



Soniprep 150 Plus

Ultrasonic Disintegrator

User Manual

Please read this before use



MSE (UK) LTD

Health and Safety at Work

MSE (UK) Ltd is required under the 1974 Health and Safety at Work Act and other UK legislation as designers, manufacturers, suppliers and exporters of articles for use at work to ensure that, as far as is reasonably practicable, articles which we design, produce, supply or import are safe and without risk to health.

We are required to provide information on the safety and handling precautions to be observed when installing, operating, maintaining and servicing our products. Such advice is contained in this manual.

We are also obliged to update this information should circumstances change and to operate a system to this end.

We should also like to point out, however that **you as users have an important responsibility in the provision and maintenance of safe working practices and conditions.**

Accordingly, we draw the following matters to your attention:

1. This apparatus should only be used as intended and within its design parameters by suitably qualified and trained personnel who have read and understood the relevant sections of this manual.
2. This manual should be readily available to such personnel at all times.
3. In addition to that which is written in the manual, normal common-sense safety precautions must be taken at all times to avoid the possibility of accidents. Particular care is required when working with apparatus at high temperature or pressure.
4. Installation, maintenance, repairs and servicing should only be carried out by an MSE (UK) Ltd approved engineer, and connection to electrical supplies should only be carried out by suitably trained personnel.

TECHNICAL SUPPORT, WARRANTY SERVICE AND MAINTENANCE

UK customers; if you are in any doubt whatsoever regarding the correct use of this apparatus, or if you require any technical data or assistance, please contact the MSE (UK) Ltd Technical Support Department at:

MSE Centrifuges Ltd

**11 Browning Road
Heathfield
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Telephone +44 1435 517 000

**E-mail: sales@msecentrifuges.com w
Website: www.msecentrifuges.com**

OVERSEAS CUSTOMERS: Should contact their local MSE (UK) Ltd distributor.

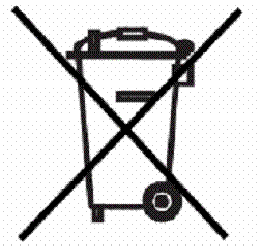
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When you would like to dispose of your equipment, please contact us on **+44 (0) 870 609 4097** to arrange a collection.



Read This Before Use!



THIS MACHINE HAS BEEN FITTED WITH A NEW THUMB TURN LOCK.

PLEASE OPERATE THIS MACHINE ONLY WHEN THE DOOR IS LOCKED AND THE LATCH IS FULLY ENGAGED

TO ENSURE THE DOOR IS FULLY LATCHED, TURN THE THUMB WHEEL FULLY CLOCKWISE TILL THE FLATS ON THE LOCK ARE SITTING HORIZONTALLY

THIS STOPS ANY SOUND WAVES FROM LEAVING THE SOUND PROOFED CHAMBER
PLEASE TURN THE SONIFICATION OFF BEFORE OPENING THE DOOR.

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EC DECLARATION OF CONFORMITY
According to ISO 17050-1, ISO/IEC 17050-2

Type of device: **Ultrasonic Disintegrator**
Product name: **Soniprep 150 Plus**
Model numbers: **SONIPREP-EXP-BUNDLE SONIPREP-9.5-BUNDLE**
SONIPREP-19-BUNDLE

EC guidelines and standards:

73/23/EEC, BS EN 61010-1, BS EN 61010-2-020

89/336/EEC, 92/31/EEC, 93/68/EEC, BS EN 61000-6-1, BS EN 61000-3-2, BS EN 61000-3-3, BS EN 55011

98/37/EG, BS EN ISO 12100-1, BS EN ISO 12100-2

Declaration

I declare as the authorised representative, the above information in relation to the supply/manufacture of this product is in conformity with the stated standards and other related documents following the provisions of EEC Directives.

Signature of authorised representative and date:

Dr B Sturgess

1st August 2018

Thank you for buying an **MSE Soniprep 150 Plus**. Please read this operating manual before using your Soniprep; it will provide you and your colleagues with useful information on all aspects of the equipment.

As our customer, we should like to ensure that you are totally satisfied at all times. Do not hesitate to contact our team.

Email - sales@msecentrifuges.com

Web - msecentrifuges.com/contactus

Your views are very important to us

MSE (UK) LTD PRODUCT WARRANTY **Terms and Conditions**

We hope that you do not have the need to use the extensive warranty cover that MSE (UK) Ltd extends to you. However should you have a problem, our prompt response is greatly helped if you have filled in and posted the pre-paid Warranty Registration Card supplied with your new equipment.

MSE Centrifuges Ltd gives a one-year warranty from the date of delivery. During this period, component parts proven to be defective in materials or workmanship will be repaired or replaced at our expense. Installation, commissioning and calibration are not covered by this warranty agreement. The MSE Centrifuges Ltd approved service agent must be contacted for warranty determination and direction prior to any work being carried out.

These warranties are only applicable to new products and not second hand nor refurbished products even if repaired by MSE Centrifuges Ltd. Any such products are covered by separate warranty terms and conditions which will be made available on request.

Replacement or repair of component parts or equipment under this warranty shall not extend the warranty to either the equipment or the component part beyond the original one year warranty period unless agreed in writing by MSE Centrifuges Ltd.

The above warranties are extended to the original purchaser upon full invoice payment. A purchase receipt or other proof of purchase may be required before warranty service will be performed. These warranties only cover failures due to defective workmanship which occur during the normal operation of the product by the original purchaser, and not failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, electrical power fluctuations, dust, or other environmental extremes, modification or service other than by an approved service agent or following the written authority of the manufacturer, or damage that is attributable to acts of God. Expendable items such as motor brushes, door seals, lid seals, 'O' rings or lamps are excluded.

MSE Centrifuges Ltd, or its approved service agent, reserves the right to repair defective equipment on the premises of the customer, or at a service station, at the sole discretion of MSE Centrifuges Ltd or their approved agent. In the event of return to an approved service centre the customer is responsible for the safe packaging of the instrument and notification to the service centre. Neither MSE Centrifuges Ltd nor its agents are responsible for any damage occurring during shipment.

Specification and Material Changes: MSE Centrifuges Ltd reserves the right to supply our latest and improved models at time of shipment.

Taxes: The prices quoted do not include any taxes imposed by the State or Country in which the purchase was made.

Installation: Installation of all equipment shall be at the expense of the purchaser unless stated otherwise. Access to the site, and the provision of required utilities e.g. power, water and drainage to suitable connections, will be the responsibility of the purchaser, and at the purchaser's expense.

Limitation of liability: In no event, whether as a result of breach of contract or warranty, shall MSE Centrifuges Ltd be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of the equipment or any associated equipment, down time costs, costs of substitute equipment, costs of labour, costs due to delays or claims of purchaser's own customers for such damages. The purchaser agrees to indemnify MSE Centrifuges Ltd and to hold them harmless from any and all liability, claims, demands, actions, suits, expenses or costs, including attorney's fees relating to such consequential or incidental damages.

All expressed and implied warranties, including the warranties of merchantable quality and fitness for a particular purpose are limited to the application period of one year.

Validity: Legal rights vary from country to country and states within countries, so some or all of the exclusions or limitations listed above may not apply, but if any part of these conditions shall be found to be unenforceable it shall not affect the validity or enforceability of the remainder of the conditions.

ELECTRICITY SUPPLY

Before connecting this apparatus to the electricity supply, check the information given on the apparatus rating plate and ensure that:

- A) Your supply is single phase AC (alternating current) of the stated frequency with the neutral nominally at earth potential.
- B) Your supply voltage is within the stated range.
- C) The current rating is within the capacity of your supply outlet.
- D) Your plug or electricity supply circuit is fitted with a suitable fuse.

Fuse Rating	220v-240v	110v-120v
	5 amp	See note 100V - 120V

WARNING! This apparatus must be earthed

Your Soniprep is supplied with an IEC mains lead that will be suitable for your local Electricity supply

NOTE: 100v-120v installations to comply with National and State Wiring Codes

IMPORTANT: Consult an electrician if in doubt or if your supply system has any of the following:

- No earth.
- Reversible plugs.
- Supply and return leads that are both above earth potential.

NOTE: Do not touch plug pins within two seconds of plug removal from socket.

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1. INTRODUCTION

The Soniprep 150 Plus Ultrasonic Disintegrator is a self-contained unit designed for convenient tabletop operation. It incorporates an acoustic cabinet, which reduces externally audible noise and ultrasound to a safe level. A transparent door allows observation of the sample during sonication. The apparatus is factory adjusted to the user's electrical supply voltage and frequency.

1.1 General Description

The generator is a solid-state transistor amplifier, which provides electrical energy, at an output frequency of 23 KHz, to a high efficiency piezo-electric transducer, which converts the electrical energy to mechanical energy. The transducer, mounted in the top of the disintegrator chamber, transmits ultrasound by high frequency vibrations via a titanium alloy probe. There is a choice of three probes, which screw into the transducer head and transmit energy of approximate amplitude for any specific application. Each probe is designed to operate at a nominal frequency of 23 KHz concentrating the resultant ultrasonic energy, as required.

Table 1 Probe Details

Description	Tip Diameter	Transformation Ratio
Large Probe Assy. (solid)	19mm(3/4')	3.8:1
Small Probe Assy. (solid)	9.5mm(3/8')	5.5:1
Exponential Microprobe	3mm(1/8')	7:1

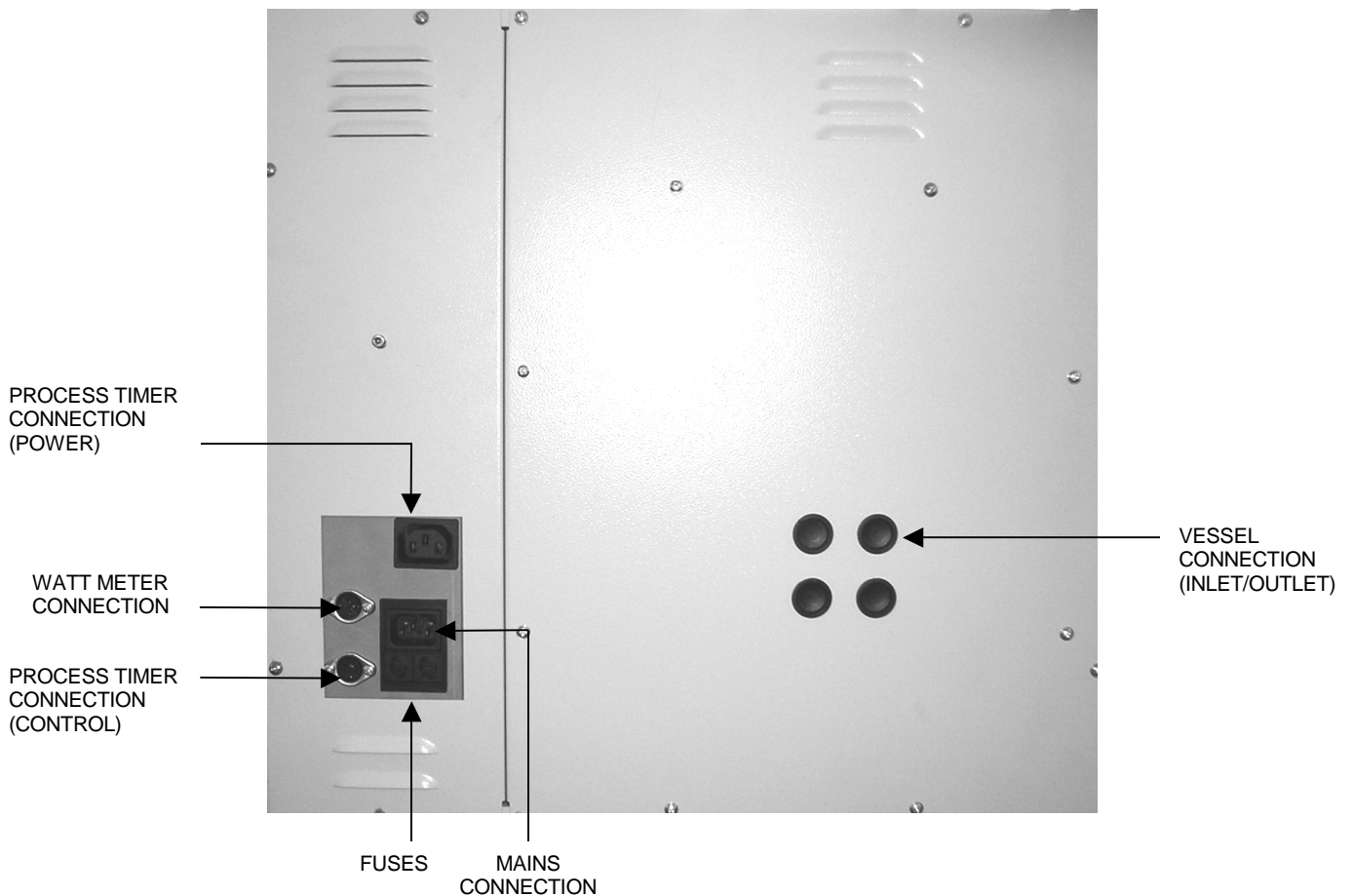
The disintegrator is designed to cope with different requirements and will ensure that there is the maximum possible acoustic energy at the tip for the probe. Once the output level has been selected it is continuously maintained by the automatic feed back from the transducer. A meter, calibrated in microns, allows the amplitude to be monitored continuously.

An adjustable table and a retort clamp are mounted on a rod within the chamber. The specimen to be treated is contained in a suitable tube clamped in position or in a vessel placed on the adjustable table.

Front



Rear



Control Panel Description

The control panel is situated on the right hand side of the unit. A brief description of their individual functions follows:

Amplitude Meter - The meter is calibrated in microns and monitors the probe amplitude, that is, the actual movement peak-to-peak that is taking place at the transducer/probe interface. Multiplying the meter indication by the transformation ratio of the particular probe in use (See Table 1) allows actual movement of the probe tip to be determined.

Power Control –The UP and DOWN arrows next to the Amplitude meter window are used to increase or decrease the amplitude level displayed on the amplitude meter. **(In order to set the amplitude level the green start button has to be pressed first)**

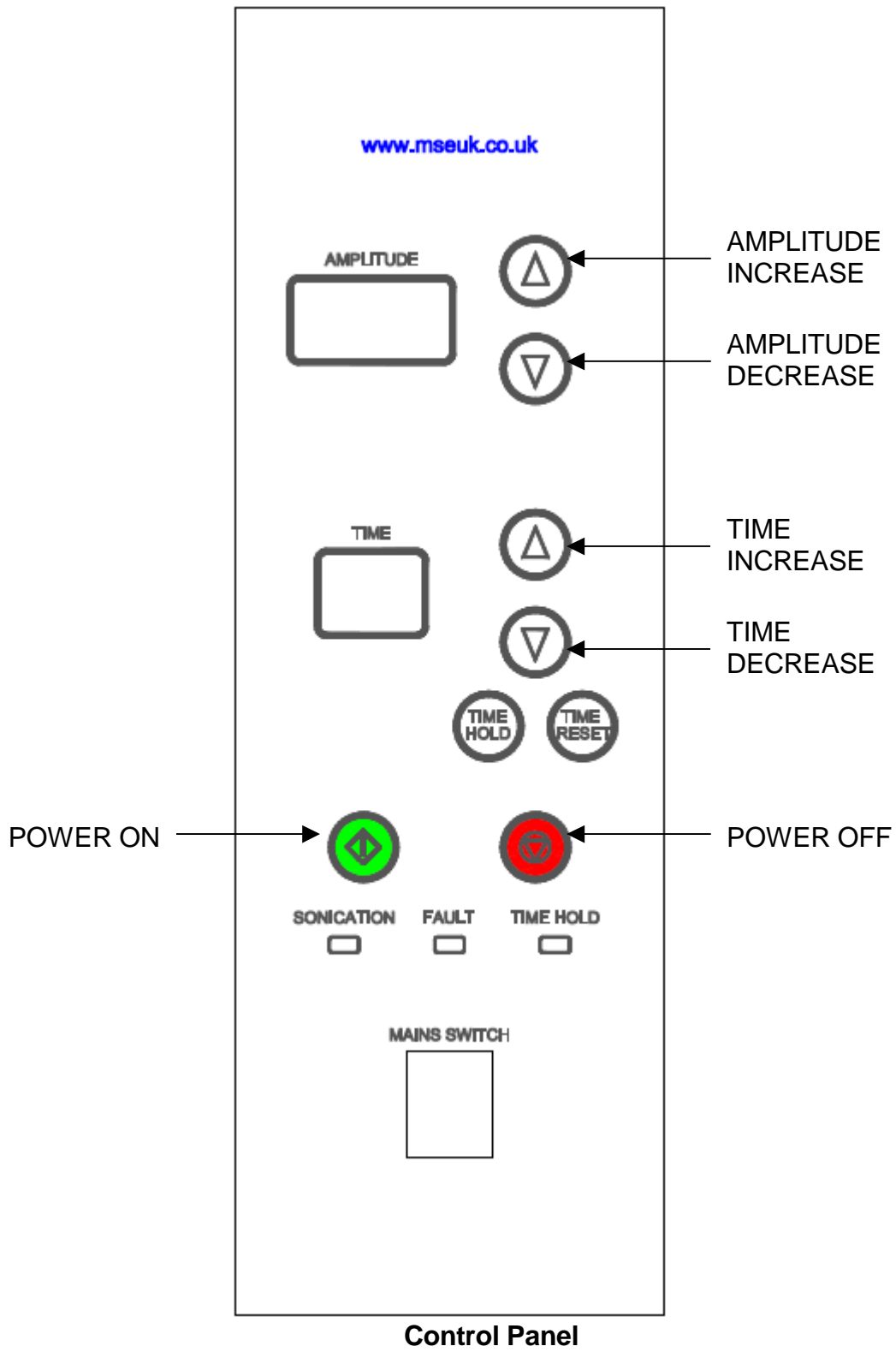
This control permits stepped selection of power output to the transducer, providing an accurate and reproducible amplitude setting for the particular probe in use.

Timer - This is a 99 minute timing unit which can be used for timed runs or in a continuous running mode. At the end of a timed run the Soniprep will turn itself off and the timer will reset itself to the last selected time. The timed run will start when the GREEN start button is pressed.

The timed run required is selected by the UP and DOWN arrows next to the TIME window. Set the time required and press START (green switch). The sonication lamp will be illuminated, ultra sonication will commence and the timer will start run-down to zero. When the time selected has expired, the unit will switch off automatically and the sonication lamp will go off.

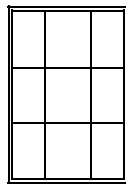
Time Hold Switch - When selected and the start (GREEN) button is pressed the unit will operate continuously and the minutes of operation will count up.

Sonication Lamp - When the lamp is illuminated, it indicates that the power is through to the transducer and therefore to the probe.



1.2 Power Supply and Fuses

When the equipment is first received, the **voltage selector switch** has been set by the manufacturer and is in the correct position to suit your local power supply.



Two anti-surge fuses are factory fitted in the holders located beneath the mains inlet connection socket.

Location of the Instrument and Electrical Connections

Place the Soniprep 150 Plus on a suitable table or bench and ensure that at the rear of the instrument is at least 50mm (2') away from the wall to allow adequate air circulation.

2. PROBES

2.1 Description and Function

The probe is a resonant element used for the transmission of vibrating mechanical energy from the transducer to the sample. The prime purpose of the probe is to increase the transducer amplitude to a usable level or, to select the acoustic power transfer. Ideally, material used for such probes should have good acoustic properties, high fatigue strength, low acoustic loss and density. It is essential that it should also be corrosion and erosion resistant and relatively inert to the materials being sonicated. The material that possesses all these qualities is titanium alloy and it is from this material that probes available for use with the disintegrator, are manufactured.

Note: Probes are specially designed to suit the Soniprep 150 Plus models and are tuned to 23 KHz.

2.2 Exponential Microprobe

This probe has been specifically designed for the treatment of small quantities of sample, up to 5ml. It should, preferably, be used with the 20ml tube and sealing cap but any other suitably sized tube may be employed.

2.3 Fitting a probe to the Transducer

Clean the mating surfaces of the probe and transducer with a soft cloth.

Before fitting the probe, screw the coupling stud into the transducer approximately 10mm leaving approximately 10mm protruding. Screw the probe onto the stud in the transducer head, by hand. Then tighten firmly using the tommy bar provided through hole in the probe. In the case of the exponential probe use the spanner provided.

It is important that the probe is clamped securely to the transducer, as failure to do so will result in a large power loss and an irritating high-pitched noise.

NOTE: The coupling stud is a relatively loose fit in both the transducer and the probe to ensure that the contact surfaces are allowed to mate perfectly. An extremely small smear of silicone grease on the probe head will facilitate surface mating.

2.4 Position of the probe in the liquid for treatment

When maximum power is necessary for a difficult application, the probe tip should be immersed into the solution to an optimum depth.

As a guide, for 50ml sample down to 10ml sample, the best position for the probe tip is 1cm below the surface of the sample. If the sample is less than 10ml, the best position for the probe tip should be found by trial and error.

Excessive depth and also the viscosity of the solution will cause the power to be damped, which will be evident by a lower indication on the amplitude meter. Conversely, if the probe tip is insufficiently below the surface, there will be a tendency to generate foam in the solution or to cause scattering of droplets out of the vessel. This is especially so when using high amplification. If the solution foams, there will be a distinct change in sound, i.e. virtually unloaded and little energy is being transferred to the solution.

Sometimes, when the solution is thoroughly aerated, the usual process noise from the beaker or test tube will stop, i.e. no buzz or vibration will be heard. Again, this is because there is little transfer of energy. When these conditions occur, turn the power off for a few seconds and set the probe deeper. Gradually increase the power and the solution will de-gas. The lower the power setting, the smaller will be the quantity that may be processed without foaming the solution. Do not allow the probe to come too close to, or make contact with, the sides or bottom of glass containers as powdered glass may be formed in the solution, or breakage may occur. Plastic tubes are more resistant to failure during sonication, but the insulation properties of plastic may make it difficult to keep the sample cool.

CAUTION

Please bear in mind that sonication can weaken glass tubes. It is therefore, advisable that glass tubes used in sonication are not subsequently centrifuged at high speed as failure of the tube may result.

2.5 Probe Maintenance

In use the probe will erode by the action of cavitation in the liquid. This dissolution of the metal from the tip of the probe, which occurs, with any metal during use at high sound intensities is, however, reduced to a minimum by the use of titanium. The erosion shows itself in concentric rings on the radiating face. An eroded surface transfers energy less efficiently into the liquid than a smooth one because of the formation of a zone of cavitation adjacent to the surface. Energy not transferred into the liquid medium will tend to heat the end of the probe. Furthermore, erosion continues at an accelerated rate on the probe tip surface, which is already pitted, thus reducing the useful life of the probe. For these reasons the tip of the probe should be polished smooth by means of a very fine emery cloth on a flat surface, **but note the following two cautions.**

CAUTION:

- a) Probes WEAR OUT, although probes may be polished / reground, the length of the probe must not be shortened by more than 2mm. **PROBES SHOULD BE REPLACED ANNUALLY OR AS REQUIRED.**
- b) The transducer/probe mating surfaces must not be cleaned with a non abrasive cleaner. Should the end require polishing, **ONLY A LIQUID NON ABRASIVE POLISH** should be used.

The Soniprep Plus has a red Fault light on the control panel that will come on when the probe is required to be changed

2.6 Testing Probe Performance

The following test should be carried out so that users may monitor the performance of each probe.

Measure the temperature rise obtained at maximum power after 5 minutes with the following volumes of chilled water (i.e. below 10°C).

Probe	Volume of Chilled Water
Exponential	15ml
9.5mm	50ml
19mm	100ml

A temperature rise of approximately 35°C should be obtained. If the rise is not obtainable, the probe or the transducer is at fault. To pinpoint the part of the system, which is faulty, repeat the test with an UNUSED probe. If you still do not obtain a temperature rise of approximately 35°C, then contact the service centre at the address inside the front cover.

The service centre will give you more advice.

3. PROCESSING SAMPLES

3.1 Vessels for Samples

NOTE:

Minimum Volume - Volumes of less than 1ml may be treated with the exponential microprobe. The sample should be held in a micro tube.

Maximum Volume - A maximum of 100ml may be treated at any one time. However, larger volumes may be processed by using the treatment vessels. It is preferable to use a narrow vessel rather than a wide one. Twice the volume in a narrow vessel takes a shorter time to process than the same volume in a wider vessel. Twice the volume or concentration takes twice as long to process. Materials that are particularly resistant to ultrasonic energy, however, should be processed in the smallest area practicable. Since the energy radiates from the probe tip in the shape of a cone, the more confined the sample under the tip the better the results. A narrow, relatively short test tube is also called for when processing small quantities, say of the order of 4ml. The probe tip should displace as much liquid as possible to force a long liquid height or 'head' above the vibrating tip. This prevents foaming or whipping the solution out of the test tube. A wide beaker is not normally suitable.

There is considerable evidence that the shape of the container has great influence on the rate of release of soluble protein or the efficiency of the cellular breakage. This is probably more the function of mixing than anything else, since the individual components are not directly exposed to the action of the probe tip for more than a second or two. If the volume is very large, then individual cells are not in the area of cavitation activity for a sufficient period of time. The probe tip should be below the surface of the liquid by approximately 13mm (1/2') and should not be too far from the bottom of the vessel (again approximately 13mm). If the tip is not satisfactorily immersed, a considerable quantity of air may be trapped in the solution thus dissipating the power delivered and not allowing it to be transmitted to the solution. As there is sufficient force generated by the Soniprep 150 Plus to fracture or shatter glass, the probe tip must not be allowed to come in contact with, or come close to, the bottom of the vessel.

3.2 Basic Processing

Test tubes of 20ml and 100ml nominal capacity are available for certain applications. In addition to these, cooled treatment vessels are available for use when it is important that the media being treated should be subjected to minimal temperature rise.

A range of rubber sealing caps are available for all tubes and cooled treatment vessels. The probe is inserted through the sealing cap which fits over the mouth of the vessel, or tube, and provides an air tight seal.

For ease of manipulation and to effect the best possible seal, the edge of the hole in the sealing cap should be lightly smeared with silicone grease. When using sealing caps, ensure the tube is securely clamped to prevent downward movement of the tube and consequent disengagement from the probe.

When fitting sealing caps, the air pressure which may have built up can be released by lifting the edge of the cap slightly. The caps are manufactured from a material which is suitable for autoclaving.

When treating samples in any of the test tubes the temperature of the suspension will rise, especially if the quantities of the material being treated are small. To avoid this temperature rise, immerse the tube containing the medium in a beaker containing crushed ice or a suitable cooling mixture. The beaker can be placed on the adjustable platform and the vessel containing medium held in the laboratory clamp. However, if the medium being treated is particularly sensitive to temperature, then one of the cooled treatment vessels described in sections 3.3, 3.3 and 3.4 should be used.

3.3 Batch Treatment Vessel

This consists of an inner chamber to contain up to 50ml of sample to be treated, surrounded by a cooling jacket through which a suitable cooling liquid (e.g. iced water or alcohol) can be circulated.

3.4 Continuous Flow Vessel

This is available for the treatment of even larger volumes where the required disintegration time is relatively short. This vessel has both inlet and outlet tubes to the inner chamber which allows the sample to be passed continuously through at a measured flow rate as disintegration takes place.

Apertures are provided in the back of the ultrasonic cabinet so that the liquid feed-lines can be passed through to the treatment vessels and permit sonication with the cabinet door closed.

4. OPERATING INSTRUCTIONS

- Misuses include:**
- a) Impeding air flow.
 - b) Incorrect positioning of the probes with respect to the transducer (see section 2.4).
 - c) Lack of probe maintenance (see section 2.5).
 - d) Probe in liquid (foaming)

4.1 Manual Control

- a) Plug the 3 pin plug into the power outlet. Switch the green supply rocker switch to its 'ON' position (its inner LED will illuminate).
- b) Open the door, place the vessel containing the sample to be treated on the Table or if a test tube, clamp in position and set up for sonication as required. **Close the door.**
- c) Press the **Time Hold** switch, the GREEN sonication lamp will illuminate and sonication can commence once amplification is set and the Start button is pressed.
- d) If not set, then select amplitude level required.
- e) After sonication is complete, switch the supply rocker switch to its 'OFF' position.

4.2 Timer Control

- a) Carry out instructions in section 4.1 a) and b).
- b) Set time, 1 to 10 minutes, by pressing the UP or DOWN arrows. Immediately the Start button is pressed the green sonication lamp will light up, and after the time selected on the timer has run out, sonication will cease and the green lamp will go off.

4.3 Optional Process Timer Unit (230V units only)

- a) Place the Process timer Unit on top of the Soniprep.
- b) Connect the two cables from the process timer - one terminating in a three-pin plug (power) and the other terminating in a five-pin plug (control) - to the corresponding sockets on the rear of the Soniprep.

4.4 Operating Instructions

- a) Set up the desired operating conditions on the digital switches of the process timer unit.

Ensure the Soniprep power is ON and that the amplitude is set as required.

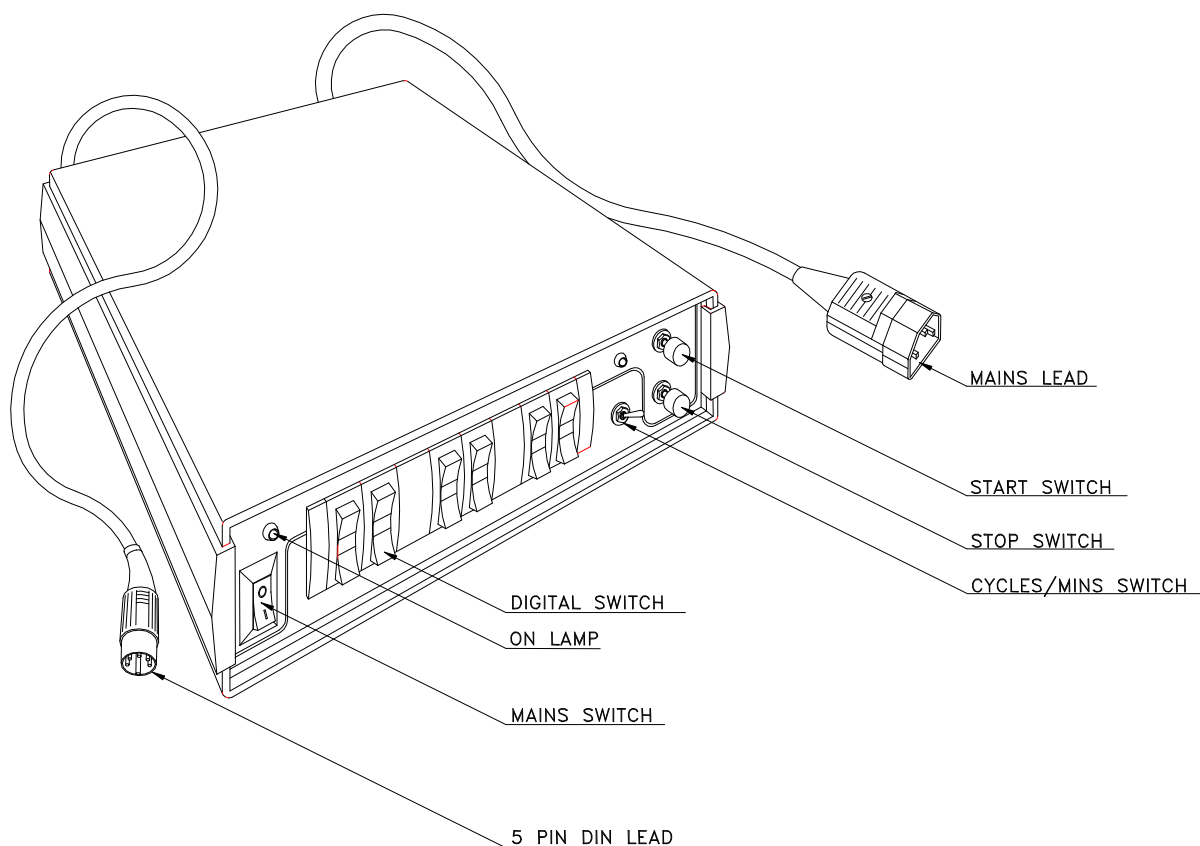
- c) Switch on the process timer mains switch. The green mains lamp will illuminate.
- d) Press the start switch push-button on the process timer unit.

The Soniprep will now operate under the control of the process timer unit. If it is required to stop the process during sonication, press the stop button on the process timer unit. Sonication will cease and the timer will reset for the next cycle.

USE THE CONTROL SWITCHES ON THE PROCESS TIMER ONLY WHILST THE PROCESS TIMER IS PLUGGED INTO THE SONIPREP

APART FROM TURNING THE SONIPREP ON AT THE MAINS AND SETTING UP THE AMPLITUDE, THE PROCESS TIMER SHOULD BE USED TO CONTROL THE SONIPREP ONLY.

(Please do not open the door whilst using the Process Timer because in this mode the door interlock switch is not in circuit.)



Process Timer

THE WATTAGE METER (Part Number 46222-5020)

The wattage meter can be plugged into the back of the Soniprep to the 3 pin din socket in order to see the power being dissipated into the sample. The display on the meter shows the watts of power that the sample is receiving. The display will show small up and down movements as the amplitude does vary slightly depending on the peak or the trough of the sign wave.

Use a damp cloth for cleaning outside.

If internal chamber etc. requires disinfecting the following fluids may be used:

TERMINEX 2 (Available from Arrow Chemicals Ltd)

VIRKON (Available from Antec International)

These cleaning agents if used as instructed by the manufacturer should not be harmful to this product, or accessories supplied for use with this product.

5. FAULT FINDING

5.1 General

Faults occurring during use can usually be traced to the titanium probe as this is subject to high mechanical stresses. Possible faults are loss of effectiveness in operation, a high-pitched screeching from the transducer unit and also a wavering indication on the amplitude meter. The amplitude meter can be used to monitor performance. Any fault condition will show as a loss of amplitude.

5.2 Fault conditions could be:

- a) Probe insufficiently tightened.
- b) Probe/Transducer faces not clean.
- c) Probe too short.
- d) Probe fatigued.
- e) Transducer fault.

5.3 Loose Probe

A change in the pitch of the noise from the transducer (usually accompanied by an indication on the amplitude meter) is a sure sign that the probe has worked loose. Uncouple the probe from the transducer and clean both surfaces with a soft cloth. Re-couple the probe to the transducer.

5.4 Fatigued Probe or Coupling Stud

Similar symptoms will be evident if the probe is fatigued, although this fault would be detected at an earlier stage as there would have been difficulty in obtaining satisfactory amplitude. However, to check that the fault is actually in the probe, remove it and the coupling stud from the transducer and test the probe's performance as described in section 2.6. If the probe is faulty, fit a new one.

Again, symptoms common to a loose, or fatigued, probe may indicate a fatigued stud. If necessary, renew it.

7.5 If your Soniprep has the door lock with a built in microswitch, **ensure that the door lock is fully turned in a clockwise direction.** If the door lock is not fully turned, it will not engage with the microswitch and your Soniprep will not operate.

6. SPECIFICATIONS

6.1 Specification for Soniprep

	MSS150.CX3.5	MSS150.CX3.1
HEIGHT (mm)	450	450
WIDTH (mm)	470	470
DEPTH (mm)	258	258
WEIGHT (Kg)	18.7	18.7
PROBE FREQUENCY (KHz)	23	23
VOLTAGE (volts)	220/240	120
MAINS FREQUENCY (Hz)	50/60	60
FUSES (anti-surge)	2amp	4amp
MAX. NOISE LEVEL (dB) WITH DOOR CLOSED	68	68
MAX. NOISE LEVEL (dB) WITH DOOR OPEN	86	86

6.2 Specification for Process Timer

	46222.5019
HEIGHT (mm)	73
WIDTH (mm)	255
DEPTH (mm)	228
WEIGHT (Kg)	1.2
VOLTAGE (volts)	230
MAINS FREQUENCY (Hz)	50
FUSES (anti-surge)	F250 μ A

7. OPTIONAL ACCESSORIES FOR THE SONIPREP 150 PLUS

PART NUMBER	DESCRIPTION
46222-5019	Process Timer Unit
38121-114A	Exponential Microprobe, end diameter 3mm
38121-1154	Solid Probe, end diameter 9.5mm
38121-1169	Solid Probe, end diameter 19mm
48535-1011	Batch Treatment Vessel
46222-5020	Wattage meter
48533-1016	Continuous Flow Vessel
34411-8163	20ml Heat Resisting Test Tube
34411-8222	50ml Heat Resisting Test Tube
34411-8237	100ml Heat Resisting Test Tube
34431-4168	Rubber Sealing Cap for 20ml and 50ml tubes for use with probe 38121-115
34431-8136	Rubber Sealing Cap for 20ml and 50ml tubes for use with probe 38121-116
34431-4094	Rubber Sealing Cap for 20ml and 50ml tubes for use with exponential probe 38121-114
34431-4115	Rubber Sealing Cap for all cooled treatment vessels or 100ml tube - probe 38121-114
34431-4187	Rubber Sealing Cap for all cooled treatment vessels or 100ml tube - probe 38121-116
34431-4172	Rubber Sealing Cap for all cooled treatment vessels or 100ml tube - probe 38121-115

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MICROCENTAUR R

Refrigerated Micro Centrifuge

Maximum speed	18000 rpm
Maximum RCF	24270 xg
Maximum Volume	24 x 2/1.5ml

HARRIER

General Purpose Centrifuge

Ambient and Refrigerated

Swing Out / Fixed Angle / Microplate

Maximum speed	18000 rpm
Maximum RCF	30065 xg
Maximum Volume	4 x 250ml



Distributor



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