

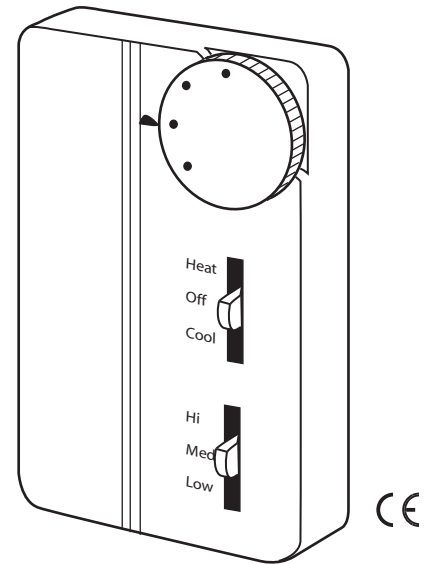
Non-Digital, On/Off Thermostat General Instructions

Application

The T155 series thermostat provides on/off control for low voltage and line voltage valves, relays and fan motors. Applications include two pipe and four pipe fan coil units, ventilators and air quality operations.

Features

- Manual or automatic changeover models
- Line voltage 3-speed fan control
- Continuous or cycling fan operation (cycling fan operation requires additional relay or relays)
- Remote sensor capability for seasonal changeover
- Handles all supply voltages from 24 to 277 Vac at 50/60 Hz (fan and system voltage must be the same)



T155

SPECIFICATIONS

Inputs

Power Input: 24 to 277 Vac @ 50/60 Hz.
Power Consumption: 0.88 watts at maximum.
Connections:
 Power, Up to 14 AWG wire.
 Control, Up to 14 AWG wire.

Outputs

Electrical:
 Heat/Cool Output Rating, Pilot Duty, 10 VA at 24 Vac, 20 VA at 120 -277 Vac.
Fan Switch, Refer to Table-1

Control

Deadband (TB155 Auto Changeover Models Only): 4F degrees (2.2C degrees).
Deadband (TA155-017 and TA155-018): 0F degrees (0C degrees).
Operating Differential: 1F degrees (0.6C degrees).
Setpoint Adjustment Range: 50 to 90°F (optional dial, 10 to 32°C).

Enclosure

Material, Rigid vinyl.
Finish, Cool gray.

Environment

Temperature Limits:
 Shipping & Storage, -30 to 130°F (-34 to 55°C).
 Operating, 32 to 130°F (0 to 55°C).
Shipping Weight: 0.31 lbs (140 g).
Location: NEMA Type 1.

Agency Listings

CE: Compliant.

Table-1 Fan Switch Current Ratings (Amps).^a

Voltage	Inductive		Resistive Amps	Pilot Duty
	FLA	LRA		
24	N/A	N/A	N/A	24 VA
120	5.8	34.8	6.0	125 VA
240	2.9	17.4	5.0	125 VA
277	2.4	14.4	4.2	125 VA

^a Fan and system must share the same voltage.

Table-2 Model Chart.

Model	Outputs	Changeover	Fan Control	System Switches
TA155-010	Dual	Manual	Hi-Med-Lo	Heat-Off-Cool
TA155-017	Single	N/A	Hi-Med-Lo	On-Off
TA155-018	Single	N/A	None	None
TB155-010	Dual	Automatic ^a	Hi-Med-Lo	On-Off
TB155-015	Dual	Automatic ^a	None	None

^a Automatic changeover models have a 4F degree deadband between heating and cooling.

Accessories

- 65345 4-3/4" X 4-3/4" adapter plate.
- 65406 Remote or changeover sensor, 60" leads 10k Ω @ 77°F (25°C).
- 65409 Fahrenheit set point dial 50 to 90°F
- 65410 Celsius set point dial, 10 to 32°C.
- 65170 Warmer/cooler set point dial.
- 65860 Set point dial stop kit. Limits dial travel in 2F degree increments.
- 680-243-5 Auto seasonal changeover switch.
- 680-243-6 Auto seasonal changeover switch.

Wiring

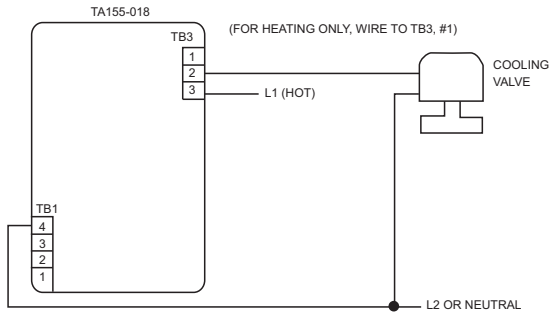


Figure-1 Typical 2-Pipe Cooling or Heating Only. No Fan Connections.

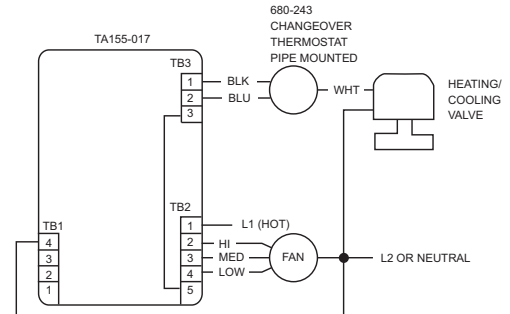


Figure-2 Typical 2-Pipe Heating/Cooling/Continuous Fan with System Switch off, Fan is Off.

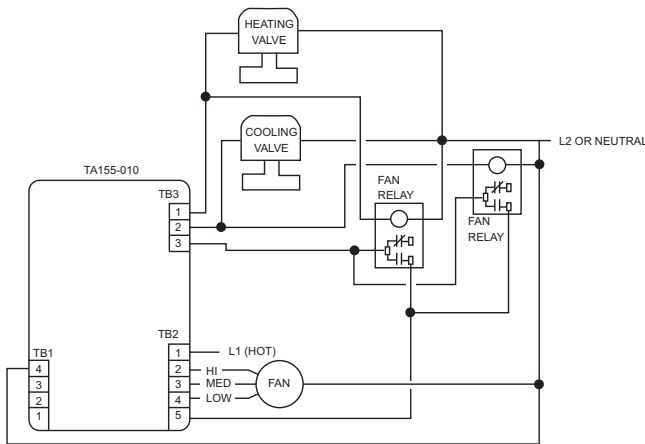


Figure-3 Typical 4-Pipe Heating/Cooling Fan cycles with Demand for Heating or Cooling. With System Switch Off, Fan is Off.

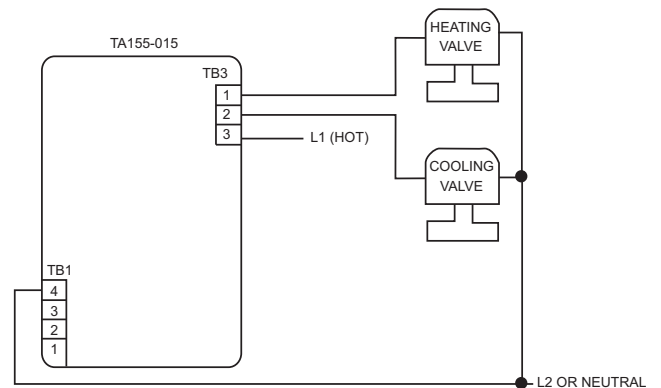


Figure-4 Typical 4-Pipe Heating/Cooling. No Fan Connections.

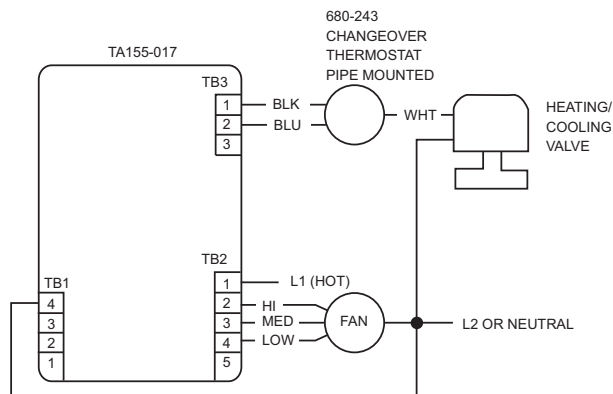


Figure-5 Typical 2-Pipe Heating/Cooling Fan Runs with System Switch On or Off.

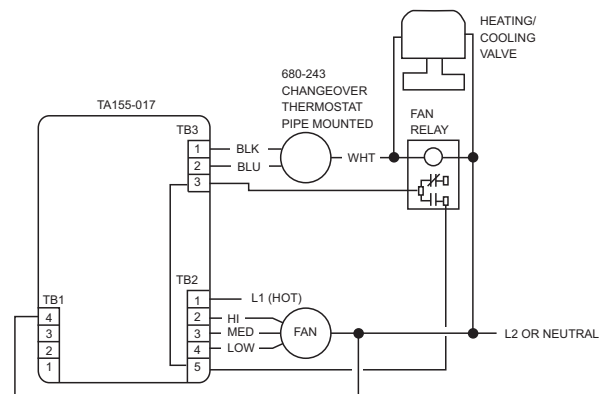


Figure-6 Typical 2-Pipe Heating/Cooling Fan Cycles with Demand for Heating or Cooling. With System Switch Off, Fan is Off.

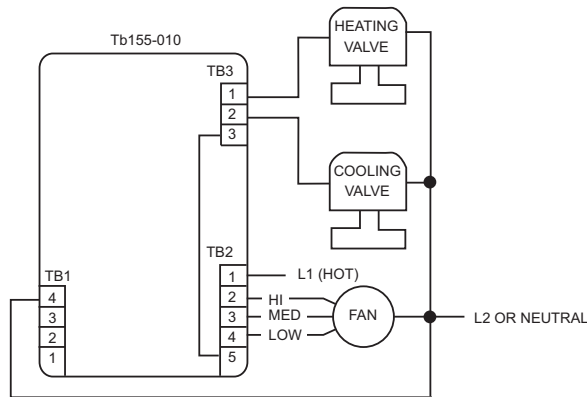


Figure-7 Typical 4-Pipe Heating/Cooling Fan Runs
Continuously with System Switch On.
With System Switch Off, Fan is Off.

INSTALLATION

Inspection

Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

Requirements

- Tools (not provided)
 - Screwdriver
 - Volt ohm multimeter
- Training: Installer must be a qualified, experienced technician
- Other accessories as appropriate

Precautions

General

WARNING

- Electrical shock hazard! Disconnect power before installation to prevent electrical shock or equipment damage.
- Make all connections in accordance with the electrical wiring diagram and in accordance with national and local electrical codes.

CAUTION

- Avoid electrical noise interference. Do not install near large conductors, electrical machinery, or welding equipment.
- Avoid locations where excessive moisture, corrosive fumes, vibration, or explosive vapors are present.

Mounting

Mount the T155 series to a standard 2 x 4 in. electrical box. Refer to Figure-8. If mounting to 4 x 4 in. electrical box use adapter plate (#65345). Standard holes are provided for mounting purposes. Mount the thermostat five feet above the floor on an inside wall. Do not mount near a heat source (lamp or sunlight), or behind a door or furniture. Do not mount on a surface that exceeds 130°F (55°C). Insulate behind thermostat if necessary to protect it from cold or warm air from outside areas.

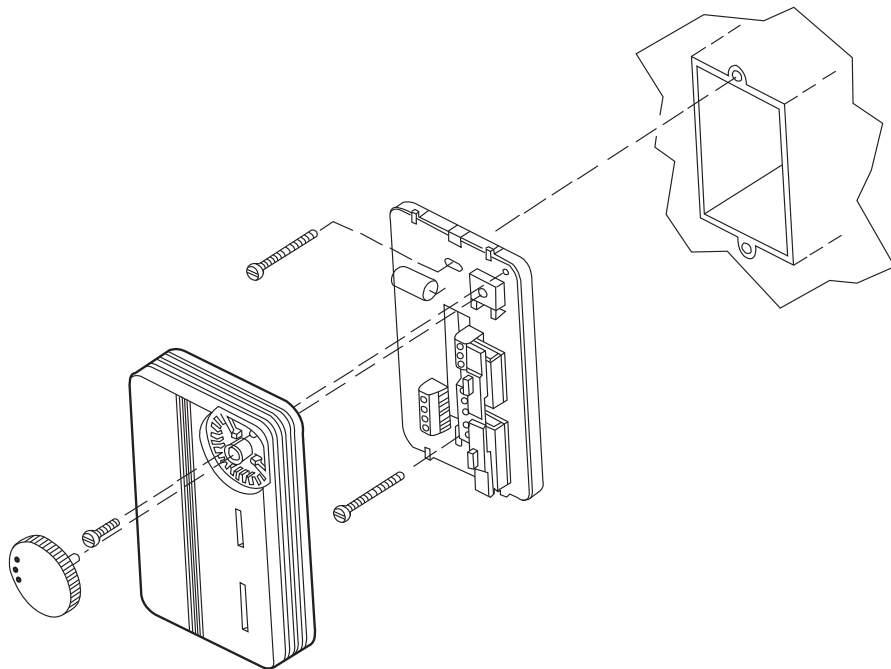


Figure-8 Mounting.

Seasonal Changeover Sensor

When installing the seasonal changeover sensor strap on the sensor to the main coil input or a pipe that will determine the fluid temperature of the coil. If a well is available use thermal grease for a faster temperature response. Insulate the entire sensor and pipe two inches before and after the sensor for a total of approximately six inches. This insulation is used to decrease the affect of ambient temperature upon the sensor.

Remote Sensor

Install the sensor in a location that will measure only the temperature to be sensed without any external heating or cooling sources influencing the sensor. Examples of sources to avoid are direct sunlight, mounting the sensor too high or too low on a wall, or any areas in ducts that have dead air movement or un-mixed air. Be aware of room stratification and air movement when determining the sensor location.

Wiring Notes

When using the optional remote sensor, remove pin pair jumper cap JP1 (Figure-9). Removing jumper JP1 disables the onboard sensor. Failure to remove jumper JP1 will provide two sensor inputs. The thermostat will not function properly. Run the remote sensor wiring away from any electrical motors or power wiring. Failure to do so may result in poor thermostat performance due to electrical noise.

An external line voltage relay is not need with 3-speed fan applications unless the current exceeds the values noted in Table-1. System and fan switch voltage must be the same.

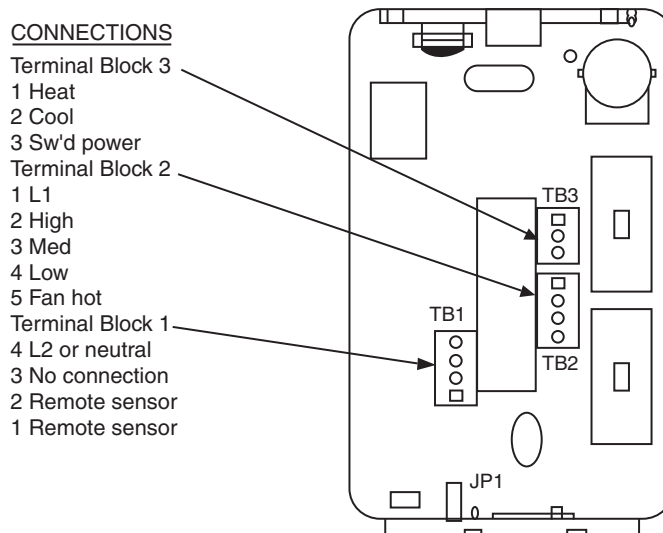
For fan cycling operation with a call for heating or cooling, a fan relay needs to be inserted.

For a two pipe heating and cooling application, an external auto seasonal changeover switch (680-243-6) must be connected to TB3-1 and TB3-2. This assures proper control depending on the temperature of the controlling media.

In all applications run the sensor wire away from any electronic noise generating devices, such as motors, fluorescent lights and microwaves. Do not run in parallel to line voltage wiring. The maximum length of non-shielded sensor wire should not exceed 25 ft. Even if the sensor wire is not near any noise generating devices, it still acts like an antenna and picks up background noise that may affect the temperature measurement.

In an electronic noisy environment or if the sensor wire must be close to noise generating devices, always use shielded wire and connect the shielding to an earth ground. Avoid electronic noise generating devices even if using shielded cable. The shielded sensor wire should not exceed 100 ft. in length and should be properly grounded.

Terminal Description



CHECKOUT

1. Verify the system voltage.
2. Make sure the fan switch and the system switch voltages are the same.
3. If a transformer is being used make sure it is large enough to support the current demands of all controls wired to the transformer.
4. Make sure devices being controlled do not exceed the power handling ability of the T155. Refer to Table-1 for current handling specifications.
5. If a remote sensor (thermistor) is in use, make sure pin pair jumper cap, JP1, has been removed.
6. When verifying system operation connect a voltmeter in parallel across the heat output terminal, TB3-1, and common terminal, TB1-4. Read the meter to verify whether the output is powered when it should be. In cooling mode check for voltage across cooling terminal, TB3-2 and common terminal, TB1-4.

THEORY OF OPERATION

All T155 models are electronic thermostats. A variable resistance device called a thermistor senses the room temperature and sends a resistance value to the T155. For example: in heat mode, the T155 measures the temperature represented by the resistance value of the onboard thermistor (or remote thermistor if used). If the sensed temperature value drops 1F (0.6C) or more degrees below the set point the heating output will be powered. A valve or damper opens to heat the space. When the temperature reaches the set point the heating output will be turned off, closing the valve or damper. The 155 series thermostats maintain temperatures with a 1F (0.6C) degree differential in both heating and cooling.

MAINTENANCE

The T155 series requires no maintenance. Replace defective units.

Regular maintenance of the total system is recommended to assure sustained, optimum performance.

FIELD REPAIR

None. Replace any damaged or failed units with functional replacements.

DIMENSIONAL DATA

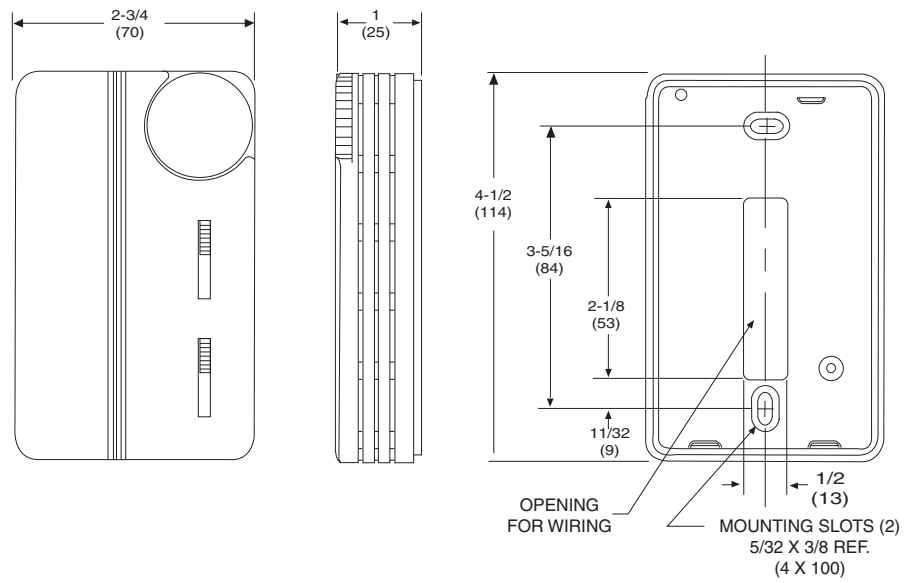


Figure-9 T155 Series.

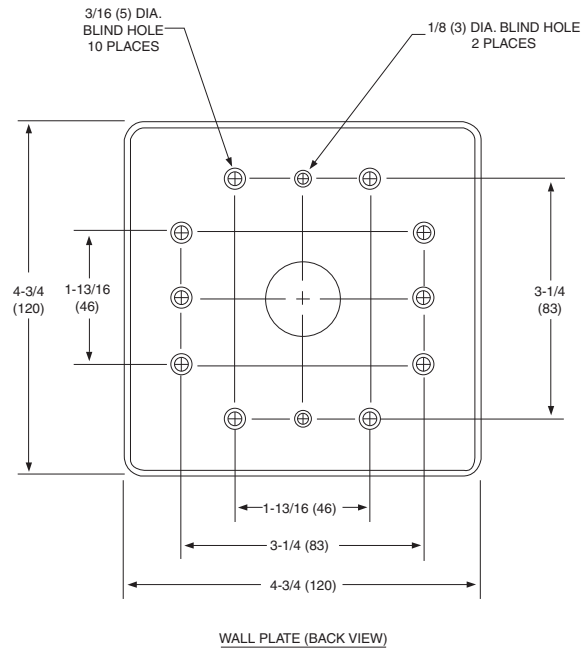


Figure-10 Adapter Plate.

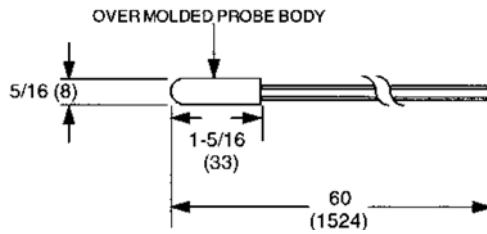


Figure-11 Remote Sensor/Change Over Sensor.

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Schneider Electric
1354 Clifford Avenue
P.O. Box 2940
Loves Park, IL 61132-2940
www.schneider-electric.com/buildings

