MP Biomedicals, LLC

FastPrep-24 5G Instruction Manual (v2.2)

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SECTION I: INTRODUCTION

A. General Description

The FastPrep-24 5G (FP5G) Instrument is a high-speed, benchtop reciprocating instrument for the optimal lysis of challenging and routine sample types. It is intended for use in applications that require grinding, lysing or homogenization of various solid sample materials. Sample types include but are not limited to the following: human, animal and plant tissues; bacterial, yeast and fungi cells teath, bones; and soil, fecal samples as well as mineral or building material.

The FastPrep-24 5G is a software controlled, standalone instrument, designed with a user-friendly touch screen interface as well as unique features such as an increased speed and a strobe light to indicate adapter rotation. The FastPrep-24 5G comes standard with the QuickPrep-3 adapter, which allows for the simultaneous processing of 24 samples in 2 mL tubes; additional adapters are available for different size tubes.

Samples are placed into tubes along with a specific, optimized lysing matrix, which are subsequently placed into the appropriate adapter within the instrument. The FastPrep-24 5G will partially rotate the adapter, and therefore the tubes, in a unique manner, resulting in a multidirectional, simultaneous beating of the lysing matrix on the sample material. The beating action will result in a mechanical lysing of the cellular membrane, allowing for the extraction of the target material (i.e., DNA, RNA, or protein) into the solution. The speed and time of the agitation, in addition to the adapter used, will vary based on specific needs, and individual parameters can be programmed using the FastPrep-24 5G touch screen.

The touch screen visual display allows for user-friendly control of the instrument. The FastPrep-24 5G, while programmed with predefined assays designed for the optimal lysis of routinely run sample types, also allows for the programming and saving of custom assays.

A front and back view of the FastPrep-24 5G Instrument, along with each of the major components, is illustrated in ***Figure I-1*** and ***Figure I-2*** respectively.

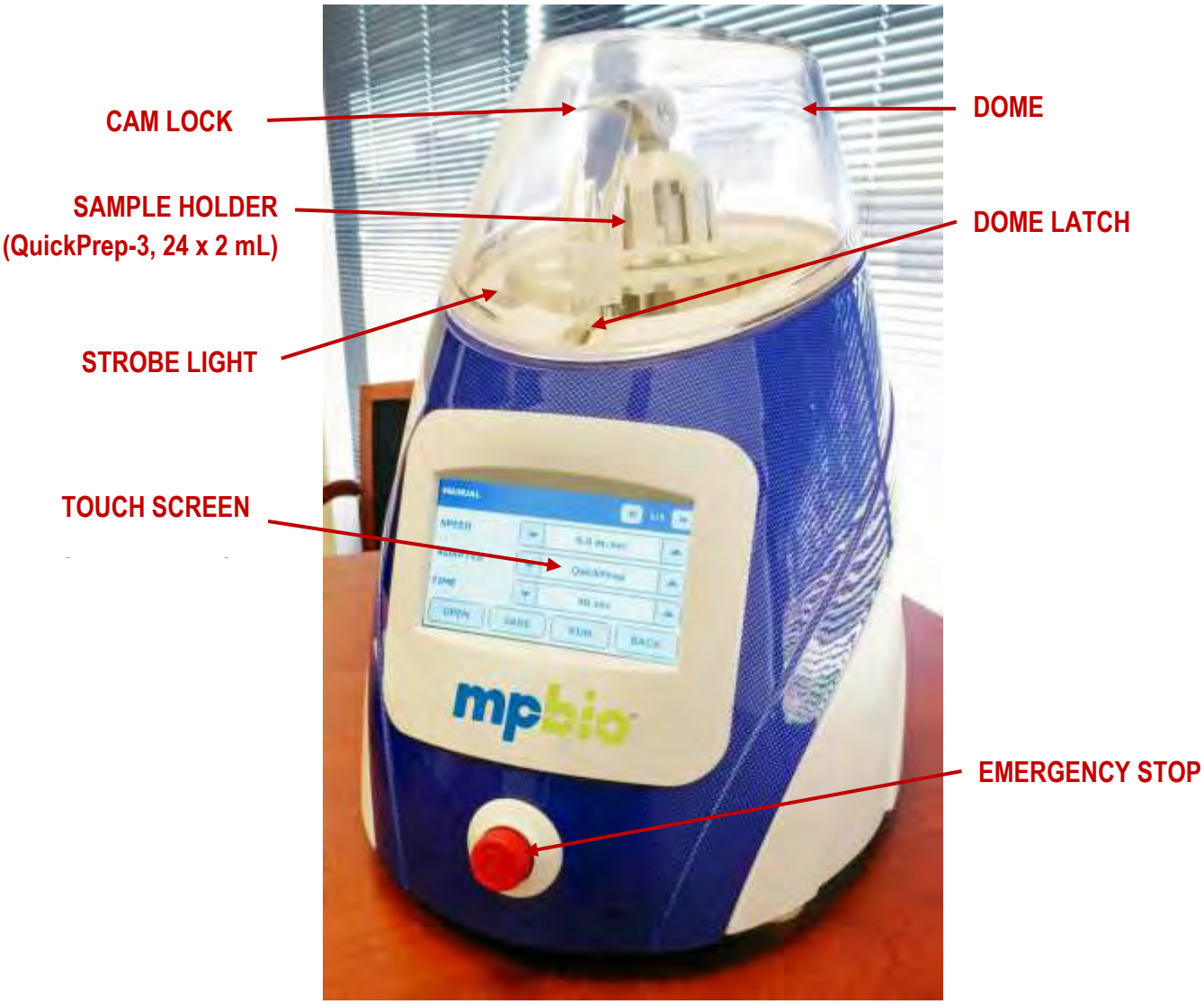


Figure I-1: Major Components of the FastPrep-24 5G (Front View)

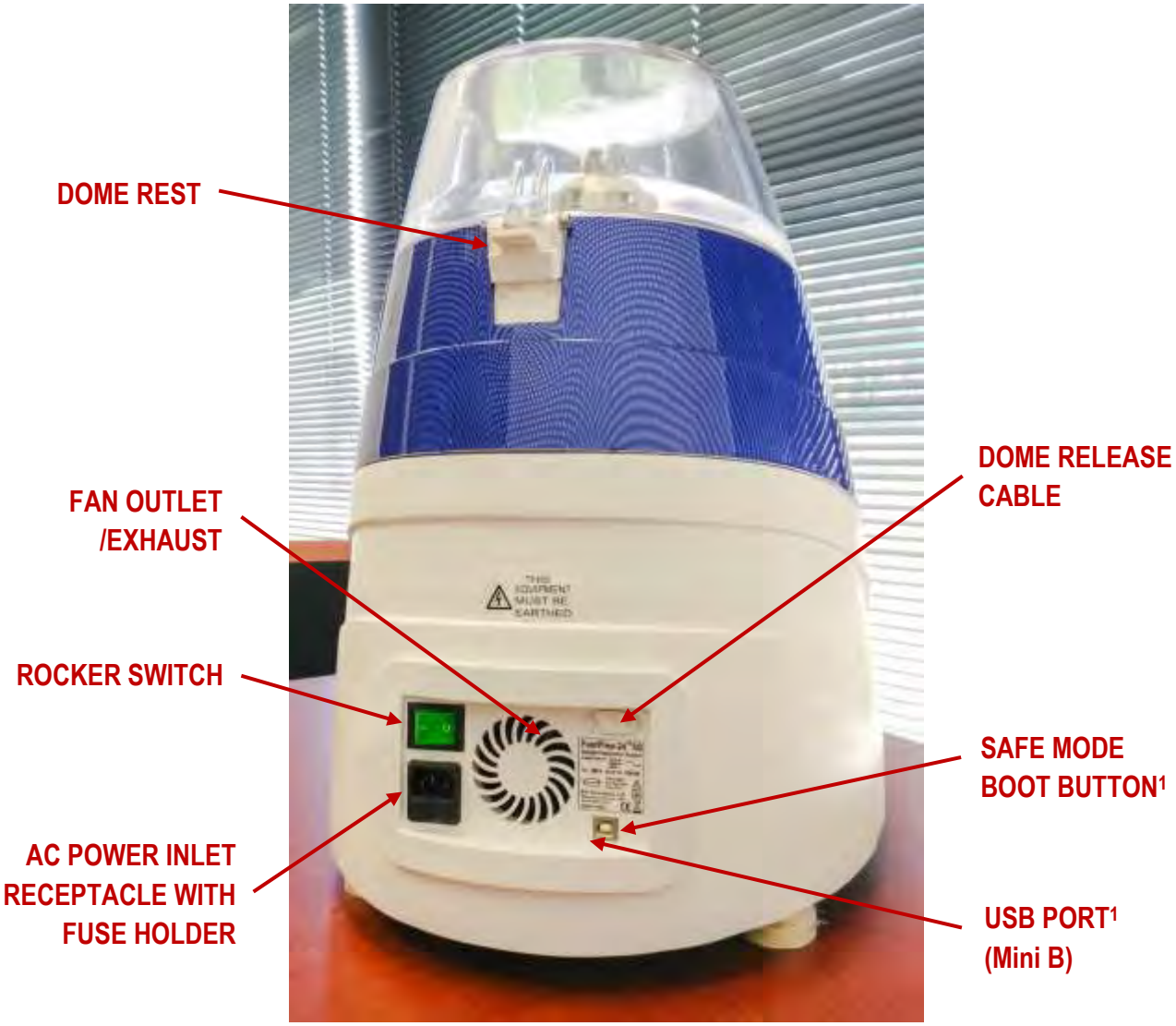


Figure I-2: Major Components of the FastPrep-24 5G (Back Panel View)

[1] Required for software update

B. Principle of Operation

The FastPrep-24 5G is a high-speed, benchtop instrument intended for use in a sample preparation application where it is necessary to grind, lyse, or homogenize difficult and routine samples, including but not limited to, biological tissues, fluids and excretions; cell cultures; environmental samples; and other inorganic solid matrices.

The FastPrep-24 5G causes cellular disruption in samples by facilitating the collision of the sample with a sample specific lysing matrix, resulting in the mechanical disruption of the cellular membrane and release of the target analyte into the surrounding protective buffer. The FastPrep-24 5Gis designed to maximize the quality and quantity of the yield through efficient cellular disruption, and the effective removal of inhibitors and removal or inhibition of nucleases and proteases.

The FastPrep-24 5G facilitates efficient and effective cellular lysis using Lysing Matrix tubes and a reciprocating motion. Individual samples are placed into individual tubes along with the appropriate lysing matrix; the tubes are sealed and disposable, minimizing the potential for contamination. The tubes are placed directly into the samples holder or adapter housed within the instrument, which produces a reciprocating motion that results in the collision of the sample with the lysing matrix. The rate of collision and energy of impact, critical factors in cellular disruption efficiency, are a function of the FastPrep-24 5G instrument speed setting and the specific gravity of the lysing matrix. The rate of collision is proportional to the speed, while the energy of impact is proportional to the square of the speed. The FastPrep-24 5G offers variable speed and time settings for optimal cellular disruption from a wide variety of sample types.

C. FastPrep-24 5G Features

The FastPrep-24 5Goffers a variety of optional, interchangeable sample holders to hold tubes of various sizes, allowing for versatility in processing volumes as well as lysis under cryogenic conditions. The FastPrep-24 5G comes standard with the QuickPrep-3 adapter, allowing for a maximum load of 24, 2 mL samples, processed at ambient temperatures. Additional sample holders available, as well as the maximum load and volume for each, are indicated below. Detailed information on each adapter can be found in **Appendix 5.**

FastPrep-24 5G Sample Holders

Description	Catalog No.	Sample Load	Sample Volume (mL)	Weight Empty (g)	Weight Filled (g)
QuickPrep-3	6005512	24 x 2 mL	2	175	264
BigPrep	6002525	2 x 50 mL	50	570	749
TeenPrep	6002526	12 x 15 mL	15	506	806
HiPrep	6002527	48 x 2 mL	2	467	643
CoolPrep (Cryogenic)	6002528	24 x 2 mL	2	680	768
CoolTeenPrep (Cryogenic)	6002530	6 x 15 mL	15	627	757
CoolBigPrep (Cryogenic)	6002531	2 x 50 mL	50	700	815
TallPrep	6002540	24 x 4.5 mL	4.5	417	596
All-Metal QuickPrep	6002545	24 x 2 mL	2	307	396
All-Metal TeenPrep	6002546	12 x 15 mL	15	840	1140
All-Metal BigPrep	6002547	2 x 50 mL	50	500	684

DAMAGE TO INSTRUMENT
Use of sample holders other than those listed in this operations manual may damage the FastPrep-24 5G

D. FastPrep-24 5G Specifications

The FastPrep-24 5G has the following specifications:

FastPrep-5G Instrument Specifications	
Item	**Specification**
Product Name:	FastPrep-24 5G
Model:	6005
Software:	Microcontroller: ARM Processor Memory: 64 MB App Version (Touch Screen): 1.3.2 Firmware Version (Driver): 1.3.7.2 Programming: Field Alterable Flash, 12 End-User Programmable Assays
Interface:	Touch Screen Interface Screen Size: 151.5 mm x 85.5 mm
Controls:	Programmable Settings for Speed, Adapter, Time, Lysing Matrix, Sample Quantity, Sample Units, Cycle, Pause Time; Display Readout
Programmable Assays:	12 Programmable Assay Locations
Pre-Defined Assays:	73 Pre-defined and Optimized Assay Programs
Time Range:	1 to 120 Seconds in 1 Second Increments (Default: 40 Seconds)
Speed Range:	4 to 10 m/sec in 0.5 m/sec Increments; (Default: 6 m/sec for QuickPrep-3 Adapter)
Cycles:	1 to 9 Cycles (Default: 1 Cycle)
Adapter(s):	Standard QuickPrep-3, 24 x 2 mL Sample Holder; Additional Sample Holders Available
Pause Time:	1 to 300 Second Pause Between Cycle in 1 Second Increments (Default: 300 Seconds)
Lysing Matrix:	Lysing Matrix A through Z, Plus Others
Quantity:	Free Entry
E-Stop:	Switch Push DPST-NC (10A, 110V)

FastPrep-5G Instrument Specifications	
Date / Time Set:	Available as 24-Hour Clock
Data Export:	Via USB
Acceleration:	< 2 seconds to maximum speed
Deceleration:	< 2 second to stop
Dimensions:	Height: 490 mm Base: 472 mm x 385 mm (Elliptic Shape)
Weight:	23.6 kg (52 lb)
Power Requirement:	120 VAC / 60 Hz, 6 A 230 VAC / 50 Hz, 3 A
Protecting Fuse:	T4A 205V, 5x30 mm
Operating Air Temperature:	2 to 48 °C (35 to 118 °F)
Operating Relative Humidity:	30 to 55%
Overvoltage Category:	II
Maximum Sound Level:	< 70 dB
Maximum Altitude:	2000 m (6562 feet)

SECTION II: SAFETY

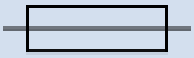
A. Regulatory

The FastPrep-24 5G is CE marked and complies with the essential requirements of the applicable European laws or Directives with respect to safety, health, environment and consumer protection.

B. Safety

The FastPrep-24 5G is designed for safe operation. However, for your safety and the safety of others, the FastPrep-24 5G should be operated as specified in this Operations Manual. Failure to do so could result in injury to yourself or others, or in damage to the instrument. There are various symbols on the FastPrep-24 5G unit relating to safety, which are indicated in the table below.

Safety Symbols used with the FastPrep-24 5G

Symbol	Description
	Alternating Current
	Resistor
	Electrical Equipment, Dispose Properly
	Caution, Warning
	Power On
	Power Off
	Earth Terminal Ground

C. Environmental Conditions

The FastPrep-24 5G is designed to be safe under the following environmental conditions:

FastPrep-24 5G Operating Specifications	
Environmental Condition	**Specification**
Location:	Indoor use only
Maximum altitude:	2000 m
Maximum sound level:	70 dB
Overvoltage Category:	II
Temperature:	2 to 48 °C (35-118°F)
Humidity:	< 95% RH
Ventilation	≥ 5 cm around instrument
Voltage	110 VAC/60 Hz or 230 VAC/50H Hz

D. Biological Safety

The FastPrep-24 5G may be used with samples that contain materials of human origin. All blood or other potentially infectious materials should be considered infectious regardless of the perceived status of the source individual. Observe Standard Precautions when working with potentially infectious materials. Ensure all materials are disposed of in accordance with applicable regulations.

DANGER

Some samples used with the FastPrep-24 5G may contain materials of human origin. Observe Standard Precautions when working with potentially infectious materials.

SECTION III: INSTALLATION

A. Unpacking

MP Biomedicals will ship the FastPrep-24 5G directly to your location. Inspect the exterior shipping crate for damage upon arrival, and notify MP Biomedicals immediately in case of damage.

The FastPrep-24 5G shipping box has been labeled to indicate the following:

	**PRECISION INSTRUMENT** Handle instrument with care.
	Keep package upright.

Store the FastPrep-24 5G shipping crate upright in a secure location until ready to install. For installation purposes, the FastPrep-24 5G shipping crate is oriented as indicated on the box.

HEAVY OBJECT

The FastPrep-24 5G should be lifted with both hands firmly under the base of the instrument, using the finger-locator cut-outs provided.

The FastPrep-24 5G must be transported in its original packaging. Use of packaging other than the original packaging may damage the instrument and/or void the product warranty.

1) To unpack the FastPrep-24 5G:

1. Open top flaps of shipping container.
2. Remove the smaller pieces of protective foam and air-bag stuffing from inside the box. The FastPrep-24 5G will be packaged within two large foam pieces.
3. Firmly grip each piece of foam, one with each hand, and lift foam and instrument vertically from the box. The foam pieces are designed to slide easily out of the box while cradling the instrument safely. Alternatively, lay the box on its side and grip the foam pieces and slide the instrument out.
4. Place the foam and instrument combination on a sturdy table or bench top.
5. Remove each piece of foam from around the instrument, freeing the instrument.
6. Place all packaging materials back into the box and store for future use.

NOTE: Alternately, the FastPrep-24 outer container may be placed horizontally on a bench top or floor for foam and instrument removal.

2) Inspection

The items listed in the "Packing List" below are included with the FastPrep-24 5G as provided by MP Biomedicals, LLC. Please contact MP Biomedicals, LLC., if an item is not received as listed.

FastPrep-24 5G Packing List

Part Description	Quantity
FastPrep-24 5G	1 ea
Power cord (European)	1 ea
Power cord (US)	1 ea
USB Cable	1 ea

Replacement Spring/Screw Assembly	2 ea
Replacement Cam Lock	1 ea
Fuse 10 Amp	2 ea
Strike Bolt	2 ea
Replacement QuickPrep-3Sample Holder	1 ea
FastPrep-24 5G Operations Manual	1 ea

3) Additional Materials Required:

The FastPrep-24 5G, when shipped to the end user facility, contains all necessary materials for immediate instrument use following proper installation, as well as some backup materials such as fuses. However, during the lifetime of the product, items such as fuses may require replacement more often than the backups provided allow for. Therefore, the following additional materials may be required but not provided. Use of the FastPrep-24 5G with parts other than those specified by the manufacturer may impact performance.

- 5 x 20 mm Miniature Fuse, Time-Lag T, L, 250 VAC

The FastPrep-24 5G contains the different components as indicated in ***Figure I-1***and ***Figure I-2*****(Section I).**Inspect the FastPrep-24 5G unit for damage that may have been caused by shipping. In the event of damage or questions, please contact MP Biomedicals, LLC.

B. Installation

The FastPrep-24 5G should be installed in an indoor location only, within an operating environment that meets all specifications as indicated. The FastPrep-24 5Gshould be placed on a clean, dry, stable surface within 1.2 m of an electrical outlet, and in a location that allows for a minimum of 5 cm space around the instrument base at all times to ensure proper ventilation.

1. Place the FastPrep-24 5G on a sturdy table or bench top.
2. Position the FastPrep-24 5G in its final installation position, ensuring easy access to the power cord and receptacle.
3. Disengage the 'Emergency Stop' by turning clockwise until it pops out. (**Device is shipped with 'Emergency Stop' engaged for safety and will not run until disengaged**.) ***(Figure III-1)***
4. To open the 'Dome', press ANY of the four options on the FastPrep-24 5G 'Home Screen'***(Figure V-1)*** and press [OPEN]. Alternatively, pull the 'Dome Release Cable' on back plate of device to release the 'Dome Latch' ***(Figure III-2).*** Raise the 'Dome' gently until it reaches the rest position. For more on 'Dome' operation see 'Dome' Operation.
5. Remove any remaining foam from the chamber assembly.
6. Gently lower the 'Dome' to a closed position. Engage the 'Dome Latch' by pressing downward on the 'Dome' until the latch mechanism clicks.

Figure III-1: Disengage 'Emergency Stop'

Figure III-2: 'Manual Dome Release Cable'

1) Connecting the Power

The power cord connects to the back of the FastPrep-24 5G as seen in ***Figure III-3.***The FastPrep-24 5G can operate on either 100-120 VAC/60 Hz or 220-240 VAC/50 Hz power. Ensure that the main 'Rocker Switch' in the back of the instrument is in the OFF position. Connect the power cord to the instrument power fixture (below 'Rocker Switch') and then connect the other end to a compatible power supply outlet**.**

Figure III-3: Power Cord Connection

To ensure a secure connection, the FastPrep-24 5G should be located no more than 1.2 m from an appropriate electrical outlet.

NOTE: Ensure the 'Rocker Switch' (**O/ I**), located on the rear panel, is in the OFF **[O]** position prior to connecting the power supply.

IMPORTANT

For safe use, ensure that the FastPrep-24 5G is properly grounded by connecting the power cord to an approved electrical outlet.

2) Set-up, Controls and Functions

IMPORTANT

To ensure safe operation and optimal performance of the FastPrep-24 5G instrument, read this Operations Manual before operating the instrument**.**

The FastPrep-24 5G instrument comes fully assembled and requires very little set-up once installed. Set-up of the FastPrep-24 5G, and control of the instrument during operation, is accomplished through the use of a 'Touch Screen' based central control panel as indicated in ***Figure III-4.***

Figure III-4: FastPrep-24 5G Touch Screen Control Panel

Users interface with the FastPrep-24 5G using a 'Touch Screen', which contains the different menu functions. The main menu functions of the FastPrep-24 5G are indicated below.

FastPrep-24 5G Touch Screen Main Menu Functions

Item Name	*Operation*	Function
Display screen	*Display*	Displays menus and programmed settings; counts down run times
Recommended Programs	*Press*	Allows user to access pre-defined program by sample type (i.e., plants, bacteria, environmental, human/animal, yeast & fungi, and feces)
Saved Programs	*Press*	Allows user to access saved custom programs
Program Manually	*Press*	Allows user to program custom parameters (i.e., speed, adapter, time, lysing matrix, quantity and unit, cycles and pause time)
Admin Tools	*Press*	Allows user to access administrative functions such as date/time set, export data, options, etc.

The FastPrep-24 5G has custom programmable settings as indicated:

Variable Speed and Time Settings

Item	Range	Increment
Speed	4.0 to 10.0[1]m/s	0.5 m/s
Adapter	All FastPrep-24 Adapters	See adapter list **(Appendix 5)**
Time	0 to 120[2]sec	1 sec
Lysing Matrix	All MP Lysing Matrix Types	See Appendix 1
Quantity	Free entry	NA
Quantity Unit	mg, g, mL, cells	NA
Cycles	1 to 9	1
Pause Time	0 to 300 sec	1 sec

[1]**NOTE:** Speed settings higher than 6.5 m/s are available only for the QuickPrep adapters. All other optional adapters are limited to a maximum speed of 6.5 m/s.

[2]**IMPORTANT**

While the FastPrep-24 5G is capable of run times up to 120 seconds, ***it is highly recommended that any run time over 60 seconds be monitored very closely!*** Some Lysing Matrix combinations can generate significant heat after 60 seconds at high speeds and tube failure is possible.

3) Installation Verification

Prior to using the FastPrep-24 5G for the first time, an installation verification should be performed. To verify installation:

1. Load and secure the QuickPrep-3 'Sample Holder' as described in **Section IV, OPERATION.**
2. Run the FastPrep-24 5G at 6 m/sec rpm for 60 seconds (Information on programming the FastPrep-24 may be found in **Section V, SOFTWARE**). Listen for loud noises, grinding or whining noises.

IMPORTANT

If loud noises, grinding or whining noises can be heard with the FastPrep-24 5G, immediately engage the '**EMERGENCY STOP BUTTON'.** Contact MP Biomedicals, LLC.

3. If the 6 m/sec run is acceptable, run the FastPrep-24 5G at 8 m/sec for 60 seconds. Listen for loud noises, grinding or whining noises.
4. If the 8 m/sec run is acceptable, run the FastPrep-24 5G at 10 m/sec for 60 seconds. Listen for loud noises, grinding or whining noises.
5. Turn instrument off when not in use by using the 'Rocker Switch' located on the back panel.

NOTE: See Section V for Administrative Functions such as setting [DATE/TIME], Optional Settings, and End-User Agreement and Registration of your new FastPrep-24 5G Instrument.

SECTION IV: OPERATION

A. Powering up the FastPrep-24 5G

Turn on the FastPrep-24 5G by switching the 'Rocker Switch' to the **[ON]** position ***(Figure I-2)***. The FastPrep-24 5G 'Touch Screen' will light up, and the instrument will display 2 splash screens of MP Biomedicals information, followed by the FastPrep-24 5G'Home Screen' ***(Figure V-1)***.

NOTE: Ensure that the 'Emergency Stop Button' has been pulled all the way out. The unit will not start if the 'Emergency Stop Button' is engaged ***(Figure III-1)***.

IMPORTANT
The samples and 'Sample Holder' must be secured properly before the instrument is operated. Failure to secure either could result in personal injury or damage to the instrument.

B. 'Dome' Operation

The safety 'Dome' is opened and closed by an electromechanical latch assembly, which is operated via the 'Touch Screen' user interface.

1. To open the 'Dome', press any of the four options on the FastPrep-24 5G 'Home Screen'.
2. Press [OPEN]. The mechanism will activate and release the 'Dome Latch'.
3. Carefully lift the 'Dome' and slowly rotate backwards on its hinge until it contacts the 'Dome Rest'.
4. To close the 'Dome', carefully lower the 'Dome' back into the closed position and press firmly downward at the 'Dome Latch' until the 'Dome Latch' automatically engages.

NOTE: The [OPEN] button is available on all programming screens, but is not available on some Admin screens or when a run is in progress.

NOTE: An assay may be programmed but cannot be initiated with the 'Dome' open.

NOTE: In the event of power loss, or to open the 'Dome' manually, pull the 'Dome Release Cable' on the back panel of the device ***(Figure III-2).***

C. Loading and Securing the Samples, NEW Cam Lock Installation

The FastPrep-24 5G comes standard with a QuickPrep-3'Sample Holder'. The maximum sample load for a FastPrep-24 5G, using the QuickPrep-3'Sample Holder', is 24 each 2 mL tubes. Alternative 'Sample Holders' will have different sample load specifications; information on the alternative 'Sample Holders' available is provided in **Appendix 5** and information on the Lysing Matrices used with each 'Sample Holder' can be found in **Appendix 1**. For optimal performance, MP Biomedicals recommends the use of FastPrep® Purification Kits and Lysing Matrix with the FastPrep-24 5G instrument.

IMPORTANT
ALL 'Sample Holders' must be properly balanced for safe operation.

Samples are added to the lysing tubes as appropriate, with precautions taken when working with potentially infectious or hazardous substances. For convenience, MP Biomedicals offers many different Lysing Matrices for both challenging and routine sample types.

IMPORTANT
Use Standard Precautions when handling potentially infectious samples.

NOTE: ***It is strongly recommended that only Lysing Matrix Tubes from MP Bio be used with the FastPrep-24 5G instrument***. While tubes from other suppliers may be compatible, MP Bio Lysing Matrix Tubes are designed with optimal dimensions and strength. Improper tube dimensions may result in lower lysing efficiency, increased chance of tube failure, and potential damage to 'Sample Holders.'

Once the samples are prepared, the samples are loaded onto the QuickPrep-3Sample Holder. The QuickPrep-3 Sample Holder is then loaded onto the FastPrep-24 5G as follows:

1. At the FastPrep-24 5G'Home Screen' ***(Figure V-1)***, press any of the 4 options.
2. Press the [OPEN] button to release the 'Dome Latch'.
3. Lift the 'Dome' and allow to rest in the open position.
4. Loosen the 'Cam Lock' by lifting handle upward and around the 'Handle Pivot', until the 'Cam Lock' is in the unlocked position ***(Figure IV-1.1)***. This requires moderate force and it may be necessary to steady the 'Sample Holder' with free hand. ***(Figure IV-1)***.
5. Rotate the 'Cam Lock', in the unlocked position, counter-clockwise to loosen until the threads disengage.

CAM LOCK IN 'LOCKED' POSITION

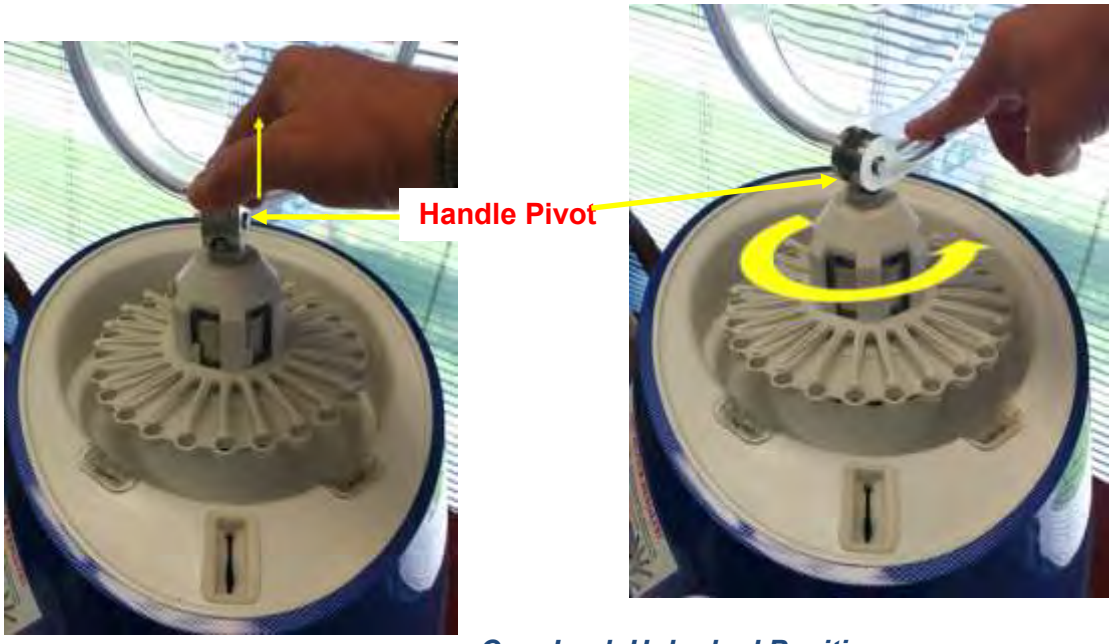
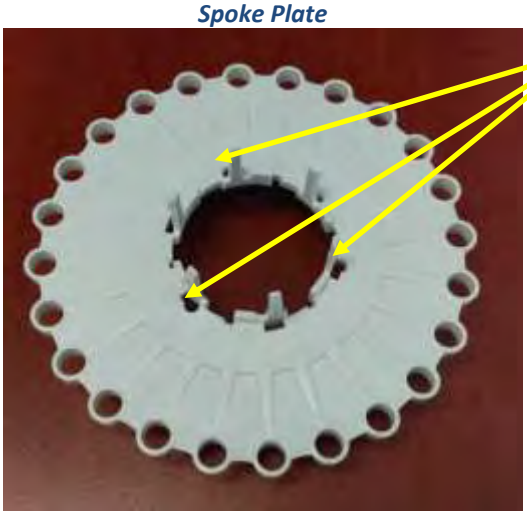


Figure IV-1: QuickPrep-3 and Cam Lock Removal

6. Remove the 'Cam Lock' from device.
7. Remove the 'Sample Holder' assembly ***(Figure IV-2)***.

Figure IV-1.1: Cam Lock, Locked and Unlocked

Spoke Plate



Tube Deck

Assembled, Unlocked Position

Figure IV-2: QuickPrep-3 Assembly Components

8. Lift the 'Spoke Plate' slightly and rotate clockwise so that the retention spokes move away from the holes on the 'Tube Deck', leaving them open for loading ***(Figure IV-3)***.

Figure IV-3: QuickPrep-3 Sample Loading Position

9. Load the sample tubes into the holes of the 'Tube Deck', and press so that they seat snugly and the 'Tube Base-Ring' contacts the 'Tube Deck' surface ***(Figure IV-3.1)***. For less than full loads, tubes must be balanced symmetrically.

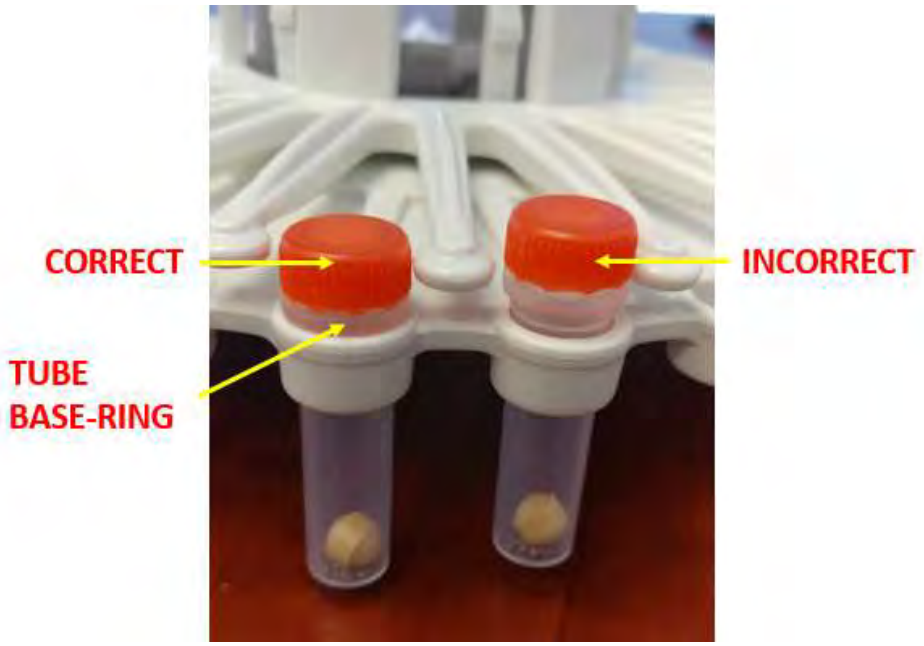


Figure IV-3.1: Tube Loading

10. Lift the 'Spoke Plate' slightly again, and rotate it counter-clockwise so that the retention spokes are placed directly above each sample tube cap ***(Figure IV-4)***.

Figure IV-4: Spoke Plate Placement

11. When all the sample tubes have been loaded, place the 'Sample Holder' back into the FastPrep-24 5G. Align the locking pin of the 'Aluminum Three Step' with an alignment hole under the 'Sample Holder', ensuring its proper placement ***(Figure IV-5).*** ***Rotate the 'Sample Holder' on the '3-Step' until the locking pin engages, no more than ⅓ turn, and the adapter will drop down on the pin ~5 mm (Figure IV-6).***

WARNING

Failure to properly position and secure the 'Sample Holder' within the FastPrep-24 5G may cause damage to the 'Sample Holder' and/or the instrument.

NOTE: Refer to ***(Figure IV-2)*** and ***(Figure IV-5)*** for views of 'Alignment Holes' 'Three Step Assembly' and 'Locking Pin.'

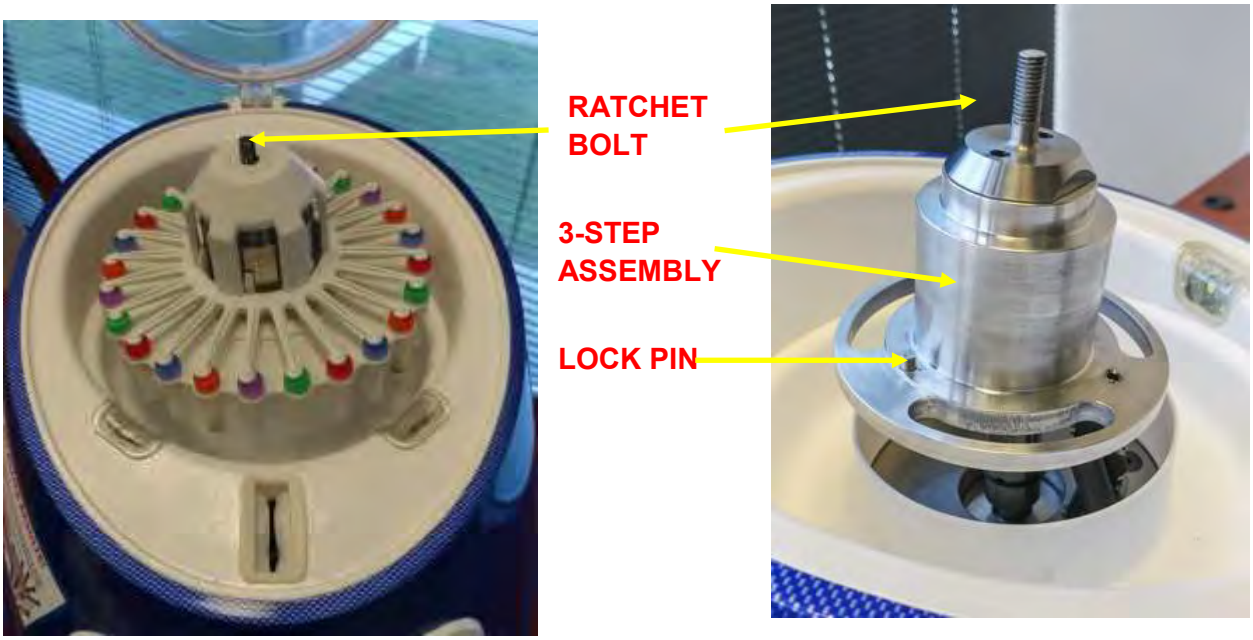


Figure IV-5: Sample Holder Placement

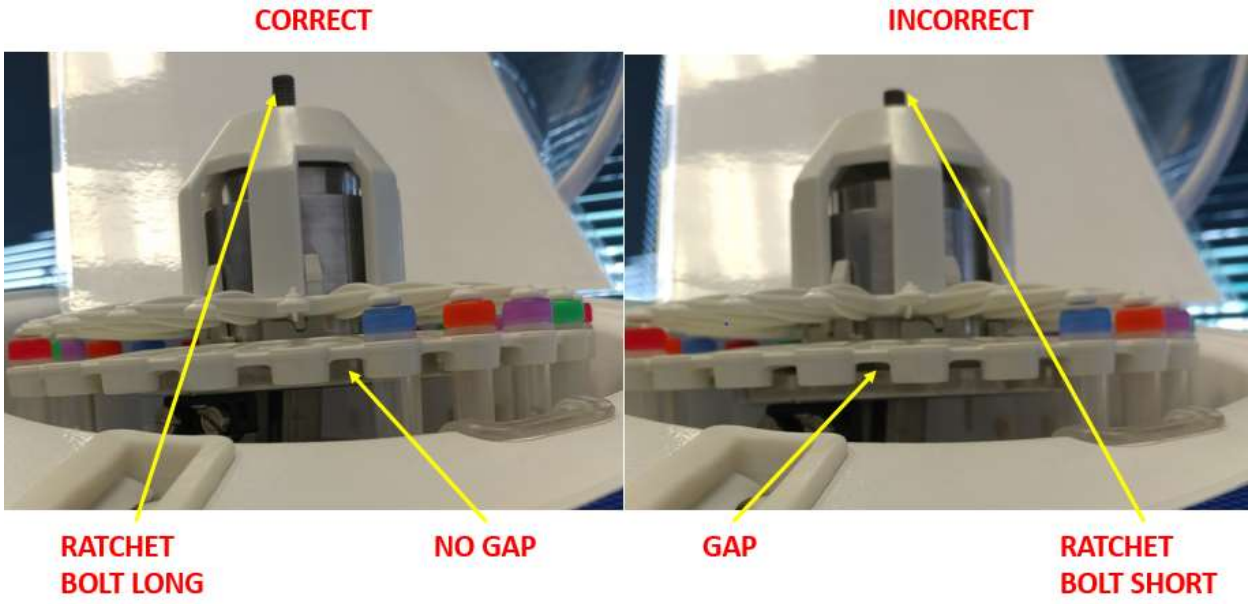


Figure IV-6: Rotate Sample Holder until Seated

12. Place the 'Cam Lock' in the locked position onto the threaded 'Ratchet Bolt' and turn clockwise to engage and seat threads ***(Figure IV-7)***.

Figure IV-7: Thread Cam Lock on Ratchet Bolt

13. Rotate ‘Cam Lock” clockwise to tighten. There should be no resistance and rotation should be done using one finger ***(Figure IV-8)***.

Figure IV-8: Rotate Cam Lock Clockwise

14. After ~ 3 complete clockwise revolutions, the 'Cam Lock' base will contact the 'Sample Holder' and resistance will be felt. Stop tightening at this point.

15. Lift the 'Cam Lock' handle straight up and around the 'Handle Pivot' to achieve the unlocked position. ***(Figure IV-9)*** **Make sure that the 'Cam Lock' DOES NOT ROTATE around the 'Ratchet Bolt'** while unlocking.

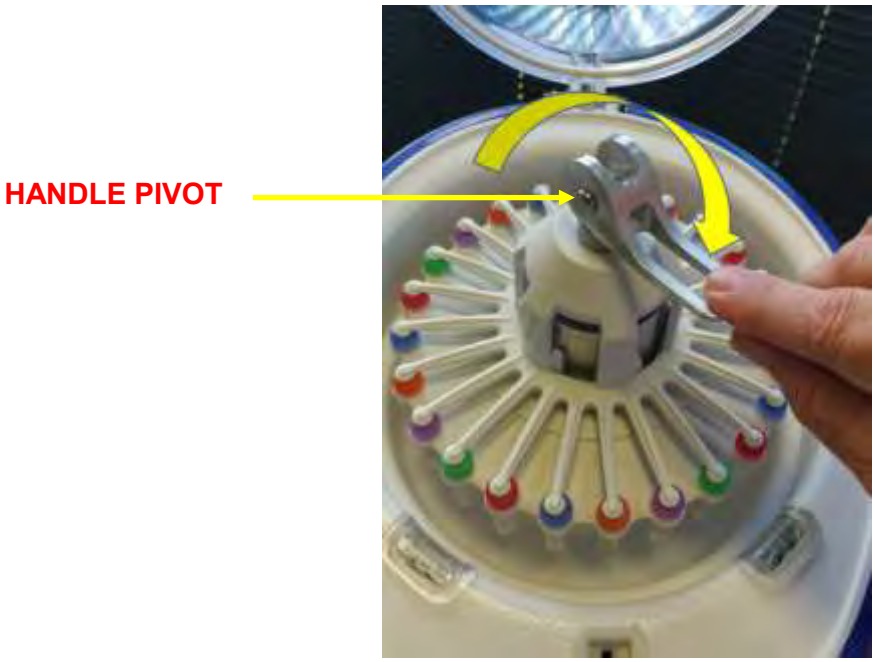


Figure IV-9: Unlock Cam Lock, 180 Degrees about Pivot

16. Rotate the unlocked 'Cam Lock' ~ 180 degrees (~ ½ turn) clockwise around the 'Ratchet Bolt' **(Figure IV-10)** The degrees rotation may vary slightly and should be verified and adjusted if necessary, See Step #17.

Figure IV-10: Rotate Unlocked Cam Lock 180 Degrees

17. Keep the 'Cam Lock' in the same position with respect to the 'Ratchet Bolt' and lift the handle upwards and around the 'Handle Pivot' to lock. Use free hand to steady the 'Sample Holder.' ***(Figure IV-11)*** As the handle is lifted, no resistance will be felt at first. **Resistance will be felt when the handle reaches vertical, or slightly past vertical. If resistance is felt before vertical, loosen the 'Cam Lock' slightly by turning a few degrees counterclockwise about the 'Ratchet Bolt.'** **Never turn 'Cam Lock' on 'Ratchet Bolt' in the locked position with resistance. Always unlock it before adjustments are made**.

WARNING

Tightening or loosening the 'Cam Lock' on the 'Ratchet Bolt' in the Locked Position with Resistance (Pressure) may cause damage to the 'Cam Lock' and/or the instrument.

NOTE: It is recommended to steady the 'Sample Holder' with your free hand to allow a stronger grip to lock the 'Cam Lock' as well as to ensure no rotation around the 'Ratchet Bolt' occurs. See ***(Figure IV-11)*** and ***(Figure IV-12)***.

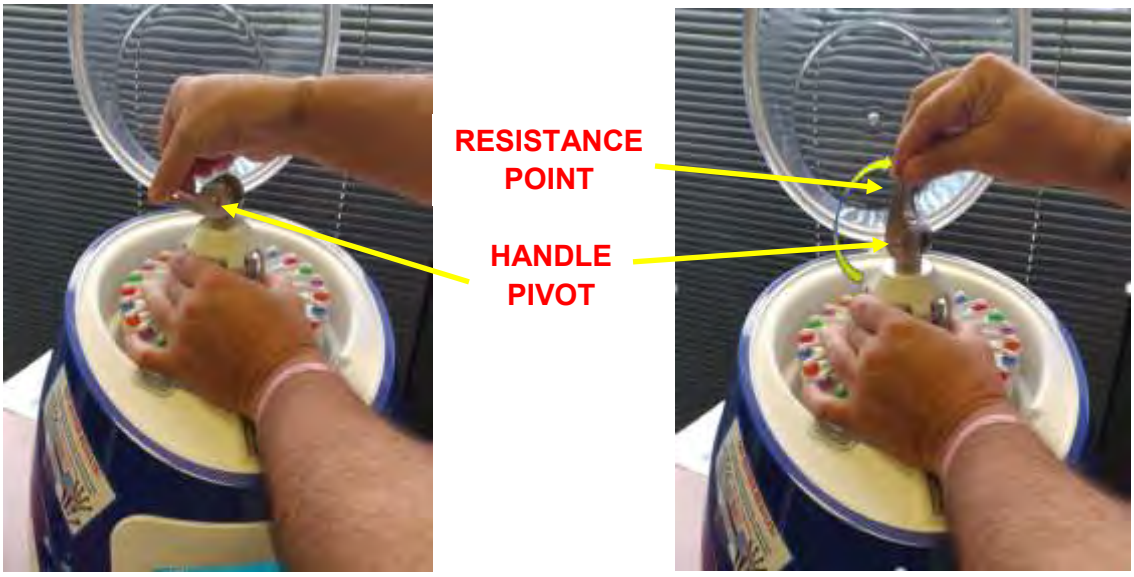


Figure IV-11: Lift Handle Around Pivot

18. Continue to pull the handle over the 'Handle Pivot' and press it downward, with force, until it stops. ***(Figure IV-12)*** It may be necessary to re-grip the handle.

Figure IV-12: Press Handle Down Until Stop

19. "Cam Lock' is now fully locked. ***(Figure IV-13)*** Tubes and 'Sample Holder' are properly positioned and secure.

Figure IV-13: Cam Lock Fully Locked

20. Close the 'Dome' and press down firmly until the 'Dome Latch' engages.

NOTE: The FastPrep-24 5G 'Dome' contains an electromechanical lock mechanism. The 'Dome Latch' must be engaged for the instrument to operate.

WARNING

When first installing the 'Cam Lock' system, carefully observe the instrument motion once the assay is started. If properly installed, 'Cam Lock' will remain fixed in place while the motor runs. If any movement of the 'Cam Lock' is observed (loosening, counterclockwise rotation) immediately engage the **(EMERGENCY STOP BUTTON)** and repeat the 'Cam Lock' installation procedure. Failure to stop the motor could result in personal injury or damage to the instrument

21. Once sample processing is complete, to remove 'Sample Holder' from instrument, first unlock 'Cam Lock' by lifting handle upward and around the

handle pivot ***(Figure IV-14)***, until the 'Cam Lock' is in the unlocked position ***(Figure IV-15)***. This requires moderate force. Steady the 'Sample Holder' with free hand for better grip and to eliminate any rotation around 'Ratchet Bolt.'

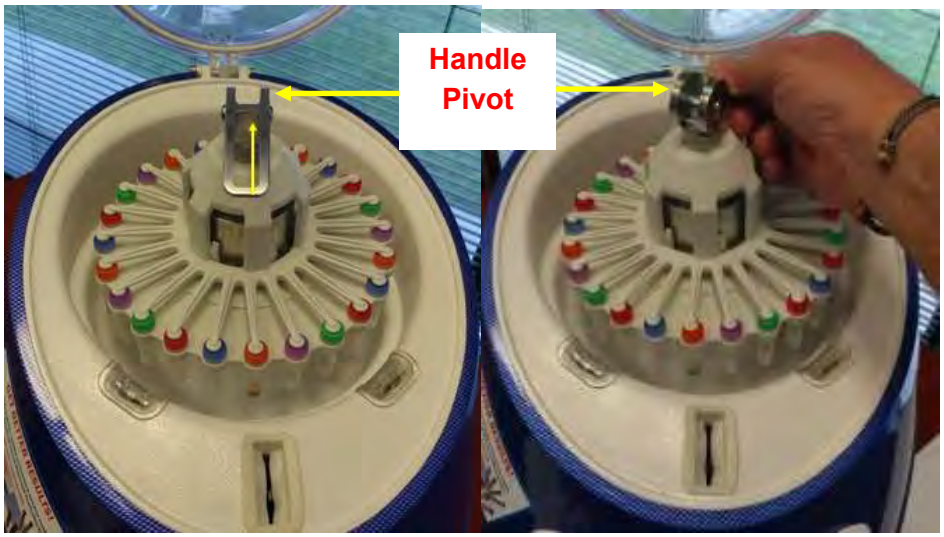


Figure IV-14: Lift Cam Handle Upwards Figure IV-15 Cam Handle Unlocked

22. Rotate the 'Cam Lock', in the unlocked position, counter-clockwise to loosen until the threads disengage ***(Figure IV-16)***. Remove 'Cam Lock' from device ***(Figure IV-5)***.

Figure IV-16 Unscrew Unlocked Cam Lock

23. ‘Sample Holder’ can now be removed from device.

D. Operating the FastPrep-24 5G

The FastPrep-24 5G is primarily operated using the FastPrep-24 5G custom software, accessed through the ‘Touch Screen’ interface. For details on the FastPrep-24 5G software operation, refer to **Section V: SOFTWARE.**

IMPORTANT

The samples and ‘Sample Holder’ must be secured properly before the instrument is operated. Failure to do so could result in personal injury or damage to the instrument.

1) ‘Emergency Stop Button’ Operation

The red ‘Emergency Stop Button’ ***(Figure IV-17),*** located directly below the ‘Touch Screen’ is a safety feature and can be used at any time. Engaging the ‘Emergency Stop Button will immediately cut all power directed to the FastPrep-24 5G instrument.

1. To engage the ‘Emergency Stop Button’, press the button firmly until it clicks. This will cut all power to the FastPrep-24 5G.
2. To restore power, firmly rotate the ‘Emergency Stop Button’ clockwise until it releases.

Figure IV-17: 'Emergency Stop Button'

IMPORTANT

Any unsaved programs will be lost when the ‘Emergency Stop Button’ is engaged.

NOTE: The FastPrep-24 5G will not power up while the ‘Emergency Stop Button’ is engaged.

SECTION V: SOFTWARE

A. FastPrep-24 5G 'Touch Screen' Software Operation

1) Running a Recommended Program Assay:

NOTE: It is recommended to allow a five (5) minute rest period between consecutive runs.

1. From the FastPrep-24 5G 'Home Screen', select [RECOMMENDED PROGRAMS] ***(Figure V-1)***. A list of Recommended Programs has been included in **Appendix 4**.

Figure V-1: FastPrep-24 5G Home Screen

2. Press the appropriate category for the sample type (i.e., plants, bacteria, environmental, human/animal, yeast & fungi, or feces) ***(Figure V-2)***.

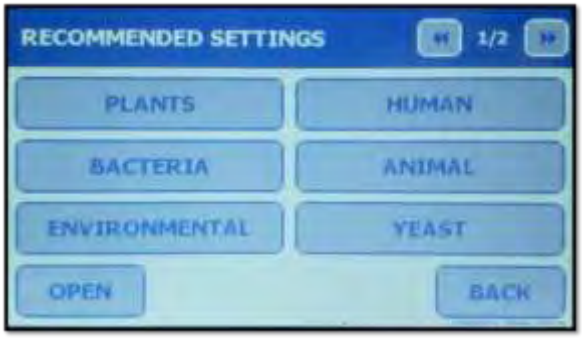


Figure V-2: Recommended Programs, page 1 of 2

3. Scroll through the program listings using the [<< / >>]buttons located on the top right corner of the 'Touch Screen' ***(Figure V-3).***

Figure V-3: Plant Category, page 1 of 11

4. Press the desired program button. The FastPrep-24 5G displays the program settings; use the [<< / >>] buttons located at the top right corner of the 'Touch Screen' to scroll through each page of parameters. ***(Figures V-4a,V-4b and V-4c)***.

NOTE: Recommended Programs are locked and cannot be edited. Program details are for viewing purposes only.

Figure V-4a: Alpowa Wheat Leaf Tissue program, page 1 of 3

Figure V-4b: Alpowa Wheat Leaf Tissue program, page 2 of 3

Figure V-4c: Alpowa Wheat Leaf Tissue program, page 3 of 3

5. Press [RUN] to initiate the program. The FastPrep-24 5G prompts for confirmation of the program run ***(Figure V-5).***

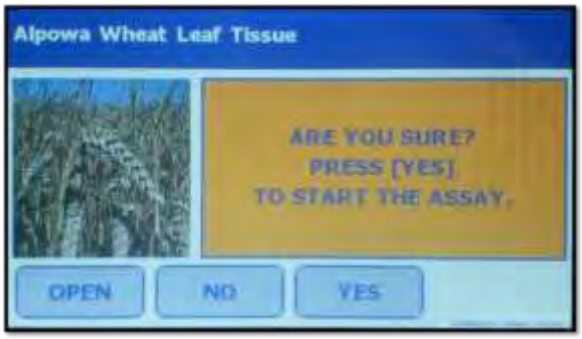


Figure V-5: Confirmation Screen for Recommended Program Assay Run

6. Press [YES] to initiate the assay run. The FP-24 5G starts the assay while displays a countdown of the assay time remaining ***(Figure V-6)***.

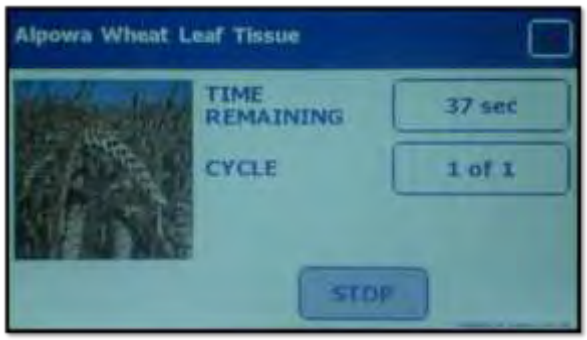


Figure V-6: FastPrep-24 5G 'Touch Screen' Countdown Display During Assay Run

NOTE: Any assay may be aborted at any time during the assay run by pressing [STOP].

NOTE: If the Program contains multiple Cycles and Pauses, a separate countdown display will show during Pause time ***(Figure V-7).***

Figure V-7: FastPrep-24 5G 'Touch Screen' Countdown Display During Cycle Pause

7. Upon completion of the assay, the FP-24 5G screen will display the message "ASSAY COMPLETED SUCCESSFULLY" ***(Figure V-8)***.

Figure V-8: Confirmation Screen for Completion of Recommended Program Assay Run

8. After an assay has been completed.

    a. Press [OPEN] to release the dome lock mechanism and retrieve your samples.

    b. Press [REPEAT] to run the same assay again.

    c. Press [OK] to return to selected program main screen.

2) Manually Programming an Assay:

The FastPrep-24 5G allows the end-user to program customized assays using variable speed, adapter, time, lysing matrix, quantity, quantity unit, cycles, and pause time parameters. To program a custom assay using the FastPrep-24 5G:

1. Press [PROGRAM MANUALLY] ***(Figure V-1)*** at the 'Home Screen'. The FP-24 5G Touch Screen will display the first of three total pages of programmable variables ***(Figures V-9a, V-9b and V-9c)***.

Figure V-9a: Manual Assay Parameters, page 1 of 3

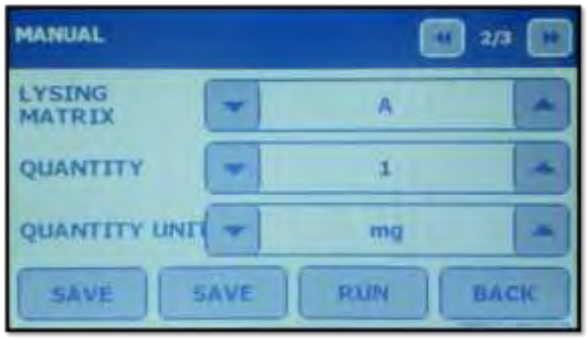


Figure V-9b: Manual Assay Parameters, page 2 of 3

Figure V-9c: Manual Assay Parameters, page 3 of 3

2. Press the up/down arrows [▲/▼] to program each parameter, using the scroll buttons in the top right corner of the screen to move from page to page. A complete list of parameters, parameter ranges, and default settings is found in the FastPrep-24 5G programmable settings in **Section 1.**

NOTE: The up/down arrows [/] are equipped with a convenient Rapid Scroll Feature. Holding the arrows down will rapidly increase or decrease the desired setting. Pressing and immediately releasing the arrows will increase or decrease by one default setting per action.

NOTE: The Manual Program mode contains three (3) screens of programmable variables. Any assay parameters not programmed will run at default levels.

NOTE: Speed settings higher than 6.5 m/s are available only for the QuickPrep and QuickPrep-3 adapters. All other optional adapters are limited to a maximum speed of 6.5 m/s.

IMPORTANT

While the FastPrep-24 5G is capable of run times up to 120 seconds, ***it is highly recommended that any run time over 60 seconds be monitored very closely!*** Some Lysing Matrix combinations can generate significant heat after 60 seconds at high speeds and tube failure is possible.

3. Once all parameters are programmed, the end user can choose to save the assay for easy recall or to run the assay.

a) Running an Assay

1. To run the program without saving, press [RUN] to initiate the program. The FastPrep-24 5G prompts “ARE YOU SURE? PRESS [YES] TO START THE ASSAY” for confirmation of the program run ***(Figure V-10).***

Figure V-10: Confirmation of Program Run

2. Press [YES] to initiate the assay run. The FP-24 5G will start the assay while displaying a countdown of the assay time remaining ***(Figure V-11)*.**

Figure V-11: FastPrep-24 5G Countdown Display during Manual Assay Run

3. Upon completion of the assay, the FP-24 5G screen displays "ASSAY COMPLETED SUCCESSFULLY!" ***(Figure V-12)*.**

NOTE: All parameters entered in the [Program Manually] mode will be saved until the program is manually edited or the system is turned off. Once power is resumed, settings will revert to factory defaults.

4. After an assay has been completed ***(Figure V-12)*:**

   a. Press [OPEN] to release the dome lock mechanism and retrieve your samples.

   b. Press [REPEAT] to run the same assay again.

c. Press [SAVE] to save program.

d. Press [OK] to return to selected program main screen.

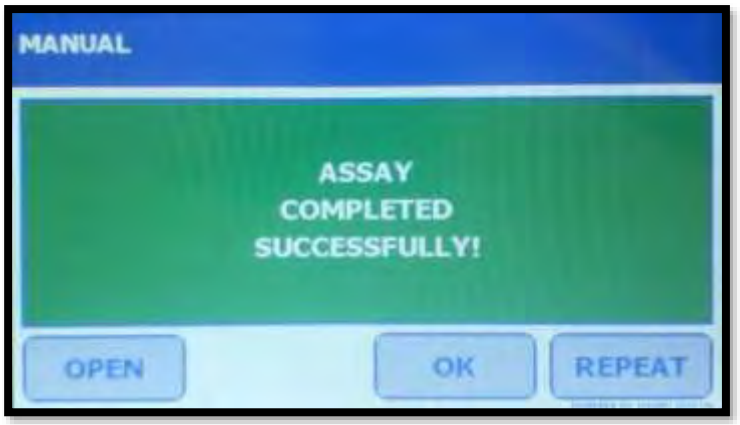


Figure V-12: Manual Assay Complete

b) Saving an Assay

In the Program Manually mode, an assay may be saved immediately after programming ***(Figure V-9)*** or upon completion of the assay ***(Figure V-12).***To save an assay:

1. Press [SAVE] at the bottom of screen. The FastPrep-24 5G will automatically display a keypad ***(Figure V-13).***

Figure V-13: FastPrep-24 5G Keypad

2. Using the keypad, enter the program name. Alpha/numeric and punctuation is limited to 25 characters and spaces.

NOTE: Each saved assay must be given a unique name.

NOTE: The maximum number of saved programs allowable is twelve (12).

3. Press [ENTER] to save named program to memory. The FastPrep-24 5G prompts “ARE YOU SURE YOU WANT TO SAVE {ASSAY NAME}?”. Press [YES] to save.
4. The FastPrep-24 5G displays “{ASSAY NAME} SAVED SUCCESSFULLY!”.
5. Press [OK] to return to the Program Manually screen.
6. To access saved programs again, press [SAVED PROGRAMS] from the FastPrep-24 5G main menu.

NOTE: Each program must be saved under a unique name. Repeating a name will result in a program error “THE ASSAY WITH THE SAME NAME EXISTS. PLEASE CHANGE THE NAME OF ASSAY!”. The name of the last saved program will remain on result line of the keypad entry screen until unit is powered off.

NOTE: A program cannot be edited once saved.

3) Using Saved Programs:

The FastPrep-24 5G allows for up to twelve (12) programs to be created, named, and stored for later recall and use. To access the saved programs, press [SAVED PROGRAMS] from the FastPrep-24 5G ‘Home Screen’. ***(Figure V-1)***

a) Retrieving a Saved Program

To retrieve a previously saved program:

1. Press [SAVED PROGRAMS] from the FastPrep-24 5G ’Home Screen’.

2. Scroll through the pages using the [<< / >>] buttons until the program location is found ***(Figure V-14)***.
3. Press {ASSAY NAME} to open the program. View the program settings using the scroll [<< / >>] buttons located at the top right corner of the 'Touch Screen'.
4. Press [RUN] to start the program. The FastPrep-24 5G prompts, "ARE YOU SURE? PRESS [YES] TO START THE ASSAY".
5. Press [YES] to start the assay run.
6. When the run is completed, the FastPrep-24 5G displays "ASSAY COMPLETED SUCCESSFULLY!".

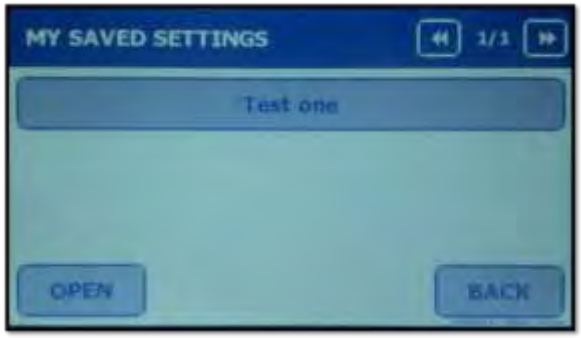


Figure V-14: FastPrep-24 5G [SAVED PROGRAMS] Menu Listing

7. After an assay has been completed:
    a. Press [OPEN] to release the dome lock mechanism and retrieve your samples.
    b. Press [REPEAT] to run the same assay again.
    c. Press [OK] to return to selected program main screen.

NOTE: A program cannot be edited once saved.

b) Deleting a User-Programmed Assay:

1. Press [SAVED PROGRAMS] from the FastPrep-24 5G 'Home Screen' ***(Figure V-1).*** Scroll through the pages using the scroll [<< / >>] buttons located at the top right corner of the 'Touch Screen'.
2. Press the {ASSAY NAME} to be deleted.
3. Press [DELETE] to delete program. The FastPrep-24 5G displays "ARE YOU SURE YOU WANT TO DELETE {ASSAY NAME}" to confirm deletion. Press[YES] to delete. ***(Figure V-15)***

Figure V-15: Confirm Delete Program (Assay Name "Test one")

4. Once the program is deleted, the FastPrep-24 5G displays "{ASSAY NAME} DELETED SUCCESSFULLY!".***(Figure V-16)***

Figure V-16: Program Deleted Successfully (Assay Name "Test one")

5. Press [OK] to return to previous screen.

4) Stopping Cycle in Progress:

A cycle in progress on the FastPrep-24 5G can be stopped as needed. To stop a cycle in progress:

1. Press the [STOP] button located at the bottom of the screen ***(Figure V-11)***.The FastPrep-24 5G prompts “ARE YOU SURE YOU WANT TO ABORT ASSAY” **(Figure V-18).** Press the [YES] button to abort the assay, or press [NO] to return to the previous screen.

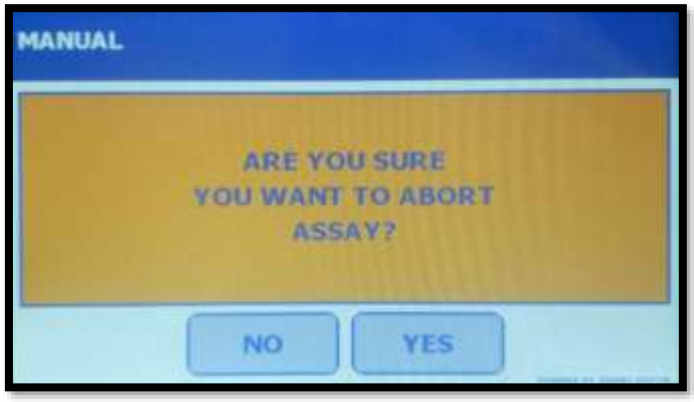


Figure V-18: Assay Abort Screen

2. If an assay is aborted, the FastPrep-24 5G displays a confirmation screen, prompting “SESSION IS ABORTED!” ***(Figure V-19).*** Press [OK] to return to the main menu or [OPEN] to open the Dome.

Figure V-19: Confirmation Screen for Aborted Assay

NOTE: The FastPrep-24 5G can be stopped at any time in a cycle by pressing the RED emergency stop (E-stop) button.

B. FastPrep-24 5G Administrative Functions

The FastPrep-24 5G allows end users to activate or deactivate system features, export data records, install software upgrade and access other onboard information. To access Administrative Functions ***(Figure V-20)***, press [ADMIN TOOLS] on the FastPrep-24 5G 'Home Screen'

Figure V-20: [ADMIN TOOLS] Main Menu

1) About FastPrep-24 5G: System Versions and End-User Agreement

The 'About FP24' screen provides information on the FastPrep-24 5G, such as current software and firmware versions, as well as the end user agreement. To access information about the FastPrep-24

1. Press the [ABOUT FP24] button. The FP-24 5G will display the current application (software) and driver (firmware) versions. ***(Figure V-21).***

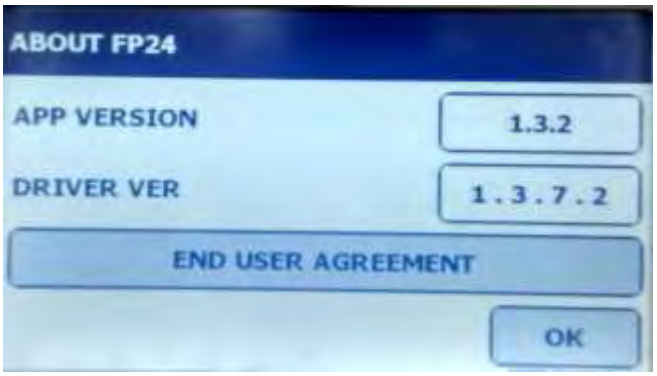


Figure V-21: About FastPrep-24 5G

2. Press [END USER AGREEMENT] to view the MP Biomedicals End User Agreement ***(Figure V-22)***. Press the [UP]/[DOWN] buttons to scroll through the text.

3. Read and accept the terms of the End User Agreement by pressing [OK]. This will exit the 'End User Agreement' Screen and return to the About FP-24 screen.

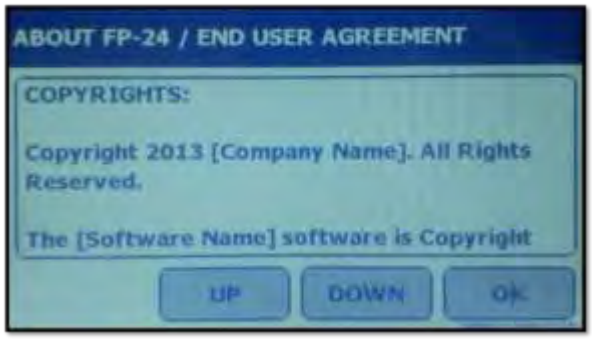


Figure V-22: End User Agreement

4. Press [OK] to return to the 'Admin Tools' menu.

NOTE: After accepting the terms, please register your New FastPrep-24 5G at www.mpbio.com/registermynewfastprep using a computer or smart phone.

2) Date /Time Set

The 'Date / Time Set' menu allows the end-user to set the date and time on the instrument. The date is formatted using month, day and year, and the time is displayed using a 24 hour clock.

1. Press the [DATE/TIME SET] button on the 'Admin Tools' main menu.

2. Press the up/down arrows [▲/▼] to program each parameter ***(Figure V-23).***

Figure V-23: 'DATE/TIME SET' Screen

3. Press [SAVE] to save changes. The FastPrep-24 5G prompts "ARE YOU SURE YOU WANT TO SAVE NEW PARAMETERS?". Press [YES] to save. ***(Figure V-24).***

Figure V-24: Confirm Parameters Screen

4. The FP-24 5G will prompt "NEW PARAMETERS SAVED SUCCESSFULLY" ***(Figure V-25).*** Press [OK] to return to 'Admin Tools' menu.

Figure V-25: New Parameters Saved Successfully Screen

3) Optional Settings

Additional FastPrep-24 5G features, including the strobe light, keyboard clicks and voice interface, may be accessed through the 'Options' menu. To access the additional FP-24 features:

1. Press [OPTIONS] on the [ADMIN TOOLS] main menu.
2. Scroll through the pages using the [<< / >>] buttons located at the top right corner of the 'Touch Screen' ***(Figure V-26a and V-26b)***.

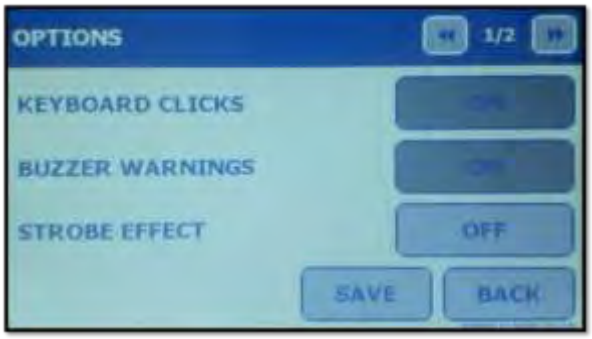


Figure V-26a: Options Screen (Page 1)

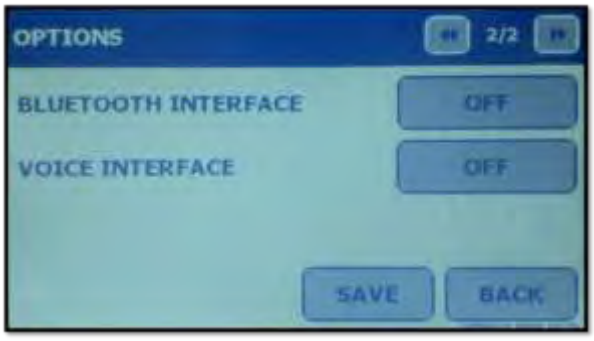


Figure V-26b: Options Screen (Page 2)

a) Keyboard Clicks

The 'Keyboard Clicks' feature controls the level of sound made when a button is pressed on the FastPrep-24 5G 'Touch Screen'. The Keyboard Clicks feature is controlled using a toggle button; press [ON] or [OFF] to turn on the sound or to silence respectively.

b) Buzzer Warnings

The 'Buzzer Warnings' feature controls the level of sound made for various minor confirmatory indication or out of compliance parameters. These ***warnings*** always accompany a ***Yellow Warning Screen*** and the user has the option to continue/over-ride. The 'Buzzer Warnings' feature is controlled using an [ON/OFF] toggle button: [ON] activates while [OFF] silences this feature.

Examples of these ***warnings*** include:

Program parameter is not acceptable.	Assay aborted in session
New administrative parameters saved	Assay deleted
Assay initiated	Data storage near capacity
Assay time complete	FastPrep-24 5G instrument warm
FastPrep-24 5G overloaded (current)	

More serious Audio System ***Alarms*** are accompanied by a ***Red Alarm Screen*****;** The user cannot over-ride these, and these cannot be deactivated. Example: System Overheating (See Section X: Troubleshooting)

c) Strobe Effect

The 'Strobe Effect' feature controls the two strobe lights located within the sample chamber. The 'Strobe Effect' is useful for optimizing assay parameters because it allows for visual inspection of sample lysis progression in real time. The 'Strobe Effect' feature is controlled using a toggle button. Press [ON] to enable strobe lighting and [OFF] to disable this feature.

NOTE: Bluetooth Interface and Voice Interface Options are currently unavailable at this time and are therefore disabled. Once available, these icons will be activated.

4) Software Update

The FastPrep-24 5G features custom software updates. Registered end-users receive software updates via email or portable drives, and the FastPrep-24 5G software can then be updated using a USB port directly located directly on the instrument along with a standard laptop installed with the FastPrep-24 5G Host Application.

Materials Required

- FastPrep-24 5G instrument
- Laptop installed with FastPrep-24 5G Host Application
- USB A/Mini B Cable
- Pin, such as push pin, straightened paper clip, or other thin, rigid wire

NOTE: The FastPrep-24 5G Host Application is currently compatible with MS Windows 10 or MS Windows XP operating systems. Contact MP Bio Technical Service for other operating systems.

a) Installing the FastPrep-24 5G Host Application

Registered end-users will receive application files for the FastPrep-24 5G Host Application as zipped files via email or portable drive. Unzip the files supplied and save on the laptop hard drive. To install the FastPrep-24 5G Host Application, double click on the setup.exe file.

1. The MS Hardware Update Wizard Dialog Box will launch ***(Figure V-27)***. Follow the steps in the Wizard to install the application.

Figure V-27: Hardware Update Wizard

b) Open the FastPrep-24 5G in Safe Mode

1. Turn off the FastPrep-24 5G using the 'Rocker Switch' ***(Figure I-2).***
2. Launch the FastPrep-24 5G Host Application by double clicking the FastPrepApp.exe program file or the program icon on your desktop. As the FastPrep-24 5G is not connected, the application will not detect a device and no buttons will be activated ***(Figure V-28)***.

Figure V-28: FastPrep App Home Screen (device not detected).

NOTE: The [UPDATE FIRMWARE] and [READ REPORT FROM DEVICE] buttons are inactive until the application recognizes that the device is connected. This is normal.

3. Connect the USB cable first to the laptop using the large Type A plug, then to the FP-24 5G using the smaller Type B plug ***(Figure V-29).***
4. The 'Safe Mode Boot Button' is found on the rear of the instrument near the 'Rocker Switch' ***(Figure V-29).*** Insert safety pin to depress this button while turning the 'Rocker Switch' to ON (I). The FastPrep-24 5G will start up in "Safe Mode".

Figure V-29: FastPrep-24 5G Rear Panel

NOTE: When in "Safe Mode", the FP-24 5G 'Touch Screen' will remain dark with no backlight. This is normal.

5. Depress the 'Safe Mode Boot Button' until the FastPrep-24 5G Host Application detects the attached device. This can take several seconds. The FastPrep-24 5G Host Application has detected the device when the [UPDATE FIRMWARE] button on the home screen becomes active ***(Figure V-30).***

Figure V-30: FastPrep-24 5G Host Application Home Screen (device detected successfully).

6. Once device detection occurs, release the 'Safe Mode Boot Button' by removing the pin.

The [Update Firmware] button remains inactive if a device is not detected. If this occurs, please follow instructions defined in the file "*Driver Installation Instructions"* supplied with the FastPrep Host Application download. Some operating systems older than Win 7 or XP may require definition of the USB driver location on the computer hard drive.

c) Installing a Software Update

Software updates are sent as zipped files to registered users via email or portable drive. Unzip the files provided; the software update is contained within a binary file with file extension .dfu ***(Figure V-31).***

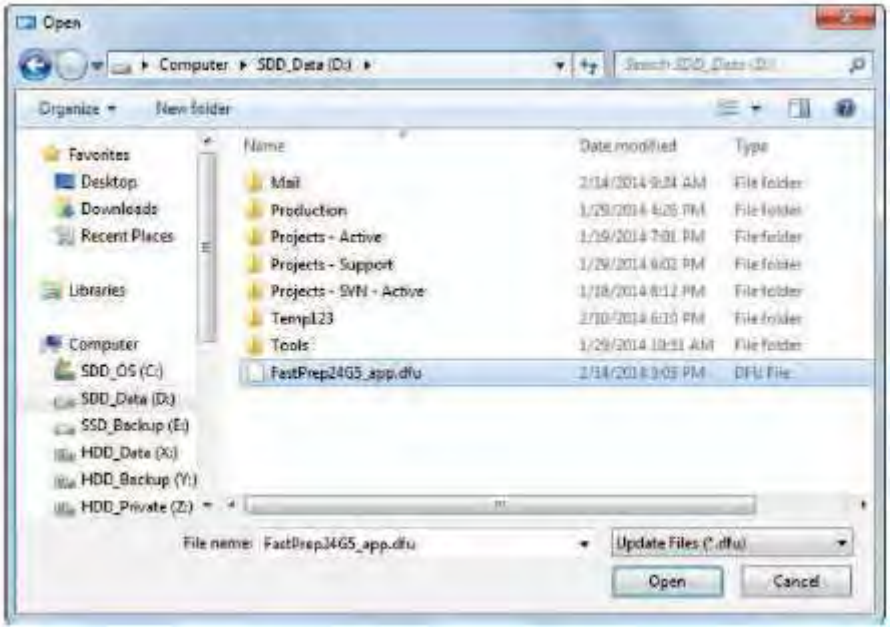


Figure V-31: Dialog Box Showing Selection of Binary File for Upload. (example file name "FastPrep245G_app.dfu")

1. Press [UPDATE FIRMWARE] to initiate the Software Upgrade Installation process. A dialog box opens, allowing for file selection.

2. Select the binary file (.dfu) and click [OPEN] to start installation. During the two minute installation process, the FastPrep-24 5G Host Application will display the 3 file upload phases in sequence: Erasing, Upgrading and Verifying ***(Figures V-32a, V-32b and V32c)***.

Figure V-32a: FastPrep App Progress Bar (Erasing)

Figure V-32b: FastPrep App Progress Bar (Upgrading)

Figure V-32c: FastPrep App Progress Bar (Verifying)

3. The FP-24 5G Host Application displays a Dialog Box ***(Figure V-33)*** upon successful completion of the file upload. Click [OK] to exit.

Figure V-33: FastPrep App Update Successfully Completed

4. Power off the FP-24 5G using the 'Rocker Switch' and allow to rest for at minimum 30 seconds.

NOTE: While powered down, the [UPDATE FIRMWARE] button on the FastPrep-24 5G Host Application will again be inactive. This is normal.

5. Power on the FP-24 5G in standard mode using the 'Rocker Switch'. The upgraded software launches and the 'Touch Screen' illuminates while displaying a progress bar.

   NOTE: If the device and laptop are still connected, the FastPrep App displays an active [READ REPORT FROM DEVICE] button.

6. Upon completion, the FP-24 5G displays "Drive MCU Firmware Updated Successfully". Press [OKAY].
7. Reboot the FP-24 5G by powering off (using the 'Rocker Switch') for a minimum of 30 seconds before powering back on.
8. Verify a successful upgrade installation using the [ABOUT FP24] button found under [ADMIN TOOLS]. The 'App Version' and 'Driver Version' will correspond to the new upgrade ***(Figure V-34)***. Additional verification and validation activities may be required. MP Biomedicals strongly recommends testing using the following functions before running samples: running an assay, saving an assay, opening the dome using the 'Touch Screen', and changing an optional setting.

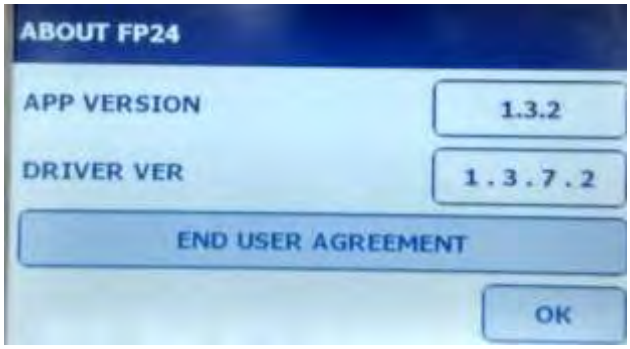


Figure V-34: About FastPrep-24 5G

d) Calibrating the FastPrep-24 5G 'Touch Screen'

The FastPrep-24 5G 'Touch Screen' may require calibration upon completion of software update. In cases requiring calibration, the FastPrep-24 5G 'Touch Screen' prompts, "Touch Panel Calibration- Step No. 1 of 4." Follow the instructions on each screen, pressing the locations as indicated to calibrate touch screen" ***(Figure V-35).***

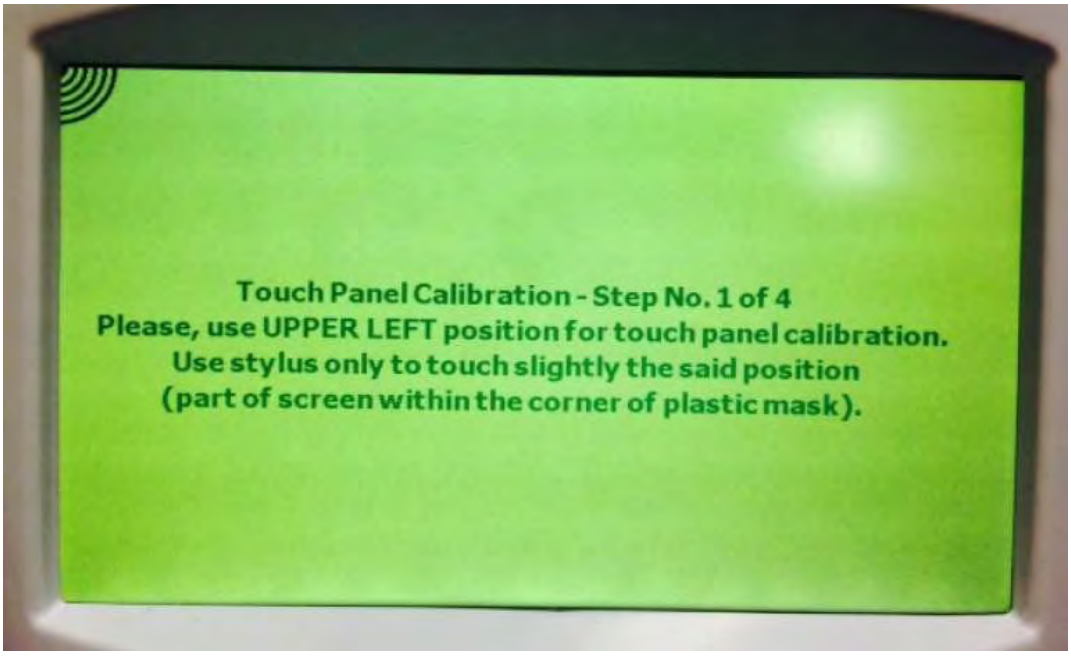


Figure V-35: FastPrep-24 5G 'Touch Screen' Calibration Prompt

To calibrate the 'Touch Screen', use a stylus or pencil to firmly press the locations as indicated The positions will appear in sequence in each quadrant, beginning with the upper left corner ***(Figure V-35)***, followed by the lower left corner, the lower right corner and finally the upper right corner.

NOTE: Use firm but not hard force when depressing the stylus or pencil during 'Touch Screen' calibration. Use of too much force can damage the 'Touch Screen'.

5) Exporting History File

The FastPrep-24 5G stores assay information that is available for export as needed to a laptop or PC. Historical data is exported in a CSV format that contains information such as assay date and time, assay name and category, assay parameters (e.g., speed, time, cycles, etc.) and whether the assay completed or aborted. While the FastPrep-24 5G can store information on up to 2048 assay, it is recommended that the system history be exported and/or purged routinely. To export an Assay History File:

1. Launch the FastPrep-24 5G Host Application by double clicking the FastPrepApp.exe program file or the program icon on your desktop.

NOTE: If the FastPrep App has not been installed on the laptop/PC, please refer to Section 4 above, UPDATING SOFTWARE VERSIONS, Steps 1-3 for application installation.

2. Power on the FastPrep-24 5G at the 'Rocker Switch' ***(Figure I-2)***.
3. Connect the USB cable first to the laptop using the large Type A plug, then to the FP-24 5G using the smaller Type B plug ***(Figure V-29)***.
4. After a few seconds, the FastPrep App detects the device and activates the [READ REPORT FROM DEVICE] button ***(Figure V-36).***

Figure V-36: FastPrep App Showing Device Detected

5. Click [READ REPORT FROM DEVICE] to initiate file download. A Dialog Box will open allowing you to select a location to save the CSV file.

6. Rename the file as appropriate and select the desired save location. Click [SAVE] to save.

7. The FP-24 5G Host Application then prompts for the purging of stored data from the FP-24 5G by displaying the message “Do you want to delete all entries in history?” ***(Figure V-37).*** Press [YES] to clear the data history cache or [NO] to continue storing data.

Figure V-37: Purge History using FastPrep-24 5G Host Application

8. Alternatively, to clear the data storage from the FP-24 5G without previously saving, press [ADMIN TOOLS] from the main menu, followed by [HISTORY]. On the History Screen, press [ERASE ALL RECORDS] to purge the data file ***(Figure V-38).***

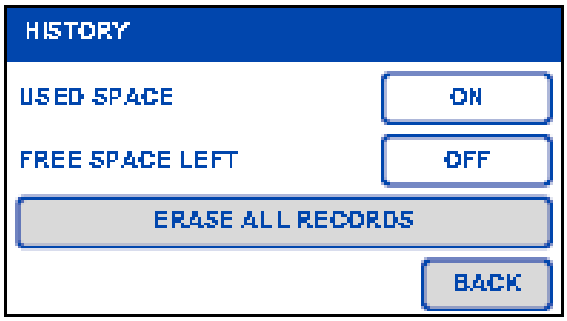


Figure V-38: Purge File from History Screen

9. The FP-24 5G prompts for “ARE YOU SURE YOU WANT TO DELETE HISTORY LOG?”. Press [YES] to erase ***(Figure V-39).***

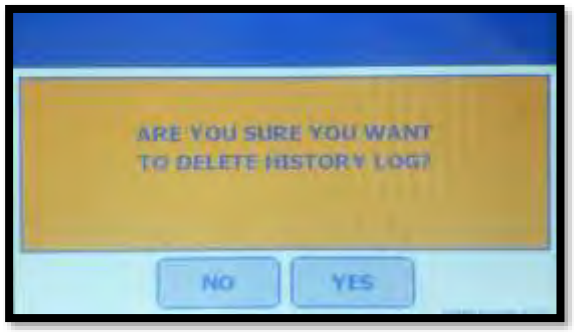


Figure V-39: Purge Confirmation Screen

10. The FP-24 5G prompts for “HISTORY LOG DELETED SUCCESSFULLY?”. Press [OK] to return to the previous screen ***(Figure V-40).***

Figure V-40: Purge Successful Screen

6) *Technical Support*

The FastPrep-24 5G contains onboard contact information for all of MP Biomedicals' technical services on a global basis; regions are listed by country. These technical services support all aspects of your FastPrep instrument, including technical support and supply of FastPrep-24 5G consumables such as Lysing Matrix Tubs and Purification kits. To access 'Technical Support':

1. Press [TECHNICAL SERVICE] from the 'Admin Tools' menu ***(Figure V-21).***
2. Scroll through the different regions listed using the scroll buttons [<< / >>] located at the top of the screen ***(Figure V-41).***

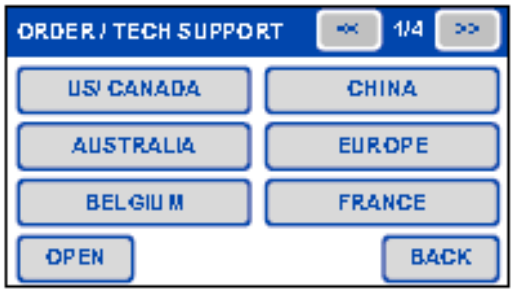


Figure V-41: Global Technical Services Listing by Country (page 1 of 4 shown)

3. Press [COUNTRY NAME] to display the desired MP Biomedicals' Technical Services contact information, including email address and telephone number ***(Figure V-42).***

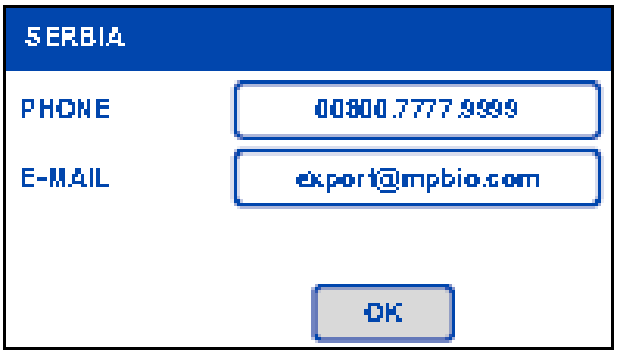


Figure V-42: Country Specific Service Listing

Resetting the FastPrep-24 5G™:

The FastPrep-24 5G is designed to retain all saved programs upon loss of power to the instrument (e.g., emergency stop deployed, unplugging the instrument, etc.). The instrument will revert to default settings for the manual programming mode.

SECTION V: WARRANTY & LIABILITY

The FastPrep-24 5G is warranted against defects in material and workmanship for one (1) year after the date of delivery to the original purchaser. This warranty is limited to defects in materials and workmanship, and does not cover incidental or consequential damages.

MP Biomedicals, will repair, free of charge, any apparatus covered by this warranty. This warranty includes one-year parts and labor in MP Biomedicals' facilities or by approved distributors. Warranty work is subject to the inspection of unit. No instruments, equipment, or accessories will be accepted without a Return Material Authorization (RMA) number issued by MP Biomedicals. Costs of shipping the unit are not covered in this warranty. The warranty obliges you to follow all precautions as listed in this manual; failure to do so will void warranty.

An instrument that may contain hazardous and / or infectious materials must be packed and labeled according to the U.S. Department of Transportation (DOT) and / or European Community (EC) regulations applying to the transportation of hazardous and / or infectious materials. All shipping documents must meet DOT and / or EC regulations. All returned units must be fully decontaminated of any chemical, biological or infectious agents.

Use of the FastPrep-24 5G in a manner other than that specified in this user manual may jeopardize personal safety. MP Biomedicals shall not be liable for damages due to the improper handling, abuse, or unauthorized repair of this instrument. MP Biomedicals, LLC assumes no liability, express or implied, for use of this instrument.

MP Biomedicals supplies kits, reagents and adapters for use with the FastPrep-24 5G. Use of kits, reagents and sample holders not supplied by MP Biomedicals with the FastPrep-24 5G is not covered under this warranty.

SECTION VI: MAINTENANCE

The FastPrep-24 5G is a robust instrument. Depending on the intensity and frequency of use certain wear parts and moving parts must be checked and are likely to require a more or less long-term replacement to keep the FastPrep-24 5G in good working condition

These are parts that undergo movement or friction..
Contact MP Biomedicals in the event of an instrument question or to subscribe for a yearly maintenance contract.

- An annual revision of your instrument
- Assistance within 48 hours
- An instrument always available
- A service tailored to your own needs

A. Daily Maintenance

The FastPrep-24 5G should be cleaned following use of the instrument, or if a spill occurs during use. If a sample tube leaks during a cycle, the inside of the 'Dome' and surrounding areas may be contaminated. To clean the FastPrep-24 5G::

1. Turn the FastPrep-24 5G off and disconnect the power cord from the instrument.
2. Wipe the exterior of the FastPrep-24 5G with a paper towel moistened with 7X™ Cleaning Solution.
3. Dry the exterior of the FastPrep-24 5G with a dry paper towel.
4. Open the dome and remove the sample holder.
5. Remove the Bowl
6. Clean the sample holder and the bowl using 7X™ Cleaning Solution, rinse with distilled water, and dry using paper towels.
7. Wipe the interior of the FastPrep-24 5G with a paper towel moistened with 7X™ Cleaning Solution.
8. Wipe the interior of the FastPrep-24 5G with a damp paper towel to remove any residual 7X™ Cleaning Solution.
9. Dry the interior of the FastPrep-24 5G with a dry paper towel.
10. Replace the sample holder and **the bowl than close the dome**

B. Yearly Maintenance

DAMAGE TO INSTRUMENT

Use of a cleaning agent other than 7X™ Cleaning Solution may damage the FastPrep-24 5G™. Bleach, solvents, or acidic, alkali or abrasive reagents may damage the gel coat finish, cause corrosion of metal parts, or crazing of the transparent lid.

7X™ Cleaning Solution

MP Biomedicals recommends that FastPrep-24 5G™ cleaning be performed using the MP Biomedicals 7X™ Cleaning Solution. 7X™ Cleaning Solution has been a safe and effective cleaning solution for many laboratory applications.

7X™ Cleaning Solution is composed of a proprietary mixture of a strong, phosphate-free sequestering reagent, a completely soluble and non-toxic solvent, and powerful, environmentally friendly wetting / foaming / emulsifying agents. This combination, along with powerful anionic surfactants, makes 7X™ Cleaning Solution an ideal solution for applications that require low cell toxicity, low debris, high efficiency cleaning, and no corrosion. As such, 7X™ Cleaning Solution is ideal for thorough cleaning of sensitive equipment such as, but not limited to: the FastPrep-5G™, bioreactors, culture apparatus, and general laboratory equipment including test tubes, microscopy slides, pathology equipment, burets, pipettes, etc.

Regular 7X™

With extremely powerful and effective surfactants, this powerful solution was designed to clean laboratory plastics and glassware by simply soaking overnight. Alternately, equipment may be boiled.

Item	Catalog No.
1 Gallon Plastic Bottle	097667093
4 x 1 Gallon Case	097667094

ES-7X™

"Environmentally Safe" phosphate-free ES works just like the original 7X™ and is designed to work in soaking or non –agitated applications. ES-7X™ is highly concentrated and a little goes a long way.

Item	Catalog No.
1 Gallon Plastic Bottle	097667193
4 x 1 Gallon Case	097667194

Regular 7X™ Ready-to-Use

A 5% solution of the classic 7X™, pre-diluted for a convenient working solution. Includes a hand pump for easy dispensing.

Item	Catalog No.
1 Gallon Plastic Bottle	097668093

ES-7X™Ready-to-Use

A 5% solution of the ES-7X™, pre-diluted for a convenient working solution. Includes a hand pump for easy dispensing.

Item	Catalog No.
1 Gallon Plastic Bottle	097668193

C. Fuse Replacement (as needed)

The FastPrep-24 5G fuse will require replacement occasionally.

IMPORTANT

Disconnect input power cord behind instrument before replacing fuse.

IMPORTANT

Use only the specified type of fuse for fuse replacement. Use of non-specified fuses may increase fire danger.

To replace a blown fuse:

1. Turn the FastPrep-24 5G off, and unplug the instrument.
2. The 'Fuse Holder' is located directly below the 'Power Inlet Receptacle' and is marked with the  symbol. To remove insert a thin-blade screw driver or similar into the access hole and gently pry outward, as seen in ***Figure VI-1.***

Figure VI-1: FastPrep-24 5G™ Fuse Assembly

3. Remove the faulty fuse and replace it with a new one.
4. Insert the fuse assembly back into the AC receptacle carefully, ensuring that the voltage is correctly configured.
5. Reconnect the power cord and power on the FastPrep-24 5G.

NOTE: Two (2) spare fuses are provided in the fuse assembly. Two (2) additional fuses are provided with the FastPrep-24 5G as part of the accessories. Additionally, fuses may be ordered as needed.

SECTION VII: PARTS INFORMATION

The following spare parts can be ordered directly from MP Biomedicals,

⚠ Parts must be replaced by a trained technician.

Part Description	Catalog Number	Picture
LCD Screen and Touchpad Set ⚠	116005560	
Front Panel Molding	116005565	
Digital (Mother) Board (PCB) ⚠	116005561	

Part Description	Catalog Number	Picture
Driver Board (PCB) ⚠	116005503	
SMPS 48V ⚠	116005502	
Motor with Shaft ⚠	116005504S	

Part Description	Catalog Number	Picture
Emergency Stop 	6005524	
Emergency Stop Molding	116005524A	
Strobe Light PCB/Assembled 	116005568 116005568L Enclosure plastic slight cap Left 116005568R Enclosure plastic slight cap Right	
USB Interface PCB 	116005569	
Bowl – 212 mm	116005505	

Part Description	Catalog Number	Picture
Electromechanical Latch	116005563	
Polycarbonate-Dome with cap and Stopper	116005506	
Dome Rubber Gasket	116005507	
Striker Bolt	116005508	
Manual Dome Release Cable Assembly	116005567	
Lock Pins for Dome	116005509	

Part Description	Catalog Number	Picture
Dome Rest Assembly Kit	116005589N	
Cam Lock	116005588	
Ratchet Bolt (Length = 25 mm)	116005511	
QuickPrep-3 Sample Holder	116005512	

Part Description	Catalog Number	Picture
3 STEP-Assembly with studded bearings 	116002513	
Spring Assembly Set with Hooks	116002514	
Rubber Shoe	116005515	
Fuse, 10 Amp-UL	116002516	
European AC Cord	1130000062	
3 Pin Flat AC Cord-USA UL	116002519	

Part Description	Catalog Number	Picture
AC Receptacle with Fuse Chamber	116002520	
Rocker Switch-UL	116002521	
Rear Panel Molding	116005570	
Gasket (OD = 150 mm, ID = 45 mm)	116004535	
Inner Ring	116004541	
Outer Ring	116004542	

Part Description	Catalog Number	Picture
Shroud Set	116005564	
USB Cable	116005587	

APPENDIX 1: FASTPREP® SAMPLE HOLDERS (ADAPTERS)

LARGE-SCALE SAMPLE HOLDERS

Our large sample volume sample holders are ideally suited for DNA and RNA isolation, enzyme isolation and protein production, natural products isolation, food preparation for quality analysis, biopharma manufacturing, and forensic applications. A wide range of disposable 15 mL and 50 mL Lysing Matrix tubes ensure thorough homogenization of any sample type in seconds.

BigPrep™ 2x50mL Sample Holder
Large-scale sample holder holds 2x50 mL Lysing Matrix tubes (compatible with SafTest™ Food Inspection System).

TeenPrep™ 12x15mL Sample Holder
Medium-size sample holder holds 12x15 mL Lysing Matrix tubes (compatible with SafTest™ Food Inspection System).

Sample Holder Ordering Information			
Cat No	**Item**	**Unit**	**Price**
116002525	BigPrep™ 2x50mL Sample Holder	1 ea	Contact for details
116002526	TeenPrep™ 12x15mL Sample Holder	1 ea	Contact for details

HIGH THROUGHPUT SAMPLE HOLDERS

Our high-throughput sample holders are ideally suited for high-throughput applications, up to 24 and 48 samples can be homogenized simultaneously. Additionally, frozen samples in Lysing Matrix tubes loaded in the adapters and stored at -20°C or -80°Care ready to be immediately processed with minimal hands-on manipulation, preventing degradation of cellular components by endogenous enzymes.

HiPrep™ 48 x 2mL Sample Holder

TallPrep™ 24x4.5mL Sample Holder

QuickPrep™ 24 x 2 mL Sample Holder

Sample Holder Ordering Information			
Cat No	**Item**	**Unit**	**Price**
116002527	HiPrep™ 48 x 2mL Sample Holder	1 ea	Contact for details
116002540	TallPrep™ 24x4.5mL Sample Holder	1 ea	Contact for details
116002512	QuickPrep™ 24 x 2 mL Sample Holder	1 ea	Contact for details

CRYOGENIC SAMPLE HOLDERS

Our cryogenic sample holders are ideally suited for extractions of any temperature-unstable or sensitive biological compounds including RNA, siRNA, metabolites, intermediates, and enzymes from even the hardest samples to lyse. Allowing simultaneous cryogenic lysis, the cool adapters ensure efficient cooling of samples through passive temperature control technology with dry ice. Due to high heat transfer capacity and precise settings of lysis parameters, samples can be repeatedly homogenized without any increase in temperature.

CoolPrep™ 24x2 mL Sample Holder

CoolTeenPrep™ 6x15 mL Sample Holder

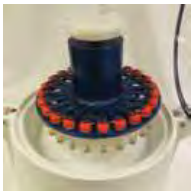
CoolBigPrep™ 2x50 mL Sample Holder

Sample Holder Ordering Information			
Cat No	**Item**	**Unit**	**Price**
116002528	CoolPrep™ 24x2 mL Sample Holder	1 ea	Contact for details
116002530	CoolTeenPrep™ 6x15 mL Sample Holder	1 ea	Contact for details
116002531	CoolBigPrep™ 2x50 mL Sample Holder	1 ea	Contact for details

ALL METAL SAMPLE HOLDERS

All Metal sample holders are ideally suited for work with highly infectious, pathogenic, or other biologically hazardous samples. They withstand temperatures up to 450°C, allowing for sterilization by pyrolysis or autoclaving. Pathogens, including bacteria, viruses, fungi, parasites, viroids, and prions, can thus be effectively eliminated. All-Metal adapters are also safe to use with most laboratory detergents and sterilization solutions, ensuring easy care and maintenance.

QuickPrep™ 24 x 2 mL All Metal Sample Holder



TeenPrep™ 12 x 15 mL All Metal Sample Holder

BigPrep™ 2 x 50 mL All Metal Sample Holder

Sample Holder Ordering Information			
Cat No	**Item**	**Unit**	**Price**
116002545	QuickPrep™ 24 x 2 mL All Metal Sample Holder	1 ea	Contact for details
116002546	TeenPrep™ 12 x 15 mL All Metal Sample Holder	1 ea	Contact for details
116002547	BigPrep™ 2 x 50 mL All Metal Sample Holder	1 ea	Contact for details

APPENDIX 2: MP FastPrep Lysing Matrix

Lysing matrices are critical components of the FastPrep System and help achieve optimal lysing performance. These MP FastPrep Lysing Matrix Tubes are prepared and dispensed under rigorous conditions, resulting in a premium product that is ready to use with confidence. All tubes are packaged in convenient dispensing boxes.

Matrices are available as part of MP FastPrep purification kits, as well as separately. A description of the MP FastPrep Lysing Matrix Tubes available from MP Biomedicals is included below.

MP FastPrep Lysing Matrix	Description	MP FastPrep Kit (when available)	Sample Type	Extraction Target
A	Contains garnet matrix and ¼-inch ceramic sphere with an orange cap: Use for all sample types except soil.	FastDNA™ Kit FastDNA™ Spin Kit	Animal Bacteria Yeast Fungi Plant	DNA RNA Proteins
B	Contains 0.1 mm silica spheres with a blue cap: Use for gram-positive and gram-negative bacteria.	FastRNA™ Pro Blue Kit FastRNA™ SPIN Kit for Microbes FastPROTEIN™ Blue Matrix	Bacteria Spores	DNA RNA Proteins
C	Contains 1-mm silica spheres with a red cap: Use for yeast and fungi.	FastRNA™ Pro Red Kit FastPROTEIN™ Red Matrix	Yeast Fungi	DNA RNA Proteins
D	Contains 1.4 mm ceramic spheres with a green cap: Use for plant and animal tissues.	FastDNA™ SPIN Kit for Plant and Animal Tissue FastRNA™ Pro Green Kit	Animal Plant	DNA RNA Proteins
E	Contains 1.4 mm ceramic spheres, 0.1 mm silica spheres, and one 4 mm glass bead with a purple cap: Use for soil and environmental samples.	FastDNA™ SPIN Kit for Soil FastRNA™ Pro Soil Kits	Soil Sediments Water Feces	DNA RNA Proteins
F	Contains 1.6 mm aluminum oxide particles and 1.6 mm silicon carbide particles with a white cap: Use for breaking tough, hard, or brittle cell membranes from plant, animal, bacteria, mold and other sample types.		Plant Animal Bacteria Molds Fungi Coral Emulsions Fixed Samples	DNA RNA Proteins
G	Contains 1.6 mm silicon carbide particles and 2 mm glass beads with a brown cap: Use for breaking tough, hard, or brittle cell membranes from yeast, fungi and spores, as well as brittle plant and animal tissue and more.		Plant Animal Yeast Fungi Spores	DNA RNA Proteins
H	Contains 2 mm glass beads and 2 mm yellow zirconium oxide beads with a yellow cap: Use for breaking tough, hard cells including organisms with dense exterior matrices.		Plant Animal Wood Seeds Very Dense Soils/Clays	DNA RNA Proteins

APPENDIX 2: FASTPREP® LYSING MATRIX

			Bacterial Aggregates Whole Insects Ticks Ancient /Dried Samples	
I	Contains 2 mm yellow zirconia beads and a 4 mm black ceramic sphere with a clear cap: Use to break primarily by impaction, very tough, hard samples such as chitin exoskeletons and dry grinding of fungal spores		Seeds Very dense soils/clays Bacterial Aggregates Whole Insects Ticks Ancient /Dried Samples Dry Grinding Fungal Sspores/Rusts	DNA RNA Proteins
J	Contains 2 mm yellow zirconia beads and 1.6 mm aluminum oxide particles and a pink cap: Use for high impaction and low shearing such as isolation of intact organelles and super-molecular structures from tissue, bacteria, molds, and fungi		Plant Animal Bacteria (gram +/-) Molds Fungi Coral Emulsions Fixed Samples Fungal Spores /Rusts	DNA RNA Proteins
K	Contains 0.8 mm zirconium silicate beads with a brown cap: Use to break spores, cysts and yeast polysaccharide capsules	GeneClean™ for Ancient DNA Kit	Non-viable Tissues Bone Preserved Tissues Animal By-Products Yeast Spores	DNA RNA Proteins
M	Contains one ¼" (6.35 mm) diameter zirconium oxide coated ceramic grinding sphere, and includes an extra bag of spheres so that 2 can be used to grind very difficult samples by impaction.		Tough Tissues Skeletal/Muscle Tissue Lung Tissue Heart Tissue Bone Tissue Seeds Spores	DNA RNA Proteins
S	Contains six (6) $^{1}/_{8}$" (3.175 mm) diameter stainless steel beads: Use for RNA and protein extraction from difficult samples where lysis by impaction is preferable.		Tough Tissues Skeletal/Muscle Tissue Lung Tissue Heart Tissue Bone Tissue Seeds Spores	DNA RNA Proteins
SS	Contains fifty (50) ¼" (6.35 mm, 0.25 cal) stainless-steel grinding balls: Use for RNA extraction from difficult samples where lysis by impaction is preferable.		Tough Tissues Skeletal/Muscle Tissue Lung Tissue Heart Tissue Bone Tissue Seeds Spores	DNA RNA Proteins
Y	Contains 0.5 mm Yttria-Satbilized zirconium oxide spheres with a white cap: Use for yeast, fungi and algal samples.	FastRNA™ SPIN Kit for Yeast	Yeast Fungi Algae	DNA RNA Proteins
Z	Contains 2.0 mm Yttria-Satbilized zirconium oxide spheres with a natural (clear) cap: Use for tough plant and animal samples.		Animal Plant	DNA RNA Proteins

APPENDIX 3: RECOMMENDED PROGRAM SETTINGS

Category: Bacteria							
Preset Name	**Speed (m/s)**	**Adapter**	**Time (seconds)**	**Cycles**	**Rest Time**	**Lysing Matrix**	**Quantity (mg)**
***Listeria monocytogenes* cells**	6.0	QuickPrep-3 / QuickPrep	30	3	300	B	10^9 cells
***Streptococcus pyogenes* cells**	6.0	QuickPrep-3 / QuickPrep	20	1	N/A	B	10^9 cells
***Streptococcus mutans* cells**	6.0	QuickPrep-3 / QuickPrep	30	1	N/A	B	10^9 cells
***Staphylococcus aureus* cells**	6.0	QuickPrep-3 / QuickPrep	40	2	300	B	10^8 cells
***Photorhabdusluminescene* cells**	6.0	QuickPrep-3 / QuickPrep	30	2	300	B	10^9 cells
***Escherischia coli* cells**	6.0	QuickPrep-3 / QuickPrep	30	1	N/A	B	10^8 cells
***Mycobacterium tuberculosis* cells**	6.0	QuickPrep-3 / QuickPrep	45	2	300	B	10^8 cells
***Lacto coccuslactis* cells**	6.0	QuickPrep-3 / QuickPrep	30	3	300	B	10^8 cells
Category: Environmental							
Preset Name	**Speed (m/s)**	**Adapter**	**Time (seconds)**	**Cycles**	**Rest Time**	**Lysing Matrix**	**Quantity (mg)**
Sediment - Soil / Rocks	5.5	QuickPrep-3 / QuickPrep	30	2	300	E	50
Soil - Sandy Sample	4.0	QuickPrep-3 / QuickPrep	30	4	300	E	50
Soil - Litter	5.5	QuickPrep-3 / QuickPrep	30	1	N/A	E	50
Waste Water	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	E	1 mL
Marine Sediment	5.5	QuickPrep-3 / QuickPrep	40	2	300	E	500
Soil from Grassland	5.5	QuickPrep-3 / QuickPrep	30	2	300	E	500

APPENDIX 3: RECOMMENDED PROGRAM SETTINGS

Rhizosphere	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	E	500
Asphalt permeated soil	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	E	500
Category: Feces							
Preset Name	**Speed (m/s)**	**Adapter**	**Time (seconds)**	**Cycles**	**Rest Time**	**Lysing Matrix**	**Quantity (mg)**
Human Feces	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix E	300
Category: Human / Animal							
Preset Name	**Speed (m/s)**	**Adapter**	**Time (seconds)**	**Cycles**	**Rest Time**	**Lysing Matrix**	**Quantity (mg)**
Human Lung	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix D	50
Human Breast	6.0	QuickPrep-3 / QuickPrep	30	2	300	Lysing Matrix D	80
Human Kidney	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Human Thyroid Tumors	6.0	QuickPrep-3 / QuickPrep	30	3	300	Lysing Matrix A	100
Mouse Eye	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix D	10
Mouse Heart	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix D	70
Mouse Kidney	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Mouse Femur	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix A	40
Mouse Leg Muscle	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Mouse Intestine	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Mouse Ear	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix D	45
Mouse Tail	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix A	100

APPENDIX 3: RECOMMENDED PROGRAM SETTINGS

Mouse Spleen	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	70
Mouse Lung	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Mouse Liver	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Mouse Brain	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Mouse Pancreatic Cells (bHC9)	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	10^7 cells
Human Ovary Biopsy	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	
Human Skin	6.0	QuickPrep-3 / QuickPrep	40	3	300	Lysing Matrix D	19
Category: Plant							
Preset Name	**Speed (m/s)**	**Adapter**	**Time (seconds)**	**Cycles**	**Rest Time**	**Lysing Matrix**	**Quantity (mg)**
Alpowa Wheat Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	75
Alpowa Wheat Seed	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	100
***Arabidopsis thaliana* Fresh Leaves (50 mg)**	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
***Arabidopsis thaliana* Fresh Leaves (200 mg)**	6.0	QuickPrep-3 / QuickPrep	40	2	300	Lysing Matrix D	200
Bartlett Pear Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Classic Oat Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	75
Classic Oat Seed	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	100
Corn Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	100
Crest Barley Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	100
Crest Barley Root	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	300

APPENDIX 3: RECOMMENDED PROGRAM SETTINGS

Kaybonnet Rice Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	100
Kaybonnet Rice Seed	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	100
Klages Barley Root	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	300
Klages barley Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	75
Tobacco Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	75
Lafitte Rice Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	2	300	Lysing Matrix D	75
Lafitte Rice Sprout Leaf	6.0	QuickPrep-3 / QuickPrep	30	1	N/A	Lysing Matrix D	100
Soybean Seed	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	100
Corn Seed	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	100
Oat FL 502 Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	75
Oact FL 502 Seed	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	100
Riser Oat Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	70
Richland Soybean Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	100
Tam Wheat Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	75
Tam Wheat Root	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix A	80
Tomato, Early Girl, Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix D	75
Williams 82 Soybean Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	70
Wrens Rye Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	100
Pine Needle	6.0	QuickPrep-3 / QuickPrep	30	1	N/A	Lysing Matrix A	100
Basil Leaf Tissue	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix D	50
Cassava Root	6.0	QuickPrep-3 / QuickPrep	60	1	N/A	Lysing Matrix A	80

APPENDIX 3: RECOMMENDED PROGRAM SETTINGS

Category: Yeast & Fungi							
Preset Name	**Speed (m/s)**	**Adapter**	**Time (seconds)**	**Cycles**	**Rest Time**	**Lysing Matrix**	**Quantity (mg)**
***Saccharoomyces cerevisiae* cells**	6.0	QuickPrep-3 / QuickPrep	40	1	N/A	Lysing Matrix	10^8 cells
***Schizosac charomycespombe* cells**	5.0	QuickPrep-3 / QuickPrep	15	4	300	Lysing Matrix	10^8 cells
***Candida albicans* cells**	6.0	QuickPrep-3 / QuickPrep	30	2	300	Lysing Matrix	10^8 cells
***Cryptococcus neoformans* cells**	6.0	QuickPrep-3 / QuickPrep	30	4	300	Lysing Matrix	10^8 cells
***Aspergillus fumigatus* cells**	6.0	QuickPrep-3 / QuickPrep	30	2	300	Lysing Matrix	10^8 cells
***Fusarium Solani*cells**	6.0	QuickPrep-3 / QuickPrep	30	2	300	Lysing Matrix	10^8 cells

APPENDIX 4: FASTPREP® INSTRUMENTS OF PARTICLE GRINDING SYSTEMS

FastPrep-96™ Instrument

Nothing Resists Grinding, Lysis and Homogenization with the High-Throughput FastPrep-96™ System

MP Biomedicals' FastPrep-96™ ***(Figure A1)*** is a versatile high-speed homogenizer offering the ultimate in high-throughput sample preparation. Developed for resistant samples, the FastPrep-96™ instrument uses a high-speed linear motion to disrupt thoroughly any tissues and cells in just seconds through the simultaneous beating of specialized Lysing Matrix beads on the sample material. This high-performance system saves hours of work during the sample preparation stage.

High Throughput :	Process up to 192 samples simultaneously in 2 x 96 deep well plates
Excellent Reproducibility:	Consistent lysis results in every well with automated feedback control
Fast Processing Speed:	1800 Oscillations/min and 1.5-inch stroke — highest available
True Linear Motion:	Eliminates the need to re-orient plates mid-cycle

2 x 96 well plate adapter

included with instrument

Figure A1: FastPrep-96™ Instrument

The FastPrep-96™ instrument offer the highest power settings and widest variety of sample holders available (2 x 96 deep well plates, 96 x 2 mL, 48 x 4.5 mL, 24 x 15 mL,8 x 50 mL, and 1 x 250 mL tubes) ***(Figure A2)***and with the closed-loop, automated control of lysing power and time, the new FastPrep-96™ is the perfect solution for all of your sample preparation needs.

Figure A2: FastPrep-96 Sample Holders

FastPrep-96™ Ordering Information			
Cat No.	**Item**	**Unit**	**Price**
116010500	FastPrep-96™ Instrument (includes 2 x 96 well plate adapter)	1 ea	Contact for details
116010570	QuickFlex™ Sample Holder (96 x 2 mL)	1 ea	Contact for details
116010580	TallFlex™ Adapter (48 x 4.5 mL)	1 ea	Contact for details
116010560	TeenFlex™ Adapter (24 x 15 mL)	1 ea	Contact for details
116010550	BigFlex™ Adapter (8 x 50 mL)	1 ea	Contact for details
116010590	LargeFlex™ Adapter (2 x 250 mL)	1 ea	Contact for details
116010595	ConeFlex™ Legacy Adapter (allows any existing FastPrep-24™ adapters to be used on the FastPrep-96™ instrument)	1 ea	Contact for details

SuperFastPrep-1™ Personal Homogenizer

The Fastest and Most Powerful Handheld SamplePrep Tool

• Omnidirectional motion with the highest G's!
• Handheld system for lab and field use.
• Uses standard 2 mL screw cap tubes for lysis.
• Compatible with all FastPrep® Lysing Matrices.
• Compatible with all FastPrep® purification kits.

Figure A3: The SuperFastPrep-2™

The SuperFastPrep-1™ ***(Figure A3)***from MP Biomedicals is the newest addition to the trusted FastPrep Instruments for sample grinding. For the first time, FastPrep® technology is available in a lightweight, compact, handheld format. An innovation in the sample lysis industry, the SuperFastPrep-2™ is a portable omnidirectional bead beating system that attaches to a rechargeable, battery-powered rotary tool.

SuperFastPrep-1™ Ordering Information			
Cat No.	**Item**	**Unit**	**Price**
116011500	SuperFastPrep-1™ Instrument	1 ea	Contact for details

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