# MODEL **9258-0202**
# UNIVERSAL SNOW DETECTOR SYSTEM

The RAILWAY EQUIPMENT Co® Universal Snow Detector System is a free standing unit that features the ability to monitor air temperature, rail temperature, and moisture conditions to control equipment dependant on these conditions. The system includes an externally powered moisture and rail temperature sensing unit that has wireless communication to the main system.

## ***RAILWAY EQUIPMENT Co®***

## *Instruction Manual for Digital Universal Snow Detector System*

RAILWAY EQUIPMENT CO.

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# 1.0 WARNINGS, CAUTIONS, AND NOTES

Please read the entire instruction manual before using the Universal Snow Detector System.

Also, read the warnings, cautions, and notes in Table 1. Failure to observe the warnings and cautions can lead to equipment damage or personal injury.

If you have any questions concerning the manufacture, design, function, installation, operation or maintenance, contact Railway Equipment Company before proceeding.

**Table 1. Warnings, Cautions, and Notes**

| Symbol | Description |
|---|---|
| | WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. |
| | CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate personal injury. It may also be used to alert against unsafe practices. |
| **NOTE** | NOTE indicates explanatory information that applies to the next step in the procedure. It is used to clarify and expand upon the importance of the procedural step when needed. |
| | If incorrectly wired, monitor can be damaged. Be sure to observe correct polarity on all DC wire connections, check the AC wiring instructions, and connect the ground wire. |

## 2.0 OPERATION

The model 9258-0202 Universal Snow Detector System is equipped to detect moisture, monitor air temperature and rail temperature. Once certain conditions are reached the unit will turn on the necessary outputs. The Universal Snow Detector System is housed in a water tight enclosure and features a removable WAGO connector to install input power, additional moisture detectors, and output wiring.

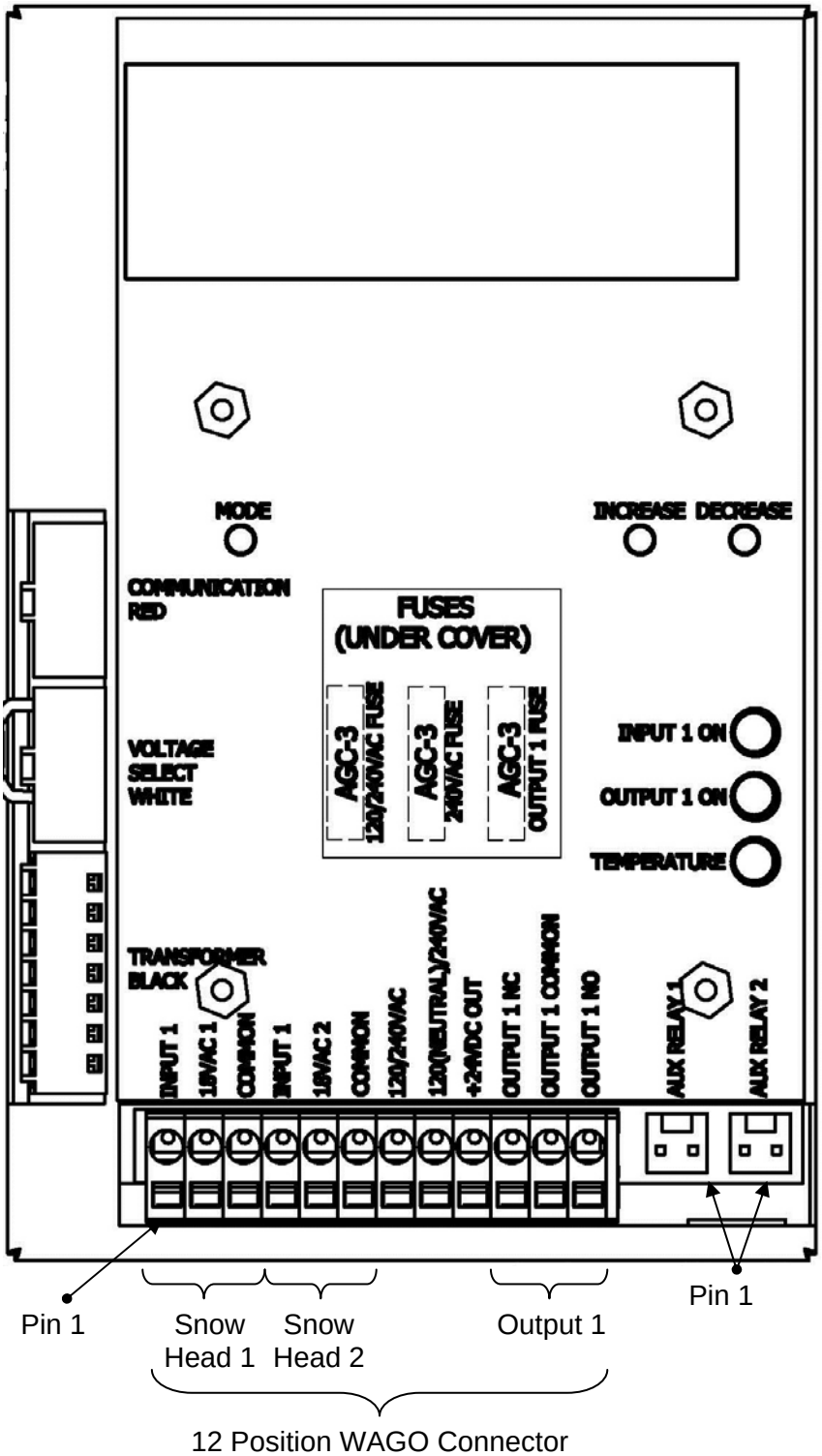
On the Snow Detector Control module, three separate outputs are provided: **Output 1**, **AUX RELAY 1**, and **AUX RELAY 2**. **Output 1** is a form C relay that will turn on if moisture is detected and the air temperature is below the air temp set point. **AUX RELAY 1** provides a +24VDC output that will turn on if the air temperature is below the air temp set point. **AUX RELAY 2** provides a +24VDC output that will turn on if the rail temperature is above the rail temp set point. **AUX RELAY 2** is used to power the **RAIL TEMP RELAY**. The **RAIL TEMP RELAY** turns on when the rail temperature is above the rail temp set point.

The Universal Snow Detector System can be powered by either 120 or 240VAC. Strapping plugs for both power sources are provided. Each is marked for the intended voltage level and when plugged into the control module it provides over voltage protection. The inputs and outputs lines of the control module are also fuse protected.

The Wireless Rail Temp/Snow Detector features magnetic connections for the rail temp and snow detect sensors. Up to twelve of the units can communicate with the Universal Snow Detector System via radio signal. Each unit requires 120VAC power; this power hookup is generally provided by hooking the power lines across the switch machine condensation heater.

## 2.1 Module Features and Components

This section describes the features and components that are on the Snow Detector module.



### 2.1.1 Digital Display

The idle screen displays the **AIR TEMP** and **SNOW TIMER** in minutes. If no moisture has been detected the **SNOW TIMER** will display 0. If moisture is being detected and the **SNOW DETECTED** and **AIR TEMP** LEDs are lit, the **SNOW TIMER** set point will be displayed. If the snow detector no longer detects snow and the **SNOW DETECTED** and **AIR TEMP** LEDs are on, the **SNOW TIMER** will begin to count down as long as no moisture is present.

To scroll through the display screens, press the **MODE** button. To change the values of displayed parameters, use the **INCREASE** or **DECREASE** buttons.

### 2.1.2 Display Menus

**PASSWORD ___-** Use the **INCREASE** or **DECREASE** buttons to set the password. The password to adjust parameters is 5. The password to select the number of wireless sensors and enter the **RADIO S/N** is 10.

**Press Inc/Dec to View Sensors –** With a **PASSWORD** of 0, pressing either **INCREASE** or **DECREASE** will allow the user to scroll through the wireless sensor menus by depressing the MODE button, once for each wireless sensor. With the **PASSWORD** set to 10, the user can select the number of wireless sensors to be used and set the radio serial numbers.

**Set Number of Sensors** – 1 through 12 sensors can be selected by using the **INCREASE** and **DECREASE** buttons.

**RADIO SN _____ -** The radio serial number can be found on the label of each Wireless Rail Temp/Snow Detect unit. This number must be entered in the **RADIO S/N** screen for communication to begin. Use the **INCREASE** or **DECREASE** buttons to adjust the radio serial number. This value can only be adjusted when the password is set to 10.

**RAIL TEMP ___F(C)**
**SNOW STATUS ___ –** Displays the temperature of the rail temp sensor and the snow status of the snow detector. Snow Status is indicated as follows: **NONE, LOW, MED, or HIGH.**

**AIR TEMP**
**SETPOINT ___ F(C)-** Air temperatures below this set point will cause **Output 1** to turn on if moisture is detected. It is adjustable between -40°F (-40°C) and +100°F (+37.8°C). Default is 38°F.

**RAIL TEMP**
**SETPOINT ___ F(C)-** Rail temperatures above this set point will cause the Rail Temp Relay to energize. The rail temp set point can be adjusted between -40°F (-40°C) and +250°F (121.1°C). Default is 80°F.

**SNOW TIMER**
**SETPOINT ____ MIN –** This parameter selects the desired time for **Output 1** to remain on after moisture is no longer detected. It can be adjusted between 10 and 999 minutes. Default is 30 minutes.

**SNOW SENSITIVITY**
**SETPOINT __ SEC –** This setting determines the amount of time moisture must be constantly present on the sensor before **Output 1** will turn on. Snow sensitivity can be adjusted from 1 to 60 seconds. Default is 1 second.

**SELECT F OR C**
**FAHRENHEIT (CELSIUS) –** Determines which temperature scale will be displayed.

**REV. LEVEL**
**_____ -** This displays the current software revision level.

### 2.1.3 Push Buttons

Three control push buttons are located below the digital display.

**INCREASE –** Used to increase the value of the displayed parameter, if enabled.

**DECREASE –** Used to decrease the value of the displayed parameter, if enabled.

**MODE –** Used to increment through the available display screens.

### 2.1.4 LED Status Indicators

Three LEDs are used to indicate the following:

**INPUT 1 ON** – Illuminated while moisture is being detected by the hardwired moisture detectors. Moisture on the Wireless Rail Temp/Snow Detect will not be indicated by this LED.

**OUTPUT 1 ON** – Indicates whenever **Output 1** is on. **Output 1** will turn on when the snow head detects moisture and the air temperature is below the air temp set point.

**TEMPERATURE** – Indicates that the air temp is below the air temp set point. This also indicates that **AUX RELAY 1** is on.

### 2.1.5 External Wiring Connector

At the bottom of the Snow Detector module there is a twelve position socket with a removable WAGO connector for external wiring. The connection locations are shown below:

| PIN | CONNECTIONS | NOTES |
|---|---|---|
| 1 | INPUT 1 | SNOW HEAD 1 SENSE - WHITE WIRE |
| 2 | 18VAC 1 | SNOW HEAD 1 POWER - BLACK WIRE |
| 3 | COMMON | SNOW HEAD 1 GROUND - GREEN WIRE |
| 4 | INPUT 1 | SNOW HEAD 2 SENSE - WHITE WIRE |
| 5 | 18VAC 2 | SNOW HEAD 2 POWER - BLACK WIRE |
| 6 | COMMON / +24VDC COM | SNOW HEAD 2 GROUND - GREEN WIRE |
| 7 | 120/240VAC | LINE 1 INPUT |
| 8 | 120(NEUTRAL)/240VAC | LINE 2 INPUT |
| 9 | +24 VDC OUT | |
| 10 | OUTPUT 1 N.C. | RELAY OUTPUT N.C. |
| 11 | OUTPUT 1 COMMON | RELAY OUTPUT COM |
| 12 | OUTPUT 1 N.O. | RELAY OUTPUT N.O. |

**AUX RELAY 1** – This 2 pin output plug will provide a +24VDC output on pin 2 and common on pin 1 when the air temperature is below the set point.

**AUX RELAY 2** – This 2 pin output plug will provide a +24VDC output on pin 2 and common on pin 1 when the rail temperature is above the set point. This output is used to power the Rail Temp Relay.

**RAIL TEMP RELAY** – This relay is in the lower left hand corner of the control panel. The Rail Temp Relay will be energized when the rail temp is above the set point. When the Rail Temp Relay is on, an indicator LED will illuminate on the relay.

### 2.1.6 Toggle Switch

When this switch is turned ON (upward position) it will simulate a hardwired Snow Detector, detecting moisture on **Input 1**. This is still dependent on the **AIR TEMP SETPOINT**. Once the ambient temperature is below the **AIR TEMP SEPOINT** then **Output1** will turn on.

### 2.1.7 Air Temperature Sensor

The air temperature sensor extends out the bottom of the control enclosure. It is a Type T thermocouple device that plugs into the control module with a polarized plug.

### 2.1.8 Output 1 Table

2.1.8.1 Table 1 shows the Toggle Switch when connected via Input 1 and Common

**Table 1**

| TOGGLE SWITCH | REMOTE SENSOR | AMBIENT greater or less than AIR TEMP SETPOINT? | OUTPUT 1 |
|---|---|---|---|
| ON | ON | less than (<) | **1** |
| | OFF | | **1** |
| | ON | greater than (>) | 0 |
| | OFF | | 0 |
| OFF | ON | less than (<) | **1** |
| | OFF | | 0 |
| | ON | greater than (>) | 0 |
| | OFF | | 0 |

2.1.8.2 Table 2 shows the Toggle Switch when connected across OUTPUT 1 (N.C. or N.O.) and OUTPUT 1 COMMON

**Table 2**

| TOGGLE SWITCH | REMOTE SENSOR | AMBIENT greater or less than AIR TEMP SETPOINT? | OUTPUT 1 |
|---|---|---|---|
| ON | ON | less than (<) | **1** |
| | OFF | | **1** |
| | ON | greater than (>) | **1** |
| | OFF | | **1** |
| OFF | ON | less than (<) | **1** |
| | OFF | | 0 |
| | ON | greater than (>) | 0 |

| | | | |
|---|---|---|---|
| | OFF | | 0 |

# 3.0 SPECIFICATIONS

## 3.1 Universal Snow Detector System

Input:

LINE: 120/240VAC (Selectable via Voltage Selector Connector)

Output:

**OUTPUT 1:** FORM C CONTACTS 3 AMP at 125VAC
**AUX RELAY 1:** 24VDC 3AMP OUTPUT
**AUX RELAY 2:** 24VDC 3AMP OUTPUT
**RAIL TEMP RELAY:** 4 NO/NC CONTACTS 5 AMP at 250VAC

Input power is 120/240VAC at 3 AMPS. Two VOLTAGE SELECT connectors are provided for power strapping and over voltage protection.

Input and output fuse protection is provided.

Wireless or wired snow detectors can be used.

## 3.2 Wireless Rail Temp/Snow Detector

Input power 120VAC at 1 AMP

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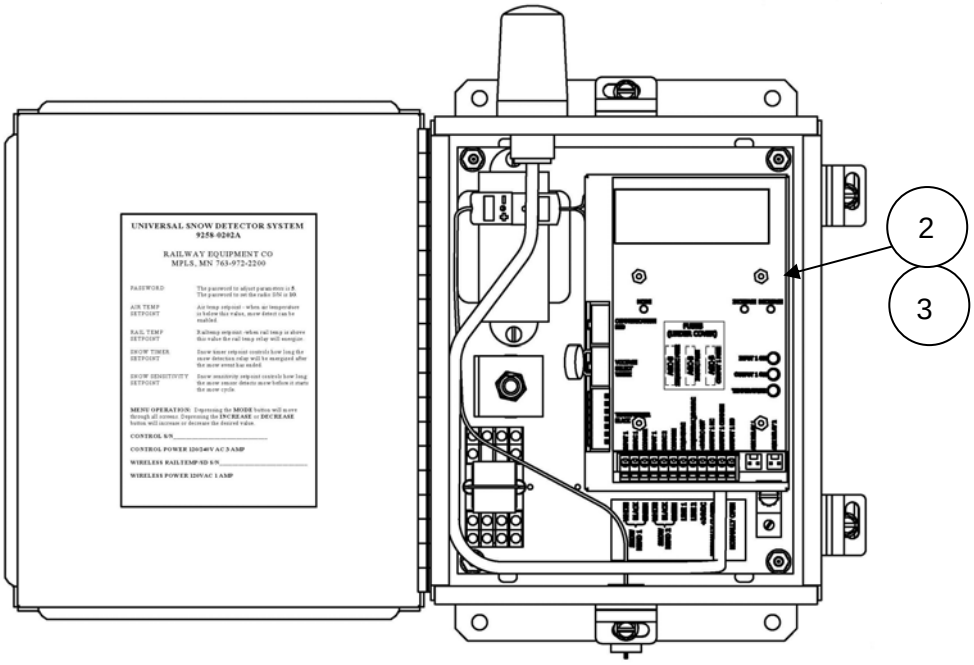
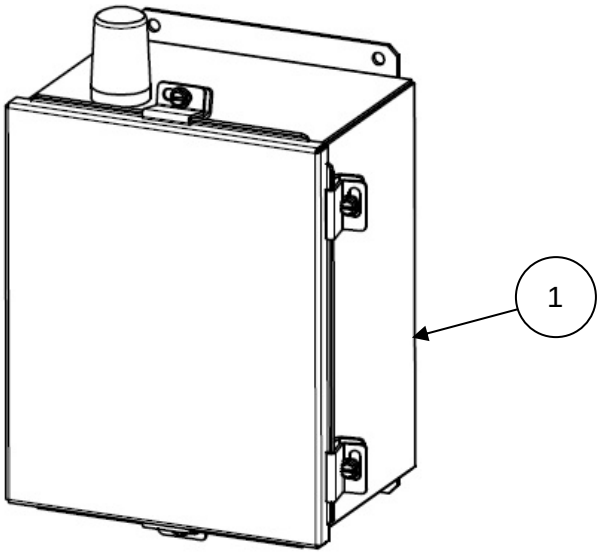
# 4.0 DRAWINGS

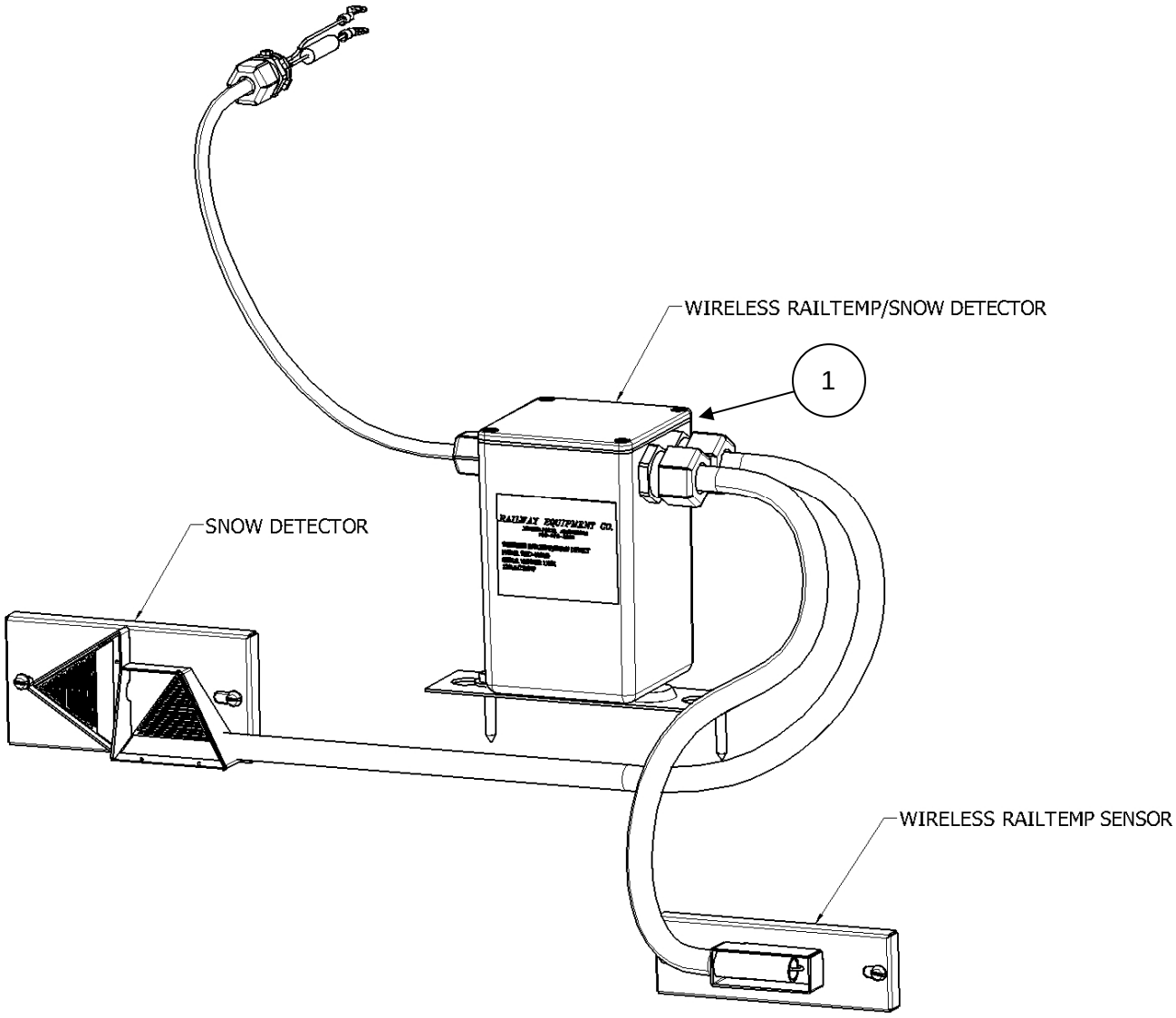
## 4.1 Universal Snow Detector System




| ITEM | P/N | DESCRIPTION |
|---|---|---|
| 1 | 9258-0202 | Universal Snow Detector System |
| 2 | 9258-0051 | Snow Detector Board |
| 3 | 9806-0100 | Communication Board |

## 4.2 Wireless Rail Temp/Snow Detector




| ITEM | P/N | DESCRIPTION |
|---|---|---|
| 1 | 9227-0080 | Wireless Remote Rail Temp and Snow Detect |

# 5.0 LIMITED WARRANTY

Railway Equipment Co., Inc. ("Railway") warrants all of its products to be free from defects in material and workmanship when used under specified operating conditions and within specified limits. Railway's warranty shall extend for a period of two (2) years from the date of shipment to the original purchaser.

This warranty is expressly in lieu of and excludes all other expressed or implied warranties, including but not to warranties of merchantability and fitness for a particular purpose.

Railway, its agents, or representatives shall in no circumstance be liable for any direct, indirect, special, penal, or consequential loss or damage of any nature resulting from the malfunction of the product.

Remedies under this warranty are expressly limited to repair or replacement of the product at the sole discretion of Railway.

Before returning any defective product to Railway, contact the factory at the address or telephone number at the bottom of this article for a Return Merchandise Authorization number and instructions as to how and where the return is to be shipped. Materials received without this authorization will be returned at the customer's expense.

Products returned to Railway under warranty must be shipped freight prepaid, and return freight charges for repaired or replaced products, in or out of warranty, will be at customer's expense.

Railway reserves the right to reject any warranty claim on a product that has been altered by the user or damaged in shipping due to inadequate packaging or mishandling by freight carrier.

By returning a product to Railway the owner grants permission to Railway to open and disassemble the as required for evaluation. Railway has the sole responsibility for determining the cause and nature of failure, and Railway's determination with regard thereto shall be final. Railway reserves the right to repair or replace any unit at its sole discretion.

A returned product that is found, upon inspection by Railway, to be operational within specification is subject to an inspection and testing fee, regardless of its warranty period.

Railway's liability on any claim of any kind (including negligence) for any loss or damage arising out of or resulting from this agreement, or from the performance of breach thereof, of from the products or services hereunder, shall in no case exceed the price of the specific product or service which gives rise to the claim. All such liability shall terminate upon the expiration of the warranty period of two (2) years, as hereinabove stated.

The furnishing of advice or other assistance without separate compensation therefore will not subject Railway to any liability, either in contract, warranty, tort (including negligence) or otherwise.

Any alteration or modification of the product, or addition on non-Railway components to the product, unless expressly permitted by Railway in its documentation, will void warranty coverage.

This warranty is non-transferable, and warranty coverage is limited to initial user only.

Installation and/or use of the product shall demonstrate acceptance of the terms of this warranty.

Each of the foregoing paragraphs in this article will apply to the full extent permitted by law. The invalidity, in whole or part, of any paragraph will not affect the remainder of such paragraph or any other paragraph.

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