



ProDispense™

3A3469B
EN

Used to meter and dispense paints, coatings, solvents, water, and lubrication fluids. For professional use only.

Not approved for use in explosive atmospheres or hazardous locations.

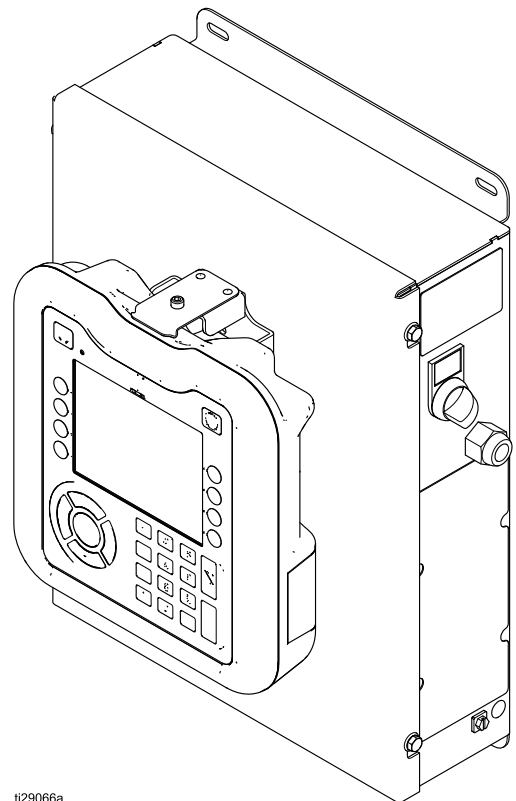


Important Safety Instructions

Read all warnings and instructions in this manual. **Save these instructions.**

See page 3 for approvals.

See page 5 for maximum working fluid pressure and system component information.



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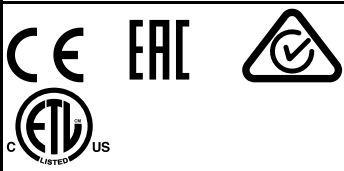
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Related Manuals

The following is a list of component manuals written in English. These manuals and any available translations can be found at www.graco.com.

| Manual No. | Description |
|------------|---|
| 308778 | Volumetric Fluid Flow Meter, Instruction/Parts |
| 308245 | Electronic Pulse Meters, Instructions/Parts |
| 313599 | Coriolis Meter Kits, Instructions/Parts |
| 306715 | Dispensing Valve, Instructions/Parts |
| 334183 | Modbus TCP Gateway Module, Instructions/Parts |
| 312864 | Communications Gateway Module, Instructions/Parts |
| 312493 | Light Tower Kit, Instructions/Parts |

Models


| Part No. | Maximum Fluid Panels | Operating Voltage | Approvals |
|----------|----------------------|--------------------------|--|
| 26A070 | 8 | 85–240 VAC, Single Phase |  Intertek 9902741 CSA STD C22.2 No. 14 UL STD 508A |
| 26A071 | — | — | |
| 26A129 | — | — | |
| 26A130 | — | — | |
| 26A131 | — | — | |
| 26A132 | — | — | |
| 26A165 | — | — | |
| 26A247 | — | — | |

ProDispense Control Panel

PART NO. SERIES


| | |
|---------|------|
| | |
| VOLTAGE | AMP |
| 120/240 | 1/.5 |

Read Instruction Manual



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

Artwork No. 294553 Rev. C




Intertek
9902471
Conforms to UL STD 508A
Certified to CSA STD C22.2 No. 14

ProDispense Fluid Panel

PART NO. SERIES


| | |
|---------------|-------------|
| | |
| MAX FLUID WPR | MAX AIR WPR |
| | |

Read Instruction Manual



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

Artwork No. 294525 Rev. C



Intertek
9902471
Conforms to UL STD 508A
Certified to CSA STD C22.2 No. 14

Automation Gateway Assemblies

The control panel comes with one FCM installed. If an automation gateway is desired, it must be ordered separately. The automation gateway module is one of the Communications Gateway Modules (CGM). To order a CGM, see the following table. You will also need to order software upgrade token (17N369) There is room in the control panel for installation of one CGM or another FCM.

| User Interface Description | Gateway Part Number to Order | Rotary Switch Position |
|----------------------------|------------------------------|------------------------|
| DeviceNet™ (CGM) | CGMDN0 | Any |
| EtherNet/IP™ (CGM) | CGMEP0 | Any |
| PROFINET™ (CGM) | CGMPN0 | Any |
| Modbus TCP | 24W462 | 0 or 1 |

Fluid Panel Kits











NOTE: The fluid panel kit numbers are listed below.









| Fluid Panel* | Maximum Working Pressure | Meter Description | K-factor (cc/pulse) | Includes: | | |
|--------------|--------------------------------|------------------------------------|---|-----------|---|---------------------------------|
| | | | | Meter | Valve Type | Fluids Moved |
| 26A129 | 1500 psi (10 MPa, 103 bar) | Graco lube meter; electronic pulse | 4.73 | 17K870 | solenoid | oil/lubricant |
| 26A130 | 250 psi (1.7 MPa, 17 bar) | Water/ Antifreeze turbine | 25 | 513891 | solenoid | water/ antifreeze |
| 26A131 | 3000 psi (21 MPa, 207 bar) | G3000 | 0.119 | 289813 | 205162, auto dispense; 116463, pneumatic solenoid | grease/paint |
| 26A132 | 3000 psi (21 MPa, 207 bar) | HG6000; Helical gear with sensor | 0.286 | 246190 | 205162, auto dispense; 116463, pneumatic solenoid | sealants paint |
| 26A165 | 3000 psi (21 MPa, 207 bar) | S3000, solvent, low flow | 0.061 | 258718 | 205162, auto dispense; 116463, pneumatic solenoid | solvent |
| 26A071 | 3000 psi (21 MPa, 207 bar) | No meter | NA | none | 205162, auto dispense; 116463, pneumatic solenoid | various lubes, paints, solvents |
| 26A247 | 2300 psi (15.9 MPa, 158.5 bar) | Coriolis, 1.4 in. Cube Mass | 0.062 default, configurable 0.020-0.200 | 16M519 | 205162, auto dispense; 116463, pneumatic solenoid | shear sensitive fiber-filled |

* Remote operator station 26A133 can be used with any fluid panel. Ordered separately.

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.





|  <h2 style="margin: 0;">WARNING</h2> | |
|---|---|
|     | <p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive. • Stop operation immediately if static sparking occurs or you feel a shock, Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area. |
|      | <p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not point dispensing device at anyone or at any part of the body. • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately. |

|  <h1 style="margin: 0;">WARNING</h1> | |
|--|---|
|   | <p>ELECTRIC SHOCK HAZARD This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment. • Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. |
|   | <p>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.</p> <ul style="list-style-type: none"> • Read SDSs to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. • Always wear chemically impermeable gloves when spraying, dispensing, or cleaning equipment. |
|  | <p>PERSONAL PROTECTIVE EQUIPMENT Always wear appropriate personal protective equipment and cover all skin when spraying, servicing equipment, or when in the work area. Protective equipment helps prevent serious injury, including long-term exposure; inhalation of toxic fumes, mists or vapors; allergic reaction; burns; eye injury, and hearing loss. This protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • A properly fitting respirator, which may include a supplied-air respirator, chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority. • Protective eyewear, and hearing protection. |
|   | <p>EQUIPMENT MISUSE HAZARD Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical 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 SDS from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations. |

Important Isocyanate (ISO) Information

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




Isocyanate Conditions

| | | | | |
|---|---|---|---|--|
|  |  |  |  | |
|---|---|---|---|--|

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

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

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 |
| <p>Partially cured ISO will reduce performance and the life of all wetted parts.</p> <ul style="list-style-type: none"> • 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.

Overview

System Overview

The ProDispense fluid metering system is a flexible electronic system that accurately dispenses preset amounts of fluids. It allows durable goods manufactures to quickly and accurately fill cavities with oil, grease, water or other industrial fluids. It can deliver from one to eight different fluids at multiple dispense points with accuracy up to +/-1%. Fluids can be configured to dispense independently or tied to recipes. They can be dispensed simultaneously or in defined sequences within recipes. The system can be configured to operate manually through user input or integrated into automation with available fieldbus gateway modules. Dispense results are tracked

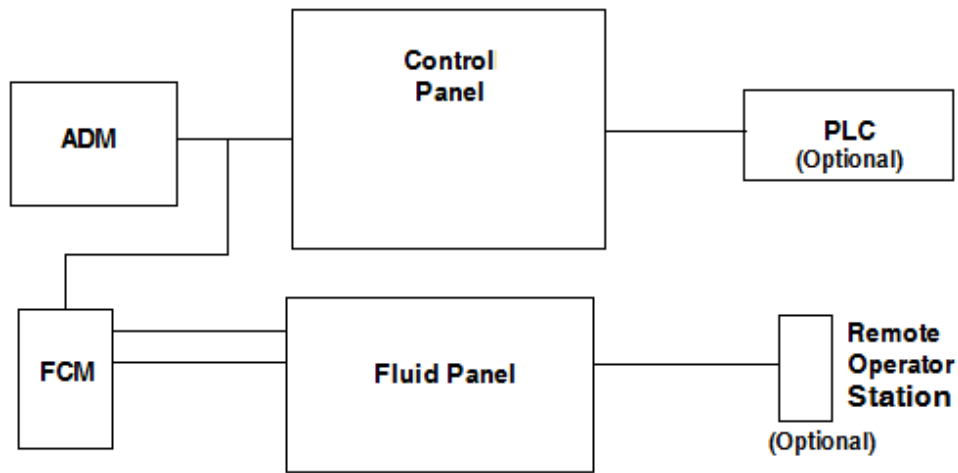
and can be accessed from the control panel, USB download, or through a gateway module.

Typical Applications

- Oil dispense
- Lubricant dispense
- Paint dispense
- Antifreeze dispense
- Water dispense
- Sealant dispense
- Solvent dispense

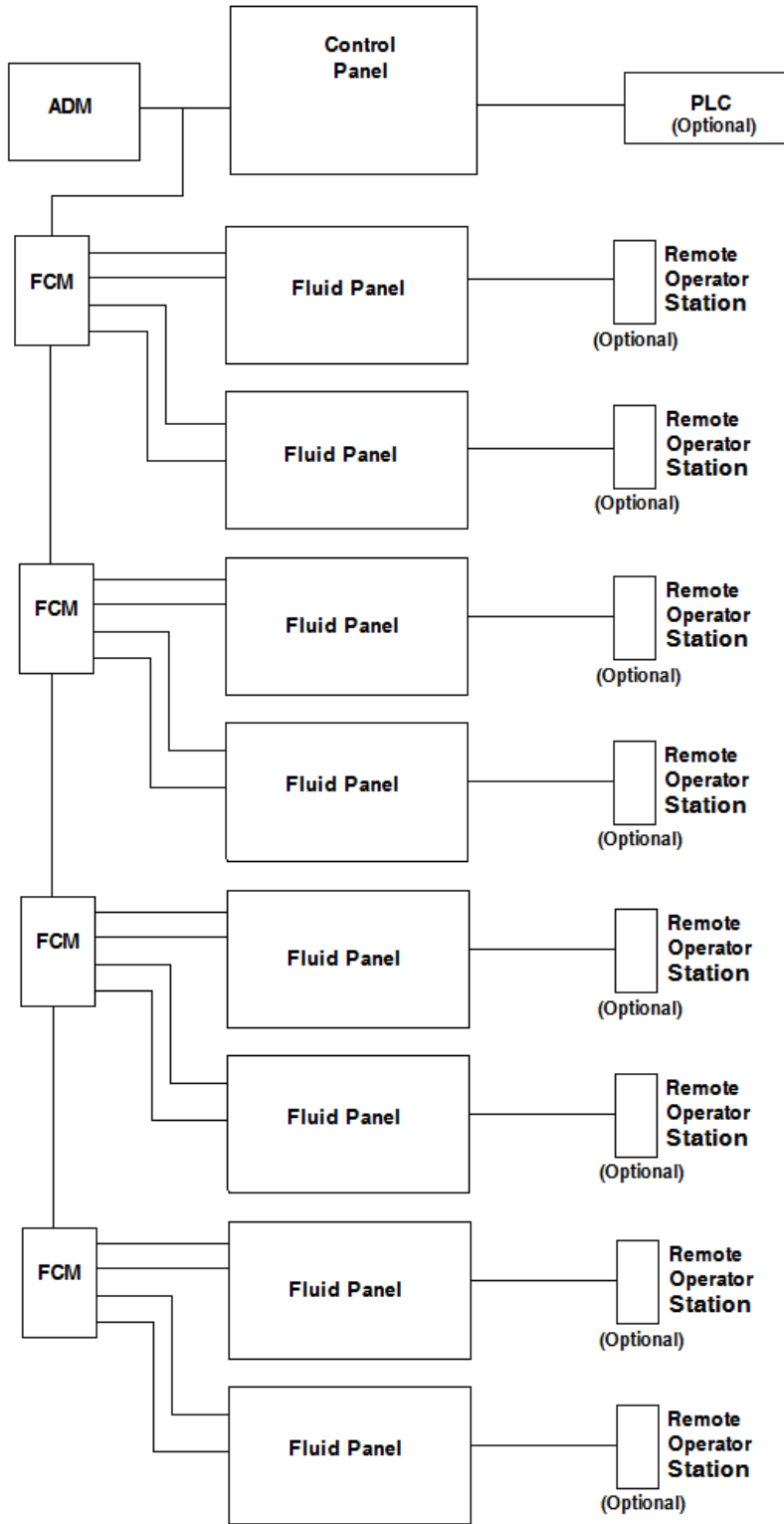
Typical Installation - Single Fluid Panel

This is an example of what a system with a single fluid panel might look like. When designing a system, power consumption may be the limiting factor in the design of the system. Refer to [Appendix B - System Design, page 114](#) for additional guidance in designing a system.



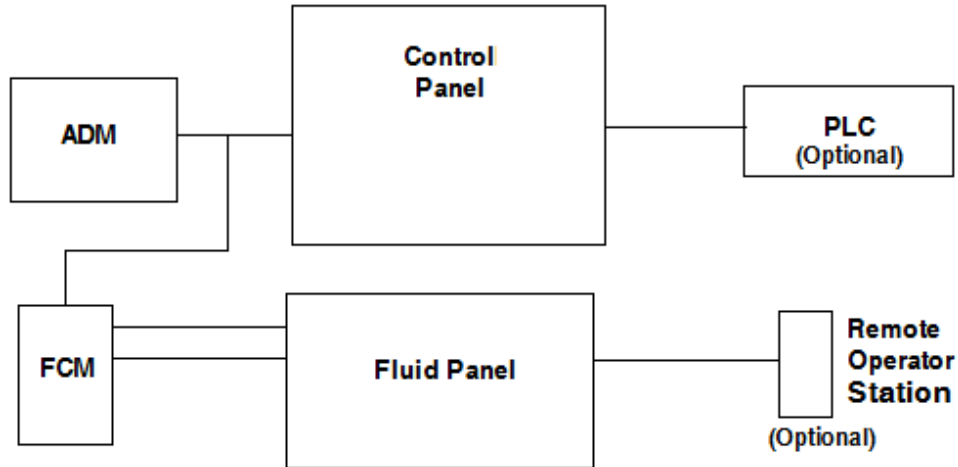
ADM – Advanced Display Module
FCM – Fluid Control Module
PLC – Programmable Logic Controller

Typical Installation - Multiple Fluid Panels



System Components

A single ProDispense system can be comprised of 1 fluid panel up to maximum of 8 fluid panels. A single system will require a control panel with ADM, an FCM, and a fluid panel. Other components such as the Remote Operator Station can be added for operator control, or control panel connection to a PLC through a communication network.



Control Panel (User Interface)

The control panel uses the Advance Display Module (ADM) to communicate with the fluid panel assembly to control fluid dispense operation.

The control panel receives operator or an automation controller (such as a PLC) input and uses this input to determine dispense activity for the fluid panel assembly.

Fluid Control Module (FCM)

Each FCM communicates with up to 2 fluid panels. The FCM receives communication from the control panel and delivers appropriate communications to the desired fluid panel. The FCMs are configured in a daisy-chain structure that will route communications through to the subsequent FCMs.

The control panel includes one FCM which comes installed in the control panel. Additional FCMs must be purchased separately.

For protection from the install environment and any potential exposure to undesirable materials, Graco recommends that additional FCMs be installed inside of the controller (if no CGM installed), or within one of the two fluid panels it connects with.

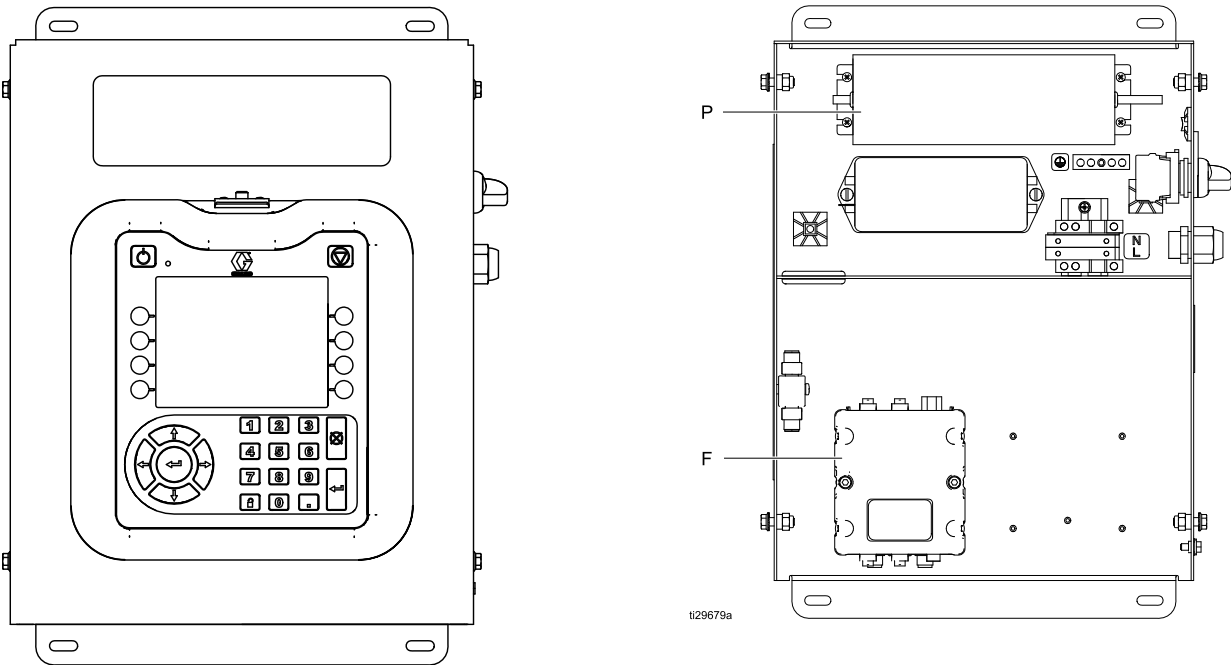
Fluid Panel Assembly

The fluid panel assembly contains components that control and monitor fluid dispensing. A fluid metering system can have up to 8 fluid panels, and simultaneously dispense a different fluid at each fluid panel.

Remote Operator Station

The remote operator station can be used by the operator at the location of the fluid panel to start or stop fluid dispensing,

Control Panel Assembly Overview

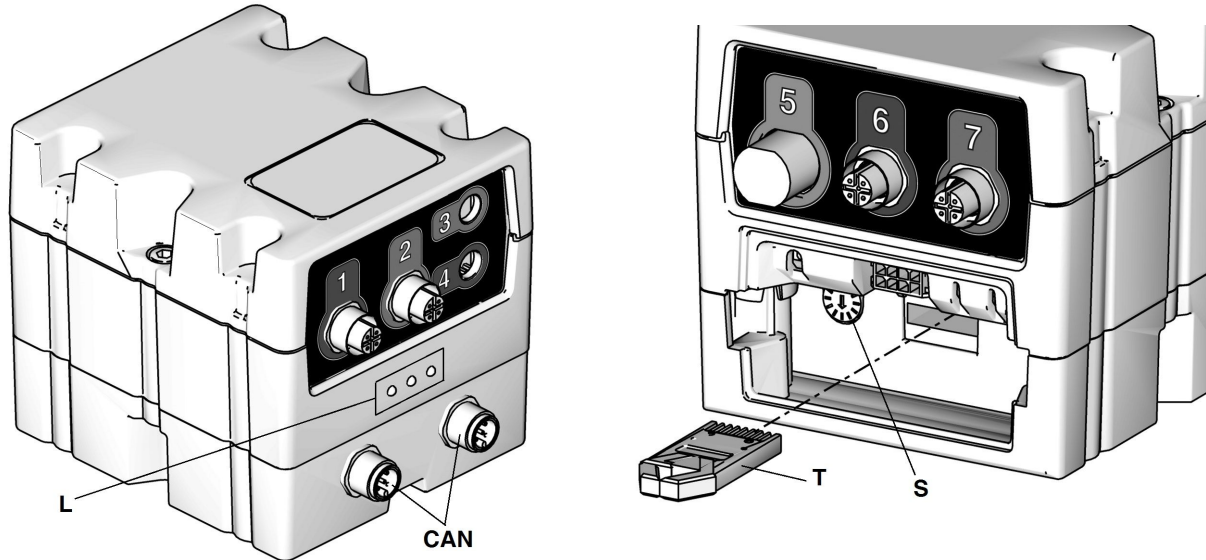


The control panel includes the following components:

- Advanced Display Module (ADM) with USB; see [ADM Display, page 16](#) for details.
- ADM mounting bracket.
- Power ON/OFF switch
- 24 VDC and 100-240 VAC power supply module (P).
- FCM (F).
- Additionally, space is available for mounting a second FCM or a Control Gateway Module (CGM).

FCM

The FCM provides the communication path between the control panel and the fluid panels. One FCM will accommodate 2 fluid panels.



| Connector No. | Function |
|---------------|--|
| 1 | Fluid panel 1 (Meter) – color code=blue |
| 2 | Fluid panel 2 (Meter) – color code=red |
| 3 | Fluid panel 2 (Solenoid) – color code=red |
| 4 | Fluid panel 1 (Solenoid) – color code=blue |
| 5 | Not used |
| 6 | Not used |
| 7 | Not used |

| | | |
|-------------------|--|-------------------------------|
| CAN | Communication cable connections between control panel (ADM) and each FCM. | |
| Rotary Switch (S) | The rotary switch (S) on the FCM must be set to a valid position and each FCM must have a unique rotary switch position. The FCM rotary switch position determines which number to assign to that fluid panel. | |
| | Fluid panels | Rotary switch position |
| | 0/1 | 0 (default) |
| | 2/3 | 1 |
| | 4/5 | 2 |
| | 6/7 | 3 |
| Status LEDs (L) | Refer to LED Diagnostic Information, page 46 for definitions of LEDs. | |

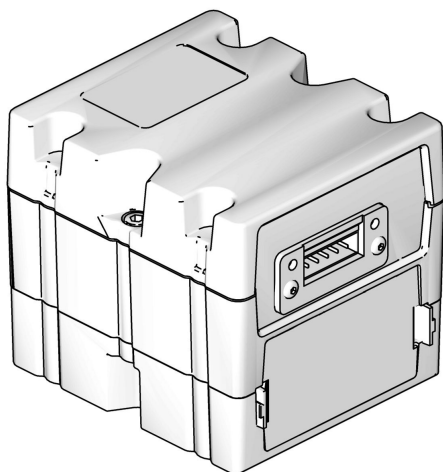
NOTE: The token (T) is only required to update operation software. It must be removed for system operation. Token 17K873 is available separately. Token 17K873 is included in FCM and ADM replacement parts.

Control Gateway Modules (CGM)

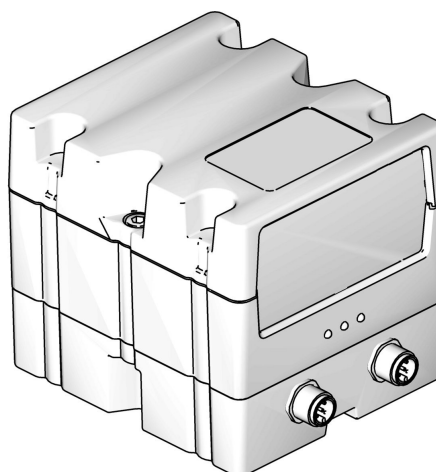
Gateway modules can be mounted in the Control Panel for communication with an external control system, such as a PLC. A Gateway should be selected from the information below:

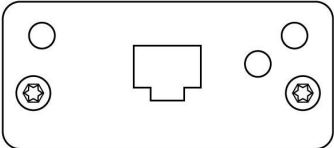
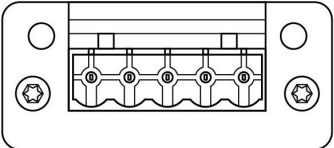
| User Interface Description | Gateway Part Number | Rotary Switch Position |
|----------------------------|---------------------|------------------------|
| DeviceNet™ | CGMDN0 | Any |
| EtherNet/IP™ | CGMEP0 | Any |
| PROFINET™ | CGMPN0 | Any |
| Modbus TCP | 24W462 | 0 or 1 |

FRONT VIEW

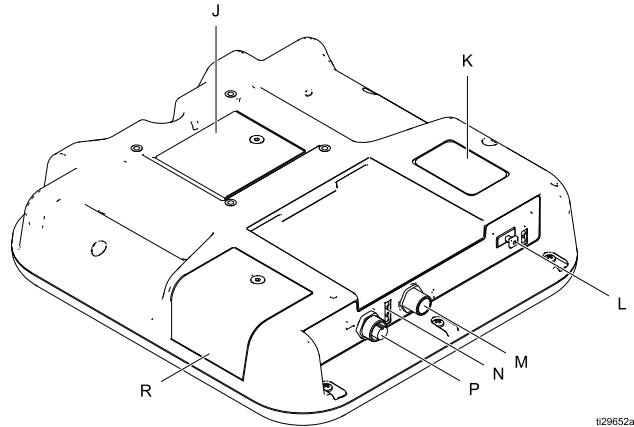
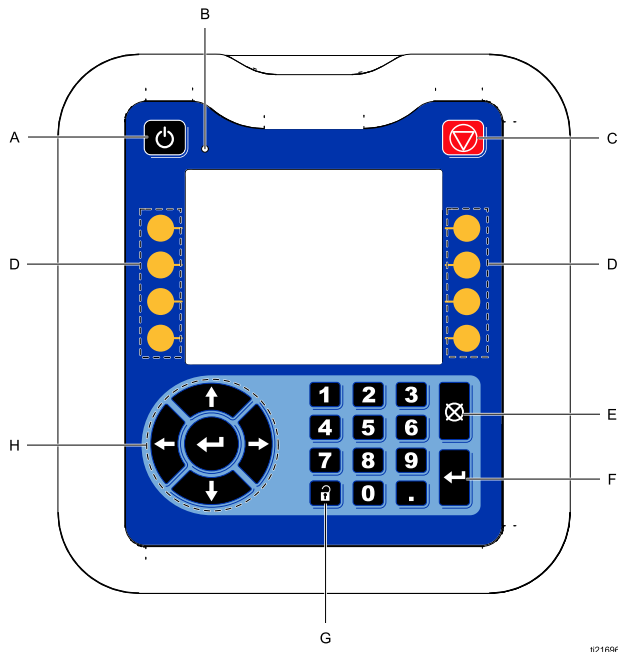


BACK VIEW



| | |
|--|---|
|  <p>PROFINET or EtherNet/IP or Modbus TCP Connector</p> |  <p>DeviceNet Connector</p> |
|--|---|

ADM Display



Key:

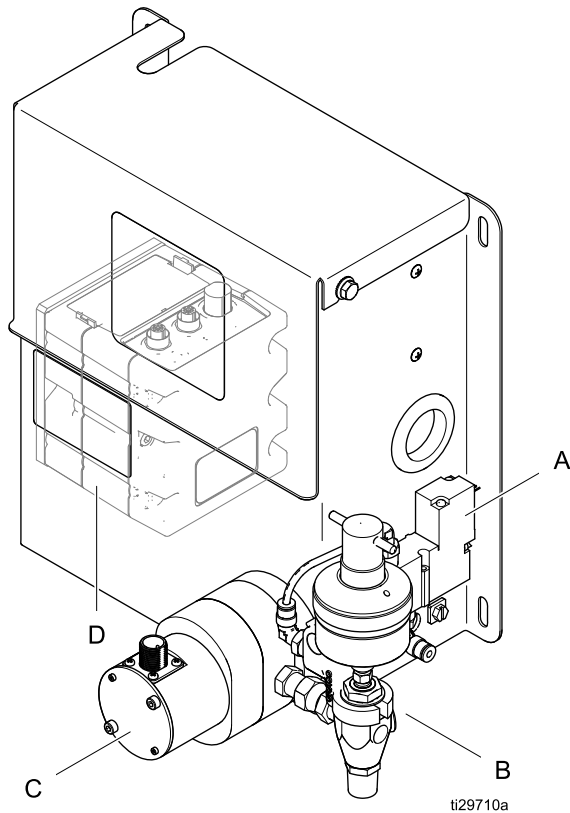
| Callout | Function |
|---------|--|
| A | Power On/Off Powers system on and off. |
| B | System Status Indicator LED Displays system status. |
| C | Stop Stop all system processes. However, it is not a safety or emergency stop. |
| D | Soft Keys Functions vary depending on selected screen. |
| E | Cancel Cancel a selection or number entry while in the process of entering a number or making a selection. |
| F | Enter Acknowledge changing a value or making a selection. |
| G | Lock/Setup Toggle between run and setup screens. If setup screens are password protected, button toggles between run and password entry screen, or current setup screen to the run screen. |

| Callout | Function |
|---------|---|
| H | Navigation Navigate within a screen or to a new screen. |
| J | Battery Cover |
| K | Model Number Tag Model number |
| L | USB Module Interface USB port and USB indicator LEDs |
| M | CAN Connector Power connection |
| N | Module Status LEDs See for signal definitions. |
| P | Accessory Cable Connection |
| R | Token Access Cover |

NOTICE

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

Fluid Panel Assembly Overview



Fluid Panel Components

The fluid panel contains components to measure and dispense fluids and terminal connections for communication with the control panel. The main components of the fluid panel assembly include:

- Fluid flow meter (C) (optional)
- Solenoid valve (A) to control the dispense valve; may function as the dispense valve in some instances
- Dispense valve (B)
- FCM (D) for communication with the control panel; one FCM supports 2 fluid panels

Fluid Flow Meter

The fluid flow meter precisely measures the flow rate and volume of fluid dispensed. Offered meters installed on fluid panels include:

- G3000
- S3000
- HG6000
- Coriolis
- Water meter
- Oil meter

A meterless fluid panel is available to accommodate a customer-supplied fluid flow meter.

Dispense Valve

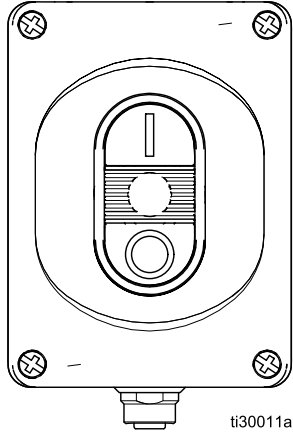
The dispense valve is set up to deliver the fluid at a precise flow rate while the solenoid valve is open.

Solenoid Valve

The solenoid valve enables/disables the activation of the dispense valve. When activated, the solenoid provides an air supply to the dispense valve which will then activate the dispense valve and allow fluid output from the dispense valve.

Some fluid panels contain a solenoid valve which is also the dispense valve. These valves are limited to use with some liquids which are low viscosity or are compatible with the materials which comprise the valve.

Remote Operator Station



The remote operator station provides local control of a single fluid panel. The remote operator station can be mounted near the point of dispense for the connected fluid panel.

The remote operator station, part number 26A133 is ordered separately (kit includes a 50 ft [16 m] cable, PN 123659). A shorter cable (1.5 ft [0.5 m]), part number 122030, is available and is ordered separately.

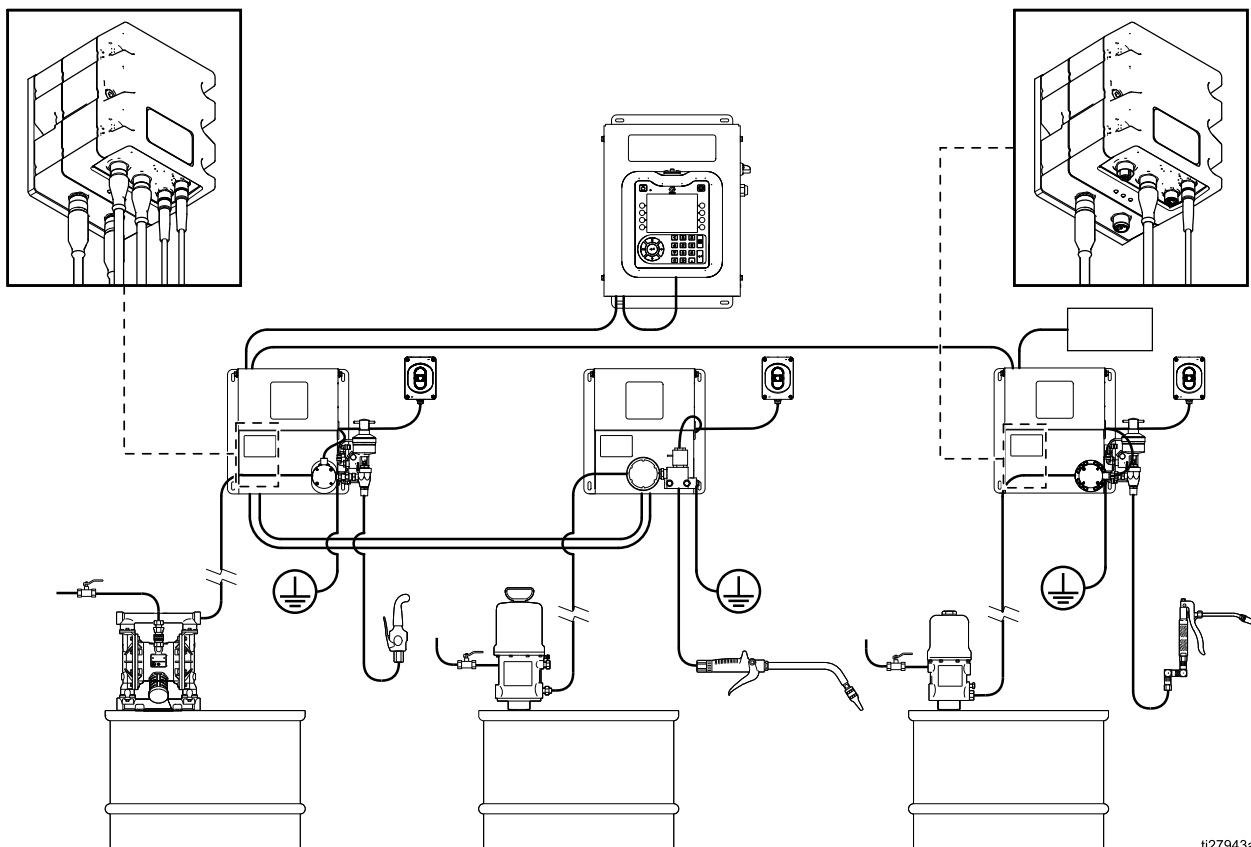
Installation

Prior to Installation

- Have all system and component documentation available during installation.
- See component manuals for specific data on component requirements. Data presented here applies to a basic ProDispense system.
- Be sure all accessories are adequately sized and pressure-rated to meet system requirements.
- Use the ProDispense control panel with ProDispense fluid panel assemblies.

Overview

Figure 1 is not an actual system design. Contact your Graco distributor for assistance in designing your system.



ti27943a

Figure 1 Sample ProDispense Installation

Installation

| Component | Description |
|-----------------------------|--|
| Fluid Control Modules (FCM) | <ul style="list-style-type: none"> • Fluid Control Module (FCM); up to four |
| Fluid Panels* | <ul style="list-style-type: none"> • Fluid Panels; up to two per FCM; up to eight total <ul style="list-style-type: none"> – Oil and Lubrication – Water and Antifreeze (not ETL listed) – Grease and Paint – Meterless (meter supplied by user) |
| Advanced Display Module | Use to set up, display, operate, and monitor the system. Use for daily functions including choosing recipes, reading/clearing errors, and placing the system in Diagnostic Mode. Locate in a non-hazardous area. |
| Remote Operation Station | Use for local control of one fluid panel. |

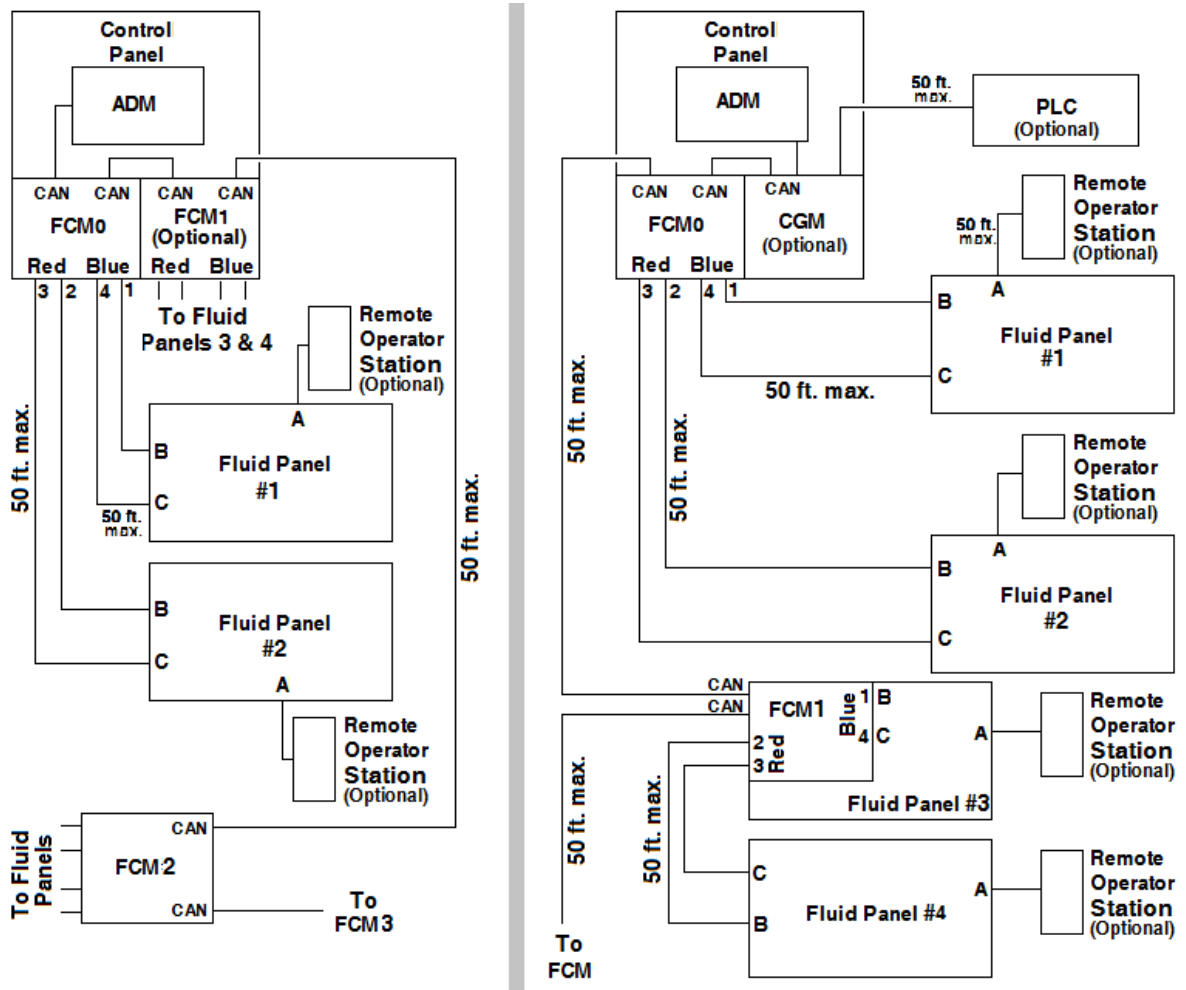
* NOTE: Fluid Panels from earlier systems can be used if the junction box is upgraded (Kit 26A243) and the Operator Station is replaced with a Remote Operator Station (Kit 26A133).

The basic steps to install a system are shown below. See the separate component manuals for detailed information.

1. Mount the control panel.
2. *For systems with multiple fluid panels*, mount an FCM on one of each 2 fluid panels being used. See [Mount FCM in Fluid Panel, page 24](#).
3. Mount each fluid panel assembly.
4. Ground each fluid panel assembly.
5. Check ground continuity.
6. Connect fluid lines between each fluid panel and applicator. Connect fluid supply line and air supply to module.
7. Plumb air filter assembly near air supply drop site that will be used for fluid panel assembly.
8. Connect other fluid and air lines to additional system components as instructed in their manuals.
9. Install fluid panel and gateway cable assemblies.
10. Install Gateway interface.

Communication Configuration

When installing a system, each component requires communication cables. See the diagram below for sample configurations.



Typical Communication Connections

NOTE: The last FCM in the system must have the CAN termination resistor installed on the uncabled CAN connector to properly terminate the circuit. The termination resistor is installed on the FCM in the control panel in the factory. It will need to be relocated if additional FCMs are installed in the system.

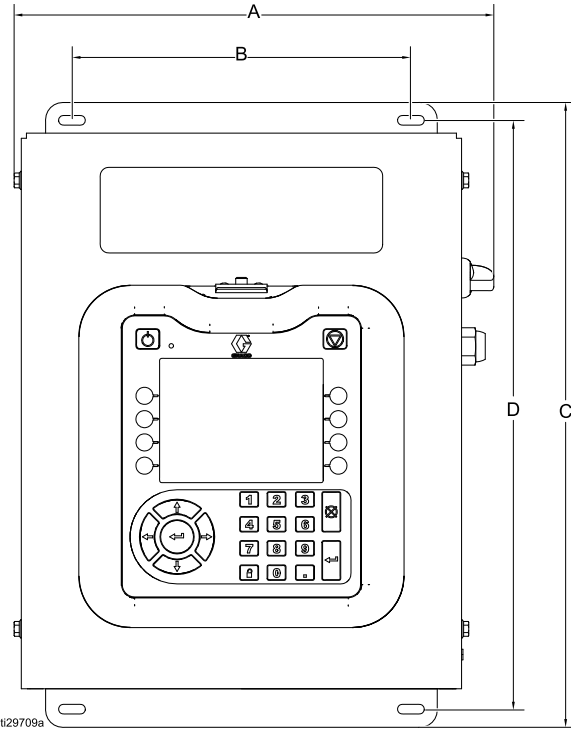
Install Control Panel

Mount Control Panel

Ensure the following criteria are met before mounting the control panel:

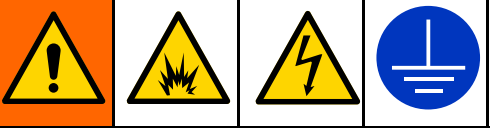
- Select a location for the control panel that allows adequate space for installation, service, and use of the equipment.
- For best viewing, the ADM should be 60-64 in. (152-163 cm) from the floor.
- Ensure there is sufficient clearance around the control panel to run cables to other components.
- Ensure there is adequate access to an appropriate electrical power source. For example, the U.S. National Electric Code requires 3 ft (0.91 m) of space in front of the control panel.
- Ensure there is easy access to the power switch.
- Ensure the mounting surface can support the weight of the control panel and the cables attached to it.

Secure the control panel with appropriate size bolts (1/4 in. diameter) through each of the slotted mounting holes in the base plate.



| | |
|------------|--------------------|
| A | 14 in. (356 mm) |
| B | 9.9 in. (251 mm) |
| C | 18.25 in. (464 mm) |
| D | 17.2 in. (437 mm) |
| Slot width | 0.28 in. (7 mm) |

Electrical Connections



To reduce the risk of fire, explosion, or electric shock, when ensuring grounding, connecting cables, connecting to a power source or making other electrical connections:

- The control center must be electrically connected to a true earth ground; the ground in the electrical system may not be sufficient. Refer to your local code for the requirements for a “true earth ground” in your area.
- All wires used for grounding must be 18 AWG minimum.
- A qualified electrician must complete all grounding and wiring connections.
- Incoming power wiring must be guarded from the enclosure. Use a protective grommet or strain relief where the power wiring enters the enclosure to prevent wear.

NOTICE

If power and grounding connections are not done properly, the equipment will be damaged and the warranty voided.

Install Light Tower

The light tower accessory will provide a visual indication from a distance whether an abnormal condition exists within the system.

1. Order the 255468 Light Tower Accessory as a diagnostic indicator for the system.
2. Locate a mounting position near the control panel that is close enough to attach the cable to the ADM. Mount the light tower assembly at the mounting location.
NOTE: If an extension cable is needed to place the Light tower a further distance from the ADM location, the following cables can be ordered separately:
 - 122487, 5 ft (1.5 m)
 - 124003, 15 ft (5 m)
 - 121006, 150 ft (50 m)
3. Connect the cable from the light tower to the I/O port located on the bottom of the ADM.

| Signal | Description |
|-----------------|--|
| Green | No errors. |
| Yellow | An advisory exists. |
| Yellow flashing | A deviation exists. |
| Red solid | An alarm exists. One or more fluid panels may be shutdown. |

NOTE: See [Errors, page 47](#) for error definitions.

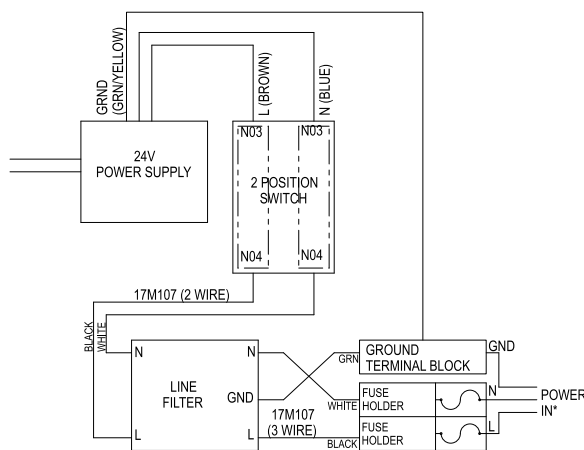
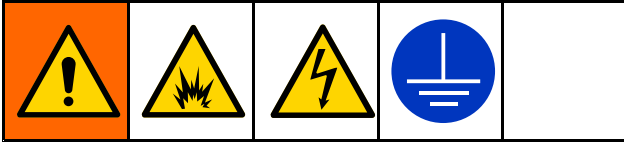


Figure 2 85-240 VAC Wiring

Install Fluid Panels

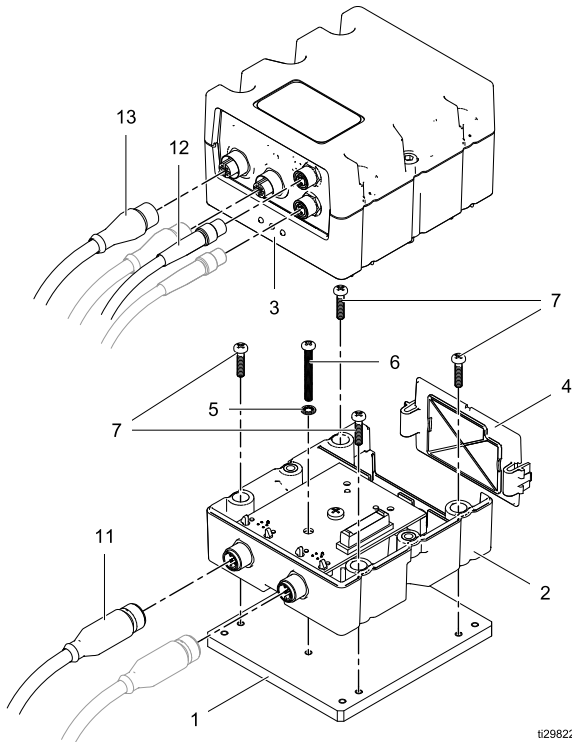


To install the fluid panel assemblies:

- Mount the fluid panel assemblies. See below.
- Ground the fluid panel assemblies. See [Ground Fluid Panel, page 26](#).
- Connect each fluid panel to the system. See [Install Cables, page 26](#).
- Connect fluid lines, air lines, and cables. See [Connect Air and Fluid Lines, page 26](#)

Mount FCM in Fluid Panel

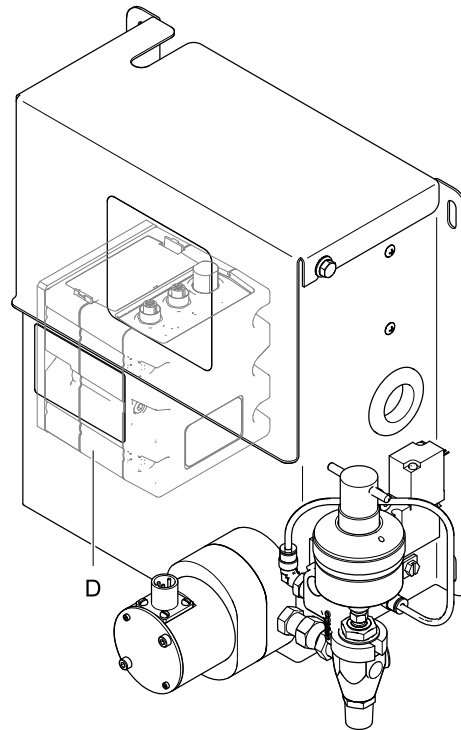
Systems with more than 2 fluid panels require additional FCMs. Graco recommends mounting the additional FCMs within a fluid panel for protection from external sources. The FCM kit 26A134 includes a mounting plate which will make attachment to the fluid panel easier.



ti29822a

1. With the FCM open, using screw (6) and washer (5), insert the screw through the ground hole in the base (2) and attach loosely to the ground hole on the adaptor plate (1).
NOTE: Screws (7) do not have a lock washer attached to them. The screws with the attached lock washer are used to mount the adaptor plate to the fluid panel.
2. Loosely attach the four screws (7) through the base and into the threaded holes on the adaptor plate. Once all five screws are threaded into the adaptor plate, tighten screws to secure the base to the adaptor plate and the ground screw to make contact with the circuit board. Do not overtighten.
3. Position the adaptor plate and FCM (D) within the fluid panel as shown below. Align the unused adaptor plate holes with the mounting holes on the left side of the fluid panel. Loosely install the four screws with the attached lockwashers in each of the four holes and into the threaded holes on the adaptor plate. Once all screws are started, tighten to secure the adaptor plate to the fluid panel. Do not overtighten.

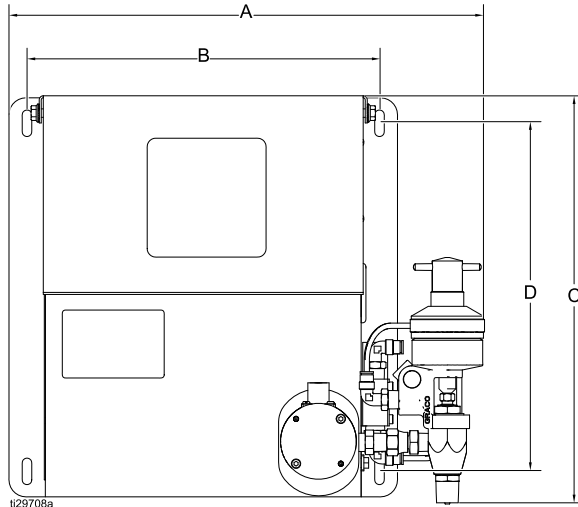
NOTE: If this FCM is not going to be connected to another FCM, the termination resistor must be installed on the uncabled CAN connector to properly terminate the circuit.



ti29710a_FCM

Before Mounting Fluid Panel

- See component manuals for specific information on component requirements. Information presented here pertains to the fluid panel only.
- Have all system and subassembly documentation available during installation.
- Be sure all accessories are adequately sized and pressure-rated to meet the system’s requirements.
- Use only a Graco fluid panel with the control panel.



Mount Fluid Panels

1. Select a location for the fluid panel assembly. Keep the following in mind:
 - Allow sufficient space for installing the equipment.
 - Make sure all fluid lines, cables and hoses easily reach the components to which they will be connected.
 - Make sure the fluid panel provides easy access for servicing its components.
2. Mount and secure the fluid panel assembly to the mounting surface with appropriate size bolts (1/4 in. diameter) through each of the 4 slotted mounting holes of the base plate. The mounting hole dimensions are shown below.
3. On fluid panels 26A071 and 26A247, the tubing length between the solenoid air valve and the dispense valve must be less than, or equal to, 10 feet.

| Panel | A | B | C | D | Slot width |
|----------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| 26A129 | 11.4 in (290 mm) | 10.4 in. (264 mm) | 11.8 in (300 mm) | 10.2 in. (259 mm) | 0.28 in. (7 mm) |
| 26A130 | 13.4 in (340 mm) | 10.4 in. (264 mm) | 11.8 in (300 mm) | 10.2 in. (259 mm) | 0.28 in. (7 mm) |
| 26A131 | 14.5 in (268 mm) | 10.4 in. (264 mm) | 12.0 in. (305 mm) | 10.2 in. (259 mm) | 0.28 in. (7 mm) |
| 26A132 | 15.0 in (381 mm) | 10.4 in. (264 mm) | 11.8 in (300 mm) | 10.2 in. (259 mm) | 0.28 in. (7 mm) |
| 26A071 | 11.6 in (295 mm) | 10.4 in. (264 mm) | 11.8 in (300 mm) | 10.2 in. (259 mm) | 0.28 in. (7 mm) |
| 26A247 | 11.6 in (295 mm) | 10.4 in. (264 mm) | 11.8 in (300 mm) | 10.2 in. (259 mm) | 0.28 in. (7 mm) |
| 26A165 | 14.0 in (356 mm) | 10.4 in. (264 mm) | 12.0 in. (305 mm) | 10.2 in. (259 mm) | 0.28 in. (7 mm) |
| Coriolis Kit bracket | 7.9 in (201 mm) | 6.9 (175 mm) | 9.7 in (246 mm) | 8.7 in (221 mm) | 0.38 in. (9.7 mm) |

Convert Fluid Panels

If fluid panels used with a 244561 controller are going to be used with the 26A070 control panel, they will require a junction box upgrade so that the fluid panel is able to communicate with the 26A070 control panel. The junction box upgrade kit 26A243 can be ordered separately. The kit will upgrade one fluid panel junction box.

NOTE: Ensure that the power consumption of the older panels is taken into consideration prior to connection. See

[Appendix B - System Design, page 114](#) for information on available power and how to calculate the power consumption of the various system components. The requirement that one FCM can communicate with two fluid panels will also apply to the converted fluid panels. FCM kit 26A134 can not be mounted within converted fluid panels due to fluid panel size restrictions. From an FCM protection standpoint, consider combining one new fluid panel with one converted fluid panel on an FCM during the layout planning for your system.

Meterless Fluid Panel

Connection of a meter to a meterless panel will require attaching the meter wires into the fluid panel junction box. For information about the meter connections of all fluid panel meters, refer to the schematics shown in [Replace Fluid Panel Junction Box, page 57](#).

Ground Fluid Panel

Ensure that every fluid panel is appropriately grounded prior to operation. For grounding instructions, refer to [Grounding, page 27](#).

Connect Air and Fluid Lines

NOTICE

Route all fluid and air lines carefully. Avoid pinching and premature wear due to excessive flexing or rubbing. Hose life is directly related to how well they are supported.

Follow the instructions in your separate component manuals to connect air and fluid lines. The following are only general guidelines.

- The fluid panel assembly should be installed on the automation unit or in another appropriate place, as close as practical to the dispense location.
- Connect a fluid line between the fluid panel dispense valve and the dispense assembly. Smaller diameter and shorter fluid lines (hoses) will provide better fluid system response.
- Connect a fluid supply line to the flow meter fluid inlet.
- If required for the selected fluid panel, connect an air line to the solenoid on the fluid panel. Air must

be clean and dry, between 85-120 psi (0.59-0.82 MPa, 5.9-8.27 bar). Flush air line before plumbing in an air filter assembly. Plumb in air filter assembly near air drop site (upstream of fluid panel module). Adding an air regulator to this line will provide more consistent dispense valve response times.

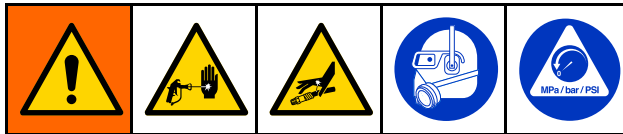
NOTE: To maximize system performance keep the dispense hose length and ID as small as the application will allow.

Install Cables

NOTE: To prevent system errors, only connect cables with the power off. See [Communication Configuration, page 21](#) for cable connections.

1. For systems with more than two fluid panels: Use a CAN cable to connect the control panel FCM to another FCM. Use additional CAN cables to connect remaining FCMs together in sequence. Ensure each FCM rotary switch has been set to indicate its order within the system. See [FCM, page 14](#) for rotary switch settings and location of CAN connectors.
2. Connect cables from the control panel FCM blue (or red) connectors to fluid panel connectors A and C. If more than one fluid panel is being attached, repeat this step using the red (or blue) connectors to the second fluid panel.
NOTE: Each fluid panel must be configured on the Fluid screen to tell the system which color FCM connectors were used for that fluid panel. See [Fluid Screen, page 103](#).
3. For fluid panels which will have a Remote Operator Station installed, attach the remote operator station cable to fluid panel connector B.

Install Fluid Supplies



- To reduce the risk of equipment overpressurization and rupture which can cause injury, including skin injection, do not exceed the pressure rating of the lowest rated system component. See the identification label for the maximum working pressure of the equipment.
- To reduce the risk of injury, including skin injection, you must install a shutoff valve between each fluid supply line and the meter. Use the valves to shut off fluid during maintenance and service.

ProDispense fluid panels can be supplied by pressure tanks, pail or drum pumps, or central recirculating lines.

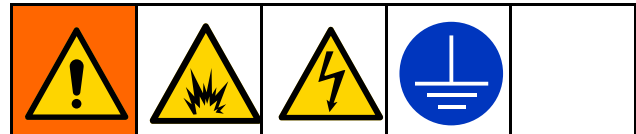
The fluid supply must be free of pressure spikes, commonly caused by a pump stroke changeover. If necessary, install pressure regulators or a surge tank on the fluid supply outlets. Note that this will also reduce the fluid supply pressure.

Install Remote Operator Station

Mount the operator station in a convenient location for the operator. Connect the cable to the fluid panel junction box connector marked **B**.

NOTE: 20 ft. (6.1 m) station cable extension, 198456, is available.

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.

Control Panel: Connect a ground wire to the grounding lug on the bottom of the controller. Connect the other end of the ground wire to a true earth ground.

Fluid Panels: Connect a ground wire to the grounding lug on the junction box bracket. Connect the other end of the ground wire to a true earth ground.

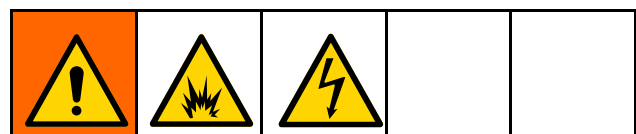
Feed Pumps or Pressure Pots: See your separate pump or pressure pot manual.

Air and Fluid Hoses: Use only grounded hoses.

Fluid Supply Container: Ground the container according to your local code.

Solvent Pails Used when Purging: Ground pails according to your local code. Use conductive, metal pails, placed on a grounded surface. Do not place pails on nonconductive surfaces, such as paper or cardboard.

Check Resistance



To reduce the risk of fire, explosion, or electric shock, the resistance between the ProDispense components and true earth ground must be less than 1 ohm.




Check the resistance between each ProDispense component and true earth ground. If the resistance is 1 ohm or greater, a different ground site may be required. Do not operate the system until the problem has been corrected.

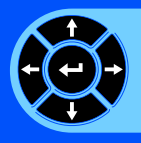



Advanced Display Module (ADM)

ADM Keys and Indicators

The ADM display shows graphics, text, information related to setup, and operational details.

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

| Key | Function |
|--|--|
|  <p>Startup/Shutdown Key and Indicator</p> | Press to startup or shutdown the system. <ul style="list-style-type: none"> • Solid green indicates that system is in Standby (Ready) mode. • Solid yellow indicates that system is off. • Blinking green or yellow indicates that the system is in Setup mode. |
|  <p>Stop</p> | Press to immediately stop the system and fluid dispense on all fluid panels. |
|  <p>Soft Keys</p> | Press to select the specific screen or operation shown on the display directly next to each key. The top left soft key is the Edit key, which allows access to any settable fields on a screen. |











| Key | Function |
|---|---|
|  <p>Navigation Keys</p> | <ul style="list-style-type: none"> • <i>Left/Right Arrows:</i> Use to move from screen to screen. • <i>Up/Down Arrows:</i> Use to move among fields on a screen, items on a dropdown menu, or multiple screens within a function. |
| Numeric Keypad | Use to input values. See ADM Display, page 16 . |
|  <p>Cancel</p> | Use to cancel a data entry field. |
|  <p>Setup</p> | Press to enter or exit Setup mode. |
|  <p>Enter</p> | Press to choose a field to update, to make a selection, to save a selection or value, to enter a screen, or to acknowledge an event. |

Soft Key Icons

The following icons appear in the ADM display, directly to the left or right of the soft key which activates that operation.

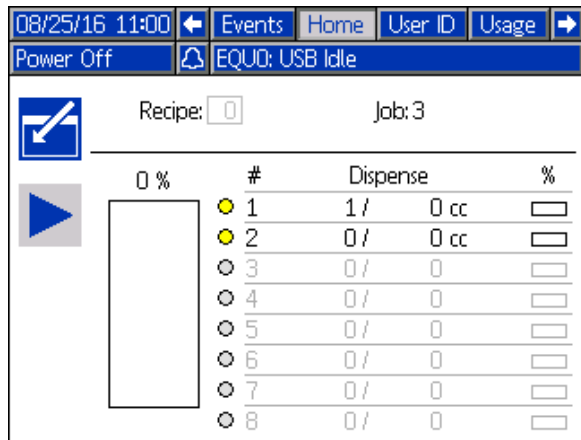
NOTICE

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

| Key | Function |
|---|---|
|  | Enter Screen Press to enter screen for editing. Highlights editable data on a screen. Use Up/Down arrows to move between data fields on the screen. |
|  | Exit Screen Press to exit screen after editing. |
|  | Cancel <ul style="list-style-type: none"> • Home Screen - Press to cancel current recipe dispense. • Calibration screen - Press to cancel calibration procedure. |
|  | Run/Start <ul style="list-style-type: none"> • Home Screen - Press to start recipe dispense. • Calibration screen - Press to start calibration procedure. |
|  | Counter Reset Press to reset the current usage counter. |
|  | Move Cursor to Left Appears on the User ID Keyboard screen. Use to move cursor to the left. |
|  | Move Cursor to Right Appears on the User ID Keyboard screen. Use to move cursor to the right. |
|  | Erase All Appears on the User ID Keyboard screen. Use to erase all characters. |
|  | Backspace Appears on the User ID Keyboard screen. Use to erase one character at a time. |
|  | Upper Case/Lower Case Appears on the User ID Keyboard screen. Use to change case (upper/lower). |

Screen Icons

As you move through the screens, you will notice that icons are used frequently to simplify global communication. The following descriptions explain what each icon represents.



| Key | Function |
|-----|--------------------|
| | User ID |
| | Recipe Number |
| | Date |
| | Time |
| | Job Number |
| | Volume |
| | Fluid Number |
| | Alarm |
| | Deviation |
| | Advisory |
| | Progress Bar |
| | Fluid Progress |
| | Fluid Panel Status |


Navigating the Screens


Screen navigation will depend on using various keys on the ADM. As the various screens appear, the menu bar above them will indicate a variety of information. The menu bar is shown below.



There are two sets of screens:

- The Run screens control dispensing operations and display system status and data.
- The Setup screens control system parameters and advanced features.

Press  on any Run screen to enter the Setup screens. If the system has a password lock, the Password screen displays. If the system is not locked (password is set to 0000), System Screen 1 displays.

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

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

Press the Exit soft key  to exit any screen.

Use the other softkeys to select the function adjacent to them.

System Setup

Brief Overview

The first step in performing system setup is to define how the system will be configured. The manner in which fluids will be dispensed can vary for each type of fluid. Some fluids may be dispensed entirely by the use of a recipe, only when an operator triggers the fluid dispense, or by either method. The table below explains these dispense modes and a short version of the System Setup Sequence. For a more detailed overview of the setup steps, see [Detailed Configuration Overview, page 33](#).

| Configura- tion | Description | Setup Sequence (Short version) |
|--------------------|--|---|
| Recipe Mode | The recipe controls the order of fluid dispenses, defines the amount of fluid to be dispensed to a very precise amount, and does not require operator actions at a fluid panel to dispense the fluid. | <ul style="list-style-type: none"> • Install system components. • Establish fluid supplies and connect to fluid panels. <p>NOTE: For detailed operating instructions for use of the ADM, see ADM Display, page 16 and Appendix A – Advanced Display Module (ADM) Operation, page 93.</p> <ul style="list-style-type: none"> • At the ADM, configure system. See Setup Mode Screens, page 99. • Configure fluid panels. See Fluid Screen, page 103. • Set up Maintenance Schedule/Parameters for each fluid panel. See Setup Maintenance Schedule / Parameters, page 108. • Configure Gateway Settings. See Gateway Screen, page 109. • Set up recipes. See Recipe Screen, page 100. Setup guidelines and an example recipe can be found at Setup Recipes, page 101 • Configure Advanced Settings. See Advanced Screen 1, page 112. • Calibrate each fluid panel. See Calibration Procedure, page 106. |
| Station Mode | The timing of fluid dispensed at each fluid panel is not controlled by the ADM. Dispensing occurs when an operator at a fluid panel activates the dispense with the Remote Operator Station. | |
| Combination Mode | A recipe is created that will dispense fluids from some fluid panels automatically, in a given sequence, while other fluid panels are entered in the recipe as being in station mode. The fluid panels being operated in station mode require operator action to dispense. | |

Detailed Configuration Overview

Initial configuration will involve settings that will not change once the system is placed into operation. The system configuration includes the following:

12/07/15 15:22 | Advanced | System | Recipe | Fluid |

Power Off | No Active Errors

Diagnostic Mode:

Fluid Panel: 8

System settings — These are used to define the number of fluids used in the system, as well as activating the diagnostic mode. Activation of diagnostic mode will display a flow rate instead of a progress bar on the Run screen.

04/25/16 12:53 | Gateway | Advanced | System |

Standby | No Active Errors

Language: English

Date Format: mm/dd/yy

Date: 04 / 25 / 16

Time: 12 : 53

Password: 0000

Screen Saver: 5 minute(s)

Silent Mode:

Advanced settings — These are used to configure the language, set the time, define a password, establish the units of measure, and USB settings. Installed system and component software versions are also found on the Advanced screens.

For detailed information about available settings, see [Advanced Screen 1, page 112](#) through [Advanced Screen 4, page 113](#).

08/25/16 11:42 | Recipe | Fluid | Calibrate | Maint. |

Power Off | EQUO: USB Idle

Fluid: 1 | Enabled:

FCM3 ID: 0 | Auto Adjust:

FCM3 Port: Blue (1,) | Mode: Recipe

Fluid Name: Fluid 1 | Stop Btn: Standby

K Factor: 0.119 | Target: 200 cc

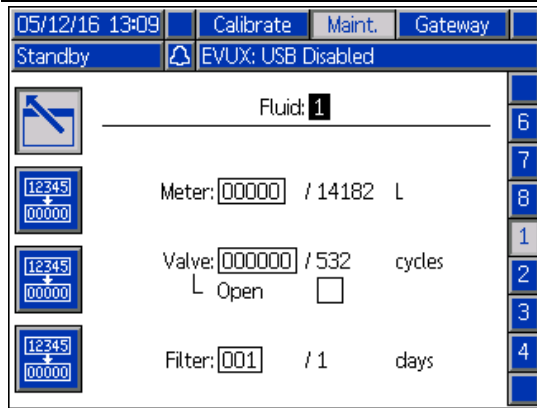
Volume Units: cc | Tolerance: 5 %

Leak: 1.0 cc/min | Timeout: 0 sec

Settling Time: 0.50 sec | Top Off: 0 sec

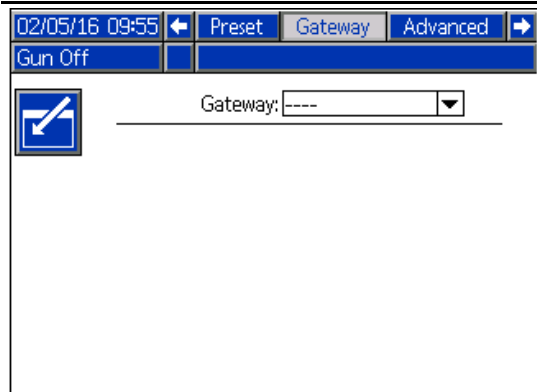
Configure fluid panels — Each fluid panel needs definition for the panel address, hardware configuration, operation mode, and presets.

For detailed information about fluid panel configuration screen fields, see [Fluid Screen, page 103](#).



Define maintenance alarm parameters — The ProDispense system has the ability to monitor each fluid panel for the volume of liquids that have been metered, the number of times the dispense valve has cycled, and the number of days that have elapsed since the meter filter has been checked.

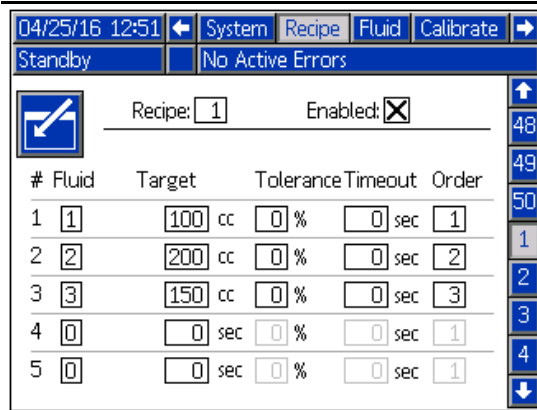
For detailed maintenance alarm parameters, see [Maintenance Screen, page 107](#).



Configure gateway — The gateway configuration screens are used to configure the fieldbus gateways. The ProDispense system supports the following types of gateway:

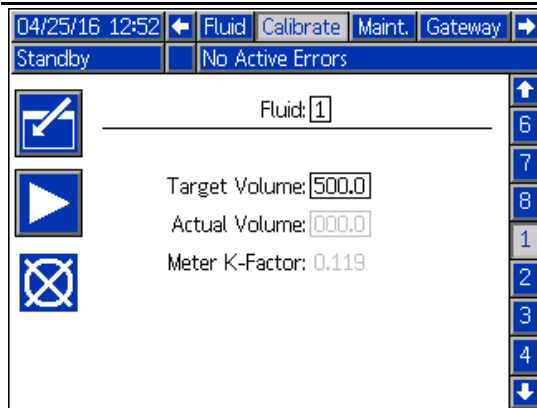
- Modbus TCP
- Ethernet/IP
- PROFINET
- DeviceNet

For a detailed step-by-step gateway configuration, see [Gateway Screen, page 109](#).



Configure recipes — The ProDispense system has the ability to handle up to 50 recipes. Each recipe can contain up to 10 preset items, which appear on 2 separate screens for each recipe. When defining a recipe, the preset items do not require sequential or contiguous entries.

For detailed step-by-step recipe setup, see [Setup Recipes, page 101](#).



Calibrate fluid panel — After a fluid panel is configured, it is necessary to calibrate the fluid output to ensure accurate dispensing.

See [Calibration Procedure, page 106](#).

Operation

During normal operation, the system can dispense recipe presets or individual dispenses when it receives a command from the control panel, a remote operator station, or an Automation source (PLC). The system operates using the concept of recipes using combined fluid panels, and can also function with each fluid panel being autonomous and providing individual fluid dispense.

For information regarding how to configure your system, see [System Overview, page 10](#) and [Detailed Configuration Overview, page 33](#).

The control panel operates using the concept of jobs. For a detailed explanation of jobs and how they work, see below. For a detailed explanation of recipes and how they work, see [Setup Recipes, page 101](#).

Pre-operation Checklist

Go through the Pre-Operation Checklist daily, before each use.

| ✓ | Checklist |
|---|--|
| | <p>System grounded</p> <p>Verify all grounding connections were made. See Grounding, page 27</p> |
| | <p>All connections tight and correct</p> <p>Verify all electrical, fluid, air, and system connections are tight and installed according to the Installation manual.</p> |
| | <p>Fluid supply containers filled</p> <p>Check component A and B and solvent supply containers.</p> |
| | <p>Solenoid pressure set</p> <p>85-120 psi inlet air supply (0.59-0.82 MPa, 5.9-8.2 bar).</p> |

Flush Before Using Equipment

The pump fluid section was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment.

Startup

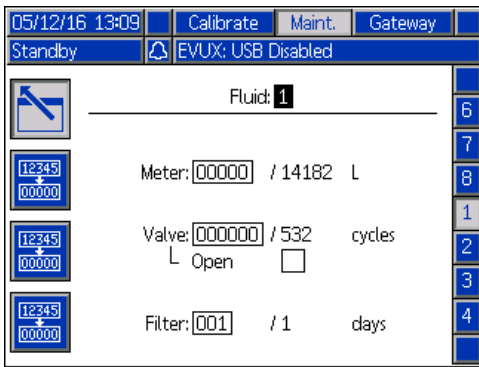
Follow this procedure to start the ProDispense system for the first time (initial startup) or after the system has been shut down.

1. Turn on the power. The ProDispense system startup screen will display while the system is starting, then the Run screen or System Startup screen will appear, depending on the mode of operation the system is in.
2. If this is the initial startup, change to the Setup Mode and complete the setup procedures.
3. Change to the Dispense Mode Run screen if you are not there already.
4. Make sure the dispense lines run into the proper reservoir.
5. Load the fluids.

Loading Fluid Lines

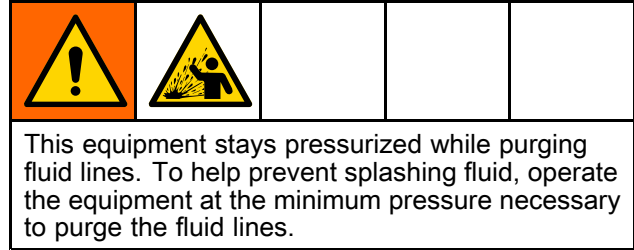
NOTE: This procedure is performed for a single fluid. Repeat as necessary for additional fluids.

1. Ensure that the following conditions exist prior to loading a fluid:
 - a. The supply line has been flushed to remove any contaminants.
 - b. The fluid line contains only fluids or solvents which are compatible with the fluid being loaded.
 - c. The supply line has been pressurized.
2. On the ADM, navigate to the Maintenance Screen.



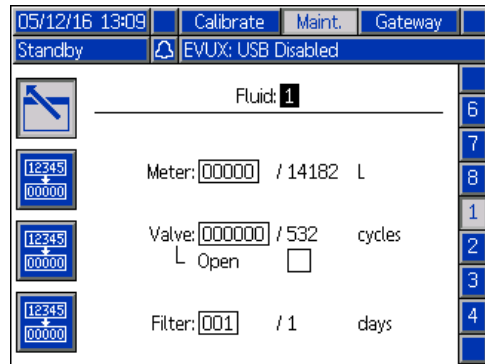
3. Select the desired fluid.
4. **NOTE:** If the dispense location has an applicator which must be triggered for fluid to dispense, this step can be performed after step 5. At the dispense location, place the dispense line (or direct the dispense valve) into a waste container.
5. On the Maintenance screen, select the Open checkbox. The dispense valve on the selected fluid panel is now open.
6. At the dispense applicator, dispense fluid into the waste container until a desired fluid dispense is achieved. If possible, stop the dispense applicator.
7. At the ADM, uncheck the Open checkbox. The fluid panel dispense valve is now closed.

Purging Fluid Lines



NOTE: This procedure is performed for a single fluid. Repeat as necessary for additional fluids.

1. Ensure that the following conditions exist prior to purging a fluid:
 - a. The supply line has been connected to a compatible solvent supply.
 - b. The fluid line pressure is at a low level to minimize splashing.
2. At the dispense location, direct the fluid outlet into a grounded metal pail.
3. On the ADM, navigate to the Maintenance Screen.



4. Select the desired fluid.
5. Select the Open checkbox. The dispense valve on the selected fluid panel is now open.
6. At the dispense location, dispense fluid into the waste container until fluid lines are clear. If possible, stop the dispense applicator.
7. At the ADM, uncheck the Open checkbox. The fluid panel dispense valve is now closed.

NOTE: If this fluid will be changed over to a different type of fluid, ensure that the new fluid will be compatible with the solvent currently in the supply line. If it is not compatible, purge the line again with a solvent that will be compatible with the new fluid to be used.

Dispense

Fluid dispensing occurs under the following conditions:

- Station dispense
- Top off
- Recipe dispense

Station Dispense

In station mode the fluid dispense presets are loaded using the fluid screen. See [Fluid Screen, page 103](#). Dispense activity is controlled by the Remote Operator Station connected to the fluid panel. The action that will be performed by the stop button of the Remote Operator Station must also be defined on the fluid screen.

By configuring the Top Off field on the fluid screen, it is possible to allow additional fluid, in excess of the target volume. This field does not limit the amount of fluid, but does limit the amount of time after the target volume is reached to dispense additional fluid.

1. Navigate to the ADM Home screen. Observe that the desired fluid has the desired target volume displayed for the desired fluid.
NOTE: Verify that the Remote Operator Station operation is understood before starting the dispense. The stop button may not allow pausing the dispense.
2. At the fluid panel Remote Operator Station, use the start and stop buttons to achieve the desired volume dispense.

Top Off

If the top off feature is configured for a fluid panel operating in station mode, (see [Setup Recipes, page 101](#) and [Fluid Screen, page 103](#)) after initial target dispense is complete, the Remote Operator Station LED will indicate that the fluid panel is in the top off state (see LED information in [Remote Operator Station Operation, page 38](#)). During the top off time, the operator can use the Remote Operator Station buttons to resume, pause or stop fluid dispense at this fluid panel. If the top off timer is reached, the Remote Operator Station LED will extinguish and no further fluid can be dispensed until a new recipe is started.

Top off volume is accounted for in the current job log.

Recipe Dispense

In recipe the dispense presets and operation is controlled by the control panel. See [Setup Recipes, page 101](#) for instruction in creating a recipe. To initiate a defined recipe, on the ADM, navigate to the Home screen, select the desired

recipe, and press the  key.

The recipe will begin dispensing on any fluid panels which are in recipe mode. If a fluid panel is encountered which is in station mode and has not been configured as independent station dispense (Order = 0), the recipe is placed in pause and the indicator light on the Remote Operator Station will light, indicating to the operator that the fluid can now be dispensed by pressing the start (1) button on the Remote Operator Station. The Remote Operator Panel stop button (0) must also be used to indicate completion of the dispense. Depending on how the recipe is configured, this may require a single push (Stop btn. = standby) of the button, or pushing and holding for at least 2 seconds (Stop btn. = pause/standby).

Fluid panels which are in station mode and have been configured in the recipe for independent station dispense (Order=0) are able to dispense fluids independent of how other fluids are dispensed in the recipe. The independent fluid panel in station mode is also able to dispense without regard to quantities or frequency stated in the recipe.

Status Indication

Station and recipe dispense progress can be observed on the home screen. Each fluid dispense progress is indicated individually by current over target dispense volumes and by progress bar.

If the system is dispensing a recipe, the Home screen displays the current recipe number and a progress bar indicates the overall progress of the dispensing recipe.

Job Records

A job record is generated after each successful station dispense with a unique job identifier. If the station dispense is part of a recipe, it is contained within that recipe job.

Station Dispense — In station dispense mode, each fluid panel dispense cycle is logged individually with a unique sequential job number for each dispense.

Recipe Dispense — In recipe mode all fluids that are part of recipe are logged with the same unique sequential job number that is associated with the whole recipe dispense. Stations which are configured

as independent dispense stations (Order = 0), will have their own job number identifiers.

Remote Operator Station Operation

The Remote Operator Station is used to control dispense operations at the fluid panel it is connected with. The Remote Operator Station functions in different manners, dependant on its operation mode. Some of the Remote Operator Station functions can be defined on the fluid screen. See [Fluid Screen, page 103](#).

| Remote Operator Station Function | Dispense Mode | |
|----------------------------------|---|---|
| | Station | Recipe |
| Start Button | Press to initiate fluid station dispense. LED will indicate dispense. | Press to start the recipe. This will only occur if the recipe is not currently running. |
| Stop Button | Press to pause or stop fluid dispense. For information about configuring the button function, see Fluid Screen, page 103 . | Terminate the current recipe without finishing. |
| LED | Lit during dispense. 2 blinks at end of dispense (100 ms @ 6.6 Hz) Short blinks when paused (100 ms @ 1 Hz) Short blinks during top off time (100 ms @ 1 Hz) | Lit during dispense. |

Pressure Relief Procedure



Follow the **Pressure Relief Procedure** whenever you see this symbol.



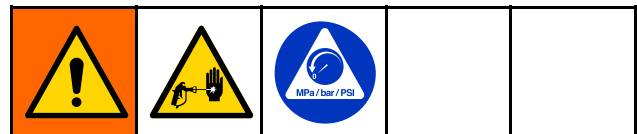
This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, and splashing fluid, follow the **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, or servicing the equipment.

NOTE: Follow the additional instructions in brackets if a dispense valve is installed on the dispense line.


1. Shut off the fluid supply to the ProDispense fluid panel. Follow the **Pressure Relief Procedure** for the fluid supply system.
2. Place the dispense line [or direct the dispense valve] into a waste container.
3. Navigate to the Maintenance screen and select the desired fluid panel. To begin dispensing, select the Open checkbox [and trigger the dispense valve].
4. When fluid stops flowing and pressure is relieved, [release the dispense valve trigger and] deselect the Open checkbox to stop dispensing.
5. Repeat the process for each fluid panel as needed.
6. Shut off compressed air (if used) to each fluid panel.
7. Turn the main power switch on the control panel to the OFF position.

8. If you suspect the dispense valve tip or hose is clogged or that pressure has not been fully relieved:
 - a. **VERY SLOWLY** loosen the hose end coupling or a fitting on the dispense side of the dispense valve to relieve pressure gradually.
 - b. Loosen the nut or the coupling completely.
 - c. Clear the obstruction in the hose or tip.
 - d. If this does not remove the clog, cover the hose end coupling with a rag then very slowly loosen the hose end coupling to relieve pressure gradually, then loosen the coupling completely. Clear the valves or hose. Do not pressurize the system until the blockage is cleared.

Shutdown



Follow this procedure before servicing the equipment and to avoid having fluid dry in the equipment and fluid lines when the equipment is not being operated.

1. On the ADM, press the  key.
2. Shut off the material supply to the fluid panel/meter.
3. Follow the [Pressure Relief Procedure, page 39](#).
4. Turn off the compressed air supply to the ProDispense system.
5. Turn off the ProDispense controller power switch.

System Performance

Dispense Accuracy

For the best accuracy and repeatability, follow the table below.

| Dispense Parameter/Fluid Panel | | Dispense Requirements | | |
|-----------------------------------|--|-----------------------|--------|--------|
| Accuracy | | 1% | 3% | 5% |
| Minimum dispense time | 26A071, 26A131, 26A132, 26A165, 26A247 | 3 sec | 2 sec | 2 sec |
| | 26A129, 26A130 | 35 sec | 30 sec | 25 sec |
| Minimum dispense volume | 26A165 (S3000, 0.020 cc/pulse) | 3 cc | 2 cc | 2 cc |
| | 26A247 (Coriolis, 0.062 cc/pulse) | 7 cc | 3 cc | 2 cc |
| | 26A131 (G3000, 0.119 cc/pulse) | 12 cc | 5 cc | 3 cc |
| | 26A132 (HG6000, 0.273 cc/pulse) | 27 cc | 10 cc | 8 cc |
| | 26A129 (Oil meter, 4.73 cc/pulse) | 500 cc | 165 cc | 100 cc |
| | 26A130 (Water meter, 25 cc/pulse) | 2500 cc | 900 cc | 600 cc |
| Maximum supply pressure variation | | 5% | 10% | 20% |

Dispense Time

The longer the dispense time, the better the accuracy and repeatability. As the dispense time is lengthened, the flow rate decreases and the relationship between valve shutoff lag time and dispense time increases.

Meter Resolution

To determine dispense accuracy for a given flow meter, divide the dispense target volume by the K-Factor of the meter.
For example, 10 cc dose/0.119 K-Factor = 1.19% of dispense per pulse (84.03 pulses/dispense).

Dispense Volume

Minimum dispense volumes are calculated based on meter resolution. Larger dispense volumes will result in greater accuracy.

Flow Rate

Dispense flow rate should be tuned in relationship to dispense time and dispense volume.

$$\text{Flow rate} = \text{Volume} / (\text{Time} * 60) = \text{volume/minute}$$

Fluid Supply

Fluid viscosity consistency is required to maintain consistent dispense repeatability. When viscosity changes, flow rates change, resulting in dispense accuracy fluctuation.

USB Data

All files downloaded from the USB are put in a DOWNLOAD folder on the drive. For example: "E:\GRACO\12345678\DOWNLOAD"

The 8-digit numeric folder name matches the 8-digit ADM serial number. When downloading from multiple ADMs, there will be one sub-folder in the GRACO folder for each ADM.

USB Logs

During operation, ProDispense stores system and performance related information to memory in the form of log files. ProDispense maintains three types of log files: a job log, an event log, and dispense data logs. Follow the [USB Download Procedure, page 42](#), to retrieve log files.

Job Log

The job log file name is 2-JOB.CSV and is stored in the DOWNLOAD folder.

The job log maintains a record of the last 10,000 jobs. At the completion of each job the following data is stored in the log file:

- Date
- Time
- Job ID1, Job ID2, Job ID3
- Job Number
- Recipe
- Material
- Target
- Actual
- Error

Event Log

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

The event log maintains a record of the last 1,000 events. Each event record in the log file contains the date and time the event occurred, the event type, event code, and event description.

System Configurations Setting File

The system configuration settings file name is SETTINGS.TXT and is stored in the DOWNLOAD folder.

A system configuration settings file automatically downloads each time a USB flash drive is inserted. Use this file to back up system settings for future recovery or to easily replicate settings across multiple ProDispense systems. Refer to the [USB Upload Procedure, page 43](#), for instructions on how to use this file.

It is recommended to retrieve the SETTINGS.TXT file after all system settings are set as desired. Store the file for future use as a backup in case the settings are changed and need to be quickly changed back to the desired setup.

NOTE: System settings may not be compatible between different versions of the ProDispense software.

NOTE: Do not modify the contents of this file.

Custom Language File

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

A custom language file automatically downloads each time a USB flash drive is inserted. If desired, use this file to create a user-defined set of custom language strings to be displayed within the ADM.

The ProDispense system is able to display the following Unicode characters. For characters outside of this set, the system will display the Unicode replacement character, which appears as a white question mark inside of a black diamond.

- U+0020 - U+007E (Basic Latin)
- U+00A1 - U+00FF (Latin-1 Supplement)
- U+0100 - U+017F (Latin Extended-A)
- U+0386 - U+03CE (Greek)
- U+0400 - U+045F (Cyrillic)

Create Custom Language Strings

The custom language file is a tab-delimited text file that contains two columns. The first column consists of a list of strings in the language selected at the time of download. The second column can be used to enter the custom language strings. If a custom language was previously installed, this column contains the custom strings. Otherwise the second column is blank.

Modify the second column of the custom language file as needed and then follow the [USB Upload Procedure, page 43](#), to install the file.

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

- The file name must be DISPTEXT.TXT.
- The file format must be a tab-delimited text file using Unicode (UTF-16) character representation.
- The file must contain only two columns, with columns separated by a single tab character.
- Do not add or remove rows in the file.
- Do not change the order of the rows.
- Define a custom string for each row in the second column.

USB Download Procedure

Use the USB port on the ADM to download or upload data.

1. Enable USB downloads.
2. Remove the cover from the USB port on the bottom of the ADM. Insert the USB drive.
3. During the download, USB BUSY appears on the screen.
4. When the download is complete, USB IDLE appears on the screen. The USB drive may then be removed.

NOTE: If the download operation takes longer than 60 seconds, the message disappears. To determine if the USB is busy or idle, check the Error Status bar on the screen. If idle, remove the USB.

5. Insert the USB flash drive into the USB port of the computer.
 6. The USB flash drive window automatically opens. If it does not, open the USB flash drive from within Windows® Explorer.
 7. Open Graco folder.
 8. Open system folder. If downloading data from more than one system, there will be more than one folder. Each folder is labeled with the corresponding serial number of the ADM. (The serial number is on the back of the ADM.)
 9. Open DOWNLOAD folder.
 10. Open LOG FILES folder labeled with the highest number. The highest number indicates the most recent data download.
 11. Open log file. Log files open in Microsoft® Excel® by default if the program is installed. They also can be opened in any text editor or Microsoft® Word.
- NOTE:** All USB logs are saved in Unicode (UTF-16) format. If opening the log file in Microsoft Word, select Unicode encoding.
12. Always reinstall the USB cover after removing the USB, to keep the drive free of dirt and dust.

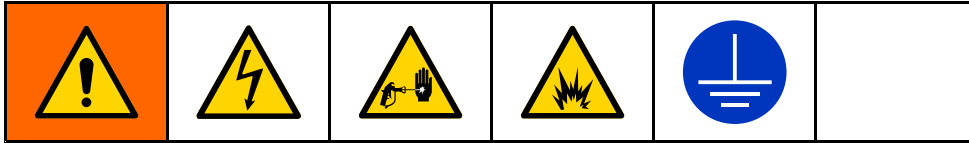
USB Upload Procedure

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

1. If necessary, follow the **USB Download Procedure**, to automatically generate the proper folder structure on the USB flash drive.
2. Insert the USB flash drive into the USB port of the computer.
3. The USB flash drive window automatically opens. If it does not, open the USB flash drive from within Windows Explorer.
4. Open the Graco folder.
5. Open the system folder. If working with more than one system, there will be more than one folder within the Graco folder. Each folder is labeled with the corresponding serial number of the ADM. (The serial number is on the back of the module.)
6. If installing the system configuration settings file, place SETTINGS.TXT file into UPLOAD folder.
7. If installing the custom language file, place DISPTXT.TXT file into UPLOAD folder.
8. Remove the USB flash drive from the computer.
9. Install the USB flash drive into the USB port of the ProDispense system USB port.
10. During the upload, USB BUSY displays on the screen. Wait for USB activity to complete.
11. Remove the USB flash drive from the USB port.

NOTE: If the custom language file was installed, users can now select the new language from the Language drop-down menu in the Advanced Setup Screen 1.

Troubleshooting



NOTE: Check all possible solutions in the chart below before you disassemble the system.

Fluid Panel

| Problem | Cause | Solution |
|----------------------------|---------------------------|--|
| No outlet pressure or flow | Air pressure low | Verify air pressure is above 80 psi (551 kPa, 5.5 bar) |
| High outlet pressure | Supply pump pressure high | Service and adjust supply pressure |
| Air leaks from fluid plate | Loose air connections | Check air connections; tighten if necessary |
| | Worn gaskets | Check/replace gaskets on solenoid valve |

Flow Meter

| Problem | Cause | Solution |
|--|--|--|
| False measurement | Flow meter not calibrated | Calibrate flow meter, Calibrate Screen, page 106 |
| | System not grounded properly | Verify system ground |
| | Noisy power source | Verify clean power supply power to main enclosure |
| Flow reported is not correct or inconsistent | Flow meter not calibrated | Calibrate flow meter, Calibrate Screen, page 106 |
| | Flow meter is worn | Replace flow meter |
| | Material supply pressure is inconsistent | Fix supply system |
| No flow measurement | Flow meter pick-up sensor loose | Tighten flow meter pick-up sensor |
| | Flow too low | Verify flow rate is above minimum for the installed flow meter |
| | Loose wiring | Verify connection from flow meter to FCM |
| | Damaged flow meter pick-up sensor | Replace pick-up sensor |
| | Flow meter stuck, worn, damaged, or contaminated | Service flow meter |

Dispense Valve

| Problem | Cause | Solution |
|-----------------------------------|--|--|
| Valve not opening | Air not getting to the open port | Verify air pressure to solenoid |
| Valve not shutting off | Valve seal is worn and needs seal replacement | Verify air pressure to solenoid |
| | | Verify solenoid operation |
| | | Verify air line routing and connections |
| Sluggish open/close | Air pressure low | Verify air pressure is above 60 psi (410 kPa, 4.1 bar) Replace air filter |
| | Needle/seat worn | Rebuild valve; replace needle/seat |
| | Pressurized material past the valve shut-off is escaping | Reduce running pressure |
| | | Reduce nozzle length |
| | | Increase nozzle orifice size |
| | Faulty solenoid valve | Replace solenoid valve |
| Solenoid valve muffler restricted | Clean or replace muffler | |
| Material leaks from back of valve | Shaft seal worn, shaft is worn, or dirty valve | Rebuild valve; replace seals |
| Air leaks from dispense valve | Loose air connections | Check air connections; tighten if necessary |
| | Worn piston o-ring | Rebuild valve; replace piston o-ring |

Recipe Troubleshooting

| Problem | Cause | Solution |
|-----------------------------------|------------------------------------|---------------------------|
| Fluid number has red background | Fluid is disabled or offline | If required, enable fluid |
| Order number = 99, red background | Order = 0; fluid in recipe mode | |
| | Order = 0; timer selected | |
| | Duplicate entry for selected fluid | |

Gateway Module

| Problem | Cause | Solution |
|------------------|--|--|
| No communication | Incorrect wiring | Check wiring per fieldbus standard. Refer to ProDispense Gateway LED status indicators and Appendix C - Communications Gateway Module, page 115 . |
| | Incorrect fieldbus settings | Confirm fieldbus settings at automation controller (fieldbus master) and ProDispense Gateway (fieldbus slave). Refer to Appendix A – Advanced Display Module (ADM) Operation, page 93 , for information on ProDispense Gateway configuration settings. |
| Incorrect data | Incorrect fieldbus configuration file installed on automation controller (fieldbus master) | Download ProDispense fieldbus configuration file from www.graco.com , and install on automation controller (fieldbus master). |
| | Incorrect map installed on ProDispense Gateway | Confirm correct ProDispense data map is installed on ProDispense Gateway. Refer to Appendix A – Advanced Display Module (ADM) Operation, page 93 for information on how to determine installed data map. If necessary, install a new Gateway data map. |

LED Diagnostic Information

The following LED signals, diagnosis, and solutions apply to the Advanced Display Module, Fluid Control Module, and Gateway module.


| Module Status LED Signal | Diagnosis | Solution |
|---|---|---|
| Green on | System is powered up | - |
| Yellow | Internal communication in progress | - |
| Red solid | Hardware failure | Replace module |
| Red flashing fast | Uploading software | - |
| Red flashing slow | Token error | Remove token and upload software token again. |
| Red flashes three times, pauses, then repeats | Invalid rotary switch position (FCM only) | Change rotary switch position to a valid position then restart the system. See FCM, page 14 . |

Errors

Error codes are stored in the events log and are displayed on the event screen. Gateway error numbers are reported over the Gateway interface.

View Errors

When an error occurs, a flashing error pop-up is displayed that takes up the entire screen until the

error is acknowledged at the ADM by pressing . Errors can also be acknowledged over the gateway. Active errors are displayed in the menu bar.



Except for record errors, which only appear in the events log, all errors are displayed on the Events

screen. Previous errors can be viewed by navigating through the various event screens.

There are three levels of errors; alarms, deviations, and advisories. Alarms cause the system to shut down. Deviations and advisories do not shut down the system.

NOTE:

- Alarms set the fluid panel to standby.
- Advisories and deviations **do not** set the fluid panel to standby.
- Records are informational entries in the events log and do not modify system operation.

Codes and Troubleshooting

When a code is displayed on the lower portion of the screen, it has the 4-character code followed by a dash and another character. The character after the dash indicates the type of error.

- A: Alarm; will generate an audible alarm at the ADM and cause an attached light bar to modify its lighting.
- D: Deviation; will generate an audible alarm at the ADM and cause an attached light bar to modify its lighting.
- V: Advisory; only displayed in the menu bar.
- R: Record; only appears in the events log.

Refer to the table below for error information.

Errors

| Code | Type | Text | Troubleshooting |
|---------------------|-----------|---------------------------------------|---|
| System Nodes | | | |
| CAC0 | ALARM | Communication Error FCM3 0 | Inspect cables for damage on fluid panels 0&1 Software malfunction/replace software |
| CAC1 | ALARM | Communication Error FCM3 1 | Tighten CAN cable fittings for lost communications Software malfunction/replace software |
| CAC2 | ALARM | Communication Error FCM3 2 | |
| CAC3 | ALARM | Communication Error FCM3 3 | |
| CAGX | ALARM | Communication Error CGM | Check cable |
| CAG0 | ALARM | Communication Error MB_TCP 0 | Gateway specific error Check gateway cables Gateway Software or hardware malfunction |
| CAG1 | ALARM | Communication Error MB_TCP 1 | |
| CDC(0-3) | ALARM | Duplicate FCM3 (0-3) | Check rotary switch |
| CD0X | ALARM | Duplicate ADM | Check FCM rotary switches for duplicate settings |
| Fluid Panel | | | |
| WXC(1-8) | ALARM | Hardware Failure Fluid (1-8) | Power down/up module Check all cables Load latest software |
| WKC(1-8) | ALARM | Dispense Valve Failure Fluid (1-8) | Power down/up module Check solenoid cables Disconnect solenoid to identify if it is causing the alarm Replace FCM |
| WFC(1-8) | ALARM | Flow Meter Failure Fluid (1-8) | Power down/up module Check flow meter cables Disconnect flow meter to identify if it is causing the alarm |
| WHC(1-8) | ALARM | Regulator Failure Fluid 1 | N/A |
| EJD(1-8) | DEVIATION | Timeout Dispense Fluid (1-8) | Increase fluid flow or increase dispense timeout Replace FCM |
| F8D(1-8) | ALARM | Flow Not Detected Fluid (1-8) | Check fluid flow from supply Check solenoid wires and functionality Confirm meter sensor functionality Clean or replace dirty or stuck meter |
| B9D(1-8) | DEVIATION | Volume Dispense Tolerance Fluid (1-8) | Reduce flow Increase dispense tolerance |
| B7D(1-8) | ALARM | Dispense Leak Detected Fluid (1-8) | Follow the dispense tolerance guidelines for flow rates and dispense size recommendations |
| B91(1-8) | RECORD | Volume Rollover Job Fluid (1-8) | Maximum totalizer volume exceeded |
| B9A(1-8) | RECORD | Volume Rollover Grand Fluid (1-8) | |
| USB | | | |
| EAUX | ADVISORY | USB Busy | System uploading/downloading files. Do not unplug USB drive. |
| EBUX | RECORD | USB Drive Removed | — |
| EQU1 | RECORD | System Settings Downloaded | — |
| EQU2 | RECORD | System Settings Uploaded | — |
| EQU3 | RECORD | Custom Lang. Downloaded | — |
| EQU4 | RECORD | Custom Language Uploaded | — |
| EQU5 | RECORD | Logs Downloaded | — |
| EVUX | ADVISORY | USB Disabled | Enable USB download/upload in Advanced Settings to use USB port |
| WXUD | DEVIATION | USB Upload Error | Check/replace USB drive Verify content of upload files USB drive may not be compatible with system |
| WXUU | DEVIATION | USB Download Error | Check/replace USB drive USB drive may not be compatible with system |

| Code | Type | Text | Troubleshooting |
|--------------------|----------|------------------------------------|--|
| EQU0 | ADVISORY | USB Idle | Safe to remove USB drive |
| MMUX | ADVISORY | Maintenance USB Logs Full | ADM memory/storage full |
| WSUX | ADVISORY | USB Configuration Error | Check/replace USB drive Check upload files Re-install software |
| General | | | |
| WX00 | ALARM | Software Errors | Cycle power to cause software reboot |
| CA0X | ALARM | Communication Error ADM | Check communication cables Power, but no communication with ADM |
| EB00 | RECORD | Stop Button Pressed | Stop button on ADM was pressed |
| ES00 | ALARM | Factory Defaults | System reset to factory defaults |
| EC00 | RECORD | Setup Value Changed | System setup was changed |
| EM00 | RECORD | Power Off | Main power supply was interrupted |
| EL00 | RECORD | Power On | Main power supply was restored |
| Maintenance | | | |
| MED (1-8) | ADVISORY | Maintenance Valve Fluid (1-8) | Maintenance due – Check the valve – Perform required valve maintenance – Reset valve maintenance on the Maintenance screen |
| MFD (1-8) | ADVISORY | Maintenance Meter Flow Fluid (1-8) | Maintenance due – Check the flow meter – Perform required meter maintenance – Reset meter maintenance on the Maintenance screen |
| MGD (1-8) | ADVISORY | Maintenance Filter Fluid (1-8) | Maintenance due – Check filter – Clean/replace filter element – Reset filter maintenance on the Maintenance screen |
| Calibration | | | |
| END (1-8) | RECORD | Calibration Flow Meter Fluid (1-8) | Meter calibration complete |
| Dispense | | | |
| B9DX | ALARM | Volume Dispense Tolerance Job | Recipe dispense has been interrupted check recipe for failure point in dispense process. |

Maintenance

Preventive Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

The recommended maintenance procedures and frequencies to operate the equipment are shown below. The maintenance is divided between mechanical and electrical tasks. Maintenance must be performed by trained personnel per this schedule.

| Task | Operator | Maintenance Person | | | | |
|-------------------------------------|----------|--------------------|---------|------------------------------------|---|--|
| | Daily | Weekly | Monthly | 3-6 months or 125,000 cycles | 18-24 months or 500,000 cycles | 36-48 months or 1,000,000 cycles |
| Mechanical | | | | | | |
| Inspect system for leaks | ✓ | | | | | |
| Depressurize fluid, after operation | ✓ | | | | | |
| Inspect air filter bowls and drain | | ✓ | | | | |
| Check hoses for wear | | ✓ | | | | |
| Check/tighten fluid connections | | ✓ | | | | |
| Check/tighten air connections | | ✓ | | | | |
| Lubricate dispense valves* | | | ✓ | | | |
| Rebuild dispense valve* | | | | ✓ | | |
| Replace air filter | | | | | ✓ | |
| Replace Solenoid | | | | | | ✓ |
| Electrical | | | | | | |
| Check cables for wear | | ✓ | | | | |
| Verify cable connections | | ✓ | | | | |

* Check component manual for more detailed maintenance information.

Flushing

Flush before changing fluids, before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment. To perform this operation, see [Purging Fluid Lines, page 36](#).

Cleaning the ADM

Use any alcohol-based household cleaner, such as glass cleaner, to clean the ADM.

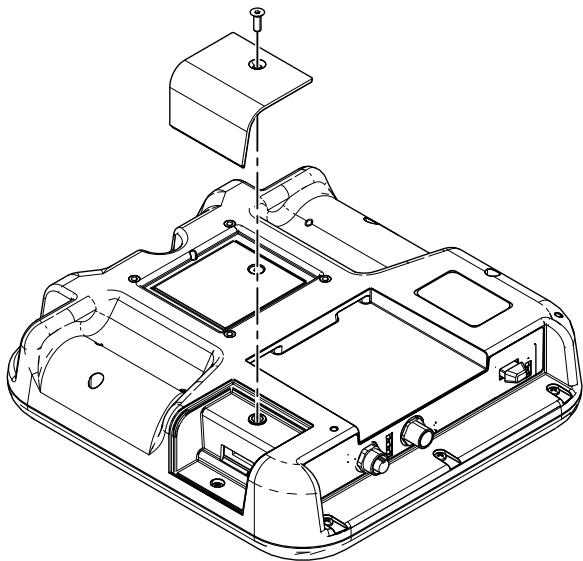
Software Installation and Update

Update ADM, FCMs, and CGM

Back up the system configuration and custom language file (if installed) before updating software. See [USB Data, page 41](#) for more information.

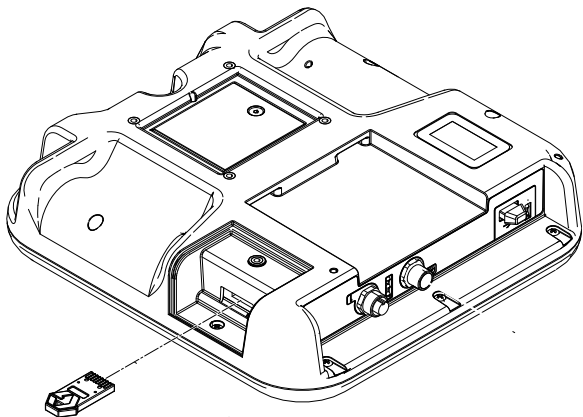
NOTE: This procedure will update the software version on the ADM, followed by update of recognized FCMs and CGM (if installed). This update is performed over the CAN connections with those devices. If a new or replacement FCM is installed in the system, it will require separate software installation using the token that was provided with it.

1. At the control panel, turn off power to the system.
2. Remove the token access panel.



ti21699a

3. Insert and press software token firmly into slot.
NOTE: There is no preferred orientation of token.



4. Turn on power to the system. The red indicator light next to the USB port will flash until new software is completely loaded.
5. After the red indicator light shuts off, turn off power to the system.
6. Remove software token.
7. Replace token access panel.

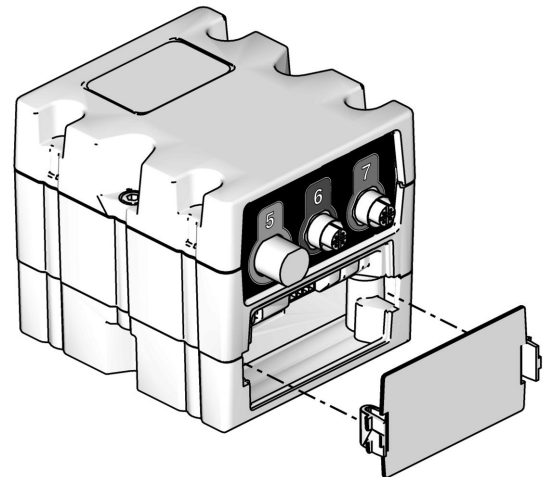
Load FCM Software

NOTE: The FCM connection is temporarily disabled during the use of the software token.

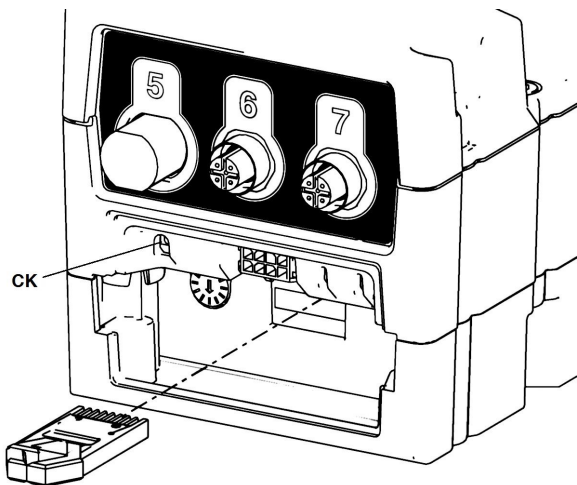
Except for the control panel FCM, which has software loaded at the factory, this procedure must be performed at each FCM installed in the system at the time they are first placed into use. If any FCM has not had the operation software installed or if it differs in version from the ADM, it will not function during system operation.

NOTE: Ensure that the FCM CAN cable is attached to the system. Without connection, the FCM will have no power.

1. Turn off power to the system.
2. Remove access cover.



3. Insert and press software token firmly into slot.
NOTE: There is no preferred orientation of token.



4. Turn on power to the system. The red indicator light (CK) will flash until new software is completely loaded.
5. After the red indicator light shuts off, turn off power to the system.
6. Remove software token.
7. Replace access cover.

NOTE: Loading the software on the token may install a more recent version than is currently installed in the system. If this is the case, use the software update using the ADM to update all other system components to this newer version software. Refer to [Update ADM, FCMs, and CGM, page 51](#).

Upgrade CGM

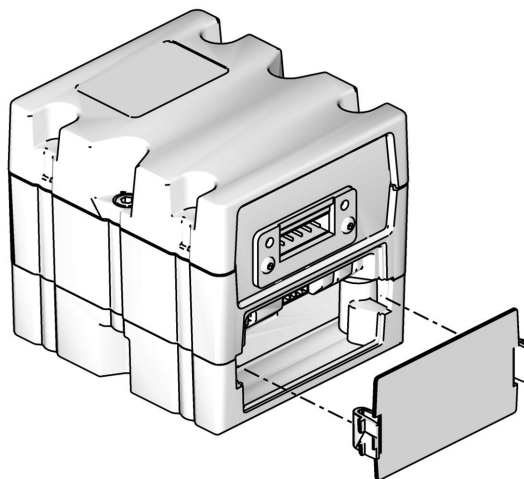
Upgrading a CGM involves two updates. First, update the software from the ADM and then update the Fieldbus Map.

Update Fieldbus Map

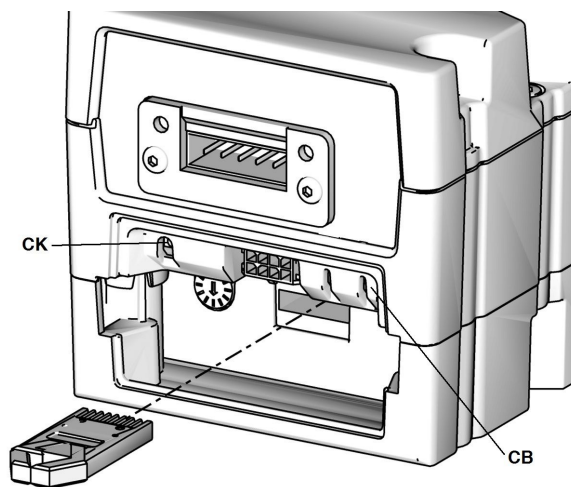
NOTE: The fieldbus connection is temporarily disabled during the use of a map token. The following instructions apply to all Gateway modules.

1. Perform the software update before performing this procedure. See [Update ADM, FCMs, and CGM, page 51](#).

2. Remove the access cover.

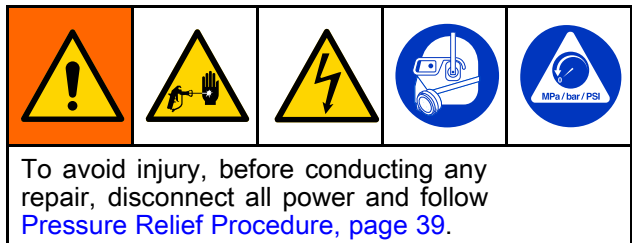


3. Insert and press map token firmly into slot. This is a different token than the one containing the software update.
NOTE: There is no preferred orientation of token.
4. Press and hold the push button (CB) for three seconds and then release. The red indicator light (CK) will flash twice, pause, and then once after the data map is uploaded.



5. Remove map token when software has successfully uploaded.
6. Replace access cover.

Repair

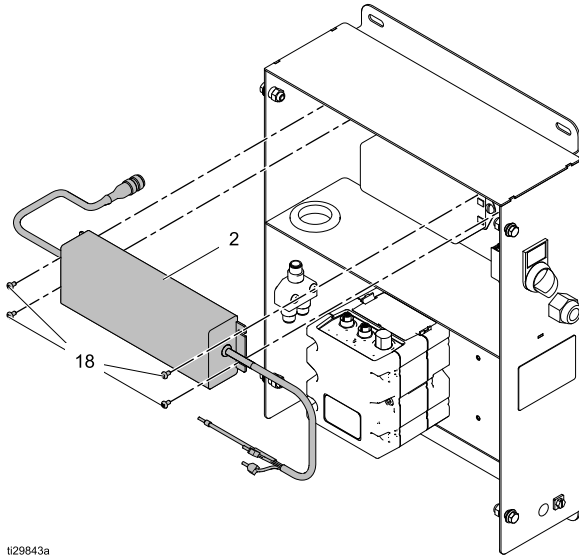


Replace ADM

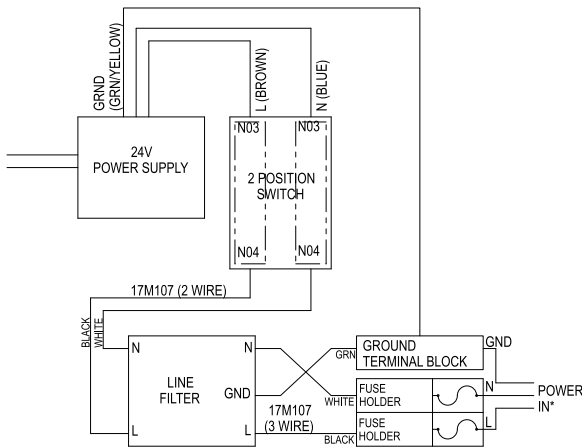
If ADM functionality allows, prior to replacing the ADM, Graco recommends downloading the configuration and system settings for upload into the new ADM. See [USB Download Procedure, page 42](#).

1. If ADM functionality allows, perform [Shutdown, page 39](#).
2. Turn off the control panel power switch.
3. Disconnect all cables attached to the ADM.
4. Remove the ADM from the mounting bracket.
5. If not already installed in new ADM, install the battery.
6. Connect cables removed in step 3 to the new ADM.
7. Turn on the control panel power switch.
8. Upload all system configuration and system settings into the new ADM. See [USB Upload Procedure, page 43](#).
9. Navigate to the Advanced Screen 4 and observe the software version for the ADM matches all other installed modules. If the ADM has a newer version software, all other modules will need to be updated to the same version as the ADM. See [Update ADM, FCMs, and CGM, page 51](#) to bring all modules to the same version.
10. If desired, return the ADM to the mounting bracket.

Replace Control Panel Power Supply



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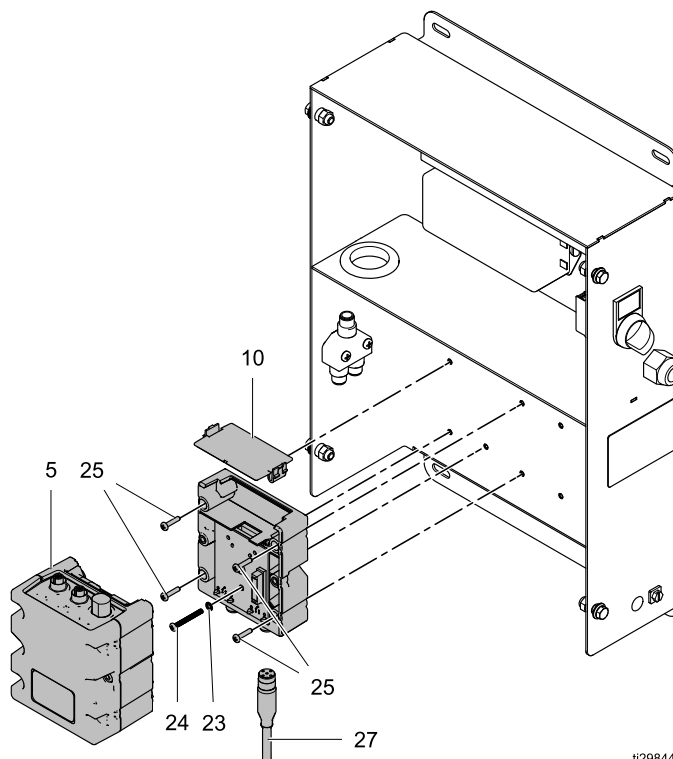
1. Turn off the control panel power switch and disconnect the input power to the switch by disconnecting from the power source or turn off the circuit breaker for this system.
NOTE: To enable removing the cover without needing to remove things attached to it, the cover can be moved so that the 2 mounting slots on the right side of the cover attach to the 2 mounting screws on the left side of the control panel assembly.
2. Loosen the 4 cover attachment screws and remove the cover.
NOTE: Remove wire ties as necessary from tie-down points.
3. Disconnect the power supply output cable from the CAN splitter.
4. Disconnect the power supply wires from the ground bus and power switch.
5. Remove the 4 screws (18) and remove the power supply from the control panel assembly.
6. Install the new power supply by performing steps 1 - 5 in reverse order.
NOTE: Wire zip ties must be supplied by customer.
7. Restore input power to the control panel assembly.

Replace Control Panel FCM

This procedure will require shutting down the entire system. Ensure all processes have been placed into a condition that will allow the shutdown without affecting a dispense activity.

This procedure will work for any FCM installed in the control panel.

NOTE: If you have 2 fluid panels attached to this FCM, ensure that you mark the 4 cables attached to connectors 1–4 for easy identification during the connection to the new FCM.



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1. Turn off the control panel power switch.
2. Disconnect all cables from the bottom of the ADM.
3. Loosen the 4 control panel front cover screws. Remove the cover and set aside.
4. Remove all cables attached to the FCM.

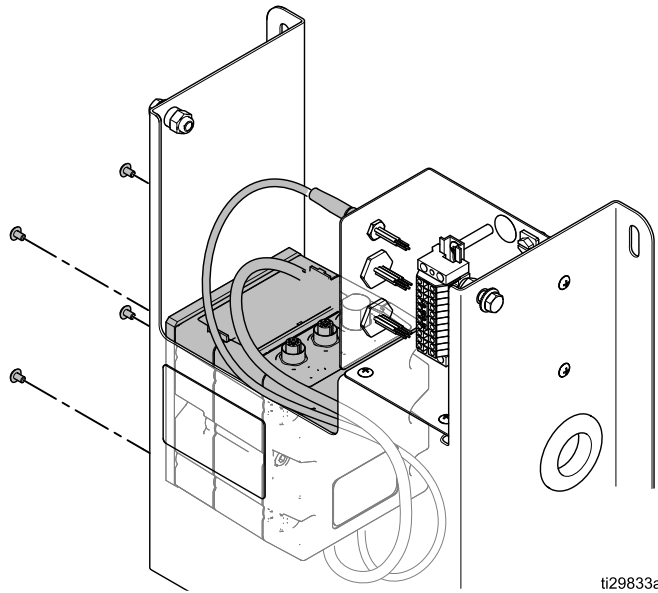
NOTE: If a termination resistor is attached to a CAN connection on the FCM, remove it and retain for installation on the new FCM.
5. Remove the two screws half way up each side of the FCM and unplug the center section from the FCM base.
6. Loosen the ground screw (24) so that it isn't contacting the back of the control panel
7. Remove the 4 base mounting screws and remove the FCM base.
8. Set the new FCM rotary switch to the same setting as the FCM being removed.
9. Perform the removal steps in reverse order to install the replacement.

Replace Fluid Panel FCM

This procedure will require shutting down the entire system. Ensure all processes have been placed into a condition that will allow the shutdown without affecting a dispense activity.

This procedure will work for any FCM installed in a fluid panel.

NOTE: If you have 2 fluid panels attached to this FCM, ensure that you mark the 4 cables attached to connectors 1–4 for easy identification during the connection to the new FCM.



NOTE: Prior to beginning this operation, prepare the replacement by mounting it on the provided mounting plate.

1. Turn off the control panel power switch.
2. Remove all cables attached to the FCM.

NOTE: If a termination resistor is attached to a CAN connection on the FCM, remove it and retain for installation on the new FCM.

3. Remove the 4 screws attaching the FCM mounting plate to the fluid panel.

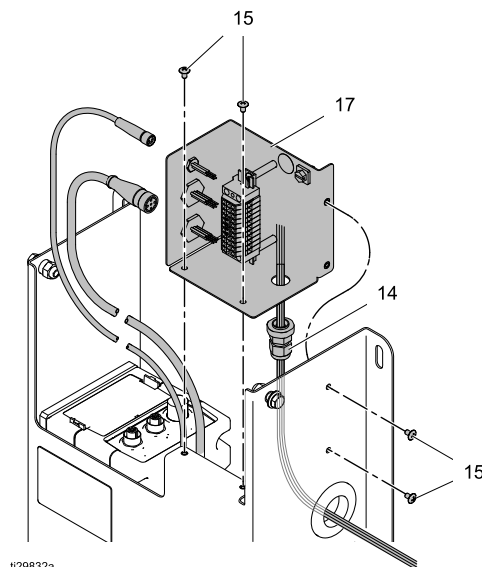
4. Set the new FCM rotary switch to the same setting as the FCM being removed.

NOTE: The new FCM must have software installed prior to use. If necessary, connect CAN cables from the FCM being replaced and power up the system long enough to load software in the FCM. For instruction on loading the FCM software, see [Load FCM Software, page 51](#). After the FCM software has been installed, power down the system and complete this procedure.

5. Perform the removal steps in reverse order to install the replacement.

Replace Fluid Panel Junction Box

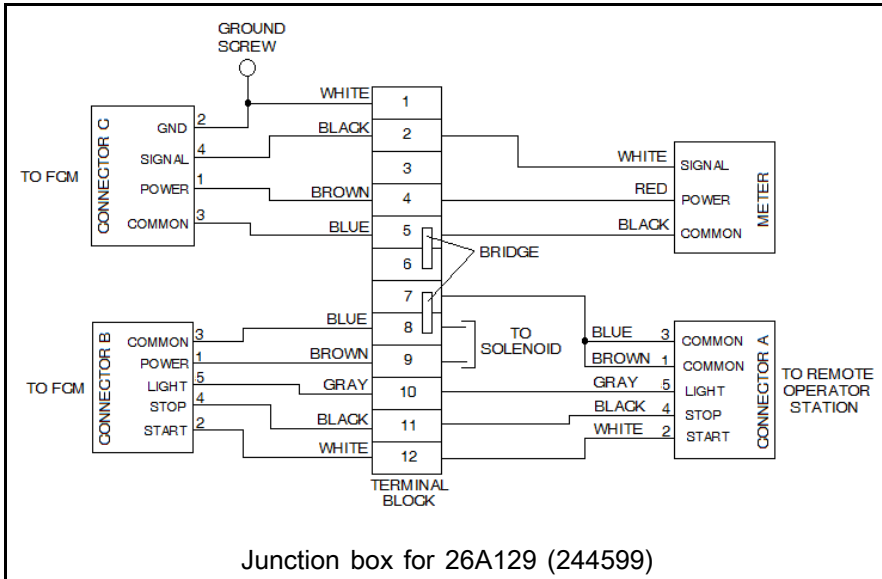
NOTE: Replacing the junction box from a single fluid panel will require shutting down the entire system. Before performing this repair, ensure that all other processes have been completed or can be shut down.



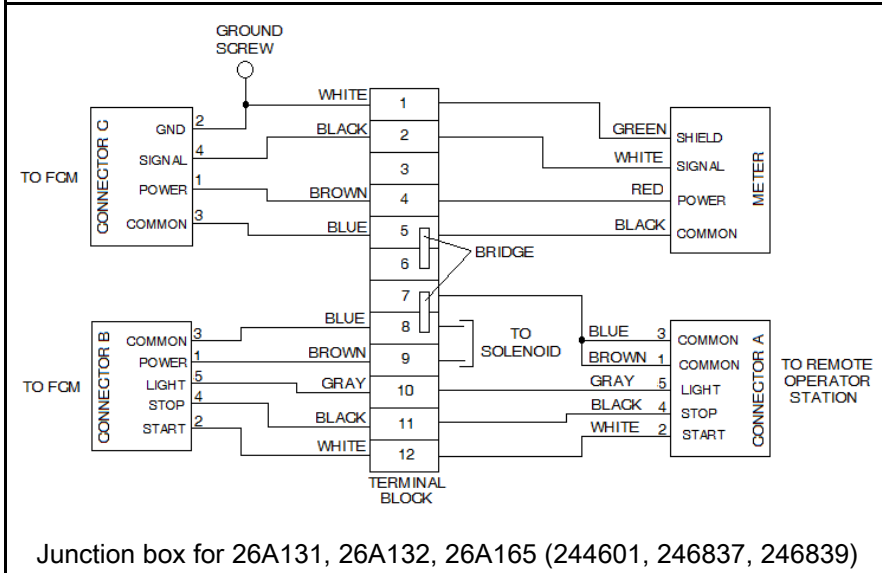
NOTE: Remote Operator Station cable not shown. If present, it is attached to connector B of the Junction Box.

1. Turn off the control panel power switch.
2. Disconnect all cable connectors from the left side of the junction box (17). There will be 2 or 3 cables present, depending on whether a remote operator station is present for this fluid panel.
3. Remove the 4 screws (15) which attach the junction box to the fluid panel. Retain screws for re-use.
NOTE: The meter and solenoid wires enter the junction box through the strain relief (14) at the bottom right of the junction box. Verify that the existing junction box terminal wiring is documented before removing wires from terminal strip.
4. Remove the meter and solenoid wires from the terminal strip.
NOTE: Your meter may have resistors or diodes attached to the meter wiring at the terminal strip. Ensure that these components are not damaged during the replacement process.
5. Loosen strain relief and remove meter and solenoid wires.
6. Loosen the strain relief on the new junction box and insert the meter and solenoid wires.
7. Connect the meter and solenoid wires to the appropriate terminal block connections. Refer to the schematics and any notes made prior to wire disconnection in step 4. Do not overtighten terminal block screws.
8. Position meter and solenoid wires within the strain relief so that strain is not present and tighten the strain relief to hold the wires in position. Do not overtighten the strain relief.
9. Position the junction box and attach to the fluid panel using the four screws (15).
10. Reconnect the 2 (or 3) cables to the left side of the junction box.

Schematics of meter and solenoid wiring for fluid panels.



Junction box for 26A129 (244599)



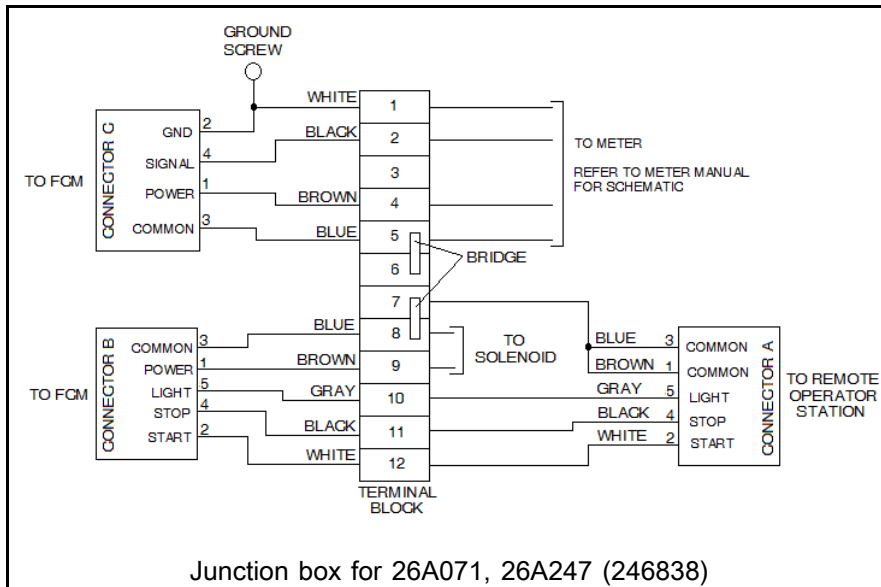
Junction box for 26A131, 26A132, 26A165 (244601, 246837, 246839)

Junction box 244660 is mounted on the outside of fluid panels 244599, 244600, 244601, 246837, 244838, and 246839. These fluid panels were used with controller 244561.

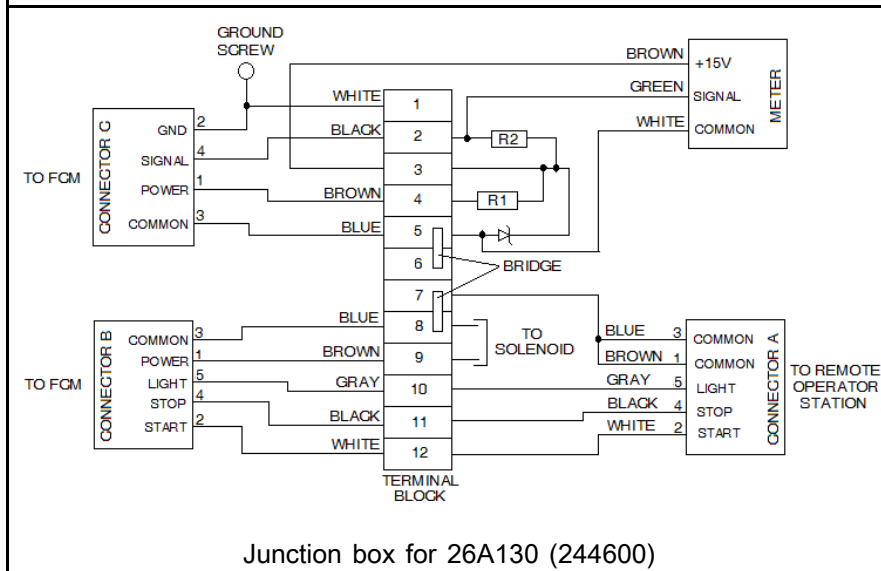
Upgrading fluid panel junction box 244660 on each desired fluid panel with junction box upgrade kit 26A243 will allow that fluid panel to be connected to controller 26A070 via an FCM.

NOTE: Before connecting any of these older panels to the 26A070 control panel, review the power usage currently consumed by the current configuration. The relationship between the old fluid panels and the new fluid panels can be seen in the schematics. Use the values for the new fluid panels to determine the approximate values which will apply in calculating power consumption for the older panels. See [Appendix B - System Design, page 114](#).

Schematics of meter and solenoid wiring for fluid panels.



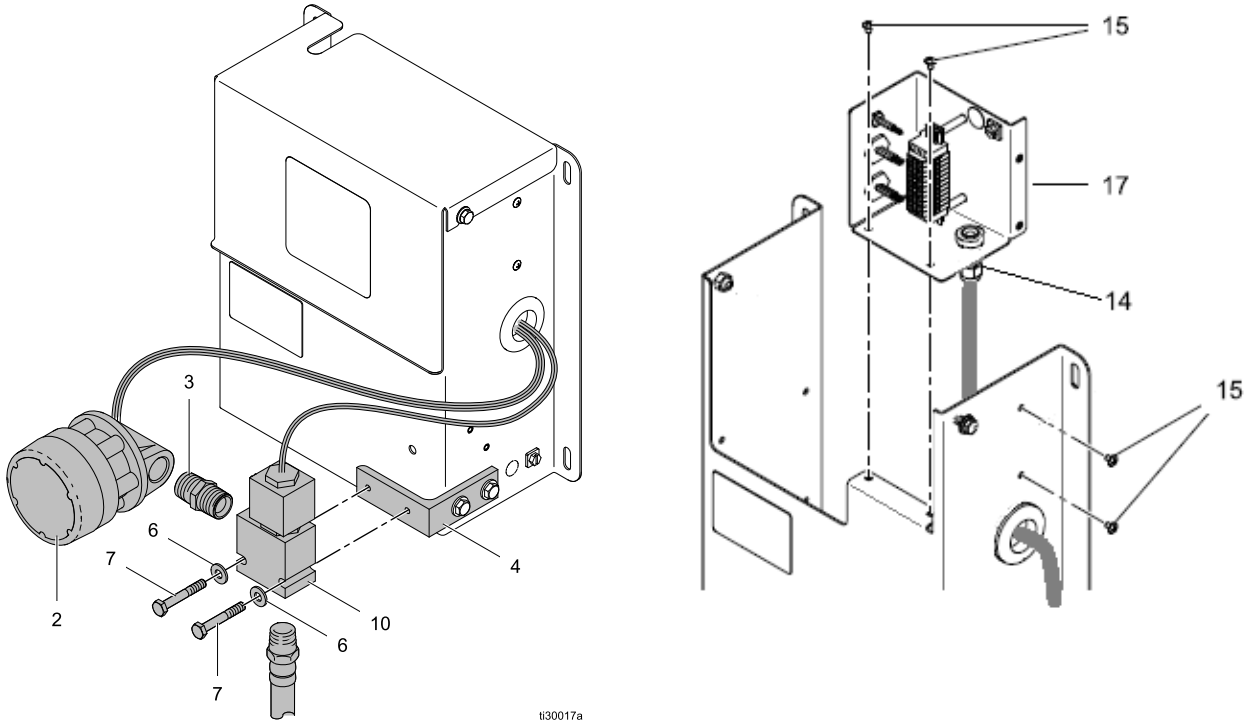
Junction box for 26A071, 26A247 (246838)



Junction box for 26A130 (244600)

Servicing Fluid Panel 26A129

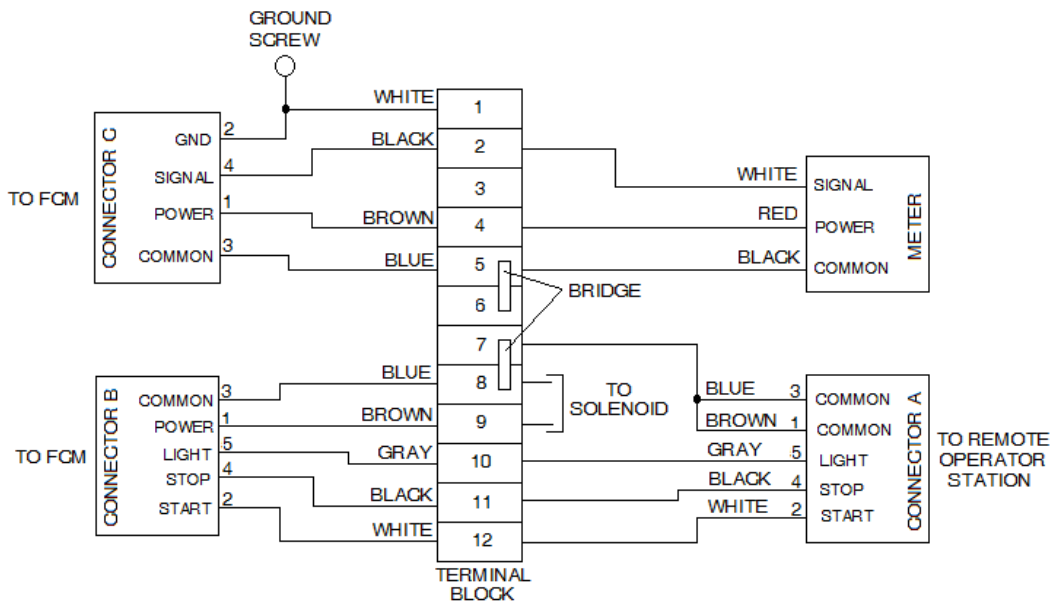
NOTE: Servicing the fluid panel will require shutting down the entire system. Before performing this repair, ensure that all other processes have been completed or can be shut down.



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Fluid panel 26A130 junction box schematic:

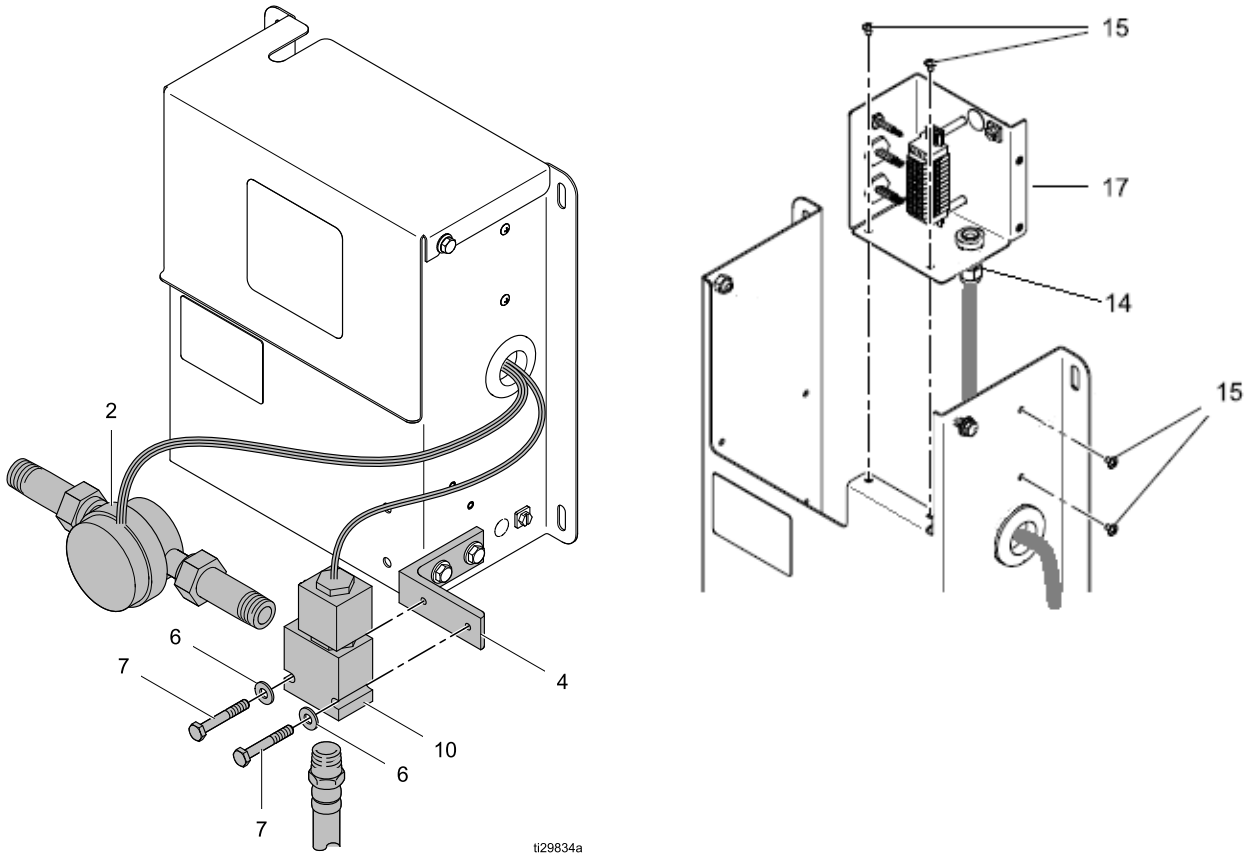
NOTE: The schematic below also represents how to wire the solenoid and meter into the 26A243 junction box upgrade on a 244599 fluid panel.



1. Purge the supply line. See [Purging Fluid Lines, page 36](#).
2. Perform [Pressure Relief Procedure, page 39](#).
3. Turn off control panel power switch.
4. Remove the fluid panel top cover.
5. At the junction box, disconnect the meter leads and if the solenoid is being replaced, disconnect the solenoid leads.
NOTE: Loosening the strain relief (14) may require removing screws (15) so that the junction box can be moved.
6. Loosen the strain relief and remove the wiring for the meter from the fluid panel. If the solenoid is being replaced, remove the solenoid wiring from the strain relief and fluid panel.
7. Disconnect the fluid supply line fitting on the inlet (left side) of the meter.
8. **If replacing the meter (2):**
 - a. Disconnect the meter from the fitting on the outlet side of the meter.
NOTE: Apply thread tape to fitting threads.
 - b. Attach the replacement meter to the solenoid valve fitting.
 - c. Attach the fluid supply line to the meter inlet.
 - d. Proceed to step 10.
9. **If replacing the solenoid valve (10):**
 - a. Disconnect the fluid line at the bottom of the solenoid valve.
 - b. Loosen screws (7). Remove one of the screws. Remove the solenoid valve and meter.
 - c. In a vice, gently clamp the solenoid valve. Remove the fitting from the inlet to the solenoid valve.
NOTE: Wrap thread tape on the fluid line fittings on the solenoid valve.
 - d. Place the new solenoid valve in the vice and install the fluid line fitting on the meter into the solenoid valve.
 - e. Install the solenoid valve on the fluid panel mounting bracket using screws (7) and washers (6).
 - f. Attach the meter fluid supply line fitting to the meter inlet.
 - g. Attach the fluid line fitting to the bottom of the solenoid valve.
10. Route all removed wiring through the access hole on the side of the fluid panel and the junction box strain relief (14).
11. Refer to the schematic for the fluid panel junction box and attach all meter and solenoid wiring.
12. Position all wires passing through the junction box strain relief so that the terminal block connections are not under strain and tighten the strain relief. Do not overtighten.
13. If necessary, reattach the junction box to the fluid panel.
14. Attach the fluid panel top cover.
15. At the control panel, turn on the power.
16. Under low pressure, load the fluid line and monitor for leaks at all fittings on the fluid panel. Tighten fittings as needed. If necessary, refer to [Loading Fluid Lines, page 36](#).
17. If necessary, calibrate the fluid panel.

Servicing Fluid Panel 26A130

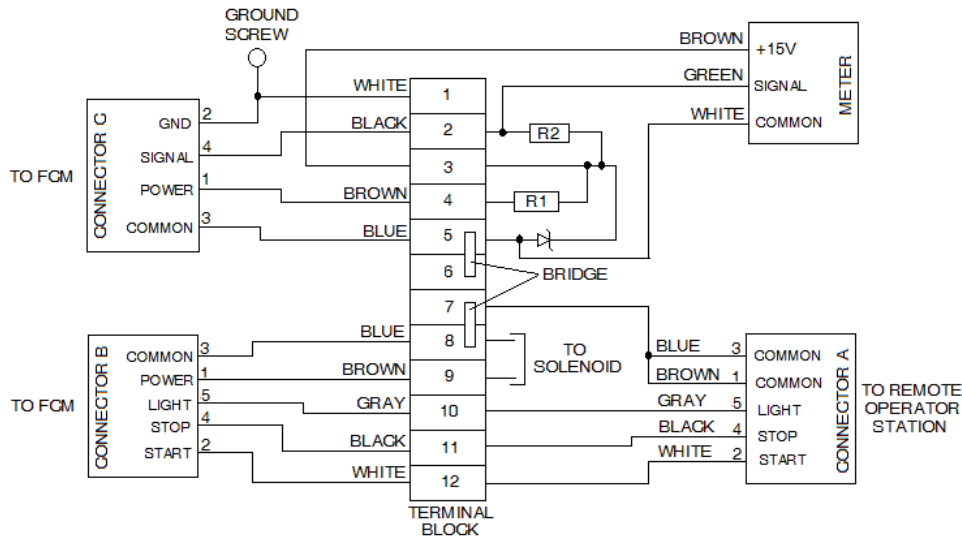
NOTE: Servicing the fluid panel will require shutting down the entire system. Before performing this repair, ensure that all other processes have been completed or can be shut down.



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Fluid panel 26A130 junction box schematic:

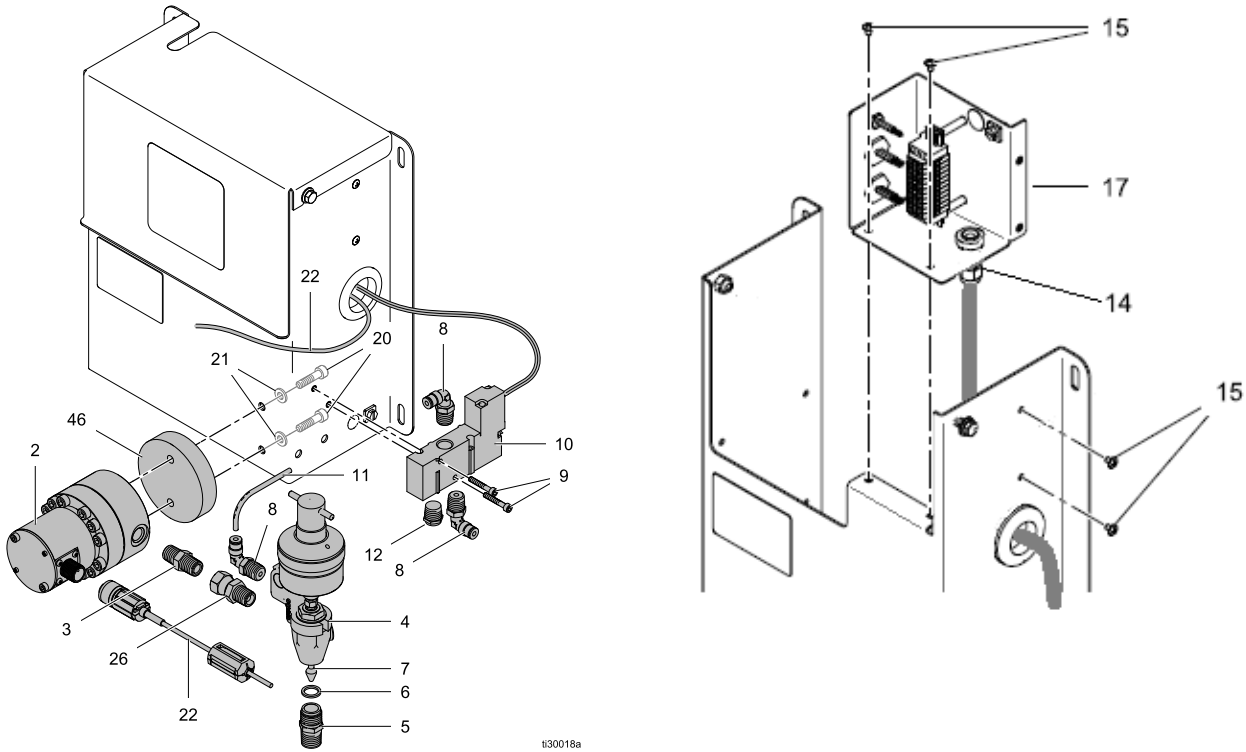
NOTE: The schematic below also represents how to wire the solenoid and meter into the 26A243 junction box upgrade on a 244600 fluid panel.



1. Purge the supply line. See [Purging Fluid Lines, page 36](#).
2. Perform [Pressure Relief Procedure, page 39](#).
3. Turn off control panel power switch.
4. Remove the fluid panel top cover.
5. At the junction box, disconnect the meter leads and if the solenoid is being replaced, disconnect the solenoid leads.
NOTE: Loosening the strain relief (14) may require removing screws (15) so that the junction box can be moved.
NOTE: The diode and resistors attached to the meter leads must be handled carefully to prevent damage while passing through the strain relief.
6. Loosen the strain relief and remove the wiring for the meter from the fluid panel. If the solenoid is being replaced, remove the solenoid wiring from the strain relief and fluid panel.
7. **If replacing the meter (2):**
 - a. Disconnect the fluid supply line fitting on the inlet (left side) of the meter.
 - b. Disconnect the fitting on the outlet side of the meter.
 - c. On the replacement meter, disconnect the fittings on both sides.
NOTE: The fluid inlet side of the meter contains a screen which can be cleaned. When installing the meter, observe the flow direction arrows on the meter body.
 - d. Connect the meter to both fittings from steps a and b above.
 - e. Proceed to step 9.
8. **If replacing the solenoid valve (10):**
 - a. Disconnect the fluid line at the bottom of the solenoid valve.
 - b. Disconnect the fitting on the outlet side of the meter and set the meter aside.
 - c. Loosen screws (7). Remove one of the screws. Remove the solenoid valve.
 - d. In a vice, gently clamp the solenoid valve. Disconnect the fluid line from the solenoid valve.
NOTE: Wrap thread tape on the fluid line fittings on the solenoid valve.
 - e. Place the new solenoid valve in the vice and install the fluid line into the solenoid valve.
 - f. Install the solenoid valve on the fluid panel mounting bracket using screws (7) and washers (6).
 - g. Attach the meter outlet fitting to the solenoid valve.
 - h. Attach the fluid line fitting to the bottom of the solenoid valve.
9. Route all removed wiring through the access hole on the side of the fluid panel and the junction box strain relief (14).
10. Refer to the schematic for the fluid panel junction box and attach all meter and solenoid wiring.
11. Position all wires passing through the junction box strain relief so that the terminal block connections are not under strain and tighten the strain relief. Do not overtighten.
12. If necessary, reattach the junction box to the fluid panel.
13. Attach the fluid panel top cover.
14. At the control panel, turn on the power.
15. Under low pressure, load the fluid line and monitor for leaks at all fittings on the fluid panel. Tighten fittings as needed. If necessary, refer to [Loading Fluid Lines, page 36](#).
16. If necessary, calibrate the fluid panel.

Servicing Fluid Panel 26A131 or 26A165

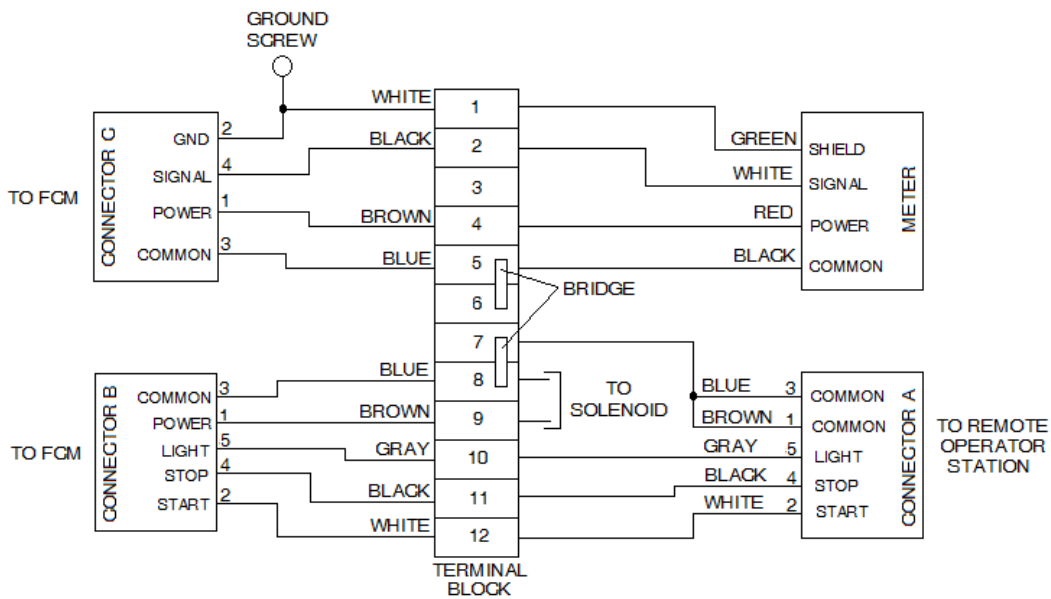
NOTE: Servicing the fluid panel will require shutting down the entire system. Before performing this repair, ensure that all other processes have been completed or can be shut down.



Fluid panel 26A131 shown

Fluid panel junction box schematic:

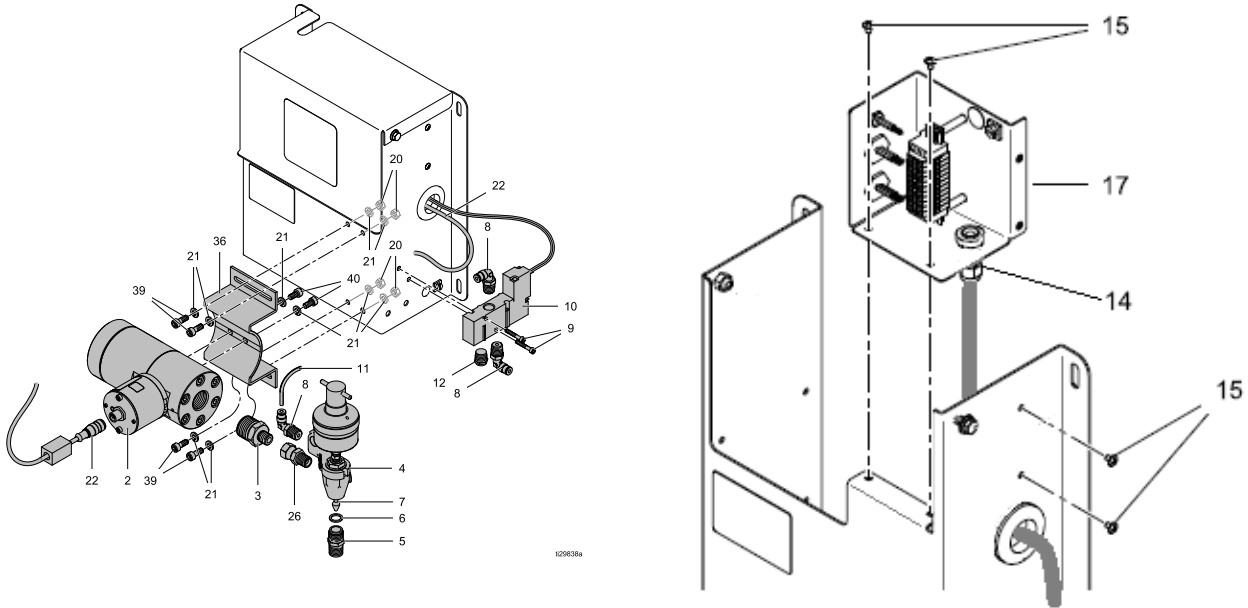
NOTE: The schematic below also represents how to wire the solenoid and meter into the 26A243 junction box upgrade on a 244601 or 246837 fluid panel.



1. Purge the supply line. See [Purging Fluid Lines, page 36](#).
2. Perform [Pressure Relief Procedure, page 39](#).
3. Turn off control panel power switch.
4. Remove the fluid panel top cover.
5. At the junction box, if the meter or dispense valve are being replaced, disconnect the meter leads and if the solenoid is being replaced, disconnect the solenoid leads.
NOTE: Loosening the strain relief (14) may require removing screws (15) so that the junction box can be moved.
6. Loosen the strain relief and remove the wiring for the meter from the fluid panel. If the solenoid is being replaced, remove the solenoid wiring from the strain relief and fluid panel.
NOTE: Remove fittings from old components and reinstall in new components as needed.
7. **If replacing the meter (2):**
 - a. Disconnect the fluid supply line fitting on the inlet (left side) of the meter.
 - b. Disconnect the air line from the solenoid air valve to the dispense valve.
 - c. If necessary, disconnect the fluid supply line on the outlet of the dispense valve.
 - d. Remove screws (20) and washers (21) and remove the meter and dispense valve assembly.
 - e. Place a wrench on the fitting (5) and disconnect the meter.
NOTE: Observe any flow direction arrow on the meter when installing. Use thread tape on supply line fittings.
 - f. Perform steps a-e above in reverse order to install the meter.
 - g. Proceed to step 10.
8. **If replacing the dispense valve:**
 - a. Perform steps 7.a - 7.d.
 - b. Place a wrench on the fitting (26) and disconnect the dispense valve.
NOTE: Use thread tape on supply line fittings.
 - c. Attach fitting (26) to the dispense valve.
 - d. Perform steps 7.a. - 7.d. in reverse order to install the meter and dispense valve.
 - e. Proceed to step 10.
9. **If replacing the solenoid and air valve (10):**
 - a. Shut off and bleed the air supply to the solenoid air valve.
 - b. Disconnect the inlet and outlet air lines at the solenoid air valve.
 - c. Remove screws (9) and remove the solenoid air valve.
 - d. Using screws (9), install the new solenoid air valve.
 - e. Attach the air lines to the solenoid air valve.
10. Route all removed wiring through the access hole on the side of the fluid panel and the junction box strain relief (14).
11. Refer to the schematic for the fluid panel junction box and attach all meter and solenoid wiring.
12. Position all wires passing through the junction box strain relief so that the terminal block connections are not under strain and tighten the strain relief. Do not overtighten.
13. If necessary, reattach the junction box to the fluid panel.
14. Attach the fluid panel top cover.
15. At the control panel, turn on the power.
16. Pressurize the air supply line and check for leaks.
17. If the fluid supply line was disconnected, under low pressure, load the fluid line and monitor for leaks at all fittings on the fluid panel. Tighten fittings as needed. If necessary, refer to [Loading Fluid Lines, page 36](#).
18. If necessary, calibrate the fluid panel.

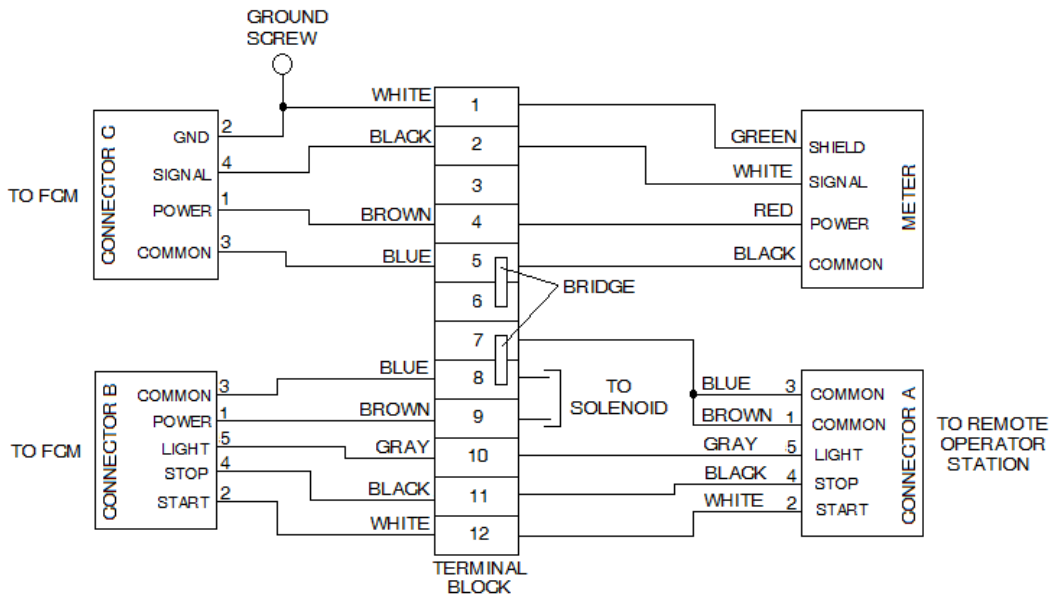
Servicing Fluid Panel 26A132

NOTE: Servicing the fluid panel will require shutting down the entire system. Before performing this repair, ensure that all other processes have been completed or can be shut down.



Fluid panel 26A132 junction box schematic:

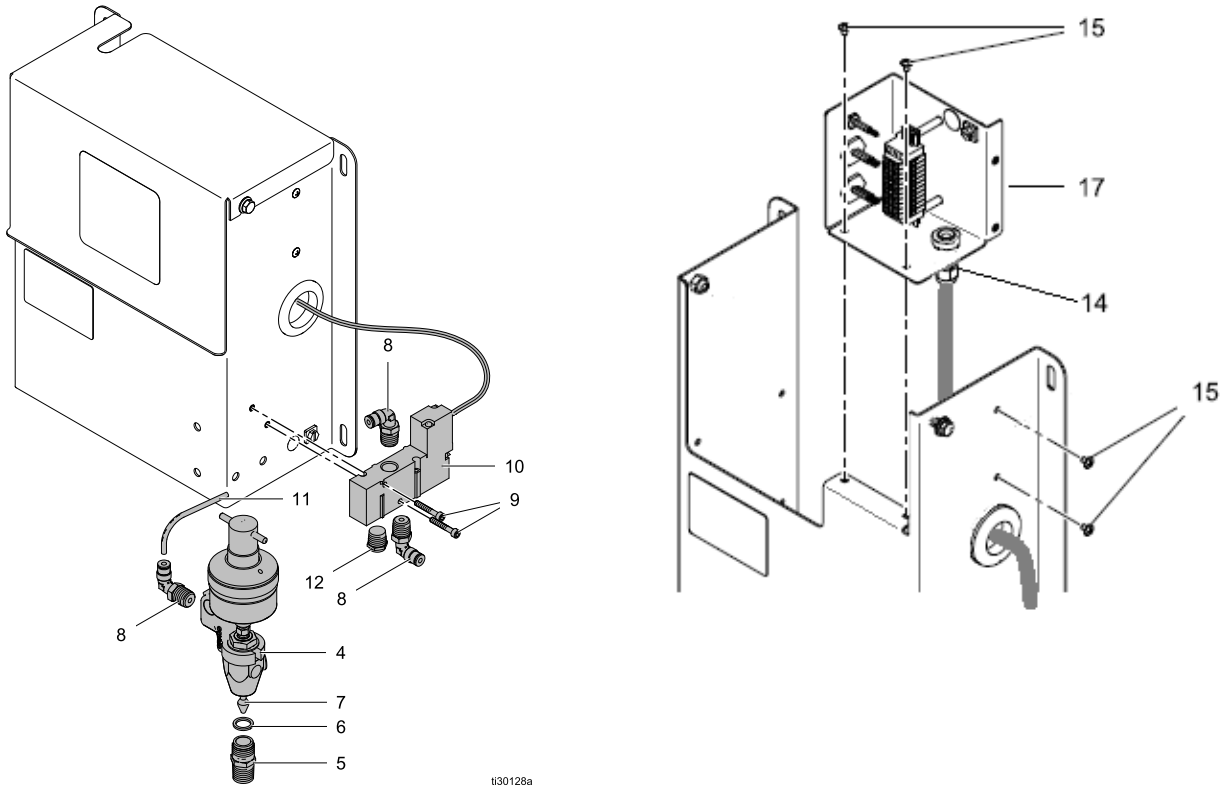
NOTE: The schematic below also represents how to wire the solenoid and meter into the 26A243 junction box upgrade on a 246839 fluid panel.



1. Purge the supply line. See [Purging Fluid Lines, page 36](#).
2. If necessary, perform [Pressure Relief Procedure, page 39](#).
3. Turn off control panel power switch.
NOTE: If not replacing the solenoid air valve, skip steps 4 - 6.
4. Remove the fluid panel top cover.
5. At the junction box, if the solenoid is being replaced, disconnect the solenoid leads.
NOTE: Loosening the strain relief (14) may require removing screws (15) so that the junction box can be moved.
6. Loosen the strain relief and remove the wiring for the meter from the fluid panel. If the solenoid is being replaced, remove the solenoid wiring from the strain relief and fluid panel.
NOTE: Remove fittings from old components and reinstall in new components as needed.
7. **If replacing the meter (2):**
 - a. At the meter, disconnect the meter cable.
 - b. Disconnect the fluid supply line fitting on the inlet (left side) of the meter.
 - c. Disconnect the air line from the solenoid air valve to the dispense valve.
 - d. If necessary, disconnect the fluid supply line on the outlet of the dispense valve.
 - e. Remove screws, washers, and nuts (20, 21, 37) and remove the meter, meter bracket, and dispense valve assembly.
 - f. Move the meter bracket to the new meter.
 - g. Place a wrench on the fitting (3) and disconnect the meter.
NOTE: Use thread tape on supply line fittings.
 - h. Perform steps a-e above in reverse order to install the meter.
 - i. Proceed to step 10.
8. **If replacing the dispense valve:**
 - a. Disconnect the air line from the solenoid air valve to the dispense valve.
 - b. Disconnect the fluid supply line on the outlet of the dispense valve.
NOTE: If additional room is needed to allow disconnecting the dispense valve from the meter fitting, the meter mounting bracket can be loosened and slid to the right.
 - c. Place a wrench on the fitting (26) and disconnect the dispense valve.
NOTE: Use thread tape on supply line fittings.
 - d. Attach the dispense valve to fitting (26).
 - e. If the meter mounting bracket was moved, place in the desired location and tighten the screws.
 - f. Attach the air line from the solenoid air valve to the dispense valve.
 - g. Attach the fluid supply line to the outlet of the dispense valve.
 - h. Proceed to step 10.
9. **If replacing the solenoid and air valve (10):**
 - a. Shut off and bleed the air supply to the solenoid air valve.
 - b. Disconnect the inlet and outlet air lines at the solenoid air valve.
 - c. Remove screws (9) and remove the solenoid air valve.
 - d. Using screws (9), install the new solenoid air valve.
 - e. Attach the air lines to the solenoid air valve.
 - f. Route all removed wiring through the access hole on the side of the fluid panel and the junction box strain relief (14).
 - g. Refer to the schematic for the fluid panel junction box and attach the solenoid wiring.
 - h. Position all wires passing through the junction box strain relief so that the terminal block connections are not under strain and tighten the strain relief. Do not overtighten.
 - i. If necessary, reattach the junction box to the fluid panel.
 - j. Attach the fluid panel top cover.
10. At the control panel, turn on the power.
11. Pressurize the air supply line and check for leaks.
12. If the fluid supply line was disconnected, under low pressure, load the fluid line and monitor for leaks at all fittings on the fluid panel. Tighten fittings as needed. If necessary, refer to [Loading Fluid Lines, page 36](#).
13. If necessary, calibrate the fluid panel.

Servicing Fluid Panel 26A071 and 26A247

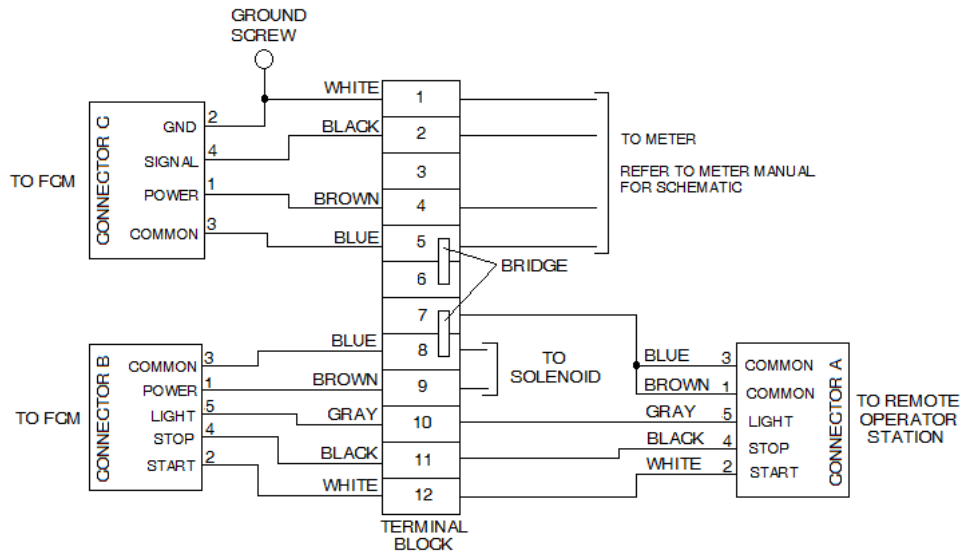
NOTE: Servicing the fluid panel will require shutting down the entire system. Before performing this repair, ensure that all other processes have been completed or can be shut down.



Fluid panel 26A071 shown

Fluid panel 26A071 and 26A247 junction box schematic:

NOTE: The schematic below also represents how to wire the solenoid and meter into the 26A243 junction box upgrade on a 246838 fluid panel.

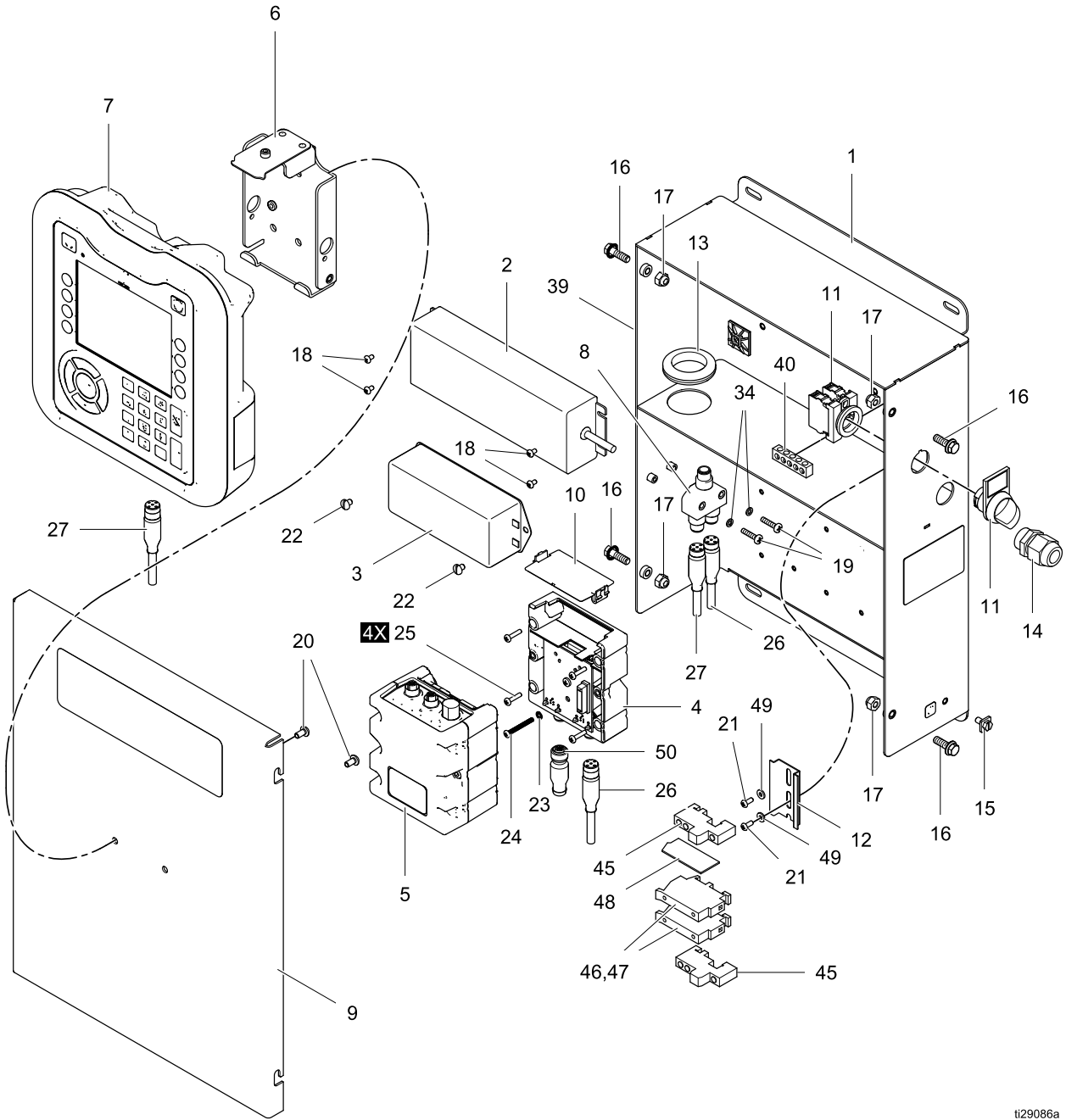


1. Purge the supply line. See [Purging Fluid Lines, page 36](#).
2. Perform [Pressure Relief Procedure, page 39](#).
3. Turn off control panel power switch.
4. Remove the fluid panel top cover.
5. At the junction box, if the meter or dispense valve are being replaced, disconnect the meter leads and if the solenoid is being replaced, disconnect the solenoid leads.
NOTE: Loosening the strain relief (14) may require removing screws (15) so that the junction box can be moved.
6. Loosen the strain relief and remove the wiring for the meter from the fluid panel. If the solenoid is being replaced, remove the solenoid wiring from the strain relief and fluid panel.
NOTE: Remove fittings from old components and reinstall in new components as needed.
7. **If replacing the dispense valve:**
 - a. Perform steps 7.a - 7.d.
 - b. Place a wrench on the fitting (26) and disconnect the dispense valve.
NOTE: Use thread tape on supply line fittings.
 - c. Attach fitting (26) to the dispense valve.
 - d. Perform steps 7.a. - 7.d. in reverse order to install the meter and dispense valve.
 - e. Proceed to step 9.
8. **If replacing the solenoid and air valve (10):**
 - a. Shut off and bleed the air supply to the solenoid air valve.
 - b. Disconnect the inlet and outlet air lines at the solenoid air valve.
 - c. Remove screws (9) and remove the solenoid air valve.
 - d. Using screws (9), install the new solenoid air valve.
 - e. Attach the air lines to the solenoid air valve.
9. Route all removed wiring through the access hole on the side of the fluid panel and the junction box strain relief (14).
10. Refer to the schematic for the fluid panel junction box and attach all meter and solenoid wiring.
11. Position all wires passing through the junction box strain relief so that the terminal block connections are not under strain and tighten the strain relief. Do not overtighten.
12. If necessary, reattach the junction box to the fluid panel.
13. Attach the fluid panel top cover.
14. At the control panel, turn on the power.
15. Pressurize the air supply line and check for leaks.
16. If the fluid supply line was disconnected, under low pressure, load the fluid line and monitor for leaks at all fittings on the fluid panel. Tighten fittings as needed. If necessary, refer to [Loading Fluid Lines, page 36](#).
17. If necessary, calibrate the fluid panel.

Parts

Control Panel Parts

Part No. 26A070 Control Panel



ti29086a

Part No. 26A070 Controller

| Ref | Part | Description | Qty |
|-----|--------|--|-----|
| 1 | ----- | PANEL, system control | 1 |
| 2 | 16T660 | POWER SUPPLY, 24 VDC | 1 |
| 3 | 16V446 | FILTER, line power, 10A | 1 |
| 4 | 289697 | MODULE, GCA, cube, base | 1 |
| 5 | 289696 | MODULE, GCA, cube, FCM | 1 |
| 6 | ----- | BRACKET, mounting, ADM | 1 |
| 7 | 26A259 | MODULE, GCA, ADM (includes token 17K873) | 1 |
| 8 | 121807 | CONNECTOR, splitter | 1 |
| 9 | ----- | COVER, system control | 1 |
| 10 | ----- | ENCLOSURE, cube door | 1 |
| 11 | 16U725 | SWITCH, selector, 2 position | 1 |
| 12 | ----- | RAIL, DIN | 1 |
| 13 | ----- | GROMMET, air fitting | 1 |
| 14 | 110515 | CONNECTOR, cord strain relief | 1 |
| 15 | ----- | SCREW, ground | 1 |
| 16 | ----- | SCREW, flanged, hex hd | 4 |
| 17 | ----- | NUT, lock, hex | 4 |
| 18 | ----- | SCREW, machine, bdgh | 4 |
| 19 | ----- | SCREW, machine, pnh | 2 |

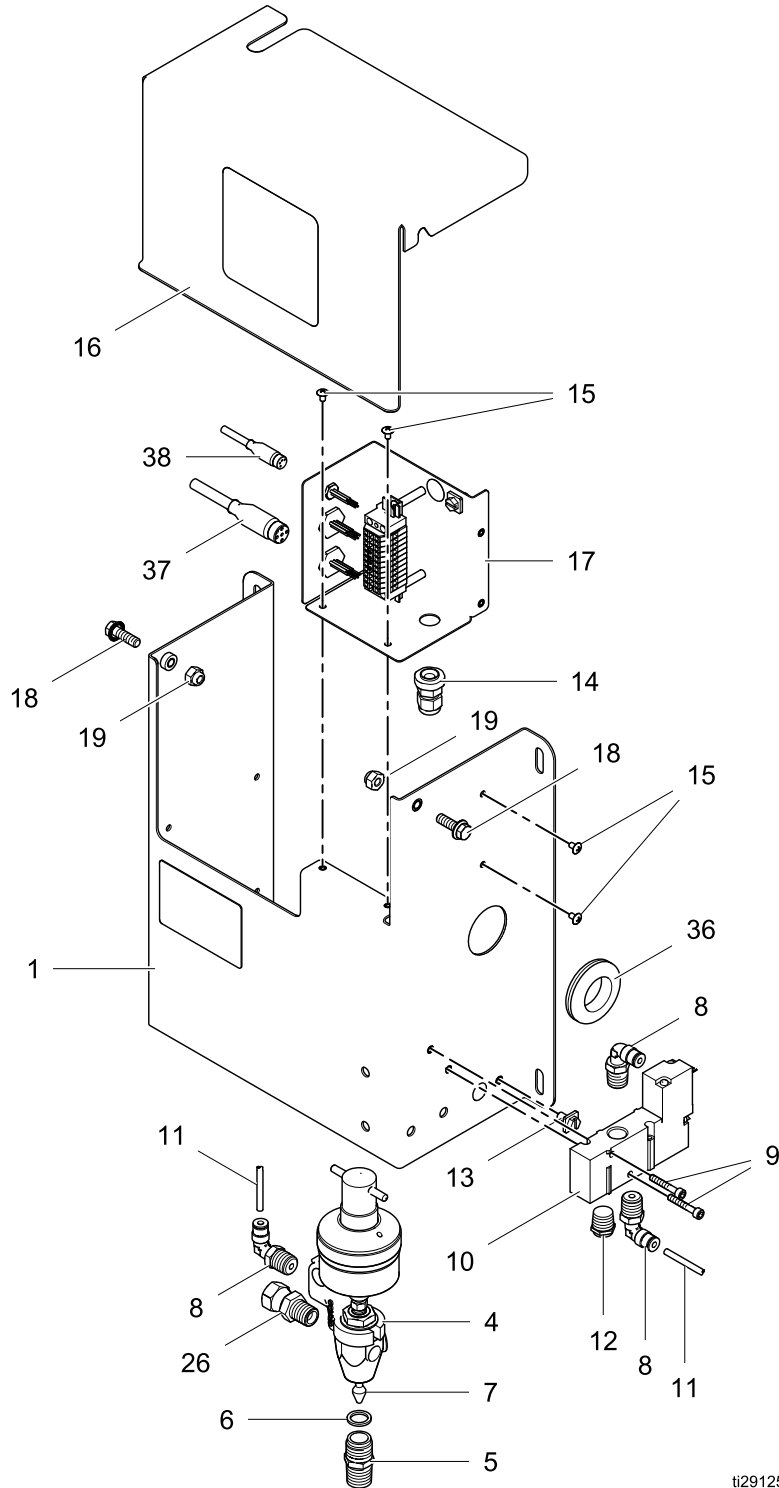
| Ref | Part | Description | Qty |
|-----|--------|-----------------------------------|-----|
| 20 | ----- | SCREW, machine, pnh | 2 |
| 21 | ----- | SCREW, SEMS | 2 |
| 22 | ----- | SCREW, machine | 2 |
| 23 | ----- | WASHER, lock, #6 | 1 |
| 24 | 867551 | SCREW, 6-3 2X 1.25, ph pn hd | 1 |
| 25 | ----- | SCREW, machine, pan hd, #6 x .625 | 4 |
| 26 | 121000 | CABLE, CAN, f/f 0.5 m | 1 |
| 27 | 121003 | CABLE, CAN, f/f 3.0 m | 1 |
| 29 | 17M107 | HARNESS, wiring | 1 |
| 34 | ----- | WASHER, lock | 2 |
| 35 | 17M094 | LABEL | 1 |
| 39▲ | 17L768 | LABEL, warning (not shown) | 1 |
| 40 | ----- | CONNECTOR, ground | 1 |
| 45 | ----- | BLOCK, end | 2 |
| 46 | ----- | HOLDER, fuse | 2 |
| 47 | 114835 | FUSE, time lag, 250V, 4A | 2 |
| 48 | ----- | STOP, end, fuse holder | 1 |
| 49 | ----- | WASHER, flat | 2 |
| 50 | 120999 | TERMINATION RESISTOR, CAN | 1 |

Items marked ----- are not available separately.

▲ Replacement Warning labels are available at no cost.

Fluid Panel Parts

Part No. 26A071 Fluid Panel



ti29125a

Part No. 26A071 Fluid Panel

| Ref | Part | Description | Qty |
|-----|--------|---------------------------------------|-----|
| 1 | — — — | PANEL, fluid | 1 |
| 4 | 205612 | VALVE, dispense, auto | 1 |
| 5 | 164749 | TIP, valve | 1 |
| 6 | 164111 | WASHER, non-metallic | 1 |
| 7 | 181526 | NEEDLE, fluid | 1 |
| 8 | — — — | ELBOW, m swivel | 4 |
| 9 | — — — | SCREW, cap, sch, sst | 2 |
| 10 | 116463 | VALVE, solenoid op, 3-way | 1 |
| 11 | 598095 | TUBE, 5.32 in. OD, nylon | 6 |
| 12 | — — — | MUFFLER | 1 |
| 13 | — — — | SCREW, ground | 1 |
| 14 | — — — | CONNECTOR, cord strain relief | 1 |
| 15 | — — — | SCREW, SEMS, machine, phillips, truss | 4 |
| 16 | — — — | COVER, fluid panel | 1 |

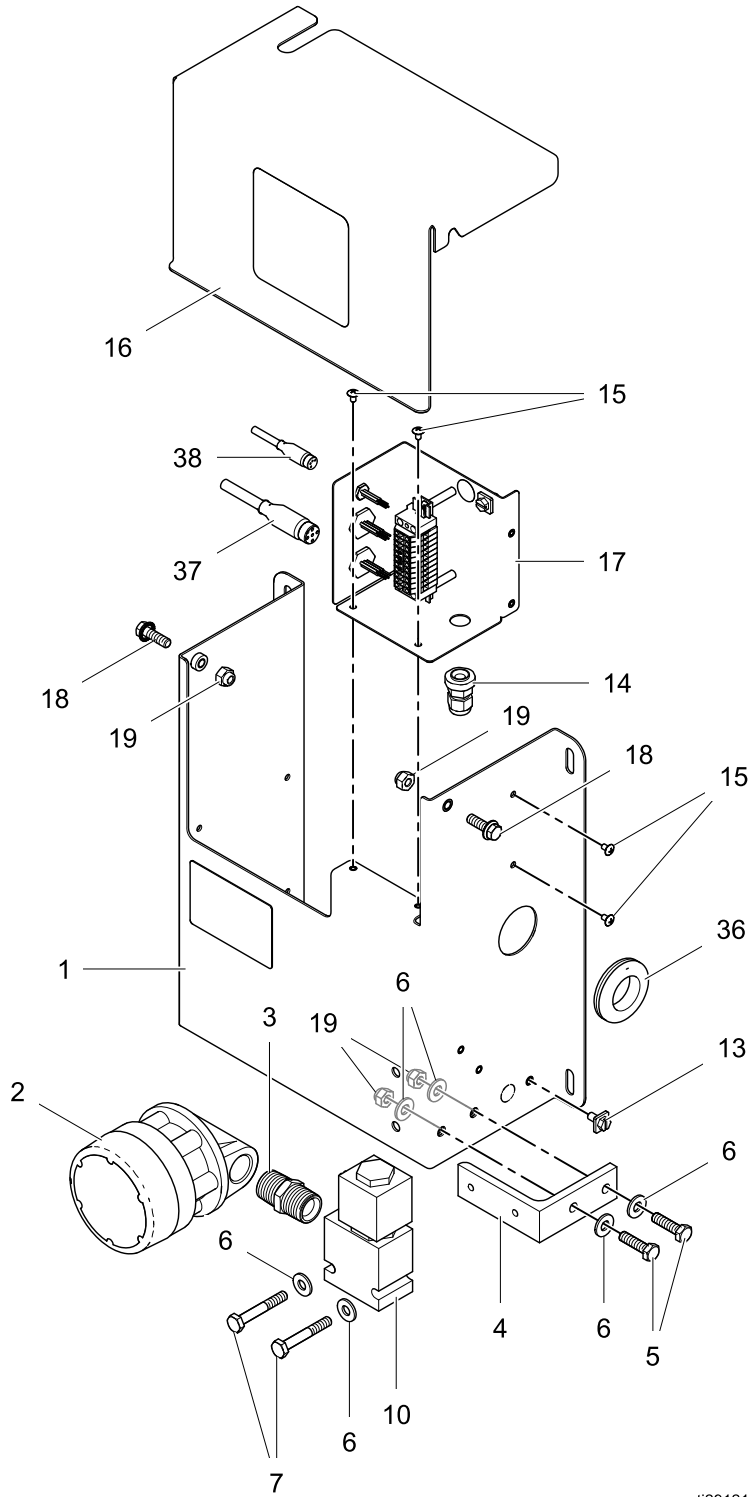
| Ref | Part | Description | Qty |
|-----|--------|--------------------------------------|-----|
| 17 | 26A072 | JUNCTION BOX, fluid panel | 1 |
| 18 | — — — | SCREW, flanged, hex hd | 2 |
| 19 | — — — | NUT, lock, hex | 2 |
| 26 | 156823 | UNION, swivel | 1 |
| 30▲ | 17L768 | LABEL, warning (not shown) | 1 |
| 36 | — — — | GROMMET, air fitting | 1 |
| 37 | | CABLE, m12, 5-pin, m/f, 50 ft (16 m) | 1 |
| | 123659 | | 1 |
| | 122030 | 1.5 ft (0.5 m) | 1 |
| 38 | | CABLE, GCA, m8, 4-pin, m/f, 15 m | 1 |
| | 17M099 | 50 ft (16 m) | 1 |
| | 17M096 | 1.5 ft (0.5 m) | 1 |

Items marked — — — are not available separately.

▲ Replacement Warning labels are available at no cost.

Fluid Panel Parts

Part No. 26A129 Fluid Panel



ti29121a

Part No. 26A129 Fluid Panel

| Ref | Part | Description | Qty |
|-----|--------|---------------------------------------|-----|
| 1 | — — — | PANEL, fluid | 1 |
| 2 | 17K870 | METER, electronic pulse | 1 |
| 3 | — — — | NIPPLE | 1 |
| 4 | — — — | BRACKET, solenoid mount | 1 |
| 5 | — — — | SCREW, cap hex hd | 2 |
| 6 | — — — | WASHER, plain | 6 |
| 7 | 102313 | SCREW, cap, hex, 1/4 in | 2 |
| 10 | — — — | VALVE, solenoid | 1 |
| 13 | — — — | SCREW, ground | 1 |
| 14 | — — — | CONNECTOR, cord strain relief | 1 |
| 15 | — — — | SCREW, SEMS, machine, phillips, truss | 4 |
| 16 | — — — | COVER, fluid panel | 1 |
| 17 | 26A072 | JUNCTION BOX, fluid panel | 1 |
| 18 | — — — | SCREW, flanged, hex hd | 2 |

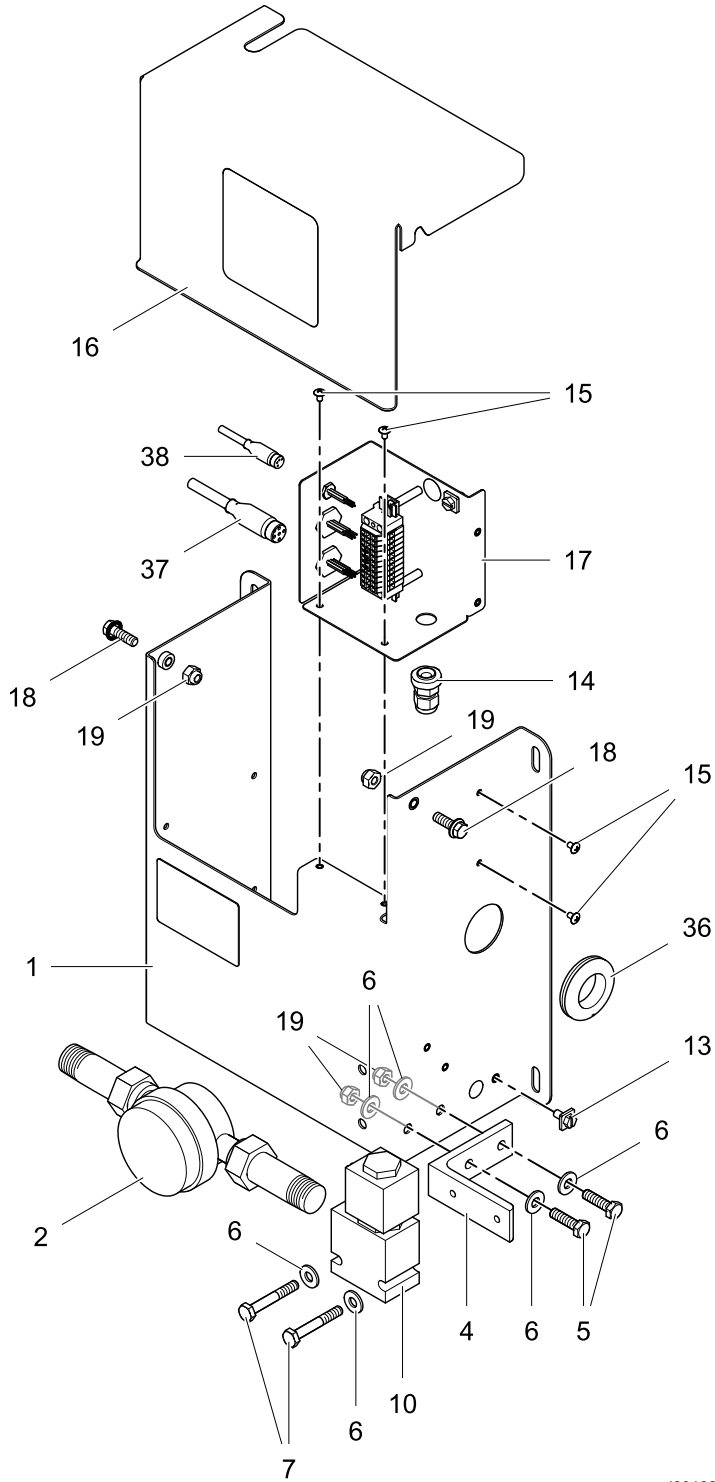
| Ref | Part | Description | Qty |
|-----|--------|----------------------------------|-----|
| 19 | — — — | NUT, lock hex | 4 |
| 25 | 223547 | WIRE, assembly, 25 ft. | 1 |
| 30▲ | 17L768 | LABEL, warning (not shown) | 1 |
| 36 | — — — | GROMMET, air fitting | 1 |
| 37 | | CABLE, m12, 5-pin, m/f, | |
| | 123659 | 50 ft (16 m) | 1 |
| | 122030 | 1.5 ft (0.5 m) | 1 |
| 38 | | CABLE, GCA, m8, 4-pin, m/f, 15 m | |
| | 17M099 | 50 ft (16 m) | 1 |
| | 17M096 | 1.5 ft (0.5 m) | 1 |

Items marked — — — are not available separately.

▲ Replacement Warning labels are available at no cost.

Fluid Panel Parts

Part No. 26A130 Fluid Panel



ti29122a

Part No. 26A130 Fluid Panel

| Ref | Part | Description | Qty |
|-----|--------|--|-----|
| 1 | ---- | PANEL, fluid | 1 |
| 2 | 26A296 | METER, pulse, water compatible, includes ref 2a-2d | 1 |
| 2a | ---- | RESISTOR, 1K, 5%, 1/2W | 1 |
| 2b | ---- | RESISTOR, 5.1K, 5%, 1/2W | 1 |
| 2c | ---- | DIODE, zener, 12V, 5%, 1W | 1 |
| 2d | ---- | FERRULE | 4 |
| 4 | ---- | BRACKET, solenoid mount | 1 |
| 5 | ---- | SCREW, cap hex hd | 2 |
| 6 | ---- | WASHER, plain | 6 |
| 7 | 102313 | SCREW, cap, hex, 1/4 in | 2 |
| 10 | ---- | VALVE, solenoid | 1 |
| 13 | ---- | SCREW, ground | 1 |
| 14 | ---- | CONNECTOR, cord strain relief | 1 |
| 15 | ---- | SCREW, SEMS, machine, Phillips, truss | 4 |
| 16 | ---- | COVER, fluid panel | 1 |

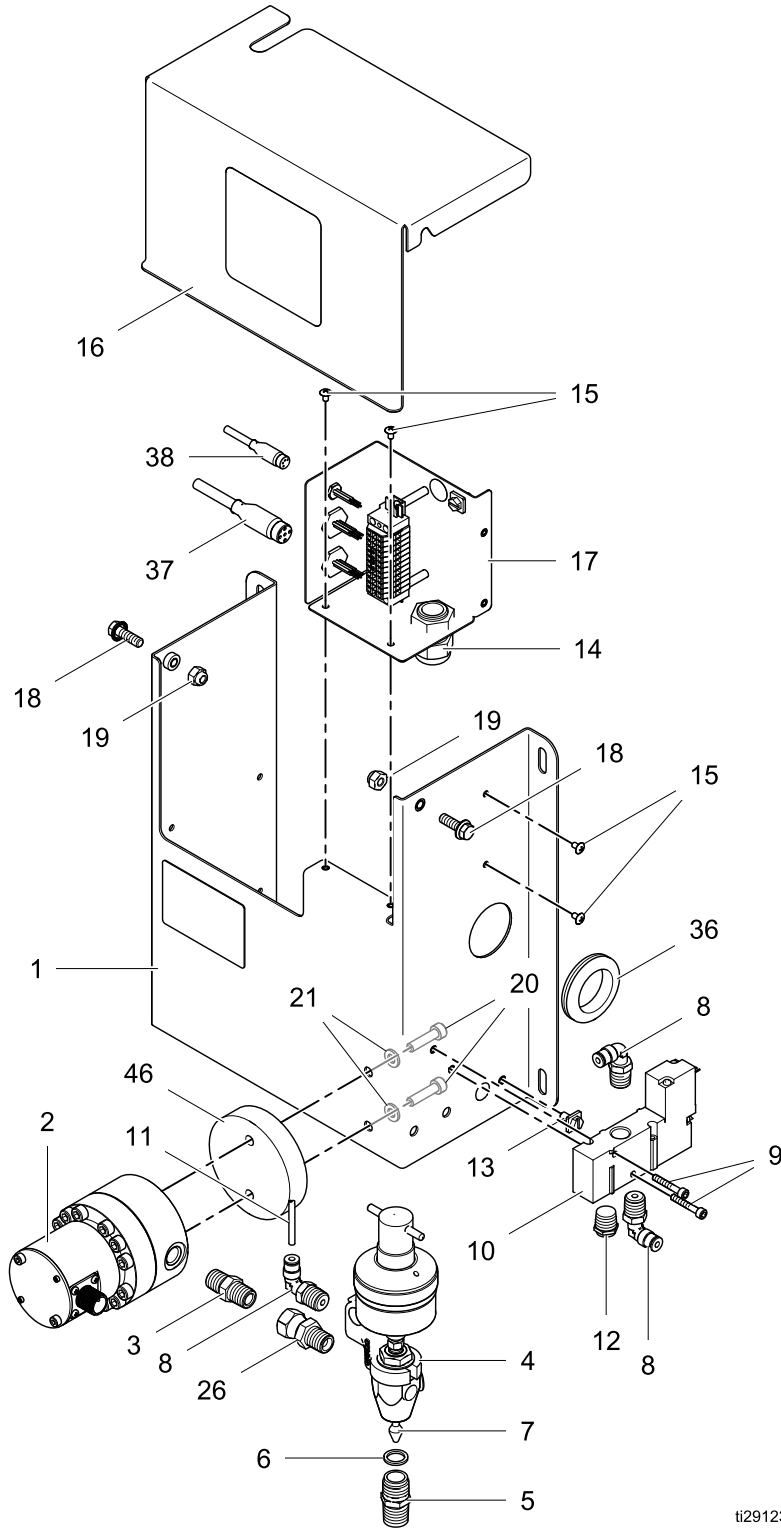
| Ref | Part | Description | Qty |
|-----|--------|----------------------------------|-----|
| 17 | 26A072 | JUNCTION BOX, fluid panel | 1 |
| 18 | ---- | SCREW, flanged, hex hd | 2 |
| 19 | ---- | NUT, lock hex | 4 |
| 23 | ---- | FERRULE, wire, awg-18 | 2 |
| 25 | ---- | WIRE, assembly, 25 ft. | 1 |
| 30▲ | 17L768 | LABEL, warning (not shown) | 1 |
| 36 | ---- | GROMMET, air fitting | 1 |
| 37 | | CABLE, m12, 5-pin, m/f, | |
| | 123659 | 50 ft (16 m) | 1 |
| | 122030 | 1.5 ft (0.5 m) | 1 |
| 38 | | CABLE, GCA, m8, 4-pin, m/f, 15 m | |
| | 17M099 | 50 ft (16 m) | 1 |
| | 17M096 | 1.5 ft (0.5 m) | 1 |

Items marked — — — are not available separately.

▲ Replacement Warning labels are available at no cost.

Fluid Panel Parts

Part No. 26A131 Fluid Panel



ti29123a

Part No. 26A131 Fluid Panel

| Ref | Part | Description | Qty |
|-----|--------|---------------------------------------|-----|
| 1 | — — — | PANEL, fluid | 1 |
| 2 | 289813 | METER, gear, assembly, G3000 | 1 |
| 3 | 156971 | NIPPLE, short | 1 |
| 4 | 205612 | VALVE, dispense, auto | 1 |
| 5 | 164749 | TIP, valve | 1 |
| 6 | 164111 | WASHER, non-metallic | 1 |
| 7 | 181526 | NEEDLE, fluid | 1 |
| 8 | — — — | ELBOW, m swivel | 4 |
| 9 | — — — | SCREW, cap, sch, sst | 2 |
| 10 | 116463 | VALVE, solenoid op, 3-way | 1 |
| 11 | 598095 | TUBE, 5/32 in. OD, nylon | 6 |
| 12 | — — — | MUFFLER | 1 |
| 13 | — — — | SCREW, ground | 1 |
| 14 | — — — | CONNECTOR, cord strain relief | 1 |
| 15 | — — — | SCREW, SEMS, machine, phillips, truss | 4 |
| 16 | — — — | COVER, fluid panel | 1 |
| 17 | 26A072 | JUNCTION BOX, fluid panel | 1 |
| 18 | — — — | SCREW, cap, hex hd | 2 |

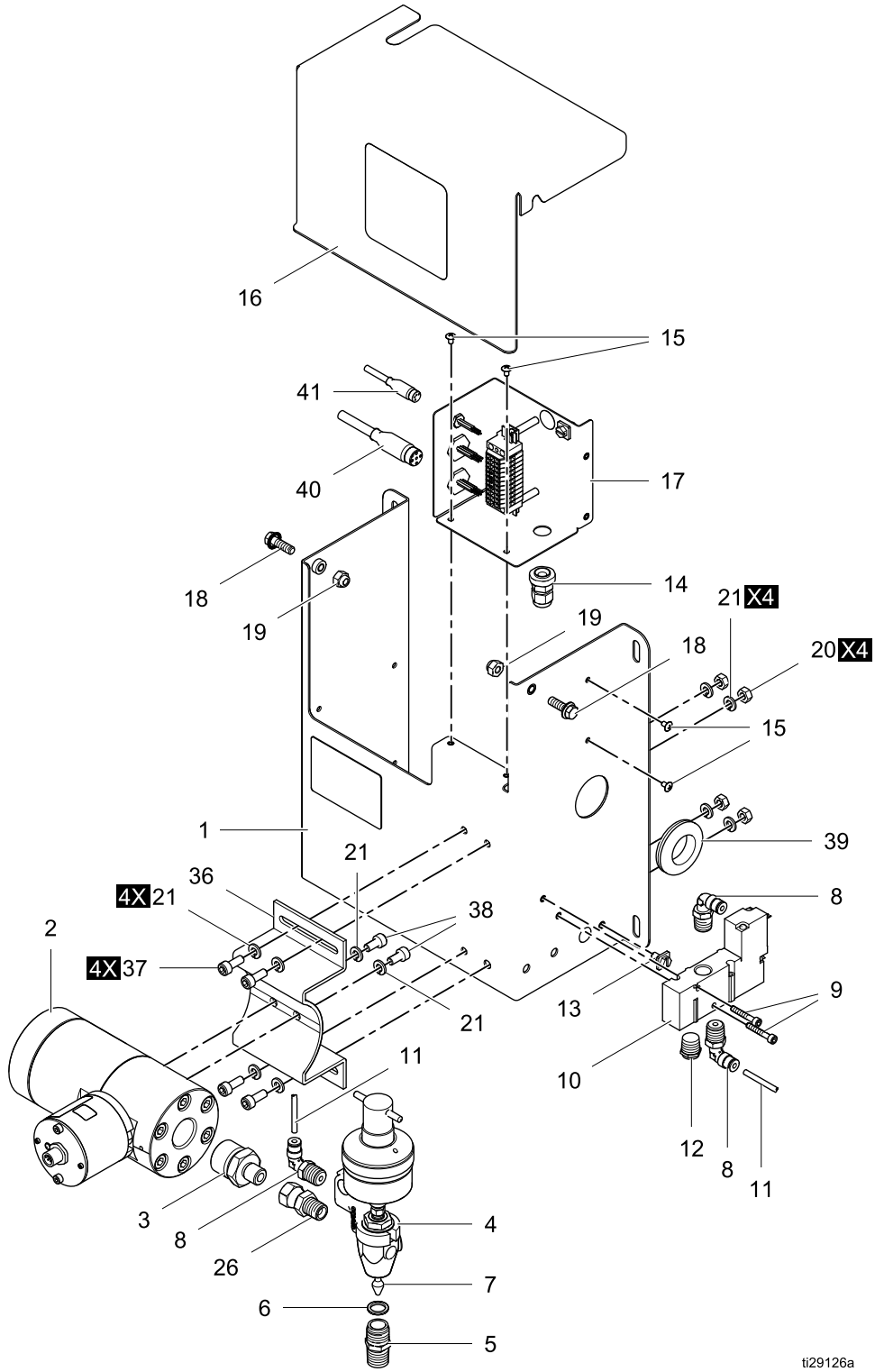
| Ref | Part | Description | Qty |
|-----|--------|----------------------------------|-----|
| 19 | — — — | NUT, lock, hex | 2 |
| 20 | — — — | SCREW, cap, hex hd | 2 |
| 21 | — — — | WASHER, plain | 2 |
| 22 | 17C909 | HARNESS, cable, G3000 16 in. | 1 |
| 23 | — — — | FERRULE, wire, awg-18 | 2 |
| 25 | 223547 | WIRE, assembly, 25 ft. | 1 |
| 26 | 156823 | UNION, swivel | 1 |
| 30▲ | 17L768 | LABEL, warning (not shown) | 1 |
| 36 | — — — | GROMMET, air fitting | 1 |
| 37 | | CABLE, m12, 5-pin, m/f, | |
| | 123659 | 50 ft (16 m) | 1 |
| | 122030 | 1.5 ft (0.5 m) | 1 |
| 38 | | CABLE, GCA, m8, 4-pin, m/f, 15 m | |
| | 17M099 | 50 ft (16 m) | 1 |
| | 17M096 | 1.5 ft (0.5 m) | 1 |
| 46 | — — — | PLATE | 1 |

Items marked — — — are not available separately.

▲ Replacement Warning labels are available at no cost.

Fluid Panel Parts

Part No. 26A132 Fluid Panel



ti29126a

Part No. 26A132 Fluid Panel

| Ref | Part | Description | Qty |
|-----|---------|---------------------------------------|-----|
| 1 | — — — — | PANEL, fluid | 1 |
| 2 | — — — — | METER, heli gear, amb w/sensor | 1 |
| 3 | — — — — | NIPPLE, reducing 3/4 in. x 1/4 in. | 1 |
| 4 | 205612 | VALVE, dispense, auto | 1 |
| 5 | 164749 | TIP, valve | 1 |
| 6 | 164111 | WASHER, non-metallic | 1 |
| 7 | 181526 | NEEDLE, fluid | 1 |
| 8 | — — — — | ELBOW, m swivel | 4 |
| 9 | — — — — | SCREW, cap, sch, sst | 2 |
| 10 | 116463 | VALVE, solenoid op, 3-way | 1 |
| 11 | 598095 | TUBE, 5/32 in. OD, nylon | 6 |
| 12 | — — — — | MUFFLER | 1 |
| 13 | — — — — | SCREW, ground | 1 |
| 14 | — — — — | CONNECTOR, cord strain relief | 1 |
| 15 | — — — — | SCREW, SEMS, machine, phillips, truss | 4 |
| 16 | — — — — | COVER, fluid panel | 1 |
| 17 | 26A072 | JUNCTION BOX, fluid panel | 1 |
| 18 | — — — — | SCREW, flanged, hex hd | 2 |
| 19 | — — — — | NUT, lock, hex | 2 |

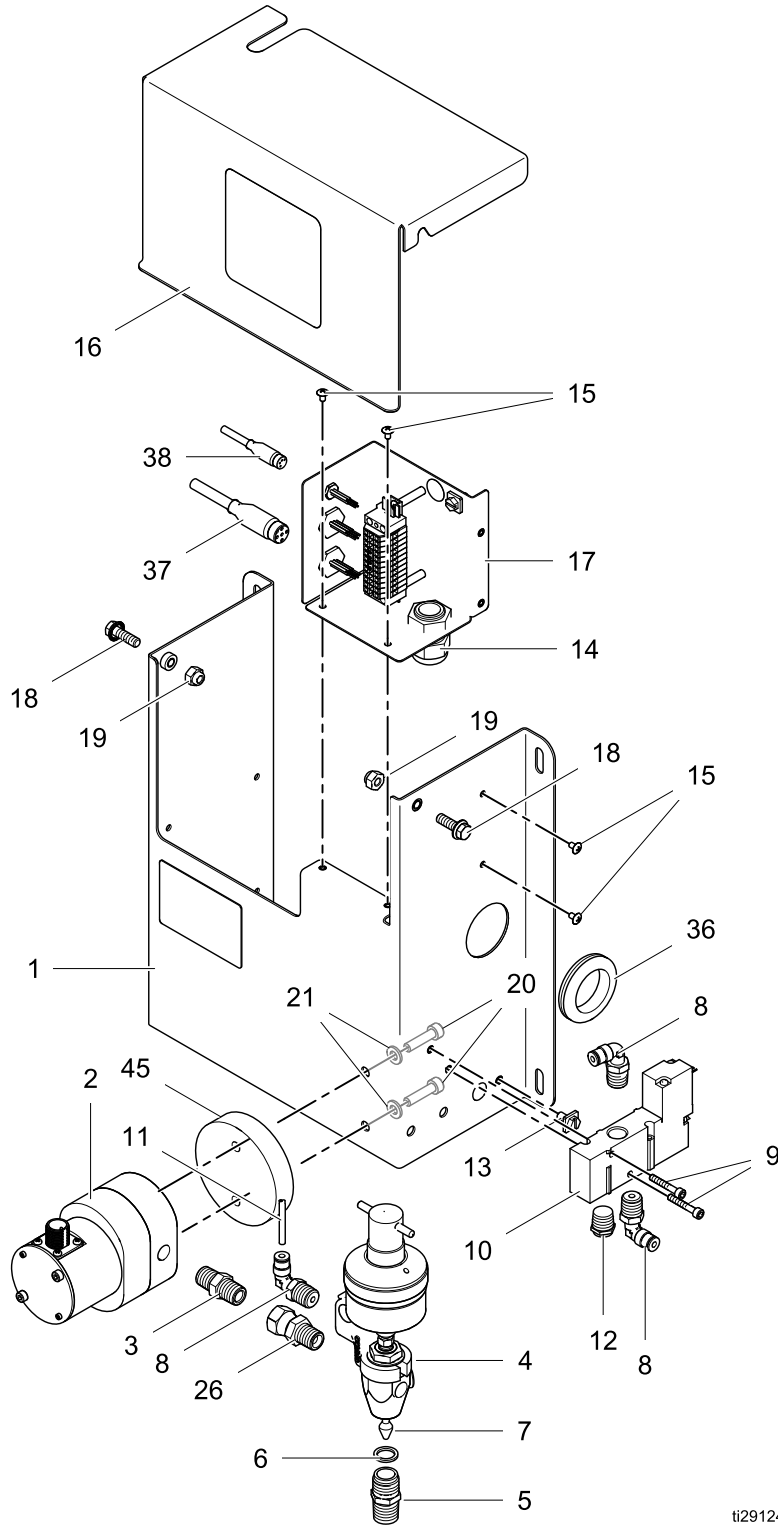
| Ref | Part | Description | Qty |
|-----|---------|---|-----|
| 20 | — — — — | NUT, hex | 4 |
| 21 | 115226 | WASHER, lock, spring, m6 | 10 |
| 22 | — — — — | CABLE, adapter, helical sensor | 1 |
| 25 | 223547 | WIRE, assembly, 25 ft. | 1 |
| 26 | 156823 | UNION, swivel | 1 |
| 30▲ | 17L768 | LABEL, warning (not shown) | 1 |
| 36 | — — — — | BRACKET, helical gear, conversion | 1 |
| 37 | — — — — | SCREW, schs me x 16 | 4 |
| 38 | — — — — | SCREW, cap, such, hex | 2 |
| 39 | — — — — | GROMMET, air fitting | 1 |
| 40 | | CABLE, Mme., 5th, m/f, 50 ft (16 m) | 1 |
| | 123659 | | |
| | 122030 | 1.5 ft (0.5 m) | 1 |
| 41 | | CABLE, GCA, m8, 4-pin, m/f, 15 m 50 ft (16 m) | 1 |
| | 17M096 | 1.5 ft (0.5 m) | 1 |

Items marked — — — are not available separately.

▲ Replacement Warning labels are available at no cost.

Fluid Panel Parts

Part No. 26A165 Fluid Panel



ti29124a

Part No. 26A165 Fluid Panel

| Ref | Part | Description | Qty |
|-----|--------|---------------------------------------|-----|
| 1 | — — — | PANEL, fluid | 1 |
| 2 | 258718 | METER, solvent, low flow, assembly | 1 |
| 3 | 156971 | NIPPLE, short | 1 |
| 4 | 205612 | VALVE, disp, auto | 1 |
| 5 | 164749 | TIP, valve | 1 |
| 6 | 164111 | WASHER, non-metallic | 1 |
| 7 | 181526 | NEEDLE, fluid | 1 |
| 8 | — — — | ELBOW, m swivel | 4 |
| 9 | — — — | SCREW, cap, sch, sst | 2 |
| 10 | 116463 | VALVE, solenoid op, 3-way | 1 |
| 11 | 598095 | TUBE, 5/32 in. OD, nylon | 6 |
| 12 | — — — | MUFFLER | 1 |
| 13 | — — — | SCREW, ground | 1 |
| 14 | — — — | CONNECTOR, cord strain relief | 1 |
| 15 | — — — | SCREW, sems, machine, phillips, truss | 4 |
| 16 | — — — | COVER, fluid panel | 1 |
| 17 | 26A072 | JUNCTION BOX, fluid panel | 1 |
| 18 | — — — | SCREW, flanged, hex hd | 2 |

| Ref | Part | Description | Qty |
|-----|--------|----------------------------------|-----|
| 19 | — — — | NUT, lock, hex | 2 |
| 20 | — — — | SCREW, cap, hex hd | 2 |
| 21 | — — — | WASHER, plain | 2 |
| 22 | 17C909 | HARNESS, cable, G3000 16 in. | 1 |
| 23 | — — — | FERRULE, wire, awg-18 | 2 |
| 25 | — — — | WIRE, assembly, 25 ft. | 1 |
| 26 | 156823 | UNION, swivel | 1 |
| 30▲ | 17L768 | LABEL, warning (not shown) | 1 |
| 36 | — — — | GROMMET, air fitting | 1 |
| 37 | | CABLE, m12, 5-pin, m/f, | |
| | 123659 | 50 ft (16 m) | 1 |
| | 122030 | 1.5 ft (0.5 m) | 1 |
| 38 | | CABLE, GCA, m8, 4-pin, m/f, 15 m | |
| | 17M099 | 50 ft (16 m) | 1 |
| | 17M096 | 1.5 ft (0.5 m) | 1 |
| 45 | — — — | PLATE | 1 |

Items marked — — — are not available separately.

▲ Replacement Warning labels are available at no cost.

Part No. 26A247 Fluid Panel

| Ref | Part | Description | Qty |
|-----|--------|--|-----|
| 1 | — — — | PANEL, fluid | 1 |
| 4 | 205612 | VALVE, dispense, auto | 1 |
| 5 | 164749 | TIP, valve | 1 |
| 6 | 164111 | WASHER, non-metallic | 1 |
| 7 | 181526 | NEEDLE, fluid | 1 |
| 8 | — — — | ELBOW, m swivel | 4 |
| 9 | — — — | SCREW, cap, sch, sst | 2 |
| 10 | 116463 | VALVE, solenoid op, 3-way | 1 |
| 11 | 598095 | TUBE, 5.32 in. OD, nylon | 6 |
| 12 | — — — | MUFFLER | 1 |
| 13 | — — — | SCREW, ground | 1 |
| 14 | — — — | CONNECTOR, cord strain relief | 1 |
| 15 | — — — | SCREW, sems, machine, phillips, truss | 4 |
| 16 | — — — | COVER, fluid panel | 1 |
| 17 | 26A072 | JUNCTION BOX, fluid panel | 1 |
| 18 | — — — | SCREW, flanged, hex hd | 2 |
| 19 | — — — | NUT, lock, hex | 2 |
| 26 | 156823 | UNION, swivel | 1 |
| 30▲ | 17L768 | LABEL, warning (not shown) | 1 |

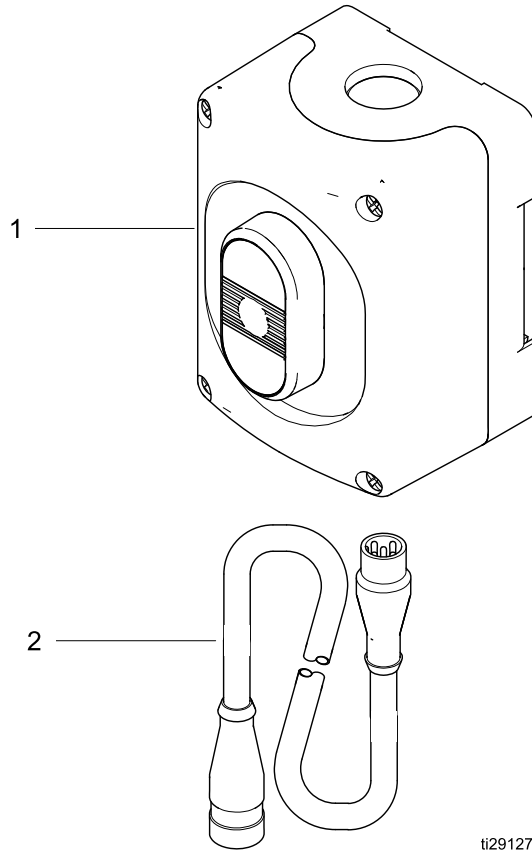
| Ref | Part | Description | Qty |
|-----|--------|--------------------------------|-----|
| 36 | — — — | GROMMET, air fitting | 1 |
| 37 | | CABLE, m12, 5-pin, m/f, | |
| | 123659 | 50 ft (16 m) | 1 |
| | 122030 | 1.5 ft (0.5 m) | 1 |
| 38 | | CABLE, GCA, m8, 4-pin, | |
| | 17M099 | m/f, 15 m | 1 |
| | 17M096 | 50 ft (16 m) | 1 |
| | | 1.5 ft (0.5 m) | |
| 101 | 16M519 | METER, coriolis | 1 |
| 102 | — — — | BRACKET | 1 |
| 103 | — — — | SCREW, cap, hex hd | 4 |
| 104 | — — — | WASHER, lock, spring | 4 |
| 105 | 24N347 | HOSE, coupled, 5.0 ft. | 1 |
| 106 | 166846 | FITTING, adapter | 1 |
| 107 | 17A106 | FITTING, adapter, 30 degree | 1 |
| 108 | 501867 | VALVE, check | 1 |
| 109 | 258743 | CABLE, installation | 1 |
| 117 | — — — | SWIVEL, union | 1 |

Items marked — — — are not available separately.

▲ Replacement Warning labels are available at no cost.

Remote Operator Station Parts

Part No. 26A133 Remote Operator Station



ti29127a

Part No. 26A133 Remote Operator Station

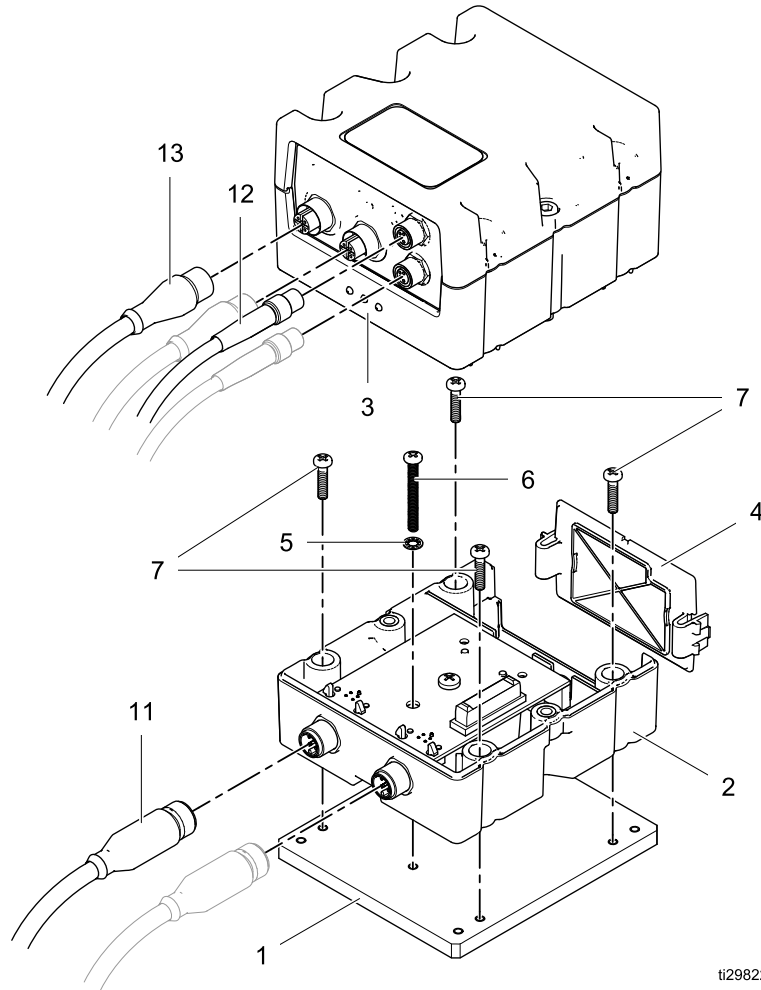
| Ref | Part | Description | Qty |
|-----|---------|----------------------------|-----|
| 1 | — — — | CONTROL, fluid | 1 |
| 2 | 123659* | CABLE, 5-pin, m/f, 16 m | 1 |

Items marked — — — are not available separately.

* Cable 122030 (1.5 ft) is available separately.

FCM Parts

Part No. 26A134 FCM



ti29822a

| Ref | Part | Description | Qty |
|-----|--------|---------------------------|-----|
| 1 | 17K868 | PLATE, adapter | 1 |
| 2 | 289697 | MODULE, base | 1 |
| 3* | 289696 | MODULE, cube | 1 |
| 4 | --- | DOOR, cube | 1 |
| 5 | --- | WASHER, lock, #6 | 1 |
| 6 | 867551 | SCREW, 6-32 x 1.25 | 1 |
| 7 | --- | SCREW, panhead #6 x 0.625 | 4 |
| 8 | --- | SCREW, 6-32 x 0.25 | 4 |
| 11 | --- | CABLE, CAN, 50 ft. (15 m) | 1 |

* Kit 26A260 is available separately and contains this part and a token (17K873).

Glossary of Terms

Advanced Display Module (ADM) - the user interface for the system. See [Advanced Display Module \(ADM\), page 28](#).

Fluid Control Module (FCM) - the fluid controller for the system.

Fluid Panel/Fluid - Fluid panel

Grand Total - a non-resettable value that shows the total amount of material dispensed through the system.

Intrinsically Safe (IS) - refers to the ability to locate certain components in a hazardous location.

Job Total - a resettable value that shows the amount of material dispensed through the system for one job. A job is complete when the user presses the Job Complete key on the Booth Control or ADM.

K-Factor - the amount of material dispensed per stroke.

Purge - when all mixed material is flushed from the mix manifold, hose, and gun.

Recipe - preset, repeatable list of fluids, the order, and amounts to be dispensed

Run Screens - The Run screens provide a graphical depiction of system operation and current status. See [Run Mode Screens, page 93](#).

Setup Screens - The Setup screens allow the user to define the system, setup recipes, and establish system operating parameters. See [Setup Mode Screens, page 99](#).

Standby - refers to the status of the system.

Technical Data

| ProDispense | U.S. | Metric |
|--|---|---------|
| Power Requirements | | |
| Electrical | 85/240 VAC, 1.6 amp maximum, 50 or 60 Hz, single phase | |
| Pneumatic 26A071, 26A131, 26A132, 26A165 | 85–120 psi (0.59–0.82 MPa, 5.9–8.2 bar) at 1/4 cfm maximum (filtered to 10 micron) | |
| Number of fluids | 1–8 fluid panels NOTE: See Appendix B - System Design, page 114 for information on the power consumption for each system component. This may affect how many fluid panels can be used with this system. | |
| Totalizers | Last Dispense; Resettable; Grand | |
| Number of Recipes | 50 maximum | |
| Operating Temperature | 40–121°F | 4–50°C |
| Weight (Control panel and ADM only) | 25 lb | 11.3 kg |

| Fluid Panels | U.S. | Metric |
|---|--|-----------------|
| 26A129 Oil/Lubricant Oil meter | | |
| Flow rate | 0.25–4 gpm | 0.95–15 lpm |
| Viscosity range | 10 wt. oil – #2 grease | |
| Accuracy | See Dispense Accuracy, page 40 | |
| Resolution | 4.73 cc/pulse | |
| Maximum working pressure | 1500 psi | 10 MPa, 103 bar |
| Fluid inlet | 1/2 npt(f) | |
| Fluid outlet | 1/2 npt(f) | |
| Weight | 12.5 lb | 5.7 kg |
| 26A130 Water/Antifreeze (not ETL listed) Water meter | | |
| Flow rate | 0.25–4 gpm | 0.95–15 lpm |
| Viscosity range | 1 – 20 cps | |
| Accuracy | See Dispense Accuracy, page 40 | |
| Resolution | 25 cc/pulse | |
| Maximum working pressure | 250 psi | 1.7 MPa, 17 bar |
| Fluid inlet | 1/2 npt(m) | |
| Fluid outlet | 1/2 npt(f) | |
| Weight | 13 lb | 5.9 kg |

Technical Data

| Fluid Panels | U.S. | Metric |
|---|--|-----------------|
| 26A131 Grease/Paint G3000 meter | | |
| Flow rate | 0.02–1 gpm | 0.76–3.8 lpm |
| Viscosity range | 20–3000 cps | |
| Accuracy | See Dispense Accuracy, page 40 | |
| Resolution | 0.119 cc/pulse | |
| Maximum working pressure | 3000 psi | 21 MPa, 207 bar |
| Maximum air pressure | 120 psi | 0.8 MPa, 8 bar |
| Fluid inlet | 1/4 npt(f) | |
| Fluid outlet | 3/8 npt(m) | |
| Air inlet | 1/4 npt(f) | |
| Weight | 18.5 lb | 8.4 kg |
| 26A165 Solvent S3000 meter | | |
| Flow rate | 0.01–0.42 gpm | 0.05–1.6 lpm |
| Viscosity range | 20–500 cps | |
| Accuracy | See Dispense Accuracy, page 40 | |
| Resolution | 0.020 cc/pulse | |
| Maximum working pressure | 3000 psi | 21 MPa, 207 bar |
| Maximum air pressure | 120 psi | 0.8 MPa, 8 bar |
| Fluid inlet | 1/4 npt(f) | |
| Fluid outlet | 3/8 npt(m) | |
| Air inlet | 1/4 npt(f) | |
| Weight | 18.5 lb | 8.4 kg |
| 26A132 Grease/Paint/Sealant HG6000 meter | | |
| Flow rate | 0.1–6 gpm | 0.05–22.7 lpm |
| Viscosity range | 30–1,000,000 cps | |
| Accuracy | See Dispense Accuracy, page 40 | |
| Resolution | 0.286 cc/pulse | |
| Maximum working pressure | 3000 psi | 21 MPa, 207 bar |
| Maximum air pressure | 120 psi | 0.8 MPa, 8 bar |
| Fluid inlet | 3/4 npt(f) | |
| Fluid outlet | 3/8 npt(m) | |
| Air inlet | 1/4 npt(f) | |
| Weight | 29 lb | 13.2 kg |

| Fluid Panels | U.S. | Metric |
|---|---|-------------------|
| 26A247 Shear Sensitive/Fiber-filled Coriolis meter | | |
| Flow rate | 0.005–1.6 gpm (20–4000 cc/min) | 0.019–6.06 lpm |
| Viscosity range | 20–5000 cps | |
| Accuracy | see Endress+Hauser manual | |
| Resolution | settable 0.020-0.150 cc/pulse | |
| Maximum working pressure | 2300 psi | 15.9 MPa, 159 bar |
| Maximum air pressure | 120 psi | 0.8 MPa, 8 bar |
| Fluid inlet | 1/4 nps(m) | |
| Fluid outlet | 3/8 npt(m) | |
| Air inlet | 1/4 npt(f) | |
| Weight | 28.5 lb | 12.9 kg |
| 26A071 Meter-less (flow meter supplied by user) | | |
| Flow rate | User supplied Refer to meter manufacturer's manual | |
| Viscosity range | | |
| Accuracy | | |
| Resolution | | |
| Input signal range | 0–24 VDC | |
| Trigger voltages | H to L transition: 5V L to H transition: 12V | |
| Minimum pulse width | 300 μs | |
| Maximum working pressure | 3000 psi | 21 MPa, 207 bar |
| Maximum air pressure | 120 psi | 0.8 MPa, 8 bar |
| Fluid inlet | User supplied Refer to meter manufacturer's manual | |
| Fluid outlet | 1/4 npt(f) | |
| Air inlet | 1/4 npt(f) | |
| Weight | 11.5 lb | 5.2 kg |

Wetted Parts

| | |
|--------|--|
| 26A129 | aluminum, carbon steel, bronze, buna-N, stainless steel |
| 26A130 | brass, stainless steel, polyimide, polypropylene, EPDM o-ring, aluminum, buna-N, carbon steel, ceramic |
| 26A131 | 303, 313, 316, 400 series, and 416 stainless steel, Tungsten carbide, PTFE, carbon steel, chrome, UHMWPE, leather |
| 26A132 | 303, 313, 316, 416, 440 stainless steel, PTFE, carbide, carbon steel, chrome, UHMWPE, leather |
| 26A165 | 303, 313, 316, 416, 17–4 stainless steel, PTFE, carbon steel, chrome, UHMWPE, leather |
| 26A247 | 1.4539/904L stainless steel alloy, C-22.2.4602/N 06022, 303, 304, 313, 316, 416 stainless steel, PTFE, carbon steel, chrome, UHMWPE, leather |
| 25A071 | 313, 316, 416 stainless steel, carbon steel, chrome, UHMWPE, leather |

Appendix A – Advanced Display Module (ADM) Operation


Run Mode Screens

NOTE: Selection fields and buttons that are grayed-out on the screens are not currently active.

Splash Screen

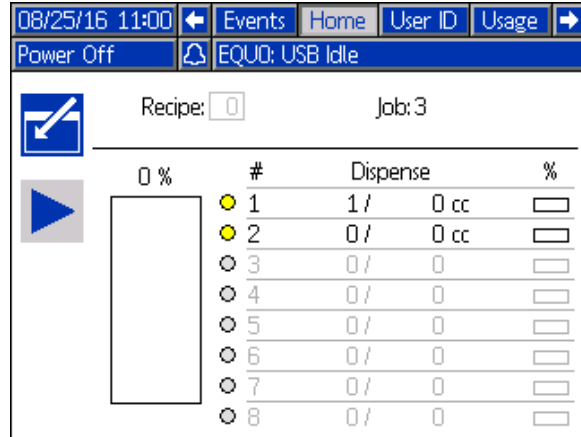
At power up, the Graco logo will display for approximately 5 seconds, followed by the Home screen.



NOTE: The ADM will start the Run screens at the Home screen. From the Run screens, press  to access the Setup screens.

Home Screen

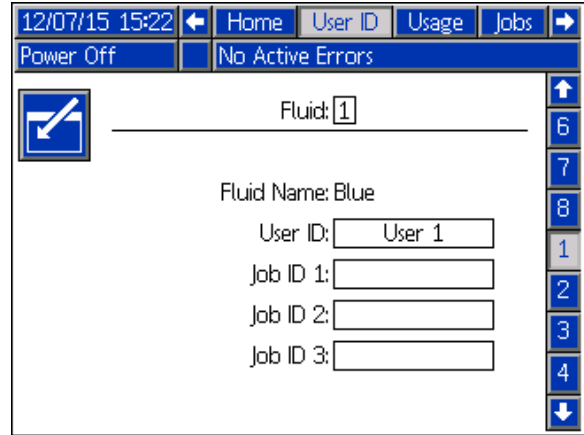
The Home screen displays the current status of the system. The following table details the information shown.



| Description | Details |
|-------------|---|
| Job Details | <p>Displays details about the current job:</p> <ul style="list-style-type: none"> • Recipe: Recipe to dispense • Job: Current job number, automatically increments with each completed job • Main % bar: Represents the percentage of total recipe dispensed • List of fluid panels: <ul style="list-style-type: none"> – Fluid Status Indicator: <ul style="list-style-type: none"> ○ Disabled or Offline ● Power Off mode ● Standby On mode ● Currently Dispensing ● Error – Fluid Number – Current and Target Dispense Volume – Percentage of individual fluids dispensed OR if in diagnostic mode, displays individual fluid flow rate <p><u>% values during dispensing</u></p> <p>Red Done dispensing, out of tolerance Green Done dispensing, within tolerance Orange Currently dispensing</p> |

User ID Screen

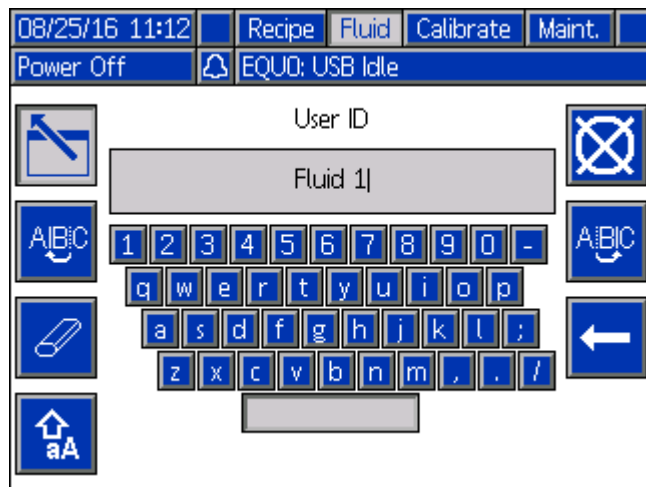
The User ID screen displays a custom user ID and associated job IDs. This information is associated with each job log and logged. It is possible to download these logs to a USB drive. See [USB Download Procedure, page 42](#).



| Field | Description |
|----------------------------------|--|
| Fluid: | The number of the fluid panel being defined. Numeric value, 1–8. Entering a value for a fluid panel which has not been defined is not allowed. |
| Fluid Name: | Name assigned to this fluid panel on the Fluid screen. See Fluid Screen, page 103 . |
| User ID: | Optional. Name assigned by individual user. This User ID will appear in the job log. Field can contain up to 10 alphanumeric characters and spaces. |
| Job ID 1: | Optional. Job ID assigned by individual user. This Job ID will appear in the job log. Field can contain up to 10 alphanumeric characters and spaces. |
| Job ID 2: | Optional. Job ID assigned by individual user. This Job ID will appear in the job log. Field can contain up to 10 alphanumeric characters and spaces. |
| Job ID 3: | Optional. Job ID assigned by individual user. This Job ID will appear in the job log. Field can contain up to 10 alphanumeric characters and spaces. |
| Numbers on vertical elevator bar | One number for each possible Fluid Panel. Use the up/down arrow keys to navigate, or enter the desired value in the Fluid: field. |

Typewriter Keyboard

NOTE: When typing numbers, the on-screen keyboard or the ADM number keypad can be used.



Usage Screen

The Usage screen displays information about fluid panel usage and total job dispense volume. The Totalizer fields can be reset.

| 05/20/16 13:58 | | User ID | Usage | Jobs | Events |
|----------------|-----------------|----------------|---------------|--------------------------|--------|
| Power Off | | EQUO: USB Idle | | | |
| # | Grand Total (L) | Valve | Totalizer (L) | Reset | |
| 1 | 14193 | 585 | 0.59 | <input type="checkbox"/> | |
| 2 | 0 | 0 | 0.00 | <input type="checkbox"/> | |
| 3 | 0 | 8 | 0.00 | <input type="checkbox"/> | |
| 4 | 0 | 4 | 0.00 | <input type="checkbox"/> | |
| 5 | 0 | 0 | 0.00 | <input type="checkbox"/> | |
| 6 | 0 | 0 | 0.00 | <input type="checkbox"/> | |
| 7 | 0 | 0 | 0.00 | <input type="checkbox"/> | |
| 8 | 0 | 0 | 0.00 | <input type="checkbox"/> | |
| | | | 0.59 | <input type="checkbox"/> | |

| Field | Description |
|------------------------|---|
| # | Fluid number. Undefined fluid panels are grayed out. |
| Grand Total (L or gal) | Based on the units value selected on Advanced Screen 2. |
| Valve | Number of times the dispense valve has been activated. |
| Totalizer (L or gal) | Based on the units value selected on Advanced Screen 2. |
| Reset | Reset the selected Totalizer value. |

Jobs Screen





The Jobs screen displays the 990 most recent job numbers, recipes, fluid panel numbers, and dispense volumes; with date, time, and User ID. All logs listed can be downloaded on a USB flash drive. See [USB Download Procedure, page 42](#).




| 08/25/16 17:09 | | Usage | Jobs | Events | Home | | |
|----------------|-------|------------------|-------|--------|------|-------|--|
| Power Off | | No Active Errors | | | | | |
| | | | | | | | |
| 12/07/15 | 14:55 | User 1 | 00294 | 3 | 1 | 77 cc | |
| 12/07/15 | 14:01 | User 1 | 00293 | 3 | 1 | 77 cc | |
| 12/07/15 | 12:35 | User 1 | 00292 | 3 | 1 | 76 cc | |
| 12/07/15 | 12:35 | User 1 | 00291 | 3 | 1 | 35 cc | |
| 12/07/15 | 12:34 | User 1 | 00290 | 3 | 1 | 34 cc | |
| 12/07/15 | 12:20 | User 1 | 00289 | 3 | 1 | 34 cc | |
| 12/07/15 | 12:18 | User 1 | 00288 | 3 | 1 | 67 cc | |
| 12/07/15 | 12:17 | User 1 | 00287 | 3 | 1 | 66 cc | |
| 12/04/15 | 19:16 | User 1 | 00286 | 2 | 1 | 12 cc | |
| 12/03/15 | 16:01 | | 00285 | 1 | 2 | 5 cc | |

| Field | Description |
|----------------------------------|---|
| | Date: The date the job occurred. The date format appears in the format selected on advanced screen 1 at the time of the occurrence. If the date format is changed on advanced screen 1 after the job occurs, the date here will remain as it was when the job was completed. |
| | Time: The time the job began. |
| | User ID: User-defined value. If no value has been defined for the selected job, this value is blank. |
| | Job Number: System-assigned as each recipe or station dispense job begins. |
| | Recipe number: Number of the recipe that performed the dispense. If the dispense was done in Station mode or Top Off mode, no recipe number is shown. |
| | Fluid number: Number of the fluid panel that performed the dispense. |
| | Volume: Amount of material dispensed. |
| Numbers on vertical elevator bar | Total number of screens with jobs listed. A system will begin with only one screen number. As a new job is added, it is the top entry on screen 1 and all other jobs move down one position. When screen 1 is full, a new screen is created at the end of the number list. Jobs are moved down to subsequent screens as the list grows. When the maximum number of screens is reached (99), jobs moved off the data at the bottom of the last screen are no longer displayed. The job data will remain available in the job log unless the job log has reached its maximum content. |



Events Screen

The Events screen displays the 990 most recent Event Codes in a log, with date, time, and description. All events can be downloaded on a USB flash drive.

| | | | | | | |
|---|---|--|------------------------------|------|---------|---|
| 05/20/16 13:55 | ← | Jobs | Events | Home | User ID | → |
| Power Off | ↻ | EQUO: USB Idle | | | | |
|  |  |  | | | |  |
| 05/20/16 | 12:55 | EB00-V | Stop Button Pressed | | | 10 |
| 05/20/16 | 12:55 | EAUX-V | USB Busy | | | 11 |
| 05/20/16 | 12:55 | CDG1-V | Duplicate Gateway Modbus TCP | | | 12 |
| 05/20/16 | 12:55 | CDG0-V | Duplicate Gateway Modbus TCP | | | 13 |
| 05/20/16 | 12:55 | CDGX-V | Duplicate Gateway | | | 14 |
| 05/20/16 | 12:55 | CDCF-V | Duplicate Fluid Module 15 | | | 15 |
| 05/20/16 | 12:55 | CDCE-V | Duplicate Fluid Module 14 | | | 16 |
| 05/20/16 | 12:55 | CDCD-V | Duplicate Fluid Module 13 | | | |
| 05/20/16 | 12:55 | CDCC-V | Duplicate Fluid Module 12 | | | |
| 05/20/16 | 12:55 | CDCB-V | Duplicate Fluid Module 11 | | | |

| Field | Description |
|---|--|
|  | Date: The date the event occurred. The date format appears in the format selected on advanced screen 1 the time of the occurrence. If the date format is changed on advanced screen 1 after the event occurs, the date here will remain as it was when the event occurred. |
|  | Time: The time the event occurred. |
|  | Alarm code: Code of the generated event. See Errors, page 47 for more information. |
| Numbers on vertical elevator bar | Total number of screens with events listed. A system will begin with only one screen number. As a new event is added, it is the top entry on screen 1 and all other events move down one position. When screen 1 is full, a new screen is created and added to the number list. Events are moved down to subsequent screens as the list grows. |

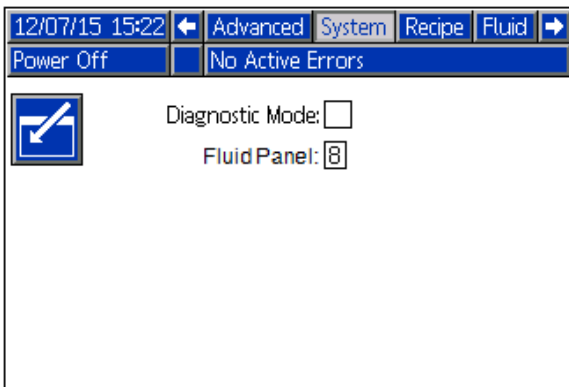
Setup Mode Screens

The ADM will start the Run screens at the Home screen, From the Run screens, press  to access the Setup screens. The system defaults with no password, entered as 0000. If requested, enter the current password then press . Press the left/right arrows to navigate through the Setup Mode screens.

NOTE: Selection fields and buttons that are grayed-out on the screens are not currently active.

System Screen

The System screen includes the following fields which define your system.



| Field | Description |
|-----------------|---|
| Diagnostic Mode | Enables/disables individual fluid flow rates that are displayed on the Run screen. |
| Fluid Panel | The number of fluid panels used in the system. Up to eight fluid panels are possible. |

Recipe Screen

The Recipe screen can be used to create and manage up to 50 recipes. Each line on the Recipe screen corresponds to one dispense batch or time delay within a recipe, with a maximum of ten items per recipe. The first screen contains items 1–5 and the second screen contains items 6–10.

| # | Fluid | Target | Tolerance | Timeout | Order |
|---|-------|--------|-----------|---------|-------|
| 1 | 1 | 100 cc | 0 % | 0 sec | 1 |
| 2 | 2 | 200 cc | 0 % | 0 sec | 2 |
| 3 | 3 | 150 cc | 0 % | 0 sec | 3 |
| 4 | 0 | 0 sec | 0 % | 0 sec | 1 |
| 5 | 0 | 0 sec | 0 % | 0 sec | 1 |

| Field | Description |
|-----------|---|
| Recipe | Enter a value to select a specific recipe. An alternate method for recipe selection can be done by using the up/down arrow keys. |
| Enabled | If an X is displayed in this box, the recipe is available for use by the system. If the box is empty, this recipe is not available for use. Leave this box empty until all items have been defined as desired for this recipe. |
| # | Item number: Each recipe can contain up to 10 items. Multiple items can occur simultaneously. This is not the order in which things will occur. Refer to the Order field to specify which items will occur and their order. |
| Fluid | Number of the fluid panel that will dispense fluid. If a value of 0 is used, this item can define a time value only. All other fields to the right for this item are disabled. A time value can be used to delay when the next item, based on the Order field, will occur. For example, if a time delay is chosen as order 2, the fluid dispensed as order 3 will not dispense until the order 2 duration has completed. NOTE: If a valid fluid has been defined in the past but the field now displays a red background, that fluid is either disabled or offline. If a value is entered for a fluid which has not been defined, such as trying to select a “3” when only fluid panels 1 and 2 exist, this field will display an “0” and set the Order field to “99”. To correct the Order field will require entering a valid fluid value, changing the order field, and then changing the Fluid field back to a “0”. |
| Target | Numeric value (“999” (sec/Oz/cc) or “999.99” (L/gal)) When a non-zero value is entered in the Fluid field, the Target field changes over to the dispense value defined in Fluid Screen, Volume Units Field for this particular fluid. Since different fluids may dispense in different volume units, different values may appear on this screen. See Fluid Screen, page 103 for more information regarding Volume Units. |
| Tolerance | Define how much volume tolerance can occur from the value defined in the Target field before an alarm is triggered. This value only applies to volume shortage or overage. The tolerance is disabled for timer presets. 0 = No tolerance check 1 – 99 = Percentage of deviation short/over Target value that will cause alarm NOTE: A setting of 5 would mean 95-105% of Target value is acceptable. |

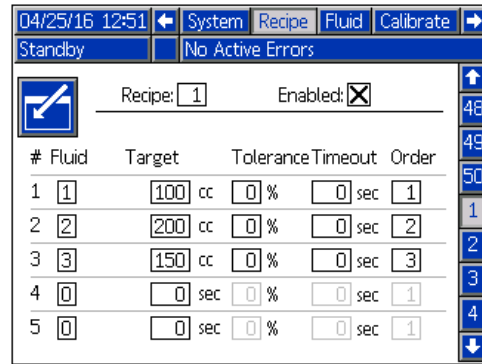
| Field | Description |
|----------------------------------|---|
| Timeout | Allowed time in seconds for dispensing of the selected fluid. The Timeout is disabled for timer presets. 0 = No timeout limit 1 – 99 Number of seconds allowed to dispense; if the Tolerance field is a zero, this value does not apply. |
| Order | Numeric value 0–10. Defines the order in which defined items will occur. Multiple items can occur at the same time. It is not necessary for each item to have a different order number. It is not necessary to use sequential order numbers. NOTE: A value of 99 with a red background will appear if the chosen fluid and entered order number combination have already been defined for this recipe. Check the other screen for this recipe to verify that is the case. 0 = Fluid panel is operating in Station Mode and can dispense at any time during the recipe 1 – 10 = The order to perform the specified items |
| Numbers on vertical elevator bar | Numeric values, 1/2 or 1–50 1 or 2 appear when defining a recipe. During definition, the first screen contains items 1–5 and the second screen contains items 6–10. Items can appear on either screen and do not require entry in sequential or contiguous order. 1–50 appear when a recipe is not being defined. These numbers correlate with available recipes. The desired recipe can be reached using the ADM up/down keys or by entering the desired number in the Recipe field. |

Setup Recipes

Each recipe can contain up to 10 preset items, which appear on 2 separate screens for each recipe. When defining a recipe, the preset items do not require sequential or contiguous entries.

NOTE: Since the unit of dispense depends on the configuration of the fluid panel, it is recommended that the fluid panels be configured before defining recipes.

Presets for a recipe are defined in the recipe screens 1 and 2 for each recipe.



Recipe 1, Screen 1 shown

Recipe Example

For this example, the table defines how the fluid panels are defined for this example system and how the recipe might appear to dispense the following liquids for a motor vehicle:

- 5 quarts of motor oil
- 12.5 quarts of transmission fluid
- 1.5 gallons of water, mixed with 1.5 gallons of antifreeze by dispensing simultaneously but in segments to allow the engine to be started to circulate the liquid.

| Fluid Panel | Fluid | Volume Unit | Required Volume |
|-------------|--------------------|-------------|-------------------------|
| 1 | Water | gal | 1.5 gal |
| 2 | Antifreeze | gal | 1.5 gal |
| 3 | Motor Oil | Oz | 5 quarts (160 Oz) |
| 4 | Transmission Fluid | gal | 12.5 quarts (3.125 gal) |

The desired order of events will be:

1. Dispense all needed motor oil within 10 minutes.
2. Dispense all needed transmission fluid within 10 minutes after the motor oil is dispensed.
3. Dispense 0.5 gal each of water and antifreeze simultaneously.
4. Allow 60 seconds to start engine so that coolant can begin circulation.
5. Dispense remaining water and antifreeze simultaneously within 3 minutes.

NOTE: The failure to dispense remaining water and antifreeze could result in the engine overheating. If the dispense has not been completed within that time, an alarm will result.

To perform these steps will require the recipe to be configured as follows:

NOTE: When a non-zero value is entered in the Target field, the Volume units will change to reflect the setting for that fluid in the Fluid screen. If they are not in the units desired, it will be necessary to either change them on the Fluid screen, or convert the desired volume to the Volume units shown on the screen.

| # | Fluid | Target | Tolerance (%) | Timeout (sec) | Order |
|---|-------|--------|---------------|---------------|-------|
|---|-------|--------|---------------|---------------|-------|

Entries on screen 1:

| | | | | | |
|---|---|-------------|---|-----|---|
| 1 | 3 | 160 (Oz) | 0 | 600 | 1 |
| 2 | 4 | 3.125 (gal) | 0 | 600 | 2 |
| 3 | 1 | 0.5 (gal) | 0 | 0 | 3 |
| 4 | 2 | 0.5 (gal) | 0 | 0 | 3 |
| 5 | 0 | 60 (sec) | — | — | 4 |

Entries on screen 2:

| | | | | | |
|----|---|-----------|---|-----|---|
| 6 | 1 | 1.0 (gal) | 0 | 180 | 5 |
| 7 | 2 | 1.0 (gal) | 0 | 180 | 5 |
| 8 | — | — | — | — | — |
| 9 | — | — | — | — | — |
| 10 | — | — | — | — | — |

Verify that the Volume units are for the quantities desired for this recipe.

Select the Enabled checkbox, making this recipe available for dispensing.

Fluid Screen

The Fluid screen is used to manage fluids and their units, and whether they are dispensed manually or by a preset recipe.


Fluid Screen

Fluid Screen with Auto Adjust

Fluid Screen in Station Mode

Fluid Screen with Fluid Disabled

| Field | Description |
|------------|---|
| Fluid: | The number of the fluid panel being defined. If a fluid panel does not exist with the selected number, it will not remain, but will revert to an "8" with a red background. |
| Enabled: | Used to make the selected fluid available for use by recipes or by the fluid panel being operated in station mode. Station mode fluid dispensing is controlled by a remote operator station at the fluid panel. Selected: This fluid can be dispensed. Deselected: This fluid can not be dispensed. |
| FCM3 ID: | Indicates the FCM number within the system layout. Valid values 0–3, depending on total number of fluid panels installed. |
| FCM3 Port: | Select which FCM ports the selected fluid panel is connected to. Blue (1,4) Red (2,3) |

| Field | Description |
|----------------|---|
| Fluid Name: | Alphanumeric field. Select the  key to display the on-screen keyboard. Enter a name for the selected fluid panel. Maximum name length 10 characters. An entry is not required. |
| K Factor: | Numeric value (0.001–999.999). Default value = 0.119. Enter the K-factor for the flow meter used on the selected fluid panel. To determine the exact value to enter, run calibration on this fluid plate. See Calibrate Screen, page 106 . |
| Volume Units: | Select the desired units of volume to use during dispensing. <ul style="list-style-type: none"> • cc • Oz • L • gal <p>NOTE: Changing this setting after recipes have been created can result in dispensing error. Always review recipes after changing this setting.</p> |
| Leak : | The allowed tolerance before a leak triggers an alarm. Leak detection is active in Standby, On, and Pause modes; and monitors leak volume within past minute. <ul style="list-style-type: none"> • Range — 0.0–99.9 cc/min • Default — 0.0 cc/min |
| Settling Time: | Enter the time necessary for the system to physically settle after dispense is done. <ul style="list-style-type: none"> • Range — 0.00–99.99 sec • Default — 0.00 sec |
| Auto Adjust: | Selecting “Auto Adjust” will allow the system to compensate for dispense overshoots. |
| Mode: | Toggles between Recipe and Station modes. <ul style="list-style-type: none"> • Recipe — Fluid dispense controlled by recipe. • Station — Each fluid panel acts as independent fluid dispenser with the following Station-only options: <ul style="list-style-type: none"> – Stop – Target – Tolerance – Timeout – Top Off |
| Stop Btn.: | Configure the function of the Stop button for the remote operator station. <ul style="list-style-type: none"> • Standby — The Stop button will finish dispense at any given time by putting system in standby. • Pause — The Stop button will pause the current dispense. The dispense Timeout timer (if configured) will continue running. • Pause-Standby — The Stop button will pause the current dispense, or will finish dispense if the button is held for two seconds. |

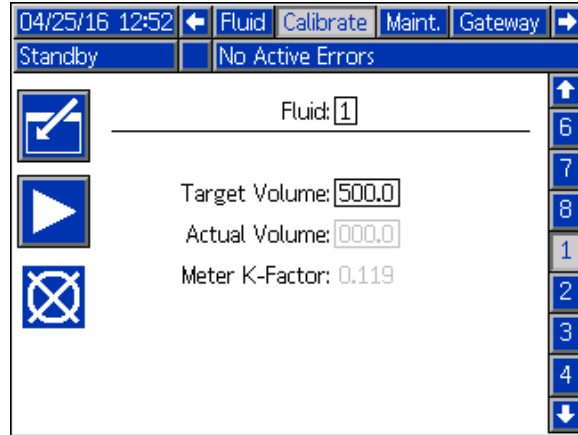
| Field | Description |
|----------------------------------|---|
| Target (cc, Oz, L, gal): | <p>Enter the target dispense volume for Station mode.</p> <ul style="list-style-type: none"> • Range (gal and L) — 0–999.99 • Range (Oz and cc) — 0–999 • Default — 0 <p>NOTE: Target is reset on unit change.</p> |
| Tolerance (%): | <p>Enter the allowed dispense tolerance, as a percentage, before an alarm is triggered.</p> <ul style="list-style-type: none"> • Range — 0 (Tolerance off) - 99% • Default — 0% |
| Timeout (sec): | <p>Enter the allowed time to dispense before the timeout alarm is triggered.</p> <ul style="list-style-type: none"> • Range — 0 (no Timeout) - 999 sec • Default — 0 sec |
| Top Off (sec) | <p>Enter the allowed time to “top off”, after which the system will go into Standby mode.</p> <ul style="list-style-type: none"> • Range — 0–999 sec • Default — 0 sec |
| Numbers on vertical elevator bar | <p>One number for each possible Fluid Panel. Use the up/down arrow keys to navigate, or enter the desired value in the Fluid field.</p> |

Some fields are only available for edit if the fluid panel is in Station Mode. These fields are only applicable when the fluid panel is dispensing while in Station Mode. If a recipe calls for this fluid panel

to dispense while in Station Mode, the recipe must specify the amount to dispense and have an Order of 0 for this fluid panel.

Calibrate Screen

The Calibrate screen is used to individually calibrate each fluid panel flow meter.



| Field | Description |
|----------------------------------|---|
| Fluid: | Displays the current fluid panel. Enter a number of a different panel or use the up/down arrows to select another fluid panel. |
| Target Volume: | Enter the target calibration volume (in cc). <ul style="list-style-type: none"> • Range — 0–999.9 • Default — 500 |
| Actual Volume: | Set/enter the actual calibration volume (in cc) dispensed. <ul style="list-style-type: none"> • Range — 0–999.9 • Default — 0 |
| Meter K-Factor: | Displays the calculated K-Factor. This value can only be changed on the Fluid Screen. See Fluid Screen, page 103 . |
| Numbers on vertical elevator bar | One number for each possible Fluid Panel. Use the up/down arrow keys to navigate, or enter the desired value in the Fluid: field. |

Calibration Procedure

Prior to dispensing fluids in a production environment, it is necessary to calibrate each fluid panel to ensure accurate dispense.

NOTE: Prior to performing this procedure, the supply line must be loaded and pressurized. See [Loading Fluid Lines, page 36](#).

Navigate to the Calibrate screen on the ADM.

1. Select the fluid panel to calibrate by using the Up/Down arrows or entering the fluid panel number in the **Fluid** field.
2. Enter the target calibration volume in the **Target Volume** field.
3. Use a calibrated beaker able to measure the targeted calibration volume.

4. Press Play softkey to start calibration.

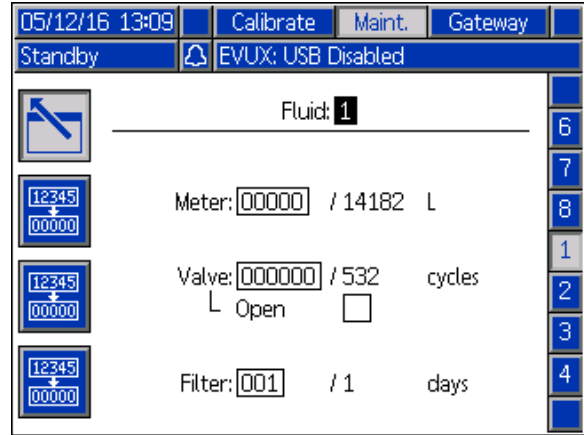
NOTE: The beaker collecting the sample must be positioned to collect the sample from the dispense location for the selected fluid. The dispense tool must be opened to enable fluid dispense into the beaker.
5. Wait for the fluid to be dispensed into the beaker.

NOTE: After the fluid is dispensed, close the dispense tool.
6. In the **Actual Volume** field, enter the actual volume measured in the beaker to calculate and save the K-Factor for the current fluid.

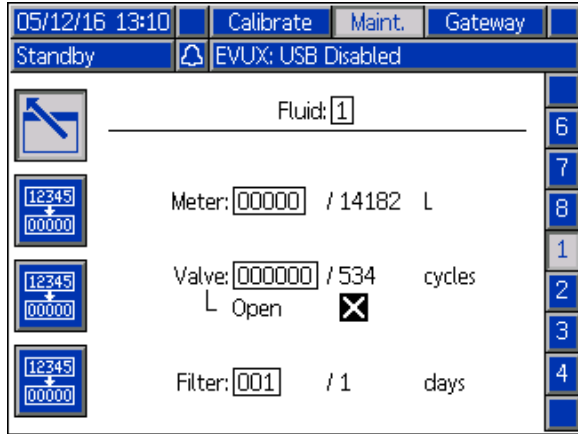
NOTE: You can press the Cancel softkey to cancel calibration. Calibration will also be cancelled if you leave the Calibrate screen.

Maintenance Screen

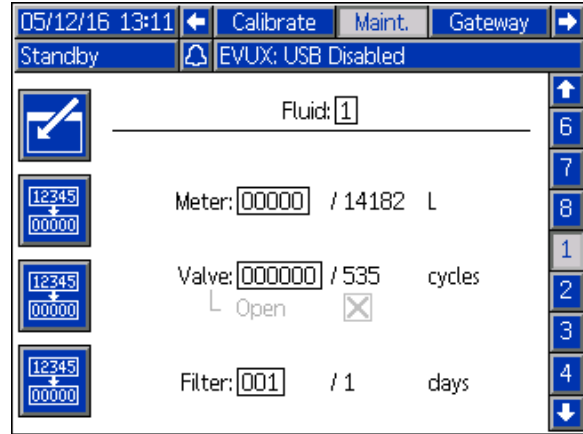
The Maintenance screen is used to set the alarm targets for meter volume, valve cycles, and filter calendar days. Each can be reset using the corresponding Reset softkey.



| Field | Description |
|----------------------------------|---|
| Fluid | Displays the current fluid panel. Enter a number of a different panel or use the up/down arrows to select another fluid panel. |
| Meter: | Enter the target meter volume. The actual meter volume is displayed to the right of the editable field. <ul style="list-style-type: none"> • Range — 0–99999 • Default — 0 |
| Valve: | Enter the target valve cycle. The actual valve cycles is displayed to the right of the editable field. <ul style="list-style-type: none"> • Range — 0–9999999 • Default — 0 <p>NOTE: Valve operation can be checked manually by toggling the Open check box. The Open check box will be grayed out when not available for editing.</p> |
| Open: | Select to open the fluid panel valve for maintenance or troubleshooting. |
| Filter: | Enter the target filter calendar days. The actual calendar days are displayed to the right of the editable field. <ul style="list-style-type: none"> • Range — 0–999 • Default — 0 |
| Numbers on vertical elevator bar | One number for each possible Fluid Panel. Use the up/down arrow keys to navigate, or enter the desired value in the Fluid: field. |



Maintenance Screen — Valve Open and available for editing



Maintenance Screen — Valve Open and not available for editing

Setup Maintenance Schedule / Parameters

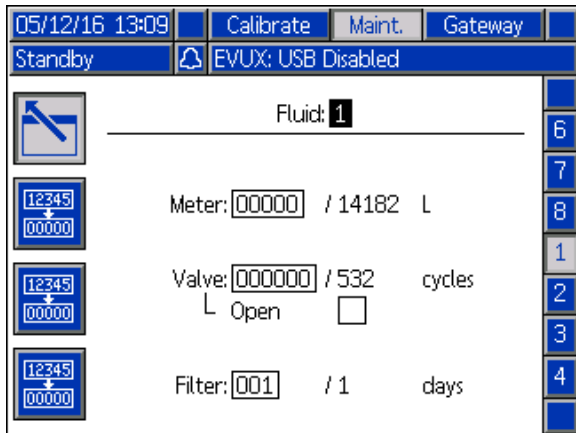
Maintenance schedule values will need to be entered for each installed fluid panel.

NOTE: Parameter values of zero will not generate a maintenance advisory for that parameter.

Set the value that will trigger a maintenance advisory for the flow meter, fluid panel valve, and supply line filter.

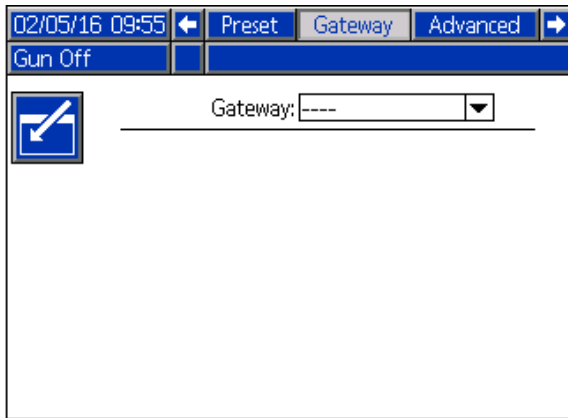
The actual value column, shown to the right of the slash (/) displays the current totalizer value. If this value exceeds the set limit, the value will turn red and a maintenance advisory is issued. See [Maintenance Screen, page 107](#) for more information about maintenance totalizers.

After a maintenance value causes an advisory, a new value which is higher than the actual reading must be entered.



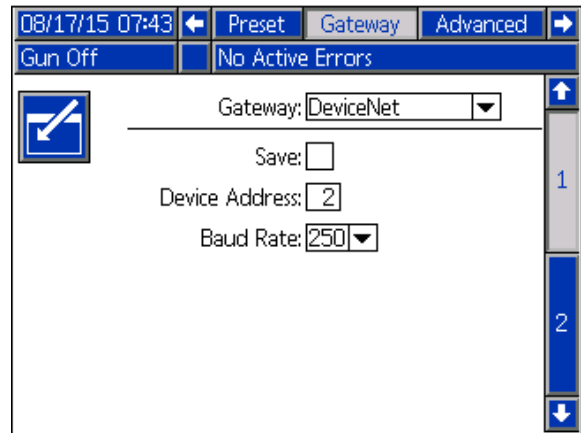
Gateway Screen

If your system has no gateway installed, the following screen displays when the Gateway tab is selected.



DeviceNet Gateway Screen 1

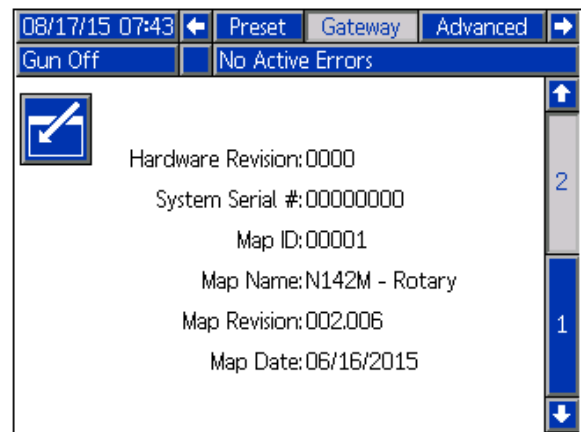
Use this screen to enter and save DeviceNet configuration information.



- Enter the address used to identify the device on the DeviceNet network (0-63).
- Select the desired baud rate from the dropdown menu.
 - 125 kbps
 - 250 kbps
 - 500 kbps
- Check the Save box to write the settings to the Gateway. (Wait) displays on the screen to indicate changes are being applied.

DeviceNet Gateway Screen 2

This screen displays the hardware revision number, system serial number, map ID, map name, map revision number, and map install date.



EtherNet/IP Gateway Screen 1

Use this screen to enter and save EtherNet/IP configuration information.

- Enter the DHCP address, the IP address, the subnet mask, the Gateway address, DNS 1, and DNS 2.
- Check the Save box to write the settings to the Gateway.

EtherNet/IP Gateway Screen 2

This screen displays the hardware revision number, system serial number, map ID, map name, map revision number, and map install date.

Modbus TCP Gateway Screen

Use this screen to enter and save Modbus TCP configuration information.

- Make sure the Enable box is unchecked.
- Enter the DHCP address, the IP address, the subnet mask, the Gateway address, DNS 1, and DNS 2.
- Check the Enable box to write the settings to the Gateway.

PROFINET Gateway Screen 1

Use this screen to enter and save PROFINET configuration information.

- Enter the DHCP address, the IP address, the subnet mask, the Gateway address, DNS 1, and DNS 2.
- Check the Save box to write the settings to the Gateway.

PROFINET Gateway Screen 2

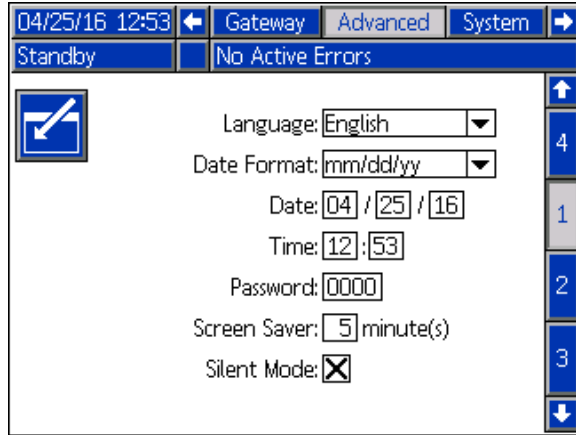
This screen displays the device address, install date, function tag, and system description.

PROFINET Gateway Screen 3

This screen displays the hardware revision number, system serial number, map ID, map name, map revision number, and map install date.

Advanced Screen 1

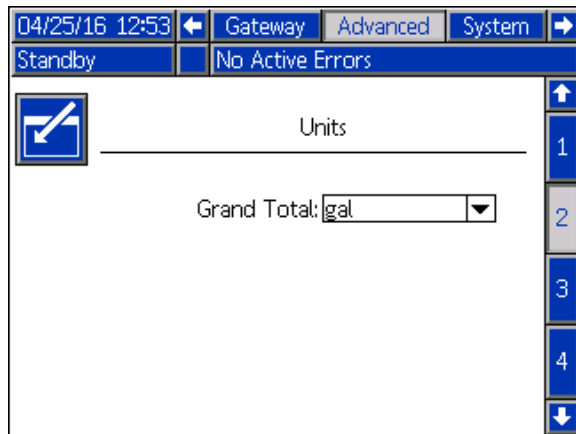
Advanced screen 1 sets the following display parameters.



| Field | Description |
|----------------------------------|---|
| Language: | Define the language all screens will display. Select one of the following. <ul style="list-style-type: none"> • English (default) • Spanish (Spain) • French (France) • German • Japanese • Chinese (Simplified) • Korean • Dutch • Italian • Portuguese (Portugal) • Swedish • Russian |
| Date Format: | Select mm/dd/yy, dd/mm/yy, or yy/mm/dd. |
| Date: | Enter the date, using the format selected. Use two digits for the month, day, and year. |
| Time: | Enter current time in hours (24 hour clock) and minutes. Seconds are not adjustable. |
| Password: | The password is only used to enter Setup mode. The default is 0000, which means no password is required to enter Setup. If a password is desired, enter a number from 0001 to 9999. NOTE: Be sure to write down the password and keep it in a secure location. |
| Screen Saver: | Select the desired screen timeout in minutes (00-99). 5 is the default. Select zero (0) to disable the screen saver. |
| Silent Mode: | Select Silent Mode to disable the alarm buzzer and audible feedback. |
| Numbers on vertical elevator bar | Represents which Advanced Screen is selected. Use the up/down arrows to move between Advanced screens. |

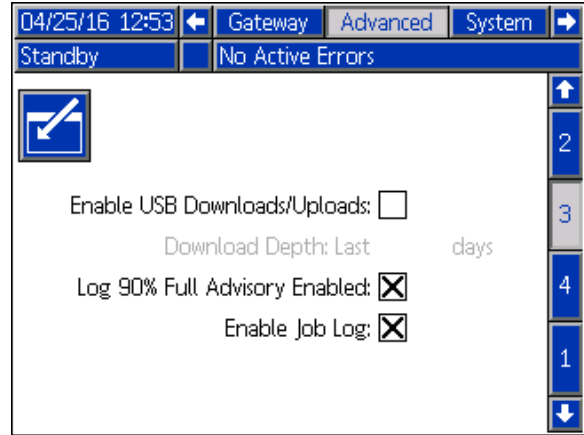
Advanced Screen 2

Advanced screen 2 sets display units (US or metric).



Advanced Screen 3

Advanced screen 3 enables USB downloads and uploads.



| Field | Description |
|--------------------------------|---|
| Enable USB Downloads/Uploads: | Select this box to enable USB downloads and uploads. Enabling USB activates the Download Depth field. |
| Download Depth: | Enter the number of days for which you want to retrieve data. For example, to retrieve data for the previous week, enter 7. |
| Log 90% Full Advisory Enabled: | Enabled by default. When enabled, the system will issue an advisory if the memory log has reached 90% of capacity. Perform a download to avoid loss of data. NOTE: If memory capacity is reached, the oldest data is lost as new data is generated. |
| Enable Job Log: | Select this box to enable the job log. NOTE: If job log data exists and this box is deselected, the existing data is retained, but no new data will be generated. |

Advanced Screen 4

Advanced screen 4 displays the software part numbers and versions for the system components. This is not an editable screen.

The screenshot shows a table with the following data:

| Module | Software Part # | Software Version |
|-------------------|-----------------|------------------|
| Advanced Display | 17F412 | 0.02.016 |
| USB Configuration | 17F414 | 0.02.006 |
| Fluid Plate - 0 | 17F416 | 0.02.016 |
| Fluid Plate - 1 | 17F416 | 0.02.016 |
| Gateway MBTCP - 0 | 16V799 | 1.02.001 |

The screenshot also shows the same top status bar and navigation elements as Advanced Screen 3.

Appendix B - System Design

Power

The finished system is limited to a power level of 100 Watts. When defining how the system will be used, it is important to ensure that power demand at any given moment does not exceed the available power.

| Item | Power Requirement |
|--------------------------------|---|
| Control Panel with FCM and ADM | 25 W |
| Fluid panel | |
| 26A071 | Solenoid – 14.64 W max The power consumption for the meter being supplied by the customer must be added into this value if it will draw power from the ProDispense system. |
| 26A129 | Solenoid – 14.64 W max Meter – 0.4 W |
| 26A130 | Solenoid – 14.64 W max Meter – 0.16 W |
| 26A131 | Solenoid – 5.4 W Meter – 0.16 W |
| 26A132 | Solenoid – 5.4 W Meter – 0.16 W |
| 26A165 | Solenoid – 5.4 W Meter – 0.16 W |
| 26A247 | Solenoid – 5.4 W Meter – 15.6 W |
| Light Bar Accessory | Negligible |
| Remote Operator Station | Negligible |
| FCM | Negligible |
| CGM | Negligible |

System size

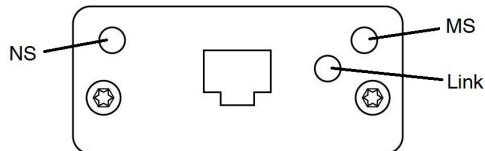
The maximum distance a system can cover is approximately 250 feet from one side to another. This limitation is because of the maximum length of the communication cables used to configure the system.

Appendix C - Communications Gateway Module

Install Fieldbus Connections

Connect cables to fieldbus per fieldbus standards.

PROFINET



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

Network Status (NS)

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

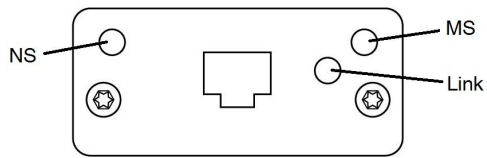
Module Status (MS)

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

Link/Activity (Link)

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

EtherNet/IP



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

Network Status (NS)

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

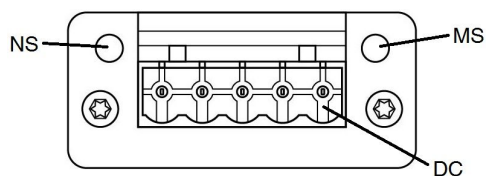
Module Status (MS)

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

Link/Activity (Link)

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

DeviceNet



Network Status (NS)

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

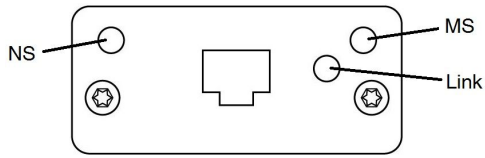
Module Status (MS)

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

DeviceNet Connector (DC)

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

Modbus TCP



The Ethernet interface supports 10/100 Mbit, full or half duplex operation.

Network Status (NS)

| State | Description |
|----------------|--|
| Off | No power or no IP address |
| Green | Connection established. Module is in the Process Active state or the Idle state. |
| Flashing Green | Waiting for connection |
| Red | Duplicate IP address or FATAL error |
| Flashing Red | Process Active timeout |

Module Status (MS)

| State | Description |
|---|---|
| Off | No power |
| Green | No operation |
| Red | Major fault. The module is in the state of EXCEPTION (or FATAL event) |
| Flashing Red | Minor fault in diagnostic object or IP conflict |
| Flashing Red (3 flashes, pause, repeat) | The host of the mapped property is not responding. <ul style="list-style-type: none"> • Check whether all system devices are powered on. • Check cabling between all system devices |
| Flashing Red (4 flashes, pause, repeat) | The host device (ADM) has not initiated property mapping <ul style="list-style-type: none"> • Disable and then re-enable the module from the ADM |
| Flashing Red (5 flashes, pause, repeat) | The module is not connected <ul style="list-style-type: none"> • Verify that the module is connected |
| | The system has an invalid network configuration <ul style="list-style-type: none"> • Ensure proper network configuration |

Link/Activity (Link)

| State | Description |
|----------------|--|
| Off | No Link, no communication present |
| Green | Link established, no communication present |
| Flashing Green | Link established, communication present |

CGM I/O Data Map

All variables are little-endian 32-bit (long word) unsigned integers. The order is presented in high-byte/low-byte order during data transfer.

Automation Inputs (signals from ProDispense via Ethernet/IP, PROFINET, DeviceNet)

| Byte | Description | Zone |
|------|--|-----------|
| 0 | Current System State | System |
| | 0 = Uninitialized 1 = Standby Off 2 = Standby On 3 = Dispensing >3 = not valid | |
| 4 | Current Recipe | System |
| | 0 = no recipe active 1-50 = recipe number >50 = not valid | |
| 8 | Current Job Number | System |
| | System-assigned job number | |
| 12 | Fluid Panel State | Fluid 1 |
| 16 | Fluid Panel State | Fluid 2 |
| 20 | Fluid Panel State | Fluid 3 |
| 24 | Fluid Panel State | Fluid 4 |
| 28 | Fluid Panel State | Fluid 5 |
| 32 | Fluid Panel State | Fluid 6 |
| 36 | Fluid Panel State | Fluid 7 |
| 40 | Fluid Panel State | Fluid 8 |
| 44 | Current Job Volume | Fluid 1 |
| 48 | Current Job Volume | Fluid 2 |
| 52 | Current Job Volume | Fluid 3 |
| 56 | Current Job Volume | Fluid 4 |
| 60 | Current Job Volume | Fluid 5 |
| 64 | Current Job Volume | Fluid 6 |
| 68 | Current Job Volume | Fluid 7 |
| 72 | Current Job Volume | Fluid 8 |
| | Values apply for each Fluid Panel 0 = Uninitialized 1 = Disabled 2 = Offline 3 = Standby Off 4 = Standby On 5 = Dispensing 6 = Pausing >6 = reserved | |
| | Values (in cc) apply for each Fluid Panel (value is represented with the last 2 digits being hundredths of a cc) For example, a value of 1250 = 12.50 cc | |
| 76 | Fluid Panel Event Raised | Fluid 1-8 |
| | 0 = Fluid Panel 1 1 = Fluid Panel 2 2 = Fluid Panel 3 3 = Fluid Panel 4 4 = Fluid Panel 5 5 = Fluid Panel 6 6 = Fluid Panel 7 7 = Fluid Panel 8 >7 = not valid | |

Appendix C - Communications Gateway Module

| Byte | Description | Zone |
|--|-------------------|--------|
| 80 | Displayed Event | System |
| <p>Values apply for each Fluid Panel 0 = Communication Error 1 = General Fluid Panel Error 2 = Hardware Dispense Valve Error 3 = Hardware Flow Meter Error 4 = Hardware Regulator Error 5 = Hardware Operator Station Error 6 = Dispense No Flow 7 = Dispense Timeout 8 = Dispense Tolerance 9 = System Fluid Leak 10 = Advisory Job Rollover 11 = Advisory Grand Total Rollover >11 = not valid</p> | | |
| Command interface | | |
| 84 | Command Status | System |
| <p>0 = NOP (default state, ready for command processing) 1 = Busy (current command being processed; no new incoming commands accepted) 2 = Ack (command successfully processed) 3 = Nak* 4 = Error* NOTE: Nak or Error indicates unsuccessful command processing. Possible issues:</p> <ul style="list-style-type: none"> • Wrong command • Wrong command arguments <p>*System is ready for command processing</p> | | |
| 88 | Command Return 1 | System |
| 92 | Command Return 2 | System |
| 96 | Command Return 3 | System |
| 100 | Command Return 4 | System |
| 104 | Command Return 5 | System |
| 108 | Command Return 6 | System |
| 112 | Command Return 7 | System |
| 116 | Command Return 8 | System |
| 120 | Command Return 9 | System |
| 124 | Command Return 10 | System |
| 128 | Command Return 11 | System |
| 132 | Command Return 12 | System |
| 136 | Command Return 13 | System |
| 140 | Command Return 14 | System |
| 144 | Command Return 15 | System |

Automation Outputs (signals to ProDispense via Ethernet/IP, PROFINET, DeviceNet)

| Byte | Description | Zone | |
|-------------------|---------------------|--|--------|
| 0 | Set Current Recipe | 0 = no recipe active 1-50 = recipe number >50 = not valid | System |
| 4 | Set System State | 0 = Uninitialized 1 = Standby Off 2 = Standby On 3 = Dispense >3 = not valid | System |
| 8 | Set Job Number | User-assigned job number | System |
| Command interface | | | |
| 12 | Command Argument 1 | Instructions to the ProDispense from the Automation (PLC) source. The number of arguments required vary by type of command being sent. The available commands are listed in byte 72 below. | System |
| 16 | Command Argument 2 | | System |
| 20 | Command Argument 3 | | System |
| 24 | Command Argument 4 | | System |
| 28 | Command Argument 5 | | System |
| 32 | Command Argument 6 | | System |
| 36 | Command Argument 7 | | System |
| 40 | Command Argument 8 | | System |
| 44 | Command Argument 9 | | System |
| 48 | Command Argument 10 | | System |
| 52 | Command Argument 11 | | System |
| 56 | Command Argument 12 | | System |
| 60 | Command Argument 13 | | System |
| 64 | Command Argument 14 | | System |
| 68 | Command Argument 15 | | System |
| 72 | Command ID | 0 = NOP 1 = Write user ID (5 arguments) 2 = Write recipe (8 arguments) 3 = Write fluid panel command (5 arguments) 4 = Write fluid panel configuration (12 arguments) 100 = Read user ID (2 arguments) 101 = Read recipe (2 arguments) 102 = Read job record (1 argument) 103 = Read event record (1 argument) 104 = Read fluid panel status (1 argument) 105 = Read fluid panel configuration (1 argument) NOTE: See Command Process, page 128 for how to present arguments and what information is returned. | System |

Automation Inputs (signals from ProDispense via Modbus TCP)

| Register | Description | | Zone |
|----------|----------------------|--|---------|
| 40100 | Current System State | 0 = Uninitialized 1 = Standby Off 2 = Standby On 3 = Dispensing >3 = not valid | System |
| 40102 | Current Recipe | 0 = no recipe active 1-50 = recipe number >50 = not valid | System |
| 40104 | Current Job Number | System-assigned job number | System |
| 40106 | Fluid Panel State | Values apply for each Fluid Panel 0 = Uninitialized 1 = Disabled 2 = Offline 3 = Standby Off 4 = Standby On 5 = Dispensing 6 = Pausing >6 = reserved | Fluid 1 |
| 40108 | Fluid Panel State | | Fluid 2 |
| 40110 | Fluid Panel State | | Fluid 3 |
| 40112 | Fluid Panel State | | Fluid 4 |
| 40114 | Fluid Panel State | | Fluid 5 |
| 40116 | Fluid Panel State | | Fluid 6 |
| 40118 | Fluid Panel State | | Fluid 7 |
| 40120 | Fluid Panel State | | Fluid 8 |
| 40122 | Fluid Panel Status | Register number shown for each fluid has bits with assigned purpose; next sequential register is not used Values apply for each Fluid Panel Bit Definitions: 0 = Flow meter enabled 1 = Flow meter volume reset 2 = Valve state (0=off, 1=on) 3 = Valve triggered 4 = Dispense pause 5 = Dispense top off 6 = Dispense complete 7 = Job complete 8-15 unused | Fluid 1 |
| 40124 | Fluid Panel Status | | Fluid 2 |
| 40126 | Fluid Panel Status | | Fluid 3 |
| 40128 | Fluid Panel Status | | Fluid 4 |
| 40130 | Fluid Panel Status | | Fluid 5 |
| 40132 | Fluid Panel Status | | Fluid 6 |
| 40134 | Fluid Panel Status | | Fluid 7 |
| 40136 | Fluid Panel Status | | Fluid 8 |

| Register | Description | | Zone |
|----------|--------------------|---|---------|
| 40138 | Fluid Panel Events | Register number shown for each fluid has bits with assigned purpose; next sequential register is not used Values apply for each Fluid Panel Bit Definitions: 0 = Communication error 1 = General fluid panel error 2 = Hardware dispense valve error 3 = Hardware flow meter error 4 = Hardware regulator error 5 = Hardware operator station error 6 = Dispense no flow 7 = Dispense timeout 8 = Dispense tolerance 9 = System fluid leak 10 = Advisory job rollover 11 = Advisory grand total rollover 12-15 = unused | Fluid 1 |
| 40140 | Fluid Panel Events | | Fluid 2 |
| 40142 | Fluid Panel Events | | Fluid 3 |
| 40144 | Fluid Panel Events | | Fluid 4 |
| 40146 | Fluid Panel Events | | Fluid 5 |
| 40148 | Fluid Panel Events | | Fluid 6 |
| 40150 | Fluid Panel Events | | Fluid 7 |
| 40152 | Fluid Panel Events | | Fluid 8 |
| 40154 | Current Job Volume | Values (in cc) apply for each Fluid Panel (value is represented with the last 2 digits being hundredths of a cc) For example, a value of 1250 = 12.50 cc | Fluid 1 |
| 40156 | Current Job Volume | | Fluid 2 |
| 40158 | Current Job Volume | | Fluid 3 |
| 40160 | Current Job Volume | | Fluid 4 |
| 40162 | Current Job Volume | | Fluid 5 |
| 40164 | Current Job Volume | | Fluid 6 |
| 40166 | Current Job Volume | | Fluid 7 |
| 40168 | Current Job Volume | | Fluid 8 |
| 40170 | Last Job Volume | Values (in cc) apply for each Fluid Panel (value is represented with the last 2 digits being hundredths of a cc) For example, a value of 1250 = 12.50 cc | Fluid 1 |
| 40172 | Last Job Volume | | Fluid 2 |
| 40174 | Last Job Volume | | Fluid 3 |
| 40176 | Last Job Volume | | Fluid 4 |
| 40178 | Last Job Volume | | Fluid 5 |
| 40180 | Last Job Volume | | Fluid 6 |
| 40182 | Last Job Volume | | Fluid 7 |
| 40184 | Last Job Volume | | Fluid 8 |
| 40186 | Current Flow | Flow in cc/min. Value has fixed-point value with the lower 10 digits being the value to the right of the decimal point. To obtain the integer value, ignore the lowest 10 digits. Values apply for each Fluid Panel | Fluid 1 |
| 40188 | Current Flow | | Fluid 2 |
| 40190 | Current Flow | | Fluid 3 |
| 40192 | Current Flow | | Fluid 4 |
| 40194 | Current Flow | | Fluid 5 |
| 40196 | Current Flow | | Fluid 6 |
| 40198 | Current Flow | | Fluid 7 |
| 40200 | Current Flow | | Fluid 8 |

| Register | Description | | Zone |
|----------|--------------------------|--|---------|
| 40202 | Dispense Target | Values (in cc) apply for each Fluid Panel (value is represented with the last 2 digits being hundredths of a cc) For example, a value of 1250 = 12.50 cc | Fluid 1 |
| 40204 | Dispense Target | | Fluid 2 |
| 40206 | Dispense Target | | Fluid 3 |
| 40208 | Dispense Target | | Fluid 4 |
| 40210 | Dispense Target | | Fluid 5 |
| 40212 | Dispense Target | | Fluid 6 |
| 40214 | Dispense Target | | Fluid 7 |
| 40216 | Dispense Target | | Fluid 8 |
| 40218 | Dispense Tolerance | Values (in percent) apply for each Fluid Panel For example, a value of 12 = 12% | Fluid 1 |
| 40220 | Dispense Tolerance | | Fluid 2 |
| 40222 | Dispense Tolerance | | Fluid 3 |
| 40224 | Dispense Tolerance | | Fluid 4 |
| 40226 | Dispense Tolerance | | Fluid 5 |
| 40228 | Dispense Tolerance | | Fluid 6 |
| 40230 | Dispense Tolerance | | Fluid 7 |
| 40232 | Dispense Tolerance | | Fluid 8 |
| 40234 | Grand Total Volume | Values (in cc) apply for each Fluid Panel | Fluid 1 |
| 40236 | Grand Total Volume | | Fluid 2 |
| 40238 | Grand Total Volume | | Fluid 3 |
| 40240 | Grand Total Volume | | Fluid 4 |
| 40242 | Grand Total Volume | | Fluid 5 |
| 40244 | Grand Total Volume | | Fluid 6 |
| 40246 | Grand Total Volume | | Fluid 7 |
| 40248 | Grand Total Volume | | Fluid 8 |
| 40250 | Fluid Panel Event Raised | Register number 40250 has bits with assigned purpose; register 40251 is not used. A fluid panel event is indicated by a value of 1 in the bit position attributed to the applicable fluid panel. NOTE: It is possible for multiple panels to have an event indicated. Bit Definition: 0 = Fluid Panel 1 1 = Fluid Panel 2 2 = Fluid Panel 3 3 = Fluid Panel 4 4 = Fluid Panel 5 5 = Fluid Panel 6 6 = Fluid Panel 7 7 = Fluid Panel 8 8-15 unused | System |
| 40252 | Displayed Event | | System |

| Register | Description | | Zone |
|-------------------|-------------------|--|--------|
| Command interface | | | |
| 40900 | Command Status | 0 = NOP (default state, ready for command processing) 1 = Busy (current command being processed; no new incoming commands accepted) 2 = Ack (command successfully processed) 3 = Nak* 4 = Error* NOTE: Nak or Error indicates unsuccessful command processing. Possible issues: <ul style="list-style-type: none"> • Wrong command • Wrong command arguments *System is ready for command processing | System |
| 40902 | Command Return 1 | Values in these registers depend on the command that was received. For information regarding the values, see the Command Structures, page 129 section and locate the command that was sent to determine the expected responses. | System |
| 40904 | Command Return 2 | | System |
| 40906 | Command Return 3 | | System |
| 40908 | Command Return 4 | | System |
| 40910 | Command Return 5 | | System |
| 40912 | Command Return 6 | | System |
| 40914 | Command Return 7 | | System |
| 40916 | Command Return 8 | | System |
| 40918 | Command Return 9 | | System |
| 40920 | Command Return 10 | | System |
| 40922 | Command Return 11 | | System |
| 40924 | Command Return 12 | | System |
| 40926 | Command Return 13 | | System |
| 40928 | Command Return 14 | | System |
| 40930 | Command Return 15 | | System |

Automation Outputs (signals to ProDispense via Modbus TCP)

| Register | Description | | Zone |
|----------|--------------------|--|--------|
| 40400 | Set Current Recipe | 0 = no recipe active, reset fluid panel presets 1-50 = recipe number >50 = not valid | System |
| 40402 | Set System State | 0 = Uninitialized 1 = Standby Off 2 = Standby On 3 = Dispense >3 = not valid | System |

Appendix C - Communications Gateway Module

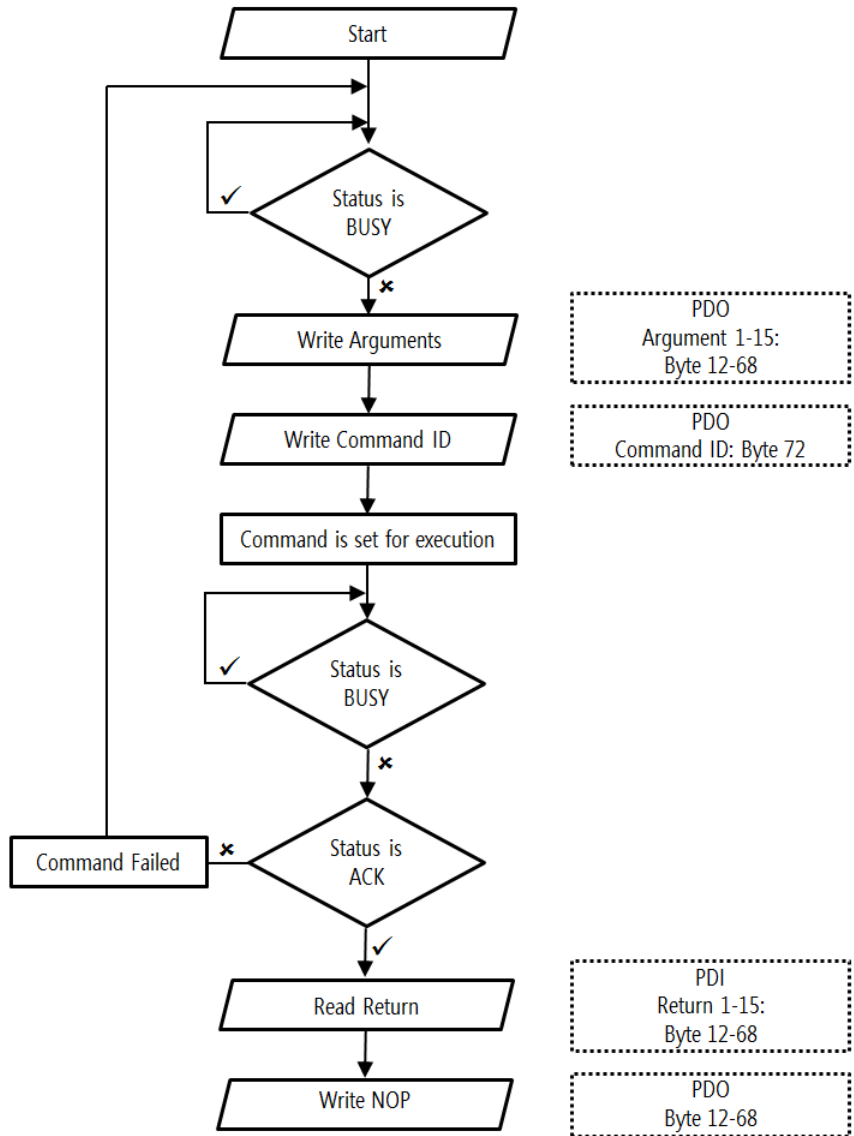
| Register | Description | | Zone |
|-------------------|------------------------|---|---------|
| 40404 | Set Job Number | User-assigned job number to be used with the current job Range allowed = 0-99999 | System |
| 40406 | Set Recipe | | System |
| 40408 | System State | 0 = Uninitialized 1 = Standby Off 2 = Standby On 3 = Dispense >3 = not valid | System |
| 40410 | Job Number | User-assigned job number to be used with the current job | System |
| 40412 | Grand Total Units | | System |
| 40414 | Number of Fluid Panels | Define the number of installed fluid panels 1-8 = Quantity installed >8 = not valid | System |
| 40416 | Fluid Panel Enabled | Values apply for each Fluid Panel 0 = Not enabled 1 = Enabled >1 not valid | Fluid 1 |
| 40418 | Fluid Panel Enabled | | Fluid 2 |
| 40420 | Fluid Panel Enabled | | Fluid 3 |
| 40422 | Fluid Panel Enabled | | Fluid 4 |
| 40424 | Fluid Panel Enabled | | Fluid 5 |
| 40426 | Fluid Panel Enabled | | Fluid 6 |
| 40428 | Fluid Panel Enabled | | Fluid 7 |
| 40430 | Fluid Panel Enabled | | Fluid 8 |
| 40432 | Fluid Panel Job Units | Values apply for each Fluid Panel 0 = cc 1 = L 2 = oz 3 = gal >3 = not valid | Fluid 1 |
| 40434 | Fluid Panel Job Units | | Fluid 2 |
| 40436 | Fluid Panel Job Units | | Fluid 3 |
| 40438 | Fluid Panel Job Units | | Fluid 4 |
| 40440 | Fluid Panel Job Units | | Fluid 5 |
| 40442 | Fluid Panel Job Units | | Fluid 6 |
| 40444 | Fluid Panel Job Units | | Fluid 7 |
| 40446 | Fluid Panel Job Units | | Fluid 8 |
| Command interface | | | |

| Register | Description | | Zone |
|----------|---------------------|--|--------|
| 40800 | Command Argument 1 | Instructions to the ProDispense from the Automation (PLC) source. The number of arguments required vary by type of command being sent. The available commands are listed in register 40830 below. | System |
| 40802 | Command Argument 2 | | System |
| 40804 | Command Argument 3 | | System |
| 40806 | Command Argument 4 | | System |
| 40808 | Command Argument 5 | | System |
| 40810 | Command Argument 6 | | System |
| 40812 | Command Argument 7 | | System |
| 40814 | Command Argument 8 | | System |
| 40816 | Command Argument 9 | | System |
| 40818 | Command Argument 10 | | System |
| 40820 | Command Argument 11 | | System |
| 40822 | Command Argument 12 | | System |
| 40824 | Command Argument 13 | | System |
| 40826 | Command Argument 14 | | System |
| 40828 | Command Argument 15 | | System |
| 40830 | Command ID | 0 = NOP 1 = Write user ID (5 arguments) 2 = Write recipe (8 arguments) 3 = Write fluid panel command (5 arguments) 4 = Write fluid panel configuration (12 arguments) 100 = Read user ID (2 arguments) 101 = Read recipe (2 arguments) 102 = Read job record (1 argument) 103 = Read event record (1 argument) 104 = Read fluid panel status (1 argument) 105 = Read fluid panel configuration (1 argument) NOTE: See Command Process, page 128 for how to present arguments and what information is returned. | System |

Commands

All parameters specified in the commands are 32 bit (long word) unsigned integer values.

Command Process



Using the flowchart:

The ProDispense makes status information available to the Automation source on a continuous basis. The information contained in the bytes of the message stream (for non-Modbus TCP) or in the registers (Modbus TCP). To determine whether that information is usable, the Automation source must monitor the command status (byte 84 for non-Modbus TCP CGMs or register 40900 for Modbus CGM). Commands to the ProDispense will only be accepted

if the command status is in the NOP, Nak, or Error state.

1. Monitor the Command Status (byte 84 or register 40900) value provided by the ProDispense system. When the Command Status value is 0, 2, 3, or 4, a new command can be sent to the ProDispense system.
2. Create the arguments for the new command and place them in bytes 12–68 or registers 40800–40828. To determine the needed arguments, see [Command Structures, page 129](#).

3. Create the Command ID in byte 72 or register 40830.
4. Send the command to the ProDispense system and monitor the Command Status value. Any value except 1 (Busy) means the command was processed. Refer to byte 84 or register 40900 to determine whether the command completed successfully.
5. **If the Command Status equals a 2 (Ack):**
 - a. The responses to the command are now available for viewing in bytes 88–144 or registers 40902–40930. For the meanings of those responses, refer to the table for the command that was sent in [Command Structures, page 129](#).
 - b. Create a new command with a Command ID of 0 (NOP) and send to the ProDispense.
6. **If the Command Status equals a 3 (Nak):** Examine the information provided with the last command to determine whether one or more arguments were not configured correctly. After correcting the arguments, go to step 3 above.
7. **If the Command Status equals a 4 (Error):**
 - a. Ensure that the arguments not necessary for the command were empty.
 - b. After correcting the arguments, go to step 3 above.

Command Structures

There are two types of commands, write and read. A write command is used to assign values to ProDispense system settings or components. A read command is used to obtain current information about the ProDispense system and its individual components.

NOTE: A write command will overwrite existing conditions. Perform a read first to determine if the current settings need to be retained.

Available write commands:

- Write User ID (only 1 fluid panel at a time can be written)
- Write Recipe (only 1 recipe at a time can be written)
- Write Fluid Panel (only 1 fluid panel at a time can be written)
- Write Fluid Panel Configuration (only 1 fluid panel at a time can be written)

Available read commands:

- Read User ID
- Read Recipe
- Read Job Record
- Read Event Record
- Read Fluid Panel Status
- Read Fluid Panel Configuration

Write User ID

| Parameter | Description | Value Range |
|------------|---|--|
| Command ID | Write User ID | 1 |
| Argument 1 | Fluid Panel Number | 1 = Fluid panel 1 2 = Fluid panel 2 . . . 8 = Fluid panel 8 |
| Argument 2 | ID Field NOTE: If more than 1 ID field is desired for a single fluid panel, a new write command will be necessary for each ID | 0 = User ID 1 = Job ID 1 2 = Job ID 2 3 = Job ID 3 |
| Argument 3 | ID characters 3-0 | Ascii characters |
| Argument 4 | ID characters 7-4 | Ascii characters |
| Argument 5 | ID characters 9-8 | Ascii characters |
| Return 1 | Fluid Panel Number | 1-8 |
| Return 2 | ID Field | 0 = User ID 1 = Job ID 1 2 = Job ID 2 3 = Job ID 3 |
| Return 3 | ID characters 3-0 | Ascii characters |
| Return 4 | ID characters 7-4 | Ascii characters |
| Return 5 | ID characters 9-8 | Ascii characters |

Write Recipe

This command will only populate one row of a recipe. It may be necessary to send up to 11 commands to fully define the recipe and enable it for use.

| Parameter | Description | Value Range |
|------------|---|---|
| Command ID | Write Recipe | 2 |
| Argument 1 | Recipe Number | 1–50 |
| Argument 2 | Batch Number NOTE: If an existing recipe is overwritten and one row already exists in the recipe and it is not overwritten prior to enabling the recipe, an error may occur due to duplication. | 0 = Use Argument 3 1–10 = These correspond with the # column of the recipe screen. |
| Argument 3 | Enable/Disable Recipe NOTE: Only used if Argument 2 = 0 | 0 = Disable 1 = Enable |
| Argument 4 | Fluid Number | 1–8 |
| Argument 5 | Target (in sec or cc) | 1–268435456 |
| Argument 6 | Tolerance (%) | 0–99 |
| Argument 7 | Timeout (ms) | 0–4294967296 |
| Argument 8 | Order (fluid sequence) NOTE: Fluids with the same order number will occur simultaneously.) | 0 = Interpret Argument 5 as being sec. 1–10 |
| Return 1 | Recipe Number | 1–8 |
| Return 2 | Batch Number | 1–268435456 |
| Return 3 | Enable/Disable Recipe (Valid if Batch = 0) | 0 = Disable 1 = Enable |
| Return 4 | Fluid Number | 1–8 |
| Return 5 | Target (in sec or cc) | 1–268435456 |
| Return 6 | Tolerance (%) | 0–99 |
| Return 7 | Timeout (ms) | 0–4294967296 |
| Return 8 | Order | 0 = Interpret Return 5 as being sec. 1–10 |

Write Fluid Panel

| Parameter | Description | Value Range |
|------------|-----------------------------|--|
| Command ID | Write Fluid Panel | 3 |
| Argument 1 | Fluid Panel Number | 1-8 |
| Argument 2 | Fluid Panel Command | 0 = Off 1 = Standby On 2 = Dispense 3 = Pause / Resume |
| Argument 3 | Target (in cc) | 0-268435456 |
| Argument 4 | Tolerance (%) | 0-99 |
| Argument 5 | Timeout (ms) | 0-4294967296 |
| Return 1 | Fluid Panel Number | 1-8 |
| Return 2 | State | 0 = Uninitialized 1 = Disabled 2 = Offline 3 = Off 4 = Standby On 5 = Dispense 6 = Pause |
| Return 3 | Valve State | 0 = Closed 1 = Open |
| Return 4 | Job Volume (in 0.1 cc) | 0-268435456 |
| Return 5 | Flow Rate (in cc/min) | 0-4194304 |
| Return 6 | Last Job Volume (in 0.1 cc) | 0-268435456 |
| Return 7 | Meter Grand Total (in cc) | 0-4294967296 |
| Return 8 | Job Events | Bit Assignment (0=no event) 0 = Communication error 1 = General error 2 = Valve error 3 = Flow meter error 4 = Regulator error 5 = Operation status error 6 = No flow 7 = Timeout 8 = Tolerance 9 = Leak 10 = Job rollover 11 = Grand rollover All other bits reserved |

Write Fluid Panel Configuration

| Parameter | Description | Value Range |
|-------------|---------------------------------|--|
| Command ID | Write Fluid Panel Configuration | 4 |
| Argument 1 | Fluid Panel Number | 1 = Fluid panel 1 2 = Fluid panel 2 3 = Fluid panel 3 4 = Fluid panel 4 5 = Fluid panel 5 6 = Fluid panel 6 7 = Fluid panel 7 8 = Fluid panel 8 |
| Argument 2 | Target (in cc) | 1-268435456 |
| Argument 3 | Tolerance (%) | 0-99 |
| Argument 4 | Timeout (in ms) | 0-4294967296 |
| Argument 5 | Top Off Time (in ms) | 0-4294967296 |
| Argument 6 | K-Factor (in 0.001) | 1-999999 |
| Argument 7 | Leak Rate (in 0.1 cc/min) | 0-268435456 |
| Argument 8 | Settling Time (in ms) | 0-99999 |
| Argument 9 | Auto Adjust Enable | 0 = Disable 1 = Enable |
| Argument 10 | Auto Adjust Time (in ms) | 0-10000 |
| Argument 11 | Op Station Mode | 0 = Station 1 = Recipe |
| Argument 12 | Op Station Stop Function | 0 = Standby 1 = Pause 2 = Pause - Standby |
| Return 1 | Fluid Panel Number | 1- 8 |
| Return 2 | Target (in cc) | 1-268435456 |
| Return 3 | Tolerance (%) | 0-99 |
| Return 4 | Timeout (in ms) | 0-4294967296 |
| Return 5 | Top Off Time (in ms) | 0-4294967296 |
| Return 6 | K-Factor (in 0.001) | 1-999999 |
| Return 7 | Leak Rate (in 0.1 cc/min) | 0-268435456 |
| Return 8 | Settling Time (in ms) | 0-99999 |
| Return 9 | Auto Adjust Enable | 0 = Disable 1 = Enable |
| Return 10 | Auto Adjust Time (in ms) | 0-10000 |
| Return 11 | Op Station Mode | 0 = Station 1 = Recipe |
| Return 12 | Op Station Stop Function | 0 = Standby 1 = Pause 2 = Pause - Standby |

Read User ID

| Parameter | Description | Value Range |
|------------|---|--|
| Command ID | Read User ID | 100 |
| Argument 1 | Fluid Panel Number | 1 = Fluid panel 1 2 = Fluid panel 2 3 = Fluid panel 3 4 = Fluid panel 4 5 = Fluid panel 5 6 = Fluid panel 6 7 = Fluid panel 7 8 = Fluid panel 8 |
| Argument 2 | ID Field NOTE: If more than 1 ID field is desired for a single fluid panel, a new write command will be necessary for each ID | 0 = User ID 1 = Job ID 1 2 = Job ID 2 3 = Job ID 3 |
| Return 1 | Fluid Panel Number | 1–8 |
| Return 2 | ID Field | 0 = User ID 1 = Job ID 1 2 = Job ID 2 3 = Job ID 3 |
| Return 3 | ID characters 3–0 | Ascii characters |
| Return 4 | ID characters 7–4 | Ascii characters |
| Return 5 | ID characters 9–8 | Ascii characters |

Read Recipe

This command will only read one row of a recipe. It may be necessary to send up to 11 commands to fully read the recipe and determine if it is enabled for use.

| Parameter | Description | Value Range |
|------------|--|--|
| Command ID | Read Recipe | 101 |
| Argument 1 | Recipe Number | 1-50 |
| Argument 2 | Batch Number | 0 = Display Enable/Disable Recipe value 1-10 = These correspond with the # column of the recipe screen. |
| Return 1 | Recipe Number | 1-8 |
| Return 2 | Batch Number | 0 = Return 3 has valid data 1-10 |
| Return 3 | Enable/Disable Recipe (Valid if Batch = 0) | 0 = Disable 1 = Enable |
| Return 4 | Fluid Number | 0 = Timer 1-8 = Fluid number |
| Return 5 | Target (in sec or cc) | 1-268435456 |
| Return 6 | Tolerance (%) NOTE: Data not valid if Return 2 = 0 | 0-99 |
| Return 7 | Timeout (ms) NOTE: Data not valid if Return 2 = 0 | 0-4294967296 |
| Return 8 | Order | 0-10 |

Read Job Record

| Parameter | Description | Value Range |
|------------------|--------------------|-------------------------|
| Command ID | Read Event Record | 102 |
| Argument 1 | Record Index | ≥ 0 |
| Return 1 | Date | — |
| Return 2 | Time | — |
| Return 3 | Job Number | 0–99999 |
| Return 4 | Recipe Number | 0–50 |
| Return 5 | Fluid Panel | 1–8 |
| Return 6 | Target Volume | — |
| Return 7 | Actual Volume | — |
| Return 8 | ID characters 3–0 | Ascii characters |
| Return 9 | ID characters 7–4 | Ascii characters |
| Return 10 | ID characters 9–8 | Ascii characters |

Read Event Record

| Parameter | Description | Value Range |
|------------------|-----------------------------|--|
| Command ID | Read Event Record | 103 |
| Argument 1 | Record Index | ≥ 0 |
| Return 1 | Date | |
| Return 2 | Time | |
| Return 3 | Event Code characters (0:3) | Ascii |
| Return 4 | Event Type | 0 = Record 1 = Advisory 2 = Deviation 3 = Alarm |
| Return 5 | Event Action | 0 = Set 1 = Acknowledge 2 = Clear |

Read Fluid Panel Status

| Parameter | Description | Value Range |
|------------|-----------------------------|--|
| Command ID | Read Fluid Panel | 3 |
| Argument 1 | Fluid Panel Number | 1-8 |
| Return 1 | Fluid Panel Number | 1-8 |
| Return 2 | State | 0 = Uninitialized 1 = Disabled 2 = Offline 3 = Off 4 = Standby On 5 = Dispense 6 = Pause |
| Return 3 | Valve State | 0 = Closed 1 = Open |
| Return 4 | Job Volume (in 0.1 cc) | 0-268435456 |
| Return 5 | Flow Rate (in 0.01 cc/min) | 0-4194304 |
| Return 6 | Last Job Volume (in 0.1 cc) | 0-268435456 |
| Return 7 | Meter Grand Total (in cc) | 0-4294967296 |
| Return 8 | Job Events | Bit Assignment (0=no event) 0 = Communication error 1 = General error 2 = Valve error 3 = Flow meter error 4 = Regulator error 5 = Operation status error 6 = No flow 7 = Timeout 8 = Tolerance 9 = Leak 10 = Job rollover 11 = Grand rollover All other bits reserved |

Read Fluid Panel Configuration

| Parameter | Description | Value Range |
|------------------|--------------------------------|---|
| Command ID | Read Fluid Panel Configuration | 105 |
| Argument 1 | Fluid Panel Number | 1–8 |
| Return 1 | Fluid Panel Number | 1– 8 |
| Return 2 | Target (in cc) | 1–268435456 |
| Return 3 | Tolerance (%) | 0–99 |
| Return 4 | Timeout (in ms) | 0–4294967296 |
| Return 5 | Top Off Time (in ms) | 0–4294967296 |
| Return 6 | K-Factor (in 0.001) | 1–999999 |
| Return 7 | Leak Rate (in 0.1 cc/min) | 0–268435456 |
| Return 8 | Settling Time (in ms) | 0–99999 |
| Return 9 | Auto Adjust Enable | 0 = Disable 1 = Enable |
| Return 10 | Auto Adjust Time (in ms) | 0–10000 |
| Return 11 | Op Station Mode | 0 = Station 1 = Recipe |
| Return 12 | Op Station Stop Function | 0 = Standby 1 = Pause 2 = Pause – Standby |

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Original Instructions. This manual contains English. MM 3A3469

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