

Mole®



GeneMole® User Manual

MGM-101-005

GeneMole® User Manual available in:

- English
- German
- French
- Spanish

All versions available on
www.molegenetics.com

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1. Introduction

1.1 General Description

GeneMole[®] is designed to perform fully automated nucleic acid extraction from a wide range of sample material like e.g. mammalian blood, cells and tissue. GeneMole[®] can process 1-16 samples in one run and all the reagents required are available as pre-filled disposable MoleStrips[™]. Several MoleStrips[™] reagent kits are available and allow optimal nucleic acid extraction from a variety of sample types.

GeneMole[®] performs nucleic acid extraction based on the use of paramagnetic beads. The method involves lysis of the starting sample, binding of nucleic acids to paramagnetic beads, removal of unwanted components by washing steps and finally elution of highly purified nucleic acids in a chosen elution volume.

The GeneMole[®] instrument delivers nucleic acids of high quality, which are ready for use in sensitive downstream applications such as PCR amplification and genotyping.

1.2 Intended Use

- The GeneMole[®] instrument is intended for indoor laboratory use only.
- The instrument is to be operated by qualified personnel who have been appropriately trained.

2. Product Components

The following components are supplied with the GeneMole[®] instrument
Prod No. MG10-000:

Component	Description	#
Worktray	Tray to setup the experiment	1
Waste Bin	Containers collecting all used tips	2
MoleStrips [™] holder	Plate for placing the MoleStrips [™] in the worktray	1
Elution Rack	The 8 tube racks for elution tubes	2
Power Cord	Standard instrument power cord	1
User Manual	Document describing how to use GeneMole [®]	1
Extra Fuse	Spare part	1

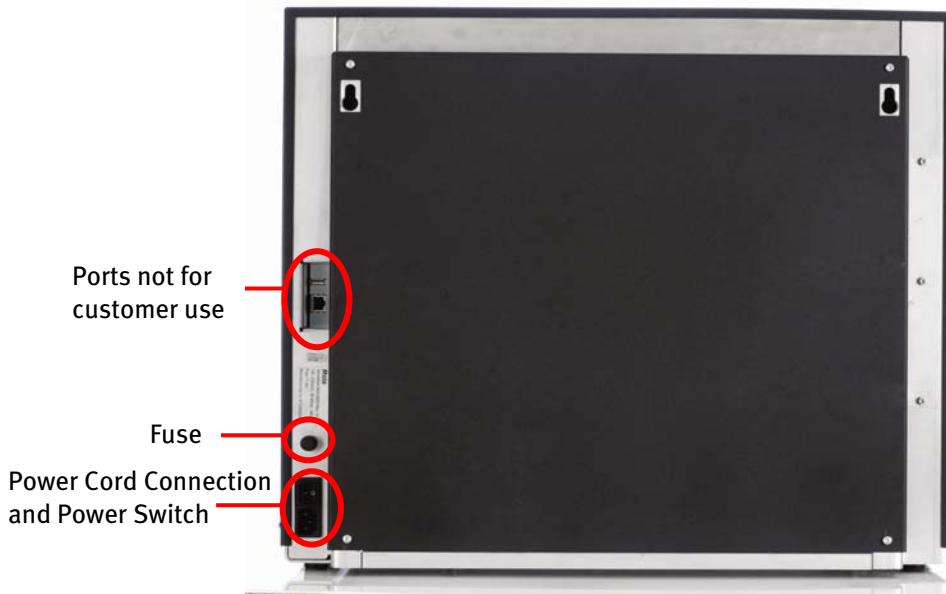


3. Instrument overview

GeneMole[®], Front



GeneMole[®], Rear









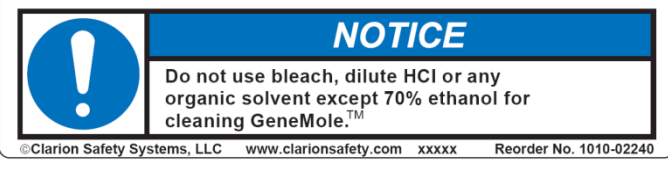
4. Safety Information

On the GeneMole® instrument and in this user manual safety information is stated that must be followed by the user to ensure safe operation of the GeneMole® instrument.

The safety information is clearly stated on the relevant parts of the GeneMole® instrument and at the appropriate places throughout this manual in order to avoid any possible hazards which can harm the user or the instrument.

Safety labels found on the GeneMole® instrument:

	This label is found on the rear side of the instrument, near the fuse box. Opening the fuse box without disconnecting the mains constitutes an electrical shock hazard. Please refer to section 10.4 for information on how to change the fuse.
	This label is found on the cover of the pipette head housing. Operations in the pipette head housing must be carried out according to the description in section 10.3 of this manual in order to avoid damage to the instrument.
	This label is found on the instrument door and signifies that an operator may have used bio hazardous samples in the instrument.
	This label is found on the instrument door and signifies to keep hands clear of the instrument door as there is a potential pinch point hazard.

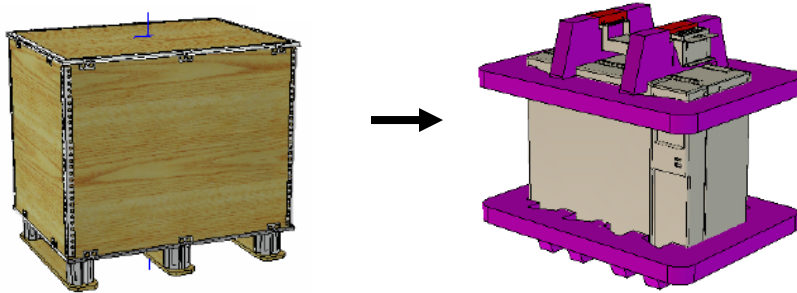
	<p>This label is found on the left side of the casing. Please refer to section 5.</p>
	<p>This label is found on the rear cover. Removing the outer casing or the front and rear covers may compromise the safety of the instrument. Please refer to section 10.1.</p>
	<p>This label is found on the rear interior wall. Using bleach or dilute HCl may cause corrosion. Using certain organic solvents may reduce the life expectancy of some of the instruments. Please refer to section 10.1.</p>




5. Getting Started with GeneMole®

5.1 Transporting and unpacking the GeneMole®

- After the GeneMole® has arrived at the premises it is most easily transported to the place where it is to be installed with a hand pallet truck before unpacking.
- Unfasten and remove the lid and the sides of the shipment container.



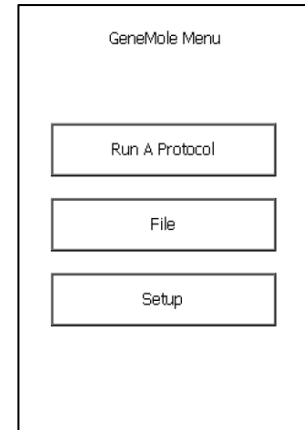
- Unpack the tray from the upper Styrofoam profile.
- Remove the upper Styrofoam profile.
- Lift the instrument out of the lower Styrofoam profile and onto a bench or a table capable of supporting 50 kg. The weight of the instrument is 41 kg, so one person should lift at each end, holding underneath the bottom plate of the instrument.

	The GeneMole® has a weight of 41 kg. Lifting the instrument requires two persons! Any surface where the instrument is to be placed should be able to support at least 50 kg.
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- The instrument should have at least 6 cm clearance to the rear and 20 cm clearance to the right so that the operator can connect/disconnect the mains supply as well as reach the mains switch.
- The instrument has no special requirement for ventilation, nor does it produce exhaust fumes that needs to be ducted away.
- The instrument is not meant for wall mounting.

5.2 Turning on the GeneMole® for the first time

- Ensure that the power switch is in the off position. The power switch is located above the power cord connection at the rear of the instrument (refer to section 3).
- Connect the power cord at the rear of GeneMole®.
- Plug the power cord into an earthed mains supply. See section 11 for power requirements.
- Turn the power switch on and GeneMole® will start up. Start up takes about 1-2 minutes. Once start up is completed a green light located under the built-in touch screen will indicate that the instrument is switched on.
- Once turned on GeneMole® will display the *GeneMole Menu* in the build-in touch screen.



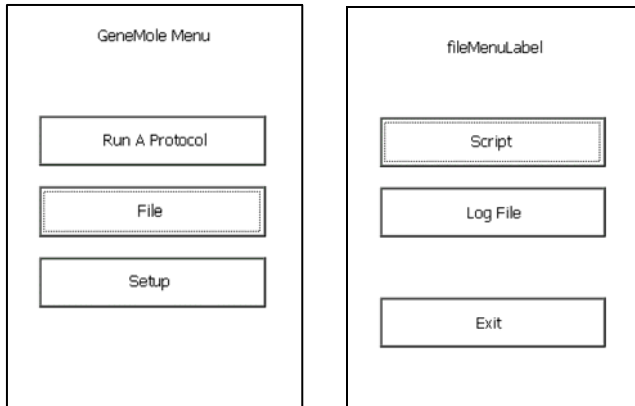
5.3 Uploading of software to the GeneMole® instrument

Software has to be uploaded to the GeneMole® instrument before it is possible to perform a protocol run.

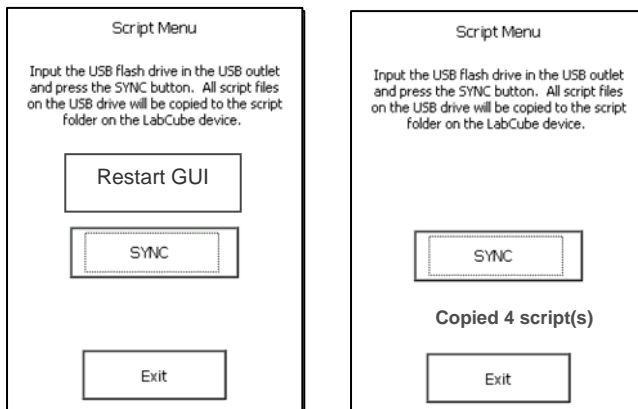
- Insert the USB stick containing the protocols you want to upload in the USB port at the front of the instrument (see illustration).



- Enter **File** from the *GeneMole Menu*.
- In the *File Menu* select **Script**.



- In the *Script Menu* select **SYNC**.



When the uploading is completed the *Script Menu* will show how many scripts/protocols have been uploaded to the instrument.

5.4 Connecting optional accessories

The USB connection on the front can be used to connect a USB keyboard in order to enter sample names (see section 6.2), alternatively to connect a USB mouse as an alternative to the touch screen.



6. Performing a Protocol Run

6.1 Preparation

Prior to performing a protocol run always refer to the **MoleStrips™** kit instructions and perform any required upstream procedures. Read any warnings about potential chemical hazards that may be found in the **MoleStrips™** kit instructions and follow the routines outlined.

Follow good laboratory practices and national rules and guidelines appropriate to the samples that are treated. If the samples are infectious and/or hazardous, treat both the samples and the waste from the instrument as hazardous material. Protective clothing, including gloves and goggles should then be worn, and waste should be disposed in the same way as if the sample was to be disposed directly.

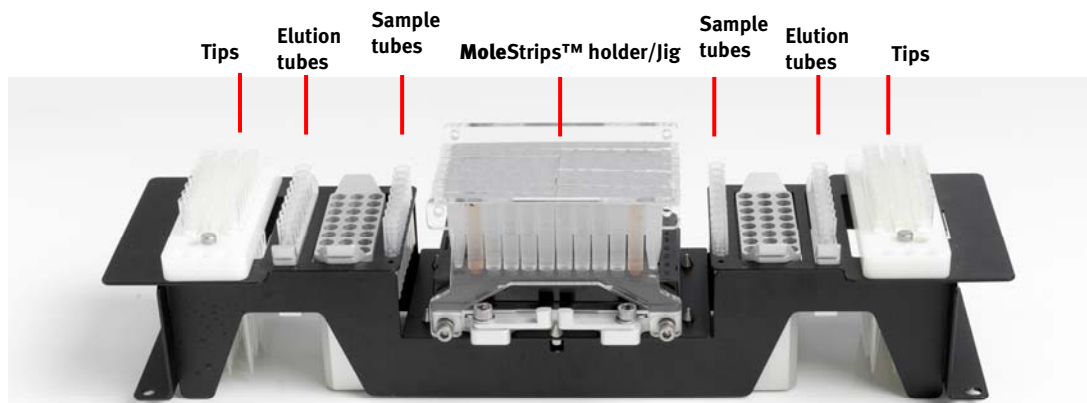
Failure to comply with the guidelines above will compromise the safety of the instrument.

- Materials required:
 - GeneMole®
 - **MoleStrips™**
 - Worktray with waste containers and elution racks
 - TIP BARRIER 1250 µl
 - TUBE 8-STRIP CAP MTS STERILE
 - TUBE MTS 8 STRIP 1,1 ML RACK STERILE
 - Gloves and or Safety goggles if required by the sample material



6.2 Loading the worktray and running a protocol

1. Switch on the GeneMole® instrument.
2. Open the GeneMole® door and lift out the worktray.
3. Load the worktray with tips, sample tubes, elution tubes, waste container and reagents according to instructions. Place components in the designated areas. See worktray setup below.



Note: The worktray is designed so that the left-hand side mirrors the right-hand side when drawing a straight line across the worktray centre. Samples 1-8 are loaded onto the left-hand side of the worktray, and samples 9-16 are loaded onto the right-hand side of the worktray.

Place the plate with the **MoleStrips™** in the **MoleStrips™** holder as shown below. Make sure the **MoleStrips™** are pressed all the way down into position before locking the **MoleStrips™** in place.



The **MoleStrips™** holder
– open position

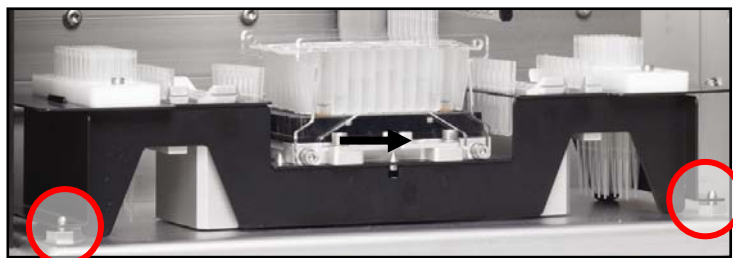


Plate with **MoleStrips™**
placed on the **MoleStrips™**
holder

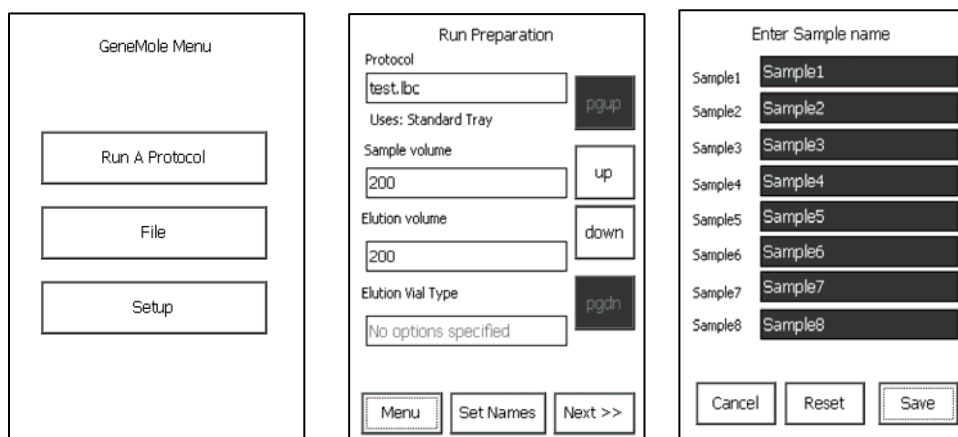


The **MoleStrips™** holder
– locked position

- Place the worktray back into GeneMole[®], making use of the positioning pins located at the base of the instrument. Fit the pins into the holes located in each front corner of the worktray. The positioning pins ensure correct positioning of the worktray in relation to the pipette.



- Close the GeneMole[®] door.
- Enter **Run A Protocol** from the *GeneMole Menu*. The first *Run Preparation* screen will appear.
- Choose the protocol of choice from the dropdown menu in the *Protocol* window.
- Specify sample and elution volume by activating the relevant windows on the *Run Preparation* screen and by pressing the **up** and **down** buttons.



Optional. Enter sample names by using the **Set Names** button on the *Run Preparation* screen. Enter sample names according to placement on worktray. Complete by pressing **Save**. This will take you back to **Run Preparation** window.

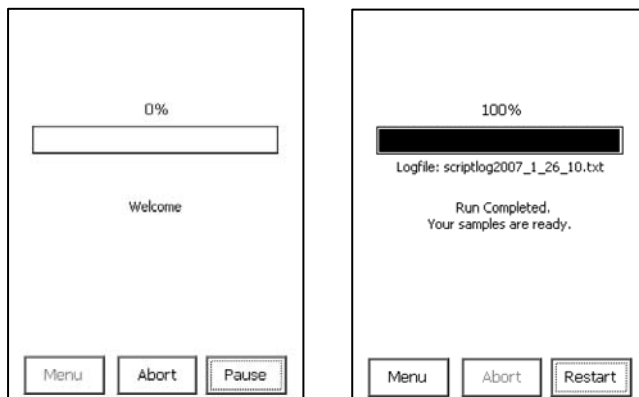
Note: The application of entering sample names requires an external USB keyboard to be connected to the USB port at the front of GeneMole[®]

9. Choose **Next** to continue with the Run Preparation procedure. The second *Run Preparation* screen will appear. Verify loading of the worktray by pressing **OK**.
10. Start Protocol Run by pressing **Start**.

Note: The green light located below the touch screen will start blinking once the run is initialized and whilst performing the run. This is to visualize that GeneMole® is not just turned on, but that it is carrying out a protocol run.



The run process can be monitored by watching the progress bar displayed on the screen. It is possible to place the run on hold at any point during a protocol run by simply pressing the **Pause** button, see section 7 for details.



Upon completion of a protocol run the *Run Completed* window will appear. Samples are now purified and ready to be used in downstream applications.

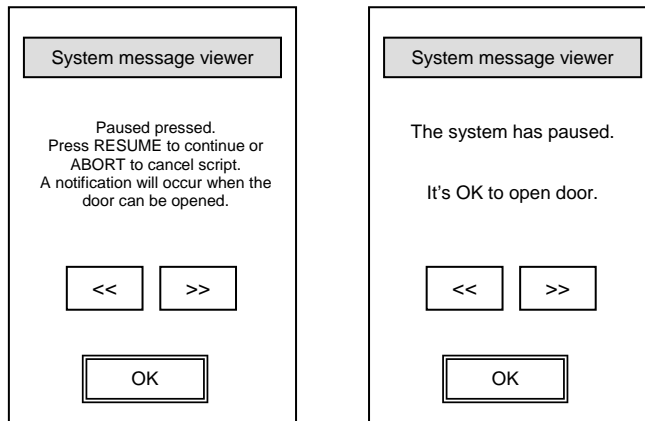
Note: The green light will go back to being static in order to visualize that the run protocol is completed, and the GeneMole® is no longer performing a run.

11. Open the GeneMole® door.
12. Lift out the worktray, and collect the purified samples.
13. Discard used plasticware. Clean the GeneMole® if necessary. Refer to section 10 for cleaning procedure.

7. Pausing or Aborting a Run

GeneMole® has a pause function which enables the user to intervene and place the run on hold before resuming the protocol again. The pause function can be carried out at any point during a protocol run.

1. Press **Pause**. Two *message* windows will appear.



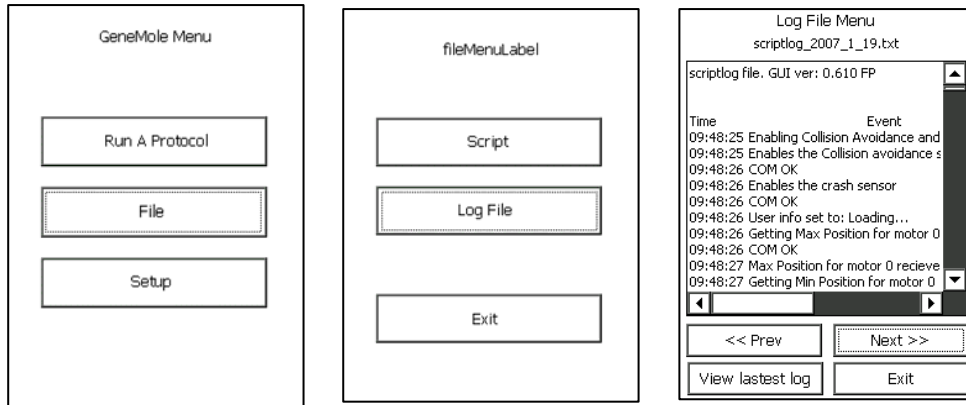
These *message* windows inform that the protocol run has been paused and that the GeneMole® door can be opened. The user can safely open the GeneMole® door to intervene with the run before proceeding with the protocol run at the exact same protocol step.

2. Close the message boxes by pressing **OK**.
3. Proceed with the protocol run by pressing **Resume**; terminate the run by pressing **Abort**.

When aborting a run the protocol will be terminated and the user is given the option to restart the protocol run from the beginning, or return to the *GeneMole Menu*.

8. Obtaining Post Run Information

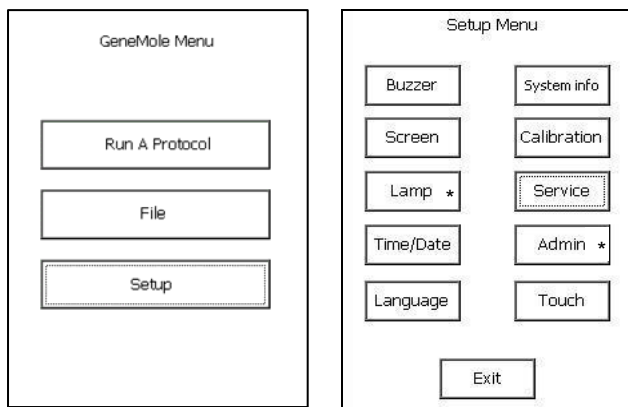
1. In order to view the log files activate the File option on the *GeneMole Menu*.
2. Select Log File button to access protocol run log files on performed protocol runs.



9. The Setup Menu

From the *Setup Menu* it is possible to customize certain parameters like e.g. buzzer signal and screen contrast. In addition time and date settings can be entered and system information retrieved. Regular volume calibrations are also performed from the setup menu (for volume calibration see section 10.2.1).

Display the *Setup Menu*: On the *GeneMole Menu* press the **Setup** button. The *Setup Menu* will appear and provide access to the various user parameters.



* Admin is for qualified service personnel use only. The Lamp button is not in use.

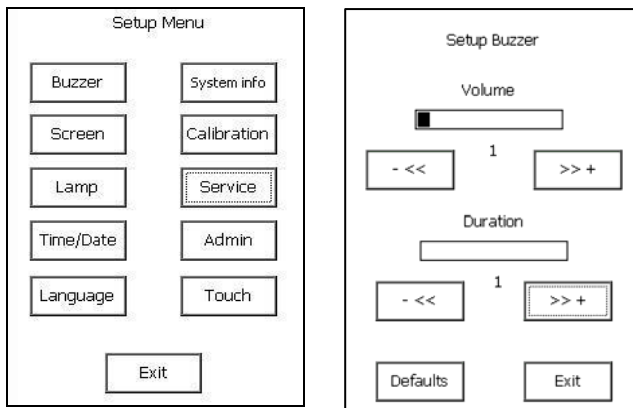
9.1 Customize Buzzer Setup

The buzzer provides a sound signal that informs about completion of a run, or the occurrence of run failure. Buzzer setup allows adjustment of volume and duration of sound signal.

1. Select the **Buzzer** button from the *Setup Menu*.
2. In the *Setup Buzzer* window use the arrows to increase or decrease buzzer volume and buzzer duration.



3. The customized buzzer settings are selected once the **Exit** button is pressed.



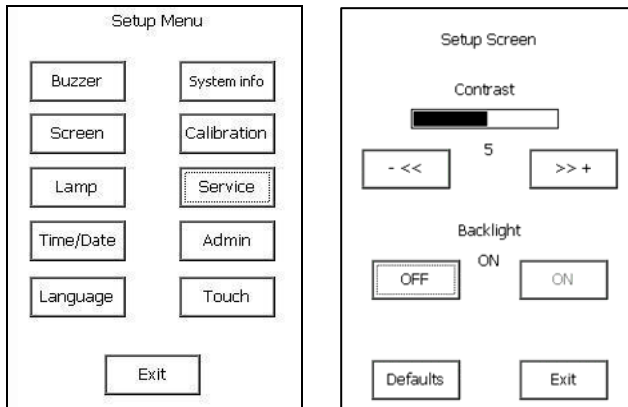
9.2 Customize Screen Setup

The Screen setup enables users to adjust screen contrast and gives the option of backlight on or off.

1. Select the **Screen** button from the *Setup Menu*.
2. In the *Setup Screen* window use the arrows to increase or decrease the screen contrast.



3. Choose to have screen backlight **ON** or **OFF**.
4. The customized screen settings are selected once the **Exit** button is pressed.



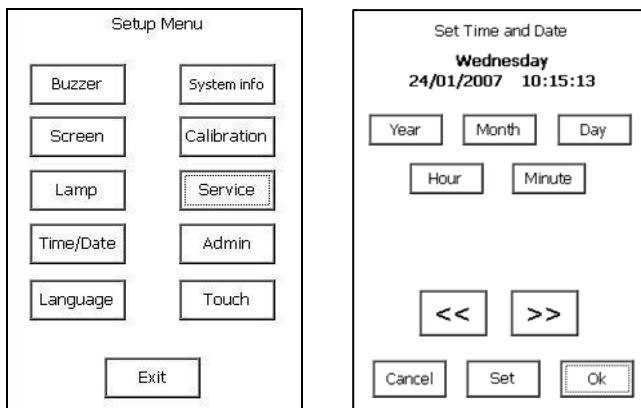
9.3 Time and Date Setup

The Time/Date setup is a feature for setting time and date.

1. Select the **Time/Date** button from the *Setup Menu*.
2. In the *Set Time and Date* window press the various units; Year, Month, Day, Hour and Minute to activate them.
3. Use arrows to adjust settings.



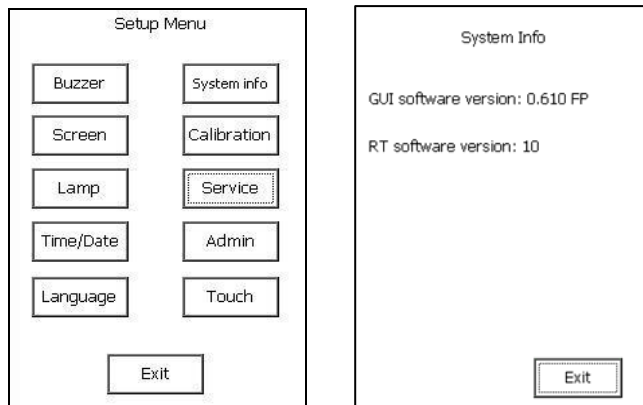
4. Install the settings by pressing the **Set** button followed by the **Ok** button.



9.4 Retrieve System Information

The **System Info** setup gives information on the software version for the Graphic User Interface (GUI) and Real Time (RT).

1. Select the **System Info** button from the *Setup Menu*. Software version of the GUI and RT will appear in the *System info* window.
2. Press the **Exit** button to return to the *Setup Menu*.



9.5 Touch Screen Calibration


The **Touch** setup makes it possible to calibrate the touch screen. Follow the on-screen instructions. Touch the screen in the centre of the 5 appearing stars with a clean pipette tip. Tap anywhere on the screen to complete the calibration.



10. Cleaning and Maintenance

10.1 General cleaning procedures

- In case of spills, wipe up any liquids after completion of the protocol run.
- After each run:
 - Discard used plasticware.
 - Remove and empty waste container.
- At the end of the day:
 - Clean worktray.
 - Wipe down internal surfaces with mild soap water, followed by clean water and then 70% ethanol.
 - If necessary wipe down magnetic rod and pipette head cones using clean tissue paper with mild soap water, followed by clean water and then 70% ethanol.

 <p>NOTICE</p>	<ul style="list-style-type: none">• Never remove the outer casing or the front and rear covers. There are no user serviceable parts inside. Failing to comply with this may compromise the safety of the instrument.• Do not use bleach, dilute HCl or any organic solvent except 70% ethanol for cleaning GeneMole®.• RNase Away can be used after cleaning, but must be followed by clean water and then 70% ethanol.
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10.2 Periodic maintenance

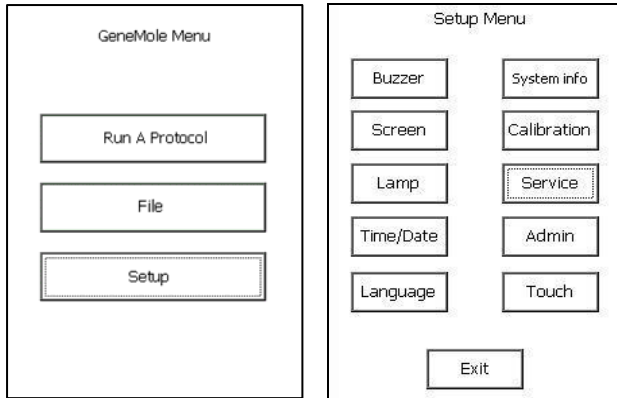
Periodic maintenance including volume calibration (section 10.2.1) and the leakage test (section 10.2.2) should be performed every 6 months.



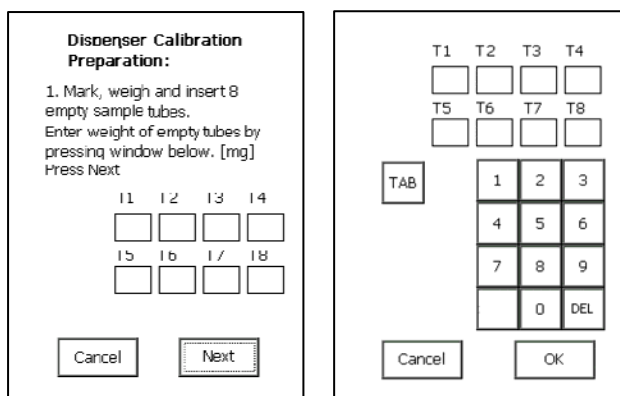
10.2.1 Volume calibration

Volume calibration of the GeneMole® instrument should be performed every 6 months in order to verify that the pipetting unit is operating according to specifications. Calibration is carried out by the using a scale, empty tubes and water.

1. From the *GeneMole Menu* press the **Setup** button. The *Setup Menu* will appear and provide access to the various user parameters.



2. Select the **Calibration** button in the *Setup Menu*.
3. Weigh and number eight empty sample tubes and enter their weight in milligrams [mg] into the calibration grid for Tube 1 (T1), Tube 2 (T2) and so on. The weight of the tubes is entered by touching the designated area followed by using the pop-up keyboard to register the different values. The **TAB** function enables movement to the next window.



Note: The **TAB** function enables movement to the next box, but there is no key to enable movement backwards. However by the use of the **TAB** function it is possible to move from the last box to the first box again.

4. After entering the weight values for all 8 tubes, press the **OK** button. A confirmation window displaying the entered weight measurements will appear. Press the **Next** button to proceed with the calibration.

Dispenser Calibration Preparation:

1. Mark, weigh and insert 8 empty sample vials.
Enter weight of empty vials by pressing window below. [mg]
Press Next

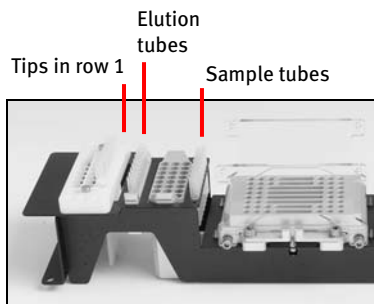
V1	V2	V3	V4
681	667	669	677
V5	V6	V7	V8
673	669	681	664

Dispenser Calibration Preparation:

2. Insert 8 elution tubes each containing 200 μ L of water
3. Insert 8 pipette tips at row 1
4. Insert waste box

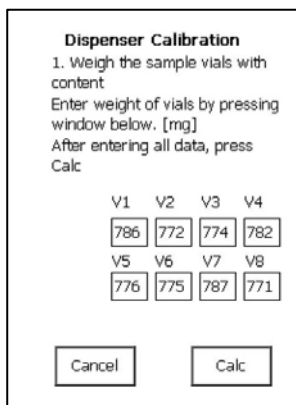
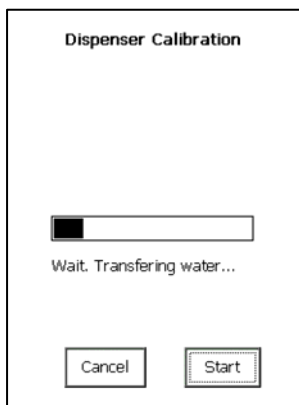
Close door and press next

5. Place the 8 empty tubes on to the worktray in the sample tube position. See worktray setup below.
6. Follow instructions displayed on the screen and insert 8 elution tubes each containing 200 μ L of water. Insert waste container and 8 pipette tips in row number 1.



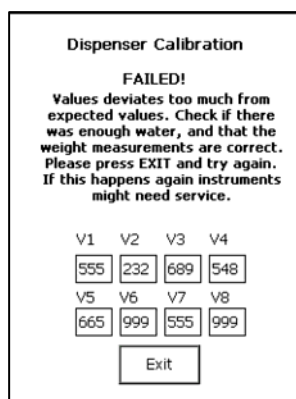
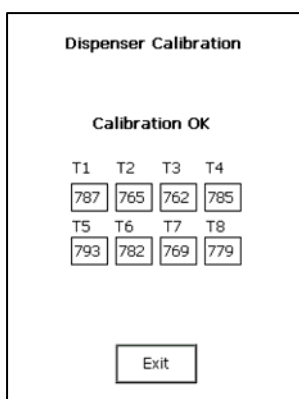
7. Press the **Next** button and the *Dispenser Calibration* window will appear.
8. Select the **Start** button to initiate volume calibration. The instrument now dispenses 100 μ L into each of the 8 empty pre-weighed sample tubes.

- Upon completion of water dispensing, collect the sample tubes containing water and measure their new weight.




- Enter the new weight into the calibration grid.

- The result of the calibration will either be *Calibration OK* or *Calibration Failed*.



If the calibration fails repeatedly, try restarting the instrument. If the calibration continues to fail, call the Mole service organization.

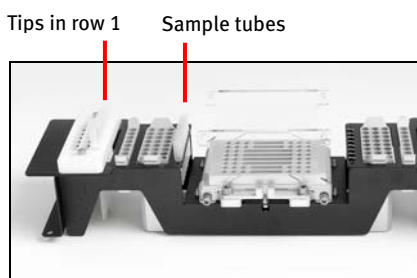
 NOTICE	<p>Failure of Volume Calibration should be followed by contacting appropriate service personnel.</p>
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10.2.2 Leakage test

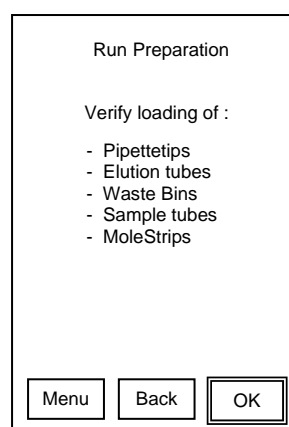
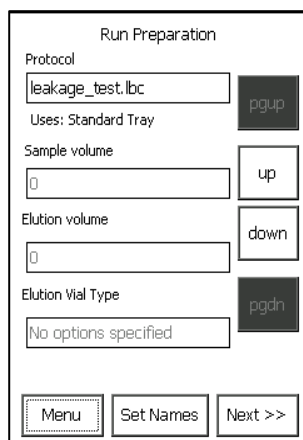
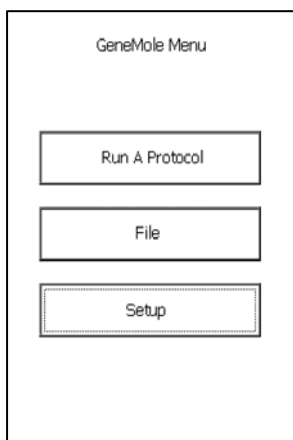
A leakage test of the GeneMole® instrument should be performed every 6 months in order to verify that the pipetting unit is operating according to specifications. A leakage test is carried out by the use of empty tubes and water.

In the leakage test the instrument will aspirate 200 µl H₂O, followed by 10 µl air. This will leave an air gap under the aspirated volume. The test is based on observing if the instrument is able to maintain this air gap intact. If the aspirated volume of fluid replaces the air gap, then the test will have failed and the GeneMole® needs the pipetting unit to be serviced.

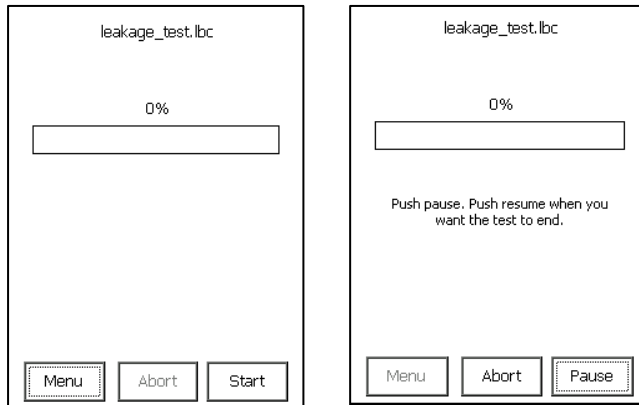
1. Load all components onto the left-hand side of the worktray for the leakage test. Place 8 pipette tips in row 1 as illustrated below. Fill 8 sample tubes with 300 µl H₂O and place the tubes as sample tubes in the worktray as illustrated below. Place the worktray in the GeneMole® instrument.



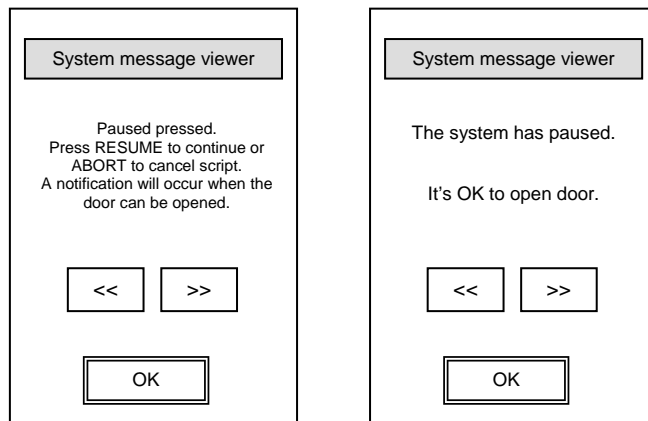
2. From the *GeneMole Menu* enter **Run A Protocol**.
3. From the *Run Preparation Menu* select the protocol **leakage_test.lbc** from the dropdown menu and press **Next**. The *Run Preparation* window will appear. Press OK if 8 pipette tips and 8 sample tubes containing 300 µl H₂O are loaded in the worktray.



- From the *leakage_test.lbc Menu* press **Start** to initiate the leakage test. GeneMole® will aspirate 200 µl H₂O, followed by 10 µl air. This will leave an air gap under the aspirated volume.
- Press **Pause** to perform the leakage test.



- Two message windows will appear when pressing **Pause**. These messages are for orientation. Press **OK** to return to *leakage test* window.

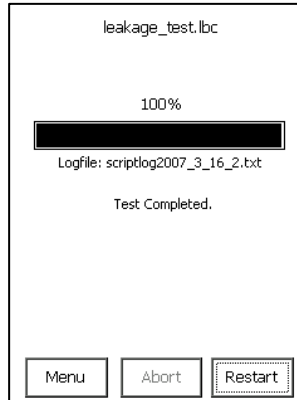
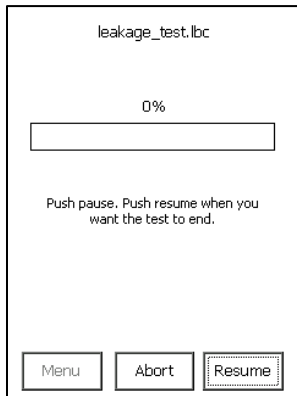


The GeneMole® will retain the aspirated fluid and air inside the tip whilst in pause mode. Allow the instrument be in pause mode for 10 minutes to ensure that pipetting unit is functioning properly.


- After 10 minutes observe if there is still an air gap intact in the tip. If any air is visible, then the leakage test has been passed with success. If no air gap is visible then the leakage test has failed, and the Mole service organization should be contacted.



- Press **OK** to exit the message window and return to the leakage test progress window. Press **Resume** and the pipette unit will return to its start position.



Upon completion there is the option of restarting the leakage test or returning to the *GeneMole Menu*.

 <p>NOTICE</p>	<p>Failure of Leakage Test should be followed by contacting appropriate service personnel.</p>
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10.3 Changing the pipette head

If the instrument has failed maintenance tests the Mole service organization may suggest to change the pipette head.

Apart from the fuse and the tray with its subunits, the pipette head is the only part of the GeneMole® that can be changed by the operator.

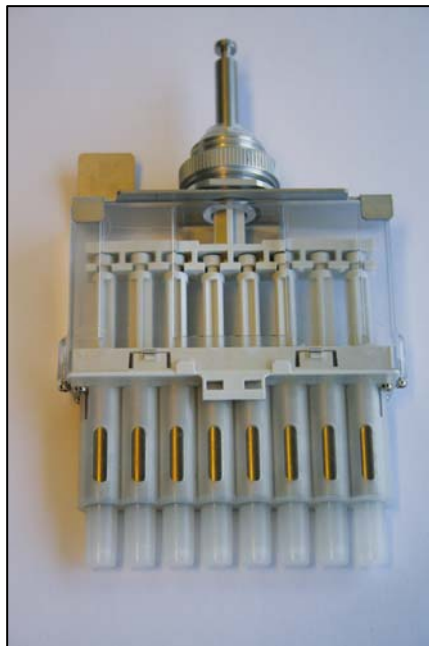


Make sure that the GeneMole® has been disconnected from the mains before removing the pipette head cover. Do not perform any other operations on the pipette assembly than those described below.

1. Remove the metal cover surrounding the pipette head by loosening the twisting knob and the two screws holding the cover in place.

The black twisting knob is located on the upper half of the left side of the cover box, and the 2 screws are located on the upper half and inner edge of the right side of the box.

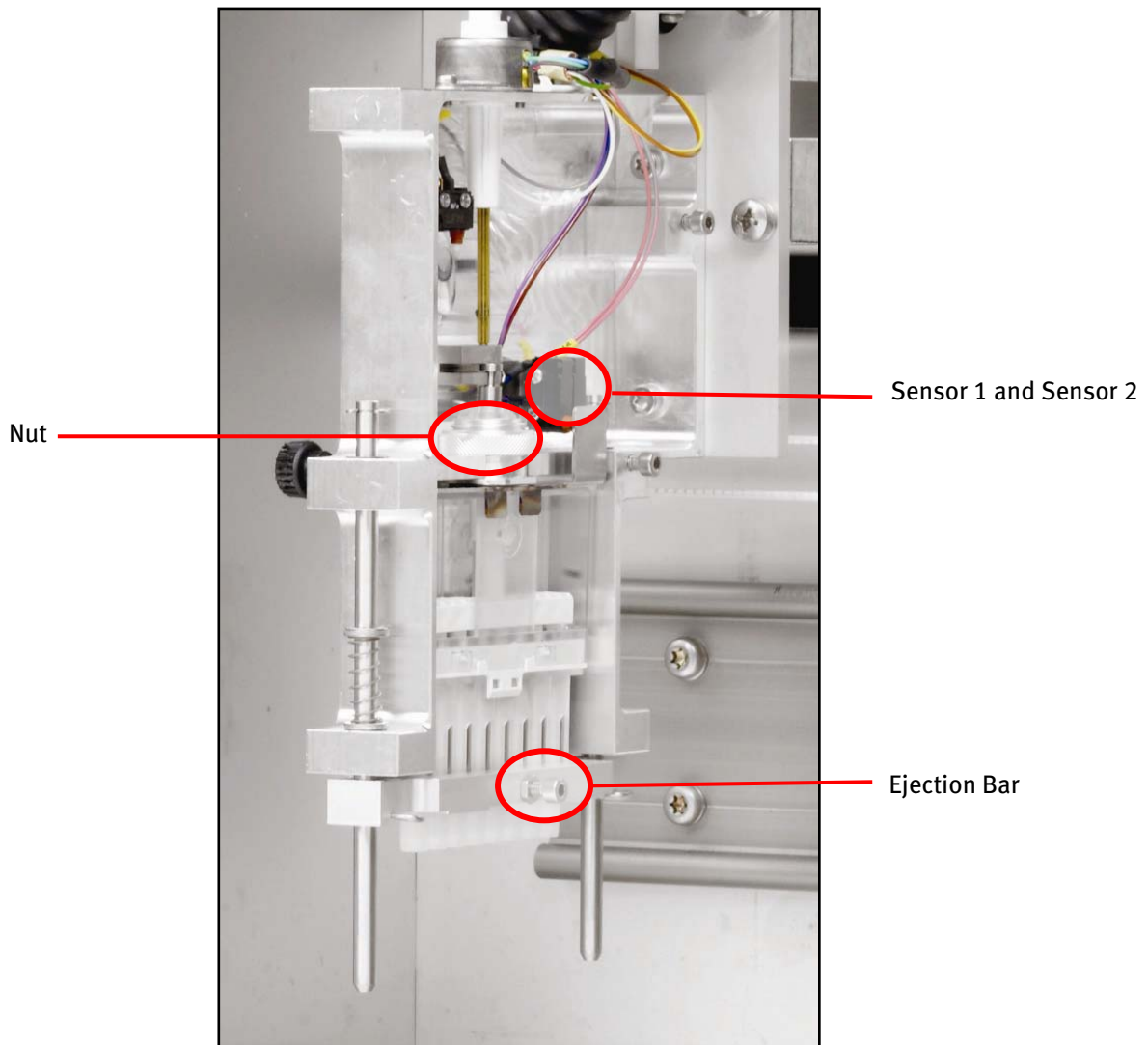
The twisting knob and the 2 screws need not to be taken out, only loosened. A torx, T6, key is used to loosen the two screws, and the metal cover is removed by sliding the cover out of the rails the screws are placed in.



The pipette head



2. Remove the pipette head by loosening the nut holding the pipette head in the casing. The use of pliers might be required. Once the nut is loosened, the pipette head can be taken out by sliding down the tip ejection bar, and lifting out the pipette head.
3. Place the new pipette head in the casing by fitting it into its designated position.
4. Before tightening the nut holding the pipette head in place, ensure that the pipette head is positioned correctly. The pipette head will fit in such a way that it presses the “in sensors”. These sensors (sensor 1 and sensor 2) enable GeneMole® to identify the type of pipette head installed.



10.4 Changing the fuse



Make sure that the GeneMole[®] has been disconnected from the mains before changing the fuse. Opening of the fuse box without disconnecting the mains constitutes an electrical shock hazard.

1. Locate the fuse on the rear of GeneMole[®] (see section 3 for fuse location).
2. Open the fuse by unscrewing the fuse holder.
3. Change the T 1.6 A, 250 V fuse, and screw fuse holder back on.

10.5 Taking the instrument out of use

Before taking the instrument out of use or transporting it to a different location through a non-laboratory environment, wipe down all exposed surfaces with 70% ethanol to remove possible biological contaminants.



11. GeneMole® - Technical Data

Product name	GeneMole®
Prod. No.	MG10-000
Dimensions	(W: 60 x D:32 x H:55 cm)
Weight	41 kg
Voltage	88 - 264 V AC
Frequency	47 - 63 Hz
Fuse	T 1.6 A, 250 V
Power Consumption	100 W
Environmental Rating	IEC 529 IP 20
EMC Compliance Europe	IEC/EN 61326-1 (1997) + A1 (1998), A2 (2001) and A3 (2003) Class B compliant
EMC Compliance US	FCC Part 15 Subpart B, Class B compliant
Electrical Safety Europe	IEC/EN 61010-1 and IEC/EN 61010-2-081 compliant
Electrical Safety US	UL 61010-1 compliant
RoHS Compliance	2002/95/EC compliant
Maximum number of samples/run	8 or 16 depending on protocol
Minimum number of samples/run	1
Maximum pipetting volume	1000 µl
Pipetting volume accuracy (1000-100 µl)	± 5%
Pipetting volume precision (1000-100 µl)	Stdev 6%
Pipetting volume accuracy (100-50 µl)	± 15%
Pipetting volume precision (100-50 µl)	Stdev 15%

12. GeneMole® - Transport and Operational Conditions

Transport Conditions

Ambient temperature allowed during transport	-10 °C to +40 °C
Ambient pressure allowed during transport	500 to 1060 hPa
Ambient humidity allowed during transport	10% to 90%

Operation Conditions

Ambient temperature allowed during operation	+10 °C to +30 °C
Ambient pressure allowed during operation	700 to 1060 hPa
Ambient humidity allowed during operation	20% to 80%

13. GeneMole® Troubleshooting Guide

GeneMole® Troubleshooting Guide		
Issue	Problem	Refer to
1	The instrument seems dead (no pilot light, nothing on screen).	Table 1
2	The instrument pilot light is on, but there is nothing on the screen	Table 2
3	The screen shows the Windows CE desktop.	Table 3
4	The screen picture is normal for GeneMole®, but the screen does not react to touch (frozen screen).	Table 4
5	The instrument will not start a run, error message “Door opened”.	Table 5
6	The instrument stops with the error message “Crash sensor activated” or “The pipette head has encountered an unexpected obstacle”.	Table 6
7	The instrument displays the error message “Y1 limit switch activated”.	Table 7
8	The instrument displays the error message “X1 limit switch activated”.	Table 8
9	The instrument displays the error message “X2 limit switch activated”.	Table 9
10	The instrument displays the error message “Y2 limit switch activated”.	Table 10
11	The instrument displays the error message “P limit switch activated”.	Table 11
12	The pipette head loses tips.	Table 12
13	The pipettes seem to leak.	Table 13
14	When volume calibration is performed, the new data are not accepted because no calibration file exists for the present pipette head.	Table 14
15	When volume calibration is performed, the new data are not accepted because the variation is too great or because the new data deviate too much from the factory settings.	Table 15
16	One axis does not move, although the instrument does not give an error message.	Table 16
17	Liquid overflow/spills.	Table 17
18	Instrument misses positions, does not pick up tips or lifts items from the work tray.	Table 18
19	Variable elution volume.	Table 19
20	Reduced yield and/or quality.	Table 20

Table 1

Problem	Cause / Remedy
<p>The instrument seems dead (no pilot light, nothing on screen).</p>	<ol style="list-style-type: none"> 1. Check that the instrument is turned on, if not turn on. 2. Check that the instrument is connected to the mains, if not, connect. 3. Check that the mains is in working order (use a lamp or other appliance), if not, switch to another mains socket. 4. Check the instrument fuse. If blown, replace (refer to User Manual section 3). 5. If all of the above is OK, turn the instrument off, leave it for 5 minutes and turn it on again. If the instrument does not come alive within three minutes after being turned on this time, call for service giving the reference A01.

Table 2

Problem	Cause / Remedy
<p>The instrument pilot light is on, but there is nothing on the screen.</p>	<ol style="list-style-type: none"> 1. Turn the instrument off, then on again. <ol style="list-style-type: none"> a) If the instrument starts directly, go ahead and use as normal. b) If the instrument shows the splash screen for longer than normal, and states that the system is being updated, recalibration may be needed before use. Do a test run and if there seems to be a problem, call for service giving the reference A02. 2. If the instrument does not restart, turn the instrument off, leave it for 5 minutes and turn it on again. <ol style="list-style-type: none"> a) If the instrument starts directly, go ahead and use as normal. b) If the instrument does not come alive within three minutes after being turned on this time, call for service giving the reference A03. c) If the instrument shows the splash screen for longer than normal, and states that the system is being updated, recalibration may be needed before use. Do a test run and if there seems to be a problem, call for service giving the reference A02.



Table 3

Problem	Cause / Remedy
<p>The screen shows the Windows CE desktop.</p>	<ol style="list-style-type: none"> 1. Turn the instrument off, then directly on again. <ol style="list-style-type: none"> a) If the instrument starts directly, go ahead and use as normal. b) If the instrument shows the splash screen for longer than normal, and states that the system is being updated, recalibration may be needed before use. Do a test run and if there seems to be a problem, call for service giving the reference A02. 2. If the instrument does not restart, turn the instrument off, leave it for 5 minutes and turn it on again. <ol style="list-style-type: none"> a) If the instrument starts directly, go ahead and use as normal. b) If the instrument does not come alive within three minutes after being turned on this time, call for service giving the reference A03. c) If the instrument shows the splash screen for longer than normal, and states that the system is being updated, recalibration may be needed before use. Do a test run and if there seems to be a problem, call for service giving the reference A02.

Table 4

Problem	Cause / Remedy
<p>The screen picture is normal for GeneMole®, but the screen does not react to touch (frozen screen).</p>	<ol style="list-style-type: none"> 1. Turn the instrument off, then directly on again. <ol style="list-style-type: none"> a) If the instrument starts directly, go ahead and use as normal. b) If the instrument shows the splash screen for longer than normal, and states that the system is being updated, recalibration may be needed before use. Do a test run and if there seems to be a problem, call for service giving the reference A02. 2. If the instrument does not restart, turn the instrument off, leave it for 5 minutes and turn it on again. <ol style="list-style-type: none"> a) If the instrument starts directly, go ahead and use as normal. b) If the instrument does not come alive within three minutes after being turned on this time, call for service giving the reference A03. <p>If the instrument shows the splash screen for longer than normal, and states that the system is being updated, recalibration may be needed before use. Do a test run and if there seems to be a problem, call for service giving the reference A02.</p>



Table 5

Problem	Cause / Remedy
<p>The instrument will not start a run, error message “Door opened”.</p>	<ol style="list-style-type: none"> 1. Check that the door is properly closed, if not, close it. 2. If the door is properly closed and the error message still appears, try to depress the door switches by hand. If the error message disappears, the problem is a maladjusted door. This information should be given when calling for service giving the reference A04. 3. If depressing the door switches by hand does not remove the error message “Door opened”, the error is in the electronics system. This information should be given when calling for service giving the reference A05.

Table 6

Problem	Cause / Remedy
<p>The instrument stops with the error message “Crash sensor activated” or “The pipette head has encountered an unexpected obstacle”.</p> <p>This means that the pipette head has encountered more resistance than normal when moving down.</p>	<ol style="list-style-type: none"> 1. Check for the presence of obstacles that may have stopped the pipette head from moving down. If found, remove them and restart the instrument. 2. Make sure that only plastic ware recommended by Mole Genetics is used. Other brands of plastic, though superficially similar, may have different dimension and cause the instrument to crash. 3. Make sure that sample tubes have been pressed all the way into their holes (they should rest on the small collar). If this is not the case, press them down. 4. Make sure that the black plate is in position between the MoleStrips™ and the strip holder. If the MoleStrips™ are placed directly into the strip holder, they will sit lower than normal, and the instrument will expect to find the bottom of the sample tubes correspondingly lower. 5. If no obvious obstacles are found, restart the instrument. If the problem persists, call for service giving the reference A06.



Table 7

Problem	Cause / Remedy
<p>The instrument displays the error message “Y1 limit switch activated”.</p> <p>The Y1 limit switch is related to the vertical movement of the pipette head and this problem is similar to “Crash sensor activated”. At some steps resistance to movement is expected, and the crash sensor is turned off. If the resistance at those steps is even greater than expected, the y1 motor may lose its position, causing it to go too far when it returns to its upper position.</p>	<ol style="list-style-type: none"> 1. Check for the presence of obstacles that may have stopped the pipette head from moving down. If found, remove them and restart the protocol. 2. Check that the MoleStrips™ have been properly seated in the strip holder (with black plate). If the MoleStrips™ are placed higher at one end than the other, this may cause this error. 3. If no obvious obstacles are found, restart the instrument. If the problem persists, call for service giving the reference A07.

Table 8

Problem	Cause / Remedy
<p>The instrument displays the error message “X1 limit switch activated”.</p> <p>The X1 limit switch is related to the horizontal movement of the pipette head.</p>	<ol style="list-style-type: none"> 1. Check for obstacles to sideways movement of pipette head. If found, remove them. 2. Check if the pipette head has been unable to detach pipette tips at the correct stage, since this may cause the pipette head to collide with the magnet arm. Possible causes for non detachment of tips is that tips from previous runs have been left in the waste container or that something has fallen into the waste container. 3. If no obvious obstacles are found, restart the instrument. If the problem persists, call for service giving the reference A08.

Table 9

Problem	Cause / Remedy
<p>The instrument displays the error message “X2 limit switch activated”.</p> <p>The X2 limit switch is related to the horizontal movement of the magnet arm.</p>	<ol style="list-style-type: none"> 1. Check for obstacles to sideways movement of magnet arm. If found, remove them. 2. Check if the pipette has been unable to detach pipette tips at the correct stage, since this may cause the pipette head to collide with the magnet arm. Possible causes for non detachment of tips is that tips from previous runs have been left in the waste container or that something has fallen into the waste container. 3. If no obvious obstacles are found, restart the instrument. If the problem persists, call for service giving the reference A09.



Table 10

Problem	Cause / Remedy
<p>The instrument displays the error message “Y2 limit switch activated”.</p> <p>The Y2 limit switch is related to the vertical movement of the magnet arm.</p>	<ol style="list-style-type: none"> 1. Check for the presence of obstacles that may have stopped the magnet arm from moving down. If found, remove them and restart the instrument. 2. If no obvious obstacles are found, restart the instrument. If the problem persists, call for service giving the reference A10.

Table 11

Problem	Cause / Remedy
<p>The instrument displays the error message “P limit switch activated”.</p>	<ol style="list-style-type: none"> 1. Check if the sample has been viscous enough to completely block the pipette tips. If this is the case, use less sample and/or avoid clots. 2. Check that nothing blocks the nozzles of the pipette head. 3. If no obvious obstacles are found, restart the instrument. If the problem persists, call for service giving the reference A11.

Table 12

Problem	Cause / Remedy
<p>The pipette head loses tips.</p>	<ol style="list-style-type: none"> 1. Call for service giving the reference A12.



Table 13

Problem	Cause / Remedy
<p>The pipettes seem to leak.</p> <p>This may be a real leakage due to a damaged pipette head, but there are also several steps in the protocols where the tips have been deep in viscous liquid. Such liquid may then run down the outside of the tips and form a drop at the end of the tip. This does not in any way compromise the run.</p>	<ol style="list-style-type: none"> 1. Run the protocol “Leakage test” as described in section 10.2.2 in the User Manual to check if the tips are leaking. <ol style="list-style-type: none"> a) If no drops have formed after 5 minutes, leakage is not a problem. b) If drops have formed at one or more tips after 5 minutes call for service, indicating on how many tips drops have formed giving the reference A13.

Table 14

Problem	Cause / Remedy
<p>When volume calibration is performed, the new data are not accepted because no calibration file exists for the present pipette head.</p>	<ol style="list-style-type: none"> 1. Open the pipette head cover and check that the switch plate depresses the two pipette head recognition switches. <ol style="list-style-type: none"> a) If the switch plate of the pipette head does not press down the two switches, twist it until it does. This may require loosening the pipette head holding nut. b) If the switch plate of the pipette head does press down the two switches, call for service giving the reference A14.

Table 15

Problem	Cause / Remedy
<p>When volume calibration is performed, the new data are not accepted because the variation is too great or because the new data deviate too much from the factory settings.</p>	<ol style="list-style-type: none"> 1. The most common reason for a failed volume calibration is typing error. Restart the instrument and do the calibration again. Note that if the instrument is not restarted after a failed calibration, it will continue to fail, even if the values are within the predefined limits <ol style="list-style-type: none"> a) If the instrument accepts new calibration values after restart, the problem is solved. b) If the instrument continues to reject the new calibration values, it is probable that the pipette head has to be replaced, call for service giving the reference A15.



Table 16

Problem	Cause / Remedy
One axis does not move, although the instrument does not give an error message.	1. This is always a matter for a service engineer, call for service giving the reference A16.

Table 17

Problem	Cause / Remedy
Liquid overflow/spills	<ol style="list-style-type: none"> 1. Check that the right sample volume was applied, including whether the pipette used to dispense the sample is correctly calibrated. 2. Check that there is nothing in the samples that may clog the pipette tips (e.g. blood clots, undigested tissue remains, hair). 3. Make sure that only plastic ware recommended by Mole Genetics is used. Other brands of plastic, though superficially similar, may have different dimension and cause liquid overflow. 4. Make sure that sample tubes have been pressed all the way into their holes (they should rest on the small collar). If this is not the case, press them down. 5. Make sure that the black plate is in position between the MoleStrips™ and the strip holder. If the MoleStrips™ are placed directly into the strip holder, they will sit lower than normal, and the instrument will expect to find the bottom of the sample tubes correspondingly lower. This may cause liquid overflow. 6. Run the protocol “Leakage test” as described in section 10.2.2 in the User Manual to check if the tips are leaking. <ol style="list-style-type: none"> a) If no drops have formed after 5 minutes, leakage is not a problem b) If drops have formed at one or more tips after 5 minutes call for service, indicating on how many tips drops have formed giving the reference A13 7. If the problem persists, even though there is no leakage from the pipette, call for service giving the reference A17.



Table 18

Problem	Cause / Remedy
<p>Instrument misses positions, does not pick up tips or lifts items from the work tray.</p>	<ol style="list-style-type: none"> 1. Make sure the tray is correctly situated. The two guide pins at the front of the instrument floor should go through the corresponding holes in the tray. Correct if necessary. 2. If the problem persists, it is an indication that a recalibration of the factory set positions is needed, call for service giving the reference A18.

Table 19

Problem	Cause / Remedy
<p>Variable elution volume.</p>	<ol style="list-style-type: none"> 1. Check that the MoleStrips™ have been properly seated in the strip holder (with black plate). If MoleStrips™ are higher at one end than the other, this may cause this error. 2. Check that there is liquid left in the well where the elution buffer was aspirated from. It is necessary to use a pipette to check this, the profile of the lower part of the well makes visual inspection difficult. <ol style="list-style-type: none"> a) If there is no elution buffer left, visually inspect some of the other MoleStrips™ from the same kit. If elution buffer volumes seem uneven, this is a likely cause. b) If the MoleStrips™ seem in order, perform a volume calibration. 3. If there is elution buffer left in the strip, run the protocol “Leakage test” to check if the tips are leaking. <ol style="list-style-type: none"> a) If no drops have formed after 5 minutes, leakage is not a problem. b) If drops have formed at one or more tips after 5 minutes call for service, indicating on how many tips drops have formed giving the reference A13. 4. If the problem persists even though there is no leakage, no problem with the kits and a correct volume calibration has been performed, call for service giving the reference A19.



Table 20

Problem	Cause / Remedy
Reduced yield and/or quality	<ol style="list-style-type: none">1. If the problem seems related to any of the problems described above, try out the solutions described for that problem.2. If the problem is unrelated to any problem described above, refer to the documentation of the kit used.3. If the problem is unrelated to any problem described above and neither seem to be related to the kit, or if it affects more than one type of kit, call for service giving the reference A20.

Notes



Notes



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● **Mole[®]**

