LS10 and LS20 Series Hot Melt Units

Manual Number: 19600-121

Revision: E

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1 Safety Precautions for Hot Melt Applicator Equipment

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

1.1 Intended Use

This equipment is designed for use with standard adhesive and sealant materials with flash points above 232 °C (450 °F). Use of flammable material or material not compatible with the specifications of this equipment can cause injury to operator and damage to equipment.

The manufacturer has designed this equipment for safe operation. Specified models are in compliance with EN 60204-1:1997. 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. Never exceed the maximum application temperature recommended by the adhesive manufacturer.

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

1.2 Personal Safety

Wear Safety Goggles

Wear Heat-Resistant Safety Gloves

Wear Protective Clothing

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

Always wear heat resistant gloves rated to 205 °C (400 °F) and allow all system temperatures to stabilize below 193 °C (380 °F) before servicing. Properly ventilate equipment according to MSDS of equipment.

Trained operators and service technicians should be aware of exposed surfaces of the unit that cannot be practically safeguarded. These exposed surfaces may be hot and take time to cool after the unit has been operating.

Keep parts of the body away from rotating parts. Do not wear loose articles of clothing when operating or servicing units with rotating parts. Remove wristwatches, rings, necklaces, or other jewelry and cover or pin up long hair before performing any work on or with the unit.

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

1.3 Electrical Safety

Determine voltage of this equipment before installation and confirm compatibility with available power. Equipment must be connected to a properly grounded circuit and installed in accordance with all applicable electrical codes. Ground fault protection must be provided in supply circuitry at site installation.

Models designed to EN60204-1: 1997 require power cords be approved to a harmonized (HAR) standard and rated for 70 °C (158 °F). A HAR approved Type B plug and strain relief for power cord is required to meet standard IEC 309. Power conducting wires must be nominal 5.3 mm^2 (10 AWG) maximum and nominal 2.1 mm^2 (14 AWG) minimum.

1.4 Emergency Power Disconnect

In the event of a malfunction, turn off power to the equipment at the power off switch and remove source power to the system at the nearest main disconnect.

1.5 Follow Directions

Read the product manual thoroughly before installation, operation or maintenance. Failure to do so can result in a serious accident or equipment malfunction. **The manufacturer will not be held liable for injuries or damage caused by misuse of this equipment**.

1.6 Safety Symbols and Signal Words

The following safety symbols and signal words are used throughout the manual and on the product 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.

Specific Symbols and Signal Words

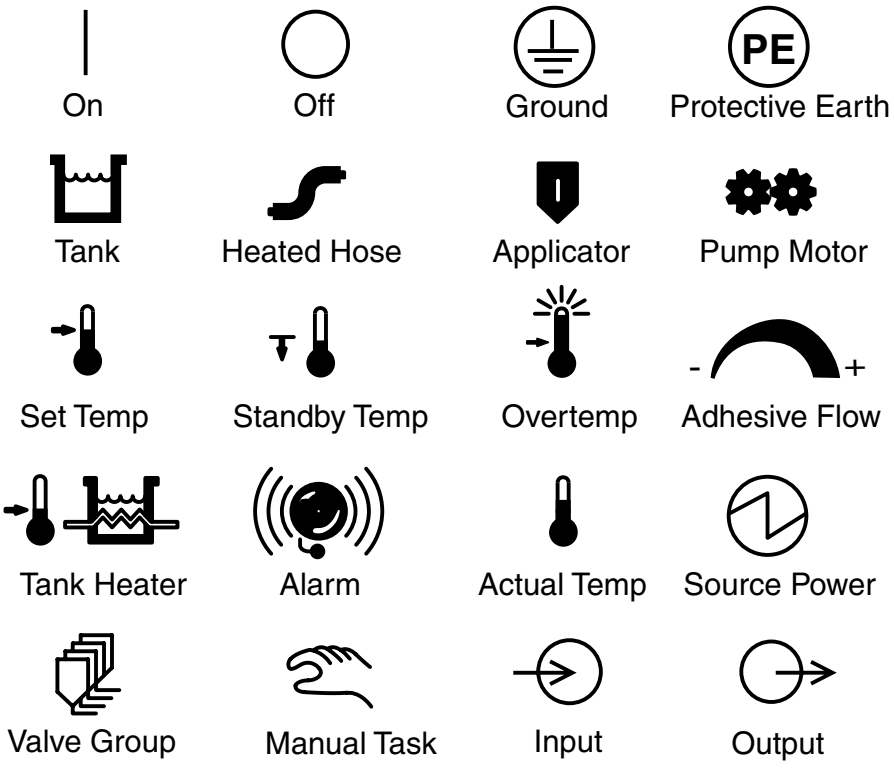
DANGER: High Voltage. Can cause serious injury, including death. Disconnect electrical power at external source before servicing

WARNING: Hot Surface. Can cause serious injury and burns. Wear heat resistant clothing, gloves and safety goggles.

WARNING: Disconnect electrical power at external source. Failure to do so can cause electrical shock.

WARNING: High Pressure. System contents under pressure. Can cause serious injury and burns or equipment and property damage. Relieve pressure before servicing.

Other Product Symbols



The manufacturer reserves the right to make design changes for product improvement. This manual may not reflect all details of these improvements.

2 Introduction

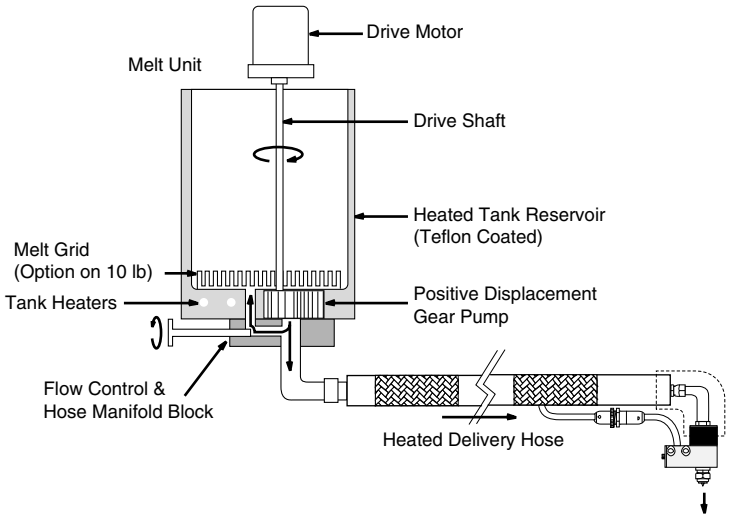
2.1 Description

The Astro Packaging LS Series Hot Melt Unit is a light to medium duty machine used for melting and pumping a variety of hot melt materials. The melt unit consists of a heated melt tank and a motor-driven, positive displacement gear pump.

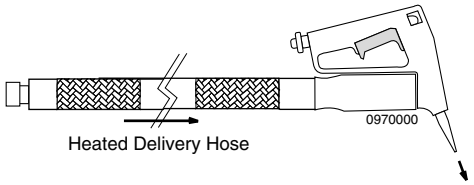
This all-electric melt unit accepts granular, pillow, pellet or block forms of adhesive. The LS Melt Unit is equipped with a flow control valve for fluid pressure and flow regulation. The melt unit is available in 10 and 20 lb tank capacities and supports 1 or 2 automatic or manual applicators and hoses.

The tank temperature ranges from ambient temperature to 205 °C (400 °F), adjustable by a bimetallic tank temperature controller. An internal melt grid transfers heat efficiently from the tank heaters to the hot melt material. The melt grid is standard on the 20 lb melt unit and an optional feature on the 10 lb tank.

Electrical power to the melt unit is controlled by a circuit breaker located on the front panel. The electrical panel contains a terminal block to make connections to the power-in supply circuit. See Section 4.3: Electrical Circuits and Wiring.



AUTOMATIC APPLICATOR



HANDGUN

2.2 Features

- System power circuit breaker protects the entire system from overload.
- A tank-mounted overtemperature thermostat turns the tank heaters off in the event of a tank controller failure.
- A circuit breaker protects the pump motor by turning the motor off should a stall or overload condition occur.
- A pump warmup thermostat protects the pump-drive mechanism by preventing motor/pump operation below 121 °C (250 °F).
- Head firing with LS automatic melt units can be from direct signal input or any AC or DC model of ET Series Pattern Controllers.
- An optional filter block is available for applications requiring adhesive filtering.
- AC power cords are supplied with 100 VAC and 115 VAC units only.
- A “Little Squirt” is a 10-pound one or two hose manual handgun configuration of the LS Series.

3 Specifications

3.1 Electrical

Voltage	100, 115, 200 or 230 VAC (±10%) single phase
Power Requirements	LS10: 900 W (melt unit only: hoses/
	LS20: 1400 W applicators not included)
Frequency	50/60 Hz
Main Circuit Breaker Rating	All VAC: 15 A
Pump Motor Circuit Breaker Rating	200/230 VAC: 0.5 A
	100/115 VAC: 1 A
Tank Overtemperature Thermostat	205 °C (400 °F) (standard, other ratings available)
Pump Warmup Thermostat	121 °C (250 °F) (standard, other ratings
	available)

3.2 Physical

Tank Capacity	LS10: 4.5 kg (10 lb)
	LS20: 9.1 kg (20 lb)
Hose Capacity	2 manual hoses or 2 automatic hoses
Shipping Weight	LS10: 29.1 kg (64 lb)
	LS20: 35.4 kg (78 lb)
Storage Temperature	0–60 °C (32–140 °F)
Pump Size	V1-450: 7.4 CCD (0.450 CID)
	V1-675: 11.1 CCD (0.675 CID)
Melt Grid	LS10: optional
	LS20: standard

3.3 Operating

Warmup Time	30–45 minutes
Viscosity	Maximum 25,000 centipoise (cps)
Melt Rate	LS10: 3.6 kg/hr (8 lb/hr) - without melt grid
	LS20: 9.1 kg/hr (20 lb/hr) - with melt grid
Temperature Range	38 °C – 232 °C (100 °F – 450 °F)

3.4 Environmental

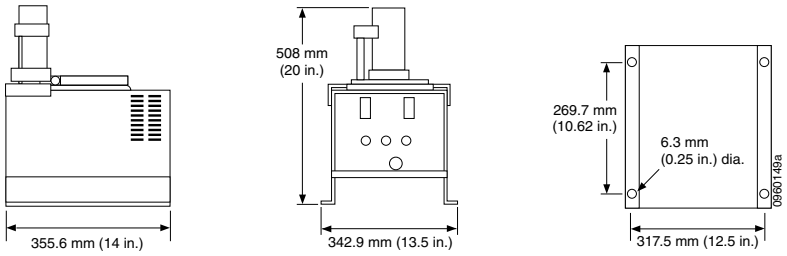
Ambient Air Temperature	5–40 °C (41–104 °F)
Altitude	Sea level up to 2 km (1.24 miles)
Humidity	30–95 R.H. (%)

3.5 Motor Speed, Adhesive Pressure, and Flow Rate

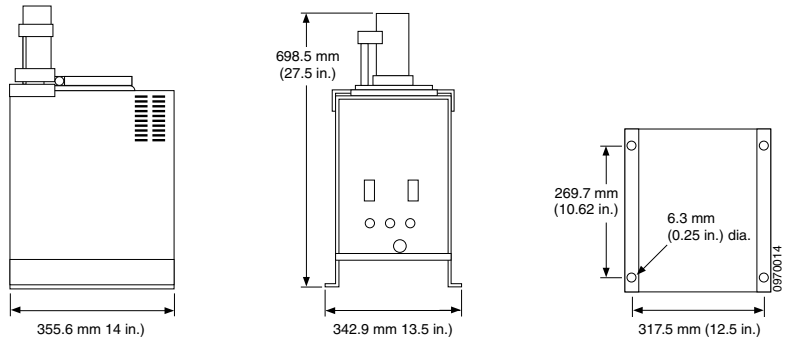
Frequency	50-60 Hz	
Motor Speed	44/min (rpm)	
Recommended Adhesive Pressure Range*		
V4-675 Pump	6.89–20.68 bar	
	689.48–2,068.43 kPa	
	100–300 psi	
Maximum Flow Rate*		
V1-675 Pump	25 kg/hr	21 kg/hr
	55 lb/hr	45 lb/hr

*Based on standard, packaging grade hot melts at 1000 cps. Varies with adhesive and tank temperature. Consult factory representative for non-standard requirements.

3.6 Dimensions



LS10 Hot Melt Unit



LS20 Hot Melt Unit

4 Installation

4.1 Setup

1. Remove all packaging material around melt unit.

2. Carefully lift melt unit out of box.

3. Unpack the binder containing product manuals, electrical schematic, warranty information and flow control valve hex wrench. Retain binder for future reference.

4. Unscrew 4 screws from plywood board base; remove and discard plywood.

5. Carefully uncoil hoses from around melt unit and remove protective wrap from applicators. Inspect all packing material for separately wrapped items.

6. Position melt unit for easy access to control panel and convenient servicing.

7. Level mounting surface to prevent warping of melt unit and to avoid misalignment of the pump and motor shaft.

8. Using the base mounting holes, bolt melt unit down to a durable mounting surface in accordance with dimensions in illustrations in Section 3.6 to prevent accidental upset and possible injury.

9. Tighten all screws before startup and after melt unit experiences excessive vibration.

4.2 Component Installation

4.2.1 Manual (Handgun) Systems

All standard components are normally installed on the melt unit at the factory with no user installation required. If not installed, refer to Hose Replacement. Refer to handgun product manual for complete information on installation and service of the handgun/hose assembly.

4.2.2 Automatic Systems

Hoses

Hoses are normally installed on an automatic melt unit at the factory with no user installation required. If not installed, refer to Hose Replacement. Refer to heated supply hoses product manual for complete installation and service information.

Automatic Applicators (Heads)

Automatic applicators may be attached to hoses or packaged separately. If not installed, proceed as follows:

1. With system power off, attach hose output electrical connector to applicator. Heat fluid fittings on applicator and output end of hose by attaching the electrical connector and applying power for 3–5 minutes or until hose fitting will rotate.

2. Connect output end of the hose to adhesive input fitting on the applicator.

3. When system reaches operating temperature, retighten all adhesive connections. Check for leaks.

Refer to applicator product manual for installation and service information.

Pattern Controllers, Head Drivers and Optional External Components

Pattern controllers, head drivers and other external components normally need to be connected to melt unit during installation. Refer to electrical schematic, located in manual binder or back of melt unit, for appropriate wire connections to the melt unit. Refer to individual component product manual for complete installation and service information.

4.3 Electrical Circuits and Wiring

4.3.1 Electrical Schematic

Consult the electrical schematic provided with the melt unit for all wire connections and component interconnections. Schematics are shipped with each system and are found in the binder with the product manuals. A copy of the schematic should remain with the melt unit at all times.

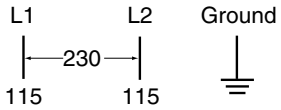
4.3.2 Power Requirements

> ⚠ **CAUTION:** Power conducting wires must be rated for intended current and 75 °C (167 °F).

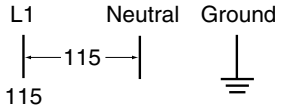
The LS Melt Unit uses single phase 100,115, 200, or 230 VAC power sources, each with earth ground for safety. Refer to illustration below for terminal block configuration. The standard 230 VAC melt units are wired for 2-wire single phase power. An identification plate is attached to each melt unit on the outside rear door of the tank housing. This plate specifies the exact voltage of the melt unit and frequency of the pump motor. Pump motor voltage, frequency and current are specified on the motor data plate located on the motor. For safe and proper installation, refer to the identification plate before applying electrical power to the melt unit.

4.3.3 Electrical Connections

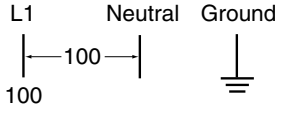
Standard 230 VAC Single Phase, 2 Wire



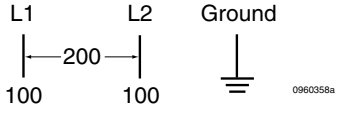
115 VAC Single Phase



100 VAC Single Phase



200 VAC Single Phase, 2 Wire



4.3.4 Power-in Wiring

100–115 VAC

The melt unit comes equipped with an 2.44 m (8 ft) power cord, unless it is a conduit model.

200–230 VAC

1. Inspect melt unit identification plate and inside electrical panel to verify actual capacity and type of 230 VAC power plug required for the system (2- or 3-wire).
2. Open front control panel.
3. Install appropriate power-in 16 AWG wires in the terminal blocks provided. For automatic systems only, also configure and install applicator program wires and jumpers. Refer to Terminal Block Configuration diagram. Liquidtight conduit and fittings are recommended when routing wires to electrical terminal blocks. Holes in the chassis are provided for these installations.
4. Close the front control panel after electrical hookup.

4.3.5 Valve Group Control Circuits for Automatic Systems

An automatic applicator, or valve, contains one or more adhesive valves which are activated by a solenoid. A valve group is a number of valves powered by the same source which activate at the same time. There are several options to activate electric valves and valve groups:

Two Types of Valves and Firing Circuits

Automatic applicators are specified by solenoid voltage and valve type. Valves must match the VAC or VDC firing voltage. Multiple valve applicators may have more than one firing circuit within a single applicator.

4.3.6 VAC Valve Firing Voltage

Firing Voltage Source	Trigger Signal Source	Optional Timer Adaptor Relay *	Pattern Control Jumpers
Melt unit	any VAC trigger	no relay	present
External	customer VAC trigger	no relay	not present
External	customer VAC trigger	AC relay	present
External	customer VDC trigger	DC relay	present

* Timer adaptor relay isolates melt unit power from an external power source

4.3.7 VDC Valve Firing Voltage

Firing Voltage Source	Trigger Signal Source	Head Driver Required	Pattern Control Jumpers
DC Head Driver	any 3–32 VDC trigger	DC Head Driver	not present

4.3.8 Foot Switch Trigger for Semi-automatic Systems

A manually operated foot switch allows operator to control adhesive deposition through automatic applicators while keeping hands free. The foot switch assembly may be factory installed or added later. See Section 9.7: Accessories.

4.3.9 External Control of Pump Motor for Automatic Systems

The pump motor circuit may be connected to a parent machine or other control device to enable the parent machine to control the hot melt system pump. This extends pump life and provides added safety when the melt unit is used in conjunction with other machinery.

1. Using melt unit electrical schematic, locate parent machine interface jumper.
2. Remove parent machine interface jumper.
3. Wire contacts from external device to the melt unit main terminal block where the parent machine interface jumper was located.

5 Operation

5.1 Controls and Indicators

> ⚠ **DANGER**: Disconnect power before opening front panel. Hazardous voltage can shock, burn, or cause death.

Please read and see illustration opposite before operating melt unit.

[1] System Power Switch/Circuit-Breaker and Indicator Light

A magnetic type breaker opens the circuit when current exceeds 15 A. The system power switch illuminates white when in ON position.

[2] Overtemperature Indicator Light

Illuminates red and ceases power to the tank heaters when melt tank temperature exceeds thermostat rating. In the event of an overtemperature condition, turn down tank temperature with control or replace control if defective. See Section 7: Trouble-shooting.

[3] Tank Thermometer

Indicates temperature of hot melt material in the melt tank. The hose temperature adjustment, located behind front panel, indicates the set temperature of the material in the hose.

[4] Tank Heating Indicator Light

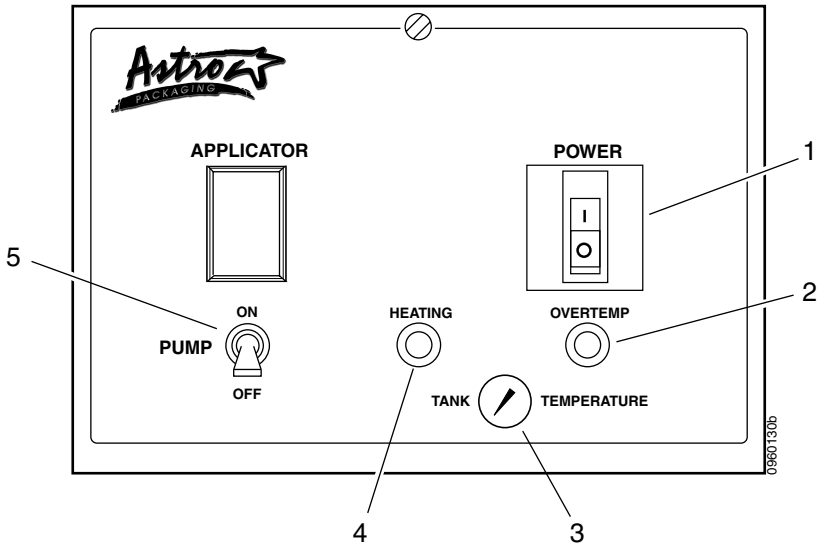
Illuminates amber when tank heaters are powered and assists user in making temperature adjustments to tank temperature controller.

[5] Pump Motor ON/OFF Breaker Switch

Turns off pump motor during system warmup or system maintenance. A circuit breaker in the pump motor circuit protects motor during a stall or overload condition.

[6] Pump Warm-Up Thermostat (Not Shown)

This close-on-rise thermostat prevents the motor from running before system reaches operating temperature.


APPLICATOR
POWER
I
O
1
5
ON
PUMP
OFF
HEATING
OVERTEMP
2
TANK
TEMPERATURE
09601130b
4
3

5.2 Start-up

1. Become familiar with Section 5.1: Controls and Indicators.
2. Install melt unit as specified in Section 4.
3. Fill tank with hot melt material to 38 mm (1.5 in.) from top.
4. Turn unit on and allow 30 minutes warmup time.
5. Align the motor, if necessary. Motor alignment is necessary on receipt of a new unit or after transportation; when replacing the motor, pump-shaft, bearing block, or pump; or when the motor is noisy.
    a. Loosen the screws holding the motor.
    b. Warm up melt unit and run the motor. This causes the motor to center itself.
    c. With motor running, tighten screws in a crisscross pattern.
6. Set hose and tank temperature to desired settings. Lower settings will increase the material pot life.
7. Set the tank temperature as low as possible for each application. Certain materials degrade over time due to oxidation.
8. To prevent stalling the motor, adjust flow control valve to minimum flow requirement.

5.3 Adjustments

5.3.1 Temperature Adjustments

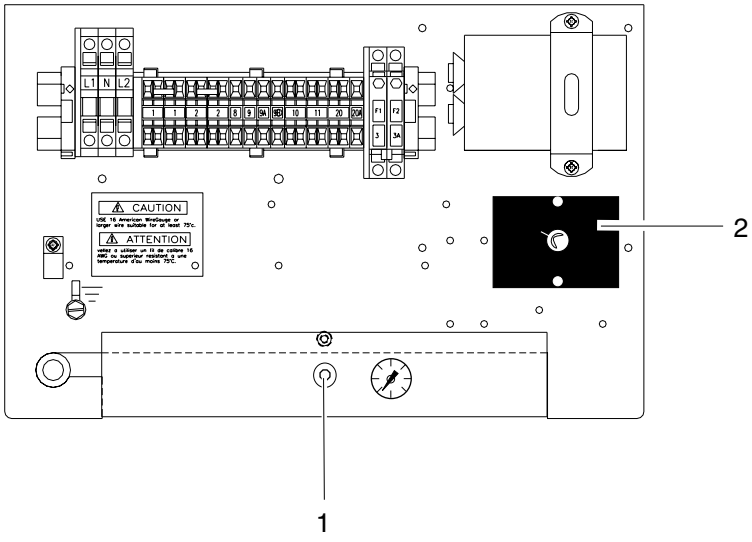
Hose Temperature Controller

Temperature graduations on hose controllers reflect approximate hose temperature.

1. For precise readings, measure inside hose temperature with a pyrometer and bead probe. Hose temperature should be the minimum temperature required for application to prevent degradation of material in the hose and maximize hose life.
2. To raise hose temperature, turn knob [2] in illustration below clockwise to desired temperature.
3. To lower hose temperature, turn knob [2] counterclockwise to desired temperature.
4. Refer to Temperature Check in Maintenance section of the Astro Packaging Heated Hose Manual.

Tank Temperature Controller

1. To prevent hot melt degradation, set melt tank temperature to the minimum temperature specified by the hot melt manufacturer.
2. To raise melt tank temperature, turn tank temperature controller adjustment shaft [1] in illustration below clockwise with screwdriver.
3. To lower melt tank temperature, turn adjustment shaft [1] counter-clockwise with screwdriver. The melt tank temperature controller ranges 260 °C (500 °F) in one 320° rotation of the adjustment shaft.
4. Verify temperature on tank thermometer.
5. Allow melt tank temperature to stabilize 30 minutes before adjusting further. See Section 3: Specifications for melt tank temperature range.



5.3.2 Flow Adjustments

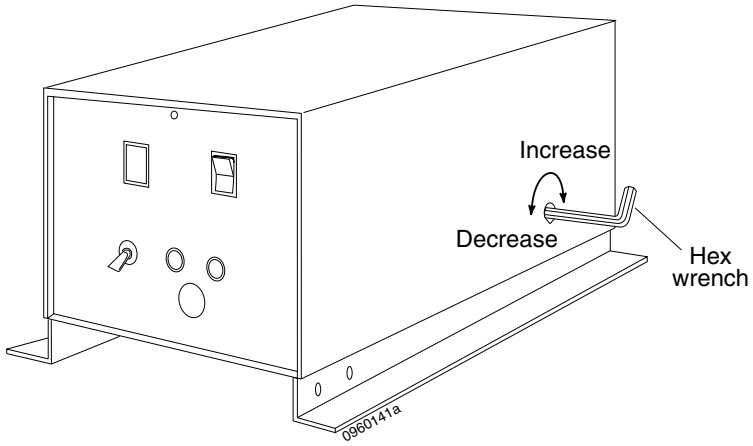
> **WARNING:** High Pressure. System contents under pressure. Can cause serious injury and burns or equipment and property damage. Relieve pressure before servicing.

> **CAUTION**: For maximum performance and motor life, do not allow pump motor to stall. A prolonged stall condition will cause motor to go into thermal overload.

Flow Control Valve

An adjustable pressure regulating device is mounted on the pump under the melt unit chassis. See illustration below.

1. Adjust flow control from the lower right side of melt unit using the hex wrench supplied with unit.
2. To increase pressure, turn hex wrench clockwise.
3. To decrease pressure, turn hex wrench counterclockwise.
4. To achieve minimum pressure and lowest flow rate, turn hex wrench fully counterclockwise.
5. Gradually turn hex wrench clockwise until desired pressure and flow rate is reached.



6 Maintenance

⚠ **WARNING**: Hot melt materials can cause severe burns resulting in disfigurement or blindness. Take the following precautions before beginning any maintenance:

- Wear protective clothing, safety goggles, and safety gloves.
- Turn pump motor switch off position. Depressurize applicator(s) by triggering.
- Unless stated otherwise, always allow melt unit to cool before beginning any maintenance.
- Disconnect hose electrical connector when hose fittings are disconnected and power is off.

⚠ **CAUTION**: To prevent damage to components (hose fittings, etc.), heat part(s) being serviced to approximately 121 °C (250 °F) prior to dismantling, assembling, or adjusting. Heat parts by applying power to the unit using a hand held hot air gun or placing parts on a hot plate. Failure to do this will result in stripped threads and ruining both parts and tools.

⚠ **CAUTION**: To avoid arcing of electrical contacts and possible failure of components, do not connect electrical connectors when the hose power switch is on.

6.1 Preventive Maintenance

Procedure	Daily	Monthly	As Required*
Check for foreign material in tank.	X		
Wipe off excess hot melt from cover.	X		
Check for leaks.	X		
Purge tank and hoses.		X	X
Inspect hoses. **		X	
Check tank temperature. ***		X	
Clean applicator nozzles.			X

* Extra maintenance required for continuous duty machines.

** Verify hose is properly supported so it is not stressed during use. Minimum bend radius is 8 in. when hot.
Check temperatures.
Adjust temperature according to Hose Temperature Controller section. On multi-hose systems, a temperature difference between hoses is quickly noted by touching outer insulation of each hose.

*** Verify system is not operating in overtemperature mode by observing Overtemperature Indicator Light.
Determine tank temperature and adjust as explained in Tank Temperature Controller section.

7 Troubleshooting

Problem	Solutions
Tank does not heat	1. Turn on main power breaker switch. If switch light fails to illuminate, replace switch. 2. Inspect power-in connections for proper fit. 3. Check for faulty wires. 4. Inspect power wires or power plug at main power source. 5. Check supply voltage to melt unit with voltmeter. The voltage of each component must equal the supply voltage or system damage will occur. 6. Check incoming control voltage to terminal blocks. 7. Check tank controller for proper operation. 8. Check wire connections against electrical schematic to ensure melt unit is properly wired. 9. If problem still exists, replace tank heaters as specified under Tank Heater Replacement.
Tank heats slowly	1. Check status of components with a voltmeter (system powered) or ohmmeter (system unpowered, wires disconnected). 2. Adjust tank temperature controller. Inadequate tank heat can affect performance. 3. If problem still exists, replace tank heaters as specified under Tank Heater Replacement.
Tank overtemperature	1. Check tank temperature when overtemp indicator is lit. If too high, turn tank controller counterclockwise to reduce temperature. If light is on at acceptable or low temperature, switch is faulty or rated at a low temperature. Replace overtemperature switch.
Applicator and hose heat slowly	1. Adjust hose and applicator temperature controllers. Inadequate heat can affect performance. 2. Verify hose electrical connector is properly connected. 3. Check supply voltage to hose controller with volt meter. 4. If problem persists, refer to Hose Controller Replacement.

Problem	Solutions
Applicator and hose fail to heat	1. Check incoming hose power connector to see if properly installed. Connector wire pins may be misaligned or loose. 2. If no change, disconnect incoming hose power connector and check hose heater resistance with ohmmeter. If hose heater fails, replace hose. See Slautterback Heated Hose Manual. 3. Determine if applicator is heating by using a pyrometer or temperature sensing device. Do not touch applicator by hand to determine temperature. Refer to the handgun manual.
Adhesive output too high	1. Decrease system fluid pressure with flow control valve. If no change, remove nozzle and replace with a smaller orifice nozzle. 2. Decrease hose temperature by 4–10 °C (25–50 °F). If no change, consult your hot melt material vendor regarding application.
Adhesive output too low	1. Increase system fluid pressure without stalling the motor by adjusting flow control valve. If no change, remove nozzle and replace with a larger orifice nozzle 2. Clean applicator nozzle. 3. Purge system. 4. Increase hose temperature by 4–10 °C (25–50 °F). If no change, consult your hot melt material vendor regarding application. 5. Hot melt formulations tend to be a factor in previously listed problems. Refer to Start-up for cautions.

- If troubleshooting attempts fail, please contact your distributor.

8 Repair and Replacement

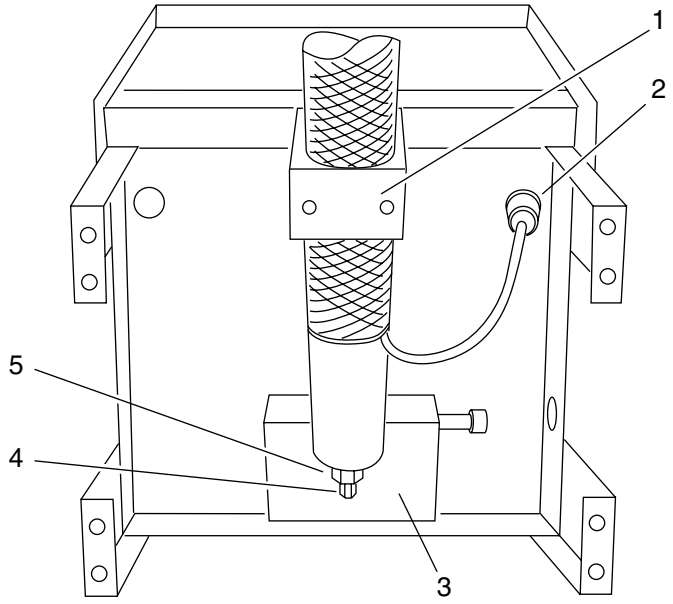
> ⚠ **CAUTION**: For safe and proper hose replacement, verify that all material in melt tank has completely solidified.

See Parts List, in Section 9, for all replacement parts listed in this section.

8.1 Hose Replacement

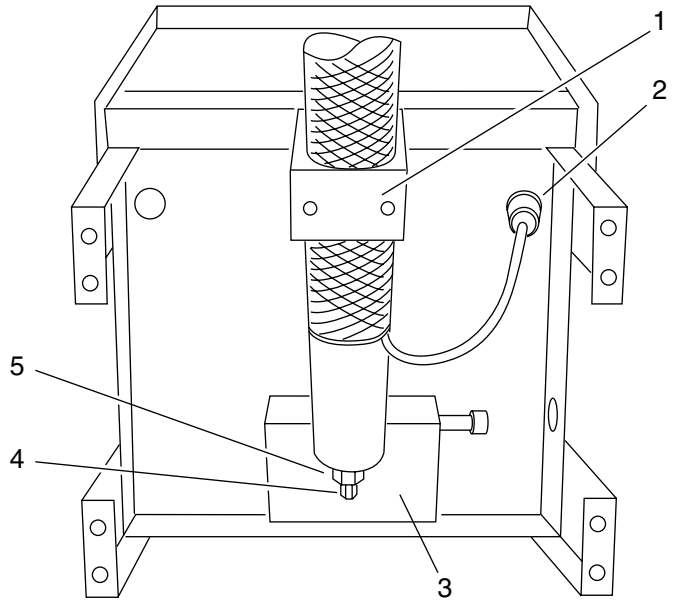
a. Removal

1. Switch system power off, and allow hot melt in tank to completely solidify.
2. Switch system on for 5 minutes to allow fittings to warm or heat fitting with a hand-held hot air gun.
3. Switch system power off, and disconnect melt unit electrical power from external source.
4. Per illustration below, disconnect hose electrical connector [2] by tilting melt unit back until underside is accessible. Support the melt unit with block on back of housing so hot melt does not spill. Do not turn melt unit upside down.
5. Remove screws from hose mounting block [1].
6. Loosen hose JIC fitting [5] and remove hose from the fitting [4] on the flow control block [3].



b. Replacement

1. Switch off system power and disconnect melt unit electrical power from external source.
2. Never flex a hose when cold. Hoses have a minimum bend radius of 20.32 cm (8 in.) when hot. Further flexing will cause permanent damage.
3. Per illustration below, heat hose JIC fittings [5] before adjusting or damage may result. New or clean hose fittings may not require heating.
4. Install hoses on melt unit by tilting melt unit back until underside is accessible. Support melt unit with block on back of housing so hot melt does not spill. Do not turn melt unit upside down.
5. Support hose to prevent excessive flexing. Do not support hose in a way which may add to its thermal insulating characteristics or overheating will result. Failure to properly support the hose will result in premature failure.
6. Install hose as follows:
    a. Loosely connect the hose JIC swivel fitting [5] to fitting [4] on the flow control block or hose manifold [3].
    b. Fasten hose support block [1] to chassis.
    c. Tighten JIC swivel fitting [5].
    d. Attach hose electrical connector [2].
    e. Tuck electrical connector under melt unit.
    f. Position and support hose before using.
    g. After heating, tighten JIC swivel fitting [5].

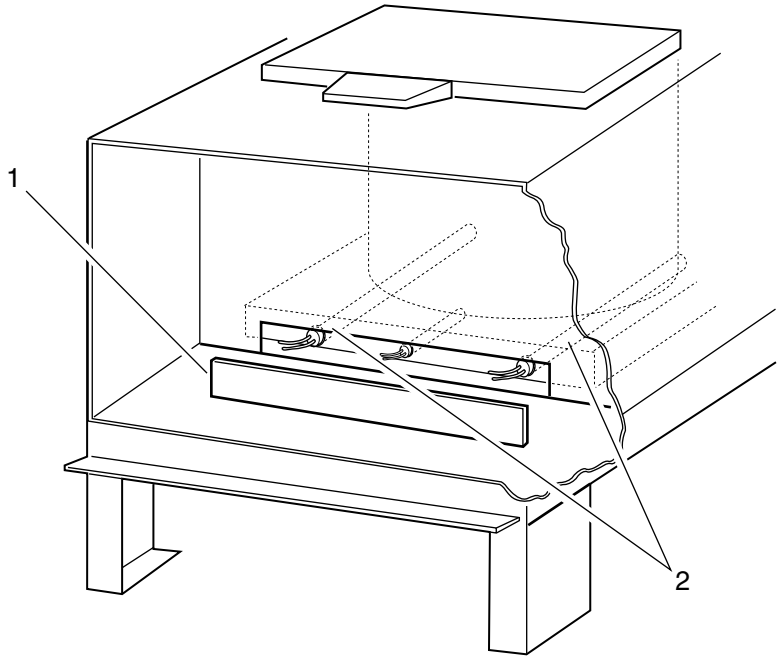


8.2 Hose Controller Replacement

1. Turn off system power and allow hot melt in tank to completely solidify.
2. Turn system power back on for five minutes to allow fittings to warm up, or heat fittings with a hand-held hot air gun.
3. Turn off system power and disconnect melt unit electrical power.
4. Tilt melt unit backward.
5. Loosen hose JIC fitting and remove hose from fitting on flow control valve.
6. Remove thermostat bulb from hose end; take care not to kink capillary tube.
7. Open front control panel.
8. Disconnect controller wires.
9. Remove screws fastening controller to electrical panel.
10. Install new controller.
    a. Insert thermostat bulb into hose end.
    b. Coil capillary tube so it hangs in a suitable position under chassis.
11. Reconnect hose to JIC as specified in Section 4.2: Component Installation.
12. Reconnect melt unit power, turn on power switch, and adjust controller as specified in Section 5.3.1.

8.3 Tank Heater Replacement

1. Before considering replacement, check each heater with amp probe (system power on) or ohmmeter (system power off, wires disconnected). Refer to electrical schematic, located in back of melt unit.
2. To measure heater resistance, switch off system power and disconnect electrical power from external source.
3. Per illustration below, open control panel and remove tank access panel [1].
4. Determine resistance of each individual heater [2]. Refer to Appendix A for Component Resistance Tables.
5. If heater requires replacement, disconnect wires of defective heater.
6. Pull heater out of bore using pliers. If heater does not come out easily, drive out using a 6.35 mm (0.25 in.) diameter rod inserted in knockout holes in back of tank base.
7. Apply a coating of heat release and transfer agent to new heater and slide it into tank heater bore from the front.
8. Route heater lead wires through electrical panel, and reconnect heater wires in original locations. See electrical schematic included with melt unit.
9. Replace tank access panel.
10. Close and fasten control panel.



8.4 Tank Controller Replacement

1. Disconnect melt unit electrical power.
2. Open front control panel.
3. Remove tank access panel at bottom of electrical panel.
4. Remove wires connected to thermostat. Tank thermostat controller is the elongated thermostat mounted horizontally on the tank base plate.
5. Remove screws holding tank thermostat to tank.
6. Apply even coating of heat sink compound to base of the new thermostat.
7. Attach replacement thermostat to the tank assembly using the mounting clip and screws. Reconnect wires.
8. Replace tank access plate.

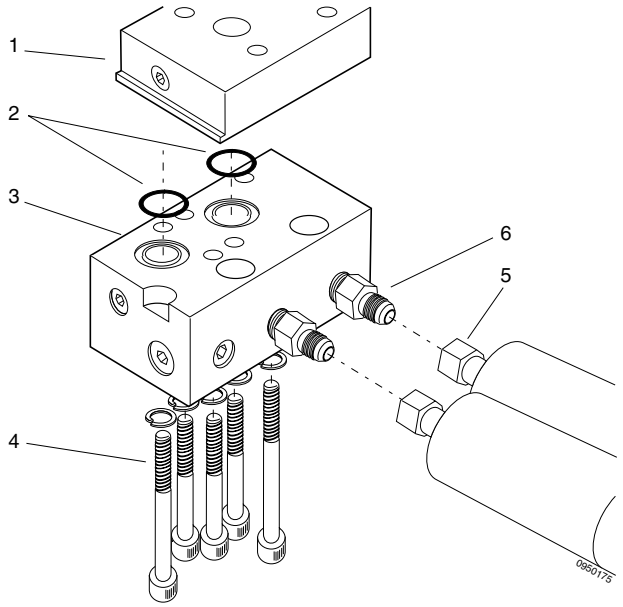
> ⚠ **WARNING**: Failure to replace the access plate will result in an electrical hazard and possible heat damage to electrical components.

9. Close front control panel.

8.5 Hose Manifold Filter Block Replacement or Cleaning

The hose manifold filter block is an optional component that is required when a pump filter is used.

1. If possible, pump out all adhesive in melt unit before disconnecting power. If not possible, disconnect power and allow hot melt in tank to solidify.
2. Switch on system power for 5 minutes to warm fittings.
3. Switch off system power and disconnect electrical power at external source.
4. Disconnect hose electrical connector and tilt melt unit backwards. Support the melt unit with block on back of housing so hot melt does not spill. Do not turn melt unit upside down.
5. Per illustration below, loosen JIC fittings [5] and remove hose(s) from fitting(s) [6] on hose manifold [3].
6. Remove screws [4] from hose manifold filter block [3].
7. Ease hose manifold [3] from flow control block [1]. Two screws remain (3 for reverse mounting) holding flow control block [1] and pump to tank base plate.
8. Clean hose manifold [3] thoroughly, especially flow control block mating surface, or replace with a spare hose manifold.
9. Refit hose manifold [3] with hardware. After lubricating with a silicone-based grease such as DC 5, replace o-rings [2].
10. Switch on system power, and allow melt unit to reach operating temperature.
11. Reconnect hose as specified in Hose Replacement.

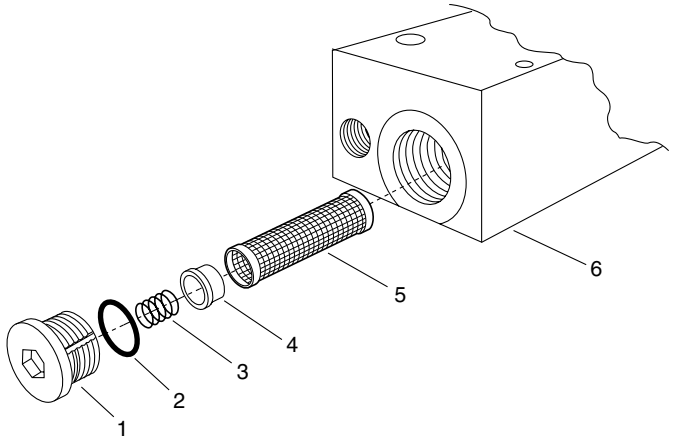


8.6 Pump Filter Installation, Servicing, and Replacement

A pump filter is an optional accessory for use when adhesive filtering is desired. The pump filter is installed in the hose manifold filter block. See illustration below for installation and servicing the filter element.

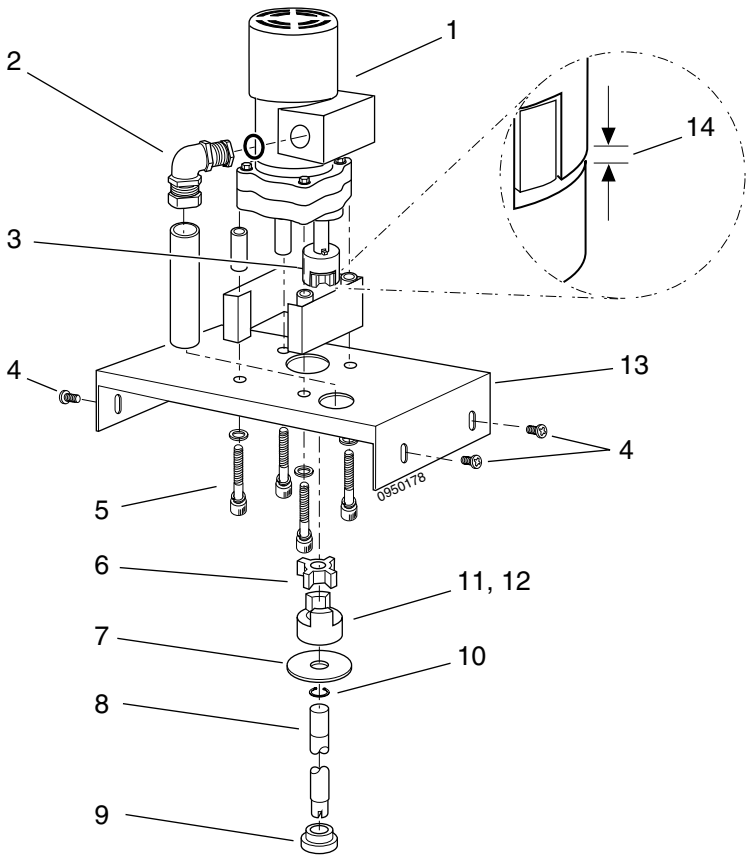
> **WARNING**: Contents at high temperature and pressure. Remove pressure before opening filter or drain valve to prevent accidental discharge of system pressure. Do not touch hot surfaces. Failure to follow these instructions may result in severe burns.

1. Bring melt unit to operating temperature.
2. Switch off pump motor.
3. Activate applicator several times to relieve all pressure in the system.
4. Place a disposable container below filter access area to catch all adhesive spillage or run off.
5. Slowly remove plug [1] with o-ring [2] to release any residual pressure trapped in hose manifold filter block [6]. A 9/16 in. hex wrench is required.
6. Remove spring [3], spring retainer [4], and filter [5]. Clean all parts.
7. Carefully switch pump motor on for approximately 1 to 2 seconds causing a small amount of adhesive to flush the filter chamber. Clean filter chamber of all foreign material. Repeat if necessary.
8. Insert spring retainer [4] and spring [3] into clean filter [5]. Place clean filter assembly into manifold filter block [6].
9. Inspect o-ring [2], and replace if damaged.
10. Install plug [1] with o-ring [2] securely into hose manifold filter block [6].



8.7 Pump Motor and Pump Shaft Assembly Replacement

1. Disconnect electrical power and allow melt unit to cool to 121 °C (250 °F).
2. Per illustration below, open motor junction box cover [1], disconnect wiring and liquidtite fitting [2].
3. Remove screws [4] holding motor mounting plate to melt unit.
4. Lift motor assembly off melt unit.
5. Inspect motor shaft coupler [3] for wear. Replace if necessary.
6. If not replacing shaft assembly, skip to Step 8. If replacing pump shaft assembly or individual shaft assembly parts, remove bronze spider [6], coupler and key [11 and 12], washer [7], retaining ring [10], and shaft [8], and shaft retainer [9].
7. Install new shaft assembly or individual components as needed.
8. Remove screws [5] holding pump motor to motor mounting plate [13].
9. Install new pump motor on motor mounting plate.
10. Check pump shaft alignment on pump in tank.
11. Align motor coupling [3] with pump shaft in tank and lower onto shaft.
12. Align motor mounting plate to melt unit with mounting screws [4].
13. Verify that pump shaft seats properly with pump, and verify that coupler clearance [14] of 0.8 mm ±0.3 mm (0.030 in. ±0.010 in.) exists.
14. Replace liquidtite fitting and wires [2].
15. Reconnect wires according to electrical schematic, located in back of melt unit. Refer to melt unit identification plate to determine exact voltage.
16. Turn on melt unit and allow melt unit to heat to normal operating temperature. Turn on pump motor.
17. Tighten screws [4] in a crisscross pattern while motor is operating to align pump shaft.
18. If replacing complete motor group, also replace pump motor switch on front panel and motor capacitor inside electrical enclosure.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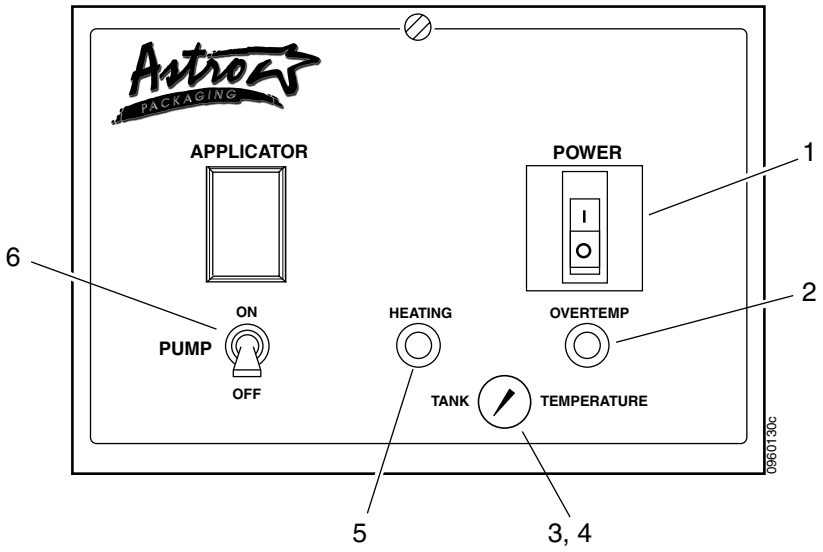
9 Parts List

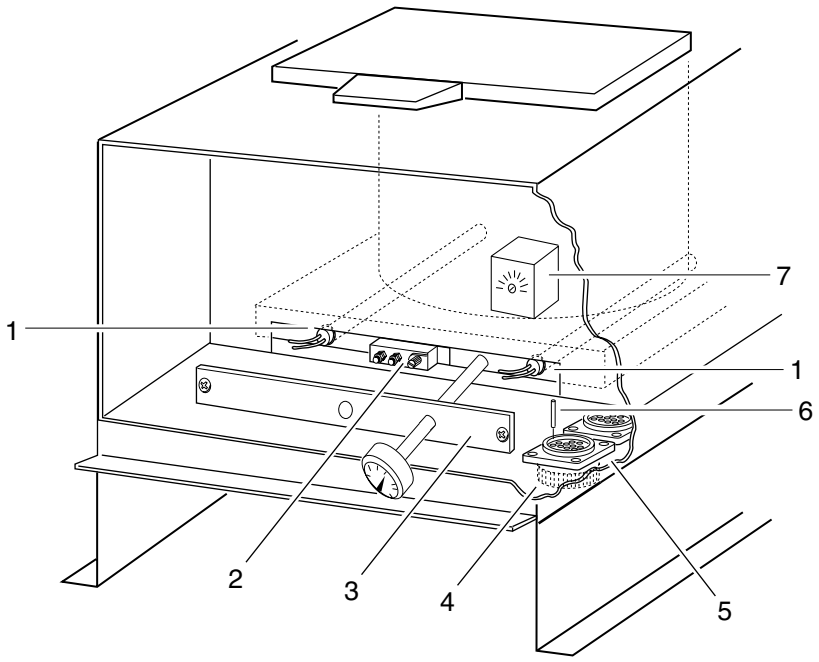
9.1 Control Panel - Front View

Item	Description (Quantity)	Part Number
1	Circuit breaker/switch, main 15 A 115 VAC	12015-1
1	Circuit breaker/switch, main 15 A 230 VAC	12015-3
2	Lamp, round red (overtemperature indicator)	12030-1
3	Thermometer	11029
4	Thermometer, spring	14488-1
5	Lamp, round amber (tank heating indicator)	12030-10
6	Circuit breaker/switch, pump motor, 1 A (100/115 VAC unit)	12055-1
6	Circuit breaker/switch, pump motor, 0.5 A (200/230 VAC unit)	12055-3



9.2 Electrical Enclosure and Chassis Base

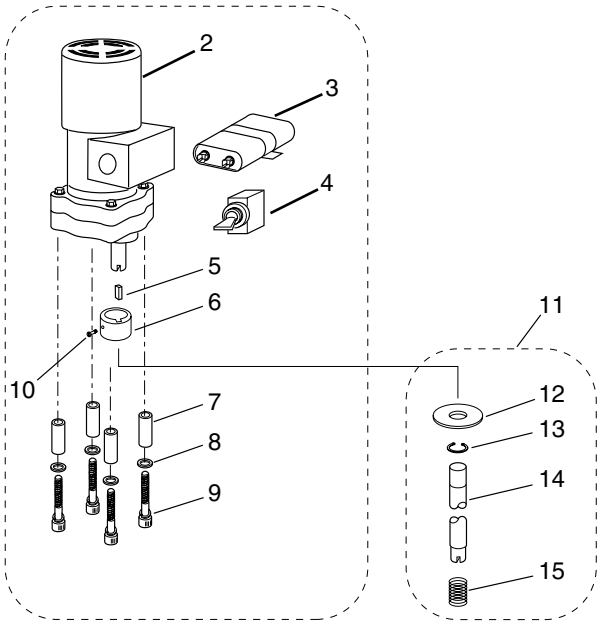
Item	Description (Quantity)	Part Number
1	Tank heater kit, 115 VAC, 400 W (2 heaters for 10 lb. unit)	79005
1	Tank heater kit, 230 VAC, 400 W (2 heaters for 10 lb. unit)	79005-1
1	Tank heater kit, 100 VAC, 400 W (2 heaters for 10 lb. unit)	79005-2
1	Tank heater kit, 200 VAC, 400 W (2 heaters for 10 lb. unit)	79005-3
1	Tank heater kit, 230 VAC, 600 W (2 heaters for 20 lb. unit)	79044
1	Tank heater kit, 115 VAC, 600 W (2 heaters for 20 lb. unit)	79044-1
1	Tank heater kit, 100 VAC, 600 W (2 heaters for 20 lb. unit)	79044-2
1	Tank heater kit, 200 VAC, 600 W (2 heaters for 20 lb. unit)	79044-3
2	Tank controller, kit 38–232 °C (100–450 °F)	79006
3	Panel, access	70350-1
4	Connector 9-pin, for solid capillary controlled melt units	12115-9
5	Flange, 9-pin connector, panel mount	12115-10
6	Female electrical pins	12116
7	Hose controller, kit 38–93 °C (100–200 °F)	79125-1
7	Hose controller, kit 93–149 °C (200–300 °F)	79125-2
7	Hose controller, kit 149–204 °C (300–400 °F)	79125-3
7	Hose controller, kit 177–232 °C (350–450 °F)	79125-4



9.3 Motor Group and Pump Shaft Assembly

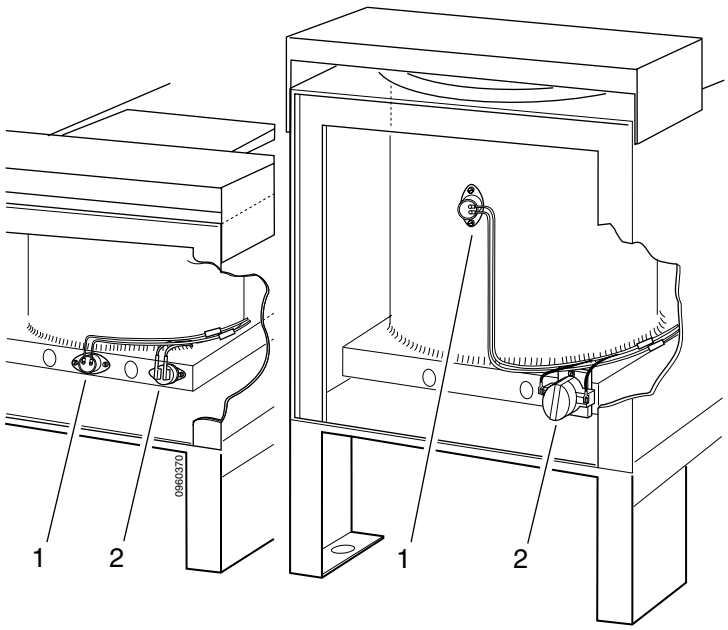
Item	Description (Quantity)	Part Number
2	Motor assembly, 44/36 rpm, 50/60 Hz, 100/115 VAC	73012-32
3	Capacitor, 3 µf, 370 VAC, flat pack	12045-3
4	Circuit breaker/switch, pump motor, 1 A (100/115 VAC unit)	12055-1
4	Circuit breaker/switch, pump motor, 0.5 A (200/230 VAC unit)	12055-3
5	Key, motor coupler to pump shaft	14475-18
6	Coupler, HF&FS, 1/2 in. w/ keyway	70460-2
7	Spacer, AL. 10 x .50 x 1.25 LG	14471-6
8	Washer, lock	14451-FA
9	Screw, socket head cap 10-32 x 1.75 LG	14431-FDO
10	Screw, set flat point, 1/4 - 28 x 3/16	14401-HDB
11	Pump shaft assembly, 10 lb. melt unit	73726-21
11	Pump shaft assembly, 20 lb. melt unit	73726-22
12	Washer, rat trap	14528-4
13	Retaining ring	14502-12
14	Shaft, pump with keyway, 10 lb. melt unit	70461-3
14	Shaft, pump with keyway, 20 lb. melt unit	70461-4
15	Retaining spring pump shaft	70028
	Retainer seal for pump shaft	70028-1
	Kit, gearbox repair, 44/36 rpm motor	79295-01
	Wire nuts (medium low temperature)	12277-2

* Motor group includes Motor Assembly, Capacitor, Pump “ON/OFF” breaker, and hardware.



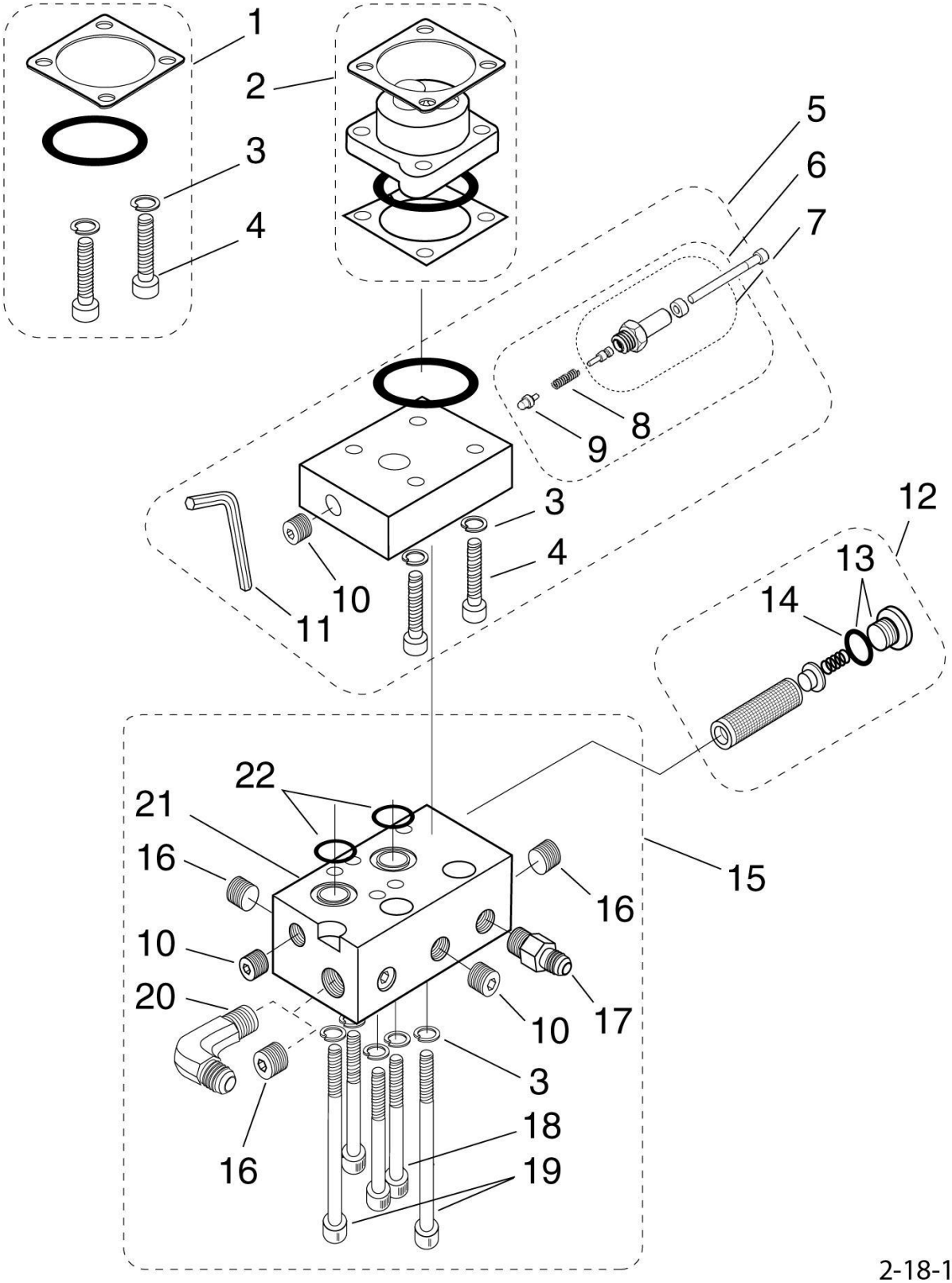
9.4 Pump Warm-up and Tank Overtemperature Thermostats

Item	Description (Quantity)	Part Number
	LS10, LS20 Pump Warm-up Thermostat Kit	
1	37.78 °C (100 °F)	79068-100
1	93.33 °C (200 °F)	79068-200
1	107.22 °C (225 °F)	79068-225
1	129.44 °C (265 °F)	79068-265
1	148.89 °C (300 °F)	79068-300
1	176.67 °C (350 °F)	79068-350
	LS10 Overtemperature Thermostat Kit	
2	65.56 °C (150 °F)	79126-150
2	93.33 °C (200 °F)	79126-200
2	148.89 °C (300 °F)	79126-300
2	204.44 °C (400 °F)	79126-400
2	232.22 °C (450 °F)	79126-450
	LS20 Overtemperature Thermostat Kit	
2	65.56 °C (150 °F)	79127-150
2	93.33 °C (200 °F)	79127-200
2	148.89 °C (300 °F)	79127-300
2	204.44 °C (400 °F)	79127-400
2	232.22 °C (450 °F)	79127-450



9.5 V4 Pump, Flow Control Valve, and Hose Manifold Filter

Item	Description (Quantity)	Part Number
1	Pump seal kit, all V4 pumps	79081
2	Pump Kit, V4-675, 0.675 CID flange thickness = 15.9 mm (0.625 in.)	79290-2
3	Washer, lock, 0.25 in.	14451-GA
4	Screw, socket head cap 1/4-20 x 2.5 in. (for V4-675)	14431-GDQ
5	Flow control valve replacement kit, 1 hose	79025-4
5	Flow control valve replacement kit, 2 hose	79082-4
5	Flow control valve replacement kit, for units with filter block	75011-010
6	Flow control valve repair kit, 2 hose	79082-2
7	Flow control valve replacement	79082-8
8	Spring, flow control valve	14489-10
9	Damper, flow control valve	70392-1
10	Plug, 1/4 NPTF, flush, steel	11603-4D
11	Hex wrench 1/4 in.	11050-1/4
12	Pump filter kit, 50 mesh	79064
13	Plug, socket head No. 12, with o-ring 10456, for filter chamber	11604-12
14	O-ring for 11604-12, viton, 0.116 in. W x 0.924 in.	10456
15	Filter block, kit, 1 hose (for rear entry only), optional	79133-01
15	Filter block, kit, 2 hose (for rear exit only), optional	79133-02
16	Plug, 3/8 NPTF, steel	11603-6A
17	Fitting, male, 1/4 in. NPT to No. 6 JIC, straight	11408-64A
18	Screw, socket head cap 1/4-20 x 2.50 in. (both pumps)	14431-GDR
19	Screw, socket head cap 1/4-20 x 3.75 in. (for V1-450)	14431-GDV
19	Screw, socket head cap 1/4-20 x 4.25 in. (for V1-675	14431-GDY
20	Hose manifold filter block	70122
21	O-ring, viton, 0.86 in. ID x 0.070 in. for hose manifold filter block	10420



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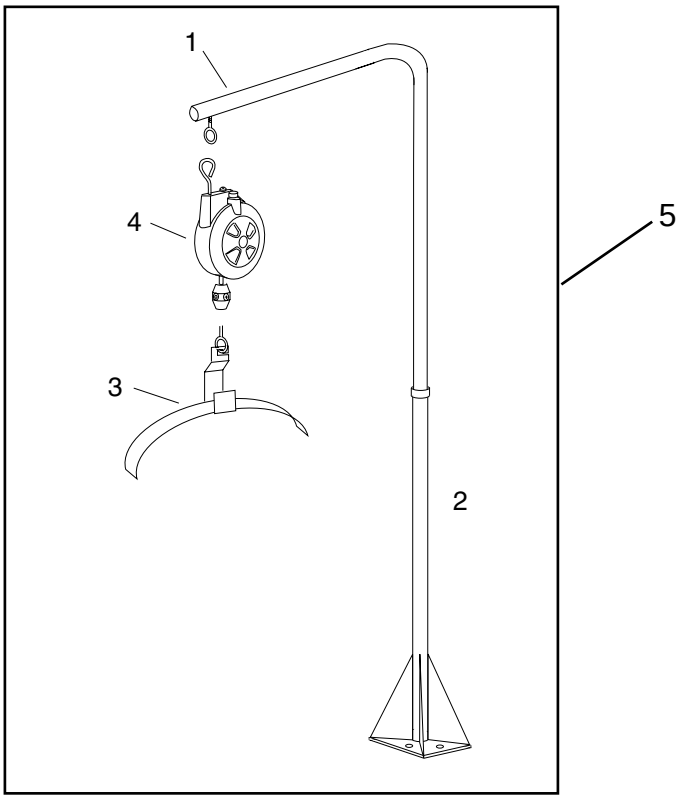
9.6 Accessories

Item	Description (Quantity)	Part Number
	Melt Grid, for LS10 (included as standard equipment on LS20)	79033-1
	Kit, Gun Hanger	79023
	Filter Block Assembly - 1 hose (recommended for adhesive filtering)	79133-01
	Filter Block Assembly - 2 hoses (recommended for adhesive filtering)	79133-02
	Kit, Pump Inlet Screen (used with a melt grid)	79282-01
	Kit, Pump Filter (use with pump Filter Block Assembly)	79064
	Kit, Reverse 1 Hose Mounting (Filter Block Assembly not included)	79135-10
	Kit, Reverse 2 Hose Mounting (Filter Block Assembly not included)	79135-11
	Kit, Knob Assembly FCV, V1 Retrofit to existing units	79287-01
1	Boom	99786-B
2	Base	99786-A
3	Hose Hammock	73464-9
4	Tension Balancer, Hose, 5 Lb	RF-8
5	Hose Boom & Balancer Assembly	99786
	Power Cord Assembly, 115 VAC	73712-12
	Kit, Hose Mole (use for in place cleaning of hoses)	79281-01
	Kit, Tank Thermometer	79014



Appendix A: Component Resistance Tables

Minimum and maximum resistance (R) of common melt unit components, hoses, and applicators. Unless otherwise specified, resistance values are measured at 20° + 5° C (68° + 10° F).

Table 1. Tank Heater Resistance

Spare Kit	Voltage	Heater	Ohms*
79005	115	12532	32.4–37.8
79005-1	230	12538	136.8–158.4
79044	230	12546-1	91–106
79044-1	115	12456-2	23–26
79088-30	230	12600	55–63.3
79088-50	230	12600	55–63.3
79088-100	230	12610	91.5–100.5

*Resistance shown is for one heater only. Spare kit may include more than one heater.

Table 2. Motor Resistance

Melt Unit Model	Motor Label	Spare Motor Group	RPM	Hz	Voltage	Ohms
SS10G, Mark II	73714-24	73714-24	38/31	50/60	100–115	6
SS10G, Mark II	73714-24	73714-24	38/31	50/60	200–230	16
LS/SQ10 & 20	73795-01	73714-20	44/36	50/60	100–115	25–28
LS/SQ10 & 20	73795-02	73714-21	44/36	50/60	200–230	102–105
KS10 & 20	73795-01	73714-25	44/36	50/60	100–115	25–28
KS10 & 20	73795-02	73714-26	44/36	50/60	200–230	102–105
KB/FS10 & 20	73794-01	73714-41/-43	86/72	50/60	100–115	6–9
	73794-02	73714-42/-44	86/72	50/60	200–230	16–20
	73794-06	73714-45/-46	72	50	200–230	16–20
KB/FS30–100	73794-02	73278-42	86/72	50/60	200–230	16–20
	73794-06	73278-45/-46	72	50	200–230	16–20
	73207-03	73278-98	170	60	200–230	8–10
	73207-04	73278-97	140	50	200–230	19
	73012-20	73278-70	340	60	200–230	8–10
	73012-82	73278-71	280	50	200–230	16
LS/KS10e & 20e	73789-05	79301-01/-03	47	50	200–230	45–50
KB10e & 20e	73794-07	79301-02/-04	70	50	200–230	60–65
Model 115C	73789-05	79301-01/-03	47	50	200–230	45–50

Table 3. RTD Sensor Resistance	
Temperature	Ohms
0 °C (32 °F)	100
38 °C (100 °F)	115
66 °C (150 °F)	126
93 °C (200 °F)	136
121°C (250 °F)	147
149 °C (300 °F)	158
177 °C (350 °F)	168
204 °C (400 °F)	178

Same RTD sensor is used in tank, hose and applicator.

Table 5. Valve Coil Resistance			
E100XT Style Coil		E900 Style Coil	
Voltage	Ohms	Voltage	Ohms
100	39–42	100	64–75
115	45–48	115	77–89
200	156–157	200	239–281
230	172–201	230	285–335

Table 6. Heater Resistance for Common Applicators					
Model	Voltage	Heater Quantity	Heater Wattage	Total Wattage	Ohms*
Automatic Applicators					
E100XT	230	2	120	240	216–264
E100	230	1	150	150	369–399
E901	230	1	150	150	369–399
E902	230	2	150	300	182–211
E904	230	2	150	300	182–211
M101	230	2	150	300	182–211
M102	230	4	150	600	91–106
M104	230	4	150	600	91–106
Manual Applicators					
L4/SW4	230	1	80	80	664–720
L1	115	1	50	50	247–314
L4/SW4	115	1	80	80	170–190

*For applicators with more than 1 heater, resistance shown is for heaters in parallel.

Table 7. Heater Resistance for Common Hoses (in Ohms)							
HC Style Automatic Hoses							
Part No. (VAC)	4 ft	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft
Capillary Sensor							
25132 (115 VAC)	153–159	105–109	80–83	65–67	54–56	47–49	41–43
26288 (230 VAC)	560–583	385–401	294–306	237–247	199–207	171–178	150–157
RTD Sensor							
26701 (115 VAC)	127–140	86–96	66–72	53–58	44–49	39–41	33–37
26703 (230 VAC)	510–563	347–384	264–291	212–235	178–196	153–169	134–148

Handgun Hoses			
Part No. (VAC)	8 ft	12 ft	16 ft
L1 Hose, Capillary Sensor			
26257 (115 VAC)	80–83	54–56	41–42
26276 (230 VAC)	293–305	199–207	150–156
L1 Hose, RTD Sensor			
26499 (115 VAC)	73–80	49–54	36–40
26500 (230 VAC)	298–306	199–204	149
L4 Hose, Capillary Sensor			
21260 (115 VAC)	71–74	48–50	36–38
21262 (230 VAC)	283–294	192–200	145–152
L4 Hose, RTD Sensor			
21285 (115VAC)	75–79	45–52	37–39
21287 (230VAC)	298–315	199–209	149–157
SW4 Hose, RTD Sensor			
21261 (115 VAC)	75–79	49–52	37–39
21263 (230 VAC)	298–314	199–209	149–157

A. Astro Packaging warrants its products, when operated and maintained in accordance with Astro Packaging recommended procedures, are free of defects in material and workmanship during the periods indicated below commencing with the date the product is placed in service.

Product	Warranty Period
1. Tank heater (including entire tank when heater is cast into tank)	5 years or 10,000 hours of use, whichever occurs first
2. Melt unit (unless specified below); pattern controller; head driver	1 years or 2,000 hours of use, whichever occurs first
3. Stationary hose; automatic electric head; JR™ Series Hot Melt System or melt unit; standard pail unloader; standard accessory purchased with a system	1 year or 2,000 hours of use, whichever occurs first
4. Manual hose; handgun; Mini Squirt III; any butyl system; any PUR system (including hose, gun or head used with PUR); any spare or replacement component; pneumatic head; industrial heated hose; T100 Temperature Controller; nozzle; nozzle bar	6 months or 1,000 hours of use, whichever occurs first
5. Rebuilt equipment	90 days or 500 hours of use, whichever occurs first

B. The sole liability of Astro Packaging and exclusive remedy extended to any Astro Packaging customer shall be limited to replacing or repairing, at the option of Astro Packaging, any product returned under the terms of this warranty. Labor and related expenses incurred to install replacement or repaired parts are not covered by this warranty.

C. Astro Packaging is not responsible for repair or replacement of any product that has been subject to abuse, misuse, alteration, accident, or negligent use, nor for repairs made by an unauthorized person or with parts other than those provided by Astro Packaging.

D. Astro Packaging assumes no responsibility for the performance of adhesives or other materials used with its products.

E. The warranty for a product repaired or replaced under this warranty shall continue in effect for the remainder of the original warranty period, or for ninety (90) days following the day of shipment by Astro Packaging of the repaired or replaced product, whichever period is longer.

F. No warranty is made with respect to custom products or products developed, designed and manufactured to customer specifications, except as specifically stated in writing by Astro Packaging.

G. Astro Packaging is responsible only for payment of shipping charges for delivery of a repaired or replaced product, via the least expensive means of transport, to customer or an authorized Sales and Service Center in the Continental United States only. Payment for shipment to Astro Packaging or an authorized Sales and Service Center for evaluation, repair or replacement is the responsibility of the customer.

H. For service under this warranty, contact the Factory Authorized Representative from which the product was purchased.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE.

Complete Reverse Side and Retain for Your Records

Equipment Record

Record the information below on all equipment received and retain for your records.

(Systems, melt units, hoses, guns, heads, pattern controllers, drivers, etc)

Products were purchased from:______________________________________

Astro Packaging

Product Model/Description____________________________ Serial No.______________

Product Part Number________________________________ Order No.______________

Date Received_____________ Start-Up Date_____________ Invoice No.____________

Product Model/Description____________________________ Serial No.______________

Product Part Number________________________________ Order No.______________

Date Received_____________ Start-Up Date_____________ Invoice No.____________

Product Model/Description____________________________ Serial No.______________

Product Part Number________________________________ Order No.______________

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