

Harrier[®] + MPI Control Box

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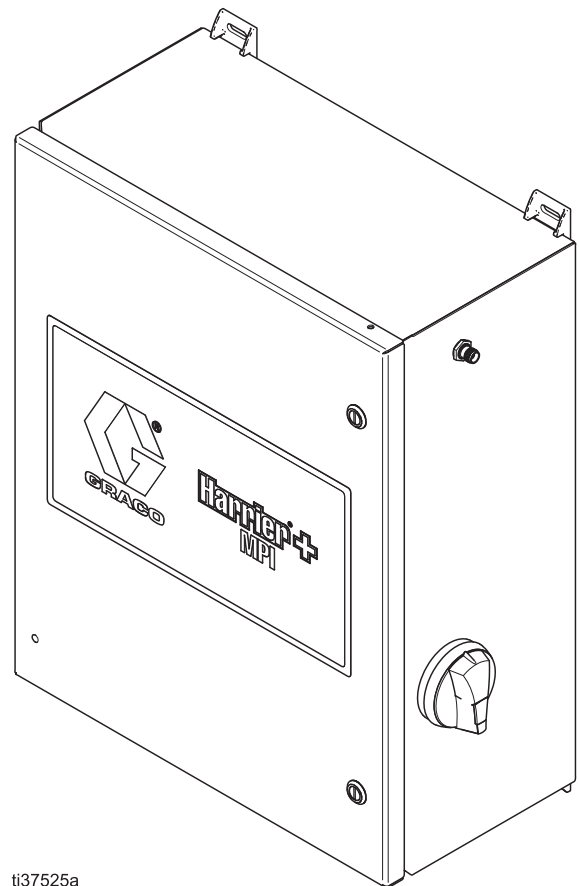
For metering and injecting chemicals into multiple wells. Intended to be used only with a KRAKN™ MPI solenoid valve manifold. For professional use only.

See page 3 for approvals and page 4 for model information. Class I, Div 2, Groups A, B, C, D, T4 approved models available.



Important Safety Instructions

Read all warnings and instructions in this manual, and in related manuals on page 2, before using the equipment. Save all instructions.



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Related Manuals

Manual No.	Description
334513	Wolverine™ Chemical Injection Pump
3A4130	Harrier®+ Chemical Injection Controller
3A5025	Stand Kits
3A5028	G-Chem™ Chemical Injection Pump
3A5375	Tank Level Monitor Kit
3A7379	KRAKN™ MPI Solenoid Valve Manifold
3A3944	Pressure Sensor Kit
3A5025	Stand Kit
3A3210	Harrier®+ Chemical Injection Controller Programming

Approvals

Models	Approvals
B52M00 - 03 CI-D24-0x00-2M	 <p>Intertek 3132066 Conforms to UL STD 508A Certified to CAN/CSA C22.2 No. 286</p>
B52M04 - 07 CI-A1A-0x00-0M	
B52M08 - 11 CI-A1A-0x00-2M	
B52H00 - 03 CI-D24-0x00-2M	 <p>Intertek 3132066 Certified to CAN/CSA C22.2 No. 286 Conforms to UL 508A</p>  <p>Intertek 3132066 Class I Division 2 Groups A, B, C, D, T4 -25°C ≤ Ta ≤ +55°C</p>
B52H04 - 07 CI-A1A-0x00-0M	
B52H08 - 11 CI-A1A-0x00-2M	

Models - Ordinary Location

Part Number	Configuration Code	Input Voltage	Controller	Output Voltage
B52M00	CI-D24-0300-2M	24 VDC	Harrier+ SCADA	24 VDC
B52M01	CI-D24-0400-2M		Harrier+ GSM USA	
B52M02	CI-D24-0500-2M		Harrier+ International	
B52M03	CI-D24-0600-2M		Harrier+ CDMA	
B52M04	CI-A1A-0300-0M	115 VAC	Harrier+ SCADA	115 VAC
B52M05	CI-A1A-0400-0M		Harrier+ GSM USA	
B52M06	CI-A1A-0500-0M		Harrier+ International	
B52M07	CI-A1A-0600-0M		Harrier+ CDMA	
B52M08	CI-A1A-0300-2M	115 VAC	Harrier+ SCADA	24 VDC
B52M09	CI-A1A-0400-2M		Harrier+ GSM USA	
B52M10	CI-A1A-0500-2M		Harrier+ International	
B52M11	CI-A1A-0600-2M		Harrier+ CDMA	

Models - Hazardous Location

Part Number	Configuration Code	Input Voltage	Controller	Output Voltage
B52H00	CI-D24-0300-2M	24 VDC	Harrier+ SCADA	24 VDC
B52H01	CI-D24-0400-2M		Harrier+ GSM USA	
B52H02	CI-D24-0500-2M		Harrier+ International	
B52H03	CI-D24-0600-2M		Harrier+ CDMA	
B52H04	CI-A1A-0300-0M	115 VAC	Harrier+ SCADA	115 VAC
B52H05	CI-A1A-0400-0M		Harrier+ GSM USA	
B52H06	CI-A1A-0500-0M		Harrier+ International	
B52H07	CI-A1A-0600-0M		Harrier+ CDMA	
B52H08	CI-A1A-0300-2M	115 VAC	Harrier+ SCADA	24 VDC
B52H09	CI-A1A-0400-2M		Harrier+ GSM USA	
B52H10	CI-A1A-0500-2M		Harrier+ International	
B52H11	CI-A1A-0600-2M		Harrier+ CDMA	

Control 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-D24-0300-2M

CI	D	24	0	3	0	0	2	M
Chemical Injection Control Box	Box Style	Voltage	Solar Charge Controller	Pump Controller	Number of Batteries	Number of Solar Panels	Option #1	Option #2

Control 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	None	3	Harrier+ SCADA	0	None	0	None	0	None	M	Multiple-Point Injection
D	DC Box	24	24 VDC			4	Harrier+ GSM USA					2	24 VDC Out		
						5	Harrier+ International								
						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	
 	<p>FIRE AND EXPLOSION HAZARD</p> <p>When flammable fluids are present in the work area be aware that flammable fumes can ignite or explode. 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 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.
 	<p>ELECTRIC SHOCK HAZARD</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 must be done by a qualified electrician and comply with all local codes and regulations.
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical 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 control box installation. (See **Related Manuals** on page 2.)

See **Typical Installation**, on page 24, 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 46, for mounting holes.)

Connect the Antenna

				
Removing or replacing the antenna while the circuit is live may spark ignitable fumes in the area. To reduce the risk of ignition, do not remove or replace the antenna while the circuit is live unless the area is free of ignitable fumes.				

1. Disconnect power.
2. Attach the antenna to the antenna bulkhead on the outside of the box.

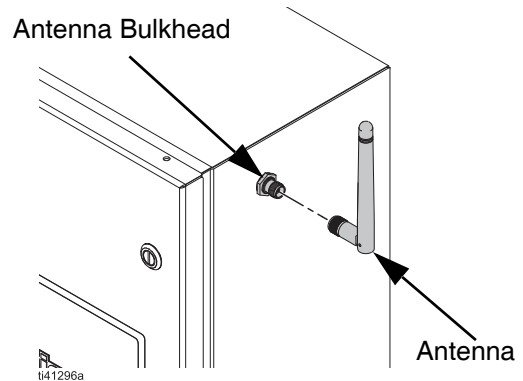






FIG. 1: Connect the Antenna

3. Reconnect power.

Grounding

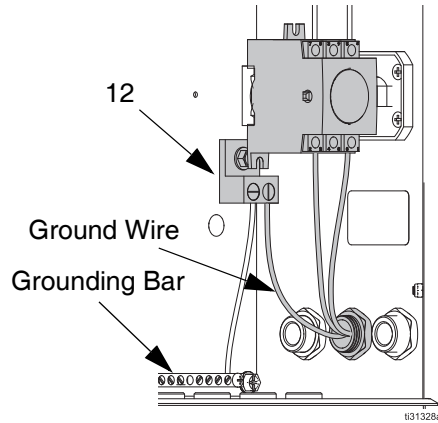
				
<p>The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.</p>				

Control Box: Contains ground terminal (12), see FIG. 2. Connect the ground terminal (12) to earth ground. Torque the terminal screw to 18-22 in-lbs (2-2.5 N•m).

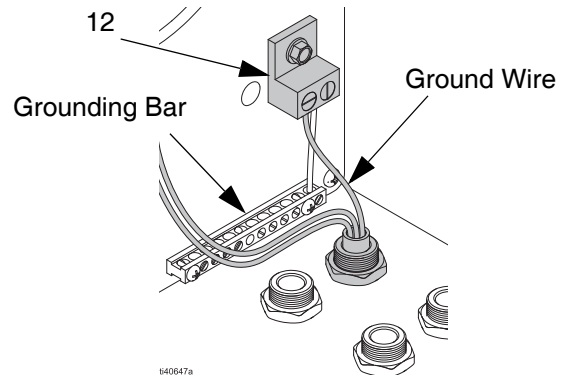
- The grounding bar and ground terminal (12) will accept up to #8 AWG (10 mm²) conductors.

All external connected equipment and accessories must be connected to the grounding bar.

NOTE: Only use copper components with a minimum 60° C rating. Tighten to specified torque requirements.



Ordinary Locations

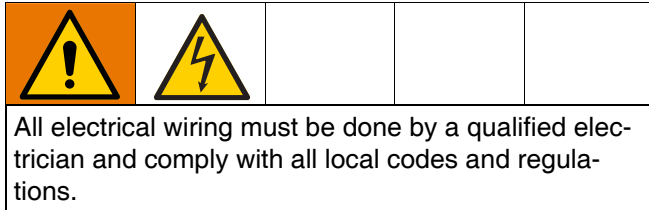


Hazardous Locations

FIG. 2: Grounding Bar and Ground Terminal - Ordinary and Hazardous Locations

Connect Power

Ordinary Location Boxes



NOTE: Main power cord is not supplied.

External branch circuit protection (UL 489 breakers or UL 1066 power circuit breakers) must be provided by the customer and installed per local code. See **Technical Specifications**, page 47, for max load requirements.

Connect the power wires to the contacts block (17) shown in FIG. 3. Terminals will accept up to #8 AWG (10 mm²) conductors.

NOTE: Only use copper components with a minimum 60° C rating. Tighten to specified torque requirement.

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

2. Connect the main power to the control box as follows:

- a. Feed the cable through the strain relief (23) on right side of the control box. The strain relief accepts 0.59-1.0 in. (15-25 mm) diameter cables.
- b. Pull the yellow release lever on the bottom of the power disconnect contacts block (17) to slide out the block for easy wiring.
- c. 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. Torque to 18-22 in-lbs (2-2.5 N•m).
- d. Snap the contacts block (17) back into position.
- e. Tighten strain relief nut (23).

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

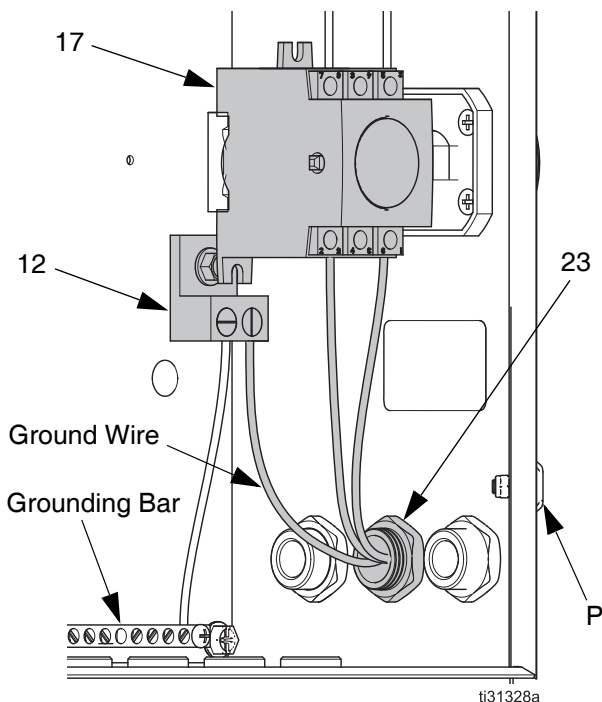




FIG. 3: Connect Electrical Power - Ordinary Location

Hazardous Location, DC In and DC Out Boxes (B52H00-03)

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

NOTE: Main power cord is not supplied.

NOTE: Strain relief is not provided. User must provide Class 1, Division 2 Nema 4X rated strain relief bushings.

Connect the power wires to the terminal blocks as shown in FIG. 4. Incoming wires will go to the DC+ and DC- terminal blocks.

NOTE: Only use copper components with a minimum 60° C rating. Tighten to specified torque requirements.

- Din Rail Terminals will accept up to #10 AWG (4 mm²) conductors
1. Using a flat screw driver, turn the front-cover fasteners 90° counterclockwise. Open the front cover.

2. Connect the main power to the control box as follows:
 - a. Feed the cable through the strain relief (23) on bottom of the control box. The strain relief accepts 0.59-1.0 in. (15-25 mm) diameter cables.
 - b. Use a screwdriver to back out the bottom screw on the DC+ terminal on the din rail terminal block. Insert the power lead for +24V into the DC+ terminal and retighten the screw to secure. Torque to 5-7 in-lbs (0.6-0.8 N•m).
 - c. Use a screwdriver to back out the bottom screw on the DC- terminal of the din rail terminal block. Insert the power lead for -24V/GND into DC-terminal block and retighten the screw to secure. Torque to 5-7 in-lbs (0.6-0.8 N•m).
 - d. Tighten strain relief nut (23).
3. Close the front cover and turn the cover fasteners 90° clockwise.

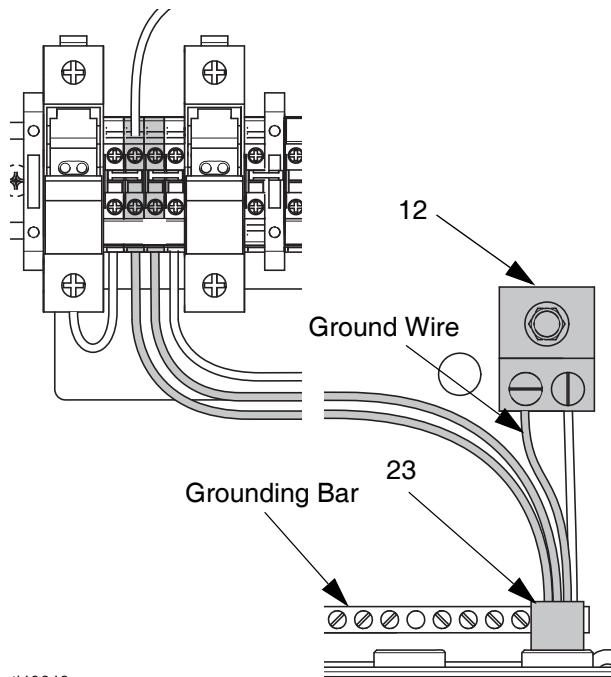




FIG. 4: 24 V to 24 V, DC In and DC Out Boxes (B52H00-03)

Hazardous Location, AC In and AC Out Boxes (B52H04-07)

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

NOTE: Main power cord is not supplied.

NOTE: Strain relief is not provided. User must provide Class 1, Division 2 Nema 4X rated strain relief bushings.

External branch circuit protection (UL 489 breakers or UL 1066 power circuit breakers) must be provided by the customer and installed per local code. See **Technical Specifications**, page 47, for max load requirements.

NOTE: Only use copper wires with a minimum 60° C rating. Tighten to specified torque requirements.

- Din Rail Terminals will accept up to #10 AWG (4 mm²) conductors.
1. Using a flat screw driver, turn the front-cover fasteners 90° counterclockwise. Open the front cover.

2. Connect the main power to the control box as follows:
 - a. Feed the cable through the strain relief (23) on right side of the control box. The strain relief accepts 0.59-1.0 in. (15-25 mm) diameter cables.
 - b. Use a screwdriver to back out the screw on the CNTL (LINE) terminal of the terminal block. Insert the Line power lead and retighten the screw to secure. Torque to 5-7 in-lbs (0.6-0.8 N•m).
 - c. Use a screwdriver to back out the screw on the CNTL (N) terminal of the terminal block. Insert the Neutral power lead and retighten the screws to secure. Torque to 5-7 in-lbs (0.6-0.8 N•m).
 - d. Tighten strain relief nut (23).
3. Close the front cover and turn the cover fasteners 90° clockwise.

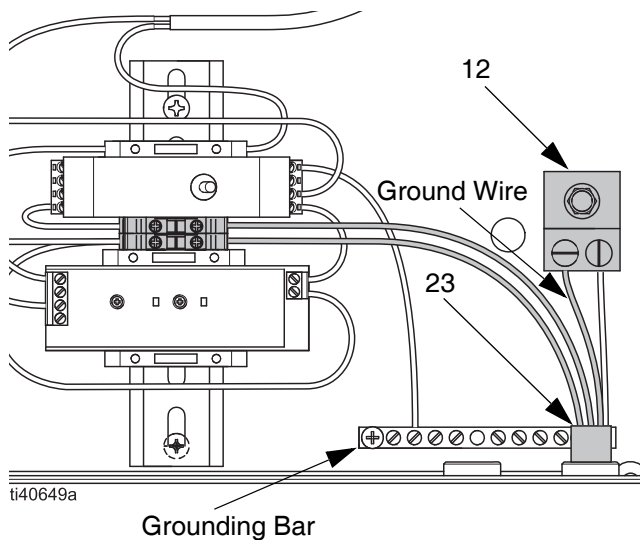




FIG. 5: 115 VAC In / 115 VAC Out, AC In and AC Out Boxes (B52H04-07)

Hazardous Location, AC In and DC Out Boxes (B52H08-11)

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

NOTE: Main power cord is not supplied.

NOTE: Strain relief is not provided. User must provide Class 1, Division 2 Nema 4X rated strain relief bushings.

External branch circuit protection (UL 489 breakers or UL 1066 power circuit breakers) must be provided by the customer and installed per local code. See **Technical Specifications**, page 47, for max load requirements.

NOTE: Only use copper wires with a minimum 60° C rating. Tighten to specified torque requirements.

- Din Rail Terminals will accept up to #10 AWG (4 mm²) conductors.
1. Using a flat screw driver, turn the front-cover fasteners 90° counterclockwise. Open the front cover.

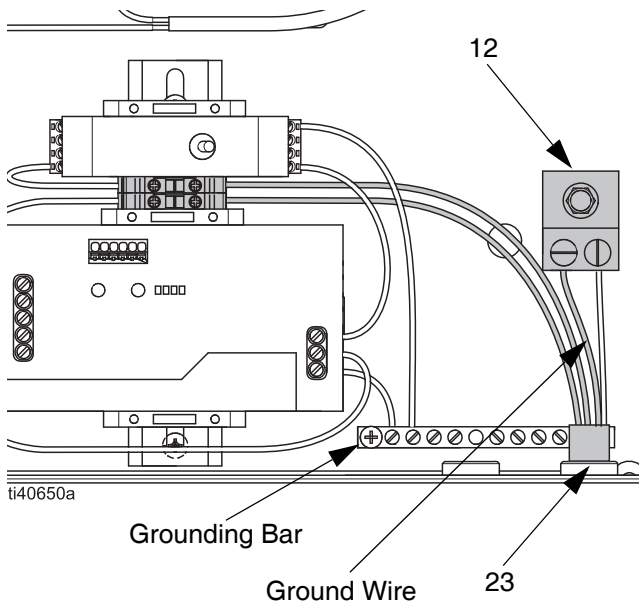
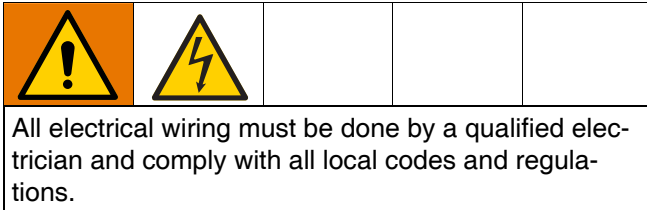


Fig. 6: 115 VAC In / 24 V Out, AC In and AC Out Boxes (B52H08-11)

2. Connect the main power to the control box as follows:

- a. Feed the cable through the strain relief (23) on right side of the control box. The strain relief accepts 0.59-1.0 in. (15-25 mm) diameter cables.
 - b. Use a screwdriver to back out the screw on the CNTL (LINE) terminal of the terminal block. Insert the Line power lead and retighten the screw to secure. Torque to 5-7 in-lbs (0.6-0.8 N•m).
 - c. Use a screwdriver to back out the screw on the CNTL (N) terminal of the terminal block. Insert the Neutral power lead and retighten the screws to secure. Torque to 5-7 in-lbs (0.6-0.8 N•m).
 - d. Tighten strain relief nut (23).
3. Close the front cover and turn the cover fasteners 90° clockwise.

Pump Connection



Disconnect power and then connect pump wires per the appropriate box as follows.

Refer to the pump instruction manual for pump operation. (See **Related Manuals** on page 2.)

115 VAC Pumps (CI-A1A-0x00-0M) for Ordinary Location Boxes

The control box is pre-configured with a 6 A circuit breaker for the pump positive terminal. (See **Power Terminals and Circuit Breakers** on page 16.)

Connect the pump wires as follows:

- Motor white wire to the MTR (N), F2 terminal. Torque to 5-7 in-lbs (0.6-0.8 N•m).
- Motor black wire to the MTR (LINE) terminal on breaker. Torque to 18-22 in-lbs (2-2.5 N•m).
- Motor green wire to the grounding bar. Torque to 18-22 in-lbs (2-2.5 N•m).

115 VAC Pumps (CI-A1A-0x00-0M) for Hazardous Location Boxes

The pump control circuit includes a Class CC din rail mounted fuse holder for the pump positive terminal. Install a fuse per your instruction manual. (See **Related Manuals**, page 2, and **Power Terminals and Circuit Breakers**, page 16.)

Connect the pump wires as follows:

- Motor white wire to the MTR (N) terminal. Torque to 5-7 in-lbs (0.6-0.8 N•m).
- Motor black wire to the MTR (LINE) terminal on fuse holder. Torque to 14.75 in-lbs (1.7 N•m).
- Motor green wire to the grounding bar. Torque to 18-22 in-lbs (2.0-2.5 N•m).

24 VDC Pumps (CI-D24-0x00-2M and CI-A1A-0x00-2M) for Ordinary Location Boxes

The pump control circuit includes an in-line mini-ATM in fuse holder F2. Install a fuse per your pump instruction manual. (See **Related Manuals**, page 2, and **Power Terminals and Circuit Breakers**, page 16.)

Connect the pump wires as follows:

- Pump positive wire to the MTR+ terminal. Torque to 5-7 in-lbs (0.6-0.8 N•m).
- Pump negative wire to MTR-. Torque to 5-7 in-lbs (0.6-0.8 N•m).
- Pump green wire to the grounding bar. Torque to 18-22 in-lbs (2-2.5 N•m).



24 VDC Pumps (CI-D24-0x00-2M and CI-A1A-0x00-2M) for Hazardous Location Boxes

The pump control circuit includes a Class CC din rail mounted fuse holder for the pump positive terminal. Install a fuse per your instruction manual. (See **Related Manuals**, page 2, and **Power Terminals and Circuit Breakers**, page 16.)

Connect the pump wires as follows:

- Pump positive wire to the MTR+, F2 terminal. Torque to 14.75 in-lbs (1.7 N•m).
- Pump negative wire MTR- terminal. Torque to 5-7 in-lbs (0.6-0.8 N•m).
- Pump green wire to the grounding bar. Torque to 18-22 in-lbs (2-2.5 N•m).

Multiple-Point Valve Manifold Connection



				
Verify that power is disconnected before connecting the multiple-point valve manifold assembly.				

Refer to the multiple-point valve manifold instruction manual for operation. (See **Related Manuals** on page 2.)

Connect the ground wire to the grounding bar. (See **Grounding** on page 9.)

Connect the valve manifold wires to terminals 32-41 according to **Multiple-Point Valve Manifold Connection** on page 22. Torque to 5-7 in-lbs (0.6-0.8 N•m).

Accessory Connections

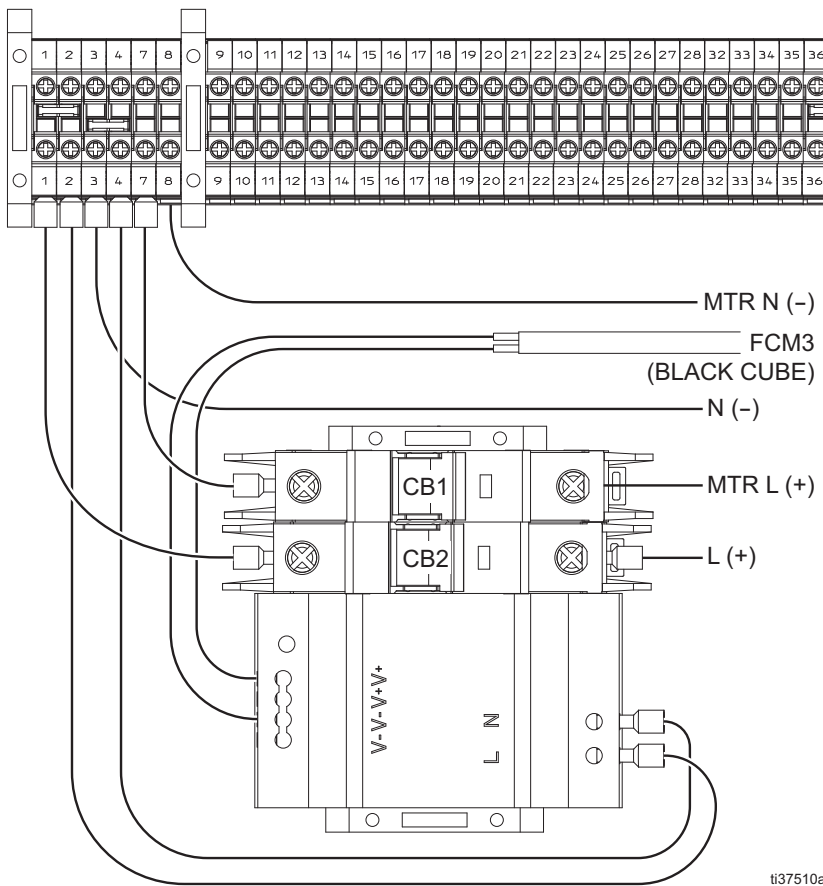
				
Verify that power is disconnected before connecting accessories.				

Refer to the Harrier+ instruction manual for operation. (See **Related Manuals** on page 2.)

Connect the ground wires to the grounding bar. (See **Grounding** on page 9.)

Connect accessory wires to terminals 9-31 according to **Multiple-Point Valve Manifold Connection** on page 22. Torque to 5-7 in-lbs (0.6-0.8 N•m).

Power Terminals and Circuit Breakers



Fuses / Circuit Breakers		
Ref	Size	Description
CB1	6 A*	MTR (LINE), Motor Power, Breaker, UL 489
CB2	6 A	CNTL (LINE), Controller Power, Breaker, UL 489

* For Graco motors, or 120% motor current rating, not to exceed 6 A.

Fig. 7: 115 VAC Out Models (CI-A1A-0x00-0M), B52M04-B52M07 (Ordinary Location)

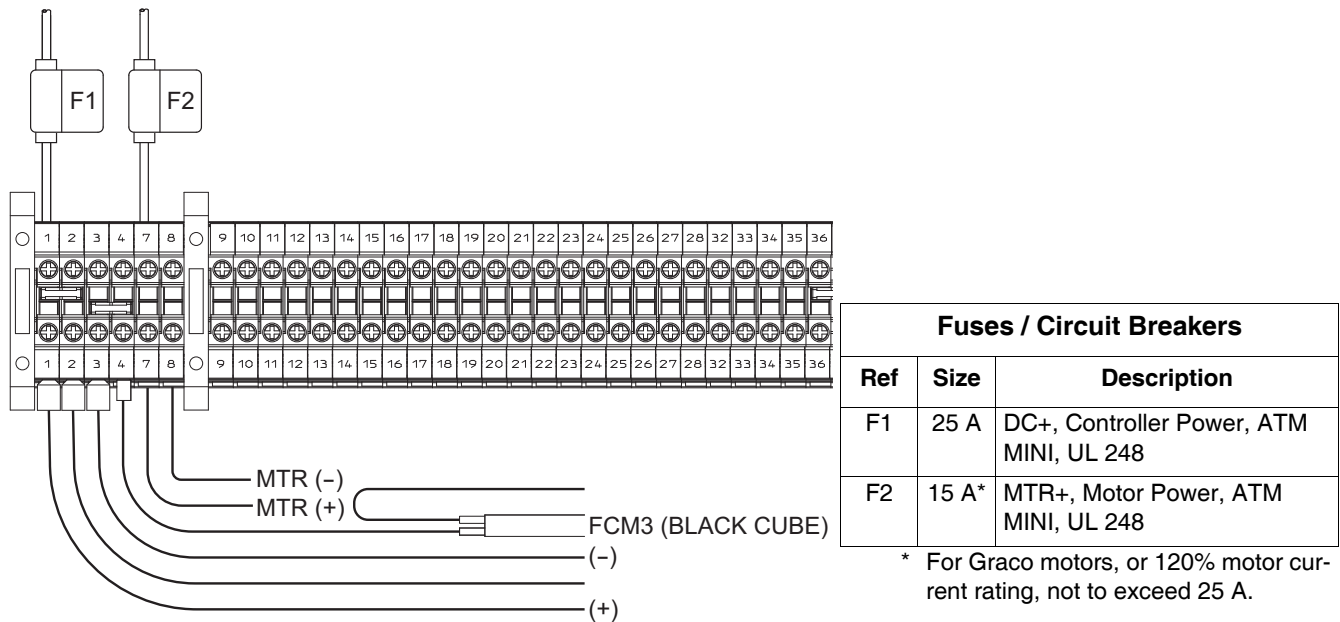
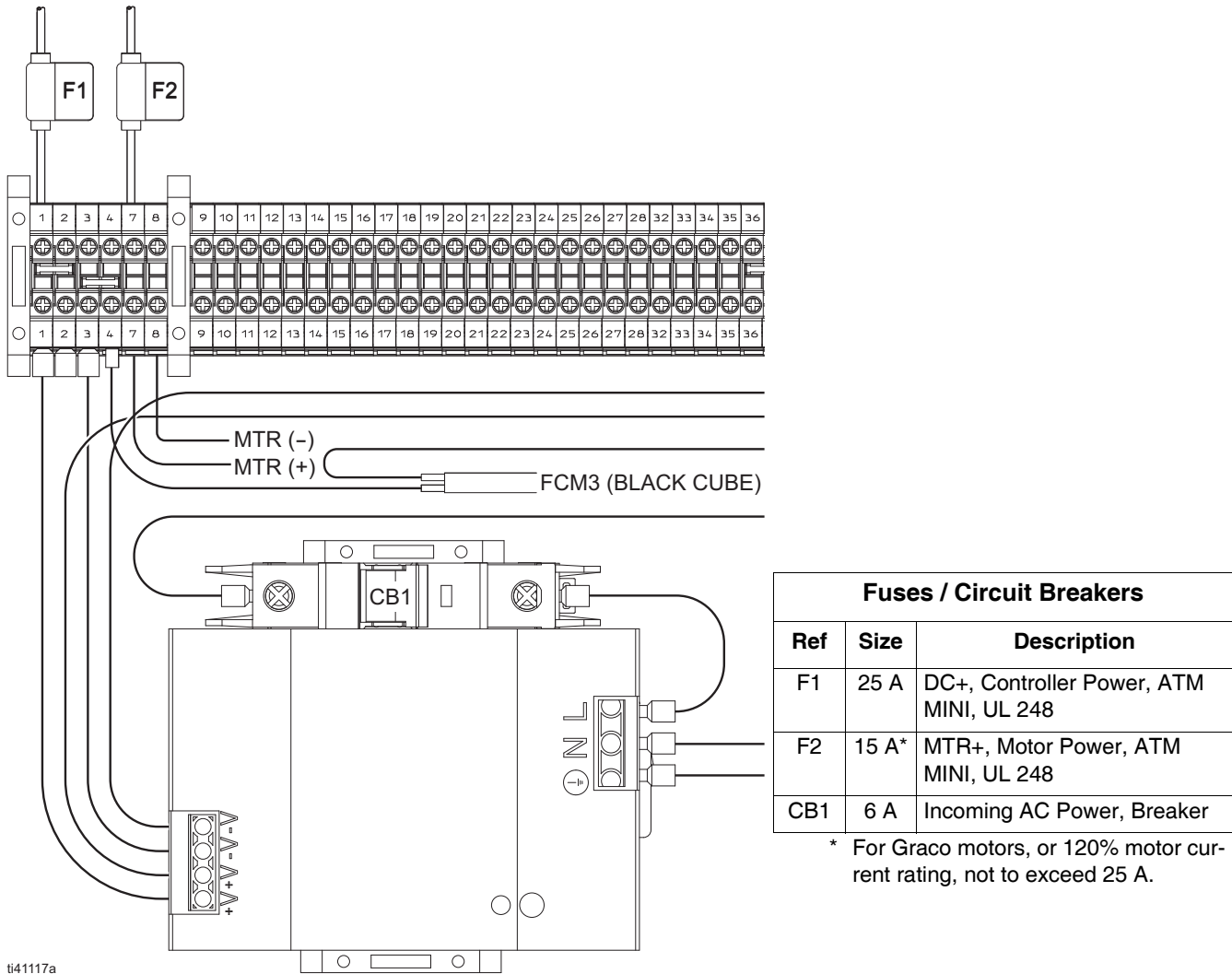


FIG. 8: 24 VDC Out Models (CI-D24-0x00-2M), B52M00-B52M03 (Ordinary Location)

To install a wire, loosen the screw above the wire location, insert the wire, tighten the screw. Torque to 5-7 in-lbs (0.6-0.8 N•m).

To remove a wire, loosen the screw and remove the wire.

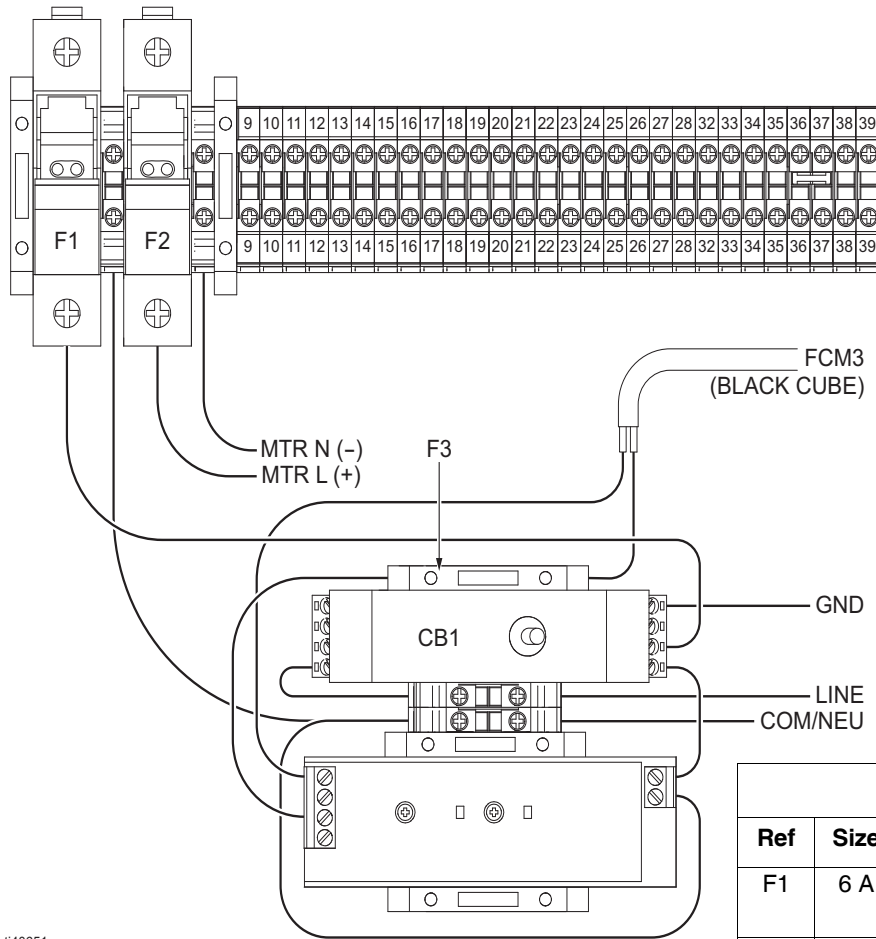


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FIG. 9: 115 VAC In, 24 VDC Out Models (CI-A1A-0x00-2M), B52M08-B52M11 (Ordinary Location)

To install a wire, loosen the screw above the wire location, insert the wire, tighten the screw. Torque to 5-7 in-lbs (0.6-0.8 N•m).

To remove a wire, loosen the screw and remove the wire.

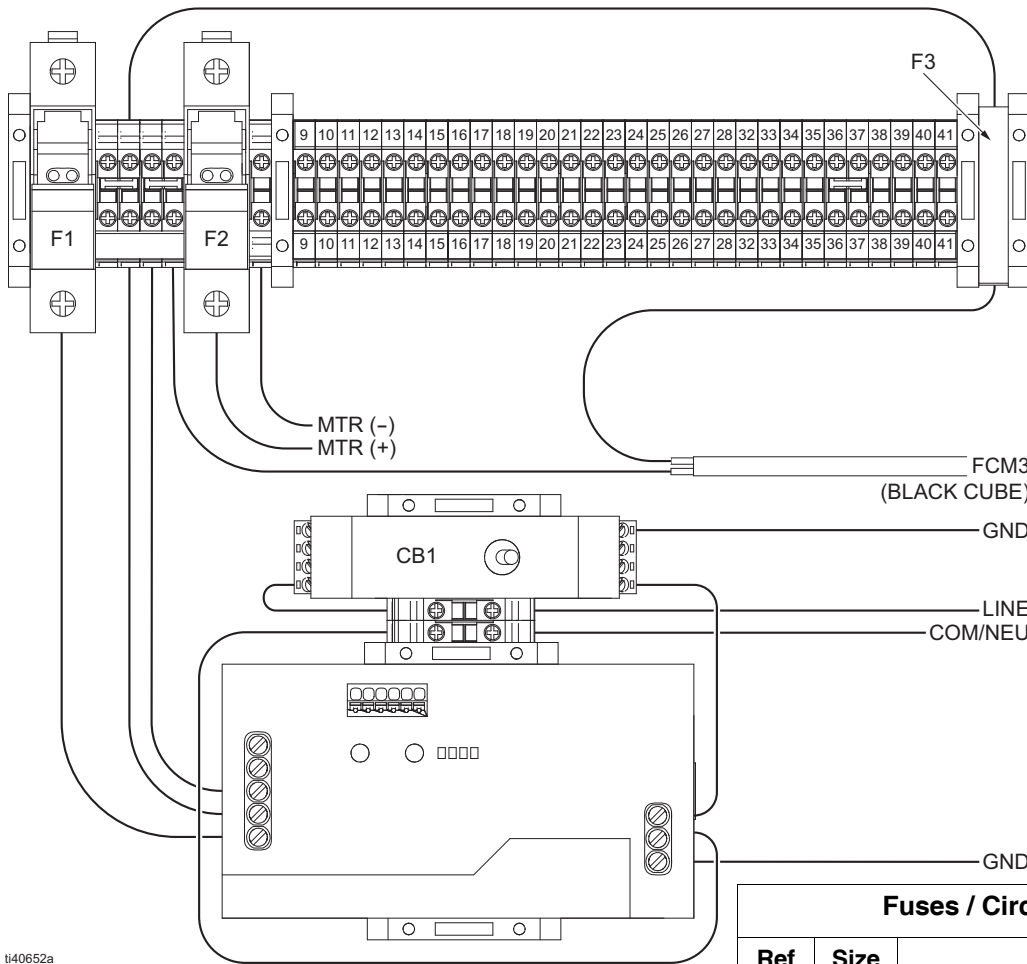


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Fuses / Circuit Breakers		
Ref	Size	Description
F1	6 A	CNTRL (LINE), Controller Power, Class CC Fuse
F2	6 A*	MTR (LINE), Motor Power, Class CC Fuse
F3	3 A	24 V+, FCM3, 5x20 MM Fuse
CB1	7.5 A	Incoming AC Power, Breaker, UL 1077

* For Graco motors, or 120% motor current rating, not to exceed 6 A.

Fig. 10: 115 VAC Out Models (CI-A1A-0x00-0M), B52H04-B52H07 (Hazardous Location)



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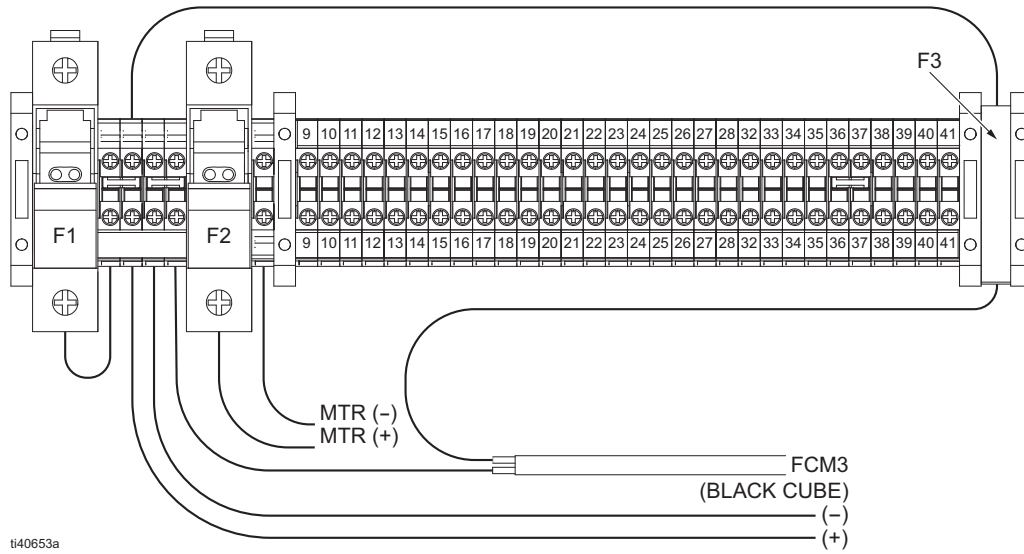
Fuses / Circuit Breakers		
Ref	Size	Description
F1	25 A	DC+, Controller Power, Class CC Fuse
F2	15 A*	MTR+, Motor Power, Class CC Fuse
F3	3 A	24 V+, FCM3, 5x20 MM Fuse
CB1	7.5 A	Incoming AC Power, Breaker, UL 1077

* For Graco motors, or 120% motor current rating, not to exceed 25A.

Fig. 11: 115 VAC In, 24 VDC Out Models (CI-A1A-0x00-2M), B52H08-B52H11 (Hazardous Location)

To install a wire, loosen the screw above the wire location, insert the wire, tighten the screw. Torque to 5-7 in-lbs (0.6-0.8 N•m).

To remove a wire, loosen the screw and remove the wire.



Fuses / Circuit Breakers		
Ref	Size	Description
F1	25 A	DC+, Controller Power, Class CC Fuse
F2	15 A*	MTR+, Motor Power, Class CC Fuse
F3	3 A	24 V+, FCM3, 5x20 MM Fuse

* For Graco motors, or 120% motor current rating, not to exceed 25 A.

FIG. 12: 24 V In, 24 V Out Models (CI-D24-0x00-2M), B52H00-B52H03 (Hazardous Location)

Hazardous Location

USE COPPER CONDUCTORS ONLY. SEE MANUAL FOR FUSE REQUIREMENTS

CNTL (LINE)	CNTL (N)	MTR (LINE)	MTR (N)	+		-		+		-		+		-		+		-		BLK (RX)	RD (TX)	GRN (GND)	+				-				+					
				CYC CNTR	AUX SW	#1 ALM	#2 ALM	P/S PWR	P/S SIG	TLM	IN ANLG	OUT ANLG	TEMP	SCADA				S1	S2				S3	S4	GND	S5	S6	S7	S8							
				9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

19D497b

USE CLASS 1 CONDUCTORS

SCADA UNITS ONLY MULTI-POINT INJECTION SOLENOID VALVES

USE COPPER CONDUCTORS ONLY. SEE MANUAL FOR FUSE REQUIREMENTS

DC +	DC +	DC +	DC -	DC -	MTR +	MTR -	+		-		+		-		+		-		+		-		BLK (RX)	RD (TX)	GRN (GND)	+				-				+					
							CYC CNTR	AUX SW	#1 ALM	#2 ALM	P/S PWR	P/S SIG	TLM	IN ANLG	OUT ANLG	TEMP	SCADA				S1	S2				S3	S4	GND	S5	S6	S7	S8							
(FUSED)					(FUSED)		9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

19D495a

USE CLASS 1 CONDUCTORS

SCADA UNITS ONLY MULTI-POINT INJECTION SOLENOID VALVES

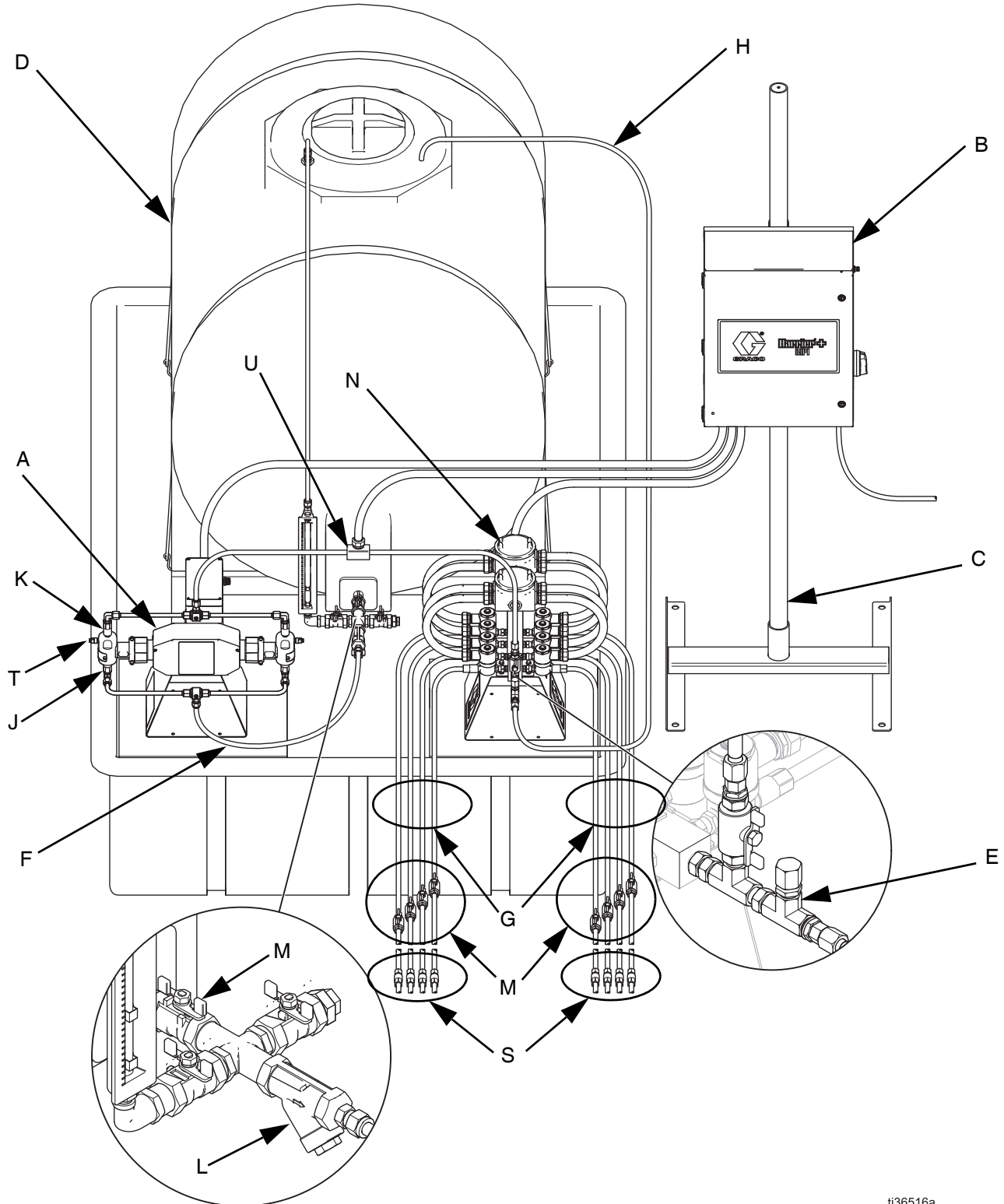
Terminal Block Key

- | | |
|--|--|
| <ul style="list-style-type: none"> 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 Pressure Sensor Power, positive 18 Pressure Sensor Power, negative 19 Pressure Sensor Signal, positive 20 Pressure Sensor Signal, negative 21 Tank Level Monitor, Power 22 Tank Level Monitor, Signal 23 Analog In, Power 24 Analog In, Signal 25 Analog Out, Signal | <ul style="list-style-type: none"> 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) 32 Solenoid Valve #1 33 Solenoid Valve #2 34 Solenoid Valve #3 35 Solenoid Valve #4 36 Solenoid Valve Ground (1-4) 37 Solenoid Valve Ground (5-8) 38 Solenoid Valve #5 39 Solenoid Valve #6 40 Solenoid Valve #7 41 Solenoid Valve #8 |
|--|--|

To install a wire, loosen the screw above the wire location, insert the wire, tighten the screw. Torque to 5-7 in-lbs (0.6-0.8 N•m).

To remove a wire, loosen the screw and remove the wire.

Typical Installation



ti36516a

FIG. 13 Multiple-Point Injection System Layout




Typical Installation Components

FIG. 13 is an example of an installation with a multiple-point injection valve manifold and control box. Your installation may differ from what is shown here. The multiple-point valve manifold assembly (N), pump (A), and control box (B) in FIG. 13 are supplied by Graco. All other components are supplied by the customer.

Key:

- A Pump (includes Inlet (J) and Outlet (K) ports)
- B Multiple-Point Injection Control Box
- C Stand
- 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 and outlet)
- N Multiple-Point Injection Valve Manifold Assembly
- S Check Valve
- T Pump Bleed Valve
- U Pressure Sensor

Operation

				
<p>To reduce the risk of electric shock when accessing the control box while power is present:</p> <ul style="list-style-type: none">• Do not make contact with components or wires unless instructed to do so.• Wear appropriate personal protective equipment.				

Your Harrier+ controller is pre-installed. Remember that power is always present in the control box whenever you configure or operate the controller.

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

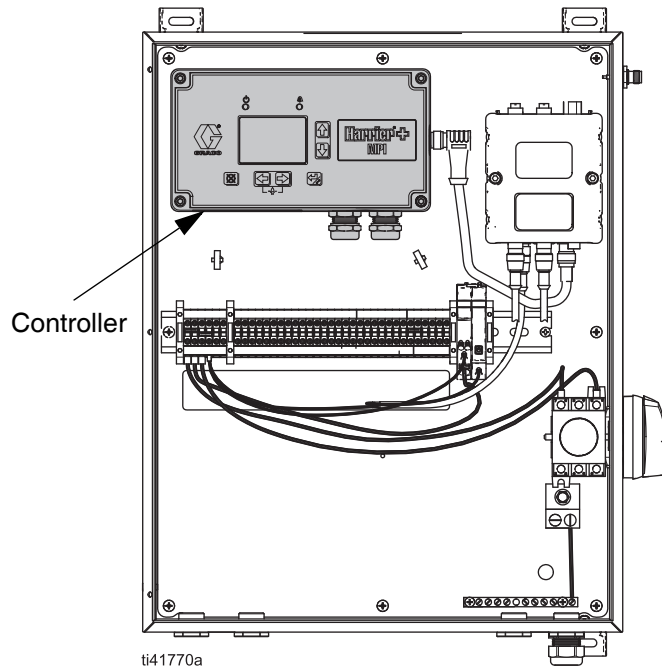


FIG. 14 Controller location in control box

Refer to your Harrier+ manual for controller operation. (See **Related Manuals** on page 2.)

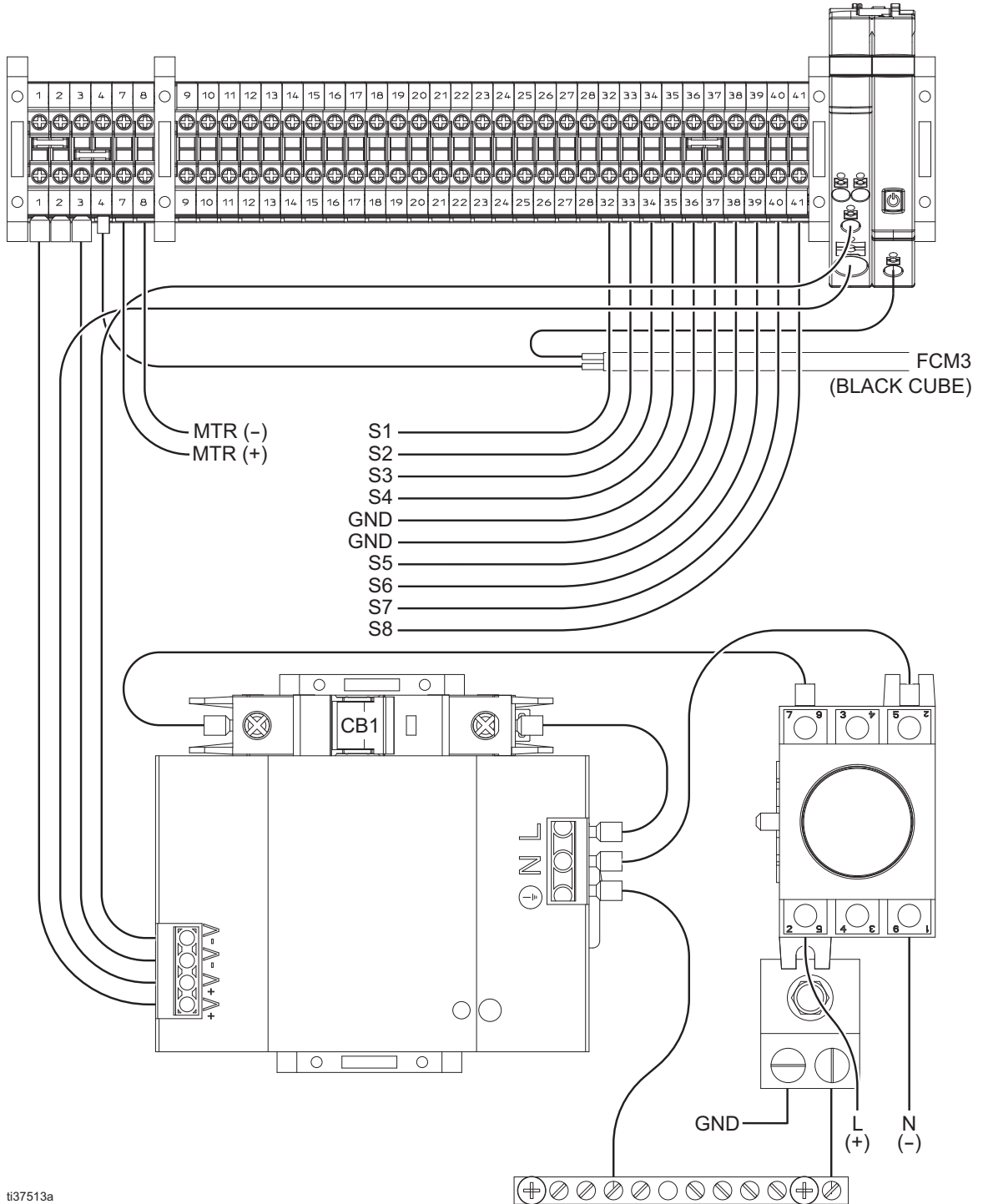
3. Close the panel door.

Software Updates

Follow the “Install Software with Token” procedure in the Harrier+ Chemical Injection Controller Programming manual to update software on the Harrier+ and FCM3. See **Related Manuals** on page 2.

115 VAC IN and 24 VDC OUT

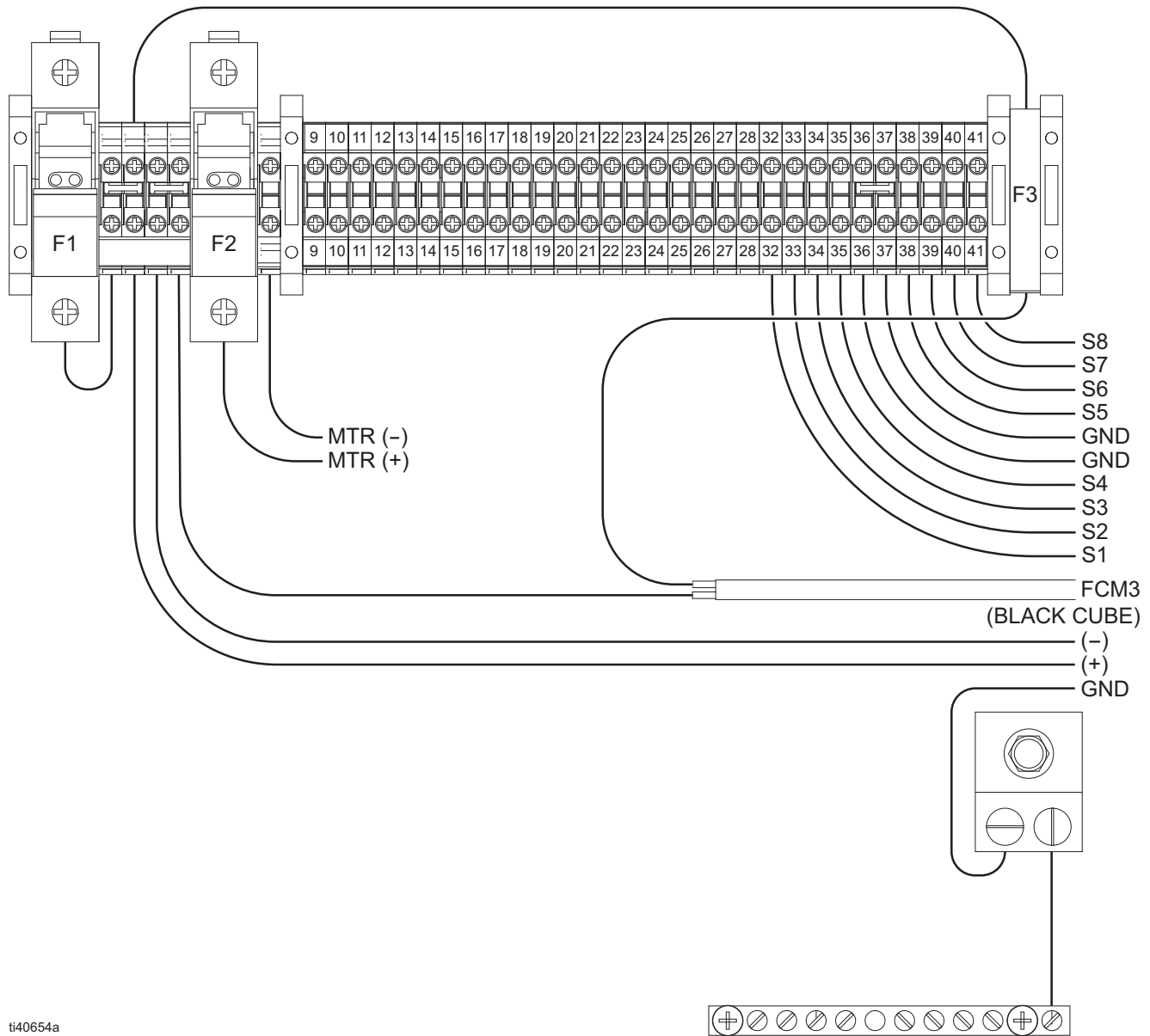
B52M08-11 configuration CI-A1A-0x00-2M is shown (Ordinary Location)



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24 VDC IN and 24 VDC OUT

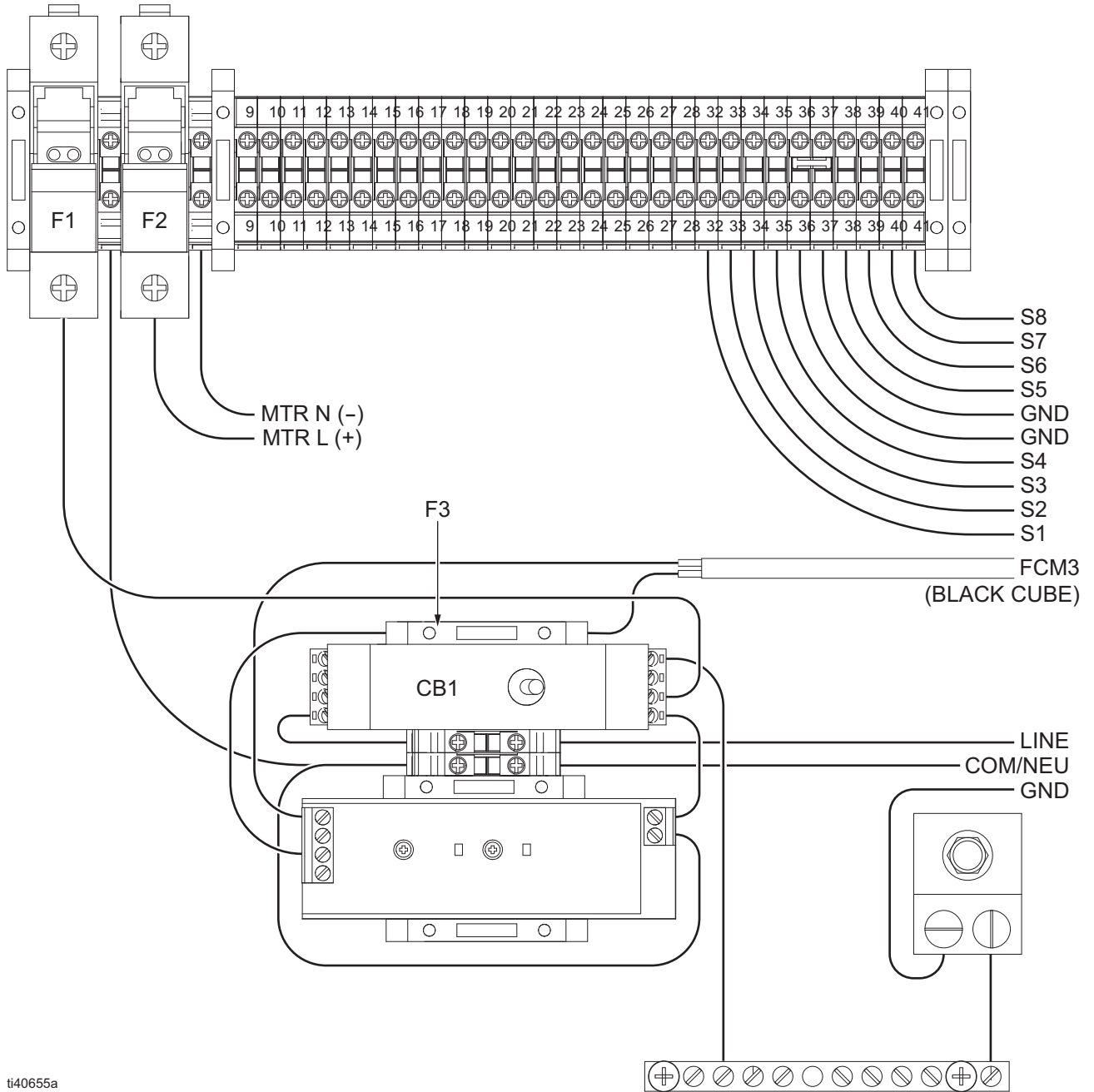
B52H00-03 configuration CI-D24-0x00-2M is shown (Hazardous Location)



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115 VAC IN and 115 VAC OUT

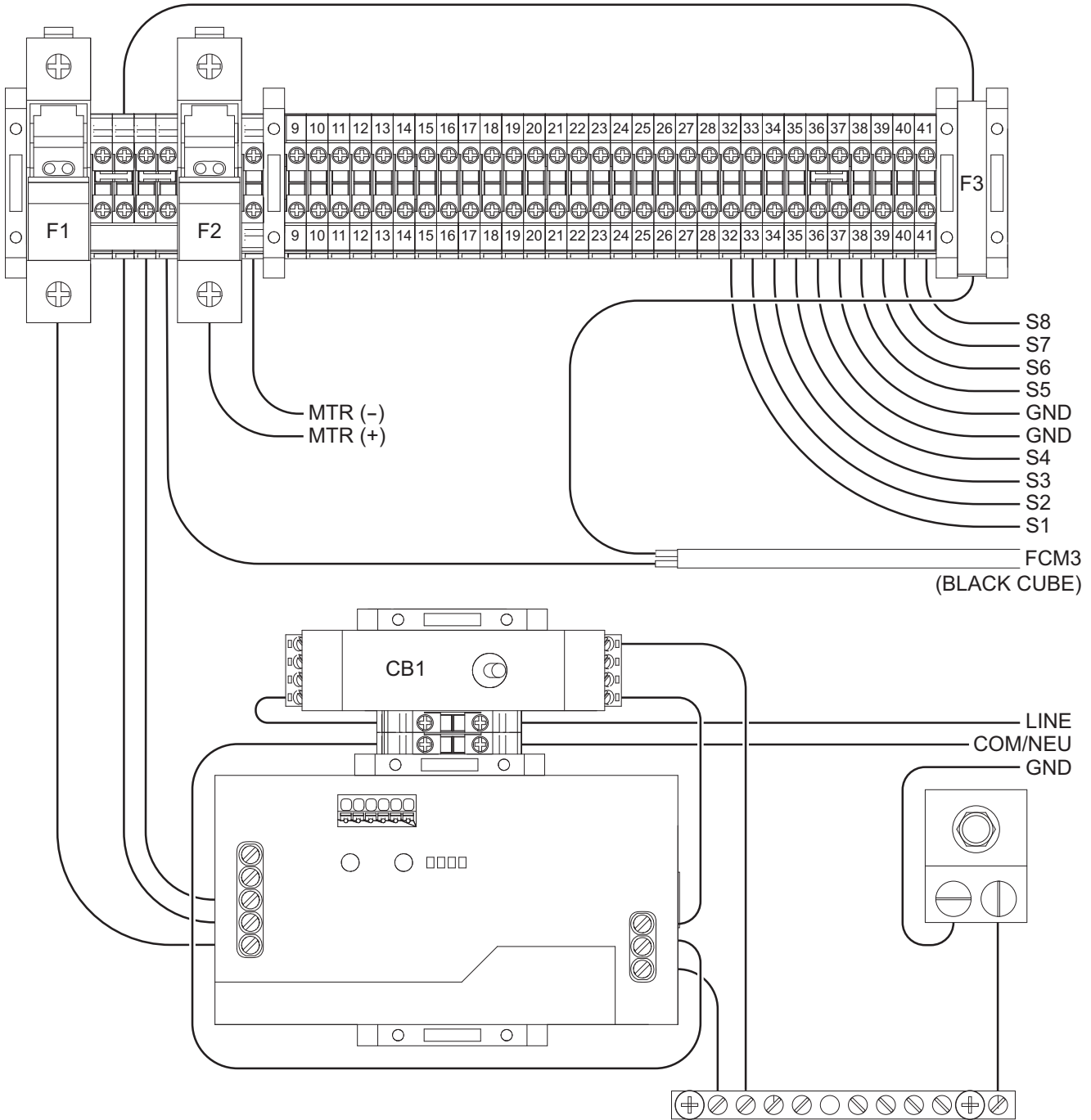
B52H04-07 configuration CI-A1A-0x00-0M is shown (Hazardous Location)






ti40655a

115 VAC IN and 24 VDC OUT

B52H08-11 configuration CI-A1A-0x00-2M is shown (Hazardous Location)



Troubleshooting

			
<p>To reduce the risk of electric shock when accessing the control box while power is present:</p> <ul style="list-style-type: none"> • Do not make contact with components or wires unless instructed to do so. • Wear appropriate personal protective equipment. 			

			
<p>EXPLOSION HAZARD</p> <ul style="list-style-type: none"> • Do not replace or remove fuse when energized. • Do not reset circuit breaker unless power has been removed from the equipment, or the area is free of ignitable concentrations. 			

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.

- Refer to your pump manual (see **Related Manuals** on page 2) for troubleshooting specific to the pump.
- Refer to your controller manual (see **Related Manuals** on page 2) for troubleshooting specific to the controller.
- Refer to multiple-point injection valve manifold manual (see **Related Manuals** on page 2) for troubleshooting specific to the valve manifold.

24 VDC IN and 24 VDC OUT Parts List, B52M00 (Ordinary Location)

Ref.	Part	Description	Qty
1	--	ENCLOSURE	1
2	--	PANEL, back, enclosure	1
3		CONTROLLER, Harrier+	1
	B32833	GSM USA; DC	
	B32835	GSM International; DC	
	B32837	SCADA; DC	
	B32839	CDMA; DC	
4	--	SCREW, shcs; 10 x .375	4
5	--	TERMINAL, ground	1
6	--	SCREW, truss head; #8	1
7	--	SCREW, hex head; thread forming	1
8	B33054	MODULE, GCA	1
9	--	WIRE, ground, main; 7 in.	1
11	--	BAR, ground	1
12	B33056	CABLE, CAN, female/90 male; 0.5 m (included with ref. 13 and 71)	1
13	B33056	CABLE, M12-female; 1 m (included with ref. 12 and 71)	1
16	--	KNOB, rotary, external	1
17	--	SWITCH, 3-pole rotary; 16 A	1
18	--	WIRE, 12 AWG; 24 in., Black (not shown)	1
19	--	WIRE, 12 AWG; 24 in., White (not shown)	1
20	--	PLUG, threaded; 1/2 in.	7
21	--	NUT, Strain Relief; 1/2 in. npt	8
23	--	BUSHING, Strain Relief; 1/2 in. npt	1
24	18B616	LABEL, logo, Harrier+, MPI (not shown)	1
25	--	Designation Plate (not shown)	1
26	29A141	IDENTIFICATION, MPI, DC	1
28	--	STRAP, tie, wire (not shown)	4
30▲	186620	LABEL, symbol, ground	1
31	--	TIE, cable, fir tree	2
35	--	LABEL, wire table	1
37	--	BRACKET, mounting, external handle	1

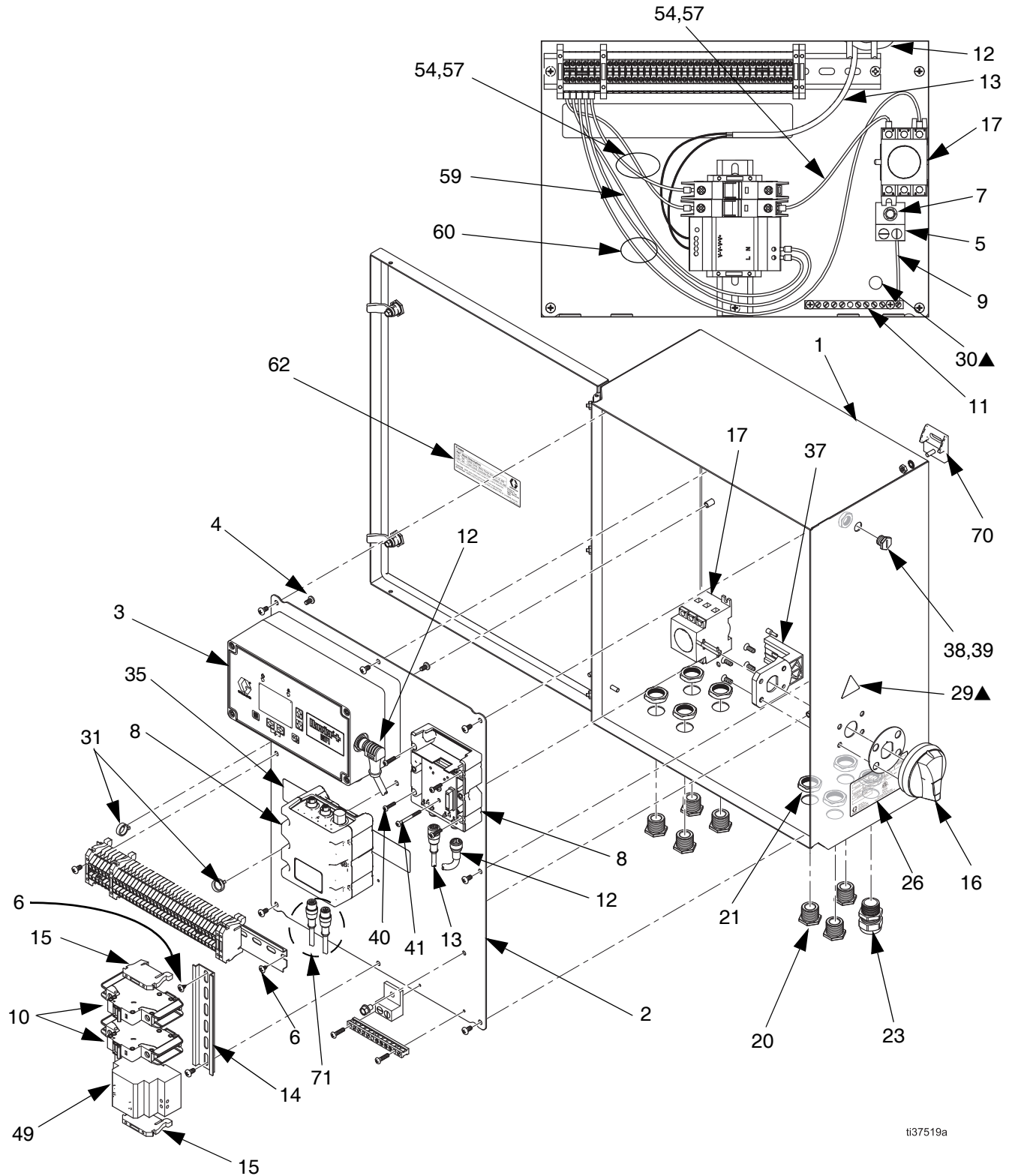
Ref.	Part	Description	Qty
38	--	PLUG, PG-7 (SCADA assemblies only)	1
39	--	NUT, PG-7 (SCADA assemblies only)	1
40	--	SCREW, pan	4
41	--	SCREW, machine, pan	1
42	--	FUSE, 15 A (not shown)	2
43	--	FUSE, 25 A (not shown)	1
47	B33060	MODULE, supply, converter; DC/DC (included with ref. 48)	1
48	B33060	CIRCUIT BREAKER; 4 A, 24 VDC (included with ref. 47)	1
51	--	WIRE, battery, pos	2
52	--	WIRE, battery, neg	1
54	--	WIRE, black; 10 in., 12 AWG	1
55	--	WIRE, ground	1
56	--	FERRULE, wire; 10 AWG	5
58	--	FERRULE, wire; 10 AWG, twin	1
62	133860	LABEL, 24 V in-24 V out	1
70	--	Mounting Feet	4
71	B33056	CABLE, S1-S4, M12-5P, M/N, 0.3 m (included with ref. 12 and 13)	2

▲ Replacement Safety labels, tags, and cards are available at no cost.

Find **Kits and Accessories** on page 45.

115 VAC IN and 115 VAC OUT

B52M04 configuration CI-A1A-0300-0M is shown (Ordinary Location)



ti37519a

115 VAC IN and 115 VAC OUT Parts List, B52M04 (Ordinary Location)

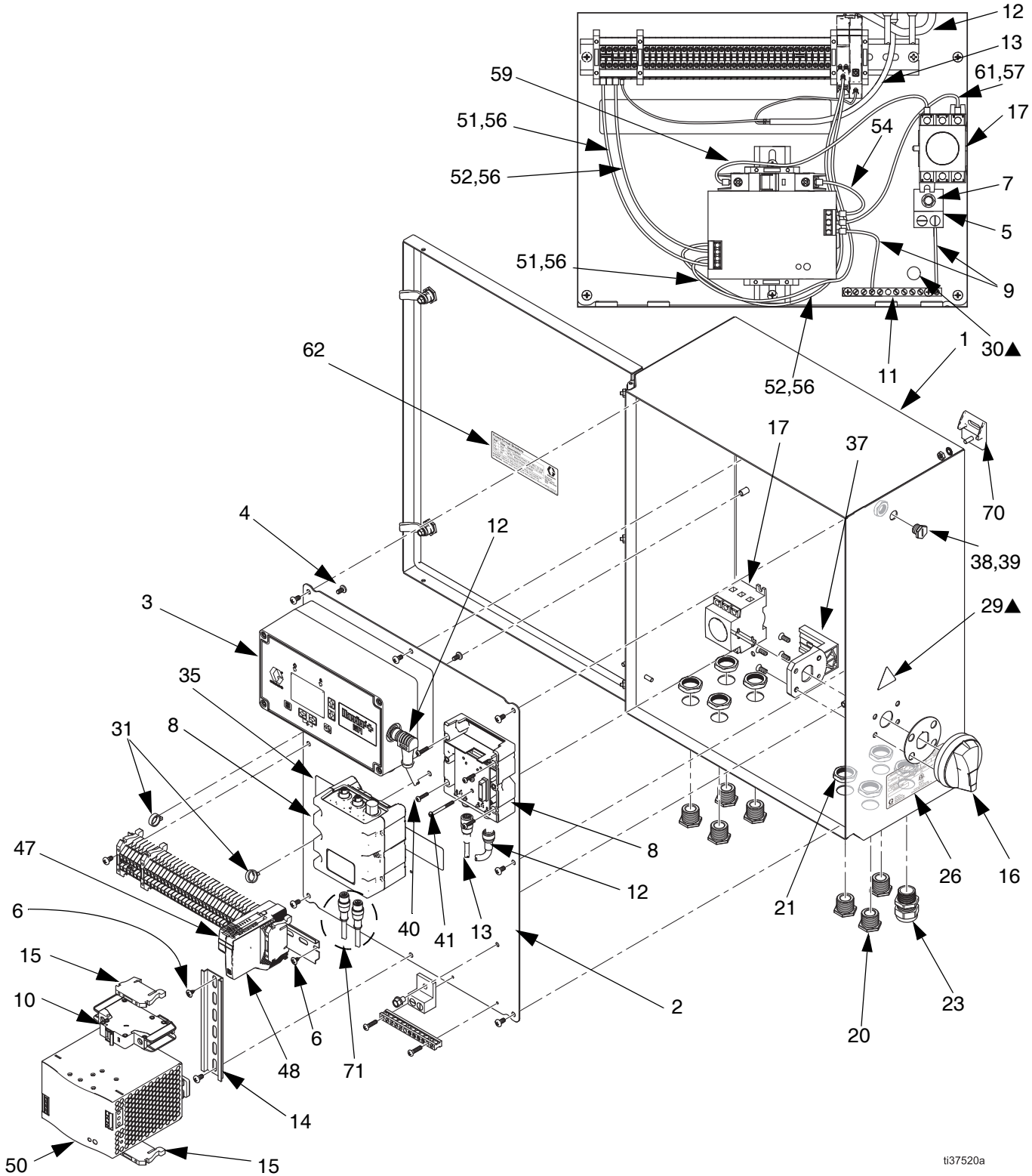
Ref.	Part	Description	Qty
1	--	ENCLOSURE	1
2	--	Panel, back, enclosure	1
3		CONTROLLER, Harrier+	1
	B32834	GSM USA; AC	
	B32836	GSM International; AC	
	B32838	SCADA; AC	
	B32840	CDMA; AC	
4	--	SCREW, shcs; 10 x .375	4
5	--	TERMINAL, ground	1
6	--	SCREW, truss head; #8	2
7	--	SCREW, hex head; thread forming	1
8	B33054	MODULE, GCA	1
9	--	WIRE, ground, main; 7 in.	1
10	B33059	CIRCUIT, breaker; 1 P, 6 A, UL489	2
11	--	BAR, ground	1
12	B33056	CABLE, CAN, female/90 male; 0.5 m (included with ref. 13 and 71)	1
13	B33056	CABLE, M12-female; 1 m (included with ref. 12 and 71)	1
14	--	RAIL, mounting, din; 35 mm, 6 in.	1
15	--	BLOCK, end stop, terminal	2
16	--	KNOB, rotary, external	1
17	--	SWITCH, 3-pole rotary; 16 A	1
20	--	PLUG, threaded; 1/2 in.	7
21	--	NUT, Strain Relief; 1/2 in. npt	8
23	--	BUSHING, Strain Relief; 1/2 in. npt	1
24	18B616	LABEL, logo, Harrier+, MPI (not shown)	1
26	29A141	IDENTIFICATION, MPI, DC	1
28	--	STRAP, tie, wire (not shown)	4
29▲	15G303	LABEL, warning, electrical	1
30▲	186620	LABEL, symbol, ground	1
31	--	TIE, cable, fir triee	2
35	--	LABEL, wire table, mpi, ac	1
36	--	LABEL, wire, disconnect (not shown)	1

Ref.	Part	Description	Qty
37	--	BRACKET, mounting, external handle	1
38	--	PLUG, PG-7 (SCADA assemblies only)	1
39	--	NUT, PG-7 (SCADA assemblies only)	1
40	--	SCREW, pan	4
41	--	SCREW, machine, pan	1
49	B33057	POWER SUPPLY, AC/DC; 24 VDC, 60 W, 2.5 A	1
54	--	WIRE, black; 10 in., 12 AWG (includes ref. 57)	3
55	--	WIRE; ground (not shown)	1
57	--	FERRULE, wire, 12 AWG (included in ref. 54)	3
59	--	WIRE; 24 in., 12 AWG, black	1
60	--	WIRE; 24 in., 12 AWG, white	2
62	133861	LABEL, 115 VAC in-115 VAC out	1
70	--	FEET, mounting	4
71	B33056	CABLE, S1-S4, M12-5P, M/N, 0.3 m (included with ref. 12 and 13)	2

▲ Replacement Safety labels, tags, and cards are available at no cost.

115 VAC IN and 24 VDC OUT

B52M08 configuration CI-A1A-0300-2M is shown (Ordinary Location)



ti37520a

115 VAC IN and 24 VDC OUT Parts List, B52M08 (Ordinary Location)

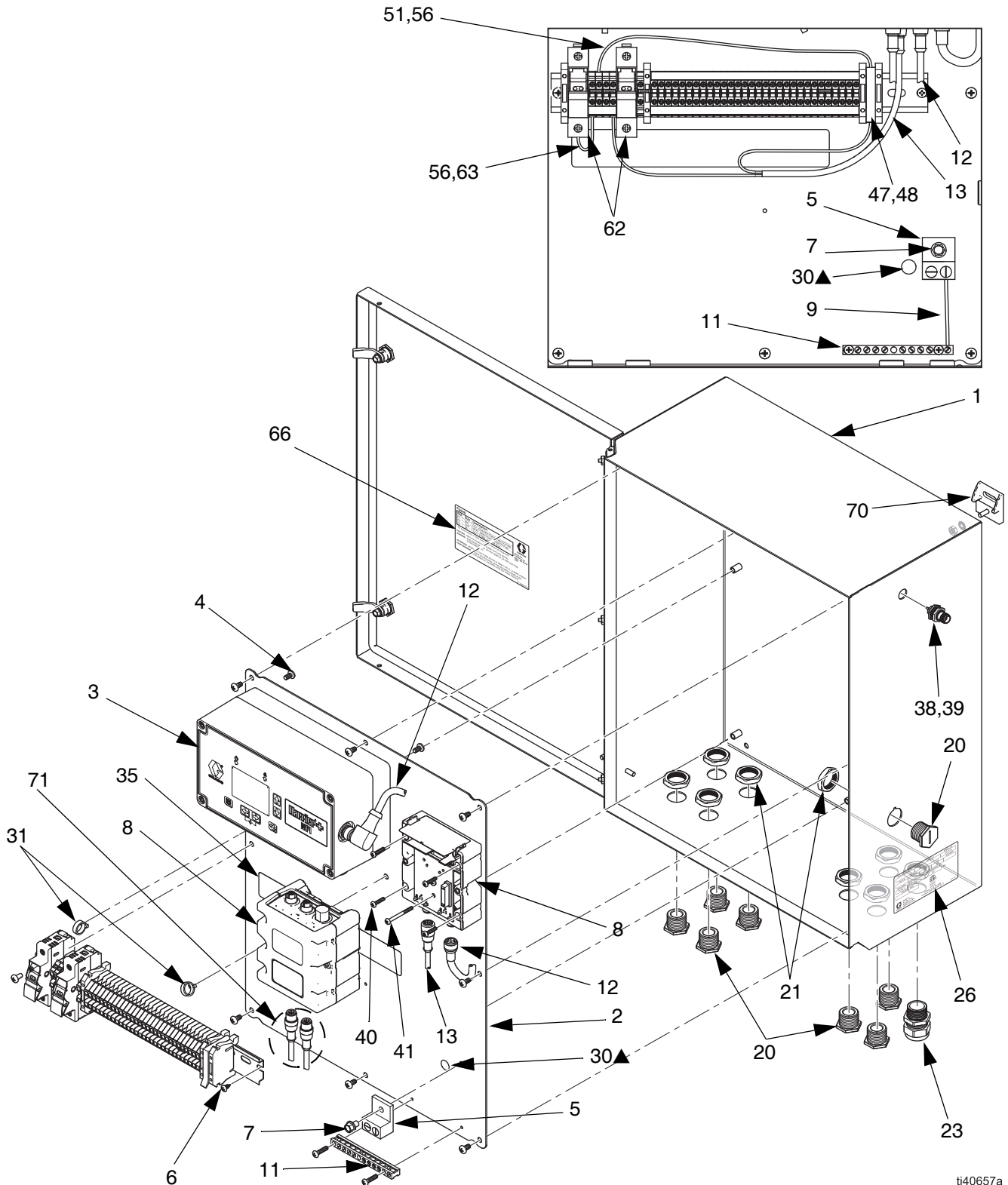
Ref.	Part	Description	Qty
1	--	ENCLOSURE (includes ref 4)	1
2	--	PANEL, back, enclosure	1
3		CONTROLLER, Harrier+	1
	B32833	GSM USA; DC	
	B32835	GSM International; DC	
	B32837	SCADA; DC	
	B32839	CDMA; DC	
4	--	SCREW, schs; 10 x .375	4
5	--	TERMINAL, ground	1
6	--	SCREW, truss head; #8	2
7	--	SCREW, hex head; thread forming	1
8	B33054	MODULE, GCA	1
9	--	WIRE, ground, main; 7 in.	1
10	B33059	CIRCUIT BREAKER; 1 P, 6 A, UL489	1
11	--	BAR, ground	1
12	B33056	CABLE, CAN, female/90 male; 0.5 m (included with ref. 13 and 71)	1
13	B33056	CABLE, M12; 1 m (included with ref. 12 and 71)	1
16	--	KNOB, rotary, external	1
17	--	SWITCH, 3-pole rotary; 16 A	1
20	--	PLUG, threaded; 1/2 in.	7
21	--	NUT, strain relief; 1/2 in. npt	8
23	--	BUSHING, strain relief; 1/2 in. npt	1
24	--	LABEL, logo, Harrier+, MPI (not shown)	1
28	--	STRAP, tie, wire (not shown)	1
29▲	15G303	LABEL, warning, electrical	1
30▲	186620	LABEL, symbol, ground	1
31	--	TIE, cable, fir tree	2
35	--	LABEL, wire table, MPI, SCADA	1
36	--	LABEL, wire, disconnect (not shown)	1
37	--	BRACKET, mounting, external handle	1
38	--	PLUG, PG-7 (SCADA assemblies only)	1

Ref.	Part	Description	Qty
39	--	NUT, PG-7 (SCADA assemblies only)	1
40	--	SCREW, pan	4
41	--	SCREW, machine, pan	1
42	--	FUSE, 15 A (not shown)	2
43	--	FUSE, 25 A (not shown)	1
47	B33060	MODULE, supply, converter; DC/DC (included with ref. 48)	1
48	B33060	CIRCUIT BREAKER; 4 A, 24 VDC (included with ref. 47)	1
50	--	POWER SUPPLY; 20 A, 24 VDC, 480 W	1
51	--	WIRE, battery, pos	2
52	--	WIRE, battery, neg	2
54	--	WIRE, black; 10 in., 12 AWG	2
55	--	WIRE, ground (not shown)	1
56	--	FERRULE, wire; 10 AWG	6
57	--	FERRULE, wire; 12 AWG	2
59	--	WIRE, black; 24 in., 12 AWG	1
61	--	WIRE, white; 12 in., 12 AWG	1
62	133862	LABEL, 115 VAC in-24 V out	1
70	--	FEET, mounting	4
71	B33056	CABLE, S1-S4, M12-5P, M/N, 0.3 m (included with ref. 12 and 13)	2

▲ Replacement Safety labels, tags, and cards are available at no cost.

24 VDC IN and 24 VDC OUT

B52H00 configuration CI-D24-0300-2M is shown (Hazardous Location)



ti40657a

24 VDC IN and 24 VDC OUT Parts List, B52H00 (Hazardous Location)

Ref.	Part	Description	Qty
1	--	ENCLOSURE	1
2	--	PANEL, back, enclosure	1
3		controller, harrier+	1
	B32833	GSM USA; DC	
	B32835	GSM International; DC	
	B32837	SCADA; DC	
	B32839	CDMA; DC	
4	--	SCREW, shcs; 10 x .375	4
5	--	TERMINAL, ground	1
6	--	SCREW, truss head; #8	1
7	--	SCREW, hex head; thread forming	1
8	B33054	MODULE, GCA	1
9	--	WIRE, ground, main; 7 in.	1
11	--	BAR, ground	1
12	B33056	CABLE, CAN, female/90 male; 0.5 m (included with ref. 13 and 71)	1
13	B33056	CABLE, M12-female; 1 m (included with ref. 12 and 71)	1
20	--	PLUG, threaded; 1/2 in.	8
21	--	NUT, Strain Relief; 1/2 in. npt	9
23	--	BUSHING, Strain Relief; 1/2 in. npt	1
24	18B616	LABEL, logo, Harrier+, MPI (not shown)	1
26	29A442	IDENTIFICATION, MPI, DC	1
28	--	STRAP, tie, wire (not shown)	4
30▲	186620	LABEL, symbol, ground	1
31	125625	TIE, cable, fir tree	2
35	--	LABEL, DC table, MPI C1D2, SCADA	1
38	--	PLUG, PG-7 (SCADA assemblies only)	1
39	--	NUT, PG-7 (SCADA assemblies only)	1
40	--	SCREW, pan	4
41	--	SCREW, machine, pan	1
43	--	FUSE, 25 A (not shown)	1

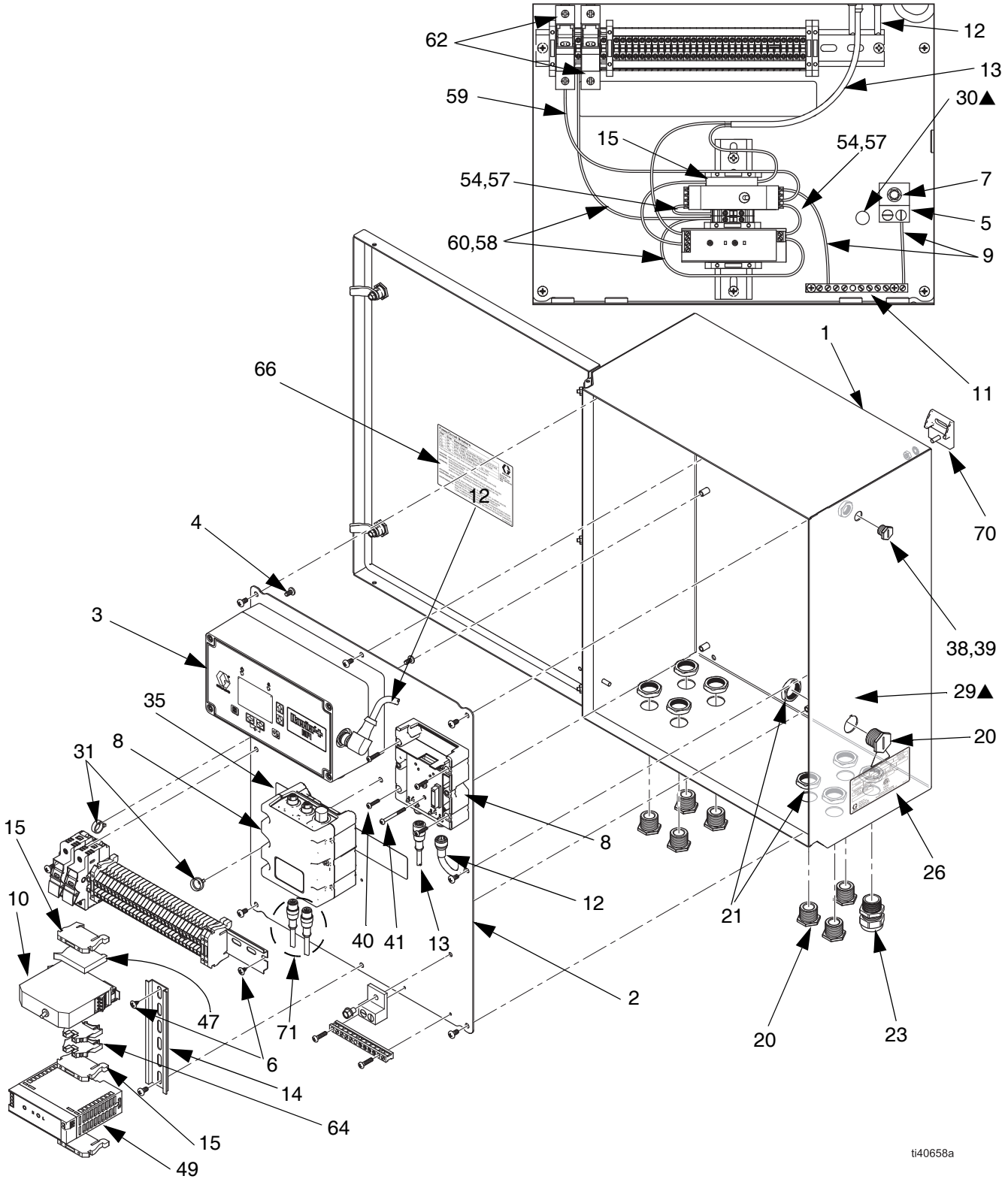
Ref.	Part	Description	Qty
47	--	HOLDER, fuse terminal block, 5 x 20 mm	1
48	--	FUSE, 3A, 5x20mm (not shown)	1
51	--	WIRE, battery, POS	1
55	--	WIRE, ground (not shown)	1
56	--	FERRULE, wire, 10 AWG	8
62	--	HOLDER, fuse, class-cc, 1-pole	2
63	--	WIRE, switch, POS	1
65	--	FUSE, class-cc- 20 A (not shown)	1
66	133805	LABEL, 24 V in-24 V out	1
70	--	FEET, mounting	4
71	B33056	CABLE, S1-S4, M12-5P, M/N, 0.3 m (included with ref. 12 and 13)	2

▲ Replacement Safety labels, tags, and cards are available at no cost.

Find **Kits and Accessories** on page 45.

115 VAC IN and 115 VAC OUT

B52H04 configuration CI-A1A-0300-0M is shown (Hazardous Location)



ti40658a

115 VAC IN and 115 VAC OUT Parts List, B52H04 (Hazardous Location)

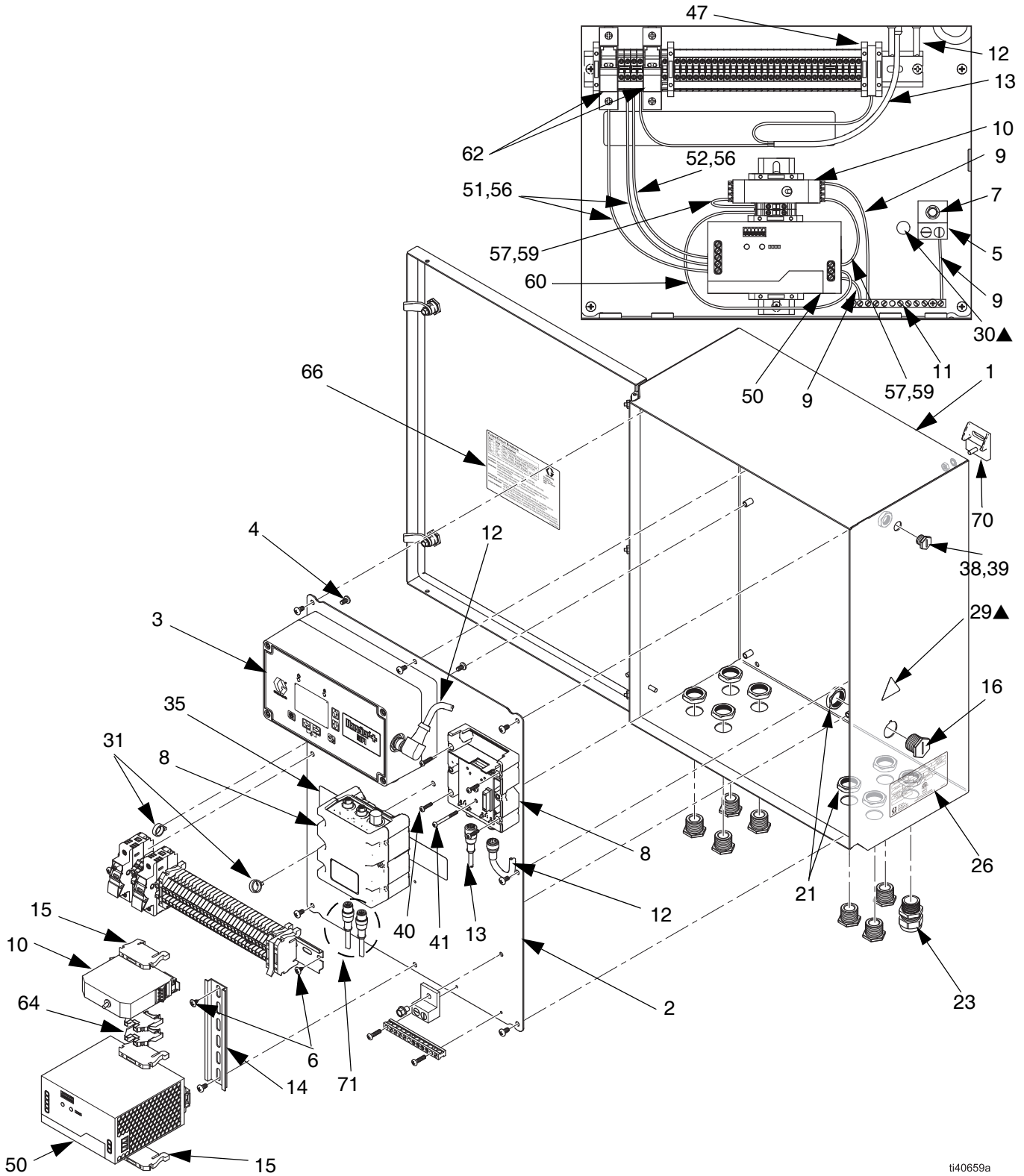
Ref.	Part	Description	Qty
1	--	ENCLOSURE (includes ref 4)	1
2	--	PANEL, back, enclosure	1
3		CONTROLLER, Harrier+	1
	B32834	GSM USA; AC	
	B32836	GSM International; AC	
	B32838	SCADA; AC	
	B32840	CDMA; AC	
4	--	SCREW, shcs; 10 x .375	4
5	--	TERMINAL, ground	1
6	--	SCREW, truss head; #8	2
7	--	SCREW, hex head; thread forming	1
8	B33054	MODULE, GCA	1
9	--	WIRE, ground, main; 7 in.	2
10	--	MODULE, circuit breaker, 120 VAC	1
11	--	BAR, ground	1
12	B33056	CABLE, CAN, female/90 male; 0.5 m (included with ref. 13 and 71)	1
13	B33056	CABLE, M12-female; 1 m (included with ref. 12 and 71)	1
14	--	RAIL, mounting, DIN, 35 mm, 6 in.	1
15	--	BLOCK, end stop, terminal	3
20	--	PLUG, hole, threaded, 1/2 in.	8
21	--	NUT, strain relief, 1/2 npt	9
23	--	BUSHING, strain relief, 1/2 npt	1
24	18B616	LABEL, logo, Harrier+, MPI (not shown)	1
26	29A443	IDENTIFICATION, MPI, AC	1
28	--	STRAP, tie, wire (not shown)	4
29▲	15G303	LABEL, warning, electrical	1
30▲	186620	LABEL, symbol, ground	1
31	--	TIE, cable, fir tree	2
35	--	LABEL, AC table, MPI, C1D2	1
36	--	LABEL, AC wire, MPI, C1D2 (not shown)	1
38	--	PLUG, PG-7 (SCADA assemblies only)	1

Ref.	Part	Description	Qty
39	--	NUT, PG-7 (SCADA assemblies only)	1
40	--	SCREW, pan	4
41	--	SCREW, machine, pan	1
42	--	FUSE, class-cc, 6 A (not shown)	1
47	--	HOLDER, fuse terminal block, 5 x 20 mm	1
48	--	FUSE, 3 A, 5 x 20 mm (not shown)	1
49	B33057	POWER SUPPLY; 24 VDC, 2.5 A	1
54	--	WIRE, black; 10 in., 12 AWG (includes ref. 57)	3
55	--	WIRE, ground (not shown)	1
57	--	FERRULE, wire; 12 AWG (included in ref. 54)	2
58	--	FERRULE, wire; 10 AWG, twin	1
59	--	WIRE; black, 24 in., 12 AWG	1
60	--	WIRE; white, 24 in., 12 AWG	2
61	--	WIRE; white, 12 in., 12 AWG	1
62	--	HOLDER, fuse, class-cc, 1-pole	2
64	--	BLOCK, terminal	2
66	133806	LABEL, 115 VAC in-115 VAC out	1
70	--	FEET, mounting	4
71	B33056	CABLE, S1-S4, M12-5P, M/N, 0.3 m (included with ref. 12 and 13)	2

▲ Replacement Safety labels, tags, and cards are available at no cost.

115 VAC IN and 24 VDC OUT

B52H08 configuration CI-A1A-0300-2M is shown (Hazardous Location)



ti40659a

115 VAC IN and 24 VDC OUT Parts List, B52H08 (Hazardous Location)

Ref.	Part	Description	Qty
1	--	ENCLOSURE	1
2	--	PANEL, back, enclosure	1
3		CONTROLLER, Harrier+	1
	B32833	GSM USA; DC	
	B32835	GSM International; DC	
	B32837	SCADA; DC	
	B32839	CDMA; DC	
4	--	SCREW, shcs; 10 x .375	4
5	--	TERMINAL, ground	1
6	--	SCREW, truss head; #8	2
7	--	SCREW, hex head; thread forming	1
8	B33054	MODULE, GCA	1
9	--	WIRE, ground, main; 7 in.	3
10	--	MODULE, circuit breaker, 120 VAC	1
11	--	BAR, ground	1
12	B33056	CABLE, CAN, female/90 male; 0.5 m (included with ref. 13 and 71)	1
13	B33056	CABLE, M12-female; 1 m (included with ref. 12 and 71)	1
14	--	RAIL, mounting, DIN, 35 mm, 6 in.	1
15	--	BLOCK, end stop, terminal	3
20	--	PLUG, 1/2 in.	8
21	--	NUT, strain relief, 1/2 npt	9
23	--	BUSHING, strain relief, 1/2 npt	1
24	18B616	LABEL, logo, Harrier+, MPI (not shown)	1
26	29A443	IDENTIFICATION, MPI, AC	1
28	--	STRAP, tie, wire (not shown)	4
29▲	15G303	LABEL, warning, electrical	1
30▲	186620	LABEL, symbol, ground	1
31	--	TIE, cable, fir tree	2
35	--	LABEL, DC table, MPI C1D2, SCADA	1
36	--	LABEL, AC wire, MPI, C1D2 (not shown)	1

Ref.	Part	Description	Qty
38	--	PLUG, PG-7 (SCADA assemblies only)	1
39	--	NUT, PG-7 (SCADA assemblies only)	1
40	--	SCREW, pan	4
41	--	SCREW, machine, pan	1
43	--	FUSE, Class-CC, 15 A (not shown)	1
47	--	HOLDER, fuse terminal block, 5 x 20 mm	1
48	--	FUSE, 3 A, 5 x 20mm (not shown)	1
50	--	POWER SUPPLY; 24 VDC, 20 A	1
51	--	WIRE; battery, POS	3
52	--	WIRE; battery, NEG	2
54	--	WIRE; black, 10 in., 12 AWG	2
55	--	WIRE; ground	1
56	--	FERRULE, wire; 10 AWG	6
57	--	FERRULE, wire; 12 AWG	2
59	--	WIRE; black, 24 in., 12 AWG	1
60	--	WIRE; white, 24 in., 12 AWG	1
62	--	HOLDER, fuse, class-cc, 1-pole	2
64	--	BLOCK, terminal	2
65	--	FUSE, class-cc, 20 A (not shown)	1
66	133807	LABEL, 115 VAC in-24 V out	1
70	--	FEET, mounting	4
71	B33056	CABLE, S1-S4, M12-5P, M/N, 0.3 m (included with ref. 12 and 13)	2

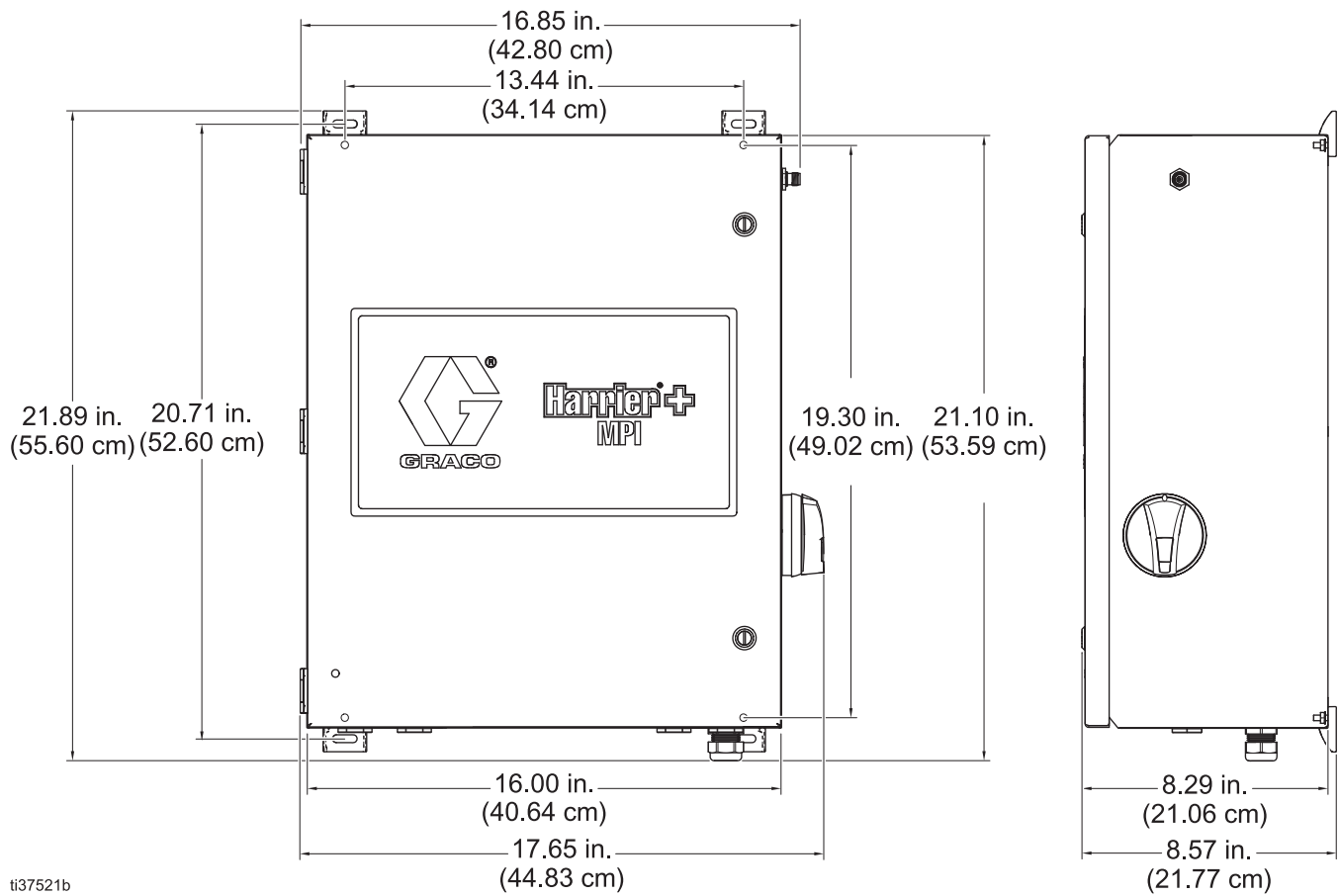
▲ Replacement Safety labels, tags, and cards are available at no cost.

Kits and Accessories

Part No.	Description
B32795	AC Box Stand
B32073	Stand Anchoring Kit
B32771	Tank Level Monitor Kit
B32072	Pressure Sensor Kit (0-6000 PSI)
B32795	Stand Kit

Dimensions

Multiple-Point Injection Control Box



ti37521b

FIG. 15 Multiple-Point Injection Control Box Dimensions and Mounting Hole Locations

Technical Specifications

Multiple-Point Injection Control Box		
	US	Metric
Nominal Input Voltage (by model, see page 4)		
CI-D24-0x00-2M		24 VDC
CI-A1A-0x00-0M		115 VAC
CI-A1A-0x00-2M		115 VAC
Maximum Input Current (by model, see page 4)		
CI-D24-0x00-2M		25 A
CI-A1A-0x00-0M		5 A
CI-A1A-0x00-2M		5 A
Nominal Pump Output Voltage (by model, see page 4)		
CI-D24-0x00-2M		24 VDC
CI-A1A-0x00-0M		115 VAC
CI-A1A-0x00-2M		24 VDC
Maximum Pump Output Current (by model, see page 4)		
CI-D24-0x00-2M		25 A
CI-A1A-0x00-0M		5 A
CI-A1A-0x00-2M		20 A
Maximum Solenoid Output Voltage (all models)		24 VDC
Maximum Solenoid Output Current (all models)		0.4 A
Operating Temperature Range (Haz Location)	-13°F - 131°F	-25°C - 55°C
Operating Temperature (Ordinary Location)	-40°F - 131°F	-40°C - 55°C
Overall Dimensions (L x W x H)	21.89 in x 17.65 in. x 8.57 in.	55.60 cm x 44.83 cm x 21.77 cm
Weight		
Control Box (all models)	33 lbs	15 kg

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.

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

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Phone: 612-623-6928 **or Toll Free:** 1-800-533-9655 **Fax:** 612-378-3590

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Original instructions. This manual contains English. MM 3A7378

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