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The following brochure describes how to wire the tekmarNet®4 (tN4) Setpoint Control 161. The 161 has a single output for heat. The 161 has one sensor input.

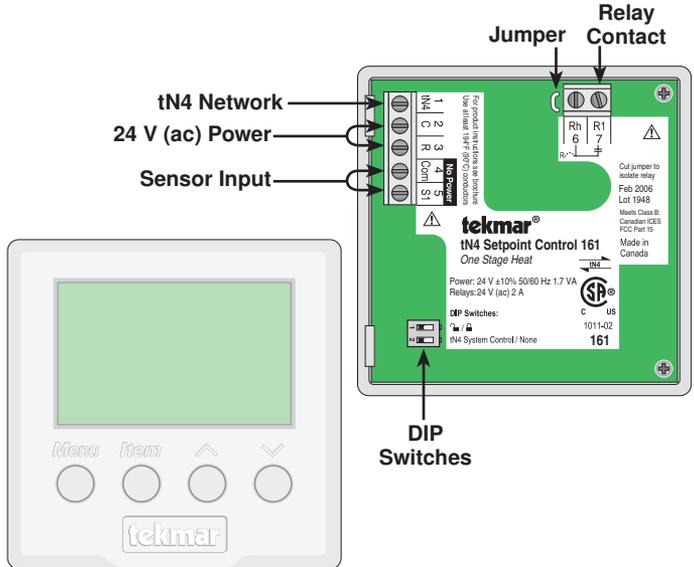


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Definitions

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.



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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 use 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. 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.

Rough-In Wiring

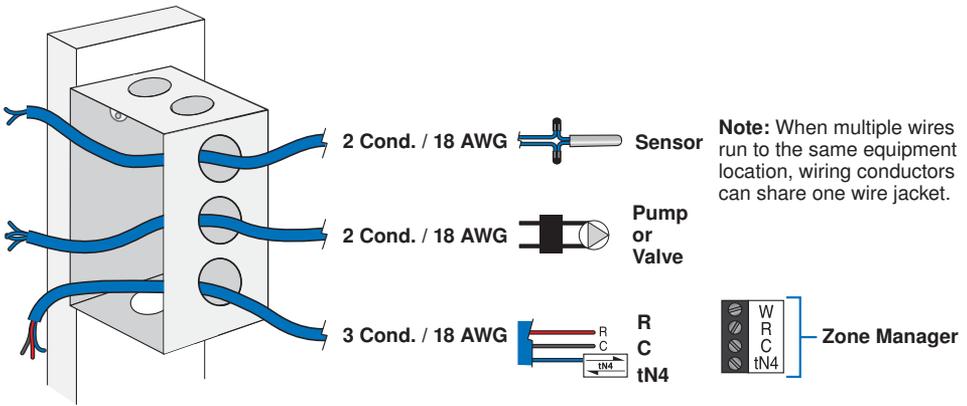
Choose the placement of the setpoint control early in the construction process to enable proper wiring during rough-in.

Consider the following:

- Interior Wall.
- Keep dry. Avoid potential leakage onto the control. $RH \leq 80\%$ to 88°F (31°C), down to 50% from 104 to 122°F (40 to 50°C). Non-condensing environment.
- No exposure to extreme temperatures beyond 32 - 122°F (0 - 50°C).
- No draft, direct sun, or other cause for inaccurate temperature readings.
- Away from equipment, appliances, or other sources of electrical interference.
- Easy access for wiring, viewing, and adjusting the display screen.
- Approximately 5 ft. (1.5 m) off the finished floor.

Use standard 18 AWG wire for the control power, relays, tN4 and sensor connections.

Refer to the diagram below to determine the number of conductors to run from each piece of equipment to the control location.



Remove the Wiring Cover

To remove the wiring cover:

- Place a small slot screwdriver or similar tool into the slot located on the top of the control.
- While pushing against the plastic tab, pull the top of the front cover so that it pivots around the bottom edge of the control's base.



Mounting the Setpoint Control

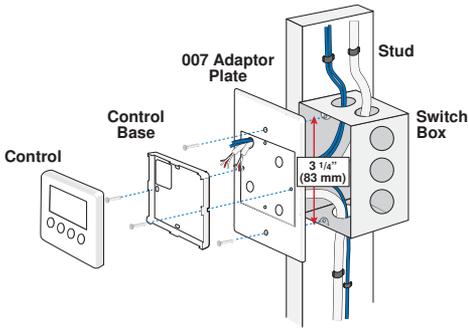
If a single gang switch box is used, an Adaptor Plate 007 is required to mount the control to the box.

- Fasten the base of the control to the adaptor plate.
- Feed the wiring through the openings in the back of the adaptor plate and control.
- Use the upper and lower screw holes to fasten the adaptor plate to the box.

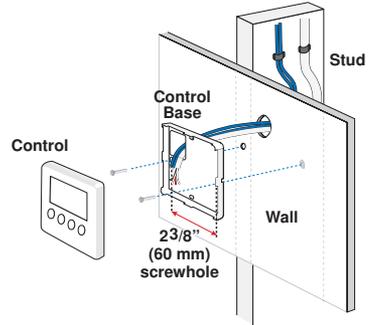
If a switch box was not used, mount the control directly to the wall.

- Feed the wiring through the openings in the back of the control.
- Use screws in the screw holes to fasten the control to the wall. At least one of the screws should enter a wall stud or similar rigid material.

Mounted on switch box



Mounted on wallboard



Wiring Symbols

	Dry contact switch. Operates a device.
	tekmarNet [®] 4
Do Not Apply Power	Do not apply power to these terminals. Serious control damage will result.

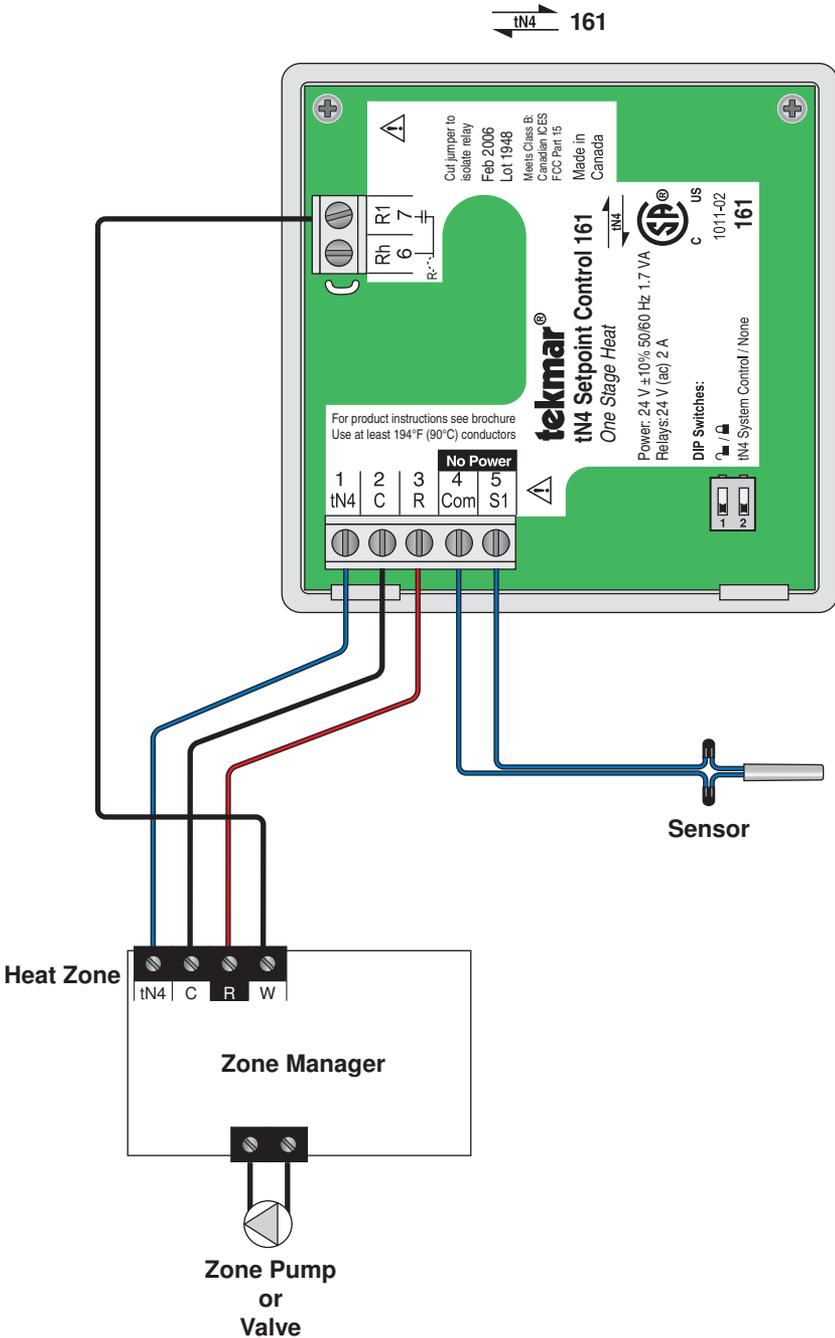
Electrical Drawings

 The electrical drawing examples on the following pages show the 161 in common applications. Choose the drawing that most accurately depicts the components in your system and use that drawing 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:

Setpoint Control used with tN4 System Zone Manager.

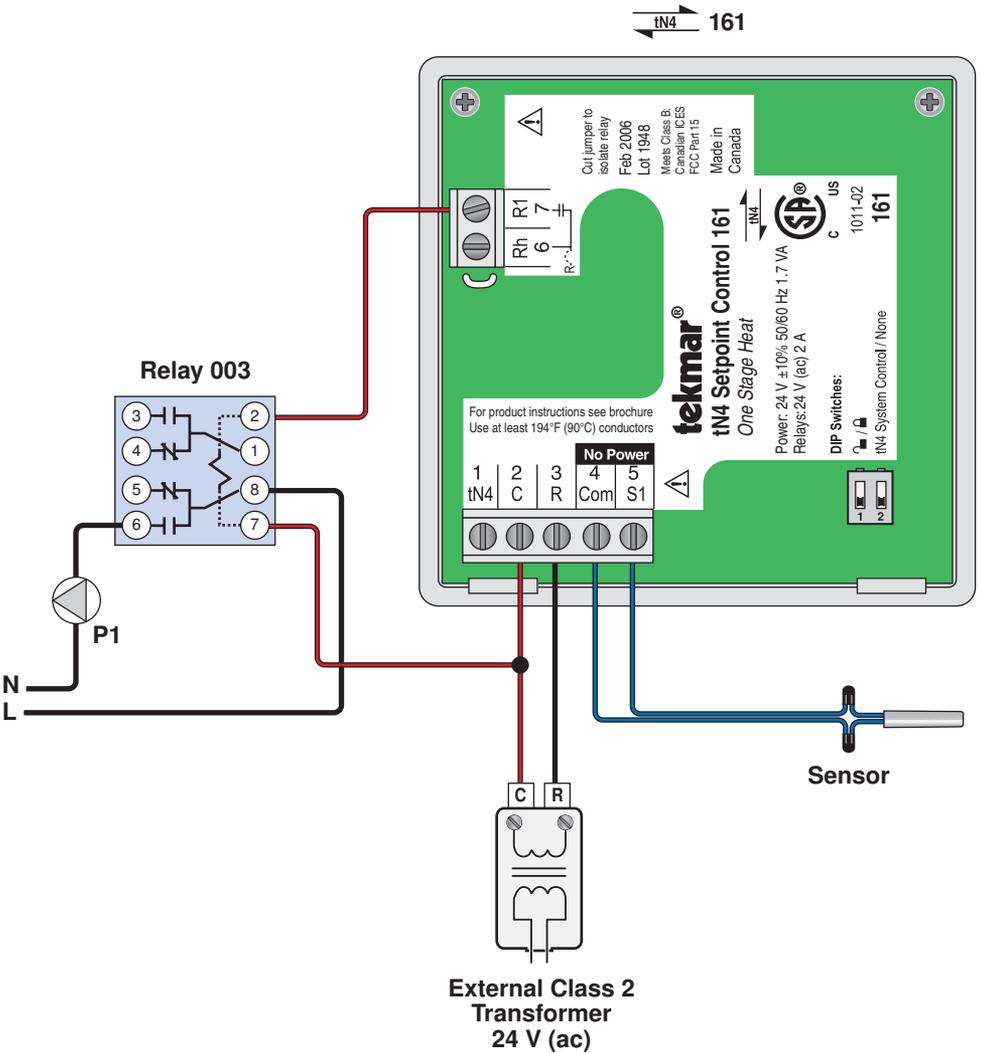


Description:

Setpoint Control used as a stand alone device. Relay 1 is used to cycle a pump to provide heat.

Legend:

P1 = Pump cycled for heating



Wiring the Setpoint Control

⚠ Power 24 V (ac)

Terminals 2, 3

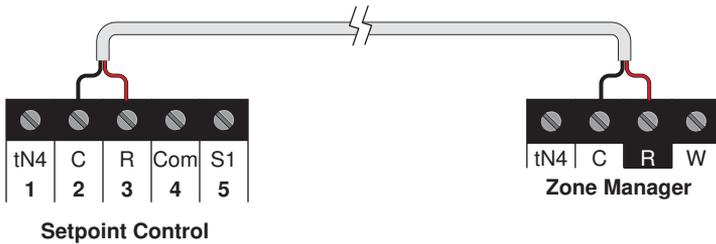
Wire 24 V (ac) to terminals C and R.

If a Zone Manager is used:

- Connect C on the setpoint control to C on the proper zone of the Zone Manager.
- Connect R on the setpoint control to R on the proper zone of the Zone Manager.

If a 24 V (ac) transformer is used:

- Connect C on the setpoint control to C on the transformer.
- Connect R on the setpoint control to R on the transformer.



⚠ tN4 Communication

Terminals 1, 2

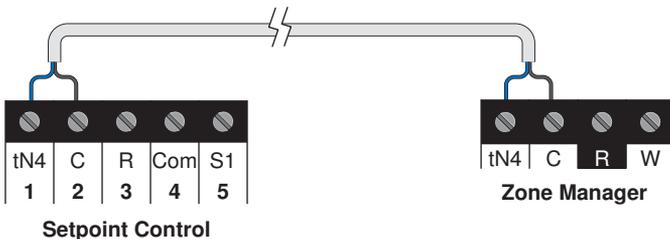
Wire the tN4 communication to terminals tN4 and C.

If a Zone Manager is used:

- Connect tN4 on the setpoint control to the tN4 on the proper zone of the Zone Manager. The C terminal is already connected.

If a Zone Manager is not used:

- Connect tN4 on the setpoint control to the tN4 terminal on another tN4 device on the same tN4 bus.
- Connect C on the setpoint control to the C terminal on another tN4 device on the same tN4 bus.



Relay 1

Terminals 6, 7

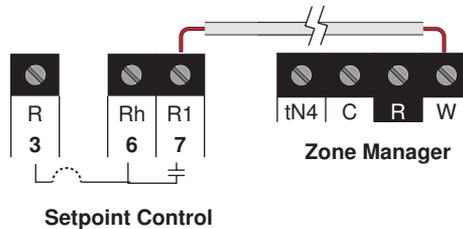
Relay 1 is used to switch the heat.

If a Zone Manager is used:

- Connect Relay 1 to W on the proper zone on the Zone Manager.

If a Zone Manager is not used:

- Determine if the jumper must be cut.
- When the jumper is not cut, Relay 1 is internally powered through terminal 3.
- When the jumper is cut, Rh and Relay 1 is an isolated switch.



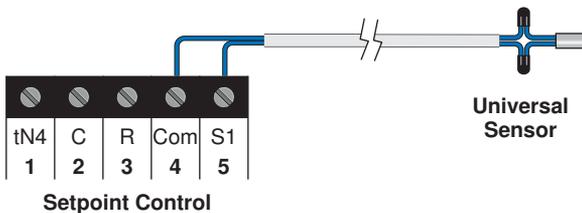
Sensor Input

Terminals 4, 5

The sensor is connected to the setpoint control on terminals Com and S1.

- Connect sensor to terminals S1 and Com.

Do not apply power to terminals S1 and Com, permanent damage to the sensors and/or setpoint control will result!



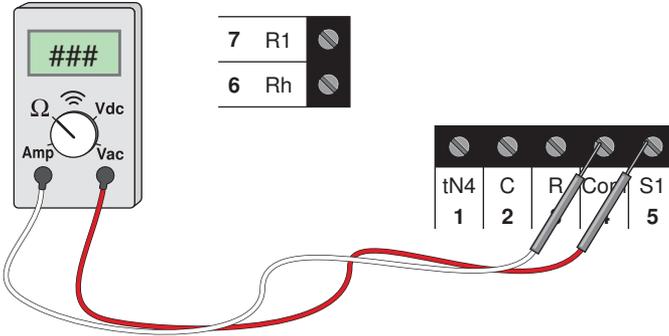
Do Not Apply Power

Troubleshooting the Wiring

⚠ 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), 0-2,000,000 Ohms, and testing for continuity is essential to properly test the wiring and sensors.



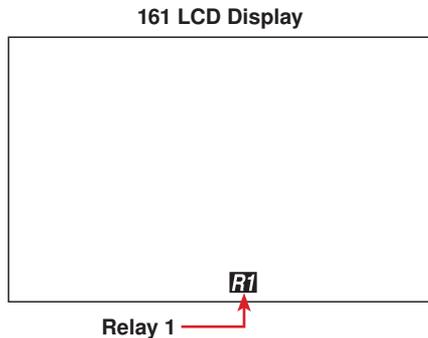
Testing the Wiring

Testing 24 V (ac) Power Supply

1. Remove the front cover from the setpoint control.
2. Use an electrical test meter to measure (ac) voltage between the R and C terminals. The reading should be 24 V (ac) +/- 10%.
3. Install the front cover.

Testing the Relay

1. Remove the front cover from the setpoint control.
2. Disconnect the wires from the relay.
3. Use an electrical test meter and check for continuity across the relay.
 - When the relay symbol is displayed in the LCD, there should be continuity.
 - When the relay symbol is not displayed in the LCD, there should be no continuity.
4. Reconnect the wires to the relay.
5. Install the front cover on the setpoint control.



Testing the Sensor

To test the sensor, the actual temperature at the sensor location must be measured.

Use a good quality digital thermometer with a surface temperature probe for ease of use and accuracy. Where a digital thermometer is not available, place a spare sensor alongside the one to be tested and compare the readings.

1. Remove the front cover from the setpoint control.
2. Disconnect the wires from the sensor.
3. Test the sensor's resistance according to the instructions in the sensor Data Brochure D070, D074 or D079.
4. Reconnect the wires.
5. Install the front cover on the setpoint control.

Testing the tN4 Network

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

1. Remove the front cover from the setpoint 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.
6. Install the front cover on the setpoint control.

Technical Data

tekmarNet®4 Setpoint Control 161 *One Stage Heat*

Control	Microprocessor PID control; This is not a safety (limit) control
Packaged Weight	0.46 lb. (210 g)
Enclosure	White PVC plastic
Dimensions	2-7/8" H x 2-7/8" W x 13/16" D (73 x 73 x 21 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) 92% RH up to 104°F (40°C), 50% RH if > 104°F (40°C) Altitude <9840 feet (3000 m), Installation Category II, Pollution Degree 2
Power Supply	24 V (ac) ± 10% 50/60 Hz, 1.7 VA, NEC / CEC Class 2
Relays	24 V (ac) 2 A
Sensors	NTC thermistor, 10 kΩ @ 77°F (25°C ± 0.2°C) β = 3892
– Included	Universal Sensor 071
– Optional	tekmar type #070, 071, 072, 073, 076, 077, 078, 079, 082, 083, 084

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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