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Millennium Signatures
MARKING SYSTEMS

Model MS-331 Instruction Manual



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510 SOLID STATE CONTROLLED POWER UNIT

MARKING AND OPERATING PROCEDURES

You have just purchased the industry's most durable, technically advanced electro-chemical marking power unit available today. Please review the following operating procedures to prevent damage to your unit, and to achieve good marking results.

FEATURES:

- "AC-DC" Selection
- "Low/High" Voltage Selection. Note: there are three positions on this switch. UP=HIGH, MIDDLE=NO POWER, DOWN=LOW
- "Deep Etch" capabilities of up to .005"
- "Automatic Mode" Selection
- Two individually timed selector switches, calibrated from 0.2 to 35 seconds to automatically control the machine cycle time
- "Power Pulse" Selection
- Two individually timed selector switches, calibrated from 0.2 to 2.4 seconds to automatically control power pulsing
- Foot Pedal, Manual, or Automatic Operator Selection
- "High Power" indicator light
- 2- "3.0" Amp Fuses for power unit protection against overloading
- Smooth action "Power Selection Switch"
- Built in alarm to alert the operator of amperage overload
- Two individual "Rotary Time Selectors"

NOTE: Avoid short circuits. (See illustration 1-A) Do not cross the leads or make contact between the marker and the grounded surface when both surfaces are bare. Your power unit is designed to work from a 110-120 AC volt outlet only. (220 is available upon request).

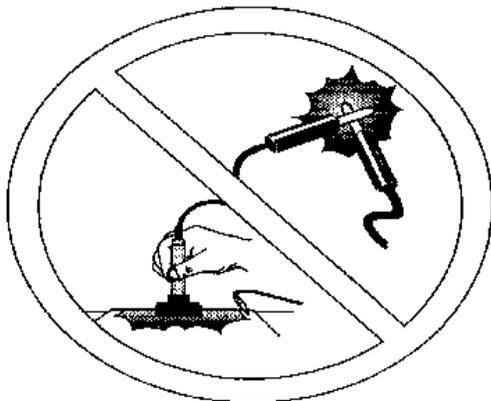


ILLUSTRATION 1-A

SET-UP AND OPERATION

The Millennium Signatures Marking Systems 510 Power Unit is designed to operate manually, semi-automatically or automatically. Follow the set-up and operating instructions given for your application.

MANUAL SET-UP:

A) Plug your unit into a 110-120 AC Volt outlet only.

B) In the manual mode 2 wires are required. Plug the black wire into the “monode” jack, and the red wire into the ground jack.

C) Attach a deep etch pad or monopad pad to the marking head, with the “O” ring enclosed. Place the monopad against the end of the marker (blue side against the marker). Slide the “O” ring over the pad and the marker until it snaps into place in the machined groove.

D) The stencil may also be attached to the marker if so desired, by following the procedure outlined above.

E) If a “roll marking” technique is desired, Follow the instructions provided in the section called “Roll Marking Applications”.

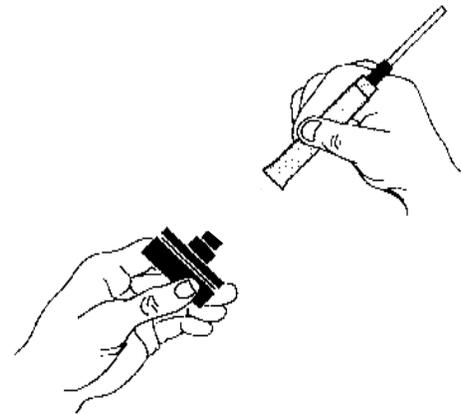


ILLUSTRATION 2-A

MANUAL OPERATION:

A) The four adjustment dials for cycle time and marking current time will not be used during manual marking. Use only the following switches: “ON/OFF”, “AC-DC”, “LOW/HIGH” and the power selection dial “A-F”. Make certain that the toggle switch labeled “SINGLE CYCLE/REPEAT” is in the single cycle position. The toggle switch labeled “TIMERS ON/OFF” should be in the off position unless pulsing is required. (Refer to figures 9,11,5,4,1, & 10 respectively, Illustration 3-A.) Turn the power unit on. Choose the proper current setting. AC produces a black mark. DC produces a white mark and is also used for deep etching. (A white mark may be desirable for etching various materials such as black oxide.)

B) The 510-B Power Unit is equipped with twelve power settings. With the voltage switch (Fig. 5) set to “LOW”, the settings on the “POWER SELECTION SWITCH” (Fig. 4) are: A=6 Volt, B=8 Volt, C=12 Volt, D=14 Volt, E=18 Volt, F=41 Volt. When the voltage switch is set to high a red warning light is visible. Always use the lowest power setting possible to prolong your stencil life. A good starting point is “D”.

C) Apply one of Millennium Signatures Marking Systems electrolytes to the monopad.

D) You are now ready to mark your part. Firmly press the marker to the grounded substrate. Contact should not exceed 2-3 seconds for a good surface etch.

E) Wipe the etched area with Millennium Signatures Marking Systems neutralizer. Millennium Signatures neutralizers are good for both ferrous and nonferrous alloys. RV-53 is an environmentally safe solution and is recommended.

F) After the part is dry, apply Millennium Signatures Marking Systems RPO (Rust Protective Oil) for additional protection for your part.

DEEP ETCHING:

To “Deep Etch” flip the toggle switch (Fig. 5) to high and select a power setting “A thru F”. Keep in mind that the higher the power setting, the shorter the life of the stencil. When deep etching, the best results are achieved by a series of short dwells to minimize heat build-up. The more short dwells used the deeper the etch will be. Always use Millennium Signatures “deep etch” pads and electrolytes for best results.

SEMI-AUTOMATIC SET-UP WITH AN AM10-A OR 30T MARKER:

A) Plug your unit into a 110V AC power outlet.

B) Connect the four wire cord set to the corresponding jacks on the power unit and the marking machine, for example: black to black, yellow to yellow, and green to green. The red lead is the ground. Be sure the ground lead is properly grounded to the part or fixture in semi-automatic marking operations.

Please note: On applications using marking from the bottom up or simultaneous top and bottom marking request set-up information from your sales representative.

C) Plug the footswitch into the back of your power unit.

D) Place the appropriate monopad on the marking head and attach the insert stencil, cap stencil, or flat stencil as required.

E) Place the long tube from the #152 electrolyte pump in the open bottle of electrolyte. Prime the pump by rotating quickly clockwise. The pump is adjusted by the small set screw on the stop below the lever.

SEMI-AUTOMATIC OPERATION:

A) Flip the power toggle switch up to turn the unit on.

B) Choose the desired current by flipping the AC/DC (FIG. 11) toggle switch up to AC or down to DC.

C) Choose the desired voltage. Refer to “B” in the section for “manual operation” to review the voltage settings and operation procedure. Set to either low or high power. (FIG. 5)

D) Set the “SINGLE CYCLE/REPEAT” switch to single cycle. (FIG. 1)

E) Adjust the “ON” dial located under the heading “CYCLE TIME” (Fig. 6). This dial controls the amount of time the marking head remains in contact with the substrate. Most dark marks require a setting of one to three seconds.

F) Accessory Cycle Time: Preset the accessory cycle time by rotating the dial marked “ON” under the heading “CYCLE TIME” clockwise to the desired setting. (FIG. 6) This will determine the amount of time the marking head spends in contact with the substrate (swell time). The greater the number, the longer the contact will be. Once

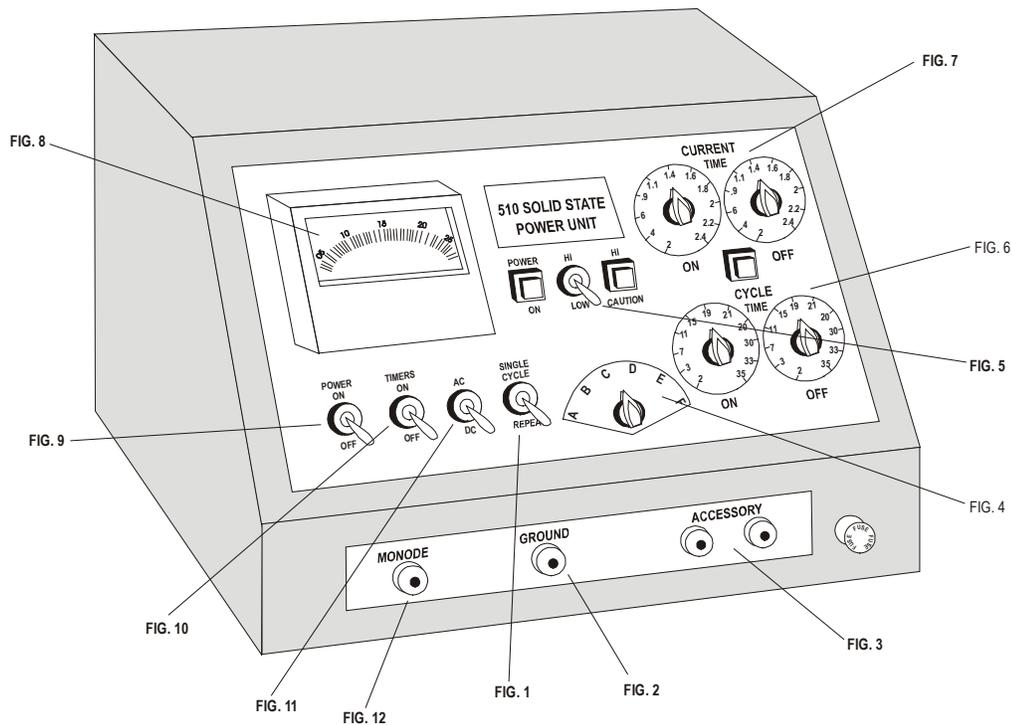


ILLUSTRATION 3-A

set, the operator need not make any further adjustments, unless an alloy change takes place. Set the dial marked "OFF" to determine the amount of time the head is up or "off" the substrate. The higher the number, the longer the head is up.

G) Current Cycle Time: The current pulse is controlled by the two dials called "MARKING CURRENT CYCLE TIME" (FIG. 7). The dials operate in the same manner as the accessory cycle dials. They are turned clockwise. The dial marked "ON" controls the length of time the current is delivered to the marking head. The dial marked "OFF" controls the length of time the current flow is interrupted, even through the marking head remains in contact with the substrate. The greater the number, the longer the times in both cases. An amp meter (FIG. 8) has been provided for visual confirmation of the current.

These timers are used for applications that require a long marking time. A long marking period builds up heat that breaks down the stencil. These timers pulse the current to the marking head. This prolongs the stencil life and reduces the total marking time needed.

These timers are also helpful in marking contour parts. The "OFF" timer is first to time out. This allows time for the marking head to descend and seat the stencil on the part before the current is applied. This improves the quality of marks on the contoured surfaces.

H) To activate a single machine marking cycle, depress the footswitch.

AUTOMATIC SET-UP:

Set-up for automatic marking is the same as for semi-automatic marking. Refer to the instructions previously given.

AUTOMATIC MARKING WITH AN AM-10-A OR AM-30-T:

A) Follow steps “A through C” as outlined above for semi-automatic marking.

B) Set the “SINGLE CYCLE/REPEAT” switch to “REPEAT” to activate the automatic mode of the power unit (FIG. 1). The AM-10-A and the AM-30-T will now cycle automatically.

C) Set the “ACCESSORY CYCLE TIME” and the “CURRENT CYCLE TIME”. See steps “F” and “G” above.

D) Depress the footswitch. The marking head of the AM-10-A or the AM-30-T will descend to make contact with the substrate for the selected time. If selected, the current will pulse on and off for the duration of the dwell time. The marking head will rise, remain up for the selected time, and then repeat this cycle until the machine is shut off.

HOUSEKEEPING:

It is important to keep your unit free of oxidation, and salt build-up. This will ensure years of dependable, trouble free operation.

A) Keep the cord ends, alligator plug, marking heads, and grounds clean. If corrosion appears, use a light abrasive, such as an emery cloth, to clean it off.

B) To prevent corrosion build-up separate the marking head from the H-100 holder at the end of each day. Remove the top plate of the B-1220 or B-2045 bench fixture when it is not in use. Following these simple steps will keep the two surfaces from fusing together, insuring good electrical contact. This will allow quick change over for small runs of various configurations.

C) Millennium Signatures stencils and pads are designed to be used again and again. Simply rinse them under cold water and place them on some toweling to dry. They are ready for use whenever you are.

THE MILLENNIUM SIGNATURES B-1220/B-2045 BENCH FIXTURES ROLL MARKING APPLICATIONS

NOTE: To avoid short circuits (See illustration 1-A), do not cross the leads, or make contact between the marker and the grounded surface when both surfaces are bare.

DIRECTIONS:

A) Plug the black wire into the black jack of the bench fixture.

B) Remove the top plate (carbon) from the fixture.

C) Pour the recommended electrolyte into the well.

E) Replace the top plate.

F) Place a deep etch pad or monopad (blue side out) on the top plate, and secure it with the enclosed "O" ring. Make certain that the sides of the pad are tucked down inside the well. This will insure that your pad will draw the fluid without operator assistance. Use either a B-1220-3, B-1220DE, B-2045-3, or a B-2045DE monopad for best results.

G) Place the stencil over the pad with the reading face down, as if to read the information from the bottom of the fixture. Slide the "O" ring over the stencil pad and top plate until it snaps into the machined groove.

H) Connect the hand ground (flat bottom or knife edge) to the ground jack of your power unit.

I) Place the substrate (surface to be marked) on the stencil in front of the reading. Place the hand ground on the substrate, and roll the substrate over the reading, using moderate pressure.

J) Use Millennium Signatures' neutralizer to neutralize any area of the substrate that has come into contact with the electrolyte.

K) For added protection, apply Millennium Signatures' Rust Preventative Oil (RPO). It is always a good practice to apply oil to ensure rust and corrosion protection.

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THANK YOU!