote 100% PH (non condensing)
	Operating range/Output Scale	<pre>c0 E0/ DH per veer</pre>
		<0.5% RT PET YEAR
		Silicon Bandgan
	Nominal Accuracy	$\pm 1/0.3^{\circ}$ (operating range)
	Maximal Accuracy	$+/-0.5^{\circ}$ C (at 25° C) $+/-1.0^{\circ}$ C (operating range)
Temperature	Resolution	
(with RH option)	Reneatability	+/-0.1° C
	Response time (3)	30s
	Sample rate	35
	Type	NTC Thermistor
	Nominal Accuracy	$+/-0.5^{\circ}$ C (operating range)
Temperature	Maximal Accuracy	$\pm/-10^{\circ}$ C (at 25° C) $\pm/-20^{\circ}$ C (operating range)
(without RH option)		
	Resolution	1.03 C
		T/-V.2 C
	Sample Kate	22 to 122E (0 to E0C)
Operating Environment	remperature	52 (0 122F (0 10 50C)
	Humidity	
Enclosure	Material	MDJ FIDSUL
(1) One side of transformer, secondary is co	onnected to signal common. Dedicated transfo	rmer is recommended.

(1) One sade of ranksonner, secondary is connected to signal commission bearcated transmission in its recommended.
 (2) Quick Start Menu parameters shown, for additional capabilities see installation manual.
 (3) Time for reaching 63% of reading at 25°C and 1 m/s airflow
 (4) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

BACnet<sup>®</sup> is a registered trademark of ASHRAE.

# Recessed Wall **Temperature Sensor**

Wide range of thermistor options Set-point & override options Low-profile design Decor color options

![](_page_55_Figure_4.jpeg)

### DESCRIPTION

The TR series is designed for use in energy management systems in buildings. The flush mount sensor housing accomodates a wide range of thermistor options for sensing room temperature. Optional setpoint slider and override button can be added for additional control.

# accent

#### APPLICATIONS

 Room temperature measurement for building automation control

### FEATURES

#### The industry's best looking temp sensor

- Fits in any standard j-box or low voltage bracket.
- No exposed screws; unobtrusive tamper resistant design
- Popular colors to match any decor
- Complements CO2 sensor installations

#### **User Friendly**

- Wide range of thermistor options
- Set-point options
- Override options

![](_page_55_Picture_20.jpeg)

Alerton TR-ES002 shown

![](_page_55_Picture_22.jpeg)

Optional Trim Ring for surface mount applications or mis-sized j-boxes

 Material
 ABS Plastic

 Enclosure
 Dimensions
 4.7"h x 2.9"w x 1.24"d (0.48" wall profile) (fits low-voltage bracket)

![](_page_55_Picture_25.jpeg)

![](_page_55_Picture_26.jpeg)

ORDERING therm color ovrd s-p TR -Temperature C = 100Pt (385)D = 1000Pt (385) E = 10k type 2 F= 10k type 3 G = 10k type 3 w/11k shunt H = 3kI = 2k2J = 1k8K = 20k L = 100k Color 1 = White 2 = Ivory3 = Brown 4 = LightAlmond 5 = Almond 6 = Black7 = GrayOverride A = None B = N.O.

#### Set-point

- A = None
- B = 1000 ohm setpoint slider
- C = 10k ohm setpoint slider

(Write your selected Temperature, Color, Override and Set-Point letters/numbers in the boxes above)

![](_page_55_Picture_33.jpeg)

![](_page_55_Picture_34.jpeg)

	SENVA THERMISTOR RESISTANCE-TEMPERATURE TABLES									
	С	D	Ε	F	G	Н	1	J	К	L
	100Pt	1000Pt	10K T2	10K T3	10K T3	3K	2K2	1K8 (100 C)	20K	100K
	385	385	B=3892	B=3694	11K Shunt	B=3892	B=3976	B0/100=4300	B=4262	B=4461
Temp					Resista	nce [0]				
F		ĺ			nesista	1100 [32]				
0	93.0	930	85.41K	70.40K	9513	25.62K	19.21K	327.5K	193.0K	1015K
5	94.1	941	72.96K	61.02K	9320	21.89K	16.41K	276.6K	163.5K	858.0K
10	95.2	952	62.50K	53.28K	9118	18.75K	14.06K	234.3K	139.7K	732.0K
15	96.3	963	53.69K	46.39K	8892	16.11K	12.08K	199.1K	118.8K	620.7K
20	97.4	974	46.24K	40.49K	8650	13.87K	10.41K	169.6K	101.3K	527.6K
25	98.5	985	39.93K	35.41K	8393	11.98K	8989	145.0K	86.73K	450.6K
30	99.6	996	34.57K	31.19K	8132	10.37K	7783	124.2K	74.87K	388.1K
32	100.0	1000	32.66K	29.49K	8012	9799	7352	116.8K	70.14K	362.9K
35	100.7	1007	30.01K	27.39K	7848	9004	6756	106.7K	64.43K	332.8K
40	101.7	1017	26.11K	24.11K	7554	7834	5878	91.87K	55.55K	285.1K
45	102.8	1028	22.77K	21.26K	7249	6832	5127	79.32K	48.07K	245.7K
50	103.9	1039	19.91K	18.79K	6938	5972	4482	68.66K	41.56K	212.3K
55	105.0	1050	17.44K	16.70K	6632	5233	3927	59.57K	36.31K	184.7K
60	106.1	1061	15.31K	14.81K	6312	4595	3448	51.80K	31.56K	160.0K
65	107.1	1071	13.48K	13.16K	5992	4043	3035	45.15K	27.50K	138.8K
70	108.2	1082	11.88K	11.72K	5675	3565	2676	39.44K	24.04K	120.9K
75	109.3	1093	10.50K	10.50K	5371	3150	2365	34.53K	21.17K	106.1K
77	109.7	1097	10.00K	10.00K	5238	3000	2252	32.76K	20.00K	100.0K
80	110.4	1104	9298	9375	5061	2789	2094	30.30K	18.58K	92.72K
85	111.5	1115	8249	8389	4760	2475	1858	26.64K	16.31K	80.95K
90	112.5	1125	7333	7520	4467	2200	1651	23.47K	14.38K	71.05K
95	113.6	1136	6530	6752	4184	1959	1471	20.71K	12.70K	62.47K
100	114.7	1147	5826	6094	3922	1748	1312	18.32K	11.29K	55.29K
105	115.8	1158	5207	5489	3662	1562	1173	16.24K	9993	48.71K
110	116.8	1168	4663	4951	3414	1399	1050	14.41K	8865	42.98K
115	117.9	1179	4182	4473	3180	1254	942	12.82K	7888	38.05K
120	119.0	1190	3757	4062	2966	1127	846	11.42K	7058	33.90K
125	120.0	1200	3381	3680	2758	1014	761	10.20K	6301	30.11K
130	121.1	1211	3047	3338	2561	914	686	9116	5623	26.71K
135	122.2	1222	2751	3033	2378	825	620	8164	5036	23.80K
140	123.2	1232	2487	2760	2206	746	560	7324	4518	21.24K
145	124.3	1243	2252	2522	2052	676	507	6581	4076	19.06K
150	125.4	1254	2043	2301	1903	613	460	5922	3664	17.04K

SENVA

![](_page_57_Picture_0.jpeg)

![](_page_57_Picture_1.jpeg)

![](_page_57_Picture_2.jpeg)

![](_page_57_Picture_3.jpeg)

The "Triple Threat Combo": CO2, RH, and temp in a compact unit with optional BACnet in the **AQW Series.** 

BACnet<sup>®</sup> is a registered trademark of ASHRAE.

# The new IAQ standard

# CO2, Humidity, and Temperature in a single compact unit

Senva has packed a high accuracy NDIR, integrated humidity IC, and a full complement of temperature sensing into a stylish housing. Now you can offer a total indoor air quality solution in one easy to install unit.

![](_page_57_Picture_9.jpeg)

Recessed wall mount for great looks and tamper resistance in schools

# Introducing the worlds only slimline CO2

This flush mount design fits in any singlegang box and sets the new standard for attractive and functional CO2 sensing. It's recessed to complement the most demanding architectural standards; it also deters tampering. Available in most popular wall plate colors, the CO2RL is proof that beauty is more than skin deep.

# Intuitive installation

Thanks to an Integrated display with pushbutton menu, it's easy to select your scale to 2000 or 5000 ppm. You can select automatic daily calibration or manual calibration to a known source. There's even a provision to offset the reading. For compatibility, 4-20mA and jumper selectable 0-5V or 0-10V outputs are provided.

![](_page_58_Picture_0.jpeg)

# INDOOR AND OUTDOOR AIR QUALITY

![](_page_58_Picture_2.jpeg)

# **AIR QUALITY**

CO2, Humidity, Temp (AQW) Series	60
Duct CO2, RH, Temp (CHTDL) Series	62
Outside Air CO2, RH, T (CHTOL) Series	64
Recessed Wall CO2 (CO2RL) Series	66
Recessed Wall Value CO2 (CO2-VAL)	68
Duct Mount CO2 (CO2D) Series	70
Duct Mount Value CO2 (CO2D-VAL)	72
Outside Air CO2 (CO2O) Series	74
CO & NO2 Toxic Gas (TG) Series	76

![](_page_58_Picture_5.jpeg)

# CO2, Humidity, and Temperature all-in-one duct mounted unit!

Our duct mounted **CHTDL** monitors CO2, RH and temperature in one combination unit. Mount all three sensing points in one enclosure accompanied with a standard LCD and field replaceable CO2 element.

![](_page_58_Picture_8.jpeg)

LCD with menu for easy set-up and parameter sections

![](_page_58_Picture_10.jpeg)

Field replaceable CO2 NDIR element

### **High reliability CO2**

Our non-dispersive infrared sensing element (NDIR) offers high performance—accurate to  $\pm 40$  ppm,  $\pm 3\%$  of reading to be exact. And while you'll probably never have to change it out, it is field replaceable in case you are in a caustic environment or if the IR source should falter. And thanks to our auto calibration mode, the sensor will adapt to the environment, ensuring effects of long term drift are negligible. Our sensing element has a life expectancy of 15+ years.

![](_page_59_Picture_1.jpeg)

111111

# Wall Combo Sensors CO2/Humidity/Temp

Available with analog outputs or protocol for BACnet RS-485 Integrated set-point relay Optional field replaceable NDIR CO2 and RH elements

#### DESCRIPTION

The AQW series design allows customization for a sensor that meets project requirements for monitoring temperature, CO2 and relative humidity. The sensor can be ordered as stand alone temperature, CO2/Temp, RH/Temp or all-in-one CO2/RH/Temp with a 0-5/10V analog or BACnet RS485 output. Lower material costs and installation time by combining multiple sensors into a single sensor housing with standard LCD and optional add-on features.

#### **APPLICATIONS**

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Offices, conference rooms, and public assembly areas

#### FEATURES

#### **Customize to meet project requirements**

- Standard LCD and temperature on each device
- Options to add CO2 and/or RH sensing elements
- Field replaceable elements for CO2 and RH
- Available with 0-5/10V Analog or BACnet protocol communication

#### **Protocol Version**

- BACnet RS-485 ready
- Auto-configuration wizard detects baud rate and MAC address
- Adjustable set-point using button menu or optional 10k slider

#### **Analog Version**

- LCD for easy setup of all parameters (concealment cover included)
- Programmable set-points for complete control
- Provision to offset CO2 reading
- Optional thermistors, sliders and override button

#### High performance field replaceable NDIR CO2 element

 Selectable auto-calibration mode returns sensor to baseline values

#### 2% RH field replaceable sensor

- On-board temperature compensation for RH eliminates temp coefficient errors achieving excellent measurement accuracy, high repeatability and offset stability.
- State of the art testing facilities. 8-point NIST traceable certification available—consult factory

#### Quality

 Industry leading 7-year limited warranty/ 2-year RH element, 3-year CO2 element limited warranties

![](_page_59_Picture_32.jpeg)

BACnet

ASHRAE)

#### **ORDERING INFORMATION**

![](_page_59_Picture_34.jpeg)

\*Add-on RTD/Thermistor not readable via BACnet; Temperature output is standard on AQW devices, Add-on RTD/Thermistor is option for Analog.

<u>Example</u>	Output	CO2	RH	SLD	BTN	RTD/TH	Color
AQW -	В	В	В	Α	Α	Α	1

(AQW sensor with BACnet RS-485, Temp, CO2, 2% RH, no set-point slide, no user push button, no RTD/thermistor, white color)

![](_page_60_Picture_0.jpeg)

SPECIFICATIONS		
Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
	Temperature	05/10V standard, Scaling 50°F to 95°F (10°C to 35°C); thermistor/RTD values optional
Analog Outputs	CO2 and RH	0-5/10V
	Update Rate	Continuous
	Programmable Relay	Solid-state output, 1A @ 30VAC/DC, N.O.
	5PE, Set point, Hi (On)	Sets relay turn-on threshold (800ppm default)
	5Ph, Set point, hysteresis (Off)	Sets the relay turn-off hysteresis (100ppm default)
	SEL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)
Analog LCD Menu	RdJ, Adjustment	CO2 Offset adjustment +/-250ppm (0 default)
Parameters (2)	ERL, Auto Calibration Period	Off, 7 days, 14 days, 30 days, 60 days (14 days default)
	PFC, Displayed Temp Unit	PF degrees fahrenheit (default), PC degrees celsius
	LuL Analog Output Scale	5ມ 5.0V full scale, Iມມ 10.0V full scale (default)
	ቦሀበ, Run Mode	Displays temp and optional CO2 and RH
	Protocol	BACnet (Isoloated)
Durate and Quaternat	Connection	3-wire RS-485, with isolated ground
Protocol Output	Data Rate	Locally set baud rate up to 115200 (9600, 19200, 28800, 38400, 57600, 76800, 115200)
	Address Range	0-127
Protocol Dolay Cat raint	Due sue see - l- l-	Solid-state output, 1A @ 30VAC/DC, N.O.
Protocol Relay Set-point	Programmable	Source selectable: CO2, RH, Temperature
	Туре	Non-dispersive Infrared (NDIR)
	Accuracy	±40ppm, ±3% of reading (400-2000ppm)
CO2	Range	0-2000/5000ppm; Programmable up to 10,000ppm
	Response time	60 seconds to 90% reading
	Sample rate	3 seconds
	Type	Digital CMOS
	Accuracy	2% models, +/-2% over 10 to 90%RH range
	Resolution	0.05%RH
	Hysteresis	+/-1%BH
	Temperature coefficient	Compensated on-board
Relative Humidity	Response time <sup>(3)</sup>	30s
	Sample rate	35
	Operating range/Output Scale	0 to 100%BH (non-condensing)
	Long term drift	<0.5%RH per vear
	Operating conditions (4)	-20° C to 60° C @ RH>90%; -20° C to 80° C @ RH=50%
	Туре	Silicon Bandgap
	Nominal Accuracy	+/-0.3° C (operating range)
	Maximal Accuracy	+/-0.5° C (at 25° C), +/-1.0° C (operating range)
Temperature	Resolution	0.01° C
(with RH option)	Repeatability	+/-0.1° C
	Response time <sup>(3)</sup>	30s
	Sample rate	3s
	Туре	NTC Thermistor
	Nominal Accuracy	+/-0.5° C (operating range)
Temperature	Maximal Accuracy	+/-1.0° C (at 25° C), +/-2.0° C (operating range)
(without KH option)	Resolution	0.05° C
	Reneatability	+/-0.2° C
	Sample Rate	100 milliseconds
	Temperature	32 to 122F (0 to 50C)
Operating Environment	Humidity	0-95% non-condensing
	Material	ABS Plastic
Enclosure	Dimensions	4 85"h x 3 25"w x 1 19"d
(1) One side of transformer, secondary is c	connected to signal common. Dedicated transfo	rmer is recommended.

(1) One sade of ranksonner, secondary is connected to signal commission bearcated transmission in its recommended.
 (2) Quick Start Menu parameters shown, for additional capabilities see installation manual.
 (3) Time for reaching 63% of reading at 25°C and 1 m/s airflow
 (4) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

BACnet<sup>®</sup> is a registered trademark of ASHRAE.

# Duct CO2/Humidity/Temp

LCD display with field calibration menu 2000/5000 ppm CO2; 2% RH Integrated set-point relay Field replaceable NDIR CO2 element

![](_page_61_Picture_4.jpeg)

#### DESCRIPTION

Senva CO2 sensors maximize energy savings by ensuring optimal ventilation. Measuring exhaled CO2 levels ensures air is conditioned only when needed. This unit combines CO2, humidity, and temperature sensing all in one compact device, reducing sensors required, installation labor and provides a cleaner IAQ solution.

#### APPLICATIONS

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Offices, conference rooms, and public assembly areas

### FEATURES

#### CO2, humidity, and temperature all in one device...fewer units to buy and install

- LCD display for easy set up of all parameters
- Options for complete control including set-point
- 0-10V outputs standard. Thermistors optional

#### High performance NDIR CO2 with set-point relay

- Non-dispersive infrared sensing element (NDIR)
- Selectable auto-calibration mode returns sensor to baseline values
- Field replaceable CO2 sensor
- 2000 or 5000 ppm scale

#### 2% RH sensor

 On-board temperature compensation for RH eliminates temp coefficient errors achieving excellent measurement accuracy, high repeatability and offset stability.

#### Quality

 Industry leading 7-year limited warranty/ 2-year RH element, 3-year CO2 element limited warranties

![](_page_61_Picture_25.jpeg)

#### **Display and menu**

 Easy set point and calibration adjustments. Set offsets for CO2

![](_page_61_Picture_28.jpeg)

#### Field replaceable element

- Display and menu
- Easy set point and calibration

![](_page_61_Picture_32.jpeg)

![](_page_62_Picture_0.jpeg)

# CHTDL -CO2/Temp/RH (2%) Thermistor Addition\*

Blank = None C = 100Pt (385) D = 1000Pt (385) E = 10k type 2 F = 10k type 3 G = 10k w/11k shunt H = 3k I = 2k2 J = 1k8 K = 20k' I = 100K

\*Addition of Thermistor requires the removal of the setpoint relay on the circuit board of the CHTDL.

To order replacement sensor elements, please consult factory

#### SPECIFICATIONS

Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
Outputs	CO2, RH, and Temperature Transmitters	3 wire 0-5/0-10V <sup>(2)</sup> (jumper selectable)
	Туре	Non-dispersive Infrared (NDIR)
	Accuracy	±40ppm ±3% of reading
602	Response time	60 seconds to 90% reading
02	Output update rate	3 seconds
	Output scaling	0-2000 ppm (default), 0-5000 ppm (option)
	Programmable set point	Solid-state output, 1A @ 30VAC/DC, N.O.
	Туре	Dual RH Temp integrated circuit
	Accuracy	+/-2% over 10 to 90%RH range
	Resolution	0.05%RH
	Hysteresis	+/-1%RH
	Non-Linearity	factory linearized <1%RH
Relative Humidity	Temperature coefficient	fully compensated on-board
	Response time (3)	30s
	Output update rate	2s
	Operating range	0 to 100%RH (non-condensing)
	Long term drift	<0.5%RH per year
	Operating conditions (4)	-20° C to 60° C @ RH>90% -20° C to 80° C @ RH=50%
	Scaling	32 to 122° F (0-50° C)
	Accuracy (-20 to 70° C range)	<+/-1° C; 0.5° C typ @ 25° C 3% models, <+/-2° C; 0.5° C typ @ 25° C
Temperature	Resolution	0.01° C
thermistors optional)	Repeatability	+/-0.1° C
	Response time (3)	30s
	Output update rate	2s
	Operating range	-40° C to 120° C (sensor only)
	5PH, Setpoint, Hi (On) point	500ppm to full-scale (700ppm default)
	5PL_ Setpoint, Lo (Off) point	400ppm to full-scale-50 (600ppm defau
LCD Menu Setup Parameters	5EL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)
	RdJ, Adjustment	Offset adjustment +/-250ppm (0 default
	ERL, Calibration mode	Automatic mode ON or OFF (default=Of
	רטח_ Run mode	Displays CO2 in ppm
Operating Environment	Temperature	32 to 122F (0 to 50C)
operating environment	Humidity	0-95% non-condensing
Fnclosure	Material	ABS/Polycarbonate
Enclosure	Dimensions	4.0' h x 4.4"w x 2.1"d (+6.8" probe)

(1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.

(2) 15-30 VDC/24VAC power supply voltage required for 10V output

(3) Time for reaching 63% of reading at 25° C and 1 m/s airflow

(4) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

# SENVA

# Outside Air Combo CO2/Humidity/Temp

LCD display with field calibration menu 2000/5000 ppm CO2; 2% RH Integrated set-point relay Field replaceable NDIR CO2 element

![](_page_63_Picture_5.jpeg)

#### DESCRIPTION

The CHTOL Series is designed to be mounted on the building exterior to provide outside CO2, relative humidity and temperature measurement all from one outdoor rated enclosure. The standard LCD, gasketed lid and field replaceable CO2 element make initial installation and future service a breeze. The CHTOL can also be customized with optional RTDs or thermistors for further added flexibility when ordering.

#### **APPLICATIONS**

- Outdoor CO2, humidity and temperature measurement for building control
- Economizer control
- Facilitates compliance with ASHRAE 62.1 standard for air quality

### FEATURES

# CO2, humidity, and temperature all in one device...fewer units to buy and install

- LCD display for easy set up of all parameters
- Options for complete control including set-point
- 0-5/10V outputs standard. Thermistors optional
- High performance NDIR CO2 with set-point relay
- Non-dispersive infrared sensing element (NDIR)
- Selectable auto-calibration mode returns sensor to baseline values
- Field replaceable CO2 sensor
- 2000 or 5000 ppm scale

#### 2% RH sensor

 On-board temperature compensation for RH eliminates temp coefficient errors achieving excellent measurement accuracy, high repeatability and offset stability.

#### Quality

- Outdoor rated enclosure includes gasketed lid and solar shield with sintered filter for RH element.
- Industry leading 7-year limited warranty: 2-year RH element, 3-year CO2 element limited warranties

![](_page_63_Picture_27.jpeg)

![](_page_63_Picture_28.jpeg)

#### **Display and menu**

 Easy set point and calibration adjustments. Set offsets for CO2

![](_page_63_Picture_31.jpeg)

#### Field replaceable element

- Display and menu
- Easy set point and calibration

![](_page_64_Picture_0.jpeg)

CHTOL -
CO2/Temp/RH (2%)
Thermistor Addition*

Blank = None C = 100Pt (385) D = 1000Pt (385) E = 10k type 2 F = 10k type 3 G = 10k w/11k shunt H = 3kI = 2k2J = 1k8K = 20k'I = 100K

\*Addition of Thermistor requires the removal of the setpoint relay on the circuit board of the CHTOL.

To order replacement sensor elements, please consult factory

DECI	FIC		ONC	
S P F C I		- I I I I		

- 1	Power Supply		12-30VDC/24VAC <sup>(1)</sup> 100mA max
	Outputs	Voltage Only	3-wire 0-5/0-10V <sup>(2)</sup> (iumper selectable)
	Digital Setpoint Output	Programmable	Solid-state, 1A@30VAC/DC, N.O.
		CO2	0-2000ppm (default), 0-5000ppm (configurable)
	Output Scaling	RH	0-100%
		Temperature	32-122°F (0-50°C)
	RTD/Thermistor	Optional	See ordering table (replaces relay output)
		Туре	Non-dispersive Infrared (NDIR)
	602	Accuracy	±40ppm ±3% of reading
	02	Response time	2 minutes to 90% reading
		Output update rate	3 seconds
		Туре	Capacitive CMOS
		Accuracy	+/-2% over 10 to 90%RH range
		Resolution	0.05%RH
		Hysteresis	+/-1%RH
		Non-Linearity	factory linearized <1%RH
	Relative Humidity	Temperature coefficient	fully compensated on-board
		Response time <sup>(3)</sup>	30s
		Output update rate	2s
		Operating range	0 to 100%RH (non-condensing)
		Long term drift	<0.5%RH per year
		Operating conditions <sup>(4)</sup>	-20° C to 60° C @ RH>90% -20° C to 80° C @ RH=50%
		Accuracy (-20 to 70° C range)	<+/-1° C; 0.5° C typ @ 25° C
		Resolution	0.01° C
	Temperature (transmitter)	Repeatability	+/-0.1° C
	temperature (transmitter)	Response time <sup>(3)</sup>	30s
		Output update rate	2s
		Operating range	-40° C to 120° C (sensor only)
		5PH, Setpoint, Hi (On) point	500 to 1999ppm (800ppm default)
		5PL_ Setpoint, Lo (Off) point	400 to 1999ppm (700ppm default)
		5EL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)
	Parameters	RdJ, Adjustment	Offset adjustment +/-250ppm (0 default)
		ERL, Calibration mode	Automatic mode ON/RESET/OFF (default=ON)
		FoC, Temperature units	$F = \circ F$ (default), $L = \circ C$
		רטח_ Run mode	Displays CO2, RH, Temp readings
	Operating Environment	Temperature	32 to 122°F (0 to 50°C)
		Humidity	0-95% non-condensing
	Enclosure	Material	ABS/Polycarbonate
	LICIUSUIC	Dimensions	4.0" h x 4.4"w x 2.1"d (+2.8" solar shield)

(1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.
(2) 15-30 VDC/24VAC power supply voltage required for 10V output
(3) Time for reaching 63% of reading at 25° C and 1 m/s airflow
(4) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

# SENVA

# Recessed Wall

LCD display with field calibration menu 2000/5000 ppm CO2 Integrated set-point relay Field replaceable NDIR element

![](_page_65_Figure_5.jpeg)

#### DESCRIPTION

Senva CO2 sensors maximize energy savings by ensuring optimal ventilation. Measuring exhaled CO2 levels ensures air is conditioned only when needed. The CO2RL is a flush mount design sensor with NDIR sensing element and features that include a standard LCD, setpoint relay, menu selectable auto-calibration and provision to offset the reading +/-250ppm.

#### APPLICATIONS

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE 62.1 standard for air quality

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 Offices, conference rooms, and public assembly areas

### FEATURES

# The industry's best looking CO2 sensor meets demanding architectural standards.

- Fits in most standard j-box or low voltage brackets.
- No exposed screws; unobtrusive tamper resistant design
- Popular colors to match any decor

#### Easy to install and maintain

- Integrated display and push-button menus for field selectable scale, calibration, and operational modes
- Dual 4-20mA and 0-5V/0-10V output (jumper selectable)
- Integrated high-reliability solid-state set-point relay is ideal for direct control applications; easy to set up thanks to LCD

#### High reliability reduces call backs

- Non-dispersive infrared sensing element (NDIR)
- Field replaceable CO2 sensor
- 15+ year life expectancy on CO2 sensing element
- Industry leading 7-year limited warranty on electronics; NDIR module 3 years

### High accuracy for improved system performance

- Selectable auto-calibration mode returns sensor to baseline values
- ±40ppm, ±3% of reading

![](_page_65_Picture_29.jpeg)

#### **Display and menu**

 Easy set point and calibration adjustments

![](_page_65_Picture_32.jpeg)

#### Field replaceable element

 Replaceable CO2 element for easy service

![](_page_65_Picture_35.jpeg)

![](_page_66_Picture_0.jpeg)

![](_page_66_Figure_2.jpeg)

SPECIFICATIONS

Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
Analog Outputs	Dual Analog	3-wire 4-20mA and 0-5V/0-10V <sup>(2)</sup> (jumper)
5	Output scaling	0 - 2000 or 0 - 5000 ppm (selectable)
Digital Setpoint Output	Programmable	Solid-state, 1A @ 30VAC/DC, N.O.
	Туре	Non-dispersive Infrared (NDIR)
Company David	Accuracy	±40ppm, ±3% of reading
Sensor Performance	Response time	60 seconds to 90% reading
	Output update rate	3 seconds
	5PH, Setpoint, Hi (On point)	500ppm to full-scale (700ppm default)
	5PL, Setpoint, Lo (Off point)	400ppm to full-scale-50 (600ppm default)
LCD Menu Setup Parameter	s 5EL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)
	리네_ Adjustment	Offset adjustment +/-250ppm (0 default)
	ERL, Calibration mode	Automatic mode ON or OFF (default=ON)
	ቦሀበ, Run mode	Displays CO2 in ppm
Outputies Facility and	Temperature	32 to 122F (0 to 50C)
Operating Environment	Humidity	0-95% non-condensing
En ale avuna	Material	ABS Plastic
Enclosure	Dimensions (fits low-voltage bracket)	4.7"h x 2.9"w x 1.24"d (0.48" wall profile)

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended.(2) 15-30VDC/24VAC power supply voltage required for 10 volt output.

Optional Trim Ring for surface mount applications or mis-sized j-boxes

DIMENSIONS

![](_page_66_Figure_8.jpeg)

please consult factory

![](_page_66_Picture_9.jpeg)

![](_page_66_Picture_10.jpeg)

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![](_page_66_Figure_11.jpeg)

![](_page_66_Figure_12.jpeg)

![](_page_67_Picture_2.jpeg)

# Recessed Wall Bid Spec CO2 Sensor

2000 ppm CO2 Field replaceable NDIR element Dual 3-wire 4-20mA and 0-5V/0-10V (selectable)

![](_page_67_Picture_5.jpeg)

#### DESCRIPTION

Senva CO2 sensors maximize energy savings by ensuring optimal ventilation. Measuring exhaled CO2 levels ensures air is conditioned only when needed. The CO2-VAL is a flush mount design sensor with NDIR sensing element and auto-calibration mode.

#### APPLICATIONS

- Indoor CO2 measurement
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Offices, conference rooms, and public assembly areas

#### **FEATURES**

# The industry's best looking CO2 sensor meets demanding architectural standards.

- Fits in any standard j-box or low voltage bracket.
- No exposed screws; unobtrusive tamper resistant design
- Popular colors to match any decor

#### High reliability reduces call backs

- Non-dispersive infrared sensing element (NDIR)
- Field replaceable CO2 sensor
- 15+ year life expectancy on CO2 sensing element
- Industry leading 7-year limited warranty on electronics; NDIR module 3 years

#### High accuracy for improved system performance

- Auto-calibration mode returns sensor to baseline values
- ±40ppm, ±3% of reading

![](_page_67_Picture_25.jpeg)

Optional Trim Ring for surface mount applications or mis-sized j-boxes

![](_page_67_Picture_27.jpeg)

### Field replaceable element

 Replaceable CO2 element for easy service

![](_page_67_Picture_30.jpeg)

![](_page_68_Picture_0.jpeg)

#### CO2-VAL Economy CO2

To order replacement sensor elements, please consult factory

### SPECIFICATIONS

Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
Analog Outputs	Dual Analog	3-wire 4-20mA and 0-5V/0-10V $^{\scriptscriptstyle(2)}$ (jumper)
	Output scaling	0 - 2000 ppm
Sensor Performance	Туре	Non-dispersive Infrared (NDIR)
	Accuracy	$\pm$ 40ppm, $\pm$ 3% of reading
	Response time	60 seconds to 90% reading
	Output update rate	3 seconds
Operating Environment	Temperature	32 to 122F (0 to 50C)
	Humidity	0-95% non-condensing
Enclosure	Material Dimensions (fits low-voltage bracket)	ABS Plastic
		4.7″h x 2.9″w x 1.24″d (0.48″ wall profile)

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended. (2) 15-30VDC/24VAC power supply voltage required for 10 volt output.

### DIMENSIONS

![](_page_68_Figure_8.jpeg)

![](_page_68_Figure_9.jpeg)

![](_page_68_Figure_10.jpeg)

![](_page_68_Figure_11.jpeg)

![](_page_69_Picture_2.jpeg)

# Duct CO2 Sensor

LCD display with field calibration menu 2000/5000 ppm CO2 Integrated set-point relay Field replaceable NDIR element

![](_page_69_Picture_5.jpeg)

#### DESCRIPTION

Senva CO2 sensors maximize energy savings by ensuring optimal ventilation. Measuring exhaled CO2 levels ensures air is conditioned only when needed. The CO2D series is duct mount sensor with NDIR sensing element and features that include a standard LCD, optional thermistor for temperature, setpoint relay, menu selectable auto-calibration and provision to offset the reading +/-250ppm.

#### APPLICATIONS

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Offices, conference rooms, and public assembly areas

### FEATURES

#### Easy to install and maintain

- Integrated display and push-button menus for field selectable scale, calibration, and operational modes
- Dual 4-20mA and 0-5V/0-10V output (jumper selectable)
- Integrated high-reliability solid-state set-point relay is ideal for direct control applications; easy to set up thanks to LCD

#### High reliability reduces call backs

- Non-dispersive infrared sensing element (NDIR)
- Field replaceable CO2 sensor
- 15+ year life expectancy on CO2 sensing element
- Industry leading 7-year limited warranty on electronics; NDIR module 3 years

#### High accuracy for improved system performance

- Selectable auto-calibration mode returns sensor to baseline values
- ±40ppm, ±3% of reading

![](_page_69_Picture_25.jpeg)

#### **Display and menu**

 Easy set point and calibration adjustments. Set offsets for CO2

![](_page_69_Picture_28.jpeg)

#### Field replaceable element

 Replaceable NDIR CO2 element for easy service

![](_page_69_Picture_31.jpeg)

![](_page_70_Figure_0.jpeg)

![](_page_70_Figure_1.jpeg)

To order replacement sensor elements, please consult factory

### SPECIFICATIONS

Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
Analog Outputs	Dual Analog	3-wire 4-20mA and 0-5V/0-10V $^{\scriptscriptstyle(2)}$ (jumper)
	Output scaling	0 - 2000 or 0 - 5000 ppm (selectable)
Digital Setpoint Output	Programmable	Solid-state, 1A @ 30VAC/DC, N.O.
Sensor Performance	Туре	Non-dispersive Infrared (NDIR)
	Accuracy	±40ppm, ±3% of reading
	Response time	60 seconds to 90% reading
	Output update rate	3 seconds
LCD Menu Setup Parameters	5PH, Setpoint, Hi (On point)	500ppm to full-scale (700ppm default)
	5PL, Setpoint, Lo (Off point)	400ppm to full-scale-50 (600ppm default)
	5EL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)
	RdJ_ Adjustment	Offset adjustment +/-250ppm (0 default)
	ERL_ Calibration mode	Automatic mode ON or OFF (default=ON)
	רטח_ Run mode	Displays CO2 in ppm
Operating Environment	Temperature	32 to 122F (0 to 50C)
	Humidity	0-95% non-condensing
Enclosure	Material	ABS/Polycarbonate
	Dimensions	4.0' h x 4.4"w x 2.1"d (+6.8" probe)

(1) One side of transformer secondary is connected to signal common.

Dedicated transformer is recommended.

(2) 15-30VDC/24VAC power supply voltage required for 10 volt output.

![](_page_71_Picture_2.jpeg)

# Duct Bid Spec CO2 Sensor

2000 ppm CO2 Field replaceable NDIR element Dual 3-wire 4-20mA and 0-5/0-10V (selectable)

![](_page_71_Picture_5.jpeg)

#### DESCRIPTION

Senva CO2 sensors maximize energy savings by ensuring optimal ventilation. Measuring exhaled CO2 levels ensures air is conditioned only when needed. The CO2D-VAL series is a duct mount sensor with a field replaceable NDIR sensing element and features that include auto-calibration and optional thermistor for temperature readings.

#### **APPLICATIONS**

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Offices, conference rooms, and public assembly areas

### FEATURES

#### Easy to install and maintain

- Dual 4-20mA and 0-5/0-10V output (jumper selectable)
- Field replaceable CO2 sensor

#### High reliability reduces call backs

- Non-dispersive infrared sensing element (NDIR)
- 15+ year life expectancy on CO2 sensing element
- Industry leading 7-year limited warranty on electronics; NDIR module 3 years

#### High accuracy for improved system performance

- Auto-calibration mode returns sensor to baseline values
- ±40ppm, ±3% of reading

![](_page_71_Picture_23.jpeg)

#### Field replaceable element

 Replaceable NDIR CO2 element for easy service

![](_page_71_Picture_26.jpeg)


5enva

# SPECIFICATIONS

Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.
Analog Outputs	Dual Analog	3-wire 4-20mA and 0-5V/0-10V $^{\scriptscriptstyle(2)}$ (jumper)
Analog Outputs	Output scaling	0 - 2000 ppm
	Туре	Non-dispersive Infrared (NDIR)
Concor Dorformanco	Accuracy	±40ppm, ±3% of reading
Sensor Performance	<b>Response time</b>	60 seconds to 90% reading
	Output update rate	3 seconds
Operating Environment	Temperature	32 to 122F (0 to 50C)
Operating Environment	Humidity	0-95% non-condensing
Enclosure	Material	ABS Plastic
Enclosure	Dimensions	4.0' h x 4.4"w x 2.1"d (+6.8" probe)

(1) One side of transformer secondary is connected to signal common.

Dedicated transformer is recommended.

(2) 15-30VDC/24VAC power supply voltage required for 10 volt output.



# Outside Air CO2 Sensor

LCD display with field calibration menu 2000/5000 ppm CO2 Integrated set-point relay Field replaceable element Internal heater for increased operating range



# DESCRIPTION

Senva CO2 sensors maximize energy savings by ensuring optimal ventilation. Measuring exterior CO2 levels ensures optimized economizer control. The CO2O series is an outside air sensor with NDIR sensing element and features that include a built-in heater, standard LCD, setpoint relay, menu selectable auto-calibration and provision to offset the reading +/-250ppm.

### **APPLICATIONS**

- Controlling ventilation in response to occupancy
- Economizer control
- Facilitates compliance with ASHRAE 62.1 standard for air quality

# FEATURES

# Easy to install and maintain

- Integrated display and push-button menus for field selectable scale, calibration, and operational modes
- Dual 4-20mA and 0-5V/0-10V output (jumper selectable)
- Integrated high-reliability solid-state set-point relay is ideal for direct control applications; easy to set up thanks to LCD

### High reliability reduces call backs

- Non-dispersive infrared sensing element (NDIR)
- Field replaceable CO2 sensor
- 15+ year life expectancy on CO2 sensing element
- Industry leading 7-year limited warranty on electronics; NDIR module 3 years

### High accuracy for improved system performance

- Internal heater for reliable outdoor operation
- Selectable auto-calibration mode returns sensor to baseline values
- ±40ppm, ±3% of reading





### **Display and menu**

 Easy set point and calibration adjustments. Set offsets for CO2



### **Field replaceable element**

 Replaceable NDIR CO2 element for easy service



# ORDERING

### CO2O-A CO2 Outside Air

To order replacement sensor elements, please consult factory

# SPECIFICATIONS

Power Supply		12-30VDC/24VAC <sup>(1)</sup> , 100mA max.				
Applag Outputs	Dual Analog	3-wire 4-20mA and 0-5V/0-10V $^{\scriptscriptstyle (2)}$ (jumper				
Analog Outputs	Output scaling	0 - 2000 or 0 - 5000 ppm (selectable)				
Digital Setpoint Output	Programmable	Solid-state, 1A @ 30VAC/DC, N.O.				
	Туре	Non-dispersive Infrared (NDIR)				
Sonsor Dorformon co	Accuracy	±40ppm, ±3% of reading				
Sensor Performance	Response time	2 minutes to 90% reading				
	Output update rate	3 seconds				
	5PH_ Setpoint, Hi (On point)	500ppm to full-scale (700ppm default)				
	5PL, Setpoint, Lo (Off point)	400ppm to full-scale-50 (600ppm default)				
LCD Menu Setup Parameters	5EL, Scaling	0-2000ppm or 0-5000ppm (2000ppm default)				
	RdJ_ Adjustment	Offset adjustment +/-250ppm (0 default)				
	ERL, Calibration mode	Automatic mode ON or OFF (default=ON)				
	רשה, Run mode	Displays CO2 in ppm				
Operating Environment	Temperature	0 to 122F (-18 to 50C)				
Operating Environment	Humidity	0-95% non-condensing				
Enclosure	Material	ABS Plastic				
	Dimensions	4.0' h x 4.4"w x 2.1"d				

(1) One side of transformer secondary is connected to signal common.

Dedicated transformer is recommended.

(2) 15-30VDC/24VAC power supply voltage required for 10 volt output.

# Wall & Duct CO & NO2 Sensor/Controller

Analog and BACnet/Modbus protocol options Field replaceable sensing elements Standard LCD with intuitive set up menu Integrated LED indicators and audible alarm

# 

# DESCRIPTION

Senva TG Series sensors can be ordered as individual CO or NO2 sensors or as a combination CO/NO2 sensor in a shared enclosure.

The analog output model features 2 outputs that support daisy chain wiring - multiple sensors may be used in a parallel sequence (0-10V) for cost effective coverage of large areas. The unit can also act as a stand alone controller, utilizing the relay for exhaust fan operation or the output for direct control of a VFD.

The BACnet/Modbus model supports BACnet MS/TP & Modbus network communication in one unit. Standard features include network auto-configuration, a programmable fan relay, LED indicators, integrated display and audible alarm.

# APPLICATIONS

- Ensure adequate air flow in occupied spaces
- Monitor multiple toxic gases with one mounted unit
- Alert occupants of elevated gas levels
- Directly control exhaust fans



# FEATURES

### Cost-effective dual gas sensing and control

- Integrated display, LED indicators, audible alarm
- Order as individual CO or NO2 sensor, or specify both sensing elements in one enclosure

### Flexibility of analog output model

- Menu selectable 0-5/10V, 1-5V and 4-20mA outputs (0-10V default)
- Dual outputs support daisy chain wiring to cost-effectively sense and control large areas

### Versatility with BACnet/Modbus model

- Supports BACnet MS/TP and Modbus RTU networks
- Auto-configuration detects network baud rate, serial format, protocol type and self-addresses

### High reliability reduces call backs

- Temperature compensated elements for maximum accuracy
- UL2034 recognized electrochemical CO sensing element
- 5 year life expectancy on CO and NO2 elements
- Warning indicators alert occupants when element's lifecycle is near end for replacement
- 7-year limited warranty on electronics; 2-year on elements

# **Easy to install**

- Test mode speeds up field commissioning for verifying warning indicators and relay functions
- Push buttons and LCD to navigate setting parameters





# ORDERING Encl Out Gas Lid TG \_ Enclosure W = WallH = Hose Barbs **Output Type** A = AnalogB = BACnet/Modbus **Gas Type** C = Carbon Monoxide (CO) N = Nitrogen Dioxide (NO2) CN = CO/NO2 Combination **Enclosure Lid** Blank = Clear/Tinted -S = Solid/Opaque

#### **Replacement Elements**

warr

TGS-CO = Carbon Monoxide TGS-NO2 = Nitrogen Dioxide

	SPECIFICATIONS							
	Power Supply		15-30VDC/24VAC <sup>(1)</sup> , 4W max, 120mA max.					
1		2 programmable outputs	0-10V (default), 0-5V, 1-5V and 4-20mA (menu selectable)					
	Apples Outputs	CO output scaling	0-200ppm (default), ranges below 200ppm (menu selectable)					
Γ	Analog Outputs	NO2 output scaling	0-10ppm (default), ranges below 10ppm (menu selectable)					
		Temperature output scaling	-20 to 85°C					
	BACnet/Modbus	Baud Rates	9600, 19200, 38400, 57600, 76800, 115200					
		Fan relay characteristics	N.C. 10A@125VAC, 5A@30VDC					
	Fan Relay	CO fan relay setpoint	25ppm (default), 0-200 ppm (menu selectable)					
		NO2 fan relay setpoint	1ppm (default), 0-10ppm (menu selectable)					
		Alarm relay characteristics	N.C. 0.5A@125VAC, 1A@30VDC					
	Alarm Relay (Analog model only)	CO alarm relay setpoint	100ppm (default), 0-200ppm (menu selectable)					
	(	NO2 alarm relay setpoint	3ppm (default), 0-10ppm (menu selectable)					
	Display	3-1/2 digit LCD	Indicates CO ppm, NO2 ppm (menu selectable)					
	LEDs	Green, Yellow, Red	Green = Normal, Yellow = Relay, Red = Alarm					
	Audible Alarm Exposure	85dB Piezo transducer	30 minutes above alarm setpoint per UL2034 (menu selectable)					
		Туре	Electrochemical					
unty		Accuracy	+/-10% of full scale @ 20°C					
Inty		Reproducibility	<+/-2% of reading					
	CO Sensor Performance	Response time	<15 seconds					
		Certifications	UL2034 Recognized Component					
		Long term stability	<+/-5% per year					
		Life expectancy	>5 years					
		Туре	Electrochemical					
		Accuracy	+/-10% of full scale @ 20°C					
	NO2 Sensor Performance	Reproducibility	<+/-3% of reading					
		Response time	<15 seconds					
		Long term stability	<+/-5% per year					
		Life expectancy	>5 years					
		Temperature, continuous	-20 to 40°C					
	Operating Environment	Temperature, intermittent	-30 to 55°C					
		Humidity	15-95% continuous, 0-95% intermittent					
	Enclosure	Material	ABS/Polycarbonate					
		Dimensions	4.0″h x 4.4″w x 2.1″d					
		Conduit Opening	Tapped 1/2" NPT					

(1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended.

Toxic Gas Series



# SPECIALTY SENSORS



# SPECIALTY SENSORS

Water Detector (WD) Series	79
High Visibility LED Display (RD) Series	80
Transformers Series	82



# Reading air quality levels shouldn't be a guessing game

Our designer LED (RD) series feature large and bright numbers in 3 colors to choose from (red, green and blue) and can be seen across the room. Never squint again trying to guess room humidity and temperature levels.



# A spot leak detector that's easy to install and cost effective

Protect vital components from water damage with our WD series spot leak detector. The WD series utilizes solid state detection, so it is not prone to mechanical failure.

# Adding transformers to your order saves you time and shipping costs

Our transformer series with integrated circuit breakers make ordering a breeze, allowing you to add an accessory you already need on to your order without cutting additional purchase orders and paying additional shipping costs.





# Surface mount Water Detectors

Soild state Gold plated sensing electrodes Floor and wall mount options



# DESCRIPTION

The WD series detects water to prevent costly damage. Unlike float systems, it utilizes solid state detection, so is not prone to mechanical failure. The WD-1 is designed for mounting on the floor, drip pans or condensate pans, as the gold plated sensing electrodes face downwards out the back of the enclosure. The WD-2 housing accomodates mounting to a wall or vertical surface, with the gold plated sensing electrodes angled to the bottom of the enclosure.

# APPLICATIONS

- Ideal for spot leak detection
- Computer rooms, critical equipment, restrooms or commercial kitchens
- Monitor condensate pans and drains—turn off equipment when pans reach limit

# FEATURES

### **Reliable water detection**

- Simple installation—screw or ram-set to surface
- Simple operation—no maintenance
- Solid-state design... no moving parts to fail
- Fully potted for water-proofing... maximum durability

### Dimensions







WD-1 Gold Plated Sensing Electrodes for floor mounting



WD-2 Gold Plated Sensing Electrodes for wall mounting

# ORDERING

WD-1	Floor Mount Water Detector, 9-30 VAC/DC
WD-2	Wall Mount Water Detector, 9-30VAC/DC

SPECIFICATIONS	
Power Supply	9-30VAC/DC, 15mA Max.
Output	N.C. (Form B) Solid State Relay, Isolated
Output Rating	30VAC/DC, 0.1A (100mA) Max.
Sensing	Gold plated electrodes
Operating Environment	-20 to 80°C





# Large LED **Remote Displays**

3 1/2 digit LED Choose Red, green, or blue Adjustable zero and span



# DESCRIPTION

These large bright displays are ideal for visual feedback of any measured value. Humidity, temperature, and pressure labels provided—others available—consult factory.

# APPLICATIONS

- Provides users with valuable visual verification of humidity and/or temperature status
- Process control feedback, including pharmaceutical, food, and coating applications

# FEATURES

## Easy to install and maintain

- Fits standard single or double gang boxes (depending on version)
- Accepts 0-10V input signal
- Pre-cut vinyl labels provided with temperature, pressure, humidity for each display ordered.
- Factory scaled; user adjustable zero and span

### **Field Adjustable**

• Adjust the scaling—both zero and span, for any application requirement.





## ORDERING



B = Green

C = Red

# Display #2 LED Color

 $\overline{A = Blue}$ 

B = Green

C = Red

D = None

Consult factory for custom labeling and calibrations

(Write your selected Display Type, Display #1 and #2 LED Color numbers/letters in the boxes above)

# SPECIFICATIONS

Power supply	12-30VDC/24VAC <sup>(1)</sup> , 40mA max. (per display)
Signal input range	0-10VDC
C Itu	Factory set for customer application
scaling	Field adjustable zero and span
Display type	3-1/2 digit LED; Red, Green, or Blue
Accuracy	+/-1% F.S. +/- 2 counts
Sampling Rate	3 / second
Input Impedance	100k ohm
Operating Temperature	32-122oF (0-50oC)

(1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.

# WIRING (PER DISPLAY)



# DIMENSIONS





# Panel Mount Multi-tap Class 2 Transformers

120, 208, 240, 277, 480 primary inputs 50, 75, and 96VA models Integrated overcurrent breaker



# SPECIFICATIONS

											UNIT: Inch±0.04			
Model#	VA	PRI(VAC)	HZ	SEC	Over Current Protection	UL MARK	CE MARK	TYPE	Α	в	С	D	Е	
5051MWCB	50	120/208/240/277/480	50/60	24	Circuit Breaker		CE	A.B.C	1.26"	1.91"	3.45"	2.5"	3.06"	
7551MWCB	75	120/208/240/277/480	50/60	24	Circuit Breaker		CE	A.B.C	1.67"	2.31"	3.87"	2.5"	3.06"	
10051MWCB	96	120/208/240/277/480	50/60	24	Circuit Breaker		CE	A.B.C	2.06"	2.69"	4.25"	2.5"	3.06"	

# CE:

UL Component Recognized, U.S. and Canada

Conformite Europende

# DIMENSIONS











# Tips, Tricks and FAQs

Senva wants to ensure each product is used for the proper application. Below is a list of FAQs we encounter on a regular basis with our current sensor lines. Remember, Senva offers live customer and technical support via email sales@senvainc.com or toll-free (866) 660-8864.

## **LOOPING WIRE**

Technicians can loop wires in order to increase the amount of current passing through the CT. Each loop doubles the amount of amperage passing through the CT. This may be required for applications where not enough amperage is present in a single wire to fall within the specified CT amperage range.

## LOAD SIDE VS. LINE SIDE

All Senva Fixed, Preset, Autoset, Multi-point and Analog current sensors are designed to go on the line side of the motor/pump as all of these CTs operate at a frequency of 50/60Hz. The VFD line (C-2350VFD & C-2350VFD-L) and C-1550 are the only CT lines that are designed to be installed on the load side as they are looking at the ratio between amperage and frequency.

### **MONITORING STATUS**

When monitoring status on your pump or motor, utilize a fixed current sensor that has a minimum threshold of 0.5A or lower. Fixed current sensors will close the contacts and relay a signal that current is present in the line to the pump/motor.

## **MONITORING BELT LOSS/COUPLING**

When looking for belt loss/coupling there are several options based on the desired signal. For a digital current sensor on constant volume motors/pumps, utilize the Preset or Autoset line. The preset line allows the electrician or technician to set the dial to the full load amperage (FLA) on the motor name plate. The Autoset line uses a microprocessor to automatically set the threshold in the same fashion as the Preset without requiring any manual adjustment. The sensor then looks for a 30% or greater decrease in amperage to alert when a belt has broken.

When working with direct drive or fractional HP motors/pumps, it is often recommended to utilize an analog CT as the change in amperage between a loaded and unloaded motor may be too small for a digital current sensor to detect and trigger the alarm.

When working on variable frequency drives (VFDs) see below for the Senva VFD specific sensor.

### **VFD APPLICATIONS**

Our most frequent technical call regarding our current sensor line is for misapplication using our VFD sensors. The C-2350VFD requires 3.5A and 15Hz minimum to power the microprocessor in the sensor. If the current and/or frequency is below the specification, the device will not function properly. If sufficient amperage is not present, the technician can attempt looping the wire to provide the necessary current. For motors/pumps less than 10HP, consider using the C-2350VFD-L, which is a 3-wire device that is specified to work in the range of 0.5-15A.

# ISSUES WITH MONITORING STATUS ON ELECTRONICALLY COMMUTATED MOTORS (ECM)

ECMs draw a small amount of AC current to the inverter, up to 120mA, when the motor isn't running. If you're using a fixed current sensor with a extremely low trip-point, it may falsely indicate the motor is running when in fact it is only passive current draw from the inverter. Choosing a current sensor with a fixed set point above the 120mA threshold will help avoid false trips. Senva has adjusted the set point across the fixed current sensor line above the ECM threshold. This includes options in our solid-core and split-core lines. (See page 22 for details)



# Notes





# Terms & Conditions of Purchase

By purchasing Senva products, buyer agrees that all of the following terms and conditions apply to every purchase and supersede any conflicting terms in any purchase order or acknowledgement:

# LIMITED WARRANTY:

SENVA IS PROVIDING THIS WARRANTY IN LIEU OF ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY IS BUYER'S EXCLUSIVE REMEDY FOR ALL CLAIMS AGAINST SENVA. SENVA SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES. SENVA TOTAL LIABILITY FOR ALL CLAIMS SHALL BE LIMITED TO THE PRICE PAID FOR ITS PRODUCT.

Senva promises buyer that any standard product manufactured by Senva shall be free from material defects in design, material, or manufacturing for a period of seven (7) years from the manufacture date; provided, however, that the warranty shall not extend to ordinary wear and tear, or to normally replaceable components (e.g., batteries and humidity sensor elements). During the warranty period, Senva may repair or replace (in its sole discretion) any product suffering from a warranty defect and returned freight prepaid by buyer, with no charge to buyer for any warranty repair or replacement. The warranty shall remain in full force and effect for said 7 year period, provided that the product: (1) was installed, operated, and maintained properly; (2) has not been abused or misused; (3) has not been repaired, altered, or modified outside of Senva authorized facilities; This warranty provides specific legal rights that may be varied by local laws.

# **SPECIAL ORDERS:**

Senva is committed to providing responsive customer service. For products designed and built to customer specifications, please consult with Senva.

# **RETURNS:**

No product may be returned without a returned material authorization number assigned by Senva. All warranty claims must be delivered to Senva, attention customer service. Standard products in unopened condition (except evaluation orders) can be returned to stock subject to a charge of 15% for up to 90 days from original shipment. Items opened, or held for 90 to 180 days, may be accepted for return subject to a 30% restocking charge. Products returned for credit must be in saleable condition. If the product has been modified, damaged, or installed, we cannot accept return for credit. Non-standard products (including those having electrical modifications or private labeling) may not be returned, except for warranty service.

# **PAYMENT:**

Payment terms are stated on each invoice. Buyer agrees to pay finance charges of 18% per annum on any past due amount. Buyer further agrees to pay any court costs, collections fees or attorney fees if legal action must be taken on any unpaid balance. For disputes, the prevailing party shall receive its costs and attorney fees (including costs and fee incurred at trial or an appeal). All legal rights shall be governed by Oregon law, excluding principles of conflict of law. Buyer consents to the jurisdiction of Oregon courts and agrees that such courts shall have personal jurisdiction over buyer. Venue shall be in Multnomah County, Oregon. Product specifications and pricing subject to change without any notice.

# **PRODUCT APPLICATION LIMITATION:**

Senva products are not designed for life or safety applications. Senva products are not intended for use in critical applications such as nuclear facilities, human implantable device or life support. Senva is not liable, in whole or in part, for any claims or damages arising from such uses. Senva strongly believes in continuous improvement, therefore we must reserve the right to change specifications and product offerings without notice. Where possible, we will substitute products with equivalent functionality when necessary.

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