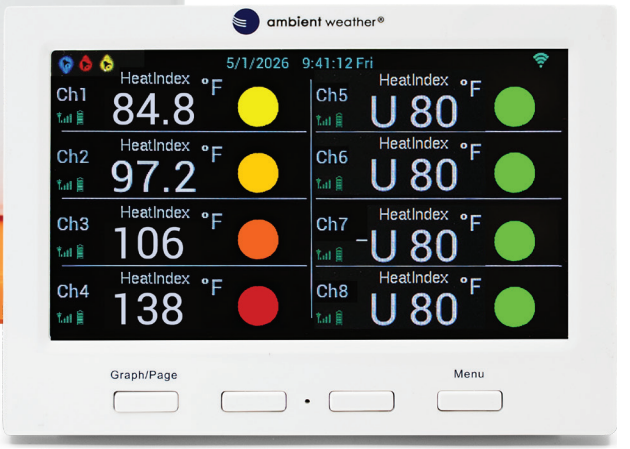
ambient weather®



WIRELESS HEAT INDEX MONITOR

Model WS-3400



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INTRODUCTION

Thank you for your purchase of the Ambient Weather WS-3400 Heat Index Monitor. The following user guide provides step by step instructions for installation, operation, and troubleshooting. To download the latest manual and additional troubleshooting tips, please visit:

https://ambientweather.com/faqs/question/tags/tag/WH51HI/

The WS-3400 can be used as a stand-alone device or connected via Wi-Fi to upload the data to our cloud hosting service at AmbientWeather.net.

To see if your weather station is compatible, please visit: https://ambientweather.com/faqs/question/tags/tag/WH51HI/

FEATURES

- Remote heat index monitoring
- On-console display
- AWN integration for current conditions, past conditions.
- Console and AWN Alarms
- Online monitoring and alerts via AWN
- Heat Index displayed on Sensor

GETTING STARTED

The Ambient Weather WS-3400 Heat Index Monitor includes the following:

Parts List

QTY	ITEM
1	WS-3400 Console
1	WH51HI Heat Index Sensor with mount
1	Power Cord

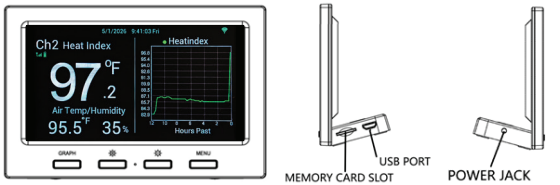
Recommended Tools

- Drill for mounting screw (if applicable).
- Small Phillips-head screwdriver for removing battery compartment cover.
- 2× AA batteries

SENSOR SETUP

Step 1: Console Setup

Power up the console using the AC adapter.



Step 2: Sensor(s) Setup

The WH51HI Wireless Heat Index Sensor requires 2×AA batteries (not included). We recommend *Energizer Lithium* batteries for longer life and a wider operating temperature range.

1. Remove the battery door on the back of the transmitter(s) by removing the Phillips-head screw then sliding down the battery door, as shown in Figure 2.
2. BEFORE inserting the batteries, locate the DIP switches on the inside cover of the lid of the transmitter.
3. The WS-3400 supports up to eight transmitters. To set each channel number (the default is Channel 1), change DIP switches 1, 2 and 3, as referenced in Figure 3.
4. To change the transmitter display units of measure (°F vs.°C), change DIP switch 4.
5. Insert two AA batteries (not included).
6. Verify the correct channel number (CH) and temperature units of measure (°F vs.°C) are on the display.
7. Close the battery door. Replace screw and tighten.
8. Repeat for the additional remote transmitters, verifying each remote is on a different channel.

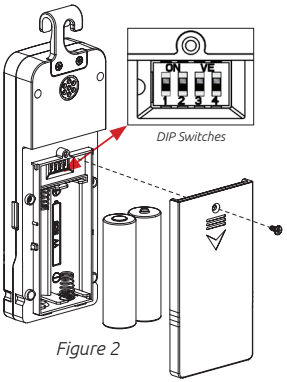


Figure 2

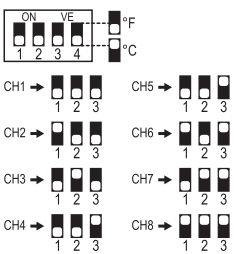


Figure 3

SENSOR PLACEMENT

To mount or hang the sensor:

- The orange hook on the top may be used to hang the sensor from wire shelving, a screw, a nail affixed to a wall or similar.
- The included orange mount plate can be attached to a wall or structure and the sensor can be pressed into it, positioned vertically, where the middle groves on the sides click in.
- The included orange mount plate can be attached to a horizontal surface, and the sensor can be pressed into it using the lower grooves on the sides to click in.
- You may choose not to attach the mount plate to a horizontal surface and allow the sensor to click in and free stand. Take care not to knock it over.



Hanger Hook



Multipurpose Mounting Plate



Back Mount

***NOTE**: Make sure the sensor is mounted vertically and not lying down on a flat surface. This will insure optimum reception. Wireless signals are impacted by distance, interference (other weather stations, wireless phones, wireless routers, TVs, and computer monitors), and transmission barriers, such as walls. In general, wireless signals will not penetrate solid metal and earth (down a hill, for example).*



Base Mount

The following is a table of reception loss vs. the transmission medium. Each "wall" or obstruction decreases the transmission range by the factor shown below.

MEDIUM	RF SIGNAL STRENGTH REDUCTION
Glass (untreated)	5-15%
Plastics	10-15%
Wood	10-40%
Brick	10-40%
Concrete	40-80%
Metal	90-100%

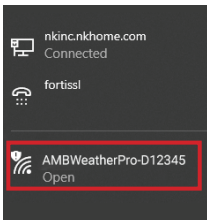
SENSOR INFO

- The WH51HI Heat Index Sensor senses temperature and humidity, then calculates heat index and sends the information to the console.
- U80: The mathematical formula to calculate heat index, as set by the US Government, is only useful within a certain range of temperature and humidity values. When conditions outside this range are present, the Sensor and Console will display “U80”. This indicates that conditions are too cool and humidity too low to result in a useful heat index value. When conditions change such that the correct heat index value is between 80° F and 140° F it will display that value.
- At the lower left of the sensor screen you will see “HI” for heat index. When conditions create an environment where heat index is above 80° F, this “HI” serves as a reminder that the value seen on the sensor is not temperature, but heat index.
- At the lower right of the sensor screen is your channel indicator. Should multiple sensors be deployed, this is the indicator of which one it is. The channel can be changed using the dip switches on the rear of the sensor, under the battery door. The battery door itself is a helpful aid to setting the switches.

CONSOLE SETUP

1. Upon powering up the display console, it will automatically search for active sensors and display on the associated channel.
2. The Wi-Fi icon on the top right corner will flash between a Wi-Fi symbol and “offline”.
3. To connect your console to Wi-Fi using any computer, smart phone, or tablet with a browser:
   - Connect to the Wi-Fi network that begins with “AMBWeatherPro.”

***NOTE**: You may be told that the network has no internet connection. Proceed to next step.*



PC Wi-Fi Networks Menu



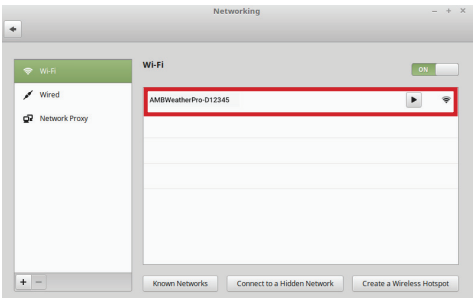
MAC Wi-Fi Selection



iOS Wi-Fi Selection

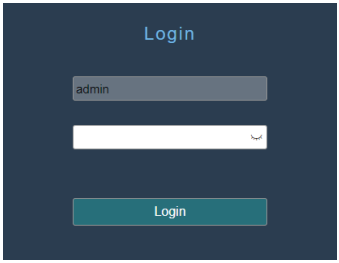


Android Wi-Fi Networks Menu



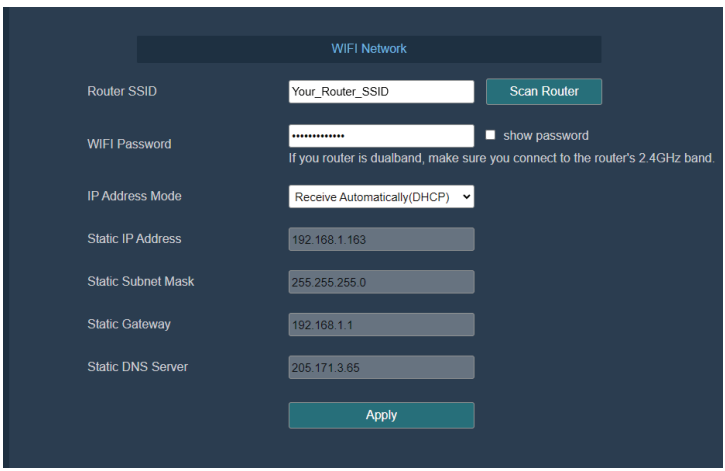
Linux Wi-Fi Networks Menu

- Open a browser window and enter 192.168.4.1 in the address bar. You will be presented with the following login screen:



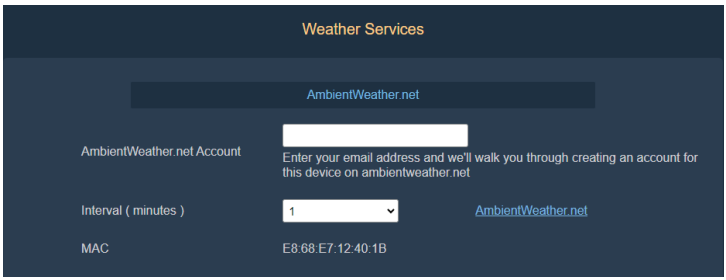
***NOTE**: Default username is "admin". No password needed—click "Login."*

- Once logged in you will want to navigate to the "Local Network" tab to connect to Wi-Fi and enter your Router SSID and Password:

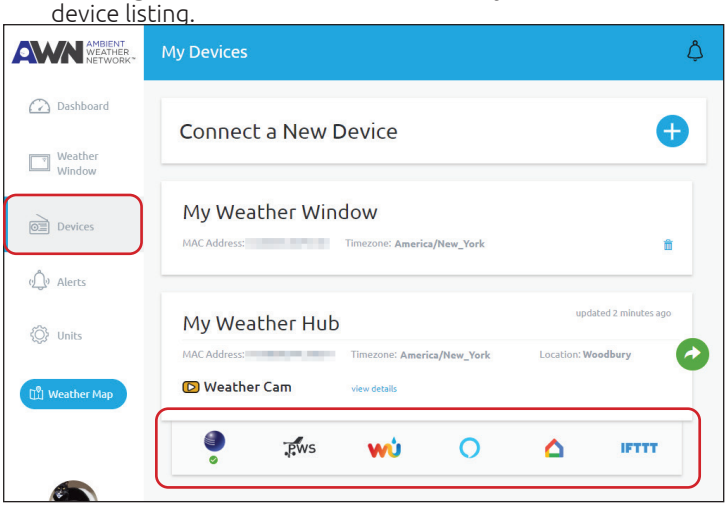


4. Select the “Weather Services” tab to program settings for the Ambient Weather Network.

   Select preferred update interval and click “Save.” Make a note of the MAC address. It will be required when you add your device to your AmbientWeather.net account.



   Services such as IFTTT, Amazon Alexa, and Google Assistant can be configured from your AWN dashboard once you have set up your AWN Account. Log in at AmbientWeather.net and go to your Dashboard. Select “Devices” from the left menu, then select the service you want to configure from the row of icons below your Weather Hub device listing.

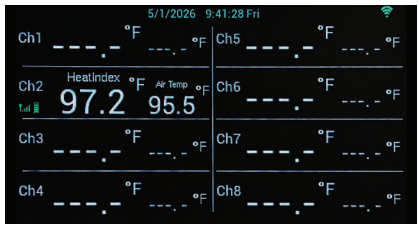


5. To reset Wi-Fi, press the “Menu” button and use the buttons associated with the arrows to scroll down once to highlight “Wi-Fi Reset”, and press the “+” button icon. On the window that appears, select “Yes.”

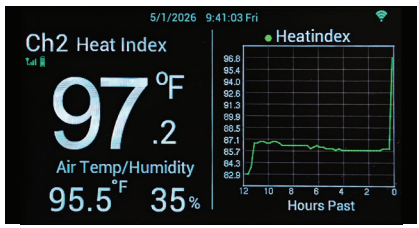
CONSOLE DISPLAY SCREENS

To switch between the three display screens, short press the "Graph/Page" button.

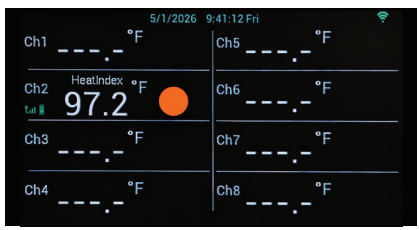
1. The first screen that comes up when plugging in the console shows 8 channels. If a sensor is active, that channel will show the heat index as well as the air temperature.



2. Pressing the "Graph/Page" button again will then display a larger heat index value with smaller air temperature and humidity values on the left half of the display, as well as a graph on the right half showing heat index over a set period. This period can be set to 12, 24, 48 and 72 hours (See menu). Each active channel will cycle through every 5 seconds.



3. One more press of the "Graph/Page" button will display the same 8 channel page as before, but with a colored dot in place of the air temperature. The dot is a way to quickly notice larger changes. This dot color goes from green when the heat index is under 80 and changes to yellows, oranges and reds as the heat index rises. The break points and colors align with US Government heat index charts.



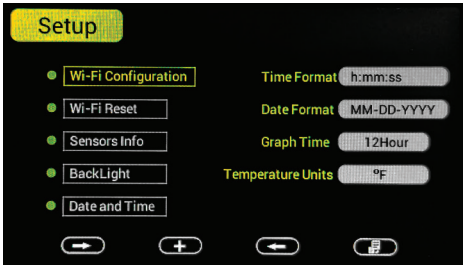
To see a full screen display of a graph, press and hold the "Graph/Page" button for about two seconds. It will show the Heat index on channel 1. Short press the same button to cycle to temperature, then humidity on the same channel. The next press will cycle to channel 2 and the process repeats all the way through channel 8. To return to one of the main pages, press the "Menu" button, with the "back" icon shown on the screen above the physical button.

MENU SCREENS

Setup Menu

Backlight

The console can set the backlight ON and OFF at prescribed times of day. The brightness can be manually set on the same page.



Date and Time

To alter date and time, press Menu, then navigate down to Date and Time and hit the "+" button. You can no adjust the time, date settings and the time zone.

Time/Date Format

- Time Format: In the Menu screen, navigate the cursor to Time Format then press the "+" icon to cycle through the options.
- Date Format: In the Menu screen, navigate to Date Format and press the "+" icon to cycle through the different options for Month, day and year.

Graph Time

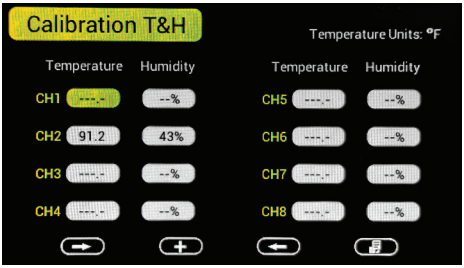
Navigate the curser to highlight "Graph Time". Then press the "+" icon to cycle through 12, 24, 48 and 72 hour options for the graphing functions of the console.

Temp Units

Navigate the curser to the highlight Temperature Units and press the "+" icon to switch between degrees F and C.

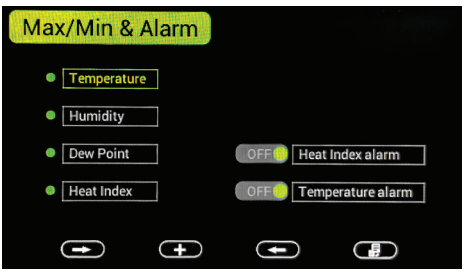
> ***NOTE**: Heat index values, the sensor, and console are optimized for degrees F. If units are changed, instead of "U80" it will read "U26.7" and subsequent heat indexes will be converted to Celsius when environment gets warm and humid enough.*

Calibration T&H Menu



The WS-3400 Heat Index Monitor includes a calibration menu for temperature and humidity sensors; however, we strongly advise against adjusting these settings, as manual changes can compromise the accuracy and safety of your Heat Index readings. Please only modify these values if specifically directed to do so by an Ambient Weather support representative to resolve a service issue.

Max/Min & Alarm Menu



- Be sure to consult your local regulatory authority before setting the alarm thresholds.
- Short Press the Menu button until you reach the “Max/Min & Alarm” page. Navigate the cursor to highlight the “ON/OFF” icon to the left of “Heat Index Alarm” or “Temperature Alarm”. With it highlighted, pressing the “+” Icon will turn the alarm on or off.
- Highlight “Heat index alarm” with the cursor and press the “+” icon to enter the alarm page. Here you may use the one-directional navigation button to highlight and select individual channel alarms and set the thresholds using the “+” and “-“ Icons.

Factory Menu



Repeatedly press the “Menu” button until you see a page labeled “Factory”. Here you can do a reset, clear the max/min values and see the device information in the “About” page. This will display relevant information such as the device’s MAC address and Firmware versions.

COMPATIBLE AMBIENT WEATHER STATIONS & SENSORS

Ambient Weather offers many optional accessory sensors. Temperature and Humidity sensors will show on the console and on AWN. Others will not show on console but will show on AWN.

> ***NOTE**: The Heat Index value calculated on the WS-3400 is based on the temperature and humidity values from the connected sensors. These can sometimes lead to inaccurate heat index values when using temperature sensors besides the WH51HI. When using the 3400 for heat index purposes, only use the WH51HI sensors.*

DESCRIPTION	PART NUMBER	IMAGE
Ultrasonic Anemometer, Outdoor Thermometer/Hygrometer, Solar Radiation and UV	WS-5000-ARRAY	
Rain Collector	WS-5000-RAIN	
Anemometer, Outdoor Thermometer/Hygrometer, Solar Radiation and UV	WS-2902-ARRAY	

Indoor Air Quality Monitor	AQIN	
Outdoor PM25 Particulate Monitor	PM25	
Indoor PM25 Particulate Monitor	PM25IN	
Wireless Temperature and Humidity Sensor	WH31E	
Wireless Temperature and Humidity Sensor	WH31B	
Leak Detector	WH31LA	
Waterproof Probe Temperature Sensor	WH31P	
Soil Moisture Sensor	WH31SM	
Leaf Wetness Sensor	WH51LW	

Wireless Refrigerator/Freezer Temperature and Humidity Sensor	WH51RF	

FIRMWARE UPDATES:

- Wi-Fi firmware can be updated via the web user interface (web UI). Consult the Wi-Fi setup section to access this page, and the Device Setting section where you will be able to check firmware and set to auto update.
- Host firmware is updated via a micro SD card containing the update, which will be available for download. To update, unplug the console, insert the micro SD card and plug in the console. It will update automatically when powered on.

BEST PRACTICES FOR WIRELESS COMMUNICATION

Wireless communication is susceptible to interference, distance, walls, and metal barriers. We recommend the following best practices for trouble free wireless communication.

Electro-Magnetic Interference (EMI): Keep the console several feet away from computer monitors and TVs.

Radio Frequency Interference (RFI): If you have other 915 MHz devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.

Line of Sight Rating: This device is rated at 300 feet line of sight (no interference, barriers or walls) but typically you will get 100 feet maximum under most real-world installations, which include passing through barriers or walls.

Metal Barriers: Radio frequency will not pass-through metal barriers such as aluminum siding. If you have metal siding, align the remote and console through a window to get a clear line of sight.

The following is a table of reception loss vs. the transmission medium. Each “wall” or obstruction decreases the transmission range by the factor shown below.

MEDIUM	RF SIGNAL STRENGTH REDUCTION
Glass (untreated)	5-15%
Plastics	10-15%
Wood	10-40%
Brick	10-40%
Concrete	40-80%
Metal	90-100%

ACCESSORIES

The WS-3400 is primarily used with the WH51HI Heat Index Sensor and is able to accept up to 8 in total. Other Ambient Weather temperature/humidity sensors are able to be used with this system, though any heat index value results from them should not be considered in your safety plan.

SPECIFICATIONS

Wireless Specifications

- Line of sight wireless sensor array RF transmission (in open air): 330 feet, 100 feet under most conditions
- Update Rate: about one minute
- RF Frequency: 915 MHz

Measurement Specifications

The following table provides specifications for measured parameters.

MEASUREMENT	RANGE	ACCURACY	RESOLUTION
Temperature	-40 to 140°F	±2°F	0.1°F
Humidity	10 to 99%	±5% (only guaranteed between 20 to 90%)	1%

Power Consumption

- 2×AA batteries (not included).

TROUBLESHOOTING

- **Email Support:** support@ambientweather.com
- **Technical Support:** 480-346-3380 (M-F 8am to 4pm Arizona Time)
- **Online Help:** https://ambientweather.com/faqs/question/tags/tag/WH51RF/

LIABILITY DISCLAIMER

Please help in the preservation of the environment and return used batteries to an authorized depot.

The electrical and electronic wastes contain hazardous substances. Disposal of electronic waste in wild country and/or in unauthorized grounds strongly damages the environment.

Reading the “User manual” is highly recommended. The manufacturer and supplier cannot accept any responsibility for any incorrect readings and any consequences that occur should an inaccurate reading take place.

This product is designed for use in the home only as indication of weather conditions. This product is not to be used for medical purposes or for public safety information.

The specifications of this product may change without prior notice.

This product is not a toy. Keep out of the reach of children.

No part of this manual may be reproduced without written authorization of the manufacturer.

Ambient, LLC WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT.

FCC STATEMENT

Statement according to FCC part 15.19:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Statement according to FCC part 15.21:

Modifications not expressly approved by this company could void the user's authority to operate the equipment.

Statement according to FCC part 15.105:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a dealer or an experienced radio/ TV technician for help.

WARRANTY INFORMATION

Ambient, LLC provides a 1-year limited warranty on this product against manufacturing defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased and only to the original purchaser of this product. To receive warranty service, the purchaser must contact Ambient, LLC for problem determination and service procedures.

Warranty service can only be performed by a Ambient, LLC. The original dated bill of sale must be presented upon request as proof of purchase to Ambient, LLC.

Your Ambient, LLC warranty covers all defects in material and workmanship with the following specified exceptions: (1) damage caused by accident, unreasonable use or neglect (lack of reasonable and necessary maintenance); (3) damage resulting from failure to follow instructions contained in your owner¡¯s manual; (4) damage resulting from the performance of repairs or alterations by someone other than an authorized Ambient, LLC authorized service center; (5) units used for other than personal use (6) applications and uses that this product was not intended (7) the products inability to receive a signal due to any source of interference or metal obstructions and (8) extreme acts of nature, such as lightning strikes or floods.

This warranty covers only actual defects within the product itself, and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.

CALIFORNIA PROP 65

***WARNING**: Use of the Ambient Weather Products can expose you to chemicals, including lead and lead compounds, which are known to the State of California to cause cancer and bisphenol A (BPA), and phthalates DINP and/or DEHP, which are known to the State of California to cause birth defects or other reproductive harm.*

Can I Trust that Ambient Weather Products are Safe Despite this Warning?

In 1986, California voters approved the Safe Drinking Water and Toxic Enforcement Act known as Proposition 65 or Prop 65. The purpose of Proposition 65 is to ensure that people are informed about exposure to chemicals known by the State of California to cause cancer, birth defects and/or other reproductive harm. A company with ten or more employees that operates within the State of California (or sells products in California) must comply with the requirements of Proposition 65. To comply, businesses are: (1) prohibited from knowingly discharging listed chemicals into sources of drinking water; and (2) required to provide a "clear and reasonable" warning before knowingly and intentionally exposing anyone to a listed chemical. Proposition 65 mandates that the Governor of California maintain and publish a list of chemicals that are known to cause cancer, birth defects and/or other reproductive harm. The Prop 65 list, which must be updated annually, includes over 1,000 chemicals, including many that are commonly used in the electronics industry.

Although our manufacturing process is "lead-free" and RoHS compliant, it remains possible that trace amounts of lead could be found in components or subassemblies of Ambient Weather

MADE IN CHINA

CUSTOMER SERVICE

Email Support:
support@ambientweather.com

Technical Support:
480-346-3380 (M-F 8am to 4pm Arizona Time)

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Products. Bisphenol A (BPSA) could conceivably be present in minute amounts in our plastic housings, lenses, labels or adhesives, and DEHP & DINP (phthalates) could possibly be found in PVC wire coatings of our cables, housings, and power cords. Unlike RoHS, Prop 65 does not establish a specific threshold for reporting on the substances of concern and instead sets forth a much less definitive standard requiring that the business demonstrate with certainty that there is "no significant risk" resulting from exposure. With respect to carcinogens, the "no significant risk" level is defined as the level which is calculated to result in not more than one excess case of cancer in 100,000 individuals exposed over a 70-year lifetime. In other words, if you are exposed to the chemical in question at this level every day for 70 years, theoretically, it will increase your chances of getting cancer by no more than 1 case in 100,000 individuals so exposed. With respect to reproductive toxicants, the "no significant risk" level is defined as the level of exposure which, even if multiplied by 1,000, will not produce birth defects or other reproductive harm. In other words, the level of exposure is below the "no observable effect level," divided by 1,000. (The "no observable effect level" is the highest dose level which has not been associated with observable reproductive harm in humans or test animals.) Proposition 65 does not clarify whether exposure is to be measured only in normal operation, or in the event of misuse such as intentionally damaging, incinerating or consuming an Ambient Weather Product or component and Ambient Weather has not attempted to evaluate the level of exposure.

A Proposition 65 warning means one of two things: (1) the business has evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) the business has chosen to provide a warning simply based on its knowledge about the presence of a listed chemical without attempting to evaluate the exposure. The California government has itself clarified that "The fact that a product bears a Proposition 65 warning does not mean by itself that the product is unsafe." The government has also explained, "You could think of Proposition 65 more as a 'right to know' law than a pure product safety law."

While using Ambient Weather Products as intended, we believe any potential exposure would be negligible or well within the "no significant risk" range. However, to ensure compliance with California law and our customers' right to know, we have elected to place the Proposition 65 warning signs on Ambient Weather Products.

For further information about California's Proposition 65, please visit https://oehha.ca.gov/prop65/background/p65plain.html