

XP-hf™ Proportioner

3A4381K

EN

***Mechanically linked fixed ratio plural-component system used for proportioning, mixing, and spraying two component coatings.
For professional use only.***

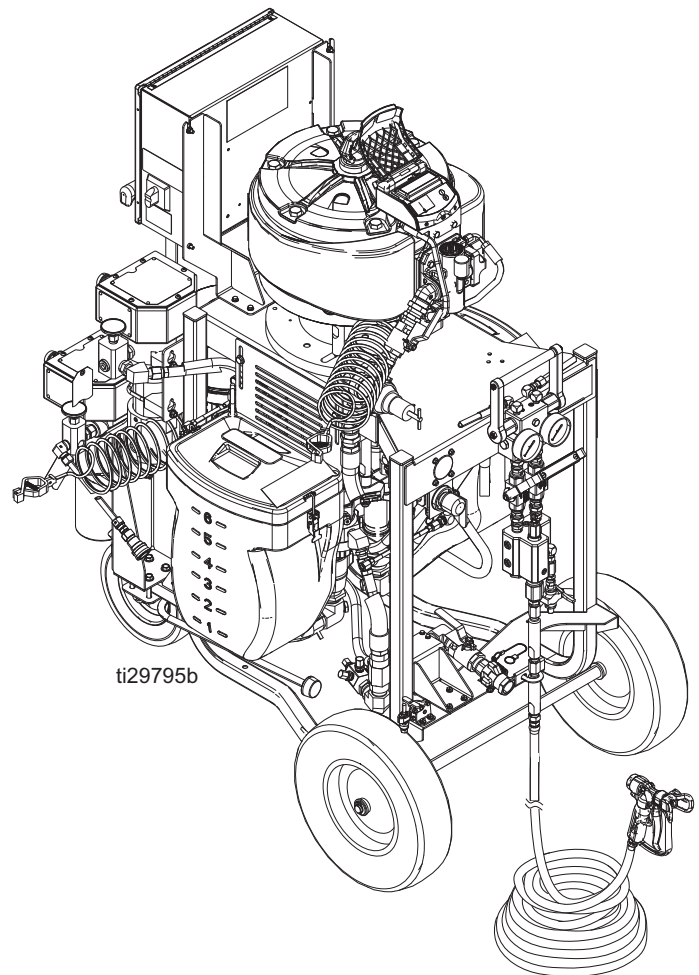
Not approved for use in explosive atmospheres or hazardous locations except where indicated in the Models section.

See page 11 for models numbers, descriptions
and agency approval designations.



Important Safety Instructions

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



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Related Manuals

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

Manual	Description
312145	XTR 5™ and XTR 7™ Spray Guns, Instructions - Parts
Pump Package Components	
334644	Xtreme® XL Air Motor, Instructions - Parts
311762	Xtreme Displacement Pumps, Instructions - Parts
Hopper Kits	
312747	20 Gallon Double Wall Hopper Kit, Instructions - Parts
406860	7 Gallon Hopper Installation Kit, Instructions - Parts
Heating	
3A2954	Viscon® HF Heater, Instructions - Parts
309524	Viscon HP Heater, Instructions - Parts
406861	Viscon HP Heater Adapter Kit, Instructions - Parts
3A5313	Xtreme-Wrap Water Heated Hose, Instructions - Parts
3A5314	Hose Heat Circulation XP and XP-hf Kit, Instructions - Parts
Solvent Flush	
310863	Feed and Solvent Flush Kits, Instructions Parts
312794	Merkur® Pump Assembly, Instructions - Parts
Accessories and Kits	
3A3320	XP and XP-hf PressureTrak Kit, Instruction - Parts
3A1331	XP Pressure Monitor Kit, Instructions - Parts
312769	Feed Pump and Agitator Kits, Instructions - Parts
339361	High Pressure Hose and Accessories Brochure
3A0421	Ratio Check Kit, Instructions - Parts
3A0590	Mix Manifold, Quickset Mix Manifold, Instructions - Parts
3A2573	Gun Splitter Valve, Instructions - Parts
406739	Desiccant Kit, Instructions - Parts
3A5312	Junction Box XP, Instructions - Parts

Warnings

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

 WARNING	
    	<p>FIRE AND EXPLOSION HAZARD</p> <p>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:</p> <ul style="list-style-type: none"> • 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. <p>Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable vapors. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Clean plastic parts only in well ventilated area. • Do not clean with a dry cloth. • Do not operate electrostatic guns in equipment work area.
	<p>SPECIAL CONDITIONS FOR SAFE USE</p> <ul style="list-style-type: none"> • If using the Viscon HP and HF Heaters see manuals for special conditions for safe use. • If using the PressureTrak, see the manual for special conditions for safe use.



WARNING



SKIN INJECTION HAZARD

High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**

- Do not spray without tip guard and trigger guard installed.
- Engage trigger lock when not spraying.
- Do not point gun at anyone or at any part of the body.
- Do not put your hand over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.



MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.



ELECTRIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment.
- Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.



WARNING



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

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



PERSONAL PROTECTIVE EQUIPMENT

Always wear appropriate personal protective equipment and cover all skin when spraying, servicing equipment, or when in the work area. Protective equipment helps prevent serious injury, including long-term exposure; inhalation of toxic fumes, mists or vapors; allergic reaction; burns; eye injury and hearing loss. This protective equipment includes but is not limited to:

- A properly fitting respirator, which may include a supplied-air respirator, chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority.
- Protective eyewear and hearing protection.



TOXIC FLUID OR FUMES HAZARD

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

- Read Safety Data Sheets (SDSs) for handling instructions and to know the specific hazards of the fluids you are using, including the effects of long-term exposure.
- When spraying, servicing equipment, or when in the work area, always keep work area well-ventilated and always wear appropriate personal protective equipment. See **Personal Protective Equipment** warnings in this manual.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.



BURN HAZARD

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

- Do not touch hot fluid or equipment.

Important Isocyanate (ISO) Information

Isocyanates (ISO) are catalysts used in two component materials.

Isocyanate Conditions



Spraying or dispensing fluids that contain isocyanates creates potentially harmful mists, vapors, and atomized particulates.

- Read and understand the fluid manufacturer's warnings and Safety Data Sheets (SDSs) to know specific hazards and precautions related to isocyanates.
- Use of isocyanates involves potentially hazardous procedures. Do not spray with this equipment unless you are trained, qualified, and have read and understood the information in this manual and in the fluid manufacturer's application instructions and SDSs.
- Use of incorrectly maintained or mis-adjusted equipment may result in improperly cured material. Equipment must be carefully maintained and adjusted according to instructions in the manual.
- To prevent inhalation of isocyanate mists, vapors, and atomized particulates, everyone in the work area must wear appropriate respiratory protection. Always wear a properly fitting respirator, which may include a supplied-air respirator. Ventilate the work area according to instructions in the fluid manufacturer's SDSs.
- Avoid all skin contact with isocyanates. Everyone in the work area must wear chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority. Follow all fluid manufacturer recommendations, including those regarding handling of contaminated clothing. After spraying, wash hands and face before eating or drinking.

Keep Components A and B Separate



Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:

- **Never** interchange component A and component B wetted parts.
- Never use solvent on one side if it has been contaminated from the other side.

Moisture Sensitivity of Isocyanates

Exposure to moisture (such as humidity) will cause ISO to partially cure, forming small, hard, abrasive crystal that become suspended in the fluid. Eventually a film will form on the surface and the ISO will begin to gel, increasing in viscosity.

NOTICE

Partially cured ISO will reduce performance and the life of all wetted parts.

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. **Never** store ISO in an open container.
- Keep the ISO pump wet cup or reservoir (if installed) filled with appropriate lubricant. The lubricant creates a barrier between the ISO and the atmosphere.
- Use only moisture-proof hoses compatible with ISO.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Always lubricate threaded parts with an appropriate lubricant when reassembling.

NOTE: The amount of film formation and rate of crystallization varies depending on the blend of ISO, the humidity, and the temperature.

Changing Materials

NOTICE

Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.

- When changing materials, flush the equipment multiple times to ensure it is thoroughly clean.
- Always clean the fluid inlet strainers after flushing.
- Check with your material manufacturer for chemical compatibility.
- When changing between epoxies and urethanes or polyureas, disassemble and clean all fluid components and change hoses. Epoxies often have amines on the B (hardener) side. Polyureas often have amines on the B (resin) side.




Overview

Usage





The XP-hf is a mechanically linked fixed ratio system that can mix and spray most two-component epoxy and urethane protective coatings.

When using quick-setting material (less than 10 minute pot life), the Remote Manifold Heater Block Kit (24Z934) is recommended for use (included in complete systems).


The two high pressure fluid pumps are carbide seat severe duty positive displacement pumps that displace fluid on both strokes.

				
<p>Using an XP-hf system, or components on the system, not approved for hazardous locations or explosive atmospheres may result in a fire or explosion hazard.</p> <p>The XP-hf systems are not approved for use in hazardous locations unless the base model, all accessories, all kits, and all wiring meet local, state, and national codes.</p> <p>See Wire Systems with Explosion-Proof Heaters on page 22.</p>				

Over Pressure Protection

				
<p>Mechanically linked pumps can create excessive fluid pressure if the full motor force is applied to only one of the fluid pumps.</p> <ul style="list-style-type: none"> <i>Cart-Mounted Systems Only:</i> Maximum air pressure set point blow off valves are provided to limit maximum fluid pressure. Do not remove these valves. Color coded automatic over pressure relief valves are used on cart-mounted systems to dump excess fluid pressure back to the supply. Never plug these return hoses. See Fluid Circulation Manifold with Over Pressure Relief Valves on page 48. When using an XP-hf bare pump package to build a system, use the over pressure relief valves referenced above. Never install individual shut off valves on the "A" and "B" lines. On cart-mounted systems, common handles link the fluid control valves. A rupture disc is provided on the small side fluid pump (pumps 145 cc and smaller) as a back-up to the over pressure relief valve. If the rupture disc ever opens, do not operate the machine until the over pressure valve and the rupture disc have been replaced. If changing pump lowers or motor on your system, use the correct over pressure relief valves from the chart on page 49. 				

Models



Using an XP-hf system, or components on the system, not approved for hazardous locations or explosive atmospheres may result in a fire or explosion hazard.


The XP-hf systems are not approved for use in hazardous locations unless the base model, all accessories, all kits, and all wiring meet local, state, and national codes.

See **Wire Systems with Explosion-Proof Heaters** on page 22.

NOTE: See special conditions for safe use in your Viscon HF Heater manual and your Viscon HP Heater manual.

Bare Proportioning Pump Packages

Packages include motor, pump lowers, and connection components.



Building systems with bare proportioning pump packages:

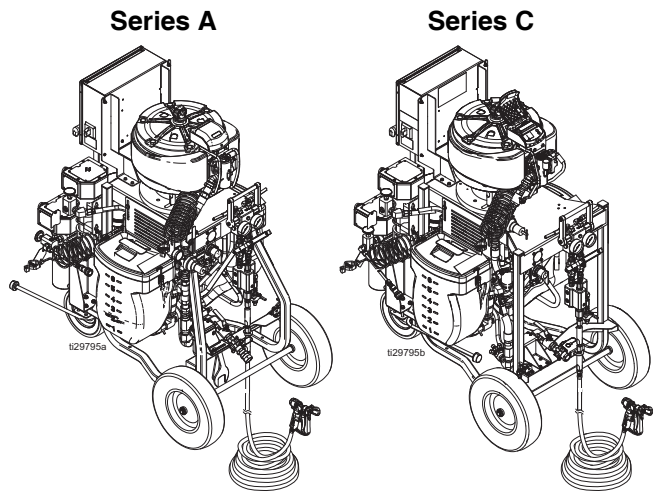
- **Over Pressure Protection** must be used, see page 9. See chart on page 18 to identify the over pressure relief valves to use with your system.
- All components must meet or exceed maximum working pressures.

Pump sizes are marked on the pump cylinder; sizes are nominal. See technical data in your pump lower manual for actual displacement.

These packages require additional components to make a complete system. See **Fluid Control Assembly**, page 15; **Main Air Controls**, page 16; and **System Components**, page 18.

Series Change

The XP cart frame was upgraded to allow better access to the pump lowers.



Benefits of the new frame include:

- Ease of use
- Ease of service and greater access to lowers

Series	Change Description
C	Upgraded XP frame

Models

PART NUMBER CODE EXAMPLE:

First Three Digits			Fourth and Fifth Digits		Last Digit
✕System Pressure Ratio			*Volume Mix Ratio		#Components (see page 12)
5	7	x	x	x	x

✕System Pressure Ratio (First Three Digits of Part Number)

First Three Digits	System Ratio	Maximum Fluid Working Pressure psi (MPa, bar)
572xxx	70 : 1	7250 (50, 500)
573xxx	50 : 1	5000 (34, 344)

*Volume Mix Ratios - 70:1 (Fourth and Fifth Digits of Part Number)

Fourth and Fifth Digits	Pump Ratio (A/B)	A Side Pump	B Side Pump	Combined Fluid Output (cc/cycle)	Fluid Flow at 40 cpm gpm (lpm)	Over Pressure Relief Valve	Maximum Air Working Pressure psi (MPa, bar)	Fluid to Air Pressure Ratio	Maximum Fluid Working Pressure psi (MPa, bar)
xxx10x	1 : 1	L14AC0	L14AC0	290	3.0 (11.3)	Silver	100 (0.7, 7)	73 : 1	7100 (49, 490)
xxx15x	1.5 : 1	L14AC0	L097C0	242	2.6 (9.8)	Silver	85 (0.59, 5.9)	86 : 1	7250 (50, 500)
xxx20x	2 : 1	L18AC0	L090C0	270	2.8 (10.6)	Silver	95 (0.65, 6.5)	76 : 1	7250 (50, 500)
xxx25x	2.5 : 1	L18AC0	L072C0	252	2.6 (9.8)	Silver	90 (0.62, 6.2)	81 : 1	7250 (50, 500)
xxx30x	3 : 1	L22XC0	L072C0	292	3.0 (11.3)	Silver	100 (0.7, 7)	71 : 1	7100 (49, 490)
xxx40x	4 : 1	L22XC0	L054C0	274	2.8 (10.6)	Silver	95 (0.65, 6.5)	76 : 1	7250 (50, 500)

*Volume Mix Ratios - 50:1 (Fourth and Fifth Digits of Part Number)

Fourth and Fifth Digits	Pump Ratio (A/B)	A Side Pump	B Side Pump	Combined Fluid Output (cc/cycle)	Fluid Flow at 40 cpm gpm (lpm)	Over Pressure Relief Valve	Maximum Air Working Pressure psi (MPa, bar)	Fluid to Air Pressure Ratio	Maximum Fluid Working Pressure psi (MPa, bar)
xxx10x	1 : 1	L22AC0	L22AC0	440	4.6 (17.4)	Gold	100 (0.7, 7)	48 : 1	4750 (33, 330)
xxx15x	1.5 : 1	L22AC0	L14AC0	365	3.8 (14.4)	Gold	90 (0.62, 6.2)	57 : 1	5000 (35, 345)
xxx20x	2 : 1	L29AC0	L14AC0	435	4.6 (17.4)	Gold	100 (0.7, 7)	48 : 1	4750 (33, 330)
xxx25x	2.5 : 1	L29AC0	L115C0	405	4.2 (15.9)	Gold	100 (0.7, 7)	51 : 1	5000 (35, 345)
xxx30x	3 : 1	L29AC0	L097C0	387	4.0 (15.1)	Gold	95 (0.65, 6.5)	53 : 1	5000 (35, 345)
xxx40x	4 : 1	L29AC0	L072C0	362	3.8 (14.4)	Gold	85 (0.59, 5.9)	57 : 1	5000 (35, 345)

#Components (Last Digit of Part Number)

★ = Ex rated		Last Digit of Part Number							
		★	★	★	★	★		★	
		xxxxx0 (†)	xxxxx1	xxxxx2	xxxxx3	xxxxx4	xxxxx5	xxxxx6 (◆)	xxxxx7 (‡)
Includes:	Pump Assembly (Air Motor and Pump Lowers)	x	x	x	x	x	x	x	x
	Cart		x	x	x	x	x	x	x
	7 gallon hoppers			x		x	x	x	x
	Solvent Pump				x	x	x	x	x
	HF Hazardous Location A/B Heaters (2)				x	x		x	
	HF Non-Hazardous Location A/B Heaters (2)						x		x
	Wiring Junction Box (connected)						x		x
	HP Hazardous Location Hose Circulation Heater (1)							x	
	HP Non-Hazardous Location Hose Circulation Heater (1)								x
	Hose Heat Circulation Pump							x	x
	Pressure Trak (Hazardous Location)							x	x
	XTRxxx Spray Gun and 35 ft (10.7m) Supply Hose (not attached)		x	x	x	x	x	x	x



† Bare pump packages ending in zero require additional components to make a complete system, see **Bare Proportioner Pump Packages**, page 10.

◆ Complete - All connected except for hazardous location heating wiring.

‡ Complete - All connected and wired for non-hazardous locations.

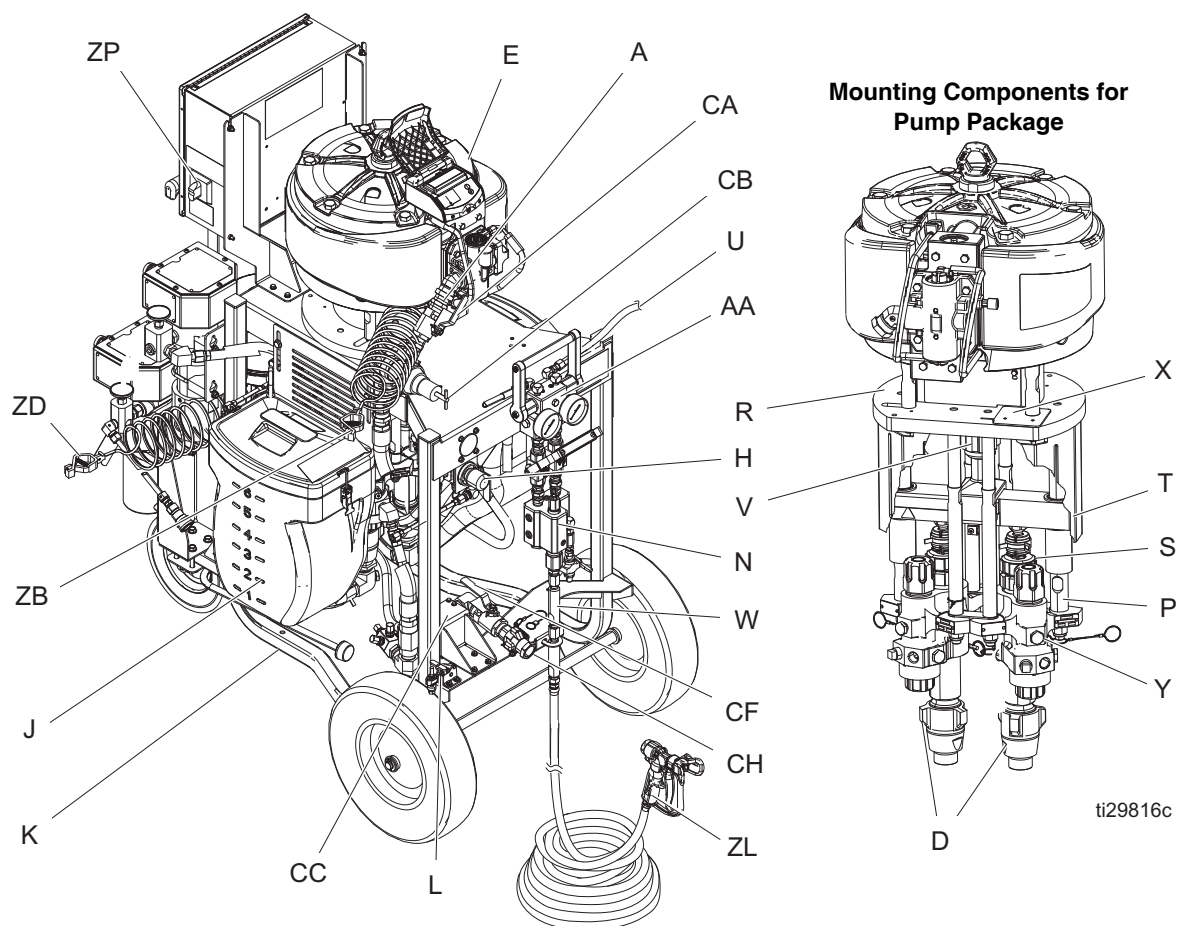
Pump Packages without Pump Lowers			Includes:	
Part	System Ratio	Maximum Fluid Working Pressure psi (MPa, bar)	Cart	XTRxxx Spray Gun and 35 ft (10.7 m) Supply hose (not attached)
572000(#)	70:1	7250 (50, 500)	X	X
573000(#)	50:1	5000 (34, 344)	X	X
# These pump packages without pump lowers are not operational and are not CE rated or Ex marked.				

Approvals

		All systems CE marked except where noted.
 II 2 G Ex h IIA T3 Gb		★ All systems with a part number ending in 0, 1, 2, 3, 4, and 6 are Ex rated for use in explosive atmospheres except where noted.

Component Identification

XP-hf Proportioners (Model 572407 shown)

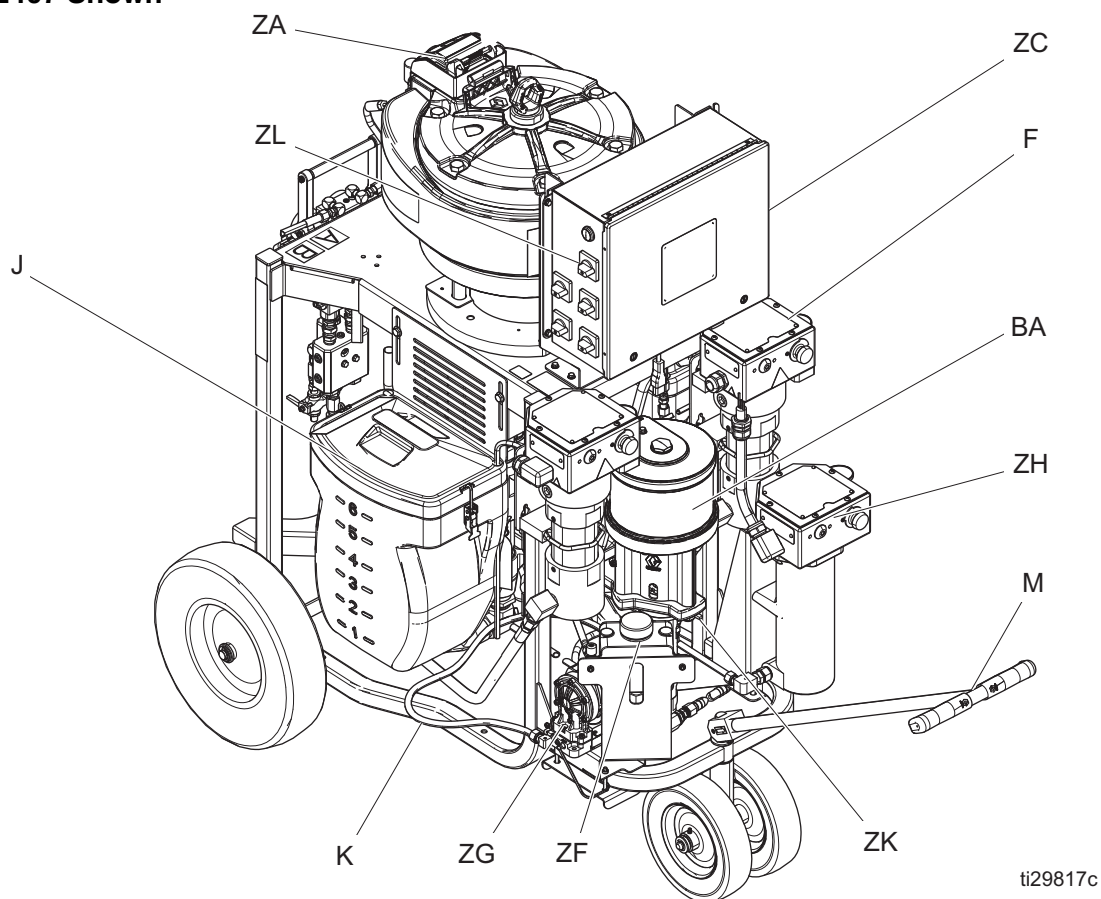


Key:

- | | | | |
|---|--|----|---|
| A | Air Supply Hose for Motor | W | Static Mixer Tubes with Replaceable Plastic Elements |
| D | High Pressure Fluid Pump | X | Motor Position Indicator Bracket; see Motor Position, page 22 |
| E | XL™ 10000 Air Motor | Y | Over Pressure Rupture Disc; only 145cc pumps or smaller |
| H | Solvent Flush Pump Air Controls; see page 17 | AA | Fluid Manifold |
| J | 7 Gallon Hoppers (blue A-side shown) | CA | Motor Air Shut Off Valve (Relieving) |
| K | Cart | CB | Motor Air Pressure Regulator |
| L | Brake | CC | Air Filter with Auto Drain |
| N | Mix Manifold; see page 15 | CF | Main Inlet Air Shut Off Valve; see page 16 |
| P | Pump Tie Rods | CH | Air Inlet 1 in. npsm(f) |
| R | Motor Adapter Plate | ZB | Air Motor Ground Wire |
| S | Adjustable Packing Nuts with Wet Cups | ZD | Solvent Pump Ground Wire |
| T | Yoke with Rod Bearings | ZL | Gun and Hose |
| U | Recirculation Lines | ZP | Power Disconnect |
| V | Connecting Rod Nut | | |

XP-hf Proportioners (continued)

Model 572407 Shown



ti29817c

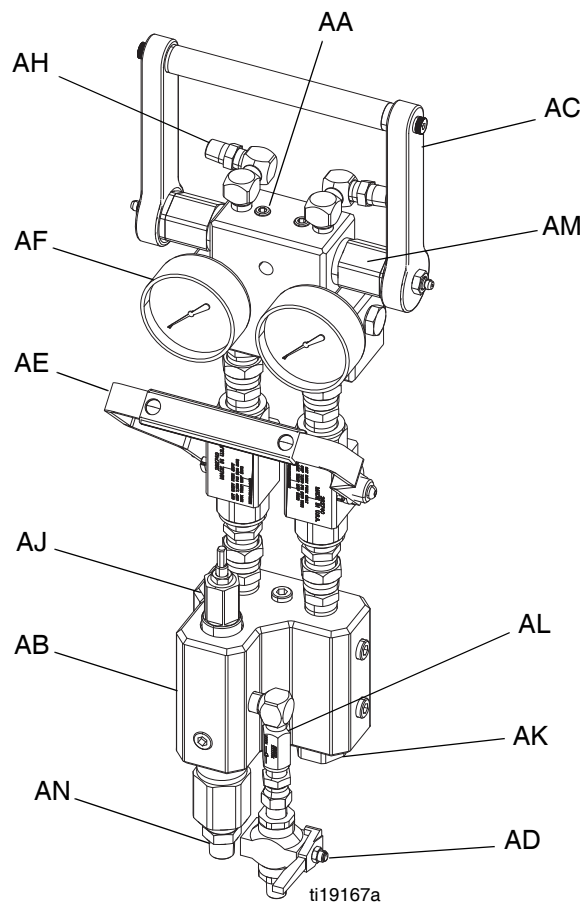
Key:

- F Viscon HF Fluid Heater
- J 7 Gallon Hoppers (green B-side shown)
- K Cart
- M Handle (lift to release)
- BA Solvent Flush Pump
- ZA Pressure Trak
- ZC Junction Box
- ZF Circulation Pump Reservoir
- ZG Circulation Pump
- ZH Viscon HP Hose Water Heater
- ZK Solvent Prime/Flush Valve
- ZL Heater ON/OFF Switches

Fluid Control Assembly

This is required to add to Bare Pump Packages to make a complete system.

Standard Mix Manifold shown

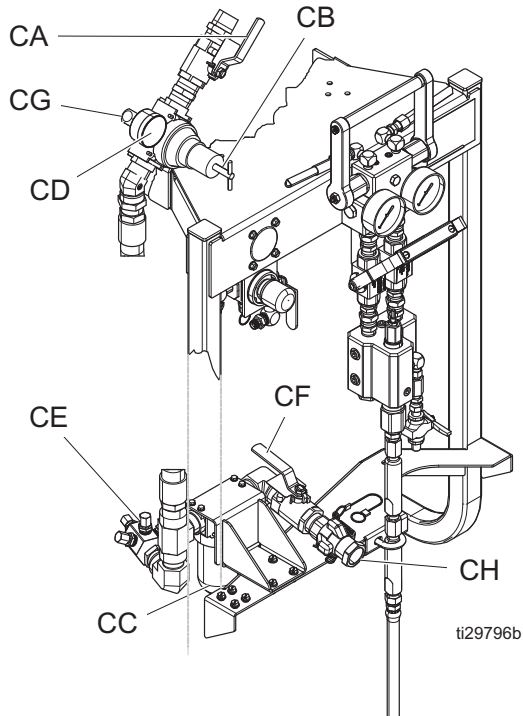


Key:

- AA Fluid Manifold
- AB Mix Manifold
- AC Circulation Handle (shown closed)
- AD Solvent Flush Valve
- AE Dual Shutoff Handle (shown closed)
- AF Fluid Pressure Gauges
- AG Fluid Supply Inlet (Behind Fluid Manifold)
- AH Fluid Circulation Fittings
- AJ B Component Adjustable Fluid Restrictor; *see page 33*
- AK A and B Mix Manifold Check Valves
- AL Solvent Inlet Check Valve
- AM Automatic, Spring Loaded, Color-Coded Over Pressure Relief Valves; with grease fittings; *see page 49*
- AN A and B Combined Outlet; 3/8 npt(m)

Main Air Controls

This is required to add to Bare Pump Packages (part number ending in zero "0" to make a complete system).

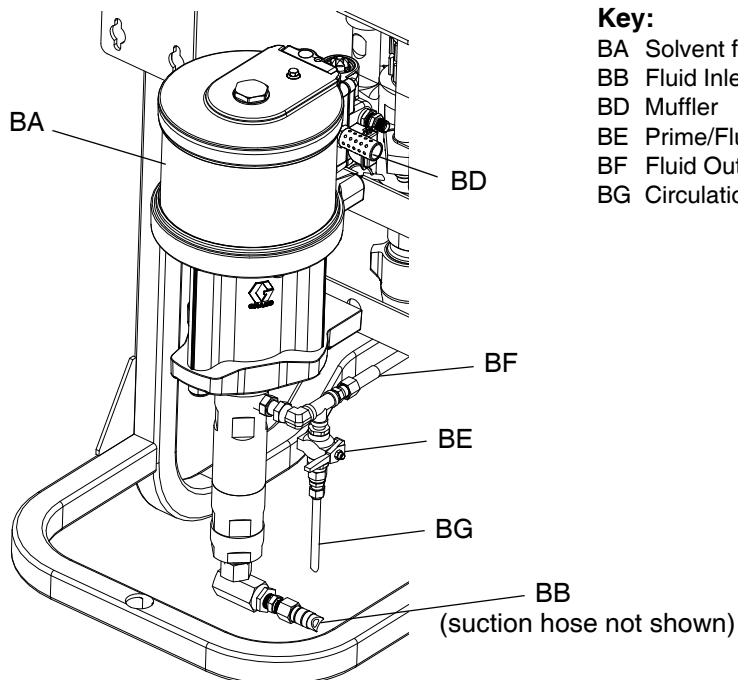


Key:

- CA Motor Shutoff Valve (Relieving)
- CB Motor Air Pressure Regulator
- CC Air Filter with Auto Drain
- CD Main Motor Air Pressure Gauge
- CE Filtered Air Distribution Manifold
- CF Main Inlet Air Shutoff Valve
- CG Pressure Relief Valve
- CH Main Air Inlet

45:1 Solvent Flush Pump

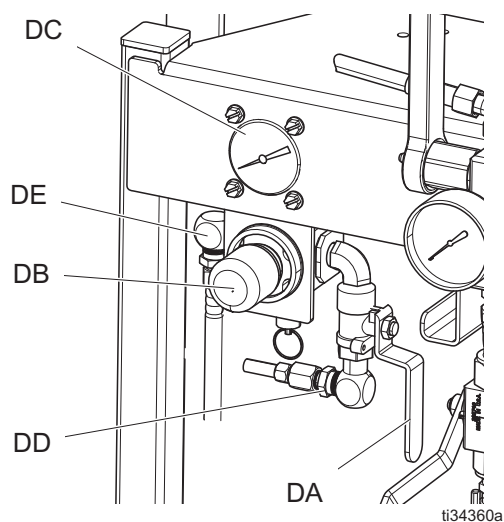
Pump



Key:

- BA Solvent flush pump (Merkur Pump)
- BB Fluid Inlet
- BD Muffler
- BE Prime/Flush/Sample valve
- BF Fluid Outlet Hose
- BG Circulation hose

Air Controls



Key:

- DA Solvent Pump Air Shutoff Valve (Relieving)
- DB Solvent Pump Air Pressure Regulator
- DC Solvent Pump Air Pressure Gauge
- DD Air Outlet
- DE Air Inlet

System Components

* Indicates a customer-supplied component required to add to Bare Pump Packages (part numbers ending in zero "0") to make a complete system.

*Bleed Type Motor Air Valve (CA)



Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts. Use the Bleed Type Master Air Valve to relieve trapped air.

Be sure the valve is easily accessible from the pump and located downstream from the air regulator (CB).

The two steps below are required in your system to relieve air trapped between the air motor when the valve is closed:

1. Open the valve to supply air to the motor.
2. Close the valve to shut off air to the motor, and bleed any trapped air from the motor.

*Air Pressure Relief Valve (CG)

Automatically opens to relieve air pressure if supplied pressure exceeds preset limit. Use the correct air pressure relief valve for the system ratio:

XP70-hf		XP50-hf	
Ratio	Valve Part	Ratio	Valve Part
1:1	113498	1:1	113498
1.5:1	16M190	1.5:1	103347
2:1	114055	2:1	113498
2.5:1	103347	2.5:1	113498
3:1	113498	3:1	114055
4:1	114055	4:1	16M190

*Air Filter (CC)

Removes harmful dirt from compressed air supply. A minimum 40 micron filter is used.

*Air Regulator (CB)




Adjusts air pressure to the motor and fluid outlet pressure of pump. Locate the air regulator close to the pump. Read air pressure on the gauge.

Fluid Line Components

- ***Fluid Manifold (AA):** Controls circulation and pump priming.
- ***Mix Manifold (AB):** Combines A and B fluid into one fluid line.
- ***Circulation Handle (AC):** Directs fluid flow for circulation or mixing. Move to open position to relieve fluid pressure, prime pumps, and circulate material in hoppers. Move to closed position to spray mixed material.
- ***Dual Shutoff Handle (AE):** Controls A and B fluid flow for mixing and dispensing. Close before flushing.
- ***Solvent Flush Valve (AD):** Controls solvent flow to the mix manifold, hose, and spray gun.
- ***Static mixer/gun hose kit:** Thoroughly mixes the two fluids and delivers the mixed fluid to the spray gun. Includes static mixer and hoses to the spray gun.
- **Fluid Heaters (F):** Heats the resin and hardener before mixing. Improves the chemical reaction and lowers viscosity to improve the spray pattern.
- **Solvent Flush Pump (BA):** Flushes the mix manifold. Includes a solvent pump, mounting hardware, and solvent supply hose.

Setup

Location

				
<p>Using an XP-hf system, or components on the system, not approved for hazardous locations or explosive atmospheres may result in a fire or explosion hazard.</p> <p>The XP-hf systems are not approved for use in hazardous locations unless the base model, all accessories, all kits, and all wiring meet local, state, and national codes.</p> <p>See Wire Systems with Explosion-Proof Heaters on page 22.</p>				

1. Locate the proportioner on a level surface.
2. Position the proportioner for convenient operator access and maintenance, proper routing of air and fluid lines, and easy connection of components and accessories.
3. For permanent mounting, remove wheels and mount the frame to the floor. See **Dimensions**, page 75.
4. Make sure cart brake (L) is in the locked position.

Initial System Setup

1. Check the shipment for accuracy. Ensure you have received everything you ordered. See **Component Identification**, page 13.
2. Check for loose fittings and fasteners.
3. Systems supplied as complete are already connected for fluid, air and electrical hookups.
4. If any accessories are added to a non-complete system refer to the individual manual listed on page 3.
5. Install desiccant kits if using polyurethane isocyanates in hoppers. See desiccant dryer kit manual for instructions.
6. Install circulation and return tube kits if you are feeding material from drums or remote hoppers. See your circulation and return tubes kit manual if you are feeding urethane material.
7. Connect the feed pumps, fluid strainers, and air hoses as necessary. For systems without hoppers, see your feed pump and agitator kit manual.
8. Connect the fluid hose assembly, including the static mixers, whip hose and gun. See **Connect Static Mixers, Gun, and Hoses**, page 23.
9. Connect the battery in the PressureTrak module.
10. Connect the air supply hose. See **Connect Air Supply**, page 23.

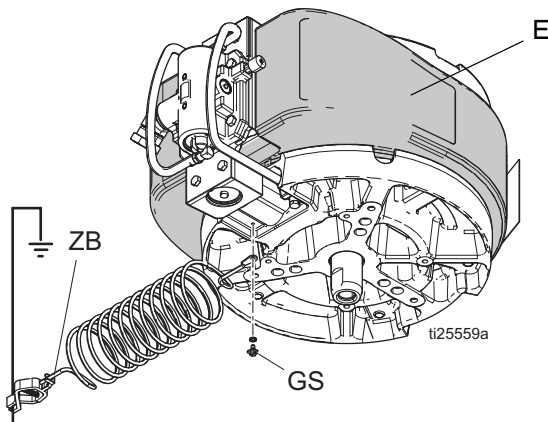
Flush test oil from system as needed. See **Connect the resin and hardener hoses to the resin and hardener inlets on the mix manifold.**, page 24. See **Empty and Flush Entire System (new system or end of job)**, page 36.

Grounding



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

Pump: Connect ground wire 244524 (ZB) to the ground stud (GS) on the air motor (E).

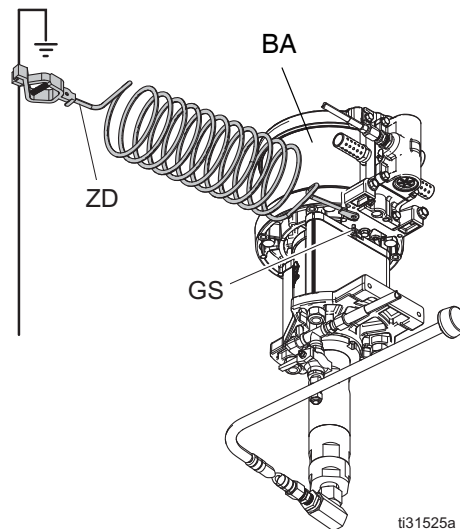


Connect the other end of the ground wire to a true earth ground for systems without heaters, otherwise connect to HF heater clamp bar.

Object being sprayed: Ground the object being sprayed, fluid supply container, and all other equipment in the work area. Follow your local code. Use only electrically conductive air and fluid hoses.

Solvent pail: Ground all solvent pails. Use only metal pails, which are conductive, placed on a grounded surface. Do not place pail on a non-conductive surface, such as paper or cardboard, which interrupts grounding continuity.

Solvent pump: Connect ground wire (ZD) and clamp (supplied with solvent pump) to the ground stud (GS) on the solvent pump (BA).



Air and fluid hoses: use only static dissipation type hoses with a maximum of 300 ft (91 m) combined hose length to ensure grounding continuity. Check electrical resistance of hoses regularly. If total resistance to ground exceeds 29 megohms, replace hose immediately.

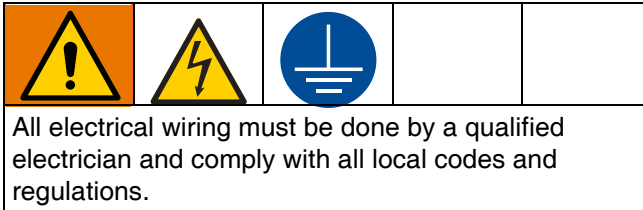
Air compressor: follow manufacturer's recommendations.

Spray gun: ground through connection to a properly grounded fluid hose and pump.

Flush Before Using Equipment

The bare pump package was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment. See **Empty and Flush Entire System (new system or end of job)**, page 36.

Connect Power

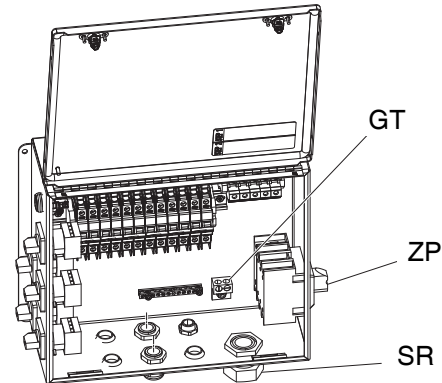


NOTE: Systems with a junction box have heaters pre-wired. Systems without a junction box need to power heaters individually (refer to your Viscon HP heater manual). If applicable, see **Wire Systems with Explosion-Proof Heaters** on page 22.

1. Turn main power disconnect switch (ZP) OFF.
2. Open the electrical enclosure door.
3. Route the power cable through the strain relief in the electrical enclosure.
4. Connect the ground wire to ground terminal (GT).
5. Connect the power cord as shown in FIG. 1 **Terminal Jumpers and Positions**. Gently pull on all connections to verify that they are properly secured.

6. Tighten the strain relief (SR).
7. Install supplied terminal jumpers in the positions shown in the image below for the power source used.

NOTE: Terminal jumpers are located inside the electrical enclosure door.



8. Verify that all items are connected properly as shown below, then close the electrical enclosure door.

NOTE: See the Junction Box XP Installation and Parts manual for detailed instructions.

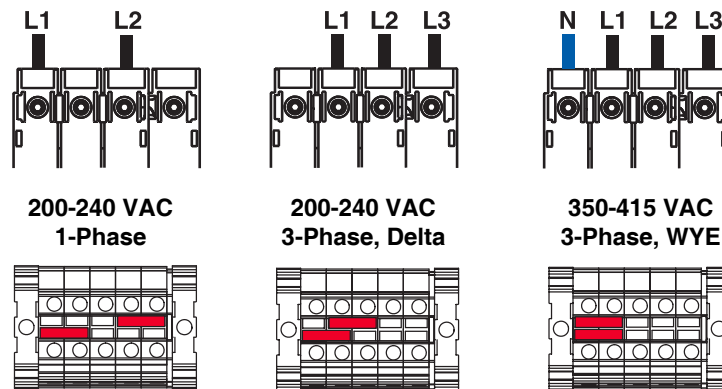


FIG. 1 Terminal Jumpers and Positions

Power Requirements			
XP Configuration	For use with 240 V Heaters and/or Junction Box 273096		
	200-240 VAC 1-Phase	200-240 VAC 3-Phase, Delta	350-415 VAC 3 Phase♦, WYE
	Maximum Amperage		
A & B Heaters	45	41	23
A & B Heaters and Heated Hose	62	56	36
A & B Heaters and Hopper Heaters	70	65	43
A & B Heaters, Heated Hose, and Hopper Heaters	87	78	46

Wire Systems with Explosion-Proof Heaters

(Hazardous location systems only)



Improperly installed or connected equipment will create a hazardous condition and cause fire, explosion, or electric shock. Follow local regulations.

If your system is rated for hazardous areas, and you have explosion-proof heaters, you must have a qualified electrician connect the heater wiring. Make sure the wiring and installation comply with local electrical codes for hazardous areas.

When explosion-proof heaters are used, ensure the wiring, wiring connections, switches, and electrical distribution panel all meet flame-proof (explosion-proof) requirements.

Refer to the Viscon HF and HP heater manual for electrical connection instructions and guidelines in hazardous locations.

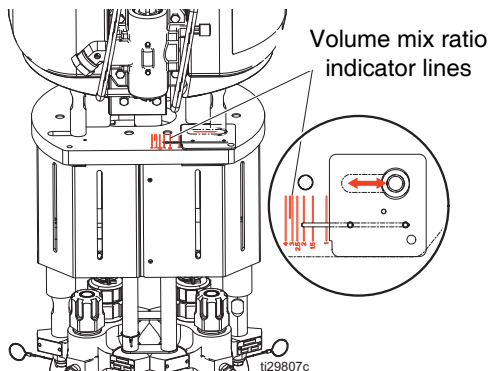
Motor Position

The motor position must be set for the volume mix ratio of the system.

NOTE: Changing the motor position does not change the mix ratio.

Check Motor Position

1. Verify that the correct pumps are mounted for your volume mix ratio. See chart in **Models** on page 10.

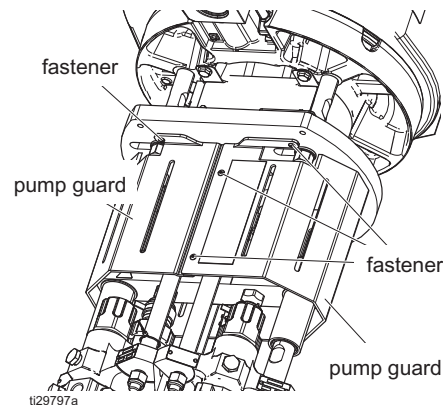


2. Verify that the motor position is adjusted correctly for that volume mix ratio. If not, perform the following **Change Motor Position** procedure.

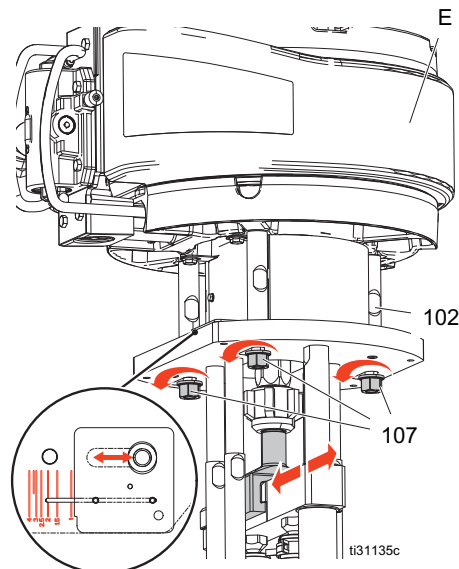
Change Motor Position

There are specific motor positions for each mix ratio setting. To Adjust the position of the air motor:

1. Perform the **Check Motor Position** procedure. If the position is incorrect, continue to the next step.
2. Loosen the eight fasteners and remove the two pump guards.



3. Loosen the three nuts (107) below the motor tie rods.



Air Motor shown

4. Slide the tie rods (102) and motor (E) until the indicator lines are aligned with your ratio.

NOTICE

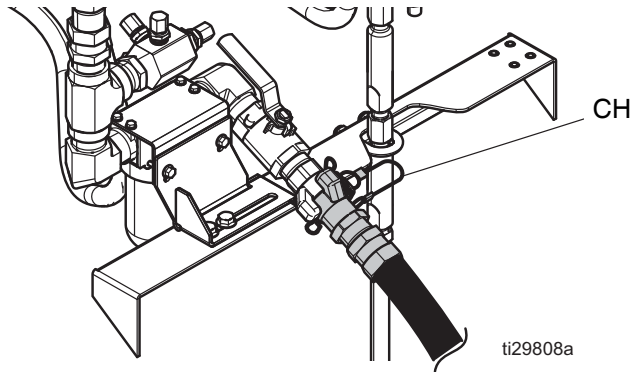
Do not hit the tie rods (P) with a hammer. Damage to the air motor base may result.

5. Tighten the three nuts (107).
6. Install the pump guards.

Connect Air Supply

Connect the air supply hose to the 1 in. npsm(f) swivel air inlet (CH).

Use a 1.0 in. (25.4 mm) ID minimum air hose. Air consumption is 75 cfm per gallon per minute (2,100 lpm per 4 lpm) spraying. Do not use pin fitting type quick disconnects.

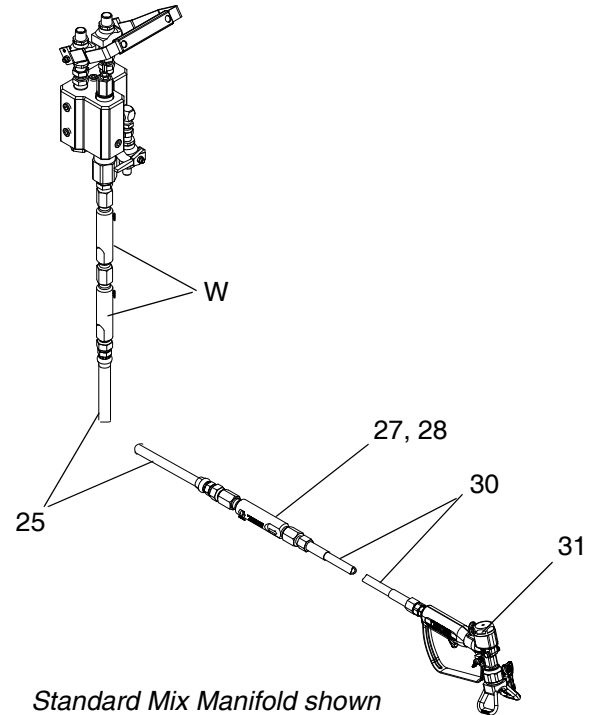


Connect Static Mixers/Gun/Hoses

NOTICE

To prevent creating a flare on the mixer tube, do not use a union swivel end on the mix tube inlet.

1. Connect the outlet of the two primary static mixer tubes with mixer elements (W) to the fluid mix hose (25), cleanup mixer (27, 28), whip hose (30), and spray gun (31).
2. Add mixed material hose as necessary between the mix hose (25) and cleanup mixer (27, 28).



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Connect Fluid Hose Bundles (Remote Mix Manifold Only)

NOTE: For all steps below refer to the illustration on the next page.

Refer to your mix manifold manual for details when the mix manifold (AB) is remotely mounted.

1. Connect additional resin and hardener fluid hose sections to the proportioner fluid manifold (AA) outlet. Hoses must be properly sized and balanced for your mix ratio.
 2. Connect the resin and hardener hoses to the resin and hardener inlets on the mix manifold.
 3. Connect the female quick-disconnect “Y” fitting assembly (FQ) to the blue tubing quick-disconnect from below the overflow bottles.
 4. Connect the male quick-disconnect “Y” fitting assembly (MQ) to the red tubing quick-disconnect from the heater outlet.
 5. Connect the glycol circulation tubing to the “Y” fitting assemblies. Cut the red and blue tubing squarely behind the hose union fittings. Connect to the “Y” fitting assembly.
- NOTE:** The tubes and fittings are color coded. Make sure all colors match when connecting the fittings.
6. Connect the mix manifold (MM) to the remote manifold carriage (MC) heater block (HB) and bracket using two screws (9).

7. Connect the resin and hardener hoses to the mix manifold.
8. Connect the extension glycol tubing from the hose bundle to the heater block (HB). Cut the tubing squarely behind only one of the u-fittings. Connect the two union fittings (10) to the hose tubing (one red, one blue). Cut the red tubing (11) piece and blue tubing (12) piece to length to fit between the hose bundle and heater block, then tighten the fittings.

Connecting Additional Hose Lengths

NOTE: For all steps below refer to the illustration on the next page.

Up to six 50 ft (15.2 m) sections of heated hose can be attached for a maximum total length of 300 ft (91.4 m).

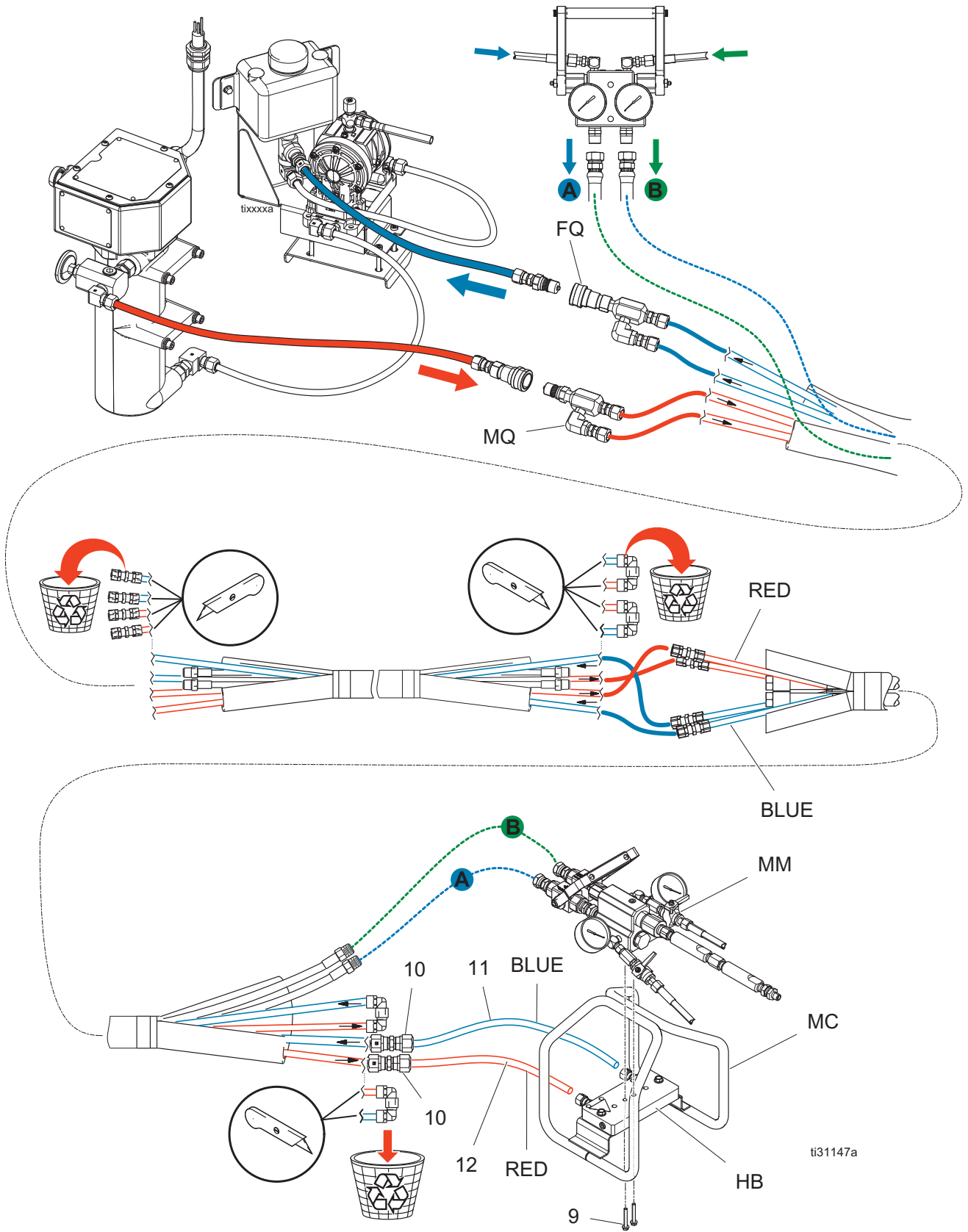
1. Remove the plastic u-turn fittings at the end of the heated hose assembly.
2. Connect the next length of hose, using union fittings supplied with the hose.

NOTE: The tubes and fittings are color coded. Make sure all colors match when connecting the fittings.

NOTICE

To prevent cross-contamination, ensure you connect the “A” side fluid hose to the “A” side fluid hose on the additional heated hose.

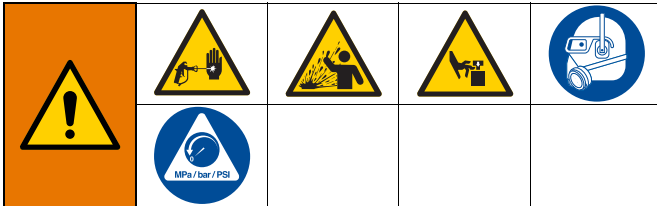
Connecting Hoses



Pressure Relief Procedure

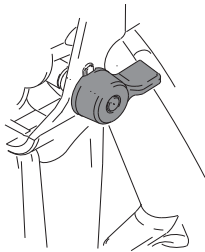


Follow the Pressure Relief Procedure whenever you see this symbol.



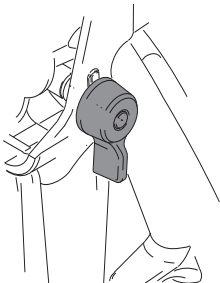
This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Engage the gun trigger lock.



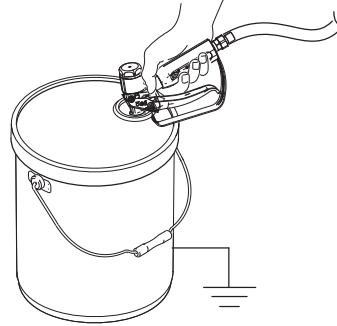
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2. Close the motor air shutoff valve.
3. Shut off heaters, if used.
4. Shut off feed pumps, if used.
5. Remove the spray tip.
6. Disengage the trigger lock.

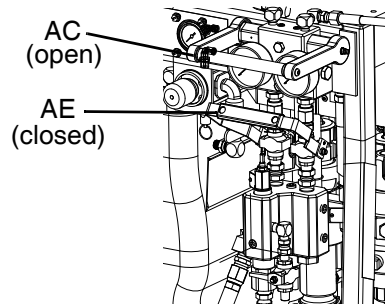


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7. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun to relieve pressure.



8. Engage the gun trigger lock.
9. Close the dual shutoff handle (AE) and open the circulation handle (AC) to relieve A and B fluid pressure.



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10. Always flush the mix hose after relieving A and B fluid pressure through the mix manifold. Follow **Flush Mixed Material**, page 34 when you stop spraying or dispensing; and before cleaning, checking, servicing, or transporting equipment.
11. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved after following the steps above, very slowly loosen tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or tip obstruction.
12. If static mixer, whip hose, and gun cannot be flushed because of mixed and cured material, very slowly loosen static mixer tube from mix manifold outlet to relieve pressure gradually, then loosen completely. Replace or clean clogged components.

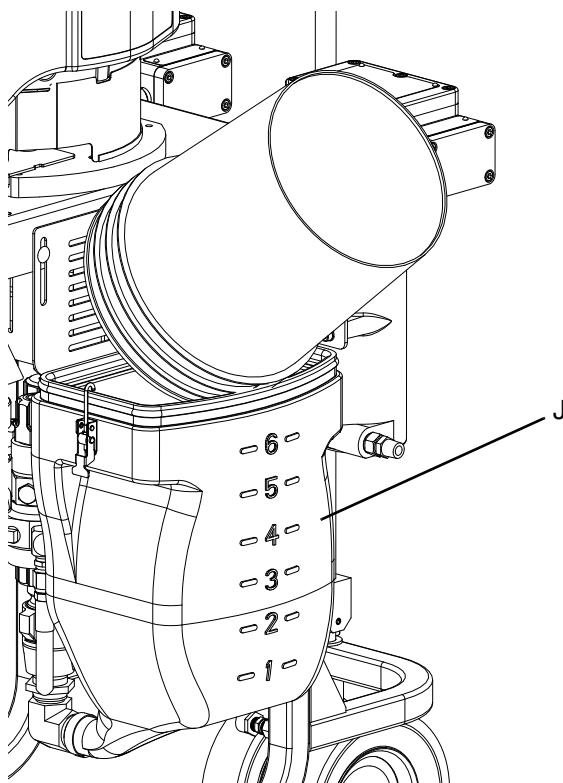
Prime Empty System

Prime A and B Fluids

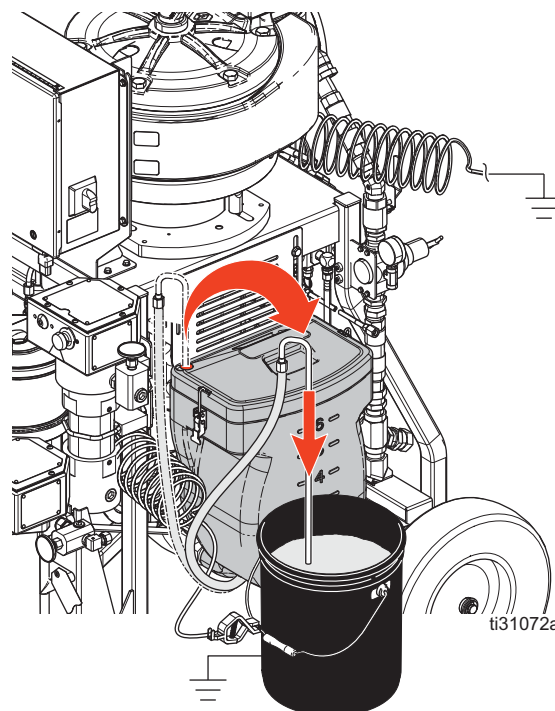
To help prevent injury, wear gloves when using solvents and/or if the fluid temperature exceeds 110° F (48° C).

The equipment is tested with light weight oil at the factory. If necessary, flush out the oil with a compatible solvent before spraying. See **Empty and Flush Entire System (new system or end of job)**, page 36.

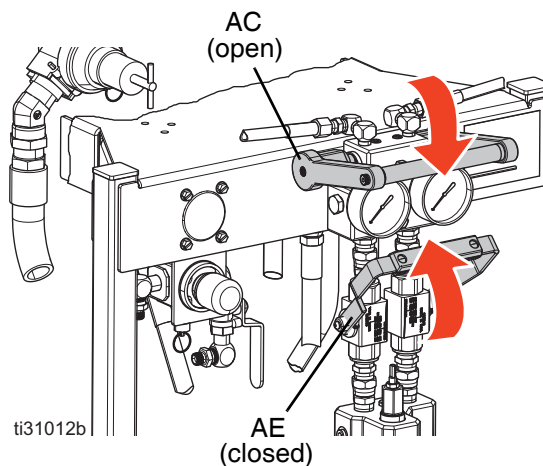
1. Prepare the materials prior to adding to the hoppers (J). Ensure that the resin materials are thoroughly mixed, homogeneous, and pour-able prior to adding to the hopper. Stir the hardeners back into suspension prior to adding material to hopper.



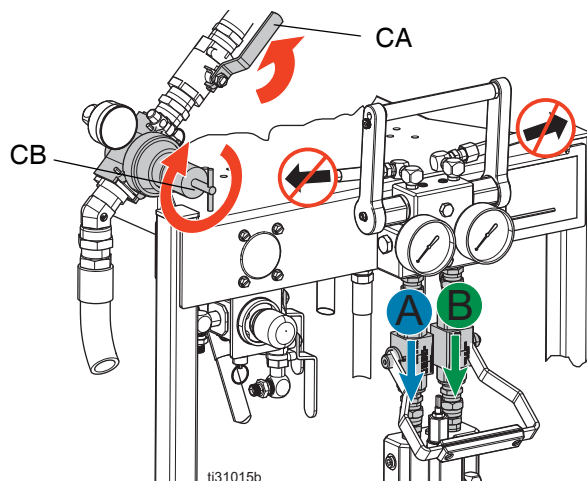
2. Fill the A and B hoppers with proper materials. Fill the A side (blue) with major volume of material; fill the B side (green) with minor volume of material (unless 1:1 mix ratio).
3. Move the recirculation lines (U) to empty containers.



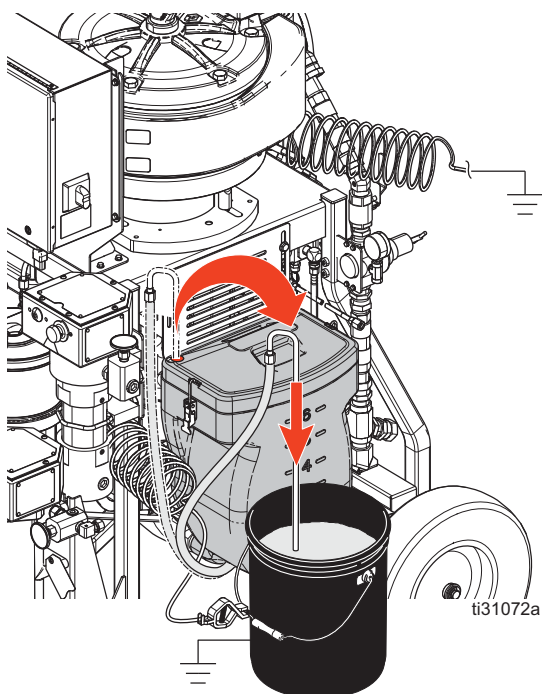
4. Close the dual shutoff handle (AE) and open the circulation handle (AC).



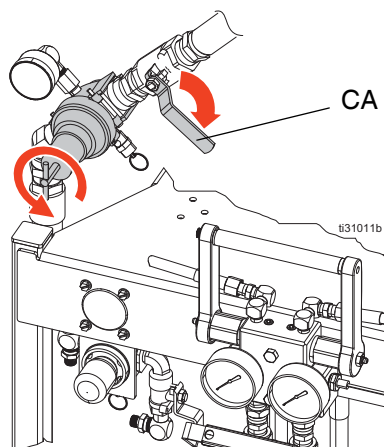
5. Open the main air shutoff valve (CA). Then slowly open the air regulator (CB).



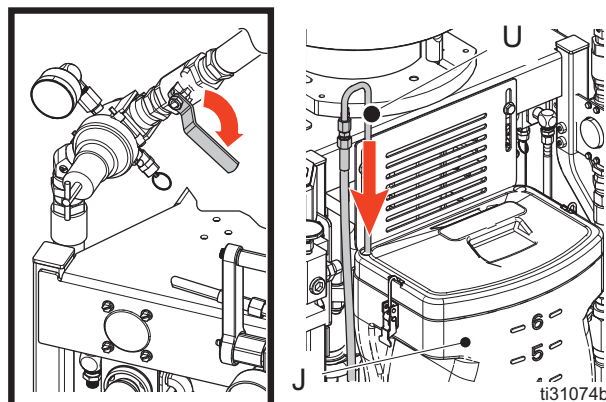
6. Dispense fluid into the containers until clean fluid comes out of the A and B recirculation lines.



7. Decrease air pressure. Close the main air shutoff valve (CA).



8. Move the recirculation lines (U) back to the correct hopper (J).



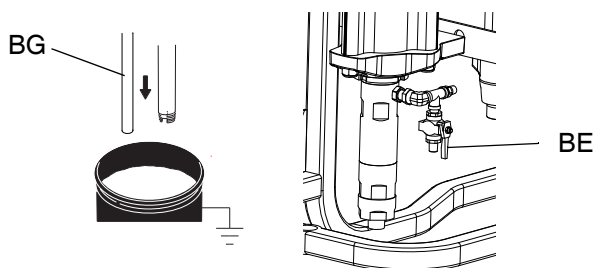
9. If using heaters, heat fluid throughout system before spraying. See **Recirculate Prior to Spraying or Re-Prime After a Pump Runs Dry**, page 30.

Prime Solvent Flush Pump

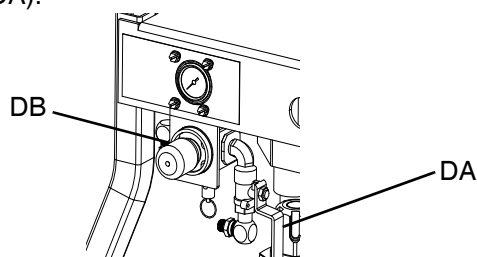
Follow instructions if the solvent flush pump is used.



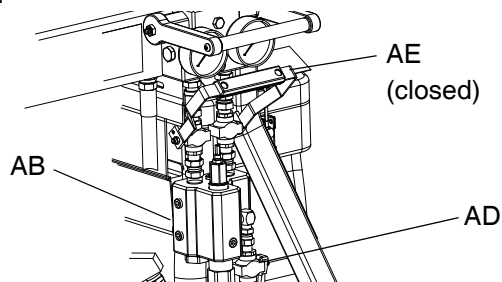
1. Connect a ground wire (not included) to a metal pail of solvent.
2. Place the siphon tube and the solvent circulation hose (BG) in the pail of solvent.



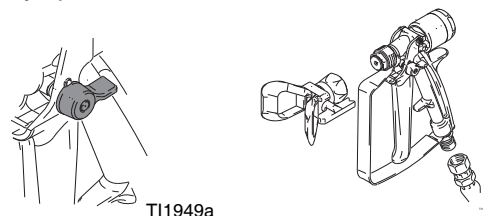
3. Open the prime valve (BE) on the solvent pump (BA) outlet.
4. Open the solvent pump air valve (DA). Slowly turn the solvent pump air regulator (DB) clockwise to prime the solvent pump and route solvent back to the pail. Close the prime valve (BE) and air valve (DA).



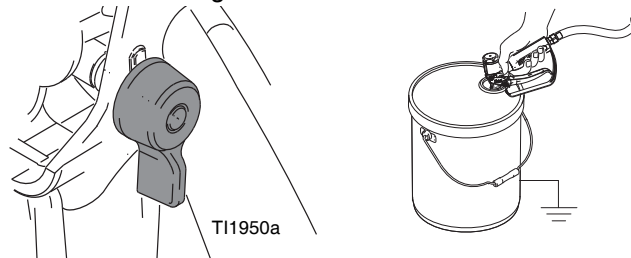
5. Open the solvent flush valve (AD) on the mix manifold.



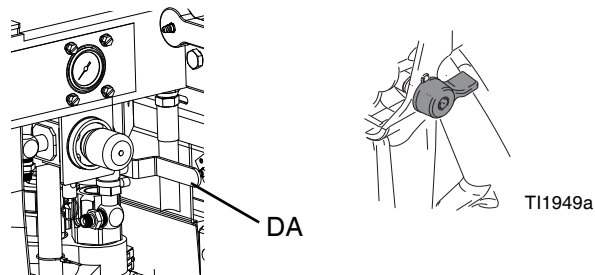
6. Ensure the trigger lock is engaged. Remove the spray tip.



7. Disengage the trigger lock and trigger the gun into a grounded metal pail while holding against a pail. Use a pail lid with a hole to dispense through. Seal around the hole and gun with a rag to prevent splash back. Be careful to keep fingers away from the front of the gun.



8. Open the solvent pump air valve (DA). Slowly turn the solvent pump air regulator (DB) clockwise to prime the solvent pump and push air out of the mix hose and gun. Trigger the gun until all air is purged.
9. Close the solvent pump air valve (DA) and trigger the gun to relieve pressure. Engage the trigger lock. Replace the spray tip.



10. Close the solvent flush valve (AD).

NOTE: Solvent pump air and pressure may be left on while spraying.

NOTICE

To prevent material from curing inside the system, always prime the solvent pump and solvent hose with solvent before spraying mixed materials.

Recirculate Prior to Spraying or Re-Prime After a Pump Runs Dry

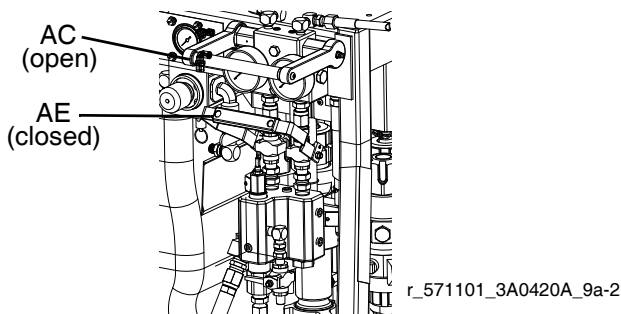
NOTE: Agitate, recirculate, and heat the material only as necessary to avoid mixing air into the fluid.

Use the recirculation mode when heating the material is required. Note the temperature at the top of the heater (outgoing or back to the hopper). When the thermometer reaches operating temperature, the material is ready to spray.

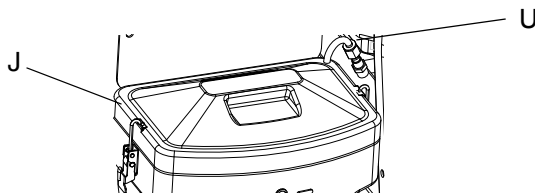
If using a system that does not require heat, recirculation is still required prior to spraying. Recirculation ensures that any settled fillers are mixed in, the pump lines are fully primed, and the pump check valves are operating smoothly.

Recirculation also allows you to re-prime one side that has run dry.

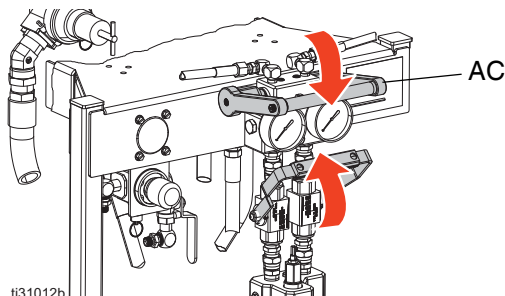
1. Follow **Prime Empty System**, page 27.
2. Lift to close the dual shutoff handle (AE).



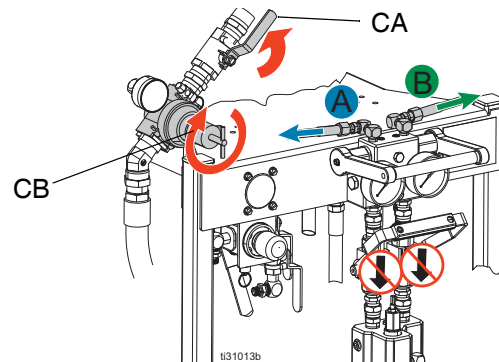
3. Ensure the recirculation hoses (U) are in the correct hoppers (J).



4. Lower to open the circulation valve handle (AC).

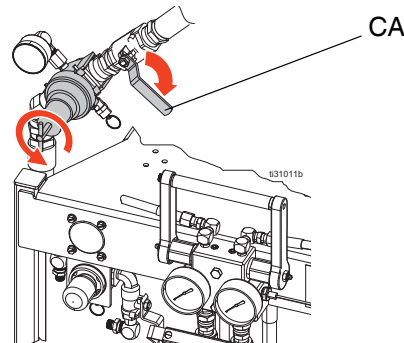


5. Turn down the air pressure regulator (CB) and then open the motor air shutoff valve (CA). Use the air pressure regulator to slowly increase the air pressure to the pumps to 15-30 psi (1-2 bar) until they start running slowly.



6. Run the pumps for a few minutes or until the material has reached the desired temperature. See **Heat Fluid**, page 30.

7. Close the motor air shutoff valve (CA).



Heat Fluid

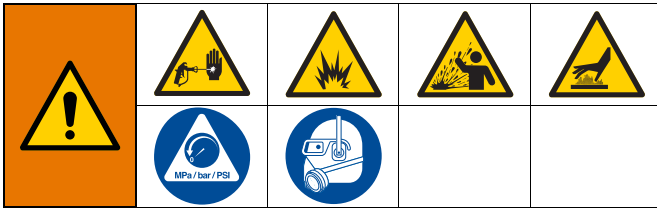
To heat fluid evenly throughout the system:

1. Circulate the fluid at approximately 1/2 gpm (10-20 cycles/min.) to raise the temperature of the hoppers to 80-90° F (27-32° C).
2. Decrease the circulation rate to approximately 0.25 gpm (5 cycles/min.) to increase the heater outlet temperature to match the spray temperature.

NOTICE

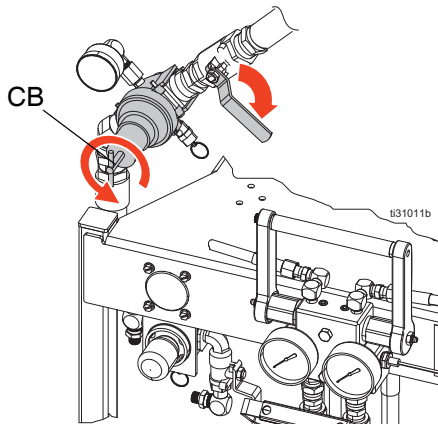
Circulating the fluid too quickly without decreasing the circulation rate will increase only the hopper temperature. Similarly, circulating fluid too slowly will increase only the heater outlet temperature.

Spray

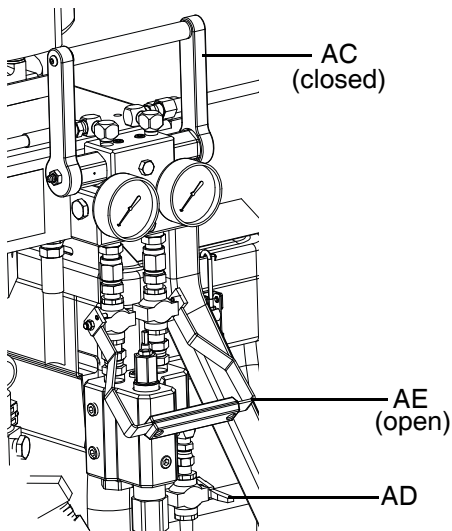


NOTE: After the first day of spraying, re-tighten all hose connection fittings and tighten the throat packing nuts on both pumps.

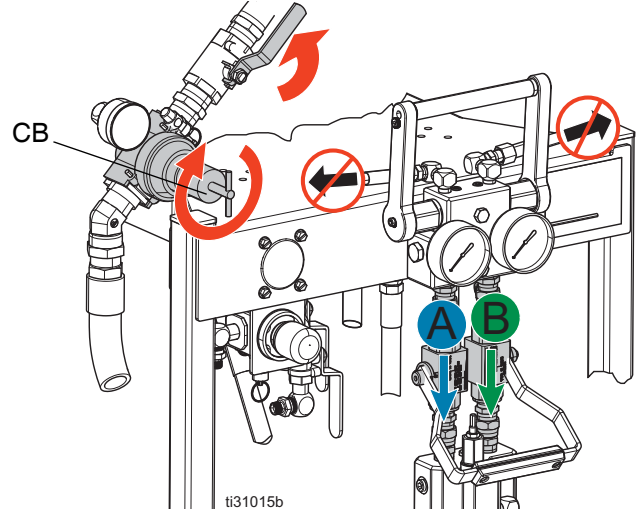
1. If heaters are used, turn them on. To adjust the heater temperature, refer to the Viscon HF or HP manual for instructions, and the **Heat Fluid** section, page 30. Circulate as necessary.
2. Close the motor air pressure regulator (CB) and decrease to zero.



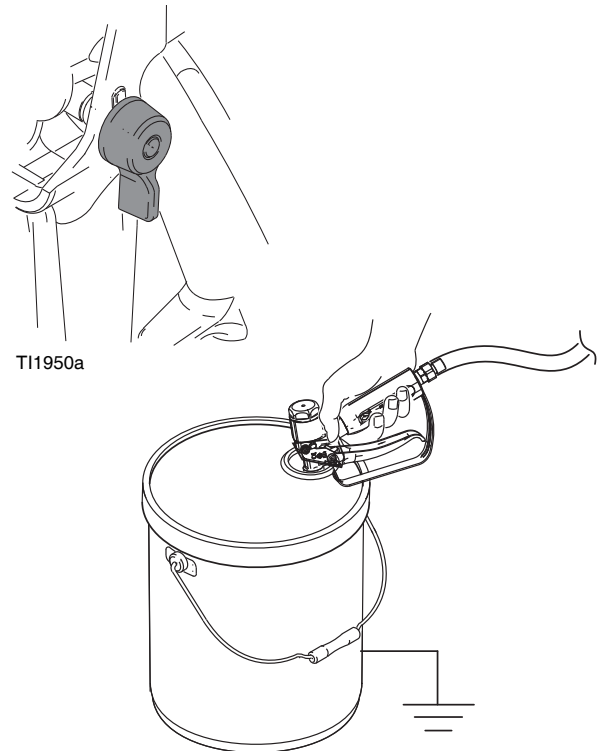
3. Close the circulation handle (AC) and the solvent flush valve (AD). Open the dual shutoff handle (AE).



4. Adjust the main air regulator (CB) to 30 psi (0.21 MPa, 2.1 bar) minimum.

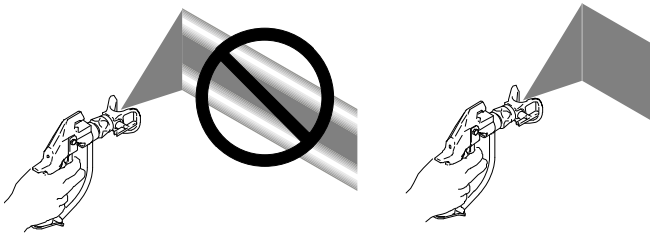


5. Remove tip. Disengage the trigger lock and trigger the gun while holding against a grounded metal pail. Use a metal pail lid with a hole to dispense through to avoid splashing. Dispense out of the mix hose until a well mixed coating flows from the gun.



6. Engage the trigger lock. Install the tip on the gun.
7. Adjust the main pump air regulator (CB) to the necessary spraying pressure and apply a coating to a test panel.

NOTE: Run **System Verification** tests everyday (see page 40).



NOTE: Excess pressure increases overspray and pump wear.

8. Check and record gauge readings frequently during operation. A change in gauge readings indicates a change in system performance.

NOTE:

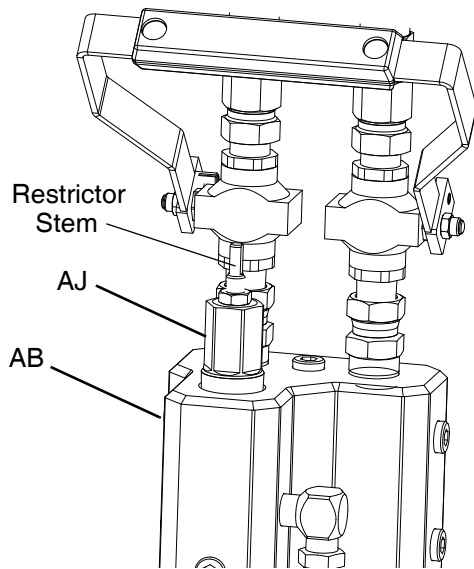
- A pressure drop occurs during pump stroke change-over. It should be quick and synchronous.
 - Flush the mix manifold as necessary during the day's operation.
9. Follow **Flush Mixed Material**, page 34 when you are finished spraying or before potlife expires.

NOTE: Mixed material potlife or working time decreases with increased temperature. Pot life in the hose is much shorter than the dry time of the coating.

B Component Adjustable Fluid Restrictor

The B side restrictor (AJ) reduces momentary “lead/lag” ratio imbalance of the A and B flow into the static mixer tubes when the gun opens. The error is caused by differences in viscosity, volume, and hose expansion.

The restrictor is used primarily when the mix manifold is positioned remotely from the machine with a short mix hose to the spray gun. It can also be used in the ratio check procedure.



If the mix manifold (AB) is mounted on the machine, you do not need to adjust the restrictor. Leave the restrictor stem open two turns minimum from fully closed.

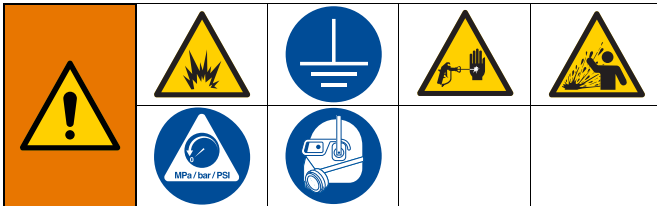
To Adjust the Restrictor:

Adjust the restrictor stem clockwise while spraying until you see a slight rise in the B side pressure gauge. The point where the pressure starts to rise is a good adjustment setting.

Unless you are dispensing directly out of the mix manifold and mixer, this is an approximate adjustment.

See your mix manifold manual for more information.

Flush Mixed Material



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

- Flush equipment only in a well-ventilated area
- Ensure main power is off and heater is cool before flushing
- Do not turn on heater until fluid lines are clear of solvent

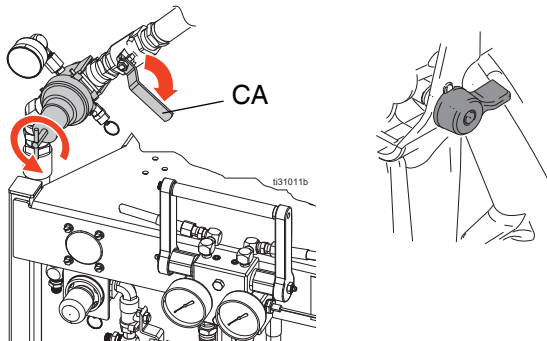
Flush the mix manifold when any of the following situations occur.

- breaks in spraying
- overnight shutdown
- mixed material in system approaching end of potlife

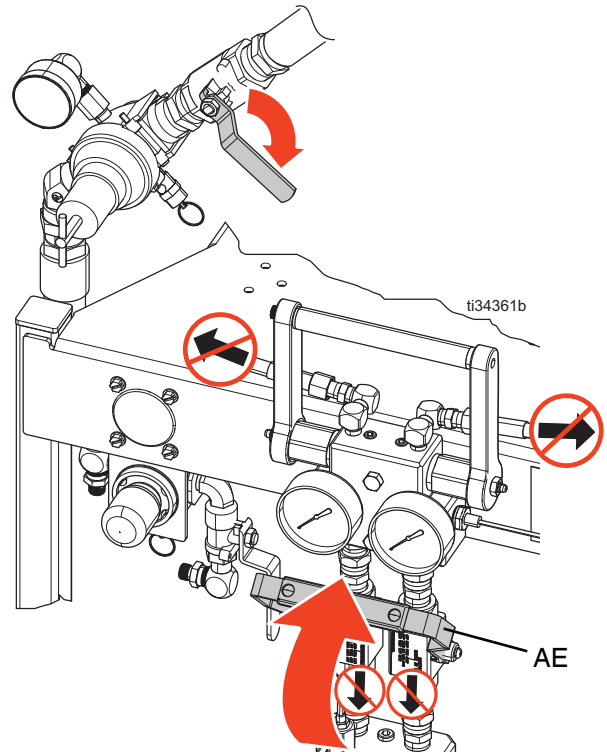
Flush Mix Manifold, Hose, and Spray Gun

If your system doesn't include a solvent flush pump, see **Empty and Flush Entire System (new system or end of job)**, page 36.

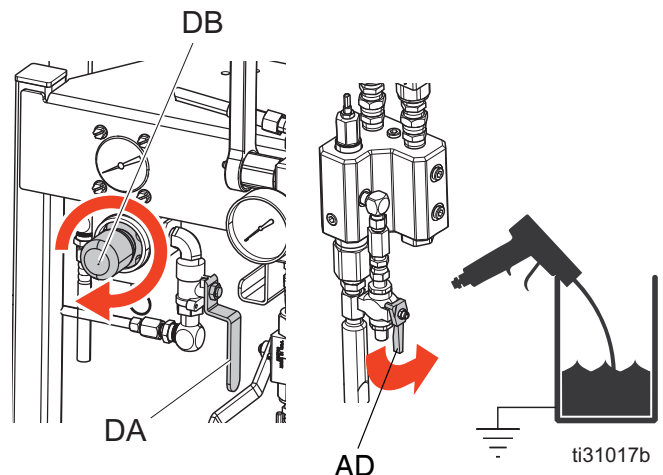
1. Turn off heaters. Allow heater and heated hoses to cool.
2. Follow the **Pressure Relief Procedure** on page 26.
3. Close the motor air shutoff valve (CA) to turn off the pump air motor and reduce air pressure. Engage trigger lock. Remove the spray tip and soak in solvent.



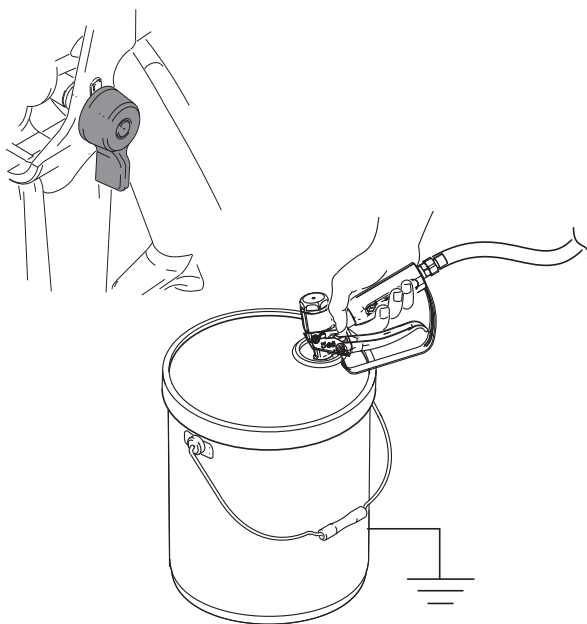
4. Lift to close the dual shutoff handle (AE).



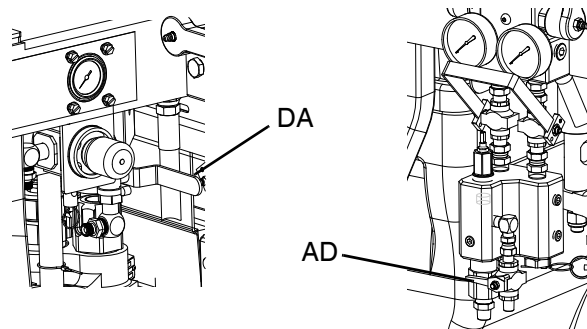
5. Open the solvent pump air valve (DA). Slowly turn the solvent pump air regulator (DB) clockwise to increase air pressure.



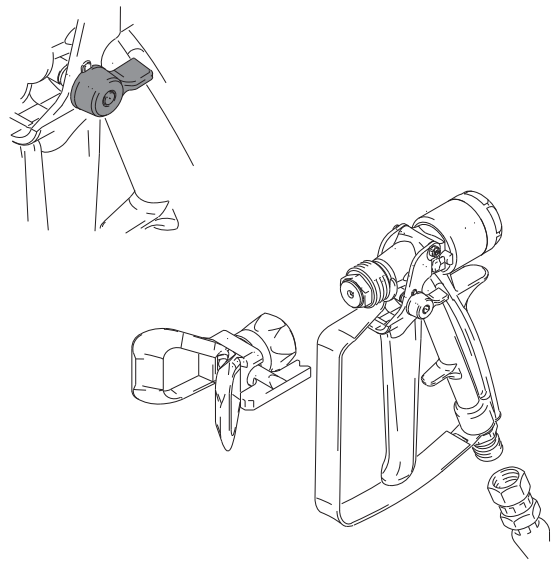
6. Open the solvent flush valve (AD)
7. Disengage the trigger lock, hold the gun against a grounded metal pail, and trigger the gun into the pail. Use a pail lid with a hole to dispense through. Seal around the hole and gun with a rag to prevent splash back. Be careful to keep fingers away from the front of the gun. Continue flushing until clean solvent dispenses.



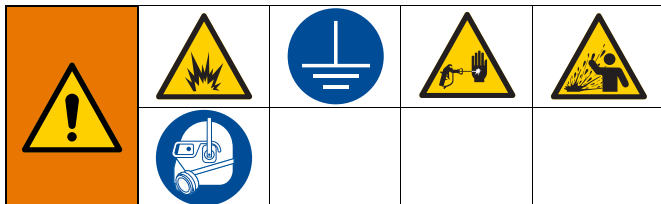
8. Close the solvent pump air valve (DA).



9. Hold a metal part of the gun against a grounded metal pail and trigger the gun to relieve pressure. Close the solvent flush valve (AD) after relieving the pressure.
10. Engage the trigger lock. Disassemble and clean the spray tip with solvent by hand. Reinstall the spray tip on the gun.



Empty and Flush Entire System (new system or end of job)



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

- Flush equipment only in a well-ventilated area
- Ensure main power is off and heater is cool before flushing
- Do not turn on heater until fluid lines are clear of solvent

NOTE:

- If the system includes heaters and heated hose, turn them off and allow to cool before flushing. Do not turn on the heaters until the fluid lines are clear of solvent.
- Cover fluid containers and use the lowest possible pressure when flushing to avoid splashing.
- Before color change or shutdown for storage, circulate the solvent at a higher flow rate and for a longer time. Change the solvent when it gets dirty.
- To only flush the fluid manifold, see **Flush Mix Manifold, Hose, and Spray Gun**, page 34.
- If the machine is inoperable, use drain plugs on the pump inlet fittings.

Guidelines

Flush new systems if the coating materials will be contaminated by mineral oil. Follow the **Flush System Procedure** on page 38 to ensure mineral oil is removed.

Flushing will help prevent materials from settling or gelling in the pumps, lines, and valves. Flush the system when any of the following situations occur.

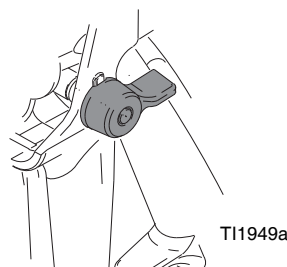
- Anytime the system will not be used for more than one week (depending on materials used)
- If the materials used have fillers that will settle
- If using materials that are moisture sensitive

- Before servicing
- If the machine is going into storage, replace the flush solvent with light oil. Never leave the equipment empty of any fluid.

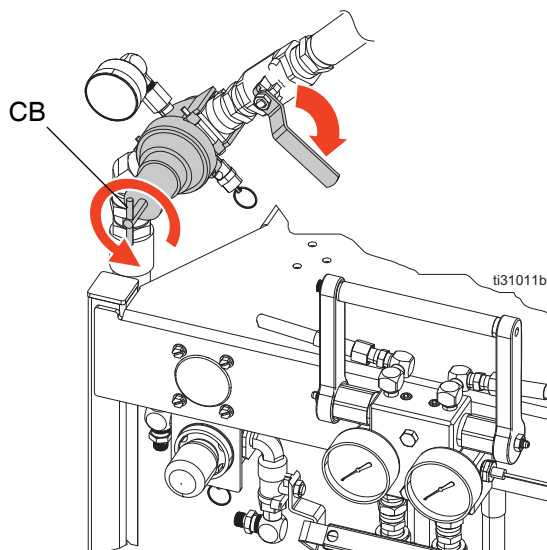
Empty System Procedure

1. Follow **Prime Empty System** steps 3-8, page 27.
2. If your system is equipped with a solvent flush pump, follow **Flush Mix Manifold, Hose, and Spray Gun** on page 34.

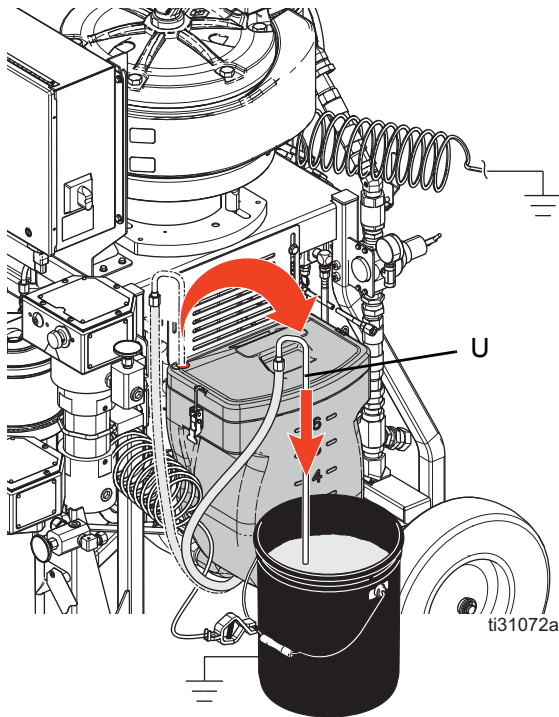
If your system is not equipped with a solvent flush pump, follow the **Pressure Relief Procedure** on page 26 before servicing the system.
3. Engage the trigger lock.



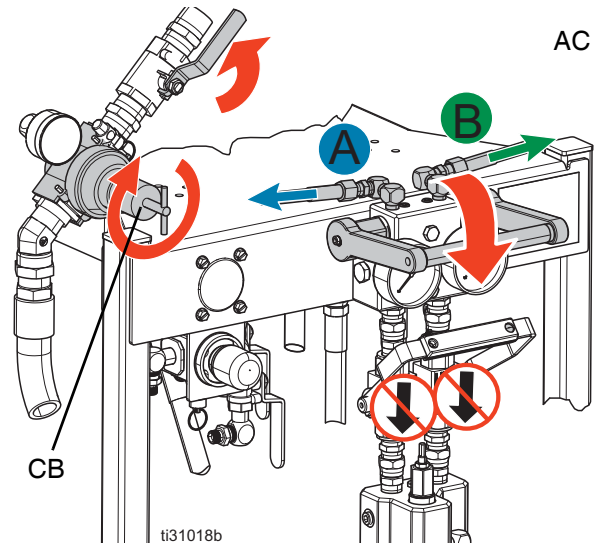
4. Turn the motor air pressure regulator (CB) fully counter-clockwise to shut off.



5. Move the recirculation lines (U) to separate fluid containers to pump remaining fluid out of the system.



6. Lower to open the circulation handle (AC) and increase the motor air pressure regulator (CB) pressure to 20 psi (138 kPa, 1.38 bar).



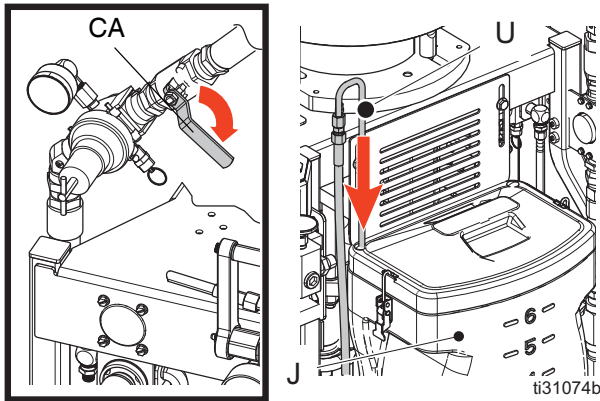
7. Open the motor air shutoff valve (CA).

NOTE: If the system does not start with static pressure, increase the air pressure by 5 psi (35 kPa, 0.35 bar) increments. To avoid splashing, do not exceed 35 psi (241 kPa, 2.4 bar).

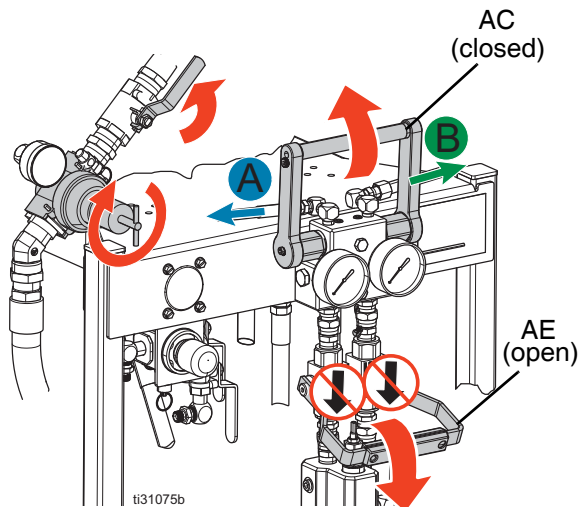
8. Run the pumps until the A and B hoppers (J) are empty. Salvage the material in separate, clean containers.

Flush System Procedure

1. Close the motor air shutoff valve (CA).

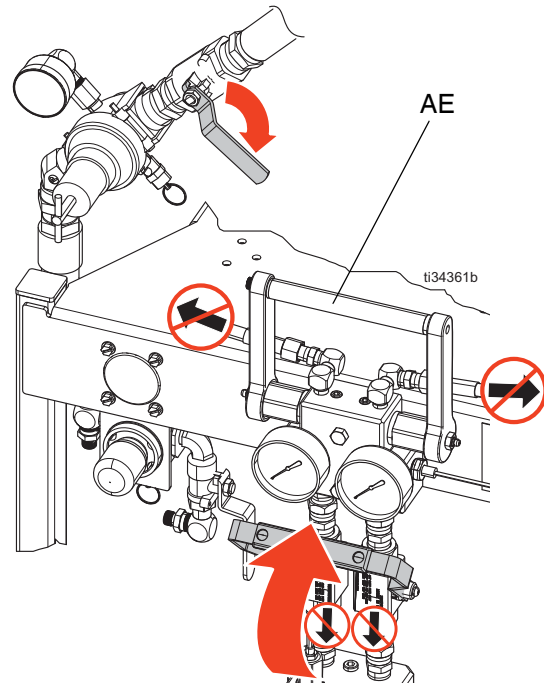


2. Wipe the hoppers (J) clean, then add solvent to each. Move the circulation lines (U) to waste containers and push out the dirty fluids.
3. Move the recirculation lines (U) back to the hoppers. Continue recirculating until the system is thoroughly flushed.
4. Lift to close the circulation handle (AC) and lower to open the dual shutoff handle (AE).



5. Open the motor air shutoff valve. Increase the air regulator pressure to 20 psi (1.9 bar).
6. Increase the motor air pressure regulator to dispense fresh solvent from the hoppers through the mix manifold valves and out the gun.

7. Turn off the air motor.
8. Lift to close the dual shutoff handle (AE).



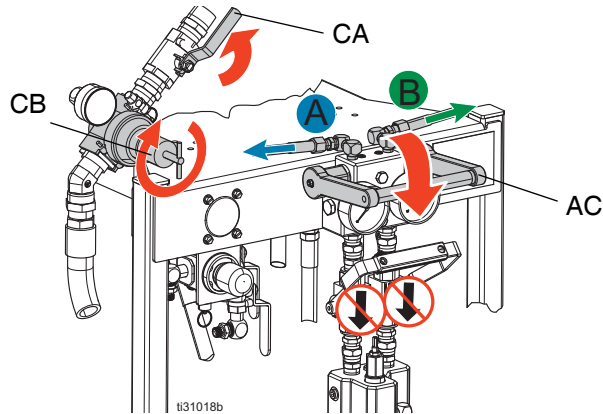
9. Remove pump fluid filters, if installed, and soak in solvent. Clean and replace the filter cap. Always replace the filter o-rings. See your Xtreme pump manual.
10. Fill the A and B pump packing nuts with TSL. Also, always leave some type of fluid, such as solvent or oil, in the system to prevent scale build up. This build up can flake off later. Do not use water.

NOTE:

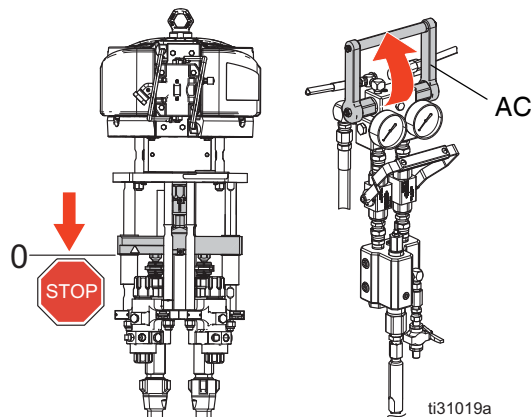
- If machine is set up with a remote mix manifold, the A and B hose can be disconnected from the mix manifold, and secured back to each hopper for circulation of flush solvent.
- Change the flush solvent at least once until it circulates clean.
- Always keep the A side and B side flush solvent containers separate to avoid cross-contamination.

Park

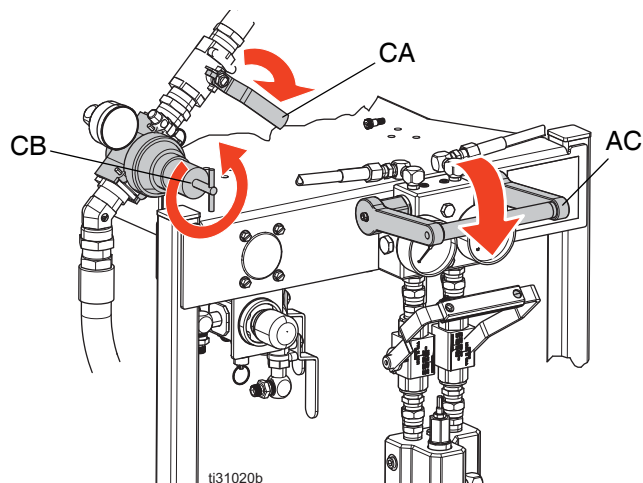
1. Lower to open the circulation handle (AC) and adjust the air regulator (CB) so that the pump runs slowly.



2. Lift to close the circulation handle (AC) when the pump is at the bottom of the stroke.

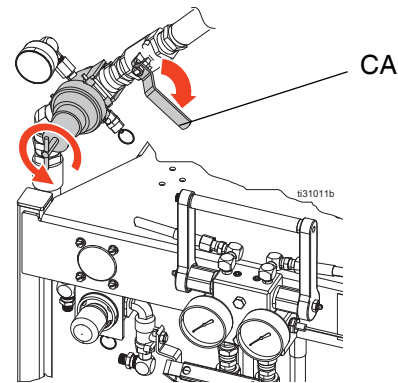


3. Close the motor air valve (CA) and turn the air regulator (CB) counterclockwise. Lower to open the circulation handle (AC).

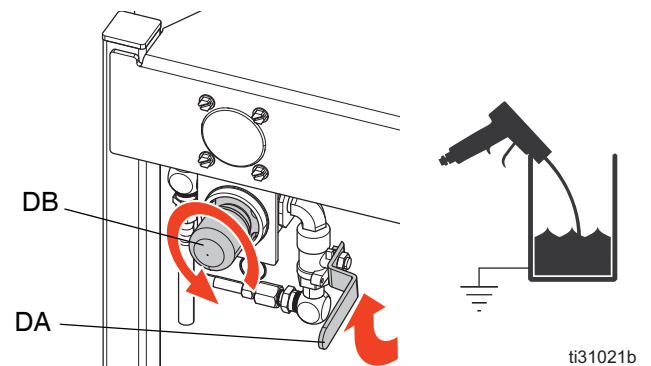


Shutdown

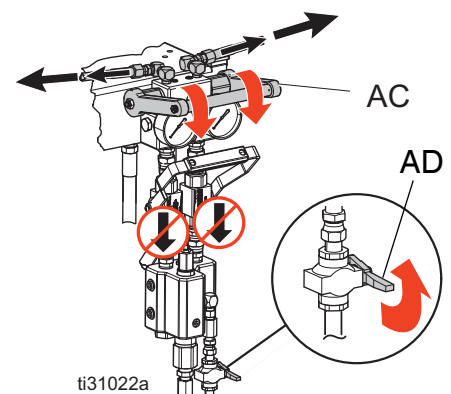
1. Flush mix manifold, hoses, and gun. See **Flush Mix Manifold, Hose, and Spray Gun**, page 34.
2. Make sure the main air shutoff valve (CA) is closed.



3. Make sure the solvent air shutoff valve (DA) is closed and the solvent air pressure regulator (DB) is turned fully counterclockwise.



4. Close the solvent flush valve (AD) and lower re-circulation handle (AC).



System Verification

Graco recommends running the following tests daily.

Check for Normal Operation

Every time you start spraying:

- Watch the fluid gauges (AF). A pressure drop occurs during pump stroke changeover. It should be quick and synchronous.
- Stop the pumps on the upstroke. Check that both gauges hold pressure for at least 20 seconds. See **Pump Troubleshooting** on page 44.

If one gauge drops, the others will rise.

- Stop the pumps on the downstroke. Check that all gauges hold pressure.
- If using feed pumps, check that both feed pumps run during the proportioner upstroke.

Mix and Integration Tests

Use the following tests to check for proper mix and integration.

Butterfly Test



At low pressure, and with the spray tip reversed, dispense a 1/2 in. (12.7 mm) bead of material onto foil until multiple changeovers of each pump have occurred. Fold the sheet of foil over the fluid then peel it back and look for unmixed material (appears marble-like), or color changes.

Curing Test

Spray a single continuous pattern on foil at typical pressure setting, flow rate, and tip size until multiple changeovers of each pump have occurred. Trigger and de-trigger at typical intervals for the application. Do not overlap or cross over your spray pattern.

Check curing at various time intervals, listed on the material data sheet. For example, check for dry to touch by running your finger along the test pattern's entire length at the time listed on the data sheet.

Spots that take longer to cure indicate insufficient pump loading, leakage, or lead/lag errors at a remote mix manifold.

Appearance Test

Spray material onto foil. Look for variations in color, gloss, or texture that may indicate improperly catalyzed material.

Monitor Fluid Supply

NOTE: To prevent pumping air into the system, which causes incorrect proportioning, never allow the feed pump or solvent pump containers to run dry.

An empty pump will quickly accelerate to a high speed, and may damage itself and the other displacement pump because it causes a pressure rise in the other pump. If a supply container runs dry, stop the pump immediately, refill the container, and prime the system. Be sure to eliminate all air from the system.

Check Pot Life

Check the fluid manufacturer's instructions for fluid pot life at your fluid temperature. Flush mixed fluid out of the mix manifold, hose, and gun before pot life time expires, or before a rise in viscosity affects the spray pattern.

Ratio Check

Check the ratio at the mix manifold after any changes to the proportioning system. Use Ratio Check Kit 24F375 to check the ratio at the mix manifold. See manual ratio check kit manual for instructions and parts.

To prevent an inaccurate ratio check when feed pumps are used in your system, the feed pressure cannot be more than a maximum of 25% of the proportioner outlet pressure. High feed pressure can float the proportioner pump check balls, resulting in an inaccurate ratio check. There must be back pressure on both sides of the mix manifold when checking the ratio.

Maintenance

Hose Electrical Resistance

Check electrical resistance of hoses regularly. If total resistance to ground exceeds 29 megohms, replace hose immediately.

Filters

Once a week check, clean, and replace (if needed) the following filters.

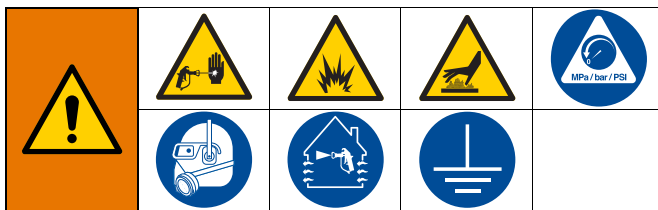
- Both pump filters; see lower manual for instructions.
- Spray gun handle filter; see spray gun manual.

Seals

Once a week, check and tighten throat seals on both pumps. See table for torque specifications. Be sure to follow the **Pressure Relief Procedure** on page 26, prior to tightening seals. There must be zero pressure on the pumps when adjusting.

Pump Size	Torque Specification
All	25-30 ft-lb (34-41 N•m)

Cleaning Procedure



1. Ensure all equipment is grounded. See **Grounding**, page 20.
2. Ensure the area where the system will be cleaned is well ventilated and remove all ignition sources.
3. Turn off all heaters and allow equipment to cool.

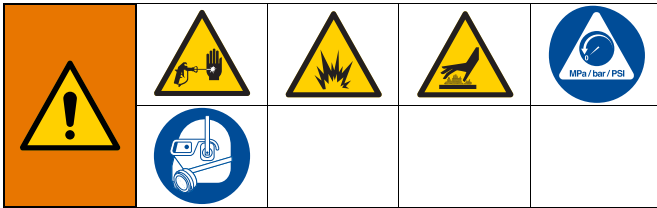
4. Flush mixed material. See **Flush Mixed Material**, page 34.
5. Perform the **Pressure Relief Procedure** on page 26.
6. Perform **Park** and **Shutdown** procedures, page 39. Turn off all power.
7. Clean the external surfaces only using a rag soaked in solvent that is compatible with the spray material and surfaces being cleaned.
8. Allow enough time for the solvent to dry before using the system.

Change the Mix Ratio

In order to change the mix ratio, one or both pumps need to be replaced, the air motor needs to be re-positioned, and the over pressure relief valves may need to be changed.

1. Check the **Varying Parts** table on page 62 for the correct pump sizes.
2. Remove and replace pump. See **Remove Displacement Pump** page 45.
3. Adjust the position of the air motor. See **Motor Position** page 22.
4. *If changing from one type of XP-hf system to another (for example - changing from XP50-hf to XP70-hf or from XP70-hf to XP50-hf):* Remove the existing over pressure relief valves (302) and install the correct valves for the new system type. See **Replace Over Pressure Relief Valves** on page 48.
5. Change the air pressure relief valve (CG) as required, depending on the ratio.

Troubleshooting



Always follow the **Pressure Relief Procedure** on page 26 before servicing the system.

✘ **Fluid ratio will be wrong.**

◆ **Purge all air from system before proportioning fluids.**

Problem	Cause	Solution
System stops or will not start.	Air pressure or volume too low.	Increase air pressure; check air compressor.
	Closed or restricted air line or air valve.	Open or clean the air line and air valve.
	Fluid valves closed.	Open the fluid valves.
	Clogged fluid hose.	Replace the fluid hose.
	Air motor worn or damaged.	Repair air motor; see your air motor manual.
	Displacement pump stuck.	Repair pump; see your lower pump manual.
System speeds up or runs erratically.	Fluid containers are empty.◆	Check fluid containers often; keep filled.
	Air in fluid lines.◆	Purge; check connections.
	Displacement pump parts worn or damaged.	Repair pump; see your lower pump manual.
Pump operates, but resin output pressure drops on upstroke.✘	Dirty, worn, or damaged resin pump piston valve or piston packings.	Clean, repair pump; see your lower pump manual.
Pump operates, but resin output pressure drops on downstroke.	Dirty, worn, or damaged resin pump intake valve.	Clean, repair pump; see your lower pump manual.
Pump operates, but resin output pressure drops on both strokes.✘	Hardener output restriction.	Clean, unplug hardener side. Open manifold restrictor.
	Fluid supply low.◆	Refill or change container.
Pump operates, but hardener output pressure drops on upstroke.✘	Dirty, worn, or damaged hardener pump piston valve or piston packings.	Clean, repair pump; see your lower pump manual.
Pump operates, but hardener output pressure drops on downstroke.✘	Dirty, worn, or damaged hardener pump intake valve.	Clean, repair pump; see your lower pump manual.
Pump operates, but hardener output pressure drops on both strokes.	Resin output restriction.	Clean, unplug resin side.
	Fluid supply low.◆	Refill or change container.
Fluid leak in packing nut.	Loose packing nut or worn throat packings.	Tighten; replace; see your lower pump manual.
Fluid leak under packing nut	Packing cartridge o-ring.	Replace o-ring; see your lower pump manual.

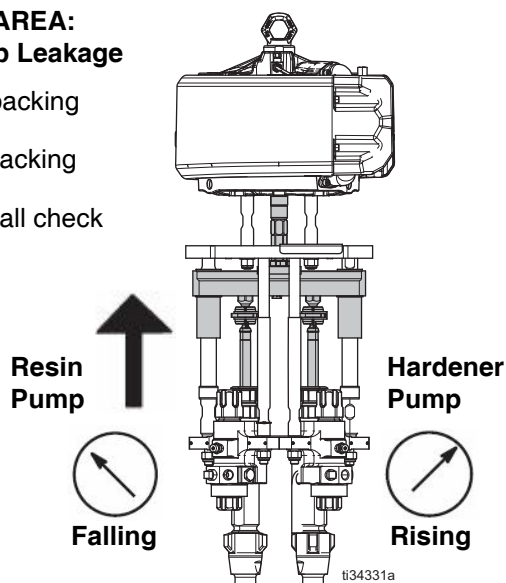
Problem	Cause	Solution
Relief valve (AM) leaks back to supply, opens too soon, or will not close.	Relief valve is dirty or damaged.	Replace over pressure relief valve (302).
No pressure on hardener side; fluid leaking from hardener pump outlet rupture disc fitting.	Overpressure rupture disk blown.	Determine cause of overpressurization and correct. Replace rupture disk assembly 258962 (see page 62) and over pressure relief valve (302).
Pressure and flow surges on upstroke.	Feed pressure too high. Every 1 psi of feed pressure adds 2 psi during upstroke.	Reduce feed pressure. See Dimensions , page 75.
Fluid outlet pressure gauges split only at the top changeover (if one gauge drops the other will rise).	Not fully loading one side on upstroke.	Increase feed pressure on side that dropped. Increase feed hose size. Clean inlet strainer or hopper screen.
	Air mixed in fluid from excessive agitation or circulation.	Flush and add new fluid.

Pump Troubleshooting

This chart uses proportioning fluid gauges to determine pump malfunctions. Observe the gauge readings during the stroke direction indicated by the bold arrow, and immediately after closing the gun or mix manifold. Refer to other manuals to troubleshoot individual components.

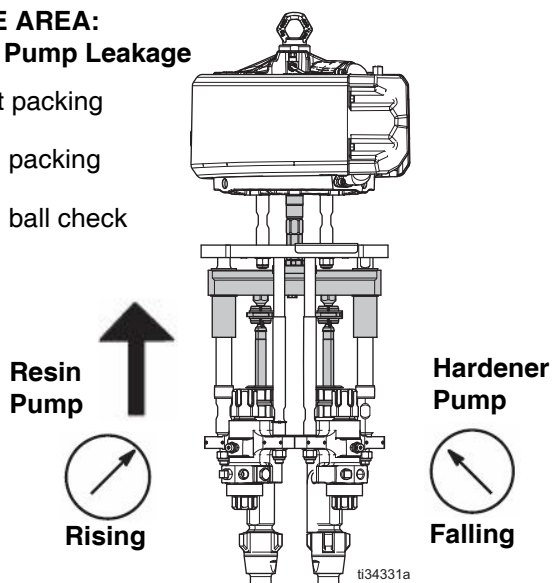
TROUBLE AREA: Resin Pump Leakage

1. Throat packing
2. Piston packing
3. Piston ball check



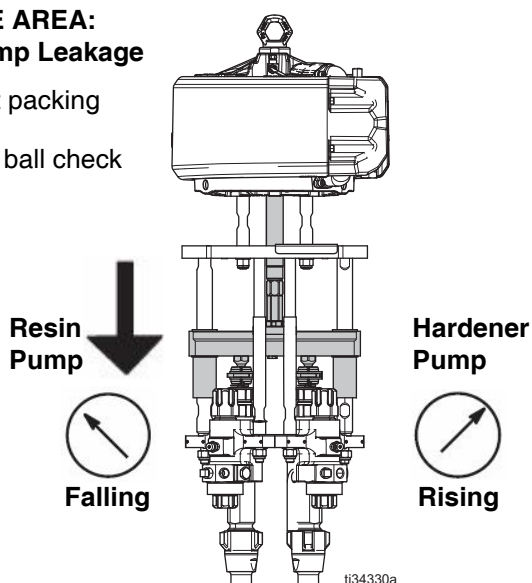
TROUBLE AREA: Hardener Pump Leakage

1. Throat packing
2. Piston packing
3. Piston ball check



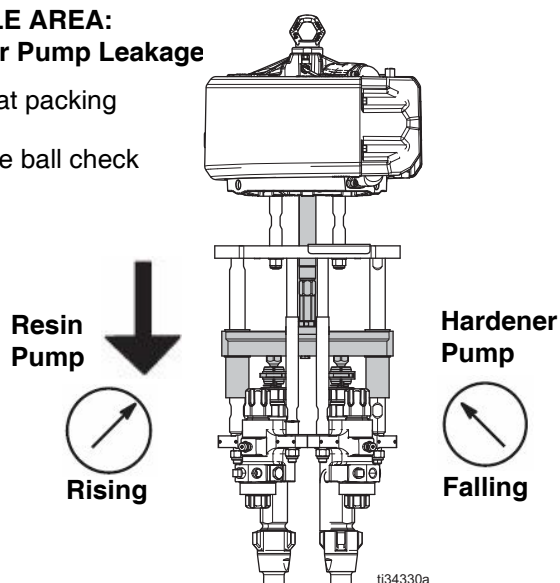
TROUBLE AREA: Resin Pump Leakage

1. Throat packing
2. Intake ball check

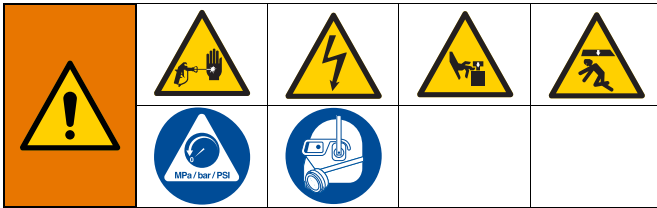


TROUBLE AREA: Hardener Pump Leakage

1. Throat packing
2. Intake ball check

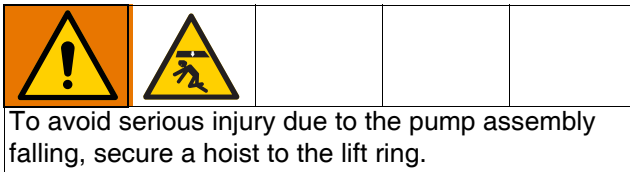


Repair



Follow the **Shutdown** procedure on page 39, which includes pressure relief and flushing if service time may exceed pot life time before servicing fluid components and before transporting system to a service area.

Pump Assembly



The displacement pumps and air motor may be removed and serviced separately or the entire pump and motor assembly can be removed with a hoist.

Remove Pump Assembly

1. Stop the pumps near the bottom of their stroke. Follow the **Park** procedure and **Shutdown** procedure on page 39.
2. Disconnect all hoses from the pump assembly.
3. If hoppers are installed, disconnect the hopper fluid lines from the pump fluid inlet. See **Hoppers**, page 50.

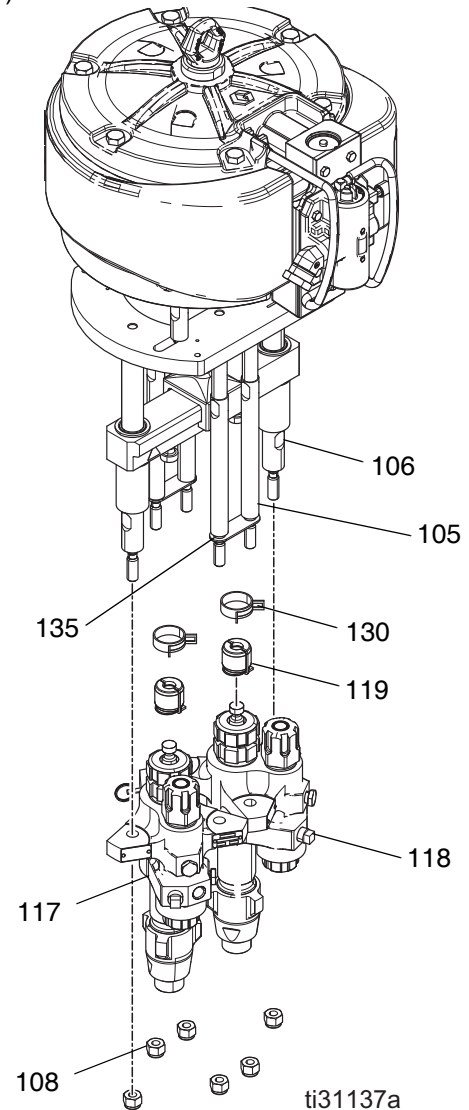
NOTE: The hopper and hopper bracket do not need to be removed from the cart.

4. Remove screws (6) and washers (5) under the tie plate (101).
5. Use hoist to remove the pump assembly by the lift ring and carefully lift out of cart (1).

Remove Displacement Pump

1. Follow the **Park** procedure and **Shutdown** procedure on page 39.
2. If hoppers are installed, remove the hopper and hopper bracket from the cart. See **Hoppers**, page 50.

3. If feed pumps are installed, close the inlet ball valve. Remove inlet union (61).
4. Remove the spring clamp (130) and coupling (119 or 120).

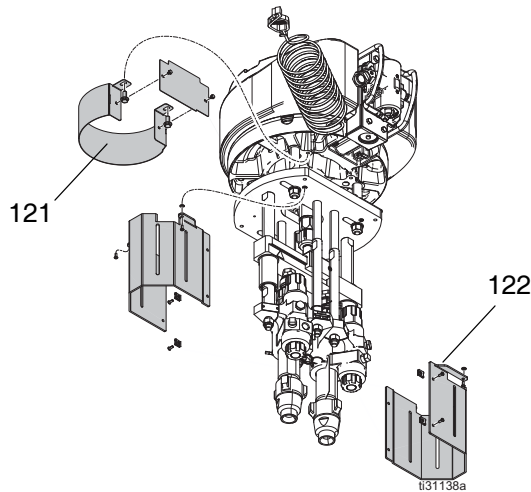


5. Use a wrench to hold the tie rod (105, 106) flats to keep the rods from turning. Unscrew the nuts (108) from the tie rods and carefully remove the displacement pump (117 or 118) and lower straps (135).
6. Refer to the Xtreme Displacement Pump manual to service or repair the displacement pump.
7. Follow the steps in reverse order to reinstall the displacement pump.

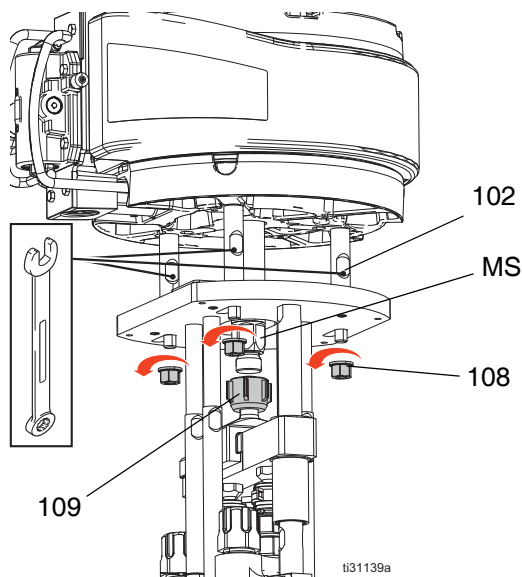
NOTE: Torque nuts (108) to 95-105 ft-lb (129-142 N•m).

Remove Motor

1. Follow the **Park** procedure and **Shutdown** procedure on page 39.
2. Disconnect the air line from the air motor.
3. Remove the air motor rod cover (121) and pump guards (122).



4. Use a wrench to hold the tie rod (102) flats to keep the rods from turning. Unscrew the nuts (108) from the tie rods.



5. Place a wrench on the motor shaft hex flats (MS). Loosen coupling nut (109).
6. Use a hoist to remove the air motor by the lift ring.
7. Refer to your air motor manual to service or repair the air motor.

8. Follow the steps in reverse order to reinstall the air motor.

NOTE: Position air motor for correct mix ratio. See **Motor Position** on page 22 for instructions. Torque nuts (108) to 95-105 ft-lb (129-142 N•m). Torque the coupling nut (109) to 230-250 ft-lb (312-339 N•m).

Air Controls

See FIG. 2 on page 47.

Replace Air Control Assembly

1. Close the main air shutoff valve on the air supply line and on the system. Depressurize the air line.
2. Disconnect the air motor air lines and system air line.
3. Remove screws (50). Remove the bottom air filter assembly from the cart.
4. Remove the upper air control assembly from the air motor.
5. Follow the steps in reverse order to reinstall the new air control assembly.

Replace Air Filter Element

1. Close the main air shutoff valve on the air supply line and on the system. Depressurize the air line.
2. Unscrew the filter bowl (710).
3. Remove and replace the filter element. See **Accessories and Kits**, page 73.

Replace System Air Regulator

1. Close the main air shutoff valve on the air supply line and on the system.
2. Disconnect the air motor air lines and system air line.
3. Remove the regulator assembly (702) and replace with a new regulator. See **Air Controls 26C414** on page 71.
4. Follow the steps in reverse order to reassemble.

Air Control Assembly

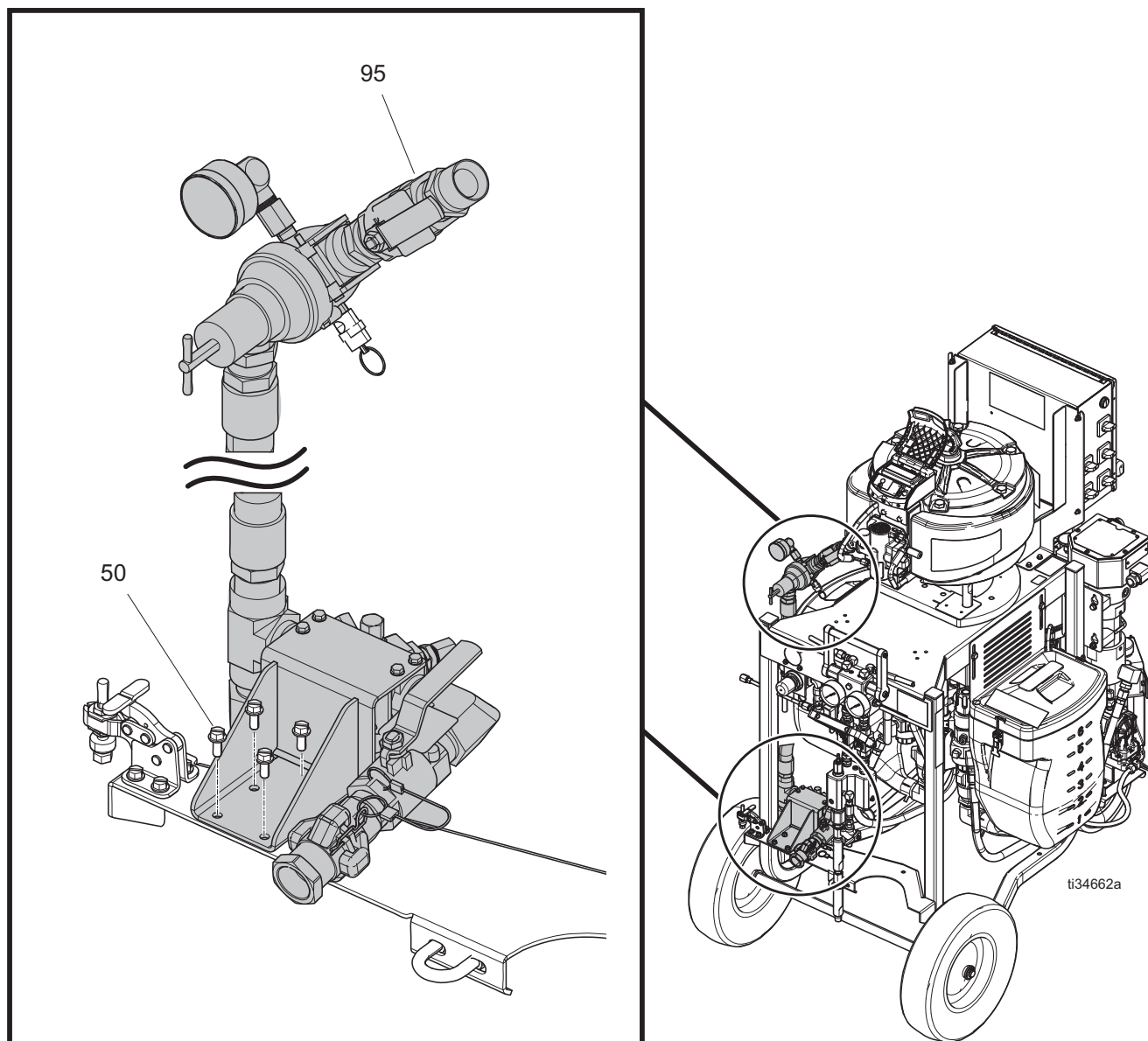
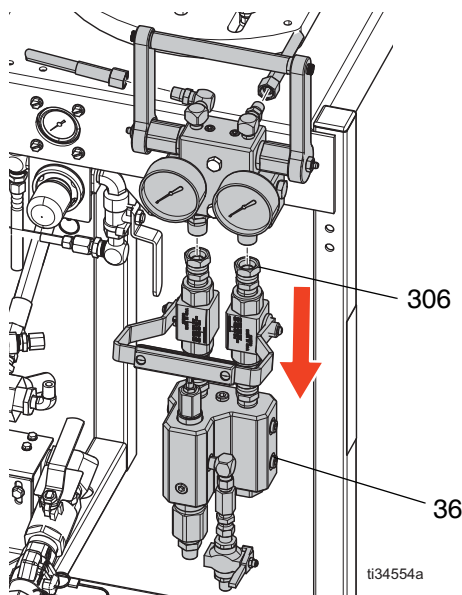


FIG. 2: Air Control Assembly

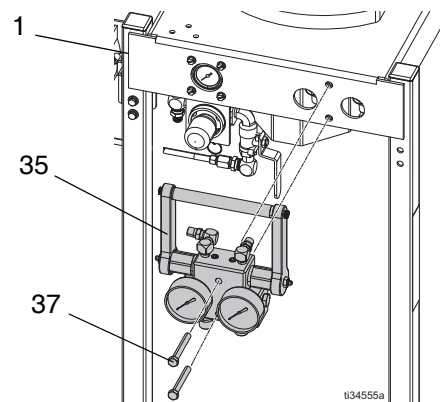
Mix Manifold Assembly

1. Follow the **Park** procedure and **Shutdown** procedure on page 39.
2. Disconnect the fluid hose (25) and the flush hose from the mix manifold (36).
3. Loosen the union fittings (306) that connect to the mix manifold adapter fittings.
4. Remove the mix manifold assembly (36).
5. See mix manifold manual for service and repair instructions.



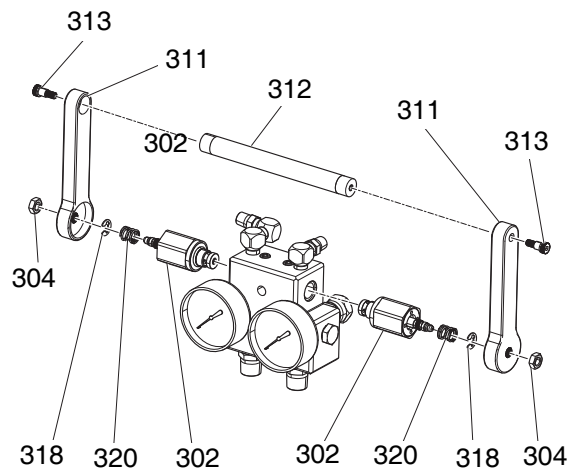
Fluid Circulation Manifold with Over Pressure Relief Valves

1. Follow the **Park** procedure and **Shutdown** procedure on page 39.
2. Disconnect all fluid hoses from the fluid circulation manifold (35).
3. Remove the mix manifold if it is assembled to the fluid circulation manifold. See **Mix Manifold Assembly** for instructions.
4. Loosen the two screws (37) that secure the manifold (35) to the cart (1).
5. Remove the two screws (37) and fluid circulation manifold (35) from the cart (1).



Replace Over Pressure Relief Valves

1. Follow the **Park** procedure and **Shutdown** procedure on page 39.
2. Ensure handle (312) is in the down position. Remove the screws (313), jam nut (304), handles (311), handle rod (312), clips (318), and springs (320).



3. Unscrew both over pressure relief valves (302) from the manifold.

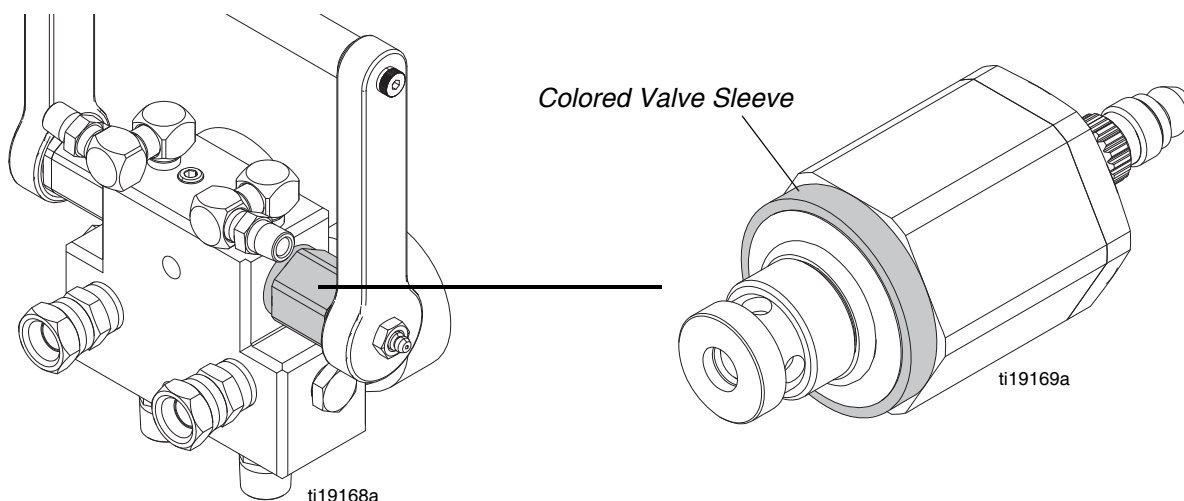
NOTE: The correct over pressure relief valve must be used on all systems. Choose the correct color coded valve from the chart on page 49.

4. Apply blue threadlock to new over pressure relief valves (302) and install in the manifold. Torque to 28-32 ft-lb (38-43 N•m).
5. Place a spring (320) over each valve stem. Place a clip (318) in each valve stem groove to retain the springs.

6. Slide handle (311) onto valve stem and rotate approximately 90° until you feel it fully lock against the valve seat. Repeat for opposite side.
7. Remove handle then place handle (311) on valve stem (302) at the vertical, or near vertical, position.
8. Apply blue threadlock on the nut (304) threads and tighten the handle against the spring (320) and clip (318). Torque to 70-80 in-lb (7.9-9 N•m).
9. Place the rod (312) and the second handle (311) on second valve stem aligned with the opposite handle.
10. Repeat step 9.
11. Install two screws (313) in handles (311).
12. Check operation of the handle and valves.
13. Operate the handle in and out of the spray and circulate positions.
14. Check for clearance with fittings.

NOTE:

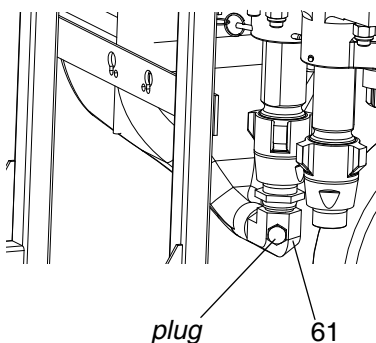
- Both valves should settle firmly into the spray position inward against the seats in the valve.
- Both valve stems should rotate out to their most extended positions when the handle is pulled down to the circulate position.

Fluid Circulation Manifold Replacement Guide

Circulation Manifold (35) Part No.	Relief Valve (302) Part No.	Valve Sleeve Color	Target Opening Pressure psi (MPa, bar)	Use with:
262783	262809	Gold	7100 (49, 490)	All XP50-hf models
262806	262520	Silver	9250 (64, 638)	All XP70-hf models

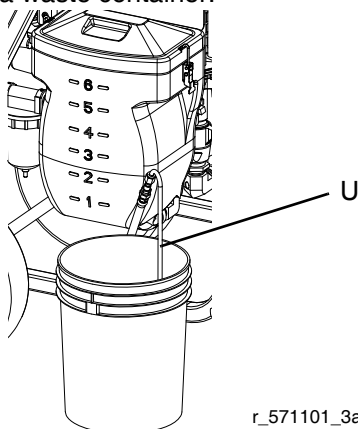
Hoppers

1. If material is in the hopper, pump out the remaining material.
2. If the pump has failed:
 - a. Place a waste container beneath the plug on fitting (61). Remove the plug.
 - b. Drain all material from hopper into the waste container.
 - c. Install plug after material is no longer draining from fitting (61).



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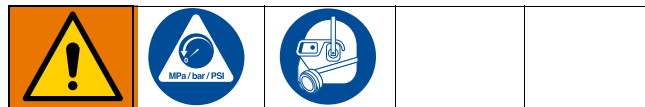
3. Follow the **Pressure Relief Procedure** on page 26.
4. Loosen fitting (61) and disconnect hopper from pump.
5. Remove the recirculation line from the hopper and place in a waste container.



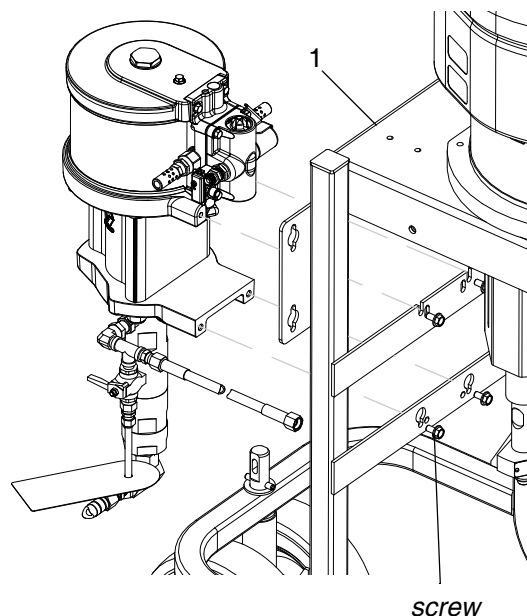
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6. Lift the hopper off of the mounting bracket.
7. Repeat for second hopper.

Solvent Pump



1. Follow the **Pressure Relief Procedure** on page 26.
2. Disconnect the fluid line and air lines from the solvent pump.
3. Loosen the four screws that attach the solvent pump to the cart (1). Lift and pull pump from the slots.



4. Refer to the Merkur Pump Assembly manual to service or repair the solvent pump.
5. Follow the steps in reverse order to reinstall the solvent pump.

Fluid Heaters

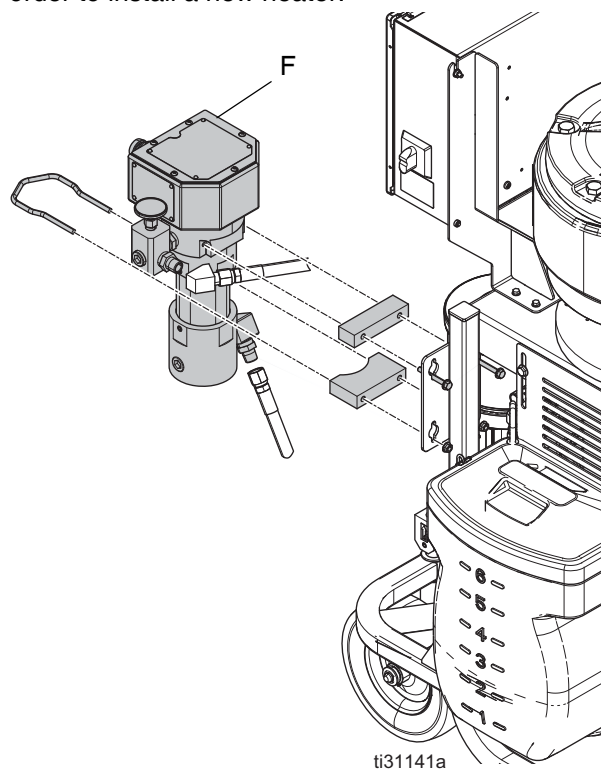


Service and Repair

1. Follow **Pressure Relief Procedure**, page 26.
2. Disconnect the fluid lines and electrical wiring from the fluid heater (F).
3. Refer to the Viscon HF heater manual to service or repair.
4. Reconnect the fluid lines and electrical wiring.

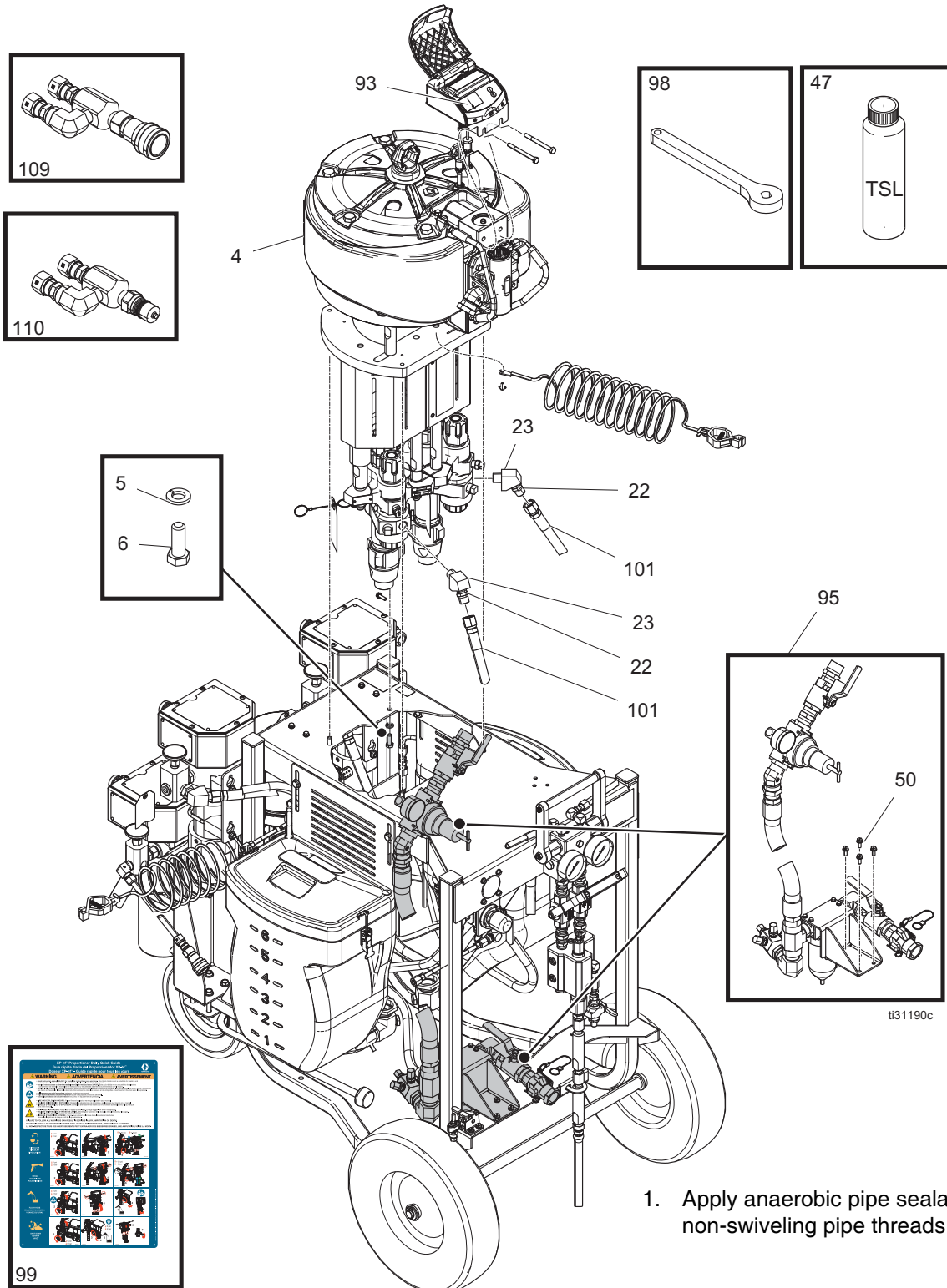
Replace

1. Follow steps 1 through 2 in the **Fluid Heaters Service and Repair** section.
2. Loosen the four mounting screws, lock washers, and plain washers on back of the heater. Slide the heater up and remove from the cart.
3. Replace the heater. Follow the steps in reverse order to install a new heater.



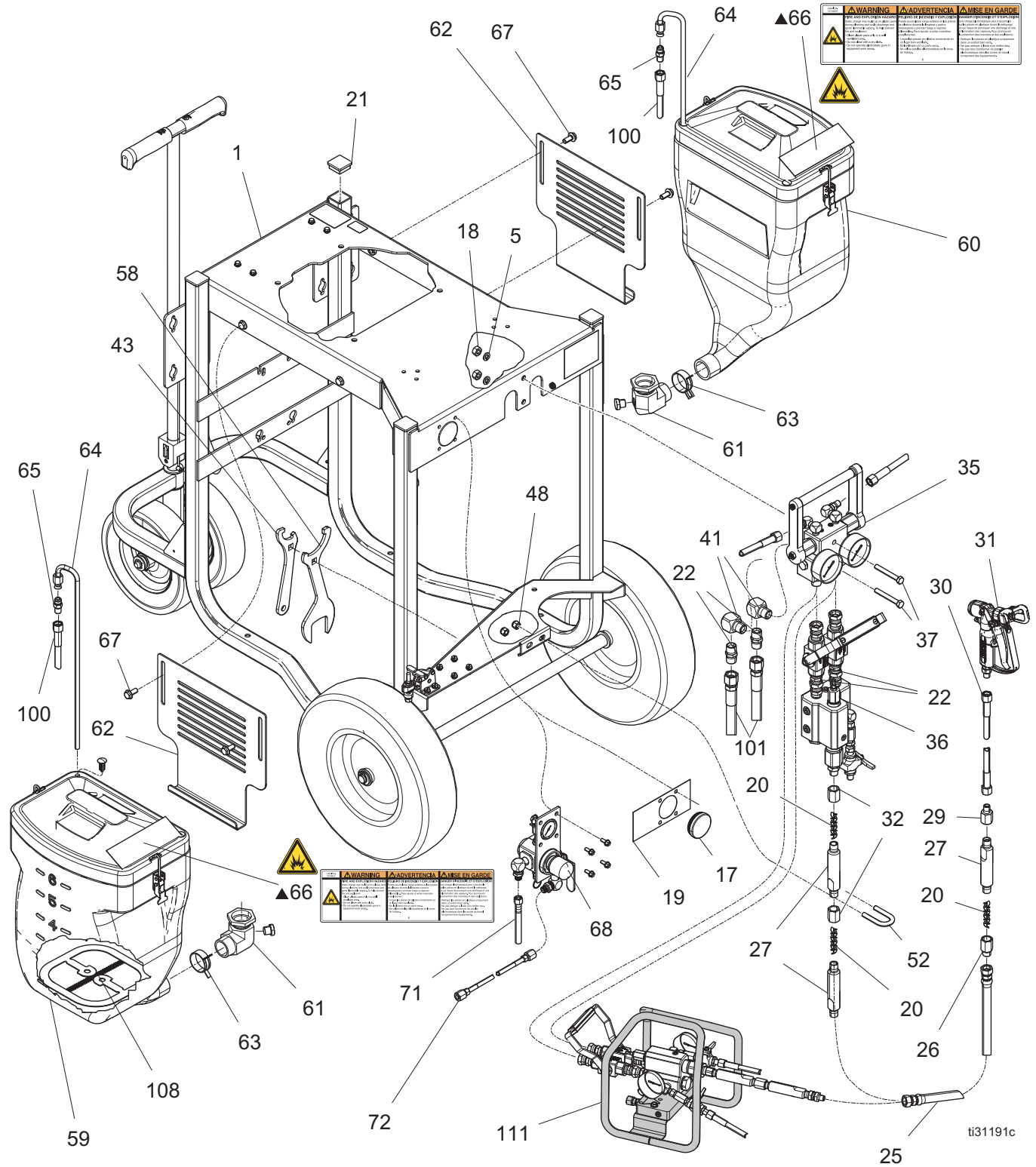
Parts

Complete System (572107 shown)

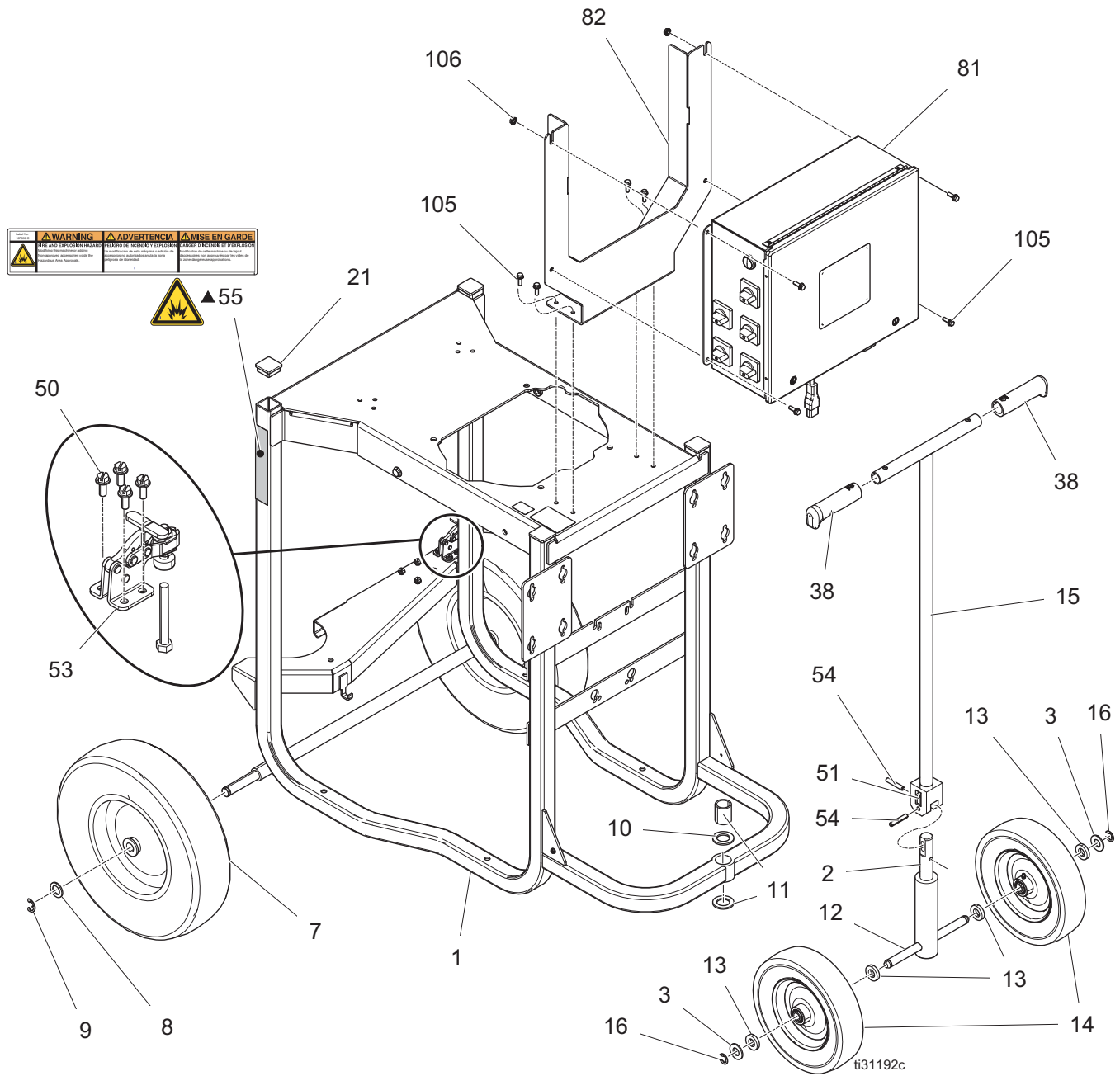


1. Apply anaerobic pipe sealant to all non-swiveling pipe threads.

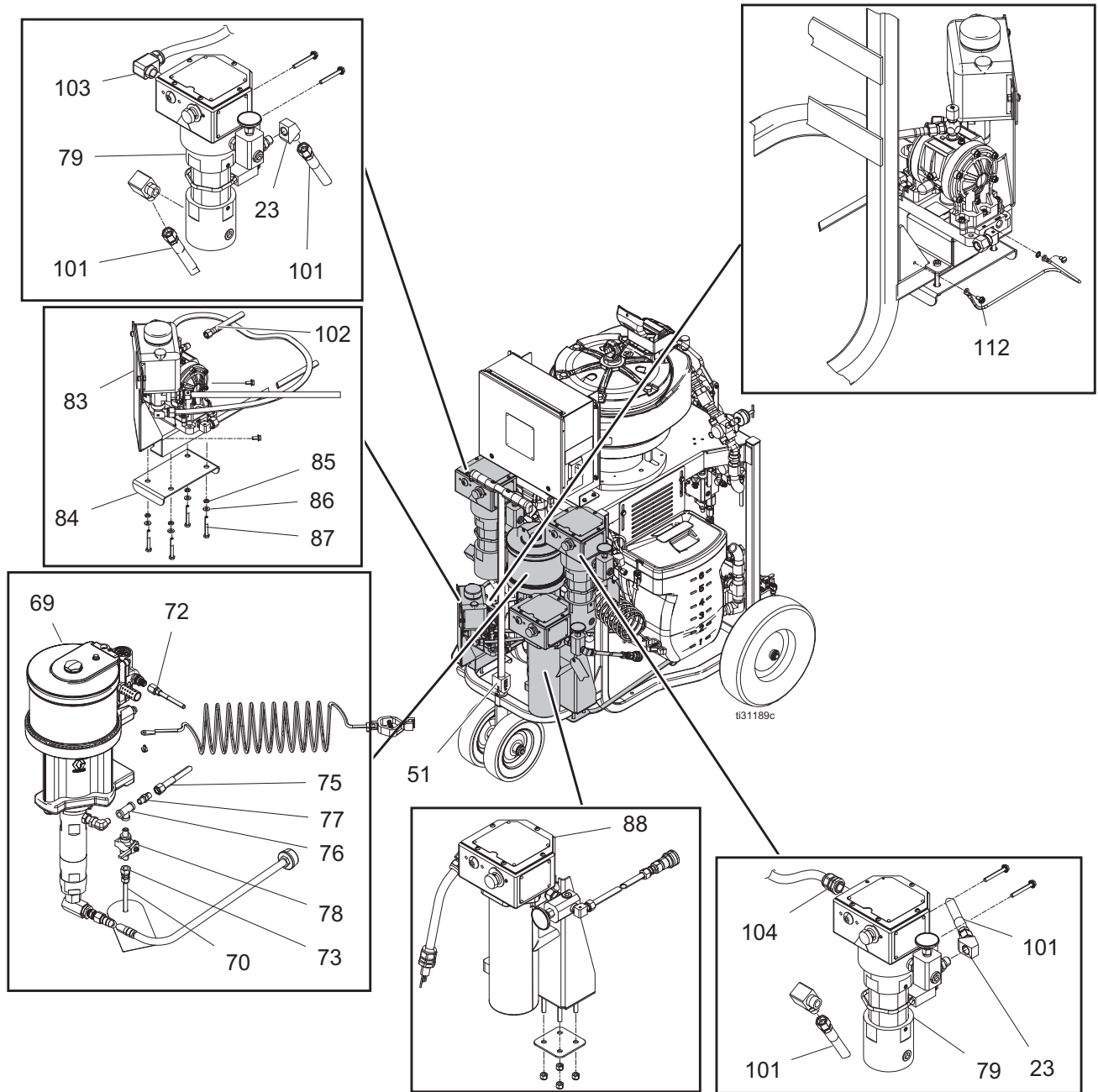
Complete System (continued)



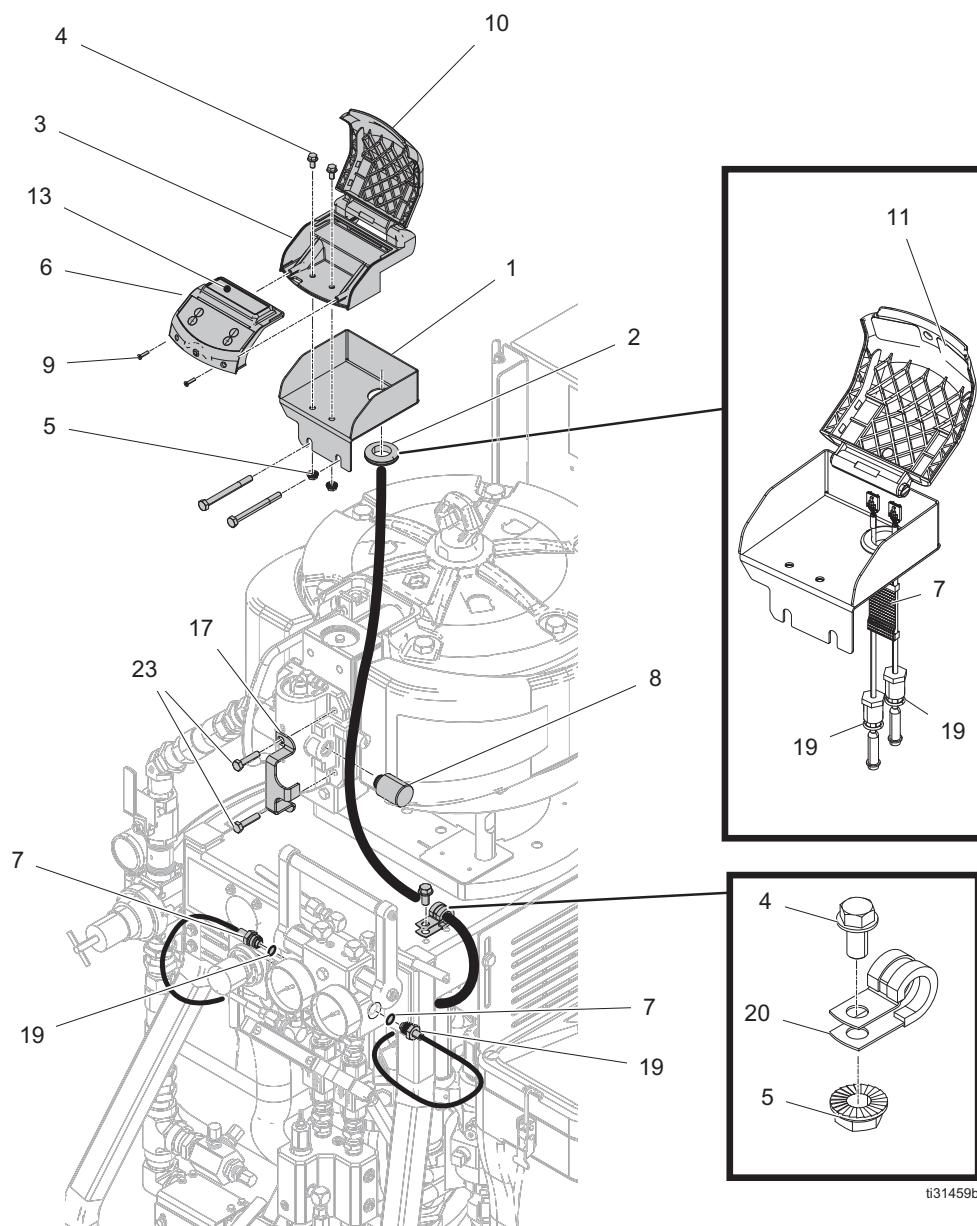
Complete System (continued)



Complete System (continued)



PressureTrak Kit 17N936



Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	17P845	BRACKET	1	9	120279	SCREW, high-low, flat head #6 x 0.625	2
2	16C251	GROMMET	1	12	24V216	KIT, repair, fuse assembly	1
3	24Y932	HOUSING	1	13▲	15F716	LABEL, warning	1
4	113161	SCREW	2	18	NXT405	KIT, membrane shield (pack of 20)	1
5	115942	NUT, hex, flange head	2	19	121399	PACKING, o-ring	2
6	24Z940	MODULE	1	20	128769	CLAMP, cable	1
7	17R447	SENSOR, PressureTrak, assembly	2				
8	15F477	SOLENOID, locking, DC	1				

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

Parts Common to All Systems

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	26C338	CART, weldment, painted	1	28	248927	KIT, mixer element, 25 pack	1
2	16E105	AXLE	1	29	150287	COUPLING, pipe, 1/4 x 3/8	1
3	111841	WASHER, plain 5/8	2	32	162024	COUPLING	2
5	100133	WASHER, lock, 3/8	4	36	262807	MANIFOLD, mix, 1/2 valves	1
6	100101	SCREW, cap, hex hd (3/8-16 x 1 in. lg)	4	37	106212	SCREW, cap, hex hd	2
7	113362	WHEEL, semi-pneumatic	2	38	116139	GRIP, handle	2
8	154628	WASHER	2	41	158683	FITTING, elbow, 90 deg	2
9	113436	RING, retaining	2	43	16G819	TOOL, wrench, Xtreme, filter	1
10	124410	BEARING, sleeve, 1.00 x 1.25 x 1.5	1	47	206995	FLUID, TSL, 1 qt.	1
11	124664	WASHER	2	48	101566	NUT, lock	2
12	15A913	AXLE	1	49	15U654	LABEL, identification, A/B	1
13	191824	WASHER, space	4	50	108296	SCREW, hex washer hd	8
14	113807	WHEEL, flat free, urethane	2	51	16F536	LABEL, arrow	2
15	258982	HANDLE, cart, painted	1	52	124293	BOLT, u-bolt, 3/8-16, 1.00 dia	1
16	101242	RING, retaining, ext.	2	53	124259	BRAKE, plunger clamp	1
19	25E211	LABEL, XP70, handles	1	54	124291	PIN, spring	2
20	512519	MIXER, 1/2-12 element	3	55▲	16F359	LABEL, warning, fire/expl hazard	1
21	111218	CAP, tube, square	4	58	16F615	TOOL, wrench, Xtreme	1
22	158491	FITTING, nipple	4	64	15V421	TUBE, recirculation	2
24	H75003	HOSE, cpd, 7250 psi, .50 ID, 3 ft	2	65	116704	ADAPTER, 9/16 JIC x 1/4 npt	2
26	15B729	COUPLING	1	95	26C414	MODULE, air controls	1
27	262478	KIT, housing, mixer	3	98	126786	TOOL, restrictor	1
				99	3A5076	DOCUMENT, guide, quick start	1

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

Parts Varying by System Pressure Ratio (third digit) and Mix Ratio (fourth and fifth digit)

Ref.	Part	Description	Quantity (By System)												No Lowers	
			70:1						50:1						572000	573000
			57210x	57215x	57220x	57225x	57230x	57240x	57310x	57315x	57320x	57325x	57330x	57340x		
4	572100	PUMP, bf, 145/145, 1:1, XP	1													
	572150	PUMP, bf, 145/90, 1.5:1, XP		1												
	572200	PUMP, bf, 180/90, 2:1, XP			1											
	572250	PUMP, bf, 180/72, 2.5:1, XP				1										
	572300	PUMP, bf, 220/72, 3:1, XP					1									
	572400	PUMP, bf, 220/54, 4:1, XP						1								
	573100	PUMP, bf, 220/220, 1:1, XP							1							
	573150	PUMP, bf, 220/145, 5:1, XP								1						
	573200	PUMP, bf, 290/145, 2:1, XP									1					
	573250	PUMP, bf, 290/115, 2.5:1, XP										1				
	573300	PUMP, bf, 290/97, 3:1, XP											1			
	573400	PUMP, bf, 290/72, 4:1, XP												1		
	273097	PUMP, XP-hf, no lowers													1	1
25	H73825	HOSE, cpld, 7250 psi, .375 ID, 25 ft	1	1	1	1	1	1							1	
	H53825	HOSE, cpld, 5600 psi, .375 ID, 25 ft							1	1	1	1	1	1		1
30	H72510	HOSE, cpld, 7250 psi, .25 ID, 10 ft	*	*	*	*	*	*							1	
	H52510	HOSE, cpld, 5600 psi, .25 ID, 10 ft							*	*	*	*	*	*		3
31	XTR702	GUN, XTR7, ovl hnd, 4 fng, XHDRAC	1	1	1	1	1	1							1	
	XTR502	GUN, XTR5, ovl hnd, 4 fng, XHDRAC							1	1	1	1	1	1		1
35	262806	MANIFOLD, recirc, XP70	1	1	1	1	1	1							1	
	262783	MANIFOLD, recirc, XP50							1	1	1	1	1	1		1
56	113498	VALVE, safety, 110 psi	1				1		1		1	1				
	16M190	VALVE, safety, 95 psi		1										1		
	114055	VALVE, safety, 105 psi			1			1					1			
	103347	VALVE, safety, 100 psi				1				1						
100	H52510	HOSE, cpld, 5600 psi, .25 ID x 10 ft	*	*	*	*	*	*	*	*	*	*	*	*	2	

* See Parts **Varying by Component (sixth digit)** on page 59.

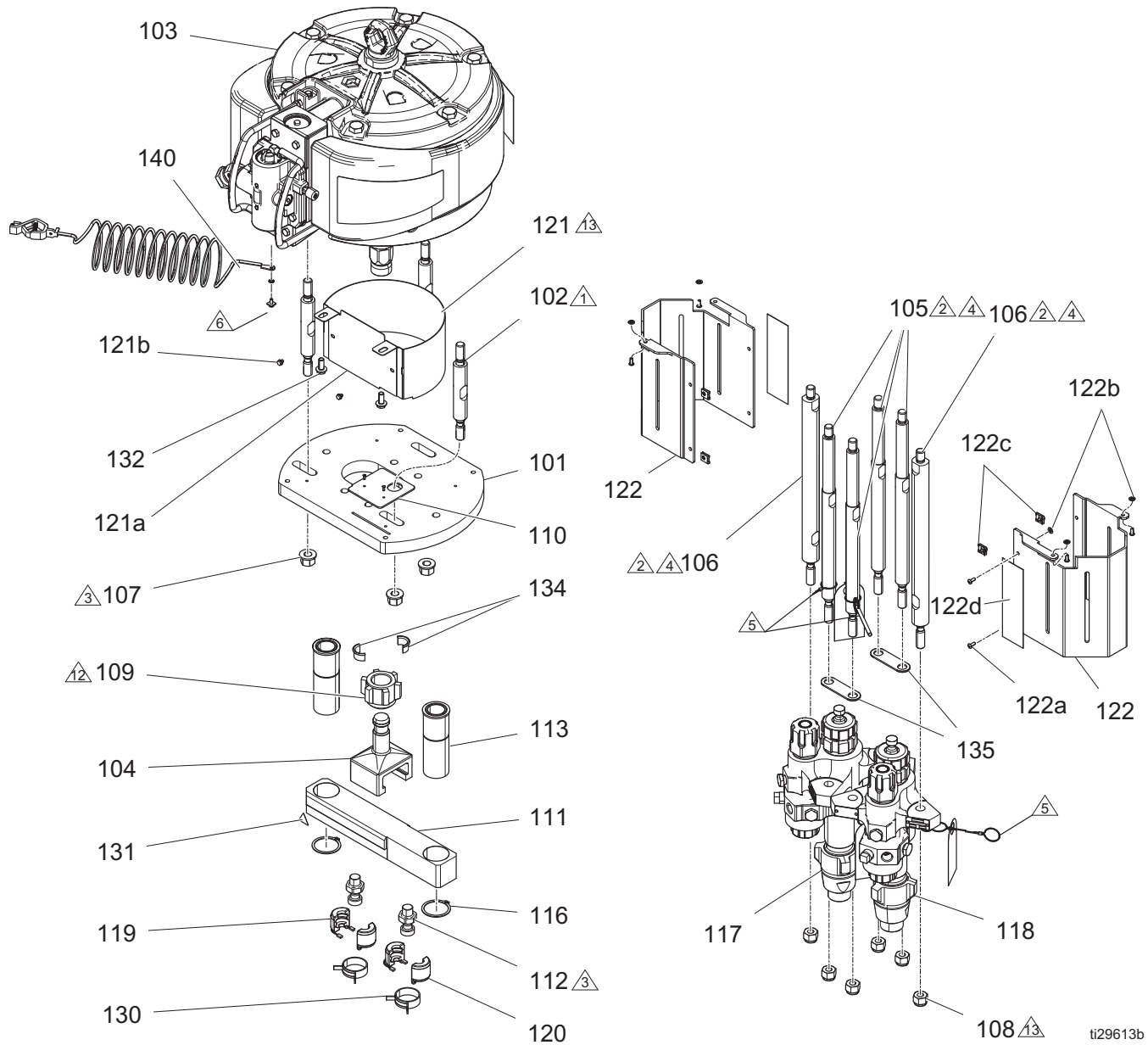
Parts Varying by Components (sixth digit)

Ref.	Part	Description	Quantity (By System)													
			572xx1	572xx2	572xx3	572xx4	572xx5	572xx6	572xx7	573xx1	573xx2	573xx3	573xx4	573xx5	573xx6	573xx7
17	16J688	PLUG, hole	1	1						1	1					
23	15M987	FITTING, elbow, 60 degree	2	2	4	4	4	4	4	2	2	4	4	4	4	4
30	H72510	HOSE, cpld, 7250 psi, .25 ID, 10 ft	1	1	1	1	1	1	1							
	H52510	HOSE, cpld, 5600 psi, .25 ID, 10 ft								3	1	3	1	1	1	1
59	262479	HOPPER, blue, packaged		1		1	1	1	1		1		1	1	1	1
60	262480	HOPPER, green, packaged		1		1	1	1	1		1		1	1	1	1
61	16D376	FITTING, swivel, 1-1/4, mod, with plug		2		2	2	2	2		2		2	2	2	2
62	24E872	BRACKET, hopper, painted		2		2	2	2	2		2		2	2	2	2
63	124450	CLAMP, spring, constant tension		2		2	2	2	2		2		2	2	2	2
66▲	15T468	LABEL, warning		2		2	2	2	2		2		2	2	2	2
67	111192	SCREW, cap flange hd		4		4	4	4	4				4	4	4	4
68	24F126	MODULE, air controls, solvent			1	1	1	1	1			1	1	1	1	1
69	262392	PUMP, solvent, 6.0 in., 50 cc, std			1	1	1	1	1			1	1	1	1	1
70	061132	HOSE, nylon, 4 ft (1.2 m)			1	1	1	1	1			1	1	1	1	1
71	17Y013	HOSE, air, 18 in.			1	1	1	1	1			1	1	1	1	1
72	16F537	HOSE, coupled, 6 ft, 1/4 npsm, 5/16			1	1	1	1	1			1	1	1	1	1
73	205447	COUPLING, hose			1	1	1	1	1			1	1	1	1	1
75	H42506	HOSE, cpld, 4500 psi, .25 ID, 3 ft			1	1	1	1	1			1	1	1	1	1
76	104984	FITTING, tee, pipe			1	1	1	1	1			1	1	1	1	1
77	156971	FITTING, nipple, short			1	1	1	1	1			1	1	1	1	1
78	214037	VALVE, ball			1	1	1	1	1			1	1	1	1	1
79	25C962	HEATER, hf, haz, tstat, XP			2	2		2				2	2		2	
	25C961	HEATER, XPhf, non-haz, tstat					2		2					2		2
81	273096	ENCLOSURE					1		1					1		1
82	17P846	BRACKET, painted, junction box					1		1					1		1
83	273093	PUMP, XPhf, htd-hose, re-circ						1	1						1	1
84	17P092	PLATE, XPhf, re-circ, painted						1	1						1	1
85	110755	WASHER, plain						4	4						4	4
86	100016	WASHER, lock						4	4						4	4
87	104429	SCREW, cap hex hd						4	4						4	4
88	273094	HEATER, hose, hazardous locations						1							1	
	273095	HEATER, hose, non-hazardous locations							1							1
93	17N936	MONITOR, PressureTrak, XPhf						1	1						1	1
100	H52510	HOSE, cpld, 5600 psi, .25 ID, 10 ft	2		2											
	H52506	HOSE, cpld, 5600 psi, .25 ID, 6 ft		2		2	2	2	2		2		2	2	2	2
101	H75003	HOSE, (lower to man/htr)	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	H75005	HOSE, (htr to manifold)			2	2	2	2	2			2	2	2	2	2
102	248208	HOSE, cpld, 4 ft.						1	1						1	1
103	17N598	HARNESS, SW3 to fluid A					1		1					1		1
104	17N599	HARNESS, SW4 to fluid B					1		1					1		1
105	113796	SCREW, flanged, hex hd					8		8					8		8
106	115942	NUT, hex, flange head					2		2					2		2
108	16E791	STRAINER, hopper, 7 gallon		2		2	2	2	2		2		2	2	2	2
109	17P594	FITTING, assy, hose coupler, split						1	1						1	1
110	17S051	FITTING, assy, hose nipple, split						1	1						1	1
111	24Z934	HEATER BLOCK, remote manifold						1	1						1	1
112	113974	SCREW, thrd forming (10-24)						1	1						1	1

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

Bare Proportioning Pump Package

Model 572100 shown



△² Torque to 50-60 ft-lb (68-81 N•m).

△³ Torque to 145-155 ft-lb (196-210 N•m).

△⁴ Apply medium strength (blue) threadlock to top thread only.

△⁵ Pins and lanyards must be positioned toward the outside of the pump as shown. Allow ends of lanyard to hang freely.

△⁶ Remove ground screw and washer from motor, then use to install cable.

△¹² Torque together to 230-250 ft-lb (312-339 N•m).

△¹³ Torque together to 95-105 ft-lb (129-142 N•m).

ti29613b

Parts Common to All Pump Packages

Ref.	Part	Description	Qty.
101	273087	PLATE, XP-HF, motor	1
102	273086	ROD, tie, 4.00 long, 1.00 dia	3
103	273088	MOTOR, air, 13 in., XP-HF	1
104	273085	ROD, connecting, yoke, XP-HF	1
105	262468	ROD, tie, 14.25 in. long, w/shoulder	4
106	262469	ROD, tie, 14.25 in. long, 1.25 dia	2
107	129383	NUT, 5/8-11, flanged, sst	3
108	101712	NUT, lock	6
109	184096	NUT, coupling	1
110	17R501	BRACKET, ratio indicator	1
111	273090	YOKE, pump, assembly, HF	1
112	273091	ROD, adapter, Xtreme, HF	2
113	262472	SLEEVE, bearing	2
116	123976	RING, snap, external	2
121+	-----	BRACKET, painted, finger guard	1
121a+	-----	PLATE, painted, finger guard	1
121b+	16P338	SCREW, mach, serrated hex head	2
122#	-----	COVER, XP-HF, pump	2
122a#	121803	SCREW, cap, button head	8
122b#	124172	WASHER, retaining, nylon, 10-32	8
122c#	124665	NUT, captive, 10-32	4
122d#▲	15T468	LABEL, warning	2
130	124078	CLAMP, spring, constant tension	2
131▲	15H108	LABEL, safety, warning, pinch	1
132	111192	SCREW, cap flange hd	2
134	184130	COLLAR, coupling	4
135	16E882	STRAP, lowers	2
140	244524	WIRE, ground assembly w/ clamp	1

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

+ Included in Motor Cover Kit 273089.

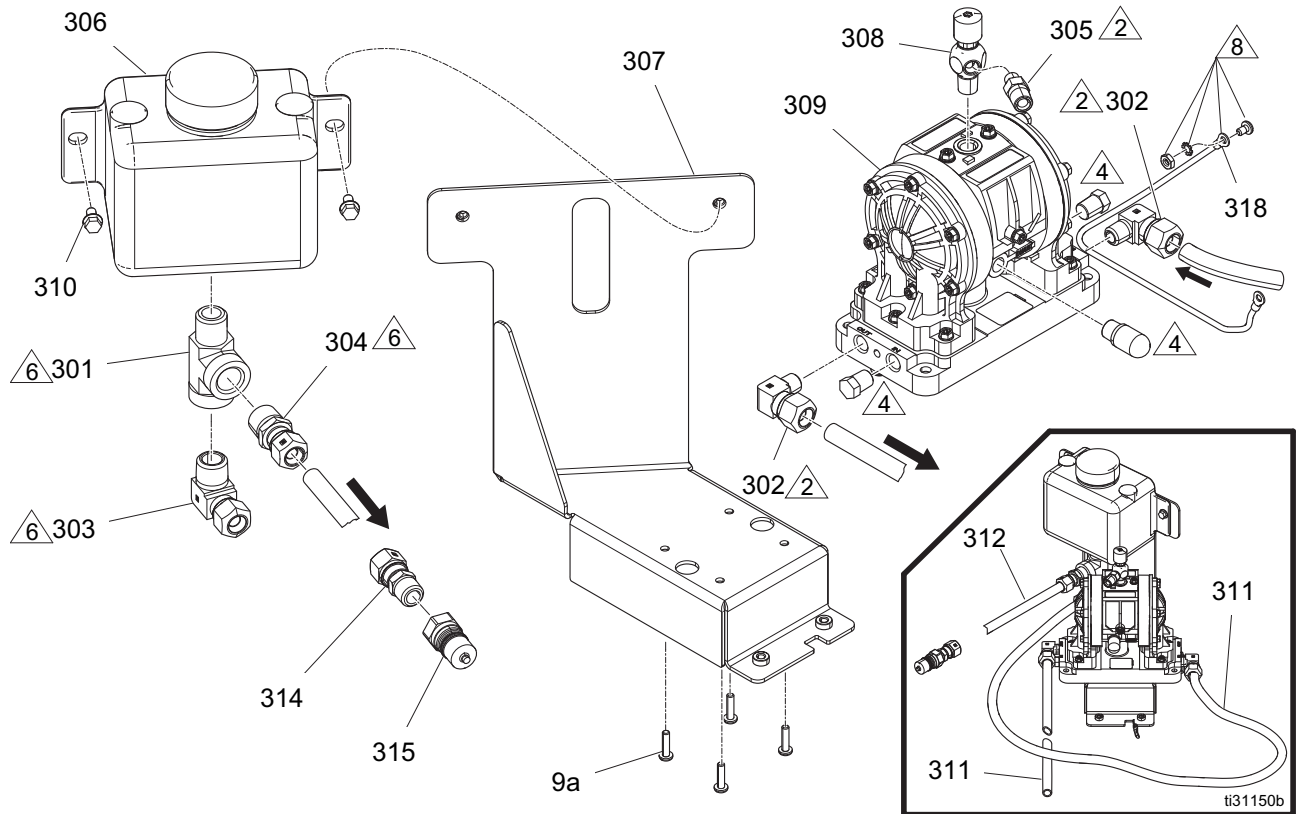
Included in Pump Cover Kit 273092.

Parts Varying by System by Pressure Ratio (third digit) and Mix Ratio (fourth and fifth digit)

Ref.	Part	Description	Quantity (By Pump Package)													
			70:1						50:1						No Lowers	
			57210x	57215x	57220x	57225x	57230x	57240x	57310x	57315x	57320x	57325x	57330x	57340x	572000	573000
117	L14AC0	PUMP, lower, 145 cc	1	1												
	L18AC0	PUMP, lower, 180 cc			1	1										
	L22AC0	PUMP, lower, 220 cc							1	1						
	L22XC0	PUMP, lower, 220 cc					1	1								
	L29AC0	PUMP, lower, 290 cc									1	1	1	1		
118	L054C0	PUMP, lower, 54 cc						1								
	L072C0	PUMP, lower, 72 cc				1	1							1		
	L090C0	PUMP, lower, 90 cc			1											
	L097C0	PUMP, lower, 97 cc		1									1			
	L115C0	PUMP, lower, 115 cc										1				
	L14AC0	PUMP, lower, 145 cc	1							1	1					
	L22AC0	PUMP, lower, 220 cc							1							
119	244819	COUPLING, for 145-290 cc lower	2	1	1	1	1	1	2	2	2	1	1	1		
120	247167	COUPLING, for 54-115 cc lower		1	1	1	1	1				1	1	1		
129	17N281	LABEL, branding, XP70-hf	1	1	1	1	1	1							1	1
	17N282	LABEL, branding, XP50-hf							1	1	1	1	1	1	1	1

Heated Hose Recirculation Pump

273093



1 Apply thread sealant to all non-swiveling pipe threads.

2 Orient fittings as shown.

4 Install two loose plugs and muffler provided with pump in the ports indicated.

6 Orient fittings approximately 15 degrees away from pump.

8 Install ground wire between screw and washer. The nut is held in the slot of the pump.

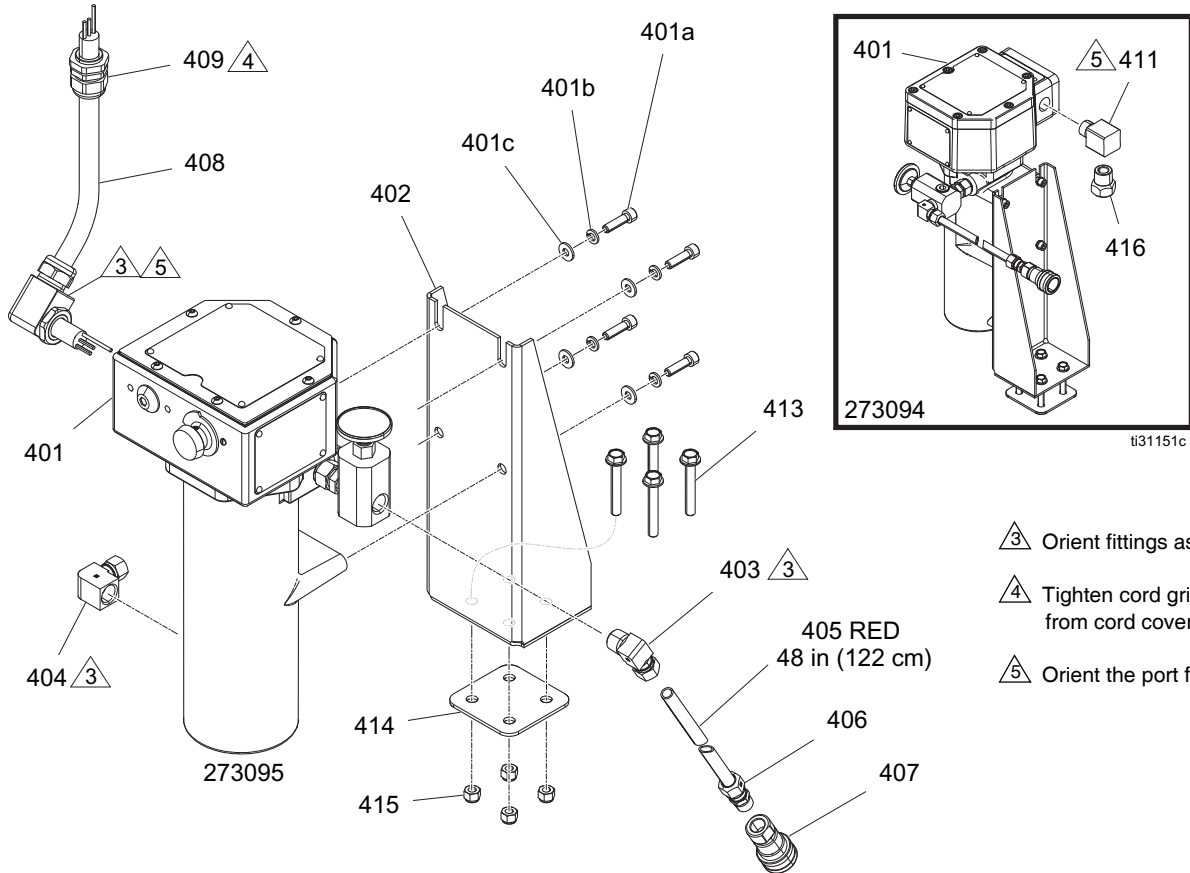
Mounted Heated Hose Parts List

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
301	108126	FITTING, tee, street	1	309	24P835	PUMP, acetal, w/pvdf check, Husky	1
302	126897	FITTING, elbow, 1/2 tube x 1/4 NPTM	2	310	113161	SCREW, flange, hex hd	2
303	126898	FITTING, elbow, 1/2 tube x 1/2 NPTM	1	311	17N910	TUBE, 35 in. x .5 OD, nylon	2
304	126899	FITTING, 1/2 tube x 1/2 NPTM	1	312	17N911	TUBE, blue, .5 OD, nylon (48 in. long)	1
305	16D939	FITTING, nipple, reducing	1	314	126900	FITTING, 1/2 tube x 3/8 NPTM	1
306	16R871	BOTTLE, overflow, 1/2 NPT	1	315	17D307	FITTING, nipple, quick coupling	1
307	17P088	BRACKET, XP-HF, re-circ, painted	1	318	17N795	WIRE, ground	1
308	206264	VALVE, needle	1				

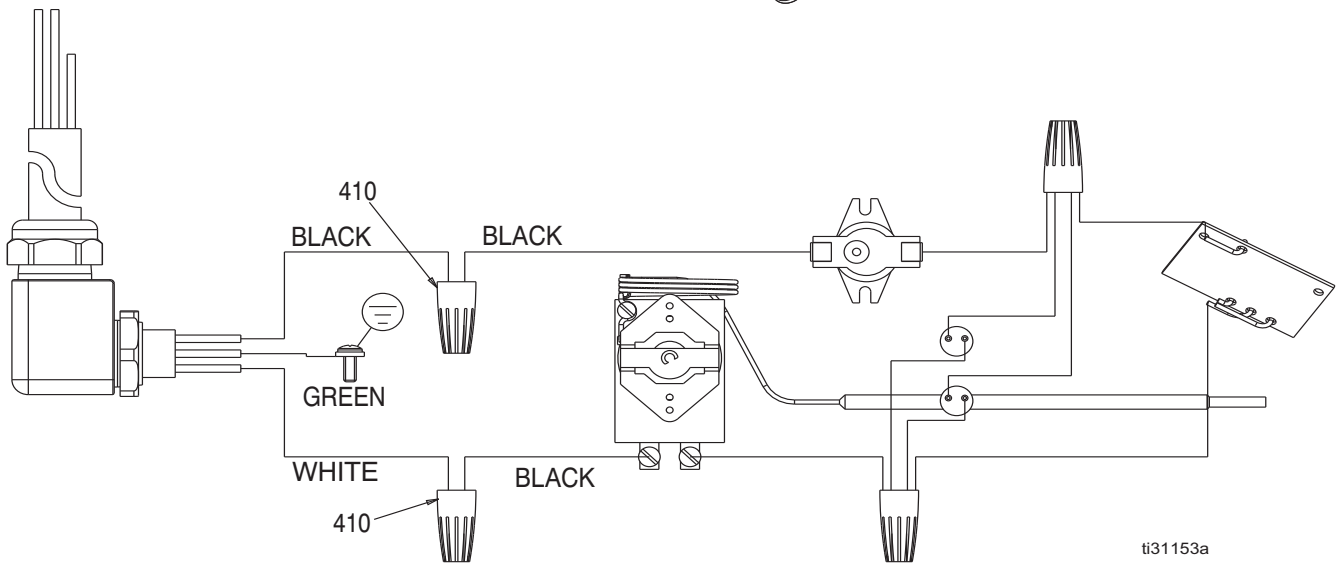
Hose Heater (bracket mounted)

273095 (Non-Hazardous Locations, 240V)

273094 (Hazardous Locations, 240V)



- 3 Orient fittings as shown.
- 4 Tighten cord grip .75 in. back from cord cover end.
- 5 Orient the port facing down.

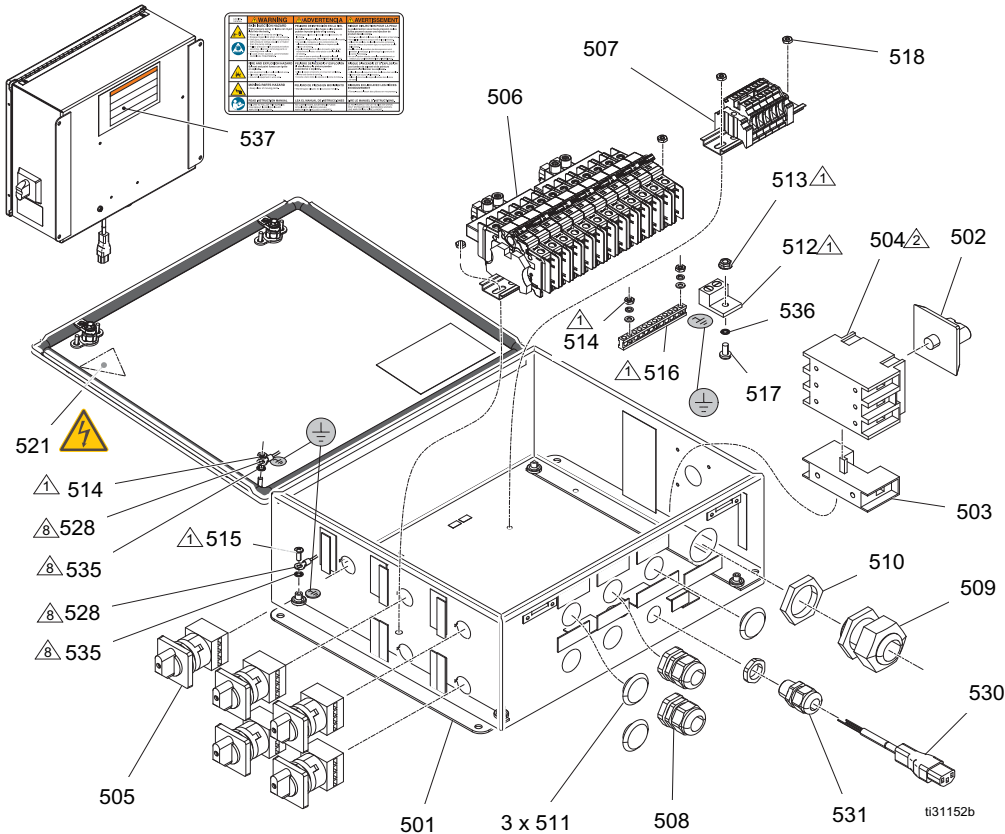


Mounted Heated Hose Parts List

Ref.	Part	Description	Qty. (273095)	Qty. (273094)
401	245869	HEATER, paint, non-hazardous locations	1	
	245863	HEATER, paint, hazardous locations		1
402	24N445	BRACKET, heater, heated hose, paint	1	1
403	126898	FITTING, elbow, 1/2 tube x 1/2 NPTM	1	1
404	126896	FITTING, elbow, 1/2 tube x 1/2 NPTF	1	1
405	17P759	TUBE, 48 in. x .5 OD, nylon	1	1
406	126900	FITTING, 1/2 tube x 3/8 NPTM	1	1
407	17D306	FITTING, coupler, quick coupling	1	1
408	17N600	HARNESS, SW5 to hose heat	1	
409	116171	BUSHING, strain relief	1	
410	122032	NUT, wire	2	
411	166590	FITTING, elbow, street		1
413	123443	SCREW, cap, flng hd	4	4
414	24N447	BRACKET, base, heated hose, painted	1	1
415	113981	NUT, lock, high tensile	4	4
416	185065	ADAPTER, cable		1

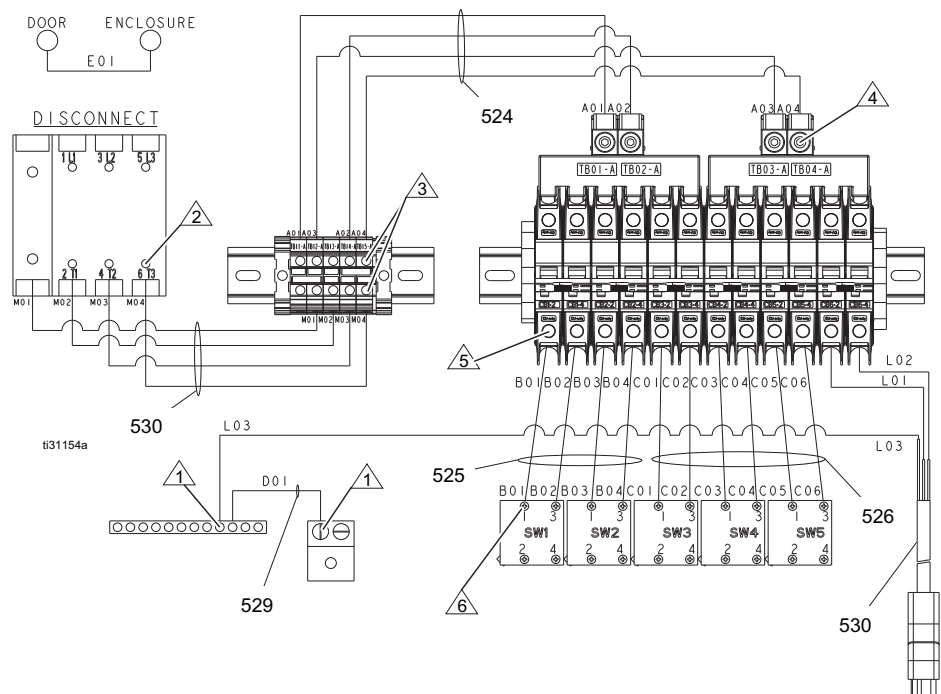
Enclosure Junction Box

Kit 273096*



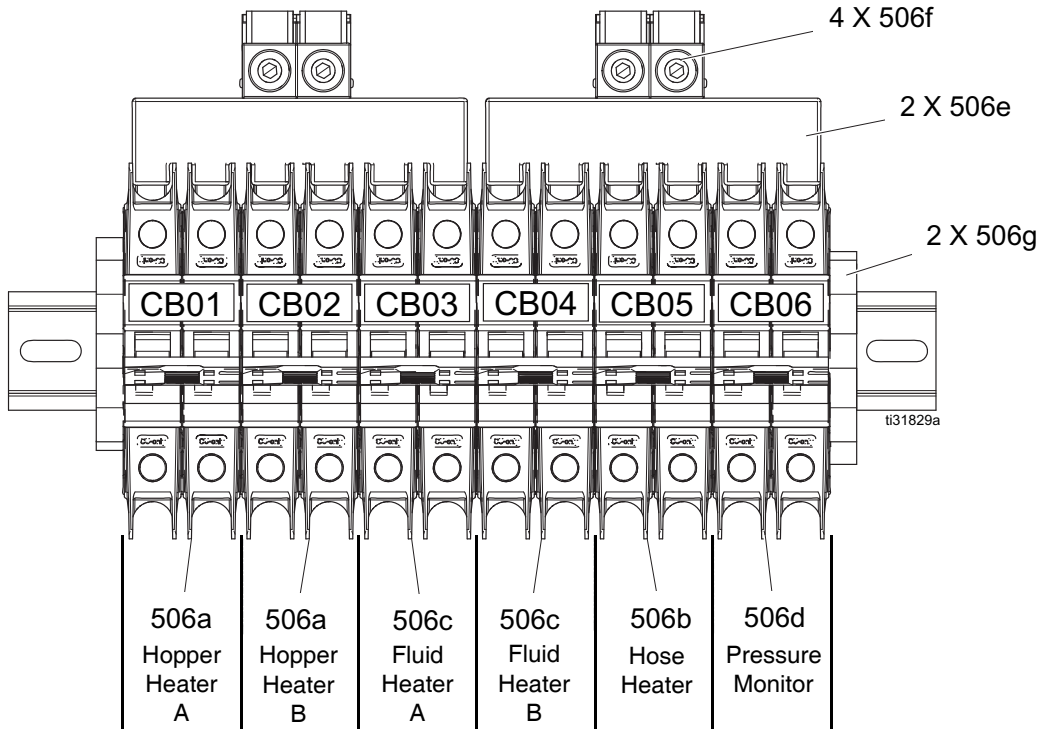
- ▲ 1 Torque to 20-23 in-lb (2.2-2.6 N•m).
- ▲ 2 Torque to 55-60 in-lb (6.2-6.8 N•m).
- ▲ 3 Torque to 13-15 in-lb (1.5-1.8 N•m).
- ▲ 4 Torque to 25-28 in-lb (2.8-3.2 N•m).
- ▲ 5 Torque to 18-20 in-lb (2.0-2.3 N•m).
- ▲ 6 Torque to 10-12 in-lb (1.1-1.3 N•m).
- ▲ 8 Assemble with washer under ground wire.

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

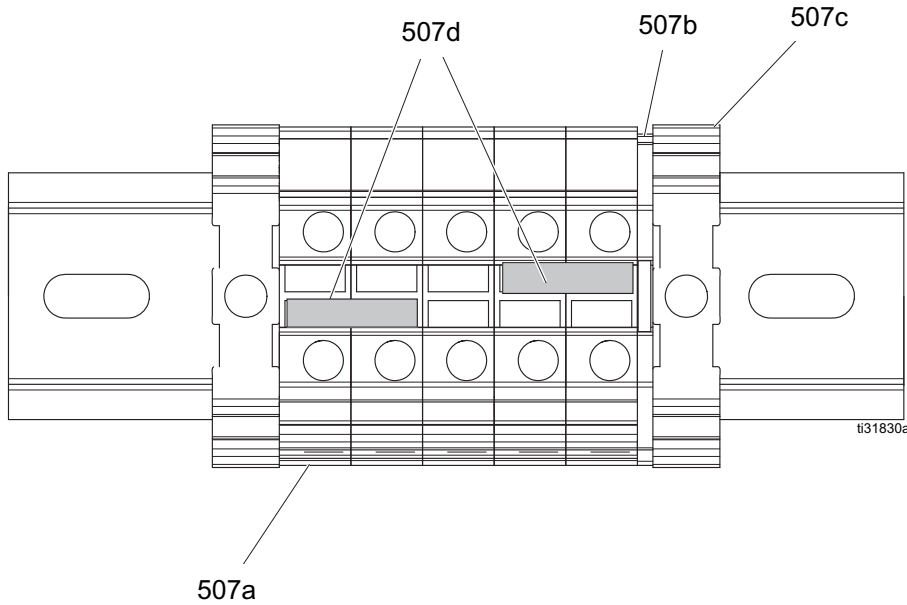


Enclosure Junction Box (continued)

Module 17N687



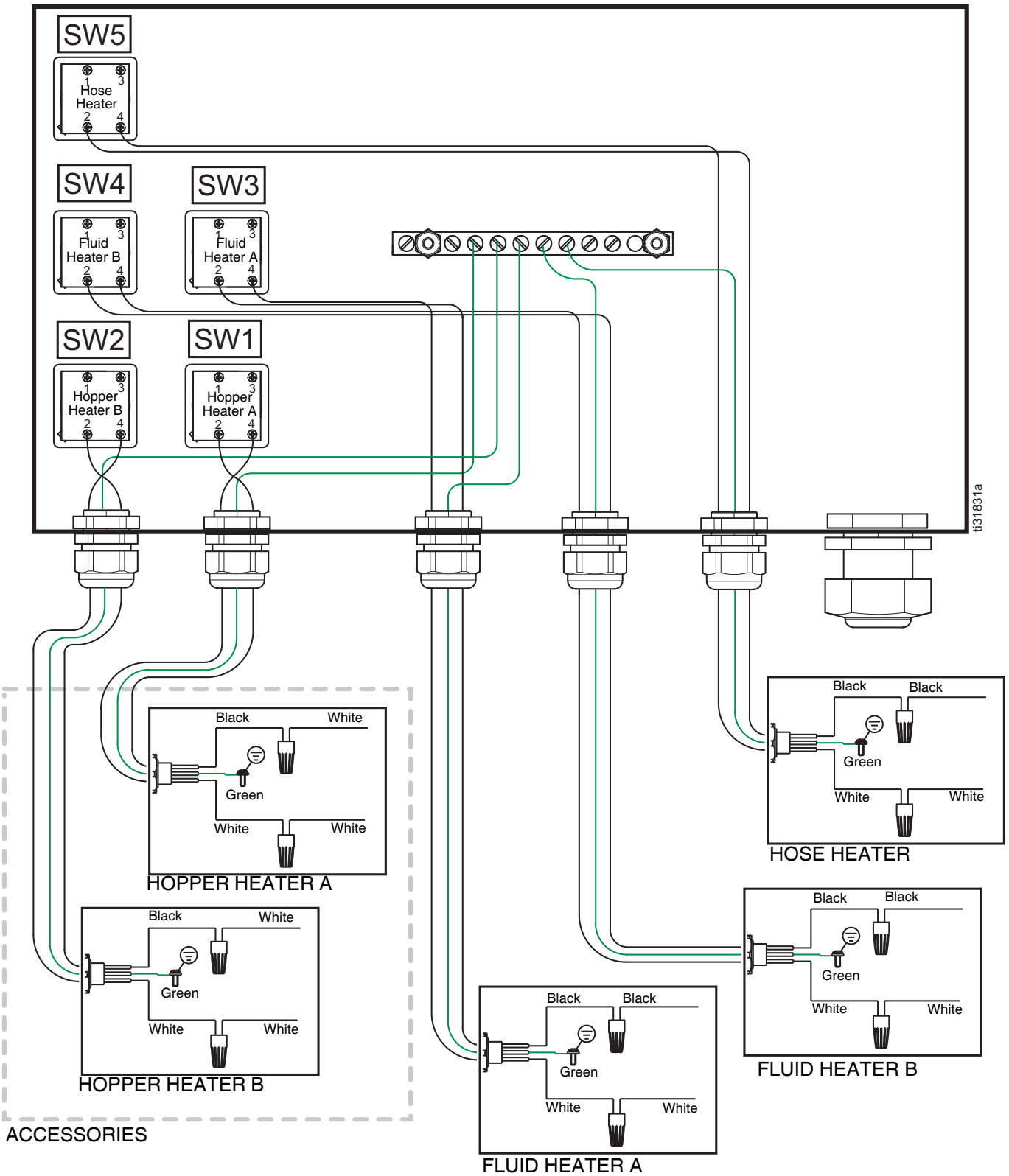
Module 17N688



Enclosure Junction Box Parts List

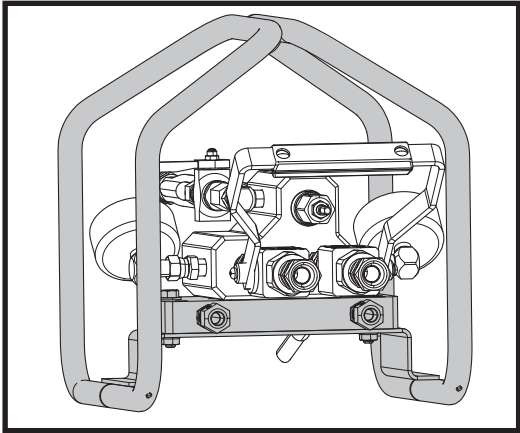
Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
82*	17P846	BRACKET, painted (not shown)	1	510	120859	NUT, strain relief, M40 thread	1
105*	113796	SCREW, 1/4-20 x .75 L (not shown)	8	511	15U544	PLUG, hole, 1 1/8 in.	3
106*	115942	NUT, flg hd, 1/4-20 (not shown)	2	512	117666	TERMINAL, ground	1
501	- - - -	ENCLOSURE, XP, electrical	1	513	115942	NUT, hex, flange head	1
502	123967	KNOB, operator disconnect	1	514	109466	NUT, lock, hex	3
503	123968	SWITCH, disconnect, ph exp 100 amp	1	515	112948	SCREW, mach	1
504	123969	SWITCH, disconnect, 100a (E-30)	1	516	122313	BAR, ground, kit	1
505	15U423	SWITCH, 2P, 25A	5	517	113783	SCREW, machine, pn hd	1
506	17N687	MODULE, din rail assy, circuit brk	1	518	113505	NUT, keps, hex hd	4
506a	17A311	CIRCUIT BREAKER, 2P, 10A, UL489	2	521▲	196548	LABEL, warning, shock	1
506b	17N315	CIRCUIT BREAKER, 2P, 25A, UL489	1	524	17N590	HARNESS, term block to circuit bkr	1
506c	17N316	CIRCUIT, BREAKER, 2P, 30A, UL489	2	525	17N592	HARNESS, circuit brkr to sw1, sw2	1
506d	17C190	CIRCUIT BREAKER, 2P, 1A, UL489	1	526	17N593	HARNESS, circuit brkr sw3, sw4, sw5	1
506e	17N690	BAR, power bus, 2P, 6 pin	2	527	17N720	HARNESS, disconnect to term block	1
506f	17N691	CONNECTOR, terminal, buss bar	4	528	17N595	WIRE, ground, door to enclosure	1
506g	120838	BLOCK, clamp ends	2	529	17N594	WIRE, ground, gnd1 to gnd2	1
507	17N688	MODULE, din rail assy, term blks	1	530	17N601	HARNESS, circuit brkr-press montr	1
507a	120570	MODULE, din rail assembly, terminal blocks	5	531	114421	BUSHING, strain relief	1
507b	120490	COVER, end	1	535	555629	WASHER, #10 lock external	2
507c	126811	BLOCK, clamp ends	2	536	558685	WASHER, 1/4 external tooth lock	1
507d	120573	BRIDGE, plug in, jumper	2	537▲	15F674	LABEL, safety	1
508	116171	BUSHING, strain relief	2	<i>*Kit includes these loose parts.</i> ▲ Replacement safety labels, tags, and cards are available at no cost.			
509	120858	BUSHING, strain relief, M40 thread	1				

Heater Wiring Diagram

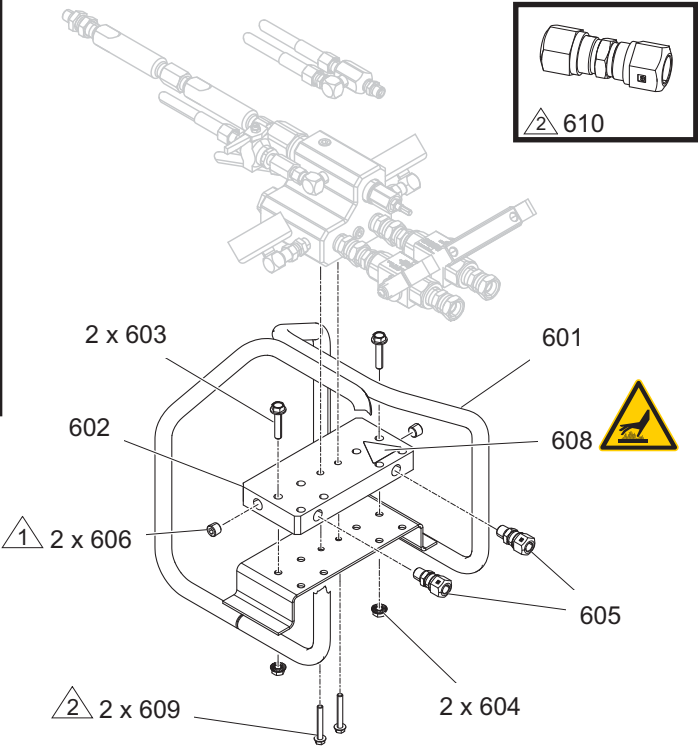


Heater Block Remote Manifold Kit

Kit 24Z934



ti31155a



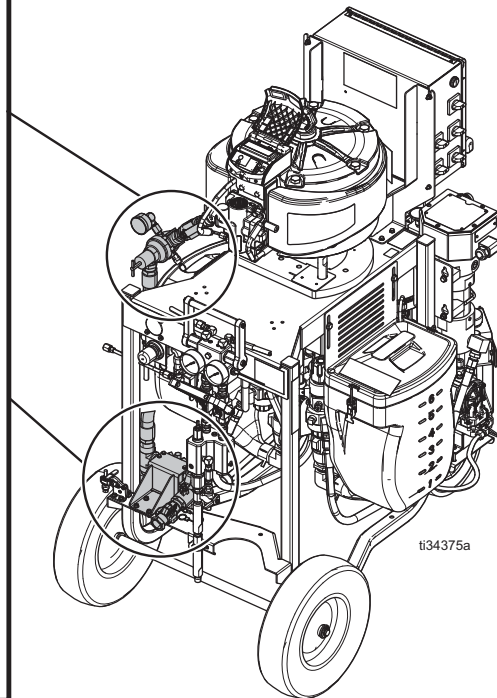
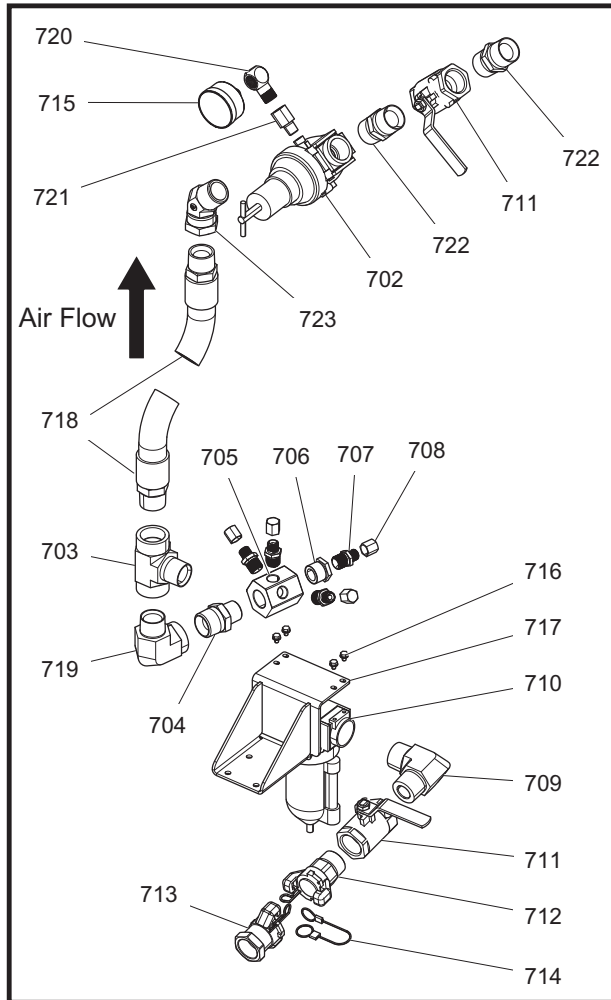
1 Apply thread sealant to all non-swiveling pipe threads. 2 Supplied loose, not installed.

Ref.	Part	Description	Qty.
601	24F834	CARRIAGE, weldment, remote manifold	1
602	16T294	PLATE, heater transfer, PFP 2k	1
603	110837	SCREW, flange, hex	2
604	110996	NUT, hex, flange head	2
605	126692	FITTING, tube, NPT x tube	2
606	100721	PLUG, pipe	2
608▲	189285	LABEL, safety, burn	1
609	120736	SCREW, hex flange HD	2
610	126894	FITTING, union, 1/2 tube x 1/2 tube	2
611*	054960	TUBE, red, nylon, .375 (9.5 mm) ID (1.5 ft)	1
612*	054961	TUBE, blue, nylon, .375 (9.5 mm) ID (1.5 ft)	1

* Supplied loose, not installed.

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

Air Controls 26C414



1. Apply anaerobic pipe sealant to all non-swiveling pipe threads.

2. Mount with air flow arrows in the direction shown.

3. Assemble with air flow arrows in the direction shown.

4. Assemble plug supplied with air regulator (5).

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
702	17N463	REGULATOR, air, 1 in. npt	1	713	127785	COUPLING, universal, 1 in. nptf	1
703	17X919	FITTING, tee, branch, 1 x 1 npt	1	714	16W586	CABLE, lanyard, whipcheck	1
704	158555	FITTING, nipple, 1 x 3/4 npt	1	715	101689	GAUGE, press, air	1
705	15E145	MANIFOLD, air distribution	1	716	16P338	SCREW, mach, serrated hex head	4
706	100505	BUSHING, pipe	1	717	26C343	BRACKET, XP-hf, fil, mount, painted	1
707	157350	ADAPTER	4	718	236990	HOSE, coupled	1
708	115781	CAP PLUG	4	719	17X920	FITTING, elbow, 1 in., m x f	1
709	17N486	FITTING, elbow, 1 in. npt	1	720	155699	FITTING, elbow, street	1
710	17N462	FILTER, air, 1 in. npt	1	721	15F741	FITTING, adapter	1
711	113163	VALVE, ball, vented, 1.0	2	722	158585	FITTING, nipple	2
712	127784	COUPLING, universal, 1 in. nptm	1	723	127945	FITTING, swivel, 45 degree, 1 npt x 1 npsm	1

Recommended Spare Parts

Keep these spare parts on hand to reduce downtime.

Pump Repair Kits

See **Models** (page 10) to see what pumps are used on your system. See lower manual for repair kits.

Pump Filter O-Rings (packs of 10)

262483, Top o-ring
244895, Middle o-ring
262484, Bottom o-ring

Recirculation/Overpressure Valve (see page 49)

XP50-hf: 262809, gold
XP70-hf: 262520, silver

15K692, Seal Mix Manifold Check Valve Cartridge

NOTE: 15K692 must be replaced when cleaning the check valves.

1/2 in. Mix Manifold Inlet Ball Valves

24M601, Ball valve repair kit
262740, Spare valve (no handle)
262739, Spare valve (single handle)

248927, Spare Mix Elements (pack of 25)

1/2 in. OD x 12 element, acetal plastic

248837, XTR Spray Gun Repair Kit

XHD010, Seat/Seal Kit for XHD RAC Tips (5 pack)

XHDxxx, Spray Tips

See spray gun manual for tips.

Accessories and Kits

Acceptable For Use in Explosive Atmospheres

PressureTrak™ Kit, 17N936

Monitors pressures to provide ratio assurance on XP-hf plural component sprayers in hazardous and non-hazardous locations.

Blue 7 Gallon Hopper Kit, 24F376

Green 7 Gallon Hopper Kit, 24F377

Mount to the sides of the XP-hf system. See your hopper kit installation manual for more information.

Solvent Pump Kit, 262393

For supplying solvent to the mix manifold. See your solvent flush kit manual for more information.

Desiccant Dryer Kit, 262454

For use with polyurethane isocyanates in 7 gallon hoppers. See your desiccant dryer kit manual for more information.

Desiccant Dryer Filter 2 Pack, 24K984

Heater Adapter Kit

Hose and fittings for connecting Viscon HP heaters to XP-hf system. See your heater adapter kit manual for parts. Purchase heaters separately, see heater manual for part numbers.

Twistork® Agitator Kit, 256274

For mixing viscous materials held within a 55 gallon drum. See your feed pump and agitator kit manual for more information.

5:1 Feed Pump Kit, 256276

For supplying viscous materials from a drum to XP-hf system. See your feed pump and agitator kit manual for more information.

5:1 Drum Feed Kit, 256255

One 5:1 pump feed kit and one Twistork agitator kit for mixing and supplying viscous materials from a 55 gallon drum to XP-hf system. See your feed pump and agitator kit manual for more information.

10:1 Drum Feed Kit, 256433

For supplying highly viscous material from a 55 gallon drum to XP-hf system. See your feed pump and agitator kit manual for more information.

20 Gallon Hopper Kit, 255963

Floor Stand for 20 Gal. Hopper, 262824

1-1/2 in. ID Hose Flex Feed Kit, 262820

XP Wall Mount Bracket, 262812

Works with air systems.

Leg Stand, 24M281

Includes wall bracket 262812.

1/2 in. Ball Valve Upgrade Kit for Mix Manifold, 24M593

Remote Mix Manifold with Heater Block, 24Z934

A mounting carriage with a heater block to circulate water-jacketed hose heat to maintain heat on the mix manifold.

Remote Mix Manifold Carriage, 262522

A protective guard to mount mix manifold remote. See your mix manifold manual for more information.

Mix Manifold Restrictor Wrench, 126786

Gun Splitter with Carriage, 262826

One splitter valve to use one, two, or three spray guns with the system. Provides independent flush for two guns. Optional 3rd gun port does not have independent flush. See your gun splitter valve manual for more information.

Filter Element, 116635

40 micron filter element.

Automatic Float Drain Kit, 17P521

Internal auto float drain for filter bowl.

Not Approved For Explosive Atmospheres

These kits do not carry the EX mark.

2:1 Feed Pump Kit, 256275

For supplying viscous materials from a drum to XP-hf system. See your feed pump and agitator kit manual for more information.

2:1 Drum Feed Kit, 256232

One T2 pump feed kit and one Twistork agitator kit for mixing and supplying viscous materials from a 55 gallon drum to XP-hf system. See your feed pump and agitator kit manual for more information.

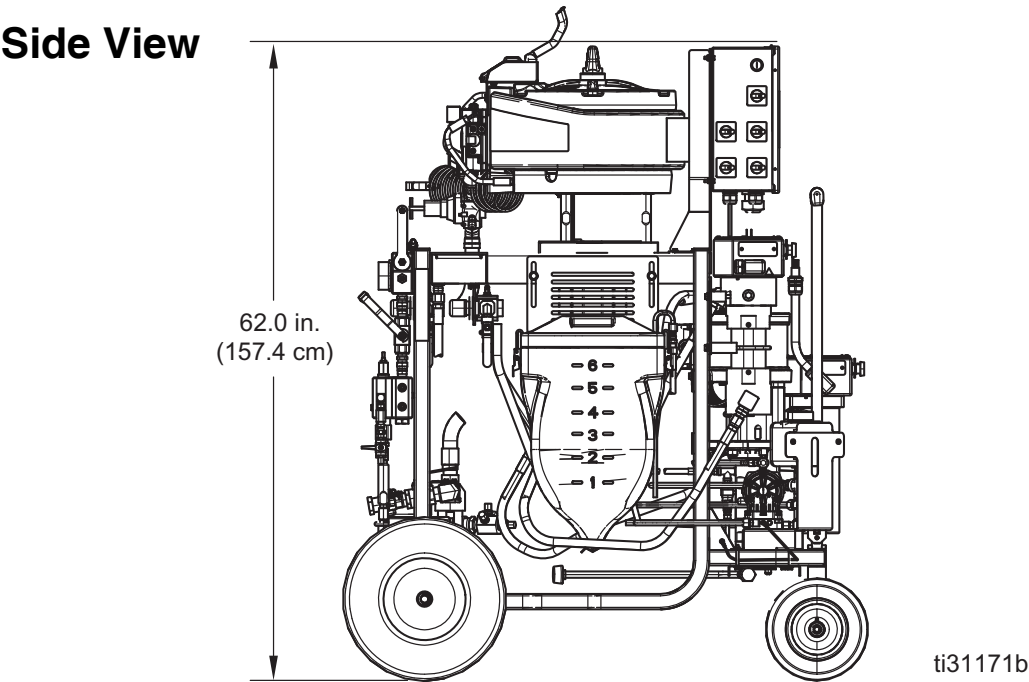
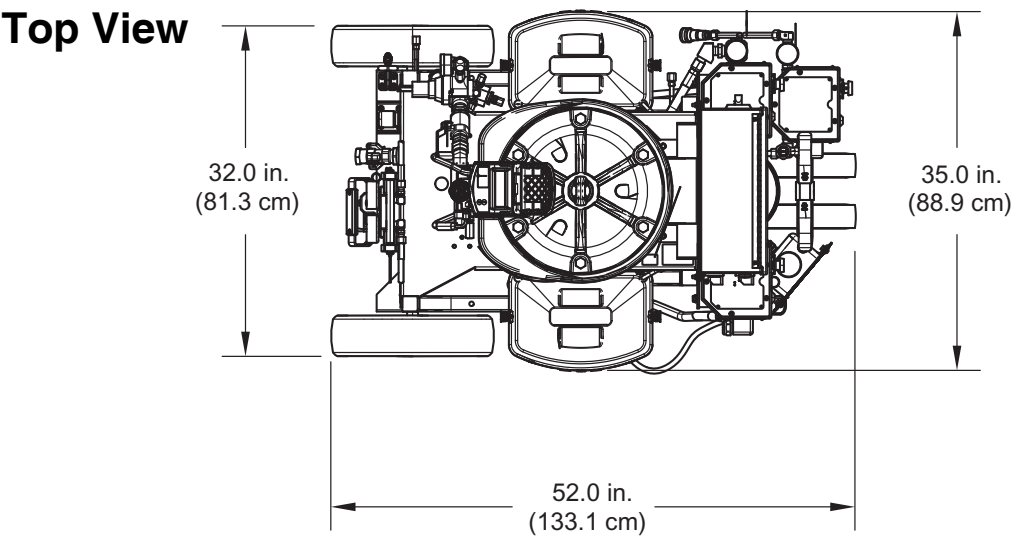
Wall Line Powered Pressure Monitor Kit, 26C008

Air Turbine Powered Pressure Monitor Kit, 26C009

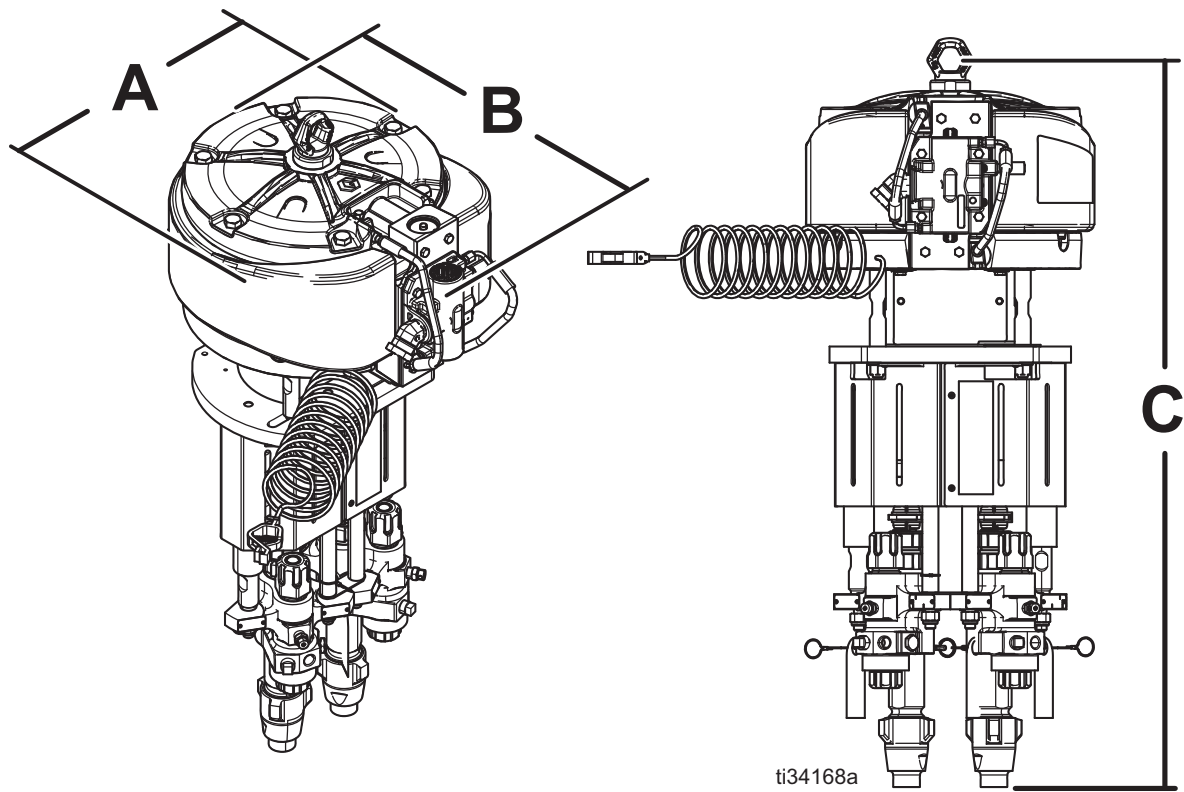
Automatically monitors difference between A and B pressures when at spray pressure and shuts down the system if there is a problem.

Dimensions

System Dimensions

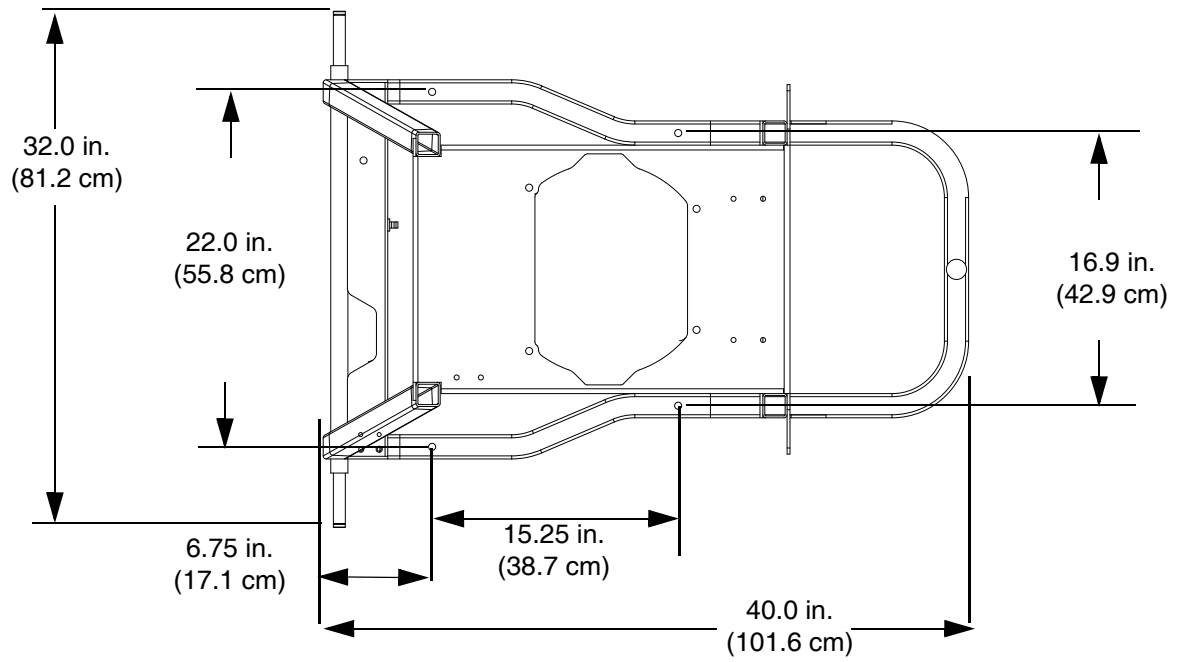


Pump Dimensions



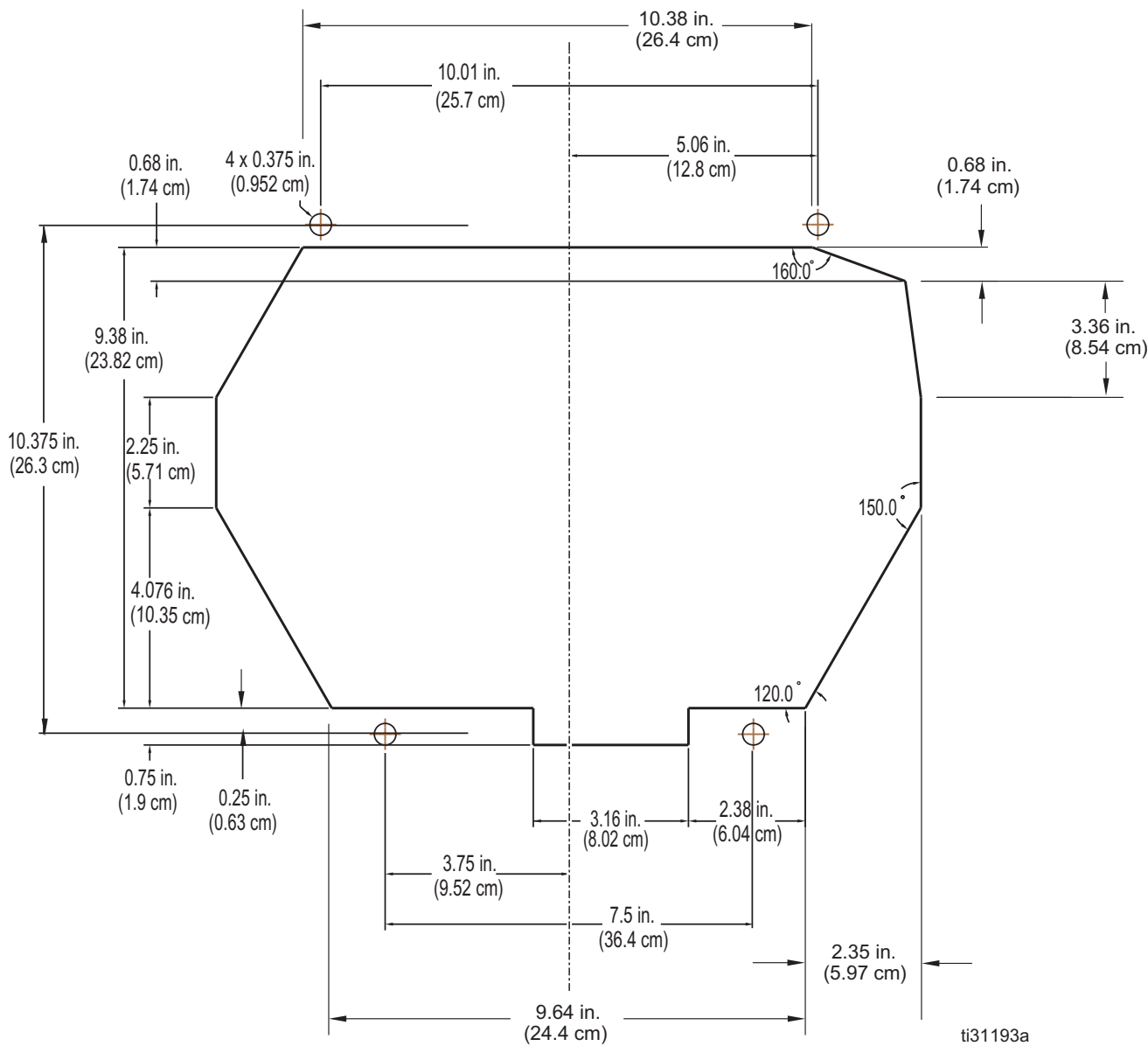
Pump Package	Part	Maximum Width (A)	Maximum Depth (B)	Maximum Height (C)
XP-hf with XL 10000 Air Motor	572100, 572150, 572200, 572250, 572300, 572400, 573100, 573150, 573200, 573250, 573300, 573400	18 in. (46 cm)	24 in. (61 cm)	48 in. (122 cm)

Floor Mounting Dimensions, Top View

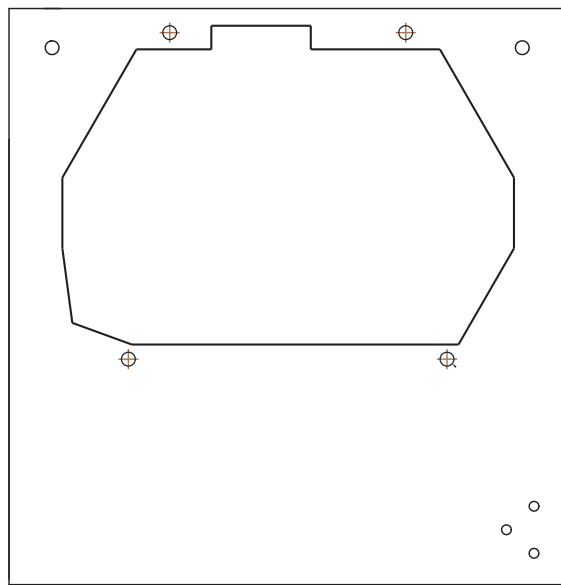
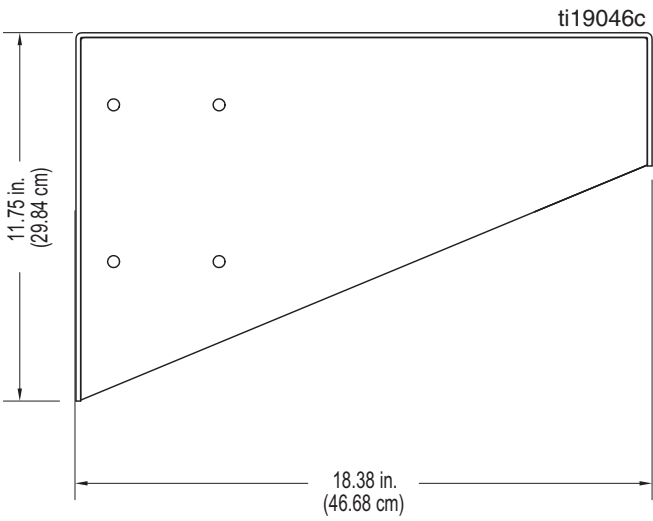
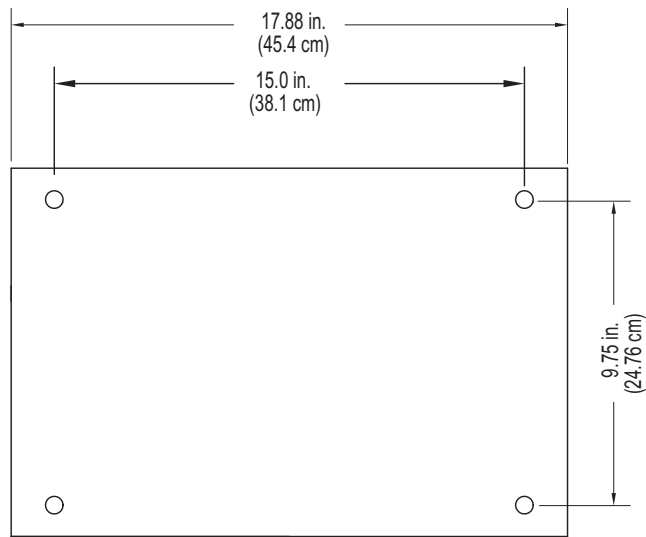


Bare Proportioner Mounting Hole Dimensions

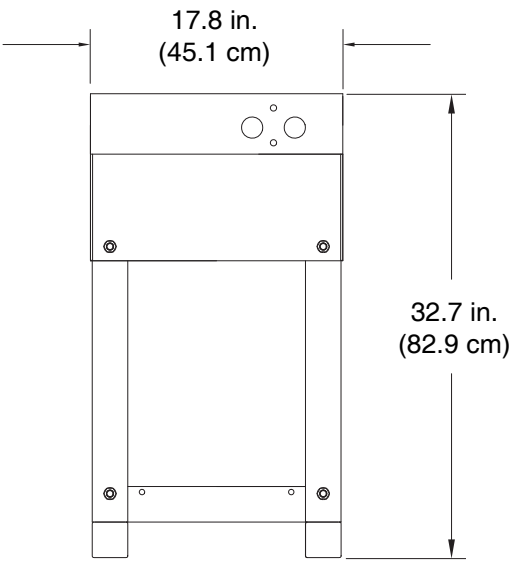
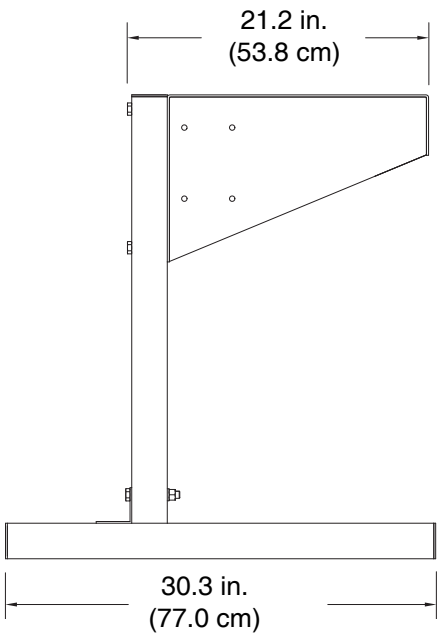
The dimensions below is the minimum opening size for mounting a bare proportioner.



Wall Mount Bracket 262812 Dimensions



Floor Stand 24M281 Dimensions



Technical Data

XP-hf Proportioners		
	U.S.	Metric
Maximum Fluid Working Pressure	See Models section beginning on page 10.	
Combined Fluid Output (cc/cycle)	See Models section beginning on page 10.	
Pressure Ratio	See Models section beginning on page 10.	
Fluid Flow at 20 cpm	See Models section beginning on page 10.	
Fluid pump inlets without hoppers	1-1/4 in. npsm(m)	
Fluid gauge manifold outlets	1/2 in. npt(f)	
Fluid mix manifold inlets	1/2 in. npt(f) ball valves	
Mix manifold material outlet	1/2 in. npt(f)	
Air Inlet Size	1 in. npsm(m)	
Sound Data	See XL 10,000 Air Motor manual for sound data	
Maximum feed pressure from remote source	250 psi	1.7 MPa, 17 bar
Maximum Storage Time	5 years (To maintain original performance, replace soft seals after 5 years of inactivity.)	
Air consumption per 1 gallon (3.78 l) of flow		
XP70	75 scfm at 100 psi/gpm	2.12 m ³ /min at 7 bar, 0.7 MPa
XP50	60 scfm at 100 psi/gpm	1.7 m ³ /min at 7 bar, 0.7 MPa
Air supply pressure range	30-100 psi	0.2-0.27 MPA, 2.0-6.7 bar
Electrical Specifications:		
Configurable Voltage / Phase / Hz	See Connect Power on page 19	
Full Load Amps	See Power Cord Requirements on page 21	
Filtration:		
Air inlet filtration	40-micron filter/separator included	
XP pump outlets	30 mesh	
XTR Spray Gun	60 mesh	
Fluid Viscosity Range:		
Gravity feed with 7 gallon (26 liter) hoppers	200 to 20,000 cps (pourable)	
Pressure feed	Any viscosity that will not require feed pressure more than 15% of outlet pressure	
Ambient Temperature Range:		
Operating	40-130° F	4-54° C
Storage	30-160° F	-1-71° C
Maximum Fluid Temperature	160° F	71° C
Wetted materials:		
Housings and manifolds	Carbon steel with electroless nickel plating	
Miscellaneous parts	Plated carbon steel, stainless steels, carbide, acetal, UHMWPE, nylon, PTFE solvent resistant plastics	
Pump packings	Carbon filled PTFE, proprietary UHMWPE	
Flush pump suction tube	Aluminum	
Hoses	Nylon core	
Weight:		
Bare XP-hf Pump Package only (xxxxx0)	320 lb	145 kg
Cart Unit (xxxxx1)	460 lb	209 kg
Cart Unit with Hoppers (xxxxx2)	485 lb	220 kg
Cart Unit with Solvent Pump, A/B Hazardous Location Heaters (xxxxx3)	640 lb	290 kg

Technical Data

Cart Unit with Hoppers, Solvent Pump, A/B Hazardous Location Heaters (xxxxx4)	665 lb	302 kg
Cart Unit with Hoppers, Solvent Pump, A/B Non-Hazardous Location Heaters, Junction Box (xxxxx5)	715 lb	324 kg
Complete Unit with A/B/Hose Hazardous Location Heaters, Hose Circulation Pump, Pressure-Trak (xxxxx6)	735 lb	333 kg
Complete Unit with A/B/Hose Non-Hazardous Loca- tion Heaters, Junction Box, Hose Circulation Pump, Pres- sure-Trak (xxxxx7)	775 lb	352 kg

[illegible]

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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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Graco Headquarters: Minneapolis

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