# VTS

## (Variable Temperature Sealer)

## Instructions for Use

Vitl

LIFE SCIENCE SOLUTIONS

Document: V501003
Revision: 9-1311

**Vitl** is the brand name for Integrated Technologies' own range of laboratory products. For further details please visit our Vitl web site.

www.vitl.co.uk

All sales and technical enquiries should be addressed to:

VITL Customer Services
Integrated Technologies Limited
Viking House
Ellingham Way
Ashford
Kent
TN23 6NF
United Kingdom

+44 (0)1233 638383
sales@vitl.co.uk

# 1 Symbols Used in this Instruction Manual

The following advisory symbols are used in this manual.

| Table 1: Advisory Symbol Meanings | |
|---|---|
|  **DANGER** | Indicates a Risk of Electric Shock which could, if not avoided, result in serve injury or death. |
|  **DANGER** | Indicates a Burn Hazard which could, if not avoided, result in serve injury or death. |
|  **DANGER** | Indicates a Risk of Explosion which could, if not avoided, result in serve injury or death. |
|  **WARNING** | Indicates a hazardous situation which could, if not avoided, result in serve injury or death; or severely damage the unit. |
|  **CAUTION** | Indicates a hazardous situation which could, if not avoided, result in minor or moderate injury; or degrade or impair the functionality of the unit. |
|  **CAUTION** | Indicates a Risk of Crush hazard due to moving parts which could, if not avoided, result in minor or moderate injury. |
|  | Advisory note or other useful information. |
| ⇨ ***NN*** | Refer to “section NN” for more details. |

## 2 Safety Precautions and Limitations of Use

It is essential that all users of this equipment have fully read and understood the following safety precautions and limitations of use before installing or operating the VTS unit.

| IMPORTANT | |
|---|---|
|  **WARNING** | The protection provided by this equipment may be impaired if it is not used in a manner described in this manual. |
|  **WARNING** | It is essential that the user of this equipment is aware of the potential hazards associated with the unit and its accessories.<br><br>All operators should be familiar with the safety precautions and warnings given in these instructions before attempting to operate the unit.<br><br>Improper use of this unit or its accessories may impair their functionality and invalidate the manufacturer's warranty. |

| Unit Handling Precautions | |
|---|---|
|  **CAUTION** | Care should be taken not to drop the unit or subject it to rough physical handling, both during normal use and during transportation and storage. |
|  **WARNING** | The unit should be held by the handle when being lifted or moved. Do not lift the unit by any other part of the casework.<br><br>Care should be taken when lifting the unit due to its weight. |
|  **CAUTION** | Care should be taken not to knock the LED display.<br><br>Do not use excessive force when pressing the control buttons or operating the seal activation handle. |

| Unit Installation and Operating Environment | |
|---|---|
|  **DANGER**  **WARNING** | The VTS unit is designed for indoor laboratory use only.<br><br>The acceptable operating temperature range is 18ºC to 30ºC, with a relative humidity of 20% to 80% non-condensing, at a maximum altitude of 2200m above sea level.<br><br>If the unit is stored in conditions outside of these ranges, it must be left to stand unpowered until it has acclimatised to within these environmental limits before being powered. |
|  **DANGER** | Use only the AC mains power cord provided with the unit or as specified section 9.<br><br>The unit must be connected to a suitably earthed mains supply, with appropriate earth-leakage and over-current protection. |
|  **WARNING** | Always ensure that the mains power connector is securely inserted into the rear of the unit, and any excess power cord does not pose a potential trip or pull hazard. |
|  **DANGER** | Do not operate the unit in any area which is, or has been, or is thought to have been exposed to explosive or flammable gases, vapours or liquids. |
|  **WARNING** | The unit must be installed and operated on a solid, stable and level working surface; ensuring that the ventilation holes at the rear of the unit are not obstructed. |

| General Operating Precautions | |
|---|---|
|  **DANGER** | Ensure that the power is switched off at both the AC mains supply outlet and at the back of the unit before inserting or removing the mains power cord. |
|  **DANGER** | The heater plate can reach temperatures of 200ºC and will remain hot for a considerable time after being turned off.<br><br>Extreme care must be taken not to touch the heater plate as it will cause a serve burn injury. |
|  **DANGER** | The unit is intended for use with plates containing biological samples only.<br><br>Never use the unit to seal any explosive, volatile or highly reactive substances or chemicals. |
|  **CAUTION** | There is a possible finger crush hazard due to the moving parts of the handle and plate carrier.<br><br>Care should be taken when operating the handle. |

| Unit Maintenance and Serviceability | |
|---|---|
|  **DANGER** | There are no user or operator serviceable parts inside the unit.<br><br>Do not remove the unit casework. |
|  **WARNING** | Removal of the unit's casework will void the manufacturer's warranty and may expose the user to a Risk of Electric Shock resulting in serious injury or death. |
|  **DANGER** | Once installed, the externally accessible unit fuse will only blow under a fault condition. This fuse should only be changed after the unit has been thoroughly inspected by a qualified engineer. See section 7.1 for details. |
|  **DANGER** | Always switch off the unit and disconnect the power cord before performing any cleaning or decontamination procedure.<br><br>If liquid is spilt into or over the unit, switch off and disconnect the power from the AC mains outlet before attempting to deal with the spillage. |
|  **CAUTION** | Ensure that the heater plate has cooled down to room temperature before performing any cleaning operation and before moving or storing the unit. |
|  **CAUTION** | The use of harsh chemicals and cleaning agents may damage the unit and degrade its performance.<br><br>Always follow the cleaning and decontamination procedures specified in sections 7.3 and 7.4 of this instruction manual. |
|  **CAUTION** | Do not autoclave any part of the unit or its accessories. |

# 3 Regulatory Limitations of Use

## Declaration of Conformity

Integrated Technologies Limited (ITL) affirm that this product fulfils the essential requirements of the Low Voltage Directive (LVD) 2006/95/EC and the EMC Directive 2004/108/EC, when installed and operated in accordance with the instructions in this manual.

ELECTRICAL SAFETY
E113628

The VTS unit has been type tested by EMC Projects Limited (UKAS and CAA approved test facility and UK appointed Notified Body) against the EMC Requirements listed below, and issued Certificate No TES-001122-01.

## Safety and EMC Requirements

| | |
|---|---|
| **SAFETY** | • EN 61010-1:2010, EN 61010-2-051:2003<br>• UL 61010-1:2001 2nd Edition (CAN C22.2 CSA 61010-1) |
| **EMC** | • EN 61326:2006, Class B<br>• FCC CFR 47 Parts 15.107 and 15.109, Class B |

## WEEE Directive Compliance

**WEEE**

Where applicable, the VTS unit should be disposed of in accordance with the European Union WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment.

Do not dispose of this product into unsorted municipal waste or public landfill. Please refer to section 7.6 for details of how to correctly dispose of this product.

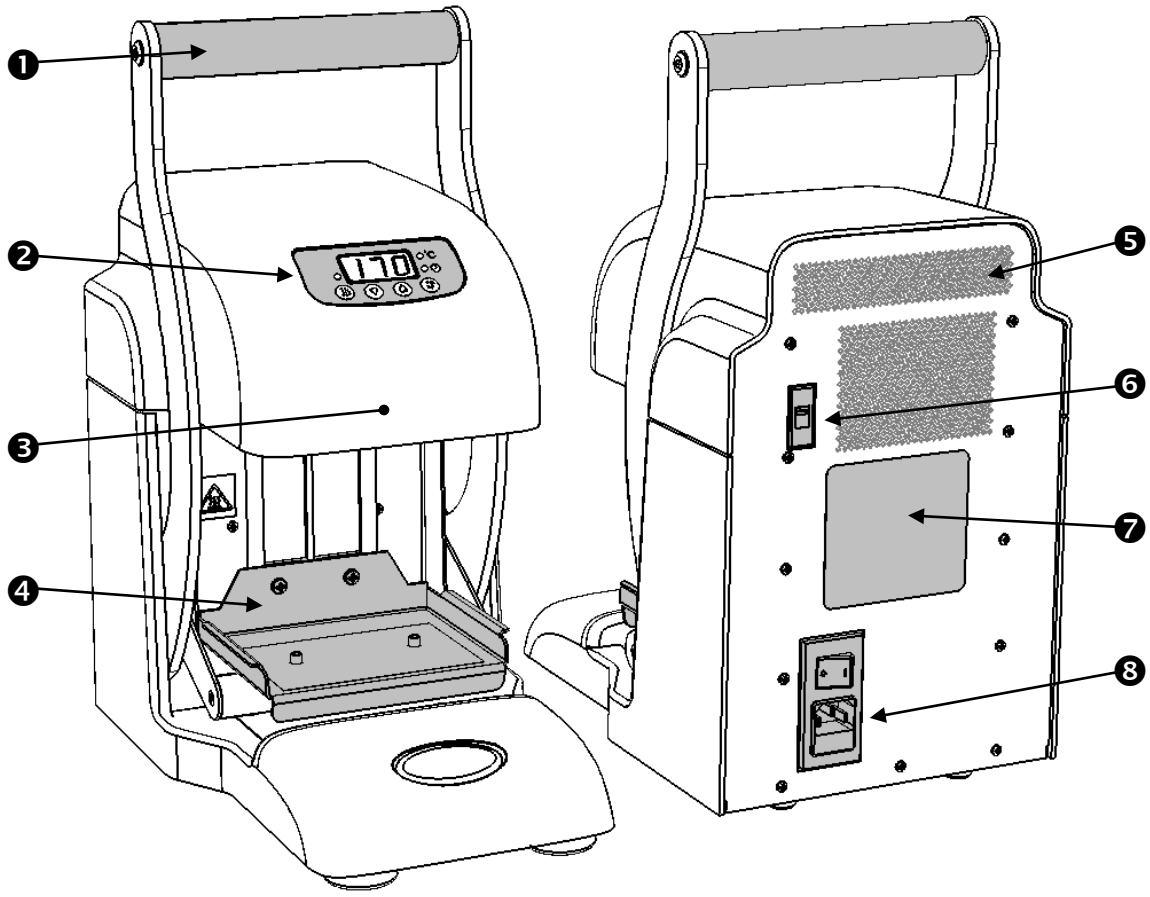
The VTS unit is designed and manufactured under ISO 9001 by:

**Integrated Technologies Limited**
Viking House, Ellingham Way, Ashford, Kent, TN23 6NF
United Kingdom

# 4 Unit Description

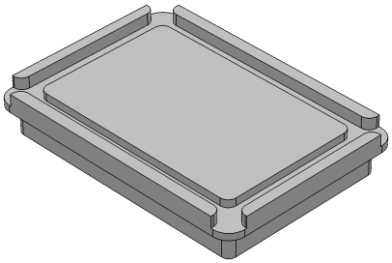
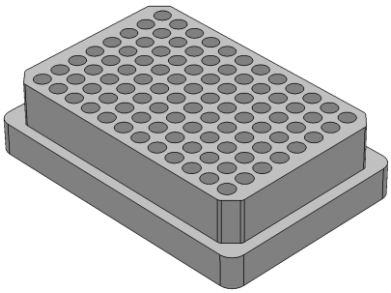
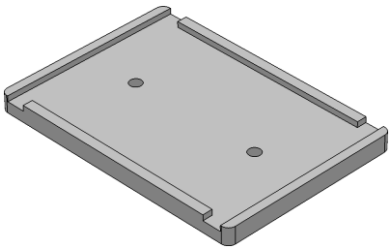
The VTS variable temperature sealer provides a safe and controlled method for sealing plastic sample plates to protect the samples from evaporation and contamination during storage. The sealer is adjustable for both the sealing time and temperature, and gives a visual countdown display during the sealing process for consistent results.

The unit has the following external features:




| Table 2: Unit Features | | |
|---|---|---|
| ❶ | Seal Activation Handle | ⇨ *6.2* |
| ❷ | User Interface Display and Control Buttons | ⇨ *6.1* |
| ❸ | Heater Plate (Internal) | ⇨ *6.1* |
| ❹ | Adaptor Plate Carrier | ⇨ Table **3** |
| ❺ | Rear Ventilation Holes | ⇨ *5* |
| ❻ | Mains Voltage Selector | ⇨ *5* |
| ❼ | Product Information Label | ⇨ *9* |
| ❽ | Power Inlet, On/Off Switch and Fuse Holder | ⇨ *5* |

The VTS unit is designed to be used with a range of sample plates and consumables – some of which are listed below:

| Table 3: Plate and Adaptor Types | |
|---|---|
| **Adaptor Type** | **Suitable Plate Types** |
|  | 96 Well Microtiter Plate<br>384 Well Microtiter Plate<br>PCR 96 Well Skirted Plate |
|  | PCR 96 Well Semi-skirted Plate<br>PCR 96 Well Unskirted Plate |
|  | Deepwell Plates |
| Plate Material Types | Polypropylene, Polyethylene or Polystyrene |

Other specialist adaptor plates may be available at request. Please contact your distributor for details.

| Table 4: Recommended Film and Foil Types | |
|---|---|
| **Films** | Clear Polyester/Polypropylene Laminate<br>Clear Polymer<br>Thin Clear Polymer |
| **Foils** | Foil Polypropylene Laminate<br>Foil Laminate<br>Foil |

A comprehensive range of VITL clear films and foils are available. Please contact your distributor for details.

# 5 Unit Installation

Before installing the VTS unit, please check that the delivery is complete and that the unit and any accessory parts are intact and free from any signs of transportation damage. Also ensure that all external and internal packaging has been removed from the unit before installation.

Please retain all packaging for future transportation and storage of the unit and its accessories.

The VTS unit should be installed in a location which meets the following requirements:

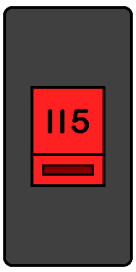
- Safe and suitable operating environment (see section 2)
- Solid, stable, level working surface
- At least 10cm clearance around the unit to adjacent objects and walls
- Earthed AC mains power connection (see section 9)

**WARNING**

Please also observe and abide by the **Unit Installation and Operating Environment** safety precautions and preconditions listed in section 2.

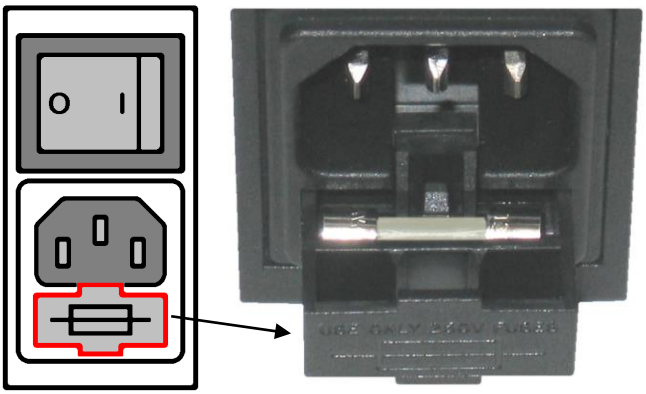
It is important the check that the Mains Voltage Selector switch on the rear of the unit has been set to the correct position for the desired operating voltage, and the correct value of fuse has been fitted (see Table 5).

**Table 5: Mains Voltage Selection**

| **Operating Voltage** | **110 to 120 VAC** | **220 to 230 VAC** |
|---|---|---|
| **Voltage Selection**<br><br>See Section 4 for switch location (❻) on unit rear panel. | 115<br>  | 230<br>  |
| **Fuse Rating** | 3.15AH | 1.6AH |

**WARNING**

Ensure that the correct fuse type has been fitted in the mains inlet fuse holder for the desired voltage selector switch value. See Table 5 for details.



1. Remove the AC plug from the power inlet module
2. Use a small flat bladed screwdriver to carefully pull out the fuse holder
3. Fit the correct fuse in the far position only
4. Push the holder back into the inlet mode

Install and test the VTS unit using the following procedure:

1) Place the unit on the suitably selected working surface (as specified above), ensuring that the ventilation holes on the rear of the unit are not obstructed.
2) Connect the unit to the AC mains power outlet using the mains power cord supplied or as specified in section 9.
3) Switch the mains power on at supply outlet first, and then switch the unit on using the power switch located at the rear of the unit.
4) Check that the unit is stable and safe by performing a trial sealing operation, as described in section 6.2.

**DANGER**

If the unit has been stored in a cool environment, it must be left to stand unplugged until it has acclimatised to the new room temperature before being powered.

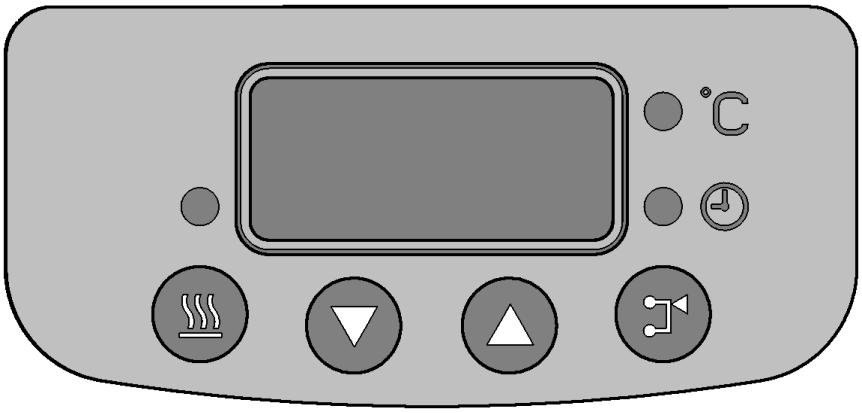
# 6 Unit Operation

**WARNING**

Please ensure that you have read and fully understood all of the **Safety Precautions and Limitations of Use** listed in section 2 before attempting to operate the VTS unit.

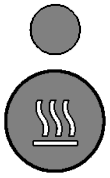
## 6.1 User Display and Controls

The unit's user interface consists of a large 3-digit LED display, four control buttons and three status indicator LEDs.



The LED display shows the current temperature or sealing time set-point (depending on the mode). The button and LED functions are listed in Table 6.

**Table 6: User Buttons and Status LEDs**

| | | |
|---|---|---|
|  | **Heater** Status LED<br>**HEATER** On/Off Button | **Off** – Heater Turned Off<br>**Flashing** – Warming Up<br>**On** – Unit Ready For Use |
|  | **DOWN** Button | |
|  | **UP** Button | |
|  | **MODE** Select Button | |
|  | **Temperature** Mode LED | |
|  | **Timer** Mode LED | |

## 6.2 Performing a Sealing Operation

Various types of plastic sample plate may be loaded onto a plate carrier and thermal sealed using a suitable foil or clear film. See section 4 for details.

The operator may set a precise temperature and seal time for the sealing operation. Sealing is initiated by pulling the handle down, which raises the sample plate into contact with the heater plate. The unit detects when the sample plate is correctly positioned and starts a countdown timer. When the display reads zero, the operator moves the handle back to its upmost position, which moves the sample plate away from the heater plate. The sample plate is then manually removed for storage or further processing.

When the unit is switched on, it recalls the last sealing operation settings and the displays the sealing temperature or time (depending on the display mode), and automatically restores the heater on/off state.

Pressing the **MODE** button toggles the LED display between the plate heater **Temperature** set-point in degrees centigrade and the seal **Timer** setting in seconds.

The sealing temperature is set by pressing the **MODE** button to illuminate the **Temperature** LED (● °C) then using the **UP** and **DOWN** buttons to set the temperature in the range 125 to 200 ºC in 1ºC steps.

Likewise, the sealing time is set by pressing the **MODE** button to illuminate the **Timer** LED (● 🕘) then using the **UP** and **DOWN** buttons to set the time in the range 1 to 9 seconds in 0.5 second steps.

Pressing the **HEATER** button toggles the plate heater between on and off. When the **Heater** LED is flashing, the heater is on and the plate is warming up, which will normally take about 10 minutes.

Once the heater plate is up to temperature (within 2ºC of the set-point) the **Heater** LED will remain constantly on, and the VTS is ready to begin sealing.

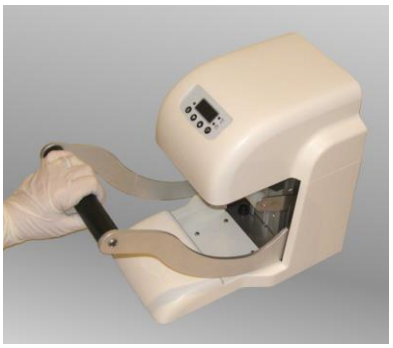
A typical operating sequence is:

1) Switch the unit on and set the required sealing time and heater plate set-point temperature for the desired sealing process (using the method described above).
2) If necessary, press the **HEATER** button to turn the heater on.
3) Allow sufficient time for the unit to reach temperature (the **Heater** LED will stop flashing and remain constantly on).
4) Using a suitable adaptor plate (listed in Table **3**), load the sample plate onto the plate carrier and add the sealing film on top, the correct way up.

> **WARNING** Care should be taken not to touch the surface of the heater plate whilst loading the sample plate.

5) Grasp the handle with one or two hands, as appropriate, and pull the handle forward and down to raise the plate carrier until the sample plate contacts the heater plate.
6) When correct sealing pressure is achieved, an audible alert will sound (if enabled – see section 6.3) and the timer will start counting down from the set value. When zero seconds is reach, the display will flash and the audible alert sound.

> **CAUTION** Do not to apply more force to the handle than is necessary to operate the start switch.



7) Immediately return the handle to its upmost position to retract the sealed sample plate from the heater plate.

> **CAUTION** Failure to release the handle when sealing is complete could degrade the sample plate and seal quality.

8) Remove the sealed plate from the unit and review the seal integrity.

> **WARNING** The sample plate and film/foil may remain hot for several seconds after being removed from the unit.

For optimum performance, the sealing temperature and/or time may need to be adjusted to best suit the sample plate and film/foil types being sealed.

### 6.3 Switching Off the Audible Alert

The unit is fitted with an audible alert which sounds at the beginning and end of each sealing operation.

If desired, this alert can be turned off (or back on again) using the following procedure:

1) If necessary, press the **MODE** button to select the **Temperature** LED setting mode.
2) Next, simultaneously press both the **HEATER** and **MODE** buttons together.
3) The display should show “01” or “00”. If it does not, repeat this procedure from step 1 above.
4) Now press the **DOWN** button to turn the alert off (display shows “00”) or the **UP** button to turn the alert back on (display shows “01”).
5) Finally, press the **MODE** button to store the new setting.

# 7 Maintenance and Servicing

Although the VTS unit does not require any scheduled maintenance or servicing, the operator should regularly clean and inspect the unit for any detects, as described in section 7.3 below.

**DANGER**

Please observe and comply with all of the **Unit Maintenance and Serviceability** precautions listed in section 2.

Never removed the unit casework. There are no user or operator serviceable parts inside the unit.

**WARNING**

Always switch off and unplug the unit before performing any cleaning or disinfecting tasks.

For technical and service related enquiries, please contact your distributor or ITL at the address given on page 2 of this manual.

## 7.1 Replacing the Unit Fuse

The unit fuse should only be replaced by a suitably qualified technician.

**DANGER**

The unit fuse will only blow as a result of an internal unit fault or if the voltage selector switch has been incorrectly set (see section 5). This fuse should only be changed after the unit has been thoroughly inspected, and must be replaced with the exact type specified in section 9.

Thoroughly inspect the unit for any signs of damage, loose components or liquid spillage or ingress. If in doubt, please contact ITL on the number given on page 2 of this manual.

**DANGER**

The fuse holder is removed by disconnecting the mains cord and then using a small flat bladed screwdriver to carefully pull open the fuse holder (see section 5) and remove the old fuse.

After replacing the fuse with the corrected rated one for the operating voltage being used (see Table 5), push the fuse holder firmly back into the inlet module.

The unit must be electrically safety tested for excess leakage current before being repowered from the mains supply.

## 7.2 Over Temperature Safety Cut-out

The unit is fitted with a non-resettable thermal fuse which blows if the heater plate temperature exceeds 235 ºC.

In the unlikely event of a fault condition, this fuse will permanently disable the heater to protect the user and unit from injury and damage. If this occurs, the heater plate will remain cold and the VTS will need to be returned for repair.

## 7.3 Routine Cleaning and Inspection

The unit casework should be cleaned and inspected at regulator internals, and whenever contamination or spillage occurs, as follows:

1. Switch off the unit and disconnect the power before performing any inspection checks or cleaning.
2. Before cleaning, always inspect the unit casework, heater plate and moving parts for any signs of wear, damage, cracks or other defects.
3. Clean the casework using a damp cloth soaked with a disinfectant solution (such as Virkon), whilst wearing suitable PPE.
4. Carefully clean the heater plate surface to remove any debris or sealing material.
5. Remove any debris or fluff from around or between the moving parts of the handle mechanism and sliding plate carrier.
6. Clean the display and buttons, taking care to avoid over wetting.
7. Check that the ventilation holes on the rear of the unit are clear of dust and fluff build-up.
8. Check and clean the adaptor blocks.

**DANGER**

After cleaning, ensure that the unit is thoroughly dry, especially around the mains power inlet, before reconnecting the power cord and switching the unit on.

### 7.4 Decontamination Procedure

The unit and accessories should be decontaminated using the following procedure before being stored or transported.

## Certificate of Decontamination

We respect the health and safety of our clients and employees, and request that any products or accessories being returned are decontaminated in accordance with the procedure below.

### 1. Decontamination Procedure

Thoroughly clean all outside surfaces of the product (including any accessories, power cords, manuals, packaging, etc) with a damp cloth soaked with suitable disinfectant solution (such as Virkon).

Allow to dry fully before packing.

### 2. Decontamination Declaration

Company Name: _____

Address: _____

Product Code: 953-A VTS

Serial Number: _____

Reason For Return: _____

Where Product Used: _____

Please tick the appropriate option(s) below:

☐ I certify that I have decontaminated the product as per the above procedure.

Decontaminant Used: _____

☐ I certify that the product has not been exposed to any chemical or biological materials.

Title: _____ Name: _____

Signature: _____ Date: _____

Telephone: _____ Email: _____

## 7.5 Transportation and Storage

The VTS unit and its accessories should be thoroughly decontaminated using the procedure detailed in section 7.4 before being placed in its original packaging for transportation or storage.

**WARNING**

Refer to section 9 for the acceptable range of Storage and Transportation environmental conditions.

Always ensure that the unit and accessories are completely dry and free of any condensation before being packed.

## 7.6 Product Disposal

At end-of-life, this product must be disposed of in accordance with your local authority regulations for the disposal of potentially hazardous waste and electronic equipment.

The unit and its accessories should be decontaminated using the procedure detailed in section 7.4 before disposal or shipping.

Do not dispose of this product into unsorted municipal waste or public landfill.

Please contact your distributor (or ITL at the address on page 2 of this manual) for details of how to correctly dispose of this product.

# 8 Warranty and Returns

Integrated Technologies Limited (ITL) warrants the VTS product, when purchased new and installed and operated in accordance with the instructions of this manual, to be free from defects in materials and workmanship, and will repair or replace, at their discretion, any unit or accessory which exhibits such defects.

In no event will ITL be liable for any indirect, incidental or consequential damages resulting from any defect or warranty claim.

**NOTE**

Unspecified use or unauthorised modification of any part of the VTS unit or its accessories or the use or attachment of any adaptor or peripheral not supplied, specified or sanctioned by ITL will invalidate this warranty.

This warranty is provided to the original purchaser of the product for one year from the date of purchase.

Under the terms of this warranty, the product must be returned in its original packaging, transportation prepaid by the sender, with a copy of the Proof of Purchase and a detailed description of the problem.

**WARNING**

The product must be decontaminated using the procedure detailed in section 7.4 and a Certificate of Decontamination supplied with any return. If the product is considered too hazardous to be shipped, please contact ITL on the number given on page 2 of this manual for further instructions.

Please contact your distributor (or ITL on the number given on page 2 of this manual) to receive authorisation to return the product.

# 9 Technical Specification

**Model Type**

| | |
|---|---|
| Model Name | VTS (Variable Temperature Sealer) |
| Modal No | 953-A |

**Physical Unit Properties**

| | |
|---|---|
| Dimensions (W x D x H) | 220 mm x 325 mm x 425 mm |
| Weight (without adaptor) | 7.2 kg |

**Mains Supply**

| | |
|---|---|
| Power Cord Rating | IEC C13, 3-Core, 5A min |
| Inlet Module Type | IEC C14, DPST, Single Fuse |
| Supply Voltage Selections | [115] 110 to 120 VAC ±10% |
| | [230] 220 to 230 VAC ±10% |
| Supply Frequency Range | 50 to 60 Hz ±5% |
| Power Consumption | 350 W max |
| Fuse Ratings and Sizes | [115] T3.15AH 250V 20x5mm |
| | [230] T1.6AH 250V 20x5mm |

**Operating Environment**

| | |
|---|---|
| Temperature Range | +18 to +30 °C |
| Relative Humidity Range | 20% to 80% non-condensing |
| Maximum Operating Altitude | 2200 m above sea-level |

**Storage and Transportation**

| | |
|---|---|
| Temperature Range | -10 to +50 °C |
| Relative Humidity Range | 20% to 95% non-condensing |

**Sealing Parameters**

| | |
|---|---|
| Temperature Range | 125 to 200 °C in 1 °C steps |
| Timer Range | 1.0 to 9.0 seconds in 0.5 second steps |
| Audible Alert | On or Off |

## 10 Glossary of Terms and Abbreviations

| | |
|---|---|
| **ANSI** | American National Standards Institute |
| **Deepwell Plate** | Plate with an SBS footprint featuring 48, 96 or 384 wells with a larger volume than microplates |
| **DWP** | Deepwell plate |
| **EMC** | Electro-Magnetic Compatibility |
| **Microtiter Plate** | Plate with an SBS footprint featuring 24, 48, 96 or 384 wells |
| **MTP** | Microtiter plate |
| **PCR** | Polymerase Chain Reaction |
| **PPE** | Personal Protective Equipment |
| **SBS** | Society for Bio molecular Screening |
| **Semi-skirted PCR Plate** | PCR plate with an outer surrounding half edge |
| **Skirted PCR Plate** | PCR plate with an outer surrounding edge |
| **Un-skirted PCR Plate** | PCR plate without an outer surrounding edge |
| **Well** | A single sample cavity in a Microtiter plate, PCR plate or Deepwell plate |

# Contents



# Tables

## Notes