BENCHMARK BM650-4
SERVICE MANUAL

Your System Configuration

Temperature Controls
Microprocessor

Tank Size
50 lb (22kg) 6 gal (23L)

Voltage Requirements
220 VAC, Single Phase, 20 A



Hot Melt
Technologies, Inc.
No One Puts It Together Like HMT®

1723 W. Hamlin Rd | Rochester Hills, MI 48309
248.853.2011 | www.hotmelt-tech.com

Intended Use

Benchmark® and ProFlex® adhesive melters and components are designed to melt and pump thermoplastic hot melt adhesives and sealants. Any other use is considered to be unintended. Hot Melt Technologies, Inc. (HMT) will not be liable for personal injury or property damage resulting from unintended use. Intended use includes the observance of HMT safety instructions. HMT recommends obtaining detailed information on the hot melt materials being used.

- The product is only intended for use in industrial applications and may only be used to melt and pump thermoplastic hot melt adhesives (e.g. EVA, PSA, APO, Polyamide).
- The product may only be installed, assembled, commissioned, operated, maintained, repaired, de-commissioned and disposed of by trained personnel.
- The product may only be operated with compatible original components and original accessories from HMT.
- The product is to be used exclusively for the purpose described herein and within the limits defined in this document. The product must not be modified with respect to its structure or its safety features without the written consent of HMT. No changes to the software or hardware of HMT products are permitted. Only use original spare parts, original accessories or standard parts that have been approved by HMT.

The instructions are part of this product. No applications other than those described in the instructions are permitted.

Improper Use

Examples of misuse of the product include:

- Melting and pumping of unsuitable adhesives (e.g. polyurethane reactive (P.U.R.) a.k.a. "Moisture Cured" adhesives)
- In defective condition
- With electrical cabinet open
- With the tank lid open
- Melting and pumping materials which, when under vacuum or pressure, can pose a health hazard or endanger safety in the workplace (e.g. solvents, explosive or highly flammable materials)
- Cleaning the product with highly flammable materials (e.g. solvents)
- Use in environments that require cleaning of the product with jets or sprays of water
- Processing of food

Residual Risks

In the design of the Benchmark® and ProFlex® systems, every measure was taken to protect personnel from potential danger. However, some residual risks cannot be avoided:

- Risk of burns from hot material
- Risk of burns when filling the tank, from the tank lid and exposed metal surfaces
- Risk of burns when conducting maintenance and repair work for which the melter or components must be heated up
- Material fumes may be hazardous; Always avoid direct inhalation

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STOP



If incorrectly used, this machine can cause severe injury. Those who use and maintain the machine should be trained in its proper use, warned of its dangers, and should read the entire manual before attempting to set up, operate, adjust or service the machine.

WARNING

- Do not allow the pump motor to stall. A prolonged stall may damage the motor and other components.
- Do not connect or disconnect electrical connectors, or remove components, with the power on. This will prevent arcing of electrical contacts and possible failure of components.
- Always close and secure the control panel access cover to protect internal electrical components.
- Always operate the system with the tank full and lid on.
- Prior to dismantling, assembly, or adjustment of certain service parts (hose/gun fittings, pump assemblies, etc.), the part(s) being serviced should be preheated to reduce the chance of stripping threads or ruining components.
- Working on or around hot melt adhesives and equipment can cause severe burns.
- Use eye protection, gloves and protective clothing while operating and/or servicing hot melt equipment.
- Before installing any hot melt equipment, determine proper electrical requirements per all applicable codes.

  At Hot Melt Technologies, we pay special attention to the needs of operators and service personnel when designing equipment, but molten hot melt adhesives are dangerous and can cause severe burns. Extreme care must be exercised to insure personnel safety.

  Fire, explosion, personal injury, property, and/or equipment damage can result if the material(s) used in or around any hot melt adhesive supply unit are toxic, heat, or fire sensitive. Always read the manufacturer's recommended use guidelines.

  All HMT units are equipped with over temperature protection as a necessary safety device. Run-away heating can cause hot melt materials to exceed their flashpoint.

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Prevent Serious Equipment Damage

Protect your hot melt equipment by installing a GFEP (Ground Fault Equipment Protector) device in your distribution panel.

HMT recommends that hot melt systems be protected from unintended line-to-ground currents by installing an appropriate ground fault equipment protection (GFEP) device. Contact HMT Technical Service & Support or a qualified electrical contractor for more information. When installing a GFEP device always comply with local electrical codes.

LEGEND: SAFETY SYMBOLS

Electric Shock Hazard: Line Voltage Present with Machine Power Off. Risk of electrical Shock or Burn

Disconnect Power Before Servicing

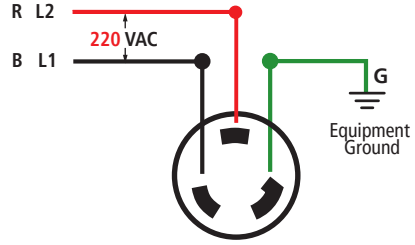
Consult Service Manual

Warning/Caution: Used to draw attention to Hot Surface Warnings, Over Temp Alarms, Hose Routing Practices, and other safety notifications.

Hot Surface: Surface and surrounding area may be hot. Exercise extreme caution and utilize proper Personal Protective Equipment (PPE).

NEMA L6-20 POWER PLUG CONFIGURATION

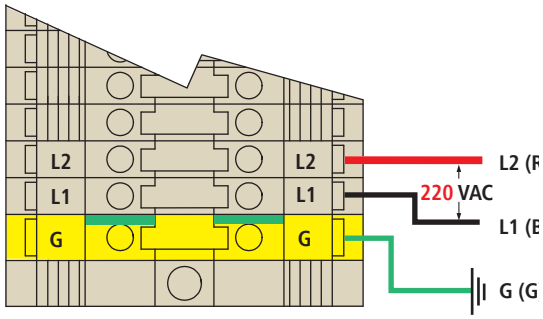
Voltage	Amps	Type	Type
220 Single Phase	20	2-Pole, 3 Wire Grounding	



Before Using Your Hot Melt System

It is your responsibility and obligation to make sure your system:

- Has been properly installed off the floor and on a steady, level work surface away from combustible materials.
- Has been located in such a way that the controls are away from the operator and that the control panel is securely closed at all times.
- Is the right capacity system for the intended use.
- Is connected to the proper power supply.(See Below).
- Is only used to do what a hot melt system is designed to do.
- Is not used by anyone unable to operate it properly.
- Is used in an area where the room temperature does not fall below 65 °F.
- Is used in an area which is free from blowing air caused by cooling fans, open doors or windows.



Control Box

Basic Electrical Power Connections

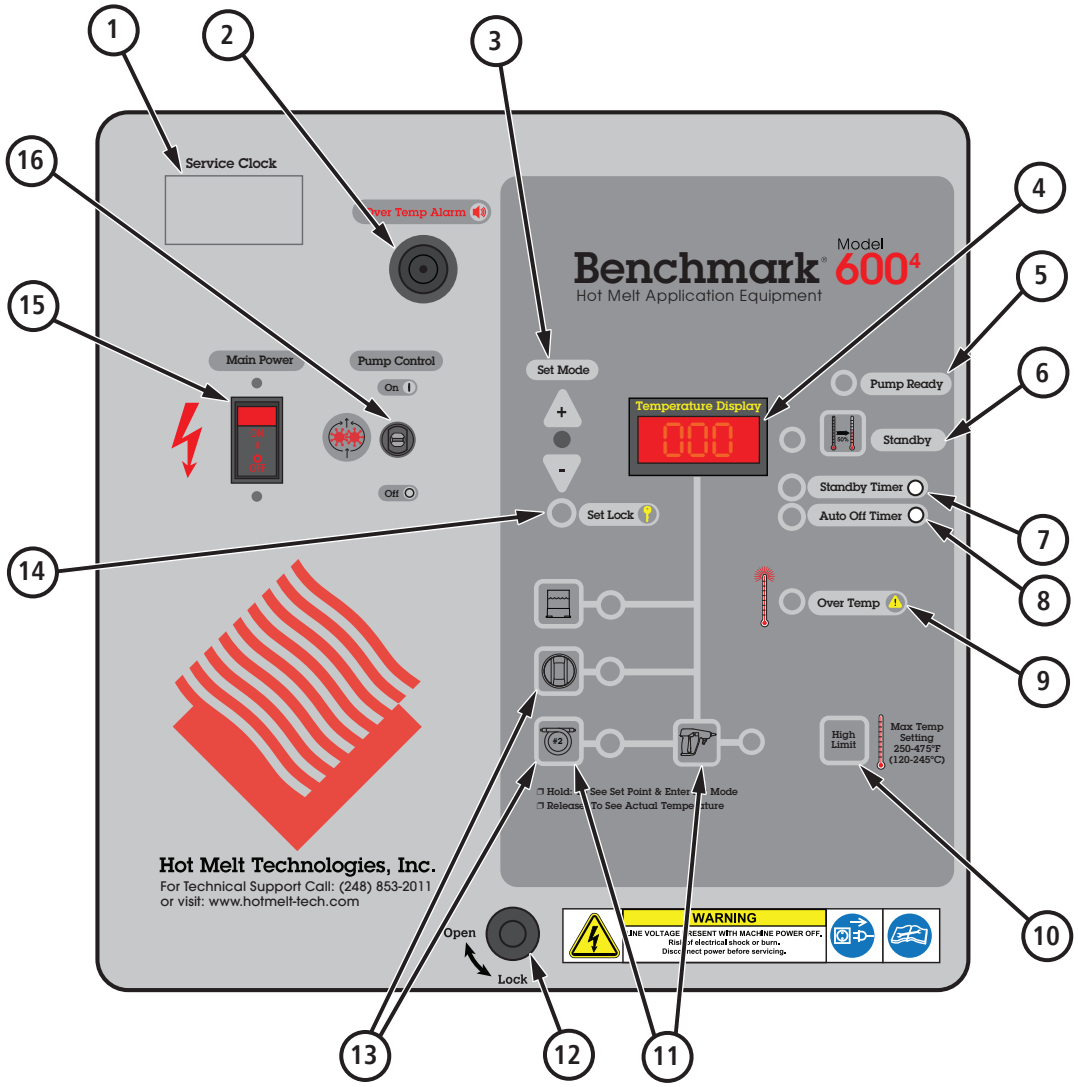
For 220 VAC Operation

- A fused 20 A 220 VAC electrical supply is required. Performance problems will occur with voltages less than 208 VAC or greater than 240 VAC.
- Total amperage draw will depend on the final system configuration; number of hoses & length, guns, accessories, etc.
- **Do not** allow the system to share the same circuit with other electrical items. A dedicated supply is recommended.
- **Do not** use an extension cord.
- **If you change the configuration** of your system in any way that may affect the electrical requirements (ex. add a gun, longer hose, automate, etc.) call HMT Technical Service & Support at 248-853-2011 for assistance.

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08/02/19 Rev A

Front Panel Controls



1. **Service Clock** (Optional): Displays the number of hours that the system has been ON.
2. **Audible Over Temp Alarm:** Sounds when a zone is in Over Temp (see #9).
3. **Set Temperatures:** Press and hold the Tank, Hose, or Gun button for 2 seconds. When the Set Mode light illuminates, continue to hold the zone button and adjust the set temperature using the arrow keys. Set temperatures range from 100°F to high limit°F (38°C to high limit°C), in 5°F (1°C) increments.
4. **Temperature Display:** During operation the actual temperatures scan every five (5) seconds. Press and release any zone button to display that zone's actual temperature.
5. **Pump Ready:** The pump will not operate until the actual tank temperature is within 25°F (15°C) of set temperature.
6. **Standby:** All temperatures lowered by 50%. Pump will not operate while in Standby.
7. **Auto Standby:** If the Standby Timer is ON, the system will automatically enter Standby after three (3) continous hours of motor inactivity. See page 7 to set.
8. **Auto Off:** If the Auto Off LED is ON, the system will automatically turn OFF after three (3) continous hours of motor inactivity. See page 7 to set.
9. **Over Temp:** If any zone reaches 25°F (15°C) above the High Limit, the Over Temp light will illuminate, and the system will shut off. The Temperature Display will read "OFF," and the light next to the faulted zone will flash.
10. **High Limit:** Limits the Set Point for any zone; adjustable between 250°F and 475°F.

    To Adjust the High Limit: Turn the system off. Press and hold down the High Limit button and turn the Power Switch ON. The display will show the current High Limit.

    Release the High Limit button and use the Arrow Keys to adjust High Limit Up or Down. Turn the Main Power Switch OFF then ON again.

    All zones will default to the new High Limit and must be reset.

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Temperature and System Controls

(11) **Turning On/Off Hose/Gun Zones:** To turn a Hose/Gun zone ON or OFF, press and hold the Hose and Gun buttons in that zone for three (3) seconds. Set lock must be off to make a change. The temperature scan will skip a Hose/Gun zone that has been turned Off.

(12) **Front Panel Lock:** Used to secure the front panel. To enhance the systems tamper resistance, a key lock option is available.

(13) **Zone Temp Display Buttons:** Press and release any Zone Button to see the actual temperature for that zone. Press and hold any Zone Button to see the set temperature for that zone and to enter Set Mode.

(14) **Set Lock:** If the Set Lock LED is ON, zone temperature set points cannot be adjusted. The Set Lock can only be activated or deactivated using the Dip Switch located on the backside of the display board within the control box. (See #18).

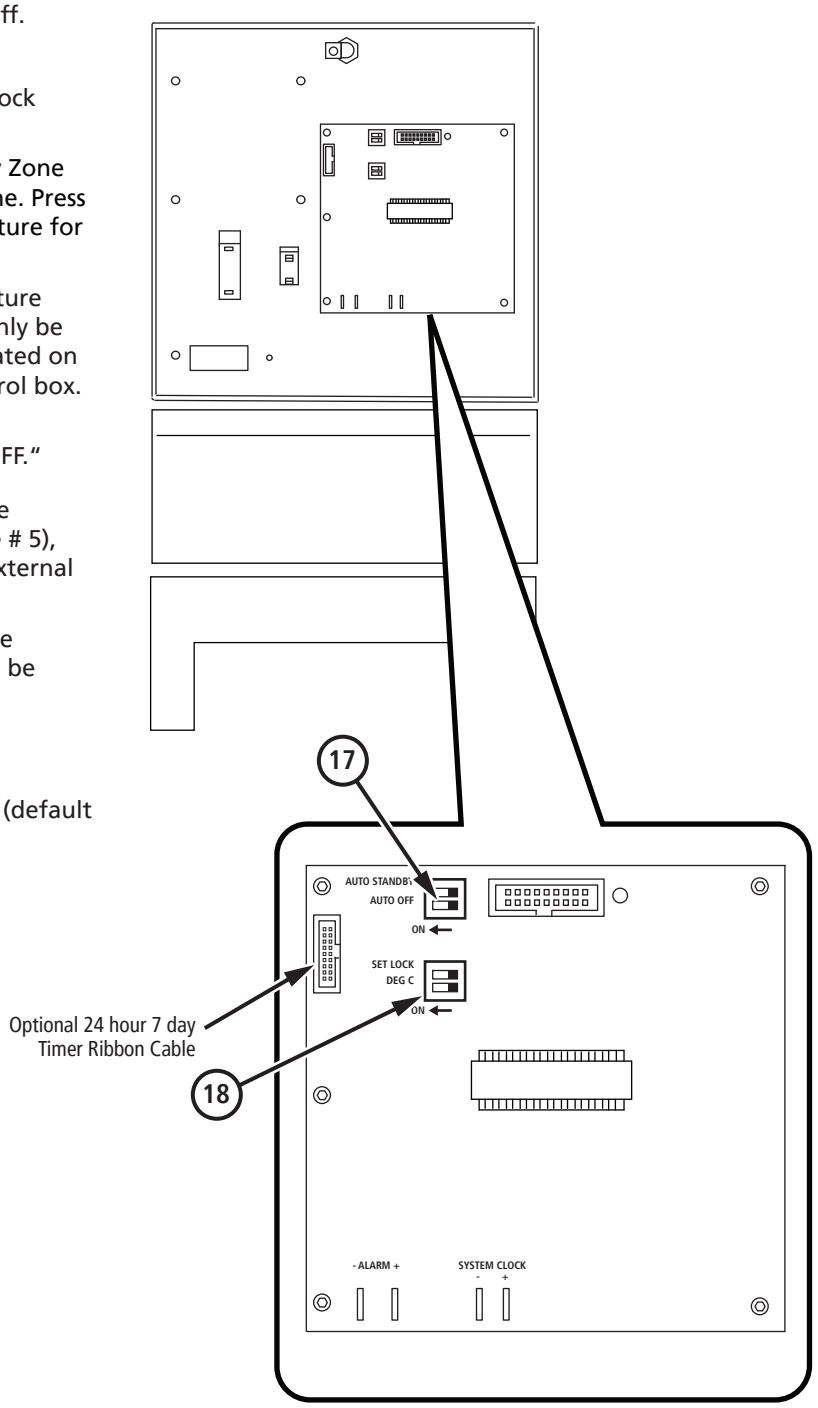
(15) **Main Power Switch:** Turns the system "ON" or "OFF."

(16) **Pump ON/OFF Switch:** The pump will only operate when: this switch is ON, the pump is "Ready" (see # 5), and there is an input signal (handgun switch or external switch).

(17) **Auto Standby/Auto OFF:** To activate either feature slide dip switch to ON. Neither, either or both can be activated.

(18) **Set Lock:** Dip Switch used to lock or unlock set temperature adjustment.

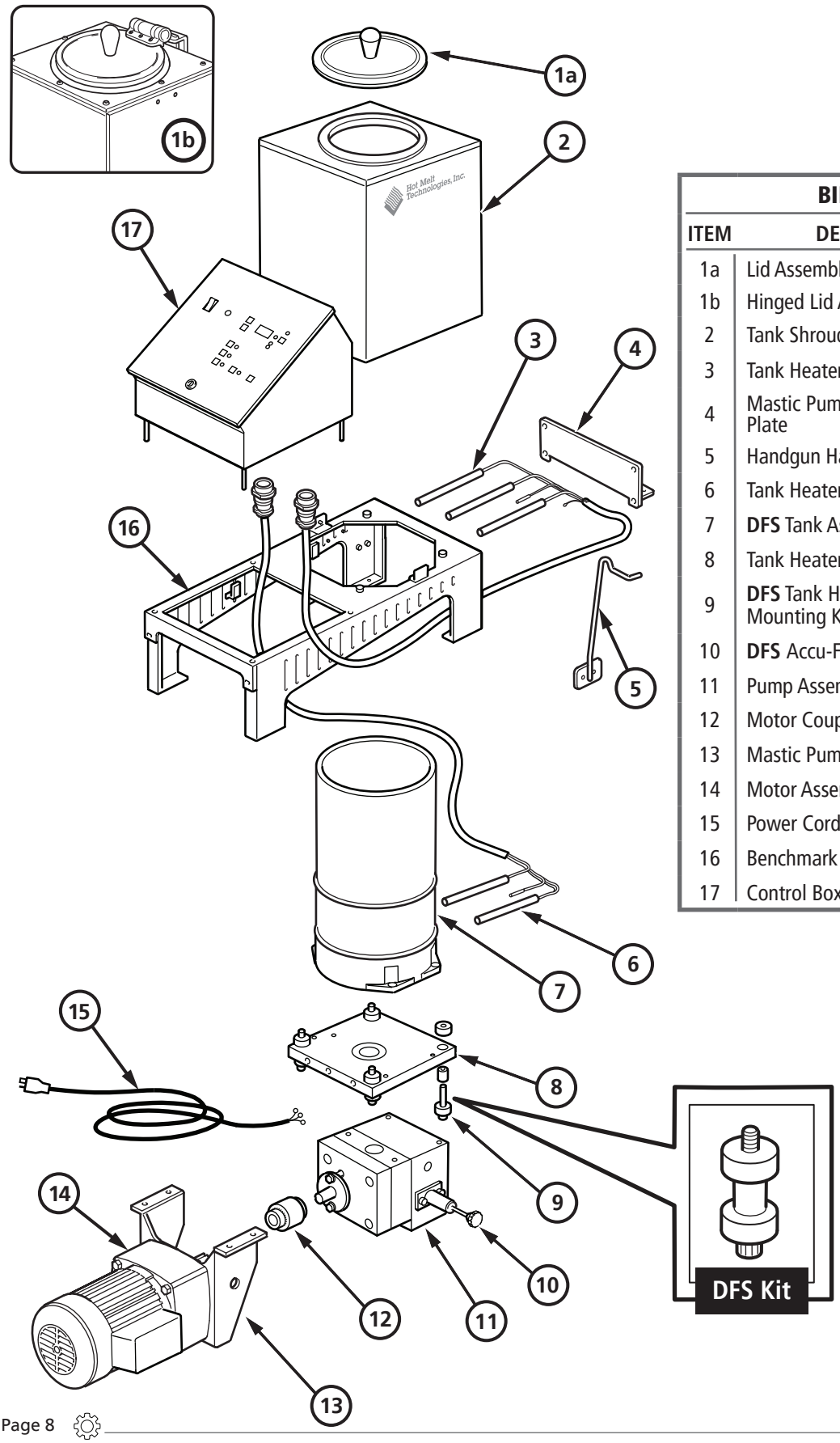
°F vs. °C: Dip Switch used to change from °F or °C (default is Fahrenheit). For Celsius set the switch to "ON."



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Benchmark BM650-4

Exploded View

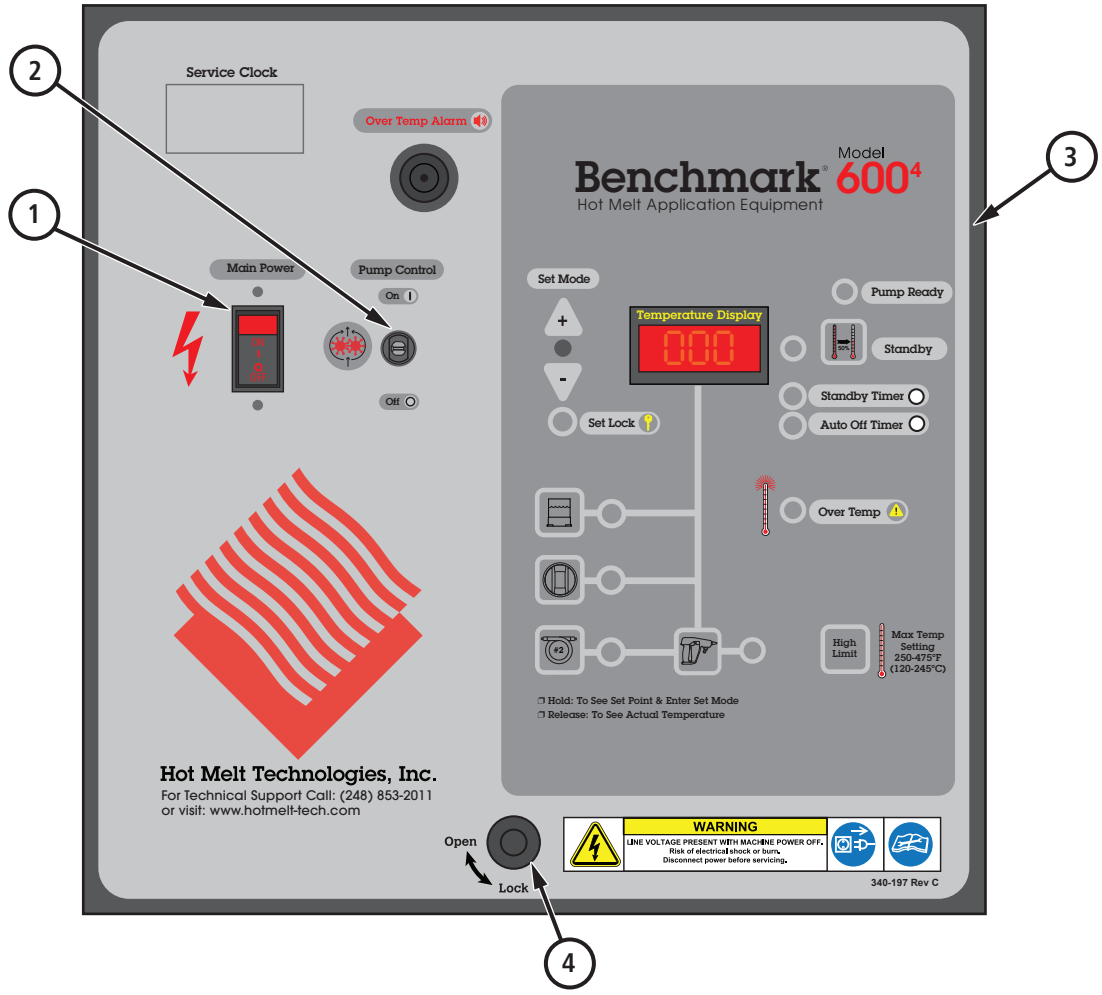


BILL OF MATERIALS

ITEM	DESCRIPTION	PART NO	QTY
1a	Lid Assembly 7"	911-002	1
1b	Hinged Lid Assembly 7"	911-100	1
2	Tank Shroud Assembly	911-250	1
3	Tank Heater Assembly, 220 VAC	923-610	1
4	Mastic Pump Hose Mounting Plate	330-076	1
5	Handgun Hanger Bar	330-012	1
6	Tank Heater Assembly, 220 VAC	923-605	1
7	**DFS** Tank Assembly	911-052	1
8	Tank Heater Plate	110-044	1
9	**DFS** Tank Heater Plate Mounting Kit	911-060	1
10	**DFS** Accu-Flow™ Control	940-015	1
11	Pump Assembly (Standard)	PA-50	1
12	Motor Coupling Assembly	941-050	1
13	Mastic Pump Motor Mount	330-075	1
14	Motor Assembly, 113 rpm	941-213	1
15	Power Cord 220 VAC, 20 A	922-184	1
16	Benchmark Base Assembly	330-001	1
17	Control Box Assembly, 220 VAC	934-661	1

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Control Panel



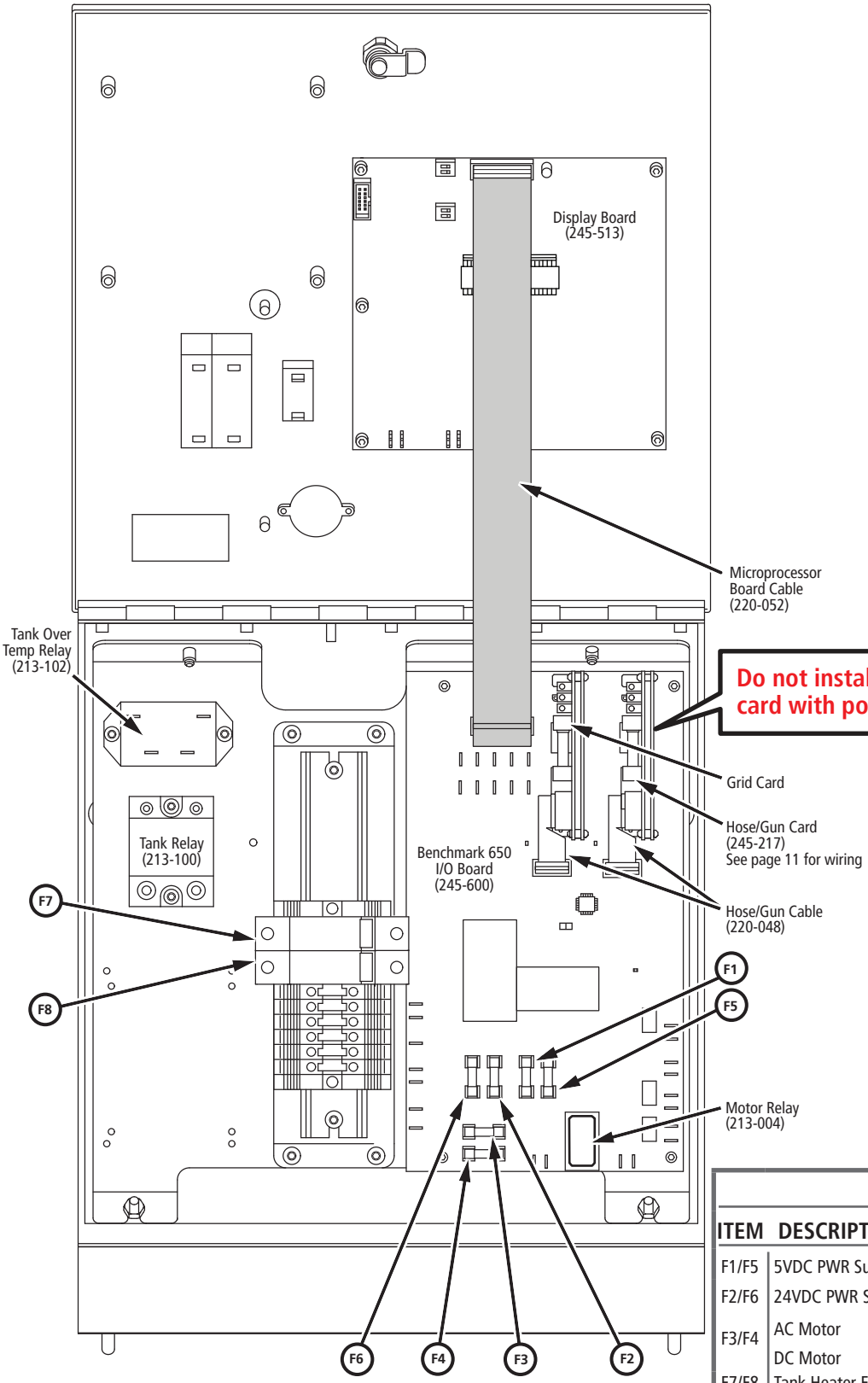
BILL OF MATERIALS

ITEM	DESCRIPTION	PART NO	QTY
1	Main Power Switch 20 A, 220 VAC	211-220	1
2	Pump Switch, 220 VAC	211-010	1
3	Decal	340-197	1
4a	Front Panel Latch, Non-locking	340-030	1
4b	Locking Latch, Locking (Optional)	340-032	1

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Fuse & Relay Chart



FUSE CHART

ITEM	DESCRIPTION	REPLACE WITH	PART NO
F1/F5	5VDC PWR Supply	500 mA, 240 VAC (GMD)	214-501
F2/F6	24VDC PWR Supply	2 A, 240 VAC (GMD)	214-503
F3/F4	AC Motor	5 A, 240 VAC (GMA)	214-105
	DC Motor	8 A, 240 VAC (GMA)	214-108
F7/F8	Tank Heater Fuse	1800 W = 15 A, 600 VAC (KLKR)	214-315

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Hose & Gun Card

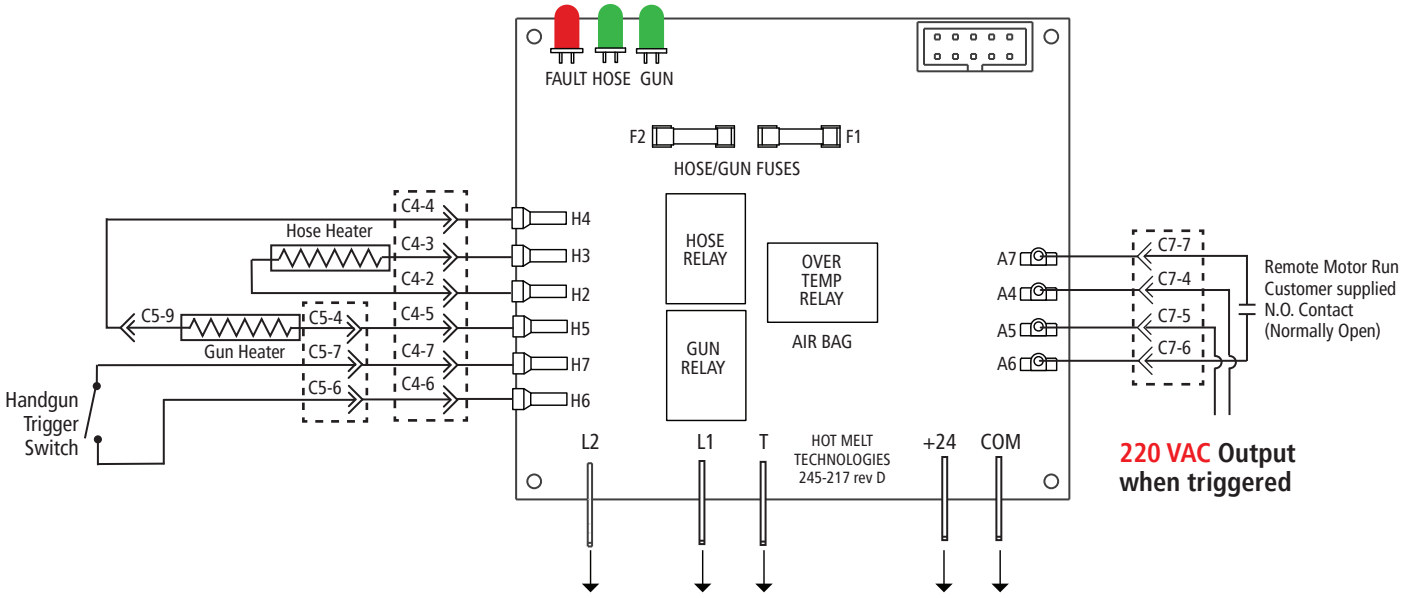
Green LED:

ON Steady = Calling for heat
Blinking = At temperature
OFF = No input from RTD

Red LED:

ON Steady = Hose or Gun sensor fault or over temp

Hose/Gun Card, 220 V (245-217)



PLUG INTO MAIN BOARD

FUSE CHART			
ITEM	DESCRIPTION	FUSE RATING	PART NO
F1/F2	Hose/Gun Fuse	7.5 A, 250 V (AGC)	214-207

CONNECTOR IDENTIFICATION	
C4	Hose connector
C5	Gun connector
C7	Accessory connector

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Melt Grid (ROF) Card

Green LED:

ON Steady = Calling for heat

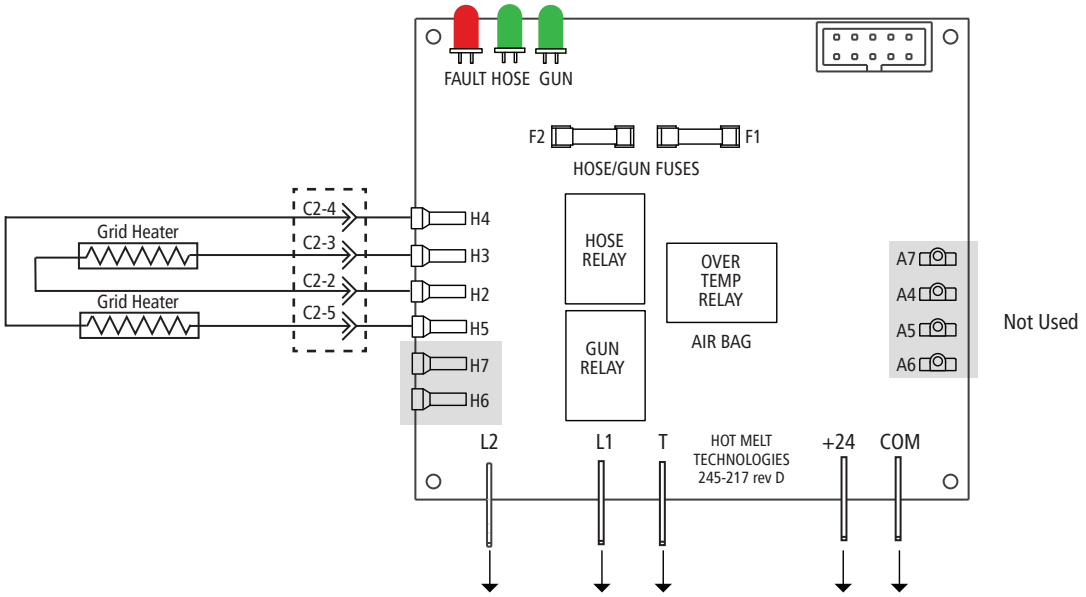
Blinking = At temperature

OFF = No input from RTD

Red LED:

ON Steady = Hose or Gun sensor fault or over temp

Hose/Gun Card, 220 V (245-217)



PLUG INTO MAIN BOARD

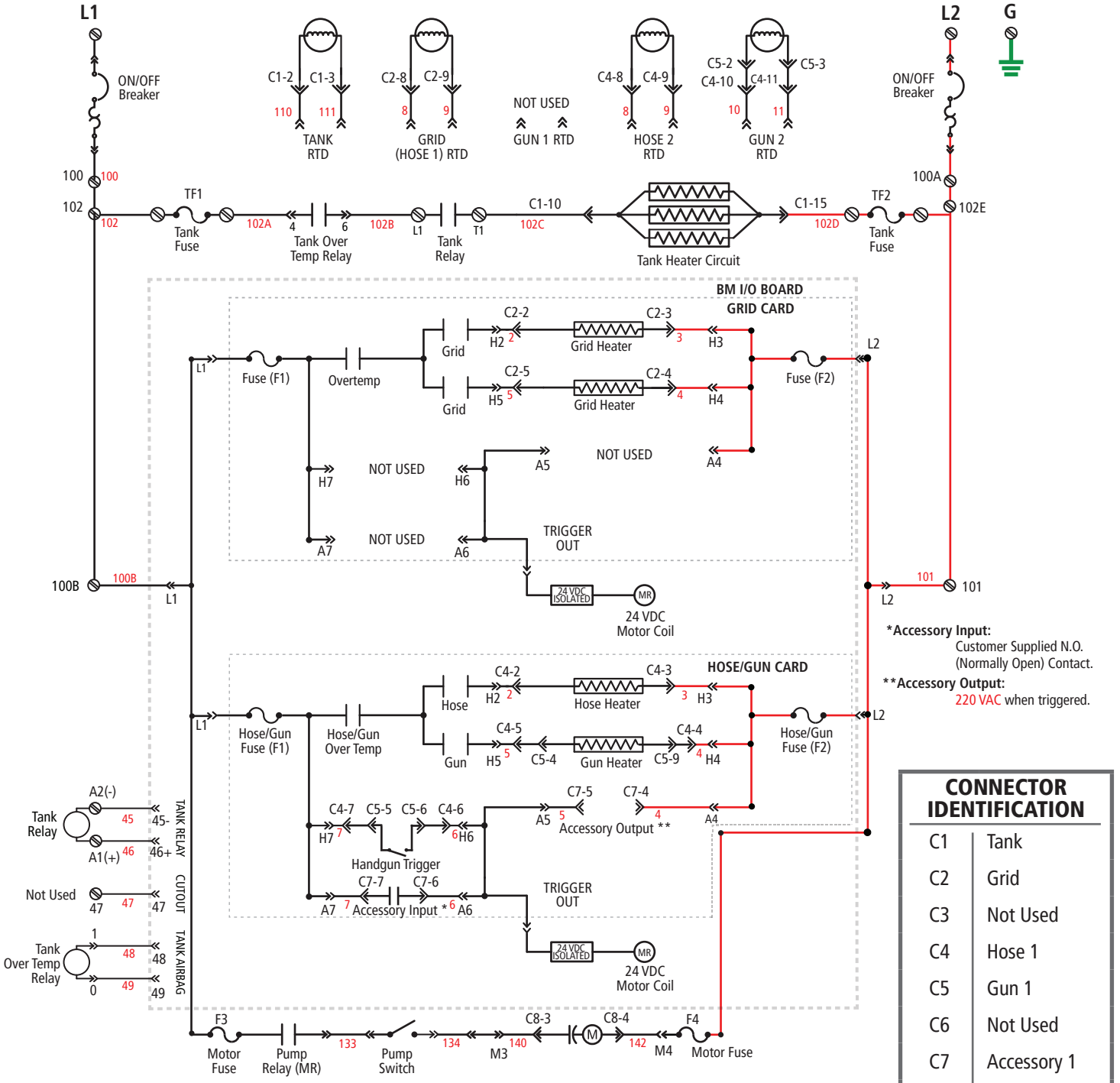
FUSE CHART			
ITEM	**DESCRIPTION**	**FUSE RATING**	**PART NO**
F1/F2	Melt Grid Fuses	7.5 A, 250 V (AGC)	214-207

CONNECTOR IDENTIFICATION	
C2	Grid Heater Connector

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Schematic

Benchmark BM650-4



ALARM OUT — **ALARM OUT** / **RATED LOAD**: Contact Closes when system in OVER TEMP; 0.5A @ 125 VAC, 1A @ 60 VDC

STANDBY IN — **STANDBY IN**: External 120 VAC Input pulse activates or deactivates STANDBY

STANDBY OUT — **STANDBY OUT** / **RATED LOAD**: Contact Closes when system in STANDBY; 0.5A @ 125 VAC, 1A @ 60 VDC

SYSTEM READY (C5-4 / C5-5) — **SYSTEM READY** / **RATED LOAD**: Contact Closes when PUMP READY; 0.5A @ 125 VAC, 1A @ 60 VDC

POWER CONNECTION

220 VAC, 20 A, 1 PH

L1 ← 220 V → L2 G

CONNECTOR IDENTIFICATION

C1	Tank
C2	Grid
C3	Not Used
C4	Hose 1
C5	Gun 1
C6	Not Used
C7	Accessory 1
C8	Motor

Pump Ready	Relay Contacts (Normally Open)		Coil
	Relay Description		Fuse
	Relay Contacts (Normally Closed)	Hose/Gun	Fuse Description
	AMP Connector & Pin Number		RTD Temperature
C2-7	AMP Quick Disconnect	M	Capacitor and Motor
	Stakon Connector		"ON/OFF" Breaker Switch
	Switch		Heater
	Wire Termination		

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This Warranty extends to the original purchaser only and commences on the date of the original purchase.

Any part of the Hot Melt Technologies (HMT) adhesive supply unit (ASU) manufactured by HMT and found in the reasonable judgement of HMT to be defective in material and workmanship, will be repaired or replaced by HMT without charge for parts or labor.

This Warranty is limited to:

a) One (1) year from initial use,

b) Eighteen (18) months from date of purchase, or

c) Two thousand (2,000) hours of use, whichever comes first.

The ASU including any defective part must be returned to HMT within the warranty period. All transportation expenses to HMT for warranty work and the expense of returning it to the owner will be paid for by the owner. HMT's responsibility in respect to claims is limited to (at its option) making the required repairs, adjustment, or replacements. No claim of breach of warranty shall be cause for cancellation of the contract of sale of any HMT ASU.

This warranty does not cover any ASU that has been subject to misuse, abuse, negligence,or accident, or which has been operated in any way contrary to the operating instructions. Warranty does not apply to any damage to the ASU that is the result of improper maintenance or installation.

This warranty does not cover any ASU that has been altered or modified by the customer. In addition, the warranty does not extend to repairs made necessary by normal wear or by the use of hot melt materials in the ASU which in the reasonable opinion of HMT are either incompatible with the ASU or adversely affect its operation, performance, or durability. This warranty does not extend to any accessory attachments to the ASU that are warranted separately for different periods of time. Other components supplied by HMT as part of a system will carry the warranty of the original manufacturer.

This warranty does not extend to an ASU damaged during shipment. Risk of loss or damage to the ASU shall pass to the buyer.

HMT reserves the right to change or improve the design of any ASU, or part of an ASU, without assuming any obligation to modify any ASU previously manufactured.

HMT assumes no responsibility for incidental, consequential or other damages including but not limited to: expense for hot melts, delivery or return freight expenses, mechanics travel time, telephone or telegraph charges, rental of a like product during the time warranty repairs are being performed, travel, loss or damage to personal property, loss of revenue, loss of use of the ASU, loss of time or inconvenience.

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