

TopDry Fuel and Electrical Component Installation

Models:

24, 30, AND 36 FT. DIAMETERS

Installation for TopDrys with Autoflow TopDry Terminal™ Controls

PNEG-4901

Version 8.0

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PNEG-4901

IMPORTANT: *This equipment must be installed in accordance with all applicable laws, directives, regulations and local codes which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.*

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Contents

Chapter 1	Safety Precautions	5
	Safety Guidelines	5
	Cautionary Symbol Definitions.....	6
	Safety Cautions.....	7
	Safety Decals	15
	Safety Sign-off Sheet.....	19
Chapter 2	Fuel Connections	21
	Guidelines for Fuel Connections.....	21
	Guidelines for Liquid Propane Installation.....	21
	Guidelines for Natural Gas Installation	23
	Internal (Seat) Leakage Testing for Safety Shut Off Valves	24
Chapter 3	Electrical Components Installation.....	27
	Location of TopDry Components and Accessories	28
	Mounting the Control Box.....	30
	Fill System Control Box Mounting	31
	Grain Temperature Sensors	32
	Plenum Temperature Sensor.....	34
	Plenum High-Limit Installation	35
	Optional Wet Supply Rotary Switch Installation.....	37
	Storage Chamber High-Limit Rotary Switch Installation.....	38
	About Drying Chamber Rotary Switches	40
	Drying Chamber Low-Level Rotary Switch Installation.....	41
	Drying Chamber High-Level Rotary Switch Installation.....	43
	Drying Chamber Overflow Rotary Switch Installation.....	45
Chapter 4	Wiring Installation	47
	Routing the Conduit.....	47
	Transformer and Wiring Voltage Drop	48
	Machine to Earth Grounding.....	49
	Power/Motor Wiring.....	50
	Electrical Load Information.....	51
	Connecting the TopDry Terminal to Control Fan 1	53
	Connecting the TopDry Terminal to Control Fan 2	55
	Connecting a CSA TopDry Terminal to Control Fan 1 and Fan 2.....	57
	Connecting TopDry Terminal to the Chute Controller	58
	Connecting the TopDry Terminal to the Wet Supply Rotary Switch (Optional).....	59
	Connecting TopDry Terminal to the Storage Chamber Rotary Switch.....	60
	Connecting TopDry Terminal to the Drying Chamber Rotary Switches	61
	Connecting TopDry Terminal to the Fill System	64
Chapter 5	Wiring Diagrams.....	65
	E-Stop Circuit Wiring for TopDry Terminal.....	66
	TopDry Terminal Control Box Wiring.....	67
	TopDry Terminal Fan and Heater Wiring	72
	TopDry Terminal Actuator Wiring	81
	Fill System Control Wiring	82
	Limited Warranty — N.A. Grain Products	83

NOTES

1 Safety Precautions

Topics Covered in this Chapter

- Safety Guidelines
- Cautionary Symbol Definitions
- Safety Cautions
- Safety Decals
- Safety Sign-off Sheet

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Read and save these instructions.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in **SERIOUS INJURY** or **DEATH**.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-4

Cautionary Symbol Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

Table 1-1 Description of the different cautionary symbols

Symbol	Description
	This symbol indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
	This symbol indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.
	This symbol indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.
	This symbol is used to address practices not related to personal injury.
	This symbol indicates a general hazard.
	This symbol indicates a prohibited activity.
	This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection



Respiratory Protection



Foot Protection



Hearing Protection



Head Protection



Fall Protection



Hand Protection



- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

Follow Safety Instructions

- **Warning:** If the information in the manual is not followed exactly, a fire or explosion can result, causing property damage, personal injury or loss of life.
- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.
- Retain these instructions for future reference.



ST-0025-3

Chapter 1: Safety Precautions

Install and Operate Equipment Properly

- Make sure grain chutes are empty by performing a manual dump before entering the bin.
- Before attempting to remove and reinstall the fan blade, contact GSI for the recommended procedure.



ST-0031-2

For Your Safety

- If you smell gas:
 - Do not try to light any appliance.
 - Extinguish any open flames.
 - Do not touch any electrical switch.
 - Immediately call your gas supplier. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- The use and storage of gasoline and other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.
- Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment. Installation and service must be performed by a qualified installer, service agency or the gas supplier.



ST-0024-1

Install and Operate Electrical Equipment Properly

- Electrical controls must be installed by a qualified electrician and must meet the standards set by applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe).
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Make sure all equipment is properly grounded.



ST-0027-4

Handle and Use Equipment Properly

- Equipment is intended for the use of grain drying only. Any other use is a misuse of this equipment.
- The operating instructions in this manual pertain to the common cereal grains as indicated. When drying any other grain, contact GSI for additional recommendations.
- On LP fired units, set pressure regulator to avoid excessive gas pressure applied to the burner during ignition and operation. Do not exceed maximum recommended drying temperatures.
- Equipment has sharp edges that can cause serious injury. To avoid injury, handle sharp edges with caution and use proper protective clothing and equipment at all times.
- All guards must be in place before and during operation. Images of guards removed in this manual are for illustration purposes only.
- Use caution when working around high-speed fans, gas burners, augers and auxiliary conveyors which can start automatically.
- Keep hands, feet, and clothing away from moving parts.
- Do not bypass any safety device or interlock.
- Do not enter the dryer or bin while it is operating.
- Do not operate in an area where combustible material will be drawn into the dryer.



ST-0029-2

Exercise Caution When Drying Flammable Grains

- Be aware that some grains are highly flammable including, but not limited to, rapeseed, canola, linseed, sunflower and milo.
- All grain and seed must be whole (minimal cracking or crushing), clean, and dust free before drying.
- Avoid dust and chaff from being drawn into the fan and heater.
- To reduce risk of fire, keep the fan, heater, drying plenum, and ducts clean at all times.
- In the event of a fire (or suspected fire):
 1. Shut down the entire dryer.
 2. Turn off the fuel at the tank or supply valve.
 3. Shut off and lock electrical power.
 4. Evacuate the area.
 5. Call the fire department.



ST-0032-1

Install and Operate Gas-Fired Equipment Properly

- Gas-fired equipment should be installed by a qualified pipe fitter and must conform with local codes.
- For Canada: The equipment shall be installed in accordance with the *Natural Gas and Propane Installation Code, CSA B149.1*, or the *Propane Storage and Handling Code, CSA B149.2*, or applicable provincial regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.
- For the United States: The equipment shall be installed in accordance with the *National Fuel Gas Code ANSI Z223.1/ NFPA 54*.



ST-0016-2

Prevent Roof Damage Due to Vacuum Pressure

- Roof damage can result from excessive vacuum or internal pressure from fans or other air moving systems. The manufacturer does not warrant this type of roof damage.
- Adequate ventilation or “makeup air” devices must be provided for all powered air handling systems.
- The manufacturer does not recommend the use of downward flow systems (suction).
- Severe roof damage can result from any blockage of air passages.
- Operating fans during high humidity or cold weather conditions can cause air exhaust or intake ports to freeze.



ST-0028-2

Maintain Equipment and Work Area

- Understand service procedures before doing work.
- Keep area clean and dry.
- Do not service equipment while it is operating. Disconnect and lock-out power and fuel supply before entering equipment or before performing maintenance.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.
- Depressurize the fuel train before disassembling for service.
- Allow the fan to operate for 20 minutes with the burner off to purge products of combustion and to cool the components before entering.
- Check regularly for any developing gas plumbing leaks. Do not operate the dryer if any gas leak is detected. Shut down and repair before further operation.



ST-0030-2

Chapter 1: Safety Precautions

Store Bin Sheets Properly

- Sidewall bundles or sheets must be stored in a safe manner. The safest method of storing sidewall bundles is by laying them horizontally with the arch of the sheet upward, like a dome.
- Sidewall sheets stored on edge must be secured so that they cannot fall over and cause injury.
- Use care when handling and moving sidewall bundles.



ST-0058-2

Rotating Auger Hazard

- Keep clear of rotating augers and moving parts.
- Do not remove or modify guards or covers.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Failure to follow these precautions will result in serious injury or death.



ST-0037-1

Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which can crush personnel and cause serious injury or death.



ST-0047-1

Confined Space Hazards and Entry Procedures

- Note that the interior of this equipment is considered a confined space. Maintenance of this equipment can require access to the confined space.
- Access doors must be shut and locked except when access is required.
- Doors giving access to dangerous equipment must be safety interlocked.
- The following entry procedures must be followed:
 - Be aware of all possible hazards present inside the confined space and wear personal protective equipment (PPE) as needed.
 - Complete a permit to work and follow all permit required confined space entry procedures defined by the site manager.
 - Make sure that the area has been purged of any hazardous products or gases. Check the atmosphere for harmful gases or vapors with a suitable gas analyzer and make sure levels are safe before entering.
 - Do not smoke or use naked flames.
 - Lock out and tag out power supplies and fuel supplies to all equipment.
 - Do not work alone. Work in teams of at least three so that help is immediately available in the event of an emergency.
 - Confirm that all personnel have safely exited the equipment and tools have been recovered once work is complete.



ST-0055-1

Chapter 1: Safety Precautions

Fall Hazard

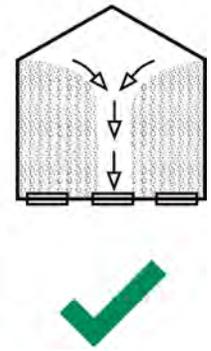
- Ladders, stairways and platforms are for use by competent and trained personnel only. Do not allow children or other unauthorized persons to have access to the equipment.
- Access to the equipment must be restricted by the use of security fencing and lockable gates.
- Lower sections of ladders must be fitted with a lockable safety gate to prevent unauthorized access.
- Make sure that hot surfaces have had adequate time to cool before working on or in the equipment.
- Lock out and tag out power supplies and fuel supplies to all equipment.
- Do not attach lifting equipment to ladders or platforms.
- Do not go outside of the safety rails provided on elevated platforms.
- Do not work at heights during high winds, rain, snow, or ice storms.



ST-0056-1

Unload the Bin Correctly

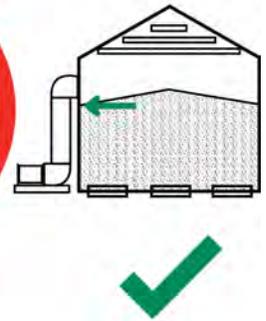
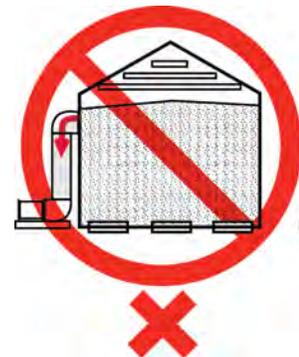
- Use CENTER FLOOR OUTLET ONLY until NO grain remains above this outlet.
- Side floor outlets to be used ONLY when above condition is satisfied.
- Lock all side floor outlets to avoid accidental premature use.
- See manufacturers instructions for proper use of factory supplied sidedraw (wall) discharge systems.



ST-0060-1

Do Not Overfill TopDry

- Do not overfill TopDry. Stored grain must be no higher than the heater duct opening.
- Filling the bin above this point will cause a blockage of the ducts.



ST-0062-1

Safety Decals

The safety decals on your equipment are safety indicators which must be carefully read and understood by all personnel involved in the installation, operation, service and maintenance of the equipment.

To replace a damaged or missing decal, contact us to receive a free replacement.

GSI Decals

1004 E. Illinois Street
 Assumption, IL 62510
 Phone: 1-217-226-4421

Bin Decals

Location	Decal No.	Decal	Description
Located next to aeration system.	DC-969		Caution Vacuum Pressure

Chapter 1: Safety Precautions

Location	Decal No.	Decal	Description
On bin door covers	DC-GBC-1A	 <p>WARNING</p> <p>Rotating flighting could kill or dismember. Flowing material could trap and suffocate. Crusted material could collapse and suffocate.</p> <p>Keep clear of all augers. DO NOT ENTER this bin!</p> <p>If you must enter the bin:</p> <ol style="list-style-type: none"> 1. Shut off and lock out all power. 2. Use a safety harness and safety line. 3. Station another person outside the bin. 4. Avoid the center of the bin. 5. Wear proper breathing equipment or respirator. <p>Failure to heed these warnings could result in serious injury or death.</p>	Danger Keep Clear of Augers
On bin door covers	DC-GBC-2A	 <p>WARNING</p> <p>UNLOADING INSTRUCTIONS:</p> <ol style="list-style-type: none"> 1. Use CENTER FLOOR OUTLET ONLY until NO grain remains above this outlet. 2. Side floor outlets to be used ONLY when above condition is satisfied. 3. Lock all side floor outlets to avoid accidental premature use. 4. See manufacturers instructions for proper use of factory supplied sidedraw (wall) discharge systems. <p>Failure to heed these warnings could result in serious injury, death, structural damage or collapse of tank.</p>	Warning Unload Instructions

Fan and Heater Decals

Location	Decal No.	Decal		Description	
Fan and Heater Unit	DC-1943	<p>⚠ DANGER HIGH VOLTAGE.</p> <p>Will cause injury or death.</p> <p>Lockout power before servicing.</p> <p><small>GSI Group 217-226-4421</small></p>		<p>⚠ DANGER HAUTE TENSION.</p> <p>Causera des blessures ou la mort.</p> <p>Bloquez le courant avant de faire l'entretien.</p> <p><small>DC-1943</small></p>	High Voltage Danger Decal
Fan and Heater Unit	DC-1948	<p>⚠ DANGER HIGH VOLTAGE</p> <p>Will cause serious injury or death.</p> <p>Lockout power before servicing.</p> <p><small>GSI Group 217-226-4421</small></p>		<p>⚠ DANGER HAUTE TENSION</p> <p>Causera de sérieuses blessures ou la mort.</p> <p>Couper/verrouiller le courant avant l'entretien.</p> <p><small>DC-1948</small></p>	High Voltage Danger Decal
Fan and Heater Unit	DC-1949	<p>⚠ WARNING</p> <p>Stay clear of rotating blade. Blade could start automatically. Can cause serious injury. Disconnect power before servicing.</p> <p><small>GSI Group Inc. 217-226-4421</small></p>		<p>⚠ AVERTISSEMENT</p> <p>Restez éloigné de la lame tournante. La lame peut se mettre en marche automatiquement. Peut causer de sérieuses blessures. Verrouillez le courant avant l'entretien.</p> <p><small>DC-1949</small></p>	Rotating Blade Warning Decal
Fan and Heater Unit	DC-1959	<p>⚠ WARNING</p> <p>Flame and pressure beyond door can cause serious injury. Do not operate with service door removed. Keep head and hands clear.</p> <p><small>GSI Group 217-226-4421</small></p>		<p>⚠ AVERTISSEMENT</p> <p>La flamme et la pression au-delà de la porte peuvent causer des dommages sérieux. Ne pas faire fonctionner si la porte de service est enlevée. Gardez les mains et la tête éloignés.</p> <p><small>DC-1959</small></p>	Flame and Pressure Warning Decal
Fan and Heater Unit	DC-2330	<p>⚠ WARNING</p> <p>Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.</p> <p><small>GSI Group 217-226-4421</small></p>		<p>⚠ AVERTISSEMENT</p> <p>Une installation, un réglage, une modification, un entretien ou une réparation incorrects peuvent entraîner des dommages, des blessures, voire la mort. Lisez attentivement les instructions d'installation, d'opération et d'entretien avant d'installer ou de réparer cet équipement.</p> <p><small>DC-2330</small></p>	Read Manual Warning Decal

Chapter 1: Safety Precautions

Location	Decal No.	Decal		Description
Fan and Heater Unit	DC-2331	<p>⚠ WARNING</p> <p>The use and storage of gasoline and other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.</p> <p><small>GSI Group 217-228-4421</small></p>	 <p>⚠ AVERTISSEMENT</p> <p>Il est dangereux d'utiliser ou de stocker de l'essence ou tout autre liquide ou vapeur inflammables dans des contenants ouverts à proximité de cet appareil.</p> <p><small>DC-2331</small></p>	Flammable Vapor Warning Decal
Fan and Heater Unit	DC-2392	<p>⚠ WARNING</p> <p>If the information in the manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.</p> <p>Do not store or use gasoline or other flammable vapours and liquids in the vicinity of this or any other appliance.</p> <p>What to do if you smell gas</p> <ul style="list-style-type: none"> - Do not try to light any appliance. - Extinguish any open flames. - Do not touch any electrical switch. - Immediately call your gas supplier. <p>Follow the gas supplier's instructions.</p> <ul style="list-style-type: none"> - If you cannot reach your gas supplier, call the fire department. <p>Installation and service must be performed by a qualified installer, service agency or the gas supplier.</p> <p><small>GSI Group 217-228-4421</small></p>	 <p>⚠ AVERTISSEMENT</p> <p>Si les directives du manuel ne sont pas suivies à la lettre, une explosion ou un incendie pourrait survenir et causer des dommages à la propriété, des blessures corporelles voire même la mort.</p> <p>N'entreposez pas et n'utilisez pas d'essence ni d'autres vapeurs et liquides inflammables près de cet appareil ou de tout autre appareil.</p> <p>Que faire en présence d'une odeur de gaz</p> <ul style="list-style-type: none"> - N'essayez pas d'allumer un autre appareil - Éteignez toute flamme découverte - Ne touchez à aucun interrupteur électrique - Contactez immédiatement votre fournisseur de gaz. Suivez les instructions du fournisseur de gaz. - Si vous n'êtes pas en mesure de joindre votre fournisseur de gaz, appelez les pompiers <p>L'installation et l'entretien doivent être effectués par un installateur qualifié, une agence spécialisée en entretien ou le fournisseur de gaz.</p> <p><small>DC-2392</small></p>	Flammable Vapor Warning Decal

NOTES

2 Fuel Connections

Topics Covered in this Chapter

- Guidelines for Fuel Connections
- Guidelines for Liquid Propane Installation
- Guidelines for Natural Gas Installation
- Internal (Seat) Leakage Testing for Safety Shut Off Valves

Guidelines for Fuel Connections

IMPORTANT:

Dryer/heater and individual shut off valve must be disconnected from the gas supply piping system during any pressure testing of the system at test pressures in excess of 1/2 PSI. The dryer/heater must be isolated from the gas supply piping by closing its individual manual shut off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 PSI.

Refer to the dryer/heater rating plate for determining the minimum gas supply pressure for obtaining the maximum gas capacity for which this dryer is specified.

The equipment must be installed in accordance with all local and national natural gas and propane installation codes or applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made. Bleeds and vents that require venting by authorities having jurisdiction shall be vented away from any sources of ignition by the gas piping installer. The installer shall also locate a manual emergency shut off valve in an appropriate location that allows access to the valve to shut off the fuel to the dryer in case of a fire or explosion at the dryer.

Vapor LPG

Dryers without internal vaporizers require LPG in vapor form.

Primary pressure regulation is required at the tank, including over pressure protection.

Supply pressure at the dryer should be at least 15 PSI.

Guidelines for Liquid Propane Installation

IMPORTANT:

Do not use propane tanks that have previously been used for ammonia or fertilizer solutions. These substances are extremely corrosive and will damage fuel supply parts.

Fuel supply system must comply with local codes for LP gas installation.

Dryers with internal vaporizers require LPG in liquid form. Avoid using propane supply tanks that have been used for vapor draw for long periods of time. When using liquid draw systems, any moisture that may be present in tanks or lines may freeze when the system is used in cold weather. To avoid this situation, purge the system with methanol.

Chapter 2: Fuel Connections

Because the vaporizer coil may need to be adjusted during operation, a flexible hose suitable for liquid propane must be used for the field connection.

See [Table 2-1 Liquid Propane \(LP\) Fuel Recommendations, page 22](#) for liquid propane (LP) to determine the correct size line to route from the tank to the dryer. Have a qualified gas service person inspect the installation to be sure that everything is installed according to local codes and ordinances.

After installation is complete, check all connections for leaks with liquid detergent or comparable. Wear rubber gloves and eye protection. Avoid contact with liquid propane.



Do not use flame for leak testing.

Figure 2-1 Field Connection for Liquid Propane



Table 2-1 Liquid Propane (LP) Fuel Recommendations

Dryer Fan Size	Dryer Horsepower	Maximum Heat Capacity BTU per Hour	Maximum Fuel Flow Gallons per Hour	Minimum Line Size	Orifice Size	Minimum Operating Pressure	Maximum Operating Pressure
36 in.	15	4.5 Million	49	1/2 in.	21/64 in.	2 lbs.	14 lbs.
40 in.	15	5.95 Million	63	1/2 in.	11/32 in.	2 lbs.	18.5 lbs.
42 in.	30	8.75 Million	95	1/2 in.	7/16 in.	2 lbs.	16 lbs.
42 in.	40	10.25 Million	112	3/4 in.	29/64 in.	2 lbs.	19.5 lbs.

Guidelines for Natural Gas Installation

Natural gas units have a larger orifice to accommodate lower pressures sometimes found with natural gas and do not have vaporizer coils like liquid propane units. A regulated pressure of 10 PSI minimum, 30 PSI maximum must be provided at the field connection point on the fan/heater unit, with gas available in sufficient volume to maintain the operating pressure. Primary pressure regulation must include over pressure protection.

See [Table 2-2 Natural Gas \(NG\) Fuel Recommendations, page 23](#) for natural gas (NG) to determine the correct size line to route to the dryer. Have a qualified gas service person inspect the installation to be sure everything is installed according to local codes and ordinances.

After installation is complete, check all connections for leaks with liquid detergent or comparable. Wear rubber gloves and eye protection.



Do not use flame for leak testing.

Figure 2-2 Field Connection for Natural Gas Line



Table 2-2 Natural Gas (NG) Fuel Recommendations

Dryer Fan Size	Dryer Horsepower	Maximum Heat Capacity BTU per Hour	Maximum Fuel Flow Cubic Ft. per Hour	Minimum Line Size	Orifice Size	Minimum Operating Pressure	Maximum Operating Pressure
36 in.	15	4.5 Million	4500	2 in.	27/64 in.	1 lb.	12.5 lbs.
40 in.	15	5.75 Million	5750	2 in.	33/64 in.	1 lb.	9 lbs.
42 in.	30	8.75 Million	8750	2 in.	19/32 in.	1 lb.	12 lbs.
42 in.	40	10.25 Million	10,250	2 in.	23/32 in.	1 lb.	8 lbs.

Internal (Seat) Leakage Testing for Safety Shut Off Valves

What You Should Know

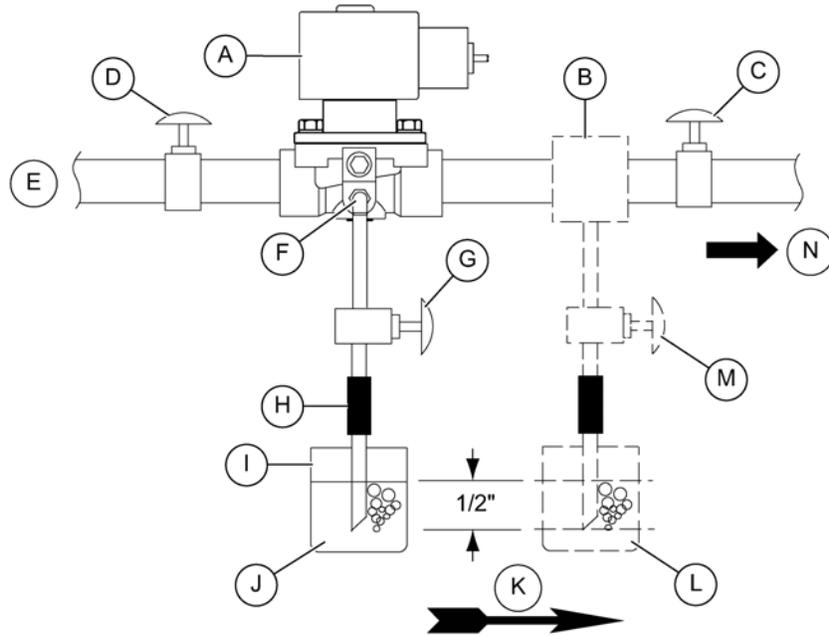
NOTE: *These instructions were adapted from ASCO valve installation and maintenance instructions and are used with permission. Please refer to the specific installation and maintenance instructions for your specific ASCO valve model for additional details.*

1. Shut off both the upstream and downstream manual shut off valves. The downstream manual shut off valve should remain closed during the entire test procedure.
2. Operate the safety shut off valve(s) through five (5) cycles. Listen carefully for the solenoid coil to click indicating proper operation.
3. Open the upstream manual shut off valve. Program the control system to energize and maintain the valve in the open (energized) position. Check all valve and piping connections for external leaks with a rich soap and water solution.
4. Shut off the upstream manual shut off valve and de-energize the safety shut off valve (A). Remove the plug from the leak test tap (B) or downstream pressure tap (F) in the valve body. Connect the leak test equipment with the test petcock (G) in the closed position.



Some gas will be released to the atmosphere when the test equipment is removed.

Figure 2-3 Testing Safety Shut Off Valve



A	Safety shut off valve	H	1/4 in. flex tubing
B	Leak test tap	I	1/4 in. aluminum or copper pilot tubing
C	Downstream manual gas cock	J	45° cut
D	Upstream manual gas cock	K	Flow
E	Gas supply	L	Glass jar filled with water
F	Downstream pressure tap	M	External leak test tap option
G	Test petcock	N	To burner

5. Open the upstream manual shut off valve. Program the control system to energize the valve to the full open position, the immediately de-energize it to seat the valve operationally.
6. Immerse the 1/4 in. leak test tubing vertically into a jar of water to a depth of about 1/2 in.. Slowly open the test petcock (G). Bubbles may appear in the water as the pressure equalizes.
7. After the rate of bubbles coming through the water stabilizes, count the number of bubbles appearing in a 10 second period. The allowable leakage in 10 seconds for an orifice diameter of 1 in. (25.4 mm) or less is six (6) bubbles (3 cc/min). If leakage exceeds this rate, replace the valve.

NOTE: *The leakage rate above recognizes that some wear and contamination from use can result in a slight amount of leakage. The allowable leakage rate is well within the leakage limits as recognized by applicable approval agencies.*

Chapter 2: Fuel Connections

8. Close the upstream manual shut off valve and the test petcock (G). Then remove the test equipment. Apply a small amount of Loctite Corporation's PST Pipe Sealant 567 (or equivalent) to the pipe plug threads. Re-install the pipe plug and tighten securely.



Some gas will be released to the atmosphere when the test equipment is removed.

9. Turn ON the gas supply (E) at the upstream manual shut off valve and energize the safety shut off valve.
10. Open the upstream manual shut off valve. Program the control system to energize and maintain the valve in the open (energized) position. Check the 1/8 in. NPT pipe plug connection for external leaks with a rich soap and water solution.
11. De-energize the valve. Open the downstream manual gas shut off valve.
12. Restore the system to normal operation.

3 Electrical Components Installation

Topics Covered in this Chapter

- Location of TopDry Components and Accessories
- Mounting the Control Box
- Fill System Control Box Mounting
- Grain Temperature Sensors
- Plenum Temperature Sensor
- Plenum High-Limit Installation
- Optional Wet Supply Rotary Switch Installation
- Storage Chamber High-Limit Rotary Switch Installation
- About Drying Chamber Rotary Switches
- Drying Chamber Low-Level Rotary Switch Installation
- Drying Chamber High-Level Rotary Switch Installation
- Drying Chamber Overflow Rotary Switch Installation

Location of TopDry Components and Accessories

Use the following as a suggested guideline for placing the TopDry components and accessories.

When locating the manway, make sure that the outside ladder will not interfere with other accessories below. Roof vents must be spaced evenly around the roof. (Quantity will vary with individual systems.)

- IMPORTANT:**
1. Items (I), (K), (M) and (O) must be in this location between the first two stiffeners to the right of the fan for proper operation.
 2. Items (I), (K), and (M) must be at platform or an optional ladder and platform will be required.
 3. Aeration fan must not be placed within 90 degrees of a fan or burner.
 4. Storage chamber rotary switch must be mounted 3 ft. below fan/heater duct opening.
 5. TopDry Terminal (Q) can be remote mounted or mounted to the dryer.

Figure 3-1 Location of TopDry Components and Accessories - Top View

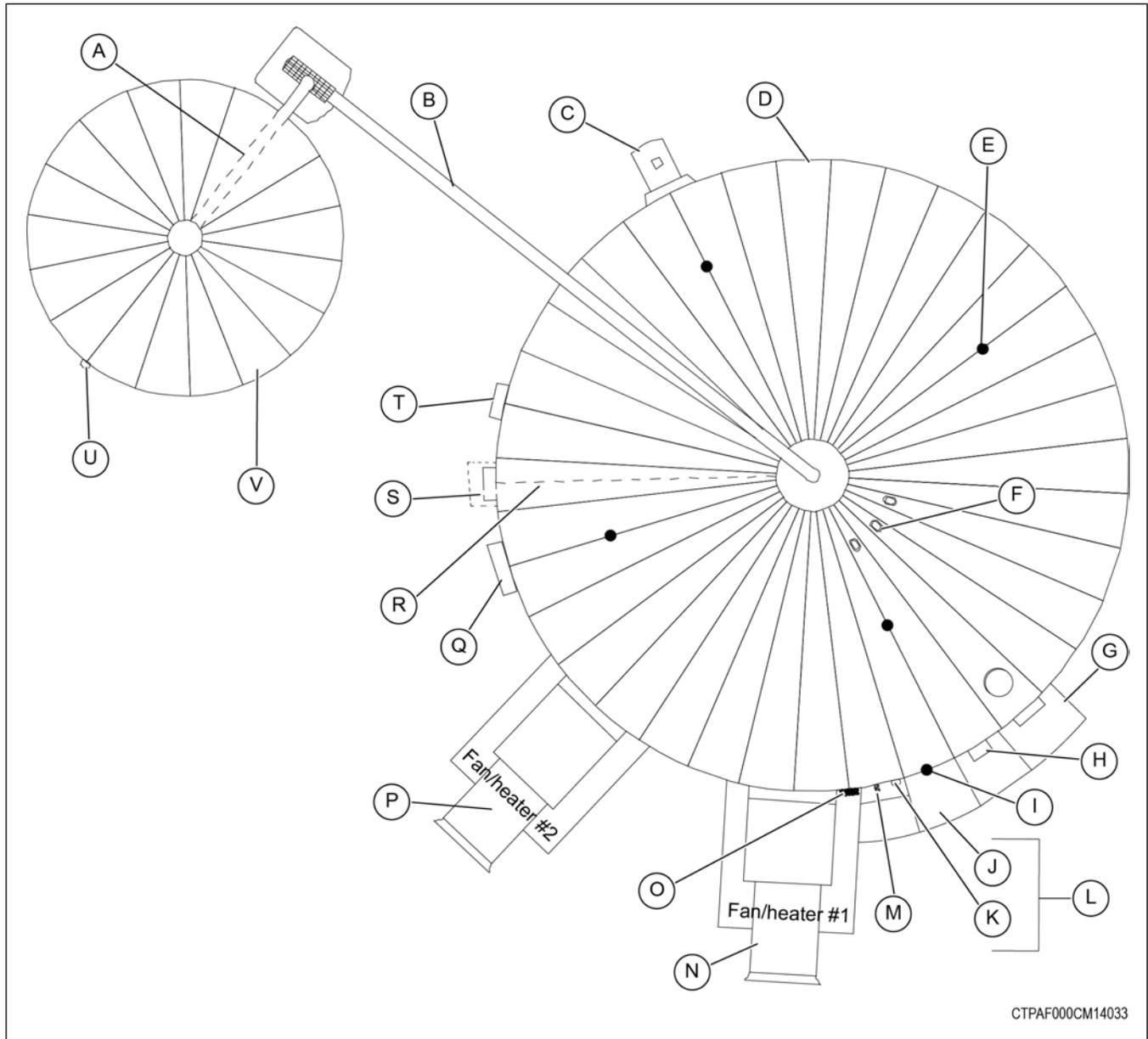
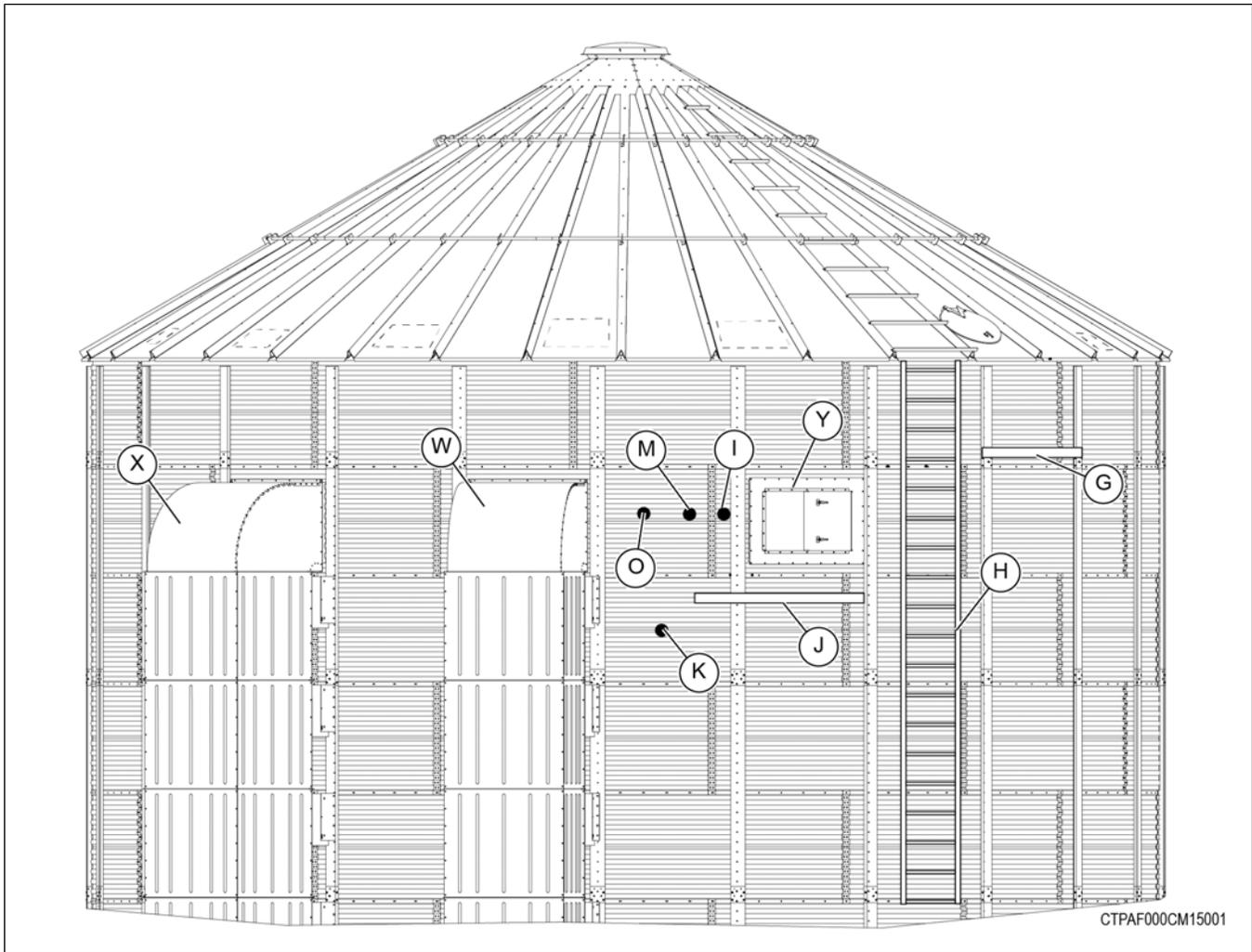


Figure 3-2 Location of TopDry Components and Accessories - Side View



CTPAF000CM15001

A	Fill system no. 2	N	Control fan/heater
B	Fill system no. 1	O	Plenum temperature sensor ¹
C	Aeration fan ²	P	Fan/heater (Secondary)
D	TopDry drying bin	Q	TopDry Terminal control mounted at eye level
E	Grain temperature sensors	R	Cable route
F	Drying chamber rotary switch	S	Chute controller
G	Eave platform	T	Fill system control mounted at eye level
H	Ladder	U	Wet supply rotary switch (optional)
I	Plenum high limit sensor ¹³	V	Wet storage bin
J	Storage chamber platform	W	Control fan/heater duct
K	Storage chamber rotary switch ¹³⁴	X	Secondary fan/heater duct
L	Mount even with fan/heater	Y	Storage chamber door
M	Grain temperature sensor junction box ¹³		

1. Must be in this location between the first two stiffeners to the right of the fan for proper operation.
2. Must not be placed within 90 degrees of a fan or burner.
3. Must be at platform or optional ladder and platform will be required.
4. Must be mounted 3 ft. below heat duct opening

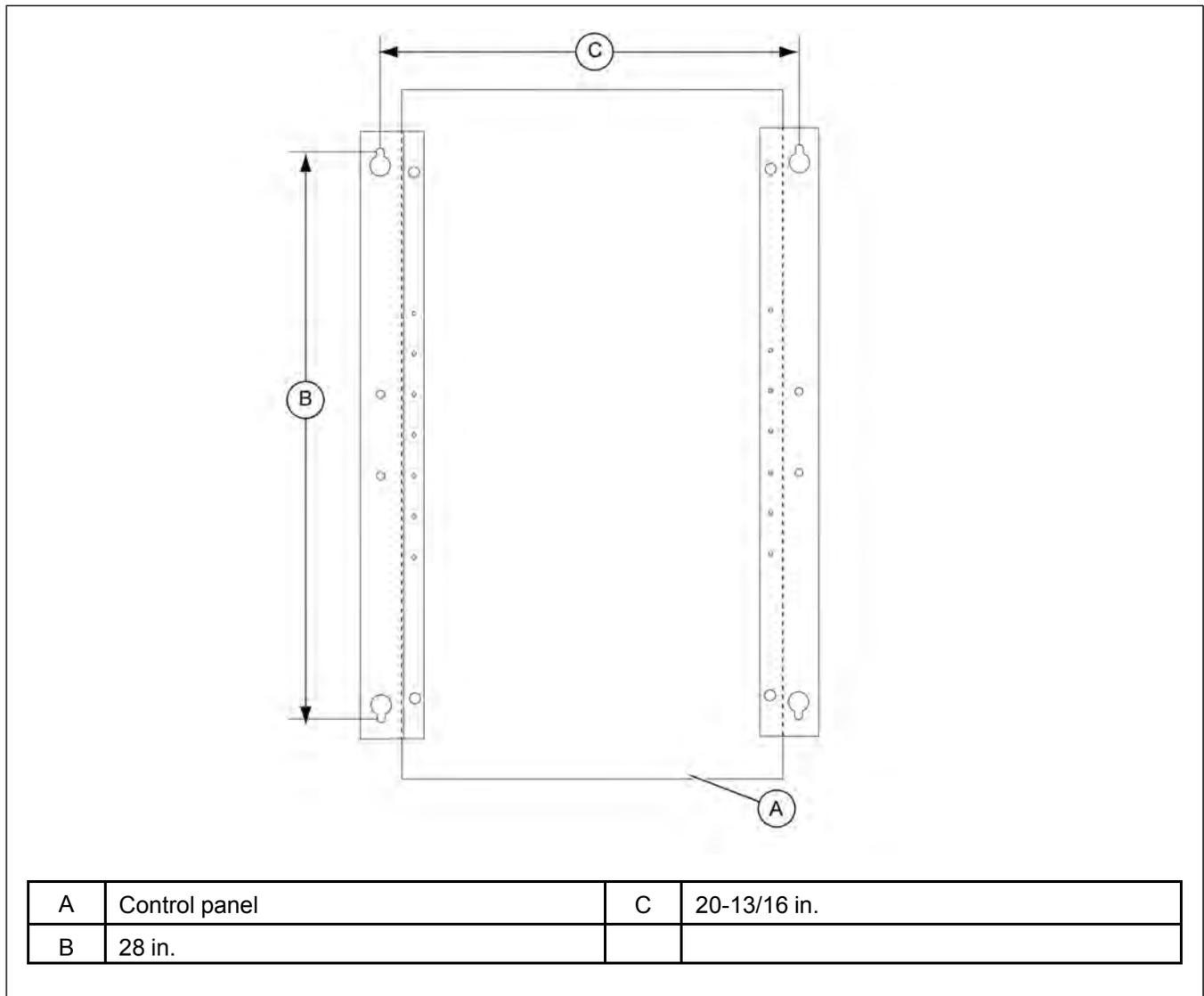
Mounting the Control Box

What You Should Know

NOTE: Do not install this control panel near any transformers or any other device that will produce an electro-magnetic field. Never run control wiring together with any wires that have amperage or voltage. Controllers can be mounted remotely with customer supplied conduit, but there must be a line of sight to the fans and heaters.

1. The control should be mounted at eye-level. Make sure to mount the control so that the fan/heater unit(s) are in view.
2. Keep in mind that wire cables will be used to connect the autoflow control with the fan/heater unit (s), fill system control, actuator, and the rotary switches.
3. Use the following hole pattern to drill holes for mounting the control panel.

Figure 3-3 Bolt Pattern for the Control Panel



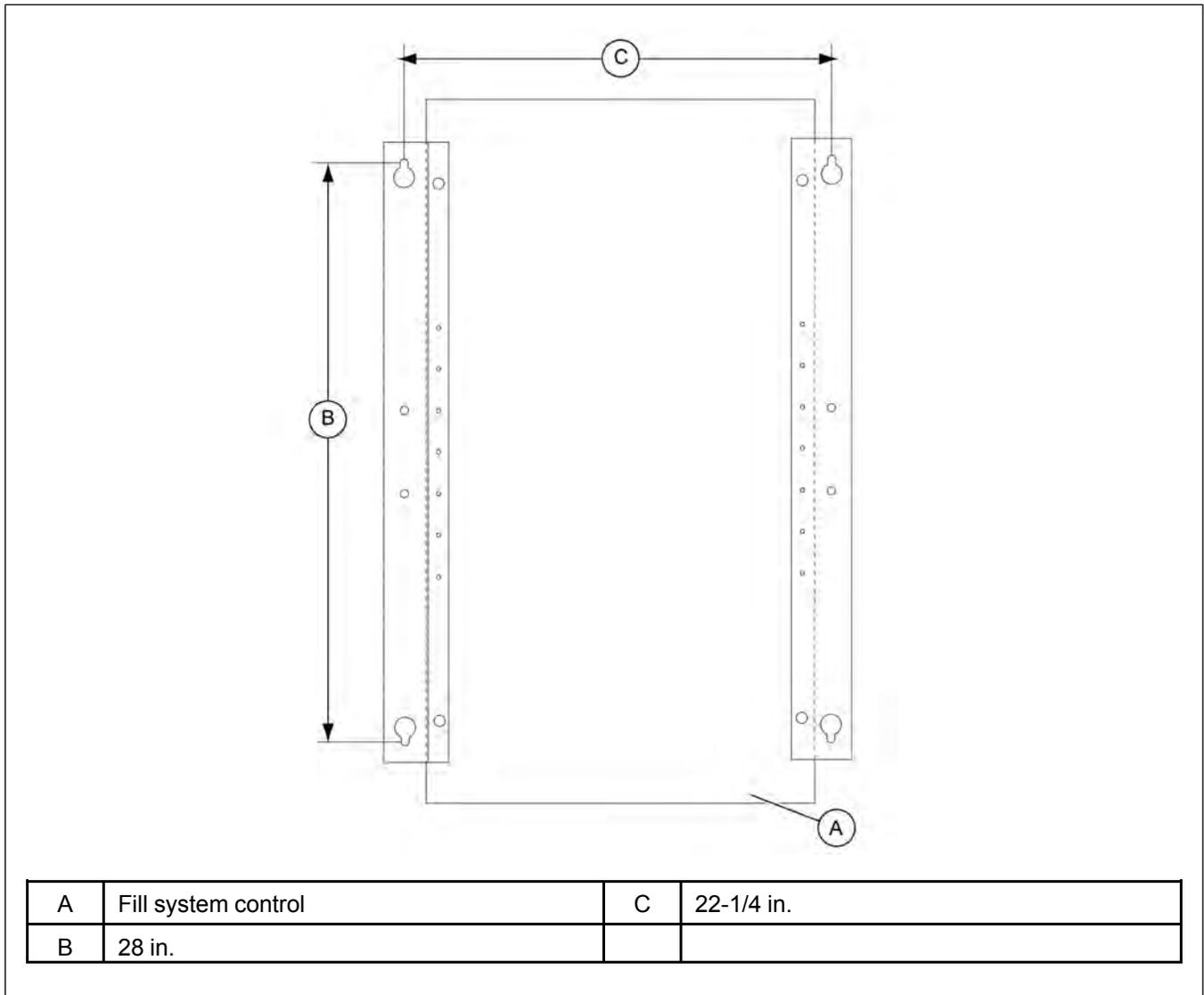
Fill System Control Box Mounting

What You Should Know

The control can be mounted remotely with customer supplied conduit and wire within 100 ft. There must be a clear line of sight from a remote location for safe operation.

1. The fill system control should be mounted at eye-level. Make sure to install the fill system control box so that the fill system(s) and aeration fan are in view.
2. Keep in mind that wire cables will be used to connect the fill system control with the TopDry Terminal control; and, that power wires will have to be routed from the entrance panel to the fill system control to power the fill system and the aeration fan motors.
3. Use the following pattern to drill holes for the fill system control box, if the box is to be mounted to the side of the bin.

Figure 3-4 Bolt Pattern for the Fill System Control Box



Grain Temperature Sensors

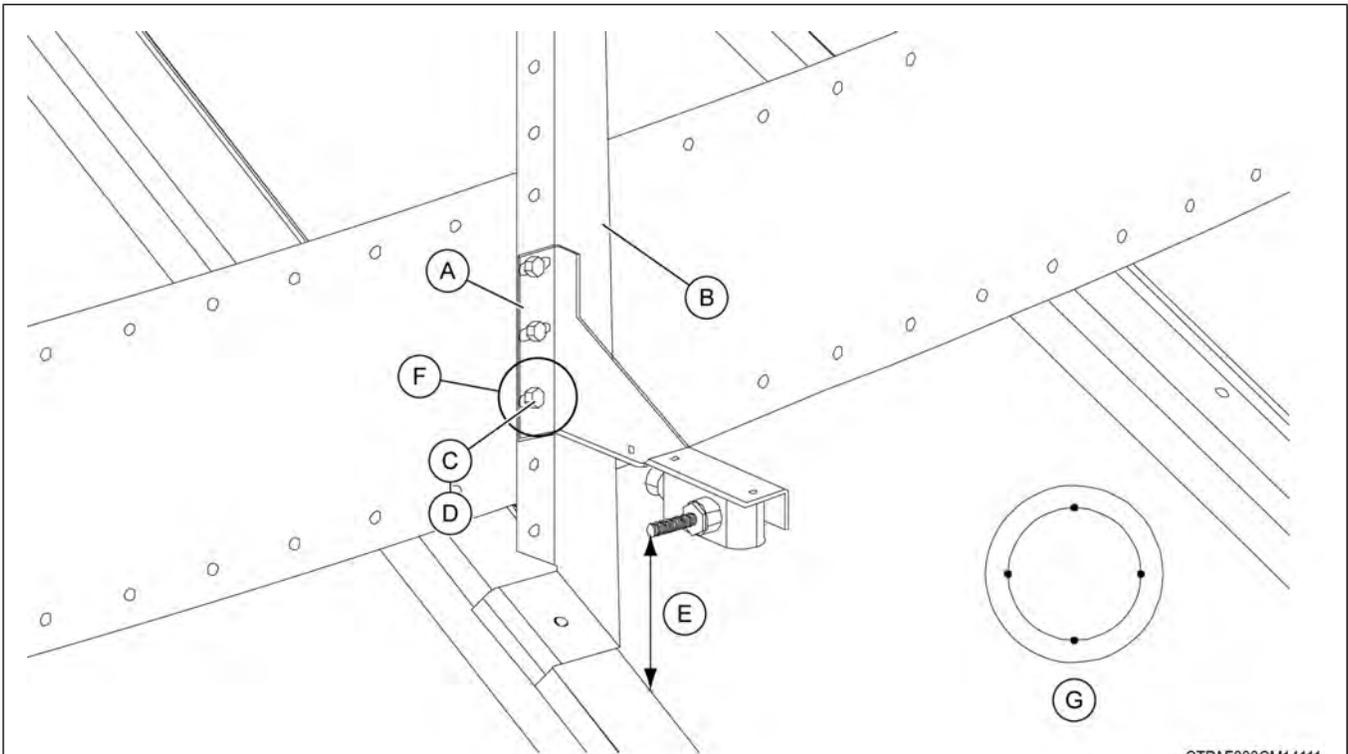
1. Install the junction box for the grain temperature sensors to the bin.

NOTE: This box must be located where it can be easily serviced from a platform. It can also be located for access from the ground by using additional cord (not supplied).

2. Mount the four grain temperature sensors and brackets evenly around the drying chamber on outer leveling band posts (G).
3. Align the bottom hole of the temperature sensor brackets (A) with the **third** hole from the bottom in the outer leveling band posts (B) with the bolts (C) and nuts (D).

NOTE: Make sure that the approximate height of the sensor bracket from the floor sheet rib is 8 1/2 in.

Figure 3-5 Grain Temperature Sensor Installation (AutoFlow)



CTPAF000CM14111

A	Grain temperature sensor bracket	E	8 1/2 in. (AutoFlow)
B	Outer leveling band post	F	Align the bottom hole with the 3 rd hole from the bottom of the leveling band post
C	Bolt	G	Mount the sensors evenly around the bin
D	Nut		

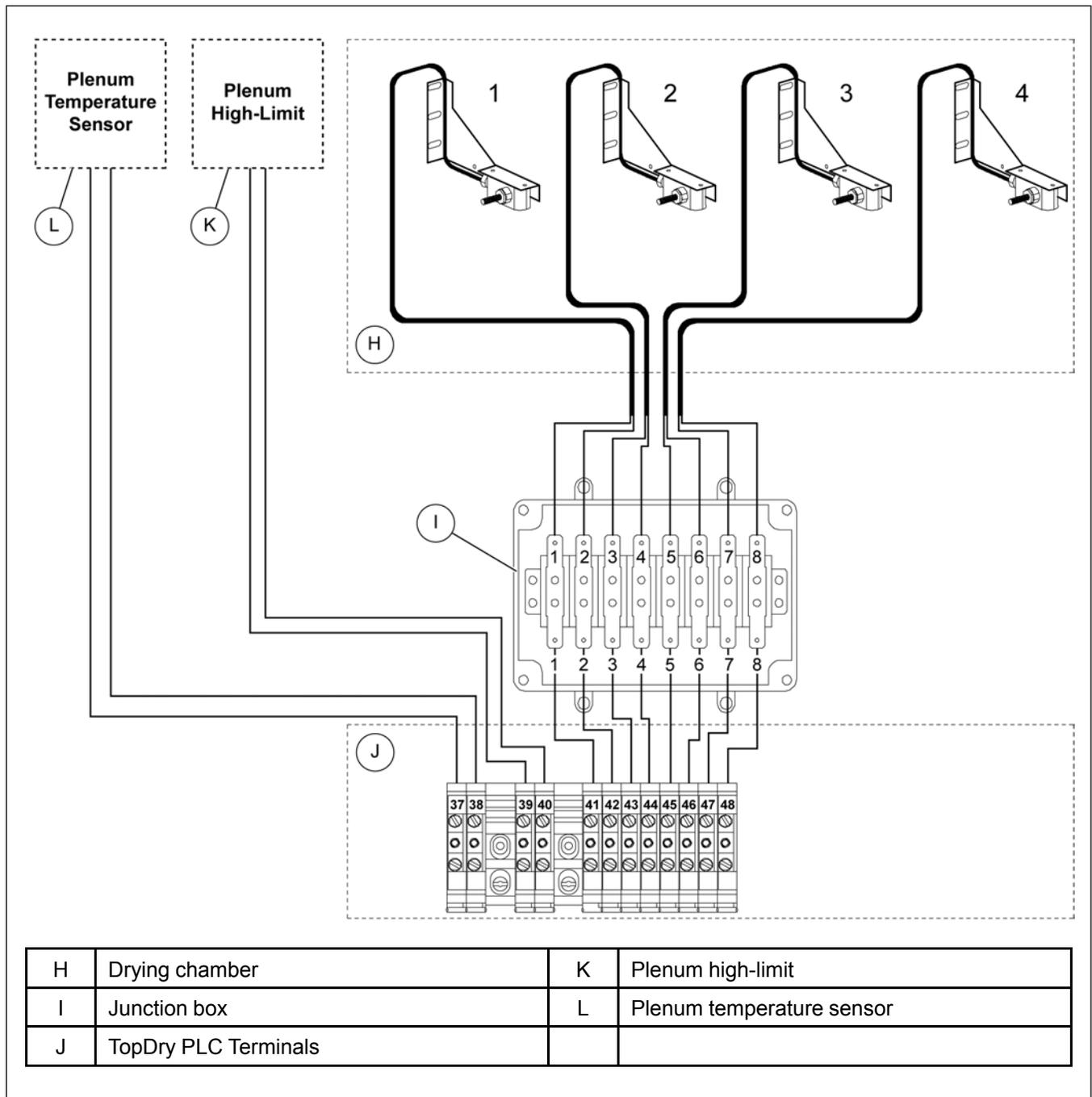
4. Route the cords up the outer leveling band post (B), across the top leveling band and through the space between the roof and the top sidewall sheet.

NOTE: The cords must never have splices or connections made inside of the bin and must exit the drying chamber above the junction box.

5. Secure the cords to the post and leveling bands with wire ties.

6. Install the cords to the junction box (I).
7. Connect the grain temperature sensors to terminals 41-48, connect the plenum high-limit (K) to terminals 39-40, and the plenum temperature sensor (L) to terminals 37-38.

Figure 3-6 Grain Temperature Sensor Wiring



Plenum Temperature Sensor

The plenum temperature sensor assembly is a small housing attached to a temperature sensor probe and monitors the plenum temperature.

1. Drill a 3/4 in. hole to the right of the furthest right drying fan and even with the duct entrance in a valley on the bin sidewall.
2. Insert the temperature sensor probe through the 3/4 in. hole.
3. Position the housing so the cord exits the housing horizontally and the tabs align on the corrugation peaks.
4. Use two self-drilling screws to mount the housing to the bin sidewall.
5. Caulk between the housing and the sidewall to seal the gaps.

IMPORTANT: Do not install the plenum temperature sensor between two fan entrances.

Figure 3-7 Plenum Temperature Sensor



A

The plenum high-limit and plenum temperature sensors are best located in this area, but not further to the right than the fourth stiffener to the right of the duct.

NOTE: All sensors need to be accessible from a standard platform or stairs. If this is not possible, then an optional ladder or ladder and platform should be ordered and installed.

Plenum High-Limit Installation

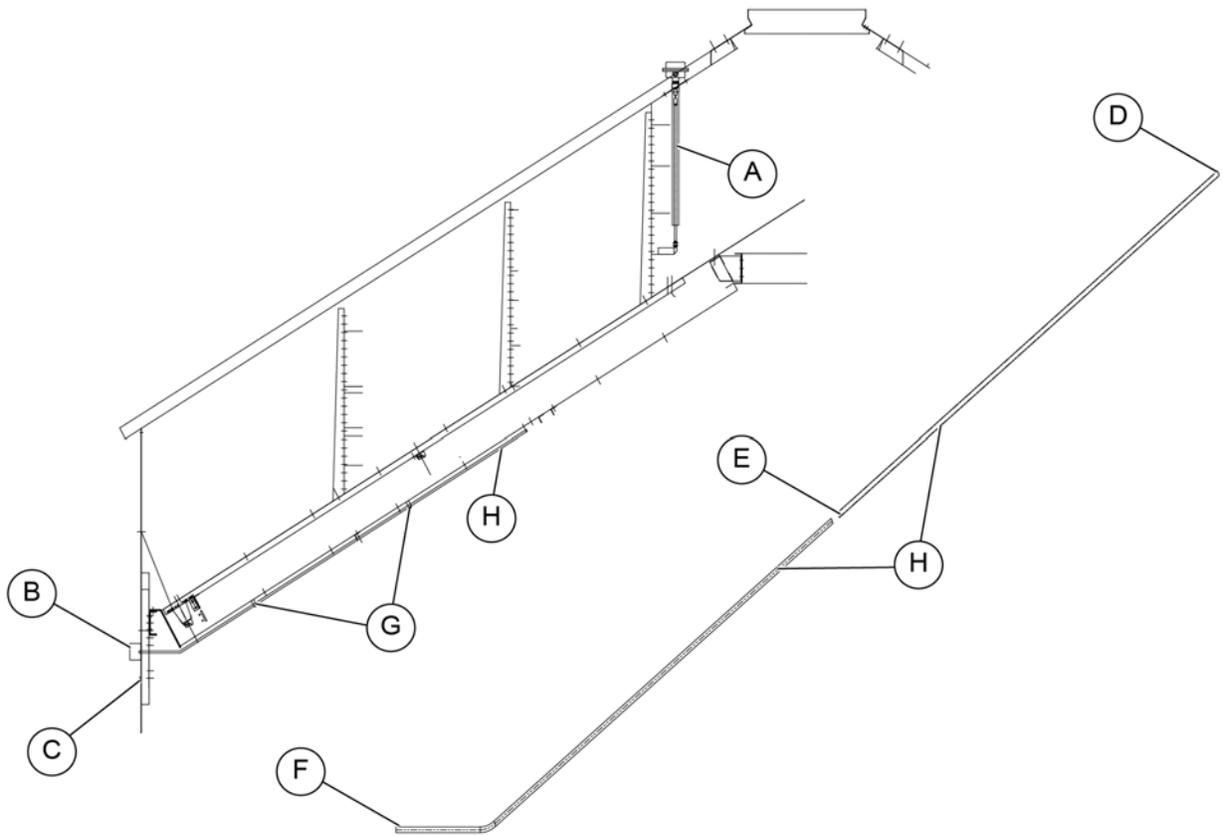
The plenum high-limit monitors the temperature of the plenum and can trigger a shut-down if the set temperature is reached.

1. Assemble two pieces of conduit together using a compression coupler (E).
2. Mount conduit clamps (G) to the conduit assembly (H).
3. Locate the conduit assembly (H) on the bottom of a rafter at least 2 ft. to the right of the furthest right drying fan duct work entrance.

NOTE: *Do not install the plenum high-limit switch between two fan entrances.*

4. Mark and drill a hole (C) in the sidewall where the conduit will pass through, making sure to seal the hole with caulk when complete.
5. Install the housing assembly (B) to the bin wall using self-drilling screws.
6. Insert the 10 ft. capillary into the conduit assembly (H) and connect it to the high-limit switch.
7. Connect wires from the switch to terminal #39 and terminal #40 on the TopDry Terminal control box. See [Figure 5-3, page 68](#).

Figure 3-8 TopDry Plenum High-Limit



A	Topdry plenum high-limit (TD-100653)	E	Connect conduits with compression coupling (D33-0002)
B	Plenum high-limit housing (FH-6972)	F	Secure housing to conduit with EMT fitting (D03-0054)
C	Drill 5/8 in. hole through sidewall	G	Conduit clamps (HH-1096)
D	Install the connector (D03-0054) with bushing (D03-0055) and cap (D03-0053) to seal the end	H	Conduits

Optional Wet Supply Rotary Switch Installation

What You Should Know

NOTE: *If the optional wet supply rotary switch is not used, install a jumper between terminals 13 and 14 in the main control box.*

It is recommended to use rivet nuts to install the rotary switches for easier service. Use fastenal rivet nut tool #0126106 with knurled nuts and the nose that matches the bolt diameter.

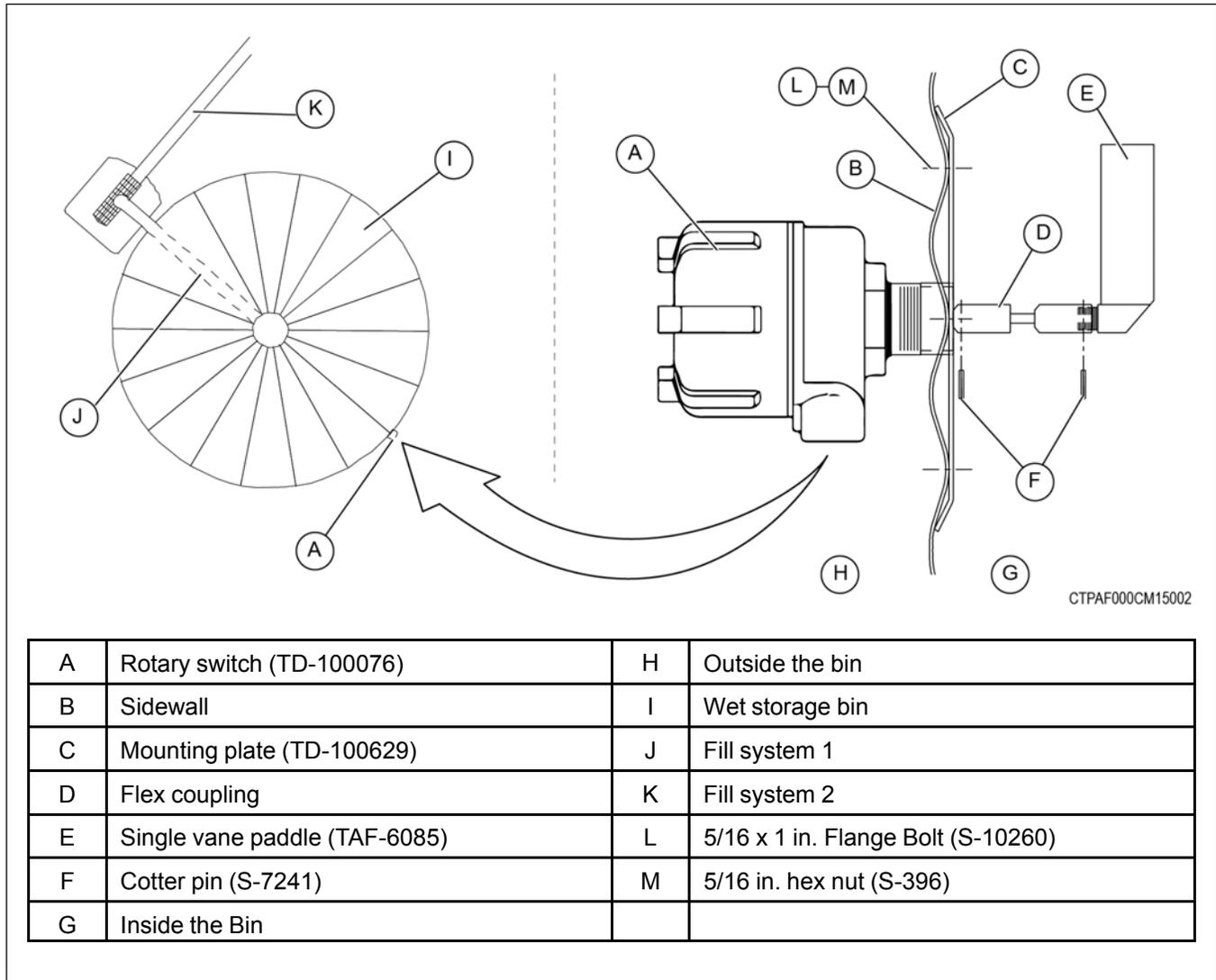
1. Drill a 2 in. diameter hole through the hopper bottom. If a flat bottom bin is being used for a wet storage tank the wet supply rotary switch would be mounted 45° up the sidewall from the center of the bin.

Example: If the wet storage bin is 18 ft. in diameter then the wet supply rotary switch would be mounted 9 ft. up from the bottom of the sidewall.

NOTE: *If using a flat bottom tank, mount rotary switch to the sidewall.*

2. Locate the hole in the center of a valley on the outside of the sidewall (B).
3. Use the mounting plate (C) as a pattern and drill four 3/8 in. holes through the sidewall (B) at the rotary switch location.
4. Add foam weather strip around the top and sides of the mounting plate (C).
5. Caulk the underside of the mounting plate (C), on all sides of the 2 in. hole, and where the plate meets the sidewall (B).
6. Bolt the mounting plate (C) to the sidewall (B).
7. Attach the flex coupling (D) to the rotary switch (A) using a cotter pin (F).
8. Attach the single vane paddle (E) to the flex coupling (D) with a cotter pin (F).
9. Make sure that the conduit hole is facing down.
10. Apply Teflon tape or pipe sealant (not included) to the rotary switch power pack (A) threads and thread the rotary switch power pack into the mounting plate coupling (C).
11. Make sure the conduit opening is facing down.

Figure 3-9 Optional Wet Supply Rotary Switch (TAF-6106)



Storage Chamber High-Limit Rotary Switch Installation

This switch needs to be in close proximity to the duct work, and must be easily accessed from the storage chamber platform.

What You Should Know

It is recommended to use rivet nuts to install the rotary switches for easier service. Use fastenal rivet nut tool #0126106 with knurled nuts and the nose that matches the bolt diameter.

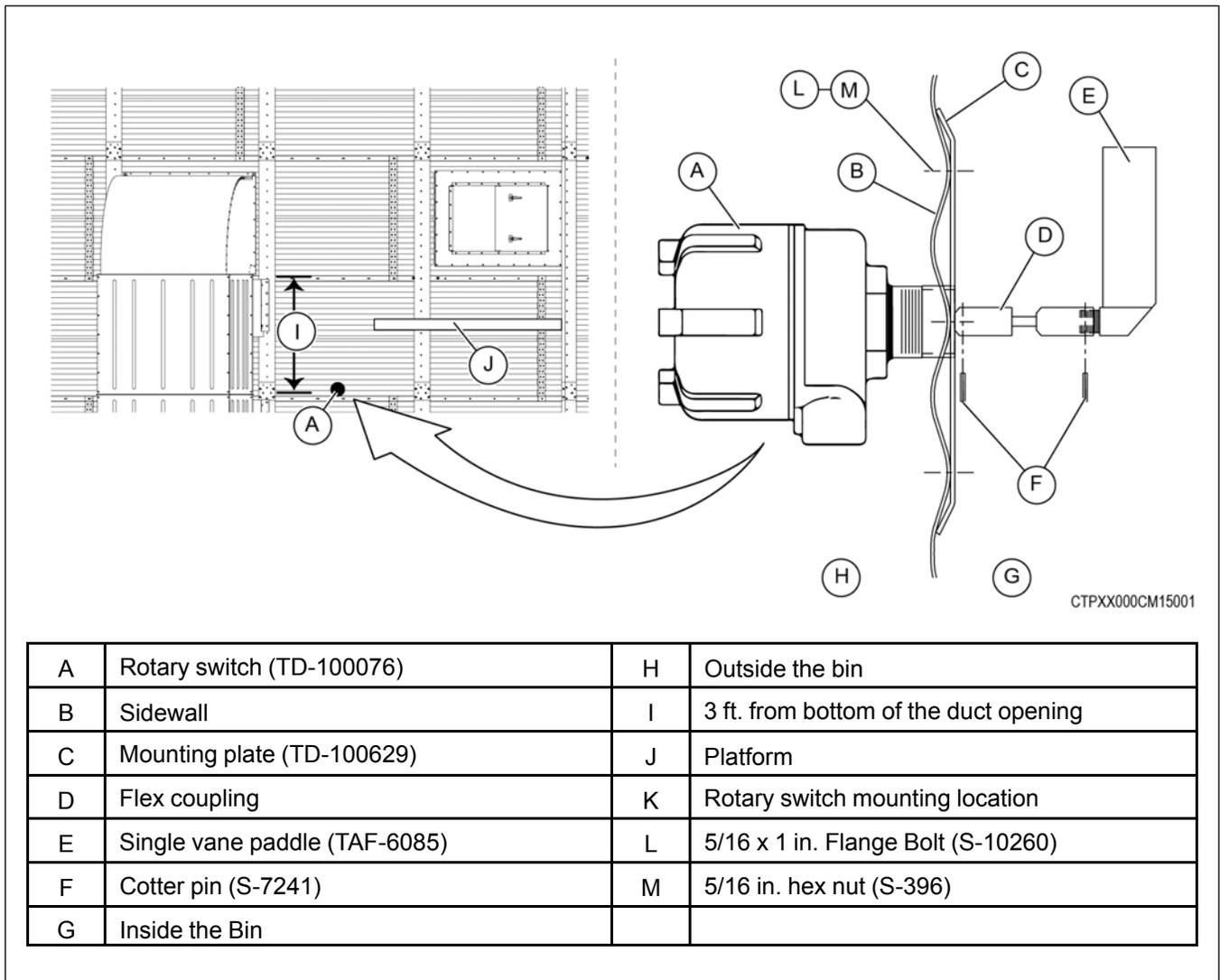
1. Drill a 2 in. diameter hole through the sidewall 3 ft. below the duct entrance (I).

NOTE: Make sure to drill the hole centered on an outside valley of the sidewall corrugation.

2. Use the mounting plate (C) as a pattern and drill four 3/8 in. holes through the sidewall (B) at the rotary switch location.
3. Add foam weather strip around the top and sides of the mounting plate (C).

4. Caulk the underside of the mounting plate, on all sides of the 2 in. hole, and where the plate meets the bin.
5. Install the mounting plate (C) to the sidewall (B) using bolts (L) and nuts (M).
6. Attach the flex coupling (D) to the rotary switch power pack (A) using a cotter pin (F).
7. Attach the single vane paddle (E) to the flex coupling (D) using a cotter pin (F).
8. Apply Teflon tape or pipe sealant (not included) to the rotary switch power pack (A) threads and thread the rotary switch power pack into the mounting plate coupling (C).
9. Make sure the conduit opening is facing down.

Figure 3-10 Storage Chamber High-Limit Rotary Switch (TAF-6106)



About Drying Chamber Rotary Switches

The drying chamber rotary switches are used by to monitor the level of the grain in the drying chamber. The Low-Level and High-Level Rotary switches are required, but the Overflow switch is optional.

The rotary switch with the shortest shaft extension is the Drying Chamber Overflow Rotary switch. It is used as a safety in the event the Chamber High-Level Rotary switch fails. (If a leg with choke fill installation is in use, the Overflow switch may be omitted.) The rotary switch with the longest extension is the Drying Chamber Low-Level Rotary switch. It is used to inform the computer when the peak has been covered with grain so the drying process can begin; and, will shut down if the drying chamber empties unexpectedly. The third rotary switch is the Drying Chamber High-Level Rotary switch. It is used to inform the dryer when the drying chamber is full so loading can stop. This switch has an adjustable mount to allow positioning of the switch to match the fill rate.

Planning is needed when before installing the Drying Chamber Rotary switches. The Drying Chamber Rotary switches should be located in close proximity to one another to reduce the amount of conduit and wiring required. The Drying Chamber Rotary switches should also be mounted so that they are located in an area of the drying chamber that fills evenly with the rest of the drying chamber.

The Drying Chamber Rotary switches should NOT be located in a part of the drying chamber that fills unevenly. If the area of the drying chamber where the Drying Chamber Rotary switches are located fills faster than the rest of the drying chamber, then the drying chamber will not fill to capacity and uneven drying will result. If the area of the drying chamber where the rotary switches are located fills slower than the rest of the drying chamber an overflow situation can occur.

It is critical that the drying chamber fill evenly and that the grain falls from fill system directly onto the perforated cone in the drying chamber.

Figure 3-11 *Drying Chamber Rotary Switches*



Drying Chamber Low-Level Rotary Switch Installation

The rotary switch with the longest extension is the drying chamber low-level rotary switch and indicates when the grain in the drying chamber is low.

What You Should Know

It is recommended to use rivet nuts to install the rotary switches for easier service. Use fastenal rivet nut tool #0126106 with knurled nuts and the nose that matches the bolt diameter.

1. Measures from the top of the roof sheet down a distance of (C) referenced in the chart and mark the location.
2. Drill a 2 in. hole through the roof sheet at the marked location (A).

NOTE: Refer to [Figure 3-1, page 28](#) for the proper placement in relationship to the fill auger.

3. Center the mounting plate (E) over the 2 in. hole and drill the four corner holes using the mounting plate (E) as a template.
4. Attach the flexible shaft coupler (F) to the drive shaft of the rotary power pack (D) using a roll pin (G).
5. Apply Teflon tape or pipe sealant (not included) to the rotary switch power pack threads and thread the rotary switch power pack into the mounting plate coupling (E).
6. Thread the rotary power pack (D) into the mounting plate (E).

NOTE: Make sure the conduit opening on the rotary power pack (D) is facing towards the eave of the bin.

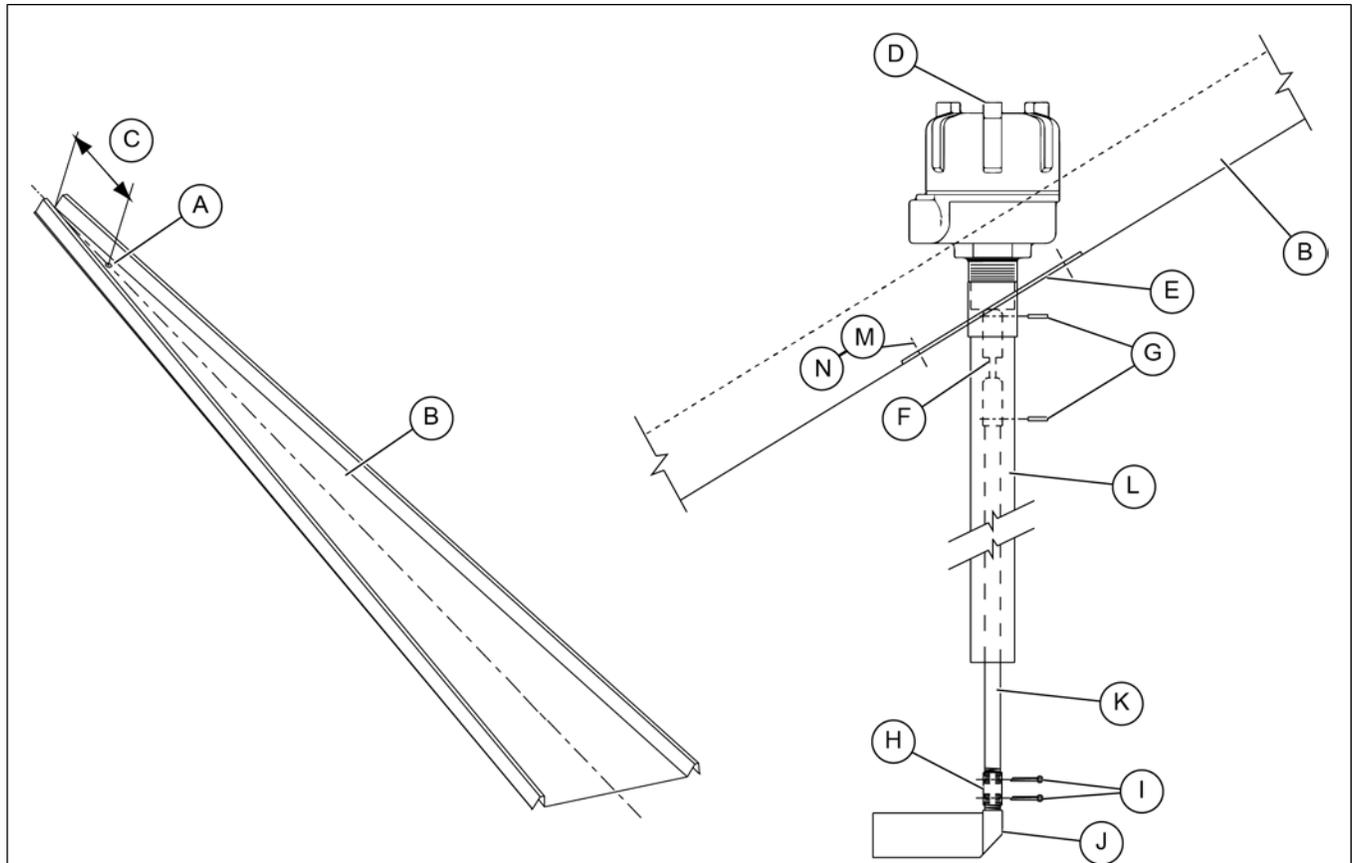
7. Thread the ¼ in. shaft extension (K) into the flexible shaft coupler (F) and fasten using a roll pin (G).
8. Slide the 1-1/4 in. guard pipe (L) over the ¼ in. shaft extension (K) and thread the 1-1/4 in. guard pipe (L) into the mounting plate (E).
9. Thread the 1/4 in. shaft coupler (H) onto the end of the ¼ in. shaft extension (K) and fasten with a cotter pin (I).
10. Insert the 1-1/4 in. shaft guard (L) through the 2 in. hole in the roof panel and attach the mounting plate to the roof panel using bolts (M) and nuts (N).

NOTE: Using a rivet tool with knurled nuts to attach the mounting plate will make removal for service much easier.

11. Thread the single vane paddle (J) into the ¼ in. shaft coupler (H) and fasten with a cotter pin (I).

Chapter 3: Electrical Components Installation

Figure 3-12 Drying Chamber Low-Level Rotary Switch



A	Field drill 2 in. hole	H	1/4 in. shaft coupler (TAF-6107)
B	Roof panel	I*	Cotter pin (S-7241)
C	Distance to drill the hole	J	Single vane paddle (TAF-6085)
D	Rotary power pack (TD-100076)	K	1/4 in. shaft extension (TAF-6094)
E	Mounting plate (TD-100627)	L	1-1/4 in. shaft guard (TAF-6093)
F	Flexible shaft coupler (TAF-100075)	M	5/16 x 1 in. flange bolt (S-10260)
G	Roll pins	N	5/16 in. hex nut (S-396)

*Cotter pin (I) is optional. You can also use MS screw (S-8896) and nylock nut (S-9100) instead of cotter pin (I).

TopDry Bin Diameter	Distance (C)
24	19-3/16 in.
30	20 in.
36	30 in.

Drying Chamber High-Level Rotary Switch Installation

The drying chamber high-level rotary switch senses when the drying chamber is full and signals the system to stop loading the grain. The high-level rotary switch has an adjustable mount to allow positioning of the switch to match the fill rate.

What You Should Know

It is recommended to use rivet nuts to install the rotary switches for easier service. Use fastenal rivet nut tool #0126106 with knurled nuts and the nose that matches the bolt diameter.

1. Measures from the top of the roof sheet down a distance of (C) referenced in the chart and mark the location.
2. Drill a 2 in. hole through the roof sheet at the marked location (A).

NOTE: Refer to [Figure 3-1, page 28](#) for the proper placement in relationship to the fill auger.

3. Center the mounting plate (E) over the 2 in. hole and drill the four corner holes using the mounting plate (E) as a template.
4. Attach the flexible shaft coupler (H) to the drive shaft of the rotary power pack (D) using a roll pin (K).
5. Apply Teflon tape or pipe sealant (not included) to the rotary switch power pack threads and thread the rotary switch power pack into the mounting plate coupling (E).
6. Thread the rotary power pack (D) into the mounting plate (E).

NOTE: Make sure the conduit opening on the rotary power pack (D) is facing towards the eave of the bin.

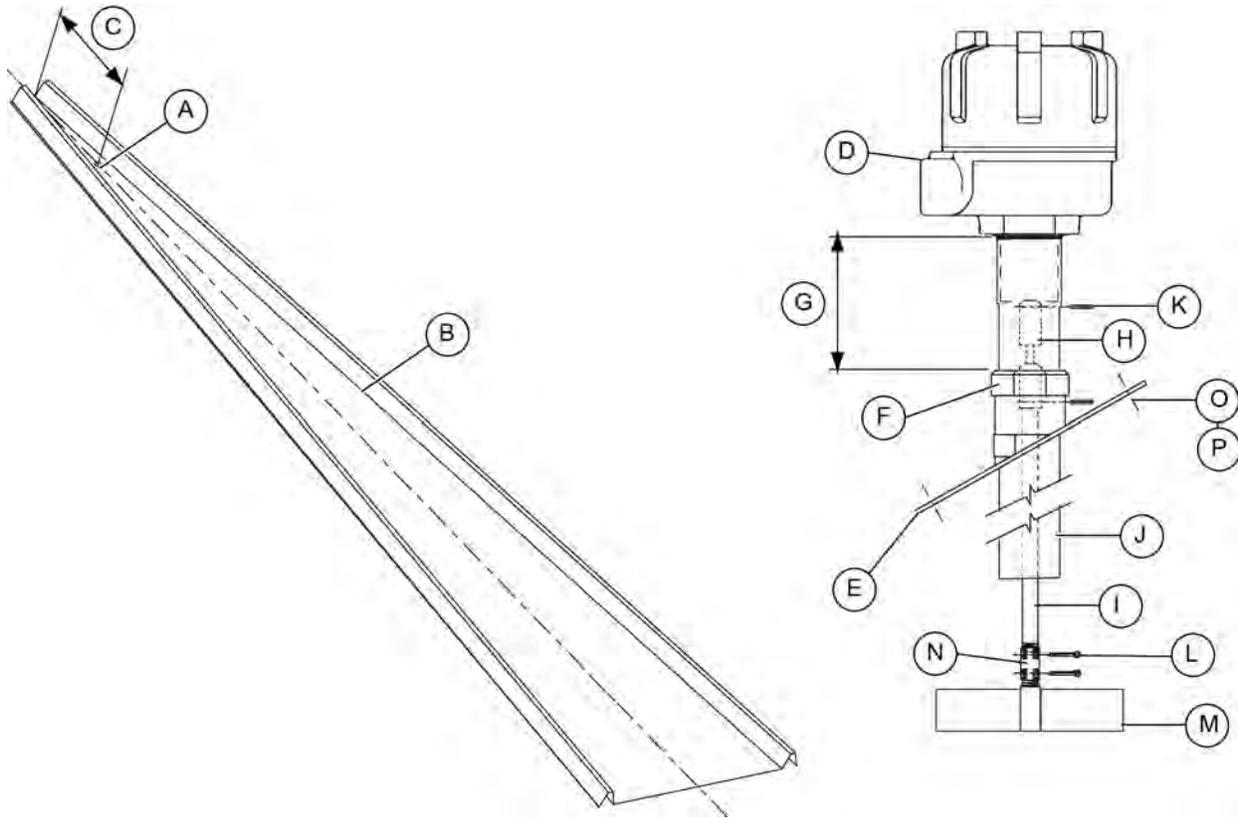
7. Thread the ¼ in. shaft extension (I) into the flexible shaft coupler (H) and fasten using a roll pin (K).
8. Slide the 1-1/4 in. guard pipe (J) over the ¼ in. shaft extension (I) and thread the 1-1/4 in. guard pipe (J) into the mounting plate (E).
9. Thread the 1/4 in. shaft coupler (N) onto the end of the ¼ in. shaft extension (I) and fasten with a cotter pin (L).
10. Insert the 1-1/4 in. shaft guard (J) through the 2 in. hole in the roof panel and attach the mounting plate to the roof panel using bolts (O) and nuts (P).

NOTE: Using a rivet tool with knurled nuts to attach the mounting plate will make removal for service much easier.

11. Thread the 3 vane paddle (M) into the ¼ in. shaft coupler (N) and fasten with a cotter pin (L).

Chapter 3: Electrical Components Installation

Figure 3-13 Drying Chamber High-Level Rotary Switch — Adjustable



A	Field drill 2 in. hole	I	1/4 in. shaft extension (TAF-6107)
B	Roof panel	J	1-1/4 in. shaft guard (TAF-6093)
C	Distance to drill the hole	K	Roll pins
D	Rotary power pack (TD-100076)	L*	Cotter pin (S-7241)
E	Hi-Limit mounting plate (TD-100626)	M	Three-vane paddle (TAF-6086)
F	Compression coupler (TD-101106)	N	1/4 in. shaft coupler (TAF-6107)
G	3 in.	O	5/16 x 1 in. flange bolt (S-10260)
H	Flexible shaft coupler (TAF-100075)	P	5/16 in. hex nut (S-396)

*Cotter pin (L) is optional. You can also use MS screw (S-8896) and nylock nut (S-9100) instead of cotter pin (L).

TopDry Bin Diameter	Distance (C)
24	19-3/16 in.
30	20 in.
36	30 in.

Drying Chamber Overflow Rotary Switch Installation

If a choke fill load system is used, the drying chamber overflow rotary switch does not have to be installed.

What You Should Know

It is recommended to use rivet nuts to install the rotary switches for easier service. Use fastenal rivet nut tool #0126106 with knurled nuts and the nose that matches the bolt diameter.

1. Measures from the top of the roof sheet down a distance of (C) referenced in the chart and mark the location.
2. Drill a 2 in. hole through the roof sheet at the marked location (A).

NOTE: Refer to [Figure 3-1, page 28](#) for the proper placement in relationship to the fill auger.

3. Center the mounting plate (E) over the 2 in. hole and drill the four corner holes using the mounting plate (E) as a template.
4. Attach the flexible shaft coupler (F) to the drive shaft of the rotary power pack (D) using a roll pin (G).
5. Apply Teflon tape or pipe sealant (not included) to the rotary switch power pack threads and thread the rotary switch power pack into the mounting plate coupling (E).
6. Thread the rotary power pack (D) into the mounting plate (E).

NOTE: Make sure the conduit opening on the rotary power pack (D) is facing towards the eave of the bin.

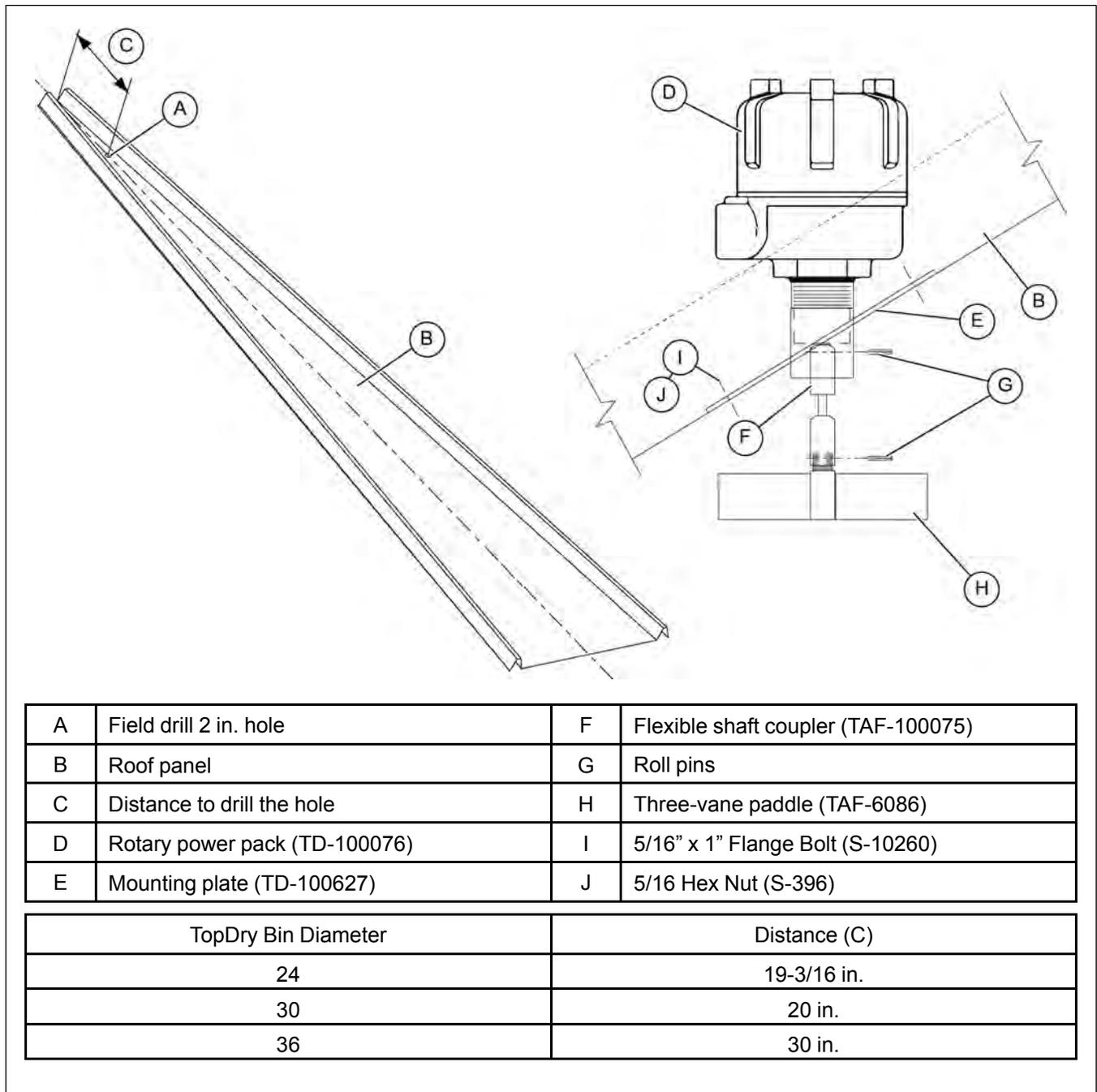
7. Insert the flexible shaft coupler (F) through the 2 in. hole in the roof panel and attach the mounting plate to the roof panel using bolts (I) and nuts (J).

NOTE: Using a rivet tool with knurled nuts to attach the mounting plate will make removal for service much simpler.

8. Thread the three vane paddle (H) into the flexible shaft coupler (F) and fasten with a roll pin (G).

Chapter 3: Electrical Components Installation

Figure 3-14 Drying Chamber Overflow Rotary Switch



4 Wiring Installation

Topics Covered in this Chapter

- Routing the Conduit
- Transformer and Wiring Voltage Drop
- Machine to Earth Grounding
- Power/Motor Wiring
- Electrical Load Information
- Connecting the TopDry Terminal to Control Fan 1
- Connecting the TopDry Terminal to Control Fan 2
- Connecting a CSA TopDry Terminal to Control Fan 1 and Fan 2
- Connecting TopDry Terminal to the Chute Controller
- Connecting the TopDry Terminal to the Wet Supply Rotary Switch (Optional)
- Connecting TopDry Terminal to the Storage Chamber Rotary Switch
- Connecting TopDry Terminal to the Drying Chamber Rotary Switches
- Connecting TopDry Terminal to the Fill System

Routing the Conduit

The conduit protects the wires and connects the components together.

IMPORTANT: *Never route control wiring together with motor wires, high amperage wires or wires with 120 volts or more.*

Control Wire Routing

- **Route 1 — TopDry Terminal to control fan 1 control**
Use fifteen control wires with a minimum of 16 gauge cable.
- **Route 2 — TopDry Terminal to control fan 2 control (If applicable)**
Use sixteen control wires with a minimum of 16 gauge cable.
- **Route 3 — TopDry Terminal to chute control**
Use eight control wires with a minimum of 16 gauge cable.
- **Route 4 — Optional: TopDry Terminal to wet supply rotary switch (if applicable)**
Use four control wires with a minimum of 16 gauge cable.
- **Route 5 — TopDry Terminal to storage chamber rotary switch**
Use five control wires with a minimum of 16 gauge cable.
- **Route 6 — TopDry Terminal to drying chamber switch**
Use six control wires with a minimum of 16 gauge cable.

Chapter 4: Wiring Installation

- **Route 7 — Optional: TopDry Terminal to fill system control (if applicable)**
Use eleven control wires with a minimum of 16 gauge cable.
- **Route 8 — TopDry Terminal to grain temperature sensor junction box**
Use eight control wires with a minimum of 16 gauge cable.

Motor Wire Routing

- Route 1 — Entrance panel to control fan 1 control (for fan motor).
- Route 2 — Entrance panel to fan 2 control (if applicable, for fan motor).
- Route 3 — Entrance panel to fill system control (if applicable).
 1. For fill system 1 motor starter.
 2. For fill system 2 motor starter (if applicable).
 3. For aeration fan motor starter.
- Route 4 — Fill system control to fill system 1 motor.
- Route 5 — Fill system control to fill system 2 motor (if applicable).
- Route 6 — Fill system control to aeration fan motor.
- Route 7 — Entrance panel to actuator control.

Grounding

All control boxes should be properly grounded with a ground lug mounted in each control box.

Power Supply

An adequate power supply and proper wiring are important factors to achieve maximum performance and long life of the dryer. Electrical service must be adequate enough to prevent low voltage damage to motors and control circuits.

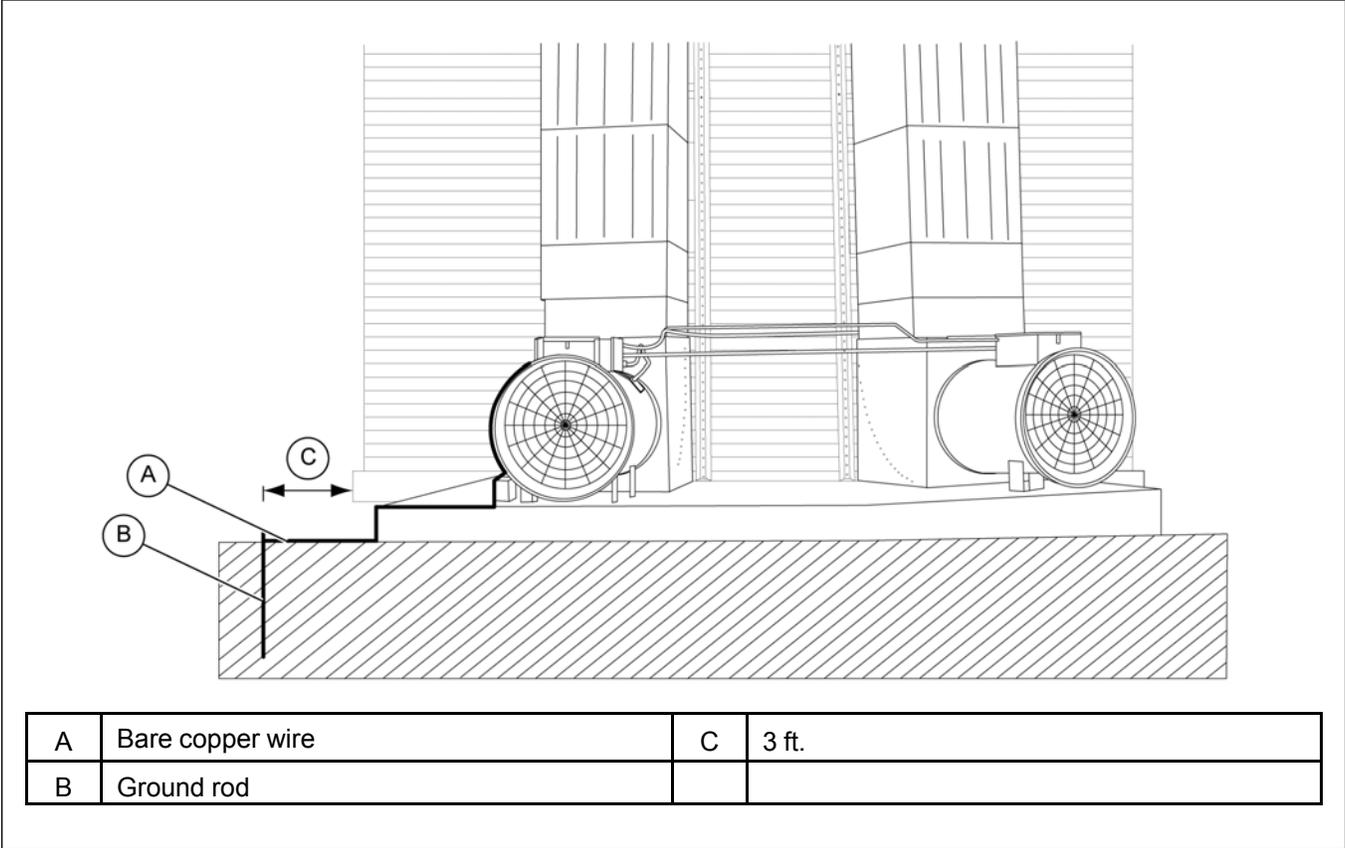
Transformer and Wiring Voltage Drop

It is necessary to know the distance from the unit to the available transformer and the horsepower of the fan unit. Advise the service representative of your local power supplier that an additional load will be placed on the line. Each fan motor should be wired through a fused or circuit breaker disconnect switch. Check on KVA rating of transformers, considering total horsepower load. The power supply wiring, main switch equipment and transformers must provide adequate motor starting and operating voltage. Voltage drop during motor starting should not exceed 14% of normal voltage and after motor is running at full speed it should be within 8% of normal voltage. Check electrical load information for HP ratings and maximum amp loads to properly size wire and fusing elements. Standard electrical safety practices and codes should be used. (Refer to National Electrical Code Standard Handbook by National Fire Protection Association.)

Machine to Earth Grounding

It is very important that a machine to earth ground rod be installed at the fan. This is true even if there is a ground at the pole 15 ft. away. Place the ground rod within 8 ft. of the dryer and attach it to the dryer control panel with at least a #6 solid, bare, copper ground wire and the clamp provided. The grounding rod located at the power pole will not provide adequate grounding for the dryer. The proper grounding will provide additional safety in case of any short and will ensure long life of all circuit boards and the ignition system. The ground rod must be in accordance with local requirements.

Figure 4-1 Ground Rod Attachment



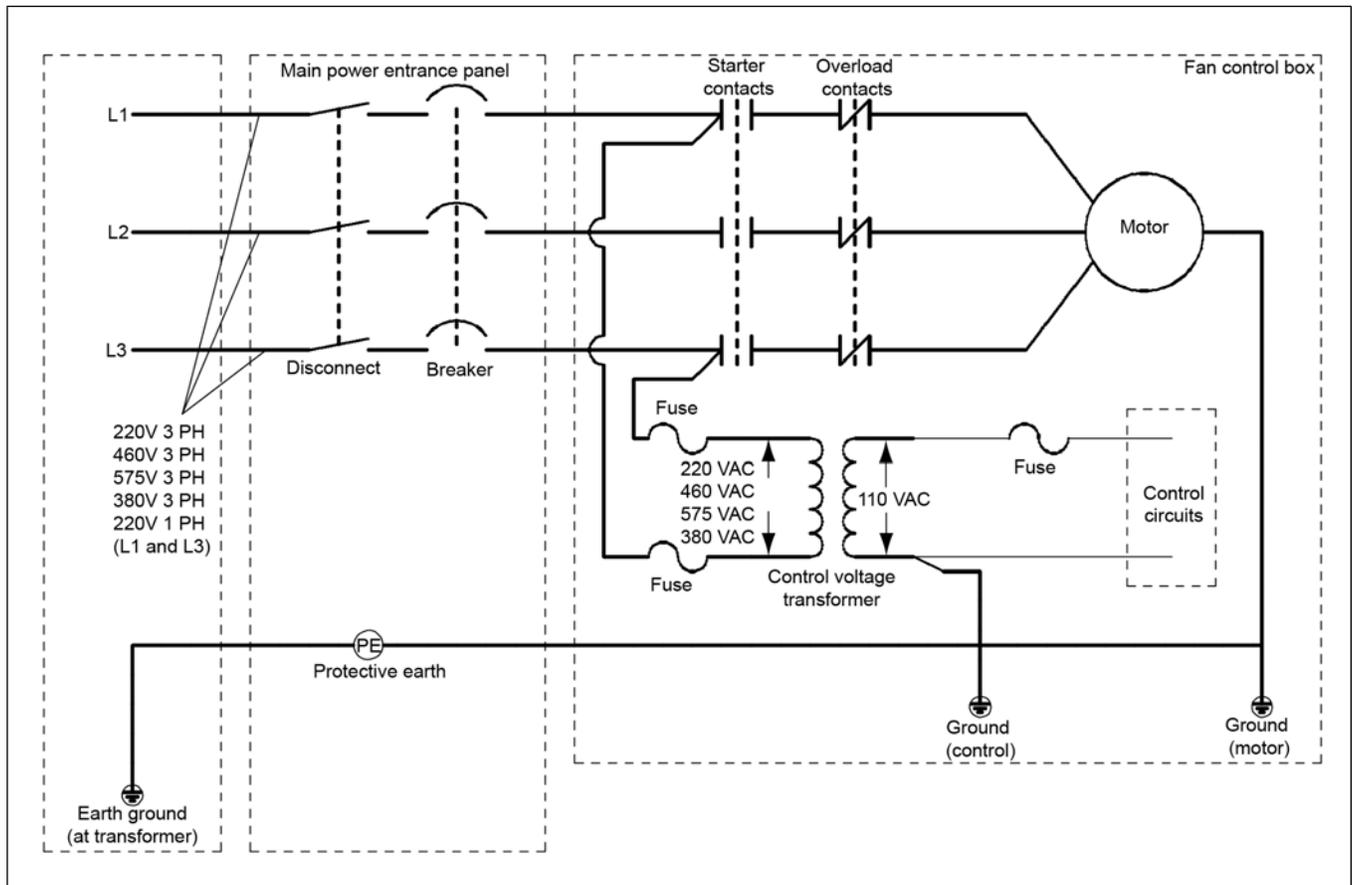
Power/Motor Wiring

The following diagram details the configuration for correct main power installation. Use the diagram in conjunction with the electrical load information and wire size information provided. The diagram details the correct main power installation for 220V 1 PH, 230V 3 PH, 460V 3 PH, 575V 3 PH and 380V 3 PH 50 Hz power supplies.

On all 3 phase systems put the leg with the highest potential difference between that leg and ground (wild or high voltage leg) on the center terminal (L2) at the motor starter.

NOTICE *Standard electrical safety procedures should be used. (Refer to the National Electrical Code Standard Handbook by the National Fire Protection Association.) A qualified electrician should make all electrical wiring installations. Follow all local or national electrical safety standards and ordinances when installing the equipment.*

Figure 4-2 Main Power Schematic



Electrical Load Information

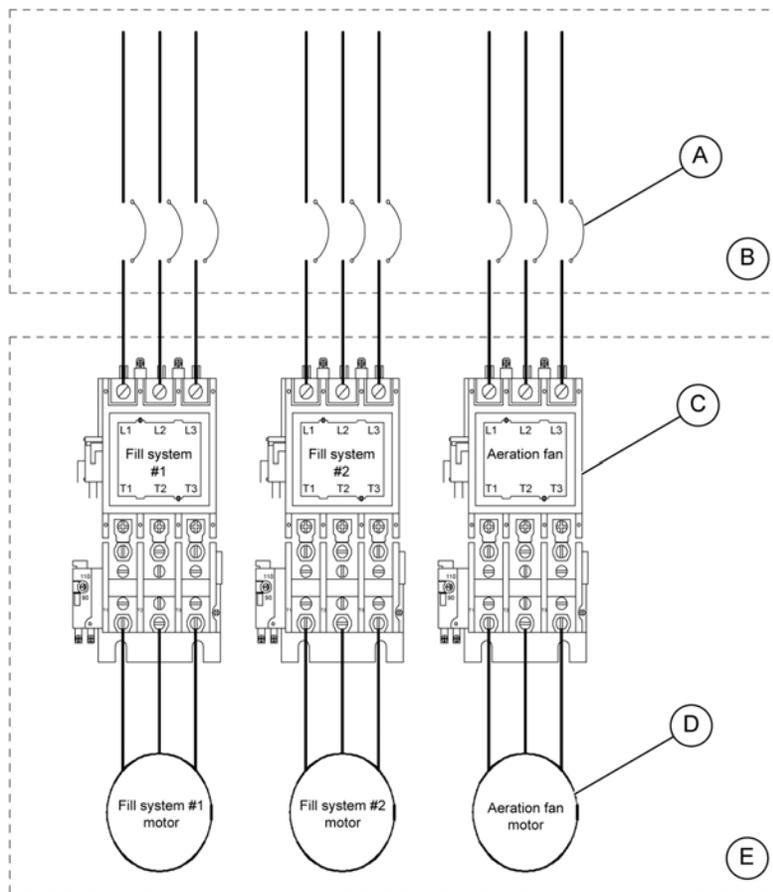
The chart below is a reference for the electrician wiring the grain dryer. It is recommended that you contact your local power company and have a representatives survey the installation to make sure that the wiring is compatible with their system and that adequate power is supplied to the unit.



The grain dryer must be the only equipment connected to the recommended service amps. Standard electrical safety procedures must be used. (Refer to the National Electrical Code Standard Handbook by the National Fire Protection Association.) A qualified electrician must make all electrical wiring installations.

Dryer Fan Size	Voltage	Horsepower	Full Load Amps	Fuse (Slow Blow)	Breaker
36 in.	220V 1 PH	15	78	150	150
	208V 3 PH	15	44	125	125
	220V 3 PH	15	39	100	100
	380V 50 Hz	15	27	80	80
	460V 3 PH	15	20	50	50
	575V 3 PH	15	16	40	40
40 in.	220V 1 PH	15	78	150	150
	208V 3 PH	15	44	125	125
	220V 3 PH	15	39	100	100
	380V 50 Hz	15	27	80	80
	460V 3 PH	15	20	50	50
	575V 3 PH	15	16	40	40
42 in.	208V 3 PH	30	80	150	150
	220V 3 PH	30	74	150	150
	380V 50 Hz	30	39	100	100
	460V 3 PH	30	37	100	100
	575V 3 PH	30	30	80	80
42 in.	208V 3 PH	40	108	200	200
	220V 3 PH	40	102	200	200
	380V 50 Hz	40	47	100	100
	460V 3 PH	40	51	100	100
	575V 3 PH	40	40	100	100

Figure 4-3 Electrical Load Information



A	Breaker	D	Motors
B	Entrance panel	E	Fill system control
C	Starters in fill system control		

Connecting the TopDry Terminal to Control Fan 1

The control fan 1 unit is the only fan and heater in a single fan unit. In a two fan unit, it is the fan and heater with the air switch, plenum temperature sensor, and grain temperature sensor connected to it.

What You Should Know

Do not route the control wires for the control fan 1 in the same conduit as the power wires for the fan motor.

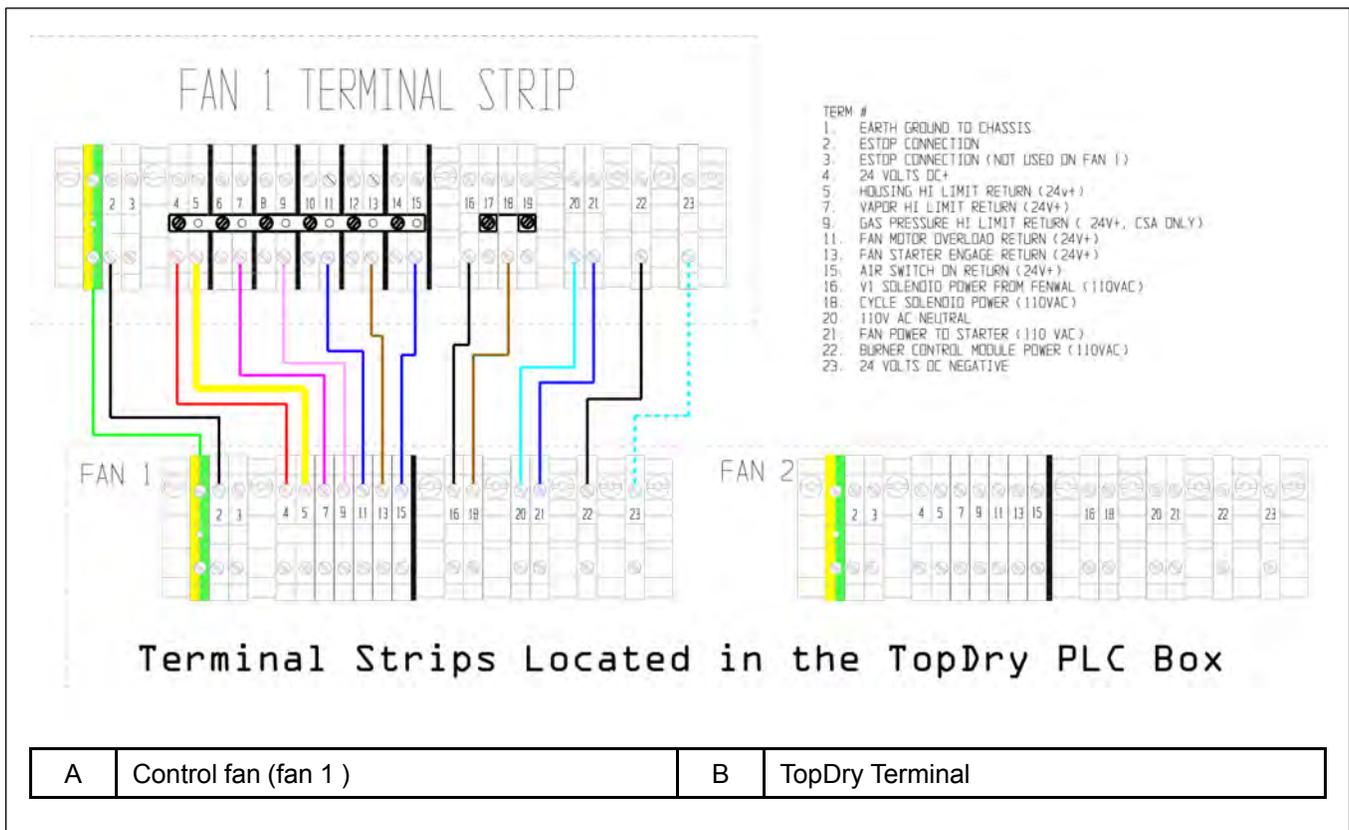
NOTE: Do NOT use solid wire for connections. Use only MTW type wire for control wiring.

NOTE: The control fan 1 is always located on the right and has a step down transformer.

Using a standard 15 conductor cable:

1. Route fifteen control wires from the TopDry Terminal to the control fan 1 unit.
2. Connect the wires as shown.

Figure 4-4 Wiring for a Control Fan (Fan 1)



Chapter 4: Wiring Installation

Using a 20 conductor cable:

3. Route the 20 conductor cable from the TopDry Terminal to the control fan 1 unit.
4. Connect the wires as shown below, the Terminal number corresponds to the fan/heater and control panel.

Table 4-1 *Conductor Identification*

Terminal Number	Insulation Color	Stripe Color
1st - Terminal 1	Black	—
2nd - Terminal 2	Red	—
3rd - Terminal 4	Blue	—
4th - Terminal 5	Orange	—
5th - Terminal 7	Yellow	—
6th - Terminal 9	Brown	—
7th - Terminal 11	Red	Black
8th - Terminal 13	Blue	Black
9th - Terminal 15	Orange	Black
10th - Terminal 16	Yellow	Black
11th - Terminal 18	Brown	Black
12th - Terminal 20	Black	Red
13th - Terminal 21	Blue	Red
14th - Terminal 22	Orange	Red
15th	Yellow	Red
16th	Brown	Red
17th	Black	Blue
18th	Red	Blue
19th	Orange	Blue
20th	Yellow	Blue

Connecting the TopDry Terminal to Control Fan 2

A second fan unit can be added to operate in unison with the control fan unit.

What You Should Know

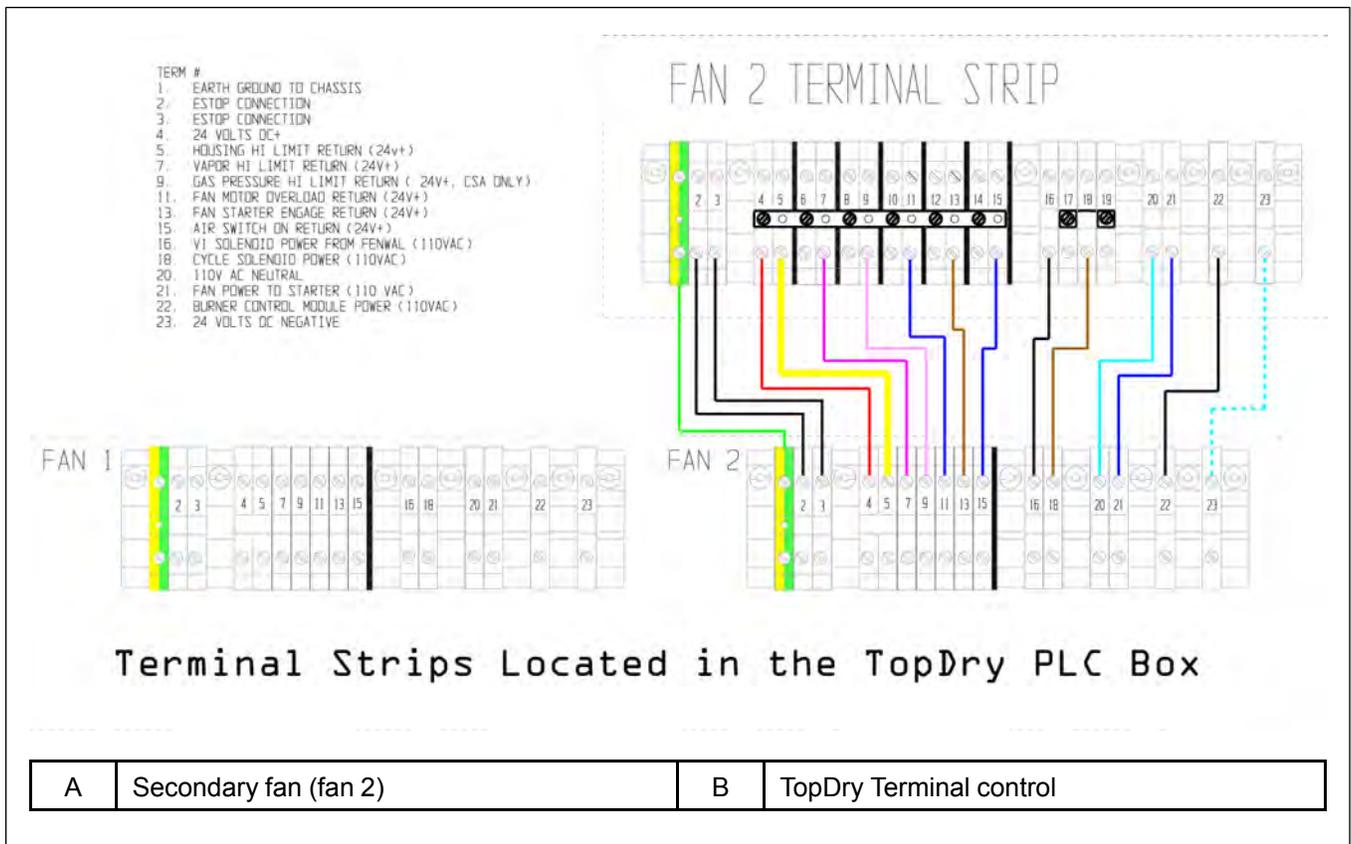
NOTE: Do not use a solid wire for connections and do not route control wires with motor wires, high amperage wires, or wires with a voltage above 120 volts.

NOTE: Do NOT use solid wire for connections. Use only MTW type wire for control wiring.

Using a 16 conductor cable:

1. Route sixteen control wires from the TopDry Terminal control to the secondary fan unit (fan 2).
2. Connect the wires as shown.

Figure 4-5 Wiring for a Second Fan Unit (Fan 2)



Chapter 4: Wiring Installation

Using a 20 conductor cable:

3. Route 20 conductor cable from the TopDry Terminal to the control fan 2 unit.
4. Connect the wires as shown below, the Terminal number corresponds to the fan/heater and control panel.

Table 4-2 *Conductor Identification*

Terminal Number	Insulator Color	Stripe Color
1st - Terminal 1	Black	—
2nd - Terminal 2	Red	—
3rd - Terminal 4	Blue	—
4th - Terminal 5	Orange	—
5th - Terminal 7	Yellow	—
6th - Terminal 9	Brown	—
7th - Terminal 11	Red	Black
8th - Terminal 13	Blue	Black
9th - Terminal 15	Orange	Black
10th - Terminal 16	Yellow	Black
11th - Terminal 18	Brown	Black
12th - Terminal 20	Black	Red
13th - Terminal 21	Blue	Red
14th - Terminal 22	Orange	Red
15th - Terminal 3	Yellow	Red
16th	Brown	Red
17th	Black	Blue
18th	Red	Blue
19th	Orange	Blue
20th	Yellow	Blue

Connecting a CSA TopDry Terminal to Control Fan 1 and Fan 2

When using a CSA TopDry Terminal you can use the same wiring for both a 1 Fan and 2 Fan system.

What You Should Know

NOTE: Do not use a solid wire for connections and do not route control wires with motor wires, high amperage wires, or wires with a voltage above 120 volts.

NOTE: Do NOT use solid wire for connections. Use only MTW type wire for control wiring.

Using a 20 conductor cable:

1. Route 20 conductor cable from the TopDry Terminal to the control fan 1 and fan 2.
2. Connect the wires as shown below, the Terminal number corresponds to the fan/heater and control panel.

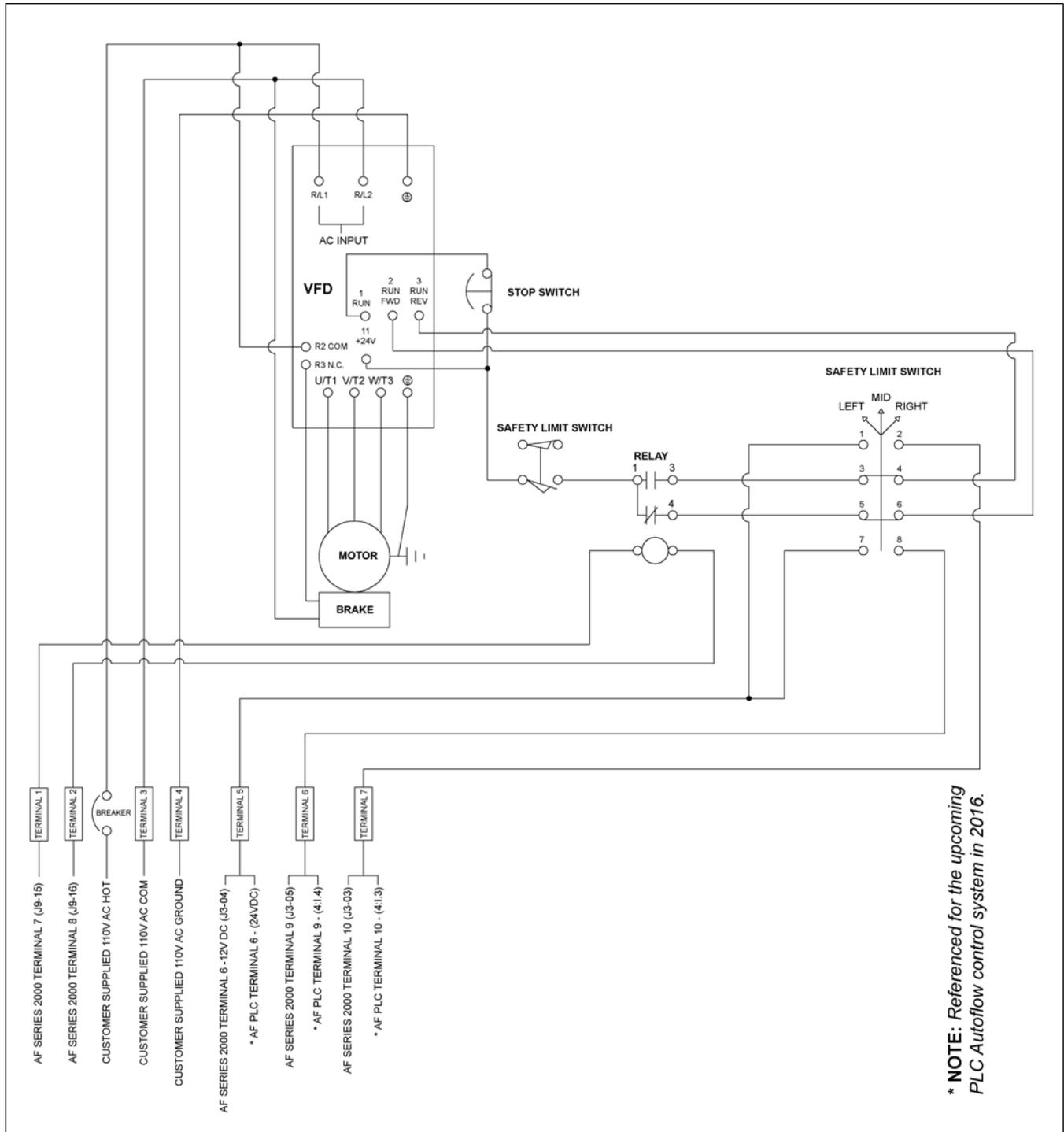
Table 4-3 Conductor Identification

Terminal Number	Insulator Color	Stripe Color
1st - Terminal 0	Black	—
2nd - Terminal 1	Red	—
3rd - Terminal 2	Blue	—
4th - Terminal 3	Orange	—
5th - Terminal 4	Yellow	—
6th - Terminal 5	Brown	—
7th - Terminal 7	Red	Black
8th - Terminal 9	Blue	Black
9th - Terminal 11	Orange	Black
10th - Terminal 13	Yellow	Black
11th - Terminal 15	Brown	Black
12th - Terminal 16	Black	Red
13th - Terminal 18	Blue	Red
14th - Terminal 20	Orange	Red
15th - Terminal 21	Yellow	Red
16th - Terminal 22	Brown	Red
17th	Black	Blue
18th	Red	Blue
19th	Orange	Blue
20th	Yellow	Blue

Connecting TopDry Terminal to the Chute Controller

1. Route eight control wires from the TopDry Terminal to the chute controller.
2. Connect the wires as shown.

Figure 4-6 TopDry Terminal to Chute Controller



Connecting the TopDry Terminal to the Wet Supply Rotary Switch (Optional)

The wet supply rotary switch is optional and is only used with system that have a wet storage tank. It is located on the wet storage tank and indicates the availability of wet grain.

Before You Begin

NOTE: If the optional wet supply rotary switch is not used, install a jumper between terminals 13 and 14 in the main control panel.

What You Should Know

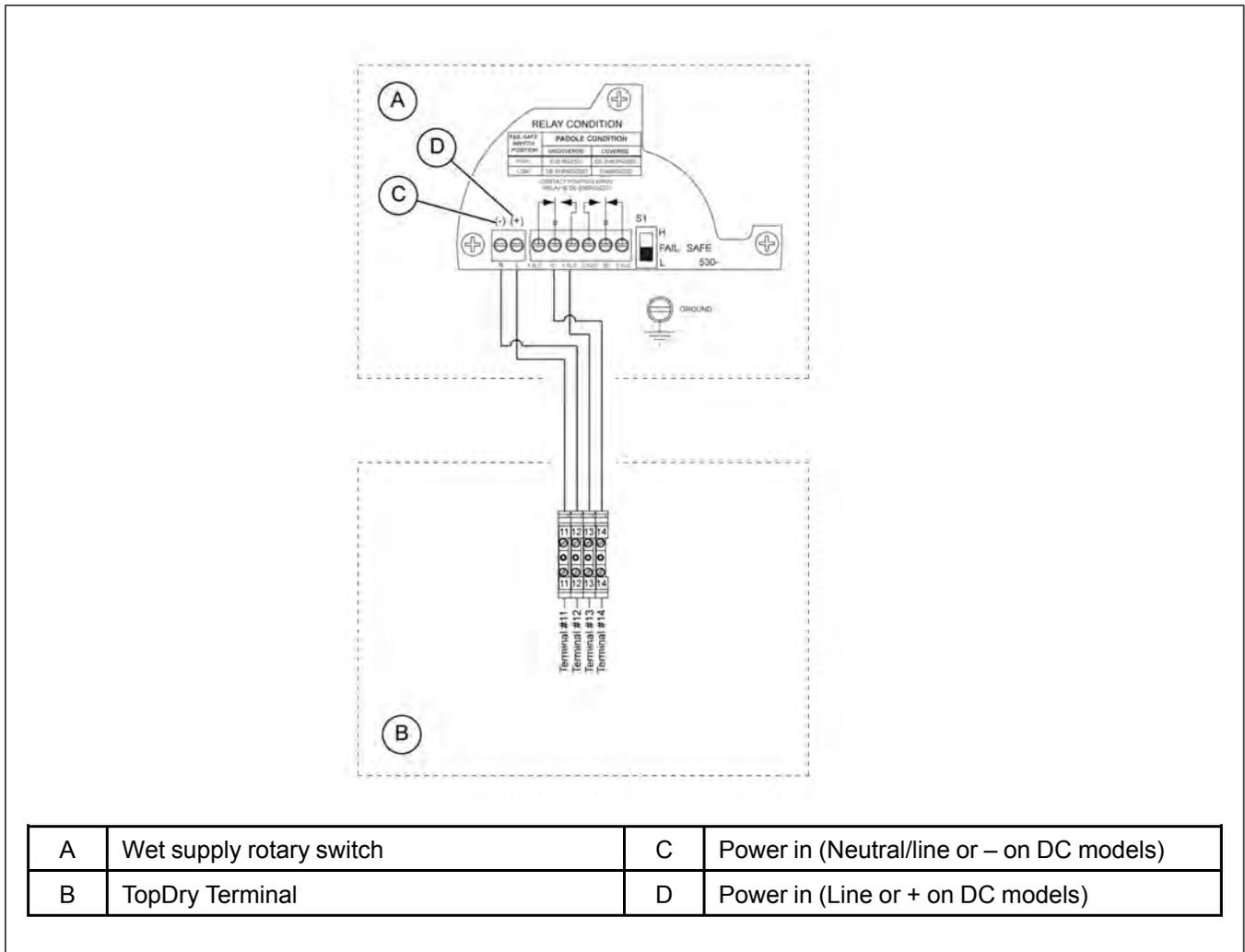
The wet supply rotary switch uses 110V AC to power the motor and 12V DC+ to switch a signal back to the computer.

1. Route four 16 gauge control wires from the TopDry Terminal to the wet supply rotary switch.

NOTE: Use only MTW type wire for control wiring.

2. Connect the wires as shown.

Figure 4-7 Optional Wet Supply Rotary Switch



Connecting TopDry Terminal to the Storage Chamber Rotary Switch

The storage chamber rotary switch is mounted 3 ft. below the duct opening on the bin. The rotary switch signals the system when the bin is full.

What You Should Know

The storage chamber rotary switch uses 110V AC to power the motor and 12V DC+ to switch a signal back to the TopDry Terminal.

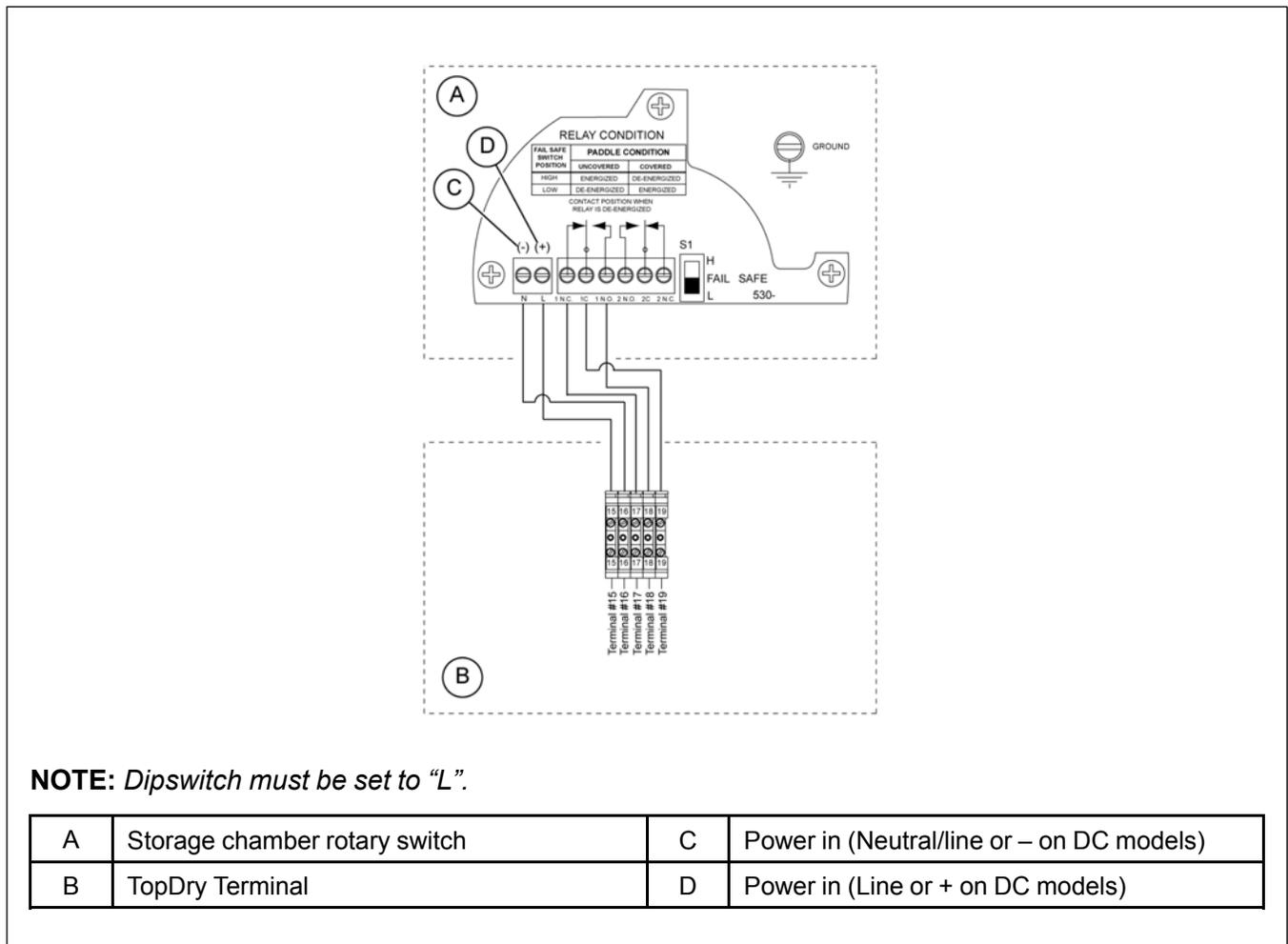
1. Make sure the storage chamber rotary switch is located between the first two stiffeners to the right of the fans and 3 ft. below the duct opening.

NOTE: The storage chamber rotary switch should be easily accessible from a platform or ladder.

2. Route five MTW 16 gauge control wires from the TopDry Terminal to the storage chamber rotary switch.

NOTE: Use only MTW type wire for control wiring.

Figure 4-8 TopDry Terminal to Storage Chamber Rotary Switch Connection



Connecting TopDry Terminal to the Drying Chamber Rotary Switches

There are three rotary switches located at the peak of bin in the drying chamber. They inform the system on the depth of grain in the drying chamber.

What You Should Know

The drying chamber rotary switches use 110V AC to power the motor and 12V DC+ to switch a signal back to the controller. The 110V AC, 110V N and the 12V DC+ wires can be jumped from rotary switch to rotary switch to reduce wiring.

1. Route the high-level rotary switch wires from the switch to the junction box.

NOTE: *The drying chamber high-level rotary switch is used to inform the dryer when the drying chamber is full.*

2. Route the low-level rotary switch wires from the switch to the junction box.

NOTE: *The low-level rotary switch has the longest extension. When it is covered by grain, the drying process will begin; and, will shut the dryer down if the drying chamber empties unexpectedly.*

3. Route the overflow rotary switch wires from the switch to the junction box.

NOTE: *The overflow rotary switch has the shortest extension. It is used as a safety in the event the chamber high-level rotary switch fails.*

4. Route six control wires from the TopDry Terminal to the drying chamber rotary switch junction box.

NOTE: *Use 16 gauge wire for control wires.*

NOTE: *Use only MTW type wire for control wiring.*

Chapter 4: Wiring Installation

Figure 4-9 *Drying Chamber Rotary Switch Connections*

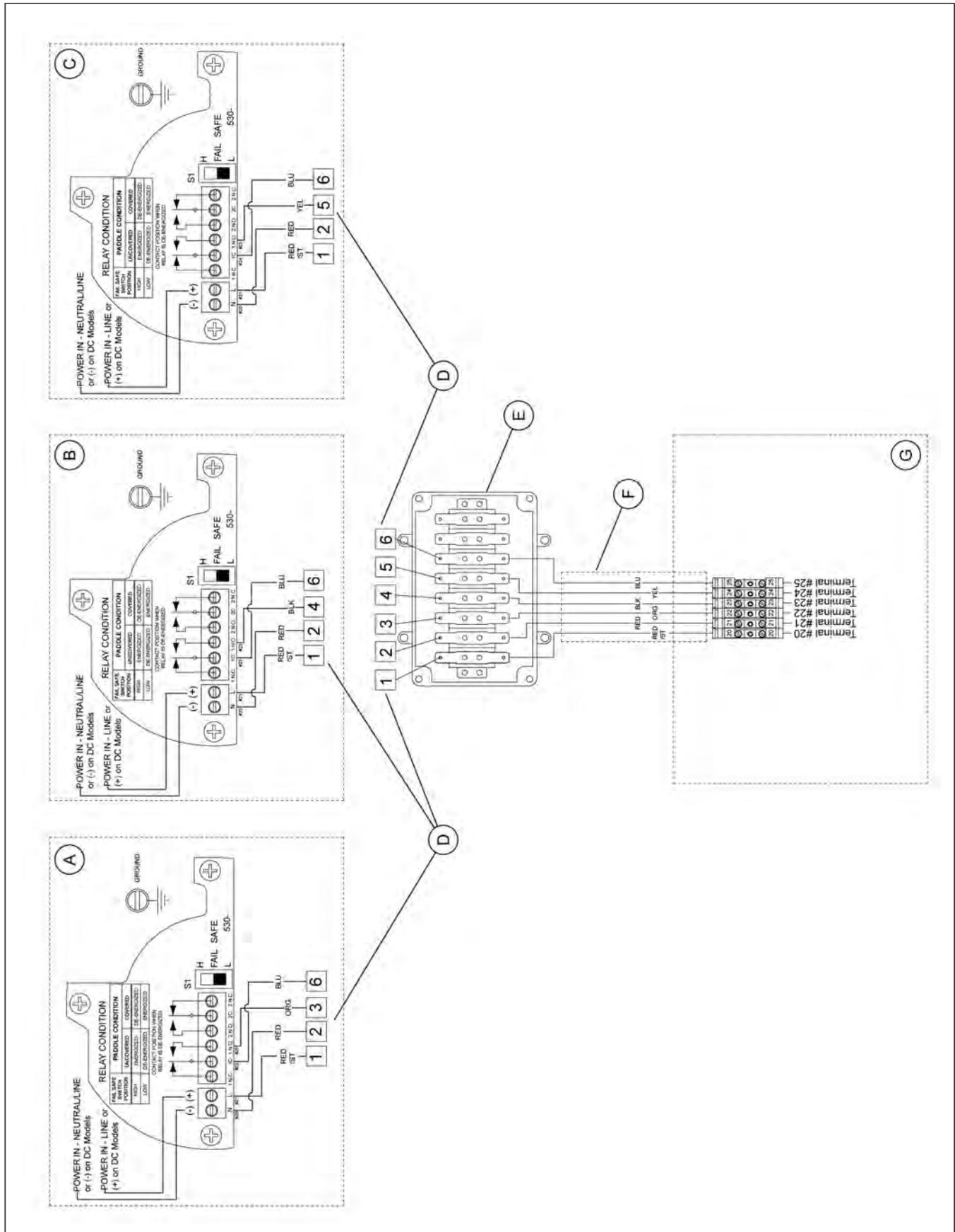


Table 4-4 *Drying Chamber Rotary Switch Identification*

A	Drying chamber low-level rotary switch	E	Drying chamber rotary switches junction box ⁵
B	Drying chamber high-level rotary switch	F	7–18 gauge conductor cable cut to length ⁶
C	Drying chamber overflow rotary switch	G	TopDry Terminal
D	Match to terminals in junction box		

Table 4-5 *Drying Chamber Rotary Switch Connections*

Terminal	Connection	Color
1	110 VAC to all rotary switches	Red with black strips
2	110 VAC neutral to all rotary switches	White
3	12 VDC positive from low-level rotary switch	Orange
4	12 VDC positive from high-level rotary switch	Black
5	12 VDC positive from overflow rotary switch	Yellow
6	12 VDC positive to all rotary switches	Blue

5. Located on top of high-level rotary switch.

6. Brown is not used

Connecting TopDry Terminal to the Fill System

The fill system control houses the starter(s) for the fill system(s) and aeration fans.

What You Should Know



DO NOT route the control wires for the fill system control box in the same conduit used for the power wires for the fill system and aeration fan motors.

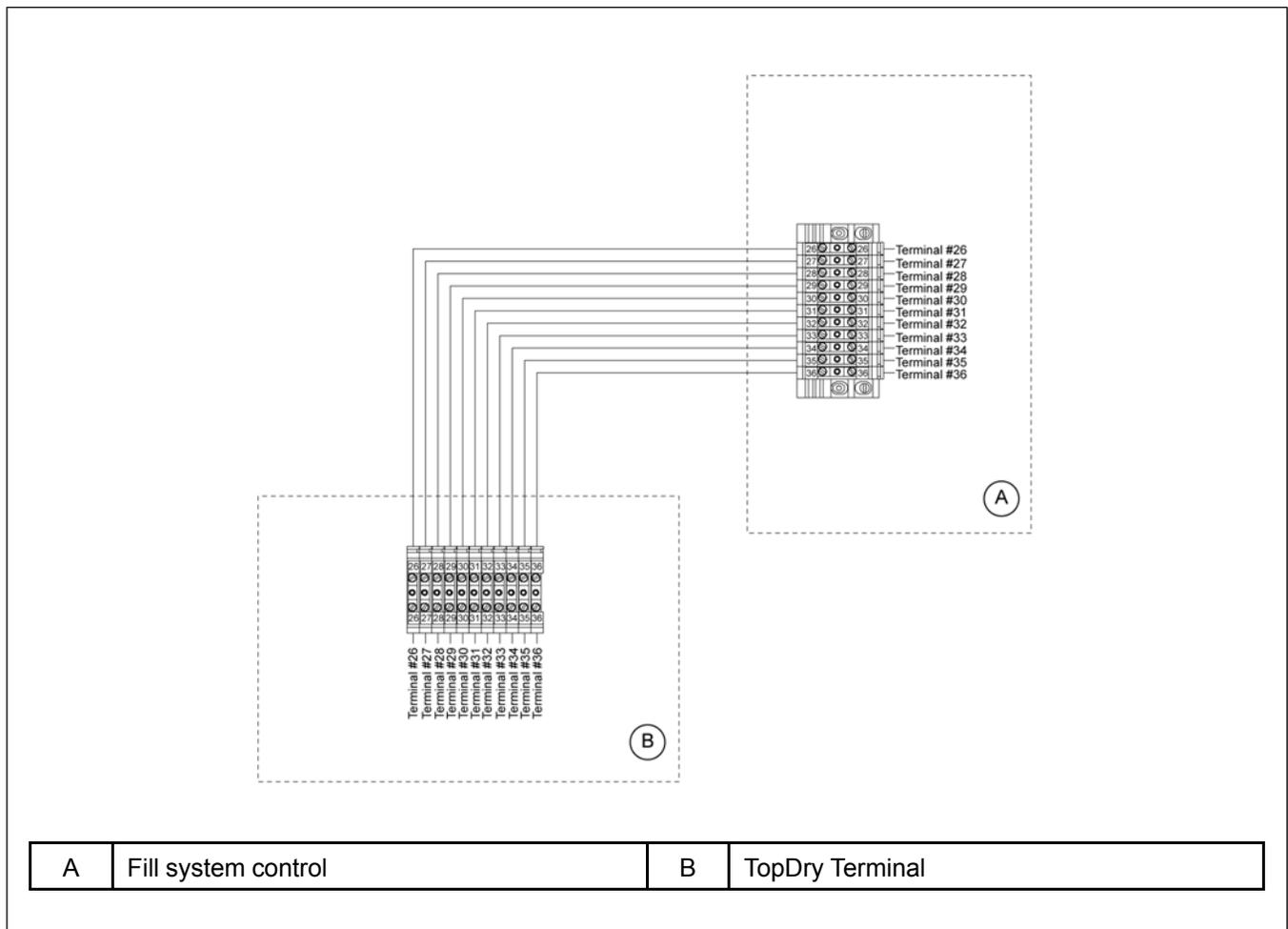
1. Route eleven control wires from the TopDry Terminal to the fill system control.

NOTE: Use 16 gauge wire for control wires.

NOTE: Use only MTW type wire for control wiring.

2. Connect the wires as shown.

Figure 4-10 TopDry Terminal to Fill System Control Connections



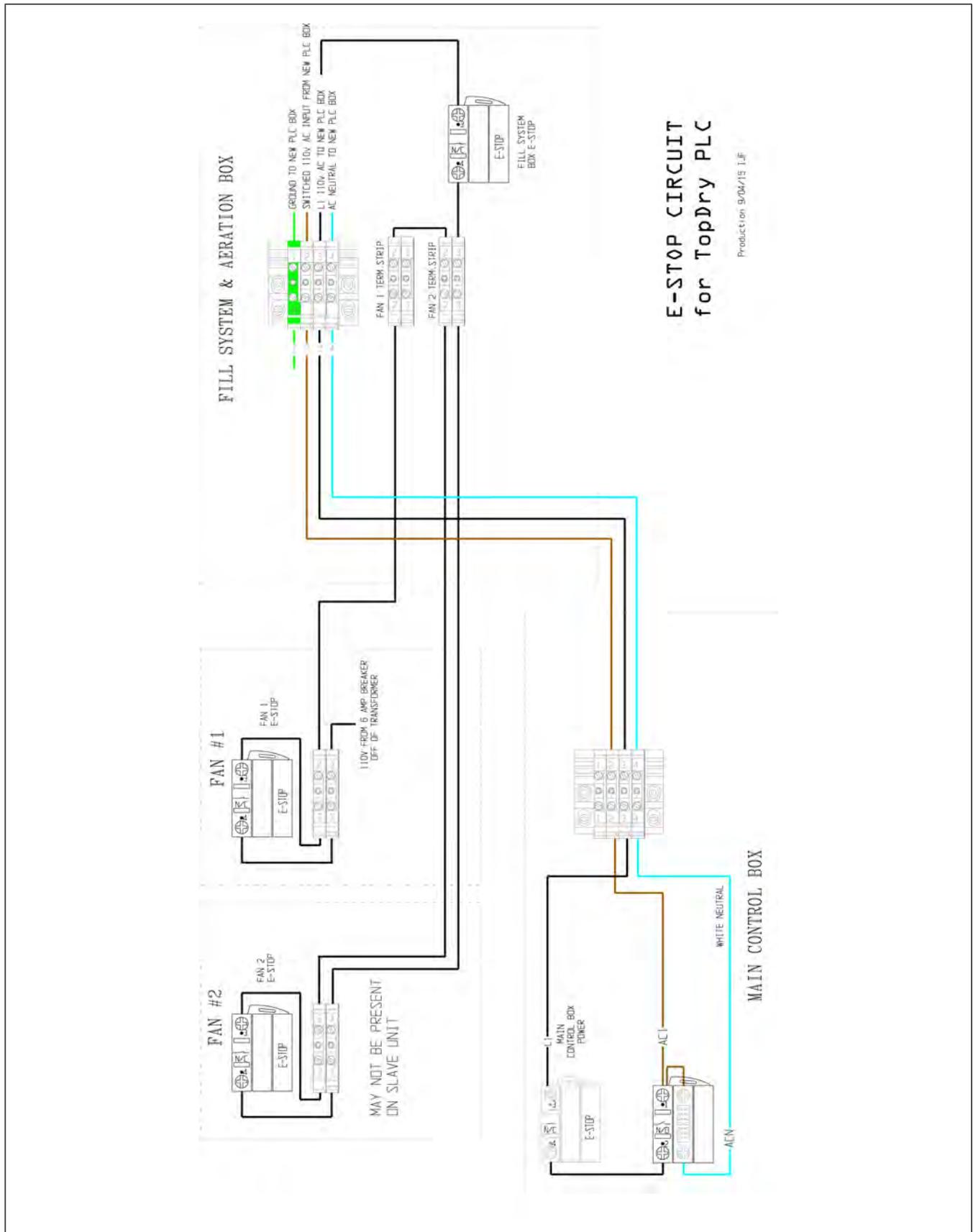
5 Wiring Diagrams

Topics Covered in this Chapter

- E-Stop Circuit Wiring for TopDry Terminal
- TopDry Terminal Control Box Wiring
- TopDry Terminal Fan and Heater Wiring
- TopDry Terminal Actuator Wiring
- Fill System Control Wiring

E-Stop Circuit Wiring for TopDry Terminal

Figure 5-1 E-Stop Circuit Wiring



TopDry Terminal Control Box Wiring

Figure 5-2 TopDry Terminal

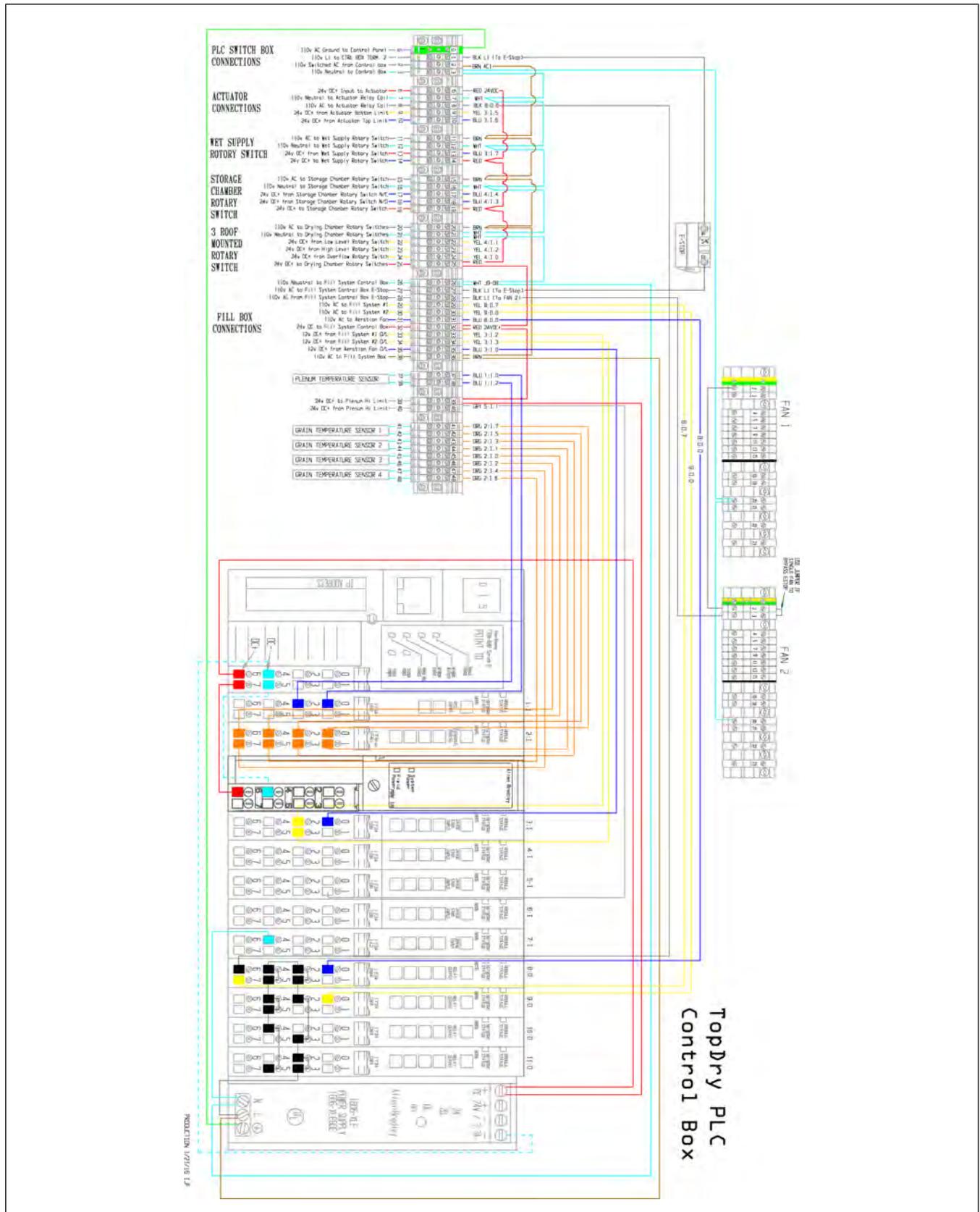


Figure 5-3 Terminal Strips on the TopDry Terminal

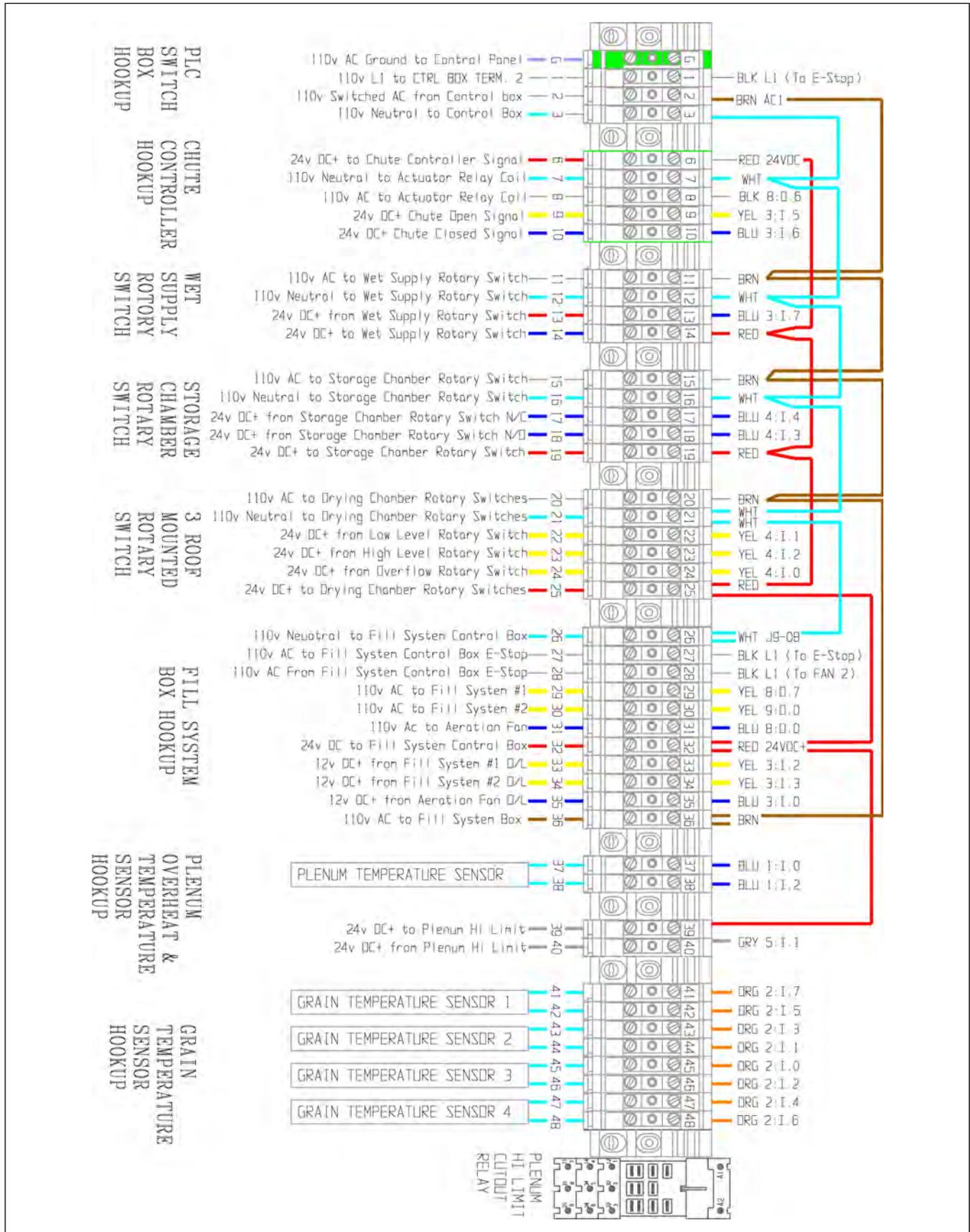


Figure 5-5 TopDry Terminal

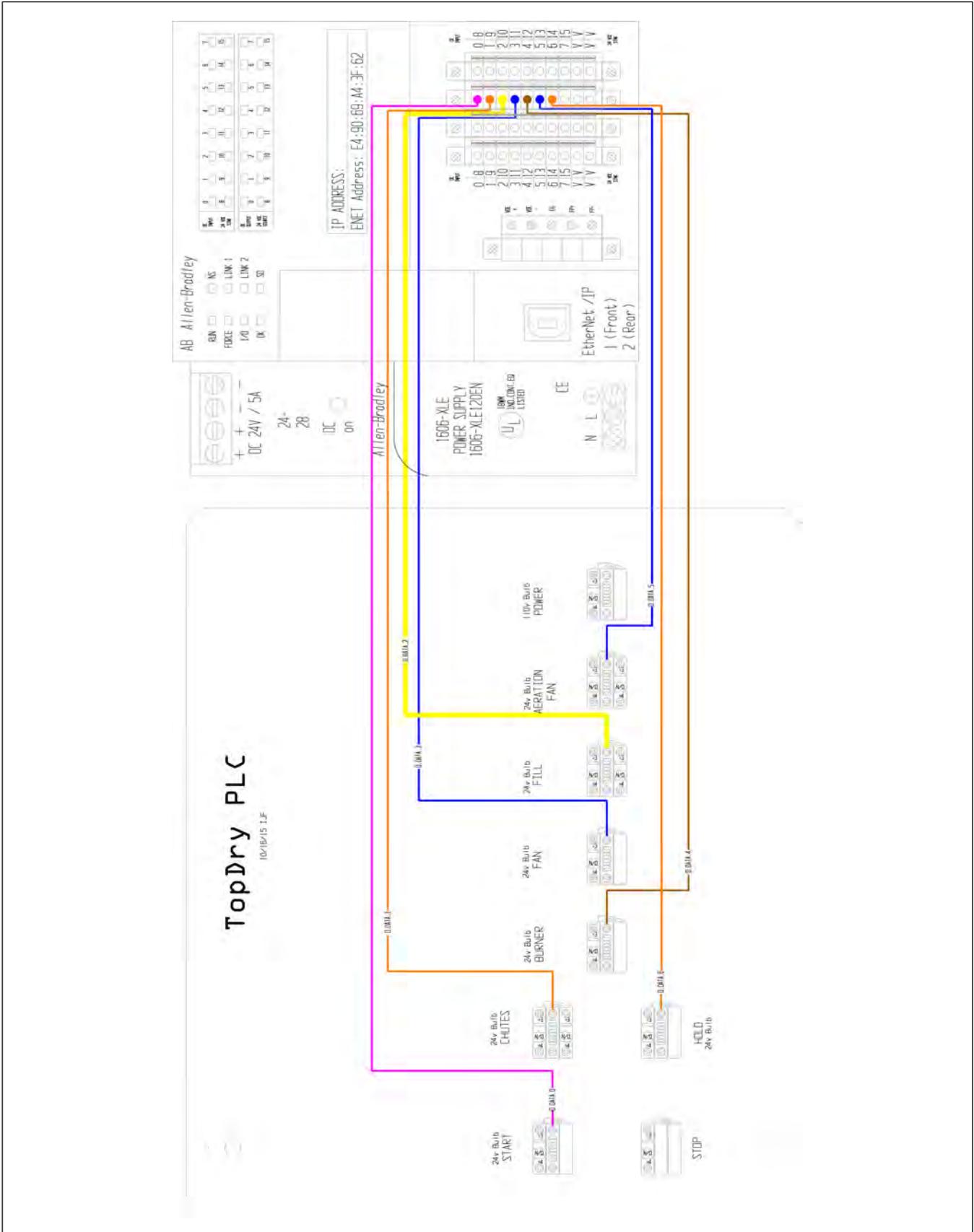
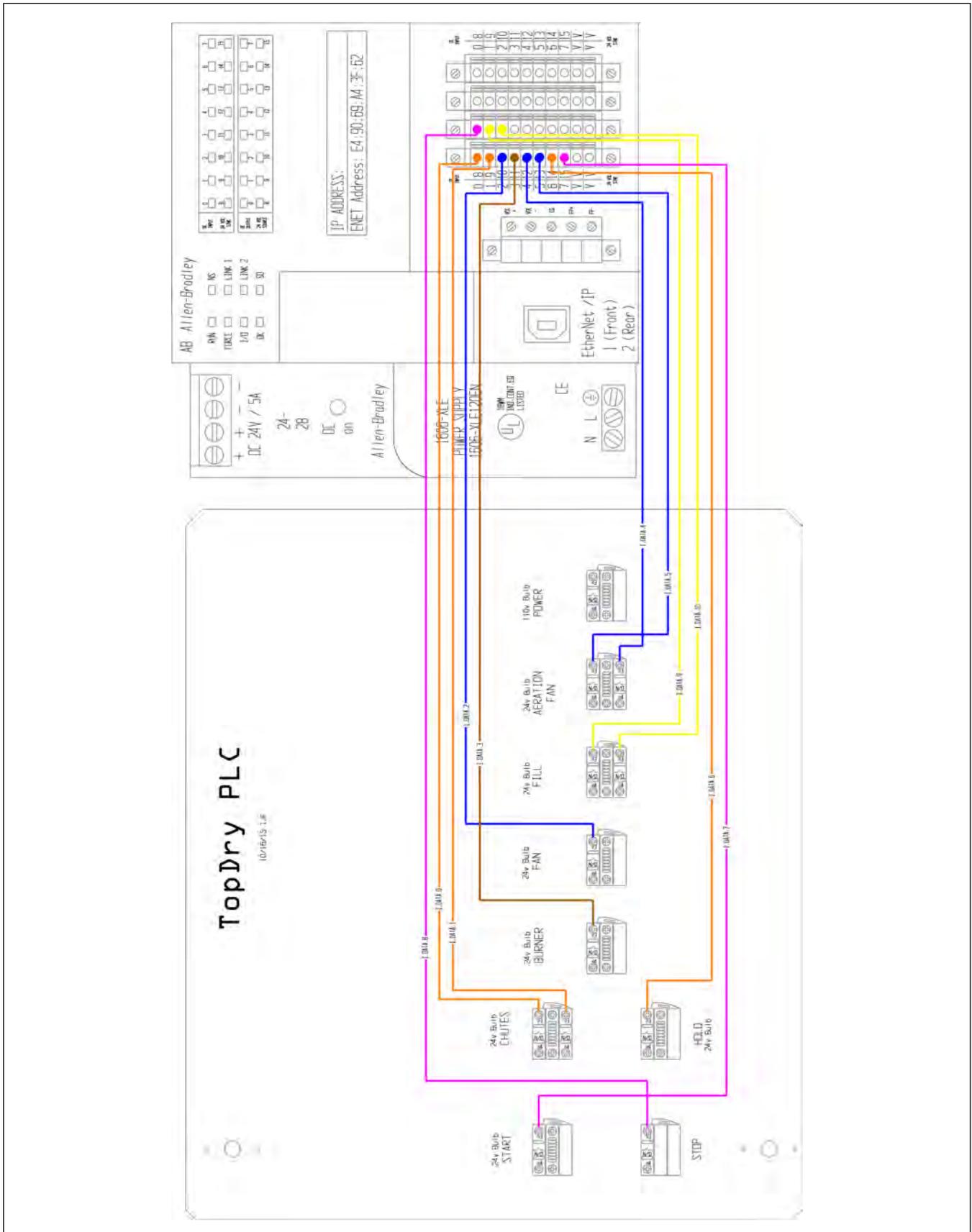


Figure 5-6 TopDry Terminal



TopDry Terminal Fan and Heater Wiring

Figure 5-7 Fan Terminal Wiring

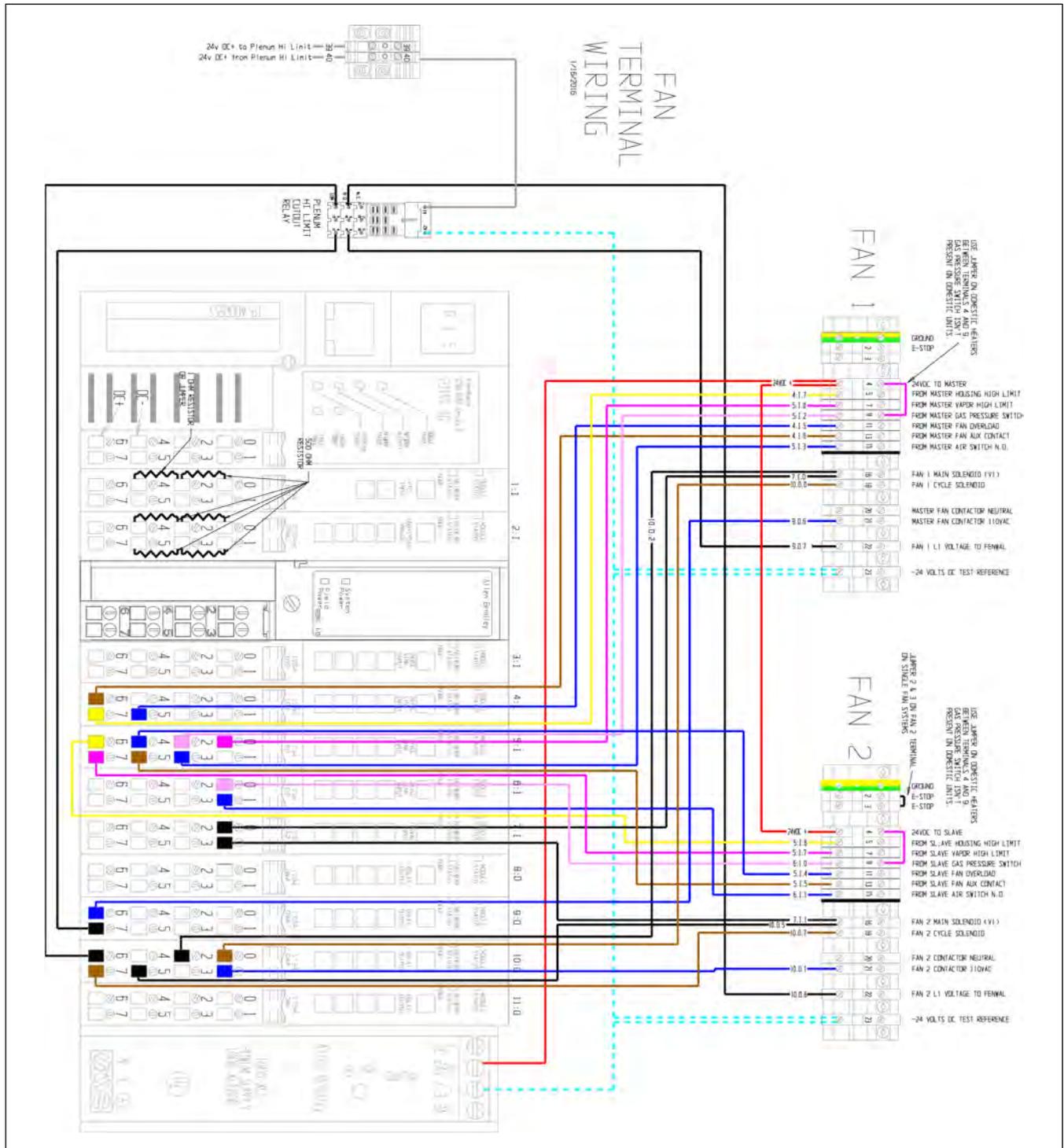


Figure 5-8 Fan and Heater 1

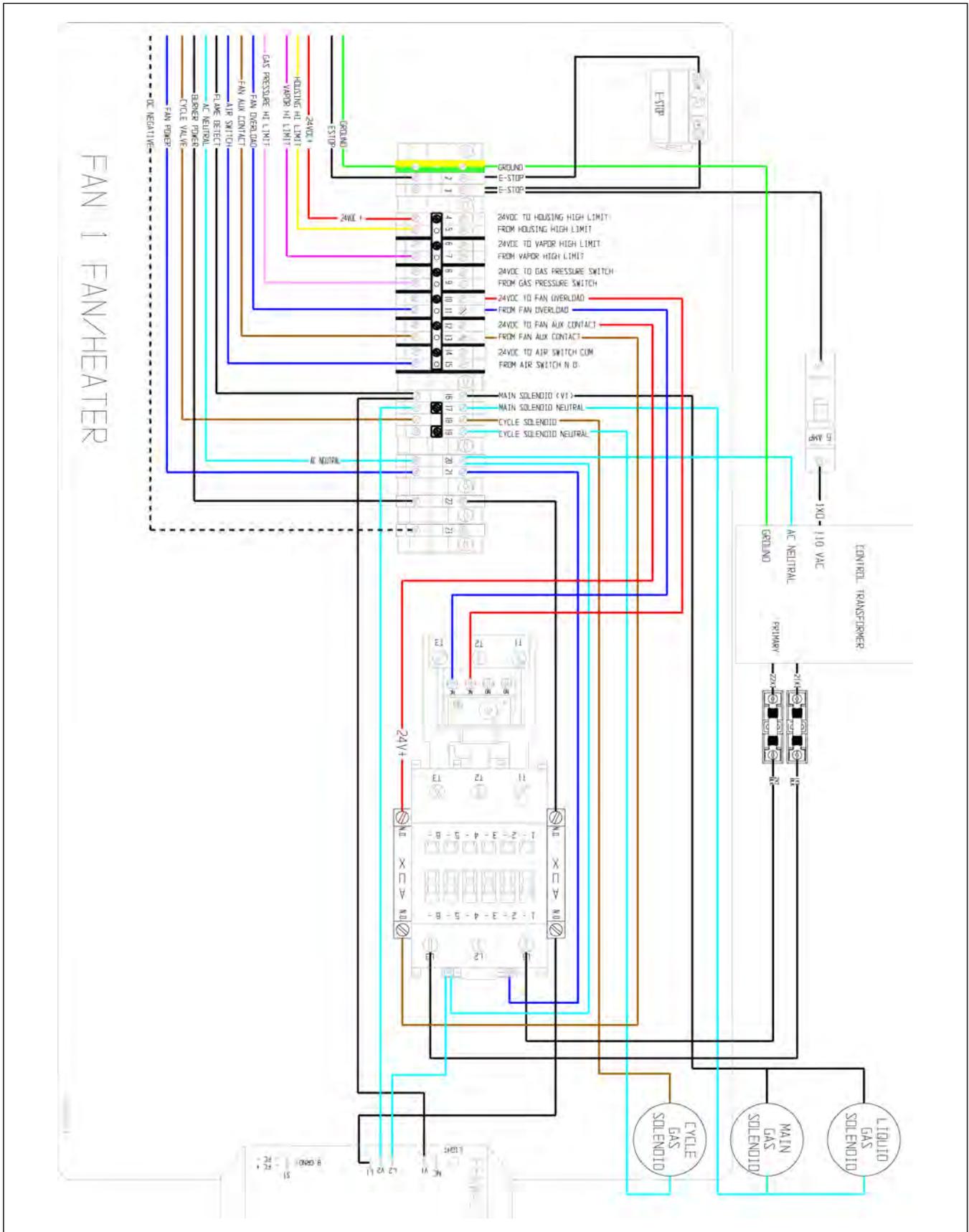


Figure 5-9 PLC Autoflow CSA LP Fan 1 Heater wiring

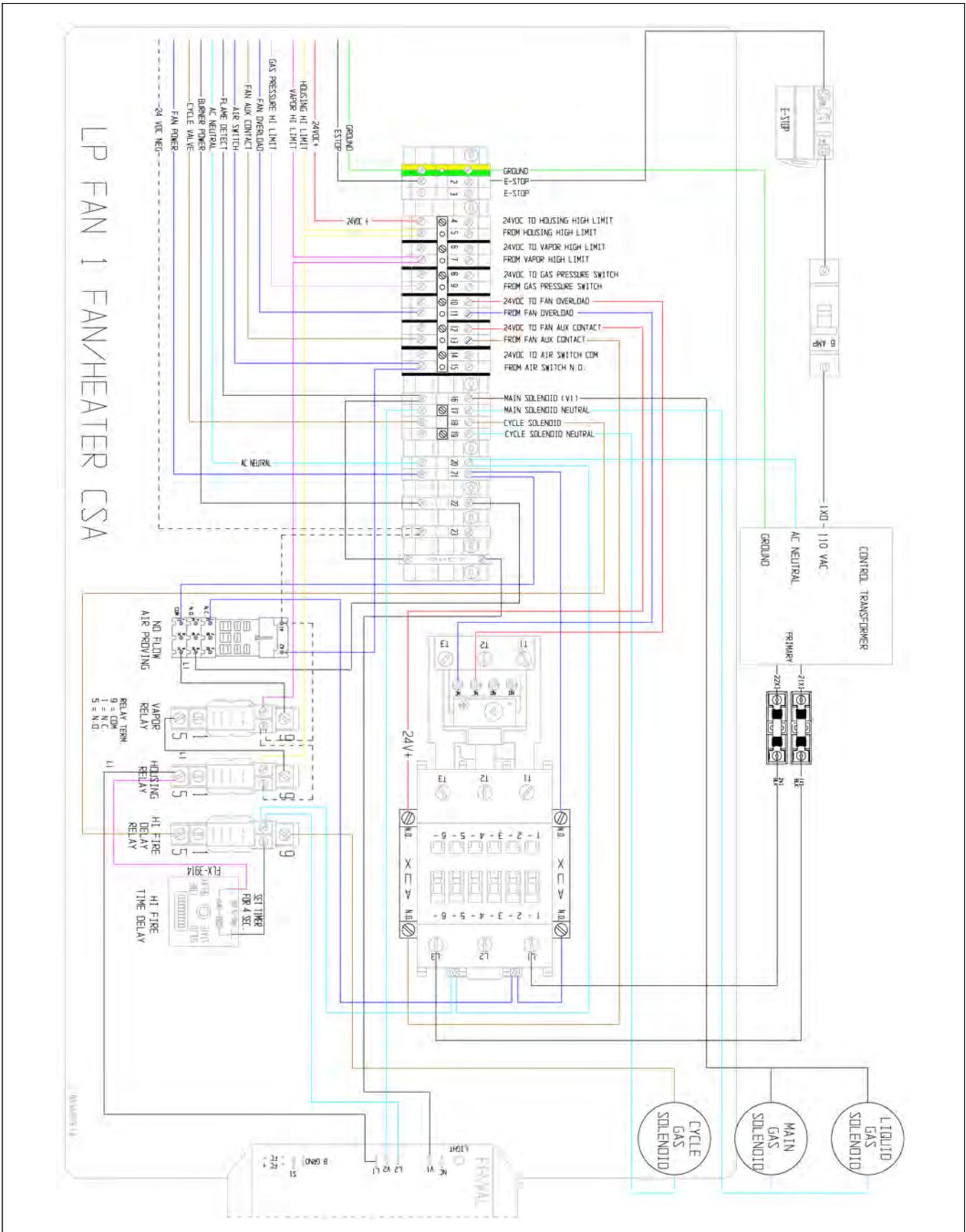


Figure 5-10 PLC Autoflow CSA NG Fan 1 Heater wiring

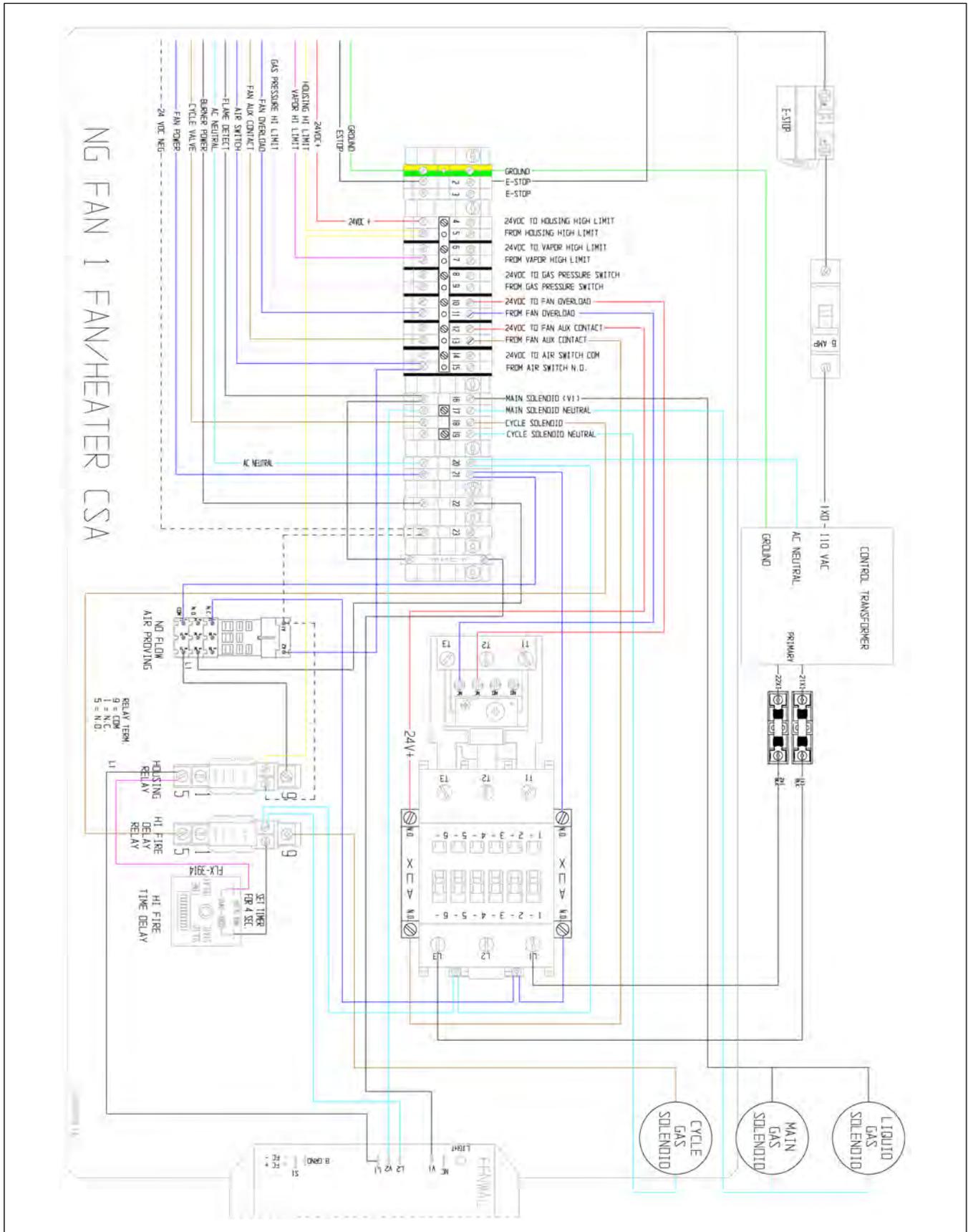
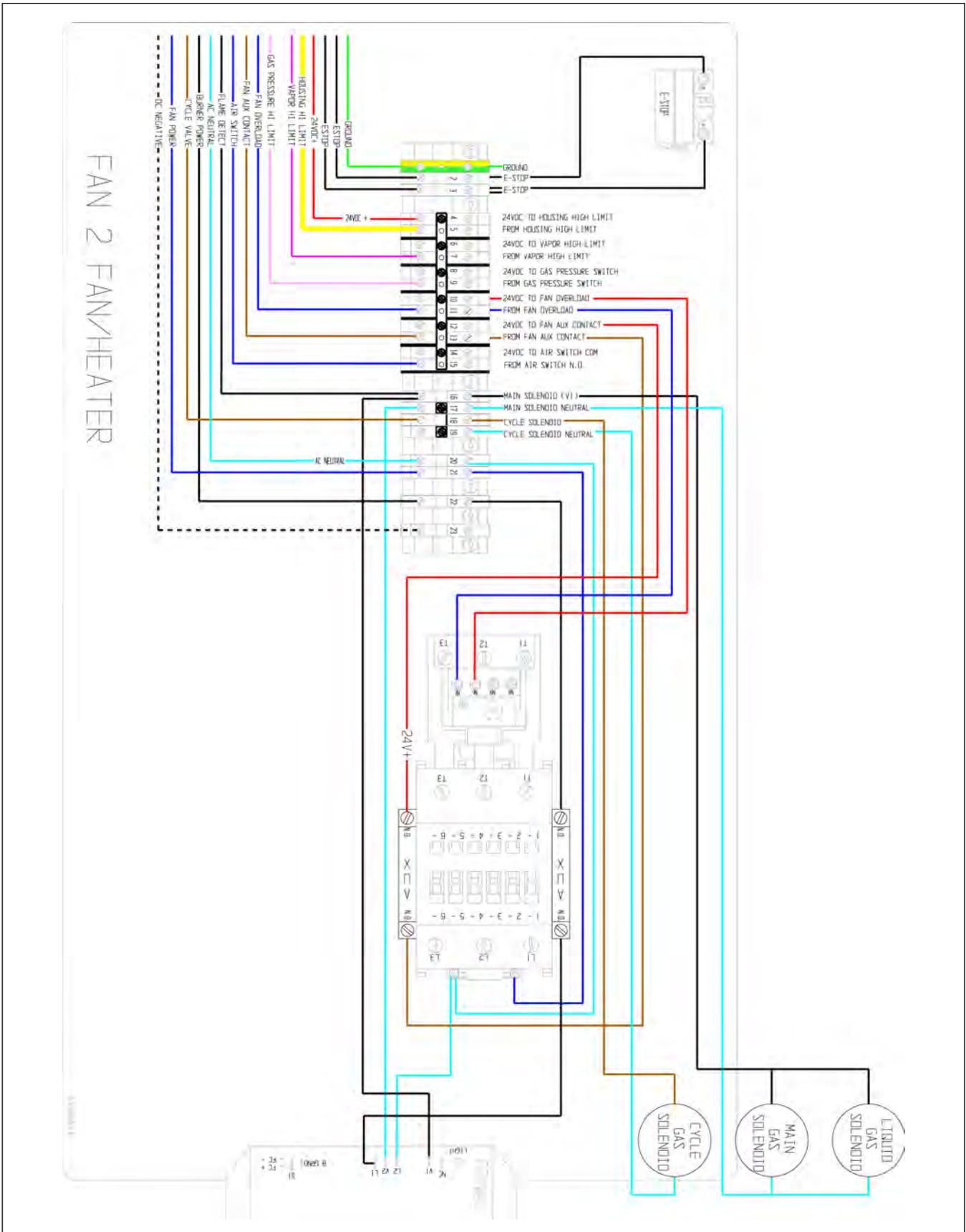


Figure 5-11 Fan and Heater 2



Chapter 5: Wiring Diagrams

Figure 5-13 PLC Autoflow CSA NG Fan 2 Heater wiring

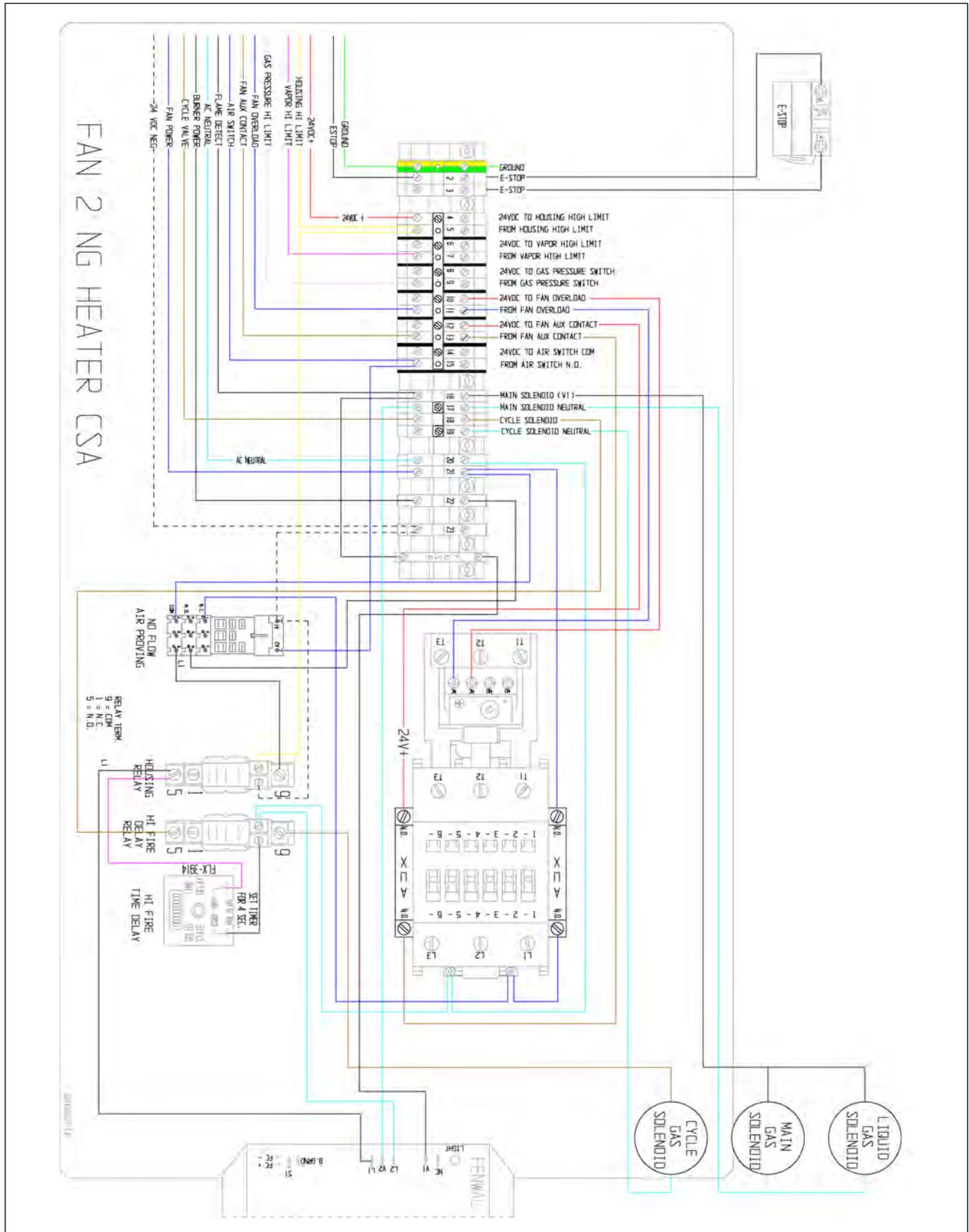
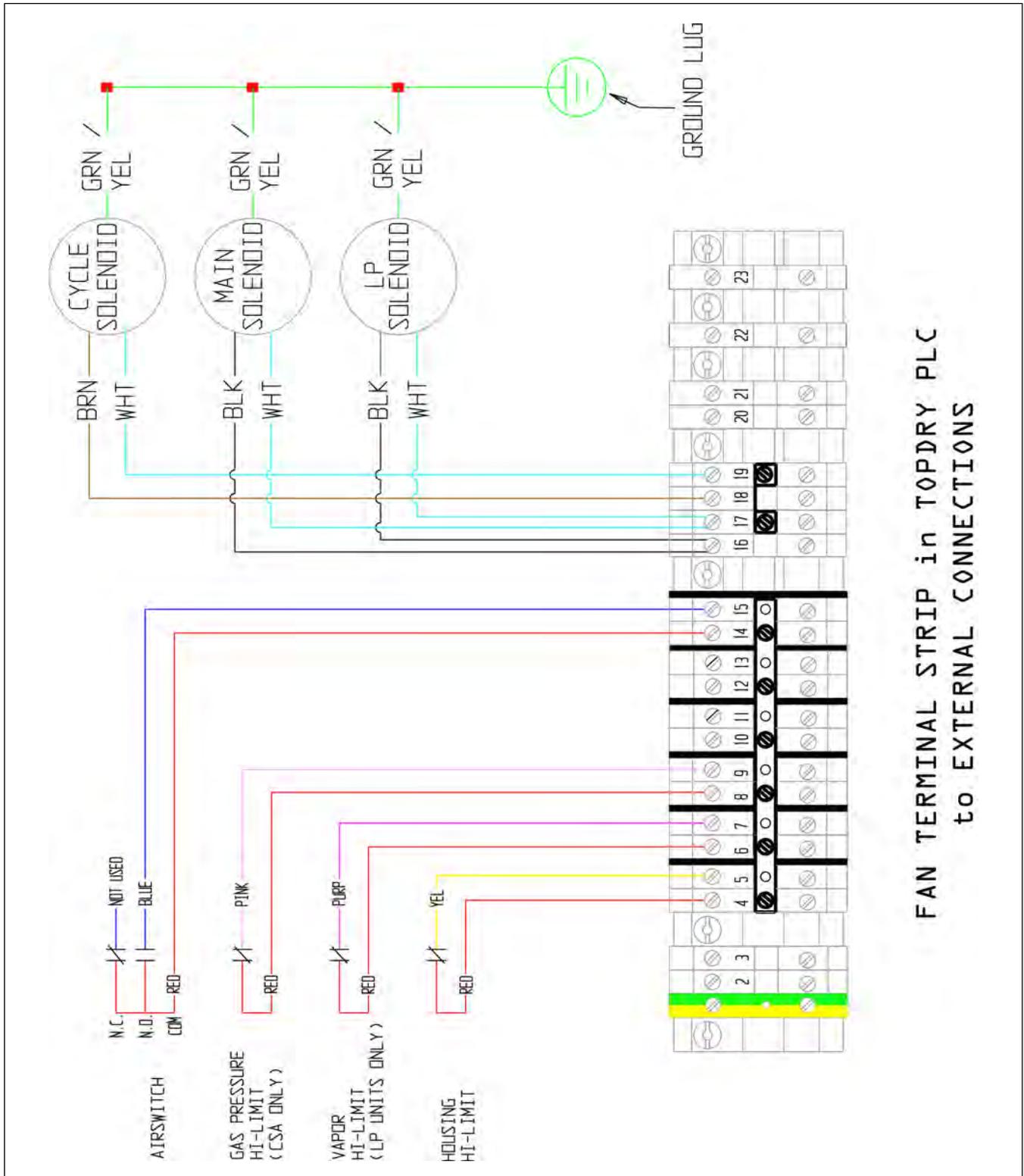
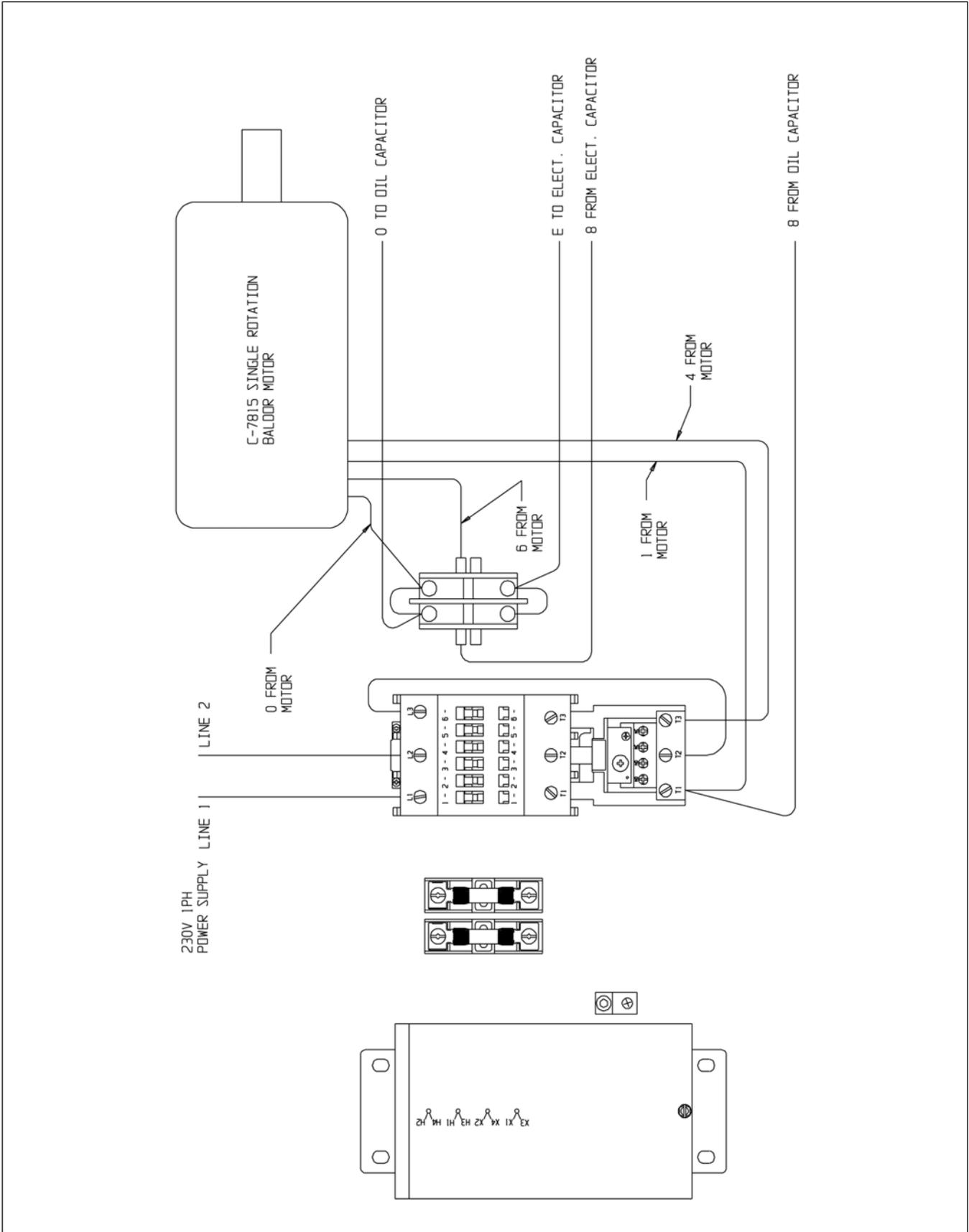


Figure 5-14 Fan Terminal Strip in PLC to External Connections



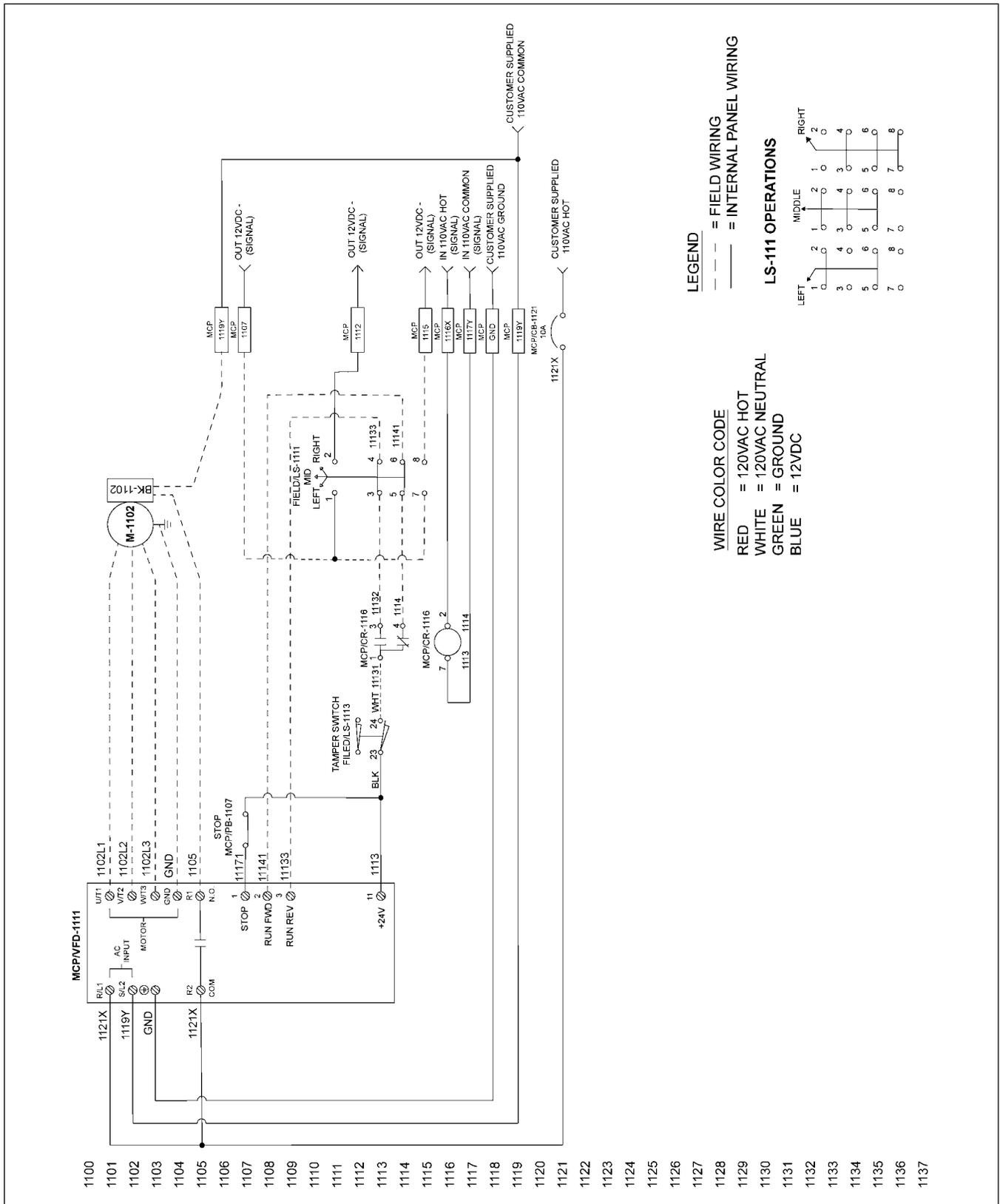
Chapter 5: Wiring Diagrams

Figure 5-15 Series 2000 Master 15 HP 220V 1 PH Capacitor Wiring (Baldor)



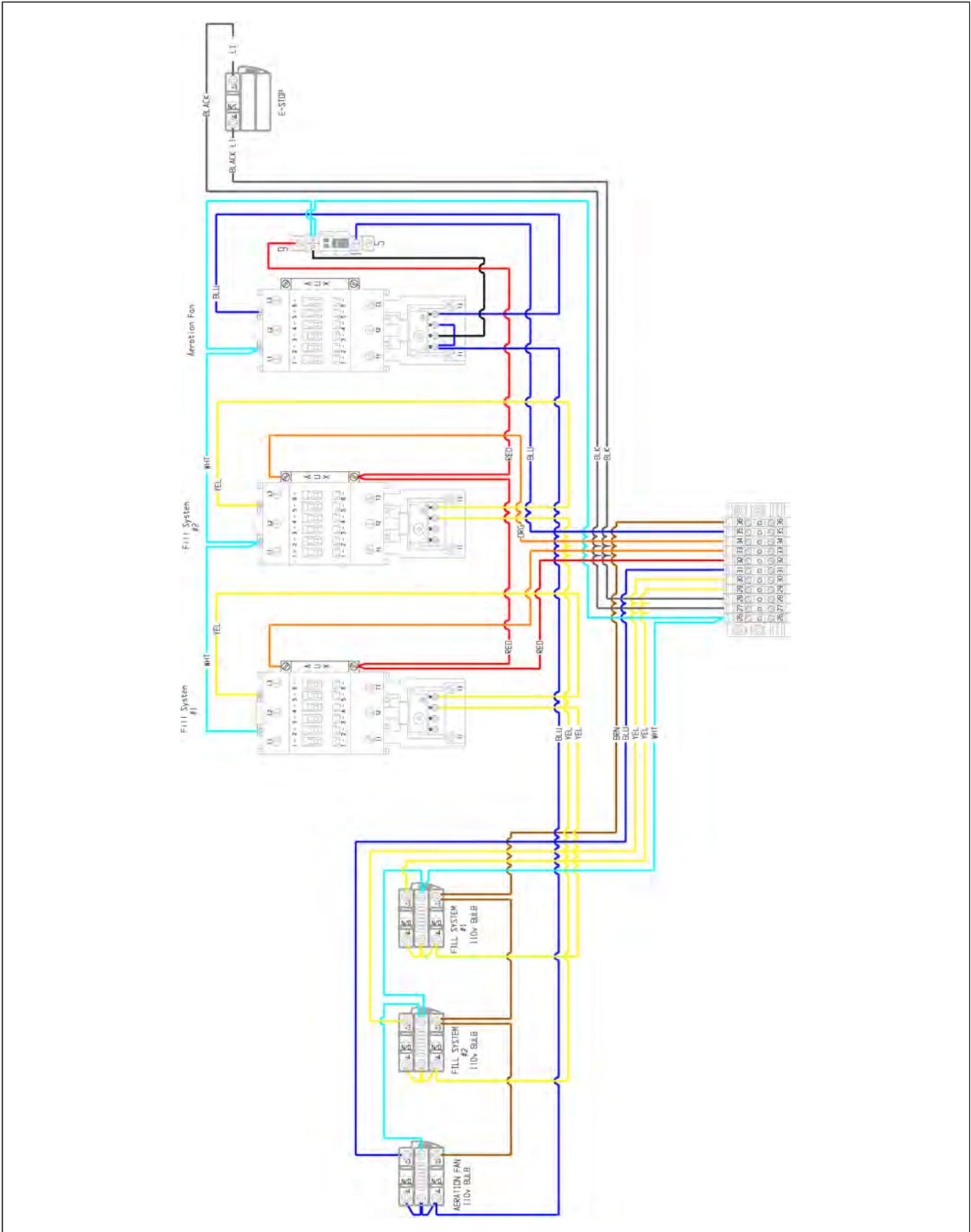
TopDry Terminal Actuator Wiring

Figure 5-16 Actuator Control Panel Wiring Schematic



Fill System Control Wiring

Figure 5-17 Fill System Wiring



Limited Warranty — N.A. Grain Products

The GSI Group, LLC. (“GSI”) warrants products which it manufactures, to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months from the date of shipment (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI’s sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

Warranty Enhancements: The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period. (Warranty Period is from date of shipment.)

	Product	Warranty Period
Storage	Grain Bin Structural Design • Roof, doors, platforms and walk arounds • Flooring (when installed using GSI specified floor support system for that floor) • Hopper tanks	5 Years
Conditioning	Dryer Structural Design – (Tower, Portable and TopDry) • Includes (frame, portable dryer screens, ladders, access doors and platforms)	5 Years
	All other Dryer parts including: • Electrical (controls, sensors, switches & internal wiring)	2 Years
	Bullseye Controllers	2 Years
Material Handling	Bucket Elevators Structural Design	5 Years
	Towers Structural Design	5 Years
	Catwalks Structural Design	5 Years
	Accessories (stairs, ladders and platforms) Structural Design	5 Years

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY PRODUCT MANUFACTURED OR SOLD BY GSI, OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor. Prior to installation, the end-user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained.

Notice Procedure:

In order to make a valid warranty claim a written notice of the claim must be submitted, using the RMA form, within 60 days of discovery of a warrantable nonconformance. The RMA form is found on the OneGSI portal.

Service Parts:

GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase unless specified in Enhancements above.

(Limited Warranty - N.A. Grain Products_ revised 19 October 2018)

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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