Installation and Operation Manual

Air Sentinel™ II Purge Controller

Model Air Sentinel™ II 110010

⚠ 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.

THINK SAFETY FIRST

scientific
A WATTS Brand

Catalog No 100038B
Rev 4

Table of Contents

Specifications

Enclosure	316 Stainless Steel
Mounting	10 Studs, ¼" -20
Display Indicators	Two Bi-color (Red & Green) LEDs
Alarms	Two 1 Form A (SPST-NO) Relay Contacts Rated 2A at 125VAC or 2A at 30VDC
Control Output	One 2 Form A (SPDT-NO) Relay Internally Connected To Mains Contacts Rated 2A at 240VAC
Electrical Connections	One Removable Power Input, Once removable Power Output
Operating Temperature Range	0°C – 55°C (32°F – 131°F)
Power Supply	100-240 VAC, 47-63 Hz, 5A
Environmental Conditions	IP 66 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 14.0016
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	2-10 mbar
Regulatory Compliance And Certifications	CE Approved, ETL listed to UL 61010-1 Issued May 11 2012 3rd Ed & ETL certified to CSA 22.2 No. 61010.1 issued May 11 2012 EN61326:2006

1.0 Safety

This manual contains basic instructions that must be followed during the installation, commissioning, operation, care and maintenance of the instrument. The safety protection provided by this equipment may be impaired if it is commissioned and/or used in a manner not described in this manual. Consequently, all responsible personnel must read this manual prior to working with this instrument.

In certain instances **"Notes"**, or helpful hints, have been highlighted to give further clarification to the instructions. Refer to the Table of Contents to easily find specific topics and to learn about unfamiliar terms.

This manual is intended to be used in conjunction with the operating manual for the instrument the Air Sentinel II is installed into.

1.1 Symbols Used in this manual

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

⚠CAUTION This symbol identifies hazards which, if not avoided, could result in minor or moderate injury or damage to the equipment.

NOTICE This symbol identifies important information, practices or actions.

This pictorial alert you to the need read the manual, possibly at a different section.

1.2 Use in Explosive Environments Safety

⚠ WARNING

In the interests 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 the purge system operating with all GREEN lamps lit indicating safe operation.

2.0 Orientation

From the diagram below, the major components can be located.

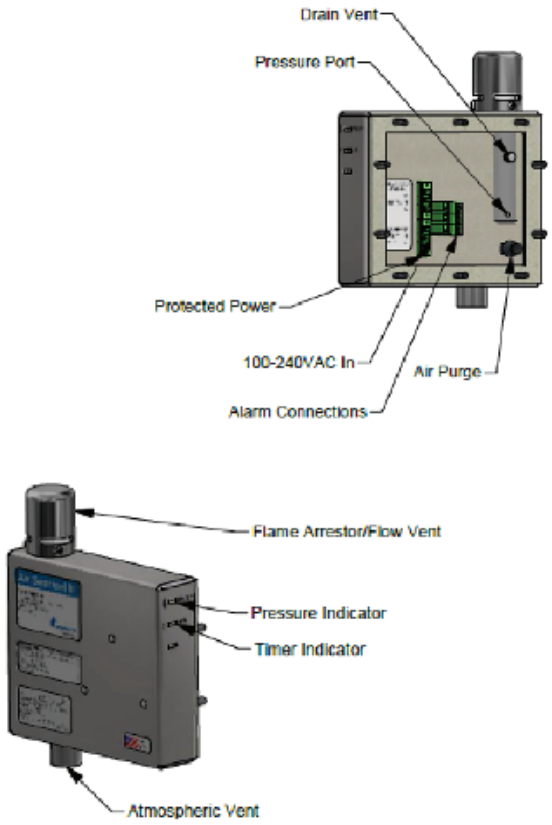


Figure 1: The Air Sentinel II

2.1 Product Description

The Air Sentinel II is a purge controller that can be used to provide protection for electrical equipment operating in potentially hazardous areas. The Air Sentinel II 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 II meets the requirement of IEC 60079-0 & 60079-2. It has been certified to IECEx hazardous location rating of Ex pxb mb IIC T4 Gb 0°C ≤ Ta ≤ 55°C and Explosive Atmospheres – Part 18: Equipment Protection by Encapsulation "m", IEC 60079-18:2009.

3.0 Installation and Commissioning

3.1 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 not probably be attained in practice.

3.2 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 II 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 II purge controller:

Terminal 3: Earth Ground

Terminal 2: Neutral

Terminal 1 Line Or Hot

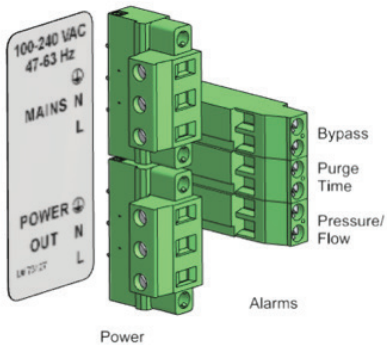


Figure 2: Air Sentinel II Electrical Connections

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

3.3 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.

3.4 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.

These contacts are rated 2A at 250VAC or 2A at 24VDC.

Refer to Figure 2 for the alarm connections. These connections terminals are NOT removable.

3.5 Mechanical Mounting

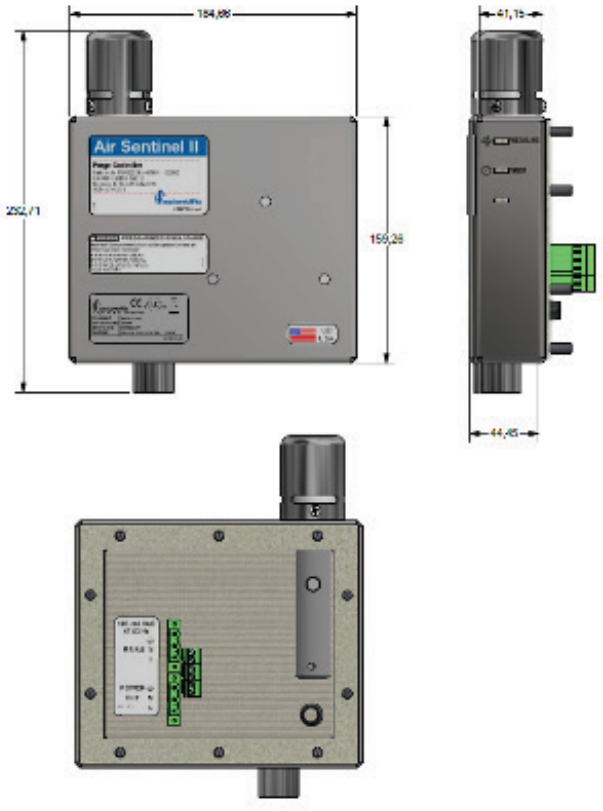


Figure 3: Air Sentinel II Dimensions

The Air Sentinel II 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 in Figure 4.

From the previous Figure 1 you will notice three ports labeled Air Purge, Pressure Port and Drain Vent. The Air Purge is the main vent that all enclosure exhaust air should exit the enclosure through. This Air Sentinel II measures this air to ensure continuous venting is occurring. The Pressure Port is where the Air Sentinel II 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.

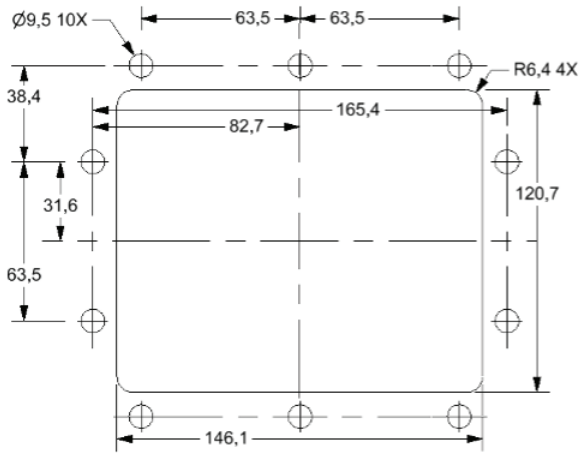


Figure 4: Enclosure Opening

4.0 Air Sentinel II Purge Controller Operation

The Air Sentinel II purge controller is mounted on the side of the main enclosure. This controller will ensure proper safe operation of the attached equipment. If of all 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 II has two indicator lamps. Should this air supply pressure fail, the top lamp on the Air Sentinel II unit will turn RED and power to the rest of the instrument is disconnected.

⚠ WARNING

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

4.1 Start Up

When power is applied to the Air Sentinel II for the first time, ensure that the air supply is connected as stated in section 3.1 and the main enclosure is closed and locked. Once power is applied, the Air Sentinel II will go through a purge period where at least five volumes of the enclosure are pushed through the Air Purge port and out the vent. During the purge period the Air Sentinel II's TIMER lamp will be RED indicating the purge is in process and no power is output.

At the complete of the purge, 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 II will continue to operate.

NOTICE

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

4.2 Indicator Lamps

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

The Air Sentinel II has two LEDs that can be either RED or GREEN.

PRESSURE : This lamp indicates if the minimum enclosure pressure is met

TIMER : This indicates if the timer is enabled

Lamp Color Matrix	Meaning	Power Out
Both lamps GREEN	Safe Operation	Power ON
TIMER Lamp RED	Instrument Purging	Power OFF
PRESSURE lamp RED	Unsafe Operation Pressure Low	Power OFF
NO Lamps	No power out applied	No power applied; everything off

Using the table above, you can quickly determine the operating condition of the power out.

Under normal safe operation both GREEN lamps should appear.

5.0 Programing

The Air Sentinel II 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 obviously vary with internal pressure and the volume of the enclosure that the system is operated at.

When used in the HF scientific SSR-Ex the purging time is set to 3 minutes.

NOTICE

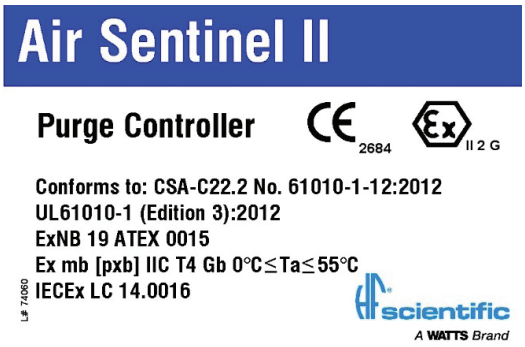
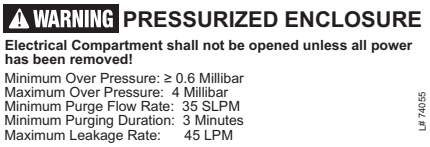
To ensure safe operation, information regarding the intended operating pressure, flow rate and timer (purge) period must be sent to HF scientific as part of the order so the Air Sentinel II can be programmed accordingly.

Each Air Sentinel II 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. To account for potential variances we recommend that the minimum setting is 1 to 2 millibar. This pressure should be regulated with an internal pressure regulator.

6.0 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 II	
Serial number, manufacturer, part number, power rating, CE & UL marking	Front of Air Sentinel II	
Warning and informational	Front of Air Sentinel II	

7.0 Limited Warranty

Watts Regulator Co. (the “Company”) warrants each ballast water market instrument 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 the Company’s invoice from the original sale of the product, 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 from the Company (Company 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 OR 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, or 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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