

Color Change & Remote Mix

Manifolds for PD 2K & 3K

333282K
EN

To add optional color change function and at-the-gun mixing of two component materials when used with a ProMix™ PD Proportioner for Automatic Spray Applications. For professional use only.

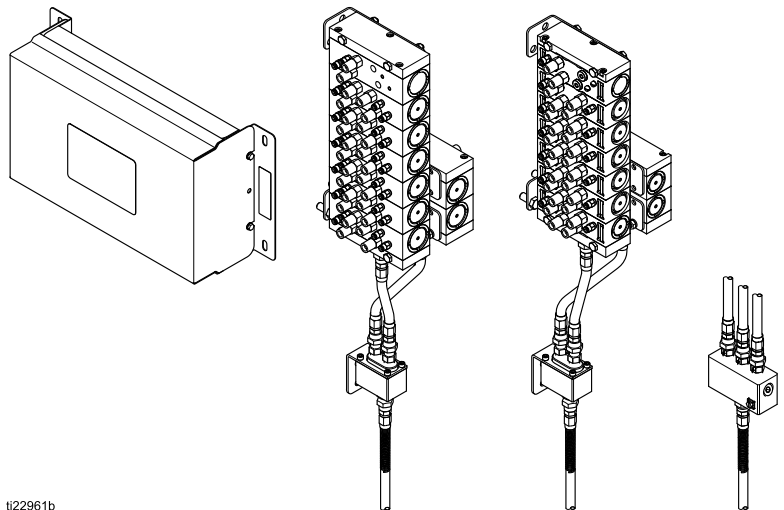


Important Safety Instructions

Read all warnings and instructions in this manual and in your system installation, operation, and repair/parts manuals.

Save these instructions.

See page 4 for model part numbers and approvals information.



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Related Manuals

Current manuals are available at www.graco.com.

Manual No.	Description
332458	PD2K Proportioner, Installation Manual, Systems for Automatic Spray Applications
332564	PD2K Proportioner Operation Manual, Systems for Automatic Spray Applications
332709	PD2K Proportioner Repair-Parts Manual, Systems for Automatic Spray Applications
332339	Pump Repair-Parts Manual
332454	Color Change Valve Repair-Parts Manual
332455	Color Change Kits (Non-IS) Instructions-Parts Manual
332456	3rd and 4th Pump Kits Instructions-Parts Manual


Manual No.	Description
3A2800	PD2K Electronic Proportioner, Manual System, Repair-Parts Manual
332457	PD2K Electronic Proportioner, Manual System, Installation Manual
332562	PD2K Electronic Proportioner, Manual System, Operation Manual
3A4186	PD2K Dual Fluid Panel Electronic Proportioner, Manual System, Operation Manual
3A4486	PD2K Dual Fluid Panel Electronic Proportioner, Auto System, Operation Manual


Models


Intrinsically Safe Modules


These kits utilize intrinsically safe control modules that are installed in the hazardous area, near the dispense valve. See the kit identification label for the product part number. See the module identification label for maximum air working pressure, approval information and certification.

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

 FM16US0241
 FM16CA0129
 Intrinsic safe equipment for Class I, Div 1, Group D, T3
 Ta = 2°C to 50°C
 Install per 16P577
 294055f

 II 2 G
 Ex ia IIA T3 Gb
 FM08ATEX0073
 FM21UKEX0011
 IECEx FMG 13.0011
 UK CA 0359

 2575

 GRACO INC.
 P.O. Box 1441
 Minneapolis, MN
 55440 U.S.A.

Kit No.
 Serial No.
 Series No.


Artwork No. 293992 Rev. C

Intrinsically Safe Color Change Module Identification Label

Kit Identification Label



Table 1 . Low Pressure, Non-Circulating Remote Mix Manifold Kits
 Maximum Fluid Working Pressure: 300 psi (2.07 MPa, 20.7 bar)

Number of Color + Solvent Valves	Number of Catalyst + Solvent Valves		
	1	2	4
1	24Y962		
2	24Y963	24Y972	
4	24Y964	24Y973	24Y980
6	24Y965	24Y974	24Y981
8	24Y966	24Y975	24Y982
12	26A060	26A061	26A062
Control Module Expansion Kits: Use to add a second control module (includes all needed solenoids, manifolds, valves and a CAN cable).			
13–18	24V163		
13–24	24V164		
13–30	24V165		

Table 2 . Low Pressure, Circulating Remote Mix Manifold Kits
Maximum Fluid Working Pressure: 300 psi (2.07 MPa, 20.7 bar)

Number of Color + Solvent Valves	Number of Catalyst + Solvent Valves		
	1	2	4
1	24Y967		
2	24Y968	24Y976	
4	24Y969	24Y977	24Y983
6	24Y970	24Y978	24Y984
8	24Y971	24Y979	24Y985
12	25A606	26A063	26A064
Control Module Expansion Kits: Use to add a second control module (includes all needed solenoids, manifolds, valves and a CAN cable).			
13–18	24V328		
13–24	24V329		
13–30	24V330		

Table 3 . High-Pressure, Non-Circulating Remote Mix Manifold Kits
Maximum Fluid Working Pressure: 1500 psi (10.34 MPa, 103.4 bar)

Number of Color + Solvent Valves	Number of Catalyst + Solvent Valves			
	1	1 (Acid)*	2	4
1	24V359	26A036		
2	24V360	26A037	24V381	
4	24V361	26A038	24V382	24V396
6	24V362	26A039	24V383	24V397
8	24V363	26A040	24V384	24V398
12	24V364	26A041	24V385	24V399
Control Module Expansion Kits: Use to add a second control module (includes all needed solenoids, manifolds, valves and a CAN cable).				
13–18	24V365			
13–24	24V366			
13–30	24V367			

Models continue on next page.

Table 4 . High-Pressure, Circulating Remote Mix Manifold Kits
Maximum Fluid Working Pressure: 1500 psi (10.34 MPa, 103.4 bar)

Number of Color + Solvent Valves	Number of Catalyst + Solvent Valves			
	1	1 (Acid)*	2	4
1	24V369	26A042		
2	24V370	26A043	24V389	
4	24V371	26A044	24V390	24V402
6	24V372	26A045	24V391	24V403
8	24V373	26A046	24V392	24V404
12	24V374	26A047	24V393	24V405
Control Module Expansion Kits: Use to add a second control module (includes all needed solenoids, manifolds, valves and a CAN cable).				
13–18	24V375			
13–24	24V376			
13–30	24V377			

★ *These acid kits are used by both high and low pressure systems.*

NOTE: Systems can use 1 to 30 colors and up to 4 catalysts. To add colors/catalysts:

- **If current control module is full:** If all solenoid ports are in use in your IS control module, an additional IS control module is needed. Order a Control Module Expansion Kit, shown above.
- **If current control module is not full:** If empty solenoid ports remain in your control module, see [Expansion Kits, page 83](#).

Table 5 Custom Valve Mapping Color Change Control 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












Non-Intrinsically Safe Modules






See Manual 332455 for parts, setup, installation, and repair.

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.

 <h2 style="margin: 0;">WARNING</h2>	
   	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive. • Stop operation immediately if static sparking occurs or you feel a shock, Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
 	<p>ELECTRIC SHOCK HAZARD</p> <p>This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment. • Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.





 <h1 style="margin: 0;">WARNING</h1>	
  	<p>INTRINSIC SAFETY</p> <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"> • 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.). • To help prevent fire and explosion: <ul style="list-style-type: none"> • 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. • Do not substitute system components as this may impair intrinsic safety. • 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.
  	<p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not point dispensing device at anyone or at any part of the body. • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately.
 	<p>MOVING PARTS HAZARD</p> <p>Moving parts can pinch, cut or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure and disconnect all power sources.
 	<p>TOXIC FLUID OR FUMES</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read MSDSs to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. • Always wear chemically impermeable gloves when spraying, dispensing, or cleaning equipment.

 <h1 style="margin: 0;">WARNING</h1>	
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>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"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.
  	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.

Important Isocyanate (ISO) Information

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



Isocyanate Conditions

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




- Read and understand the fluid manufacturer's warnings and Safety Data Sheet (SDS) to know specific hazards and precautions related to isocyanates.
- 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.
- Use of incorrectly maintained or mis-adjusted equipment may result in improperly cured material. Equipment must be carefully maintained and adjusted according to instructions in the manual.
- To prevent inhalation of isocyanate mists, vapors, and atomized particulates, everyone in the work area must wear appropriate respiratory protection. Always wear a properly fitting respirator, which may include a supplied-air respirator. Ventilate the work area according to instructions in the fluid manufacturer's SDS.
- 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.

Material Self-ignition

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

Keep Components A and B Separate

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

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

Moisture Sensitivity of Isocyanates

Exposure to moisture (such as humidity) will cause ISO to partially cure; forming small, hard, abrasive 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"> • Read and understand the fluid manufacturer’s warnings and Safety Data Sheet (SDS) to know specific hazards and precautions related to the acid. • 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. • 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. • 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. • Regularly inspect equipment for potential leaks and remove spills promptly and completely to avoid direct contact or inhalation of the acid and its vapors. • Keep acid away from heat, sparks, and open flames. Do not smoke in the work area. Eliminate all ignition sources. • 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. 									

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.

Setup the Modules

Setup IS Control Modules

NOTE: Two IS color change control modules may be installed in the hazardous area. The module for colors 1–12 is labeled board 7. The module for colors 13–30 is labeled board 8. An alternate label for Module 8 (Colors 13–30) is provided with the module kit. Affix the label according to your system configuration.

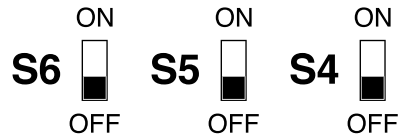
NOTE: For a system that has more than one color pump but relatively few color change materials, alternate remote valve maps may be enabled that will consolidate these colors onto a single IS color change board (module 7). (See “Pump Screen 1” in Operation Manuals 332562 and 332564 for further detail.)

NOTE: For systems using air/solvent chop to purge the spray device, the air valve will use the bottom right solenoid location (see following tables). It is important to note that the color number (valve) that shares the solenoid location with the air valve cannot be supported in this configuration. (See Operation Manuals 332562 and 332564, and Installation Manuals 332457 and 332458 for further detail on air/solvent chip for PD2K.)

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

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. Open the color change module. Locate switches S4, S5, and S6 on the control module board. The switches may be shipped in the OFF position.



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

IS Control Module Switch Settings			
Control Module	S6	S5	S4
Module 7			
Module 8			

4. Use the following figure and tables to determine the solenoid valve assigned to each valve in the valve manifold.

Setup the Modules

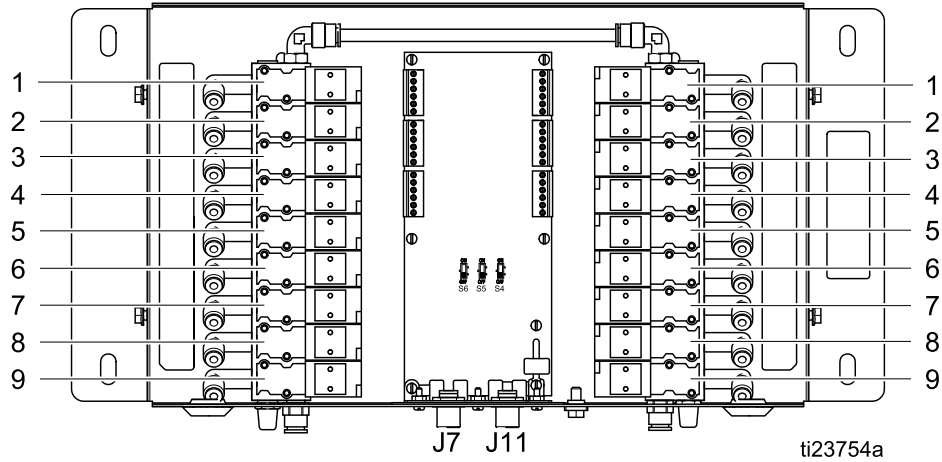


Figure 1 IS Control Module

Standard Map

IS Control Module 7			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent	1	Catalyst Solvent
2	Color 1	2	Catalyst 1
3	Color 2	3	Catalyst 2
4	Color 3	4	Catalyst 3
5	Color 4	5	Catalyst 4
6	Color 5	6	Color 9
7	Color 6	7	Color 10
8	Color 7	8	Color 11
9	Color 8	9	Color 12*

IS Control Module 8			
Solenoid	Valve	Solenoid	Valve
1	Color 13	1	Color 22
2	Color 14	2	Color 23
3	Color 15	3	Color 24
4	Color 16	4	Color 25
5	Color 17	5	Color 26
6	Color 18	6	Color 27
7	Color 19	7	Color 28
8	Color 20	8	Color 29
9	Color 21	9	Color 30

* Air valve location when using air/solvent chop.

Alternate Map 1 (Consolidation of Two Resin Pumps)

IS Control Module 7			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent	1	Catalyst Solvent
2	Color 1	2	Catalyst 1
3	Color 2	3	Catalyst 2
4	Color 3	4	Catalyst 3
5	Color 4	5	Catalyst 4
6	Color 5	6	Color 19
7	Color 6	7	Color 20
8	Color 17	8	Color 21
9	Color 18	9	Color 22*

IS Control Module 8			
Solenoid	Valve	Solenoid	Valve
1	Color 7	1	Color 16
2	Color 8	2	Color 23
3	Color 9	3	Color 24
4	Color 10	4	Color 25
5	Color 11	5	Color 26
6	Color 12	6	Color 27
7	Color 13	7	Color 28
8	Color 14	8	Color 29
9	Color 15	9	Color 30

Alternate Map 2 (Consolidation of Three Resin Pumps)

IS Control Module 7			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent	1	Catalyst Solvent
2	Color 1	2	Catalyst 1
3	Color 2	3	Catalyst 2
4	Color 3	4	Catalyst 3
5	Color 4	5	Catalyst 4
6	Color 17	6	Color 25
7	Color 18	7	Color 26
8	Color 19	8	Color 27
9	Color 20	9	Color 28*

IS Control Module 8			
Solenoid	Valve	Solenoid	Valve
1	Color 5	1	Color 14
2	Color 6	2	Color 15
3	Color 7	3	Color 16
4	Color 8	4	Color 21
5	Color 9	5	Color 22
6	Color 10	6	Color 23
7	Color 11	7	Color 24
8	Color 12	8	Color 29
9	Color 13	9	Color 30

* Air valve location when using air/solvent chop.

Setup the Modules

NOTE: For a system that uses a mix-at-wall manifold and also has more than one gun, additional remote solvent valves are required, so the IS color change control modules will have modified valve maps. Similarly, alternate remote valve maps may be enabled to consolidate gun solvent valves and colors from multiple resin pumps onto a single IS color change board (module 7). (See Operation Manuals 332562 and 332564 for further detail on using multiple guns.)

NOTE: For systems using air/solvent chop to purge, each spray device must have its own air valve (denoted in the tables below). It is important to note that the color numbers (valves) that share the solenoid location with the air valve(s) cannot be supported in this configuration. (See Operation Manuals 332562 and 332564, and Installation Manuals 332457 and 332458 for further detail on air/solvent chip for PD2K.)

Standard Map — Multiple Guns

IS Control Module 7			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent (Gun 1)	1	Catalyst Solvent (Gun 1)
2	Color 1	2	Catalyst 1*
3	Color 2	3	Catalyst 2*
4	Color 3	4	Catalyst 3*
5	Color 4	5	Catalyst 4*
6	Color 5	6	Color 9
7	Color 6	7	Color 10
8	Color 7	8	Color 11
9	Color 8	9	Color 12 / Air (Gun 1)

IS Control Module 8			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent (Gun 2)	1	Catalyst Solvent (Gun 2)
2	Color 13	2	Color 22
3	Color 14	3	Color 23
4	Color 17	4	Color 24
5	Color 18	5	Color 25
6	Color 19	6	Color 26
7	Color 20	7	Color 27 / Air (Gun 2)
8	Color 21	8	Color 28 / Air (Gun 3)
9	Color Solvent (Gun 3)	9	Catalyst Solvent (Gun 3)

* The remote catalyst valve assignment requires special attention when common catalyst materials are used. See “Multiple Guns” in Operation Manuals 332562 or 332564.

Alternate Map 1 — Multiple Guns (Consolidation of Two Guns)

IS Control Module 7			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent (Gun 1)	1	Catalyst Solvent (Gun 1)
2	Color Solvent (Gun 2)	2	Catalyst Solvent (Gun 2)
3	Color 1	3	Catalyst 1*
4	Color 2	4	Catalyst 2*
5	Color 3	5	Catalyst 3*
6	Color 4	6	Catalyst 4*
7	Color 5 / Air (Gun 1)	7	Color 19
8	Color 17	8	Color 20
9	Color 18	9	Color 21 / Air (Gun 2)

IS Control Module 8			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent (Gun 3)	1	Catalyst Solvent (Gun 3)
2	Color 6	2	Color 14
3	Color 7	3	Color 22
4	Color 8	4	Color 23
5	Color 9	5	Color 24
6	Color 10	6	Color 25
7	Color 11	7	Color 26
8	Color 12	8	Color 27
9	Color 13	9	Color 28 / Air (Gun 3)

Alternate Map 2 — Multiple Guns (Consolidation of Three Guns)

IS Control Module 7			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent (Gun 1)	1	Catalyst Solvent (Gun 1)
2	Color Solvent (Gun 2)	2	Catalyst Solvent (Gun 2)
3	Color Solvent (Gun 3)	3	Catalyst Solvent (Gun 3)
4	Color 1	4	Catalyst 1*
5	Color 2	5	Catalyst 2*
6	Color 3/ Air (Gun 1)	6	Catalyst 3*
7	Color 17	7	Color 25
8	Color 18	8	Color 26
9	Color 19 / Air (Gun 2)	9	Color 27 / Air (Gun 3)

IS Control Module 8			
Solenoid	Valve	Solenoid	Valve
1	Color 4	1	Catalyst 4*
2	Color 5	2	Color 13
3	Color 6	3	Color 14
4	Color 7	4	Color 20
5	Color 8	5	Color 21
6	Color 9	6	Color 22
7	Color 10	7	Color 23
8	Color 11	8	Color 24
9	Color 12	9	Color 28

* The remote catalyst valve assignment requires special attention when common catalyst materials are used. See "Multiple Guns" in Operation Manuals 332562 or 332564.

Setup the Modules

NOTE: The PD2K Dual Panel system supports up to 16 materials per Mix Unit. The maximum number of catalysts per Mix unit is four, but each catalyst reduces the maximum number of colors.

Standard Map — PD2K Dual Panel

IS Control Module 7			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent (Gun 1)	1	Catalyst Solvent (Gun 1)
2	Color 1	2	Catalyst 1 / Color 16
3	Color 2	3	Catalyst 2 / Color 15
4	Color 3	4	Catalyst 3 / Color 14
5	Color 4	5	Catalyst 4 / Color 13
6	Color 5	6	Color 12 / Air Purge 1
7	Color 6	7	Color 11
8	Color 7	8	Color 10
9	Color 8	9	Color 9

IS Control Module 8			
Solenoid	Valve	Solenoid	Valve
1	Color Solvent (Gun 2)	1	Catalyst Solvent (Gun 2)
2	Color 17	2	Catalyst 5 / Color 32
3	Color 18	3	Catalyst 6 / Color 31
4	Color 19	4	Catalyst 7 / Color 30
5	Color 20	5	Catalyst 8 / Color 29
6	Color 21	6	Color 28 / Air Purge 2
7	Color 22	7	Color 27
8	Color 23	8	Color 26
9	Color 24	9	Color 25

Installation

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

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

Mounting the Control Modules

1. See [Dimensions, page 87](#).
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 air inlet fitting (317) of each color change control module in the non-hazardous area and each remote module in the hazardous area. 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).

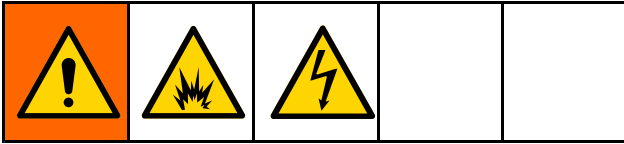
Grounding

<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>				

Intrinsically safe remote color change modules located in the hazardous area must be connected to a true earth ground in the hazardous area.

Hazardous Location

Connect Remote Color Change Control Module



NOTE: IS color change control modules provide control for remote color/catalyst change valves located in the hazardous location for use with automatic spray systems. A maximum of two IS control modules may be installed in the hazardous location. See [IS Color Change Control Modules, page 79](#) for a list of modules approved for installation in a hazardous location.

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.

Only approved cables may be used in the hazardous location. Hazardous location cables are marked with a light blue flag next to each connector. See [Optional Cables and Modules, page 52](#) for a list of M12 CAN cables for use in a hazardous area.

1. Remove electrical power from the system.
2. Mount the first remote color change control module as described in [Mounting the Control Modules, page 21](#).

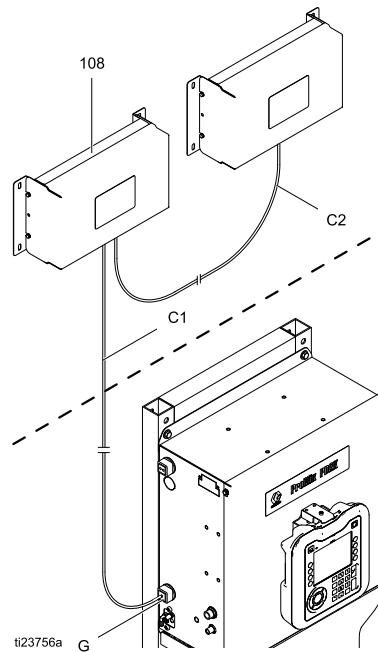


Figure 2 Intrinsically Safe Cable Connections

3. Connect the hazardous location cable (C1) to J7 on the remote color control module (108).

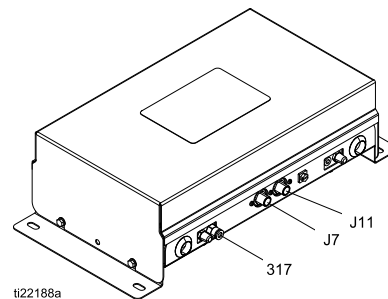


Figure 3 Cable Connectors J7 and J11 at IS Color Control Module

4. Remove the cover from the PD2K electrical control box. Install the grommet (G) on the supplied cable (C1) and secure the grommet to the side of the electrical control box. Locate J4 on the IS side of the isolation board in the electrical control box. Connect the cable (C1) to J4. See [Electrical Schematics, page 40](#).

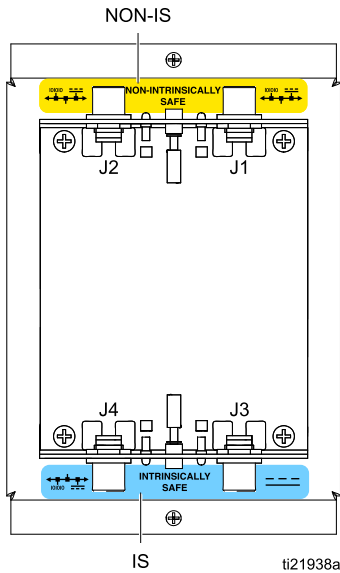
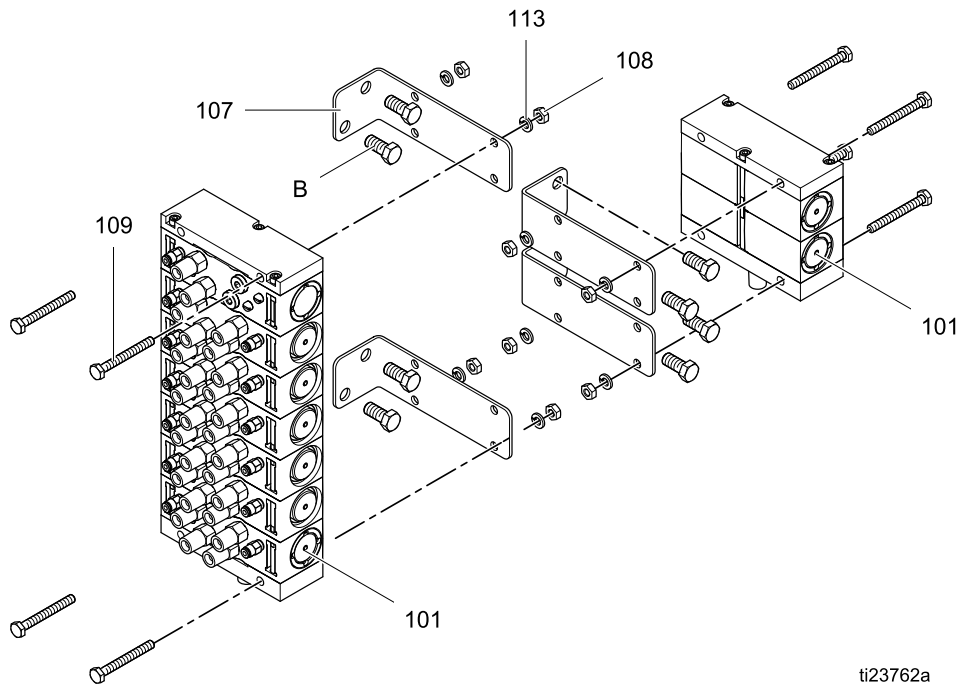


Figure 4 Detail of Isolation Board Cable Connections

Install the Remote Valve Manifolds

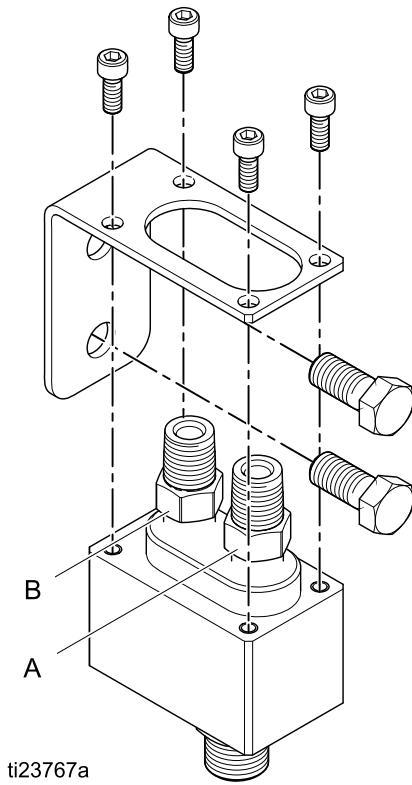
1. Using the equipment as a template, mark the mounting holes on the wall at a convenient height for the operator and so the equipment is easily accessible for maintenance. Mount the remote valve manifolds near the remote color module and the automatic dispensing device.
2. Install the mounting brackets for the color valve manifolds and the catalyst valve manifolds. See [Dimensions, page 87](#). Use bolts to attach the equipment securely.
3. Install the color and catalyst valve manifolds to the brackets with four screws, washers, and nuts.
4. Connect the air lines from the solenoids to the valves. See [Connect the Valve Air Lines, page 24](#).
5. Connect the fluid supply lines to the valves. See [Connect the Fluid Lines, page 27](#).

5. If your system includes a second remote color control module mount it as described in [Mounting the Control Modules, page 21](#). Connect the supplied hazardous location cable (C2) from J11 on the **first** color control module to J7 on the **second** module.
6. Replace the cover of the PD2K electrical control box before turning on power to the system.



Install the Remote Mix Manifold

1. Using the equipment as a template, mark the mounting holes on the wall or robot arm, near the automatic dispensing device.
2. Install the remote mix manifold. See [Dimensions, page 87](#). Use two bolts to attach the equipment securely.
3. Install the remote mix manifold to the bracket with four screws.
4. Connect the fluid supply lines to the remote mix valve. See [Connect the Fluid Lines, page 27](#).

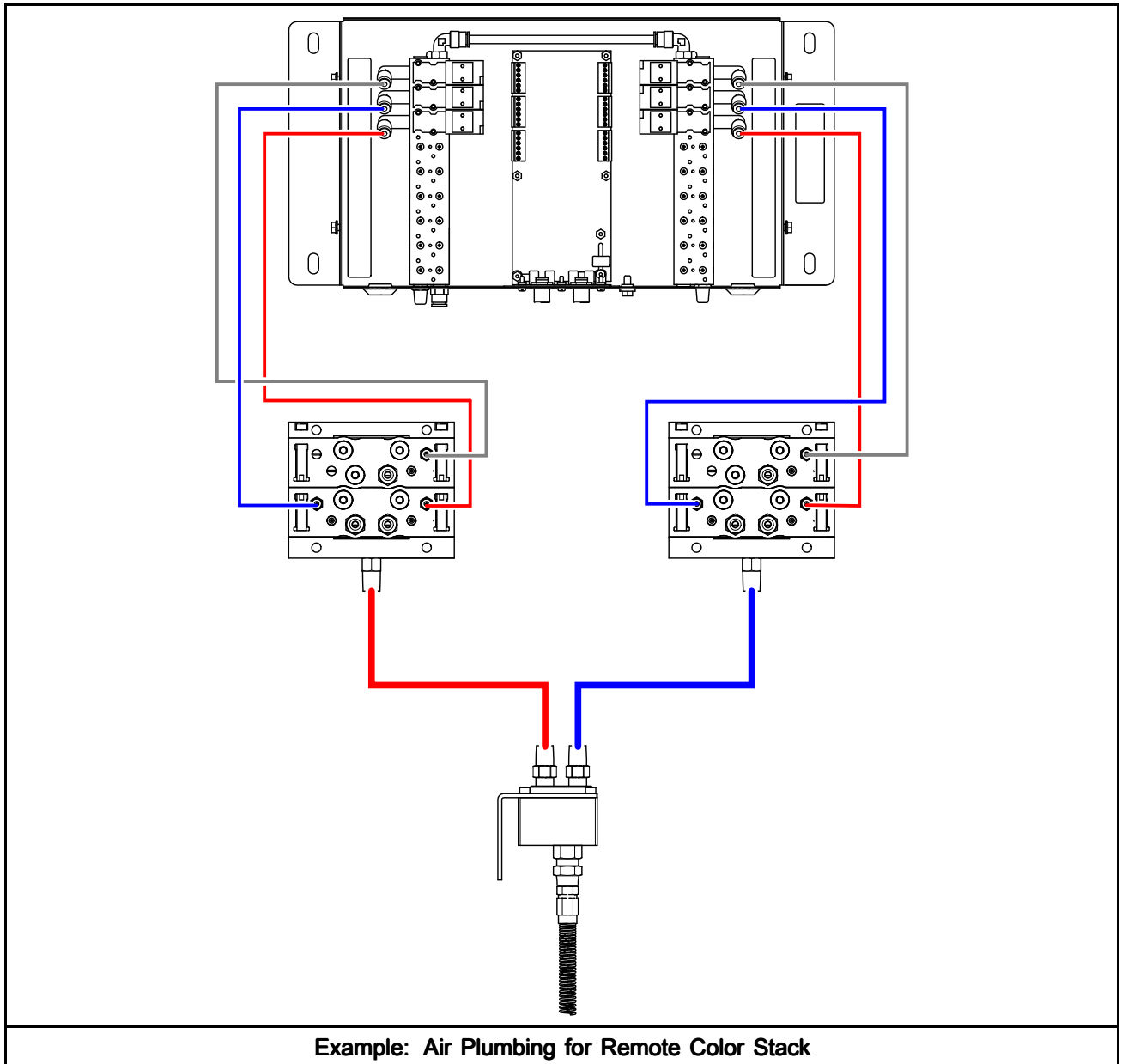


Connect the Valve Air Lines

Hazardous Area

Connect 5/32 in (4 mm) OD air tubes from the solenoids to the air inlet of each valve, using the labels inside of the remote color control module as a guide. See [Setup the Modules, page 15](#).

The figure on the following page is an example of possible air line configurations.



Example: Air Plumbing for Remote Color Stack

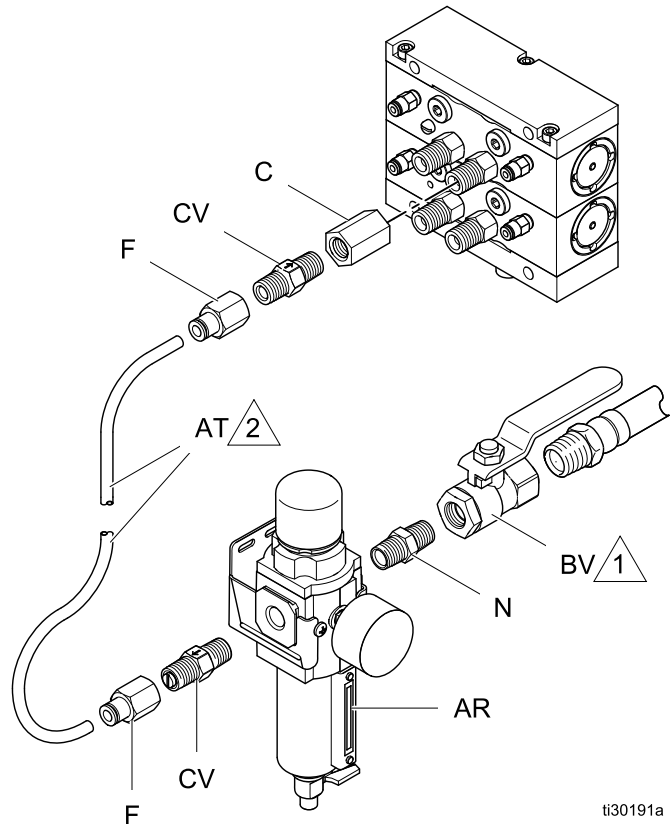
Connect the Air Purge Valve

1. Install check valve (CV) at the outlet of the air regulator (AR), then connect tube fitting (F) to the inlet of the check valve.
2. Connect coupler (C) to the inlet of the air purge valve fitting at the manifold. Connect check valve (CV) to the coupler, then connect tube fitting (F) at the outlet of the check valve.
3. Install the bleed-type air shutoff valve (BV) to the inlet of the air regulator, using nipple (N).
4. Connect the air tube (AT) between the two fittings (F) and attach the Caution tag.

NOTICE

Use a separate purge air supply line for the air purge valve (APV). Do not connect the air purge valve to the unit's main air supply or to the air manifold, to avoid contaminating the solenoids, air logic lines, or unit's main air supply with fluid if the air purge valve (APV) and check valve (CV) fail.

Do not shorten the 25 ft (7.6 m) 1/4 in. (6 mm) OD purge air tubing (AT). Check daily for any visible solvent accumulation. Notify your supervisor if solvent is present.



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Install a bleed-type air shutoff valve here.



Purge air line (AT) must be a separate air supply, connected to the check valve (CV). Do not connect the purge air line to the unit's main air supply or to the air manifold.

Connect the Fluid Lines

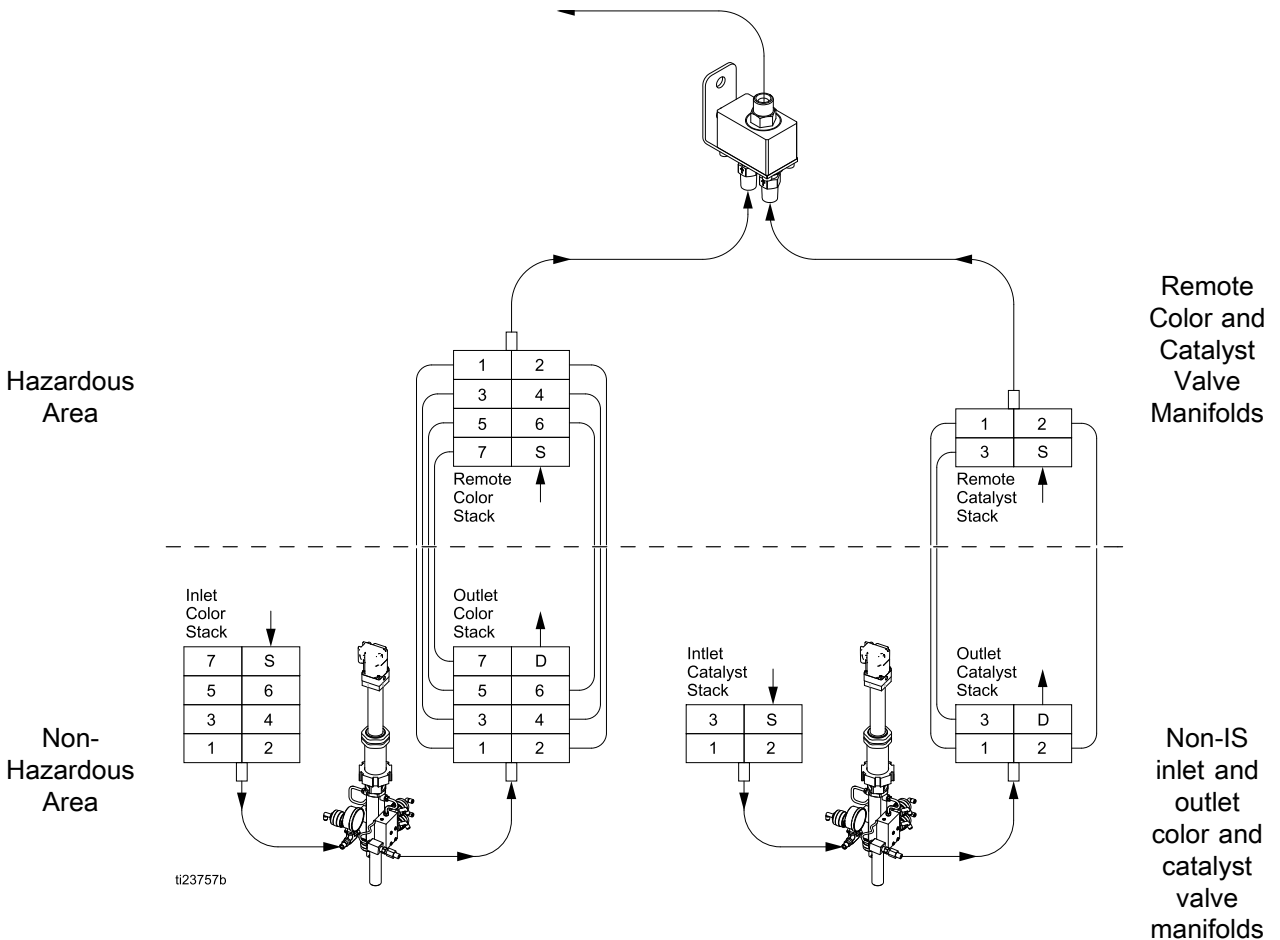
Connect Non-Circulating Fluid Lines

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

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.



Valve Manifold Stack Schematic

Installation

6. Connect a dedicated 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 each line to the corresponding color valve fitting on the remote color stack.
7. Connect a supply line from the outlet valve on the bottom of the remote color valve stack to inlet A on the remote mix manifold.
8. Connect the supply line for each catalyst to the corresponding catalyst valve fitting on the **inlet** catalyst valve stack.
9. Connect a supply line from the bottom fitting of the **inlet** catalyst valve stack to the **inlet** manifold of the material B dosing pump.
10. Connect a supply line from the **outlet** manifold of the material B dosing pump to the bottom fitting of the **outlet** catalyst valve stack.
11. Connect a dedicated supply line for each catalyst to the corresponding catalyst valve fitting on the **outlet** catalyst valve stack. Connect the other end of each line to the corresponding catalyst valve fitting on the remote catalyst valve stack.

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.

12. Connect a supply line from the outlet valve of the remote catalyst valve stack to inlet B on the remote mix manifold.

13. Connect the static mixer to the outlet valve of the remote mix manifold.
14. Connect a fluid line from the static mixer to the automatic dispense device.

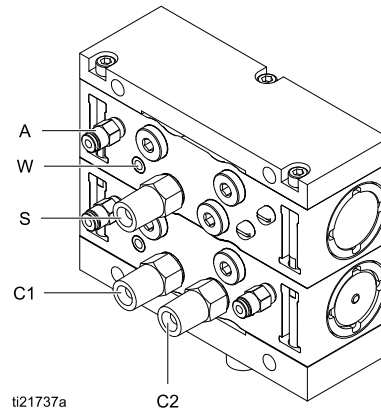
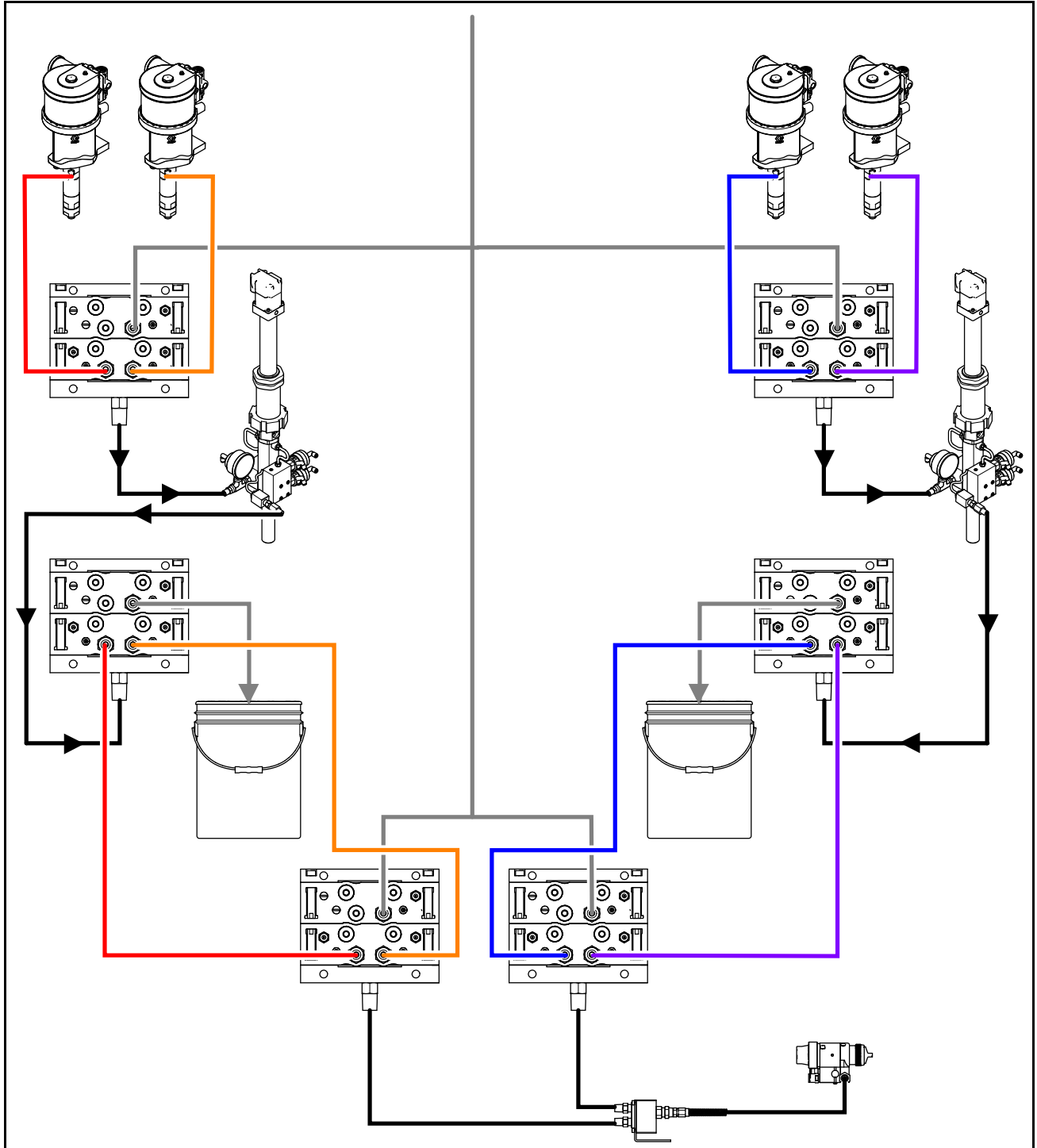


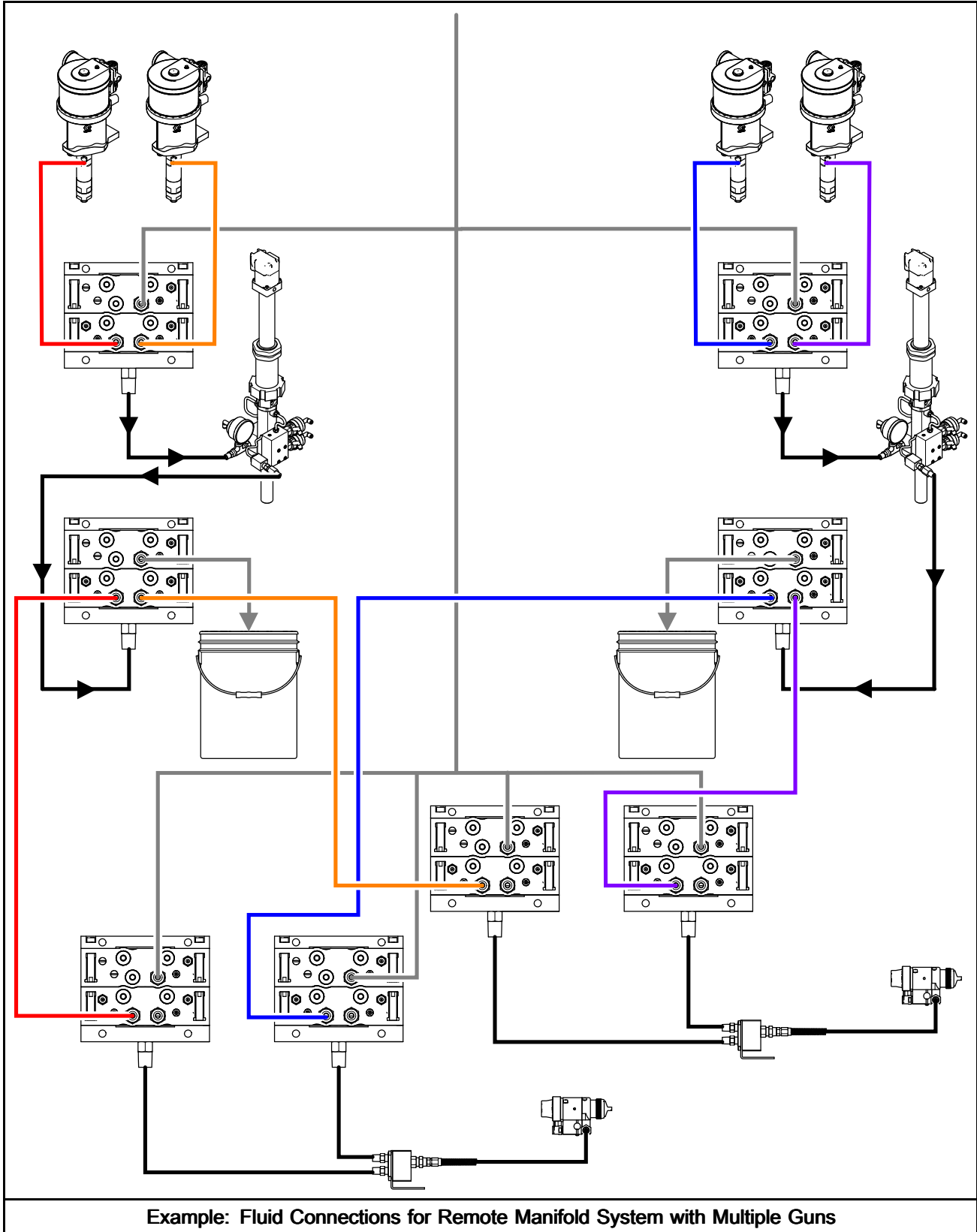
Figure 5 Color Change Connections (Non-Circulating System)

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

The figures on the following pages are examples of possible fluid line configurations.



Example: Fluid Connections for Remote Manifold without Circulation



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 to the remote color valve, through a circulation line, 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 remote color valve stack and mix manifold, as in normal operation.

NOTE: On circulating systems, install a cap (T) on any unused valve fittings.

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

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. Connect a dedicated fluid supply line for each color to the corresponding color valve

(C1, C2, etc.) on the **outlet** color valve stack. Connect the other end of each line to the corresponding color valve on the remote color stack.

- c. Connect a 1/4 npt(f) circulation line from the circulation port on each remote valve back to the fluid supply container.

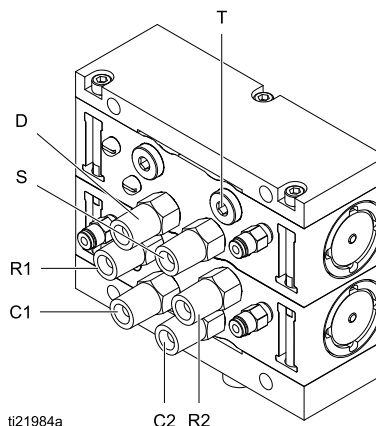
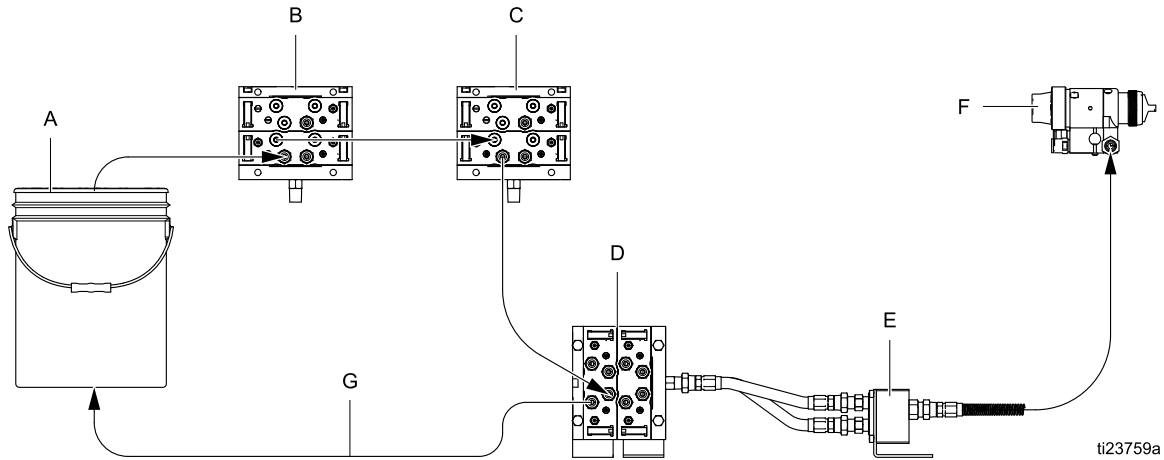


Figure 6 Valve Manifold Connections (Circulating System)

KEY

- D Dump valve fitting
- S Solvent fitting
- C1 Color 1 fitting
- C2 Color 2 fitting
- R1 Color 1 circulation fitting
- R2 Color 2 circulation fitting

Installation

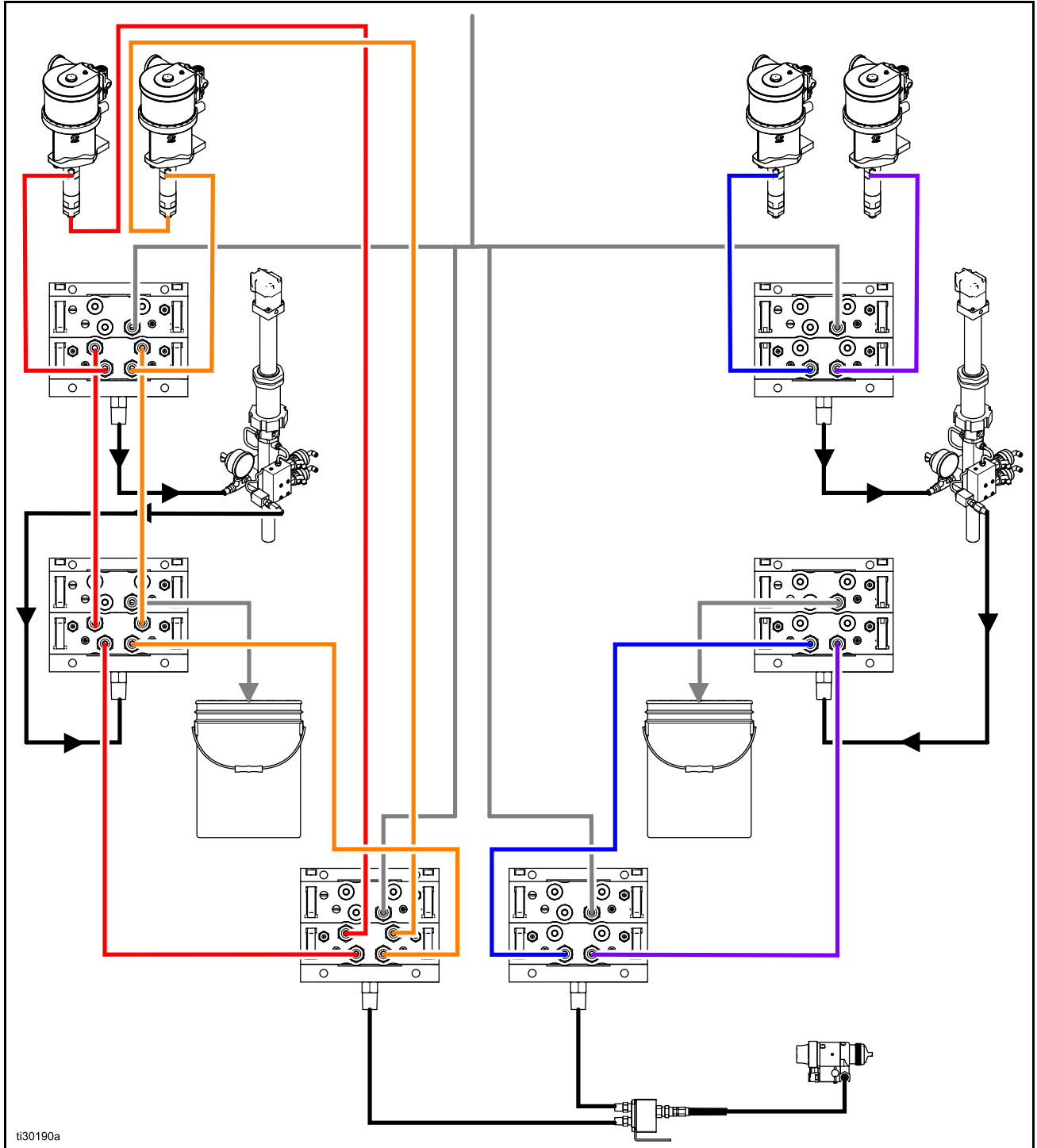


Fluid Flow Schematic Diagram in Circulating Mode (Pump Not Shown for Clarity)

KEY

- A Color supply
- B Inlet color stack
- C Outlet color stack
- D Remote color stack
- E Remote mix manifold
- F Automatic spray gun
- G Return line to fluid supply

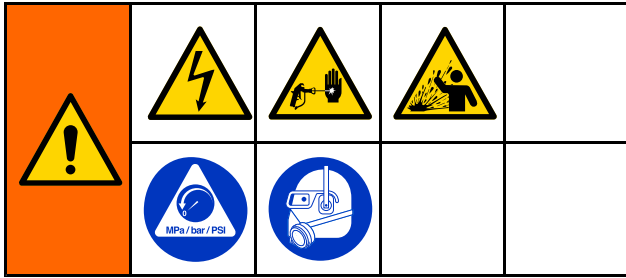
The figure on the following page is an example of possible fluid line configurations for a circulation system.



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Example: Fluid Connections for Remote Manifold with Circulation

Install an Expansion Kit



Expansion Kits are available to add valves or manifolds to your system. For each additional color/catalyst desired, order a Non-IS Expansion Kit and a corresponding IS Expansion Kit. See [Expansion Kits, page 83](#) for available kits.

NOTE: Remember that you may need up to 6 Non-IS control modules and up to 2 IS control modules.

Follow Steps 1–7 to install solenoids, manifolds, and valves, first in the Non-IS area, and then in the IS area.

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 [Setup the Modules, page 15](#). 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 53](#).
 - 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 53](#). 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 53](#).
7. Install the o-ring(s) (12) and fluid fitting(s) (13).
8. For each color/catalyst, connect fluid lines from the source to the input color/catalyst stack. Then, connect fluid lines from each output valve to the corresponding remote color change valve. Install the air fitting(s) (14).
9. Connect the tubing from the solenoid valve(s) (see step 3) to the fitting(s) in both the IS and Non-IS areas.
10. Install the control module covers.
11. Return the unit to service.

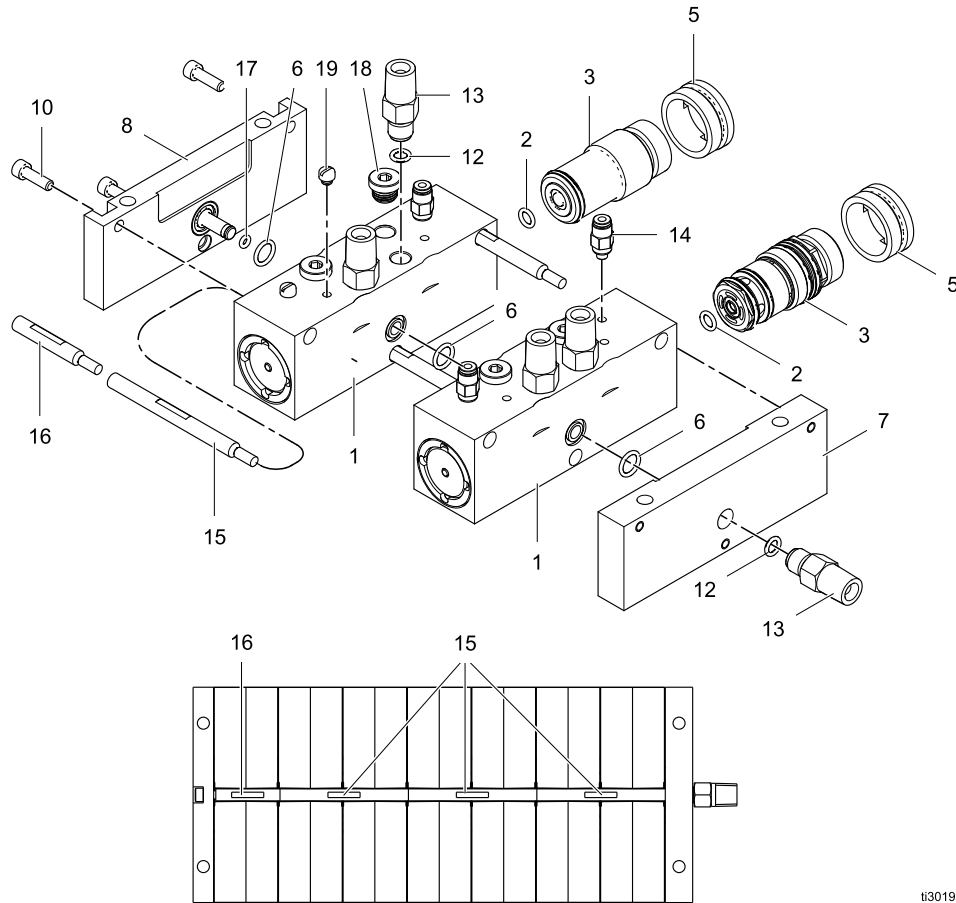
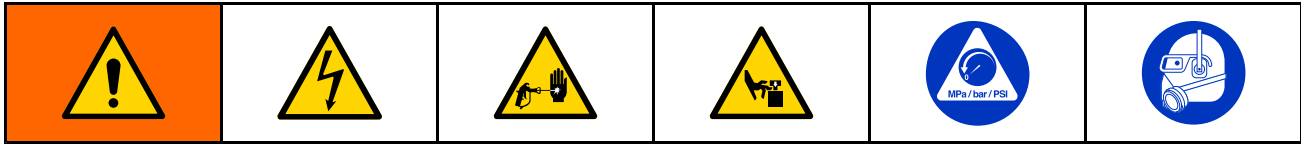


Figure 7 Install an Expansion Kit (Low Pressure Valve Manifold Shown)

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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 (ADM). See “Maintenance Screen 5” in Operations Manuals 332562, 332564, 3A4186, or 3A4486.

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 Color Change Board, page 38. 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"> • In a non-hazardous location, replace the solenoid if voltage is 24 Vdc. • In a hazardous location, replace the solenoid if voltage is between 9–15 Vdc. <p>Test the valves as explained under Maintenance Screen 5 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"> • Air pressure to the valve actuators is too low. See Cause 1. • Solenoid is clogged. Make sure the air supply has a 5 micron filter installed. • 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.

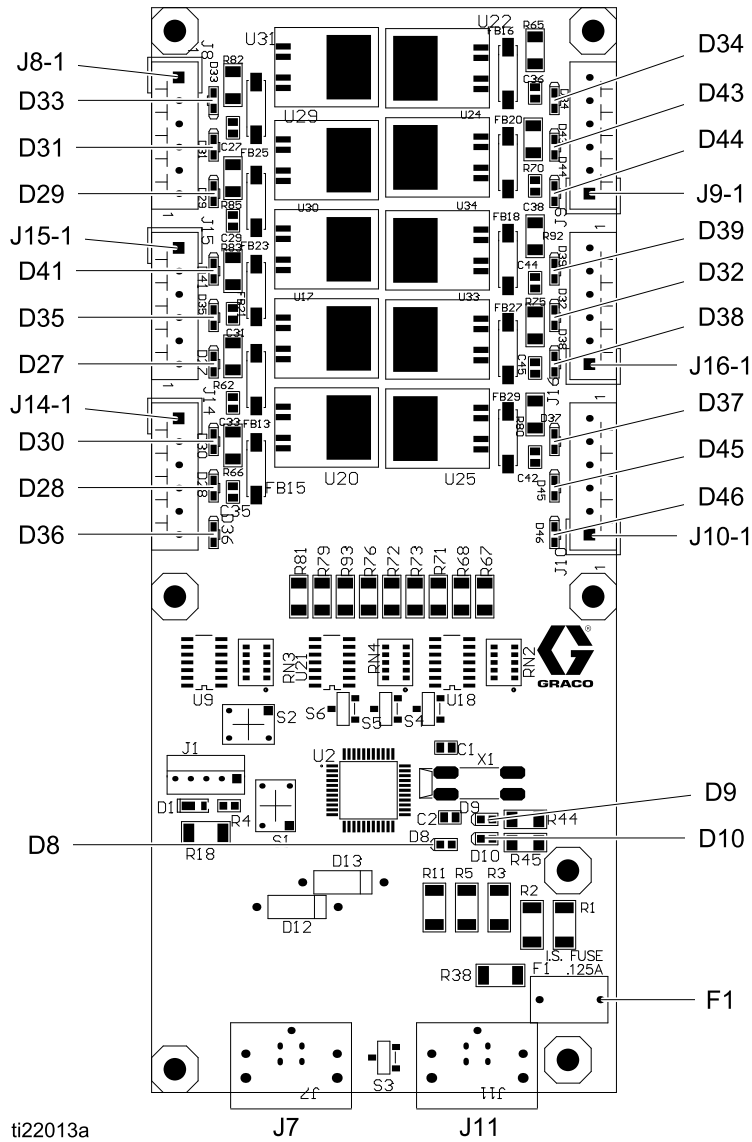
Cause	Solution
<p>4. Control board or cable failure.</p>	<p>If there is no voltage across the pins on the board or it is less than 9 Vdc, check LEDs D8, D9, and D10. If they are lit and functioning properly, or other solenoids in the module are working properly, replace the color change board.</p> <p>If D9 is not lit:</p> <ul style="list-style-type: none"> • Verify the condition of the fuse (F1) and replace if necessary. See Replace the Color Change Board Fuse, page 54. • Check if the cable is disconnected or damaged. • Check the isolation board. See the PD2K Repair-Parts manual. <p>If D8 is not blinking:</p> <ul style="list-style-type: none"> • Cycle the system power. • Check if the cable is disconnected or damaged. • Check the isolation board. See the PD2K Repair-Parts manual. <p>If D10 is not occasionally blinking:</p> <ul style="list-style-type: none"> • Check if the cable is disconnected or damaged. • Check the isolation board. See the PD2K Repair-Parts manual.

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.



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Figure 8 Color Change Board

Color Change Board Diagnostics

ID	Component or Indicator	Function
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 17M730 board.
	Fuse, 0.500 A, 125 V	Protects board from over current. Used on the 25D312 board used in modules 25D313 - 25D327. See Custom Valve Mapping Color Change Kits in Intrinsically Safe Modules .

Electrical Schematics

Standard Models (MC1000, MC2000, MC3000, MC4000, AC1000, AC2000)

NOTE: The electrical schematic illustrates all possible wiring expansions in a standard model ProMix PD2K system. Some components shown are not included with all systems.

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

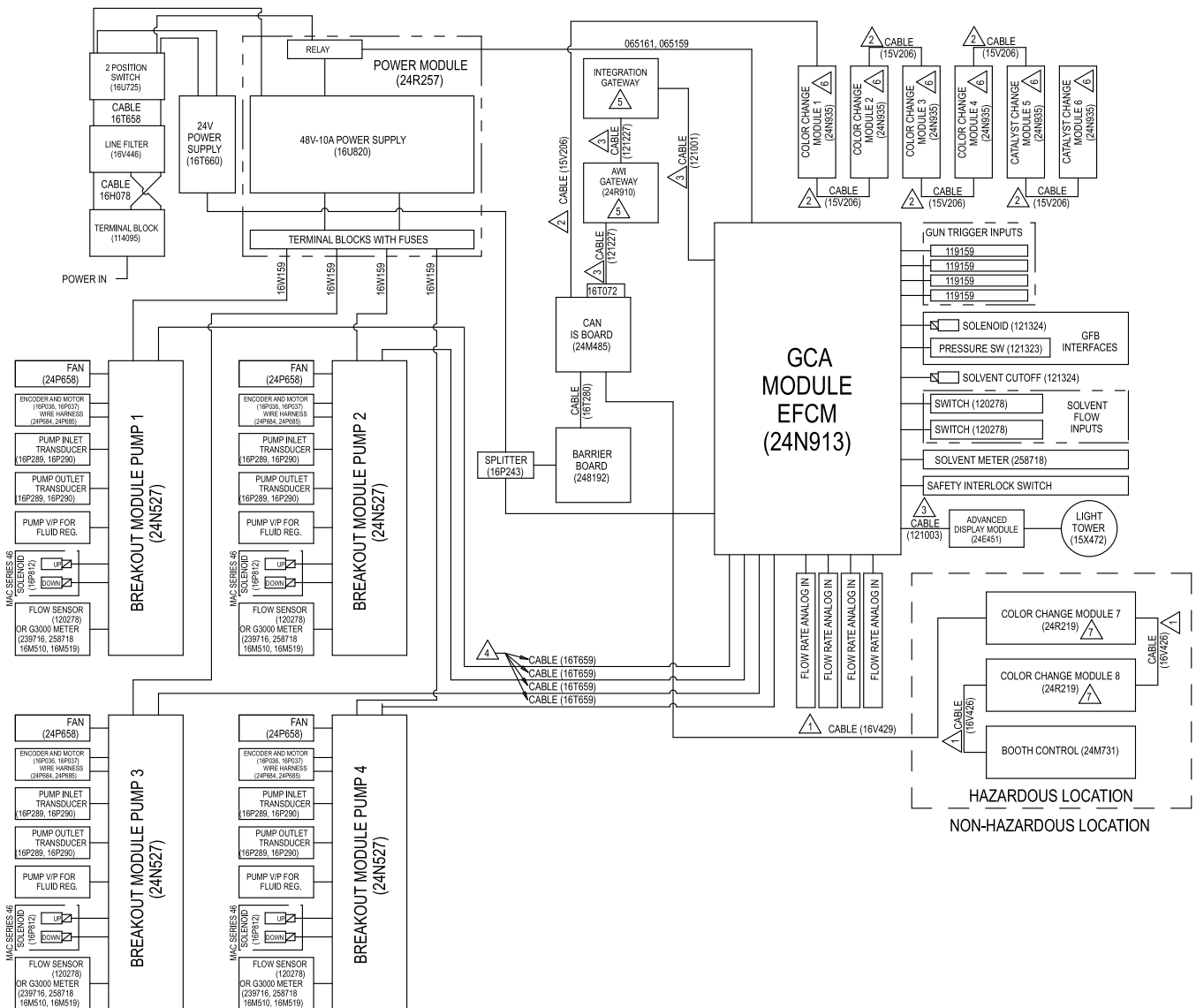


Figure 9 Electrical Schematic, Sheet 1

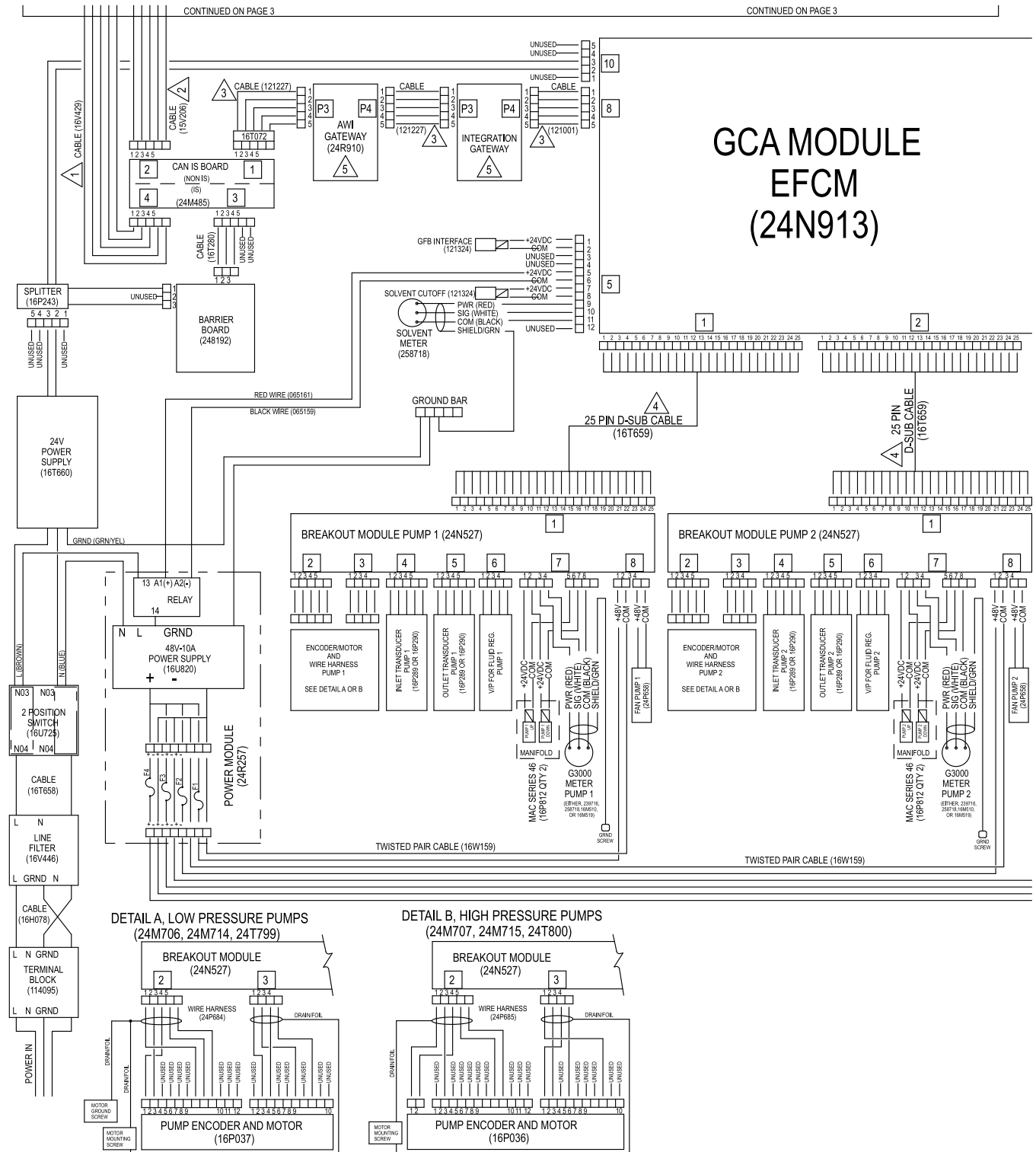


Figure 10 Electrical Schematic, Sheet 2, Part 1

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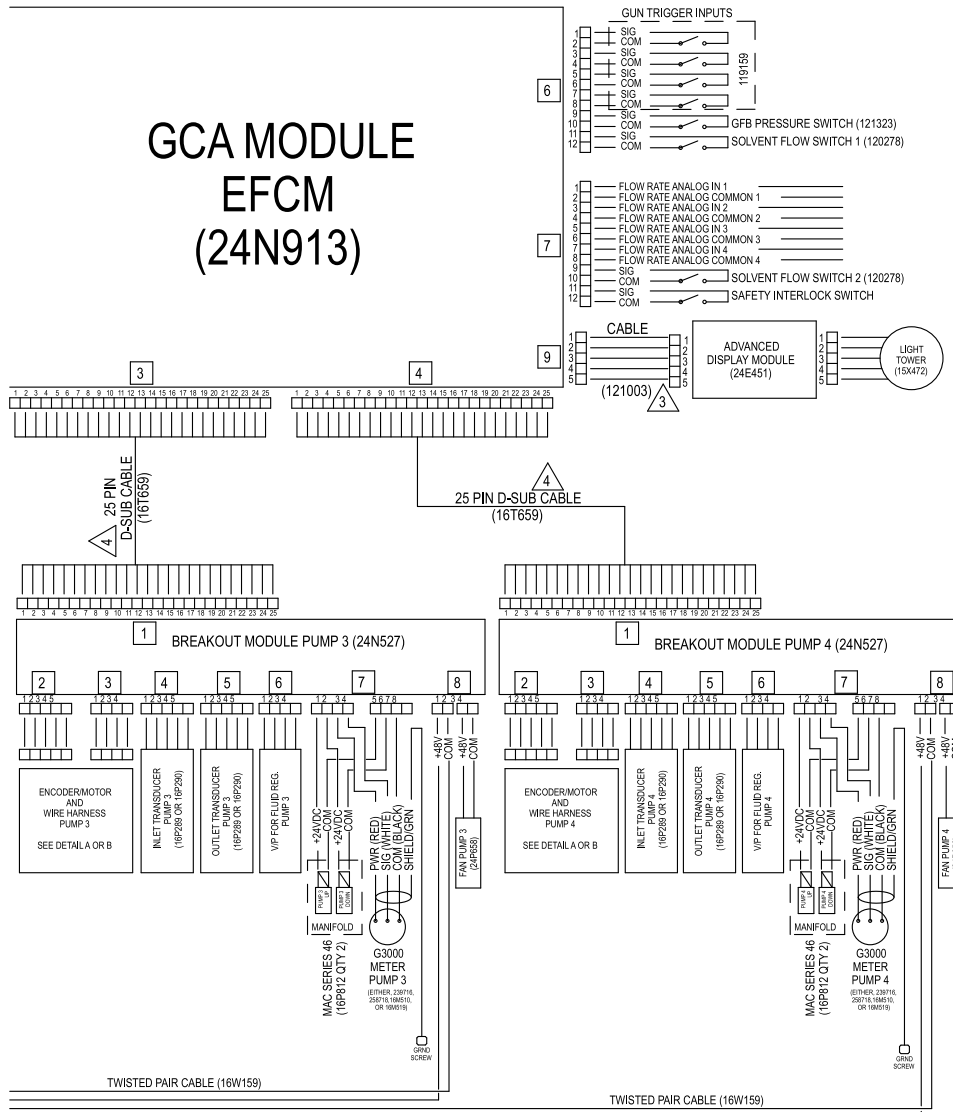


Figure 11 Electrical Schematic, Sheet 2, Part 2

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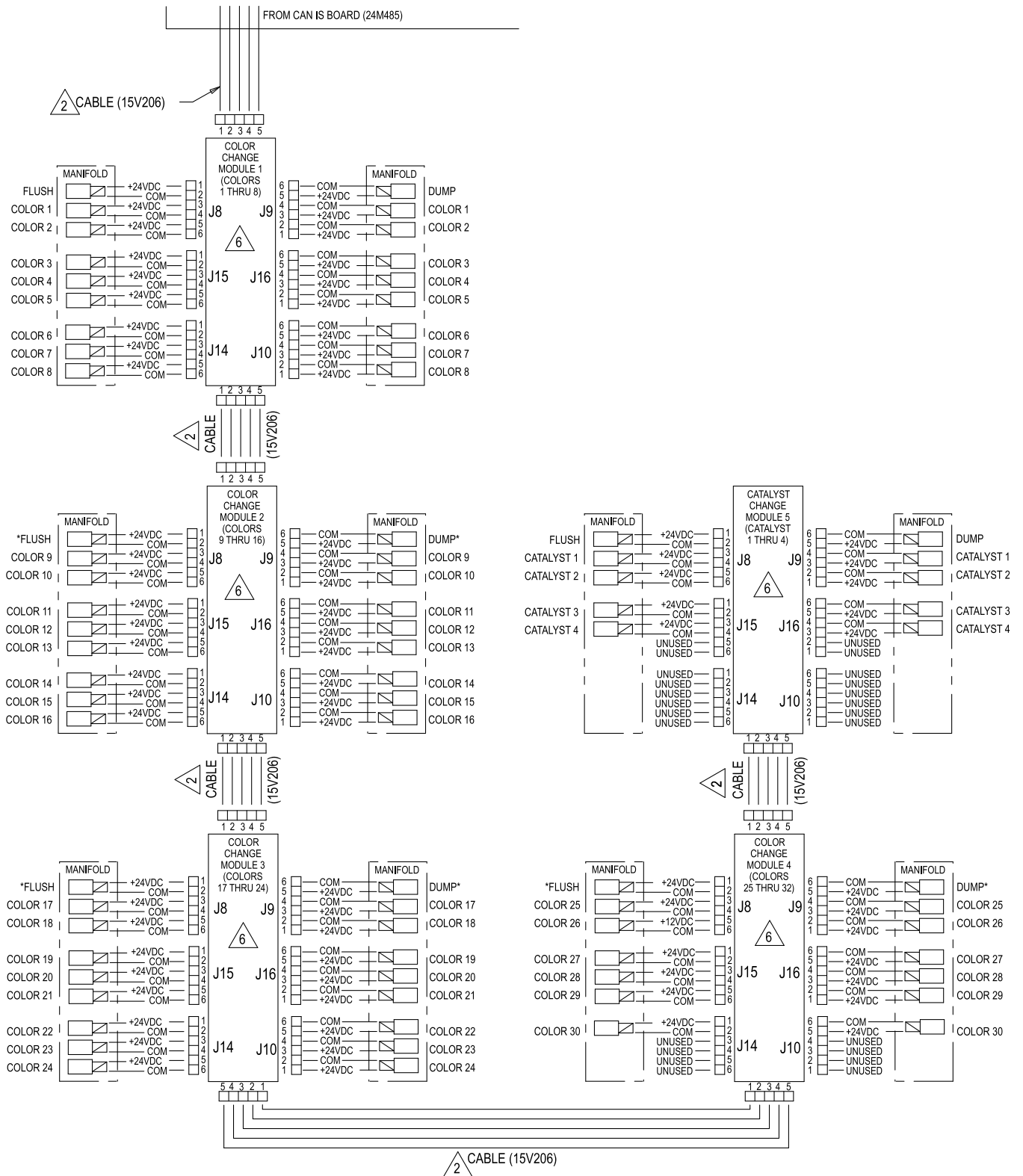
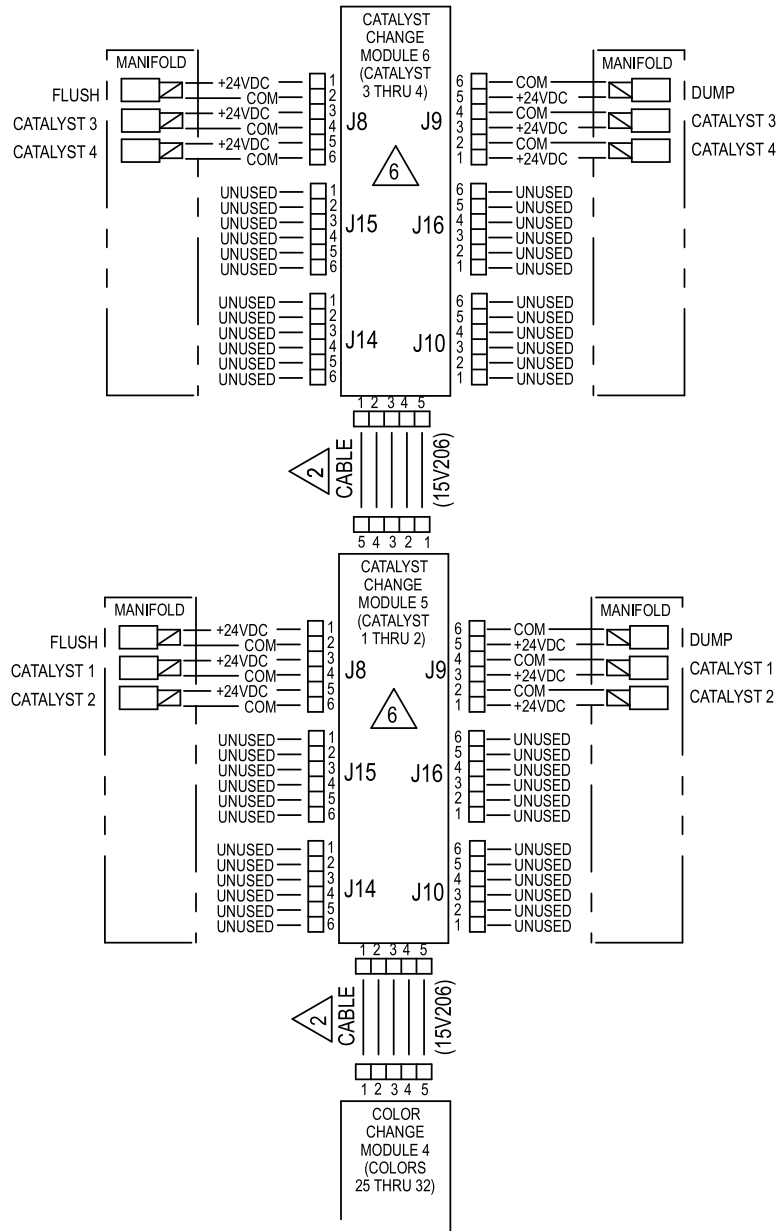


Figure 12 Electrical Schematic, Sheet 3

* May be unused in some configurations.

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ALTERNATE CONFIGURATION FOR CATALYST CHANGE CONTROL

Figure 13 Electrical Schematic, Sheet 3, Alternate Configuration for Catalyst Change Control

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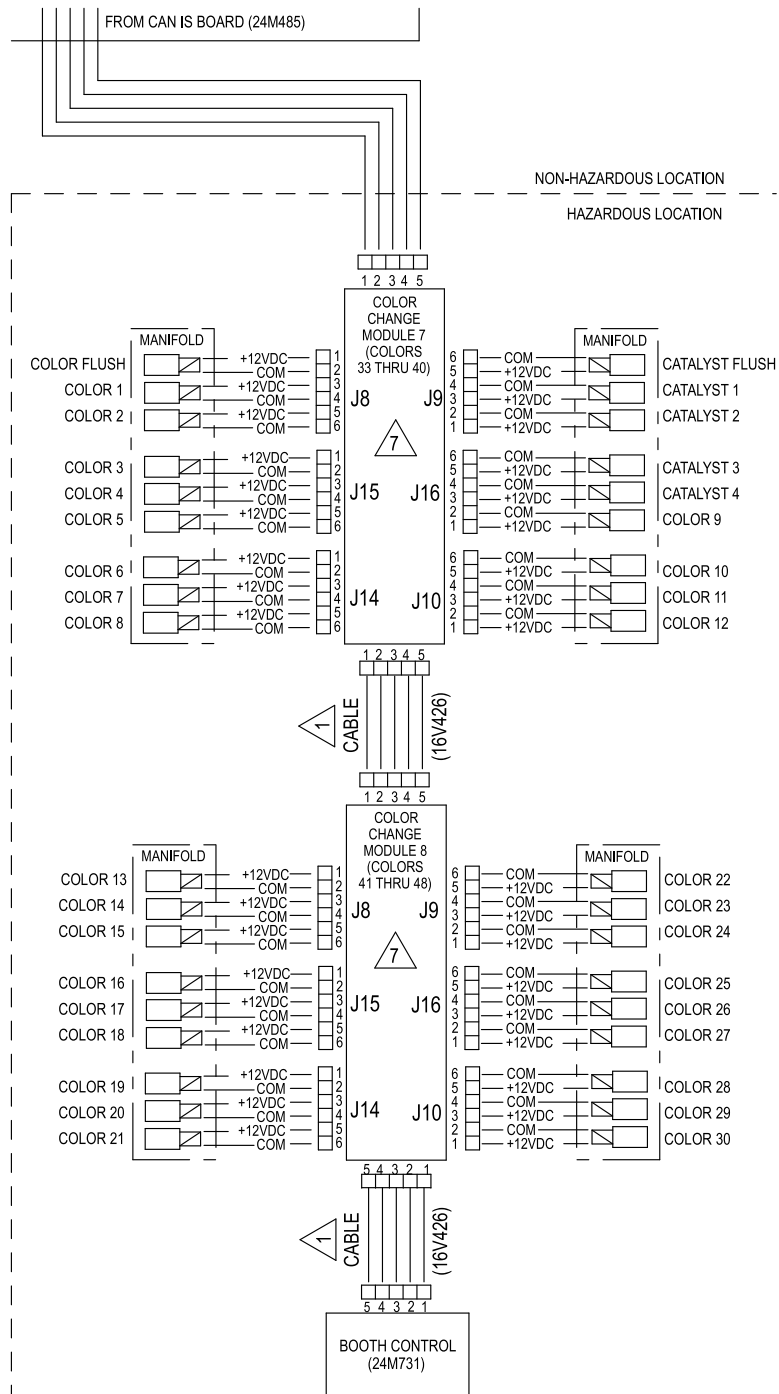


Figure 14 Electrical Schematic, Sheet 3, Hazardous Location

Dual Panel Models (MC1002, MC2002, MC3002, MC4002, AC1002, AC2002)

NOTE:The electrical schematic illustrates all possible wiring expansions in a dual panel model ProMix PD2K system. Some components shown are not included with all systems.

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

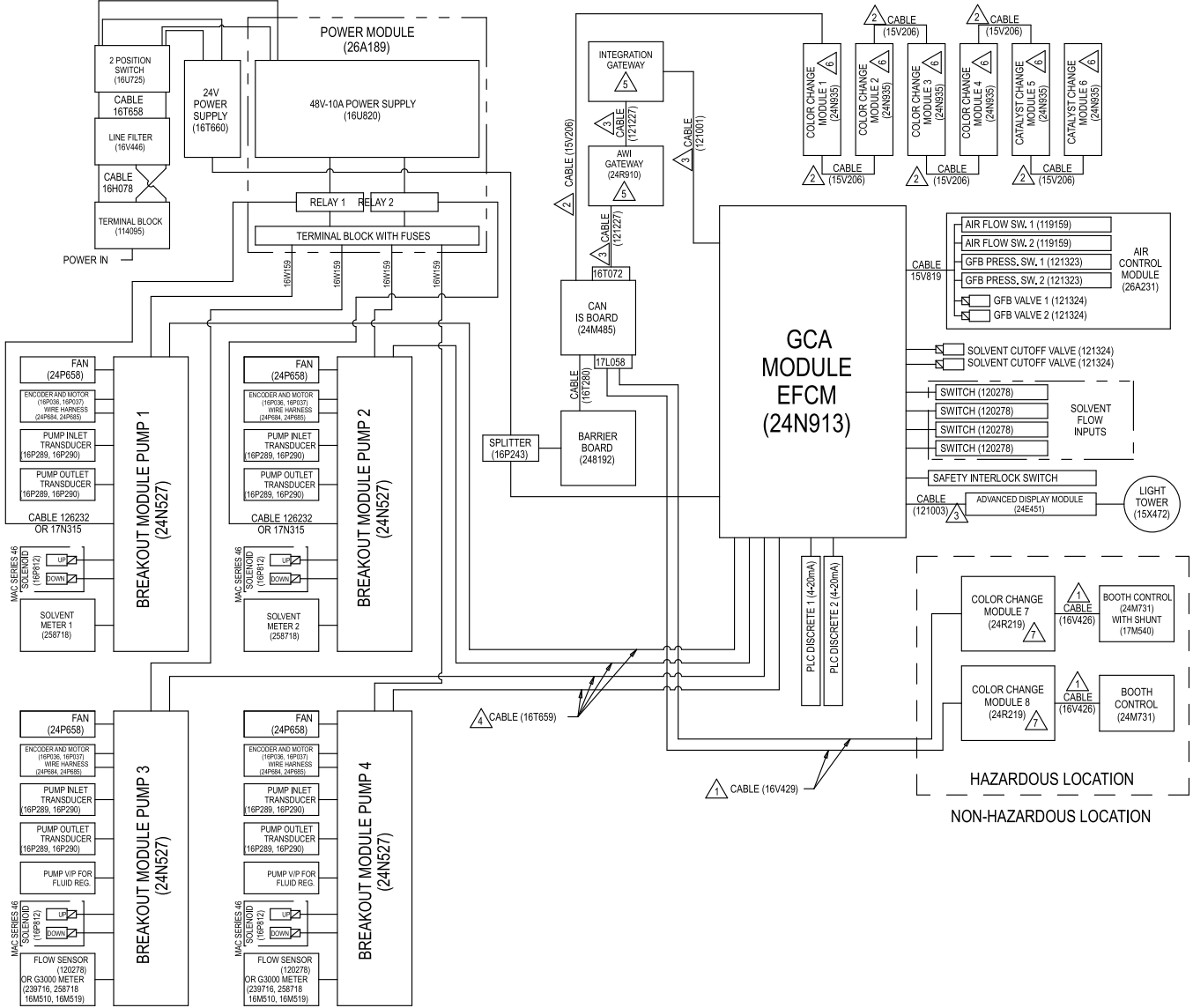


Figure 15 Electrical Schematic, Sheet 1

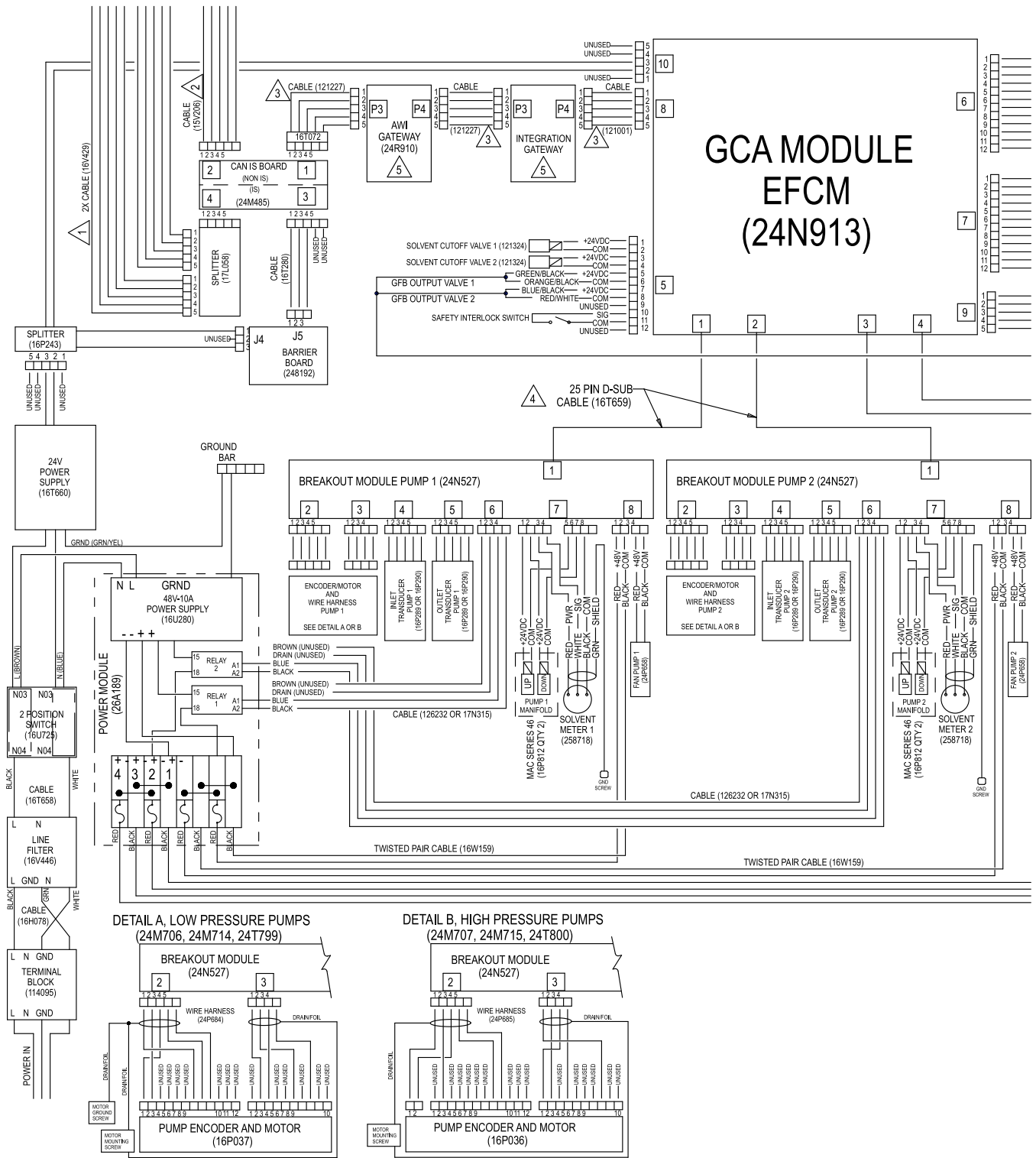


Figure 16 Electrical Schematic, Sheet 2, Part 1

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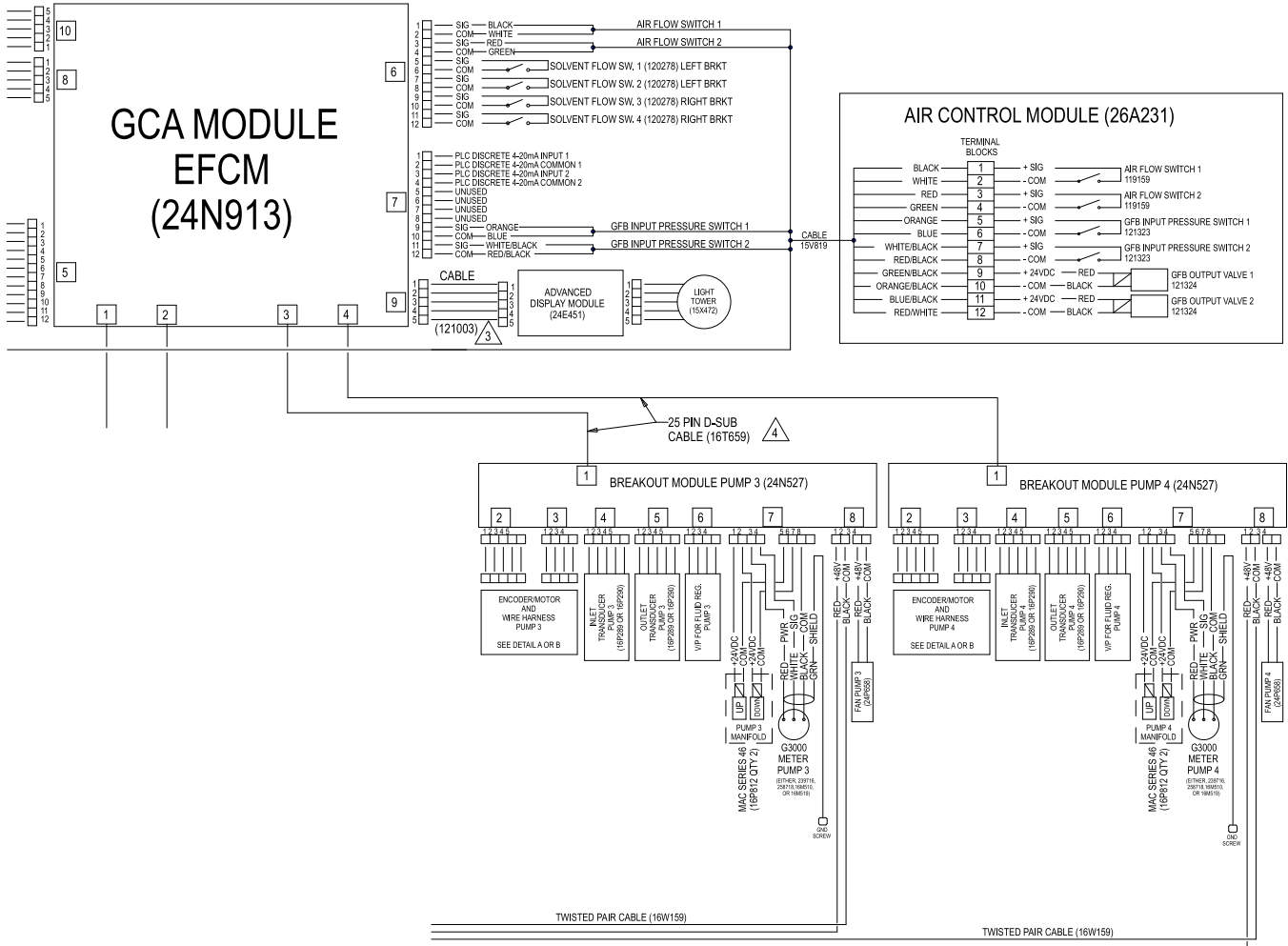


Figure 17 Electrical Schematic, Sheet 2, Part 2

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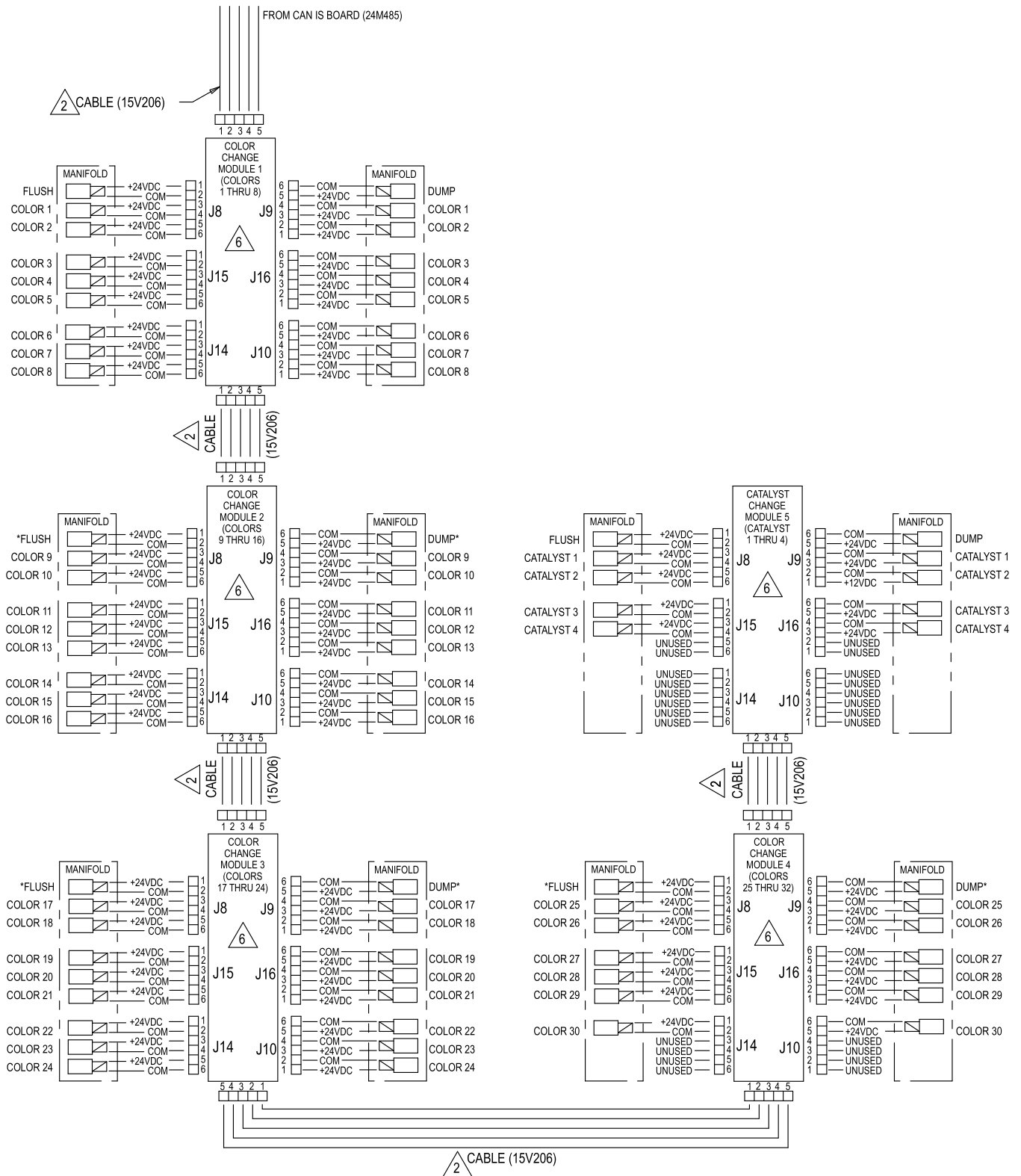


Figure 18 Electrical Schematic, Sheet 3, Part 1

* May be unused in some configurations.

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Electrical Schematics

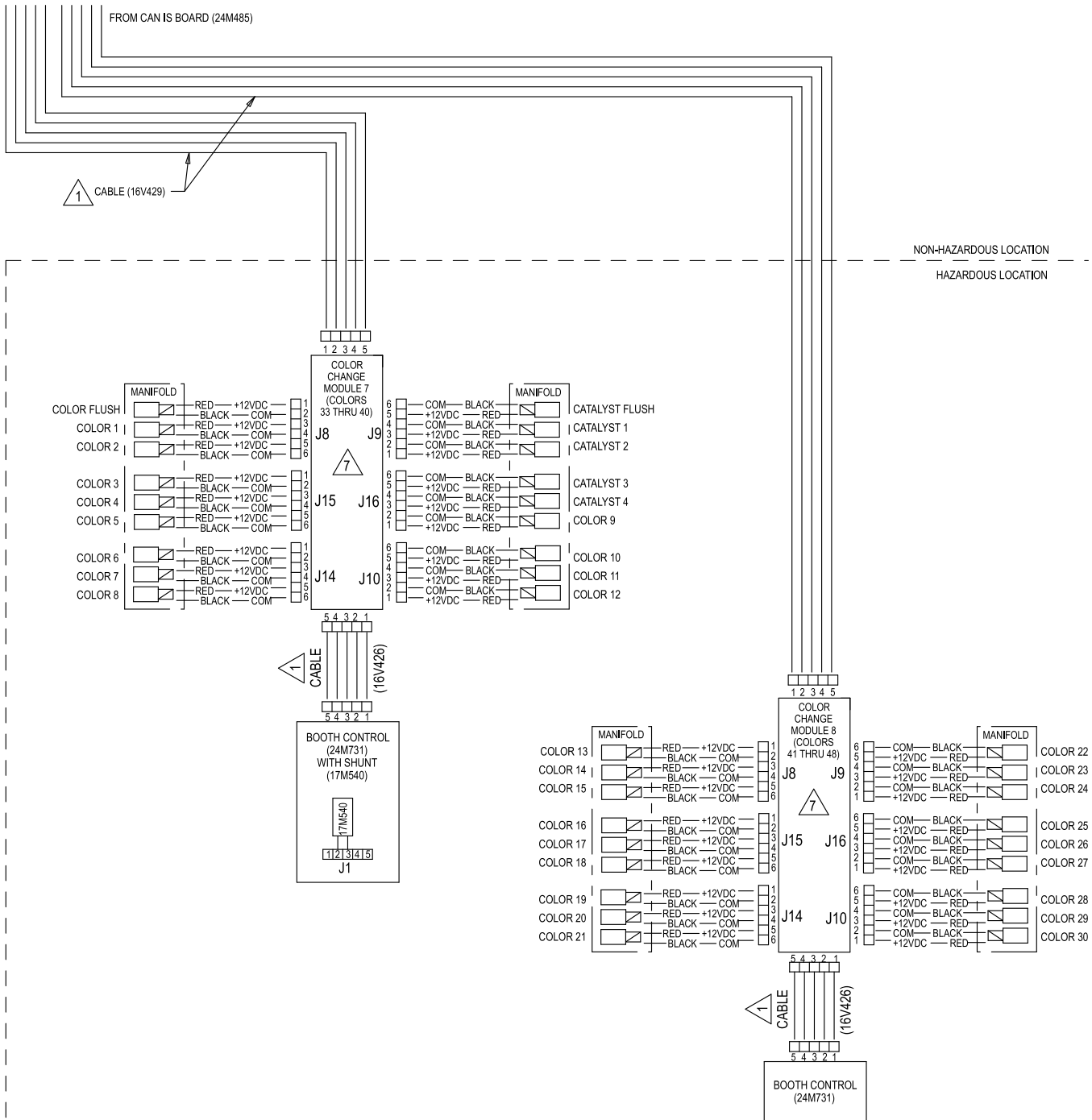
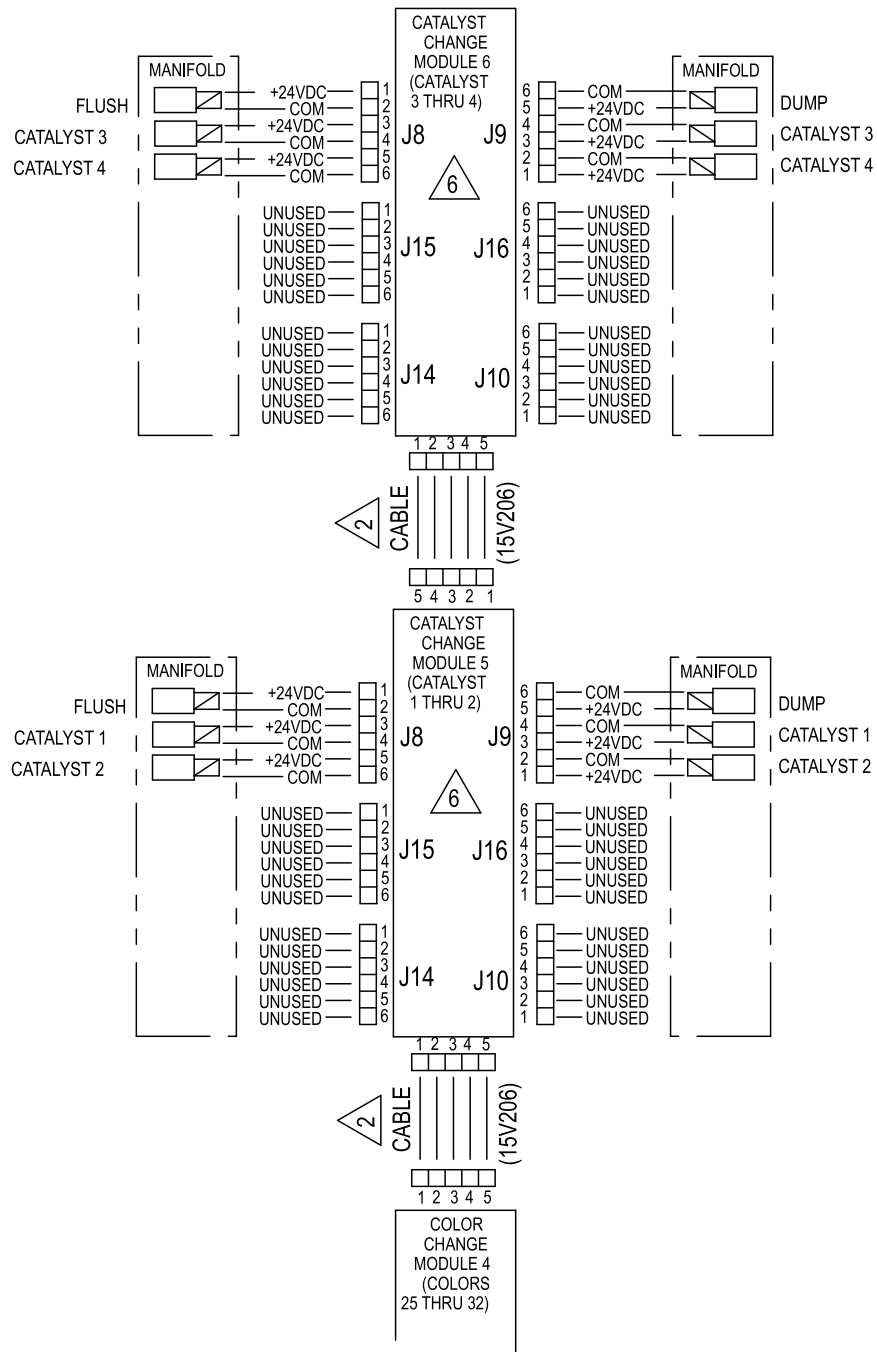


Figure 19 Electrical Schematic, Sheet 3, Part 2

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




ALTERNATE CONFIGURATION
FOR CATALYST CHANGE CONTROL
IN NON-HAZARDOUS LOCATION


Figure 20 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](#).




 M12 CAN Cables, for Hazardous Locations	
NOTE: 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)
 M12 CAN Cables, for Non-Hazardous Locations Only	
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)
 CAN Cables, for Non-Hazardous Locations Only	
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)

 25 Pin D-SUB Cables, for Non-Hazardous Locations Only	
16T659	2.5 (0.8)
16V659	6.0 (1.8)

 Communication Module for integration with a PLC, Non-Hazardous Locations Only	
Module Part No.	Module Part No.
CGMDN0*, DeviceNet	CGMPN0*, Profinet
CGMEP0*, Ethernet IP	24W462*, Modbus TCP
* You must purchase CGM Installation Kit 24W829 for use with these devices.	

 Alternates for Color Change Modules by Part Number (Factory Configuration), for Non-Hazardous Locations Only, see page 61	
Module Part No.	Description
24T557	2 color/2 catalyst
24T558	4 color/4 catalyst
24T559	6 color/6 catalyst
24T560	8 color/8 catalyst
 Alternates for Color Change Modules by Part Number (Factory Configuration), for Hazardous Locations Only, see page 62	
24T571	2 color/2 catalyst
24T572	4 color/2 catalyst
24T573	6 color/2 catalyst
24T574	8 color/2 catalyst, 13–24 color
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, 13–30 color
24T779	13–18 color

Repair

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

NOTICE

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

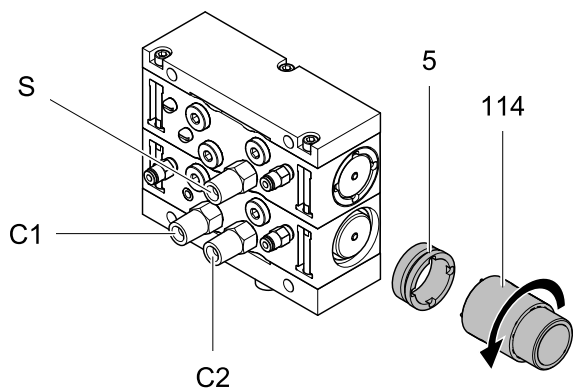
To avoid electrical component damage, remove all system power before plugging any connectors.

Replace a Color Valve

Use the following procedure to replace a valve, whether the valve is part of the color stacks near the pump or part of the remote color stacks.

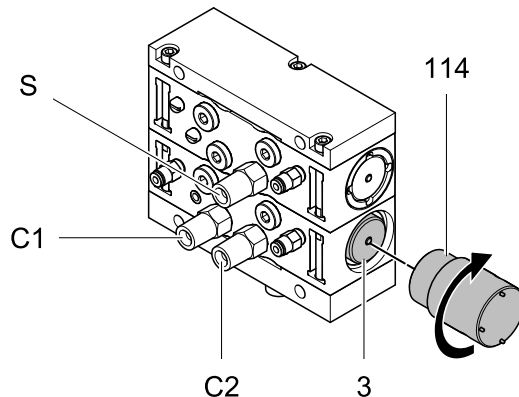


1. Flush and relieve pressure as described in your PD2K operation manual.
2. Engage the pins of the tool (114) with the notches in the retainer (5) and unscrew the retainer.



ti22080b
Figure 21 Remove Retainer

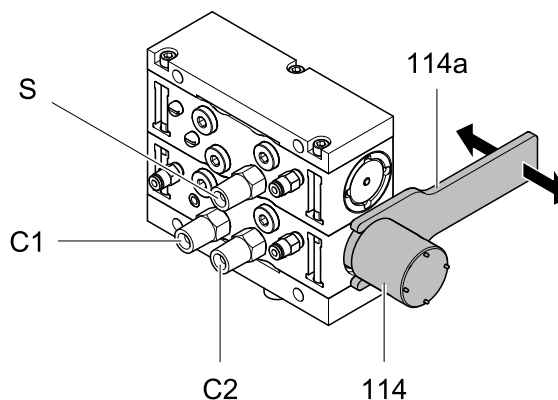
3. Using the other end of the tool (114), screw it onto the valve (3). Leave a gap to allow the tool handle (114a) to be inserted in step 4, below.



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Figure 22 Attach Tool to the Valve

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



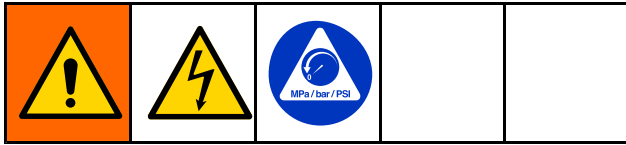
ti30014a

Figure 23 Remove the Valve

NOTE: See manual 332454 to repair the valve.

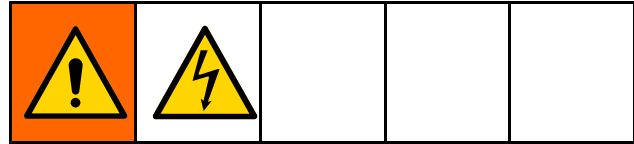
5. Install the valve in the reverse order of disassembly. Be sure all o-rings are in place and lubricated, and that the valve is seated completely in the manifold.
6. Return the system to service.

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

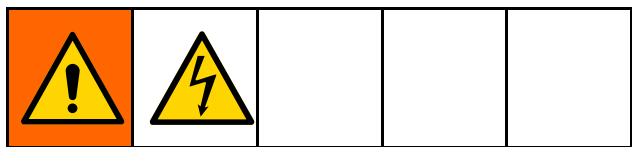


NOTE: Replacing the fuse with a non-Graco fuse voids the IS system safety approval.

Fuse	Part No.	Description
F1	123690	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

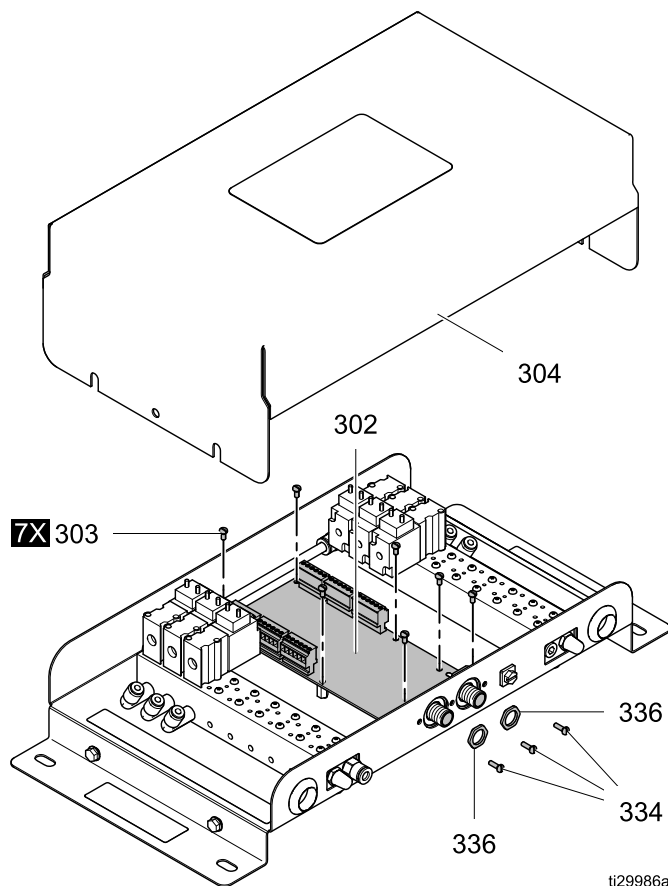


NOTICE

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 jam nuts (336) from the two connectors.
5. Turn three screws (334) to loosen or remove ground plate (333).
6. Remove mounting screws (303).
7. Slide board (302) out from underneath ground plate tabs.
8. Install the new board under the ground plate tabs. Make sure fuse holder (308) is between the board and the bracket tabs. Reinstall mounting screws (303).
9. Turn three screws (334) to install or tighten ground plate (333).
10. Install and tighten jam nuts (336) onto the two connectors.
11. Reconnect the cables to the proper connectors, as noted in step 3. See [Electrical Schematics, page 40](#).
12. Reinstall the cover (304). Restore electrical power to the system.

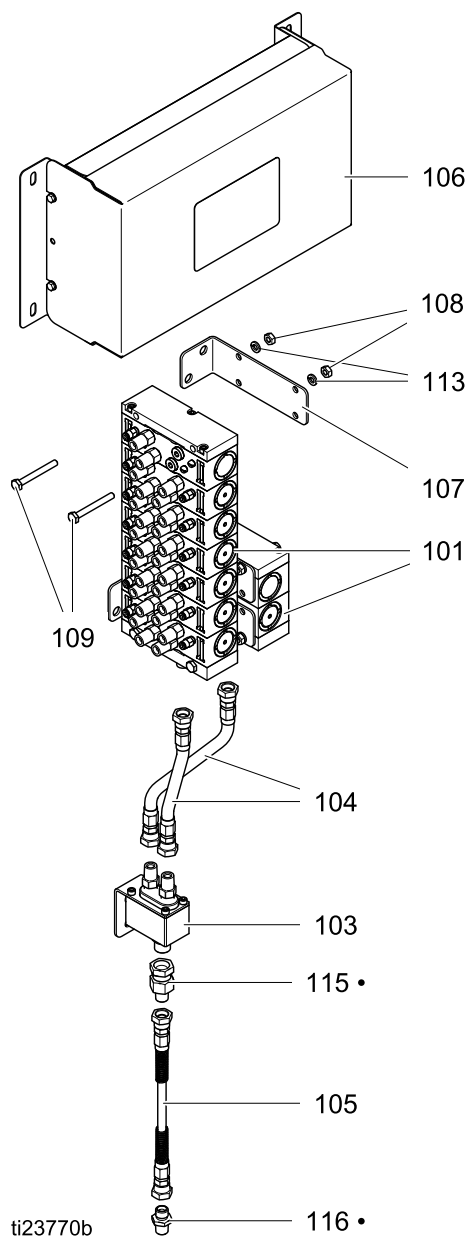


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Figure 24 Control Module Repair (IS Module Shown)

Parts

IS Color Change Kits



Ref. No.	Part No.	Description	Qty
101	♦	KIT, manifold, valve; See Valve Manifold Kits, page 68 for available kits.	2
103	24V436*+	MANIFOLD, mix, remote	1
104	24N346*+	HOSE, coupled, 2.5 ft.	2
105	16W564* 16W563+ 26A079	HOSE, static mixer Low Pressure High Pressure Acid, High Pressure	1
106	♦	KIT, module, control	1
107	16Y954*+	BRACKET, manifold	2
108	100015 104121*+	NUT, hex NUT, hex, stainless steel	4
109	104429 113469 17B745*+	SCREW, cap, hex Low Pressure High Pressure Custom Valve Mapping	4
110	24U236 24R124	TOOL, repair, color change valve, not shown Low Pressure High Pressure	1
111	24U239 24U240	TOOL, installation, color change valve, not shown Low Pressure High Pressure	1
112	223547*+	WIRE, assembly, 25 ft.	2
113	100016 104123*+	WASHER, lock WASHER, lock, stainless steel	4
114	16V429	CABLE, CAN, 50 ft (15.2 m); not shown	1
115•	112497+	SWIVEL, union, 3/8 npsm(f) x 1/4 npt(m)	1
116•	166846+	FITTING, adapter, 1/4 npt(m) x 1/4 npsm(m)	1

Parts

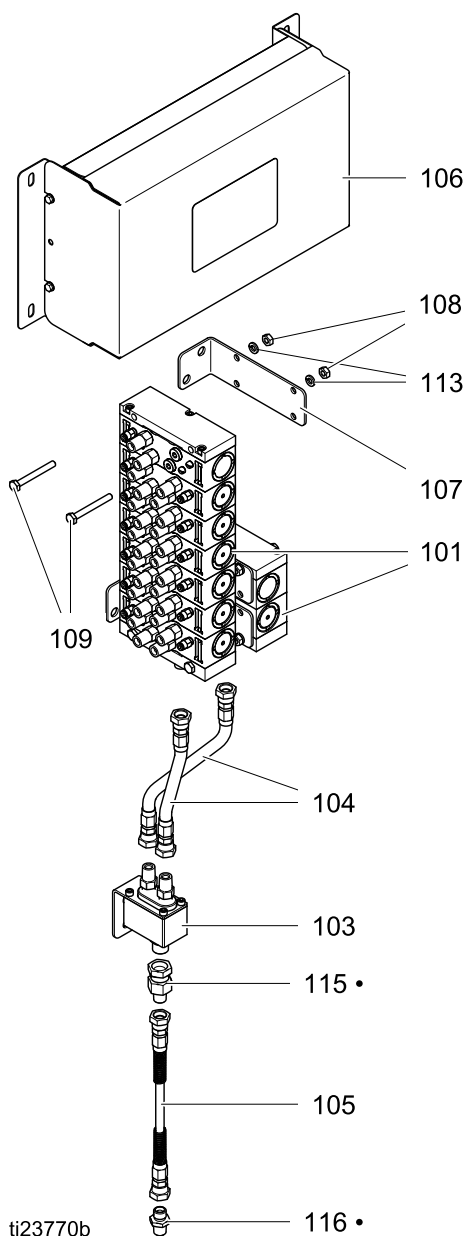
• *Used only with high pressure acid kits. The acid static mixer does not have a 3/8 npsm fitting, so this swivel and adapter are needed.*

* *Included in 25D543, Low-Pressure Custom Valve Mapping Remote Mix Manifold Kit.*

+ *Included in 25D605, High-Pressure Custom Valve Mapping Remote Mix Manifold Kit.*

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

Custom Valve Mapping Mix-At-Wall Hardware Kits



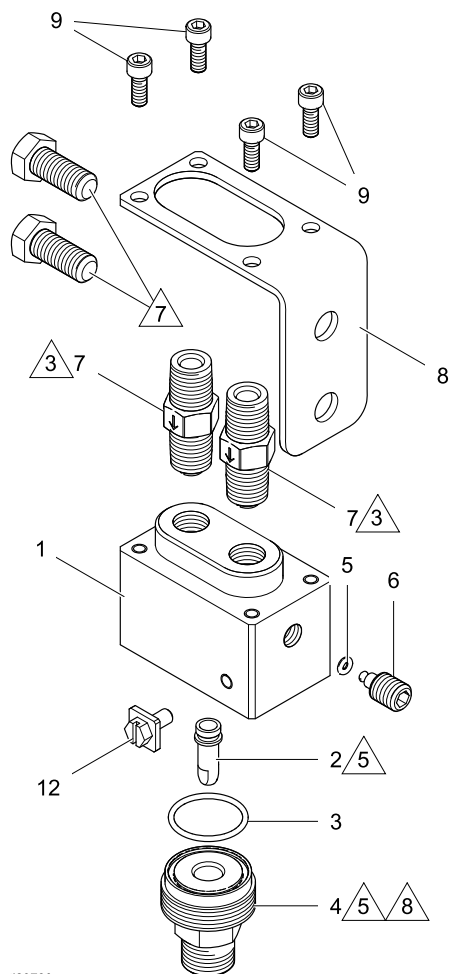
Manifold Kits, Custom Valve Mapping Installations	
25D543	Kit, Remote manifold CVM, low pressure
25D605	Kit, Remote manifold CVM, high pressure
26C288	Kit, PD3K remote manifold, low pressure
26C289	Kit, PD3K remote manifold, high pressure

Ref. No.	Part No.	Description	Qty
101	♦	KIT, manifold, valve	2
103	24V436*+	MANIFOLD, mix, remote	1
	26C259±	MANIFOLD, mix, remote, PD3K	
104	24N346*+	HOSE, coupled, 2.5 ft. (for CVM)	2
	24N346±	HOSE, coupled, 2.5 ft. (for PD3K)	3
105	16W564*±	HOSE, static mixer Low Pressure	1
	16W563±	High Pressure	
	26A079	Acid, High Pressure	
106	♦	KIT, module, control	1
107	16Y954*+	BRACKET, manifold	2
108	100015	NUT, hex	4
	104121*+	NUT, hex, stainless steel	
109	♦	SCREW, cap, hex	4
	104429	Low Pressure	
	113469	High Pressure	
	17B745*+	Custom Valve Mapping	
110	♦	TOOL, repair, color change valve, not shown	1
	24U236	Low Pressure	
	24R124	High Pressure	
111	♦	TOOL, installation, color change valve, not shown	1
	24U239	Low Pressure	
	24U240	High Pressure	
112	223547*+	WIRE, assembly, 25 ft.	2
113	100016	WASHER, lock	4
	104123*+	WASHER, lock, stainless steel	
114	16V429	CABLE, CAN, 50 ft (15.2 m); not shown	1
115•	112497+±	SWIVEL, union, 3/8 npsm(f) x 1/4 npt(m)	1
116•	166846+±	FITTING, adapter, 1/4 npt(m) x 1/4 npsm(m)	1

Parts

- *Used only with high pressure acid kits. The acid static mixer does not have a 3/8 npsm fitting, so this swivel and adapter are needed.*
- * *Included in 25D543, Low-Pressure Custom Valve Mapping Remote Mix Manifold Kit.*
- + *Included in 25D605, High-Pressure Custom Valve Mapping Remote Mix Manifold Kit.*
- ‡ *Included in 26C288, Low-Pressure PD3K Remote Mix Manifold Kit.*
- ± *Included in 26C289, High-Pressure PD3K Remote Mix Manifold Kit.*
- ◆ *See Manual 332455 for part numbers.*

Remote Mix Manifold



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Ref. No.	Part No.	Description	Qty
1	16Y950	MANIFOLD, mix, color/catalyst	1
	24V251*+	MANIFOLD, remote mix	
2	16Y952	TUBE, integrator	1
	24N290*	HOSE, low-pressure static-mixer	
	24N291+	HOSE, high-pressure static-mixer	
3	111603	O-RING; ptfе	1
4	16Y951	FITTING, outlet	1
5	16W572	O-RING; ptfе	1
6	16U403	PLUG, dose pump	1
7	24T894	VALVE, check; 316 sst	2

Ref. No.	Part No.	Description	Qty
8	16Y953	BRACKET	1
9	17A612	SCREW, cap, socket head; 10-24 x 0.5 in. (13 mm), sst	4
10	070303	LUBRICANT, grease	1
11	070408	SEALANT, pipe; sst	1
12	116343	SCREW, ground	1
13	223547	WIRE ASSEMBLY; 25 feet (7.6 m)	1
14	070494	ADHESIVE, anerobic	1


* Included in 25D543, Low-Pressure Custom Valve Mapping Remote Mix Manifold Kit.

+ Included in 25D605, High-Pressure Custom Valve Mapping Remote Mix Manifold Kit.


Parts


1 Apply lubricant (10) to all seals.


2 Apply sealant (11) to all pipe threads.

 3 Install check valve (7) with flow arrow to direction shown.

4 Items not shown (10), (11), (13), (14).

 5 Apply adhesive (14) to threads.

 6 Torque to 25 ft-lbs (34 N·m).

 7 Bolts not supplied, will vary depending on installation

Low Pressure IS Kits

Kit No.	Kit Description	Standard Valve Manifold Kits (101) [see High Pressure Valve Manifold Kits, page 73 for all available kits]	Control Module Kit (106) [see IS Color Change Control Modules, page 79 for parts]
Low Pressure Non-Circulating Color Change Kits			
24Y962	1 color and 1 catalyst	24Y936 (2)	24T571
24Y963	2 colors and 1 catalyst	24Y938, 24Y936	24T571
24Y964	4 colors and 1 catalyst	24Y942, 24Y936	24T572
24Y965	6 colors and 1 catalyst	24Y946, 24Y936	24T573
24Y966	8 colors and 1 catalyst	24Y950, 24Y936	24T574
26A060	12 colors and 1 catalyst	24Y936, 26A286	24T774
24Y972	2 colors and 2 catalysts	24Y938 (2)	24T571
24Y973	4 colors and 2 catalysts	24Y942, 24Y938	24T572
24Y974	6 colors and 2 catalysts	24Y946, 24Y938	24T573
24Y975	8 colors and 2 catalysts	24Y950, 24Y938	24T574
26A061	12 colors and 2 catalysts	24Y938, 26A286	24T774
24Y980	4 colors and 4 catalysts	24Y942 (2)	24T775
24Y981	6 colors and 4 catalysts	24Y946, 24Y942	24T776
24Y982	8 colors and 4 catalysts	24Y950, 24Y942	24T777
26A062	12 colors and 4 catalysts	24Y942, 26A286	24T778
Low Pressure Circulating Color Change Kits			
24Y967	1 color and 1 catalyst	24Y937, 24Y936	24T571
24Y968	2 colors and 1 catalyst	24Y939, 24Y936	24T571
24Y969	4 colors and 1 catalyst	24Y943, 24Y936	24T572
24Y970	6 colors and 1 catalyst	24Y947, 24Y936	24T573
24Y971	8 colors and 1 catalyst	24Y951, 24Y936	24T574
24A606	12 colors and 1 catalyst	25A605, 24Y936	24T774
24Y976	2 colors and 2 catalysts	24Y939, 24Y938	24T571
24Y977	4 colors and 2 catalysts	24Y943, 24Y938	24T572
24Y978	6 colors and 2 catalysts	24Y947, 24Y938	24T573
24Y979	8 colors and 2 catalysts	24Y951, 24Y938	24T574
26A063	12 colors and 2 catalysts	24Y938, 25A605	24T774
24Y983	4 colors and 4 catalysts	24Y943, 24Y942	24T775
24Y984	6 colors and 4 catalysts	24Y947, 24Y942	24T776
24Y985	8 colors and 4 catalysts	24Y951, 24Y942	24T777
26A064	12 colors and 4 catalysts	24Y942, 25A605	24T778

High Pressure IS Kits

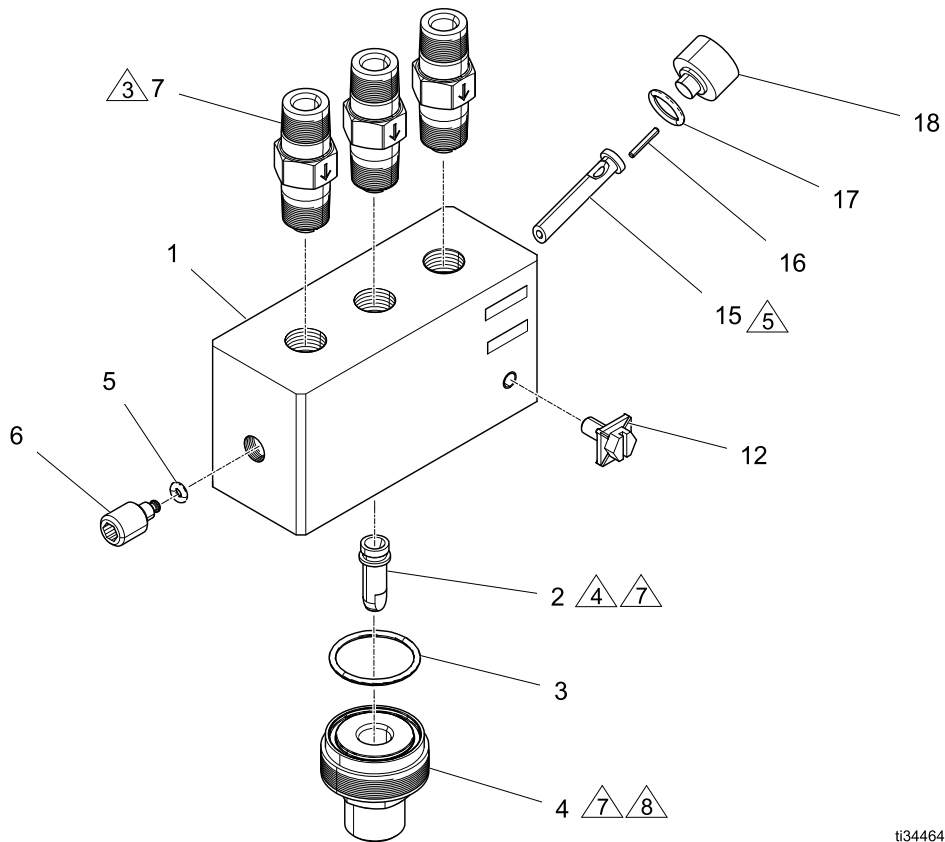
Kit No.	Kit Description	Standard Valve Manifold Kits (101) [see High Pressure Valve Manifold Kits, page 73 for all available kits]	Control Module Kit (106) [see IS Color Change Control Modules, page 79 for parts]
High Pressure Non-Circulating Color Change Kits			
24V359	1 color and 1 catalyst	24T647 (2)	24T571
24V360	2 colors and 1 catalyst	24T648, 24T647	24T571
24V361	4 colors and 1 catalyst	24T650, 24T647	24T572
24V362	6 colors and 1 catalyst	24T652, 24T647	24T573
24V363	8 colors and 1 catalyst	24T654, 24T647	24T574
24V364	12 colors and 1 catalyst	24T658, 24T647	24T774
24V381	2 colors and 2 catalysts	24T648 (2)	24T571
24V382	4 colors and 2 catalysts	24T650, 24T648	24T572
24V383	6 colors and 2 catalysts	24T652, 24T648	24T573
24V384	8 colors and 2 catalysts	24T654, 24T648	24T574
24V385	12 colors and 2 catalysts	24T658, 24T648	24T774
24V396	4 colors and 4 catalysts	24T650 (2)	24T775
24V397	6 colors and 4 catalysts	24T652, 24T650	24T776
24V398	8 colors and 4 catalysts	24T654, 24T650	24T777
24V399	12 colors and 4 catalysts	24T658, 24T650	24T778
High Pressure Circulating Color Change Kits			
24V369	1 color and 1 catalyst	24T677(2)	24T571
24V370	2 colors and 1 catalyst	24T678, 24T677	24T571
24V371	4 colors and 1 catalyst	24T680, 24T677	24T572
24V372	6 colors and 1 catalyst	24T682, 24T677	24T573
24V373	8 colors and 1 catalyst	24T684, 24T677	24T574
24V374	12 colors and 1 catalyst	24T688, 24T677	24T774
24V389	2 colors and 2 catalysts	24T678 (2)	24T571
24V390	4 colors and 2 catalysts	24T680, 24T678	24T572
24V391	6 colors and 2 catalysts	24T682, 24T678	24T573
24V392	8 colors and 2 catalysts	24T684, 24T678	24T574
24V393	12 colors and 2 catalysts	24T688, 24T678	24T774
24V402	4 colors and 4 catalysts	24T680 (2)	24T775
24V403	6 colors and 4 catalysts	24T682, 24T680	24T776
24V404	8 colors and 4 catalysts	24T684, 24T680	24T777
24V405	12 colors and 4 catalysts	24T688, 24T680	24T778

Acid IS Kits

Acid color change kits are used for high pressure and for low pressure systems.

Kit No.	Kit Description	Standard Valve Manifold Kits (101) [see High Pressure Valve Manifold Kits, page 73 for all available kits]	Control Module Kit (106) [see IS Color Change Control Modules, page 79 for parts]
Acid Non-Circulating Color Change Kits			
26A036	1 color and 1 catalyst	24T647, 24X360	24R219
26A037	2 colors and 1 catalyst	24T648, 24X360	24R219
26A038	4colors and 1 catalyst	24T650, 24X360	24R220
26A039	6colors and 1 catalyst	24T652, 24X360	24R221
26A040	8colors and 1 catalyst	24T654, 24X360	24R222
26A041	12 colors and 1 catalyst	24T658, 24X360	24V406
Acid Circulating Color Change Kits			
26A042	1 color and 1 catalyst	24T677, 24X360	24R219
26A043	2 colors and 1 catalyst	24T678, 24X360	24R219
26A044	4colors and 1 catalyst	24T680, 24X360	24R220
26A045	6colors and 1 catalyst	24T682, 24X360	24R221
26A046	8colors and 1 catalyst	24T684, 24X360	24R222
26A047	12 colors and 1 catalyst	24T688, 24X360	24V406

PD3K+ Mix-at-Wall Manifold Kit (26C259)



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Ref. No.	Part No.	Description	Qty
1	17W452	MANIFOLD, mix, color/catalyst, PD3K	1
2	16Y952*	TUBE, integrator	1
3	111603*	O-RING; ptfе	1
4	17W453	FITTING, outlet	1
5	16W572*	O-RING; ptfе	1
6	16U403	PLUG, dose pump	1
7	24T894	VALVE, check; 316 sst	3

Ref. No.	Part No.	Description	Qty
12	116343	SCREW, ground	1
13	223547	WIRE ASSEMBLY; 25 feet (7.6 m)	1
15	17W455*	TUBE, integrator, PD3K	1
16	105402*	PIN, dowel	1
17	111457*	O-RING	1
18	17W454	FITTING, plug	1


* Included in 26C478, PD3K Remote Mix Manifold Repair Kit.


Manifold Dimensions: 3.75 in. (W) x 1.9 in. (H) x 1.45 in. (D) (9.5 cm x 4.8 cm x 3.7 cm)


Mounting Holes (back face of manifold for wall mounting): four holes; 3.05 in. (7.7 cm) horizontal, 1.30 in. (3.3 cm) vertical


1 Apply lubricant to all seals.


2 Apply sealant to all pipe threads.

 3 Install check valve (7) with flow arrow to direction shown.

 4 The integrator tube (2) must be installed before the PD3K integrator tube (15), dowel pin (16), o-ring (17), and plug fitting (18).

 5 Install the PD3K integrator tube (15) as shown.

 7 Apply adhesive to the threads of the integrator tube (2) and the PD3K outlet fitting (4).

 8 Torque to 25 ft-lbs (34 N·m).

Valve Manifold Kits

The low pressure and high pressure valve manifold kits listed in this section are used in both the Non-IS and IS color valve stacks.

Low Pressure Valve Manifold Kits

Non-Circulating Valve Manifold Kits

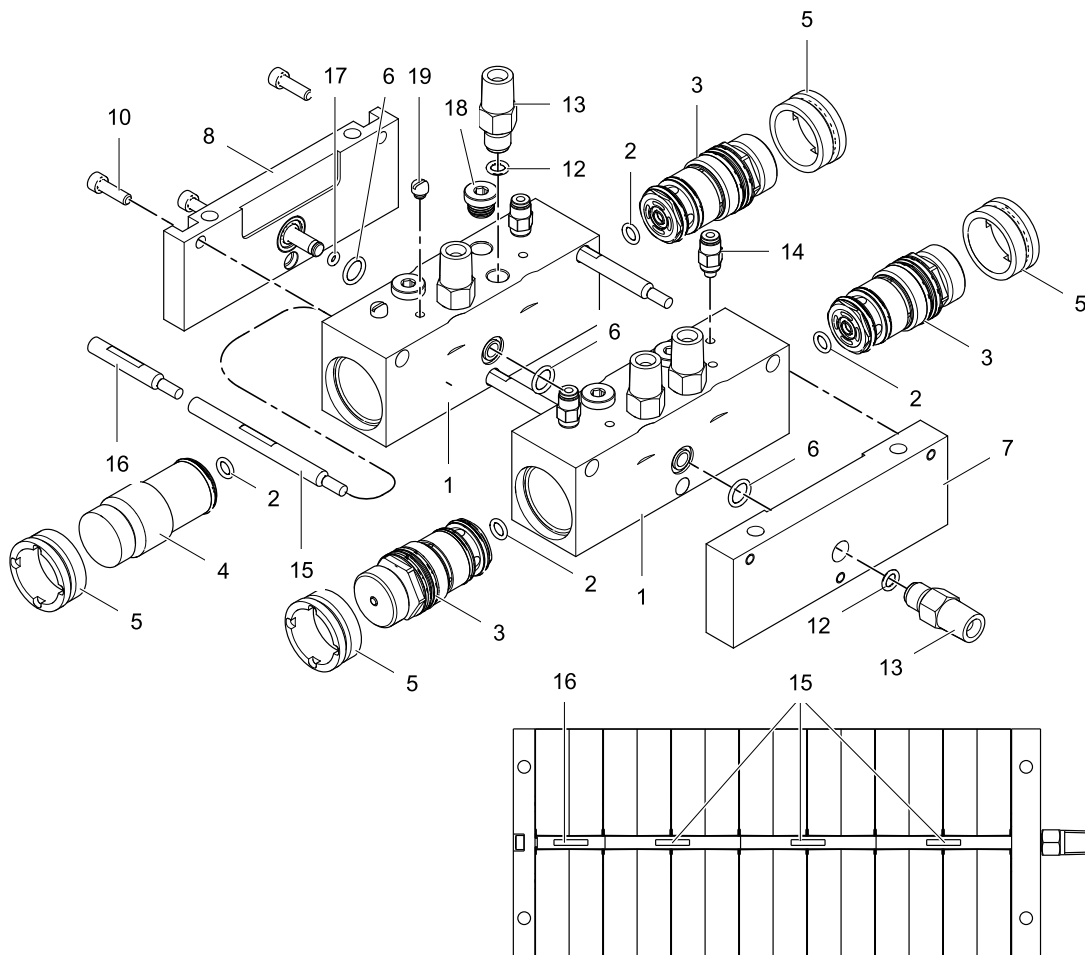
Kit No.	Series	Kit Description
24Y936	A	2 valves
24Y938	A	3 valves
24Y940	A	4 valves
24Y942	A	5 valves
24Y944	A	6 valves
24Y946	A	7 valves
24Y948	A	8 valves
24Y950	A	9 valves
24Y952	A	10 valves
26A272	A	11 valves
26A274	A	12 valves
26A286	A	13 valves
26A276	A	14 valves
26A278	A	15 valves
26A280	A	16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

Circulating Valve Manifold Kits

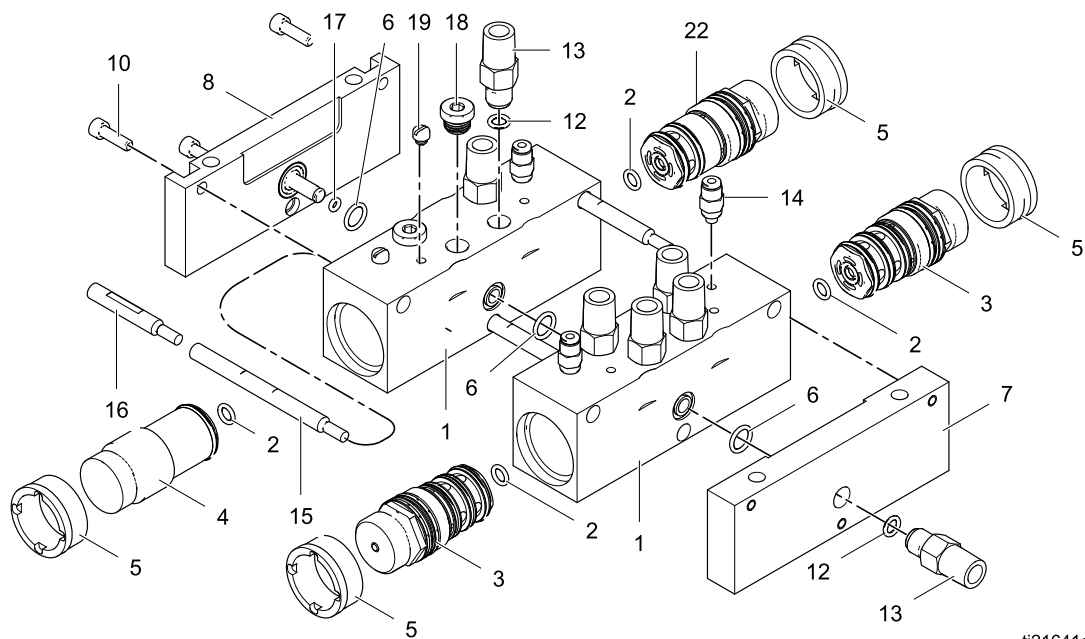
Kit No.	Series	Kit Description
24Y937	A	2 valves
24Y939	A	3 valves
24Y941	A	4 valves
24Y943	A	5 valves
24Y945	A	6 valves
24Y947	A	7 valves
24Y949	A	8 valves
24Y951	A	9 valves
24Y953	A	10 valves
26A273	A	11 valves
26A275	A	12 valves
25A605	A	13 valves
26A277	A	14 valves
26A279	A	15 valves
26A281	A	16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

Valve Manifold Kit Parts

Non-Circulating Kits



Circulating Kits



ti21641a

Parts

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	26A362	VALVE, solvent, for circulating kits; includes item 2		1

★ 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	22
24Y936	1	2	1	0	2	2	1	1	3	3	3	2	0	3	1	2	0	1
24Y938	2	4	2	1	4	3	1	1	3	4	4	3	3	0	1	5	2	1
24Y940	2	4	3	0	4	3	1	1	3	5	5	4	3	0	1	4	0	1
24Y942	3	6	4	1	6	4	1	1	3	6	6	5	3	3	1	7	2	1
24Y944	3	6	5	0	6	4	1	1	3	7	7	6	3	3	1	6	0	1
24Y946	4	8	6	1	8	5	1	1	3	8	8	7	6	0	1	9	2	1
24Y948	4	8	7	0	8	5	1	1	3	9	9	8	6	0	1	8	0	1
24Y950	5	10	8	1	10	6	1	1	3	10	10	9	6	3	1	11	2	1
24Y952	5	10	9	0	10	6	1	1	3	11	11	10	6	3	1	10	0	1
26A272	6	12	10	1	12	7	1	1	3	12	12	11	9	0	1	13	2	1
26A274	6	12	11	0	12	7	1	1	3	13	13	12	9	0	1	12	0	1
26A286	7	14	12	1	14	8	1	1	3	14	14	13	9	3	1	15	2	1
26A276	7	14	13	0	14	8	1	1	3	15	15	14	9	3	1	14	0	1
26A278	8	16	14	1	16	9	1	1	3	16	16	15	12	0	1	17	2	1
26A280	8	16	15	0	16	9	1	1	3	17	17	16	12	0	1	16	0	1
26A282	9	18	16	1	18	10	1	1	3	18	18	17	12	3	1	19	2	1
26A284	9	18	17	0	18	10	1	1	3	19	19	18	12	3	1	18	0	1

Parts

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	1	2	1	0	2	2	1	1	3	4	4	2	0	3	1	1	0	1
24Y939	2	4	2	1	4	3	1	1	3	6	6	3	3	0	1	3	2	1
24Y941	2	4	3	0	4	3	1	1	3	8	8	4	3	0	1	1	0	1
24Y943	3	6	4	1	6	4	1	1	3	10	10	5	3	3	1	3	2	1
24Y945	3	6	5	0	6	4	1	1	3	11	11	6	3	3	1	1	0	1
24Y947	4	8	6	1	8	5	1	1	3	14	14	7	6	0	1	3	2	1
24Y949	4	8	7	0	8	5	1	1	3	16	16	8	6	0	1	1	0	1
24Y951	5	10	8	1	10	6	1	1	3	18	18	9	6	3	1	3	2	1
24Y953	5	10	9	0	10	6	1	1	3	20	20	10	6	3	1	1	0	1
26A273	6	12	10	1	12	7	1	1	3	22	22	11	9	0	1	3	2	1
26A275	6	12	11	0	12	7	1	1	3	24	24	12	9	0	1	1	0	1
26A605	7	14	12	1	14	8	1	1	3	26	26	13	9	3	1	3	2	1
26A277	7	14	13	0	14	8	1	1	3	28	28	14	9	3	1	1	0	1
26A279	8	16	14	1	16	9	1	1	3	30	30	15	12	0	1	3	2	1
26A281	8	16	15	0	16	9	1	1	3	32	32	16	12	0	1	1	0	1
26A283	9	18	16	1	18	10	1	1	3	34	34	17	12	3	1	3	2	1
26A285	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

Kit No.	Series	Kit Description
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
24X360 (acid-catalyzed)	A	2 valves
24T845 (acid-catalyzed)	A	3 valves
24T846 (acid-catalyzed)	A	5 valves

Parts

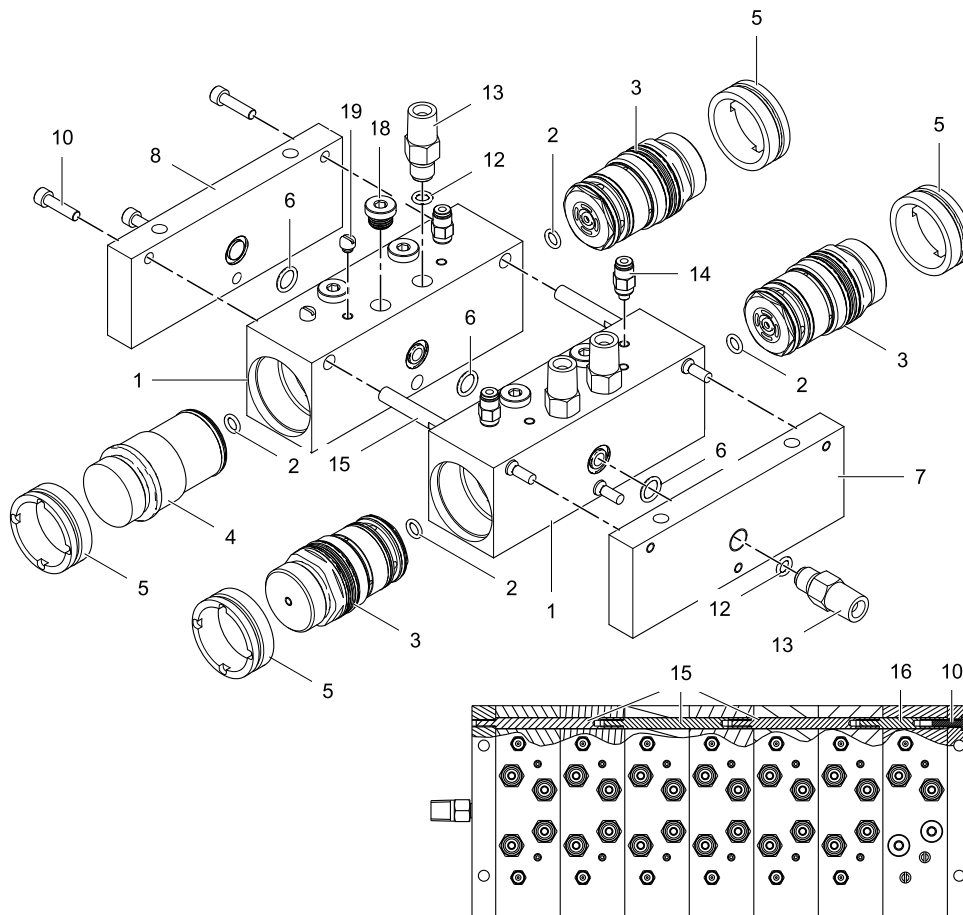
Circulating Valve Manifold Kits

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

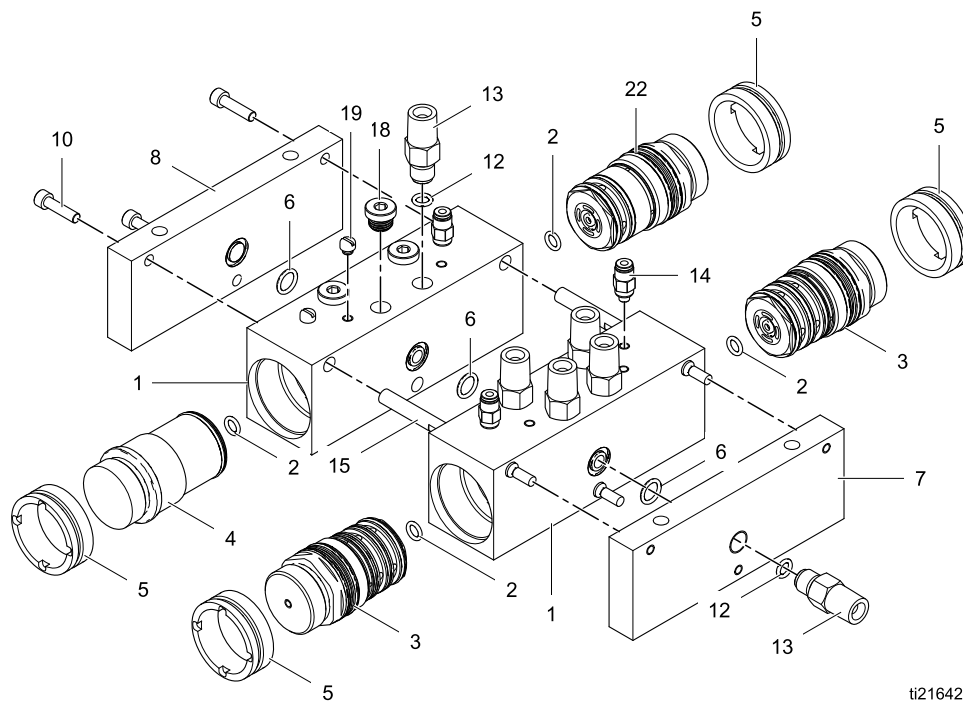
Kit No.	Series	Kit Description
24T692	A	17 valves
24T693	A	18 valves
24T694	A	19 valves
24T695	A	20 valves
24T696	A	21 valves
24T697	A	22 valves
24T698	A	23 valves
24T699	A	24 valves
24T700	A	25 valves
24T701	A	26 valves
24T702	A	27 valves
24T703	A	28 valves
24T704	A	29 valves
24T705	A	30 valves
24T706	A	31 valves

Valve Manifold Kit Parts

Non-Circulating Kits



Circulating Kits



ti21642a

Parts

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	
4	24R052	PLUG, cc valve	
5	16N269	RETAINER, nut	
6	111457	O-RING; ptfе	
7	24T725	PLATE, outlet, manifold	
8	24T726	PLATE, end, manifold	
10	111820	SCREW, cap, socket head; 10–24 x 0.75 in. (19 mm)	
12	104893	O-RING; ptfе	

Ref. No.	Part No.	Description	Qty
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, solvent, for circulating kits; includes item 2	1
	24T583	VALVE, solvent, for non-circulating acid compatible 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	13	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
24X360	1	1	1	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

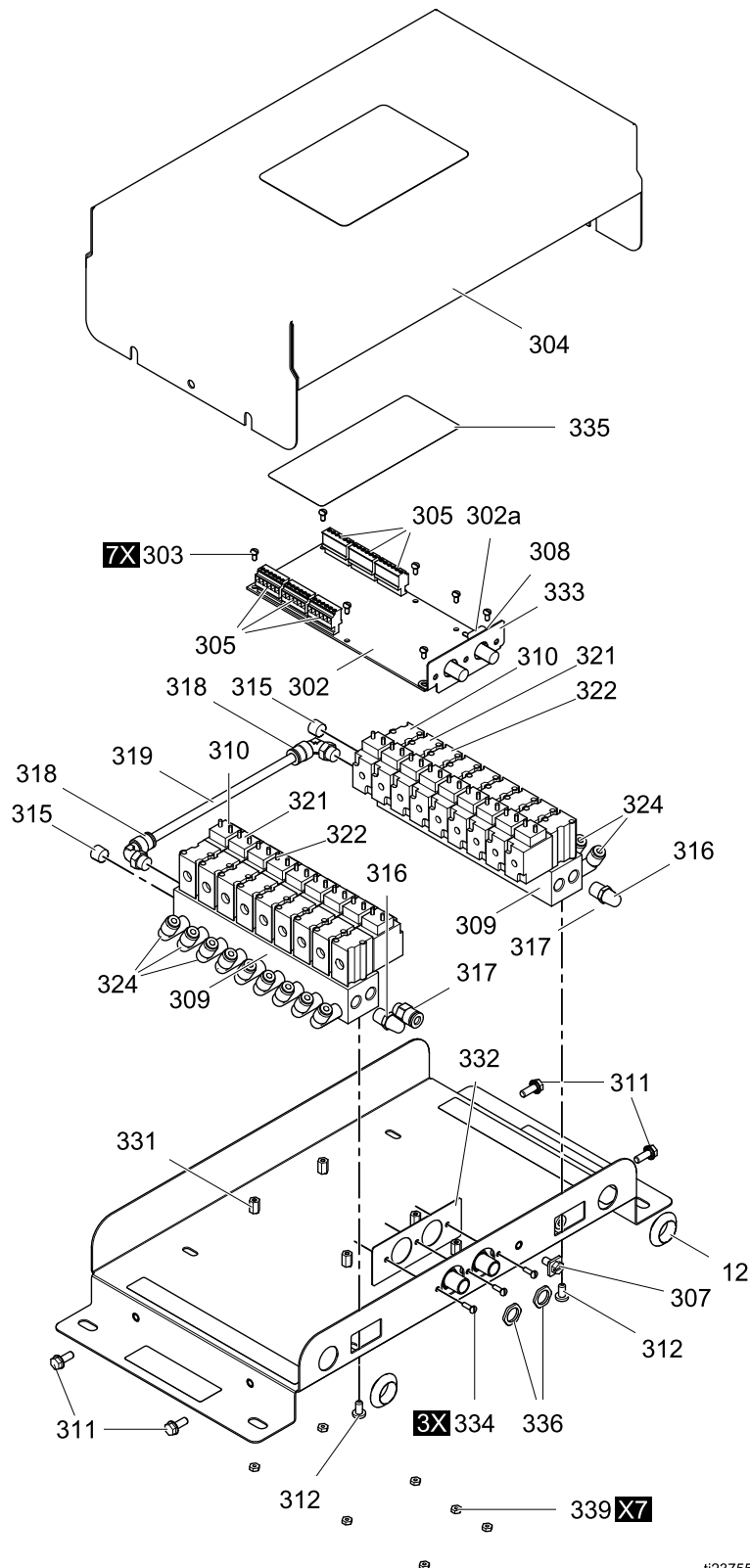
Parts

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

IS Color Change Control Modules



t123755a

Parts

Ref. No.	Part No.	Description	Qty
301	— — —	PANEL	1
302	24T566	BOARD, circuit	1
302a	123690	FUSE; 125 mA	1
303	112324	SCREW, machine, pan head; 4-40 x 0.25 in. (6 mm)	7
304	24U567	COVER	1
305	119162	CONNECTOR, 6-position	6
307	116343	SCREW, ground; M5 x 0.8	1
308	123691	HOLDER, fuse	1
309	15T636	MANIFOLD	2
310	121324	SOLENOID	★
311	16M007	SCREW, machine, serrated head; 10-32 x 0.5 in. (13 mm)	4
312	103833	SCREW, machine, pan head; 10-32 x 0.375 in. (10 mm)	4
313	121628	SCREW, self-sealing; 4-40 x 0.25 in. (6 mm)	★
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

Ref. No.	Part No.	Description	Qty
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	2
322	— — —	FERRULE	★
324	109193	ELBOW, connector; 10-32 (m) x 5/32 in. (4 mm) OD tube	★
331	16U743	SPACER	6
332	16U744	PLATE, non-conductive	1
333	16U745	PLATE, ground	1
334	16U746	SCREW, pan-head; 4-40	3
335	16W501	LABEL, instructions	1
336	— — —	NUT, jam	2
339	102794	NUT, hex	7

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

Parts labeled — — — are not available separately.

Table 6 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

Parts

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	Solenoid (310)	Plug (313)	Tube (320)	Ferrule (322)	Connector Fitting (324)
24T571	2 color and 2 catalyst	6	24	30 ft (9.1 m)	12	6
24T572	4 color and 2 catalyst	8	20	40 ft (12.2 m)	16	8
24T573	6 color and 2 catalyst	10	16	50 ft (15.2 m)	20	10
24T574	8 color and 2 catalyst	12	12	60 ft (18.3 m)	24	12
24T774	12 color and 2 catalyst; 13–24 color	16	4	80 ft (24.4 m)	32	16
24T775	4 color and 4 catalyst	10	16	50 ft (15.2 m)	20	10
24T776	6 color and 4 catalyst	12	12	60 ft (18.3 m)	24	12
24T777	8 color and 4 catalyst	14	8	70 ft (21.3 m)	28	14
24T778	12 color and 4 catalyst; 13–30 color	18	0	90 ft (27.4 m)	36	18
24T779	13–18 color	6	24	30 ft. (9.1 m)	12	6

Expansion Kits

To add colors/catalysts, order the correct IS Expansion Kit.

IS Expansion Kits

The following kits are available to add color valves in an IS area. Order a kit without a manifold if you have room for a valve on an existing manifold. Order a kit with a manifold if all ports on your existing manifolds have valves already. See [Install an Expansion Kit, page 34](#) for instructions.

Low Pressure Expansion Kits

Kit No.	Kit Description
Without Manifold	
24T449	One non-circulating valve (replaces a plug). Includes valve, IS solenoid, fittings, and tubing.
24T450	One circulating valve (replaces a plug). Includes valve, IS solenoid, fittings, and tubing.
24T519	One log-pressure plug.
With Manifold	
26A058 (sst manifold)	Manifold with one non-circulating valve. Includes valve, plug, IS solenoid, fittings, and tubing.
26A059 (sst manifold)	Manifold with one circulating valve. Includes valve, plug, IS solenoid, fittings, and tubing.
26A054 (sst manifold)	Manifold with two non-circulating valves. Includes valves, IS solenoids, fittings, and tubing.
26A055 (sst manifold)	Manifold with two circulating valves. Includes valves, IS solenoids, fittings, and tubing.
SST Manifold Without Valves	
24Y989	Manifold with fittings for non-circulating valves. Includes fittings, connecting rods, and o-rings. Also order two solenoid kits (121324), one for each valve.
24Y990	Manifold with fittings for circulating valves. Includes fittings, connecting rods, and o-rings. Also order two solenoid kits (121324), one for each valve.
Air Purge/Air Chop Kits	
26C299	Air valve for a stack with an open valve port. Includes valves, retainer. o-rings, tubing, fittings, connectors, and air regulator.
26C301	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
Without Manifold	
24T712	One non-circulating valve (replaces a plug). Includes valve, IS solenoid, fittings, and tubing.
24T713	One circulating valve (replaces a plug). Includes valve, IS solenoid, fittings, and tubing.
24T723	One high-pressure plug.
With Manifold	
24T714	Manifold with one non-circulating valve. Includes valve, plug, IS solenoid, fittings, and tubing.
24T715	Manifold with one circulating valve. Includes valve, plug, IS solenoid, fittings, and tubing.
24T716	Manifold with two non-circulating valves. Includes valves, IS solenoids, fittings, and tubing.
24T717	Manifold with two circulating valves. Includes valves, IS solenoids, fittings, and tubing.
Air Purge/Air Chop Kits	
26C300	Air valve for a stack with an open valve port. Includes valves, retainer. o-rings, tubing, fittings, connectors, and air regulator.
26C302	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
Without Manifold	
24T718	One non-circulating acid-compatible valve (replaces a plug). Includes valve, IS solenoid, fittings, and tubing.
With Manifold	

Kit No.	Kit Description
24T719	Manifold with one non-circulating acid-compatible valve. Includes valve, plug, IS solenoid, fittings, and tubing.
24T720	Manifold with two non-circulating acid-compatible valves. Includes valves, IS solenoids, fittings, and tubing.

Air/Solvent Chop Expansion Kits

To add the capability to purge the spray device with an air/solvent chop, order the correct Air Purge Valve Kit.

Air Purge Valve Kits

The following kits are available to provide an air purge valve, used to perform air/solvent chop to purge a spray device. Order a kit without a manifold if you have room for a valve on an existing manifold. Order a kit with a manifold if all ports on your existing manifolds have valves already. If you plan on using an existing valve, order just the air supply kit. See [Connect the Air Purge Valve, page 26](#) for instructions.

Low Pressure Kits

Kit No.	Kit Description
Without Manifold	
26A309	One non-circulating valve (replaces a plug). Includes valve, IS solenoid, fittings, tubing, air regulator, and air supply valves.
With Manifold	
26A310 (sst manifold)	Manifold with one non-circulating valve. Includes valve, plug, IS solenoid, fittings, tubing, air regulator, and air supply valves.

High Pressure Kits

Kit No.	Kit Description
Without Manifold	
26A333	One non-circulating valve (replaces a plug). Includes valve, IS solenoid, fittings, tubing, air regulator, and air supply valves.
With Manifold	
26A334 (sst manifold)	Manifold with one non-circulating valve. Includes valve, plug, IS solenoid, fittings, tubing, air regulator, and air supply valves.

Air Supply Kit

For use with both low pressure and high pressure systems. Order this kit if using an existing valve as an air purge valve.

Kit No.	Kit Description
26A311	Air regulator, air supply valves, and tubing.

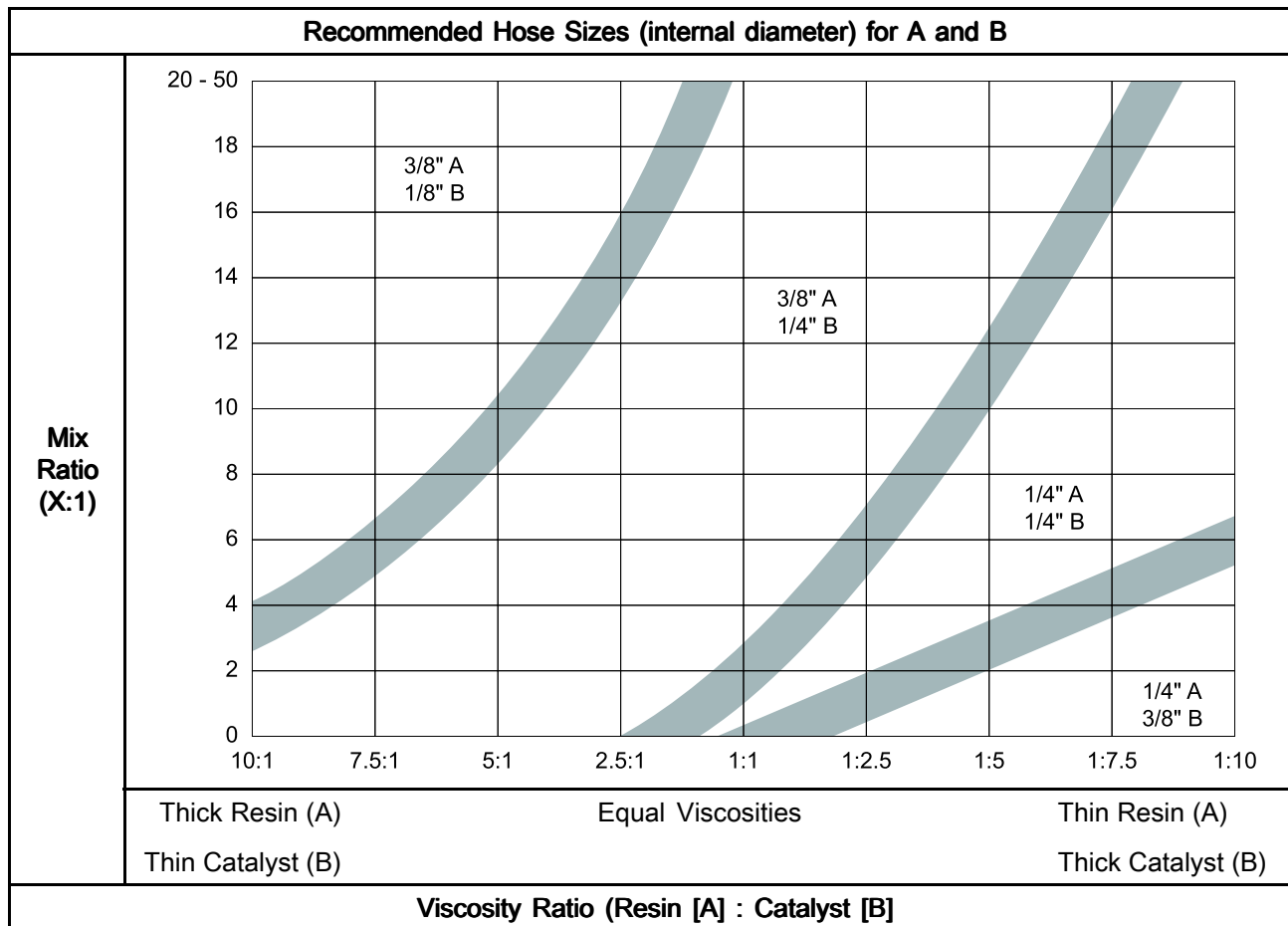
Hose Selection

Hose Selection Tool

Use this chart to determine the proper size hoses for your mix ratio and viscosity., then select hoses for your application.

NOTE: Shaded areas may use hose sizes from either of the two adjacent areas.

NOTE: Always use Graco hoses.



Parts

1/4 in. (6 mm) ID Hoses

Application	Material	Pressure	Maximum Fluid Working Pressure	Length		
				15 ft (4.6 m)	25 ft (7.6 m)	50 ft (15.2 m)
Catalyst	Moisture-Lok	High and Low	2000 psi (13.8 MPa, 138 bar)	947078	24T134	24T135
	Nylon	Low	225 psi (1.6 MPa, 16 bar)	17C967	24T266	24T267
		High	4100 psi (28.3 MPa, 283 bar)	238825	239107	239111
Resin	Nylon	Low	225 psi (1.6 MPa, 16 bar)	17C967	24T266	24T267
		High	4100 psi (28.3 MPa, 283 bar)	238825	239107	239111
Solvent	Nylon	Low	225 psi (1.6 MPa, 16 bar)	17C967	24T266	24T267
		High	4100 psi (28.3 MPa, 283 bar)	238825	239107	239111
Atomizing Air	Nylon	Low	225 psi (1.6 MPa, 16 bar)	17C967	24T194	24T195

Dimensions

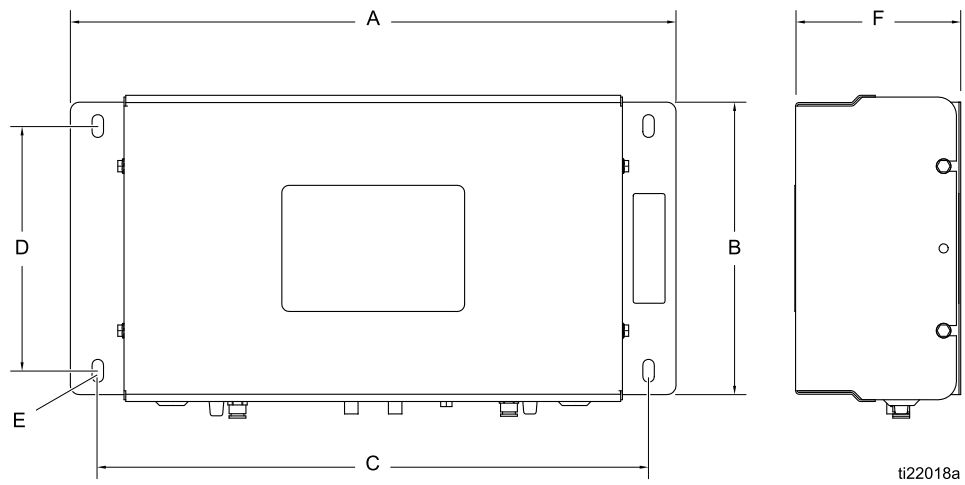
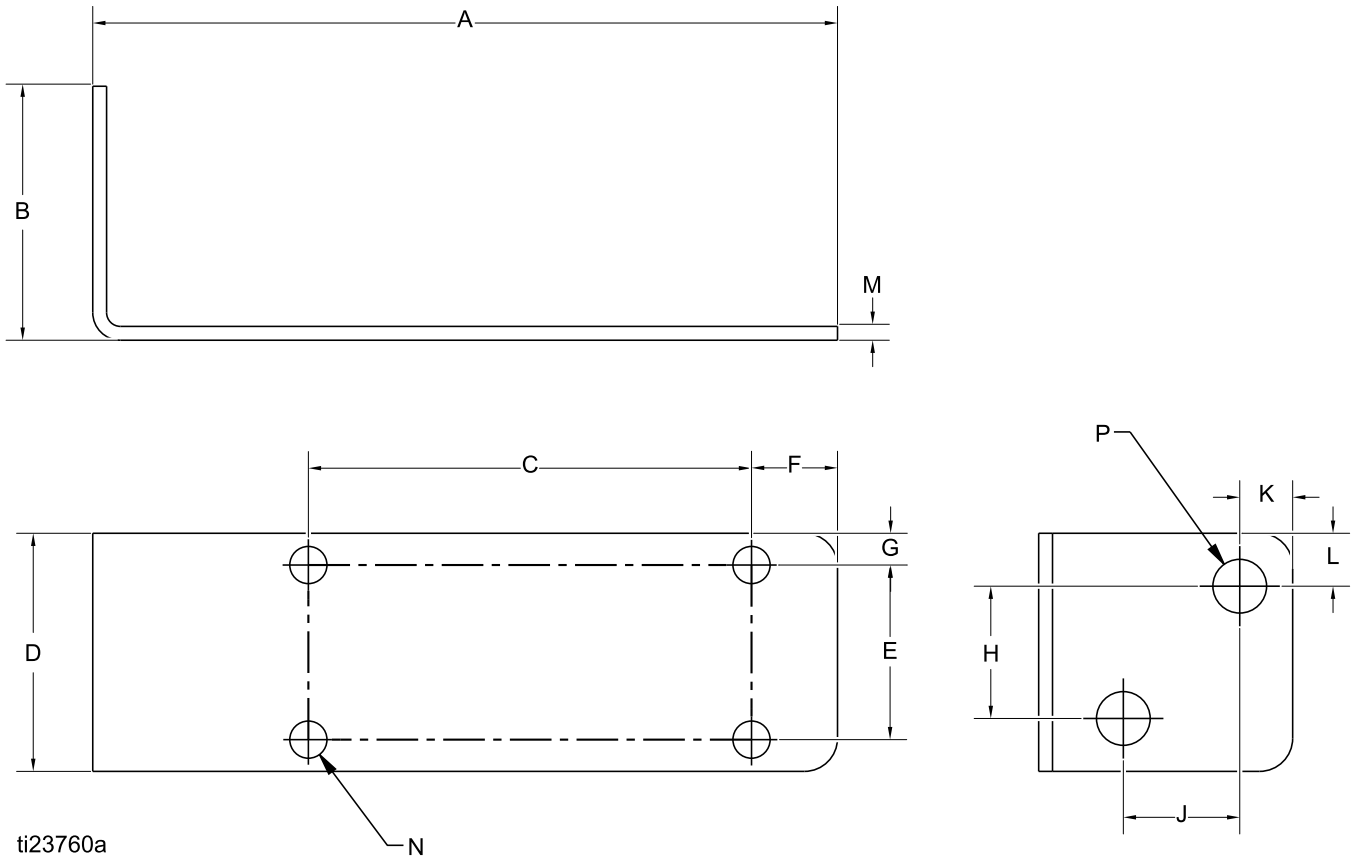


Figure 25 IS Control Module

A	B	C	D	E	F
16.57 in. (421 mm)	8.22 in. (209 mm)	15.07 in. (383 mm)	6.70 in. (170 mm)	0.31 in. (8 mm)	4.52 in. (115 mm)

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

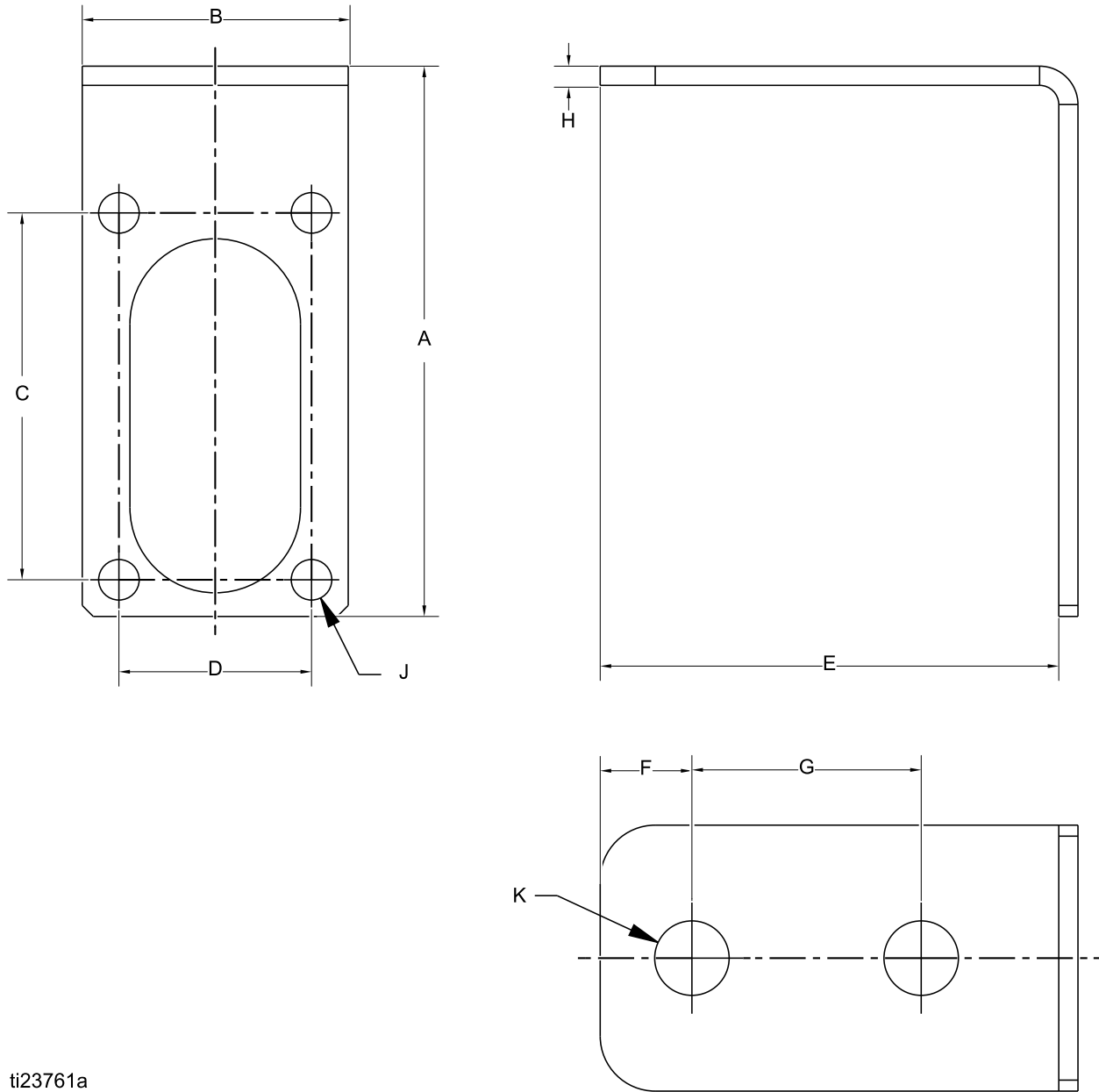
Dimensions



ti23760a

Figure 26 IS Valve Manifold Bracket

A	B	C	D	E	F
5.63 in (168 mm)	1.92 in (49 mm)	3.35 in (85 mm)	1.80 in (46 mm)	1.32 in (34 mm)	0.65 in. (17 mm)
G	H	J	K	L	M
0.24 in (6 mm)	1.00 in (25 mm)	0.88 in (22 mm)	0.40 in (10 mm)	0.40 in (10 mm)	0.11 in (3 mm)
N	P				
4 x 0.28 in (7 mm)	2 x 0.41 in (10 mm)				



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Figure 27 Remote Mix Manifold Bracket

A	B	C	D	E	F
3.00 in (76 mm)	1.45 in (37 mm)	2.00 in (51 mm)	1.05 in (27 mm)	2.50 in (64 mm)	0.50 in (13 mm)
G	H	J	K		
1.25 in (32 mm)	0.11 (3 mm)	4 x 0.22 in (6 mm)	2 x 0.41 (10 mm)		

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(m)	
Fluid outlet size:	1/4 npt(m)	
Air inlet size:	5/32 in. OD tube	4 mm OD tube
Wetted parts:		
Valve manifold	Glass-filled polyphenylene sulfide, 316 SST, PTFE, chemically resistant o-rings, FEP encapsulated fluoroelastomer o-rings	
Valve	See valve manual 332454.	

Mix Manifold Kits	U.S.	Metric
Maximum fluid working pressure:		
2K Low pressure kit (25D543)	100 psi	0.7 MPa, 7.0 bar
2K High pressure kit (25D605)	1500 psi	10.5 MPa, 105 bar
3K Low pressure kit (26C288)	100 psi	0.7 MPa, 7.0 bar
3K High pressure kit (26C289)	1500 psi	10.5 MPa, 105 bar
Viscosity range of fluid:	20–5000 centipoise	
Fluid inlet size:	1/4 npt(m)	
Fluid outlet size:	1/4 npt(m)	
Wetted parts:		
Low pressure kits	303, 304, and 316 SST; PTFE; Acetol; FFKM	
High pressure kits	316 SST; PTFE; Acetol; FFKM	

California Proposition 65

CALIFORNIA RESIDENTS

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

Graco Standard Warranty

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

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Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

All written and visual data contained in this document reflects the latest product information available at the time of publication.

Graco reserves the right to make changes at any time without notice.

Original Instructions. This manual contains English. MM 333282

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