Cole-Parmer®

HG-400 MiniG®

Tissue and Cell Lyser for Biological Applications

Operation Manual

For 115V/230V (04500-08)

For Product Information

SPEX SamplePrep is now part of Cole-Parmer®.
The Cole-Parmer® HG-400 MiniG was formerly known as SPEX 1600 MiniG.

Over the years, we've acquired many high-quality and reputable brands. After many years of continual growth, we realize our brands are all as brilliant as each other. Rather than have a portfolio of complementary brands, we felt consolidating them under one world-class brand name enabled us to offer a single and significant brand experience. Through one brand we can speak in one voice through our team of experts who provide support in product selection, usage and troubleshooting to empower laboratories to run efficiently throughout the world.

Same Great Quality!
One World-Class Brand Name!

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1.0 INTRODUCTION

The HG-400 MiniG® is a mechanical disrupter that is designed to effectively disrupt cellular materials by oscillating one or two deep-well titer plates vertically. This motion allows the unit to be used to prepare sample tissue for extractions of nucleic acid, protein, and other constituents by shaking the tissue, steel balls and a buffering agent together in each well of the titer plate. Alternatively, small sample vials can be used in place of titer plates.

Operation of the HG-400 MiniG® is quick and easy: the titer plates or vials are secured in the clamp, and the cabinet cover is closed. The run time and operating rate are set and the START button pushed. When the run is complete, the cover is lifted and the vials are unclamped and removed. (Run times are typically less than two minutes.)

The isolation of nucleic acids from intact samples requires mechanically disrupting the samples, followed by the extraction and subsequent purification of the nucleic acid. Mechanical tissue disruption is often performed manually with handheld homogenizers, an approach that is not practical for high-throughput screening since manual grinding of tissues is slow, inconsistent, and will require cleaning between samples, which may lead to cross-contamination. Alternatively, the HG-400 MiniG® provides consistent sample preparation of one to two titer plates or trays of small vials during a single run.

Sample materials that can be prepared include seeds, stems, roots, leaves, and certain animal tissue. Because the unique vertical shaking motion of the HG-400 MiniG® is so strong, many seeds and other forms of plant tissue can also be pulverized dry in titer plates with the help of one or two grinding balls per well.

NOTE: ***PLEASE DO NOT OPERATE THE HG-400 MiniG® UNTIL YOU HAVE READ THESE INSTRUCTIONS AND ARE FAMILIAR WITH ITS CONTROLS AND CLAMP MECHANISM. THE HG-400 MiniG® IS INTENDED FOR USE ONLY BY QUALIFIED AND TRAINED PERSONNEL.***

2.0 SPECIFICATIONS

Type of Mixer:	Homogenizer, Bead Beater
Grinding Mechanism:	Stainless Steel, Ceramic, or Plastic Balls
Dimensions:	21.5 in. (54.6 cm) high x 11.25 in. (28.6 cm) wide x 17.0 in. (43.2 cm) deep
Weight:	49 lbs. (22 kg)
Capacity:	Maximum sample load 1.2 lb. (0.54 kg) ***NOTE: Operating with loads that exceed the recommended maximum weight limits can result in damage to the HG-400 MiniG®. Therefore, warranty restrictions or invalidation may apply.***
Typical Load:	1 or 2 titer plates (stacked) 24 or 48 Standard 2 ml Vials (stacked in 1680 Foam Holders) 12 Tall 15 ml Tall Tubes in 1685 Foam Holder Six 50 ml Tubes in 1686 Foam Holder Only 1 cryo-block (do not attempt to stack cryo-blocks)
Clamp Speed:	Variable 500 - 1500 strokes/min.
Clamp Travel:	1.25 in. (3.2 cm)
Electrical Specifications:	CE approved.
Fuse:	3AG 8-amp, 250 V slow-blow fuse
Cord:	115V/60Hz: 3-prong grounded plug supplied. 230V/50Hz: 2-prong European plug supplied. ***NOTE: Operator is responsible for supplying alternate line cord/plug if required.***
Safety Features:	Interlock prevents unit from running if cover is open.
Timer:	Digital in minutes:seconds, maximum 10:00.
Motor:	1/7 HP. Maximum speed 1516 rpm.
Environment:	For indoor use only at a maximum altitude of 6600 ft. (2000 m). Operate at ambient conditions between 40°F (5°C) and 104°F (40°C), with maximum relative humidity 80% below 88°F (31°C) decreasing linearly to 50% at 104°F (40°C). Main supply voltage fluctuations up to 10% of nominal voltage (115 or 230 volts AC RMS). Pollution degree 1: none or only dry, conductive pollution occurs.

3.0 UNPACKING

Carefully inspect the exterior of the packing box. Any visible damage should immediately be reported to the carrier. Remove all packing documents from the exterior of the box and file in your records. Remove the top of the shipping box, the foam packaging material, and the HG-400 MiniG® accessories (power cord, clamp, etc.). Grasp the HG-400 MiniG® on both sides, using proper lifting techniques, and place it on a stable bench top. Make sure that there is adequate clearance on the sides to reach the power switch at the rear of the unit and on top when the top cover is fully open. Visually check the unit to ensure that no damage occurred during shipping. Inspect the accessories and compare with the Packing List to ensure that no parts are missing.

Follow a logical sequence of steps as you inspect the unit.

1. Inspect the electrical input module for any visible damage.
2. Inspect the cabinet and top cover for any visible damage.
3. Ensure that the display and control panel are intact.
4. Open the top cover and inspect the interior of the unit.
5. Check the clamp assembly. Ensure that it is intact and undamaged.

If everything appears to be in proper order, store the packaging materials in case there is a need to return the unit for service or repair.

4.0 SETTING UP

4.1 Cabinet Set-Up

To open the cabinet, grasp the handle and raise the top cover to its full upright position. The hinge will hold the top cover in its open position. To close, grasp the handle and carefully lower the cover until it is fully closed.

A safety interlock will engage the HG-400 MiniG® only when the top cover is closed. If the START button is pressed while the top cover is open, the MiniG® will not start. Similarly, if the cover is opened during operation, the safety interlock will disengage, the motor will immediately stop, and movement of the clamp assembly will cease.

NOTE: The HG-400 MiniG® must be operated on a flat, hard, stable surface due to the vigorous motion and vibration generated during operation.

4.2 Installing the Clamp Assembly

To prevent damage during shipping, the clamp assembly is not installed at the factory. Before operation, this must be installed by the user.

To install the clamp, use the 3/16 in. Allen wrench (supplied in bag with power cords and operating manual) and the three bolts and lock washers (used to secure shipping block to shaft) supplied with the HG-400 MiniG®. Open the MiniG® top cover and place the clamp base on top of the shaft. Using the lock washers and bolts, secure the clamp base to the shaft with the Allen wrench, as shown in Figure 1.

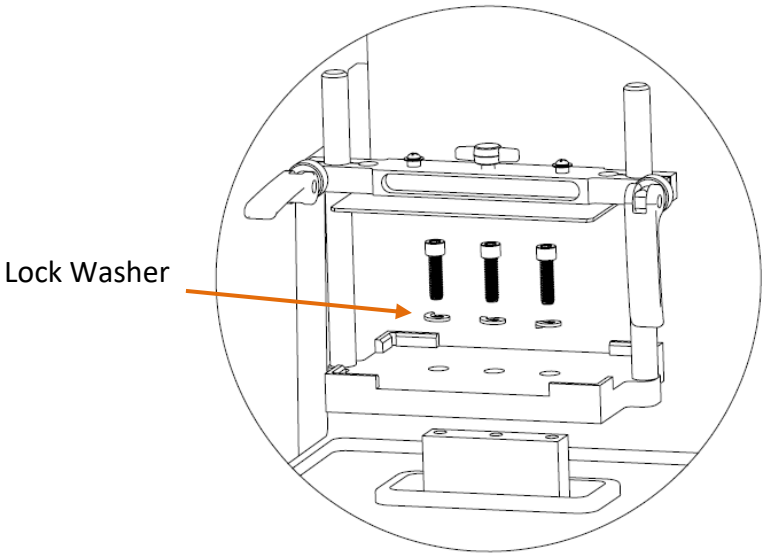


Figure 1 – Installing the Clamp

4.3 Electrical Connection

The power (off/on) switch, fuse tray, and power cord receptacle are located on the rear of the HG-400 MiniG® cabinet. The off/on switch is a standard rocker switch with symbols 0 (for OFF) and I (for ON).

The detachable power cord should be plugged firmly into its inlet, then into an electrical outlet. Make sure that the electrical outlet is easily accessible in case it becomes necessary to unplug the unit. For 115V/60HZ use, a 3-prong outlet fused at 20 amps is recommended. For 230V/50HZ use, the HG-400 MiniG® power cord has a standard European 2-prong plug, but modification by the user may be necessary to meet local electrical codes.

5.0 CE Safety Features

CE directives require that electricity to the motor and timer be interrupted whenever the lid is open, and that the clamp arm must stop completely before the lid can open.

Safety Interlock: The Safety Interlock cuts off power when the lid is opened; the switch is located inside the lid hinge at the back. Do not disconnect or damage lid hinge.

5.1 General Safety

***Note**: To avoid injury, follow the safety information in this section. Keep these instructions for future reference.*

***Caution**: Every effort has been made to ensure the HG-400 MiniG operates at a moderate noise level. The intensity of noise is directly impacted by the runtime, rate, container type, as well as the amount of balls. Ear protection is recommended during operation*.

It is essential that hands are kept free from the clamp area during operation and maintenance of the unit.

Turn OFF power to unit and disconnect the electrical cord before beginning any cleaning or maintenance of the unit.

6.0 CONTROLS

The control panel is located on the front of the HG-400 MiniG® (Figure 2). Upon start-up, "COLE-PARMER" and "HG-400 MiniG" will appear briefly on the display screen followed by the run time.

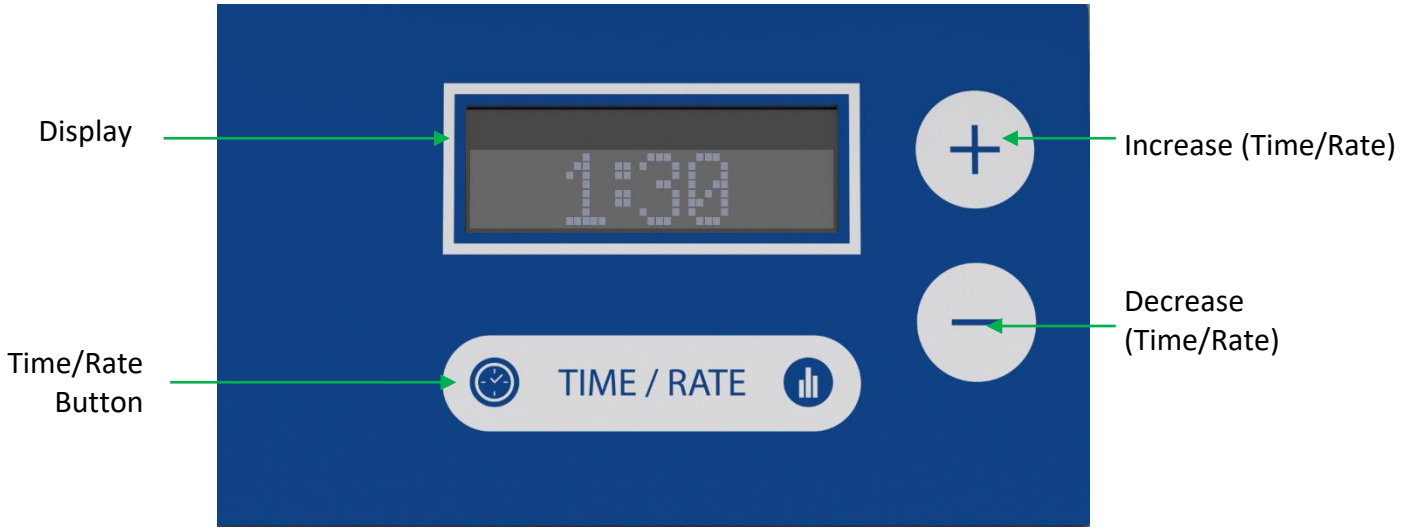


Figure 2 – Control Panel

6.1 Timer

The display shows the run times in minute:second format. For example, 1:30 represents one minute and thirty seconds. The run time is adjusted using the plus and minus buttons located to the right of the display screen. ***Press the plus button (+) to increase the run time in 5 second increments or press the minus button (-) to decrease the run time in 5 second increments.*** When the desired run time is reached, release the control button. The run time setting is saved once the HG-400 MiniG® is operated at the new setting. When the MiniG® is turned off, it will revert to the last saved run time upon start-up. The maximum run time is 10 minutes.

During a run, the time remaining will be shown on the screen, with countdown in 1 second increments.

6.2 Rate Control

To adjust or display the operating rate press the Time/Rate button located below the display. The display will then display the operating rate. Then use the plus and minus buttons to increase or decrease the operating rate in increments of 25 rpm. The minimum rate is 500 rpm; the maximum is 1500 rpm.

To return to the Time display, press the Time/Rate button again.

During a run the display will count down the time remaining in the run. However, to check the rate, simply press the Time/Rate button. The display will show the rate for 3 seconds before reverting to the timer. The timer will continue to count down while the rate is displayed.

6.3 Start and Stop Buttons

Press the green START button to start the HG-400 MiniG® in its timed run. The MiniG® will stop automatically at the end of a run. A run can be interrupted by pressing the red STOP button. This will stop the operation and reset the timer. Normally, the STOP button is used only in an emergency or when the unit is being test-run for a short period of time.

7.0 CLAMP

The clamp is the most critical component of the HG-400 MiniG®, as it must be carefully adjusted to hold the titer plates or vials firmly in place. The up-and-down motion of the clamp is extremely vigorous. Sample holders must be held securely in the clamp during operation to prevent damage and leakage.

The HG-400 MiniG® is supplied with an adjustable clamp that can accommodate 1-2 titer plates or 1-2 trays of small vials. Follow the clamp loading procedure described below and illustrated in Figure 3.

7.1 Loading Titer Plates into the Clamp

1. Place a titer plate into the clamp base. When using two titer plates, place the nesting plate (sold separately) between them, as shown in Figure 3.
2. On the clamp lid, ensure that the top rail center locking screw is backed out from contacting the floating plate.
3. With the locking levers in the released position, slide the clamp lid onto the side posts and press it down gently, until it comes into firm contact with the top of the titer plate.
4. While holding down the top rail assembly, push down on the locking levers to secure the top rail assembly. The locking levers have a preset adjustment knob to establish a desired locking force.
5. Tighten the center locking screw until finger tight and ensure that the titer plates are secure.

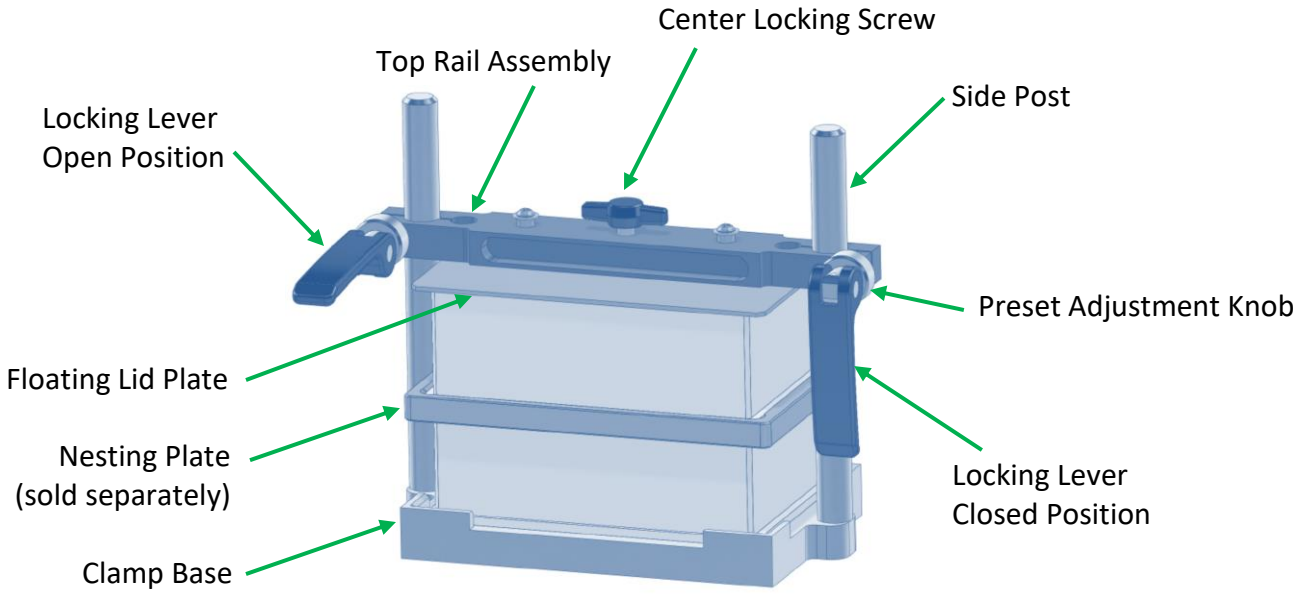


Figure 3 – Loading Titer Plates

7.2 Loading Vials into the Clamp

1. Insert the sample vials into the appropriate holder and place the holder into the clamp base. The sample load must be evenly distributed across the clamp to avoid excess wear to the HG-400 MiniG®. Also, the clamp lid must have an even surface upon which to rest. If running less than a full holder of vials, be sure to place vials at the 4 corners and 2 in the center (Figure 4) to support the clamp lid.
2. If small vials (2 mL or 5 mL) are used, two trays of vials can be stacked to maximize throughput, as shown in Figure 5. It is not necessary to use the nesting plate (sold separately) between the two vial holders.
3. Follow Steps 3-5 in Section 7.1 to secure the clamp.

NOTE: ***Never run the* HG-400 MiniG® *with the clamp lid unfastened or not properly secured. Damage and leakage will result. It is critical that the clamp lid be supported by at least six vials, one at each corner and two in the center. Empty vials can be used as place holders if few samples are run.***

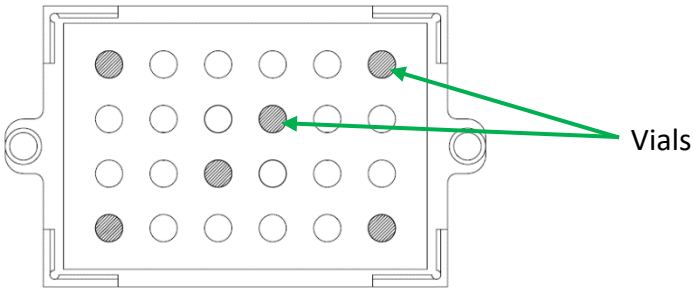


Figure 4 – Top view of Clamp with 2 mL Vials in Corner and Center Positions

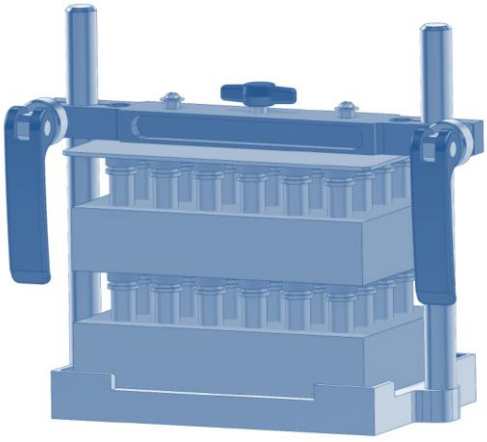


Figure 5 –Stacked Trays of 2 mL Vials (in two foam holders)

7.3 Cryo Accessories

1. For samples that must be processed cold, cryo accessories should be used. Cryo-Blocks are available for vials and the 2650 cryo-adapter is available for use with 96 well titer plates with round wells.
2. Place the loaded cryo-block or cryo-adapter into the clamp base. The aluminum nesting plate (sold separately) can also be chilled and placed on top of vials or a titer plate to help maintain the sample at cold temperature during processing.
3. Follow Steps 3-5 in Section 6.1 to secure the clamp.

WARNING: ***Due to the weight of the cryo accessories, only one cryo-block or one cryo-adapter may be run. Do not attempt to stack cryo-blocks or cryo-adapters!! Excess weight can cause severe damage to the HG-400 MiniG®.***

7.4 Releasing the Clamp

1. At the end of a run, loosen the center locking screw on top rail assembly of the clamp.
2. Raise the locking levers to the open position.
3. Slide the clamp lid up on the side posts until the sample holders can be easily removed. It is not necessary to remove the clamp lid entirely.

7.5 Adjusting the Preset Adjustment Knob

The adjustment knob is preset at the factory and should not require adjustment when the HG-400 MiniG® is received and installed. However, if the locking levers become loose over time and do not lock the clamp lid securely to the side posts, it may require adjustment. To adjust, simply turn the adjustment knob slightly until the locking lever closes snugly, but does not require significant force to close.

Lock Sample Holder!

This warning symbol is visible inside the unit when the top cover is in the open position. It is essential that samples are securely locked into the sample holder (clamp assembly) before operation.

8.0 OPERATION

Before operating the HG-400 MiniG®, it is advisable to perform several "dry runs" to become familiar with the clamp and controls. The following steps outline a standard operating cycle:

1. Load and cap the titer plates or vials.
2. Clamp the sample holder in place.
3. Close the top cover.
4. Set the timer.
5. Set the operating rate.
6. Press the START button to run the HG-400 MiniG®.
7. When the run is complete, lift the top cover
8. Unclamp the lid and remove the sample holder.

NOTE: The HG-400 MiniG® must be operated on a flat, hard, stable surface due to the vigorous motion and vibration generated during operation.

8.1 Operating the Top Cover

To close the top cover, grasp the handle and slowly lower the cover to the closed position. The cover must remain closed during a run. At the end of a run, the HG-400 MiniG® will stop automatically. Lift the cover to its full upright position before unclamping the lid and removing the titer plates or vials.

8.2 Running the HG-400 MiniG™

Press the green START button to run. It will be obvious when the unit is running. The screen will display a countdown of the time remaining in a run. The HG-400 MiniG® will stop automatically at the end of the run.

To stop the MiniG® during a run, press the red STOP button. Operation will cease and the timer will reset.

If the top cover is opened while the HG-400 MiniG® is in operation, a safety interlock will disengage, the motor will immediately stop, and movement of the clamp assembly will cease. The screen will display a "LID OPEN" message and the START and STOP buttons will flash. The "LID OPEN" message will disappear once the cover is closed and the display will show the time remaining in the run. Press the green START button to finish the run or, to end the run and reset the timer, press the red STOP button.

If the MiniG® does not run when the START button is pressed, make sure the unit is plugged in and switched on via the rocker switch on the back of the cabinet.

9.0 ERROR MESSAGES

9.1 Lid Error

If the top cover is opened while the HG-400 MiniG® is running, the unit will stop running and the screen will display a "LID OPEN" message and the START and STOP buttons will flash. To restart, close the top cover and press the green START button to finish the run. To end the run and reset the timer, press the red STOP button. The "LID OPEN" message will disappear once the cover is closed.

9.2 Numbered Error Messages

Error messages other than "LID OPEN" are followed by a number, which indicates the type of problem. These are:

ERROR 1: Over temperature
ERROR 2: Low motor voltage
ERROR 3: Safe start error
ERROR 4: Other error

If an error message appears on the screen, this indicates the HG-400 MiniG® is not operating correctly. Contact Cole-Parmer service technician at 732-623-0465 for assistance. Please indicate which error message is displayed.

10.0 SAFETY RECOMMENDATIONS

The HG-400 MiniG® is intended for use only by qualified and trained personnel. For questions about the operation, maintenance, or service of the HG-400 HG-400 MiniG®, please call Cole-Parmer at 732-623-0465.

Every effort has been made to ensure that the HG-400 MiniG® is safe to operate. However, the safety protection provided by the unit may be impaired if the MiniG® is operated in a manner other than that described in this manual. In addition, the HG-400 MiniG® should only be used with accessories provided by or recommended by Cole-Parmer and must be used in the intended manner. The use of accessories not recommended by Cole-Parmer may negatively affect the safety protection provided by the unit and may void the warranty. For example, do not use glass vials in the HG-400 MiniG®. Impact of the grinding media may cause the vials to break, resulting in broken glass and spilled samples.

Do not use the HG-400 MiniG® with hazardous materials for which the unit was not designed. Be aware of the hazards of the materials that are being used, particularly in the event of a spill. For instance, use of a flammable liquid could create a fire hazard if a sample is spilled.

11.0 MAINTENANCE

The HG-400 MiniG® has been designed to provide trouble-free operation over a long period of time. To assure proper performance, the most important factor is cleanliness. Any spills should be wiped up immediately.

The HG-400 MiniG® cabinet is made of painted plastic and steel. The interior as well as the exterior surfaces of the unit are designed to be easily cleaned in case of a sample spill. To maintain the overall appearance of the unit, occasionally wipe the exterior and interior of the MiniG® with a mild window cleaner or similar product (use a soft non-abrasive cotton cloth).

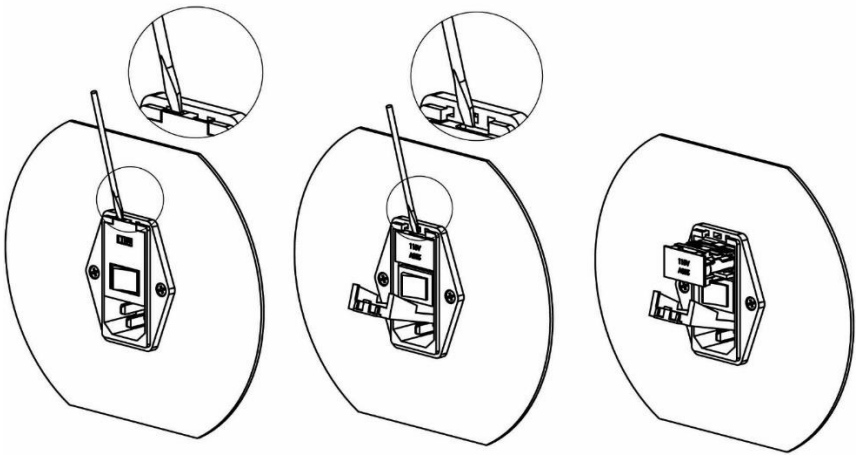
There is a raised "dam" around the clamp shaft to keep spilled liquid from dripping onto the motor or drive mechanism; however, any spills should be cleaned up immediately. It is never a good idea to leave the cabinet dirty. Sample contamination and/or equipment damage can result.

Normally, the HG-400 MiniG® requires no maintenance other than keeping it clean.

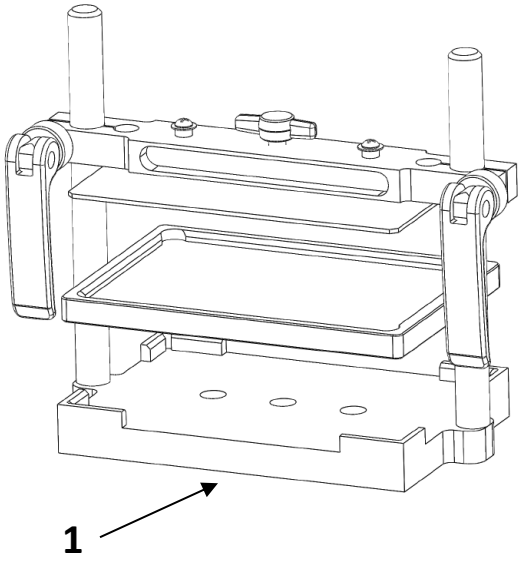
NOTE: Disconnect the electrical cord of the HG-400 MiniG® before beginning any cleaning or maintenance of the unit.

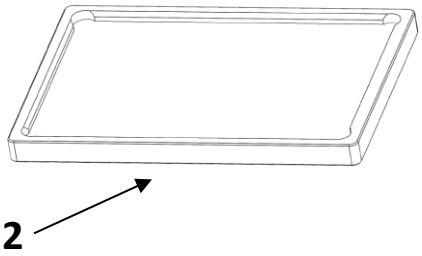
11.1 Changing the Fuses

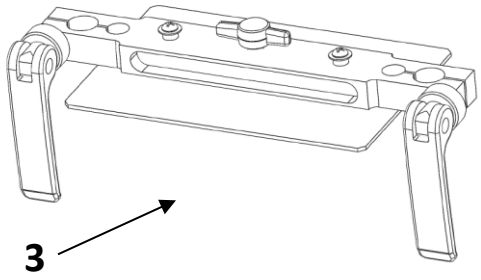
If the HG-400 MiniG® will not operate when the start button is pressed, it is possible that one or both of the fuses may have blown. To access the fuses, first remove the power cord from the back of the MiniG®. Then open the door on the fuse compartment by gently prying it open at the top and flipping it down. Use a small screwdriver to gently pry the red fuse holder out of the compartment, as shown in Figure 6. Remove the fuses and check them using a continuity tester. If either fuse is blown or defective, replace both with 3AG 8-amp, 250V slow-blow fuses, available from Cole-Parmer as VPN 93850.

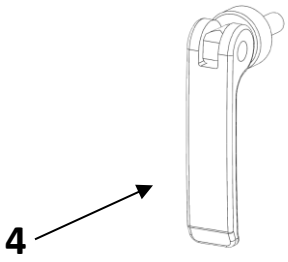


12.0 PARTS LIST









Item	Part Number	Description
1	1690	Complete Clamp Assembly
2	1690T	Nesting Plate **(sold separately)**
3	1691	Clamp Lid
4	51209	Locking Lever (2 per Lid required)
Figure 6	93850	Fuse, 8 amp, 250V slow-blow, (2 per unit required)

13.0 WARRANTY

Cole-Parmer® guarantees its products against defects in materials or workmanship for three years from the date of original shipment. Repairs, replacements, or parts are guaranteed for 30 days or for the remaining original warranty period (whichever is greater) for the item that was repaired or replaced. Items not produced by Cole-Parmer® carry the manufacturer's warranty only.

The warranty excludes wear parts. These are parts that wear out through use and must be replaced periodically for proper operation. HG-400 MiniG® wear parts include the timing belt and clamp. In the event that these or other parts require service, please contact Cole-Parmer to arrange a return shipment.

Wear Parts	
Part No.	Description
50147	Timing Belt
1690	Clamp Assembly

The customer pays return freight for warranty claims. If the warranty claim is valid, Cole-Parmer® will pay return freight to the customer. However, Cole-Parmer® reserves the right to judge whether a malfunction during the warranty period is due to defects in materials or workmanship, or to wear, negligence, or misuse.

13.1 Product Specifications

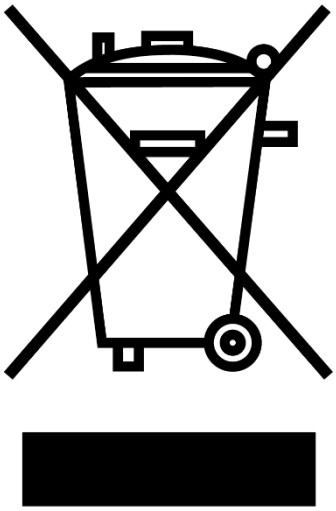
Every effort has been made to provide complete and accurate product operation and information in this manual. However, since specifications are subject to change without notice, changes may be made from time to time to improve the performance of the product.

13.2 To Arrange a Return Shipment

We want you to be satisfied with your purchase from Cole-Parmer®. Please bring any problem to our attention, but please DO NOT RETURN any item before contacting us for a Return Authorization Number and instructions. Unauthorized returns will be refused. The cost for all return transportation is the responsibility of the customer. Credit for returned merchandise will be issued only after goods have been received and inspected. Returned goods are subject to a 25% restocking charge.

14.0 INSTRUMENT DISPOSAL

In accordance to the EU Directive 2012/19/EU covering Waste Electrical and Electronic Equipment, all equipment with the disposal symbol must not be disposed of with general waste. (See Figure 7)



Disposal Label is located on the back of unit.

Figure 7 – Disposal Symbol

Throughout the European Community, guidelines regarding disposal regulations may vary from territory to territory. Please contact the national legislation or local authority for more information on proper disposal of all equipment with this symbol.

15.0 CONTACT US

Repair Service
Phone: 1.732.623.0465

Cole-Parmer
65 Liberty St
Metuchen, NJ 08840
US

Attn: Service and Repair
Please include RA Number on the shipping label.

Cole-Parmer®
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