

HiSorb™ Agitator



Instruction for use

Product reference:

HiSorb Agitator, with 16 × 20 mL vial block U-HSAG-20

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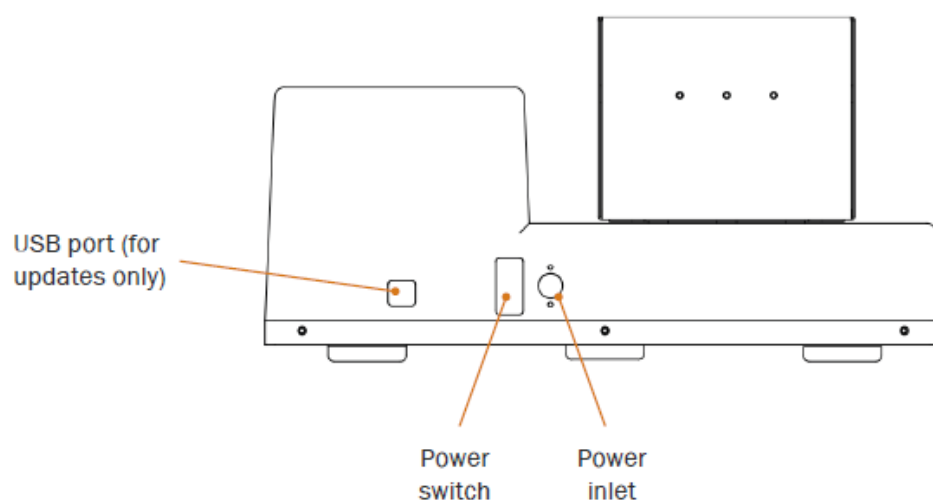
1. Introduction

The HiSorb Agitator is a laboratory agitation unit for 20 mL, 10 mL or 2 mL vials, with control of speed, incubation temperatures and agitation time. The HiSorb Agitator can be used in conjunction with Markes' HiSorb probe technology for sorptive sample extraction, and as a stand-alone unit for general laboratory mixing of liquids or solid suspensions.

The key parts of HiSorb Agitator are labelled below. They will be referred to throughout this manual.



Rear panel schematic



2. Notices

2.1. Warranty

The HiSorb Agitator is designed for laboratory use only. It is not intended for use in domestic establishments or establishments directly connected to a low-voltage power supply network that supplies buildings used for domestic purposes.

Where the HiSorb Agitator is used in a field environment, care must be taken to ensure that it is not exposed to detrimental conditions, *i.e.* rain, wind, or sun. Exposure may diminish the performance, cause damage to the instrument, and/or cause the instrument to become unsafe to the user.

If the instrument is not used in a way specified by the manufacturer, the protection provided by the instrument may be reduced. System failures arising from such use may not be covered in standard warranty and service contract documents.

2.2. Regulatory certifications

The instrument is designed and manufactured under a quality system registered to ISO 9001.

3. Safety warnings

3.1. Symbols

Make sure you follow the safety notices presented in this manual and follow warning symbols on the product. Markes International assumes no liability for the failure to comply with these requirements. The following terms are used in this manual:

WARNING This highlights actions that could cause personal injury.

CAUTION This highlights actions that may cause damage to hardware or software, render test results invalid, or result in non-optimal performance.

NOTES This emphasises important information about a specific task.

3.2. Mains voltages/External power supply

WARNING Ensure that the plug (electrical isolator) can be easily and quickly accessed during equipment use.

WARNING The instrument must be suitably earthed.

WARNING The internal parts of the HiSorb Agitator are all low-voltage. However, the external power supply will contain potentially dangerous voltages (even if the power switch is off) – never remove the cover of the external power supply.

CAUTION To reduce risk of damage, position the power supply unit away from the agitator and any liquids.



3.3. Liquid handling

WARNING Flammable and/or explosive liquids must not be used with the agitator. Use of these substances will render safety approval of the agitator invalid, and may cause serious injury and/or damage.

WARNING To avoid injury, observe safe laboratory practice when handling solvents and samples, and observe company policy on safety at all times.



WARNING Before using hazardous substances, know the physical and chemical properties of the solvents you use, and read the hazard indications and information reported in the Material Safety Data Sheet (MSDS) supplied by the manufacturer referring to the relevant CAS (Chemical Abstract Service) number. Any safety requirements must be followed at all times.



WARNING In laboratories where samples with potential biological hazards are handled, it is the user's responsibility to label any equipment (or parts thereof) that may become contaminated with biohazardous material, and to fulfil the mandatory requirements as determined by the hazard.



NOTES If the agitator comes in contact with hazardous materials, whether they are biological or chemical, do not return it to Markes or any of Markes' distributors without a valid returns number.

3.4. Pressure

NOTES Only sample vials manufactured from high-quality glass should be used with the agitator.

CAUTION Depending on the application conditions, high pressure can build up in the vial. Whenever a temperature greater than 60 °C is applied, consider the vapour pressure of the solvent used, and ensure that no excessive pressure builds up. Be aware that solid materials can also contain volatile compounds such as water (humidity) which could cause build-up of pressure.

CAUTION Do not reuse headspace vials. During the washing process, micro-cracks can form, which will weaken the glass and increase the chances of breakage.

3.5. Spillage prevention

CAUTION Vials should never be prepared in the agitator.

CAUTION Do not overfill sampling vials, and consider the sampling device that is to be used.

CAUTION If sampling is to take place from vials positioned on the agitator, care must be taken when adding/removing the sampling device.

3.6. Spillage cleaning

CAUTION If liquid does spill onto the agitator cover or heater plate, immediately turn off the power (even if the agitator appears to be functioning properly), and contact technical support.

NOTES If spillage occurs inside the vial sampling block (e.g. from a damaged vial), turn off the power to the instrument and disconnect the power lead *before* removing the liquid.

NOTES If spillage occurs onto the user interface, turn off the power to the instrument and disconnect the power lead *before* removing the liquid.

NOTES All users should be trained on how to react in a spill situation including how to disconnect power from the agitator.

3.7. High temperatures

WARNING Several parts of the agitator can be operated at high temperatures, and consequently represent a burn hazard. These zones include:

- The vial block
- The vial block heat plate (exposed when the vial block is removed).

These zones are labelled with 'burn hazard' labels similar to the one shown.



CAUTION Always allow the vial block to return to room temperature before removing it from the heat plate.

CAUTION Always ensure that the heating function is off when no vial block is present.

3.8. Agitation

WARNING The vial block will agitate during use, and care should always be taken to avoid injury. In particular, the cover may represent a pinch hazard.


4. Technical Specifications

4.1. HiSorb Agitator

The HiSorb Agitator does not require any additional space around its exterior. All movements are contained within the profile of the instrument, and there are no vents. However, the external power supply requires space (see below).

- Height: 14 cm (to top of agitator)
18 cm (to top of agitator fitted with a heated block for 16 × 20 mL vials; other sizes may vary)
- Width: 35 cm
- Depth: 19 cm
- Weight: 5 kg

4.2. Power supply

- Manufacturer: Meanwell
- Model: GS220A24-R7B
- Mains voltage: 100–240 V_{ac}
- Mains current: 4.0 A (max.)
- Voltage output: 24 V_{DC}
- Power: 221 W (max.)
- Output current: 9.2 A (max.)
- Inrush current: <120 A (cold start)
- Frequency: 50–60 Hz
- Symbols: 
- Standards: ANSI/UL 60950-1 CAN/CSA-C22.2 No. 60950-1 2007 EN 60950-1:2006
- UL file number: E183223
- Height: 5 cm
- Width: 9 cm
- Depth: 21 cm
- Mains lead length: 100 cm
- Low-voltage lead length: 100 cm

4.3. PC

No PC is required to operate the HiSorb Agitator. The USB port is for updates only.

5. Environmental operating conditions

The performance of the agitator can be affected by variation in environmental conditions caused by heating, air conditioning systems, or drafts.

CAUTION After exposure of the instrument to extremes of temperature or humidity, allow 2 hours to ensure that the conditions have returned to the recommended ranges before switching the instrument on.

5.1. Operating conditions

- Recommended temperature: 15 °C to 30 °C
- Recommended relative humidity: 5–95% (non-condensing)
- Altitude: Up to 2000 m (6561 ft)

NOTES Higher altitudes invalidate the safety certification and performance specification.

5.2. Storage and shipping conditions

Allowable temperature: –40 °C to 70 °C

Allowable relative humidity: 5–95% (non-condensing)

6. Instrument operation

6.1. Vial block fitting/removal

The vial block locates onto two pins on the heater plate, and is secured using fixing screws. Loosening the screws and lifting the block will remove it from the agitator.

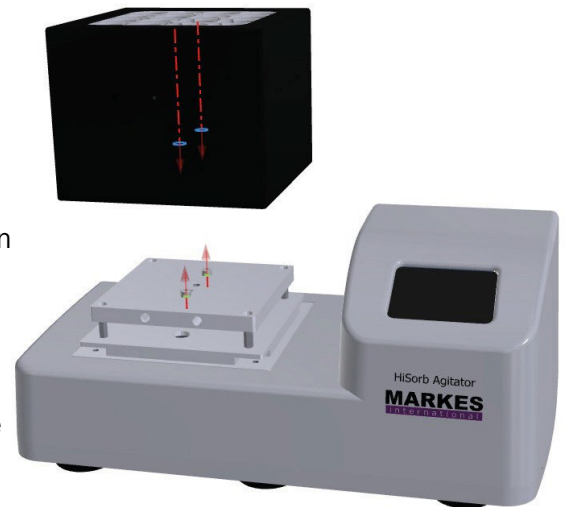
To fit the block:

- 1 Place the vial block onto the heater plate, locating the pins in the holes on the underside of the vial block.

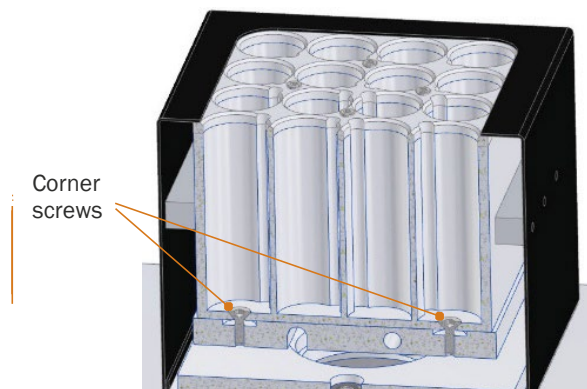
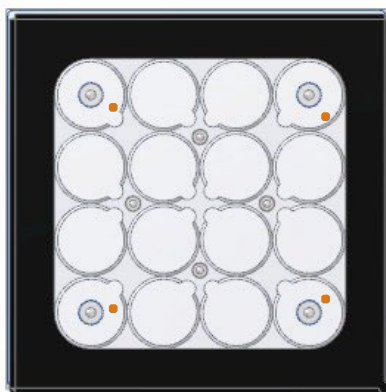
NOTES The vial block can fit in any direction.

- 2 Tighten the screws in each corner to secure the block to the heater plate.

WARNING The vial block must be secured to heater plate at all times during use. Failure to do so may cause injury and/or damage during use.



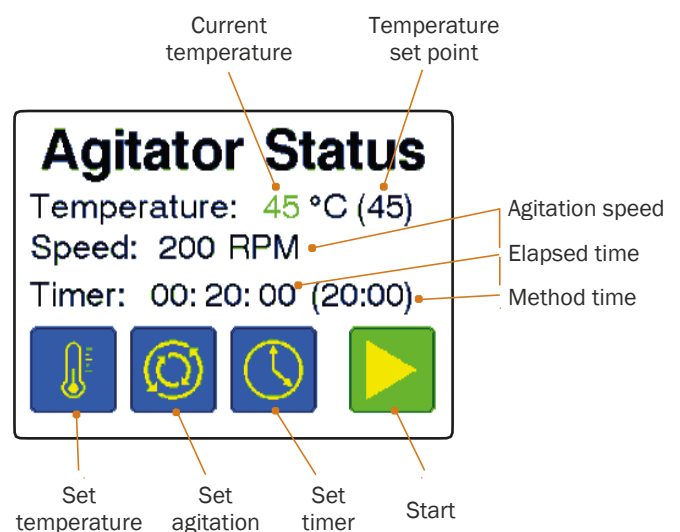
Step [1]: Fitting the vial block on the agitator.




Step [2]: Securing the vial block on the heater plate.

6.2. Setting the agitator

- 1 Power-on the agitator. This displays the home screen, which shows the current status of the agitator. From this screen the method temperature, agitation parameters and time can be set, as described below.



Step [1]: HiSorb Agitator home screen.

[2] Navigate to the 'Set temperature' screen by pressing the  icon.


[3] Set the desired temperature (between 40 °C and 90 °C) using the arrow buttons.

[4] Press <ON> to activate the heaters

NOTES Before running the method, ensure that sufficient time has elapsed for the vial block to heat.

NOTES If the HiSorb Agitator needs to be run at room temperature, then ensure the temperature is set to <OFF>.


[5] Press <OK> to return to the home screen.

[6] Navigate to the 'Set agitation' screen by pressing the  icon.

[7] Set the following functions:

- Agitation speed (50–300 rpm)
- Bi-directional time – the time (in seconds) in each direction before stopping and reversing.
- Delay – the time (in seconds) the agitation pauses between changing direction.

[8] Press <OK> to return to the home screen.


[9] Navigate to the 'Set timer' screen by pressing the  icon.

[10] Set the method time in hours (HH) and minutes (MM).

NOTES For continuous operation, set both HH and MM to zero. In this mode, the agitator, once started, will continue until the user intervenes.

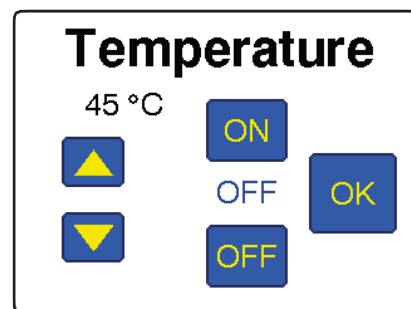
[11] Once complete, press <OK> to return to the home screen.

6.3. Activating the agitator

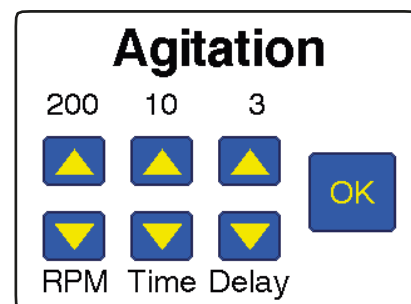
[4] Once all of the required values are set, the agitator can be started by pressing the  icon.

NOTES Time may be required to allow the temperature to reach set-point.

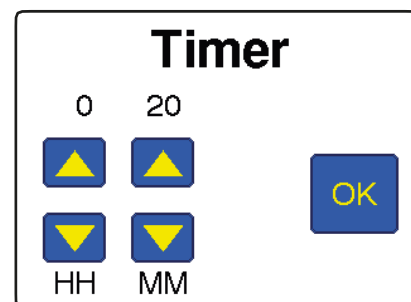
NOTES Once the agitator has been started, it will run until the timer reaches zero.



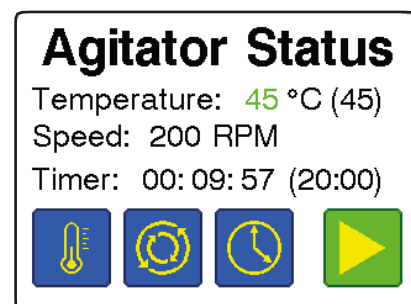
Step [2]: 'Set temperature' screen.




Step [6]: 'Set agitation' screen.




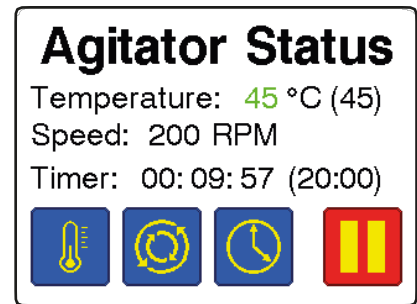
Step [9]: 'Set timer' screen.



Step [1]: Home screen prior to running.

[2] To stop the agitator at any time, press the  icon.

[3] Pressing  will resume the timer from this point, unless the time values have been modified.

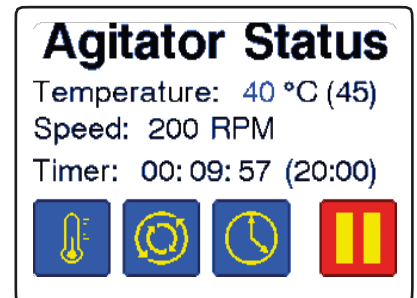


Step [2]: Home screen while running.

6.4. Temperature display

The agitator status display includes a colour-coded indicator of temperature, to show if the temperature is at the required set point:

- Below the set point, the value will display in blue.
- At the set point, the value will display in green.
- Above the set point, the value will display in red.




Home screen, showing temperature below the set point (blue).

6.5. Error states

The agitator has built-in safety functions. If a safety function becomes active, an error message will appear on screen.

NOTES Please make a note of the error message before switching the agitator off, because the message may be cleared when the agitator is powered-off. Contact technical support as detailed below.

NOTES If a heater fault is detected, the agitator will continue to agitate until the time has completed. Alternatively, the agitation can be stopped using the  icon.

7. Instrument cleaning

7.1. General points

WARNING Before cleaning the agitator, ensure that it is disconnected from the mains power.

CAUTION Incorrect cleaning/decontamination could result in damage to the instrument.

NOTES If unsure of the correct procedure, please consult your local agent or Markes International for information.

7.2. Cleaning the touchscreen

[1] Clean the touchscreen with a lint-free cloth/wipe.

NOTES For difficult marks, isopropanol (isopropyl alcohol, rubbing alcohol) can be used in moderation and only briefly.

[2] Before connecting the mains power, ensure that the instrument is completely dry.

7.3. Cleaning the cover

[1] Soak a sponge or towel in warm, soapy water (household detergent), and then wring it out until it is damp.

[2] Gently run the fabric over the cover of the agitator.

CAUTION Do not allow liquid to enter the cover, and do not submerge the base unit in liquid. The base unit houses the electronic motor and control system for the appliance, and exposure of these parts to moisture will cause instrument failure.

NOTES For difficult marks, a soft brush can be used.

[3] Before connecting the mains supply, ensure that the instrument is completely dry.

7.4. Cleaning the vial block

[1] Remove the vial block prior to cleaning, and clean away from the base unit.

[2] Soak a sponge or towel in warm, soapy water (mild household detergent), and then wring it out until it is damp.

[3] Gently run the fabric over the vial block.

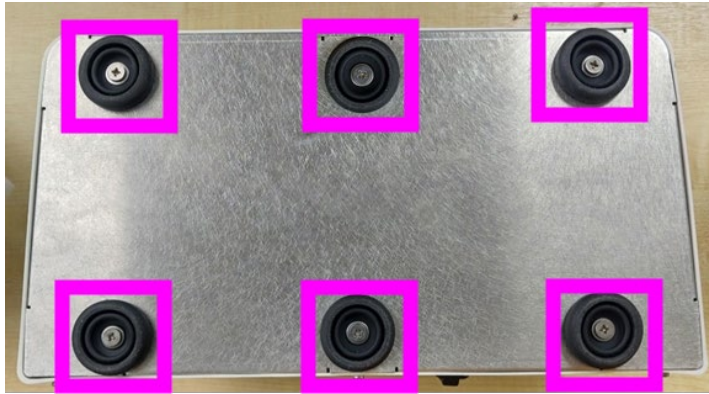
NOTES For difficult marks, a soft brush can be used on the cover, and a stiff brush can be used inside the sample vial holes. If necessary, moderate amounts of cleaning solution can be directly applied to the block.

[4] Before replacing the vial block on the base unit and connecting the mains supply, ensure that the vial block is completely dry.

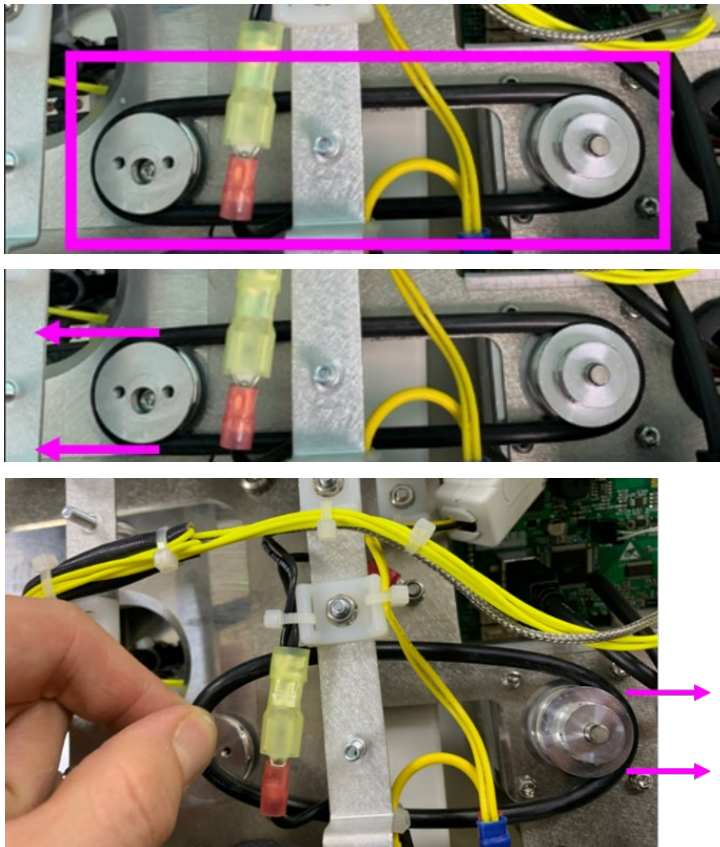
8. Preventative maintenance

8.1. Replacing the drive belt – Part number: SERZ-1240

- [1]** Turn the power off to the HiSorb agitator (back switch) located at the back of the device.
- [2]** Turn off the power pack from the mains outlet.
- [3]** Remove the power cable from the rear of the HiSorb agitator.
- [4]** Sit the HiSorb agitator upside down on a bench top.
- [5]** Remove the 6 feet from the base plate of the HiSorb agitator by unscrewing the M5 x 10 mm pozi pan screws.

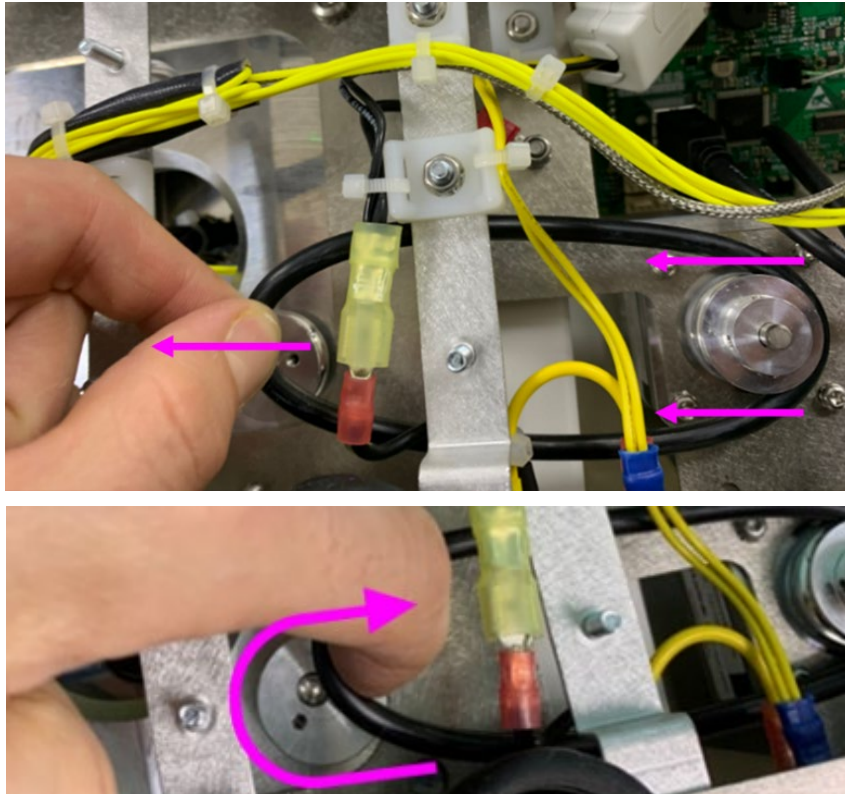


- [6]** Lift off the base plate to access the drive belt.
- [7]** Stretch the drive belt or remove the drive belt if broken from the HiSorb agitator.



- [8]** With the new belt, position over the right-hand side pulley so that it sits in the pulley guide.
- [9]** Without excessive twisting, slightly stretch the drive belt over the second pulley and seat in the pulley guide,

NOTES Position the belt under the wiring and frame whilst installing in steps 7-8.



- [10]** Once the drive belt is installed, inspect for any excessive twisting and adjust accordingly.
- [11]** Replace the base plate and secure with the fixing screws through the 6 feet.
- [12]** Turn the HiSorb agitator back to the usual position on the bench top.
- [13]** Insert power cable to the back of the HiSorb agitator.
- [14]** Turn the power on from the mains outlet.
- [15]** Turn on the HiSorb agitator device (back switch) located at the back of the HiSorb agitator.
- [16]** The HiSorb agitator is now ready for use.

9. Contact details

For technical support, please contact your supplier in the first instance. If they are unable to resolve your query, please contact Markes International's service department:

E: support@markes.com

T: +44 (0)1443 230935

W: www.markes.com

Please provide your serial number, which is located on the rear of the agitator.

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