

## Color Change Kits

332455L  
EN

To add optional color change function to ProMix® PD2K Electronic Proportioners. Kits include low or high pressure color/catalyst change valves and a Non-IS control module.  
For professional use only.

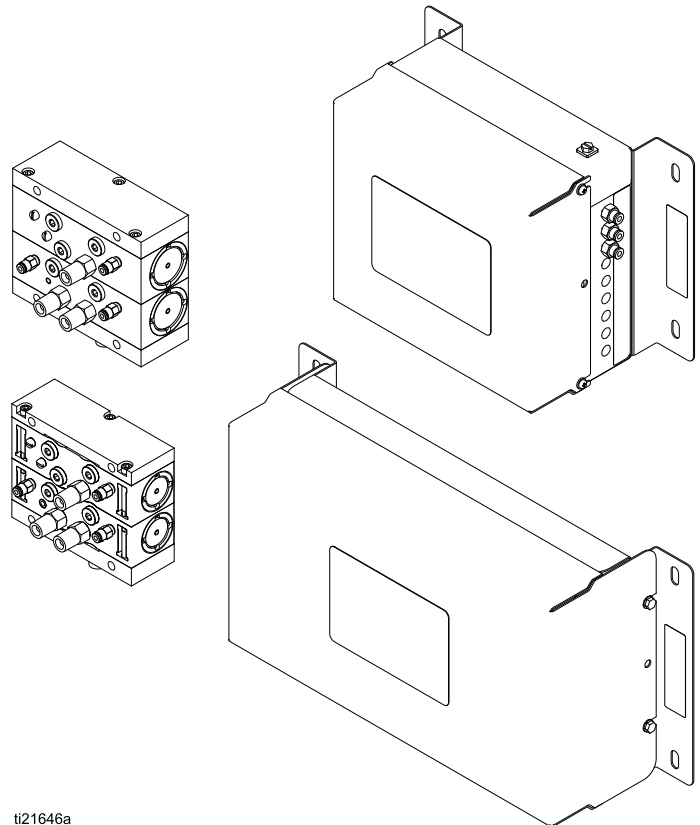


### Important Safety Instructions

Read all warnings and instructions in this manual and in your PD2K proportioner manual.


**Save these instructions.**

*See page 4 for model part numbers and approvals information.*



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## Related Manuals

Manual No.	Description
3A2800	PD2K Proportioner Repair-Parts Manual, Manual Systems
332457	PD2K Proportioner Installation Manual, Manual Systems
332562	PD2K Proportioner Operation Manual, Manual Systems
3A2801	Mix Manifold Instructions-Parts Manual
332339	Pump Repair-Parts Manual
332454	Color Change Valve Repair-Parts Manual
332456	3rd and 4th Pump Kits Instructions-Parts Manual
332709	ProMix PD2K Proportioner for Automatic Spray Applications Repair-Parts Manual


Manual No.	Description
332458	ProMix PD2K Proportioner for Automatic Spray Applications Installation Manual
332564	ProMix PD2K Proportioner for Automatic Spray Applications Operation Manual
333282	Color Change and Remote Mix Manifold Kits Instructions-Parts Manual
3A4186	PD2K Dual Fluid Panel Electronic Proportioner, Manual System, Operation Manual
3A4486	PD2K Dual Fluid Panel Electronic Proportioner, Auto System, Operation Manual

# Models

## Non-Intrinsically Safe Kits

See the module identification label for product part number, maximum air working pressure, and approval information and certification.

ProMix® PD				COLOR CHANGE CONTROL		
PART NO.	SERIES	SERIAL	MFG. YR.	MAX AIR WPR		
				.7	7	100
				MPa	bar	PSI


**GRACO INC.**  
 P.O. Box 1441  
 Minneapolis, MN  
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**CE**

294840a

Figure 1 Non-Intrinsically Safe Color Change Control Module Label



Kit No.	Series	Kit Description	Maximum Air Working Pressure (Control Module)	Maximum Fluid Working Pressure (Valves)
<b>Low Pressure Non-Circulating Color Change Kits</b>				
25A239	A	1 color or 1 catalyst	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y954	A	2 color or 2 catalyst	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y955	A	4 color or 4 catalyst	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y956	A	6 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y957	A	8 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
<b>Low Pressure Circulating Color Change Kits</b>				
25A240	A	1 color or 1 catalyst	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y958	A	2 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y959	A	4 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y960	A	6 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24Y961	A	8 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)








Kit No.	Series	Kit Description	Maximum Air Working Pressure (Control Module)	Maximum Fluid Working Pressure (Valves)
<b>High Pressure Non-Circulating Color Change Kits</b>				
24X318	A	1 color or 1 catalyst	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R959	A	2 color or 2 catalyst	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R960	A	4 color or 4 catalyst	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R961	A	6 color	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R962	A	8 color	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
<b>High Pressure Acid Compatible Non-Circulating Catalyst Change Kits</b>				
26A067	A	Pump flush (acid compatible)	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24X320	A	1 catalyst (acid compatible)	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24T579	A	2 catalyst (acid compatible)	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24T580	A	4 catalyst (acid compatible)	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
<b>High Pressure Circulating Color Change Kits</b>				
24X319	A	1 color	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R963	A	2 color	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R964	A	4 color	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R965	A	6 color	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R966	A	8 color	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)





# Models

Kit No.	Solenoid Valves	CAN Cable (15V206)	1/4 in. Tubing (590332)	5/32 in. Tubing (598095)	Low and High Pressure Valve Control Modules
<b>Custom Valve Mapping Color Change Kits</b>					
25D328	4	10 ft.	6 ft.	24 ft.	25D313
25D329	5			30 ft.	25D314
25D474	6			36 ft.	25D315
25D475	7			42 ft.	25D316
25D476	8			48 ft.	25D317
25D477	9			54 ft.	25D318
25D478	10			60 ft.	25D319
25D479	11			66 ft.	25D320
25D480	12			72 ft.	25D321
25D481	13			78 ft.	25D322
25D482	14			84 ft.	25D323
25D483	15			90 ft.	25D324
25D484	16			96 ft.	25D325
25D485	17			102 ft.	25D326
25D486	18			108 ft.	25D327








# 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, 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.

 <b>WARNING</b>	
   	<b>FIRE AND EXPLOSION HAZARD</b> Flammable fumes, such as solvent and paint fumes, in <b>work area</b> can ignite or explode. To help prevent fire and explosion: <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li> <li>• Keep work area free of debris, including solvent, rags and gasoline.</li> <li>• Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.</li> <li>• Ground all equipment in the work area. See <b>Grounding</b> instructions.</li> <li>• Use only grounded hoses.</li> <li>• Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive.</li> <li>• <b>Stop operation immediately</b> if static sparking occurs or you feel a shock, Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>
 	<b>ELECTRIC SHOCK HAZARD</b> This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock. <ul style="list-style-type: none"> <li>• Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment.</li> <li>• Connect only to grounded power source.</li> <li>• All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.</li> </ul>

 <h1>WARNING</h1>	
	<h3>INTRINSIC SAFETY</h3> <p>Intrinsically safe equipment that is installed improperly or connected to non-intrinsically safe equipment will create a hazardous condition and can cause fire, explosion, or electric shock. Follow local regulations and the following safety requirements.</p> <ul style="list-style-type: none"> <li>• Be sure your installation complies with national, state, and local codes for the installation of electrical apparatus in a Class I, Group D, Division 1 (North America) or Class I, Zones 1 and 2 (Europe) Hazardous Location, including all of the local safety fire codes (for example, NFPA 33, NEC 500 and 516, OSHA 1910.107, etc.).</li> <li>• To help prevent fire and explosion:             <ul style="list-style-type: none"> <li>• Do not install equipment approved only for a non-hazardous location in a hazardous location. See model ID label for the intrinsic safety rating of your model.</li> <li>• Do not substitute system components as this may impair intrinsic safety.</li> </ul> </li> <li>• Equipment that comes in contact with the intrinsically safe terminals must be rated for Intrinsic Safety. This includes DC voltage meters, ohmmeters, cables, and connections. Remove the unit from the hazardous area when troubleshooting.</li> </ul>
	<h3>SKIN INJECTION HAZARD</h3> <p>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. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not spray without tip guard and trigger guard installed.</li> <li>• Engage trigger lock when not spraying.</li> <li>• Do not point gun at anyone or at any part of the body.</li> <li>• Do not put your hand over the spray tip.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Follow the <b>Pressure Relief Procedure</b> when you stop spraying/dispensing and before cleaning, checking, or servicing equipment.</li> <li>• Tighten all fluid connections before operating the equipment.</li> <li>• Check hoses and couplings daily. Replace worn or damaged parts immediately.</li> </ul>
	<h3>MOVING PARTS HAZARD</h3> <p>Moving parts can pinch, cut or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> and disconnect all power sources.</li> </ul>







 <h1>WARNING</h1>	
 	<p><b>TOXIC FLUID OR FUMES</b> Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>• Read MSDSs to know the specific hazards of the fluids you are using.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> <li>• Always wear chemically impermeable gloves when spraying, dispensing, or cleaning equipment.</li> </ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b> Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Protective eyewear, and hearing protection.</li> <li>• Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.</li> </ul>
  	<p><b>EQUIPMENT MISUSE HAZARD</b> Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.</li> <li>• Do not leave the work area while equipment is energized or under pressure.</li> <li>• Turn off all equipment and follow the <b>Pressure Relief Procedure</b> when equipment is not in use.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.</li> <li>• Make sure all equipment is rated and approved for the environment in which you are using it.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>



## Important Isocyanate (ISO) Information

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




### Isocyanate Conditions

				
<p>Spraying or dispensing fluids that contain isocyanates creates potentially harmful mists, vapors, and atomized particulates</p> <ul style="list-style-type: none"><li>• Read and understand the fluid manufacturer's warnings and Safety Data Sheet (SDS) to know specific hazards and precautions related to isocyanates.</li><li>• Use of isocyanates involves potentially hazardous procedures. Do not spray with the 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 SDS.</li><li>• 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.</li><li>• 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 SDS.</li><li>• 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.</li></ul>				

### Material Self-ignition

				
<p>Some materials may become self-igniting if applied too thick. Read material manufacturer's warnings and material MSDS.</p>				

### Keep Components A and B Separate

				
<p>Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:</p> <ul style="list-style-type: none"><li>• <b>Never</b> interchange component A and component B wetted parts.</li><li>• Never use solvent on one side if it has been contaminated from the other side.</li></ul>				

## Moisture Sensitivity of Isocyanates

Exposure to moisture (such as humidity) will cause ISO to partially cure; forming small, hard, abrasive crystals, which 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 A (resin) side.

## Important Acid Catalyst Information

Some color change and remote mix manifold kits in this manual are designed for acid catalysts ("acid") currently used in two-component, wood-finishing materials. Current acids in use (with pH levels as low as 1) are more corrosive than earlier acids. More corrosion-resistant wetted materials of construction are required, and must be used without substitution, to withstand the increased corrosive properties of these acids.

### Acid Catalyst Conditions

									
<p>Acid is flammable, and spraying or dispensing acid creates potentially harmful mists, vapors, and atomized particulates. To help prevent fire and explosion and serious injury.</p> <ul style="list-style-type: none"><li>• Read and understand the fluid manufacturer's warnings and Safety Data Sheet (SDS) to know specific hazards and precautions related to the acid.</li><li>• Use only genuine, manufacturer's recommended acid-compatible parts in the catalyst system (hoses, fittings, etc). A reaction may occur between any substituted parts and the acid.</li><li>• To prevent inhalation of acid 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 acid manufacturer's SDS.</li><li>• Avoid all skin contact with acid. Everyone in the work area must wear chemically impermeable gloves, protective clothing, foot coverings, aprons, and face shields as recommended by the acid manufacturer and local regulatory authority. Follow all fluid manufacturer recommendations, including those regarding handling of contaminated clothing. Wash hands and face before eating or drinking.</li><li>• Regularly inspect equipment for potential leaks and remove spills promptly and completely to avoid direct contact or inhalation of the acid and its vapors.</li><li>• Keep acid away from heat, sparks, and open flames. Do not smoke in the work area. Eliminate all ignition sources.</li><li>• Store acid in the original container in a cool, dry, and well-ventilated area away from direct sunlight and away from other chemicals in accordance with acid manufacturer's recommendations. To avoid corrosion of containers, do not store acid in substitute containers. Reseal the original container to prevent vapors from contaminating the storage space and surrounding facility.</li></ul>									

## **Moisture Sensitivity of Acid Catalysts**

Acid catalysts can be sensitive to atmospheric moisture and other contaminants. It is recommended the catalyst pump and valve seal areas exposed to atmosphere are flooded with ISO oil, TSL, or other compatible material to prevent acid build-up and premature seal damage and failure.

### ***NOTICE***

Acid build-up will damage the valve seals and reduce the performance and life of the catalyst pump. To prevent exposing acid to moisture:

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. Never store acids in an open container.
- Keep the catalyst pump and the valve seals filled with the appropriate lubricant. The lubricant creates a barrier between the acid and the atmosphere.
- Use only moisture-proof hoses compatible with acids.
- Always lubricate threaded parts with an appropriate lubricant when reassembling.

# Set Up the Modules

## Set Up Non-IS Control Modules

**NOTE:** The PD2K System can use up to four pumps and six color change modules in the non-hazardous area.

- Determine the number of pumps (both color and catalyst) in the system pump configuration.
- Determine the number of color change modules needed for your system.
  - For static valve mapping systems, find the table in [Module Selection for Static Valve Mapping, page 14](#), that matches your system pump configuration to understand how many color change modules are needed, and which module should be associated to which pump.
  - For custom valve mapping systems, use the tables in [Module Selection for Custom Valve Mapping, page 16](#), to determine the number of valves and solenoids needed for your system, which will determine number of control modules.

### Module Selection for Static Valve Mapping

All Non-IS modules ship from the factory addressed and labeled as Module 1 (Colors 1–8). Labels for Modules 2 through 6 are provided with the module kit. Affix the labels according to your system configuration.

Total Pumps = 1 (1 Color)

Pump 1: Color	Pump 2: N/A	Pump 3: N/A	Pump 4: N/A
Module 1 Color Valves: 1–8			
Module 2 Color Valves: 9–16			
Module 3 Color Valves: 17–24			
Module 4 Color Valves: 25–30			

Total Pumps = 2 (1 Color, 1 Catalyst)

Pump 1: Color	Pump 2: Catalyst	Pump 3: N/A	Pump 4: N/A
Module 1 Color Valves: 1–8	Module 5 Catalyst Valves: 1–4		
Module 2 Color Valves: 9–16			
Module 3 Color Valves: 17–24			
Module 4 Color Valves: 25–30			

Total Pumps = 2 (2 Color)

Pump 1: Color	Pump 2: N/A	Pump 3: Color	Pump 4: N/A
Module 1 Color Valves: 1–8		Module 3 Color Valves: 17–24	
Module 2 Color Valves: 9–16		Module 4 Color Valves: 25–30	

Total Pumps = 3 (2 Color, 1 Catalyst)

Pump 1: Color	Pump 2: N/A	Pump 3: Color	Pump 4: N/A
Module 1 Color Valves: 1–8	Module 5 Catalyst Valves: 1–4	Module 3 Color Valves: 17–24	
Module 2 Color Valves: 9–16		Module 4 Color Valves: 25–30	

**Total Pumps = 3 (3 Color)**

Pump 1: Color	Pump 2: N/A	Pump 3: Color	Pump 4: Color
Module 1 Color Valves: 1–8		Module 3 Color Valves: 17–24	Module 4 Color Valves: 25–30
Module 2 Color Valves: 9–16			

**Total Pumps = 4 (3 Color, 1 Catalyst)**

Pump 1: Color	Pump 2: Catalyst	Pump 3: Color	Pump 4: Color
Module 1 Color Valves: 1–8	Module 5 Catalyst Valves: 1–4	Module 3 Color Valves: 17–24	Module 4 Color Valves: 25–30
Module 2 Color Valves: 9–16			

**Total Pumps = 4 (4 Color)**

Pump 1: Color	Pump 2: Color	Pump 3: Color	Pump 4: Color
Module 1 Color Valves: 1–8	Module 2 Color Valves: 9–16	Module 3 Color Valves: 17–24	Module 4 Color Valves: 25–30

**Total Pumps = 4 (2 Color, 2 Catalyst)**

Pump 1: Color	Pump 2: Catalyst	Pump 3: Color	Pump 4: Catalyst
Module 1 Color Valves: 1–8	Module 5 Catalyst Valves: 1–2*	Module 3 Color Valves: 17–24	Module 6 Catalyst Valves: 3–4*
Module 2 Color Valves: 9–16		Module 4 Color Valves: 25–30	

\* If the alternate catalyst valve mapping is enabled, see note below.

**NOTE:** For a system with two catalyst pumps that requires one pump to change among three catalysts, an alternate valve map may be enabled that will instead include Catalyst Valves 1–3 on Pump 2 (Module 5) and only include Catalyst Valve 4 on Pump 4 (Module 6 if color change is still used for this pump). See Pump Screen 1 in Operation Manuals 332562 and 332564 for details.

**NOTE:** For a system that uses a mix-at-wall manifold, and also has more than one gun, the number of colors is limited to a total of 26. Colors 15 and 16 (on Module 2) and colors 29 and 30 (on Module 4) are not available. See Operation Manuals 332562 and 332564 for details on using multiple guns.

**Dual Panel System**

**NOTE:** The PD2K Dual Panel system has only one pump and color change combination.

**Total Pumps = 4 (2 Color, 2 Catalyst)**

Pump 1: Color	Pump 2: Catalyst	Pump 3: Color	Pump 4: Catalyst
Module 1 Color Valves: 1–8	Module 5 Catalyst Valves: 1–4*	Module 3 Color Valves: 17–24	Module 6 Catalyst Valves: 5–8*
Module 2 Color Valves: 9–16*		Module 4 Color Valves: 25–32*	

\* Each Mix Unit supports up to 16 materials. The maximum number of colors will depend on the number of catalysts for which the Mix Unit is configured (i.e., 2 catalysts, 14 colors).

## Module Selection for Custom Valve Mapping

Use the following tables to determine the number of valves and solenoids required for your custom valve mapping system. The total number of valves and

solenoids will then determine the minimum number of control modules for your system. Up to eight total Non-IS modules can be used.

**Table 1 Number of valves and solenoids required for PD2K pumps**

	Pump 1		Pump 2		Pump 3		Pump 4		
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	
Color Change Valves									Subtotal 1
Solvent Valves									
Air Valves									
Total Valves and Solenoids									

**Table 2 Number of valves and solenoids required for Mix-at-Wall and Automatic System guns**

	Gun 1		Gun 2		Gun 3		
	Resin	Catalyst	Resin	Catalyst	Resin	Catalyst	
Color Change Valves							Subtotal 2
Solvent Valves							
Air Valves							
Total Valves and Solenoids							

Subtotal 1		+	Subtotal 2		=	Grand Total	

The minimum number of control modules required for your custom valve mapping system is equal to the Grand Total divided by 18, rounded up to the next whole number.

**Single Panel Models:** Supports resins up to 30 colors, split between all resin pumps, and up to 4 catalysts.

**Dual Panel Models:** Each Mix Unit supports up to 16 materials. The maximum number of colors will depend on the number of catalysts for which the Mix Unit is configured (i.e., 2 catalysts, 14 colors).



## Inlet Manifold

## Outlet Manifold

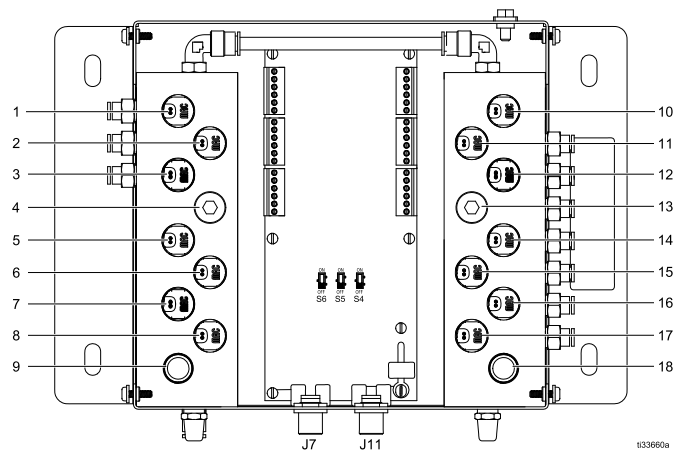


Figure 2 Custom Valve Mapping Locations

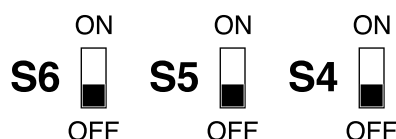
**NOTE:** Valves are positioned so consecutive numbers may be used for each color, and inlet and outlet stacks are plumbed from the side of the control module for convenience.

## Module Configuration

Configure each module according to its designated number, as follows:

<b>NOTICE</b>	
To avoid damaging the circuit boards, wear Part No. 112190 grounding strap on your wrist and ground appropriately.	
To avoid electrical component damage, remove all system power before plugging any connectors.	

1. Remove electrical power from the system.
2. Open the color change module. Locate switches S4, S5, and S6 on the control module board. The switches are shipped in the OFF position.



3. For each module, set the switches to ON or OFF, as shown in the following table.

Non-IS Control Module Switch Settings			
Control Module	S6	S5	S4
Module 1			
Module 2			

Inlet Manifold

Outlet Manifold

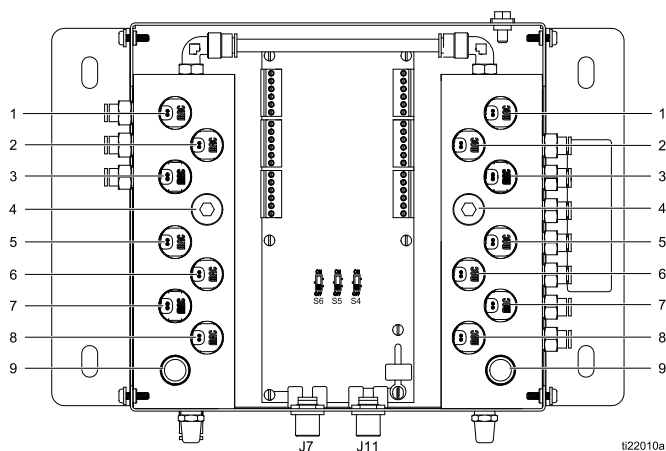


Figure 3 Non-IS Static Control Module

Non-IS Control Module Switch Settings			
Control Module	S6	S5	S4
Module 3			
Module 4			
Module 5			
Module 6			
Module 7			
Module 8			

4. For static valve mapping, use the following figure and tables to determine the solenoid valve assigned to each valve in the valve manifold.

**NOTE:** There can be only one solvent valve and one dump valve per pump.

Non-IS Control Module 1			
Inlet Manifold		Outlet Manifold	
Solenoid	Valve	Solenoid	Valve
1	Solvent	1	Dump
2	Color 1	2	Color 1
3	Color 2	3	Color 2
4	Color 3	4	Color 3
5	Color 4	5	Color 4
6	Color 5	6	Color 5
7	Color 6	7	Color 6
8	Color 7	8	Color 7
9	Color 8	9	Color 8

Non-IS Control Module 2			
Inlet Manifold		Outlet Manifold	
Solenoid	Valve	Solenoid	Valve
1	(Solvent)*	1	(Dump)*
2	Color 9	2	Color 9
3	Color 10	3	Color 10
4	Color 11	4	Color 11
5	Color 12	5	Color 12
6	Color 13	6	Color 13
7	Color 14	7	Color 14
8	Color 15†	8	Color 15†
9	Color 16†	9	Color 16†

Non-IS Control Module 3			
Inlet Manifold		Outlet Manifold	
Solenoid	Valve	Solenoid	Valve
1	(Solvent)*	1	(Dump)*
2	Color 17	2	Color 17
3	Color 18	3	Color 18
4	Color 19	4	Color 19
5	Color 20	5	Color 20
6	Color 21	6	Color 21
7	Color 22	7	Color 22
8	Color 23	8	Color 23
9	Color 24	9	Color 24

Non-IS Control Module 4			
Inlet Manifold		Outlet Manifold	
Solenoid	Valve	Solenoid	Valve
1	(Solvent)*	1	(Dump)*
2	Color 25	2	Color 25
3	Color 26	3	Color 26
4	Color 27	4	Color 27
5	Color 28	5	Color 28
6	Color 29†	6	Color 29†
7	Color 30†	7	Color 30†
8	Not Used	8	Not Used
9	Not Used	9	Not Used

Non-IS Control Module 5			
Inlet Manifold		Outlet Manifold	
Solenoid	Valve	Solenoid	Valve
1	(Solvent)*	1	(Dump)*
2	Catalyst 1	2	Catalyst 1
3	Catalyst 2	3	Catalyst 2
4	Catalyst 3	4	Catalyst 3
5	Catalyst 4	5	Catalyst 4
6	Not Used	6	Not Used
7	Not Used	7	Not Used
8	Not Used	8	Not Used
9	Not Used	9	Not Used

\* There should be only one solvent valve and one dump valve per pump.

† These colors are not available for systems using mix-at-wall and have more than one gun.




## Set Up the Modules







Non-IS Control Module 6 (default mapping)			
Inlet Manifold		Outlet Manifold	
Solenoid	Valve	Solenoid	Valve
1	(Solvent)*	1	(Dump)*
2	Catalyst 3	2	Catalyst 3
3	Catalyst 4	3	Catalyst 4
4	Not Used	4	Not Used
5	Not Used	5	Not Used
6	Not Used	6	Not Used
7	Not Used	7	Not Used
8	Not Used	8	Not Used
9	Not Used	9	Not Used

Non-IS Control Module 6 (alternate mapping)			
Inlet Manifold		Outlet Manifold	
Solenoid	Valve	Solenoid	Valve
1	(Solvent)*	1	(Dump)*
2	Catalyst 4	2	Catalyst 4
3	Not Used	3	Not Used
4	Not Used	4	Not Used
5	Not Used	5	Not Used
6	Not Used	6	Not Used
7	Not Used	7	Not Used
8	Not Used	8	Not Used
9	Not Used	9	Not Used

\* There should be only one solvent valve and one dump valve per pump.

# Installation

				
<ul style="list-style-type: none"> <li>• To avoid electric shock, turn off power at the main circuit breaker before opening the enclosure.</li> <li>• All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.</li> <li>• Do not substitute or modify system components as this may impair intrinsic safety.</li> <li>• Do not install equipment approved only for non-hazardous location in a hazardous location. See the identification label for the intrinsic safety rating for your model.</li> </ul>				

				
				
<p>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 <b>Pressure Relief Procedure</b> in the PD2K Operation Manual before installing the kit.</p>				





## Mounting the Color Change Control Module

1. See [Dimensions, page 75](#).
2. Ensure that the wall and mounting hardware are strong enough to support the weight of the equipment, fluid, hoses, and stress cause during operation.
3. Using the equipment as a template, mark the mounting holes on the wall at a convenient height for the operator and so the equipment is easily accessible for maintenance.
4. Drill mounting holes in the wall. Install anchors as needed.
5. Bolt the equipment securely.

## Air Supply

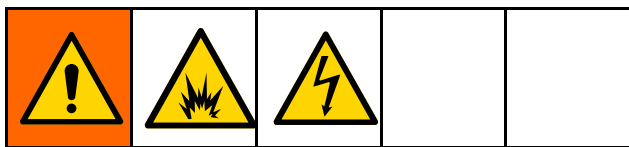
Connect a clean and dry air supply to the color change control module air inlet fitting (317); the fitting is for 1/4 in. (6 mm) OD tubing. Use a 5 micron filter. Regulate the air pressure to 85–100 psi (0.6–0.7 MPa, 6.0–7.0 bar).

## Grounding

				
<p>This 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.</p>				

Connect a ground wire from the color change module to a true earth ground.

## Non-Hazardous Location



**NOTE:** Non-IS color change control modules provide control for the pump's inlet and outlet color/catalyst change valves. Depending on the number of valves in the system, as many as six control modules may be installed in the non-hazardous location.

1. Mount the first non-IS color control module as described in [Mounting the Color Change Control Module, page 21](#).
2. Connect the 5-pin CAN cable (109) to J7 on the color control module (108).

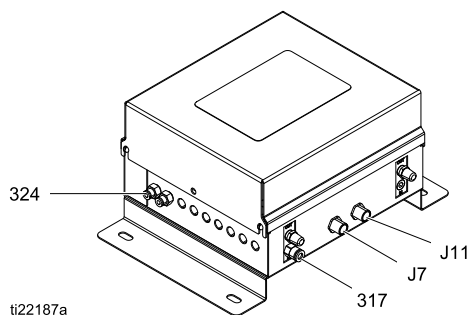


Figure 4 Cable Connector J7 at Non-IS Color Control Module

### NOTICE

To avoid damaging the circuit boards, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

3. Remove electrical power from the system.
4. Remove the cover from the PD2K electrical control box.
5. Replace the one-cable grommet (at the top of the control box) with the supplied two-cable grommet (110). Move the ADM cable to the two-cable grommet, and install the cable (109).
6. Connect the cable (109) to J2 on the non-IS side of the isolation board inside the electrical control box. See [Electrical Schematics, page 40](#) for a list of M12 CAN cables for use in a non-hazardous area.

7. To install additional color control modules (six maximum), mount the module(s) as described in [Mounting the Color Change Control Module, page 21](#). Connect a 5-pin CAN cable from J11 of the previous color control module to J7 of the next control module.
8. Replace the cover of the PD2K electrical control box before turning on power to the system.

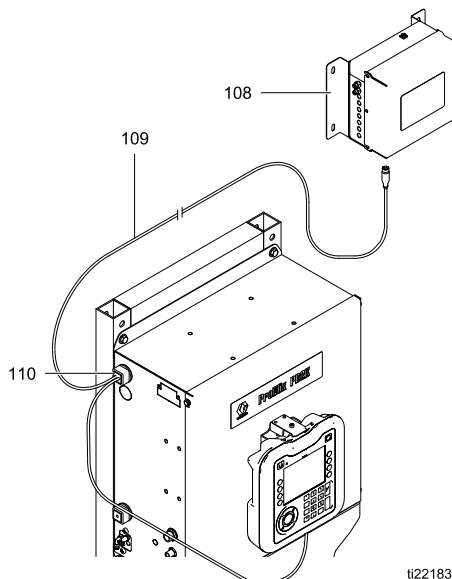


Figure 5 Cable Connection at PD2K Electrical Control Box

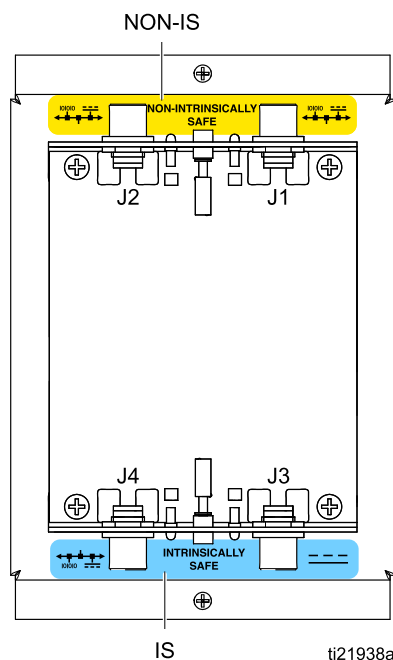
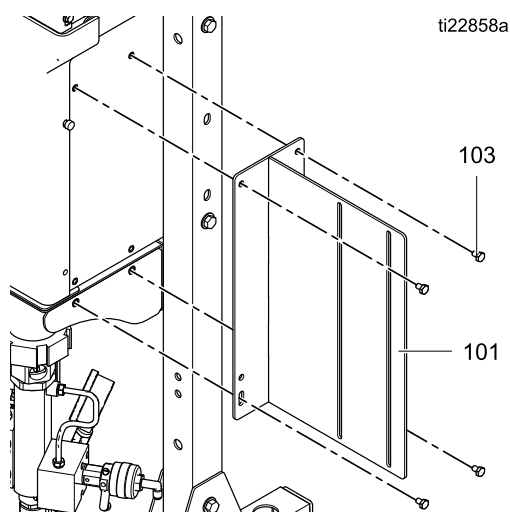


Figure 6 Detail of Isolation Board Cable Connections

## Install the Valve Manifolds

**NOTE:** Always label the color connections to prevent cross-connections. Label the inlet manifold, outlet manifold, and each color valve with its assigned color. The solvent and dump valves should be furthest from the manifold stack primary inlet or outlet.

1. Install a mounting bracket (101) on the PD2K with four screws (103). **High pressure systems:** For stability, be sure to fasten the bottom screws (103) to the pump bracket.



2. Install the inlet and outlet valve manifolds (102) on the mounting bracket (101) with four screws (104), washers (105), and nuts (106).

**NOTE:** On low pressure systems, the supplied bracket (101) will accommodate a manifold

with 16 valve positions (14 colors). On high pressure systems, the supplied bracket (101) will accommodate a manifold with 14 valve positions (12 colors). A larger valve stack will require a customer supplied/sourced bracket.

3. Repeat for the opposite side of the PD2K.
4. Connect the air lines from the solenoids to the valves. See [Connect the Valve Air Lines, page 26](#).

**NOTE:** On high pressure systems, see [Install the Back Pressure Regulator \(High Pressure Systems Only\), page 25](#).

5. Connect the fluid supply lines to the valves. See [Connect the Fluid Lines, page 27](#).

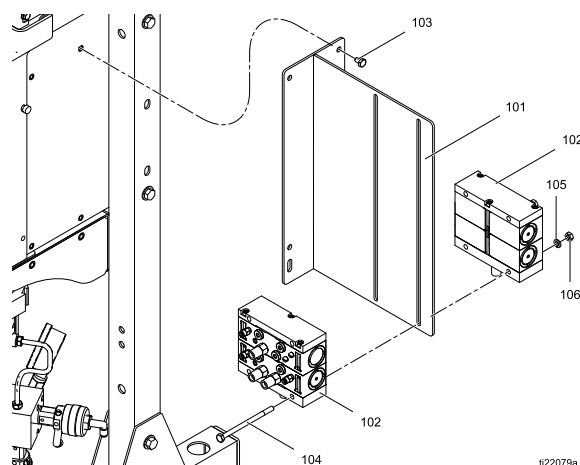


Figure 7 Install the Valve Manifolds

## Mount Color Change Stack to Expansion Pump Frame

This procedure is for installing the Color Change Stack Mount kit, 25D311 (see [Parts, page 58](#)), which includes hardware to mounting color change stacks to an expansion pump frame. The following color change valve stack mounting kits are available, depending on your current PD2K setup:

- **25E016** - Hardware used to mount color change stacks to a standard PD2K pump frame.
- **25D535** - Hardware used with kit 25E016 to mount color change stacks to expansion brackets.

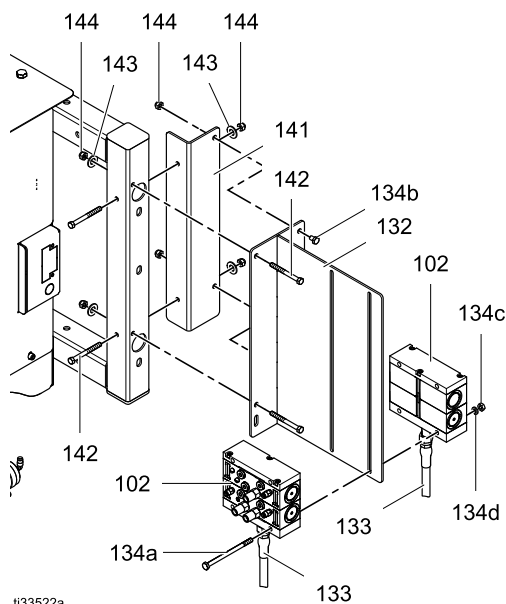
**NOTE:** Always label the color connections to prevent cross-connections. Label the inlet manifold, outlet manifold, and each color valve with its assigned color. The solvent and dump valves should be furthest from the manifold stack primary inlet or outlet.

1. Install the expansion mounting bracket (141) on the PD2K with two screws (142), washers (143), and nuts (144).

2. Install the valve mounting bracket (132) on the PD2K and expansion mounting bracket (141) using two sets of screws, washers, and nuts. The first set, which installs the valve mounting bracket (132) on the PD2K, includes two screws (142), washers (143), and nuts (144). The second set, which attaches the valve mounting bracket (132) to the expansion mounting bracket (141), includes two screws (134b) and washers (144).
3. Install the inlet and outlet valve manifolds (102) on the valve mounting bracket (132) with four screws (134a), washers (134d), and nuts (134c).
4. Repeat for the opposite side of the PD2K.
5. Connect the air lines from the solenoids to the valves. See [Connect the Valve Air Lines, page 26](#).

**NOTE:** On high pressure systems, see [Install the Back Pressure Regulator \(High Pressure Systems Only\), page 25](#).

6. Connect the fluid supply lines to the valves. See [Connect the Fluid Lines, page 27](#).





## Install the Back Pressure Regulator (High Pressure Systems Only)

**NOTE:** The back pressure regulator is required on high pressure systems to prevent the system's feed pumps from overdriving the dosing pumps during color change pump flush and color fill operations. Adjust the back pressure during the dump process to be approximately 75% of the supply pressure from the feed pumps, but never more than 300 psi (2.1 MPa, 21 bar) less than the supply pressure.

Install the back pressure regulator (120) and attaching hardware at the dump valve of the outlet manifold stack.

1. Screw the tee (122) onto the dump valve fitting of the outlet manifold stack.
2. Assemble the two nipples (121) to the back pressure regulator (120). Screw the regulator assembly into the tee (122) as shown.
3. Install the gauge (123) in the open port of the tee (122).
4. Connect a 1/4 npt(f) dump line to the downward facing nipple (121).
5. Connect the fluid supply lines to the valves. See [Connect the Fluid Lines, page 27](#).

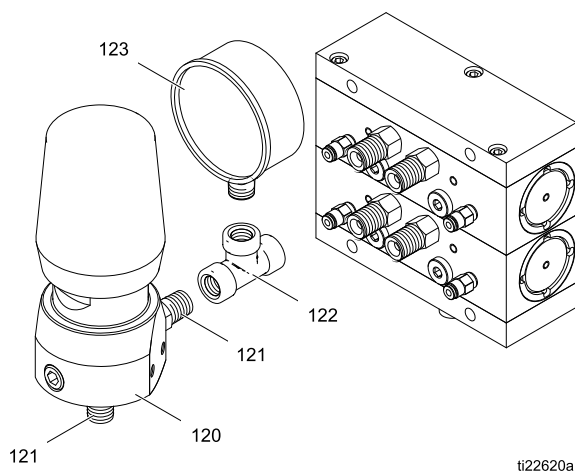


Figure 8 Install Back Pressure Regulator at Dump Valve of Outlet Stack

### Back Pressure Regulator Kit (25D627)

The Back Regulator Kit (25D627) includes a swivel union fitting (124) and replaces the 1/4 npt nipple fittings (121) with 3/8 - 1/4 npt reducer nipple fittings. See [Parts, page 58](#).

1. Screw the swivel union fitting (124) onto the dump valve fitting of the outlet manifold stack.
2. Screw the tee (122) onto the swivel union fitting (124).
3. Perform steps 2 - 5 from the previous procedure for installing the back pressure regulator.

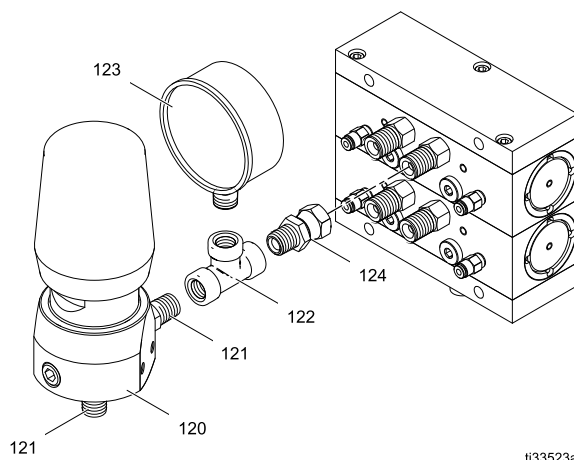


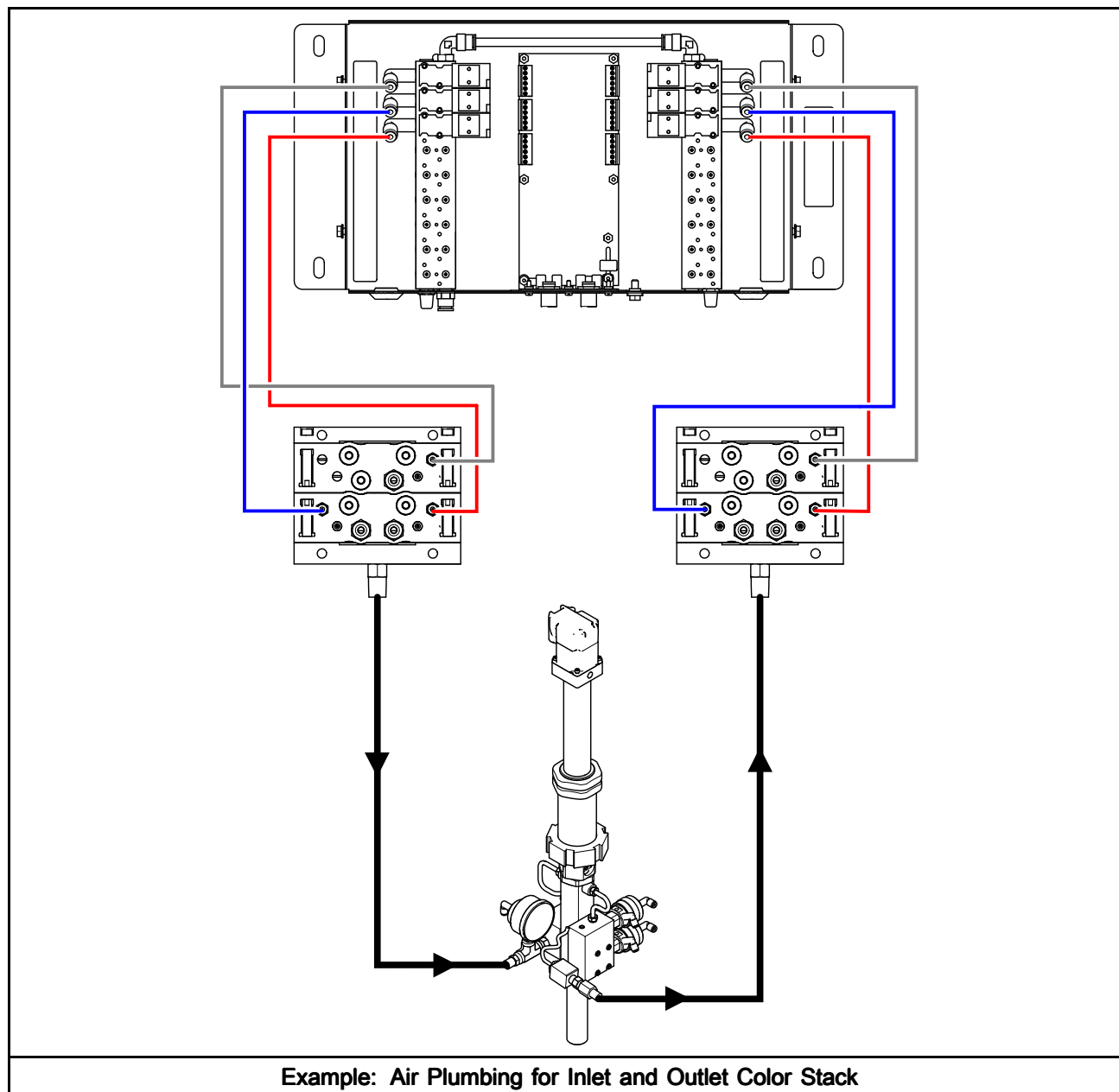
Figure 9 Back Pressure Regulator kit (25D627)

## Connect the Valve Air Lines

1. Connect 5/32 in. (4 mm) OD air tubes from the inlet solenoids to the air inlets of each inlet valve, using the label inside the color control module as a guide. See [Set Up the Modules, page 14](#).

2. Repeat for the outlet valves.

The following figure is an example of a possible air line configuration.



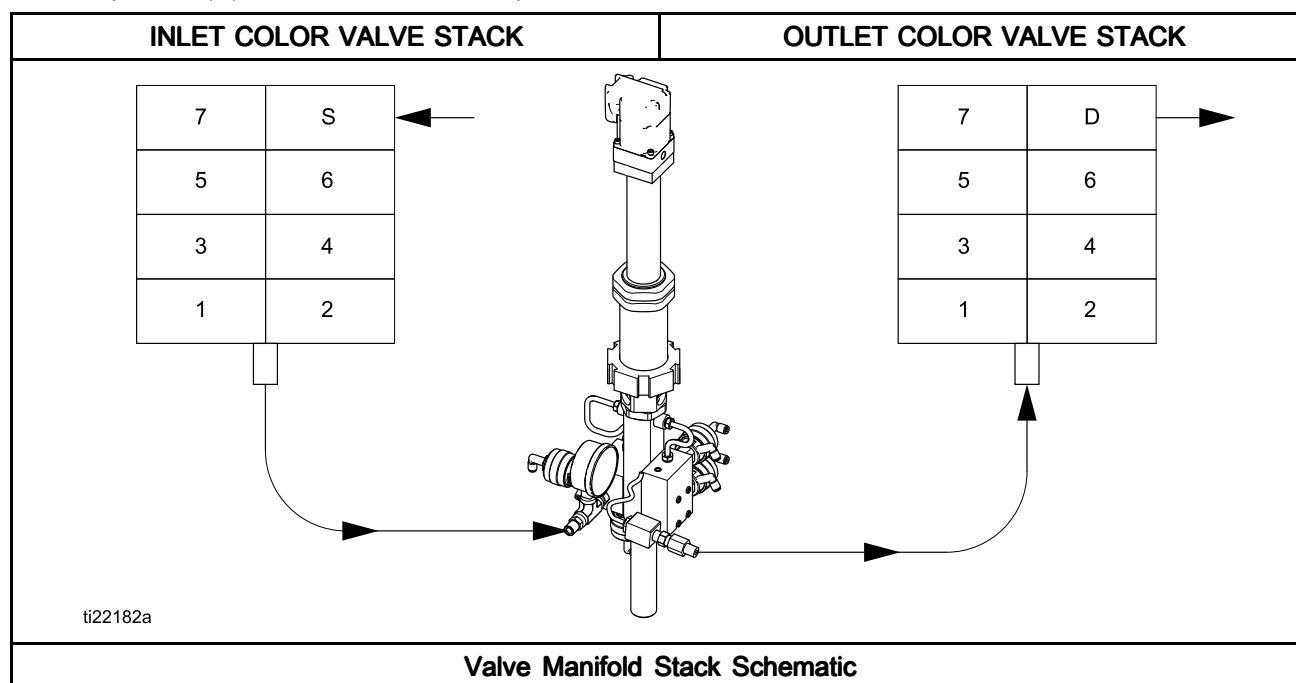
## Connect the Fluid Lines

### Connect Non-Circulating Fluid Lines

**NOTE:** There can be only one solvent valve (S) and one dump valve (D) per pump.

**NOTE:** On high pressure systems, see [Install the Back Pressure Regulator \(High Pressure Systems Only\)](#), page 25.

1. Use the top valve of the **inlet** valve stack as the solvent valve (S). Connect a solvent supply line to the 1/4 npt(m) solvent valve inlet on the color and catalyst valve stacks.
2. Use the top valve of the **outlet** valve stack as the dump valve (D). Connect a waste dump line to the 1/4 npt(m) dump valve outlet on the color and catalyst valve stacks.
3. Connect the supply line for each color to the corresponding color valve fitting (C1, C2, etc.) on the **inlet** color valve stack.
4. Connect a supply line from the bottom fitting of the **inlet** color valve stack to the **inlet** manifold of the material A dosing pump.
5. Connect a supply line from the **outlet** manifold of the material A dosing pump to the bottom fitting of the **outlet** color valve stack.



## Installation

6. Connect a dedicated gun supply line for each color to the corresponding color valve fitting (C1, C2, etc.) on the **outlet** color valve stack. Connect the other end of this line to the A side of the mix manifold at the gun.
7. Connect the supply line for each catalyst to the corresponding catalyst valve fitting on the **inlet** catalyst valve stack.
8. Connect a supply line from the bottom fitting of the **inlet** catalyst valve stack to the **inlet** manifold of the material B dosing pump.
9. Connect a supply line from the **outlet** manifold of the material B dosing pump to the bottom fitting of the **outlet** catalyst valve stack.
10. Connect a dedicated gun supply line for each catalyst to the corresponding catalyst valve fitting on the **outlet** catalyst valve stack. Connect the other end of this line to the B side of the mix manifold at the gun.

**NOTE:** If your system uses more colors than catalysts, branch the catalyst line to connect it to each mix manifold. Install a check valve on each branch of the catalyst line.

**NOTE:** For ease of maintenance, install a ball valve at all fluid line tees.

11. The mix manifold is belt-mounted. Connect a fluid hose between the manifold outlet and the gun inlet.

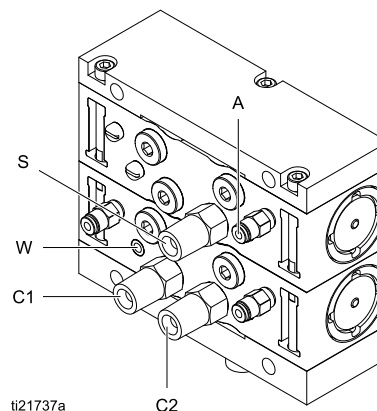
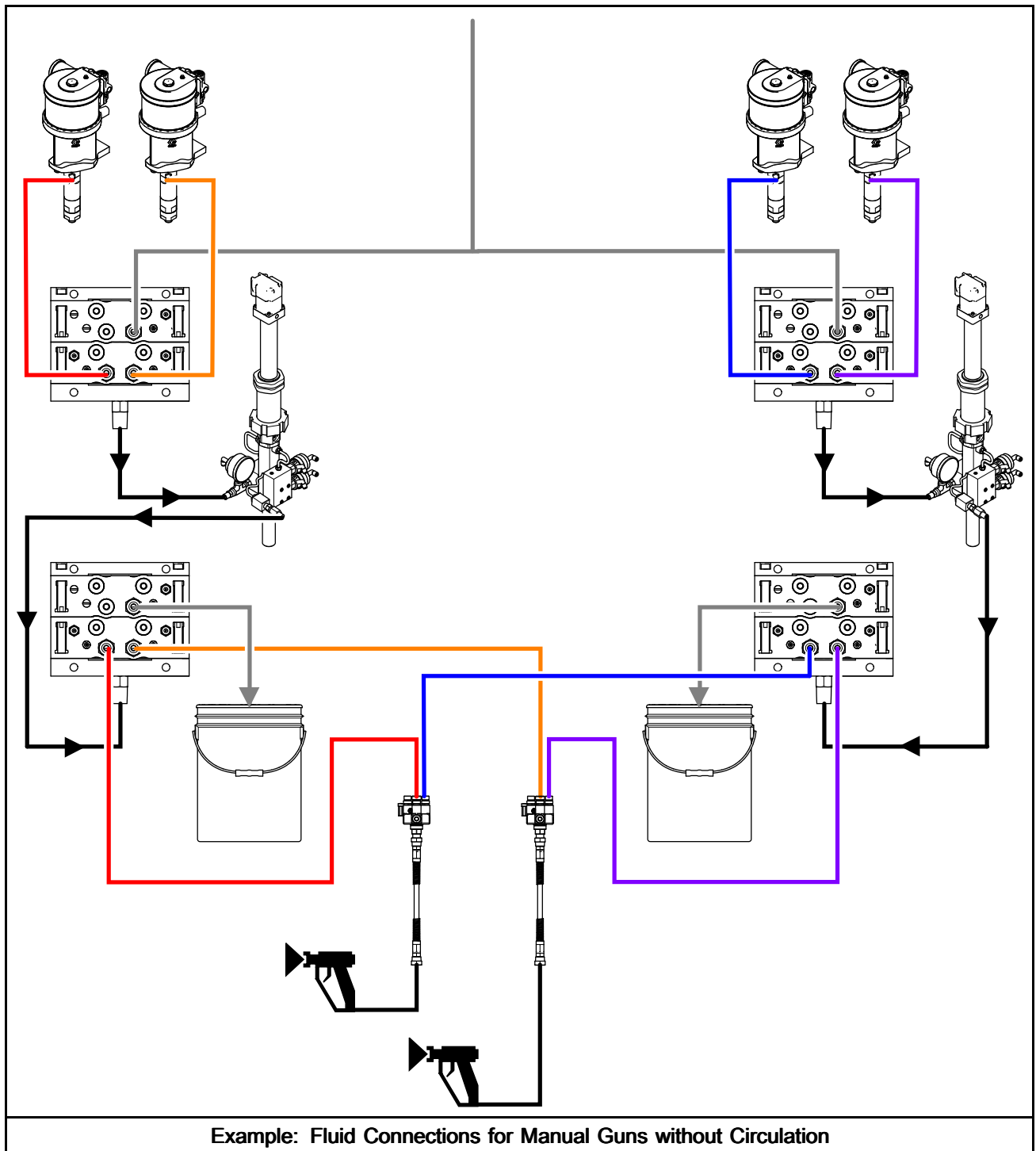


Figure 10 Color Change Connections  
(Non-Circulating System)

KEY	
A	Air inlet
W	Seal weep and lubrication port
S	Solvent fitting
C1	Color 1 fitting
C2	Color 2 fitting

The figure on the following page is an example of a possible fluid line configuration.



## Connect Circulating Fluid Lines

Circulation valves enable constant circulation of a color when that color is not being sprayed:

- When a color valve is **closed**, the system bypasses the dosing pump by directing that color from the inlet color valve to the outlet color valve through a circulation line, then to a Y fitting at the mix manifold, then back to the color supply.
- When a color valve is **open**, the circulation line is shut off. The color is directed through the material A dosing pump and out to the gun to be mixed and sprayed, as in normal operation.

**NOTE:** There can be only one solvent valve (S) and one dump valve (D) per pump.

**NOTE:** On high pressure systems, see [Install the Back Pressure Regulator \(High Pressure Systems Only\)](#), page 25.

1. Connect all fluid lines as described in [Connect Non-Circulating Fluid Lines](#), page 27. These lines are used during normal mixing and spraying.
2. Connect the circulation lines as follows:
  - a. Connect a 1/4 npt(f) circulation line for each color from the color valve's circulation fitting (R1, R2, etc.) on the **inlet** color valve stack (B) to the corresponding circulation fitting (R1, R2, etc.) on the **outlet** color valve stack (C). This circulation line bypasses the material A dosing pump when the color valve is closed, allowing continuous circulation of that color.
  - b. Install a Y fitting (D) in the A side of the mix manifold (F). Install a fluid shutoff valve (E) in one branch of the Y fitting. Connect a fluid

return line (H) to the shutoff valve, to circulate the color back to the color supply (A).

**NOTE:** The fluid shutoff valve (E) must be **closed** when spraying, to allow proper ratio mixing and flow from the gun (G).

- c. Connect a dedicated gun supply line for each color to the corresponding color valve (C1, C2, etc.) on the **outlet** color valve stack. Connect the other end of this line to the open branch of the Y fitting (D).

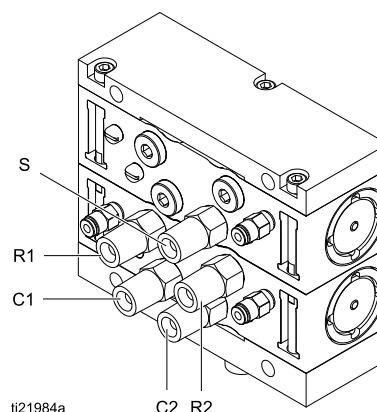
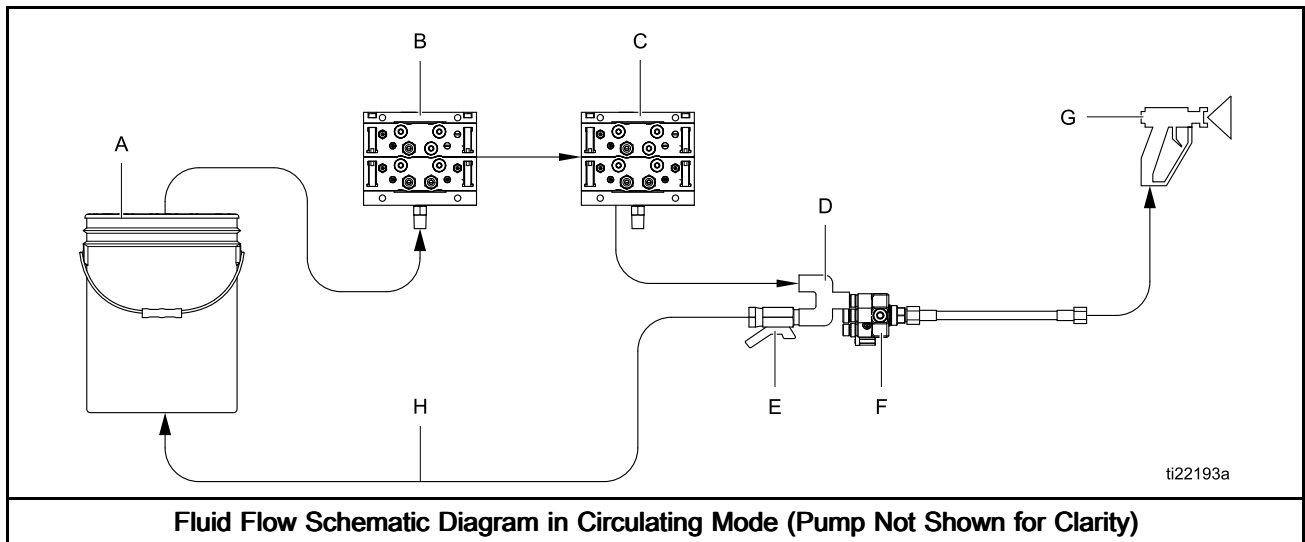


Figure 11 Valve Manifold Connections (Circulating System)

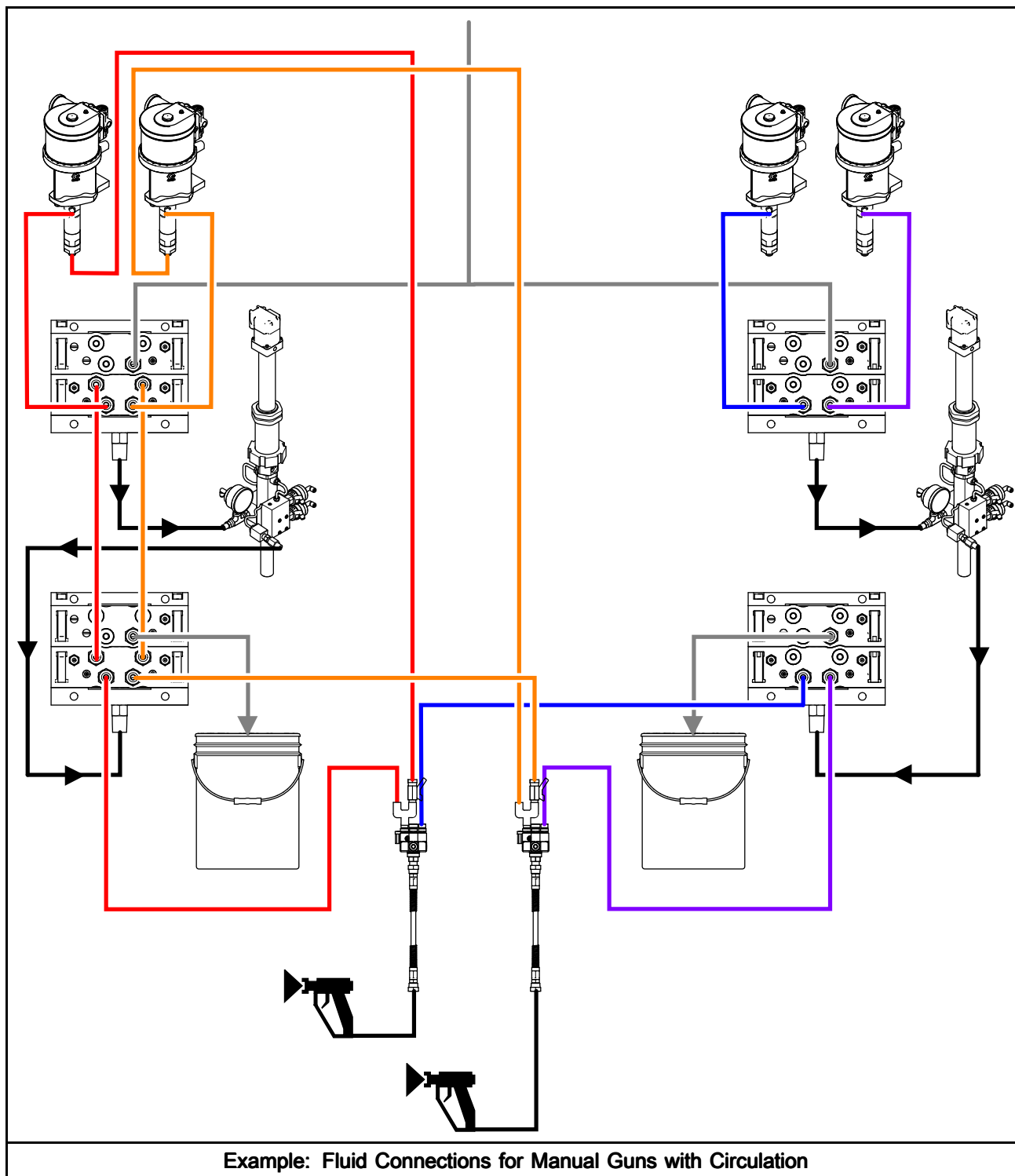
KEY	
S	Solvent fitting
C1	Color 1 fitting
C2	Color 2 fitting
R1	Color 1 circulation fitting
R2	Color 2 circulation fitting



KEY	
A	Color supply
B	Inlet color stack
C	Outlet color stack
D	Y fitting at mix manifold A port
E	Fluid shutoff valve
F	Mix manifold

KEY	
G	Spray gun
H	Return line to fluid supply

The figures on the following pages are examples of possible fluid line configurations for a circulation system.

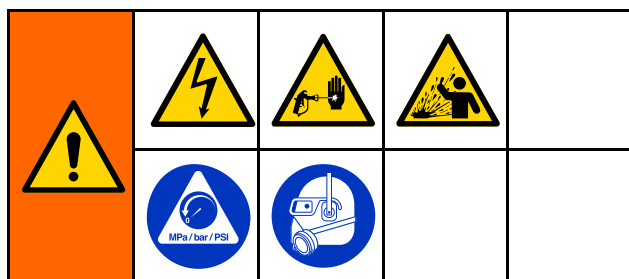




## Notes

[illegible]

## Install an Expansion Kit



Expansion Kits are available to add valves or manifolds to your system. See [Expansion Kits, page 74](#) for available kits.

1. Remove electrical power from the system.
2. Relieve pressure as described in your PD2K Operation Manual.
3. Open the control module cover. Install the solenoid(s) and air fitting(s) at the appropriate position(s) in the solenoid manifold. See [Set Up the Modules, page 14](#). Connect one end of the tubing to the solenoid's air fitting.
4. Connect the solenoid wires to the appropriate pins on the control module board. See [Electrical Schematics, page 40](#).

**NOTE:** If installing a one valve kit, it is not necessary to disassemble the manifold stack as shown in the figure. Skip step 5 and go on to step 6.

5. If your kit is adding a manifold block (1), remove the screws (10). Slide the existing manifolds off the rods (15, 16), keeping the manifolds in the correct order. Install the new manifold block (1). The new block must be in the bottom position to maintain correct location of the solvent and dump valves. Screw the rods (16) included in the kit into the existing rods. Slide the existing manifold blocks onto the rods, being sure that they are in the same positions as before. Ensure all o-rings (6, 17) are in place, then install the screws (10).

6. Install the valves as follows:
  - a. For a one valve kit, remove the plug (4) and o-ring (2). Install a new o-ring (2), the valve (3), and retainer (5), using the valve installation tool. See [Replace a Color Valve, page 54](#).
  - b. For a manifold kit with one valve, install the o-ring (2), valve (3), and retainer (5), using the valve installation tool. See [Replace a Color Valve, page 54](#). Install the plug (4) in the unused manifold port.
  - c. For a manifold kit with two valves, install the o-rings (2), valves (3), and retainers (5), using the valve installation tool. See [Replace a Color Valve, page 54](#).
7. Install the o-ring(s) (12) and fluid fitting(s) (13). Connect fluid lines to the fittings.
8. Install the air fitting(s) (14). Connect the tubing from the solenoid valve(s) (see step 3) to the fitting(s).
9. Install the control module cover.
10. Return the unit to service.

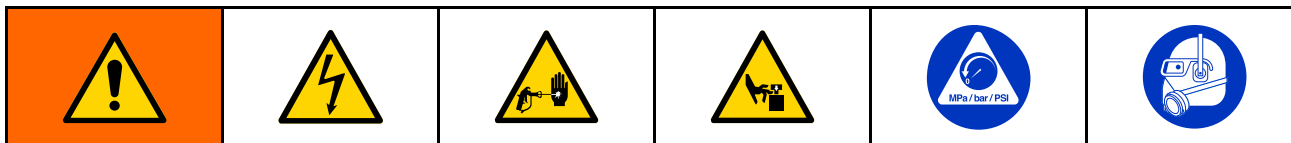
This diagram shows an exploded view of a mechanical assembly. The main components are two rectangular blocks, labeled 1 and 6, which serve as the base. Various bolts, nuts, washers, and pins are used to secure the assembly. Key parts include:
 

- Block 1:** The primary base component.
- Block 6:** A secondary base or support component.
- Assembly 3:** A complex assembly consisting of a central body (3) and a flange (5), secured with a nut (2) and a washer (12).
- Assembly 4:** A component with a flange (5) and a central shaft (4), secured with a nut (2) and a washer (12).
- Assembly 13:** A component with a central shaft (13) and a flange (5), secured with a nut (2) and a washer (12).
- Assembly 14:** A component with a central shaft (14) and a flange (5), secured with a nut (2) and a washer (12).
- Assembly 15:** A component with a central shaft (15) and a flange (5), secured with a nut (2) and a washer (12).
- Assembly 16:** A component with a central shaft (16) and a flange (5), secured with a nut (2) and a washer (12).
- Assembly 17:** A component with a central shaft (17) and a flange (5), secured with a nut (2) and a washer (12).
- Assembly 18:** A component with a central shaft (18) and a flange (5), secured with a nut (2) and a washer (12).
- Assembly 19:** A component with a central shaft (19) and a flange (5), secured with a nut (2) and a washer (12).

 The diagram uses dashed lines to indicate the assembly path and alignment of the components.

This exploded view diagram illustrates the assembly of a hydraulic valve. The central component is the valve body (1), which features two main ports. To the left, a solenoid coil (4) is shown with its mounting bracket (8) and securing pins (10, 16). The coil is connected to a wiring harness (15) via a plug (17). To the right, two spool valves (2) are shown, each with a spring (5) and a seal (3). These spool valves are mounted on the valve body using pins (12) and washers (13). The entire assembly is supported by a base plate (7) and secured with various bolts (11, 18, 19) and pins (14, 15). The diagram uses dashed lines to indicate the assembly path and alignment of the components.

# Troubleshooting



**NOTE:** Check all possible remedies before disassembling the system.

## Color Change Solenoid Valves

All color change solenoid valves may be exercised individually for diagnostic purposes through the Advanced Display Module. See Maintenance Screen 4 in Operations Manuals 332562 and 332564 for details.

**NOTE:** Refer to [Electrical Schematics, page 40](#). If the color change valves are not turning on or off correctly, it could be caused by one of the following.

Cause	Solution
1. Air regulator pressure set too high or too low.	Check that air pressure is at least 85 psi (0.6 MPa, 6.0 bar). Do not go above 100 psi (0.7 MPa, 7.0 bar).
2. Air or electrical lines damaged or connections are loose.	Visually inspect air and electrical lines for kinks, damage, or loose connections. Service or replace as needed.
3. Solenoid failure.	<p>Check the applicable solenoid's LED; see <a href="#">Color Change Board, page 38</a>. If lit, proceed with the following checks. If not lit, go to Cause 4.</p> <p>Remove the connector for the applicable solenoid and measure voltage across the pins on the board:</p> <ul style="list-style-type: none"> <li>• In a non-hazardous location, replace the solenoid if voltage is 24 Vdc.</li> <li>• In a hazardous location, replace the solenoid if voltage is between 9–15 Vdc.</li> </ul> <p>Test the valves as explained under <b>Maintenance Screen 5</b> in your PD2K Operation manual. Valves should open and close quickly. If the valves actuate slowly, it could be caused by:</p> <ul style="list-style-type: none"> <li>• Air pressure to the valve actuators is too low. See Cause 1.</li> <li>• Solenoid is clogged. Make sure the air supply has a 5 micron filter installed.</li> <li>• Something is restricting the solenoid or tubing. Check for air output from the air line for the corresponding solenoid when the valve is actuated. Clear the restriction.</li> </ul>

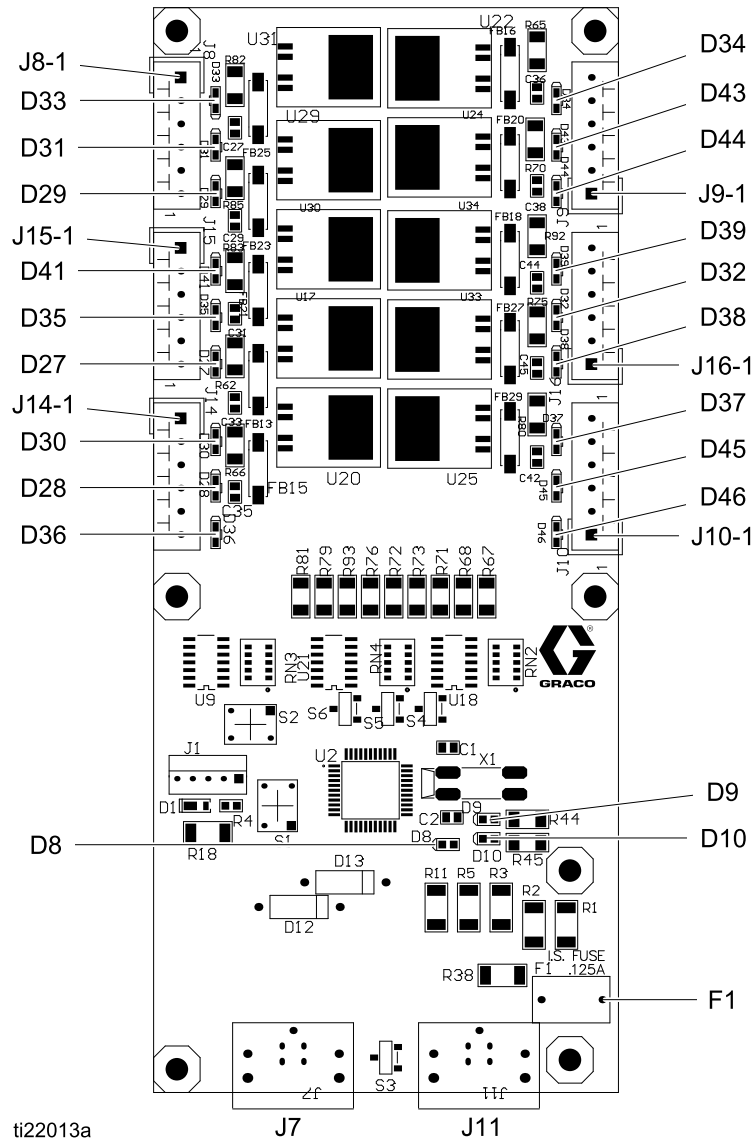
Cause	Solution
4. Control board or cable failure.	<p>If there is no voltage across the pins on the board or it is less than 9 Vdc, check LEDs D8, D9, and D10. If they are lit and functioning properly, or other solenoids in the module are working properly, replace the color change board.</p> <p>If D9 is not lit:</p> <ul style="list-style-type: none"> <li>• Verify the condition of the fuse (F1) and replace if necessary. See <a href="#">Replace the Color Change Board Fuse, page 55</a>.</li> <li>• Check if the cable is disconnected or damaged.</li> <li>• Check the isolation board. See the PD2K Repair-Parts manual.</li> </ul> <p>If D8 is not blinking:</p> <ul style="list-style-type: none"> <li>• Cycle the system power.</li> <li>• Check if the cable is disconnected or damaged.</li> <li>• Check the isolation board. See the PD2K Repair-Parts manual.</li> </ul> <p>If D10 is not occasionally blinking:</p> <ul style="list-style-type: none"> <li>• Check if the cable is disconnected or damaged.</li> <li>• Check the isolation board. See the PD2K Repair-Parts manual.</li> </ul>

## Color Change Board

### NOTICE

To avoid damaging the circuit boards, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.



ti22013a

Figure 12 Color Change Board

**Color Change Board Diagnostics**

Component or Indicator	Description	Diagnosis
D8	LED (green)	Blinks (heartbeat) during normal operation.
D9	LED (green)	Turns on when power is supplied to the board.
D10	LED (yellow)	Turns on when board is communicating with electronic control.
D27–D39, D41, D43–D46	LED (green)	Turn on when a signal is sent to actuate the related solenoid valve.
F1	Fuse, 0.125 A, 125 V	Used on the 24T566 board.
	Fuse, .500 A, 125 V	Used on the 25D312 board used in modules 25D313 - 25D327. See Custom Valve Mapping Color Change Kits in <a href="#">Non-Intrinsically Safe Kits, page 4</a> .

**NOTE:** The electrical schematic illustrates all possible wiring expansions in a ProMix PD2K system; standard models MC1000, MC2000, MC3000, MC4000, AC1000, and AC2000. Some components shown are not included with all systems.

The diagram illustrates the GCA Module EFCM (24N913) and its associated components, organized into two main sections: HAZARDOUS LOCATION and NON-HAZARDOUS LOCATION.

**HAZARDOUS LOCATION:**

- Power Module (24R257):** Includes a 48V-10A POWER SUPPLY (16U820), a RELAY, and TERMINAL BLOCKS WITH FUSES. It is connected to a 24V POWER SUPPLY (16T660) and a 2 POSITION SWITCH (16U725).
- GCA Module EFCM (24N913):** The central control unit, featuring multiple analog input channels (FLOW RATE ANALOG IN, FLOW RATE ANALOG IN, FLOW RATE ANALOG IN, FLOW RATE ANALOG IN) and a CAN IS BOARD (24M485).
- Integration Gateway:** Connected to the GCA Module EFCM via a CABLE (12/1227).
- Color Change Modules:** Multiple modules (24N935) are connected to the GCA Module EFCM via CABLE (15V206).
- Gun Trigger Inputs:** Connected to the GCA Module EFCM via CABLE (119159).
- Solenoid and Pressure Switches:** Includes SOLENOID (121324), PRESSURE SW (121323), and SOLVENT CUTOFF (121324).
- Safety Interlock Switch:** Connected to the GCA Module EFCM via CABLE (121003).
- Advanced Display Module (24E451):** Connected to the GCA Module EFCM via CABLE (121003).
- Light Tower (15X472):** Connected to the GCA Module EFCM via CABLE (15X472).

**NON-HAZARDOUS LOCATION:**

- Breakout Module Pumps (24N527):** Four pumps are shown, each with a FAN (24P658), ENCODER AND MOTOR (16P038, 16P037), WIRE HARNESS (24P684, 24P685), PUMP INLET TRANSDUCER (16P289, 16P290), PUMP OUTLET TRANSDUCER (16P289, 16P290), PUMP V/F FOR FLUID REG., and FLOW SENSOR (120278) OR G3000 METER (239716, 258718, 16M510, 16M519).
- MAC Series 46:** Includes a SOLENOID (16P912) and a FLOW SENSOR (120278) OR G3000 METER (239716, 258718, 16M510, 16M519).
- Flow Rate Analog Inputs:** Four channels are shown, each connected to the GCA Module EFCM via CABLE (16T659).
- Booth Control (24M731):** Connected to the GCA Module EFCM via CABLE (16V429).
- Color Change Modules 7 and 8 (24R219):** Connected to the GCA Module EFCM via CABLE (16V426).

**Legend:**

- SOLENOID (16P912):** Represented by a square symbol with a diagonal line.
- FLOW SENSOR (120278) OR G3000 METER (239716, 258718, 16M510, 16M519):** Represented by a circle symbol with a diagonal line.

332455L



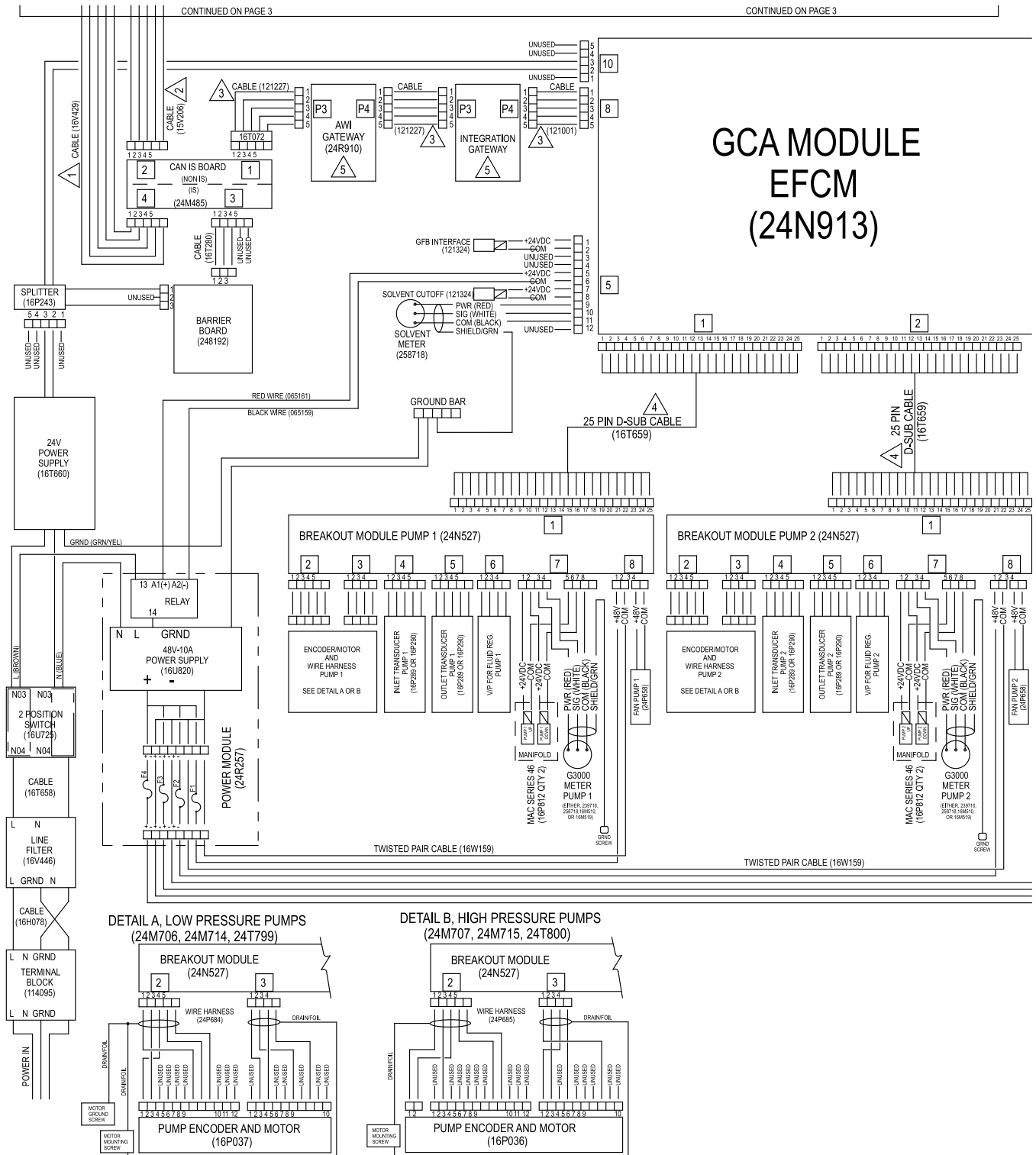


Figure 14 Electrical Schematic, Sheet 2, Part 1

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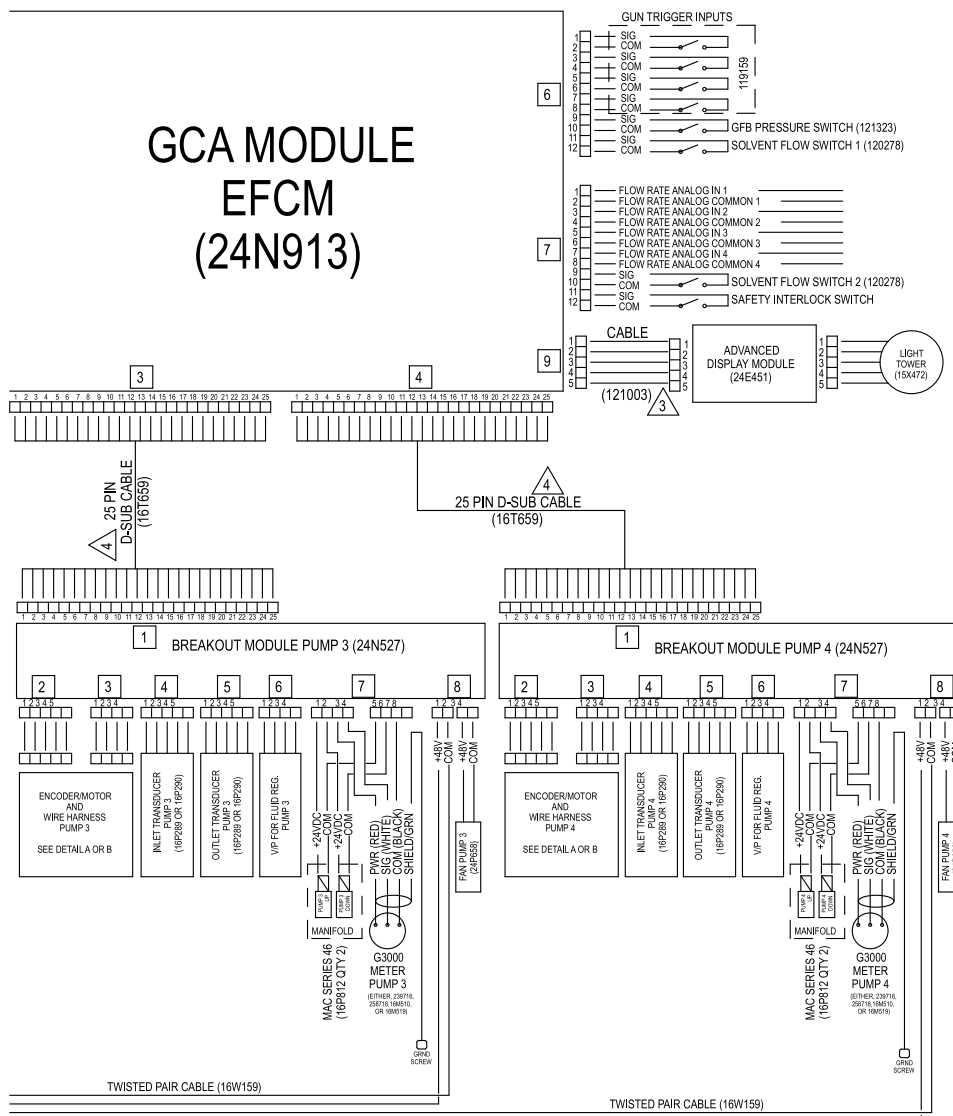


Figure 15 Electrical Schematic, Sheet 2, Part 2

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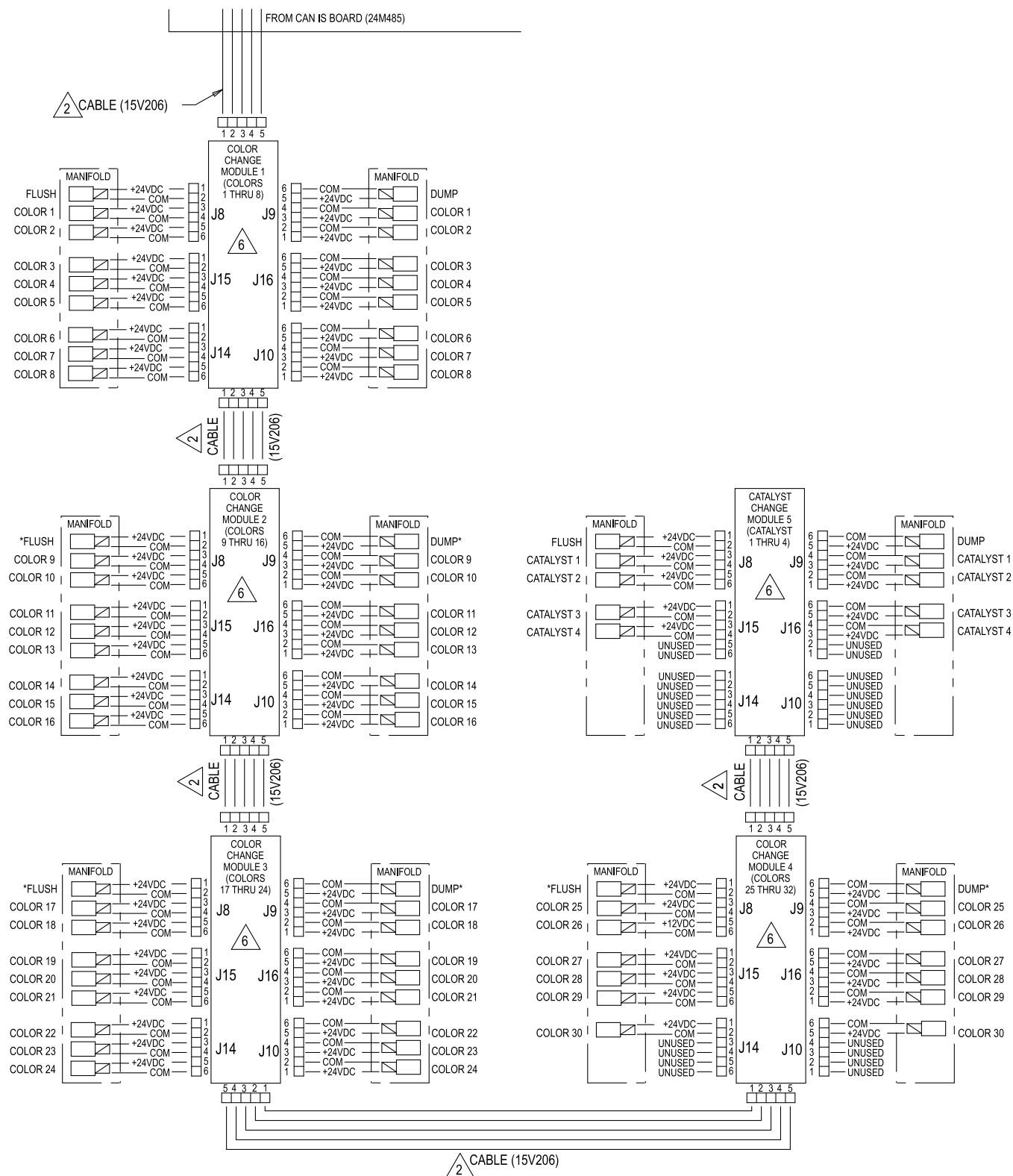
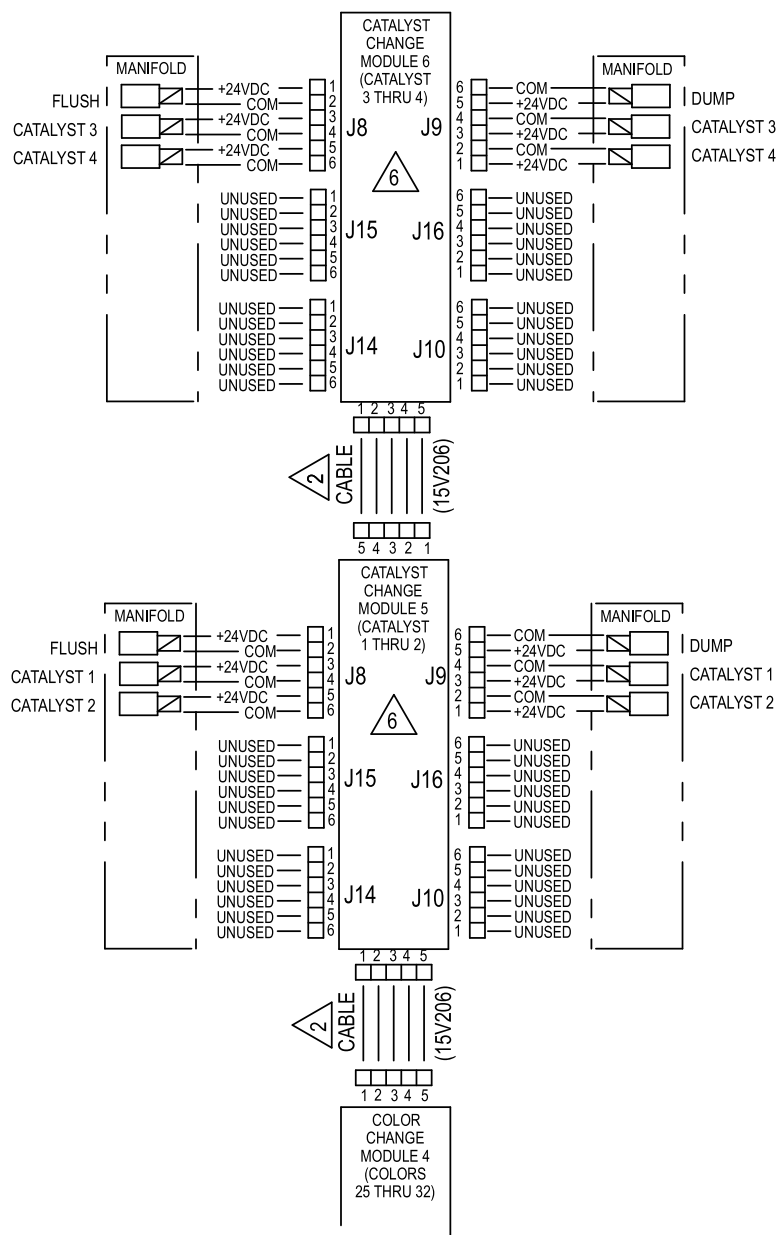


Figure 16 Electrical Schematic, Sheet 3

\* May be unused in some configurations.

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### ALTERNATE CONFIGURATION FOR CATALYST CHANGE CONTROL

Figure 17 Electrical Schematic, Sheet 3, Alternate Configuration for Catalyst Change Control

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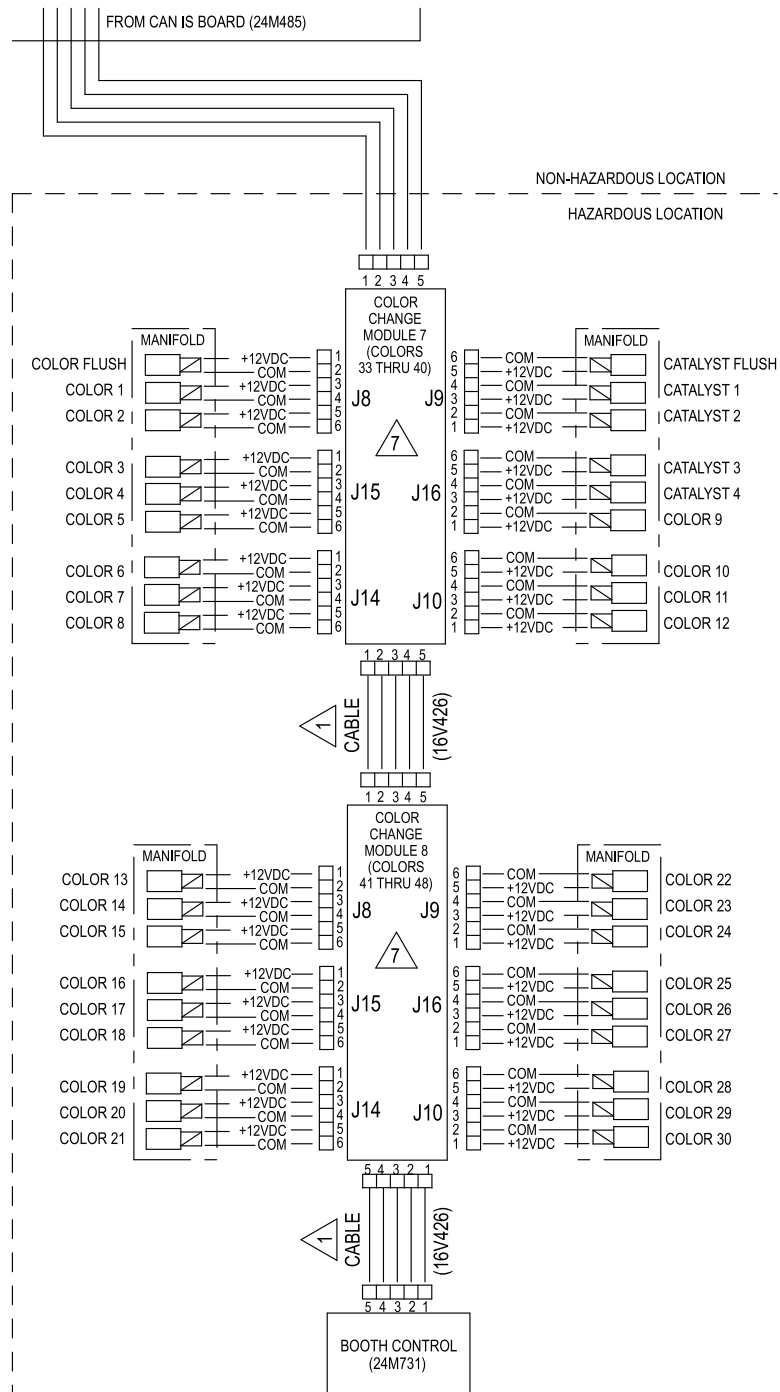
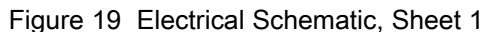


Figure 18 Electrical Schematic, Sheet 3, Hazardous Location

**NOTE:** See [Optional Cables and Modules, page 52](#) for a list of cable options.



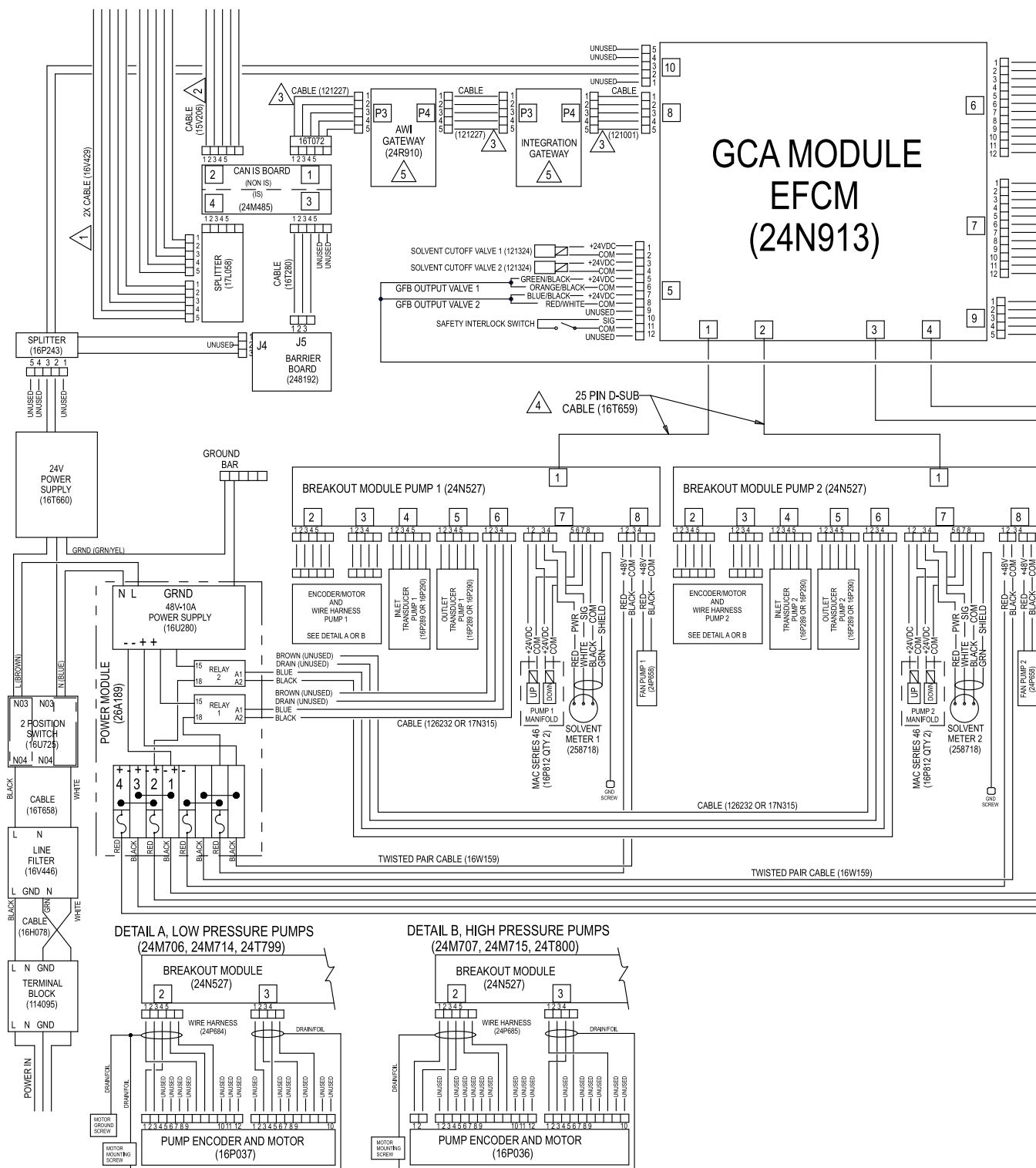


Figure 20 Electrical Schematic, Sheet 2, Part 1

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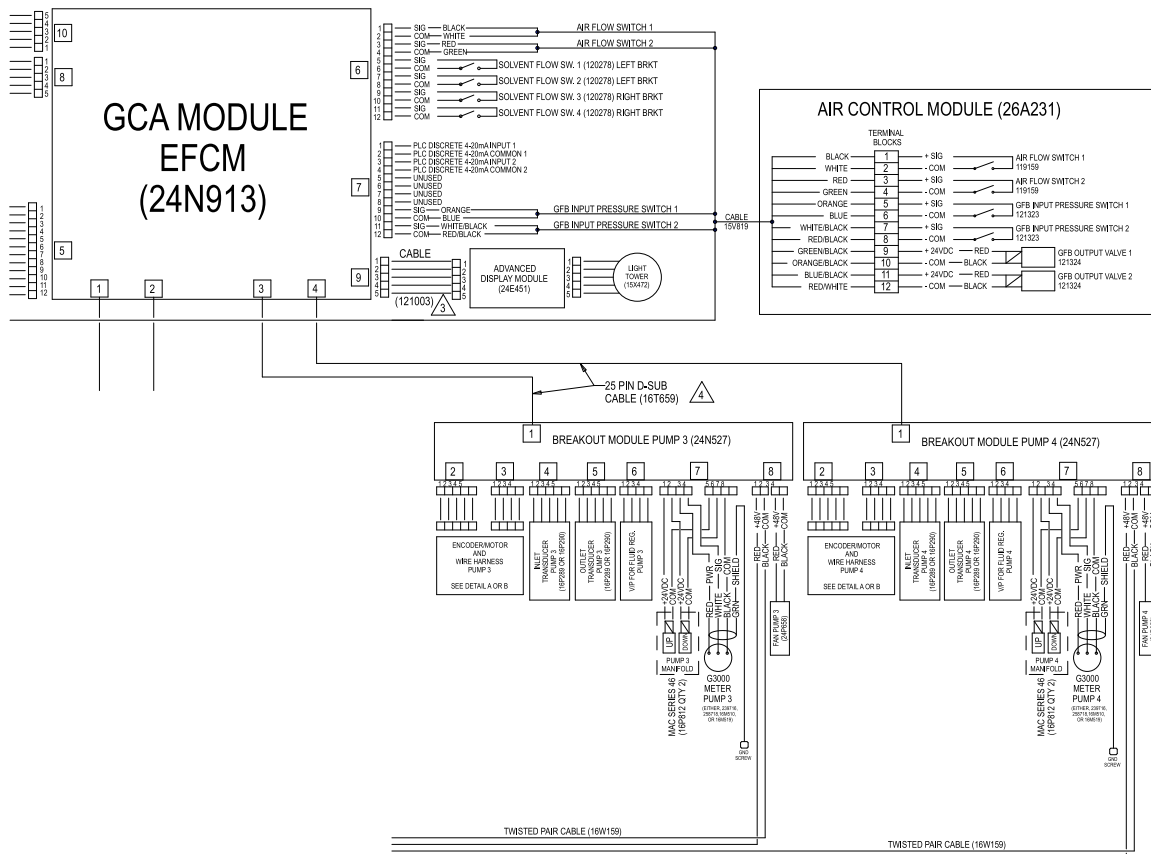


Figure 21 Electrical Schematic, Sheet 2, Part 2

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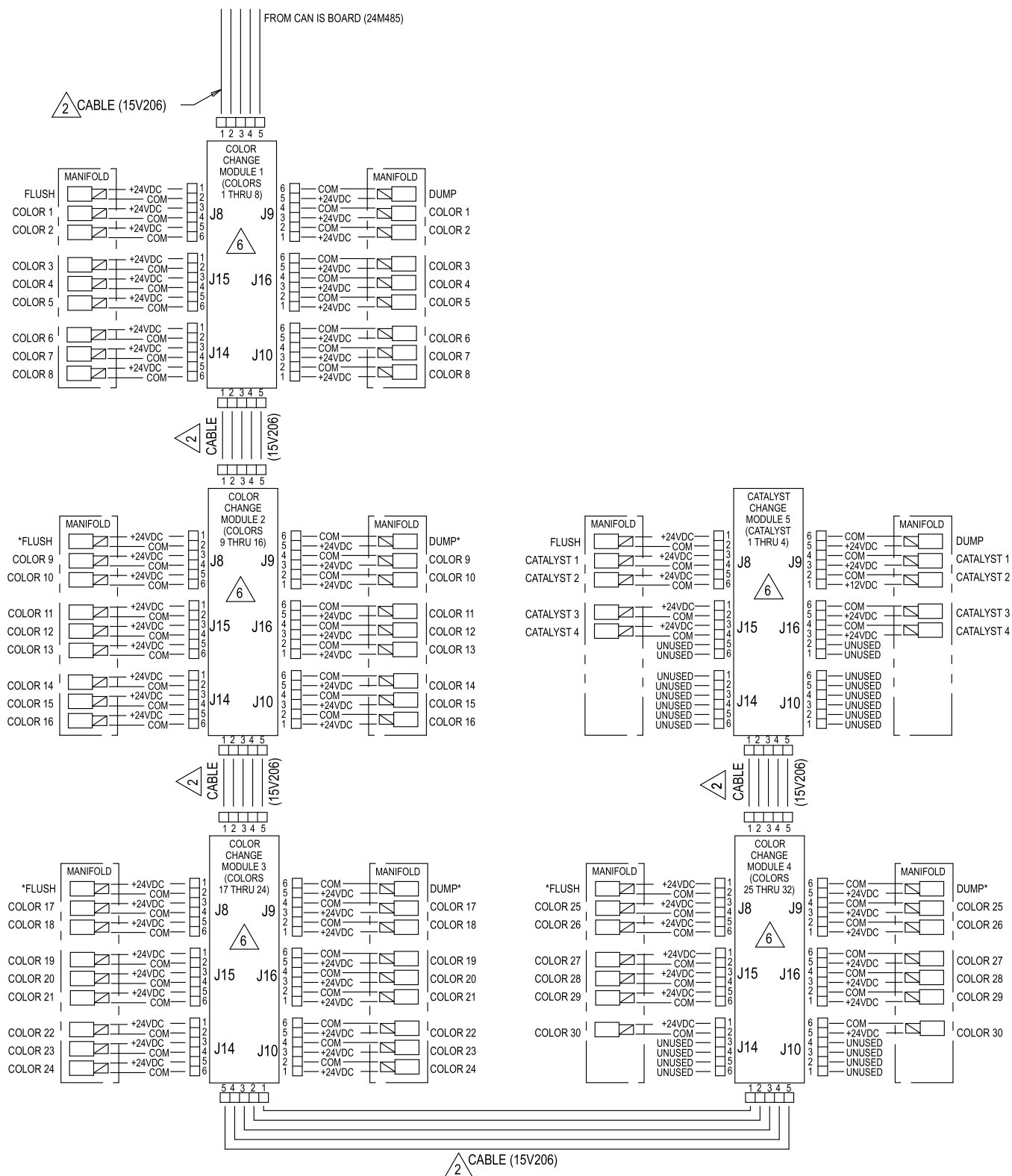


Figure 22 Electrical Schematic, Sheet 3, Part 1

\* May be unused in some configurations.

CONTINUED ON THE NEXT PAGE

## Electrical Schematics

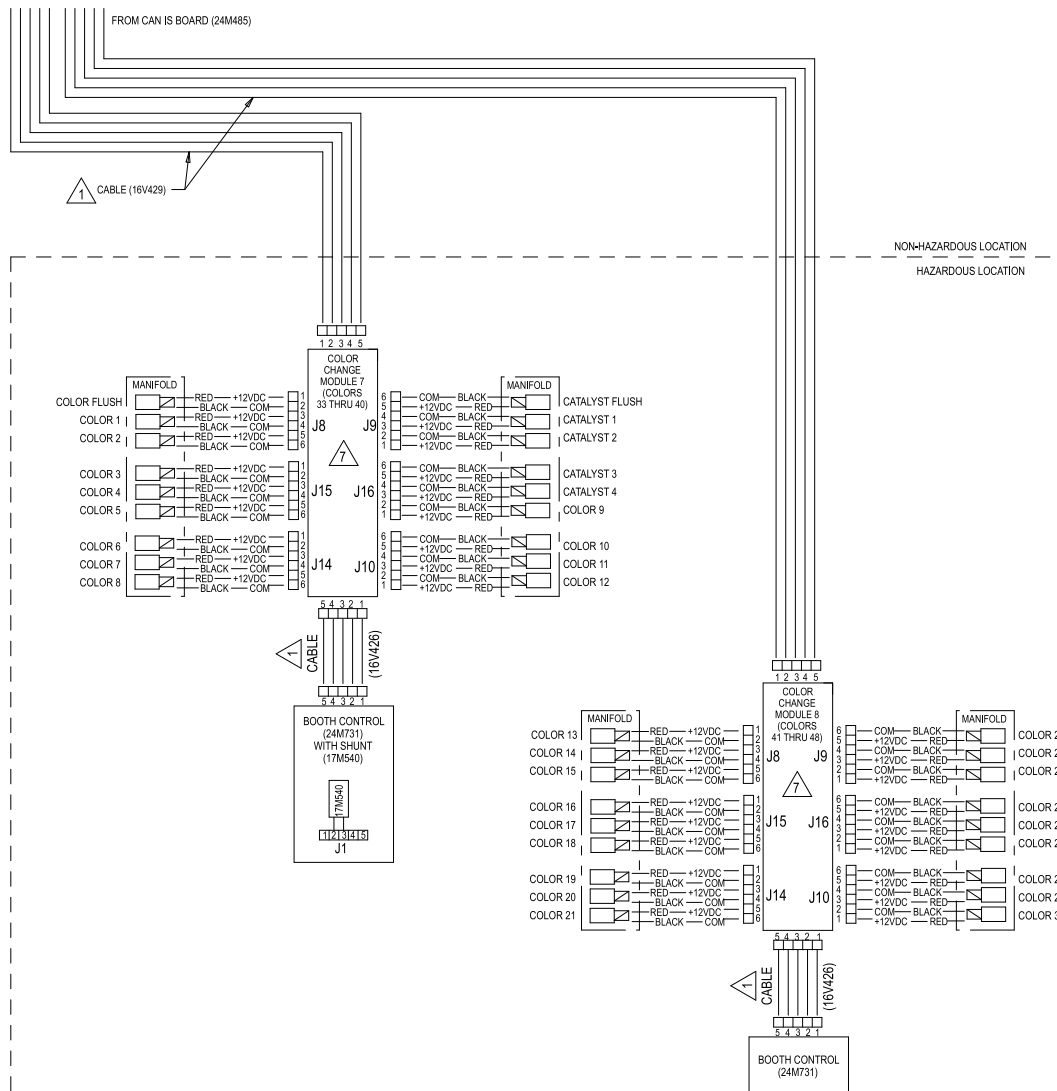


Figure 23 Electrical Schematic, Sheet 3, Part 2

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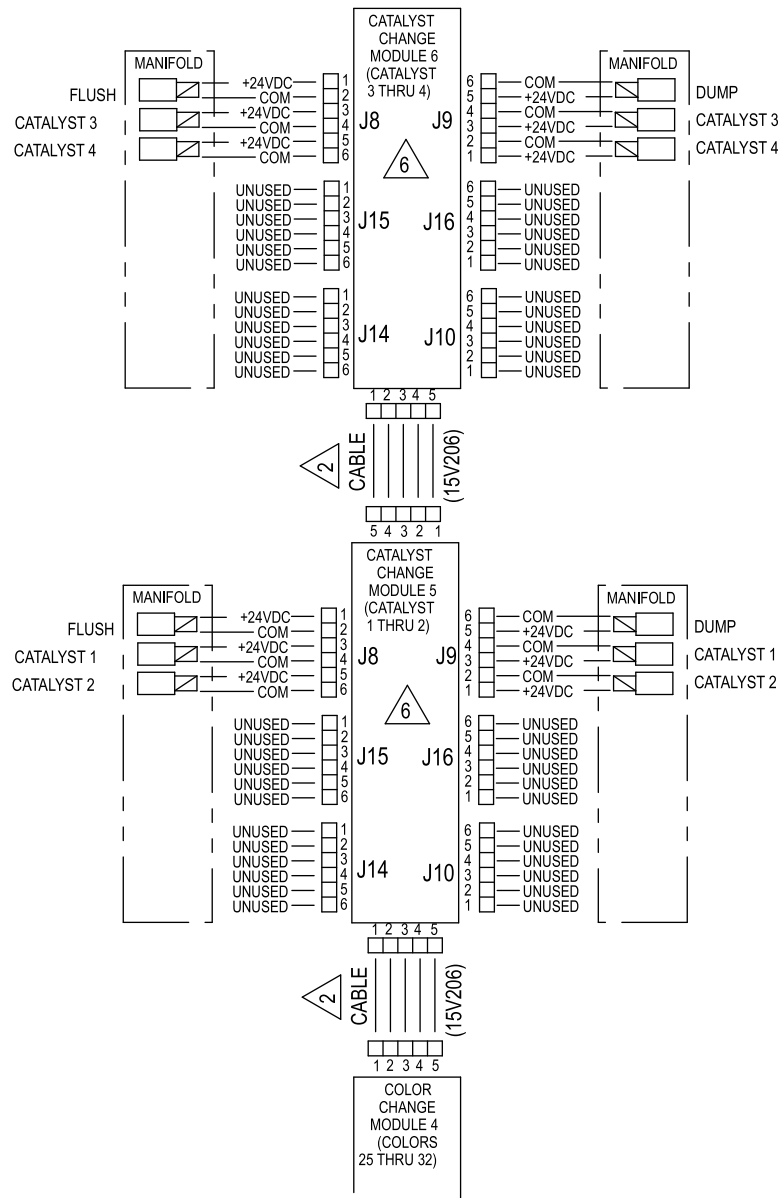





Figure 24 Electrical Schematic, Sheet 4, Alternate Configuration for Catalyst Change Control


## Optional Cables and Modules


**NOTE:** The total length of all cable used in the system must not exceed 150 ft (45 m). See the [Electrical Schematics, page 40](#).

 <b>M12 CAN Cables, for Hazardous Locations</b>	
<b>NOTE:</b> The total length of cable used in the hazardous location must not exceed 120 ft (36 m).	
Cable Part No.	Length ft (m)
16V423	2.0 (0.6)
16V424	3.0 (1.0)
16V425	6.0 (2.0)
16V426	10.0 (3.0)
16V427	15.0 (5.0)
16V428	25.0 (8.0)
16V429	50.0 (16.0)
16V430	100.0 (32.0)

 <b>M12 CAN Cables, for Non-Hazardous Locations Only</b>	
Cable Part No.	Length ft (m)
15U531	2.0 (0.6)
15U532	3.0 (1.0)
15V205	6.0 (2.0)
15V206	10.0 (3.0)
15V207	15.0 (5.0)
15V208	25.0 (8.0)
15U533	50.0 (16.0)
15V213	100.0 (32.0)

 <b>CAN Cables, for Non-Hazardous Locations Only</b>	
Cable Part No.	Length ft (m)
125306	1.0 (0.3)
123422	1.3 (0.4)
121000	1.6 (0.5)
121227	2.0 (0.6)
121001	3.0 (1.0)
121002	5.0 (1.5)
121003	10.0 (3.0)
120952	13.0 (4.0)
121201	20.0 (6.0)
121004	25.0 (8.0)
121228	50.0 (15.0)

 <b>25 Pin D-SUB Cables, for Non-Hazardous Locations Only</b>	
Cable Part No.	Length ft (m)
16T659	2.5 (0.8)
16V659	6.0 (1.8)

 <b>Alternates for Color Change Modules by Part Number (Factory Configuration), for Non-Hazardous Locations Only</b>	
Module Part No.	Description
24T557	2 color/2 catalyst
24T558	4 color/4 catalyst
24T559	6 color/6 catalyst
24T560	8 color/8 catalyst

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">7</div> <div> <b>Alternates for Color Change Modules by Part Number (Factory Configuration), for Hazardous Locations Only</b> </div> </div>	
<b>Module Part No.</b>	<b>Description</b>
24T571	2 color/2 catalyst
24T572	4 color/2 catalyst
24T573	6 color/2 catalyst
24T574	8 color/2 catalyst
24T774	12 color/2 catalyst
24T775	4 color/4 catalyst
24T776	6 color/4 catalyst
24T777	8 color/4 catalyst
24T778	12 color/4 catalyst
24T779	13–18 color




## Communications Options (for PLC and AWI) 5

1. If your application requires integration with a PLC:
  - a. 24W829, CGM Kit for PD2K
  - b. CGMEP0, Ethernet IP  
CGMDN0, Device Net  
CGMPN0, ProfiNet  
24W462, Modbus TCP
2. If your application requires AWI:
  - a. 24W829, CGM Kit for PD2K
  - b. 24W462, Modbus TCP\*
  - c. 15V337, AWI Module

**NOTE:** AWI is not currently available for Dual Panel systems.

\* AWI requires its own Modbus TCP module. If the PLC is also communicating over Modbus TCP, then two 24W462 modules are necessary.

# Repair

				
<ul style="list-style-type: none"> <li>To avoid electric shock, turn off power at the main circuit breaker before opening the control module.</li> <li>All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.</li> <li>Do not substitute or modify system components as this may impair intrinsic safety.</li> </ul>				

## NOTICE

To avoid damaging the circuit boards, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

## Replace a Color Valve



1. Flush and relieve pressure as described in your PD2K operation manual.
2. Engage the pins of the tool (114) with the notches in the retainer (5) and unscrew the retainer.

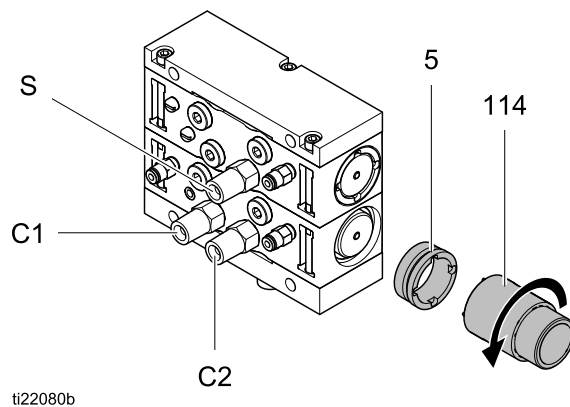
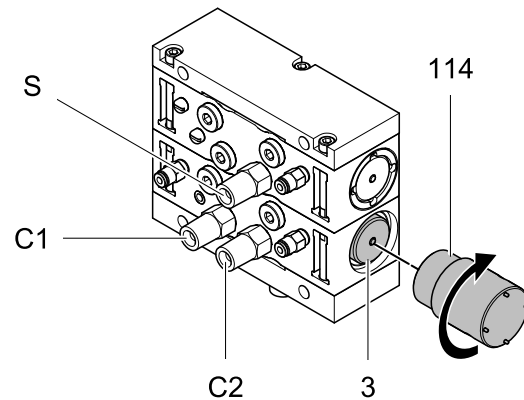


Figure 25 Remove Retainer

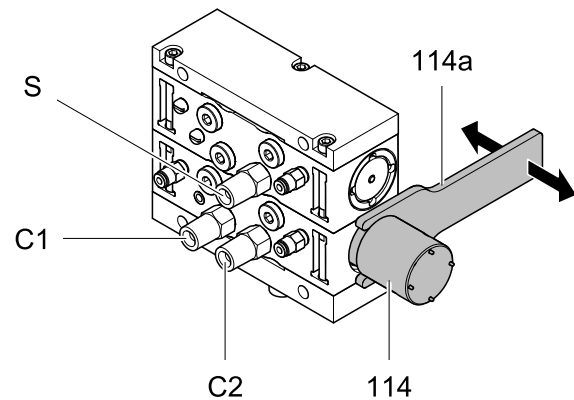
3. Using the other end of the tool (114), screw it onto the valve (3). Leave a gap to allow the tool handle (114a) to be inserted in step 4, below.



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Figure 26 Attach Tool to the Valve

4. Use the tool handle (114a) to pull valve (3) from the manifold.



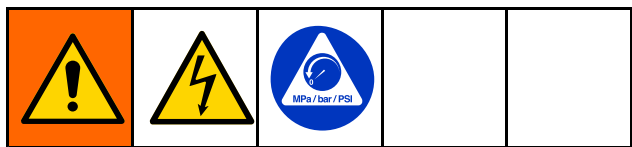
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Figure 27 Remove the Valve

**NOTE:** See manual 332454 to repair the valve.

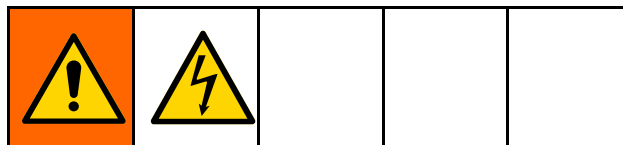
5. Install the valve in the reverse order of disassembly. Be sure all o-rings are in place and lubricated, and that the valve is seated completely in the manifold.
6. Return the system to service.

## Replace a Solenoid



1. Remove electrical power from the system.
2. Remove air supply pressure from the system.
3. Remove the color change module cover (304).
4. Disconnect the two solenoid wires from the color change board (302). See the color change board wiring diagrams in the [Electrical Schematics, page 40](#).
5. Remove the solenoid (310) from the manifold (309).
6. Install the new solenoid.
7. Connect the two solenoid wires to the color change board (302). See the color change board wiring diagrams in the [Electrical Schematics, page 40](#).
8. Reinstall the cover.

## Replace the Color Change Board Fuse

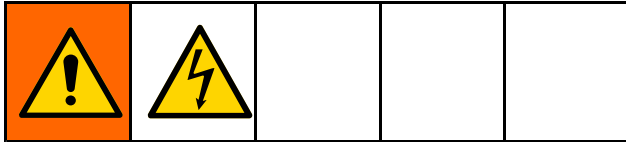


**NOTE:** Replacing the fuse with a non-Graco fuse voids the IS system safety approval.

Fuse	Part No.	Description
F1	12369 0	Fuse; 125 mA, intrinsically safe

1. Remove electrical power from the system.
2. Remove the color change module cover (304).
3. Locate fuse F1 (302a) on the color change board. Pull the fuse away from the board.
4. Install the new fuse.
5. Reinstall the cover. Restore electrical power to the system.

## Replace the Color Change Board

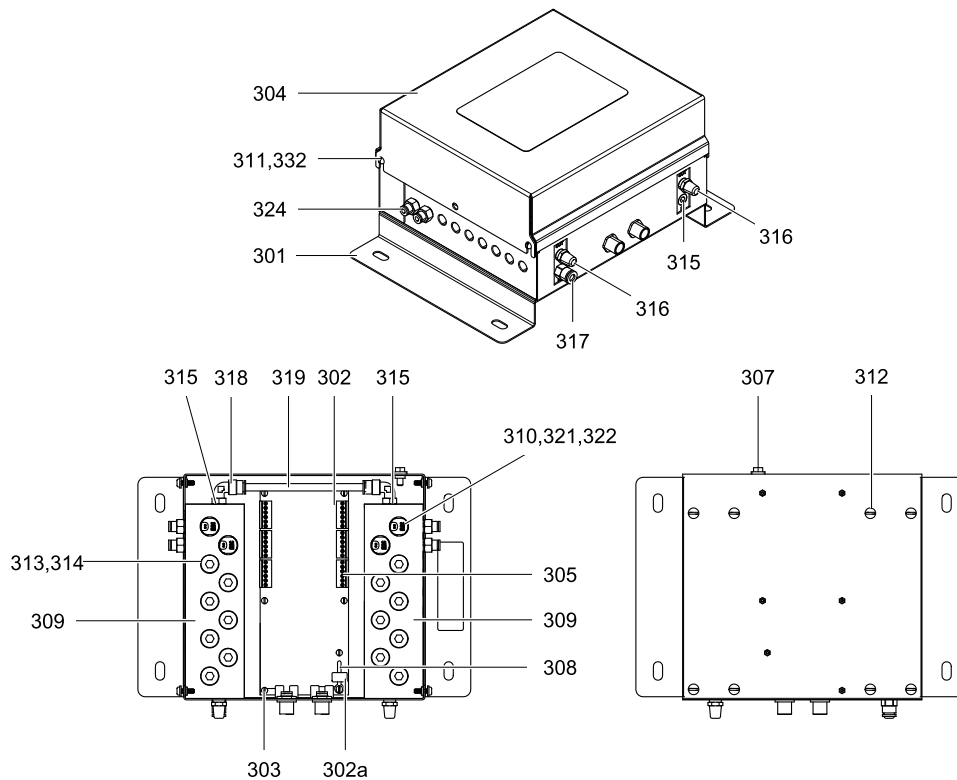


### NOTICE

To avoid damaging the circuit boards, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Remove electrical power from the system.
2. Remove the color change module cover (304).
3. Note where each cable is connected, then disconnect all cables from the color change board connectors.
4. Remove the seven mounting screws (303) and the board (302).
5. Install the new board. Reinstall the screws.
6. Reconnect the cables to the proper connectors, as noted in step 3. See [Electrical Schematics, page 40](#).
7. Reinstall the cover (304). Restore electrical power to the system.



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Figure 28 Control Module Repair (Non-IS Module Shown)

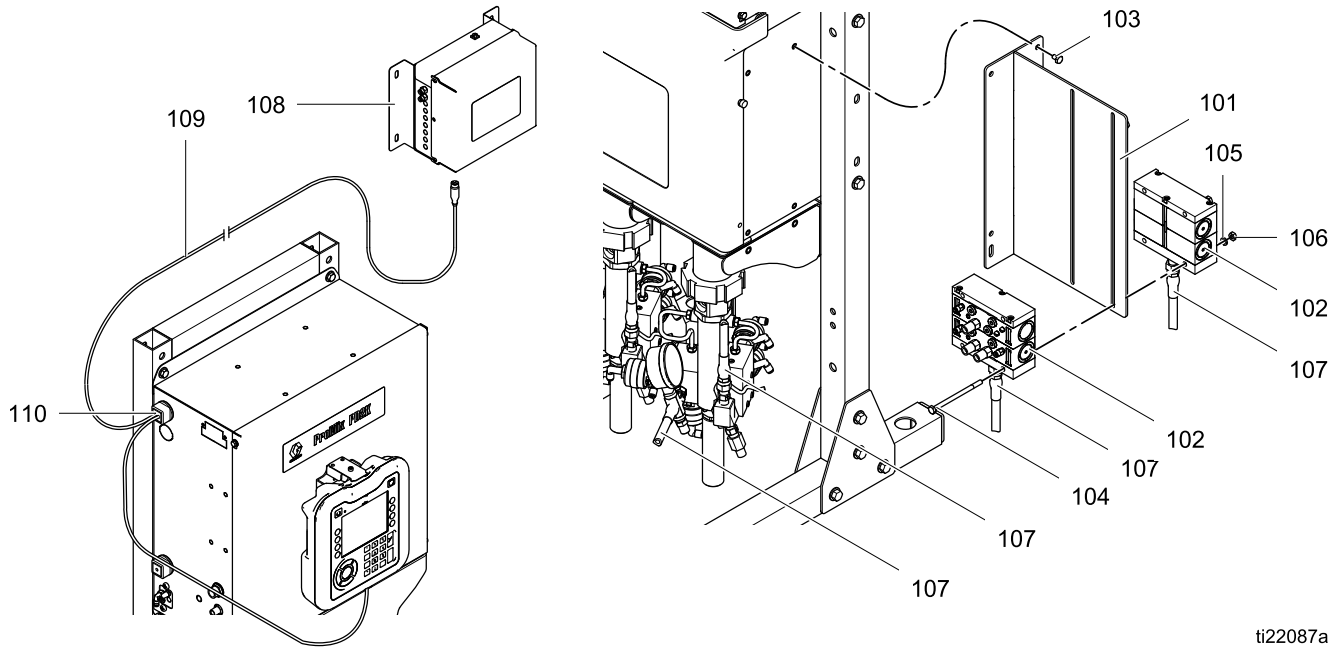


## Notes

[illegible]

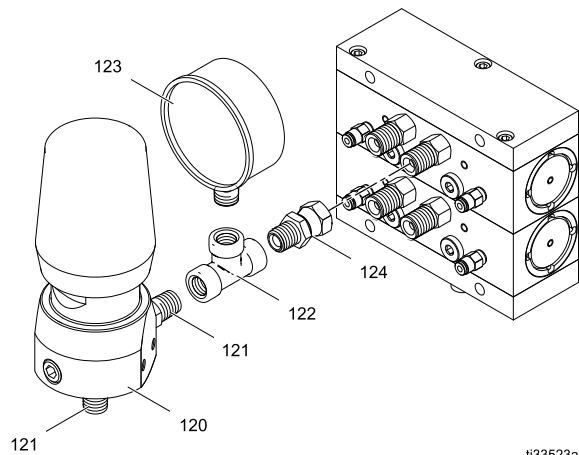
# Parts

## Non-IS System with Mounting Kit 25E016 shown



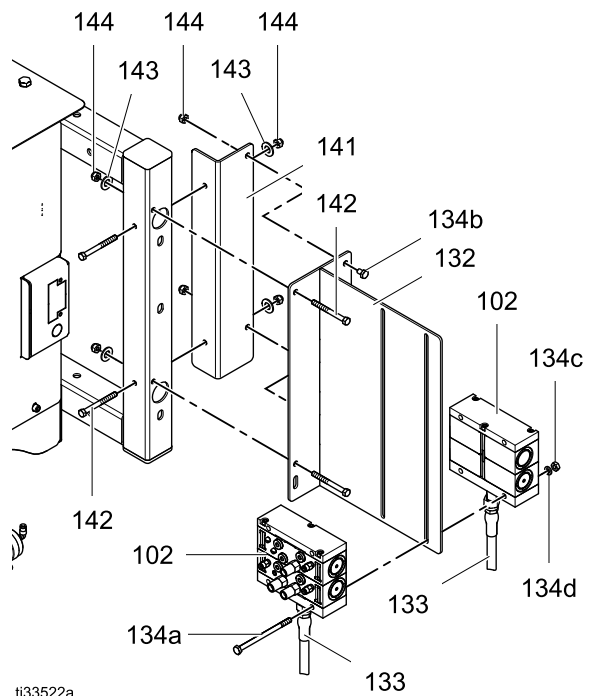
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### Detail of Back Pressure Regulator (High Pressure Outlet Stack only) Kit 25D627 shown



ti33523a

### Color Change Stack Mount Kit 25D311 shown



ti33522a

Mounting kit 25D535 includes reference items 141-144 from kit 25D311.

## Non-IS Color Change Kits

Ref. No.	Part No.	Description	Qty
101	24U237	BRACKET, mounting	1
102	♦	KIT, manifold, valve	2
103	100157	SCREW, cap, hex head; 1/4-20 x 0.375 in. (10 mm)	4
104	103195	SCREW, cap, hex head; 1/4-20 x 4.0 in. (101 mm)	4
105	100016	WASHER, lock; 1/4	4
106	100015	NUT, hex; 1/4-20	4
107	24N346	HOSE, fluid; 1/4 npsm (fbe); 2.5 ft (0.76 m); ptfе	2
108	♦	KIT, module, control	1
109	15V206	CABLE, CAN; 5-pin female; 10 ft (3.05 m)	1
110	16V819	GROMMET, cable	1
111	24U236	TOOL, repair, valve (not shown)	1
114	♦	TOOL, installation, valve (not shown)	1
115	598095	TUBE; nylon; 5/32 in. (4 mm) OD	♦
120	238926	REGULATOR, back pressure; used on high pressure kits only (see detail drawing); see manual 307892	1
121	166421	NIPPLE; 1/4 npt; sst; used on high pressure kits only (see detail drawing)	2
	113070	NIPPLE; 3/8 - 1/4 npt; sst; used on high pressure kits only; included only with Back Pressure Regulator kit 25D627 (see detail drawing)	2
122	110290	TEE; 1/4 npt(f); sst; used on high pressure kits only (see detail drawing)	1

Ref. No.	Part No.	Description	Qty
123	112564	GAUGE, pressure, fluid; used on high pressure kits only (see detail drawing)	1
124	114339	FITTING, swivel union; 1/4 npt; sst; used on high pressure kits only; included only with Back Pressure Regulator kit 25D627 (see detail drawing)	1
131	25D535	KIT, color change stack mount bracket; included with Color Change Stack Mount kit 25D311; (includes ref. 141 - 144)	1
132	16P221	BRACKET, painted color change valve mounting; included with Color Change Stack Mount kit 25D311	1
133	24N346	HOSE, coupled; 2.5 ft.; included with Color Change Stack Mount kit 25D311	2
134	26A238	KIT, low-pressure PD2K hardware; includes 1/4-20 x 4 in. screws (4), 1/4-20 .375 in. screws (2), 1/4-20 nuts (4), and 1/4 in. washers (4); included with Color Change Stack Mount kit 25D311	1
141	17V401	BRACKET, color change stack mounting (included with ref. 131)	1
142	103547	SCREW, hex head machine (included with ref. 131)	4
143	100731	WASHER (included with ref. 131)	4
144	102040	NUT, hex lock (included with ref. 131)	6

♦ See the following tables for the part number used in your color change kit.

## Low Pressure Non-IS Kits

Kit No.	Kit Description	Standard Valve Manifold Kits (102) [see <a href="#">Low Pressure Valve Manifold Kits</a> , page 63 for all available kits]	Control Module Kit (108) [see <a href="#">Non-IS Color Change Control Modules</a> , page 72 for parts]	Tool (114)	Tube Length (115)
<b>Low Pressure Non-Circulating Color Change Kits</b>					
25A239	1 color or 1 catalyst	24Y936	24T557	24U239	30 ft (9.1 m)
24Y954	2 color or 2 catalyst	24Y938	24T557	24U239	30 ft (9.1 m)
24Y955	4 color or 4 catalyst	24Y942	24T558	24U239	50 ft (15.2 m)
24Y956	6 color	24Y946	24T559	24U239	70 ft (21.3 m)
24Y957	8 color	24Y950	24T560	24U239	90 ft (28.0 m)
<b>Low Pressure Circulating Color Change Kits</b>					
25A240	1 color	24Y937	24T557	24U239	30 ft (9.1 m)
24Y958	2 color	24Y939	24T557	24U239	30 ft (9.1 m)
24Y959	4 color	24Y943	24T558	24U239	50 ft (15.2 m)
24Y960	6 color	24Y947	24T559	24U239	70 ft (21.3 m)
24Y961	8 color	24Y951	24T560	24U239	90 ft (28.0 m)

## High Pressure Non-IS Kits

Kit No.	Kit Description	Standard Valve Manifold Kits (102) [see <a href="#">High Pressure Valve Manifold Kits, page 67</a> for all available kits]	Control Module Kit (108) [see <a href="#">Non-IS Color Change Control Modules, page 72</a> for parts]	Tool (114)	Tube Length (115)
<b>High Pressure Non-Circulating Color Change Kits</b>					
24X318	1 color or 1 catalyst	24T647	24T557	24U240	30 ft (9.1 m)
24R959	2 color or 2 catalyst	24T648	24T557	24U240	30 ft (9.1 m)
24R960	4 color or 4 catalyst	24T650	24T558	24U240	50 ft (15.2 m)
24R961	6 color	24T652	24T559	24U240	70 ft (21.3 m)
24R962	8 color	24T654	24T560	24U240	90 ft (28.0 m)
<b>High Pressure Acid Compatible Non-Circulating Catalyst Change Kits</b>					
26A067	1 flush valve	26A066	24T557	24U240	30 ft (9.1 m)
24X320	1 catalyst	24X360	24T557	24U240	30 ft (9.1 m)
24T579	2 catalyst	24U182	24T557	24U240	30 ft (9.1 m)
24T580	4 catalyst	24U183	24T558	24U240	50 ft (15.2 m)
<b>High Pressure Circulating Color Change Kits</b>					
24X319	1 color	24T677	24T557	24U240	30 ft (9.1 m)
24R963	2 color	24T678	24T557	24U240	30 ft (9.1 m)
24R964	4 color	24T680	24T558	24U240	50 ft (15.2 m)
24R965	6 color	24T682	24T559	24U240	70 ft (21.3 m)
24R966	8 color	24T684	24T560	24U240	90 ft (28.0 m)

## Notes

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## Valve Manifold Kits

### Low Pressure Valve Manifold Kits

#### Non-Circulating Valve Manifold Kits

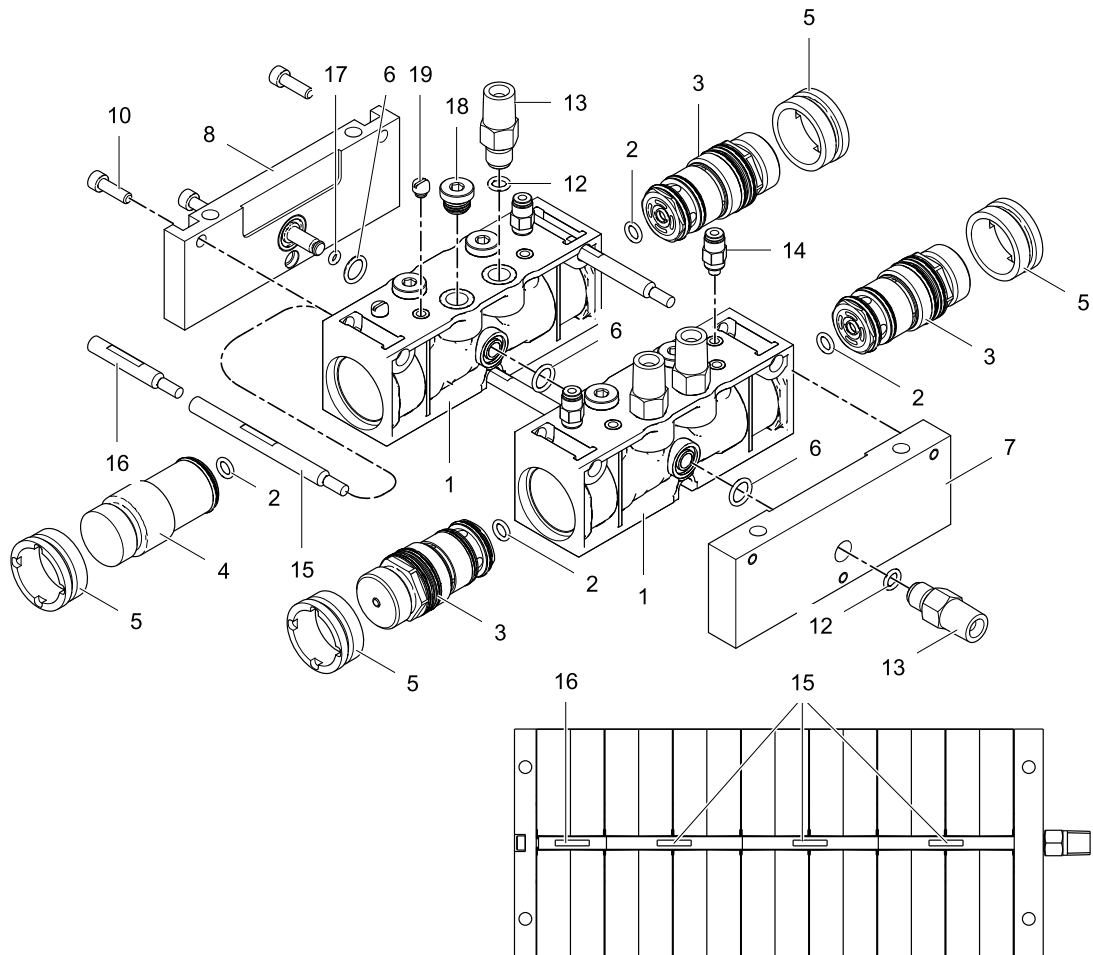
Kit No.	Series	Kit Description
24Y936	A	2 valves
24Y938	A	3 valves
24Y940	A	4 valves
24Y942	A	5 valves
24Y944	A	6 valves
24Y946	A	7 valves
24Y948	A	8 valves
24Y950	A	9 valves
24Y952	A	10 valves
26A272	A	11 valves
26A274	A	12 valves
26A286	A	13 valves
26A276	A	14 valves
26A278	A	15 valves
26A280	A	16 valves
26A282	A	17 valves
26A284	A	18 valves

#### Circulating Valve Manifold Kits

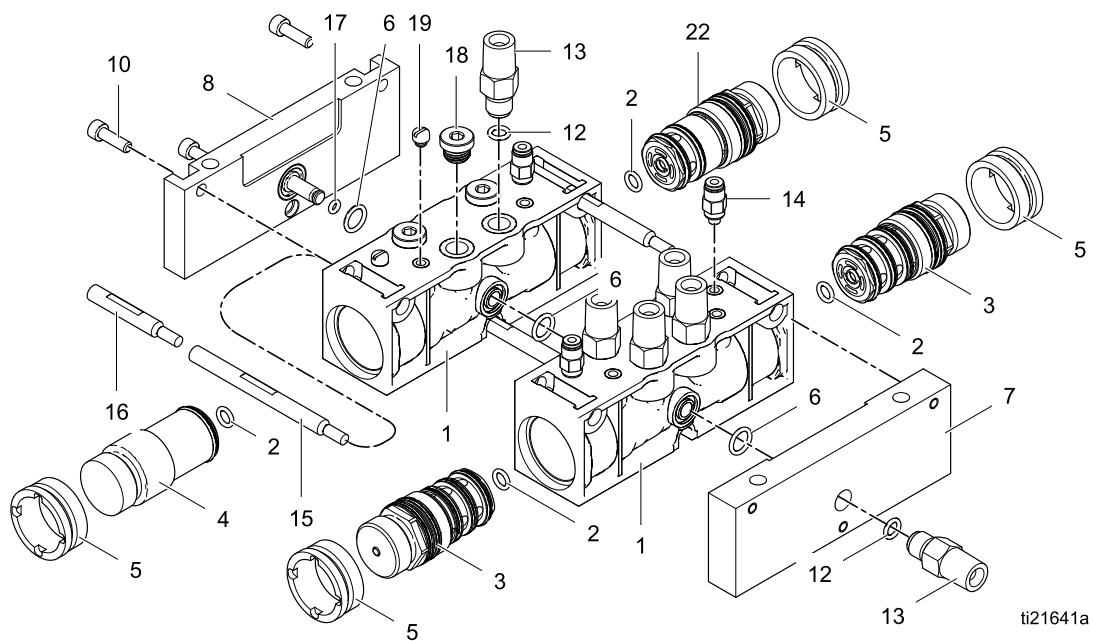
Kit No.	Series	Kit Description
24Y937	A	2 valves
24Y939	A	3 valves
24Y941	A	4 valves
24Y943	A	5 valves
24Y945	A	6 valves
24Y947	A	7 valves
24Y949	A	8 valves
24Y951	A	9 valves
24Y953	A	10 valves
26A273	A	11 valves
26A275	A	12 valves
25A605	A	13 valves
26A277	A	14 valves
26A279	A	15 valves
26A281	A	16 valves
26A283	A	17 valves
26A285	A	18 valves

# Valve Manifold Kit Parts

## Non-Circulating Kits



## Circulating Kits



ti21641a



Ref. No.	Part No.	Description	Qty
1	17J100	MANIFOLD, SST	
2	124878	O-RING; FEP encapsulated fluoroelastomer	
3	24T441	VALVE, for non-circulating kits; includes item 2	
	24T442	VALVE, for circulating kits; includes item 2	
4	24R051	PLUG, cc valve	
5	16N256	RETAINER, nut	
6	111457	O-RING; ptfe	
7	24T521	PLATE, outlet, manifold	
8	24T522	PLATE, end, manifold	
9	157974	WASHER, plain	
10	104092	SCREW, cap, socket head; 10-24 x 0.625 in. (16 mm)	
11	100179	NUT, hex; 10-24	

Ref. No.	Part No.	Description	Qty
12	104893	O-RING; ptfe	★
13	24T523	FITTING, fluid; 7/16-20 x 1/4 npt(m)	
14	111328	CONNECTOR, tube; 10-32(m) x 5/32 in. (4 mm) OD tube	
15	24T525	ROD, connecting; 3 in. (76 mm)	
16	24T524	ROD, connecting; 1.5 in. (38 mm)	
17	111504	O-RING; chemically resistant	
18	557716	PLUG; 7/16-20	
19	104644	PLUG, screw; 10-32 x 0.156 in. (4 mm)	
22	24T441	VALVE, for circulating kits; includes item 2	

★ See the following tables to determine the quantity of each part in your valve manifold kit.

#### Low Pressure Non-Circulating Valve Manifold Kit Part Quantities

Kit No.	Reference Numbers																	
	1	2	3	4	5	6	7	8	10	12	13	14	15	16	17	18	19	
24Y936	1	2	2	0	2	2	1	1	3	3	3	2	0	3	1	2	0	
24Y938	2	4	3	1	4	3	1	1	3	4	4	3	3	0	1	5	2	
24Y940	2	4	4	0	4	3	1	1	3	5	5	4	3	0	1	4	0	
24Y942	3	6	5	1	6	4	1	1	3	6	6	5	3	3	1	7	2	
24Y944	3	6	6	0	6	4	1	1	3	7	7	6	3	3	1	6	0	
24Y946	4	8	7	1	8	5	1	1	3	8	8	7	6	0	1	9	2	
24Y948	4	8	8	0	8	5	1	1	3	9	9	8	6	0	1	8	0	
24Y950	5	10	9	1	10	6	1	1	3	10	10	9	6	3	1	11	2	
24Y952	5	10	10	0	10	6	1	1	3	11	11	10	6	3	1	10	0	
26A272	6	12	11	1	12	7	1	1	3	12	12	11	9	0	1	13	2	
26A274	6	12	12	0	12	7	1	1	3	13	13	12	9	0	1	12	0	
26A286	7	14	13	1	14	8	1	1	3	14	14	13	9	3	1	15	2	
26A276	7	14	14	0	14	8	1	1	3	15	15	14	9	3	1	14	0	
26A278	8	16	15	1	16	9	1	1	3	16	16	15	12	0	1	17	2	
26A280	8	16	16	0	16	9	1	1	3	17	17	16	12	0	1	16	0	
26A282	9	18	17	1	18	10	1	1	3	18	18	17	12	3	1	19	2	
26A284	9	18	18	0	18	10	1	1	3	19	19	18	12	3	1	18	0	

## Low Pressure Circulating Valve Manifold Kit Part Quantities

Kit No.		Reference Numbers																	
		1	2	3	4	5	6	7	8	10	12	13	14	15	16	17	18	19	22
24Y937	24T487	1	2	1	0	2	2	1	1	3	4	4	2	0	3	1	1	0	1
24Y939	24T488	2	4	2	1	4	3	1	1	3	6	6	3	3	0	1	3	2	1
24Y941	24T489	2	4	3	0	4	3	1	1	3	8	8	4	3	0	1	1	0	1
24Y943	24T490	3	6	4	1	6	4	1	1	3	10	10	5	3	3	1	3	2	1
24Y945	24T491	3	6	5	0	6	4	1	1	3	12	12	6	3	3	1	1	0	1
24Y947	24T492	4	8	6	1	8	5	1	1	3	14	14	7	6	0	1	3	2	1
24Y949	24T493	4	8	7	0	8	5	1	1	3	16	16	8	6	0	1	1	0	1
24Y951	24T494	5	10	8	1	10	6	1	1	3	18	18	9	6	3	1	3	2	1
24Y953	24T495	5	10	9	0	10	6	1	1	3	20	20	10	6	3	1	1	0	1
26A273	24T496	6	12	10	1	12	7	1	1	3	22	22	11	9	0	1	3	2	1
26A275	24T497	6	12	11	0	12	7	1	1	3	24	24	12	9	0	1	1	0	1
25A605	24T498	7	14	12	1	14	8	1	1	3	26	26	13	9	3	1	3	2	1
26A277	24T499	7	14	13	0	14	8	1	1	3	28	28	14	9	3	1	1	0	1
26A279	24T500	8	16	14	1	16	9	1	1	3	30	30	15	12	0	1	3	2	1
26A281	24T501	8	16	15	0	16	9	1	1	3	32	32	16	12	0	1	1	0	1
26A283	24T502	9	18	16	1	18	10	1	1	3	34	34	17	12	3	1	3	2	1
26A285	24T503	9	18	17	0	18	10	1	1	3	36	36	18	12	3	1	1	0	1

## High Pressure Valve Manifold Kits

### Non-Circulating Valve Manifold Kits

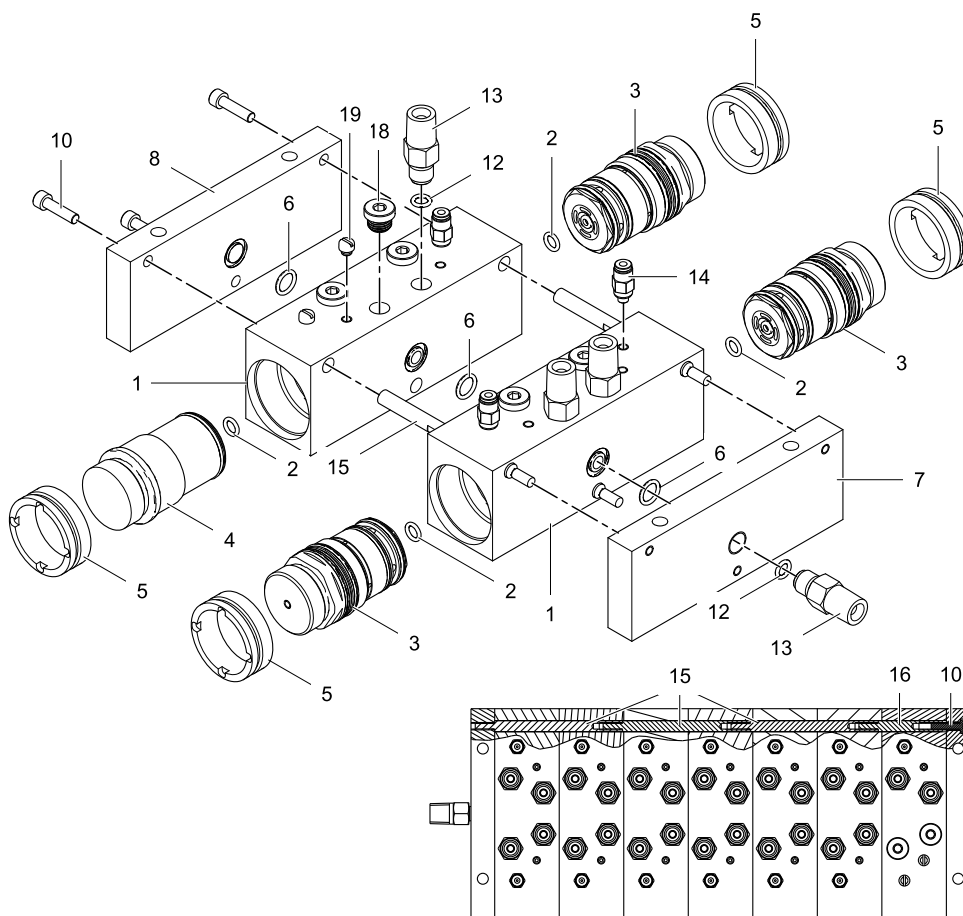
Kit No.	Series	Kit Description
24T647	A	2 valves
24T648	A	3 valves
24T649	A	4 valves
24T650	A	5 valves
24T651	A	6 valves
24T652	A	7 valves
24T653	A	8 valves
24T654	A	9 valves
24T655	A	10 valves
24T656	A	11 valves
24T657	A	12 valves
24T658	A	13 valves
24T659	A	14 valves
24T660	A	15 valves
24T661	A	16 valves
24T662	A	17 valves
24T663	A	18 valves
24T664	A	19 valves
24T665	A	20 valves
24T666	A	21 valves
24T667	A	22 valves
24T668	A	23 valves
24T669	A	24 valves
24T670	A	25 valves
24T671	A	26 valves
24T672	A	27 valves
24T673	A	28 valves
24T674	A	29 valves
24T675	A	30 valves
24T676	A	31 valves
26A066 (pump flush)	A	1 valve
24X360 (acid-catalyzed)	A	2 valves
24U182 (acid-catalyzed)	A	3 valves
24U183 (acid-catalyzed)	A	5 valves

### Circulating Valve Manifold Kits

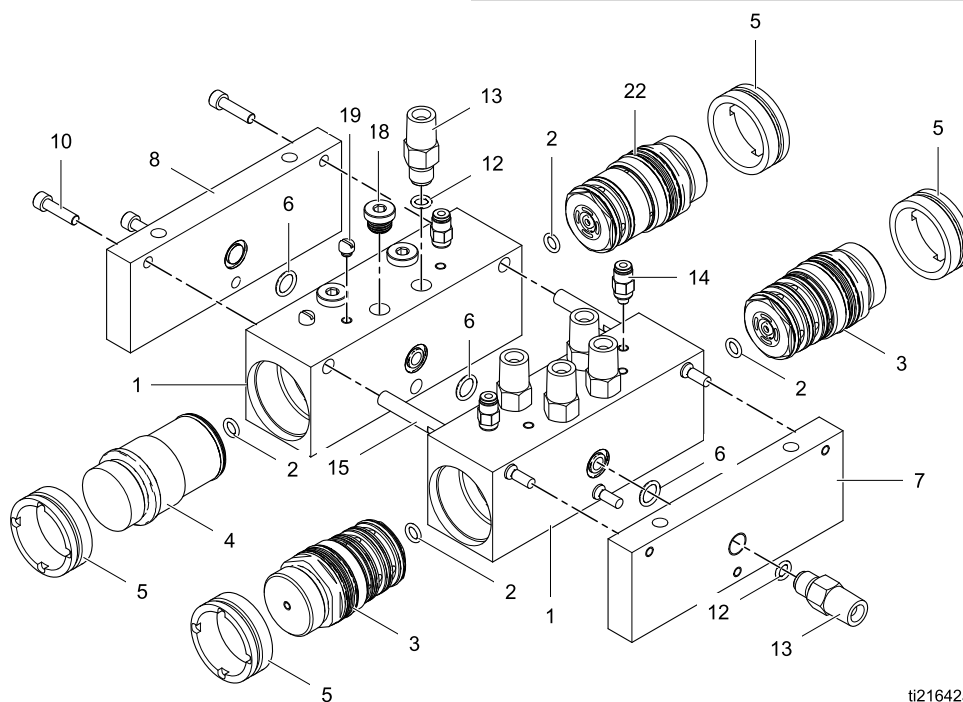
Kit No.	Series	Kit Description
24T677	A	2 valves
24T678	A	3 valves
24T679	A	4 valves
24T680	A	5 valves
24T681	A	6 valves
24T682	A	7 valves
24T683	A	8 valves
24T684	A	9 valves
24T685	A	10 valves
24T686	A	11 valves
24T687	A	12 valves
24T688	A	13 valves
24T689	A	14 valves
24T690	A	15 valves
24T691	A	16 valves
24T692	A	17 valves
24T693	A	18 valves
24T694	A	19 valves
24T695	A	20 valves
24T696	A	21 valves
24T697	A	22 valves
24T698	A	23 valves
24T699	A	24 valves
24T700	A	25 valves
24T701	A	26 valves
24T702	A	27 valves
24T703	A	28 valves
24T704	A	29 valves
24T705	A	30 valves
24T706	A	31 valves

# Valve Manifold Kit Parts

## Non-Circulating Kits



## Circulating Kits



ti21642a

Ref. No.	Part No.	Description	Qty
1	16N271	MANIFOLD, for circulating kits	★
2	124878	O-RING; FEP encapsulated fluoroelastomer	
3	24T581	VALVE, for non-circulating kits; includes item 2	
	24T582	VALVE, for circulating kits; includes item 2	
	24T583	VALVE, for non-circulating, acid compatible kits; includes item 2	
4	24R052	PLUG, cc valve	
5	16N269	RETAINER, nut	
6	111457	O-RING; ptfe	
7	24T725	PLATE, outlet, manifold	
8	24T726	PLATE, end, manifold	
10	111820	SCREW, cap, socket head; 10–24 x 0.75 in. (19 mm)	

Ref. No.	Part No.	Description	Qty
12	104893	O-RING; ptfe	★
13	24T523	FITTING, fluid; 7/16–20 x 1/4 npt(m)	
14	111328	CONNECTOR, tube; 10–32(m) x 5/32 in. (4 mm) OD tube	
15	24T729	ROD, connecting; 3.290 in. (84 mm)	
16	24T728	ROD, connecting; 1.645 in. (42 mm)	
18	557716	PLUG; 7/16–20	
19	104644	PLUG, screw; 10–32 x 0.156 in. (4 mm)	
22	24T581	VALVE, for circulating kits; includes item 2	

★ See the following tables to determine the quantity of each part in your valve manifold kit.

## High Pressure Non-Circulating Valve Manifold Kit Part Quantities

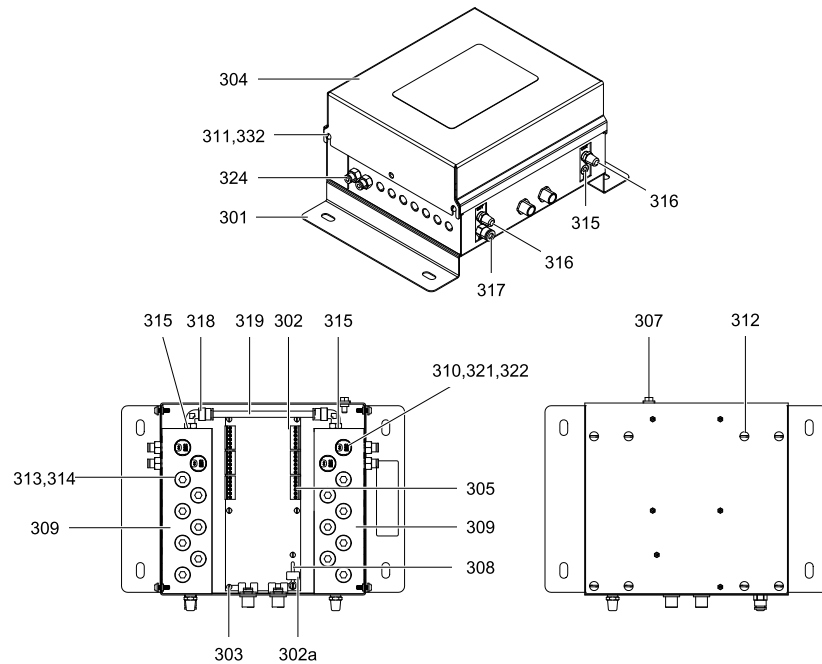
Kit No.	Reference Numbers															
	1	2	3	4	5	6	7	8	10	12	13	14	15	16	18	19
24T647	1	2	2	0	2	2	1	1	3	3	3	2	0	3	2	0
24T648	2	4	3	1	4	3	1	1	3	4	4	3	3	0	5	2
24T649	2	4	4	0	4	3	1	1	3	5	5	4	3	0	4	0
24T650	3	6	5	1	6	4	1	1	3	6	6	5	3	3	7	2
24T651	3	6	6	0	6	4	1	1	3	7	7	6	3	3	6	0
24T652	4	8	7	1	8	5	1	1	3	8	8	7	6	0	9	2
24T653	4	8	8	0	8	5	1	1	3	9	9	8	6	0	8	0
24T654	5	10	9	1	10	6	1	1	3	10	10	9	6	3	11	2
24T655	5	10	10	0	10	6	1	1	3	11	11	10	6	3	10	0
24T656	6	12	11	1	12	7	1	1	3	12	12	11	9	0	13	2
24T657	6	12	12	0	12	7	1	1	3	13	13	12	9	0	12	0
24T658	7	14	13	1	14	8	1	1	3	14	14	13	9	3	15	2
24T659	7	14	14	0	14	8	1	1	3	15	15	14	9	3	14	0
24T660	8	16	15	1	16	9	1	1	3	16	16	15	12	0	17	2
24T661	8	16	16	0	16	9	1	1	3	17	17	16	12	0	16	0
24T662	9	18	17	1	18	10	1	1	3	18	18	17	12	3	19	2
24T663	9	18	18	0	18	10	1	1	3	19	19	18	12	3	18	0
24T664	10	20	19	1	20	11	1	1	3	20	20	19	15	0	21	2
24T665	10	20	20	0	20	11	1	1	3	21	21	20	15	0	20	0
24T666	11	22	21	1	22	12	1	1	3	22	22	21	15	3	23	2
24T667	11	22	22	0	22	12	1	1	3	23	23	22	15	3	22	0
24T668	12	24	23	1	24	13	1	1	3	24	24	23	18	0	25	2
24T669	12	24	24	0	24	13	1	1	3	25	25	24	18	0	24	0
24T670	13	26	25	1	26	14	1	1	3	26	26	25	18	3	27	2
24T671	13	26	26	0	26	14	1	1	3	27	27	26	18	3	26	0
24T672	14	28	27	1	28	15	1	1	3	28	28	27	21	0	29	2
24T673	14	28	28	0	28	15	1	1	3	29	29	28	21	0	28	0
24T674	15	30	29	1	30	16	1	1	3	30	30	29	21	3	31	2
24T675	15	30	30	0	30	16	1	1	3	31	31	30	21	3	30	0
24T676	16	32	31	1	32	17	1	1	3	32	32	31	24	0	33	2
26A066	1	1	0	1	2	2	1	1	3	2	2	1	0	3	3	2
24X360	1	2	2	0	2	2	1	1	3	3	3	2	0	3	2	0
24U182	2	4	3	1	4	3	1	1	3	4	4	3	3	0	5	2
24U183	3	6	5	1	6	4	1	1	3	6	6	5	3	3	7	2

## High Pressure Circulating Valve Manifold Kit Part Quantities

Kit No.	Reference Numbers																
	1	2	3	4	5	6	7	8	10	12	13	14	15	16	18	19	22
24T677	1	2	1	0	2	2	1	1	3	4	4	2	0	3	1	0	1
24T678	2	4	2	1	4	3	1	1	3	6	6	3	3	0	3	2	1
24T679	2	4	3	0	4	3	1	1	3	8	8	4	3	0	1	0	1
24T680	3	6	4	1	6	4	1	1	3	10	10	5	3	3	3	2	1
24T681	3	6	5	0	6	4	1	1	3	12	12	6	3	3	1	0	1
24T682	4	8	6	1	8	5	1	1	3	14	14	7	6	0	3	2	1
24T683	4	8	7	0	8	5	1	1	3	16	16	8	6	0	1	0	1
24T684	5	10	8	1	10	6	1	1	3	18	18	9	6	3	3	2	1
24T685	5	10	9	0	10	6	1	1	3	20	20	10	6	3	1	0	1
24T686	6	12	10	1	12	7	1	1	3	22	22	11	9	0	3	2	1
24T687	6	12	11	0	12	7	1	1	3	24	24	12	9	0	1	0	1
24T688	7	14	12	1	14	8	1	1	3	26	26	13	9	3	3	2	1
24T689	7	14	13	0	14	8	1	1	3	28	28	14	9	3	1	0	1
24T690	8	16	14	1	16	9	1	1	3	30	30	15	12	0	3	2	1
24T691	8	16	15	0	16	9	1	1	3	32	32	16	12	0	1	0	1
24T692	9	18	16	1	18	10	1	1	3	34	34	17	12	3	3	2	1
24T693	9	18	17	0	18	10	1	1	3	36	36	18	12	3	1	0	1
24T694	10	20	18	1	20	11	1	1	3	38	38	19	15	0	3	2	1
24T695	10	20	19	0	20	11	1	1	3	40	40	20	15	0	1	0	1
24T696	11	22	20	1	22	12	1	1	3	42	42	21	15	3	3	2	1
24T697	11	22	21	0	22	12	1	1	3	44	44	22	15	3	1	0	1
24T698	12	24	22	1	24	13	1	1	3	46	46	23	18	0	3	2	1
24T699	12	24	23	0	24	13	1	1	3	48	48	24	18	0	1	0	1
24T700	13	26	24	1	26	14	1	1	3	50	50	25	18	3	3	2	1
24T701	13	26	25	0	26	14	1	1	3	52	52	26	18	3	1	0	1
24T702	14	28	26	1	28	15	1	1	3	54	54	27	21	0	3	2	1
24T703	14	28	27	0	28	15	1	1	3	56	56	28	21	0	1	0	1
24T704	15	30	28	1	30	16	1	1	3	58	58	29	21	3	3	2	1
24T705	15	30	29	0	30	16	1	1	3	60	60	30	21	3	1	0	1
24T706	16	32	30	1	32	17	1	1	3	62	62	31	24	0	3	2	1

## Color Change Control Module Kits

### Non-IS Color Change Control Modules



ti21639a

**Table 3 Custom Valve Mapping Color Change Kits**

Kit No.	Solenoid Valves	CAN Cable (15V206)	1/4 in. Tubing (590332)	5/32 in. Tubing (598095)	Low and High Pressure Valve Control Modules
25D328	4	10 ft.	6 ft.	24 ft.	25D313
25D329	5			30 ft.	25D314
25D474	6			36 ft.	25D315
25D475	7			42 ft.	25D316
25D476	8			48 ft.	25D317
25D477	9			54 ft.	25D318
25D478	10			60 ft.	25D319
25D479	11			66 ft.	25D320
25D480	12			72 ft.	25D321
25D481	13			78 ft.	25D322
25D482	14			84 ft.	25D323
25D483	15			90 ft.	25D324
25D484	16			96 ft.	25D325
25D485	17			102 ft.	25D326
25D486	18			108 ft.	25D327



Ref. No.	Part No.	Description	Qty
301	16P855	PANEL	1
302	24T566	BOARD, circuit	1
	25D312	BOARD, circuit; used with 25D313 - 25D327 control modules	1
302a	123690	FUSE; 125 mA	1
	17U084	FUSE; 500 mA; used with 25D313 - 25D327 control modules	1
303	112324	SCREW, machine, pan head; 4-40 x 0.25 in. (6 mm)	6
304	24T562	COVER	1
305	119162	CONNECTOR, 6-position	★
307	116343	SCREW, ground; M5 x 0.8	1
308	123691	HOLDER, fuse	1
309	24T563	MANIFOLD	2
310	16P316	SOLENOID	★
311	117831	SCREW, machine, pan head; 6-32 x 0.5 in. (13 mm)	4
312	103833	SCREW, machine, pan head; 10-32 x 0.375 in. (10 mm)	8
313	24T565	PLUG; 5/8-32; includes item 314	★

Ref. No.	Part No.	Description	Qty
314	113418	O-RING; buna-N	14
315	100139	PLUG, pipe; 1/8 npt	3
316	C06061	MUFFLER	2
317	115671	FITTING, connector; 1/8 npt(m) x 1/4 in. (6 mm) OD tube	1
318	112698	ELBOW; 1/8 npt(m) x 1/4 in. (6 mm) OD tube	2
319	590332	TUBE; polyethylene; 1/4 in. (6 mm) OD	1
320	598095	TUBE; nylon; 5/32 in. (4 mm) OD	1
321	— — —	STRAP, tie	★
322	— — —	FERRULE	★
324	114263	FITTING, connector; 1/8 npt(m) x 5/32 in. (4 mm) OD tube	★
332	151395	WASHER	4

★ See the following table to determine the quantity of each part in your control module kit.

Parts labeled — — — are not available separately.

### Non-IS Control Module Part Quantities

Find your module kit no. in the left column and the desired reference number in the top row to find the part quantity used in your control module kit.

Kit No.	Kit Description	6-Position Connector (305)	Solenoid (310)	Plug (313)	Tie Strap (321)	Ferrule (322)	Connector Fitting (324)
24T557	2 color	6	6	12	4	12	6
24T558	4 color	6	10	8	4	20	10
24T559	6 color	6	14	4	4	28	14
24T560	8 color	6	18	0	4	36	18

## Expansion Kits

### Non-IS Expansion Kits

The following kits are available to add color valves in a non-IS area. See [Install an Expansion Kit, page 34](#) for instructions.

#### Low Pressure Expansion Kits

Kit No.	Kit Description
<b>Without Manifold</b>	
<b>24T443</b>	One non-circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
<b>24T444</b>	One circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
<b>With Manifold</b>	
<b>26A056</b>	Manifold with one non-circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
<b>26A057</b>	Manifold with one circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
<b>26A052</b>	Manifold with two non-circulating valves. Includes valves, solenoids, fittings, and tubing.
<b>26A053</b>	Manifold with two circulating valves. Includes valves, solenoids, fittings, and tubing.
<b>SST Manifold Without Valves</b>	
<b>24Y989</b>	Stainless steel manifold with fittings for non-circulating valves. Includes fittings, retainers, connecting rods, and o-rings. Also order valve kits (24T443) and plug kits (24T519).
<b>24Y990</b>	Stainless steel manifold with fittings for circulating valves. Includes fittings, retainers, connecting rods, and o-rings. Also order valve kits (24T444) and plug kits (24T519).
<b>Air Purge/Air Chop Kits</b>	
<b>26C299</b>	Air valve for a stack with an open valve port. Includes valves, retainer. o-rings, tubing, fittings, connectors, and air regulator.
<b>26C301</b>	Stainless steel manifold with air valve and valve plug. Includes valves, retainer. o-rings, tubing, fittings, connectors, and air regulator.

#### High Pressure Expansion Kits

Kit No.	Kit Description
<b>Without Manifold</b>	
<b>24T584</b>	One non-circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
<b>24T585</b>	One circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
<b>With Manifold</b>	
<b>24T586</b>	Manifold with one non-circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
<b>24T587</b>	Manifold with one circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
<b>24T588</b>	Manifold with two non-circulating valves. Includes valves, solenoids, fittings, and tubing.
<b>24T589</b>	Manifold with two circulating valves. Includes valves, solenoids, fittings, and tubing.
<b>Air Purge/Air Chop Kits</b>	
<b>26C300</b>	Air valve for a stack with an open valve port. Includes valves, retainer. o-rings, tubing, fittings, connectors, and air regulator.
<b>26C302</b>	Stainless steel manifold with air valve and valve plug. Includes valves, retainer. o-rings, tubing, fittings, connectors, and air regulator.

#### High Pressure Acid-Compatible Expansion Kits

Kit No.	Kit Description
<b>Without Manifold</b>	
<b>24T590</b>	One non-circulating acid-compatible valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
<b>With Manifold</b>	
<b>24T591</b>	Manifold with one non-circulating acid-compatible valve. Includes valve, plug, solenoid, fittings, and tubing.
<b>24T592</b>	Manifold with two non-circulating acid-compatible valves. Includes valves, solenoids, fittings, and tubing.

# Dimensions

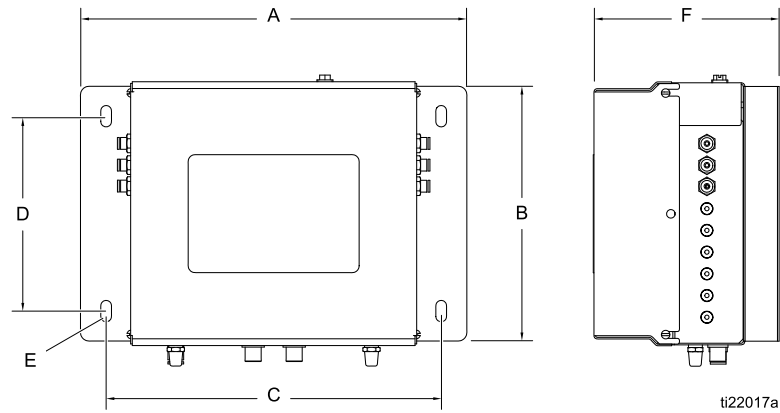


Figure 29 Non-IS Control Module

A	B	C	D	E	F
11.30 in. (1478 mm)	7.67 in. (195 mm)	9.8 in. (249 mm)	5.70 in. (145 mm)	0.31 in. (8 mm)	5.80 in. (147 mm)

NOTE: Total height of valve stack = H + K + (J x number of manifold blocks in your stack).

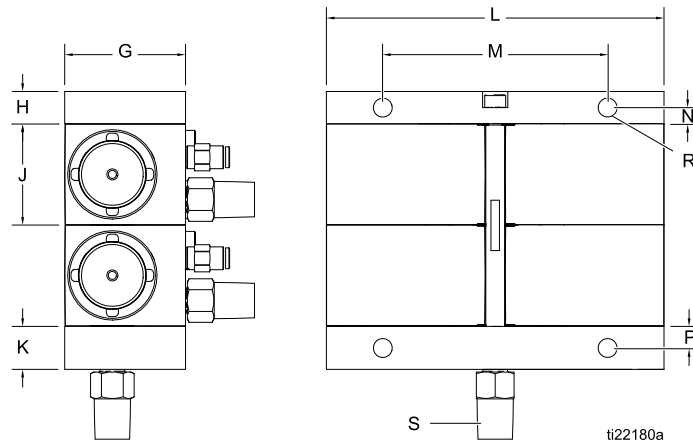
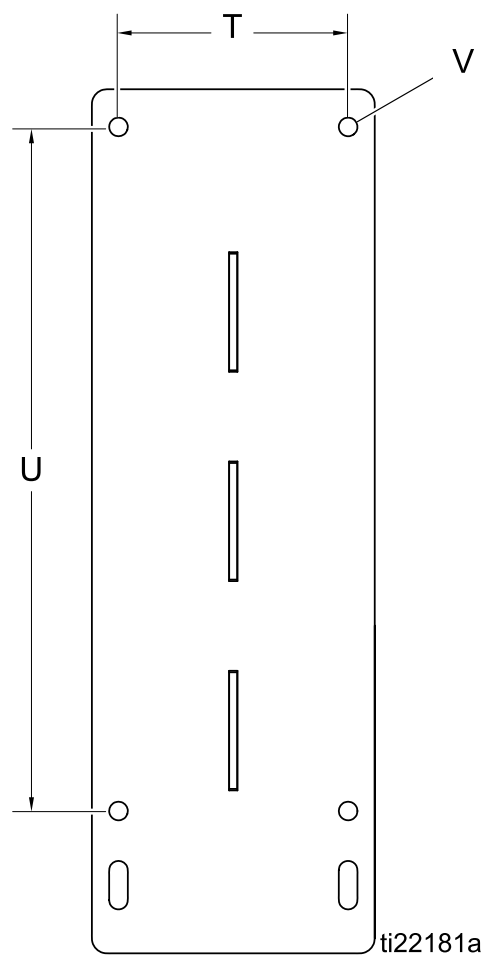


Figure 30 Manifold

G	H	J	K	L	M	N	P	R	S
<b>Low Pressure Valve Manifolds</b>									
1.80 in. (46 mm)	0.48 in. (12 mm)	1.50 in. (38 mm)	0.64 in. (16 mm)	5.03 in. (128 mm)	3.35 in. (85 mm)	0.24 in. (6 mm)	0.32 in. (8 mm)	0.28 in. (7 mm)	1/4 npt(m)
<b>High Pressure Valve Manifolds</b>									
2.00 in. (51 mm)	0.61 in. (15 mm)	1.66 in. (42 mm)	0.61 in. (15 mm)	5.4 in. (137 mm)	3.35 in. (85 mm)	0.30 in. (7.6 mm)	0.30 in. (7.6 mm)	0.28 in. (7 mm)	1/4 npt(m)

Dimensions



T	U	V
3.84 in. (98 mm)	11.44 in. (291 mm)	0.312 in. (8 mm) diameter

Figure 31 Manifold Mounting Bracket

# Weights

## Low Pressure Non-Circulating Valve Manifold Kits (Stainless Steel)

Kit No.	lb	grams
24Y936	3.90	1769
24Y938	6.82	3093
24Y940	6.80	3084
24Y942	9.71	4404
24Y944	9.69	4395
24Y946	12.61	5720
24Y948	12.59	5711
24Y950	15.50	7031
24Y952	15.48	7022
26A272	18.39	8342
26A274	18.37	8332
26A286	21.28	9552
26A276	21.26	9643
26A278	24.19	10,973
26A280	24.15	10,954
26A282	27.06	12,275
26A284	27.04	12,265

## Low Pressure Circulating Valve Manifold Kits (Stainless Steel)

Kit No.	lb	grams
24Y937	4.01	1819
24Y939	6.98	3166
24Y941	7.01	3180
24Y943	9.98	4527
24Y945	10.02	4545
24Y947	12.98	5888
24Y949	13.02	5906
24Y951	15.99	7253
24Y953	16.02	7267
26A273	19.01	8640
26A275	19.02	8645
25A605	21.99	9995
26A277	22.02	10,003
26A279	25.00	11,363
26A281	25.02	11,372
26A283	28.00	12,726
26A285	28.02	12,735

## Non-IS Color Change Control Modules

Kit No.	lb	grams
24T557	9.7	4386
24T558	10.1	4576
24T559	10.5	4766
24T560	10.9	4956

## High Pressure Non-Circulating Valve Manifold Kits

Kit No.	lb	grams
24T647	7.7	3503
24T648	11.5	5210
24T649	11.7	5329
24T650	15.5	7036
24T651	15.8	7154
24T652	19.5	8861
24T653	19.8	8980
24T654	23.6	10687
24T655	23.8	10806
24T656	27.6	12512
24T657	27.8	12631
24T658	31.6	14338
24T659	31.9	14457
24T660	35.6	16163
24T661	35.9	16282
24T662	39.7	17989
24T663	39.9	18108
24T664	43.7	19814
24T665	43.9	19933
24T666	47.7	21640
24T667	48.0	21759
24T668	51.7	23465
24T669	52.0	23584
24T670	55.8	25291
24T671	56.0	25410
24T672	59.8	27117
24T673	60.0	27235
24T674	63.8	28942
24T675	64.1	29061
24T676	67.8	30768
24U182 (acid-catalyzed)	11.5	5210
24U183 (acid-catalyzed)	15.5	7036
24X846 (acid-catalyzed)	7.7	3503

## High Pressure Circulating Valve Manifold Kits

Kit No.	lb	grams
24T677	7.7	3508
24T678	11.5	5216
24T679	11.8	5337
24T680	15.5	7046
24T681	15.8	7167
24T682	19.6	8876
24T683	19.8	8997
24T684	23.6	10706
24T685	23.9	10826
24T686	27.6	12535
24T687	27.9	12656
24T688	31.7	14365
24T689	31.9	14486
24T690	35.7	16195
24T691	36.0	16316
24T692	39.7	18024
24T693	40.0	18145
24T694	43.8	19854
24T695	44.0	19975
24T696	47.8	21684
24T697	48.1	21805
24T698	51.8	23514
24T699	52.1	23634
24T700	55.9	25343
24T701	56.1	25464
24T702	59.9	27173
24T703	60.2	27294
24T704	63.9	29003
24T705	64.2	29124
24T706	68.0	30832

# Technical Data

Color Change Kits	U.S.	Metric
Maximum fluid working pressure:		
Low pressure kits	300 psi	2.1 MPa, 21 bar
High pressure kits	1500 psi	10.5 MPa, 105 bar
Maximum working air pressure:	100 psi	0.7 MPa, 7.0 bar
Air supply:	85–100 psi	0.6–0.7 MPa, 6.0–7.0 bar
Viscosity range of fluid:	20–5000 centipoise	
Fluid inlet size:	1/4 npt(f)	
Fluid outlet size:	1/4 npt(f)	
Air inlet size:	5/32 in. OD tube	4 mm OD tube
Weights:	See <a href="#">Weights, page 77</a> .	
Wetted parts:		
Stainless-Steel Valve manifold	303 SST, 316 SST, PTFE, chemically resistant o-rings	
Valve	See valve manual 332454.	

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