



# **Magnetic Deburring & Polishing Machine**

## ***Operation Manual***

**Models: EHD-750CL, 766, 735, 728, 716, 715**

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## **1. Before Starting to Use the sPINner**

- A. Before powering on the sPINner Magnetic Deburring Machine, thoroughly read this operation manual and familiarize yourself with all operations.
- B. Make sure the power voltage is correct before plugging the machine in.
- C. Keep a 4" clearance to the wall. Operate in a cool, well-ventilated area.
- D. Prevent deburring solution from spilling into the well of the machine. Clean the well and keep it dry immediately after spilling to prevent damage to the machine.
- E. A powerful magnetic field exists at the bottom of the well. Keep the machine clear of any strong magnetic fields.
- F. Do not move the machine while operating.
- G. Keep articles such as credit cards, watches, cellular phones, etc. which are prone to interference from magnetic fields away from the machine to avoid possible damage.
- H. The temperature of the deburring solution rises during operation and may rise to 90°C (194°F) during continuous use. Handle with care to avoid injury.
- I. The media is small and sharp. Handle with care to avoid injury.
- J. Do not dismantle or remodel this machine. The manufacturer will accept no responsibility for injury or machine failure resulting from dismantling of remodeling the machine.
- K. Operate with proper safety precautions (goggles, rubber gloves, etc.)

## **2. Functions:**

This Magnetic Deburring machine is excellent for high precision grinding including deburring, chamfering, and polishing on products made of non-ferrous metal, light metal, and hard plastic, etc.

## **3. Principle:**

The magnetized medium (stainless steel pins), the workpieces and the polishing fluid are put together in a container placed in the well of the machine. A powerful magnetic field is generated when powering on the machine. The result excites the media and causes the media to bounce off the workpieces to achieve deburring.

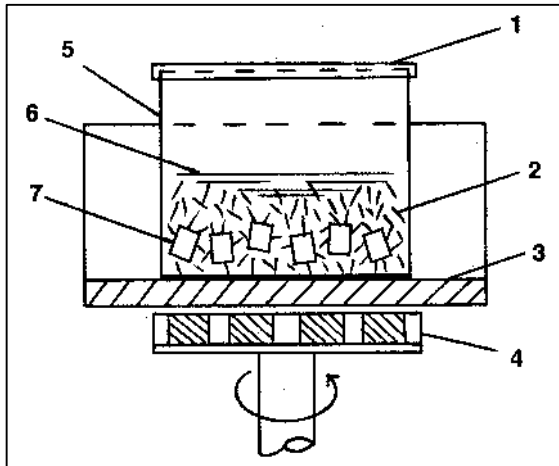
## **4. Features:**

- A. Excellent for deburring and chamfering.
- B. Great for irregular parts, internal holes, blind angles, and clearance, etc.
- C. No deformation of parts, no surface damage, no effect on accuracy of parts.
- D. Works well on internal tubular surfaces or high precision parts with no deformation.
- E. Long life cycle of media. Typical applications can result in 3-5 years of use.
- F. Easy to use. The workpieces can be removed without interruption of the machine.

## Other Applications Include:

- Surface polishing
- Internal deburring
- Pre-electroplating processing
- Oxidized film cleaning
- Removing Heat Treat Scaling
- Removing rust

## 5. Principle of sPINner:



1. Lid
2. Magnetic media (Stainless steel pin)
3. Top plate
4. Magnetic disc
5. Container
6. Liquid and water ( 1 / 50 - 100)
7. Parts

## 6. Operation:

- A. Put the magnetic media (stainless steel pins) in the container. The quantity of pins should be 0-0.2" inches from bottom of container.
- B. Place a single layer of parts in the bottom of the container so they do not overlap.
- C. Add enough water to just cover the parts. Add deburring solution to create a 50-100 parts water to 1 part deburring solution. (Add more solution for brighter, shiny parts)
- D. Place the lid on the container and place the container in the well of the machine.
- E. Enter the cycle times in the digital timers on the control panel. (Note: cycle time, media size, and parts quantity will depend on the specific application.)
- F. Press the green, start cycle button on the control panel.
- G. Adjust the spin frequency with the spin frequency control knob on the control panel.
- H. Running the machine dry: The machine may be run without water or grinding solution. This is good option for heavier burrs. If operating dry, keep cycle

times to 2-4 minutes maximum. Be careful when handling media as the media will get hot during operation.

## **7. Comments**

- A. Cycle times can vary between 2-30 minutes depending on the effect needed on the parts.
- B. Demagnetizing ferrous materials: If the container is removed while the magnetic disc is rotating, the contents of the container will be demagnetized.

## **8. Parts and Media Separation Procedure**

- A. Slowly pour the contents of the container into the separation container. Avoid letting the media fall into the separation container in one clump to prevent splashing. Place the lid on the separation container.
- B. Place the separation container in the well of the machine.
- C. Turn the spin frequency to about 1/3<sup>rd</sup> power. Turn on the machine for about 10 seconds.
- D. Lift the separation container out of the well of the machine.
- E. Stop the machine. The parts should be trapped in the top of the separation container. The pins will be pulled through the separation container to the bottom.

Note: Some pins may remain in the top of the Separation Container. Remove the parts and reclaim the pins for reuse. Also, some pins may fall off the parts after separation. Use the magnetic syringe to reclaim these pins for reuse.

The handling of work after deburring such as rinsing and rust proofing, etc, should be subject to your normal procedures.

The fluid may be reused. Once the fluid becomes turbid, filter the fluid from the pins. Dispose of the fluid in a method consistent with regulations and company policy. Rinse the pins and reuse.

## **9. Stainless Steel Pins: Deburring Media**

- Sizes: 0.2mm x 5mm, 0.3mm x 5 mm, 0.5 x 5mm, 0.7 x 5mm, 1.0 x 5mm, 1.2 x 5mm
- The stainless steel pins are virtually permanent lasting 3-5 years in typical environments.
- The stainless steel pins are very small. Handle with care.
- Clear the tank if steel pins are dropped in to avoid damaging the machine.
- Rinse the pins and keep them dry after finishing the work.
- The steel pins are restricted for use with the magnetic deburring machine. No other purpose is allowed.
- The following are guidelines for pin sizes for different materials. Please note, these are only guidelines and each individual application may require different

media and/or cycle times depending on the unique nature of the part and the desired effect.

Material	Media Size	Cycle Time	Speed
Brass	0.3, 0.5 mm	10 minutes	30-60 Hz
Copper	0.3, 0.5 mm	10 minutes	30-60 Hz
Aluminum	0.2, 0.3, 0.5	10 minutes	30-60 Hz
Stainless Steel	0.5, 0.7, 1.0	10 – 20 minutes	40-60 Hz
Tungsten Carbide	0.7, 1.0, 1.2	30 minutes	60 Hz

Also, here are some guidelines for the maximum weight of parts to be process in the different models of the sPINner:

Model	Brass, Copper, Gold, Platinum, Stainless (non-magnetic)	Aluminum, Alloy, Pewter, Zinc, Silver	Steel, Iron, Stainless (magnetic)
EHD-750CL	17 lbs	10.5 lbs	5.5 lbs
EHD-735	7 lbs	4.5 lbs	2.5 lbs
EHD-728	2.5 lbs	1.5 lbs	NR
EHD-716	0.5 lbs	0.25 lbs	NR

NR – Not recommended

### **Cleaning the Media:**

Occasionally the media will need cleaned to insure the best possible results on the parts being processed. To clean the media simple simply run a 10-minute cycle with only the media, water and PFS-747 deburring compound mixed to 25:1 with the water. The action of the pins on themselves with the soap solution will clean the media. Rinse the media when complete and repeat if necessary.

### **10. Deburring Solution (PFS-747)**

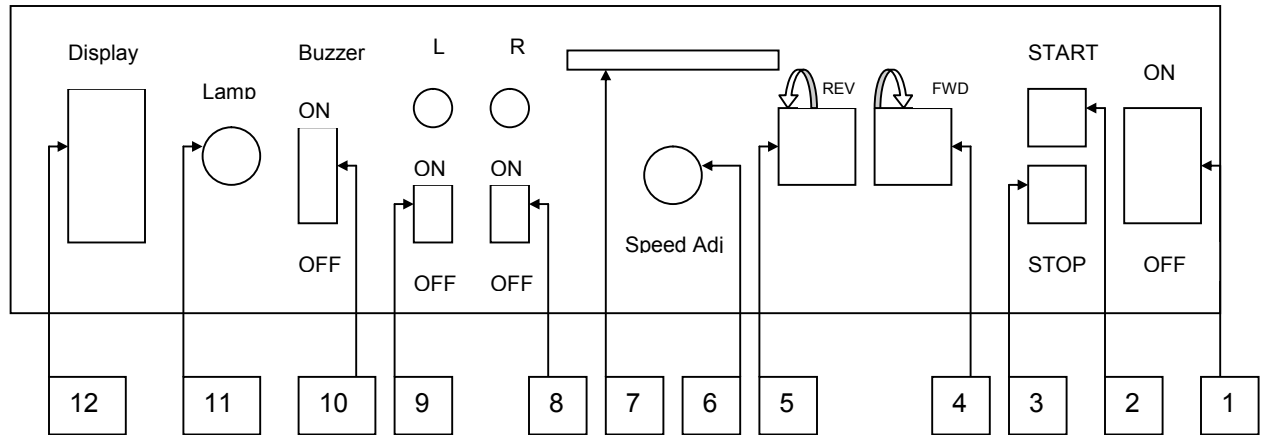
The fluid is restricted for use with the magnetic deburring machine. No other purpose is allowed.

The fluid is concentrated. Dilute in water 50 – 100 times before starting work. The fluid can be re-used after running work. If the fluid becomes turbid, filter it or change for subsequent processing.

**Caution:** Do not eat/drink the fluid. If the fluid is accidentally consumed, drink large amounts of water and seek medical attention.

**Caution:** The temperature of the fluid in the container rises during operation. Temperatures may approach 90° C after continuous operation.

## 11. Control Panel for EHD-766



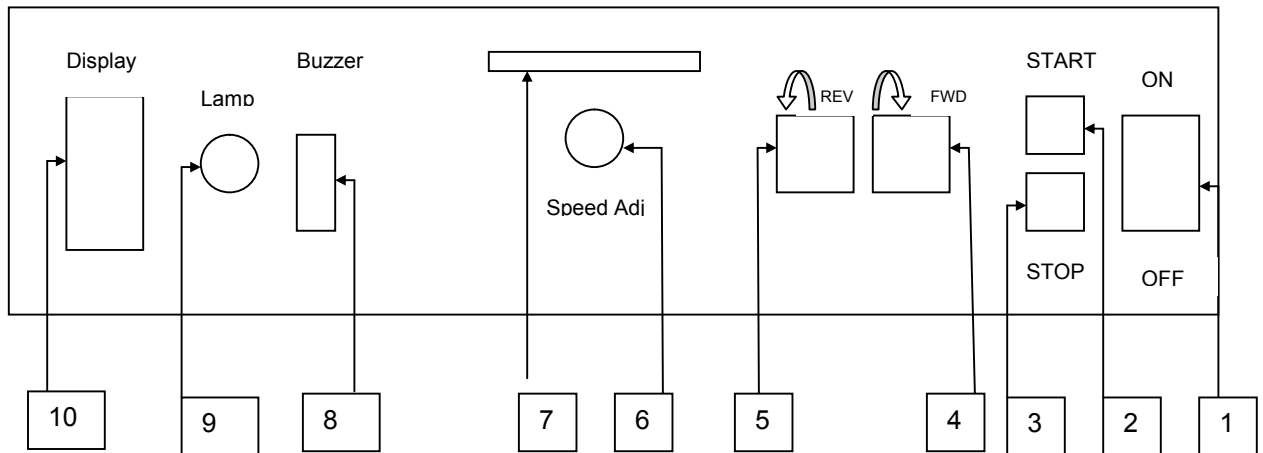
1. **Power Source:** When turning power to ON position, the power is connected and the power indicator is lighted.
2. **Start Switch:** Press start switch to begin a cycle.
3. **Stop Switch:** Press the stop switch to end a cycle.
4. **FWD TIMER:** This timer is preset to forward (clockwise) direction. The unit of this timer is minutes. Press the timer buttons for the desired time. (Ex. A value of 15 will run for 15 minutes in the forward direction). The number shown in the upper part is the completed time while running.
5. **REV TIMER:** This timer is preset to the Reverse (counter-clockwise) direction. Setting instructions are the same for the FWR TIMER.
  - Timer preset and performance order are below: After starting the REV TIMER will first operate to spin in a counter-clockwise direction. Timer stops when the preset time is reached and will automatically switch to FWD TIMER. The magnets will rotate in a clockwise direction until the preset time is reached. Total cycle time is the sum of both the REV TIMER and the FWD TIMER. After a cycle, the lamp will light for 3 minutes.
  - If a single direction of spin is desired, set the timer in the direction of spin desired to the appropriate time, set the other timer to "0".
6. **SPEED ADJUST:** This knob controls the spin speed of the magnets. Turning the knob in a clockwise direction increases the spin speed, counter-clockwise decreases speed. A faster spin rate makes a more powerful deburring action.
7. **SPEED DISPLAY:** This display the sped of the magnets via 10 lamps, dividing the speed into percentages from 20-100%.
8. **9. L/R/ Function:** These two switches control the operation of the two tanks (left and right). To run both tanks simultaneously, set both switches to the ON position.
  - Make sure to switch on or off these switches when the motor has stopped.
10. **11. FINISH ALARM:** When a cycle is complete, the lamp will light for 3 minutes. If the switch (10) is ON an end cycle buzzer will sound.
  - To stop the lamp and/or the buzzer, press the STOP button.

12.FREQ, HZ DISPLAY: This displays the frequency in Hz of the rotation of the magnets. When the frequency is higher the speed is faster. 60 Hz is the maximum setting.

- This display can also show some fault settings in the event of machine malfunction.
- Other buttons on this display are for programming machine performance parameters. Please do not press these buttons.



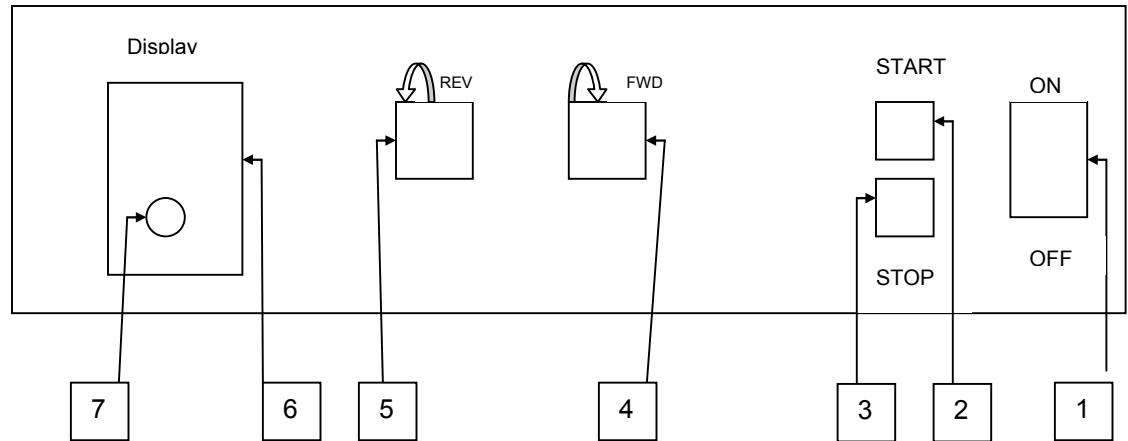
## 12. Control Panel for EHD-750CL



1. Power Source: When turning power to ON position, the power is connected and the power indicator is lighted.
2. Start Switch: Press start switch to begin a cycle.
3. Stop Switch: Press the stop switch to end a cycle.
4. FWD TIMER: This timer is preset to forward (clockwise) direction. The unit of this timer is minutes. Press the timer buttons for the desired time. (Ex. A value of 15 will run for 15 minutes in the forward direction). The number shown in the upper part is the completed time while running.
5. REV TIMER: This timer is preset to the Reverse (counter-clockwise) direction. Setting instructions are the same for the FWR TIMER.
- Timer preset and performance order are below: After starting the REV TIMER will first operate to spin in a counter-clockwise direction. Timer stops when the preset time is reached and will automatically switch to FWD TIMER. The magnets will rotate in a clockwise direction until the preset time is reached. Total cycle time is the sum of both the REV TIMER and the FWD TIMER. After a cycle, the lamp will light for 3 minutes.
- If a single direction of spin is desired, set the timer in the direction of spin desired to the appropriate time, set the other timer to "0".
6. SPEED ADJUST: This knob controls the spin speed of the magnets. Turning the knob in a clockwise direction increases the spin speed, counter-clockwise decreases speed. A faster spin rate makes a more powerful deburring action.
7. SPEED DISPLAY: This display the sped of the magnets via 10 lamps, dividing the speed into percentages from 20-100%.
8. 9. FINISH ALARM: When a cycle is complete, the lamp will light for 3 minutes. If the switch (8) is ON an end cycle buzzer will sound.
- To stop the lamp and/or the buzzer, press the STOP button.
10. FREQ, HZ DISPLAY: This displays the frequency in Hz of the rotation of the magnets. When the frequency is higher the speed is faster. 60 Hz is the maximum setting.

- This display can also show some fault settings in the event of machine malfunction.
- Other buttons on this display are for programming machine performance parameters. Please do not press these buttons.

### 13. Control Panel for EHD-728 & 735



1. Power Source: When turning power to ON position, the power is connected and the power indicator is lighted.
2. Start Switch: Press start switch to begin a cycle.
3. Stop Switch: Press the stop switch to end a cycle.
4. FWD TIMER: This timer is preset to forward (clockwise) direction. The unit of this timer is minutes. Press the timer buttons for the desired time. (Ex. A value of 15 will run for 15 minutes in the forward direction). The number shown in the upper part is the completed time while running.
5. REV TIMER: This timer is preset to the Reverse (counter-clockwise) direction. Setting instructions are the same for the FWR TIMER.
  - Timer preset and performance order are below: After starting the REV TIMER will first operate to spin in a counter-clockwise direction. Timer stops when the preset time is reached and will automatically switch to FWD TIMER. The magnets will rotate in a clockwise direction until the preset time is reached. Total cycle time is the sum of both the REV TIMER and the FWD TIMER. After a cycle, the lamp will light for 3 minutes.
  - If a single direction of spin is desired, set the timer in the direction of spin desired to the appropriate time, set the other timer to "0".
6. FREQ, HZ DISPLAY: This displays the frequency in Hz of the rotation of the magnets. When the frequency is higher the speed is faster. 60 Hz is the maximum setting.
  - This display can also show some fault settings in the event of machine malfunction.
  - Other buttons on this display are for programming machine performance parameters. Please do not press these buttons.
7. SPEED ADJUST: This knob controls the spin speed of the magnets. Turning the knob in a clockwise direction increases the spin speed, counter-clockwise decreases speed. A faster spin rate makes a more powerful deburring action.

## **14. Control Panel for EHD-716, 715**

1. Power Source (start & Stop Switch): When the power is ON, the power is connected.
2. 60 Minute Timer: Turn this knob to select the cycle time. Turning the knob to the right increases the cycle time. When a cycle is complete a tone will sound and the machine will stop.

## **15. Troubleshooting and Fault Information for EHD-750CL, 766, 735, & 728**

The AC motor drive has a comprehensive fault diagnosis system that includes more than 20 different alarms and fault messages. Once a fault is detected, the corresponding protective functions will be activated to shut down the AC motor drive output. The different AC motor drive failures may be classified as follows:

Over Voltage/Lower Voltage

- **Heat-sink Over Temperature**
- **Motor Overload**
- **AC Motor Drive Overload**
- **Motor Stalled**
- **Microprocessor System Failure**

This section provides information to guide the user through the different AC motor drive fault conditions and their general troubleshooting procedures. A listing and description of the different AC motor drive failures is given along with their possible solutions as follows:

## **16. Power Requirements**

EHD-750CL: 220V Single Phase/ 15A

EHD-766: 220V Single Phase/ 10A

EHD-735: 220V Single Phase/ 10A

EHD-728: 220V Single Phase/5A

EHD-716/715: 110V

Please note: the machine should be placed on a dedicated circuit and be protected with a surge protector to insure maximum protection for the machine. Failure to place the machines on a dedicated circuit will void the warranty as power fluctuations from other equipment can cause malfunction or damage to the machine

## 17. Preventative Maintenance

The sPINner Deburring Systems have been designed for years of trouble-free use with minimum maintenance. The following preventative maintenance schedule should be followed for optimal performance of the sPINner:

<p>Before and after every deburring cycle:</p>	<p>Check to make sure no liquid has spilled into the working tank of the machine outside the processing buckets. Wipe up any liquid in the working tank of the machine. If a considerable amount of liquid was spilled into the working tank of the machine, remove the lower back panel cover of the machine and check that no liquid has come into contact with any electrical components. If liquid is obvious around the electrical components wipe away as much liquid as possible and leave the machine open to dry for at least 24 hours or until no liquid is apparent around the electrical components.</p>
<p>Each day:</p>	<p>Check to make sure the power cord is free of pinches or crimps and has no visible damage.</p> <p>Check the processing buckets to make sure they do not leak into the working tank of the machine.</p> <p>Check that no moisture is apparent on the control panel. Wipe away any moisture on the control panel.</p>
<p>Each quarter:</p>	<p>Remove the lower back panel cover and check that the wire connections to the bus are free of moisture or corrosion. Clean corroded connections with a soft wire brush. Wipe away any liquid and removed corrosion. If liquid is apparent around the electrical components, wipe away the liquid and keep the machine open for at least 24 hours to allow the liquid to dry before powering on the machine. Inspect the working tank of the machine for leaks.</p>

	Check the silicon sealant around the working tank of the machine. If the sealant is removed or broken re-apply a silicon sealant.
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**18. Service Information**

In the event you require service, please contact Earth-Chain, Inc. at 877-354-3837