

QUANTM™ Input/Output (I/O) Cable

3A8982E

EN

For use with QUANTM pumps that are certified for use in explosive atmospheres or hazardous (classified) locations. For professional use only.

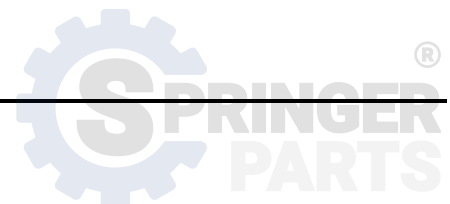
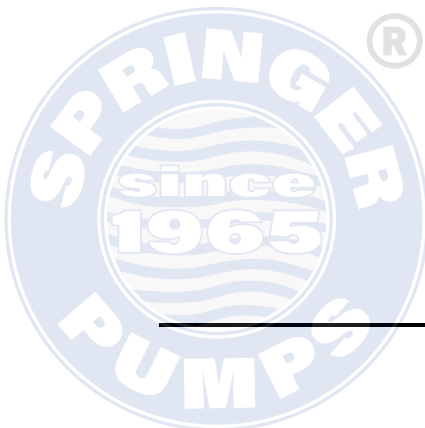
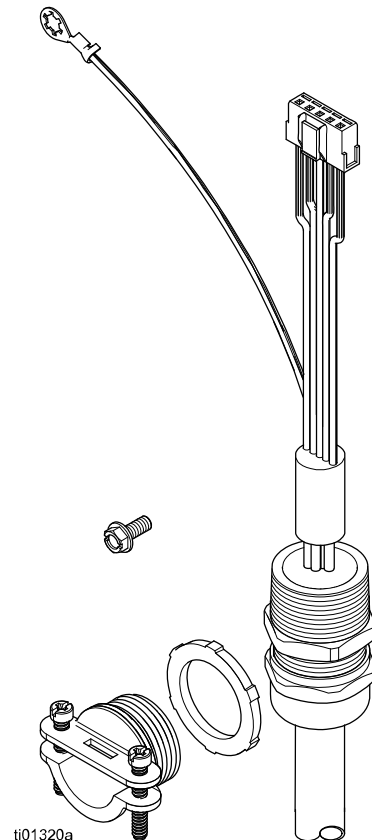


Important Safety Instructions

Read all warnings and instructions in this manual and related system manuals before using or servicing the equipment. Save these instructions.

I/O Cable Kits

Kit No.	Kits include:
25V080	1 cable clamp assembly 2 clamp fasteners 1 ground fastener



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Related Manuals








English Manual Number	Description	Reference
3A7637	QUANTM Electric Motor, Repair-Parts	Motor Manual
3A8572	QUANTM Pumps, Instructions, Industrial Models	Pump Manual
3A9286	QUANTM Pumps, Instructions, Hygienic Models	Pump Manual
3A8946	QUANTM Pumps, Parts, Industrial Models	Parts Manual
3A9287	QUANTM Pumps, Parts, Hygienic Models	Parts Manual



Safety Symbols

The following safety symbols appear throughout this manual and on warning labels. Read the table below to understand what each symbol means.

Symbol	Meaning
	Burn Hazard
	Electric Shock Hazard
	Equipment Misuse Hazard
	Fire and Explosion Hazard
	Moving Parts Hazard
	Pressurized Equipment Hazard
	Splash Hazard

Symbol	Meaning
	Do Not Wipe with a Dry Cloth
	Eliminate Ignition Sources
	Follow Pressure Relief Procedure
	Ground Equipment
	Read Manual
	Ventilate Work Area
	Wear Personal Protective Equipment





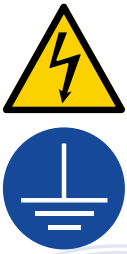
Safety Alert Symbol









This symbol indicates: Attention! Become Alert! Look for this symbol throughout the manual to indicate important safety messages.



Warnings

The following warnings apply throughout this manual. Read, understand, and follow the warnings before using this equipment. Failure to follow these warnings can result in serious injury.

 WARNING	
	<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 sparking). • Ground all equipment in the work area. See Grounding instructions in your pump manual. • 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. • Use only conductive grounded fluid lines. • 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>Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable vapors. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Clean plastic parts only in well-ventilated area. • Do not clean with a dry cloth.
	<p>ELECTRIC SHOCK HAZARD</p> <p>Explosive Atmospheres or Hazardous (Classified) Locations Pumps (hard wired for permanent connection):</p> <p>This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment. • Connect only to grounded power source. • All electrical wiring and repairs must be done by a qualified electrician and comply with all local codes and regulations. • Do not expose to rain. Store indoors.

 WARNING	
  	PRESSURIZED EQUIPMENT HAZARD Fluid from the equipment, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury. <ul style="list-style-type: none"> Follow the Pressure Relief Procedure in your pump manual when you stop spraying/dispensing and before cleaning, checking, or servicing equipment. Tighten all fluid connections before operating the equipment. Check fluid lines and connections daily. Replace worn or damaged parts immediately.
 	EQUIPMENT MISUSE HAZARD Misuse can cause death or serious injury. <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 Specifications in all equipment manuals. Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer. Turn off all equipment and follow the Pressure Relief Procedure in your pump manual 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 fluid lines, cords, and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not kink or over-bend fluid lines, cords, or cables. Do not use fluid lines, cords, or cables to pull equipment. Keep children and animals away from work area. Comply with all applicable safety regulations.
	BURN HAZARD Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns: <ul style="list-style-type: none"> Do not touch hot fluid or equipment.
	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. Protective equipment includes but is not limited to: <ul style="list-style-type: none"> Protective eyewear, and hearing protection. Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Component Identification

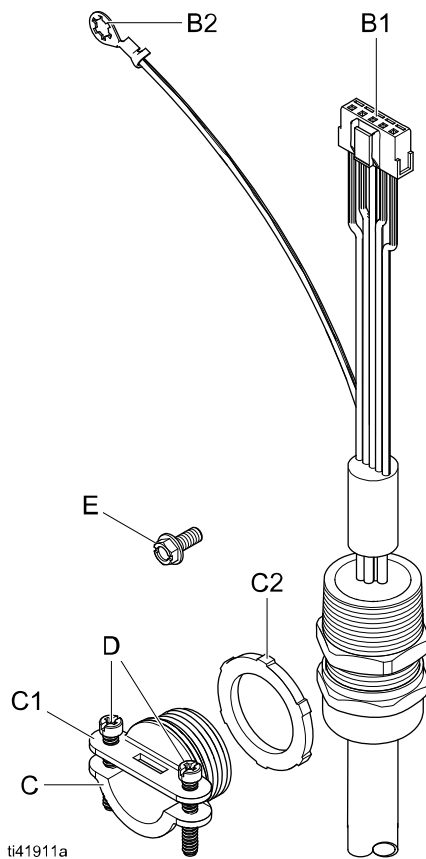


FIG. 1: I/O Cable Kit Components

Key:

- B1 I/O cable wire
- B2 I/O cable ground wire
- B3 I/O cable flying leads, *not shown*; see FIG. 6
- C Cable clamp base
- C1 Cable clamp top
- C2 Cable clamp jam nut
- D Clamp fastener
- E Ground fastener

Installation



To avoid injury from fire, explosion, or electric shock, all electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

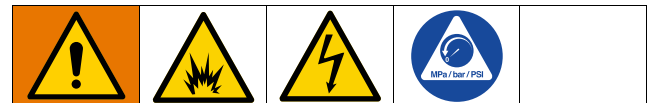
To prevent electric shock, turn off the pump and disconnect from power before performing any service or repair procedure.



To help prevent serious injury from pressurized fluid, such as splashing fluid and moving parts, relieve the pressure when you stop operating and before cleaning, checking, or servicing the equipment. Follow the **Pressure Relief Procedure** in your related pump manual. See **Related Manuals**, page 2.

Perform **Prepare the Pump**, page 6, before performing any service or repair.

Prepare the Pump



To avoid injury from fire and explosion, move the equipment to a non-explosive or non-hazardous location before performing any service or repair to the equipment.

Always complete the following procedure before performing any service or repair to the equipment.

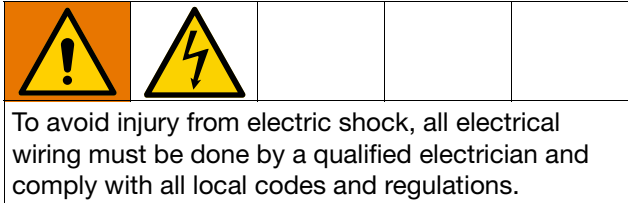
1. Relieve the pressure. Follow the **Pressure Relief Procedure** in your related pump manual. See **Related Manuals**, page 2.
2. Verify that the pump is turned off and power to the system is disconnected before performing any service or repair procedure.

Install the I/O Cable

See FIG. 1–FIG. 4.

Required Tools:

- 1/4 in. socket wrench
- 1-1/8 in. or 28 mm open-end wrench
- No. 2 Phillips screwdriver
- 9/16 hex key wrench



Remove the I/O Cable

If an I/O cable is currently installed, remove the current I/O cable before installing the new I/O cable.

1. Follow **Prepare the Pump**, page 6.
2. Disconnect the I/O cable flying leads (B3) from your I/O system setup.
3. Remove the control cover (F). See your related motor manual. See **Related Manuals**, page 2.
4. Disconnect the I/O cable wire (B1), ground fastener (E), and I/O cable ground wire (B2) from the port in the control housing (H). See **Connect to the Control Board**, page 9.

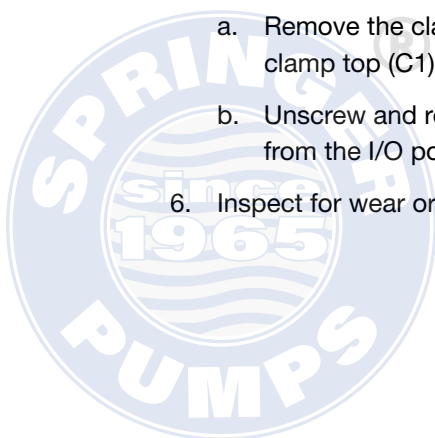
NOTICE

To avoid damage to the control board, ensure that fluid does not contact electrical components in the control housing.

5. Remove the I/O cable (B):
 - a. Remove the clamp fasteners (D) and clamp top (C1) from the I/O cable (B).
 - b. Unscrew and remove the I/O cable assembly from the I/O port (G1).
6. Inspect for wear or damage. Replace as necessary.

Install the I/O Cable Assembly

1. Follow **Prepare the Pump**, page 6.
2. Remove the control cover (F). See your related motor manual. See **Related Manuals**, page 2.
3. If installing the I/O cable assembly for the first time, remove the plug (G) from the I/O port (G1).
4. Install the I/O cable assembly (B):
 - a. Slide the I/O connector (B1) and ground wire (B2) through the I/O port (G1).
 - b. Apply thread sealant to the threads of the cable gland base (A), and screw into and tighten securely into the I/O port (G1).
 - c. On the back side of the control cover (F), slide the I/O connector (B1) and ground wire (B2) through the clamp base (C) and jam nut (C2).
 - d. Screw the clamp base (C) into the back side of the port (G1), and tighten the jam nut (C2) against the back side of the cover.
 - e. Position the short piece of cable sheathing so it is centered inside the clamping area of the clamp base (C), and attach clamp (C1) to the base (C) using screws (D) and tighten securely.
 - f. Securely tighten the clamp top fasteners (D).
5. Install the I/O cable ground wire (B2) and ground fastener (E) to the hole in the control housing (H). Securely tighten. See **Connect to the Control Board**, page 9.
6. Connect the plug on the I/O cable (B1) to the socket on the control board. See FIG. 5.
7. Install the control cover (F). See your related motor manual. See **Related Manuals**, page 2.



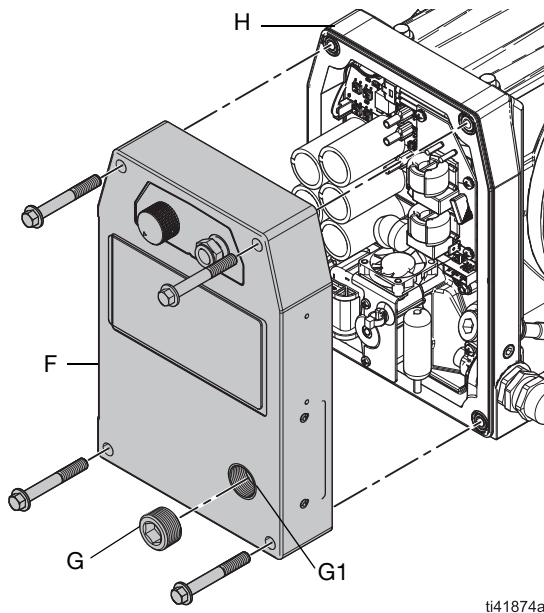


FIG. 2: Control Cover and Plug

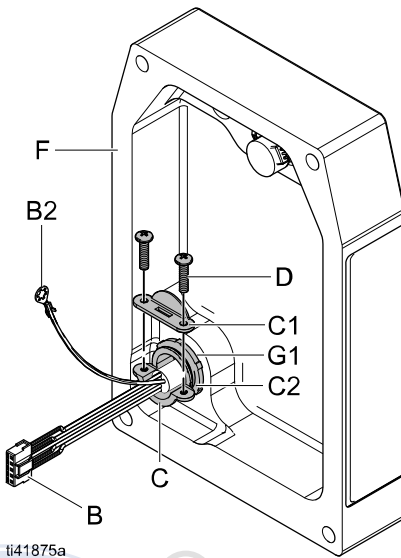
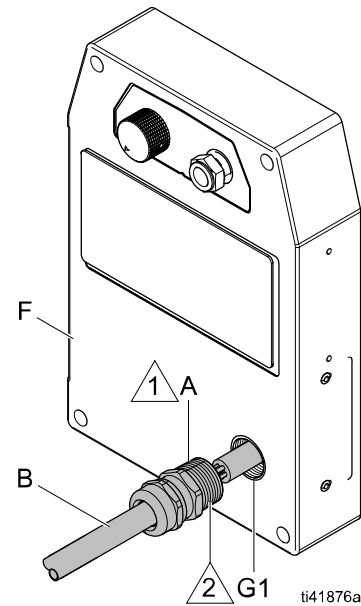


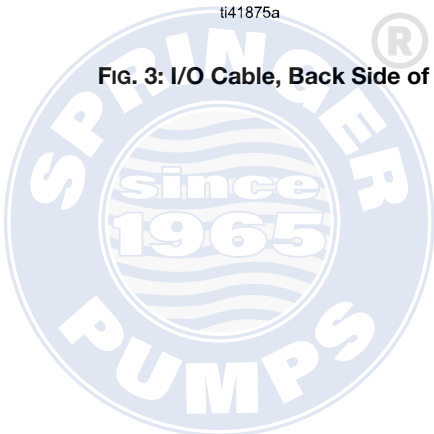
FIG. 3: I/O Cable, Back Side of Control Cover



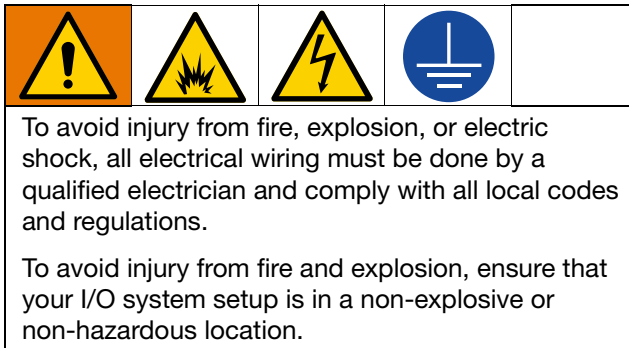
1 Threaded side faces toward the I/O port (G1).

2 Apply thread sealant.

FIG. 4: I/O Cable, Front Side of Control Cover



Electrical Connections and Wiring



Connect to the Control Board

1. Install the I/O cable ground wire (B2) and ground fastener (E) to the hole in the control housing (H). Securely tighten. See FIG. 5.
2. Connect the plug on the I/O cable (B1) to the socket on the control board. See FIG. 5.

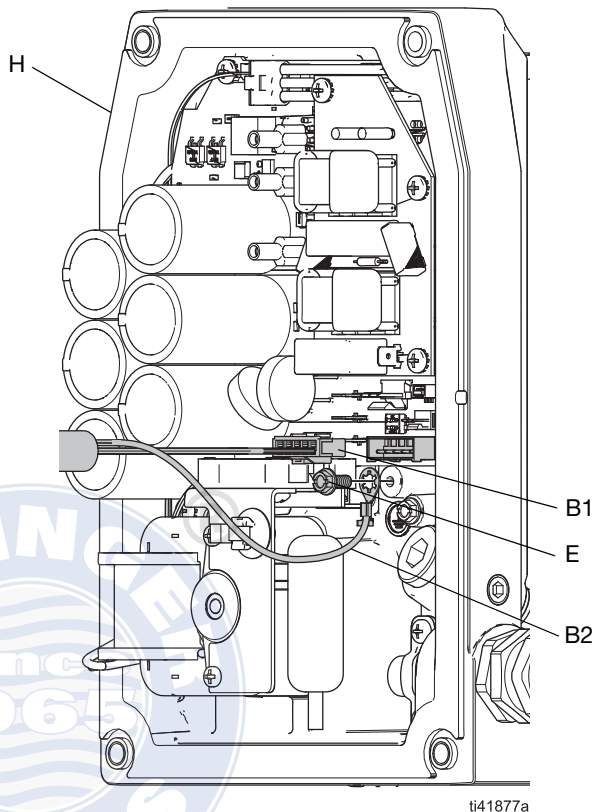


FIG. 5: I/O Cable Wire and I/O Cable Ground Wire Connection

Wire the I/O Cable Flying Leads

Connect the I/O cable flying leads (B3) to your I/O system setup. See **Equivalent Electrical Circuits for I/O Pin Connection**, page 10.

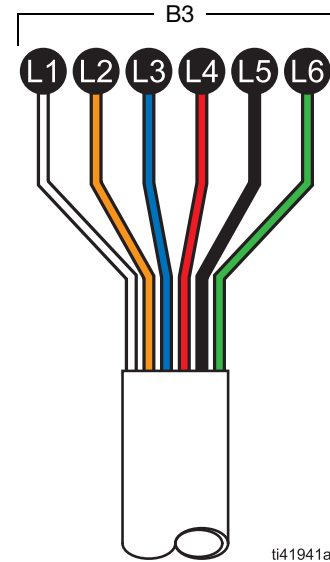


FIG. 6: I/O Cable Flying Leads

Internal I/O Cable Pinout			
Ref.	Wire Color	Connector Type	Internal Pin Connection
L1	White	Digital Input	Pin 1
L2	Orange	Digital Output	Pin 2
L3	Blue	GND/Common	Pin 3
L4	Red	Analog Input, Positive	Pin 4
L5	Black	Analog Input, Negative	Pin 5
L6	Green	Ground	Ground

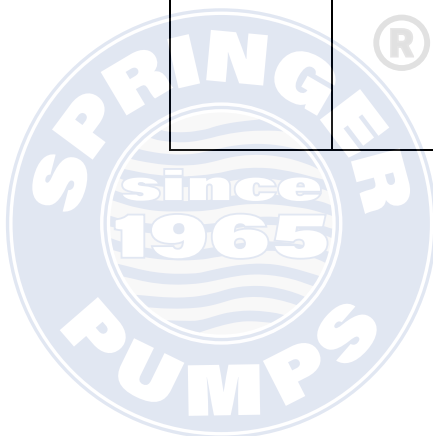


Equivalent Electrical Circuits for I/O Pin Connection

Equivalent Electrical Circuits for I/O Pin Connection	
I/O Circuit	Equivalent Circuit
Digital Input	<p>5 VDC</p> <p>4.7 Kiloohms</p> <p>Pin 1 +</p> <p>Logic: Low (Run) < 2.0 V High (Stop) > 3.0 V</p> <p>Pin 3 -</p> <p>Maximum 30 VDC</p>
Compatible Drivers for Digital Input	
Switch or Relay	
Open Collector (NPN)	
Push-Pull Driver	<p>Maximum 30 VDC</p>

Equivalent Electrical Circuits for I/O Pin Connection	
I/O Circuit	Equivalent Circuit
Digital Output	<p>Pin 2 +</p> <p>Maximum 30 VDC, Maximum 100 mA</p> <p>Pin 3 -</p> <p>Logic: Pump Running: Active Pump Stopped: Inactive</p>
Compatible Digital Output Circuit Drivers	
PLC With Internal Pull-up	<p>5-30 VDC</p> <p>PLC With Internal Pull-up</p> <p>M12 Pin 2 +</p> <p>100 mA Max</p> <p>M12 Pin 3 -</p>
PLC without Internal Pull-up	<p>5-30 VDC</p> <p>PLC</p> <p>PLC without Internal Pull-up</p> <p>M12 Pin 2 +</p> <p>100 mA Max</p> <p>M12 Pin 3 -</p>

Equivalent Electrical Circuits for I/O Pin Connection	
I/O Circuit	Equivalent Circuit
Digital Output	<p>Relay or Solenoid</p>
	<p>LED</p>
	<p>Lamp</p>
Analog Input	<p>Maximum 30 VDC</p>



Technical Specifications

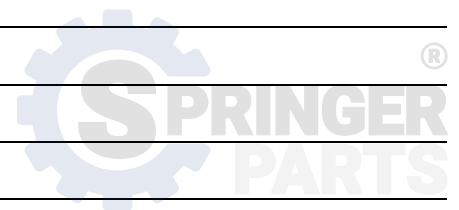
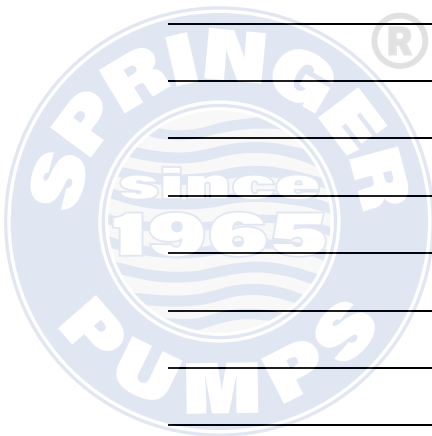
QUANTM I/O Cable		
	US	Metric
Temperature Range	-4° to 104°F	-20° to 40°C
Maximum Voltage	30 V	

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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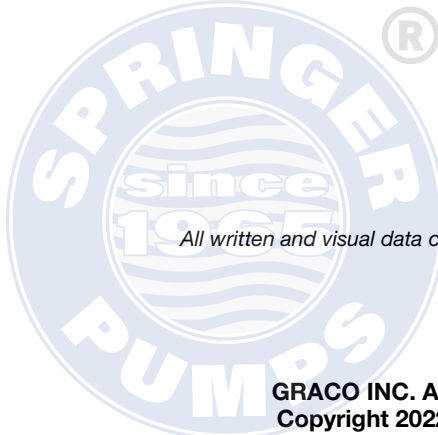
Graco Information

For the latest information about Graco products, visit www.graco.com.

For patent information, see www.graco.com/patents.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.

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



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