



MODEL OS-200

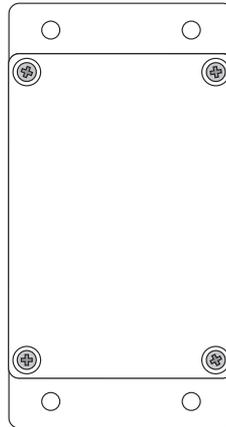
Wireless Outdoor Sensor

for Model 3200-Plus and
Model 3250-Plus
Fuel Smart HydroStats

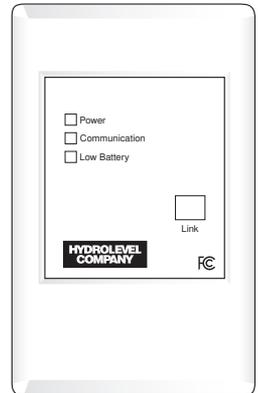
Installation Instructions and Operating Manual

- Compatible with all HydroStat-Plus models
- Low Transmitter battery status indicator on the Receiver
- Power and communication indicator lights
- Transmitter temperature range of -40°F to 140°F (-40°C to 60°C)
- Long battery life (minimum 10 years) with included 1.5V lithium AA batteries
- 5000 ft. (1500 m) open range
- 8 walls / 250 ft. (75 m) indoor range
- Transmits outdoor temperature every 10 minutes

The Hydrolevel Wireless Outdoor Sensor OS-200 provides outdoor temperature measurement in any application without exterior wiring. The **transmitter** and **receiver** are sold pre-linked and are installation-ready. With exceptional range and a 10-year battery life, the Wireless Outdoor Sensor OS-200 provides maximum accuracy, convenience and reliability.



TRANSMITTER
(OUTDOOR)



RECEIVER



WARNING **Electrical shock hazard.** To prevent electrical shock, death or equipment damage, disconnect power supply before installing or servicing control.

Only qualified personnel may install or service this control in accordance with local codes and ordinances. Read instructions completely before proceeding.



CAUTION To prevent serious burns, boiler should be thoroughly cooled before installing or servicing control.



WARNING **Frozen pipes/water damage.** Central heating systems are prone to shut down as a result of power or fuel outages, safety related fault conditions or equipment failure. Installation of freeze protection monitoring or other precautions is recommended for unattended dwellings in climates subject to sustain below-freezing temperatures.

**HYDROLEVEL
COMPANY**

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www.hydrolevel.com

FCC ID: 2AHQR-10850A **IC ID:** 21247-10850A

FCC: This product has been tested and found to comply with FCC part 15 subpart C. Operation is subject to the following two conditions: (1) this device may not cause Harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of the device. However, there is no guarantee that interference will not occur in a particular installation. If this device 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 the dealer or an experienced radio/TV technician for help

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada

This Device complies with Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions: 1) this device may not cause interference, and 2) this device must accept any interference, including interference that may cause undesired operation of the device under Industry Canada regulations.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Warning: FCC and IC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this equipment must be installed to provide a separation distance of at least 8 inches (20cm) from all persons.

Cet équipement est conforme à l'exposition aux radiations de FCC et d'Industrie Canada établies pour un environnement non contrôlé. L'antenne (s) utilisé pour cet équipement doit être installé pour fournir une distance d'au moins 20cm à partir de toutes les personnes.

WARNING



It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. Hydrolevel is not responsible for damages resulting from improper installation and/or maintenance.

To avoid serious personal injury and damage to the equipment:



- Read manual and all product labels BEFORE using the equipment. Do not use unless you know the safe and proper operation of this equipment.
- Keep this manual available for easy access by all users.
- Replacement manuals are available at hydrolevel.com
- Disconnect all power before opening the control.
- Do not attempt to service the control. There are no user serviceable parts inside the control. Attempting to do so voids warranty.



NOTICE

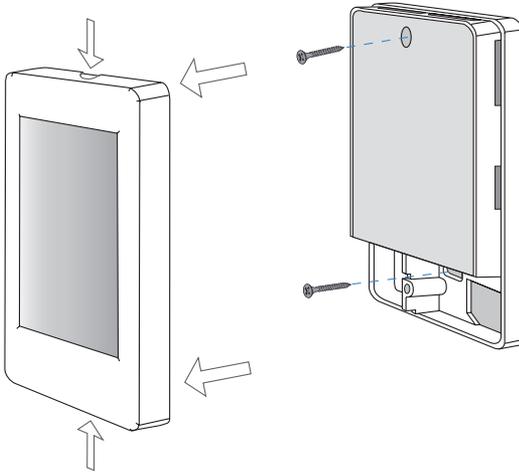
This symbol identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.

This product is packaged with two AA lithium metal batteries and must be transported in accordance with all relevant and international regulations. Contact your freight company for more information. Hydrolevel is not responsible for damages resulting from improper transportation, installation and/or maintenance.

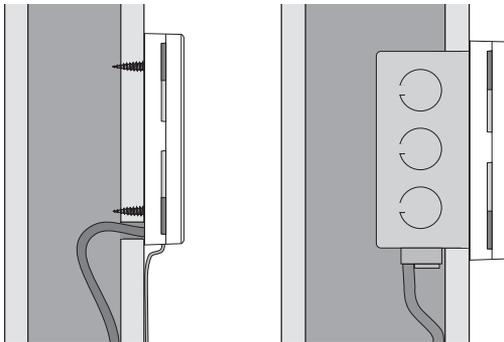
STEP 1 - INSTALL RECEIVER

When choosing the location for the **receiver** unit, consider the following:

- Interior wall.
- Keep dry. Avoid potential leakage onto the unit.
- Relative humidity less than 90%. Non-condensing environment.
- No exposure to extreme temperatures beyond 32° to 122°F (0° - 50°C).
- Away from equipment, appliances, or other sources of electrical interference.
- Easy access for wiring.
- Approximately 5 feet (1.5 m) off the finished floor.



Grasp the front cover by the fingertip grips on the top and bottom of the enclosure and pull the front cover off.



The enclosure is either mounted flush onto a wall or it can be placed onto a 2" x 4" non-conductive electrical box. The mounting holes in the enclosure accept #6 screws. Wiring to the control enters the wiring chamber through the back or bottom of the enclosure.

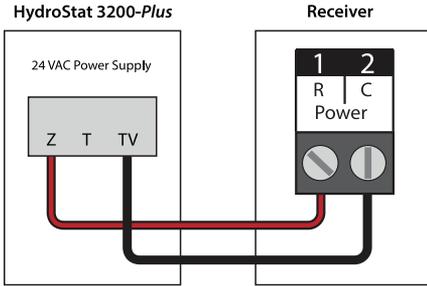
STEP 2 – PROVIDE POWER

NOTICE

The receiver unit must be powered with 24 VAC

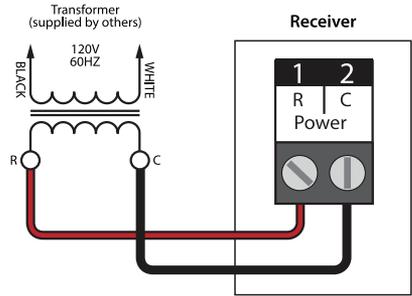
Wiring to HydroStat Model 3200-Plus (Gas applications)

The 3200-Plus provides a 24 volt power supply in the thermostat terminal block located at the top left hand corner of the control. Make connections as shown below.



Wiring to HydroStat Model 3250-Plus (Oil applications)

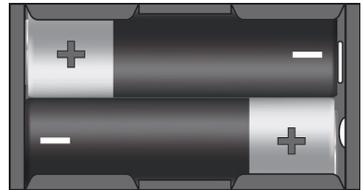
The 3250-Plus is not equipped with a 24 VAC power supply. Locate an existing 24 volt power supply or add a transformer (supplied by others) as shown below.



Batteries in the Transmitter unit

Remove the cover from the **transmitter** unit. Insert the included batteries as marked on the battery holder.

1.5V lithium batteries are required to provide the specified battery life and temperature range. Alkaline batteries have short life spans and may fail during cold weather.

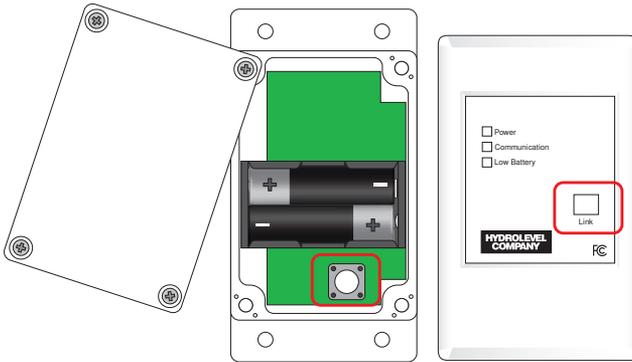
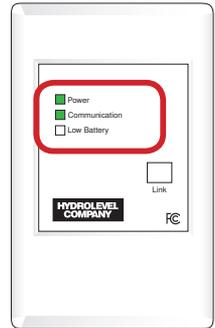


STEP 3 – CONFIRM LINK

If the communication light is displayed on the control, the **transmitter** is linked properly.

If the light is not on, the devices will need to be linked.

To link the **transmitter** and **receiver**, remove the cover on the **transmitter** so that the button below the battery terminals can be accessed. Press and hold both the button on the **transmitter** and the button on the **receiver** simultaneously for 5 seconds and release. Upon release, the linkup process will begin; the communication LED on the **receiver** will flash 8 times. Linking is successful when the communication LED is steady on.

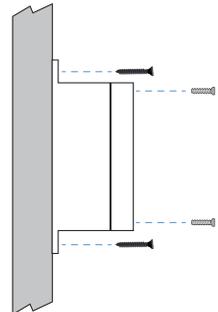


The link button on the **receiver** can also be used as a reset. If pushed, the **receiver** will revert to a power-up condition; a temperature of 75°F (24°C) will be reported until the first transmission is received (up to 10 minutes).

STEP 4 – INSTALL TRANSMITTER

The **transmitter** should be mounted on a northern exterior wall away from direct sunlight. 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.

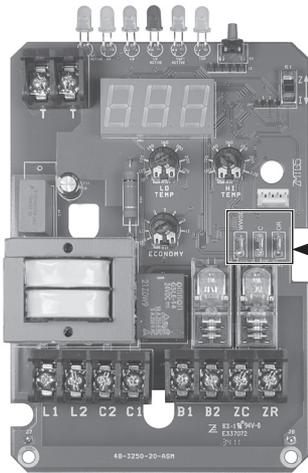
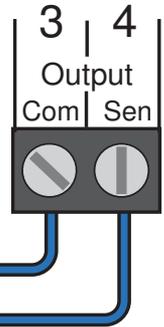
- The OS-200 should not be exposed to heat sources such as ventilation or window openings.
- The OS-200 should be installed at an elevation above the ground that will prevent accidental damage or tampering.
- Do not install the **transmitter** on a conductive surface.
- The **transmitter** will send outdoor temperature data every 10 minutes.



STEP 5 – SENSOR TERMINAL WIRING

Connect 2-conductor wire between the HydroStat control and the sensor terminals (3 and 4) on the **receiver**. This connection is polarity sensitive. Wire the output **Com** terminal on the **receiver** to the **C** terminal on the HydroStat control. Wire the output **Sen** terminal on the **receiver** to the **OR** (or **WWSD**) terminal on the HydroStat control. At power-up the **receiver** will report a temperature of 75°F (24°C) until the first temperature transmission is received (up to 10 minutes). Wait up to 10 minutes to verify that the temperature at the control is accurate. If the temperature displayed at the control is unreasonably hot the wires may be reversed.

To outdoor sensor terminals on
Hydrolevel control



HydroStat Control

Outdoor Sensor Terminals

Locate the three quick connect posts on the HydroStat circuit board. The sensor cable will plug into two of these terminals depending on the features to be used.

Outdoor Reset AND Warm Weather Shutdown

Attach the spade connectors to the **right** and **center** spade posts (**OR** and **C**) for full outdoor reset functionality including warm weather shutdown protection. Wiring this way overrides the Thermal Targeting function of the Fuel Smart HydroStat control.

Warm Weather Shutdown Only (WWSD)

Connect the wire ends to the **left** and **center** spade connectors (**WWSD** and **C**) to add warm weather shutdown functionality only. When wired this way, the Fuel Smart HydroStat control will utilize its internal Thermal Targeting function to reset the boiler temperature.

STEP 6 – SETTING THE HYDROSTAT CONTROL

IMPORTANT: The OS-200 must be plugged in to the HydroStat prior to setting the control.

SETTING WARM WEATHER SHUTDOWN

The warm weather shutdown feature prevents the boiler from providing space heating when the outside temperature reaches a level that you select. Available settings range from OFF or 40°- 70°F. The boiler will still operate to satisfy a call for domestic hot water. The factory default setting for the warm weather shutdown is 70°F.

STEP 6 – SETTING THE HYDROSTAT CONTROL – continued

To set the desired warm weather shutdown temperature:

Press and hold the TEST/SETTING BUTTON and simultaneously adjust the ECONOMY dial to the desired setting. To turn the feature off – which will allow space heating regardless of outdoor temperature – press and hold the TEST/SETTING BUTTON and simultaneously turn the ECONOMY dial fully counter-clockwise. Release the TEST/SETTING BUTTON. Be sure to reset the ECONOMY dial to the correct setting. Any time the outdoor temp exceeds the WWSD setpoint, the display will toggle boiler temperature (8 seconds), outdoor temperature (2 seconds), and OFF (2 seconds).

SETTING THE OUTDOOR RESET

The outdoor reset will regulate the boiler's temperature based on the temperature outside. On cold days, the boiler will run at higher temperatures to meet the heating load in the house. On warmer days, the boiler will run cooler to save energy while still meeting the heating needs of the house. The HydroStat control uses a Reset Ratio to calculate and maintain the proper boiler temperature.

To set the desired outdoor Reset Ratio:

1. Determine the Reset Ratio using the table below:

- Locate the Outdoor Design Temperature for the system on the bottom of the Reset Ratio Chart below. Round down to the next lowest number.
- Locate the Boiler Design Temperature (supply temperature needed to meet heating load at the Outdoor Design Temperature) on the left of the Reset Ratio Chart below.

2. Adjust the ECONOMY dial on the Fuel Smart HydroStat control to the Reset Ratio determined by the intersection of a. and b. above.

Example: For a house located in Springfield MA (Design Temperature of 0°F) with baseboard heat (that was sized for the house based on the 180°F baseboard rating), the reset ratio is 1.50.

RESET RATIO CHART

BOILER TEMPERATURE	220	1.50	1.50	1.50	1.50	1.75	1.75	1.75	2.00	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50		
	215	1.25	1.50	1.50	1.50	1.50	1.75	1.75	1.75	2.00	2.25	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
	210	1.25	1.25	1.50	1.50	1.50	1.50	1.50	1.75	2.00	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	205	1.25	1.25	1.25	1.50	1.50	1.50	1.50	1.75	1.75	2.00	2.25	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	200	1.25	1.25	1.25	1.50	1.50	1.50	1.50	1.75	1.75	2.00	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	195	1.00	1.25	1.25	1.25	1.50	1.50	1.50	1.50	1.75	1.75	2.00	2.25	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	190	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.50	1.75	1.75	2.00	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	185	1.00	1.00	1.00	1.25	1.25	1.25	1.25	1.25	1.50	1.50	1.75	1.75	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	180	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.50	1.75	2.00	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	175	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.50	1.75	1.75	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	170	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.50	1.75	1.75	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	165	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.50	1.50	1.75	1.75	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	160	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.75	1.75	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50
	155	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.75	2.00	2.25	2.50	2.50	2.50	2.50	2.50	2.50
	150	0.75	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.25	1.25	1.50	1.50	1.75	1.75	2.00	2.50	2.50	2.50	2.50	2.50	2.50
	145	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.25	1.25	1.50	1.50	1.75	2.00	2.25	2.50	2.50	2.50	2.50	2.50
140	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.25	1.25	1.50	1.50	1.75	2.00	2.50	2.50	2.50	2.50	2.50	
		-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45				
		OUTDOOR DESIGN TEMPERATURE																					

Refer to the Fuel Smart HydroStat instructions for other control settings.

HOW THE OUTDOOR SENSOR WORKS

Outdoor Temperature Reset

The outdoor reset feature monitors outdoor temperature to continuously adjust the boiler water to the minimum temperature required to satisfy the heat demand. The feature is activated automatically when the Hydrolevel OS-100 or OS-200 is wired to the OR and C spade connects on the Fuel Smart HydroStat. When connected, Outdoor Reset overrides the Thermal Targeting temperature reset method which is built into the Fuel Smart HydroStat. The display will toggle between boiler temperature (8 seconds) and outdoor temperature (2 seconds). If the sensor becomes damaged or disconnected, the control will automatically revert back to the Thermal Targeting reset method. The display will no longer toggle outdoor temperature.

Reset Ratio

The Fuel Smart HydroStat control's Outdoor Reset feature uses a reset ratio method to control the boiler temperature. The reset ratio determines how much the boiler temperature is adjusted for changes in outdoor temperature. A reset ratio of 2.0 means that for each 1 degree increase in outdoor temperature, the boiler temperature will decrease 2 degrees. Conversely, for each 1 degree drop in outdoor temperature, the boiler temperature will increase 2 degrees. The control adds 10 degrees to the calculated reset temperature and provides a 20 degree differential for burner operation. So, if the control calculates a reset temperature of 150°F, it will set a target temperature of 160°F. It will then allow the burner to fire up to 160°F and draw down to 140°F before re-firing. This operation will maintain the desired average temperature of 150°F. You can check the current target temperature at any time, by pressing the Test/Settings button in 4 short intervals.

Thermal Boost

To insure that the heating system always satisfies a call for heat, the Fuel Smart HydroStat control is equipped with a thermal boost feature. If the thermostat is not satisfied thirty minutes after the boiler reaches the reset temperature, the control will boost the reset temperature by 10 degrees. It will continue to boost at 30 minute intervals until the call is satisfied. Once the call is satisfied, the control reverts to normal operation, utilizing the calculated reset temperature.

LOSS OF COMMUNICATION / TROUBLESHOOTING

If the Communication LED is not on, try the following:

1. Confirm that the receiver is powered with 24 VAC by observing that the green Power LED is on.
2. Locate the **transmitter**. Remove the cover, and push the button located below the battery terminals. The LED will flash once to indicate transmission. Locate the **receiver**, and see if the Communication LED is on. If it does not come on, it may be one of three problems:
 - The **transmitter** may be out of range. Try moving the **transmitter** closer to the **receiver**. Push the transmission button inside the **transmitter** and confirm that the communication LED turns green.
 - The battery life of the **transmitter** batteries may have expired. This is likely the issue if the batteries have been in extended service. They can be replaced with 1.5V lithium batteries.
 - The link may have been interrupted. Try re-linking the devices, as described on page 4.
3. If the communication LED remains off for over 30 minutes, please call Tech Support at 203-776-0473.

LED OPERATION

LED Indicator	Status	Description
Power	Green	Normal operation
	Off	No power. Check that the wires are securely connected to the device.
Communication	Green	Signal is good.
	Off	No signal. There is a loss of communication or the Transmitter battery is dead, resulting in an open circuit error on the control.
	Flashing	Signal is weak. Consider relocating a device to obtain a stronger signal.

SENSOR RESISTANCE SETTINGS

10K Type 2 NTC Thermistor

Resistance	Temperature
336095	-40°F (-40°C)
242426	-31°F (-35°C)
176801	-22°F (-30°C)
130307	-13°F (-25°C)
97007	-4°F (-20°C)
72910	5°F (-15°C)
55303	14°F (-10°C)
42316	23°F (-5°C)
32651	32°F (0°C)
25395	41°F (5°C)
19903	50°F (10°C)
15714	59°F (15°C)
12493	68°F (20°C)
10000	77°F (25°C)
8056	86°F (30°C)
6530	95°F (35°C)
5325	104°F (40°C)
4367	113°F (45°C)
3601	122°F (50°C)
2985	131°F (55°C)
2487	140°F (60°C)

TECHNICAL DATA

Wireless Outdoor Sensor OS-200

Dimensions	Transmitter: 5–3/16" H x 2–3/4" W x 2" D (132 x 70 x 50 mm) Receiver: 4–3/4" H x 2–7/8" W x 7/8" D (120 x 74 x 23 mm)
Enclosure	Transmitter: White ABS plastic, NEMA 4X Receiver: White PVC plastic, NEMA Type 1
Packaged Weight	0.92 lb. (420g)
Sensor	10K Type 2
Approvals	FCC and IC
Operating range	Transmitter: -40 to 140°F (-40 to 60°C) Receiver: Indoor use only, 32 to 122°F (0 to 50°C), RH ≤90% non-condensing
Receiver power	24 V (ac) +/- 10%, 1 VA

LIMITED MANUFACTURER'S WARRANTY

We warrant products manufactured by Hydrolevel Company to be free from defects in material and workmanship for a period of two years from the date of manufacture or one year from the date of installation, whichever occurs first. In the event of any claim under this warranty or otherwise with respect to our products which is made within such period, we will, at our option, repair or replace such products or refund the purchase price paid to us by you for such products. In no event shall Hydrolevel Company be liable for any other loss or damage, whether direct, indirect, incidental or consequential. This warranty is your EXCLUSIVE remedy and shall be IN PLACE OF any other warranty or guarantee, express or implied, including, without limitation, any warranty of MERCHANTABILITY or fitness for a particular purpose. This warranty may not be assigned or transferred and any unauthorized transfer or assignment thereof shall be void and of no force or effect.