

tekmar® - Wiring Brochure

Zone Manager 336



W336

12/08

- 1 Information Brochure**
 Choose controls to match application
- 2 Application Brochure**
 Design your mechanical applications
- 3 Rough-in Wiring**
 Rough-in wiring instructions
- 4 Wiring Brochure**
 Wiring and installation of specific control
- 5 Data Brochure**
 Control settings and sequence of operation
- 6 Job Record**
 Record settings & wiring details for future reference

Introduction

The following wiring brochure describes how to wire the tekmar Zone Manager 336. The 336 comes installed on the right side of an enclosure with a blank plastic insert on the left. The blank insert may be replaced by either a Reset Control or an Expansion Module. The 336 allows for up to four tekmarNet®4 (tN4) thermostats, four zone pumps and one zone group pump. The wiring of tekmarNet®4 (tN4) components is simple and cost effective.

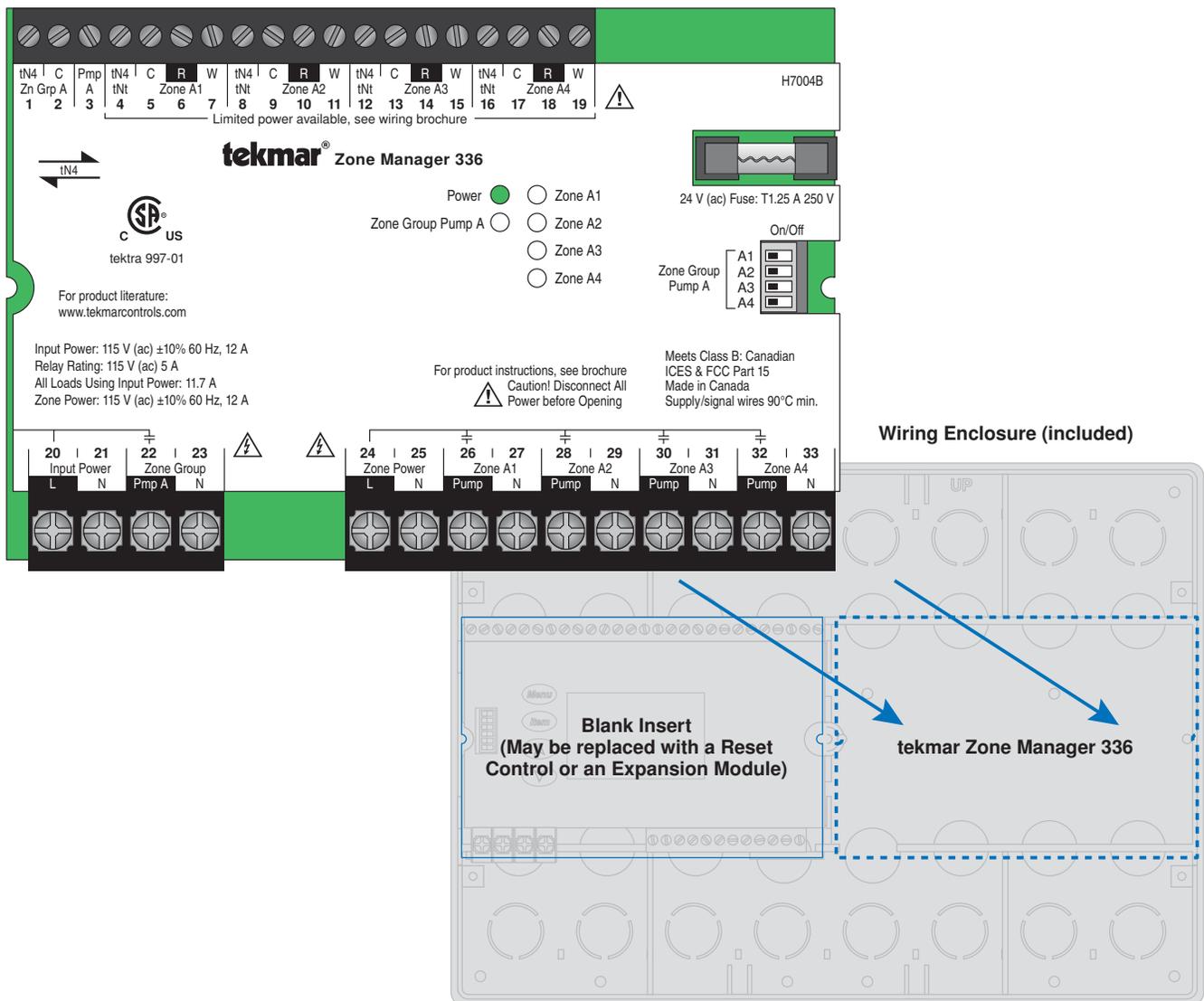


Table of Contents

Wiring Symbols & Definitions	2	Wiring the Control.....	7-8
Caution	2	Adding Extra VA	9
Control and Enclosure Location	2	Troubleshooting the Control.....	10-11
Mounting the Enclosure	3	Technical Data.....	12
Electrical Drawings	4-6		

Wiring Symbols

	Powered switch. 24-115 V (ac) power, switched output to valve, pump, etc.		Black reverse lettering denotes an internally 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% from 104 to 122°F (40 to 50°C). Non-condensing environment.
- Do not expose to temperatures beyond 32-122°F (0-50°C)
- Provide adequate ventilation.

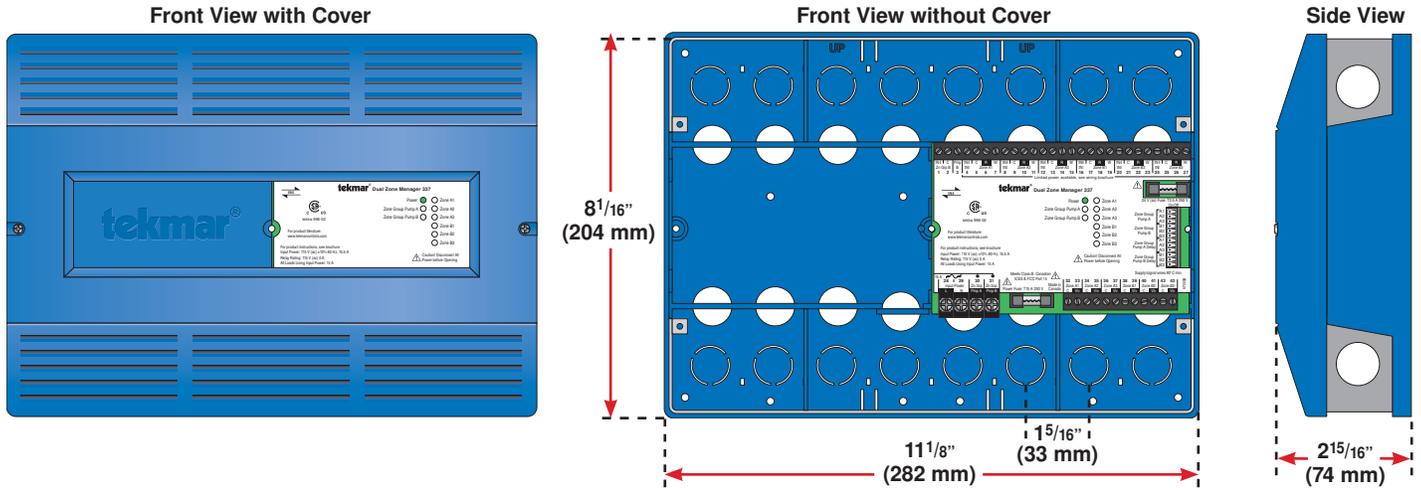
- Keep away from equipment, appliances or other sources of electrical interference.
- Provide easy access for wiring, viewing, and adjusting the display screen.
- Mount approximately 5 ft. (1.5 m) off the finished floor.
- Mount close to the zones and any equipment being controlled.
- Mount the enclosure 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.

- Thermostat wiring enters through the upper half of the enclosure.
- Power, zone group pump, and zone pump wiring enters through the lower half of the enclosure.

WIRING 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 brushings and jumpers to provide a continuous path to ground.

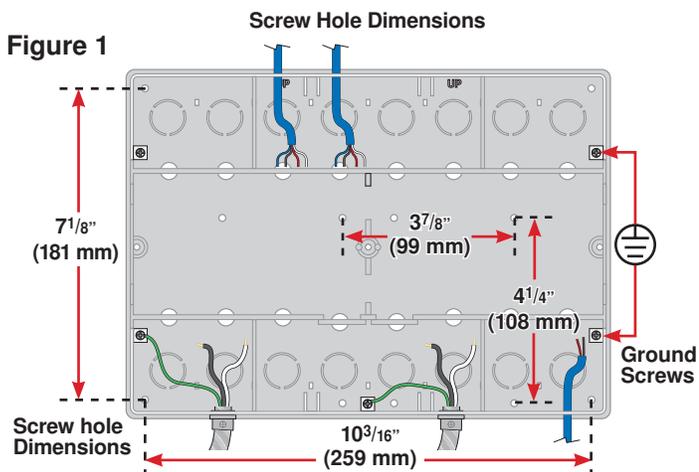
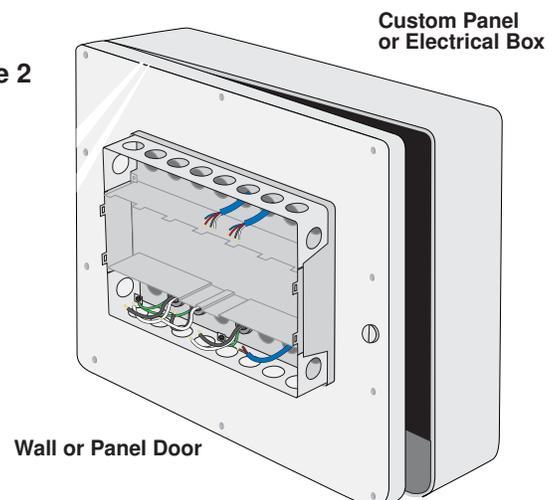


Figure 2



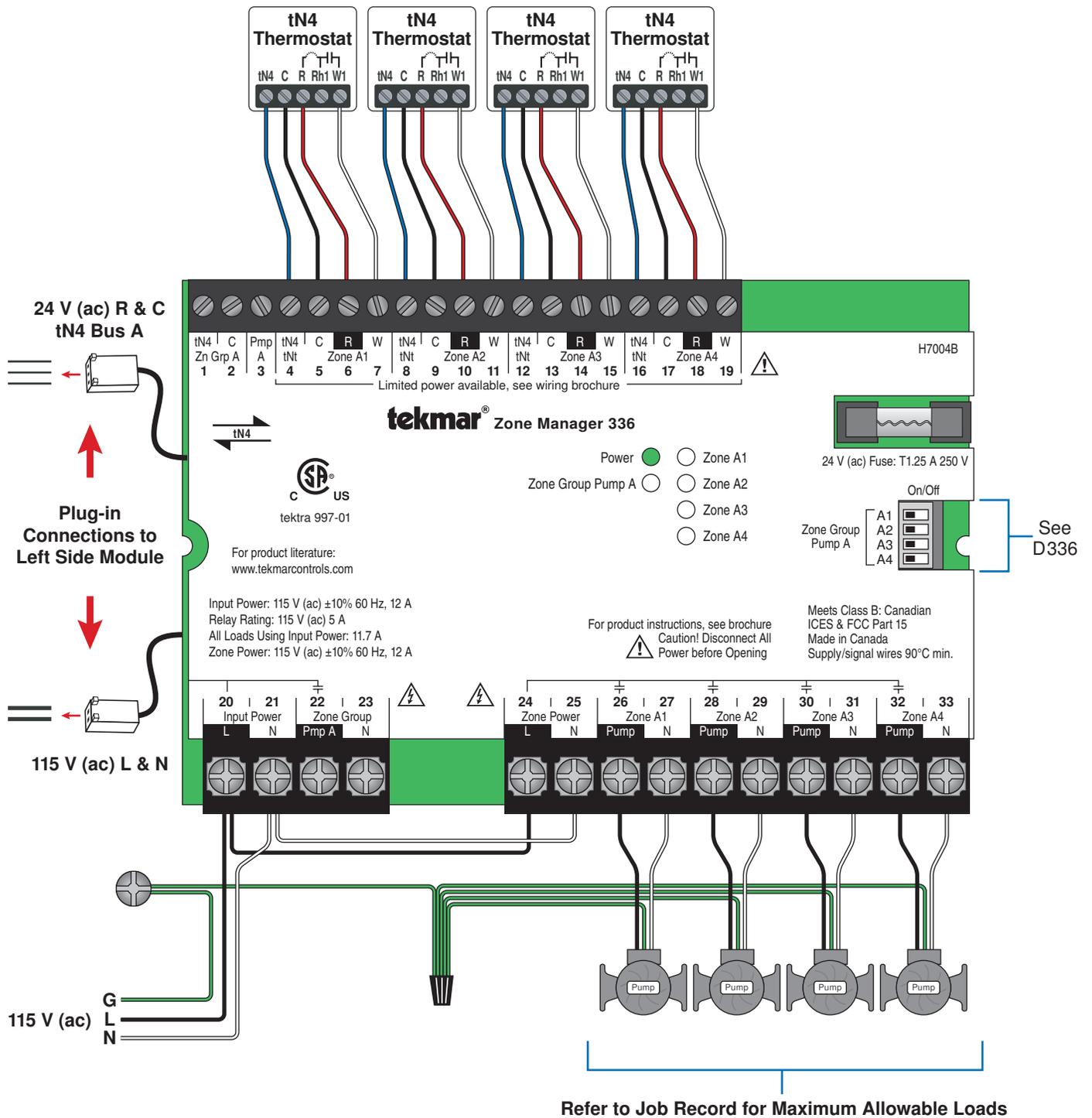
Electrical Drawings

⚠ The electrical drawing examples on the following pages show the 336 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.

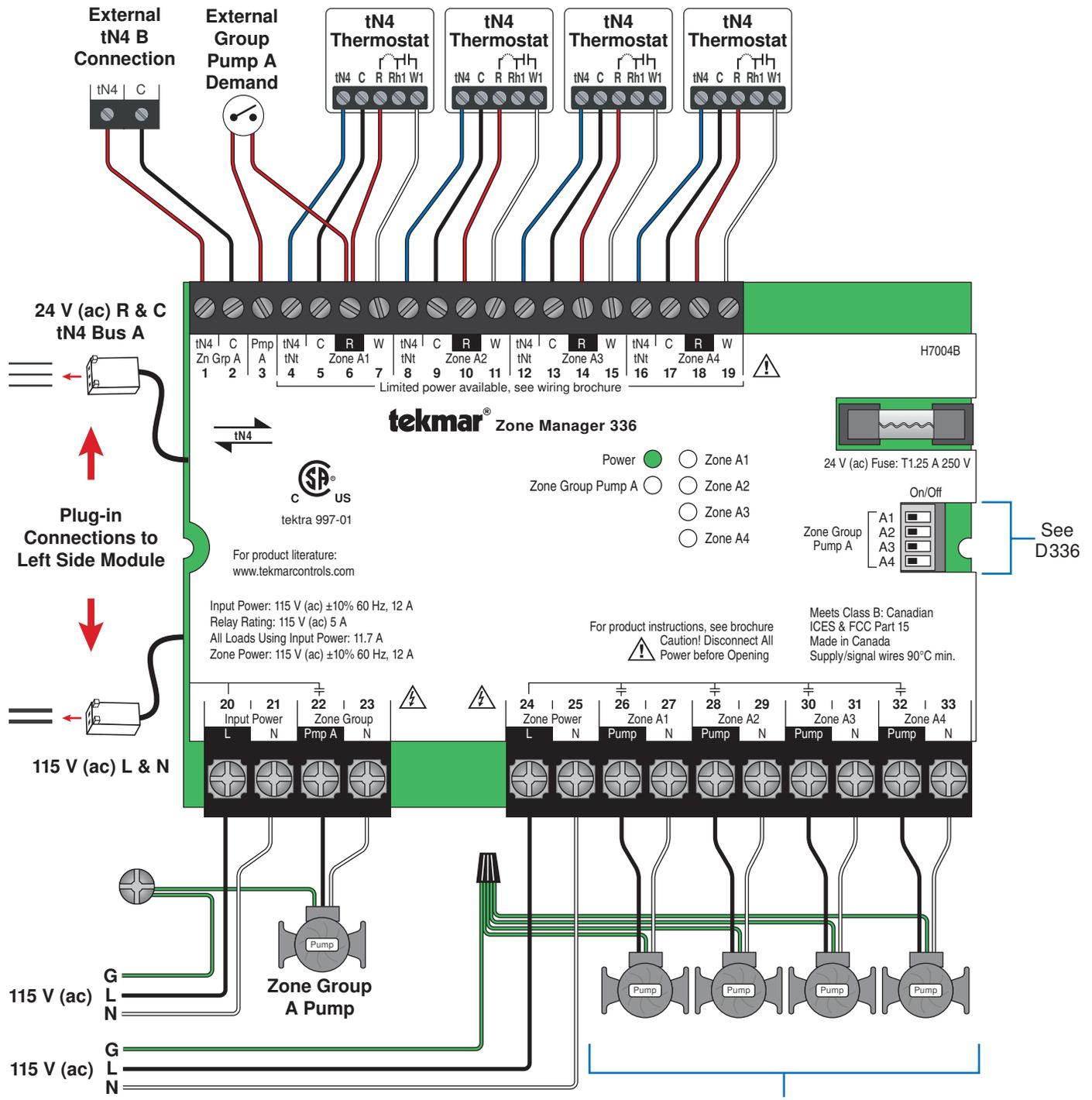
These are only concept drawings, not engineered drawings. They are not intended to describe a complete system nor any particular system. It is up to the system designer

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 judgement 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: Zone Manager 336; Four tN4 Thermostats, Four Zone Pumps.



Description: Zone Manager 336; Four tN4 Thermostats, Four Zone Pumps (separate power), Zone Group Pump, tN4 connection.



⚠ This section explains how to wire individual devices to the Zone Manager 336. 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.
- Refer to the current and voltage ratings at the back of this brochure before connecting devices to this control.

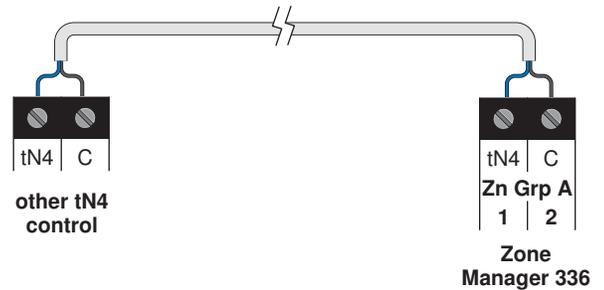
⚠ Wiring tekmarNet®4 (tN4) between Devices

Terminals 1, 2

Terminals 1 and 2 provide a tN4 connection for tN4 devices on the tN4 bus. Connect terminals 1 (tN4) and 2 (C) to the corresponding terminals on the tN4 devices that are to be connected to the tN4 bus.

Polarity is important.

Ensure that terminal 1 (tN4) is connected to the tN4 terminal on the tN4 device and that terminal 2 (C) is connect to the C terminal on the tN4 device.

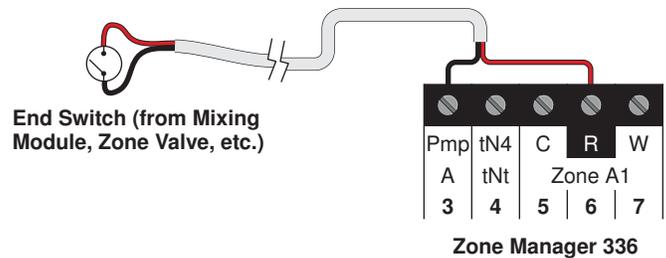


⚠ Wiring the Zone Group A Pump Demand

Terminals 3, 6

To operate the Zone Group Pump A externally, wire a switch between terminals 3 (Pmp A) and 6 (R).

When the switch closes, Zone Group Pump A turns on.

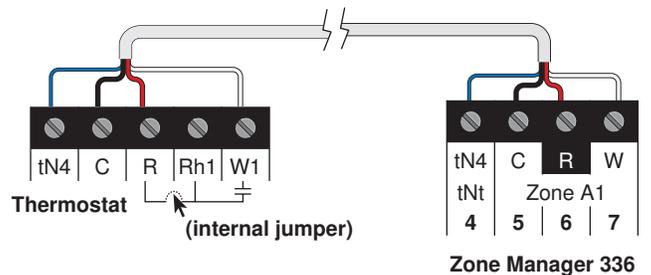


⚠ Wiring the Thermostats (tN4)

Terminals 4-19

Up to four tekmarNet®4 (tN4) thermostats may be wired to the 336. Four terminals are provided for each thermostat. For each of the thermostats,

- Connect the tN4 terminal on the Zone Manager to the tN4 terminal on the thermostat.
- Connect the C terminal on the Zone Manager to the C terminal on the thermostat.
- Connect the R terminal on the Zone Manager to the R terminal on the thermostat.
- Connect the W terminal on the Zone Manager to the W or W1 terminal on the thermostat (or W2 in the case of second stage heat).



⚠ Wiring the Input Power and Zone Power

Terminals 20-21, 24-25

Provide a 15 Amp circuit for the Input Power.

1. Wire 115 V (ac) Input Power to terminals 20 and 21.

- Connect 115 V hot (L) to terminal 20.
- Connect 115 V neutral (N) to terminal 21.
- Connect the ground wire to one of the ground screws provided in the wiring chamber.

If separate power is used for the Zone Pumps:

2. Wire 115 V (ac) Zone Power to terminals 24 and 25.

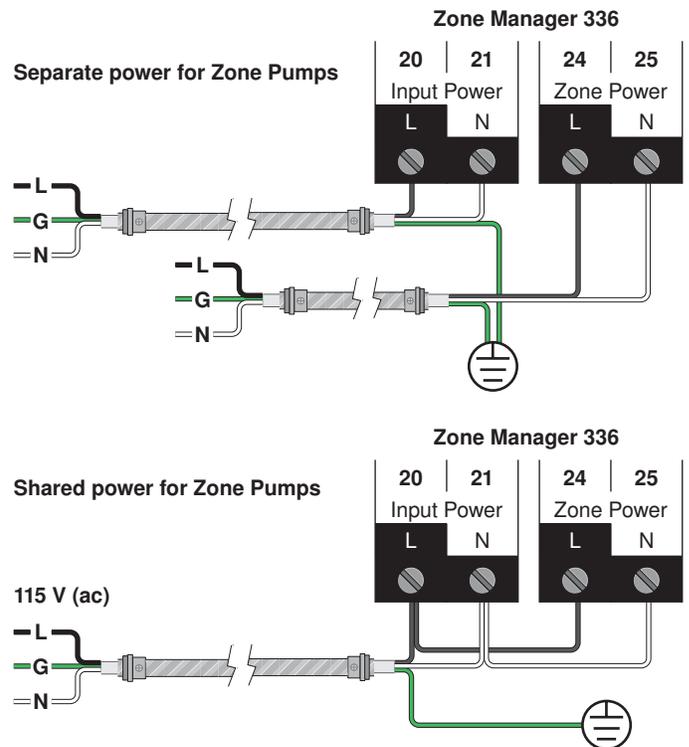
- Connect 115 V hot (L) to terminal 24.
- Connect 115 V neutral (N) to terminal 25.
- Connect the ground wire to one of the ground screws provided in the wiring chamber.

or

If shared power is used for the Zone Pumps:

- Connect 115 V hot (L) to terminal 24 using a jumper from terminal 20.
- Connect 115 V neutral (N) to terminal 25 using a jumper from terminal 21.

Note: The total allowable Amps for Zone Pumps is different based on which method is used. See E2 drawing.



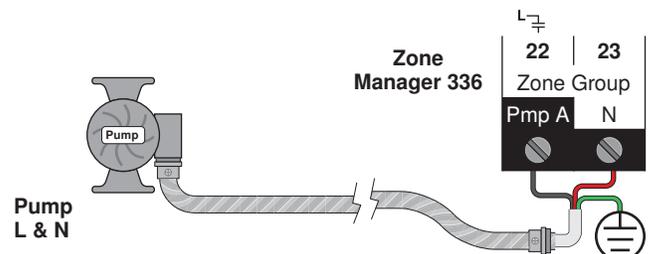
⚠ Wiring the Zone Group Pump

Terminals 22-23

The 336 operates one Zone Group Pump.

- If the Zone Group Pump A is used, the pump is wired directly to terminals 22 and 23.
- The pumps' ground wire is connected to the ground screw provided in the wiring chamber.

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



⚠ Wiring the Zone Pumps

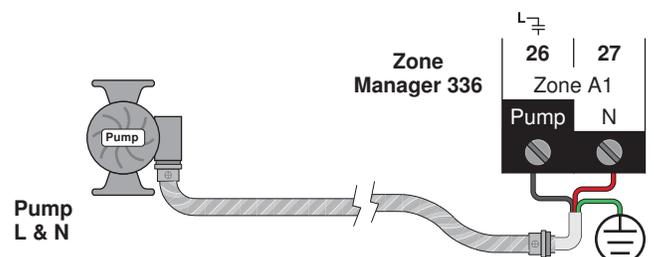
Terminals 26-33

The 336 operates up to four Zone Pumps.

Each zone pump is wired to a Pump and N terminal on the Zone Manager. For each zone,

- Connect the pump's (L) to the (Pump) terminal.
- Connect the pump's (N) to the (N) terminal.
- The pump's ground wire is connected to the ground screw provided in the wiring chamber.

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



⚠ Wiring an External Transformer

Use the supplied Job Records to determine if an external 24 V (ac) transformer is required.

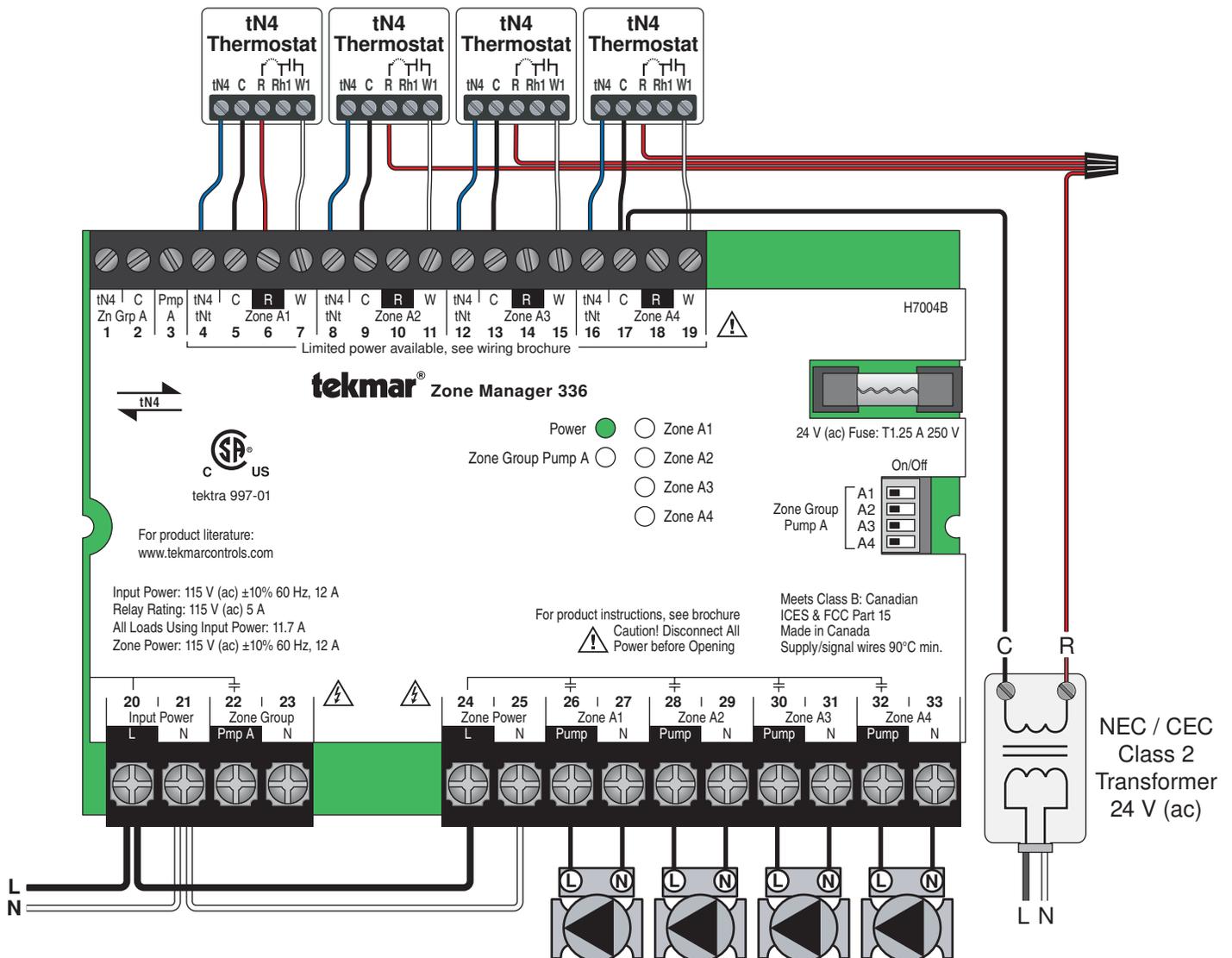
If the combined total 24 V (ac) load exceeds 24 VA, an external NEC / CEC Class 2 transformer is required.

1. Determine the number of zones (thermostats and zone valves) that require an external transformer.
2. Choose a transformer with a VA rating sufficient to operate these zones. (Thermostats and Zone Valves)
3. Mount and wire the external transformer according to the manufacturer's instructions.

4. For each of the selected zones, connect the thermostat's R wire to the external transformer's 24 V (ac) R output. (Do not use the 336's R terminals)
5. Connect the C terminal of the external transformer's 24 V (ac) output to terminal 17 (C) on the Zone Manager.

Note: For each zone using this external transformer, only the tN4, C and W terminals from the thermostat are connected to the Zone Manager.

Example: Zones A1 operates off internal 336 transformer.
Zones A2, A3 and A4 operate off external 24 V (ac) NEC / CEC Class 2 transformer.

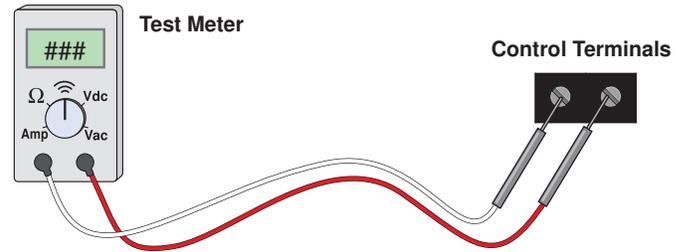


Troubleshooting the Control

⚠ 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 tN4 Network

[Terminals 1, 2](#)

To test the tN4 Network, check the wires for continuity.

1. Remove the front cover from the control.
2. Disconnect the two wires (tN4 and C) at one end and connect them together.
3. Go to the other end of the wires and disconnect them.
4. Using an electrical test meter, check for continuity.
5. Reconnect the wires to the proper terminals.

⚠ Testing the Zone Group Pump A Demand

[Terminal 3](#)

1. Remove the front cover from the control.
 2. Use an electrical test meter to measure the (ac) voltage between the Pmp A and the C terminals (3 and 5)
 - When the Zone Group Pump A light is off, the reading should be 0 V (ac) and the pump should be off.
 - When the Zone Group Pump A light 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 Thermostat Connections

[Terminals 4-19](#)

tN4, C, R, and W terminals are provided for each thermostat connected to the Zone Manager. (Example - Zone A1 terminals 4, 5, 6, 7).

Perform the following tests for each thermostat connected to the Zone Manager using an electrical test meter.

1. Remove the front cover from the control.
2. Measure the (ac) voltage between the R and C terminals.
 - The reading should be 24 V (ac) + / - 10% and the 'Power' LED should be lit green.
 - If power is not present and the 'Power' LED is lit amber, then the transformers' field replaceable fuse is blown. Determine the cause of the failure before replacing the fuse.
 - If power is not present and the 'Power' LED is not lit, check the power supply of the Zone Manager.
3. To test the tN4 Network, check the tN4 and C wires for continuity.
 - Disconnect the tN4 and C wires from the Zone Manager and connect them together.
 - Go to the thermostat and disconnect the tN4 and C wires.
 - Using an electrical test meter, check for continuity.
 - Reconnect the wires to the proper terminals.
4. To test the call for Heat (W), measure the (ac) voltage between the C and the W terminals.
 - When the thermostat is not calling for heat, the reading should be 0 V (ac) and the zone light should be off.
 - When the thermostat calls for heat, the reading should be 24 V (ac) + / - 10% and the zone light should be on.

Testing the Input Power and Zone Power

Terminals 20-21, 24-25

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 (20 and 21) and the Zone Power terminals (24 and 25). The reading should be 115 V (ac) + / - 10%.
3. If power is not present:
 - Check the circuit(s) that supply power to the Zone Manager's Input Power and/or Zone Power terminals.
4. If power is present but the 'Power' LED is lit amber:
 - Check the field replaceable transformer fuse on the Zone Manager.
 - If the fuse is blown, determine the cause of the failure before replacing the fuse.

Testing the Zone Group Pump Output

Terminals 22, 23

1. Remove the front cover from the control.
 2. Use an electrical test meter to measure the (ac) voltage between the Zone Group Pump A terminals (22-23).
 - When the Zone Group Pump A light is off, the reading should be 0 V (ac) and the pump should be off.
 - When the Zone Group Pump A light 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.

Testing the Zone Pump Outputs

Terminals 26-33

1. Remove the front cover from the control.
 2. Use an electrical test meter to measure the (ac) voltage between the Zone Pump terminals (Pump-N) for each zone.
 - When the Zone light is off, the reading should be 0 V (ac) and the pump should be off.
 - When the Zone light 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

Zone Manager 336; Four Zone Pumps

Control	Microprocessor PID control; This is not a safety (limit) control
Packaged weight	4.86 lb. (2200 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% from 104 to 122°F (40 to 50°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) 24 VA, fuse T1.25 A 250 V
Zone Group Pump A Relay	115 V (ac) 5 A
Zone Pump Relays	115 V (ac) 5 A
Combined Load on Input Power	11.7 A Maximum
Combined Load on Zone Power	12 A Maximum
Group A Pump Demand	24 V (ac) < 0.1 VA

The installer must ensure that this control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise. Conversely, this Class B digital apparatus complies with Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Regulations. However, if this control does cause harmful interference to radio or television reception, which is determined by turning the control off and on, the user is encouraged to try to correct the interference by re-orientating or relocating the receiving antenna, relocating the receiver with respect to this control, and/or connecting the control to a different circuit from that to which the receiver is connected.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.



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