Accessory

Haz Loc Wireless Remote & Meter / Solenoid Barriers

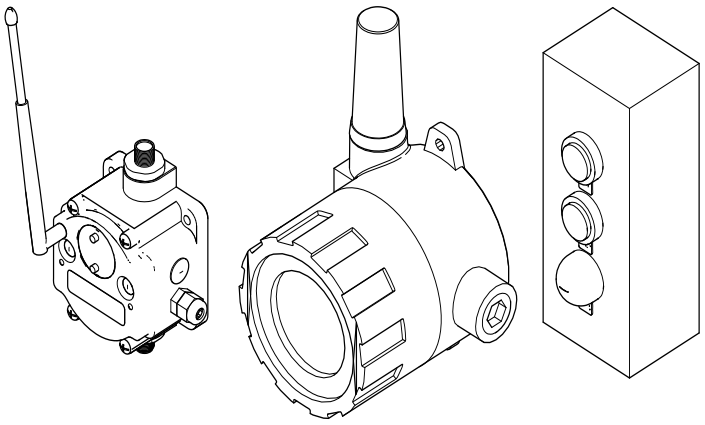
3A6715C

EN

Components that allow the installation of a ProDispense™ user-interface and fluid control in a hazardous location. For professional use only.

26C266

Hazardous Location Wireless Remote



Hazardous Location Wireless Remote

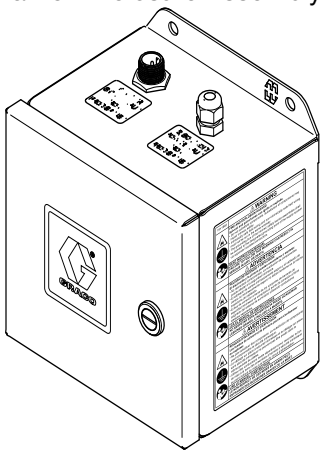
25E765

Meter Barrier Enclosure Assembly

25B223

Solenoid and Meter Barrier Enclosure Assembly, with Solenoid

Barrier Enclosure Assembly



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Important Safety Instructions

Read all warnings and instructions in this manual and in your dispensing operations manual before using the equipment. Save these instructions.

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Contents

Related Manuals

Manual	Description
3A3469	ProDispense™, Operation/Parts
308778	Volumetric Fluid Flow Meter, Instructions/Parts
— — —	Banner Manual; included with product

Overview

The barrier enclosure assemblies and wireless remote network are intended to be used exclusively with a Graco ProDispense system.

Barrier Enclosure

The barrier enclosure assemblies (25E765 and 25B223) use R. STAHL's safety barrier technology for field devices.

Meter Barrier Assembly (25E765)

The meter barrier assembly includes an enclosure, with cover; DIN rail-mounted barrier; panel-mounted connector; and 50 ft. cable to route from the enclosure assembly to the meter located in the hazardous location.

This assembly includes connectors on the enclosure and meter cable for direct and convenient connection to a Graco meter sensor. The included barrier has matching entity parameters to the Graco meter sensor. The meter sensor, when used with this barrier, is approved for installation and use in a Class I, Div 1, or Class I, Zone 0 hazardous location. See **Barrier Enclosure Component Entity Parameter Data** and **Barrier Enclosure Approvals**, on page 5, for specific classification details.

Meter and Solenoid Barrier Assembly (25B223)

The meter and solenoid barrier assembly includes all components of the 25E765 assembly. It also includes a DIN rail-mounted solenoid barrier; 36 in. of input cable; an additional 50 ft. of safe-side cable to route to the solenoid mounted in the hazardous location; strain-relief fittings at the enclosure for cable management; a 24 VDC Class I, Div 1 solenoid valve (MAC 411 valve) with fittings and wire splices.

NOTE: The MAC 411 valve is approved for North American Class I, Div 1 installations only.

Wireless Remote Network

The 26C266 Hazardous Location Wireless Remote allows for limited operation of a ProDispense from a user-interface located in a hazardous location. It uses Banner Engineering's FlexPower® power management technology to operate wireless nodes (1), remotes (sensors) (3), and gateways (4). See **26C266 Kit Component Identification** on page 15.

ProDispense and Wireless Nodes

- The ProDispense ADM (Advanced Display Module) must have software revision 1.03.007, or higher, installed. Refer to the ADM software update procedure in your ProDispense operation manual.

- The wireless nodes (1) have been pre-configured for proper functionality between the nodes and the ProDispense.

  - The modes and dip switch settings have been pre-set.
  - Cable wiring to terminal blocks has been completed to eliminate in-field wiring. The I/O and wireless functionality are tested prior to shipping.
  - All field connections are plug-in cable connectors. See **Cable Connections** on page 17.

Gateway

The gateway (4) must be connected to an FCM (fluid control module) fluid panel and the primary FCM communicating with that panel.

- Only recipes, which are normally controlled by the control panel, can be dispensed using the remote operator station (3). See FIG. 7.

- The fluid panel to which the gateway (4) is physically connected must manage a fluid included in all recipes to be dispensed.

Remote Operator Station with LED Indicator

The remote operator station and LED indicator (3) is connected by a conductor cable (2) to a wireless node (1).

Barrier Enclosure

Barrier Enclosure Assemblies

Assembly	Component	Description
25E765 - Meter Barrier Enclosure Assembly	111985 - Dual-channel Stahl Barrier	Provides power and signal interface to the Graco G3000 meter sensor.
	17C888 - 50 ft Meter Cable	Pre-wired to the barrier, using individually-shielded twisted-pair cables selected to be used in hazardous locations.
	19A758 - Barrier Enclosure	Metal enclosure with hinged cover, for barrier mounting and protection. The barrier is DIN-rail mounted in the enclosure, and cable connections are separated by entering the enclosure on opposite ends of the barrier. The cables are secured to maintain separation by strain relief cable grommets and adhesive wire-conductor anchoring pads.
25B223 - Solenoid and Meter Barrier Enclosure Assembly, with Solenoid	111985 - Dual-channel Stahl Barrier	Same as for 25E765, Meter Barrier Enclosure Assembly.
	514895 - Single-channel Stahl Barrier	Additional single-channel barrier for a solenoid valve circuit.
	19A982 - IS-approved MAC 411 Series 2/5 Solenoid Valve	Assembly includes pneumatic inlet and outlet fittings, and sintered exhaust silencers.
	Solenoid Barrier Cables	Shielded single-twisted-pair cables, secured to maintain separation by strain relief cable grommets and adhesive wire-conductor anchoring pads. The solenoid cables are spliced with Wago lever-lock connectors.
	19A758 - Barrier Enclosure	Same as for 25E765, Meter Barrier Enclosure Assembly.

NOTE: The barriers and MAC valve have matching entity parameters.

Barrier Enclosure Component Entity Parameter Data

Entity parameter data can be found on the component's label. The 111985 Meter Barrier is common to both barrier enclosure assemblies. The 514895 Solenoid Barrier is only included in the 25B223 Solenoid Barrier and Solenoid Enclosure Assembly.

Meter Circuit			
111985 Barrier		**G3000 Meter Sensor**	Class I, Division 1, Group C,D T3 ⟨Ex⟩ 2 I G Ex ia IIB T3
Uo = 28 V	£	Ui = 30 V	
Io = 107 mA	£	Ii = 110 mA	
Po = 749 mW	£	Pi = 800 mW	
Co = 9.6 mH	³	Ci = 0.4 µF	
Lo = 0.65 µH	³	Li = 0.01 µH	
Solenoid Circuit			
514895 Barrier		**19A982 Solenoid Valve**	
Uo = 28 V	£	Ui = 30 V	
Io = 100 mA	£	Ii = 175 mA	
Po = 700 mW		Pi = N/A	
Co = 11mH	³	Ci = 0 µF	
Lo = 0.65 µH	³	Li = 0 µH	

Barrier Enclosure Approvals

Part No.	Description	Approvals
25E765	Meter Barrier Enclosure Assembly MET c us E115887 Complies with UL 508A CSA C22.2 No. 286 and UL 698A	Barriers are approved through R. Stahl, Inc. Barrier (p/n 111985) is approved to Class I, Div 1, Group D T3, and Class I Zone 0; ⟨Ex⟩ 2 I G Ex (ia Ga) IIB/IIC T4 Gc. Sensors (G3000 Sensors only; p/n 24W650 or 24W651) are approved through Graco. Class I, Div 1, Group D T3, and Class I, Zone 0; ⟨Ex⟩ 2 I G Ex ia IIA T3. Entity parameters of the barrier and Graco meter sensor have been matched for proper connection and safe use.
25B223	Solenoid and Meter Barrier Enclosure Assembly, with Solenoid MET c us E115887 Complies with UL 508A CSA C22.2 No. 286 and UL 698A	Barriers are approved through R. Stahl, Inc. Barriers (p/n 514895) are approved to Class I, Div 1, Group D T3, and Class I Zone 0; ⟨Ex⟩ 2 I G Ex (ia Ga) IIB/IIC T4 Gc. Solenoids (p/n 19A982) are approved through MAC Engineering to Class I, Div 1, Group A, B, C, D, E, F, G, 0-50°C. Entity parameters of the barrier and Graco solenoid valve have been matched for proper connection and use.

Barrier Enclosure Installation

WARNING

FIRE AND EXPLOSION HAZARD

Do not substitute or modify system components as this may impair intrinsic safety. Do not install equipment approved only for a non-hazardous location in a hazardous location.

STATIC SHOCK HAZARD

Improper grounding, setup, or usage of the system can cause static shock. To prevent shock:

- Turn off and disconnect power at main switch before disconnecting any cables and before 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.

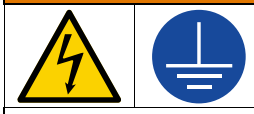
With the Barrier Enclosure Assemblies (8) installed, it is possible to move key components from the ProDispense Fluid Panel (12) in the non-hazardous location and to safely install them at the dispensing station in the hazardous location. These include the Fluid Flow Meter (10) and the Dispense Valve (13). See FIG. 1 and FIG. 2 on page 7.

NOTE: Do not use the solenoid valve provided with the ProDispense Fluid Panel (12) in hazardous locations. Only use the new Solenoid Valve (9) provided with the Barrier Enclosure Assembly (8).

An approved Solenoid Valve (9) and a Fluid Flow Meter (10) must both be used with a Barrier Enclosure Assembly (8) when installed in a hazardous location.

Grounding

WARNING



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.

Barrier Enclosures (8): Connect the other end of the factory-installed ground wire (14) to a true earth ground using the screw clamp provided. See FIG. 1 on page 7.

Check the resistance between each barrier enclosure 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.

ProDispense Fluid Panels (12): Ground as instructed in the ProDispense operations manual (3A3469).

Solenoid Valve (9): Must be mounted to a grounded support structure when moved from the panel into a hazardous location.

Fluid Flow Meter (10): Must be mounted to a grounded support structure when moved from the panel into a hazardous location.

Dispense Valve (13): Must be mounted to a grounded support structure when moved from the panel into a hazardous location.

Typical Barrier Enclosure Installation

This is an example of how the barrier assembly kits could be integrated into a ProDispense setup. ProDispense component installation is covered in manual 3A3469.

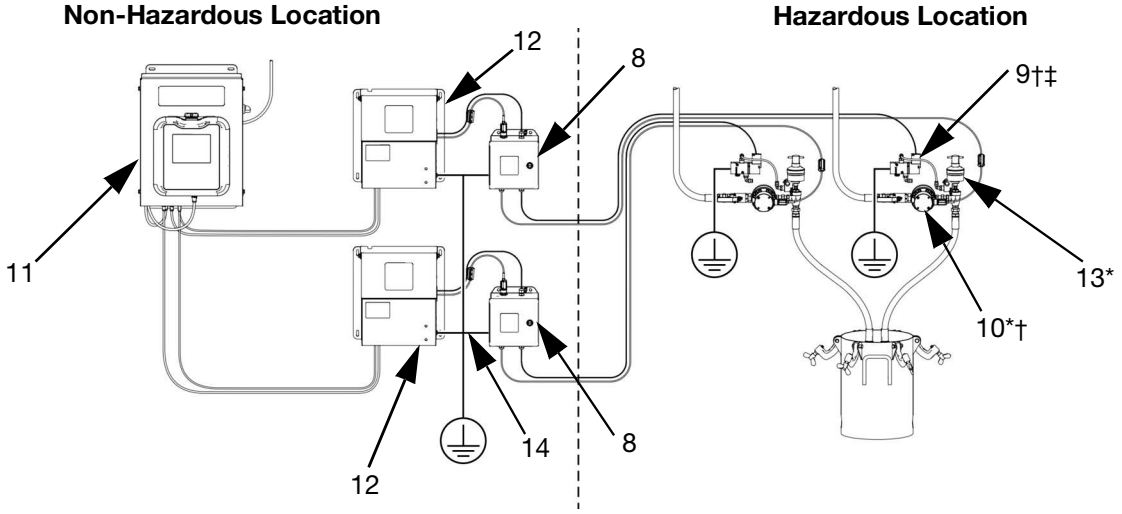


FIG. 1 Typical Installation with Hazardous Location Solenoid and Meter Barriers

Barrier Enclosure Assembly Key:

8 Barrier Enclosure Assembly

ProDispense Key:

9 Solenoid Valve†‡
10 Fluid Flow Meter*†
11 ProDispense Control Panel
12 ProDispense Fluid Panel
13 Dispense Valve*
14 Ground Wire (24 ft, factory-installed)
* Removed from Fluid Panel when installed in hazardous locations; mounting hardware not included.
† Must be used with a Barrier Enclosure Assembly and approved Solenoid Valve when installed in a hazardous location.
‡ Do not use the Solenoid Valve provided with the ProDispense Fluid Panel.

Barrier Enclosure Wiring Diagram

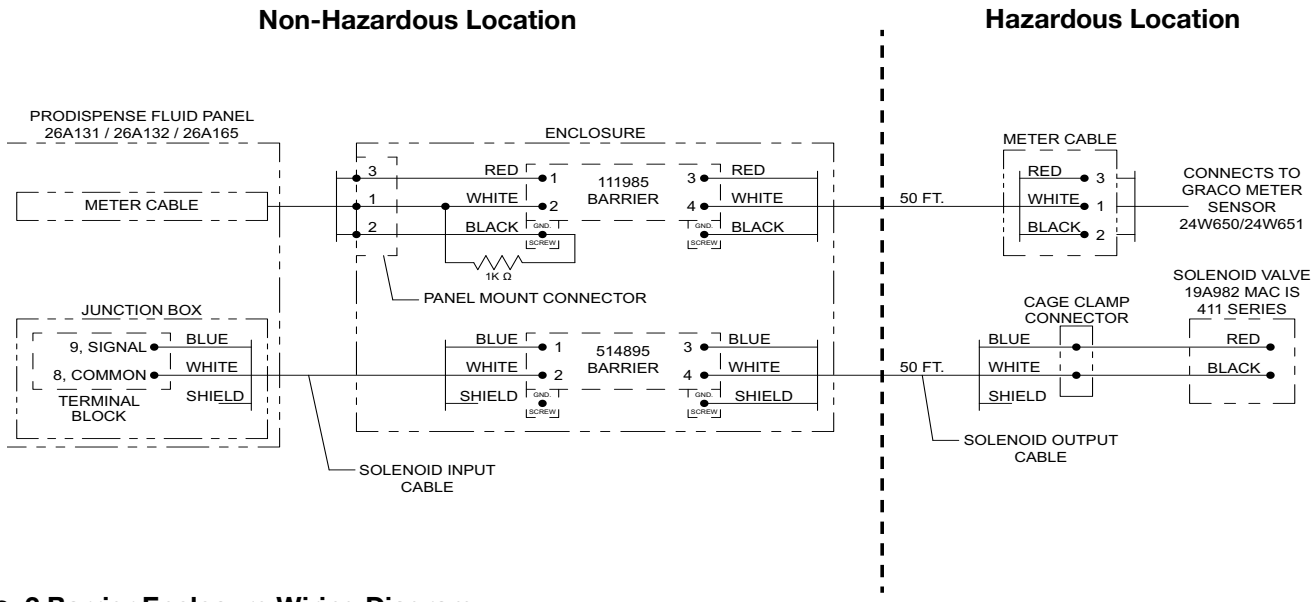


FIG. 2 Barrier Enclosure Wiring Diagram

Barrier Enclosure Control Drawing (25E765 and 25B223)

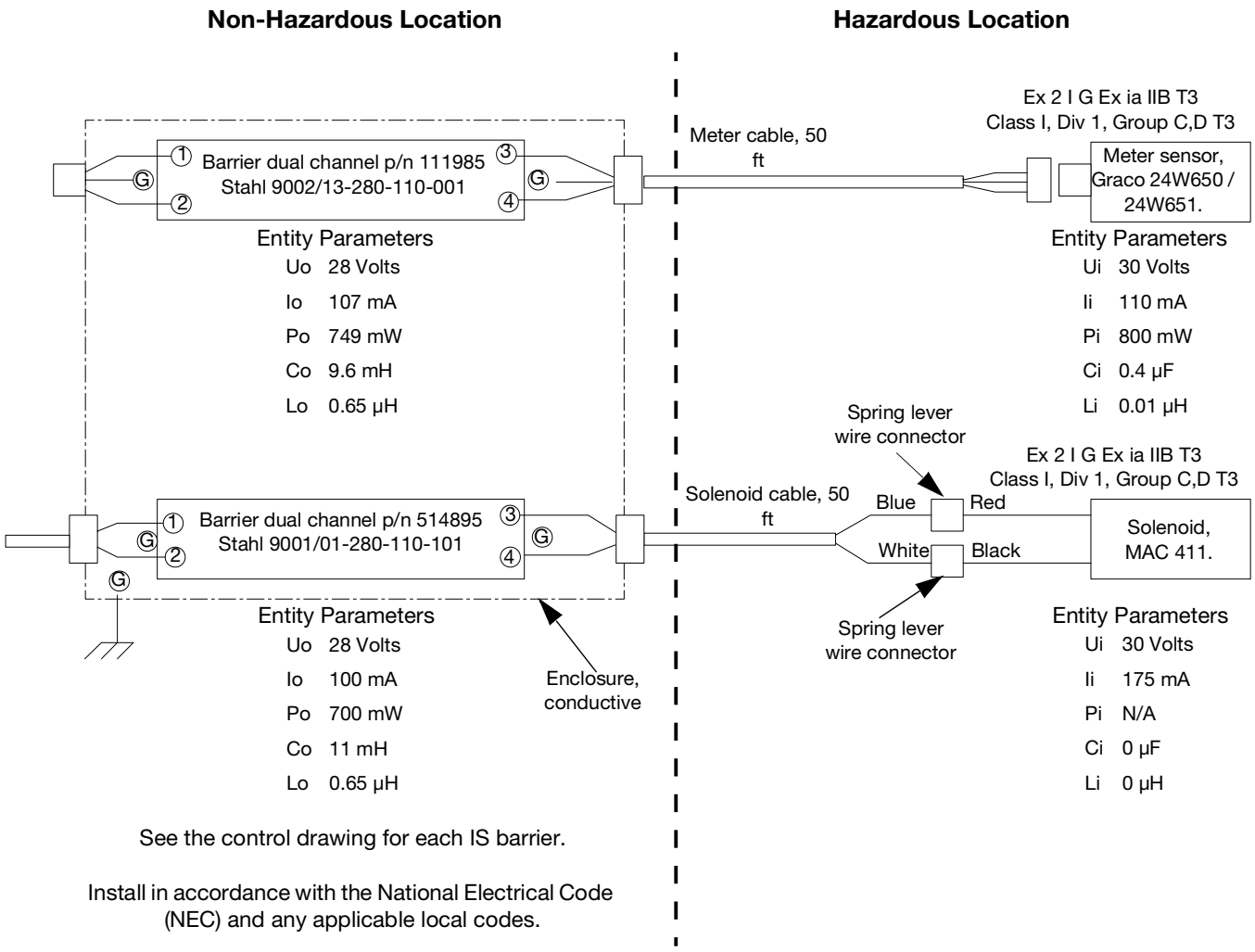


FIG. 3 Barrier Control Drawing

26C266 Wireless Remote

26C266 Wireless Remote Components

The 26C266 wireless remote allows for limited operation of a ProDispense from a user-interface located in a hazardous location. The kit is comprised of three major components and a conductor cable.

NOTE: The ProDispense must have software revision 1.03.007, or higher, to be functional with the 26C266 Wireless Remote kit. A software update token is included with the kit.

Component	Location	Description
17V933 - Transceiver Gateway	Non-hazardous	Wireless communication gateway with discrete digital I/O conducted through a pre-wired signal cable for interfacing with a Graco fluid control module (FCM). Inputs include start and stop, and outputs include dispense and alarm.
17V930 - Transceiver Node	Hazardous	Third-party approved battery-powered wireless transmitter, with a discrete IS (intrinsically safe) I/O for interfacing with a user-interface push-button module.
17V932 - Remote Operator Push-Button Station and LED Indicator	Hazardous	User-interface enclosure assembly with momentary-contact push-button switches and an LED indicator. The LED indicator components were selected based on third-party certifications to US, Canada, ATEX, and IECEx standards for use in hazardous locations.
17V931 - Conductor Cable	Hazardous	Cable for IS circuit, with an IS circuit designation label. The cable has male and female M12 connectors. The cable is used for connecting IS circuits of the user interface indicator lights and switches to the wireless transceiver node.

26C266 Wireless Remote Approvals

Part No.	Description	Approvals through Banner Engineering
17V930	Transceiver node only. Battery-operated, with entity parameter-approved input/output interface, with indicator lights and switches. See **26C266 Wireless Control Drawing**, on page 14, for entity parameter details.	CE 1725 Ex C SP US **Approvals** **CSA - C/US** Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, G; Class III, Division 1 (Ex ia IIC T4; AEx ia IIC T4) Certificate: 2008243 **ATEX** Zone 0 (Category 1G) and 20 (Category 1D), Temperature Class T4 (II 1 GD; Ex ia IIC T4 Ga; Ex ia IIIC T82°C Da IP68) Certificate: LCI 08 ATEX 6098 X Special Conditions for Safe Use Imposed by Intrinsic Safety Certificate LCIE 08 ATEX 6098 X: Ambient temperature range is -40 to 70 °C. Sure Cross® DX99 *FlexPower* devices can only be connected to Intrinsically Safe certified equipment or simple apparatus as defined by EN 60079-11. All connected equipment must comply with the Entity Parameters (Safety Parameters) listed in the Control Drawings (p/n 141513). The device must only use a lithium battery manufactured by XENO, type XL-205F.
17V932	User interface assembly, with IS-approved LEDs and simple apparatus-assessed switches.	CE 1725 Ex C SP US IEC IECx SIR 13.0020X ATEX Sira 13ATEX2058X CSA CoC 2679646 **Approvals** **CSA-C/US** Gas and Vapors: Class I Zone 0 AEx/Ex ia IIC T4 Ga; Class I Div 1 Groups A, B, C, D **ATEX/IECEx** Gas and Vapors: II 1 G Ex ia IIC T4 Ga (Group IIC Zone 0)

Wireless Remote Kit Installation

WARNING

STATIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause static shock. To prevent shock:

- Turn off and disconnect power at main switch before disconnecting any cables and before 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.

Transmitter Nodes (1) and Remote Operator Stations (3) can be installed in the hazardous location. The Gateway Module (4) is installed in the non-hazardous location and is connected directly to the ProDispense Control Panel (11) and Fluid Panel (12). See **26C266 Kit Mounting Instructions**, page 16, and **Cable Connections**, page 17, for more detailed instructions.

The wireless remote kit can be installed either with or without barrier enclosures. The typical installation shown in FIG. 4 on page 12 represents an installation without barrier enclosures. With this installation, the wireless remote kit can be integrated into an existing ProDispense setup with very few changes to existing components.

NOTE: If you are also installing barrier enclosures, the notes in FIG. 4 include considerations for integrating barrier enclosures with the wireless remote kit. See **Barrier Enclosure Installation**, page 6, for more information about installing barrier enclosures.

Grounding

WARNING

FIRE AND EXPLOSION, AND ELECTRIC SHOCK HAZARD

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

Transmitter Nodes (1) and Remote Operator Stations (3): Mount to a grounded support structure for dissipation of static charges. See FIG. 4.

Gateway Modules (4): Mount to a grounded structure to prevent static build-up. See FIG. 4.

ProDispense Components (9-13): Ground as instructed in the ProDispense operations manual (3A3469).

Typical Installation

This is an example of how a standalone wireless remote kit could be integrated into a ProDispense setup. The notes include information for including barrier assembly kits this integration.

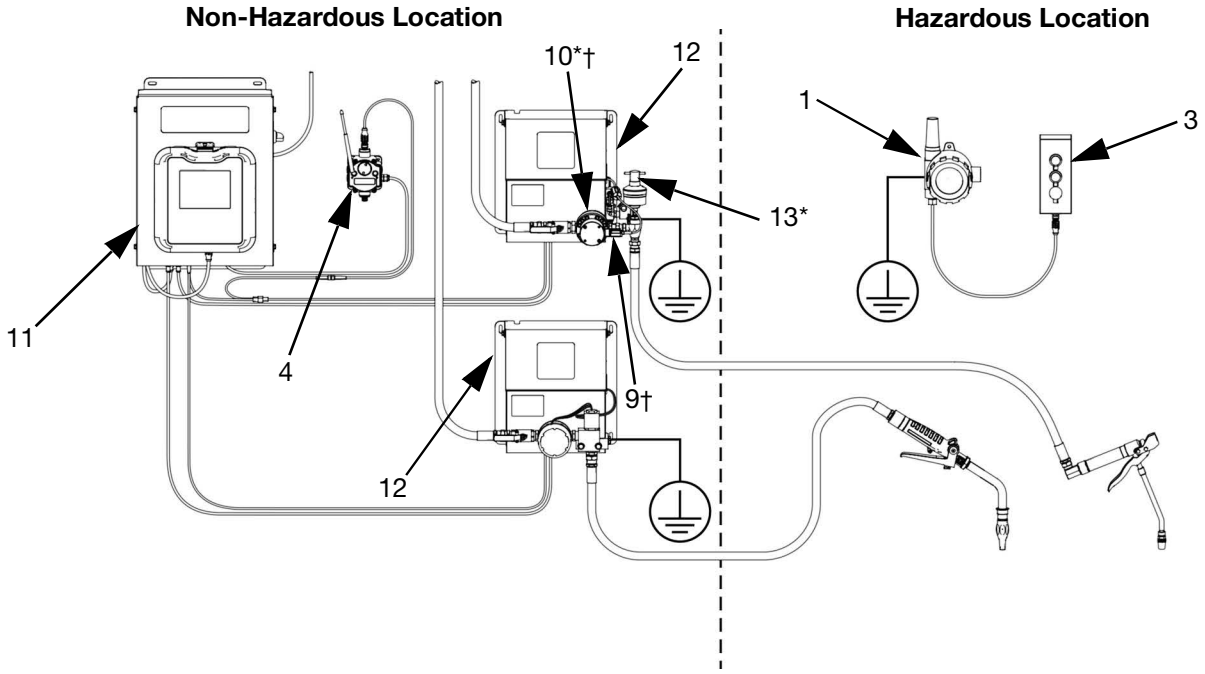


FIG. 4 Typical Installation with Hazardous Location Wireless Remote

Wireless Network Key:

1 Node
3 Remote Operator Station with LED Indicator
4 Gateway

ProDispense Key:

9 Solenoid Valve†
10 Fluid Flow Meter*†
11 ProDispense Control Panel
12 ProDispense Fluid Panel
13 Dispense Valve*
* Removed from Fluid Panel when installed in hazardous locations; mounting hardware not included. See **Barrier Enclosure Installation**, page 6, for more information.
† Must be used with a Barrier Enclosure Assembly and approved Solenoid Valve when installed in a hazardous location. See **Barrier Enclosure Installation**, page 6, for more information.

26C266 Wireless Electrical Schematics

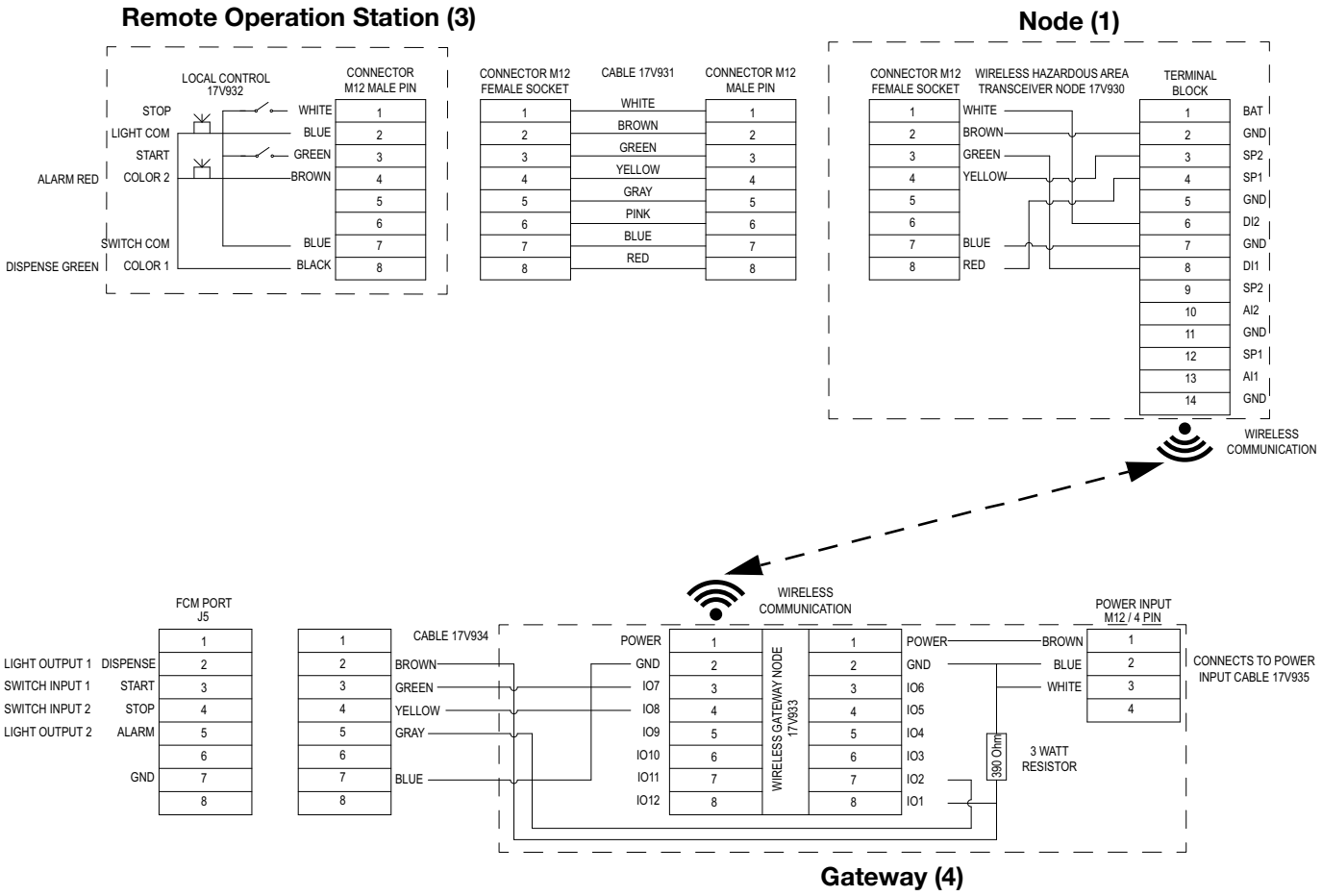


FIG. 5 26C266 Wireless Electrical Schematics

26C266 Wireless Control Drawing

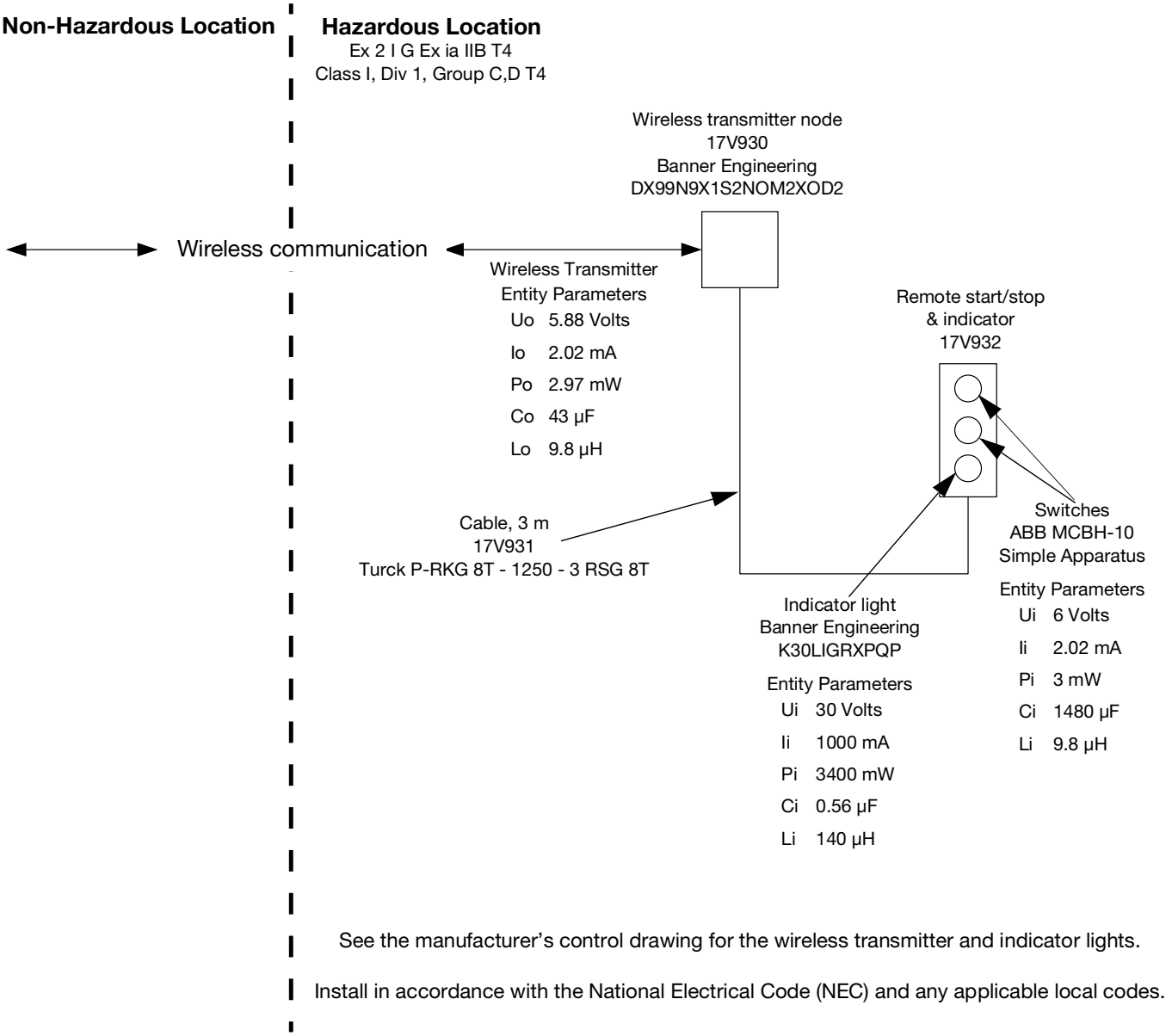


FIG. 6 26C266 Wireless Control Drawing

26C266 Kit Component Identification

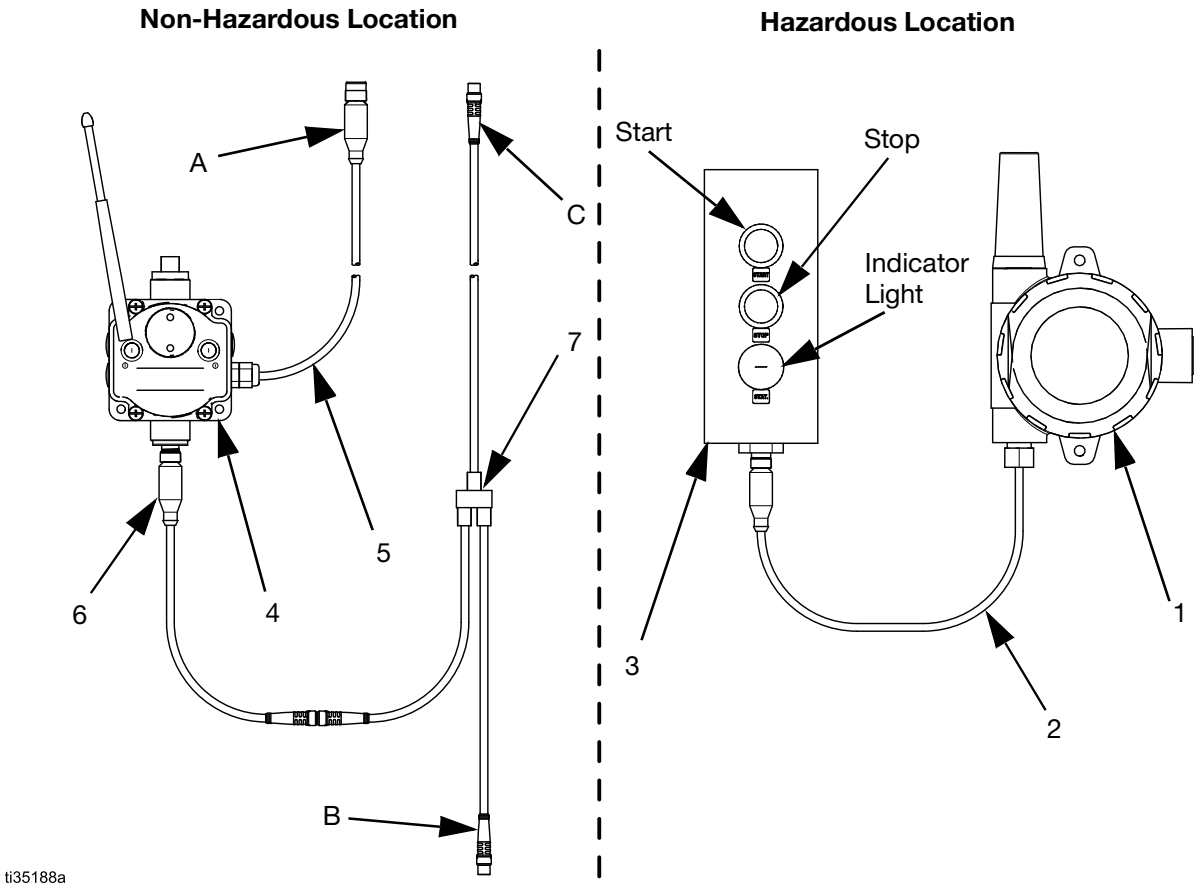


FIG. 7 26C266 Kit Components

Key:

1 Node, wireless transmitter
2 Conductor Cable; 10 ft.
3 Remote Operator Station with LED Indicator
4 Gateway (locate so cable can reach FCM, Port)
5 Cable, signal
6 Adapter Cable, power
7 Y-Split Cable, power
A To ProDispense FCM3, Port 5; 10 ft.
B To ProDispense FCM3, Port 3 or 4
C To ProDispense Junction Box, port M8 connector, Port C

Gateway Component Identification

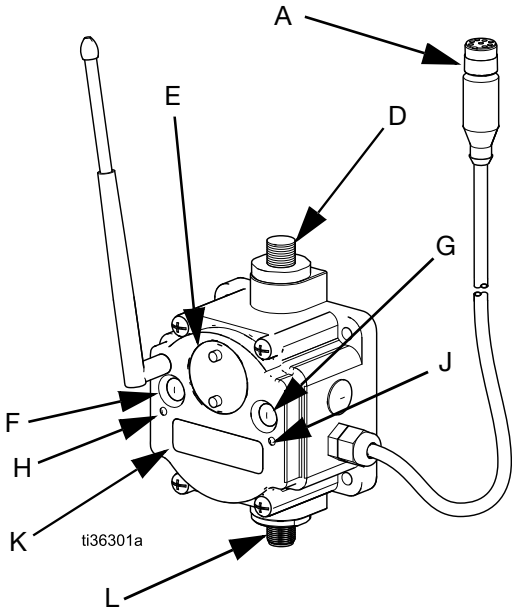


FIG. 8

Key:

A M12 Connector (to FCM3, Port 5); 10 ft.
D Industrial Ethernet port (not used)
E Rotary switches 1 (left) and 2 (right)
F Button 1
G Button 2
H LED 1
J LED 2
K LCD Display
L Power Input port (M12)

26C266 Kit Mounting Instructions

Inside Hazardous Location

The node (1) and remote operator (3) station are located inside the hazardous location. See FIG. 4.

- Use the holes in the housings as templates for the mounting hole patterns.
- Mount the remote operator station (3) in a convenient location for operator access.
- Mount the node (1) away from high-traffic areas and exposure to fluid contamination.

  NOTE: The location should provide the least amount of signal shielding between the node (1) and the gateway (4).

  NOTE: Avoid mounting the node (1) on the back sides of building columns or structural supports for the building or equipment.

Outside Hazardous Location

The gateway (4) is located outside the hazardous location with the ProDispense system and close to the ProDispense fluid control panel. See FIG. 4.

- Use the holes in the gateway's (4) housing as a template for the mounting hole pattern.

Cable Connections

1. Use the conductor cable (2) provided to connect the remote operator station (3) to the node (1), as shown in FIG. 7.

   NOTE: The node (1) has a D-cell battery pre-installed. No power connection is needed. (See **Battery Replacement** on page 24 to replace the battery.)

2. Attach the signal cable (5) provided from the side port of the gateway (4) to port 5 on the FCM3 (see FIG. 9).

   NOTE: The gateway is powered through the same circuit as the ProDispense FCM (Fluid Control Module). The gateway is powered off when the FCM is powered off at the ProDispense power switch on the ProDispense control assembly.

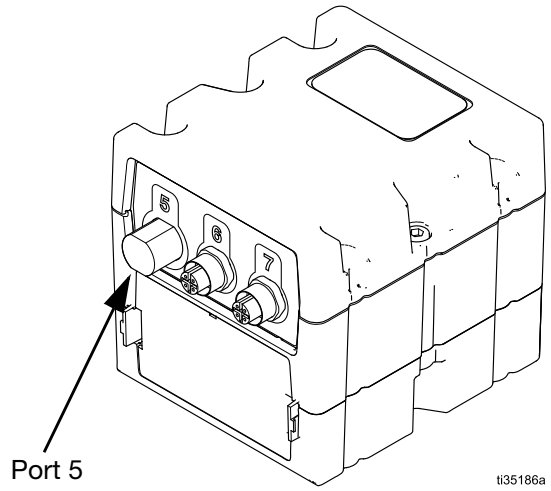


FIG. 9 ProDispense FCM3 Port 5

3. Attach one branch (see B in FIG. 7) of the Y-split cable (7) provided to Port 3 or 4 on the FCM3 (see FIG. 10).

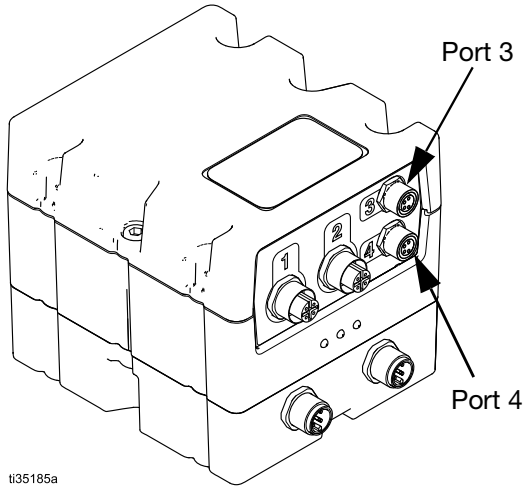


FIG. 10 ProDispense FCM Ports 3 and 4

4. Attach the Y-split cable (7) (see C in FIG. 7) of the cable (7) to the top port of the ProDispense junction box (see FIG. 11).

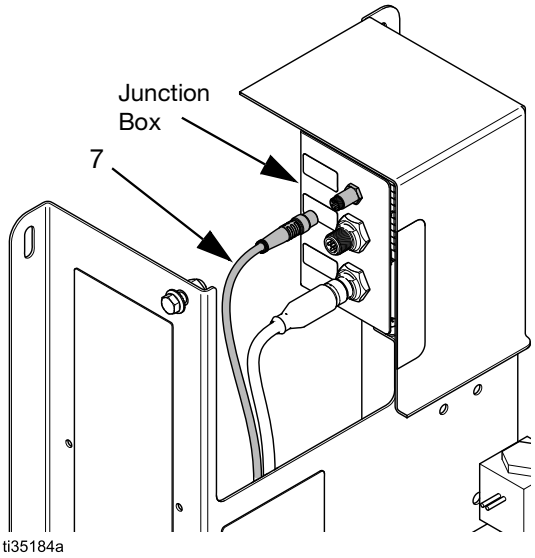


FIG. 11 ProDispense Junction Box

5. Attach the second branch of the Y-split cable (7) to the adapter cable (6), as shown in FIG. 7.

6. Attach the adapter cable (6) to the bottom port of the gateway (4), as shown in FIG. 7.

Set Up Wireless Network

NOTE: The 26C266 Hazardous Location Wireless Remote kit is shipped from Graco with necessary configurations and bindings already completed. These steps may be required if a node or gateway is replaced.

The following should be done before permanently installing your wireless network devices.

1. Disconnect power from the gateway (4) and nodes (1).
2. Configure the DIP switches of the gateway (4) and nodes (1). (Consult with a Graco technical support representative and refer to your Banner Engineering documentation.)
3. Connect sensors to the gateway (4) and nodes (1).
4. Connect power to all devices. Once powered, the gateway's LED 1 should be a solid green and the node's LED 2 should be flashing red, indicating there is no radio link to the gateway.
5. Form the wireless network by binding the nodes to the gateway. See **Bind Nodes To Form Network**.
6. Observe the LED behavior to verify the devices are communicating with each other. See **Gateway LED Behavior** and **Node LED Behavior**.
7. Conduct a site survey between the gateway and nodes. See **Appendix B - Conducting a Site Survey** on page 31.
8. Install the wireless network components.

Bind Nodes To Form Network

Binding nodes to a gateway ensures the nodes only exchange data with the gateway they are bound to.

Apply power to the gateway and nodes before proceeding.

1. Enter the binding mode on the gateway by triple-clicking button 2 on the gateway. The two LEDs flash alternately when the gateway is in binding mode, and any node entering binding mode will bind to this gateway.
2. Enter the binding mode on the node by triple-clicking button 2 on the node. The two LEDs flash alternately while locating the gateway. Once binding is complete, both LEDS are solid red for a few seconds. The node will automatically exit binding mode, cycle power, and then enter Run mode.
3. Use the node's rotary dials to assign a valid decimal Node Address. The address is always 01; with 0 on the left rotary dial, and 1 on the right.
4. Exit binding mode on the gateway by single-clicking either button 1 or 2.

Gateway LED Behavior

Verify all devices are communicating properly. The radios and antennas must be a minimum distance of 10 ft. apart to function properly. See **Technical Specifications** on page 33.

LED 1	LED 2	Gateway Status
Solid Green	--	Power ON
Flashing Red	Flashing Red	Device Error
--	Flashing Amber	Modbus Communication Active
--	Flashing Red	Modbus Communication Error

Node LED Behavior

Nodes do not sample inputs until they are communicating with the gateway. The radios and antennas must be a minimum distance apart to function properly.

LED 1	LED 2	Node Status
Flashing Green	--	Radio Link OK
Flashing Red	Flashing Red	Device Error
--	Flashing Red, 1 per 3 sec	No Radio Link

NOTE: Since the nodes are powered through the FCM, which is powered through the ADM, it may take 2 - 5 minutes for the nodes to connect after the ADM is powered up. Therefore, wait a few minutes to ensure connection after power-up before interpreting node LED behavior.

Operation

Test the Remote Operator Station and Node

1. Power on the ProDispense System.
2. Observe the indicator light on the remote operator station (3):
   - Clear light - Stand by
   - Blinking clear light - Running/dispensing
   - Red light - Fault
3. Observe the display on the node (1):
   - Red light - No communication
   - Green light - Communication connected

Remote Operator Station Functions and Indicators

Start Button

- Starts a recipe dispense.
  - ProDispense must be in Standby mode with an active recipe.
  - The recipe can only be selected or changed at the ADM or PLC.
- Restarts a halted recipe dispense.

Stop Button

- Puts ProDispense in Standby mode and cancels active recipe dispense.

Indicator Lights

- Green LED
  - Indicates a dispense is in process when the light flashes in 1 second intervals.
  - Only indicates system dispenses or calibration functions.
- Red LED
  - Indicates all Alarms (including System Alarms in ADM) when the light flashes in 1 second intervals.
  - Active alarms will only flash for the configured time, in seconds, before stopping to conserve the battery. (See your ProDispense manual for setting the Output Timer on the System Setup screen. This is required to ensure operators have time to see the alarm without the LED blinking continuously and draining the battery prematurely.)
  - All alarms must be acknowledged on the ADM.

NOTE: Make sure the Power button on the ADM is enabled. This powers the FCM, which provides power for the radio. On power-up, allow 2 - 5 minutes for the radios to connect.

Troubleshooting

REMOTE ACTIVATION HAZARD

The equipment can be activated remotely. Unexpected activation could result in serious injury, such as skin injection. To reduce risk of serious injury, ensure that hands are clear of dispensers.

PRESSURIZED FLUID HAZARD

This equipment stays pressurized until pressure is manually relieved. Before cleaning, checking, or servicing the fluid components, follow the Pressure Relief procedure in the ProDispense operation manual (3A3469).

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns.

1. Follow **Troubleshooting**, page 20, before checking or repairing devices.
2. Check all possible problems and causes before disassembling devices.

Common Troubleshooting Issues

For more detail, refer to the Banner Engineering manual shipped with your 26C266 Wireless Remote Kit.

Problem	Cause	Solution
The radio won't wake up.	While in Storage mode, the radio does not operate. All Sure Cross® radios powered from an integrated battery ship from the factory in storage mode to conserve the battery.	To wake the device, press and hold button 1 for 5 seconds. To put any *FlexPower* or integrated battery Sure Cross radio into storage mode, press and hold button 1 for 5 seconds. The radio is in storage mode when the LEDs stop blinking, but in some models, the LCD remains on for an additional minute after the radio enters storage mode. After a device has entered storage mode, you must wait 1 minute before waking it.
The sensors are not powered.	Many SureCross devices have several switch power outputs for powering sensors.	Enable the power supplies using the I/O point parameters for sensor supply #, supply output voltage, and warm-up time.

Problem	Cause	Solution
The radio seems only partially powered.	The ribbon cable has been unplugged from the radio board.	Verify the ribbon cable is fully seated and that it has been plugged into all pins.
	The ribbon cable was plugged in incorrectly and missed a row of pins.	Plug in the ribbon cable taking care that all pins are aligned correctly.
The radio won't enter Binding mode.	Power was not disconnected before changing the DIP switch positions.	Cycle power to the device so the device can register the DIP switch changes. For devices with an integrated battery, cycle the power by removing the battery for one minute.

LED Message Codes

Solid or flashing LEDs mean different things depending on whether the device is a gateway, node, or remote I/O Modbus slave.

LED 1	LED 2	Definition/Solution
Solid green		Gateway, Remote I/O: Power is on
Flashing green		Node: Good radio communication link
	Flashing amber	Gateway, Remote I/O: Active Modbus communication
Flashing red	Flashing red	Device error. If the LCD also reports BAD EE, contact your Graco representative for replacement.
	Flashing red	Gateway, Remote I/O: Modbus communication error For a GatewayPro system, a Modbus communications error indicates a communications problem internal to the GatewayPro. Solutions: 1. The default communications settings for the RS485 port are: 1 start bit, 8 data bits, no parity, 1 stop bit, and 19.2k baud. The DX80 Gateway uses Modbus RTU protocol for all communications. Supported Modbus function codes are 3, 6, and 16. 2. Verify the DX80 model supports RS485 serial communications. 3. RS485 termination or biasing is not supplied on the Gateway and should be provided externally to the DX80. (Termination is not required by the Gateway, proper biasing of the serial lines is required.) 4. Bad connection or bad cable.

LED 1	LED 2	Definition/Solution
	Flashing red	Node: No radio communication There are two settings on every node device used to synchronize to the gateway device: • The node must be bound to the gateway. • Each node ID with that network must be set to a unique number. Solutions: 1. If the Gateway and Node are less than two meters apart, device communication may fail (radios may saturate). If the Gateway is less than two meters from another Gateway, send and receive transmissions between all devices the Gateways communicate with fails. 2. The Gateway and Node may be too far apart to achieve synchronization – consult the factory for options. 3. Use a qualified antenna on both the Gateway and Node devices. 4. After any system parameter change, cycle the power to re-synchronize all devices. 5. When a Node loses synchronization, it is programmed to attempt resynchronization for five seconds, then sleep for fifteen seconds. Synchronizing may require up to twenty seconds. 6. Re-cycle power on the Gateway and Node devices.
	Not blinking amber	Gateway: No Modbus communication Solution: 1. The gateway's LED 2 should always be blinking amber to indicate Modbus communication. If LED 2 does not blink amber, verify the baud rates, slave IDs, parity, and stop bits are set correctly. 2. Check the cables connecting the gateway to the host device.
No LED 1	No LED 2	All devices display "POWER" on the LCD for the first five to ten seconds after applying power. A gateway always has a green LED 1 on when the power is connected. Nodes flash a red LED 2 every three seconds, or a green LED 1 every second, depending on the RF Link status. If no LEDs are lighting up: 1. Put battery-powered devices into power-down mode by pressing and holding button 1 for three to five seconds. To return from power-down mode, press and hold button 1 for three to five seconds. 2. Recheck the powe connections and power requirements. Battery-powered devices require 3.6 - 5.5 VDC. Non-battery powered devices require 10 - 30 VDC. 3. After replacing the battery, allow up to sixty seconds for the device to power up. 4. The gateway cannot be attached to another Modbus master device or a Modbus slave ID 1 via RS-485. Special configuration using the Web page configuration tool allows the gateway to become a slave unit when necessary.

LCD Message Codes

Message	Solution
BAD EE	System Error. A system error typically represents a failure of the EE PROM. Contact the factory for replacement.
EC *XX*	The XX refers to the Modbus register 8 message code shown in *Modbus Message Codes for Register 8*. The LCD displays the message code in decimal; host-controlled systems read the message codes in hex. DX80 display shows *ERROR: The Gateway uses fully-acknowledged polling to ensure each Node radio link is robust. If a prescribed number of sequential polling cycles are not acknowledged by a Node, the Gateway considers the radio link with that Node to be timed out. All outputs on the Node in question are set to the user-selected default state or the output holds its last state, depending on user configuration options set using the User Configuration Tool. If the Node's radio link recovers and the Gateway or Gateway Pro determines enough acknowledged polling messages have accumulated, the link is reinstated.
EC 53	Radio Device (polling/heartbeat) Timeout. (Decimal value 13569.) A Node dropped out of the wireless network based on the parameters defined for polling or heartbeat. For more information, see Message Code 35 in *Modbus Message Codes for Register 8*.
EC 54	Modbus time-out. A Gateway timeout (time of inactivity on the serial channel) was detected. For more information, see Message Code 36 in *Modbus Message Codes for Register 8*.
No LCD	All DX80s display "POWER" on the LCD for the first 5 to 10 seconds after applying power. A Gateway's LED 1 is solid green when power is connected. Nodes flash a red LED 2 every 3 seconds or a green LED 1 every second depending on the radio link status. • Battery-powered devices turn off the LCD after 15 minutes (factory default). Push any button to reactivate the LCD. Battery-powered devices may be in storage mode. To put battery powered devices into storage mode, hold button 1 for 5 seconds. To return from storage mode, hold button 1 for 5 seconds. • Recheck the power connections and power requirements. Battery-powered devices require 3.6 to 5.5 VDC. Non-battery powered devices require 10 to 30 VDC. • After replacing the battery, allow up to sixty seconds for the device to power up.

Repair

WARNING

FIRE AND EXPLOSION HAZARD

This equipment must be grounded. It has the potential of static dissipation. Improper grounding, setup, or usage of the system can cause static shock. All grounding must be done by a qualified electrician and comply with all local codes and regulations.

After any service or repair, refer to **Grounding** on pages 6 and 11 to ensure proper grounding has been maintained.

Battery Replacement

Replacement battery: 19A792

WARNING

FIRE AND EXPLOSION HAZARD

In order to maintain hazardous locations approvals, no battery substitutions are allowed.

Battery life for the wireless transmitter node (1) is expected to be one year or more, and is directly related to the LED lights. The user can shorten the output duration time to extend battery life.

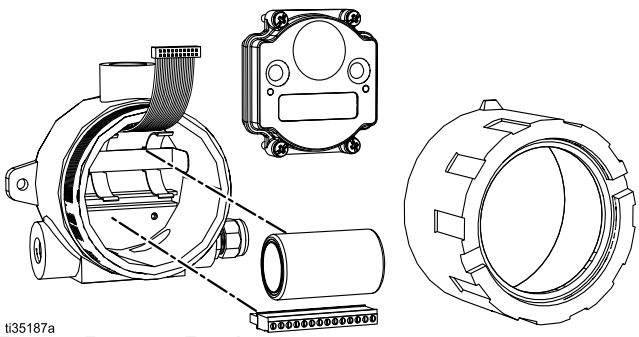


FIG. 12 Battery Replacement

NOTE: The battery can be replaced within the hazardous location. It is not necessary to remove the unit from the hazardous location during this procedure.

1. Open the end with the glass window and gently lift the radio core unit and the space frame it sits on up. The core unit connects to the space frame using two pins and the radio core is connected to the wiring board with a ribbon cable.
2. Disconnect the ribbon cable from the radio.
3. Remove the existing battery from the battery holder.
4. Insert the new battery (only use Graco part 19A792) into the battery holder, verifying the positive and negative poles of the battery are positioned according to the marking on the board.
5. Reconnect the ribbon cable to the radio.
6. Reinsert the two pins connecting the radio core unit to the space frame.
7. Gently reinstall the core unit and space frame into the housing of the gateway.
8. Reattach the glass window.

Battery Disposal

Do not place batteries in the trash. Recycle batteries according to local regulations.

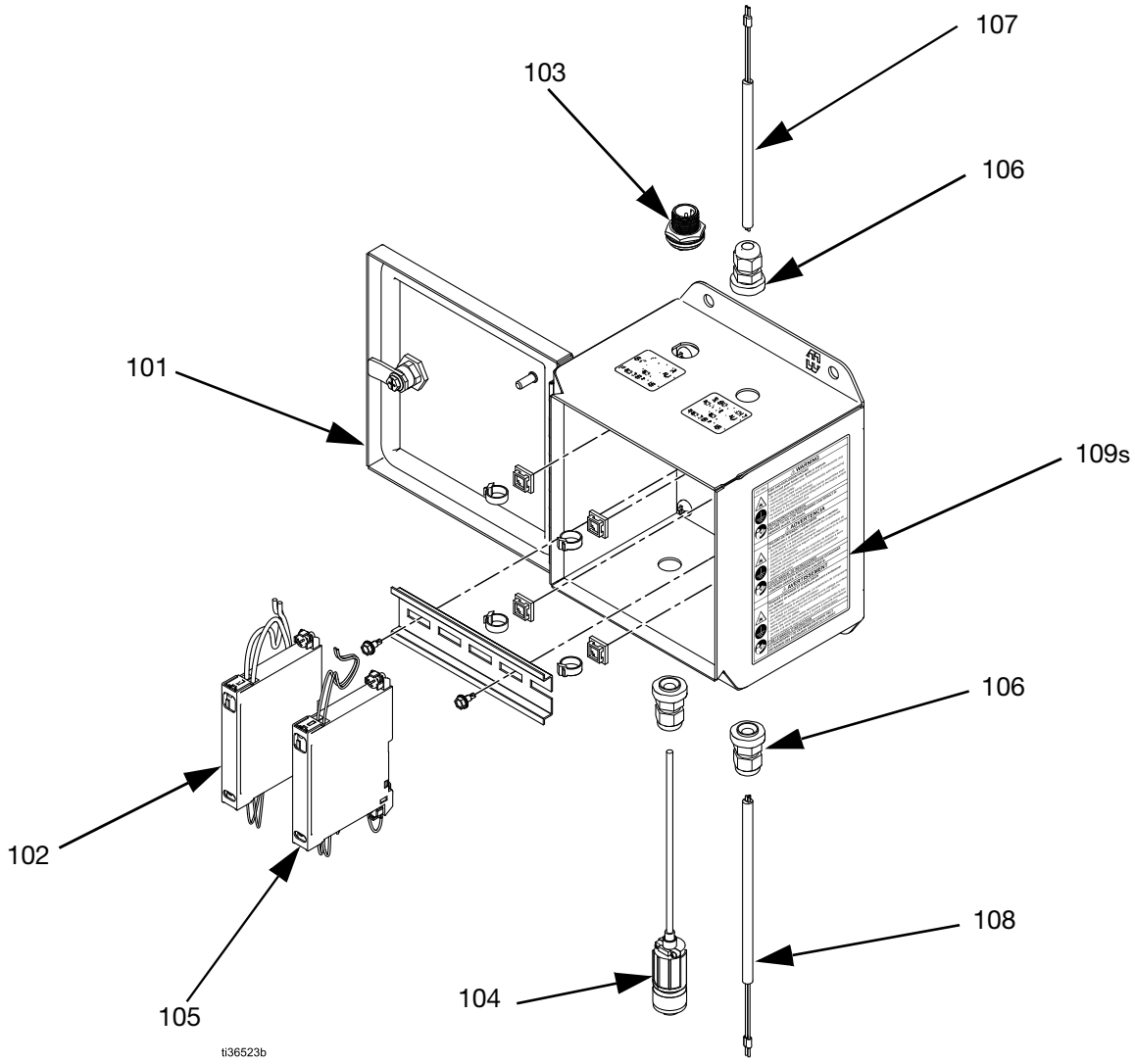
Barrier Replacement

1. Turn off power at the ProDispense power switch on the ProDispense control assembly.
2. Open the door of the barrier enclosure (101). (Refer to **Dimensions** on page 27.)
3. Disconnect the wires from the barrier (102 or 105) being replaced.
4. Detach the barrier (102 or 105) from the DIN rail.
5. Attach the new barrier (102 or 105) to the DIN rail.
6. Connect the wires to the barrier (102 or 105), as shown in the **Barrier Enclosure Wiring Diagram** on page 7.
7. Close the door of the barrier enclosure (101).

Parts

Barrier Enclosure Assembly

25B223 shown, with second barrier for solenoid valve



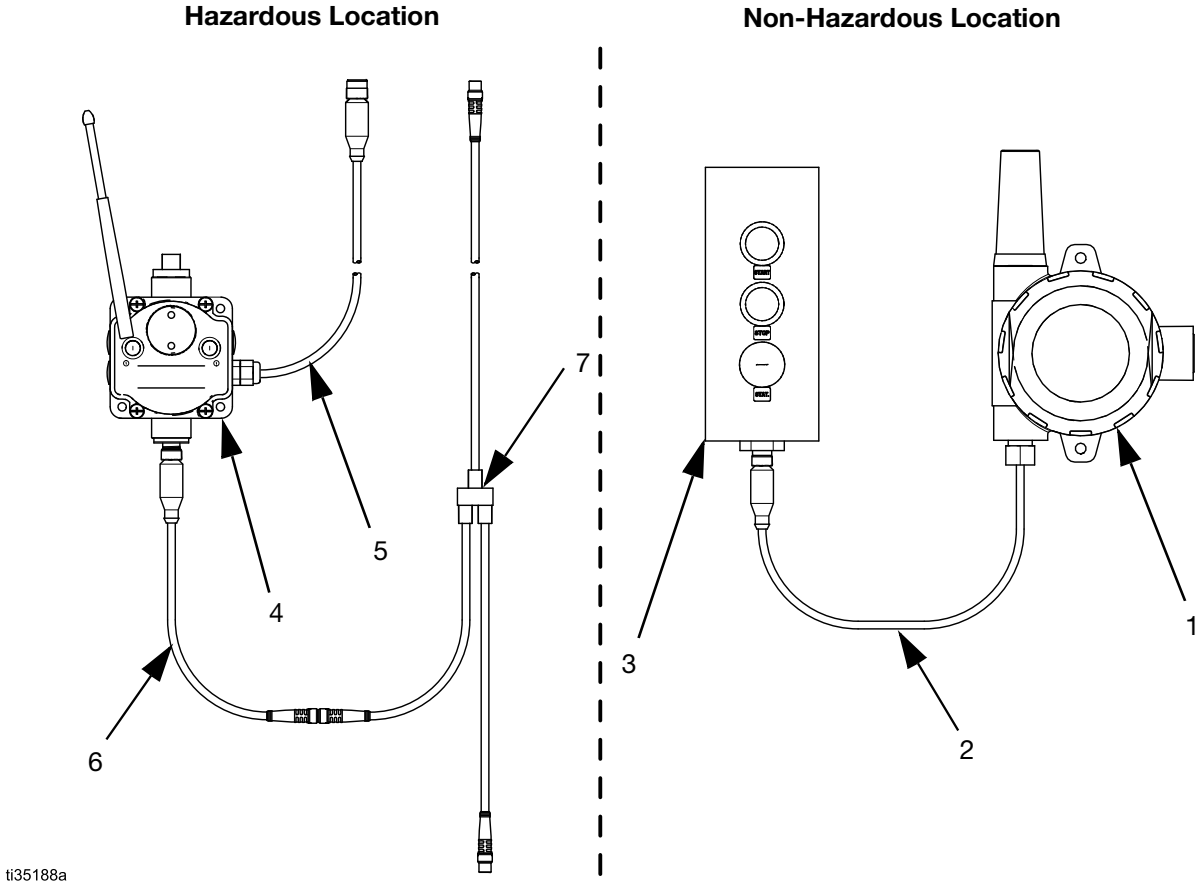
Barrier Enclosure Parts List

Ref.	Part	Description	Qty
101	--	Enclosure	1
102	111985	Barrier, meter	1
103	194751	Connector, meter	1
104	17C888	Cable, meter; 50 ft.	1

Ref.	Part	Description	Qty
105	514895	Barrier, solenoid	1
106	111987	Strain relief, cable	3
107	19A947	Cable; 36 in.	1
108	19A948	Cable; 50 ft.	1
109s	19Y196	Warning label	1

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

26C266 Hazardous Location Wireless Remote

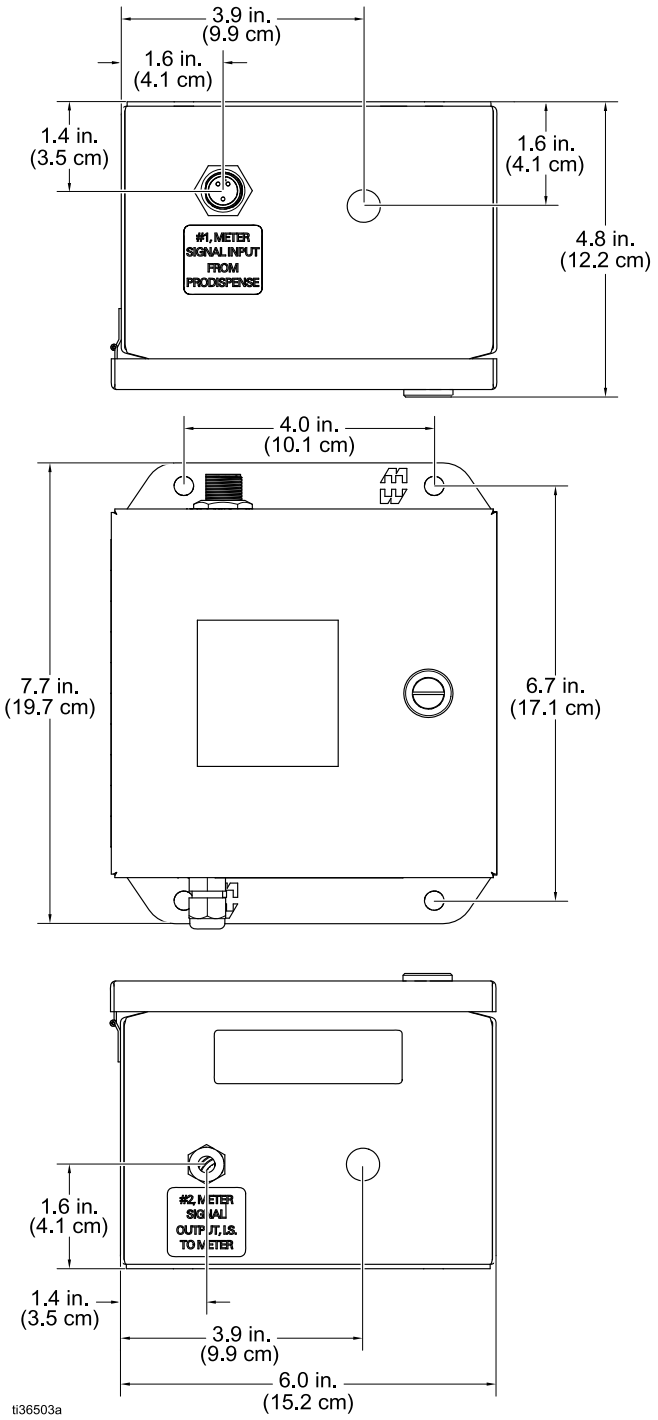


26C266 Hazardous Location Wireless Remote Parts List

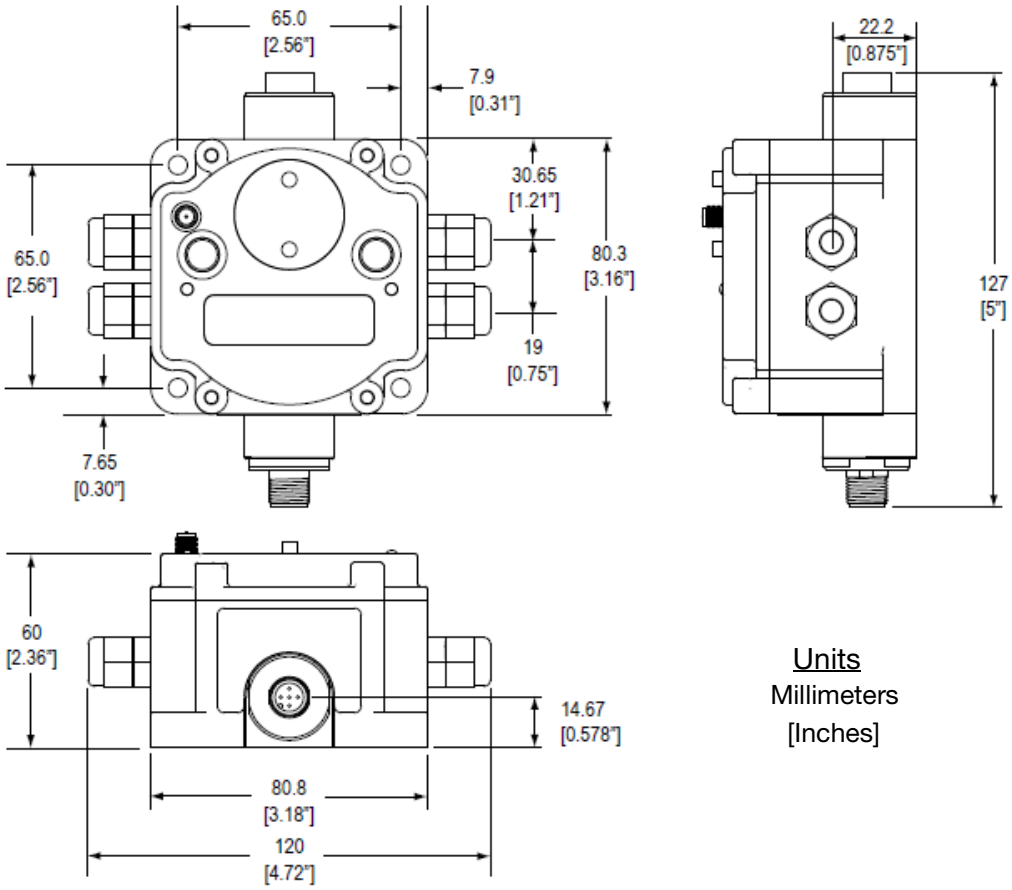
Ref.	Part	Description	Qty
1	17V930	Node	1
2	17V931	Cable, 8 conductor, 3m, m12, m to f	1
3	17V932	Remote control and indicator enclosure	1
4	17V933	Gateway	1
5	17V934	Cable, signal, 8p, 3m, m12, m/fl	1
6	17V935	Cable, adapter, 0.5m, m12f/m8f	1
7	17V936	Cable, y-split, 4p, 0.5m, m8f, m8m/m8m	1
14	17K873	Token, software upgrade, ProDispense (not shown)	1

Dimensions

Barrier Enclosure

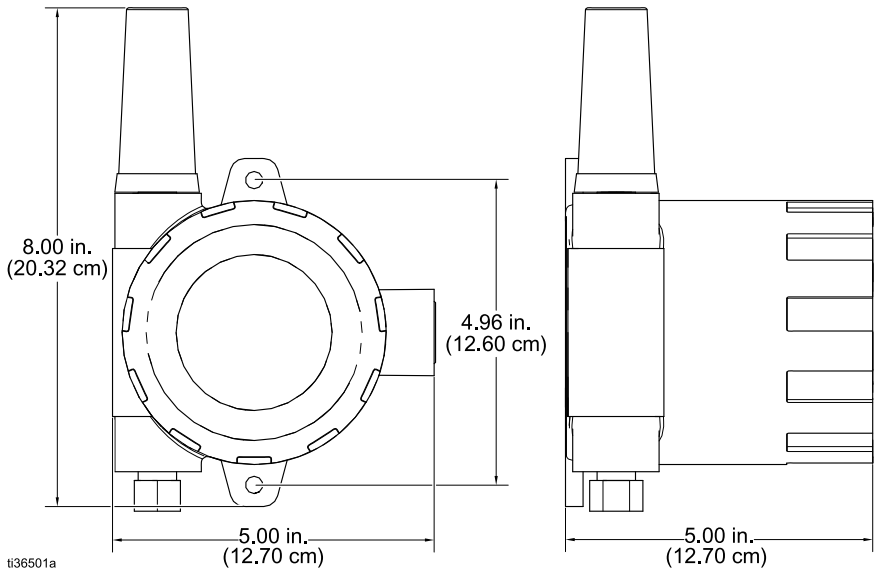


Gateway

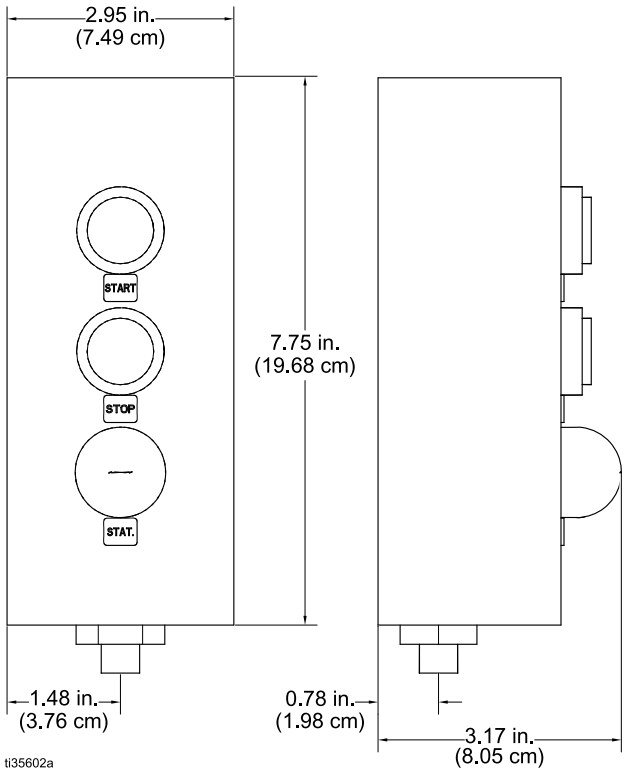


Units
Millimeters
[Inches]

Node



Remote Control and Indicator Enclosure



Appendix A - Factory Settings

NOTE: The User Configuration Tool and factory settings are not to be used or accessed unless directed to by Graco personnel.

The 26C266 Hazardous Location Wireless Remote has been pre-configured for proper functionality between the nodes and the ProDispense. Additional changes to dip switches and other settings should only be done after consulting a Graco technical support representative. Additional cables and software may be required, and are available from Graco upon request.

User Configuration Tool

The User Configuration Tool (UCT) allows users to link I/O points in the wireless network, view I/O register values, and set system communication parameters when a host system is not part of the wireless network. The software runs on any computer with a Windows Vista, Windows 7, Windows 8, or Windows 10 operating system.

Appendix B - Conducting a Site Survey

A site survey, or Radio Signal Strength Indication (RSSI), analyzes the radio communication link between the gateway and any node within the network by analyzing the radio signal strength of received data packets and reporting the number of missed packets that required a retry.

Perform a site survey before permanently installing the radio network to ensure reliable communication. Activate Site Survey mode from either the gateway buttons or the gateway modbus holding register 15. Only the gateway can initiate a site survey, an the site survey analyzes the radio communications link with one node at a time.

Site Survey Using the Menu System

Initiate a survey using the gateway's buttons and menu system.

1. Remove the rotary dial access cover.
2. To check the status of node 1, change the gateway's right rotary dial to 1. The gateway is now enabled to read the status of node 1, and the display scrolls through the node's I/O status.
3. Single-click button 1 to scroll across the menu levels until reaching the Site Survey (SITE) menu.
4. Single-click button 2 to enter the Site Survey menu.
5. Single-click button 2 again to begin conducting a site survey with the node selected in step 2. The gateway analyzes the quality of the signal from the selected node by counting the number of data packets it receives from the node.
6. Examine reception readings (M, R, Y, G) of the gateway at various locations. Site survey results are displayed as percentages. M represents the percent of missed packets, while R, Y, and G represent the percent of received packets at a given signal strength. M = missed packets; R = Red, marginal signal; Y = Yellow, good signal; G = Green, excellent signal.
7. Change the gateway's right rotary dial to conduct a site survey on another node and repeat steps 2 through 6.
8. To end the site survey, double-click button 2.
9. Change the gateway's right rotary dial back to 0. The LCD displays the device readings for the gateway.
10. Double-click button 2 to move back to the top-level menu.
11. Single-click button 1 to return to Run mode.
12. Install the rotary dial access cover, referring to the Installation section of the manual to create an IP67 seal.

Site Survey from a Gateway Board Model

Perform the following steps to conduct a site survey from the board module gateway:

1. Set the gateway's rotary dials to the node address you'd like to conduct a site survey with. The site survey automatically begins running. If there is no node at the address, the LED is solid red. If there is a node, the LED flashes amber.
2. Evaluate the signal strength. The amber LED flashes at specific rates to indicate the site survey results. Each signal strength represents the majority of the data packets being received at that signal strength.
    - Eight flashes per second: Very strong signal strength
    - Four flashes per second: Strong signal strength
    - Two flashes per second: Good signal strength
    - One flash per second: Weak signal strength
    - Solid amber LED: No radio communication detected
3. To exit the site survey, set the gateway's rotary dials to 00. Otherwise, the gateway automatically exits Site Survey mode after 15 minutes. The LED flashes green to indicate the gateway is in standard operating mode.

Improving Site Survey Results

If your site survey results have more yellow than green, consider replacing the node's antenna with one of the following:

- A 2 dBi Omni dome antenna (model BWA-9O2-D) or a 5 dBi Omni antenna (model BWA-9O5-C)
- A 6 dBi Yagi (directional) antenna (model BWA-9Y6-A)

If the distance between devices is greater than 5,000 meters (3 miles) line-of-sight, or objects (such as trees or man-made obstructions) interfere with the path, and the Missed packet count exceeds 25%, consider the following steps:

- Install antenna(s) remotely at a higher position (requires an antenna signal cable);
- Use a higher gain antenna;
- Decrease the distance between devices; or
- Use data radios to extend the position of the gateway relative to the host system.

Performance Levels

Very strong signal strength is 100 green (displayed on the LCD) or eight flashes per second (models without LCDs). If the included 2 dBi OMNI antenna does not achieve this signal strength, use a different omni antenna, such as the 2 dBi dome antenna (same gain, different form factor) or 5 dBi antenna (higher gain). You may also use a low-gain directional antenna, such as the 6.5 dBd Yagi antenna.

Strong signal strength is represent by some green signals and some yellow signals (very few red signals and very few missed signals) for four flashes per second. To improve your radio performance, consider using a different omni antenna, such as the 2 dBi dome antenna, 5 dBi antenna, 6 dBi antenna, or 8 dBi antenna. You may also use a low-gain directional antenna, such as the 6.5 dBd Yagi antenna. We also recommend installing the antenna(s) remotely at a higher position. Additional antenna cables are available from Banner Engineering if needed.

Good or weak signal strength equals some yellow signals and a majority of red signals (very few green signals, a small number of yellow signals, and a small to medium number of missed signals) or one to two flashes per second. To improve your radio performance, consider using one of the 6 dBi or 8 dBi omni-directional antennas or the 10 dBd directional antenna. We also recommend installing the antenna(s) remotely at a higher position. Additional antenna cables are available from Banner Engineering if needed.

No radio communication is when more than 50% of the radio signals are missed or a solid amber LED. To improve radio performance, use a 8 dBi omni-direction antenna or a 10 dBd directional antenna and elevate the antenna above any obstructions. The lack of signals may also be due to the distance between the Gateway (master radio) and Nodes (remote radio). If this is the case, please contact Banner Engineering for further assistance. We also recommend installing the antenna(s) remotely at a higher position. Additional antenna cables are available from Banner Engineering if needed.

Technical Specifications

26C266 Hazardous Location Wireless Remote	
Battery Life	> 1 year with alarm output time set at 15 sec. or less
Wireless Range	
Minimum separation of atennas	10 ft (3 m)
Outdoors, no obstructions	3.5 miles (5.6 km)
Indoors, with non-metal obstructions	300 - 500 ft (91.4 - 152.4 m)
In metal spray booth	100 - 300 ft (30.5 - 91.4 m)
Multiple metal obstructions	10 - 100 ft (3.0 - 30.5 m)

FCC / IC Notice

26C266 Assembly (17V930 and 17V933 models)

FCC Certification, 900 MHz

Complies with Part 15 of the FCC rules and regulations.

FCC ID: TGUDX80 This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IC: 7044A-DX8009

Refer to your Banner Engineering documentation provided for additional details.

California Proposition 65

CALIFORNIA RESIDENTS

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

Graco Standard Warranty

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

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

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

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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

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

Original instructions. This manual contains English. MM 3A6715
Graco Headquarters: Minneapolis
International Offices: Belgium, China, Japan, Korea

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