Installation

Chemical Injection AC Control Box

3A5187E

EN

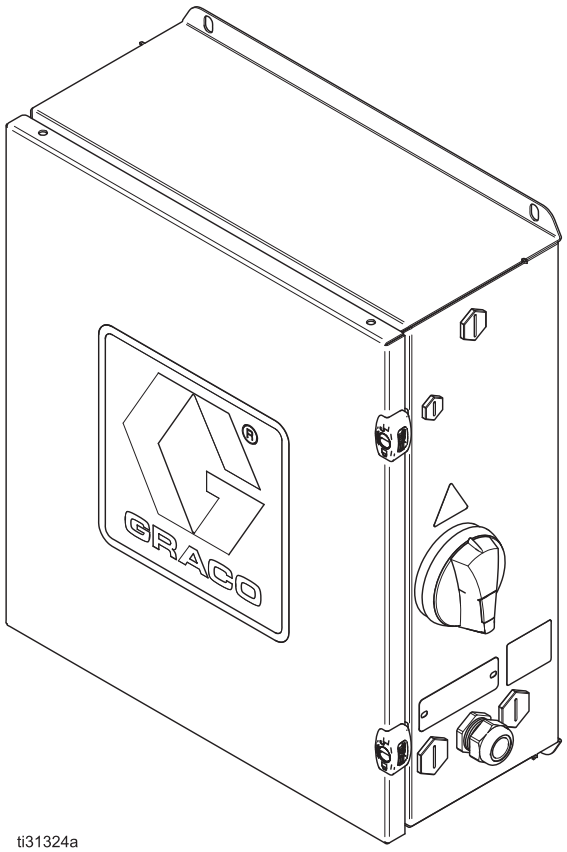
For accurately metering and injecting chemicals at well sites. For professional use only.

Not approved for use in explosive atmospheres or hazardous locations.

See page 4 for model information.

Important Safety Instructions

Read all warnings and instructions in this manual, and other related manuals on page 3, before using the equipment. Save all instructions.



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Contents

Related Manuals

Manual No.	Description
334513	Wolverine™ Chemical Injection Pump
3A4130	Harrier+ Hazardous Location Chemical Injection Controller
3A5025	Stand Kits
3A5028	G-Chem™ Chemical Injection Pump
3A5131	Mongoose Chemical Metering Pump
3A5757	Tank Level Monitor Kit

Approvals

Models	Approvals
CI-AxA-xxxx-0x	C ETL US LISTED CM Intertek **9902471** **Conforms to UL STD 508A** **Certified to CSA STD C22.2 No. 14**
CI-AxA-xxxx-1x CI-AxA-xxxx-2x	None

Models

Part Number	Configuration Code	Input Voltage	Controller	Output Voltage
B52A08	CI-A1A-0000-10	115 VAC	None	12 VDC
B52A09	CI-A1A-0000-20			24 VDC
B52A10	CI-A1A-0100-10		Harrier EZ	12 VDC
B52A11	CI-A1A-0100-20			24 VDC
B52A00	CI-A1A-0300-00		Harrier+ SCADA	115 VAC
B52A01	CI-A1A-0400-00		Harrier+ GSM USA	
B52A02	CI-A1A-0500-00		Harrier+ International	
B52A03	CI-A1A-0600-00		Harrier+ CDMA	
B52A12	CI-A2A-0000-10	230 VAC	None	12 VDC
B52A13	CI-A2A-0000-20			24 VDC
B52A14	CI-A2A-0100-10		Harrier EZ	12 VDC
B52A15	CI-A2A-0100-20			24 VDC
B52A04	CI-A2A-0300-00		Harrier+ SCADA	230 VAC
B52A05	CI-A2A-0400-00		Harrier+ GSM USA	
B52A06	CI-A2A-0500-00		Harrier+ International	
B52A07	CI-A2A-0600-00		Harrier+ CDMA	

Box Configuration Number Matrix

Check the identification plate (ID) for the 12-digit Configuration Number of your box. Use the following matrix to define the components of your box.

NOTE: Not all possible configurations are available.

Sample Configuration Number: CI-A1A-0300-00

CI	A	1A	0	3	0	0	0	0
Chemical Injection Box	Box Style	Voltage	Solar Charge Controller	Pump Controller	Number of Batteries	Number of Solar Panels	Option #1	Option #2

Box Style		Voltage		Solar Charge Controller		Pump Controller		Number of Batteries		Number of Solar Panels		Option #1		Option #2	
A	AC Box	1A	115 VAC	0	AC Box	0	None	0	AC Box	0	AC Box	0	None	0	None
		2A	230 VAC			1	Harrier EZ					1	12 VDC Out		
						3	Harrier+ SCADA					2	24 VDC Out		
						4	Harrier+ GSM USA								
						5	Harrier+ Interna-tional								
						6	Harrier+ CDMA								

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

FIRE AND EXPLOSION HAZARD

When flammable fluids are present in the work area be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources, such as cigarettes and portable electric lamps.
- Ground all equipment in the work area.
- Keep work area free of debris, including rags and spilled or open containers of solvent.
- Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
- Use only grounded hoses.
- **Stop operation immediately** if static sparking occurs or you feel a shock**.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

ELECTRIC SHOCK HAZARD

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

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

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 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 Sheet (SDS) from distributor or retailer.
- Turn off all equipment 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.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

⚠WARNING

PERSONAL PROTECTIVE EQUIPMENT

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

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

Installation

All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

Attach Control Box to Stand

Refer to your stand manual for box installation. (See **Related Manuals** on page 3.)

See **Typical Installation**, on page 10, for location of the control box and stand relative to the chemical injection pump.

NOTE: The control box can also be mounted to a flat surface (either vertical or horizontal). (See **Dimensions**, on page 20, for mounting holes.)

Determine Power Source

The AC control box can be wired, depending on the model, to two types of power source:

- 115 VAC, 1-phase (2-wire + ground/PE)
- 230 VAC, 1-phase (2-wire + ground/PE)

Grounding

The 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.

Box: Contains ground terminal (12), see FIG. 1. Connect box to earth ground. See **Pump Connection and Operation** on page 9.

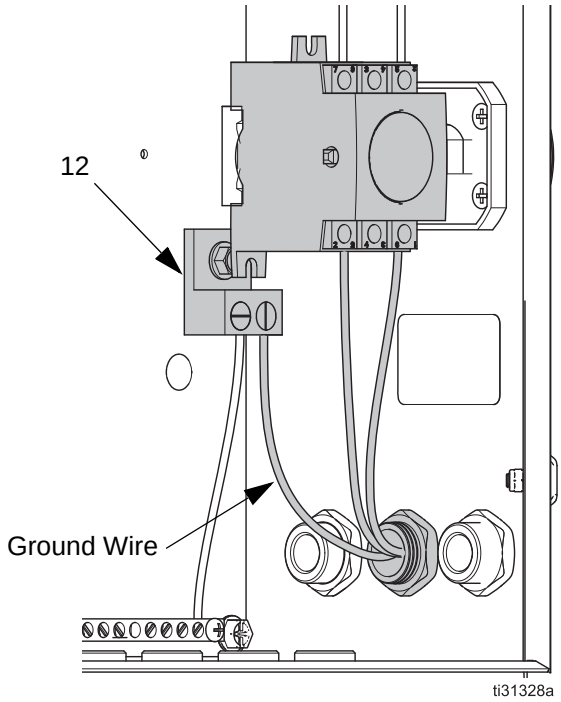


FIG. 1: Grounding Lug

Connect Line Power

Improper wiring may cause electric shock or other serious injury if work is not performed properly.

- Have a qualified electrician connect power and ground to main power switch terminals and ground lug.
- Ensure your installation complies with all National, State, and Local safety and fire codes.
- Ensure that incoming power is disconnected and locked out at the source.

NOTE: Power cord is not supplied.

Wire electrical cord to positions shown in FIG. 2. Terminals will accept up to #8 AWG (10 mm^2) conductors.

1. Using a flat screw driver, turn the cover fasteners (P) 90° counterclockwise. Open the front cover.

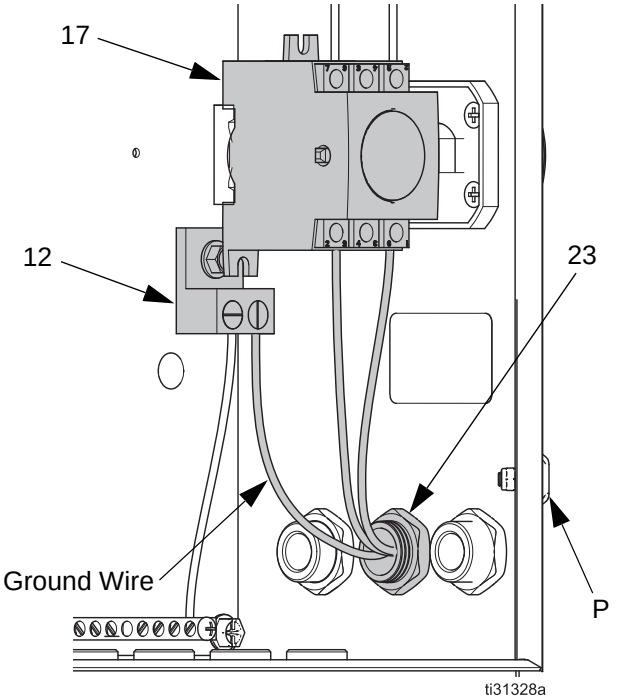


FIG. 2: Connect Electrical Cord

2. Connect the main power cord to the electrical enclosure as follows:

   a. Feed the power cord through the strain relief (23) on right side of the unit. Pull the yellow release lever on the bottom of the power disconnect contacts block (17) to slide out the block for easy wiring. The strain relief accepts cords 0.59 to 1.0 in. (15-25 mm) diameter.

   b. Use a screwdriver to back out the screws at the power lead locations on the contacts block (17). Insert the power leads and retighten the screws to secure.

   c. Snap the contacts block (17) back into position.

   d. Tighten strain relief nut (23).

3. Close the front cover and turn the cover fasteners (P) 90° clockwise.

Pump Connection and Operation

Verify that power is disconnected before connecting motor/pump power wires.

Refer to your pump manual for pump operation. (See **Related Manuals** on page 3.)

115 and 230 VAC Motors (CI-A1A-xxxx-0x and CI-A2A-xxxx-0x)

Connect the motor wires as follows:

- Motor white wire to the MTR (COM) terminal.
- Motor black wire to the MTR (LINE) terminal.
- Motor green wire to the grounding bar.

(See **Power Terminals and Circuit Breakers** on page 11.)

12 and 24 VDC Motors (CI-AxA-xxxx-1x and CI-AxA-xxxx-2x)

The control box includes 10 ft. of pre-wired, flexible conduit terminated with a 3/4 in. hub.

The motor control circuit includes an in-line mini-ATM fuse holder. Install a fuse per your pump manual. (See **Related Manuals** on page 3.)

Connect the motor wires as follows:

- Motor red wire to the positive terminal.
- Motor black wire to the negative terminal.
- Motor green wire to the ground terminal.

Controller Operation and Accessory Connections

To reduce the risk of electric shock when accessing the electrical enclosure while power is present:

- Do not make contact with components or wires unless instructed to do so.
- Wear appropriate personal protective equipment.

Your controller is pre-installed. Remember that power is always present in the enclosure whenever you configure or operate the controller.

1. Open the panel door.
2. Do not touch anything but the controller while the enclosure is open and power is present.

   Refer to your controller manual for controller operation. (See **Related Manuals** on page 3.)
3. Close the panel door.

Disconnect the power before connecting any necessary controller accessories. (See **Accessory Terminal Block Wiring** on page 12.)

Typical Installation

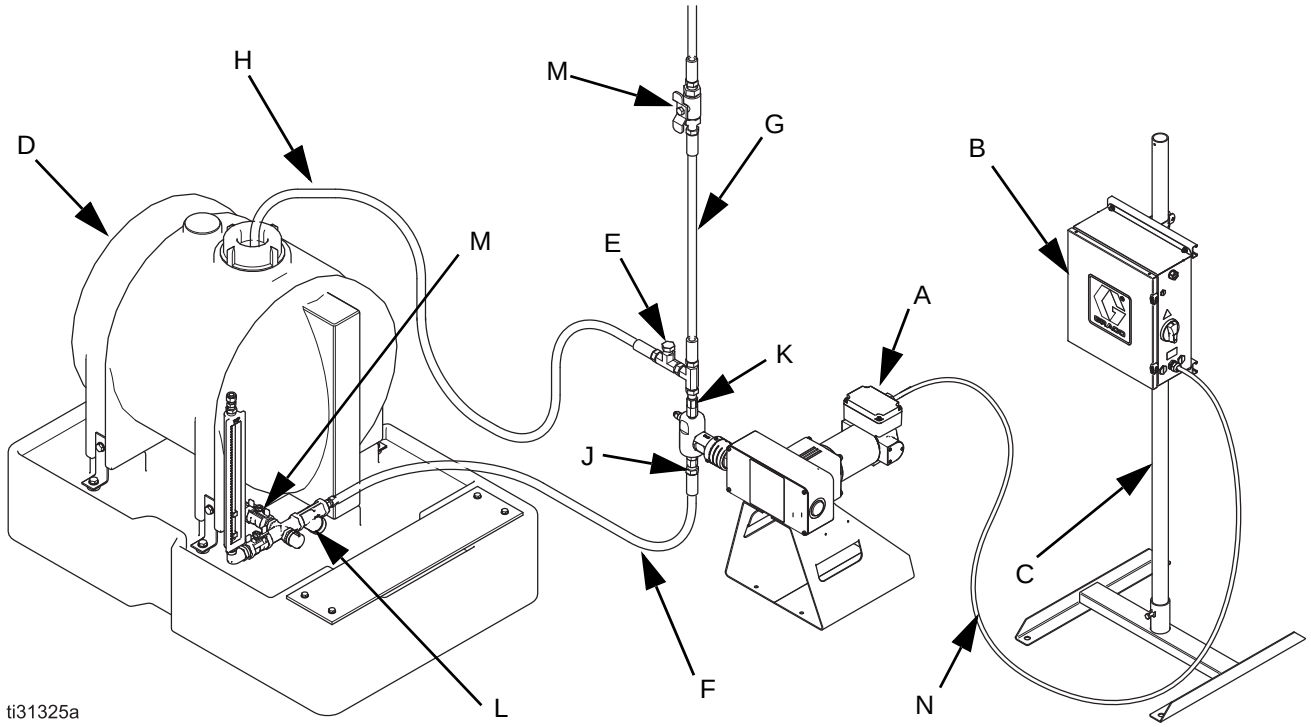


FIG. 3: Chemical Injection System Layout

FIG. 3 is an example of control box installation with a chemical injection system. Your installation may differ from what is shown here.

Components Supplied by Graco

The following components, see FIG. 3, are supplied by Graco with the AC control box:

B Control Box

Additional Modular System Components

The following components, see FIG. 3, are available from Graco or supplied by the customer:

A Pump (includes Inlet (J) and Outlet (K) ports)

C Stand Unit

D Tank

E Pressure Relief Valve

F Inlet Line

G Outlet Line

H Pressure Relief Line

J Inlet Port

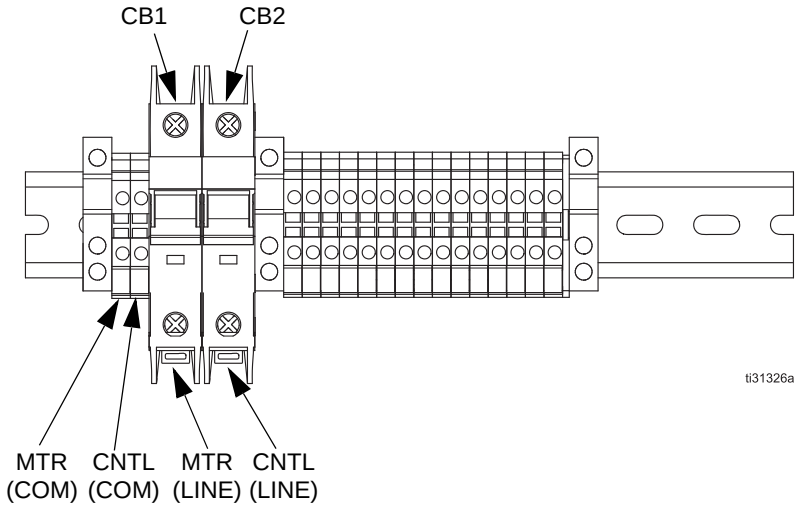
K Outlet Port

L Manifold Assembly [includes y-strainer and fluid shutoff valve (M)]

M Fluid Shutoff Valve (inlet & outlet)

N Conduit from Control Box to the Pump (included with CI-xxx-xxxx-1x and CI-xxx-xxxx-2x)

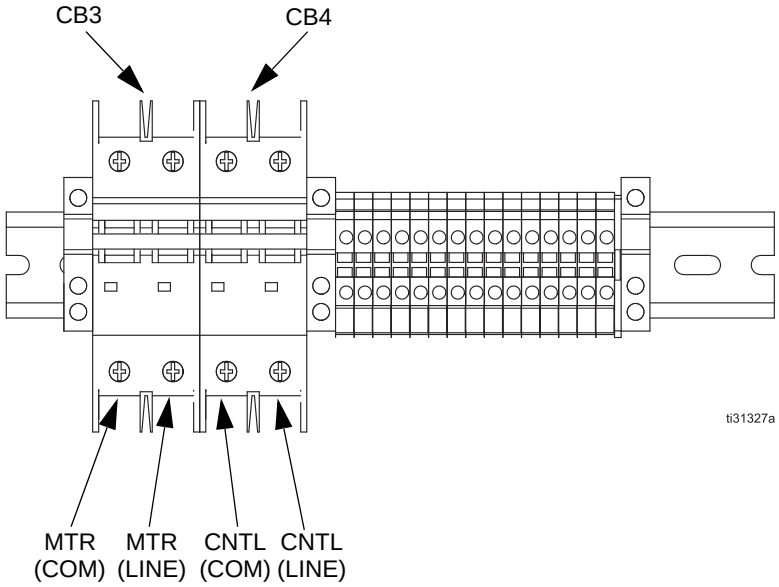
Power Terminals and Circuit Breakers



MTR (COM) = Motor (COM)
MTR (LINE) = Motor (LINE)
CNTL (COM) = Controller (COM)
CNTL (LINE) = Controller (LINE)

Circuit Breakers		
Ref	**Size**	**Description**
CB1	6A	Motor Power
CB2	6A	Controller Power

FIG. 4: 115 VAC Models (CI-A1A-xxxx-0x)



MTR (COM) = Motor (COM)
MTR (LINE) = Motor (LINE)
CNTL (COM) = Controller (COM)
CNTL (LINE) = Controller (LINE)

Circuit Breakers		
Ref	**Size**	**Description**
CB3	3A	Motor Power
CB4	3A	Controller Power

FIG. 5: 230 VAC Models (CI-A2A-xxxx-0x)

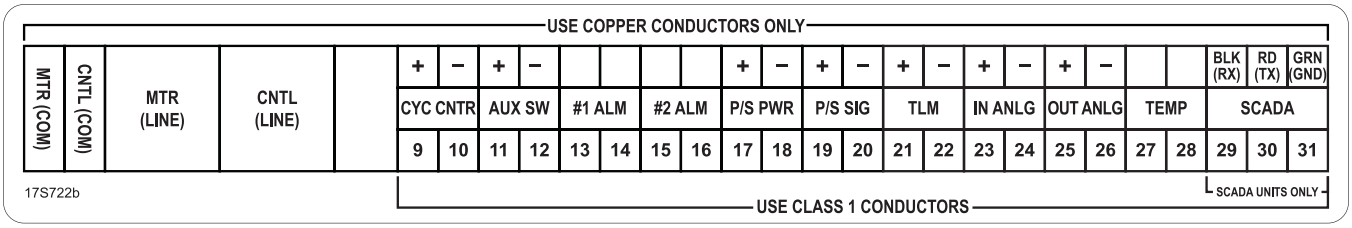
To install a wire, back out the screw above the wire location, insert the wire, tighten the screw.

To remove a wire, back out the screw and remove the wire.

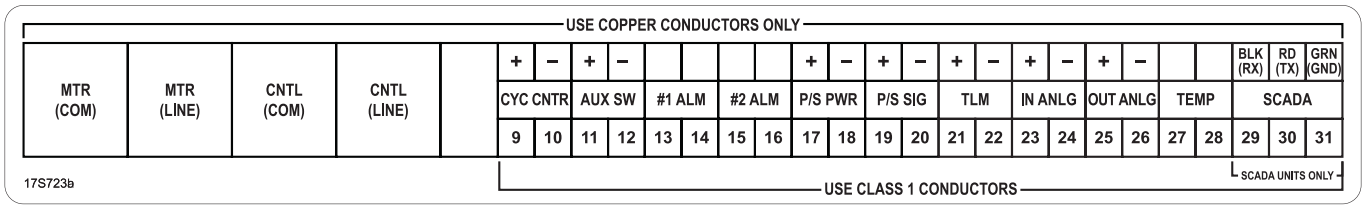
Accessory Terminal Block Wiring

A terminal block assembly is included to ease wiring accessories. All terminal blocks are labeled similar to the tables shown below. Depending on your system, not all of the terminals will be present.

115 VAC Models (CI-A1A-xxxx-0x)



230 VAC Models (CI-A2A-xxxx-0x)



Terminal Block Key

9 Cycle Counter, positive
10 Cycle Counter, negative
11 Auxiliary Switch, positive
12 Auxiliary Switch, negative
13 Alarm #1
14 N/A
15 Alarm #2
16 N/A
17 P/S Power, positive
18 P/S Power, negative
19 P/S Signal, positive
20 P/S Signal, negative
21 Tank Level Monitor, Power
22 Tank Level Monitor, Signal
23 Analog In, Power
24 Analog In, Signal
25 Analog Out, Signal
26 Analog Out, Ground
27 Temperature Sensor
28 Temperature Sensor
29 Receive, black (SCADA models only)
30 Transmit, red (SCADA models only)
31 Ground, green (SCADA models only)

To install a wire, back out the screw above the wire location, insert the wire, tighten the screw.

To remove a wire, back out the screw and remove the wire.

Troubleshooting

Problem	Cause	Solution
System stops running	Power is disconnected	Confirm main power is active.
	Circuit breaker is tripped	Reset circuit breaker. Find short if problem persists.

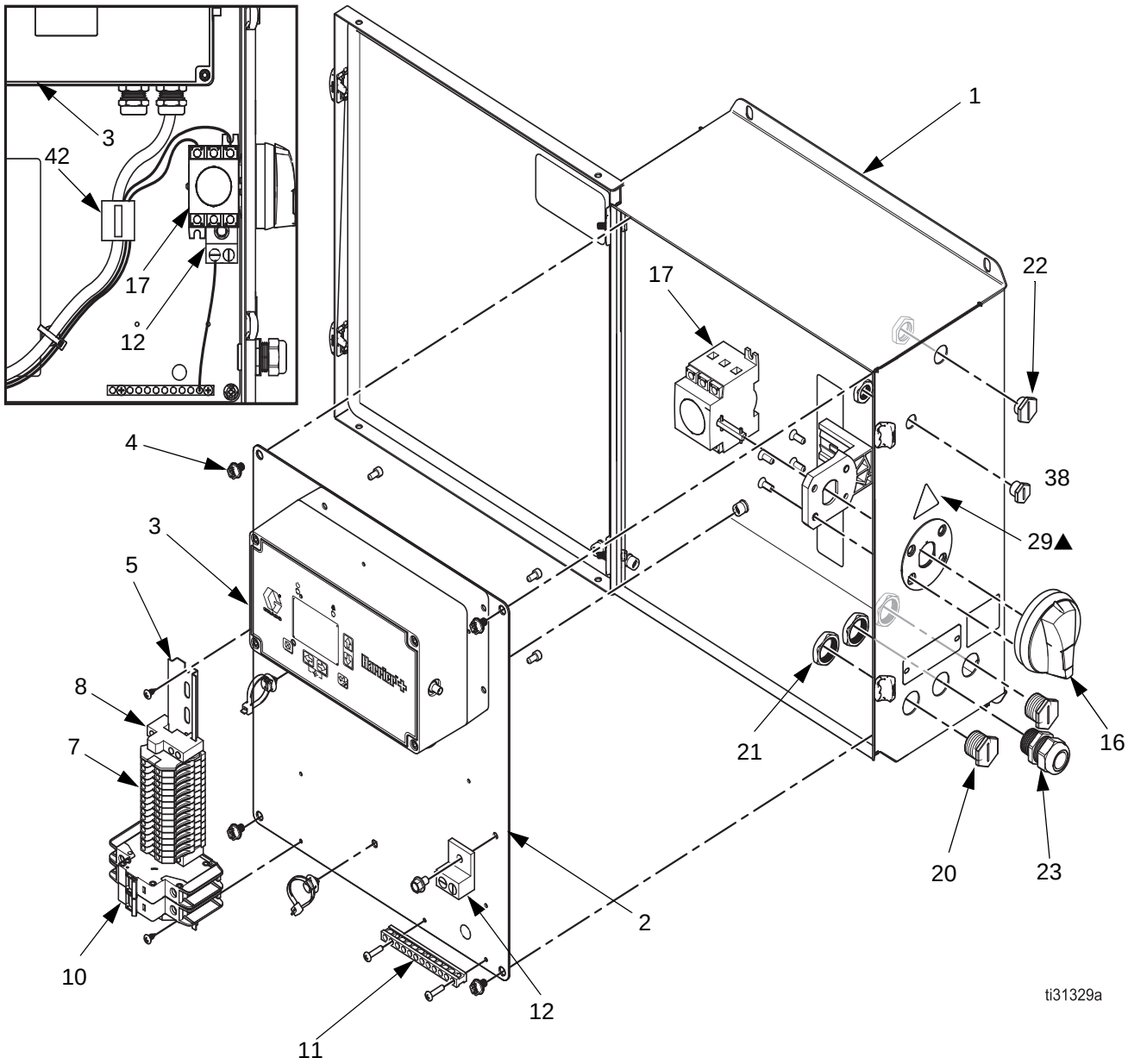
NOTES:

- Refer to your pump manual (see **Related Manuals** on page 3) for troubleshooting specific to the pump.
- Refer to your controller manual (see **Related Manuals** on page 3) for troubleshooting specific to the controller.
- Refer to the stand manual (see **Related Manuals** on page 3) for troubleshooting specific to the stand.

Parts

AC Control Box (with Harrier+)

Configuration CI-A1A-0300-00 is shown



AC Control Box (with Harrier+) Parts List

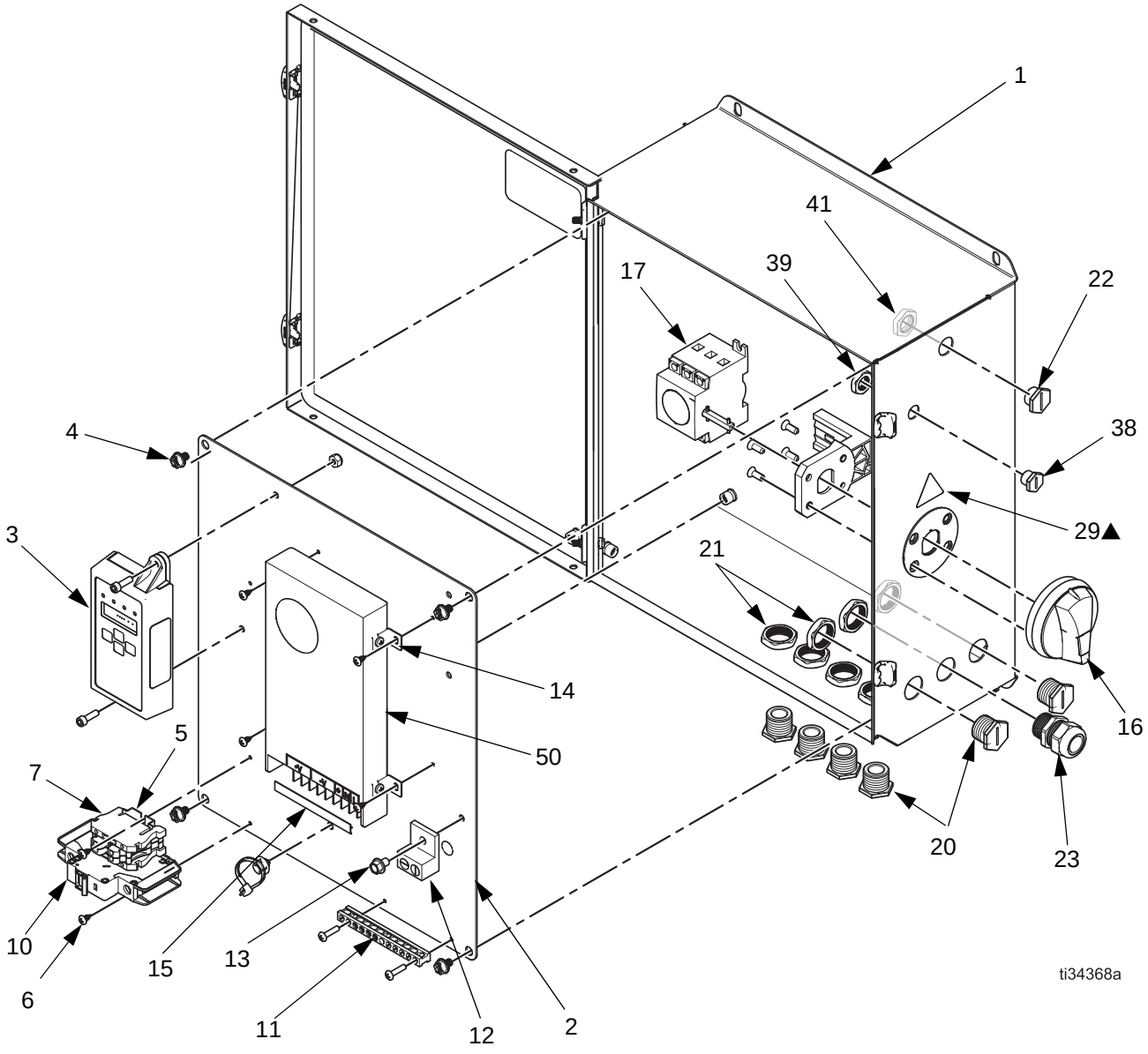
Ref.	Part	Description	Qty
1	--	Control Box	1
2	--	Back Panel	1
3	B32631	Harrier+ SCADA	1
	B32627	Harrier+ GSM USA	1
	B32629	Harrier+ International	1
	B32643	Harrier+ CDMA	1
4	--	Socket Head Cap Screw, 10 x .375	4
5	--	DIN Rail Assembly	1
6	--	Truss Head Screw, #8	2
7	--	Terminal Block	17
8	--	End Cover	1
9	--	Clamp End Block (not shown)	3
10	--	Circuit Breaker, 6A (115 VAC)	2
	--	Circuit Breaker, 3A (230 VAC)	4
11	--	Grounding Bar	1
12	--	Ground lug	1
16	--	Door Mount Knob	1
17	--	Disconnect Switch	1
18	--	12 AWG Wire, 24 in., Black (not shown)	1
19	--	12 AWG Wire, 24 in., White (not shown)3	1
20	--	Plug, 1/2 in.	3
21	--	Strain Relief Nut	3
22	--	Plug, M16	
23	--	Strain Relief Bushing	1
25	--	Designation Plate (not shown)	1
29▲	15G303	Shock Warning Sticker	1
37	--	External Handle Mounting Bracket	1
38	--	Plug, PG-7	1
39	--	Nut, PG-7	1
41	--	Nut, M16	
42	--	Ferrite Box Snap Suppressor	1

▲ *Replacement Danger and Warning labels, tags, and cards are available at no cost.*

Find **Kits and Accessories** on page 19.

AC Control Box (with Harrier EZ)

Configuration CI-A1A-0100-10 is shown



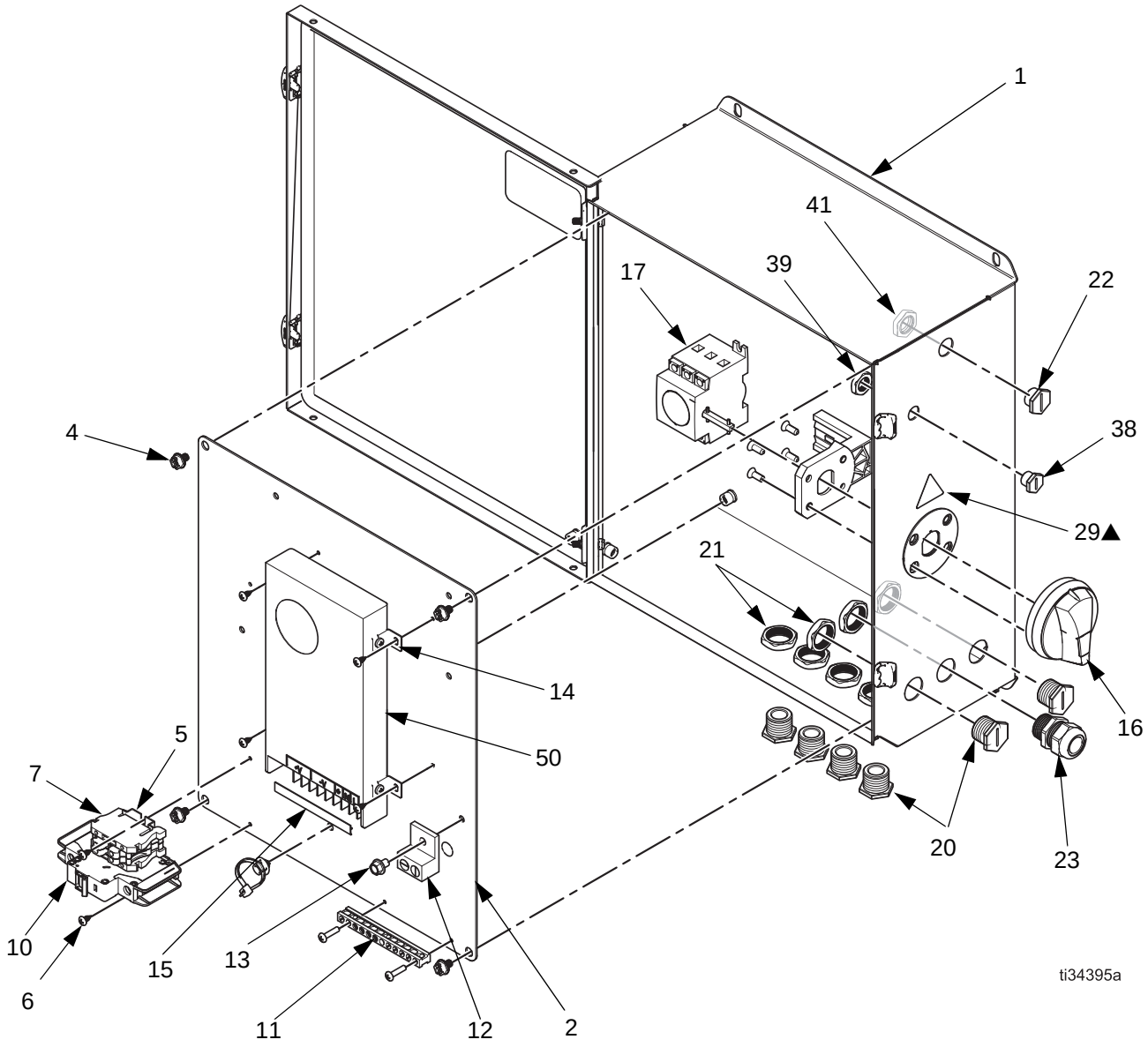
AC Control Box (with Harrier EZ) Parts List

Ref.	Part	Description	Qty
1	--	Control Box (includes ref 4)	1
2	--	Back Panel	1
3	B32110	Harrier EZ	1
4	--	Socket Head Cap Screw, 10 x .375 (included with ref 1)	4
5	--	DIN Rail Assembly	1
6	--	Truss Head Screw, #8	2
7	--	Terminal Block	17
9	--	Clamp End Block (not shown)	3
10	--	Circuit Breaker, 6A (115 VAC)	2
	--	Circuit Breaker, 3A (230 VAC)	4
11	--	Grounding Bar	1
12	--	Ground Lug	1
13	--	Hex head screw	1
14	--	Mounting bracket	4
15	--	Power supply terminal cover	1
16	--	Door Mount Knob	1
17	--	Disconnect Switch	1
18	--	12 AWG Wire, 24 in., Black (not shown)	1
19	--	12 AWG Wire, 24 in., White (not shown)3	1
20	--	Plug, 1/2 in.	5
21	--	Strain Relief Nut	6
22	--	Plug, M16	1
23	--	Strain Relief Bushing	1
25	--	Designation Plate	1
29▲	15G303	Shock Warning Sticker	1
37	--	External Handle Mounting Bracket	1
38	--	Plug, PG-7	1
39	--	Nut, PG-7	1
41	--	Nut, M16	1
42	--	Ferrite Box Snap Suppressor	1
50	--	Power Supply, 12 VDC	1
	--	Power Supply, 24 VDC	1

▲ *Replacement Danger and Warning labels, tags, and cards are available at no cost.*

AC Control Box (without Controller)

Configuration CI-A1A-0000-10 is shown



AC Control Box (without Controller) Parts List

Ref.	Part	Description	Qty
1	--	Control Box (includes ref 4)	1
2	--	Back Panel	1
4	--	Socket Head Cap Screw, 10 x .375 (included with ref 1)	4
5	--	DIN Rail Assembly	1
6	--	Truss Head Screw, #8	2
7	--	Terminal Block	17
9	--	Clamp End Block (not shown)	3
10	--	Circuit Breaker, 6A (115 VAC)	2
	--	Circuit Breaker, 3A (230 VAC)	4
11	--	Grounding Bar	1
12	--	Ground Lug	1
13	--	Hex head screw	1
14	--	Mounting bracket	4
15	--	Power supply terminal cover	1
16	--	Door Mount Knob	1
17	--	Disconnect Switch	1
18	--	12 AWG Wire, 24 in., Black (not shown)	1
19	--	12 AWG Wire, 24 in., White (not shown)3	1
20	--	Plug, 1/2 in.	5
21	--	Strain Relief Nut	6
22	--	Plug, M16	1
23	--	Strain Relief Bushing	1
25	--	Designation Plate	1
29▲	15G303	Shock Warning Sticker	1
37	--	External Handle Mounting Bracket	1
38	--	Plug, PG-7	1
39	--	Nut, PG-7	1
41	--	Nut, M16	1
42	--	Ferrite Box Snap Suppressor	1
50	--	Power Supply, 12 VDC	1
	--	Power Supply, 24 VDC	1

▲ *Replacement Danger and Warning labels, tags, and cards are available at no cost.*

Kits and Accessories

Part No.	Description
B32072	Pressure Sensor (7500 psi)
B32795	AC Box Stand
B32073	Stand Anchoring Kit
B32771	Tank Level Monitor Kit

Dimensions

AC Control Box

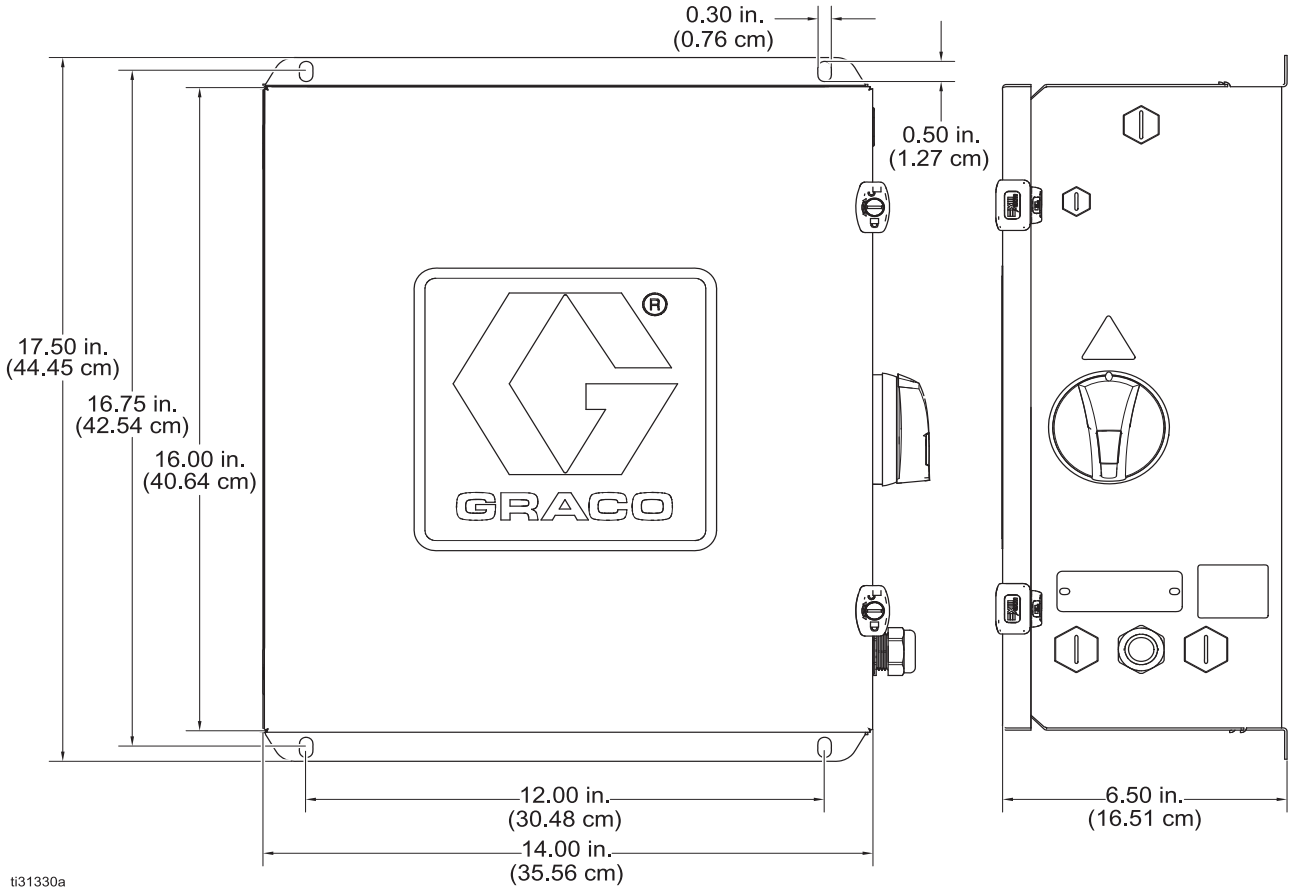


FIG. 6 AC Control Box Dimensions and Mounting Hole Locations

Technical Specifications

AC Control Box		
	US	**Metric**
Nominal Input Voltage (by model, see page 4)		
CI-A1A-xxxx-xx	115 VAC	
CI-A2A-xxxx-xx	230 VAC	
Maximum Input Current (by model, see page 4)		
CI-A1A-xxxx-xx	5 A	
CI-A2A-xxxx-xx	3 A	
Nominal Output Voltage (by model, see page 4)		
CI-A1A-xxxx-0x	115 VAC	
CI-A2A-xxxx-0x	230 VAC	
CI-AxA-xxxx-1x	12 VDC	
CI-AxA-xxxx-2x	24 VDC	
Maximum Output Current (by model, see page 4)		
CI-A1A-xxxx-0x	5 A	
CI-A2A-xxxx-0x	3 A	
CI-AxA-xxxx-1x	19 A	
CI-AxA-xxxx-2x	11 A	
Operating Temperature Range (by model, see page 4)		
CI-A1A-xxxx-0x	-40 - 131°F	-40 - 55°C
CI-A2A-xxxx-0x	-40 - 131°F	-40 - 55°C
CI-AxA-xxxx-1x	-40 - 122°F	-40 - 50°C
CI-AxA-xxxx-2x	-40 - 113°F	-40 - 45°C
Overall Dimensions (L x W x H)	17.5 in x 14.0 in. x 6.5 in.	44.5 cm x 35.6 cm x 16.5 cm
Weight		
Control Box	20.0 lbs	9.07 kg

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.

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Revision E, June 2019