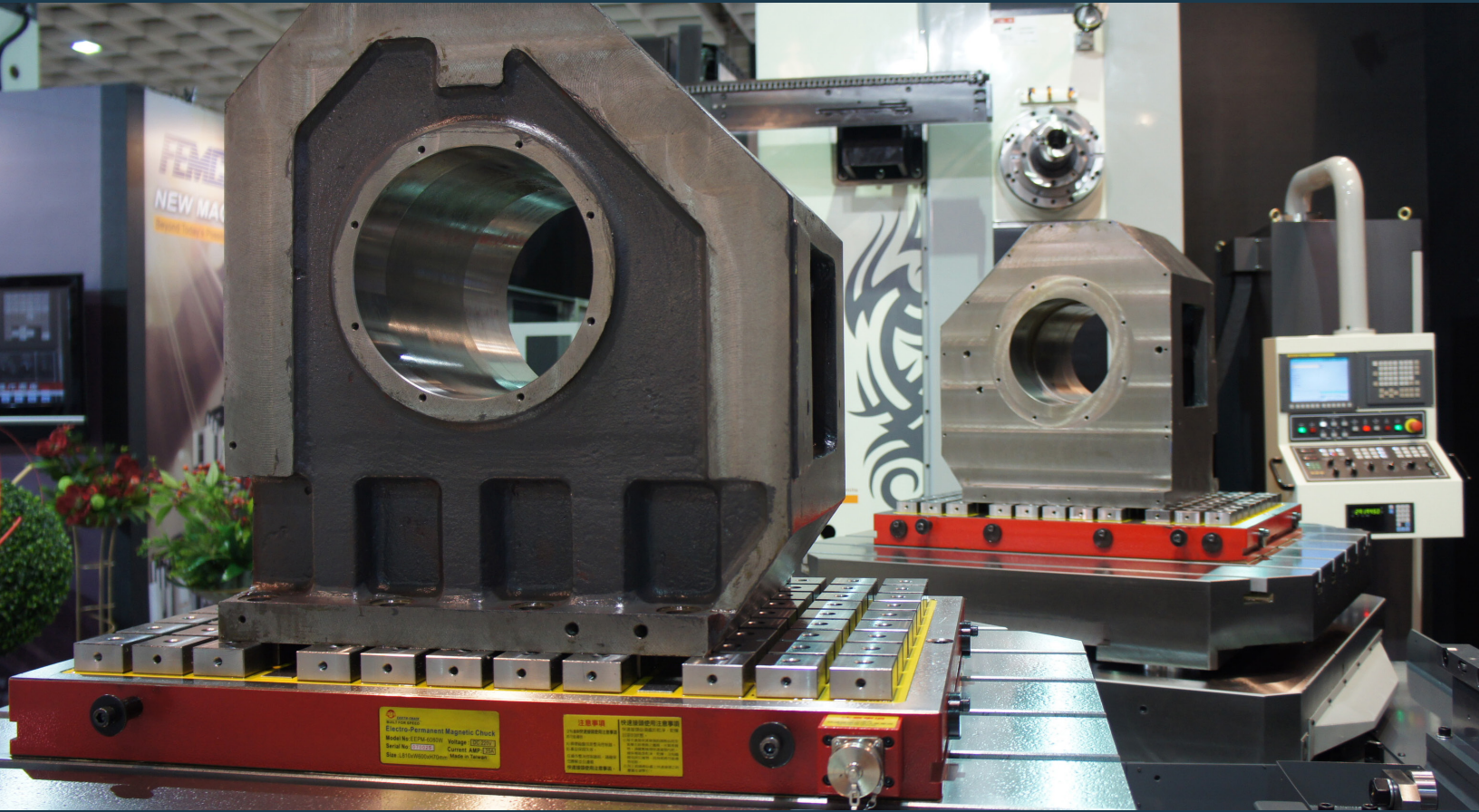




# EEPM MAGNETIC CHUCKS OPERATIONS MANUAL

## COMPLETE INSTALLATION AND TROUBLESHOOTING GUIDE



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## NOTES & TIPS FOR OPTIMUM PERFORMANCE

- Confirm your power supply meets the EEPM requirements.
- Stock is of ferrous metals, or any grade of steel and cast iron.
- Stock is of sufficient thickness and material type.
- Smooth clean contact between the magnetic chuck and the workpiece.
- Your results will vary depending upon the size, shape, thickness and material type you are holding.

## ELECTRICAL NOTES

- Electricity is NOT required to maintain magnetic holding power.
- Electricity is used only to reverse the polarity of the alnico magnets.
- When in a magnetized state, holding power is secure until demagnetized.
- The chuck will NOT lose holding power in the event of a power loss.



## CAUTIONS AND WARNINGS

- To prevent injury never put any part of your body (i.e. fingers, skin, etc) between a metal object and the chuck surface. Do not wear rings, watches, necklaces, bracelets etc., while operating the chuck.
- To prevent damage to the chuck and/or controller wait at least two (2) minutes after magnetizing or demagnetizing the a
- Always make sure the power receptacle on the chuck and the plug on the chuck controller cable are free of moisture, chips, and any contaminants before connecting the chuck controller cable to the chuck. Failure to do so could result in damage to the chuck and chuck controller.
- Always verify that the controller is properly connected to the chuck before operating the controls.
- Always replace the cap on the chuck power receptacle when disconnecting the power cable from the chuck.
- Always use workstops when operating the chuck at a power level lower than 8 to ensure the workpiece does not move during machining.
- High temperatures (176 °F or above) will cause permanent decay / loss of magnetic power. Do not operate the chuck under high temperature conditions.



# UNPACKING AND INSTALLATION

## UNPACKING THE CHUCK AND CONTROLLER

Upon receiving the equipment carefully unpack and verify the following items were shipped with your order:

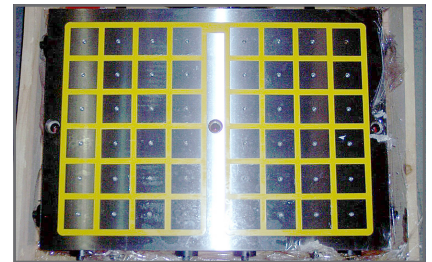
- 1 EEPM magnetic chuck
- 1 chuck controller with attached power supply cable for the chuck.
- 1 auxiliary hand-held remote & 1 touchscreen HMI remote control.
- 1 set of 4 toe clamps, and this Operations Manual.



**Reminder:** Review the packing list and confirm that all items listed arrived intact and undamaged. In case of damaged or missing items, please contact Techniks immediately.

### Power Requirements

208-480V/30A single phase



## EEPM CHUCK INSTALLATION

Read this manual completely before installing the chuck and controller. Always obey the CAUTIONS and warnings instructions in this manual. Installation should only be carried out by qualified personnel.

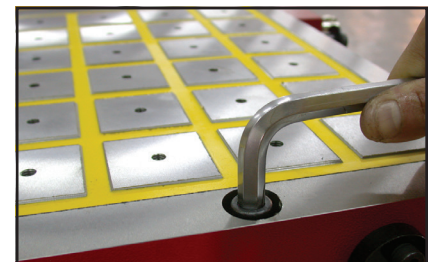
- Make sure all the EEPM components and your machine bed are clean and dry.
- Use a Techniks EZ-Lift Lifting Magnet to safely transport the chuck to your machine bed.
- Position the magnetic chuck on to the bed of your machining center or pallet, securing the chuck using the supplied toe clamps or T-slots.



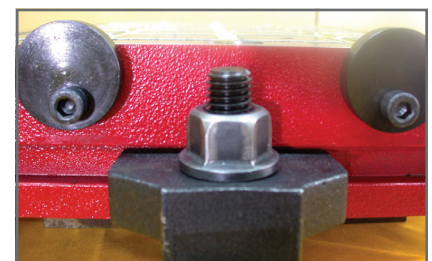
transporting the EEPM chuck

## FACTORS THAT AFFECT MAGNETIC HOLDING POWER

- Higher carbon content in the workpiece reduces the magnetic attraction between the chuck and the workpiece.
- Thickness of workpiece
  - a) above 1-1/4" = 100%
  - b) 3/4" - 1-1/4" = 85%
  - c) 3/8" - 3/4" = 50%
- Contact surface between workpiece and chuck. Chips, burrs, oil, dirt, rough or uneven surfaces will reduce holding power.
- Contact area with the chuck. Holding power is approximately 1 ton for every 4 poles.
- Temperatures above 176° will reduce holding power.



Securing EEPM chuck to bed "T" slots



toe clamps

# EEPM CONTROLLER INSTALLATION & FEATURES



## CONTROLLER FEATURES

1. Product ID: Please confirm if the product specification matches the specification on the label and your order form after unpack.
2. Magnetize Status (Green): Light is ON, the controller is magnetized.
3. Demagnetize Status (Red): Light is ON, the controller is De-magnetized.
4. Power Switch: "ON" to start controller power; switch "OFF" to shut down controller power.
5. Touch Screen Remote (HMI): For connect the controller to control MAG., DE-MAG and adjust magnetic force level.
6. Touch Screen Remote (HMI) Port: located on side of chuck
7. Standard Remote
8. Standard Remote Port: located on side of chuck
9. Chuck Cable: : Connect to magnetic chuck
10. Power Cord : Connect to a power source.
11. CNC Control Port: Connect with CNC machine center. Can be used to operate EEPM controller from CNC control.



Warning Sign: Please do not open the controller case due to risk of electrical shock.

Please keep this label on the controller body and in good condition.

We recommend having a certified electrician make all electrical connections and complete the Power Supply Check (below) to ensure proper power supply and wiring connections.

## POWER SUPPLY CHECK PROCEDURE

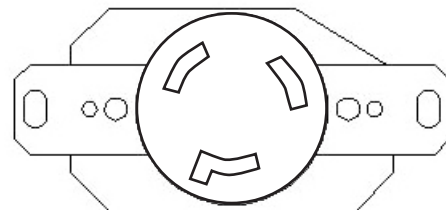
The EEPM chuck and controller must have the correct power supply to operate safely. Have a certified electrician test and verify that your power supply meets the power requirements listed below. Write the actual readings in the spaces below, and fix any problems before attempting to install and operate your EEPM chuck.

Power Requirements	ON-Site Actual
Voltage at outlet: 208 - 480V	
Amperage: 30A circuit	
Phase: single phase	
Hertz (Hz): 60	
10 gage wire from breaker box to outlet	
Dedicated circuit	

## ELECTRICAL CONNECTIONS

The chuck controller requires 208-480V/30A single phase power. For the single phase input, the cable has three leads.

1. Connect the wires as shown in the connection diagram (right). 2 cable leads are provided for phase/neutral, and one for ground.
2. For your convenience we have installed a NEMA L8-30P plug on the chuck controller power cord. You will need to provide a NEMA L8-30R receptacle. See drawing of the NEMA L8-30R.



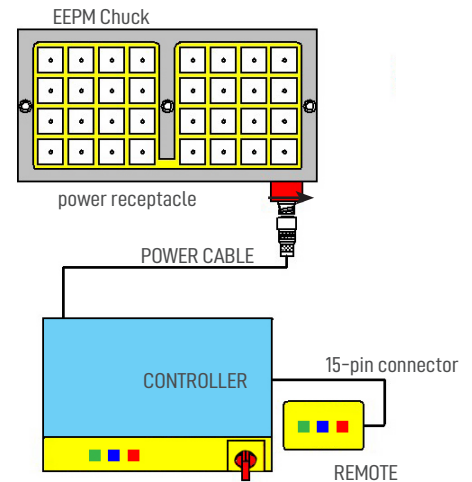
NEMA L8-30R

# EEPM CONTROLLER INSTALLATION & FEATURES

## CONTROLLER-TO-CHUCK CONNECTIONS

Place the chuck controller next to the CNC machine's control panel in a location away from chips, oil, coolant, and any moving parts of the machine, but near enough to the machine bed and EEPM chuck for convenient operation.

1. Connect the chuck controller power cable to the correct power source (208-480V/30A single phase)
2. Connect the standard or touch screen remote cable to the controller.
3. Remove the cap from the EEPM chuck power receptacle and gently spray the with dry shop air to knock out any unseen contaminants.
4. Connect the power supply cable from the controller to the power receptacle on the chuck. Make sure it is properly secured.



## INTERFACING WITH A CNC MACHINE CONTROL

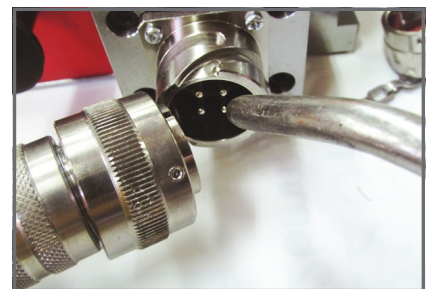
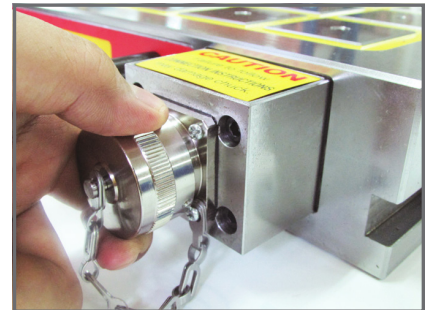
The EEPM magnetic chuck controller can interface with most CNC controls via the 9-pin connection on the back of the controller, allowing the magnetic chuck to be operated from the CNC control panel.

The magnetic status of the EEPM chuck (demagnetized or magnetized) is indicated with a set of dry contacts connected to pins 1, 2, & 3 of the CNC control connector. When the contacts close between 3 & 1, the chuck status is "demagnetized." When the same contacts are open, the chuck status is "magnetized." The contacts between 2 & 1 operate in reverse of 3 & 1.

To magnetize the chuck, connect the negative of an external 5-26 VDC supply to Pin 9 and connect the positive 5-26 VDC to Pin 7 for 0.8 to 1.5 seconds. To demagnetize the chuck, connect the negative of an external 5-26 VDC supply to Pin 9 and connect the positive 5-26 VDC to Pin 5 for 0.8 to 1.5 seconds.

The pin assignments are as follows:

- Pin 1 – Status Relay COM
- Pin 2 – Status Relay N.O. Chuck is magnetized
- Pin 3 – Status Relay N.C. Chuck is demagnetized
- Pin 5 – Demagnetize command
- Pin 7 – Magnetize Command
- Pin 9 – Command Negative (0V)





# STANDARD REMOTE OPERATION

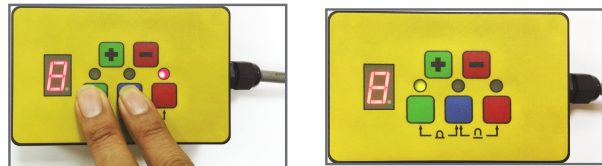
## POWERING UP THE CONTROLLER

1. Turn the power switch on the chuck controller to "On"
2. Watch mag/demag light on controller is activated.



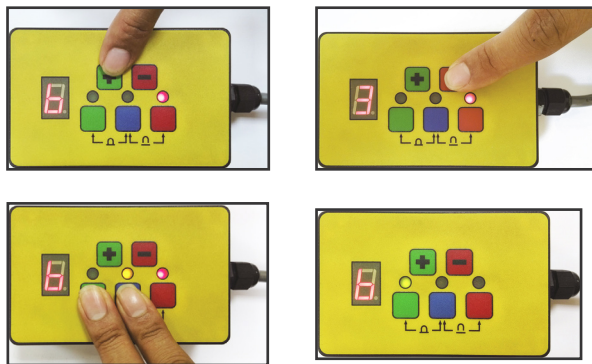
## MAGNETIZING THE CHUCK

1. Press both the blue and green buttons on the remote simultaneously for 1 second and release.
2. Check that the green light above the green button is lit. This indicates the chuck is magnetized (ON).
3. Perform a Touch Test to verify magnetization. With a small ferrous object (screwdriver) you should feel a magnetic attraction.



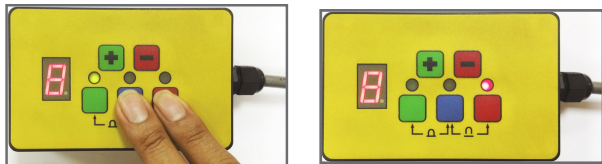
## ADJUSTING THE MAGNETIC HOLDING POWER

1. Adjust the power level as needed using the + or - keys. Magnetize the chuck and verify that it is magnetized.
3. Perform the touch test to verify that the magnetic field is no longer strong at the surface of the workpiece.



## DEMAGNETIZING THE CHUCK

1. Press the blue and the red buttons on the remote simultaneously for 1 second and release.
2. Check that the red light above the red button on the chuck controller is lit. This indicates the chuck is demagnetized (OFF).
3. Verify that the chuck is demagnetized by touching the surface of the chuck (touch test) with a ferrous object (screwdriver). You should not feel any magnetic attraction as the tip of the screwdriver comes in close proximity to the chuck surface.



## POWERING DOWN THE CONTROLLER AND CHUCK

1. Demagnetize the chuck and verify it is demagnetized.
2. Turn OFF the power switch on the chuck controller.
3. Disconnect the power cable from the chuck and gently blow out the receptacle with dry shop air to remove any contaminants. Replace the power receptacle cap making sure it is properly secured.

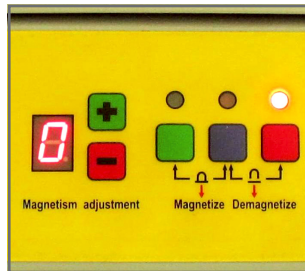
The controller has 8 power levels. Level 1 is the weakest, and 8 is strongest. We recommend using level 8 for general operation. Using the control panel or hand-held remote, you can adjust magnetic power levels to compensate for stock thickness or to provide better chip evacuation.

You only need to adjust the holding power if a strong magnetic field extends beyond the surface of the workpiece. This is more likely when workpieces are under  $\frac{3}{4}$ " thick. Perform a touch test to determine if it is necessary to reduce the magnetic power.

# STANDARD REMOTE TROUBLESHOOTING

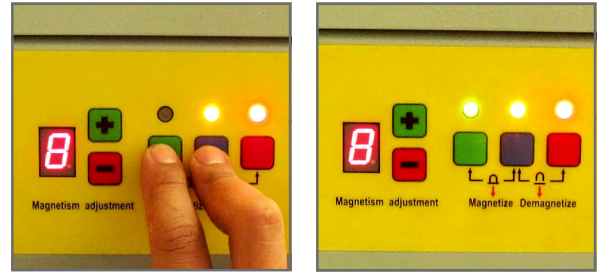
## NUMBER DISPLAY FLASHES "0" (DETECT TIME: 5 SEC.)

IF number flashes "0"- the input voltage is lower than the Controller's lower limit. Your voltage is not meeting the controller's minimum requirement.



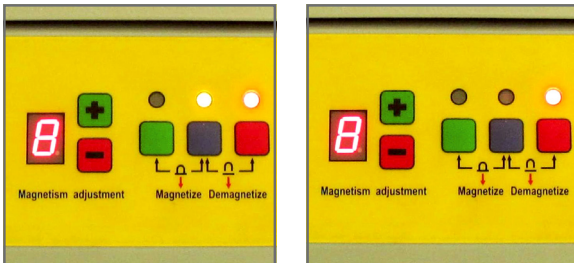
## NUMBER DISPLAY FLASHES "8"

When operating the Controller to magnetize a chuck, if the red and yellow lights stay lit and the green light and number "8" flash, this indicates an SCR failure.



## YELLOW LIGHT FLASHES FOR 15 SECONDS AND RED LIGHT REMAINS ON

During the magnetization process, if the red light remains on and the yellow light flashes for 15 seconds, this indicates the chuck cable is disconnected from the chuck.

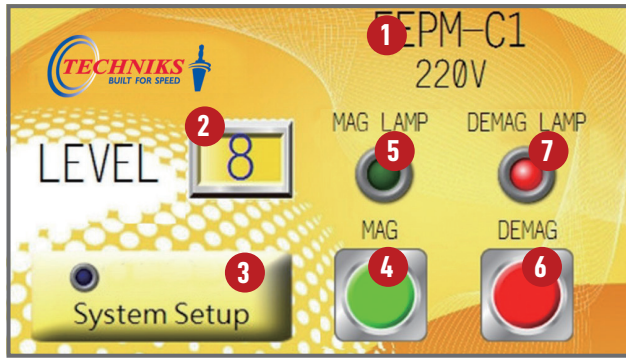


## YELLOW LIGHT FLASHES FOR 15 SECONDS AND THEN GREEN LIGHT REMAINS ON FLASHES

During the magnetization process, if the yellow light flashes for 15 seconds and then green light remains on flashes, this indicates one block has malfunctioned and cannot be magnetized or demagnetized.



# TOUCH SCREEN CONTROL OPERATION



1. Specification: Controller Type.
2. Magnetic Force Level: Display current magnetic force level.
3. System Setup : Touch button to enter setting page. Includes language setup, brightness, buzzer switch, power management, and advance setting.
4. MAG. Button Push button to conduct chuck magnetization.
5. MAG. Lamp: Green light ON is chuck magnetized.
6. DE-MAG. Button: Push button to conduct chuck demagnetization.
7. DE-MAG. Lamp: Red light ON is chuck demagnetized.

## MAGNETIZING THE CHUCK

1. Touch green MAG button.
2. Confirmation prompt will appear, touch YES.
3. Watch for green MAG LAMP light to activate.



## DEMAGNETIZING THE CHUCK

1. Touch red DE-MAG button.
2. Confirmation prompt will appear, touch YES.
3. Watch for red DE-MAG LAMP light to activate.



## ADJUSTING HOLDING POWER

1. Touch "LEVEL" setting.
2. Power level pad will appear, touch desired level.
3. Watch for green MAG LAMP light to activate.



## MULTI-CHUCK CONTROL SETUP

1. Touch System Setup. Enter Chuck Number Setting.
2. Touch On to activate your chucks.
3. Touch Off to de-activate your chucks.



## ONE CONTROLLER FOR TWO CHUCKS SETTING

1. For EEPM-C2-2C1 can control two EEPM-C1 chucks.
2. Touch "System Setup". Enter Chuck Number Setting.
3. Touch CH1 ON, then go back to Home and Touch MAG.

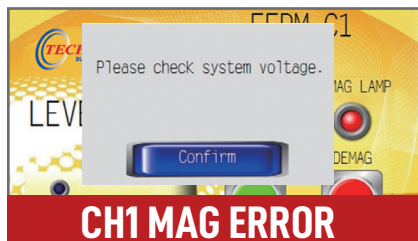




# TOUCH SCREEN CONTROL TROUBLESHOOTING

## MAGNETIC FAILURE

1. Touch MAG green button.
2. CH1 magnetization failure is displayed.
3. Check if the chuck cable is connected or damaged, then touch confirm button.
4. Re-start the power, if no warning message is displayed, the situation is normal.



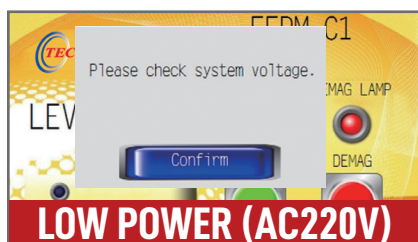
## DEMAGNETIZATION FAILURE

1. Push DE-MAGred button.
2. CH1 demagnetization failure is displayed.
3. Check if the chuck cable is connected or damaged, then touch confirm button.
4. Re-start the power, if no warning message is displayed, the situation is normal.



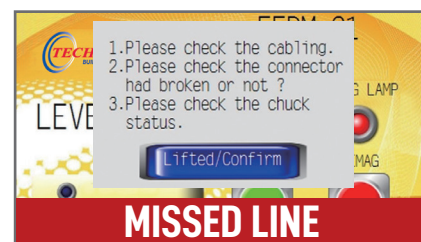
## LOW VOLTAGE

1. A low voltage is displayed if the voltage drops below 186VAC.
2. Check whether the power voltage is within the acceptable voltage range, Confirm the voltage improved, then touch disable button.
3. Re-start the power, if no warning is displayed, the situation is normal.



## CHUCK CABLE DISCONNECTED

1. Touch MA red. button.
2. Chuck cable disconnected message displayed.
3. Check whether the chuck cable is connected, or if the connector is damaged, then touch confirm button.
4. Touch MAG. button again, if no warning is displayed, the situation is normal.



# EEPM CHUCK OPERATIONS

## SAFETY PRECAUTIONS

Follow these precautions while servicing the chuck and/or controller:

- Only qualified personnel should carry out maintenance operations
- Always make sure the receptacle on the chuck and plug on the chuck controller cable are free of moisture, chips, and any contaminants before connecting the chuck controller cable to the chuck. Failure to do so could result in damage to the chuck and chuck controller.
- Always replace the cap on the chuck power receptacle when disconnecting the power cable from the chuck
- Disconnect the equipment from the power supply before attempting any repairs or maintenance. Never touch connections or components unless the power supply is disconnected
- Do not wear rings, watches, necklaces, bracelets etc. while performing maintenance operations
- Always use protective gloves, safety shoes, and any other protective gear needed

## CHUCK CONTROLLER MAINTENANCE

Regular routine maintenance includes keeping the exterior of the controller, hand-held remote, and cables clean and dry. Every time you use the chuck make the following inspections.

1. Carefully inspect all electric connections and condition of the cables between the chuck and controller, and the hand-held remote too. Make sure that no part of the power supply circuit or connections has become loose or show signs of overheating.
2. Make sure all cycle lamps are functioning well and the keypad covers are all in good shape.

## INDUCTION BLOCK MAINTENANCE

1. Holding power of the chuck is greatly influenced by the contact area between the chuck (or induction blocks) and the workpiece. Regularly check the condition of all induction blocks and remove any gouges, rust, or other signs of wear.
2. Machine the top surface of the inductions blocks as needed to restore them to a smooth, even surface.

## PART SETUP

1. **Power Up** and **Demagnetize** the EEPM chuck following the procedures and **CAUTIONS AND WARNINGS**.
2. If you are using fixed or spring-loaded induction blocks install these on the chuck before loading your workpiece. Then, machine flat the top surface of the fixed induction blocks only.
3. Center your workpiece on the chuck. Position it so it covers an even number of poles (4, 8, etc.) as evenly as possible.
4. Install workstops as needed. Small or thin workpieces may require workstops to prevent the part from moving during machining. For best results we recommend using workstops whenever possible.
5. Adjust the power level as needed using the + or - keys. We recommend using power level 8 for standard operation. **Magnetize** the chuck and verify that it is magnetize.
6. Perform a **touch test** to verify that the magnetic field is no longer strong at the surface of the workpiece. If a strong magnetic field is present on the top of the workpiece adjust the power level as necessary following the procedures listed.
7. Verify that the workpiece is properly secured by gently tapping it on the side with a soft hammer, or striking a block of wood with a regular hammer while checking for any movement.
8. After the machining is complete, **Demagnetize** the EEPM chuck. You may now remove the workpiece.

# EEPM CHUCK MAINTENANCE

There are no user-serviceable parts inside the chuck. Chuck maintenance is limited the surface finish of the chuck face and verifying that the electrical connection is clean and uncontaminated by chips or liquid. Proper maintenance increases the life expectancy of your chuck and controller and keeps them in safe working condition.

## WEEKLY MAINTENANCE

For proper operation the chuck surface must be clean and smooth. Regularly check the surface condition of all magnetic poles for damage. Remove any gouges or roughness using 250 grit sandpaper with a backing block. Finish the surface using 400 grit. Remove any rust or scale deposits with 400 grit sandpaper and a backing block. Remove all dust or other contaminants before storing the chuck or returning it to operation.

## DAILY MAINTENANCE

Unscrew the cap and inspect the electrical socket connection on the front of the chuck. Make sure there are no chips or other contaminants in the socket. Gently spray the socket and cap with dry shop air. Make sure the socket and cap are clean and dry, and the cap functions properly and makes a tight seal. Any contaminants or liquid in the socket may cause damage during magnetize / demagnetize operations.

## STORING THE EQUIPMENT

If the need arises to store the equipment for a certain amount of time observe the following instructions.

1. Demagnetize the chuck.
2. Turn the power switch on the chuck controller to "OFF"
3. Disconnect the chuck controller from the power supply
4. Disconnect the controller from the chuck
5. Remove any moisture or debris from the chuck receptacle and replace the cap over the receptacle
6. Clean all components and coat the surface of the chuck in a protective, rust inhibitive solvent.
7. Cover the equipment with a waterproof sheet (plastic)
8. Keep equipment in a dry environment. To preserve all electric parts the room temperature must be between 45°F to 80°F

## DISPOSING OF THE EQUIPMENT

If the need arises to dispose of the equipment, it is mandatory to observe a few fundamental rules for the safeguarding of the environment.

1. Protective covering, flexible pipes, plastic or non-metal material should be dismantled and disposed of separately.
2. The electric components should be disassembled and if in good condition, re-used or recycled, or if that is not possible properly disposed of according to local municipal regulations.
3. This equipment contains polluting oils that must be disposed of at authorized waste disposal sites.



# FREQUENT TROUBLESHOOTING SOLUTIONS

**Problem:**

The controller is ON but the lamp in the remote is not lit.

**Solution:**

(a) The power supply cable is loose or is not connected properly.

**Problem:**

The chuck does not magnetize / demagnetize when the correct buttons are pushed.

**Solution:**

(a) The chuck cable is not properly connected to the controller, or the receptacle contains moisture or debris.

(b) The power supply does not meet the required specifications, or is incorrectly wired to the controller.

**Problem:**

Insufficient holding power

**Solution:**

(a) Verify that the power supply meets the requirements stated in the Power Requirements section of this manual.

(b) Verify that the power setting on the chuck controller is set to the maximum value(8). The power setting must be changed when the chuck is in a demagnetized state.

(c) Verify that both the blue and green buttons on the chuck controller or hand-held remote unit are pressed at the same time for a period of one full second. Do not hold the buttons down for more than 2 seconds.

(d) Verify that the workpiece covers at least 4 poles and is thick enough, and has enough iron content to be magnetically attracted to the chuck.

(e) Verify that the mating surfaces of the chuck and the workpiece are clean, smooth, and free of burrs.

(f) Machine the surface of the fixed pole extensions to ensure a uniform, flat surface.

(g) Remove any oil or coolant from the workpiece and chuck surface before positioning workpiece on chuck.

(h) Install workstops as needed to prevent slippage.