Instructions

Harrier® EZ-Batch Chemical Injection Controller

3A8606A
EN

For controlling and monitoring an automated injection system. Not approved for outdoor use. For professional use only.

Not approved for use in explosive atmospheres or hazardous locations.

B32707

See page 2 for approvals.

Important Safety Instructions

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

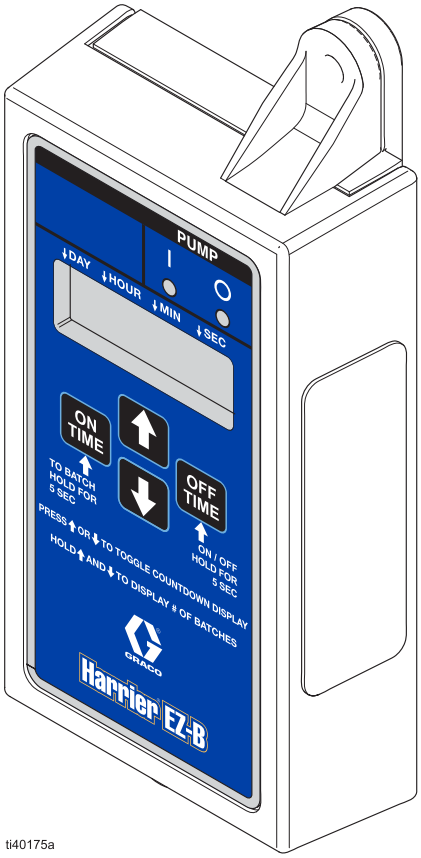

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Table of Contents

Approvals

3151640
Certified to CAN/CSA C22.2 No. 14
Conforms to
UL 508

Related Manuals

Manual No.	Description
334913	Wolverine® Basic Chemical Injection System, Instructions-Parts
334513	Wolverine® Chemical Injection Pump, Instructions-Parts
3A5028	G-Chem Chemical Injection Pump, Instructions-Parts

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to Procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠WARNING

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheet (SDS) from distributor or retailer.
- Turn off all equipment when not in use and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment regularly. 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.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

Component Identification

Keypad, Display, and Icons

NOTICE

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

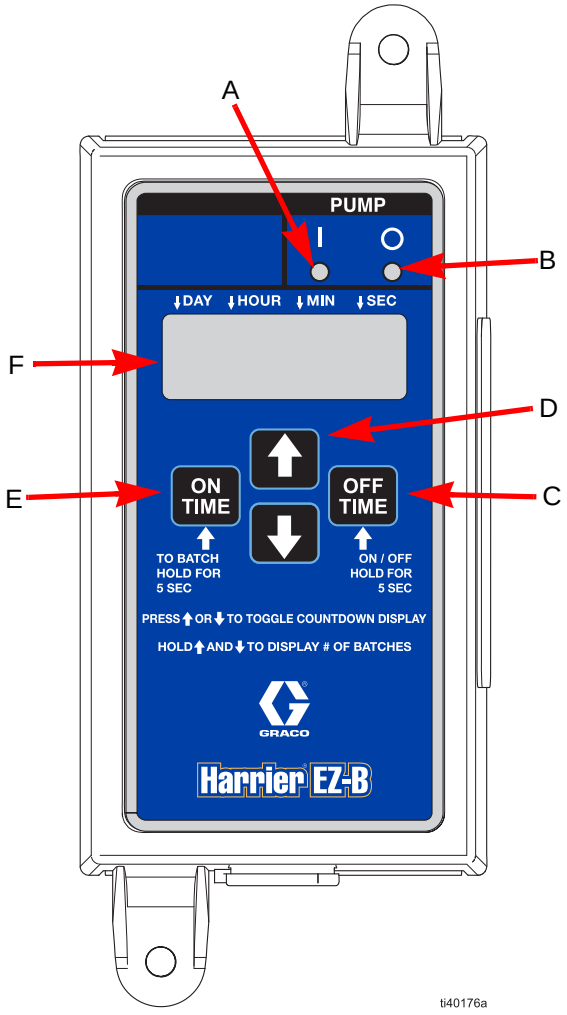

FIG. 1

PUMP LEDs (A & B)

- ON LED (A): In Run Mode, this LED is lit during the On portion of the Run cycle.
- OFF LED (B): In Run Mode, this LED is lit during the Off portion of the Run cycle.

OFF TIME (C)

- In Setup Mode, scrolls through time settings, and saves entry.
- Toggles controller between Run Mode and Off Time Setup Mode.
- Press and hold for five seconds to enter Sleep Mode.

Up and Down Direction Arrows (D)

- In Setup Mode, increase or decrease the time.
- In Run Mode, the Pump On/Off countdown display toggles between days and hours, and minutes and seconds.
- Press both Direction Arrows at the same time for three seconds to display the number of batches that have been completed.

ON TIME / Batch/ Prime Mode (E)

- In Setup Mode, scrolls through time settings, and saves entry.
- Toggles controller between Run Mode and On Time Setup Mode.
- Press and hold for five seconds to start batching.

Display (F)

- In Run Mode, press the Up and Down Arrows (D) to toggle between two display types: Pump On/Off Countdown and number of batches.
- When a Pump LED (A or B) is lit, a 4-digit countdown display counts down the remaining time in the corresponding On or Off portion of the Run cycle. The possible range is 99 days, 23 hours, 59 minutes, and 59 seconds. It is displayed as 99:23 with the days and hours dots lit, or 59:59 with the minutes and seconds dots lit. Pressing the Up and Down arrows toggles between the two. Pressing and holding the Up and Down arrows for five seconds will show the number of batches instead of the Pump On/Off countdown. The pump still cycles on and off while the number of batches is displayed.

Installation

Typical Installation and Wiring Diagram

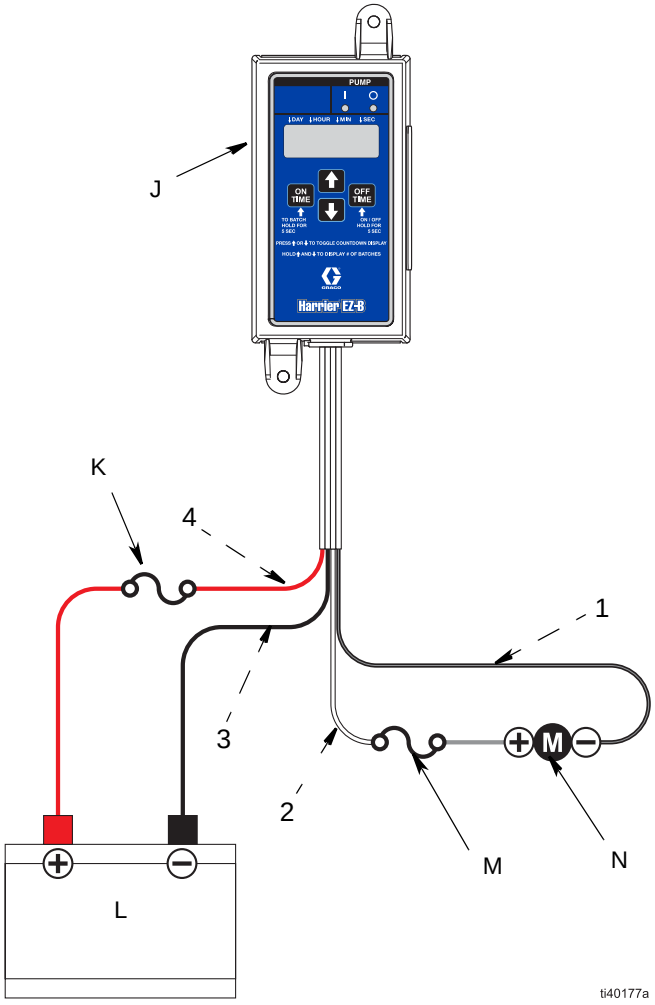

FIG. 2 Typical Installation and Wiring

FIG. 2 is an example of a Harrier EZ-B chemical injection controller installation. Your installation may differ from what is shown here. The controller (J), with wiring, is supplied by Graco. All other components are supplied by the customer. Contact your Graco distributor for assistance in planning a system to suit your needs.

Key:

J	Controller
K	In-line Fuse (battery) - UL 248 approved, 15A or 20A max (per motor size)
L	Battery (12 V or 24 V)
M	In-line Fuse (pump) - UL 248 approved, 15A or 20A max (per motor size)
N	Pump

Wiring Key:

1	Pump (-), black w/gray stripe
2	Pump (+), white
3	Ground (-), black
4	Voltage Input (+), red

Installing the Injection Controller

AUTOMATIC SYSTEM ACTIVATION HAZARD

Unexpected activation of the system could result in serious injury, including skin injection and amputation.

This device has an automatic timer that activates the pump injection system when power is connected or when exiting the programming function. Before you install or remove the Injection Controller from the system, disconnect and isolate all power supplies.

1. Select a flat surface to install the Injection Controller. Drill mounting holes. Refer to **Dimensions** on page 12.
2. Align junction box with predrilled holes. Use two screws (not provided) to secure junction box to mounting surface.

Operation

AUTOMATIC SYSTEM ACTIVATION HAZARD

Unexpected activation of the system could result in serious injury, including skin injection and amputation.

This device has an automatic timer that activates the pump injection system when power is connected or when exiting the programming function. Before you install, service, or remove the pump from the system, pull the motor fuse (see pump manual) and disconnect and isolate all power supplies.

Cool Down Mode

When the controller detects that it is too hot, it will turn the pump off and display “HOT”. Once it has cooled down, the controller will automatically resume running.

Setup Modes

See **Calculating On and Off Times for Batch Treatment**, page 8, for information on how to calculate the On and Off Time values entered in Setup Mode.

Set Up On Time

1. While in Run Mode (either of the ON or OFF LEDs are lit and not blinking), press the ON TIME button (E) to enter On Time Setup Mode (the ON LED is blinking). (See **Keypad, Display, and Icons** on page 4.)

   The first press of the ON TIME button (E) activates the DAY LED dot in the Display (F) and displays days.

2. Press and hold the Up or Down arrow buttons (D) to increase or decrease the duration of On Time in days. (The rate of increase or decrease increases the longer an arrow button is held.)

3. Press the ON TIME button (E) again to activate the HOUR LED dot in the Display (F) and to display hours.

4. Press and hold the Up or Down arrow buttons (D) to increase or decrease the duration of On Time in hours.

5. Press the ON TIME button (E) again to activate the MIN LED dot in the Display (F) and to display minutes.

6. Press and hold the Up or Down arrow buttons (D) to increase or decrease the duration of On Time in minutes.

7. Press the ON TIME button (E) again to activate the SEC LED dot in the Display (F) and to display seconds.

8. Press and hold the Up or Down arrow buttons (D) to increase or decrease the duration of On Time in seconds.

9. Press the ON TIME button (E) again to save the On Time values. “SAvE” appears in the Display (F) and the controller returns to Run Mode.

Set Up Off Time

1. While in Run Mode (either of the ON or OFF LEDs are lit and not blinking), press the OFF TIME button (C) to enter Off Time Setup Mode (the OFF LED is blinking). (See **Keypad, Display, and Icons** on page 4.)

   The first press of the OFF TIME button (C) activates the DAY LED dot in the Display (F) and displays days.

2. Repeat steps 2-9 in **Set Up On Time** while substituting Off Time and the OFF TIME button (C) for On Time and the ON TIME button (E).

Calculating On and Off Times for Batch Treatment

1. Set your pump for continuous operation and max flow rate (see your related pump manual).
2. Identify the max flow rate for your pump depending on the plunger size:
   a. Approximate method:
      - Look up the max flow rate of your pump using the following table. This table only applies to Graco pumps and assumes the pump is running at full speed (60 RPM) and maximum stroke adjustment.

Fluid Plunger Diameter (Full Stroke)	Max Flow Rate (GPD)
3/16”	10.3
1/4”	18.4
3/8”	33.0
1/2”	62.4
5/8”	103.3
3/4”	148.7

   b. Calibration method:
      - Run a one-minute continuous flow cycle on your chemical tank’s calibration column (see your related pump manual for detailed chemical dosage instructions).
      - Read the volume pumped on your chemical tank’s calibration column. This is your max flow rate (see your related pump manual for detailed chemical dosage instructions).
      - Convert the measured value to a gallon per day (GPD) measurement, if necessary.
3. Calculate the On Time in days.
4. Convert the On Time to days, hours, minutes, and seconds to enter in the Harrier EZ-B controller.
5. Calculate the Off Time in days.
6. Convert the Off Time to days, hours, minutes, and seconds and enter in the Harrier EZ-B controller (see **Setup Modes** on page 7).

Calculation and Conversion Example

- 5 gallon batch desired with a 1/4” pump and a batch once every 7 days. Enter the bold time values below in **Setup Modes** on page 7.

Calculating On Time	Calculating Off Time
1. Max flow rate of pump = 18.4 GPD 2. On Time = Gallons Desired (Gal) / Max Flow Rate (GPD) = 5 / 18.4 = 0.27 days 3. Convert On Time to enter in the controller in Days, Hours, Minutes, and Seconds:	1. Off Time = Desired Batch Interval - On Time = 7 days - 0.27 days = 6.73 days 2. Convert Off Time to enter in the controller in Days, Hours, Minutes, and Seconds:
	

Batch/Prime Mode

While in Run Mode (either of the ON or OFF LEDs are lit and not blinking), press and hold the ON TIME button (E) for five seconds to start batching. This will turn the pump on for the duration of the programmed On Time, which appears on the display (F) as it counts down to “0”. This can be used to prime the pump or to force a pump to start a batch cycle immediately. (See **Keypad, Display, and Icons** on page 4.)

Once the countdown is complete, the pump will return to Run Mode and continue its cycle of Off and On according to the setpoints entered in the On Time and Off Time Setup Modes.

NOTE: The Batch/Prime Mode countdown can be canceled at any time by pressing any button. The pump will return to Run Mode and normal operation.

Sleep Mode

While in Run Mode (either of the ON or OFF LEDs (A or B) are lit and not blinking), press and hold the OFF TIME button (C) for five seconds to put the controller in Sleep Mode. To wake the controller, press and hold the OFF TIME button (C) for five seconds. The controller will then resume Run Mode and continue where it left off in its cycle of Off and On Times.

Alarm Operation

When an alarm situation occurs:

- pump operation is disabled,
- an error code displays.

Cycle power to clear alarm.

NOTE: Alarms are visual only.

Alarm Type	Error Code	Description	Things to Check/Do
Memory		Problem writing setup values to memory	Cycle power. Try writing values again. If error persists, contact Graco Customer Support.
Low Voltage		Voltage too low to safely write memory	Cycle power. Allow battery to charge up before trying to write values again. If error persists, contact Graco Customer Support.

Troubleshooting

Description	Problem	Solution
Unit does not power on or display is dim/unresponsive	Incorrect or loose wiring	Refer to installation instructions beginning on page 5.
	Input voltage is out of range	Confirm power source is between 9 and 26 VDC.
	Blown external fuse	Confirm that none of the devices or wiring connected to the controller are causing a short circuit connection. Replace fuse. If fuse trips again, contact Graco Customer Support.
Motor is stuck in the On portion of the Run cycle.	Incorrect wiring	Verify the wiring on page 5. If the pump remains stuck in the On portion of the Run cycle, contact Graco Customer Support.
Controller flashes software revision code (i.e. 1.14)	Low voltage supplied to controller	Remove motor fuse and verify controller operation. If controller operates without motor fuse, charge or replace battery. If controller does not operate properly without motor fuse, contact Graco Customer Support

Accessories

Related Kits

Kit No.	Description
B32070	15A Fuses (10)
B32071	20A Fuses (10)

Dimensions

NOTE: The following image is not to scale.

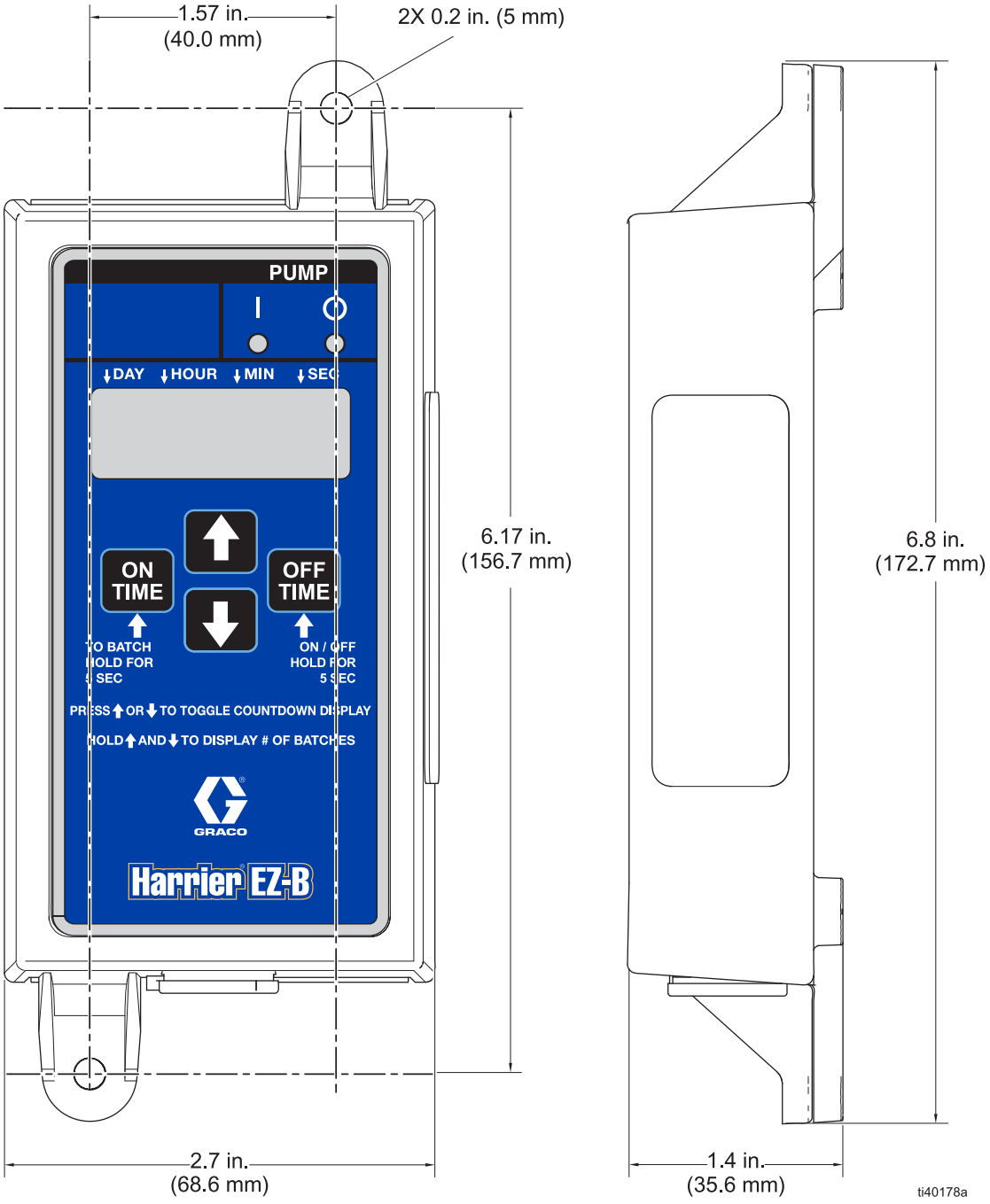

FIG. 3 Harrier EZ Controller Dimensions

Technical Specifications

Harrier EZ-B Controller	
Power Input	
Power Source DC	9 - 26 VDC
Power Consumption	1 Watt
Pump Control Outputs	
Voltage	Pump Control Voltage = Power Source
Max Switching Voltage	26 VDC
Max Switching Current	16 A (DC)
Min Switching Current	100 mA (DC)
Protection Grade	IP54 for indoors
Operating Temperature Range	- 40°F to 131°F (- 40°C to 55°C)
Storage Temperature Range	- 40°F to 176°F (- 40°C to 80°C)
Maximum Humidity	90% Relative Humidity (non-condensing)
Materials of Construction	
Enclosure Material	Polycarbonate + PET
Membrane Material	Polyester

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

Original instructions. This manual contains English. MM 3A8606
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