



EPIQ + Hardware Installation Guide

Product Specifications

- Fan Node Power Input Voltage Range:
 - 100-480VAC for line-to-line power
 - 100-277VAC for single phase power
- Incoming Fuse Rating: T2A 600VAC 5x20 or 6.3x32mm form factor
- Relay Fuse Rating: F15A 600VAC 5x20 or 6.3x32 mm form factor
- Product Weight : 4.5 kg (10 lbs)
- Dimensions (Width x Height x Depth): 343mm x 419mm x 107mm (13.5" X 16.5" X 4.2")
- IP55 rating ensures protection against dust and low-pressure water from any direction
- Operational temperature from minus 25°C to 55°C (minus 13°F to 131°F)
- Manufacturer:
 - OPIsystems Inc - 1216 36th AVE NE, Calgary, Alberta, Canada, T2E 6M8
- Specifications conform to ANSI/UL 61010-1
- Certified to CAN/CSA std. CSA C22.2#61010-1

Required Tools

- 7/16" wrench
- 1-1/16" wrench or adjustable equivalent wrench
- Drill with a 3/8" Nut Driver and extender
- #2 or #3 Philips screwdriver
- 1/8" flathead screwdriver
- Wire stripper with #14 and #20 AWG positions
- Impact Driver and a 1 1/4" step bit or 1 1/4" through saw.

General Instructions & Warnings

- **WARNING:** If you are installing an OPI EPIQ system with EPIQ+ Automated (Fan and Heater) Control, it is important to recognize and understand that all electrical wiring that deals directly with the AC power supply, as well as fan and heater control must be completed by a certified Electrician. This includes Transformers (if required), main (AC) power, relays, and any external switches.

- It is imperative that all local electrical code guidelines applicable by law are followed. **Failure to follow these guidelines may result in improper operation of equipment, damage to the equipment, loss of warranty, and personal harm resulting in severe injury or even death.**
- **Safety Precautions:** Before proceeding with the installation of the Fan Node and associated fan control hardware, take the following steps to reduce the risk of damage to the equipment or injury:
 1. De-Energize the power to the installation location at the circuit breaker by switching the circuit breaker to “OFF”.
 2. Before proceeding with any electrical work validate that the power is indeed OFF. Use a multimeter to confirm that power has indeed been disabled.
 3. Do Not install any Fan Control Equipment while:
 - a. Aeration fans are running.
 - b. There is heavy equipment in active use on the site (tractors, grain trucks, etc.)
 - c. There is grain being filled into the bin structure.
 4. Always complete any required safety inductions and evaluate the site for potential safety hazards before installing any equipment. Review any site-specific safety precautions defined by the site owner/company/organization in addition to the above instructions.
 5. For the installation of EPIQ Cable Nodes please refer to USR-000034-A: “OPI EPIQ Installation and Configuration Manual”.

EPIQ+ Fan Node Installation

- Depending on the site configuration and application, the EPIQ+ Fan Node should be installed in a location that best supports the operational requirements of the system.
- In addition to the fan or heater and power connections, several additional connections and sensors are required to complete the installation and ensure proper system operation. These additional connections and sensors include the following: EPIQ Cable nodes, Weather Station, Headspace Grain Quality Sensor, and Plenum Grain Quality Sensor.
- **Line power to the Fan Node must be installed by a certified electrician.** Standard installations use conduit for all power runs. In applications where conduit is not used, tray rated cabling must be used for any exposed wiring. In some installations, a step-down transformer installed by a certified electrician may be required to reduce the incoming power supply to a usable input voltage for the Fan Node. This connection is permanent and fixed. Again, ensure all local regulations are verified prior to installation.
- Depending on the system configuration, a wired connection installed by a certified electrician will run from the relays within the Fan Node to the aeration fan(s), with or without heater(s). The EPIQ+ Fan Node is available in either two relay or four relay configurations. These are permanent fixed connections.
- **Note:** Failure to use the equipment in the manufacturer’s intended manner or outside the specifications could result in the built-in safety features no longer protecting personnel or the equipment itself.
- The EPIQ+ Fan Node must be connected by a wired connection to an EPIQ Primary or Secondary Cable Node which is on top the storage structure. This connection does not

require installation by a certified electrician and can be completed by any installer. It provides line power to the EPIQ Cable Node and enables communication for data transfer between the hardware and the cloud platform.

- The Plenum Grain Quality Sensor is installed on the outer wall of the bin in the plenum and connected to the EPIQ+ Fan Node on each storage structure. It measures pressure, air temperature, calculated relative humidity, and Equilibrium Moisture Content, providing key inputs for automated control of aeration fans and heaters.
- The Weather Station is installed at a central location on the storage site and connects to a single EPIQ+ Fan Node that is connected to an EPIQ Primary Cable Node. **Note:** The Weather Station **must be** without exception connected to a Fan Node that is connected to a Primary Cable Node. The Primary Cable Node shares the weather data with each of the Secondary Cable Nodes. The exact installation location may vary by site, but it should be mounted where the required connections can be easily accommodated, typically on a bin wall and at roughly 6 feet from the ground.

Note: If liquid-tight flexible metal conduit is used it is imperative that the proper certified ½ inch liquid tight metal conduit fitting is used. The recommended fitting is from manufacturer ABB Part # 5232. When a ground lug is needed the recommended fitting also from manufacturer ABB Part # 5232GR.

Connector Specifications

Type LTGC – General Purpose

General Purpose, CSA Certified T&B liquid-tight Flexible Metallic Conduit provides excellent strength and liquid-tight performance meeting CEC requirements.

Materials: Steel Core Smooth PVC Jacket

Color: (Black Standard)

CSA Flame Test: FT4 Rated

Installation Steps:

1. Select an installation location near the fans that is at eye level, or approximately 5'.
2. Measure and mark the desired installation location, ensuring the EPIQ+ Fan Node is level. Making sure that the self-tapping screws used to secure the Fan Node to the bin wall should always be drilled into the peak of the corrugation. (shown in Fig. 1below)



Figure 1: Self-Tapping Screw Location on Peak of Bin Wall Corrugation

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3. With one hand hold the EPIQ+ Fan node in place, and with the other hand, starting at the top corner of your dominant hand, use a cordless drill or impact driver to attach the 4 x #14-1 ¼" self-tapping screws into each of the mounting corners of the enclosure (see Figure 1).

Note: Once the installation location has been marked for ease of installation it is recommended that a pilot hole is pre-drilled prior to drilling with the self-tapping screws. Once completed make sure to check alignment and level after each corner is secured.

Pro-Tip: For ease of installation, use an extended nut driver with your cordless drill or impact driver.



Figure 2: Mounting Screw Locations on EPIQ+ Fan Node

4. 4-conductor COM cable is required to connect the EPIQ+ Fan Node to the EPIQ Cable Node installed on top of the Bin Structure (Figure 3).



Figure 3: Example Connection Between EPIQ+ Fan Node and EPIQ Cable Node Shown

5. Ensure that all connections into the EPIQ+ Fan Node are inserted through the appropriate connector spot on the bottom of the node. (Figure 4) **Note:** Three of the connector locations will come pre-drilled (for low voltage connections) while the remaining six will have a center indicator to aid in drilling in the field as needed.

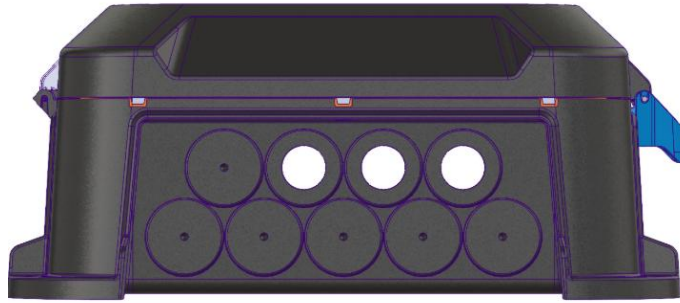


Figure 4: Fitting Connector Locations (3 Pre-Drilled + 6 to be Drilled in Field as Needed)

6. Cut the COM cable to length, strip (1.5 inches – 4 cm) off from the outer jacket. Using the same wire stripper on the exposed run cable remove 3/8 inch (1 cm) from the wire insulation. This ensures a good consistent termination of all wires.

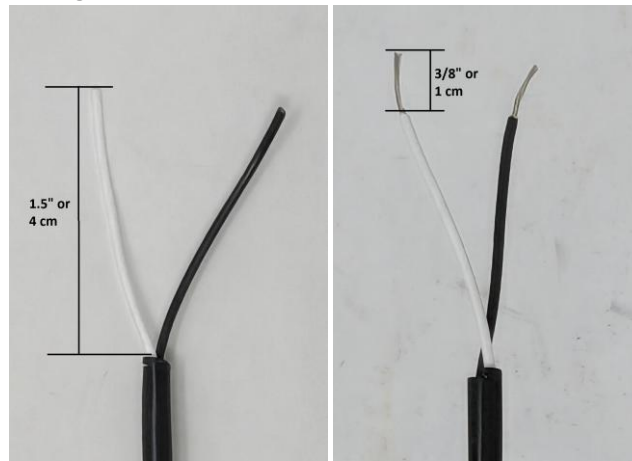


Figure 5: Example of wire cutting and stripping ONLY. Not a match for number of wires or colour.

7. Connect the 4-conductor COM cable from the EPIQ+ Fan Node terminations inside of the EPIQ Cable Node at the top of the bin. (Figure 6)
 - a. If exposed run rated cable is used, the following is the correct termination of each wire: VCC = Red wire, Gnd = Black wire, B = White wire, and A = Green wire.
 - b. If non-exposed run rated cable is used, the following is the correct termination of each wire: Vcc = Red wire, Gnd = Black wire, B = White wire, A = Blue wire.



Figure 6: Termination Points on the EPIQ Cable Node for connection to the EPIQ+ Fan Node

8. Insert one end of the COM cable into the EPIQ+ Fan Node through the appropriate connector location (refer back to Figure 3).

9. Connect the 4-conductor COM cable from the EPIQ Cable Node terminations inside of the EPIQ+ Fan Node. (Figure 7)

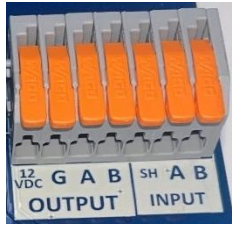


Figure 7: Termination Points on the EPIQ+ Fan Node for connection to the EPIQ Cable Node

- a. If exposed run rated cable is used, the following is the correct termination of each wire: 12VDC = Red wire, G = Black wire, A = Green wire, and B = White wire.
 - b. If non-exposed run rated cable is used, the following is the correct termination of each wire: 12VDC = Red wire, G = Black wire, A = Blue wire, and B = White wire.
10. The shield (5th stripped braided wire between the 4 wires) is to be only connected on the EPIQ+ Fan Node end (“SH” termination in Figure 5 above).

WARNING: Installing the exposed run cable or the COM cable in conduit on the side of the bin wall will require the installer to work at heights which will expose the installer to risk of fall, serious injury, or death. **Note:** It is the installer’s responsibility to ensure they have the proper personal safety and protective equipment to minimize risk. It is also important that all local laws and site regulations when working at heights including but not limited to having up to date certifications for working at height and operating any required equipment.

11. Secure the 4-conductor COM cable on:
 - a. Side of the bin wall:
 - i. If using an exposed 4-conductor COM cable run, secure the cable with P-Clips every 1.5 meters (4’-5’).
 - ii. If using a non-exposed 4-conductor COM cable, secure the conduit to the ½ inch conduit fittings on both the Cable Node and the Fan Node to create water-tight fittings.
 - b. Or alongside staircase or vertical ladder rail:
 - i. If using an exposed 4-conductor COM cable run, secure the cable with zip ties every 2 meters (5’ - 6’).
 - ii. If using a non-exposed 4-conductor COM cable, secure the conduit with J-straps every 2 meters (5’ - 6’). Make sure to secure the ½ inch conduit fittings on both the Cable Node and the Fan Node to create water-tight fittings.

Weather Station (ORHT) installation

- The Weather Station measures ambient temperature and relative humidity that is used to determine the Equilibrium Moisture Content of the ambient air.
- This device can be installed by a non-electrician installer.

- The Weather Station should be installed near the bins/silos in an unobstructed area. It should not be in a shaded area, or an area that is too close to the bins/silos that it gets influenced by the heat emitted from the fans and/or heaters when they are running.
- Avoid installing it directly on a bin roof or wall as the radiated heat from the surface can alter temperature values.
- The weather station will be installed using a tray rated cable as it is an exposed run of cable from the device to the EPIQ+ Fan Node.

Installation Instructions:

1. Once the ideal installation location is determined, use a cordless drill with a 3/8" Nut Driver attach the 3 self-tapping screws, which were included in the Weather Station box, to secure the foot mount (Figure 8).

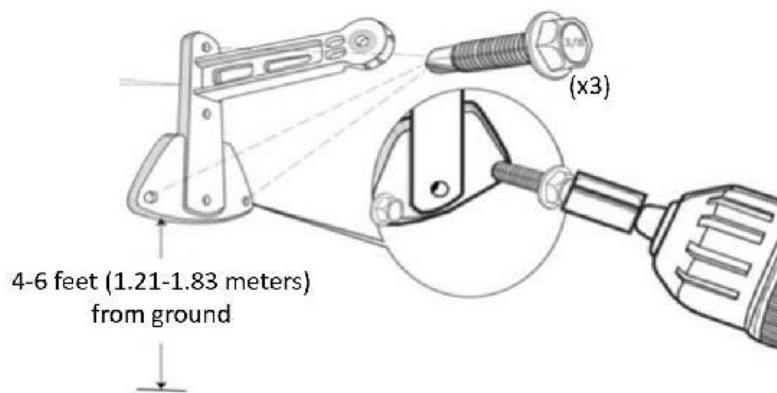


Figure 8: Weather Station Mounting

2. Attach the Weather Station to the foot mount using a 7/16-inch wrench and tighten so it is in a vertical position, typically at 90 degrees. (Figure 9)

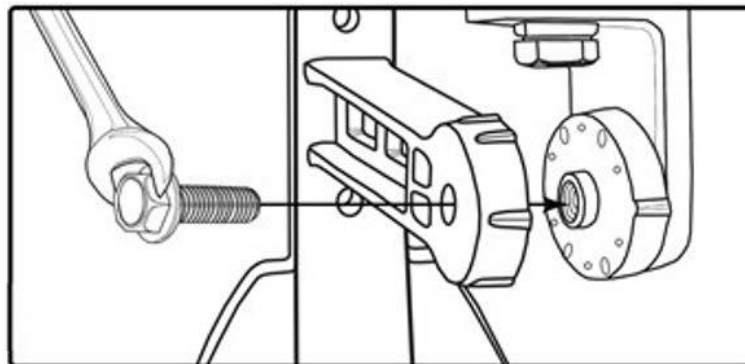


Figure 9: Attach Weather Station to Foot Mount

3. Cut the INT2 cable to the proper length. This will ensure the correct length and avoid any excess cable or risk from it being cut too short.
4. Run the 2-wire cable lead through the appropriate ½ inch cable gland on the EPIQ+ Fan Node.
5. Strip (1.5 inches – 4 cm) off from the outer jacket off using a wire stripper to expose the black and white wire. Using a wire stripper remove 3/8 inch (1 cm) from the wire insulation (refer back to Figure 4).
6. Refer back to Figure 3 for the exact connector location entry point and insert the wire into the EPIQ+ Fan Node appropriately.
7. Connect the white (W) and black (B) wire in the appropriate Weather Station (WS) 2-wire levered termination as labeled on the EPIQ+ Fan Node (Figure 10).



Figure 10: EPIQ+ Fan Node Weather Station Termination

8. Secure the INT2 cable between the Weather Station (ORHT) and the Fan Node every 4 feet (1.25 meters) using the P-Clips provided. (Figure 11)



Figure 11: P-Clips Used for Securing Cables

Plenum Grain Quality Sensor (PGQS)

- The PGQS should be installed in a location close enough to where the fan transition is mounted to the outside bin/silo wall. This installation location ensures the most reliable and timely pressure and temperature readings from the sensor.
- Between the PGQS and the EPIQ+ Fan Node if exposed run cable is used, conduit is not required. If non-exposed run cabling is used, conduit is required. **Note:** It is recommended that Liquid Tight Flex conduit is used in this application. It is a simple cost-effective means to creating a protective liquid tight barrier from the device into the Fan Node enclosure.
- This device can be installed by a non-electrician installer.



Figure 12: Overview of Plenum Sensor Installation

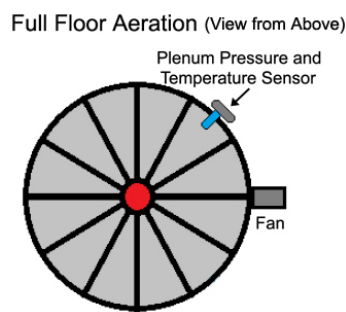


Figure 13: Illustration of Plenum Sensor Location

Installation Instructions:

1. Use a step bit to drill a 1 ¼ inch (3.1 cm) hole in the desired location ensuring it is in plenum. (Between the concrete pad and the Aeration floor).



Figure 24: Step Bit for Drilling Holes in Corrugated Steel

2. Feed the probe/nozzle portion of the PGQS through the drilled hole and mount the PGQS to the bin surface using two 12-14 x ¾ self-drill screws provided.
3. Measure the correct length of conduit needed to reach from the PGQS to the EPIQ+ Fan Node. Be sure to include extra length (3 feet or 1 meter) to accommodate a drip loop at both the PGQS and the Fan Node enclosure.



Figure 35: Flex Conduit and J-Strap to Secure Conduit

4. Using a Fish Tape pull the cable from the PGQS through the ½ inch conduit.

5. Secure the ½ inch conduit to the ½ inch conduit fitting at the bottom of the PGQS and tighten the conduit fitting to create a watertight connection.
6. Secure the installed ½ inch conduit run (with a drip loop) every 4' - 5' (1.5 meters) with a J-Strap between the PGQS and the EPIQ+ Fan Node.
7. Drill a small drain hole in the underside of the drip loop of the conduit at either end of the conduit connection points.
8. Refer back to Figure 3 for the exact connector location entry point and insert the wire into the EPIQ+ Fan Node appropriately.
9. Connect the Red (R) Black (b) and White (W) wires in the appropriate Plenum Sensor (Plenum) 3-wire levered termination as labeled on the EPIQ+ Fan Node (Figure 16).



Figure 16: Plenum Grain Quality Sensor Station Termination on EPIQ+ Fan Node

Maintenance of Equipment

Regular visual inspection and timely maintenance of this equipment are essential to ensure safe and reliable operation. Failure to properly inspect and maintain the system may result in equipment malfunction, reduced performance, electrical hazards, or personal injury.

All electrical components—including wiring, terminals, contactors, relays, transformers, and protective devices—must be routinely checked for signs of wear, damage, corrosion, overheating, or loose connections. Any abnormalities must be addressed immediately by qualified personnel.

Maintenance shall be performed at appropriate intervals based on operating conditions and manufacturer recommendations. This includes tightening connections, cleaning components, verifying proper voltage levels, and confirming the correct operation of all control and safety devices.

Always de-energize and lock out the equipment before performing any inspection or maintenance work.

Failure to follow these guidelines may void warranties, compromise system integrity, and create unsafe operating conditions. Only trained and authorized personnel should perform inspection and maintenance activities.

Electrician Instructions – Wiring and Schematics

- **Warning:** The following steps and instructions are to be completed exclusively by certified and compliant electricians.
- All high voltage connections occur behind the orange door inside the EPIQ+ Fan Node.

- **Note:** Before proceeding it is imperative that all applicable electrical sources are de-energized and proper lockout/tagout procedures are followed prior to any electrical work taking place. Once this process has been followed verification with properly rated voltage meter must be completed as a final step prior to commencing work.

Protective Earth Connection Configuration (electrician use only)

1. Earth connection to terminal block

- Ensure the incoming cable includes a Protective Earth (PE) conductor.
- Verify the Protective Earth Bonding meets local electrical regulations and guidelines.
- Verify the PE conductor is securely terminated in the designated earth terminal. (Figure 17)



Figure 17: Designated earth terminal

Single Phase Installation with a Step-Down Transformer (Qualified Electricians)

Overview

This system uses a transformer to reduce high voltage to a safer level for controls, while a contactor switches power to the motor.

Pre-installation Requirements

- Verify incoming voltage exceeds 480V and matches transformer rating
- Confirm motor voltage and full load amperage (FLA)
- Ensure transformer, contactor, overload, and fuses are properly rated
- Follow all applicable electrical codes (CEC/NEC). followed prior

Power Circuit Wiring

- Connect Line (L1) through a primary fuse to transformer terminal H4
- Connect Neutral (N) or second phase to H2/H3
- Feed contactor line terminals from incoming supply
- Connect contactor load side (T1/T2) to motor terminals

Transforming Wiring

- Primary: H4 (Line), H2/H3 (Neutral/Phase)
- Secondary: X1 (control hot via fuse), X2 (grounded/common)
- Bond transformer core to ground

Control Circuit Wiring

- Supply control voltage from X1 through fuse
- Wire X2 as control return (grounded)
- Connect relay COM to control hot
- Relay N.O. feeds contactor coil (A1)
- A2 returns to X2
- Optional local switch wired in series with relay output

Overload Protection

- Install overload in series with motor or within contactor
- Wire auxiliary contacts (95-96) in series with control circuit

Grounding

- Ground transformer secondary (X2)
- Ground motor frame and enclosure
- Ensure proper bonding throughout system

Final Checks

- Verify correct secondary voltage
- Confirm contactor coil voltage compatibility
- Set overload based on motor FLA
- Perform functional startup test

Schematics (electrician use only)

Schematic for Single Phase Motor Control - Without Transformer (Figure 16)

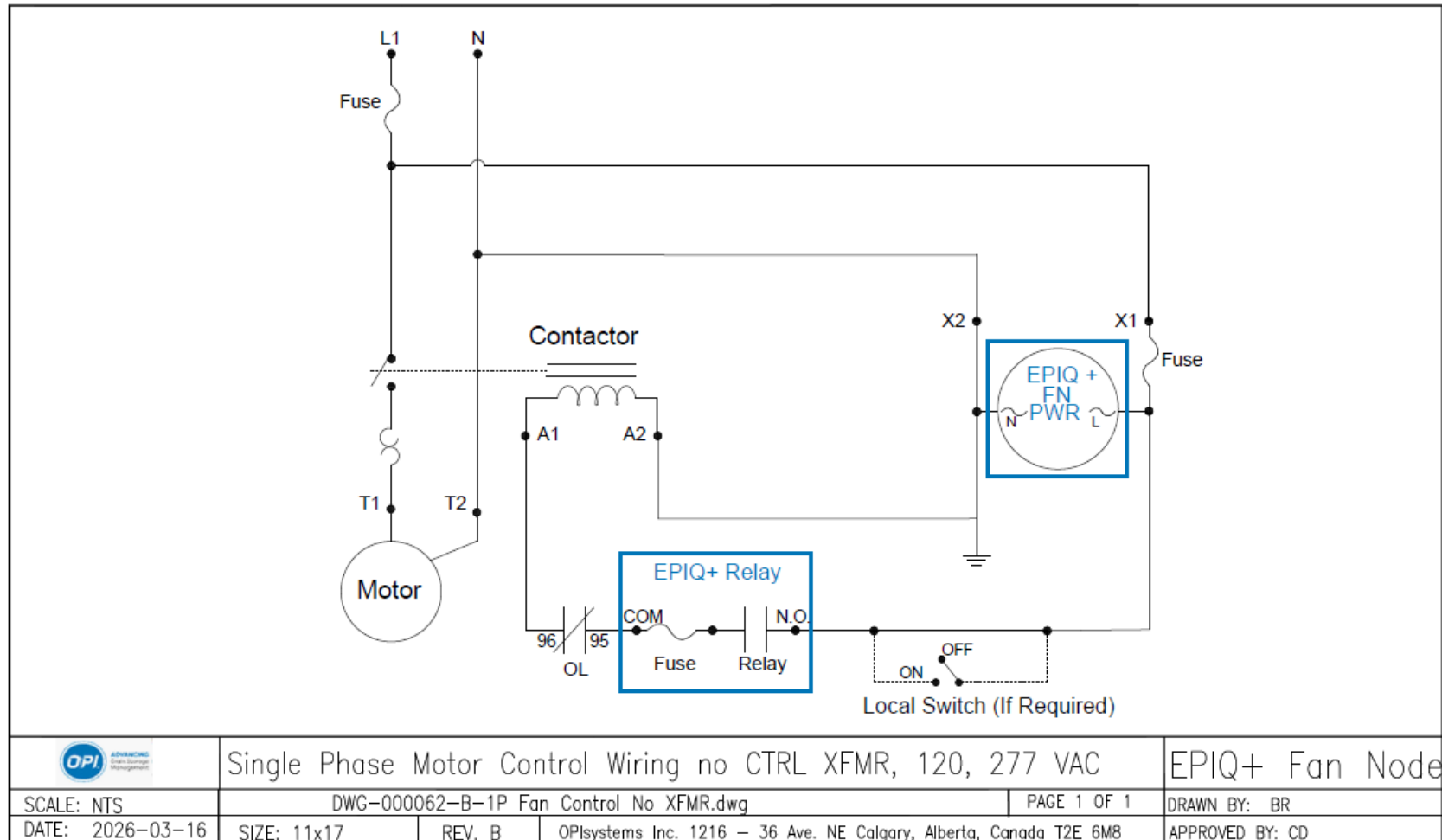


Figure 18: Single Phase Motor Control - Without Transformer

Schematic for Single Phase Motor Control - With Transformer (Figure 17)

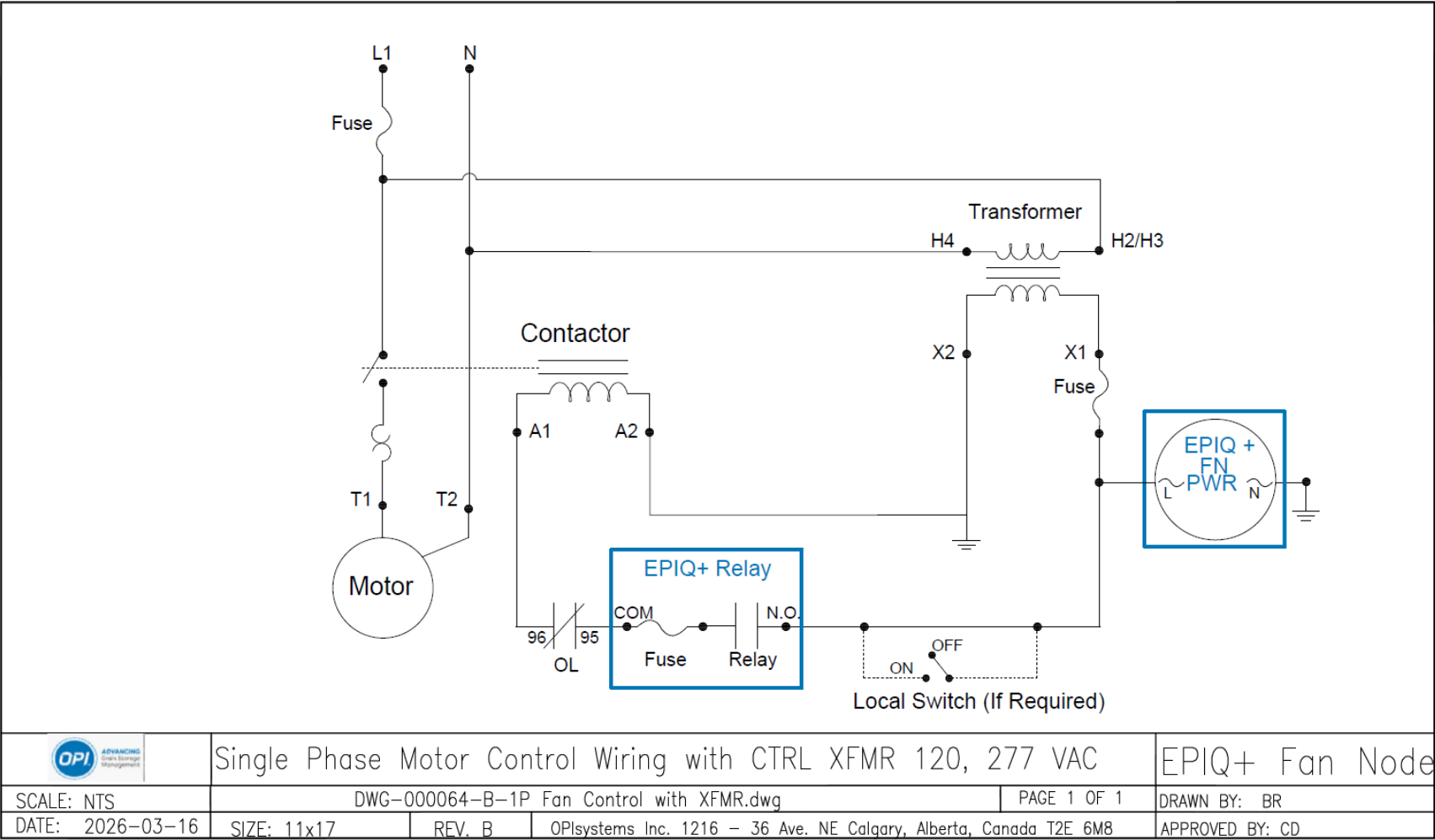


Figure 19: Single Phase Motor Control – With Transformer

Schematic for Three Phase Motor Control - Without Transformer (Figure 18)

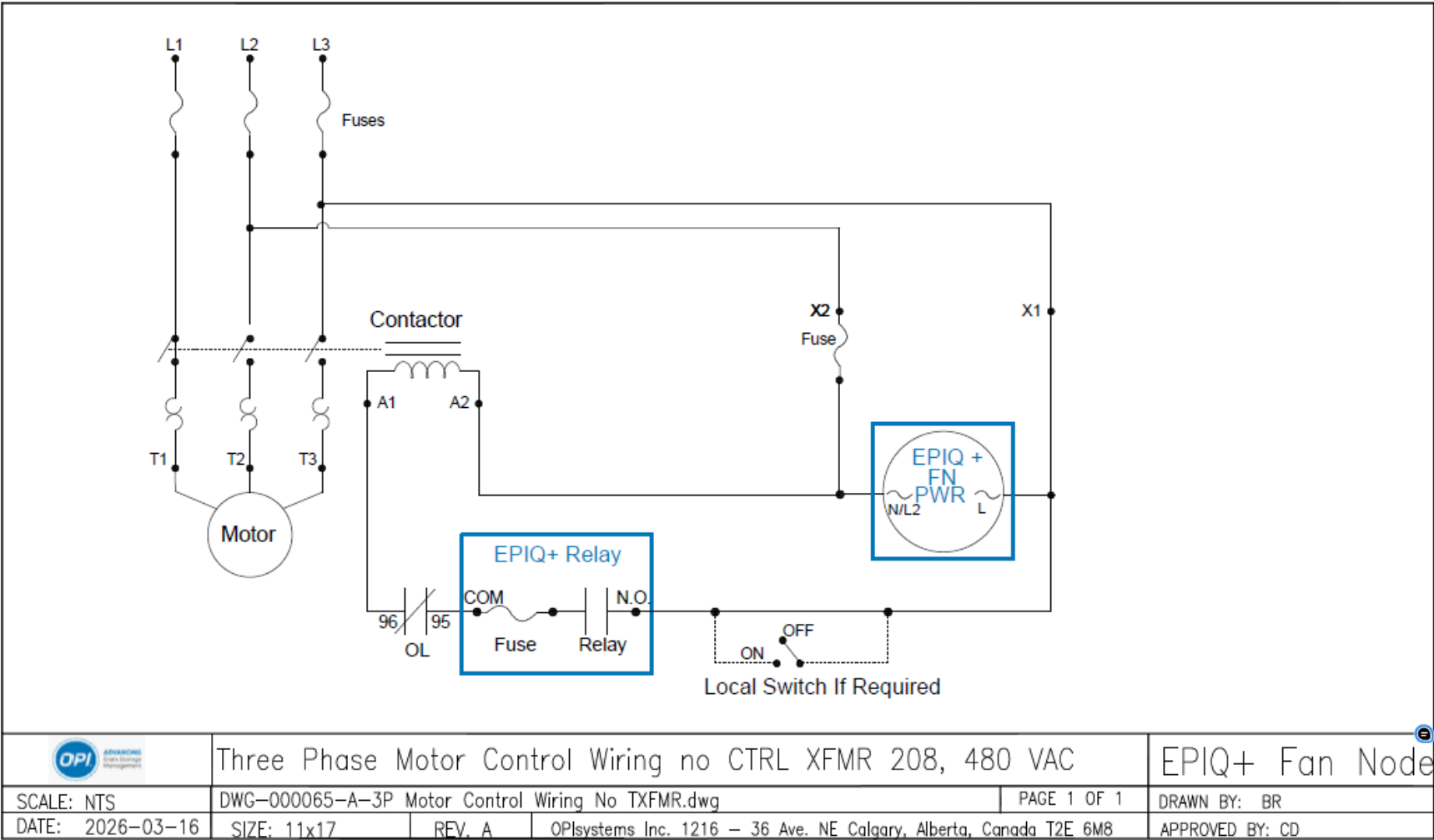


Figure 20: Three Phase Motor Control - Without Transformer

Schematic for Three Phase Motor Control - With Transformer (Figure 19)

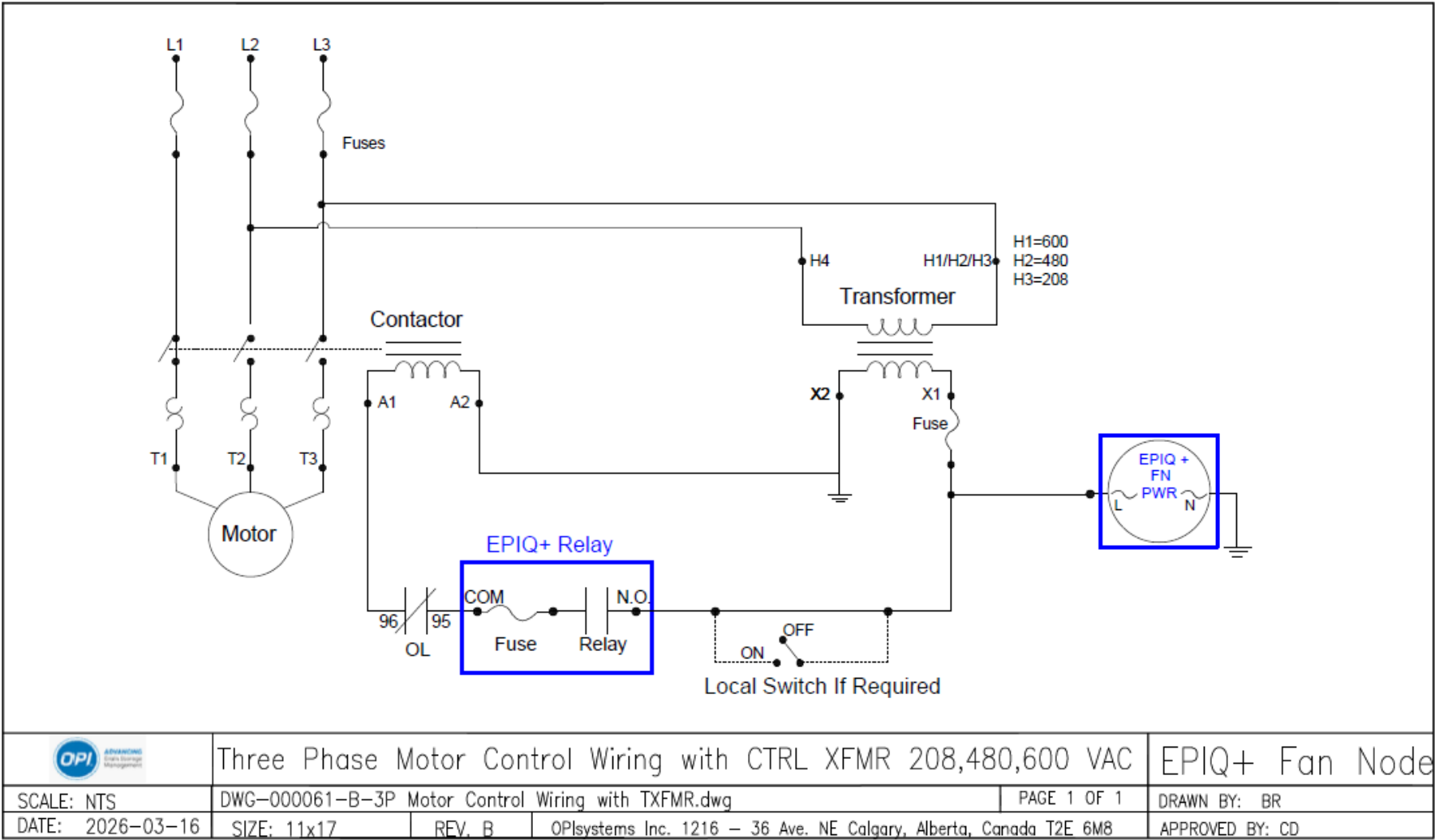


Figure 21: Three Phase Motor Control - With Transformer

Schematic for heater control (typical) (Figure 20)

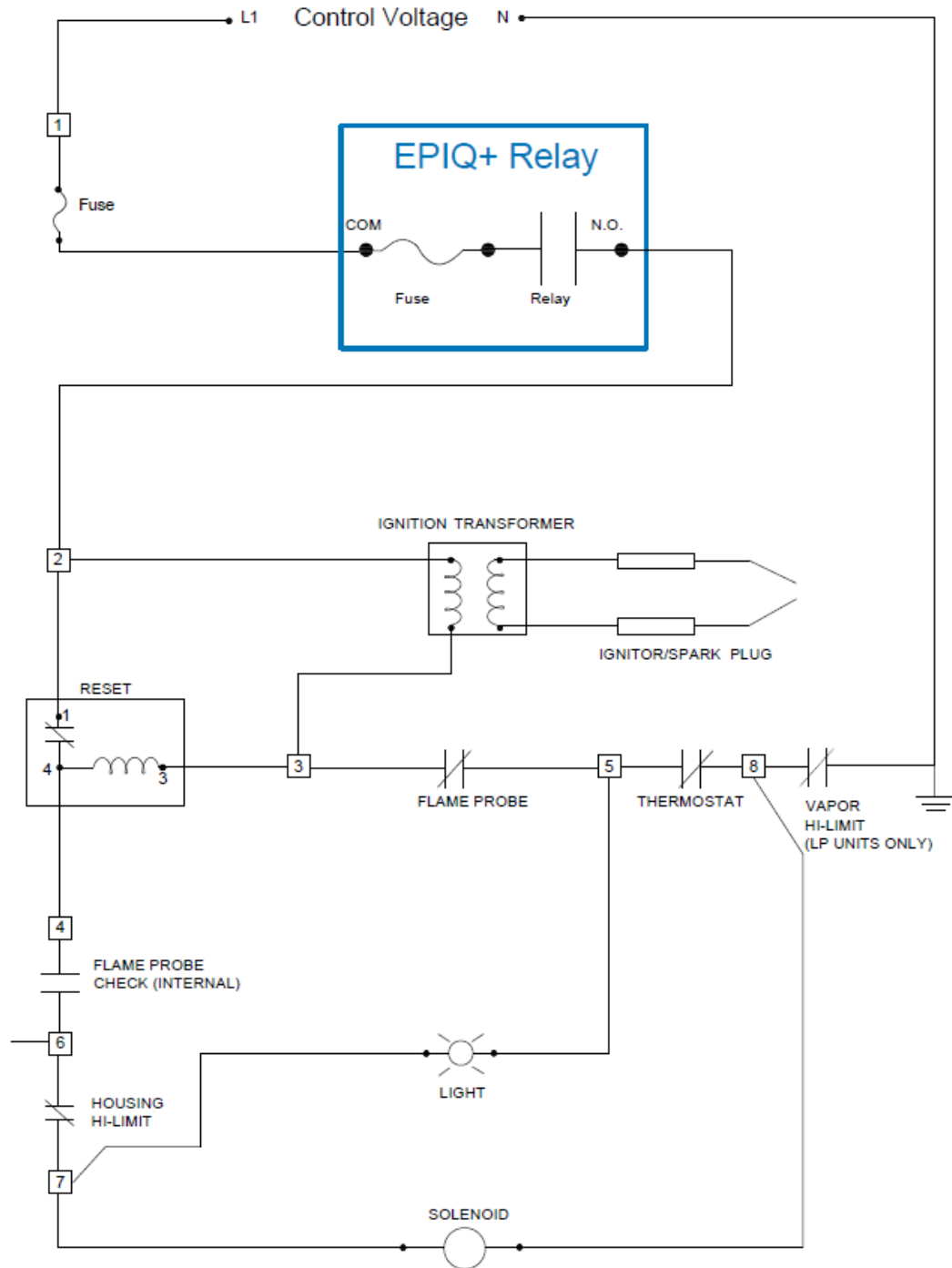


Figure 22: Heater Control Wiring (typical)

Line-to-Line Control Operation - No Control Transformer (electrician use only)

- The device may be powered with out a control transformer by supplying the power directly from two phases of the incoming power system.
- In this configuration, the contactor coil for fan control is energized using **phase-to-phase voltage** through either of the Fan Node's relay outputs.
- **Conditions for Line-to-Line Operation**
 - The following conditions **must be met** when operating the device without a control transformer:
 - The maximum phase-to-phase voltage applied to the input power or either of the relays **shall not exceed 480 VAC**.
 - The conductor connected to the **N/L2 terminal** shall be protected by an **upstream 2 A fuse** located in the control panel or other upstream power distribution equipment.
 - The **normally open (NO) relay output contact** shall be protected by a **fuse installed on the NO output conductor** to protect the relay contact and downstream wiring.
 - The contactor coil connected to the relay output **must be rated for the applied line-to-line voltage**.
 - All field wiring supplying the control circuit **must be rated for the maximum system voltage present** and installed in accordance with applicable electrical codes.
 - The upstream supply circuit must provide **overcurrent protection for both ungrounded conductors** of the control circuit.

Warning Labels (electrician use only)

- Once all the connections have been made into the Fan Node Enclosure, peel off the back of one of the supplied Fan Warning stickers and affix it to the appropriate fan(s) connected into the system. (There are four stickers supplied per system)

Supplied Warning Label (Exact sticker shown: Figure 21)



Figure 23 Caution Fan Warning Sticker