

Installation Manual
WAV-0100
Version 1.0



WAV-0100

HBX Control Systems Inc.

Table of Contents

• Introduction	3-5
o Getting Started.....	3
o Safety Symbols and Warnings.....	3
o Receiving, Inspection and Storage.....	3
o Description.....	4
o Technical Data and Dimensions.....	5
• Installation and Wiring	6-8
o Mounting and Wiring.....	6
o Setting the Dipswitches.....	6
o Establish a Wireless Connection.....	7-8
o Verify Wireless Pairing.....	8
o Battery Life Indicator.....	8
o Thermistor Output Curves.....	9-10
• Warranty Information	11

Comfort
Control
Innovation

HBX WAV-0100 WIRELESS OUTDOOR SENSOR

Introduction

This manual will help with the installation, parameter setting, troubleshooting and general maintenance requirements for the Controller. To guarantee the safe and reliable operation of this Control, you must first read this manual in detail and take particular note to any and all warnings or caution directives prior to connecting to AC power.

Only suitably qualified individuals with formal training in electrical and HVAC controls should attempt the installation of this equipment. Incorrect wiring and installation will affect the warranty provided with this unit. Wiring must be completed in accordance with the codes and practices applicable to the jurisdiction for the actual installation.

The HBX WAV-0100 is a microprocessor based controller and as such is not to be regarded as a safety (limit) control. Please consult and install the heating or cooling appliance in accordance with the manufacturer's recommendations.

SAFETY SYMBOLS AND WARNINGS:



Extreme Hazard -

This action poses a serious threat that could result in personal injury or death, as well as permanent damage to the equipment. Proceed with caution.



Moderate Hazard -

This action may cause personal injury or have adverse effects on the installation process if handled incorrectly.



Disconnect Power Source -

The presence of low voltage(24VAC) or high voltage(120VAC) could result in personal injury or permanent damage to components or equipment.



Point of Interest -

This point clarifies pertinent information, or brings your attention to an action that may have adverse effects on the installation process.

RECEIVING, INSPECTION AND STORAGE

This HBX WAV-0100 has gone through rigorous quality control tests at the factory before shipment. After receipt and before installation perform the following checks:

Receipt

After receiving, inspect the unit for any possible physical damage that may have occurred during transportation.

Inspection

After unpacking the unit make sure the box contains:

- 1 x Base Unit
- 1 x Outdoor Unit
- 2 x AA Batteries (installed in Outdoor Unit)
- Instruction Manual

Make sure the part number on the unit corresponds to the part number on the original box.

Storage

The WAV-0100 should be kept in its original shipping carton prior to installation. In order to retain the warranty coverage it should be stored properly:

- Store in a clean dry place
- Store within an ambient temperature range of +10°C to +40°C
- If possible, store in an air-conditioned environment where the relative humidity is less than 95%
- Do not store in places where the unit may come into contact with corrosive gases or liquids
- Do not store in an area or upon an unstable surface where it may become damaged due to falling

HBX WAV-0100 WIRELESS OUTDOOR SENSOR

Description

The HBX WAV-0100 Control is designed to be a microprocessor based outdoor wireless sensor system. It is easy to install, requiring no wiring for simple installation. The weatherproof sensor is reliable and has a minimum two year battery life.

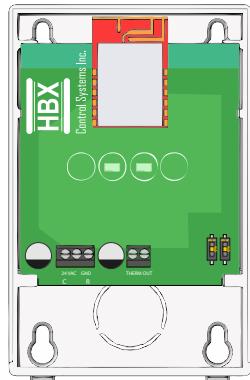
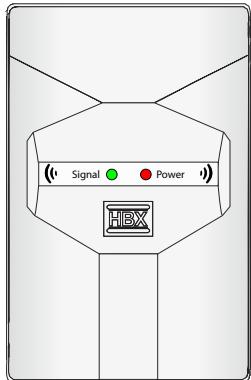
Some features of the HBX WAV-0100 are:

- Temperature range: -20°F to 225°F
(operating temperature range down to -40°F)
- Proprietary pairing and communication protocol
- 500,5k,10k,20k Ohm thermistor options built in; dipswitch selectable
- Provides a 2000 ft. open air range

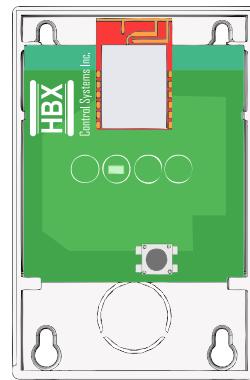
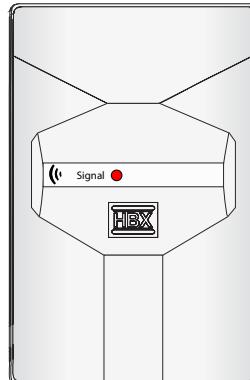
The HBX WAV-0100 consists of two components:

- Base Unit: This box is designed to be the interface between the controller and the outdoor unit.
- Outdoor Unit: This weatherproof box contains a thermistor sensing element to provide a reliable outdoor temperature to the base unit.

Base Unit



Outdoor Unit



TECHNICAL DATA AND DIMENSIONS

Technical Data

- 1 x Power Contact: 24VAC
- 2 x Contact output

Storage:

+10°C to 40°C

Languages:

English

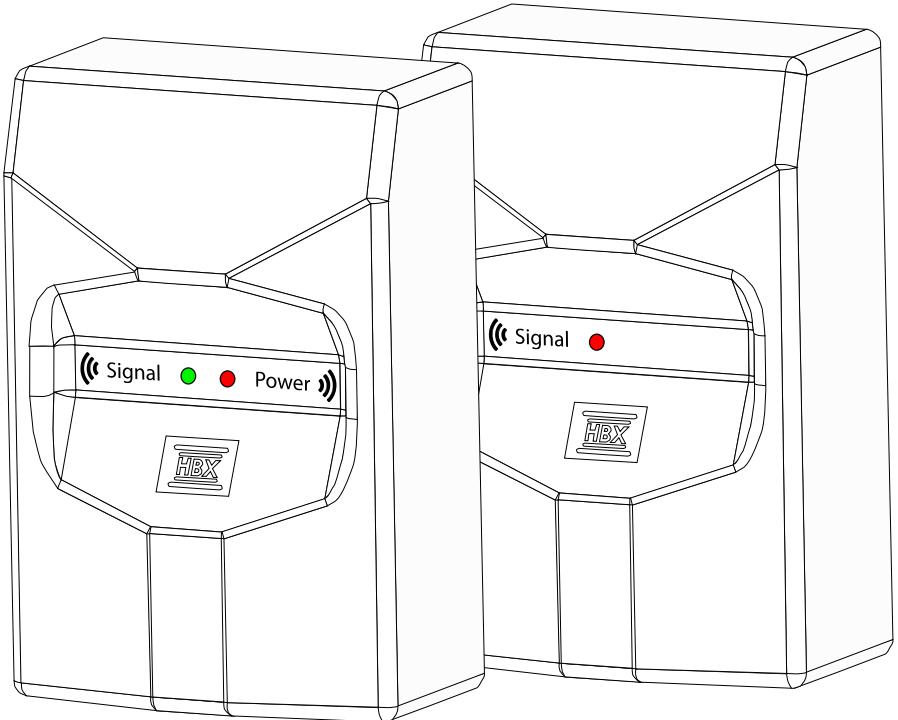
Weight:

0.177kg

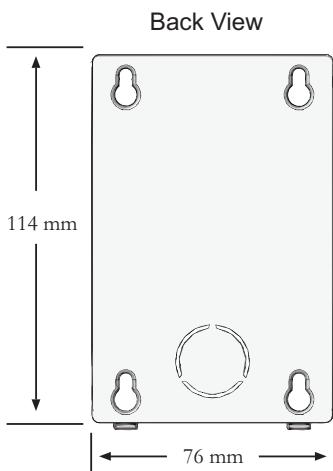
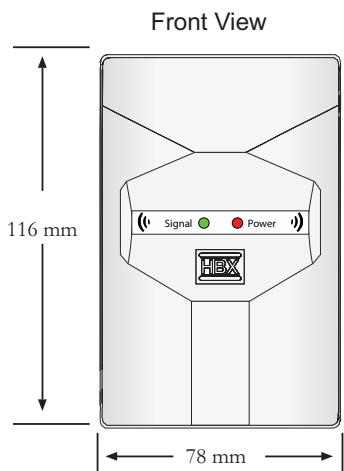
RF Info:

Contains IC: 7693A-24J40MB

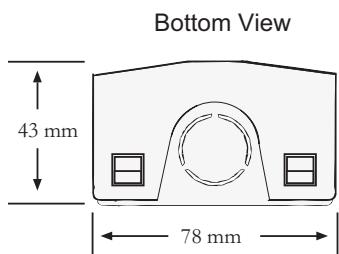
Contains FFC ID: 0A3MRF24J40MB



Dimensions



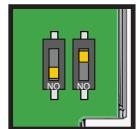
Note: Outdoor and base units are the same dimensions.



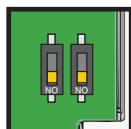
WIRING AND INSTALLATION

Setting the Dipswitches

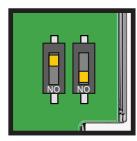
The Dipswitches enable you to configure the Wireless Outdoor Sensor to work with different thermistor curves. See FIG 1 to select the appropriate thermistor curve.



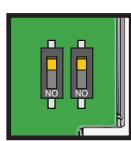
Dip 1 ON only: 500 Ohms



Both ON: 20k Ohms



Dip 2 ON only: 5k Ohms



Both OFF : 10k Ohms*

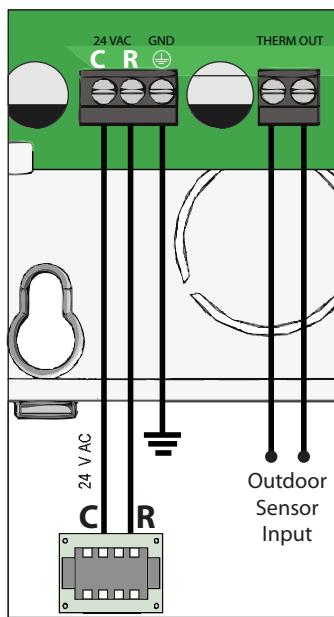
*Default Setting

FIG 1

Mounting and Wiring the Base Unit

- Place a flat screwdriver into the top part of the base unit. Pry the screwdriver up on the back of the plastic and then pull off the front cover.
- Connect 18 AWG or similar wire to the THERM OUT terminals in the base and run the wire from here to the outdoor sensor control terminal. See FIG 2A for regular setup, and FIG 2B for Vitodens 200 setup.
- Supply 24 VAC power to the terminals in the base unit. This connection provides power to the microprocessor. (see FIG 2A/2B)

Regular Setup



If you are using an existing transformer to connect the Base Unit, make sure the "C" and "R" wires are connected to the right terminal.



Ensure Proper setup, or damage will occur to the board.



Try not to mount the Base Unit by high voltage wiring or equipment, especially contactors or high voltage switching devices.

Vitodens 200 Setup ONLY

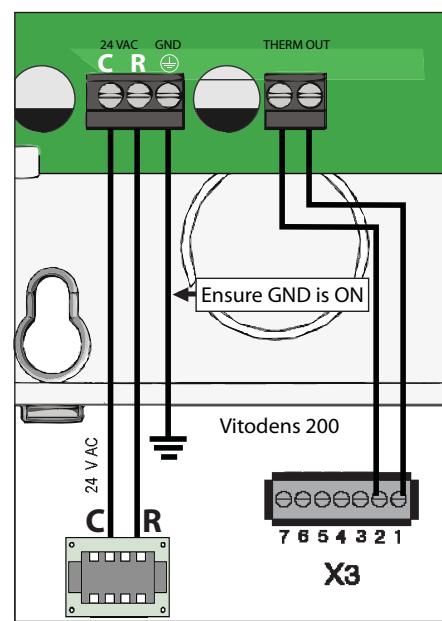
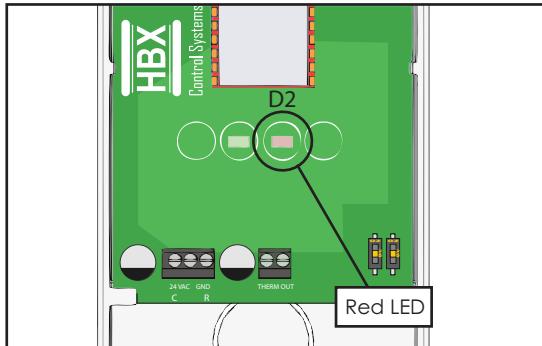


FIG 2A

FIG 2B

Establish a Wireless Connection

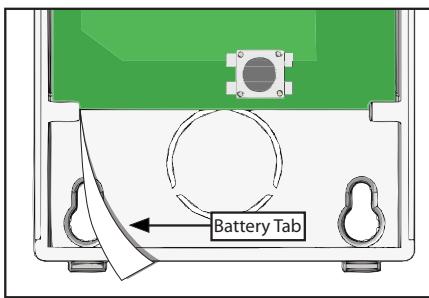
- Once you connect 24 VAC to the base unit, the red power LED (D2) will start to flash (after a 15 seconds startup process). (see FIG 3)



Base Unit

FIG 3

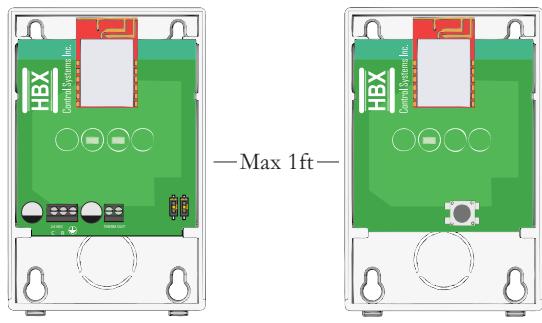
- Remove the battery tab from the outdoor unit. (see FIG 4)



Base Unit

FIG 4

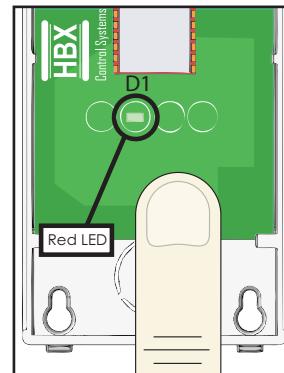
- Hold the outdoor unit within 1 foot of the base unit during this pairing. (see FIG 5)



Base Unit

Outdoor Unit

- Push and hold the button located on the outdoor sensor until the red LED light turns off (approx. 15 seconds), then release the button. The LED will switch back on after a few seconds as it is initiating the pairing process. (see FIG 6)



Outdoor Unit

FIG 6

- Once paired, the outdoor sensor will blink 3 times. Wireless pairing is successful when you see the green LED on the base unit flash. The green LED should flash up to 6 times, indicating good signal strength. You can then put the front cover on both the base and the outdoor sensor. At this point, you will install the outdoor sensor. (see FIG 7)

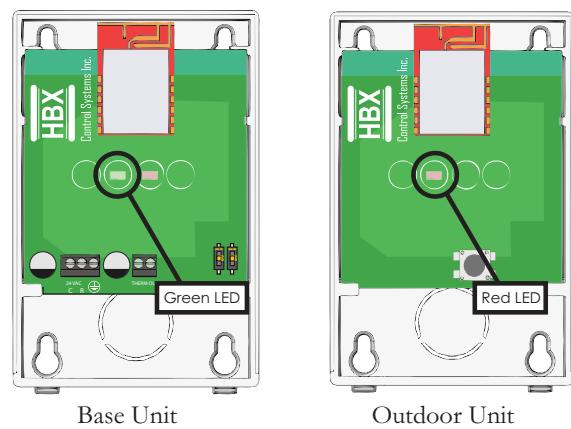


FIG 7

- The HBX WAV-0100 can be mounted directly onto a wall.
- In order to prevent heat transmitted through the wall from affecting the sensor reading, it may be necessary to install an insulating barrier behind the enclosure.
- Mount the sensor on an exterior NORTH wall. Choose a location protected from direct sunlight.
- Keep the sensor away from any wiring that may be outside and also at least 1 foot away from any metal in all directions so there is not interference with the wireless sensor.



Do not mount the outdoor sensor with the conduit knockout facing upwards as rain could enter the enclosure and damage the sensor.

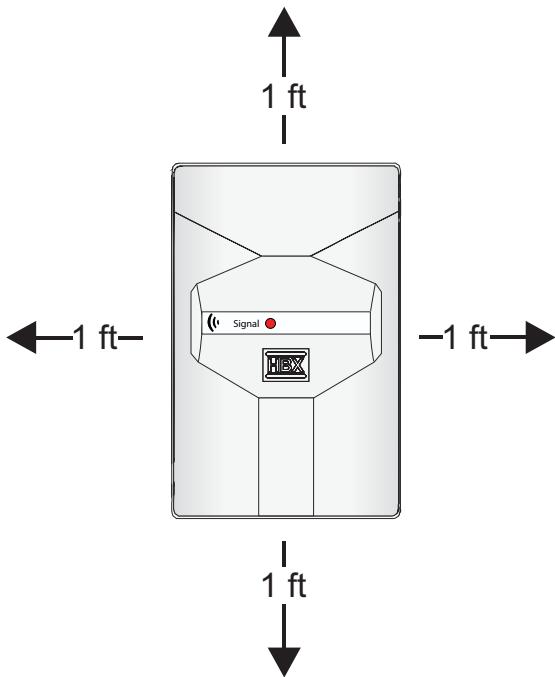


FIG 8

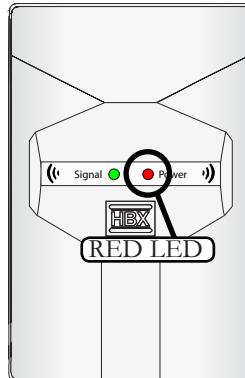
Verify Wireless Pairing

After the base unit and the outdoor unit are installed and the wireless pairing process is complete, verify the wireless operation.

Steps to take for verification:

1. Press the button on the outdoor unit once. The red LED will flash on the outdoor unit to indicate a transmit.
2. The green signal strength on the base unit should flash up to 6 times based on the signal strength, six being the strongest signal.
3. Wireless verification is complete

Battery Life Indicator

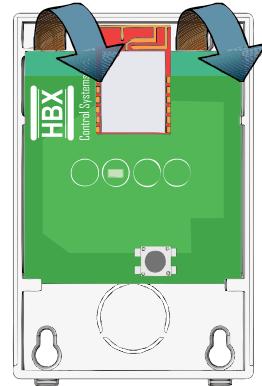


Check the RED power LED on the base unit. If the LED flashes twice per second (Four times faster than average), it indicates that the Outdoor Unit will require new batteries within 3 months. (FIG 9)

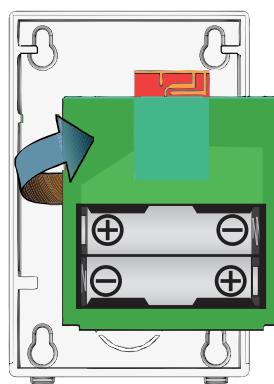
FIG 9

Changing the Batteries

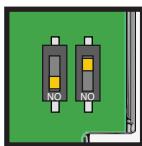
Flip Forward and Out



Flip and Replace Batteries

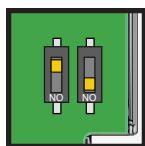


Outdoor Unit

THERMISTOR OUTPUT CURVES

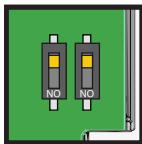
Dip 1 ON only: 500 Ohms

Temp (°C)	Temp (°F)	Resistance (Ohms)
-29	-20	426
-26	-15	433
-23	-10	440
-21	-5	447
-18	0	454
-15	5	461
-12	10	469
-9	15	476
-7	20	483
-4	25	490
-1	30	497
2	35	504
4	40	511
7	45	519
10	50	526
13	55	533
16	60	540
18	65	547
21	70	554
24	75	561
27	80	568
29	85	576
32	90	583
35	95	590



Dip 2 ON only: 5k Ohms

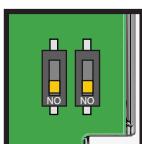
Temp (°C)	Temp (°F)	Resistance (Ohms)
-30	-22	88340
-20	-4	48487
-10	14	27648
0	32	16325
10	50	9952
20	68	6247
25	77	5000
30	86	4028
40	104	2662
50	122	1801
60	140	1244
70	158	876

THERMISTOR OUTPUT CURVES (CONT.)

Both OFF : 10k Ohms*

*Default Setting

Temp (°C)	Temp (°F)	Resistance (Ohms)
-29	-20	166342
-26	-15	138482
-23	-10	11571
-21	-5	102868
-18	0	86463
-15	5	7294
-12	10	61711
-9	15	52392
-7	20	47052
-4	25	40153
-1	30	34367
2	35	29498
4	40	26686
7	45	23013
10	50	19903
13	55	17255
16	60	15000
18	65	13681
21	70	11942
24	75	10449
27	80	9164
29	85	8407
32	90	7401
35	95	653



Both ON: 20k Ohms

Temp (°C)	Temp (°F)	Resistance (Ohms)
-28	-19	371140
-25	-13	300459
-22	-7	244304
-18	-1	199368
-15	5	163471
-12	11	134575
-8	17	111156
-5	23	92214
-2	29	76783
2	35	64129
5	41	53777
8	47	45249
9	49	42750
13	55	36111
16	61	30615
19	67	26037
23	73	22200
26	79	18994
29	85	16297
33	91	14016

Limited Warranty

HBX Controls warrants each of its products to be free from defects in workmanship and materials under normal use and service for a period of 24 months from date of manufacture or 12 months from date of purchase from an HBX Authorized Dealer, if within the above documented period after date of manufacture.

If the product proves to be defective within the applicable warranty period, HBX on its sole discretion will repair or replace said product. Replacement product may be new or refurbished of equivalent or better specifications, relative to the defective product. Replacement product need not be of identical design or model. Any repair or replacement product pursuant to this warranty shall be warranted for not less than 90 days from date of such repair, irrespective of any earlier expiration of original warranty period. When HBX provides replacement, the defective product becomes the property of HBX Controls.

Warranty Service, within the applicable warranty period, may be obtained by contacting your nearest HBX Controls office via the original Authorized Agent and requesting a Return Material Authorization Number (RMA #). Proof of purchase in the form a dated invoice/receipt must be provided to expedite the issuance of a Factory RMA.

After an RMA number has been issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit. The RMA number must be visible on the outside of the package and a copy included inside the package. The package must be mailed or otherwise shipped back to HBX with all costs of mailing/shipping/insurance prepaid by the warranty claimant.

Any package/s returned to HBX without an approved and visible RMA number will be rejected and shipped back to purchaser at purchaser's expense. HBX reserves the right, if deemed necessary, to charge a reasonable levy for costs incurred, additional to mailing or shipping costs.

Limitation of Warranties.

If the HBX product does not operate as warranted above the purchasers sole remedy shall be, at HBX's option, repair or replacement. The foregoing warranties and remedies are exclusive and in lieu of all other warranties, expressed or implied, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for a particular purpose/application. HBX neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale, installation maintenance or use of HBX Controls products.

HBX shall not be liable under this warranty; if its testing and examination discloses that the alleged defect in the product does not exist or was caused by the purchasers or third persons misuse, neglect, improper installation or testing, unauthorized attempts to repair or any other cause beyond the range of intended use, or by accident, fire, lightning or other hazard.

Limitation of Liability.

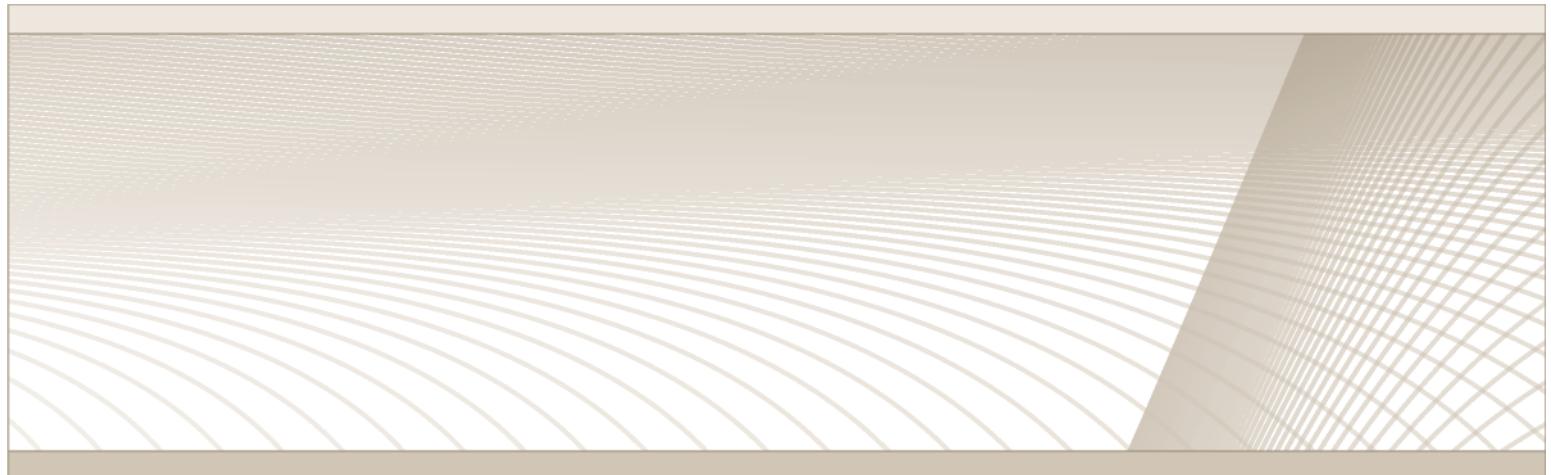
In no event will HBX be liable for any damages, including loss of data, loss of profits, costs of cover or other incidental, consequential or indirect damages arising out of the installation, maintenance, commissioning, performance, failure or interruption of an HBX product, however caused and on any theory of liability. This limitation will apply even if HBX has been advised of the possibility of such damage.

Local Law.

This limited warranty statement gives the purchaser specific legal rights. The purchaser may also have other rights which vary from state to state in the United States, from Province to Province in Canada and from Country to Country elsewhere in the world.

To the extent this Limited Warranty Statement is inconsistent with local law, this statement shall be deemed modified to be consistent with such local law. Under such local law, certain disclaimers and limitations of this statement may not apply to the purchaser. For example, some states in the United States, as well as some governments outside the United States (including Canadian Provinces), may: Preclude the disclaimers and limitations in this statement from limiting the statutory rights of a consumer (e.g. United Kingdom); Otherwise restrict the ability of a manufacturer to enforce such disclaimers or limitations; or Grant the purchaser additional warranty rights which the manufacturer cannot disclaim, or not allow limitations on the duration of implied warranties.

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