AFM ENGINEERING, INC.

AFM Model 14 Mini Stamper
Standard Control Box Manual

with an Omron PLC and Screen

January 2018

SAFETY PRECAUTIONS
READ BEFORE INSTALLING OR USING EQUIPMENT

This system has been designed to assure maximum operator safety. However, no design can completely protect against improper usage. For maximum safety and equipment protection, observe the following warnings at all times and read the instruction manual carefully before you attempt to operate the equipment.

• High voltage is present in the equipment. Disconnect the line cord before removing the cover or servicing.

• Make sure the equipment is properly grounded with a 3-prong plug. Before plugging in the equipment, test the electrical outlet for proper earth grounding.

IMPORTANT SERVICE LITERATURE

Please read carefully before operating the equipment, then forward to your service department.

The equipment supplied with this instruction manual is constructed of the finest material and the workmanship meets the highest manufacturing standards. It has been thoroughly tested and inspected before leaving the factory and when used in accordance with the procedures outlined in this manual, will provide you with many years of safe and dependable service.

CHANGE INFORMATION MANUAL

We continually strive to keep up with the latest electronic developments by adding circuit and component improvements to our equipment as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we cannot incorporate these changes immediately into printed manuals. Hence, your manual may contain new change information.

We reserve the right to make any changes in the design or construction of our equipment at any time, without incurring any obligation to make any change whatsoever in units previously delivered.

The technical data and schematics in the manual are for informational purposes only and may not reflect the current configuration being shipped from our factory. Upon formal request, complete and up to date information can be provided from the factory free of charge.

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Introduction

This instruction manual provides descriptive information and principles of Hot Stamping. Hot Stamping is a process that incorporates the use of heat, pressure and time to transfer a hot stamp foil onto a plastic part. The Hot Stamping machine consists of six components: the heating system, pneumatic system, timing control, foil feed, hot stamp die, and the nest.

1. ***The heating system***
   The heating system supplies heat to the hot stamp die for printing. The normal range of temperature used is between 200° F to 500° F. The temperature required per job is determined by the plastic part to be printed, the type of hot stamp die used, and the type of hot stamp foil used.

2. ***The pneumatic system***
   The pneumatic system produces the pressure required for hot stamping. The pneumatic pressure can be adjusted by means of the pressure regulator. The amount of pressure required for printing is determined by the size of the print, the type of die used, the temperature used, and the depth of the impression required.

3. ***The timing control***
   The timing controls the amount of time the plastic part is clamped for printing. The amount of time required for printing is determined by the die temperature, the amount of pressure used, the depth of impression required and type of hot stamp foil used.

4. ***The foil feed assembly***
   The foil feed system feeds the hot stamp foil in the correct amount to print the plastic part.

5. ***The hot stamp die***
   The hot stamp die is engraved with the imprint, which is to be printed. Hot stamp dies are made of a variety of materials depending on the hot stamping application. Some die materials are made of steel, aluminum, magnesium, and rubber.

6. ***The nest***
   The nest supports and locates the plastic part for hot stamping. The nest can be made of any material as long as it can take the pressure produced by the pneumatic system and can locate the part to be printed accurately.

Complete AFM Standard Control Box

Standard AFM Control Box with an Omron PLC, touchscreen and temperature controller

Inspection

After unpacking the AFM Control Box, perform a thorough visual inspection for any evidence of damage that may have occurred during shipment. Check the packing material carefully for small items before disposing of the material.

Claims for Loss or Damage

The AFM Control Box was thoroughly inspected and carefully packed before leaving the factory. The carrier, upon acceptance of the shipment, assumes responsibility for its safe delivery. Claims for loss or damage in transit must be made to the carrier, as follows:

· *Concealed Loss or Damage*

Concealed loss or damage is loss or damage that does not become apparent until the equipment has been unpacked. The contents might have been damaged in transit due to rough handling even though the shipping container may not show any external damage. When damage is discovered upon unpacking, make a written request for inspection within 48 hours of the delivery date. Then, file a claim with the carrier since the damage is the responsibility of the carrier. Do not destroy packing materials or move material from one location to another before the carrier makes his inspection.

· *Visible loss or Damage*

Any external evidence or loss or damage must be noted on the freight bill or express receipt and is signed by the carrier's agent. Failure to adequately describe such external damage may result in the carrier's refusal to honor a damage claim. The form required to file a claim will be supplied by the carrier damaged equipment without waiting for the claim against the carrier to be settled, provided that a new purchase order is received to cover the repair or replacement costs. Should any damage, shortage, or discrepancy exist, please notify us immediately.

Electrical Power Requirements

The Mini Stamper requires a fused, single-phase, standard 3-terminal grounding type receptacle. Input voltage and current capability requirements are 120 VAC 50/60 Hz, single-phase, 4 amp.

The line cord of the Mini Stamper is equipped with a 3-prong, grounding plug. Do not, under any circumstances, remove the ground plug. The plug must be plugged into a mating 3-prong, grounding type outlet.

Installation Site Requirements

The AFM Control Box is a freestanding assembly. It should be installed in a clear, uncluttered location that is free from excessive dirt, dust, corrosive fumes, and temperature and humidity extremes. The selected installation site should be near the electrical power source and pneumatic source, and away from equipment that generates abnormally high electrical transients. Position the AFM Control Box so that the front panel controls are visible and readily accessible.

Making Electrical Connections

When making electrical connections, be careful not to strain or kink the cables. When going around corners, make as wide a bend as possible.

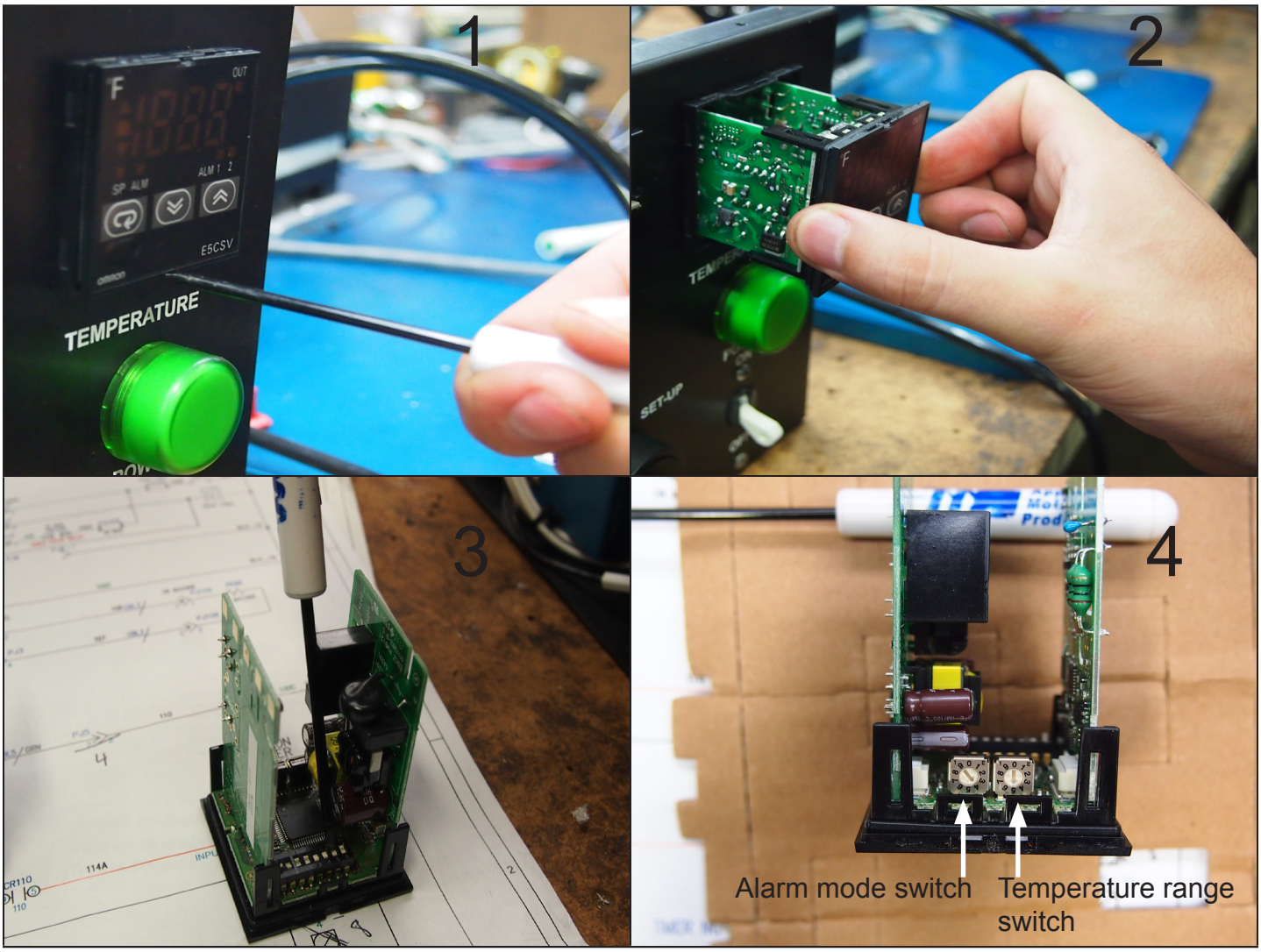
Functions of Controls and Indicators

• Power Switch/ Circuit Breaker:	Turns on/off all power to the machine.
• Power Indicator Switch:	When lit, indicated power is ON.
• Head ON/OFF Switch:	When on OFF mode, removes power from the pneumatic system, which disables the pneumatic system. The head switch should always be turned OFF when clearing obstructions and during setup when changing dies or nest.
• Head Descending Indicator Light:	When lit, indicated power applied to the pneumatic system and instructs the head to descend. The Descending indicator is a trouble-shooting device. If the Head Descending light is NOT lit, the air pressure to the machine is too low or the pneumatic valve is stuck.
• Mode RUN/ SET-UP Switch:	When the Mode Control is on RUN mode, the machine will run as normal. When the Mode Control is on SETUP mode, the head will move down and stay until the mode is switched to RUN mode. RUN mode is used to set-up the hot stamp machine.
• Temperature Controller:	Controls the hot stamp die temperature (see page 8)
• Touchscreen	Controls the time the plastic part is clamped for printing (see page 10)

Omron Model E5CSV Temperature Controller

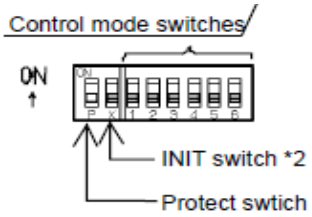
Temperature display	Displays the present temperature or the parameters for the set point, etc.
Output indicator	OUT (control output): Lights when the control output function is ON.
Alarm indicators	(1) ALM1(Alarm 1): Lights when the alarm 1 function is ON. (2) ALM2 (Alarm 2): Lights when the alarm 2 function is ON.
Mode indicators	(1) SP mode): Lights when SP mode is being used. Lights when the SP is being displayed in the operation level. (2) (ALM mode): Lights when ALM mode is being used. Lights when the alarm value 1 is being displayed in the operation level. Flashes when alarm value 2 is being displayed.
Deviation indicators	▲ : Lights when the deviation between the PV and SP is greater than 1% FS ■ : Lights when the deviation between the PV and SP is within ±1% FS ▼ : Lights when the deviation between the PV and SP is smaller than −1% FS
(Mode) Key	Press this key to change parameters within a setting level.
(Up) Key	Each press of this key increments the setting value. Holding the key down speeds up the incrementation.
(Down) Key	Each press of this key decrements the setting value. Holding the key down speeds up the decrementation.
Lock Release Key	When the protect switch is ON, the set value can be changed by pressing the (Up) and (Down) Keys while holding down the Lock Release Key.

Replacing Temperature Controller



To replace the Omron Temperature Controller you need to follow the steps below:

1. Insert the small screwdriver into the two tool insertion holes (one on the top and one on the bottom) and release the hooks.
2. Them, grip the front panel and pull out towards you to remove it.
3. Use a small screw driver to set the dip switches on the controller as shown.
4. Use a small screw driver to set the selector switches o the controller as shown.



*1. The alarm mode switch is not provided on models without alarms.
*2. The INIT switch is always OFF during normal operation.

Reading machine temperature

Press the SELECT button until both the SET POINT and SET ALARM lights are off. The display will read the current machine temperature.

Note: Temperature controller should be left in the READ TEMPERATURE mode when running the machine.

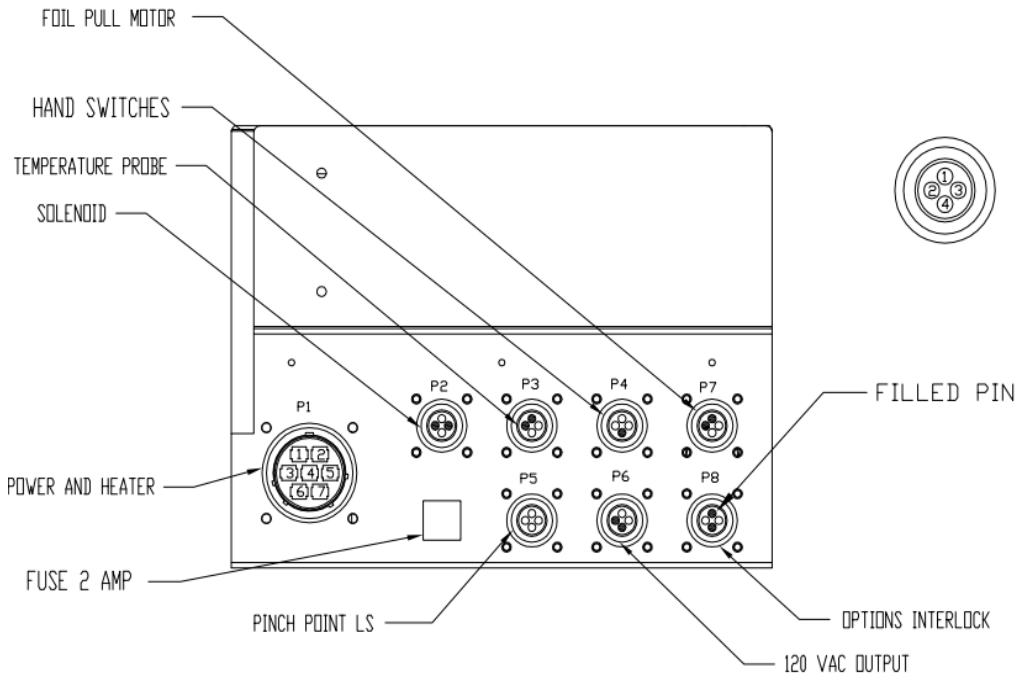
Set machine temperature

Press the SELECT button until the SET POINT light is ON. Use the UP and DOWN buttons to set the display to the temperature you require.

Set ALARM

Press the SELECT button until the SET ALARM light is on. Use the UP and DOWN buttons to set the display to the alarm setting you require.

Above, you will see the main screen. Here you are able to


FOIL PULL MOTOR
HAND SWITCHES
TEMPERATURE PROBE
SOLENOID
POWER AND HEATER
FUSE 2 AMP
PINCH POINT LS
FILLED PIN
OPTIONS INTERLOCK
120 VAC OUTPUT
P1
P2
P3
P4
P5
P6
P7
P8