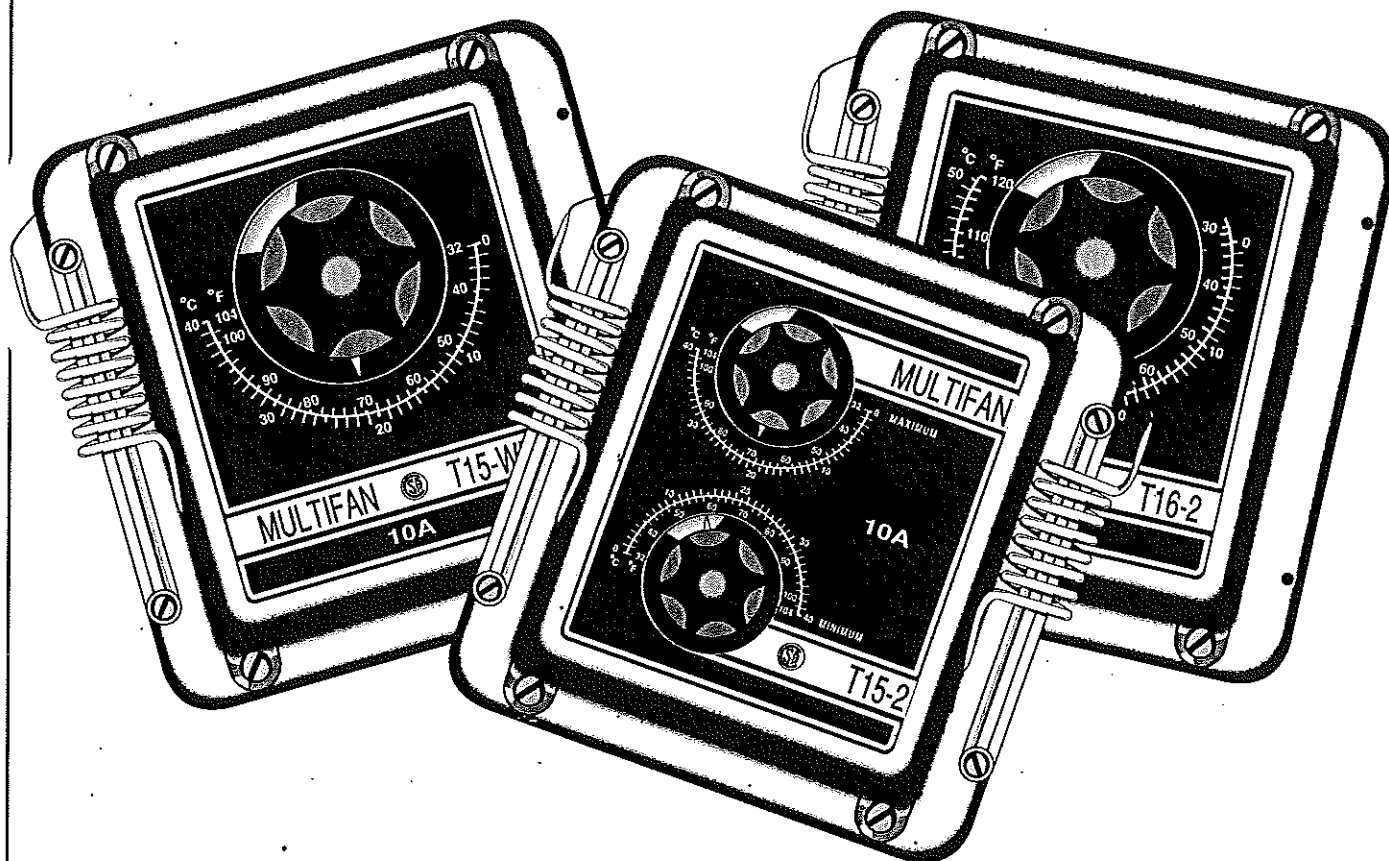# Multifan Mechanical Thermostats

T15-WD
T15-2
T16-2

General Description

The thermostats in this series are simply on/off switches which can control one or two electrical devices. These thermostats come completely assembled and ready to install.

These thermostats can be used to operate fans, heaters, curtains on livestock buildings, or any other electrical device needing to be automatically controlled. The thermostats will work with any Multifan fan or any other fan rated up to a maximum of 10 amps. The thermostats will operate on 120 or 240 Volt, single phase 50/60 hertz, electrical systems. The T15-WD and T15-2 thermostats can also be wired in-line with a Multifan STW or STW-S Speed Controller*.

Each of the thermostats is designed to be water and dust resistant. The housings are made from a high-impact, fire-resistant plastic and should provide users with many years of trouble free operation. These units can be located inside any type of building or confinement center.

Each type of thermostat has been tested and approved by CSA and meets current standards for operation and safety.

Specific descriptions of how each thermostat can be used are provided in the following paragraphs.

* For more information on availability and use of the Speed Controllers, contact Multifan at 1-800-458-5532.

T15-WD One-Step Mechanical Thermostat

The T15-WD will work on any Multifan fan. It will also work on any other motor or electrical device which has a maximum 10 amp rating.
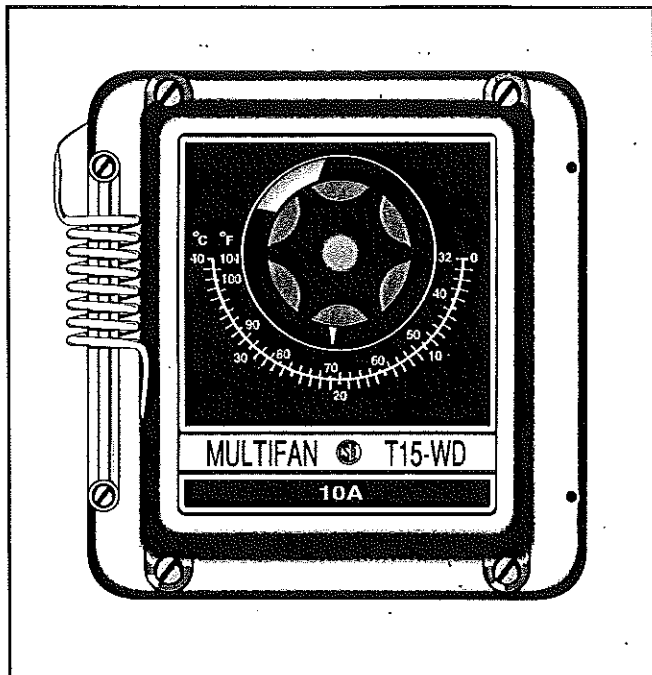

Figure 1. T15-WD Mechanical Thermostat

This unit is a mechanical thermostat with a single pole two-way switch. This is a simple on/off control for a single electrical device. Using this thermostat enables you to automatically turn a fan, heater, or other such electrical devices on and off.

The electrical motor is automatically turned on when the outside temperature rises above the temperature setting on the thermostat dial. When the temperature decreases below the setting, the fan/heater turns off.

The T15-WD has an operating range of 32 °F (0 °C) to 104 °F (40 °C). In fan applications where a Multifan fan is used, the T15-WD can be wired in-line with the STW and STW-S Speed Controllers for six-speed fan control.

T15-2 Two-Step Mechanical Thermostat

This unit is recommended for heater and fan combinations or two speed fan applications. The T15-2 provides the same functions as the T15-WD, except the T15-2 can control two separate electrical devices. Another use for the unit is controlling fans at two different speeds. This can be done on Multifan variable speed fans or other motors having two windings. The T15-2 can also be used to activate a Multifan temperature alarm system.
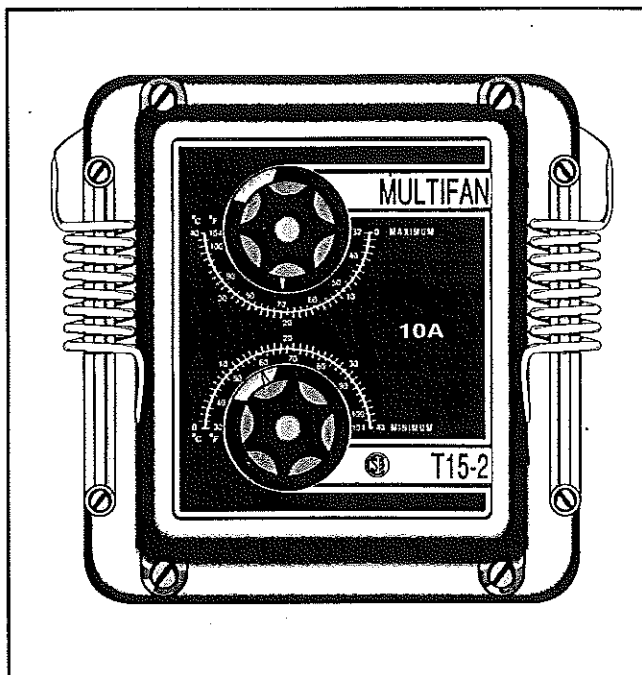

Figure 2. T15-2 Mechanical Thermostat

The T15-2 has two separate mechanical thermostats in one housing. Using this unit in a fan heater combination, a fan can be turned on when the inside temperature rises to the set point on the "Maximum" thermostat. In turn, when the temperature drops below the "Minimum" thermostat setting, a heater can be switched on.

If you need to control a fan at two speeds, the T15-2 can provide this option without the need to install a speed controller. Read more about the operation of two speed or fan/heater combinations using the T15-2 thermostat in the Operation section.

The T15-2 has an operating range of 32 °F (0 °C) to 104 °F (40 °C). In fan applications where a Multifan fan is used, the T15-2 "Maximum" thermostat can be wired in-line with the STW-S Speed Controller for six-speed fan control.

T16-2 Thermostat

The T16-2 thermostat is especially suited for controlling servo motors, often found in curtain systems on the sides of livestock buildings.
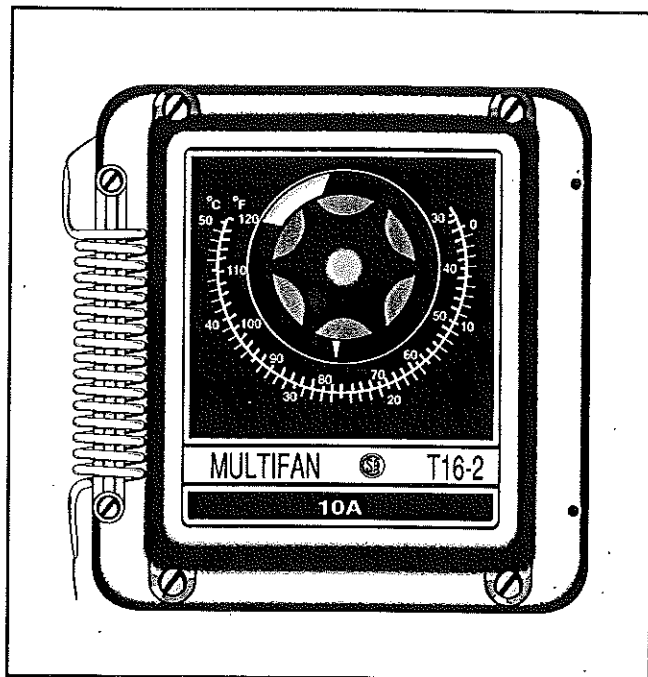
Figure 3. T16-2 Mechanical Thermostat

The thermostat uses a single pole, two-way switch with a 3.6°F (2 °C) rest position. When the temperature reaches the set point of the thermostat, the servo motor is turned on. It remains on and lowers the curtain until the temperature in the building decreases by 1.8 °F (1 °C). At this time the motor shuts off. The motor remains off until the temperature drops an additional 1.8 °F (1 °C) at which time the servo motor is turned on in the opposite direction, and the curtain rises.

The T16-2 has an operating range of 32 °F (0 °C) to 122 °F (50 °C).

Specifications

Model	Actual Size	Temperature Adjustment Range	Temperature Difference	Voltage	Amperage Rating
T15-WD	5 1/4 W x 5 3/4H x 3 1/4D	32 - 104 °F (0 - 40 °C)	1.8 °F (1°C)	120/240	10
T15-2	5 1/4 W x 5 3/4H x 3 1/4D	32 - 104 °F (0 - 40 °C)	1.8 °F (1°C)	120/240	10
T16-2	5 1/4 W x 5 3/4H x 3 1/4D	32 - 122 °F (0 - 50 °C)	3.6 °F (2°C)	120/240	10

Model	Used For	Used with Speed Controller
T15-WD	Fans or heaters	STW and STW-S
T15-2	Fan/heater combination or temperature alarm system	STW-S
T16-2	Livestock building curtain	None

Safety

Electricity is recognized as a serious workplace hazard. It exposes people working with it to dangers such as electric shock and electrocution, fires, and explosions. Many electrical mishaps can be easily avoided by using common sense and taking some simple precautions.

Some of these safety precautions are listed below. Read and follow these safety precautions as well as those of Federal, state, or local electrical codes.

1. Prior to wiring any electrical component, shut off the power. If the main power supply can be locked off with a padlock, do so. If the box cannot be locked off, use a tag which states the work being performed and the words "Do Not Turn Power On".

2. Always ground electrical components such as fans, thermostats, speed controllers, or alarm systems.

3. When installing a fan or heater system, use a separate circuit. This allows the power to be shut off to that system without disconnecting other power.

4. In the United States, all electric wiring, boxes, conduit, circuit breakers, and other hardware should meet the National Electrical Code (NEC) regulations.

5. Thermostats and speed controllers should be located in a place that provides sufficient space to operate and maintain these components.

6. Always try to place a thermostat or speed controller within sight of the motor it's controlling.

7. Always use wiring of the correct size for the amount of current required for the electrical component.

8. Electrical wiring should only be done by competent people and in accordance with applicable standards and codes.

9. Use all hand tools safely and with the purpose they were intended.

Installation Of Mechanical Thermostats

Before installing the T15-WD, T15-2 or T16-2, read and understand the safety points in the Safety section of this booklet. Always follow all Federal, state, and local electrical and safety codes.

The location you install your Multifan thermostat is important. If it is installed against cold or hot outside walls, in a drafty area, too close to the ceiling, or too close to the floor, the thermostat cannot accurately control the temperature in the building.

To provide more accurate temperature control, install the thermostat in the middle of the building if possible. Try to keep the thermostat away from outside walls. Locate the thermostat about 5 feet (1.5 meters) above the floor of the building.

T15-WD Installation

1. Remove the four screws holding the cover of the thermostat, and carefully open the thermostat.

Note: *A ground wire runs from the cover of the thermostat to the base.*
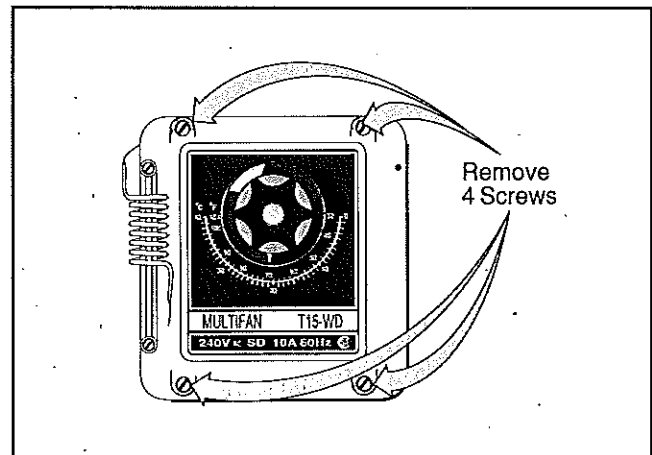

Remove 4 Screws

Figure 4. Remove the Cover

2. Fasten the base of the unit to a wall or post with four screws. Be careful not to over tighten the screws as they could crack the plastic base.

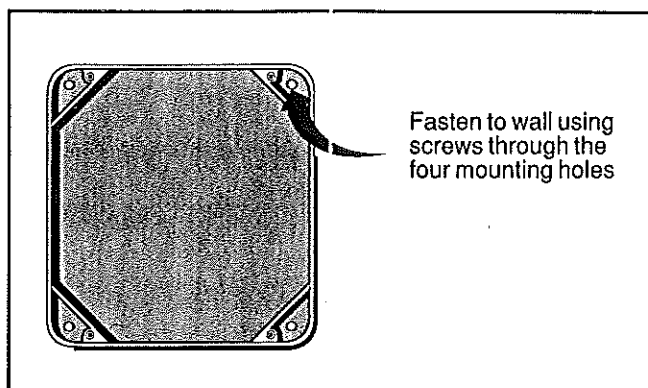Fasten to wall using screws through the four mounting holes

Figure 5. Fasten Base to Wall

3. Route the electrical wiring through the base of the unit. Watertight connections should be used throughout the installation.

Note: *In this manual, N is neutral; L1 is the 120 Volt connection; and L2 is the 240 Volt connection.*

4. Connect the wires to the proper terminals. The connections to P, 1, and 2 depend on whether the fan or heater is 120 or 240 Volts. Connections to P, 1, and 2 should have the insulation of the wire stripped away 1/4 inch (6 mm).

    a. Connect the ground wire to the ground terminal.

    b. Connect the N (white) or L2 wire to terminal P.

    c. For heater control, connect L1 (black wire) to the heater and then to terminal 1.

    d. For fan control, connect L1 (black wire) to the fan and then terminal 2.

Note: *See the electrical schematics for your particular application.*
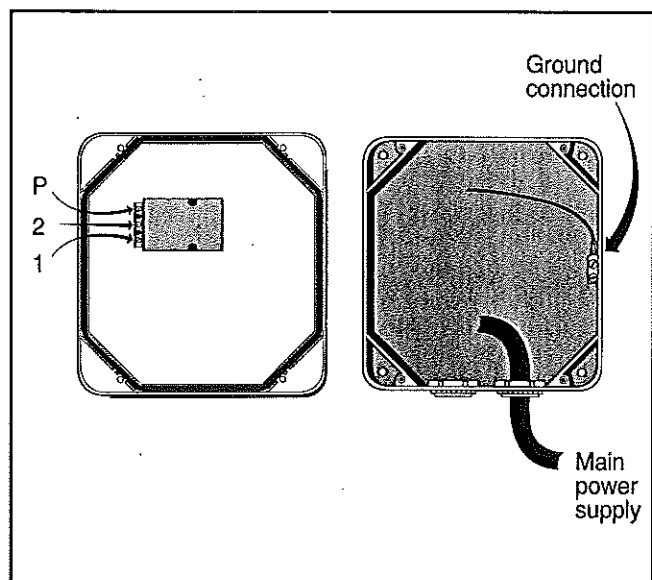

Figure 6. Connect Wires to Terminals

5. Make sure the black watertight gasket is in place, and place the cover over the base. Secure the cover using the four screws previously removed.

T15-WD Electrical Schematics

120 Volts / Single Phase / 50-60 Hz (Cycles)

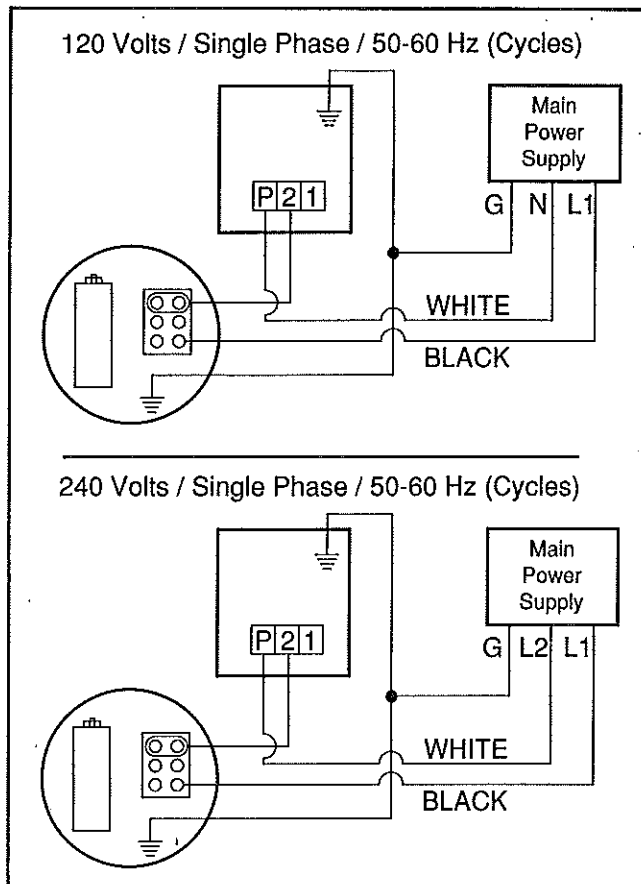240 Volts / Single Phase / 50-60 Hz (Cycles)

Figure 7. Fan Control—120/240 Volts

T15-2 Installation

1. Remove the four screws holding the cover of the thermostat, and carefully open the thermostat. See Figure 4. Remove the Cover.

Note: *A ground wire runs from the cover of the thermostat to the base.*

2. Fasten the base of the unit to a wall or post with four screws. Be careful not to over tighten the screws as they could crack the plastic base. See Figure 5. Fasten Base to Wall.

3. Route the electrical wiring through the base of the unit. Watertight connections should be used throughout the installation.
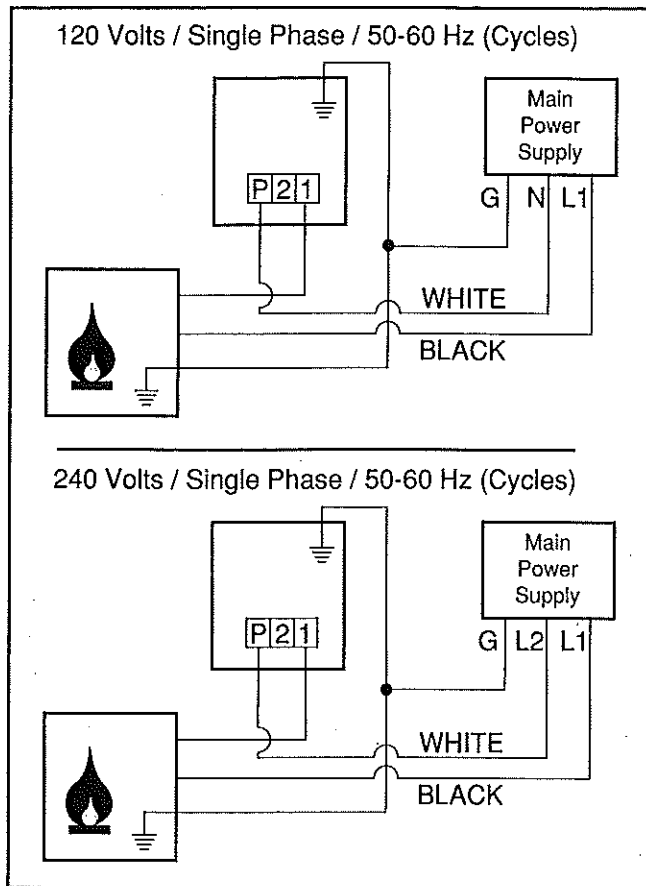
Figure 8. Heater Control—120/240 Volts

5. Make sure the black watertight gasket is in place, and place the cover over the base. Secure the cover using the four screws previously removed.
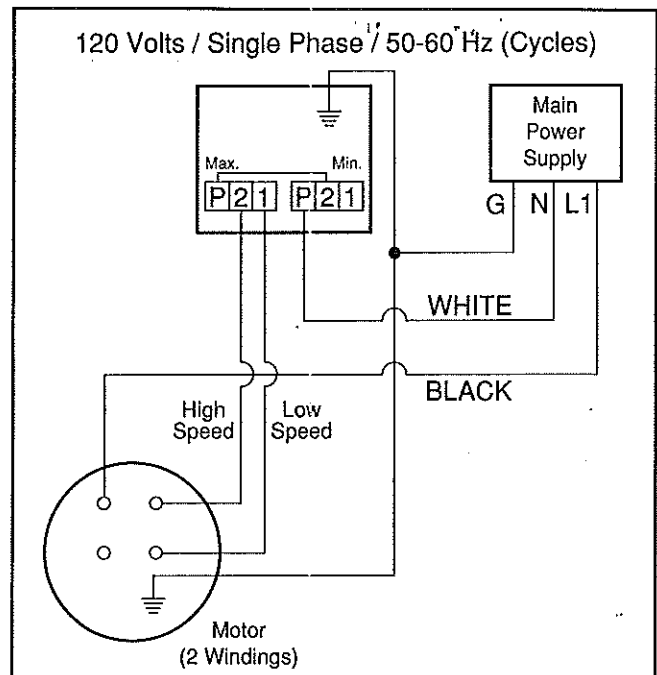
T15-2 Electrical Schematics

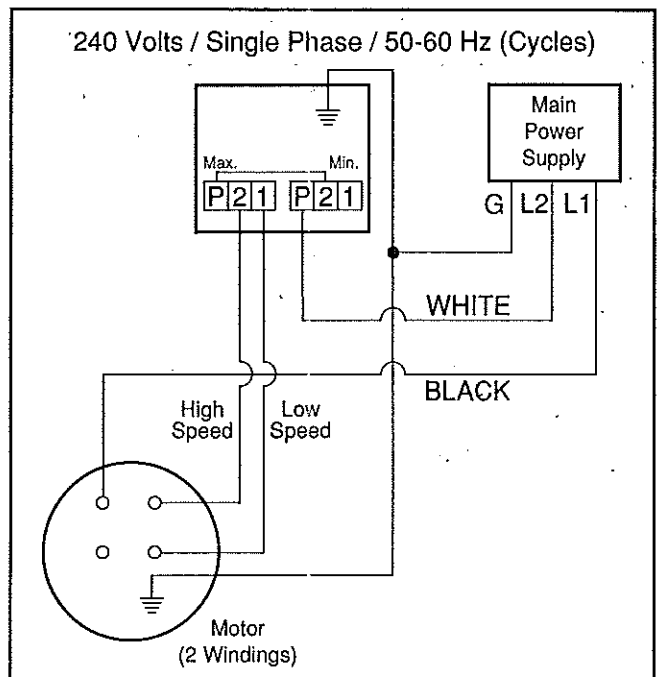Figure 9. Two-Speed Motors—120 Volts

4. Connect the wires to the proper terminals. See the T15-2 Electrical Schematics for your particular application. Connections to P, 1, and 2 should have the insulation of the wire stripped away 1/4 inch (6 mm).

For two-speed motors:

a. Connect the ground wire to the ground terminal.

b. Connect the N (white) or L2 wire to terminal P on the Minimum dial.

c. Connect the L1 (black wire) to the fan.

d. Connect the high speed wire to terminal 2 of the Maximum dial.

e. Connect the low speed wire to terminal 1 of the Maximum dial.

For variable speed motors:

a. Connect the ground wire to the ground terminal.

b. Connect the N (white) wire to terminal 1 on the Maximum dial.

c. Connect the L1 (black wire) to the fan and then to terminal P on the Minimum dial.

d. Connect the L2 to terminal 2 of the Maximum dial.

Figure 10. Two-Speed Motors—240 Volts

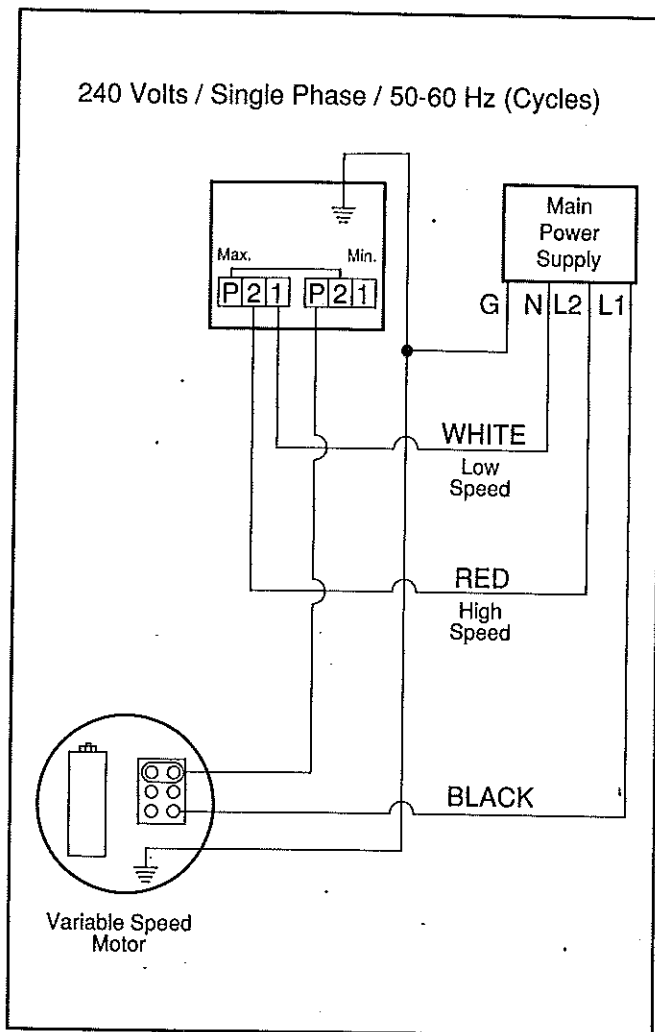## 240 Volts / Single Phase / 50-60 Hz (Cycles)

Figure 11. Variable Speed Motors—240 Volts

T16-2 Installation

1. Remove the four screws holding the cover of the thermostat, and carefully open the thermostat. See Figure 4. Remove the Cover.

Note: *A ground wire runs from the cover of the thermostat to the base.*

2. Fasten the base of the unit to a wall or post with four screws. Be careful not to over tighten the screws as they could crack the plastic base. See Figure 5. Fasten Base to Wall.

3. Route the electrical wiring through the base of the unit. Watertight connections should be used throughout the installation.

4. Connect the wires to the proper terminals. See the T16-2 Electrical Schematics for your particular application. Connections to P, 1, and 2 should have the insulation of the wire stripped away 1/4·inch (6 mm).

a. Connect the ground wire to the ground terminal in the thermostat and the servo motor.
b. Connect the N (white) to the servo motor.
c. Connect the L1 (black wire) to terminal P.
d. Connect terminal 2 to the servo motor terminal which controls downward movement of the curtain.
e. Connect terminal 1 to the servo motor terminal which controls upward movement of the curtain.

5. Make sure the black watertight gasket is in place, and place the cover over the base. Secure the cover using the four screws previously removed.
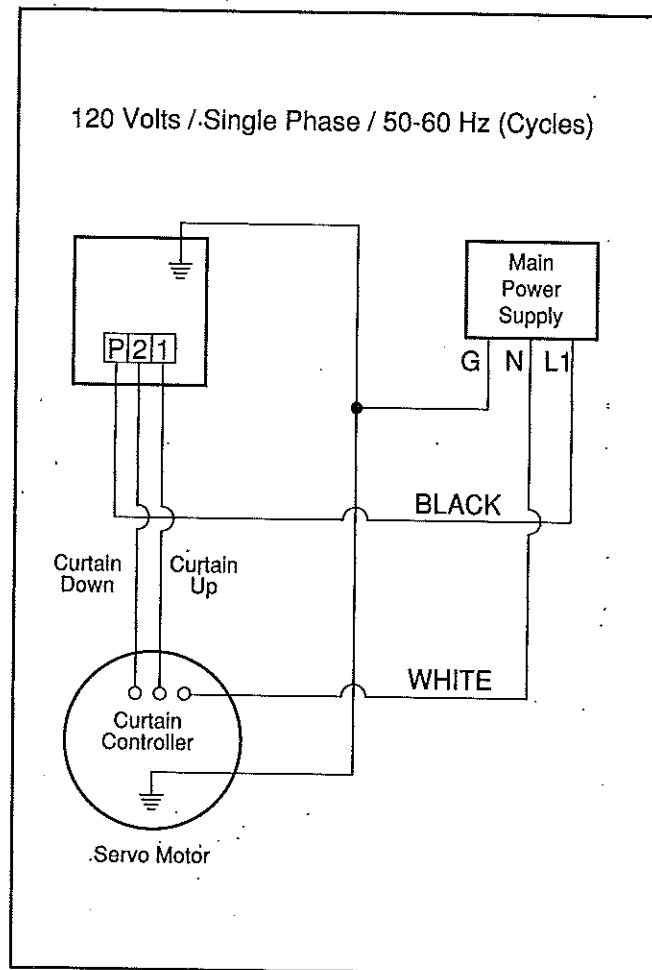
T16-2 Electrical Schematics

120 Volts /·Single Phase / 50-60 Hz (Cycles)

Figure 12. Servo Motors—120 Volts
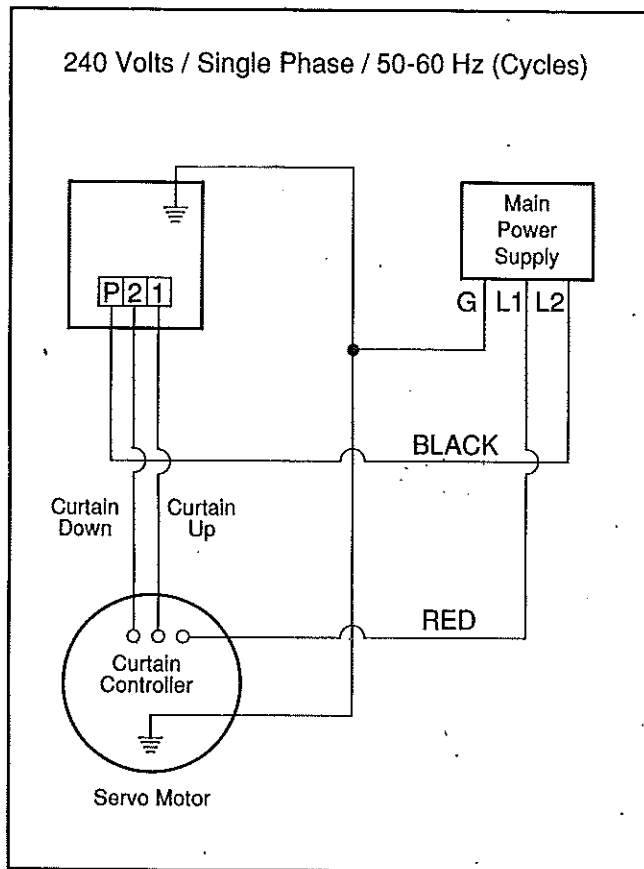
240 Volts / Single Phase / 50-60 Hz (Cycles)

Figure 13. Servo Motors—240 Volts

Operation

Prior to setting the thermostat's temperature dial, the thermostat must be calibrated. Use the calibration procedure in this section.

Calibrating a Mechanical Thermostat

A thermostat should be calibrated only after it has acclimated to the temperature conditions in the room.

1. Use a thermometer to obtain the actual temperature, for example 70 °F (21 °C). This should be done as close to the thermostat as possible.
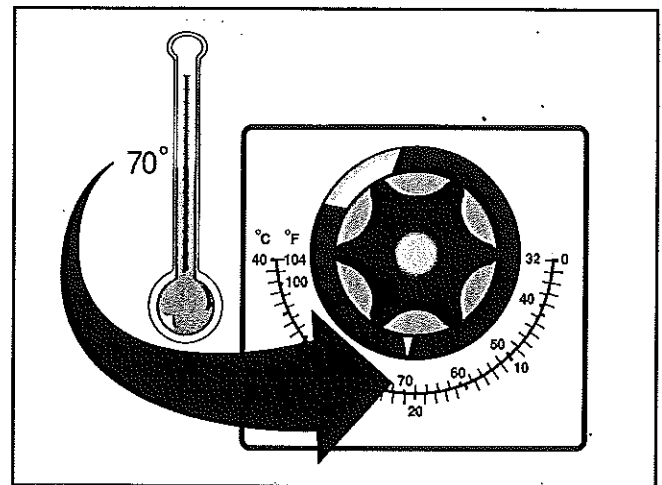
Figure 14. Determine the Temperature in the Building

2. Turn the dial on the thermostat until the white arrow points at the actual inside temperature, for example 70 °F (21 °C).

Hold the lower portion of the two-piece dial
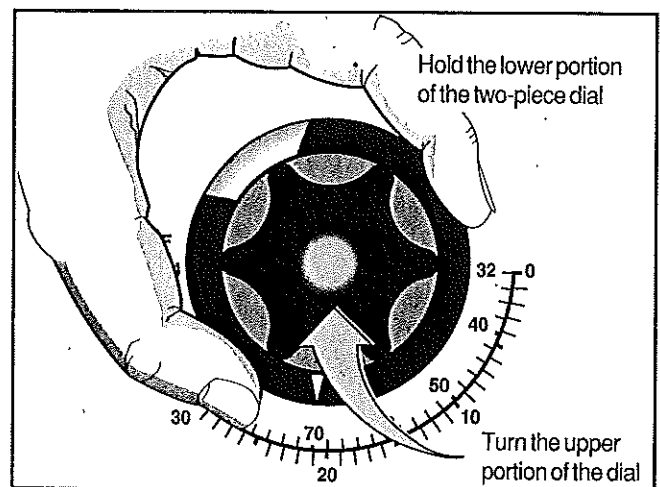
Turn the upper portion of the dial

Figure 15. Turn the Upper Portion of the Dial to Calibrate

3. Firmly hold the lower portion of the two-piece dial, and turn the upper portion until you hear a click.
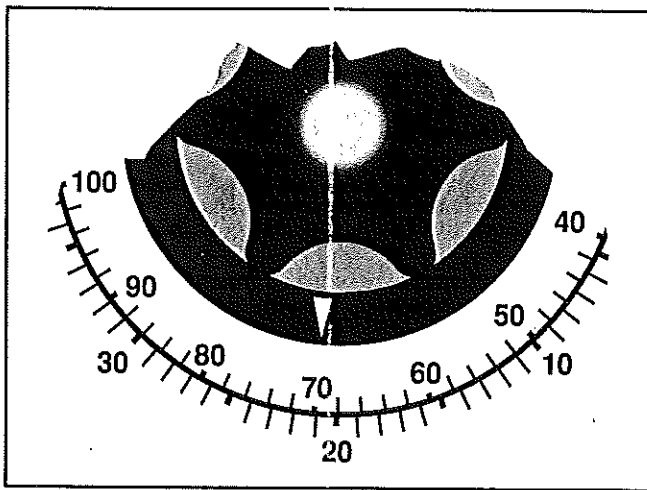
Figure 16. Adjust the Dial to the Inside Temperature

4. To check the setting, turn the entire dial to the 104 °F (40 °C) mark and then slowly turn it back toward the 70 °F (21 °C) setting. If the thermostat is properly calibrated, a click can be heard when reaching 70 °F (21 °C) or the actual temperature within the building.

T15-WD Operation

Use the T15-WD for heater or fan operation.

After the T15-WD has been properly installed and calibrated, simply set the dial at the temperature you wish the fan or heater to turn on.

T15-2 Operation

The T15-2 can be used to control a fan and heater in combination with each other. When using the T15-2 thermostat in a fan/heater combination, the jumper wire between the two thermostats must be removed.
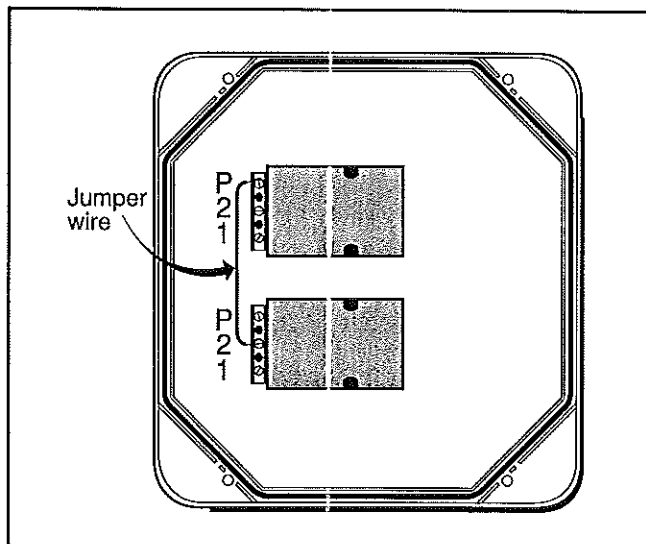

Figure 17. Remove Jumper Wire for Fan/Heater Combinations

For proper operation:

1. Calibrate both thermostat dials using the procedure found in this section.

2. To set the unit, position the "Maximum" dial at the desired high temperature limit. When the temperature rises to the high (maximum) setting, the fan is turned on and remains on until the temperature drops 1.8 °F (1 °C).

Use the Maximum dial for Fan control

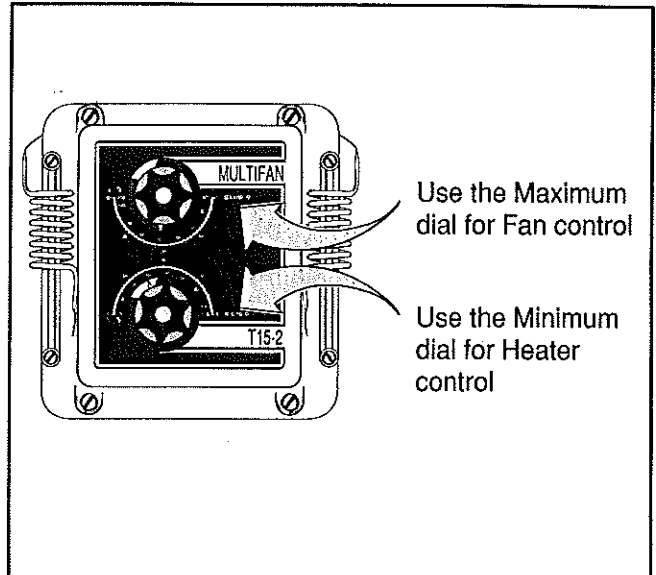Use the Minimum dial for Heater control

Figure 18. Set the Temperature

3. Set the "Minimum" dial at the low temperature setting. On the low (minimum) side, when the temperature drops to the set point, the heater will be switched on and will remain on until the temperature rises 1.8 °F (1 °C).

4. When the outside temperature is between the two settings, both switches are off.

Temperature Alarm System

As mentioned earlier, this unit can also be wired into a temperature sensor. The sensor along with a warning horn or bell will provide an alarm of high or low temperatures in the building.

Simply set the high and low settings at the temperatures you wish the building to remain within, and an alarm will sound anytime the temperature goes outside the preset temperature range.

Warning

Multifan products are designed and manufactured to provide reliable performance, but they are not guaranteed to be 100% free of defects. Even reliable products will experience occasional failures, and this possibility should be recognized by the user. If these products are used in a life support ventilation system where failure could result in loss or injury, the user should provide adequate back-up ventilation, supplementary natural ventilation or failure alarm system, or acknowledge willingness to accept the risk of such loss or injury.

Warranty and Disclaimer

Multifan, Inc., extends this limited warranty to the original buyer and warrants that products manufactured shall be free from original defects in workmanship and materials for one year from date of shipment, provided same have been properly stored, installed, serviced, maintained, and operated. This warranty shall not apply to products which have been altered or repaired without Multifan's express authorization, or altered or repaired in any way so as in judgment to affect its performance or reliability, nor which have been improperly installed or subjected to misuse, negligence or accident, or incorrectly used in combination with other substances. The buyer assumes all risks and liability for the results of use of the products.

Multifan, Inc., is not responsible for the cost of removal of the defective product or part damages due to removal, or any expenses incurred in shipping the product or part to or from Multifan's plant or the installation of the repaired or replaced product or part.

No employee, agent, dealer, or other person is authorized to give any warranties on behalf of Multifan to assume for Multifan any other liability in connection with any of its products except in writing and signed by an officer of Multifan, Inc.

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