GMS

GMS© Hot Melt Gluing System Operation and Maintenance Manual

Covering Basic Operation for the GMS HM10 Hot Melt Unit (10# Tank)

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HM10 HOT MELT GLUING SYSTEM OPERATION & MAINTENANCE MANUAL

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Chapter 1

General Description

The Gluing Machinery & Systems, Inc's **microglue®** Hot Melt Gluing System is used for melting and pumping hot melt thermoplastic adhesives. The system consists of the melt unit, heated supply hose(s), and applicators. System operation is further enhanced by the use of an integrated pattern controller. All temperatures in the microglue system are controlled by closed loop electronics using thermistor-based sensors.

1.1 Melt Unit

The **microglue®**melt unit is able to pump a variety of thermoplastic materials, such as packaging or product assembly adhesives, wax, and various potting materials. The melt unit consists of a heated melt tank with a motor-driven, positive-displacement gear pump. The tank has a 10 pound capacity with an integral melt grid. The unit is completely electric; it does not require the use of compressed air for operation. The wide-mouth design of the tank lid allows use of virtually any form of adhesive, including granules, flakes, pillows, and blocks. The tank's integral melt grid transfers heat efficiently from the heaters to the thermo-plastic material. Temperatures are selected using the LCD control panel located on the front of the unit. Output pressure is electronically monitored and controlled through the front panel as well. All temperature and pressure settings are conveniently displayed on one screen for easy monitoring.

1.2 Supply Hoses

The **microglue®**melt unit supports up to two hot melt supply hoses. The output manifold has two outlets to channel adhesive flow to the supply hoses. Temperatures for each hose are individually selected using the front panel. All hoses are electrically and mechanically attached to the melt unit via easy access connectors on the back of the melt unit.

1.3 Applicator Heads

Applicators used with the **microglue®**melt unit are connected electrically and mechanically to the supply hoses. Temperatures for each applicator are individually selected using the front panel of the melt unit.

Automatic applicator heads will be used in conjunction with the integrated pattern controller; pump motor switching and proportional pressure control are also accomplished automatically. Handgun applicators are generally used in manual application systems and possess an integral reed relay switch on the pistol grip to control the melt unit pump motor.

1.4 Electrical Considerations

Electrical power to the microglue melt unit is controlled by a circuit breaker located at the lower right back side of the melt unit. The system is designed to be energized from a 15amp 230 volt single phase power source. Hoses and applicator heads are designed with multi-pin plugs to easily connect to the melt unit for simplicity of installation. All connections are located at the rear of the melt.

1.5 Safety Considerations

The following safety features are included in each melt unit:

- The tank, hoses, and applicator heads are monitored for over temperature conditions. The affected zone is shut down if an error condition is detected. An LED indicator is lit until the error condition is corrected when the tank, supply hose or applicator is sensed to be over temperature or sensing incorrectly. An error code will also be display in place of the actual reading for that zone.

- An emergency stop switch is located on the front of the unit. When pressed, primary power to the unit is shut off. The unit is also equipped with a circuit breaker on the back as well as an input power fuse.

- Operation of the pump/motor is inhibited until the melt tank reaches approximately 90% of the selected temperature. This prevents damage to the pump/motor by attempting to operate while the adhesive is too viscous to be pumped. Always ensure the tank temperature is set to or above the melting point of the adhesive.

1.6 Maintenance Considerations

Microglue hot melt systems are designed with simplicity and reliability in mind. Troubleshooting, maintenance and service are quite easy. Front panel diagnostics isolate specific zones which may be experiencing fault conditions. All electrical components are designed for easy access using ordinary hand tools. Modular design minimizes down time in the event of sub-assembly failures.

Chapter 2

Controls and Indicators

This section covers the operating controls and indicators found on the HM10 hot melt unit. Please read them carefully before attempting to operate the machine.

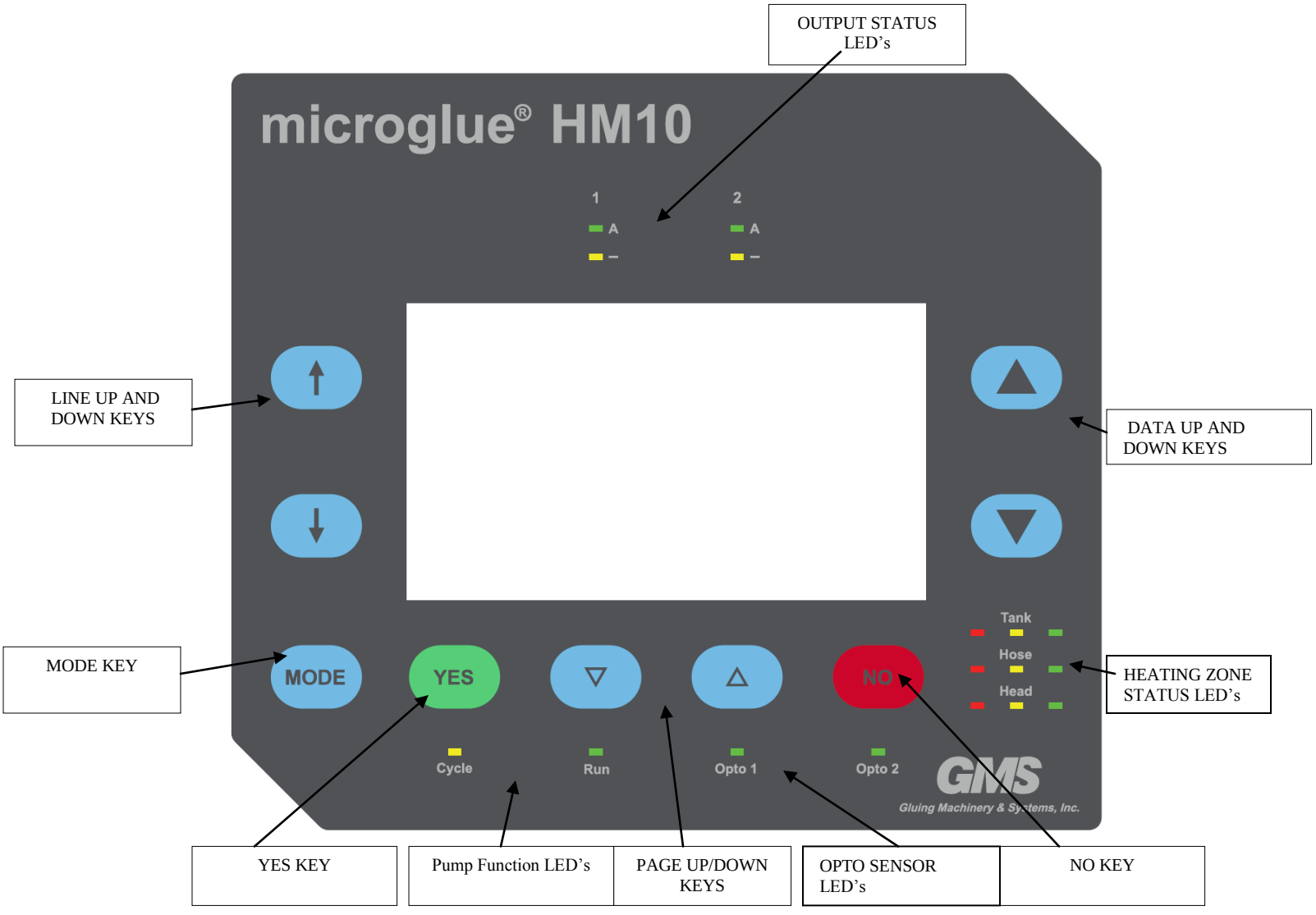
2.1 On/Off Switch and Circuit Breaker

The circuit breaker in the rear of the unit turns on and off all power to the melt unit as well as protects against excessive current being drawn in case of malfunction. Once the circuit breaker is on, the unit can be controlled using the "soft" ON/OFF button on the front panel. The unit can also be shut off in case of emergency by depressing the red emergency off button (EMO) located on the lower right front of the unit. The EMO button needs to be turned clockwise a quarter turn to allow it to return to the on position.

FIGURE 2.1

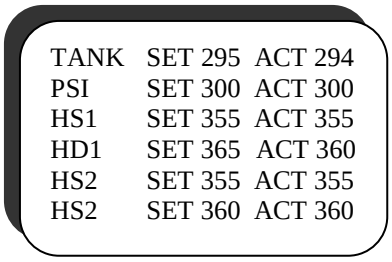
2.2 Front Panel

Control and trouble shooting for the entire melt system is accomplished from the melt unit front panel. A brief overview of these controls and indicators are shown on the following pages:



2.2.2 Zone Select and Temperature Setting

Use the mode key to select melt unit function screen. Use the line "UP" and "DOWN" arrow keys to select the desired zone. Use the "YES" button to turn the selected zone on and the "NO" button to turn it off. Temperatures/pressure are set using the Data Up and Down keys. See temperature setting example in



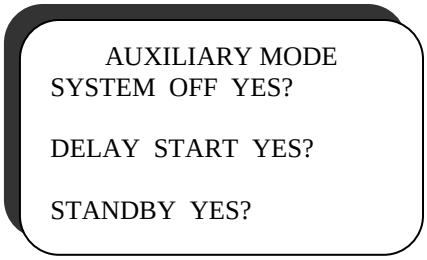
2.2.3 Pump Function Selector

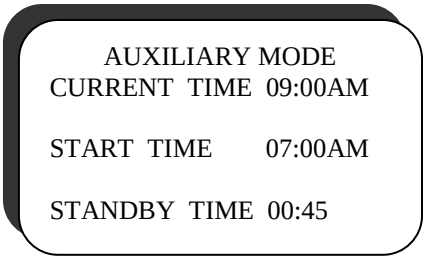
These two LED's indicate the pump function modes; Cycle or Run, and are controlled by the PSI zone.

- The tank must be up to temperature before the pump is allowed to operate.
- Cycle: The pump is cycled on/off automatically when the encoder speed is above the cutoff speed and an output is enabled or when a hand gun is triggered.
- Run: the pump is running either in cycle mode as stated or has been turned on manually by selecting the PSI line and pressing the "YES" key.

2.2.4 Standby Mode and 24 Hour Timer

To activate the standby mode, the delay start function or power the system off, page up once from the first screen of the Auxiliary mode. Use the line up and down keys to highlight the desired function and press yes. To adjust start and standby times or set the clock, page up again and highlight the time to be adjusted. Use the data up and down keys to adjust minutes and the YES and NO keys to adjust the hours.





2.2.5 Melt Unit Ready Lights (Safety Feature)

When the Melt Unit is ready to operate, all LED indicators as observed on the Heating Zone Status LED's will be green. Note that the pump will not operate until the Tank is at temperature. The tank is at temperature when the associated LED is green. The pump will operate even if the HOSE or HEAD is not at temperature. It is therefore recommended

that adhesive only be dispensed after all of the Status LED's have changed from amber to green.

2.2.6 Open Sensor Error (Safety Feature)

The red HEATING ZONE LED will be flashing when an open circuit condition is sensed. It could happen due to a faulty applicator, a melt unit malfunction, or even a hose that has failed. The affected zone is automatically de-energized and an error code will be displayed on the Actual display for the affected zone. This provides a very accurate, simple, and fast turn-around time when there is a system problem. For example, if the failure occurred in the HEAD area, a new applicator could easily be installed, and the system would be back up and running.

2.2.7 Temp Error (Safety Feature)

The red status LED will blink when an over temperature condition is detected in a hose or head and an error code will be displayed on the Actual display for the affected zone. The affected zone will be de-energized until the problem is corrected.

2.2.8 Pressure Error (Safety Feature)

An error code will be displayed on the PSI actual reading line under two fault conditions. The first fault condition is excessively low pressure where in the pump is not able to produce enough pressure. This can be caused by several things including but limited to running the pump dry, running through an open hose or manifold port, and setting the pressure level above the capabilities of the pump based on viscosity or volume being pumped. The second condition would be excessively high pressure in which case the pump would be turned off. There is no reason this condition should ever occur.

2.2.11 Reduction of the "Set" Temperatures

Significant reductions in temperatures can cause the unit to sense and over temperature condition. Large reductions should not be required during typical use but if they are they should be made in incremental stages not larger than 40º F.

2.3 "Cold Temperature" Start-Ups

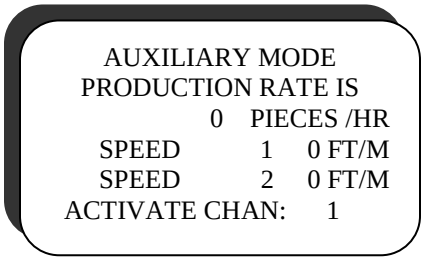
The **microglue** Melt Unit should not be operated at ambient temperatures below freezing (32 degrees F or 0 degrees C). At very cold temperatures (near 0 degrees C), it is potentially possible for the unit to improperly detect an "open sensor" condition. This condition will prevent that "open" zone from heating.

Chapter 3

Pattern Control Operation

3.1 Auxiliary mode

The *AUXILIARY MODE* screens display the machine speed in feet/min or meters/min and production rate in pieces/hour, Output activation, Product length setting set in inches or metric, Output cutoff speed set in ft/min or meters/min, Proportional control settings, clock and timer functions and the Purge option. Use the ▵ or ▿ key to scroll to each screen. The screens will rap around to get back to the top or take a short cut to get to the last screen.

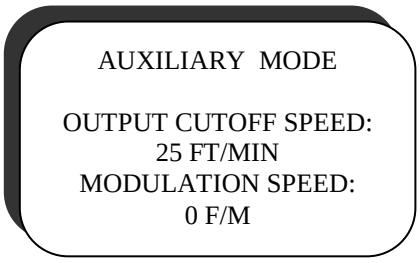


The production rate is displayed in increments of 1000 pieces/hr
The machine speed is displayed either in, feet/minute or meters/minute. Use the YES and NO keys to enable or disable channel 1,2 or 1+2.

Notice the yellow "Enable" LED illuminates when a channel is enabled.
The green "Active" LED will illuminate when the channel turns on the gluing device.

Use the ▿ key to scroll down to the next option.

microglue® HM10 will prompt the following:



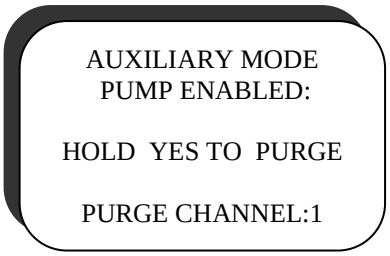
Press the ▲ or ▼ keys to the right of the display to edit the Output cutoff speed.

The cutoff speed is the minimum speed the machine may run before **microglue® HM10** disables the outputs, preventing puddles as the machine is coming to a stop. Enter a cutoff speed that is greater than your jog speed but less than your minimum run speed.

Cutoff speed is one of two prerequisites that are used to determine if the glue valve or pump control signals are sent. The **modulation speed** sets a point at which the outputs start a pulsated operation to decrease glue volume as the machine slows down to speeds where proportional control is ineffective.

Use the ▽ key to scroll down to the next option.

microglue® HM10 will prompt the following:



This screen allows purging of the hot glue guns. Select the output to be purged then press and hold the YES key. The output will purge until the key is released. Caution Note: the pump is always on when on this screen.

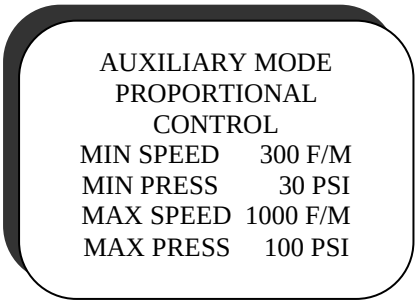
microglue® HM10 automatically turns on the hot glue pump during operation when:

1. Machine speed is greater than the MINIMUM SPEED setting and . . .
2. At least one output has been enabled.

Press ▽ to continue after purging is completed. The hot glue pump will stop.

Use the ▽ key to scroll down to the next option. **microglue® HM10** will prompt the following:

This screen allows you to configure the proportional control settings. The proportional control is the controller's ability to raise or lower the pressure at which adhesive is applied at varied speeds.

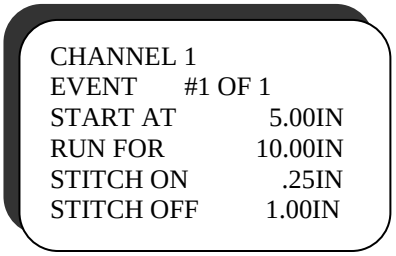


Example:
Set minimum speed for 0 ft/min
Set the minimum pressure for 200 psi
Set the maximum speed for 500 ft/min
Set the maximum pressure for 300 psi

The pressure will be at 200 psi while the machine is not running and rise at a rate of 20 psi for every 100 ft/min that the machine increases in speed. The pressure at 300 ft/min will be 260 psi

3.2 Channel Operation

To program the **microglue® HM10** channels, press the MODE key until the desired Channel is displayed. **microglue® HM10** will prompt the following display:



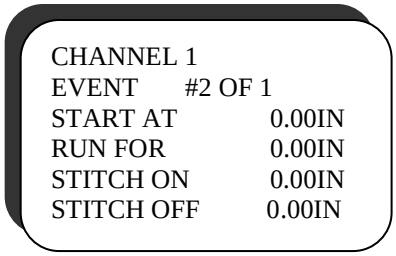
The "Start At" value is relative to the leading edge of the sheet when the optical sensor precedes the glue valve.

Hold the arrow keys down continuously to make large adjustments for the glue starting position, run length, stitch on or stitch off, for small changes a tapping technique works well.

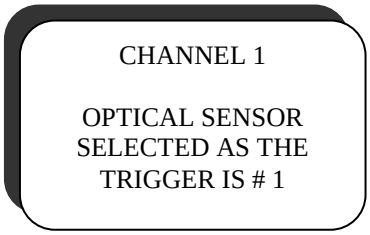
Note that when the "Stitch off" value is zero, there is no stitching and the glue line will run continuously.

The **microglue® HM10** allows each channel to be programmed to produce four separate events, each event can be either a dot, line or stitch pattern.

If a second, third or fourth event are not needed, simply set the run value to zero.



microglue® HM10 allows each channel to be triggered by either of the two optical sensor inputs. To select the optical sensor input press ▽ key while the channel to be modified is displayed. **microglue® HM10** will prompt the following display:

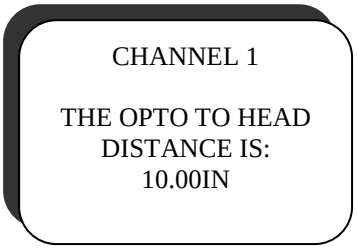


Use the ▲ **or** ▼ keys to the right of the display to select an optical sensor as a trigger.

You can select from either optical sensor number 1or 2.

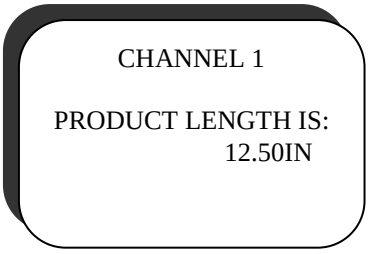
The opto lead distance, encoder input and on and off compensation times must be entered correctly for the output to be programmed accurately and remain accurate throughout a range of speeds. To edit the compensation times and optical lead distance, press the ▽ key while the channel to be modified is displayed.

The opto to head distance is the distance the product travels from the opto to the nozzle of the glue valve. Do not assume that the **microglue® HM10** sees the product directly under the optical sensor as distance and angle may vary the trip point. Use the opto LED on the **microglue® HM10** display to mark the trip point and measure the products forward travel from there to the nozzle of the glue valve. Entering an accurate opto lead distance is critical for **microglue® HM10's** operating procedure. When done properly the "start at" and "run for" value will be exact in relation to the leading edge or reference position of the product, making programming simple. **microglue® HM10** will prompt the following display:



Use the ▲ **or** ▼ keys to the right of the display to edit the opto lead distance. The opto lead is the physical distance between the optical sensor and the glue gun nozzle**. If the optical sensor is positioned behind the glue gun nozzle that distance will need to be subtracted from the start value programmed to get accurate glue line/ dot placement.**

Press the ▽ and **microglue® HM10** will prompt:



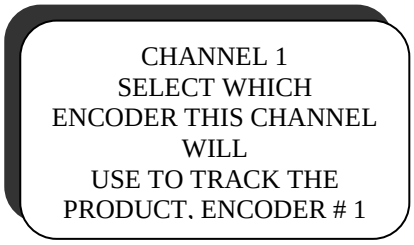
Press the ▲ **or** ▼ keys to the right of the display to edit the product length. The product length should be set to equal the length of the actual product traveling under the optical sensor selected for the channel being programmed

If **microglue® HM10** knows the length of the product, it will lock out and not permit false opto triggers on product with windows or printing. If the product length is set too

long **microglue® HM10** may ignore the next product, leaving every other product unglued. Always remember to use the product length optical sensor lockout feature to protect against opto mis-triggers on products with printing or cutouts.

Use the ▽ key to scroll down to the next option. **microglue® HM10** will prompt the following:

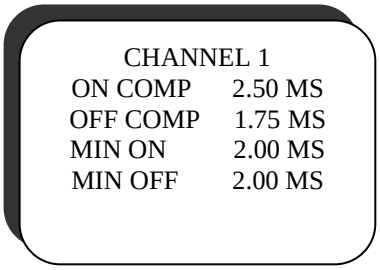
microglue® HM10 allows each channel to track the position of the product with either encoder input 1 or encoder input 2. To select the encoder input for each channel, Press ▽ key while the channel to be modified is displayed. **microglue® HM10** will prompt the following display:



Use the ▲ **or** ▼ keys to select the desired encoder input.
You can select from either encoder input 1, or 2.

Press ▽ to modify the on and off compensation times.

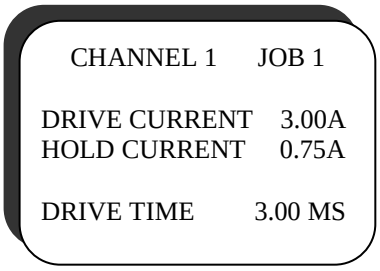
microglue® HM10 will prompt the following display:



The compensation times of a glue valve may vary over the life of the valve and with the use of different glues and pressures. Compensation allows the controller to maintain accurate position and length of the glue line through the range of operating speeds.

Compensation adjustments
If the start position moves toward the tail of the sheet as speed increases, the on compensation time needs to be increased. If the start position moves forward as speed increases, the on compensation time needs to be decreased. If the length of the glue line increases with speed, increase the off compensation time, if the glue line decreases in length as speed is increased lower the off compensation time

Press ▽ to modify the drive current settings.

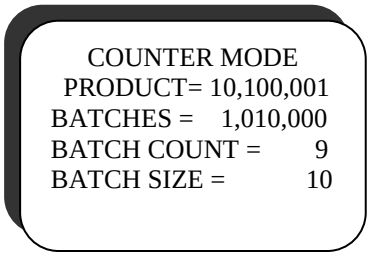


Use the ▲ **or** ▼ keys to change the drive current.
Use the ▲ **or** ▼ keys to change the hold current.
Use the ▲ **or** ▼ keys to change the drive time.

GMS HM100 hot glue valves operate at 3.00 Amps drive and .75 Amps hold with a drive time of 3.00 MS.

3.3 Counter Mode

microglue® HM10 is equipped with a product and batch counter. To view the product and batch counter values press the MODE key until the COUNTER MODE is displayed. The display will show the current product count and number of batches completed. The product and batch counter may be used independently of the gluing system.



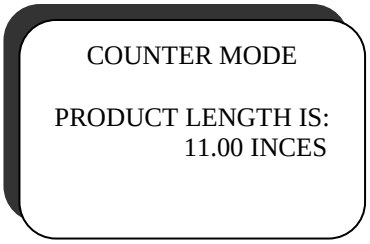
Use the △ or ▽ keys located under the display to toggle through each screen available in the *COUNTER MODE*.

The maximum product count is 99,999,999. The product counter will increment by one each time the optical sensor is tripped, provided that the product length has been exceeded each time the optical sensor is tripped.

The maximum number of batches is 99,999.

The batch counter increments each time the amount of product fed through the equipment exceeds the designated reset value, up to 99,999.

It is very important to set the counter product length to the actual length of the product that is passing under the optical sensor. This will ensure that the counter correctly tracks the actual number of products as opposed to the number of times the optical sensor is tripped.

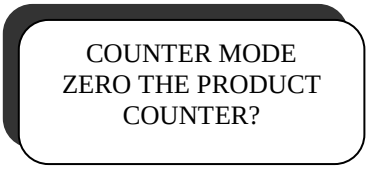


Use the ▲ **or** ▼ keys to adjust the product length value.

Adjust the product length to the actual length of the product as it passes under optical sensor number one. **All counting is done from the number one optical sensor input.**

To zero the product count or batch count, press the ▽ key while in the *COUNTER MODE*.

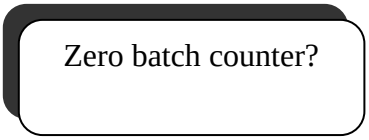
microglue® will prompt the following questions:



Press the YES key to zero the product counter. Press NO to leave the value alone.

microglue® HM10 will not ask if you want to zero the product counter if the product count is already zero.

Press ▽ to go to the next option.



Press the YES key to zero the batch counter. Press the NO key to leave the counter alone.

microglue® HM10 will not ask if you want to zero the batch counter if the batch count is already zero.
The product and batch counters are now ready for operation. Press ▽ to return the first screen.

Chapter 4

Installation Instructions

4.1 Shipping and Handling

The microglue hot melt system is shipped with the melt unit, supply hoses, and applicator heads disconnected. The supply hoses and applicator heads are typically packed in separate boxes from the melt unit. The melt unit is shipped in a plywood crate. Padding is placed around the bottom and top of the melt unit to protect it during shipment.

A system manual is shipped with each melt unit.

The supply hoses will be loosely coiled in a box separate from the melt unit. Automatic applicator heads will be packed in a box separate from the hoses as well as other system accessories.

EXTREME CARE MUST BE TAKEN WHEN SHIPPING THE MICROGLUE MELT UNIT DUE TO ITS SIZE AND WEIGHT, OTHERWISE IT MAY BECOME DAMAGED. IT IS STRONGLY RECOMMENDED THAT THE ORIGINAL PACKING MATERIALS BE KEPT FOR LATER USE. IT IS ALSO RECOMMENDED THAT THE MELT UNIT BE PLACED ON A PALLET FOR SHIPMENT VIA COMMON CARRIER RATHER THAN SHIPPING VIA PARCEL SERVICES.

4.2 Positioning the Melt Unit

Remove the melt unit from the shipping materials. Position it so servicing is convenient and the control panel is easily accessible. Select a surface that is flat, level and strong enough to support the unit. It is highly recommended that a GMS rolling stand be used.

CAUTION

THE MELT UNIT SHOULD BE PROPERLY BOLTED TO ITS SUPPORTING SURFACE USING THE BASE MOUNTING HOLES TO PREVENT ACCIDENTAL UPSET AND POSSIBLE INJURY.

4.3 Component Installation

WARNING

BE CERTAIN THE MELT UNIT CIRCUIT BREAKER IS TURNED OFF AND THE POWER CORD IS DISCONNECTED PRIOR TO INSTALLING HOSES AND/OR APPLICATOR HEADS TO THE MELT UNIT TO AVOID ACCIDENTAL SYSTEM PRESSURIZATION OR ELECTRICAL SHOCK. READ CHAPTER 2 OF THIS MANUAL BEFORE INSTALLING ANY COMPONENTS.

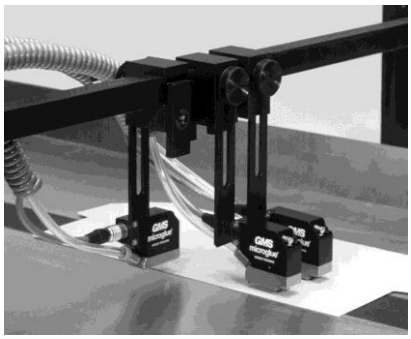
microglue® is a distance based programmable control system that requires the use of an optical sensor and encoder to detect the leading edge and velocity of the product. The

peripheral components must be installed correctly and in the appropriate positions for **microglue**® to operate properly.

4.4 Cross Bar Bracket

The cross bar is used as a support for mounting the other components. Locate a position where the cross bar can be mounted across the machine, usually near where the glue valves need to be installed. The installation may vary depending on the application. On some installations the cross bar will support all of the components, optical sensor, encoder, glue valves and the controller, while others may require components to be mounted elsewhere.

Position the vertical brackets with two slots on the side frame of the machine with the cutout for the horizontal pieces facing inward. Fasten the horizontal brackets within the cutout of the vertical pieces and secure using the 1/4-20x3/4" thumbscrew. Slide the ¾ inch cross bar through the horizontal pieces and secure by tightening the Phillips screws.



4.5 Encoder

The encoder is used to measure the speed that the product is traveling. The friction wheel must be resting on a surface that is traveling at the same speed as the product. The encoder can usually be mounted on one of the drive rollers or a belt.

The encoder has a built-in bidirectional spring mechanism and should be fastened so the spring tension provides adequate friction to keep the velocity wheel from slipping. Secure the encoder to the slotted bracket with a 1/4 -20 nut and lock washer.

The encoder can be adjusted horizontally by loosening the screws which hold the ½" bar, or vertically by sliding the encoder up on its slotted bracket.

Built into the encoder is a 12' cable. Plug the cable into the operator console into the appropriate receptacle on the **microglue**® controller.

Warning- Make sure no hazards are created or safety features compromised by installing the encoder.

4.6 Optical Sensor

GMS offers two basic optical sensors. The current sensor is made by Carlo Gavazzi, the instruction for setting the sensitivity is described below.

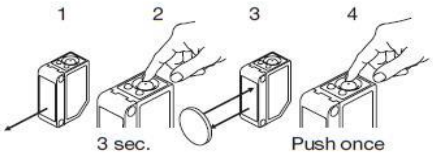
PD30CND10....RT

CARLO GAVAZZI

Teach functions

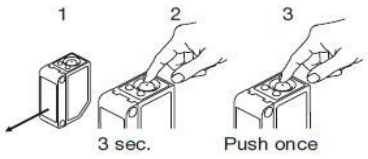
Normal operation, optimized switching point.

1. Line up the sensor at the background. Yellow LED is OFF and Green LED is ON.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.
   (The first switch point is stored)
3. Place the object in the detection zone.
4. Press the button once and the sensor is ready to operate (Green LED ON, Yellow LED ON)
   (The second switch point is stored)



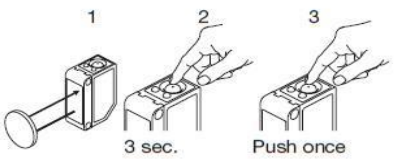
For maximum sensing distance (default setting)

1. Line up the sensor at the background. Yellow LED is OFF and Green LED is ON.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.
   (The first switch point is stored)
3. Press the button a second time and the sensor is ready to operate (Green LED ON, Yellow LED ON)
   (The second switch point is stored)



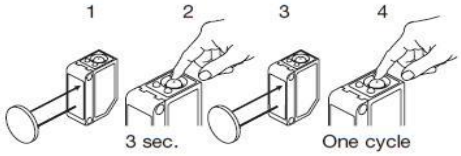
For minimum detection overhead.

1. Line up the sensor at the object. Yellow LED is OFF and Green LED is ON.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.
   (The first switch point is stored)
3. Press the button a second time and the sensor is ready to operate(Green LED ON, Yellow LED ON)
   (The second switch point is stored)



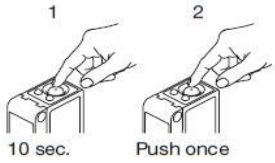
For dynamic set-up (running process)

1. Line up the sensor at the object. Green LED is ON, status on the yellow LED is not important.
2. Press the button for 3 second until both LEDs flashes simultaneously.
3. Press the button a second time for at least one second, both LED's flashes fast siultainiously and keep the button pressed for at least one process cycle, release the button and the sensor is ready to operate (The second switch point is stored)



For make or break set-up (N.O. or N.C.)

1. Press the button for 10 seconds, until the green LEDs flashes.
2. While the green LED flashes, the output is inverted each time the button is pressed. Yellow LED indicates N.O. function selected.
   If the button is not pressed within the next 10 seconds, the current output is stored.



4

Specifications are subject to change without notice (02.07.2007)

TOOLS USED FOR INSTALLATION
One 7/16" Open End Wrench
One 1/2" Open End Wrench
One 4-mm Hex Wrench
One 7/64" Hex Wrench

4.7 Hot Melt Supply Hoses

The following points should be kept in mind concerning hot melt supply hoses:

1. The hose should not be flexed when cold to avoid damage. The hoses have a minimum bend radius of eight inches when hot, further flexure will cause permanent damage. New and clean hoses do not need to be heated.

2. Hot melt fittings must be heated before loosening or tightening to prevent damage. New and clean supply hose fittings do not need to be heated.

3. Support the hose during gluing operations to prevent excessive flexure. Failure to properly support the hose will result in premature failure.

DANGER

BE CERTAIN TO WEAR PROPER PROTECTIVE CLOTHING WHEN INSTALLING SUPPLY HOSES TO A MELT UNIT AT HIGH TEMPERATURES TO AVOID POSSIBLE SERIOUS INJURY. EXTREME CARE SHOULD BE EXERCISED AT ALL TIMES.

a) Loosely connect the JIC swivel fitting on the hose to the manifold fitting, and then tighten the JIC swivel fitting using a 9/16" open end wrench. Be certain the JIC fitting is securely seated on the manifold fitting otherwise glue will leak once the unit reaches operating temperature.

b) Properly align the keys of the hose electrical connector to the melt unit connector and securely screw these parts together.

4.8 Hand Gun Applicators

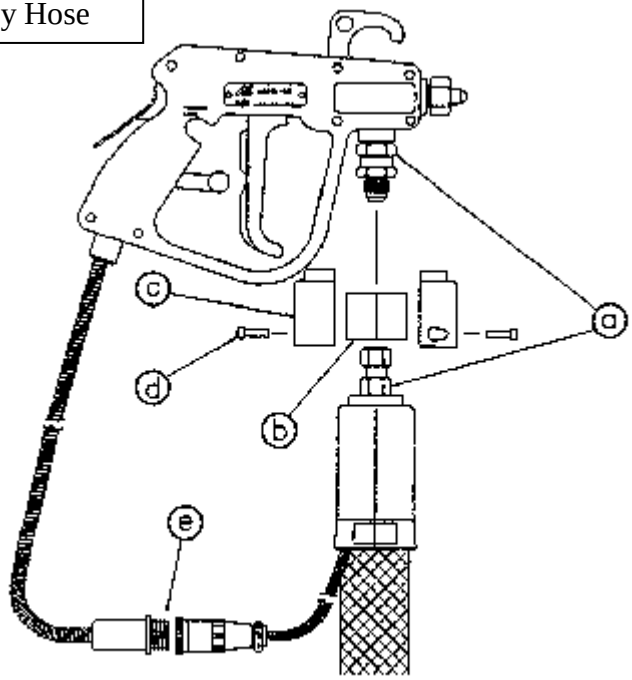
The handgun nozzle should never be pointed towards people when the melt unit is powered. Pressures can develop within the hot melt system causing the glue to be projected significant distances. Pointing the handgun at someone (including yourself!) presents a potential burn hazard.

The trigger mechanism of the handgun should never be pulled until the entire system is up to operating temperature. Attempts to retract the trigger before glue in the handgun has adequately softened will result in damage to the needle assembly. This damage is not covered under warranty.

The backside of the handgun grip contains a yellow lever to control pump motor operation. It is recommended that the front panel of the melt unit be set for cycle operation with pump motor control from the handgun switch. This will prevent unnecessary wear on the motor and pump mechanisms.

Hot melt fittings must be heated before loosening or tightening to prevent damage. New and clean supply hose fittings do not need to be heated.

Figure 3-2 Handgun Installation to Supply Hose



a) Loosely connect the JIC fitting on the supply hose to the handgun, then tighten the JIC fitting using two 11/16" open end wrenches, one on the handgun and one on the hose.

b) Install the heat shield insulation over the handgun/hose connectors.

c) Assemble the two pieces of the handgun swivel shield over the insulation assuring the top collar of the shield fits into the groove machined in the JIC male handgun fitting.

d) Insert the two hex head screws into the handgun swivel shield and tighten using a 7/64" hex wrench.

e) Properly align the keys of the hose electrical connector to the handgun connector and securely screw these parts together.

4.9 Automatic Applicator Heads

The following points should be kept in mind concerning automatic applicator heads:

- Automatic heads are mounted to appropriate brackets using supplied hardware.

- Insulation spacers must be used between the applicator head and the mounting bracket and between the mounting bracket and mounting bolt to assure minimum heat loss and allow the applicator to efficiently reach the desired temperature.

- Fittings connecting the applicator head to the hose should be kept as short as possible and insulation should be applied over the hose/head fitting connections to further minimize heat loss since this connection is unheated.

Hot melt fittings must be heated before loosening or tightening to prevent damage. New and clean supply hose fittings do not need to be heated.

4.10 Electric Applicator Heads

HM-100 electric applicator heads require only electricity to actuate the needle. Both applicator head heating and actuating power is supplied through the melt unit through the supply hose, therefore no external connections are required making installation very simple. This applicator is ideal for installation sites where no compressed air is available.

a) Loosely connect the mounting bolts through the insulation washers and mounting bracket into the applicator head. Tighten the bolts using a 9/64" Allen wrench.

b) Loosely connect the JIC fitting on the supply hose to the applicator head, then tighten the JIC fitting using an 9/16" open end wrench.

c) Properly align the keys of the hose electrical connector to the applicator connector and securely screw these parts together.

4.11 Electrical Wiring

The microglue HM10 series hot melt units use single phase, 200 to 240 VAC, 50 to 60 Hz power sources, each with earth ground for safety. Units come with three bare wire leads for connection to an electrical circuit box.

4.12 Supply Hose Electrical Connections

Electrical power to heat supply hoses is provided via the melt unit. Supply hoses are equipped with a multi-pin, molded connector that is attached to the back connector plate of the melt unit for ease of installation.

4.13 Applicator Head Electrical Connections

Electrical power to heat all handgun and automatic applicator heads is supplied by the melt unit via the supply hoses. The applicators are equipped with multi-pin, molded connectors designed to mate to hose connectors for ease of installation.

attern controllers supplied by Gluing Machinery & Systems, Inc.
are available with terminated cables to simplify connection to the
melt system.

4.14 Start-Up Instructions

WARNING

FIRE, EXPLOSION, PERSONAL INJURY, PROPERTY AND EQUIPMENT DAMAGE CAN RESULT IF THE MATERIALS USED IN OR AROUND ANY HOT MELT SUPPLY EQUIPMENT DO NOT MEET ALL THE FOLLOWING REQUIREMENTS:

I. Minimum flash point of the material should be at least 50° F (10° C) above the highest operating temperature of the melt system.
II. Liquid and vapors should be non-toxic and non-flammable at operating temperatures of the melt system.
III. Any materials mixed in the melt system (i.e. purging compounds and adhesives or different adhesives) should not react violently to produce heat, flames, toxic gases, cross linking or disabling of the adhesive's ability to melt at its designed temperature.
IV. Materials used in the melt system must not corrode, abrade or otherwise detrimentally affect the system.

1. Become familiar with all melt unit controls by reading Chapter 2 (Controls & Indicators) of this manual.

2. Install the microglue hot melt system as specified in this section.

3. Fill the melt tank with adhesive material to a level no higher than 1.5 inches (4 cm) from the top. Certain product assembly materials will degrade over time due to oxidation. It is best not to put more material in the tank than will be used in one day. Set the tank temperature as low as feasible for each specific application.

4. Turn the melt unit on, selecting the desired temperature setting for the melt tank, supply hose(s), and applicator head(s). Lower temperature settings will increase the material's pot life. The microglue hot melt system employs staged heating upon start-up to reduce current loads and prevent glue degradation in the hose and applicator head as the melt unit achieves its desired temperature. All three elements of the melt system achieve desired temperature at approximately the same time utilizing this method of heating.

5. Select the desired pump output pressure. In most cases this pressure is between 200 and 250 psi.

4.15 Temperature Setting Example

Most manufacturers of hot melt adhesives offer advice for setting the temperatures of the delivery system. The manufacturer's recommended temperature usually applies to the temperature of the applicator. In order to reduce degradation of the adhesive, the delivery hose should be at a lower temperature than the applicator and melting tank at a lower temperature than the delivery hose. When volume requirements vary, the temperature settings for the melting tank and delivery hose may also vary. The applicator will always be set to the recommended delivery temperature; however certain conditions may require adjustment of this setting. For the purpose of this example however, we will assume that conditions are ideal.

In this example, the adhesive will have a recommended delivery temperature of 350° F.

Volume Requirement:	Low	Medium	High
Tank Setting	300	315	325
Hose Setting	340	345	350
Applicator Setting	360	360	360

Chapter 5

Maintenance

All electrical and mechanical components of the microglue hot melt system should be visually inspected for damage/wear prior to powering up the system each day. This inspection should include, but may not be limited to, the following areas event of sub-assembly failures:

- Inspect the melt tank for foreign materials and/or charring of the adhesive. Wipe off all excess adhesives from all surfaces with purging compound.
- Check the hoses, applicator heads, and nozzles for wear and assure integrity of all electrical connections.
- Verify the hose is being properly supported so it is not over-stressed during use. The minimum bend radius is 8 inches (21 cm) when hot.
- Look for leaks under the melt unit and at all mechanical connections.

Problems noted should be remedied prior to powering up the unit. The system should be purged with a flushing agent when char build-up occurs or if the hot melt formulation is changed.

WARNING

HOT MELT MATERIALS CAN CAUSE SEVERE BURNS RESULTING IN DISFIGUREMENT OR BLINDNESS. TAKE THE FOLLOWING PRECAUTIONS BEFORE BEGINNING ANY MAINTENANCE ACTION:

1. Wear eye protection goggles, gloves, and protective clothing.
2. De-pressurize the supply hoses and applicator heads by shutting off the pump motor and firing the applicator head either manually or automatically into a disposal receptacle until no more glue is expelled through the applicator.
3. Allow the melt unit to cool down before beginning any maintenance.
4. Always disconnect hose/applicator electrical connectors before disconnecting mechanical fittings.

CAUTION

The part of the system being serviced should be heated to a temperature high enough to soften the glue prior to dismantling, assembly or adjustment to prevent damage to mechanical components (i.e. hose/head fittings, stroke adjusters, tank lid, etc.).

Assure that power to the melt system is turned off prior to attaching any electrical connector to avoid arcing or possible component failure.

5.1 Tank Screen Inspection

A filter screen is located in the bottom of the melt tank to prevent contaminants from damaging the glue pump assembly. This screen should be inspected and cleaned on a regular basis. It is easiest to do this when the melt tank is at operating temperature and close to being empty of glue.

1. Grasp the screen from the bottom of the melt tank using needle nose pliers. Be very careful not to let any contaminants on the screen fall back into the melt tank.

2. Clean all debris from screen.

3. Inspect the screen for damage and replace if necessary.

4. Reposition the screen into the bottom of the melt tank assuring it fits snugly back into the recess over the top of the sump hole outlet to the gear pump.

5.2 Manifold Filter Replacement

The manifold houses a fine particle filter. This filter should be replaced periodically to ensure proper glue flow from pump to manifold. Filter replacement is best done with the unit hot and turned off. Proper caution should taken.

1. Remove filter cap from manifold using a 3/4" wrench.

2. Slide filter element out.

3. Install new filter element.

4. Install new O-ring on filter cap and screw filter cap back in place with wrench.

5.3 Hose Replacement

1. Turn off the melt unit circuit breaker and allow the adhesive in the tank to completely solidify.

CAUTION

LIQUIFIED HOT MELT ADHESIVE IN THE MELT UNIT TANK AFFORDS A POTENTIAL BURN HAZARD WHEN ATTEMPTING TO REPLACE SUPPLY HOSES. BE CERTAIN THAT ALL MATERIAL IN THE TANK HAS COOLED BEFORE ATTEMPTING THIS MAINTENANCE ACTION.

2. Turn on the melt unit circuit breaker for several minutes to allow fittings to warm or heat fittings with a hot air gun.

3. Turn off the melt unit circuit breaker and disconnect the melt unit's electrical power.

4. Disconnect the supply hose electrical connector.

5. Loosen the supply hose JIC fitting and remove the hose from the melt unit.

6. Install a new hose as specified in 3.4.

5.4 Opening outer cover

Under normal operating conditions you should never have to remove the outer cover. Should you be asked to do so, the following procedure can be used:

1. Using a Philips screw driver, remove the six screws securing the outer cover to the back panel and base. These screws are located along the bottom right and left sides and back top and side of the outer cover.

2. Raise the tank lid and carefully slide the cover forward. This will allow access to all higher level electrical components.

Chapter 6

Parts Lists, Assembly Drawings, and Electrical Schematics

This chapter provides parts lists, assembly drawings, and electrical schematics for the various components of the microglue Melt System including the melt unit, supply hose, and applicator heads.

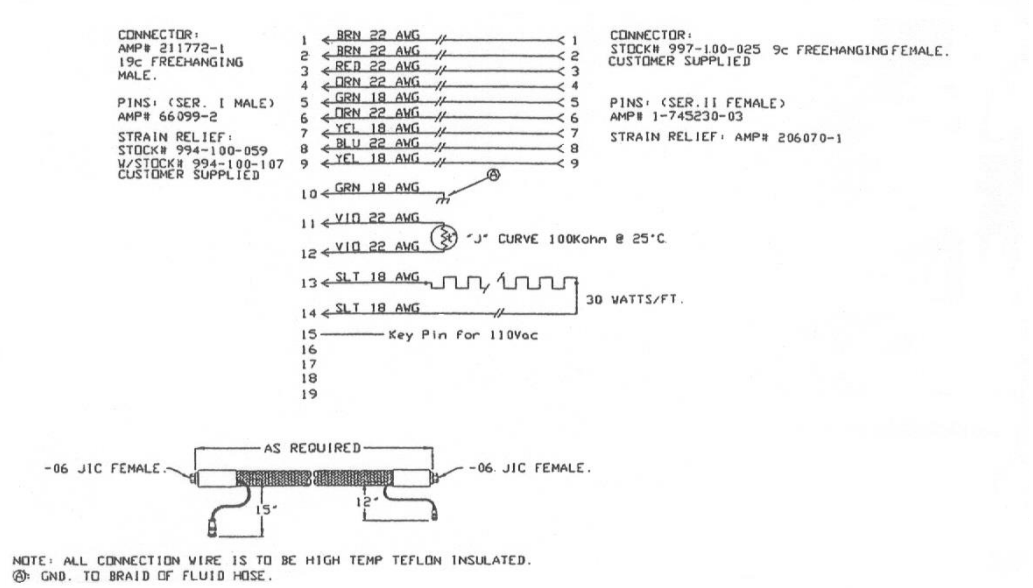
6.1 Tank Filter

Part # HM-44238

6.2 Manifold Filter

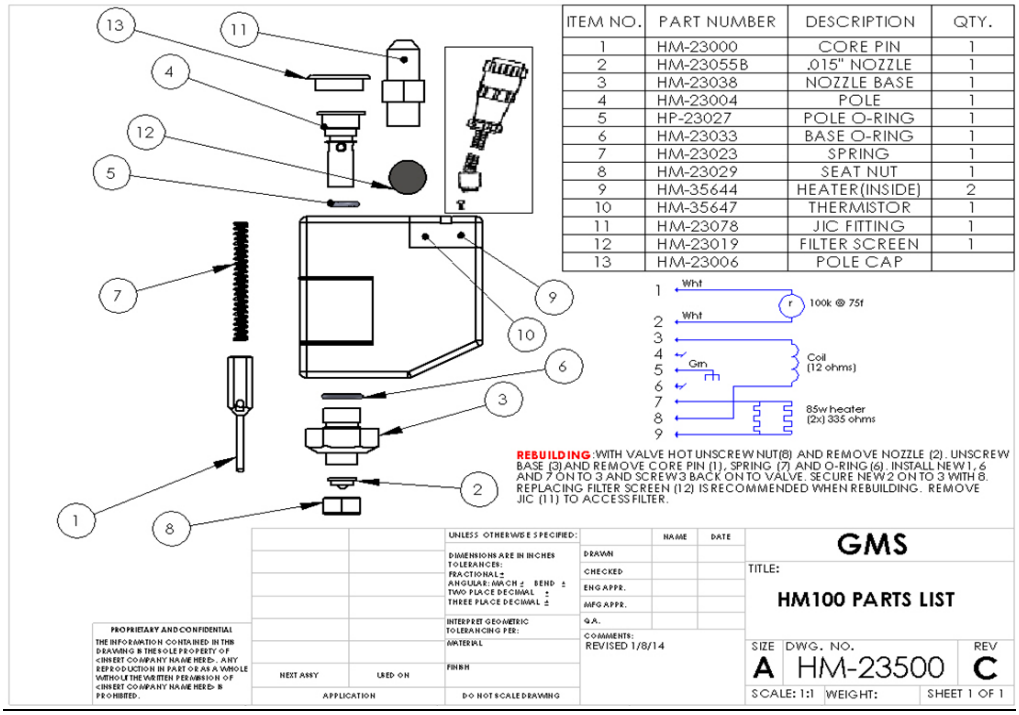
Part # ASSY-52008

6.3 Hose Electrical



HM 100 REBUILD INSTRUCTIONS

1. HEAT UP VALVE AND MAKE SURE PUMP IS OFF.
2. LOOSEN SET SCREW AND REMOVE POLE CAP (13)
3. BACK POLE (4) OUT TWO REVOLUTIONS COUNTER CLOCKWISE.
4. VALVE IS EASIER TO REBUILD IF YOU CAN SECURE IT POINTING UPWARD.
5. UNSCREW SEAT NUT (8) CAREFULLY, NOZZLE (2) IS UNDER PRESSURE BY SPRING (7), THEN UNSCREW NOZZLE BASE (3)
6. PULL CORE PIN (1) AND SPRING (7) OUT.
7. CAREFULLY INSERT NEW PIN (1) AND SPRING (7) MAKING SURE SPRING (7) SITS INSIDE POLE (4) PROPERLY.
8. REMOVE USED BASE O-RING (6) FROM NOZZLE BASE AND REPLACE WITH NEW O-RING (6), THEN REATTACH NOZZLE BASE (3) TO VALVE BODY.
9. POINT GLUE VALVE BACK DOWNWARD AND PUMP SOME GLUE THRU THE VALVE TO FLUSH OUT ANY DEBRIS.
10. PLACE NOZZLE (2) INSIDE SEAT NUT (8) AND REATTACH TO NOZZLE BASE (3) MAKING SURE THE TIP OF THE CORE PIN (1) IS CENTERED TO THE BACK OF THE NOZZLE (2).
11. RESET “STROKE” BY TURNING THE POLE (4) CLOCKWISE UNTIL IT STOPS THEN BACK OUT A ¼ TURN. PLACE POLE CAP (13) BACK IN POSITION AND SECURE WITH SET SCREW.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HM-23000	CORE PIN	1
2	HM-23055B	.015" NOZZLE	1
3	HM-23038	NOZZLE BASE	1
4	HM-23004	POLE	1
5	HP-23027	POLE O-RING	1
6	HM-23033	BASE O-RING	1
7	HM-23023	SPRING	1
8	HM-23029	SEAT NUT	1
9	HM-35644	HEATER(INSIDE)	2
10	HM-35647	THERMISTOR	1
11	HM-23078	JIC FITTING	1
12	HM-23019	FILTER SCREEN	1
13	HM-23006	POLE CAP	

Chapter 7

Warranty

GMS® warrants that products manufactured by it shall be free of defects in material and workmanship when operated in accordance with GMS's operating and maintenance procedures for the following period from the date of shipment:

Product	Warranty Limit
Melt Units, Timers, Temperature Controls	1 Year
Mobile Hoses, Handguns, Nozzles, and Mechanical Assemblies	6 Months
Stationary Hoses and Automatic Applicators	1 Year

GMS's© liability is limited to the repair or replacement, at **GMS**'s option, of any product which proves to be defective during the warranty period outlined. The product must be returned, prepaid by purchaser, to **GMS**© after obtaining a Return Authorization Number from **GMS**©. **GMS**© shall have the right of final determination as to the existence and cause of any defects.

This warranty shall not cover unauthorized repairs, alterations, modifications, or use by the purchaser of product for which it is not intended without prior written consent from **GMS**©.

This warranty shall not cover abuse, neglect, improper operating or maintenance procedures, voluntary or involuntary damages of the product by the purchaser.

GMS's© liability under this warranty shall in no event exceed the purchase order price and shall not cover any losses caused by delays or for any expenses for labor, supplies, machine rental or loss or damages to other property.

No warranty is made with respect to customer equipment or products manufactured to purchaser's specifications except as specifically stated in writing by **GMS**©.

GMS© assumes no responsibility for the quality or performance of coatings, adhesives, or other customer supplied materials used with **GMS's'**© equipment.

GMS's© responsibility for transportation under this warranty is limited to charges for delivery of repaired products via the least expensive transportation available, to the purchaser in the Continental United States only. Payment for shipment of **GMS**© parts or products to **GMS's**© facilities is the responsibility of the purchaser.

Warranty for items that are repaired or replaced by **GMS**© shall continue in effect for the remainder of the original warranty period or for ninety (90) days following the date of shipment by **GMS**©, whichever period is longer.

This warranty supersedes any other warranty, expressed or implied, and constitutes all of Gluing Machinery & Systems, Inc.'s liability with respect to its products.

This warranty is non-transferable. Warranty card information must be complete and verifiable with the user for this warranty to be valid.

Safety Precautions for Hot Melt Applicator Equipment

This manual contains important safety information and instructions. Failure to comply with the following procedures could result in death, injury, or permanent damage to this equipment and will void the warranty.

Intended Use

This equipment is designed for use with standard adhesive and sealant such as EVA's and PVA's with flash points above 232° C (450° F). It is not designed for use with polyamides. Do not use flammable material or material not compatible with the specifications of this equipment. Failure to follow this instruction can cause injury to operators and damage to equipment.

Gluing Machinery & Systems, Inc., has designed this equipment for safe operation. However, heated thermoplastics and other hot melt materials are dangerous and care must be exercised to ensure operational safety. Handling must be in accordance with hot melt manufacturer specifications.

Do not mix hot melt formulations in the melt tank. To change formulations, purge and clean tank with materials recommended by the adhesive manufacturer at the recommended temperature.

Dispose of hot melt properly. Refer to the Materials Safety Data Sheet (MSDS) of the hot melt for recommended disposal methods.

Personal Safety

Wear the following protection when working on or around this equipment:

Always wear heat resistant gloves rated to 205° C (400° F). Then using heat resistant gloves, allow all system temperatures to stabilize at 193° C (380° F) or below before attempting operation or maintenance.

Properly ventilate equipment according to appropriate MSDS of the hot melt material used.

Do not store combustible materials in the vicinity of equipment.

Trained operators may perform only external equipment adjustments. Trained maintenance technicians must perform internal adjustments and service.

Emergency Power Disconnect

In the event of a malfunction, turn off power to the equipment at the main circuit breaker of the melt unit and remove source power to the unit at the nearest main disconnect.

Follow Directions

Read the equipment manual thoroughly before installation, operation or maintenance.

Gluing Machinery & Systems, Inc. will not be held liable for injuries or damages caused by misuse of this equipment.

Safety Labels and Signal Words

The following safety words are used throughout this manual and in product labels to alert the reader and operator to personal safety hazards or to identify conditions that may result in equipment or property damage.

DANGER

Indicates a hazard which, if not avoided, will result in serious injury, including death, or equipment and property damage.

WARNING

Indicates a hazard which, if not avoided, can result in serious injury, or equipment and property damage.

CAUTION

Indicates a hazard which, if not avoided, can result in minor injury, or equipment and property damage.