2017-2018
ENGINEERING
CATALOG

SENVA® SENSORS

SUPERIOR BUILDING AUTOMATION SENSORS

Higher Reliability
Faster Installation
Superior Accuracy

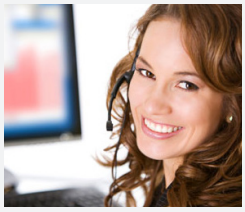
- Current
- Pressure
- Humidity
- Temperature
- Carbon Dioxide
- Nitrogen Dioxide
- Carbon Monoxide
- Energy Monitoring
- Water Detection
- Transformers

Sense the Difference

CONTENTS

"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.*

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

Reduce the risk of arc flash with Senva.

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

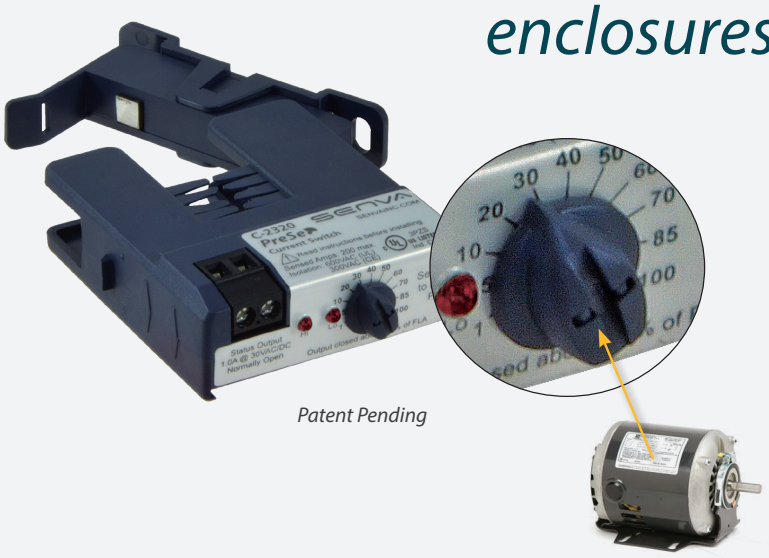
Save over 1/2 hour per sensor install.

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

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.

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



Patent Pending

PreSet™ 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!

Split Core Mini now available!

PreSet™

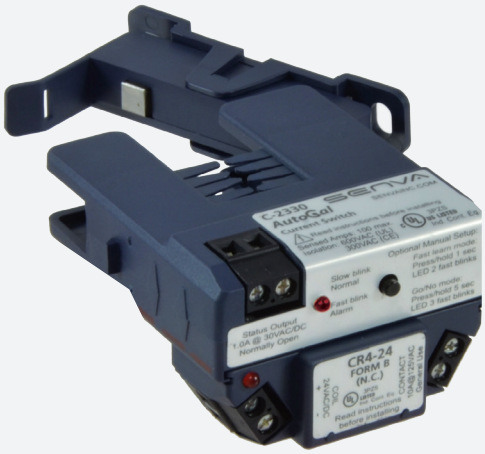
Set the sensor to motor full load amps—never return to calibrate!

CURRENT

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™ do the calibrating for you!



AutoSet™ 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.

AutoSet™

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

PreSet™
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

c UL us

DESCRIPTION

PreSet™ 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

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

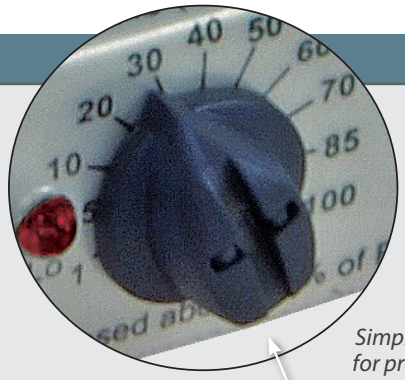
FEATURES

Save time and money while eliminating calibration inside energized enclosures

- Preset™ 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

Maintenance-free—no call backs

- Superior to traditional adjustable CTs and pressure switches
- Industry leading 7 year warranty

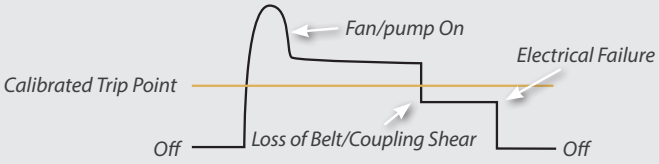


Simply set to motor FLA for proof of flow set-point

Patent Pending

SET-POINT OPERATION

Detects Belt Loss/Coupling Shear!



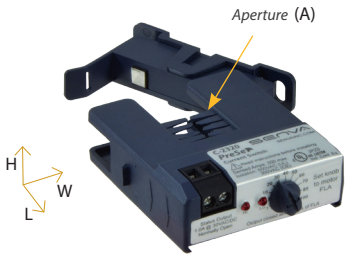
Now you can easily detect when drive belts slip, break, or pump coupling shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

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.

SPLIT CORE C-2320



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 detach-able base to screw or DIN mount
- Larger 0.75" aperture accomodates oversize conductors

OPTIONAL RELAY for additional labor savings

L: .84" H: .72" W: 2.06"

- Add to 2320 series to get start/stop/status in a single device
- Reduces the number of installed components... saves time and space
- Removable relay facilitates service

SPLIT CORE - MINI C-2220

L: 2.00" H: .75" W: 1.75"
A: .40"x 0.32"

- Mount sensor without removing conductor for installation savings
- Fits in small enclosures
- Clamp on conductor with iris, or screw mount detachable base

SOLID CORE C-1320

L: 2.40" H: 1.04" W: 1.6"
A: 0.52" diameter

- Compact design
- Aperture accomodates spade terminals

SOLID CORE - MINI C-1220

L: 1.91" H: .88" W: 1.31"
A: 0.30" diameter

- Super small—fits anywhere
- Low cost

ORDERING INFORMATION

SPLIT 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 *NEW LOWER TURN-ON!*	0.50A	150A	1.0A@30VAC/DC	•	•
C-2320HV	0.50A	100A	0.2A@120VAC	•	•
C-2320HV-L	0.45A	50A	0.2A@120VAC	•	•
SPLIT CORE - MINI					
C-2220	1.00A	50A	1.0A@30VAC/DC	•	
SOLID CORE					
C-1320	0.75A	50A	1.0A@30VAC/DC	•	
SOLID 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	•	
C-1220HV	0.75A	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.

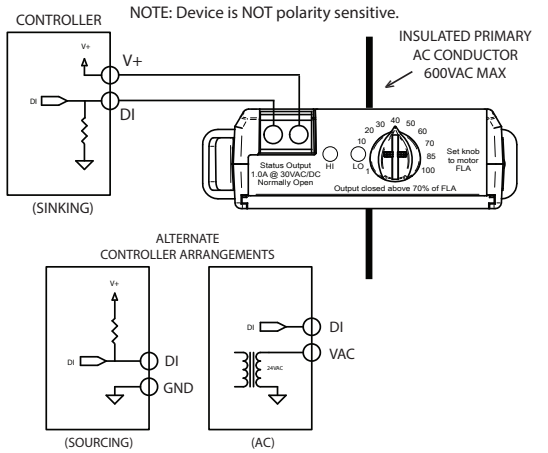
Other coil voltages available—consult factory

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*

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.*

Designed and Assembled In the U.S.A

7 year limited warranty

AutoSet™ 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™ 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

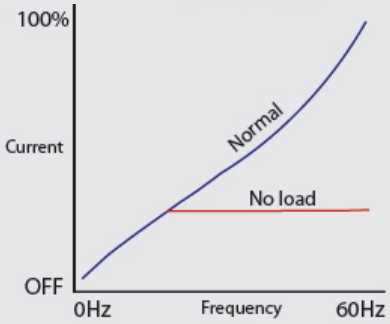
Maintenance-free—no call backs

Save time and money

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

SET POINT OPERATION

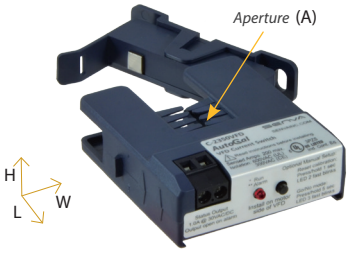
Positive proof of flow for VFD driven fans and pumps



Designed and Assembled In the U.S.A

7 year limited warranty

SPLIT CORE
C-2350VFD



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

SPLIT CORE
C-2350VFD-L
for fractional and small HP VFDs

Note: 3-wire device

- 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

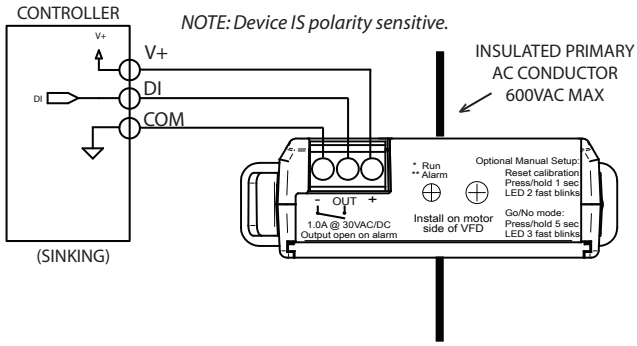
SPLIT CORE	Min (on)	Max A	Output*	Sensor Power
C-2350VFD-L	0.5A	15 A	1.0A@30VAC/DC	12 to 30VDC/ 24VAC
C-2350VFD	3.5A	135A	1.0A@30VAC/DC	Induced
C-2350VFD-HV	3.5A	135A	0.2A@120VAC	Induced

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.

SPECIFICATIONS

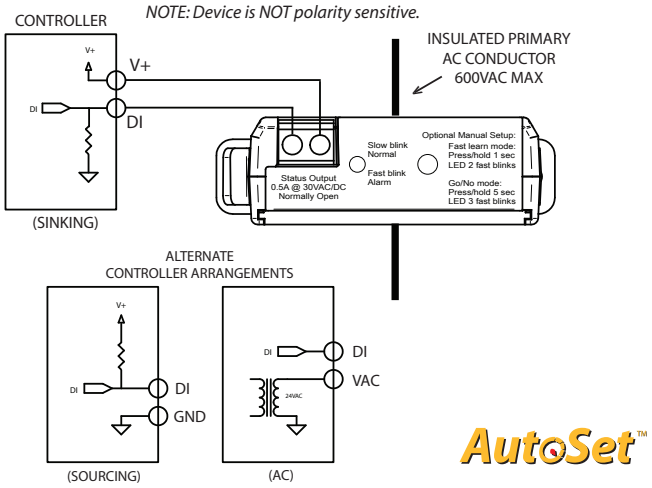
Standard Output Rating	1.0A@30VAC/DC
Line Voltage Output Rating	0.2A@120VAC (-HV MODEL ONLY)
Output Type	NO, solid-state FET
Temperature Rating	-15-60 ° C
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Frequency Range (C-2350VFD)	20-60Hz; proof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

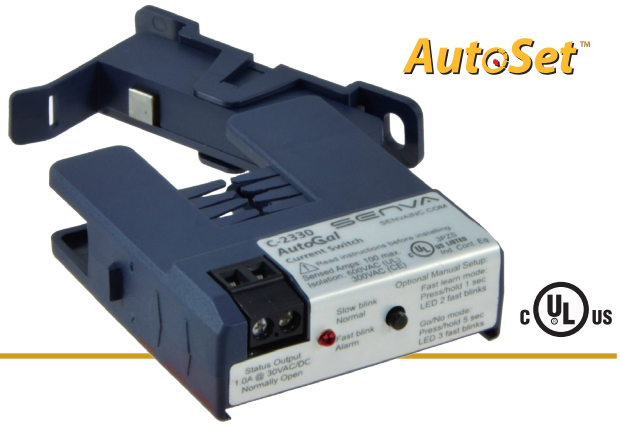
WIRING FOR C-2350VFD



AutoSet™

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™ 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

Designed and Assembled In the U.S.A

7 year limited warranty

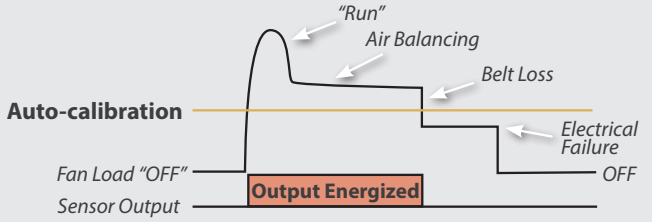
Save time and money by eliminating hazardous calibration energized enclosures

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

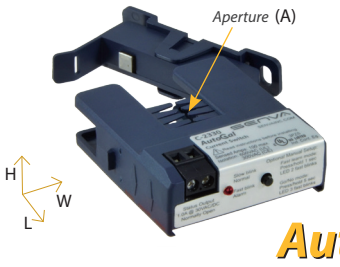
Save up to 1/2 hour per sensor install (based on field productivity tests.)

SET-POINT OPERATION



Positive proof of flow for constant volume fans and pumps

SPLIT CORE
C-2330



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

OPTIONAL RELAY

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

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

ORDERING INFORMATION

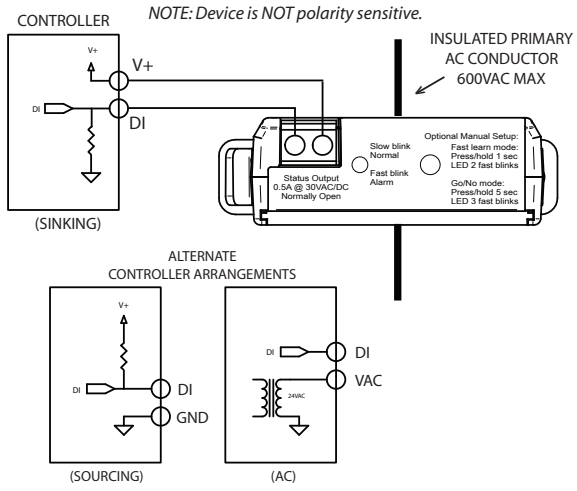
SPLIT CORE	Min (on)	Max A	N.O. Output*	Sensor Power
C-2330	2.5A	135A	1.0A@30VAC/DC	Induced
C-2330HV	2.5A	135A	0.2A@120VAC	Induced

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.

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	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.*

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

EC MOTOR CERTIFIED

c UL us

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

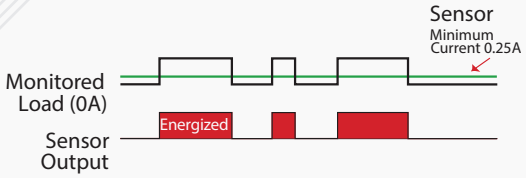
Reliable and cost-effective

- 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

Designed and Assembled In the U.S.A

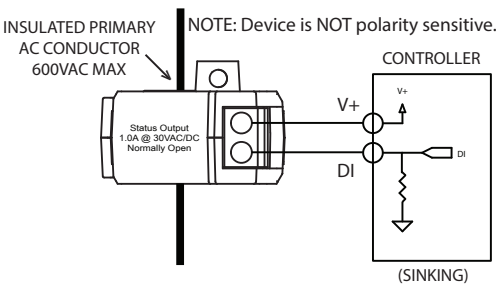
7 year limited warranty

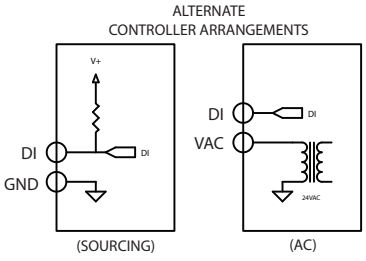
Run status based on current



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.

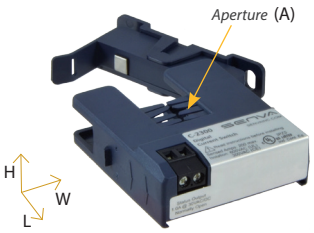
TYPICAL WIRING





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

SPLIT CORE
C-2300



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

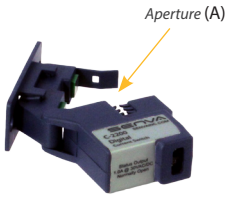
- Mount sensor without removing conductor for installation savings
- Clamp on conductor with iris, or use detachable base to screw or DIN mount
- Larger 0.75" aperture accomodates oversize conductors

OPTIONAL RELAY

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

- Add to 2300 series to get start/stop/status in a single device
- Reduces the number of installed components... saves time and space
- Removable relay facilitates service

SPLIT CORE - MINI
C-2200



L: 2.00" H: .75" W: 1.75"
A: .0.40"x 0.32"

- Mount sensor without removing conductor for installation savings
- Fits in small enclosures
- Clamp on conductor with iris, or screw mount detachable base

SOLID CORE
C-1300

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

- Compact design
- Aperture accomodates spade terminals

SOLID CORE - MINI
C-1200

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

- Super small—fits anywhere
- Low cost

ORDERING INFORMATION

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

c UL us

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

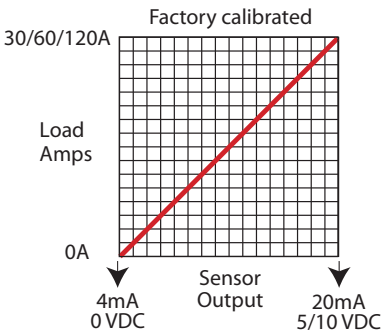
- Industry leading 7 year limited warranty

Designed and Assembled In the U.S.A

7 warranty

7 year limited warranty

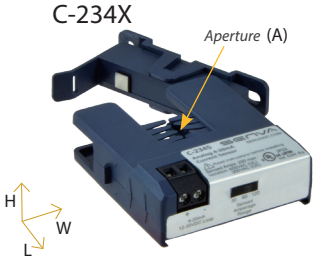
SET-POINT OPERATION- MODELS C-2343, C-2344, C-2345



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

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

SOLID CORE
C-120X

L: 1.78″ H: .88″ W: 1.31″
A: 0.30″ diameter

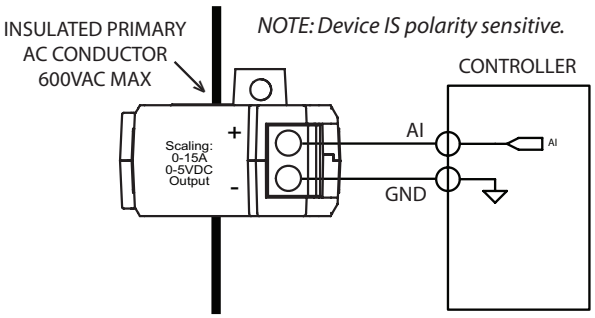
- Compact design
- Apeture accomodates spade terminals

ORDERING INFORMATION

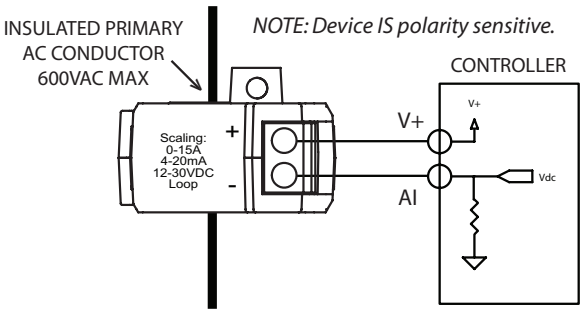
SPLIT CORE	Range A	Output	Sensor Power
C-2343	30A, 60A, 120A Selectable	0 - 5 VDC	Induced
C-2344	30A, 60A, 120A Selectable	0 - 10 VDC	Induced
C-2345	30A, 60A, 120A Selectable	4 - 20mA	Loop- powered, 30 VDC
C-2343-L	5A, 10A, 20A Selectable	0 - 5 VDC	Induced
C-2345-L	5A, 10A, 20A Selectable	4 - 20mA	Loop- powered, 30 VDC
C-2343-200	200A	0 - 5 VDC	Induced
C-2344-200	200A	0-10 VDC	Induced
SOLID CORE - MINI			
C-1203	15 A	0 - 5 VDC	Induced
C-1205	15 A	4 - 20mA	Loop- powered, 30 VDC
C-1203-L	5 A	0 - 5 VDC	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 0-5/10VDC OUTPUT



TYPICAL WIRING LOOP 4-20 MA

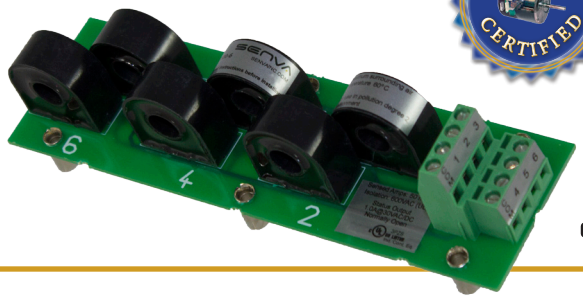


Warning: *Refer to installation instructions that accompany product and heed all safety instructions.*

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

- 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

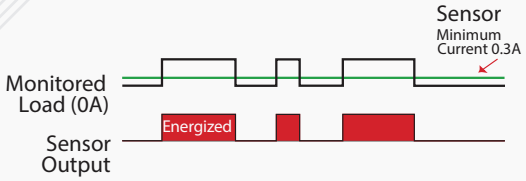
Reliable and cost-effective

- 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.

Designed and Assembled In the U.S.A

7 year limited warranty

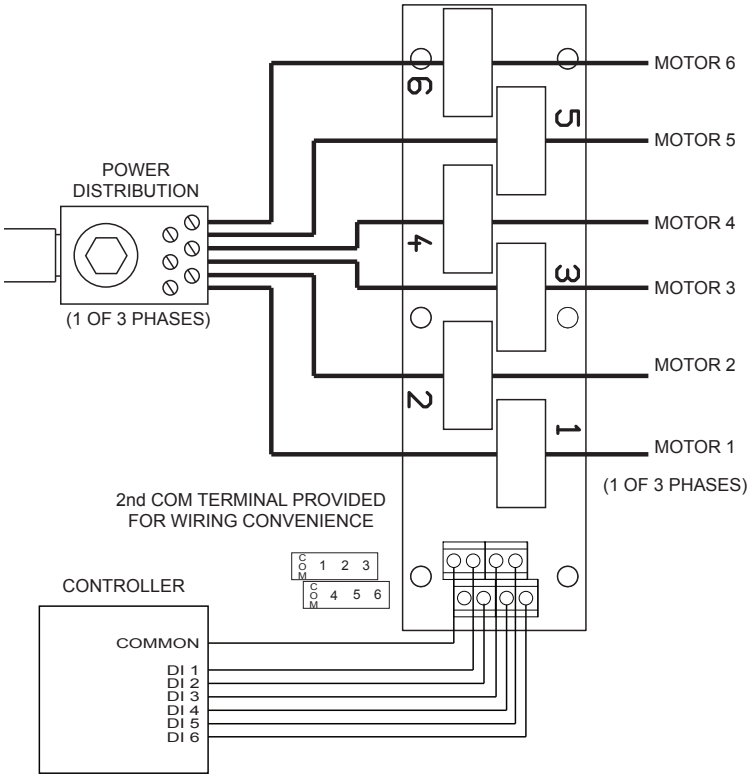
ORDERING INFORMATION

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

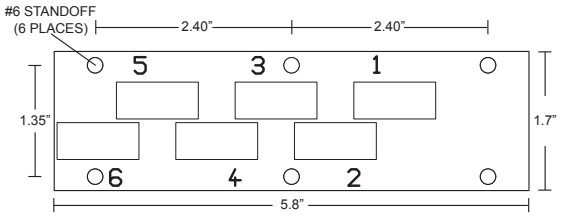
SPECIFICATIONS

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



DIMENSIONS

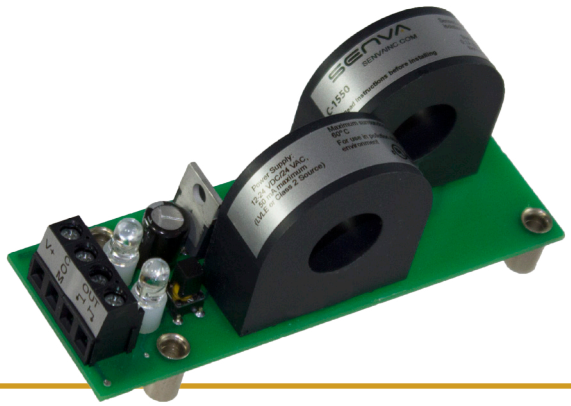


Warning: *Refer to installation instructions that accompany product and heed all safety instructions. Do not rely on current status LED to indicate presence of power.*

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

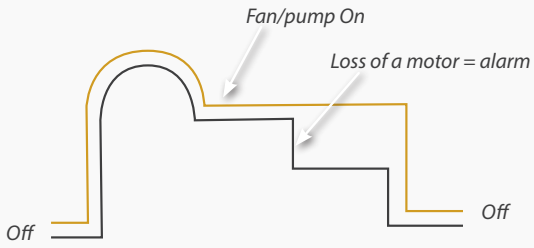
Easy installation

- 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.

Designed and Assembled In the U.S.A

7 warranty

7 year limited warranty

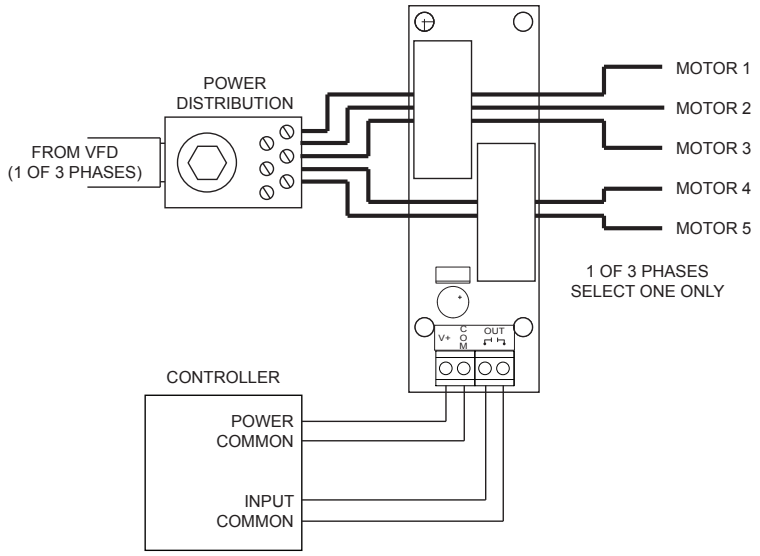
ORDERING INFORMATION

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

SPECIFICATIONS

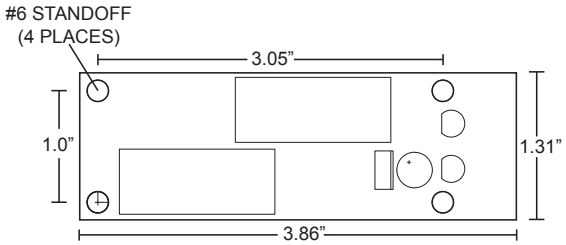
Amperage Range	0.1A (on)-50A (50A max per sensor)
Output Type	NO, solid-state FET
Standard Output Rating	0.1A@30VAC/DC
Temperature Rating	-15-60 ° C, Maximum surrounding air ambient, 60 ° C. For use in Pollution Degree 2 Environment.
Insulation Class	600V RMS. For use on insulated conductors only! Use 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

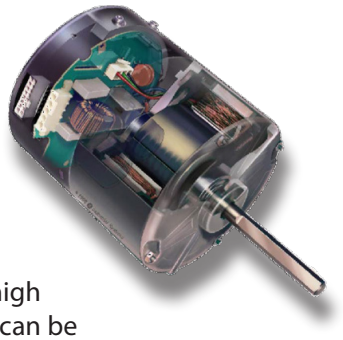


Warning: *Refer to installation instructions that accompany product and heed all safety instructions. Do not rely on current status LED to indicate presence of power.*

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?

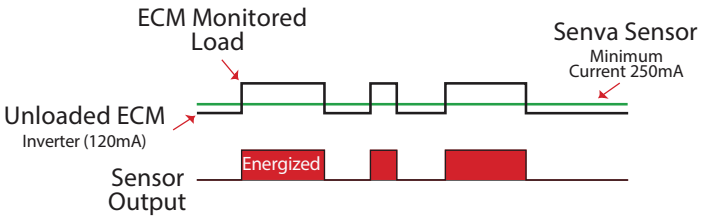
ECMs are cost and energy efficient and can reduce operating costs. They maintain a high level (65 to 75 percent) of efficiency at a variety of speeds. In comparison, AC motors can be inefficient when used in air control systems because the fan motor noise can require the motor to run at less than a full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

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

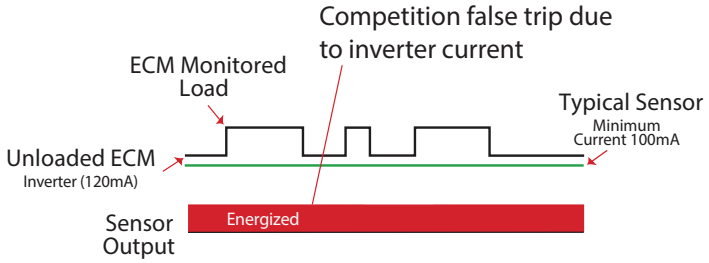
ECMs draw a small amount of AC current to the inverter, up to 120mA, when the motor isn't running. If you're using a fixed current sensor with a extremely low trip-point, it may falsely indicate the motor is running when in fact it is only passive current draw from the inverter.

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

C-1200

C-1500-6

C-1300

C-2300

C-2200

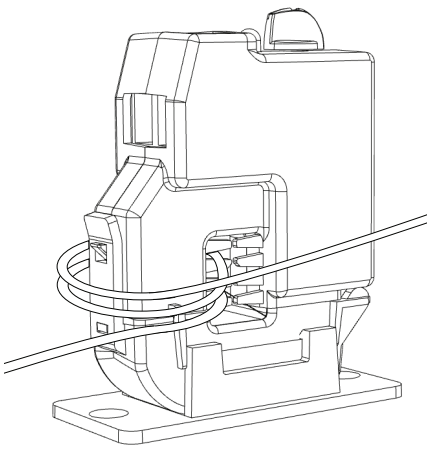
Designed and Assembled In the U.S.A

7 year limited warranty

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

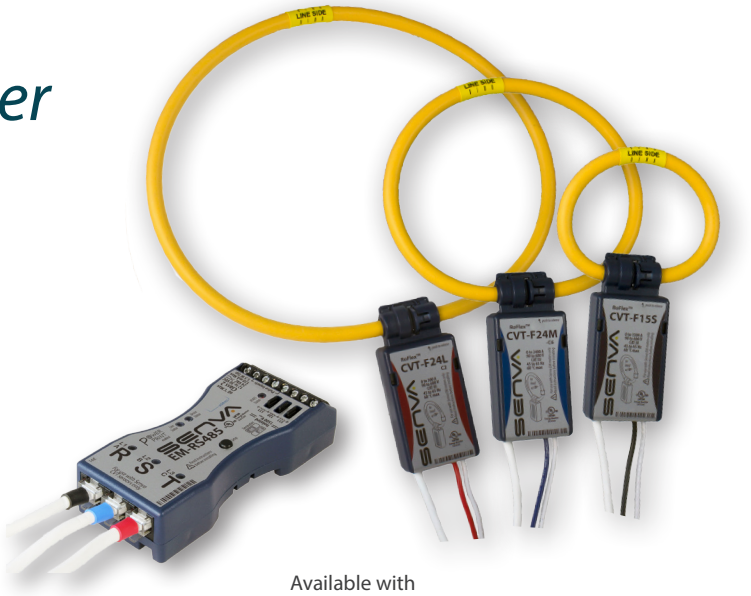
The table below provides the average full-load currents of squirrel cage motors based on NEC (National Electrical Code) Tables 430-148, 149, and 150. These values are given only as a guide - they may vary depending on the type of motor and manufacturer. Refer to the actual motor nameplate for full-load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

HP	110 to 120 VAC			220 to 240 VAC			440 to 480 VAC		
	Single Phase	Two Phase	Three Phase	Single Phase	Two Phase	Three Phase	Single Phase	Two Phase	Three Phase
1/10	3.0	-	-	1.5	-	-	-	-	-
1/8	3.8	-	-	1.9	-	-	-	-	-
1/6	4.4	-	-	2.2	-	-	-	-	-
1/4	5.8	-	-	2.9	-	-	-	-	-
1/3	7.2	-	-	3.6	-	-	-	-	-
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	-	-	-	-	-	602.0	-	-	302.0
300	-	-	-	-	-	-	-	-	361.0
350	-	-	-	-	-	-	-	-	414.0
400	-	-	-	-	-	-	-	-	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)

The ultimate energy meter from Senva

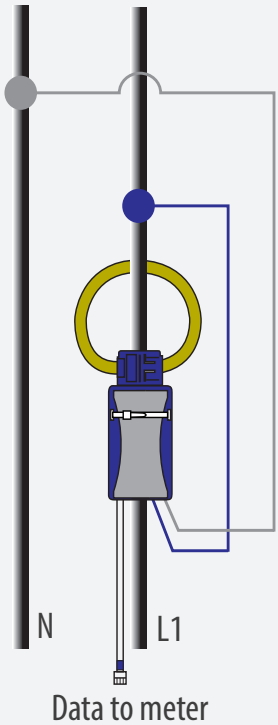


Get in. Get out. Get data.

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.

Available with ASHRAE BACnet® Modbus

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



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

Smart microprocessor enabled CVTs™ boast numerous benefits:

- *Digitally calibrated CVTs™ are extremely accurate*
- *The accuracy is as high as a calibrated system, yet different CVTs™ 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™ 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™*
- *Rogowski CVTs™ 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

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

The meter recognizes the CVT™ 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™ connections for easy installation

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

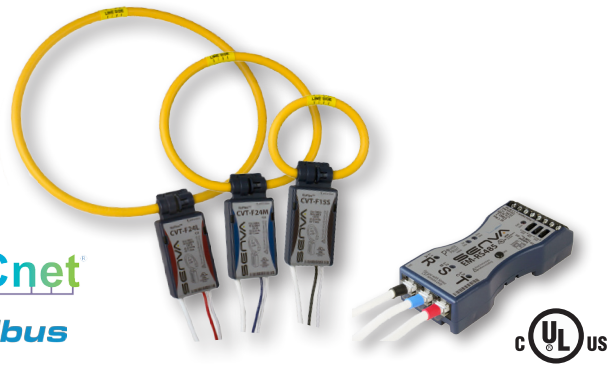
Flexible Rogowski CVT™ sensors are available in four sizes from 9" to 36" in circumference (approximately 2.8" to 11.4" in diameter) and include rating options from 300A to 6000A

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

BACnet® is a registered trademark of ASHRAE.

EM Series
Energy Meters

Pulse Version: kWh, KVAR, kVA
Protocol Version: BACnet & Modbus
Flexible Split-core Rogowski CVT™ 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™ (CVT™). The entire assembly is easily mounted inside the electrical panel eliminating labor and space required to install a separate transducer box. Each CVT™ uses digital communication with the meter for superior noise immunity--ideal for applications where accuracy matters! The CVTs™ are individually calibrated and measurement accuracy is independent of the transducer. To complement the CVT™, 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!

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

Designed and Assembled In the U.S.A

7 year limited warranty

FEATURES

Intelligent Meter Technology

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

Ultimate Flexibility

- One universal meter supports all CVT™ 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™ sensors and scales itself accordingly
- No manual configuration necessary

Compact Size

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

METER ORDERING

version

EM- [ ]

Version

PULSE = Pulse
RS485 = Modbus & BACnet

CVT ORDERING

coil *len* *clr*

CVT- **F** [ ] - [ ] - [ ]

Type

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

Blank = Black (default)
C2 = Red
C6 = Blue
3PH = Three CVT Kit (1 Black, 1 Red, 1 Blue)

SPECIFICATIONS (METER AND CVT™)

Power Supply Input		12-30VDC/24VAC(1), 100mA max.
Pulse Outputs	Dual Outputs	Import and Export Energy Outputs
	Type	Solid state dry contact
	Specifications	N.O., 300mA max, 40V max
	Pulse scaling	0.01, 0.1, 1, 10, 100, 1k Wh/Pulse
RS-485 Output	RS-485	2-wire, BACnet MS/TP, Modbus RTU
	Baud Rates	9600, 19200, 38400, 57600, 76800, 115200
	RS-485 Loading	1/4 unit
Pulse Inputs(2)	Dual Inputs	3.5 +/- 0.5 VDC, short circuit current is 10mA max
	Pulse Rate	50 Hz (default), configurable up to 500 Hz
	Pulse active	<100 ohms
	Pulse Undefined	100-1000 ohms
	Pulse Idle	>1000 ohms
Service Types	Configurations	1Ph, 2Ph, 3Ph Wye (4-Wire), 3Ph Delta (3-Wire)
	Voltages	90V_{L-N} through 600V_{L-L}
	Frequency	45-65 Hz
Performance	Accuracy	1% for V, A, kW, kVAR, kVA
Current/Voltage Transducer™	Small Rope Circumference	9"
	Medium Rope Circumference	15"
	Large Rope Circumference	24"
	Grande Rope Circumference	36"
	300A Operating Range(3)	+/-1% 30-300A (+/-3% >10A)
	800A Operating Range(3)	+/-1% 30-800A (+/-3% >10A)
	1500A Operating Range(3)	+/-1% 30-1500A (+/-3% >10A)
	2400A Operating Range(3)	+/-1% 50-2400A (+/-3% >15A)
	6000A Operating Range(3)	+/-1% 120-6000A (+/-3% >40A)
Operating Environment	Temperature	-4 to 140°F (-20 to 60°C)
	Humidity	0-95% non-condensing
Meter Enclosure	Material	Polycarbonate/ABS
	Dimensions	4.1"h x 1.8"w x 0.9"d
CVT™ Enclosure	Material	Polycarbonate/ABS
	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™ Accuracy based on reading, not full scale.

FUSE ORDERING

Color

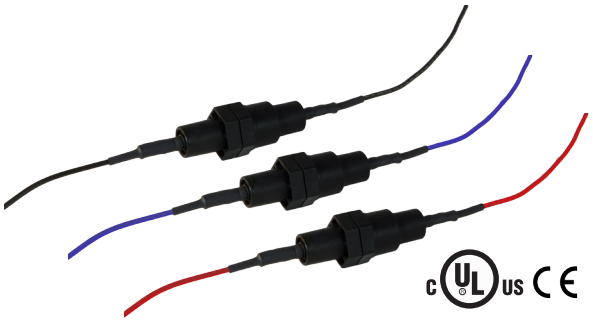
CVT-FUSE- [ ]

Color

Blank = black (default)
C2 = Red
C6 = Blue
3PH = Three Fuse Kit (1 Black, 1 Red, 1 Blue)

SPECIFICATIONS (FUSES)

Fuse	1/2 Amp, 600VAC slow blow, 200kA AC Interrupting rating
Wire	18AWG, 18" lead on each end of fuse pack, 600VAC rating



CVT-FUSE-3PH pictured

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