



Countertop RFID Refrigerator

TS098



TABLE OF CONTENTS

ABOUT THIS MANUAL	3
PRECAUTIONS FOR SAFE OPERATIONS	3
GETTING STARTED	7
MAINTENANCE	10
TROUBLESHOOTING	12
APPENDIX A: DEVICE SPECIFICATIONS	12
APPENDIX B: MODEL SPECIFICITIONS	Error! Bookmark not defined.
APPENDIX C: GLOSSARY	13
APPENDIX D: SAFETY CHECKLIST	14

ABOUT THIS MANUAL

Read this manual carefully before using the device and follow the instructions for safe operation.

Terso Solutions does not guarantee safe operation if the device is not used as intended as outlined in this manual.




Keep this manual in a place easily accessible for all users. The contents of this manual are subject to change without notice. Contact Terso Solutions Technical Support if a new manual is needed or if any point in this manual is unclear.

PRECAUTIONS FOR SAFE OPERATIONS


It is imperative for users to comply with instructions outlined in this manual for safe operation.

Procedures are described so this device may be used correctly and safely. Following the precautions will prevent possible injury to the user and damage to the device.

Precautions are illustrated in the following way:






<p style="text-align: center;">⚠ WARNING</p> <p>Failure to observe WARNING signs could result in a hazard to personnel possibly resulting in serious injury or death.</p>	<p style="text-align: center;">⚠ WARNING</p> <p>Only use the system as specified in these instructions.</p>
<p style="text-align: center;">⚠ CAUTION</p> <p>Failure to observe CAUTION signs could result in injury to personnel and damage to the device and associated property.</p>	<p style="text-align: center;"></p> <ul style="list-style-type: none"> • This symbol means an action is prohibited. • This symbol means an instruction must be followed
<p style="text-align: center;"></p> <p>Caution, read all accompanying documents before operating the device.</p>	<p style="text-align: center;"></p> <p>This label is on the cover in which the electrical components of high voltage are enclosed to prevent electrical shock.</p>

Be sure to store this manual in a location accessible to users.










<p style="text-align: center;"></p>	<p>This mark indicates the location of the protective earth conductor. Do not disconnect. Disconnection of the protective earth conductor may impair the protection provided by the device.</p>
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WARNING

	Risk of shock is present inside the device. The cover should be removed by qualified engineers or service personnel only.
	Do not use the device outdoors. Exposure to water may lead to current leakage or electric shock.
	Install the device in stable location. If the installation site is not adequate, injury or damage to device may result from the device tipping over.
	Do not install the device in a flammable or volatile location. This may cause explosion or fire.
	Do not install device in presence of acid or corrosive gases. This may lead to corrosion resulting in current leakage or electrical shock.
	Dedicate a power source to be used exclusively for device.
	Remove dust from the power supply plug before inserting in a power source. A dusty plug or improper insertion may pose a hazard.
	Use a power supply outlet with ground (earth) to prevent electric shock. If the power supply outlet is not grounded, it will be necessary to have qualified engineers install a ground.
	Always unplug device using the power supply plug, not the cord. Pulling the cord may result in electric shock or fire by short circuit.
	Do not damage or break the power supply plug or cord. Do not use the supply plug if its cord is loose. This may cause fire or electric shock.
	Do not touch any electrical parts such as power supply plug or any switches with a wet hand. This may cause electric shock.
	Do not ground the device through a gas pipe, water main, telephone line or lightning rod. Such grounding may cause electric shock in the case of an incomplete circuit.
	Do not insert metal objects such as a pin or wire into any outlet, vent, or gap for inner air circulation. This may cause electric shock.
	If this device will be used for storing poisons, radioactive material, or other harmful products, ensure that it is in a safe area. Failure to do so may lead to an adverse effect on the health of personnel in the area and local environment.

	Do not splash water directly onto the device as this may cause electric shock or short circuit.
	Do not disassemble, repair, or modify this device yourself. Any such work carried out by an unauthorized person may result in fire or injury due to a malfunction.
	Disconnect the power supply plug if there is something wrong with the device. Continued abnormal operation may cause electric shock or fire.
	If the device is to be stored unused in an unsupervised area for an extended period, ensure that children do not have access and that doors cannot be closed completely.
	Prepare a safety check sheet when you request any repair or maintenance for the safety of service personnel.

CAUTION

	Do not disconnect the protective earth conductor. Disconnection may impair the protection provided by the equipment.
	Do not place any switches or disconnect device from the earth conductor.
	Do not climb onto the device. This may cause injury by tipping or damage to the device.
	This device is equipped with an automatic door closing mechanism, always hold the handle when closing the door. This will reduce the likelihood of a trapped finger.
	Do not lean on the door. This may cause injury if the device tips over.
	Always disconnect the power supply plug before moving the device. Take care not to damage the power cord. A damaged cord may cause electric shock or fire.
	Be careful not to tip over the device during movement to prevent damage or injury.
	Always disconnect the power plug when the device is not used for long periods of time.
	Always disconnect the power supply to the device prior to any repair or maintenance of the device to prevent electric shock or injury.



Cautions for Using the Device

- Never store corrosive materials such as acid or alkali unless the container is completely sealed. Corrosion may lead to failure of the device in time.
- Always close the door firmly. The door open alarm will sound after the door is open for five minutes unless configured otherwise. The alarm will be canceled automatically when the door is closed.
- Always open and close the door gently. Rough operation may lead to stored items location shifting, incomplete closing, or damage of the door and auto closing mechanism.
- Items should be added to the device in small batches to minimize temperature increase.

Environmental Conditions

This device is designed to be safe under the following conditions:

- Indoor use only
- Up to 2000 m / 6550 ft altitude
- +18 °C to +30 °C, ≤ 80% relative humidity
- Over Voltage Category II
- Pollution degree 2 (normal office conditions)
- Main supply voltage fluctuations up to ± 10% of the nominal voltage

GETTING STARTED

Components

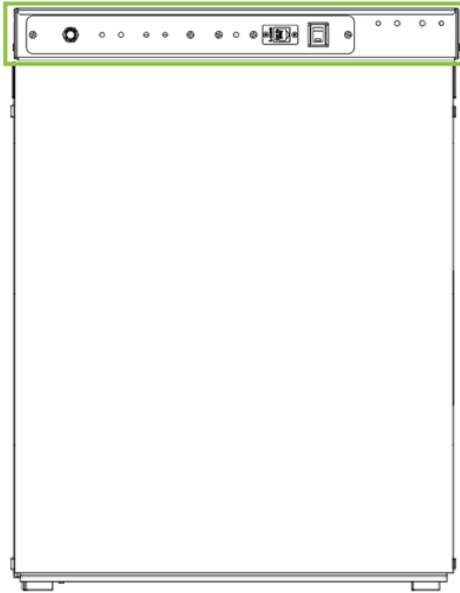


Figure 1: View of Back Panel Location

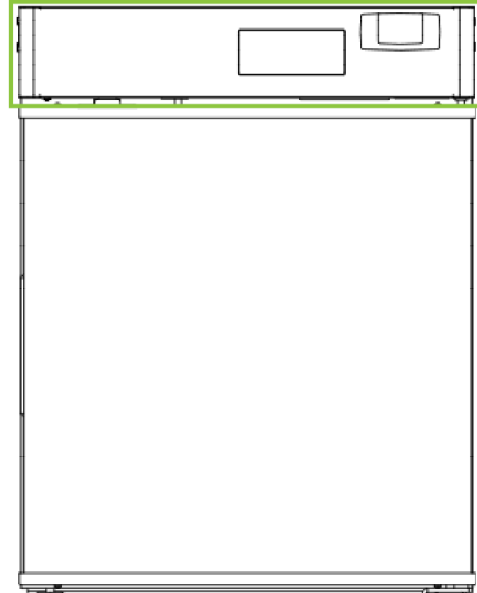


Figure 2: View of Front Panel Location

Device Front *Figure 3*

- A. USB interface jack
- B. Pass reader
- C. LCD display
- D. Refrigerator controller

Device Back Panel *Figure 4*

- A. AC circuit breaker
- B. Hardware reset
- C. Ethernet jack
- D. RFID system power switch
- E. Emergency door release
- F. Alarm mute switch

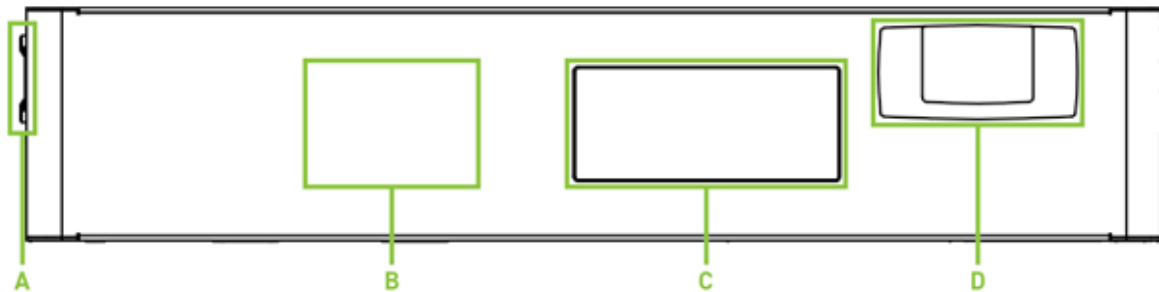


Figure 3: Front Panel

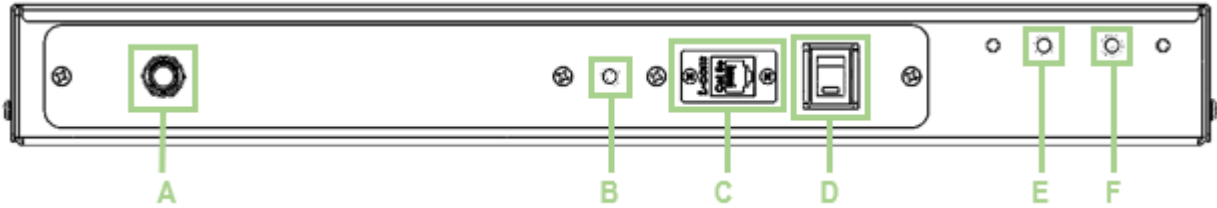


Figure 4: Back Panel

Unpacking the Device

Inspection

Before unpacking the device, inspect for any damage that may have occurred during transit. If any damage is present, please contact Terso Solutions Technical Support at +1 888.376.0257.

Unpacking

- Remove the straps and remove all packaging. Gently position the device in place on the ground.
- **Remove accessories from inside the device.** Items included are a **power cable and Ethernet cable**. Other items may also be included such as cables and bins, or other device specific items.

Proper Handling

Do not use push the handle to move the device. Always move the device with the door facing you. Carefully roll the device into designated location leaving at least a 4 inch (in.) gap between the back of the device and the wall.

Installation



Site

When choosing an install site, reference state and federal requirements prior to installation in a medical setting and designate backup device to store contents if the device has an unforeseen issue.

For proper operation and maximum performance, install the device in a location which meets the following conditions:

Correct power outlets

- ✓ Device requires a grounded 120 V 10 A NEMA 5-15 outlet.
- ⊘ **Do not connect device to a GFI** (Ground Fault Interrupt) circuit.
- ⊘ **Do not use an extension cord** or any multi-outlet strip or plug. Using such equipment can cause insufficient power leading to component failure.

Sturdy and level floor

- ✓ Install the device on a sturdy floor to ensure proper door alignment.
- ⊘ **Do not install on unstable floor.** This may result in user injury from device tipping.

Dry location with minimal humidity

- ⊘ **Do not operate device outdoors.** Exposure to humidity or water may result in current leakage or electric shock.
- ⊘ **Never install the device in humid location** or a place where it is likely to be splashed by water. This may result in current leakage or electric shock.
- ⊘ **Do not install the device under water** pipes or steam pipes. This may result in current leakage or electric shock.

Absence of flammable or corrosive gas

- ⊗ **Never install device in a flammable or volatile location.** This may cause explosion or fire.
- ⊗ **Never install the device where acid or corrosive gases are present** as current leakage or electric shock may result due to corrosion.

Leveling the device

Properly level the device before use. Appropriate leveling is critical to the device's successful operation. To level the device, set a level on the top of the device. If the device is not level, adjust the front leveling legs.

Connecting to AC Power

Plug the device into a grounded wall outlet with a minimum of a 15 A rating. See specifications for further details. The power outlet must be within 10 feet (ft) / 3 meters (m) of the device and be easily accessible. In an emergency the power cord can be unplugged and turn off the device.

Connecting Communications

Plug the Ethernet cable into device back panel followed by appropriate wall data jack or cellular router.

Initial Device Loading

Allow device to operate at desired temperature for a minimum of 4 hours before loading with inventory. If stocking ambient temperature products, load the device one shelf at a time, beginning with the top shelf. After loading each shelf, allow the device to recover to the desired set point before loading the next shelf. Repeat this process until the device is fully stocked.

Access Verification

Present a valid access pass to device pass reader located to the left of the LCD display on the front panel. Once accepted, the LCD display text will indicate the door is now unlocked. Device door can be closed at any time and will relock automatically. Check door is locked by gently pulling on the door handle.

Remote Alarm Contacts

Alarm contacts on the back of the device are available to wire the device into an alarm system. These contacts alarm on high/low temperature, power outages, and control probe failures.

Third-Party Temperature Systems

The device is equipped with a probe access port for any third-party temperature monitoring system.

To access the port, remove the white caps from back of device and run the probe through to the interior. The port location is indicated with a label. Reseal the port hole with putty to prevent outside air from getting into the device. Mount the probe inside the device near labeled location. Refer to third-party probe installation guide for further details. **Do not run a temperature probe across device door gasket**, this may cause excessive condensation or frosted evaporator.

Operating Instructions

Device is equipped with a digital temperature controller designed to provide full temperature control of the device. The controller provides a constant readout of inventory temperature inside device. Keypad buttons allow the user to easily select the display devices, set point, and alarm information.

The controller has been factory set and tested to allow your device to operate at its desired temperature cycle. Please consult the manufacturer's documentation for additional instructions on using the temperature controller.

Adjusting the settings on the controller will override the factory settings. It is recommended to consult with Terso's technical support department prior to adjusting controller.

Basic Access Process

An end user will present an access pass to the pass reader on the device. The access pass needs to be presented close to the pass reader to be read. The LCD display will indicate granted access when a valid access pass has been presented.

The user now can open the door for a configurable time period, normally about five seconds. Otherwise, the user will need to present an access pass again. Once unlocked, desired inventory may be added or removed. The device will give an audible alarm if the door is left open for more than one minute or configured alarm time.

Once products have been added or retrieved close the device door. The door will automatically lock, and the inventory process will begin and take about a minute to complete. The resulting updated inventory will then be sent to Terso Solutions for processing. The device will not be accessible during the inventory process. Access will then be restored, and the process can be repeated.

Device Alarms

All device alarms are automatically sent to Terso Solutions. Terso Solutions' staff may contact on site staff to assist in correcting a potential problem.

Alarm Types

Door Ajar

When the device's door is left open for longer than one minute, an audible alarm will sound, and the LCD display will show "Please close door" until the door is closed. If the door appears to be closed, verify nothing is obstructing the door and attempt to re-close.

Power Outage

In the event of a power outage, an audible alarm will sound, the LCD display will change to "AC power fail". The alarm will continue until AC power has been restored or the onboard UPS system runs out of power. Device cooling will not function during a power failure. Once power has been restored, the device will perform an inventory scan and resume normal operation.

Temperature

The device continuously monitors internal temperature with specific temperature probes installed by Terso Solutions. If a temperature alarm is triggered, Terso Solutions' staff will contact on site staff to help troubleshoot and/or move temperature sensitive products to a safe location. The device may prevent access if inventory integrity has been compromised or until temperature stabilizes.

Hardware Failure

The device will automatically attempt to correct any system errors preventing correct function. However, in the event of a hardware component failure, the device may lock down to prevent access. Terso Solutions' staff will be in contact with on-site staff if this is the case.

Door Breach

If the device door is forced open a notification will indicate there has been unauthorized access or a door breach. This information is communicated to Terso Solutions as part of a specific event where no access pass was used to access the inventory inside the device. Any products taken will be reported as a standard event but without access pass identification information.

MAINTENANCE

There are no user serviceable parts in the device. Please contact Terso Solutions for any service-related inquiries. Terso recommends that the user perform periodic maintenance items as listed below:





Always disconnect the power supply to the device prior to any repair or maintenance to prevent shock or injury.

Cleaning

Exterior Cleaning

Use a dry cloth to wipe off the outside and inside of device and all accessories. If device outside panels are dirty, clean them with a diluted neutral dishwashing detergent (undiluted detergent can damage the plastic components. For the dilution refer to the instruction of the detergent.) After cleaning with diluted detergent, always wipe off the same areas with a wet cloth. Wipe off excess moisture on device or accessories with a dry cloth. Never pour water onto or into the device. Doing so can cause electric shock or a short circuit.

Do not clean the device with scrubbing brushes, acid, thinner, solvents, powdered soap, cleanser, or hot water. These agents can scratch the paint or cause it to peel. Plastic and rubber parts can be easily damaged by these materials. Especially never use any volatile solvent to clean the plastic or rubber parts. When a neutral dish washing detergent is used to clean the device, wipe it up thoroughly with a cloth soaked in clean water and sanitize with a 70% IPA solution.

Interior Cleaning

If the interior of the device requires cleaning, refer to in house safety procedures to ensure any harmful materials are handled and cleaned correctly.

Cleaning the Door Gasket

The door gasket should be cleaned monthly. Using a soft cloth, remove any frost build-up from the gasket and door(s). The door gasket may need to be cleaned more frequently if dirt or excessive frost build-up prevents the door from closing properly.

Cleaning the Condenser

The condenser should be cleaned once per year at a minimum. Clean the condenser using a vacuum cleaner exercising care to not damage the condenser fins. Depending upon environmental conditions, the condenser may need to be cleaned more frequently.

Cleaning Agents and Tips

ITEM	CLEANING AGENT	TIPS AND PRECAUTIONS
Interior and door liners	Soap and water Baking soda and water	Use 2 tablespoons of baking soda in 1 quart of warm water. Be sure to wring excess water out of sponge or cloth before cleaning around controls, light bulb, or any electrical parts.
Door gaskets	Soap and water	Wipe gaskets and their seating surfaces with a clean, soft cloth.
Shelves and drawers	Soap and water	Do not wash removable shelves in dishwasher.
Exterior and handles	Soap and water Non-abrasive glass cleaner	Do not use commercial household cleaners, ammonia, or alcohol to clean handles. Use a soft cloth to clean smooth handles. Do not use a dry cloth to clean smooth handles.

TROUBLESHOOTING

If the device appears to not be operating correctly, check to ensure that it is plugged into a wall outlet and powered on. If further support is needed, contact Terso Technical Support at +1 888.376.0257. Support can also be contacted by visiting <http://support.tersosolutions.com>.

APPENDIX A: DEVICE SPECIFICATIONS

FEATURES	SPECIFICATION
ELECTRICAL REQUIREMENTS	
Electrical power & frequency	115 VAC, 60 Hz, 2 A
Power consumption	0.9 kW/day (average)
RFID battery backup	12 VDC SLA, qty 2
Plug style	NEMA 5-15
COMMUNICATIONS	
Connection	Ethernet LAN standard, cellular and WiFi optional
ENVIRONMENTAL	
Operating temperature	18 °C to 30 °C
Operating humidity	5% to 95% non-condensing
REFRIGERATION	
Operating temperature	+1 °C to +10 °C
Refrigerant	R600a (SNAP)
Cooling method	Forced air circulation
Defrost type	Automatic
PHYSICAL ATTRIBUTES	
External dimensions (H x W x D)	23.0 in. x 18.0 in. x 18.0 in.
Internal dimension (H x W x D)	15.75 in. x 14.0 in. x 8 in.
External clearance (H x W x D)	25.0 in. x 26.0 in. x 35.0 in.
Volume	1.0 ft ³
Unit weight	60 lbs.
Maximum shelf capacity	10 lbs.
RFID	
Frequency	902 to 928 MHz
Standard	RAIN RFID: EPCglobal UHF RFID Class 1 Gen2v2 / ISO 18000-63
REGULATORY	
FCC	Class B digital device, pursuant to Part 15 of the FCC Rules
RoHS	RoHS 2011/65/EU compliant

* Specifications may change without notice.

APPENDIX C: GLOSSARY

TERM	DESCRIPTION
CONDENSER	A condenser is the part within a refrigerated device that's responsible for cooling the temperature down.
FCC	Federal Communications Commission www.fcc.gov .
MHZ	Megahertz is used to measure the transmission speed of radiofrequency products. Megahertz is equal to One million cycles per second.
IPA	An acronym for Isopropyl Alcohol
LCD	An acronym for L iquid C rystal D isplay
NEMA	An acronym for the US National Electrical Manufacturers Association that sets standards for power plugs and receptacles.
RAIN RFID	RAIN RFID is a global alliance promoting the universal adoption of UHF RFID technology.
RFID	An acronym for R adio F requency I dentification.
RFID BATTERY BACKUP	Provides power to Terso electronics to remain operational when the device has lost electrical power. Indicated by V, Ah, SLA.
RFID TAG (OR TAG)	A radio frequency tag, or label that communicates with the RFID Reader. RFID tags consist of three major components – An RFID microchip, an RFID antenna, and a physical label with or without adhesive.
ROHS	RoHS stands for R estriction of H azardous S ubstances. RoHS originated in the European Union and restricted the use of specific hazardous materials found in electrical and electronic products.
SCAN OR SCANNING SNAP USB	Capturing data from products labeled with an RFID tag. An acronym for the US FDA's S ignificant N ew A lternatives P olicy for environmentally friendly refrigerants. Universal Serial Bus (USB) is an industry standard that establishes specifications for cables and connectors.

APPENDIX D: SAFETY CHECKLIST

CAUTION

Please fill out this form before servicing and ensure that the unit is properly marked with any applicable markings to denote any hazards inside.

Provide this form to the service engineer to keep for safety purposes.

SAFETY CHECKLIST

Device Contents:

Risk of infection	Yes	No
Risk of toxicity	Yes	No
Risk of radioactive sources	Yes	No

Please list any potentially hazardous materials that have been stored in this device:

Contamination of the device:

No contamination	Yes	No
Decontaminated	Yes	No
Contaminated	Yes	No



APPENDIX E:

TERSO SOLUTIONS, INC. TS098, COUNTERTOP RFID REFRIGERATOR WARRANTY – USA AND CANADA

TERSO SOLUTIONS, INC. TS098 COUNTERTOP RFID REFRIGERATOR WARRANTY – USA AND CANADA

Read the TS098 Countertop RFID Refrigerator User Manual before operating the device, accessories, or software (defined collectively and individually as the “Terso Device”) and keep it for future reference. This document contains important Terms and Conditions. Electronic acceptance, opening the device packaging, use of the device, or retention of the device constitutes acceptance of these Terms and conditions.

Terso Solutions, Inc. warrants the Terso Device against defects in materials and workmanship when used normally in accordance with Terso’s guidelines for a period of 36 months from date of shipment to the customer (“Warranty Period”).

This Standard Limited Warranty is conditioned upon proper use of the Device.

This Standard Limited Warranty does not apply: (a) to consumable parts, such as plastic drawers and dividers, or protective coatings that may diminish over time, unless failure has occurred due to a defect in materials or workmanship; (b) to cosmetic damage, including but not limited to scratches, dents and broken plastic unless failure has occurred due to a defect in materials or workmanship; (c) to damage caused by use with a third-party component or product that does not meet Terso Device’s specifications; (d) to damage caused by accident, abuse, misuse, fire, liquid contact, earthquake or other external cause; (e) to damage caused by operating the Terso Device outside Terso’s published guidelines; (f) to damage caused by service (including upgrades and expansions) performed by anyone who is not a representative of Terso; (g) to a Terso Device that has been modified to alter functionality or capability without the written permission of Terso; (h) to defects caused by normal wear and tear or otherwise due to the normal aging of the Terso Device, (i) if any serial number has been removed or defaced from the Terso Device; or (j) if Terso receives information from relevant public authorities that the device has been stolen or if you are unable to deactivate the device or other security measures designed to prevent unauthorized access to the Terso Device, and you cannot prove in any way that you are the authorized user of the device (e.g. by presenting proof of purchase), (k) defects or damage resulting from excessive force or use of a metallic object to open secured panels, or any breakage of the device glass door, (l) equipment that has the serial number or the enhancement data code removed, defaced, damaged, altered or made illegible, (m) ordinary wear and tear.

Important: Do not remove the Terso electronics panel or attempt access the electronics. Opening the Terso Device may cause damage that is not covered by this Warranty. Only Terso or an authorized service representative should perform service on this Terso Device.

If during the Warranty Period you submit a claim to Terso or in accordance with this warranty, Terso will, at its option:

- (i) repair the Terso Device using new or previously used parts that are equivalent to new in performance and reliability, or
- (ii) replace the Terso Device with the same model (or with your consent a device that has similar functionality) formed from new and/or previously used parts that have been reconditioned, rebuilt, or new parts but are equivalent to new in performance and reliability.

All warranty returns must be made using Terso’s RMA process. Terso is not responsible for shipping costs to return the device for a warranty claim. Terso is not responsible for any damage caused by poor packaging of the device being returned and has the right to refuse replacements, repairs, or exchanges if device is damaged due to packaging or during shipment.

Following warranty service your Terso Device or a replacement device will be returned to you at Terso’s cost as your Terso Device was configured when originally purchased, subject to applicable updates. Repaired or replaced devices are covered for the remainder of the original warranty. Replacement or repair of component parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part(s) beyond the original 36-month warranty period.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.

EXCEPT AS PROVIDED IN THIS WARRANTY AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, TERSO IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOSS OF USE; LOSS OF REVENUE; LOSS OF ACTUAL OR ANTICIPATED PROFITS (INCLUDING LOSS OF PROFITS ON CONTRACTS); LOSS OF THE USE OF MONEY; LOSS OF ANTICIPATED SAVINGS; LOSS OF BUSINESS; LOSS OF OPPORTUNITY; LOSS OF GOODWILL; LOSS OF REPUTATION; LOSS OF, DAMAGE TO, COMPROMISE OR CORRUPTION OF DATA; OR ANY INDIRECT OR CONSEQUENTIAL LOSS OR DAMAGE HOWSOEVER CAUSED INCLUDING THE REPLACEMENT OF EQUIPMENT AND PROPERTY, ANY COSTS OF RECOVERING, PROGRAMMING OR REPRODUCING ANY PROGRAM OR DATA STORED IN OR USED WITH THE TERSO DEVICE OR ANY FAILURE TO MAINTAIN THE CONFIDENTIALITY OF INFORMATION STORED ON THE TERSO DEVICE.

THE FOREGOING LIMITATION SHALL NOT APPLY TO DEATH OR PERSONAL INJURY CLAIMS, OR ANY STATUTORY LIABILITY FOR INTENTIONAL AND NEGLIGENT ACTS AND/OR OMISSIONS. TERSO DISCLAIMS ANY REPRESENTATION THAT IT WILL BE ABLE TO REPAIR ANY TERSO DEVICE UNDER THIS WARRANTY OR REPLACE THE TERSO DEVICE WITHOUT RISK TO OR LOSS OF INFORMATION STORED IN THE TERSO DEVICE.

If equipment service is required, please call Terso’s Technical Services Department at +1 888.376.0257 (USA and Canada).