ALLIED
HIGH TECH PRODUCTS, INC.

MetPrep 3™

Grinder/Polisher with PH-3™ Power Head

Operation Manual

2376 E. Pacifica Place * Rancho Dominguez, CA 90220 * 310-635-2466
www.alliedhightech.com
07/11, Version 3.3

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Safety Precaution Sheet

WARNING!

Please read carefully before operating the machine

1. All operators should be thoroughly trained in all aspects of machine operation, following the guidelines set forth in this manual, prior to use.

2. The machine should be placed on a stable, sturdy surface to allow for operation without hindrance to the controls.

3. Only consumables that are compatible with the operation of a grinding/polishing machine should be used.

4. Any local machinery and occupational standards must be strictly observed.

5. The operator must ensure the samples being polished are properly secured in the selected fixture prior to machine operation.

6. The operator should not be wearing any loose clothing, ties or jewelry that can get caught in the machine during operation.

Safety Labels

Electrical
This sticker is located on the rear of the machine and indicates where the power cord is connected. **Unplug the power cord when changing fuses or when performing any service.**

Hand Entanglement
It is possible to entangle your hands or fingers in the moving parts of this machine. Please use caution and turn off all power before reaching into the machine or when changing platens.

Protective Eyewear Recommended
It is recommended that protective eyewear be worn while operating the machine.

Machine Details

Model:	MetPrep 3™ with PH-3™ Power Head
Item No.:	#5-2500, 5-2500-230
Description:	Variable Speed Polishing/Grinding Machine
Serial Number:	_____
Voltage:	115 V AC (50/60 Hz) _____ OR 230 V AC (50/60 Hz) _____
Power, PH-3™:	186 W (¼ HP)
Power, MetPrep 3™:	466 W (⅝ HP)
Fuse:	10 A Slow Blow, 1.25", 250 V AC
Date of Mfr:	_____ (dd/mm/yyyy)
Dimensions:	15" (381 mm) W x 26" (660 mm) D x 25" (635 mm) H
Weight:	152 lb. (69 kg)
Shipping Dimensions:	34" (863 mm) x 34" (863 mm) x 34" (863 mm)
Shipping Weight:	215 lb. (98 kg)
Software Version:	_____
Recommended Operational Temperature Range:	50° F (10° C) – 100° F (40° C)
Humidity Range:	None Established If operated in humid climates, steel components such as bearings and motor components can fail prematurely.
Note:	The MetPrep 3™ will operate at either 50Hz or 60Hz frequency.

Warranty

Thank you for choosing Allied High Tech!

This product is warranted by Allied High Tech Products, Inc., to be free of defects in material and workmanship for **two (2) years** from date of original purchase. This warranty does not cover damage from abuse, neglect, negligence, accidental breakage, improper use or failure to exercise reasonable care and maintenance in accordance with the instructions accompanying this product.

To obtain warranty support or spare parts please contact your Product Application Specialist or Allied Technical Support at (310) 635-2466, M-F, 8:00 – 5:00 PM PST. Please be prepared to supply the serial number for the product you are calling about; this will help our staff confirm warranty eligibility and provide you with thorough, timely assistance.

At your discretion, in consultation with your Allied Product Application Specialist or an Allied Technical Services representative, we will be happy to send you replacement parts, at no charge - or - have you send the product to Allied for warranty repair. Most Allied products are designed for ease of parts replacement, so customer repairs, with no-charge parts from Allied, are often the quickest and easiest way to return a product to active service.

If you wish to return a product to Allied for warranty repair, you must first obtain an "REA", or "Return Equipment Authorization" number. An REA may be obtained from your Product Application Specialist, or from a member of our Technical Services staff. Please ensure that your REA number is referenced prominently on your shipping paperwork as outlined below. Please pre-pay shipping "to" Allied and provide an address and phone number for return shipping, which is paid for by Allied during the warranty period.

Please return your product to:

Allied High Tech Products, Inc.
REA#: _____
2376 East Pacifica Place
Rancho Dominguez, CA 90220 USA
P: (310) 635-2466

Please Note: Damage to products during transit to/from Allied, or resulting from improper in-bound packaging, will not be the responsibility of Allied. Therefore, please ensure that your product is securely boxed or packaged. It is further recommended that you insure your shipment for the full value of the product. Should damage occur during in-bound shipment, we will be happy to provide you with a formal quotation estimating the cost of materials and labor necessary to repair such damage. A Purchase Order will be required to make these repairs.

Repairs for Products No Longer Under Warranty

Allied will be happy to make repairs to products no longer under warranty. For these products we will be pleased to provide you with an estimate of the costs (materials and labor) necessary to make requested repairs. For non-warranty repairs, customer is responsible for in-bound (to Allied) and out-bound (from Allied to customer) shipping and handling costs. Non-warranty repairs are made with the same attention to detail and commitment to quality workmanship that is provided to "in" warranty customers.

Thank you for choosing Allied and please let us know if you have comments or questions about these warranty provisions.

Facility Requirements

WATER

Inlet Tubing Size (OD):	¼" (6.35 mm)
Minimum Inlet Water Pressure:	50 psi (3.52 kgf/cm²)
Maximum Inlet Water Pressure:	100 psi (7.03 kgf/cm²)

To avoid particles in the facility water line from clogging the orifice of the solenoid and causing its failure, the supplied water filter MUST be installed to avoid damage to the solenoid. The use of DI water does not guarantee the water is particle filtered.

Drain Tube Dimensions:	1¼" (32 mm) ID, 4 ft. (1.2 m) Length
Drain Rate/Capacity:	1.0 gal/minute (3.78 L/minute) (recommended @ 30 PSI)

Note: Do not SEAL the drain hose to the drain. A backup in the facility may cause the machine to flood. Any flooding of the interior of the machine that causes damage to components will void warranty coverage.

AIR

WARNING!

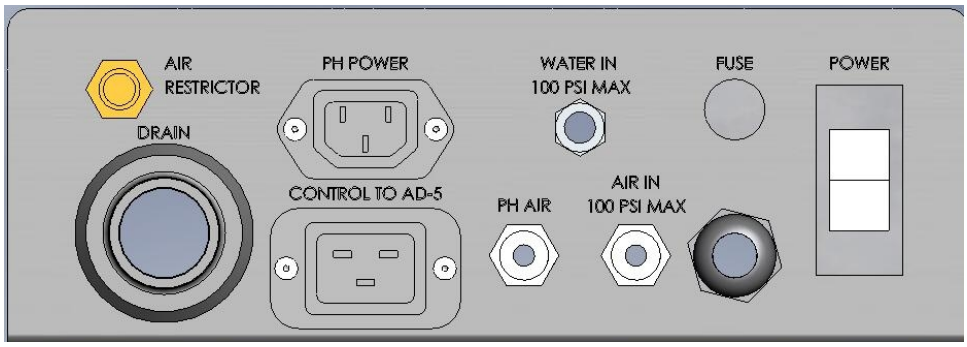
To ensure long, reliable life and avoid corrosion of air components, moisture-free, particle-filtered air should be supplied to the machine (ref. ISO Standard 8573-1).

The fitting for AIR IN is different from the water fitting by design. Install the air tubing by pressing the flat end of the tube into the fitting at the rear service panel labeled "AIR IN". To remove the tubing, push in the outer collar and pull the tubing out.

Inlet Tubing Size (OD):	¼"
Minimum Inlet Air Pressure:	50 psi (3.52 kgf/cm²)*
Maximum Inlet Air Pressure:	100 psi (7.03 kgf/cm²)

***Note:** Failure to supply adequate air pressure will negatively affect PH-3™ force functionality.

The incoming air restrictor allows adjustment of the acceleration rate of the sample holders and pistons. It is factory set but can be adjusted to the preference of the operator.



Installation

The unit should be placed on a sturdy, clean, dry surface with the control panel facing toward the operator. It is recommended the grinder/polisher be located close to a sink/faucet or cleaning basin so cleaning the samples is convenient.

Electrical

Machines operating on 115 V AC come supplied with an electrical cord that fits a North American (U.S.) outlet. Although Allied will supply a 230 V power cord for those machines, the prong pattern may not match the wall socket for that country of operation. In this case be sure to use a certified, properly rated power cord.

Before the machine is plugged into the wall socket, make sure the power is switched to the "Off" position on the power inlet at the rear of the machine. The power inlet contains a fuse holder that accepts a 10 A Slow Blow, 1.25", 250 V AC fuse.

The only power switch is located on the rear service panel. If any maintenance is done to the machine that requires removing the cover, the power cord **MUST** be unplugged first.

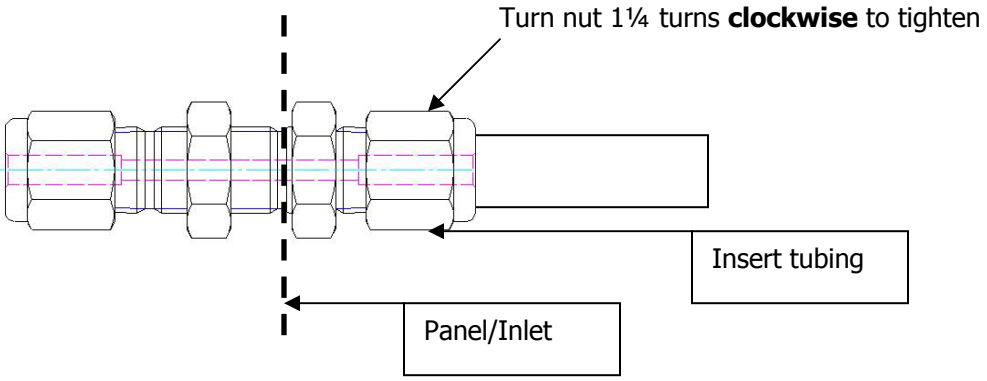
Plumbing

Water is used during grinding and polishing as a lubricant and to wash debris from the grinding surface for improved performance and results. At the rear of the machine, "WATER IN" marks the point where the inlet tube for the water source will be installed.

Installation

The water supply line MUST be routed through the filter assembly to maintain warranty compliance. Failure to regulate and control the water pressure may cause the filter housing to burst. The filter prevents foreign particles from clogging the solenoid orifice. Failure to regulate and control the water pressure may cause the filter housing to burst.

The supply line from the "OUT" connector of the filter housing is routed to the water inlet, where it is pressed/inserted into the stainless steel bulkhead marked on the rear panel as "WATER IN" until it stops. From finger tight, turn the nut on the bulkhead one (1) and one-quarter (¼) turns clockwise to "cinch" or "swage" (seal) the nut and ferrule onto the tubing.



Operation

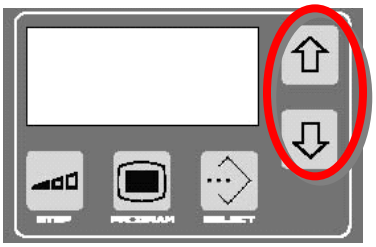
The MetPrep 3™ can be used for both semiautomatic and manual grinding/polishing applications.

Manual Grinding/Polishing

To disable the power head and operate only the platen and water for manual use, the JOG button next to the START and STOP buttons is used.

During this operation, the platen always rotates counter-clockwise and water can be activated by pressing the coolant button.

During operation using the "jog" function, the display looks like this:



Change the platen RPM using the arrow buttons (circled above) to the right of the display.

Semiautomatic Grinding/Polishing

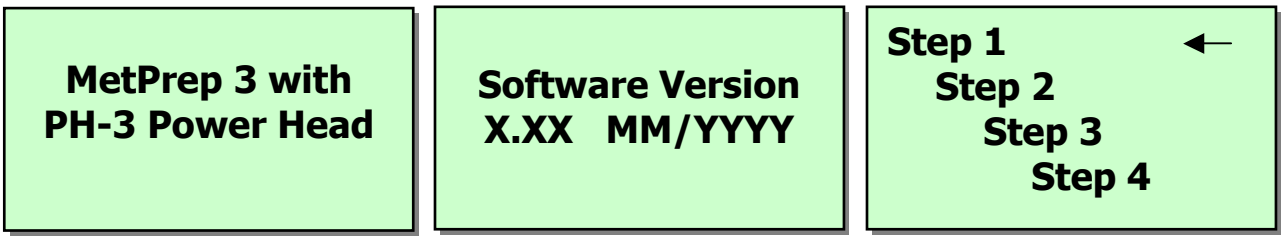
To perform semiautomatic, unattended grinding/polishing, the operator can store specific parameters in each Step.

Each "STEP" stores the following parameters:

Platen RPM:	40-600, 10 RPM increments
Mode:	Comp/Contra
Time:	0-120 minutes, 15 second increments
Sample RPM:	0-150, 10 RPM increments
Force:	Single/Central
Force:	Lb/F (pound/force) or N (newton), selectable units
	Central: 5-50 LbF/1 LbF Increments or 22-219 N, ~4 N Increments
	Individual/Single: 0-16 LbF/1 LbF Increments or 0-70 N, ~4 N Increments
Fluid:	Off, Water, AD-5™ (fluid dispenser)
Rinse:	0-60 seconds, 1 second increments
Frc Reduce:	On/Off
Reduce Time:	0-60 seconds, 1 second increments
Reduce %:	0-90, 10% increments
Frc Start:	On/Off

See the section titled "Programming Steps" for detailed information.

When the machine first powers on, the display will read (from left to right):



Button/Function Glossary

Jog: When pressed and released, the jog button activates platen rotation. Jog is used when applying water to the platen for cleaning purposes or for applying abrasive media (such as diamond suspension or extender, alumina powder/suspension) onto a new or existing cloth before polishing.

Use either arrow button to adjust the speed.

Stop: The stop button deactivates every function during operation. **Note:** Pressing the stop button does not power the machine off. If any maintenance is done to the machine that requires removing the cover, the power cord **MUST** be unplugged.

Start: The start button activates the selected step/mode.

Step: When pressed the step menu is accessed. The steps will be displayed when the arrow buttons are used to navigate the selection arrow through each line as follows:

1st screen

Step 1 ←
Step 2
Step 3
Step 4

2nd screen

Step 5 ←
Step 6
Step 7
Step 8

3rd screen

Step 9 ←
Step 10
Step 11
Step 12

4th screen

Step 13 ←
Step 14
Step 15:
Step1

5th screen

Step 17 ←
Step 18
Step 19
Step

6th screen

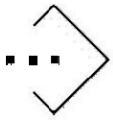
Step 21 ←
Step 22
Step 23
Step 2

7th screen

Step 25 ←
Development

See **"Programming Steps"** on page 13 for instructions on changing the parameters of each step.

Program: This button is used to program parameters of each "step" and to change the password.



Select: SELECT is used to toggle the selection arrow in display windows and navigate to different screens and select steps for programming

Water: The WATER button activates and deactivates the water. Either during manual or automatic operation, the water button will override any setting for water.

EMERGENCY STOP

The Emergency Stop switch is used to stop/cease operation of the machine in an emergency. This shuts power off to all components. The red knob is rotated in the direction of the arrows to reset the power. Once power is restored, the machine will restart its power-up sequence.

Programming Steps

The MetPrep 3™ has twenty-five (25) programmable steps that maintain machine settings during operation of a cycle.

It also features a "Procedure Development" step. This step is useful when developing a procedure by allowing the operator to adjust Platen RPM, Sample RPM and Force during operation to optimize conditions.

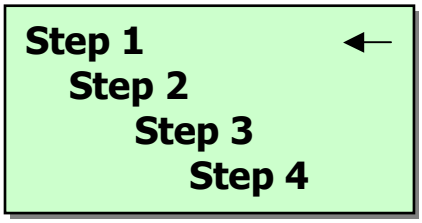
Settings

The following settings can be individually adjusted in each of the first 25 steps:

Platen RPM:	40-600, 10 RPM increments
Mode:	Comp/Contra
Time:	(time of cycle) 0-120 minutes, 15 second increments
Sample RPM:	0-150, 10 RPM increments
Force:	Single/Central (adjusts force values according to mode of operation)
Force:	LbF (pound/force) or N (newton)
Fluid:	Off, Water, AD-5
Rinse:	0-60 seconds (1 second increments)
Frc Reduce:	Off/On
Reduce Time:	0-60 seconds (1 second increments)
Reduce %:	0-90
Frc Start:	On/Off

Programming Steps

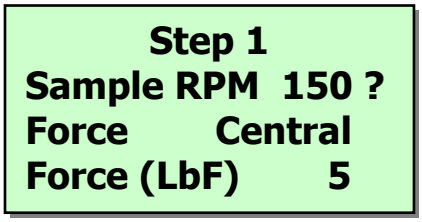
Navigate to the "steps" menu shown below:



Using the ARROW buttons to the right of the display, scroll the indicator arrow to the step to be programmed.

Once the arrow is aligned with the step to be programmed, press the SELECT button to enter the settings menu.

To change the value of any parameter, scroll the arrow to the line of that parameter and press the PROGRAM button. A "?" will appear in the field adjacent, and pressing either arrow button will adjust the value accordingly. Once the value has been selected, press PROGRAM to set it into memory.

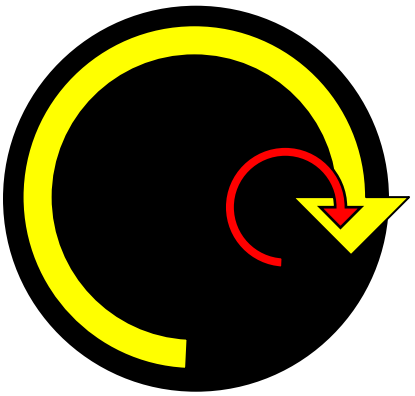


Sample RPM represents rotation speed of the sample holder, variable between 0 and 150 RPM.

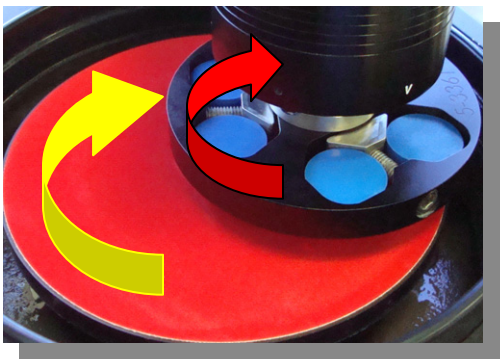
Comp/Contra

The terms "Comp" and "Contra" refer to the directions of the platen and sample holder.

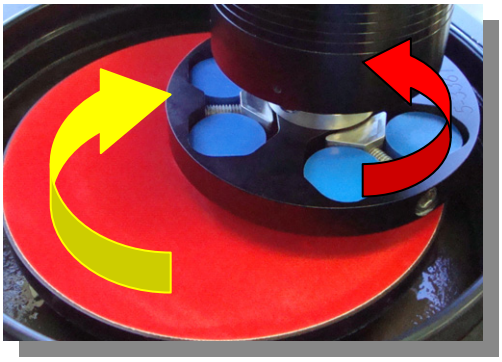
When Comp is selected the platen and sample holder rotate in the same, complimentary direction:



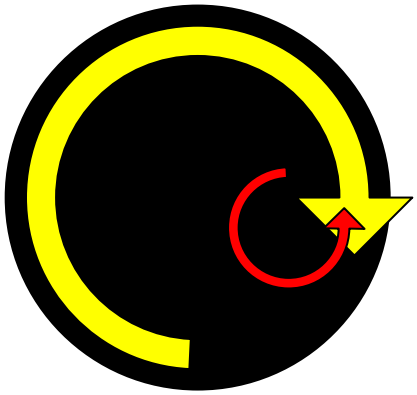
COMP



When Contra is selected the platen and sample holder rotate in the opposite, contra direction:



CONTRA

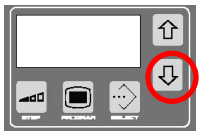


Step 1:	
Platen RPM	250 ←
Mode	Comp
Time	1:15:30

Since the list of function settings cannot be displayed in its entirety, continue scrolling with either arrow button to view other settings.

Selecting Units of Force, LbF/N

The unit of force displayed may be either pound-force (lbF) or Newton (N). To switch between units, follow these steps:



1) Turn machine power off.
2) Turn machine on and press and hold the down arrow.
3) Release the down arrow when the screen goes blank.
4) Toggle the unit by pressing the down arrow.
5) Press SELECT when the desired unit is displayed. The screen will now display the "step" menu screen and the parameters stored within the step.

Step 1	
Fluid	**Off◄—**
Water Last	**0s**
Frc Reduce	**Off**

"Fluid" allows selection of water, AD-5™ (fluid dispenser) or Off. When set to "off" no water is activated when the step is started. Selection of "AD-5" will send a signal to the AD-5™ fluid dispenser, if it is hooked up to the machine, causing it to start when the step is started. When "water" is selected, water will be dispensed from the nozzle. Water is generally used for grinding applications and to flush/rinse the platen.

"Water Last" provides a flush, or rinse, activated in the last XX seconds of the duration value. It is commonly used to wash/rinse or "flush" the cloth, samples and fixture with water and strongly recommended when colloidal silica, colloidal silica/alumina or colloidal alumina is used as the abrasive.

Step 1	
Reduce Time	**0s◄—**
Reduce %	**00**
Frc Start	**Off**

Frc Reduce (Force Reduction)

At the beginning *and* end of any step, the force applied to the sample holder and/or sample(s) can be reduced. In some cases, gradual application of force onto a sample produces a more shallow scratch and may protect delicate, brittle samples from cracking.

Reduce Time

This value defines how much time force reduction will occur at the beginning and end of the cycle.

Reduce %

This value defines the percentage of the total selected force that will be deducted during the reduction time.

Frc Start

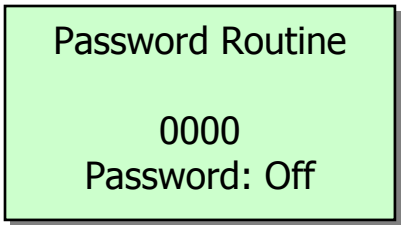
At the beginning of any step, the force is reduced by 70% for the first ten (10) seconds as a soft start function. This protects the samples from damage which a sudden full force may inflict. The "Frc Start" function can be turned on and off.

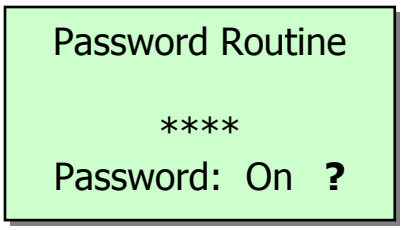
Password Protection

Each step may be password protected. Settings for each step will always be viewable when password control is on, but they cannot be changed unless the password is entered.

Activating the Password

Pressing and releasing the STEP button in the Step display screen will open the Password Routine display.





Toggle the arrow to off by using SELECT. Press PROGRAM to turn the feature on using the down arrow button.

Press PROGRAM again and the display changes to:

Scroll to the desired four-digit password number (#) using up and/or down arrows to the desired 4-digit number and press PROGRAM secure the number into memory.

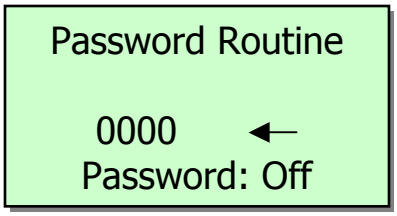
The display changes to:

To deactivate password protection:

From the step display, press STEP to enter the display as shown. Press PROGRAM and enter the password number.

Press START two times and the display changes to:

In order to deactivate the password, the password will need to be known or filed somewhere for reference.



FORGOT THE PASSWORD? Contact Allied for the reset procedure. The machine can still be operated using the "Procedure Development" step.

Platens

Each machine is supplied with one (1) 8-inch aluminum platen (item #5-2005). It is properly installed when the counter-bore on the underside of the platen is aligned to the centering bore of the platen base, and then rotated to engage the two (2) drive pins so the platen rests flat and stable. Magnetic platens are also available (item #5-2005M) for use with magnetic system cloths or discs.

Splash Ring

Each machine comes with a splash ring that is designed to collect and direct the water into the drain bowl. To maintain cleanliness, avoid contamination and for safety, it is strongly recommended the splash ring be used during operation. The splash ring should also be cleaned and wiped as needed to prevent buildup of dirt and debris.

PH-3™ Power Head Operation

The PH-3™ power head can be used to prepare up to three (3) single samples (Individual) or multiple samples (Central), semiautomatically. These two methods are referred to as IP (Individual Pressure) and CP (Central Pressure).

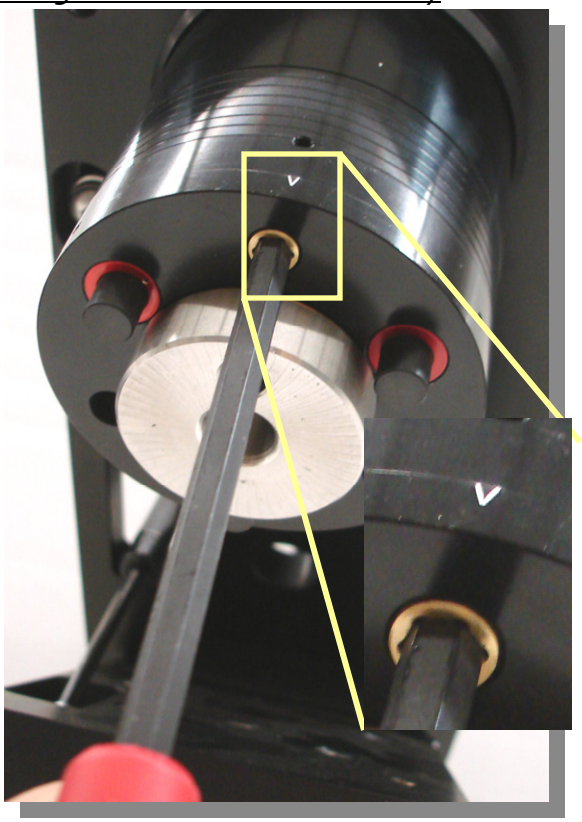
Individual Pressure (IP) Mount Holders & Functionality

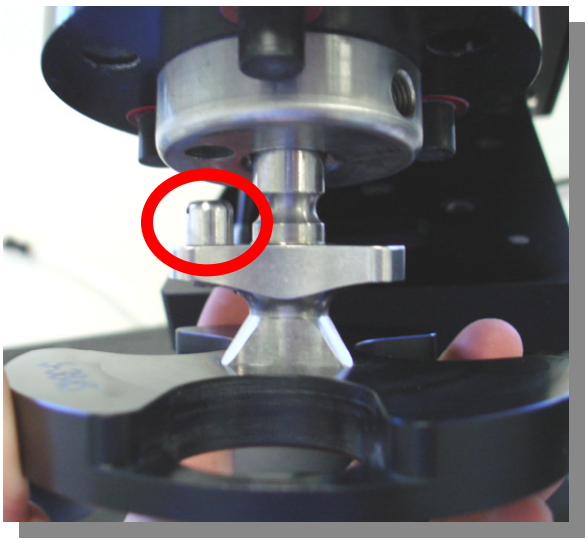
Individual pressure functionality allows up to three (3) mounts to be prepared simultaneously. Each mount floats independently and pressure is applied individually to each location in the holder. IP functionality is more suitable for precision/site-specific applications.

In each Step, the "Force" mode should also be set to "Single" so the value is accurately displayed.

A diverter valve must be manually engaged to switch between IP and CP functions. Where the white "V" is stamped into the cylinder, the supplied ¼" T-handle Allen wrench must be inserted in the hole on the bottom edge of the cylinder. By pressing upward and rotating the wrench one-quarter turn clockwise, the diverter will lock into place and remain for IP use.

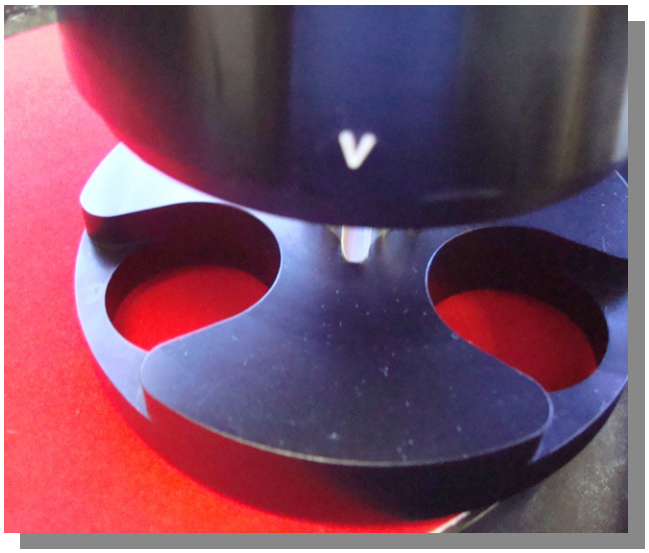
Note: Failure to lock it into place will engage the center piston and force the IP fixture into the platen.

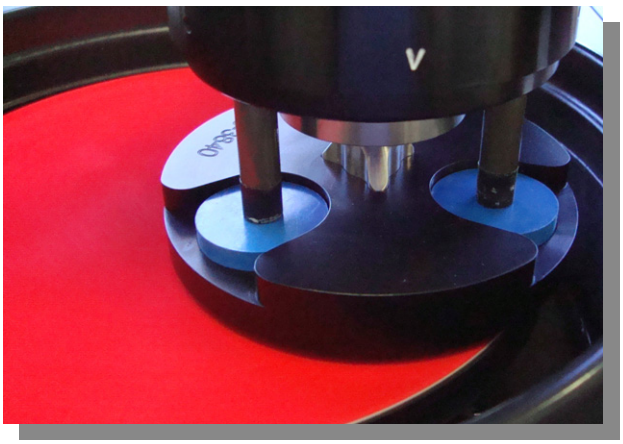




The mount holders are "keyed" into the central receiver of the cylinder so the drive pin (circled) is aligned as shown.

Laterally swivel the power head by loosening the positioning lever and rotating it so the mount holder is located between the edge and center of the platen, then lock it into place by tightening the lever.





During operation, the individual pistons will extend from the cylinder body to apply pressure to the back of the mounts. Where there is an empty location, the piston stops above the platen surface so it does not make contact.

WARNING!

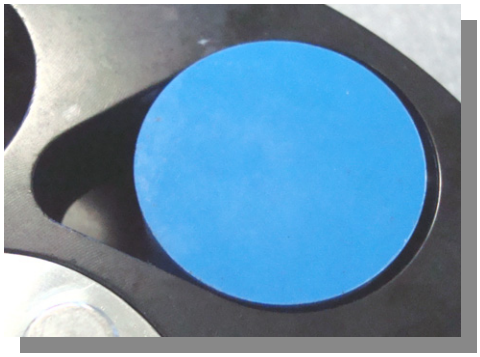
Keep hands away from sample holder when power head is activated.

Central Pressure (CP) Sample Holders & Functionality

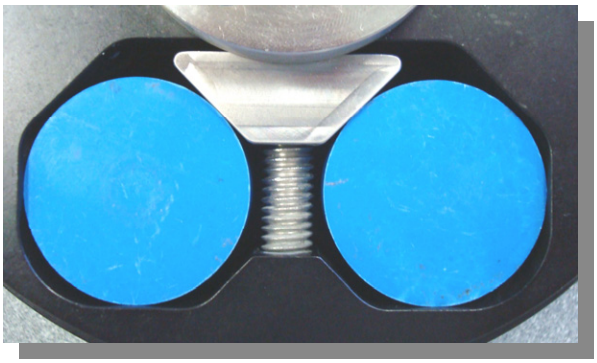
Central pressure is used when preparing a minimum of three (3) samples/mounts. Since aligning more than three (3) samples to dissect a specific location within the mount is challenging, this method is not recommended for precision/site specific applications.

It is important the samples be equally positioned around the center of the sample holder so they polish evenly and remain balanced. Failure to balance may cause damage to the machine, sample holder or operator.

Tear-Drop



Dual-Cavity



"Tear-drop" style sample holders are most commonly used for general applications. They are also recommended to hold larger samples that do not require mounting or that can withstand the screw pressure securing the sample/mount.

"Dual-Cavity" is a design that enables faster loading/unloading of round, encapsulated mounts by using a single screw for two mounts. These holders can be used to secure either hot or cold mounted samples.

Accessing Mounts/Holders/Platens

A convenient and unique feature of the power head is the ability to tilt the head/cylinder back to gain access to the sample holder/samples and to change the platen/abrasive. The release latch located on the right side of the power head (see Figure A) is used to disengage the lock and allow it to lift up and back from the platen. Once the sample holder is inserted and the machine is ready for use, the head/cylinder is simply lowered until it locks into place.

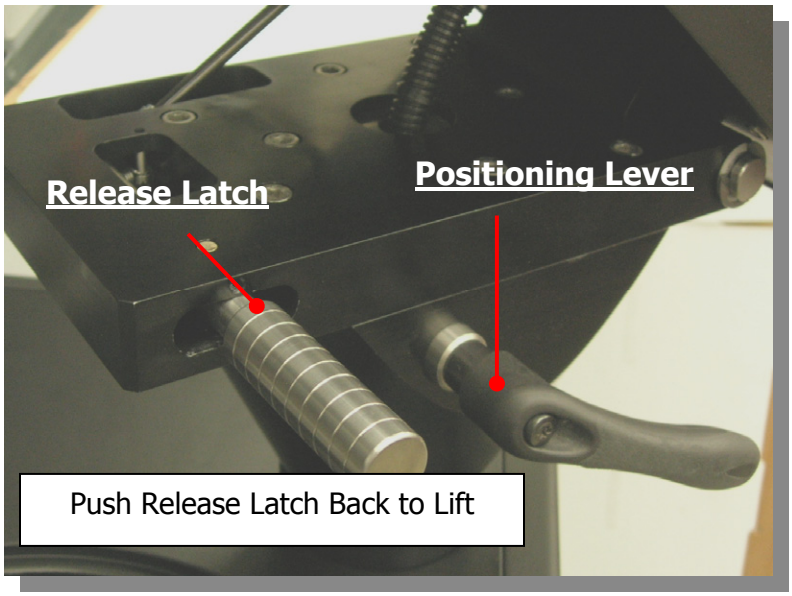
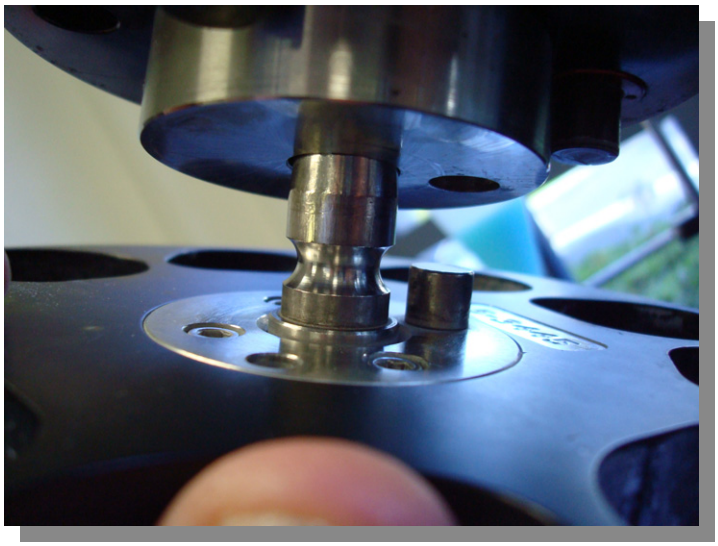


Figure A

Securing CP Sample Holders

Secure CP sample holders by aligning the drive pin of the holder with the central receiver in the cylinder and pushing it in. To remove the holder, pull it from the hub.

Note: Attachment and removal should be done when rotation of the grinder/polisher and power head has stopped and is tilted/retracted up, before the abrasive disc/cloth is changed. This helps prevent contamination of the abrasive and cloth surfaces.



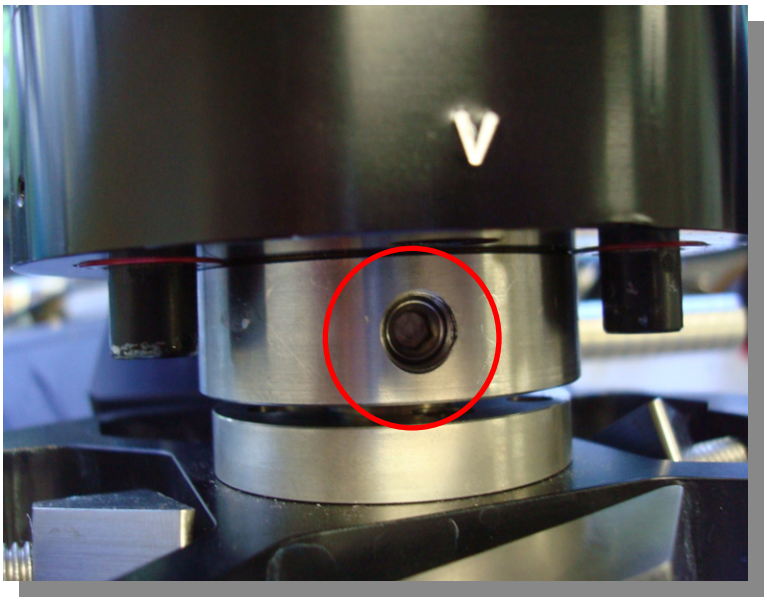
Adjusting Tension

Tension load is applied to a ball that retains the sample/mount holders by engaging the circumferential groove on the central pin of the holder.

Tension is adjusted with a 5/32 Allen wrench of the hex-shaped set-screw (see photo, inside red circle).

The fixtures should pull easily when being removed but remain in place when the power head is pulled down and latched.

Typically, CP sample holders loaded with heavier samples/mounts require greater tension.



Loading Samples/Mounts into CP Sample Holders

The "Sample Loading Fixture" is used to set the proper depth of mounts when secured in the CP holders so they protrude an equal distance from the bottom of the holder. This minimizes the volume of material to be removed from all samples to establish a common grinding plane.

Figure C illustrates how the sample comes to rest against the "loading" fixture base.

The CP sample holder is positioned on the sample loading fixture so it references against the machined edges. Once in position, the rod/bolt is used to secure the sample holder to the loading fixture so when the screws to secure the samples/mounts are tightened, the mounts/samples remain in place.

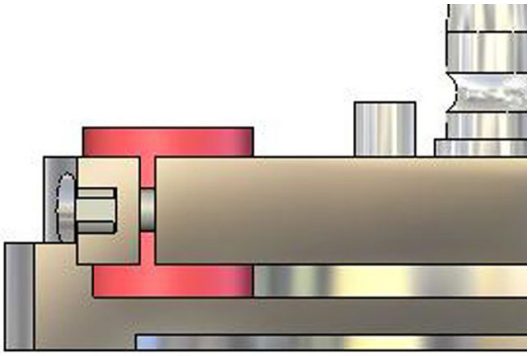
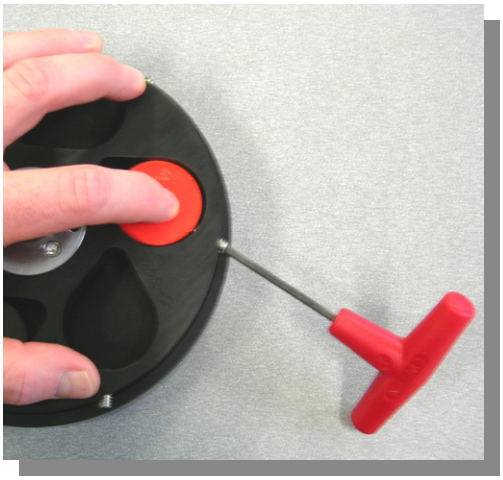


Figure C

To secure, apply pressure to the backside of the mount/sample and tighten the set-screw (tear-drop shown).



Sample/Mount Balancing

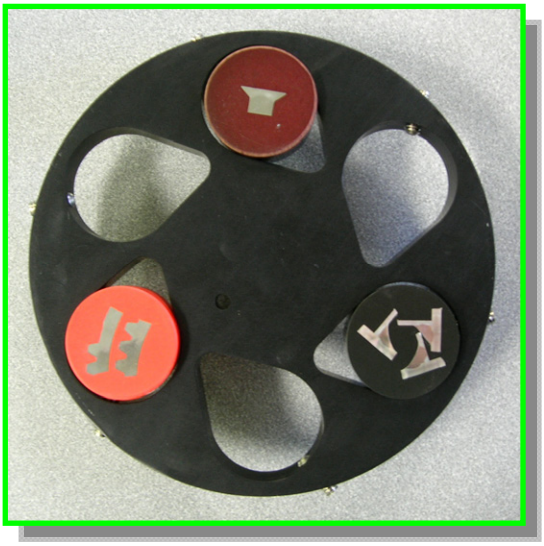
The two photos below show the **CORRECT** and **INCORRECT** scenarios for loading the sample holders (tear-drop shown).

The **CORRECT** method has the samples/mounts evenly spaced around the central pressure point/pin, balancing the pressure being applied to the sample holder.

The **INCORRECT** method has the mounts located unevenly around the central pressure point/pin, creating an unbalanced orientation.

CORRECT

Balanced



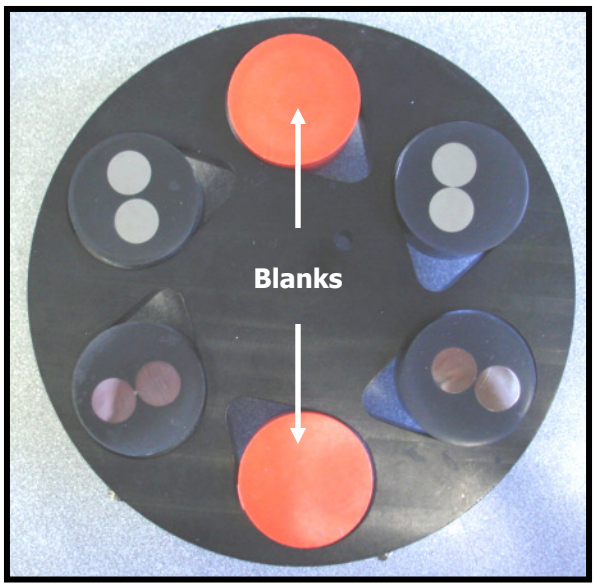
INCORRECT

Unbalanced

Note: Sample holders are shown upside down to show the polished mount. The center engaging pin is located on the underside out of view.

Using Blanks

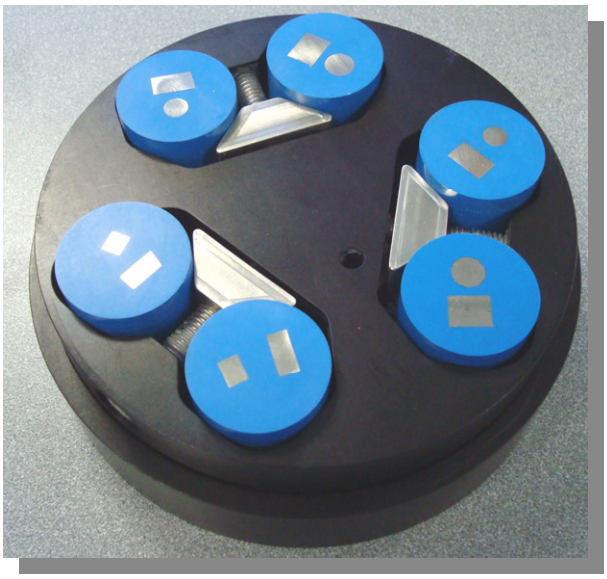
In the photo to the right, there are four (4) mounts containing samples secured into a six-position fixture. The other two places are being held by "blanks", or samples made to fill the empty spaces in the holder so it is properly/evenly balanced.



Unloading Samples/Mounts from CP Sample Holders

The Sample Loading Fixture is designed for "loading" and "unloading" of samples/mounts using the CP sample holders.

When flipped 180 degrees, the "unloading" side of the fixture is used to remove/unload each polished sample/mount to preserve the polished surface so it is not scratched. When unloading, the sample holder is positioned upside down so the polished surface of the sample/mount faces upward. In this position, the sample/mount can be inspected for light scratches and unloaded/removed from the fixture by loosening the screw.



Grinding

Grinding is performed using various grinding products. The type of product and grit (or micron size) chosen depends on the material, total surface area and amount that must be removed from one or all samples.

When grinding using Central Pressure functionality, all the samples/mounts must be ground to a common plane. Grinding is done to remove any deformation left over from the sectioning procedure and/or to expose a specific region in the sample from the bottom of the mount.

Although the speed ultimately used will be determined based on preference, a platen RPM between 200 and 300 is most common for grinding applications.

The amount of force used for grinding will also depend on material and sample size/surface area; based on a common 1¼" (32 mm) mount diameter, a "per sample" force between 4 and 6 LbF (pound-force) is most common. As sample size gets larger, the amount of force must increase to maintain psi (pressure or kPa) for the abrasive to work effectively and efficiently.

Silicon carbide is the most common abrasive used for almost any metallic or plastic sample.

Diamond discs, such as DiaGrid, are better suited for grinding non-metallic samples, composites, ceramics, refractory metals and other hard or tough samples. Consult the Allied catalog for information and suggestions on which bond type (metal or resin) is best suited for your application, or contact an Allied Product Application Specialist or Allied's Technical Service Department for more assistance.

Polishing

Polishing is performed to remove not only the scratches from grinding, but also the metallurgical deformation to properly reveal true microstructure. Failure to use the appropriate cloth or abrasive will yield inaccurate results and may generate polishing artifacts (smearing, comet-tails, rounding) that can interfere with accurate microstructural interpretation.

Polishing is done by using a polishing pad/cloth in combination with a loose abrasive delivered as a liquid (suspension or mixed slurry) or paste with a lubricant.

The most common platen and sample rotation direction is Comp (complimentary/same). The platen and sample rotation RPM selected will depend on user preferences. Generally it is ideal for the platen and sample rotation RPM to match.

The amount of force used will also depend on material and sample size/surface area; a "per sample" pressure between 2 and 5 LbF is most common (based on a 1¼" diameter mount), using less in the final steps of the polishing process. As sample size gets larger, the amount of force must increase to maintain psi (pressure or kPa) for the abrasive to work effectively and efficiently.

A common polishing sequence will include an intermediate step or steps such as 9, 6 or 3 micron (one or all three), followed by a final step. The surface finish requirements will depend on the feature size and magnification used to inspect the microstructure.

Adhesive-backed cloths can be adhered to a single platen (requiring a platen for each cloth) for multiple uses, or magnetic system cloths can be adhered to a single magnetic platen for more convenience, and also used multiple times.

Importance of Cloth Selection and Abrasive Combination

It is important that not only the right cloth be used/selected, but that the right abrasive and particle size is used with the selected cloth. This will influence performance and outcome.

For instance, if a 1-micron abrasive were to be used with a coarse woven cloth, the diamond will fall into the weave and fail to make contact with the sample/mount to cut/remove scratches from the previous step.

Consult the "Polishing Cloth" section of the Allied/supplier catalog for recommendation of abrasive particle size given for each cloth.

With intermediate polishing, to maintain planarity and flatness of the sample and mounting material, a flat cloth is recommended. This keeps polishing time to a minimum to maintain flatness. It also effectively removes the scratches and the deformed material remaining from the final grinding step.

Cleaning Samples/Mounts

Between <u>both</u> grinding AND polishing steps, the samples MUST be cleaned to ensure scratch-free surfaces and avoid contamination of remaining steps. Failure to clean the abrasive particles from the sample and holder between steps will bring these particles onto the surface of the next step, which will likely lead to contamination of that surface. In most cases, this means the cloth must be cleaned or replaced.

Optional Fluid Dispenser, AD-5™

A fluid dispenser enables unattended operation of the polishing process. If the AD-5™ is used, it is connected to the back of the grinder/polisher using the supplied connector cable.

Contact Allied for more information about this product.

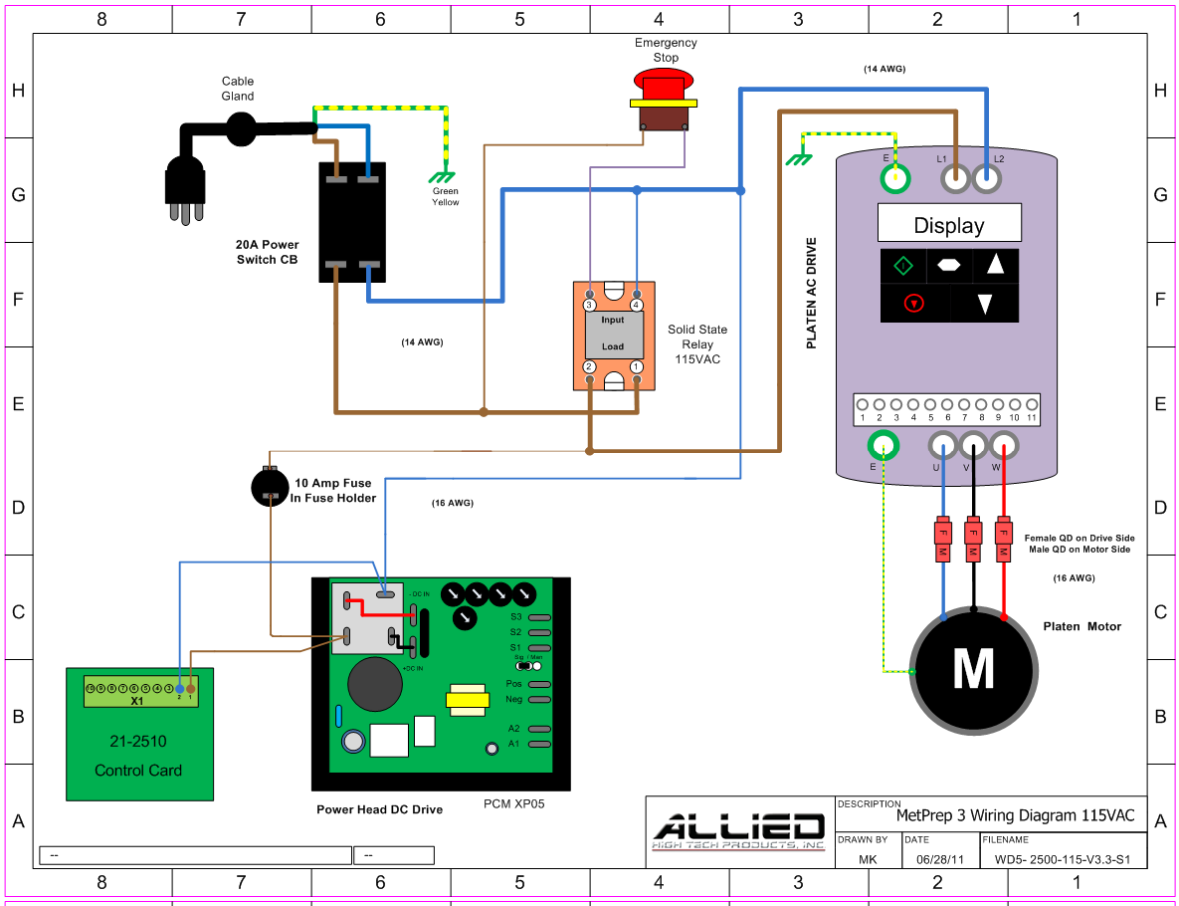
Maintenance

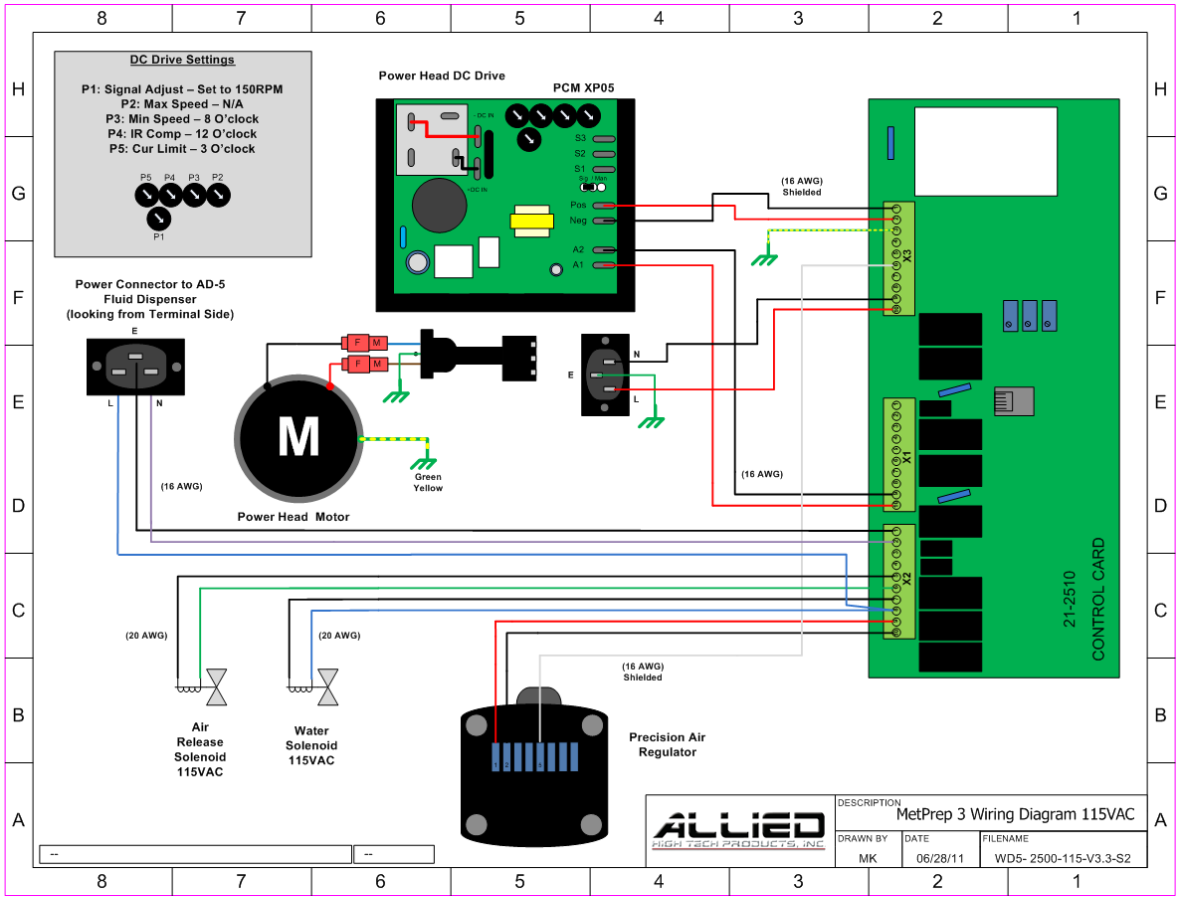
The MetPrep 3™ is designed to provide many years of trouble-free service. It should be cleaned and wiped after each use. There are no maintenance requirements for the motor or electrical components.

Sample holders and the outer surfaces of the power head should be wiped and cleaned after each use, to remove polishing suspensions, abrasive particles and other debris that may splash from the grinding/polishing process.

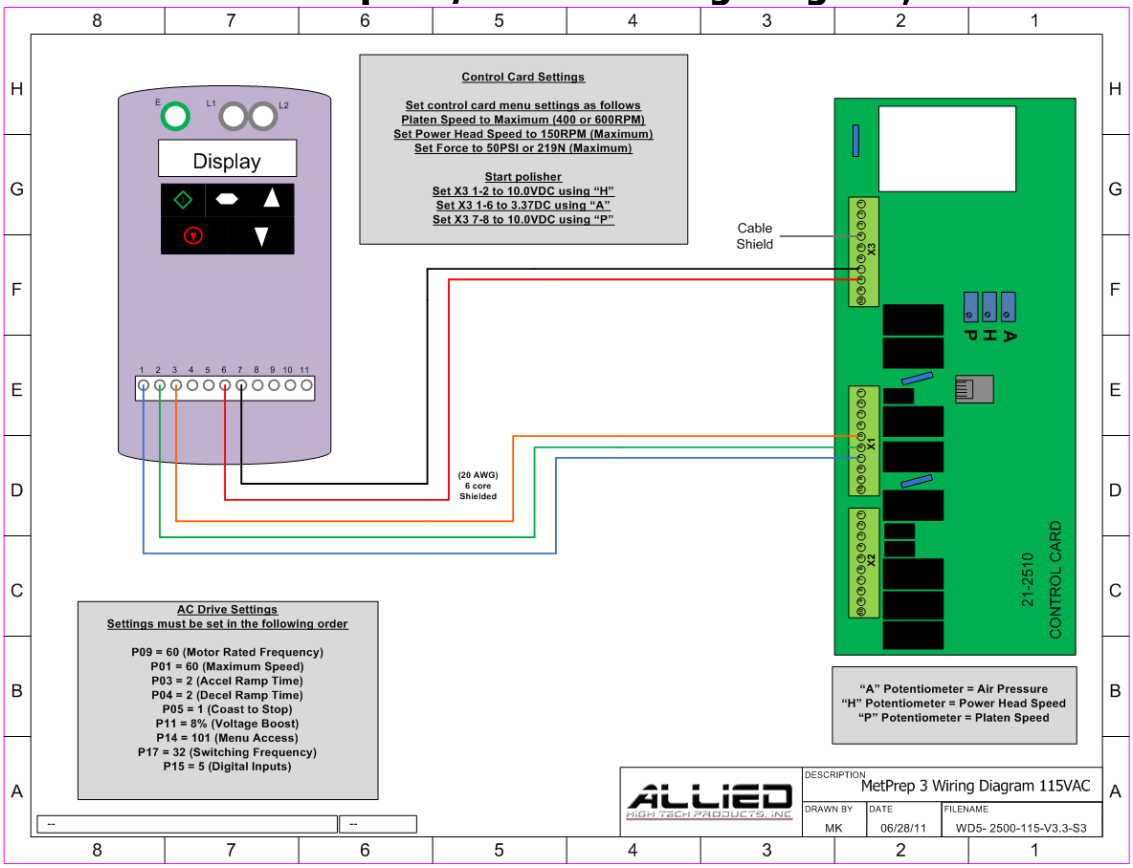
The drain bowl should be regularly inspected for clogging and cleaned as frequently as necessary to remove any debris that may collect or clog the orifice. Periodic "power" flushing of the drain is recommended to remove debris that settles in the drain from the bowl to the back of the machine. Flooding as a result of failure to clean the drain that damages any electrical or mechanical component of the machine will not be covered under warranty.

5-2500 MetPrep 3™/PH-3™ Wiring Diagrams, 115 V AC

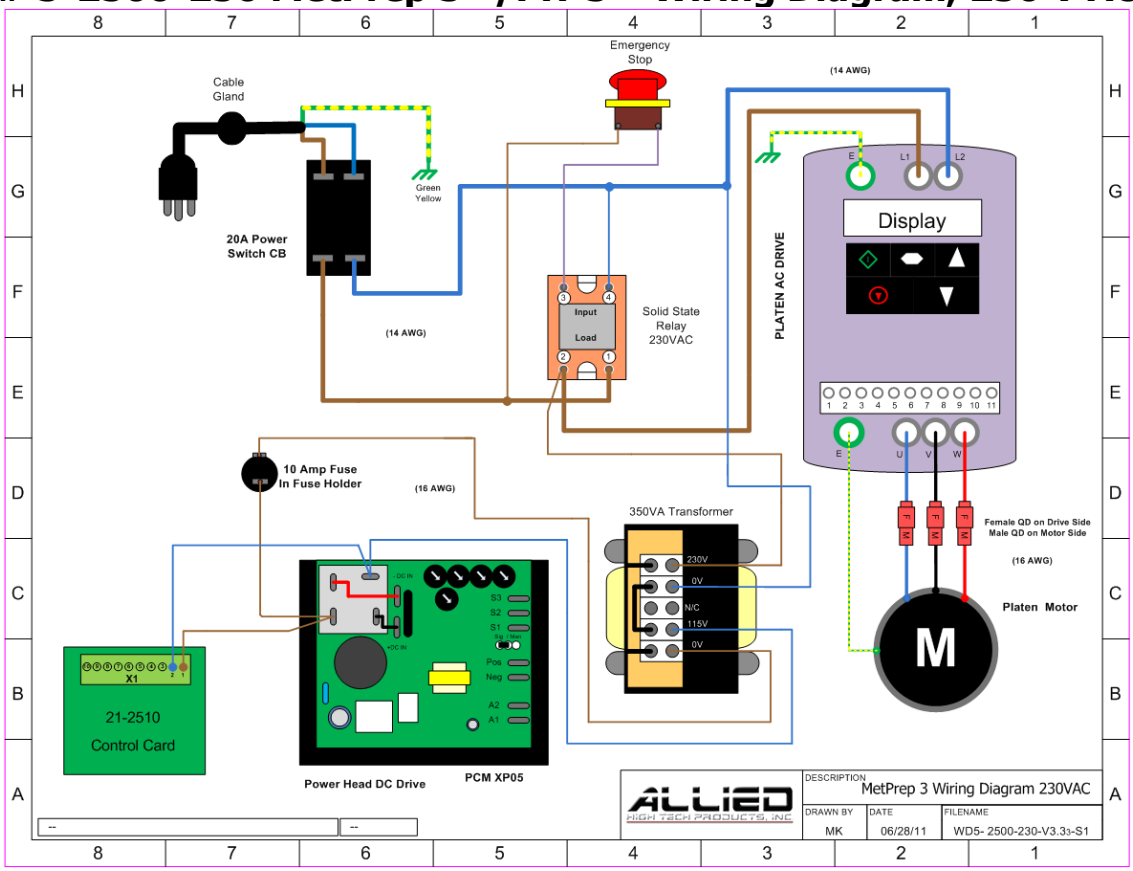




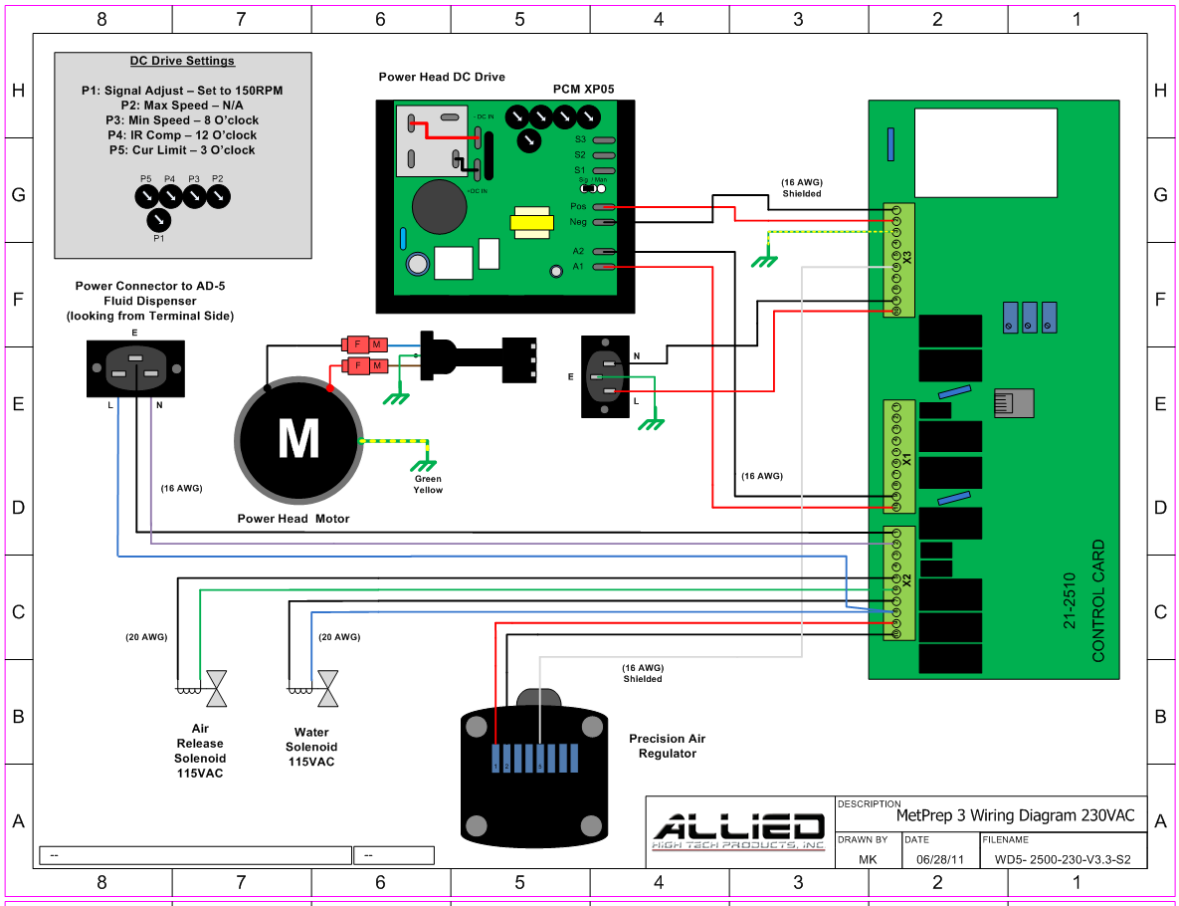
5-2500 MetPrep 3™/PH-3™ Wiring Diagram, 115 V AC

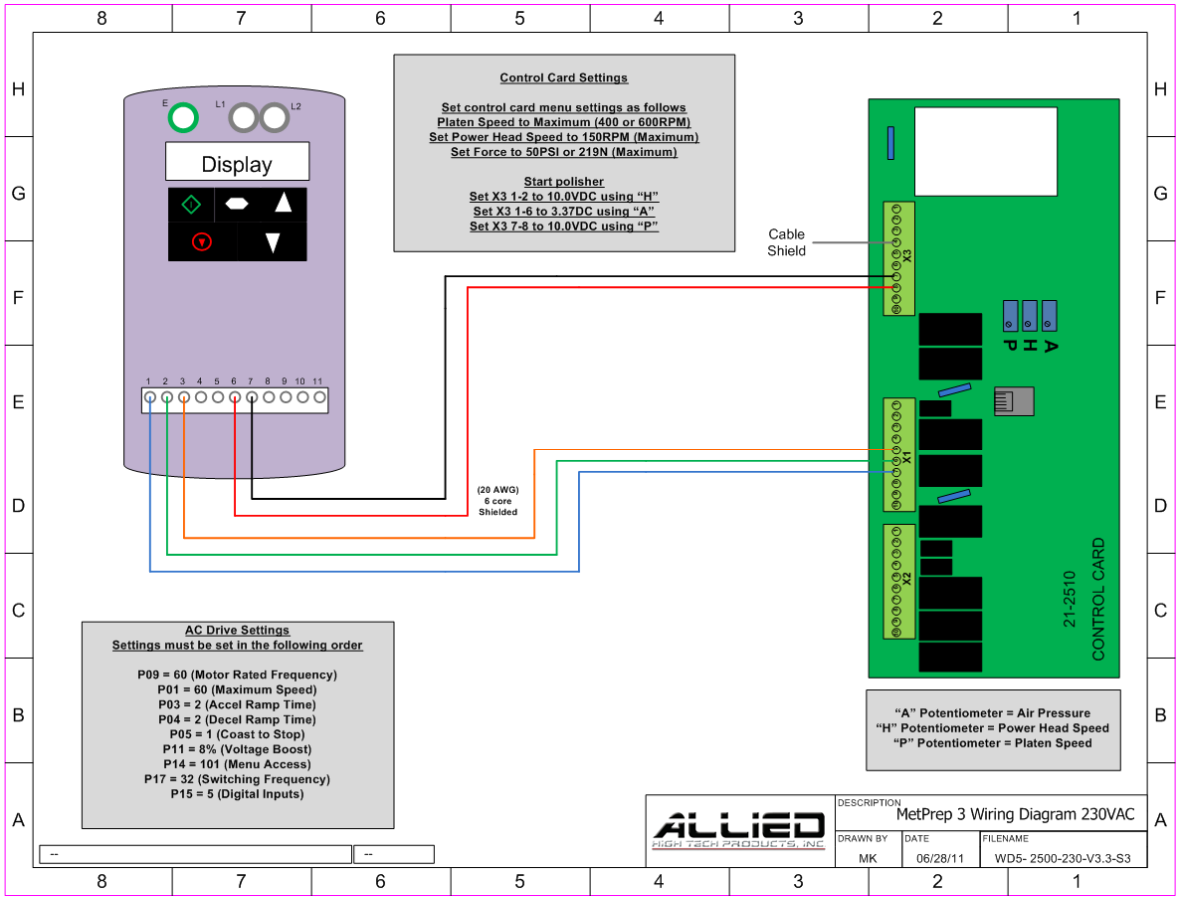


5-2500-230 MetPrep 3™/PH-3™ Wiring Diagram, 230 V AC

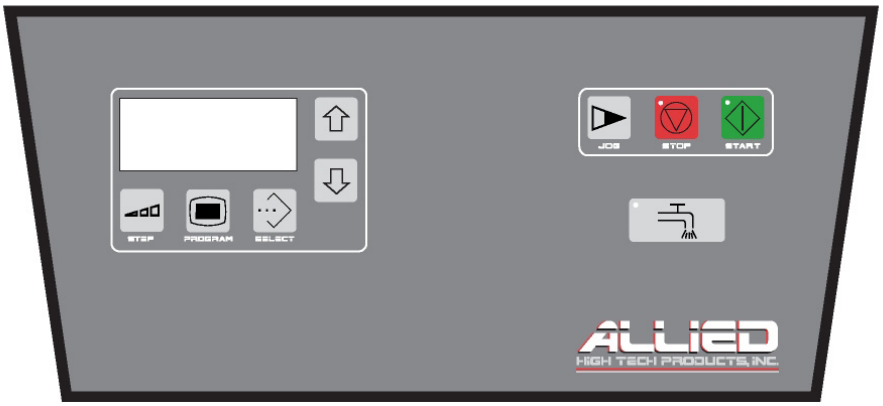


5-2500-230 MetPrep 3™/PH-3™ Wiring Diagrams, 230 V AC





Faceplate Diagram



Spare Parts List

MetPrep 3™/PH-3™		
Description	**Qty/Unit**	**Part #:**
AC Motor 5/8 HP, 1700 RPM, 230 V AC	1	21-6218
Motor, ¼ HP (Power Head)	1	21-3512
AC Drive, 1.0 HP, 4.3 A, 115 V AC (115 V Machines)	1	21-6226
AC Drive, 1.0 HP, 4.3 A, 230 V AC (230 V Machines)	1	21-6227
Platen Cover	1	21-2115
Circuit Board with Faceplate/Keypad	1	21-2510
Spindle Assembly	1	10-SPINDLE-8
Power Switch Breaker 20 A (RoHS Comp.)	1	21-6204
DC Drive PCM XP-05-115 V AC (Isolated Input 0-10 V)	1	21-2502
Water Valve/Nozzle and Hose Assembly, 11 Segment	1	27-6116
Drive Pin, 3/8" OD, Stainless Steel	2	21-2506
V Belt 4L310 (MetPrep 3™)	1	21-2123
V Belt 4L150 (Power Head)	1	21-3546
Solenoid Valve w/ Threaded Port for 1/8 NPT	1	21-2538
Gas Spring, 80 lbs.	1	21-3451
Contactor "Mini" 115 V AC Coil	1	21-6154
Solid State Relay, 115 V, 40 A (115 V Machines)	1	31-0136
Solid State Relay, 230 V, 40 A (230 V Machines)	1	31-0136-230
Air Regulator, Precision Electronic ¼" NPT Ports	1	21-6220

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