Instructions

InvisiPac® GM100 Plug-Free™

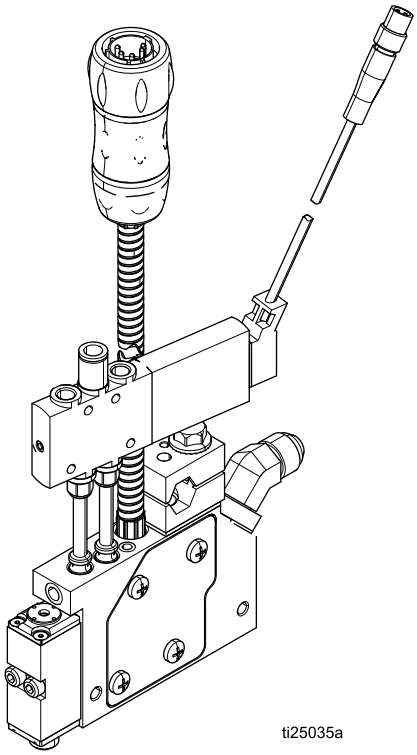
Hot Melt Applicator

334627D
EN

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

Important Safety Instructions
Read all warnings and instructions in this manual and in related manuals. Save these instructions.

See page 6 for models, approval information and working pressure ratings.



PROVEN QUALITY. LEADING TECHNOLOGY.

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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

BURN HAZARD

Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.

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.

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.

WARNING

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:

- 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.
- Hold applicator firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive.
- **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.

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.
- 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.

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.

Models

All models use a 240 V heater.

Applicators with Ni 120 RTD types come with a 6–pin rectangular cordset (24X040 for slim, 24X761 for standard Dual, and 24W088 for all other models).

Slim (Single)

24UPart	RTD Type	Solenoid Valve
25B021	Pt 100 (385)	24 VDC
25B024	Ni 120	24 VDC

Dual

Part	RTD Type	Solenoid Valve
25B075	Pt 100 (385)	24 VDC
25B301	Ni 120	24 VDC

Quad

Part	RTD Type	Solenoid Valve
25B077	Pt 100 (385)	24 VDC
25B303	Ni 120	24 VDC

Low Profile - Quad

Part	RTD Type	Solenoid Valve
25B033	Pt 100 (385)	24 VDC
25B036	Ni 120	24 VDC

Low Profile - Dual

Part	RTD Type	Solenoid Valve
25B027	Pt 100 (385)	24 VDC
25B030	Ni 120	24 VDC

Related Manuals

Manual Number	Description
332072	InvisiPac Heated Hose Instructions - Parts
333347	InvisiPac HM25 Tank-Free Hot Melt Delivery System

Working Pressure

Maximum Working Fluid Pressure:
1500 psi (10.3 MPa, 103 bar)

Maximum Working Air Pressure:
80 psi (0.5 MPa, 5.5 bar)

Minimum Working Air Pressure:
65 psi (0.44 MPa, 4.4 Bar)

Model Approvals

CE RECOGNIZED COMPONENT ETL LISTED c US Intertek

Component Identification

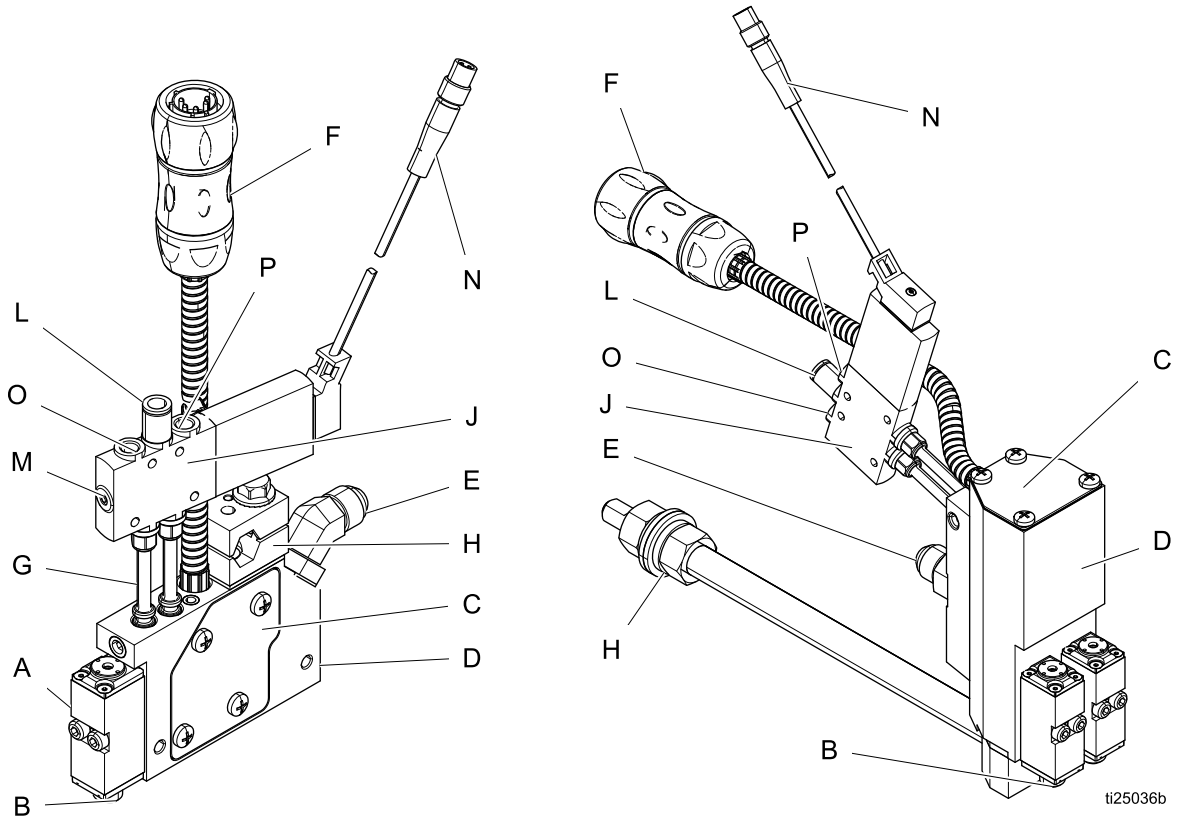


Figure 1 Slim Model Shown on Left, Dual Low Profile Model Shown on Right

A	Module
B	Fluid outlet
C	Fluid filter
D	Manifold
E	Fluid inlet (9/16–18, —6 JIC, 37° flare)
F	Cordset
G	Air tubes
H	Mounting clamp (1/2 in. diameter bar)
J	Solenoid valve (24 VDC)
L	Air inlet (1/4 in. diameter tubing)
M	Manual override switch
N	M8 Solenoid valve electrical connector
O	Air Close Exhaust Port
P	Air Open Exhaust Port

Overview

The applicator uses the air-opened, air closed mode of operation. It uses a five-way exhausting solenoid to control the piston inside the valve. Fluid is filtered through the manifold filter (C) before entering the valve fluid inlet port. Then the fluid is filtered one final time through the module filter, which is located in each module, directly before the ball and seat.

When air moves the piston and rod from its seat, it opens the fluid outlet. To turn off the fluid, the solenoid redirects air to the top of the piston. The air and spring work together to push the piston and rod into the seat.

The applicator should be rigidly mounted and remotely operated by a melter system and triggering device. The melter system provides pressurized fluid to the valve. The triggering device controls the fluid flow by opening and closing the solenoid valve.

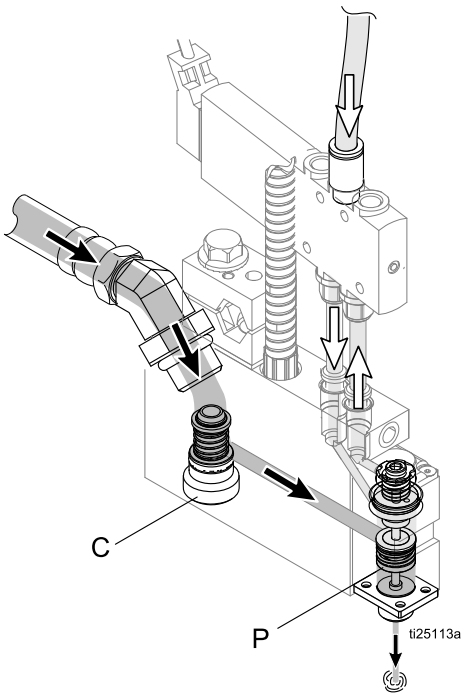
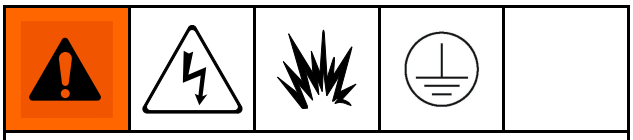


Figure 2 Air and Fluid Flow

Air

Fluid

Grounding



The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

- **Pump:** follow manufacturer's recommendations.
- **Applicator:** grounded through electrical connection.
- **Air compressor:** follow manufacturer's recommendations.
- **Fluid supply container:** follow local code.
- **Solvent pails used when flushing:** follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts grounding continuity.
- **To maintain grounding continuity when flushing or relieving pressure:** ensure mounting manifold and electrical power connector are grounded properly.

Installation

Mounting

NOTICE

To prevent heat transferring into other components of the packaging line, ensure that the insulator is installed.

Low Profile Models: Use a 3/4 in. (19 mm) wrench to adjust nuts that control position of applicator on threaded rod.
All Other Models: See the following instructions. Mount manifold on up to a 1/2 in. (12 mm) diameter bar using mounting clamp (H) to hold the applicator in place and ensure adhesive is applied properly. For optimal mounting strength of a slim model, use a 7/16 hex bar.

NOTE: Slim Standard Dual and Standard Quad models use a 5 mm Allen wrench.

1. Use an appropriate wrench to loosen the mounting clamp and slide the applicator on the mounting bar.
2. Tighten the mounting clamp. Torque to 144 in-lb (16.2 N•m).

   NOTE: Provide enough room to access sides of applicator for maintenance and repair.

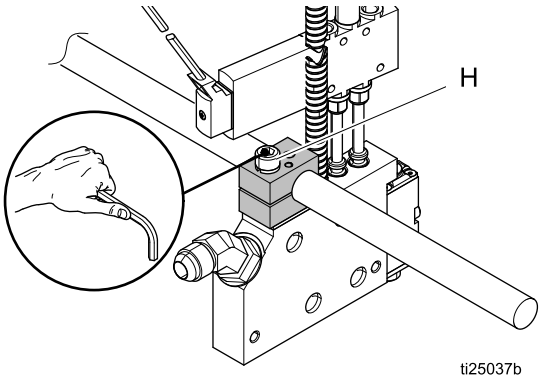


Figure 3 Mounting Clamp

Connect Heated Hose

1. Connect the hose fluid outlet to the manifold fluid inlet (E). Use two 11/16 in. wrenches to tighten the hose fitting.

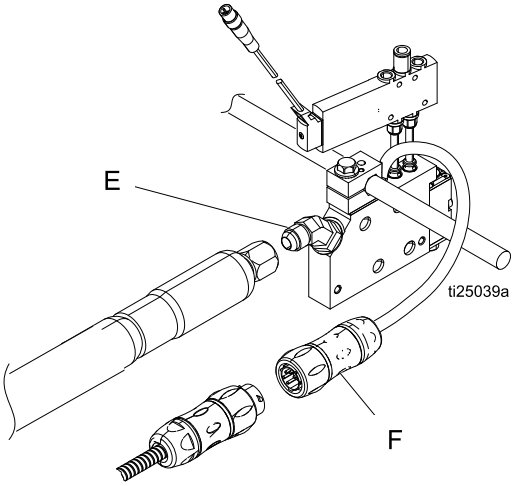


Figure 4 Connect the Heated Hose

2. Connect the cordset (F) to the hose.
3. Connect the hose inlet to the melter system outlet. See the heated hose manual for installation guidelines.
4. Connect the hose cordset to melter. See the heated hose manual for installation guidelines.

Recommended Air Setup

1. Connect tubing from the air filter (Graco part 106148) to the air regulator.

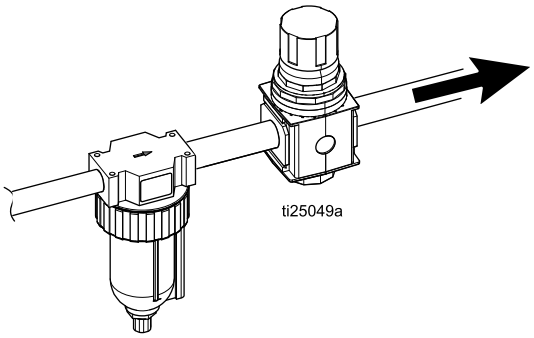


Figure 5 Connect the Air Supply

2. Set the air regulator to 80 psi (5.5 Bar, 0.5 MPa).
3. Connect tubing from the air regulator to the applicator solenoid.

Connect Solenoid Valve

1. Connect 1/4 in. diameter air supply tubing to a clean, dry, and non-lubricated air supply and to the push-to-connect air inlet fitting (L).

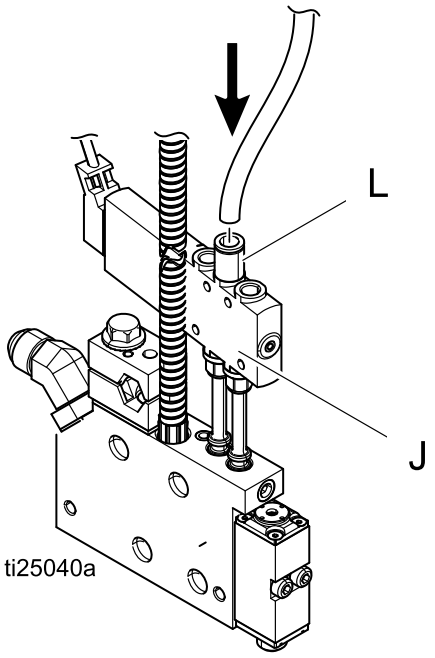


Figure 6 Air Inlet Fitting

2. Connect solenoid valve (J) to 24 VDC signal. See Connect Triggering Device, page 10.

   NOTE: A 6 mm tube fitting is included with the applicator. The fitting can be changed using a 5 mm Allen wrench.

Connect Triggering Device

All GM100 valves use a 24 VDC solenoid valve.

Improper electrical connection can result in electric shock. All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

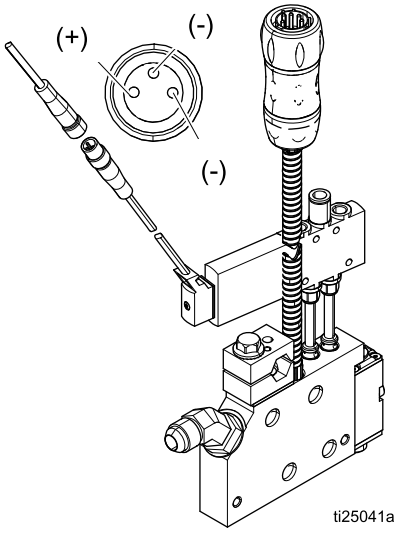


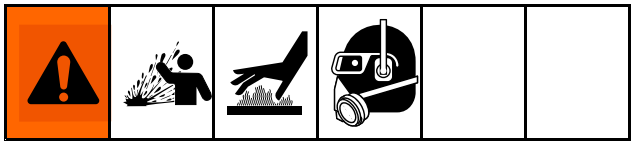
Figure 7 Solenoid Valve Electrical Connector

Standard Wiring Colors		
Terminal Cable	**Function**	**M8**
Plus (+)	24V Supply	Brown
Minus (-)	Return	Blue/Black

Before Using Equipment

The equipment was tested with canola oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, prime the equipment with hot melt until all of the oil is pushed out before using the equipment. See Flush, page 11.

Flush



NOTE: Do NOT cycle the module until the temperature set point has been achieved. Cycling the module below the temperature set point may cause premature seal leakage.

1. Disconnect or turn off the device which triggers the solenoid valve.
2. Ensure the nozzle (Z) is removed.
3. Heat the system to working temperature.
4. Place waste container under the applicator to catch the adhesive.
5. Press the manual override switch (M) to manually trigger the solenoid valve.
6. Dispense hot melt (adhesive) until it is clean.

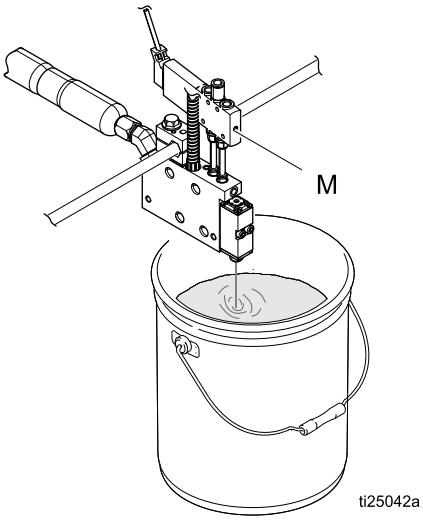


Figure 8 Flush

Install Nozzle

Use 1/2 in. wrench to install nozzle. See Kits and Accessories, page 37.

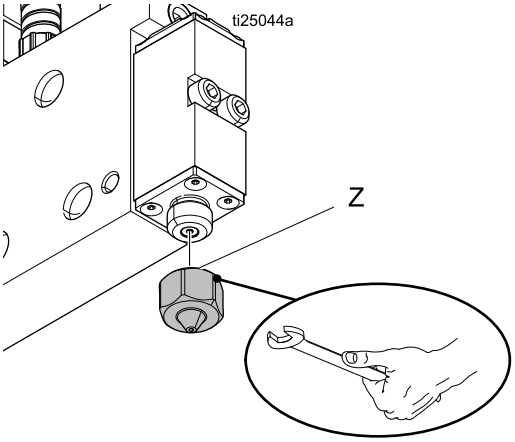


Figure 9 Install Nozzle

Select RTD

NOTE: For InvisiPac systems only.

Identify RTD type used in applicator on the system Advanced Display Module (ADM). The RTD type is listed on the manifold cover plate.

NOTICE

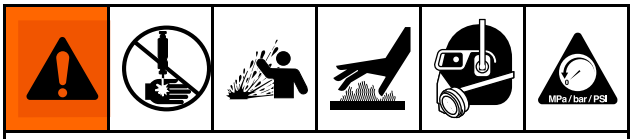
An incorrect RTD setting will cause the system to be incapable of maintaining the temperature setting. The applicator may overheat and trip the thermal cutoff, if the applicator uses a PT 100 (385) and NI 120 is selected on the ADM Setup screen. The applicator may under-heat if the applicator uses a NI 120 and PT 100 (385) is selected on the ADM Setup screen.

- If PT 100 (385) is listed, select PT 100 (385) in the ADM Setup screens.
- If NI 120 is listed, select NI 120 in the ADM Setup screens.

Operation

Pressure Relief Procedure

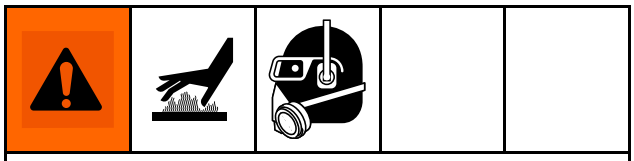
Follow the Pressure Relief Procedure whenever you see this symbol.



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

1. Depressurize hotmelt system.
2. Close the bleed-type master air valve.
3. Actuate the applicator repeatedly until no fluid flows.
4. If you suspect the module nozzle is clogged, remove nozzle and then actuate the module to relieve pressure.
5. If you suspect the module or fluid hose is clogged or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen inlet fitting, inlet filter, or hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or module obstruction.
6. Turn off air pressure to the solenoid valve.

Maintenance



Material inside the applicator can be near setpoint temperature. Wear protective clothing to avoid severe burns.

Daily:

Clean hot melt from exterior of applicator.

Weekly:

Inspect the applicator, fluid lines, cordset, and solenoid cable for wear or damage. See Repair, page 20 for instructions.

Replace Inlet Filter

NOTICE

Remove the filter when the applicator is hot. If the applicator is cold, the adhesive will be hard and the filter may be difficult to remove or damaged.

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Remove dirty filter (C) from manifold (D).

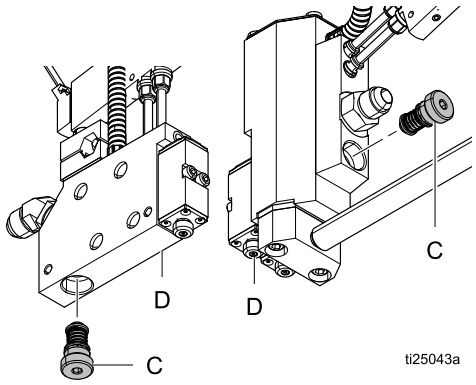


Figure 10 Inlet Filter

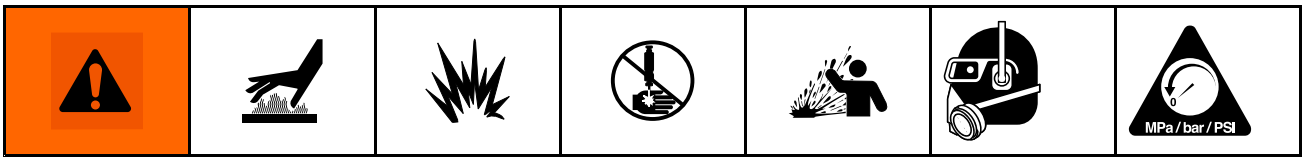
3. Apply a thin coating of high-temperature lubricant to seals on the new filter (C) and install in the manifold (D). Torque to 30 in.-lb (3.4 N•m), using a 5/32 in. (4 mm) Allen wrench.

Filter Maintenance Guidelines

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 powdered 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.

	Environment Classification		
	Clean	**Moderate**	**Dusty**
Manifold filter	Replace filter every **six** months	Replace filter every **four** months	Replace filter every **two** months

Troubleshooting



Problem	Cause	Solution
No adhesive or incorrect amount of adhesive out of all modules when triggered	Plugged manifold filter	Replace manifold filter. See Replace Inlet Filter, page 13.
	Clogged hose	Clean or replace hose.
	Failed solenoid valve	Check for correct operation. Clean or replace.
	No signal to solenoid valve	Check solenoid valve for correct operation.
	Incorrect solenoid valve wiring	Check solenoid valve wiring.
	Incorrect signal to solenoid valve	Check if 24 VDC.
	Solenoid muffler plugged	Check and replace mufflers.
	No fluid pressure	Check adhesive delivery system.
	Heater failure (cold applicator)	Check and replace heater cartridges. See Replace Heater Cartridge, page 20.
	No air to solenoid valve	Check air supply.
	Dirty or faulty triggering device	Check, clean, or replace triggering device.
	Solenoid valve connected incorrectly	Check solenoid valve air connections.
	Clogged manifold passage	Clean or replace manifold.
No adhesive or incorrect amount of adhesive out of one/some modules when triggered	Plugged nozzle	Clean or replace nozzle.
	Failed module in closed position	Check for correct operation. Clean or replace. See Check Module, page 17.
	Plugged module filter	Replace module. See Replace Module, page 24.
	Clogged manifold passage	Clean or replace manifold.
Adhesive out of one/some modules when not triggered	Failed module in open position	Clean or replace module. See Replace Module, page 24.
	Adhesive pressure too high	Check and reduce fluid pressure.

Problem	Cause	Solution
Applicator will not heat	Heater failure	Check and replace heater cartridge. See Replace Heater Cartridge, page 20.
	Loose cord set connection	Check connection.
	RTD failure	Check and replace RTD. See Check RTD, page 19.
	Incorrect RTD for adhesive delivery system	Check delivery system RTD requirement
	Thermal cutoff failure	Check and replace thermal cutoff. See Replace Thermal Cutoff, page 21.
	Wrong RTD type selected	Check RTD type settings on the system. Change if necessary. See Select RTD, page 11.
Applicator overheats	Heater failure	Check and replace heater cartridge. See Replace Heater Cartridge, page 20.
	RTD failure	Check and replace RTD. See Check RTD, page 19.
	Incorrect RTD for adhesive delivery system	Check delivery system RTD requirement.
	Incorrect power to heater	Check and correct power.
	Wrong RTD type selected	Check RTD type settings on the system. Change if necessary. See Select RTD, page 11.
Applicator under-heats	Heater failure	Check and replace heater cartridge. See Replace Heater Cartridge, page 20
	RTD failure	Check and replace RTD.
	Incorrect RTD for adhesive delivery system	Check delivery system RTD requirement.
	Incorrect power to heater	Check and correct power.
	Wrong RTD type selected	Check RTD type settings on the system. Change if necessary. See Select RTD, page 11.
Adhesive leaking from applicator	Module o-ring failure	Check and replace o-ring. See Replace Module, page 24.
	Inlet fitting loose	Tighten fitting.
	Manifold filter o-ring failure	Check and replace o-ring.
	Nozzle loose	Tighten nozzle.

Problem	Cause	Solution
Speed has reduced on one module	Low air pressure to solenoid valve	Check air supply
	Low fluid pressure	Check adhesive delivery system
	Low applicator temperature	Check heat operation. See “Applicator will not heat” section in Troubleshooting, page 14.
	Plugged manifold filter	Replace manifold filter (see Replace Inlet Filter, page 13).
	Module piston seal air leak	Check solenoid air close exhaust port (O). See Replace Module, page 24.
Adhesive out of all modules when not triggered	Solenoid valve failure	Check and replace solenoid valve.
	Adhesive pressure too high	Check and reduce fluid pressure.
	Solenoid valve connected incorrectly	Check solenoid valve air connections.
	Module failure	Check and replace all modules. See Check Module, page 17.
	No air to solenoid valve	Check air supply.

Check Module

Check the module operation to verify if the module has failed and needs to be replaced.

1. Visually check for the presence of glue in the weep hole (W).

   NOTE: If glue is present, the module needs to be replaced. See Replace Module, page 24.

2. Verify that the air pressure to the solenoid valve is 65–80 psi (4.4 – 5.5 bar, 0.44 – 0.55 MPa).

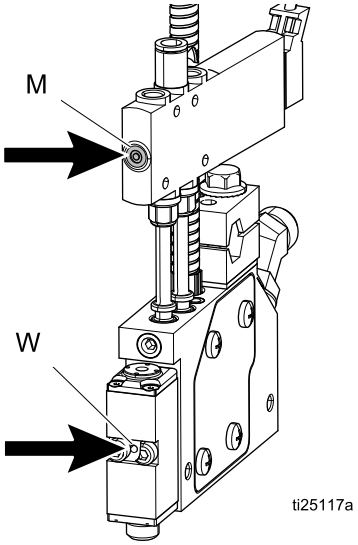


Figure 11 Check Module

3. Verify that there is air pressure to the motor, which will verify that there is fluid pressure.
4. Make sure the system is at the correct temperature.
5. While looking in the weep hole press the solenoid valve manual override switch (M) to manually trigger the applicator.

   NOTE: Look through the weep hole. If the rod moves then the module is functioning properly. If the rod does not move, the module needs to be replaced. See Replace Module, page 24.

6. Remove the nozzle.
7. Press the manual over-ride switch to trigger the module. If glue flows from the seat, the module is functioning properly.

Check Nozzle and Module

Trigger the applicator without the nozzle to determine if the nozzle or module is clogged.

1. Disable applicator assembly. See Before Beginning Repair, page 20.
2. Use a 1/2 in. wrench to loosen the nozzle and remove by hand.

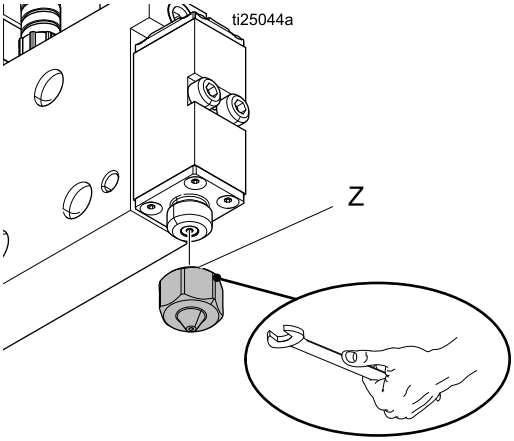


Figure 12

3. Connect the power and solenoid cable.
4. Return the applicator back into operation.
5. Trigger the applicator.
   a. If adhesive flows, clean the nozzle and reinstall on the module.
   b. If adhesive does not flow, the module is clogged and needs to be replaced. See Replace Module, page 24.

Check Heater

Check the continuity of the heater to verify proper resistance. If there is no continuity, the heater has failed and needs to be replaced.

1. Disable applicator. See Before Beginning Repair, page 20.
2. Check resistance of the heater using a multi-meter between the pins of the cordset connector. See connectors illustrations in cordset pin tables.
3. Replace the heater cartridge if the resistance reading is outside the range or if there is no continuity. See Replace Heater Cartridge, page 20.

Cordset	Check Pins	Model	Resis-tance Values
24W087, 24X039, or 24X760 Pt 100 (385) RTD Cordset	A and C	Slim Models	365–405 Ohms
		Dual and Dual Low Profile Models	180–200 Ohms
		Quad and Quad low Profile Models	145–165 Ohms
24W088, 24X040, or 24X761 Ni 120 RTD Cordset	1 and 2	Slim Models	365–405 Ohms
		Dual and Dual Low Profile Models	180–200 Ohms
		Quad and Quad low Profile Models	145–165 Ohms

Table 1 24W087, 24X039, or 24X760, Pt 100 (385) RTD Cordset

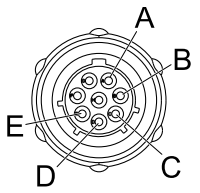
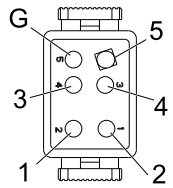
Pin	Description	
A	Thermal Cutoff	
B	Ground	
C	Heat	
D	RTD (White)	
E	RTD (Red)	

Table 2 24W088, 24X040, or 24X761, Ni 120 RTD Cordset

Pin	Description	
1	Thermal Cutoff	
2	Heat -	
3	RTD (White)	
5	RTD (Red)	
G	Ground	

Check RTD

Check the continuity of the RTD to verify proper resistance. If there is no continuity, the RTD has failed and needs to be replaced.

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Check resistance of the RTD using a multi-meter between the pins of the cordset connector. See connectors illustrations in cordset pin tables.

Cordset	Check Pins	Resistance Values At Room Temperature
24W087, 24X039, or 24X760 Pt 100 (385) RTD Cordset	D and E	107-115 ohms
24W088, 24X040, or 24X761 Ni 120 RTD Cordset	3 and 5	130-140 ohms

3. Replace the RTD if the resistance reading is outside the range, or if there is no continuity. See Replace RTD, page 21.

Check Thermal Cutoff

If working properly, the cutoff will trip at 500° F (260° C) and rest at 420° F (216° C). If failure is suspected, allow the applicator to cool and then check the continuity of the thermal cutoff to verify it has not failed. If there is no continuity, the cutoff has failed and needs to be replaced.

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Remove cover plate.
3. Check for continuity using a multi-meter between pin of cord set connector and the wire from the thermal cutoff that connects to the heater lead.

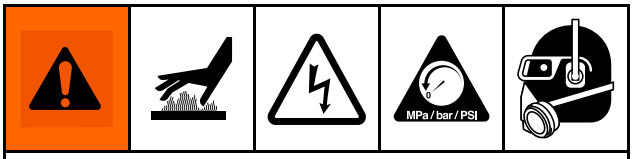
Cordset	Check Pins
24W087, 24X039, or 24X760 Pt 100 (385) RTD Cordset	A
24W088, 24X040, or 24X761 Ni 120 RTD Cordset	1

Repair

Required Tools

- Phillips screwdriver
- Flat blade screwdriver
- 3 mm, 4 mm, and 5 mm Allen wrenches
- 10 mm, 1/2 in. 11/16 in., and 3/4 in. wrenches
- Torque wrenches
- Waste container
- High-temperature anaerobic thread sealant
- High-temperature lubricant
- Anti-seize
- Crimp tool

Before Beginning Repair



Material inside the applicator can be near setpoint temperature. Wear protective clothing to avoid severe burns.

1. Turn off the melter system. See melter manual for shutdown instructions.
2. Relieve pressure. See Pressure Relief Procedure, page 12.
3. Disconnect the cordset (F) from the heated hose.

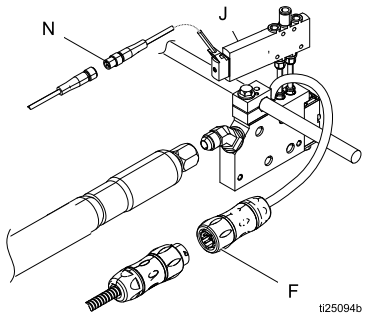
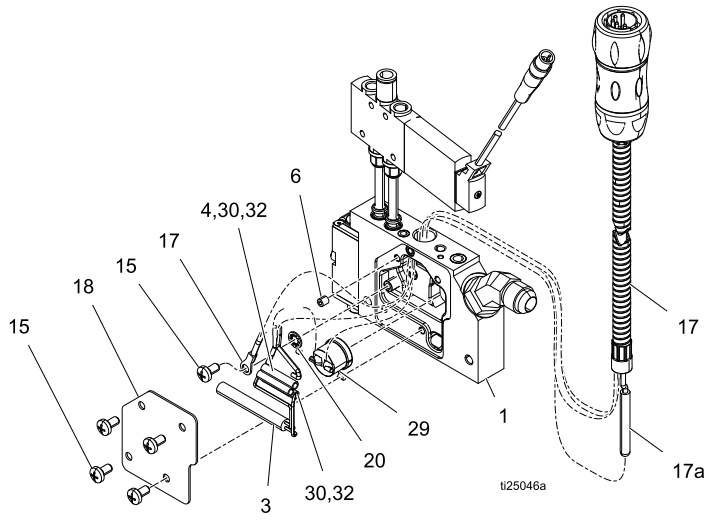


Figure 13 Disconnect Cordset

4. Disconnect M8 solenoid electrical connector (N).

Replace Heater Cartridge



1. Disable the applicator. See Before Beginning Repair, page 20.
2. Use a Phillips screwdriver to remove the four screws (15) and manifold cover plate (18).
3. Remove the heater cartridges (3) from the manifold (1).

   NOTE: Note the placement of the heaters and lead lengths.
4. Remove butt splices (4) from heater wires (3), thermal cutoff (29), and cordset wire leads (17).
5. Crimp new heater wires into new splices (4). See wiring diagram.

NOTICE

To prevent a short to ground and blowing a MZLP fuse, ensure bare wires are covered and fiber glass tape and sleeves are centered over splices.

6. Insert the new heater cartridges (3) into the manifold (1).

   NOTE: Do not apply thermal grease to the heater cartridge.
7. Reinstall the manifold cover plate (18).
8. Reconnect the cordset (17) to the heated hose.
9. Reconnect the M8 solenoid electrical connector (N).

Replace RTD

The RTD is replaced by replacing the entire cordset. See Replace Cordset, page 23, for instructions.

Replace Thermal Cutoff

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Use a Phillips screws driver to remove the four screws (15) and manifold cover plate (18).
3. Remove butt splices (4) from heater wires (3) and cordset wire leads (17).
4. Crimp wires. See Wiring Diagram.

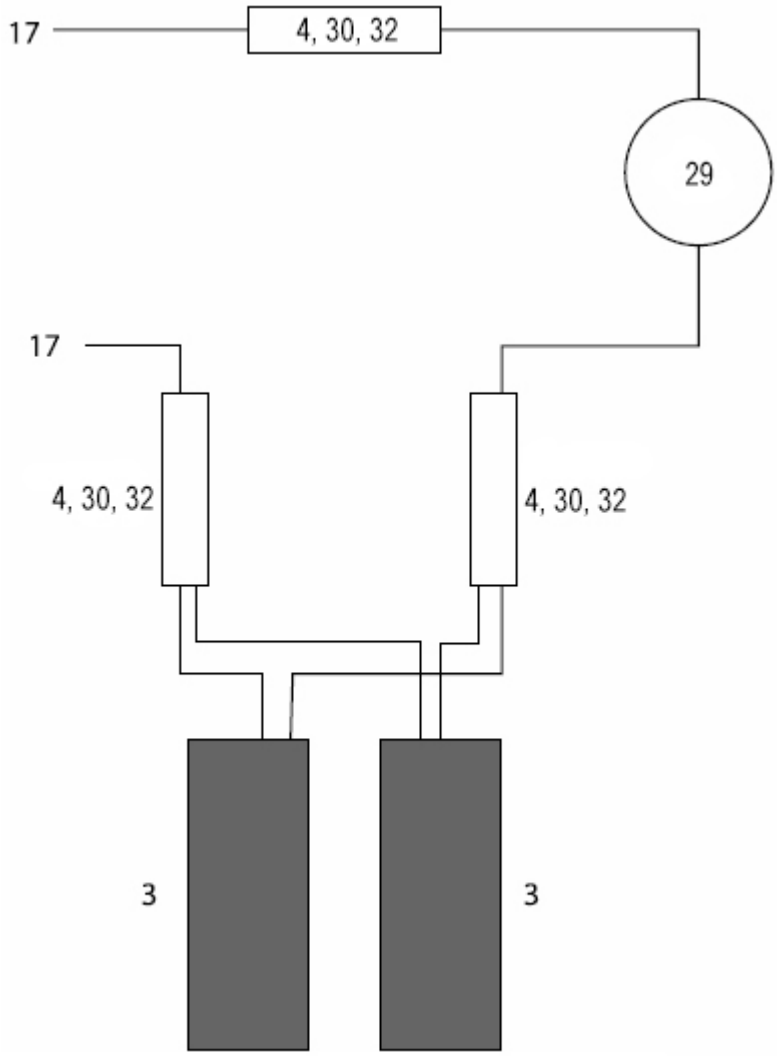
   NOTICE

   To prevent a short to ground and blowing a MZLP fuse, ensure bare wires are covered with fiber glass tape (32) and sleeves (30) are centered over butt splices (4).

   a. Crimp butt splice on cordset heater wires (17) and heater wires (3). Light pull on splice to ensure it is crimped.
   b. Slide sleeves (30) over each pair of wires before crimping.
   c. Crimp white wire to one thermal cutoff lead (29).
   d. Crimp other thermal cutoff lead (29) to one heater wire(s) (3).
   e. Crimp other heater wire(s) to black lead (17).
   f. Wrap a short piece of fiber glass tape around each splice.
   g. Center sleeves (30) over each taped splice.
5. Gently press wires into the manifold. Instal plate (18) and screws (15).

Wiring Diagram

Thermal Cutoff



NOTE: Slim (25B021 and 25B024), Quad (25B077 and 25B303) and Low Profile Quad (25B075 and 25B301) use one heater (3).

Replace Cordset

See Fig 14, page 23.

NOTE: There are six types of cordsets (17):
24X039 is for slim 100 Ohm RTD controlled applicators.
24X040 is for slim 120 Ohm RTD controlled applicators.
24X760 is for dual 100 Ohm RTD controlled applicators.
24X761 is for dual 120 Ohm RTD controlled applicators.
24W087 is for Low Profile Dual, Low Profile Quad, and Quad 100 Ohm RTD controlled applicators.
24W088 is for Low Profile Dual, Low Profile Quad, and Quad 120 Ohm RTD controlled applicators.
Make sure you have the correct cordset before replacing.

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Use a Phillips screwdriver to remove the four screws (15) and manifold cover plate (18).
3. Use a 2 mm Allen wrench to remove the set screw (6) holding the cordset (17) on the manifold (1).
4. Use a Phillips screwdriver to remove the ground lead and star washer (20) from the manifold (1). **Low Profile Models only:** Remove Phillips screw next to RTD.
5. Remove the RTD (17a) from the manifold (1).
6. Disconnect thermal cutoff (29).
7. Remove the cordset (17) from the manifold (1).
8. Install the new cordset, RTD, and ground (17) in the manifold (1). Crimp thermal cutoff wires (29). See Wiring Diagram, page 22 for connections.

   NOTE: Ensure the cordset bushing is fully inserted into the manifold.
9. Install set screw (6) against the cordset bushing to secure the cordset (17) to the manifold (1).
10. Reinstall the ground lead onto the manifold (1).

    NOTE: Ensure the star washer (20) is placed below the ground ring terminal.
11. Insert the RTD (17a) and thermal cutoff (29) into the manifold ports. See Fig 14.

    NOTE: Do not apply grease on the RTD or thermal cutoff.
12. Insert the heater cartridges (3) in the manifold (1).

> **NOTICE**
>
> Do not pinch any wires when inserting wire in the manifold, to prevent removing wire insulation or disconnecting wires. If wire insulation is removed, the RTD or heaters could short out and need to be replaced.

13. Reinstall the manifold cover plate (18).
14. Reconnect the cordset (17) to the heated hose.
15. Reconnect the M8 solenoid electrical connector..

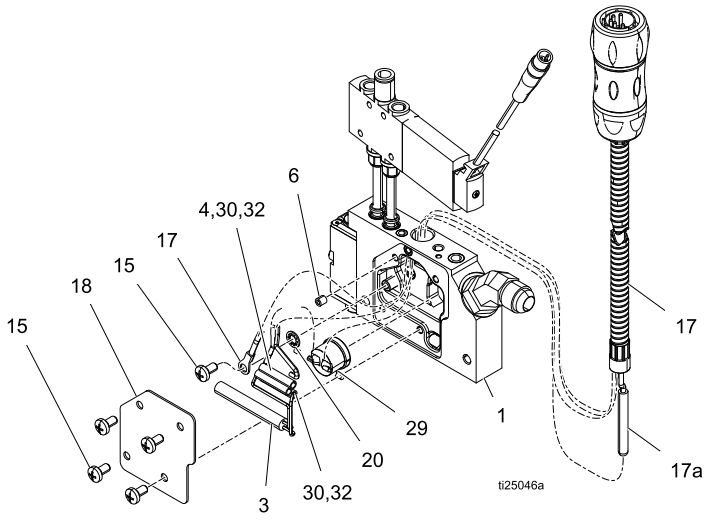


Figure 14 Repair Parts

Replace Solenoid Valve

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Turn off the air supply to the solenoid valve.
3. Disconnect the M8 solenoid electrical connector (N).
4. Disconnect air line from air fitting (L).

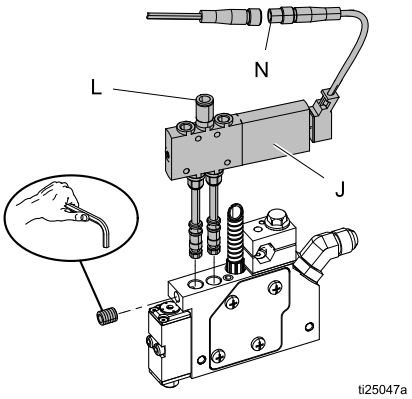


Figure 15 Replace Solenoid Valve

5. Loosen the solenoid valve set screw with a 3 mm Allen wrench, then remove the solenoid valve (J).
6. Apply high temperature grease to o-rings on solenoid tubes.
7. Install the new solenoid valve into the manifold, then use a 3 mm Allen wrench to tighten the solenoid valve set screw.
8. Connect the M8 solenoid valve electrical connector (N).
9. Connect the 1/4 in. air line to the solenoid. Turn air on.

Replace Module

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Use a 3 mm Allen wrench to remove the two mounting screws (22) and module (2) from manifold (1).

NOTICE

Do not allow adhesive to enter the air ports, to allow air to flow through valve. Adhesive in the air ports will obstruct the flow of air and damage the valve.

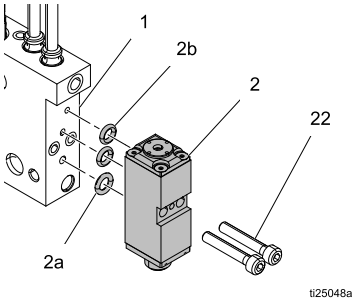


Figure 16 Remove Module From Manifold

3. Verify that no glue is present in the manifold air ports.
4. Apply high temperature lubricant to air section o-rings (2b) and fluid section o-ring (2a) in module (2).

   NOTE: Air section o-rings are brown and the fluid section o-ring is black. All o-rings are fluoroelastomer. The color is only used to identify the difference in size.
5. Apply anti-seize to two screw threads (22). Use a 3 mm Allen wrench to install new module (2) on manifold with two screws (22). Torque to 28–32 in.-lb (3.2–3.6 N•m).
6. Connect cordset (17) to the heated hose.

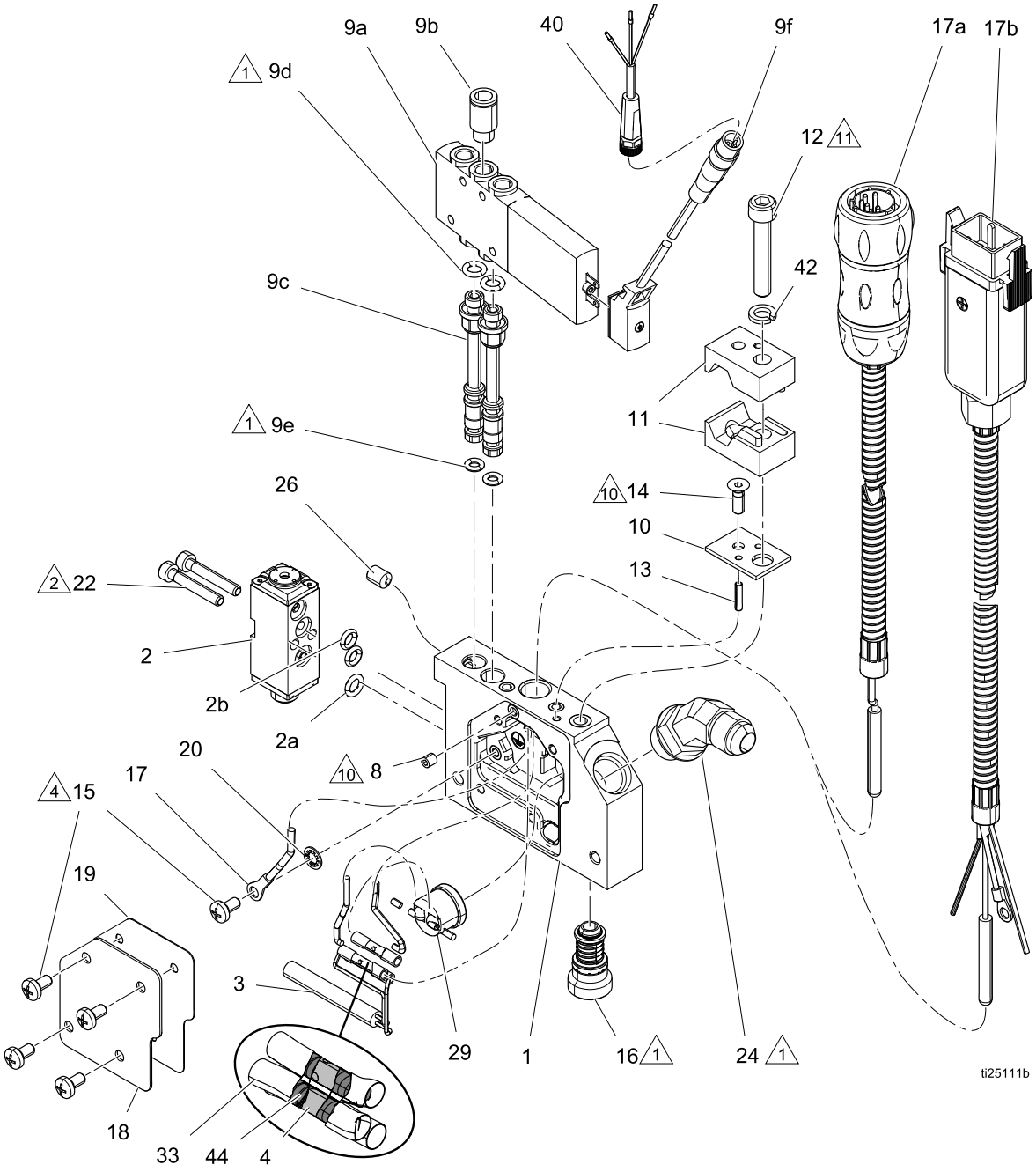
Replace Applicator

1. Disable the applicator. See Before Beginning Repair, page 20.
2. Loosen the mounting bar clamp and remove the applicator from the mounting bar.
3. Install new applicator. See Installation, page 9 .

Notes

Parts

SLIM (25B021, 25B024)



1 Apply a thin coating of lubricant to seals.

2 Apply lubricant to the first .05 in. of the thread of the bolts (22) before installing module (2). Torque to 30 +/- 2 in-lb (3.3 +/- 0.2 N•m).

4 Torque to 15–20 in-lb (1.7–2.2 N•m).

10 Torque to 10–12 in-lb (1.1–1.5 N•m).

11 Torque to 144 in–lb/12 ft-lb (1.5 N•m).

Table 1 Slim Parts List

Ref.	Part	Description	Qty.
1		MANIFOLD, single	1
2	25B241	MODULE, AC, GM100	1
3◆	24X043	HEATER, rod	1
4○		CONNECTOR, butt splice	3
5▲	16K931	TAG, warning	1
8	124736	SCREW, set, cup, M4 x 7 x 4 mm, sst	1
9☼	24X038	SOLENOID, quick disconnect	1
10●		INSULATOR, slim	1
11●		CLAMP, bottom, hinged	2
12●		BOLT, shcs, M6 x 35 mm	1
13	102411	PIN, spring,	1
14●		SCREW, mach, hex, flat hd	1
15	128306	SCREW, mach, phillips, pan hd	5
16■		FILTER, applicator, 80 mesh	1
17		CORD, set, 240 V, applicator, mini	1
17a	24X039	APPLICATOR, GM100, single, 24 VDC, PT100 (Model 25B021)	
17b	24X040	APPLICATOR, GM100, single, 24 VDC, Ni120 (Model 25B024)	
18	17A518	PANEL, single	1
19	17B164	INSULATOR, electrical	1
20	157021	WASHER, lock, int	1
22	111119	SCREW, valve	2
24	24P548	FITTING, elbow, 45, JIC 06 x SEA06, mm	1
25	103473	STRAP, tie, wire	1
26	16P285	SCREW, set, cup, socket hd	1
29	24X046	SWITCH, over temp, 500F, 2 in. leads	1
30○		SLEEVE, silicone, red, 2 in. LGX, 0.16 in. OD	3
32○	C33049	TAPE, adhesive, fiberglass	0.25
40	24X456	CABLE, M8, 3–pin, 5.0 m	1
41▲	17F001	TAG, instruction	1
42●		LOCK WASHER	1

● *Included in Slim Mounting Clamp Kit, see Kits and Accessories, page 37.*

○ *Included with all Heater, Cordset, and Overtemp Kits, see Kits and Accessories, page 37.*

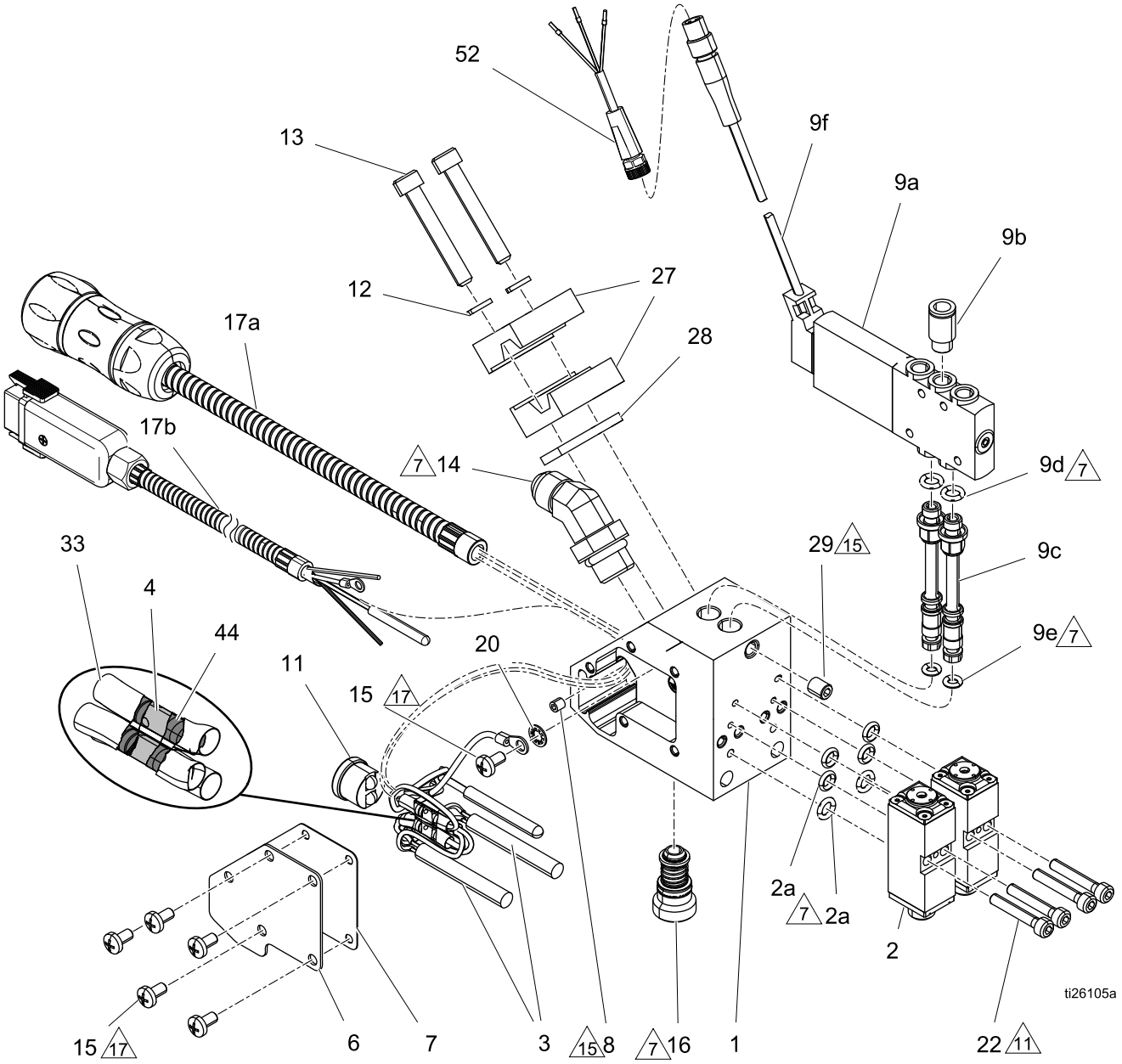
◆ *Included with Slim Heater Kit, see Kits and Accessories, page 37.*

■ *Included in Inlet Filter Kit options, see Kits and Accessories, page 37.*

☼ *For individual solenoid components, see Solenoid Valve Kits, page 36.*

▲ *Replacement Danger and Warning labels are available at no cost.*

Dual (25B075, 25B301)



7 Apply a thin coating of lubricant to seals.

11 Apply lubricant to the first .05 in. of the thread of the bolts (22) before installing module (2). Torque to 30 +/- 2 in-lb (3.3 +/- 0.2 N•m).

15 Torque to 10–12 in-lb (1.1–1.5 N•m).

17 Torque to 15–20 in-lb (1.7–2.2 N•m).

Table 2 Dual Parts List

Ref.	Part	Description	Qty.
1		MANIFOLD, dual, GM100, machined	1
2	25B241	MODULE, AC, GM100	2
3◆	24X242	HEATER, rod	2
4○		CONNECTOR, butt splice	3
5▲	16K931	TAG, warning	1
6	17D782	PLATE, electrical, GM100, dual	1
7	128220	INSULATOR, electrical, dual	1
8	124736	SCREW, set, cup, M4 x 0.7 x 4 mm, sst	1
9☼	24X038	SOLENOID, quick disconnect	1
11	24X046	SWITCH, over temp, 500 F, with 2 in. leads	1
12	108050	WASHER, lock, spring	2
13	117030	SCREW, shcs, M6 x 40	2
14	24P549	FITTING, elbow, 45, JIC 06 x SEA06, mm	1
15	128306	SCREW, mach, phillips, pan hd	6
16■		FILTER, applicator, 80 mesh	1
17		CORD, set, 240 V, applicator, dual, 100	1
17a	24X760	APPLICATOR, GM100, dual, 24VDC, PT100 (Model 25B075)	
17b	24X761	APPLICATOR, GM100, dual, 24VDC, Ni120 (Model 25B301)	

Ref.	Part	Description	Qty.
20	157021	WASHER, lock, int	1
22	111119	SCREW, valve	4
26	103473	STRAP, tie, wire	1
27●	16T205	CLAMP, bar, housing, metric	2
28●	16P848	INSULATOR, clamp, bar, housing	1
29	16P285	SCREW, set, cup, socket hd	1
33○		SLEEVE, silicone, red, 2 in. LGX 0.16 in. OD	3
44○	C33049	TAPE, adhesive, fiberglass	0.25
52	24X456	CABLE, M8, 3–pin, 5.0 m	1
53▲	17F001	TAG, instruction	1

● *Included in Dual Mounting Clamp Kit, see Kits and Accessories, page 37.*

○ *Included with all Heater, Cordset, and Overtemp Kits, see Kits and Accessories, page 37.*

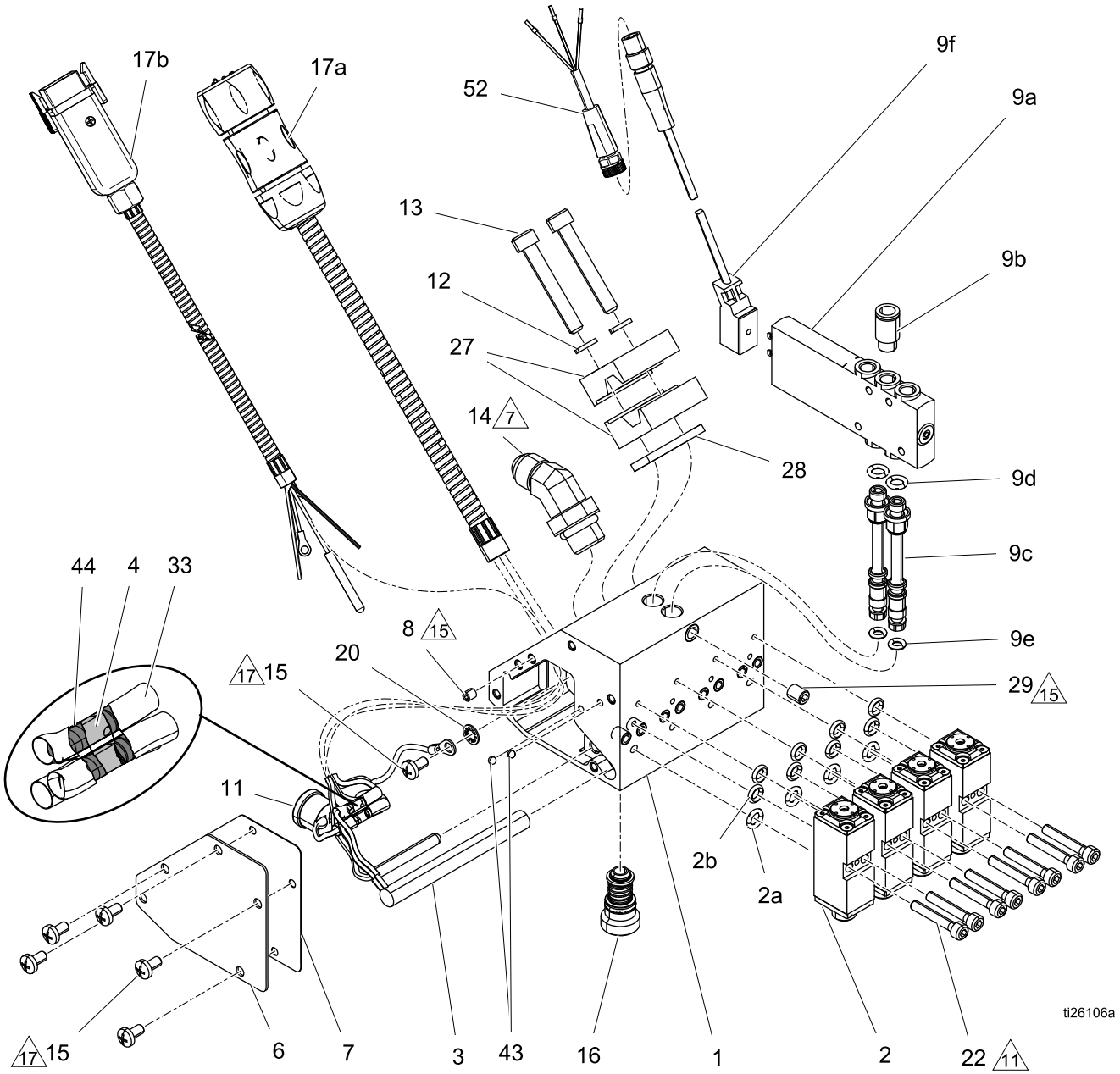
◆ *Included with Dual Heater Kit, see Kits and Accessories, page 37.*

■ *Included in Inlet Filter Kit options, see Kits and Accessories, page 37.*

☼ *For individual solenoid components, see Solenoid Valve Kits, page 36.*

▲ *Replacement Danger and Warning labels are available at no cost.*

Quad (25B077, 25B303)



7 Apply a thin coating of lubricant to seals.

11 Apply lubricant to the first .05 in. of the thread of the bolts (22) before installing module (2). Torque to 30 +/- 2 in-lb (3.3 +/- 0.2 N•m).

15 Torque to 10–12 in-lb (1.1–1.5 N•m).

17 Torque to 15–20 in-lb (1.7–2.2 N•m).

Table 3 Quad Parts List

Ref.	Part	Description	Qty.
1		MANIFOLD, quad, mini, machine head	1
2	25B241	MODULE, AC, GM100	4
3◆	24X758	HEATER, 240 VAC, 375W, 8 mm dia.	1
4○		CONNECTOR, butt splice	3
5▲	16K931	TAG, warning, turbo	1
6	17A618	COVER, electric, GM100, quad	1
7	128219	INSULATION, electrical, quad	1
8	124736	SCREW, set, cup, M4 x 0.7 x 4 mm, sst	1
9☼	24X038	SOLENOID, quick disconnect	1
11	24X046	SWITCH, over temp, 500F with 2 in. leads	1
12●	108050	WASHER, lock, spring	2
13●	117030	SCREW, shcs M6X40	2
14	24P549	FITTING, elbow, 45, JIC 06XSAE06, mm	1
15	128306	SCREW, mach, phil, pan hd	6
16■		FILTER, applicator, 80 mesh	1
17		CORD SET, 240V, applicator	1
17a	24W087	APPLICATOR, GM100, quad, 24 VDC, PT100 (Model 25B077)	
17b	24W088	APPLICATOR, GM100, quad, 24 VDC, Ni120 (Model 25B303)	

Ref.	Part	Description	Qty.
20	157021	WASHER, lock, int	1
22	111119	SCREW, valve	8
26	103473	STRAP, tie, wire	1
27●	16T205	CLAMP, bar, housing, metric	2
28●	16P848	INSULATOR, clamp, bar, housing	1
29	16P285	SCREW, set, cup, socket hd	1
33○		SLEEVE, silicone, red, 2 in. LGX 16 in. OD	3
43	102233	BALL, stainless steel	2
44○	C33049	TAPE, adhesive, fiberglass	
52	24X456	CABLE, M8, 3–pin, 5.0 m	1
53▲	17F001	TAG, instruction	1

● *Included in Quad Mounting Clamp Kit, see Kits and Accessories, page 37.*

○ *Included with all Heater, Cordset, and Overtemp Kits, see Kits and Accessories, page 37.*

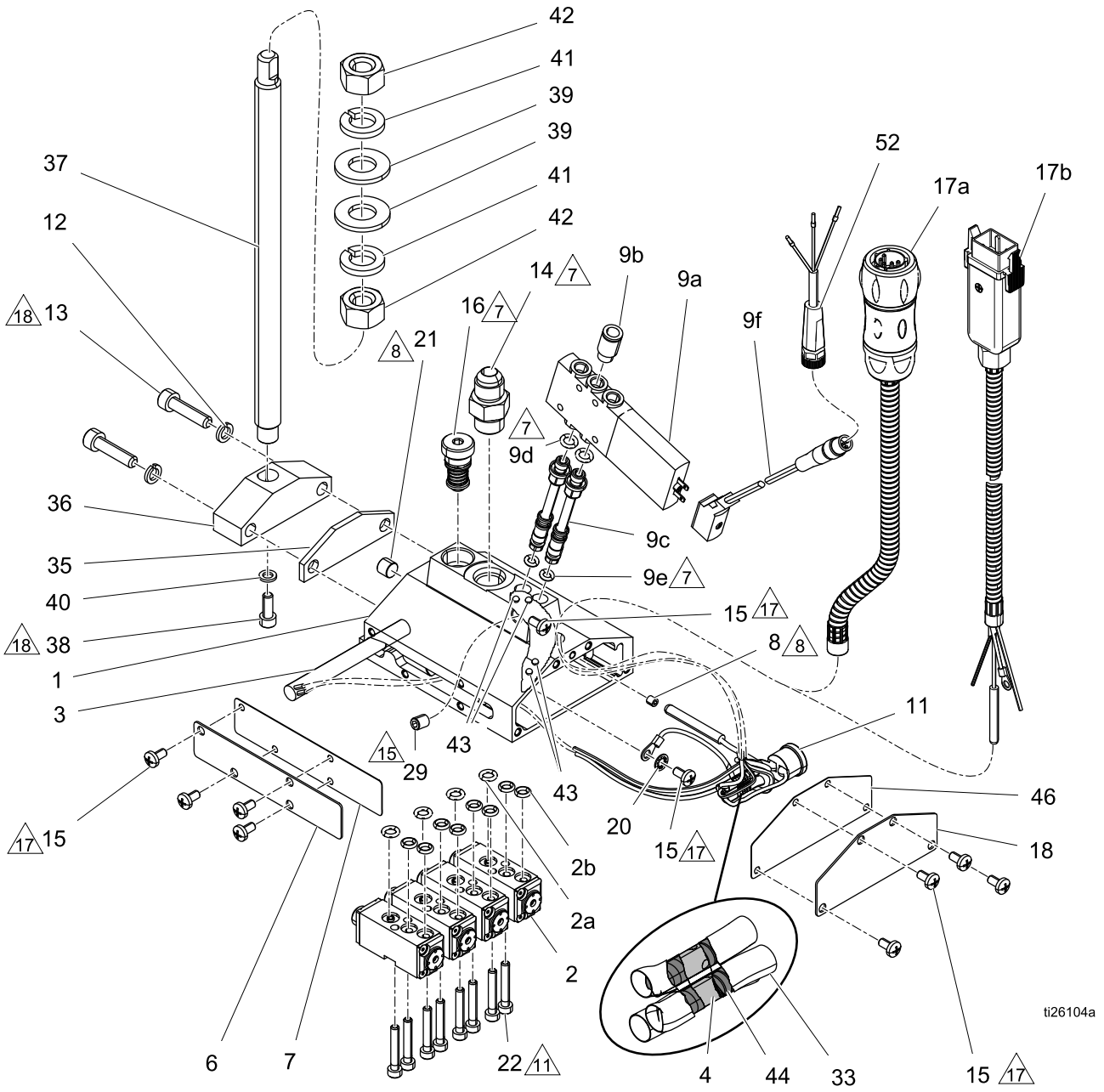
◆ *Included with Quad Heater Kit, see Kits and Accessories, page 37.*

■ *Included in Inlet Filter Kit options, see Kits and Accessories, page 37.*

☼ *For individual solenoid components, see Solenoid Valve Kits, page 36.*

▲ *Replacement Danger and Warning labels are available at no cost.*

Low Profile Quad (25B033, 25B036)



7 Apply a thin coating of lubricant to seals.

8 Apply sealant to threads. The head of the plug needs to be flush with the housing.

11 Apply lubricant to the first .05 in. of the thread of the bolts (22) before installing module (2). Torque to 30 +/- 2 in-lb (3.3 +/- 0.2 N•m).

17 Torque to 15–20 in-lb (1.7–2.2 N•m).

18 Torque to 20–30 in-lb (2.2–3.3 N•m).

Table 4 Low Profile Quad Parts List

Ref.	Part	Description	Qty.
1		MANIFOLD, quad, LP, mini, machined	1
2	25B241	MODULE, AC, GM100	4
3◆	24X758	HEATER, 240 VAC, 375 W, 8 mm diameter	1
4○		CONNECTOR, butt splice	3
5▲	16K931	TAG, warning	1
6	17B968	PLATE, side, quad, LP, GM100	1
7	128007	INSULATOR, electrical, side plate	1
8	124736	SCREW, set, cup, M4 x 0.7 x 4 mm, sst	1
9☼	24X038	SOLENOID, quick disconnect	1
11	24X046	SWITCH, over temp, 500F, with 2 in. leads	1
12●	108050	WASHER, lock, spring	2
13●	117029	SCREW, shcs, M6X25	2
14	24P615	FITTING, adapter, JIC 06 x SEA06, mm	1
15	128306	SCREW, mach, phillips, pan hd	10
16■		FILTER, applicator, mesh 80	1
17		CORD, set, 240 V, applicator	1
17a	24W087	APPLICATOR, GM100, dual, LP, 24VDC, PT100 (Model 25B033)	
17b	24W088	APPLICATOR, GM100, dual, LP, 24VDC, Ni120 (Model 25B036)	
18	17D216	PLATE, back, quad, LP, GM100	1
20	157021	WASHER, lock, int	1
21	103147	PLUG, pipe	1
22	111119	SCREW, valve	8
26	103473	STRAP, tie, wire	1
29	16P285	SCREW, set, cup, socket hd	1
33○		SLEEVE, silicone, red, 2 in. LGX 0.16 in. OD	3
35●		INSULATOR, clamp, GM100, quad, LP	1
36●		BLOCK, mounting, GM100, quad, LP	1
37●		ROD, mtg, threaded, low profile	1
38●	102598	SCREW, cap, socket head	1
39●	109570	WASHER, plain	2
40●	100020	WASHER, lock	1
41●	100018	WASHER, lock, spring	2
42●	100321	NUT	2
43	102233	BALL, stainless steel	4
44○	C33049	TAPE, adhesive, fiberglass	0.25
46	128008	INSULATOR, electrical, back plate	1
52	24X456	CABLE, M8, 3–pin, 5.0 M	1
53▲	17F001	TAG, instructions	1

● *Included in Quad Mounting Clamp Kit, see Kits and Accessories, page 37.*

○ *Included with all Heater, Cordset, and Overtemp Kits, see Kits and Accessories, page 37.*

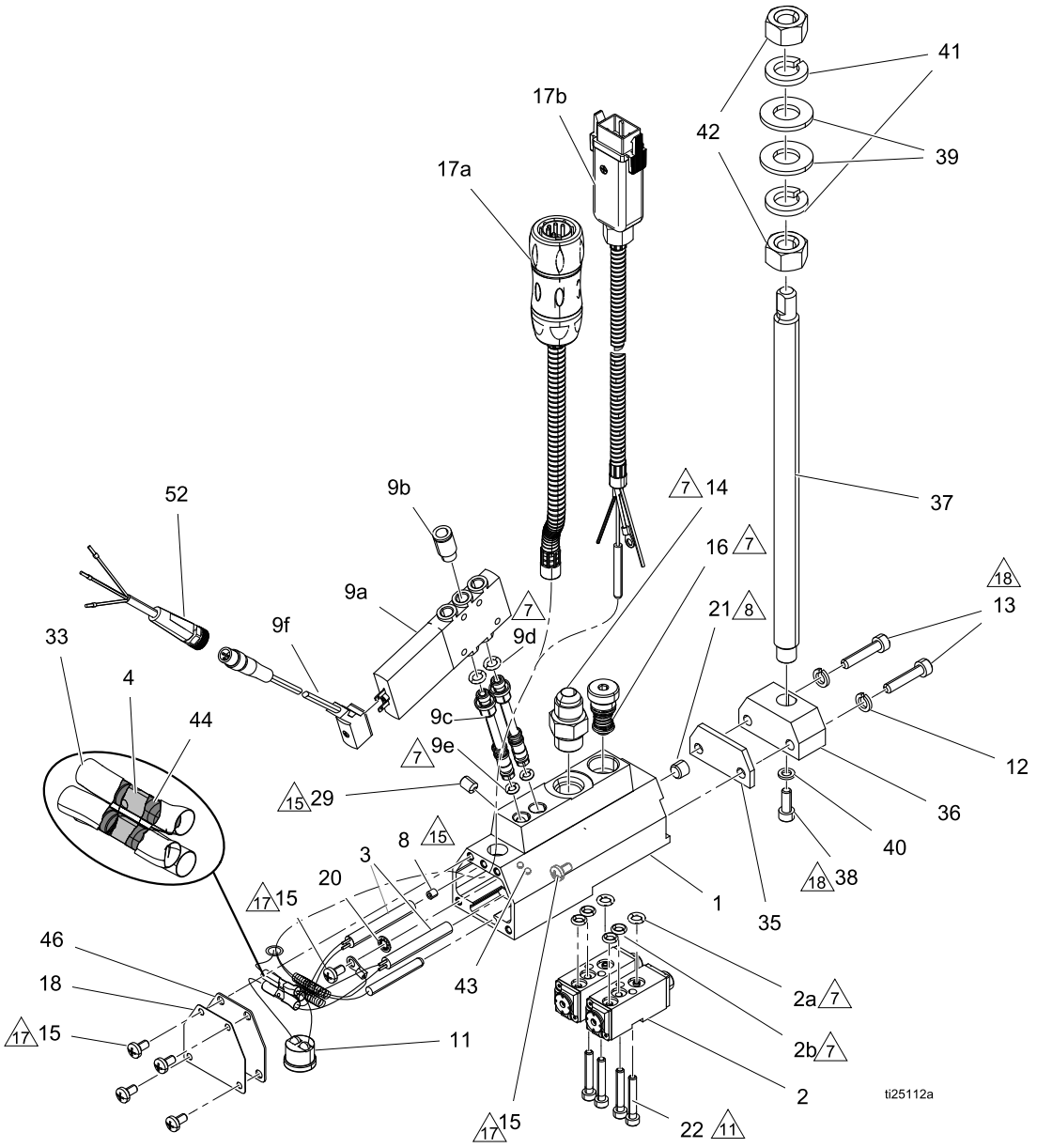
◆ *Included with Quad Heater Kit, see Kits and Accessories, page 37.*

■ *Included in Inlet Filter Kit options, see Kits and Accessories, page 37.*

☼ *For individual solenoid components, see Solenoid Valve Kits, page 36.*

▲ *Replacement Danger and Warning labels are available at no cost.*

Low Profile Dual (25B027, 25B030)



7	Apply a thin coating of lubricant to seals.
8	Apply sealant to threads. The head of the plug needs to be flush with the housing.
11	Apply lubricant to the first .05 in. of the thread of the bolts (22) before installing module (2). Torque to 30 +/- 2 in-lb (3.3 +/- 0.2 N•m).
15	Torque to 10–12 in-lb (1.1–1.5 N•m).
17	Torque to 15–20 in-lb (1.7–2.2 N•m).
18	Torque to 20–30 in-lb (2.2–3.3 N•m).

Table 5 Low Profile Dual Parts List

Ref.	Part	Description	Qty.
1		MANIFOLD, dual, LP, mini, machined	1
2	25B241	MODULE, AC, GM100	2
3♦	24X242	HEATER, rod	2
4○		CONNECTOR, butt splice	3
5▲	16K931	TAG, warning	1
8	124736	SCREW, set, cup, M4 x 0.7 x 4mm, sst	1
9☼	24X038	SOLENOID, quick disconnect	1
11	24X046	SWITCH, over temp, 500F, with 2 in. leads	1
12●	108050	WASHER, lock, spring	2
13●	127941	SCREW, shcs, M5 x 25	2
14	24P615	FITTING, adapter, JIC 06 x SEA06, mm	1
15	128306	SCREW, mach, phillips, pan hd	6
16■		FILTER, applicator, 80 mesh	1
17		CORD, set, 240V, applicator	1
17a	24W087	APPLICATOR, GM100, dual, LP, 24 VDC, PT100 (Model 25B027)	
17b	24W088	APPLICATOR, GM100, dual, LP, 24 VDC, Ni120 (Model 25B030)	
18	17C165	PLATE, electrical, GM100, dual, LP	1
20	157021	WASHER, lock, int	1
21	103147	PLUG, pipe	1
22	111119	SCREW, valve	4
26	103473	STRAP, tie, wire	1
29	16P285	SCREW, set, cup, socket hd	1

Ref.	Part	Description	Qty.
33○		SLEEVE, silicone, red, 2 in. LGX 0.16 in. OD	3
35●	17C164	INSULATOR, clamp, GM100, dual LP	1
36●	17C163	BLOCK, mounting, GM100, dual, LP	1
37●	16V783	ROD, mtg, threaded, low profile	1
38●	102598	SCREW, cap, socket head	1
39●	109570	WASHER, plain	2
40●	100020	WASHER, lock	1
41●	100018	WASHER, lock, spring	2
42●	100321	NUT	2
43	102233	BALL, stainless steel	2
44○	C33049	TAPE, adhesive, fiberglass	0.25
46	127943	INSULATOR, electrical	1
52	24X456	CABLE, M8, 3–pin, 5.0 m	1
53▲	17F001	TAG, instructions	1

● *Included in Quad Mounting Clamp Kit, see Kits and Accessories, page 37.*

○ *Included with all Heater, Cordset, and Overtemp Kits, see Kits and Accessories, page 37.*

♦ *Included with Quad Heater Kit, see Kits and Accessories, page 37.*

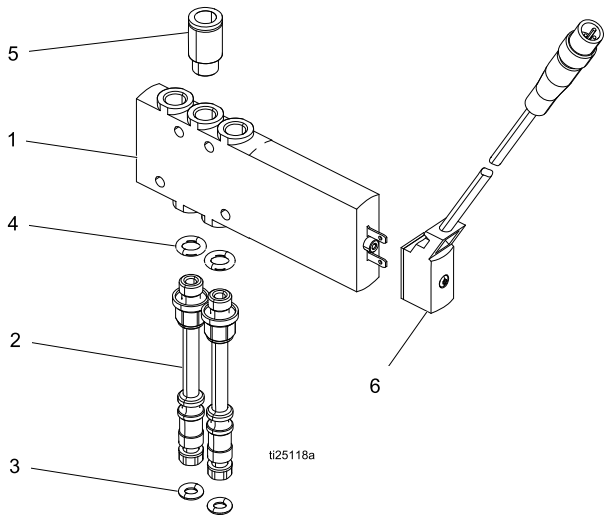
■ *Included in Inlet Filter Kit options, see Kits and Accessories, page 37.*

☼ *For individual solenoid components, see Solenoid Valve Kits, page 36.*

▲ *Replacement Danger and Warning labels are available at no cost.*

Solenoid Valve Kits

24X038, 24 VDC Solenoid Valve



Ref.	Part	Description	Qty.
1	- - -	VALVE, solenoid, 5w, sr, 24 VDC	1
*2	24X044	KIT, solenoid tube with o-rings	1
*3	106560	O-RING, packing	1
*4	295685	O-RING	1
*5	17A633	FITTING, 1/4 push-to-connect, M7	1
*6	24X045	KIT, solenoid cable	1

Kits and Accessories

Module Replacement

25B241

Part	Description	Qty.
- - - -	MODULE	1
111119	SCREW, valve	2
24R835	O-RING (10 pack) Fluid	1
24T179	LUBRICANT, anti-seize	1
24X834	Air O-RING (10 pack)	2

Cordsets

Cordsets include the RTD. Use crimp tool kit 24W086 (purchase separately).

Kit	Model	RTD Type
24X039	Slim	Platinum 100 Ohm
24X040	Slim	Nickel 120 Ohm
24X760	Standard Dual	Platinum 100 Ohm
24X761	Standard Dual	Nickel 120 Ohm
24W087	All other models	Platinum 100 Ohm
24W088	All other models	Nickel 120 Ohm

Heater Cartridges

Heater cartridges for single, dual, and quad models.

Kit	Model	Length	Qty.
24X043	Slim	1.75 in. (44 mm)	1
24X242	Dual Low Profile and Dual	1.75 in. (44 mm)	2
24X758	Quad Low Profile and Quad	3.1 in. (79 mm)	1

High Temperature Lubricant

24T156

Packet with 3–grams of high temperature lubricant. For use on seals in InvisiPac applicators.

Anti-Seize

24T179

Tube with 0.5 oz of anti-seize for use on module mounting screws in InvisiPac applicators.

Mufflers

24X037

Includes two mufflers that can be used with solenoid valve kits.

Blanking Plate Kit

24W017

Use to run two or three modules on a quad applicator or one module on a dual applicator.

Inlet Filter

Kit	Qty.
24P275	Single
24P802	3 Pack

Material Inlet Fittings

Single Kit	Description
24P615	Straight
24P548	45°
24P547	90°

Thermal Cutoff Replacement Kits

Kit	Description
24X046	Standard

Mounting Clamp Kits

(Slim 24X042)

Ref	Part	Description	Qty.
10	17A496	INSULATOR, clamp, bar, housing	1
11	- - -	CLAMP, bar housing	2
12	108050	WASHER, lock, spring	1
13	112674	SCREW, shcs, M6 x 35	1
14	106371	SCREW, flat head	1

24X243 (Dual Low Profile)

Ref	Part	Description	Qty.
10	24P276	INSULATOR, clamp, bar, housing	1
11	- - -	BLOCK, mating, low profile	1
12	108050	WASHER, lock, spring	2
13	117029	SCREW, shcs, M6 x 25	2
44	- - -	ROD	1
45	- - -	SCREW, cap, socket head	1
46	- - -	WASHER, lock	1
47	- - -	WASHER, plain	2
48	- - -	WASHER, lock, spring	2
49	- - -	NUT, 1/2–13	2

24P277 (Dual and Quad)

Ref.	Part	Description	Qty.
1	16T205	CLAMP, bar, housing, metric	2
2	108050	WASHER, lock, spring	2
3	117030	SCREW, shcs, M6x40	2
4	16P848	INSULATOR, clamp, bar, housing	1

24X835 (Low Profile Quad)

Ref.	Part	Description	Qty.
1	100018	WASHER, lock, spring	2
2	100020	WASHER, lock	1
3	100321	NUT	2
4	102598	SCREW, cap, socket head	1
5	108050	WASHER, lock, spring	2
6		WASHER, plain	2
7		SCREW, shcs M5x25	2
8	16V783	ROD, mtg, threaded, low profile	1
9	17C203	BLOCK, mounting, GM100, quad, lp	1
10	17C204	INSULATOR, clamp, GM100, quad, lp	1

Solenoid Extension Cables

24X456	5 m
24X457	10 m

Remote Mounting Kit

NOTE: Performance is decreased as tube length increases.

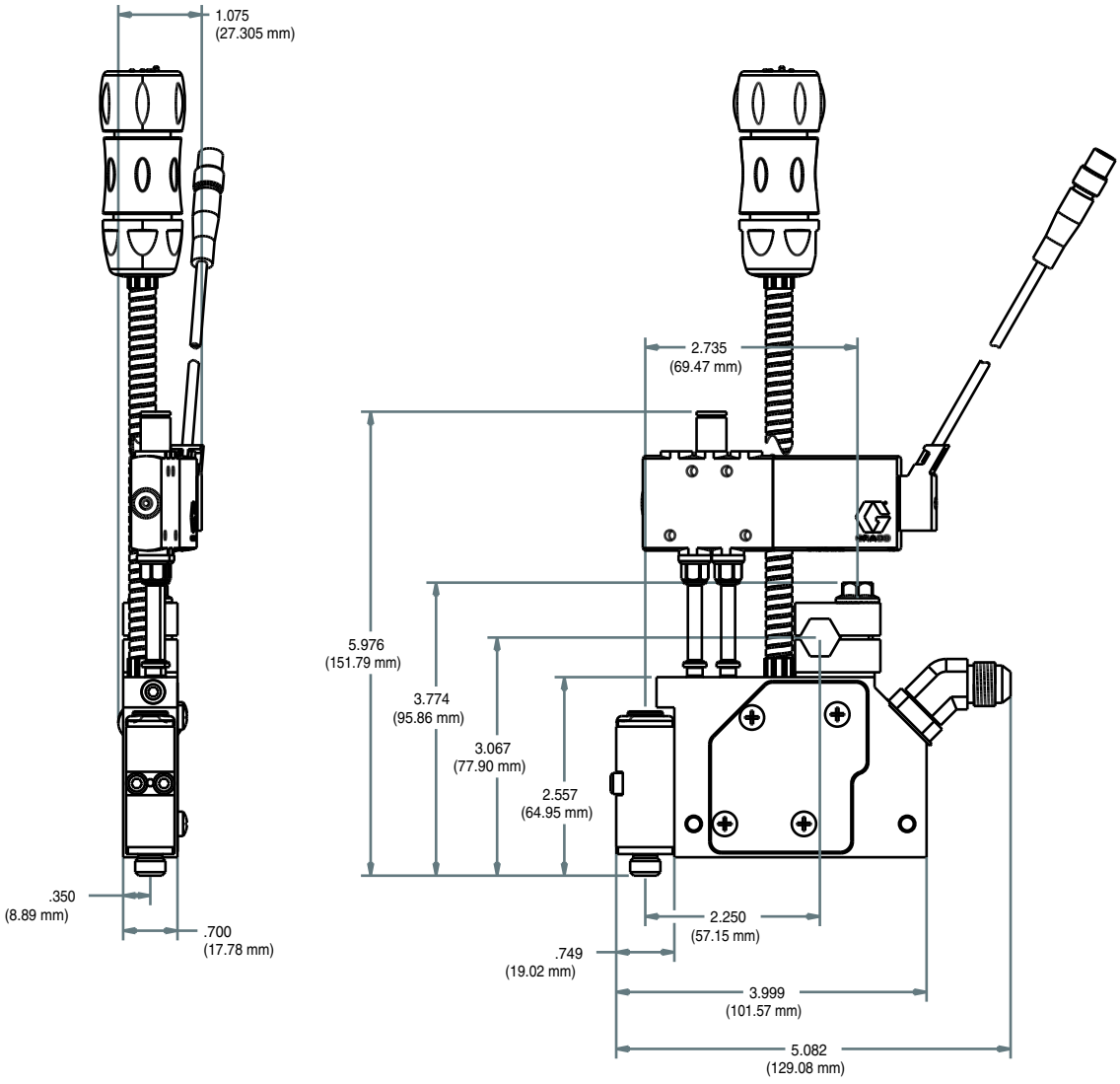
24X049	Standard
24X050	Metric

Nozzles (Single Orifice)

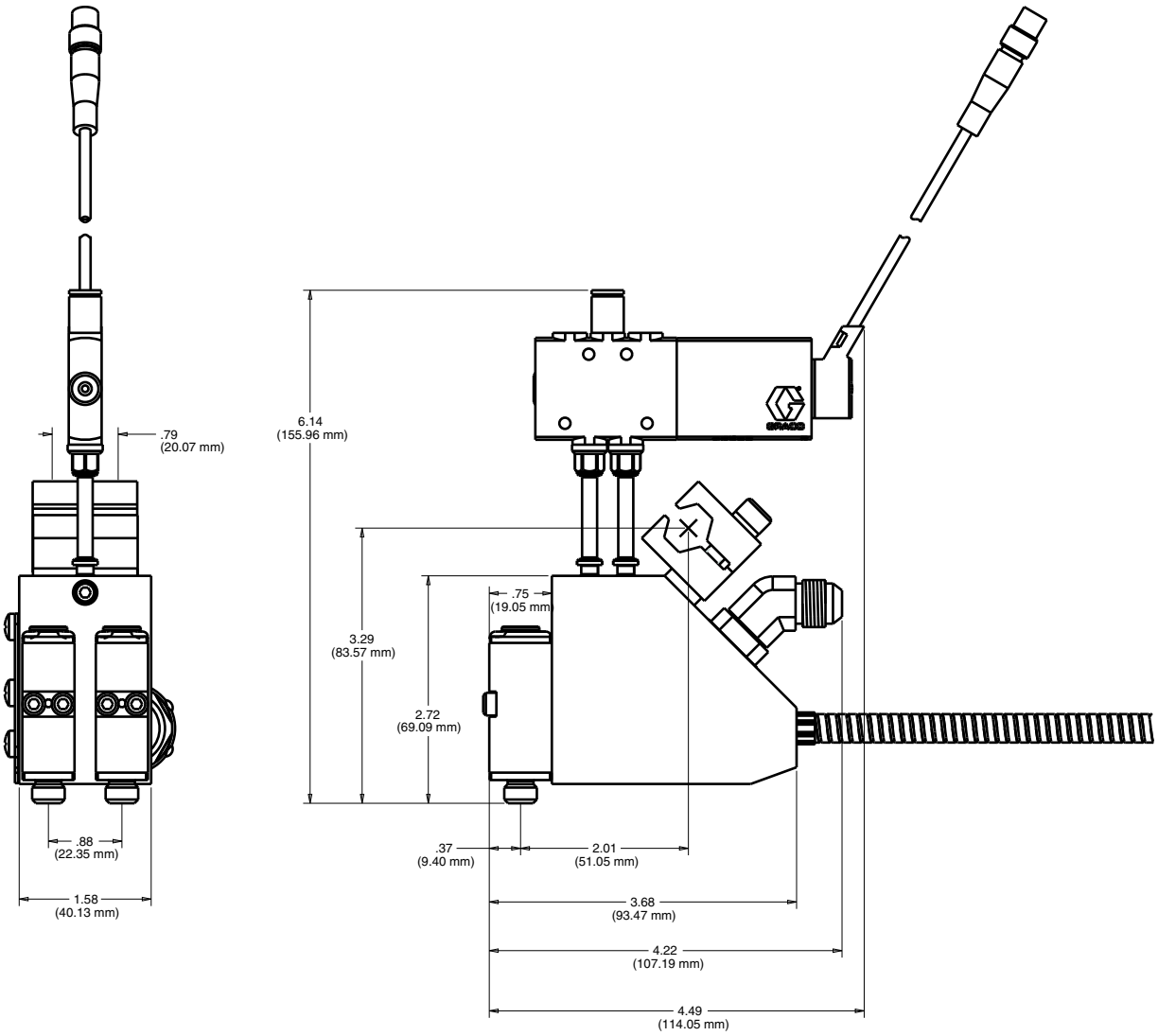
Single	5 Pack	Description
24P636	24P794	0.008 straight
24P637	24P795	0.010 straight
24P638	24P796	0.012 straight
24P639	24P797	0.016 straight
24P640	24P798	0.018 straight
24P641	24P799	0.020 straight
24P642	24P800	0.024 straight
24P643	24P803	0.008 90°
24P644	24P804	0.010 90°
24P645	24P805	0.012 90°
24P646	24P806	0.016 90°
24P647	24P807	0.018 90°
24P648	24P808	0.020 90°
24P649	24P809	0.024 90°

Dimensions

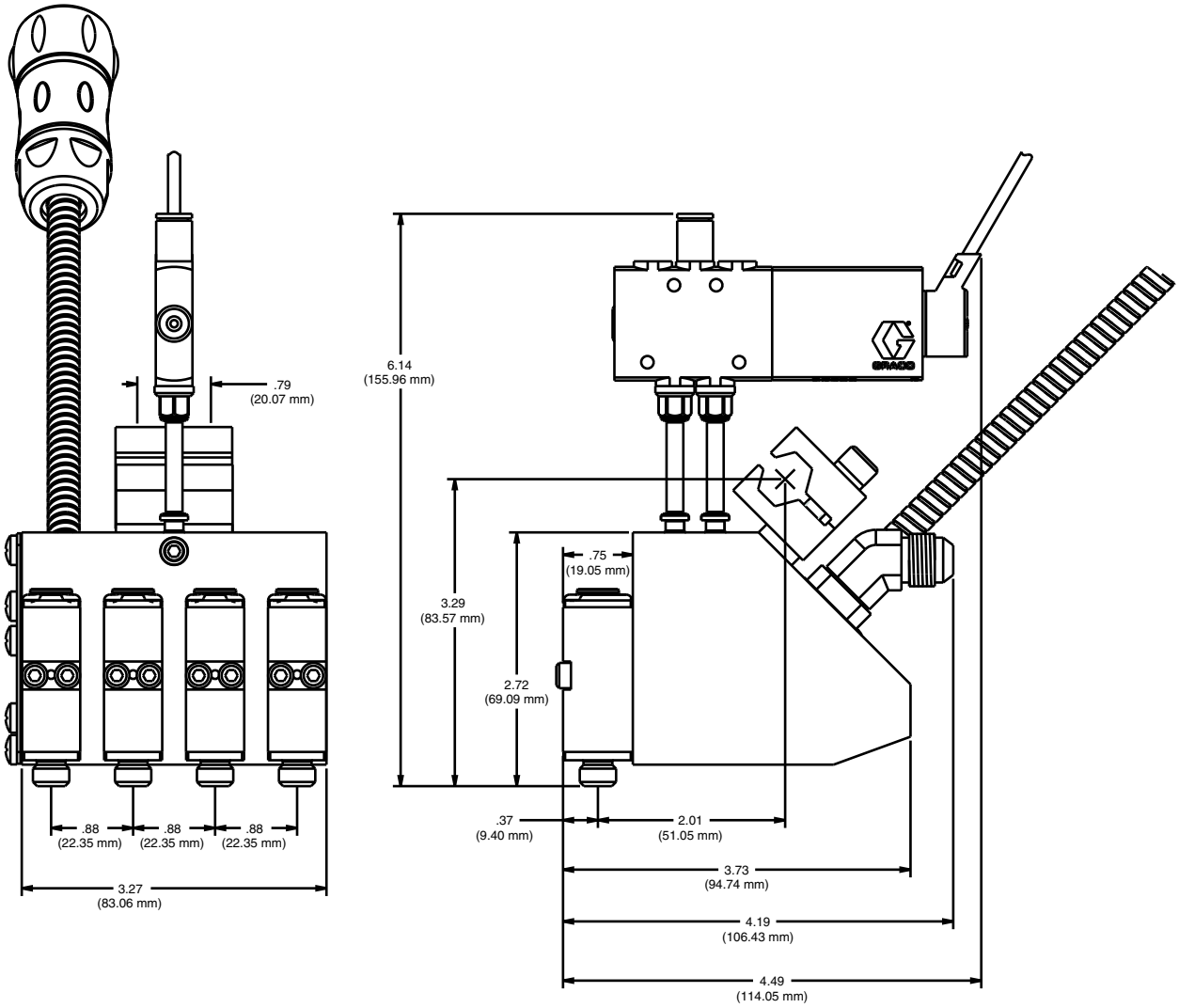
Slim (25B021, 25B024)



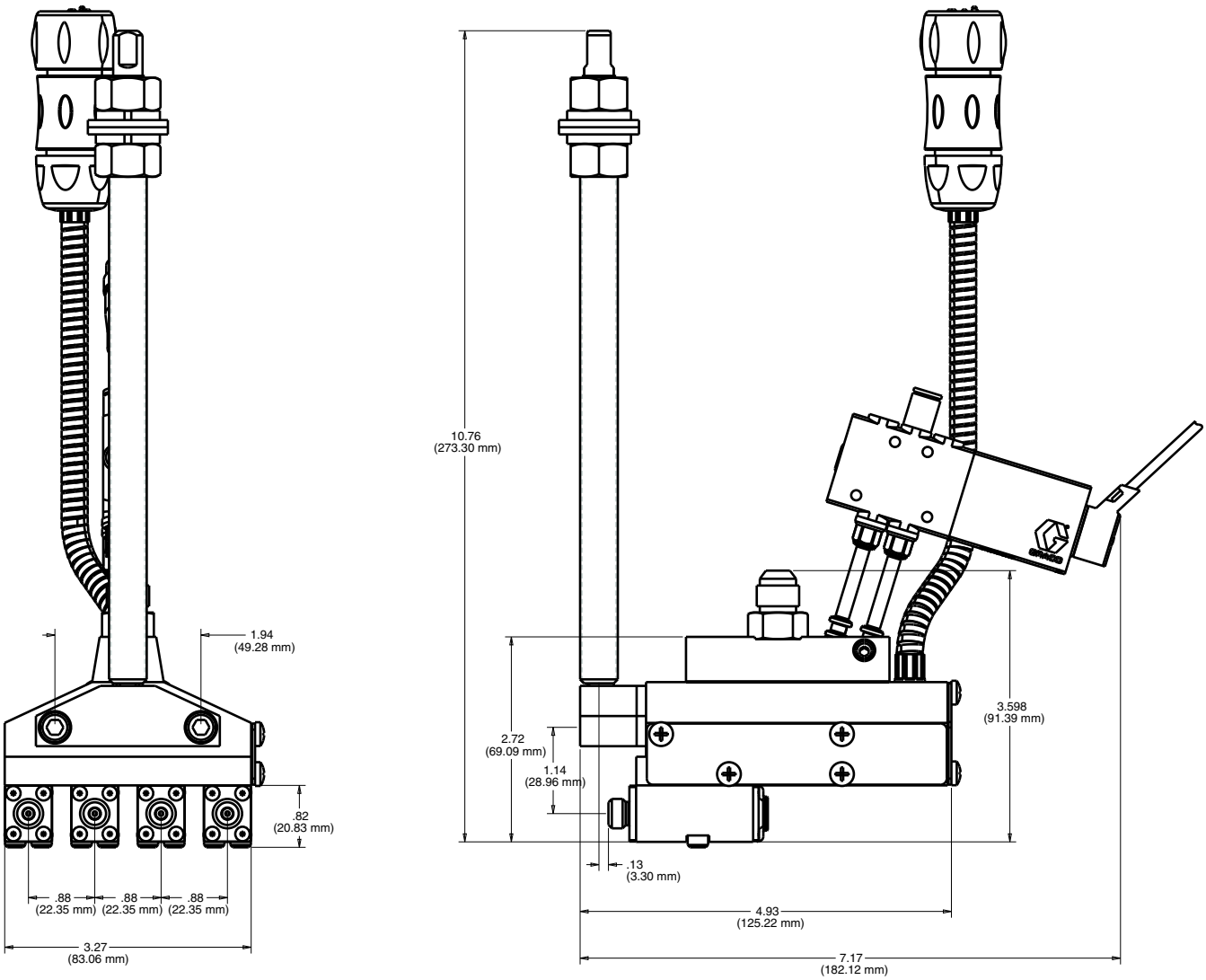
Dual (25B075, 25B301)



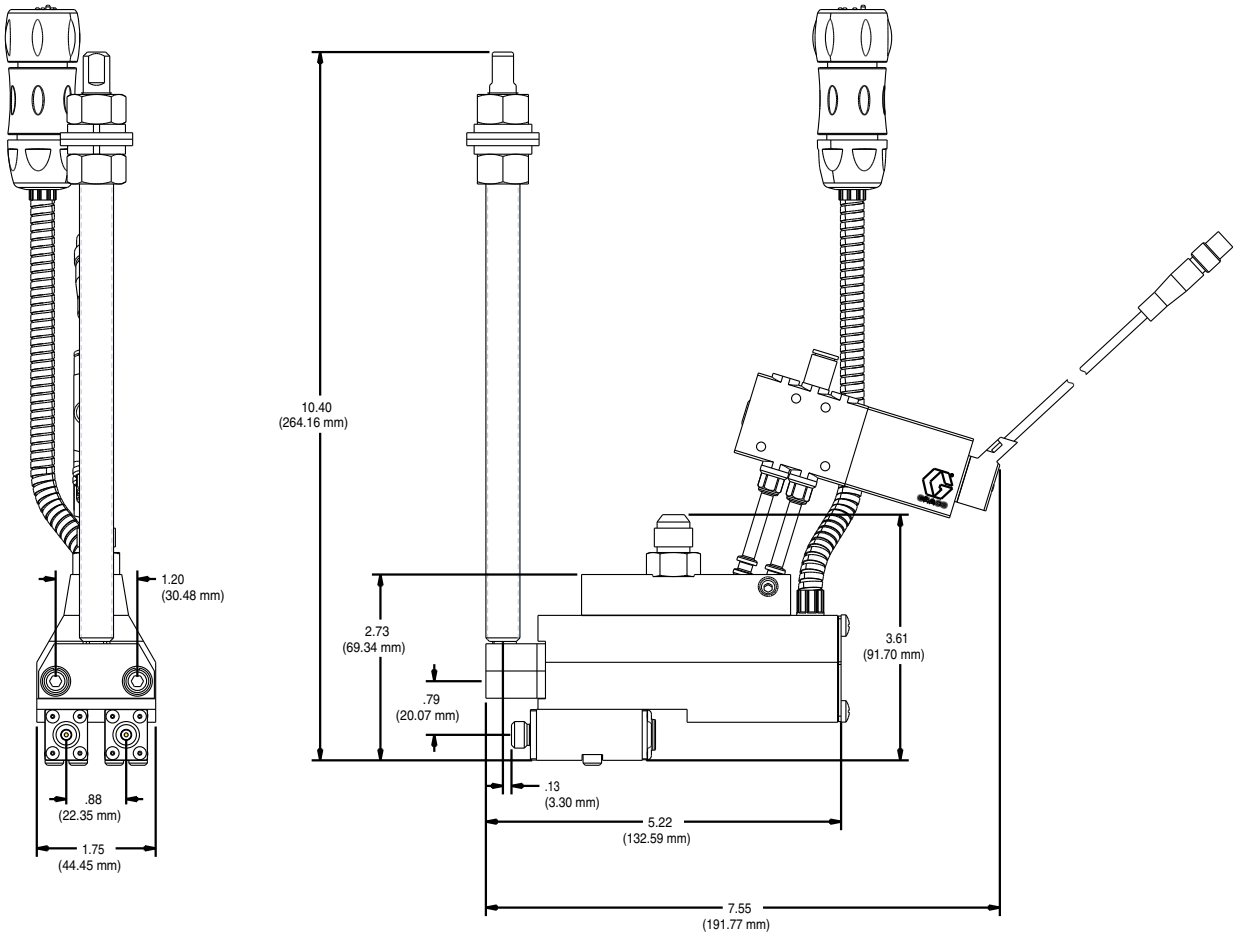
Quad (25B077, 25B303)



Low Profile Quad (25B033, 25B036)



Low Profile Dual (25B027, 25B030)



Technical Data

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For more information about InvisiPac, visit www.InvisiPac.com.

To place an order, contact your Graco Distributor or call to identify the nearest distributor.

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Revision D – May 2015