PINPOINT SCIENTIFIC

ImpactAir® User Manual

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Table of Contents

1. Summary 3
2. Overview 4
2.1 Safety instructions 4
2.2 CE certification – production units only 4
2.3 Symbols 4
2.4 Weight and dimensions 6
2.5 Environmental operating conditions 6
2.6 Storage temperature 6
3. Product Description 7
3.1 Front view 7
3.2 Chamber lid 7
3.3 Rear view 8
3.4 Exhaust 8
4. User Interface Overview 9
4.1 Overview of operating conditions 9
4.2 Summary of set up conditions and defaults 9
4.3 Run cycle and results 10
4.4 Summary of notification and error conditions 10
4.5 Checking settings 11
4.5.1 Set run time 13
4.5.2 Set plate percentage 14
4.5.3 Set run delay time 15
4.5.4 Set date and time 16
4.5.5 Set date 16
4.5.6 Set time 17
4.6 Run operation and displays 17
4.6.1 Run delay 18
4.6.2 Normal run 18
4.6.3 Pausing the run 19
4.6.4 5 minutes to the end of run…. 19
4.6.5 Run complete 21
4.6.6 Run summary 21
4.7 Error Messages 22
4.8 Screen Saver 23
4.9 Service Date Equipment Details 23
4.10 More Settings 24
4.10.1 Access to service menu 24

4.10.2 To change screen brightness 25
4.10.3 To change sound settings 25
4.11 Purge 26
4.11.1 Conditions 26
4.11.2 Purge complete 27
4.12 Password Settings 27
4.12.1 Password enabled/disabled 29
4.12.2 Changing password 29
5. Accessories 30
5.1 Remote control panel 30
6. Cleaning 31
7. Service 32
7.1 AC mains lead Fuse replacement - UK USERS ONLY 32
8. Training 33
9. Troubleshooting 34
10. Warranty Information 36
11. Contact Details 37

1 Summary

The ImpactAir® product is a microbiological active air sampler designed for use in pharmaceutical cleanrooms or other highly controlled environments.

- *Fully 316L stainless construction*
- *D50 < 0.5µm (*50% of the particles of this diameter will impact the collection surface*)*
- *Up to 4 hours run time per plate*
- *Dynamic height control*
- *Universal power supply*
- *Flexible design – multipurpose*
- *Large clear touch screen*
- *High reliability air pump*
- *Does not shed particles*
- *Very low vibration*
- *Very low power consumption <50 Watt*
- *H14 HEPA filtered exhaust*
- *Low noise*
- *Data & communications enabled*

The ImpactAir, air sampler is a slit to Agar design using 140mm agar plates located on a rotating turntable to prevent twin impingement of impacted organisms, to minimize drying of the agar medium and to provide a time correlated deposition of captured microbes.
ImpactAir has been designed to optimise the impaction and growth of air-borne microbial contamination down to 1 micron. This has been achieved by a combination of the design of the area of the slit, coupled with sufficient air flow (calibrated for accuracy at 28.3 LPM / 1 cfm), giving an air velocity of 70 metres per second. The Physical and Biological Efficiency of ImpactAir is independently validated (with and without remote probe), to meet the requirements of ISO 14698 part 1 Annexe B meeting the exact standards required of a Class A air sampler.
ImpactAir can be used as a stand-alone active air sampler, or as a remote sampler allowing the instrument to be located up to 8 feet away from the critical sampling point. To perform remote sampling, a maximum length of 8 feet (2.2 metres) of half inch (12.6 mm) bore stainless steel tubing, with up to 3 x 90 degree elbows, is attached over the slit assembly by a stainless steel bayonet cap.

- The ImpactAir has the ability to sample air over a time period that is determined by the user.
- The volume of air sampled is fixed at 28.3 litres per minute (lpm), driven by an air pump. A Mass Flow Sensor is used to measure the flow-rate allowing the firmware to dynamically adjust the air pump's speed.
- $1m^3$ of air is sampled in 35 m 20 s.
- The Rotation speed is constant during a run. The speed is calculated by a combination of the Run Time and Plate Percentage, both of which are configurable through an administrator password access screen.
- Each sample (an individual plate of agar), can rotate up to a maximum of 360°, and can be limited to less by the Plate Percentage setting.

- There are 3 model variations available
  - ImpactAir – Fully automatic system
  - ImpactAir – Remote with remote control screen
  - ImpactAir ISO – with minimal footprint and remote control only

2 Overview

Please read this manual carefully to familiarise yourself with the operation and maintenance of the Impact Air.

2.1 Safety instructions

For your safety, the safety of others using the workstation and those around you;

- The equipment must be disconnected from the AC mains power supply during installation. The electrical system must have an isolation device (isolator) which disconnects the equipment at both AC mains poles. As well as correct in-line isolation devices: line protecting cut-outs, fuses, earth leakage trips and contactors.
- Switch off the equipment when not in use.
- When Isolating the equipment from the AC Mains supply ensure that the equipment, its peripherals, accessories and all other interconnected equipment are switched off before commencing isolation/disconnection from the AC mains supply.
- Replace consumable parts with only those specified by the manufacturer.
- Where applicable only replace faulty power cord/s with the approved replacement part.
- Do not use multi-way outlet adapters to connect equipment to the AC Mains supply as this is a fire risk.

- **FAILURE TO ADHERE TO THESE SAFETY INSTRUCTIONS COULD CAUSE SERIOUS INJURY AND WILL INVALIDATE THE IMPACTAIR WARRANTY. PINPOINT SCIENTIFIC ACCEPTS NO RESPONSIBILITY FOR ANY ACCIDENT, INJURY OR LOSS CAUSED BY UNSAFE OPERATION OF THE IMPACTAIR.**

2.2 CE certification – production units only

- This product complies the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC and the RoHS Directive 2011/65/EU (RoHS 2).
- CB certified units can be made to order.

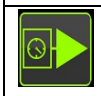
2.3 Symbols

Before using the Impact Air please ensure that you are familiar with the symbols on the Impact Air.

Figure 1: Impact air Electrical symbols – Production units

Symbol	Description
O	Power Off
I	Power On
	Alternating Current AC Source
	Warning this equipment contains high voltage circuitry
	Warning: If the Impact Air is used in a manner not specified by Pinpoint Scientific the protection afforded by the equipment may be impaired
	Warning: If the Impact Air contains a Class II laser. Do not stare into the beam.
	ImpactAir contains hazardous components and must not be disposed of at a household waste site. It should be taken to the appropriate collection point for the recycling of electrical and electronic equipment.

Figure 2: Software symbols and functions

Symbol	Description	Comments
	Lid Open	The lid has to be closed for a run or purge to proceed.
	Run	Activates the run cycle
	Settings	To access the settings screen – To set: Run Time / Plate percentage / Start - Run Delay /Password settings / Service Calibration / Date -Time
	Run/sample Time	Sets the period for which air is sampled during a single 'run'.
	Plate Percentage	Sets how much of the agar plate is exposed to the sampled air during a 'run'
	Start/Run Delay	Sets the time between the user initiating a 'run' - and air-sampling starting. This allows time for the user to leave the area.
	Date and Time	Sets the date and time
	Service	Restricted access for service settings by service personal
	Calibration	Display of calibration/service dates and equipment version details
	Password settings	To set and activate password
	More settings	To access the More settings screen – To set: Brightness / Volume / Purge
	Brightness	Sets the brightness of the screen
	Volume	Sets the volume control
	Purge	Sets the period for which air is pumped through the inlet.
	Incorrect password	
	Return to a previous screen	
	Plate Error	No plate detected when a run is attempted Plate detected when a Purge is attempted
	Warning/Error	The system has detected a malfunction or a setting out of range – pressing this icon will display the details.
	Run disabled	Any system malfunction or incorrect setting that may affect the behaviour of a run, will prevent the user from starting one.

	Run Error	Run has not completed correctly
	Error classification	Codes for error conditions. See table in this manual

2.4 Weight and dimensions

The Impact Air weight approximately 9kg. Figure 3 lists the dimensions of the Impact Air;

Figure 3: Impact Air dimensions

Width	200.0mm
Depth	240.0mm
Height including lid	239.5mm
Height excluding lid	186.9mm

2.5 Environmental operating conditions

The ImpactAir should only be operated under the following environmental conditions:

- Temperature – Between 15°C and 30°C
- Maximum relative humidity - 90% @ 30°C
- NOTE: The ImpactAir should not be operated in an explosive gas or dust environment as it is NOT ATEX rated

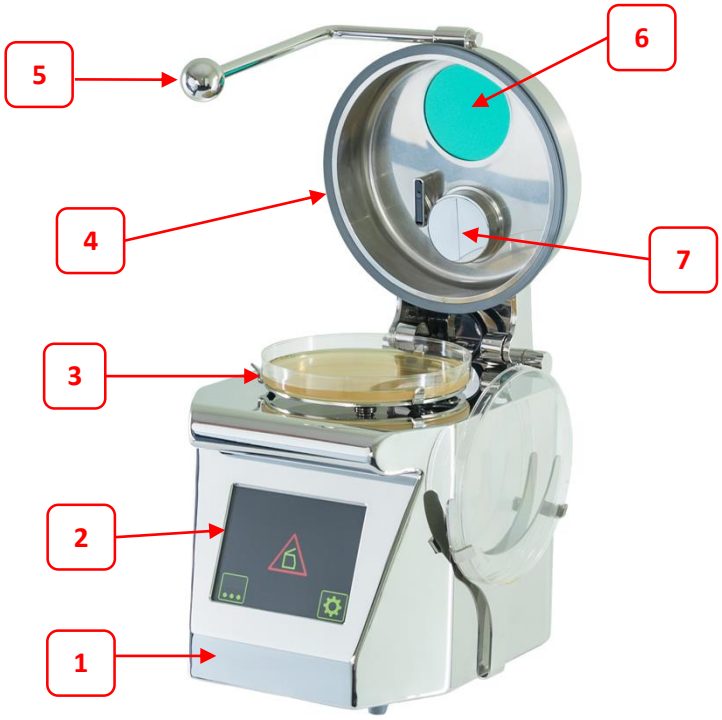
2.6 Storage temperature

- When not in use, the Impact Air must only be stored under the following environmental conditions: Temperature – Between 5°C and 40°C

Storage outside of this range may damage the unit.

3 Product Description

3.1 Front view



1. ImpactAir Main body (316L Stainless Steel)
2. Full colour TFT capacitive touch screen
3. 140mm plate turntable
4. Chamber Lid
5. Handle
6. Viewing glass
7. Air inlet

3.2 Chamber lid

- The chamber lid provides a circular machine glass viewing panel which provides good visibility of the 140mm plate as shown in Figure 4. The chamber lid features a seal, a handle attachment and an inlet with a bayonet fitting to allow hose adaptors to be used for sampling remotely.
- The chamber lid contains proprietary circuitry for measurement and setting of the distance between the inlet and the surface of the agar.
- The chamber lid can be removed by service personal only, due to the nature of the embedded electronics.

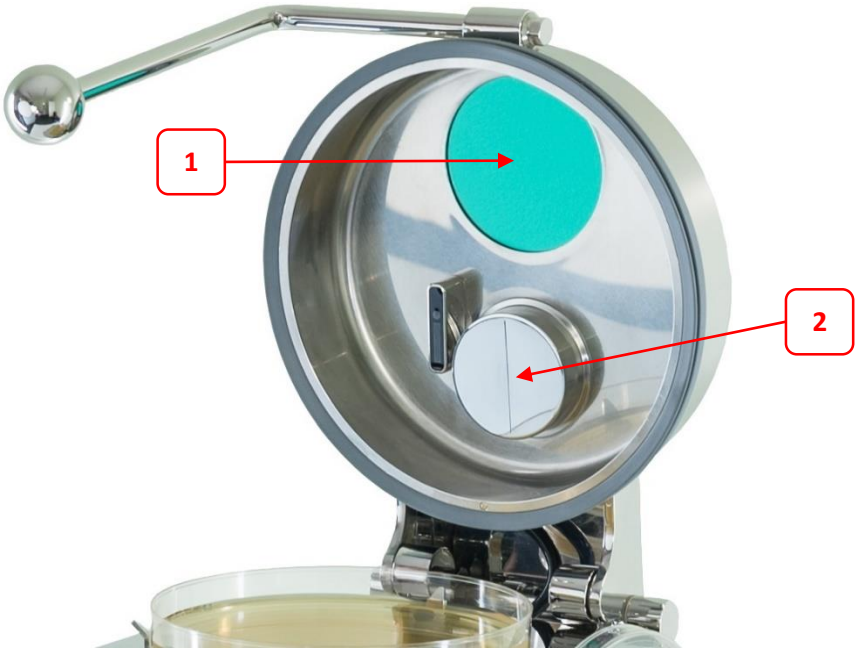


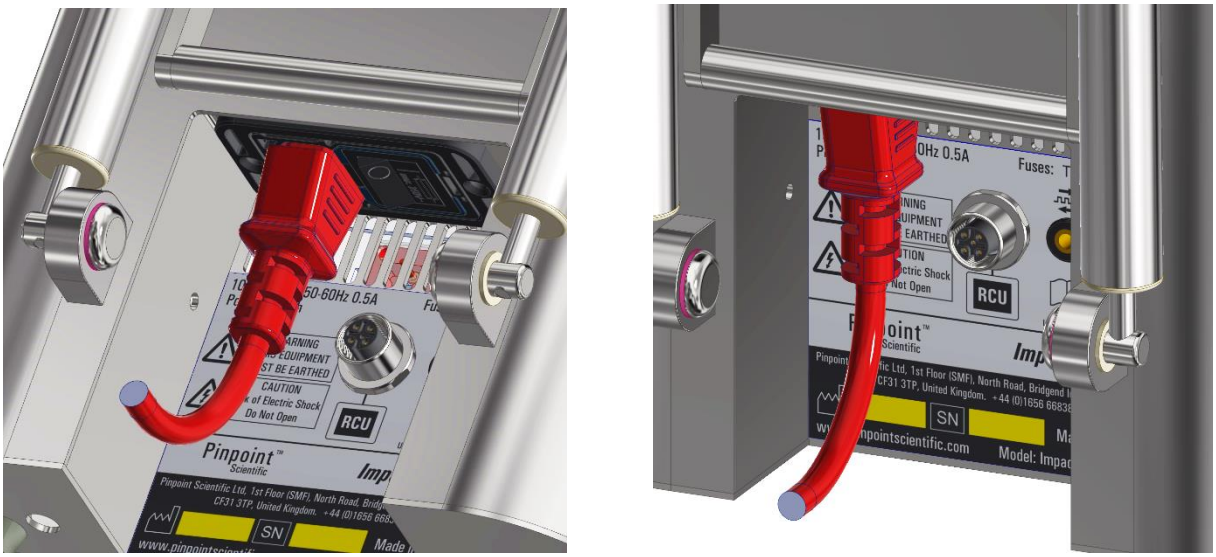
Figure 4: Chamber lid showing viewing panel

1. Viewing glass
2. Air inlet

3.3 Rear view

The rear of the unit features an on off power switch, a downward facing power connector which is “splash guarded” recess, as shown below and a remote panel communication port.

Figure 5: Rear access electrical panel



3.4 Exhaust

- The ImpactAir features a built in HEPA filter exhaust with large area base to minimise air flow disturbance.

4 User Interface Overview

- The ImpactAir Features a colour capacitive touch screen display on the front of the unit to control the functionality and display alarms.
- The capacitive nature of the screen ensures that is can be touched through laboratory gloves and RABS gauntlets.
- An audible function is available to indicate end of runs and alarm conditions.

4.1 Overview of operating conditions

The software functions are utilised through the user interface. An administrator password access screen is used to set the initial run parameters and set up conditions. The operator can use the run and purge buttons.

Figure 6: Software functions

Operation	Symbol	Description
Run		To run, a plate of media must be present, the chamber lid closed and the unit powered. The rotation speed is determined by a combination of the sample time, with the Plate Percentage setting.
Purge		A purge function is available and can be run initially or as part of the cleaning process. The chamber lid must be closed, and no media plate should be present.
Settings		The settings button is used to set the: • Run Time • Plate percentage • Start - Run Delay • Password settings • Service Calibration • Date -Time
More settings		The More settings screen is used to set the: • Brightness • Volume • Purge

4.2 Summary of set up conditions and defaults

The set up conditions are accessed through a password protect screen by an administrator.

Figure 7: Set up conditions

Function	Description	Range	Default
Plate percentage	Sets how much of the agar plate is exposed to the sampled air during a 'run'	1-100%	100%
Start Delay	Sets the time between the user initiating a 'run' - and air-sampling starting.	0-10min	0
Run time	Sets the period for which air is sampled during a single 'run'.	2 min - 9hrs59min 59secs	35min 20 sec $1m^3$
Purge Time	Sets the period for which air is pumped through the inlet.	10sec - 9hrs59min 59secs	5min
Brightness control	Increase / Decrease the screens brightness		
Volume control	Increase / Decrease the volume		
Date (Day/Month/Year)	Set the date	(0-31/1-12/0-99)	1st Jan 2000
Time (Hour / Min / Sec)	Set the Time	(0-24/0-60/0-60)	00:00
Password	Set or disable the password	0000-9999	9999

4.3 Run cycle and results

The run cycle display, provides an indication of the completeness of the run via a percentage and time value. A green bar showing a percentage completion from 0 - 100% is displayed, with a time indication below the green bar. When the run is near completion (less than 5 minutes) an audible sound is heard. At 1 minute until end of run the screen flashes as detailed below.

A summary screen is displayed when the run is complete. This provides:

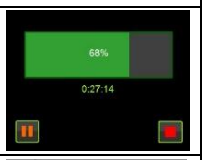
- Run Start time and date
- Run Stop time and date
- Air sample i.e. $1m^3$

NOTE: This screen is cleared when the green tick is pressed.

4.4 Summary of notification and error conditions

The following table shows operator notifications and audible alarms that can occur during a run.

Figure 8: Notifications and audible alarms

Status	Description	Audible	Symbol
Running	A percentage and time value is shown. Percentage value 0% at start to 100% at end of run. Countdown time from start to end of run.	No audible	
Less than 5 minutes to end of run	Less than 5 minutes left on the run, activates an audible beep. The rate of the audible beep increases as time decreases. A flashing screen occurs at 1 minute before the end of the run and continues until the end of the run.	Beeping sound 20sec/beep to 1 sec per beep	
End of run	When the run is complete the screen keeps flashing and a rapid audible beep occurs. When the green tick is pressed a run summary screen is displayed.	Beeping sound 4 beeps per second	
Error in run	When an error occurs in the run, an error code will appear on the summary screen together with a red cross. There will be a continuous audible beep, the air mover motor and the plate rotation are deactivated, and the plate is lowered. Error details are listed in the Troubleshooting section.	Continuous sound	

The following table shows warning messages that occur on screen with no audible alarm.

Figure 9: Warning messages- no audible alarm

Error	Status	Symbol
Lid open	Warning symbol displayed on screen	
Plate Error No plate detected when a run is attempted Plate detected when a Purge is attempted	Warning symbol displayed on screen	
Incorrect Password	Warning symbol displayed on screen	

System	This button will appear on the Main run screen if the system detects an error, a setting out of range, or an error during a run. Selecting it will cause another screen to be shown, providing details of the particular problem. Error details are listed in the Troubleshooting section.	
Run Prevented	This symbol is displayed instead of the 'Run' button when the system has detected a problem which would compromise the integrity of a run. Error details are listed in the Troubleshooting section.	

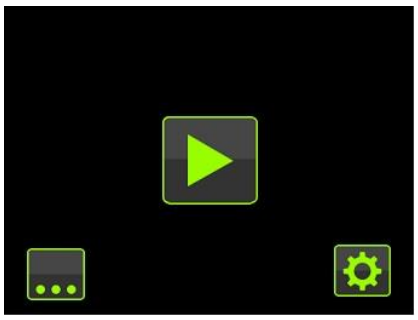
Prior to the unit being placed in operation, it is recommended to check settings and set the run conditions required for operation. An initial password is needed (default 9999) and alternative password can be set at this time. The following sections detail all operations and user interface screens.

4.5 Checking settings

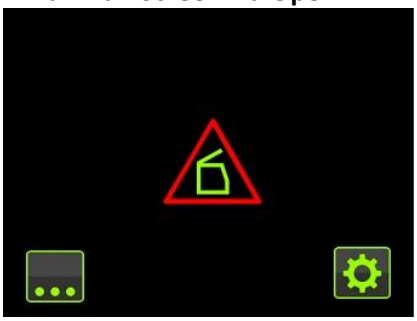
- After the unit is powered the initial Pinpoint Scientific screen is displayed, quickly followed by the main run screen as shown below. (The Checking settings can be performed with no media present and /or lid open).

Figure 10: Initial Pinpoint screen

Main run screen Lid closed

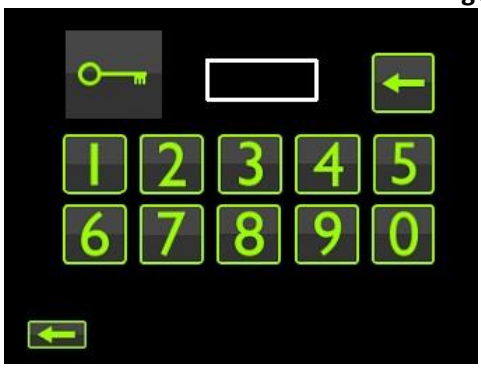


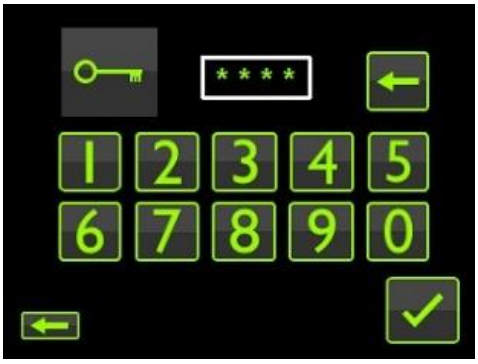
Main run Screen Lid Open



- Press Settings icon  shown in the bottom right hand corner of either main screens (lid open or closed) shown above.
- Enter Password (default 9999). Refer to Section 4.12 for details of changing or disabling password.

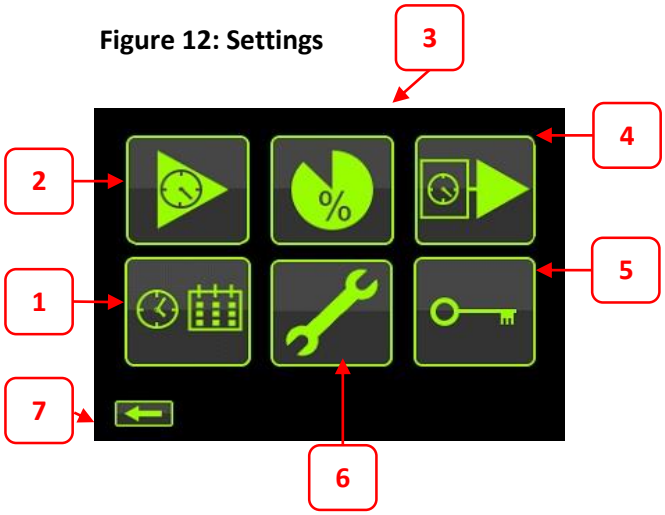
Figure 11: Password screen





- The run settings and other features can be set and checked from the settings screen.

Figure 12: Settings



1. Date / Time
2. Run Time
3. Set Plate percentage
4. Set Start / Run Delay
5. Password settings
6. Service Calibration
7. Return to previous screen

4.5.1 Set run time

- Enter the run time by pressing backspace to remove numbers and then use the number pad keys to enter the required run time (item 5). The run time will be shown in the box.
- Press the green tick button (item 4) to confirm run time and return to the settings screen.
- Press the bottom LHS arrow (item 6) to return to the settings menu **without** changing the run time.

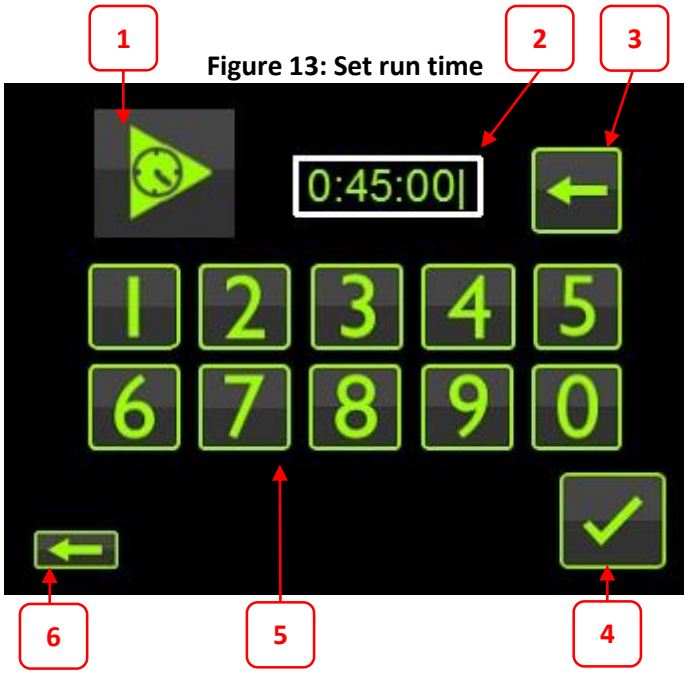


Figure 13: Set run time

1. Run time Icon
2. Run time entry box
3. Keyboard – Backspace
4. OK – returns to settings screen with saving settings
5. Keyboard to enter time (0-9)
6. Back to settings screen without saving settings

4.5.2 Set plate percentage

- The set plate percentage is used to define how much of the agar plate is exposed to the sampled air during a 'run'.
- Quick pre-set percentages of 100, 90, and 80% can be selected.
- When 75% is selected a keyboard is displayed and a manual percentage can be entered.

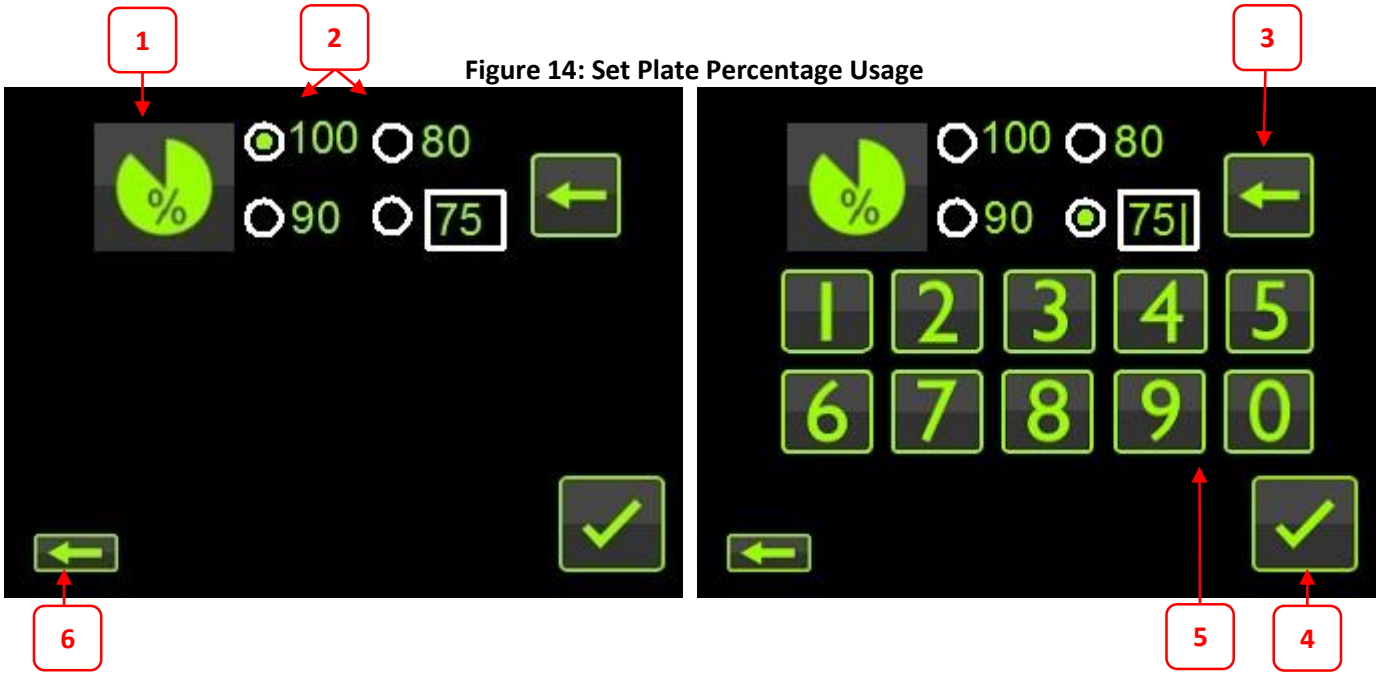


Figure 14: Set Plate Percentage Usage

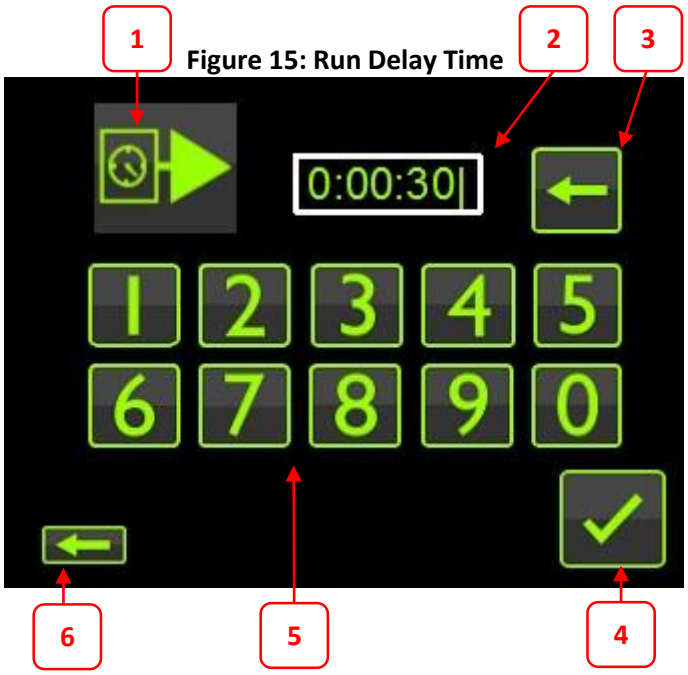
1. Plate percentage Icon
2. Pre- set percentage values (100%, 90%, 80%)
3. Keyboard – Backspace
4. OK – returns to settings screen with saving settings
5. Keyboard to enter percentage (0-9)
6. Back to settings screen without saving settings

4.5.3 Set run delay time

The run Delay sets the time between the user initiating a 'run' – and air-sampling starting.
This delay time allows time for the user to leave the area.

- Enter the run delay time by pressing backspace to remove numbers and then use the number pad keys to enter the required run delay time (item 5). The run delay time will be shown in the box.
- Press the green tick button (item 4) to confirm run delay time and return to the settings screen.
- Press the bottom LHS arrow (item 6) to return to the settings menu **without** changing the run delay time.

Figure 15: Run Delay Time

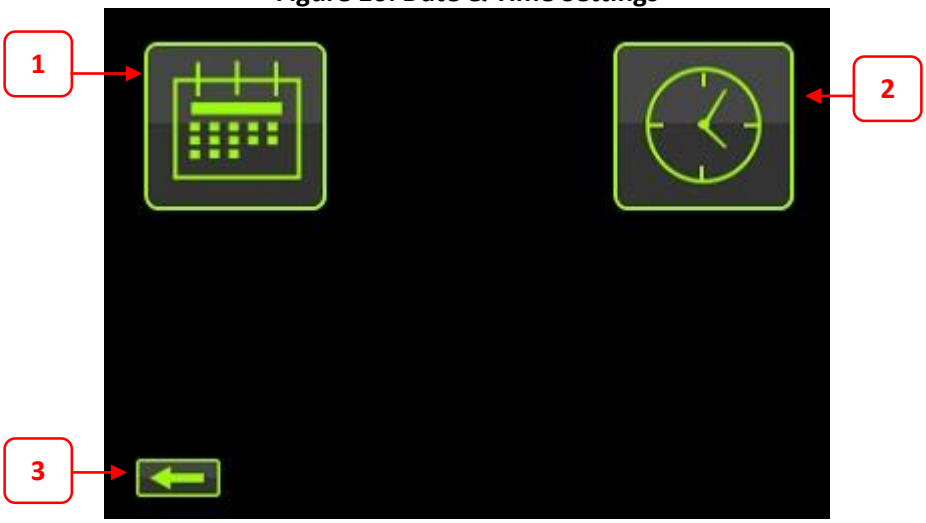


1. Run delay time Icon
2. Run delay time entry box
3. Keyboard – Backspace
4. OK – returns to settings screen with saving settings
5. Keyboard to enter time (0-9)
6. Back to settings screen **without** saving settings

4.5.4 Set date and time

The date time settings have been set at factory. They can be checked using the date / time screen.

Figure 16: Date & Time Settings

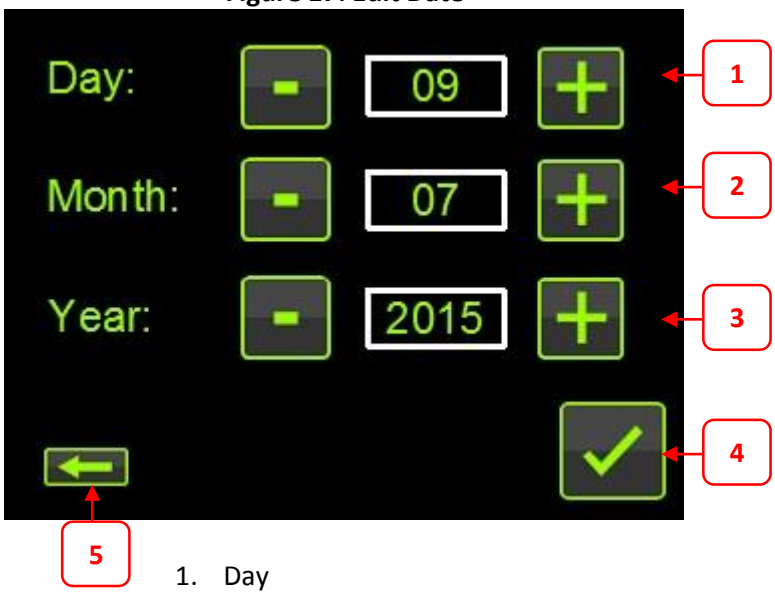


1. Date
2. Time
3. Back to settings screen

4.5.5 Set date

The Day / Month / Year can be increased by using the button and decreased by using the button.

Figure 17: Edit Date

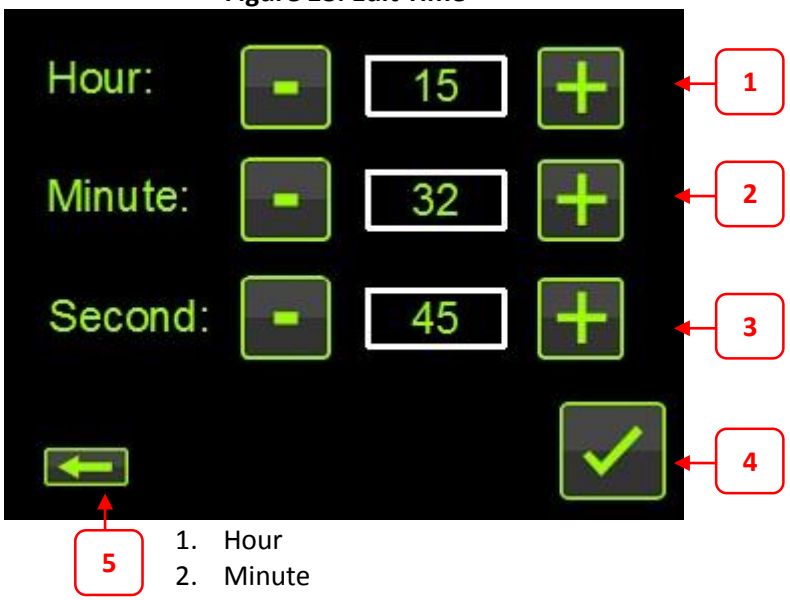


1. Day
2. Month
3. Year
4. OK – returns to settings screen with saving settings
5. Back to settings screen **without** saving settings

4.5.6 Set time

The Hour /Minute / Second can be increased by using the + button and decreased by using the - button.

Figure 18: Edit Time



1. Hour
2. Minute
3. Second
4. OK – returns to settings screen with saving settings
5. Back to settings screen **without** saving settings

4.6 Run operation and displays.

To perform a run ensure:

- A plate of Agar is present with a minimum depth of 3mm and maximum depth of 10mm
- The lid is closed.
- The rotation speed is determined by a combination of the sample time, with the Plate Percentage setting which has been set through the settings screen.

When the above conditions are meet

- Press run item 2 shown below.
- A confirmation question mark will appear.
- Press run again to confirm the operation and start the run. **Note**: there will be a slight initialisation delay of a few seconds before the run starts

Figure 19: Confirm Run

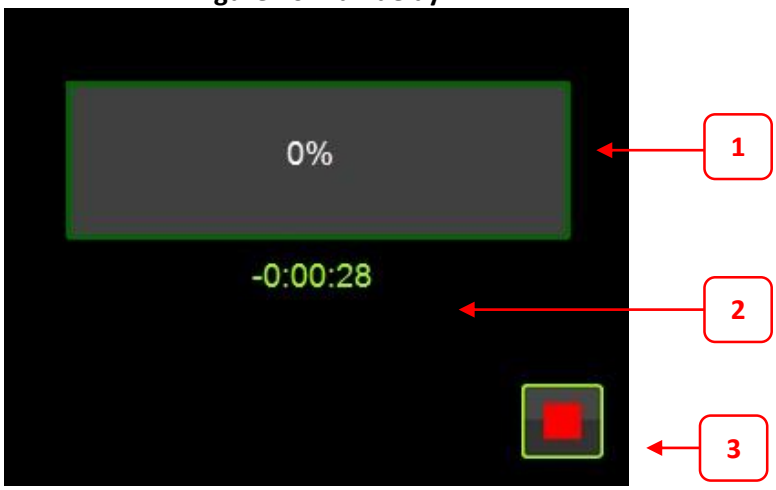
1. Back
2. Run button
3. Run Confirmation? Press run (item 2) again

NOTE: If a run delay has been set up in setting the run will not start until the run delay has been completed.

4.6.1 Run delay

If a run delay has been programmed through settings, the delay time will count once the run has been confirmed. The run delay time allows an operator to leave the area before the run starts. Once the run has been pressed the following screen displays the amount of time remaining before the run starts.

Figure 20: Run delay



1. Run Percentage
2. Time remaining before run starts.
3. Abort run

4.6.2 Normal run

When a run occurs the user interface shows what percentage of the run is complete, as shown below.

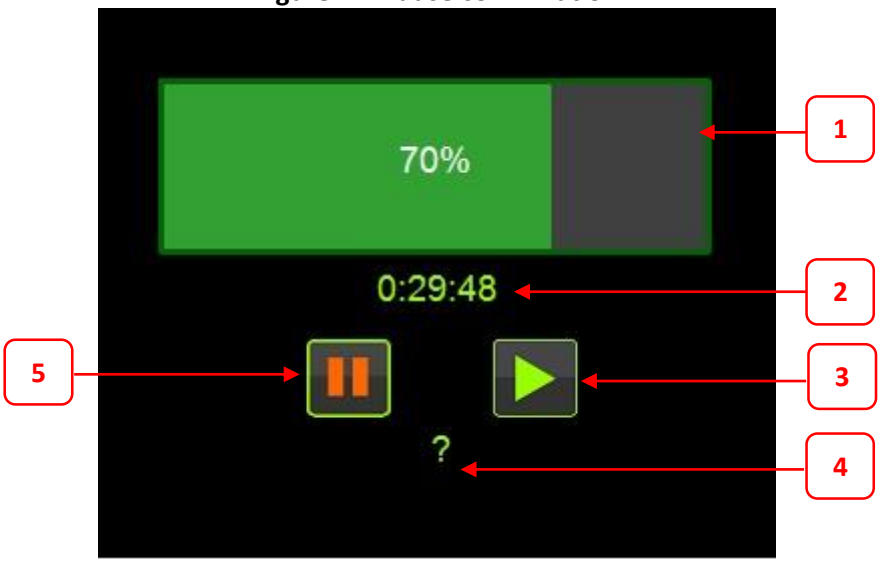
Figure 21: Running

1. Run Percentage
2. Time remaining
3. Abort Run
4. Pause Run

4.6.3 Pausing the run

A run can be paused or stopped using the pause and stop buttons and confirming the action. To re-start (resume) the run the run button is pressed and confirmed.

Figure 22: Pause confirmation

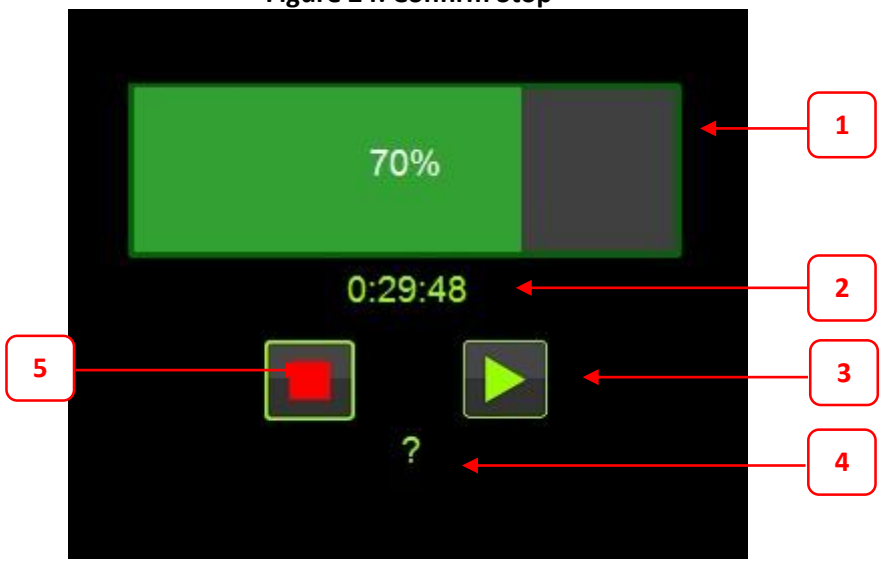


1. Run Percentage
2. Time remaining
3. Run
4. Pause request indicator. Press pause button 5 to confirm and accept. To continue run press button 3.
5. Pause Run

Figure 23: Paused

1. Run Percentage
2. Time remaining
3. Paused
4. Run. Press to exit pause.

Figure 24: Confirm Stop



1. Run Percentage
2. Time remaining
3. Run
4. Stop request indicator. Press stop button 5 to confirm and accept. To continue run press button 3.
5. Stop Run

4.6.4 5 minutes to the end of run

Less than 5 minutes left on the run activates an audible beep. The rate of the audible beep increases as time decreases. A flashing screen occurs at 1 minute before the end of the run and continues until the end of the run.

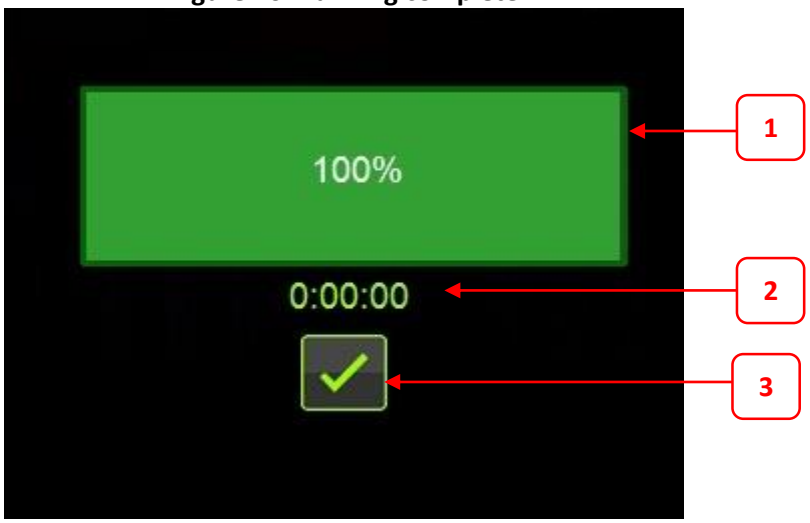
Figure 25: Running with less than 5 minutes from completion

1. Run Percentage
2. Time remaining
3. Abort Run
4. Pause Run

4.6.5 Run complete

When the run has completed the screen keeps flashing, and rapid audible beeps sound occurs (4 per second)

Figure 26: Running complete



1. Run Percentage
2. Time remaining
3. Run complete

Once the run complete green tick (item 3) is touched, a run summary screen is displayed.

4.6.6 Run summary

Figure 27: Run Summary

1. Start time of run
2. End time of run
3. Air sample m^3
4. Start Date
5. End Date
6. Done green tick, returns to main control screen

The summary screen remains displayed until the green tick is touched.

4.7 Error Messages

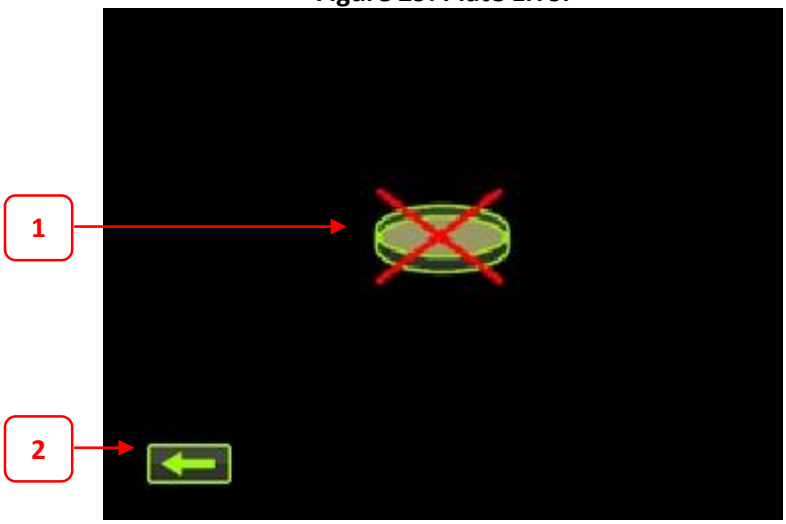
The following screen is displayed for an incomplete run and error in run. The error summary screen remains displayed until the  button is pressed.

Figure 28: Error occurred in run

1. Start time of run
2. End time of run
3. Air sample m^3
4. Start Date
5. End Date
6. Run not complete indicator, when pressed returns to main control screen
7. Error code indicator

The Plate error screen occurs when either there is no plate detected when a run is attempted, or there is a plate present when the purge cycle occurs.

Figure 29: Plate Error



1. No Plate detected
2. Back to main screen

4.8 Screen Saver

A screen saver is displayed after 20 seconds (default) from the main control screen if the screen has not been touched.

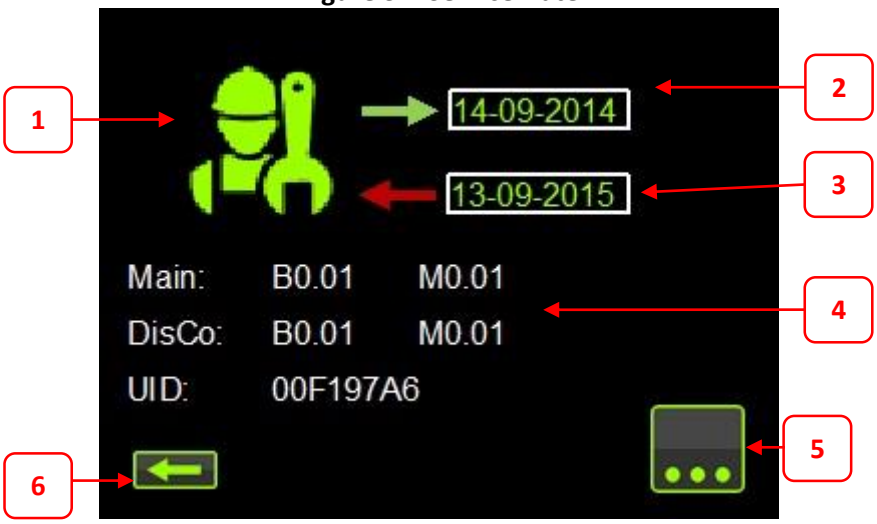
The screen saver shows the time and date scrolling across the screen.
Touching anywhere on the screen will return the user to the main control menu.

Figure 30: Screen Saver

4.9 Service Date Equipment Details

Service dates and due date information can be found on the Calibration -Service screen which is accessed using item from the settings screen.

Figure 31: Service Date



1. Calibration Icon
2. Last serviced date
3. Next service date
4. Device, model and firmware information and versions
5. More settings screen – factory password required
6. Back to Settings screen

Note: If more settings , is accessed through the calibration screen a factory password is required to access service settings and information see Figure 33.

4.10 More Settings

Use More Settings  to change brightness of screen, to change volume of sound, or access the purge cycle. More settings

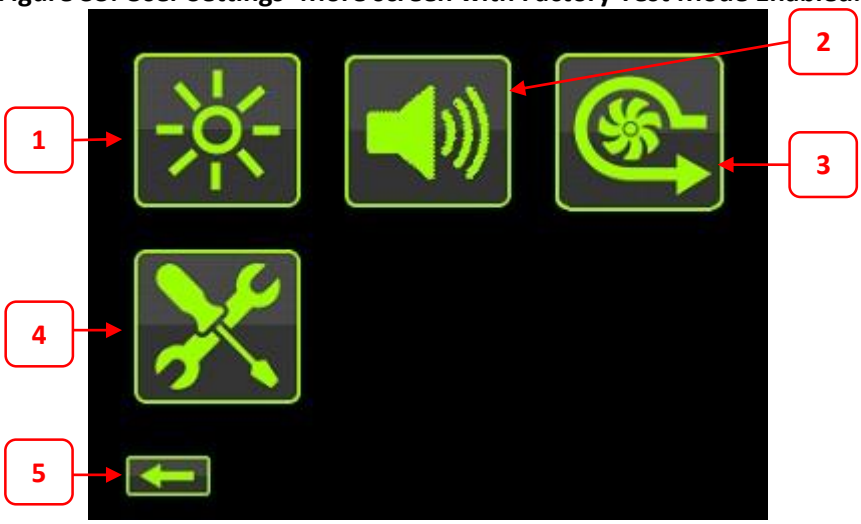
Figure 32: User Settings-More screen Saver inactive

1. Set screen brightness
2. Sound volume
3. Purge
4. Back to main screen

4.10.1 Access to service menu

If the factory password has been entered through the Calibration screen or through the main control screen then the user settings includes an additional icon.

Figure 33: User Settings- More screen with Factory Test Mode Enabled.

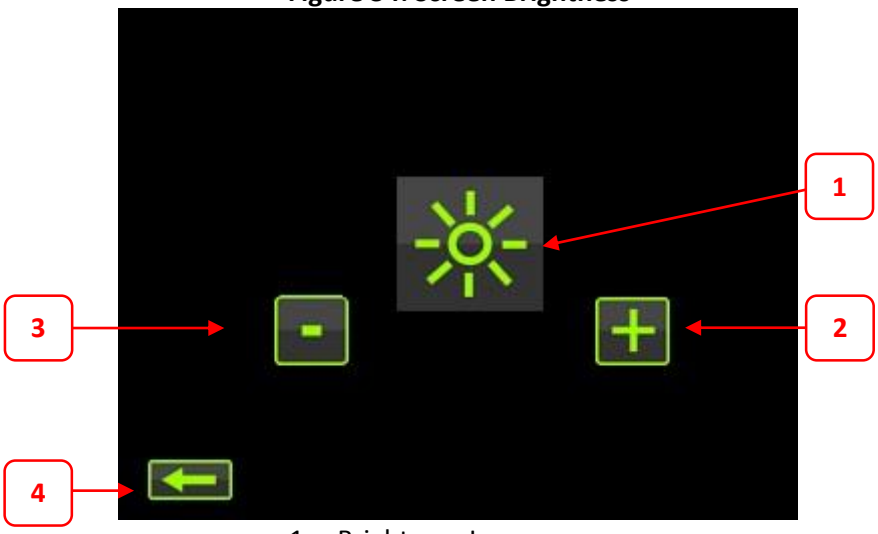


1. Set screen brightness
2. Sound volume
3. Purge
4. Factory Test Mode –For quick access to service menu screen
5. Back to main screen

4.10.2 To change screen brightness

Use + / - to increase / decrease the screen brightness.

Figure 34: Screen Brightness

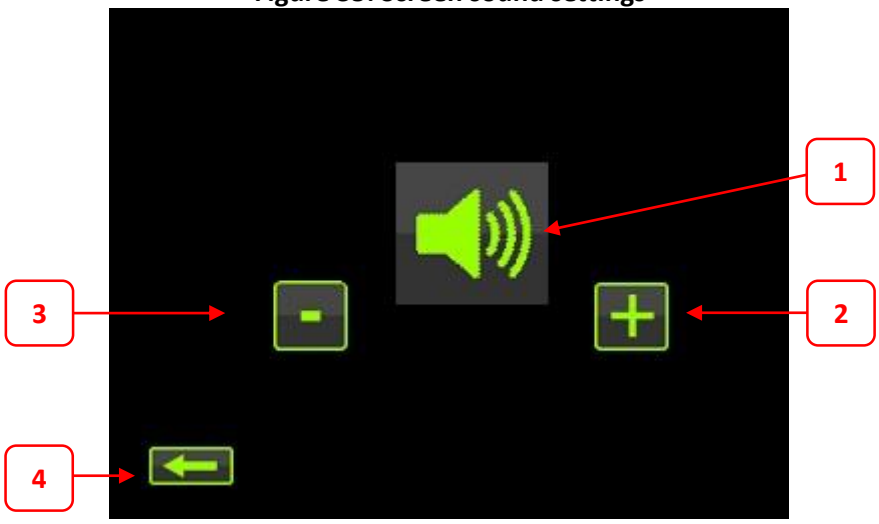


1. Brightness Icon
2. Increase Display Brightness
3. Decrease Display Brightness
4. Back to main screen

4.10.3 To change sound settings

Use + / - to increase / decrease the sound settings.

Figure 35: Screen sound settings



1. Sound Icon
2. Increase Volume
3. Decrease Volume
4. Back to main screen

4.11 Purge

A purge function is available and can be run initially, after cleaning or as part of the cleaning process.

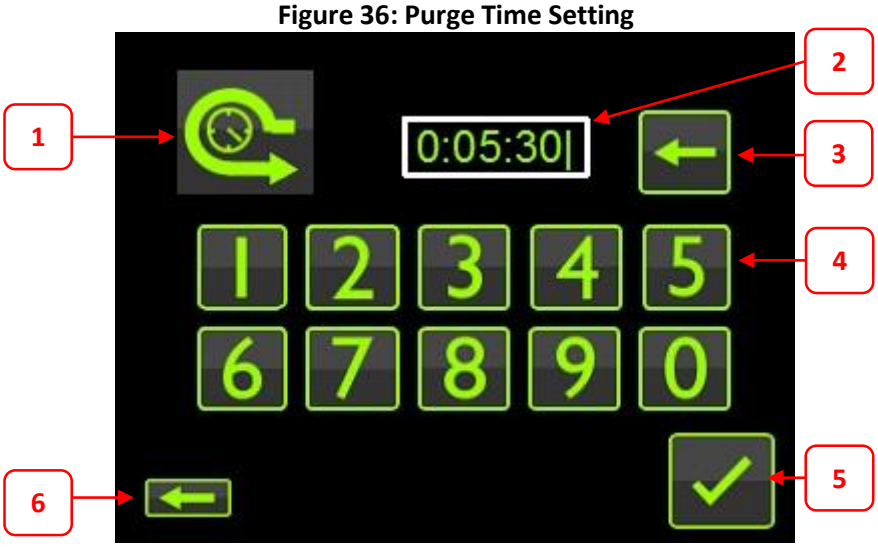
4.11.1 Conditions

The Chamber lid must be closed. No agar plate should be present.

If the lid is forced open during a purge, the air mover motor is deactivated.

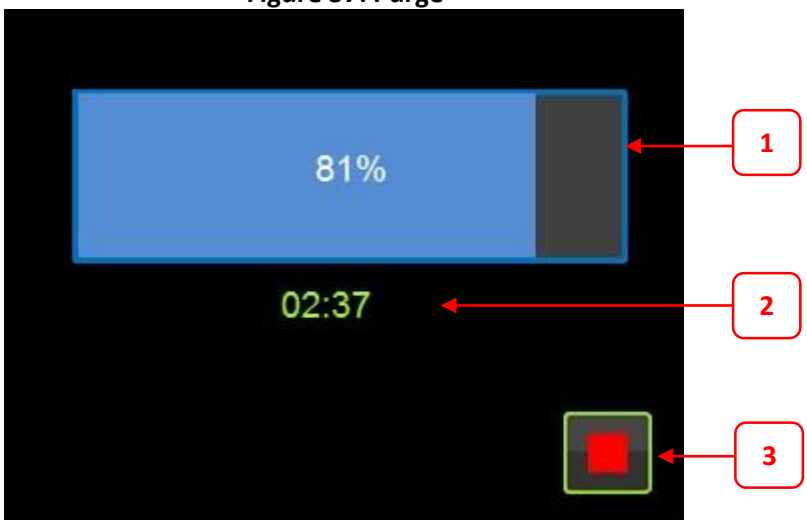
- Set the purge time and press tick button (item 5), to start purge.

Figure 36: Purge Time Setting



1. Purge Icon
2. Purge time
3. Keyboard - Backspace
4. Keyboard to enter time (0-9)
5. OK Update setting and start purge
6. Back to More screen without changing settings

Figure 37: Purge

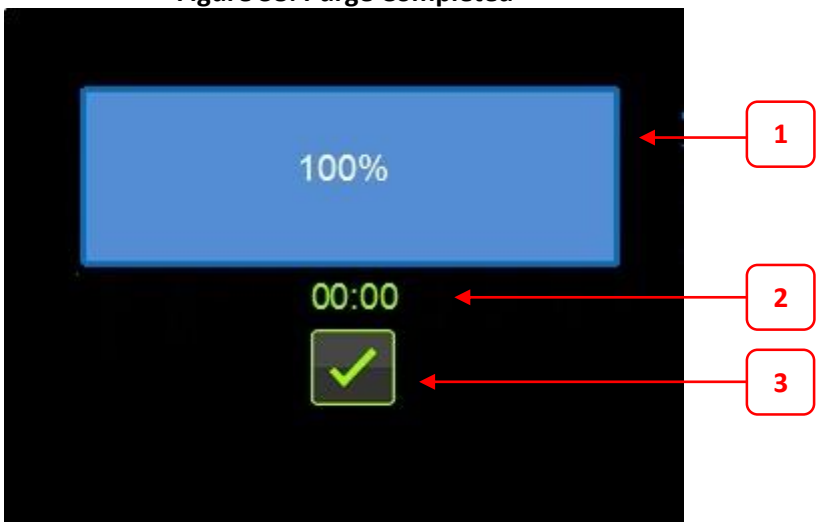


1. Purge Percentage
2. Time remaining
3. Abort Purge – back to main screen

4.11.2 Purge complete

When the purge is complete, 100% is shown on a flashing screen.

Figure 38: Purge Completed

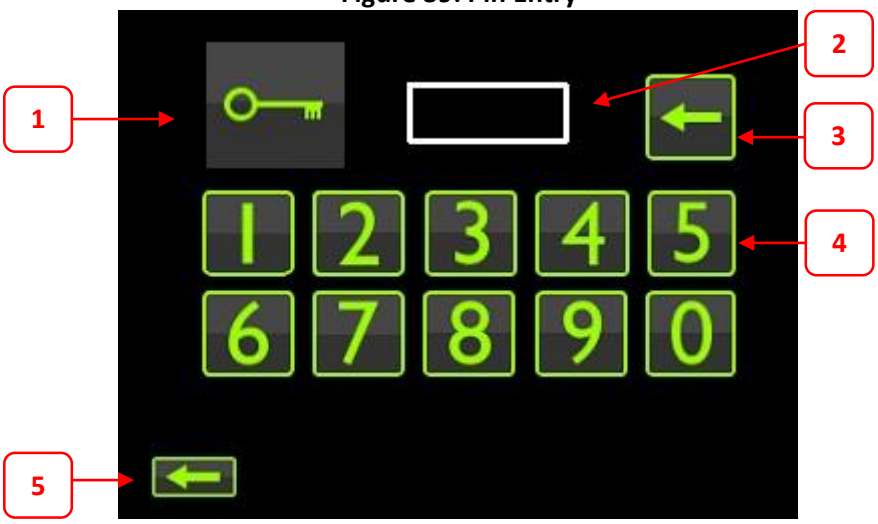


1. Purge Percentage
2. Time remaining
3. Done – Back to main screen

4.12 Password Settings

A password of 4 digits can be set to limit access to the run settings screen.

Figure 39: Pin Entry

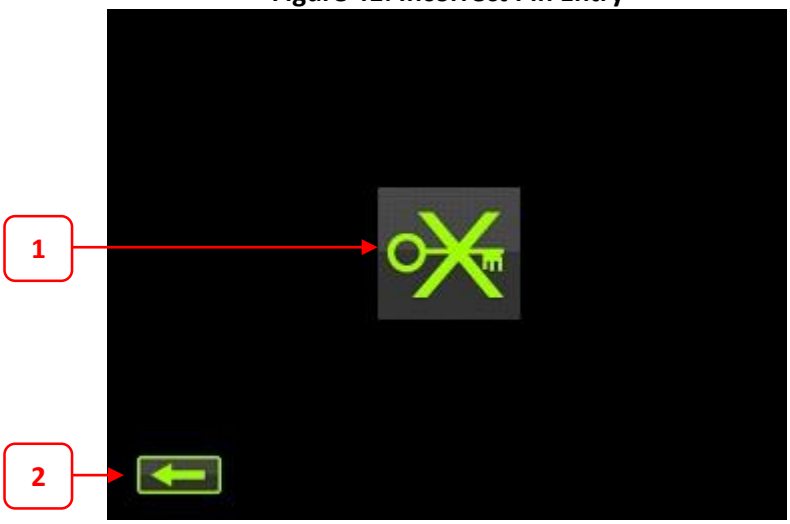


1. Password icon
2. Password entry
3. Keyboard - Backspace
4. Keyboard to enter password (0-9)
5. Back to Main screen without changing settings

Figure 40: PIN Entry 4 digits

1. Password Icon
2. Password Entry
3. Keyboard - Backspace
4. Keyboard to enter time (0-9)
5. OK –Submit PIN number
6. Back to Main screen

Figure 41: Incorrect Pin Entry



1. Incorrect Password Icon
2. Back to Main screen

4.12.1 Password enabled/disabled

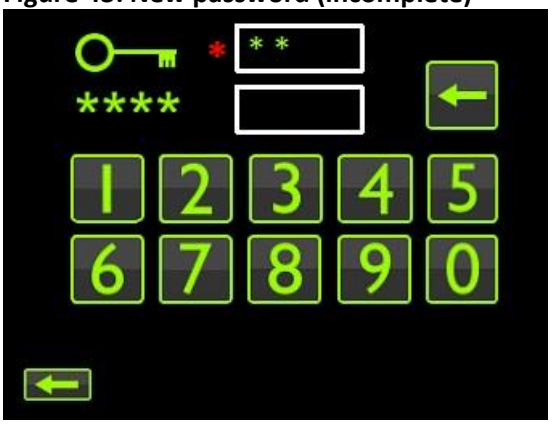
When disabling the password the current password will need to be re-entered.

Figure 42: Password enabled

Password disabled

4.12.2 Changing Password

Figure 43: New password (incomplete)



Password complete

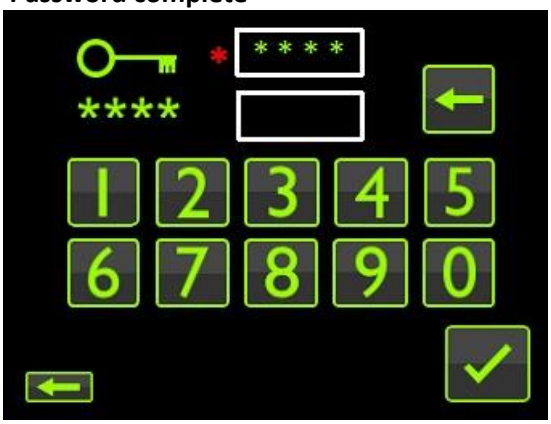
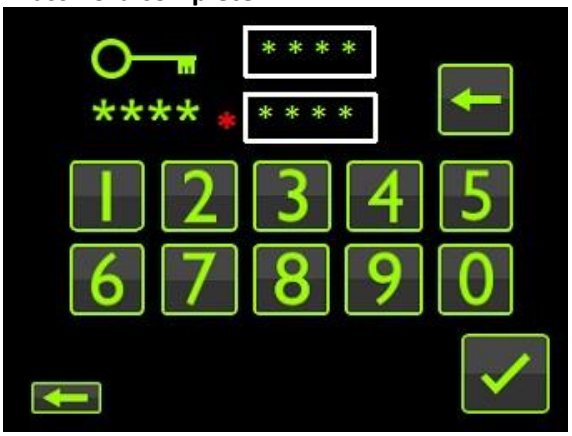


Figure 44: Change password (incomplete)

Password complete



5 Accessories

- **Remote control panel**
- **Exhaust adaptors**
- **Inlet adaptors**
- **Handles**
- **Trolleys**
- **Local laminar flow hood**

5.1 Remote Control Panel

A secondary remote control panel can be mounted externally from the unit, i.e. on the outside of a RABS /cabinet, and is connected via the remote control port on the rear of the unit. The connecting cable from the main unit provides power and connection to the remote unit.

The remote panel allows the user to operate the unit from either a remote location or the unit, the display is duplicated on both panels.

Figure 45: Remote Screen with operator

6 Cleaning

- The Impact Air chamber and lid can be wiped with 70/30 IPA.
- The chamber lid can be removed by service personal only, due to the nature of the embedded electronics.
- The chamber seal can be removed for cleaning.

Figure 46: Cleaning Documents

Document Reference	Description
02-158 R1.0 Cleaning Guide	Cleaning User Guide

7 Service

The Impact Air is designed for long term operation.

It is recommended that routine operation units be serviced and calibrated annually.

Units placed in critical areas be serviced and calibrated twice a year.

The chamber lid, must only be removed by qualified service personnel.

All Pinpoint Scientific distributors have been approved to conduct servicing and calibration.

7.1 AC Mains lead Fuse replacement - UK USERS ONLY

In cases where AC Mains lead power cords are fitted with a fused wall plug the following applies.

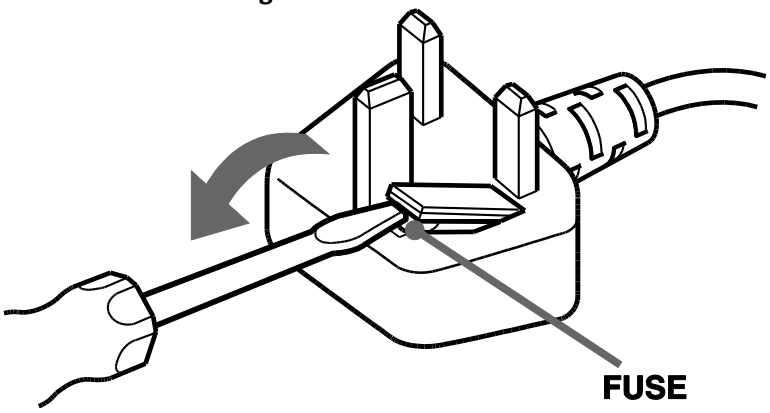
In the event of a fuse failure in the power supply AC Mains power cord lead wall plug.

Replace the fuse with only an approved fuse carrying the BSI or ASTA mark.

The preferred replacement part reference is to BS 1362/IEC269-3A for example **Cooper Bussmann –TDC180 – 3A – Fuse Rated 3Amps, 250vac** or approved equivalent ASTA type

The fuse should only be replaced by a competent person.

Figure 47: Fuse Removal



8 Training

A comprehensive training package and user documentation is available for customer training sessions.

Training sessions can be arranged as required at the customer's premises.

9 Troubleshooting

In the case of a fault occurring, a Warning Icon  will be shown on the Main Run screen.

Certain faults will prevent a Run from being started, and the symbol  is displayed instead of the Run button.

Selecting the Warning Icon will show another screen which provides details of the fault(s)

The following table lists all possible faults, and the suggested action to take.

Error	Code	Cause	Action
Service & Calibration Overdue	001	The unit's date is past its stored 'Next Service and Calibration' date.	Contact Service Centre. The unit is still fully operable.
Lower-Limit Switch	002	The Rise & Fall Lower-Limit Switch is not operating.	Contact Service Centre if the problem persists Run Prevented.
Upper-Limit Switch	003	The Rise & Fall Upper-Limit Switch is not operating.	No action required. The unit is still fully operable. (This fault has no effect on the unit in normal operation).
Height Sensor	004	The Height Sensor is not operating.	Contact Service Centre if the problem persists Run Prevented.
Blower Drive too high	005	The Blower Motor's speed control (PWM) is found to be too high in achieving the correct mass flow. (> 25% higher than calibrated value)	Attempt a Purge to see if the problem persists, if it does, contact Service Centre.
Blower Drive too low	006	The Blower Motor's speed control (PWM) is found to be too low in achieving the correct mass flow. (> 25% lower than calibrated value)	Attempt a Purge to see if the problem persists, if it does, contact Service Centre.
Mass Flow too low	007	The Mass Flow Sensor reading is too low. (> 50% lower than calibrated value)	Attempt a Purge to see if the problem persists, if it does, contact Service Centre.
Mass Flow too high	008	The Mass Flow Sensor reading is too high. (> 50% higher than calibrated value)	Attempt a Purge to see if the problem persists, if it does, contact Service Centre.
Rotation	009	The Rotation Speed is too low. (< half the expected)	Attempt a Purge to see if the problem persists, if it does, contact Service Centre.
Blower °C Sensor	010	The Blower Temperature Sensor is not operating.	Contact Service Centre if the problem persists. Run Prevented.
Ambient °C Sensor	011	The Ambient (external) Temperature Sensor is not operating.	Contact Service Centre if the problem persists. Run Prevented.
Exhaust Flow °C Sensor	012	The Exhaust Flow Temperature Sensor is not operating.	Contact Service Centre if the problem persists Run Prevented.
Mass Flow Sensor	013	The Exhaust Flow Temperature Sensor is not operating.	Contact Service Centre if the problem persists Run Prevented.

EEPROM	014	The EEPROM (non-volatile memory) is not operating. (This will cause the unit's calibration settings to be default values)	Contact Service Centre if the problem persists Run Prevented.
Clock	015	The Clock device is not operating.	The unit is still fully operable, but the Summary Screen at the end of a run will show inaccurate Start & End times.
Unit ID	016	The Unit ID device is not operating.	The unit is still fully operable. This fault only effects Service and Calibration personnel.
Invalid Time	017	The unit's date is before its stored 'Last Service and Calibration' date.	The unit is still fully operable. The time and date should be corrected.
Lid opened during run	018	The Lid Sensor detects that the lid has been opened during a run.	No action required. The unit is still fully operable.
Blower Temp too High	019	The Blower Temperature Sensor reads > 50°C	Attempt a Purge to see if the problem persists, if it does, contact Service Centre.
Exhaust Flow Temp too High	020	The Exhaust Flow Temperature Sensor reads > 52°C	Attempt a Purge to see if the problem persists, if it does, contact Service Centre.
Mass Flow low warning	021	At least one reading of the Mass Flow Sensor was > 10% lower than calibrated value.	The average level for the entire run, as a percentage of the calibrated value, is shown in Warning screen – use this to decide if enough air has been sampled.
Mass Flow high warning	022	At least one reading of the Mass Flow Sensor was > 10% higher than calibrated value.	The average level for the entire run, as a percentage of the calibrated value, is shown in Warning screen – use this to decide if too much air has been sampled.

10 Warranty Information

Pinpoint Scientific Limited warrants for the applicable time period from the date of shipment that the Pinpoint Scientific IMPACTAIR will substantially perform in accordance with the User Documentation. The terms of this Agreement does not affect or prejudice the statutory rights of a consumer acquiring a Pinpoint Scientific IMPACTAIR Instrument otherwise than in the normal course of a business.

THIS WARRANTY DOES NOT APPLY IN THE FOLLOWING CIRCUMSTANCES:

(A) IF the Pinpoint Scientific Limited IMPACTAIR HAS BEEN REPAIRED BY PERSONS NOT AUTHORIZED BY PINPOINT SCIENTIFIC LIMITED; OR

(B) The Pinpoint Scientific Limited IMPACTAIR and associated accessories/peripherals HAVE BEEN ALTERED, MODIFIED, OR MISUSED; OR

(C) The Pinpoint Scientific Limited IMPACTAIR IS USED WITH NON- Pinpoint Scientific Limited IMPACTAIR COMPONENTS; OR

(D) The Pinpoint Scientific Limited IMPACTAIR OR A COMPONENT IS USED FOR OTHER

USES (FOR EXAMPLE USE WITH OTHER MANUFACTURER ACCESSORIES) OR

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If within one year after shipment, the Pinpoint Scientific Limited IMPACTAIR does not conform to the express warranty set forth above, Pinpoint Scientific Limited sole obligation and User‘s sole remedy shall be, at Pinpoint Scientific Limited option: 1. to repair or replace the non-conforming component; or, 2. refund the price paid to Pinpoint Scientific.

LIMITATION OF LIABLITY.

UNLESS PROHIBITED BY LAW, Pinpoint Scientific Limited WILL NOT BE LIABLE TO USER OR OTHERS

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The parties agree that Pinpoint Scientific Limited total cumulative liability to User for direct damages for all causes under this Agreement shall not exceed £1,000,000 (1MILLION UK STERLING POUNDS), or the price paid for the IMPACTAIR whichever is higher. Some states or countries may have laws which require liability rights different from those stated above. In such states or countries, the minimum required liability terms shall apply.

This liability is valid for the year of issue of this manual, and is subject to change. Please contact Pinpoint Scientific for current liability terms.

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