EZ-2 4.0

Bionic

ATS LIFE SCIENCES GENEVAC

Disclaimer

EZ-2 4.0 - Bionic

Original Instructions

The U.S. English version of this document is the original instructions.

All other languages are a translation of the original instructions.

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Safety

Users must be familiar with all the issues outlined in this user manual before attempting to operate the equipment. Any personnel without sufficient training and/or experience to understand any hazards that may arise while operating the equipment should not be permitted to use it.

A risk assessment in accordance with applicable local or national regulations should be carried out for each solvent before use. The possible consequences of applying vacuum to solvent mixtures should always be considered during this assessment.

Warnings & Cautions

The following warning symbols are used in this manual and/or on the product:

	Refer to User Manual. Wherever this symbol is displayed, the user shall refer to the user manual in order to determine any actions needed to avoid a hazard.
	Cold surface hazard
	Hot surface hazard
	Electric shock hazard
	General warning
	Drain port cold surface hazard
	Crush Hazard

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General Safety Precautions

Observe the following safety precautions when operating the evaporator:

- Only operate the evaporator in a sufficiently ventilated space.
- Start system immediately after loading to prevent vapor build-up in the system.
- Ensure that all exhaust hose connections are securely and independently connected to suitable laboratory fume extraction systems at all times.
- Ensure that the condenser jar has been emptied or condenser pot has been drained and the waste solvent container emptied, before starting the evaporator.
- Only use sample holders and swings that are approved for use by SP.
- Do not start or restart the evaporator without ensuring that it is correctly loaded.
- Do not leave the evaporator unevenly loaded (someone else may start it).
- Do not place or store items on top of or beside the evaporator.
- Clean up any solvent spills immediately.

Hazardous Areas & Ventilation

This equipment is intended for installation in ordinary, non-Hazardous or Classified, indoor locations, and shall be installed in accordance with the latest Edition of the National Electrical Code, NFPA 70 or the national equivalent, where the ambient temperature does not exceed 40°C (104°F) maximum.

Refer to the ***Installation & Maintenance Manual*** for information on minimum ventilation requirements.

Solvent Safety

WARNING: Some of the solvents approved for use with the EZ-2 may be subject to occupational exposure limits. Small quantities of solvent liquid or vapor may be present in the condenser or evaporation chamber at the end of an evaporation run. Appropriate protective equipment shall be worn when working with potentially harmful solvents, in accordance with local or national regulations.

WARNING: Evaporating combustible solvents may create a vapor ignition hazard. Minimum ventilation requirements shall be adhered to at all times. Only load the evaporator when you are ready to use it. Clean up all spills immediately.

For specific precautions when using flammable solvents, please refer to the ***Safety Measures for Flammable Solvents*** in this manual.

Solvent Compatibility

WARNING: Low auto-ignition point solvents (such as Diethyl Ether or Pentane) shall not be permitted for use unless the evaporator is fitted with the Inert Gas Purge system.

WARNING: HCl, Thionyl Chloride or other acid chlorides shall not be permitted for use in the EZ-2 unless the evaporator is HCl-compatible. Acids and acid solutions shall not be prepared or stored near the evaporator, even for short periods.

WARNING: Do not use unapproved solvents in the EZ-2. Refer to the list of acceptable solvents in this user manual for solvent compatibility information. Contact SP for advice before using any solvents that are not listed.

Electrical Safety

The evaporator is a Protection Class I product and shall not be used with any interruption to the electrical earth conductor. This equipment is rated for use in Pollution Degree II environments and is intended to operate from a normal single-phase supply.

WARNING: Do not connect to supplies providing more than 1500 A, or with a short-circuit current equal to, or exceeding 1.5 kA.

To prevent nuisance tripping, the mains power supply to the evaporator shall be fitted with a suitably rated Type-D (or equivalent) mains circuit breaker. This circuit breaker shall be installed near the equipment. If using an earth leakage device, use at least a 30 mA rated unit to avoid trips at start-up.

WARNING: If using flammable solvents, take anti-static precautions when loading and unloading the evaporator.

If the evaporator has spent a prolonged period below room temperature (e.g. during transit or storage), do not operate the evaporator for at least one hour after installation to allow the system to acclimatize and disperse any condensation etc.

Disconnection of Supply

To disconnect the supply, remove the plug from the mains power connection. During installation and operation, sufficient access to the disconnection device (plug) shall be made available.

After disconnection, the operator shall wait at least ten seconds before reconnecting the supply or ten minutes when performing maintenance of any kind.

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Inert Gas Purge

WARNING: Asphyxiation hazard. Inert gas may leak from the evaporator during operation of the Inert Gas Purge system. To avoid the risk of asphyxiation, minimum ventilation requirements shall be complied with at all times and all hose connections shall be secured before use.

Refer to the **Installation & Maintenance Manual** for information on minimum ventilation requirements.

Seals

WARNING: Seals provided with the EZ-2 are not bioseals and cannot be relied on for protection against micro-organisms.

Hot & Cold Surfaces

WARNING: The condenser operates at temperatures in excess of -50°C to +60°C. Allow the condenser to reach room temperature before conducting any operation near the condensing coil. Note that some solvents may still be liquids at temperatures below 0°C. Always wear suitable personal protective equipment as indicated by risk assessment.

CAUTION: At the completion of an evaporation run, sample holders and the lamp window may be hot. Take care when unloading sample holders. Do not touch the lamp or the lamp window until they have been allowed to cool.

Emergency Shutdown

All SP Genevac evaporators are designed to be safe with respect to the user and to samples when switched off in an emergency. When power is removed, the evaporation chamber automatically vents to atmospheric pressure and the rotor spins down slowly.

Once powered on again, the system will not allow access to the evaporation chamber for a period of up to 10 minutes after shutdown to ensure the rotor has slowed to a safe speed.

To shut down in an emergency, unplug the evaporator from the mains supply. Users shall familiarize themselves with the location of the connections to the mains supply and ensure that power sockets and plugs are always accessible.

Safety

SP Genevac EZ-2 Evaporators are intended for evaporation and concentration of samples dissolved in solvent(s) for laboratory research, development and analysis purposes only. Acceptable solvents are defined in the ***Acceptable Solvents*** list contained within this user manual; SP may evaluate and advise on the suitability of additional solvents on request. Contact SP before attempting to use any unapproved solvent.

The EZ-2 evaporator is not suitable for the processing or manufacture of foodstuffs, radioactive substances, or cosmetics or pharmaceuticals intended for human or animal consumption. If in doubt, contact SP for advice. This product shall be installed in laboratory or similar environments only.

WARNING: Use of the EZ-2 outside of its intended use may impair the protection provided by the machinery.

Disposal

CAUTION: Risk Of Fire Or Explosion. Dispose Of Properly In Accordance With Federal Or Local Regulations. FLAMMABLE REFRIGERANT Used.

Automated Lid Actuation

A finger trap hazard exists at the back of the lid when opening the actuated lid from the robotic interface or the touch screen. Do not place your hand at the back of the lid when opening the lid.

CAUTION: Risk of Crushing. Do Not Place Your Hands At The Back Of The Lid When Opening The Lid.

Maintenance

Any maintenance or repair of this product, other than that specified within this user manual, should be carried out by an authorized SP representative using SP-approved components. SP offer a comprehensive range of service contracts designed to keep your evaporator in top condition. Maintenance areas which require tools to access, except those procedures described in this manual, should be performed by authorized SP representatives only.

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Electrical Earth Connection

EZ-2 Bionic shall be permanently connected to electrical earth at all times during operation. The system shall be fitted with an earth cable accessible from the utilities panel.
The earth cable shall be connected to the earth stud located behind the moulding (shown below), fed through the grommeted holes and through the cable gland, and to a suitable permanent earth point at the installation site.

Connection of the earth cable shall meet the installation requirements of the current edition of the National Electrical code (NEC; refer to Article 250 for details), or your local or national equivalent.

NOTE: the earth stud is size M6 and shall be tightened to 2.8 Nm. The cable used shall be at least 10 AWG / 6 mm^2.

WARNING: High Leakage Current. The earth cable shall be connected before the power cable. The earth cable shall not be disconnected while the evaporator is connected to the mains power.

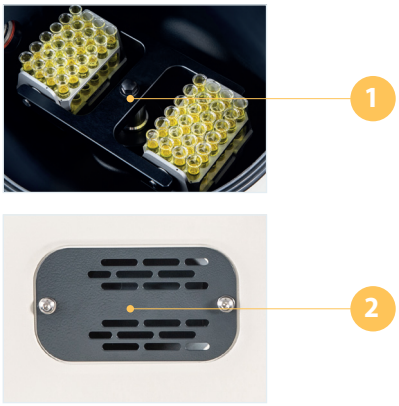
Introduction

SP Genevac EZ-2 ***Bionic*** evaporator represent the ultimate development in high-throughput solvent evaporation technology. The systems comprise a centrifugal evaporation chamber and built-in condenser within a single compact unit. The Bionic includes an external vacuum pump.

The system features two rotor positions on a single rotor level. Each rotor position accommodates a SP Genevac sample holder.

The system is controlled via a high-definition LCD touch screen which is resistant to the unique demands of the laboratory environment or via the RS-232 automation command interface.

EZ-2 Bionic Front, Services Panel, Rotor & IR Lamp Access Panel



Item		Function
1	Rotor	Compatible with a wide range of sample holders to suit a variety of glassware, including round-bottom flasks (up to 500 ml volume), tubes (up to 160 mm length), custom reaction blocks, shallow or deep-well microtitre plates, as well as special sample holders such as the revolutionary SP Genevac SampleGenie™ system.
2	IR Lamp Access Panel	Provides access to infra-red (IR) lamp, allowing lamp replacement to be carried out by the user.
3	Evaporation Chamber Lid	Lid is automatically unlocked when lid is safe to open. Safety interlocks prevent the door from being unlocked when the rotor is spinning.
4	LCD Touch Screen	Provides quick access to everyday functions. Sub-menus and data input screens provide access to more advanced features. At-a-glance information is shown graphically and numerically throughout the evaporation process.
5	USB Ports	Connection ports for USB storage device, facilitating data transfer.
6	Waste Solvent Drain Feed	Feed line for fully-automated condenser defrost and waste solvent drain.
7	Inert Gas Purge Inlet	For connection of inert gas supply.
8	Automation RS-232 Port	Connection port for automation control.
9	Vacuum Pump Control Cable	Controls the nXDS6i vacuum pump.
10	Auxiliary Input	Safety port to disable rotor and lid actuator from automation system E-Stop.
11	Power Switch	Switches the evaporator on or off.
12	Mains Power Socket	Connects system to wall supply through location specific power cable.
13	Electrical Earth Connection	Permanent earth connection required due to high earth leakage current of the unit,
14	Vacuum Inlet	For connection of low-maintenance dry vacuum pump.

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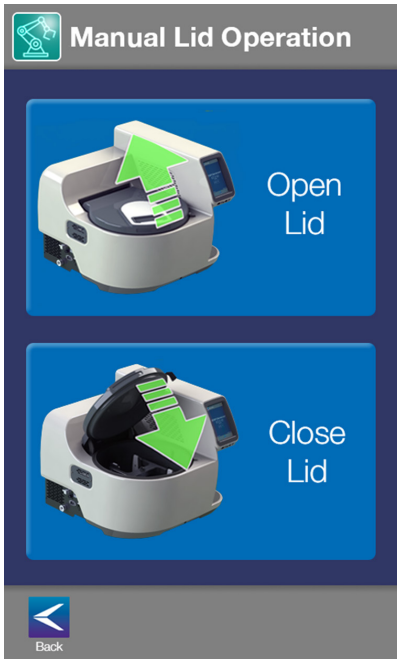
Introduction

The EZ-2 4.0 has been updated to include the option for automation of the EZ-2 Elite. This replaces the manual lid with an automatic lid and the motor with a positioning unit to allow the rotor to be commanded to position for loading and unloading.

Manual Operation

This allows the EZ-2 to be used as a manual unit. The rotor will be free to be turned by hand to allow loading and unloading.

The lid will be able to be actuated from the Menu > Utilities > 'Manual Lid Operation' screen. To open or close the lid, navigate to the screen, and tap the appropriate button.



NOTE: The lid will not hold in position if raised and released manually. Under these conditions, the lid is designed to lower slowly to the closed position.

WARNING: When operating the lid in manual mode, the lid must be held in position for loading and unloading.

Automatic Operation

When the unit is placed in automated operation mode then the touch screen display will display the automation screen.

When in Automated mode the stop button will be displayed. The stop button will stop any active function and remove the system from Automated Operation.

All operations will be controlled through the communications interface. No functions, such as starting a run, will be available from the user interface.

Powering Up

On power-up the system will go into Standby mode. The system will then need to be put into the automation mode via the communications interface.

Lid Operation

To support automated operation the EZ-2 Bionic has an actuated lid. The lid operation is controlled via the communications interface.

When in manual mode the lid can be opened manually. Unlike the non-automated version of the EZ-2, the lid will not retain position when released. Instead, the lid will slowly lower until it is in the closed position.

Rotor Positioning

To support automated operation the EZ-2 Bionic has a servo-controlled rotor. This will position the rotor for loading and unloading, holding the rotor in position between operations. The rotor positioning is controlled via the communications interface.

When in manual mode the rotor will be free to turn. This allows loading and unloading by hand.

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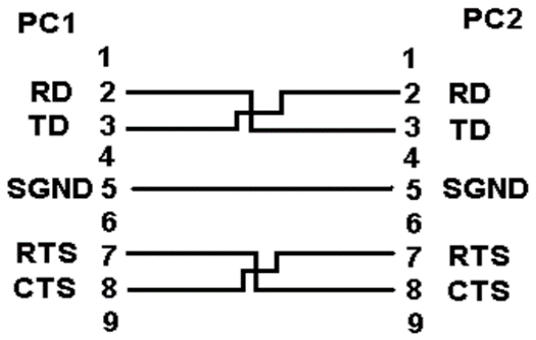
Auxiliary Input

The EZ-2 Bionic is fitted with an input to disable active operation of the Actuator and Servo Drive. This can be tied to the automated systems general safety cut-out in the case that the integrity of the system is compromised by opening of a safety door or interruption of a light curtain. Please see the Auxiliary Input section later in the manual.

Communications

The interface to the Bionic is software language independent. The unit is controlled by ASCII character strings via the RS-232 port.

Serial Port Settings



Baud Rate: 115200
Parity: None
Data Bits: 8
Stop Bits: 1
Handshaking: RTS/CTS hardware flow control

Recommend Polling Rate

We suggest that the EZ-2 Bionic is polled with command 'd' once per second.

Control Characters

STX = 02 hex: Start of text
ETX = 03 hex: End of text
ACK = 06 hex: Acknowledge
NAK = 15 hex: Not acknowledged

Command Format

All characters are standard valid ASCII characters transmitted at RS232 levels.

All messages are in the format: <STX><TYPE><DATA><ETX>CHECKSUM

Where: - TYPE is the message type. (Either Status or Command)
DATA is the required data, if appropriate.
Checksum is the modulo 256 addition of all bytes from STX to ETX inclusive, and expressed as 2 ASCII characters representing the Hexadecimal value of checksum

All messages sent by or sent to the EZ-2 system are to be acknowledged by the following messages.
<STX><TYPE><RESPONSE><ETX>CHECKSUM For a valid Status request
<STX><ACK><ETX>CHECKSUM For valid Commands

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<STX><NAK>#<ETX>CHECKSUM	For invalid (or bad checksum) Commands or Status requests

Not Acknowledge (NAK) codes

A <NAK># response has the following meanings:

<NAK>0: ETX without STX
<NAK>1: Bad Checksum
<NAK>2: No Such Command
<NAK>3: Command can't perform the requested action due to machine status
e.g. 'Lid Open' prevented when under vacuum
<NAK>4: Insufficient Data
<NAK>5: Command unavailable in current mode

Command Set

Command Designator	Command Function
Ca	Enter / Exit Automation Mode
Cc	Idle / Standby System
Cd	Start / Stop Defrost
Ce	Open / Close Lid
Cf	Return Rotor to Home Position
Cg	Move Rotor to Position X
Ch	Lock / Unlock Lid
Ci	Enable / Disable Servo Drive
Cj	Start / Stop Method
Ck	Get System Test Results
Cl	Clear Errors
Cm	Set Evaporator Settings
d	Get Evaporator Settings
e	Get System Values
f	Get Settings
h	Get Method Details
i	Get Logging Details
j	Get Service Information
U	Upload Method
V	Download Method

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To perform automated operation the system must be in Automation mode. When not in Automation mode the only commands that will be available are status requests and the command to enter Automation mode.

Entering Automation Mode

On power-up the system will enter the 'Standby' state. To start automated operation the system must be placed in Automation mode. The system must be in Automation mode to perform any operations.

Putting the System in Idle

The system must be in Standby mode.

Opening the Lid

To open the lid the system cannot be performing any other operation. The chamber pressure must be at atmospheric pressure (this depends on elevation from sea level) and the rotor must be stationary.

Closing the Lid

To close the lid the system cannot be performing any other operation. The rotor must be stationary.

Positioning the Rotor

To position the rotor the system cannot be performing any other operation.

Performing a Run

To perform a Run the system must not be performing any other task. The rotor shall be loaded with sample holders which are balance to be within 10g of each other. This balancing must be performed before loading the sample holders into the sample swings.

A Run can be aborted at any time.

Performing a System Test

To perform a Run the system must not be performing any other task. The rotor shall be load with empty swings.

A System Test run can be aborted at any time.

At the end of the System Test run the results should be evaluated to determine the status of the system.

Performing a Manual Defrost & Drain

To perform a Manual Defrost & Drain the system must not be performing any other task.

The Manual Defrost & Drain can be terminated at any time.

Note: A manual defrost & drain cycle should not be required when using standard methods and the End Of Method Defrost & Drain is allowed to complete normally.

Disabling Servo Controller & Lid Actuator

This should only be used in an emergency. This command can be performed at any time. Lid and rotor operation will be inhibited until re-enabled.

Note: This command will remove power from the Servo Controller and Lid Actuator. If this is triggered during operation this will cause the Run to fail with errors. If stopping the rotor during a Run, then the quickest way to bring the rotor to a full stop will be to abort the run.

Note: If loading or unloading the rotor, the rotor position will not be maintained if the Servo Controller is disabled.

Enabling Servo Controller & Lid Actuator

This command can be performed at any time.

Enabling Inert Gas Purge & Inert Gas Blanket

Enable the Inert Gas Purge and Inert Gas Blanket. This allows the system to evaporate high volatile solvent, including Diethyl Ether or Pentane.

Note: To enable or disable the Inert Gas Purge the password for the system must be known. The factory default for this is 0000.

Resetting Lamps Hours

After replacing the consumable IR Lamp it is best practice to reset the Lamp Hours.

Putting the System in Standby

The system must be in Idle mode.

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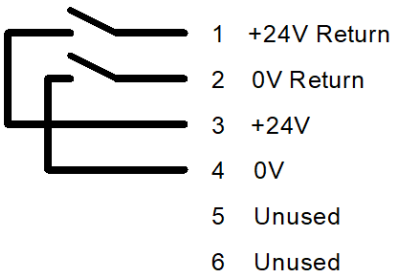
The auxiliary input is used to provide an override from the parent automation system to the EZ-2 Bionic. The input breaks the power connection to the servo controller and lid actuator, preventing operation.

The unit will be supplied with a plug with internal connections, if this operation should not be required, as well as an plug to be wired into the safety circuit.

The connection type is a DIN 45329 series connector.

The connections should be managed through volt free contacts, such as a mechanical relay.

NOTE: A risk assessment in accordance with applicable local or national regulations should be carried out before use.



NOTE: Use of the auxiliary input during a run will cause the run to be terminated. This is to protect the integrity of the samples in the system.

NOTE: On activation of the auxiliary input, error Fault 150 will be generated. This error will persist until the auxiliary input is reset and the error is cleared.

NOTE: Due to rotor braking, the rotor will stop faster by a controlled shut-down instead of using the Auxiliary Input.

System Component Hours

The system records the length of time that various system components are active for. This is to provide data on component life to help with fault analysis. The system components to log are:

1. IR Lamp
2. Chamber Heater
3. Lid Heater
4. Condenser Compressor
5. Pump Running
6. Motor Spinning
7. System – increment when not in standby
8. Lamp Activations
9. Lid Actuator Cycles

The IR Lamp is a consumable, when replacing the IR Lamp the hours counter should be reset using the command ‘Cm04’.

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Error messages are classified on severity. The rules for each type of error are shown below.

- The highest priority error will be displayed first. Lower priority errors will be 'stacked' behind.
- Clearing the highest priority error clears that error message (dependent upon rules listed below). Consecutive errors are cleared in order of priority (high to low).
- Errors are prioritized so that it is possible to see the root cause of a problem.

Table entries

Error – Definition of error type and unique identification number. The error type is one of the following:

Definition of Faults, Warnings, Errors & Advice	
Fault	*The system is affected by a failure that is not hazardous but could prevent it operating correctly. May requires intervention by Service Engineer to rectify*
Warning	*The system is affected by an issue that may be hazardous (to the user, samples or the system itself). The user must take action: the action may be corrective (e.g. rebalance rotor) or may be preventive (e.g. switch off and call Service)*
Error	*The system is affected by an issue that could prevent it operating correctly; issue could be external/consumable/ correctable (e.g. replace lamp, replace battery)*
Advice	*Information with no action required*

Error Text Reported – The actual message displayed in the Error Message pop-up. Manual mode only.

Detected by – Condition that causes the error to occur.

End Run? – Run behaviour when the error occurs. This entry consists of one of the following codes:

E	*Ends run using System Abort (Emergency Stop) - Does not wait to vent before spinning down rotor*
C	*End run using System Stop (Controlled Stop) – Vents to atmospheric before spinning down rotor.*
N	*Does not end run.*
N/A	*Not applicable. Only occurs outside of a run.*

Refuses to start next run? – A yes ('Y') in this column indicates that the error is 'persistent' and will prevent the next attempted run from being started.

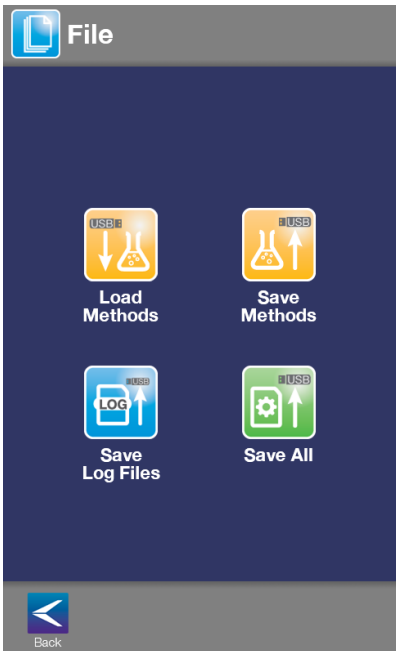
Detect Period – Time taken to confirm the detection condition before the error is raised.

Action – Any additional actions that are taken when the error occurs.

Category – The broad type of error that the specific error falls into.

Comment(s) – Any other relevant comments or information.

Data Transfer



Data can be transferred to or from the evaporator using a USB storage device (not supplied), via the File menu.

Data transfer requires the following directory path to be present on the USB device:

\EZ2

The evaporator will create this directory automatically when it transfers files to a USB device that has not previously been used. If files are to be transferred to a USB device from a computer (e.g. a method file that has been emailed), the EZ2 folder must be created manually before use.

To transfer files, insert the USB device into the USB-A data port. The "USB Connected" icon will be displayed in the top right corner of the Information Bar. Once the USB device is connected, tap the "File" icon to open the File Menu.

The File Menu contains the following options:

Option	Function
Load Methods	Copy selected methods from a USB storage device to the evaporator.
Save Methods	Save selected methods from the evaporator to a USB storage device.
Save Log Files	Save selected log files from the evaporator to a USB storage device.
Save All	Back up system files (all methods, log files & system files) to a USB storage device

NOTE: When transferring methods to the system then the method files should be placed on the USB storage device in the following directory:

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Tap an option to select and follow the on-screen prompts. For information on the "Update Software" process, please refer to the ***EZ-2 Installation & Maintenance Manual***.

NOTE: Do not power on the evaporator when a USB storage device or USB-B cable are connected.

NOTE: Only dedicated USB storage devices (USB flash drives etc.) are suitable for use with the evaporator. Cell-phones and similar multi-purpose devices that function as USB storage devices are not supported.

NOTE: For reliable operation, use a USB device that does not have protection or encryption, and is not partitioned. USB devices must be formatted as FAT32 with an allocation unit size of 4096 bytes to be used with EZ-2 evaporators.

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Evaporator	
Max. Rotor Speed	1920 rpm
Nominal sample load g force	500 g
Temperature control range	30 °C to 80 °C
Max. Load per Swing	1.5 kg
Max. Operational Imbalance	80 g
Dimensions (W x D x H)	614 x 648 x 560 mm
Weight (Approx)[1]	88 kg
Vacuum Pump (External)	
Type	Oil-free Scroll
Ultimate System Vacuum	< 0.4 mbar
Dimensions (W x D x H)	432 x 282 x 302 mm
Weight	26.2 kg
Vacuum Hose / Control Cable	2 m
Condenser	
Type	Single-stage vapor compression
Refrigerant Gas	R1270
Refrigerant Charge	28 g
Refrigerant GWP	2
Refrigerant CO_2e	< 0.001 tonnes
Ultimate Low Temperature[2]	-50° C
Max. Pressure (PS)	30 bar
Emissions	
Noise (@ 1 meter)	65 dB(A)
Exhaust Hose (Supplied)	6 mm ID / 8 mm OD
Electrical	
Supply	100 V 50 Hz
	100 V 60 Hz
	120 V 60 Hz
	220 V 60 Hz
	230 V 50 Hz
Max. Supply Input	1500 A

Storage / Transportation Environment	
Ambient Temperature	0 °C to 40 °C[3]
Relative Humidity	10-80% non-condensing
Store Upright at all Times	
Operational Environment	
Ambient Temperature	15 °C to 30 °C
Relative Humidity	10-80% non-condensing
Altitude	Sea-level to 1600 m
Min. Ventilation Air-Gap	50 mm
Installation Environment	Indoor only
	Static-Dissipative Laboratory or Similar
Solvent Capacity & ACC Range	
Maximum Solvent Capacity	750 mL
Refrigeration ACC Range	110 °C
Inert Gas Supply Requirements	
Max. Pressure	2 bar g (3 bar abs.)
Min Pressure	1.5 bar g (2.5 bar abs.)
Flow Rate (Nominal)	50 liters/min @ STP[4]
Hose Length	2.5 m
Max. Consumption (Purge)	170 liters approx.
Max. Consumption (Blanket)	88 liters/hour approx.
Connector Type	⅜ in BSP female

1 Varies with build options.
2 Ultimate low temperature; operational values may vary.
3 -10 °C permissible during transport (only).
4 STP = Standard Temperature & Pressure.

The power cable supplied is 2.5 meters in length and is appropriate to the region to which the system is delivered.

NOTE: To prevent nuisance tripping, the mains power supply to the evaporator shall be fitted with a suitably rated Type D (or equivalent) mains circuit breaker. If using an earth-leakage device (e.g. an RCD or GFI), use at least a 30 mA rated unit to avoid trips at start-up. The circuit breaker shall be installed near to the equipment.

The evaporator is designed for use in a Pollution Degree 2 environment (normally only non-conductive pollution occurs). The evaporator is considered Class B industrial equipment according to EN61326/CISPR11 and is intended for use in a laboratory or similar environment. In non-laboratory environments this product may cause interference, in which case the user is required to take appropriate actions.

For the purpose of air-conditioning or ventilation requirement calculations, all power consumed by the system is dissipated as heat.

Technical Specification

Power Consumption

Supply	Outlet	Peak Power (VA)	Peak Current (A)	BTU/h Output
100 V 50 Hz	System	1020	10.2	5220
	Pump	510	5.1	
100 V 60 Hz	System	1080	10.8	5320
	Pump	480	4.8	
120 V 60 Hz	System	1220	10.1	6210
	Pump	600	5	
220 V 60 Hz	System	1320	6	6480
	Pump	580	2.5	
230 V 50 Hz	System	1380	6	6685
	Pump	580	2.5	

Display Specification

Display	
Size	18 cm (7") diagonal
Resolution	800 x 480
Panel Type	TFT
Touch Screen	Projective Capacitance

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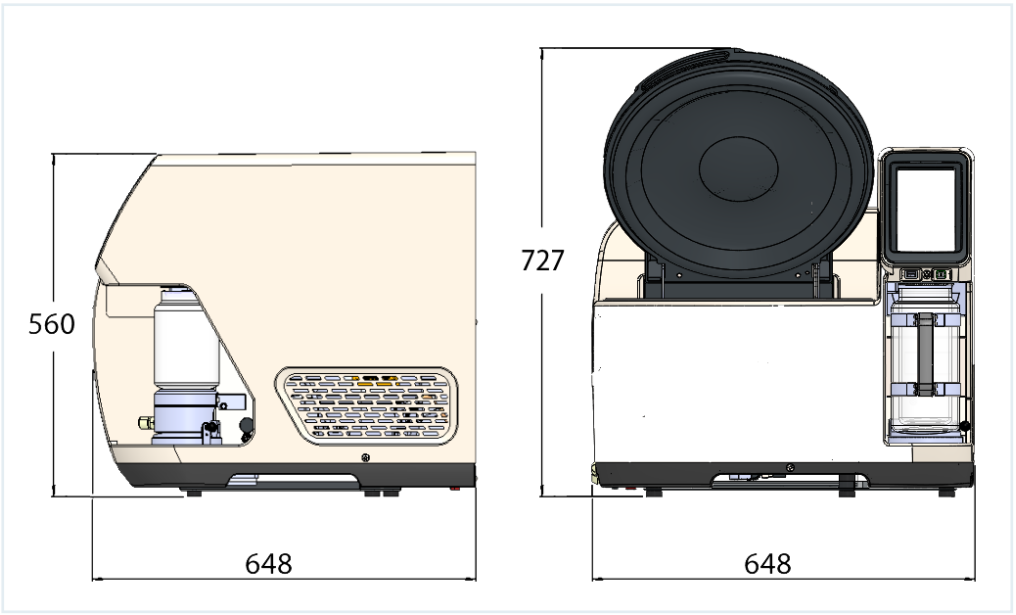
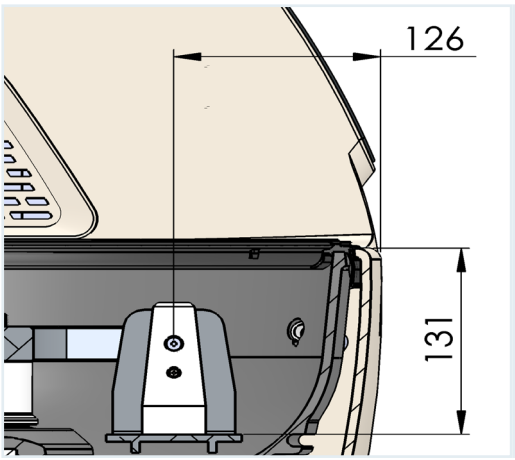
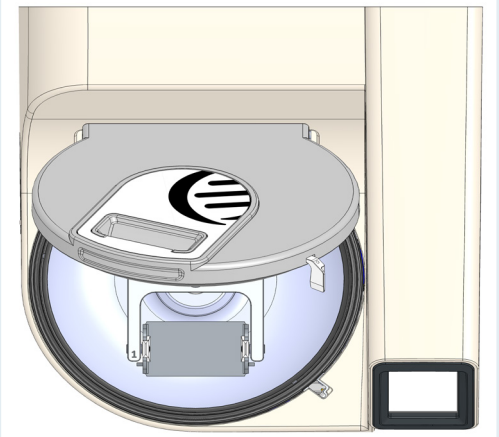
Sample Holder Loading Position

To allow for robotic loading the lid opens to provide access from the both sides of the sample holder when accessing from above.

For loading the rotor positions are presented square to the front of the system. The diagrams below show the critical dimensions for the loading location in the chamber.







Warranty Information

The EZ-2 4.0 product is offered by Company solely with the limited warranty provided below when operated as specified in the instructions provided in this manual.

For prompt service, locate the serial tag on your new EZ-2 4.0 and record the information below for future reference. Company also recommends that you complete an on-line warranty registration at scientificproducts.com.

EZ-2 4.0 – Bionic

Limited Warranty

Unless otherwise mutually agreed to in writing, Company warrants each of its products against any defects in material or workmanship for a period of 12 months from the date of shipment under the following conditions (the "Limited Warranty"). This warranty supersedes and replaces any general advice provided to you by Company's employees concerning the use of Company's products, and any oral representations shall not be considered warranties with respect to particular products or their uses and may not be relied upon if they are inconsistent with the relevant product specifications for the items set forth in the applicable product manual. This limited warranty is only provided to the original purchaser and is not transferable.

The sole and exclusive obligation of Company shall be, at its option, to repair or replace, without charge any parts that prove to be defective within the term of the Limited Warranty and if applicable, labor required to repair and/or replace such defective parts, if the purchaser notifies the Company promptly in writing of such defect. Company shall have no obligation under the Limited Warranty or otherwise if the product is not used in a reasonable manner under appropriate conditions and consistent with the applicable operating instructions, or if there is any service or repairs made by any third-party other than Company or its authorized service providers during the term of the Limited Warranty. Company shall not be responsible for labor charges payable with respect to persons other than Company employees or authorized service providers performing services at the direction of Company. Replacement or repair of parts pursuant to this warranty shall not in any way extend the original term of the Limited Warranty.

In addition, this Limited Warranty shall be void upon your violation of or failure to conform to the following provisions:

- Exhaust vapors must be ducted away from the system to a suitable laboratory fume extraction system.
- The system is only used for the purpose for which it was sold, and in accordance with the Acceptable Solvents list.
- Maintenance and cleaning must be carried out as detailed in the instructions provided.
- Power leads supplied with the system are used with that system only.
- Only SP-approved sample holders, accessories and consumables are used.

In the event of a vacuum pump failure, the pump may be exchanged for a refurbished unit. The owner is responsible for the exchange and return of the failed unit.

EXCEPT AS EXPRESSLY PROVIDED HEREIN, Company PROVIDES THE PRODUCTS "AS-IS" AND, TO THE MAXIMUM EXTENT ALLOWED BY LAW, DOES NOT MAKE AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES OF ANY KIND, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE SALE, INSTALLATION, DESIGN OR USE OF ITS PRODUCTS.

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COMPANY SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF OR ANY DEFECTS IN ITS PRODUCTS, INCLUDING DAMAGES FOR LOST PROFITS, LOST OPPORTUNITIES OR LOST DATA, EVEN IF SUCH DAMAGES WERE FORESEEABLE OR A BREACH OF AN AGREEMENT BETWEEN THE PARTIES. THIS LIMITATION SHALL APPLY REGARDLESS OF WHETHER THE DAMAGES ARISE OUT OF BREACH OF CONTRACT, TORT, OR ANY OTHER LEGAL THEORY OR FORM OF ACTION. IN NO EVENT SHALL COMPANY'S LIABILITY RELATED TO THE PRODUCTS EXCEED IN THE AGGREGATE THE AMOUNT PAID FOR THE PRODUCT OR THE PARTICULAR PIECE OF EQUIPMENT AT ISSUE.

Notwithstanding the above, to the extent that the terms and conditions set forth in Company's formal sales contracts conflict with these provisions, the term and conditions of Company's formal sales contracts shall control.

Returning Equipment to SP

SP will not accept delivery of parts or equipment being returned which is not accompanied by an appropriately completed Safety Declaration. This applies to all equipment and/or parts. In some cases, you may be responsible for payment of certain packaging or shipping charges related to returns under the Limited Warranty. To obtain a Safety Declaration, or to inquire about the return of a product and requirements thereof, contact your local SP representative or service department. Contact details are shown on the back of this manual. You bear all responsibility and assume all risk for return shipping as part of the repair process. The Limited Warranty shall not apply to, and Company shall have no obligation or responsibility to fix, repair, or cover, any damages to parts or equipment which occur as a result of improper packaging or during any shipping during the return process.

Where possible, retain the packaging for re-use in the unlikely event that the system needs to be returned for repair. If required, replacement packaging can be provided subject to a charge for materials and shipping costs.

Patents

1556149	7,503,997
1556149 FR	600 07 636.9-08
2396575	4465277

Patent pending No. 2203169.4

China RoHS2 Compliance Table

Listing of Hazardous Substances Contained within the Equipment:

Hazardous Substances 危险物质						
Part Name 部件名称	Lead (Pb) 铅	Mercury (Hg) 汞	Cadmium (CD) 镉	Hexavalent Chromium (CR(VI)) 六价铬	Polybrominated Biphenyls (PBBs) 多溴联苯	Polybrominated Biphenyls Ethers (PBDEs) 多溴二苯醚
Inert Gas Purge Supply Valve 惰性气体吹扫供应阀	X	O	O	O	O	O
Inert Gas Purge Vent Valve 惰性气体吹扫放空阀	X	O	O	O	O	O
Pressure Selection Valve 压力选择阀	X	O	O	O	O	O
Compressor Electronic 压缩机 控制器	X	O	O	O	O	O

This table is prepared in accordance with the provisions of SJ/T 11364.
此表是按照 SJ/T 11364 的规定编制。

O: Indicates that said hazardous substance contained in all the homogenous materials for this part is below the limit requirement of GB/T 26572.

O: 表示该有害物质在该部件的所有均质材料中的含量低于 GB/T 26572 标准规定的限量要求。

X: indicates that said hazardous substance contained in at least one of the homogenous materials used in this part is above the limit requirement of GB/T 26572.

X: 表示该有害物质在该部件的至少一种均质材料中的含量超出 GB/T 26572 标准规定的限量要求。

NOTE: These components are EU RoHS2 compliant through use of exemptions. These components are safe to use for the environmentally friendly use period (EFUP) below.

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ATS
LIFE SCIENCES GENEVAC

EU Declaration of Conformity

Name and address of Manufacturer:

Genevac Limited
The Sovereign Centre, Farthing Road, Ipswich, Suffolk, IP1 5AP, UK

Name and address of the person authorized to compile the technical file:

Irta Dosificacio I Tecnologia SL
Carrer dels Remences, 44, 08304 Mataró, Barcelona, Spain

Declare under our sole responsibility as manufacturer that the products:

SP Genevac EZ-2 4.0 Bionic

to which this declaration relates are in conformity with the relevant Union harmonisation legislation:

- The Machinery Directive 2006/42/EC
- The Electromagnetic Compatibility Directive 2014/30/EU
- The Restriction of Certain Hazardous Substances Directive (ROHS) 2015/863/EU
- The Fluorinated Greenhouse Gases Directive 517/2014/EU

by reference to the following harmonized standards:

- **BS EN 12100: 2010** Safety of machinery. General principles for design. Risk assessment and risk reduction.
- **BS EN 60204-1: 2018** Safety of machinery - electrical equipment of machines. Part 1: General requirements.
- **BS EN 61010-1: 2010 + A1: 2019** Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements.
- **BS EN 61326-1: 2013** Electrical equipment for measurement, control and laboratory use. EMC requirements. Part 1: General requirements.

Hermetically sealed equipment containing fluorinated greenhouse gases accounted for within the United Kingdom F-Gas Quota system.

Signed for and on behalf of: G. Page
R&D Manager
Genevac Ltd. Ipswich, United Kingdom
Date: 16-Feb-2023

CE

ATS LIFE SCIENCES GENEVAC

UK Declaration of Conformity

Name and address of Manufacturer:

Genevac Limited
The Sovereign Centre, Farthing Road, Ipswich, Suffolk, IP1 5AP, UK

Declare under our sole responsibility as manufacturer that the products:

SP Genevac EZ-2 4.0 Bionic

to which this declaration relates are in conformity with the relevant UK Statutory Instruments (and their amendments):

- The Supply of Machinery (Safety) Regulations 2008 No. 1597
- The Electromagnetic Compatibility Regulations 2016 No. 1091
- The Restriction of Use of Certain Hazardous Substances in Electrical and Electronics Equipment Regulations 2012 No. 3032
- The Fluorinated Greenhouse Gases Regulations 2015 No. 310

by reference to the following harmonized standards:

- **BS EN 12100: 2010** Safety of machinery. General principles for design. Risk assessment and risk reduction.
- **BS EN 60204-1: 2018** Safety of machinery - electrical equipment of machines. Part 1: General requirements.
- **BS EN 61010-1: 2010 + A1: 2019** Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements.
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Hermetically sealed equipment containing fluorinated greenhouse gases accounted for within the United Kingdom F-Gas Quota system.

Signed for and on behalf of: G. Page
R&D Manager
Genevac Ltd. Ipswich, United Kingdom
Date: 16-Feb-2023

UK CA

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Read these instructions carefully before operating the evaporator and keep them near the system for ease of reference. Your attention is drawn, in particular, to the **Safety** section.

These instructions are correct at the time of going to press and may be subject to change without notice. Some of the features and software functions described within this manual may not apply to equipment manufactured before this manual's publication date; this includes systems that have been upgraded.

No part of these instructions may be reproduced in any form or be processed, duplicated or distributed by electronic or other means without the express written permission of SP.

Should you need to contact SP for assistance, please use one of the contact methods shown. Please have the equipment serial number and any other pertinent information to hand.

This equipment should not be discarded in your regular waste stream. Contact your representative or SP for proper disposal instructions.

Within the EU, it is SP's responsibility under the WEEE Directive to provide for the recycling of SP products.

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Bel-Art | FTS | Genevac | Hotpack | Hull | i-Dositecno | Service | VirTis | Wilmad-LabGlass

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