

Therm-O-Flow® Warm Melt

3A8005A

EN

For dispensing sealants, adhesives, and other medium to high viscosity fluids. For professional use only.

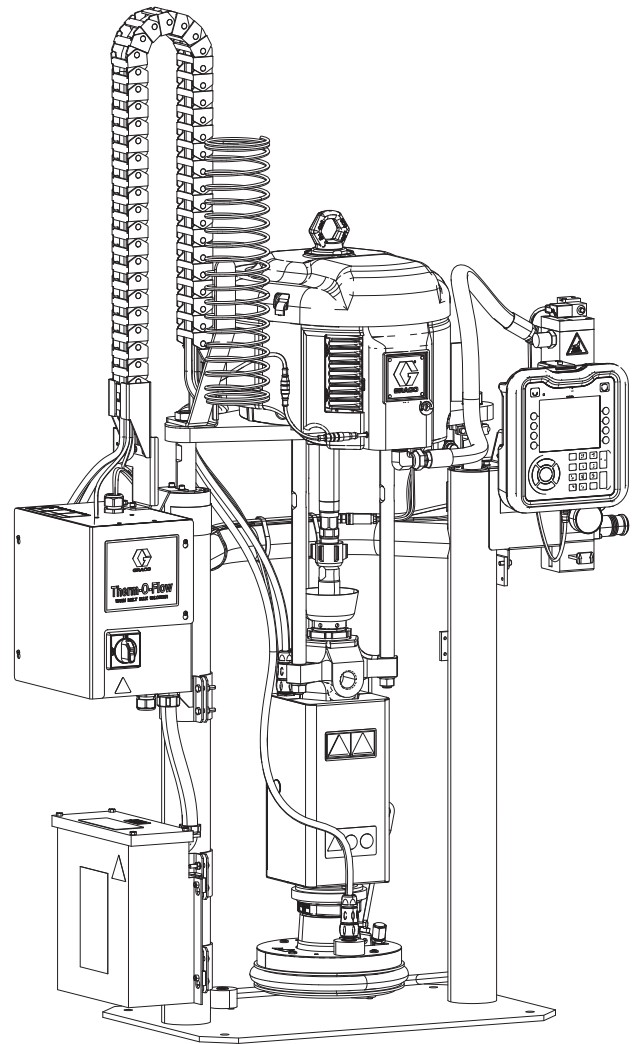
Not approved for use in explosive atmospheres or hazardous (classified) locations.

See page 4 for model information, including maximum working pressure and approvals.



Important Safety Instructions

Read all warnings and instructions in this manual and related manuals before using the equipment. Save these instructions.



Contents

Related Manuals	3	Operation	40
Models	4	Single Run Screen	41
Therm-O-Flow Warm Melt	4	Tandem Run Screen	42
Approvals	4	Heat Run Screen	43
Therm-O-Flow Warm Melt Pressure	5	Events and Errors	45
Heat Zones	6	Pressure Relief Procedure	46
Warnings	7	Stop Controls	47
Component Identification	10	Shutdown	48
Single Therm-O-Flow Warm Melt	10	Schedule	49
Tandem Therm-O-Flow Warm Melt	11	Maintenance	50
Air Line Accessories	12	Maintenance Screen	50
Power Disconnect	12	Diagnostics	51
Integrated Air Controls	13	System Diagnostics Screen	51
Platen (D) Component Identification	14	Heat Diagnostics Screen	51
Heat Control Box Connections	15	Troubleshooting	53
Advanced Display Module (ADM)	16	View Errors	53
ADM Display Details	17	Troubleshoot Errors	54
ADM LED Status Descriptions	19	Error Codes	55
ADM Icons	19	Ram Assembly Troubleshooting	66
ADM Soft Keys	20	Pump Troubleshooting	67
Main Menu	21	Air Motor Troubleshooting	67
Installation	22	Heat Control Box Troubleshooting	68
Location	22	Check Resistance (Heated Systems)	69
Grounding	22	USB Data	71
Power Requirements	23	Download Procedure	71
Connect Power	23	USB Logs	71
Air Line Connections	24	Event Log	71
Light Tower (Optional)	24	Data Log	72
Attach Drum Stops	25	System Configuration Settings	72
Setup	26	Custom Language File	72
Low Level and Drum Empty Sensors	26	Create Custom Language Strings	72
Wet Cup	26	Upload Procedure	73
Connect Heated Accessories	27	Integration	74
Install Expansion Module	29	Connect PLC Inputs	74
System Setup Screen	31	Connect PLC Outputs	77
Heat Settings	32	Communications Gateway Module (CGM)	79
Advanced Setup	34	System Error Codes	88
Hose Care Guidelines	37	Timing Diagrams	93
Startup	38	Connection Details	97
Purge System	38	Gateway Setup Screens	100
Prime Pump	38		

Repair	103
Disconnect Pump from Platen	103
Repair Platen	105
Connect Platen	106
Remove Wipers	106
Install Wipers	106
Remove Displacement Pump	107
Install Displacement Pump	108
Remove Air Motor	109
Install Air Motor	110
Ram Repair	111
Replace Heat Control Box Electrical Component(s)	114
Replace Fuses in Harness (25R652)	116
Recycling and Disposal	116
End of Product Life	116
Parts	117
D200s 6.5 in. Rams	117
D200 3 in. Rams	119
D60 3 in. Rams	121
D200, D200s Pump Mounts for 55 Gallon (200 Liter) Platen	123
D60 Pump Mount for 5 Gallon (20 Liter) Platen	124
D200s Pump Mounts for 16 Gallon (60 Liter) Platens	125
Heat Control Box	126
Expansion Module, 26B238	127
55 Gallon Platen, 255663	128
Cable Track Assemblies	129
20 Liter (5 Gallon) Platens	130
60 Liter (16 Gallon) Platens	132
Kits and Accessories	134
System Kits and Accessories	134
Drum Kits and Accessories	135
Platen/Pump Heat Harness	135
Fittings	135
Tandem Cable Kit, 26B339	135
Heated Tandem Block, 26B346	136
Check-Mate 200 CS Pump Heater Kit, 25R450	137
Platen Heater Kit, 25R451	138
Communications Gateway Module (CGM) Kits	139
Dimensions	141
Dimensions	142
Wiring Diagrams	143
Technical Specifications	150
California Proposition 65	151
Graco Standard Warranty	152

Related Manuals

Manual in English	Description
312375	Check-Mate® Displacement Pumps Instructions-Parts
312468	200 cc Check-Mate Displacement Pump Repair Parts
312374	Air Controls Instructions-Parts
312491	Pump Fluid Purge Kit Instructions - Parts
312492	Drum Roller Kit Instructions
312493	Light Tower Kit Instructions
312494	Enclosed Wetcup Recirculation Kit Instructions - Parts
406681	Platen Cover Kit
334048	EPDM Hose Wiper Kit Instructions - Parts
3A6321	ADM Token In-System Programming Instructions
3A1244	Graco Control Architecture Module
3A4241	Hot Melt/Warm Melt Heated Hose Instructions
311238	NXT® Air Motor Instructions-Parts
312864	Communications Gateway Module Instructions-Parts
312376	Check-Mate Pump Packages Instructions-Parts
310523	Global Ram Instructions-Parts List

Models

Therm-O-Flow Warm Melt

Check the identification plate (ID) on the back of the ram post near the Heat Control Box (S) for the seven-digit part number of the Therm-O-Flow Warm Melt. Use the following matrix to define the construction of the unit, based on the seven digits. For example, Part No. **WMC11B1** represents a Warm Melt supply system (**WM**), a carbon steel Check-Mate 200 Severe Duty displacement pump (**C1**), a D60 ram (**1**), a 20 L heated platen with an EPDM seal (**B**), and an Advanced Display Module (ADM)/240V (**1**).

NOTE: The heat for the Therm-O-Flow Warm Melt is for warm melt applications with a maximum temperature of 70° C (158° F).

The digits in the following matrix do not correspond to the reference numbers in the Parts drawings and lists.

WM	C1				1				B						1	
First and Second Digit	Third and Fourth Digit				Fifth Digit				Sixth Digit						Seventh Digit	
	Check-Mate Pump Options				Ram Options				Platen and Seal Options						Interface / Power Options	
		Size	Pump Material	Heated/ Ambient		Name	Size	Drum Size		Platen Size	Platen Material	Seal Material	Wiper	Heated/ Ambient		Interface / Power
WM (Warm Melt Supply System)	C1	36:1	CS	Ambient*	1	D60	3 in.	20 L (5 Gal)	A	20 L (5 Gal)	CST/AL	EPDM	Single Ring	Ambient*	1	ADM / 240V
	C2	36:1	CS	Heated ≤ 70° C	2	D200	3 in.	200 L (55 Gal)	B	20 L (5 Gal)	CST/AL	EPDM	Single Ring	Heated ≤ 70° C	2	ADM / 480V
	C3	36:1	CM	Ambient*	3	D200s	6.5 in.	200 L (55 Gal)	C	60 L (16 Gal)	CST/AL	PTFE Coated Nitrile	Single Flat	Ambient*	3	No ADM / 240V
	C4	36:1	CM	Heated ≤ 70° C					D	60 L (16 Gal)	CST/AL	PTFE Coated Nitrile	Single Flat	Heated ≤ 70° C	4	No ADM / 480V
	C5	68:1	CS	Ambient*					F	200 L (55 Gal)	AL	EPDM	Double Ring	Ambient*		
	C6	68:1	CS	Heated ≤ 70° C					G	200 L (55 Gal)	AL	EPDM	Double Ring	Heated ≤ 70° C		
	C7	68:1	CM	Ambient*												
	C8	68:1	CM	Heated ≤ 70° C												

KEY:

CS = Carbon Steel Severe Duty


CM = Carbon Steel MaxLife

CST/AL = Carbon Steel/Aluminum

AL = Aluminum

* When the system is configured with an ambient pump, only an ambient platen is available.

Approvals

Component	Agency Approval
Heat Control Box	

Therm-O-Flow Warm Melt Pressure

Due to factors such as the dispensing system design, the material being pumped, and the flow rate, the dynamic pressure will not reach the rated working (stall) pressure of the system.

	Pump Working (Stall) Pressure					
	Lower Size	Air Motor	Power Factor	psi	bar	MPa
	200CS/CM	NXT 3400	36:1	3600	248	24.8
Check-Mate		NXT 6500	68:1	5000	345	34.5

Heat Zones

The following tables show how many heat zones are available on Therm-O-Flow Warm Melt systems. The tables show heat zones available for hoses or accessories used on single or tandem systems. The number of heat zones depends on whether the system has an ambient or heated pump and platen, and if the system includes a Heat Expansion Module.

Single System

Standard Heat Control Box with Ambient Pump and Platen	
Heated Hose Zones	4
End of Hose Zones	4

Standard Heat Control Box with Heat Expansion Module and Ambient Pump and Platen	
Heated Hose Zones	8
End of Hose Zones	8

Standard Heat Control Box with Heated Pump and Platen	
Heated Pump Zone	1
Heated Platen Zone	1
Heated Hose Zones	3
End of Hose Zones	3

Standard Heat Control Box with Heat Expansion Module and Heated Pump and Platen	
Heated Pump Zone	1
Heated Platen Zone	1
Heated Hose Zones	7
End of Hose Zones	7

Tandem System

Standard Heat Control Box Ambient Pump and Platen	
Heated Hose Zones	8
End of Hose Zones	8

Standard Heat Control Box Plus One Heat Expansion Module Ambient Pump and Platen	
Heated Hose Zones	12
End of Hose Zones	12

Standard Heat Control Box Plus Two Heat Expansion Modules Ambient Pump and Platen	
Heated Hose Zones	16
End of Hose Zones	16



Standard Heat Control Box Ambient Pump and Platen	
Heated Pump Zones	2
Heated Platen Zones	2
Heated Hose Zones	6
End of Hose Zones	6







Standard Heat Control Box Plus One Heat Expansion Module and Heated Pump and Platen	
Heated Pump Zones	2
Heated Platen Zones	2
Heated Hose Zones	10
End of Hose Zones	10

Standard Heat Control Box Plus Two Heat Expansion Modules and Heated Pump and Platen	
Heated Pump Zones	2
Heated Platen Zones	2
Heated Hose Zones	14
End of Hose Zones	14

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.

 DANGER	
	<p>SEVERE ELECTRIC SHOCK HAZARD</p> <p>This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.</p> <ul style="list-style-type: none"> • Turn off and disconnect power at main switch before disconnecting any cables and before servicing equipment. • This equipment must be grounded. Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

 WARNING	
    	<p>SKIN INJECTION HAZARD</p> <p>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.</p> <ul style="list-style-type: none"> • 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



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.
- Equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.



FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. 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 sparking).
- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush solvent at high pressure.
- 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.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static 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.









THERMAL EXPANSION HAZARD

Fluids subjected to heat in confined spaces, including hoses, can create a rapid rise in pressure due to the thermal expansion. Over-pressurization can result in equipment rupture and serious injury.



- Open a valve to relieve the fluid expansion during heating.
- Replace hoses proactively at regular intervals based on your operating conditions.

WARNING

 	<p>EQUIPMENT MISUSE HAZARD Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • 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 Specifications in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) 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.
	<p>SPLATTER HAZARD Hot or toxic fluid can cause serious injury if splashed in the eyes or on skin. During blow off of platen, splatter may occur.</p> <ul style="list-style-type: none"> • Use minimum air pressure when removing platen from drum.
	<p>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.</p> <ul style="list-style-type: none"> • Read Safety Data Sheets (SDSs) 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.
	<p>BURN HAZARD Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:</p> <ul style="list-style-type: none"> • Do not touch hot fluid or equipment.
	<p>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. Protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Component Identification

Single Therm-O-Flow Warm Melt

D200 3 in. Dual Post, 200 Liter Platen

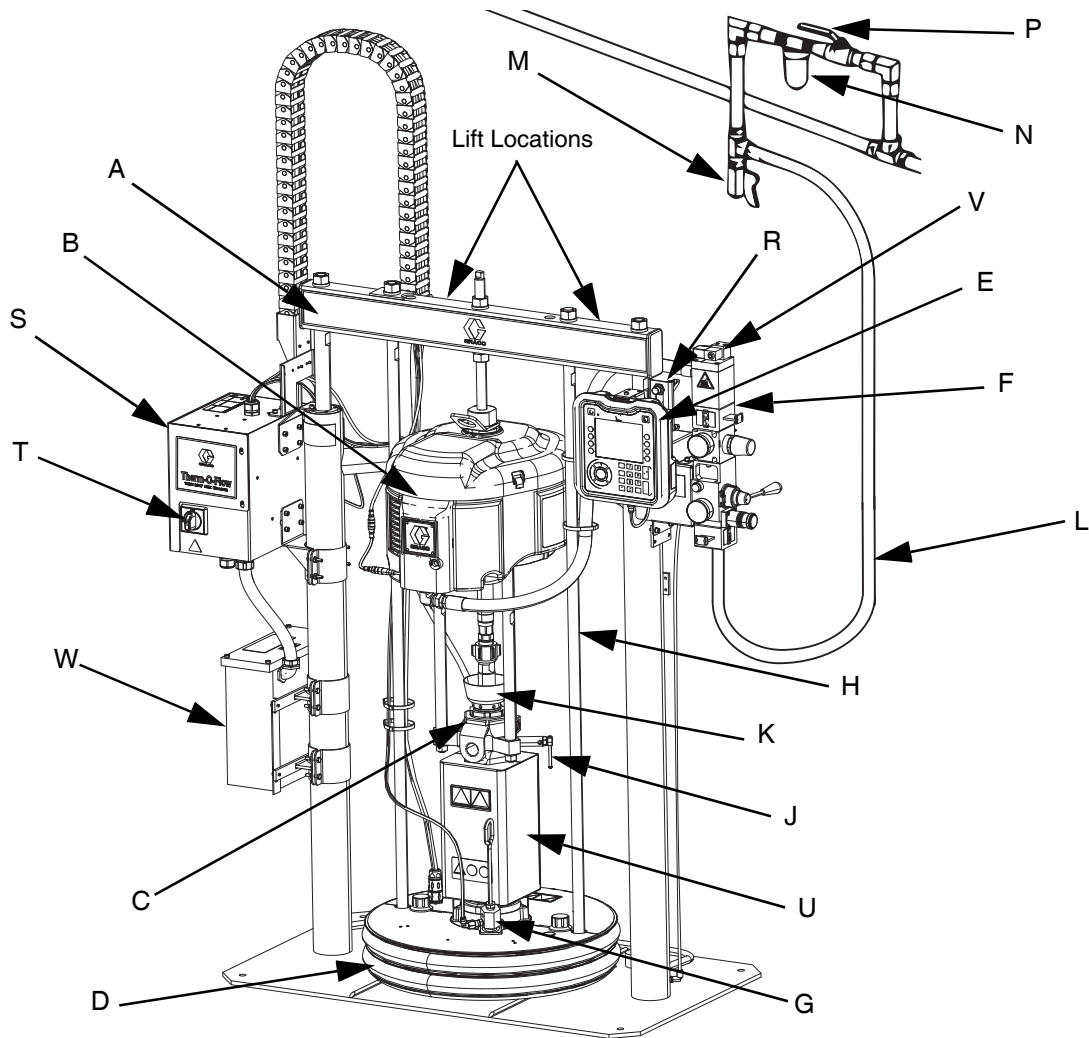


FIG. 1: Therm-O-Flow Warm Melt

Key:

- | | | | |
|---|---|---|--|
| A | Ram Assembly | S | Heat Control Box |
| B | Air Motor | T | Disconnect Switch (see Power Disconnect on page 12) |
| C | Displacement Pump | U | *Pump Heater |
| D | Platen (see FIG. 5) | V | Air Motor Solenoid |
| E | Advanced Display Module (ADM) (see FIG. 7) | W | Transformer (480V only) |
| F | Integrated Air Controls (see FIG. 4) | | |
| G | Platen Bleed Port | | |
| H | Platen Lift Rod | | |
| J | Pump Bleed Valve | | |
| K | Wet Cup | | |
| L | Air Line (not supplied) | | |
| M | Air Line Drain Valve (not supplied) | | |
| N | Air Filter (not supplied) | | |
| P | Bleed Type Air Shut Off Valve (required) (not supplied) | | |
| R | Level Sensors | | |

* Components on heated pumps only.

Tandem Therm-O-Flow Warm Melt

See **Tandem Cable Kit, 26B339** on page 135.

D200 3 in. Dual Post, 200 Liter Platen

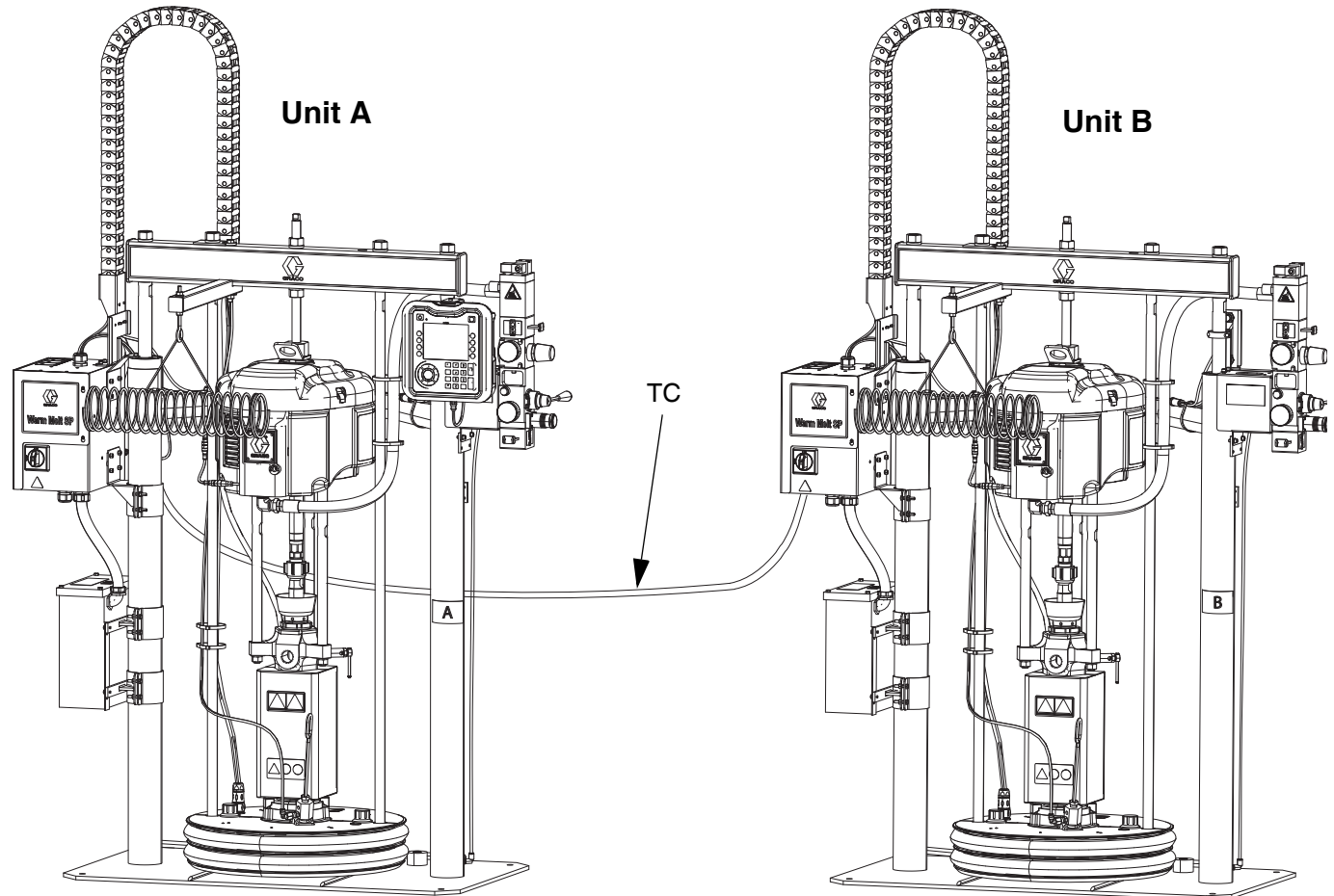


FIG. 2: Tandem Therm-O-Flow Warm Melt

Unit A: This Therm-O-Flow Warm Melt includes an ADM and is marked with the “A” label included in the Tandem Cable Kit.

Unit B: This Therm-O-Flow Warm Melt does not include an ADM and is marked with the “B” label included in the Tandem Cable Kit.

TC: Tandem Cable Kit (26B339)

Air Line Accessories

See FIG. 1 on page 10.

Air Line Drain Valve (M)

Air Filter (N): Removes harmful dirt and moisture from compressed air supply.

Bleed Type Air Shut Off Valve (P): Isolates air line accessories and Therm-O-Flow Warm Melt Supply System for servicing. Locate upstream from all other air line accessories.

Power Disconnect

Every Therm-O-Flow Warm Melt has a Disconnect Switch which shuts off power to the entire system.

The Disconnect Switch (T) is located on the Heat Control Box (S), and removes power to the entire system. Turning OFF the Disconnect Switch (T) will also remove power to the Air Motor Solenoid, which will stop the Air Motor. The switch can be locked in the open position.

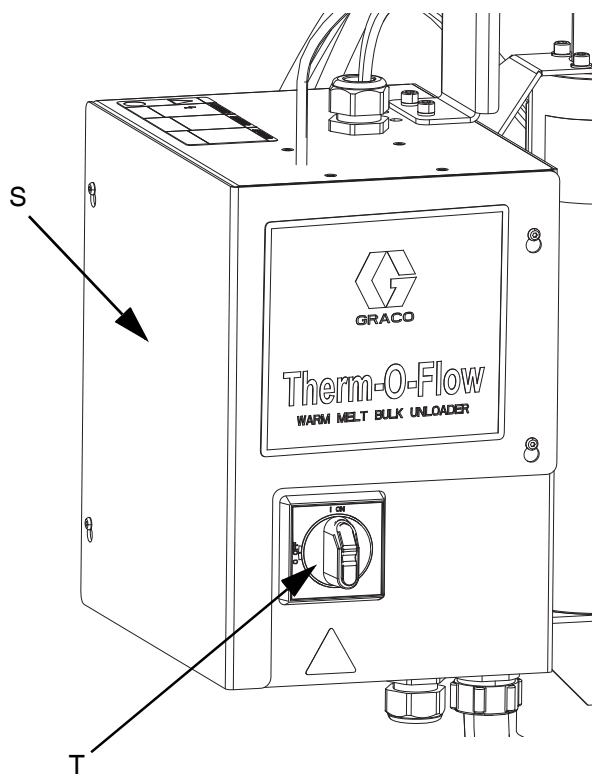


FIG. 3. Power Disconnect

Integrated Air Controls

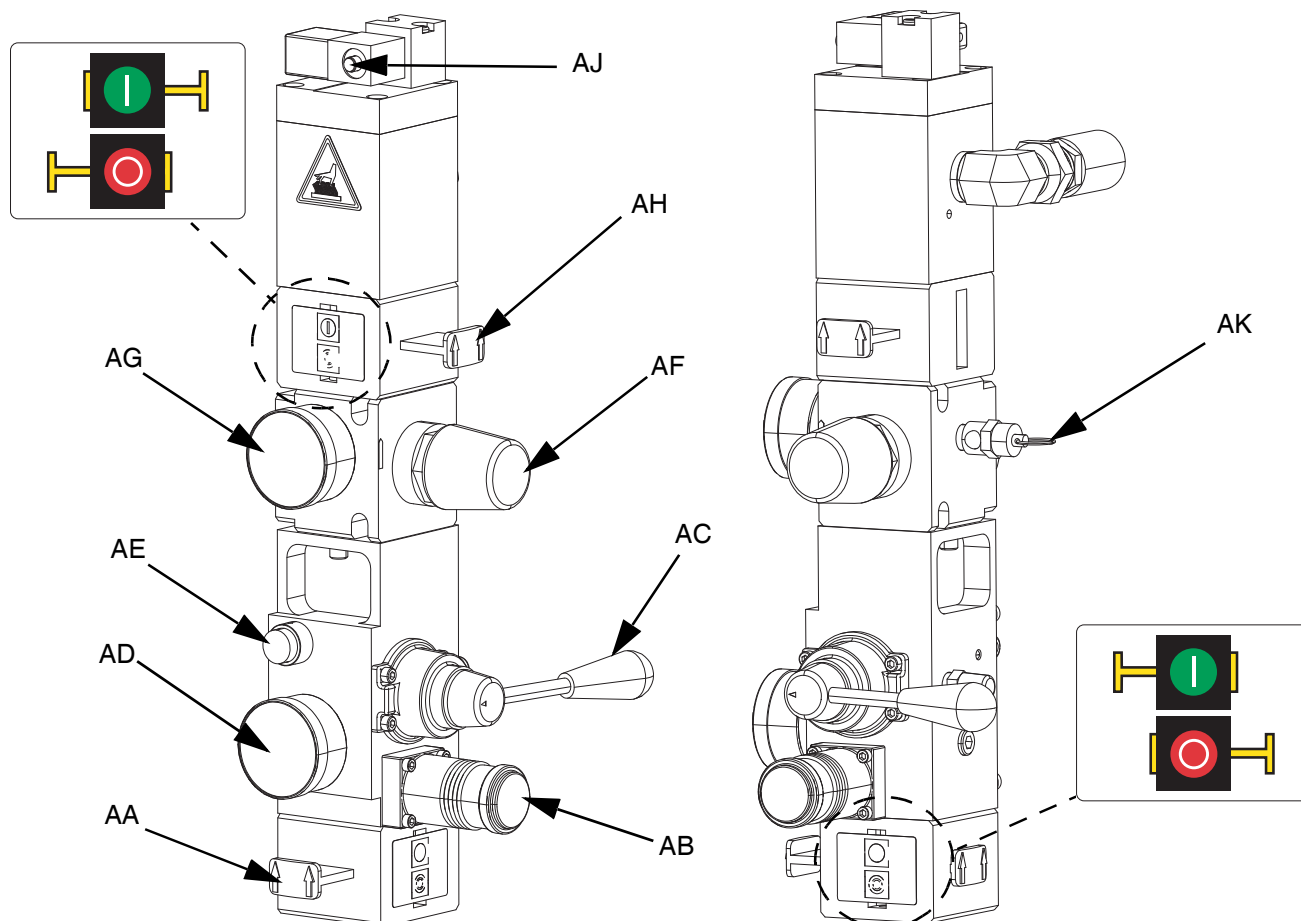


FIG. 4. Integrated Air Controls

AA Main Air Slider Valve

Turns air on and off to the entire system. When closed, the valve relieves pressure downstream. The valve can be locked in the closed position.

AB Ram Air Regulator

Controls the ram down pressure.

AC Ram Director Valve

Controls the ram direction.

AD Ram Air Gauge

Displays the ram down pressure.

AE Blowoff Button

Turns air on and off to push the platen out of an empty drum.

AF Air Motor Air Regulator

Controls the air pressure to the motor.

AG Air Motor Pressure Gauge

Displays the air pressure to the motor.

AH Air Motor Slider Valve

Turns air on and off to the air motor. When closed, the valve relieves air trapped between it and the motor. Push the valve in to shut off air. The valve can be locked in the closed position.

AJ Air Motor Solenoid Valve

Turns air on and off to the air motor when system stopped on the ADM. When closed, the valve relieves air trapped between it and the motor.

AK Relief Valve

Exhausts air through relief valve to ensure air does not exceed a certain pressure (75 psi on 68:1 systems, and 100 psi on 36:1 systems).

Platen (D) Component Identification

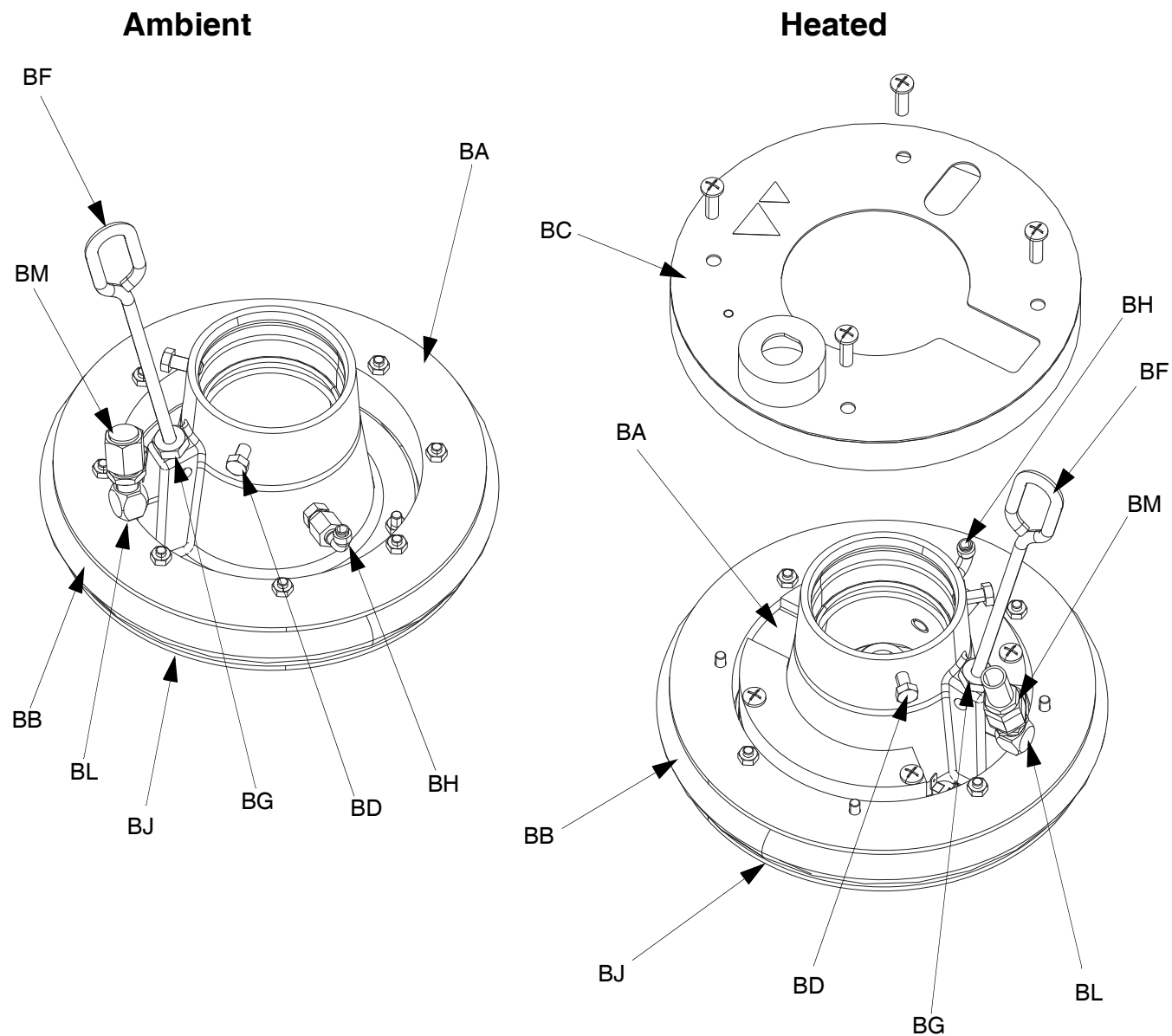


FIG. 5

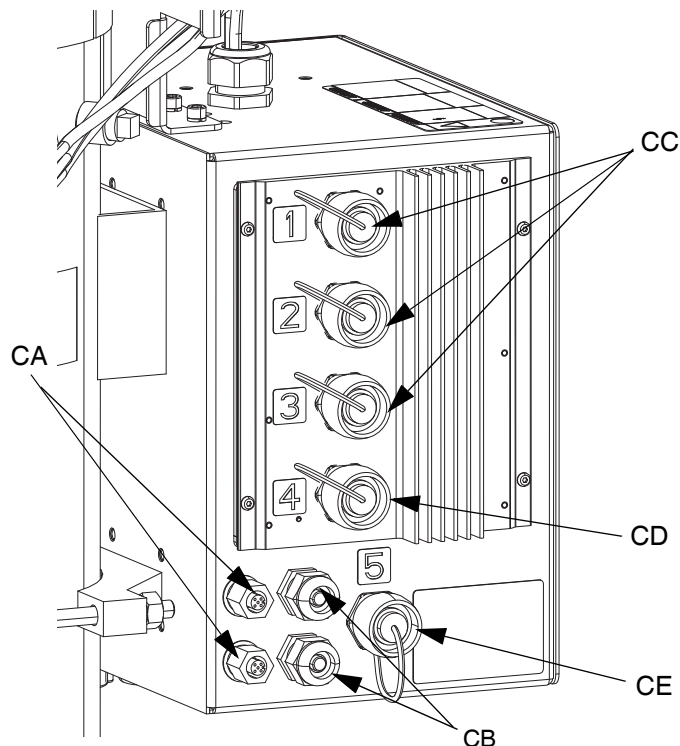
Key:

BA Plate
BB Wiper
BC Heater Cover
BD Cap Screws
BF Bleed Stick
BG Bleed Port

BH Air Assist Body Check Valve
BJ Wiper Plate (under wiper)
BK O-ring Seal (not shown)
BL Platen Valve Port
BM Platen Valve Cap

Heat Control Box Connections

Single Heat Module



Expansion Heat Module

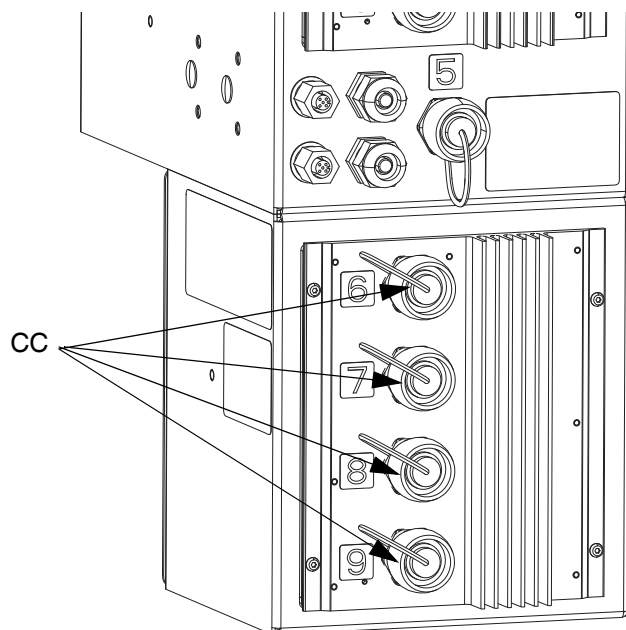


FIG. 6

Key:

- CA CAN Cable Connection Ports*
- CB PLC Input/Output Cord Grip
- CC Heated Hose/Accessory Connector
- CD Heated Pump Connection**
- CE Heated Platen Connection

* On Unit A, this top port connects to the ADM. If using a tandem system, the top connection port on Unit A is connected to the top connection port on Unit B via the CAN cable.

** This port can be used as a heated hose/accessory connection when the system does not have a heated pump/platen.

Advanced Display Module (ADM)

Front and Rear Views

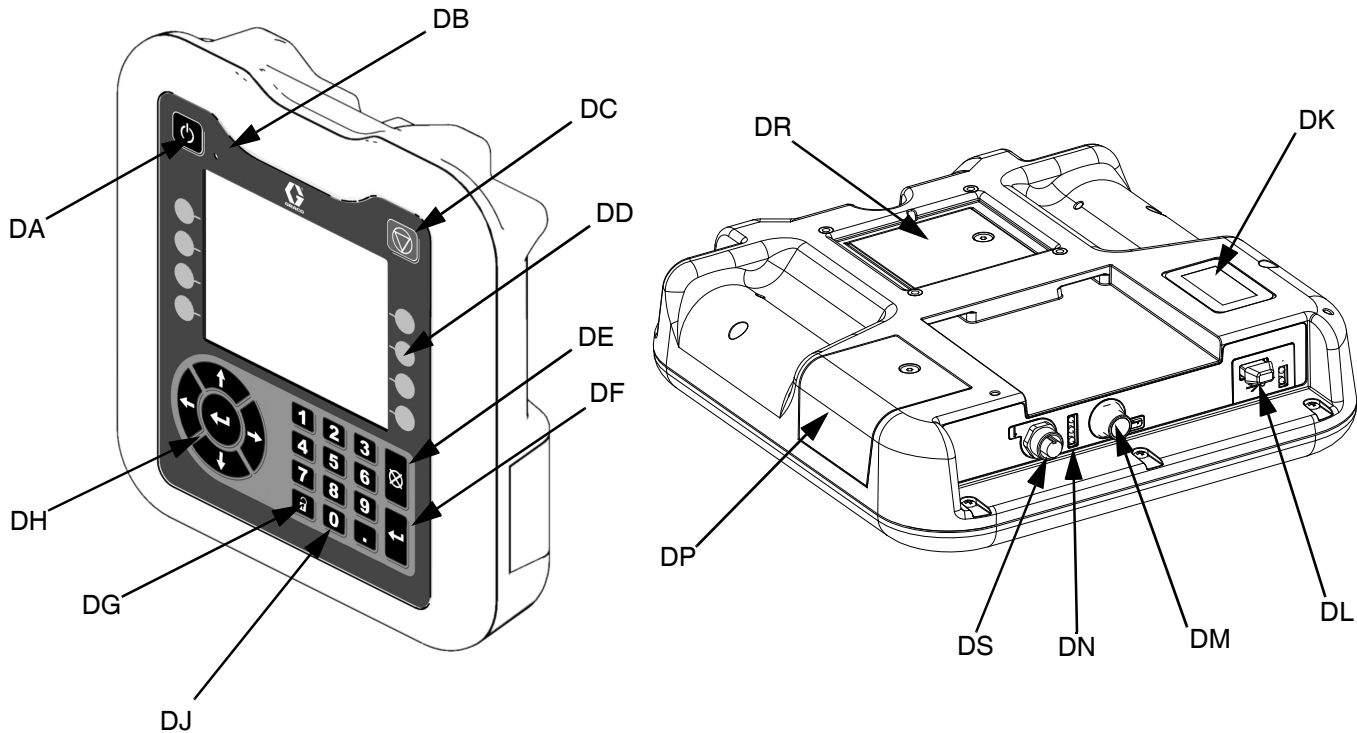


FIG. 7. ADM Component Identification

Key:

DA **Startup/Shutdown**

Starts up or shuts down the system. Toggles between Active and Inactive system.

DB **System Status Indicator LED**

DC **System Soft Stop**

Stops all processes and disables the Air Motor. Also stops all heating processes and disables the heat. This is not a safety or emergency stop.

DD **Soft Keys**

Defined by the icon on the screen next to the soft key. Performs the specific operation for that icon when pressed.

DE **Cancel**

Cancels a selection or number entry while in the process of entering a number or making a selection. Cancels the pump processes. Exits a screen without saving changes.

DF **Enter**

Select to update a field, accept a selection or value, acknowledge an event, enter a screen, and toggle selected items.

DG **Lock/Setup**

Toggles between Run screens and the Main Menu.

DH **Directional Keypad**

Navigate within a screen or to a new screen.

DJ **Numeric Keypad**

Input numeric values.

DK **Part Number Identification Label**

DL **USB Interface**

DM **CAN Cable Connection**

Power and communication.

DN **Module Status LEDs**

Visual indicators to show the status of the ADM.

DP **Token Access Cover**

Access cover for blue software token.

DR **Battery Access Cover**

DS **Light Tower Connection**

NOTE: If using a tandem system, the ADM is only included with the Therm-O-Flow Warm Melt Unit A.

ADM Display Details

Power Up Screen

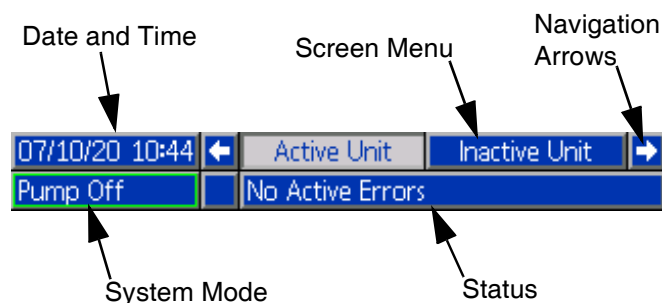
This screen appears when the ADM is powered up.

This screen remains on while the ADM runs through initialization and establishes communication with other modules in the system.



Menu Bar

The Menu Bar appears at the top of each screen (the following image is only an example).



Date and Time

The date and time are always displayed in one of the following formats. The time is always displayed as a 24-hour clock.

- DD/MM/YY HH:MM
- YY/MM/DD HH:MM
- MM/DD/YY HH:MM

Navigation Arrows

The left and right arrows are only visible when screen navigation is allowed.

Screen Menu

The screen menu indicates the current active screen, which is highlighted. It also indicates the associated screens that are available by scrolling left and right.

System Modes

The current system mode is displayed in the lower left of the Menu Bar, and toggles between Pump Status and Heat Status. Pump Status includes: Pump Active, Pump Inactive, Pump On, Pump Off, and Pump Priming. Heat Status Includes: Heat Active, Heat Inactive, Heat Off, Warming Up, Heat Soak, Heat at Temp, and Setback.

NOTE: If using a tandem system, only the active unit system modes are displayed.

Status

The current system status is displayed in the lower right of the Menu Bar.

Alarm/Deviation

The current system error is displayed in the middle of the Menu Bar. There are four possibilities.

Icon	Function
No Icon	No information or no error has occurred
	Advisory
	Deviation
	Alarm

Soft Keys

Icons next to the soft keys indicate which mode or action is associated with each soft key. Soft keys that do not have an icon next to them are not active in the current screen. See **Advanced Display Module (ADM)** on page 16 and **ADM Soft Keys** on page 20.

NOTICE


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


Navigating the Screens


There are two types of screens:


Run screens control operations and display system status and data.

Setup screens control system parameters and advanced features. These screens are accessed through the Main Menu.


Press  on any Run screen to switch to the Main Menu screens. If the system has a password lock, the Password screen is displayed. If the system is not locked (password is set to 0000), Menu Screen 1 is displayed. Refer to **Main Menu** on page 21 for additional information.



Press  on any Setup screen to return to the Run screen.


Press the Enter soft key  to activate the editing function on any screen.

Press the Exit soft key  to exit the editing function and save any changes.

Use the other soft keys to select the function adjacent to them.

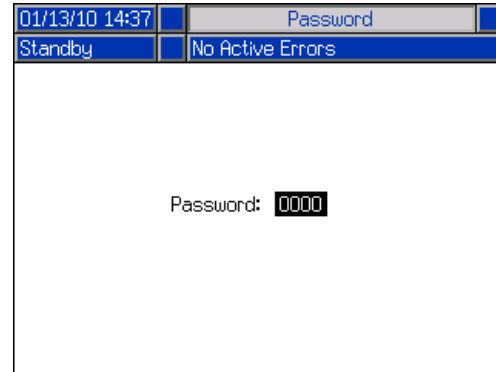
Use  to exit a screen. Using this key while in editing mode will exit the screen without saving changes.

Use the   keys on the ADM to move through the settings on a screen or drop down menu and to scroll through multiple screens on the right side of the display.


Use the  key to choose a field to update, to make a selection, to save a selection or value, to enter a screen, or to acknowledge an event.

Set Password










You can set a password to protect access to some selections on the Main Menu screens. See **Main Menu** on page 21. To set or remove the password, select Advanced from Menu 2. See **Advanced Setup Screen 1** on page 34.

























ADM LED Status Descriptions









LED	Conditions	Description
System Status 	Green Solid	Run Mode, System On
	Green Flashing	Setup Mode, System On
	Yellow Solid	Run Mode, System Off
	Yellow Flashing	Setup Mode, System Off
USB Status (CL)	Green Flashing	Data recording in progress
	Yellow Solid	Downloading information to USB
	Green and Yellow Flashing	ADM is busy, USB cannot transfer information when in this mode
ADM Status (CN)	Green Solid	Power applied to module
	Yellow Flashing	Active Communication
	Red Steady Flashing	Software upload from token in progress
	Red Random Flashing or Solid	Module error exists

ADM Icons

Icon	Function
	Alarm - See Troubleshooting , page 53 for more information.
	Deviation - See Troubleshooting , page 53 for more information.
	Advisory - See Troubleshooting , page 53 for more information.
	No issues found with parameter or setting value
	Missing or unexpected parameter or setting value
	System is processing request (animated)
	Zone setpoint temperature showing the temperature the zone heats too when the heat is turned on.
	Zone setback temperature showing the setback the zone goes to when the heat is in setback mode.
	Displays the status of the lockout bit of the PLC.


ADM Soft Keys

Icon	Function
 	Enter or exit editing mode for a particular screen.
	Access the Schedule screens.
	Access the Heat Setup screens.
	Access the Diagnostics function.
	Access the Events logs.
	Access the Errors logs.
	Access the Troubleshooting function.
	Access the System Setup screen.
	Access the Advanced System Setup screens.
	Access the Maintenance function.
	Access the Fieldbus Gateway Setup screens.
	Access the Integration Feedback screens.
	Globalize selection. Apply a heat setting to all of the heat zones in Heat Settings.
	Confirm globalizing a setting.
	Cancel globalizing a setting.
 	Tandem systems only. Toggle between Pump A and Pump B.
 	Energizes the Air Motor to prime the Pump.
 	Energizes the Pump.

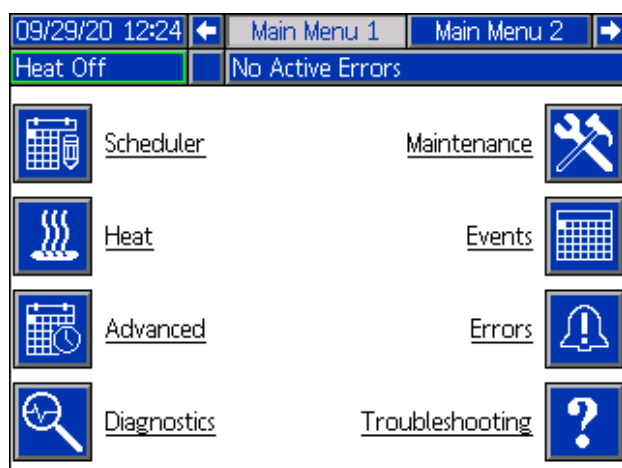
Icon	Function
 	Turn heat zones on and off.
 	Place all heat zones into setback and out of setback.
	Reset Cycle Counter.
	Continue.
	Previous screen.
	Search.

Main Menu

The Menu screens provide access to settings that help to ensure the proper operation and maintenance of the system. These functions can be performed when the ADM is either in Active or System OFF Mode.

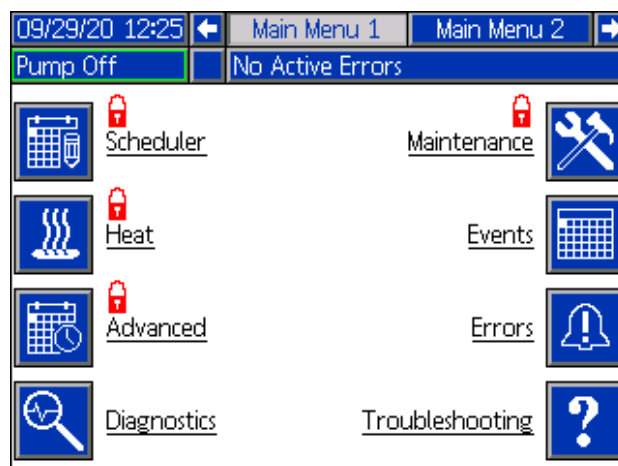
1. Provide power to the system to turn on the ADM.
2. Press  on the ADM from any Run screen to go to the Main Menu screens.

Main Menu Screen 1

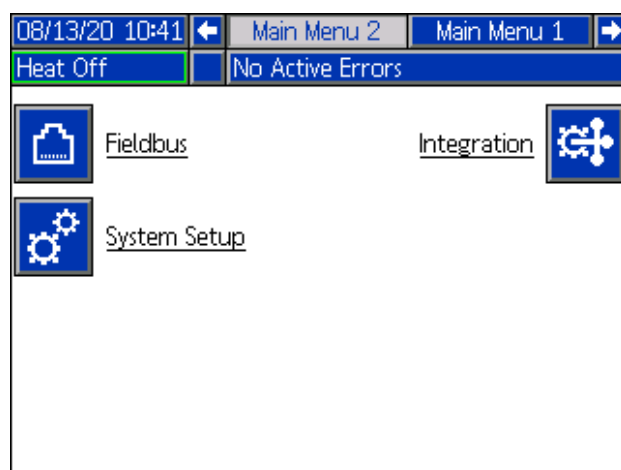


If you set a password, the menu will be displayed with red locks above the menu selections with parameters that can be changed. Enter your password when prompted to access these screens.

The selections that do not have a red lock have information that can be viewed but not changed and would not require a password. See **Advanced Setup Screen 1** on page 34 for information about setting a password.



Main Menu Screen 2



Installation

The Therm-O-Flow Warm Melt includes the fully assembled Ram Assembly and Pump.

This section describes how to install and set up the Therm-O-Flow Warm Melt and make all the necessary component connections.

Location

Remove the Therm-O-Flow Warm Melt from its crate. Attach a lifting sling at the proper lift locations (see FIG. 1). Lift off of the pallet using a crane or a forklift.

To properly locate and anchor the Therm-O-Flow Warm Melt, see **Dimensions** on page 141.

NOTICE

Always lift the Therm-O-Flow Warm Melt at the proper lift locations (see FIG. 1). Do **not** lift in any other way. Failure to lift at the proper lift locations can result in damage to the system.

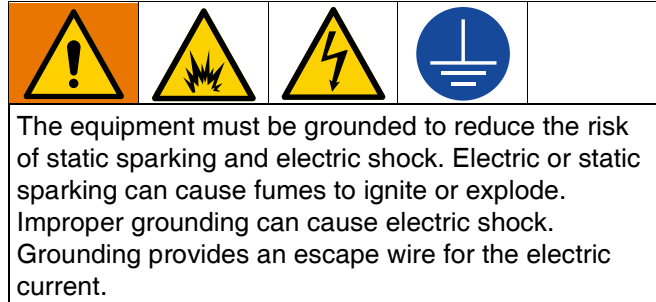
NOTE: The lift ring on the Air Motor (B) is only to be used for replacing the Air Motor. Do not use it to lift the entire system.

Position the Ram Assembly (A) so the Air Motor (B), Disconnect Switch (T), Integrated Air Controls (F), and ADM (E) are easily accessible. Ensure that there is enough space overhead for the Ram Assembly to raise fully.

Use the holes in the Ram Assembly base as a guide and drill holes for 1/2 in. (13 mm) anchors.

Ensure that the Ram Assembly base is level in all directions. If necessary, level the base using metal shims. Secure the base to the floor using 1/2 in. (13 mm) anchors that are long enough to prevent the Ram Assembly from tipping.

Grounding



Ram Assembly: the Therm-O-Flow Warm Melt is grounded through the incoming power cord. See **Connect Power** on page 23.

Air and fluid hoses: use only electrically conductive hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check the electrical resistance of the hoses. If the total resistance to ground exceeds 29 megaohms, replace the hose immediately.

Air compressor: follow the manufacturer's recommendations.

Dispense valve: ground through connection to a properly grounded fluid hose and pump.

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 the grounding continuity.

To maintain grounding continuity when flushing or relieving pressure: hold a metal part of the dispense valve firmly to the side of a grounded metal pail, then trigger the valve.

Material Drums: follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

Power Requirements

Each Therm-O-Flow Warm Melt requires a dedicated circuit protected with a circuit breaker.

5 Gallon Heated Pump and Platen:

Voltage	Phase	Hz	Standard Heat Control Box Max Amps	Expansion Module Max Amps
200-240	1	50/60	19	28
200-240	3	50/60	8	16
380-420	3YN	50/60	8	16
480	3	50/60	4	8

5 Gallon Ambient Pump and Platen:

Voltage	Phase	Hz	Standard Heat Control Box Max Amps	Expansion Module Max Amps
200-240	1	50/60	16	28
200-240	3	50/60	8	16
380-420	3YN	50/60	8	16
480	3	50/60	4	8




55 Gallon Heated Pump and Platen:

Voltage	Phase	Hz	Standard Heat Control Box Max Amps	Expansion Module Max Amps
200-240	1	50/60	28	28
200-240	3	50/60	16	16
380-420	3YN	50/60	16	16
480	3	50/60	8	8

55 Gallon Ambient Pump and Platen:

Voltage	Phase	Hz	Standard Heat Control Box Max Amps	Expansion Module Max Amps
200-240	1	50/60	16	28
200-240	3	50/60	8	16
380-420	3YN	50/60	8	16
480	3	50/60	4	8

Connect Power

				
All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.				

NOTICE

To avoid equipment damage, route and secure a power cord that is long enough to allow the full range of movement for the Ram Assembly (A).

Use copper conductors rated 600 volts minimum and 167°F (75°C) minimum only.

- Cut power cord wires to the following lengths:
 - Ground wire - 6.5 inches (16.5 cm)
 - Power wires - 3.0 inches (7.6 cm)
 - Add ferrules as necessary. See Fig. 8.

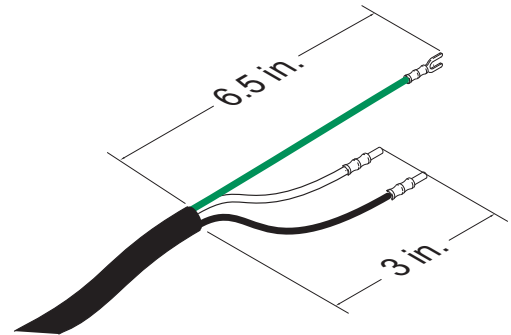


FIG. 8: Power Cord

- Turn the Disconnect Switch (T) OFF.
- Loosen the screws and remove the cover (452) on the Heat Control Box (S).

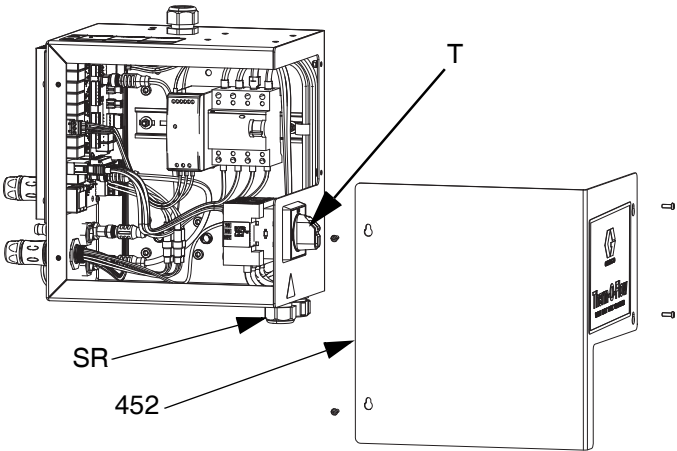


FIG. 9

4. Insert the power cord through the Heat Control Box strain relief bushing (SR).
5. Attach insulated ferrules to the end of each wire.
6. Connect the ground wire to the ground terminal (455).

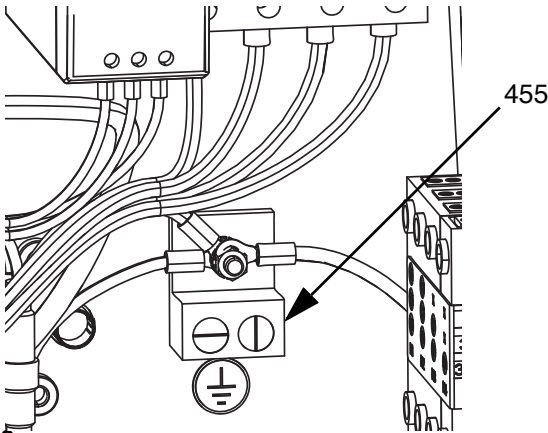
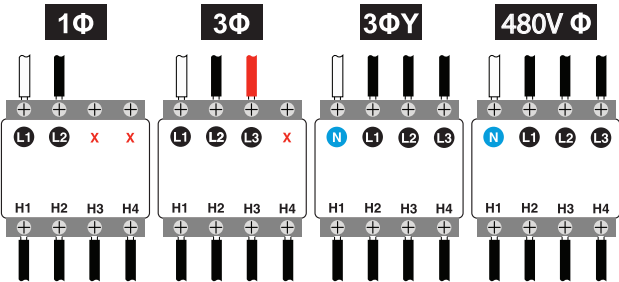


FIG. 10

7. Connect power cord to the Heat Control Box Disconnect Switch (T) as shown below.



NOTE: Use a flat-head or Pozidriv screwdriver to tighten the terminals to 7-10 in-lb (0.8-1.1 N•m).

8. Tighten the strain relief bushing (SR) around the electrical cord.
9. Replace the cover (452) on the Heat Control Box (S).

Air Line Connections

Refer to FIG. 1 on page 10 for a typical installation.

Attach the Air Line (L) (not supplied) to the bottom of the Integrated Air Control (F) at the 3/4 in. NPT connection through the Bleed Type Air Shut Off Valve (P).

NOTE: Be sure all components are adequately sized and pressure rated to meet the system's requirements.

Light Tower (Optional)

For light tower installation instructions, see the Light Tower Kit Instructions manual. See **Related Manuals** on page 3.

1. Order the Light Tower Accessory (255468) as a diagnostic indicator for the Therm-O-Flow Warm Melt.
2. Connect the cable from the light tower to the Light Tower Connection (DS) on the ADM (E).

Signal	Description
Off	System is not active
Green Light On	System is active and no errors are present
Green Light Flashing	Heat is warming up/Heat Soak
Yellow Light On	An advisory exists
Yellow Light Flashing	A deviation exists
Red Light On	The system has shut down due to an alarm

Attach Drum Stops

Therm-O-Flow Warm Melt systems are provided with drum stops in place to help position the drum on the Ram Assembly (A). For replacement parts, order Kit 255477. The kit includes 2 each of capscrews, lock washers (not shown), and drum stops.

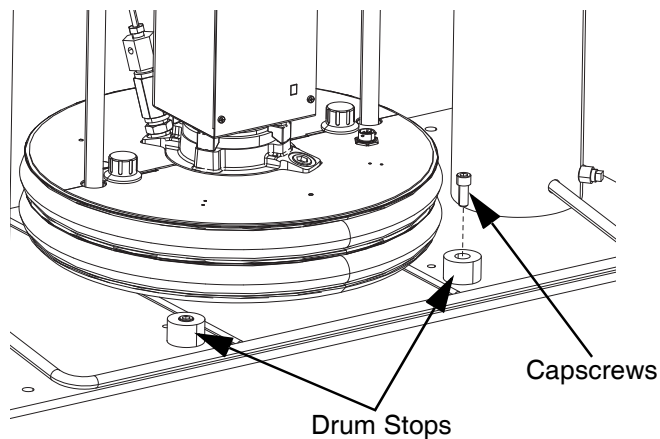


FIG. 11: Drum Stop Installation

1. Locate the correct set of mounting holes on the Ram Assembly base. See FIG. 12.

2. Using the capscrews and lock washers, attach the drum stops to the Ram Assembly base.

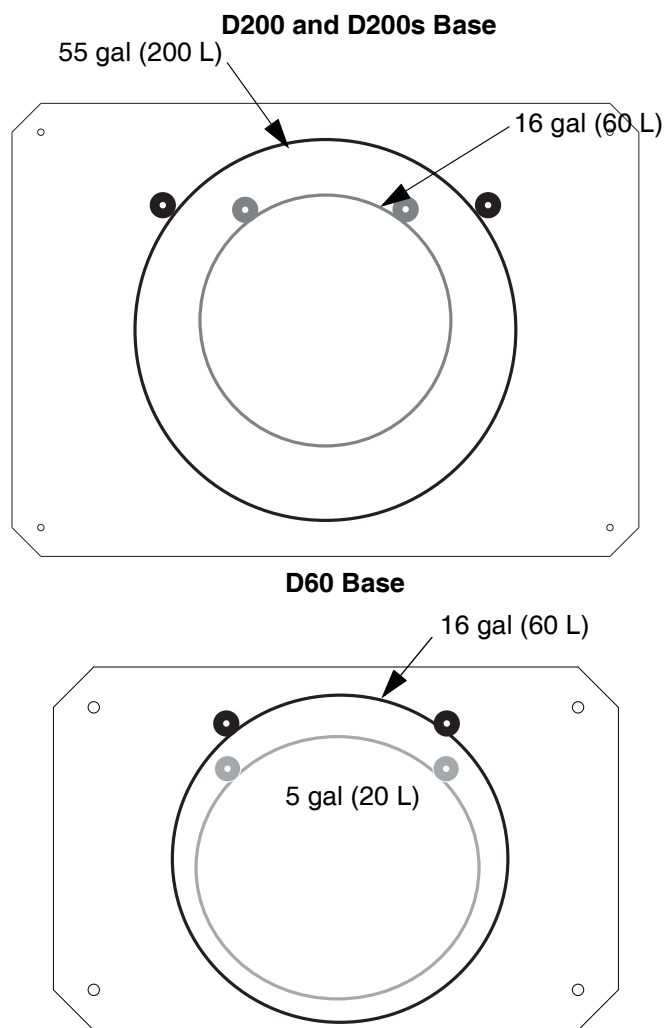






FIG. 12: Ram Base

Setup

			
<p>To prevent personal injury from pressurized fluid such as skin injection or splashing fluid, make sure that all components in your system are rated to the maximum pressure the system is capable of attaining. All components must be rated for maximum pressure even if the pump is operated below maximum pressure.</p>			

NOTICE

To prevent damage to components in the system, all components must be rated to the maximum pressure the system is capable of attaining.

Low Level and Drum Empty Sensors

NOTE: The Drum Low (LL) and Empty Sensors (EL) are used to indicate when a drum is empty.

1. Raise or lower the Low Level Sensor (LL) to the desired position to activate the sensor.
2. Increase the distance between the Low Level (LL) and the Empty Sensor (EL) to increase the heat up time for the tandem secondary system.

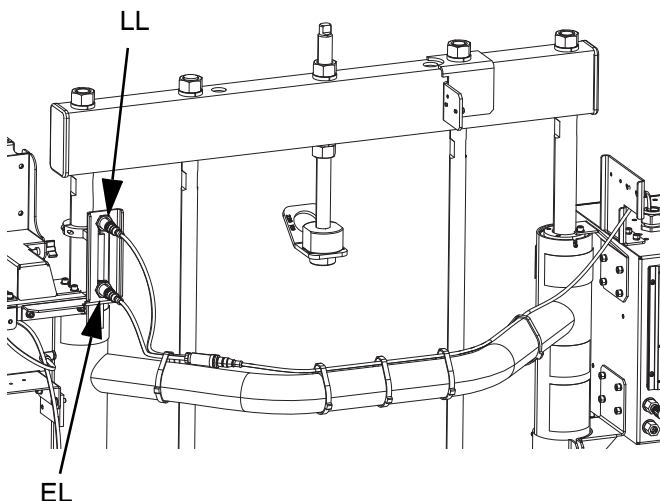


FIG. 13: Low Level and Empty Sensors

Wet Cup



Before starting, fill the Wet Cup (K) 1/3 full with Graco Throat Seal Liquid (TSL) or a compatible solvent.

Torque the Wet Cup

The Wet Cup (K) is torqued at the factory; however, throat packing seals on Severe Duty pumps may relax over time. Check Wet Cup torque frequently after initial start-up and periodically after the first week of production. Maintaining proper Wet Cup torque is important to extending seal life.

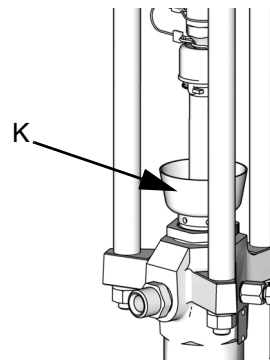


FIG. 14: Wet Cup

NOTE: Checkmate MaxLife pumps use a special u-cup throat seal that is non-adjustable and does not require periodic torquing.

1. Follow the **Pressure Relief Procedure** on page 46.
2. Torque the Wet Cup (K) 95-115 ft-lbs (128-155 N•m) using the packing nut wrench (supplied) whenever necessary. Do not overtighten the Wet Cup.

Connect Heated Accessories

If your application requires multiple heated accessories, connect heated hose electrical connectors to the Heat Control Box.

Example

Heated zones are used to connect a primary and secondary system to a heated block and a single dispense valve. A-# zones are on the Heat A screen and B-# zones are on the Heat B display screen. If an expansion module is used, these would be on Heat A-E or Heat B-E screens.

In this example, Unit A includes the following heated components:

- Hose 1: The circular electrical connector connects to Port 1 on the AMZ located on the Heat Control Box on Unit A. The square electrical connector from hose 1 connects to the heated tandem block.
- Pump Heat: The pump heat connects to Port 4 on the AMZ located on the Heat Control Box on Unit A.
- Platen Heat: The platen heat connects to Port 5 on the AMZ located on the Heat Control Box on Unit A.
- Hose 3: The circular electrical connection connects to Port 6 on the Expansion Module located on Unit A. The square electrical connection connects to the Heated Dispense Valve.

In this example, Unit B includes the following heated components:

- Hose 2: The circular electrical connection connects to Port 1 on the Heat Control Box located on unit B.
- Pump Heat: The pump heat connects to Port 4 on the AMZ located on the Heat Control Box on Unit B.
- Platen Heat: The platen heat connects to Port 5 on the AMZ located on the Heat Control Box on Unit B.

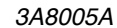
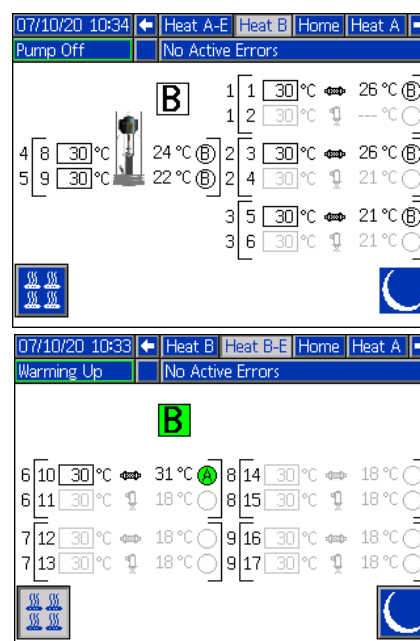
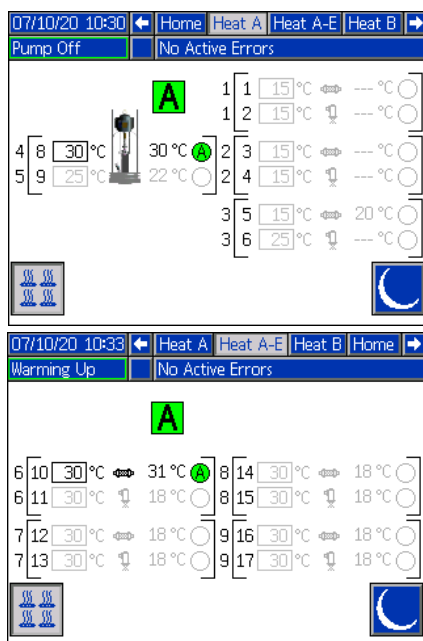


FIG. 15



Install Expansion Module



The Therm-O-Flow Warm Melt comes standard with a Heat Control Box (S), which supports up to six heat zones in addition to the Pump and Platen heat zones. When the Expansion Module is added to the system, eight additional heat zones can be added, which increases the maximum current draw of the system.

See **Expansion Module, 26B238** on page 127 for Expansion Module parts.

See **Power Requirements** on page 23 for the maximum amp rating for a standard system as well as a system with the Expansion Module installed.

1. Perform the **Pressure Relief Procedure** on page 46.
2. Turn off and disconnect power to the system.
3. Loosen the screws and remove the cover (452) on the Heat Control Box (S). See FIG. 9 on page 24.
4. Remove the two screws (433) and cover (457) from the bottom of the Heat Control Box (S).

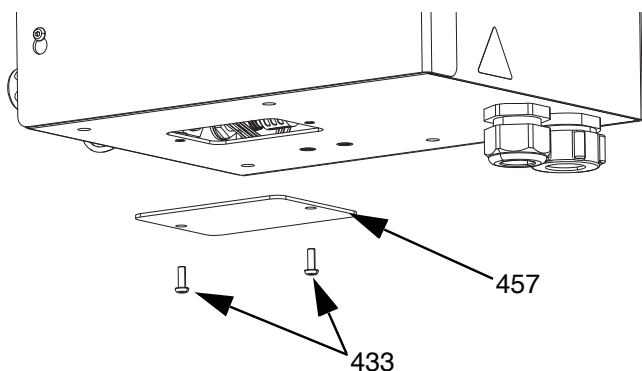


FIG. 16

5. Disconnect the wiring harness (447) from AMZ 1 in the Heat Control Box (S) by unscrewing the L1, L2, L3, and L4 wires from the circuit breaker (445). Discard the wiring harness (447).

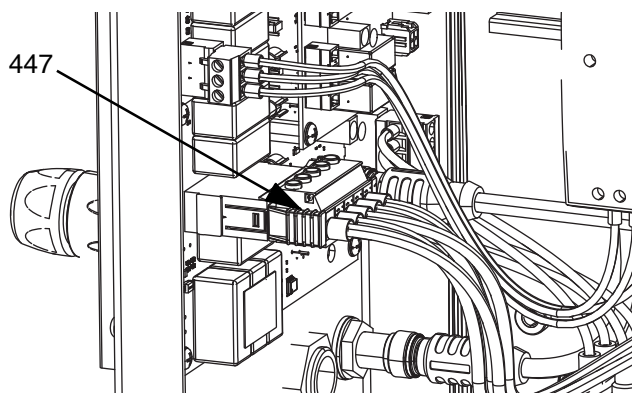


FIG. 17

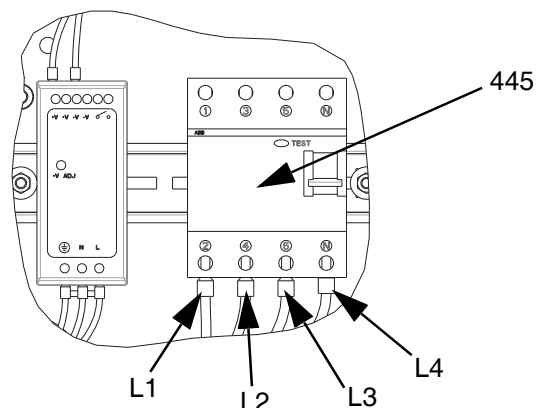


FIG. 18

6. Disconnect the CAN cable from Bulkhead 2 (B2) on AMZ 1 in the Heat Control Box (S) and reconnect it to Bulkhead 1 (B1) on AMZ 2 in the Expansion Module.

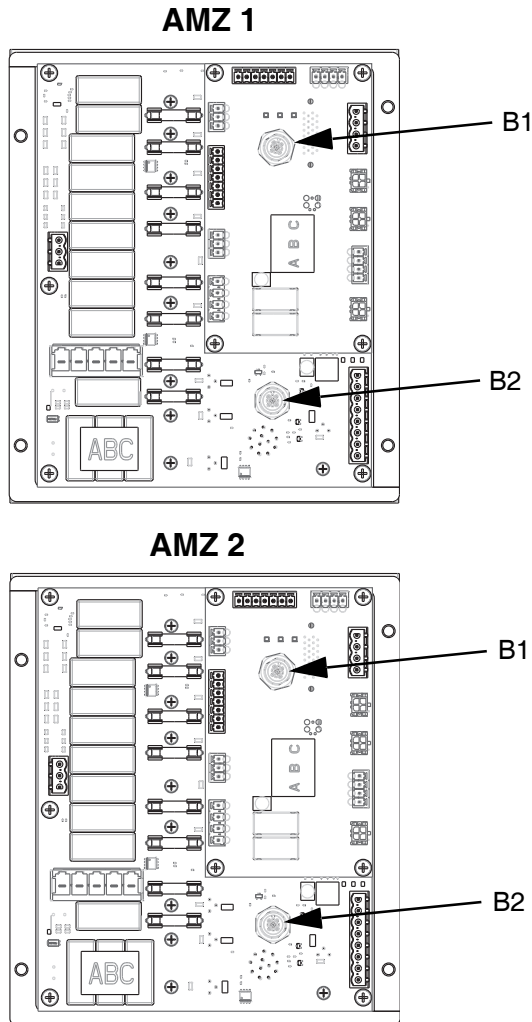


FIG. 19

7. Connect the Expansion Module to the Heat Control Box (S) using the four screws included in the kit.

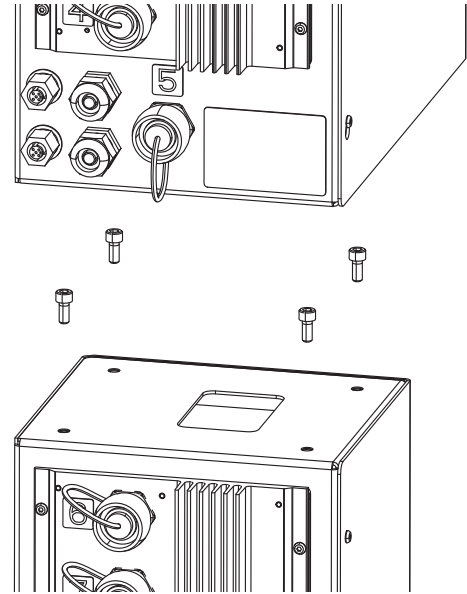


FIG. 20

8. Install the protective strip around the opening between the enclosures.
9. Connect the CAN cable included with the Expansion Module to Bulkhead 2 (B2) in AMZ 1 in the Heat Control Box (S).
10. Connect the wiring harness (479) from the Expansion Module to AMZ1 as shown in FIG. 17.
11. Connect the L1, L2, L3, and L4 wires from the Expansion Module to circuit breaker (445) as shown in FIG. 18.

12. Connect the ground wires to the ground terminal (455) by loosening the nut (437) on the wiring harness.

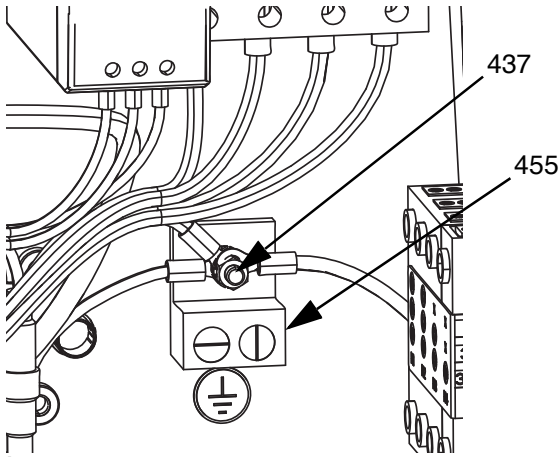


FIG. 21

13. In the Expansion Module, set the AMZ rotary switch to position 2 if using a single system, and to position 4 if using a tandem system.

AMZ Dial Position

Unit A: Dial Position #1

Units A-E (Expansion Module): Dial Position #2

Unit B: Dial Position #3

Units B-E (Expansion Module): Dial Position #4

NOTE: Unit A and B are set at the factory.

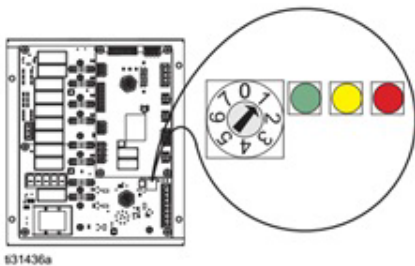


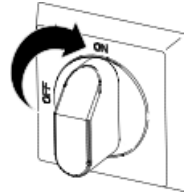
FIG. 22: AMZ Dial Position


System Setup Screen


NOTICE

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

Turn the Disconnect Switch (T) ON.

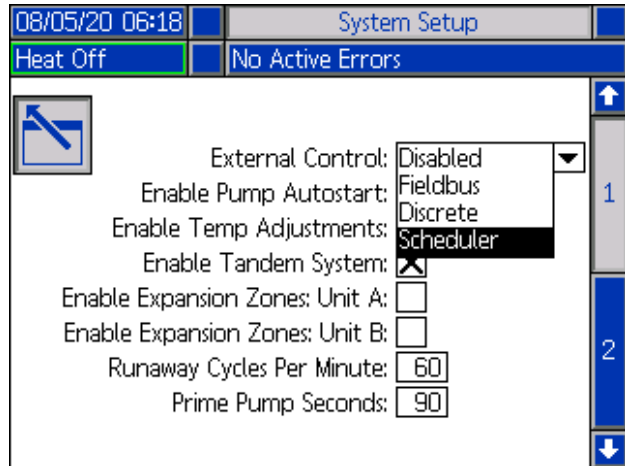


When the ADM is finished starting up, press  to access the Main Menu screens. Use the ADM Directional Keypad (DH) to navigate between screens.

Press the  soft key to access the System Setup screen.

System Setup Screen 1

Set the following system settings on System Setup screen 1.



External Control: Select the type of commands the system looks for from a PLC. Options included Disabled, Fieldbus, Discrete, or Scheduler.

To run the Scheduler, select Scheduler from the drop down list. This will enable the Scheduler feature. See page 49 for more information.

Enable Pump Autostart: Once the system is up to temperature, the pump will automatically start.

Enable Temp Adjustments: Allows the temperatures to be edited from the Run screens.

Enable Tandem System: Allows for the use of a tandem system.

Enable Expansion Zones: Enables expansion zones for Unit A or Unit B for additional heat zones.

Runaway Cycles Per Minute: Number of cycles that can pass in one minute before the system declares that the Pump is running away and is shut down.

Prime Pump Seconds: Amount of time the pump will remain in prime mode before timing out.

System Setup Screen 2

Set the following alarm levels on System Setup screen 2.

The screenshot shows the 'System Setup' screen with a status bar at the top indicating '07/10/20 10:29', 'System Setup', 'Heat Off', and 'No Active Errors'. The main area is titled 'Temp Offset Errors' and contains the following settings:

- High Alarm: + 25 °C
- High Deviation: + 15 °C
- Low Deviation: - 15 °C
- Low Alarm: - 25 °C

Below this section is the 'Pump Inactive Timeout: 60 minutes' setting. On the right side of the screen, there are navigation buttons labeled '2' and '1'.


In the Temp Offset Errors section, set the variance in degrees allowed from a zone temperature setting before a deviation and alarm is triggered. The default values are 15 for deviations and 25 for alarms. You can enter other temperature values.

For example, if the zone temperature is set at 50 degrees and you set +15 degrees for a High Deviation and +25 degrees for a High Alarm, the deviation will occur when the temperature reaches 65 (50 + 15) and the alarm will occur when it reaches 75 (50 + 25).

The same applies to the Low Alarm and Low Deviation settings. In the same example at 50 degrees with a Low Deviation of -15 and a Low Alarm of -25, the deviation will occur when the temperature reaches 35 (50-15) and the alarm will occur when it reaches 25 (50-25).

The Pump Inactive Timeout feature provides the capability to place the system into setback after the pump has not moved for a set amount of time. Enter the number of minutes in the box provided, and after the selected amount of time passes twice, the system is .

Heat Settings

Press the  soft key at the Main Menu screen 1 to access the Heat setup screens. These screens allow you to configure the operating settings for the Heat function.

Heat Setup Screen 1

NOTE: For Tandem systems, read this section first, then refer to **Tandem Heat Setup Screen 1** on page 34.

The heat zone number in the first column corresponds to the connector and heat zone on the Automatic Multi-Zone (AMZ) heat control. For example, heat zone number 4-7 corresponds to connector 4 and heat zone 7.

Set the primary system setpoint and setback temperatures for the Pump, Platen, and heat zones on the Heat A screens.

- Select the appropriate “Zone Type” for all installed zones.
- Check the “A” and “B” boxes according to which systems need to use the heated accessory.

NOTE: The “B” box only appears when the “Enable Tandem System” box is checked in System Setup Screen 1.

07/10/20 10:31		Heat B	Heat A	Heat A-E
Pump Off		No Active Errors		
Zone Type		°C	°C	A B
1-1:	Hose	65	55	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
1-2:	Manifold	65	55	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
2-3:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
2-4:	Valve	65	55	<input checked="" type="checkbox"/> <input type="checkbox"/>
3-5:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
3-6:	Valve	65	55	<input type="checkbox"/> <input type="checkbox"/>
4-7:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
4-8:	Pump	65	55	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
5-9:	Platen - 20L	65	55	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

NOTE: To ensure accurate hose temperatures, be sure all heated hoses have their “Zone Type” set to “Hose.” Hoses are only present on odd zone numbers: 1, 3, 5, 7, or Heat A. If using an expansion module, Heat A-E zone numbers for hoses are even numbers: 10, 12, 14, or 16.

If a Tandem Therm-O-Flow Warm Melt is used, set temperatures on the Heat B screens.

NOTE: Connector 5, zone 9, can be configured for a 20L, 60L or 200L Platen. This is set at the factory, but can be changed as needed.

If using an expansion module, set the primary system setpoint and setback temperatures for heat zones on the Heat-A-E screens.

- Select the appropriate “Zone Type” for all installed zones.
- Check the “A” and “B” boxes according to which systems need to use the heated accessory.

07/10/20 10:56		Heat A-E	Heat B	Heat A
Pump Off		No Active Errors		
Zone Type		°C	°C	A B
6-10:	Hose	65	55	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
6-11:	Valve	65	55	<input type="checkbox"/> <input type="checkbox"/>
7-12:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
7-13:	Valve	65	55	<input type="checkbox"/> <input type="checkbox"/>
8-14:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
8-15:	Valve	65	55	<input type="checkbox"/> <input type="checkbox"/>
9-16:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
9-17:	Valve	65	55	<input type="checkbox"/> <input type="checkbox"/>


NOTE: To ensure accurate hose temperatures, be sure all heated hoses have their “zone type” set to “Hose.” If using an expansion module, Heat-A-E zone numbers for hoses are even numbers: 10, 12, 14, or 16.

To setup the optional Schedule function, see **Schedule**, page 49. The schedule function allows the system to automatically enable and disable heating and setback at specified times.


Optional: Set any remaining settings in the Setup screens before using the system. These are not required for system operation, but include useful functions. Other optional heating zone types include: Hose, Valve, Manifold, PGM, Flow Meter, Press Regulator, and Other.


Apply a Heat Setting Globally

While still in Heat A or Heat B Setup screen, press the

globalize  soft key to apply a setpoint or setback heat setting across all of the heat zones.

A message will appear prior to completing the change.

Press the  soft key to complete applying the

selected parameter. Press the  soft key to cancel the globalization.

07/10/20 10:38		Heat A-E	Heat B	Heat A
Pump Off		No Active Errors		
Zone Type		°C	°C	A B
1-1:	Hose	65	55	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
1-2:	Manifold	65	55	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
2-3:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
2-4:	Valve	65	55	<input checked="" type="checkbox"/> <input type="checkbox"/>
3-5:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
3-6:	Valve	65	55	<input type="checkbox"/> <input type="checkbox"/>
4-7:	Hose	65	55	<input type="checkbox"/> <input type="checkbox"/>
4-8:	Pump	65	50	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
5-9:	Platen - 60L	65	50	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

Are you sure
you want to globalize
Setpoint
to
65 °C

Tandem Heat Setup Screen 1


Read all of **Heat Setup Screen 1** starting on page 32 before reading this section.

The Heat Setup screens are the same for Single and Tandem systems, except Tandem systems will show Heat B in the Menu Bar. Use the ADM's Directional Keypad (DH) to navigate between Heat A and Heat B screens.

One of the advantages of a Tandem system is continuous operation if a pump needs to be shut down for any reason, such as changing a drum of material. In a heated system, it is equally important to maintain heat for the entire system when one of the pumps is shut down.

Heat Setup - Heat Soak


Use the ADM Directional Keypad (DH) to navigate to Heat screen 2 for either Heat A or Heat B, or if using the expansion module, for either Heat A-E or Heat B-E.

Press the  soft key to enter Editing Mode.

The heat soak time in the far right column is the amount of additional time that the heat zone needs to ensure that the material is heated evenly throughout after the zone is up to temperature. Enter a time in minutes.


07/10/20 10:37		Heat A-E		Heat B	Heat A
Heat Active		No Active Errors			
Heat Soak					
1-1:	Hose	3	minutes		
1-2:	Valve	3	minutes		
2-3:	Hose	3	minutes		
2-4:	Valve	3	minutes		
3-5:	Hose	3	minutes		
3-6:	Valve	3	minutes		
4-7:	Hose	3	minutes		
4-8:	Pump	3	minutes		
5-9:	Platen - 60L	3	minutes		


Advanced Setup

Press  on the ADM to navigate to the Main Menu


screens. Press the  soft key to access the Advanced Setup screens. This function allows the user to configure the operating settings for Therm-O-Flow Warm Melt systems.

Advanced Setup Screen 1

1. Press the  soft key to enter editing mode.
2. Select the Language from the drop down menu. Available languages are English, Spanish, French, German, traditional Chinese, Japanese, Korean, Portuguese, Italian, and Russian.

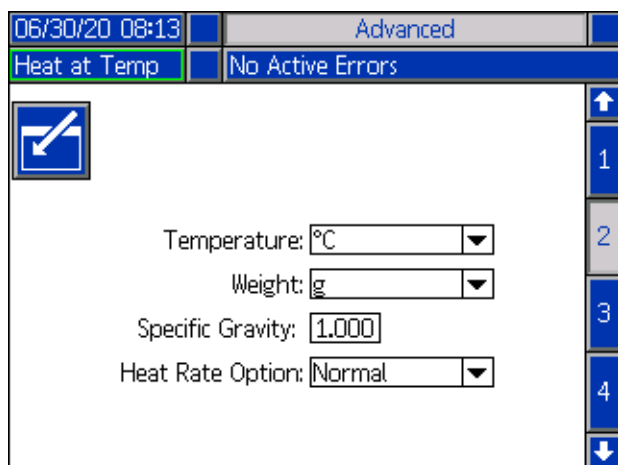
06/30/20 08:13		Advanced	
Pump Off		No Active Errors	
		Language: English	
		Date Format: mm/dd/yy	
		Date: 06 / 30 / 20	
		Time: 08 : 13	
		Screen Saver: 5 minutes	
		Password: 0000	
		Password Timeout: 0 minutes	


3. Select a Date Format from the drop down menu. The available formats are mm/dd/yy, dd/mm/yy, yy/mm/dd.
4. Enter numeric values for the month, day, and two-digit year in the Date field.
5. Enter numeric values in the Time field for the 24-hour clock in hours and minutes.
6. Enter the number of minutes of inactivity before the Screen Saver turns off the screen back-lighting. Enter a 0 to leave it on constantly. Press any key to disable the screen saver.
7. For the Password, enter any numbers from 0001 to 9999. To remove the password, change the password to 0000. This disables the password function.

8. For the Password Timeout, enter the amount of time that can pass before the password is required.
9. Press the  soft key to save your changes and exit editing mode.


Advanced Setup Screen 2

Use the ADM Directional Keypad (DH) to navigate to Advanced Screen 2. This screen allows you to select the type of temperature scale to use for the operation of your system, mass units, specific gravity, and heat rate options.



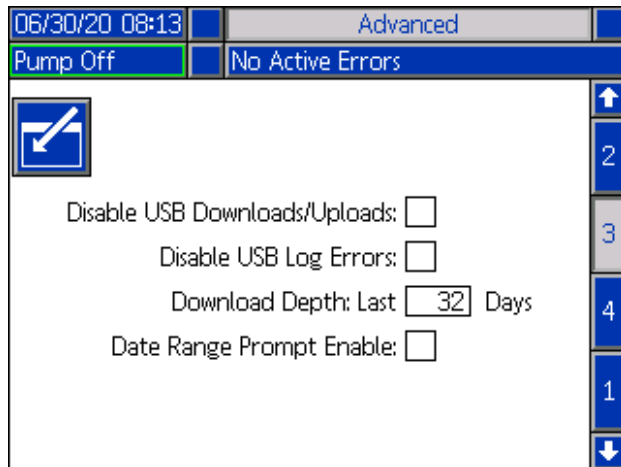
1. Press the  soft key to enter editing mode.
2. Select the Temperature between °C and °F.
3. Select the Mass Units between kg, grams, and lbs.
4. Enter the Specific Gravity.
5. Select the Heat Rate Option between slow, normal, and fast. The Heat Rate controls how fast the material is heated. When running at lower temperatures (26° C - 40° C), use the slow heat rate to ensure temperatures do not overshoot. When running at medium temperatures (41° C - 55° C), use the normal heat rate. When running at higher temperatures (56° C - 70° C), use the fast heat rate.







NOTE: If material heat overshoots on a particular heat rate setting, select a slower heat rate.

6. Press the  soft key to save your changes and exit editing mode.

Advanced Setup Screen 3

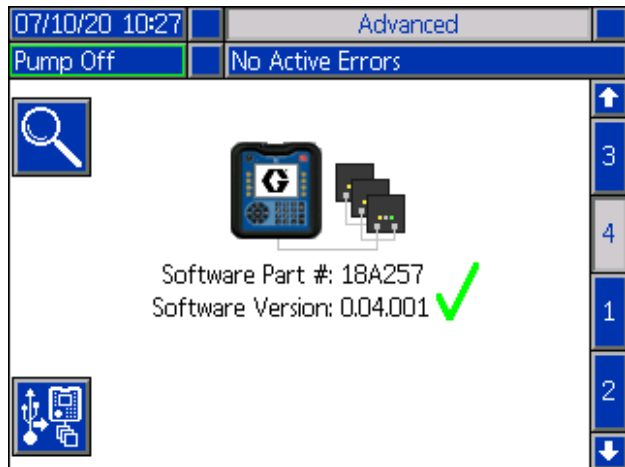
Use the ADM Directional Keypad (DH) to navigate to Advanced Screen 3. The parameters on this screen pertain to USB downloads.



1. Press the  soft key to enter editing mode.
2. USB downloads automatically begin when a USB drive is inserted. Use the  key to disable this feature in the Disable USB Downloads/Uploads box.
3. If you do not want USB log errors to be generated on the ADM, use the  key to disable this feature in the Disable USB Log Errors box.
4. For the Download Depth: Last feature, set the desired download depth using the keypad and  key to enter the desired number of days. This specifies how many days worth of pump data will be kept in the USB logs. Once the logs fill up, the oldest recording will be overwritten.
5. To enable a time frame range of data to download upon insertion of a USB drive, use the  key in the Data Range Prompt Enable box.
6. Press the  soft key to save your changes and exit editing mode.

Advanced Setup Screen 4




Use the ADM Directional Keypad (DH) to navigate to Advanced Screen 4.



This screen can be used to view the version of software used in the system. Additionally, this screen is used to update the system software using a USB drive with the latest software and a Graco black token. The latest software is provided on Help.graco.com.

Refer to the ADM Token In-System Programming manual for a detailed description of this screen. See **Related Manuals** on page 3.

Hose Care Guidelines

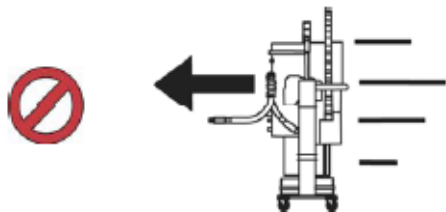




Fluids subjected to heat in confined spaces can create a rapid rise in pressure due to the thermal expansion. Over-pressurization can result in equipment rupture and serious injury.


- Open the Pump Bleed Valve (J) to relieve the fluid expansion during heating.
- Replace hoses proactively at regular intervals based on your operating conditions.

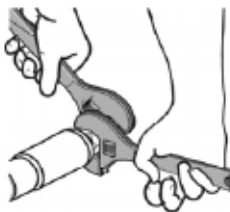
NOTE: Pressure check the hose assemblies. Refer to **Prime Pump** on page 38 for instructions on priming the system. Check carefully for leaks at the hose connections. If there are leaks, follow the **Pressure Relief Procedure** on page 46.

Do not use hose to pull the equipment.



Use 2 wrenches to tighten. Torque to specification:

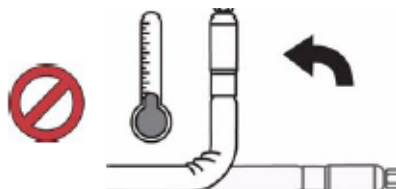
	Fitting	Torque, in-lb (N•m)
	-10	700 (79.1)
	-12	1000 (113.0)
	-16	1400 (158.2)



Do not tape or cover hose.



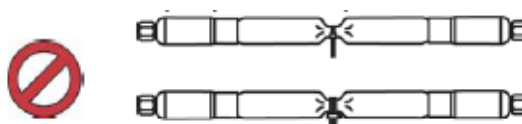
Do not flex hose when cold.




Use hose support spring.

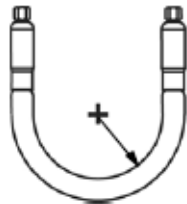


Do not clamp, squeeze, or zip tie hose.



Minimum bend radius:

	Fitting	Radius
	-10	12 (305)
	-12	14 (356)
	-16	18 (457)



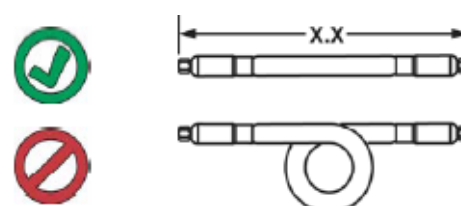
Do not bend or crimp hose.



Do not twist hose.









Use proper length hose.



Startup

Letters in parenthesis are used in this section for reference to callouts in the **Component Identification** section starting on page 10.

Purge System

To avoid fire and explosion, always ground the equipment and the waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

NOTICE

Purge the system before initial use and when chemicals are changed to prevent material contamination, which may cause the material to fail or perform poorly. The system was factory- tested using a light soluble oil, a soybean oil, or some other oil as tagged. Flush the system to avoid contaminating the material that has been designated for initial material loading.







NOTICE

Use fluids that are chemically compatible with the equipment wetted parts. See **Technical Specifications** in all of the equipment manuals.

1. Select the material for the initial material load.
2. Verify whether the factory-test oil and the initial material load are compatible:
 - a. If the two substances are compatible, omit the remaining steps in this procedure and refer to step 7.
 - b. If the two substances are incompatible, perform the remaining steps in this procedure to flush the system.

3. Select a pail of material that can eliminate the factory-test oil from the system. If necessary, check with Graco or the material supplier for a recommended solvent.
 4. Before purging, be sure the entire system and waste pail are properly grounded. See **Grounding**, page 22.
 5. Turn all heat zones' setpoint temperature to the material manufacturer's recommended dispense temperature.
- NOTE:** Remove any dispense valve orifices before purging. Reinstall after purging has been completed.
6. Purge the material through the system for approximately 1 to 2 minutes.
 7. Remove the pail if purge material was used.

Prime Pump

The following steps are required when you are loading material in the system. This procedure should be performed after the Therm-O-Flow Warm Melt is installed, flushed, and ready for operation.

For additional information about the Warm Melt Run screens, see **Operation** on page 40.

Prepare the Pump

1. Turn the Disconnect Switch (T) ON.
2. Open the Main Air Slider Valve (AA) on the Integrated Air Controls, and set the Ram Air Regulator (AB) to 40 psi (.20 MPa, 2.0 bar).
3. Move the Ram Director Valve (AC) up to raise the Ram Assembly (A) to its full height.
4. Set the Ram Director Valve (AC) to neutral (horizontal position).

5. Lubricate the Platen wiper with grease or another lubricant compatible with the material being loaded.
6. Place a full pail or drum of material on the Ram Assembly base and center it under the Platen (D), then remove the drum cover and smooth the surface of the material with a straightedge.
7. To prevent air from being trapped under the platen (D), scoop fluid from the center of the pail/drum to the sides to make the surface concave.
8. Adjust the pail/drum to make sure it is aligned with the Platen (D).
9. Remove the Platen Bleed Stick to open the Platen Bleed Port (G).
10. With your hands away from the pail/drum and the Platen (D), move the Ram Director Valve (AC) down to lower the Ram Assembly (A) until the Platen (D) rests on the lip of the pail/drum.
11. Return the Ram Director Valve (AC) to the neutral position.


NOTE: Loading the material at a lower pressure keeps the Pump (C) from cavitating while there is no material in the Pump.

NOTE: For tandem units, only the inactive system can be loaded and primed through the ADM.

Load the Platen

1. Move the Ram Director Valve (AC) down to lower the Ram Assembly (A) until material appears at the Platen Bleed Port (G).
2. Return the Ram Director Valve (AC) to the neutral position.
3. Replace the Platen Bleed Stick that was removed in step 9 in **Prepare the Pump**.


Load the Pump

1. Move the Ram Director Valve (AC) down to lower the Ram Assembly (A).
2. Adjust the Air Motor Air Regulator (AF) to 10-20 psi (0.69-1.30 bar).
3. Open the Pump Bleed Valve (J) and place a waste container below it to catch material.
4. At the ADM (E), press the  soft key to enable pump priming mode.
5. Adjust the Air Motor Air Regulator (AF) as needed.

Operation

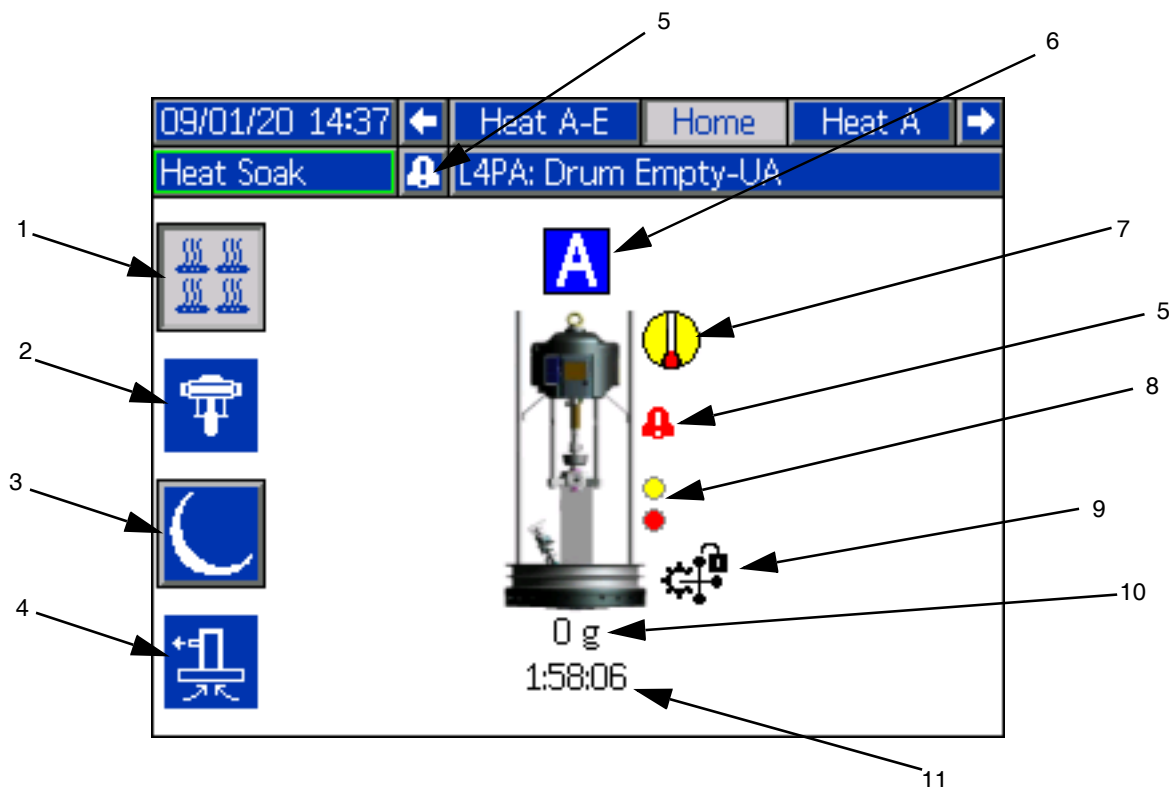
1. Turn the Disconnect Switch (T) ON. The Graco logo will display until communication and initialization is complete.





2. Press the  button. Verify the machine is in “Warm Up” state, and that the temperatures are increasing. Allow the system to reach the “Ready” state before pumping. The Pump will automatically turn on, if Enable Pump Autostart is enabled in setup screens, when all the heat zones reach their setpoint temperature.

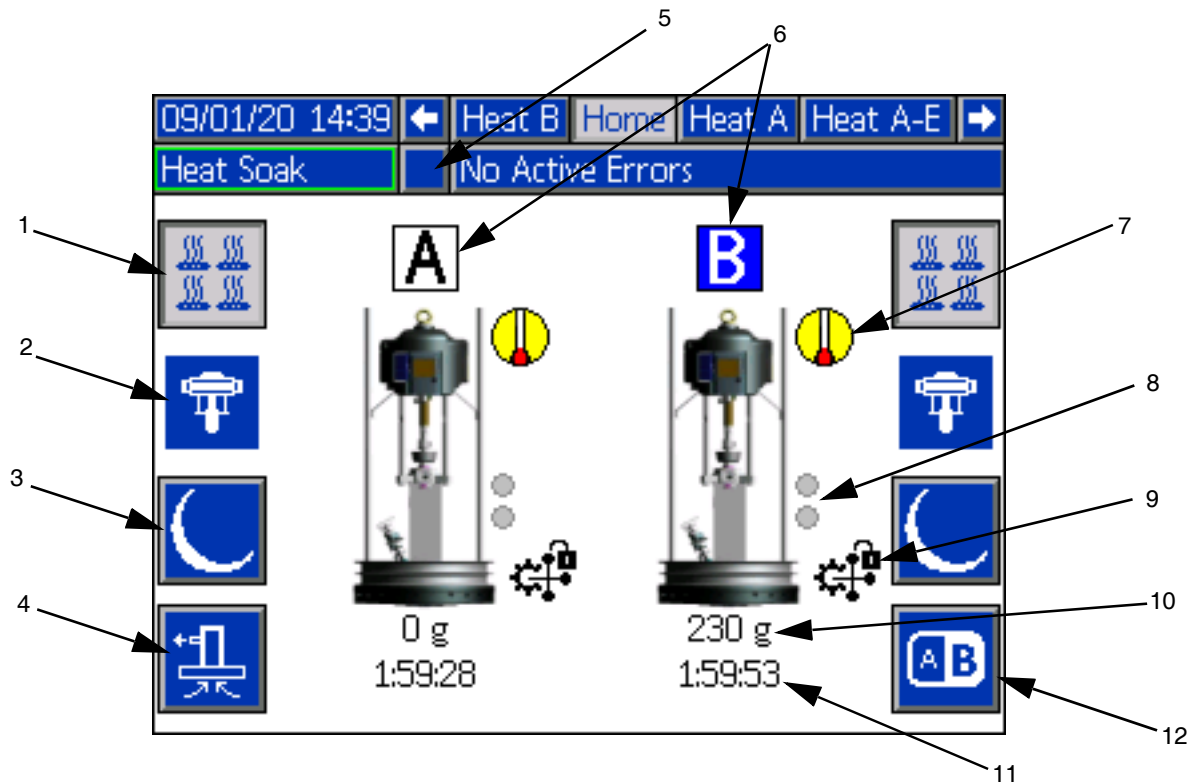
NOTE: Pressing the  button will only turn the system on when the integration control is disabled.



Single Run Screen



1. Heat On/Off: Turns the heat on and off on all active zones.
2. Pump Enable ON/OFF: Energizes the Solenoid to enable the Air Motor when all heat zones are up to temperature.
3. Temperature Setback: Places all active heat zones to setback temperature.
4. Prime Pump: Used to prime the Pump. Energizes the solenoid to enable the Air Motor.
5. Active Errors: Displays active errors.
6. Unit A
7. Heat Status: Displays heat status. Gray is off, yellow is Warmup, Heat Soak, and Setback, and Green is at temperature.
8. Low Level: Displays low level and empty level status. Green is inactive, yellow is low level active, and red is empty level active.
9. PLC Lockout: Displays the PLC lockout status. When the PLC is in control, the icon displayed is . When the ADM is in control, the icon displayed is .
10. Material Dispensed: Displays the weight of the material amount dispensed.
11. Heat Soak Timer: Countdown of the heat soak time.

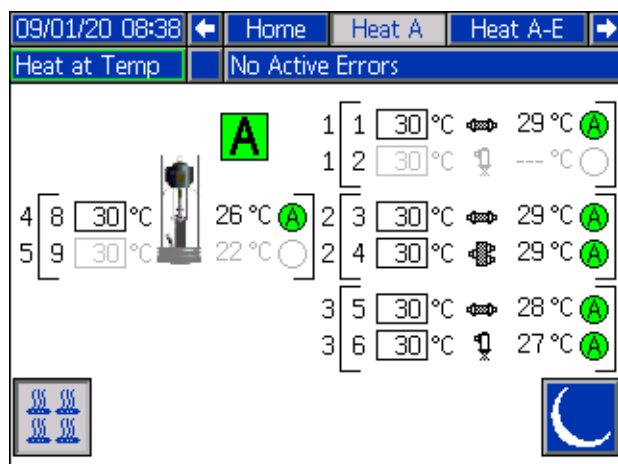
Tandem Run Screen



1. Heat On/Off: Turns the heat on and off on all active zones.
2. Pump Enable ON/OFF: Energizes the Solenoid to enable the Air Motor when all heat zones are up to temperature.
3. Temperature Setback: Places all active heat zones to setback temperature.
4. Prime Pump: Used to prime the Pump. Energizes the solenoid to enable the Air Motor.
5. Active Errors: Displays active errors.
6. Unit A or Unit B
7. Heat Status: Displays heat status. Gray is off, yellow is Warmup, Heat Soak, and Setback, and Green is at temperature.
8. Low Level: Displays low level and empty level status. Green is inactive, yellow is low level active, and red is empty level active.
9. PLC Lockout: Displays the PLC lockout status. When the PLC is in control, the icon displayed is . When the ADM is in control, the icon displayed is .
10. Material Dispensed: Displays the weight of the material amount dispensed.
11. Heat Soak Timer: Countdown of the heat soak time.
12. Toggles between Unit A and Unit B.

Heat Run Screen

When Heat is selected for a pump or accessory at the System Setup screen, a Heat Run screen is available. See **System Setup Screen** on page 31. Use the ADM Directional Keypad (DH) to go to the Heat Run screen.



NOTE: The zone must be enabled at the Heat Setup screen to be displayed on the Heat Run screen. See **Heat Settings** on page 32.

The Pump and Platen Heat zones are shown on the top left side of the screen and the zones for the other system components are shown on the lower left and right. The letter in the box next to the Ram represents Unit A or Unit B.

For each component, the number outside the left bracket is the connector number. The number just inside the left bracket is the zone number.

The temperature reading inside the box is the zone setpoint/setback temperature. It is the setpoint to which control is heating the zone when the zone is turned on. When the system is placed in setback, the temperature displayed in the box is the setback value.

The temperature units can be changed from °C to °F in the Advanced Settings screens. See **Advanced Setup Screen 2** on page 35.


The Zone Heat Symbols on the right side of the screen correspond to the current type to which the zone is set.

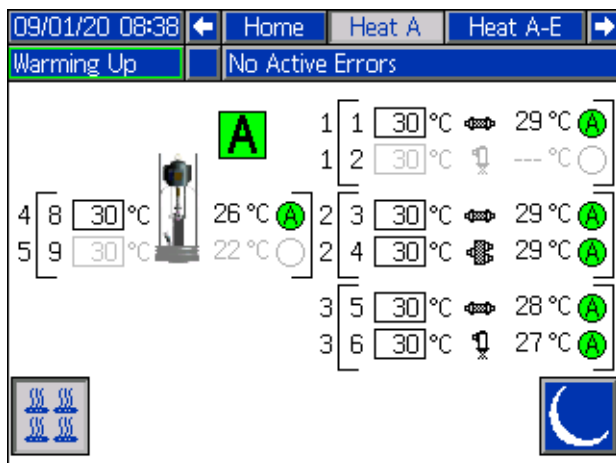
Zone Heat Symbol	
	Hose
	Valve
	Manifold
	PGM
	Flowmeter
	Press Regulator
	Pump
	Platen




The number to the right of the Zone Heat Symbol is the zone's actual temperature. The temperature unit is the same as the zone setpoint/setback temperature unit.

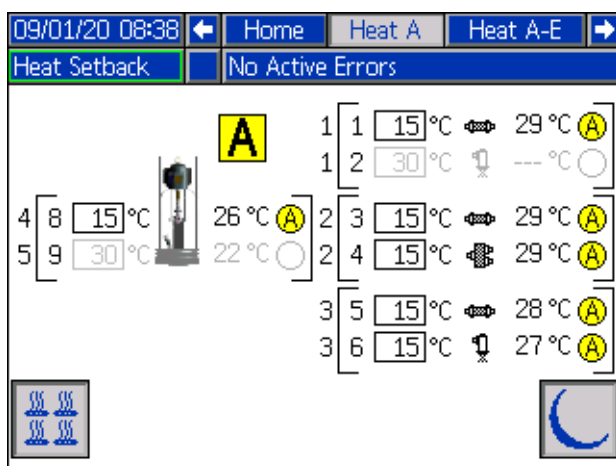
The zone heat state is the circle with a number inside of it next to the temperature unit. There are four different colors used in the indicators for the heat zone.

Color	Description
Green	Heat zone is at temperature.
Yellow	Heat Zone is in setback.
Yellow to Green	Heat zone is warming up or heat zone is heat soaking. It starts as yellow then progresses clockwise to green as it warms up. The pump number also flashes yellow to green during heatsoak.
Red	Heat zone has an error.
Gray	Heat zone is turned off.

1. Press the  soft key to turn the heat zones on and off.




2. When the  icon is showing, the user can put the system into setback by pressing the  soft key. This places all of the zones displayed on the screen to setback and shows the setback temperature in the zone setpoint/setback temperature box.
3. Press the  soft key to take the system out of setback.



Events and Errors

Events Log Screen

Press the  soft key on Main Menu screen 1 to access the Events log.

This screen shows the Date, Time, Event Code, and Description of all events that have occurred on the system. There are 20 pages, each holding 10 events. The 200 most recent events are shown.


Use the ADM directional keypad (DH) to scroll through the pages.

07/10/20 10:42	Events			
Heat at Temp	No Active Errors			
Date	Time	Code	Description	
07/10/20	10:32	EAWA-R	Heat is Warming Up-UA	2
07/10/20	10:32	ELOX-R	Power On	3
07/10/20	10:32	EMOX-R	Power Off	4
07/10/20	10:31	EBPA-R	Pump Off-UA	5
07/10/20	10:31	EACA-R	Mat. Counter Paused-UA	6
07/10/20	10:31	EAPA-R	Pump On-UA	7
07/10/20	10:31	ECOX-R	Setup Values Changed	8
07/10/20	10:30	ECOX-R	Setup Values Changed	
07/10/20	10:30	ECOX-R	Setup Values Changed	
07/10/20	10:29	EAWB-R	Heat is Warming Up-UB	

See **Troubleshoot Errors** on page 54 for instructions on viewing event code descriptions.

All events listed on this screen can be downloaded on a USB flash drive. To download logs, see the **Download Procedure** on page 71.

Errors Log Screen

Press the  soft key on Main Menu screen 1 to access the Errors log.

This screen shows the Date, Time, Error Code, and Description of all errors that have occurred on the system. There are 20 pages, each holding 10 events. The 200 most recent errors are shown.

Use the ADM directional keypad (DH) to scroll through the pages.

07/10/20 10:42	Errors			
Heat at Temp	No Active Errors			
Date	Time	Code	Description	
07/10/20	10:28	V6H2-A	Wiring Error-UAE-D2	1
07/10/20	10:28	CBT2-A	Comm. Error-UAE-D2	
07/10/20	10:27	V6H2-A	Wiring Error-UAE-D2	
07/10/20	10:24	CBV1-A	Comm. Error-UA-D1	
07/10/20	10:24	CBT1-A	Comm. Error-UA-D1	
12/05/19	14:51	CBV1-A	Comm. Error-UA-D1	
12/05/19	14:51	CBT1-A	Comm. Error-UA-D1	
12/05/19	14:51	WSUD-A	USB Configuration Error	

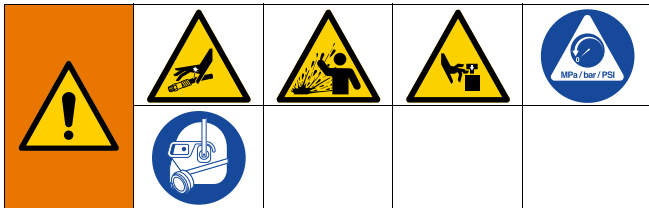
See **Troubleshoot Errors** on page 54 for instructions on viewing error code descriptions.

All errors listed on this screen can be downloaded on a USB flash drive. To download logs, see the **Download Procedure** on page 71.

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.

NOTE: See the appropriate manual for your specific dispense applicator for pressure relief instructions.

1. Engage the trigger lock.

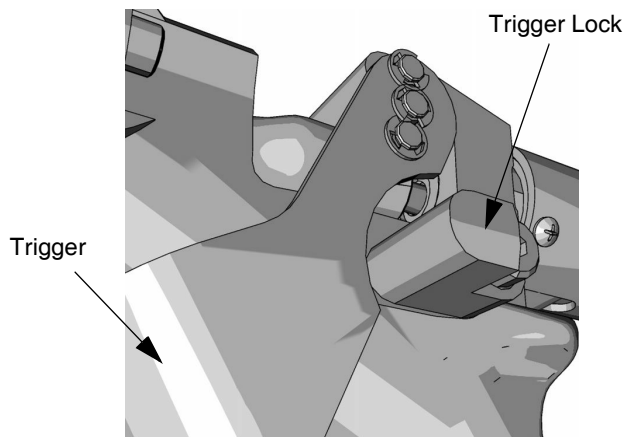


FIG. 23

2. Close the system Main Air Slider Valve (AA).

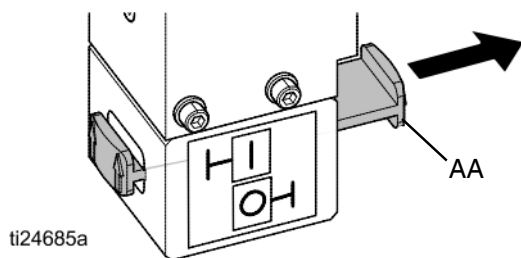


FIG. 24

3. Set the Ram Director Valve (AC) to the neutral position.

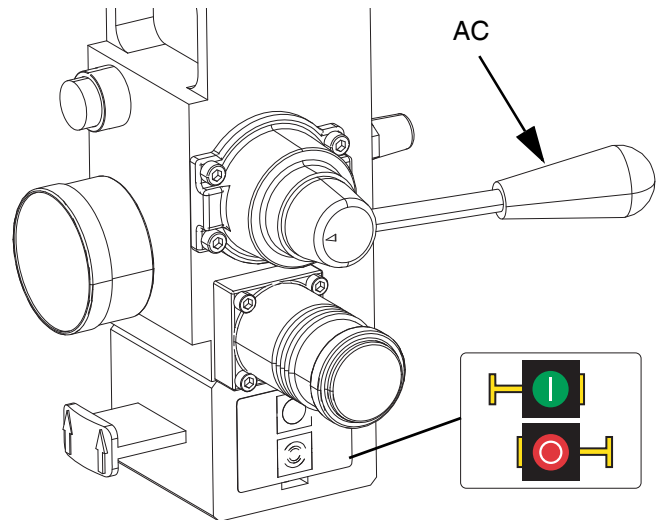


FIG. 25

4. Disengage the trigger lock.

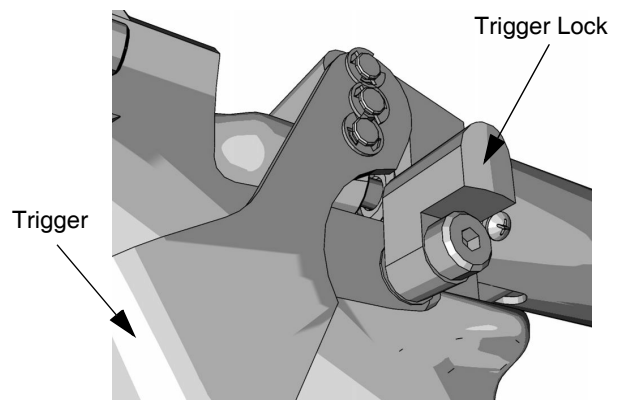


FIG. 26

5. Hold a metal part of the applicator firmly to a grounded metal pail. Trigger the applicator to relieve pressure.
6. Engage the trigger lock.
7. Open the Pump Bleed Valve (J), having a waste container ready to catch drainage. Leave the Pump Bleed Valve open until you are ready to dispense again.
8. If you suspect the tip or hose is clogged or that pressure has not been fully relieved after following the steps above, **VERY SLOWLY** loosen hose end coupling to relieve pressure gradually, then loosen completely. Clear the hose or tip obstruction.

NOTE: If work needs to be performed on the Ram Assembly (A) portion, perform the following additional steps to relieve any trapped air in the inactive portion of the Ram Assembly.

9. Validate that the Pump (C) is fully supported and is resting on the bottom plate.

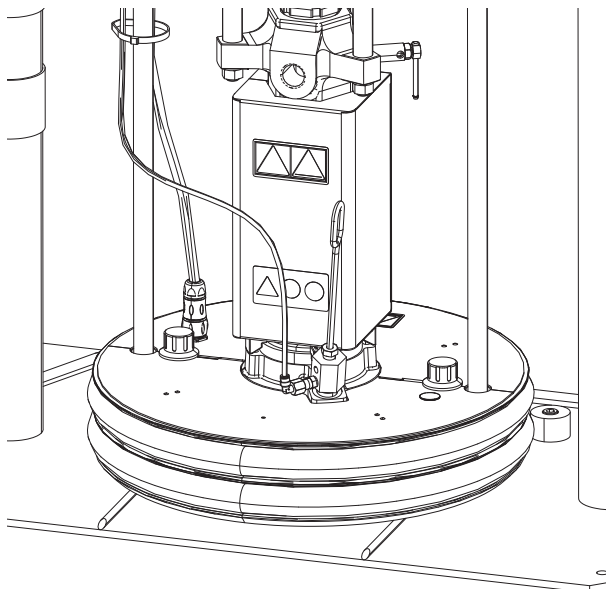


FIG. 27

10. Toggle the Ram Director Valve (AC) up and down to relieve any trapped air.

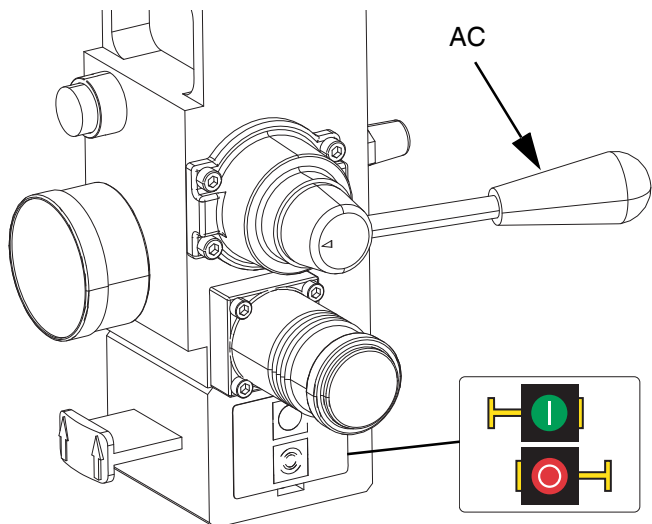



FIG. 28

Stop Controls

Normal Stop Control

To stop all electrical and most pneumatic processes,

press the System Soft Stop button  located on the ADM.

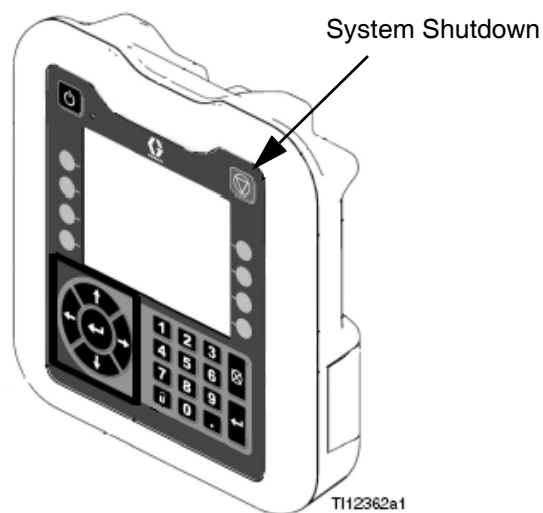


FIG. 29

All electrical operations will be shut down and the air pressure to the Air Motor (B) will be immediately relieved, which will stop the movement of the Pump (C) and turn the heat off.

Electrical components located in the Heat Control Box (S) will remain energized, but all operations will stop

until the system Enable/Disable button  has been pressed.

The Ram Director Valve (AC) will remain operable.

Air Motor and Pump Stop

To stop only the Air Motor (B) and Pump (C), close the Air Motor Slider Valve (AH). This is the preferred method while changing drums.

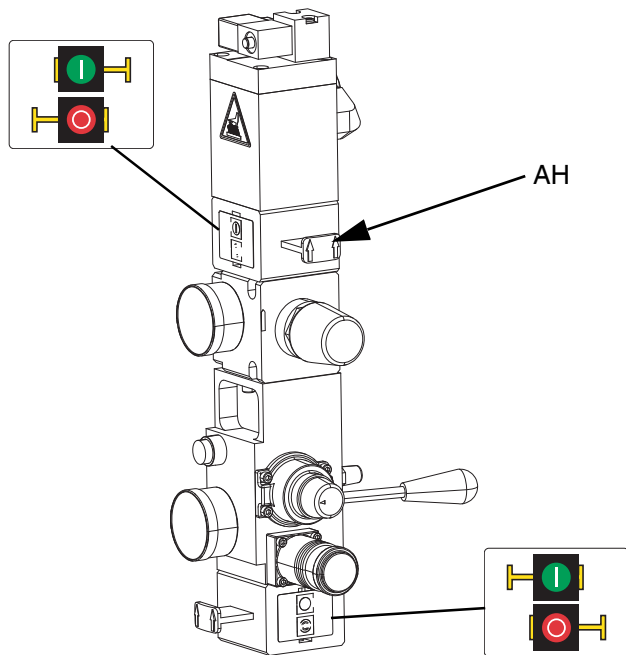


FIG. 30

Air pressure to the Air Motor (B) will be immediately relieved, which will stop movement of the Pump (C) but allow the heater to remain operable.

The Ram Director Valve (AC) will also remain operable.


The Air Motor Slider Valve (AH) can be locked in the closed position.


Shutdown



NOTICE

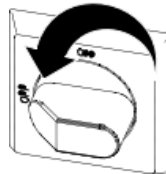
To prevent damage to the pump from rust, never leave water or water-based fluid in a carbon steel pump overnight. If you are pumping a water-based fluid, flush with water first. Then flush with a rust inhibitor, such as mineral spirits. Relieve pressure, but leave the rust inhibitor in the pump to protect parts from corrosion.

1. Press  to disable the heaters and Pump (C). The screen will toggle between “Pump Inactive” and “Heat Inactive”. If using the Schedule function, the heaters and Pump will be disabled automatically at

the set time. Only press  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. The system must be active for the Schedule function to work.

NOTE: Do not perform step 2 if using the Schedule function. Leave the power on.

2. Turn the Disconnect Switch (T) OFF.



Total System Shutdown

Follow the **Pressure Relief Procedure** on page 46.

To stop all electrical and most pneumatic processes, turn the Disconnect Switch (T) OFF.



NOTE: If using a tandem system, make sure both Disconnect Switches (T) are turned OFF for total system shutdown.


This will remove all electrical power to the system past the Disconnect Switch (T).


Air pressure to the Air Motor (B) will be relieved, which will stop movement of the Pump (C).

The Ram Director Valve (AC) will remain operable.

The Disconnect Switch (T) can be locked in the OFF position.

Schedule

Press the  on the ADM from any run screen to go to the Main Menu Screens.

Press the  soft key on the ADM to go to the Schedule screen.

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

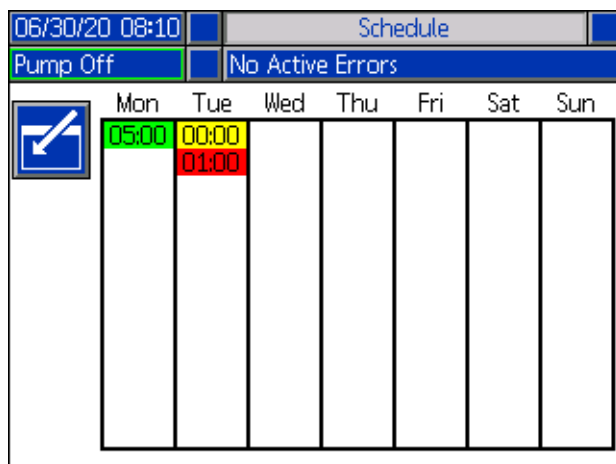
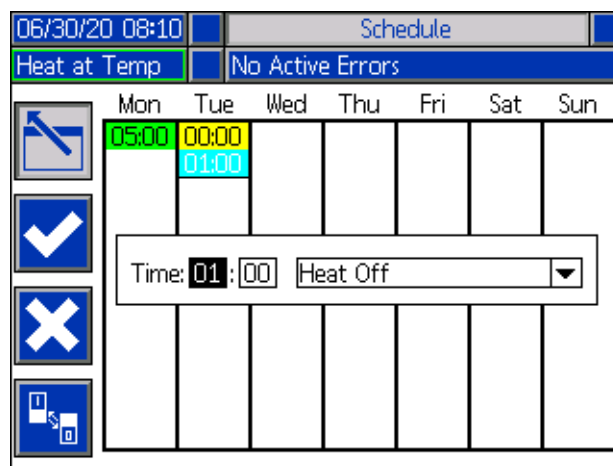


Table 1: Schedule Screen Color Identification

Color	Description
Green	System on
Yellow	Setback
Red	System off
Gray	Disabled

Set Schedule Times

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



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

Enable Schedule Function

To enable the Schedule feature, set the external control to Scheduler. See **System Setup Screen** on page 31.

The Schedule function is automatically enabled when values are entered in the Schedule screen. To disable a scheduled event, navigate to the event and press the



soft key.

The event will appear gray on the screen when it is disabled. To re-enable an event, navigate to the event and

press the  soft key.


The event will appear red (system off), yellow (system setback), or green (system on). If no events are needed, turn the Disconnect Switch (T) OFF to prevent system from automatically enabling and disabling the heaters.

Use the Schedule Function

At the end of the work day, leave the Disconnect Switch (T) ON. As long as the system remains active, the Schedule function will automatically enable and disable the heaters and Pump at the specified times.

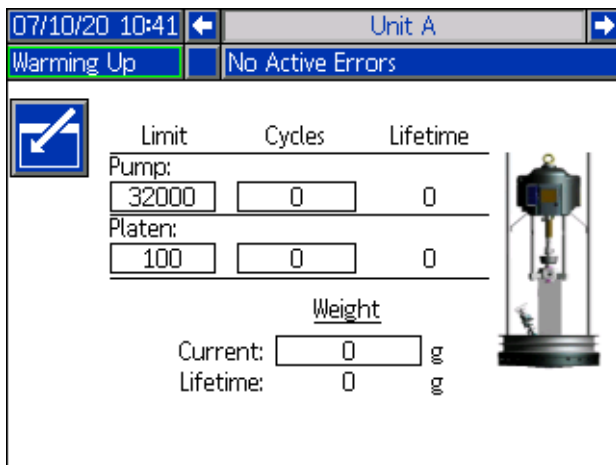
NOTE: The Schedule feature will only work if the integration control is disabled.

Maintenance

Press the  soft key at Main Menu screen 2 to access the Maintenance screens. The Maintenance screens are the same for Single and Tandem systems, except Tandem systems will show Unit B in the Menu Bar. Use the ADM's Directional Keypad (DH) to navigate to Unit A or Unit B.

Maintenance Screen

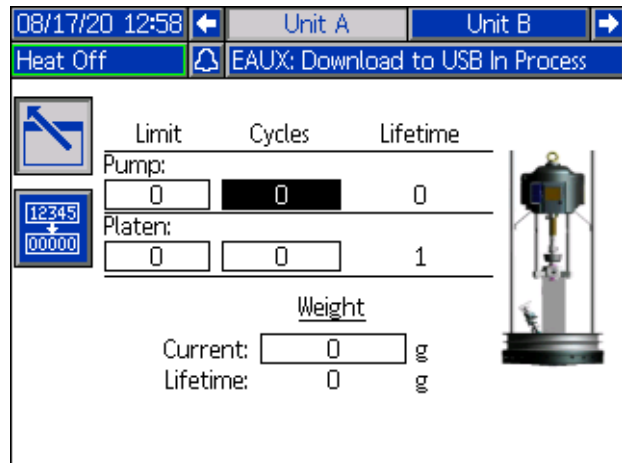
The Maintenance screen allows you to set maintenance parameters.



	Limit	Cycles	Lifetime
Pump:	32000	0	0
Platen:	100	0	0

Weight

Current: 0 g
Lifetime: 0 g





	Limit	Cycles	Lifetime
Pump:	0	0	0
Platen:	0	0	1

Weight


Current: 0 g
Lifetime: 0 g

NOTE: Reset the counter after maintenance is completed.

1. Press the  soft key to enter editing mode.
2. The Pump field allows the user to enter a limit for the number of cycles the pump can run before a message is issued that maintenance is needed. Use the navigation arrows to move between selections and enter the number using the numeric keypad (DJ).
3. The Platen field displays how many times the material has been changed.
4. To reset the Cycles counter, use the navigation arrows to move to each one you want to reset and press the  soft key.

NOTE: Lifetime counters cannot be reset.





Diagnostics

Press the  soft key at Main Menu screen 1 to access the Diagnostics screens. These screens display key parameters that are useful in troubleshooting issues.

These Diagnostics screens are the same for Single and Tandem systems, except Tandem systems show Unit A and Unit B in the Menu Bar.

System Diagnostics Screen

This screen shows the values of the system parameters. This is for informational purposes. No changes can be made at this screen.

07/10/20 10:40 ← Heat B Unit A Unit B Heat A →		
Pump Off No Active Errors		
Diagnostics		
Parameter	Value	Units
Pump Solenoid		
Drum Low		
Drum Empty		
Pump Direction		
Pump Cycle Rate	0.00	Cycles/Hour

The Pump Solenoid indicates if air to the pump is on (green) or off (gray).

The Drum Empty and Low shows the status of the drum.

The Pump Direction arrow indicates the direction that the pump is moving.










The Pump cycles are shown in cycles per hour.









The icons will appear gray when not active and will turn green when active.

Heat Diagnostics Screen









Use the ADM's Directional Keypad (DH) to navigate to the Heat Diagnostics Screen. This screen displays the current heat state, temperature, current, and duty cycle at which the zone is currently running, along with the heat soak timer and line voltage coming into the AMZ.

This is for informational purposes. No changes can be made at this screen.

07/10/20 10:41 ← Heat A-E Heat B Unit A Unit B →		
Pump Off No Active Errors		
Diagnostics		
 30.1 °C	0.7 A	5 % -- : --
 --- °C	0.0 A	0 % -- : --
 30.0 °C	0.4 A	3 % -- : --
 21.6 °C	0.0 A	0 % -- : --
 27.6 °C	0.4 A	6 % 1:46
 21.4 °C	0.0 A	0 % -- : --
 --- °C	0.0 A	0 % -- : --
 27.6 °C	1.2 A	13 % 1:21
 30.1 °C	2.1 A	8 % 0:03
		Line Voltage:
		1: 244.3 V
		2: 241.5 V
		3: 11.1 V

07/10/20 10:40 ← Heat A Heat A-E Heat B →		
Warming Up No Active Errors		
Diagnostics		
 32.3 °C	0.0 A	0 % -- : --
 18.2 °C	0.0 A	0 % -- : --
 18.2 °C	0.0 A	0 % -- : --
 18.2 °C	0.0 A	0 % -- : --
 18.2 °C	0.0 A	0 % -- : --
 18.2 °C	0.0 A	0 % -- : --
 18.2 °C	0.0 A	0 % -- : --
 18.2 °C	0.0 A	0 % -- : --
		Line Voltage:
		1: 240.0 V
		2: 240.0 V
		3: 240.0 V

The Zone Heat Symbol on this screen corresponds to the current type to which the zone is set.

Zone Heat Symbol	
	Hose
	Valve
	Manifold
	PGM
	Flowmeter
	Press Regulator
	Pump
	Platen

The zone heat state is the circle with two numbers inside of it next to the zone heat symbol. There are four different color indicators for the heat zone.

Color	Description
Green	Heat zone is at temperature.
Yellow	Heat zone is in setback.
Yellow/Green	Heat zone is in warmup or heat zone is temperature soaking.
Red	Heat zone has an error.
White	Heat zone is turned off.

The zone actual temperature is next to the zone heat state and shows the actual temperature of the zone. The temperature units can be changed from °C to °F in the Advanced Settings screens. See **Advanced Setup Screen 2** on page 35.

Continuing to the right on the screen, the current is the actual use of current for the zone. The current is shown in units of Amps (A).

The zone duty cycle is the actual cycle to which the zone is working. The duty cycle is in units of percentage (%) and is shown to the right of the current.

The heat soak countdown timer, which is next the column on the right, shows the remaining time that the zone will be in heat soak.

The Line Voltage at the far right of the screen shows the current system voltages coming into the AMZ.

Troubleshooting




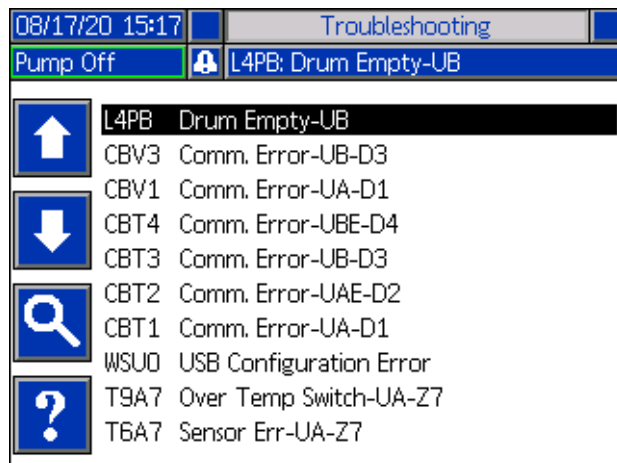
REMOTE SYSTEM ACTIVATION HAZARD

To avoid injury due to remote machine operation, perform the steps below before troubleshooting. This will prevent commands sent from the fieldbus or display module from actuating the air motor/pump.

1. Follow **Pressure Relief Procedure**, page 46, before checking or repairing the Therm-O-Flow Warm Melt.
2. Turn off the yellow and red Disconnect Switch (T). See **Power Disconnect** on page 12.

View Errors

Press the  soft key at Main Menu screen 1 to access the Troubleshooting screen.





08/17/20 15:17 Troubleshooting


Pump Off L4PB: Drum Empty-UB

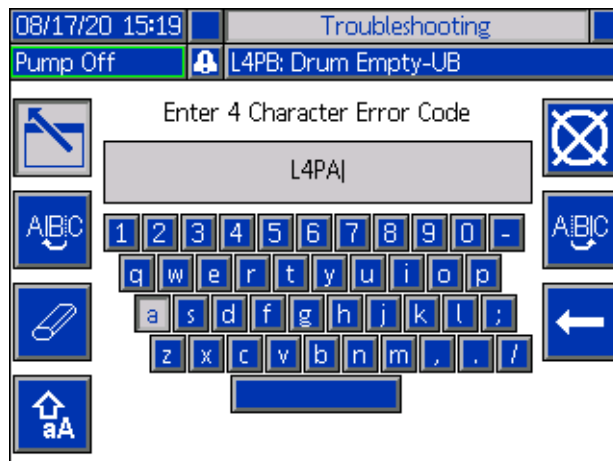
- L4PB Drum Empty-UB
- CBV3 Comm. Error-UB-D3
- CBV1 Comm. Error-UA-D1
- CBT4 Comm. Error-UBE-D4
- CBT3 Comm. Error-UB-D3
- CBT2 Comm. Error-UAE-D2
- CBT1 Comm. Error-UA-D1
- WSUD USB Configuration Error
- T9A7 Over Temp Switch-UA-Z7
- T6A7 Sensor Err-UA-Z7

This screen shows the list of errors with error codes and descriptions. Use the arrow soft keys to scroll through

the list and select an error. Press the  soft key to advance to the QR Code screen for the selected error. See **Troubleshoot Errors** on page 54.

Press the  soft key to advance to a keyboard screen that allows you to search for an error by error

code. Type in the error code, then press the  soft key to advance to the QR Code screen.



08/17/20 15:19 Troubleshooting

Pump Off L4PB: Drum Empty-UB

Enter 4 Character Error Code

L4PA|

1 2 3 4 5 6 7 8 9 0 -

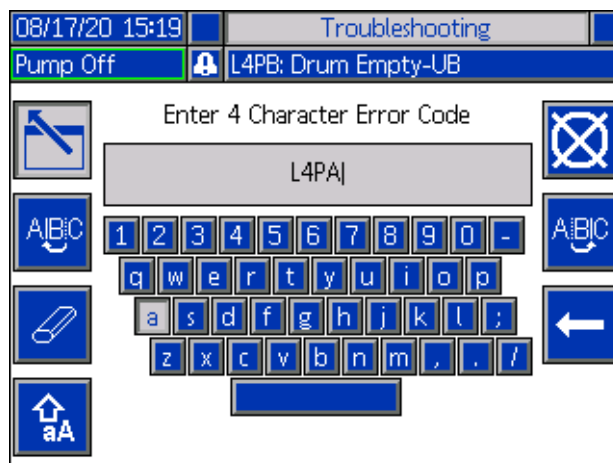
q w e r t y u i o p

a s d f g h j k l ;

z x c v b n m , . /

⏮ ⏭

Error Code Finder



08/17/20 15:19 Troubleshooting

Pump Off L4PB: Drum Empty-UB

Enter 4 Character Error Code

L4PA|

1 2 3 4 5 6 7 8 9 0 -


q w e r t y u i o p


a s d f g h j k l ;


z x c v b n m , . /



⏮ ⏭

Use the  and  soft keys to scroll the keyboard to select letters.

The  soft key changes back and forth from lower and upper case.

The  soft key erases everything you have typed.

The  soft key is the backspace to delete one letter at a time.


Press the  soft key to save the name and exit the keyboard screen. Press the  soft key to exit the screen without saving. Both actions return you to the Troubleshooting screen.


Troubleshoot Errors


When an error occurs, the error information screen displays the active error code and description.

The error code, alarm bell, and active errors will scroll in the status bar. Error codes are stored in the error log and displayed on the Error and Troubleshooting screens on the ADM.

There are three types of errors that can occur. Errors are indicated on the display as well as by the light tower (optional).

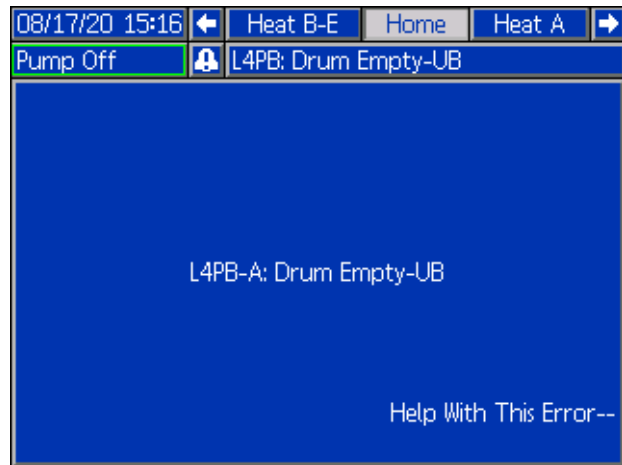
Alarms are indicated by . This condition indicates a parameter critical to the process has reached a level requiring the system to stop. The alarm needs to be addressed immediately.

Deviations are indicated by . This condition indicates a parameter critical to the process has reached a level requiring attention, but not sufficient enough to stop the system at this time.

Advisories are indicated by . This condition indicates a parameter that is not immediately critical to the process. The advisory needs attention to prevent more serious issues in the future.

To troubleshoot the error:

1. Press the soft key next to “Help With This Error” for help with the active error.




2. The QR Code screen will be displayed. Scan the QR code with your smart phone to be sent directly to online troubleshooting for the active error code.





NOTE: For causes and solutions for each error code, refer to the **Error Codes** table on page 55. You can also call Graco Technical Assistance or navigate to: <http://help.graco.com/en/therm-o-flow-products/therm-o-flow-warm-melt.html>.


Error Codes

There are three types of errors that can occur. Errors are indicated on the display as well as by the optional Light Tower.

Alarms are indicated by . This condition indicates a parameter critical to the process has reached a level requiring the system to stop. The alarm needs to be addressed immediately.

Deviations are indicated by . This condition indicates a parameter critical to the process has reached a level requiring attention, but not sufficient enough to stop the system at this time.

Advisories are indicated by . This condition indicates a parameter that is not immediately critical to the process. The advisory needs attention to prevent more serious issues in the future.

To acknowledge the error, press .

The third digit, or sometimes the last digit of the error code, indicates which unit the error is active on. The “★” (star) character indicates the code applies to multiple system components.

Third or Last Digit “★”	Code Relates To:
A	Unit A
B	Unit B

The last digit of the error code indicates which system component the error applies. The “#” (pound) character indicates the code applies to multiple system components.

Last Digit “#”	Code Relates To System Component:
1	AMZ 1 Unit A
2	AMZ 2 Unit A Expansion
3	AMZ 3 Unit B
4	AMZ 4 Unit B Expansion

The last digit of the error code indicates which heat zone the error applies. The “_” (underscore) character indicates the code applies to multiple system components.

Last Digit “_”	Code Relates To Heat Zone:
1	Zone 1
2	Zone 2
3	Zone 3
4	Zone 4
5	Zone 5
6	Zone 6
7	Zone 7
8	Zone 8 / Pump
9	Zone 9 / Platen
A	Zone 10
B	Zone 11
C	Zone 12
D	Zone 13
E	Zone 14
F	Zone 15
G	Zone 16
H	Zone 17

Error	Location	Type	Error Name	Error Description	Cause	Solution
A1__	AMZ	Alarm	Low Current U_Z_	Heater current is below the minimum allowed value	Fault heater element	Check heater resistance and resistance to ground. Replace faulty heater
A2__	AMZ	Advisory	Low Current U_Z_	Heater current is below the minimum allowed value	Fault heater element	Check heater resistance and resistance to ground. Replace faulty heater
A3__	AMZ	Alarm	High Current U_Z_	Heater current exceeds maximum allowed value	Heater element is defective	Replace heater element
					Heater element is shorted	Check wiring to the heater element to ensure no bare wires are touching and that no wires are shorted to ground
A4__	AMZ	Alarm	High Current U_Z_	Heater current exceeds maximum allowed value	Heater element is defective	Replace heater element
					Heater element is shorted	Check wiring to the heater element to ensure no bare wires are touching and that no wires are shorted to ground
A7__	AMZ	Alarm	Unexpected Current U_Z_	Heat current has an unexpected current flow	Unexpected Current flow to the heat element	Fault heater element. Check heater resistance and resistance to ground. Replace heater element
						Faulty AMZ, Replace AMZ
A8__	AMZ	Alarm	No Current U_Z_	Power is not getting to heating element	Power not getting to heating element	Check fuse on the AMZ that the error element is connected to
						Check that electrical connector on the heated hose is plugged into the AMZ
						Check continuity of pins on electrical connector at AMZ end of heated element. See heated element manual for impedance measurements and pin outs. Replace hose if readings are to high

Error	Location	Type	Error Name	Error Description	Cause	Solution
CAC_	ADM	Alarm	Communication Error U_	Communication lost between ADM and Heat Module	No 24 VDC power supply to ADM	Reconnect or replace CAN cable connecting AMZ and ADM. If CAN connection good, check 24V power supply wiring in side the heat box. Make sure AC power to pump is turned off before checking power supply. Yellow LED on AMZ board should be flashing.
					Cross threaded CAN cable.	CAN cables carry 24 V DC power and communication between modules. A cross threaded CAN cable connector may cause problems with communication and/or power to modules. Carefully check for cross threaded CAN connections on the ADM and AMZ. Yellow LED on AMZ board should be flashing.
CBGX	Gateway	Alarm	Fieldbus Reset	The fieldbus has performed a reset	Changing the fieldbus setup properties	No action necessary
CBT_	AMZ	Alarm	Communication Error U_D_	Communication lost between AMZ MZLP4 and ADM	No AC power to the AMZ MZLP4	Verify AMZ MZLP4 is turned on by confirming disconnect switch of the heat box is in the ON position.
					Faulty AMZ MZLP4 control board	Replace AMZ MZLP4 control board
CBV_	AMZ	Alarm	Communication Error U_D_	Communication lost between AMZ DB and ADM	No AC power to the AMZ DB	Verify AMZ DB is turned on by confirming disconnect switch of the heat box is in the ON position.
					Faulty AMZ DB control board	Replace AMZ DB control board

Error	Location	Type	Error Name	Error Description	Cause	Solution
CCG_	Gateway	Alarm	Fieldbus Comm. Error U_	No communication with the fieldbus	The gateway lost communication with the unit controller	Restore communications.
CCT_	AMZ	Alarm	Duplicate Module U_D_	Multiple AMZ MZLP4s using same module ID	Two or more AMZ MZLP4s have the same module ID	Turn dial on AMZ to a non used module ID
CCV_	AMZ	Alarm	Duplicate Module U_D_	Multiple AMZ DBs using same module ID	Two or more AMZ DBs have the same module ID	Turn dial on AMZ to a non used module ID
EUH_	AMZ	Record Only	Pump Inactive Timeout U_	Automatically turn the heat to setback after the designated amount of time the pump has been inactive. If the pump has been inactive for two times the designated amount of time, the heat will be turned off.	All zones on heat module were successfully turned off	No action necessary.
EAUX	ADM	Advisory	Download to USB In Process	Information is currently being downloaded to USB	Download to USB initiated	No action necessary. Self-clearing.
EBUX	ADM	Advisory	Download to USB Complete	Download to USB is complete	All requested information has finished downloading to USB	No action necessary. Self-clearing.
EBH_	AMZ	Record Only	Heat Off U_	Unit Heat was turned off	Unit heat was successfully turned off	No action necessary.
EC0X	ADM	Record Only	Setup Values Changed	A setting in the setup screen was changed	A setting in the setup screens was changed	No action necessary if changes were desired.
EDF_	AMZ	Record Only	Heat is Temperature Soaking U_	Unit Heat is in temperature soaking state	Unit heat went into temperature soaking	No action necessary.
EDS_	AMZ	Record Only	Heat in Setback U_	Unit Heat is in setback state	Unit heat went into setback	No action necessary.

Error	Location	Type	Error Name	Error Description	Cause	Solution
EDT_	AMZ	Record Only	Heat at Temperature U_	Unit Heat is at the desired zone temperature	Unit heat has successfully reach the desired zone temperature	No action necessary if the desired temperature was reached.
EAW_	AMZ	Record Only	Heat is Warming Up U_	Unit Heat is warming up to the desired temperature	Unit heat is was turn on and zones required to warm up to desired temperature	No action necessary.
EL0X	ADM	Record Only	Power On	The ADM was powered on	The ADM was powered on	No action necessary.
EM0X	ADM	Record Only	Power Off	The ADM was powered off	The ADM was powered off	No action necessary.
EKA_	Pump	Record Only	Automatic Crossover to U_	The system has success crossover over to the other unit	Empty alarm in the system requested a crossover to the other unit	No action necessary.
EKM_	Pump	Record Only	Manual Crossover to U_	The system has received a crossover request	The system has received a crossover request from the ADM or CGM	No action necessary.
EVUX	ADM	Advisory	USB Disabled	USB downloads/uploads are disabled	USB download/uplo ad was attempted, but USB activity is disabled within the setup screen	Advisory will clear when drive is removed. Enable USB downloads/uploads in setup screen if desired and reinsert USB drive.
L4P_	Pump	Alarm	Drum Empty U_	Drum is empty	Drum is empty and needs to be replaced	Replace drum and prime pump if desired.
					Drum level sensor is disconnected	Verify level sensor is connected. Replace sensor if connection is good.

Error	Location	Type	Error Name	Error Description	Cause	Solution
L2P_	Pump	Deviation	Drum Low U_	Drum level is low	Fluid level in drum is low. Consider replacing soon	Clear deviation and return to normal pump operation.
					Drum level sensor is disconnected	Verify level sensor is connected. Replace sensor if connection is good.
MMUX	ADM	Advisory	USB Log 90% Full	One or more USB log is 90% full.	Data in the jobs or events log has not been downloaded recently and logs are nearly full.	Download the data or disable USB errors.
MAD_	Pump	Advisory	Maint. Due Pump U_	Maintenance due for pump of the unit	The number of pump cycles since last reset has exceeded the maintenance limit set	Perform desired maintenance and reset the pump cycles in the maintenance screen.
MLC_	Pump	Advisory	Rebuild Platen Seals U_	Maintenance due for platen seals of the unit	The number of replaced drums since last cycles reset has exceeded the maintenance limit set	Rebuild the platen seals if desired and reset the platen cycles in the maintenance screen.
TA__	AMZ	Alarm	Heat Zone Offline Z_U_	The Heat Zone is off line for the other unit	The AMZ lost communication with the other Tandem AMZ	Restore communications.
T1__	AMZ	Alarm	Low Temperature U_Z_	Temperature of the zone is below the setpoint	Zone has reached setpoint but dropped below setpoint and can not recover	Check resistance of heater rods. Refer to manual for resistance.
						Adjust the temp Offset Errors in the Heat setup screen.
T2__	AMZ	Advisory	Low Temperature U_Z_	Temperature of the zone is below the setpoint	Zone has reached setpoint but dropped below setpoint and can not recover	Check resistance of heater rods. Refer to manual for resistance.
						Adjust the temp Offset Error in the Heat setup screen.

Error	Location	Type	Error Name	Error Description	Cause	Solution
T3__	AMZ	Advisory	High Temperature U_Z_	The zone temperature has exceeded the setpoint	Element continues to raise above the setpoint	Defective RTD. Replace.
					RTD not in correct location on element	See manual to find correct location of RTD on element.
					Temperature reading has risen too high	Adjust the temp Offset Error in the Heat setup screen
T4__	AMZ	Alarm	High Temperature U_Z_	The zone temperature has exceeded the setpoint	Element continues to raise above the setpoint	Defective RTD. Replace.
					RTD not in correct location on element	See manual to find correct location of RTD on element.
					Temperature reading has risen too high	Adjust the temp Offset Error in the Heat setup screen.
T4T_	DB	Alarm	High Temperature Transformer U_	The transformer cord temperature is to high	Transformer temperature is too high	Cool down transformer.
T6__	AMZ	Alarm	Sensor Error U_Z_	The zone has no reading from RTD	No reading from the RTD of the heat zone	Check the wired connections to make sure that RTD is wired correctly.
						Defective RTD. Replace.
T6T_	DB	Alarm	Sensor Error Transformer U_	The transformer has no temperature reading	No reading from the RTD of the heat zone	Check the wired connections to make sure that RTD is wired correctly.
						Defective RTD. Replace.
T8__	AMZ	Alarm	No Temperature Rise U_Z_	The zone temperature does not changed	The zone temperature does not changed	Check fuse on the AMZ that the error element is connected to.
						Check that electrical connector on the heated hose is plugged into the AMZ.
						Defective heater rods in element. Replace.

Error	Location	Type	Error Name	Error Description	Cause	Solution
T9__	AMZ	Alarm	Over Temperature Switch Error U_Z_	The zone over temperature switch triggered	The zone over temperature switch is wires are unplugged	Plug back in.
					The zone temperature is to high	Cool pump down.
					Fault over temperature switch	Replace over temperature switch.
V2H_	AMZ	Deviation	Low Voltage U_D_	The incoming power of the unit is below minimum acceptable limit	Incoming line to line voltage has dropped below 175V	Verify incoming power is correct gauge for current draw and verify incoming power lines are securely attached to disconnect.
V4H_	AMZ	Alarm	High Voltage U_D_	The incoming power of the unit is above minimum acceptable limit	Incoming line to line voltage has increased above 265V	For 3 phase with neutral have qualified electrician verify neutral wire.
V6H_	AMZ	Alarm	Wiring Error U_D_	The wiring of the unit is invalidated from what the AMZ is expecting	Wrong wiring of the power source to the AMZ	Verify incoming power is wired to the disconnect correctly per the manual.
WMG0	Gateway	Alarm	Gateway Error Detected	Gateway error detected; includes any error not covered by a more specific error	---	---
WNG0	Gateway	Alarm	Gateway Map Error	Missing or invalid gateway map	Missing or invalid gateway map	Install map in gateway.
WSU0	ADM	Alarm	USB Configuration Error	USB configuration file not detected	USB congifuration file not loaded or was deleted	Update software to the latest available on help.graco.com.
DAP_	Pump	Alarm	Pump Runaway U_	Pump Runaway Detected	Pump is trying to feed material, no material to feed	Adjust the drum empty level sensor to detect an empty state.
					Worn or damaged pump seals	Ensure the ram director valve is in the down position and sufficient air is forcing the ram down. Inspect pump seals and replace if necessary.

Error	Location	Type	Error Name	Error Description	Cause	Solution
DDP_	Pump	Deviation	Pump Diving U_	Pump Diving Detected	Pump is trying to feed material, no material to feed	Adjust the drum empty level sensor to detect an empty state.
						Ensure the ram director valve is in the down position and sufficient air is forcing the ram down.
					Worn or damaged pump seals	Inspect pump seals and replace if necessary.
L1P_	Pump	Deviation	Pump Level Sensor Error U_	Pump Level Sensor Error Detected	Machine is detecting an empty state, without a low state	Make sure the empty level sensor is not covered in material.
						Verify the low level sensor is plugged into correct location. See manual for connection spot.
						Verify the low level sensor is close enough to the metal bar; adjust if necessary.
						Replace sensors.
DEP_	Pump	Alarm	Pump Reed Switch Error U_	Pump Reed Switch Failure Detected	Reed switch failed	Check that sensor cable is plugged into correct location. See manual for connection spot.
						Check for loose connection at reed switch.
						Ensure reed switch is securely attached to the air motor.
						Replace if necessary.
WKP_	Pump	Alarm	Fill Solenoid Disconnection Error U_	Fill Solenoid Disconnected Detected	Fill is not turning on when it should	Verify harness is plugged into the correction location. See manual for connection spot.
						Verify that the solenoid is secured correctly.
						Replace Solenoid.

Error	Location	Type	Error Name	Error Description	Cause	Solution
WKD_	Pump	Alarm	Fill Solenoid High Current U_	High Current detected on Fill solenoid	Solenoid is drawing too much current	Inspect for short in harness.
						Inspect for a shorted solenoid cable/short to ground.
						Replace solenoid.
WJP_	Pump	Alarm	Pump Solenoid Disconnection Error U_	Pump Solenoid Disconnected Detected	Pump is not turning on when it should	Verify harness is plugged into the correction location. See manual for connection spot.
						Verify that the solenoid is secured correctly.
						Replace Solenoid.
WJD_	Pump	Alarm	Pump Solenoid High Current U_	High Current detected on pump solenoid	Solenoid is drawing too much current	Inspect for short in harness.
						Inspect for a shorted solenoid cable/short to ground.
						Replace solenoid.
EAP_	Pump	Record Only	Pump Power On U_	Pump of unit Placed into On State	The unit received a command to turn on pump	No action necessary.
EBP_	Pump	Record Only	Pump Power Off U_	Pump of unit Placed into Off State	The unit received a command to turn off pump	No action necessary.
ERC_	Pump	Record Only	Pump Cycle Totalizer Cleared U_	Unit was told to clear pump cycle totalizer	The unit received a command to clear pump cycle totalizers	No action necessary.
ERW_	Pump	Record Only	Pump Weight Totalizer Cleared U_	Unit was told to clear weight totalizer	The unit received a command to clear weight totalizers	No action necessary.

Error	Location	Type	Error Name	Error Description	Cause	Solution
ERP_	Pump	Record Only	Pump Counter Cleared U_	Unit was told to clear pump counter	The unit received a command to clear pump counter	No action necessary.
ERD_	Pump	Record Only	Pump Drum Counter Cleared U_	Unit was told to clear drum counter	The unit received a command to clear drum counter	No action necessary.
EPP_	Pump	Record Only	Pump Priming U_	Pump of unit Placed into Priming State	The unit received a command to priming.	No action necessary.
ETAX	ADM	Record Only	Scheduled Heat On	The Scheduler on the ADM has requested Heat On	The ADM clock has match a time in the schedule that heat was requested into on	No action necessary.
ETBX	ADM	Record Only	Scheduled Heat Off	The Scheduler on the ADM has requested Heat Off	The ADM clock has match a time in the schedule that heat was requested into off	No action necessary.
ETSX	ADM	Record Only	Scheduled Heat Setback	The Scheduler on the ADM has requested Setback	The ADM clock has match a time in the schedule that heat was requested into setback	No action necessary.
DHP_	Pump	Alarm	Unexpected Movement U_	The unit has seen an unexpected movement in the pump	The unit has seen an unexpected movement in the pump	Check Pump Solenoid Air valve connections for shorts. Replace if necessary.

Ram Assembly Troubleshooting

Problem	Cause	Solution
Ram will not raise or lower.	Closed main air valve or clogged air line,	Open air valve; clear air line.
	Not enough Ram air pressure.	Increase Ram air pressure.
	Worn or damaged Ram piston.	Replace piston. See the Global Ram Instructions-Parts manual.
	Platen not fully up to temperature.	Wait for full temperature.
	Ram air pressure too high.	Decrease Ram air pressure.
	Dented drum has stopped Platen.	Fix or replace drum.
Ram raises or lowers too fast.	Ram "up / down" air pressure too high.	Decrease Ram air pressure.
Air leaks around cylinder rod.	Worn rod seal.	Replace o-rings in guide sleeve. See the Global Ram Instructions-Parts manual.
Fluid squeezes past Platen wipers.	Ram air pressure too high.	Decrease Ram air pressure.
	Worn or damaged wipers.	Replace wipers.
Pump will not prime properly, or pumps air.	Closed main air valve or clogged air line.	Open air valve; clear air line.
	Not enough air pressure.	Increase air pressure.
	Worn or damaged Ram piston.	Replace piston. See the Global Ram Instructions-Parts manual.
	Ram directional valve closed or clogged.	Open valve; clear valve or exhaust.
	Ram directional valve dirty, worn, or damaged.	Clean; repair valve.
	Directional valve not in the down position.	Position handle in the down position.
	Dented drum has stopped Platen.	Fix or replace drum.
Air pressure will not push Platen out of drum.	Closed main air valve or clogged air line.	Open air valve; clear air line.
	Platen not fully up to temperature.	Wait for full temperature.
	Not enough blow-off air pressure.	Increase blow-off air pressure.
	Blow-off valve passage clogged.	Clean valve passage.
	Dented drum has stopped Platen.	Fix or replace drum.
	Wipers bonded to drum or drum liner.	Lubricate wipers with high temperature grease at every drum change.

Pump Troubleshooting

See Pump manual for additional Pump troubleshooting information. See **Related Manuals**, page 3.

Problem	Cause	Solution
Rapid downstroke or upstroke (Pump cavitation).	Material not heated to proper temperature.	Check and adjust temperature to proper setpoint. Wait for Pump/Platen to heat up.
	Air is trapped in Pump.	Bleed air from Pump. See Prime Pump , page 36.
	Downstroke: Dirty or worn Pump intake valve.	Clean or repair. See Pump Manual.
	Upstroke: Dirty or worn Pump piston valve.	Clean or repair.
	Machine is out of material	Adjust empty level sensor.
Material leaks around Pump outlet.	Loose outlet fitting.	Tighten outlet fitting.
Material leaks around bleed port.	Loose bleed port fitting.	Tighten bleed port fitting.
Pump will not move up and down.	Problem with Air Motor.	See Air Motor Manual.
	Foreign object lodged in Pump.	Relieve pressure. See Pump Manual.
	Platen not fully up to temperature.	Wait for full temperature.
	Valve to Air Motor is off.	Check gauges and valves to the Air Motor.
Leak around Pump wet-cup.	Worn throat seals.	Replace throat seals. See Servicing the Throat packings in the Check-Mate Displacement Pumps Instructions-Parts manual and the 200 cc Check-Mate Displacement Pump Repair Parts manual.

Air Motor Troubleshooting

See Air Motor manual for additional Air Motor troubleshooting information. See **Related Manuals**, page 3.



Problem	Cause	Solution
Air motor will not run.	Air motor solenoid is off.	Wait for heat zones in use to reach temperature setpoint values.
Air motor stalled.	Damaged main air valve spool or poppets.	Inspect and clean poppets. See Air Motor Manual.
		Rebuild main air valve. See Air Motor Manual.
Air continuously exhausting around Air Motor shaft.	Damaged Air Motor shaft seal.	Replace Air Motor shaft seal. See Air Motor Manual.
Air continuously exhausting around air valve/slide valve.	Air valve/slide valve gasket is damaged.	Replace the valve gasket. See Air Motor Manual.
Air continuously exhausting from muffler when motor is idle.	Internal seal damage.	Rebuild Air Motor. See Air Motor Manual.
Icing on muffler.	Air motor operating at high pressure or high cycle rate.	Reduce pressure, cycle rate, or duty cycle of motor.

Heat Control Box Troubleshooting

Problem	Cause	Solution
System does not heat.	Blown fuse.	Replace fuse.
	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.
	Cable to over-temperature switch is off or broken.	Check connection of cable to over-temperature switch both to main board and to switch. If connection is good, look for a break in the wire.
	Electrical short.	Check jumpers.
		Check resistances on heater rods and RTDs.
		Check cable connections.
	Disconnect switched OFF.	Check disconnects.
Slow warm-up time.	Low incoming voltage.	Verify incoming voltage is 200V L-N or 240V L-C.
	Insufficient power supplied to system.	Connect system to a power supply capable of maximum power per system specification. All changes must be performed by a qualified electrician.
	Zone Types set up incorrectly.	Ensure Zone Types are set up correctly in the ADM.
	Open heater.	Verify resistance of heaters. See Main Enclosure Sensors on page 70.
ADM off while power is on.	RCD breaker tripped.	Verify the RCD breaker is on.

Check Resistance (Heated Systems)

Check Heater and Sensor Resistance

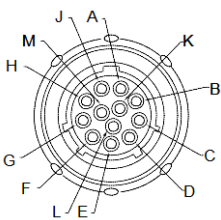
				
To reduce risk of injury or damage to equipment, conduct these electrical checks with the Disconnect Switch (T) OFF.				

NOTE: Instructions for checking sensor resistance applies to heated systems only. If an expansion module (26B238) is added, an additional eight sensors are available.

The system includes up to nine heat sensors and controllers for each of the heated zones. To check sensor resistance:

1. Turn the Disconnect Switch (T) OFF.
2. Wait for components to cool down to ambient room temperature 63°-77°F (17°-25°C). Check electrical resistance for the components.

NOTE: Check resistance at ambient room temperature 63°-77°F (17°-25°C).

AMZ	Pins	Circular Hose Connector
First Heat Zone	A, J	
Second Heat Zone	C, D	
First RTD	G, K	
Second RTD	M, K	
Earth Ground	B	

3. Replace any parts whose resistance readings do not comply with the ranges listed in **Table 2: Main Enclosure Sensors** and **Table 3: Expansion Enclosure Sensors** on page 70.

Table 2: Main Enclosure Sensors

Port	Zone	Component	RTD Range (Ohms)	RTD Pin Numbers	Heater Element Resistance (Ohms)	Heater Pin Numbers
1	1	Heated Hose	100	G, K	See hose manual	See hose manual
	2	Heated Accessory 1	100	M, K	See accessory manual	See accessory manual
2	3	Heated Hose	100	G, K	See hose manual	See hose manual
	4	Heated Accessory 2	100	M, K	See accessory manual	See accessory manual
3	5	Heated Hose	100	G, K	See hose manual	See hose manual
	6	Heated Accessory 3	100	M, K	See accessory manual	See accessory manual
4*	7	Not Used	NA	NA	NA	NA
		Heated Hose	100	G, K	See hose manual	See hose manual
	8	Pump	1000	M, K	37	C, D
		Heated Accessory 4	100	M, K	See accessory manual	See accessory manual
5	9	5 gallon platen	100	M, K	80	C, D
		55 gallon platen	1000	M, K	15	C, D (#1) A, J (#2)

* For Ambient Pumps and Platens, Port 4 can be used for a hose or accessory.

Table 3: Expansion Enclosure Sensors

Port	Zone	Component	RTD Range (Ohms)	RTD Pin Numbers	Heater Element Resistance (Ohms)	Heater Pin Numbers
6	10	Heated Hose	100	G, K	See hose manual	See hose manual
	11	Heated Accessory 4	100	M, K	See accessory manual	See accessory manual
7	12	Heated Hose	100	G, K	See hose manual	See hose manual
	13	Heated Accessory 5	100	M, K	See accessory manual	See accessory manual
8	14	Heated Hose	100	G, K	See hose manual	See hose manual
	15	Heated Accessory 6	100	M, K	See accessory manual	See accessory manual
9	16	Heated Hose	100	G, K	See hose manual	See hose manual
	17	Heated Accessory 7	100	M, K	See accessory manual	See accessory manual

USB Data

Download Procedure

NOTE: If log files are not correctly saving to the USB flash drive (for example, missing or empty log files), save the desired data off of the USB flash drive and reformat it before repeating the download procedure.

NOTE: System configuration setting files and custom language files can be modified if the files are in the UPLOAD folder of the USB flash drive. See **System Configuration Settings**, page 72, **Custom Language File**, page 72, and **Upload Procedure** on page 73.

1. Insert the USB flash drive into the USB port located on the bottom of the ADM (E).

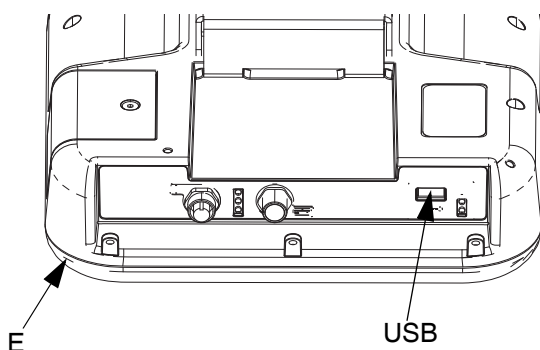


FIG. 31

2. The Menu Bar and USB indicator lights indicate that the USB is downloading files. Wait for USB activity to complete.
3. Remove the USB flash drive from the USB port.
4. Re-insert the USB flash drive into the USB port of computer.
5. The USB flash drive window automatically opens. If it does not, open the USB flash drive from within Windows® Explorer.
6. Open the GRACO folder.
7. Open the system folder. If downloading data from more than one system, there will be more than one folder. Each folder is labeled with the corresponding serial number of the ADM

NOTE: The serial number is on back of the ADM.

8. Open the DOWNLOAD folder.

9. Open the DATAxxxx folder.
10. Open the DATAxxxx folder labeled with the highest number. The highest number indicates the most recent data download.
11. Open the log file. Log files open in Microsoft® Excel by default as long as the program is installed. However, they can also be opened in any text editor or Microsoft® Word.

NOTE: All USB logs are saved in Unicode (UFT-16) format. If opening the log file in Microsoft Word, select Unicode encoding.

USB Logs

NOTE: The ADM can read/write to FAT (File Allocation Table) storage devices. NTFS, used by 32 GB or greater storage devices, is not supported.

During operation, the ADM stores system and performance related information to memory in the form of log files. The ADM maintains six log files:

- Event Log
- Data Log

Follow the **Download Procedure**, page 71, to retrieve log files.

Each time a USB flash drive is inserted into the ADM USB port, a new folder named DATAxxxx is created. The number at the end of the folder name increases each time a USB flash drive is inserted and data is downloaded or uploaded.

Event Log

The event log file name is 1-EVENT.CSV and is stored in the DATAxxxx folder.

The event log maintains a record of the last 1,000 events and errors. Each event record contains:

- Date of event code
- Time of event code
- Event code
- Event Type
- Event Description

Event codes include both error codes (alarms, deviations, and advisories) and record only events.

Data Log

The Data log file name is 2-DATA.csv and is stored in the DATAxxxx folder.

The Data log records system information every 15 seconds when the system is active. The following information is included for Units A and B:

- Weight (g)
- Pump cycles
- Platen cycles
- Zone temperatures for zones 1-17 (°C)

NOTE: “_ _” will be displayed if the unit is not installed, if the unit is offline, if the temperature zone is uninstalled, or if the sensor is not plugged in.

System Configuration Settings

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 into the ADM. Use this file to back up system settings for future recovery or to easily replicate settings across multiple systems. Refer to the **Upload Procedure** on page 73 for instructions on how to use this file.

Custom Language File

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

A custom language file automatically downloads each time a USB flash drive is inserted into the ADM. 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)

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** on page 73 to install the file.

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

- Define a custom string for each row in the second column.

NOTE: If the custom language file is used, you must define a custom string for each entry in the DISPTXT.TXT file. Blank second-column fields will be displayed blank on the ADM.

- 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.

Upload Procedure

Use this procedure to install a system configuration file and/or a custom language file.

1. If necessary, follow the **Download Procedure** on page 71 to automatically generate the proper folder structure on the USB flash drive.
2. Insert a USB flash drive into the USB port of computer.
3. The USB flash drive window automatically opens. If it does not, open the USB flash drive from within Windows Explorer.
4. Open the GRACO folder.
5. Open the 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 configuration settings file, place the SETTINGS.TXT file into the UPLOAD folder.
7. If installing the custom language file, place the DISPTXT.TXT file into the UPLOAD folder.
8. Remove the USB flash drive from the computer.
9. Install the USB flash drive into the ADM USB port.
10. The Menu Bar and USB indicator lights indicate that the USB is downloading files. Wait for USB activity to complete.
11. Remove the USB flash drive from the USB port.

NOTE: If the custom language file was installed, you can select the new language from the Language drop-down menu in **Advanced Setup Screen 1** on page 34.

Integration

Connect PLC Inputs

DANGER
SEVERE ELECTRIC SHOCK HAZARD

This equipment can be powered by more than 240V. Contact with this voltage will cause death or serious injury.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing equipment.

The Therm-O-Flow Warm Melt can integrate with core functionality to a PLC. By supplying a 10-30VDC signal to the inputs, key features such as Heat On, Setback, and Pump On can be controlled.

A PLC can control and monitor all items shown in the customer Digital Inputs and Outputs shown on the integration screen when the integration control is set to discrete.

Each Therm-O-Flow Warm Melt is equipped with six PLC inputs. The following table shows all PLC inputs:

Machine Control	
PLC Input (J9)	Description
1	PLC Lockout Enable
2	Heat On Request
3	Pump On Request
4	Map Selection (0 = Machine States, 1 = Error States)
5	Not Used
6	Not Used

If using a Tandem Ram Therm-O-Flow Warm Melt, both Unit A and Unit B are controlled by the PLC inputs through Unit A.

When Discrete Integration is selected on System Setup, functionality is restricted from the ADM.

NOTE: PLC inputs are only fed on Unit A.

NOTE: Holding the inputs shown above at a logic high (10-30VDC) will keep the requests to the machine active.

NOTE: In order to use the controls above, the machine global power must be on (green light on the ADM), Discrete must be selected on the setup screen, and Input 5 (PLC Lockout Enabled) must have voltage applied to it.

NOTE: If using a Single Ram Therm-O-Flow Warm Melt, after a drum change (Drum Empty error occurred), the Pump On Request but must be pulled low and reset high in order to re-enable the pump.

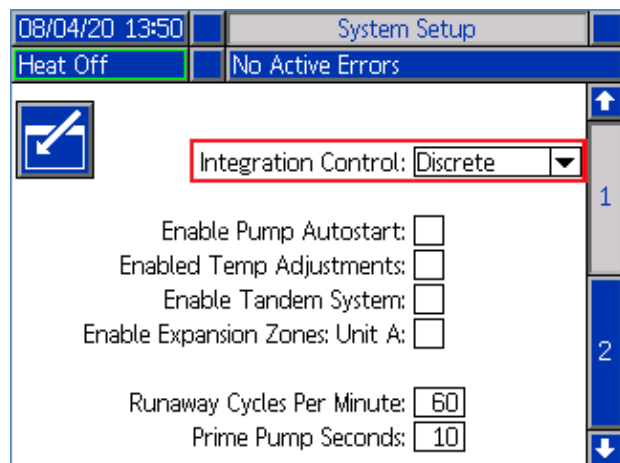


FIG. 32

J9, Pin4 - Because Discrete Outputs are always provided, this input will always function regardless of the conditions listed above.

NOTE: When “Discrete” is selected on the setup screen, the ADM will no longer turn heat on with the global power button. The “Enable Pump Autostart” and “Scheduler” features will also be ignored. As long as the PLC Lockout input is “low” the buttons on the ADM can be used to control the machine.

NOTE: The Therm-O-Flow Warm Melt is provided with two screw terminal connectors that plug into the AMZ System I/O Board (J9 and J11) located inside of the Heat Control Box (S).

Wire the PLC Inputs

1. Turn off and disconnect power to the system.
2. Route a multi-conductor cable through one of the cable grommets (CG) on the back of the Heat Control Box (S).

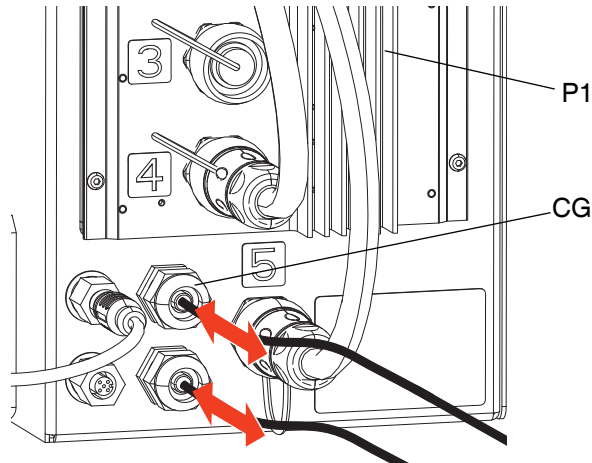


FIG. 33

3. Refer to the following sections (**Digital Inputs (0 - 30 VDC)** and **Dry Contact Inputs (Open/Closed Circuit)**), depending on the input type needed) to wire the PLC inputs to the System I/O Board on AMZ #1 (P1).

NOTE: On Therm-O-Flow Warm Melt systems with expansion modules, an additional System I/O board is included on AMZ #2 (Unit A-E). Do not wire PLC inputs to the System I/O Board on AMZ #2 (Unit A-E), or AMZ #4 (Unit B-E) if using the expansion module.

NOTE: PLC I/O should only wire to AMZ #1 for single systems, or AMZ #1 and AMZ #3 on tandem systems. See **AMZ Dial Position** on page 31.

Discrete Input Signal Specifications

The Therm-O-Flow Warm Melt will accept the following input types:

Input Type	Specifications
Digital Input	0-30 VDC Signal Low: 0-2.5 V Signal High: 10-30 V
Dry Contact	Open/Closed Circuit Signal Low: Open Circuit Signal High: Closed Circuit

Digital Inputs (0 - 30 VDC)

1. Connect the PLC GND wire (16-28 AWG) to the "ISO GND" terminal on J9.
2. Connect the input signal wire to the desired input terminal on J9 (labeled by input number).
3. Repeat step 2 for remaining inputs.

NOTICE

The system I/O board and/or the PLC could become damaged if connections are made to J8. Do not connect any wires to J8 while using Digital Input type PLC inputs. Signals on J8 are provided for Dry Contact type inputs only.

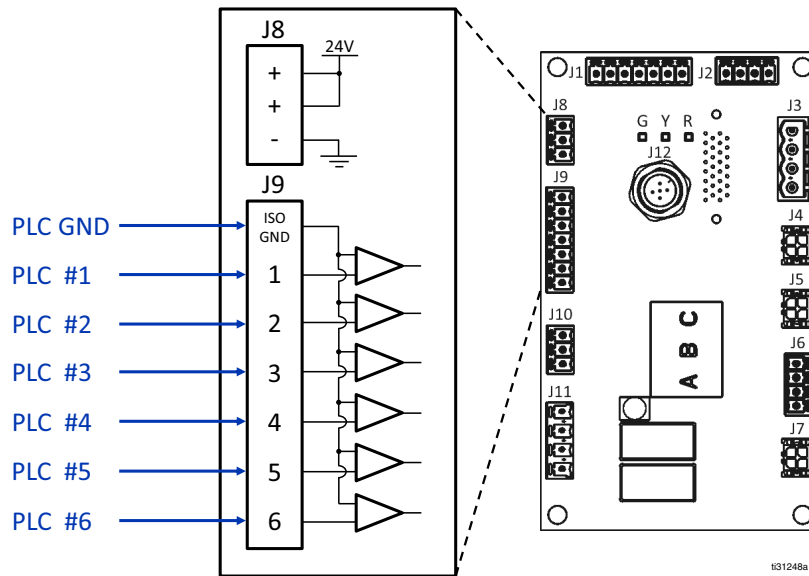


FIG. 34

Dry Contact Inputs (Open/Closed Circuit)

1. Connect a jumper wire (16-28 AWG) between "-" terminal on J8 and "ISO GND" terminal on J9.
2. Connect one side of the input to one of the "+" terminals on J8.
3. Connect the other side of the input to the desired input terminal on J9 (labeled by input number).
4. Repeat steps 2 and 3 for remaining inputs.

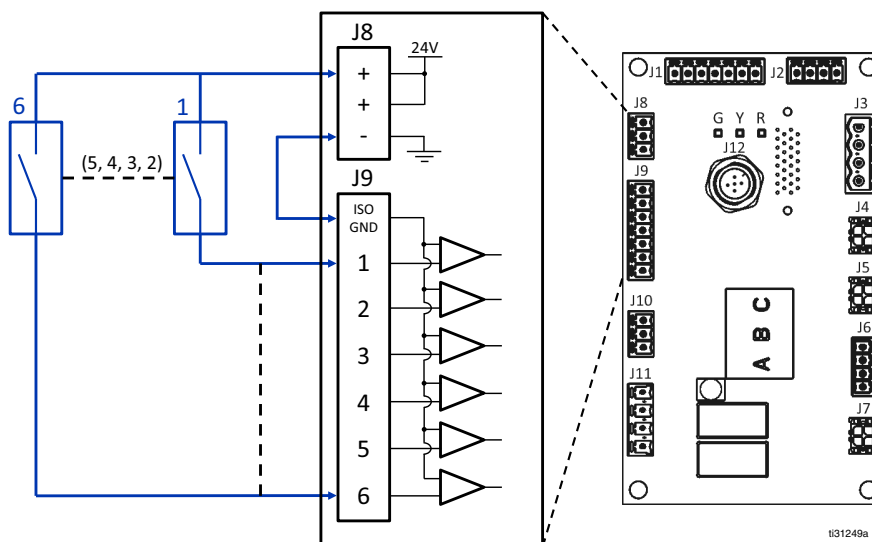




FIG. 35

Connect PLC Outputs

				
<p>DANGER SEVERE ELECTRIC SHOCK HAZARD</p> <p>This equipment is powered by more than 240V. Contact with this voltage will cause death or serious injury.</p> <ul style="list-style-type: none"> Turn off and disconnect power at main switch before disconnecting any cables and before servicing equipment. 				

Each Therm-O-Flow Warm Melt is equipped with two PLC outputs.

Discrete Output data will always be provided regardless of the system's setup. Output data is structured in a state format as shown in the table below.

By setting "Map Selection" (J9, Pin 4 of the discrete inputs) to either high or low logic levels, the machine will either provide the overall machine state or error states.

If the map selection signal is low, the PLC outputs will return machine states. See table below.

Map Selection - Machine States (J9, Pin 4 = Low)		
PLC Output 2 (J11)	PLC Output 1 (J11)	Description
0	0	Heat OFF, Pump OFF
0	1	Heat ON, Not Ready
1	0	Heat ON, Heat Ready
1	1	Heat ON, Pump ON

If the map selection signal is high, the PLC outputs will return error states. See table below.

Map Selection - Error States (J9, Pin 4 = High)		
PLC Dry Contact 2 (J11)	PLC Dry Contact 1 (J11)	Description
0	0	No Errors
0	1	Drum Low
1	0	Drum Empty
1	1	Alarm Present

When Discrete Integration is selected on System Setup:

- Functionality is restricted from the ADM.
- Automatic crossover is disabled. Rely on the PLC and Machine State indicators to know when to cross over using the I/O.

Discrete Output Signal Specifications

The Therm-O-Flow Warm Melt will accept the following output specifications:

Item	Specifications
Output Type	Dry Contact (Open/Closed Circuit) Signal Low (Open Circuit) Signal High (Closed Circuit)
Max Voltage	24 VDC / 240 VAC
Max Current	2A

Wire the PLC Outputs

1. Turn off and disconnect power to the system.
2. Route a multi-conductor cable through one of the cable grommets (CG) on the back of the Therm-O-Flow Warm Melt enclosure.

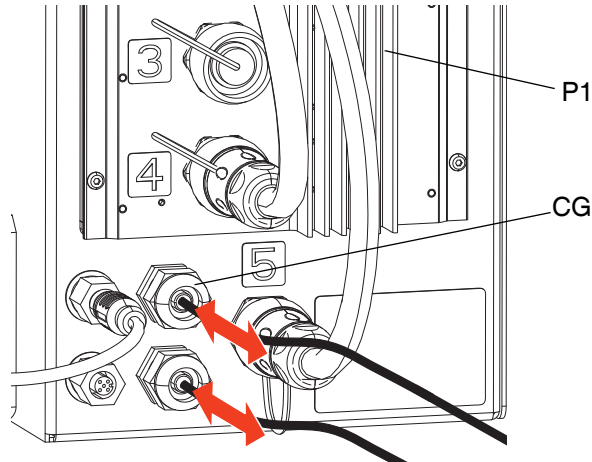


FIG. 36

3. Refer to the image below to wire PLC outputs to the system I/O Board on AMZ #1 (P1).

NOTE: On Therm-O-Flow Warm Melt systems with an Expansion Module, an additional System I/O board is included on AMZ #2 (P2). Do not wire PLC outputs to the System I/O Board on AMZ #2, or AMZ #4 if using the expansion module.

NOTE: PLC I/O should only wire to AMZ #1 for single systems, or AMZ #1 and AMZ #3 on tandem systems.

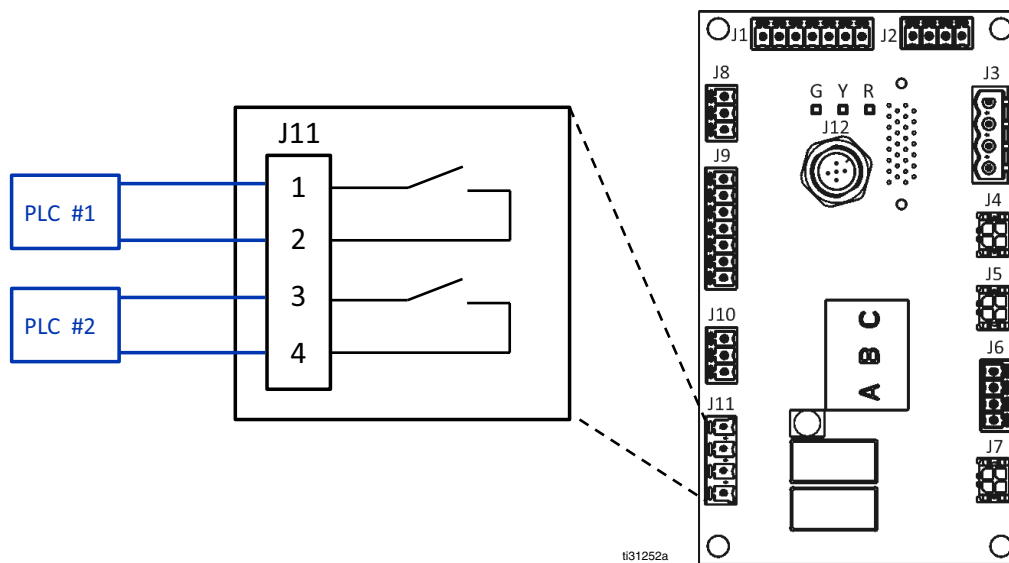


FIG. 37

Communications Gateway Module (CGM)

Overview

The Communications Gateway Module (CGM) provides a control link between the Therm-O-Flow Warm Melt system and a selected fieldbus. This provides the means for report monitoring and control by external automation systems.

NOTE: The following system network configuration files are available at help.graco.com.

- EDS file: DeviceNet or EtherNet/IP fieldbus networks
- GSD file: PROFIBUS fieldbus networks
- GSDML: PROFINET fieldbus networks

NOTE: See **Installation** on page 22. See **Related Manuals** on page 3.

Therm-O-Flow Warm Melt and PLC Connection Setup

Verify that the PLC parameters are set up correctly, see the Gateway Map table.

NOTE: If the PLC connection parameters are not setup correctly, the connection between the Therm-O-Flow Warm Melt and PLC will not be made.

Gateway Map: Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map	
Comm. Format	Data-SINT
Input Assembly Instance:	100
Input Instance Size:	32
Output Assembly Instance:	150
Output Instance Size:	18

Available Internal Data

Unless stated otherwise, bytes are stored in each instance in little endian order (byte order within instance: most significant to least significant).

NOTE: Automation Outputs can be monitored by the corresponding Automation Inputs to verify that the Therm-O-Flow Warm Melt received the data.

See the **PLC Inputs** on page 80 and the **PLC Outputs** on page 83.

PLC Inputs

Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map				
Automation Inputs (signal from Therm-O-Flow Warm Melt to PLC)				
Instance ID	Description	Data Type	Bit	Byte
1	Heartbeat To PLC	Boolean	0	0
2	Fieldbus Integration Control Selected	Boolean	1	
3	System Active	Boolean	2	
4	PLC Lockout/Control Active	Boolean	3	
5	Pump On	Boolean	4	
6	Pump Off	Boolean	5	
7	Pump Priming	Boolean	6	
8	Drum is Low	Boolean	7	
9	Drum is Empty	Boolean	0	
10	Active Tandem Unloader (0 = Pump A, 1 = Pump B)	Boolean	1	1
11	Heat is On	Boolean	2	
12	Heat is Warming Up	Boolean	3	
13	Heat is At Temperature	Boolean	4	
14	Heat is in Temperature Soak Mode	Boolean	5	
15	Heat is in Setback Mode	Boolean	6	
16	Heat is Off	Boolean	7	
17	Pump Okay to Prime	Boolean	0	2
18	Pump Inactive Timeout Happened	Boolean	1	
19	No Module Alarms Active	Boolean	2	
20	No Module Deviations Active	Boolean	3	
21	No Module Advisories Active	Boolean	4	
22	No Heat Zone(s) Alarms Active	Boolean	5	
23	No Heat Zone(s) Deviations Active	Boolean	6	
24	No Heat Zone(s) Advisories Active	Boolean	7	
25	Reserved Bit 1	Boolean	0	3
26	Reserved Bit 2	Boolean	1	
27	Reserved Bit 3	Boolean	2	
28	Reserved Bit 4	Boolean	3	
29	Reserved Bit 5	Boolean	4	
30	Reserved Bit 6	Boolean	5	
31	Reserved Bit 7	Boolean	6	
32	Reserved Bit 8	Boolean	7	
33	Unit Heat Soak Time Remaining (xx seconds)	uint16	0-15	4-5
34	Weight Dispensed (xxx grams)	uint32	0-31	6-9

Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map				
Automation Inputs (signal from Therm-O-Flow Warm Melt to PLC)				
Instance ID	Description	Data Type	Bit	Byte
35	*Module Data Exchange Active Command	uint16	0-15	10-11
36	+Module Data Exchanged Active Command Value	uint32	0-31	12-15
37	Heartbeat to PLC	Boolean	0	16
38	Fieldbus Integration Control Selected	Boolean	1	
39	System Active	Boolean	2	
40	PLC Lockout/Control Active	Boolean	3	
41	Pump On	Boolean	4	
42	Pump Off	Boolean	5	
43	Pump Priming	Boolean	6	
44	Drum is Low	Boolean	7	
45	Drum is Empty	Boolean	0	17
46	Active Tandem Unloader (0 = Pump A, 1 = Pump B)	Boolean	1	
47	Heat is On	Boolean	2	
48	Heat is Warming Up	Boolean	3	
49	Heat is At Temperature	Boolean	4	
50	Heat is in Temperature Soak Mode	Boolean	5	
51	Heat is in Setback Mode	Boolean	6	
52	Heat is Off	Boolean	7	
53	Pump Okay to Prime	Boolean	0	18
54	Pump Inactive Timeout Happened	Boolean	1	
55	No Module Alarms Active	Boolean	2	
56	No Module Deviations Active	Boolean	3	
57	No Module Advisories Active	Boolean	4	
58	No Heat Zone(s) Alarms Active	Boolean	5	
59	No Heat Zone(s) Deviations Active	Boolean	6	
60	No Heat Zone(s) Advisories Active	Boolean	7	
61	Reserved Bit 1	Boolean	0	19
62	Reserved Bit 2	Boolean	1	
63	Reserved Bit 3	Boolean	2	
64	Reserved Bit 4	Boolean	3	
65	Reserved Bit 5	Boolean	4	
66	Reserved Bit 6	Boolean	5	
67	Reserved Bit 7	Boolean	6	
68	Reserved Bit 8	Boolean	7	
69	Unit Heat Soak Time Remaining (xx seconds)	uint16	0-15	20-21

Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map				
Automation Inputs (signal from Therm-O-Flow Warm Melt to PLC)				
Instance ID	Description	Data Type	Bit	Byte
70	Weight Dispensed (xxx grams)	uint32	0-31	22-25
71	*Module Data Exchange Active Command	uint16	0-15	26-27
72	+Module Data Exchanged Active Command Value	uint32	0-31	28-31

Key
Active Unit
Inactive Unit

- + Whenever a crossover happens in tandem or at system start up an invalid command value (0xFFFFFFFF) will be returned.
- * Whenever a crossover happens in tandem or at system start up an invalid command value (0xFFFF) will be returned.

PLC Outputs

Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map				
Automation Outputs (signal from PLC to Therm-O-Flow Warm Melt)				
Instance ID	Description	Data Type	Bit	Byte
1	System Enabled Request	Boolean	0	0
2	System Disabled Request	Boolean	1	
3	System PCL Lockout/Control	Boolean	2	
4	System Tandem Crossover Request	Boolean	3	
5	Reserved Bit 1	Boolean	4	
6	Reserved Bit 2	Boolean	5	
7	Reserved Bit 3	Boolean	6	
8	Reserved Bit 4	Boolean	7	
9	Reserved Bit 5	Boolean	0	1
10	Reserved Bit 6	Boolean	1	
11	Reserved Bit 7	Boolean	2	
12	Reserved Bit 8	Boolean	3	
13	Reserved Bit 9	Boolean	4	
14	Reserved Bit 10	Boolean	5	
15	Reserved Bit 11	Boolean	6	
16	Reserved Bit 12	Boolean	7	
17	Heat On Request	Boolean	0	2
18	Heat Off Request	Boolean	1	
19	Heat Setback Request	Boolean	2	
20	Pump On Request	Boolean	3	
21	Pump Off Request	Boolean	4	
22	Pump Prime Request	Boolean	5	
23	Acknowledge/Clear Heat Errors	Boolean	6	
24	Reserved Bit 1	Boolean	7	
25	Reserved Bit 2	Boolean	0	3
26	Reserved Bit 3	Boolean	1	
27	Reserved Bit 4	Boolean	2	
28	Reserved Bit 5	Boolean	3	
29	Reserved Bit 6	Boolean	4	
30	Reserved Bit 7	Boolean	5	
31	Reserved Bit 8	Boolean	6	
32	Reserved Bit 9	Boolean	7	

Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map				
Automation Outputs (signal from PLC to Therm-O-Flow Warm Melt)				
Instance ID	Description	Data Type	Bit	Byte
33	Data Exchange Command	uint16	0-15	4-5
34	Data Exchanged Command Desired Value	uint32	0-31	6-9
35	Heat On Request	Boolean	0	10
36	Heat Off Request	Boolean	1	
37	Heat Setback Request	Boolean	2	
38	Pump Off Request	Boolean	3	
39	Pump Prime Request	Boolean	4	
40	Acknowledge/Clear Heat Errors	Boolean	5	
41	Reserved Bit 1	Boolean	6	
42	Reserved Bit 2	Boolean	7	
43	Reserved Bit 3	Boolean	0	11
44	Reserved Bit 4	Boolean	1	
45	Reserved Bit 5	Boolean	2	
46	Reserved Bit 6	Boolean	3	
47	Reserved Bit 7	Boolean	4	
48	Reserved Bit 8	Boolean	5	
49	Reserved Bit 9	Boolean	6	
50	Reserved Bit 10	Boolean	7	
51	Data Exchange Command	uint16	0-15	12-13
52	Data Exchanged Command Desired Value	uint32	0-31	14-17

Key
System
Active Unit
Inactive Unit

Data Exchange

Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map		
Data Exchange		
Command Value (hexadecimal)	Name	Units/Format
0x0000	AMZ Active Module Alarms	Bitfield
0x0001	AMZ Active Module Deviations	Bitfield
0x0002	AMZ Active Module Advisories	Bitfield
0x0003	AMZ Expansion Active Module Alarms	Bitfield
0x0004	AMZ Expansion Active Module Deviations	Bitfield
0x0005	AMZ Expansion Active Module Advisories	Bitfield
0x0006	I/O Daughter Board Active Module Alarms	Bitfield
0x0007	I/O Daughter Board Active Module Deviations	Bitfield
0x0008	I/O Daughter Board Active Module Advisories	Bitfield
0x0009	System High Temperature Alarm Offset	xx deg C
0x000A	System High Temperature Deviation Offset	xx deg C
0x000B	System Low Temperature Alarm Offset	xx deg C
0x000C	System Low Temperature Deviation Offset	xx deg C
0x000D	Drum/Platen Size	Enum Number: 0: 20 Liters 1: 60 Liters 2: 200 Liters
0x000E	Pump Inactive Timeout	xx minutes
0x000F	AMZ Line Voltage, Leg #1	xxx.x Volts
0x0010	AMZ Line Voltage, Leg #2	xxx.x Volts
0x0011	AMZ Line Voltage, Leg #3	xxx.x Volts
0x0012	AMZ Expansion Line Voltage, Leg #1	xxx.x Volts
0x0013	AMZ Expansion Line Voltage, Leg #2	xxx.x Volts
0x0014	AMZ Expansion Line Voltage, Leg #3	xxx.x Volts
0x0015	System Specific Gravity	x.xxx
0x0016	Pump Cycles Limit	xx Cycles
0x0017	Drum/ Platen Limit	xx Cycles
0x0018	+ Pump Current Pump Cycles	xx Cycles
0x0019	+ Pump Current Platen Cycles	xx Cycles
0x001A	+Pump Current Weight Dispensed	xx grams
0x001B	Pump Lifetime Pump Cycles	xx Cycles
0x001C	Pump Lifetime Platen Cycles	xx Cycles

Therm-O-Flow Warm Melt Heated Advanced Fieldbus Map		
Data Exchange		
Command Value (hexadecimal)	Name	Units/Format
0x001D	Pump Lifetime Weight Dispensed	xx grams
0x001E	System Runway Cycles Per Minute	xxx cpm
0x001F	System Prime Pump Timeout	xx seconds
0x0020	System External Pump Control	Boolean: TRUE = Enabled FALSE = Disabled
0x0021	Pump Prime Timeout Remaining	xx seconds
0x0022	System Heat Rate	Boolean: TRUE = Enabled FALSE = Disabled
0xZ00	AMZ Active Zone #Z Alarms	Bitfield
0xZ01	AMZ Active Zone #Z Deviations	Bitfield
0xZ02	AMZ Active Zone #Z Advisories	Bitfield
0xZ03	Zone #Z Heat State	Bit Number: 0: Heat Zone Off 1: Heat Zone On 2: Heat Zone Warming Up 3: Heat Zone At Temperature 4: Heat Zone is Heat Soaking 5: Heat Zone is in Setback 6: Heat Zone has an Error
0xZ04	Zone #Z Actual Temperature	xx.x deg C
0xZ05	Zone #Z Actual Current Usage	xx.xxx A
0xZ06	Zone #Z Actual Duty Cycle	xxx%
0xZ07	Zone #Z Soak Time Remaining	xx seconds
0xZ08	Zone #Z Setpoint Temperature	xx deg C
0xZ09	Zone #Z Setback Temperature	xx deg C
0xZ0A	Zone #Z Heat Soak Time	xx minutes
0xZ0B	Zone #Z Heat Enabled/ Installed State	boolean
0xZ0C	Zone #Z Other Tandem Heat Enabled/Installed State	boolean
0xZ0D	Zone #Z Type State	Enum Number: 0: Hose 1: Valve 2: Manifold 3: PGM 4: Flowmeter 5: Press Regulator 6: Other 7: Pump 8: Platen

- + Sending a 1 back across the value will request that the counter be reset to zero.
- * Z corresponds to zone number, starting with zone one at 0x100. Each zone has an offset of 0x100. See table below.

NOTE: If an invalid command is requested, a invalid value will be returned to the Automation Outputs Data Exchange Elements.

Zone Z's hex Number (corresponds to the Z location)	Actual Zone Number
0x01	Zone 1
0x02	Zone 2
0x03	Zone 3
0x04	Zone 4
0x05	Zone 5
0x06	Zone 6
0x07	Zone 7
0x08	Zone 8
0x09	Zone 9
0x0A	Zone 10
0x0B	Zone 11
0x0C	Zone 12
0x0D	Zone 13
0x0E	Zone 14
0x0F	Zone 15
0x10	Zone 16
0x11	Zone 17

System Error Codes

AMZ Active Module Alarms		
Bit Number	Alarm Code	Alarm Name
0	V6H _	Wiring Error U_D_
1	V4H _	High Voltage U_D_
2	-	reserved
3	-	reserved
4	-	reserved
5	-	reserved
6	-	reserved
7	-	reserved
8	-	reserved
9	-	reserved
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved

AMZ Active Module Deviation		
Bit Number	Deviation Code	Deviation Name
0	V2H_	Low Voltage U_D_
1	-	reserved
2	-	reserved
3	-	reserved
4	-	reserved
5	-	reserved
6	-	reserved
7	-	reserved
8	-	reserved
9	-	reserved
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved

AMZ Active Module Advisories		
Bit Number	Advisory Code	Advisory Name
0	-	reserved
1	-	reserved
2	-	reserved
3	-	reserved
4	-	reserved
5	-	reserved
6	-	reserved
7	-	reserved
8	-	reserved
9	-	reserved
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved

I/O Daughter Board Active Module Alarms		
Bit Number	Alarm Code	Alarm Name
0	TA1_	Heat Zone Offline Z1 U_
1	TA2_	Heat Zone Offline Z2 U_
2	TA3_	Heat Zone Offline Z3 U_
3	TA4_	Heat Zone Offline Z4 U_
4	TA5_	Heat Zone Offline Z5 U_
5	TA6_	Heat Zone Offline Z6 U_
6	TA7_	Heat Zone Offline Z7 U_
7	TA8_	Heat Zone Offline Z8 U_
8	TA9_	Heat Zone Offline Z9 U_
9	TAA_	Heat Zone Offline Z10 U_
10	TAB_	Heat Zone Offline Z11 U_
11	TAC_	Heat Zone Offline Z12 U_
12	TAD_	Heat Zone Offline Z13 U_
13	TAE_	Heat Zone Offline Z14 U_
14	TAF_	Heat Zone Offline Z15 U_
15	TAG_	Heat Zone Offline Z16 U_
16	TAH_	Heat Zone Offline Z17 U_
17	-	reserved
18	-	reserved
19	CCG_	Fieldbus Comm. Error U_
20	CAC_	Display Comm. Error U_
21	DAP_	Pump Runaway U_
22	DHP_	Pump Unexpected Movement U_
23	WJP_	Pump Solenoid Error No Current U_
24	WJD_	Pump Solenoid Error High Current U_
25	WKP_	Fill Solenoid Error No Current U_
26	WKD_	Fill Solenoid Error High Current U_
27	T6T_	Sensor Error Transformer U_
28	T4T_	High Temp Transformer U_
29	L4P_	Drum Empty U_
30	-	reserved
31	-	reserved

I/O Daughter Board Active Module Deviation		
Bit Number	Deviation Code	Deviation Name
0	L2P_	Drum Low U_
1	L1P_	Level Sensor Error U_
2	A2V_	Low Current Fan U_
3	A3V_	High Current Fan U_
4	DDP_	Pump Diving U_
5	-	reserved
6	-	reserved
7	-	reserved
8	-	reserved
9	-	reserved
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved

I/O Daughter Board Active Module Advisories		
Bit Number	Advisory Code	Advisory Name
0	MAD_	Maint. Due Pump U_
1	MLC_	Rebuild Platen Seals U_
2	DEP_	Cycle Switch Error U_
3	MGF_	Clean Fan Filter U_
4	-	reserved
5	-	reserved
6	-	reserved
7	-	reserved
8	-	reserved
9	-	reserved
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved

AMZ Active Zone #x Alarms		
Bit Number	Alarm Code	Alarm Name
0	T4__	High Temperature U_Z_
1	T4__	High Temperature U_Z_
2	T1__	Low Temperature U_Z_
3	T8__	No Temperature Rise U_Z_
4	T9__	Over Temperature Switch U_Z_
5	A4__	High Current U_Z_
6	A1__	Low Current U_Z_
7	A8__	No Current U_Z_
8	A7__	Unexpected Current U_Z_
9	T6__	Sensor Error U_Z_
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved


AMZ Active Zone #x Deviation		
Bit Number	Deviation Code	Deviation Name
0	-	reserved
1	-	reserved
2	-	reserved
3	-	reserved
4	-	reserved
5	-	reserved
6	-	reserved
7	-	reserved
8	-	reserved
9	-	reserved
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved

AMZ Active Zone #x Advisories		
Bit Number	Advisory Code	Advisory Name
0	T3__	High Temperature U_Z_
1	T3__	High Temperature U_Z_
2	T2__	Low Temperature U_Z_
3	-	reserved
4	A3__	High Current U_Z_
5	A2__	Low Current U_Z_
6	-	reserved
7	-	reserved
8	-	reserved
9	-	reserved
10	-	reserved
11	-	reserved
12	-	reserved
13	-	reserved
14	-	reserved
15	-	reserved
16	-	reserved
17	-	reserved
18	-	reserved
19	-	reserved
20	-	reserved
21	-	reserved
22	-	reserved
23	-	reserved
24	-	reserved
25	-	reserved
26	-	reserved
27	-	reserved
28	-	reserved
29	-	reserved
30	-	reserved
31	-	reserved

Timing Diagrams

NOTE: It is recommended to use a 50 ms delay between bits.

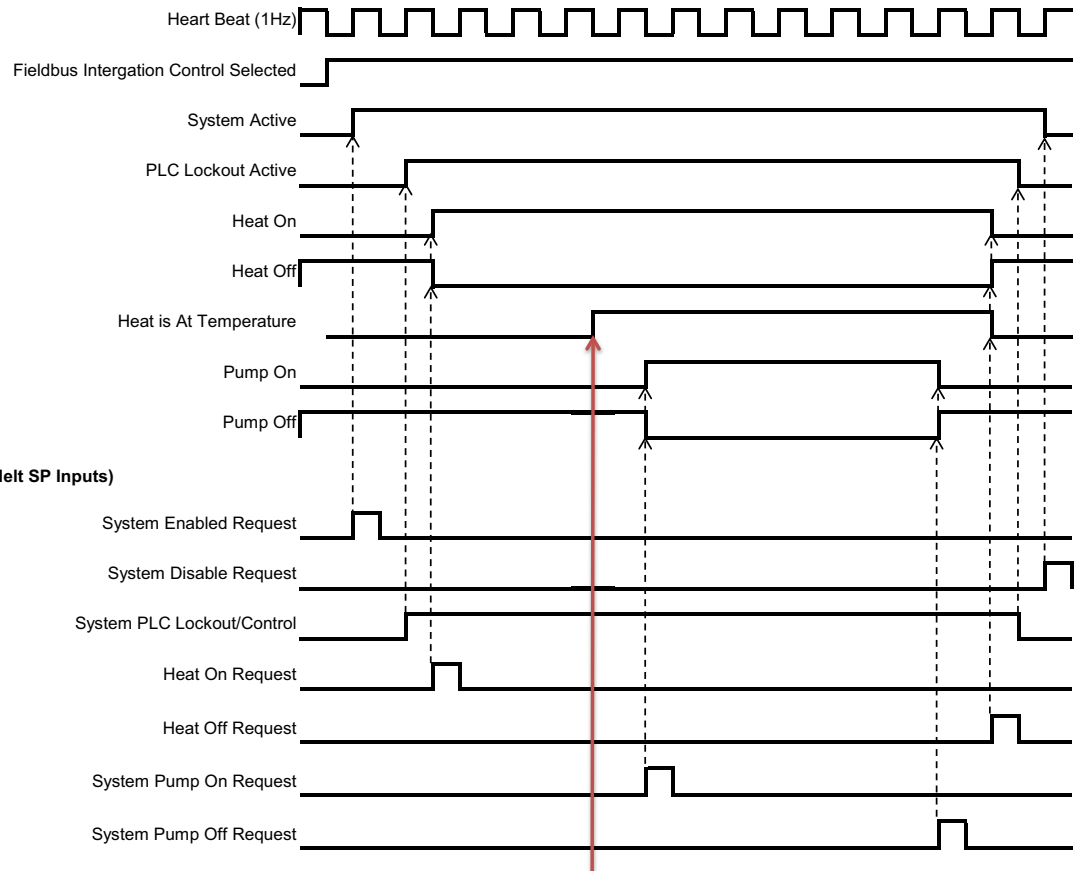
NOTE: Fieldbus Integration Control Selected means that the fieldbus option is selected for integration on the setup screen. In order for any Automation Outputs to be accepted by the Therm-O-Flow Warm Melt, the fieldbus Integration must be High.

NOTE: When in Fieldbus Integration Control, pressing the  button on the ADM will not turn the heat on. The “Enable Pump Autostart,” “External Pump Control,” and the Scheduler function will be ignored. When the PLC lock out input is low, the ADM controls the system. When the PLC lockout input is high, the PLC controls the system.

Turn Pump On and Off Diagram

Turn Pump On and Off

Automation Inputs (Warm Melt SP Outputs)

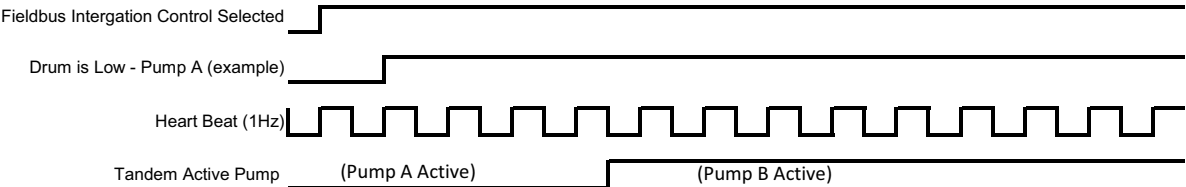


All zones enabled are at the setpoint temperature.

Manual Crossover Diagram

Manual Crossover

Automation Inputs (Warm Melt SP Outputs)



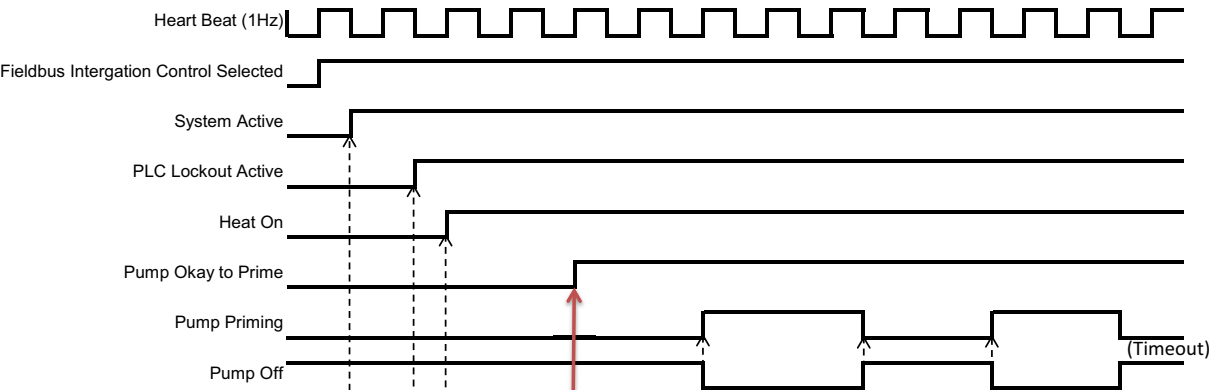
Automation Outputs (Warm Melt SP Inputs)



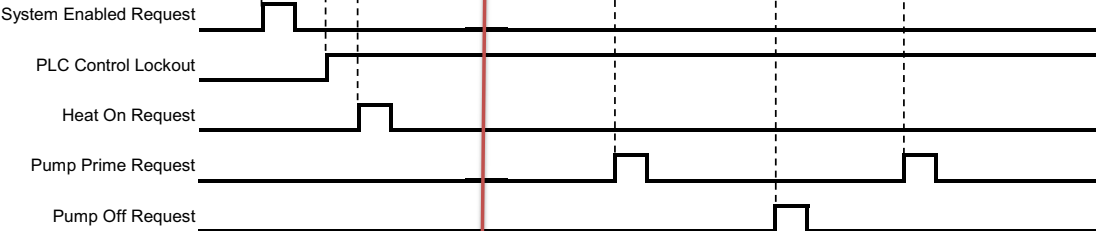
Priming Diagram

Priming

Automation Inputs (Warm Melt SP Outputs)



Automation Outputs (Warm Melt SP Inputs)

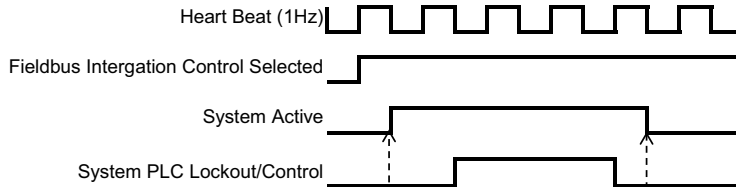


Pump and Platen are up to desired temperature, ready to be primed.

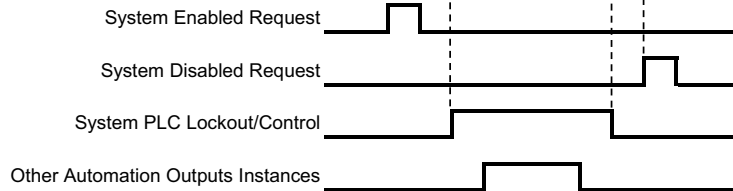
Overall CGM Timing Diagram

Overall CGM Timing

Automation Inputs (Warm Melt SP Outputs)



Automation Outputs (Warm Melt SP Inputs)



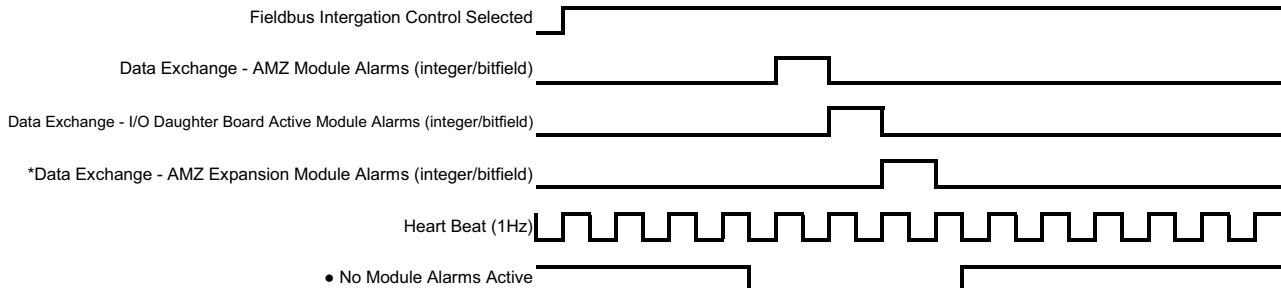
Notes:

- "System Enabled Request", "System Disable Request" and "Module Data Exchange Command" will be accepted with out the "PLC Lockout/Control" set high, any other Automation Outputs Instance needs to have the " PLC Lockout/Control" set high for the Automation Output Instance to be accepted by the Warm Melt SP Controller

Module Acknowledge/Clear Error Diagram

Module Ack-Clear Error

Automation Inputs (Warm Melt SP Outputs)



Automation Outputs (Warm Melt SP Inputs)



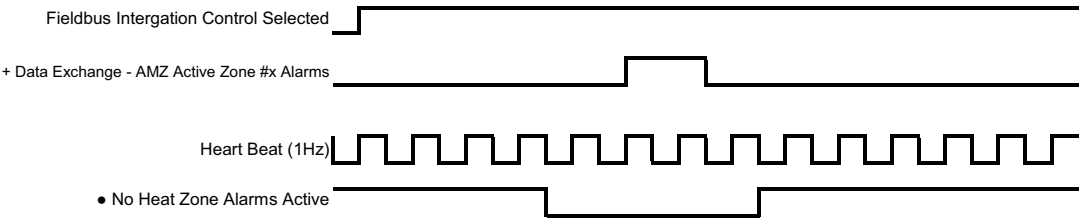
Notes:

- If errors are not successfully resolved/fixed the bit will reminder high, once the system has successfully seen that the error has been resolved, the bit will go low
- * Only Need to check if the expansion module is installed
- Process can be repeated for deviations and advisories

Zone Acknowledge/Clear Error Diagram

Zone Ack-Clear Error

Automation Inputs (Warm Melt SP Outputs)



Automation Outputs (Warm Melt SP Inputs)

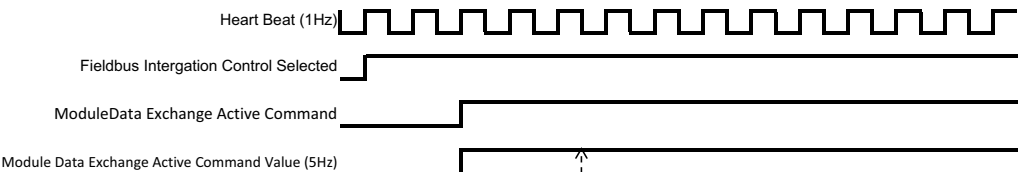


- Notes:**
- + Each zone has to be scanned for errors before send the Acknowledge/clear errors bit
 - If errors are not successfully resolved/fixed the bit will reminder high, once the system has successfully seen that the error has been resolved, the bit will go low
 - Process can be repeated for deviations and advisories

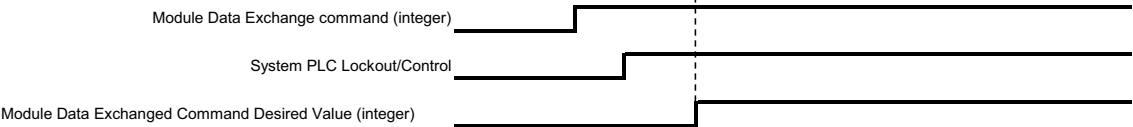
CGM Data Exchange Diagram

CGM Data Exchange

Automation Inputs (Warm Melt SP Outputs)



Automation Outputs (Warm Melt SP Inputs)



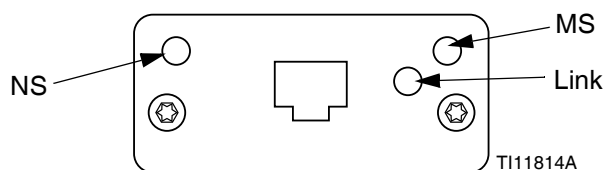
New Active
Command
Value

Connection Details

Fieldbus

Connect cables to the fieldbus module per fieldbus standards. See the Communications Gateway Module Instructions-Parts manual. See **Related Manuals** on page 3.

PROFINET



The EtherNet interface operates at 100M bit, full duplex, as required by PROFINET. The EtherNet interface is auto-polarity sensing and auto-crossover capable.

Network Status (NS)

State	Description	Comments
Off	Off-line	<ul style="list-style-type: none"> No power No connection with IO Controller
Green	On-line, (RUN)	<ul style="list-style-type: none"> Connection with IO Controller established IO Controller with RUN state
Flashing Green	On-line, (STOP)	<ul style="list-style-type: none"> Connection with IO Controller established IO Controller in STOP state

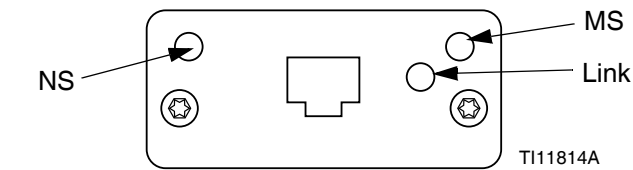
Module Status (MS)

State	Description	Comments
Off	Not initialized	No power or module in "SETUP" or "NW_INIT" state
Green	Normal operation	Diagnostic event(s) present
Flashing Green	Initialized, diagnostic event(s) present	Used by engineering tools to identify node on network
Red	Exception error	Module in state "EXCEPTION"
Red (1 flash)	Configuration error	Expected Identification differs from Real Identification
Red (2 flashes)	IP Address not set	Set IP address via system monitor or DNS server
Red (3 flashes)	Station Name not set	Set Station Name via system monitor
Red (4 flashes)	Major Internal Error	Cycle system power; replace module

Link/Activity (Link)

State	Description
Off	No Link, no communication present
Green	Link established, no communication present
Green, flashing	Link established, communication present

EtherNet/IP



The Ethernet interface operates at 100Mbit, full duplex, as required by PROFINET. The Ethernet interface is auto-polarity sensing and auto-crossover capable.

Network Status (NS)

State	Description
Off	No power or no IP address
Green	On-line, one or more connections established (CIP Class 1 or 3)
Flashing Green	On-line, no connections established
Red	Duplicate IP address, FATAL error
Flashing Red	One or more connections timed out (CIP Class 1 or 3)

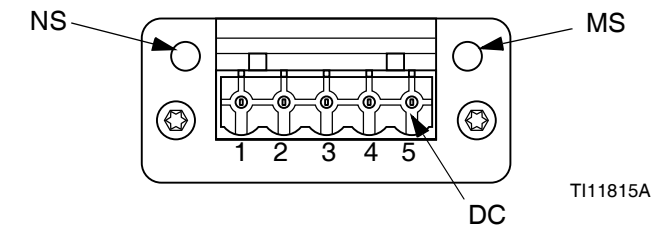
Module Status (MS)

State	Description
Off	No power
Green	Controlled by a Scanner in Run state
Flashing Green	Not configured, or Scanner in Idle state
Red	Major fault (EXCEPTION-state, FATAL error etc.)
Flashing Red	Recoverable fault(s)

LINK/Activity (Link)

State	Description
Off	No link, no activity
Green	Link established
Flashing Green	Activity

DeviceNet



Network Status (NS)

State	Description
Off	Not online / No power
Green	On-line, one or more connections are established
Flashing Green (1 Hz)	On-line, no connections established
Red	Critical link failure
Flashing Red (1 Hz)	One or more connections timed-out
Alternating Red/Green	Self test

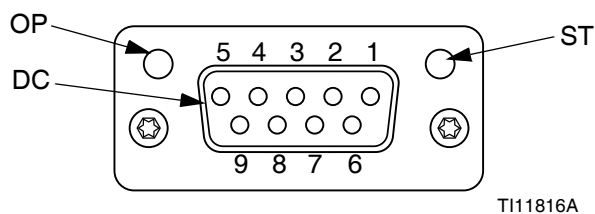
Module Status (MS)

State	Description
Off	No power or not initialized
Green	Initialized
Flashing Green (1 Hz)	Missing or incomplete configuration, device needs commissioning
Red	Unrecoverable Fault(s)
Flashing Red (1 Hz)	Recoverable Fault(s)
Alternating Red/Green	Self test

DeviceNet Connector (DC)

Pin	Signal	Description
1	V-	Negative bus supply voltage
2	CAN_L	CAN low bus line
3	SHIELD	Cable shield
4	CAN_H	CAN high bus line
5	V+	Positive bus supply voltage

PROFIBUS



Operation Mode (OP)

State	Description
Off	Not online / No power
Green	On-line, data exchange
Flashing Green	On-line, clear
Flashing Red (1 flash)	Parameterization error
Flashing Red (2 flashes)	PROFIBUS Configuration error


Status Mode (ST)

State	Description
Off	No power or not initialized
Green	Initialized
Flashing Green	Initialized, diagnostic event(s) present
Red	Exception error

PROFIBUS Connector (DC)


Pin	Signal	Description
1	-	-
2	-	-
3	B Line	Positive RxD/TxD, RS485 level
4	RTS	Request to send
5	GND Bus	Ground (isolated)
6	+5V Bus Output	+5V termination power (isolated)
7	-	-
8	A Line	Negative RxD/TxD, RS485 level
9	-	-
Housing	Cable Shield	Internally connected to the Anybus protective earth via cable shield filters according to the PROFIBUS standard.

Gateway Setup Screens

Press the  soft key at Main Menu screen 2 to access the Fieldbus screens. The Fieldbus screens are shown only if a Fieldbus CGM is installed. If one is not installed, a Fieldbus Comm Error screen will be displayed.



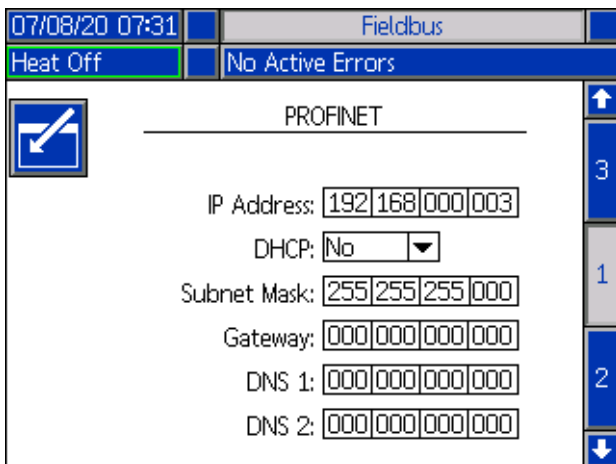
NOTE: The screens that will be shown here depend on the type of network you are using.

Some screens are informational only. For those that can be edited, press the  soft key to enter editing mode. Use the Directional Keypad (DH) and Numeric Keypad (DJ) to make changes.

PROFINET

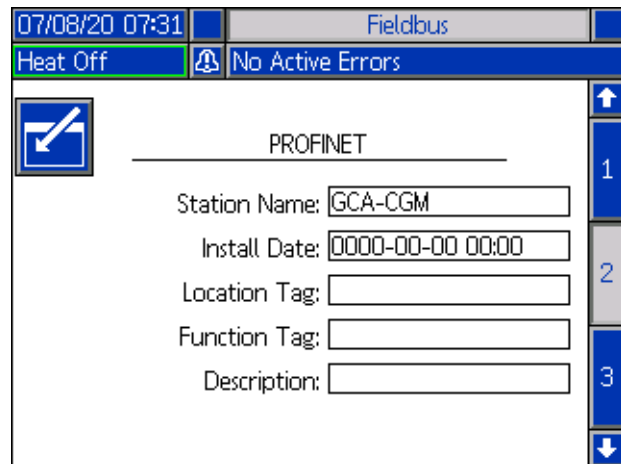
PROFINET Screen 1

This screen allows you to set the IP Address, DHCP settings, Subnet Mask, Gateway, and DNS information.



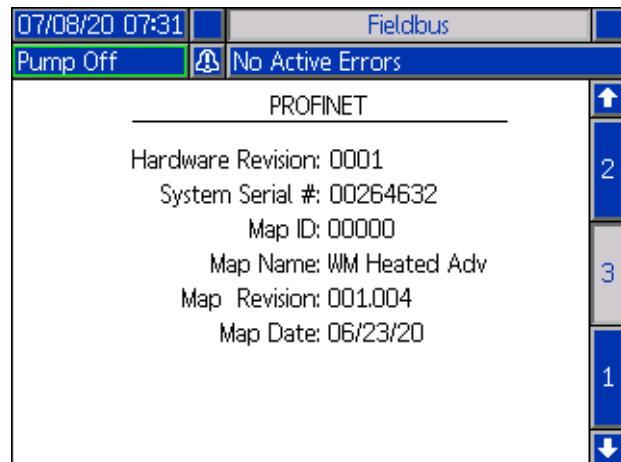
PROFINET Screen 2

This screen allows you to set the Station Name, Install Date, Location Tag, Function Tag, and Description.



PROFINET Screen 3

This screen displays the Hardware Revision, System Serial number, and data map identification information.



EtherNet/IP

EtherNet Screen 1

This screen allows you to set the IP Address, DHCP settings, subnet mask, gateway, and DNS information.

EtherNet Screen 2

You can view the Hardware Revision, System Serial number, and data map identification information at this screen.

PROFIBUS

PROFIBUS Screen 1

This screen allows you to set the Device Address, Install Date, Location Tag, Function Tag, and Description.


PROFIBUS Screen 2

You can view the Hardware Revision, System Serial number, and data map identification information at this screen.

DeviceNet

At this screen, you can set the Device Address and Baud Rate and view the Hardware Revision, System Serial number, and data map identification information

07/08/20 07:29	Fieldbus
Heat Off	No Active Errors



DeviceNet

Device Address:

Baud Rate:

Hardware Revision: 0001

System Serial #: 00242410

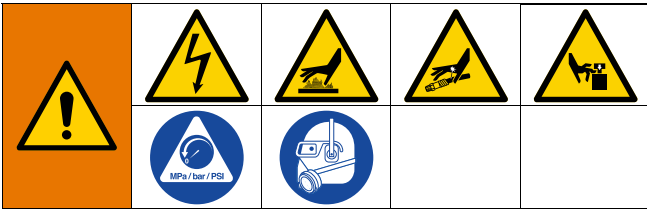
Map ID: 00000

Map Name: WM Heated Adv

Map Revision: 001.004

Map Date: 06/23/20

Repair

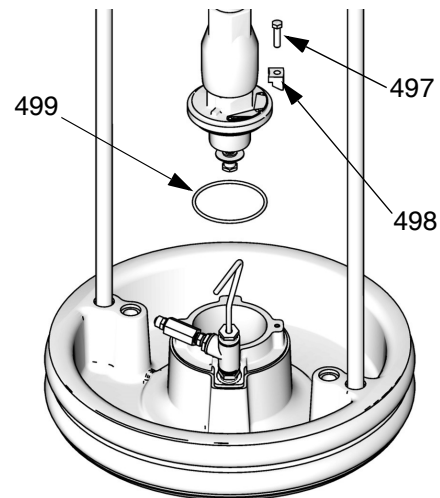


Disconnect Pump from Platen

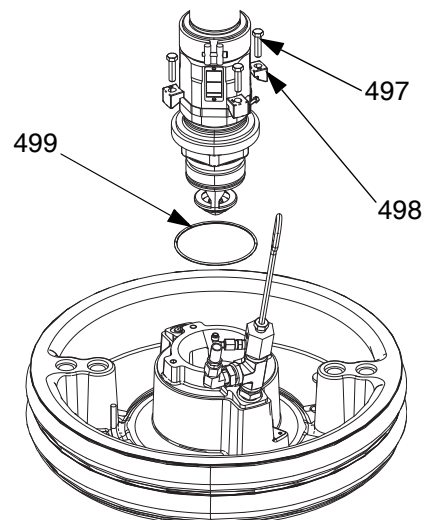
The Pump (C) is mounted to the Platens (D) by different mounting kits. See the **Kits and Accessories** on page 134.

200 Liter Platen

1. Follow the **Pressure Relief Procedure** on page 46.
2. Turn the Disconnect Switch (T) OFF. If using a Tandem Ram Therm-O-Flow Warm Melt, turn the Disconnect Switch (T) OFF on the Ram that requires repair only.
3. Remove four hex screws (497) and four clamps (498).
4. Carefully pull Pump away to prevent damage to Pump inlet and remove o-ring (499).



Ambient Platen



Heated Platen

FIG. 38: 200 Liter Mounting Kit

20 and 60 Liter Platen

1. Follow the **Pressure Relief Procedure** on page 46.
2. Turn the Disconnect Switch (T) OFF. If using a Tandem Ram Therm-O-Flow Warm Melt, turn the Disconnect Switch (T) OFF on the Ram that requires repair only.
3. Loosen two 5/16 in. screws (548) from Platen (D).
4. Carefully pull Pump away to prevent damage to Pump inlet. If using a Pump with an intake adapter, remove screws (548) and o-ring (558) from Pump inlet.

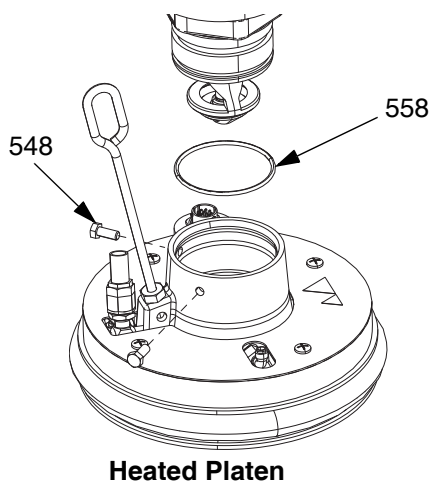
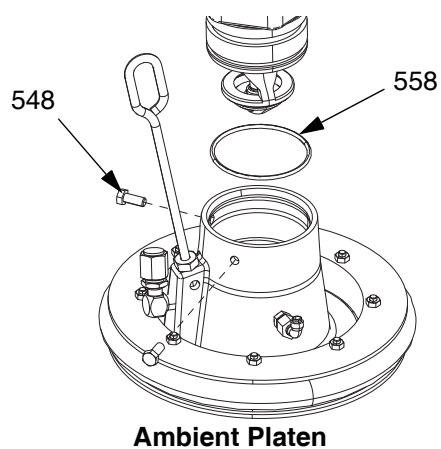


FIG. 39: 20 liter mounting kit

Repair Platen



1. Follow the **Pressure Relief Procedure** on page 46.
2. Refer to parts illustration on page 130 and remove the platen check valve (549) as shown.
3. Clear air assist tube (AT) in Platen (D).
4. Clean all parts of the platen check valve (549) and replace if necessary.
5. Remove Bleed Stick (BF) from Platen (D). Push Bleed Stick through Bleed Relieve Ports (BG) to remove material residue.

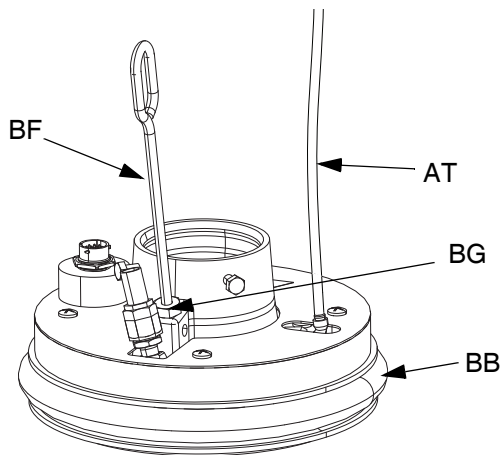


FIG. 40

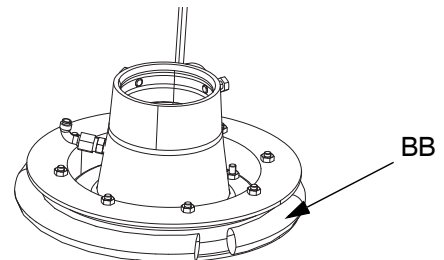
Remove and Reinstall Wipers

Remove Platen Wipers

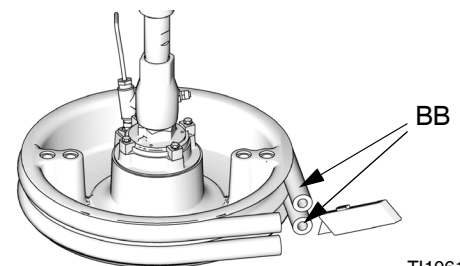
NOTE: Five gallon Platens have a single Wiper that must be removed, and 55 gallon Platens have a top and bottom Wiper that must be removed.

1. Follow the **Pressure Relief Procedure** on page 46.
2. If using an ambient system, turn the Disconnect Switch (T) OFF.
3. To replace worn or damaged Wipers (BB), raise Platen up out of drum. Remove drum from base. Wipe fluid off of Platen.
4. Cut the Wiper(s) (BB) with knife and remove from Platen. See FIG. 41.

5 Gallon Platen



55 Gallon Platen



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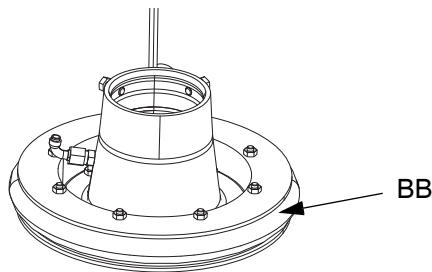
FIG. 41

Reinstall Platen Wipers

NOTE: Five gallon Platens have a single Wiper that must be reinstalled, and 55 gallon Platens have a top and bottom Wiper that must be reinstalled.

1. Using a wooden or plastic tool to prevent damage to the Wiper (BB), clean all material from the seal grooves.
2. *Working from the bottom*, angle one Wiper (BB) over the back of the Platen (D). See FIG. 42.
3. Insert the Wiper (BB) in the top groove and run the front of the Wiper into the groove.
4. If using a 55 gallon Platen, insert the second Wiper (BB) in the lower groove and run the front of the Wiper into the groove.
5. Lubricate the outside of the Wiper with lubricant compatible with the material being pumped. Check with the material supplier.

5 Gallon Platen



55 Gallon Platen

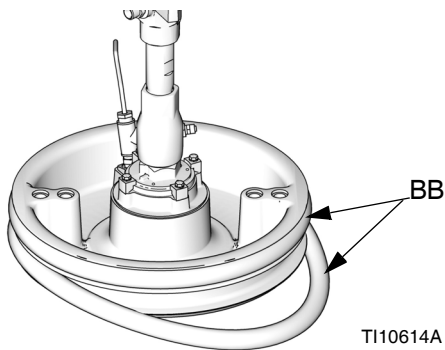


FIG. 42

Connect Platen

200 Liter Platen

1. Place o-ring (499) from mounting kit on the Platen (D). If attached to plate, place Displacement Pump (C) onto Platen (D). See FIG. 38.
2. Secure Pump's intake flange to plate with screws (497) and clamps (498) included in mounting kit 255392.

20 Liter Platen

NOTE: Before installing the 20 or 60 liter Platen to a Pump with an intake adapter, install adapter and o-ring from mounting kit using the two set screws. See FIG. 39.

1. Place o-ring (499) from mounting kit on Pump intake. Loosen the Pump intake flange screws (548) and carefully lower Pump onto o-ring (499) and Platen.
2. Secure Pump's intake flange to plate with screws (548).

Remove Wipers

See **Remove and Reinstall Wipers** on page 105.

Install Wipers

See **Remove and Reinstall Wipers** on page 105.

Remove Displacement Pump



The procedure for removing the Displacement Pump (C) depends on which Air Motor (B) and Platen (D) the unit uses. Find your Ram Assembly (A), Air Motor (B), and Platen (D) below to remove the Displacement Pump (C). Refer to your Displacement Pump manual to repair the Displacement Pump.

If the Air Motor (B) does not require servicing, leave it attached to its mounting. If the Air Motor does need to be removed, see **Remove Air Motor** on page 109.

D200 3 in. and D200s 6.5 in. Ram

1. Follow the **Pressure Relief Procedure** on page 46.
2. Turn off power to the Ram Assembly (A):
 - a. Turn the Disconnect Switch (T) OFF.
 - b. If using a Tandem Ram Therm-O-Flow Warm Melt, turn the Disconnect Switch (T) OFF on the Ram that requires repair only.
3. See **Disconnect Displacement Pump** in your Pump package manual.
4. Open the Main Air Slider Valve (AA).
5. Raise the Air Motor (B):
 - a. Loosen nut (405) under tie bar and thread it down the threaded rod (406) to the lift ring adapter (407) holding the Air Motor (B). Use wrench on nut (105) on top of tie bar to raise Air Motor (B).

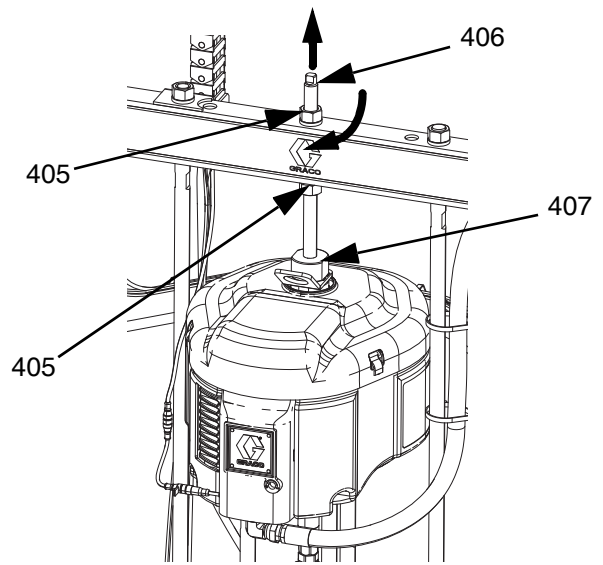


FIG. 43

- b. For Air Motor (B) with smaller Platens (D) and all rams: See procedure for **D60 3 in. Dual Post Rams** on page 108.
6. See **Disconnect Pump from Platen** on page 103 to disconnect the Platen (D) from the Displacement Pump (C).
7. Use two people to lift out the Displacement Pump (C).

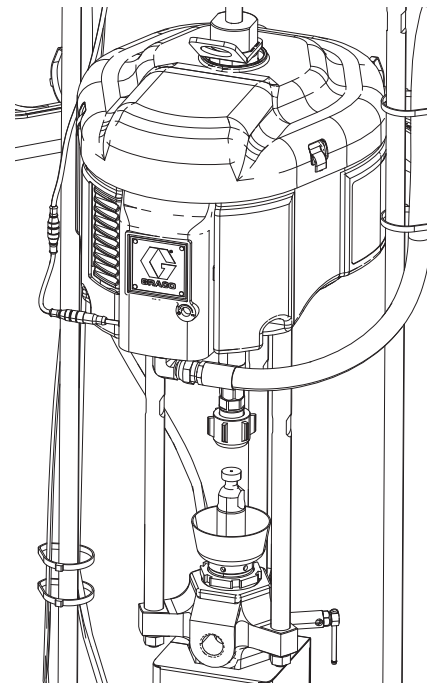


FIG. 44

D60 3 in. Dual Post Rams

1. Follow the **Pressure Relief Procedure** on page 46.
2. Turn the Disconnect Switch (T) OFF. If using a Tandem Ram Therm-O-Flow Warm Melt, turn the Disconnect Switch (T) OFF on the Ram that requires repair only.
3. See **Disconnect Displacement Pump** in your Pump packages manual.
4. See **Disconnect Pump from Platen** on page 103 to disconnect the Platen (D) from the Displacement Pump (C).
5. Open the Main Air Slider Valve (AA).
6. Raise the Ram Assembly (A) to lift the Air Motor (B) away from the Displacement Pump (C).
7. Remove Displacement Pump (C) and service as needed.

Install Displacement Pump

D200 3 in. and D200s 6.5 in. Rams

1. Insert Displacement Pump (C) on Platen (D). Follow **Connect Platen** steps on page 106.
2. See **Reconnect Displacement Pump** in your Pump package manual.
3. Connect Air Motor (B):
 - a. Use wrench on nut (405) on top of tie bar to lower Air Motor (B) onto Displacement Pump (C). See FIG. 43 on page 107. Thread nut (405) up and tighten it under tie bar. Tighten nut (405) below the tie bar to 25 ft-lb (34 N•m) maximum.

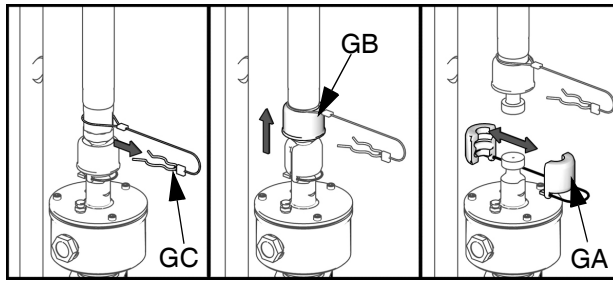
D60 3 in. Dual Post Rams

1. Raise the Ram Assembly (A) to install the Displacement Pump (C) to the Platen (D).
2. Insert Displacement Pump (C) on Platen (D). Follow **Connect Platen** steps on page 106.
3. See **Reconnect Displacement Pump** in your Pump packages manual.

Remove Air Motor



1. Turn the Disconnect Switch (T) OFF.
2. Perform the **Pressure Relief Procedure** on page 46 and follow the Pressure Relief Procedure in your pump manual.
3. Perform the **Disconnect Displacement Pump procedure** in the Check-Mate Pump Packages, Instructions-Parts manual.
4. Disconnect the air hose from the Air Motor (B).
5. Remove Quick Coupler: Remove the clip (GC), and slide the coupling cover (GB) up to remove the coupling (GA).



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FIG. 45: Remove Quick Coupler

6. *D60 3 in Rams*: Disconnect Air Motor: Remove the screws and washers securing the Air Motor (B) to the mounting bracket. See FIG. 46.

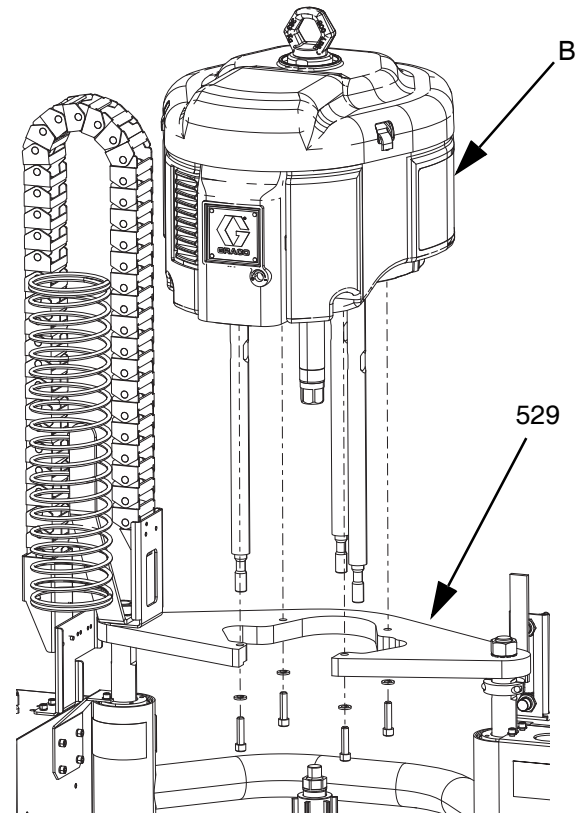
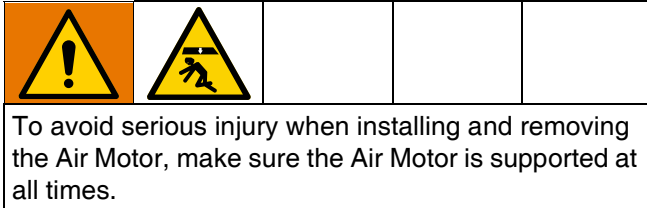


FIG. 46: Air Motor Disconnection

Install Air Motor



1. Attach tie rods to the Air Motor (B) according to the procedure in the Check-Mate Pump Packages, Instructions-Parts manual. See **Related Manuals** on page 3.
2. Connect the air hose to the Air Motor (B).

D200 3 in. and D200s 6.5 in. Rams

200 liter platen:

Using a capable hoist, insert tie rods into the Displacement Pump (C) and secure the Air Motor (B) to the Pump (C).

- a. See **Reconnect Displacement Pump** in your Pump package manual.
- b. Install threaded rod (406) through center hole in the Ram. Install lock washers (404) and nuts (405) onto threaded rod (406), both above and below tie bar. Use a wrench to hold lift ring adapter (407) and tighten threaded rod (406) into lift ring adapter (407) using another wrench. See FIG. 47.
- c. Tighten nut (405) below tie bar to 25 ft-lb (34 N•m) maximum.
- d. Tighten nut (405) above tie bar to lock Air Motor (B) in place.

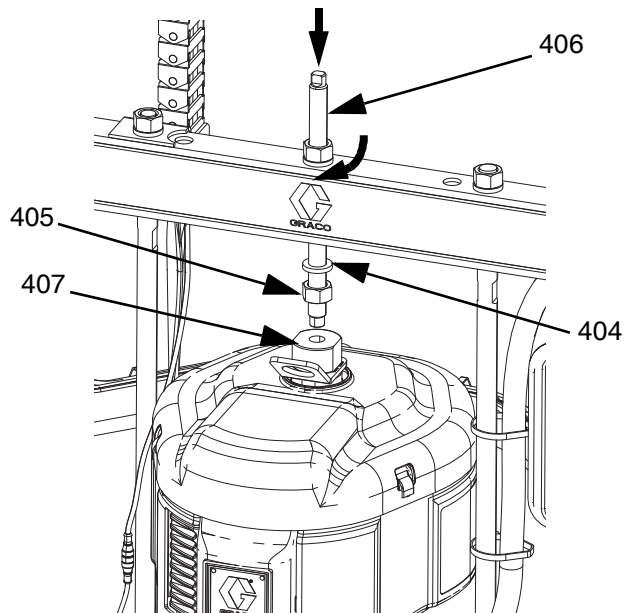


FIG. 47

D60 3 in. Dual Post Rams

1. Using a secure hoist, attach Air Motor (B) to mounting plate (409) with screws (413) and washers (412).
2. See **Reconnect Displacement Pump** in your Pump package manual.

Ram Repair

			
<p>To reduce the risk of serious injury whenever you are instructed to relieve pressure always follow the Pressure Relief Procedure on page 46. Do not use pressurized air to remove the guide sleeve or the piston.</p>			

D200s 6.5 in. Ram Piston Rods

Always service both cylinders at the same time. When you service the Platen Lift Rod (H) always install new o-rings in the piston rod seal and Ram piston.

Disassemble Piston Rod Seal

1. Follow the **Pressure Relief Procedure** on page 46.
2. Turn the Disconnect Switch (T) OFF. If using a Tandem Therm-O-Flow Warm Melt, turn the Disconnect Switch (T) OFF on the Ram that requires repair only.
3. Remove the nuts (123) and lockwashers (122) holding the tie bar (219) to the piston rods (132). See parts illustration on page 117.
4. Remove nuts (403, 405) and washers (402, 404). See parts illustration on page 123.
5. Lift tie bar (219) off of rods.
6. Remove retaining ring (136) by gripping the ring tab with a pair of pliers and rotating the ring out of its groove.
7. Remove snap ring (134) and rod wiper (133).
8. Remove guide sleeve (135) by sliding it off of rod (132). Four 1/4 in -20 holes are provided to ease removal of the guide sleeve.
9. Inspect parts for wear or damage.

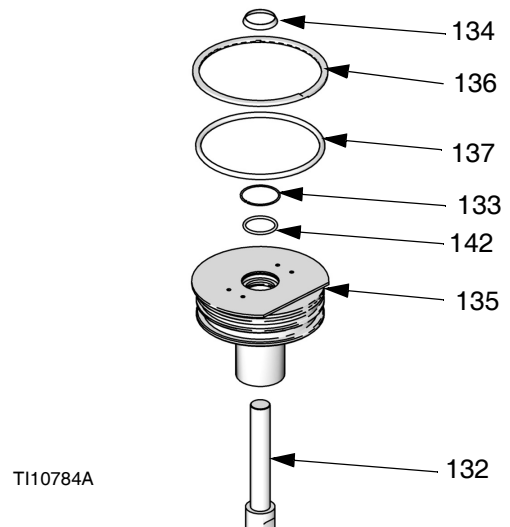


FIG. 48: 6.5 in. Piston Rod Seal

Assemble Piston Rod Seal

1. Install new o-rings (137,142), rod wiper (133), and snap ring (134). Lubricate packings with o-ring lubricant.
2. Slide guide sleeve (135) onto rod (132) and push it into cylinder. Replace retaining ring (136) by feeding it around the guide sleeve groove.
3. Reinstall tie bar (219) using nuts (123) and lockwashers (122). Torque to 40 ft-lb (54 N•m).
4. Reinstall washers (402, 404) and nuts (403, 405).

Disassemble Ram Piston

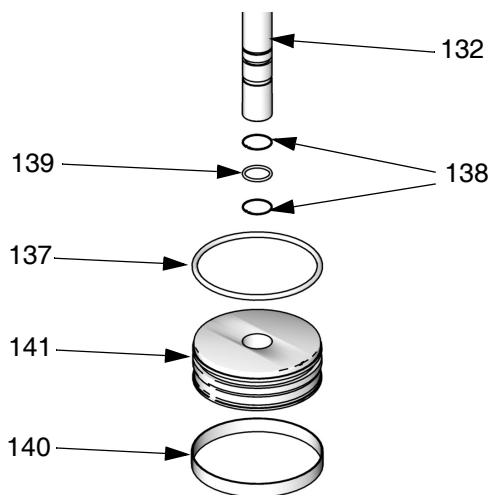
1. Follow the **Pressure Relief Procedure** on page 46.
2. Turn the Disconnect Switch (T) OFF. If using a Tandem Ram Therm-O-Flow Warm Melt, turn the Disconnect Switch (T) OFF on the Ram that requires repair only.
3. Remove nuts (123) and lockwashers (122) holding the tie bar (219) to the piston rods (132). See page 117.
4. Remove nuts (403, 405) and washers (402, 404). See parts illustration on page 117.
5. Lift tie bar (219) off rods.
6. Remove retaining ring (136) by gripping the ring tab with a pair of pliers and rotating the ring out of its groove.

7. Remove guide sleeve (135) and slide it off piston rod (132).

NOTICE

Do not tilt the piston rod to one side when removing it from the base or when installing it. Such movement can damage the piston or inside surface of the base cylinder.

8. Carefully lay piston (141) and rod (132) down so rod will not be bent. Remove bottom retaining ring (138) and o-ring (139). Remove piston guide band (140). Slide piston (141) off piston rod (132).



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FIG. 49: 6.5 in. Ram Piston

Assemble Ram Piston

1. Install new o-rings (139, 137) on piston rod (132) and piston (141). Lubricate the piston (141) and o-rings (139, 137). Reinstall piston (141) and lower retaining ring (138) onto piston rod (132). Install piston guide band (140) onto piston (141).
2. Carefully insert piston (141) into cylinder and push rod (132) straight down into cylinder. Add three ounces of lubricant to each cylinder after inserting the piston (141).
3. Slide guide sleeve (135) onto piston rod (132).
4. Install retaining ring (134) and tie bar (219). Perform steps to **Disassemble Ram Piston** in reverse order.

D200 and D60 3 in. Ram Piston Rods

Always service both cylinders at the same time. When you service the piston rod always install new o-rings in the piston rod seal and Ram piston.

Disassemble Piston Rod Seal and Bearing

1. Follow the **Pressure Relief Procedure** on page 46.
2. Access piston rod seal and bearing.
 - a. *For D200 3 in. Ram:* Remove nuts (125) and lockwashers (124) holding the tie bar (219) to the piston rods (246). Remove nuts (403, 405) and washers (402, 404). Remove tie bar (219). Refer to parts illustrations on page 119 and 123.
 - b. *For D60 3 in. Ram:* Ensure Ram Assembly (A) is in lowest position. Remove nuts (125) and lockwashers (254) from piston rods (261). Remove entire Pump, including the mounting plate (259) off of the piston rods (261). Secure the Pump so the Pump (C) and Platen (D) will not fall. See page 124.
3. Remove retaining ring (218).
4. Remove piston rod seal and bearing.
 - a. Slide end cap (242), pin (238), o-ring (245), and spring (244) up off of the piston rod (261, 246). Remove retaining ring (241) and bearing (243) from end cap (242) and remove o-ring (240).
5. Inspect parts for wear or damage. Replace as necessary.

NOTE: Do not reinstall end cap assembly if the Ram piston (247) needs to be removed from the piston rod. See the next page for Ram piston repair instructions.

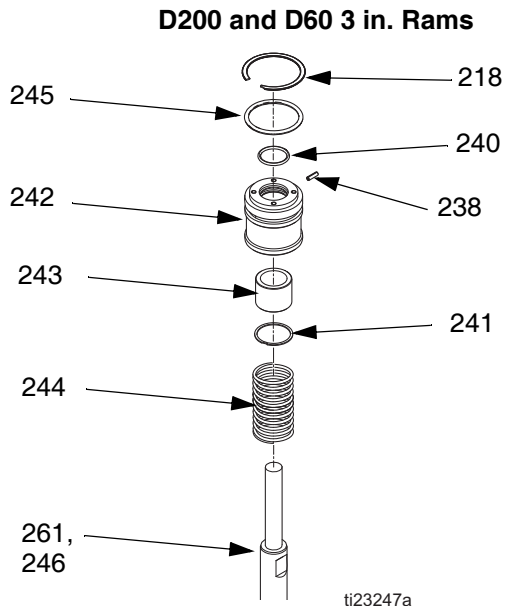


FIG. 50: 3 in. Piston Rod Seal

Assemble Piston Rod Seal and Bearing

See FIG. 50 on page 113.

1. Lubricate o-ring (240) and bottom bearing (243).
 - a. Install o-ring (240), bottom bearing (243), and retaining ring (241) into end cap (242).
 - b. Install new o-ring (245) and pin (238) on end cap (242). Lubricate o-ring (245) and end cap (242).
 - c. Slide spring (244) and end cap (241) on piston rod (261, 246).
2. Install retaining ring (218).
3. *For D200 3 in Ram:* Install tie bar (219), nuts (403, 405), and washers (402, 404).
4. *For D60 3 in. Ram:* Remount mounting plate (259) and attach screws (255) and lockwashers (256). Torque to 40 ft-lb (54 N•m).

Disassemble Ram Piston

1. Complete steps 1-4 from **Disassemble Piston Rod Seal and Bearing** to remove the end cap from the piston rod.

NOTICE

Do not tilt the piston rod to one side when removing it from the base or when installing it. Such movement can damage the piston or inside surface of the base cylinder.

2. Carefully lay piston (247) and rod (261, 246) down so piston rod will not be bent. Remove nut (125), washer (124), piston (247), outer o-ring (245), and inner o-ring (239).
3. Inspect parts for wear or damage. Replace as necessary.

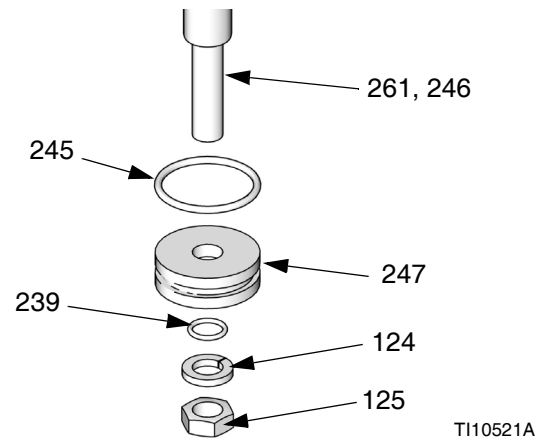
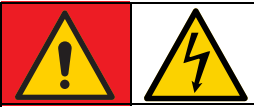


FIG. 51: 3 in. Ram Piston

Assemble Ram Piston

1. Install new o-rings (245, 239) and lubricate piston (247) and o-rings.
2. Apply medium strength thread sealant. Install piston (247), washer (124), and nut (125) on piston rod (261, 246).
3. Carefully insert piston (247) into cylinder and push piston rod (261, 246) straight down into cylinder.
4. Slide spring (244) and end cap (242) onto piston rod (261, 246).
5. *For D200 3 in. Rams:* Install retaining ring (218), tie bar (219), washers (124), and nuts (125).
6. *For D60 3 in. Rams:* Install retaining ring (218) and install mounting plate (259) with screws (255) and washers (256) with Pump and Platen.

Replace Heat Control Box Electrical Component(s)



DANGER
SEVERE ELECTRIC SHOCK HAZARD
This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.

- Turn the Disconnect Switch (T) OFF before disconnecting any cables and before servicing equipment.

1. Turn the Disconnect Switch (T) OFF.
2. Remove the door (452) on the Heat Control Box (S).
3. Use a non-conductive fuse puller tool to remove the blown fuse.

NOTICE

Using an improper tool, such as a screwdriver or pliers may break the fuse or cause damage to board.

NOTE: Fuses FHA and FHB are not replaceable. If FHA or FHB fuses are blown, order AMZ Replacement Kit, 25R533.

Replace Auto Multi-Zone (AMZ) Fuse(s)

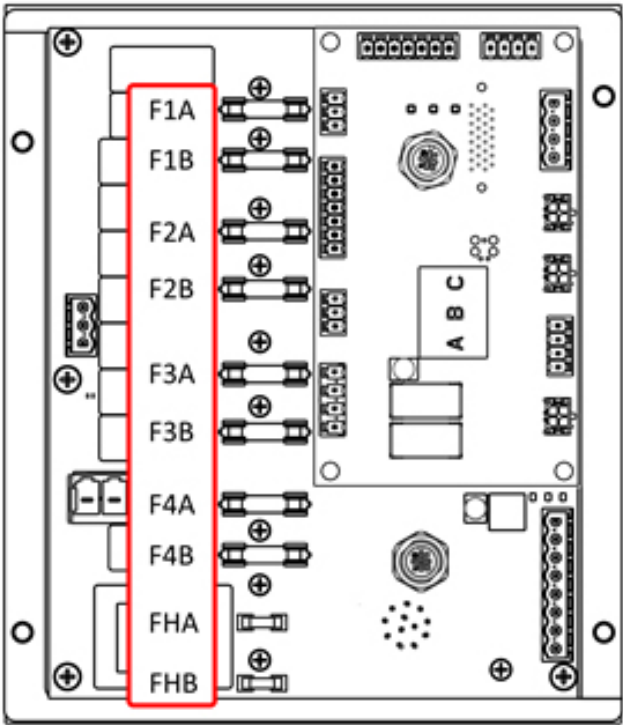


FIG. 52

NOTICE

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

Fuse	Part	Identification
F1A-F4B	129346	250VAC, 12.5A, fast acting
FHA-FHB	-----	250VAC, 25A

4. Install a new fuse into the empty fuse holder.
5. Install the Heat Control Box door (452).

Replace Auto Multi-Zone (AMZ)

1. Turn the Disconnect Switch (T) OFF.
2. Loosen screws and remove the door (452) on the Heat Control Box (S).

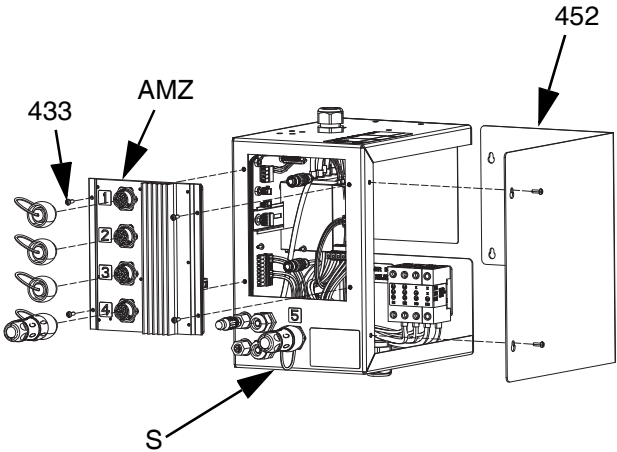


FIG. 53

3. Remove the AMZ:
 - a. Disconnect the heated electrical connections from the back of the AMZ.
 - b. Disconnect the cables from the AMZ on the inside of the Heat Control Box (S).

- c. Remove the four screws (433) used to mount the AMZ to the back of the Heat Control Box (S) and remove the AMZ.
4. Insert the new AMZ:
 - a. Set the AMZ dial position according to the image below. See **AMZ Dial Position** on page 31.
 - b. Mount the AMZ to the back of the Heat Control Box (S) using the four screws (433) removed from the original AMZ.
 - c. Reconnect the cables on the inside of the Heat Control Box (S) to the AMZ.
 - d. Reconnect the heated electrical connections to the back of the AMZ.
5. Replace the Heat Control Box door (452).

Replace Advanced Display Module (ADM)

NOTICE

The ADM stores useful lifetime and diagnostic data that will be lost when it is replaced. To keep this data, perform a USB download prior to replacing the ADM.

1. Turn the Disconnect Switch (T) OFF.
2. Disconnect the cable from the bottom of the ADM (E).
3. Remove the ADM (E) from the bracket (114). See **Parts** on page 117.
4. Install the new ADM (E) into the bracket (114).
5. Connect the cable to the bottom of the new ADM (E).

Replace Power Supply

NOTE: Instructions for replacing the power supply applies to heated systems only.

1. Turn the Disconnect Switch (T) OFF.
2. Loosen the screws and remove the door (452) on the Heat Control Box (S).
3. Disconnect the power supply harness from the AMZ (headers J3 and J21).
4. Remove the power supply (438) from the din rail in the Heat Control Box (S).
5. Disconnect the power supply harness from the power supply.
6. Mount the new power supply to the din rail in the Heat Control Box (S).
7. Connect the power supply harness to the AMZ (headers J3 and J21).
8. Close the Heat Control Box door (452).

Replace Fuses in Harness (25R652)

The harness comes with fuses installed. Follow these steps to replace a fuse.

1. Turn the Disconnect Switch (T) OFF.
2. Remove the Heat Control Box door (452).
3. Unscrew the spring-loaded fuse holder to open it.
The fuse can be easily removed by hand.

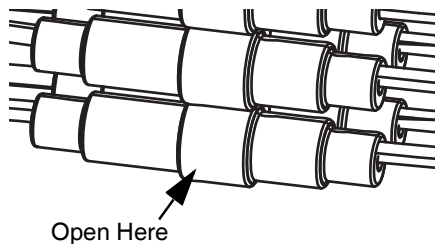


FIG. 54

4. Install the new fuse.
5. Reconnect and tighten the fuse holder.
6. Install the Heat Control Box Door (452).


NOTICE

To prevent damage to the AMZ circuit board, use only 5 x 20 mm, 10 Amp AC, fast acting fuses. Fast acting fuses are required for short-circuit protection.

Recycling and Disposal

End of Product Life

At the end of the product's useful life, dismantle and recycle it in a responsible manner.

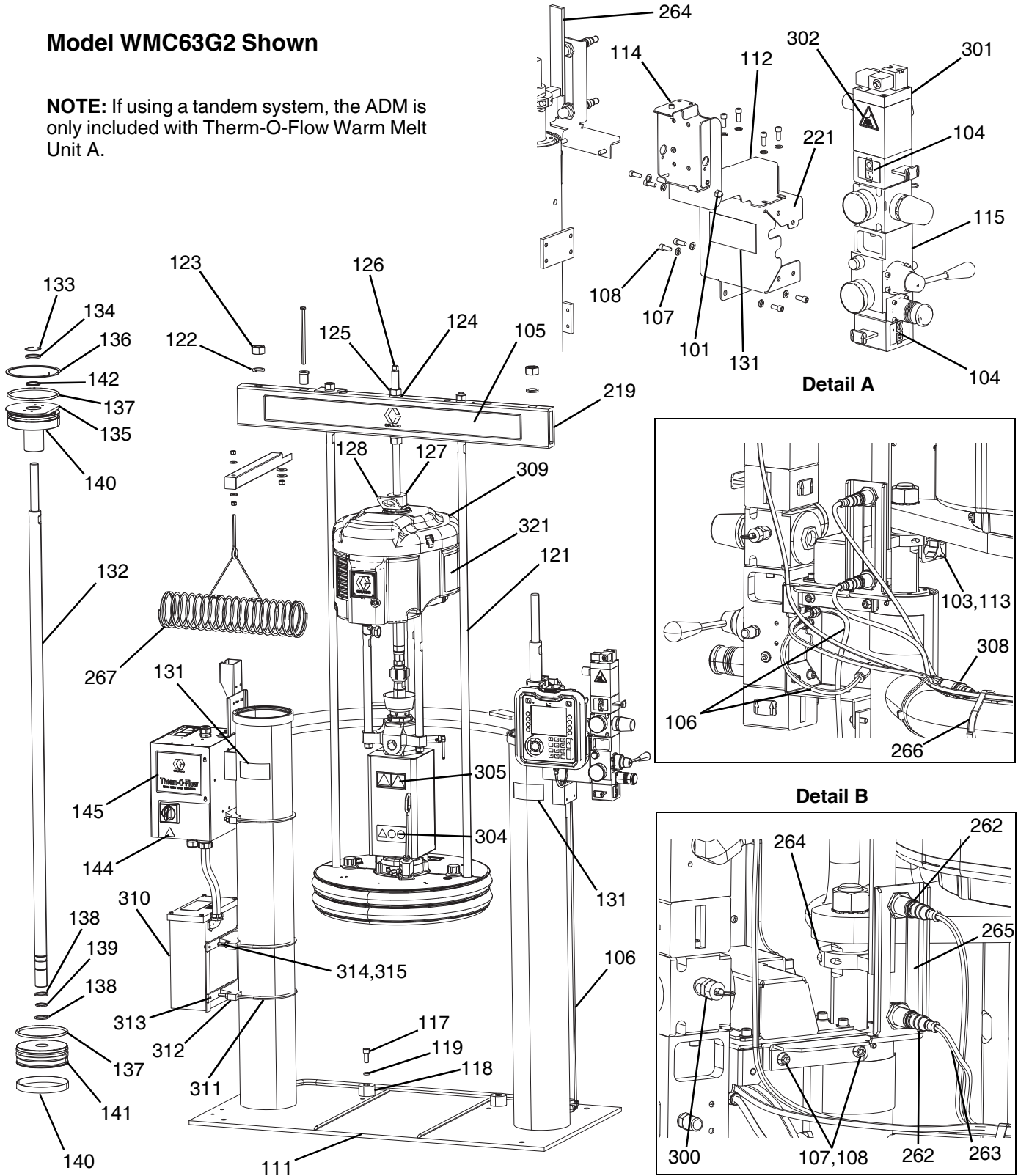
- Perform the **Pressure Relief Procedure**.
- Drain and dispose of fluids according to applicable regulations. Refer to the material manufacturer's Safety Data Sheet.
- Remove motors, batteries, circuit boards, LCDs (liquid crystal displays), and other electronic components. Recycle according to applicable regulations.
- Do not dispose of batteries or electronic components with household or commercial waste.

- Deliver remaining product to a recycling facility.

Parts

D200s 6.5 in. Rams

Model WMC63G2 Shown

NOTE: If using a tandem system, the ADM is only included with Therm-O-Flow Warm Melt Unit A.



D200s 6.5 in. Rams, WMC63G2

Ref.	Part	Description	Qty.
101	102040	NUT	1
103	117017	WASHER	1
104	15V954	LABEL, valve, shutoff, air control	1
105	---	LABEL, cross bar	1
106	C12509	TUBE, nylon	15
107	100016	WASHER, lock	15
108	121112	SCREW	15
111	---	RAM, 6.5 in.	1
112	---	BRACKET, pendant pivot, painted	1
113	---	FASTENER, knob	2
114	---	BRACKET, mounting, assembly	1
115	255650	KIT, air control	1
117	C19853	SCREW	2
118	C32467	STOP, drum	2
119	C38185	WASHER, lock	2
120X	---	SEALANT, pipe, sst	1
121	15M531	ROD, follower	2
122	101015	WASHER, lock	2
123	C19187	NUT	2
124	101533	WASHER, spring lock	2
125	101535	NUT	2
126	15J992	ROD, threaded	1
127	15J991	ADAPTER, lift ring	1
128	15J993	RING, lift, plate	1
129X	---	LUBRICANT, anti-seize	1
131▲	15J074	LABEL, safety, crush & pinch	3
132	C32401	ROD	2
133*	C03043	RING, snap	2
134*	C31001	WIPER, rod	2
135	18C233	SLEEVE, guide	2
136*	C32409	RING, retaining	2
137*	C38132	PACKING, o-ring	4
138*	C20417	RING, retaining	4
139*	158776	PACKING, o-ring	2
140*	C32408	BAND, guide	2
141	C32405	PISTON, elevator air	2
142*	C02073	PACKING, quad ring	2
144▲	15G303	LABEL, warning, electrical	1
145	---	CONTROL, box, heat	1
219	167646	BEAM, tie	1
221	255296	BRACKET, mounted, painted	1
262	130787	SENSOR, barrel	1

Ref.	Part	Description	Qty.
263	123673	HARNESS	1
264	255381	ACTUATOR, sensor, low/empty, painted	1
265	---	BRACKET, lvl sensor, dual, D200	1
266	---	TIE, cable	4
267	234966	KIT, accessory, hose hanger	1
300	---	VALVE, safety	1
301	121235	SOLENOID, air motor, ram pkg	1
302▲	189285	LABEL, safety, burn	1
303	17C255	CABLE	1
304▲	15J075	LABEL, safety, hot surface	1
305▲	17V667	LABEL, safety	1
306	15N061PKG	HARNESS, switch, reed, amz	1
307	15N061PKG	HARNESS, solenoid, amz	1
308	15N062PKG	HARNESS, sensor, level, amz	1
309	P36RCS	PUMP, 36:1, Severe Duty	1
	P36RCM	PUMP, 36:1, MaxLife	1
	P68RCS	PUMP, 68:1, Severe Duty	1
	P68RCM	PUMP, 68:1, MaxLife	1
310	---	MODULE, transformer, 480V, 6" ram	1
311	C32424	BOLT, U, 7"	3
312	617395	CLAMP, saddle	3
313	---	BAR, xformer mtg, 6" ram	3
314	---	WASHER, lock	6
315	---	NUT	6
321	15F674	LABEL, safety, motor	1

▲ Replacement safety labels, tags, and cards are available at no cost.

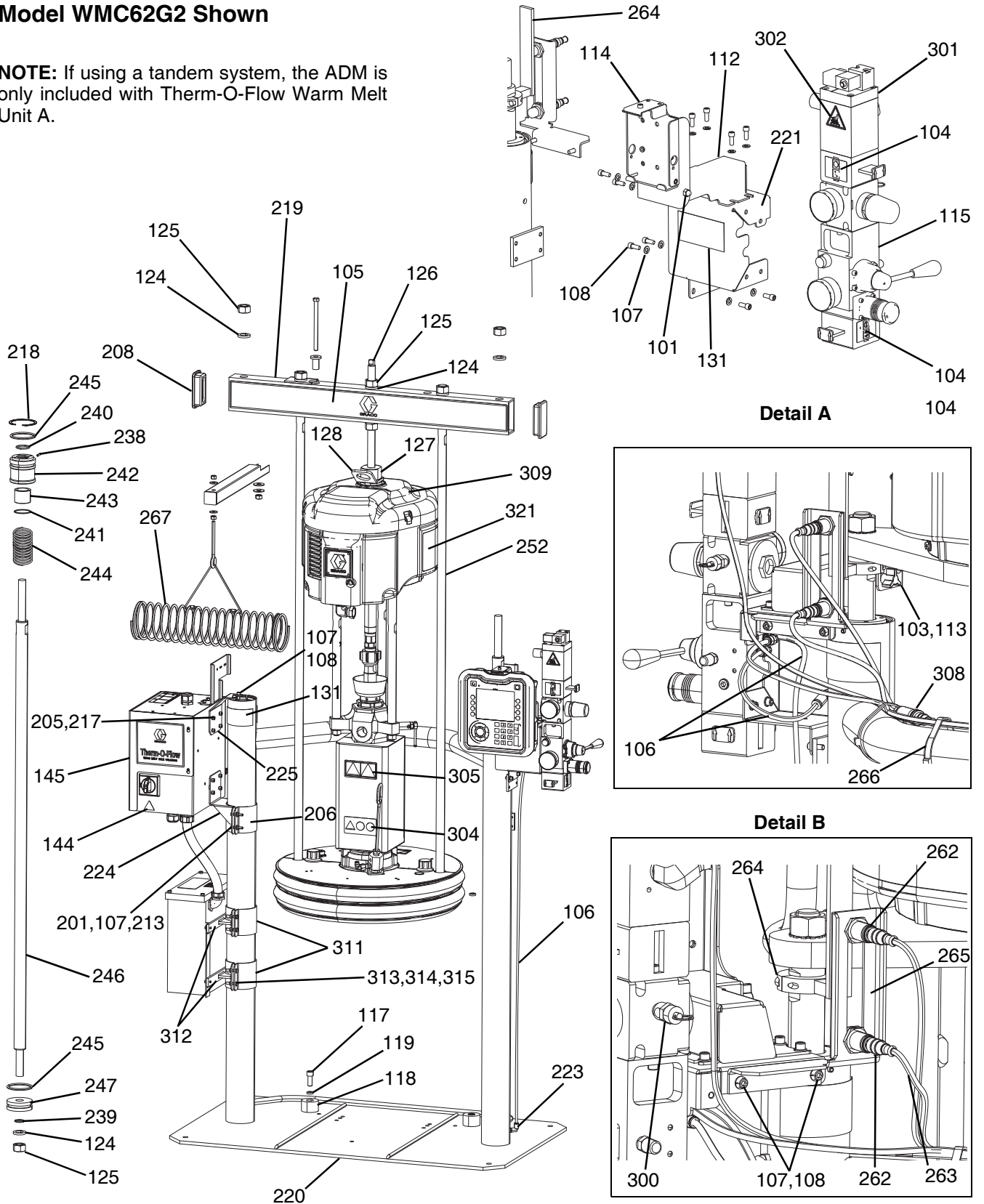
* Parts included in Ram Supply Units Repair Kit 918432 (purchase separately).

X Not shown.

D200 3 in. Rams

Model WMC62G2 Shown

NOTE: If using a tandem system, the ADM is only included with Therm-O-Flow Warm Melt Unit A.



D200 3 in. Rams, WMC62G2

Ref.	Part	Description	Qty.
101	102040	NUT	1
103	117017	WASHER	1
104	15V954	LABEL, valve, shutoff, air control	1
105	---	LABEL, cross bar	1
106	C12509	TUBE, nylon	15
107	100016	WASHER, lock	16
108	121112	SCREW	12
112	---	BRACKET, pendant pivot, painted	1
113	---	FASTENER, knob	1
114	---	BRACKET, mounting, assembly	1
115	255650	KIT, air control	1
117	C19853	SCREW	2
118	C32467	STOP, drum	2
119	C38185	WASHER, lock	2
120X	---	SEALANT, pipe, sst	1
124*	101533	WASHER, spring lock	6
125*	101535	NUT, full hex	6
126	15J992	ROD, threaded	1
127	15J991	ADAPTER, lift ring	1
128	15J993	RING, lift, plate	1
129X	---	LUBRICANT, anti-seize	1
131▲	15J074	LABEL, safety, crush & pinch	4
144▲	15G303	LABEL, warning, electrical	1
145	---	CONTROL, box, heat	1
201	100014	SCREW	4
205	108050	WASHER, lock, spring	6
208	189559	CAP, end	2
213	100015	NUT	4
217	121518	SCREW	6
218*	127510	RING, retaining, internal	2
219	167646	BEAM, tie	1
220	---	RAM, weldment, 3"	1
221	255296	BRACKET, mounted, painted	1
223	597151	FITTING, elbow	2
224	---	BRACKET, mounting, top	1
225	---	BRACKET, mounting, acc. box	1
226	---	BRACKET, mounting, ram, warm melt, 3"	1
234X	---	LUBRICANT, grease	1
235X	---	LUBRICANT, oil	1
237X	---	SEALANT, thread, med strength	1
238*	---	BEARING, ram end cap	1
239*	156401	PACKING, o-ring	1
240*	156698	PACKING, o-ring	1
241*	15F453	RETAINER, retaining ring	1
242	15M295	BEARING, ram end cap	1
243	15U979	PIN, spring, straight	1
244*	160138	SPRING, compression	1
245*	160258	PACKING, o-ring	2

Ref.	Part	Description	Qty.
246	167651	ROD, piston ram	1
247	183943	PISTON	1
251X	C20987	PACKING, o-ring	1
252	167652	ROD, tie ram	2
262	130787	SENSOR, barrel	1
263	15N018PKG	HARNESS, level	1
264	255381	ACTUATOR, sensor, low/empty, painted	1
265	---	BRACKET, lvl sensor, dual, D200, pnt	1
266	---	TIE, cable	4
267	234966	KIT, accessory, hose hanger	1
300	---	VALVE, safety	1
301	121235	SOLENOID, air motor, ram pkg	1
302	189285	LABEL, safety, burn	1
303	17C255	CABLE	1
304	15J075	LABEL, safety, hot surface	1
305	17V667	LABEL, safety	1
306	15N061PKG	HARNESS, switch, reed, amz	1
307	15N061PKG	HARNESS, solenoid, amz	1
308	15N062PKG	HARNESS, sensor, level, amz	1
309	P36RCS	PUMP, 36:1, Severe Duty	1
	P36RCM	PUMP, 36:1, MaxLife	1
	P68RCS	PUMP, 68:1, Severe Duty	1
	P68RCM	PUMP, 68:1, MaxLife	1
310	---	MODULE, transformer, 480V, 6" ram	1
316	---	BRACKET, mounting, ram, warm melt, 3"	2
317	---	BRACKET, mounting, xformer, 3" ram, painted	2
318	---	NUT	8
319	---	SCREW	8
320	---	WASHER, lock	8
321	15F674	LABEL, safety, motor	1

▲ Replacement safety labels, tags, and cards are available at no cost.

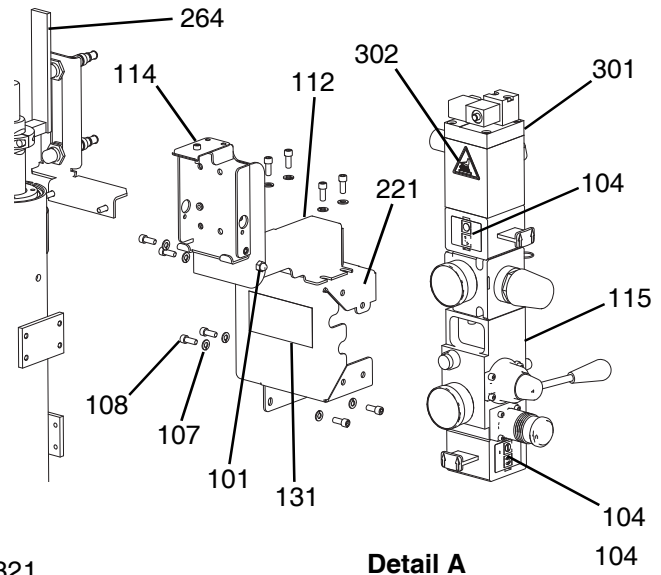
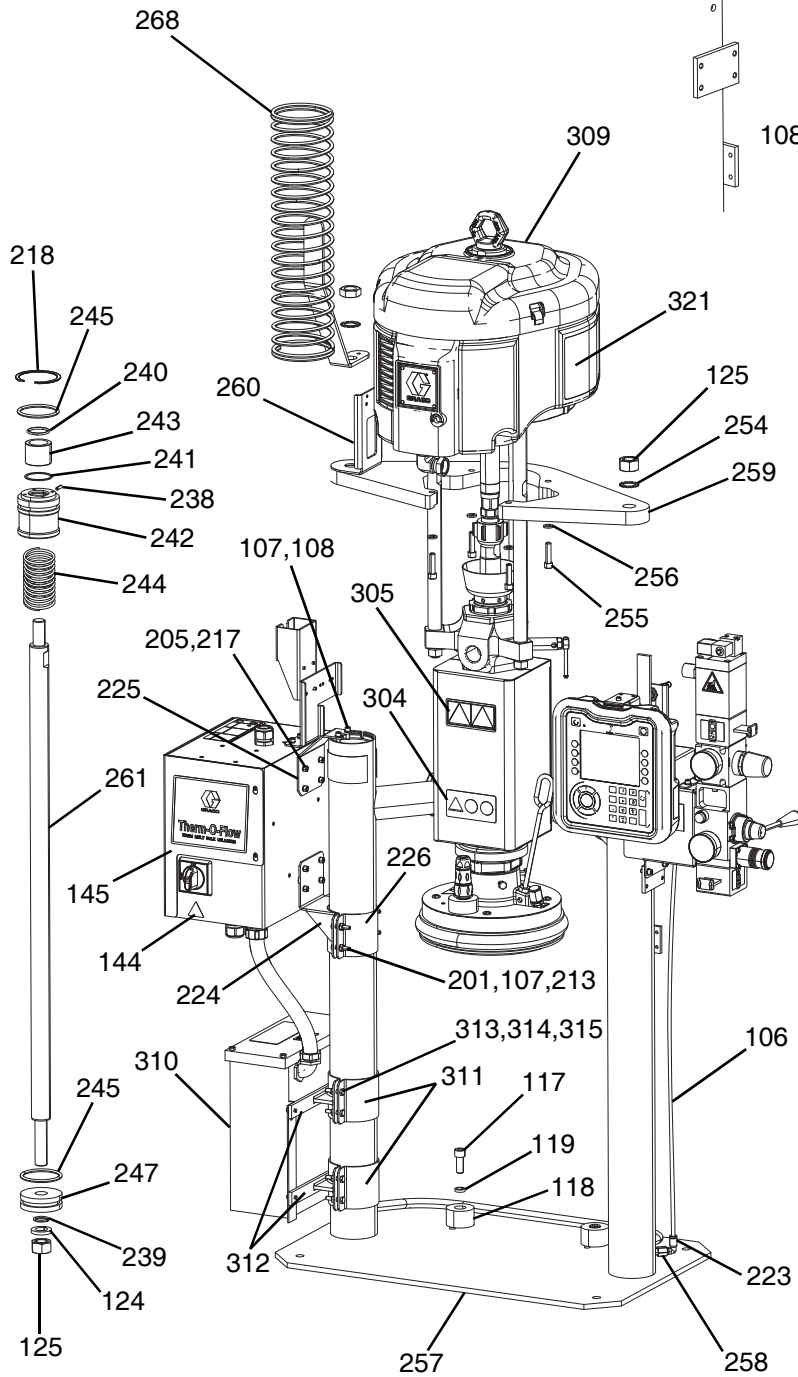
* Parts included in Ram Supply Units Repair Kit 255687 (purchase separately).

X Not shown.

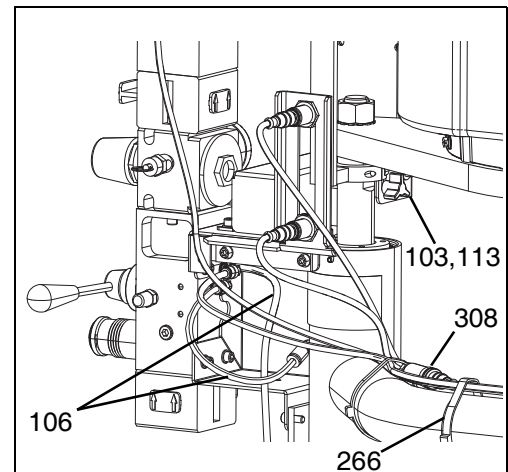
D60 3 in. Rams

Model WMC61G2 Shown

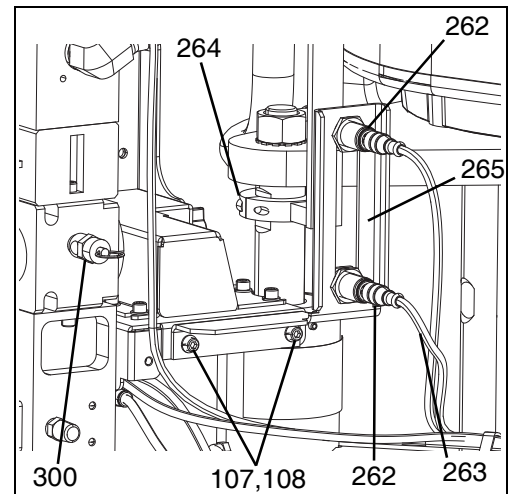
NOTE: If using a tandem system, the ADM is only included with Therm-O-Flow Warm Melt Unit A.



Detail A



Detail B



D60 3 in. Rams, WMC61G2

Ref.	Part	Description	Qty.
101	102040	NUT	1
103	117017	WASHER	1
104	15V954	LABEL, valve, shutoff, air control	1
106	C12509	TUBE, nylon, rnd	2
107	100016	WASHER, lock	18
108	121112	SCREW	14
112	---	BRACKET, pendant pivot, painted	1
113	---	FASTENER, knob	1
114	---	BRACKET, mounting, assembly	1
115	255650	CONTROL, air, ram, hyd driver	1
117	C19853	SCREW	2
118	C32467	STOP, drum	2
119	C38185	WASHER, lock	2
120X	---	SEALANT, pipe, sst	1
124*	101533	WASHER, spring lock	1
125*	101535	NUT	3
131▲	15J074	LABEL, safety, crush & pinch	4
144▲	15G303	LABEL, warning, electrical	1
145	---	CONTROL, box, electric, heat	1
201	100014	SCREW	4
205	108050	WASHER, lock, spring	6
213	100015	NUT	4
217	121518	SCREW	6
218*	127510	RING, retaining, internal	2
221	255296	BRACKET, mounted, painted	1
223	597151	FITTING, elbow	2
224	---	BRACKET, mounting, ram, warm melt, 3"	1
225	---	BRACKET, mounting, acc. box	1
226	---	BRACKET, mounting, top	1
234X	---	LUBRICANT, grease	1
235X	---	LUBRICANT, oil	1
237X	---	SEALANT, thread, med strength	1
238*	---	BEARING, ram end cap	1
239*	156401	PACKING, o-ring	1
240*	156698	PACKING, o-ring	1
241*	15F453	RETAINER, retaining ring	1
242	15M295	BEARING, ram end cap	1
243	15U979	PIN, spring, straight	1
244*	160138	SPRING, compression	1
245*	160258	PACKING, o-ring, buna-n	2
247	183943	PISTON	1
254	104395	WASHER, lock, tooth, external	2
255	110141	SCREW	4
256	100133	WASHER, lock	4
257	---	RAM, dp, weldment	1
258	16T421	ADAPTER, pipe hex	1
259	---	BRACKET, shelf, D60, 3400/6500, paint	1
260	---	BRACKET, cable track, D60 ram, paint	1

Ref.	Part	Description	Qty.
261	---	ROD, piston, dp ram	1
262	130787	SENSOR, barrel	1
263	15N018PKG	HARNESS, level	1
264	255381	ACTUATOR, sensor, low/empty, painted	1
265	---	BRACKET, lvl sensor, dual, D200, pnt	1
266	---	TIE, cable	4
268	26B203	BRACKET, hose, spring	1
300	---	VALVE, safety	1
301	121235	SOLENOID, air motor, ram pkg	1
302	189285	LABEL, safety, burn	1
303	17C255	CABLE	1
304	15J075	LABEL, safety, hot surface	1
305	17V667	LABEL, safety	1
306	15N061PKG	HARNESS, switch, reed, amz	1
307	15N061PKG	HARNESS, solenoid, amz	1
308	15N062PKG	HARNESS, sensor, level, amz	1
309	P36RCS	PUMP, 36:1, Severe Duty	1
	P36RCM	PUMP, 36:1, MaxLife	1
	P68RCS	PUMP, 68:1, Severe Duty	1
	P68RCM	PUMP, 68:1, MaxLife	1
310	---	MODULE, transformer, 480V, 6" ram	1
316	---	BRACKET, mounting, ram, warm melt, 3"	2
317	---	BRACKET, mounting, xformer, 3" ram, painted	2
318	---	NUT	8
319	---	SCREW	8
320	---	WASHER, lock	8
321	15F674	LABEL, safety, motor	1

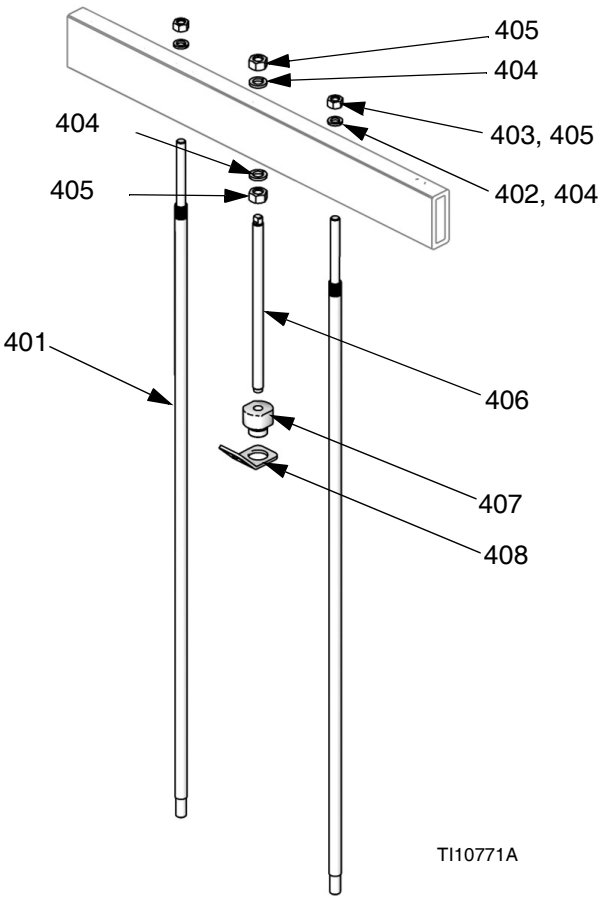
▲ Replacement safety labels, tags, and cards are available at no cost.

* Parts included in Ram Supply Units Repair Kit 255687 (purchase separately).

X Not shown.

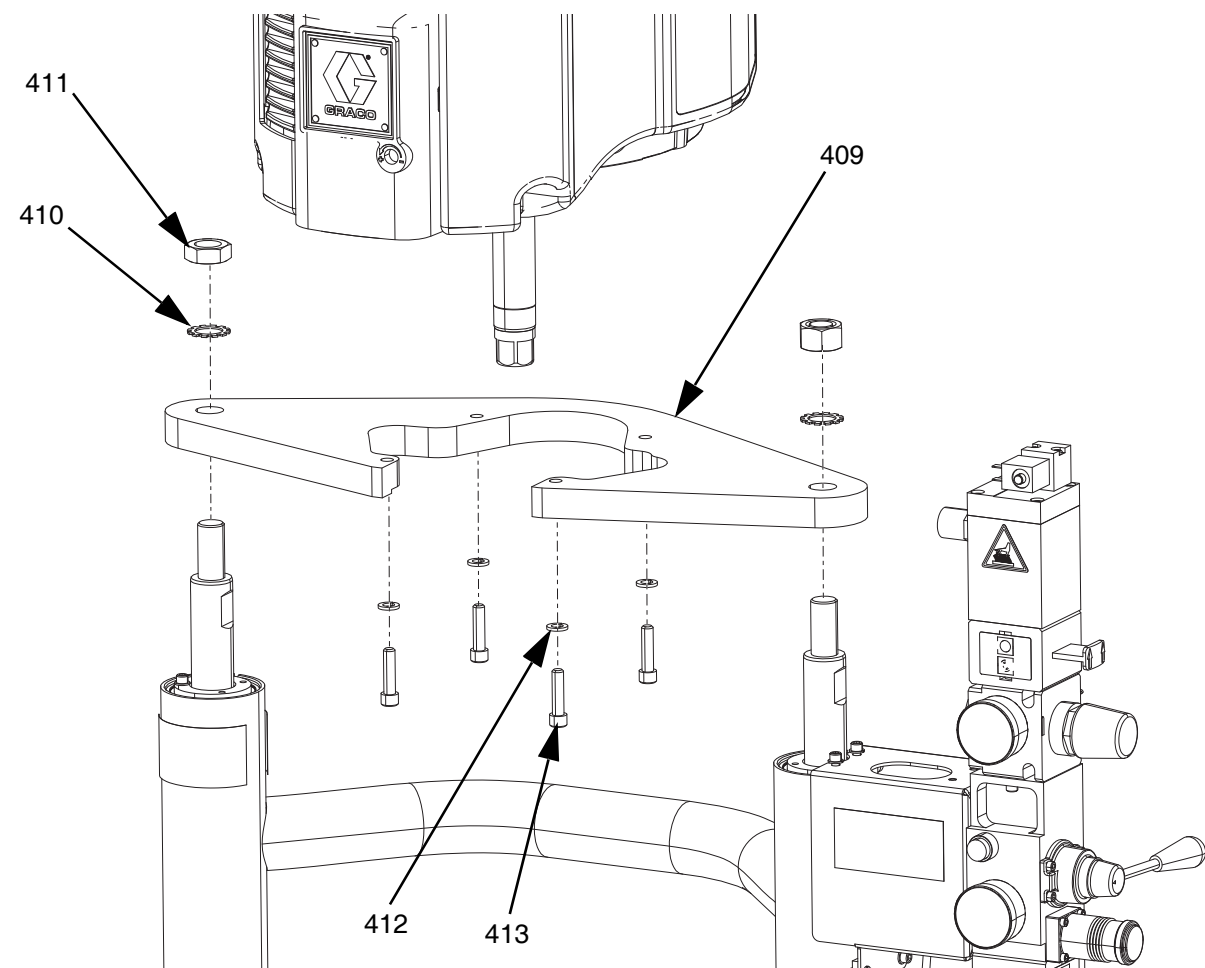
D200, D200s Pump Mounts for 55 Gallon (200 Liter) Platen

Note: See page 59 for kit configuration table.



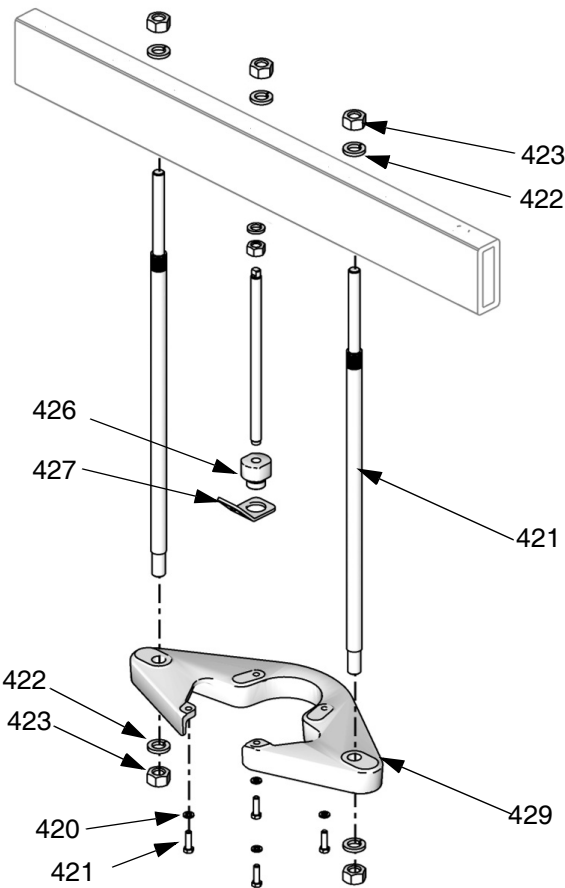
Ref.	Part	Description	Qty.
401	15M531	ROD, platen	2
402	101015	WASHER, lock	2
403	C19187	NUT	2
404	101533	WASHER, spring lock	2
405	101535	NUT	2
406	---	ROD, threaded	1
407	15J991	ADAPTER, lift, ring	1
408	15J993	RING, lift, plate	1

D60 Pump Mount for 5 Gallon (20 Liter) Platen



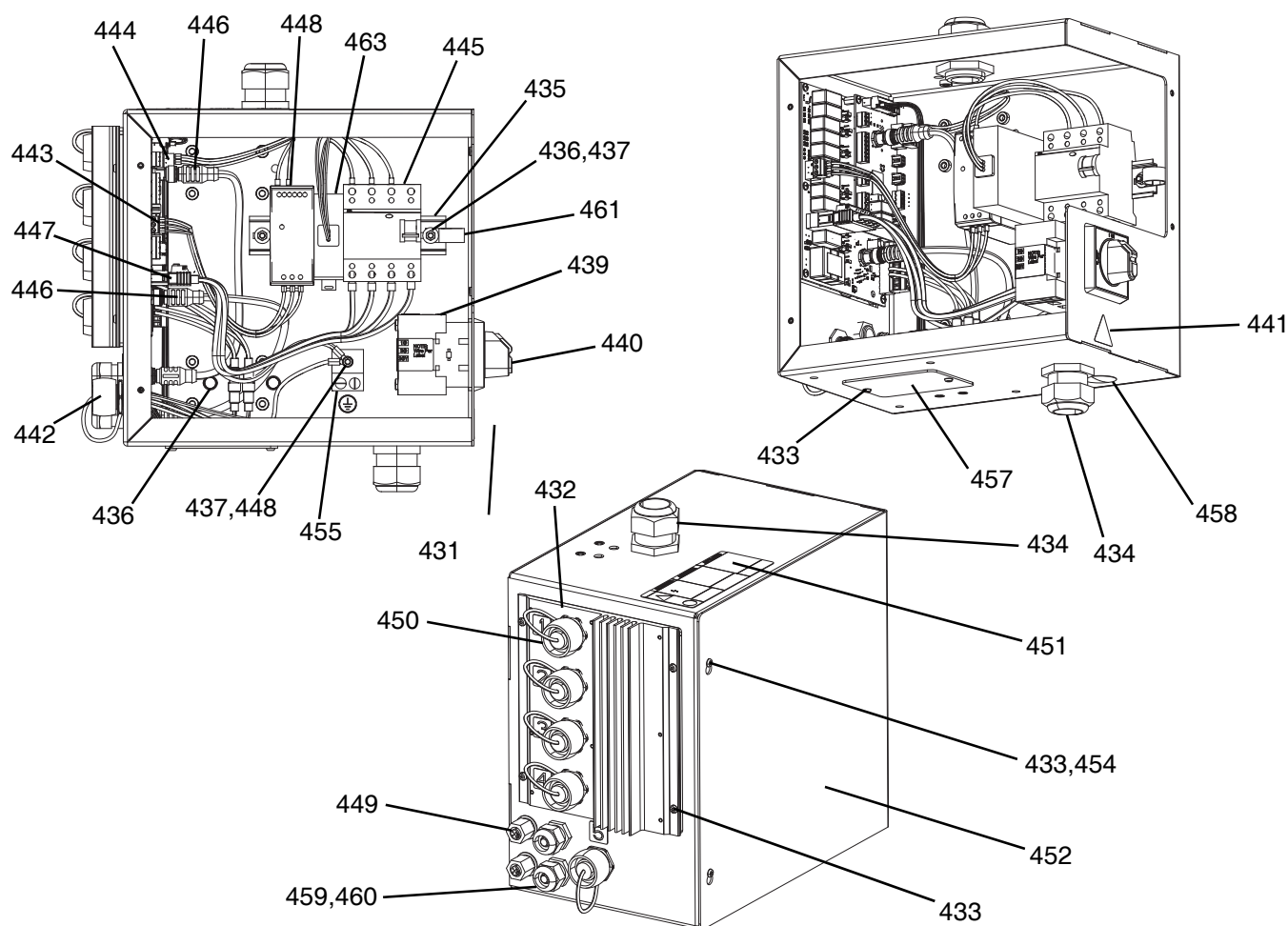
Ref.	Part	Description	Qty.
409	---	BRACKET, shelf	1
410	101533	WASHER, spring lock	2
411	101535	NUT	2
412	100133	WASHER, lock	4
413	110141	SCREW	4

D200s Pump Mounts for 16 Gallon (60 Liter) Platens



Ref.	Part	Description	Qty.
421	15M298	ROD, tie bar, shelf	2
422	101533	WASHER, lock	4
423	101535	NUT, hex	4
424	---	BRACKET, shelf	1
425	100133	WASHER, lock	4
426	---	SCREW, cap, hex hd	4
427	---	ROD, threaded	1
428	---	ADAPTER, lift, ring	1
429	---	RING, lift, plate	1

Heat Control Box



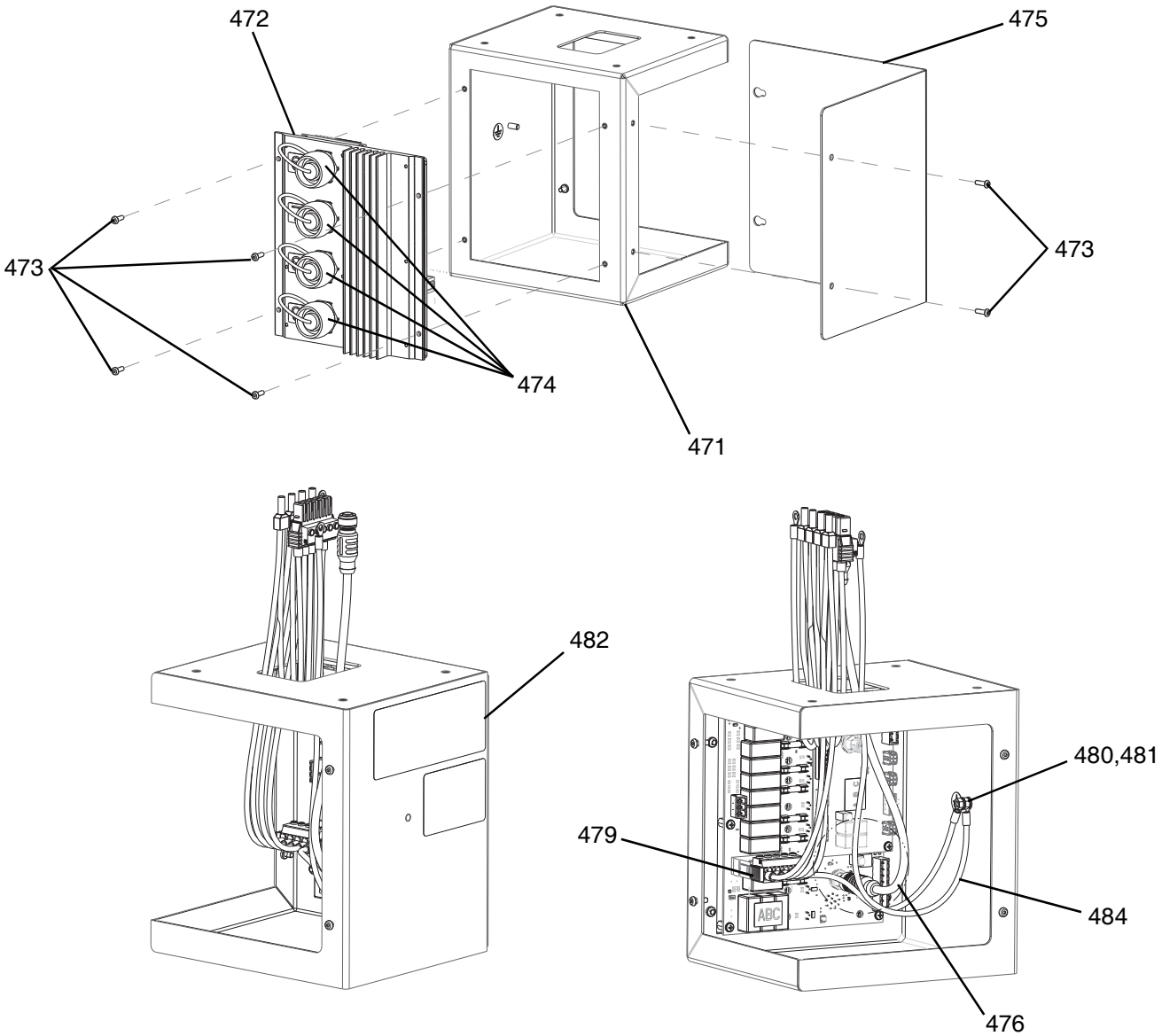
Ref.	Part	Description	Qty.
431	---	ENCLOSURE, electrical, heat, painted	1
432	26B438	KIT, repair, AMZ, TOF warm melt	1
433	116595	SCREW, M4	10
434	117682	BUSHING, strain relief	2
435	514014	RAIL, mt.	0.6'
436	112776	WASHER, plain	2
437	110911	NUT, hex	4
438	126453	POWER SUPPLY, 24V	1
439	123967	KNOB, operator disconnect	1
440	---	SWITCH, disconnect	1
441▲	15G303	LABEL, warning, electrical	1
442	25R652	HARNESS, heat, control	1
443	---	HARNESS, power, heat	1
444	---	HARNESS, 24V, heat	1
445	---	CIRCUIT, breaker	1
446	121000	CABLE, can	2
447	15N079PKG	HARNESS, power, AMZ	1
448	111307	WASHER, lock, external	5
449	121612	CONNECTOR	2
450	16T440	CAP	5

Ref.	Part	Description	Qty.
451▲	19B283	LABEL, danger, multiple, control, heat	1
452	---	COVER, electrical, heat, painted	1
453	105334	NUT, lock, hex	4
454	125946	PLUG, hole	2
455	117666	TERMINAL, ground	1
456	---	CONTACT, auxiliary, disconnect	1
457	---	PLATE, cover, enclosure, painted	1
458	15U544	PLUG, hole	1
459	114421	BUSHING, strain relief	2
460	---	PIN, dowel	2
461	123601	CLAMP, wire, harness, nylon	1
462	---	LABEL, identification	1
463*	132971PKG	FILTER, 240VAC, 3phase	1

▲ Replacement safety labels, tags, and cards are available at no cost.

* *Parts for 480V Rams only.*

Expansion Module, 26B238



Ref.	Part	Description	Qty.
471	---	ENCLOSURE, expansion, heat, painted	1
472	26B348	KIT, repair, AMZ, TOF warm melt	1
473	116595	SCREW, M4	8
474	16T440	CAP	1
475	---	COVER, expansion, painted	1
476	121000	CABLE, can	1
477*	121518	SCREW, cap	4
478*	108050	WASHER, lock, spring	4
479	18C767PKG	HARNESS, power, heat, expansion	1

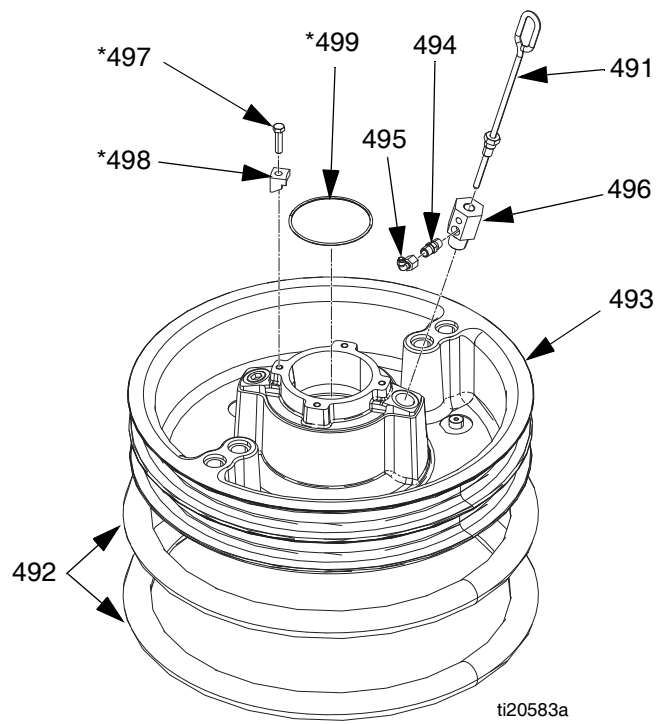
Ref.	Part	Description	Qty.
480	110911	NUT, hex	2
481	111307	WASHER, lock, external	2
482▲	18C768	LABEL, danger, multiple, control, heat	1
483*	114225	TRIM, edge protection	0.75
484	---	HARNESS, ground, heat	1

▲ Replacement safety labels, tags, and cards are available at no cost.

* Not shown.

55 Gallon Platen, 255663

200 Liter (55 Gallon) Platen



200 Liter (55 Gallon) Platen Parts

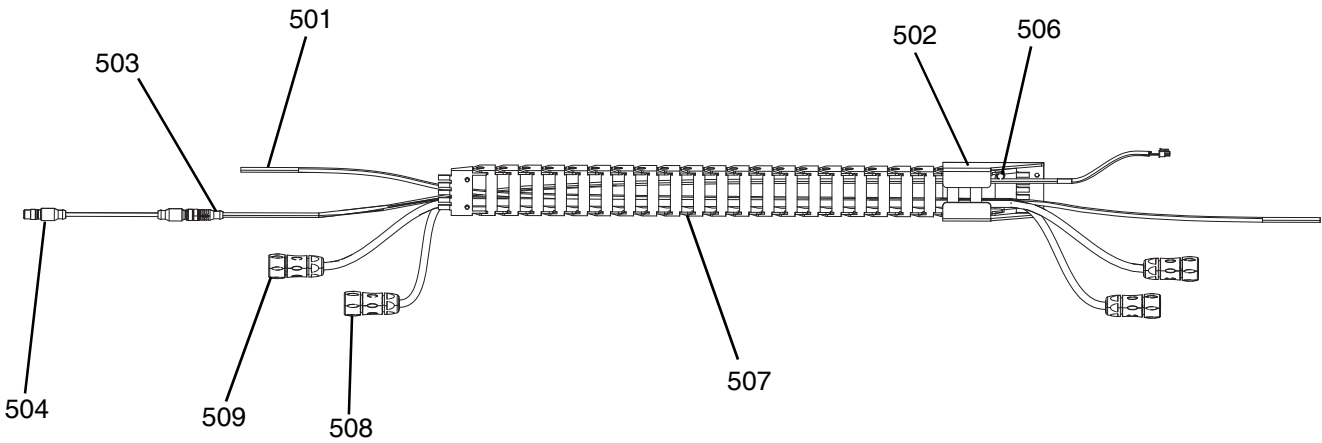
Ref.	Part	Description	Qty.
491	257697	HANDLE, bleed assy	1
492	255653	SEAL, wiper, drum, 55 gal., EPDM	2
493	256663	PLATE, ram 55 gal.	1
	---	PLATE, ram 55 gal., PTFE	1
494	122056	VALVE, check, 1/4, for 255662 and 255663 only	1
495	C20350	FITTING, TUBE, quick disconnect	1
496	---	ADAPTER, for 255663, 255664, and 25N344	1
	16W974	ADAPTER, for 255662 only	1
497*⌘	102637	SCREW, cap	4
498*⌘	---	CLAMP	4
499*⬥	109495	O-RING	1

* Parts included in 255392 Kit (purchase separately).

⌘ Parts not included with 255662, 663, and 664.

⬥ Parts not included with 25N344.

Cable Track Assemblies



Ref.	Part	Description	Qty.
501	C12509	TUBE, nylon, round	17.5'
502	15N075PKG	BRACKET, track, cable, painted	1
503	15N063PKG	HARNESS, switch, reed, AMZ	1
504	17C255	CABLE, M12	1
505*	C38321	TIE, cable	6
506	128670	BOLD FLANGE HD, serrated	8
507	---	CABLE, track	1
508	25R662	HARNESS, heat, paten/pump, 10' (for heated D60 rams only)	1
	25R664	HARNESS, heat, paten/pump, 14' (for heated D200 and D200s rams only)	
509	25R663	HARNESS, heat, paten/pump, 12' (for heated D60 rams only)	1
	25R665	HARNESS, heat, paten/pump, 16' (for heated D200 and D200s rams only)	

* Not shown.

20 Liter (5 Gallon) Platens

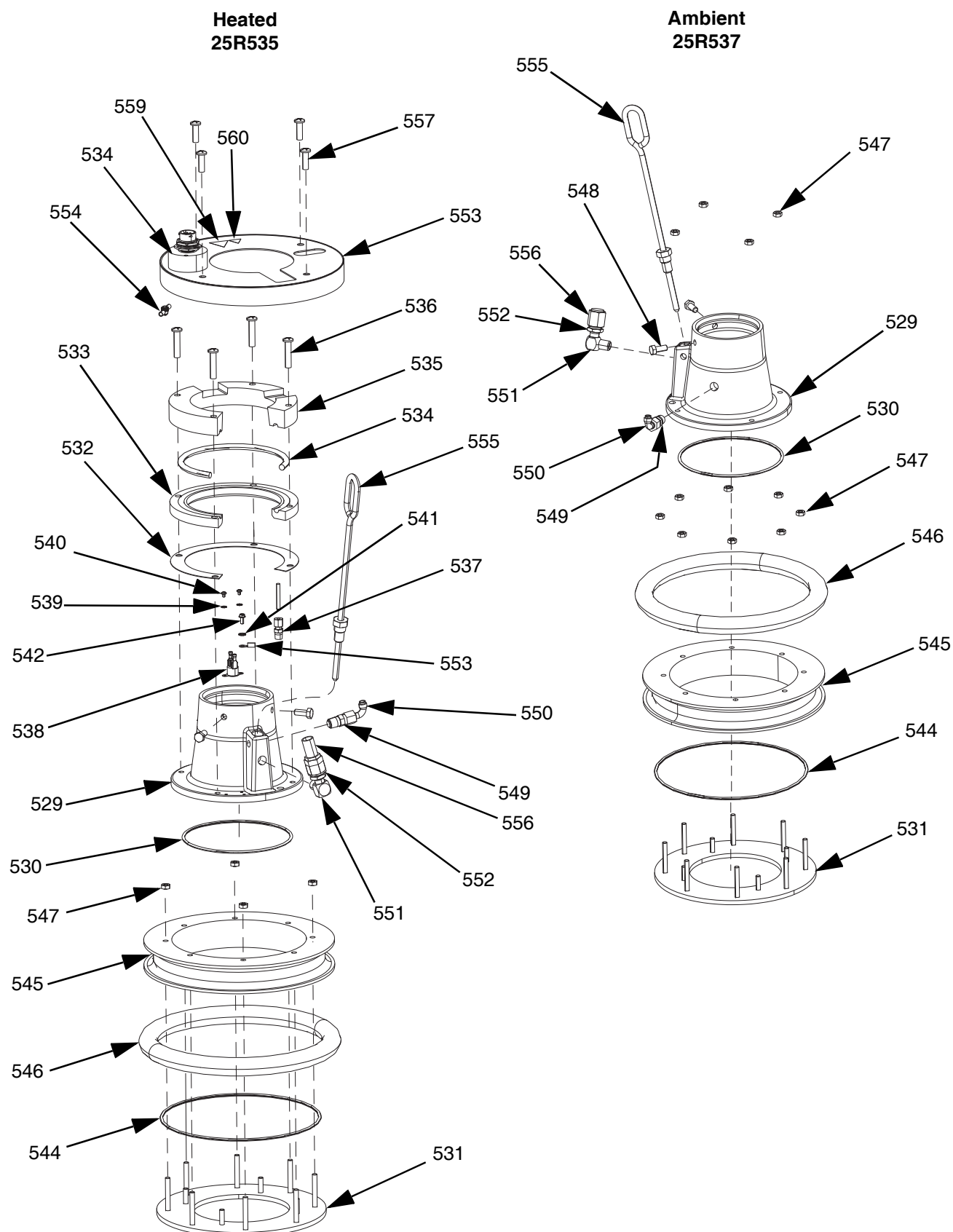


FIG. 55: Single and Double Wiper Assemblies

20 Liter (5 Gallon) Platen Parts, Heated (25R535)

Ref.	Part	Description	Qty.
529	---	BASE, platen, heated, recharge	1
530	121829	O-RING, packing	1
531	---	PLATE, btm, 20 30L platen, warm melt	1
532	16C499	GASKET, heat transfer, D60, warm melt	1
533	---	PLATE, heater, lower, D60 warm melt	1
534	25R653	HARNESS, heat, wiper, 5 gallon	1
535	---	PLATE, heater, upper, D60 warm melt	1
536	123744	SCREW	4
537	---	FITTING	1
538	---	SWITCH, over-temperature	1
539	103181	WASHER, lock external	2
540	104714	SCREW	2
541	111307	WASHER, lock, external	4
542	111593	SCREW	1
543	---	HARNESS, ground, 14AWG, 12" long	1
544	17T371	SEAL	1
545	---	PLATE	1
546	25R654	SEAL, drum, wiper, 5 gallon, neoprene	1
	25R656	SEAL, drum, wiper, 5 gallon, EPDM	1
547	113504	NUT	8
548	100057	SCREW	2
549	122056	VALVE, check	1
550	C20350	FITTING, elbow 90°	1
551	100840	FITTING, elbow, street	1
552	121310	FITTING, connector	1
553	---	COVER, wiper, 5 gallon, heated, painted	1
554	110911	NUT	1
555	257697	HANDLE, bleed, SST, assembly	1
556	123140	FITTING	1
557	132371	SCREW	4
558*	109482	PACKING, o-ring	1
559▲	15K616	LABEL, caution	1
560▲	189930	LABEL, caution	1

▲ Replacement safety labels, tags, and cards are available at no cost.

* Not shown.

20 Liter (5 Gallon) Platen Parts, Ambient (25R537)

Ref.	Part	Description	Qty.
529	---	BASE, platen, heated, recharge	1
530	121829	O-RING, packing	1
531	---	PLATE, btm, 20 30L platen, warm melt	1
544	17T371	SEAL	1
545	---	PLATE	1
546	25R656	SEAL, drum, wiper, 5 gallon, EPDM	1
547	113504	NUT	12
548	100057	SCREW	2
549	122056	VALVE, check	1
550	C20350	FITTING, elbow 90°	1
551	100840	FITTING, elbow, street	1
552	121310	FITTING, connector, NPT x JIC	1
555	257697	HANDLE, bleed, SST, assembly	1
556	123140	FITTING, cap, 1/2 JIC, CS	1
558*	109482	PACKING, o-ring	1

* Not shown.

60 Liter (16 Gallon) Platens

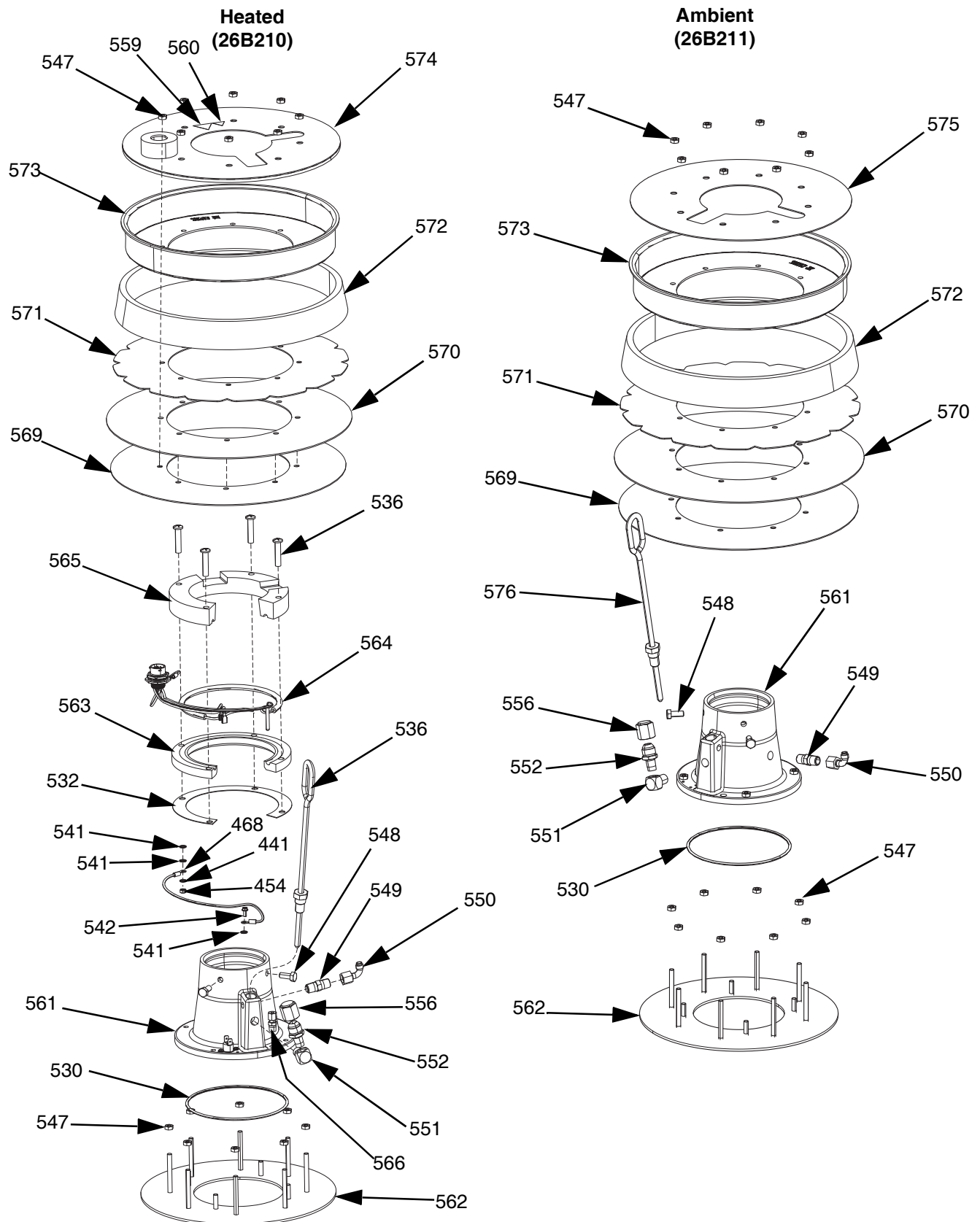


FIG. 56: Single and Double Wiper Assemblies

**60 Liter (16 Gallon) Platen Parts, Heated
(26B210)**

Ref.	Part	Description	Qty.
561	---	BASE, platen, heated, recharge	1
530	121829	O-RING, packing	1
562	---	PLATE, bottom, platen	1
532	16C499	GASKET, heat transfer, D60, warm melt	1
563	---	PLATE, heater, lower, D60, warm melt	1
564	25R653	HARNESS, heat, wiper, 5 gal	1
565	---	PLATE, heater, upper, D60, warm melt	1
536	123744	SCREW	4
566	---	FITTING, 1/8" NPT	1
567	15B137	SWITCH, over temperature	1
539	103181	WASHER, lock external	2
540	104714	SCREW	2
541	111307	WASHER, lock, external	4
542	111593	SCREW	1
569	257683	KIT, wiper, PE support	1
570	257677	KIT, wiper, main	1
571	257691	KIT, wiper, support	1
572	257684	KIT, spacer	1
573	257685	KIT, clamp, retaining	1
547	113504	NUT	16
548	100057	SCREW, cap	2
549	122056	VALVE, check	1
550	C20350	FITTING, elbow 90 deg	1
551	100840	FITTING, elbow, street	1
552	121310	FITTING, connector, NPT x JIC	1
556	123140	FITTING, CAP, 1/2 JIC, cs	1
574	---	COVER, wiper, 60L, heated	1
560▲	189930	LABEL, caution	1
559▲	15K616	LABEL, caution	1
554	110911	NUT, hex	1
576	257697	HANDLE, bleed, stainless steel, assembly	1
558*	109482	PACKING, o-ring	1
577	---	SEALANT, pipe, stainless steel	1
578	---	LUBRICANT, grease	1
579	---	LUBRICANT, grease	1

▲ Replacement safety labels, tags, and cards are available at no cost.

* Not shown.

**60 Liter (16 Gallon) Platen Parts, Ambient
(26B211)**

Ref.	Part	Description	Qty.
561	---	BASE, platen, heated, recharge	1
530	121829	O-RING, packing	1
562	---	PLATE, bottom, platen	1
547	113504	NUT	20
569	257683	KIT, wiper, PE support	1
570	257677	KIT, wiper, main	1
571	257691	KIT, wiper, support	1
572	257684	KIT, spacer	1
573	257685	KIT, clamp, retaining	1
548	100057	SCREW, cap	2
549	122056	VALVE, check	1
550	C20350	FITTING, elbow 90 deg	1
551	100840	FITTING, elbow, street	1
552	121310	FITTING, connector, NPT x JIC	1
556	123140	FITTING, CAP, 1/2 JIC, cs	1
575	---	COVER, wiper, 60L	1
576	257685	HANDLE, bleed, sst, assy	1
558*	109482	PACKING, o-ring	1
577	---	SEALANT, pipe, sst	1
578	---	LUBRICANT, grease	1
579	---	LUBRICANT, grease	1

* Not shown.

Kits and Accessories

Accessories are available from Graco. Make certain all accessories are adequately sized and pressure-rated to meet the system’s requirements.

System Kits and Accessories

Light Tower Kit, 255468

For D200s, D200, and D60 single supply systems.

200 Liter (55 Gallon) Platen Cover Kits, 255691

See the Platen Cover Kit manual for more information.

ADM Kit, 26B363

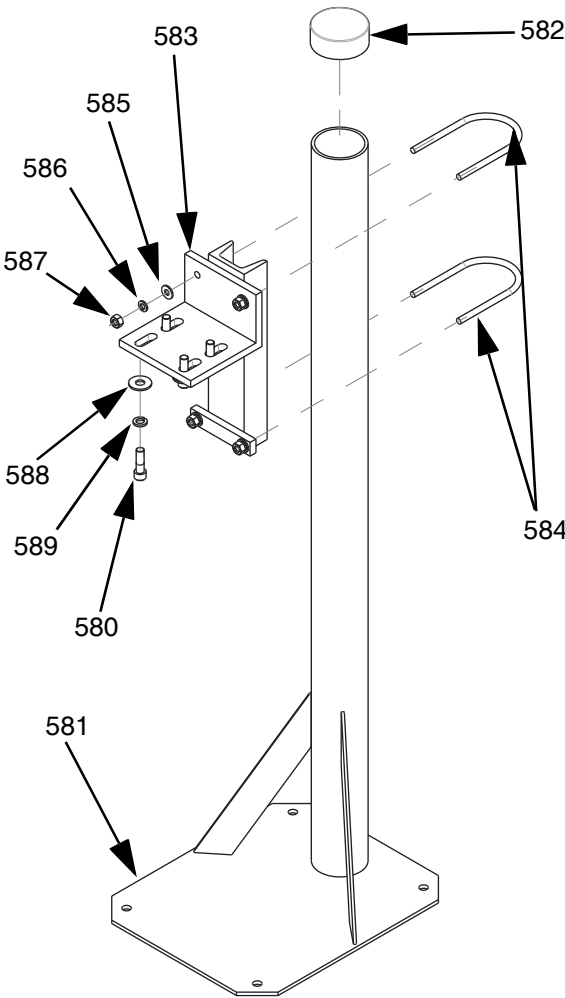
Part	Description	Qty.
---	MODULE, gca, adm	1
18A258	TOKEN, gca, upgrade, WM	1

Enclosed Wet Cup Recirculation Kit

See the Enclosed Wet Cup Recirculation Kit manual for more information.

Tandem Block Stand, 26B177

For use with tandem systems only.



Ref.	Part	Description	Qty.
581	---	SUPPORT, stand	1
582	---	CAP PLUG, vinyl	1
583	---	BASE, mounting	1
584	C30021	BOLT, u	2
585	100023	WASHER, flat	4
586	100133	WASHER, lock	4
587	100131	NUT	4
588	101044	WASHER, plain	4
589	100018	WASHER, lock, spring	4
580	117638	SCREW	4

To install the Tandem Block Stand:

1. Use the holes in the Tandem Block Stand support (581) as a guide and drill holes for 1/2 in. (13 mm) anchors.
2. Secure the support (581) to the floor using 1/2 in. (13 mm) anchors that are long enough to prevent the Tandem Block Stand from tipping.
3. Attach the Heated Tandem Block to the Tandem Block Stand mounting base (583) using the supplied screws (580). The warning labels should be pointing away from the stand so they are visible after attaching the Heated Tandem Block.

Drum Kits and Accessories

Drum Roller Kits for D200 and D200S Rams, 255627

See the Drum Roller Kit manual for more information.

Drum Position Clamp Set for D200 Rams, 206537

Includes two clamps.

Platen/Pump Heat Harness

Part	Description	Length
25R662	HARNESS, heat, platen/pump	3.0 m
25R663	HARNESS, heat, platen/pump	3.7 m
25R664	HARNESS, heat, platen/pump	4.3 m
25R665	HARNESS, heat, platen/pump	4.9 m

Fittings

Part	A	B	Pressure Rating
15M805*	1 in. NPT Male	3/4 in. NPT Male	5400 psi
124903*	3/4 in. NPT Female	#8 JIC Male	5000 psi
130992	1 in. NPT Male	#10 JIC Male	4500 psi
123135	1 in. NPT Male	#12 JIC Male	5000 psi
123854	1 in. NPT Male	#16 JIC Male	5000 psi
15D936	1 in. NPT Male	#20 JIC Male	3500 psi

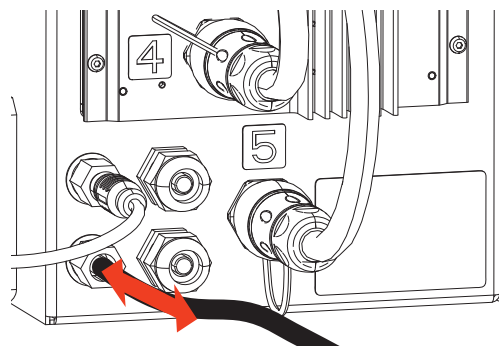
NOTE: 15M805 and 124903 are used together to go from 1 in. NPT male to #8 JIC.

Tandem Cable Kit, 26B339

Part	Description	Qty.
123653	CABLE, CAN	1
123856	HARNESS, CAN cable	1
15G476	LABEL, A-B identification	1
123680	CABLE, CAN	1

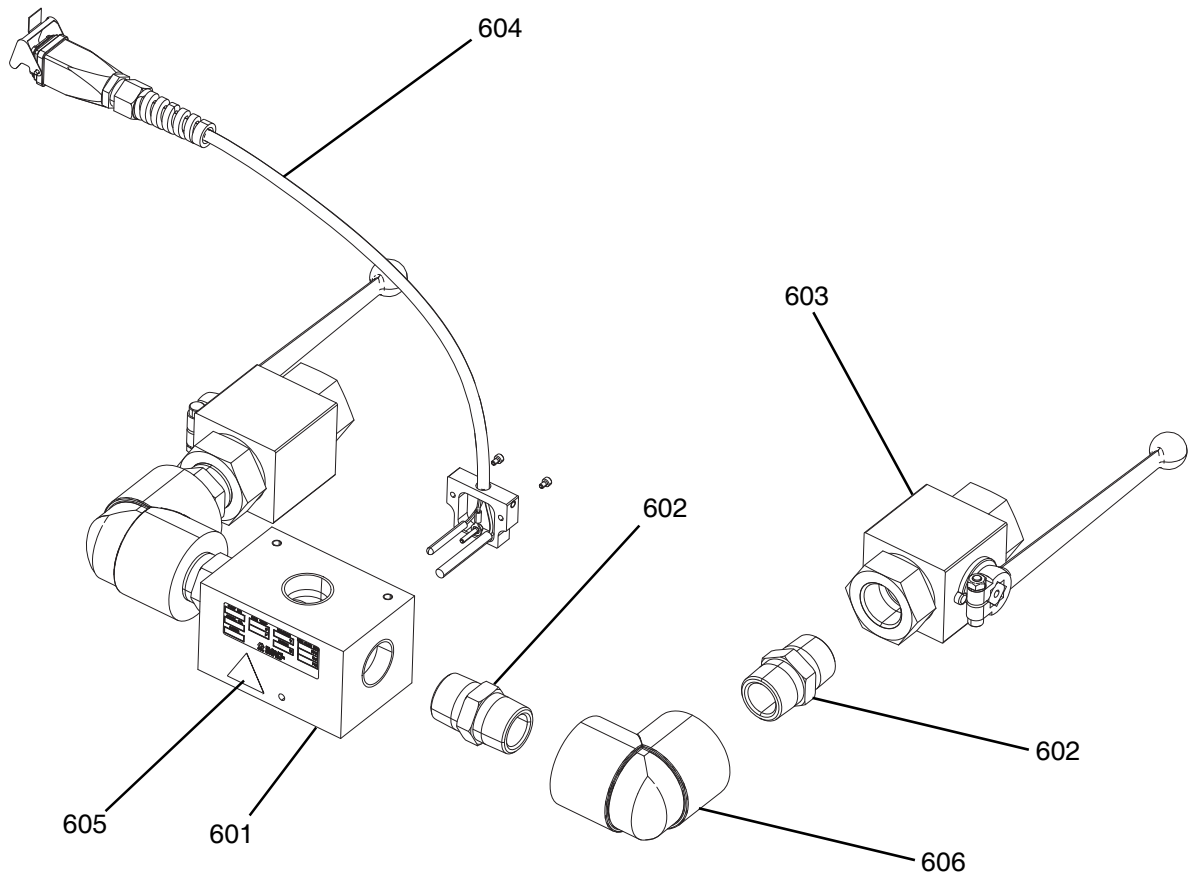
To install the Tandem Cable Kit:

1. Add the "A" label (15G476) onto the Ram with an ADM installed.
2. Add a "B" label (15G476) onto the Ram that does not have an ADM installed.
3. Connect one end of the Tandem Cable to the lower port on the back of the Heat Control Box (S) on Unit A as shown below.



4. Connect the other end of the Tandem Cable to the top port on the back of the Heat Control Box (S) on Unit B.

Heated Tandem Block, 26B346



Ref.	Part	Description	Qty.
601	---	BLOCK, 3 way, cs, 1" NPT	1
602	C38302	FITTING, nipple, cs, 1" NPT	4
603	521477	VALVE, ball 1"	2
604	24E413	KIT, heat, PGM, inlet	1
605▲	15K616	LABEL, caution	1
606	C19441	FITTING, elbow	2

▲ Replacement safety labels, tags, and cards are available at no cost.

Check-Mate 200 CS Pump Heater Kit, 25R450

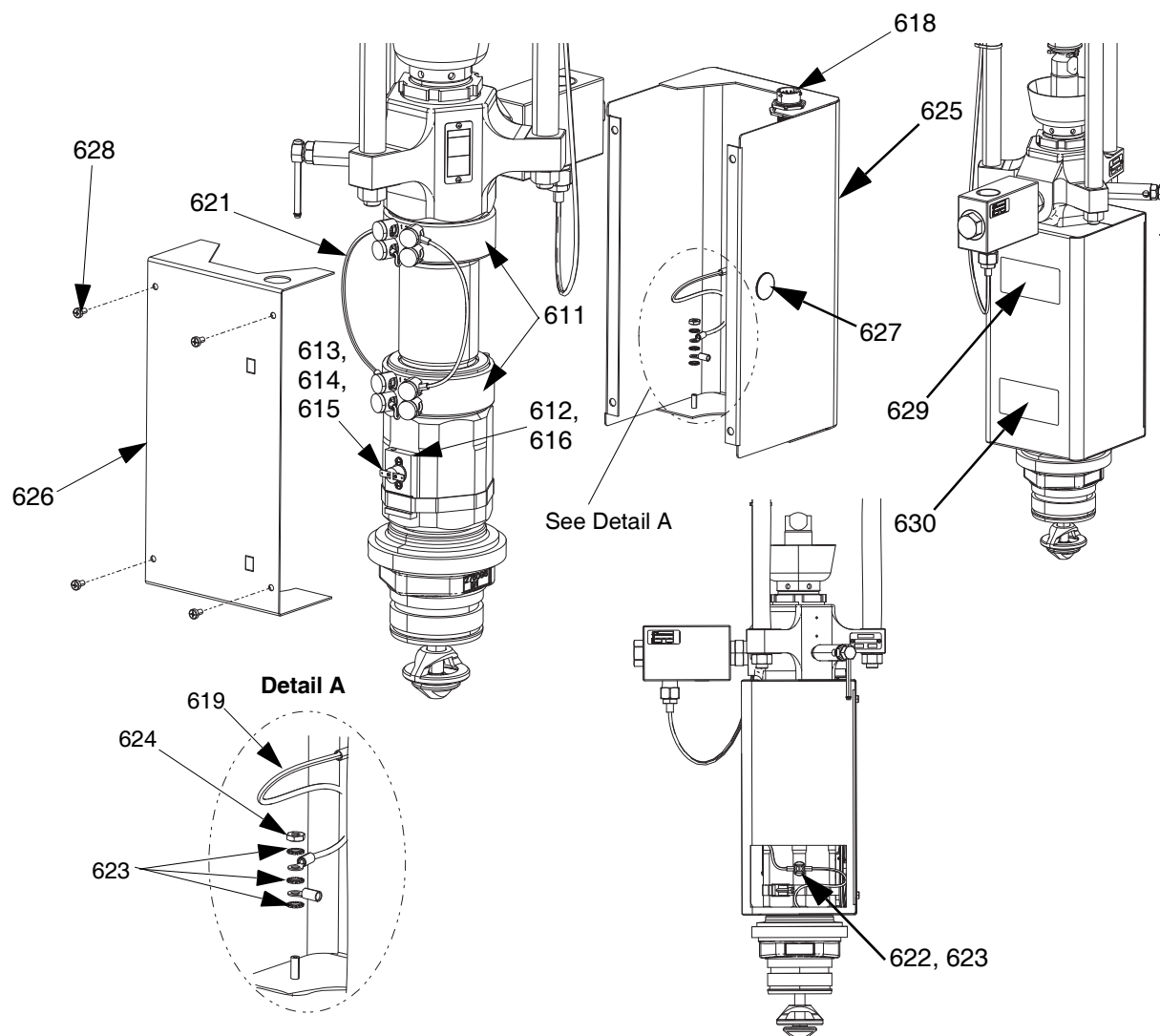


FIG. 57: Check-Mate 200 CS Pump Heater Kit, 25R450

Ref.	Part	Description	Qty.
611	121980	HEATER, pump, 725 watt	2
612	---	HOLDER, rtd, overtemp	1
613	16K094	SWITCH, overtemp, horizontal	1
614	103181	WASHER	2
615	104714	SCREW	2
616	102273	SCREW	1
617	C31012	CLAMP	1
618	25R660	HARNESS, heater, pump, rtd, overtemp	1
619	---	HARNESS, ground	2
620	---	HARNESS, heater, pump #1	1
621	---	HARNESS, heater, pump #2	1

622	116343	SCREW	1
623	111307	WASHER	7
624	100166	NUT	2
625	15W706	ENCLOSURE, pump, front	1
626	25R658	COVER, enclosure, pump, heat	1
627	---	PLUG	1
628	110637	SCREW	4
629▲	15J075	LABEL, safety, hot surface and energized	1
630▲	17V667	LABEL, safety, warning, amputation	1

▲ Replacement safety labels, tags, and cards are available at no cost.

Platen Heater Kit, 25R451

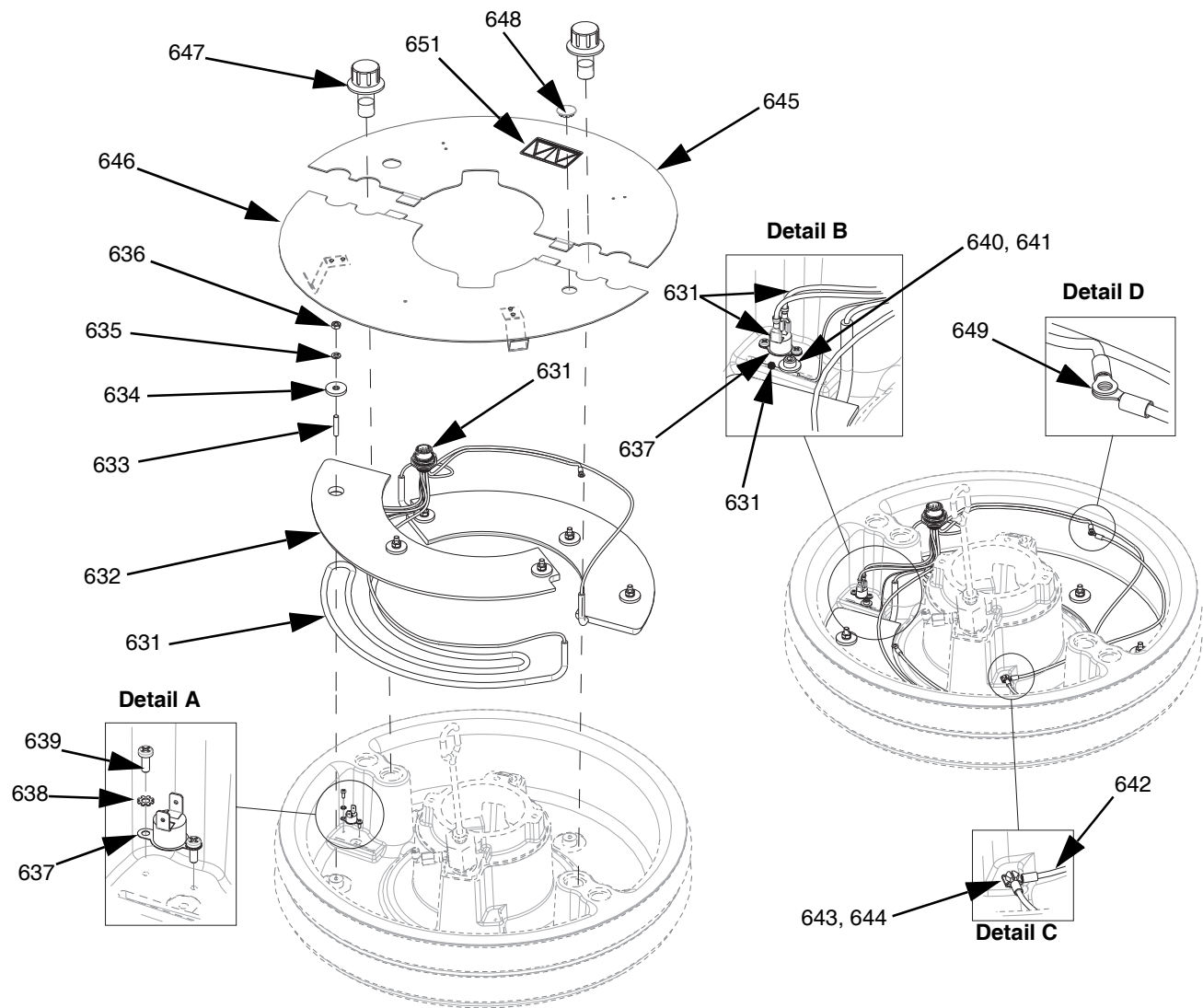


FIG. 58: Platen Heater Kit, 25R451

Ref.	Part	Description	Qty.
631	25R666	HARNESS, heat, wiper, 55 gallon	1
632	---	CONDUCTOR, block, heater	2
633	---	STUD	6
634	---	WASHER, flat	6
635	---	WASHER, lock	6
636	100015	NUT	6
637	15B137	SWITCH, over temperature	1
638	103181	WASHER	2
639	124131	SCREW	2
640	---	WASHER	1
641	117026	SCREW	1

642	---	HARNESS, ground, 14awg, 18" long	1
643	---	WASHER	7
644	116343	SCREW	1
645	---	COVER, platen, heated, rear	1
646	---	COVER, platen front, assy	1
647	---	FASTENER, platen, cover	2
648	---	PLUG	1
649	100166	NUT	2
650	---	LUBRICANT, thermal	1
651▲	15J075	LABEL, safety, hot surface and energized	1

▲ Replacement safety labels, tags, and cards are available at no cost.

Communications Gateway Module (CGM) Kits

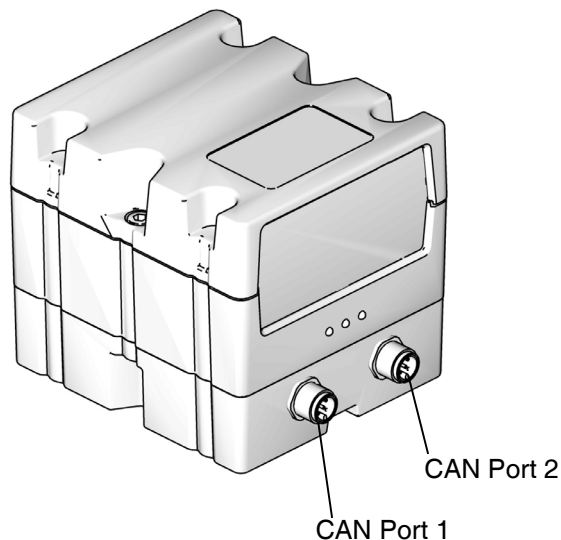


FIG. 59: CGM CAN Connections

CGM Kits

Part Number	Description	Heat Option
26B343	CGM Kit, EtherNet/IP	Heated
26B282	CGM Kit, DeviceNet	Heated
26B345	CGM Kit, PROFINET	Heated
26B344	CGM Kit, PROFIBUS	Heated

NOTE: CGM kits come with the Therm-O-Flow Warm Melt map and software installed.

Installing a CGM Kit



1. Follow the **Pressure Relief Procedure** on page 46.
2. Verify the power is off to the system.
3. Install the CGM bracket to the Ram post bracket using the four 1/4 -20 x 0.50 in. screws included with the kit.
4. Remove the access cover from the CGM (EA). Loosen the two screws (EB) and remove the CGM (EC) from the base (ED) as shown in FIG. 60.

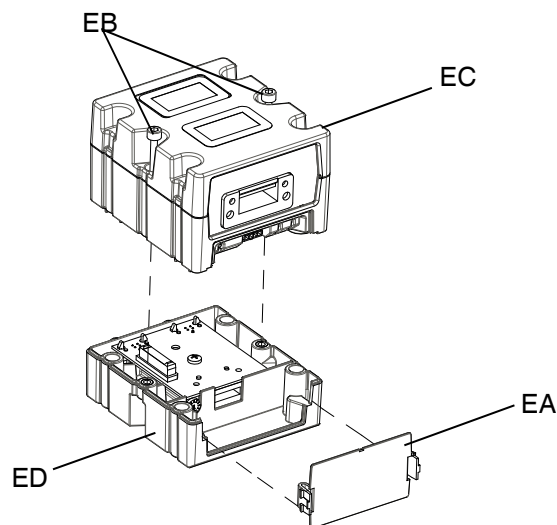


FIG. 60: Disassembling the CGM

5. Using the four M4 x .7 x 20 mm mounting screws included with the kit, mount the base (ED) to the CGM bracket.
6. Reattach the CGM (EC) on the base (ED) with the two screws (EB) that were removed in step 4.
7. Reattach the access cover (EA).
8. Unplug the cable from the ADM (E) and plug it into the CGM (EC).
9. Plug the 3.0 m cable (121003) included in the CGM kit from the CGM to the ADM.

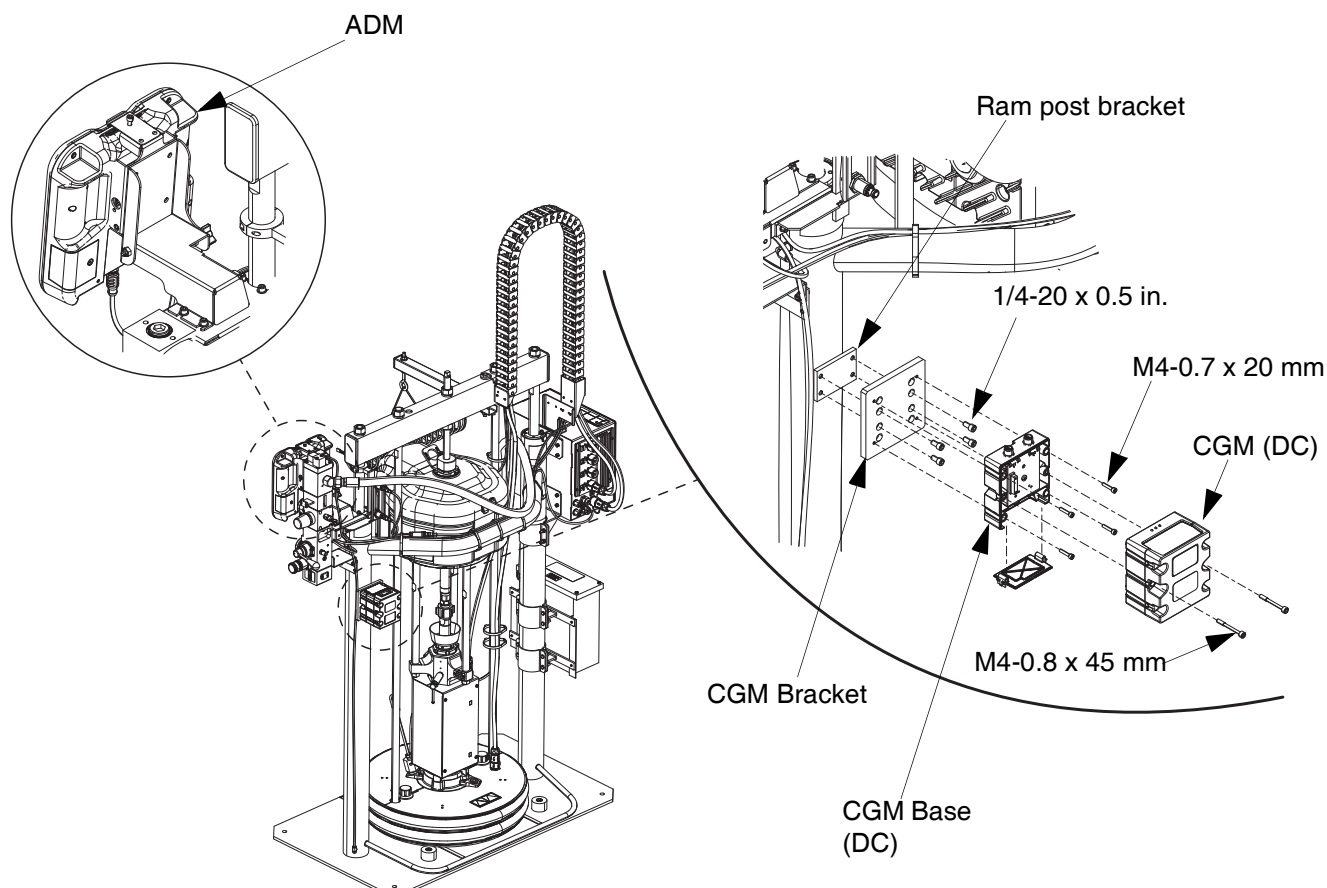


FIG. 61

10. Connect the EtherNet/IP, DeviceNet, or PRIFIBUS cable to the fieldbus connection on the CGM as applicable. See Fig. 62.

11. Connect the other end of the cable to the fieldbus device.

12. Refer to the Graco Control Architecture Module Programming manual for step-by-step instructions on how to update the software version of GCA modules. See **Related Manuals** on page 3.

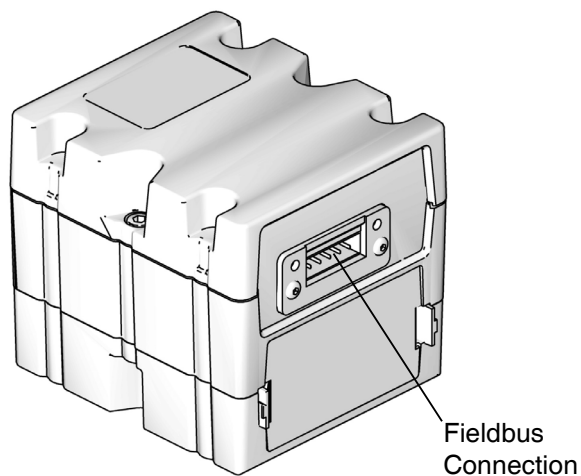
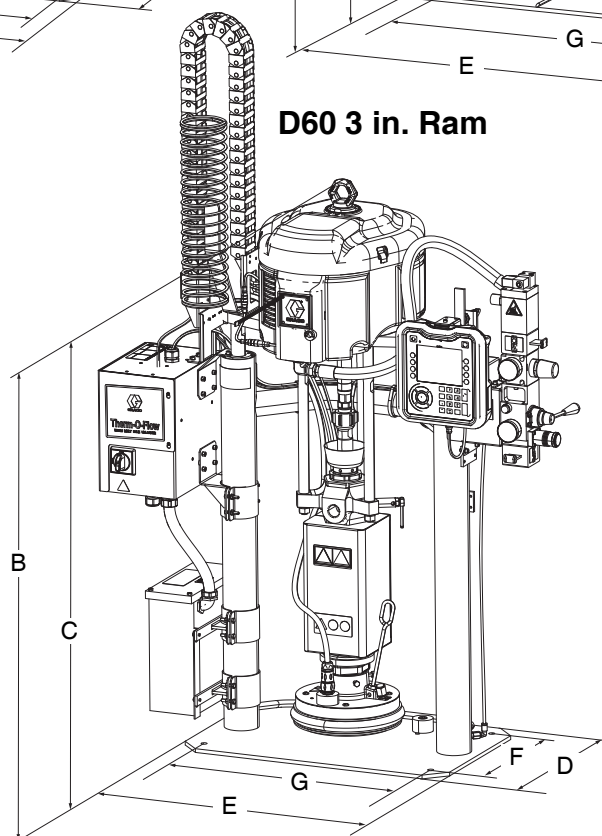
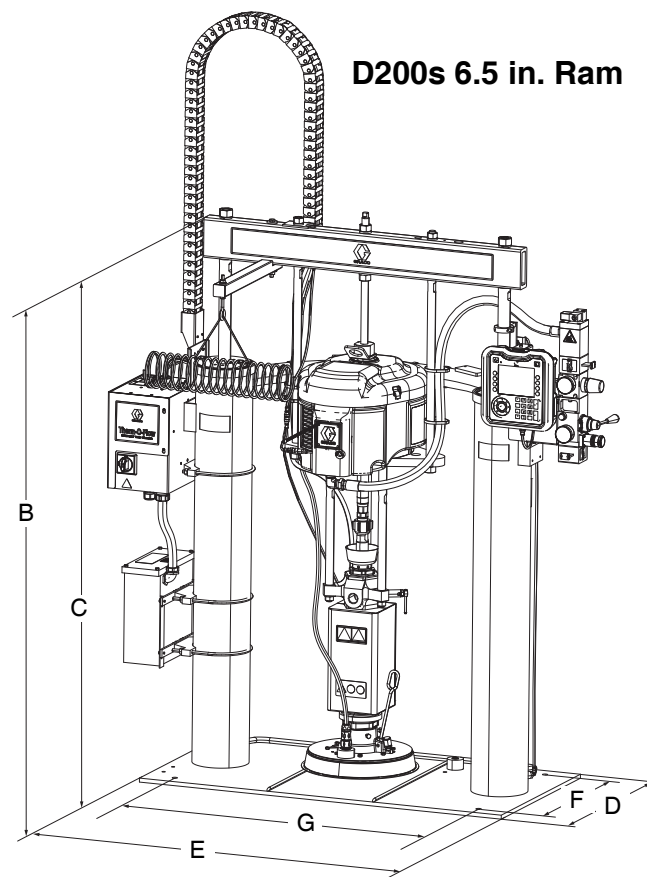
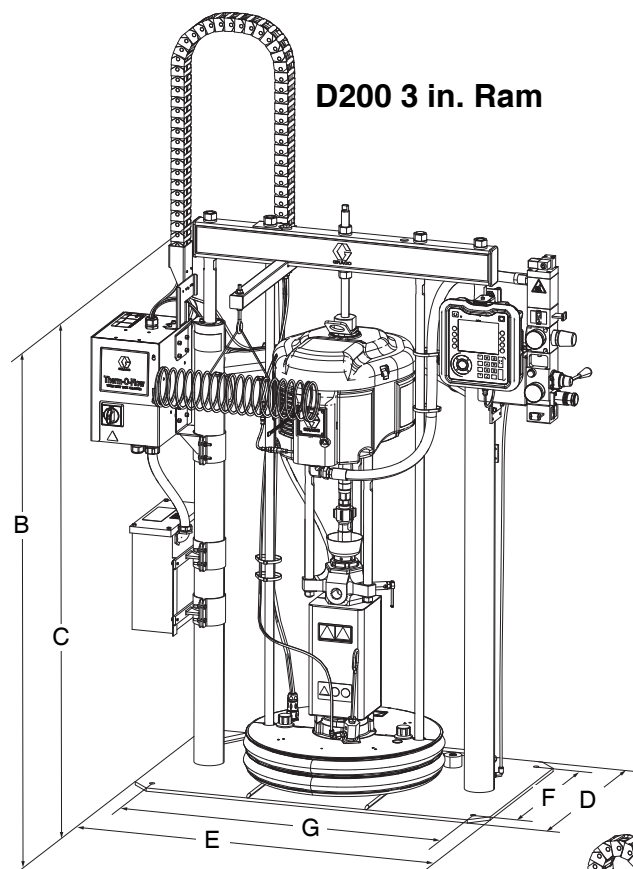


FIG. 62: CGM Fieldbus Connection

Dimensions

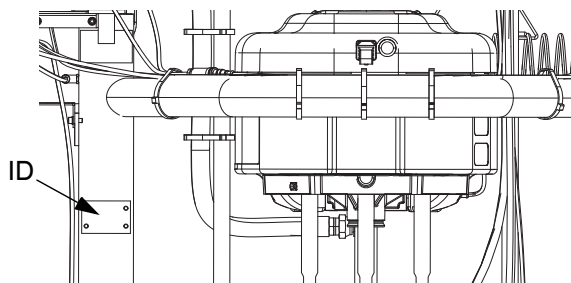


Dimensions

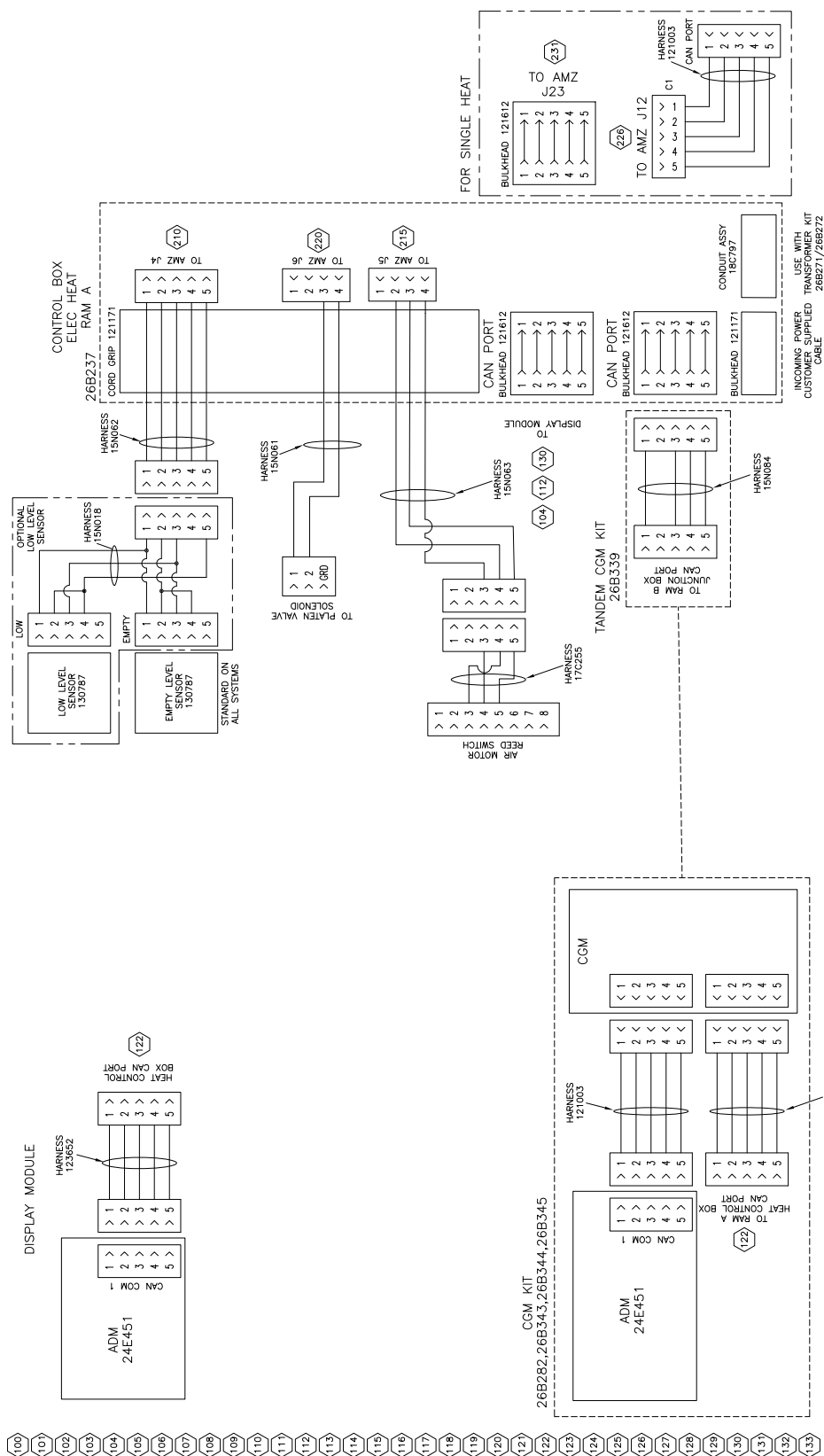
	Ram Size in. (mm)		
	D60	D200	D200s
Total Height (A)	70 (1778)	88 (2235)	96 (2438)
Ram Height (B)	57 (1448)	70 (1778)	69 (1753)
Extended Ram Height (C)	89 (2261)	118 (2997)	125 (3175)
Base Depth (D)	20 (508)	25 (635)	25 (635)
Machine Width (E)	45 (1143)	52 (1321)	45 (1143)
Mounting Hole Depth (F)	14 (356)	21 (533)	23 (584)
Mounting Hole Width (G)	24 (610)	38 (965)	45 (1143)

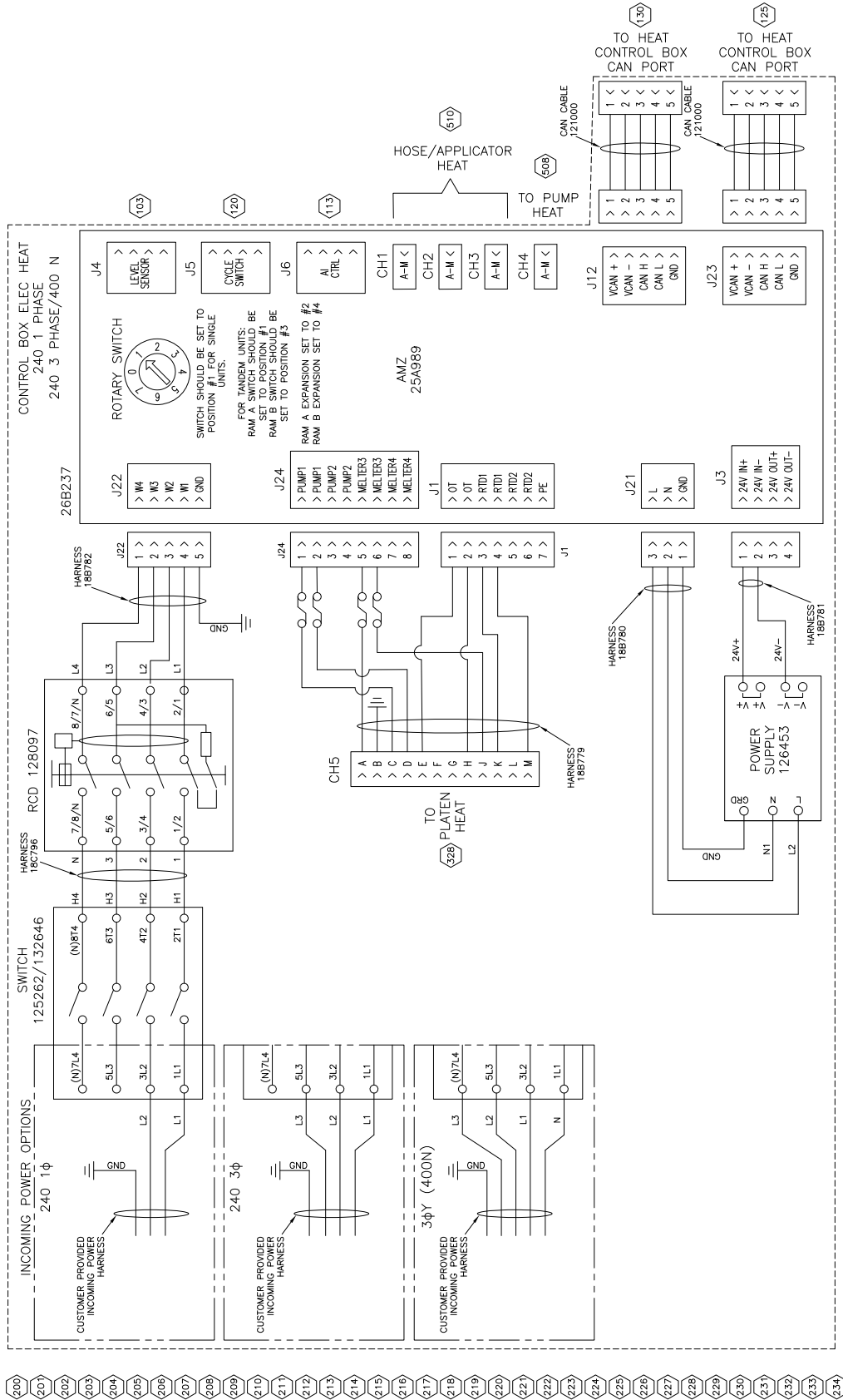
	Ram Weight lb (kg)		
	D60	D200	D200s
Heated/240V	398 (180.5)	521 (236)	802 (363.8)
Heated/480V	468 (212.3)	601 (273)	872 (395.5)

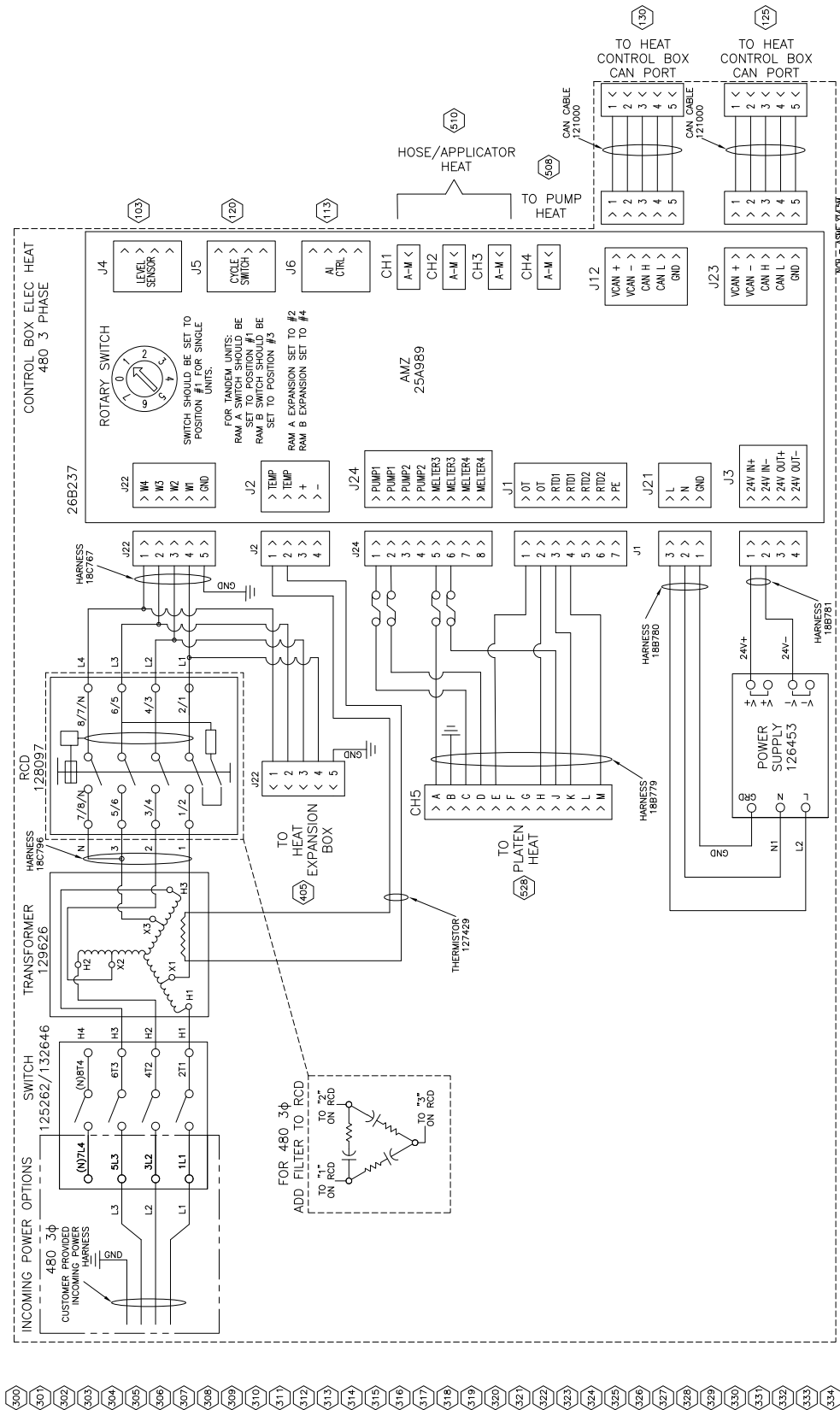
See the identification plate (ID) for the weight of your Ram.

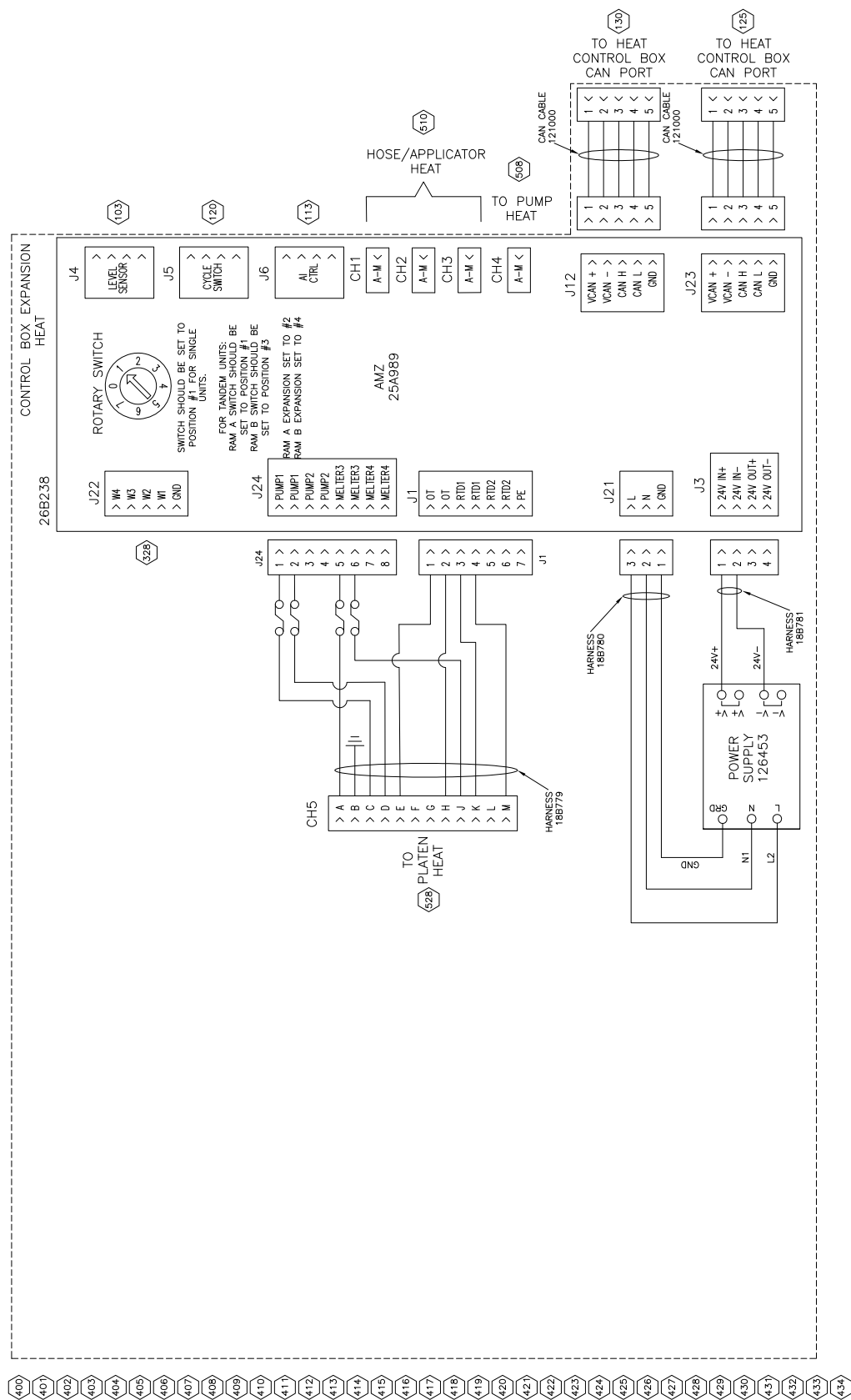


Wiring Diagrams



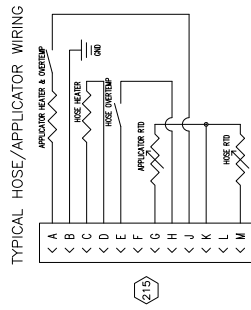
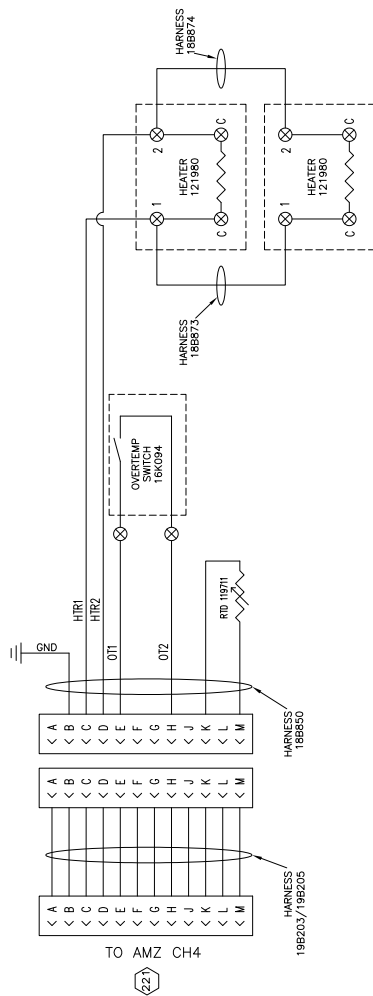






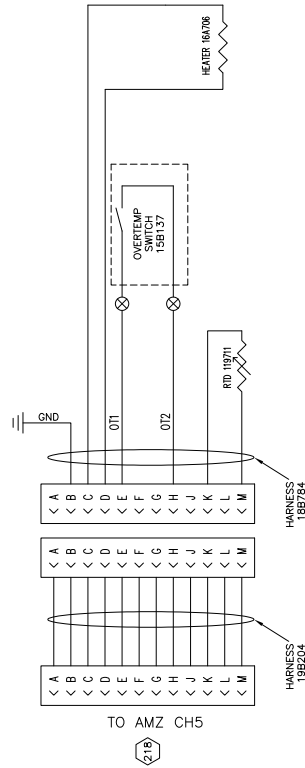
TYPICAL PUMP HEAT WIRING

500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534



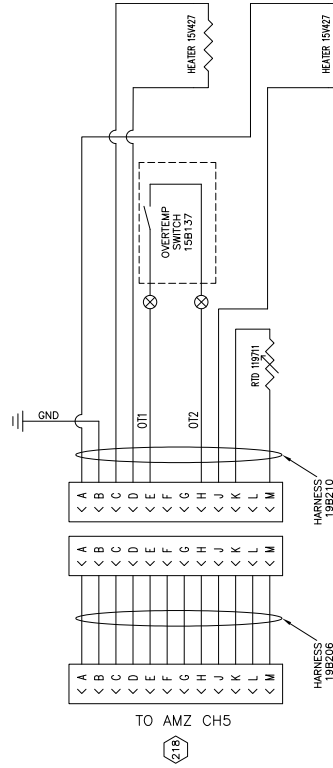
20L(5 GAL) PLATEN HEAT WIRING

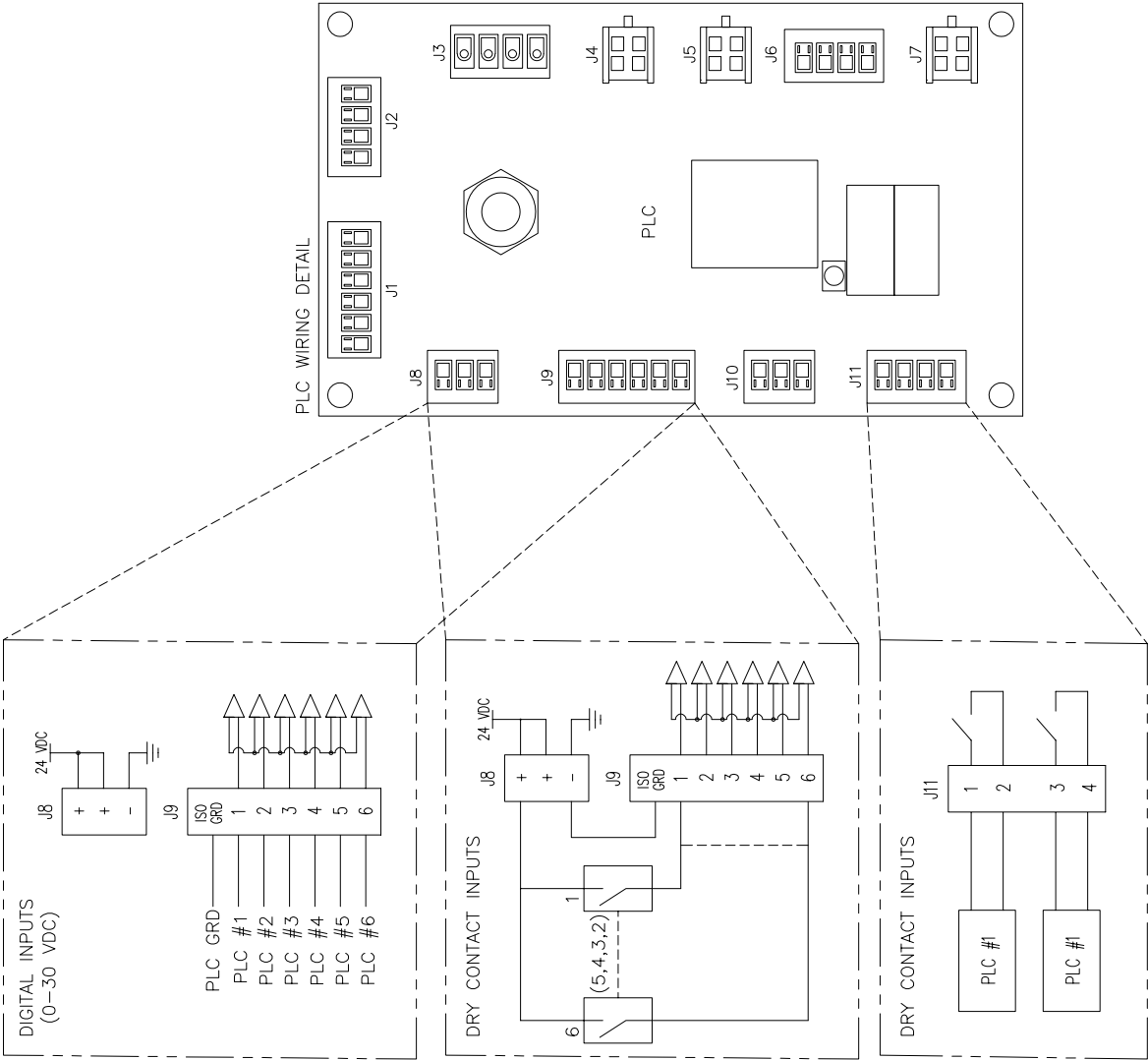
521 522 523 524 525 526 527 528 529 530 531 532 533 534



200L(55 GAL) PLATEN HEAT WIRING

535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600





500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538

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Technical Specifications

Therm-O-Flow Warm Melt		
	US	Metric
Maximum fluid operating temperature	158°F	70°C
Maximum air motor cycle rate	60 cycles per minute	
Air inlet size (supply system)	3/4 npt(f)	
Air motor sound data	See Air Motor instruction manual.	
Ambient operating temperature range (supply system)	32-120°F	0-49°C
Displacement pump effective area	See pump manual.	
Wetted parts	See component manual. See Related Manuals on page 3.	
Maximum working pressure		
36:1	3600 psi	28 MPa, 276 bar
68:1	5000 psi	28 MPa, 276 bar
Platen wetted materials		
26B210, 26B211, 16 Gallon (60 Liter)	Electroless nickel plated ductile iron, EPDM, PTFE coated aluminum, 6061 aluminum, Buna, Viton, Zinc plated steel, 316 stainless steel, 17-4 stainless steel	
25R535, 25R537, 5 Gallon (20 Liter)	Electroless nickel plated ductile iron, EPDM, PTFE coated aluminum, 6061 aluminum, Buna, Viton, Zinc plated steel, 316 stainless steel, 17-4 stainless steel	
255663, 55 Gallon (200 Liter)	319 cast aluminum, EPDM, Zinc plated carbon steel, 17-4 stainless steel	
Electrical requirements		
Heated 5 Gallon (20 Liter)	200-240 VAC, 1 phase, 50/60 Hz, 19 A	
	200-240 VAC, 3 phase, 50/60 Hz, 8 A	
	380-420 VAC, 3 phase (YN), 50/60 Hz, 8 A	
	480 VAC, 3 phase, 50/60 Hz, 4 A	
Ambient 5 Gallon (20 Liter)	200-240 VAC, 1 phase, 50/60 Hz, 16 A	
	200-240 VAC, 3 phase, 50/60 Hz, 8 A	
	380-420 VAC, 3 phase (YN), 50/60 Hz, 8 A	
	480 VAC, 3 phase, 50/60 Hz, 4 A	
Heated 55 Gallon (200 Liter)	200-240 VAC, 1 phase, 50/60 Hz, 28 A	
	200-240 VAC, 3 phase, 50/60 Hz, 16 A	
	380-420 VAC, 3 phase (YN), 50/60 Hz, 16 A	
	480 VAC, 3 phase, 50/60 Hz, 8 A	
Ambient 55 Gallon (200 Liter)	200-240 VAC, 1 phase, 50/60 Hz, 16 A	
	200-240 VAC, 3 phase, 50/60 Hz, 8 A	
	380-420 VAC, 3 phase (YN), 50/60 Hz, 8 A	
	480 VAC, 3 phase, 50/60 Hz, 4 A	
Fluid outlet size		
Check-Mate 200	1" NPT female	
Maximum air input pressure (supply system)		
D60 - 3 in. dual post, 5 gal. (20 L)	150 psi	1.0 MPa, 10 bar
D200 - 3 in. dual post, 55 gal. (200 L)	150 psi	1.0 MPa, 10 bar
D200s - 6.5 in. dual post, 55 gal. (200 L)	125 psi	0.9 MPa, 9 bar

California Proposition 65

CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

Graco Standard 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 twelve 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.

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Sealant and Adhesive Dispensing Equipment

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For patent information, see www.graco.com/patents.

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

If calling from the USA: 1-800-746-1334

If calling from outside the USA: 0-1-330-966-3000

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Original instructions. This manual contains English. MM 3A8005

Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

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