

InvisiPacTM HM25 Tank-FreeTM Hot Melt Delivery System

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EN

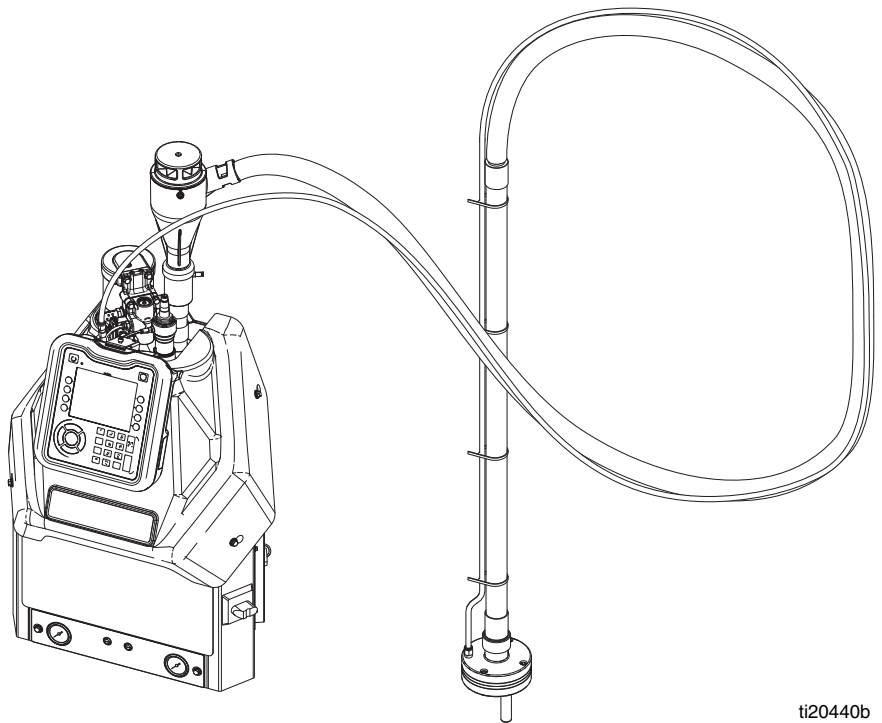
**For delivering and dispensing hot melt adhesive pellets. For professional use only.
Not approved for use in explosive atmospheres or hazardous locations.**

*1200 psi (8.3 MPa, 83 bar) Maximum Working Pressure
400°F (204°C) Maximum Fluid Operating Temperature
100 psi (0.7 MPa, 7 bar) Maximum Air Inlet Pressure*



Important Safety Instructions

Read all warnings and instructions in this manual and in the gun and hose manuals.
Save all instructions.



ti20440b



Intertek
9902471
Certified to
CAN/CSA C22.2 No. 88
Conforms to
ANSI/UL 499

PROVEN QUALITY. LEADING TECHNOLOGY.

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Related Manuals

Manuals are available at www.graco.com. Component manuals in English:

Part	Description
3A2805	InvisiPac GS35 Hot Melt Gun Instructions - Parts
332072	InvisiPac Heated Hose Instructions - Parts
333348	MZLP Fuse Kit, Instructions
334784	InvisiPac Pattern Controller, Operations-Repair-Parts
335010	Dedicated Feed Sensor Air Kit

Required Tools

- Standard allen wrench set
- Metric allen wrench set
- Various sizes of crescent wrenches
- 11/16 in. wrench
- 3/8 in. ratchet
- 3/8 in. socket
- 5/16 in. driver
- 7/16 in. socket
- 7/8 in. deep well socket
- 1 in. socket
- 13 mm socket
- 10 mm socket
- 1/2 in. ratchet
- Side cutter
- Phillips head screwdriver
- Flat head screwdriver
- Multimeter
- Tubing cutter

Models

NOTICE

To prevent system damage, verify terminal jumpers are installed correctly before applying power.

Model	Channels	Voltage	Φ Type	Description	Frequency	Max Amps
24P260	2	200-240VAC	1Φ / PE 	1-Phase 200-240VAC 2 wire and PE 	50/60 Hz	32A
24P261	4	200-240VAC	1Φ / PE 		50/60 Hz	40A
24P262	2	350-415VAC Y	3Φ / Neutral / PE 	3-Phase with Neutral 350-415 VAC Line to Line 200-240VAC Line to Neutral 3 wire and Neutral and PE 	50/60 Hz	16A
24P263	4	350-415VAC Y	3Φ / Neutral / PE 		50/60 Hz	16A
24P264	2	200-240VAC Δ	3Φ / PE 	3-Phase without Neutral 200-240 VAC Line to Line 3 wire and PE 	50/60 Hz	27A
24P265	4	200-240VAC Δ	3Φ / PE 		50/60 Hz	27A
24U132	6	200-240VAC	1Φ / PE 	1-Phase 200-240VAC 2 wire and PE 	50/60 Hz	40A
24U133	6	350-415VAC Y	3Φ / Neutral / PE 	3-Phase with Neutral 350-415 VAC Line to Line 200-240VAC Line to Neutral 3 wire and Neutral and PE 	50/60 Hz	30A
24U134	6	200-240VAC Δ	3Φ / PE 	3-Phase without Neutral 200-240 VAC Line to Line 3 wire and PE 	50/60 Hz	40A

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 WARNING	
 	ELECTRIC SHOCK HAZARD This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock. • Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment. • Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
	BURN HAZARD Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns: • Do not touch hot fluid or equipment.
  	SKIN INJECTION HAZARD High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment. • Do not point dispensing device at anyone or at any part of the body. • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately.
 	MOVING PARTS HAZARD Moving parts can pinch, cut or amputate fingers and other body parts. • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure and disconnect all power sources.



WARNING



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.



FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Do not use solvent-based adhesives that can create an explosive atmosphere when processed.
- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- **Stop operation immediately** if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.



TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDSs to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.



WARNING



PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer

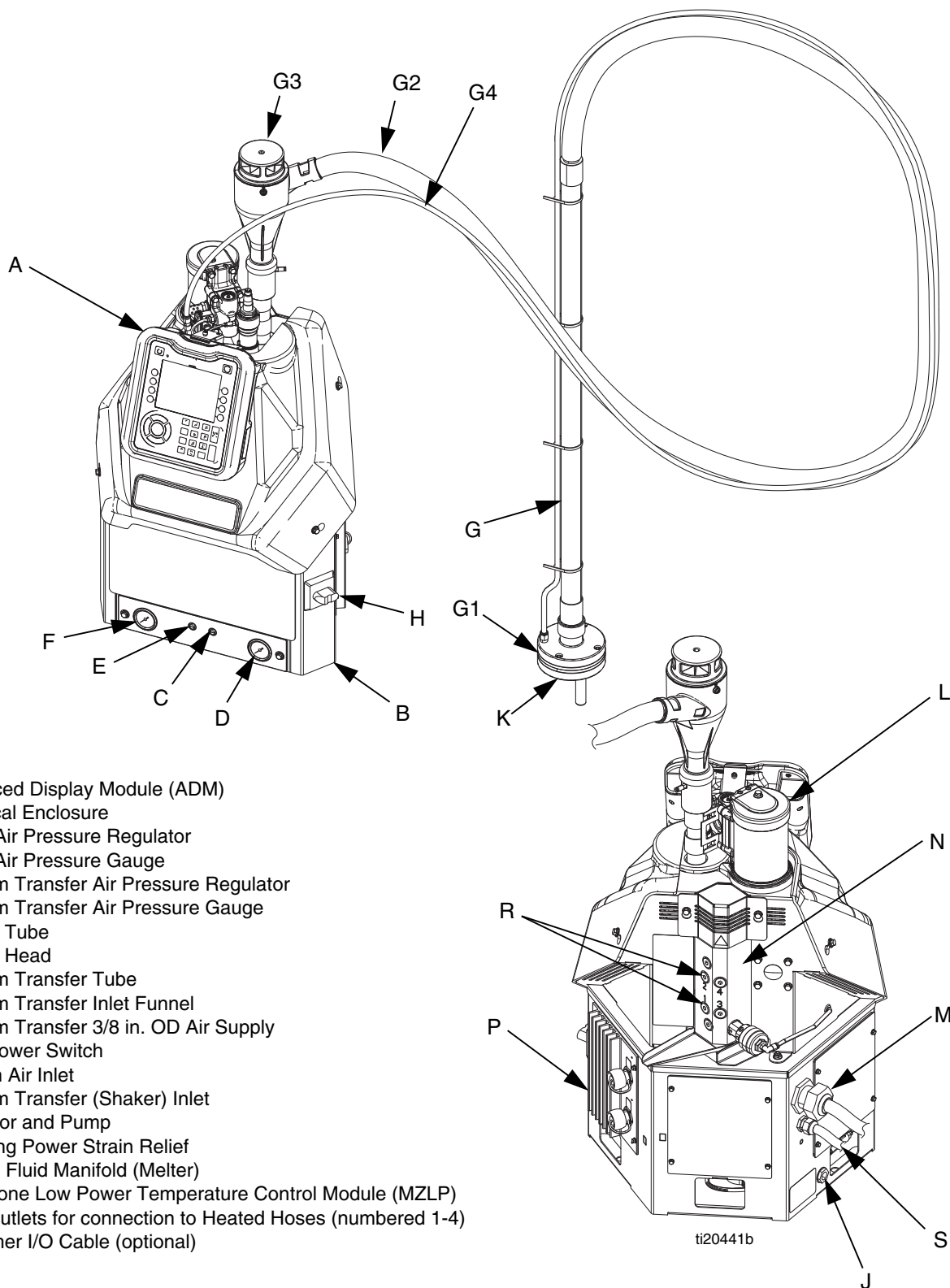


PRESSURIZED ALUMINUM PARTS HAZARD

Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.

- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.
- Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.

Component Identification

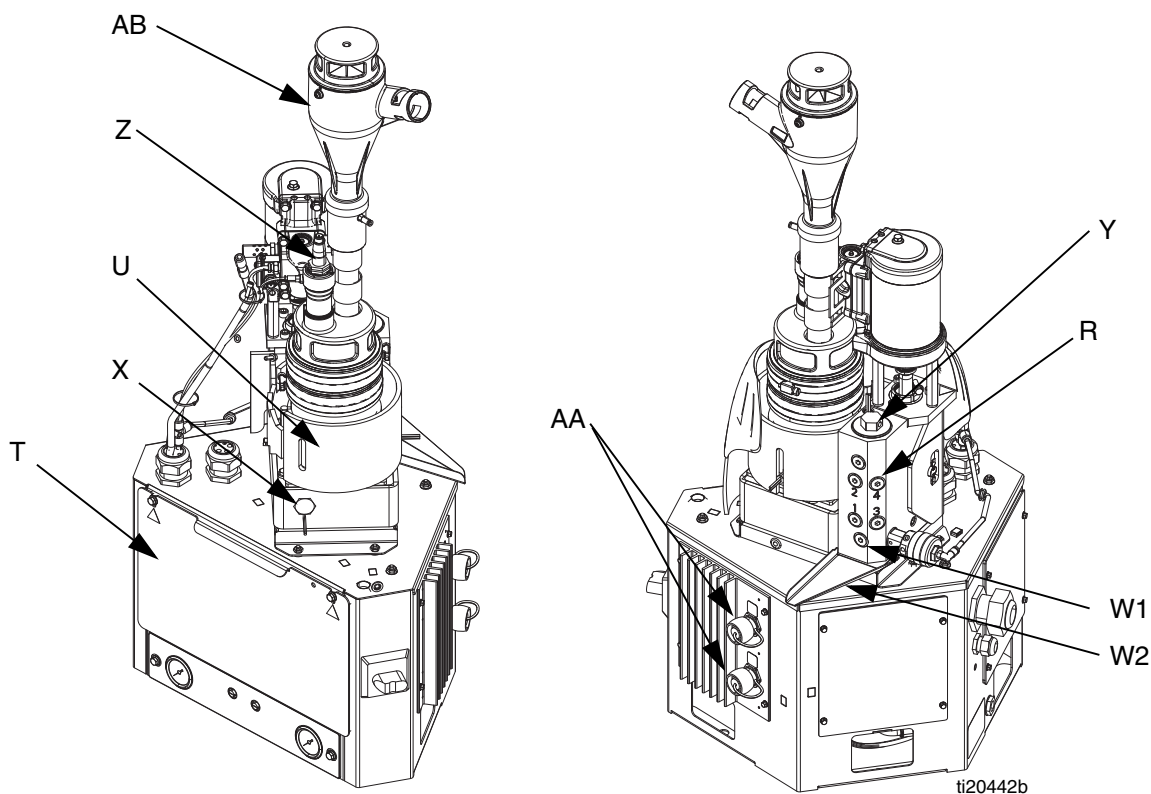


Key:

- A Advanced Display Module (ADM)
- B Electrical Enclosure
- C Pump Air Pressure Regulator
- D Pump Air Pressure Gauge
- E Vacuum Transfer Air Pressure Regulator
- F Vacuum Transfer Air Pressure Gauge
- G Shaker Tube
- G1 Shaker Head
- G2 Vacuum Transfer Tube
- G3 Vacuum Transfer Inlet Funnel
- G4 Vacuum Transfer 3/8 in. OD Air Supply
- H Main Power Switch
- J System Air Inlet
- K Vacuum Transfer (Shaker) Inlet
- L Air Motor and Pump
- M Incoming Power Strain Relief
- N Heated Fluid Manifold (Melter)
- P Multi-Zone Low Power Temperature Control Module (MZLP)
- R Fluid Outlets for connection to Heated Hoses (numbered 1-4)
- S Customer I/O Cable (optional)

FIG. 1

Heated Fluid Manifold



NOTE: System shown with plastic and metal shrouds removed.

FIG. 2

Key:

T Electrical Enclosure Front Access Door
 U Melter
 W1 Drain Port
 W2 Drain Tray
 X Inlet Filter (Low Pressure - Before Pump)
 Y Outlet Filter (High Pressure - After Pump)

Z Adhesive Pellets Level Sensor
 AA Power and RTD Harness Connection to Heated Hose and Gun (harness connects from system to heated hose then from heated hose to gun)
 AB Inlet Funnel Screen

Electrical Enclosure

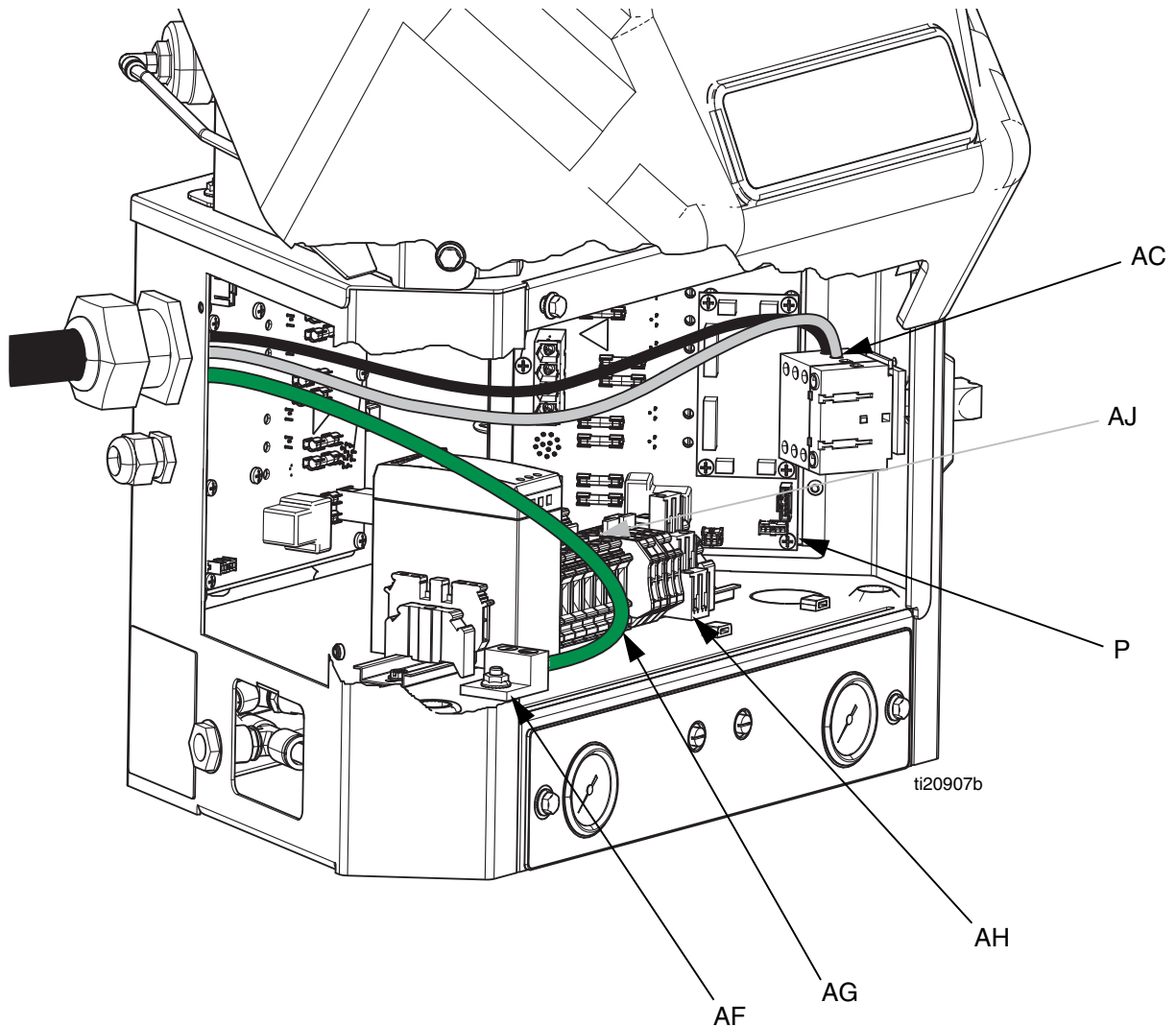


FIG. 3

Key:

P Multi-Zone Low Power Temperature Control Module (MZLP)
AC Incoming Power Connection
AF Chassis Ground

AG Terminal Blocks and Jumpers
AH Heater Relay
AJ Incoming Power Terminal Jumpers. See page 18.

Advanced Display Module (ADM)

User Interface

NOTICE

To prevent damage to soft key buttons, do not press the buttons with sharp objects such as pens, plastic cards, or fingernails.

NOTE: See **Appendix A - ADM** on page 111 for complete ADM operation details.

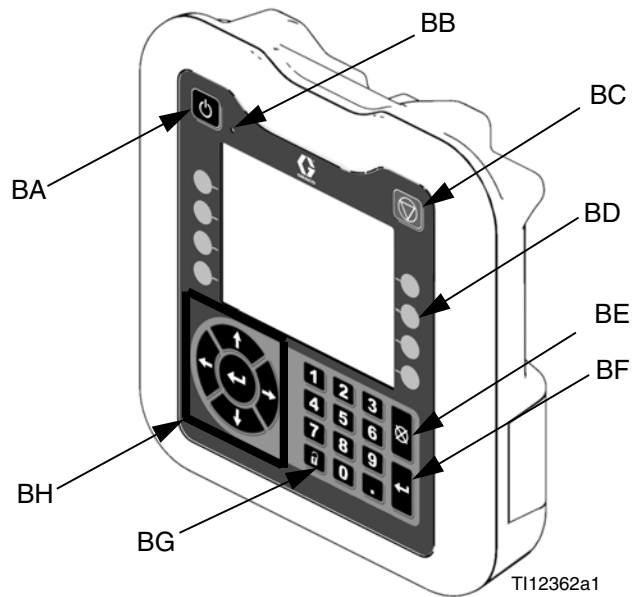


FIG. 4

Key	Function
BA	Heating system and pump enable/disable
BB	System status indicator (LED)
BC	Stop all system processes
BD	Defined by icon next to softkey
BE	Abort current operation
BF	Accept change, acknowledge error, select item, toggle selected item
BG	Toggle between Operation and Setup screens
BH	Navigate within a screen or to a new screen

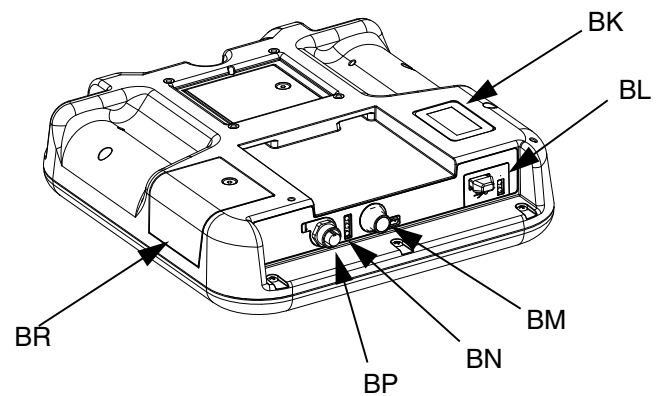


FIG. 5

Key:

- BK Part Number Identification Label
- BL USB Interface
- BM CAN Cable Connection (Power Supply and Communication)
- BN Module Status LEDs
- BP (Not used)
- BR Software Token Access Panel

Screen Components

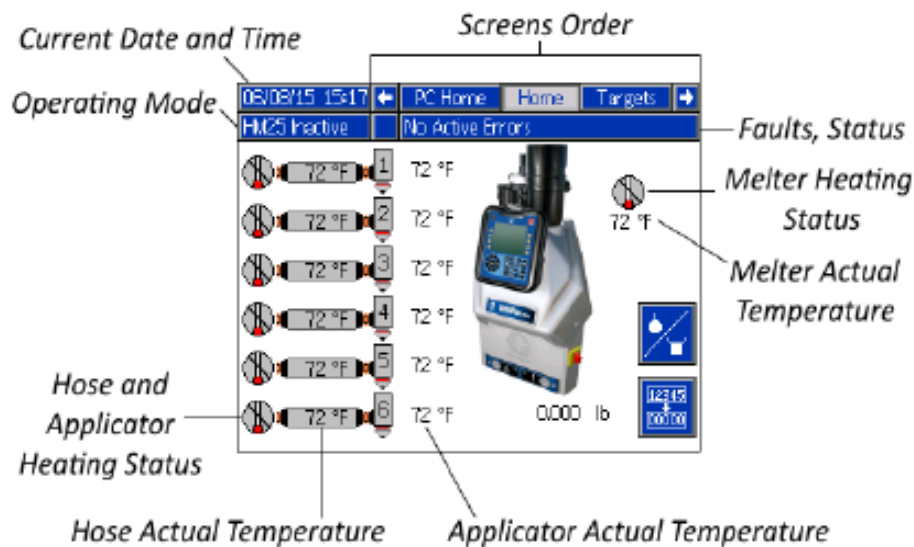


FIG. 6: Main Screen Components

Operating Mode	Description	Component Status
System Off	The system doesn't have power.	- No System Status Indicator LED on the ADM - No heat - Pump is off
Inactive	The heating system and pumps are disabled.	- Yellow system status indicator LED on the ADM - No heat - Pump is off (manually changed)
Warm Up	The system is increasing the material to the set temperature.	- Flashing green system status indicator LED on the ADM - Heat is increasing to setpoint temperature - Pump is off
Active	The system is ready to dispense material.	- Solid green system status indicator LED on the ADM - Heat is at setpoint temperature - Pump is on

Setup

Grounding

						
The equipment must be grounded to reduce the risk of electric shock. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.						

The InvisiPac system is equipped with a ground terminal. Have a qualified electrician ground the system using this terminal. See **Connect Electrical Cord** on page 18.

Location

Ambient temperature must be 32-120°F (0-49°C).

The supplied vacuum transfer hose length is 10 ft (3 m). The maximum vacuum transfer hose length available is 30 ft (9.1 m). The adhesive pellets container must be located within reach of the vacuum transfer hose and no more than 30 ft (9.1 m).

The gun(s) must be located no more than 25 ft (7.6 m) from the melter.

Place the base system on a surface that is eye-level for easiest operation. Use **System Stand, 24R088**, to install system at eye-level. See page 98.

If installing the system in place of a non-Graco hot melt system, purchase **Adapter Plate, 24R083**. See page 98.

Optional **30 Gallon Vibrating Hopper, 24R136**, available (purchase separately). See page 99.

To make repairing the system easier, locate the system so that all sides are easily accessible and have sufficient lighting.

Attach Components

						
To reduce the risk of electric shock, do not connect electrical cord until after this Attach Components procedure is complete.						

- Place the base system in the desired operating location and orientation. See **Location** on this page.
 - The bottom of the electrical enclosure has holes for securing the InvisiPac system to a surface. The holes are accessible through the bottom access doors in the three rear walls of the electrical enclosure.
 - To install the InvisiPac system in place of a non-Graco hot melt system, purchase **Adapter Plate, 24R083**. See installation instructions on page 98.*
 - To raise the system to eye-level, purchase **System Stand, 24R088**. See installation instructions on page 98.*

NOTE: Supplied vacuum transfer hose must reach from the system to the adhesive pellets container. Supplied heated hose must reach from system to gun(s).

- Install vacuum transfer inlet funnel (G3) onto system. See FIG. 7.
 - Slide funnel through the bracket connected to the air motor.
 - Position the funnel so the funnel inlet faces the desired direction.
 - Connect 5/32 in. OD air line to funnel.
 - Install supplied hose clamp around the air motor bracket and funnel base then tighten.

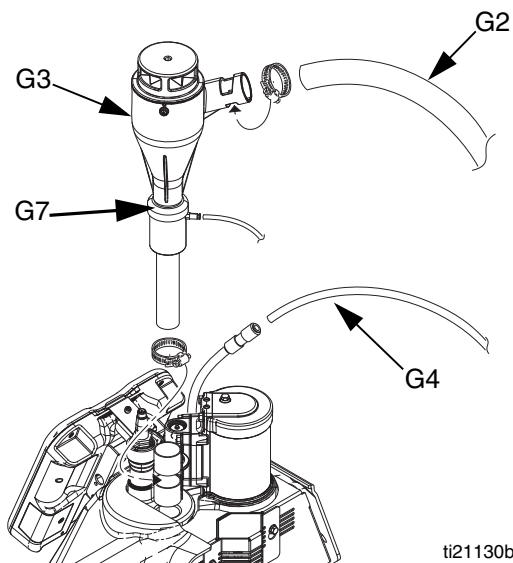


FIG. 7

3. Insert 1.3 in. (33 mm) OD clear vacuum transfer hose (G2) into vacuum transfer funnel (G3) inlet and secure with supplied hose clamp. See FIG. 7.
4. Connect the long supplied 3/8 in. OD air line (G4) to the 3/8 in. push-to-connect fitting on the air line from the system. See FIG. 7.

NOTE: To rotate funnel, loosen set screws (qty 4, G7) 1/4 turn each. Once funnel is aligned properly, hand tighten screws back down.

NOTE: In the following steps, when routing the vacuum transfer hose, ensure there are no tight coils, turns, or dips in the vacuum hose. These will inhibit optimal functioning of the vacuum transfer system.

NOTE: Maximum vacuum hose length is 30 ft (9.1 m). Use horizontal hose routing as much as possible. The vacuum hose must not rise more than 10 ft (3.0 m), measured from the vacuum inlet. Any vertical rise will lower the maximum flow rate of the vacuum transfer system.

5. Route the 1.3 in. (33 mm) OD clear vacuum transfer hose from the system to the adhesive pellets container location.

6. Apply pipe sealant to threads then attach steel shaker tube (G) to shaker head (G1). See FIG. 8.

NOTICE

To prevent shaker head (G1) galling to the shaker tube (G), do not overtighten shaker head onto shaker tube. These should be hand-tightened.

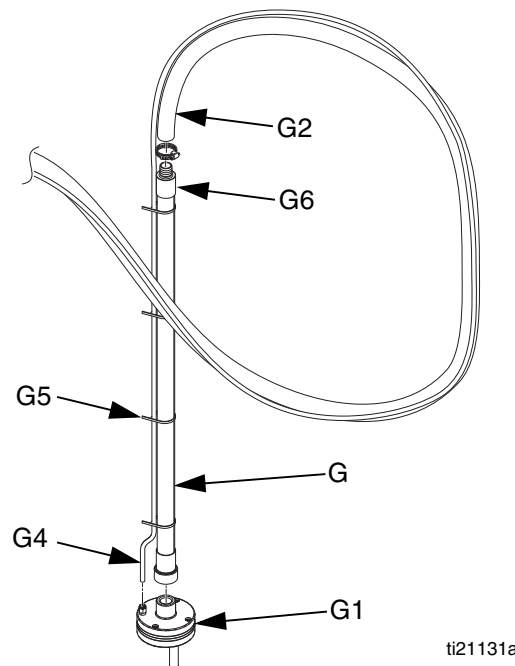


FIG. 8

7. Attach 1.3 in. (33 mm) clear vacuum transfer hose (G2) to steel shaker tube (G) and secure with supplied hose clamp. See FIG. 8.
8. Route the 3/8 in. OD air line (G4) alongside the 1.3 in. (33 mm) clear vacuum transfer hose (G2) and secure at multiple points with the supplied zip ties (G5). See FIG. 8.
9. If desired, secure the 1.3 in. (33 mm) clear vacuum transfer tube and 3/8 in. OD air line with zip ties to a supporting structure at various points in the routing.
10. Attach the other end of the long 3/8 in. OD air line (G4) to the 3/8 in. push-to-connect fitting on the shaker head (G1).
11. Ensure the adhesive pellets container is in the desired operating location. The location should be chosen to make it easy to fill the container with pellets.

12. Place shaker assembly in an empty adhesive pellets container then fill the container with adhesive pellets.

NOTE: To promote optimal system performance, purchase **30 Gallon Vibrating Hopper, 24R136**. See installation instructions on page 99.

NOTE: If static buildup on feed tube (G) is excessive, install optional feed tube ground kit 24R708 to feed tube end (G6). See FIG. 8.

13. Install heated hoses, see FIG. 9:

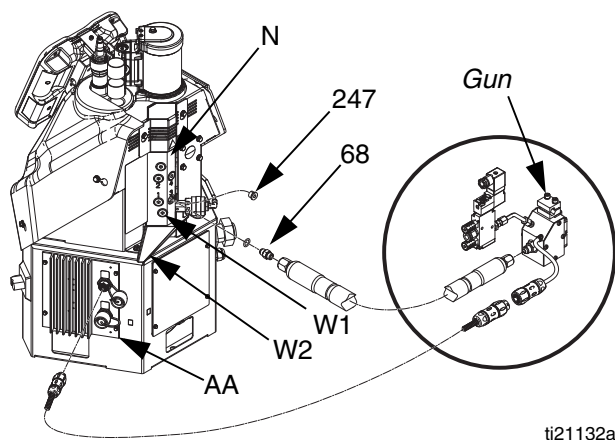
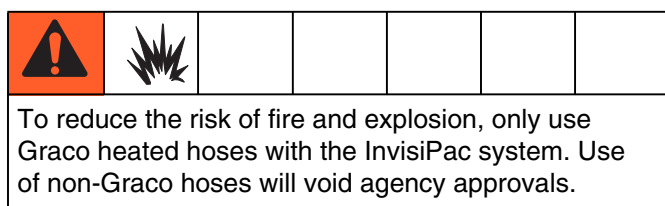


FIG. 9

- a. Place a rag on the drain tray (W2) attached to the melter. Residual oil may be in the system from the factory. See FIG. 9.
- b. Use a 1/4 in. allen wrench to remove the drain port plug (W1). See FIG. 9.

NOTE: A 1/4 in. allen wrench is shipped loose with the system.

- c. When fluid stops draining, re-install drain port plug (W1) then remove rag. See FIG. 9.

- d. Remove plug (247) from the lowest numbered outlet on the melter. Do not use the drain plug (W1). See FIG. 9.

NOTE: In the following step, the o-ring side of the hydraulic fitting (68) faces the system. See FIG. 9.

- e. Install the supplied hydraulic fitting (68) with an o-ring into the open port and tighten with an 11/16 in. wrench or socket.
- f. Install hose onto hydraulic fitting (68) with male electrical connector side toward the system. Use 11/16 in. wrench to tighten hose onto hydraulic fitting (68).
- g. Locate MZLP (AA) connector marked with same number as the hose fluid outlet port. Remove that connector cover then install connector from heated hose. See FIG. 9.
- h. Repeat the procedure for the remaining channels. Use the bottom melter ports first to ease installation.
- i. Install cap on any unused MZLP electrical connectors.

NOTE: Fluid outlet port 1 must be used and electrical connector from that hose must be connected to MZLP connector 1. The system will not operate unless a hose is connected to MZLP connector 1. If a hose is not connected to connector 1, "Invalid Sensor - hose/gun" faults will result.

14. Install gun(s), see FIG. 9:

NOTE: Use of a Graco gun is not required with this system. However, all guns attached to the system must be rated for 1200 psi (8.3 MPa, 83 bar), 400°F (204°C), have an RTD type sensor, and use no more than 400W.

- a. Connect heated hose fluid outlet to gun fluid inlet. Use 11/16 in. wrench to tighten. See FIG. 9.
- b. *For Graco guns*, attach gun electrical connector to heated hose electrical connector. See FIG. 9.

- c. *For non-Graco guns*, attach gun electrical connector to adapter harness (16T916, 16T917, or 16Y828) then attach adapter harness connector to heated hose connector. See **Non-Graco Gun Adapter Cables** on page 96 to determine which adapter cable to use with your valve.
- d. Repeat for any additional guns.

15. *If necessary*, set up the valve controller to control opening and close the gun. See gun manual.

NOTE: The system controls gun heating only. A separate gun controller must be set up to open and close the guns.

16. Install the supplied air inlet bleeding ball valve and air filter kit (Graco Part No. 24R707) at the 1/4 NPT female system air inlet (J). See FIG. 10.

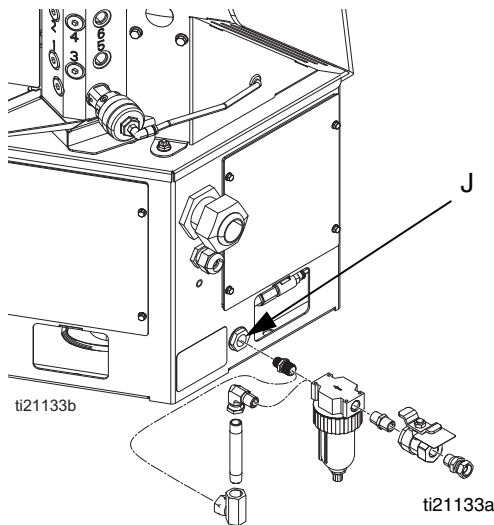


FIG. 10

NOTE: The system must have a bleed-type ball valve that bleeds pressure downstream when closed. Otherwise, the supplied air will need to be disconnected from the system whenever the pressure is relieved.

NOTE: The system must use an air filter with a minimum flow rate of 30 scfm.

17. *If using the same air for the gun(s)*, make sure to install the tee in the air line before the ball valve. There should not be anything between the ball valve and the system. See gun manual for gun air pressure requirements, and use a regulator before the gun to decrease the air pressure, if necessary.

18. Close the ball valve.

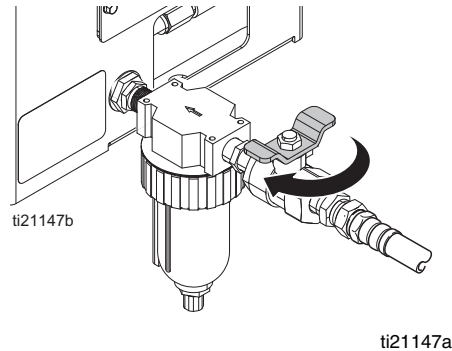


FIG. 11

19. Attach a 3/8 in. minimum air supply line to air filter. See FIG. 11.

NOTE: Air supply pressure must be between 80 psi (550 kPa, 5.5 bar) and 100 psi (690 kPa, 6.9 bar). Recommended pressure is 100 psi (690 kPa, 6.9 bar). If air pressure is expected to drop below 80 psi (0.5 MPa, 5 bar), there is an air reservoir kit that allows the system to operate down to 60 psi (0.4 MPa, 4 bar). See **Air Reservoir Kit, 16W366**, on page 102.

20. *To lock access to the air pressure adjustments*, purchase **See Attach Components on page 13.** See installation instructions on page 96.
21. *To install a light tower that illuminates red when a system error occurs*, purchase **Light Tower Kit, 24R226**. See installation instructions on page 101.
22. *To upgrade a 2 channel system to a 4 channel system*, purchase **4 Channel Upgrade Kit, 24R237**. See installation instructions on page 103.
23. Install MZLP electrical connector caps on all unused channels.

Recommended Air Setup

Setup

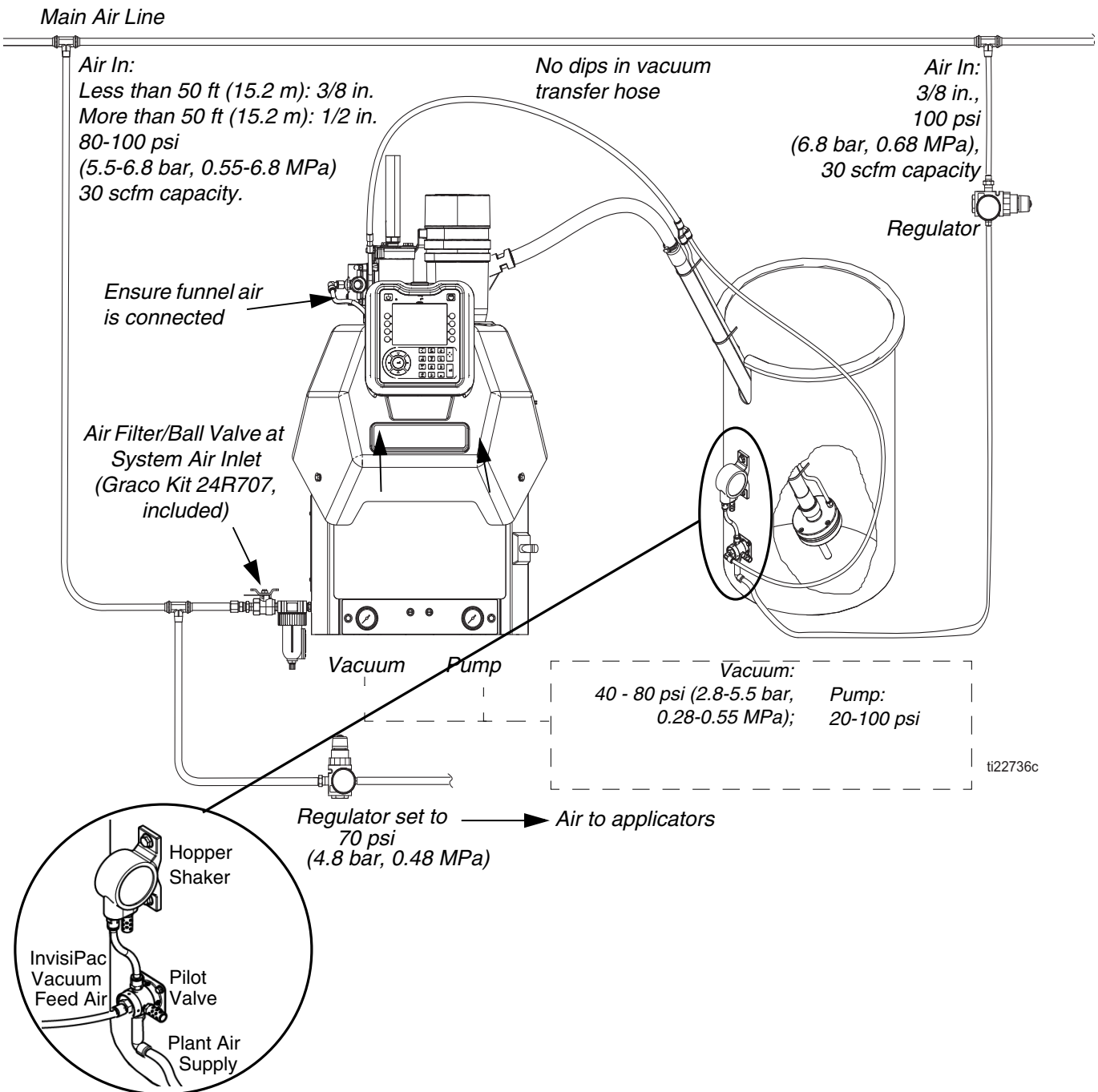


FIG. 12

If plant air pressure is >90 psi, add air regulator kit to the 24H420 to the air supplying the hopper shaker. Regulate the shaker air according to the vacuum feed pressure according to the table below.

NOTE: Using vacuum feed air pressure higher than necessary may cause the melter to over fill and Interrupt production.

Vacuum Feed air pressure	Max air pressure to hopper
40 psi (2.8 bar)	60 psi (4.1 bar)
50 psi (6.4 bar)	75 psi (5.2 bar)
60 psi (4.1 bar)	90 psi (6.2 bar)
70 psi (4.8 bar)	105 psi (7.2 bar)
80 psi (5.5 bar)	120 psi (8.3 bar)

Connect Electrical Cord

NOTE: See **Grounding** section on page 13.



Improper wiring may cause electric shock or other serious injury if work is not performed properly. Have a qualified electrician perform any electrical work. Be sure your installation complies with all National, State and Local safety and fire codes.

To reduce the risk of electric shock, perform the entire **Attach Components** procedure beginning on page 13 prior to connecting electrical cord.

NOTE: The installed strain relief bushing (106) fits a 0.708-1.260 in. OD electrical cord. See FIG. 14. If needed, use a wrench to tighten the strain relief bushing until it is snug on the cable.

NOTE: Tubing 17F777 and 17F779 is included for smaller diameter electrical cord. Place around the power cord and secure in the strain relief brushing (106).

NOTE: The accessory strain relief bushing kit 24x190 is available for smaller (0.512-1.024 in, 13-26 mm) OD electrical cords. See Accessories, page 107.

For **480V Electrical Circuits**, see page 20.

1. Turn main power switch OFF.
2. Disconnect cable from ADM, push cable through plastic shroud, then remove plastic shroud from system.
3. Remove electrical enclosure access door (T). See FIG. 2 on page 9.
4. Ensure the terminal block jumpers are in the correct locations for the phase and voltage used. If necessary, change them to match FIG. 15 on page 19. See the following table, FIG. 13, and FIG. 15.

NOTICE

To prevent system damage, verify terminal jumpers are installed correctly before going on to the next step.

Terminal Block Jumper Installation Guide				
Voltage	Terminal Block Location			
	Jumper Wire 127201	2-Terminal Jumper 126814	3-Terminal Jumper 126815	5-Terminal Jumper 126816
200-240VAC, 1 phase	Not used	Not used	3-5	6-10
350-415VAC, 3 phase, WYE	Not used	5-6, 8-9	2-4	Not used
200-240VAC, 3 phase, DELTA	3-7	4-5, 9-10	6-8	Not used

NOTE: The jumpers only need to be changed if using a different phase or voltage from what the system was designed for at the factory.

NOTE: All necessary jumpers are supplied with the system in a bag located behind the electrical enclosure front access panel. Keep unused jumpers in bag.

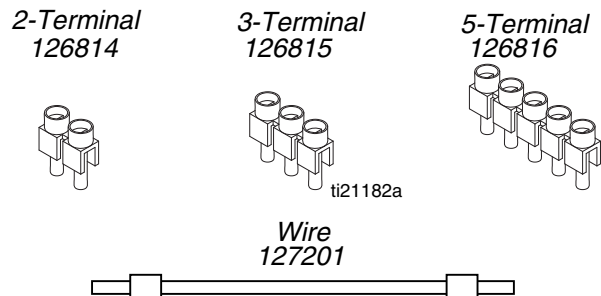


FIG. 13: Jumpers

NOTE: Use the supplied hard metal 2, 3, and 5 terminal jumpers and jumper wire for terminals 2C-10C. Use the red, plastic jumpers for terminals 11-14.

5. Insert electrical cord through electrical enclosure strain relief bushing (106). See FIG. 14 on page 19.
 - a. Alternate electrical cord routing: using conduit, run electrical cord from access port (X) through hole (Y). Conduit is required when routing wires near compressed air components.

6. Attach insulated ferrules to the end of each wire.

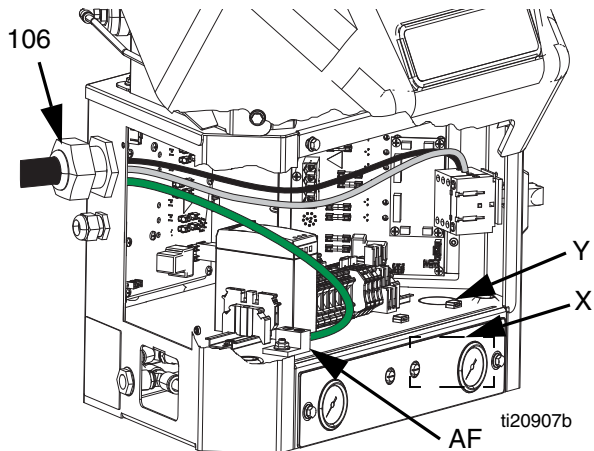


FIG. 14

7. Connect ground wire to chassis ground (AF). See FIG. 14.
8. Connect L1, L2, L3, and N as shown in FIG. 15. Not all models use all 4 wires.
9. Use zip ties to secure the electrical cord to the tie-downs located on the top of the inside of the electrical enclosure.
10. Tighten screw-terminals to at least 10 in-lb (1.1 N•m).
11. Install electrical enclosure door.
12. Perform **Select ADM Settings** on page 20 prior to turning on heat.

24P260 / 24P261 / 24U132 200-240 VAC, 1Ø	24P262 / 24P263 / 24U133 350-415 VAC, 3Ø, Y	24P264 / 24P265 / 24U134 200-240 VAC, 3Ø, Δ

FIG. 15

480V Electrical Circuits

For 480V electrical supply, a 480V to 240V step-down transformer must be installed by a qualified electrician.

Transformer Sizing

For single-phase power, 480V to 240V transformer 24U169 (purchase separately) may be used. See **Single-Phase 480V to 240V Transformer, 24U169** on page 107.

Minimum transformer rating can be calculated by taking output voltage times the ADM setting.

Single Phase, 20A ADM Breaker Setting Example:
 $240 \text{ volts} \times 20 \text{ amps} = 4800 \text{ watts}$

Three Phase, 20A ADM Breaker Setting Example:
 $240 \text{ volts} \times 20 \text{ amps} \times \sqrt{3} (3) = 8315 \text{ watts}$

208V Electrical Circuits

For 208V electrical supply, a qualified electrician can install a 208V to 240V step-up transformer to improve startup times.

Transformer Sizing

Minimum transformer rating can be calculated by taking transformer output voltage times the ADM breaker setting.

Single Phase, 20A ADM Breaker Setting Example:
 $240 \text{ volts} \times 20 \text{ amps} = 4800 \text{ watts}$

Three Phase, 20A ADM Breaker Setting Example:
 $240 \text{ volts} \times 20 \text{ amps} \times \text{SQRT}(3) = 8315 \text{ watts}$

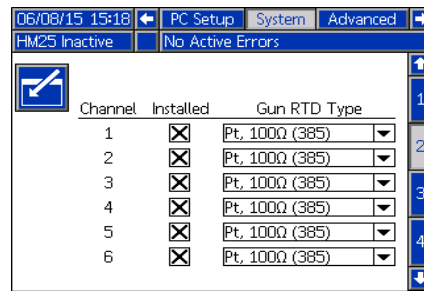
Select ADM Settings

NOTE: See **Appendix A - ADM** on page 111 for detailed ADM information, including general operation.

1. Turn main power switch ON .

2. When the ADM is finished starting up, press  to switch from the Operation screens to the Setup screens. Use , , , and  to navigate between screens.

3. On the System 2 screen:



Channel	Installed	Gun RTD Type
1	☒	Pt, 100Ω (385)
2	☒	Pt, 100Ω (385)
3	☒	Pt, 100Ω (385)
4	☒	Pt, 100Ω (385)
5	☒	Pt, 100Ω (385)
6	☒	Pt, 100Ω (385)

- a. Check the box in the “Installed” column for each channel that has a heated hose and gun installed.
- b. Select the RTD type used on each installed gun. See gun manual.

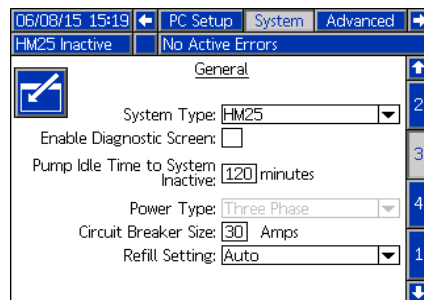
NOTE: An incorrect RTD setting will cause the system to be incapable of maintaining the temperature setting.

NOTE: The supported RTD types are Ni, 100 ohm; Ni, 120 ohm; NiFe, 604 ohm; Pt, 100 ohm (385), Pt, 100 ohm (392); and Pt, 1000 ohm. An “Auto” selection is available but should only be used when the specific RTD type cannot be identified. Using the “Auto” RTD setting may result in inaccurate temperatures.




To prevent fire and explosion, a qualified electrician must determine the proper circuit breaker size to use for the power supplied to the system.

4. On the System 3 screen:



Setting	Value
System Type	HM25
Enable Diagnostic Screen	☐
Pump Idle Time to System Inactive	120 minutes
Power Type	Three Phase
Circuit Breaker Size	30 Amps
Refill Setting	Auto

- a. Enter the main circuit breaker size used. This is the circuit breaker installed external to the system for the system power supply.

NOTE: If using a 480V to 240V transformer, the breaker size entered will be two times the 480V rating. If using transformer 24U169, the breaker size should be set to 30 amps and power type should be set to single phase.

NOTE: The InvisiPac system limits the amount of power it pulls based on the input circuit breaker size. This impacts the startup times because it affects the heating energy used to warm up the materials.

b. Select the incoming power type.

5. On the Advanced 1 screen, set the system date and time.

06/08/15 15:20 System Advanced Maintenance
HM25 Inactive No Active Errors

Language: English
Date Format: mm/dd/yy
Date: 06 / 08 / 15
Time: 15 : 20
Enter Password: 0000
Screen Saver: 0 minutes
Silent Mode: ☐
Lock Run Screens: ☐

6. On the Advanced 2 screen, set the temperature and mass units.

06/08/15 15:21 System Advanced Maintenance
HM25 Inactive No Active Errors

Temperature Units: °F
Mass Units: lb
Distance Units: in

7. To setup the optional Schedule function, see **Schedule** on page 32.

NOTE: The Schedule function enables the system to automatically enable and disable heating at specified times so that the system is already up to temperature when a shift begins.

8. *If desired*, set any remaining settings in the Setup screens before going on to the next steps that use the Operation screens. These are not required for system operation but include useful functions. See **Appendix A - ADM**, beginning on page 111, for detailed information about each setup item.

9. Press to switch from the Setup screens to the Operation screens. Use , , , and to navigate between screens.

10. On the Targets screen, use and , shown

next to , to adjust system melter setting.

→ 350 °F

Also, the desired temperature setting can be typed in using the numeric keypad.

06/08/15 15:25 Home Targets Targets Events
HM25 Inactive No Active Errors

1	350 °F	350 °F			
2	350 °F	350 °F			
3	350 °F	350 °F			
4	350 °F	350 °F			

→ 350 °F

06/08/15 15:21 System Advanced Maintenance
HM25 Inactive No Active Errors

Temperature Units: °F
Mass Units: lb
Distance Units: in

11. On the Targets screen, adjust heated hose and gun temperature settings:

NOTE: InvisiPac is a high powered tank-free system that delivers heat faster than traditional tank systems. Tanks are often run at a lower temperature than the application temperature to avoid excessive adhesive degradation since a large volume of adhesive sits at temperature.

- a. Press  to select the channel.

- b. Use  and , shown next to , to
350 °F
adjust gun temperature setting to the desired setting for that channel.

NOTE: If a higher applicator temperature is desired, adjust all zones to the higher temperature or adjust only the applicator in small increments.

NOTE: Alternatively, use the physical up and down arrow push-buttons on the ADM keypad until  → is next to the temperature setting to change then use the numeric keypad to enter the desired temperature.

- c. Use  and , shown next to ,
350 °F
to adjust heated hose temperature setting to the desired setting for that channel.

NOTE: Alternatively, use the physical up and down arrow push-buttons on the ADM keypad until  → is next to the temperature setting to change then use the numeric keypad to enter the desired temperature.

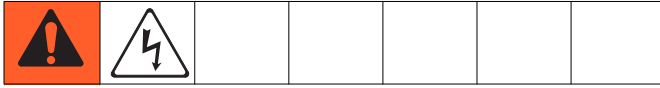
NOTICE

Set melter, hose, and gun to the same setpoint temperature for best performance. Do not set the hose temperature higher than the melter. Running the hose at a setpoint higher than the melter is unnecessary in this tank-free system and could lead to adhesive degradation in the hose. Short adhesive residence time in the melter eliminates the need to set the melter at a lower setpoint than other zones. See **Operation Tips to Minimize Charring**, page 36.

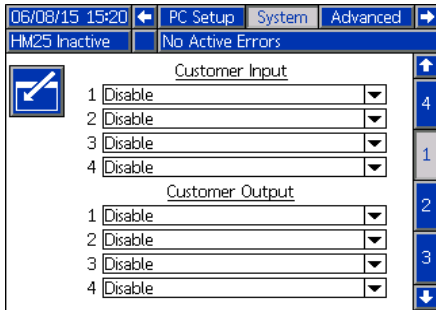
Guns

Gun heating is controlled by the InvisiPac system. A pattern controller is required to control the opening and closing of guns. If using an InvisiPac Pattern Controller, refer to manual 334784 - InvisiPac Pattern Controller for details on wiring and setup.

PLC Connection



A PLC can control and monitor all items shown in the dropdown menus on the System 1 screen in the Setup screens.



Customer Input Dropdown Options

Option	Description
Disable	Not used.
Heater On/Off	Turn on or off the heating system and pump.
Channel 1, 2, 3, or 4 Enable/Disable	Enable or disable hose and gun heating for that individual channel.

Customer Output Dropdown Options

Option	Description
Disable	Not used.
System Ready	Indicates when the system is up to temperature and the pump is stalled at pressure.
Error (Alarm)	Indicates when there is an active alarm. An active alarm will disable the heating system and pump.
Error (Deviation/Advisory)	Indicates when there is an active deviation or advisory. An active deviation or advisory will NOT disable the heating system and pump.
Maintenance Due	Indicates when the maintenance total has reached the preset notification value.

NOTE: All outputs are normally open when power is OFF. For Error (Alarm) output, the contacts open when an alarm occurs. For all others, contacts close.

NOTE: The InvisiPac system ships with two screw-terminal connectors that plug into MZLP connectors H1 and H2. Connectors are located in a bag on the inside of the electrical enclosure front access door. To replace the connectors, order kit 24P176.

1. On the System 1 screen (in the Setup screens) select the function of each input on MZLP connector H1 and each output on MZLP connector H2.
2. Turn main power switch OFF.
3. Remove electrical enclosure front access door.
4. Route I/O cable through strain relief in electrical enclosure. See Customer I/O Cable (S) in FIG. 1 on page 8.
5. Remove power from PLC.
6. Connect the PLC to connectors H1 and H2.

NOTE: Each connector has four signals. The MZLP board specifies the input range for each signal. See the following table for pin assignments.

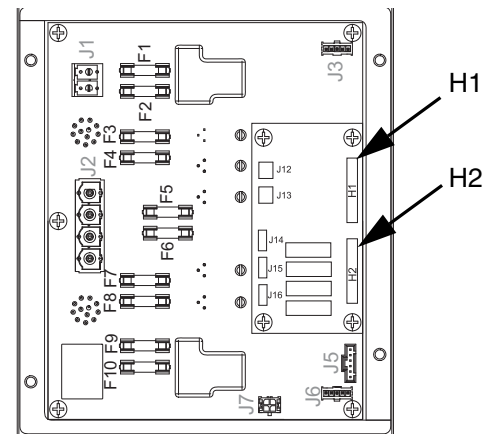


FIG. 16: MZLP Board

H1 - Customer Input		H2 - Customer Output	
Signal	Pin	Signal	Pin
1	1, 2	1	1, 2
2	3, 4	2	3, 4
3	5, 6	3	5, 6
4	7, 8	4	7, 8

Inputs: High: 10-30 Vdc, Low: 0-5 Vdc. Inputs function without concern for polarity. Applying “high” voltage will turn the heaters on and enable channels. Removing voltage will turn the heaters off and disable channels.

Outputs: 0-250 Vac, 0-30 Vdc, 2A.

PLC Connection Block Diagrams

The following block diagrams show how to connect customer inputs and outputs to the InvisiPac MZLP. For convenience, each InvisiPac ships with connector kit 24P176. If a connector is lost or damaged, order kit 24P176 for replacements.

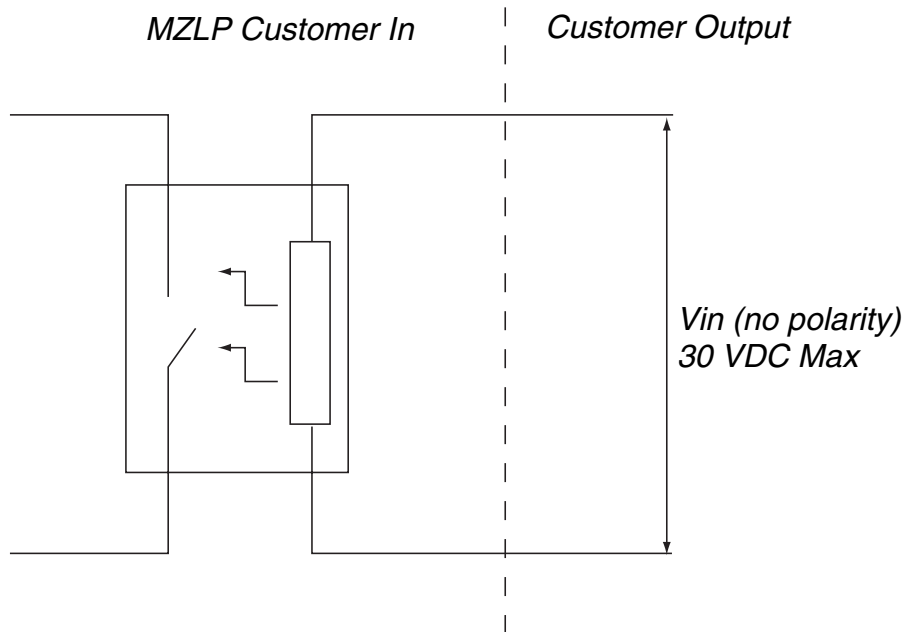


FIG. 17: Customer Input

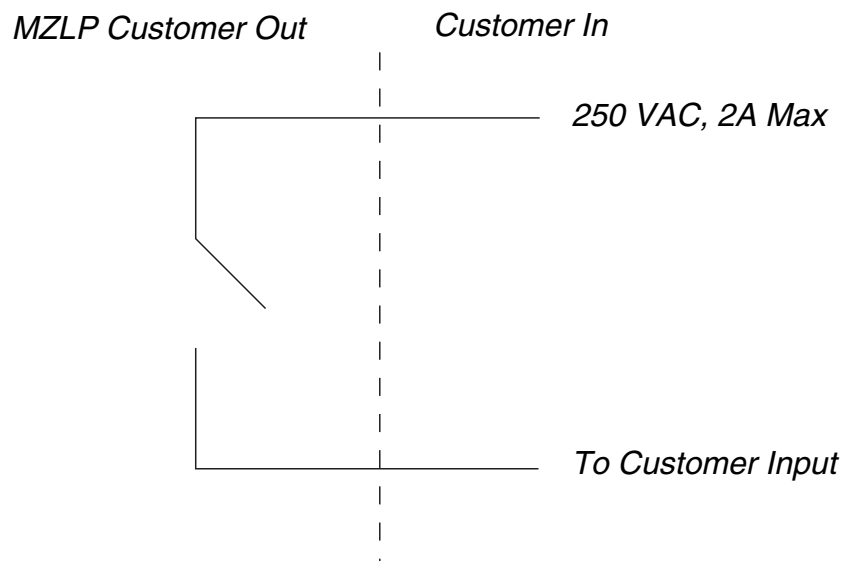


FIG. 18: Customer Output

Material Tracking

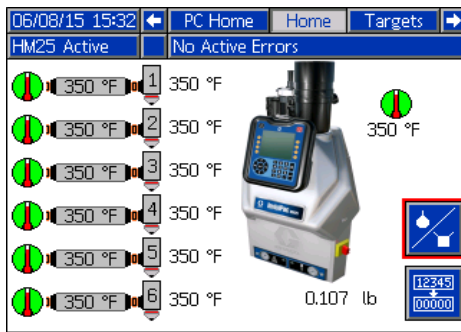
The material tracking function allows the user to track product counts and material usage for long term data collection.

Viewing the Log

In order to view the log, navigate to the Home screen



and press the material log softkey (see below).



Once inside the log (see below), use the up/down arrow keys to view previous data. The log stores up to 200 rows of data including the following:

Item	Icon
Date	N/A
Cycles	N/A
Material Used	
Program	lb
Products	
Material per Product	#



06/08/15 17:29		PC Home	Home	Targets
HM25 Active		No Active Errors		
	Date	#	1	g
5.35	06/08/15	1	3	4.46
	06/07/15	1	86399	4.56
	06/06/15	1	86398	4.70
	06/05/15	1	86399	4.83
	06/04/15	1	86398	4.94
	06/03/15	1	86399	5.02
	06/02/15	1	47939	5.09
	06/01/15	1	69	4.51
	05/31/15	1	38036	5.15
	05/30/15	1	56826	5.18

Different system types will have different data shown in the material log. The chart below outlines what data is shown for each system type.

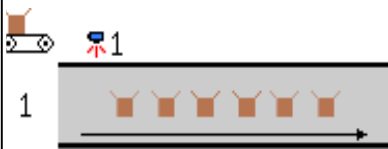
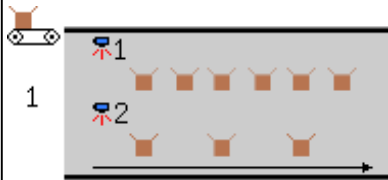
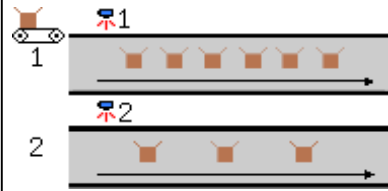
System Type	Date	Cycles				
InvisiPac	X	X	X			
InvisiPac w/ ADM Unit Counter	X		lb		#	1
InvisiPac w/ Pattern Controller	X			X	X	X*

* See Material Tracking Coverage for pattern Controller Systems.



To exit the log, press the screen exit softkey .

Material Tracking Coverage for Pattern Controller Systems

Line Configuration	Diagram	Material Used (lb )	Products per Line (#  1)	Material per Product (g  / )
Single Line		X	X	X
Multi-Unit Line		X	X	X*
Multi-Line		X	X	**

* Products on both parts of the line must be the same in order to generate accurate material per product data.

** Accurate material per product data cannot be generated for multi-line configurations (assumes different products).

Calibration



Perform the following steps to calibrate the material tracking function:

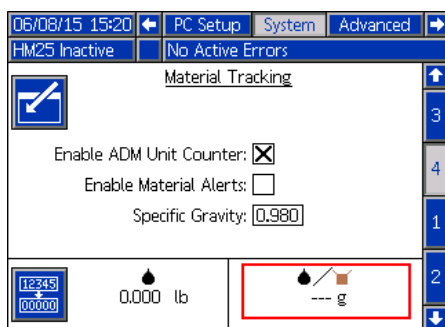
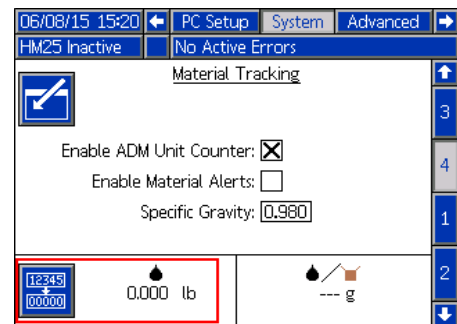
1. Navigate to the material Tracking Screen (Screen 4 of the System chapter).
2. To calibrate using the **tape and scrape** method:
 - a. Obtain a scale.
 - b. Place tape on a product(s) in locations where material is dispensed.
 - c. Run normal production (un-taped products) until a value appears in the grams per product label (this could take several minutes of production).
 - d. Run taped products(s) through line and allow material to cool and harden on the tape.
 - e. Scrape all material from product and place on scale.
 - f. Adjust the specific gravity setting until the grams per product displayed matches the value measured by the scale using the following formula:

$$\text{New SG Value} = \text{Current SG Value} \times \text{Measured Grams per Product} / \text{Displayed Grams per Product}$$

3. To calibrate using the **purge** method:

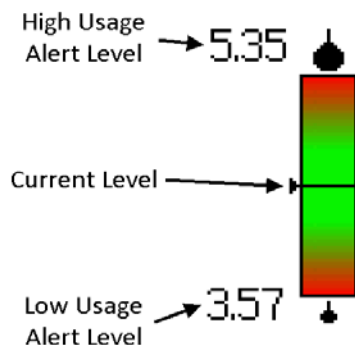
- a. Obtain a scale and a container.
- b. Reset the calibration weight totalizer by pressing and holding the reset softkey .
- c. Tare scale with empty container and purge at least 1 lb. of material into the container.
- d. Weigh container with material.
- e. Adjust the specific gravity setting until the weight displayed in the totalizer matches the value measured by the scale using the following formula:

$$\text{New SG Value} = \text{Current SG Value} \times \text{Measured Weight} / \text{Displayed Weight}$$



Material Alerts

This feature can be used to monitor material usage based on a target material per unit value. If material alerts are enabled the system will record an event every time the system deviates over 20% from the target. The material alert information can be seen in the bottom left corner of the material log (see image below).



Reset Material Target

To reset the material target value, press the reset material target softkey . An hourglass will appear indicating that the system is learning the new target (current machine output).

06/08/15 17:30	PC Home	Home	Targets
HM25 Active	No Active Errors		
Date	#	g	
06/08/15	1	3	4.46
06/07/15	1	86399	4.56
06/06/15	1	86398	4.70
06/05/15	1	86399	4.83
06/04/15	1	86398	4.94
06/03/15	1	86399	5.02
06/02/15	1	47939	5.09
06/01/15	1	69	4.51
05/31/15	1	38036	5.15
05/30/15	1	56826	5.18

Enable/Disable Material Alerts

To enable/disable material alerts, select/deselect the *Enable Material Alerts* setting on the Material Tracking Screen (Screen 4 of the System chapter).

06/08/15 15:20		PC Setup	System	Advanced
HM25 Inactive		No Active Errors		
Material Tracking				
☒ Enable ADM Unit Counter:				
☐ Enable Material Alerts:				
Specific Gravity: 0.980				
12.345	0.000 lb	g		

NOTE: the material target will be automatically reset whenever a Pattern Controller setting is changed (e.g. switch from solid bead to stitched bead).

Operation

Heating and dispensing hot melt adhesive may create potentially harmful vapors. Read material manufacturer's warnings and material MSDS to know specific hazards and precautions. Ventilation of the work area may be required.						

NOTE: See **Appendix A - ADM** on page 111 for detailed ADM information.

NOTICE	
To prevent damage to soft key buttons, do not press the buttons with sharp objects such as pens, plastic cards, or fingernails.	

NOTE: See **Appendix B - USB Downloading, Uploading** on page 117 for detailed USB information.

Overview

The system includes a vacuum transfer system that pulls the adhesive pellets into the system as needed. Once melted, the adhesive enters the pump where it is pumped into the heated hoses then to the heated guns. The gun then briefly opens to dispense the desired quantity of adhesive.

Even though the system rises to operating temperature quickly, there is a Schedule function in the ADM that eliminates waiting for the system to heat up. The Schedule function automatically enables the heating system at the user-specified times so the system is ready to dispense when a shift begins. The Schedule function also disables the heating system at user-specified times to ensure the heating system is disabled when not being used.

Initial Startup and Prime

--	--	--	--	--	--	--

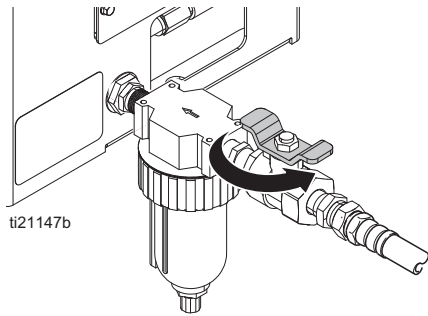
NOTE: All setup procedures must be completed prior to initial startup. See **Setup** on page 13.

NOTE: Only 1/4 in. (6 mm) round hot melt adhesive pellets can be used in the InvisiPac system. PSA-type adhesive pellets will not work in the InvisiPac system.

1. Direct the guns into an appropriate waste container.
2. Verify the shaker inlet is at the bottom of the empty adhesive pellets container. Optional vibrating adhesive pellets container, part 24R136, is available. See **Accessories** on page 94.

NOTE: The shaker inlet must be completely covered in adhesive pellets to effectively pull pellets into the tube.

3. Fill adhesive pellets container with hot melt adhesive pellets.
4. Turn main power switch ON
5. Open system air inlet ball valve.



6. Use pump air pressure regulator (C) to adjust pump air pressure to 0. See FIG. 1 on page 8.

7. Use vacuum transfer air pressure regulator (E) to adjust vacuum transfer air pressure setting to 40-100 psi (280-690 kPa, 2.8-6.9 bar). Recommended setting is 60 psi (414 kPa, 4.1 bar). See FIG. 1 on page 8.

NOTE: Vacuum transfer will not begin operating until pump reaches operating temperature.

						
To prevent fire and explosion, never exceed the cleaning fluid's rated temperature. If the system was just flushed, residual cleaning fluid is still in the system until the system is primed with adhesive. Do not raise temperature above cleaning fluid rated temperature until system is primed with adhesive.						

NOTE: A new system may have residual oil due to testing at the factory prior to shipping. To prevent smoking, make sure to perform the following step.

8. *On new systems only:* temporarily adjust the melter temperature to 250°F (121°C). See **Select ADM Settings** on page 20 for instructions.

9. Press  to enable the heaters and pump.

NOTE: When system is up to temperature, the pump will be activated automatically but will not start because there is no air pressure supplied to the pump.

NOTE: When the melter is up to temperature, the auto-fill function will initiate to fill the funnel with pellets.

10. *On new systems only:* After the melter has reached 250°F (121°C) and the funnel is filled with pellets, set the melter temperature back to the desired operating temperature. See **Select ADM Settings** on page 20 for instructions.
11. Use separate gun controller to open the guns and keep them open.

NOTICE
In the following step, to prevent damage to the pump due to pump cavitation, do not supply more than 20 psi (140 kPa, 1.4 bar) air pressure to the pump until the system is fully primed.

12. With the guns open and the system up to temperature, slowly increase pump air pressure until the pump begins to run very slowly. Approximately 20 psi (140 kPa, 1.4 bar) should be sufficient.

NOTE: Operation may be erratic below 20 psi (140 kPa, 1.4 bar).

13. Continue running the pump until clean, air-free material is dispensed from each gun.
14. When each gun is fully primed, adjust pump to desired pressure setting:
 - a. Adjust pump pressure to between 20-100 psi (140-690 kPa, 1.4-6.9 bar).
 - b. Use separate gun controller to repeatedly open and close each gun while inspecting the dispense pattern.
 - c. Repeat until desired dispense pattern is achieved.

Manual Refill

NOTE: Use Automatic Refill whenever possible. The system uses Automatic Refill by default and must be manually changed to Manual Refill. Only use Manual Refill if the Automatic Refill system is not functioning properly and cannot be fixed in a timely manner. Perform service to automatic feed system as soon as possible to limit debris buildup on feed cap.

It is recommended to maintain a minimum flow rate of 1.5 lb/hour to prevent material from melting within the feed cap and funnel. If production rate is below 1.5 lb/hour or system sits at temperature without dispensing for extended periods of time, use manual refilling with caution. System flow rate can be monitored by enabling the Diagnostic screen.

1. On the System 3 screen (in the Setup screens), select "Manual" from the Refill mode dropdown.
2. Remove the phillips head screws then remove the funnel cap from the funnel.

3. Fill the funnel with adhesive pellets.

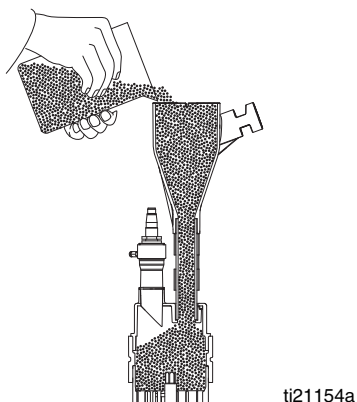


FIG. 19

4. Refill the funnel as needed to maintain the required dispense rate.
5. When finished dispensing for the day, dispense into a waste container until the material level is down to the smallest diameter section of the funnel then continue purging material through the valve for an additional 75 pump strokes.

NOTE: This will lower the adhesive level within the feed cap to the correct level to prevent any issues upon startup the following production day.

NOTE: Pump strokes can be monitored on the Maintenance screen, or by counting pump changeovers. To count pump changeovers, listen to the air motor exhaust pulses; two exhaust pulses equals one pump cycle (two strokes).

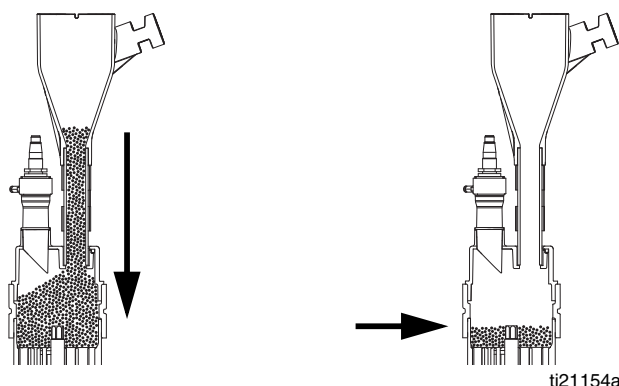


FIG. 20

Automatic Refill

The system uses automatic refill by default. If the automatic refill system is malfunctioning and cannot immediately be fixed, Manual Refill can be used.

To use automatic refill:

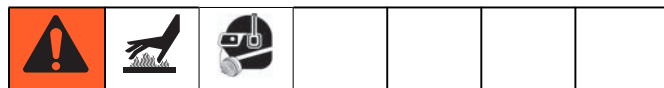
1. On the System 3 screen (in the Setup screens), select "Automatic" from the Refill mode dropdown.
2. Verify shaker and tube are connected to the system. See **Attach Components** on page 13.
3. Verify shaker inlet (K) is at the bottom of the adhesive pellets container that is filled with hot melt adhesive pellets. See FIG. 1 on page 8.

NOTE: The shaker inlet must be completely covered in adhesive pellets in order for it to effectively pull pellets into the tube.

4. *If not already set*, use vacuum transfer air pressure regulator (E) to adjust vacuum transfer air pressure setting to 40-100 psi (280-690 kPa, 2.8-6.9 bar). Recommended setting is 60 psi (414 kPa, 4.1 bar). See FIG. 1 on page 8.

NOTE: The system will automatically transfer the pellets to the system as necessary.

Dispense



NOTE: Only hot melt adhesive pellets can be used in the InvisiPac system.

1. *If the system is empty or has air in the lines*, perform **Initial Startup and Prime** procedure on page 29.
2. If main power switch is OFF, turn main power switch



NOTE: The main power switch should be left ON at all times when using the Schedule function.

3. Prepare for dispensing:

- Verify air inlet ball valve (J) is open. See FIG. 1 on page 8.
- Check pressure gauges (D, F) to verify vacuum transfer and pump air pressures are set as desired. See FIG. 1 on page 8.
- If using *Automatic Refill*, see **Automatic Refill** on page 31.
- If using *Manual Refill*, see **Manual Refill** on page 30.
- Verify guns are closed.

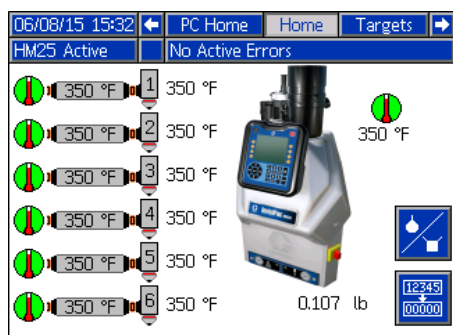
4. Press to enable the heaters and pump.

NOTE: If using the Schedule function, the heaters and pump will be enabled automatically at the set time. You will not need to press  if using the Schedule function unless you wish to enable the heating system before the set time.

NOTE: When system is up to temperature, the pump will begin running automatically. It will stall at pressure unless a gun is open. Material will be dispensed whenever a gun is open after the system is up to temperature.

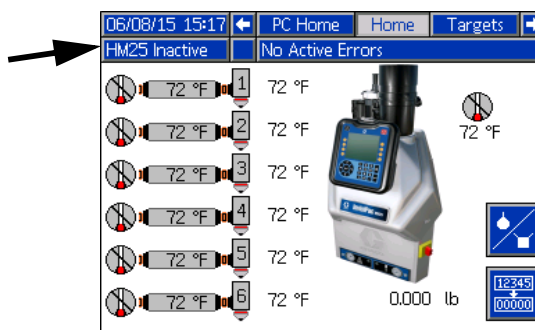
5. When the system is up to temperature, use separate gun controller to open and close the guns as desired to dispense material.

NOTE: While operating the system, the actual temperatures of the hose, gun, and system melter are displayed on the Home screen.



Shutdown

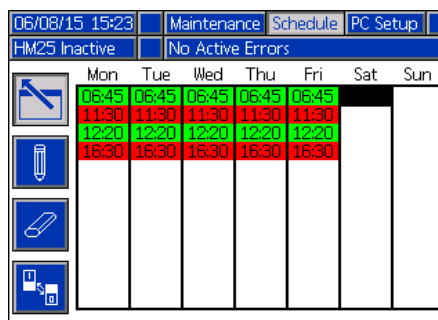
Press  to disable the heaters and pump. The screen will say "Inactive". If using the Schedule function, the heaters and pump will be disabled automatically at the set time. You will not need to press  if using the Schedule function unless you wish to disable the heating system before the set time. If the heaters were manually disabled, the Schedule function will automatically enable them at the next set time.



Do not turn the main power switch OFF if using the Schedule function.

Schedule

The Schedule function allows the user to specify times when the system will automatically turn ON and OFF the heaters and pump.



Set Schedule Times

NOTE: Times are set using a 24-hour clock. Several on and off times can be set each day.

- On the Schedule screen (in the Setup screens), set the ON times for each day of the week.
- Set the OFF times for each day of the week.

Enable Schedule Function

The Schedule function is automatically enabled when values are entered in the Schedule screen. To disable the Schedule function, delete all values on the Schedule screen or turn the main power switch OFF to prevent system from automatically enabling and disabling the heaters.

How to Use the Schedule Function

At the end of the work day leave main power switch ON



The Schedule function will automatically enable and disable the heaters and pump at the specified times.

Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Turn main power switch OFF .

2. Close the inlet air supply ball valve.

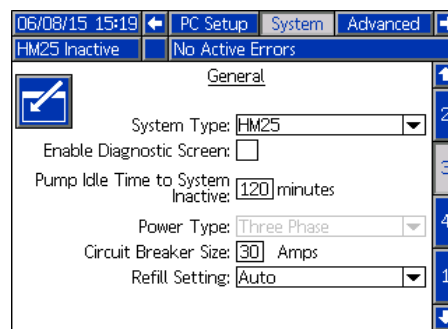
NOTE: Manually verify the pressure is relieved by opening the gun and ensuring no adhesive is dispensed.

Drain the System



NOTE: The system must be drained prior to flushing and prior to some maintenance and repair procedures.

1. On the System 3 screen (in the Setup screens), change the Refill Setting to "Manual".



2. If the heating system is disabled, press  to enable the heaters and pump.
3. Decrease pump air pressure to 0.
4. Close system air inlet ball valve.
5. Disconnect hose from gun inlet then place hose outlet in a waste container. Repeat for all hoses. Keep hose to gun electrical connector connected.
6. Open gun to allow residual fluid in gun to drain.
7. When system is at operating temperature, slowly increase pump air pressure until fluid begins flowing into the waste container.

NOTE: It may take several minutes to empty the system. When there is no melter fluid at the pump, the pump will begin to cycle faster.

8. When the pump begins to cycle faster, close the system air inlet ball valve.
9. Press  to disable the heaters and pump.
10. Remove melter drain plug (W1). See FIG. 2 on page 9.
11. Disconnect hose from melter outlet.
12. Wait until system stops draining or at most 10 minutes.
- NOTE:** There will be some residual adhesive in the system.
13. When done performing the procedure that required draining the system, set Refill Setting back to "Auto" on the System 3 screen.

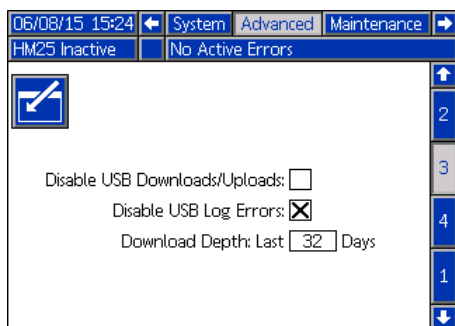
Flush

To prevent fire and explosion, use the adhesive manufacturer's recommended cleaning fluid. • Never exceed the cleaning fluid's rated temperature. • Never flush your system or clean any aluminum components with halogenated hydrocarbon cleaning solutions. To prevent severe burns, wear protective clothing.						

NOTE: This procedure describes how to flush one hose at a time for maximum effectiveness.

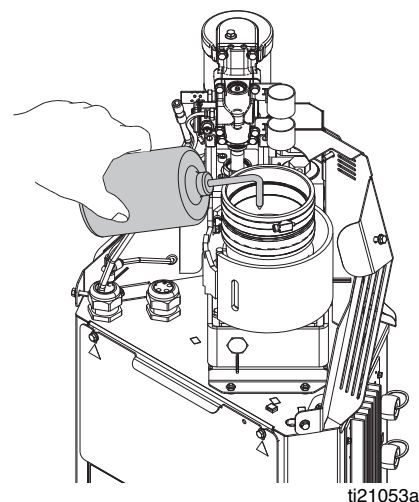
See the hot melt adhesive technical data sheet or MSDS for the recommended cleaning fluid. Contact the hot melt supplier if the technical data sheet or MSDS is not available.

1. Perform **Drain the System** on page 33.
2. *If the heating system is enabled*, press  to disable the heaters and pump.
3. Loosen hose clamp securing funnel assembly to air motor bracket then remove funnel assembly from system. Keep 1.3 in. (33 mm) clear tube and funnel cap attached to funnel.
4. Loosen upper clamp then remove plastic melter cap. Keep fill sensor attached to cap.
5. On the System 3 screen (in the Setup screens), verify the Refill Setting is set to "Manual".



To prevent fire and explosion, never exceed the cleaning fluid's rated temperature.						

6. Change the melter, heated hoses, and guns temperature settings to the high temperature hot melt cleaning fluid manufacturer's recommended temperature.
7. Verify the system air inlet ball valve is closed and pump air pressure is set to 0.
8. Allow the system to heat or cool to the cleaning fluid manufacturer's recommended temperature.
9. Fill melter with high temperature rated hot melt cleaning fluid. See hot melt adhesive material supplier for recommended hot melt cleaning fluids. Fluid level should be 1/2 in. (12.7 mm) from the top of the melter.



10. Disconnect one hose from its gun manifold.
- NOTE:** Keep all guns closed throughout this procedure.
11. Route the disconnected hose to a waste container.
 12. *If heating system is disabled*, press  to enable the heaters and pump.
 13. Wait for the melter temperature to reach the hot melt cleaning fluid manufacturer's recommended temperature.
- NOTE:** The pump will not run because the system air inlet ball valve is closed.
14. Once the required melter temperature is reached, let the hot melt cleaning fluid "soak" in the melter at temperature for the duration specified by the hot melt cleaning fluid manufacturer.

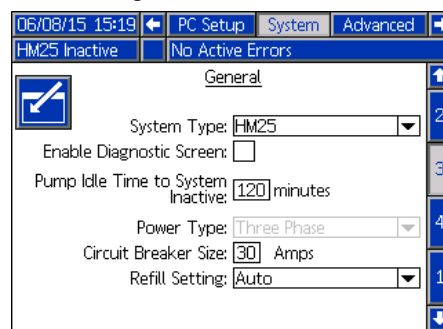
NOTE: “Soaking” is important to ensure the best possible cleaning.

15. After the hot melt cleaning fluid has “soaked” for the specified amount of time, open the system air inlet ball valve. Slowly increase the pump air pressure until pump begins to cycle to begin pumping the hot melt cleaning fluid and adhesive mixture out through the hose into the waste container.
16. Once the pump begins to cycle faster, close the system air inlet ball valve to stop the pump.
17. Repeat steps 7 through 16 until clean, adhesive-free hot melt cleaning fluid is dispensed from the detached hose.

NOTE: Now the melter and the disconnected hose are thoroughly flushed.

18. Reattach the hose to the gun manifold.
19. Repeat steps 7 through 18 for each additional installed hose, leaving a different hose disconnected from the gun manifold each time.
20. Remove and replace filter(s) in all gun manifolds. See gun manual.
21. **Replace Outlet Filter.** See page 37.
22. Turn main power switch OFF.
23. Place waste container below drain tray (W2) then remove drain plug (W1) and wait for system to finish draining. See FIG. 2 on page 9.

24. Allow the system and fluid to cool then perform any required maintenance procedures beginning on page 37.
25. Install fill cap onto melter rubber housing. Re-tighten upper clamp to 25 in-lbs.
26. Slide funnel assembly through air motor bracket then tighten clamp.
27. On the System 3 screen (in the Setup screens), set the Refill Setting to “Auto”.



To prevent fire and explosion, never exceed the cleaning fluid's rated temperature. Residual cleaning fluid is still in the system until the system is primed with adhesive.						

28. Perform **Initial Startup and Prime** on page 29.

Operation Tips to Minimize Charring

Set the **Pump Idle Time to System Inactive** function on the System 3 screen to lowest value that will not interfere with normal operation. This feature automatically disables the heating system if the pump is idle for longer than the preset amount of time. Disabling the heating system minimizes adhesive degradation and limits char formation.

When possible, utilize the **Schedule** function, see page 32, to automatically enable and disable the heating system in accordance with your production schedule. This will ensure adhesive spends as little time at temperature as possible. Less time at high temperature ultimately means less adhesive degradation and less char.

NOTICE

Set melter, hose, and gun to the same setpoint temperature for best performance. Do not set the hose temperature higher than the melter. Running the hose at a setpoint higher than the melter is unnecessary in this tank-free system and could lead to adhesive degradation in the hose. Short adhesive residence time in the melter eliminates the need to set the melter at a lower setpoint than other zones.

Maintenance

Replace Outlet Filter

The outlet filter is designed to prevent small contaminants from entering the hoses and guns. Inspect filter regularly. Replace the filter after flushing and when you change the adhesive used in the system.

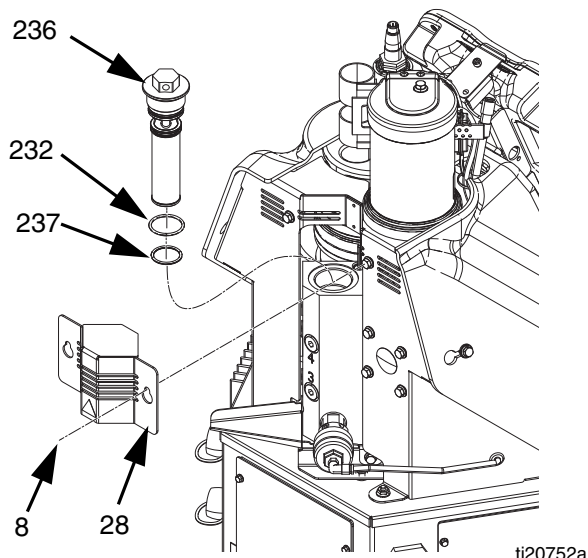


FIG. 21

1. If the system is not up to temperature, press  to enable the heaters and pump then wait for system to reach operating temperature.

						
To avoid severe burns, wear protective gloves and clothing that will insulate your hands and body from the hot surfaces and material.						

2. Perform **Pressure Relief Procedure**, page 33 but do not allow system to cool. Adhesive must be a fluid to perform this procedure.
3. Turn main power switch OFF.
4. Loosen two screws (8) then slide the small metal shroud (28) on the back of the system up to remove. See FIG. 21.
5. Use a 1 in. socket to unscrew outlet filter (236).

6. Insert allen wrench through the outlet filter cap to lift outlet filter (236) out of the system.
7. Discard outlet filter assembly.
8. Place o-rings (232, 237) provided with new outlet filter onto new outlet filter (236).
9. Place new outlet filter with o-rings into housing. Tighten with 1 in. socket.
10. Install small metal shroud (28) over outlet filter then tighten two screws (8).

Replace Inlet Filter

						
To avoid severe burns, wear protective gloves and clothing that will insulate your hands and body from the hot surfaces and material.						

The inlet filter is designed to prevent large items from entering the system. The inlet filter can only be replaced with the system empty.

1. Close the system air inlet ball valve.

NOTE: Some adhesives have different melting points. The first temperature tried should be approximately half of the dispensing temperature. If dispensing at 400°F (204°C), first try 200°F (93°C) then increase in 20°F (11°C) increments. If dispensing at 250°F (121°C), first try 125°F (52°C) then increase in 20°F (11°C) increments.

NOTE: To ensure the adhesive is a gel, not a liquid, do not remove inlet filter cap (215) when the temperature is above the desired temperature. If the temperature is too low, the adhesive viscosity may be too high to remove the inlet filter (213).

2. If the melter is below the desired temperature and heating system is disabled, press  to enable the heaters.
If the melter is above the desired temperature and heating system is enabled, press  to disable the heaters.
3. Wait until melter temperature is the desired temperature.

4. When the melter temperature is the desired temperature, turn main power switch OFF.
5. Disconnect cable from ADM, push cable through plastic shroud, then remove plastic shroud from system.
6. Place a piece of cardboard beneath the inlet filter cap (215) to route fluid away from system into a waste container in the event the adhesive is a fluid.
7. Use 1 in. socket to remove inlet filter cap (215).

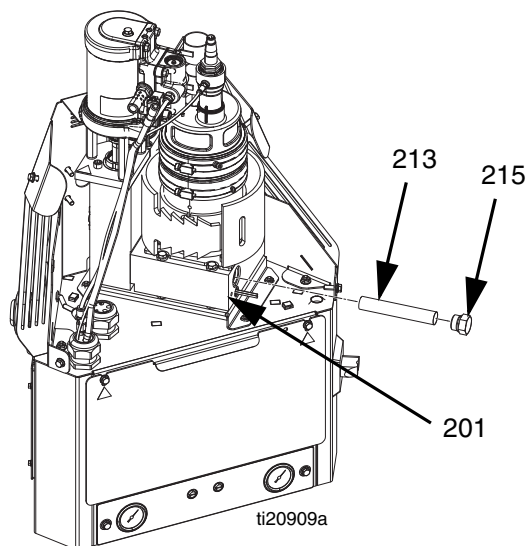


FIG. 22

8. *If the adhesive is a thin enough gel to remove the inlet filter:* Use an o-ring pick or small allen wrench to remove filter screen (213) from system.
Otherwise:
 - a. Install inlet filter cap (215).
 - b. Install shroud and ADM.
 - c. Turn main power switch ON.
 - d. Once ADM software finishes starting up, press  to enable the heaters.
 - e. Wait for temperature to rise 20°F (11°C) beyond previous temperature.

- f. Go to step 4.
9. Slide new screen (213) into melter base manifold (201).
10. Install filter cap (215) then use a 1 in. socket to tighten.
11. Feed ADM cable through plastic shroud (29) then install shroud onto system. Connect cable to ADM (30).

Replace Funnel Filter

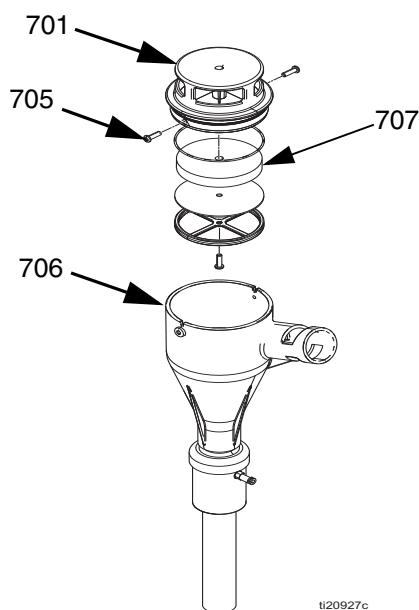


FIG. 23

Disassembly (see FIG. 23):

1. Turn main power switch OFF.
2. Loosen and remove the two phillips head screws (705) on the side of the funnel (706) then remove the funnel cap (701).
3. Remove and replace foam filter (707).

Reassembly (see FIG. 23):

1. Place funnel cap (701) onto funnel (706).
2. Install two phillips head screws (705) to secure funnel cap to funnel base.

Filter Maintenance Guidelines*

	Environment Classification		
	Clean	Moderate	Dusty
Pump outlet filter	Replace filter every six months	Replace filter every four months	Replace filter every two months
Gun manifold filter			
System air filter			
Solenoid exhaust filters			
Feed funnel filter			
Feed funnel inspection/clean out			

** These recommendations are service level guidelines - actual service levels required in your factory will vary based on environmental and operating conditions. High or low volume adhesive usage, as well as adhesives that contain a powered release agent or are otherwise dusty, will have an impact on the frequency of filter maintenance. To establish a preventative maintenance cycle tailored to your environment, Graco recommends inspecting filters every 4 weeks after installation and replacing when necessary. Document replacement intervals and use this as your preventative maintenance schedule moving forward.*

Troubleshooting

To avoid injury due to unexpected machine operation initiated by a remote controller, disconnect the customer I/O cable from the system prior to troubleshooting.

ADM Error Code Table

When an error occurs, press to acknowledge the error. If a Maintenance error occurs, navigate to the Maintenance screen and press to clear the error.

The last digit of the error code indicates the melter, gun, or hose to which the error applies. The “_” (underscore) character indicates the code applies to multiple items.

Last Digit in Code	Code Relates to:
0	Melter
1	Gun 1
2	Hose 1
3	Gun 2
4	Hose 2
5	Gun 3
6	Hose 3
7	Gun 4
8	Hose 4
9	Gun 5
A	Hose 5
B	Gun 6
C	Hose 6

An alarm will disable the heating system and pump. A deviation or advisory will not disable the heating system and pump.

Code	Description	Type	Cause	Solution
A4D0	High Current Melter	Alarm	Band heater or rod heater.	Measure resistance to ground between heater leads. Replace band heater or rod heater. See Replace Band Heater (page 60), or Replace Rod Heater (page 62).
A4D_	High Current Hose X	Alarm	Hose power wires.	Check heater resistance and resistance to ground. Replace heated hose.
A4D_	High Current Gun X	Alarm	Heater rods in gun manifold.	Check heater resistance and resistance to ground. Replace gun manifold.

Code	Description	Type	Cause	Solution
A7D0	Unexpected Current	Alarm	Unexpected current flow to melter.	Replace MZLP.
				Check heater resistance and resistance to ground. Replace heater(s).
A7D_	Unexpected Current, Gun X	Alarm	Unexpected current flow to gun X.	Replace MZLP.
				Check heater resistance and resistance to ground. Replace heater.
A7D_	Unexpected Current, Hose X	Alarm	Unexpected current flow to hose X.	Replace MZLP.
				Check heater resistance and resistance to ground. See hose manual for proper resistance range. Replace hose.
A8D0	No Current Melter	Alarm	Power not getting to melter.	Check fuses F1 and F2 on MZLP with daughter board.
				Check J1 is plugged into MZLP with daughter board.
				System needs a hose connected to Channel 1 or use the optional Overtemperature Jumper, 16Y727.
A8D_	No Current Hose X	Alarm	Power not getting to hose.	Check fuses F5 and F6 or F9 and F10 on MZLP that the error hose is connected to.
				Check that electrical connector on the heated hose is plugged into the MZLP.
				Check continuity of pins C and D on electrical connector at MZLP end of heated hose. See heated hose manual for impedance measurements. Replace hose if readings are too high.
				If system only uses one hose and gun, the heated hose electrical connector must be plugged into channel 1 of the MZLP.
A8D_	No Current Gun X	Alarm	Power not getting to gun.	Check fuses F3 and F4 or F7 and F8 on MZLP that controls the error channel.
				Check that electrical plug on hose is plugged into back of MZLP.
				Check continuity of hose pin A gun end to J on MZLP connector end of hose and pin C on gun end to pin A on the MZLP end of the hose. Reading should be 0-1 ohm. Replace hose if measurement is outside this range.
				If system only uses one hose and gun, electrical connector of the heated hose must be plugged into channel 1 of the MZLP.
CAC_	Comm Error Module	Alarm	System not responding to ADM.	System is not properly loaded with correct software. Perform Software Update Procedure on page 74.
				Dial not set correct on MZLP. Set to 1 on board with daughter board. Set to 2 on MZLP without the daughter board.

Code	Description	Type	Cause	Solution
CACX	Missing DB	Alarm	System not acknowledging the daughter board.	Bad connection between daughter board and MZLP board. Loosen daughter board, re-seat, then secure. If MZLP daughter board does not respond to adjustment, replace daughter board.
DADX	Pump Run-away	Alarm	Pump is trying to feed adhesive, no adhesive to feed.	Storage bin out of adhesive. Refill adhesive.
				Melter at incorrect temperature, too low. Check setpoint and set to manufacturer's recommendation.
			Plugged vacuum transfer hose or funnel. Clear plugged hose or funnel.	
			Worn or damaged pump seals	Inspect pump seals. Repair if necessary.
DDDX	Pump Diving	Deviation	Pump is trying to feed adhesive, no adhesive to feed.	Storage bin out of adhesive pellets. Refill with pellets.
				Melter at incorrect temperature, too low. Check melter temperature setting and set to manufacturer's recommendation.
				Plugged vacuum transfer hose or funnel. Clear plugged hose or funnel.
			Feed rate for dispensing too high.	
			Worn or damaged pump seals	Inspect pump seals. Repair if necessary.
DE0X	Cycle Switch Error	Alarm	No signal from air motor sensor.	Check wiring on J16 of the daughter board. See Electrical Schematics on page 76.
				Loose cycle switch bolt. Tighten cycle switch bolt.
				Replace cycle switch.
L6FX	Level Sensor Error	Alarm	No signal from the level sensor.	Check that sensor cable is plugged into sensor.
				Check connector at J14 of the daughter board.
				Verify there is nothing blocking fill (level) sensor line of sight.
				Replace fill (level) sensor.
			No air to fill cap.	Check for air coming from 5/32 in. air line.
			Plugged orifice in fill cap below fill sensor.	Remove fill cap and remove object plugging the orifice.
L8FX	Refill timeout	Alarm	Melter did not receive enough adhesive pellets for flow rate.	Storage bin out of adhesive. Refill adhesive.
				Plugged inlet feed hose or funnel. Clear plugged hose or funnel.
MMUX	USB Log Full	Advisory	USB logs full. Data loss will occur if not downloaded.	Download USB data. See Appendix B - USB Downloading, Uploading on page 117.
T1D0	Low Temp Melter	Alarm	Melter reached setpoint but dropped below setpoint and can not recover.	Check resistance of heater rods and band heater.
T1D_	Low Temp Hose	Alarm	Hose reached setpoint but dropped below setpoint and can not recover.	Check resistance of heated hose. Refer to hose manual for proper resistance range.

Code	Description	Type	Cause	Solution
T1D_	Low Temp Gun	Alarm	Gun reached setpoint but dropped below setpoint and can not recover.	Check resistance of manifold heater rods. Refer to gun manual for resistance value.
T4C_	High MZLP PCB Temp	Alarm	MZLP board is overheating.	Ambient temperature must be under 120°F. Replace MZLP board.
T4D0	High Temp Melter	Alarm	Melter continues to raise above the setpoint.	Verify connector J5 on MZLP board is securely connected. Replace melter RTD.
T4D_	High Temp Hose	Alarm	Hose continues to raise above the setpoint.	Hose electrical connector not plugged into MZLP. Replace hose.
T4D_	High Temp Gun	Alarm	Gun assembly continues to raise above the setpoint.	Hose electrical connector not plugged into MZLP or manifold electrical connector not plugged into heated hose. Replace gun RTD.
T6D0	Sensor Error Melter	Alarm	No reading from RTD.	Verify connector J5 on MZLP board is securely connected. Replace melter RTD.
T6D_	Sensor Error Hose	Alarm	No reading from RTD.	Hose electrical connector not plugged into MZLP. Replace hose RTD.
T6D_	Sensor Error Gun	Alarm	No reading from RTD.	Hose electrical connector not plugged into MZLP or manifold electrical connector not plugged into heated hose. Replace gun RTD.
T8D_	No Temp Rise in Gun (all zones)	Alarm	Temperature reading does not change.	Check fuses F3 and F4 or F7 and F8 on MZLP that error channel is connected to. Check resistance of heater rods in gun manifold. Replace gun manifold. Check resistance of hose wiring. See hose manual for proper resistance range. NOTE: Heater rods in the gun manifold can also cause the no current error.
T8D_	No Temp Rise in Hose (all zones)	Alarm	Temperature reading does not change.	Check fuses F5 and F6 or F9 and F10 on the MZLP that controls the error channel. Defective heater wires in hose. Replace heated hose. Check resistance of hose wiring. See hose manual for proper resistance range. Replace heated hose. NOTE: Heater wires in the hose can also cause the no current error.

Code	Description	Type	Cause	Solution
T8D0	No Temp Rise in Melter (all zones)	Alarm	Temperature reading does not change.	Check fuses F1 and F2 on MZLP with daughter board.
				Check J1 is properly plugged into the MZLP with daughter board. (MZLP #1)
				Check that RTD is installed in the melter.
				Check resistance of heater in melter. Replace melter heaters. NOTE: Heater wires in the melter can also cause the no current error.
V1I_	Low Can Voltage	Alarm	Bad or overloaded power supply.	Verify power supply voltage is 24 VDC. If voltage is low, disconnect the power lines and re-check voltage reading. If voltage is still low, replace power supply. If voltage is correct after disconnecting the power lines, replace the MZLP.
V4I_	High Can Voltage	Alarm	Bad or overloaded power supply.	Verify power supply voltage is 24 VDC. If voltage is high, replace power supply unit.
V8M_	No line voltage	Alarm	Incoming line voltage is less than 100 VAC.	Measure incoming power with system unplugged. If line voltage is less than 100 VAC, contact qualified electrician to correct the low voltage.
WJDX	Pump Solenoid Error	Alarm	No voltage draw from air solenoid for air motor.	Check connector is properly connected to J14 of the daughter board.
				Replace air manifold.
WKFX	Fill Solenoid Error	Alarm	No voltage draw from air solenoid for fill.	Check connector at J14 of the daughter board.
				Replace air solenoids. See page 69.
WSUX	USB Invalid Configuration	Deviation	A valid configuration file can't be found for the USB.	System is not properly loaded with correct software. Perform Software Update Procedure on page 74. Retry USB download.
			ADM not functioning properly.	Replace ADM.

Mechanical and Electrical Troubleshooting

Problem	Cause	Solution
Refill Timeout Error	The system was unable to refill in less than 30 seconds.	Check hopper for adequate material and material blocking. Verify the vacuum transfer system air pressure is 40-80 psi (60 psi recommended) and that air is flowing to the feed wand while attempting to refill. Restart system. If the error persists after attempting another refill and unit is needed immediately for production, place system into the manual refill mode. See Manual Refill on page 30. Check funnel filter. If plugged, see Replace Funnel Filter on page 38.

Problem	Cause	Solution
The InvisiPac system takes a long time to refill adhesive.	Glue level in hopper is low.	Check hopper for adequate material and material blocking.
	Vacuum flow is restricted.	Verify the vacuum transfer system air pressure is 40-80 psi (60 psi recommended) and that air is flowing to the feed wand while attempting to refill.
		Check funnel filter. If plugged, see Replace Funnel Filter on page 38.
Vacuum transfer not working	Air to vacuum assembly missing.	Verify the vacuum transfer system air pressure is 40-80 psi (60 psi recommended)
	Air at system air gauge but not to air to shaker.	Check that air line is connected or not pinched.
	Air is at shaker but there is no feed.	Plugged shaker unit, remove from system and remove plug.
Adhesive pellets in storage bin not covering shaker head.	Shaker unit not vibrating.	Verify shaker is vibrating during material loading. If not, the ball in the shaker assembly is stuck. Remove shaker housing and separate to clean raceway and ball inside.
	Materials are blocking in the hopper. Some adhesive materials are prone to blocking. High ambient temperature and high humidity can increase the likelihood of blocking.	Some materials may require agitation periodically to breakup bridging. Purchase and install 30 Gallon Vibrating Hopper, 24R136 . See page 99.
Fill Solenoid Error	Failure of the fill solenoid or fill solenoid wiring.	Verify wiring between J13 and the refill solenoid is not damaged. Restart system. If the error persists after attempting another refill and unit is needed immediately for production, place system into the manual refill mode. See Manual Refill on page 30.
Level Sensor Error	Failure of the level sensor (20) or sensor cable 16T108 (J14 to level sensor (20)).	Check sensor cable J14 to level sensor (20). Enable Diagnostic screen on ADM then check sensor readings on the Diagnostic screen. Sensor readings should be about 3V if melter is completely empty (melter passage holes are visible). The normal operating range is 2.1 to 2.8V. If the sensor is reading more than 2.75V the system should be requesting additional material. Restart system. If the error persists after attempting another refill and unit is needed immediately for production, place system into the manual refill mode. See Manual Refill on page 30.
The InvisiPac system expels adhesive pellets dust when refilling.	Some adhesives are very dusty due to the anti-blocking agents used or because the adhesive manufacturing process has created small adhesive shavings. Feed inlet cap filter may have become clogged.	Replace Funnel Filter , see page 38. NOTE: Feed cap filter maintenance should be performed at regular service intervals. It is recommended that the feed cap filter be serviced at a minimum of every 1200 lb dispensed, however with some adhesives the frequency may need to be increased significantly to maintain desired system cleanliness.

Problem	Cause	Solution
The InvisiPac system will not stall, pump continues to move even if the guns are all closed.	Fluid leak.	Verify that no external leakage is present. Inspect and test the pressure relief valve. Perform Flush Pressure Relief Valve, page 52. If system is still unable to stall, the pump or pressure relief valve may need to be repaired.
The system will not dispense material.	System is not up to temperature.	Verify that the system is active.
	Incorrect temperature set points entered into ADM.	Verify the temperature settings are correct.
	Air motor is not receiving compressed air or air pressure too low.	Verify that the pump air pressure is set above 20 psi. Check the Pump Air Solenoid Operation , page 52.
	Feed pump not feeding adhesive.	Repair or replace air control assembly as necessary. Repair or replace pump assembly as necessary.
	Control for manifold and guns not working.	InvisiPac system does not control the timing of the manifold and valves. This is a separate control that needs to be adjusted. Consult control manufacturer or qualified electrician.
Cycle Switch Error	Cycle switch or cycle switch wiring failure.	Check the wiring between the air motor cycle switch and J16. Repair/replace as required.
	Loose or missing fastener (26).	Ensure fastener (26) is tight. See InvisiPac Systems section beginning on page 81 for part identification.
USB Log Full	The InvisiPac system will display this notification when the USB data logs reach 90% full.	To prevent data loss download system data. See Appendix B - USB Downloading, Uploading on page 117.

Problem	Cause	Solution
The InvisiPac system is displaying pump runaway or pump diving.	This error generally occurs when the pump cavitates due to improper material loading.	This can occur if the melt rate for the system is exceeded, resulting in air entrapment within the incoming adhesive material and lower than desired material temperature. 1. Verify that the InvisiPac system is not exceeding 33 cpm by enabling the diagnostic screen. 2. If the cycle rate is below 33 cpm and the system is still running away increase the InvisiPac system temperature by 10°F over the current set point, leave hoses and guns at desired set point. 3. If the pump continues to runaway or dive continue increasing temperature by 10°F, do not exceed maximum temperature for the material being dispensed. NOTE: Some materials are more difficult to melt than others and it may be impossible to process them at a rate of 25 lb/hr. The InvisiPac system was tested to achieve continuous melt rates of 25lb/hr when dispensing standard EVA packaging grade adhesives in pellet form with an InvisiPac system temperature of 375°F and hose and valve temperatures of 350°F.
	Level sensor blocked, reading level incorrect.	Clean feed cap by fill sensor, make sure there are no adhesive pellets blocking the sensor hole.
	The system is not supplying enough air to the ultrasonic sensor venturi.	Make sure the air supplied to the system is at least 80 psi (550 kPa, 5.5 bar).
Unable to achieve 25lb/hr melt rate at the desired adhesive temperature.	The InvisiPac system monitors temperature within aluminum mass of melter (202). As melt rates exceed 20 lb/hr a system temperature offset may be required.	1. If the cycle rate is below 33 cpm and the system is still running away increase the InvisiPac system temperature by 10°F over the current set point, leave hoses and guns at desired set point. 2. If the pump continues to runaway or dive continue increasing temperature by 10°F, do not exceed maximum temperature for the material being dispensed. NOTE: A 50 amp breaker is required in order to maximize startup and flow rate performance. Set the breaker size used in the Setup screens. NOTE: Some materials are more difficult to melt than others, therefore it may be impossible to process them at a rate of 25 lb/hr. The InvisiPac system was tested to achieve continuous melt rates of 25lb/hr when dispensing standard EVA packaging grade adhesives in pellet form with an InvisiPac system temperature of 375°F and hose and valve temperatures of 350°F.

Problem	Cause	Solution
ADM not displaying when system turned on	Main power circuit breaker off or power cord unplugged.	Turn main circuit breaker on or plug in power cord.
	Cable on ADM unplugged.	Reconnect ADM cable.
	Connector on MZLP board not plugged in.	ADM cable should be plugged into J6 of the MZLP board.
	Bad 24VDC power supply.	Check output on power supply should measure 24VDC, if no voltage reading replace power supply.
	ADM not functioning properly.	Replace ADM.
Main breaker tripping	Wrong setting in ADM breaker setup.	Wrong breaker setting on ADM in the breaker setting in the setup screen.
	Internal short to ground in system.	Unplug or disconnect power and measure between each leg of the power to ground. There should be an open resistance reading.
	Too small of a circuit breaker in main power panel.	Consult qualified electrician for proper size circuit breaker.
Slow start-up time or system takes longer than 10 minutes to startup	Wrong setting in ADM breaker setup.	Wrong breaker setting on ADM in the breaker setting in the setup screen.
	Low incoming voltage.	Incoming voltage should be 200-240VAC for a 230 volt unit and 380-400 VAC for a 400 volt unit.
	Melter heater rod and gun manifold.	Measure and check heater rods in melter or manifold. Manifold resistance 130-140 ohms.
	Heated hose.	Measure heater wires in hose, pins C and D. See repair section for each hose resistance.
	Insufficient power supplied to system. Depending on hose and gun combinations, along with minimal supply power, startup time will vary.	Connect system to a power supply capable of maximum power per system specification. All changes must be performed by a qualified electrician. See Electrical Schematics on page 76 for details about connecting to a different power supply.
No adhesive or little adhesive being dispensed	Incorrect RTD setting in system.	1. Verify melter, hose, and manifold temperatures are all within the same range of the room ambient. 2. If the manifold temperature is either much higher or much lower than the melter temperature then the RTD setting is not correct for the RTD being used. Select correct RTD setting in the setup screen system 2 before beginning. NOTE: Failure to have the correct RTD value will cause the manifold and gun to either under-heat or over-heat. Setting for RTD in the ADM screens is higher than actual RTD value. Consult manufacturer for actual RTD value.

Problem	Cause	Solution
System indicates no errors and correct temperature however manifold and gun are over the temperature setpoint	Incorrect RTD setting in system.	1. Verify melter, hose, and manifold temperatures are all within the same range of the room ambient. 2. If the manifold temperature is either much higher or much lower than the melter temperature then the RTD setting is not correct for the RTD being used. Select correct RTD setting in the setup screen system 2 before beginning. NOTE: Failure to have the correct RTD value will cause the manifold and gun to either under-heat or over-heat. Setting for RTD in the ADM screens is lower than actual RTD value. Consult manufacturer for actual RTD value.
No adhesive or incorrect amount of adhesive output when all valves are triggered	Plugged gun manifold filter.	Replace manifold filter. Graco manifold filter in bottom of manifold or inline filter on other manifolds.
	Clogged hose.	Flush or replace hose.
	Solenoid valve.	Check that correct voltage is input into valve solenoid. If voltage is correct, replace solenoid.
	No signal from control to solenoid.	If no voltage is present at solenoid, check control cable and remote control device. Replace component.
	Solenoid mufflers plugged.	Replace solenoid mufflers.
	No air to air solenoid.	Re-establish air supply to solenoid.
	Plugged system outlet filter.	Replace Outlet Filter. See page 37.
	If multiple valves are triggered simultaneously, maximum pump rate may be exceeded.	Stagger valve opening to reduce the maximum required flow rate to below maximum pump rate.

Problem	Cause	Solution
No adhesive or incorrect amount of adhesive out of one/some of the valves when triggered	Plugged tip on gun.	Replace tip on gun.
	Gun in closed/partial open position.	Replace gun.
	Plugged manifold filter (single valves manifold).	Replace manifold filter. Graco manifold filter in bottom of manifold or inline filter on other manifolds.
	Clogged hose (single valves).	Flush or replace hose.
	Solenoid valve (single manifold).	Check that correct voltage is input into valve solenoid. If voltage is correct, replace solenoid.
	No signal from control to solenoid (single valve manifold).	If no voltage is present at solenoid, check control cable and remote control device. Replace component.
	Plugged solenoid mufflers (single valve manifold).	Replace solenoid mufflers.
	No air to solenoid (single valve manifold)	Re-establish air supply to solenoid.
	Plugged system outlet filter.	Replace Outlet Filter. See page 37.
	If multiple valves are triggered simultaneously, maximum pump rate may be exceeded.	Stagger valve opening to reduce the maximum required flow rate to below maximum pump rate.
Adhesive flowing out of one/some valves when not triggered	Failed valve in the open position.	Replace valve.
	Adhesive pressure too high.	Reduce air pressure to air motor.
Gun will not heat.	Heat rod failure in manifold.	Check resistance on heater rods. Repair manifold if heater rods measure open.
	Loose cable connection at system or manifold.	Check cable connections on both ends of the hose.
	RTD failure.	Check resistance on the RTD, if out of normal range replace RTD.
	Incorrect RTD setting in the ADM setup.	Set correct RTD value in the AMD setup screen. Consult manufacture for correct RTD value.
	Thermal cutoff is tripped.	Measure resistance of the thermal cutoff. If open, replace.

Problem	Cause	Solution
Adhesive leaking from manifold or valve.	Valve is loose on the manifold.	Tighten screws on loose valve.
	Valve o-ring failed.	Replace o-rings on the back of the leaking valve.
	Failed valve, adhesive leaking out middle of valve.	Replace valve.
	Hose loose.	Tighten hose.
No melter heat.	Fuse blown in F1 and F2.	Check heater rods for a short or a short between the rod wires and ground.
	Cable to over-temperature switch off or broken.	Check connection of cable to over-temperature switch both to main board and to switch. If connection good, look for break in wire.
	Over-temperature switch tripped.	Measure over-temperature switch resistance. It should read close to 0 ohms when at room temperature. If open, replace over-temperature switch.
Air motor will not function.	No air being supplied to air motor.	Check incoming air supply. Check that air solenoid is adjusted for air motor.
	Air solenoid not adjusting the air motor.	If air can not be adjusted at the air solenoid, check voltage, if 24VDC present at air solenoid replace air solenoid.
	Air present at air motor but it will not work.	Replace air motor.
System not turning on.	No power to unit.	Check main power breaker is turned on. Check that power plug is connected.
Static shock when touching shaker or adhesive bin.	Ground wire not in place on shaker assembly. Some adhesives, flow rates, and ambient conditions can cause excessive static buildup on the shaker tube.	Attach a ground wire from the shaft of the shaker unit to a true earth ground. Order shaker grounding kit 24R708.
Adhesive not dispensing at the correct time.	Guns opening at the wrong time.	InvisiPac system does not control the opening and closing of the guns. The separate controller needs to be adjusted. Consult control manufacturer or qualified electrician.

Flush Pressure Relief Valve



Perform this procedure when directed in the Troubleshooting table.

1. With the system active at the required adhesive temperature, set the air motor air pressure to 20 psi (140 kPa, 1.4 bar).
2. Remove the air line (36) from the pressure relief valve.

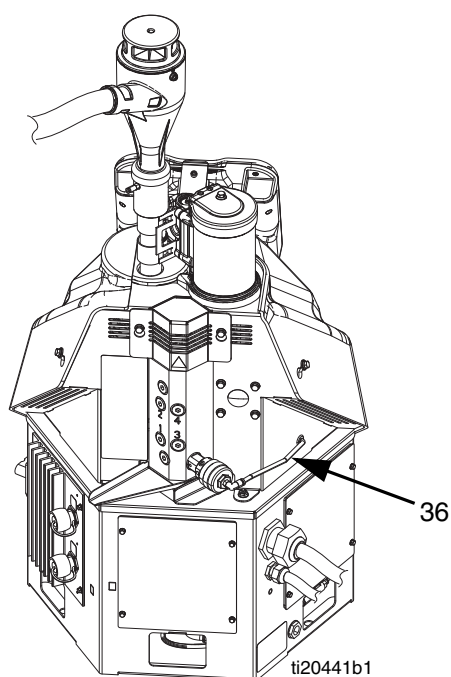
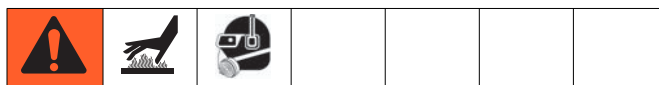


FIG. 24

3. Plug air line and allow the air motor to cycle.
4. Re-connect air line to relief valve and check whether the system will stall.
5. *If system still does not stall*, purge ten pump cycles of material through one gun.
6. Repeat this entire procedure until no additional air is expelled from the gun.

Check the Pump Air Solenoid Operation



Perform this procedure when directed in the Troubleshooting table.

NOTE: System must be up to operating temperature for pump solenoid to trigger on.

1. *If the heating system and pump is disabled*, press  to enable the heaters and pump.
2. Wait for system to reach the temperature setpoints.
3. Set pump air pressure to 20 psi (140 kPa, 1.4 bar).
4. Remove the 3/8 in. OD air line from the air motor.
5. Verify that air is flowing through the air line.
6. *If air is not flowing*, check the wiring between J13 and the pump solenoid.

MZLP Troubleshooting

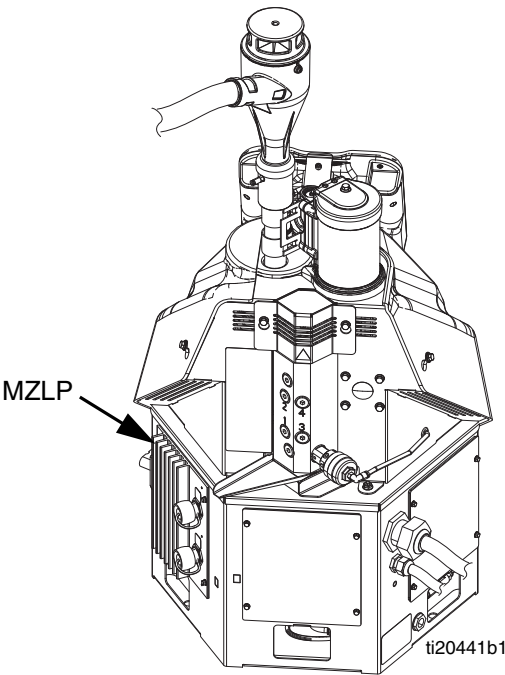


FIG. 25: MZLP LED Signals

NOTE: The MZLP LED is located on the inside of the electrical enclosure. To view, remove the electrical enclosure front access door.

Signal	Description
Green On	MZLP is powered up and input voltage is within operating conditions.
Yellow On	Internal communication in process
Red Solid	MZLP failure. See troubleshooting table.
Red Flashing	Software update in process or missing software.

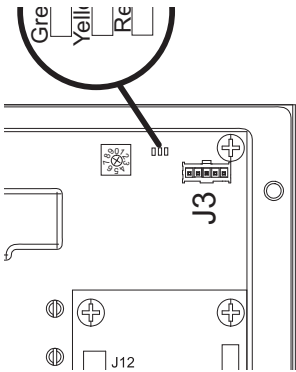


FIG. 26: MZLP Diagnostic LED Location

Repair

NOTE: Some procedures require special tools. Read through each procedure prior to beginning it to ensure you have the required tools to complete the entire procedure. Order any required tools and have them on hand prior to beginning the procedure.

NOTICE

When performing any procedure that requires removal of seals or other soft parts, do not leave a system that has not been flushed disassembled for more than 30 minutes to prevent the adhesive from hardening. Hardened adhesive will damage the seals and other soft parts during installation.

Pump

Replace Throat Seal, Throat Bearing, Piston Rod, Piston Seal, and Piston Bearing

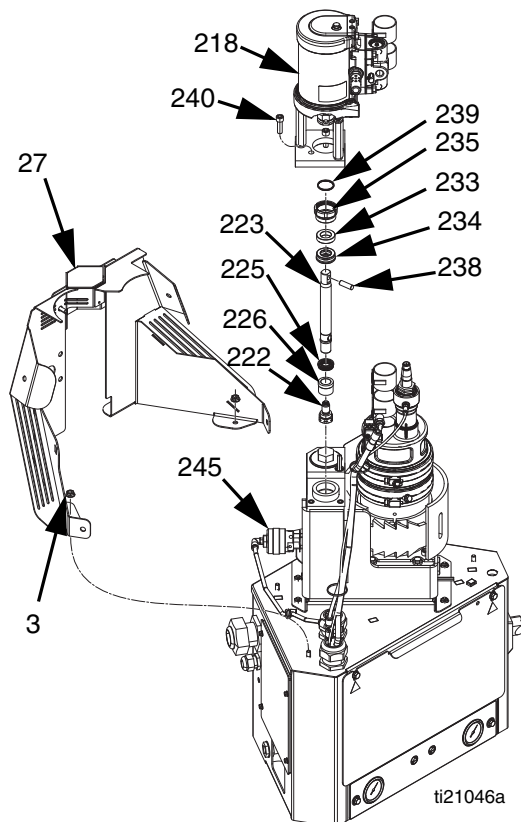


FIG. 27

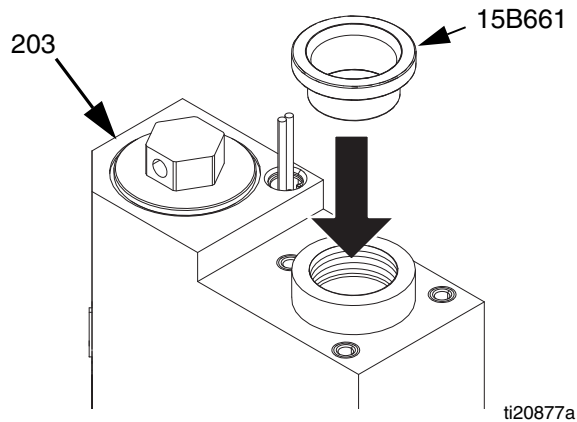
Disassembly (see FIG. 27):

1. **Flush** the system. See page 34.
2. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
3. Turn main power switch OFF.
4. Remove plastic shroud (27).
5. Remove vacuum transfer inlet funnel.
6. Remove air lines from relief valve (245) and air motor (218).
7. Remove four nuts (3) securing melter shield (27) in place then remove melter shield.
8. Remove air motor assembly:
 - a. Remove retaining ring (239).
 - b. Remove dowel pin (238).
 - c. Remove three screws (240).
9. Use a flat head screwdriver and a rubber mallet to break loose the retaining nut (235).
10. Use channel lock pliers to remove the retaining nut (235).
11. Insert an allen wrench through the hole in the top of the piston rod (223) to lift the piston rod (223) up out of the manifold. This will also pull out the throat u-cup (234) and throat bearing (233).
12. Remove piston valve (222) from piston rod (223).
13. Remove and discard piston u-cup (225) and bearing (226).

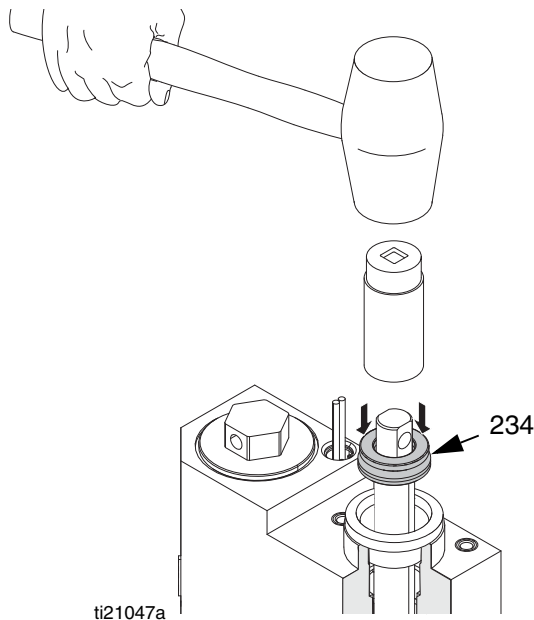
Reassembly (see FIG. 27):

1. Assemble piston rod:
 - a. Install new piston u-cup (225) onto piston rod (223) with the lips facing the rod.
 - b. Install piston bearing (226) onto piston rod (223) with grooved end towards the center of the piston rod.

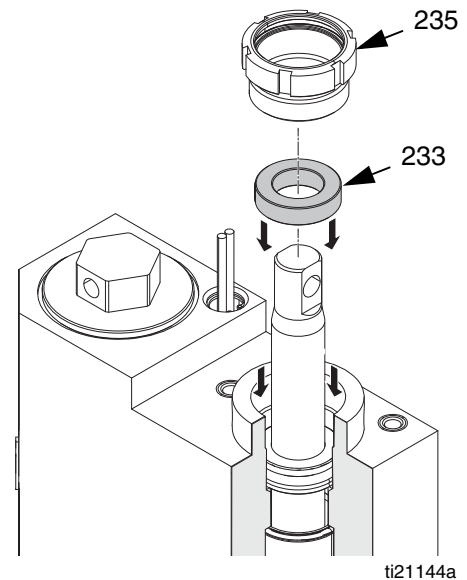
- c. Install piston valve (222) onto piston rod (223). Torque to 24-30 ft-lb (33-41 N•m).
2. To protect the seals from the sharp threads, place seal installation tool 15B661 into the throat bore. See FIG. 28.

**FIG. 28**

3. Push the piston rod assembly (223) into the melter outlet manifold (203).
4. Grease the throat u-cup (234) and slide the u-cup over the piston rod (223) with the lips facing down.
5. Place a 7/8 in. deep-well socket (3/8 in. drive) over the piston rod (223) then use a rubber mallet to gently tap throat u-cup (234) into place. See FIG. 29.

**FIG. 29**

6. Slide throat bearing (233) over the piston rod (223). Use socket and tap with a rubber mallet to press throat bearing (233) into place and seat the throat u-cup.

**FIG. 30**

7. Remove seal installation tool.
8. Install retaining nut (235). See FIG. 28.
9. Install air motor assembly (see FIG. 27):
 - a. Install three screws (240).
 - b. With retaining ring around piston rod, install dowel pin (238).
 - c. Install retaining ring (239) over dowel pin.
10. Use nuts (3) to install melter shield (27).
11. Connect air lines to relief valve and air motor.
12. Install plastic shroud (27).

Replace Pump Inlet Housing Checks

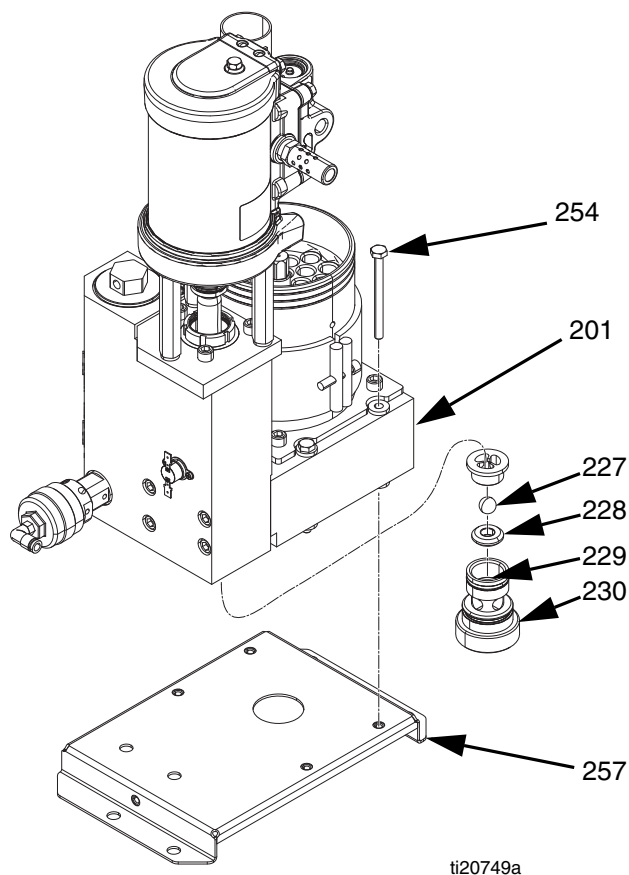


FIG. 31

Disassembly (see FIG. 31):

1. **Flush** the system. See page 34.
2. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
3. Turn main power switch OFF.
4. **Remove Melter Assembly.** See page 58.
5. Use a 1/2 in. drive ratchet without a socket to remove foot valve (230) from bottom of melter outlet manifold (203).
6. Remove and discard seat (228), ball (227), and o-ring (229).

Reassembly (see FIG. 31):

1. Install new o-ring (229), seat (228), and ball (227) then use a 1/2 in. drive ratchet without a socket to install and tighten foot valve (230) onto melter.
2. **Install Melter Assembly.** See page 59.

Replace Pump Cylinder Seals and Piston Seals

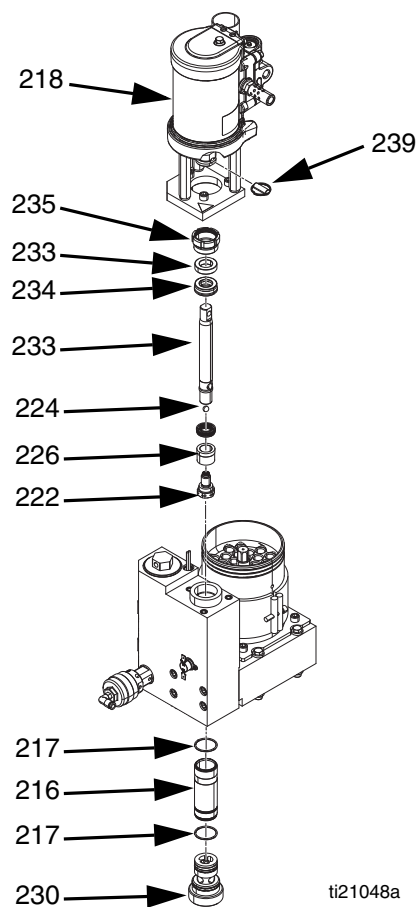


FIG. 32

Disassembly (see FIG. 27):

1. **Flush** the system. See page 33.
2. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
3. Turn main power switch OFF.
4. Remove plastic shroud (27). See FIG. 27 on page 54.

5. Remove air lines from relief valve (245) and air motor (218) See FIG. 27 on page 54.
6. Remove nuts (3) securing melter shield (27) in place then remove melter shield. See FIG. 27 on page 54.
7. Remove air motor assembly. See FIG. 27 on page 54:
 - a. Remove retaining ring (239).
 - b. Remove dowel pin (238).
 - c. Remove three screws (240).
8. Use a flat head screwdriver and a rubber mallet to break loose the retaining nut (235).
9. Use channel lock pliers to remove the retaining nut (235).
10. Insert an allen wrench through the hole in the top of the piston rod (223) to lift the piston rod (223) up out of the manifold. This will also pull out the throat u-cup (234) and throat bearing (233).
11. **Remove Melter Assembly.** See page 58.
12. Use a 1/2 in. drive ratchet without a socket to remove foot valve (230) from bottom of melter outlet manifold (203).
13. Insert cylinder tool (1301) into bottom of melter outlet manifold (203). Use a rubber mallet to gently remove cylinder (216). See FIG. 31.

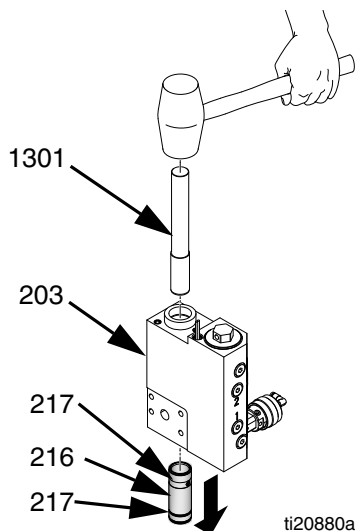


FIG. 33

14. Remove and discard cylinder seals (217). See FIG. 31.

Reassembly:

1. Apply grease to seals (217) then install new cylinder seals (217) onto cylinder (216). See FIG. 31.

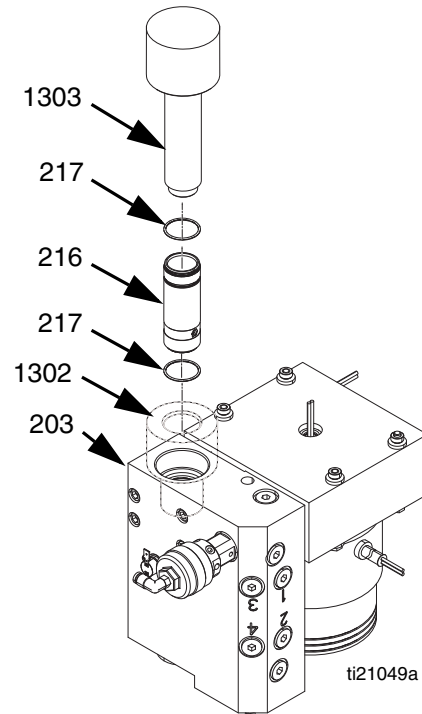


FIG. 34

2. Place female cylinder installation tool (1302) into melter outlet manifold (203) to protect seals from sharp threads. See FIG. 34.
3. Use male cylinder installation tool (1303) to press cylinder (216) into melter outlet manifold (203). If necessary, use rubber mallet tap into place. See FIG. 31.
4. Use a 1/2 in. drive ratchet without a socket to install and tighten foot valve (230) into bottom of melter outlet manifold (203).
5. Perform **Install Melter Assembly** on page 59.
6. Perform *Reassembly* portion of the **Replace Throat Seal, Throat Bearing, Piston Rod, Piston Seal, and Piston Bearing** procedure which starts on page 54.

Melter

Remove Melter Assembly

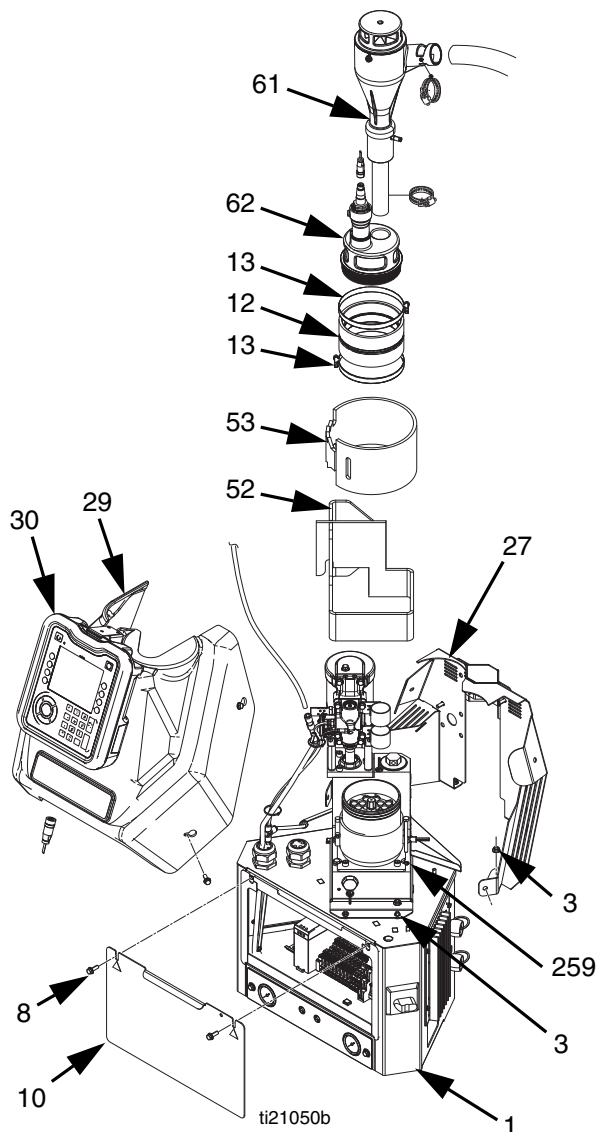


FIG. 35

NOTE: This only needs to be done when replacing items that require access to the bottom of the melter assembly.

1. Perform **Drain the System** procedure on page 33 then wait for system to cool.
2. Close the bleed type ball valve at the system air inlet.
3. Turn main power switch OFF.

4. Disconnect all heated hoses from the melter outlet manifold (203).
5. Remove cable from ADM (30) then slide forward the shroud (29) and remove it from the system.
6. Remove screws (8) then remove electrical enclosure front access door (10).
7. Remove the air tube (36) from the relief valve (245). Pull the air tube from the metal shroud (27).
8. Remove nuts (3) on the back metal shroud (27) then remove shroud.
9. Loosen hose clamp on air motor bracket (528) then remove funnel (61).
10. Remove wire connectors from the over-temperature switch (251).
11. Remove insulators (52, 53) from the melter assembly (5).
12. Disconnect the fill sensor cable from the fill sensor (20).
13. Disconnect the pump cycle sensor cable from the air motor.
14. Remove the air tube from the fill cap (62).
15. Remove the air tube from the air motor (218).
16. Loosen screw (AA) then remove sensor (125). See FIG. 36 on page 60.
17. Remove electrical enclosure front access door (10).
18. Remove all heater wires from the following terminals. Pull wires up through the rubber grommet on the top of the electrical enclosure (1). See FIG. 36 on page 60 for references.

Item	Wire Marking 1	Wire Marking 2
Band Heater (208)	TB1-11B	TB1-13B
Melter Heater Rod (209)	TB1-14C	CR1-NC
Base Heater Rod (210)	TB1-11C	TB1-13C
Pump Heater Rod (250)	TB1-12B	CR1-COM

19. Remove four nuts (3) then remove melter assembly from system. Save any loose insulators for reassembly.

20. Remove bolts (259) then remove melter assembly from melter base (257).

Install Melter Assembly



1. Route melter heater rod (209) wire through large hole in the melter base (257) then through small hole in side of melter base (257).
2. With the 10 insulators (4) in place on the melter assembly, place melter assembly on melter base (257).

NOTICE

To prevent crushing the soft insulators (4), do not overtighten the 4 bolts (259) in the following step. Torque to 5-11 ft-lb (7-15 N•m).

3. Use 4 bolts (259) to secure melter assembly to melter base (257).
4. Use four nuts (3) to secure melter assembly to system.
5. Group the 4 sets of heater wires together and run them through the grommet on the top of the electrical enclosure (1). Connect wires as noted below. See FIG. 36 on page 60 for references.

Item	Wire Marking 1	Wire Marking 2
Band Heater (208)	TB1-11B	TB1-13B
Melter Heater Rod (209)	TB1-14C	CR1-NC
Base Heater Rod (210)	TB1-11C	TB1-13C
Pump Heater Rod (250)	TB1-12B	CR1-COM

6. Connect air tube to air motor (218).
7. Connect air tube to fill cap (62).
8. Connect fill sensor cable to the fill sensor (20).
9. Connect pump cycle sensor cable to air motor.
10. Install funnel (61) into air motor bracket (528) then tighten clamp.
11. Install temperature sensor (125) into melter then tighten screw (AA) on band heater. See FIG. 36 on page 60.
12. Install insulators (52, 53) onto the melter assembly (5).
13. Connect wire connectors to the over-temperature switch (251). See FIG. 38 on page 62.
14. Use nuts (3) to install metal shroud (27).
15. Pull the relief valve air tube (36) through the metal housing then attach air tube to relief valve (245).
16. Install front access door (10) onto electrical enclosure (1).
17. Feed ADM cable through shroud then install shroud and connect cable to ADM.
18. Reconnect all heated hoses to the melter outlet manifold (203).
19. Turn main power switch ON.
20. Open system air inlet ball valve.

Replace Band Heater

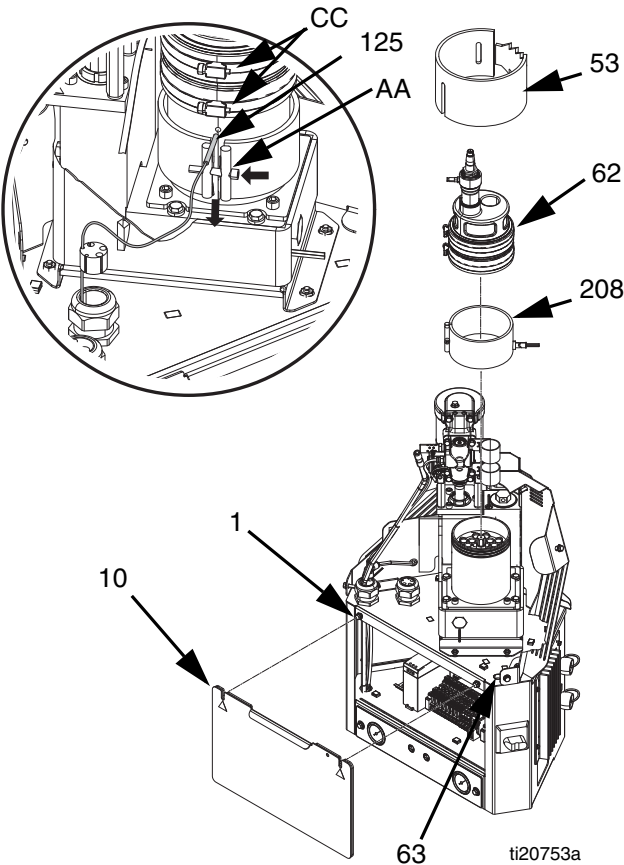


FIG. 36

Disassembly (see FIG. 36):

1. Loosen clamp on air motor bracket (528) then remove funnel assembly (61).
2. While looking through the hole in the fill cap, dispense until the fluid level in the melter is at or below the honeycomb grid.
3. Once the fluid level is low enough, close the bleed-type ball valve installed at the system air inlet.
4. Turn main power switch OFF.
5. Disconnect cable from ADM (30) then remove shroud (29).
6. Remove front access door (10) from electrical enclosure (1).
7. Remove fabric melter insulator (53).

8. While system is still near operating temperature, loosen band clamps (CC) then slide fill cap (62) and rubber housing off melter. When removing rubber housing from melter, separate rubber from melter by pressing on inside surface.
9. Loosen screw (AA) then remove sensor (125).
10. Locate the wires in terminal blocks TB1-11B and TB1-13B. Loosen terminal block screws and remove wires.
11. Pull wires up through grommet (63) on top of the electrical enclosure (1). Clip any wire ties that hold the wires in place.
12. Continue loosening screw (AA) then slide band heater (208) up to remove.

Reassembly (see FIG. 36):

1. Install band heater (208) on the melter with the opening and screw facing the front of the system in alignment with the sensor port.
 2. Install sensor (125).
 3. Slide band heater up then tighten screw (AA).
- NOTE:** Band heater should be oriented to hold sensor in place when tightened. It should not bend the sensor.
4. Route band heater wires through grommet (63) in the top of the electrical enclosure (1).
 5. Connect wires to terminals as marked. Wires should be marked as shown in the following table. Tighten terminal block screws.

Item	Wire Marking 1	Wire Marking 2
Band Heater (208)	TB1-11B	TB1-13B

6. Install electrical enclosure access door (10). See FIG. 36.
7. Install fabric melter insulator (53).
8. Install fill cap (62) rubber housing with band clamps in place. Ensure rubber housing is fully seated on melter or incorrect refilling may occur. Tighten band clamps to 25 in-lbs.
9. Install funnel into fill cap (62) then tighten band clamps (CC) on rubber housing.

10. Slide funnel assembly (61) through air motor bracket (528) then tighten clamp.
11. Feed ADM cable through shroud then install shroud and connect cable to ADM.
12. Open system air inlet ball valve.
13. Turn main power switch ON.

Replace Band Heater Temperature Sensor

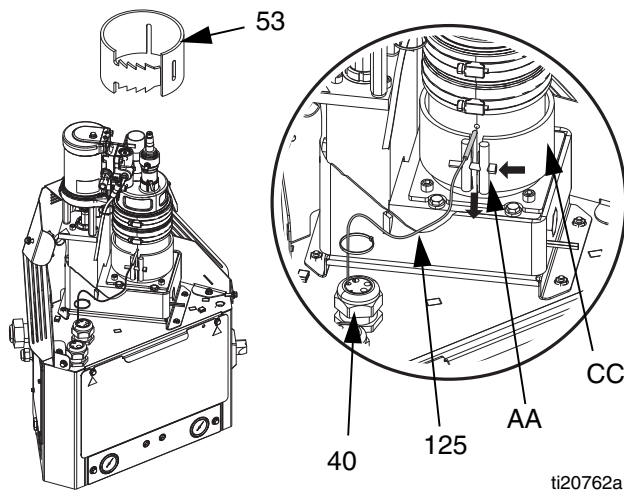


FIG. 37

Disassembly (see FIG. 37):

1. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
 2. Turn main power switch OFF.
 3. Disconnect cable from ADM then remove shroud.
 4. Remove air tube (36) from relief valve. Pull the air tube through the metal shroud (27).
 5. Remove nuts (3) then remove metal shroud (27).
 6. Remove fabric melter insulator (53).
 7. Loosen screw (AA) then remove sensor (125).
 8. Remove electrical enclosure access door (10).
 9. Disconnect the temperature sensor cable from MZLP connector labeled J5. See FIG. 37.
- NOTE:** This connector also includes the over-temperature switch wires.
10. Disconnect wire connectors from over-temperature switch (251). See FIG. 38 on page 62.
 11. Pull cable out of the electrical enclosure then discard sensor (125) and wires.
- Reassembly (see FIG. 37):*
1. Route new harness wires through grommet (63) in the top of the electrical enclosure.
 2. Connect wire connectors to over-temperature switch (251). See FIG. 38 on page 62.
 3. Place band heater temperature sensor (125) in melter.
 4. Tighten screw (AA).
- NOTE:** Screw should lightly squeeze the temperature sensor to hold it in place. It should not bend the sensor.
5. Connect new harness to MZLP connector labeled J5.
 6. Install electrical enclosure access door (10). See FIG. 36 on page 60.
 7. Install fabric melter insulator (53).
 8. Use nuts (3) to install metal shroud (27).
 9. Route relief valve air tube through the metal shroud then attach to the relief valve.
 10. Feed ADM cable through shroud then install shroud and connect cable to ADM.
 11. Turn main power switch ON.
 12. Open system air inlet ball valve.

Replace Heater Over-Temperature Switch

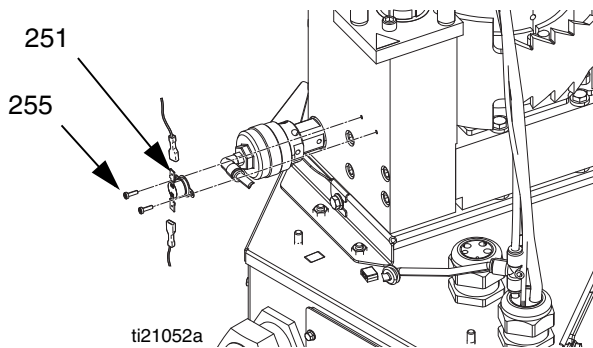


FIG. 38

Disassembly (see FIG. 37):

1. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
2. Turn main power switch OFF.
3. Disconnect cable from ADM then remove shroud.
4. Remove air tube (36) from relief valve. Pull the air tube through the metal shroud (27).
5. Use 7/16 in. socket to remove nuts (3) then remove metal shroud (27).
6. Disconnect the wire connectors from the over-temperature switch (251).
7. Remove the screws (255) securing the over-temperature switch (251) to the melter assembly (5), then remove the switch.

Re-assembly (see FIG. 37):

1. Use the two screws (255) to secure the new over-temperature switch (251) to the melter.
2. Connect wire connectors to new over-temperature switch.
3. Use 7/16 in. socket to install nuts (3) to secure metal shroud (27).
4. Route relief valve air tube (36) through the metal shroud then attach to the relief valve.
5. Feed ADM cable through shroud then install shroud and connect cable to ADM.

6. Open system air inlet ball valve.
7. Turn main power switch ON.

Replace Heater Rod

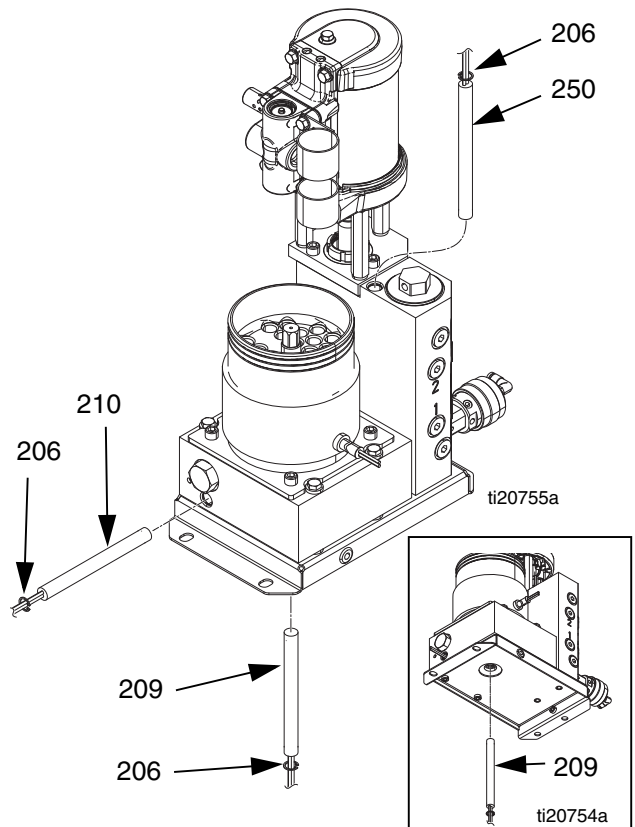


FIG. 39

Disassembly (see FIG. 39):

NOTE: This procedure is for replacing any of the above heater rods.

1. Turn main power switch OFF.
2. *If replacing the melter heater rod (209), Remove Melter Assembly.* See page 58.
3. Disconnect cable from ADM then remove shroud (29).
4. *If removing the pump heater rod (250):*
 - a. Remove the air tube (36) from the relief valve (245). Pull the air tube through the metal shroud (27).

- b. Remove nuts (3) then remove shroud (27).
5. Remove electrical enclosure front access door (10). See FIG. 36.
6. Disconnect heater rod wires from terminal blocks described in the following table.

Item	Wire Marking 1	Wire Marking 2
Melter Heater Rod (209)	TB1-14C	CR1-NC
Base Heater Rod (210)	TB1-11C	TB1-13C
Pump Heater Rod (250)	TB1-12B	CR1-COM

7. Pull heater rod wires up through the grommet in the top of the electrical enclosure (1).
8. Remove heater rod retaining ring (206) then remove and discard heater rod (209, 210, or 250).

Reassembly (see FIG. 39):

1. Route new heater rod cable through grommet (63) in top of electrical enclosure then connect new heater rod wires to terminal blocks as described in the previous table.

NOTICE

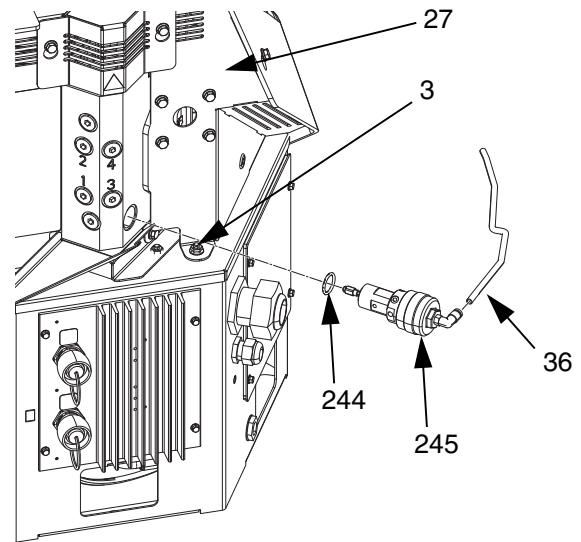
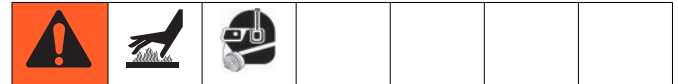
To prevent damaging the heater rod, do not use thermal grease in the following step.

2. Install heater rod then install heater rod retaining ring (206). See FIG. 39.
3. Install electrical enclosure access door (10). See FIG. 36.
4. *If replacing the melter heater rod (209), Install Melter Assembly.* See page 58.
5. *If replacing pump heater rod (210 or 250),* feed ADM cable through shroud then install shroud and connect cable to ADM.
6. *If installing the pump heater rod (250),* install the metal shroud (27):
 - a. Place metal shroud on system.
 - b. Install and tighten nuts (3).

- c. Pull the air tube through the metal shroud (27) then connect the air tube (36) to the relief valve (245).

7. Feed ADM cable through plastic shroud then install plastic shroud and connect cable to ADM.

Replace Fluid Pressure Relief Valve



ti20757a

FIG. 40

1. **Drain the System.** See page 33.
2. Close the system air inlet ball valve.
3. Turn main power switch OFF.
4. Remove the air tube (36) from the relief valve (245). Pull the air tube through the metal shroud (27). See FIG. 40.
5. Remove nuts (3) then remove shroud (27).
6. Use crescent wrench to remove melter fluid pressure relief valve (245). See FIG. 40.
7. Use an o-ring pick to remove o-ring (244).
8. Install o-ring (244) into manifold.

NOTICE

To prevent damage to o-ring, ensure o-ring is seated properly prior to moving to next step.

Repair

9. Thread new fluid pressure relief valve (245) into manifold. See FIG. 40. Once hand-tight, use crescent wrench to tighten.
10. Use nuts (3) to install metal shroud.
11. Connect air tube to pressure relief valve.
12. Feed ADM cable through plastic shroud then install shroud and connect cable to ADM.

Multi-Zone Low Power Temperature Control Module (MZLP)

Replace MZLP Fuse



MZLP Identification

	24R234	24V510
Key		
A	F1 and F2 fuses are physically the same size as F3-F10	F1 and F2 fuses are physically larger than F3-F10
B	---	Blue sticker on relay
C	Marked 24N568	Marked 24V133

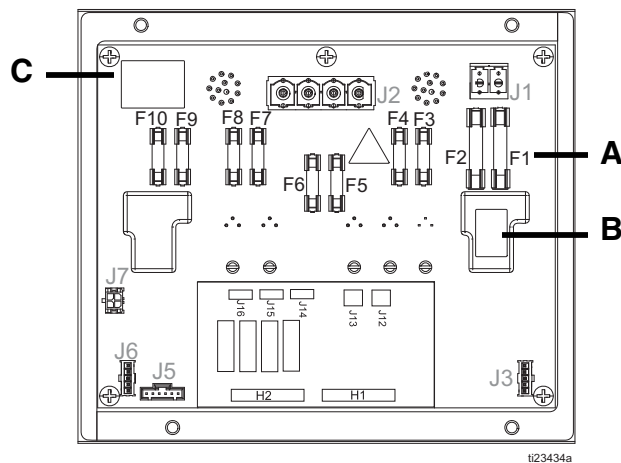


FIG. 41: MZLP ID and Fuse Locations

NOTICE

To prevent system damage, always use fast acting fuses. Fast acting fuses are required for short-circuit protection.

Fuse	Part
24R234 MZLP Fuses	
F1, F2	250VAC, 16A, fast acting, white
F3-F10	250VAC, 8A, fast acting
24V510 MZLP Fuses	
F1, F2	250VAC, 25A, fast acting, white, 0.25 in x 1.2 in
F3-F10	250VAC, 8A, fast acting

Fuse Kits

Kit	MZLP	Description
24P859	24R234	Includes standard clear fuses.
24X479		Includes ceramic fuses used for food industries.
24V289	24V510	Includes standard clear fuses.
24X480		Includes ceramic fuses used for food industries.

1. Turn main power switch OFF.
2. Remove electrical enclosure front access door (10).

3. Use a proper non-conductive fuse puller tool to remove the blown fuse.

NOTICE

Using an improper tool, such as screw drivers or pliers may break glass on fuse.

4. Use a proper non-conductive fuse puller tool to install the new fuse.

NOTICE

Using an improper tool, such as screw drivers or pliers may break glass on fuse.

5. Install electrical enclosure front access door (10).

Replace MZLP



Use See **MZLP Identification**, page 65.

Disassembly:

1. Turn main power switch OFF.
2. Remove electrical enclosure front access door (10).
3. Disconnect heated hose electrical connectors from MZLP (112).
4. Note location of each cable, then unplug all cables from the MZLP (112) that will be replaced. See FIG. 43.

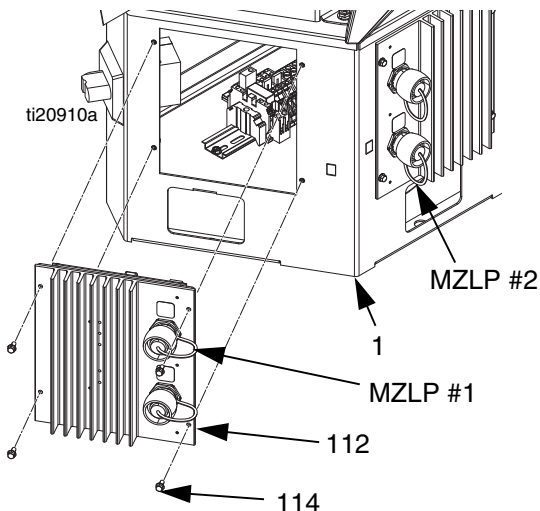


FIG. 42

5. Remove four screws (114) securing MZLP (112) to electrical enclosure (1) then carefully remove MZLP from electrical enclosure. See FIG. 42.
6. If replacing MZLP #1, remove the daughter card and standoffs, and re-install them on the new MZLP. See FIG. 42 for MZLP #1 and MZLP #2 identification.

Reassembly:

1. Set MZLP rotary switch to "1" on MZLP with daughter card. Set MZLP rotary switch to "2" on MZLP without daughter card. See FIG. 43 for rotary switch location.
2. Use four screws (114) to install MZLP (112) to electrical enclosure (1).
3. Reconnect cables to MZLP (112).

NOTE: Do not force the electrical connection. Minimal force is required to seat the connector. If resistance is felt, stop and verify the connector orientation.

NOTE: If unable to determine connector location, see **Electrical Schematics** on page 76.

4. Install electrical enclosure front access door (10).
5. Connect heated hose electrical connectors to new MZLP.

NOTE: MZLP may need updated software. See **Software Update Procedure** on page 74.

Replace MZLP Daughter Card



Disassembly:

1. Turn main power switch OFF.
2. Remove electrical enclosure front access door (10).
3. Note location of each cable then unplug all cables from MZLP daughter card (112a). See FIG. 43.

- Remove four mounting screws (112b) from daughter card (112a) and set aside. See FIG. 43.

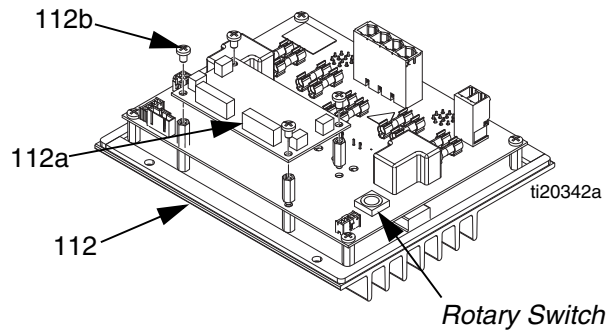


FIG. 43

- Unplug daughter card (112a) from the MZLP (112).

Reassembly:

- Plug new daughter card (112a) into the MZLP (112).
- Use screws (112b) to secure daughter card to MZLP (112).
- Connect cables to new daughter card (112a).

NOTE: Do not force the electrical connection. Minimal force is required to seat the connector. If resistance is felt, stop and verify the connector orientation.

NOTE: If unable to determine connector location, see **Electrical Schematics** on page 76.

- Install electrical enclosure front access door (10).

System

Replace Fill Sensor

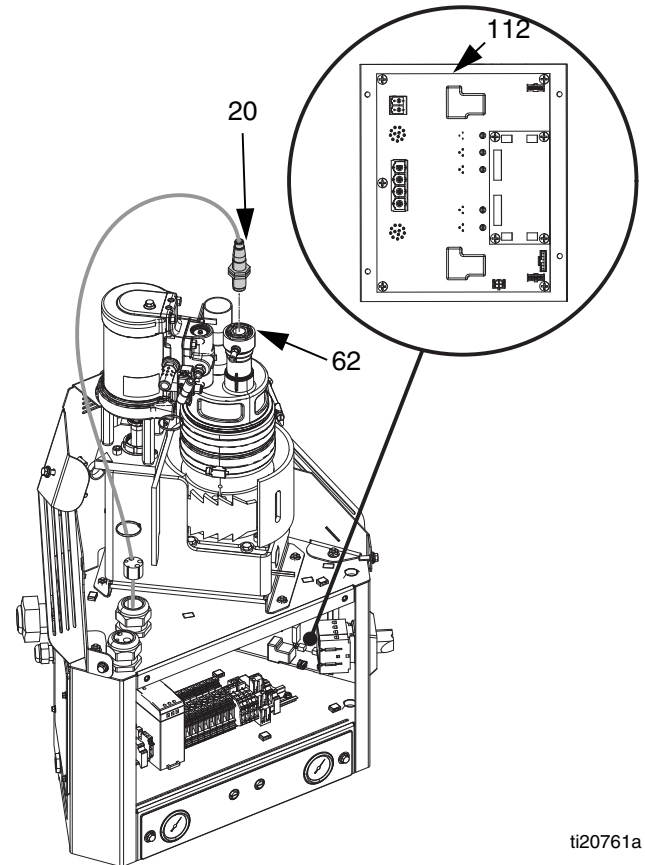


FIG. 44

Disassembly (see FIG. 44):

- Turn main power switch OFF.
- Gently pull up on cable while unscrewing fill sensor connector then remove fill sensor cable from fill sensor (20).
- Loosen fill sensor jam nut then remove fill sensor (20) from fill cap (62).

Reassembly (see FIG. 44):

- Thread new fill sensor (20) into fill cap (62). Bottom out the sensor in the fill cap then back out 1/2 turn.
- Tighten jam nut on fill sensor (20).
- Connect fill sensor cable to new fill sensor (20).

Replace Fill Cap

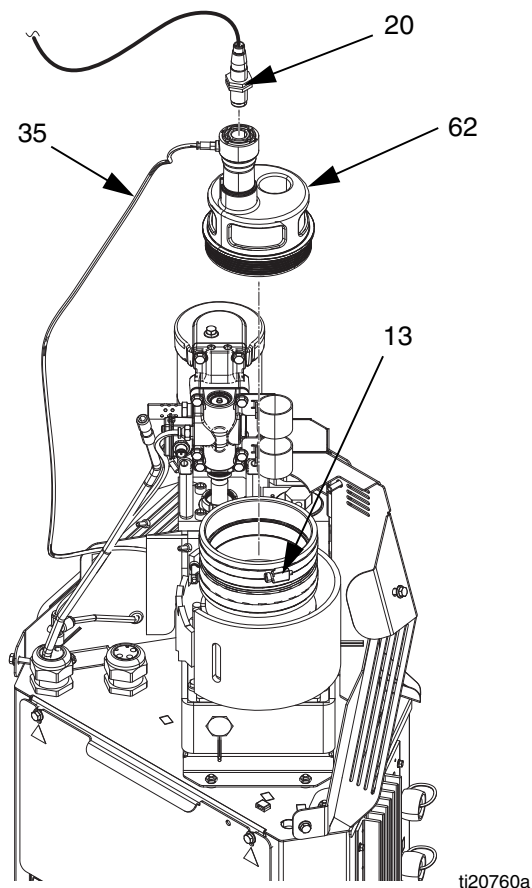


FIG. 45

Disassembly (see FIG. 45):

1. Turn main power switch OFF.
2. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
3. Disconnect cable from ADM then remove shroud.
4. Loosen hose clamp on air motor bracket (528) then remove funnel assembly.
5. Loosen fill sensor jam nut then remove sensor (20) from fill cap (62).
6. Remove air line (35) from fill cap (62).

7. Loosen upper clamp (13) on rubber housing then remove fill cap (62).

Reassembly (see FIG. 45):

1. Place new fill cap on melter. Align funnel inlet hole with bracket.
2. Install funnel through air motor bracket (528) then tighten funnel clamp.
3. Tighten rubber housing clamp (13) to 25 in-lbs to secure fill cap in place.
4. Connect air line (35) to fill cap (62).
5. Thread fill sensor (20) into fill cap (62). Bottom out the sensor in the fill cap then back out 1/2 turn.
6. Tighten jam nut on fill sensor (20).

Replace ADM

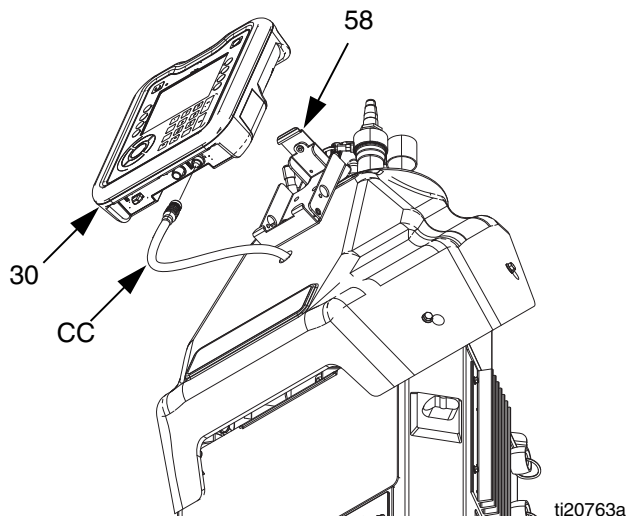


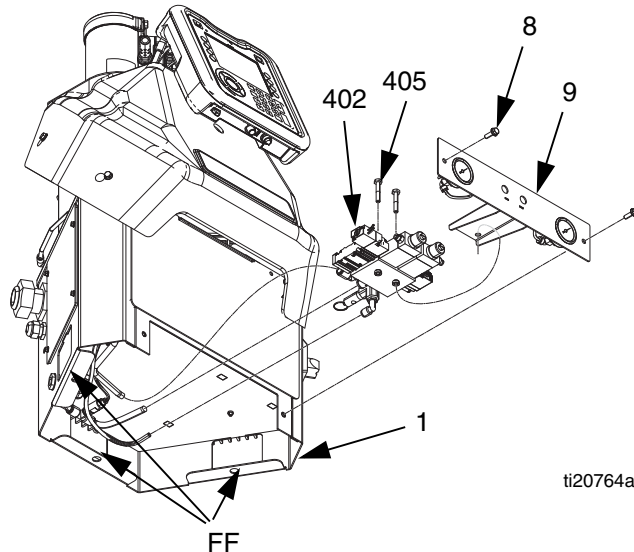
FIG. 46

1. Turn main power switch OFF.
2. Disconnect cable (CC) from bottom of ADM (30). See FIG. 46.
3. Remove ADM from bracket (58).
4. Install new ADM into bracket.
5. Connect cable to bottom of new ADM.

NOTE: ADM may need updated software. See **Software Update Procedure** on page 74.

Air Controls

Replace Air Control Solenoids



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FIG. 47

NOTE: In order to replace the air control solenoids, the system must be tipped back to access underneath the electrical enclosure.

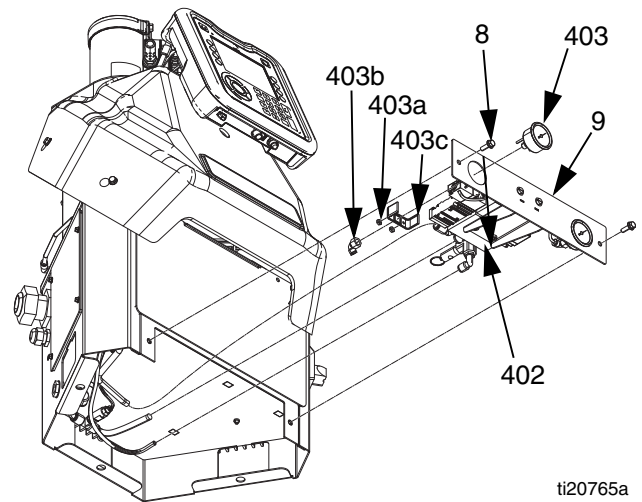
Disassembly (see FIG. 47):

1. Turn main power switch OFF.
2. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
3. Remove front access panel (10) from electrical enclosure (1).
4. Use 3/8 in. socket to remove two screws (8).
5. Note location of each air line connection.
6. Insert hands through access holes (FF), see FIG. 47, in bottom of electrical enclosure then disconnect air lines from air control solenoids (402).
7. Disconnect air control solenoids cable from MZLP daughter board connector J13. Pull wire out of the electrical enclosure.
8. Remove two screws (405) securing solenoids (402) to air control assembly (9) then remove air control solenoids.

Reassembly (see FIG. 47):

1. Use two screws (405) to secure new solenoids (402) to air control assembly (409).
2. Feed the new solenoid cable into the electrical enclosure and attach cable to MZLP daughter board connector J13.
3. Insert hands through access holes (FF), see FIG. 47, in bottom of electrical enclosure then connect air lines to air control solenoids (402).
4. Slide air control assembly (9) into place then use two screws (8) to secure to electrical enclosure (1).
5. Install electrical enclosure front access door.

Replace Air Control Gauge



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FIG. 48

Disassembly (see FIG. 48):

1. Turn main power switch OFF.
2. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
3. Remove two screws (8) then slide air control assembly (9) out from electrical enclosure (1) so the back of the gauges are exposed.
4. Remove two nuts (403a) securing gauge (403) in place then remove bracket (403c).
5. Place one small crescent wrench on the brass part of the gauge then use a second small crescent wrench to remove the air fitting (403b).

6. Remove air gauge from panel.

Reassembly (see FIG. 48):

1. Slide new air gauge into panel and slide the bracket onto the back of the gauge. Install air fitting onto the gauge by hand, do not tighten yet.
2. Install bracket (403c) then install two nuts (403a) finger tight.
3. Place one small crescent wrench on the brass part of the gauge then use a second small crescent wrench to tighten the air fitting (403b).

NOTICE

In the following step, do not overtighten the two nuts (403a). Overtightening may cause the gauge to break.

4. Orient gauge as desired then tighten two nuts (403a) to secure gauge (403) in place.
5. Slide air control assembly (9) into place then use two screws (8) secure to electrical enclosure.

Air Motor

Replace Pilot Valve

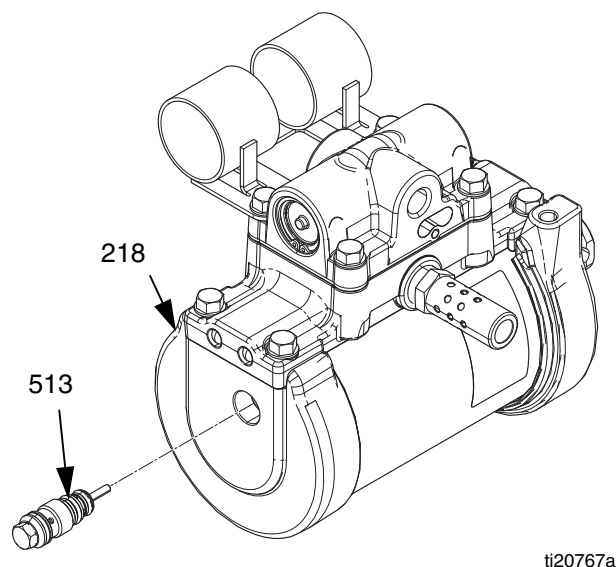


FIG. 49

1. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
2. Turn main power switch OFF.

3. Use 10 mm socket to remove air motor pilot valve (513) from air motor (218).
4. Lubricate with grease and install new air motor pilot valve (513).
5. Torque pilot valve to 95-105 in-lb (10.7-11.9 N•m).

Replace Air Valve

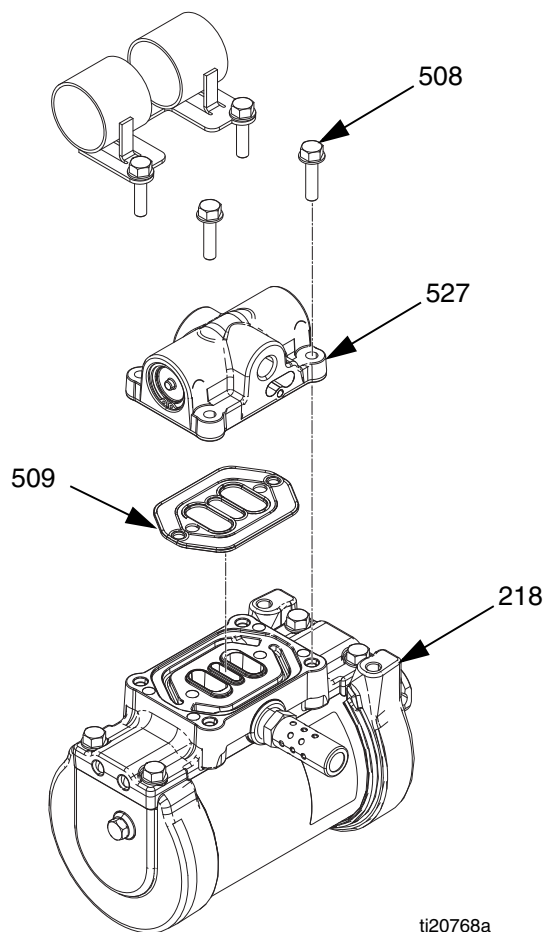


FIG. 50

Disassembly (see FIG. 50):

1. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
2. Turn main power switch OFF.
3. Loosen clamp on air motor bracket (528) then remove funnel assembly (61).
4. Loosen upper hose clamp on rubber housing then remove fill cap.
5. Dispense until the fluid level in the melter is at or below the honeycomb grid.

NOTE: If a screw or air valve seal is dropped during this procedure it could fall into the melter. Melter fluid level must be below honeycomb grid before moving to next step.

6. Once the fluid level is low enough, close the bleed-type ball valve installed at the system air inlet.
7. Disconnect air hose and cable from the air motor.
8. Use 10 mm socket to remove four screws (508) securing air valve (527) to air motor (218).
9. Remove air valve (527) and seal (509) then discard.

Reassembly (see FIG. 50):

1. Lubricate with grease then place new air valve seal (509) onto air valve (527).
2. Carefully place new air valve (527) against air motor then thread in the four screws (508). Ensure the air valve seal (509) stays in place by applying constant pressure against the air motor.
3. Use 10 mm socket to torque screws (508) to 95-105 in-lb (10.7-11.9 N•m).
4. Install fill cap then tighten upper hose clamp on rubber housing.
5. Connect air hose and cable to the air motor.

Remove Air Motor

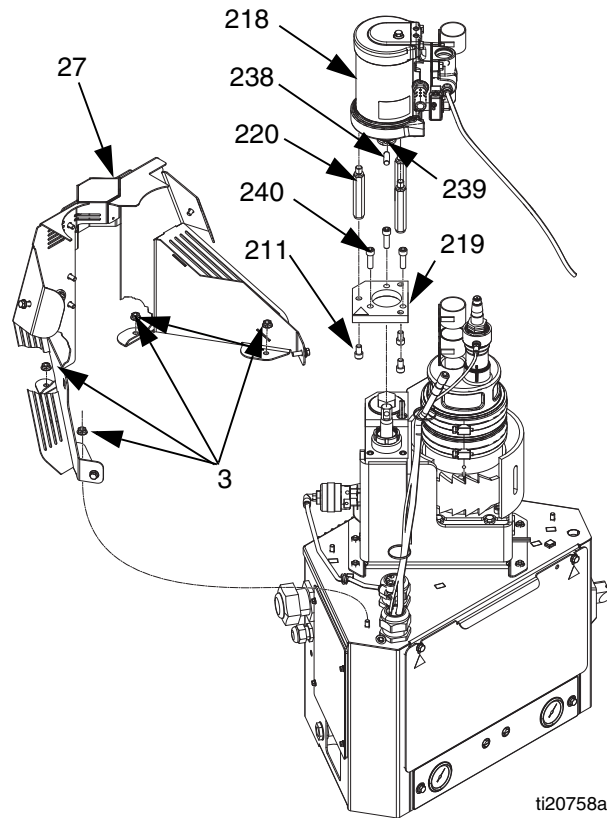


FIG. 51

See FIG. 51.

1. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
2. Turn main power switch OFF.
3. Disconnect air line (36) from pressure relief valve (245) then pull through metal shroud (27). See FIG. 40 on page 63.
4. Remove three nuts (3) securing metal shroud (27) in place then remove metal shroud (27).
5. Disconnect air supply line from air motor (218).
6. Remove air motor assembly:
 - a. Slide retaining ring (239) down.
 - b. Remove dowel pin (238).
 - c. Remove three screws (240).

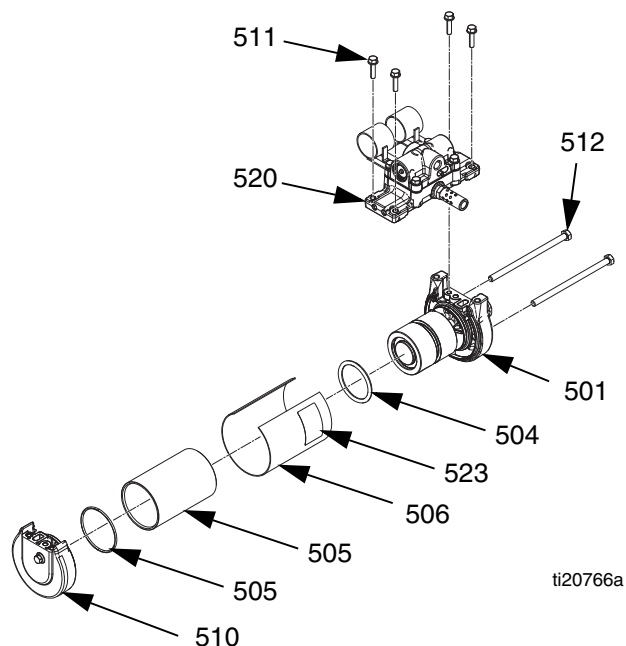
7. If replacing a damaged air motor with a new fully assembled air motor:
 - a. Remove three screws (211) securing air motor tie rods (220) to base plate (219).
 - b. Remove tie rods (220) from air motor (218).

Install Air Motor

See FIG. 51.

1. If replacing a damaged air motor with a new fully assembled air motor:
 - a. Install tie rods (220) onto air motor (218).
 - b. Install three screws (211) securing air motor tie rods (220) to base plate (219).
2. Connect air motor assembly to system:
 - a. Install three screws (240) to secure air motor assembly to system.
 - b. Install dowel pin (238).
 - c. Install retaining ring (239) over dowel pin (238).
3. Use four nuts (3) to install melter shield (27).
4. Reconnect air supply line to air motor (218).
5. Reconnect air line (36) to pressure relief valve (245). See FIG. 40 on page 63.

Replace Air Motor Piston O-Ring



ti20766a

FIG. 52

Disassembly (see FIG. 52):

1. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
2. Turn main power switch OFF.
3. **Remove Air Motor**, page 71.
4. Use 10 mm socket to remove four screws (511) to remove air manifold assembly (520). See FIG. 52.
5. Use 13 mm socket to remove two bolts (512) then remove air motor top cap (501).
6. Remove and discard piston o-ring (504) from piston (519).

Reassembly (see FIG. 52):

1. Lubricate all seals with grease.
2. Install new piston o-ring (504) onto piston (519).

NOTICE

Carefully reassemble air motor to prevent damage to seals.

3. Reassemble remaining air motor parts, excluding air manifold assembly, then install two bolts (512) finger tight.

4. Use four screws (511) to install air manifold assembly (520) onto air motor finger tight to align cover (506).
5. Torque two bolts (512) incrementally to 11-13 ft-lb (15-18 N•m) to ensure top and bottom cap seals (505) seat properly.
6. Torque four air manifold screws (511) to 95-105 in-lb (10.7-11.9 N•m).
7. **Install Air Motor**, page 72.

Replace Air Motor Throat Seals

NOTE: This procedure uses adhesive that requires a 12-hour system idle time for full cure. If possible, perform this procedure at the end of the day or week so it can cure overnight or over the weekend while the system does not need to run. Otherwise, keep a spare air motor on hand so it can be used while the adhesive cures.

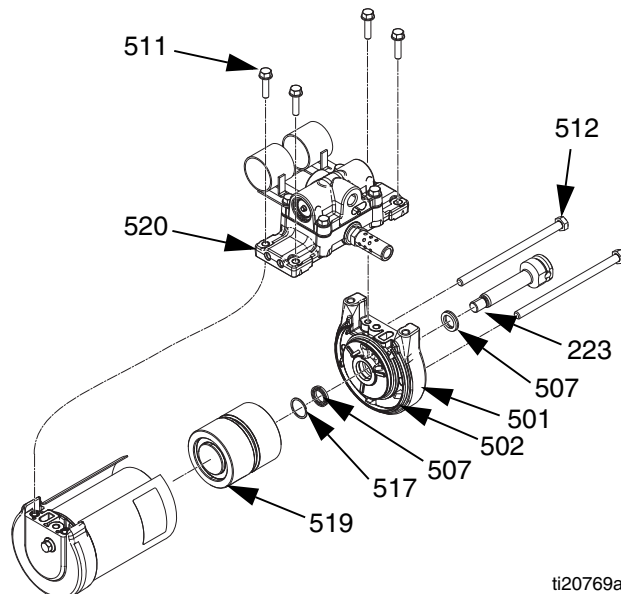


FIG. 53

Disassembly (see FIG. 53):

1. Close the bleed-type ball valve installed at the system air inlet to relieve all air pressure in the system.
2. Turn main power switch OFF.
3. **Remove Air Motor**, page 71.

4. Remove four screws (511) to remove air manifold assembly (520).
5. Remove two bolts (512) then carefully remove air motor base cap (501) from the rest of the air motor assembly.
6. Disconnect rod (223) from air motor piston (519) then remove rod from air motor base cap (501).
7. Remove retaining ring (517) from base cap (501).
8. Remove two u-cup throat seals (507) from throat of air motor base cap (501) and discard seals.

Reassembly (see FIG. 53):

1. Apply water-resistant grease to new u-cup seals (507) then install seals into throat of air motor base cap (501).
2. Install retaining ring (517) in base cap (501).
3. Carefully insert rod (223) into air motor base cap.
4. Apply high strength adhesive, supplied with kit, to rod threads then connect rod (223) to air motor piston (519). Torque to 35-40 ft-lb (47-54 N•m).

NOTICE

Carefully reassemble air motor to prevent damage to seals.

5. Reassemble remaining air motor parts, excluding air manifold assembly, then install two bolts (512) finger tight.
6. Use four screws (511) to install air manifold assembly (520) onto air motor finger tight to align cover (506).
7. Torque two bolts (512) incrementally to 11-13 ft-lb (15-18 N•m) to ensure top and bottom cap seals (505) seat properly.
8. Torque four air manifold screws (511) to 95-105 in-lb (10.7-11.9 N•m).
9. **Install Air Motor**, page 72.
10. Prior to using system, wait 12 hours for adhesive used in step 4 to fully cure.

Software Update Procedure

When software is updated on the ADM the software is then automatically updated on all connected GCA components. A status screen is shown while software is updating to indicate progress.

- 1. Turn system main power switch OFF.
- 2. Remove ADM from bracket.
- 3. Remove token access panel.

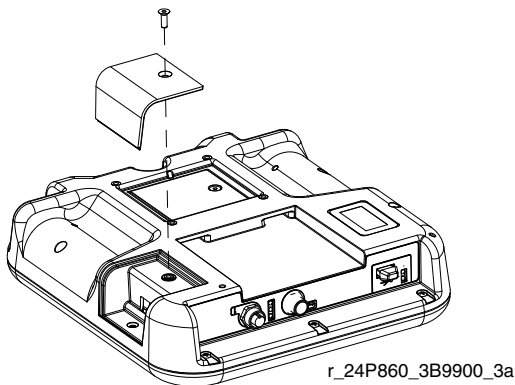


FIG. 54: Remove Access Panel

- 4. Insert and press InvisiPac software upgrade token (T, part no. 24R324) firmly into slot.

NOTE: There is no preferred orientation of token.

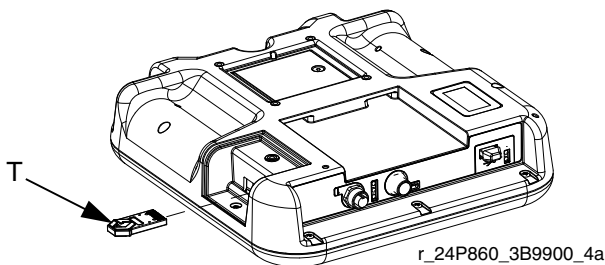


FIG. 55: Insert Token

- 5. Install ADM into bracket.
- 6. Turn system main power switch ON.

NOTICE

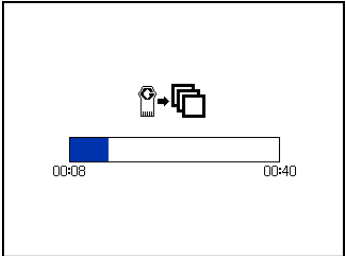
A status is shown while software is updating to indicate progress. To prevent corrupting the software load, do not remove token until the status screen disappears.

NOTE: When the screen turns on, you will see the following screens:

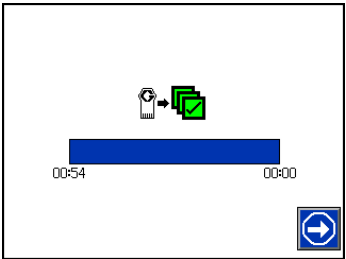
First:
Software is checking which GCA modules will take the available updates.



Second:
Status of the update with approximate time until completion.



Third:
Updates are complete. Icon indicates update success/failure. See the following icon table.



Icon	Description
	Update successful.
	Update unsuccessful.
	Update complete, no changes necessary.
	Update was successful/complete but one or more GCA modules did not have a CAN boot-loader so software was not updated on that module.

- 7. Remove token (T).
- 8. Replace token access panel.
- 9. Press to continue to the InvisiPac operation screens.

10. Navigate to System Screen. Verify the following pages. Reference screens on page 113.
 - a. System Screen Page 1, Customer I/O is set correctly.
 - b. System Screen Page 2, Channel and RTD types are set correctly.
 - c. System Screen Page3, System Type, Pump Idle Time, Power Type, Circuit Breaker Size, and Refill Settings.

Electrical Schematics



To prevent electric shock and system damage, all electrical work must be performed by a qualified electrician.

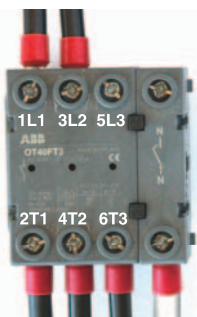
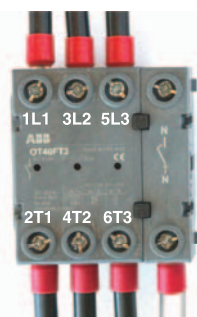
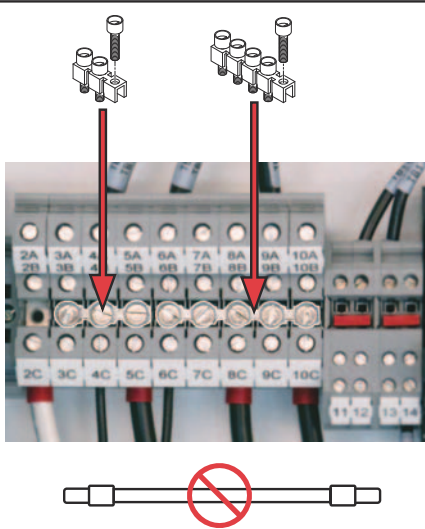
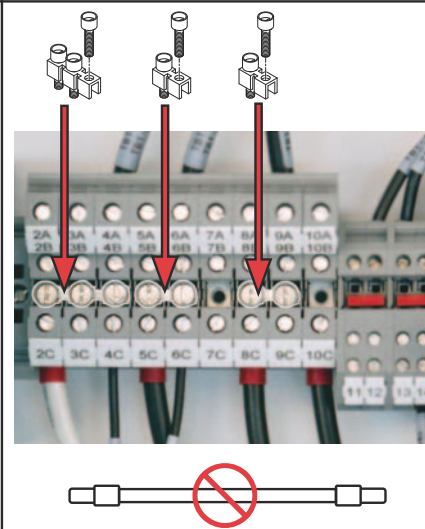
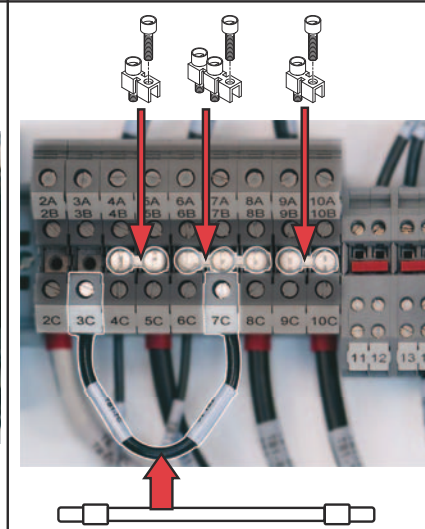
Incoming Power and Terminal Jumpers

NOTICE

To prevent severe system damage, ensure terminal jumpers are installed correctly. See **Connect Electrical Cord** on page 18.

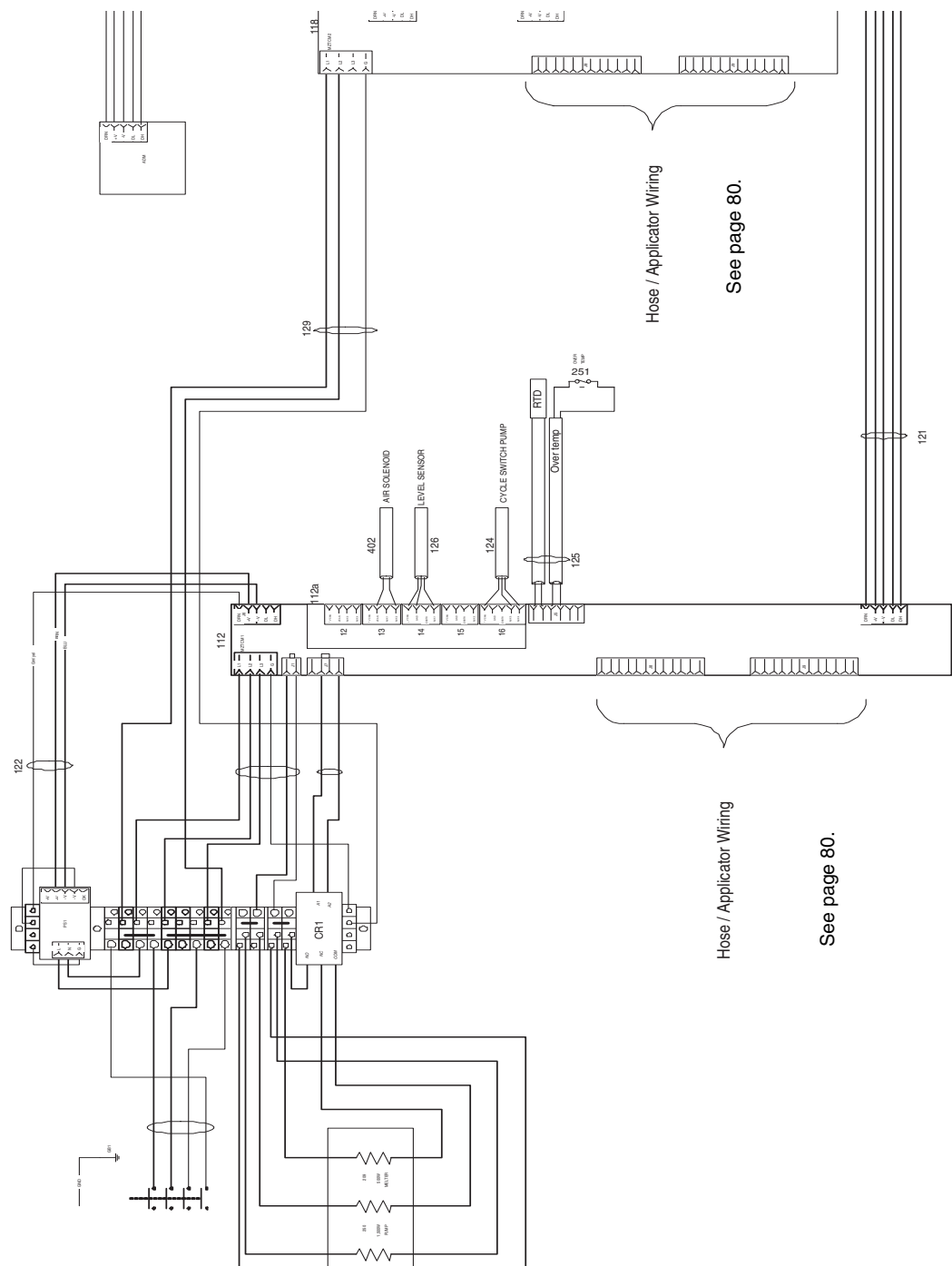
The incoming power and terminal jumpers are specific to the phase and voltage used. The power type and circuit breaker size must be correctly set in the ADM. See **Select ADM Settings** on page 20.

If changing power type, use the supplied hard metal 2, 3, and 5 terminal jumpers and screws and supplied jumper wire to jumper the terminals. See **Connect Electrical Cord** on page 18 for detailed information about changing terminal jumper locations.

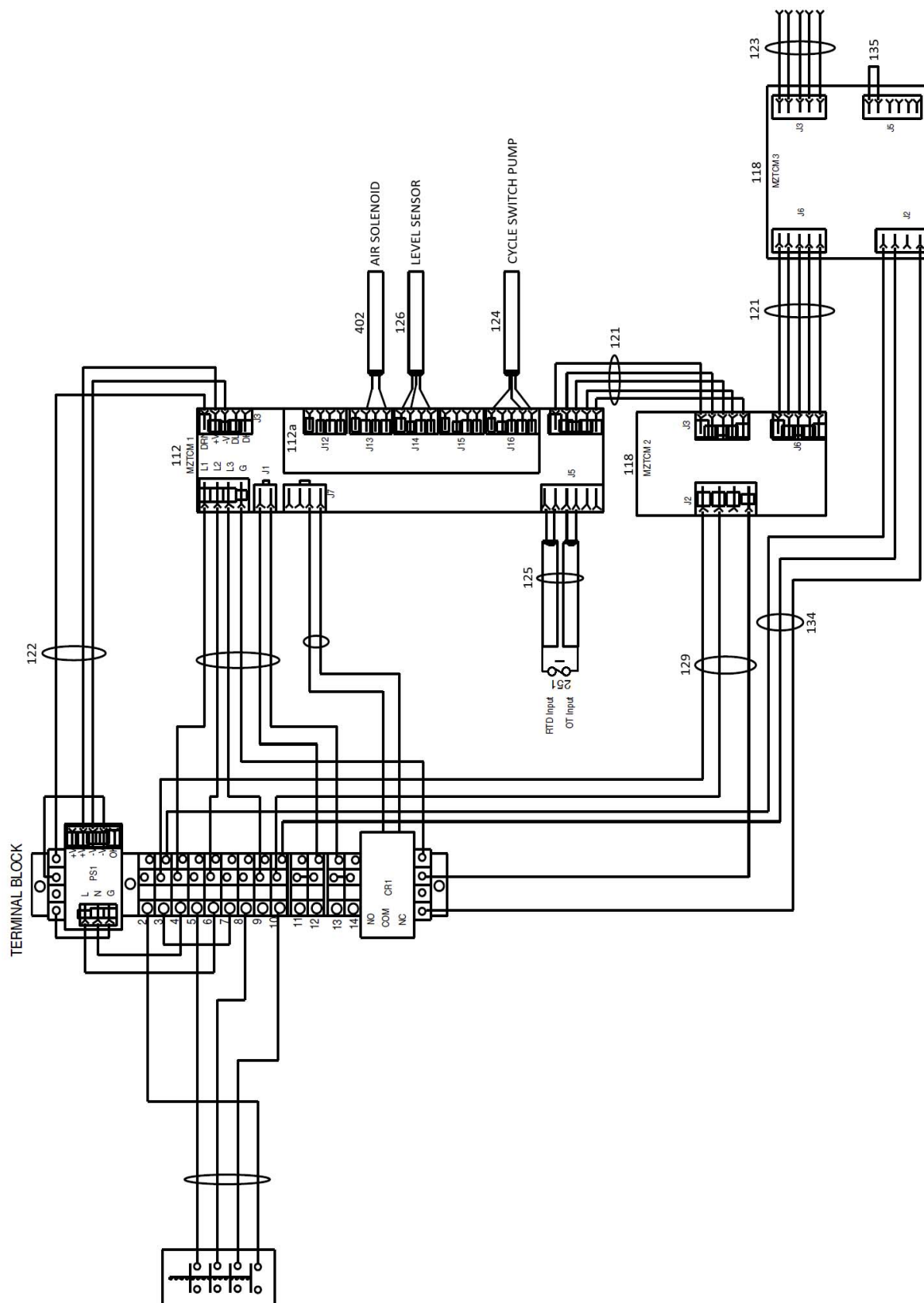
24P260 / 24P261 / 24U132 200-240 VAC, 1Ø	24P262 / 24P263 / 24U133 350-415 VAC, 3Ø, Y	24P264 / 24P265 / 24U134 200-240 VAC, 3Ø, Δ
		
		



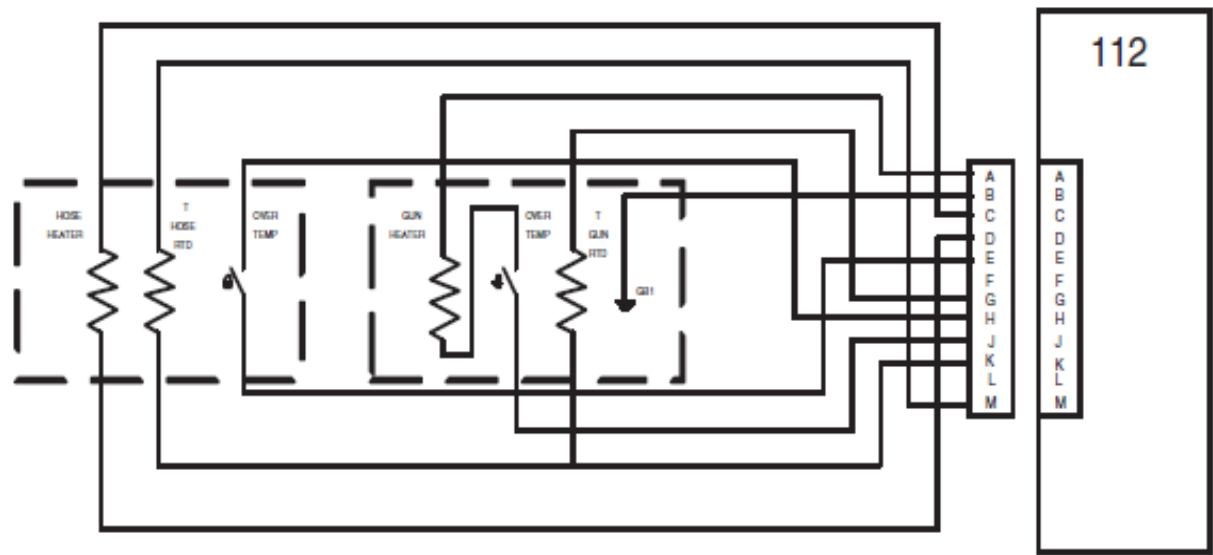
Systems with Two MZLP Modules



3A2347ZAA



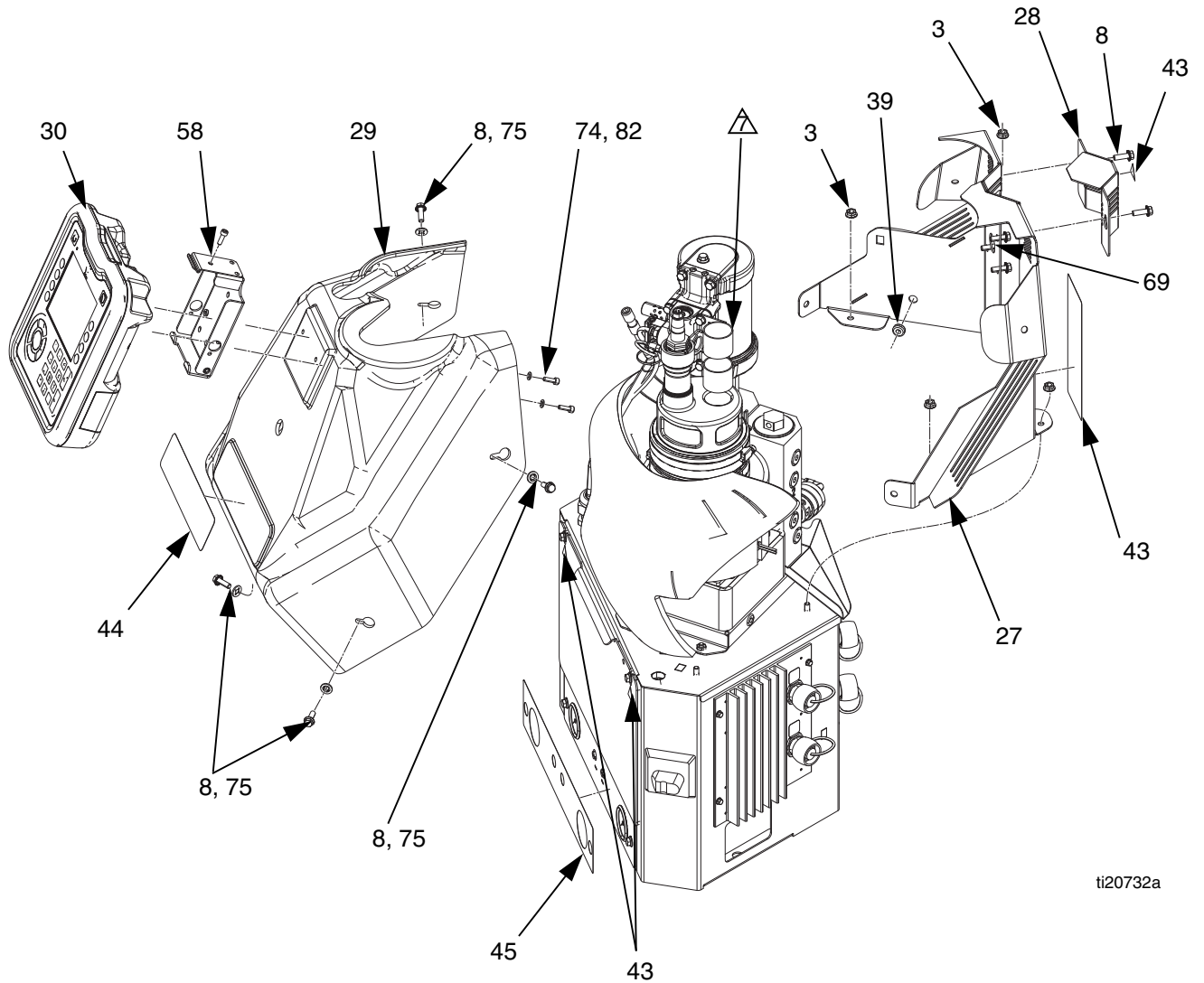
Typical Hose Applicator Wiring



Parts

InvisiPac Systems

System Parts, Page 1 of 3

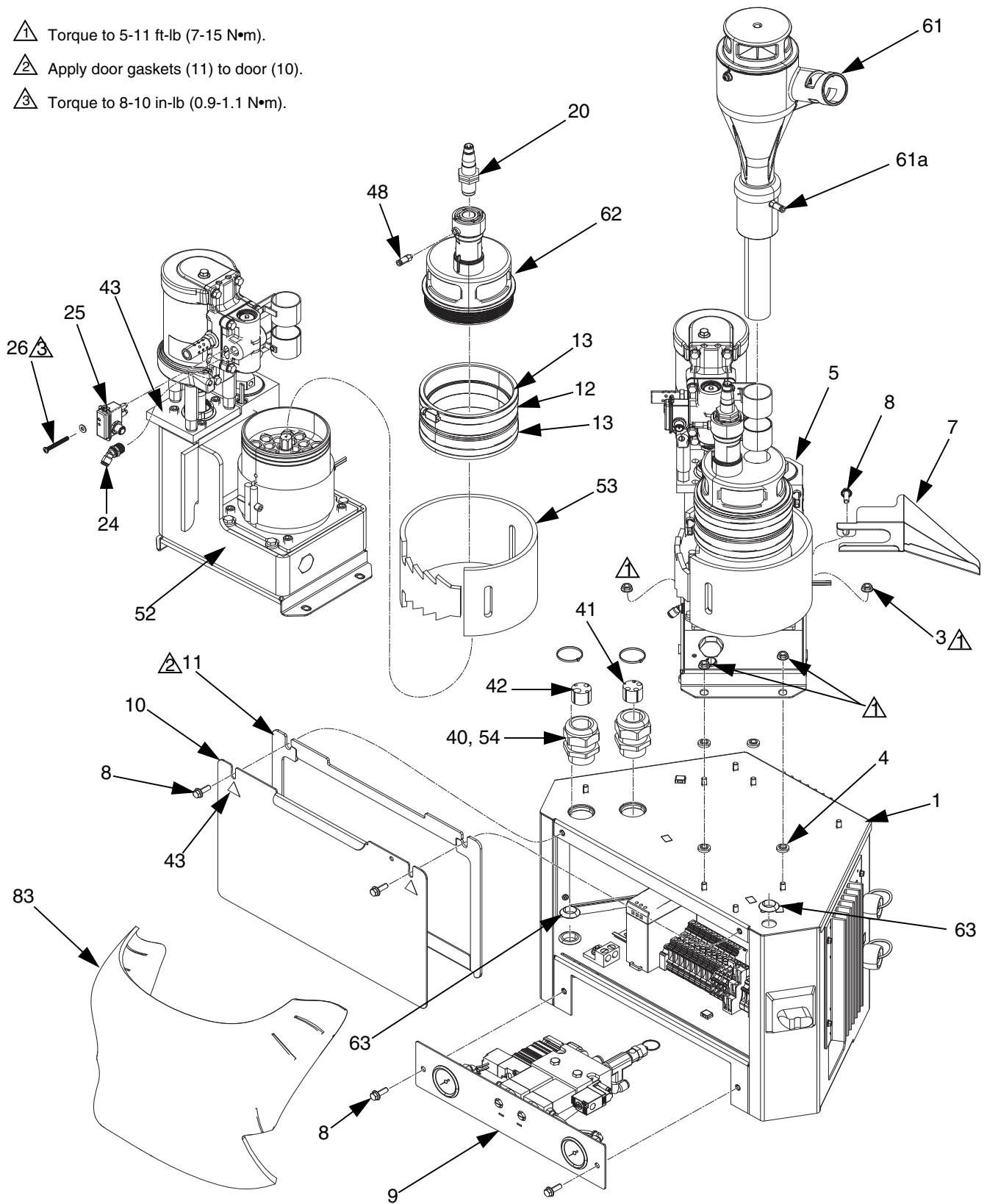


ti20732a

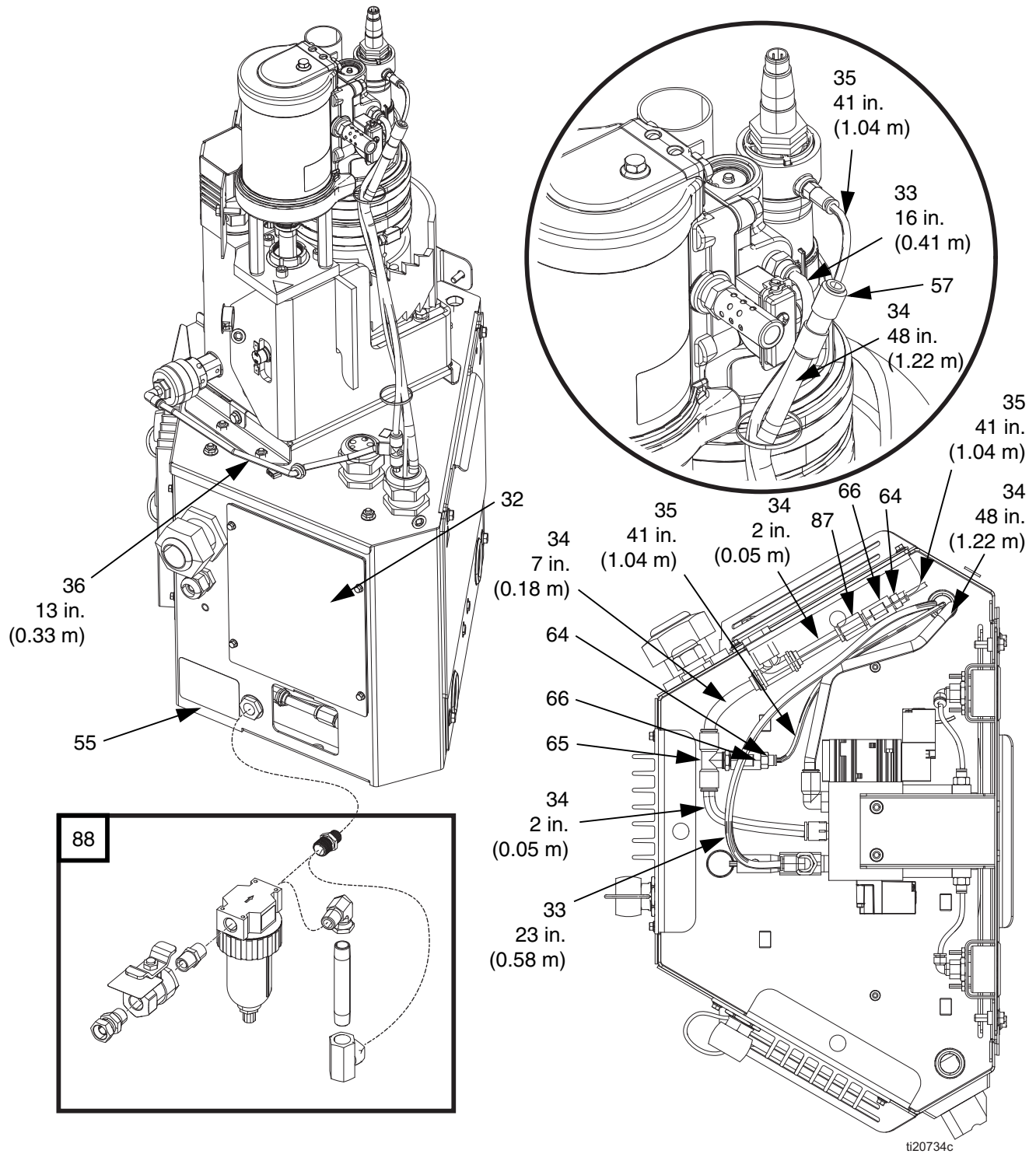
-  Apply door gaskets (11) to door (10) per layout diagram.
-  Apply pipe sealant to all non-swiveling pipe threads.
-  Orient as shown.

System Parts, Page 2 of 3

- ⚠ Torque to 5-11 ft-lb (7-15 N•m).
- ⚠ Apply door gaskets (11) to door (10).
- ⚠ Torque to 8-10 in-lb (0.9-1.1 N•m).



System Parts, Page 3 of 3

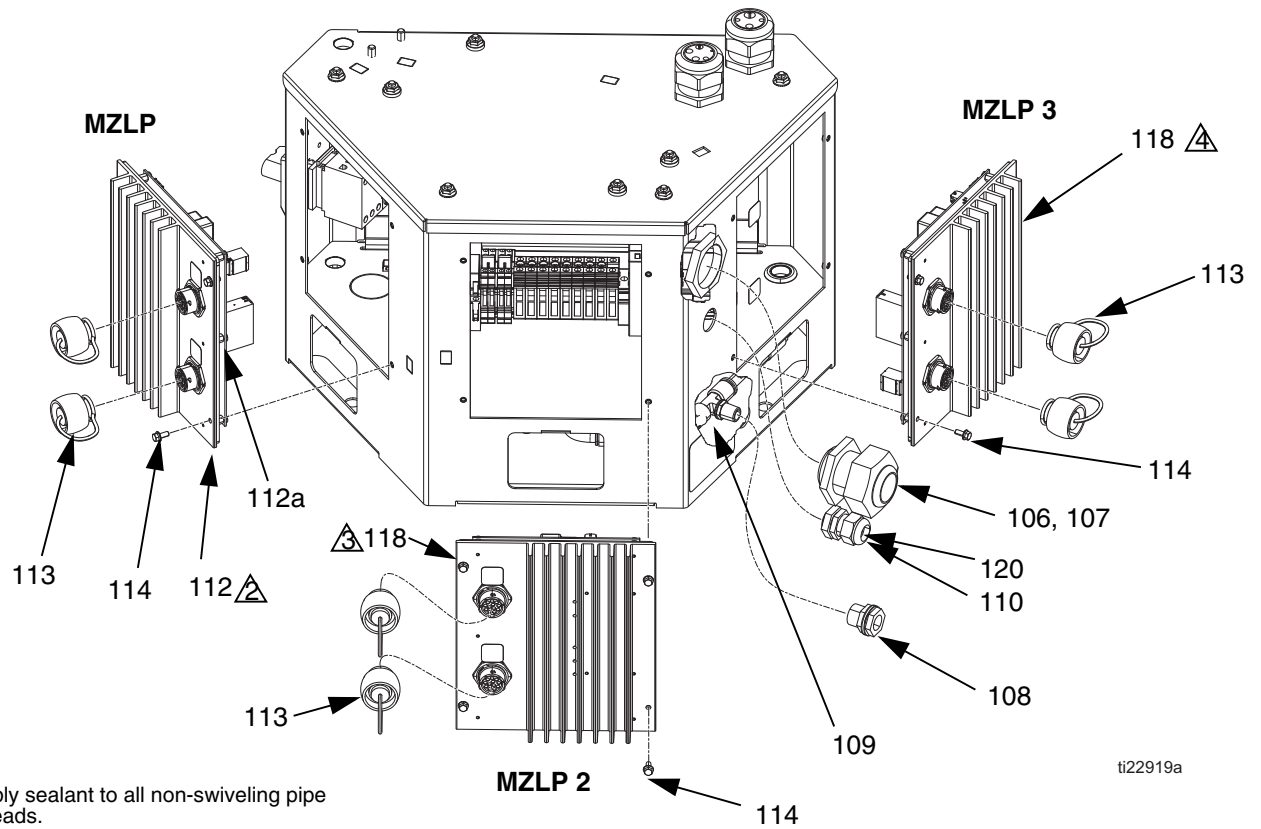


System Parts

Ref	Part	Description	Qty	Ref	Part	Description	Qty
1	---	ENCLOSURE, electrical	1	69	114606	PLUG, hole	1
3	115942	NUT, hex, flange head	8	70	24R324	SOFTWARE UPGRADE TOKEN, InvisiPac System	1
4	167002	INSULATOR, heat; washer	4	74	117126	SCREW, socket head cap, M5 x 16	3
5	24R375	MELTER AND PUMP	1	75	16V153	WASHER, retaining	4
7	---	TRAY, drip	1	80	262907	FUNNEL SCREEN KIT (not shown)	1
8	113161	SCREW, flanged, hex head	15	82	117017	WASHER	2
9	---	AIR CONTROLS ASSEMBLY	1	83	16V540	INSULATOR, melter assembly	1
10	---	DOOR, front	1	85	24V289	MZLP FUSES KIT (not shown)	1
11	---	FOAM, border, door	1	86	24P176	I/O CONNECTOR KIT (not shown)	1
12*	---	ADAPTER, melter inlet	1	87	108982	CONNECTOR, tube	1
13*	---	CLAMP, hose, spacer	2	88	24R707	AIR INLET KIT	1
20	24R041	SENSOR, ultrasonic	1	89	114271	RETAINING STRAP (assemblies 24P260, 24P262, 24P264 only; Qty 8)	
22	---	SHAKER AND TUBE, feed system	1			(assemblies 24P261, 24P263, 24P265 only; Qty 16)	
24	116658	FITTING, tube, male, 1/4 npt	1			(assemblies 24U132, 24U133, 24U133 only; Qty 24)	
25◆	---	SWITCH, cycle	1	92	127208	FITTING, tee, 6 JIC x 6 JIC x 9/16-18 (assemblies 24U132, 24U133, 24U133 only; Qty 2)	
26◆	---	FASTENER, screw, pn hd M4 x 35 mm	1	93		FITTING, 45° elbow, hydraulic (assemblies 24P260, 24P262, 24P264 only; Qty 2)	
27	---	BRACKET, back	1			(assemblies 24P261, 24P263, 24P265 only; Qty 4)	
28	---	COVER, filter	1			(assemblies 24U132, 24U133, 24U133 only; Qty 2)	
29	---	COVER, melter	1	94	116793	FITTING, elbow, hydraulic, 9/16-18 x 9/16-18 (assemblies 24P260, 24P262, 24P264 only; Qty 2)	
30*	24P860	MODULE, Advanced Display (ADM)	1			(assemblies 24P261, 24P263, 24P265 only; Qty 4)	
31	117026	SCREW, socket head cap, M5 x 12	2			(assemblies 24U132, 24U133, 24U133 only; Qty 2)	
32†	112739	TEE, union	1	95◆	---	WASHER, flat	
33†	C12509	TUBE, nylon, round	3.25	--- Not for sale.			
34†	---	HOSE, nylon, 3/8 in. OD, 250 psi (1.7 MPa, 17 bar)	4.92	▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.			
35†	598095	TUBE, 5/32 in. OD, nylon	6.75	* ADM does not come with software. Order software token 24R324.			
36†	---	TUBE, PTFE, 1/4 in. OD	1.3	Available kits (purchase separately):			
39	---	GROMMET, 1/4 in. ID	1				
40	---	BUSHING, strain relief	2				
41	---	GROMMET, wire	1				
42	---	GROMMET, tube	1				
43▲	16U029	LABEL, safety	1				
44	---	LABEL, InvisiPac	1				
45	---	LABEL, pressure gauges	1				
48	110932	CONNECTOR, male	1				
49	C38321	STRAP, tie, cable	10				
52	16T675	INSULATOR, melter manifold	1				
53✱	16T677	INSULATOR, melter	1				
54	---	NUT, bushing	2				
55	---	LABEL, identification	1				
57	---	COUPLER, 3/8 in. OD tubing	1				
58	---	BRACKET, mounting	1				
61	17F461	FUNNEL, inlet, feed	1				
61a	110932	CONNECTOR, male	1				
62*	---	MANIFOLD, feed inlet	1				
63	121487	GROMMET, sheet metal, 3/4 in.	3				
64	198177	FITTING, connector, male	2				
65	---	FITTING, tee, 1/8 npt x 3/8 in. tube x 3/8 in. tube	1				
66	---	RESTRICTOR, air, 0.0225 in. orifice	2				
67	101976	TOOL, allen, wrench	1				
68	255021	FITTING, straight, hydraulic (assemblies 24P260, 24P262, 24P264 only; Qty 2) (assemblies 24P261, 24P263, 24P265 only; Qty 4) (assemblies 24U132, 24U133, 24U133 only; Qty 6)					

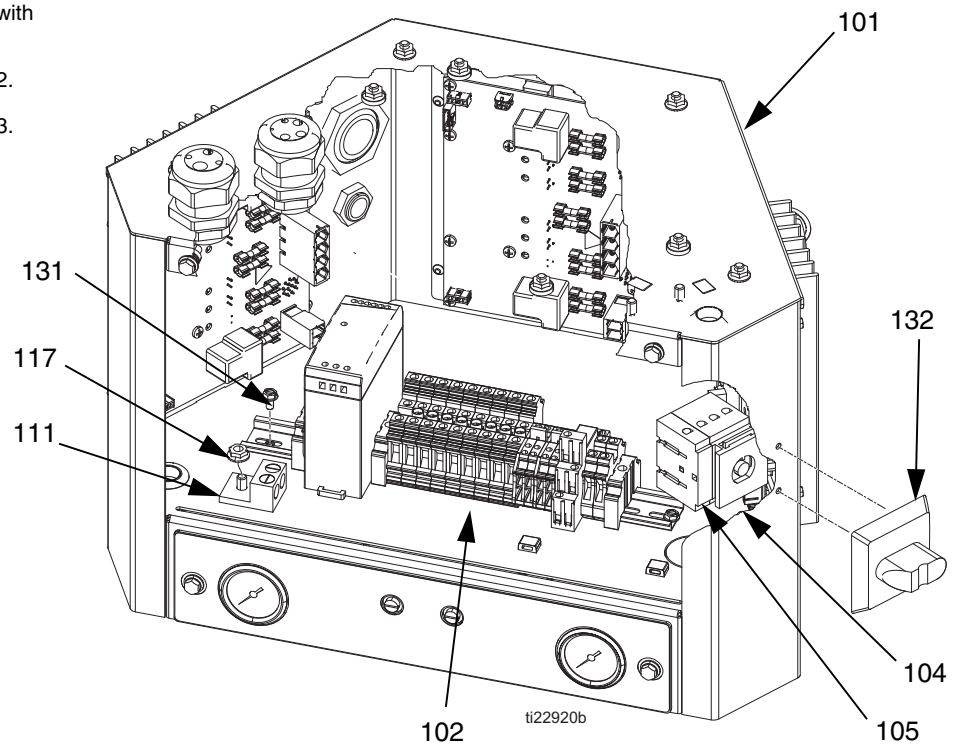
Kit	Description	Includes
24R885◆	Cycle Switch	25, 26, 95
24R028*	Inlet housing	12, 13, 62
24R030†	Tubing	32, 33, 34, 35, 36, 304. See Feed System Shaker and Tube, 24T812 on page 90 for identification of item 304.
24R031✱	Melter	53, 202, 204, 207, 211, and 253. See Melter and Pump Parts on page 88 for identification of items 202-253.
24U635	Acrylic Lens Pressure Gauge	

Electrical Enclosure



ti22919a

- 1 Apply sealant to all non-swiveling pipe threads.
- 2 Set rotary switch to "1" on MZLP with daughter card.
- 3 Set rotary switch to "2" on MZLP 2.
- 4 Set rotary switch to "3" on MZLP 3.



ti22920b

Electrical Enclosure Parts

Ref	Part	Description	Qty	Ref	Part	Description	Qty
101	---	CABINET, controls	1	131	113974	SCREW, machine, slotted hex washer head	2
102	126807	MODULE, breaker	1	132	123967	KNOB, operator disconnect	1
104	123970	SWITCH, disconnect, 40 amp	1	133	24P176	KIT, Customer I/O connector	1
105	126839	CONTACT, n-pole	1	134✿	16W034	HARNESS, 3rd MZLP	1
106	---	BUSHING, strain relief, M40 thread	1	135✿	16W035	CONNECTOR, jumper	1
107	---	NUT, strain relief, M40 thread	1	--- Not for sale.			
108	104641	FITTING, bulkhead	1	Available kits (purchase separately):			
109	502937	FITTING, tee, 3/8 tube, 1/4 male npt	1				
110	114421	BUSHING, strain relief	1				
111	117666	TERMINAL, ground	1				
112*	---	MODULE, MZLP with Daughter Board	1				
112a	24R042	MZLP DAUGHTER BOARD	1				
113†	16T440	CAP, jam nut, sealing	1				
✿		(1 MZLP assemblies only; Qty 2)					
		(2 MZLP assemblies only; Qty 4)					
		(3 MZLP assemblies only; Qty 6)					
114	125856	SCREW, 8-32, serrated flange	12				
116	24P175	PLATE, blank, single MZLP	1				
		(1 MZLP assemblies only; Qty 2)					
		(2 MZLP assemblies only; Qty 1)					
117	115942	NUT, hex, flange head	1				
118†	24V510	MODULE, GCA, MZLP	1				
✿✿		(2 MZLP assemblies only; Qty 1)					
		(3 MZLP assemblies only; Qty 2)					
119	---	GASKET, foam, MZLP	1				
		(1 MZLP assemblies only; Qty 2)					
		(2 MZLP assemblies only; Qty 1)					
120	196762	PIN, straight	1				
121†	16T087	CABLE, board, male/male, 4 in. (101 mm)	1				
✿		(2 MZLP assemblies only; Qty 1)					
		(3 MZLP assemblies only; Qty 2)					
122	16T088	CABLE, power, male/wire	1				
123	16T089	CABLE, CAN, male/female, 1 m	1				
124	16T103	CABLE, pump	1				
125◆	16T106	SENSOR, band heater temperature	1				
126	16T108	CABLE, ultrasonic, M12-4p, 1 m	1				
129†	16T201	HARNESS, 2nd MZLP	1				
✿		(2 MZLP assemblies only; Qty 1)					
		(3 MZLP assemblies only; Qty 1)					
130	114958	STRAP, tie	4				

--- Not for sale.

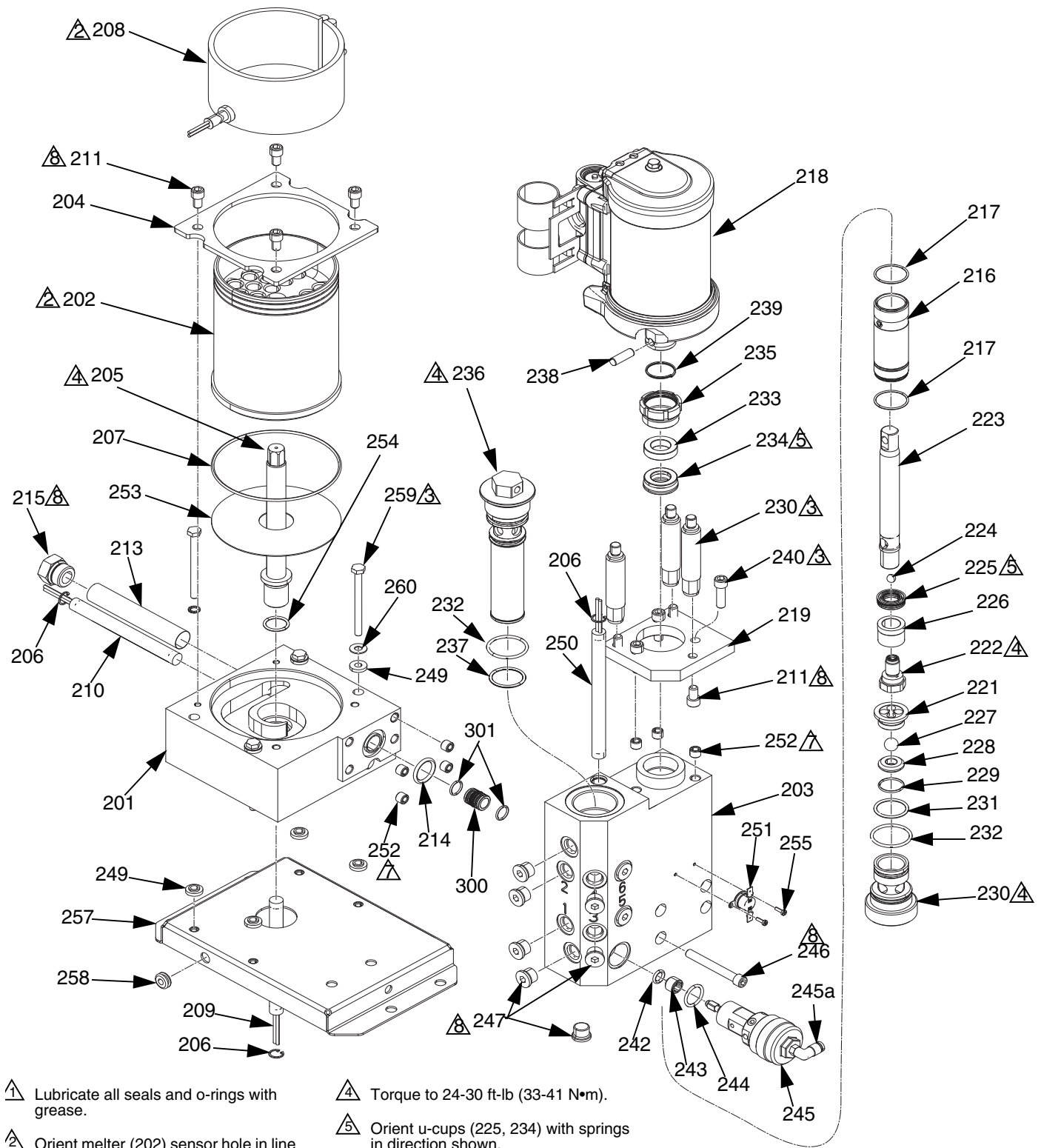
Available kits (purchase separately):

Kit	Description	Includes
24R237†	Upgrade from 2 channel system to 4 channel system	113, 118, 121, 129, a grounding wrist strap, and a software upgrade token. See 4 Channel Upgrade Kit, 24R237 on page 103.
24U575✿	Upgrade from 4 channel system to 6 channel system	113, 118, 121, 129, 134, 135, grounding wrist strap, and a software upgrade token. See 6 Channel Upgrade Kit, 24U575 on page 105.
24R040◆	RTD	125, 251, and 255. See Melter and Pump Assembly, 24R375 on page 87.
24V289	MZLP fuses	Qty 8 - 8 Amp, 250V Fuses Qty 2 - 16 Amp, 250V Fuses
24P176	Customer I/O Connectors	2 connectors for connecting to H1 and H2 on MZLP daughter board. Use for PLC connection.

* Purchase MZLP (118) and daughter board (112a) separately.

✿ Use Blank Plate Kit (116) if removing MZLP (118).

Melter and Pump Assembly, 24R375



Melter and Pump Parts

Ref	Part	Description	Qty	Ref	Part	Description	Qty
201*	---	MANIFOLD, melter base	1	250•	24R037	HEATER, fire rod, 1500 watts	1
202✕	---	MELTER	1	251**•	126780	SWITCH, over temperature	1
203•	---	MANIFOLD, outlet	1	252•✕	---	INSERT, helical	7
204✕	---	PLATE, mounting	1	253✕	---	PLATE, melter	1
205	---	HOUSING, heater	1	254	558722	O-RING, 910	1
206•	111317	RING, retaining, internal	3	255**•	107388	SCREW, machine, panhead, #4-40, 3/8 in. long	2
207✕	126475	O-RING, FKM, 157	1	256	---	LUBRICANT, grease	1
208	24R039	HEATER, band	1	257	---	BRACKET, melter	1
209	24R034	HEATER, fire rod, 500 watts	1	258	---	GROMMET, 1/4 in. ID	1
210	24R036	HEATER, fire rod, 1000 watts	1	259	115506	SCREW, machine, hex washer head, 1/4-20, 3.0 in. long	4
211✕	128167	SCREW, cap, sh, 5/16-18, 0.5 in. long	7	260	115814	WASHER, flat	3
213	24R369	INLET FILTER	1	297*	24P615	FITTING, straight, hydraulic	1
214*✕	112855	PACKING, o-ring	1	298*	126961	FITTING, 45 deg. elbow, hydraulic	1
215	24T297	PLUG, o-ring boss	1	299*	116793	FITTING, 90 deg. elbow, hydraulic	1
216†•	---	SLEEVE, cylinder	1	300	128612	TUBE, cross over	1
217††•	108526	PACKING, o-ring, PTFE	2	301	103610	O-RING, 014	2
218✓	24R025	MOTOR, air, 2.5 in., 0.48 in. stroke, high temperature	1	* Not shown or assembled. Quantity equals number of chan- nels the unit supports.			
219	---	PLATE, pump adapter	1	--- Not for sale.			
220	---	ROD, tie	3	Available kits (purchase separately):			
221•	192624	GUIDE, ball	1				
222◆•	239932	VALVE, piston	1				
223◆•	---	ROD, piston	1				
224†◆•	105444	BALL, 0.3 in.	1				
225†◆•	---	SEAL, u-cup, piston	1				
226†◆•	---	BEARING, piston	1				
227†•	105445	BALL, 0.5 in.	1				
228†•	192642	SEAT, carbide	1				
229†•	107079	PACKING, o-ring	1				
230•	---	HOUSING, foot valve	1				
231†•	105802	PACKING, o-ring	1				
232†◆•	113944	PACKING, o-ring	2				
233†•	---	BEARING, throat	1				
234††•	---	SEAL, u-cup, throat	1				
235•	193046	NUT, packing	1				
236◆•	---	FILTER, assy, 100 mesh	1				
237◆•	15K234	PACKING, o-ring	1				
238✓	196762	PIN, straight	1				
239✓	196750	SPRING, retaining	1				
240	128190	SCREW, socket head cap, 5/16-18, 1.0 in long	3				
242★•	117059	O-RING, fluoroelastomer	1				
243★•	16W327	RETAINER, seat, dump valve	1				
244★•	15Y627	PACKING, o-ring #2-116, PTFE	1				
245★•	---	VALVE, relief	1				
245a	126474	FITTING, push to connect	1				
246•	C19829	SCREW, cap, socket head, 5/16-18, 2.5 in. long	4				
247•	15H304	FITTING, plug 9/16 in. SAE	5				
249	167002	INSULATOR, heat	10				

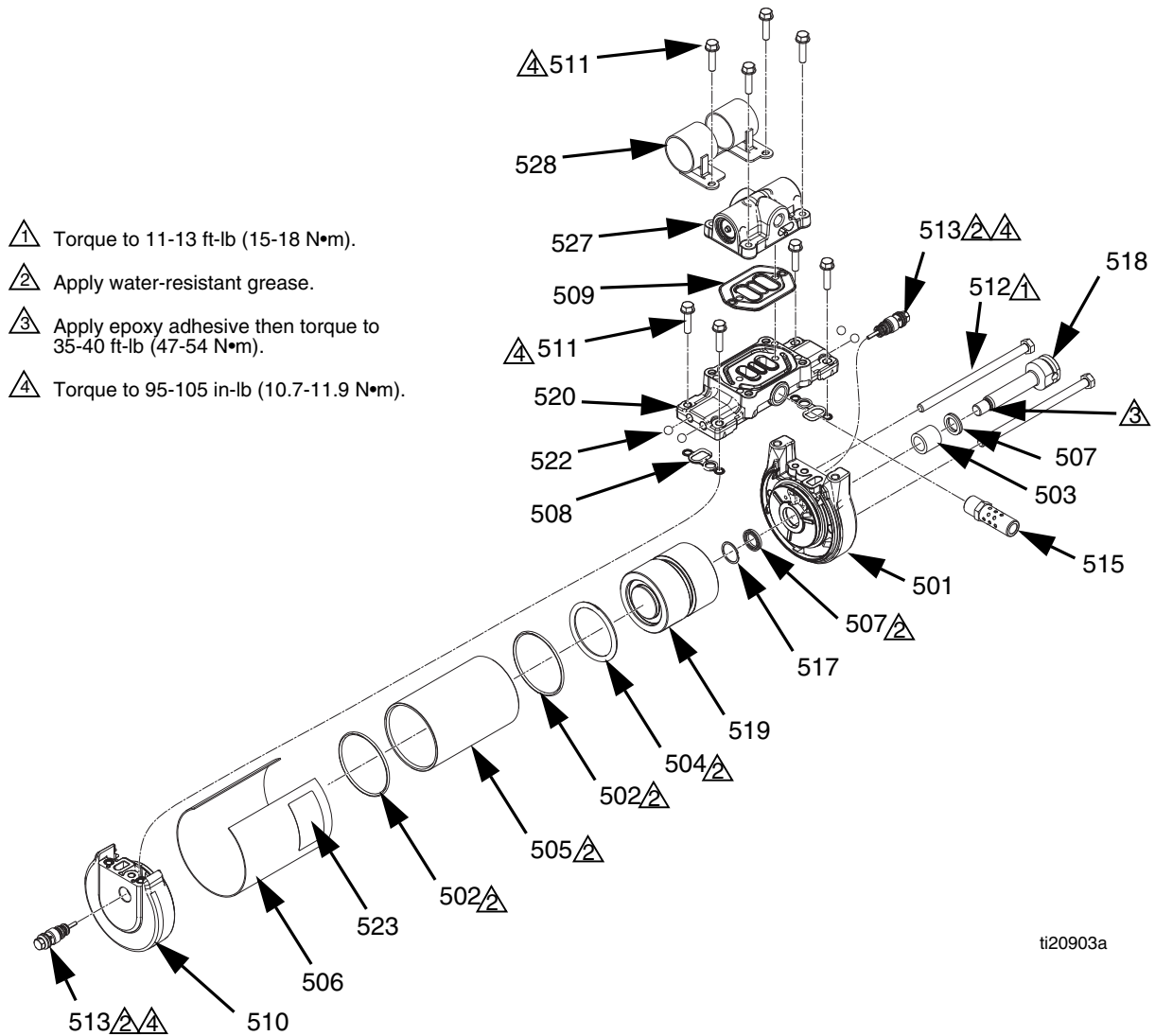
* Not shown or assembled. Quantity equals number of channels the unit supports.

--- Not for sale.

Available kits (purchase separately):

Kit	Description	Includes
24P852†	Pump repair	217, 224, 225, 226, 227, 228, 229, 232, 233, 234, and seal installation tool 15B661.
24P853†	Cylinder	216, 217, 234, and seal installation tool 15B661.
24P854◆	Pump rod	222, 223, 224, 225, 226
24P855◆	100-mesh filter	232, 236, 237
24P856★	Pressure relief valve	242, 243, 244, 245
24R025✓	Air motor	218, 238, 239
24R031✕	Melter	202, 204, 207, 211, 253, and insulator (53). See InvisiPac Systems parts starting on page 81 for insulator (53) identification.
24R040**	Kit, RTD Harness and Switch	125, 251, and 255. See Electrical Enclosure on page 85.
24R709 •	Assembled pump manifold	203, 206, 214, 216, 217, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 242, 243, 244, 245, 246, 247, 250, 251, 252, 255
24W594*	Melter base kit	201, 214, 254, 252
24W595	Filter rebuild kit	See Filter Rebuild Kit, 24W595 , page 110
---	Special tools	See Special Tools on page 94.

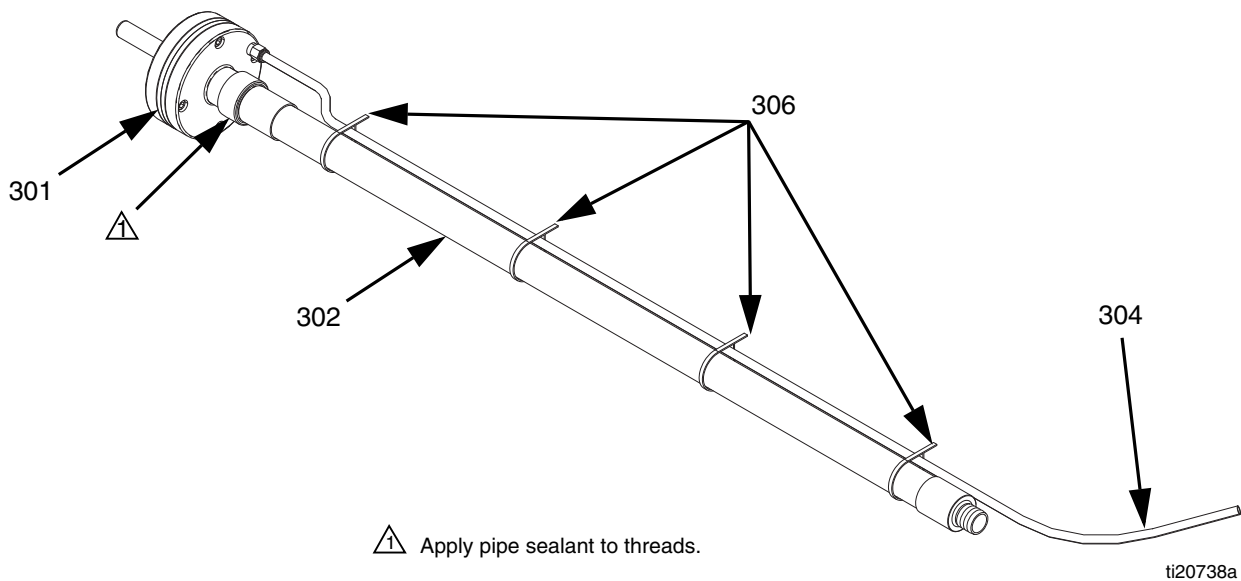
Air Motor, 24R025



24R025 Parts

Ref	Part	Description	Qty	Ref	Part	Description	Qty
501	---	COVER, lower, 2.5 in.	1	520	---	MANIFOLD, medium, short	1
502◆	108993	PACKING, o-ring	2	521★◆	---	ADHESIVE	1
503	---	BEARING, 9/16 in.	1	522	105444	BALL, 0.3 in.	4
504★◆	---	PACKING, o-ring, FKM	1	523	---	LABEL, identification	1
505	15M289	CYLINDER, motor, 2.5 in.	1	527†	24R026	VALVE, air, small	1
506	---	COVER, air motor	1	528	---	BRACKET, feed inlet assembly	1
507◆	---	SEAL, u-cup, FKM	2	--- Not for sale.			
508◆	---	GASKET, cover, small	2	★ Included in Air Motor Piston Kit 24R705 (purchase separately).			
509†◆	---	SEAL, air valve, manifold	1	◆ Included in Air Motor Seals Kit 24R706 (purchase separately).			
510	15M291	COVER, motor, 2.5 in.	1	† Included in Air Motor Valve Kit 24R026 (purchase separately).			
511†	---	SCREW, M6 x 25, thread forming	8				
512	15M314	SCREW, cap	2				
513	24R027	VALVE, pilot	2				
515	15M213	MUFFLER, 3/8	1				
516	---	GREASE, water-resistant	1				
517◆	---	RING, retaining	1				
518★	---	ROD, air motor, 2.5 in.	1				
519★	---	PISTON, air motor, 2.5 in.	1				

Feed System Shaker and Tube, 24T812



Parts

Ref	Part	Description	Qty
301	24P861	SHAKER	1
302	24N954	TUBE, steel	1
303†◆	---	TUBE, clear PVC, 1.3 in. (33 mm) OD	10
304	---	HOSE, nylon, 3/8 in. OD, 250 psi (1.7 MPa, 17 bar)	15.5
305◆	125370	CLAMP, hose, dia. 11/16 to 1-1/2 in.	3
306	125871	TIE, cable, 7.50 in. (190 mm)	4

--- Not for sale.

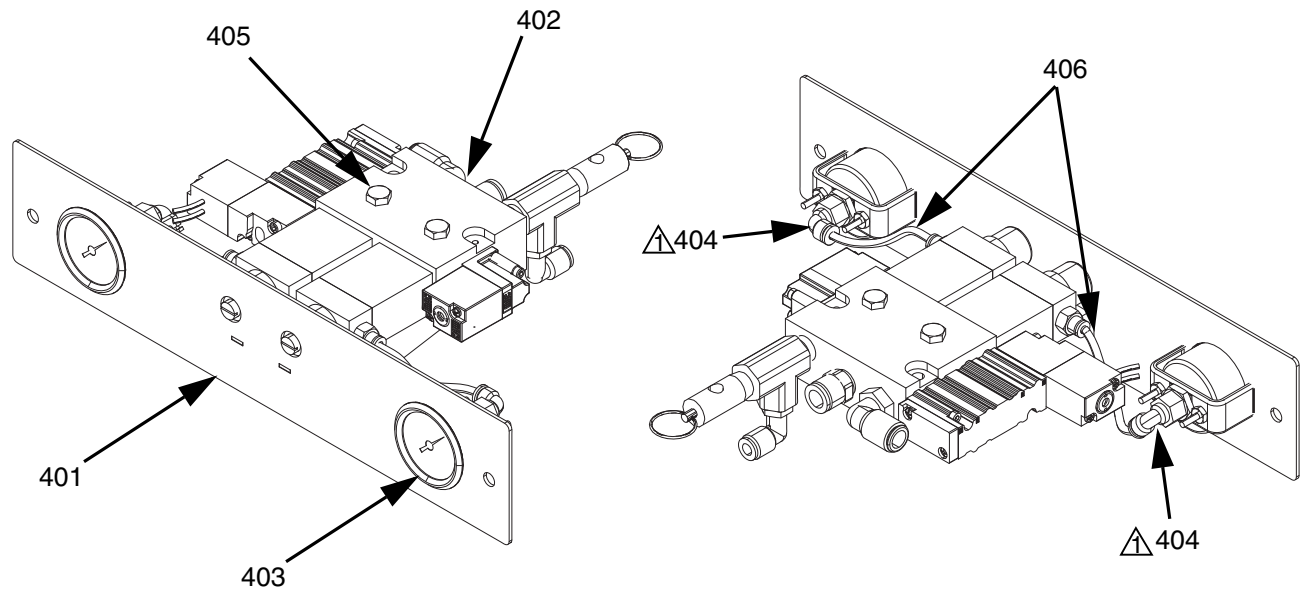
† 30 ft (9.1 m) Feed Hose Kit 24R043 also available (purchase separately). Kit also includes 2 hose clamps.

★ Included in Tubing Kit 24R030. See **System Parts** on page 84 for other kit contents.

◆ Not shown.

NOTE: Shaker Grounding Kit 24R708 (purchase separately) also available. Kit includes a grounding wire assembly, and a screw and washer for installing on the shaker tube (301).

Air Controls Assembly



ti20737a

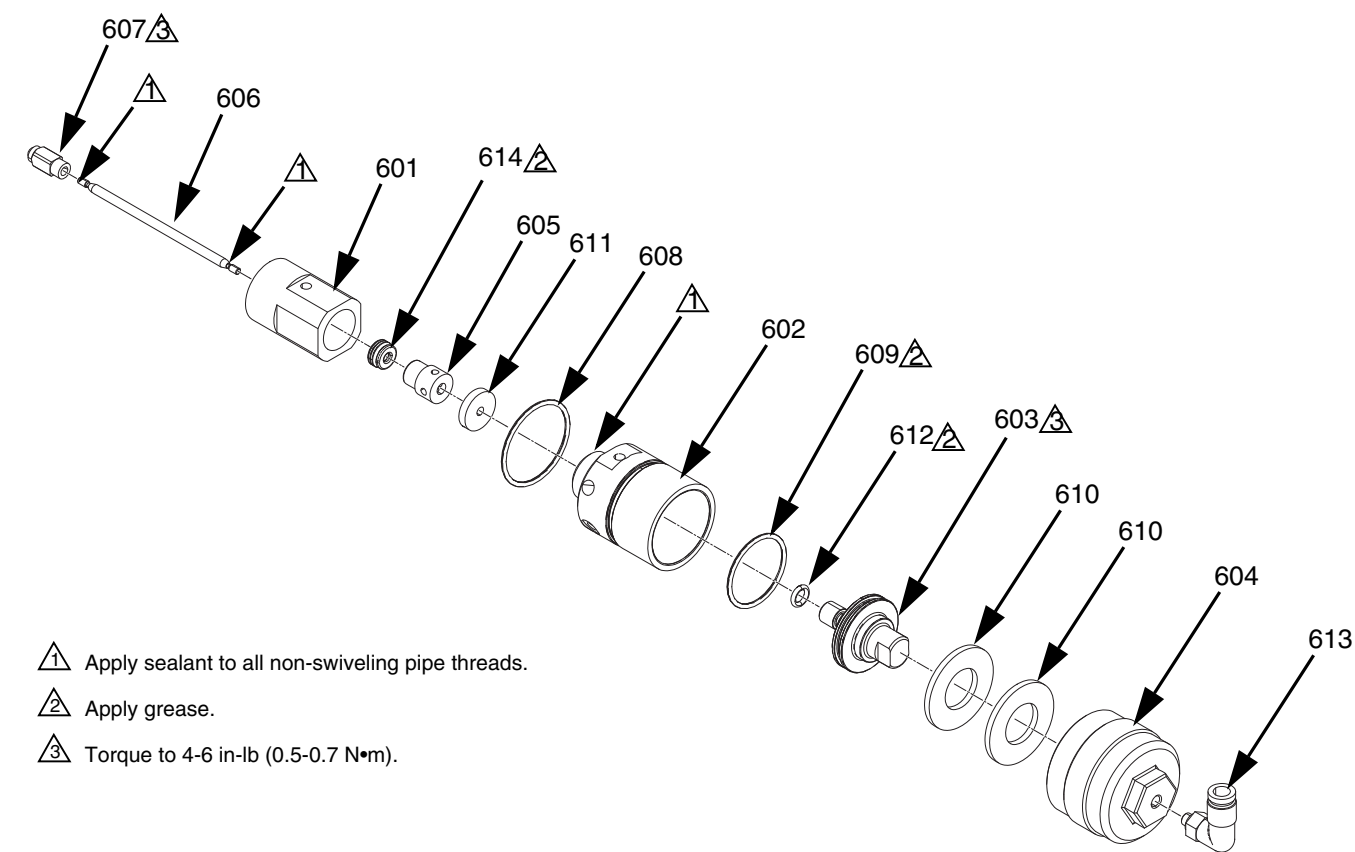
⚠ Apply sealant to all non-swiveling pipe threads.

Air Controls Assembly Parts

Ref	Part	Description	Qty
401	---	PANEL, air, controls	1
402	24R029	CONTROL, air, vacuum transfer and pump	1
403	15T500	GAUGE, pressure, air, panel mount, 1/8 in. npt	2
404	15T498	FITTING, 90 degree, swivel, 5/32 in. tube x 1/8 in. female npt	2
405	100058	SCREW, cap, hex head	2
406	054753	TUBE, nylon, round, black	2

--- Not for sale.

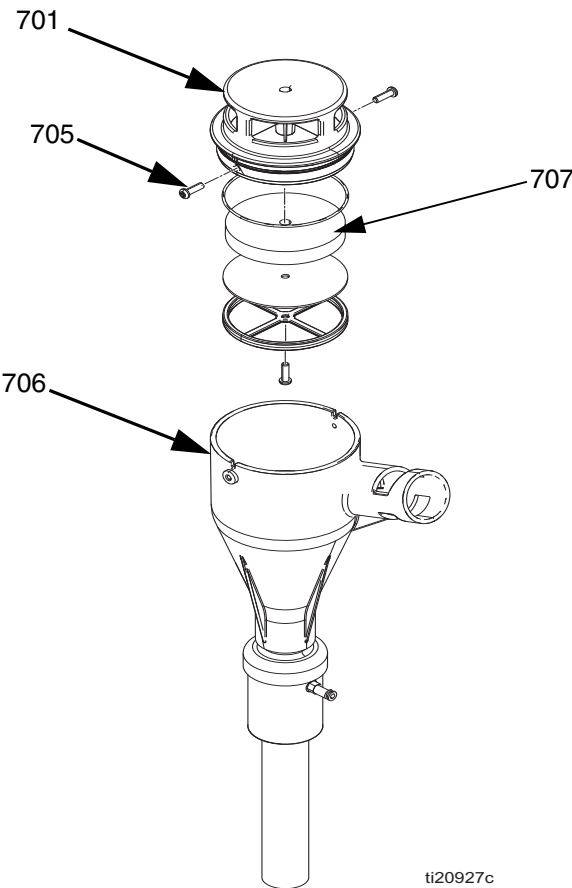
Pressure Relief Valve, 24P856



ti20926a

Ref	Part	Description	Qty	Ref	Part	Description	Qty	
601	---	BODY, fluid	1	610	111841	WASHER, plain 5/8 in.	2	
602	---	BODY, air	1	611†	---	BEARING, valve	1	
603	15T413	PISTON, air	1	612†	---	O-RING, FKM	1	
604	---	AIR CAP, valve	1	613	126474	FITTING, push to connect	1	
605	---	BEARING, shaft, needle	1	614†	---	SEAL, u-cup, relief valve	1	
606	---	SHAFT, needle, valve	1	---				Not for sale.
607	---	SOCKET, ball assembly	1	†				Parts included in Relief Valve Repair Kit 24P857 (purchase separately).
608†	108771	PACKING, o-ring	1					
609†	110073	PACKING, o-ring	1					

Feed Inlet Funnel, 17F461



ti20927c

Ref	Part	Description	Qty
701	262907	FILTER AND CAP ASSEMBLY	1
705	---	SCREW, #10-16, thread forming	2
706	---	FUNNEL, feed inlet	1
707	---	FOAM, screen, funnel	1

Inlet Funnel Filter Kit, 24U701

Ref	Part	Description	Qty
707	---	FOAM, screen, funnel	10

--- Not for sale.

Accessories

Special Tools

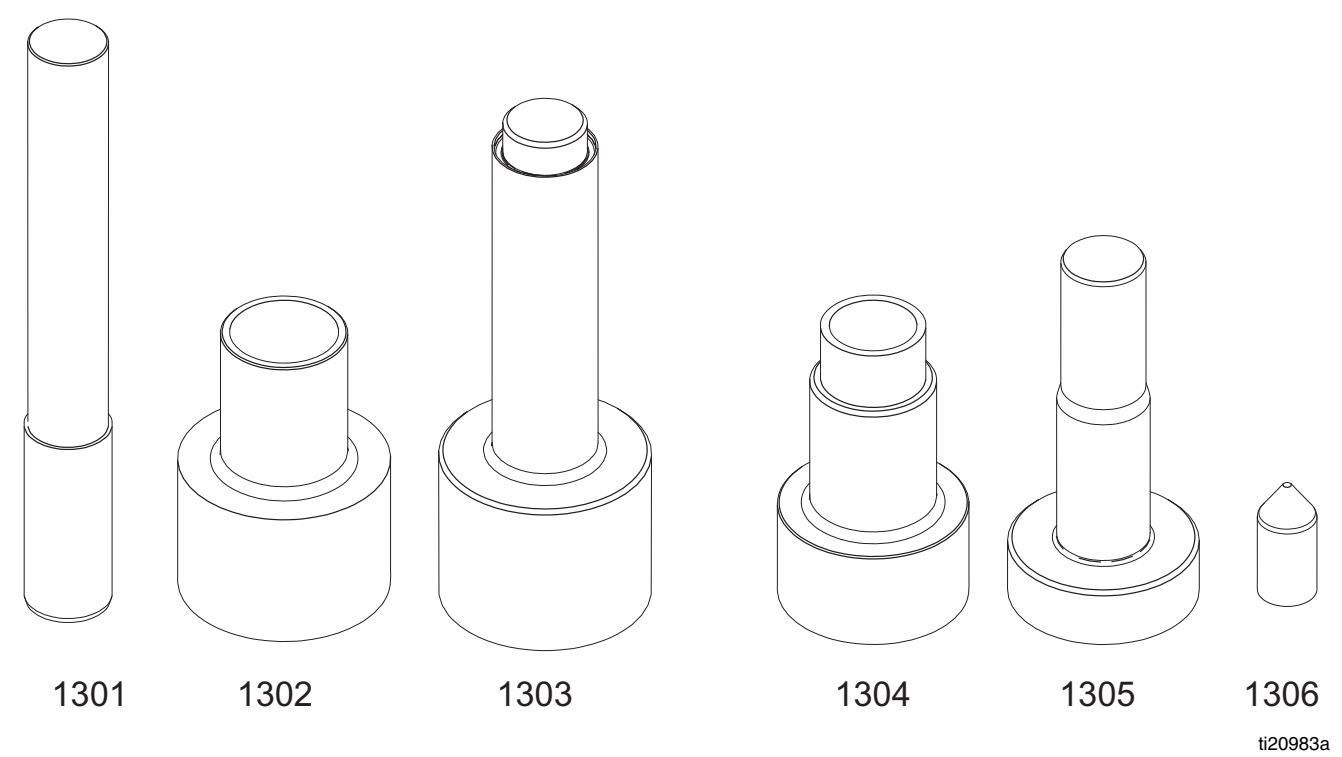
These special tools are designed to make system repairs as easy as possible while ensuring that parts do not get damaged.

Part	Purpose
1301*	Remove Cylinder
1302*	Install Cylinder - Female
1303*	Install Cylinder - Male

* Parts included in Cylinder Tools Kit 24R227 (purchase separately).

Part	Purpose
1304**	Install Rod - Female
1305**	Install Rod - Male
1306**	Install Rod - Bullet

** Parts included in Rod Tools Kit 24R228 (purchase separately).



Preventive Maintenance Kit

This kit contains components which are commonly used in maintenance.

Gen 1 HM25 Preventive Maintenance Kit, 24X865

Ref	Part	Description	Qty
1	24U701	Kit, Foam, Screen, Funnel	1
2	24W595	Kit, Filter Rebuild	2
3	24X967	Filter, Air, Repair	2
4	16T124	Filter, Screen, Wire	1
5	24P802	Kit, Gun Filter, 3pk	4
6	24X220	Switch, Reed	1
7	127110	Screw, #8-32	1
8	102360	Washer, Flat	1

Complete Maintenance Kit

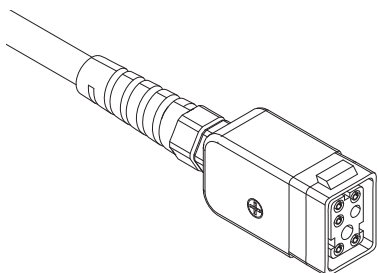
This kit contains repair components which are not part of regular preventive maintenance.

Gen 1 HM25 Complete Maintenance Kit, 24X869

Ref	Part	Description	Qty
1	24P856	Kit, Valve, Discharge	1
2	24P861	Kit, Shaker, Feed	1
3	24R027	Kit, Poppet	1
4	24R026	Kit, Valve, Motor	1
5	24R041	Kit, Level Sensor	1
6	24P852	Kit, Repair, Pump	1
7	127520	Kit, Power Supply	1
8	24R042	Kit, Board, Daught.	1
9	24R885	Kit, Cycle Switch	1
10	24V510	Kit, MZLP w/ fuses	1
11	24P859	Kit, Fuses, MZLP	1
12	24R039	Kit, Band Heater	1
13	24R037	Kit, 1500W Heat Rod	1
14	24R036	Kit, 1000W Heat Rod	1
15	24R034	Kit, 500W Heat Rod	1
17	127411	Jumper, OT	1

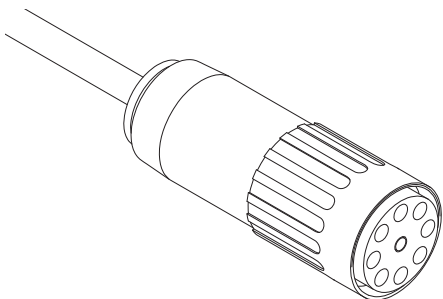
Non-Graco Gun Adapter Cables

16T916: For connecting to non-Graco guns that use a rectangular, 6-pin connector.



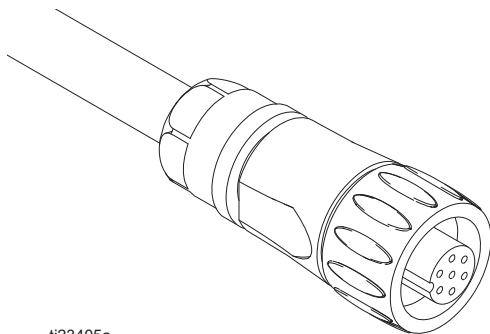
ti21128a

16T917: For connecting to non-Graco guns that use a circular, 9-pin connector.



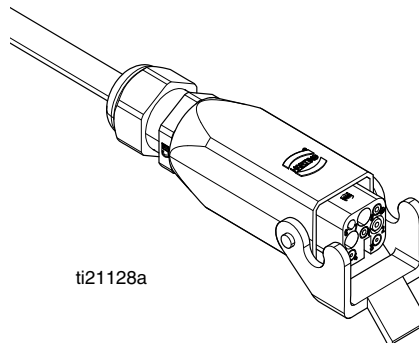
ti21129a

16Y828: For connecting to non-Graco guns that use a circular 6-pin connector. IPx6 rated.



ti23405a

128372: For connecting to non-Graco guns that use a rectangular 8-pin connector.



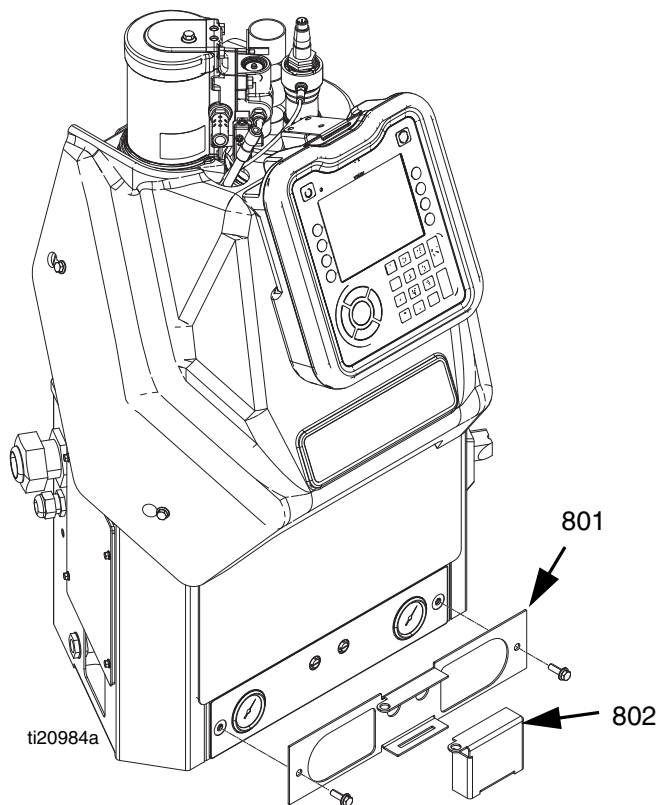
ti21128a

Non-Graco Gun Adapter Cable Installation

See **Attach Components** on page 13.

Air Adjustment Lock, 24R084

Panel enables locking access to the air adjustment screws.



NOTE: Screws are part of the base system and are not included in the kit.

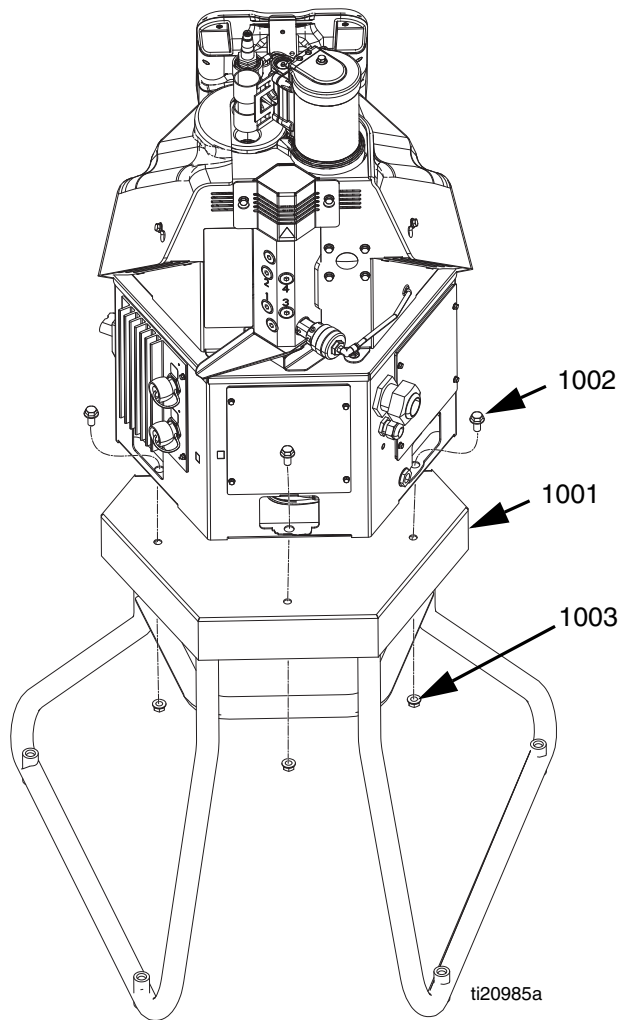
Ref	Part	Description	Qty
801	---	PANEL, lock, air control	1
802	---	BRACKET, lock, air control	1

Air Adjustment Lock Installation

1. Remove screws from system air panel.
2. Use screws to install panel (801).
3. Snap bracket (802) into panel (801).
4. Insert lock through hole in panel and bracket to lock access to the air controls. Lock not included in kit.

System Stand, 24R088

Use the stand to mount the system at eye level. When the system is mounted on the stand, the ADM is 45 in. (1.14 m) above the bottom of the stand.



Ref	Part	Description	Qty
1001	---	STAND	1
1002	112395	SCREW flange head cap	3
1003	112958	NUT, hex, flanged	3

System Stand Installation

1. Place stand (1001) in desired location.
2. Use bolt holes to bolt stand in place.
3. Place system on stand.
4. Use screws and nuts to secure system to stand.

Caster for Stand, 120302



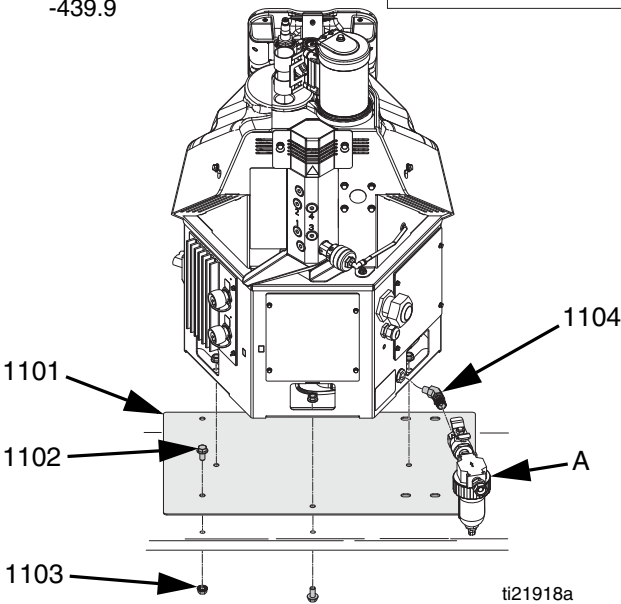
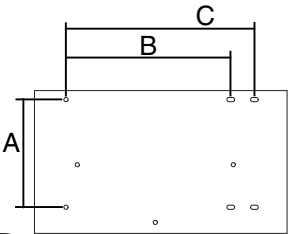
Caster with friction post mounts directly to system stand using no extra hardware. Four required. Casters raise stand an additional 4.25 in. (108 mm).

Adapter Plate, 24R083

Use this adapter plate to install InvisiPac in place of an existing hot melt applicator system.

Bolt Hole Dimensions

- A 9.8 in. (249 mm)
- B 14.843-15.157 in. (377.0-385.0 mm)
- C 17.003-17.317 in. (431.9-439.9)



Ref	Part	Description	Qty
1101	---	PLATE, adapter	1
1102	112395	SCREW flange head cap	6
1103	112958	NUT, hex, flanged	9
1104	121283	FITTING, elbow, 45 degree	1

Adapter Plate Installation

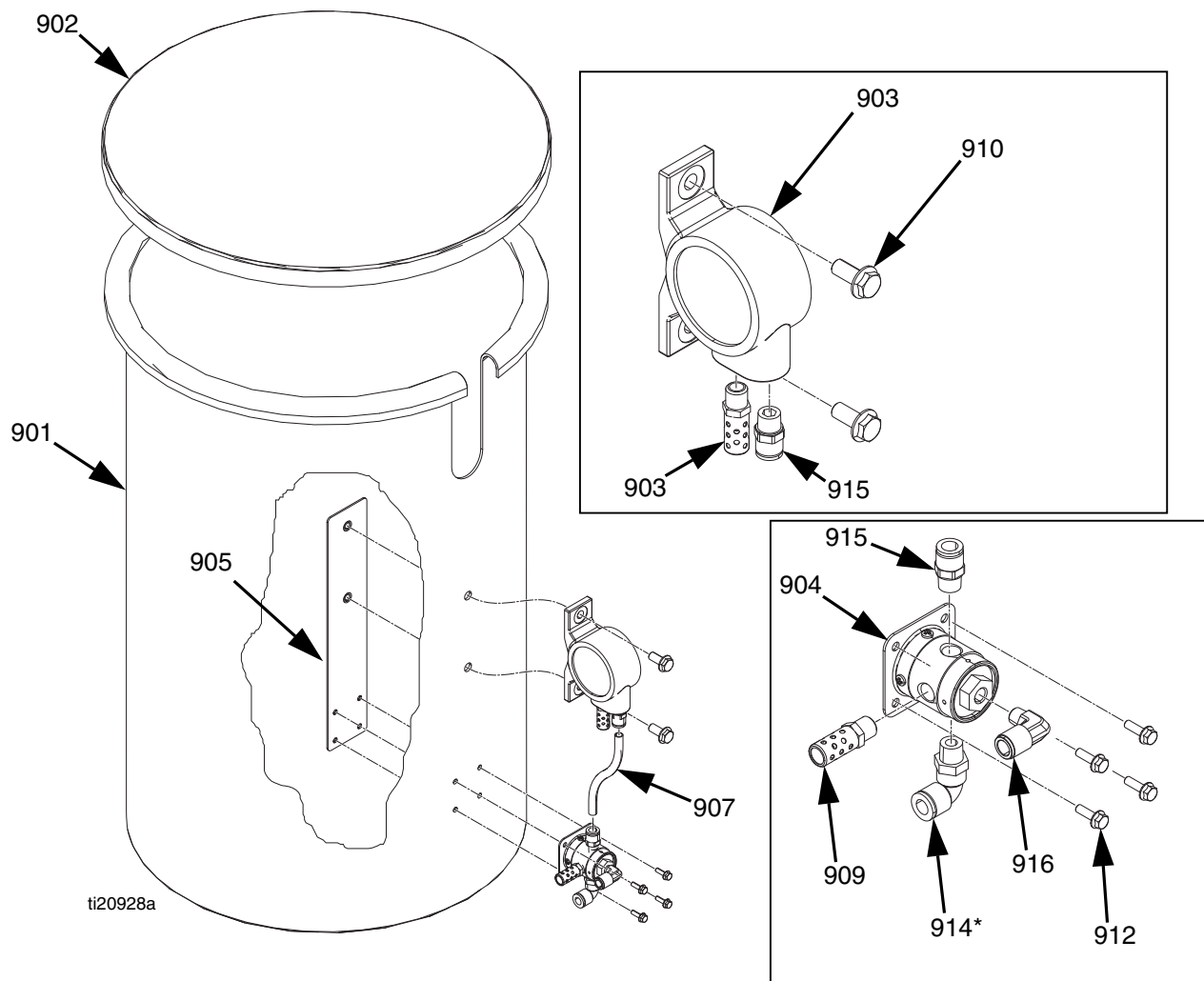
1. Remove existing hot melt applicator system.
2. Use six screws (1102) and six nuts (1103) to secure adapter plate (1101) through the existing holes from the previous system.
3. Align the InvisiPac system with the bolts on the adapter plate (1101) then place onto the adapter plate (1101).
4. Use the remaining three nuts (1103) to secure the InvisiPac system to the adapter plate (1101).
5. Use elbow fitting (1104) to install system air inlet filter (A, not included with kit).

30 Gallon Vibrating Hopper, 24R136

Hopper includes a shaker to ensure the adhesive pellets maintain a level surface at all times. Without this, the adhesive pellets can stick together, preventing them from continuously covering the vacuum transfer system's inlet. This would cause the vacuum transfer system to be unable to transfer the adhesive pellets.

Input Air Pressure Requirement: 100 psi (7 bar, 0.7 MPa)

Air Consumption: 17.1 scfm (29.1 cubic meters per hour)



Ref	Part	Description	Qty	Ref	Part	Description	Qty
901	---	HOPPER, 30 gallon	1	912	125857	SCREW, 10-24, serrated flange	4
902	---	LID, hopper, 30 gallon	1	914*	121141	FITTING, elbow, swivel, 3/8 in. tube connector, 1/4 male npt	1
903	126930	SHAKER, ball vibrator	1	915	120389	FITTING, tube	2
904	126929	VALVE, air pilot, 3-way, closed	1	916	---	CONNECTOR, tube, 90 degree	1
905	---	BRACKET, shaker, container	1	917	125539	FITTING, splitter, 3/8 in. OD tubing	1
907	---	HOSE, nylon, 3/8 in. OD, 250 psi (1.7 MPa, 17 bar)	1	---			Not for sale.
908	119798	CONNECTOR, tee, push-tube	1	*			Metric fitting included in Air Metric Fitting Kit, 24W637 , page 110.
909	113779	MUFFLER	1				
910	111192	SCREW, cap flange head	2				

30 Gallon Vibrating Hopper Installation

See FIG. 56 for illustration of installed vibrating hopper.

1. Turn main power switch OFF.
2. With the steel shaker rod fully assembled and the 3/8 in. OD air line connected to the shaker head, cut the 3/8 in. OD air line where the 1.3 in. clear vacuum transfer hose connects to the steel shaker rod.
3. Use the splitter fitting (917) to reconnect the 3/8 in. OD air line that was just cut.
4. Install the 48 in. section of 3/8 in. OD hose supplied with the kit into the remaining connection on the splitter fitting (917).
5. Connect the other end of the 48 in. section of 3/8 in. OD air line to elbow fitting (916) on the piloted air valve.
6. Connect shop air to elbow fitting (914) on the piloted air valve. Shop air must be capable of 100 psi (0.7 MPa, 7 bar).
7. Place steel shaker rod assembly into hopper (901) with steel rod resting in the hopper groove in the rim of the hopper.
8. Place lid (902) on hopper (901).

NOTE: The piloted air valve must use shop air. Adding a tee at the system inlet to run the hopper shaker may impact pump and vacuum transfer performance.

NOTE: The hopper shaker will be active while the vacuum transfer system is transferring pellets.

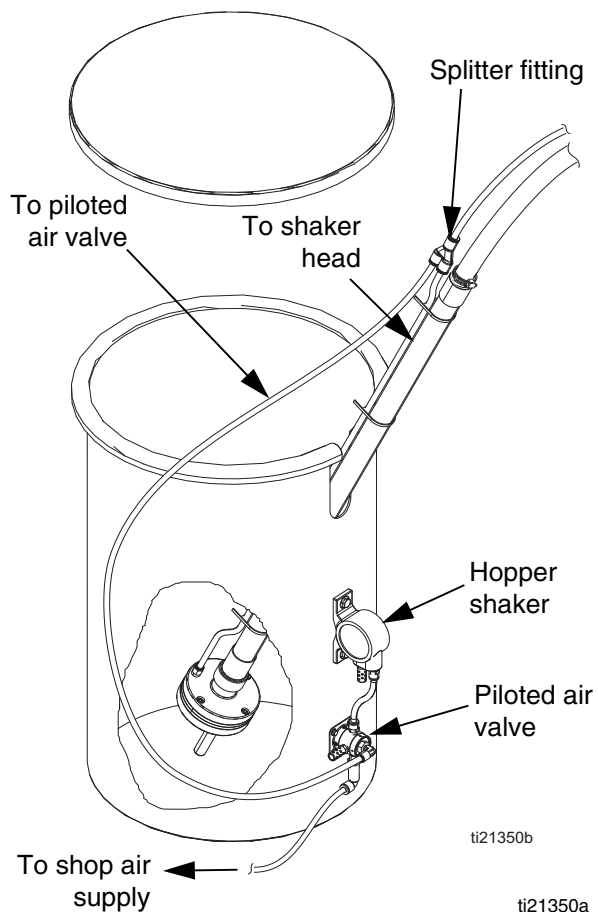
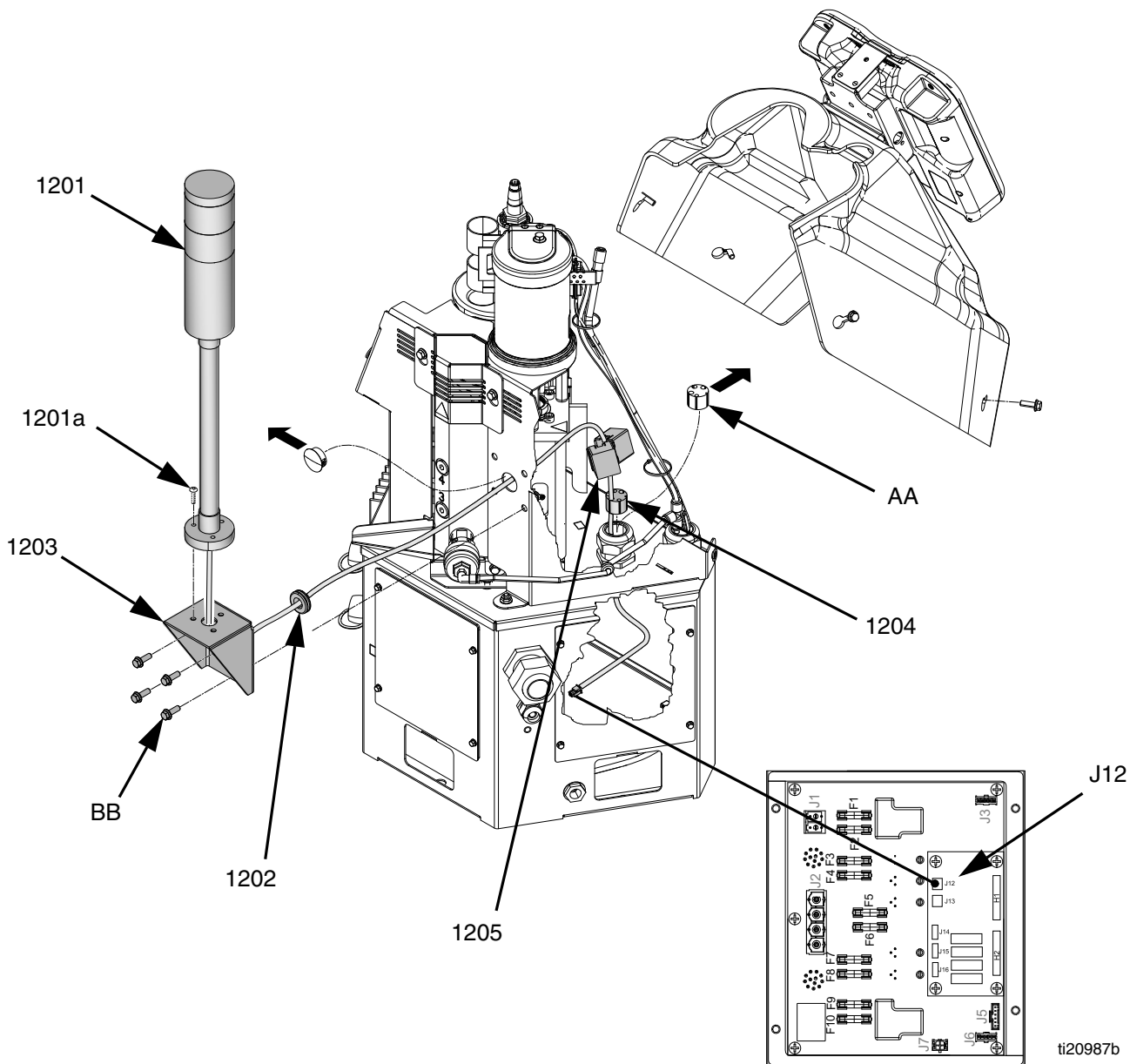


FIG. 56

Light Tower Kit, 24R226

The light tower enables someone away from the system to quickly see whether the system is inactive or OFF (no lights), warming up (flashing green), at temperature (solid green), or has an active error (red).



24R226 Parts

Ref	Part	Description	Qty
1201	16T102	LIGHT, tower, red and green	1
1201a	---	SCREW	3
1202	---	GROMMET, single cable	1
1203	16K322	BRACKET, light tower	1
1204	---	GROMMET, multiple wires	1
1205	125835	CLIP, ferrite bead	1

--- Not for sale.

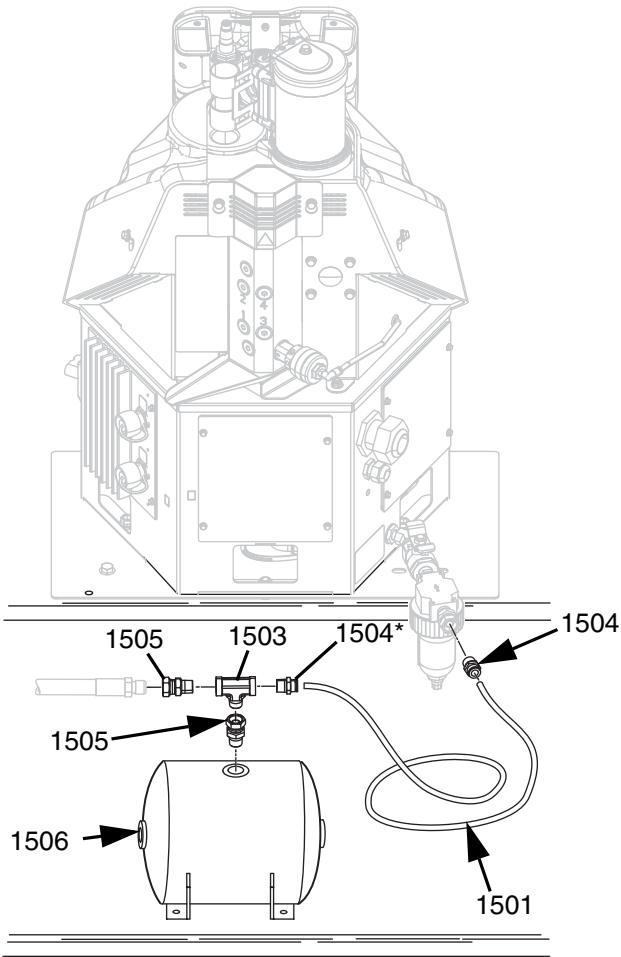
Light Tower Kit Installation



- 1. Turn main power switch OFF.
- 2. Disconnect cable from ADM, push cable through plastic shroud, then remove shroud from system.
- 3. Remove existing grommet (AA) from electrical enclosure then install new grommet (1204) in its place.
- 4. Insert grommet (1202) into hole on the light tower bracket (1203).
- 5. Remove bolts (BB) from metal shroud on the system then use the bolts (BB) to secure bracket (1203) to metal shroud.
- 6. Route light tower cable through hole in bracket (1203) then use supplied light tower screws (1201a) to install light tower (1201).
- 7. Remove electrical enclosure front access door.
- 8. Route light tower cable through the other hole in the bracket (1203), then through the grommet (1204) into the electrical enclosure.
- 9. Connect light tower cable to MZLP connector labeled J12.

Air Reservoir Kit, 16W366

This kit allows the system to operate as low as 60 psi (0.4 MPa, 4 bar).



16W366 Parts

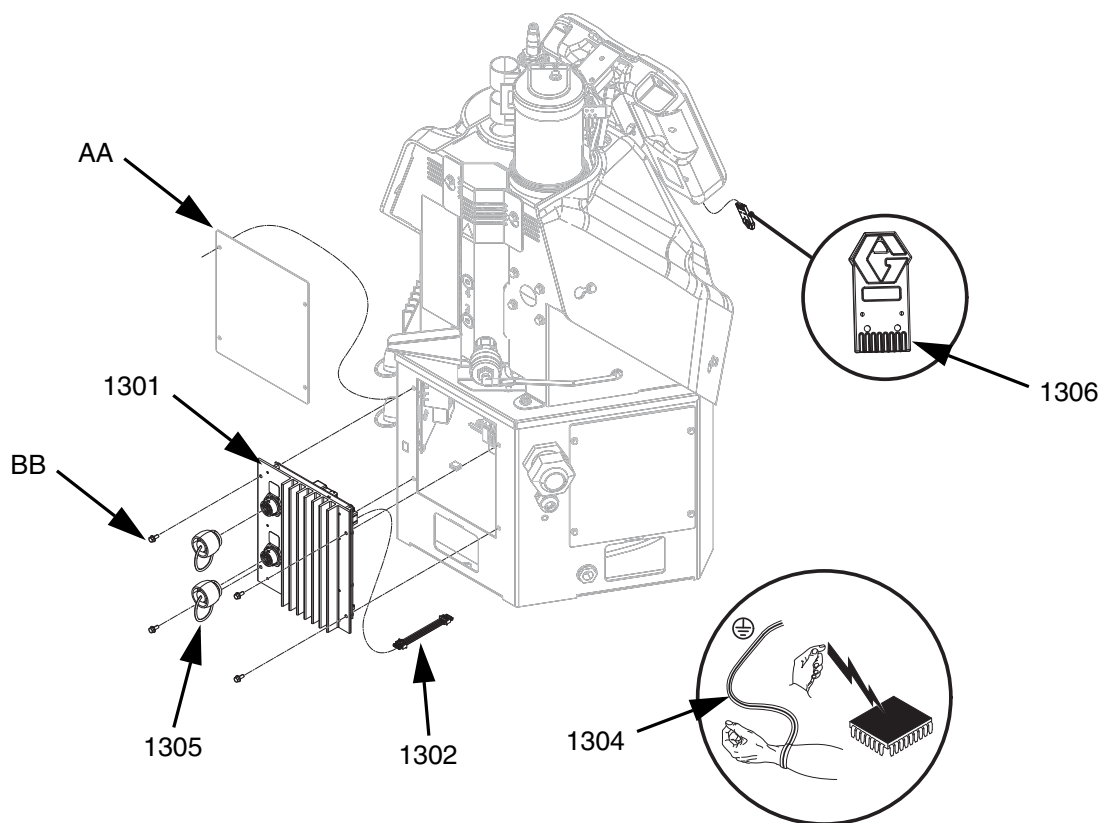
Ref	Part	Description	Qty
1501	---	HOSE, nylon (6 ft)	1
1502	100081	BUSHING, pipe	1
1503	113777	TEE, branch	1
1504*	114485	CONNECTOR, male, 3/8 npt	2
1505	155665	UNION, adapter	1
1506	---	TANK, air, accumulator	1

--- Not for sale.

* Metric fitting included in **Air Metric Fitting Kit, 24W637**, page 110.

4 Channel Upgrade Kit, 24R237

Use this kit to upgrade a 2 channel system to a 4 channel system.



ti20988a

Ref	Part	Description	Qty
1301	---	MODULE, GCA, MZLP	1
1302	16T087	CABLE, jumper, male/male, 4 in.	1
1303	16T201	HARNESS, 2nd MZLP power	1
1304	112190	STRAP, wrist, grounding	1
1305	16T440	CAP, jam nut, sealing	2
1306	24R324	SOFTWARE UPGRADE TOKEN, InvisiPac System	1

◆ Not shown.

4 Channel Upgrade Kit Installation



1. Disconnect plug from power outlet or turn off circuit breaker for incoming power.
2. Place grounding wrist strap (1304) over your wrist and secure other end to a grounded surface.
3. Set MZLP rotary switch to "1" on MZLP with daughter card.
4. Set MZLP rotary switch to "2" on MZLP without daughter card.
5. Remove screws (BB) then remove plate (AA) from system.
6. Use screws (BB) to install MZLP (1301) onto system.

NOTE: The new MZLP (1301) will be referred to as MZLP 2, and the original MZLP that came with the system will be referred to as MZLP 1 from here on. See FIG. 57.

7. Remove electrical enclosure front access door.

NOTE: Do not force the electrical connection. Minimal force is required to seat the connector. If resistance is felt, stop and verify the connector orientation. Verify the connector has 'Locked' by gently pulling on the white connector housing.

8. Move CAN connector from MZLP 1 connector J3 to MZLP 2 connector J6. See FIG. 57.
9. Move power cable (CC) from MZLP 1 connector J6 to MZLP 1 connector J3. See FIG. 57.
10. Connect jumper cable (1302) to MZLP 1 connector J6 and connect other end of jumper cable (1302) to MZLP 2 connector J3. See FIG. 57.
11. Connect wires from power harness (1303) to connectors as labeled on the plastic connector.
12. Connect power harness (1303) to MZLP 2 connector J2.

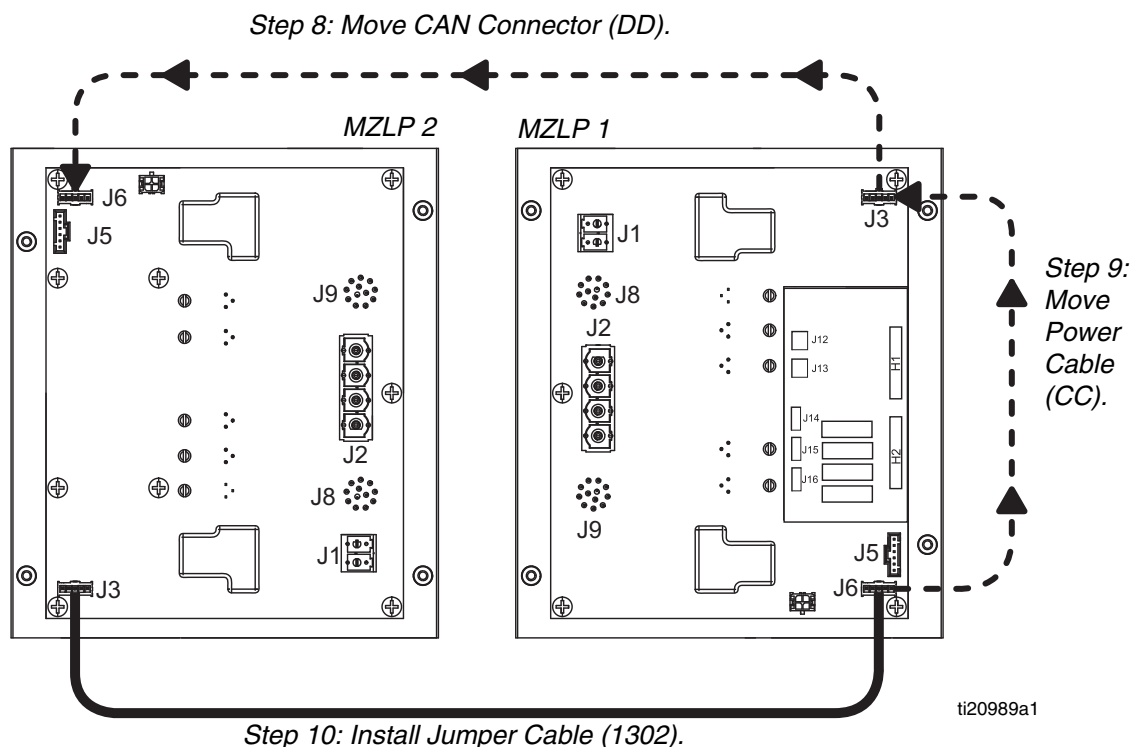
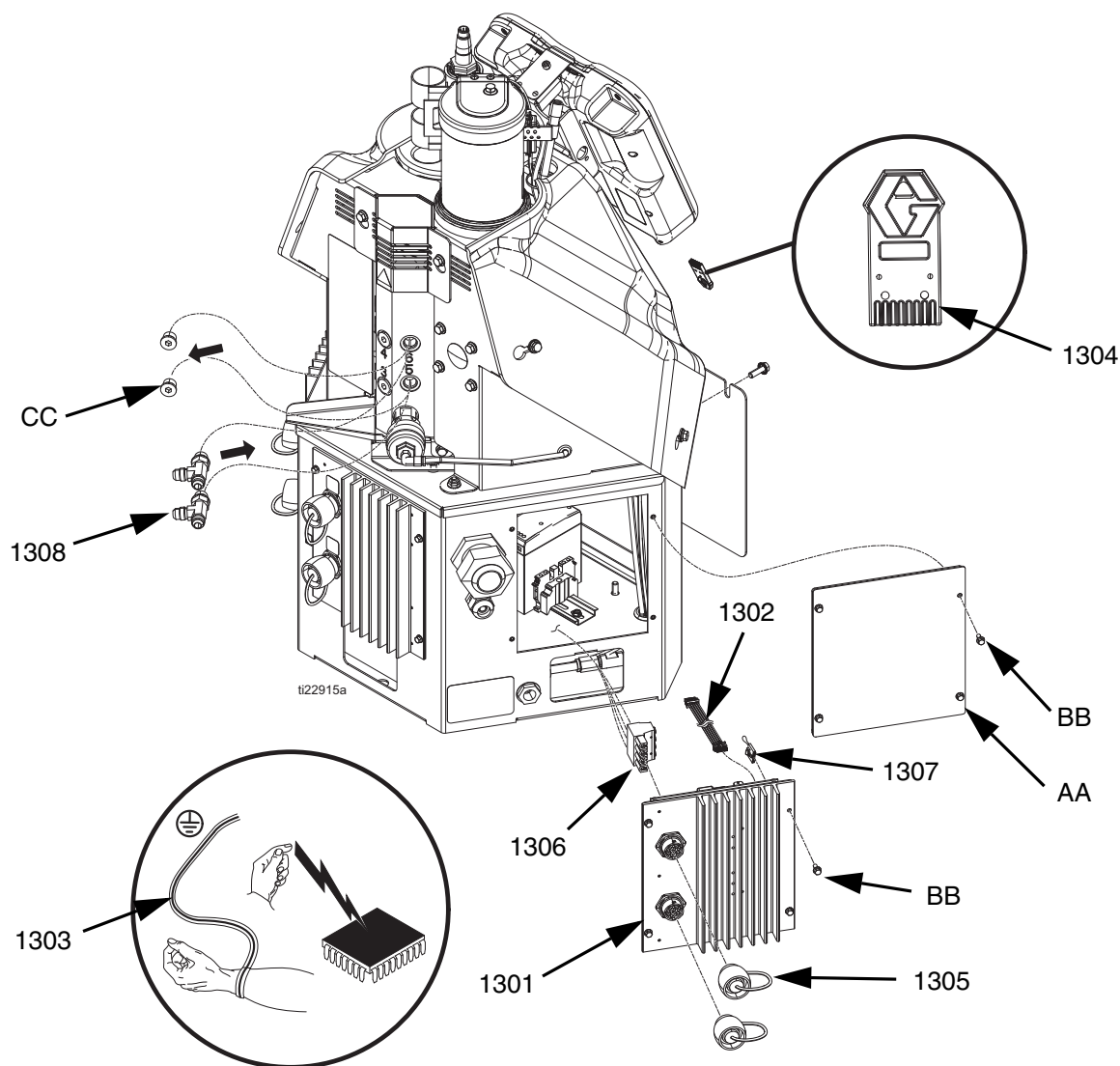


FIG. 57

6 Channel Upgrade Kit, 24U575

Use this kit to upgrade a 4 channel system to a 6 channel system.



Ref	Part	Description	Qty	Ref	Part	Description	Qty
1301	---	MODULE, GCA, MZLP	1	1304	24R324	TOKEN, software upgrade	1
1302	16T087	CABLE, jumper, male/male, 4 in.	1	1305	16T440	CAP, jam nut, sealing	2
1303	112190	STRAP, wrist, grounding	1	1306	16W034	HARNESS, MZLP #3	1
				1307	16W035	CONNECTOR, jumper	1
				1308	127208	FITTING, tee	2

6 Channel Upgrade Kit Installation

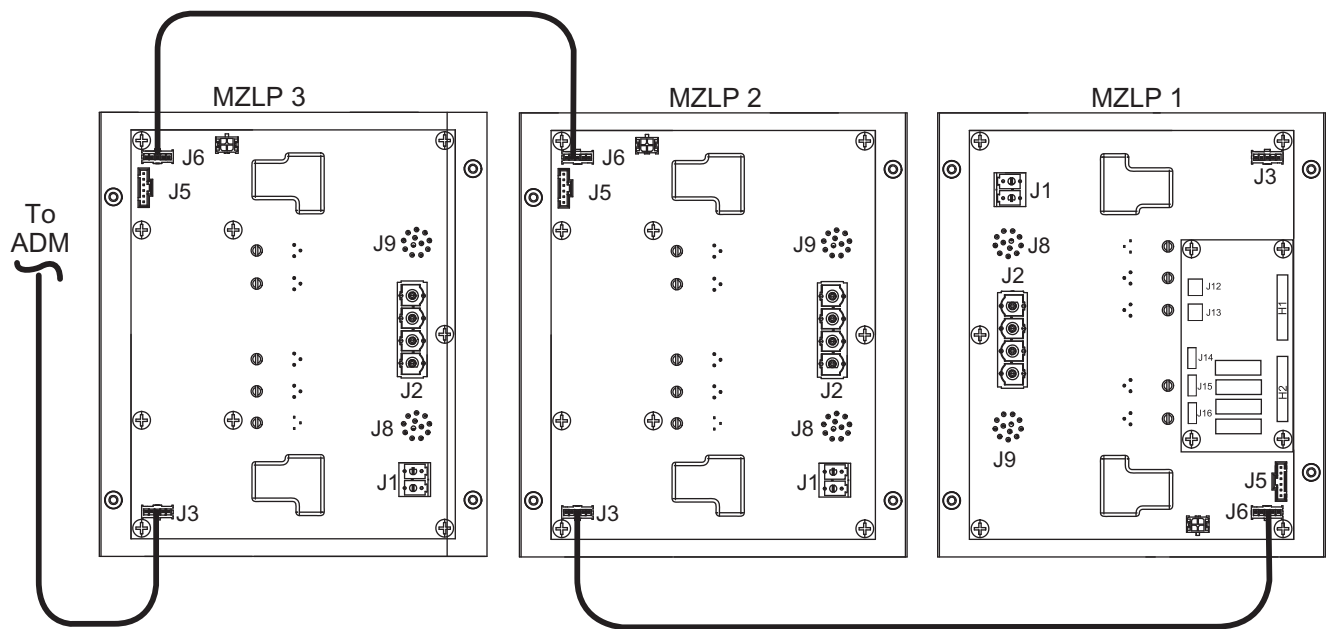


1. Disconnect plug from power outlet or turn off circuit breaker for incoming power.
2. Place grounding wrist strap (1303) over your wrist and secure other end to a grounded surface.
3. Set MZLP (1301) rotary switch to "3".
4. Remove screws (BB) then remove plate (AA) from system.
5. Use screws (BB) to install MZLP (1301) onto system.
6. Remove electrical enclosure front access door.
7. Move ADM CAN connector from MZLP 2 connector J6 to MZLP 3 connector J3. See FIG. 58.
8. Connect CAN jumper cable (1302) to MZLP 2 connector J6 and connect other end of jumper cable (1302) to MZLP 3 connector J6. See FIG. 58.
9. Install jumper connector (1307) in J5 on MZLP 3.
10. Connect wires from power harness (1306) to connectors as labeled on the plastic connector.
11. Connect power harness (1306) to MZLP 3 connector J2.
12. Remove plugs (CC) from fluid manifold and replace with tee fittings (1308).

NOTE: Do not force the electrical connection. Minimal force is required to seat the connector. If resistance is felt, stop and verify the connector orientation. Verify the connector has 'Locked' by gently pulling on the white connector housing.

NOTE: The new MZLP (1301) will be referred to as MZLP 3, and the original MZLPs that came with the system will be referred to as MZLP 1 and MZLP 2 from here on. See FIG. 58.

Step 8: Install jumper cable (1302).



Step 7: Move ADM CAN connector.

ti22916a

FIG. 58

Single-Phase 480V to 240V Transformer, 24U169

This transformer must be installed by a qualified electrician to operate 240V InvisiPac units with single-phase 480V electrical supply.

NOTE: When using transformer 24U169, the ADM amp limit must be set to 30 amps and power type set to single phase. See step 4 of **Select ADM Settings** on page 20.

24U169 Electrical Specifications:

Phase: Single
 Frequency: 60 Hz
 kVa: 7.5 kVa
 K Rating: 1
 Primary Config.: 2 winding
 Secondary Config.: 2 winding
 Winding material: Copper
 Connection: Wire leads

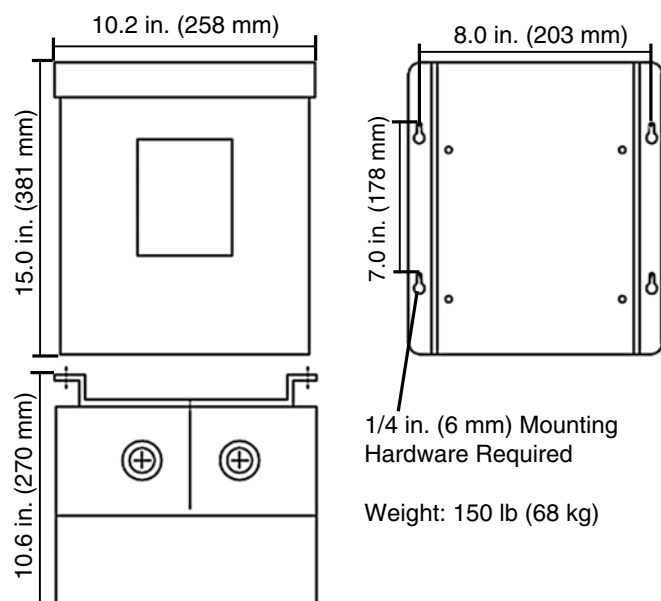
24U169 Mechanical Specifications:

Temperature Rise: 115°C (239°F)
 Insulation Sys.: 180°C (356°F)
 Cooling Sys.: Air/Dry
 Construction: Enclosed-encapsulated core and coil
 Enclosure: Steel, NEMA 3R

24U169 Approvals:

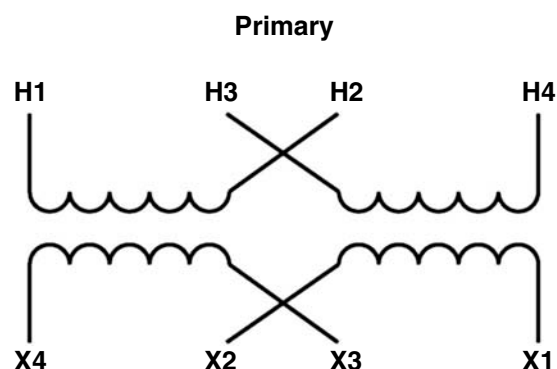
Approvals: UL listed, cUL listed, CSA approved
 Sound level: Below NEMA standards

24U169 Mounting Information:



24U169 Wiring:

Primary Voltage	Secondary Voltage	Taps
240 x 480	120/240	None



Volts	Connections	Line Leads
480	H2 - H3	H1, H4
240	H1 - H3, H2 - H4	H1, H4
240	X2 - X3	X1, X4
240/120	X2 - X3	X1, X2, X4
120	X1 - X3, X2 - X4	X1, X4

InvisiPac ADM Simulator Kit, 24R323

Use this kit to train users in ADM operation without using the full InvisiPac system. Kit includes everything necessary to simulate the ADM screens. Does not include an InvisiPac system.

Ref	Part	Description	Qty
1401	24P860	MODULE, Advanced Display (ADM)	1
1402	124149	POWER SUPPLY, GCA	1
1403	---	CORD SET, US, MX, PR, CA, TW, 115V, 10A	1
1404	24R322	TOKEN, InvisiPac Simulator	1
1405	24R324	SOFTWARE UPGRADE TOKEN, InvisiPac System	1

Simulator Instructions

1. Remove ADM access panel and install InvisiPac Simulator Token (1404).

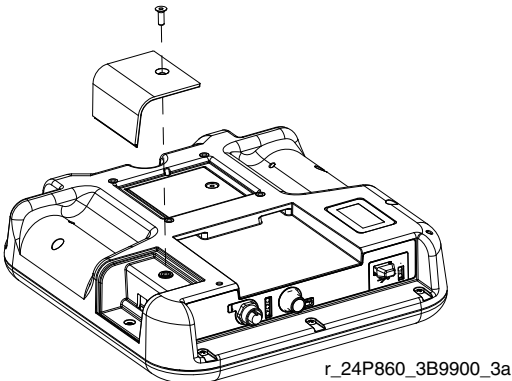
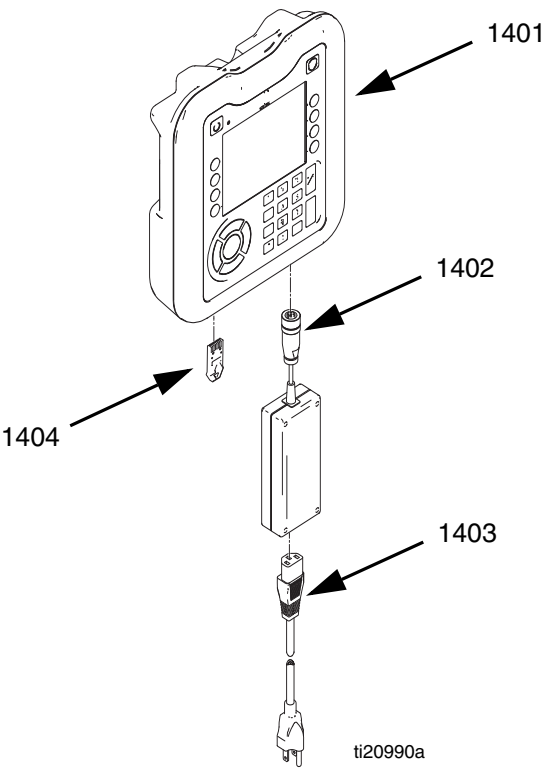
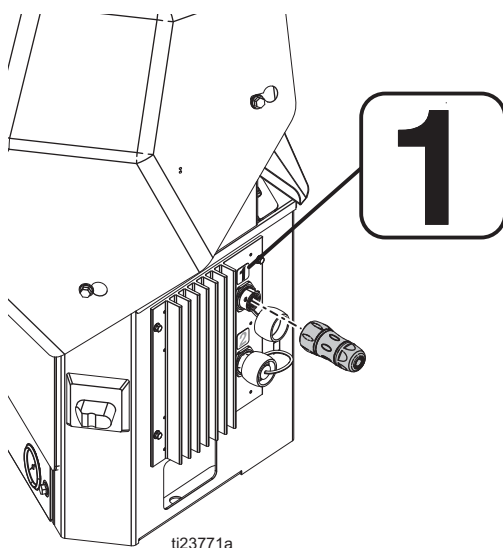


FIG. 59: Remove Access Panel

2. Connect power supply (1402) to ADM (1401).
3. Connect cord (1403) to power supply (1402).
4. Perform **Software Update Procedure** on page 74.

Overtemperature Jumper, 16Y727

Use the Overtemperature jumper plug to run the InvisiPac melter without a hose and gun attached to the Channel 1 electrical connection.



Installation

1. In the ADM setup screens, uninstall Channel 1. All other Channels can be installed or uninstalled as needed.

06/08/15 15:18		PC Setup	System	Advanced
HM25 Inactive		No Active Errors		
Channel	Installed	Gun RTD Type		
1	☒	Pt, 100Ω (385)		
2	☒	Pt, 100Ω (385)		
3	☒	Pt, 100Ω (385)		
4	☒	Pt, 100Ω (385)		
5	☒	Pt, 100Ω (385)		
6	☒	Pt, 100Ω (385)		

NOTE: Failure to uninstall Channel 1 on the ADM setup screens will result in several Alarms regarding Channel 1 when there is no hose/gun attached to Channel 1.

2. Attach the Overtemperature jumper plug to Channel 1.
3. The ADM should have zero Active Alarms. The melter is now ready to run without a hose and gun attached to Channel 1.

Strain Relief Bushing Kit, 24X190

The strain relief bushing kit allows the use of a smaller outside diameter (OD) power cord. This strain relief bushing is intended for power cords with an OD of 0.512-1.024 in (13-26 mm).

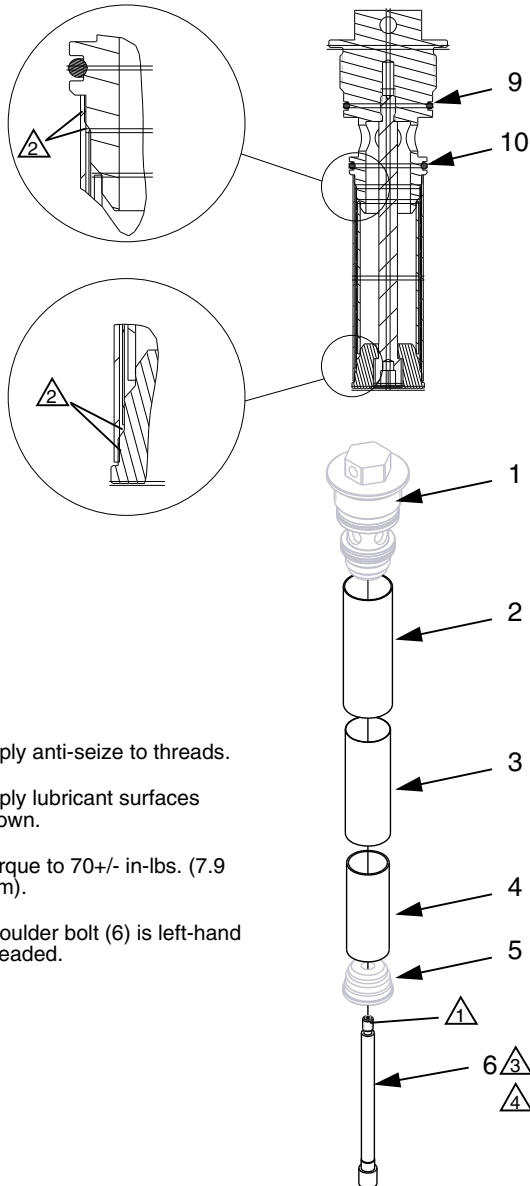
Installation

1. Remove standard strain relief bushing (106). Retain and reuse nut.
2. Install strain relief bushing from kit and secure with retained nut.

Filter Rebuild Kit, 24W595

NOTICE

Shoulder bolt (6) is left-hand threaded. To prevent damage to the threads, turn clockwise to remove and counterclockwise to tighten.



- 1 Apply anti-seize to threads.
- 2 Apply lubricant surfaces shown.
- 3 Torque to 70+/- in-lbs. (7.9 N•m).
- 4 Shoulder bolt (6) is left-hand threaded.

Ref.	Part	Description	Qty.
1✖	16T383	HOUSING, filter	1
2	126671	SCREEN, perforated	1
3	126672	SCREEN, 100 mesh	1
4	126673	SCREEN, wire	1
5✖	16T382	CAP, filter	1
6	126674	BOLT, shoulder	1
9	113944	PACKING, o-ring	1
10	15K234	PACKING, o'ring	1

✖ *Not included. Reuse parts when replacing filter screens.*

Air Metric Fitting Kit, 24W637

For replacing air fittings with metric air fittings on Invisi-Pac systems. See manual 334358 for installation instructions.

Ref.	Part	Description	Qty.
1	127922	FITTING, 3/8 npt(m) x M18(f)	1
2	127923	FITTING, 1/4 npt(m) x 10 mm tube	1
3	127924	FITTING, 1/4 npt(m) x 10 mm 90° elbow tube	1
4	127925	FITTING, 3/8-18 npt(m) x 3/8-19 bspt (f)	1

Material Tracking Kit, 24Y162

Ref.	Part	Description	Qty.
1	124333	CABLE, extension, M12, 5M	1
2	128069	SENSOR, reflector	1
3	128070	BRACKET, angled	1
4	128071	BRACKET, straight	1
5	128072	SENSOR, polarized	1
6	128073	SENSOR, diffuse	1
7	16U422	TOKEN, software upgrade	1

Appendix A - ADM

General Operation

ADM Power

The ADM automatically turns on when the main power switch is turned ON.

Screen Navigation

To switch between the Setup and Operation screens, press . Use , , , and  to navigate between screens.

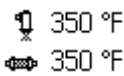
NOTE: For information on InvisiPac Pattern Controller screens, see manual 334784.

Enable, Disable Heating System

To enable or disable the entire heating system, press . To set which channels are active when the heating system is enabled, use the System 2 screen. See page 114.

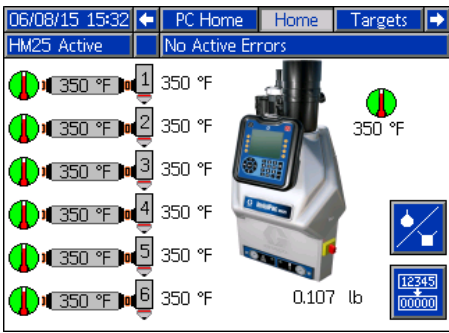
Icon Identification

Icon	Description
Operation Screens Only	
	Heating disabled
	Warming up, actual temperature is below setting
	Temperature setting achieved
	Actual temperature of hose (left) and gun (right)
	Actual temperature of system (shown warming up)
	System temperature setting. Use  and  to adjust setting.

Icon	Description
	Use the physical numeric keypad on ADM to enter temperature setting.
	Select channel to view and/or edit the gun or hose temperature setting
 350 °F	gun temperature setting. Use  and  to adjust setting.
 350 °F	Hose temperature setting. Use  and  to adjust setting.
	Use to adjust temperature settings
 350 °F 350 °F	Temperature settings of gun (top) and hose (bottom)
	Reset weight total
	Reset material target
Setup Screens Only	
	Enter screen to change settings
	Exit screen
	Reset Maintenance error
Schedule Screen Only	
	Edit schedule value
	Erase schedule value
	Accept schedule change
	Cancel schedule change

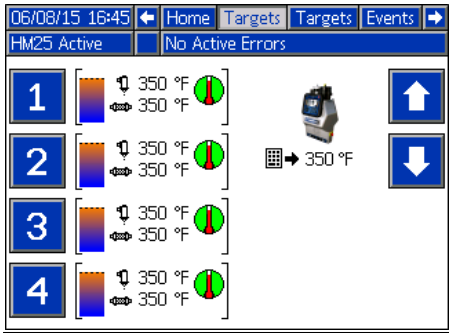
Operation Screens

Home



This screen shows the actual temperatures of the system melter and each gun and hose.

Targets



This screen shows and allows editing of the temperature settings for the system melter and each gun and hose. See **Select ADM Settings** on page 20.

Events

06/08/15 15:25	←	Targets	Events	Errors	→
HM25 Inactive		No Active Errors			
Date	Time	Code	Description	↑	
06/08/15 15:25	ECD1	Setpt. Changed	CH1 Gun	18	
06/08/15 15:25	EBDX	Heat Off		19	
06/08/15 15:24	EADX	Heat On		20	
06/08/15 15:24	ECOX	Setup Value(s) Changed		1	
06/08/15 15:18	EBDX	Heat Off		2	
06/08/15 15:18	EADX	Heat On		3	
06/08/15 14:52	ERD1	Pump Weight Tot. Reset		4	
06/08/15 14:51	ELOX	System Power On			
06/08/15 14:51	EMOX	System Power Off			
06/08/15 14:51	EVUX	USB Disabled		↓	

The Events screens store a maximum of 200 events. The events list can be downloaded in the USB logs. See **Appendix B - USB Downloading, Uploading** on page 117.

Tracked Events	Code
Custom Language Downloaded	EQU3
Custom Language Uploaded	EQU4
Fill Valve Closed	EBFX
Fill Valve Open	EAFX
Heat Off	EBDX
Heat On	EADX
High Material Usage	ECAH
Logs Downloaded	EQU5
Low Material Usage	ECAL
Material Target Reset	ERM1
Pump Cycles Total Reset	ERD1
Pump Off	EBPX
Pump On	EAPX
Red Stop Button Pressed	EB0X
Setup Value Changed	EC0X
System Power Off	EM0X
System Power On	EL0X
System Settings Downloaded	EQU1
System Settings Uploaded	EQU2
USB Disabled	EVUX
USB Drive Inserted	EAUX
USB Drive Removed	EBUX
User Maintenance Count Reset	ERN1
Setpoint Changed	ECD(*)

* Zone

Errors

06/08/15 16:50	Events	Errors	Diagnostic
HM25 Inactive	No Active Errors		
Date	Time	Code	Description
06/08/15 14:49	CAC3	Comm. Error	MZLP 3
06/08/15 14:49	CAC2	Comm. Error	MZLP 2
06/08/15 14:49	CAC1	Comm. Error	MZLP 1
06/08/15 14:49	CACX	Comm. Error	System I/O
06/08/15 12:27	CAC3	Comm. Error	MZLP 3
06/08/15 12:27	CAC2	Comm. Error	MZLP 2
06/08/15 12:27	CAC1	Comm. Error	MZLP 1
06/08/15 12:27	CACX	Comm. Error	System I/O
06/08/15 12:25	CAC3	Comm. Error	MZLP 3
06/08/15 12:25	CAC2	Comm. Error	MZLP 2

The Errors screens store a maximum of 200 errors. See **ADM Error Code Table** on page 40. The errors list can be downloaded in the USB logs. See **Appendix B - USB Downloading, Uploading** on page 117.

Diagnostic

06/08/15 15:26	Errors	Diagnostic	PC Control
HM25 Inactive	No Active Errors		
Melter:	0.00 A	71.6 °F	0 %
Gun 1:	0.00 A	71.6 °F	0 %
Hose 1:	0.00 A	71.6 °F	0 %
Gun 2:	0.00 A	71.6 °F	0 %
Hose 2:	0.00 A	71.6 °F	0 %
Gun 3:	0.00 A	71.6 °F	0 %
Hose 3:	0.00 A	71.6 °F	0 %
Gun 4:	0.00 A	71.6 °F	0 %
Hose 4:	0.00 A	71.6 °F	0 %
Gun 5:	0.00 A	71.6 °F	0 %
Hose 5:	0.00 A	71.6 °F	0 %
Gun 6:	0.00 A	71.6 °F	0 %
Hose 6:	0.00 A	71.6 °F	0 %
A B C			

This screen shows details of various items to aid in troubleshooting the system. This screen can be hidden by de-selecting “Enable Diagnostics Screen” on the System 3 screen. The flow rate updates every 15-20 seconds with the average flow rate over the last 15-20 seconds.

The following information is displayed.

	Diagnostic Data
A	Current Draw
B	RTD Reading
C	Duty Cycle

CAN: 24 VDC power supply voltage reading (18-28 VDC)

DI: System Digital Inputs

0: Not Used

1: Not Used

2: Pump Cycle Switch Up

3: Pump Cycle Switch Down

DO: System Digital Outputs

0: Pump Solenoid

1: Fill Solenoid

2: Light Tower Green Light

3: Light Tower Red Light

ISO DI: Customer Digital Inputs

0: Customer Input 1

1: Customer Input 2

2: Customer Input 3

3: Customer Input 4

ISO DO: Customer Digital Outputs

0: Customer Input 1

1: Customer Input 2

2: Customer Input 3

3: Customer Input 4

Fill: Reading of Ultrasonic Fill Sensor

- Old Fill Sensor (2750-2400 mV)
- New Fill Sensor (4200-3800 mV)

Fill Sol: Current draw of fill solenoid

- (0 mA - off)
- (150-250 mA - on)

Flow/H: Melt rate of the system

Life Cycles: total number of pump cycles over life of system.

Life Weight: Weight of material dispensed over life of system.

Pump Sol: Current draw of pump solenoid

- (0 mA - off)
- (150-250 mA - on)

PCB Temp: PCB Temperature on MZLP1

- 32-16°F (0-71°C)

Pump CPM: Pump cycles per minute.

USB DL%: Percentage Complete, only applies when downloading USB data.

Material Log

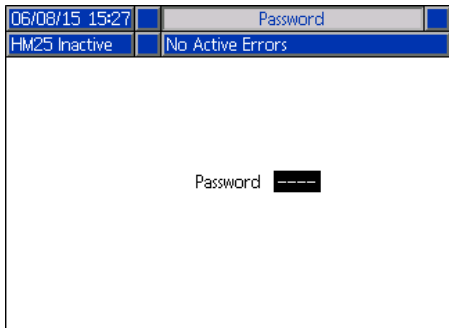
This screen shows a daily log of material usage. For more details see the Setup - Material Tracking section.

06/08/15 17:29	PC Home	Home	Targets
HM25 Active	No Active Errors		
Date	#	g	°F
06/08/15	1	3	4.46
06/07/15	1	86399	4.56
06/06/15	1	86398	4.70
06/05/15	1	86399	4.83
06/04/15	1	86398	4.94
06/03/15	1	86399	5.02
06/02/15	1	47939	5.09
06/01/15	1	69	4.51
05/31/15	1	38036	5.15
05/30/15	1	56826	5.18

Setup Screens

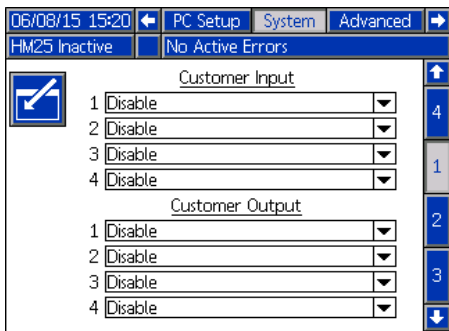
NOTE: It is important to set all settings in the System screens correctly to ensure optimal system performance.

Password



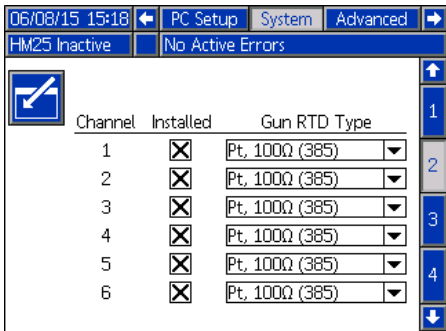
If the password is not “0000”, the password must be entered to access the setup screens.

System 1



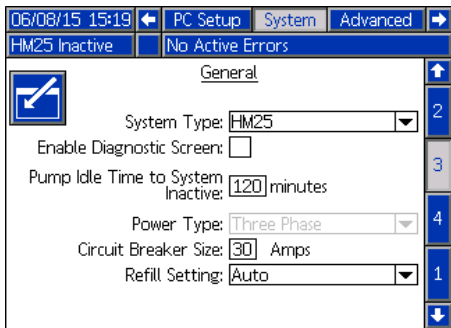
A PLC can be used to control or monitor the system. See **PLC Connection** on page 23 for instructions.

System 2



Use this screen to enable the installed channels and specify the type of gun RTD type used. See **Select ADM Settings** on page 20.

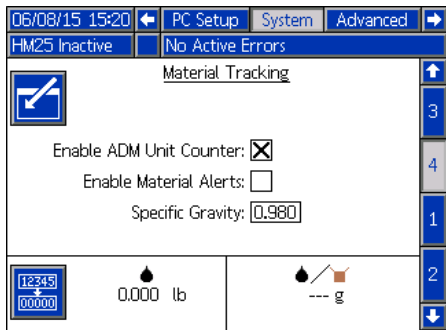
System 3



- System Type:** Choose the model of the system. Older versions of software may not have this option.
- Enable Diagnostic Screen:** Choose whether to hide the Diagnostic screen.
- Pump Idle Time to System Inactive:** The heating system will be disabled after the pump has been idle for the set amount of time
- Power Type:** Select the system power type.
- Circuit Breaker Size:** Select the circuit breaker size.
- Refill Setting:** To use the automatic vacuum transfer, select Auto. To disable the automatic vacuum transfer, select Manual. The main reason to disable automatic refill is while flushing. However, if an issue is present with the automatic refill system that cannot be solved in a timely manner, manual refill can be used to return the system to service. See **Manual Refill** on page 30.

See **Select ADM Settings** on page 20.

System 4



- Enable ADM Unit Counter:** Select to enable ADM counting of units using an external sensor.
- Enable material Alerts:** Select to enable record only events indicating low/high material usage.
- Specific Gravity:** Required to convert the volume dispensed to mass dispensed for tracking the total weight and flow rate.

Maintenance

The system will notify the user at the set interval that maintenance is required. The fields in boxes can be edited by the user. “Due” and “Current” are both the number of cycles since the last reset. “Interval” is the set number of cycles between maintenance notifications. “Lifetime” is the number of cycles in the lifetime of the system.

NOTE: The lifetime cycle count will only be reset if the Advanced Display Module (ADM) is replaced.

Schedule

Use this screen to set times where the system will automatically enable and disable heating. See **Select ADM Settings** on page 20.

Advanced 1

Language: Language displayed on the screen.

Date Format: Choose format of the date.

Date: Set the date.

Time: Set the time.

Enter Password: If not “0000”, the Setup screens will be password protected.

Screen Saver: The screen will go black after the set amount of time.

Silent Mode: Disable ADM sounds.

Lock Run Screens: Disable setpoint changes on the run (operation) screens. If the setup screens are password protected, the setpoints cannot be changed without first entering the password.

Advanced 2

Temperature Units: Units of measure for displayed temperatures.

Mass Units: Units of measure for mass.

Distance Units: Units of measure for distance.

Advanced 3

06/08/15 15:24

SystemAdvancedMaintenance

HM25 Inactive

No Active Errors

Disable USB Downloads/Uploads:☐

Disable USB Log Errors:☒

Download Depth: Last Days

Disable USB Downloads/Uploads: Disables use of the USB for downloading and uploading.

Disable USB Log Errors: When disabled, the system will not warn the user when logs are full. If the logs are full, data will be overwritten.

Download Depth: Last ____ Days: The USB download will provide data as old as the number of days entered. Old data may be in memory but will not be downloaded if older than the number of days entered.

Advanced 4

06/08/15 17:28	SystemAdvancedMaintenance	
HM25 Inactive	No Active Errors	
Module	Software Part #	Software Version
Advanced Display	16P067	1.10.027
Temperature Control Module 1	16T936	1.07.001
Temperature Control Module 2	16T936	1.07.001
Temperature Control Module 3	16T936	1.07.001
USB Configuration	16T910	1.08.001
AWB	16W672	1.03.003
PCM	24W342	1.05.013
WPAN CGM	17A597	1.02.003

This screen shows the part number and version of each installed software module.

Appendix B - USB Downloading, Uploading

The system can store 150,000 entries in its logs and the system adds a new entry to the logs every 15 seconds. This means the system stores 655 hours of system operation data, or 27 days of around-the-clock operation. Once full, the system will overwrite the oldest data.

NOTE: To prevent losing any data, never go more than 27 days without downloading the logs.

NOTE: Older software may store more information than stated above.

Download Procedure

NOTICE

Uploading an edited system configuration file can damage the system. Never put a modified SETTINGS.TXT file in the UPLOAD folder on the flash drive.

NOTE: The event log, error log, system settings, and system language files are all downloaded in this procedure. See **USB Logs**, **System Settings File**, and **System Language File** starting on page 118.

1. Insert USB flash drive into USB port. See FIG. 60.

NOTE: Flash drive must be 8 GB or smaller.

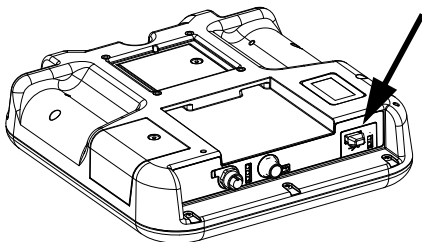


FIG. 60: ADM USB Port

2. The menu bar and USB indicator lights indicate that the USB is downloading files. Wait for USB activity to complete. A pop-up will be present until the transfer is complete if it is not acknowledged.

NOTE: If the pop-up screen does not appear, the flash drive is not compatible with the ADM. Try a different flash drive.

NOTE: The system can log up to 45 mb of additional data per week, depending on system operation.

Accessing Files

All files downloaded from the USB are put in a DOWNLOAD folder on the stick drive. For example: "E:\GRACO\12345678\DOWNLOAD\". The 8-digit numeric folder name matches the 8-digit ADM serial number, which is located on the back of the ADM. When downloading from multiple ADMs, there will be one sub-folder in the GRACO folder for each ADM.

The log files should be opened in a spreadsheet program.

NOTE: If emailing the files, zip (compress) them to minimize file size.

Upload Procedure

NOTICE

Uploading an edited system configuration file can damage the system. Never put a modified SETTINGS.TXT file in the UPLOAD folder on the flash drive.

Use this procedure to install a system configuration file and/or a custom language file. See **System Settings File** or **System Language File** starting on page 118.

1. If necessary, follow the **Download Procedure**, page 117, to automatically generate the proper folder structure on the USB flash drive.
2. Insert USB flash drive into USB port of computer.
3. The USB flash drive window automatically opens. If it does not, open USB flash drive from within Windows Explorer.
4. Open Graco folder.
5. Open system folder. If working with more than one system, there will be more than one folder within the Graco folder. Each folder is labeled with the corresponding serial number of the ADM. (The serial number is on the back of the module.)

6. *If installing the system settings file*, place SETTINGS.TXT file into UPLOAD folder.
7. *If installing the custom language file*, place DISPTXT.TXT file into UPLOAD folder.
8. Remove USB flash drive from computer.
9. Install USB flash drive into InvisiPac system USB port.
10. The menu bar and USB indicator lights indicate that the USB is uploading files. Wait for USB activity to complete.
11. Remove USB flash drive from USB port.

NOTE: If a custom language file was installed, users can now select the new language from the Language drop-down menu.

NOTE: If the SETTINGS.TXT or DISPTXT.TXT files remain in the UPLOAD folder, they will be uploaded every time the USB drive is inserted into the corresponding ADM. To avoid unintentionally overwriting system settings, delete the files from the UPLOAD folders on the USB drive after the upload is complete.

USB Logs

During operation, InvisiPac stores system and performance related information to memory in the form of log files. InvisiPac maintains the events, data, GCA, Black Box, and Diagnostics logs. Follow the **Download Procedure**, page 117, to retrieve log files.

Events Log

The event log (1-EVENT.CSV) maintains a record of the last 175,000 events. Each event record in the log file contains the date and time the event occurred, the event type, event code, and event description.

Data Log

The data log (2-DATA.CSV) tracks the setpoint and actual temperatures every 15 seconds. This log can store up to 250,000 lines of data.

The system stores 1041 hours of system operation data, or 43 days of around-the-clock operation. Once full, the system will overwrite the oldest data.

NOTE: To prevent losing any data, never go more than 43 days without downloading the logs.

GCA Log

This log (3-GCA.CSV) lists the installed GCA modules and their respective software versions.

Black Box, Diagnostics Logs

These logs (4-BLACKB.CSV, 5-DIAGN.CSV) are designed to provide useful information to Graco when calling for technical assistance.

System Settings File

NOTICE

Uploading an edited system configuration file can damage the system. Never put a modified SETTINGS.TXT file in the UPLOAD folder on the flash drive.

The system configuration settings file name is SETTINGS.TXT and is stored in the DOWNLOAD folder.

A system configuration settings file automatically downloads each time a USB flash drive is inserted. Use this file to back up system settings for future recovery or to easily replicate settings across multiple InvisiPac systems. Refer to the **Upload Procedure**, page 117, for instructions on how to use this file.

It is recommended to retrieve the SETTINGS.TXT file after all system settings are set as desired. Store the file for future use as a backup in case the settings are changed and need to be quickly changed back to the desired setup.

NOTE: System settings may not be compatible between different versions of the InvisiPac software.

System Language File

The system language file name is DISPTXT.TXT and is stored in the DOWNLOAD folder.

A system language file automatically downloads each time a USB flash drive is inserted. If desired, use this file to create a user-defined set of custom language strings to be displayed within the ADM.

The system is able to display the following Unicode characters. For characters outside of this set, the system will display the Unicode replacement character, which appears as a white question mark inside of a black diamond.

- U+0020 - U+007E (Basic Latin)
- U+00A1 - U+00FF (Latin-1 Supplement)
- U+0100 - U+017F (Latin Extended-A)
- U+0386 - U+03CE (Greek)
- U+0400 - U+045F (Cyrillic)

Create Custom Language Strings

The custom language file is a tab-delimited text file that contains two columns. The first column consists of a list of strings in the language selected at the time of download. The second column can be used to enter the custom language strings. If a custom language was previously installed, this column contains the custom strings. Otherwise the second column is blank.

Modify the second column of the custom language file as needed and then follow the **Upload Procedure**, page 117, to install the file.

The format of the custom language file is critical. The following rules must be followed in order for the installation process to succeed.

- The file name must be DISPTXT.TXT.
- The file format must be a tab-delimited text file using Unicode (UTF-16) character representation.
- The file must contain only two columns, with columns separated by a single tab character.
- Do not add or remove rows to the file.
- Do not change the order of the rows.
- Define a custom string for each row in the second column.

Technical Data

InvisiPac Hot Melt Delivery System		
	US	Metric
Electrical		
Electrical Service	24P260: 200-240VAC, 1-ph, 50/60 Hz, 32A Max 24P261: 200-240VAC, 1-ph, 50/60 Hz, 40A Max 24P262: 350-415VAC/200-240VAC, 3-ph with Neutral, 50/60 Hz, 16A Max 24P263: 350-415VAC/200-240VAC, 3-ph with Neutral, 50/60 Hz, 16A Max 24P264: 200-240VAC, 3-ph without Neutral, 50/60 Hz, 27A Max 24P265: 200-240VAC, 3-ph without Neutral, 50/60 Hz, 27A Max 24U132: 200-240VAC, 1-ph, 50/60 Hz, 40A Max 24U133: 350-415VAC/200-240VAC, 3-ph with Neutral, 50/60 Hz, 30A Max 24U134: 200-240VAC, 3-ph without Neutral, 50/60 Hz, 40A Max	
Maximum Gun Wattage Per Channel	400 W	
Input / Output Capability	4 inputs (0-30VDC), 4 outputs (240VAC, 24VDC, 2A)	
General		
Adhesive	1/4 in. (6 mm), round, adhesive pellets	
Pump Flow Rate	96 lb/hr	43.5 kg/hr
Pump Output	6.2 cc/cycle	
Time to Temperature *	Less than 10 minutes	
Melt Rate / Constant Throughput	25 lb/hr	11.3 kg/hr
Pump	Pneumatic Piston, 12:1	
Channels	1 to 4	
System Dimensions, without vacuum tube or shaker (Width x Height x Depth) **	19.0 x 42 x 16.5 in.	483 x 1067 x 419 mm
Shaker Dimensions (Width x Height)	0.4 x 4.0 ft	0.12 x 1.22 m
Weight	85 lb	39 kg
Pressure and Temperature Ranges		
Main System Air Supply Pressure Range (set with regulator on front of system)	80-100 psi	0.55-0.69 MPa (5.5-7 bar)
Pump Operating Air Pressure Range	20-100 psi	0.14-0.69 MPa (0.7-7 bar)
Pump Operating Fluid Pressure Range	240-1200 psi	1.7-8 MPa (17-80 bar)
Control Temperature Range	100-400°F	38-204°C
Ambient Temperature Range	32-120°F	0-49°C
Vacuum Transfer Specifications		
Maximum Vacuum Transfer Hose Length	30 ft	9.1 m
Maximum Vacuum Transfer Hose Maximum Vertical Rise	10 ft	3.0 m
Vacuum Transfer Operating Pneumatic Pressure Range (set with regulator on front of system)	40-100 psi	280-690 kPa (2.8-6.9 bar)
Vacuum Transfer Air Consumption at 40 psi (280 kPa, 2.8 bar),	9.5 scfm (intermittent duty; 4% at 25 lb/hr)	16.1 scmh (intermittent duty; 4% at 11.3 kg/hr)
Vacuum Transfer Air Consumption at 80 psi (550 kPa, 5.5 bar)	17.2 scfm (intermittent duty; 4% at 25 lb/hr)	29.2 scmh (intermittent duty; 4% at 11.3 kg/hr)

InvisiPac Hot Melt Delivery System		
	US	Metric
Required Air Tubing Size		
Minimum Air Tubing Inner Diameter (less than 50 ft, 15.2 m of tubing)	3/8 in.	9.5 mm
Minimum Air Tubing Inner Diameter (50 ft, 15.2 m or longer of tubing)	1/2 in.	12.7 mm
Sound		
Sound Pressure Level***	77 dB(A)	
IP Code		
InvisiPac Base System	IP54	
Wetted Parts		
Wetted Parts	PTFE, chemically resistant o-rings, aluminum, stainless steel, zinc plating, carbon steel, brass, carbide, chrome	
Approvals and Standards	UL499, CSA88, CE, ISO 9001	
30 Gallon Vibrating Hopper		
Required Air Pressure Supplied To 30 Gallon Vibrating Hopper	100 psi	0.7 MPa (7 bar)
Air Consumption	17.1 scfm	29.1 cubic meters per hour
* From 70°F to 350°F (21°C to 177°C), dependant upon power supply and machine configuration.		
** Excludes vacuum transfer tube, shaker assembly, and pellet storage bin.		
*** Sound pressure level measured 3.1 ft (1 meter) from equipment.		

Startup Time

Single Phase

NOTE: Times are approximate and may vary with ambient conditions, voltage configuration, and machine configuration.

Channels (#)	Hose Length ft (m)	Start Time in Minutes							
		20 Amp Breaker 240V	30 Amp Breaker 240V	40 Amp Breaker 240V	50 Amp Breaker 240V	20 Amp Breaker 208V	30 Amp Breaker 208V	40 Amp Breaker 208V	50 Amp Breaker 208V
1	4 (1.2)	11	9.9	9.9	9.9	13	13	13	13
1	12 (3.6)	13	9.9	9.9	9.9	14	13	13	13
1	25 (7.6)	15	9.9	9.9	9.9	17	13	13	13
2	4 (1.2)	13	9.9	9.9	9.9	15	13	13	13
2	12 (3.6)	16	9.9	9.9	9.9	18	13	13	13
2	25 (7.6)	20	13	9.9	9.9	23	13	13	13
3	4 (1.2)	15	9.9	9.9	9.9	17	13	13	13
3	12 (3.6)	19	12	9.9	9.9	22	13	13	13
3	25 (7.6)	26	16	12	9.9	29	19	13	13
4	4 (1.2)	16	9.9	9.9	9.9	18	13	13	13
4	12 (3.6)	22	14	9.9	9.9	25	16	13	13
4	25 (7.6)	31	20	14	12	35	23	16	13
5	4 (1.2)	18	11	9.9	9.9	20	13	13	13
5	12 (3.6)	25	16	11	9.9	28	18	13	13
5	25 (7.6)	36	23	17	14	41	27	19	15
6	4 (1.2)	20	12	9.9	9.9	22	13	13	13
6	12 (3.6)	28	18	13	10	32	20	13	13
6	25 (7.6)	41	27	20	16	47	31	22	18

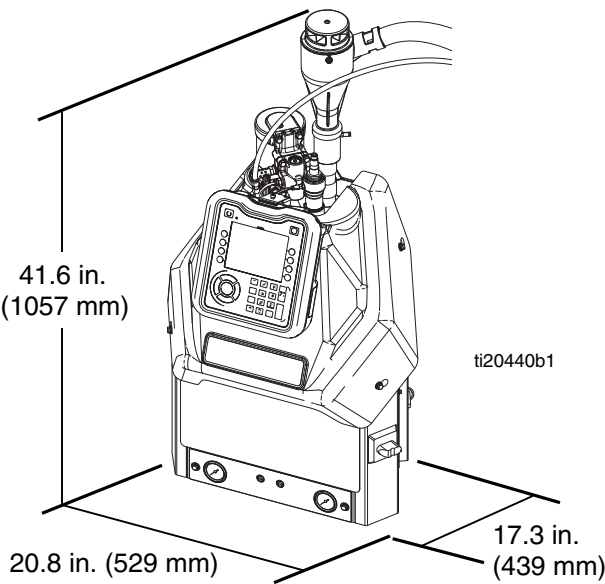
Three Phase

NOTE: Times are approximate and may vary with ambient conditions, voltage configuration, and machine configuration.

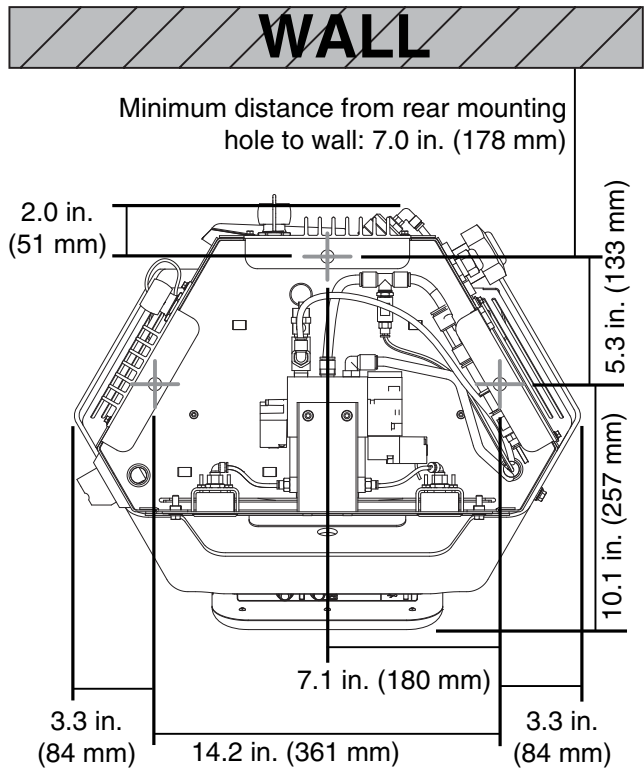
Channels (#)	Hose Length ft (m)	Start Time in Minutes							
		20 Amp Breaker 240V/480V	30 Amp Breaker 240V/480V	40 Amp Breaker 240V/480V	50 Amp Breaker 240V/480V	20 Amp Breaker 208V/415V	30 Amp Breaker 208V/415V	40 Amp Breaker 208V/415V	50 Amp Breaker 208V/415V
1	4 (1.2)	11	9.9	9.9	9.9	13	13	13	13
1	12 (3.6)	13	9.9	9.9	9.9	14	13	13	13
1	25 (7.6)	15	9.9	9.9	9.9	16	13	13	13
2	4 (1.2)	13	9.9	9.9	9.9	14	13	13	13
2	12 (3.6)	16	11	9.9	9.9	17	13	13	13
2	25 (7.6)	20	14	10	9.9	22	14	13	13
3	4 (1.2)	14	9.9	9.9	9.9	16	13	13	13
3	12 (3.6)	18	12	9.9	9.9	20	13	13	13
3	25 (7.6)	25	17	13	9.9	26	18	13	13
4	4 (1.2)	15	10	9.9	9.9	17	13	13	13
4	12 (3.6)	21	14	11	9.9	23	15	13	13
4	25 (7.6)	30	20	15	12	34	22	17	13
5	4 (1.2)	17	11	9.9	9.9	19	13	13	13
5	12 (3.6)	23	16	12	9.9	27	18	14	13
5	25 (7.6)	34	23	17	14	40	27	20	16
6	4 (1.2)	18	12	9.9	9.9	21	14	13	13
6	12 (3.6)	26	17	13	11	30	20	15	13
6	25 (7.6)	39	26	19	16	46	31	23	19

Dimensions

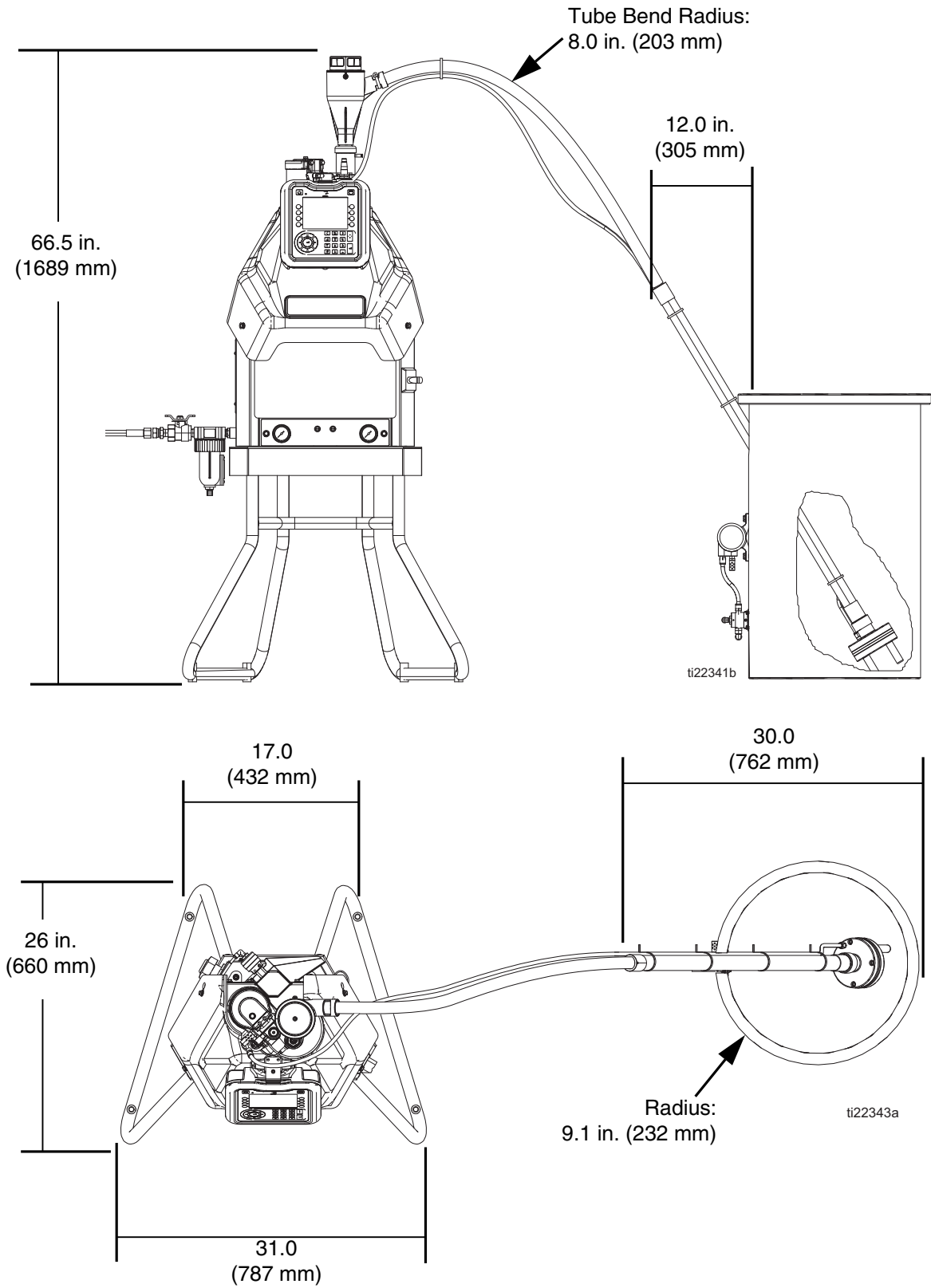
System Dimensions



Mounting Hole Dimensions



System with Stand and Vacuum Feed Dimensions



Graco Extended Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of eighteen months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Information

For more information about InvisiPac, visit www.InvisiPac.com or email InvisiPac@graco.com.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.

For technical assistance or customer service, call toll free: 1-800-458-2133.

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