Instructions/Parts

Color Change and Remote Mix Manifold Kits

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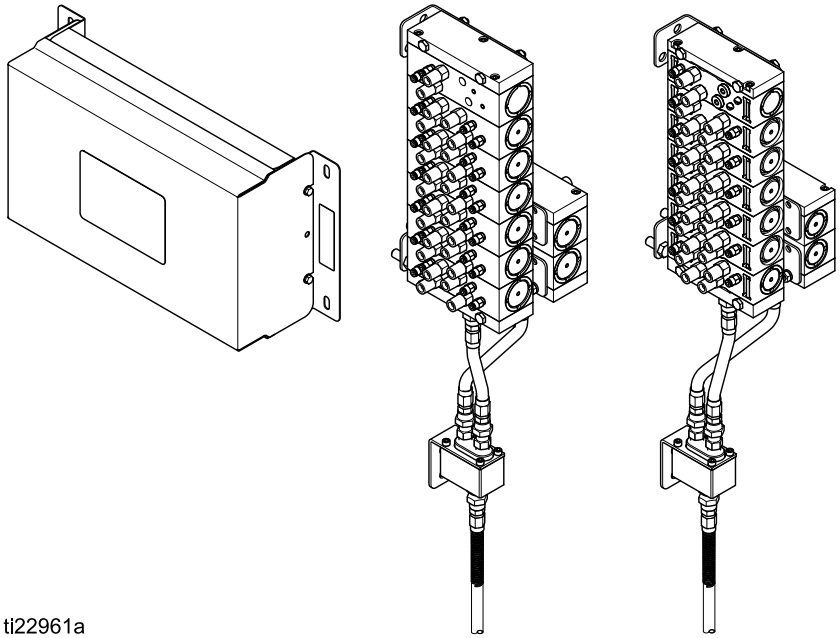
EN

To add optional color change function and at-the-gun mixing of two component materials when used with a ProMix™ PD2K 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 3 for model part numbers and approvals information.



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Related Manuals

Current manuals are available at www.graco.com.

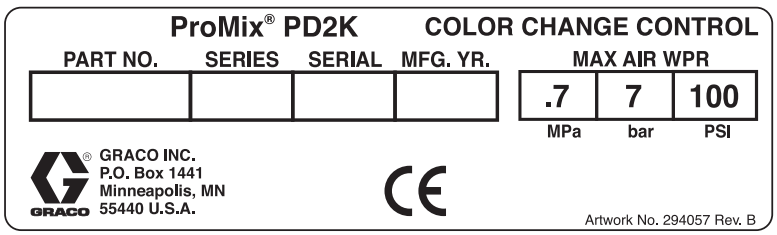
Manual No.	Description
332458	PD2K Proportioner, Installation Manual, Systems for Automatic Spray Applications
332564	PD2K Proportioner Operation Manual, Systems for Automatic Spray Applications
332565	PD2K Proportioner Repair-Parts Manual, Systems for Automatic Spray Applications

Manual No.	Description
332709	Pump Repair-Parts Manual
332454	Color Change Valve Repair-Parts Manual
332456	3rd and 4th Pump Kits Instructions-Parts Manual

Models

Non-Intrinsically Safe Modules

These kits are installed in the non-hazardous location, near the pumps. See the Kit label for the product part number. See the module identification label for maximum air working pressure, approval information and certification.



Non-Intrinsically Safe Color Change Control Module Label

Kit Identification Label

Kit No.	Series	Kit Description	Maximum Air Working Pressure (Control Module)	Maximum Fluid Working Pressure (Valves)
Low Pressure Non-Circulating Color Change Kits				
24R915	A	2 color or 2 catalyst	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24R916	A	4 color or 4 catalyst	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24R917	A	6 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24R918	A	8 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
Low Pressure Circulating Color Change Kits				
24R919	A	2 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24R920	A	4 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24R921	A	6 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)
24R922	A	8 color	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)

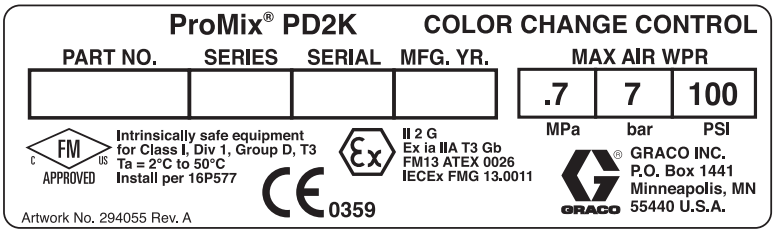
Kit No.	Series	Kit Description	Maximum Air Working Pressure (Control Module)	Maximum Fluid Working Pressure (Valves)
High Pressure Non-Circulating Color Change Kits				
24R959	A	2 color or 2 catalyst	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)
24R960	A	4 color or 4 catalyst	100 psi (0.7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

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 control module(s), an additional control module is needed. Order another complete color change change kit, shown above.
- **If current control module is not full:** If empty solenoid ports remain in your control module, see Expansion Kits, page 69.

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.



Intrinsically Safe Color Change Module Identification Label

Kit Identification Label

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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	24V157		
2	24V158	24V331	
4	24V159	24V332	24V343
6	24V160	24V333	24V344
8	24V161	24V334	24V345
12	24V162	24V335	24V346
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	24V166		
2	24V167	24V336	
4	24V308	24V337	24V347
6	24V309	24V338	24V348
8	24V326	24V339	24V349
12	24V327	24V340	24V350
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	2	4
1	24V359		
2	24V360	24V381	
4	24V361	24V382	24V396
6	24V362	24V383	24V397
8	24V363	24V384	24V398
12	24V364	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	2	4
1	24V369		
2	24V370	24V389	
4	24V371	24V390	24V402
6	24V372	24V391	24V403
8	24V373	24V392	24V404
12	24V374	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		

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 69.

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 symbol refers to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

WARNING




FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold 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.


ELECTRIC SHOCK HAZARD

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

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

WARNING

INTRINSIC SAFETY

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.

- 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:
  - 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.

SKIN INJECTION HAZARD

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

- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

MOVING PARTS HAZARD

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

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

TOXIC FLUID OR FUMES

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

- Read MSDSs to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear chemically impermeable gloves when spraying, dispensing, or cleaning equipment.

WARNING

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

EQUIPMENT MISUSE HAZARD

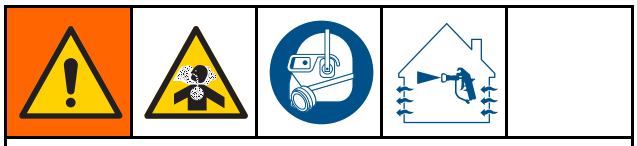
Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- 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



Spraying or dispensing materials containing isocyanates creates potentially harmful mists, vapors, and atomized particulates.

Read and understand material manufacturer's warnings and material MSDS to know specific hazards and precautions related to isocyanates.

Prevent inhalation of isocyanate mists, vapors, and atomized particulates by providing sufficient ventilation in the work area. If sufficient ventilation is not available, a supplied-air respirator is required for everyone in the work area.

To prevent contact with isocyanates, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons, and goggles, is also required for everyone in the work area.

Keep Components A and B Separate

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

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

Moisture Sensitivity of Isocyanates

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

Setup the Modules

Setup Non-IS Control Modules

NOTE: The PD2K System can use up to four pumps and six color change modules in the non-hazardous area. Use the following table to understand how many color change modules are needed for the number of pumps in your system, and which module should be associated to which pump.

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

Table 5 . Relationship of Non-IS Color Change Control Modules to Pumps

<table>
<tr><th colspan="3">System Pump Configuration</th><th colspan="6">Color Change Control Modules, Colors, and Catalysts</th></tr>
<tr><th>Color Pump(s)</th><th>Catalyst Pump(s)</th><th>Total Pumps</th><th>Module 1 (Colors 1–8)</th><th>Module 2 (Colors 9–16)</th><th>Module 3 (Colors 17–24)</th><th>Module 4 (Colors 25–30)</th><th>Catalyst 1–2</th><th>Catalyst 3–4</th></tr>
<tr><td>1</td><td>0</td><td>1</td><td rowspan="10">Pump # 1</td><td rowspan="8">Pump # 1</td><td rowspan="2">Pump # 1</td><td rowspan="2">Pump # 1</td><td colspan="2">Not Applicable</td></tr>
<tr><td>1</td><td>1</td><td>2</td><td colspan="2">Module # 5
Pump # 2</td></tr>
<tr><td>2</td><td>1</td><td>3</td><td rowspan="5">Pump # 3</td><td rowspan="3">Pump # 3</td><td colspan="2">Module # 5
Pump # 2</td></tr>
<tr><td>2</td><td>0</td><td>2</td><td colspan="2">Not Applicable</td></tr>
<tr><td>2</td><td>2</td><td>4</td><td>Module # 5
Pump # 2</td><td>Module # 6
Pump # 4</td></tr>
<tr><td>3</td><td>1</td><td>4</td><td rowspan="3">Pump # 4</td><td colspan="2">Module # 5
Pump # 2</td></tr>
<tr><td>3</td><td>0</td><td>3</td><td colspan="2">Not Applicable</td></tr>
<tr><td>4</td><td>0</td><td>4</td><td>Pump # 2</td><td colspan="2">Not Applicable</td></tr>
</table>

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 are shipped in the OFF position.

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

Non-IS Control Module Switch Settings			
Control Module	**S6**	**S5**	**S4**
Module 1	ON / OFF	ON / OFF	ON / OFF
Module 2	ON / OFF	ON / OFF	ON / OFF
Module 3	ON / OFF	ON / OFF	ON / OFF
Module 4	ON / OFF	ON / OFF	ON / OFF
Module 5	ON / OFF	ON / OFF	ON / OFF
Module 6	ON / OFF	ON / OFF	ON / OFF

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

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

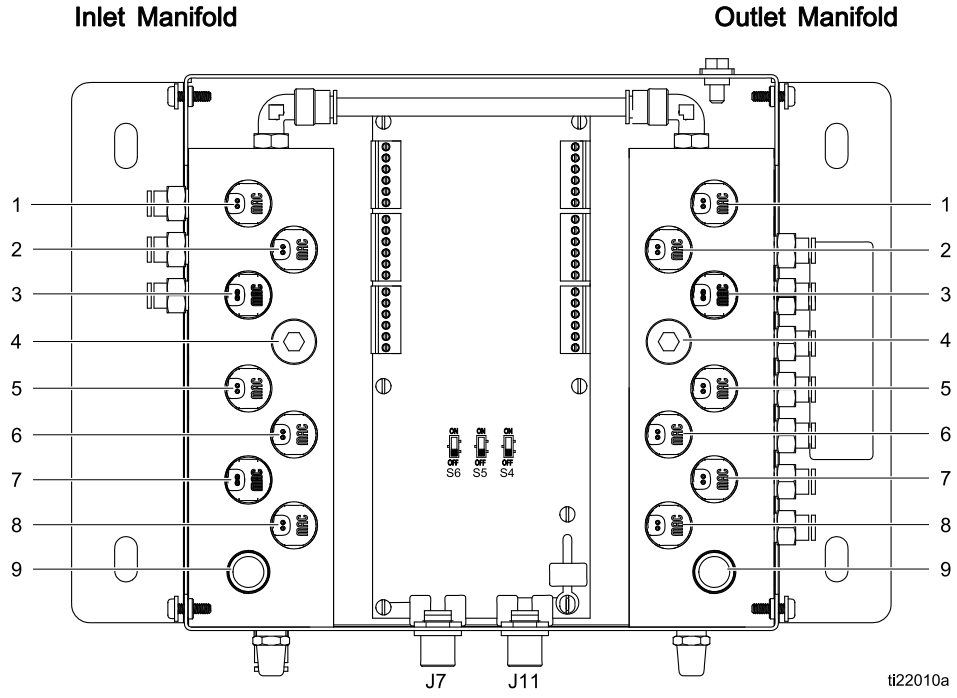


Figure 1 Non-IS Control Module

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

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

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

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

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

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

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

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.

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.

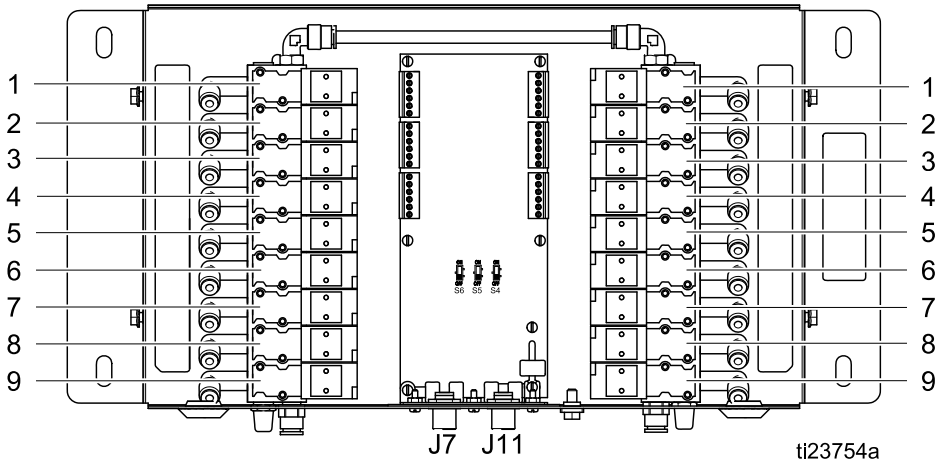


Figure 2 IS Control Module

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

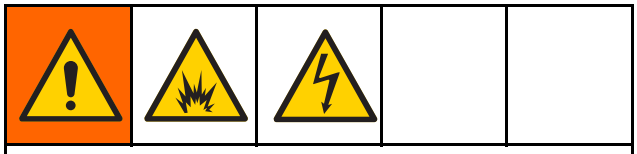
IS Control Module Switch Settings			
Control Module	**S6**	**S5**	**S4**
Module 7	ON OFF	ON OFF	ON OFF
Module 8	ON OFF	ON OFF	ON OFF

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

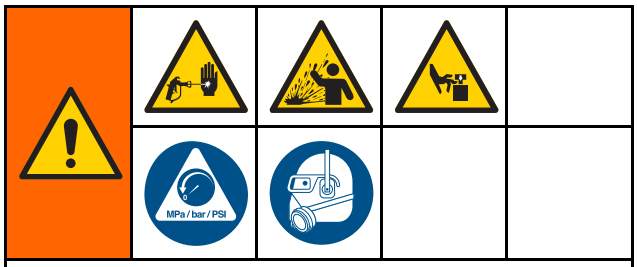
IS Control Module 7			
Solenoid	**Valve**	**Solenoid**	**Valve**
1	Color Solvent	1	Catalyst Solvent
2	Color 1	2	Catalyst 1
3	Color 2	3	Catalyst 2
4	Color 3	4	Catalyst 3
5	Color 4	5	Catalyst 4
6	Color 5	6	Color 9
7	Color 6	7	Color 10
8	Color 7	8	Color 11
9	Color 8	9	Color 12

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

Installation



- 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.



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.

Mounting the Control Modules

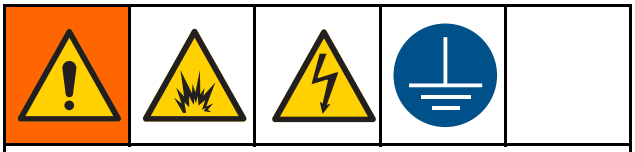
1. See Dimensions, page 71.
2. Ensure that the wall and mounting hardware are strong enough to support the weight of the equipment, fluid, hoses, and stress cause during operation.
3. Using the equipment as a template, mark the mounting holes on the wall at a convenient height for the operator and so the equipment is easily accessible for maintenance.

   NOTE: The smaller color change control modules must be mounted in the Non-IS area. The larger remote color change module may be mounted in the IS area.
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



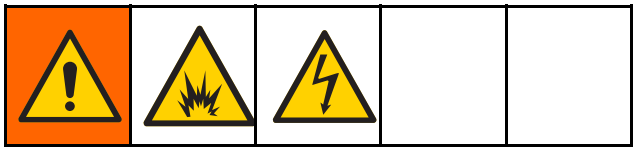
This equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

Connect a ground wire from each color change module in the non-hazardous area to a true earth ground.

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

Non-Hazardous Location

Connect the Color Change Control Modules



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

1. Mount the first non-IS color control module as described in Mounting the Control Modules, page 18.
2. Connect the 5–pin CAN cable (109) to J7 on the color control module (108).

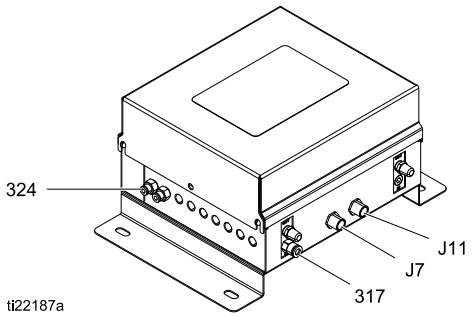


Figure 3 Cable Connector J7 at Non-IS Color Control Module

NOTICE

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

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

3. Remove electrical power from the system.
4. Remove the cover from the PD2K electrical control box.
5. Install the supplied 2–cable grommet (110) on the cable (109) and secure the grommet to the side of the electrical control box.
6. Connect the cable (109) to J2 on the non-IS side of the isolation board inside the electrical control box. See Electrical Schematics, page 36 for a list of M12 CAN cables for use in a non-hazardous area.
7. To install additional color control modules (six maximum), mount the module(s) as described in Mounting the Control Modules, page 18. Connect a 5–pin CAN cable from J11 of the previous color control module to J7 of the next control module.
8. Replace the cover of the PD2K electrical control box before turning on power to the system.

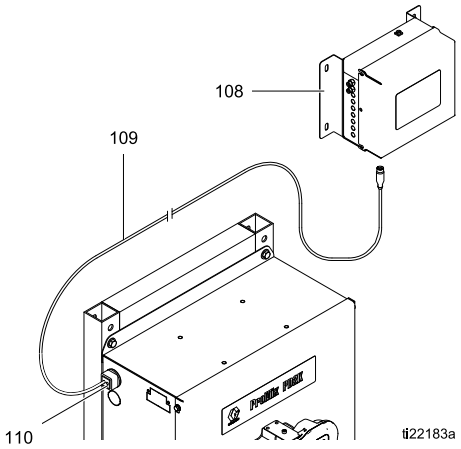


Figure 4 Cable Connection at PD2K Electrical Control Box

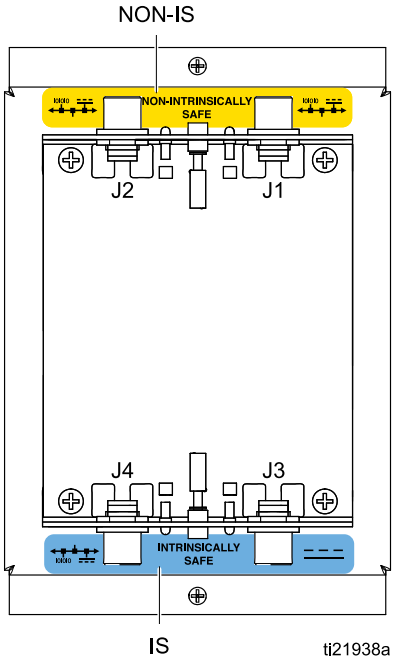
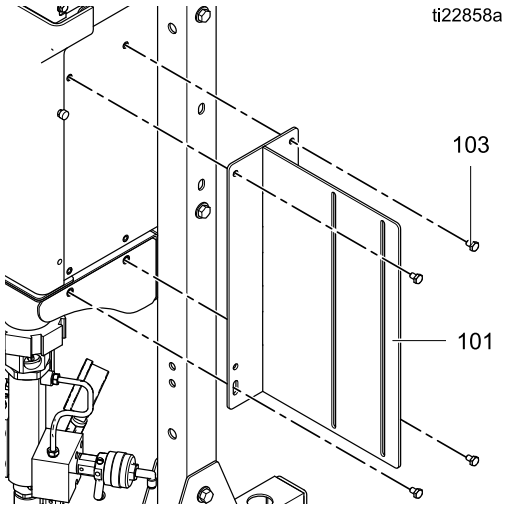


Figure 5 Detail of Isolation Board Cable Connections

Install the Valve Manifolds

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

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



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

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

3. Repeat for the opposite side of the PD2K.
4. Connect the air lines from the solenoids to the valves. See Connect the Valve Air Lines, page 24.

   NOTE: On high pressure systems, see Install the Back Pressure Regulator (High Pressure Systems Only), page 21.

5. Connect the fluid supply lines to the valves. See Connect the Fluid Lines, page 26.

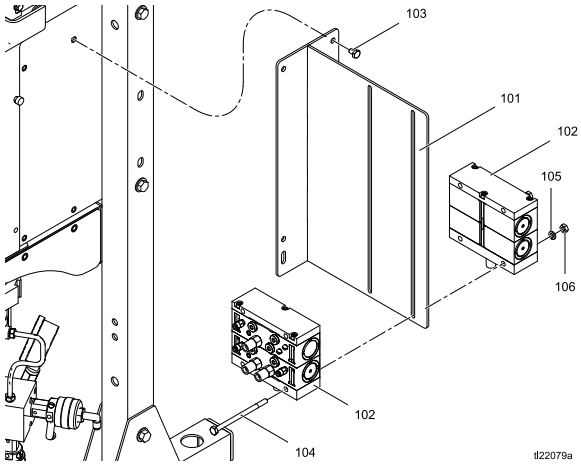


Figure 6 Install the Valve Manifolds

Install the Back Pressure Regulator (High Pressure Systems Only)

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

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

1. Install the gauge (123) in the open port of the tee (122).
2. Screw the tee (122) onto the dump valve fitting of the outlet manifold stack.
3. Assemble the two nipples (121) to the back pressure regulator (120). Screw the regulator assembly into the tee (122) as shown.
4. Connect a 1/4 npt(f) dump line to the downward facing nipple (121).
5. Connect the fluid supply lines to the valves. See Connect the Fluid Lines, page 26.

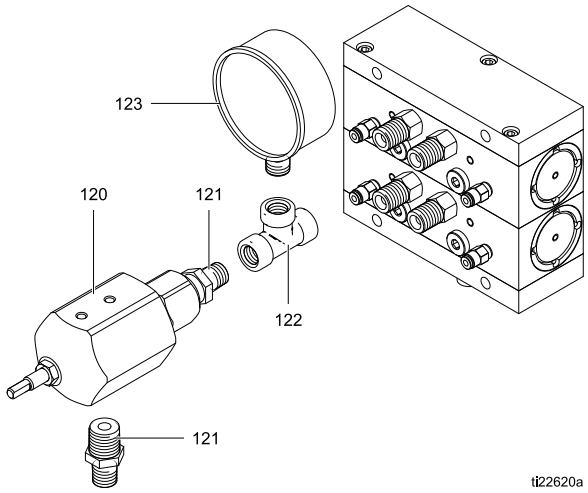
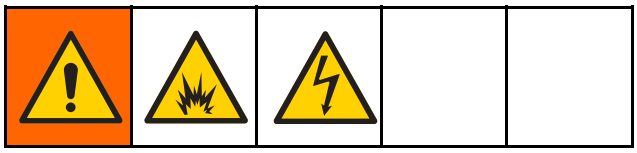


Figure 7 Install Back Pressure Regulator at Dump Valve of Outlet Stack

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 66 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 42 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 18.

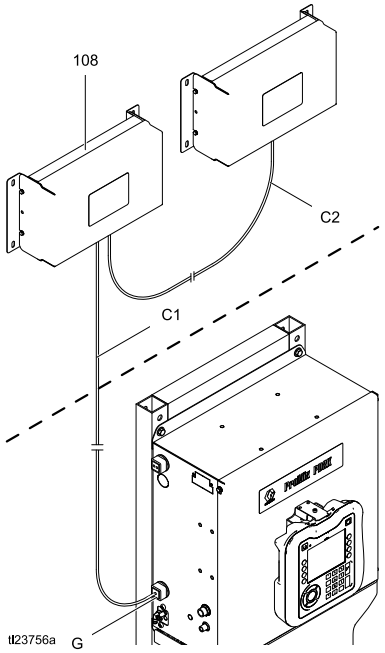


Figure 8 Intrinsically Safe Cable Connections

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

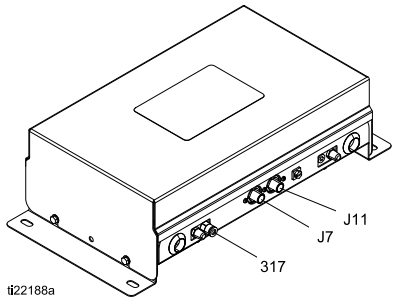


Figure 9 Cable Connectors J7 and J11 at IS Color Control Module

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 36.

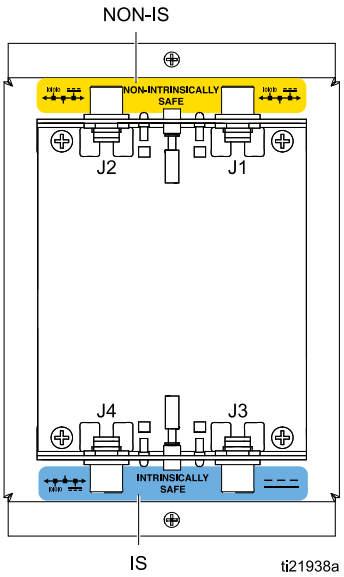
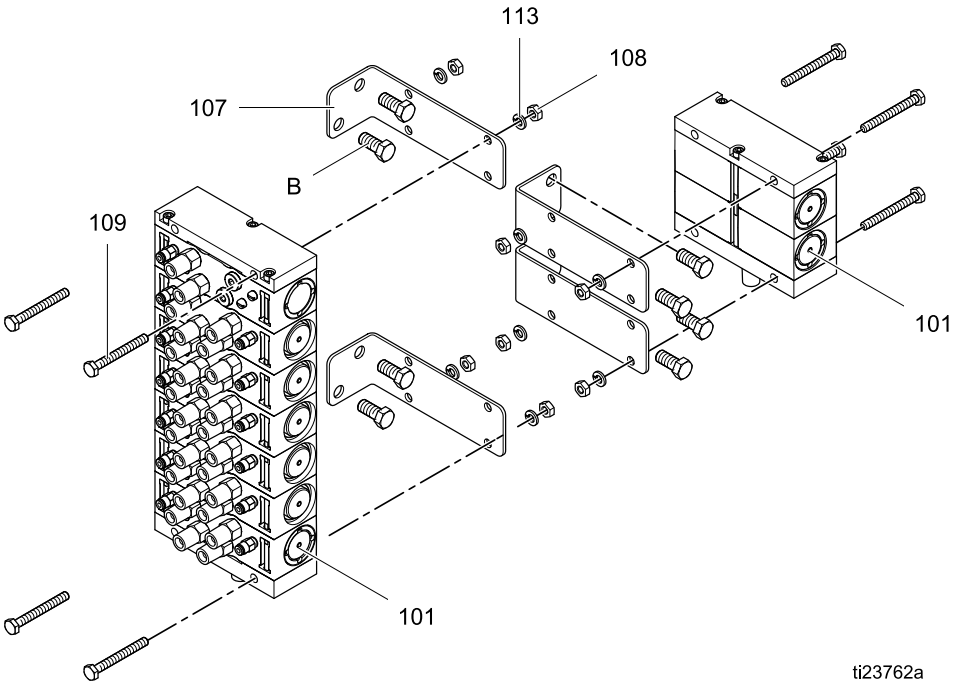


Figure 10 Detail of Isolation Board Cable Connections

5. If your system includes a second remote color control module mount it as described in Mounting the Control Modules, page 18. 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.

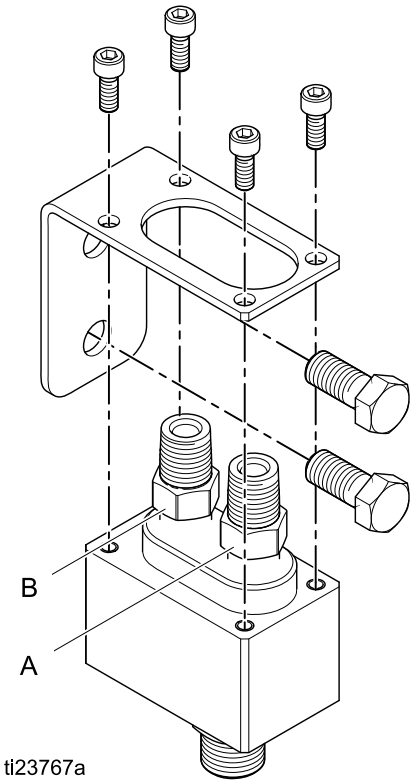
Install the Remote Valve Manifolds

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 71. 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 26.



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 71. 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 26.



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Connect the Valve Air Lines

Non-Hazardous Area

1. Connect 5/32 in. (4 mm) OD air tubes from the inlet solenoids to the air inlets of each inlet valve, using the label inside of the color control module as a guide. See Setup the Modules, page 13.
2. Repeat for the outlet valves.

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 13.

Notes

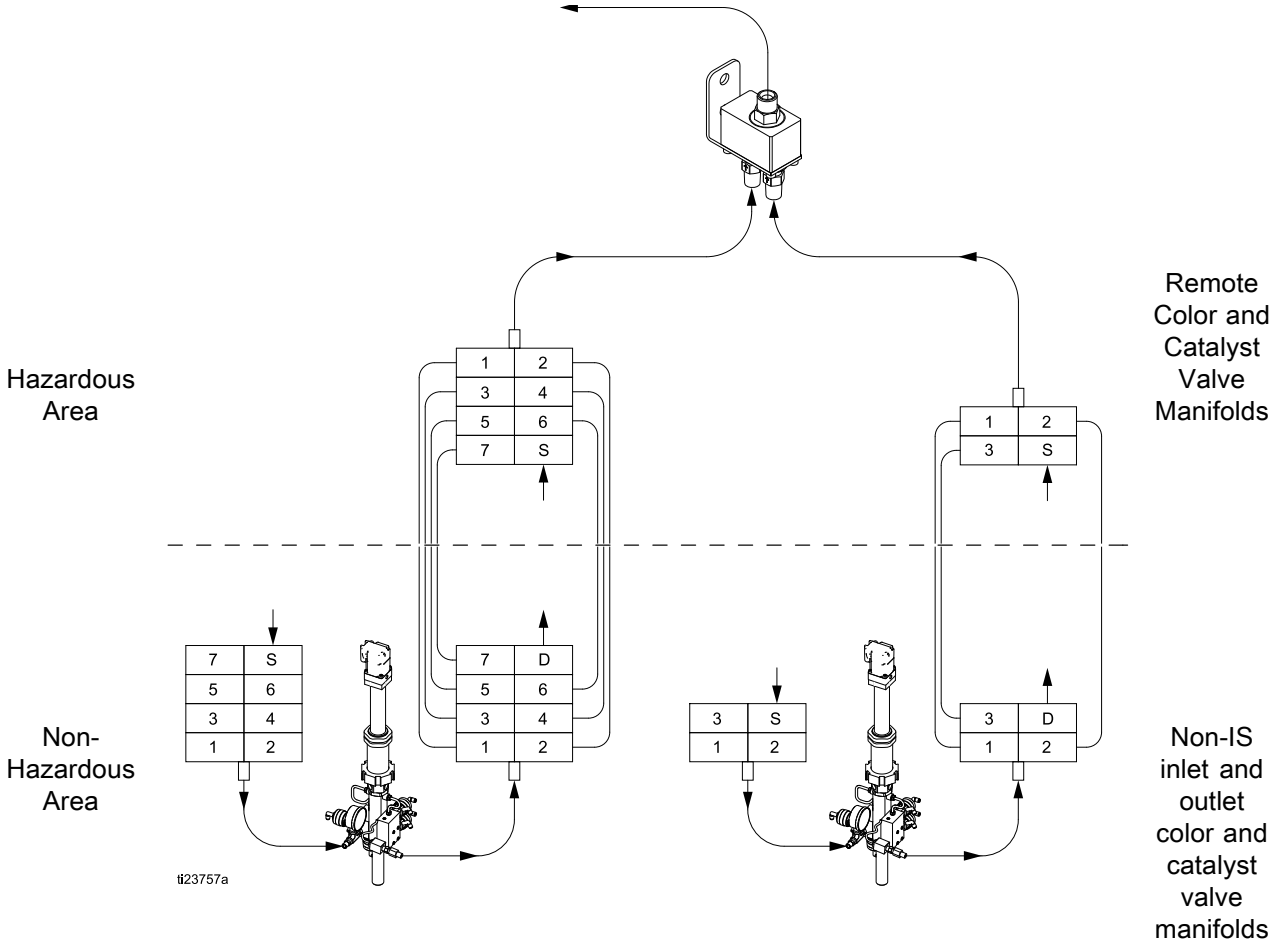
Connect the Fluid Lines

Connect Non-Circulating Fluid Lines

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

NOTE: On high pressure systems, see Install the Back Pressure Regulator (High Pressure Systems Only), page 21.

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

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.

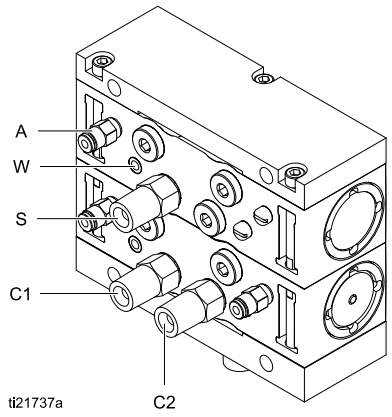


Figure 11 Color Change Connections (Non-Circulating System)

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

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.

NOTE: On high pressure systems, see Install the Back Pressure Regulator (High Pressure Systems Only), page 21.

1. Connect all fluid lines as described in Connect Non-Circulating Fluid Lines, page 26. 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.

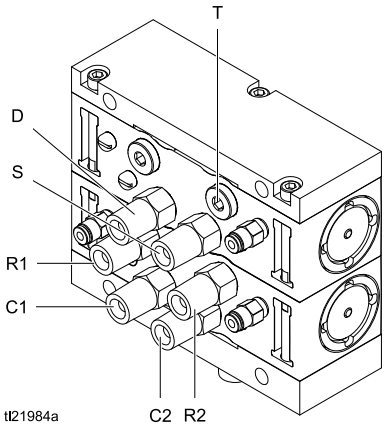
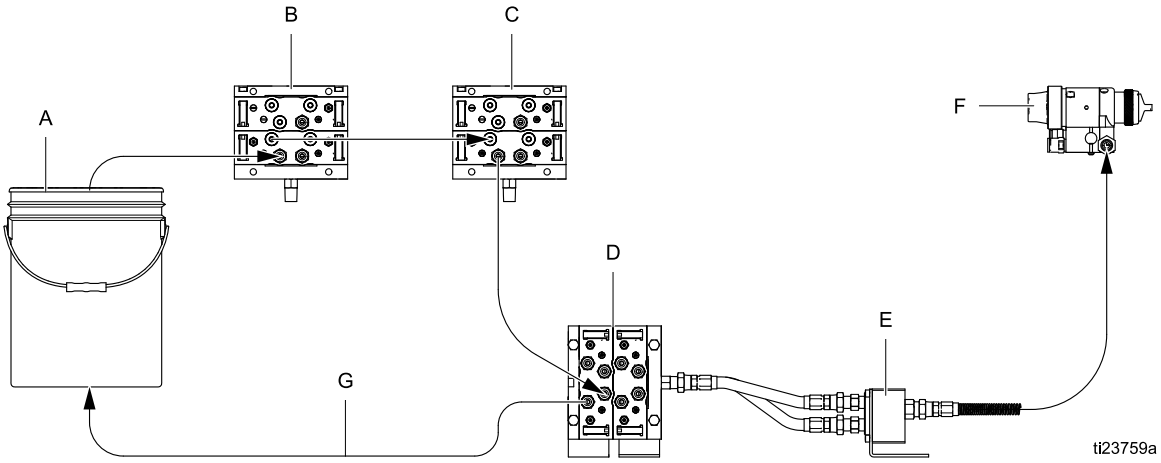


Figure 12 Valve Manifold Connections (Circulating System)

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



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

KEY

A Color supply

B Inlet color stack

C Outlet color stack

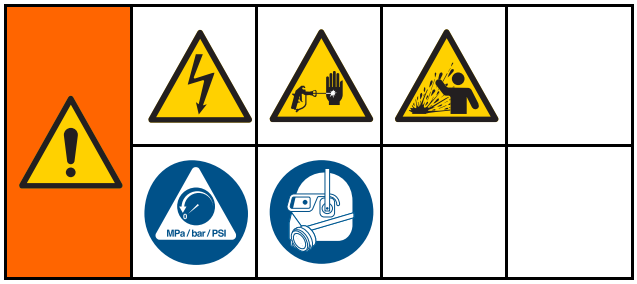
D Remote color stack

E Remote mix manifold

F Automatic spray gun

G Return line to fluid supply

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 69 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 13. 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 36.

   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 43.
   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 43. 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 43.
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 and Non-IS areas.
10. Install the control module covers.
11. Return the unit to service.

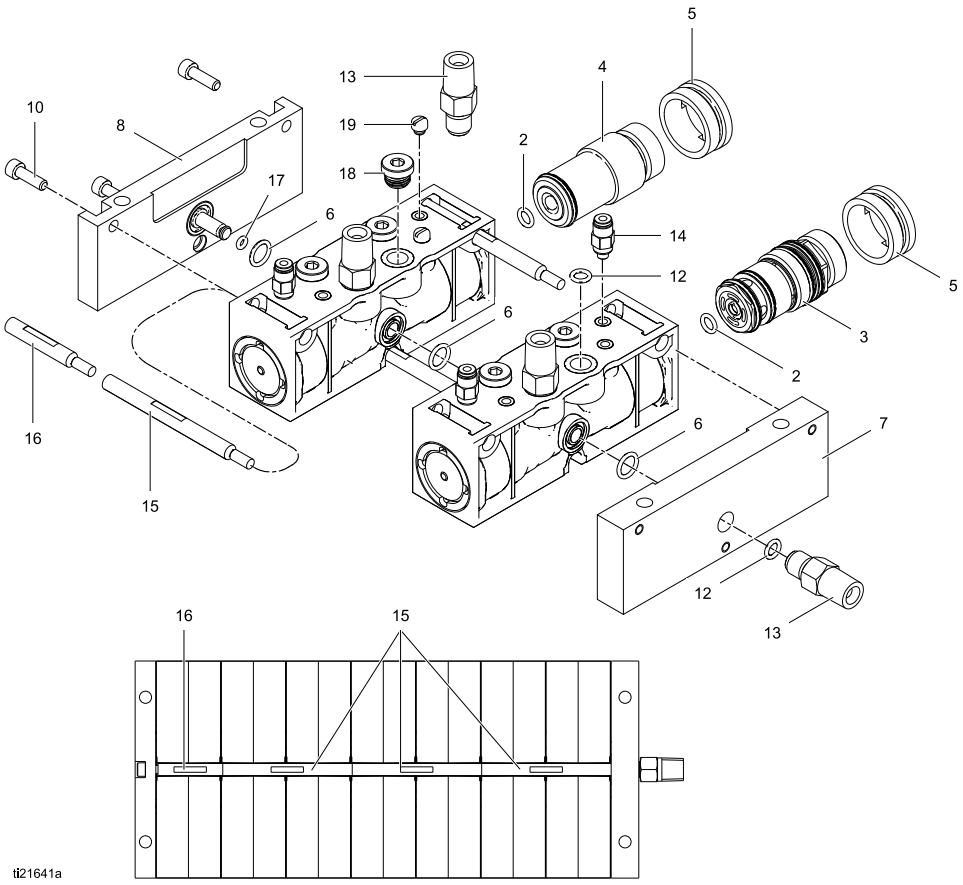
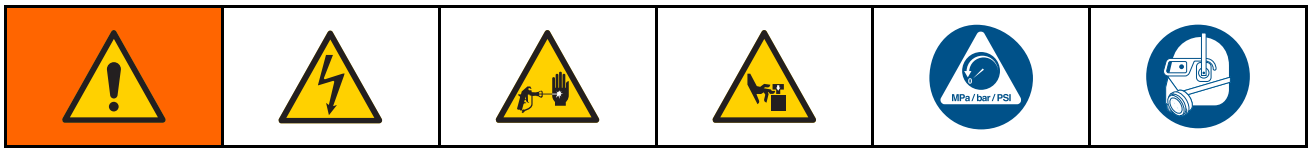


Figure 13 Install an Expansion Kit (Low Pressure Valve Manifold Shown)

Troubleshooting



NOTE: Check all possible remedies before disassembling the system.

Color Change Solenoid Valves

NOTE: Refer to Electrical Schematics, page 36. 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.	Check the applicable solenoid's LED; see Color Change Board, page 34. If lit, proceed with the following checks. If not lit, go to Cause 4. Remove the connector for the applicable solenoid and measure voltage across the pins on the board: • 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. Test the valves as explained under **Maintenance Screen 4** in your PD2K Operation manual. Valves should open and close quickly. If the valves actuate slowly, it could be caused by: • 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
4. Control board or cable failure.	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. If D9 is not lit: • Verify the condition of the fuse (F1) and replace if necessary. See Replace the Color Change Board Fuse, page 44. • Check if the cable is disconnected or damaged. • Check the isolation board. See the PD2K Repair-Parts manual. If D8 is not blinking: • Cycle the system power. • Check if the cable is disconnected or damaged. • Check the isolation board. See the PD2K Repair-Parts manual. If D10 is not occasionally blinking: • 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.

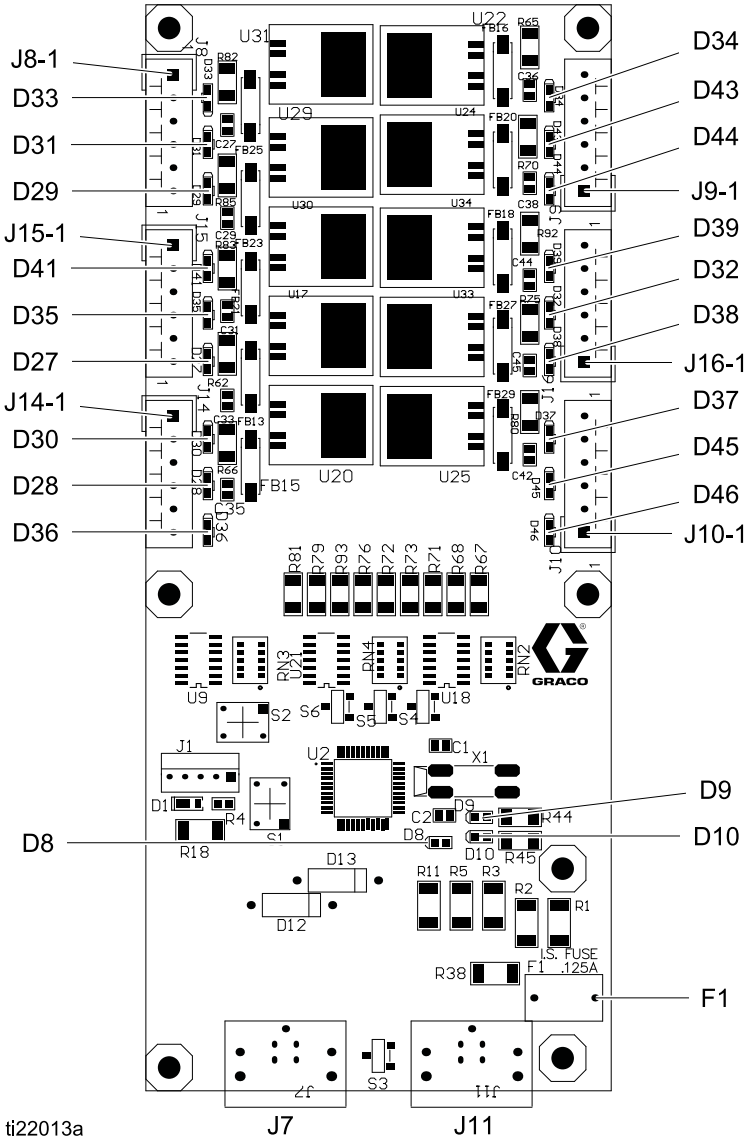


Figure 14 Color Change Board

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	

Electrical Schematics

NOTE: The electrical schematic illustrates all possible wiring expansions in a ProMix PD2K system. Some components shown are not included with all systems.
NOTE: See Optional Cables and Modules, page 42, for a list of cable options.

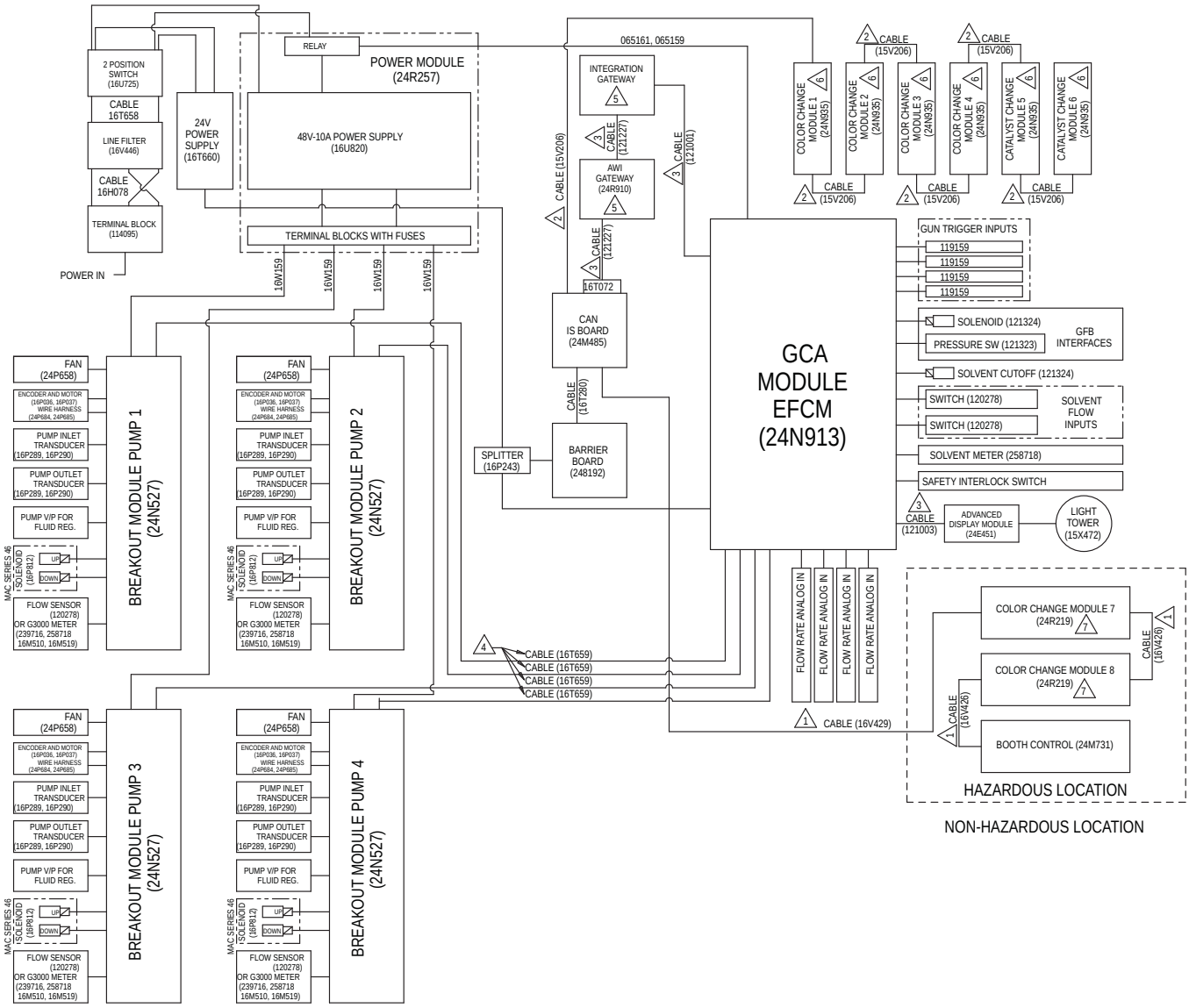


Figure 15 Electrical Schematic, Sheet 1

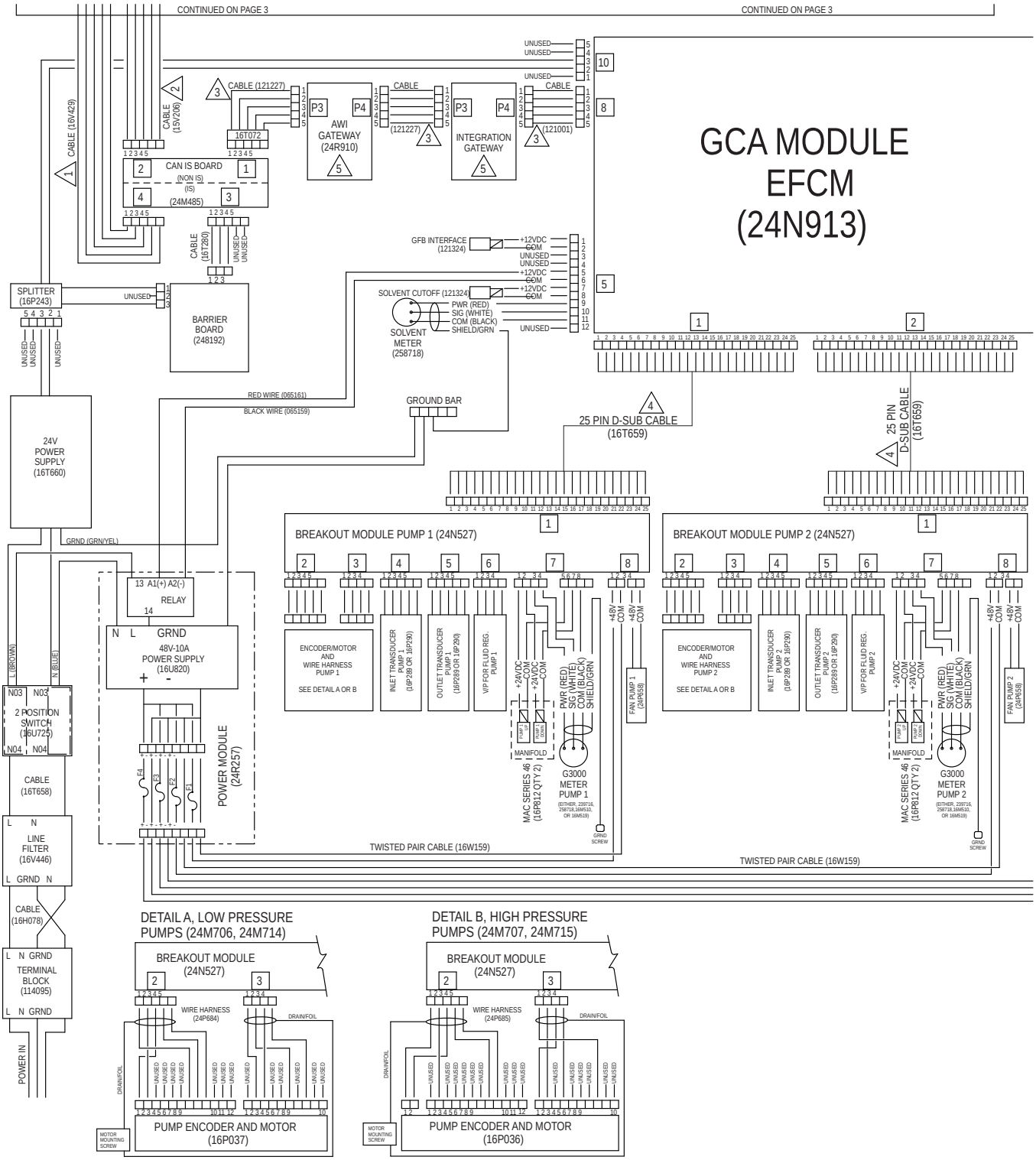


Figure 16 Electrical Schematic, Sheet 2, Part 1

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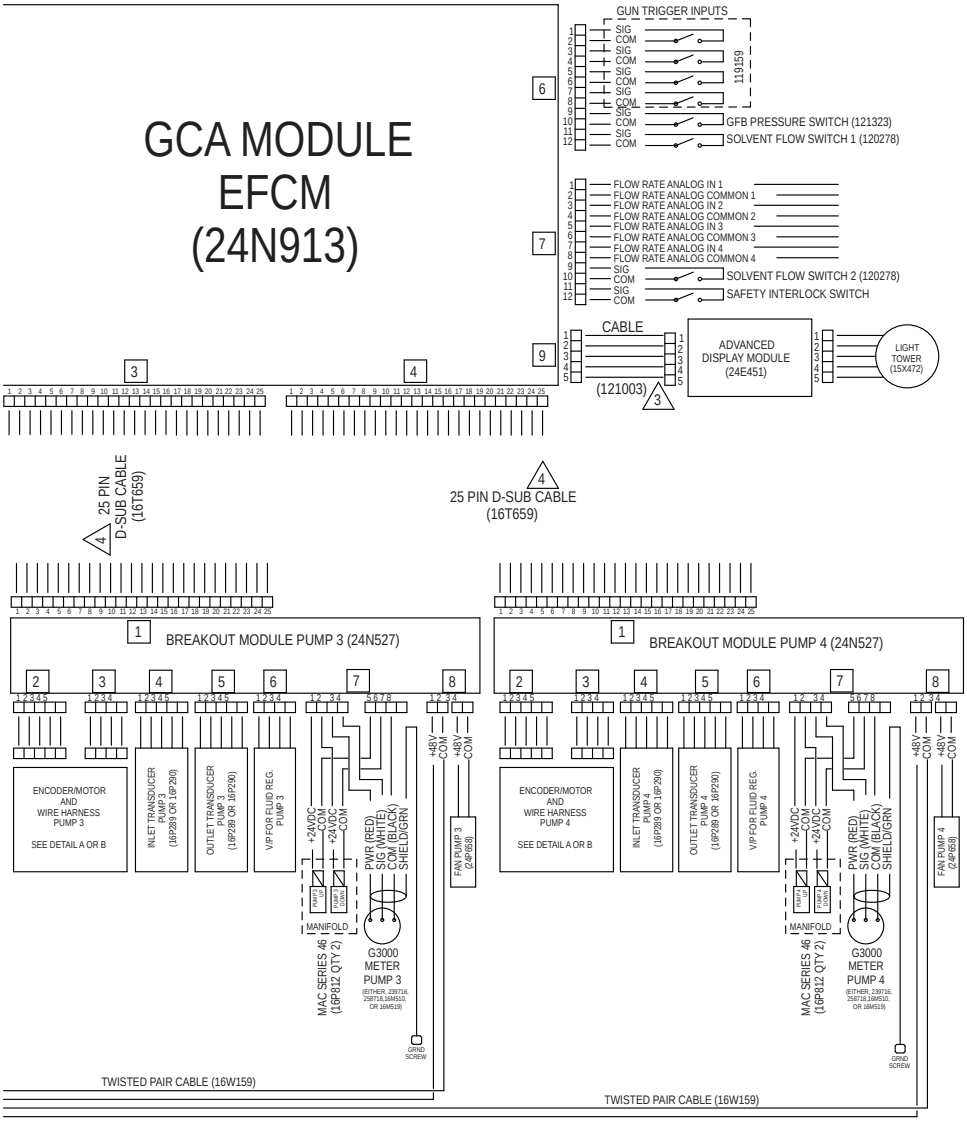

Figure 17 Electrical Schematic, Sheet 2, Part 2

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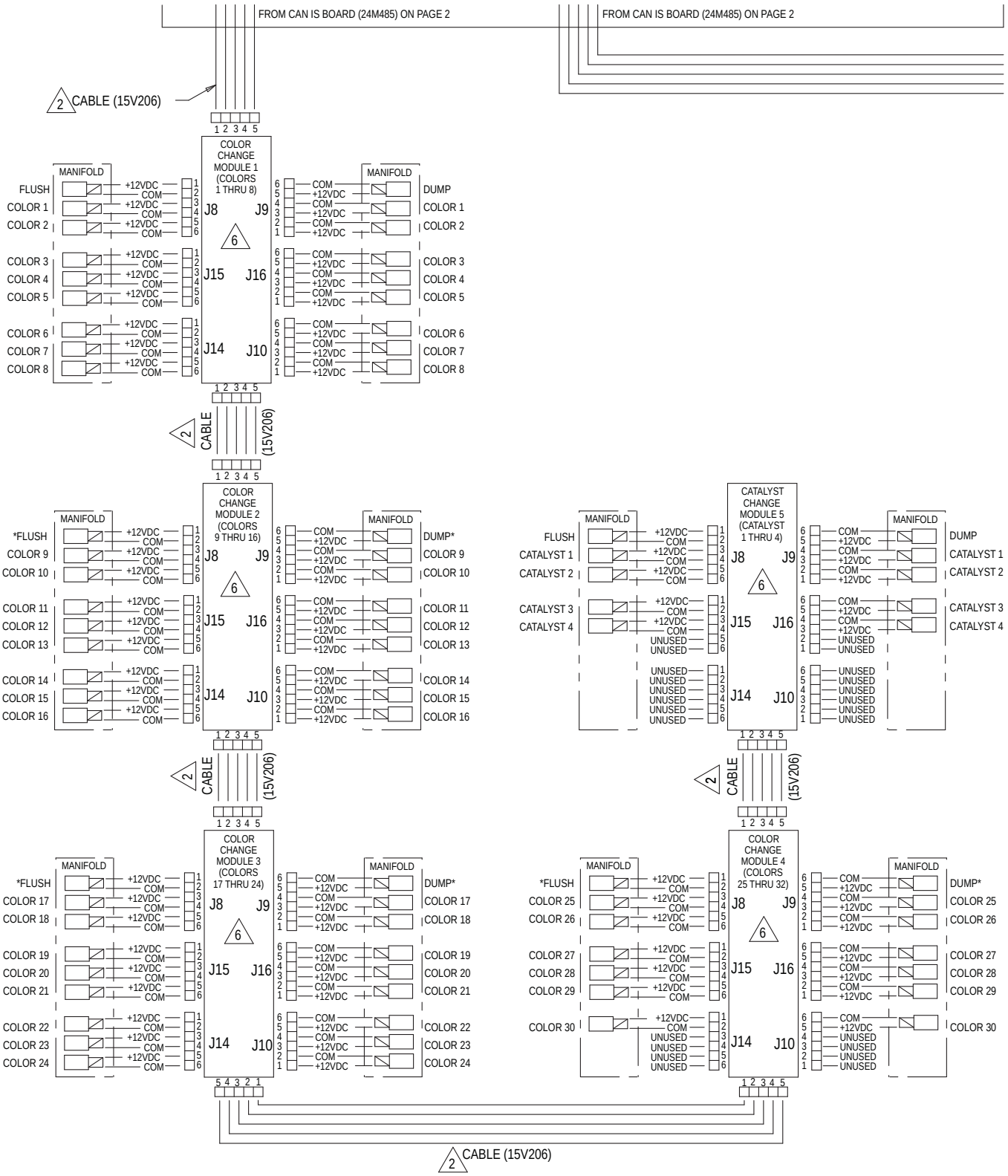

Figure 18 Electrical Schematic, Sheet 3

* May be unused in some configurations.

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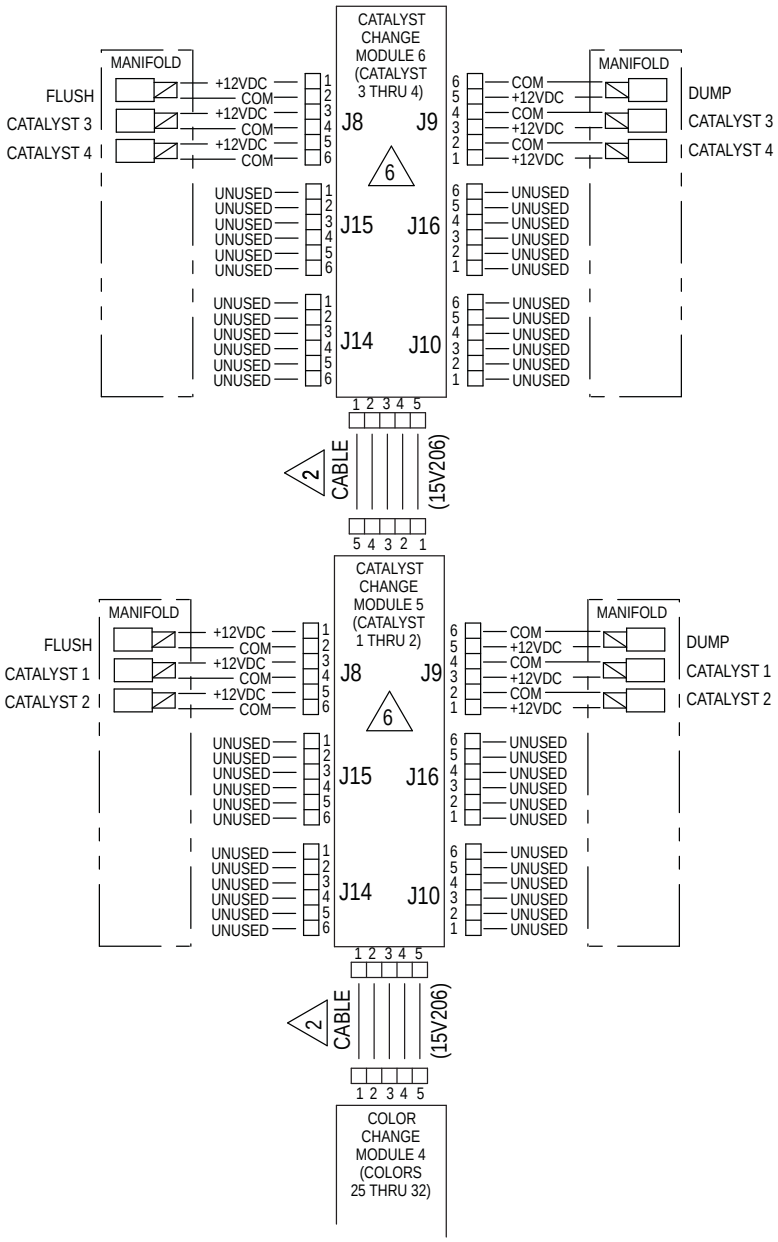

Figure 19 Electrical Schematic, Sheet 3, Alternate Configuration for Catalyst Change Control

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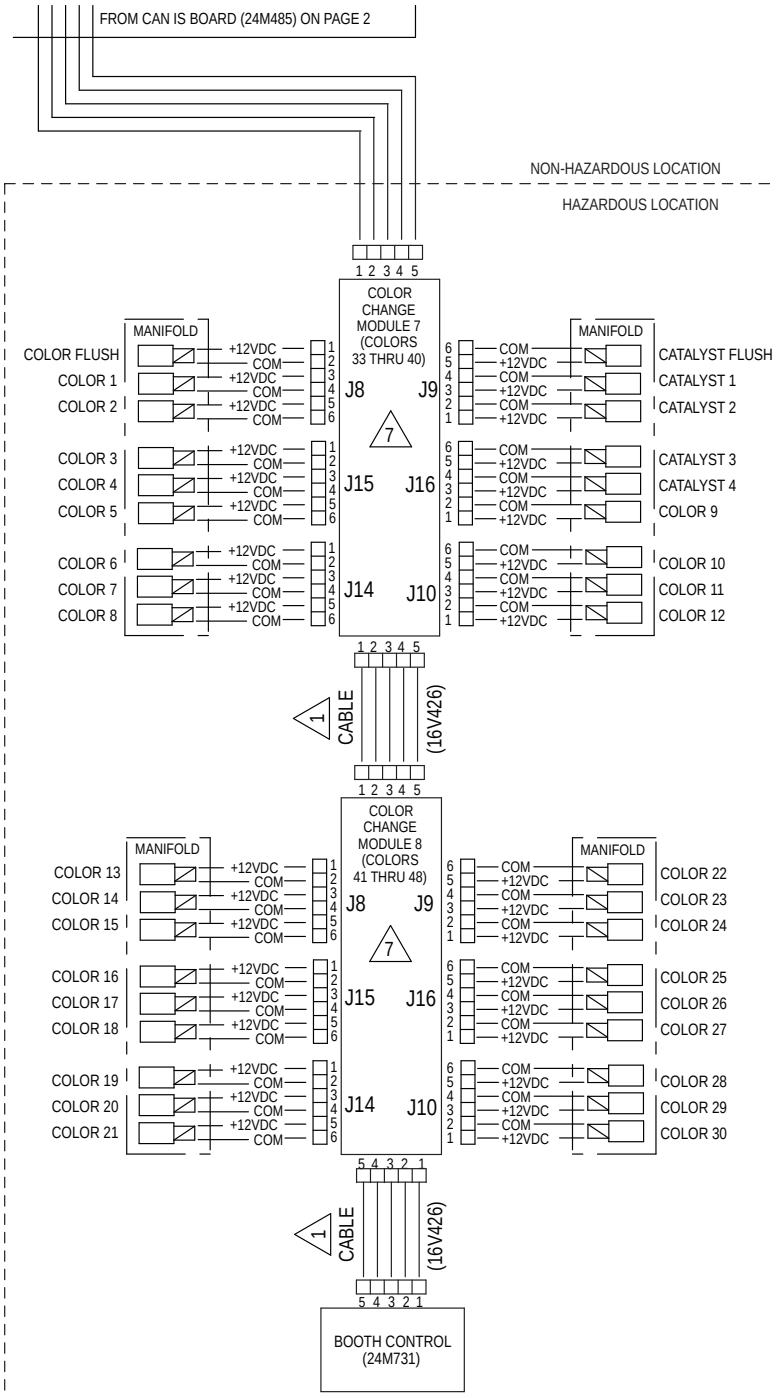


Figure 20 Electrical Schematic, Sheet 3, Hazardous Location

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 36.

1 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)

2 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)

3 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)

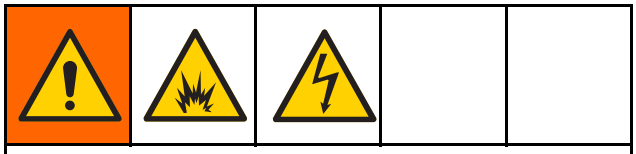
4 25 Pin D-SUB Cables, for Non-Hazardous Locations Only	
16T659	2.5 (0.8)
16V659	6.0 (1.8)

5 Alternates for Communication Module 24R910, for Non-Hazardous Locations Only	
Module Part No.	**Module Part No.**
CGMDN0*, DeviceNet	CGMPB0*, Profibus
CGMEP0*, Ethernet IP	CGMPN0*, Profinet
* You must purchase Map Token Kit 17C087 for use with these kits.	

6 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

7 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



- 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

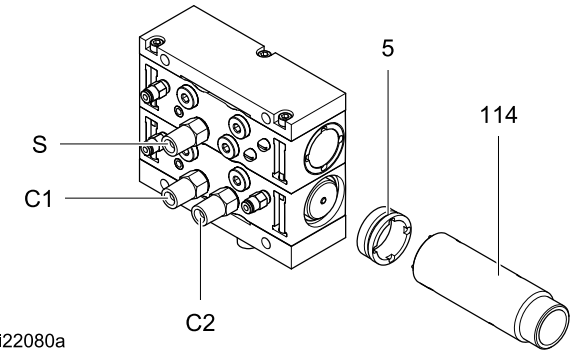
To avoid damaging the circuit boards, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

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.

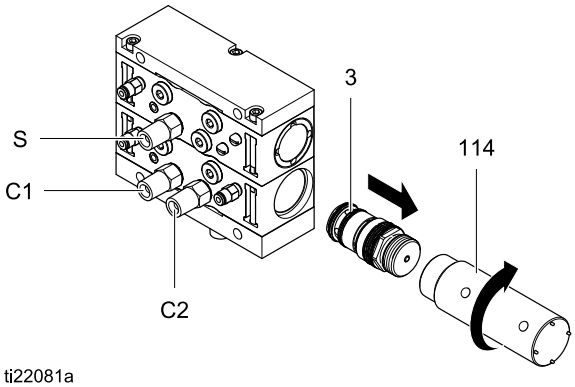
1. Flush and relieve pressure as described in your PD2K operation manual.
2. Engage the pins of the tool (114) with the notches in the retainer (5) and unscrew the retainer.



ti22080a

Figure 21 Remove Retainer

3. Using the other end of the tool (114), screw it all the way onto the valve (3). Pull the valve from the manifold.



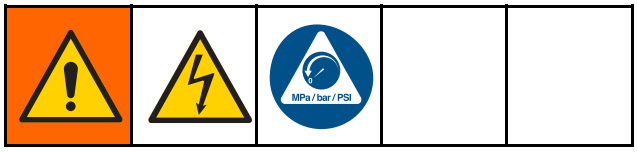
ti22081a

Figure 22 Remove the Valve

NOTE: See manual 332454 to repair the valve.

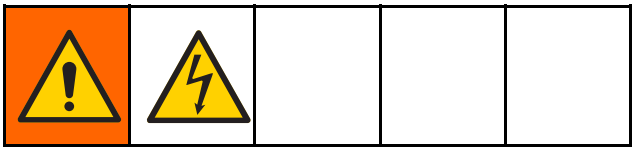
4. Install the valve in the reverse order of disassembly. Be sure all o-rings are in place and lubricated, and that the valve is seated completely in the manifold.
5. Return the system to service.

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 36.
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 36.
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 the seven mounting screws (303) and the board (302).
5. Install the new board. Reinstall the screws.
6. Reconnect the cables to the proper connectors, as noted in step 3. See Electrical Schematics, page 36.
7. Reinstall the cover (304). Restore electrical power to the system.

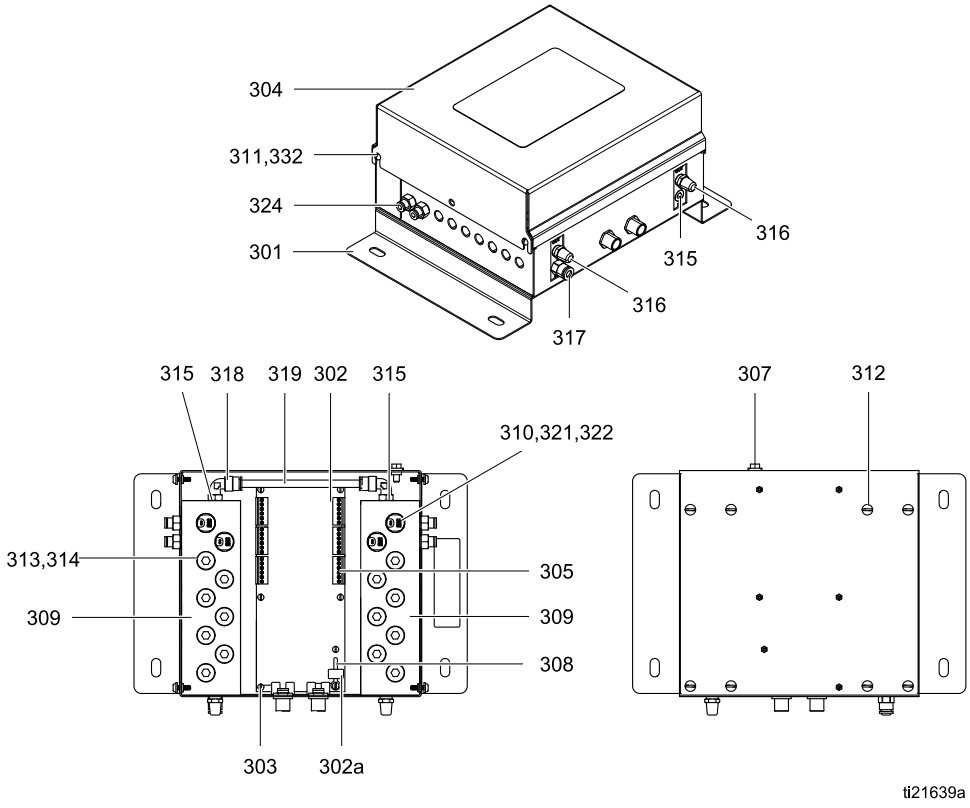
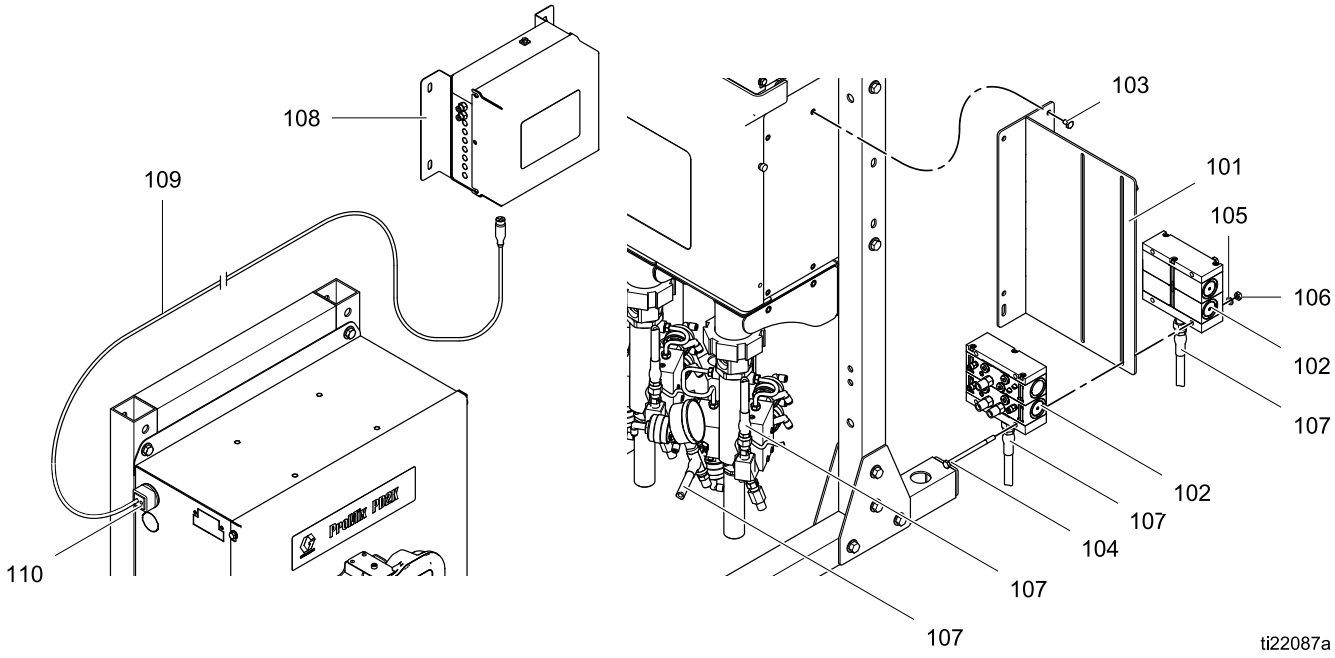


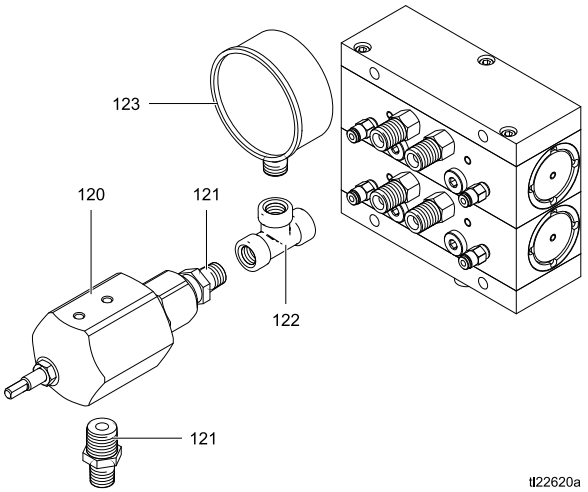
Figure 23 Control Module Repair (Non-IS Module Shown)

Parts

Non-IS Color Change Kits



Detail of Back Pressure Regulator (High Pressure Outlet Stack only)



Ref. No.	Part No.	Description	Qty
101	24U237	BRACKET, mounting	1
102	◆	KIT, manifold, valve	2
103	100157	SCREW, cap, hex head; 1/4–20 x 0.375 in. (10 mm)	4
104	103195	SCREW, cap, hex head; 1/4–20 x 4.0 in. (101 mm)	4
105	100016	WASHER, lock; 1/4	4
106	100015	NUT, hex; 1/4–20	4
107	24N346	HOSE, fluid; 1/4 npsm (fbe); 2.5 ft (0.76 m); ptfe	2
108	◆	KIT, module, control	1
109	15V206	CABLE, CAN; 5–pin female; 10 ft (3.05 m)	1
110	16V819	GROMMET, cable	1
111	24U236	TOOL, repair, valve (not shown)	1
114	◆	TOOL, installation, valve (not shown)	1

Ref. No.	Part No.	Description	Qty
115	598095	TUBE; nylon; 5/32 in. (4 mm) OD	◆
120	222200	REGULATOR, back pressure; used on high pressure kits only (see detail drawing); see manual 307892	1
121	113070	NIPPLE; 3/8 npt x 1/4 npt; sst; used on high pressure kits only (see detail drawing)	2
122	110290	TEE; 1/4 npt(f); sst; used on high pressure kits only (see detail drawing)	1
123	112564	GAUGE, pressure, fluid; used on high pressure kits only (see detail drawing)	1

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

Low Pressure Non-IS Kits

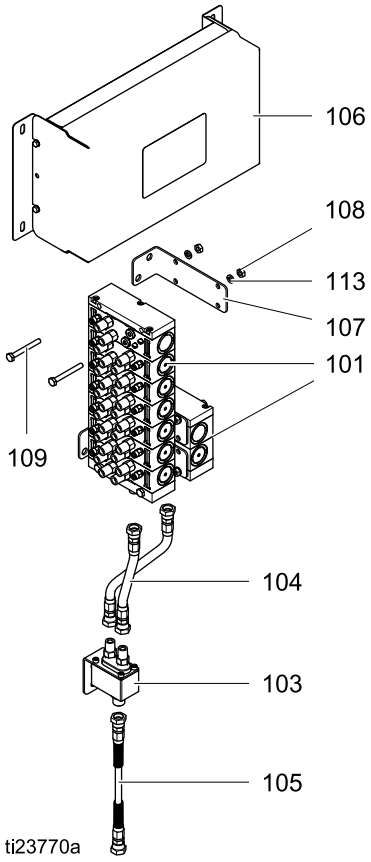
Kit No.	Kit Description	Standard Valve Manifold Kits (102) [see Low Pressure Valve Manifold Kits, page 53 for all available kits]	Control Module Kit (108) [see Non-IS Color Change Control Modules, page 64 for parts]	Tool (114)	Tube Length (115)
Low Pressure Non-Circulating Color Change Kits					
24R915	2 color or 2 catalyst	24T458	24T557	24U239	60 ft (18.3 m)
24R916	4 color or 4 catalyst	24T460	24T558	24U239	120 ft (36.6 m)
24R917	6 color	24T462	24T559	24U239	210 ft (64.05 m)
24R918	8 color	24T464	24T560	24U239	360 ft (109.8 m)
Low Pressure Circulating Color Change Kits					
24R919	2 color	24T488	24T557	24U239	60 ft (18.3 m)
24R920	4 color	24T490	24T558	24U239	120 ft (36.6 m)
24R921	6 color	24T492	24T559	24U239	210 ft (64.05 m)
24R922	8 color	24T494	24T560	24U239	360 ft (109.8 m)

High Pressure Non-IS Kits

Kit No.	Kit Description	Standard Valve Manifold Kits (102) [see High Pressure Valve Manifold Kits, page 58 for all available kits]	Control Module Kit (108) [see Non-IS Color Change Control Modules, page 64 for parts]	Tool (114)	Tube Length (115)
High Pressure Non-Circulating Color Change Kits					
24R959	2 color or 2 catalyst	24T648	24T557	24U240	60 ft (18.3 m)
24R960	4 color or 4 catalyst	24T650	24T558	24U240	120 ft (36.6 m)
24R961	6 color	24T652	24T559	24U240	210 ft (64.05 m)
24R962	8 color	24T654	24T560	24U240	360 ft (109.8 m)
High Pressure Acid Compatible Non-Circulating Catalyst Change Kits					
24T579	2 catalyst	24U182	24T557	24U240	60 ft (18.3 m)
24T580	4 catalyst	24U183	24T558	24U240	120 ft (36.6 m)
High Pressure Circulating Color Change Kits					
24R963	2 color	24T678	24T557	24U240	60 ft (18.3 m)
24R964	4 color	24T680	24T558	24U240	120 ft (36.6 m)
24R965	6 color	24T682	24T559	24U240	210 ft (64.05 m)
24R966	8 color	24T684	24T560	24U240	360 ft (109.8 m)

Notes

IS Color Change Kits



Ref. No.	Part No.	Description	Qty
101	◆	KIT, manifold, valve; . See Valve Manifold Kits, page 53 for available kits.	2
103	24V351	MANIFOLD, mix, remote	1
104	24N346	HOSE, coupled, 2.5 ft.	2
105		HOSE, static mixer	1
	16W564	Low Pressure	
	16W563	High Pressure	
106	◆	KIT, module, control	1
107	16Y954	BRACKET, manifold	2
108	100015	NUT, hex	4
109		SCREW, cap, hex	4
	104429	Low Pressure	
	113469	High Pressure	

Ref. No.	Part No.	Description	Qty
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
114	16V429	CABLE, CAN, 50 ft (15.2 m); not shown	1

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

Low Pressure IS Kits

Kit No.	Kit Description	Standard Valve Manifold Kits (101) [see Low Pressure Valve Manifold Kits, page 53 for all available kits]	Control Module Kit (106) [see IS Color Change Control Modules, page 66 for parts]
Low Pressure Non-Circulating Color Change Kits			
24V157	1 color and 1 catalyst	24T457 (2)	24T571
24V158	2 colors and 1 catalyst	24T458, 24T457	24T571
24V159	4 colors and 1 catalyst	24T460, 24T457	24T572
24V160	6 colors and 1 catalyst	24T462, 24T457	24T573
24V161	8 colors and 1 catalyst	24T464, 24T457	24T574
24V162	12 colors and 1 catalyst	24T468, 24T369	24T774
24V331	2 colors and 2 catalysts	24T458 (2)	24T571
24V332	4 colors and 2 catalysts	24T460, 24T458	24T572
24V333	6 colors and 2 catalysts	24T462, 24T458	24T573
24V334	8 colors and 2 catalysts	24T464, 24T458	24T574
24V335	12 colors and 2 catalysts	24T468, 24T458	24T774
24V343	4 colors and 4 catalysts	24T460 (2)	24T775
24V344	6 colors and 4 catalysts	24T462, 24T460	24T776
24V345	8 colors and 4 catalysts	24T464, 24T460	24T777
24V346	12 colors and 4 catalysts	24T468, 24T460	24T778
Low Pressure Circulating Color Change Kits			
24V166	1 color and 1 catalyst	24T487 (2)	24T571
24V167	2 colors and 1 catalyst	24T488, 24T487	24T571
24V308	4 colors and 1 catalyst	24T490, 24T487	24T572
24V309	6 colors and 1 catalyst	24T492, 24T487	24T573
24V326	8 colors and 1 catalyst	24T494, 24T487	24T574
24V327	12 colors and 1 catalyst	24T498, 24T487	24T774
24V336	2 colors and 2 catalysts	24T488 (2)	24T571
24V337	4 colors and 2 catalysts	24T490, 24T488	24T572
24V338	6 colors and 2 catalysts	24T492, 24T488	24T573
24V339	8 colors and 2 catalysts	24T494, 24T488	24T574
24V340	12 colors and 2 catalysts	24T498, 24T488	24T774
24V347	4 colors and 4 catalysts	24T490 (2)	24T775
24V348	6 colors and 4 catalysts	24T492, 24T490	24T776
24V349	8 colors and 4 catalysts	24T494, 24T490	24T777
24V350	12 colors and 4 catalysts	24T498, 24T490	24T778

High Pressure IS Kits

Kit No.	Kit Description	Standard Valve Manifold Kits (101) [see Low Pressure Valve Manifold Kits, page 53 for all available kits]	Control Module Kit (106) [see IS Color Change Control Modules, page 66 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

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

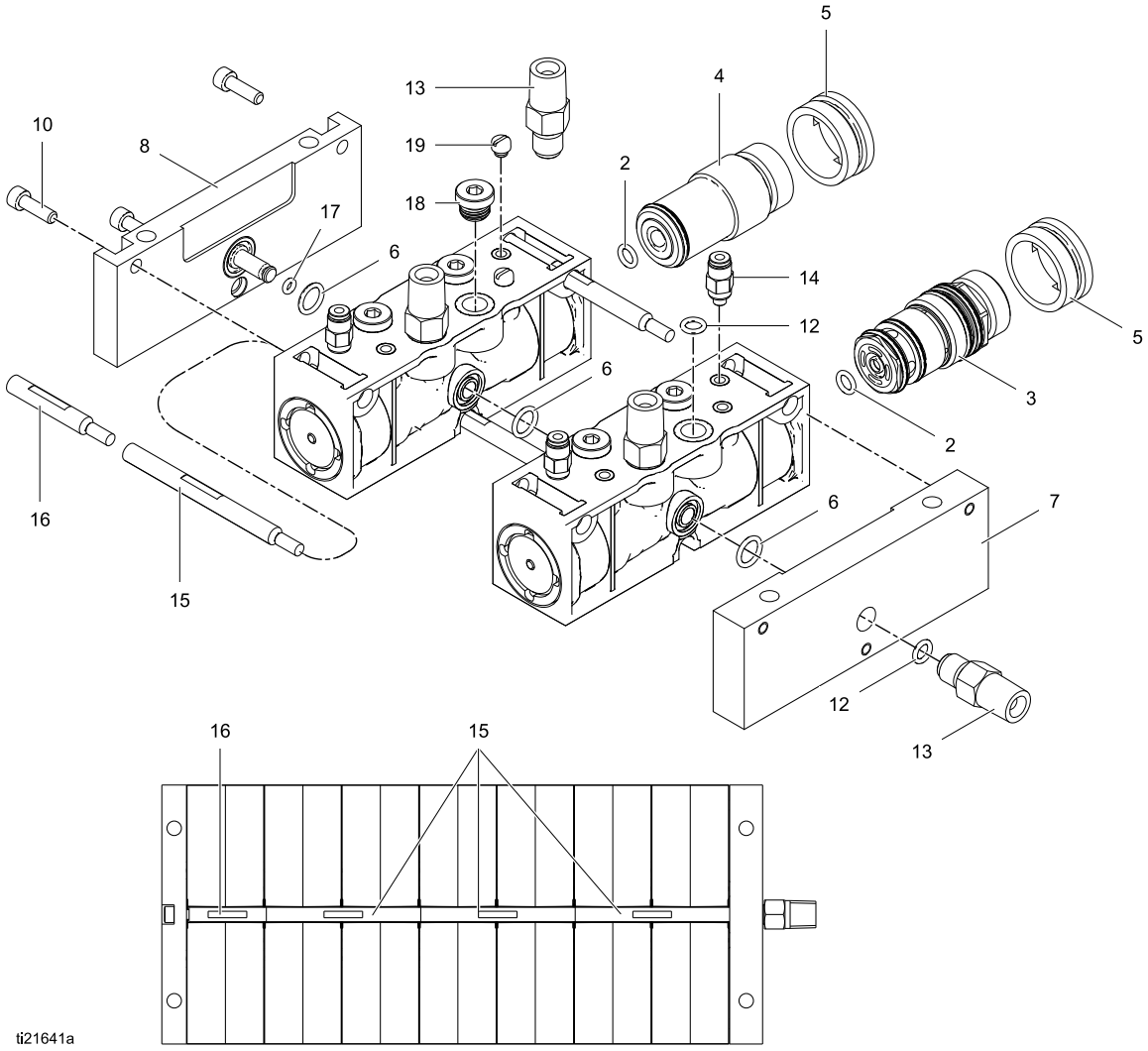
Non-Circulating Valve Manifold Kits

Kit No.	Series	Kit Description
24T457	A	2 valves
24T458	A	3 valves
24T459	A	4 valves
24T460	A	5 valves
24T461	A	6 valves
24T462	A	7 valves
24T463	A	8 valves
24T464	A	9 valves
24T465	A	10 valves
24T466	A	11 valves
24T467	A	12 valves
24T468	A	13 valves
24T469	A	14 valves
24T470	A	15 valves
24T471	A	16 valves
24T472	A	17 valves
24T473	A	18 valves
24T474	A	19 valves
24T475	A	20 valves
24T476	A	21 valves
24T477	A	22 valves
24T478	A	23 valves
24T479	A	24 valves
24T480	A	25 valves
24T481	A	26 valves
24T482	A	27 valves
24T483	A	28 valves
24T484	A	29 valves
24T485	A	30 valves
24T486	A	31 valves

Circulating Valve Manifold Kits

Kit No.	Series	Kit Description
24T487	A	2 valves
24T488	A	3 valves
24T489	A	4 valves
24T490	A	5 valves
24T491	A	6 valves
24T492	A	7 valves
24T493	A	8 valves
24T494	A	9 valves
24T495	A	10 valves
24T496	A	11 valves
24T497	A	12 valves
24T498	A	13 valves
24T499	A	14 valves
24T500	A	15 valves
24T501	A	16 valves
24T502	A	17 valves
24T503	A	18 valves
24T504	A	19 valves
24T505	A	20 valves
24T506	A	21 valves
24T507	A	22 valves
24T508	A	23 valves
24T509	A	24 valves
24T510	A	25 valves
24T511	A	26 valves
24T512	A	27 valves
24T513	A	28 valves
24T514	A	29 valves
24T515	A	30 valves
24T516	A	31 valves

Valve Manifold Kit Parts



Ref. No.	Part No.	Description	Qty
1	16P259	MANIFOLD	★
2	111450	O-RING; chemically resistant	
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	
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)	

★ *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
24T457	1	2	2	0	2	2	1	1	3	3	3	2	0	3	1	2	0
24T458	2	4	3	1	4	3	1	1	3	4	4	3	3	0	1	5	2
24T459	2	4	4	0	4	3	1	1	3	5	5	4	3	0	1	4	0
24T460	3	6	5	1	6	4	1	1	3	6	6	5	3	3	1	7	2
24T461	3	6	6	0	6	4	1	1	3	7	7	6	3	3	1	6	0
24T462	4	8	7	1	8	5	1	1	3	8	8	7	6	0	1	9	2
24T463	4	8	8	0	8	5	1	1	3	9	9	8	6	0	1	8	0
24T464	5	10	9	1	10	6	1	1	3	10	10	9	6	3	1	11	2
24T465	5	10	10	0	10	6	1	1	3	11	11	10	6	3	1	10	0
24T466	6	12	11	1	12	7	1	1	3	12	12	11	9	0	1	13	2
24T467	6	12	12	0	12	7	1	1	3	13	13	12	9	0	1	12	0
24T468	7	14	13	1	14	8	1	1	3	14	14	13	9	3	1	15	2
24T469	7	14	14	0	14	8	1	1	3	15	15	14	9	3	1	14	0
24T470	8	16	15	1	16	9	1	1	3	16	16	15	12	0	1	17	2
24T471	8	16	16	0	16	9	1	1	3	17	17	16	12	0	1	16	0
24T472	9	18	17	1	18	10	1	1	3	18	18	17	12	3	1	19	2
24T473	9	18	18	0	18	10	1	1	3	19	19	18	12	3	1	18	0
24T474	10	20	19	1	20	11	1	1	3	20	20	19	15	0	1	21	2
24T475	10	20	20	0	20	11	1	1	3	21	21	20	15	0	1	20	0

Kit No.	Reference Numbers																
	1	2	3	4	5	6	7	8	10	12	13	14	15	16	17	18	19
24T476	11	22	21	1	22	12	1	1	3	22	22	21	15	3	1	23	2
24T477	11	22	22	0	22	12	1	1	3	23	23	22	15	3	1	22	0
24T478	12	24	23	1	24	13	1	1	3	24	24	23	18	0	1	25	2
24T479	12	24	24	0	24	13	1	1	3	25	25	24	18	0	1	24	0
24T480	13	26	25	1	26	14	1	1	3	26	26	25	18	3	1	27	2
24T481	13	26	26	0	26	14	1	1	3	27	27	26	18	3	1	26	0
24T482	14	28	27	1	28	15	1	1	3	28	28	27	21	0	1	29	2
24T483	14	28	28	0	28	15	1	1	3	29	29	28	21	0	1	28	0
24T484	15	30	29	1	30	16	1	1	3	30	30	29	21	3	1	31	2
24T485	15	30	30	0	30	16	1	1	3	31	31	30	21	3	1	30	0
24T486	16	32	31	1	32	17	1	1	3	32	32	31	24	0	1	33	2

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
24T487	1	2	2	0	2	2	1	1	3	5	5	2	0	3	1	0	0
24T488	2	4	3	1	4	3	1	1	3	7	7	3	3	0	1	2	2
24T489	2	4	4	0	4	3	1	1	3	9	9	4	3	0	1	0	0
24T490	3	6	5	1	6	4	1	1	3	11	11	5	3	3	1	2	2
24T491	3	6	6	0	6	4	1	1	3	13	13	6	3	3	1	0	0
24T492	4	8	7	1	8	5	1	1	3	15	15	7	6	0	1	2	2
24T493	4	8	8	0	8	5	1	1	3	17	17	8	6	0	1	0	0
24T494	5	10	9	1	10	6	1	1	3	19	19	9	6	3	1	2	2
24T495	5	10	10	0	10	6	1	1	3	21	21	10	6	3	1	0	0
24T496	6	12	11	1	12	7	1	1	3	23	23	11	9	0	1	2	2
24T497	6	12	12	0	12	7	1	1	3	25	25	12	9	0	1	0	0
24T498	7	14	13	1	14	8	1	1	3	27	27	13	9	3	1	2	2
24T499	7	14	14	0	14	8	1	1	3	29	29	14	9	3	1	0	0
24T500	8	16	15	1	16	9	1	1	3	31	31	15	12	0	1	2	2
24T501	8	16	16	0	16	9	1	1	3	33	33	16	12	0	1	0	0
24T502	9	18	17	1	18	10	1	1	3	35	35	17	12	3	1	2	2
24T503	9	18	18	0	18	10	1	1	3	37	37	18	12	3	1	0	0
24T504	10	20	19	1	20	11	1	1	3	39	39	19	15	0	1	2	2
24T505	10	20	20	0	20	11	1	1	3	41	41	20	15	0	1	0	0
24T506	11	22	21	1	22	12	1	1	3	43	43	21	15	3	1	2	2
24T507	11	22	22	0	22	12	1	1	3	45	45	22	15	3	1	0	0
24T508	12	24	23	1	24	13	1	1	3	47	47	23	18	0	1	2	2
24T509	12	24	24	0	24	13	1	1	3	49	49	24	18	0	1	0	0
24T510	13	26	25	1	26	14	1	1	3	51	51	25	18	3	1	2	2
24T511	13	26	26	0	26	14	1	1	3	53	53	26	18	3	1	0	0
24T512	14	28	27	1	28	15	1	1	3	55	55	27	21	0	1	2	2
24T513	14	28	28	0	28	15	1	1	3	57	57	28	21	0	1	0	0
24T514	15	30	29	1	30	16	1	1	3	59	59	29	21	3	1	2	2
24T515	15	30	30	0	30	16	1	1	3	61	61	30	21	3	1	0	0
24T516	16	32	31	1	32	17	1	1	3	63	63	31	24	0	1	2	2

High Pressure Valve Manifold Kits

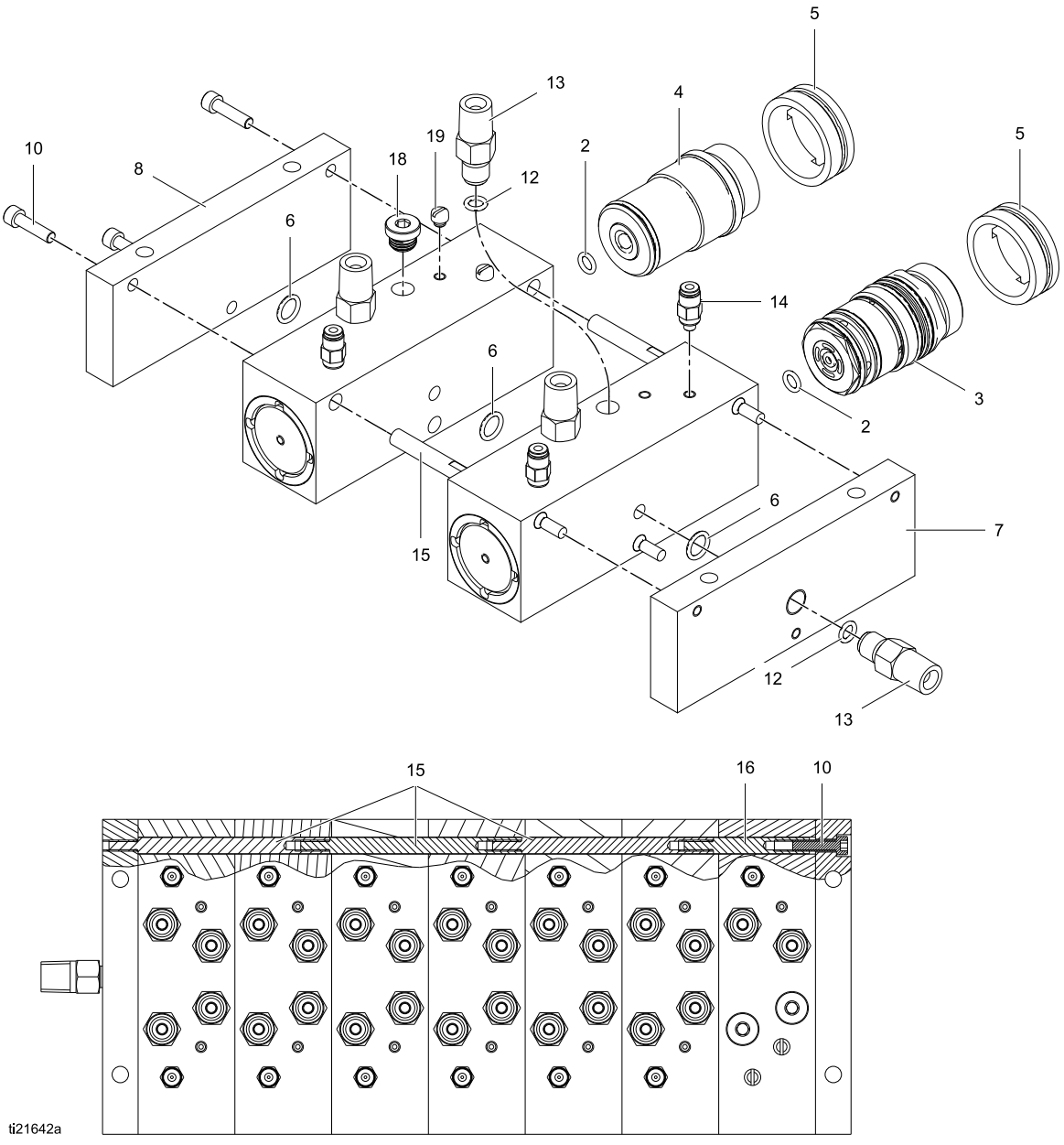
Non-Circulating Valve Manifold Kits

Kit No.	Series	Kit Description
24T647	A	2 valves
24T648	A	3 valves
24T649	A	4 valves
24T650	A	5 valves
24T651	A	6 valves
24T652	A	7 valves
24T653	A	8 valves
24T654	A	9 valves
24T655	A	10 valves
24T656	A	11 valves
24T657	A	12 valves
24T658	A	13 valves
24T659	A	14 valves
24T660	A	15 valves
24T661	A	16 valves
24T662	A	17 valves
24T663	A	18 valves
24T664	A	19 valves
24T665	A	20 valves
24T666	A	21 valves
24T667	A	22 valves
24T668	A	23 valves
24T669	A	24 valves
24T670	A	25 valves
24T671	A	26 valves
24T672	A	27 valves
24T673	A	28 valves
24T674	A	29 valves
24T675	A	30 valves
24T676	A	31 valves
24T845 (acid-catalyzed)	A	3 valves
24T846 (acid-catalyzed)	A	5 valves

Circulating Valve Manifold Kits

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

Valve Manifold Kit Parts



Ref. No.	Part No.	Description	Qty
1	16N271	MANIFOLD, for circulating kits	★
2	111450	O-RING; chemically resistant	
3	24T581	VALVE, for non-circulating kits; includes item 2	
	24T582	VALVE, for circulating kits; includes item 2	
	24T583	VALVE, for non-circulating, acid compatible kits; includes item 2	
4	24R052	PLUG, cc valve	
5	16N269	RETAINER, nut	
6	111457	O-RING; ptfe	
7	24T725	PLATE, outlet, manifold	
8	24T726	PLATE, end, manifold	
10	111820	SCREW, cap, socket head; 10–24 x 0.75 in. (19 mm)	
12	104893	O-RING; ptfe	

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)	

★ *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	1	0	0
24T648	2	4	3	1	4	3	1	1	3	4	4	3	1	0	1	2
24T649	2	4	4	0	4	3	1	1	3	5	5	4	1	0	0	0
24T650	3	6	5	1	6	4	1	1	3	6	6	5	1	1	1	2
24T651	3	6	6	0	6	4	1	1	3	7	7	6	1	1	0	0
24T652	4	8	7	1	8	5	1	1	3	8	8	7	2	0	1	2
24T653	4	8	8	0	8	5	1	1	3	9	9	8	2	0	0	0
24T654	5	10	9	1	10	6	1	1	3	10	10	9	2	1	1	2
24T655	5	10	10	0	10	6	1	1	3	11	11	10	2	1	0	0
24T656	6	12	11	1	12	7	1	1	3	12	12	11	3	0	1	2
24T657	6	12	12	0	12	7	1	1	3	13	13	12	3	0	0	0
24T658	7	14	13	1	14	8	1	1	3	14	14	13	3	1	1	2
24T659	7	14	14	0	14	8	1	1	3	15	15	14	3	1	0	0
24T660	8	16	15	1	16	9	1	1	3	16	16	15	4	0	1	2
24T661	8	16	16	0	16	9	1	1	3	17	17	16	4	0	0	0
24T662	9	18	17	1	18	10	1	1	3	18	18	17	4	1	1	2

Kit No.	Reference Numbers															
	1	2	3	4	5	6	7	8	10	12	13	14	15	16	18	19
24T663	9	18	18	0	18	10	1	1	3	19	19	18	4	1	0	0
24T664	10	20	19	1	20	11	1	1	3	20	20	19	5	0	1	2
24T665	10	20	20	0	20	11	1	1	3	21	21	20	5	0	0	0
24T666	11	22	21	1	22	12	1	1	3	22	22	21	5	1	1	2
24T667	11	22	22	0	22	12	1	1	3	23	23	22	5	1	0	0
24T668	12	24	23	1	24	13	1	1	3	24	24	23	6	0	1	2
24T669	12	24	24	0	24	13	1	1	3	25	25	24	6	0	0	0
24T670	13	26	25	1	26	14	1	1	3	26	26	25	6	1	1	2
24T671	13	26	26	0	26	14	1	1	3	27	27	26	6	1	0	0
24T672	14	28	27	1	28	15	1	1	3	28	28	27	7	0	1	2
24T673	14	28	28	0	28	15	1	1	3	29	29	28	7	0	0	0
24T674	15	30	29	1	30	16	1	1	3	30	30	29	7	1	1	2
24T675	15	30	30	0	30	16	1	1	3	31	31	30	7	1	0	0
24T676	16	32	31	1	32	17	1	1	3	32	32	31	8	0	1	2
24T845	2	4	3	1	4	3	1	1	3	4	4	3	1	0	1	2
24T846	3	6	5	1	6	4	1	1	3	6	6	5	1	1	1	2

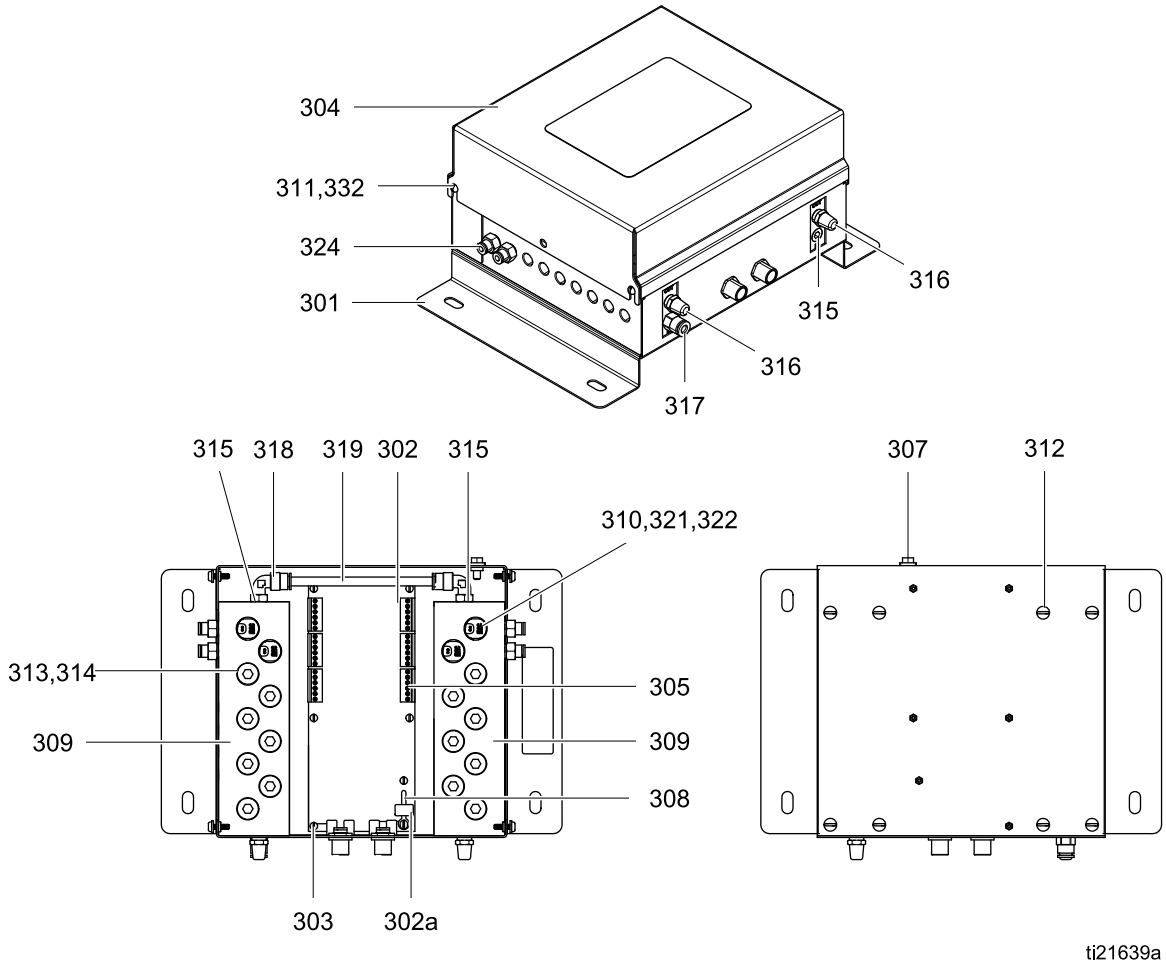
High Pressure Circulating Valve Manifold Kit Part Quantities

Kit No.	Reference Numbers															
	1	2	3	4	5	6	7	8	10	12	13	14	15	16	18	19
24T677	1	2	2	0	2	2	1	1	3	5	5	2	0	1	0	0
24T678	2	4	3	1	4	3	1	1	3	7	7	3	1	0	2	2
24T679	2	4	4	0	4	3	1	1	3	9	9	4	1	0	0	0
24T680	3	6	5	1	6	4	1	1	3	11	11	5	1	1	2	2
24T681	3	6	6	0	6	4	1	1	3	13	13	6	1	1	0	0
24T682	4	8	7	1	8	5	1	1	3	15	15	7	2	0	2	2
24T683	4	8	8	0	8	5	1	1	3	17	17	8	2	0	0	0
24T684	5	10	9	1	10	6	1	1	3	19	19	9	2	1	2	2
24T685	5	10	10	0	10	6	1	1	3	21	21	10	2	1	0	0
24T686	6	12	11	1	12	7	1	1	3	23	23	11	3	0	2	2
24T687	6	12	12	0	12	7	1	1	3	25	25	12	3	0	0	0
24T688	7	14	13	1	14	8	1	1	3	27	27	13	3	1	2	2
24T689	7	14	14	0	14	8	1	1	3	29	29	14	3	1	0	0
24T690	8	16	15	1	16	9	1	1	3	31	31	15	4	0	2	2
24T691	8	16	16	0	16	9	1	1	3	33	33	16	4	0	0	0
24T692	9	18	17	1	18	10	1	1	3	35	35	17	4	1	2	2
24T693	9	18	18	0	18	10	1	1	3	37	37	18	4	1	0	0
24T694	10	20	19	1	20	11	1	1	3	39	39	19	5	0	2	2
24T695	10	20	20	0	20	11	1	1	3	41	41	20	5	0	0	0
24T696	11	22	21	1	22	12	1	1	3	43	43	21	5	1	2	2
24T697	11	22	22	0	22	12	1	1	3	45	45	22	5	1	0	0
24T698	12	24	23	1	24	13	1	1	3	47	47	23	6	0	2	2
24T699	12	24	24	0	24	13	1	1	3	49	49	24	6	0	0	0
24T700	13	26	25	1	26	14	1	1	3	51	51	25	6	1	2	2
24T701	13	26	26	0	26	14	1	1	3	53	53	26	6	1	0	0
24T702	14	28	27	1	28	15	1	1	3	55	55	27	7	0	2	2
24T703	14	28	28	0	28	15	1	1	3	57	57	28	7	0	0	0
24T704	15	30	29	1	30	16	1	1	3	59	59	29	7	1	2	2
24T705	15	30	30	0	30	16	1	1	3	61	61	30	7	1	0	0
24T706	16	32	31	1	32	17	1	1	3	63	63	31	8	0	2	2

Notes

Color Change Control Module Kits

Non-IS Color Change Control Modules



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)	6
304	24T562	COVER	1
305	119162	CONNECTOR, 6–position	★
307	116343	SCREW, ground; M5 x 0.8	1
308	123691	HOLDER, fuse	1
309	24T563	MANIFOLD	2
310	16P316	SOLENOID	★
311	117831	SCREW, machine, pan head; 6–32 x 0.5 in. (13 mm)	4
312	103833	SCREW, machine, pan head; 10–32 x 0.375 in. (10 mm)	8
313	24T565	PLUG; 5/8–32; includes item 314	★
314	113418	O-RING; buna-N	14
315	100139	PLUG, pipe; 1/8 npt	3
316	C06061	MUFFLER	2
317	115671	FITTING, connector; 1/8 npt(m) x 1/4 in. (6 mm) OD tube	1
318	112698	ELBOW; 1/8 npt(m) x 1/4 in. (6 mm) OD tube	2
319	590332	TUBE; polyethylene; 1/4 in. (6 mm) OD	1
320	598095	TUBE; nylon; 5/32 in. (4 mm) OD	1
321	— — —	STRAP, tie	★
322	— — —	FERRULE	★
324	114263	FITTING, connector; 1/8 npt(m) x 5/32 in. (4 mm) OD tube	★
332	151395	WASHER	4

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

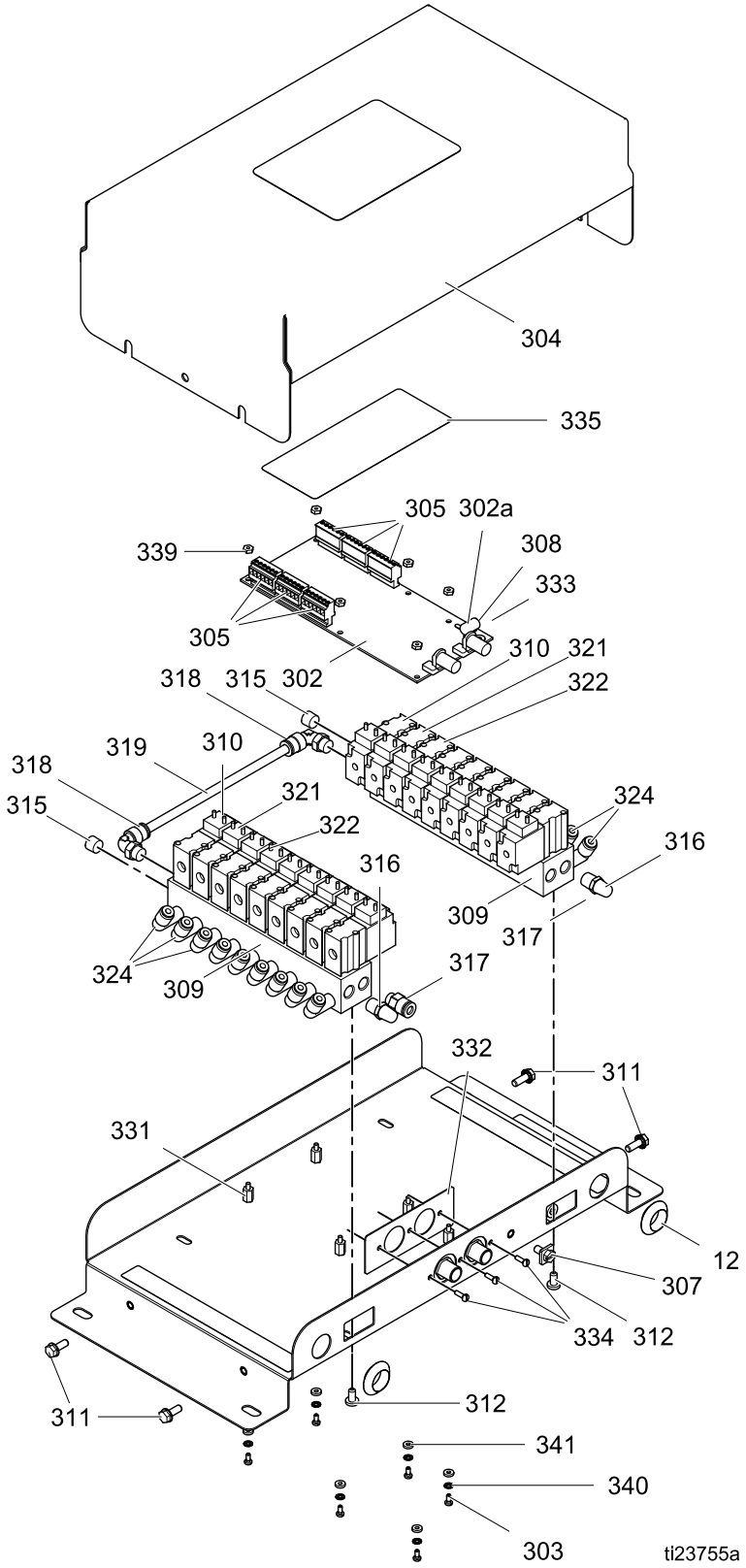
Parts labeled — — — are not available separately.

Non-IS Control Module Part Quantities

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

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

IS Color Change Control Modules



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)	6
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
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
339	102794	NUT, hex	7
340	101764	WASHER, lock	7
341	188773	WASHER, flat	7

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

Parts labeled — — — are not available separately.

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

Kit No.	Kit Description	Solenoid (310)	Plug (313)	Tube (320)	Ferrule (322)	Connector Fitting (324)
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 Non-IS Expansion Kit. Also order the corresponding IS Expansion Kit. See IS Expansion Kits, page 70.

Non-IS Expansion Kits

The following kits are available to add color valves in a non-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 30 for instructions.

Low Pressure Expansion Kits

Kit No.	Kit Description
Without Manifold	
24T443	One non-circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
24T444	One circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
With Manifold	
24T445	Manifold with one non-circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
24T446	Manifold with one circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
24T447	Manifold with two non-circulating valves. Includes valves, solenoids, fittings, and tubing.
24T448	Manifold with two circulating valves. Includes valves, solenoids, fittings, and tubing.

High Pressure Expansion Kits

Kit No.	Kit Description
Without Manifold	
24T584	One non-circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
24T585	One circulating valve (replaces a plug). Includes valve, solenoid, fittings, and tubing.
With Manifold	
24T586	Manifold with one non-circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
24T587	Manifold with one circulating valve. Includes valve, plug, solenoid, fittings, and tubing.
24T588	Manifold with two non-circulating valves. Includes valves, solenoids, fittings, and tubing.
24T589	Manifold with two circulating valves. Includes valves, solenoids, fittings, and tubing.

High Pressure Acid-Compatible Expansion Kits

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

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 30 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.
With Manifold	
24T451	Manifold with one non-circulating valve. Includes valve, plug, IS solenoid, fittings, and tubing.
24T452	Manifold with one circulating valve. Includes valve, plug, IS solenoid, fittings, and tubing.
24T453	Manifold with two non-circulating valves. Includes valves, IS solenoids, fittings, and tubing.
24T454	Manifold with two circulating valves. Includes valves, IS solenoids, fittings, and tubing.

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.
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.

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	
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.

Dimensions

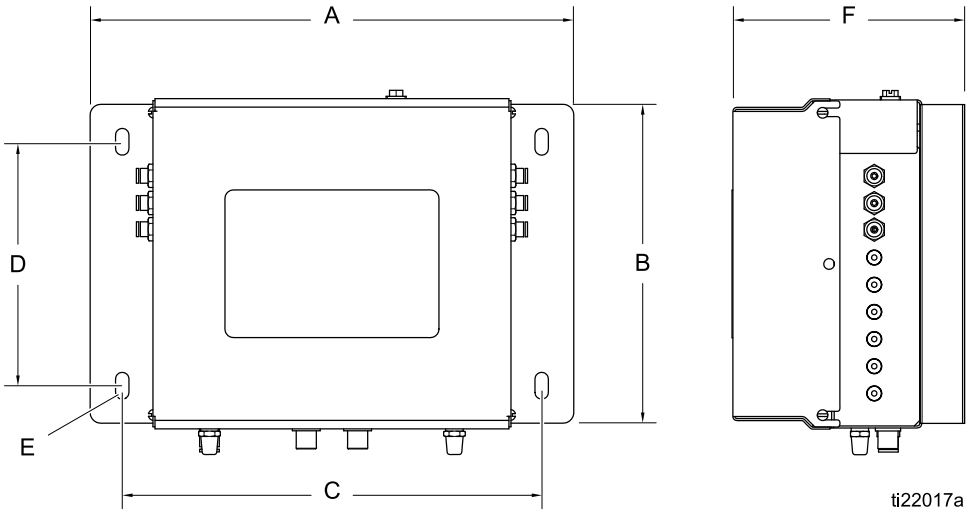


Figure 24 Non-IS Control Module

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

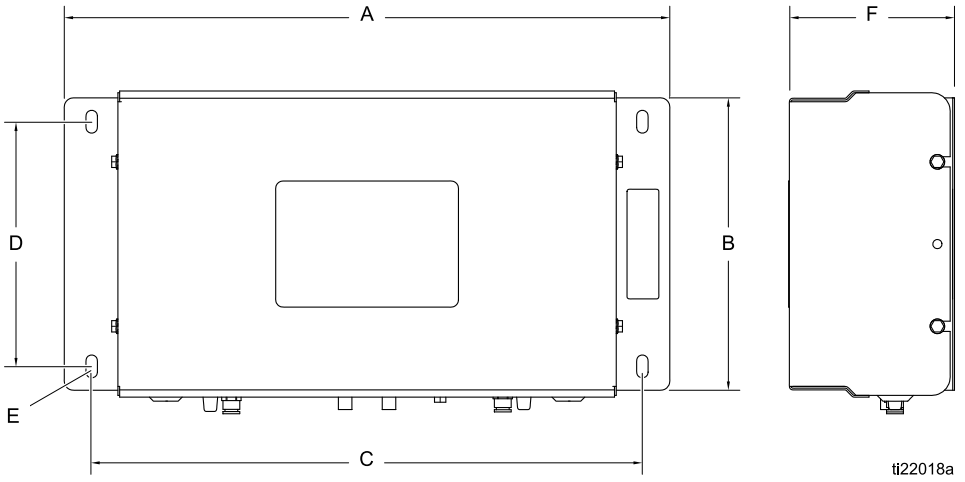


Figure 25 IS Control Module

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)

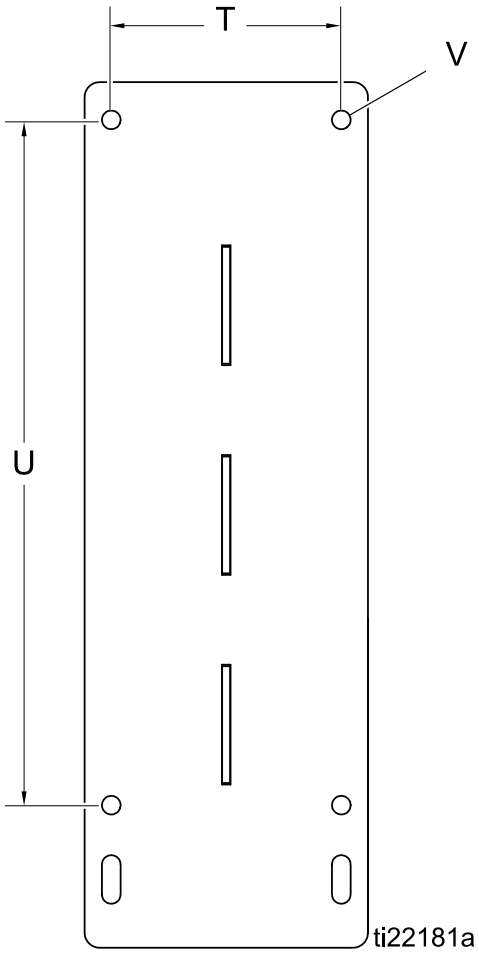


Figure 26 Manifold Mounting Bracket, Non-IS

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

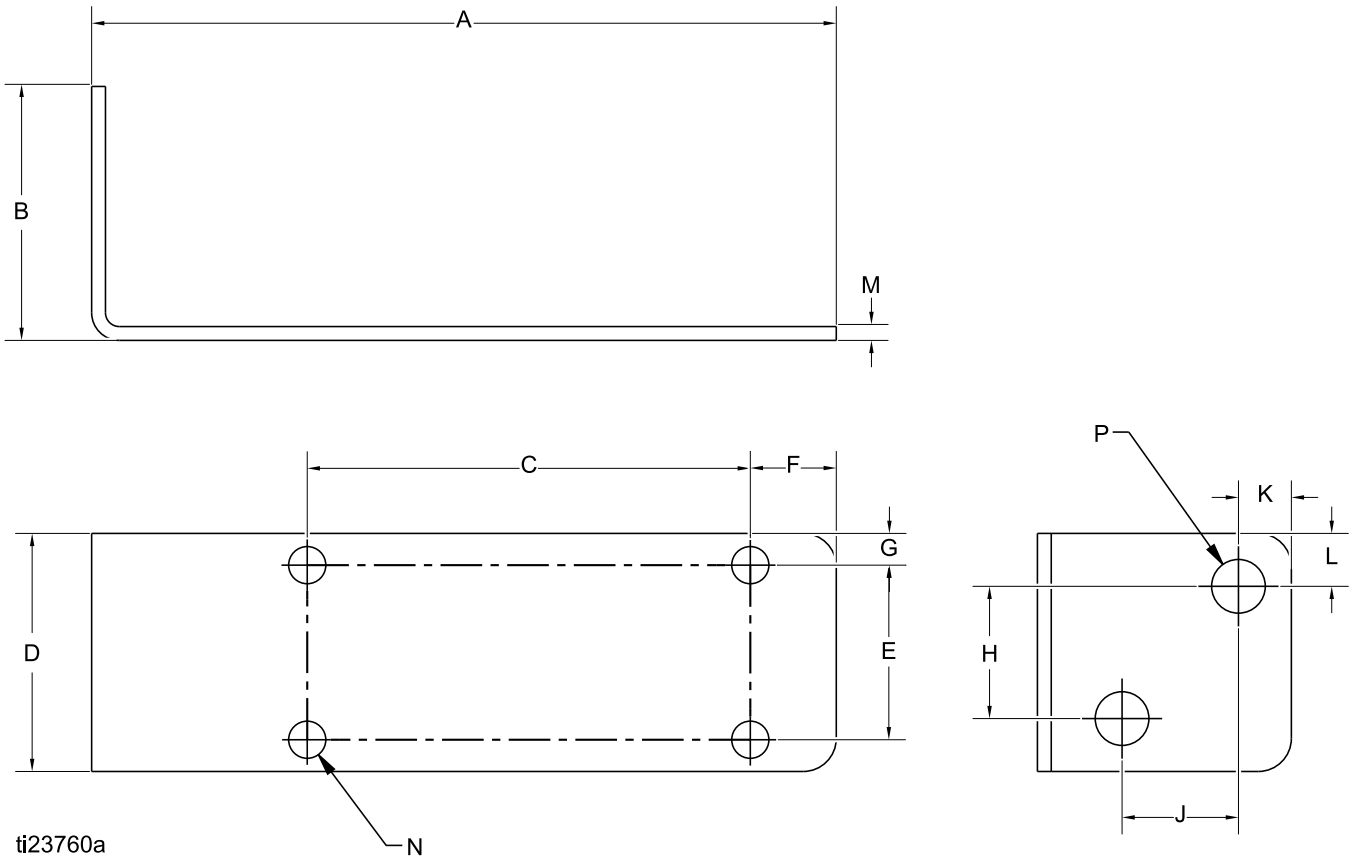


Figure 27 IS Valve Manifold Bracket

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)				

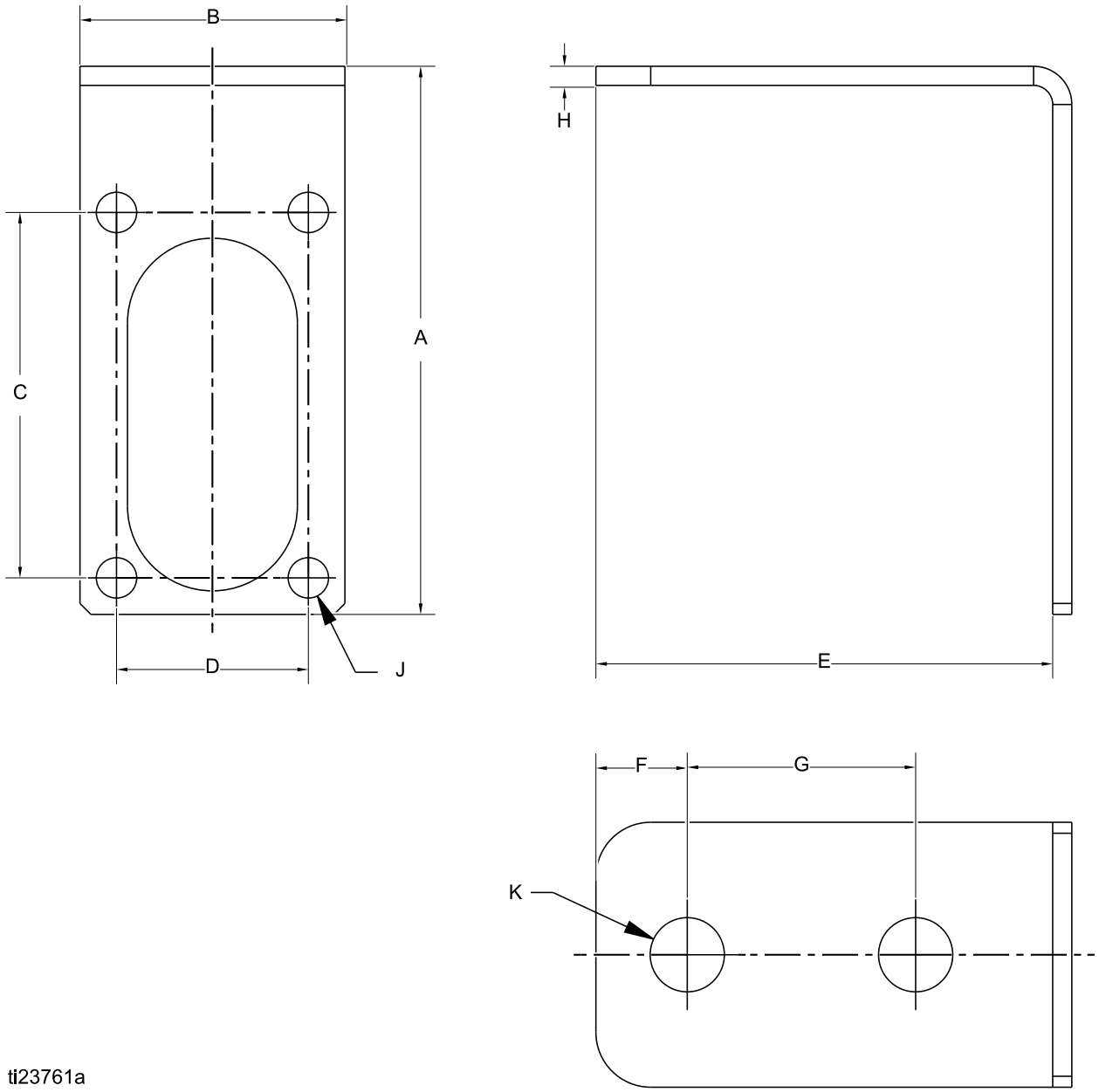


Figure 28 Remote Mix Manifold Bracket

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(f)	
Fluid outlet size:	1/4 npt(f)	
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	
Valve	See valve manual 332454.	

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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This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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