JDTMECH01 & JDTMECH02 Line Voltage Thermostats

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Description
These Line Voltage Thermostats are designed for reliable use in heating, ventilating, and refrigeration applications.

Models made with high strength plastic enclosures are NEMA 4X rated, and may be mounted indoors or outdoors. These models are protected from rain and may be washed down with a hose but must not be exposed to standing water or be submerged. Models rated in accordance with NEC547 are suitable for use in agricultural buildings.

Model numbers and electrical ratings are found on the underside of the access plate attached to the thermostat.

GENERAL SAFETY INFORMATION

WARNING

Disconnect all power before installing or servicing this product. If the power disconnect is out of view, lock it in the open position and tag it to prevent unexpected restarting of power. Failure to do so could result in fatal electric shock.

1. Special attention must be given to any grounding information on this product and to other equipment associated with its installation and use. To ensure a proper ground, the grounding means must be checked by a qualified electrician.

2. Be certain that the electrical ratings of the thermostat conform to the power source and the load(s) being controlled. Loads that exceed the rating of the thermostat should be handled with a suitable rated relay or motor starter.

WARNING

Do not depend upon the thermostat as the sole means of disconnecting power when installing or servicing the product it is controlling. Always disconnect power at the main circuit breaker as described above. Failure to do so could result in fatal electric shock.

3. This thermostat is intended ONLY for permanent installation in accordance with the United States National Electrical Code (NEC), all applicable local codes and ordinances, and all sections of this manual. All wiring should be done by a qualified electrician, using copper wire only.

WARNING

These thermostats are intended for general heating, ventilating, and refrigeration ONLY. They must NOT be used in potentially dangerous locations such as flammable, explosive, chemical laden areas or in wet atmospheres.

WARNING

These thermostats are designed for use as operating controls only. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (supervisory alarm systems) that protect against, or warn of control failure.

WARNING

In cases where personal injury or property damage may result from malfunction of the thermostat, a backup system must be used. Where critical or high value products are maintained, an approved temperature limit should be wired in series with this thermostat. In less critical applications, a second thermostat with alarm contacts may be used for redundancy.

INSTALLATION

LOCATION

Mount this product 5 to 6 feet (1.5 to 1.8 m) above the floor so it will be exposed to the average temperature of the controlled space. Do not mount control where it could be affected by unusual heat or cold such as in sunlight or beside equipment. Avoid locations near a door, window or other opening. Do not mount on an outside wall.

WARNING

Do not allow the thermostat to be placed on the floor where it could come in contact with moisture, or be stepped on. Doing so could result in a fatal electric shock.

MOUNTING – FIXED INSTALLATIONS

Four mounting holes for fixed installations are found in the back of the case. On rough surfaces use the top mounting holes only. When mounting this control on uneven surfaces, when all four mounting screws are tightened, the housing may deform enough to affect the thermostat calibration and operation.

CAUTION

Do not dent or deform the sensor coil of this control. A dent or deformation will change the calibration and cause the control to cycle at a temperature lower than the knob setting.

THERMOSTAT WITH CORD AND 3-PRONG PLUG

CAUTION

To reduce the risk of electric shock, this product has a grounding type plug that has a third (grounding) pin. This plug will only fit into a grounding type power outlet. If the plug does not fit into the outlet, contact a qualified electrician to install the proper outlet. Do not change the plug in any way.

Certain thermostats are supplied with a cord and series plug for easy connection to a 120V AC grounded receptacle. Hang the thermostat near a 120V three prong receptacle with a ground pin using the hanging wire included in the package. Plug the male prongs into the receptacle and then plug the controlled equipment into the female part of the plug. For best results do not locate the thermostat near an exterior wall or window and away from the discharge of the equipment. If an extension cord is required use only one with a grounded 3 prong plug and 14 gauge wire.

These thermostats are designed for use in wet or humid environments. They meet NEMA 4X requirements when used with approved watertight connectors (not included).

To ensure water tightness, a UL listed cord seal or conduit hub marked "4X" should be tightened onto the conduit before installing in the enclosure. A drip loop must be used to prevent moisture from entering the thermostat housing. Make certain that all connectors are securely tightened.

When reinstalling the cover, make sure it is squarely positioned over the gasket. Then uniformly tighten the screws, evenly compressing the gasket to provide a watertight seal. Do not over tighten.

WIRING FOR SINGLE STAGE THERMOSTAT - JDTMECH01

IMPORTANT: All wiring should be done in accordance with applicable codes, ordinances and regulations. Use a disconnect device and overload protection to assure safe installation complying with local and national codes. Use copper conductors only.

NOTE: Letters R, B and Y (red, blue and yellow) refer to color of paint dots near terminals and wire colors **(see Figure A)**.

Figures 1, 2 and 3 illustrate typical wiring for control of heating, cooling, refrigeration, and combination heating/cooling control systems (use copper conductors only).

Figure A

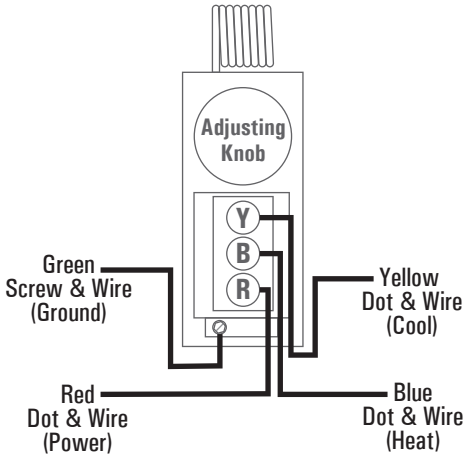


Figure 1

Connection for a Typical Heating Control Circuit
(**B** - open on temp. rise)

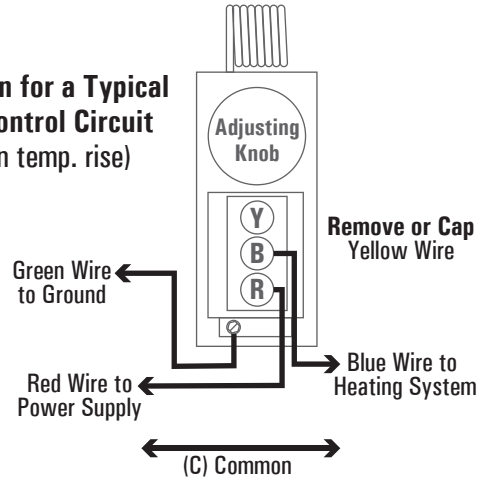


Figure 2

Connection for a Typical Refrigeration, Ventilation or Cooling Control Circuit
(**Y** - close on temp. rise)

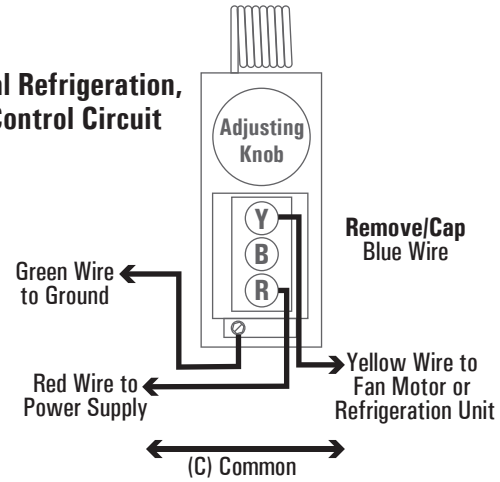
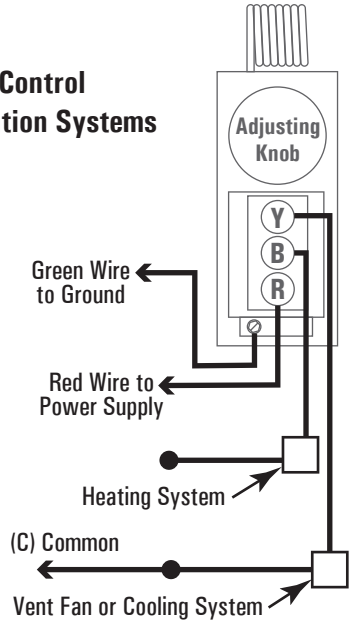


Figure 3

SPDT Thermostats in Control of Heating and Ventilation Systems



TESTING PROCEDURE FOR SINGLE STAGE - JDTMECH01

Before leaving the installation, a complete operating cycle should be observed to ensure that all components are functioning properly. Check for correct operation in the following sequence:

1.When thermostat is connected to refrigeration, ventilating, or cooling systems:
- 1) Turn knob clockwise to a setting warmer than ambient temperature.
  - — Fan or cooling system should be off
- 2) Turn knob counterclockwise (to cooler than ambient temperature setting)
  - — Fan or cooling system should turn on.

2.When thermostat is connected to a heating device or system:
- 1) Turn knob clockwise above the ambient temperature
  - — The heating unit should be on
- 2) When knob is turned counterclockwise (to lower temperature setting)
  - — The heating unit should turn off approximately at the knob setting

NOTE: No Replacement parts available. Do not attempt any field repair.

WIRING FOR TWO STAGE THERMOSTAT - JDTMECH02

IMPORTANT: All wiring should be done in accordance with applicable codes, ordinances and regulations. Use a disconnect device and overload protection to assure safe installation complying with local and national codes. Use copper conductors only

NOTE: Letters R, B and Y (red, blue and yellow) refer to color of paint dots near terminals but not necessarily the color of the wire **(see Figure B)**.

Figure B

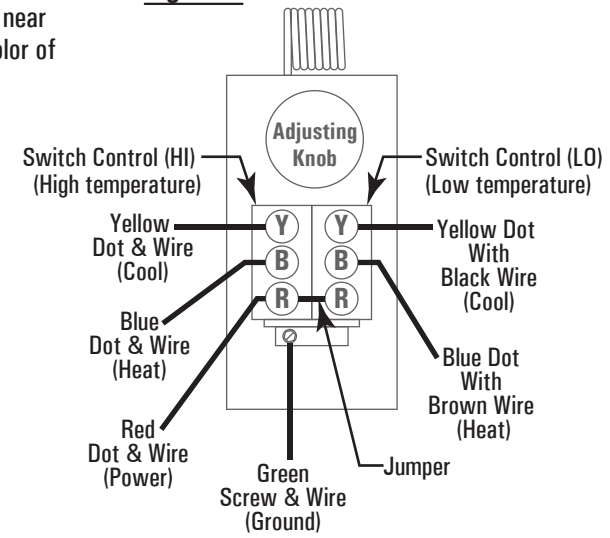


Figure 4a, 4b, & 4c shows wiring for controlling a two-speed ventilating fan. When the control element reaches the knob settings, the low temperature switch starts the fan on low speed. If the ambient temperature continues to rise, the high temperature switch supplies power to the high-speed motor winding.

Figure 4a

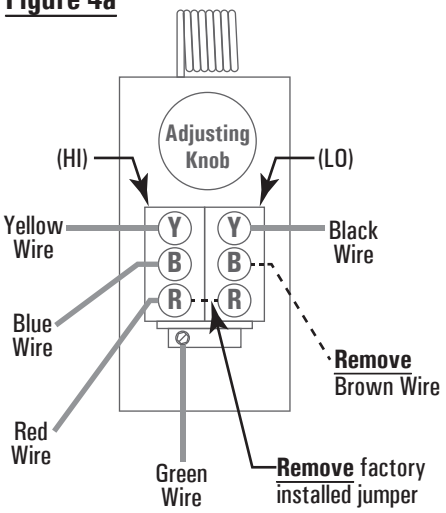


Figure 4b

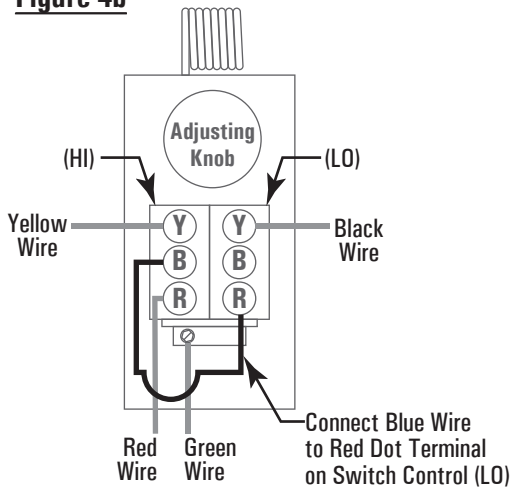


Figure 4c

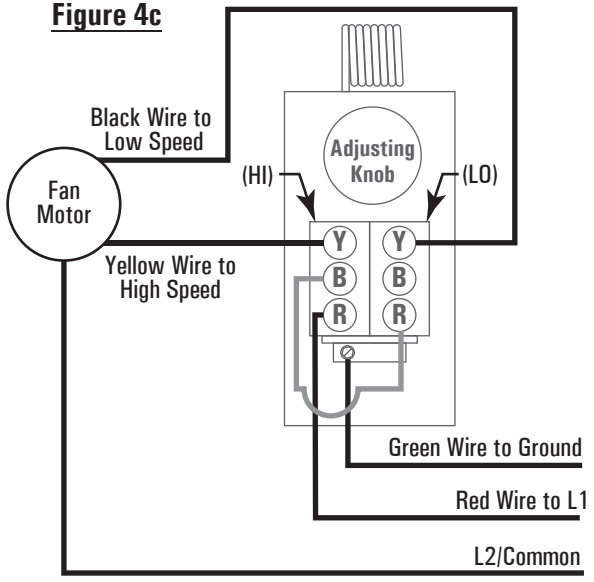


Figure 5a and 5b shows a typical SPDT/SPDT connection for a two-stage ventilation application. The damper motor will be energized when the temperature reaches the knob setting. If the temperature continues to rise, the fan motor will be energized by the high temperature switch.

Figure 5a

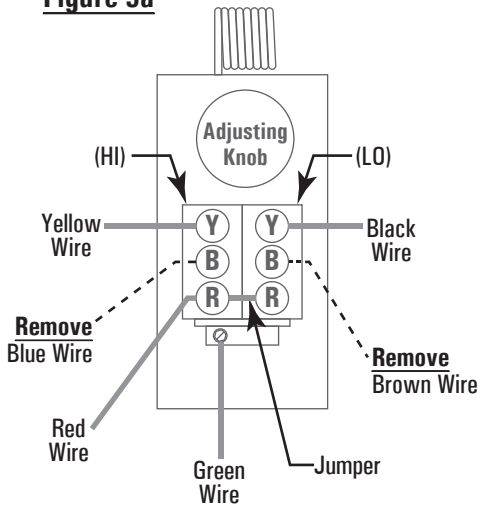
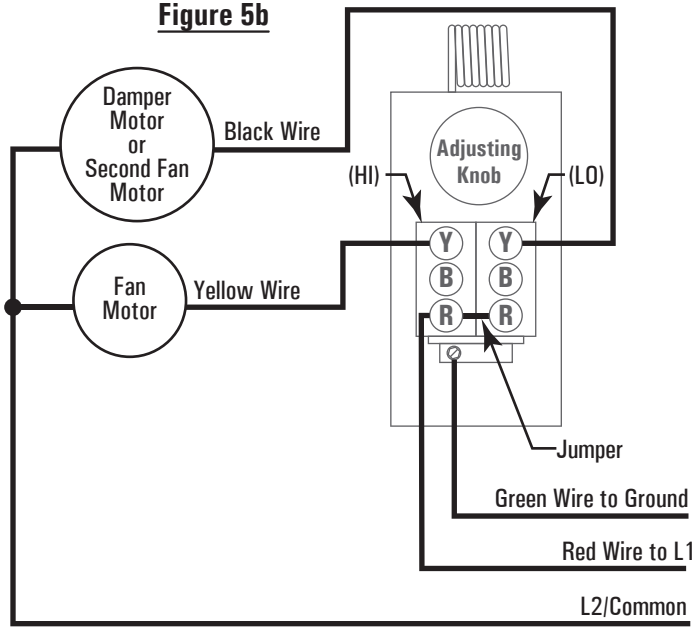


Figure 5b – **Shows two-stage SPDT/SPDT Thermostat in control of a single-speed ventilating fan and volume increase damper motor**

Figure 5b



SPDT/SPDT units can also be used to control a combination heating and ventilating/cooling system, as shown in **Figure 6a & 6b**. When knob is set warmer than ambient temperature cooling will turn on. When knob is set cooler than ambient temperature heating will turn on. Once ambient temperature is reached a drop or increase of 3ºF is needed to activate device.

Figure 6a

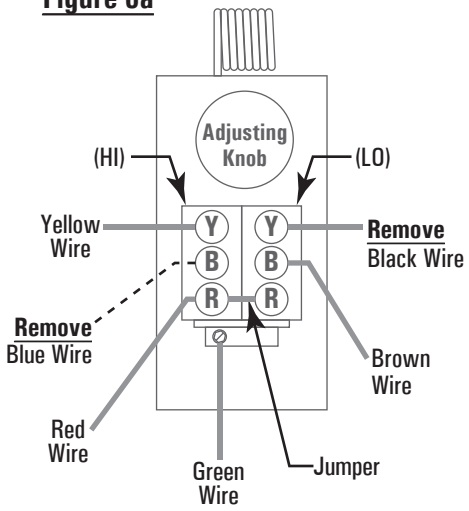


Figure 6b – Two-stage SPDT/SPDT Thermostats with automatic changeover in control of heating and cooling systems

Figure 6b

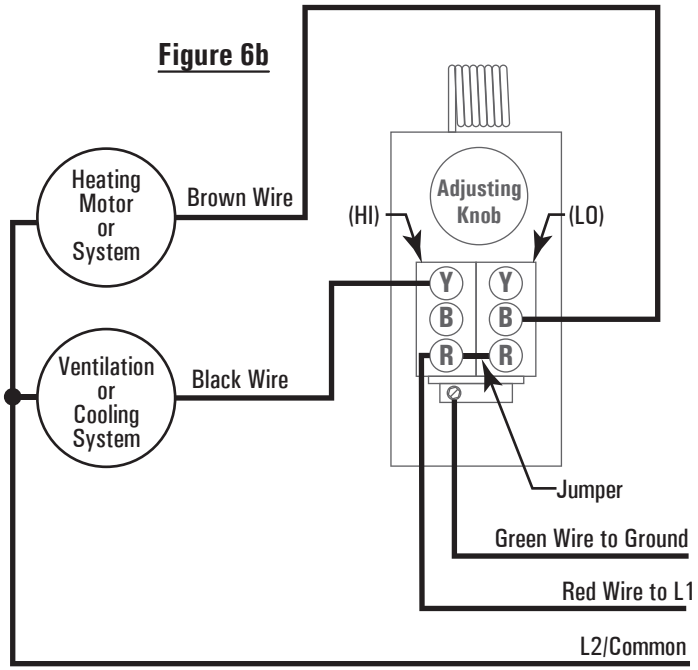


Figure 7a & 7b illustrates typical wiring for SPDT/SPDT units for control of two heating stages. As the ambient temperature decreases to the knob setting, the high temperature switch will make Red-Brown wire or Blue dot, Yellow dot contact, turning on the first stage of heating. If the temperature continues to drop (about 3ºF) the low temperature switch will make Red-Blue contact, turning on the second stage of heating.

Figure 7a

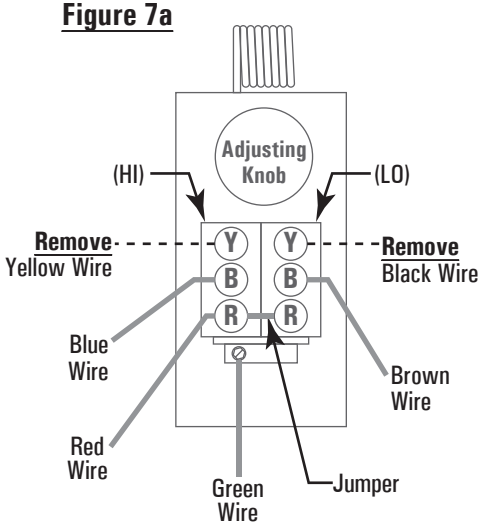
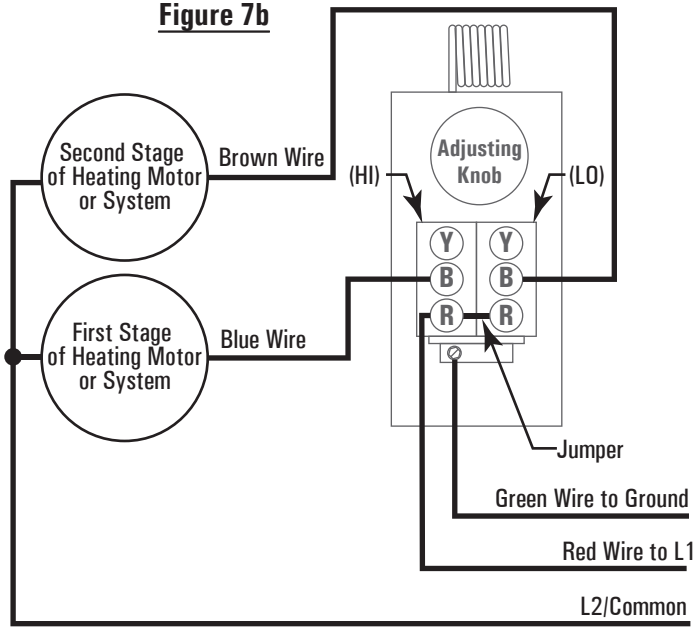


Figure 7b – Two-stage SPDT/SPDT Thermostats in Control of a Two-stage Heating System

Figure 7b



OPERATIONAL SEQUENCE OF TWO STAGE THERMOSTAT

Figure 8 illustrates the operation of thermostat with SPDT/SPDT 2 Stage switching. On a temperature increase to the knob setting, the (LO) YR circuit closes. Simultaneously opening the (LO) BR circuit.

On a further increase in temperature the (HI) YR circuit closes. Simultaneously opening the (LO) BR circuit.

The reverse sequencing takes place with a decrease in temperature.

NOTE: No Replacement parts available. Do not attempt any field repair.

Figure 8

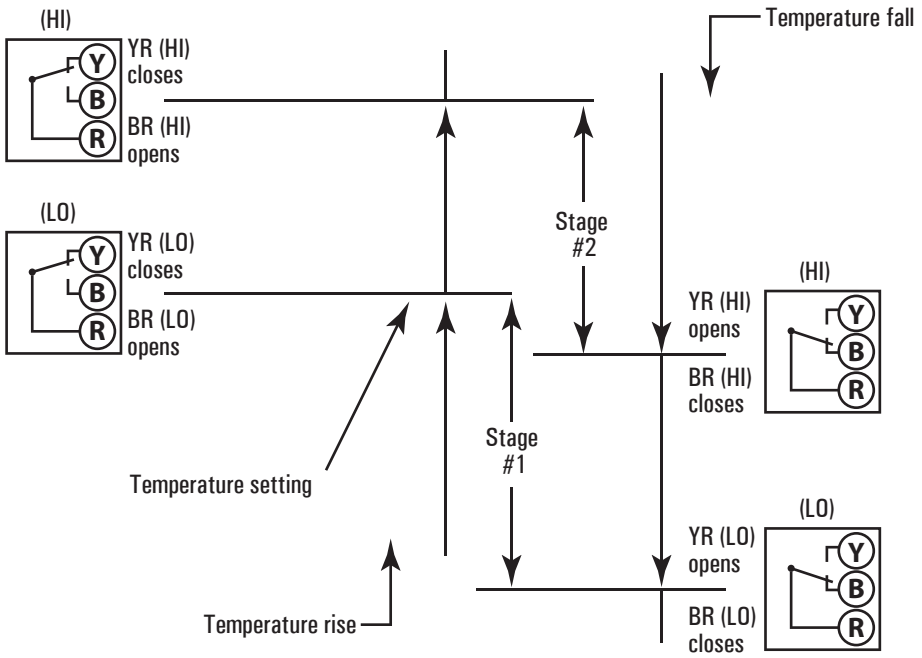


Figure 8 – Operational Sequence of Two-stage SPDT/SPDT Thermostats

TESTING PROCEDURE FOR TWO STAGE - JDTMECH02

Before leaving the installation, a complete operating cycle should be observed to ensure that all components are functioning properly. Check for correct operation according to the chosen connection/s wired for.

If wiring is the same as Figure 4c for controlling a two-speed ventilating fan

1) When knob is turned to approximately ambient temperature
   – Fan should start up
2) As knob is turned counterclockwise to a lower temperature setting
   – Fan should change to high speed
3) The devices should act in reverse sequence when the knob is turned clockwise

If wiring is the same as Figure 5b for a two-stage ventilation application

1) When knob is turned to approximately ambient temperature
   – Damper motor should be energized
2) As knob is turned counterclockwise to a lower temperature setting
   – Fan should start up
3) The devices should act in reverse sequence when the knob is turned clockwise

If wiring is the same as Figure 6b for controlling a combination heating and ventilating/ cooling system

1) When knob is set warmer than ambient temperature
   – Cooling will turn on
2) When knob is set cooler than ambient temperature
   – Heating will turn on
3) Once ambient temperature is reached
   – Neither heat or cool should systems should be on
   – A drop or increase of 3ºF in the ambient temperature is needed to activate the corresponding heating or cooling system

If wiring is the same as Figure 7b for control of two heating stages

1) When knob is turned to approximately ambient temperature
   – Stage #1 of heating system should start up
2) As knob is turned counterclockwise to a lower temperature setting
   – Stage #2 of heating system should start up

TROUBLESHOOTING

Issue	Possible Cause/s	Solution/s
Cooling or Fan		
Does not operate	1. Improper wiring 2. Knob set above ambient temp.	1. Check wiring 2. Set knob to lower temp.
Runs continuously	1. Improper wiring 2. Knob set below ambient temp.	1. Check wiring 2. Set knob to higher temp.
Operates in reverse	Improper wiring	Check wiring
Heating Unit		
Does not operate	1. Improper wiring 2. Knob set below ambient temp.	1. Check wiring 2. Set knob to higher temp.
Runs continuously	1. Improper wiring 2. Knob set above ambient temp.	1. Check wiring 2. Set knob to lower temp.
Operates in reverse	Improper wiring	Check wiring

WARRANTY

J&D Mfg. warrants this product is free from defects in materials and workmanship under normal use for the period of one year from date of purchase. Our warranty does not cover ordinary wear and tear. J&D Mfg can repair or replace at our option, any product or part of the product that is found to be defective. Our warranty applies to materials only and does not include return freight, delivery, loss or damage to personal property, cost of removal or installation, any incidental or consequential damages or labor. This warranty does not apply to products which are misused, abused, altered, improperly installed or subject to negligence. All warranties must be approved through our warranty department. The original purchaser must present a copy of the invoice for the defective product.