

OEM
Solutions



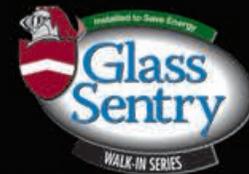
ANTI-SWEAT ENERGY MANAGER SERIES

Proven Results

Sensible Energy Management



MULTIPLE CASE SERIES | GLASS SENTRY MODEL MCS



WALK-IN SERIES | GLASS SENTRY MODEL GSW



REACH-IN SERIES | GLASS SENTRY MODEL GSR



MERCHANDISER SERIES | GLASS SENTRY MODEL GSM

CUSTOMIZED ELECTRONIC

CONTROLS FOR THE HVAC/R INDUSTRY



ANTI-SWEAT ENERGY MANAGER

Sensible Energy Management

Proven Results

OVERVIEW

The *Glass Sentry* line of anti-sweat heater controls is designed to conserve the electricity consumption of the heater circuit in walk-in or reach-in cooler/freezer glass merchandisers. Originally, systems were built with heaters that run constantly 24/7/365 thereby wasting energy. The *Glass Sentry's* unique design allows the heaters to operate only when necessary to keep condensation off the glass and save a substantial amount of money. In doing so, the *Glass Sentry* prevents the doors from fogging while cutting the run time of the heaters by as much as 80-90% depending on the climate.

Anti-sweat heater controls fall under two categories – closed loop or open loop. We make both.

Closed loop designs take a direct approach to control heater run time. A combination sensor monitors both the air temperature and humidity and those readings are used to mathematically calculate the dew point of the outside air in contact with the door. A separate temperature sensor is mounted at the coldest part of the door frame to monitor the surface temperature.

The controller compares the dew point with the surface temperature and then allows the heaters to run only when the dew point is reached at the surface of the door. Whenever the surface temperature drops to or below the dew point, the heaters are allowed to run and the heaters remain on for a minimum of 5 minutes or until the surface temperature rises 2° Celsius thereby assuring that the surface temperature of the glass is properly elevated so condensation is impossible.

Open loop designs use humidity sensors and algorithms to determine control. Generally speaking these units are less efficient but with product line testing, specific algorithms can be calculated for optimal operation.

We manufacture units with single outputs to control both the frame heaters and door heaters together and we also manufacture dual output units to separately control the frame heaters and the door heaters.

The *Glass Sentry* line is the "Go To" line for anti-sweat heater controls. We have been the leader in this market for over 15 years. All of our products are UL recognized and we offer private labeling options. We regularly sign nondisclosure agreements with OEMs and work with them to provide proprietary controllers for their particular corporation.

The Glass Sentry Line is broken down into four Series of Controls:

| The MULTIPLE CASE SERIES consists of 5 controllers specifically designed to control a number of cooler/freezer systems on the same 20 or 30A circuit.

| The WALK-IN SERIES is a diverse series of 4 controllers designed to handle 10A loads typically found in walk-in applications.

| The REACH-IN SERIES is a diverse series of 4 controllers designed to handle 7A loads typically found in reach-in applications.

| The MERCHANDISER SERIES is a group of 4 controllers used to handle smaller 3A loads typically seen with 2-3 door merchandisers.



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The Glass Sentry Line Series of Controls

Multiple Case Series | Walk-in Series
Reach-in Series | Merchandiser Series



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ANTI-SWEAT ENERGY MANAGER

For up to 30A Multiple Applications.



Proven Results



MULTIPLE CASE SERIES | GLASS SENTRY MODEL MCS

The *Glass Sentry* is now the crown jewel of our anti-sweat product line. The *Glass Sentry* is UL listed economical model designed specifically for retrofit applications. The unit has a discrete dew point sensor and separate temp sensor. By handling up to 30 amp loads, a single *Glass Sentry* can control the multiple door set-ups of a typical C-store. Once the heater circuit is turned on, it stays on for a minimum of 5 minutes, assuring that the surface temperature of the glass is properly elevated without wasting energy. An adjustment on the end of the unit is set for optimum operation for all conditions, but can be changed for even better energy-savings depending on the conditions. Pig-tail leads and flexible conduit provided with the *Glass Sentry* allow for easy retrofit installation without any additional wiring which translates into minimum up-front costs and head-aches. The *Glass Sentry* can pay for itself within months of installation and it is now one of the most popular energy saving alternatives for the C-store industry.

| Glass Sentry II

As the industry became more accepting of the anti-sweat philosophy, customized requests became more and more frequent. We developed the *Glass Sentry II* to utilize a single humidity sensor and preset logic tables. Now customizers can tell us when they want the unit to operate, how long they want it to energize, and match it to the operational functionality of their particular boxes. The *Glass Sentry II* can still control 30A loads. It's mounted on top or inside of the box making it versatile enough for retrofit or new installations. The *Glass Sentry II* is ordered with freezer logic or with cooler logic. If you have specific ideas about how you'd like an anti-sweat controller to work, then the *Glass Sentry II* is a good alternative.

| Glass Sentry LP

When the HR-6 initiative was passed and incorporated in January 2009, it required all cooler manufacturers to either use more expensive energy efficient glass doors or to install anti-sweat controllers into their units. We redesigned the *Glass Sentry* into a low profile, potted option that could be mounted in the mullion. Tens of thousands of these units have been used and are now a standard component on a number of cooler systems. The *Glass Sentry LP* utilizes a discrete dew point sensor and one smaller separate temp sensor. It remains a popular model with cooler OEMs.

| Glass Sentry Modbus

Many of the larger grocery and C-store chains utilize more sophisticated building automation controls (BACs). Process specific controls for lighting, security, refrigeration, pumping applications, etc. link with the BAC computers to collect, analyze, and present data in real time to corporate executives. We chose the Modbus communication format, the most widely accepted format, and incorporated it into our *Glass Sentry* line so that we could communicate with BAC controls and open a marketing avenue into these larger industries. Parameters such as relative humidity, store humidity, dew point, frame temperatures, percent heater run time, hour watts saved, as well as alarm conditions can be viewed on a unit by unit basis. Perfect for the Corporate Energy Manager to evaluate site efficiencies and analyze systems from the convenience of their desk.

| Glass Sentry II Modbus

The *Glass Sentry II Modbus* combines preset logic algorithms with the Modbus communications protocol thereby allowing larger grocery and C-store chains utilize more sophisticated building automation controls (BACs). Process specific controls for lighting, security, refrigeration, pumping applications, etc. link with the BAC computers to collect, analyze, and present data in real time to corporate executives. Parameters such as relative humidity, store humidity, dew point, frame temperatures, percent heater run time, hour watts saved, as well as alarm conditions can be viewed on a unit by unit basis. The *Glass Sentry II Modbus* is another option for the Corporate Energy Manager to evaluate site efficiencies and analyze systems from the convenience of their desk.



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ANTI-SWEAT ENERGY MANAGER

Applications up to 10A.



Proven Results



WALK-IN SERIES | GLASS SENTRY MODEL GSW

As the industry evolved, several changes occurred. The HR-6 initiative passed and all glass door OEMs scammed to find cost effective alternatives, beer caves became more prevalent and the need for a simpler low amp anti-sweat controller emerged, and finally new more forceful directives were enacted to make the HR-6 initiative more measurable. With the 2012 changes, all OEMs were forced to measurably control heat once the humidity reached 55%. In response, we expanded the line to include a dozen *Glass Sentry* derivatives. The *Glass Sentry Walk-in Series* comprises 4 anti-sweat controllers in a smaller shell that will handle loads up to 10A. Now OEMs can match the controller to operate according to specific product line characteristics.

| GSW-C

Another round of HR-6 initiatives comes into effect in 2017 with even more stringent requirements. Engineers are being forced to use all their resources to cut energy consumption wherever they can. Anti-sweat controls can make a big difference and the GSW-C can help with the new requirements. This is a closed loop unit making it the ultimate in maximum energy savings. It keeps condensation off the doors and frames when it needs to and it saves money when it's impossible for fog to form. The unit's rated to 10A giving it the needed flexibility to be used in supermarket, C-store, or drug store applications.

| GSW-O

The GSW-O is an open loop unit with a generic algorithm designed for reach-in or walk-in applications. Based on humidity, it can be programmed generically from the factory or specifically to match the characteristics of the OEM product line. This 10A unit is a versatile and economical solution for engineers who have instituted other changes but still need additional savings to meet the new requirements.

| GSW-OC (1 open/1 closed)

The GSW-OC is a 2 output unit controlling both the glass door heaters as well as frame heaters with 1 closed loop humidity/frame sensor combination in addition to a second open loop algorithm. This gives engineers the option of controlling one heater circuit with the ultimate maximum savings and then using an open loop algorithm for a second less critical circuit.

| GSW-OO (2 open loop)

The GSW-OO is a 2 output unit using 2 algorithms to control both the glass door heaters and the frame heaters. This unit allows OEMs to match the two outputs together. We provide the OEM with a software tool with table values that can be filled in with duty cycle numbers and %RH. Hard start times and cycle times can also be modified accordingly.



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ANTI-SWEAT ENERGY MANAGER

Applications up to 7A.



Proven Results



REACH-IN SERIES | GLASS SENTRY MODEL GSR

More stringent 2017 energy directives are now in place that will force manufacturing engineers to rethink their designs. Anti-sweat controls play a major factor in that equation. Not only will systems need to save energy, but the engineers need to do it economically in order to stay competitive. The *Glass Sentry* Reach-in Series is comprised of 4 anti-sweat controllers that will handle loads up to 7A. Now OEMs can install controls at the factory and match the controller to operate according to specific product line characteristics in order to meet the new directives.

| GSR-C

Another round of HR-6 initiatives comes into effect in 2017 with even more stringent requirements. Engineers are being forced to use all their resources to cut energy consumption wherever they can. Anti-sweat controls can make a big difference and the GSR-C can help with the new reach-in requirements. This is a closed loop unit making it the ultimate in maximum energy savings. It keeps condensation off the doors and frames when it needs to and it saves money when it's impossible for fog to form. The unit's rated to 7A giving it the needed flexibility to be used in supermarket, C-store, or drug store applications.

| GSR-O

The GSR-O is an open loop unit with a generic algorithm designed for reach-in or walk-in applications. Based on humidity, it can be programmed generically from the factory or specifically to match the characteristics of the OEM product line. This 7A unit is a versatile and economical solution for engineers who have instituted other changes but still need additional savings to meet the new requirements.

| GSR-OC (1 open/1 closed)

The GSR-OC is a 2 output unit controlling both the glass door heaters as well as frame heaters with 1 closed loop humidity/frame sensor combination in addition to a second open loop algorithm. This gives engineers the option of controlling one heater circuit with the ultimate maximum savings and then using an open loop algorithm for a second less critical circuit.

| GSR-OO (2 open loop)

The GSR-OO is a 2 output unit using 2 algorithms to control both the glass door heaters and the frame heaters. This unit allows OEMs to match the two outputs together. We provide the OEM with a software tool with table values that can be filled in with duty cycle numbers and %RH. Hard start times and cycle times can also be modified accordingly.



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ANTI-SWEAT ENERGY MANAGER

For 3A Applications.



Proven Results



MERCHANDISER SERIES | GLASS SENTRY MODEL GSM

The more stringent 2017 energy directives are affecting the manufacturers of merchandisers. Engineers are re-thinking their designs and incorporating anti-sweat controls. Because merchandisers are so cost sensitive, the controls need to be economical, save energy, meet the directives, and work in an array of environments. The *Glass Sentry* Merchandiser Series is comprised of 4 anti-sweat controllers that will handle the 3 Amp loads of a typical merchandiser. Now OEMs can install the controller before the units leave the factory and make sure that the controllers operate according to their specific product line characteristics.

| GSM-C

The GSM-C is an economical single output unit designed to control smaller 3A loads typically found in freezer merchandisers. The unit incorporates a discrete dew point sensor and separate temp sensor to determine optimal savings. As the dew point is approached, the unit turns on power to the heater circuit thereby preventing condensation. When physics dictate that it's impossible for condensation to form, power to the heater circuit is shut off thereby saving energy and lowering electrical bills.

| GSM-O

The GSM-O is an open loop unit using an algorithm to control smaller 3A merchandiser loads. Humidity is the primary factor affecting the algorithm. While not as efficient as the closed loop system, the GSM-O unit uses a single sensor which saves wiring labor and still saves a good deal of energy. It's a good economical solution for a number of applications.

| GSM-OC

The GSM-OC is a dual output unit designed to control both the glass door heaters as well as frame heaters in merchandisers. This unit allows engineers the option of controlling one heater circuit with the ultimate maximum savings and then using an open loop algorithm for a second less critical circuit.

| GSM-OO

The GSM-OO is a dual output unit designed to control both the glass door heaters as well as frame heaters in merchandisers. This unit allows OEMs to match the two outputs together. We provide the OEM with a software tool with table values that can be filled in with duty cycle numbers and %RH. Hard start times and cycle times can also be modified accordingly.



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LINEUP



TERMS AND CONDITIONS OF SALE

Multiple Systems Series	Market	Market	Technology	Amperage
Glass Sentry	Multiple	C-store/Grocer	Closed Loop	30
GSII - Freezer	Multiple	C-store/Grocer	Open Loop	30
GSII - Cooler	Multiple	C-store/Grocer	Open Loop	30
Glass Sentry LP	Multiple	Grocery Reach-in	Closed Loop	22
Glass Sentry Modbus	Multiple	C-store/Grocer	Closed Loop	30
GSII Modbus - Freezer	Multiple	C-store/Grocer	Open Loop	30
GSII Modbus - Cooler	Multiple	C-store/Grocer	Open Loop	30
Walk-in Series	Market	Market	Technology	Amperage
GSW-O	Reach-in/Walk-in	C-store/Grocer	1 Open Loop	10
GSW-C	Reach-in/Walk-in	C-store/Grocer	1 Closed Loop	10
GSW-OO	Reach-in/Walk-in	C-store/Grocer	2 Open Loop	10A combined
GSW-OC	Reach-in/Walk-in	C-store/Grocer	1 Open/1 Closed	10A combined
Reach-in Series	Market	Market	Technology	Amperage
GSR-O	Reach-in/Walk-in	C-store/Grocer	1 Open Loop	7
GSR-C	Reach-in/Walk-in	C-store/Grocer	1 closed loop	7
GSR-OO	Reach-in/Walk-in	C-store/Grocer	2 Open Loop	7A combined
GSR-OC	Reach-in/Walk-in	C-store/Grocer	1 Open/1 Closed	7A combined
Merchandiser Series	Market	Market	Technology	Amperage
GSM-O	Merchandiser	Retail space	1 Open Loop	3
GSM-C	Merchandiser	Retail space	1 Closed Loop	3
GSM-OO	Merchandiser	Retail space	2 Open Loop	3A per output
GSM-OC	Merchandiser	Retail space	1 Open/1 Closed	3A per output
Multiple Systems Series	UL Status	Voltage Range	Ouput Control	Sensor
Glass Sentry	UL Listed	90-132 VAC*	Electro-Mechanical	Frame temp & Dew point
GSII - Freezer	UL Listed	90-132 VAC*	Electro-Mechanical	Humidity
GSII - Cooler	UL Listed	90-132 VAC*	Electro-Mechanical	Humidity
Glass Sentry LP	UL Listed	90-132 VAC*	Electro-Mechanical	Frame temp & Dew point
Glass Sentry Modbus	UL Listed	90-132 VAC*	Electro-Mechanical	Frame temp & Dew point
GSII Modbus - Freezer	UL Listed	90-132 VAC*	Electro-Mechanical	Humidity
GSII Modbus - Cooler	UL Listed	90-132 VAC*	Electro-Mechanical	Humidity
Walk-in Series	UL Status	Voltage Range	Ouput Control	Sensor
GSW-O	UL Recognized	90-253 VAC	Electro-Mechanical	Humidity
GSW-C	UL Recognized	90-253 VAC	Electro-Mechanical	Frame temp & Dew point
GSW-OO	UL Recognized	90-253 VAC	Electro-Mechanical	Humidity
GSW-OC	UL Recognized	90-253 VAC	Electro-Mechanical	Frame temp & Dew point
Reach-in Series	UL Status	Voltage Range	Ouput Control	Sensor
GSR-O	UL Recognized	90-253 VAC	Electro-Mechanical	Humidity
GSR-C	UL Recognized	90-253 VAC	Electro-Mechanical	Frame temp & Dew point
GSR-OO	UL Recognized	90-253 VAC	Electro-Mechanical	Humidity
GSR-OC	UL Recognized	90-253 VAC	Electro-Mechanical	Frame temp & Dew point
Merchandiser Series	UL Status	Voltage Range	Ouput Control	Sensor
GSM-O	UL Recognized	90-253 VAC	Solid-State	Humidity
GSM-C	UL Recognized	90-253 VAC	Solid-State	Frame temp & Dew point
GSM-OO	UL Recognized	90-253 VAC	Solid-State	Humidity
GSM-OC	UL Recognized	90-253 VAC	Solid-State	Frame temp & Dew point

*180-253 VAC Available Upon Request

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ORDERS

All orders are received subject to acceptance of OEM Solutions, Inc. at its offices at 712 Jackson Blvd., Rapid City, SD 57702. An acceptance by the purchaser of any goods, ordered either in writing or verbally, shall constitute an acceptance of these Terms and Conditions of Sale. Changes in an order are subject to acceptance in the same manner as the original order. OEM Solutions, Inc. is to be reimbursed for all costs and materials that cannot be used due to the order change.

OEM Solutions, Inc. will accept annual purchase agreements for both individual and combined quantities of its products. OEM Solutions, Inc. reserves the right to bill back to the appropriate quantity discount should purchaser fail to accept the quantities as specified on such an annual agreement. An additional charge will be levied against the purchaser based on a computation of the percentage of work complete and materials purchased to fulfill the annual agreement.

CANCELLATION

Unless otherwise stated in writing, all orders that have been received and accepted by OEM Solutions, Inc. are non-cancelable/non-refundable.

TERMS

Unless otherwise stated in writing, all orders are based on net payment due within 30 days of invoice date. Outstanding balances beyond Net 30 days may restrict delivery of future orders.

CLAIMS

All claims for shortages or errors on shipments must be made in writing to OEM Solutions, Inc. within 15 days of receipt of shipment. Returns of such items must follow the procedure as listed under RETURNS.

QUOTATIONS

Quoted prices do not include taxes and are subject to any applicable taxes imposed by the Federal or State governments, or any other governmental authority. Additionally, transportation and duties are not included in quoted prices.

RETURNS

OEM Solutions, Inc. will not accept return of any goods without prior issuance, by OEM Solutions, Inc., of a Return Material Authorization number. Upon inspection of returned goods, either replacement products or credit will be issued for those items shown to be defective due to OEM Solutions, Inc. manufacturing. Authorization for product repair or replacement will be requested by OEM Solutions, Inc. for those items damaged by the customer.

INDEMNIFICATION

The purchaser shall protect, indemnify, and hold OEM Solutions, Inc. harmless against all claims of infringement of patents, designs, copyrights, trade names, or similar rights arising from compliance with purchaser's designs, specifications, or requirements.

WARRANTY

OEM Solutions, Inc. warrants its products to be free from defects in workmanship and material for a period of one (1) year from the date of delivery to the purchaser buying direct from OEM Solutions, Inc.

This warranty includes, but is not limited to those products manufactured to specifications supplied to OEM Solutions, Inc. by the purchaser.

Before using, the purchaser shall determine the suitability of the products for their intended use. The purchaser assumes all risk and liability whatsoever in connection with such determination. OEM Solutions, Inc. assumes no risk or liability for the suitability or unsuitability or results of use of its products. OEM Solutions, Inc. shall in no event be liable for any property damage or personal injury resulting directly or indirectly from the use or operation of any products purchased from OEM Solutions, Inc. Nor shall OEM Solutions, Inc. be liable for any apparatus containing products purchased from OEM Solutions, Inc. or for any consequential damages or loss of anticipated profits.

OEM Solutions, Inc. assumes no responsibility for the suitability or liability for the adequacy of any design, specifications, drawings, or material furnished or specified by the purchaser.

OEM Solutions, Inc. sole responsibility, under this warranty, shall be to repair or replace, at its discretion, FOB factory, any defective products received according to the RETURNS terms and within the warranty period.

GENERAL

OEM Solutions, Inc. does not recognize any terms and conditions printed on purchaser's order which enlarge OEM Solution, Inc.'s liability or responsibility beyond those stated in this quotation.

These terms of sale contain the entire agreement between OEM Solutions, Inc. and the purchaser with respect to the subject matter herein. Placement of an order with OEM Solutions, Inc. for any product shall constitute full acceptance of these terms and conditions of sale.

This Agreement shall be construed and interpreted under the laws of the State of South Dakota. The parties hereby consent to the jurisdiction of the courts of the State of South Dakota and agree that venue shall lie solely in Pennington County.



ANTI-SWEAT ENERGY MANAGER

Sensible Energy Management

THE 'GO TO' LINE

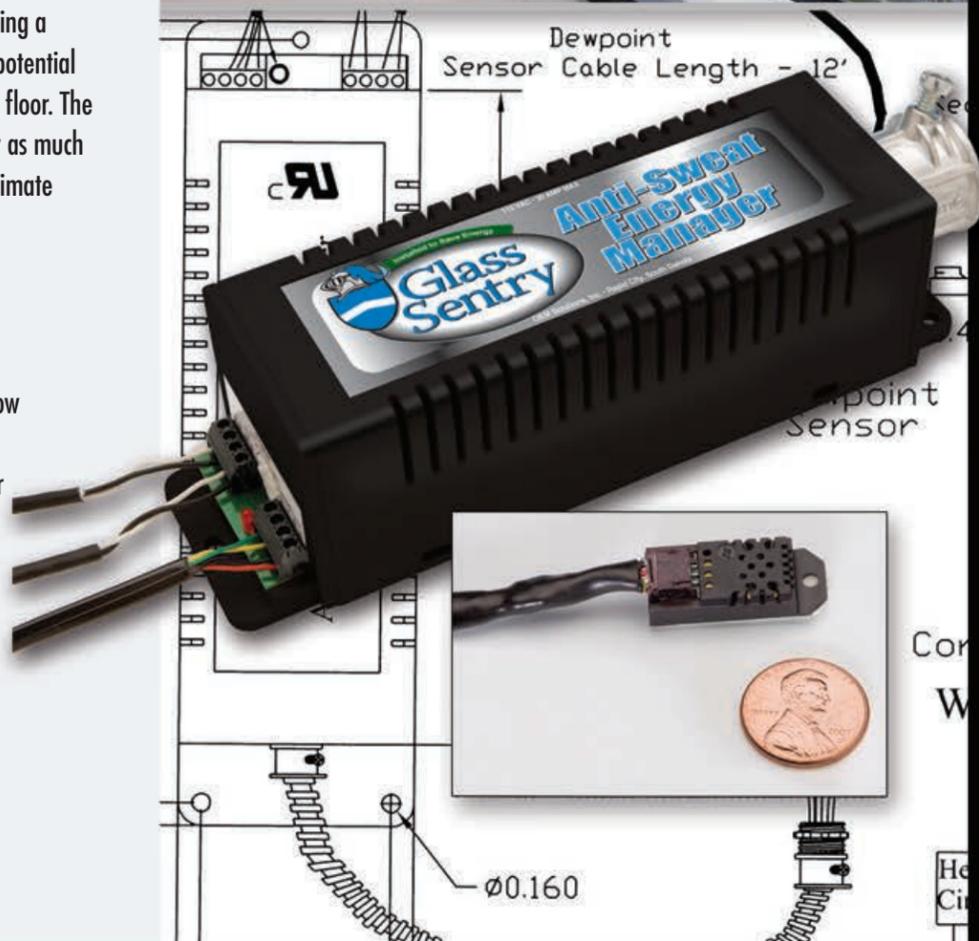
FOR Anti-sweat Heater Controls

The Glass Sentry is The GO TO Line of anti-sweat heater controls for energy savings and convenience. Designed to conserve the electricity consumption of the heater circuit in walk-in or reach-in cooler/freezer glass merchandisers where previous systems were built with heaters that run 24/7/365, thereby wasting energy.

The Glass Sentry's unique design allows the anti-sweat heaters to operate only when necessary to keep condensation off the glass, saving a substantial amount of money and the potential safety hazard of water dripping on the floor. The run time of the heaters is shortened by as much as 80 to 90% depending on the area climate preventing the doors from fogging.

Distinct Advantages of Glass Sentry:

- | Compact size
- | Flexible conduit and pig-tail leads allow for easy retrofit installation
- | Small highly accurate humidity sensor can easily and discreetly be installed into retrofit applications
- | Simple wiring for easy installation
- | Glass Sentry has models that can handle heater loads as high as 30 amps, allowing one unit to handle multiple doors



ANTI-SWEAT ENERGY MANAGER

Sensible Energy Management



CLOSED LOOP & OPEN LOOP

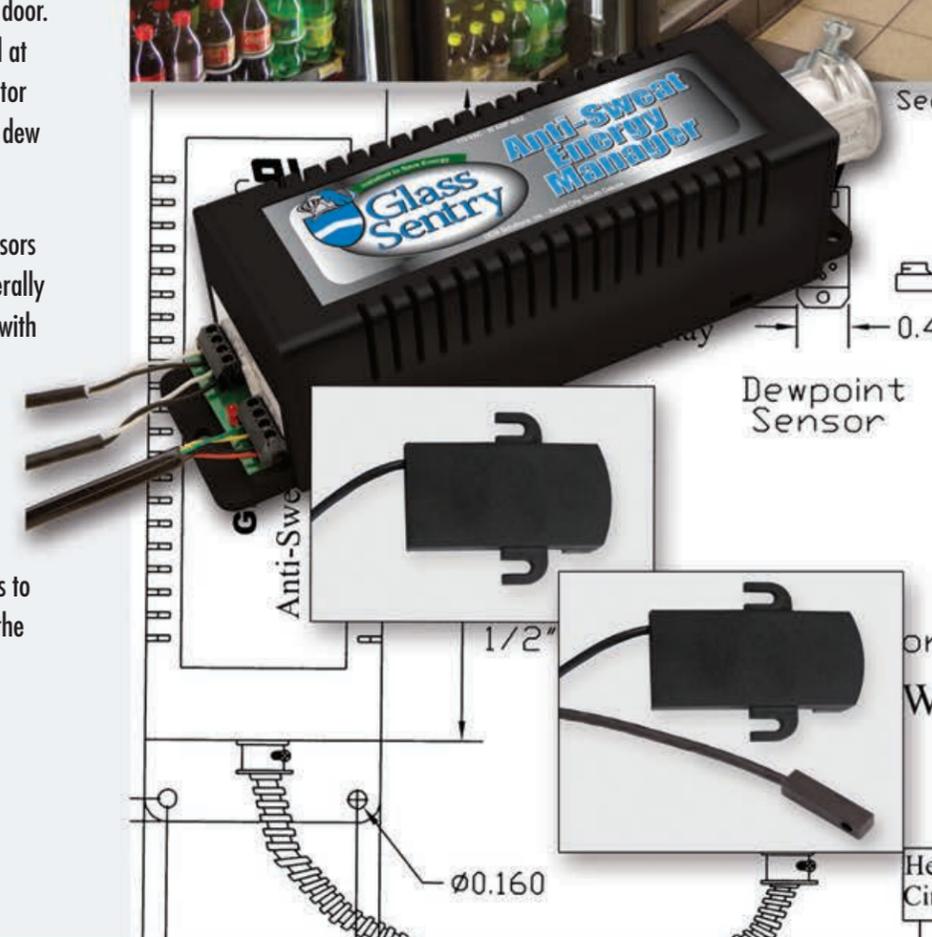
Anti-sweat Heater Controls

There are two categories of Anti-sweat Heater Controls – CLOSED LOOP or OPEN LOOP.

CLOSED LOOP DESIGNS take a direct approach to control heater run time. A combination sensor monitors both the air temperature and humidity and those readings are used to mathematically calculate the dew point of the outside air in contact with the door. A separate temperature sensor is mounted at the coldest part of the door frame to monitor the surface temperature and calculate the dew point of the glass.

OPEN LOOP DESIGNS use humidity sensors and algorithms to determine control. Generally speaking these units are less efficient but with product line testing, specific algorithms can be calculated for optimal operation.

OEM Solutions, Inc. manufactures units with single outputs to control both the frame heaters and door heaters together and we also manufacture dual output units to separately control the frame heaters and the door heaters.



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