

Installation Instructions

Air Sentinel™ III

Purge Controller - Model 110046



⚠ WARNING



Read this Manual **BEFORE** using this equipment.
Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.
Keep this Manual for future reference.



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Understanding Safety Information

This manual contains safety and use instructions that must be followed during the installation, commissioning, operation, care and maintenance and service of the Air Sentinell III™. All responsible personnel must read this manual prior to working with this instrument and should familiarize themselves with the following safety symbols, signals and pictorials.



This is a safety-alert symbol. The safety alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION), a pictorial and/or a safety message to identify hazards.

When you see this symbol alone or with a signal word on your equipment or in this Manual, be alert to the potential for death or serious personal injury.



This symbol identifies hazards which, if not avoided, could result in death or serious injury.



This symbol identifies hazards which, if not avoided, could result in minor or moderate injury.



This symbol identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.



This pictorial alerts you to the need to read the manual.



This pictorial alerts you to electricity, electrocution, and shock hazards.

Introduction to the Unit

Overview

The Air Sentinel™ III is a purge controller that can be used to provide protection for electrical equipment operating in potentially hazardous areas. The Air Sentinel III controls the equipment power and measures the air flow and pressure of the enclosure. The equipment must be placed into a suitable electrical enclosure. The Air Sentinel III meets the requirements of IEC 60079-0 and 60079-2. It has been certified to IECEx hazardous location rating of Ex mb [pxb] IIC T4 Gb 0°C ≤Ta≤55°C and Explosive Atmospheres - Part 18: Equipment Protection by Encapsulation "m", IEC 60079-18:2009.

Use in Explosive Environments Safely

WARNING







In the interest of safety, the operator must ensure the atmosphere where the instrument is located is safe from gases, vapors, dust or other flammable conditions whenever the instrument is opened for service or maintenance. At all other times, the enclosure door must be kept closed with purge air connected and the purge system operating with all GREEN lamps lit indicating safe operation.

Specifications

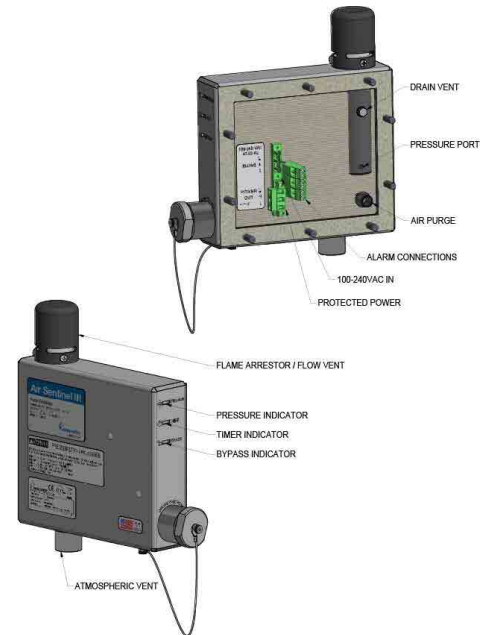
Enclosure	316 Stainless Steel
Mounting	10 Studs, ¼"-20
Display Indicators	Three Bi-Color (Red and Green) LEDs
Alarms	Three Form A (SPST-NO) Relay Contacts Rated 2A at 125VAC or 2A at 30VDC
Control Output	One Form A (SPDT-NO) Relay Internally Connected to Mains Contacts Rated 2A at 240VAC
Electrical Connections	One removable power input, one removable power output
Operating Temperature Range	0°C to 55°C (32°F to 131°F)
Power Supply	100-240VAC, 47-63 Hz, 5A
Environmental Conditions	IP55 Altitude up to 2000 meters Up to 95% RH (non-condensing)
IECEx Hazloc Rating	Ex mb [pxb] IIC T4 Gb 0°C ≤ Ta ≤55°C
IECEx File #	IECEx LC 19.0014
Recommended Supply Gas	Water and oil free, Dry air, particles <5u, ISA Grade Hydrocarbon Free. Full time, clean, dry air at 0-50 SLPM.
Pressure Measurement Range	1-10 mbar
Regulatory Compliance and Certifications	CE Approved, UL 61010-1 (ed. 3), CAN/CSA C22.2 No. 61010-1-12 (R2017), EN61326:2006

Instrument Labels

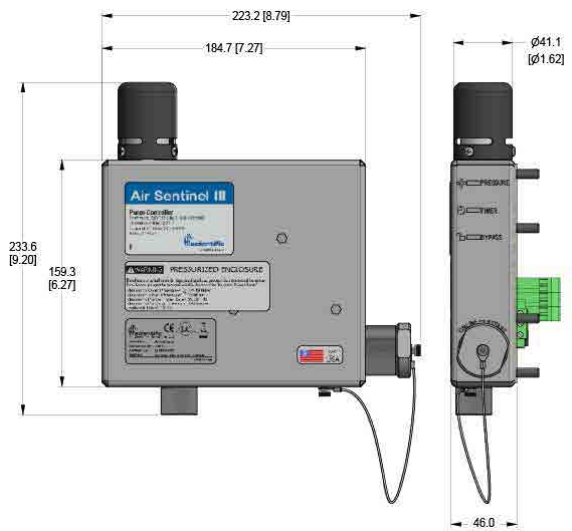
The following labels should be applied to the outside of the enclosure.

Purpose	Location	Label
Product name and certifications	Front of Air Sentinel III	Air Sentinel III Purge Controller Conforms to CSA-C22.2 No. 61010-1-12:2012 UL61010-1 (edition 3:2012) Ex mb [pxb] IIC T4 Gb 0°C≤Ta≤55°C IECEx LC 19.0014 
Serial number, manufacturer, part number, power rating, CE & cLUS marking	Front of Air Sentinel III	   Toll free: 888-255-7248 PRODUCT Purge Controller MODEL Air Sentinel III 110046 SERIAL NO. 2018122835 RATING 100-240 VAC 47-63Hz 5A Permitted supply short-circuit current: 5A 
Warning and Informational	Front of Air Sentinel III	WARNING PRESSURIZED ENCLOSURE Enclosure shall not be opened unless power is removed or area has been properly tested and is known to be non-hazardous! Minimum Over Pressure: ≥ 0.6 Millibar Maximum Over Pressure: 4 Millibar Minimum Purge Flow Rate: 35 SLPM Minimum Purging Duration: 7 Minutes Maximum Leakage Rate: 40 LPM 

Orientation



Dimensions



Installation and Commissioning

Air Supply

This instrument requires water free and oil free air, Dry Air, Particles <5u, ISA Grade Hydrocarbon Free. Requirements are full time, clean dry air at a cabinet pressure of 0-10 mbar at a flow rate of 0-50 SLPM. Please note that 10 mbar and 50 SLPM are maximum values that will probably not be attained in practice.

Electrical Power Input Connections

⚠ WARNING

Only qualified electricians should be allowed to perform the installation of the instrument as it involves a line voltage that could endanger life.

The Air Sentinel III purge controller requires 100-240 VAC 47-63 Hz.

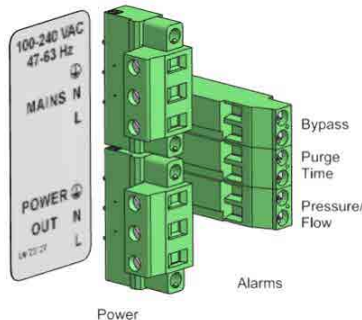
A circuit breaker must be placed prior to the power connection in close proximity and within easy reach to allow for service. This circuit breaker must be marked to indicate that it is a disconnecting means for the instrument. The rating of the circuit should be 5A.

Supply power connections are made ONLY to top "MAINS" connection on the back of the Air Sentinel III purge controller:

Terminal 3: Earth Ground
Terminal 2: Neutral
Terminal 1: Line or Hot

Suitable wire would be stranded, 3 conductors 18-12 AWG copper or tin plated copper with a voltage rating of 600 VAC with a temperature rating of 90°C or higher.

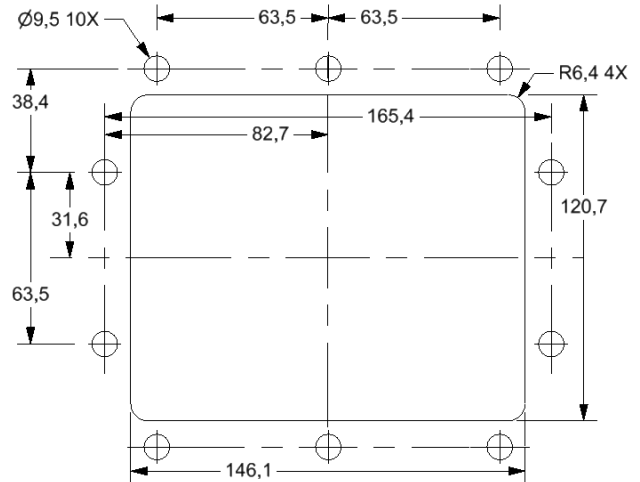
Common earth bond points are provided both inside the enclosure on the chassis and outside of the enclosure. This terminal set can be removed for easier connections. Please ensure this terminal set is properly tightened using the two side screws.



Mechanical Mounting

The Air Sentinel III is mounted to an enclosure using the 10, ¼"-20 studs. The recommended hardware is a ¼" flat washer and locking nut, or the provided locking nut with the built-in washer. The recommended enclosure opening is shown below.

There are 3 ports: air port, pressure port and drain vent. The air purge is the main vent that all enclosure exhaust air should exit the enclosure through. The Air Sentinel III measures this air to ensure continuous venting is occurring. The pressure port is where the Air Sentinel III measures the enclosure pressure to ensure the enclosure is kept above atmospheric pressure (overpressure). The drain vent is an optional atmospheric pressure vent for certain applications such as venting a drain. If this vent is not used, it must be capped.



Electrical Power Output Connections

The second or lower three terminals are controlled power output. This is where a powered device is connected to ensure power is not applied unless the enclosure is purged and pressurized. The output is connected to the mains power after the purge time has been exceeded assuming the enclosure is under pressure and air is exiting the vent. The load should not exceed 2A at 240VAC.

This terminal set can be removed for easier connections. Please ensure this terminal set is properly tightened using the two side screws.

Electrical Alarm Connections


Three relay (1 Form A) alarm connections are supplied that can be used to indicate an Alarm condition under the following modes of operation:

1. Loss of Pressure or Flow. Under this condition, the front panel LED labeled Pressure will turn RED and the associated alarm contacts will close.
2. Purge Timer enabled. Under this condition, the front panel LED labeled Timer will turn RED and the associated alarm contacts will close.
3. Bypass enabled. Under this condition, the front panel LED labeled Bypass will turn RED and the associated alarm contacts will close.

These contacts are rated 2A at 250VAC or 2A at 24VDC. Refer to Electrical connections image for the alarm connections. These connection terminals are NOT removable.

Operation

The Air Sentinel III purge controller is mounted on the side of the main enclosure. This controller will ensure proper safe operation of the attached equipment. If all of the required conditions are met, the controller will act as a power governor. It does this by monitoring the pressurization of the main enclosure with clean, dry air. The Air Sentinel III has three indicator lamps. Should the air supply pressure fail, the top lamp on the Air Sentinel III unit will turn RED and power to the rest of the instrument is disconnected.

 **WARNING**

Do not apply power to the Air Sentinel III purge controller unless the area has been properly tested and is known not to contain explosive materials.

Startup

When power is applied to the Air Sentinel III for the first time, ensure that the air supply is connected as stated in the Installation and Commissioning section earlier in this manual. Also ensure that the main enclosure is closed and locked. Once power is supplied to the Air Sentinel III, it will run through an automatic seven-minute purge cycle before supplying power to the rest of the system. During the purge period, the Air Sentinel III's Timer lamp will be RED indicating the purge is in process and no power is output.

 **NOTICE**


After power is applied, the Air Sentinel III requires 10 seconds to respond while it runs a self-test.


At the completion of the purge, the Timer lamp will go GREEN and power will be applied to the rest of the system. As long as the proper air supply conditions are met, the Air Sentinel III will continue to operate.


Indicator Lamps

The Air Sentinel III indicator lamps are a very quick way to determine operation of the controller and the safety condition of the connected instrument or equipment.

The Air Sentinel III has three LEDs that can be either RED or GREEN.

 **PRESSURE** This lamp indicates if the minimum enclosure pressure is met.


 **TIMER** This lamp indicates if the timer is enabled.

 **BYPASS** This indicates if the Bypass Key has been used.

Lamp Color Matrix	Operation	Power to Instrument
All lamps GREEN	Safe Operation	ON
TIMER Lamp RED	Instrument is purging.	OFF
PRESSURE Lamp RED	Unsafe operation, pressure low.	OFF
Bypass Lamp RED	Bypass key operating.	ON

Using the table above, you can quickly determine the operating condition of the power out. Under normal, safe operation, all lamps should appear **GREEN**.

Maintenance Bypass Operation

 **WARNING**

Use of the bypass key disables the safety features and safe operation of this instrument. It is very important that the operator checks the operating atmosphere and determines that it is safe before opening the enclosure. This is intended as a temporary operating condition.

To perform some maintenance operations on the enclosed equipment, it may be necessary to have the enclosed equipment powered up while the enclosure door is open. Under these conditions, normally the Air Sentinel III purge controller would determine that the enclosure is not pressurized and power would be removed to the equipment. To allow for this situation, a special maintenance bypass key is supplied.

Located on the front of the Air Sentinel purge controller is a knurled cap. Removing this cap reveals the key slot. Insert the key, push in slightly and turn it clockwise to engage the bypass operation. The BYPASS lamp will turn RED to indicate entering bypass mode. Assuming the atmosphere around the enclosure has been tested and known to be safe, the enclosure door can now be safely opened and power will remain on to the entire system. The key cannot be removed while operating in the maintenance bypass mode.

 **WARNING**

Do not operate the Air Sentinel III for long periods of time in the bypass mode. This is intended only for maintenance operations.


Do not operate the Air Sentinel in the bypass mode unattended.

To return the Air Sentinel III to normal, safe operation, close the enclosure door. Ensure that the air supply is connected, turn the key counter-clockwise and remove. Replace the knurled cover. If the pressure in the cabinet has built up to a normal acceptable level, the instrument will continue to run.

Programming

The Air Sentinel III is factory programmed for the application to ensure that during purge, at least five volumes of air are exchanged during the Timer period. This will vary with internal pressure and the volume of the enclosure that the system is operated at.

When used in the HF scientific AccUVView LED Ex, the purging time is set to 7 minutes.

 **NOTICE**

To ensure safe operation, information regarding the intended operating pressure, flow rate and timer (purge) period must be sent to HF scientific as part of the order so the Air Sentinel III can be programmed accordingly.

Each Air Sentinel III is factory programmed and checked for flow rate, internal (enclosure) pressure and timer period.

To meet the requirements of the IEC 60079-2, the minimum overpressure is 50 Pa or 0.5 millibar. This pressure should be regulated with an internal pressure regulator.

[illegible]

[illegible]

Warranty

Watts Regulator Co. (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of two (2) years from first use or three (3) years from date of invoice, whichever occurs first. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge. Parts, which by their nature are normally required to be replaced periodically, consistent with normal maintenance, specifically reagents, desiccant, sensors, electrodes and fuses are excluded. Also excluded are accessories and supply type items.

Proof of purchase (invoice or paid order confirmation) and/or first use (commissioning) must be provided when making a product warranty claim.

THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. In addition, the Company shall not be responsible for any costs incidental to the Company's warranty response efforts, including, without limitation, costs associated with the removal and replacement of systems, structures or other parts of facilities, de-installation, decontamination and re-installation of products, or transportation of products to and from the Company. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance, alteration of the product, or use of any parts or accessories (including but not limited to reagents) not provided by the company.

Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights. **SO FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT.**



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