Dual Jacketed Reactor

Model: JRE Series

JRE-10, JRE-20, JRE-50

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1 Safety Instructions and Features

1.1 Safety Instructions

The Lid Requires Manual Stopping at the Top of the Glass Vessel.

The use of Personal Protection Equipment (PPE) is REQUIRED.

Follow all federal, state and municipal laws, codes and ordinances.

Please make sure the power connection is correct and well-grounded. (see the technical parameters for details)

Fluid lines should be unobstructed without any hard bends in the run. Install gasket inside fittings before use.

Apply a rag to wipe the parts clean after washing away stains; do not use hard objects.

Do not use flammable, corrosive or explosive substances on, in, or near the equipment.

If there is a problem, do not continue to use the reactor. Contact us immediately.

Safety Precautions and Explanations

At USA Lab, safety is our number one priority. The following information provides guidelines for safety when using USA Lab equipment. Any piece of machinery can become dangerous to personnel when improperly operated or poorly maintained. ALL employees operating and maintaining USA Lab equipment should be familiar with its operation, thoroughly trained, and Instructed on the best safety practices. Most industry accidents are preventable through safety awareness.

Training

It is the responsibility of the customer to ensure that all personnel who will be expected to operate or maintain the equipment. Participate in training and instruction sessions to become trained operators. All personnel operating, inspecting, servicing, or cleaning this equipment must be properly trained in the operation and machine safety. **BEFORE** operating this equipment, read the operating instructions in this equipment manual. Become thoroughly familiar with the machinery and its controls.

Safety

- Never leave the equipment running unattended and use this equipment only for its intended purpose.
- Ensure that all power sources are turned off when the machine is not in use. This encompasses electrical and pneumatic power.
- Read the manual for any special operational instructions for each piece of equipment. All USA Lab authored manuals are typically included with each device as well as posted online.
- Know how the equipment functions and understand the operating and halting processes.
- Wear the appropriate personal protective equipment for the task.
- When working on or around all equipment, avoid wearing loose clothing, jewelry, unrestrained long hair, loose ties, belts, scarves, or articles that may be caught in moving parts. Keep all extremities away from moving parts. Entanglement can cause death or severe injury.
- For new equipment, check input voltage and compare with the equipment voltage rating. DO NOT supply the incorrect power to any equipment for any reason whatsoever. Electrical specifications for your machine are printed on the machine tag. A properly grounded receptacle is required for safe operation regardless of voltage requirements.
- Keep the equipment operating zone free of obstacles that could cause a person to trip or fall toward an operating machine. Keep fingers, hands, or any part of the body out of the machine and away from moving parts when the machine is operating.
- Any machine with moving parts and/or electrical components can be potentially dangerous no matter how many safety features it contains. Stay alert and think clearly while operating or servicing the equipment. Be aware of operations and personnel in your surroundings. Be attentive to indicator lights, warning lights, and/or operator interface screens displayed on the machine and know how to respond.
- Do not operate machinery if you are fatigued, emotionally distressed, or under the influence of drugs or alcohol.
- Know where the FIRST AID SAFETY STATION is located.
- Know where the FIRE EXTINGUISHING EQUIPMENT is located.
- Never sit or stand on the machine or on anything that might cause you to fall against the machine.
- Rotating and moving parts are dangerous. Keep clear of the operating area. Never put any foreign object into the operating area.
- Use proper lifting and transporting devices for heavy equipment. Some types of equipment can be extremely heavy. An appropriate lifting device should be used.
- Use caution when moving portable equipment. In some cases, the machinery can be heavy and/or may be top heavy. Portable equipment can gain momentum during transporting and must always be controlled.

Symbols and Warnings

Below are examples of commonly used symbols and what they mean. Understand them and their potential consequences.

High Voltage or Electrical Hazard

Explosive Hazard

Not User Serviceable

Flammable Hazard

Hot Surface or Steam Hazard

1.2 Features

The JRE Series Double Jacketed Reactor is an advanced dual jacket reaction vessel. With a built-in motorized lift for the head plate, and a rotating vessel. It allows for easy cleaning or pouring. Each reactor has an inner jacket allowing circulation of liquid, while the outer jacket allows for vacuum insulation. This creates higher chilling or heating efficiency as well as less temperature loss. Each jacket can be drained and released of pressure with ease, due to the convenient drain ports near the bottom portion of the reactor. The stirring paddles are made of PTFE, mounted to a PTFE coated stainless steel rod. Allowing for better chemical compatibility and cleaning.

1.3 Technical Parameters

JRE-10:

JRE-10 SPECIFICATIONS
•**Glass Material:** GG-17 Borosilicate Glass
•**Reaction Vessel Capacity:** 10L
•**Material Flask Capacity:** 2L
•**Fluid Jacket Capacity:** 6L
•**Rotary Speed:** 0-450RPM
•**Glass Temperature Range:** -80°C to 250°C / -112°F to 482
•**Lifting Mechanism:** Electric
•**Power Requirements:** 110V 60Hz 15A Single Phase
•**Lift Wattage:** 40W
•**Stirrer Wattage:** 90W
•**Vacuum Level:** Under 0.098Mpa
•**Dimensions:** 33"L x 27"W x 74"H
•**Weight:** 350lbs
•**Speed Regulation:** Digital Step-Less
•**Condenser and Feed Valve Barbs:** 12.7MM - 1/2"
•**Bottom Drain Port:** 35MM - 1 3/8"
•**Receiving Flask Barb:** 16MM - 5/8"
•**Fluid Connection:** 12.7MM - 1/2"

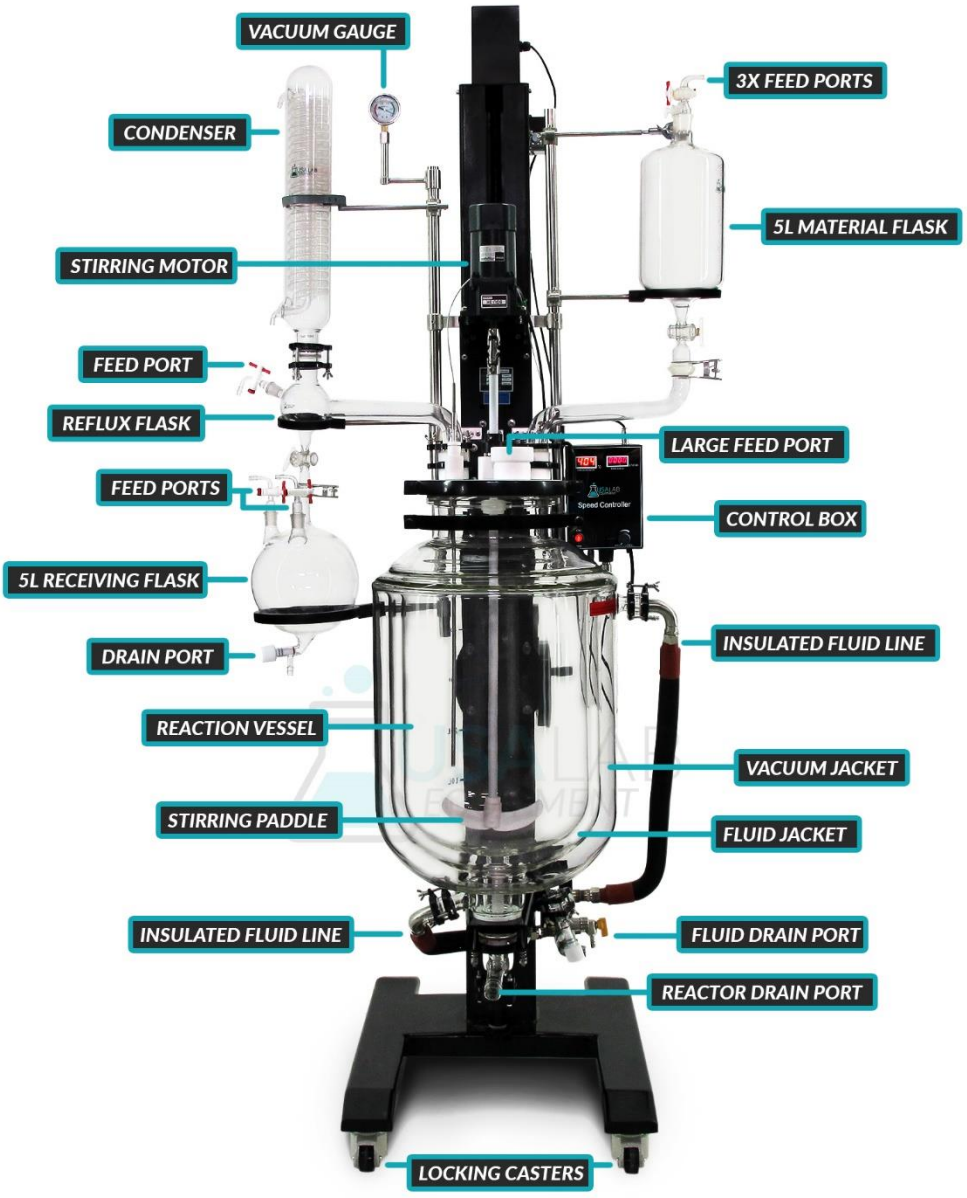
JRE-20:

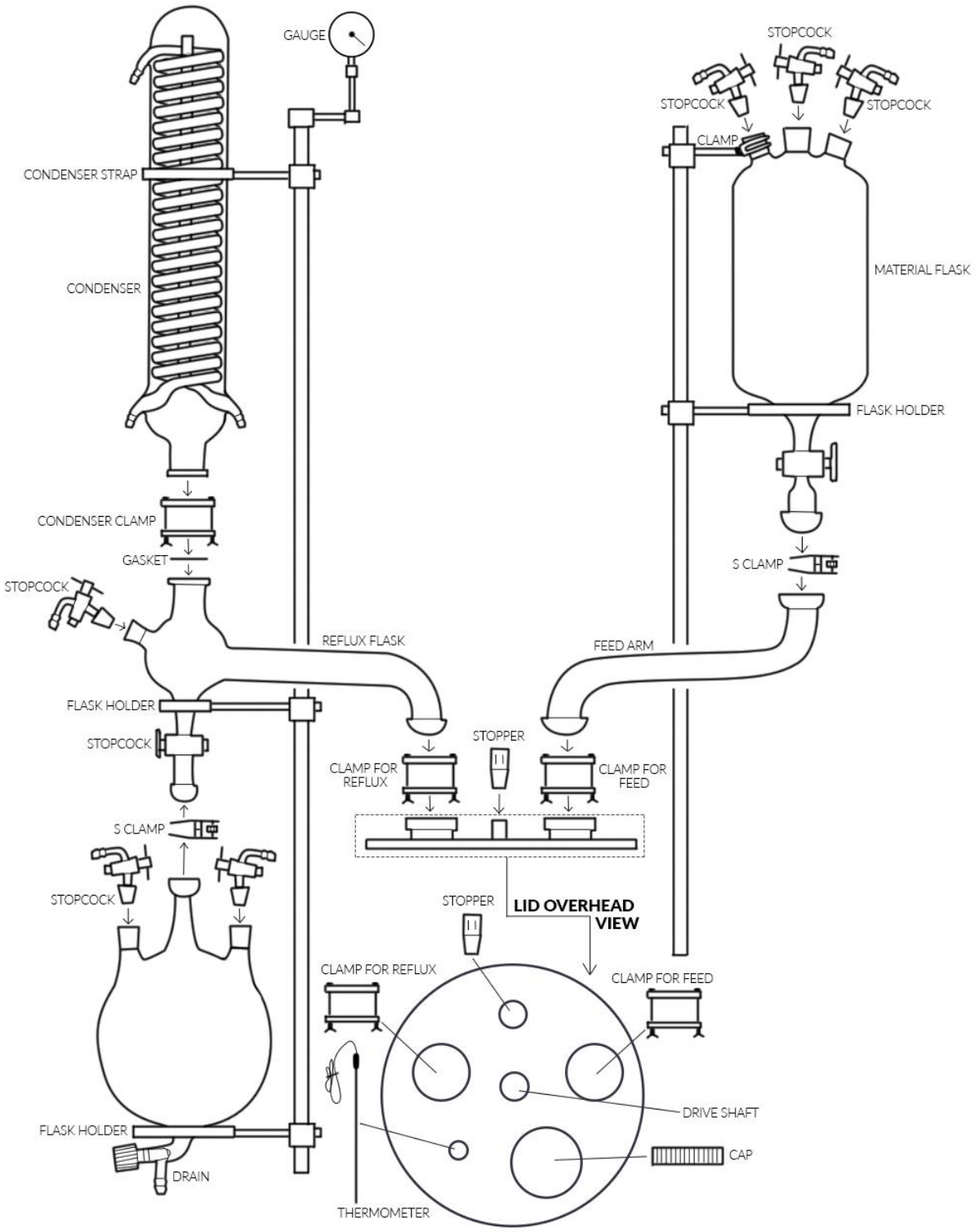
JRE-20 SPECIFICATIONS
•**Glass Material:** GG-17 Borosilicate Glass
•**Reaction Vessel Capacity:** 20L
•**Material Flask Capacity:** 2L
•**Fluid Jacket Capacity:** 8L
•**Rotary Speed:** 0-450RPM
•**Glass Temperature Range:** -80°C to 250°C / -112°F to 482
•**Lifting Mechanism:** Electric
•**Power Requirements:** 110V 60Hz 15A Single Phase
•**Lift Wattage:** 40W
•**Stirrer Wattage:** 90W
•**Vacuum Level:** Under 0.098Mpa
•**Dimensions:** 38"L x 27"W x 85"H
•**Weight:** 400lbs
•**Speed Regulation:** Digital Step-Less
•**Condenser and Feed Valve Barbs:** 12.7MM - 1/2"
•**Bottom Drain Port:** 35MM - 1 3/8"
•**Receiving Flask Barb:** 16MM - 5/8"
•**Fluid Connection:** 12.7MM - 1/2"

JRE-50:

JRE-50 SPECIFICATIONS
•**Glass Material:** GG-17 Borosilicate Glass
•**Reaction Vessel Capacity:** 50L
•**Receiving Flask Capacity:** 5L
•**Material Flask Capacity:** 5L
•**Fluid Jacket Capacity:** 11L
•**Rotary Speed:** 0-450RPM
•**Glass Temperature Range:** -80°C to 250°C / -112°F to 482
•**Lifting Mechanism:** Electric
•**Power Requirements:** 110V 60Hz 15A Single Phase
•**Lift Wattage:** 40W
•**Stirrer Wattage:** 120W
•**Vacuum Level:** Under 0.098Mpa
•**Dimensions:** 41"L x 35"W x 102"H
•**Weight:** 470lbs
•**Speed Regulation:** Digital Step-Less
•**Condenser and Feed Valve Barbs:** 12.7MM - 1/2"
•**Bottom Drain Port:** 35MM - 1 3/8"
•**Receiving Flask Barb:** 16MM - 5/8"
•**Fluid Connection:** 12.7MM - 1/2"

2 Diagrams


VACUUM GAUGE
3X FEED PORTS
CONDENSER
5L MATERIAL FLASK
STIRRING MOTOR
FEED PORT
REFLUX FLASK
LARGE FEED PORT
FEED PORTS
CONTROL BOX
5L RECEIVING FLASK
INSULATED FLUID LINE
DRAIN PORT
REACTION VESSEL
VACUUM JACKET
STIRRING PADDLE
FLUID JACKET
INSULATED FLUID LINE
FLUID DRAIN PORT
REACTOR DRAIN PORT
LOCKING CASTERS


GAUGE
CONDENSER STRAP
CONDENSER
CONDENSER CLAMP
GASKET
STOPCOCK
REFLUX FLASK
FLASK HOLDER
STOPCOCK
S CLAMP
STOPCOCK
FLASK HOLDER
DRAIN
STOPCOCK
STOPCOCK
STOPCOCK
CLAMP
MATERIAL FLASK
FLASK HOLDER
S CLAMP
FEED ARM
STOPPER
CLAMP FOR REFLUX
CLAMP FOR FEED
STOPPER
LID OVERHEAD VIEW
CLAMP FOR REFLUX
CLAMP FOR FEED
DRIVE SHAFT
CAP
THERMOMETER

3 Control Panel Operation

4 Preparing for Installation

JRE-10:

JRE-10 PACKING LIST	
USA Lab 10L Jacketed Reactor JRE-10	1 set
Main Condenser	1 pc
2L Material Flask	1 pc
Reflux Flask with Valve	1 pc
Glass - Material Flask to Lid	1 pc
29/32 Stopper	1 pc
Lid Glass PTFE Stopper w/ Barb	1 pc
Strap for Condenser and Material Flask	2 sets
Condenser Sealing Flange	1 set
Lid Sealing Flange (Pre-Installed)	1 sets
Fluid Line Sealing Flange (Pre-Installed)	2 sets
Control Box (Pre-Installed)	1 pc
Vacuum Gauge	1 pc
Support Rings (Pre-Installed)	1 pc
Stirring Motor w/ Paddle (Pre-Installed)	1 set
Temperature Probe (Pre-Installed)	1 pc
Liquid 1/2" Connections (Pre-Installed)	2 pcs
3/8" Drain Valve (Pre-Installed)	1 pc
Lift Remote Control	1 pc
PTFE Sealing Tape	1 pc
Allen Keys and hex screws	1 set
3oz. Vacuum Grease	1 pc
Vacuum Hose	10 ft.

JRE-20:

JRE-20 PACKING LIST	
USA Lab 20L Jacketed Reactor JRE-20	1 set
Main Condenser	1 pc
2L Material Flask	1 pc
Reflux Flask with Valve	1 pc
Glass - Material Flask to Lid	1 pc
29/32 Stopper	1 pc
Lid Glass PTFE Stopper w/ Barb	1 pc
Strap for Condenser and Material Flask	2 sets
Condenser Sealing Flange	1 set
Lid Sealing Flange (Pre-Installed)	1 sets
Fluid Line Sealing Flange (Pre-Installed)	2 sets
Control Box (Pre-Installed)	1 pc
Vacuum Gauge	1 pc
Support Rings (Pre-Installed)	1 pc
Stirring Motor w/ Paddle (Pre-Installed)	1 set
Temperature Probe (Pre-Installed)	1 pc
Liquid 1/2" Connections (Pre-Installed)	2 pcs
3/8" Drain Valve (Pre-Installed)	1 pc
Lift Remote Control	1 pc
PTFE Sealing Tape	1 pc
Allen Keys and hex screws	1 set
3oz. Vacuum Grease	1 pc
Vacuum Hose	10 ft.

JRE-50:

JRE-50 PACKING LIST	
USA Lab 50L Jacketed Reactor JRE-50	1 set
Main Condenser	1 pc
5L Receiving Flask	1 pc
5L Material Flask	1 pc
Reflux Flask with Valve	1 pc
Glass - Material Flask to Lid	1 pc
S Clamps	2 pcs
Feed Ports	6 pcs
4 Prong Clamp (Pre-Installed)	1 pc
Condenser Sealing Flange	1 set
Lid Sealing Flange (Pre-Installed)	2 sets
Fluid Line Sealing Flange (Pre-Installed)	2 sets
Control Box (Pre-Installed)	1 pc
Vacuum Gauge	1 pc
Support Rings (Pre-Installed)	4 pcs
Stirring Motor w/ Paddle (Pre-Installed)	1 set
Temperature Probe (Pre-Installed)	1 pc
Lid Glass Stopper	1 pc
Liquid 1/2" Connections (Pre-Installed)	2 pcs
3/8" Drain Valve (Pre-Installed)	1 pc
Lift Remote Control	1 pc
PTFE Sealing Tape	1 pc
Allen Keys and hex screws	1 set
3oz. Vacuum Grease	1 pc
Vacuum Hose	10 ft.

1. Please refer to the packing list above to check whether the components and parts are included. If there are any missing parts, please contact us immediately.
2. Remove any residue before assembly and keep all surfaces clean.
3. Tools that might be needed in the installation include: large adjustable wrench.
4. A professionally installed 5-15R receptacle. See Specs in section 1.3.

5 Instructions for Installation

Precaution: JRE-10 and JRE-20 have a different material flask than the JRE-50. “UHC” refers to the UHC series heater chiller for vessel jackets. “UC / DLSB” refers to the UC / DLSB series chiller for the condenser.

Steps:

- Assemble glass material column and condenser.
- Add gaskets into UHC tubing.
- Install tubing from top of the liquid jacket to the outlet of the UHC, then bottom of the liquid jacket to inlet of UHC.
- Follow the Instructions in the UHC manual to fill the reactor liquid jacket.
- Add tubing from UC / DLSB to condenser coil inlet and outlet.
- Follow the instructions in the UC / DLSB manual to fill the condenser loop.

6 Notes

6.1 Purpose

The JRE reactor is intended to be used with the UHC chiller for the fluid jacket and the UC / DLSB chiller series for the condenser.

6.2 Storage

For long periods, please disconnect the power. Empty and clean the reaction vessel, stirrer, jacket, the condenser, and material flask.

7 Maintenance

- Shut off the power switch and disconnect the power cord before any maintenance.
- Use a damp soft cloth to wipe clean. Stubborn stains should be cleaned by neutral detergents.
- The maintenance of internal electrical and heating parts must be performed by professionals or trained electricians.
- Do not directly splash water over the product or use abrasive powder, diluent, oil, kerosene, acidic material and similar substances during cleaning, or else shock or other accidents will occur.

8 Service

Our company provides limited warranty for any product with failures due to manufacturing quality within 12 months after the date of delivery on the premise of normal operation by users. Reasonable repair costs will be charged for damage caused by improper use. After-sales service Tel：(734) 855-4890 or sales@usalab.com

USA Lab reserves the right of ultimate interpretation of the instruction manual. Additionally, USA Lab is not responsible for damages or injuries caused by improper use; knowingly or unknowingly. Glassware is not covered under warranty. We ship all glassware products with additional care, but sometimes they arrive broken. If glassware arrives broken, please contact us within 3 days of receiving your product and we will either send you a brand new piece or send you a refund. Any glassware broken 3 days after or later will not be covered by warranty. Maintenance items such as seals and gaskets are not covered under the warranty. Thank you for understanding!

Return Policy:

We offer a 30-day return policy from when your package is delivered to your shipping address. By placing an order with USA Lab, you express that you have read and agreed to the following return policies.

• We do not accept returns for customized items. When purchasing a customized item, you agree that there are no returns due to the nature of the item(s) being specific to your needs.

• By default, a 15% restocking fee is applied on all items that are in original packaging and unused with no damage. This applies to all items returned within 30 days. No exceptions. You will be responsible for the return shipment unless deemed defective by USA Lab. In that case, we will pay for return shipment and replacement shipment costs.

• The item(s) must be returned in original packaging and in undamaged condition. The item(s) must have no signs of usage or wear including stickers, scratches, dents, resins, non-standard fluids, plant matter, or any other wear not representing a new, unused item. Products deemed defective with any signs of usage or wear will result in a 25% restocking fee.

• Once the returned item is received, tested, inspected, and processed, a refund will be issued. If your item(s) are in original packaging and unused, you will be refunded the initial purchase price with the 15% restocking fee deducted. If your item(s) are deemed damaged or used, you will be refunded the initial purchase price with the 25% restocking fee deducted.

• If an item has been deemed to be severely misused, modified resulting in catastrophic failure, operated anywhere but inside of a climate-controlled facility. A minimum of 25% restocking fee will be deducted from the refund.

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