

tekmar® - Wiring Brochure

Power Manager 345



W345
12/08

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Introduction

The Power Manager 345 is used to provide power to a Reset Module 420, 421, 422, or 423. The 345 is factory installed on the right side of an enclosure with a blank plastic insert on the left. The blank insert is to be replaced with a Reset Module.

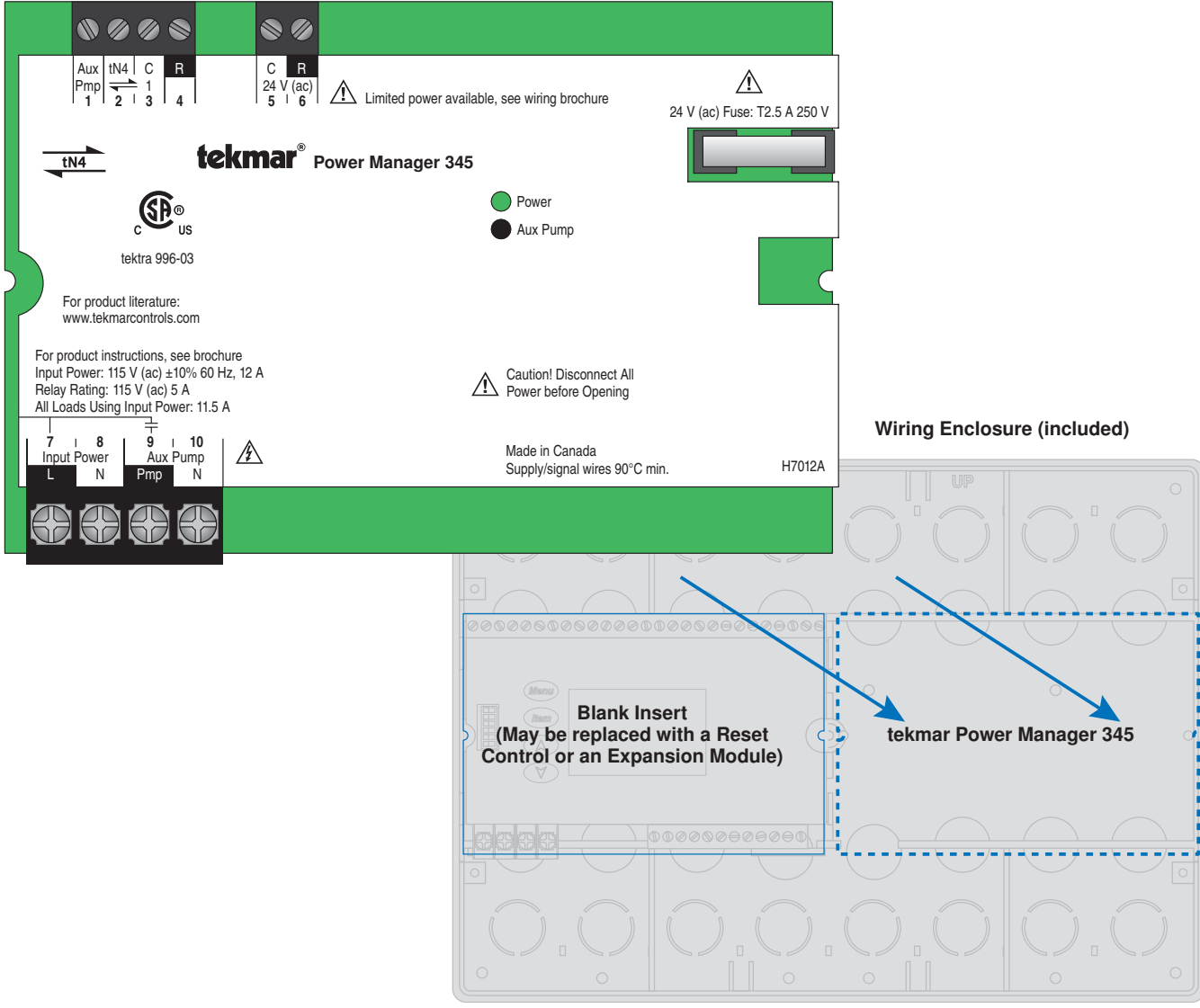
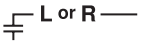






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Wiring Symbols

	Powered switch. 24-115 V (ac) power, switched output to valve, pump, etc.		Black reverse lettering denotes powered output.
	tekmarNet®4		Earth ground.
	Fuse, field replaceable.		

Definitions

The following defined terms and symbols are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.



– Caution: Refer to accompanying documents



– Caution: Refer to accompanying documents

**INSTALLATION
CATEGORY II**

– Local level appliances

Caution

Improper installation and operation of this control could result in damage to the equipment and possibly even personal injury or death. It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. This electronic control is not intended for uses as a primary limit control. Other controls that are intended and certified as safety limits

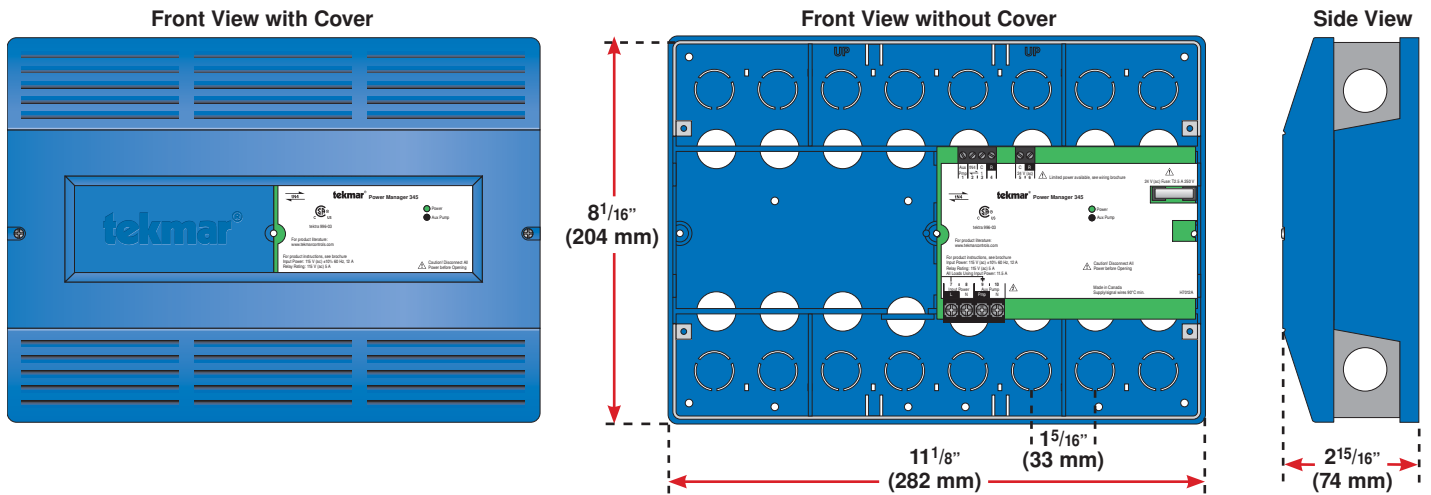
must be placed into the control circuit. Do not attempt to service the control. Refer to qualified personnel for servicing. Apart from any field replaceable fuse(s) there are no user serviceable parts. Attempting to do so voids warranty and could result in damage to the equipment and possibly even personal injury or death.

Control and Enclosure Location

Placement of the controls is important. To enable proper wiring during rough in, select an appropriate location for the controls early in the construction process. Consider the following:

- Keep dry. Avoid potential leakage onto the control. RH ≤ 80% to 88 °F (31 °C), down to 50% above 104 °F (40 °C). Non-condensing environment.
- Do not expose to temperatures beyond 32-122 °F (0-50 °C).
- Provide adequate ventilation.
- Keep away from equipment, appliances or other sources of electrical interference.
- Provide easy access for wiring, viewing, and adjusting the display screen.

- Mount approximately 5 ft. (1.5 m) off the finished floor.
- Mount close to the zones and any equipment being controlled.
- Mount the enclosure to a solid backing.
- The wiring enclosure allows for easy wiring of devices as the upper and lower chambers provide ample room for wiring.
- Use the conduit knockouts provided on the upper, lower, back and sides of the enclosure.
- Low voltage wiring enters through the upper half of the enclosure.
- Power and auxiliary pump wiring enters through the lower half of the enclosure.

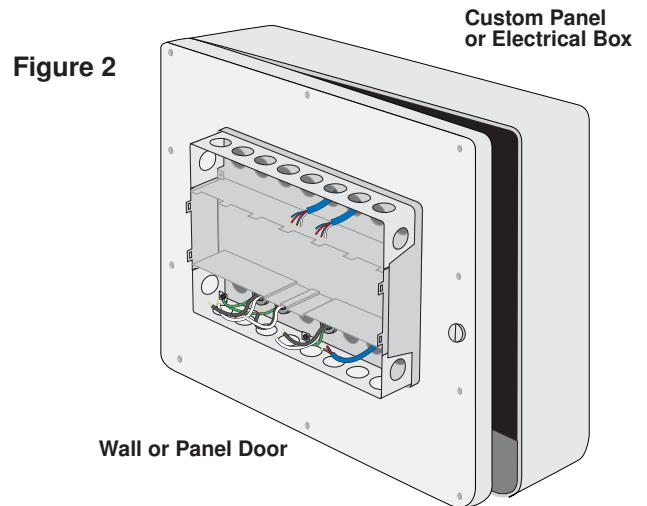
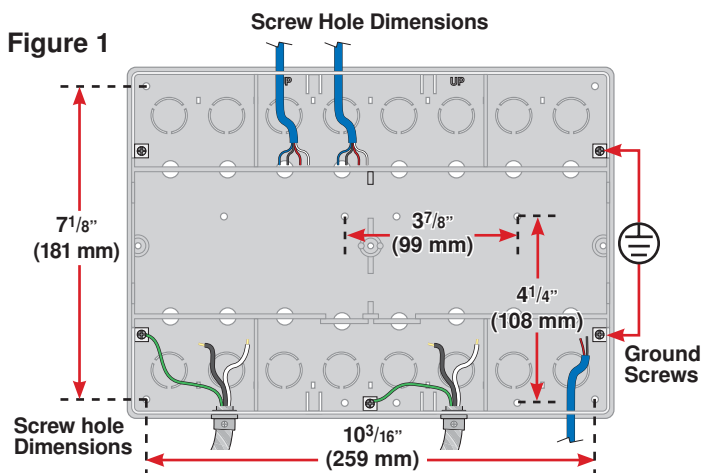


Mounting the Enclosure

To mount the wiring enclosure;

- Remove the front cover of the enclosure by removing the two screws in the cover.
- Place the enclosure in the location decided upon during the rough-in wiring stage. Wiring will enter through either the top and bottom knockouts or through the back upper and lower knockouts. See figures 1 and 2.
- There are twelve holes in the back of the enclosure that allow for mounting.
- Using screws, ensure that the enclosure is securely fastened in place.

Note: The nonmetallic conduit entries in the back of the enclosure do not provide grounding between conduit connections. Use bonding bushings and jumpers to provide a continuous path to ground.



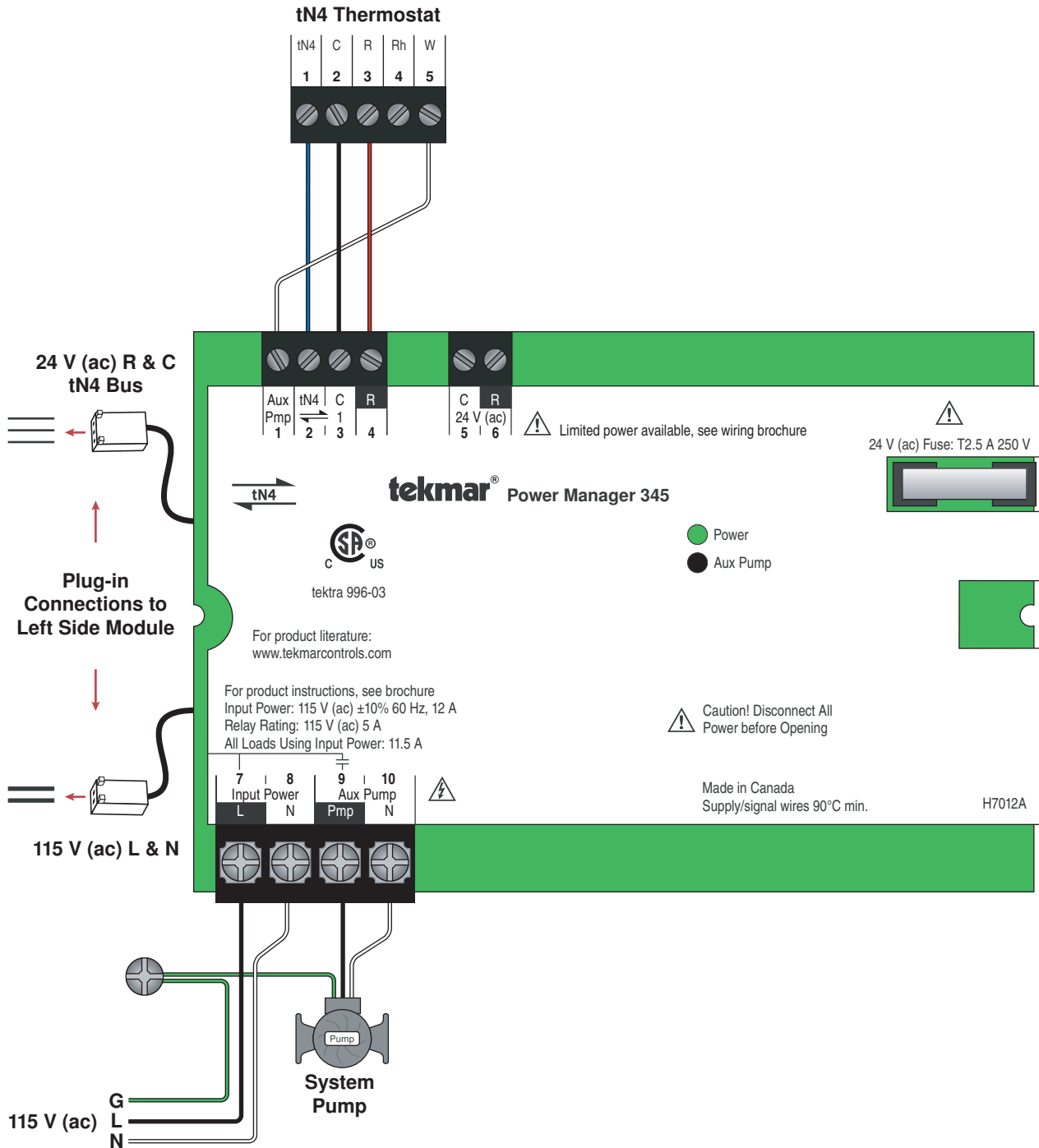
Electrical Drawings

⚠ The electrical drawing examples on the following pages show the 345 in common applications. These drawings have a brief explanation of what is being operated in each system. Choose the components in your system and use the drawings as a guide to aid in wiring your system.

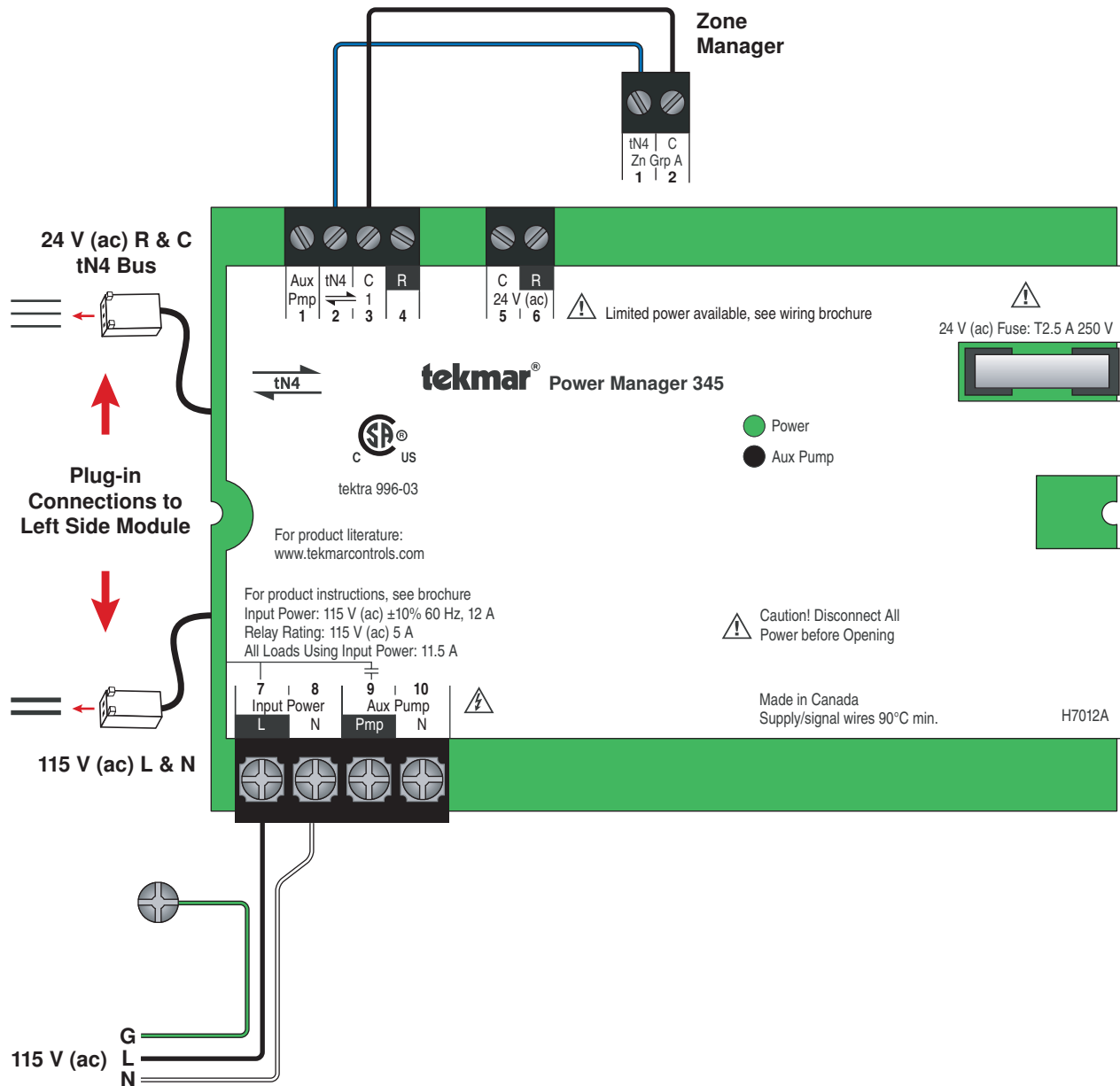
These are only concept drawings, not engineered drawings. They are not intended to describe a complete system nor any particular system. It is up to the system designer to

determine the necessary components for and configuration of the particular system being designed including additional equipment isolation relays (for loads greater than the controls specified output ratings) and any safety devices which in the judgment of the designer are appropriate in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

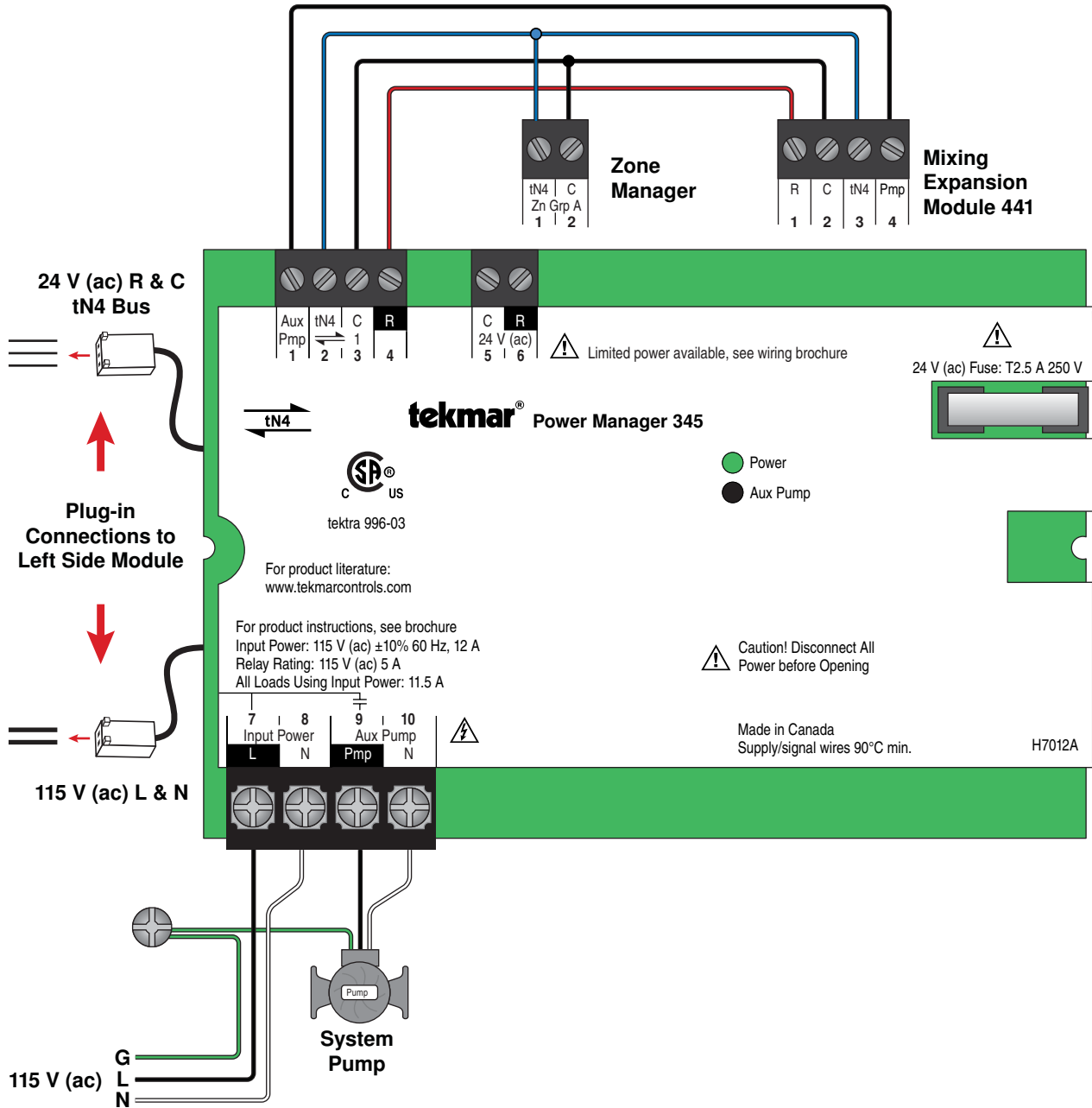
Description: The Power Manager 345 operates a single zone system. The 345 provides power to a Reset Module located on the left side. The tN4 Thermostat connects to the 345 to operate the single heating zone.



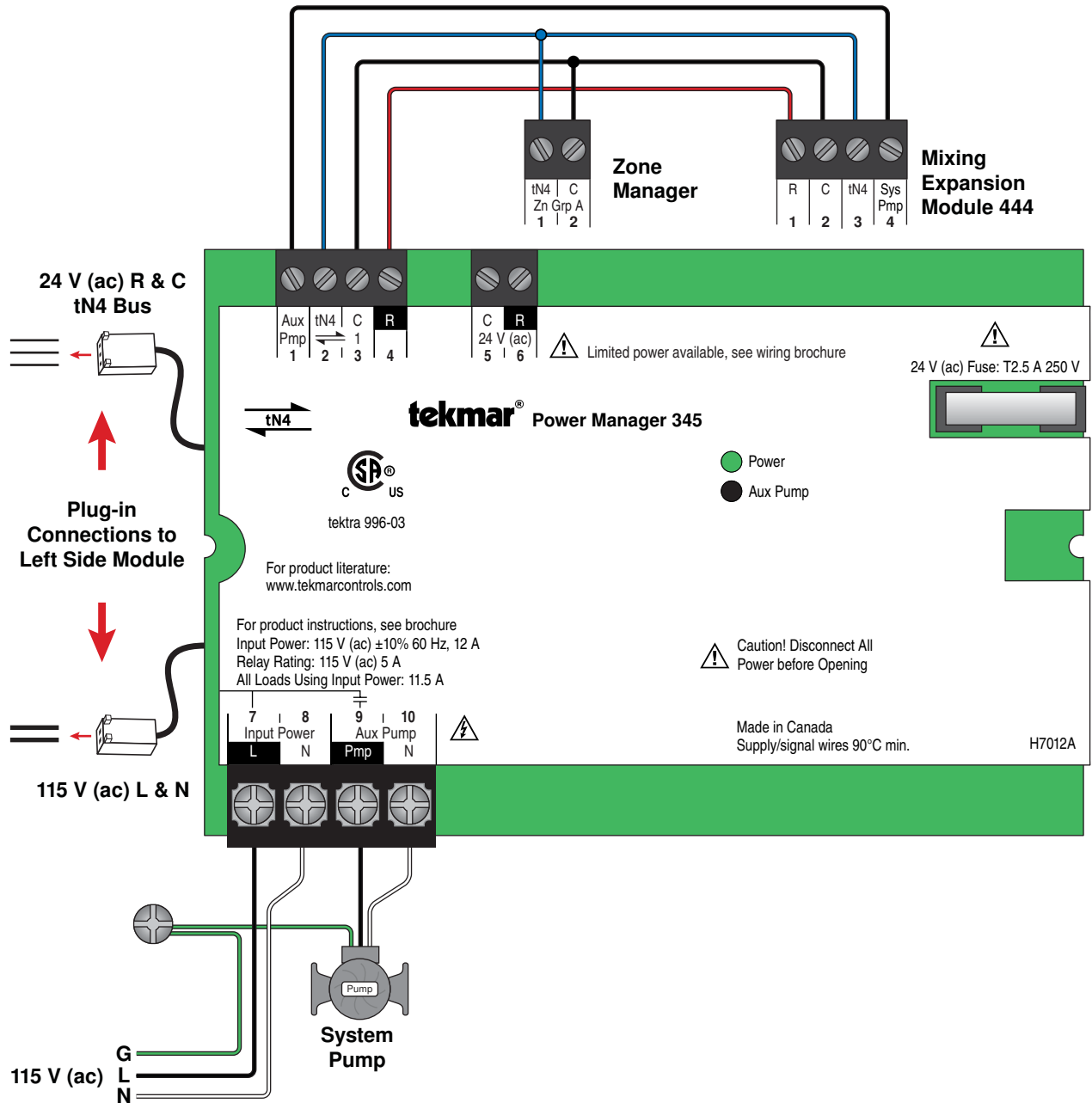
Description: The Power Manager 345 provides power to a Reset Module located on the Left Side. The 345 connects to a remotely located Zone Manager through a tN4 communication bus.



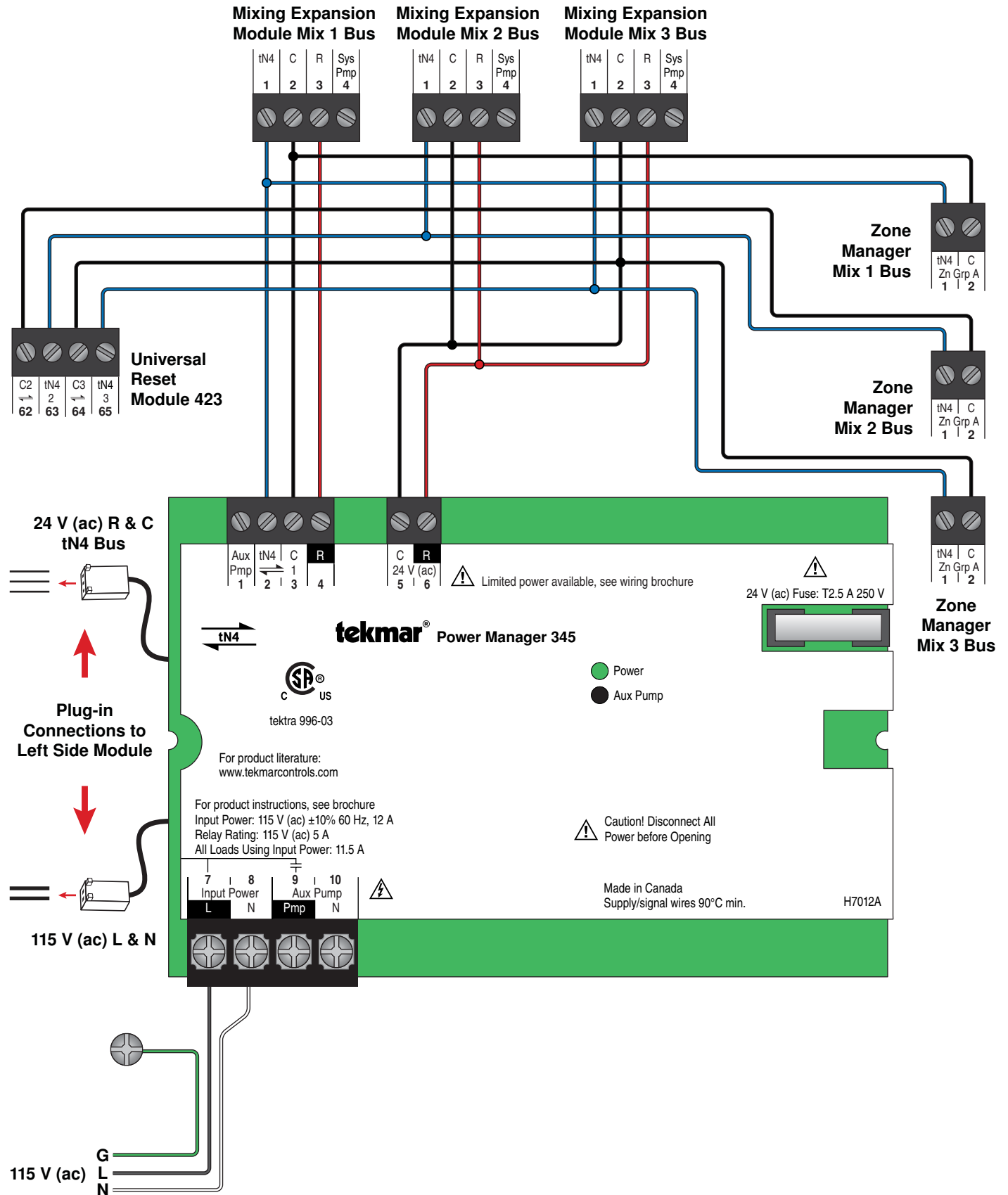
Description: The Power Manager 345 provides power to a Reset Module located on the left side, and power to a Mixing Expansion Module. The 345 connects to a remotely located Zone Manager through a tN4 mix communication bus. The Mixing Expansion Module provides a signal for the 345 to operate the mix system pump.



Description: The Power Manager 345 provides power to a Reset Module located on the left side, and power to a Mixing Expansion Module. The 345 connects to a remotely located Zone Manager through a tN4 mix communication bus. The Mixing Expansion Module provides a signal for the 345 to operate the mix system pump.



Description: The Power Manager 345 provides power to a Universal Reset Module 423 as well as powers three Mixing Expansion Modules. This allows the Zone Managers to be remotely located. There are 3 different mix water temperatures supported.



⚠ This section explains how to wire individual devices to the Power Manager 345. For step by step wiring refer to the terminal number on the right of the page.

- Before wiring, ensure all power is turned off and take all necessary precautions.
- Install the supplied wiring compartment barriers by sliding them into the grooves provided to isolate the low and high voltage wiring.

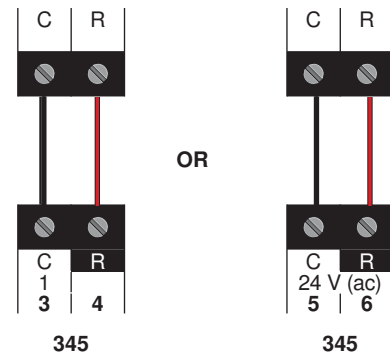
- Strip all wiring to a length of 3/8 in. or 10 mm for all terminals.
- A circuit breaker or power disconnect that provides power to the control should be located nearby and clearly labeled.
- Refer to the current and voltage ratings at the back of this brochure before connecting devices to this control.
- Only qualified personnel should install or service the control.

⚠ Wiring a 24 V (ac) Power Supply

Terminals 3, 4 or 5, 6

The 345 includes a 56 VA power supply that is used to provide power to devices such as the Reset Modules, Mixing Expansion Modules, tN4 Thermostats, and tN4 Setpoint Controls.

- Connect C (terminal 3 or 5) to C on the device.
- Connect R (terminal 4 or 6) to R on the device.
- Ensure the polarity is correct, as this affects the tN4 communication.



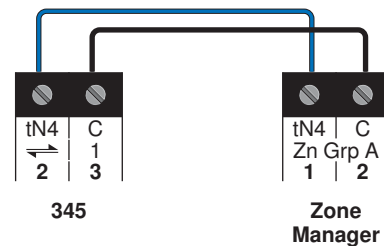
⚠ Wiring tekmarNet®4 (tN4) between Devices

Terminals 2, 3

The 345 includes a single tN4 bus that plugs into a Reset Module. The field wiring allows the Power Manager to connect to either a Zone Manager to operate heating zones. The 345 may also be connected to a Mixing Expansion Module to operate a mixing device (injection pump or mixing valve). For single zone systems, a tN4 Thermostat or tN4 Setpoint Control may be connected to the 345.

Connection to Zone Manager:

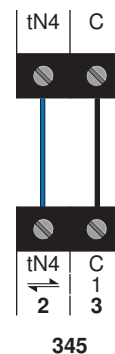
- Connect tN4 (terminal 2) to the tN4 (terminal 1) on the Zone Manager.
- Connect C (terminal 3 or 5) to the C (terminal 2) on the Zone Manager.



Connection to Mixing Expansion Module:

- Connect tN4 (terminal 2) to the tN4 terminal on the Mixing Expansion Module.
- Connect C (terminal 3 or 5) to the C terminal on the Mixing Expansion Module.

**tN4 Thermostat
tN4 Setpoint Control
Mixing Expansion Module**



Connection to a tN4 Thermostat or tN4 Setpoint Control:

- Connect tN4 (terminal 2) to the tN4 terminal on the tN4 Thermostat or tN4 Setpoint Control.
- Connect C (terminal 3 or 5) to the C terminal on the tN4 Thermostat or tN4 Setpoint Control.

⚠ Wiring the Auxiliary Pump Input

Terminals 1-4

The Auxiliary Pump can be used for one of two purposes:

- 1) Operate the pump for single zone systems.
 - 2) Operate the system pump when using a Mixing Expansion Module.
- Once the power supply R is connected to the Aux Pmp Input (terminal 1), the Aux Pump (terminals 9 and 10) is powered.

To connect to a tN4 Thermostat:

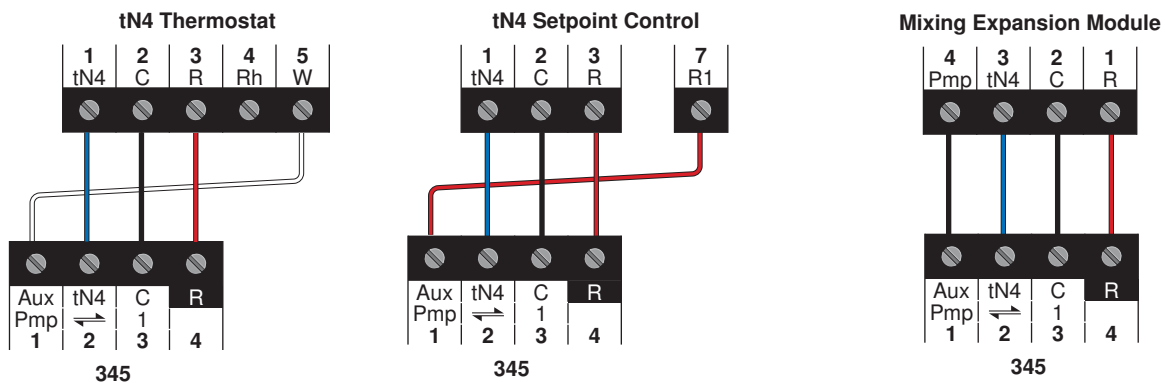
- Connect C (terminal 3) to the C terminal on the tN4 Thermostat.
- Connect R (terminal 4) to the R terminal on the tN4 Thermostat.
- Connect Aux Pmp (terminal 1) to the W terminal on the tN4 Thermostat.

To connect to a tN4 Setpoint Control:

- Connect C (terminal 3) to the C terminal on the tN4 Setpoint Control.
- Connect R (terminal 4) to the R terminal on the tN4 Setpoint Control.
- Connect Aux Pmp (terminal 1) to the R1 terminal on the tN4 Setpoint Control.

To connect to a Mixing Expansion Module:

- Connect C (terminal 3) to the C terminal on the Mixing Expansion Module.
- Connect R (terminal 4) to the R terminal on the Mixing Expansion Module.
- Connect Aux Pump (terminal 1) to the Sys Pmp terminal on the Mixing Expansion Module.

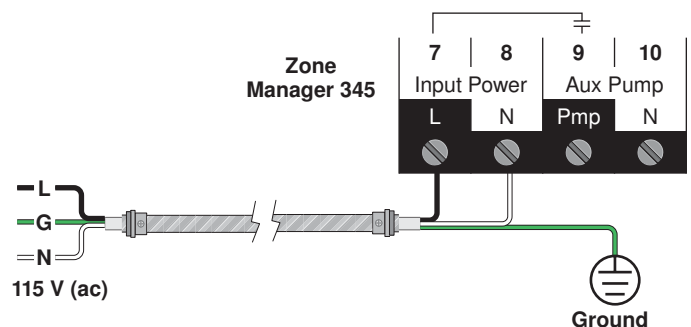


⚠ Wiring the Input Power

Terminals 7, 8

Provide a 15 Amp circuit for the input power.

- Connect the 115 V (ac) line wire (L) to terminal 7.
- Connect the neutral wire (N) to terminal 8.
- Connect the ground wire (G) to one of the ground screws provided in the wiring chamber.



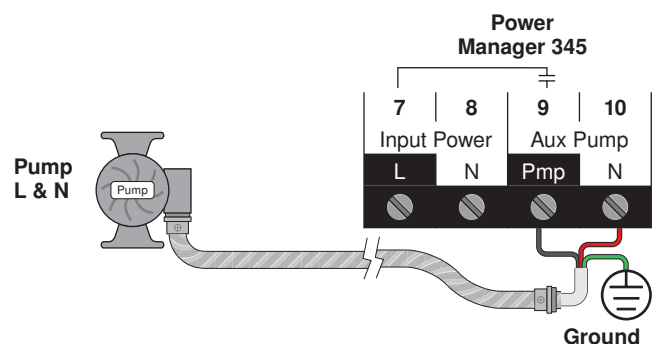
⚠ Wiring the Auxiliary Pump Output

Terminals 9, 10

The Power Manager operates the Auxiliary Pump Output when the Auxiliary Pump Input is powered.

- Connect the auxiliary pump 115 V supply to Aux Pump terminal 9.
- Connect the auxiliary pump neutral to Aux Pump Neutral terminal 10.
- Connect the pump ground wire to one of the ground screws provided in the wiring chamber.

Note: For pumps larger than the control's rated capacity, an external isolation relay must be used.

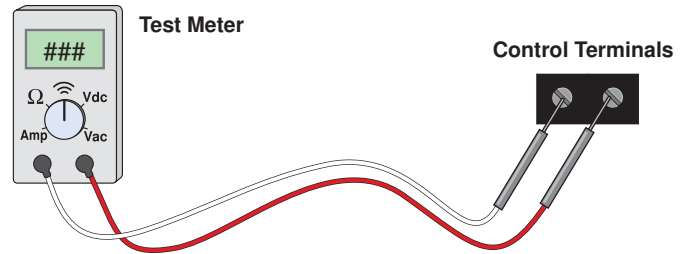


Troubleshooting the Control

⚠ General

The following tests are to be performed using standard testing practices and procedures and should only be carried out by properly trained and experienced persons.

A good quality electrical test meter, capable of reading from at least 0-300 V (ac), 0-30 V (dc), 0-2,000,000 Ohms, and testing for continuity is essential to properly test the wiring and sensors.



For an explanation on the use of the Test Button, the “Test” sequence or any error messages, refer to the Data Brochure.

⚠ Testing the Input Power

Terminals 7, 8

1. Remove the front cover from the control.
2. Use an electrical test meter to measure (ac) voltage between the Input Power L and N terminals (7 and 8). The reading should be 115 V (ac) + / – 10% and the “Power” LED should be lit green.
3. If power is not present and the “Power” LED is off:
 - Check the circuit that supplies power to the Power Manager.
4. If power is present but the “Power” LED is lit amber:
 - Check the field replaceable transformer fuse on the Power Manager.
 - If the fuse is blown, determine the cause of the failure before replacing the fuse.

⚠ Testing the Auxiliary Pump Input

Terminals 1, 3

1. Remove the front cover from the control.
 2. Use an electrical test meter to measure the (ac) voltage between the Aux Pump and the C terminals (1 and 3).
 - When the Aux Pump LED is off, the reading should be 0 V (ac) and the pump should be off.
 - When the Aux Pump LED is on, the reading should be 24 V (ac) + / – 10% and the pump should be running.
- Note:** If the pump does not operate properly, refer to any troubleshooting information supplied by the pump manufacturer.

⚠ Testing the Auxiliary Pump Output

Terminals 9, 10

1. Remove the front cover from the control.
 2. Use an electrical test meter to measure the (ac) voltage between the Aux Pump terminals (9 and 10).
 - When the Aux Pump LED is off, the reading should be 0 V (ac) and the pump should be off.
 - When the Aux Pump LED is on, the reading should be 115 V (ac) + / – 10% and the pump should be running.
- Note:** If the pump does not operate properly, refer to any troubleshooting information supplied by the pump manufacturer.

Technical Data

Power Manager 345; One Auxiliary Pump

Packaged weight	3.5 lbs (1610 g)
Enclosure	Blue PC+ABS plastic with metal top and bottom conduit connection walls
Dimensions	8-1/16" H x 11-1/8" W x 2-15/16" D (204 x 282 x 74 mm)
Approvals	CSA C US, CSA/UL 61010-1, meets Class B: ICES and FCC Part 15
Ambient conditions	Indoor use only, 32 to 122°F (0 to 50°C)
	RH ≤ 80% to 88°F (31°C), down to 50% above 104°F (40°C)
	Altitude <6560 feet (2000 m), Installation Category II, Pollution Degree 2
Power Supply	115 V (ac) +/- 10% 60 Hz 12 A
Transformer Power Available	24 V (ac) 56 VA, fuse T2.5 A 250 V
Auxiliary Pump Input	24 V (ac), < 0.5 VA
Auxiliary Pump Relay	115 V (ac) 5 A
Combined Load on Input Power	11.5 A Maximum



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