

# INSTALLATION AND OPERATING INSTRUCTIONS

## TEMPSTAT SPDT THERMOSTAT MODEL TF-115

READ INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS CONTROL. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE.

### APPLICATION

The TF-115 thermostat is intended for applications that need a rugged, weatherproof type control. These include agricultural, industrial and commercial environments. This one model is suitable for either heating control or cooling (ventilation) control in greenhouses as well as factory buildings, warehouses, garages, gymnasiums, etc.

The TF-115 thermostat is designed for use only as an operating, or regulating control. Where failure of the TF-115 could result in personal injury and/or loss of property, an approved backup temperature limit control should be connected in series or a supervisory alarm system should be used to warn of control failure.

### DESCRIPTION

The TF-115 thermostat has a sealed molded plastic case with all exposed metal parts of stainless steel. The unit has been tested by Underwriters Laboratories Inc. (UL), meets the requirements for NEMA 4X equipment, and is suitable for use under the National Electrical Code (N.E.C.) Article 547-4, when used with appropriate water tight connections (not included). The unit operates by expansion and contraction of liquid in response to temperature change. The liquid is contained within the stainless steel coiled sensor and actuates a stainless steel diaphragm, which in turn operates a heavy duty precision snap action switch. The non-removable adjusting knob is provided with a large visible scale for ease of setting.

### SPECIFICATIONS

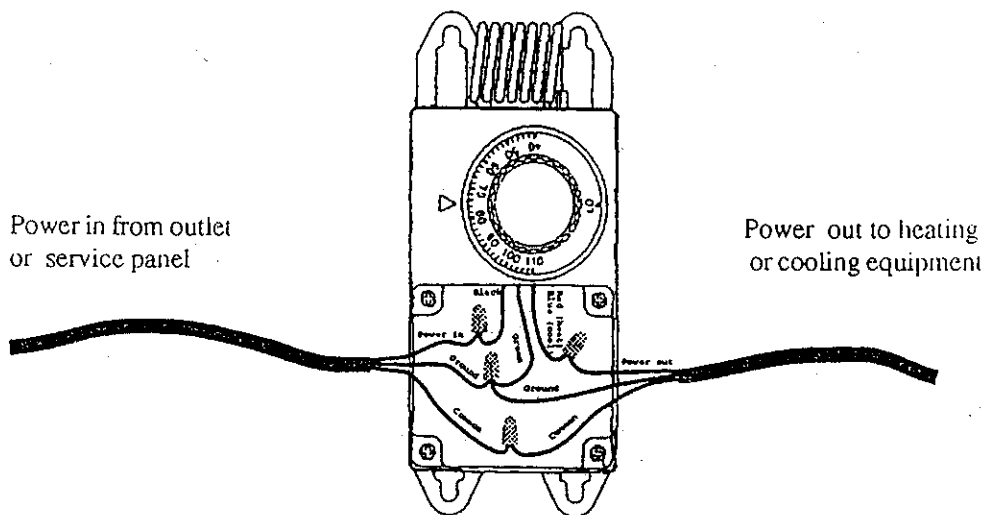
SPDT switch (one set of contacts open on temperature rise as the other set closes). Not suitable for load transfer (see Safety Information Note 7). RANGE: 40° F to 110° F (135° F maximum withstand temperature), when set at low, the heating load is "off" or the cooling load is "on" continuously.

### DIFFERENTIAL

Approximately 3° F based on normal rate of temperature change. Thermostat switching mechanism is isolated from wiring compartment and sealed within the tamperproof enclosure. Thermostat may be mounted with coiled sensor at top, bottom or side as needed in application without affecting performance.

# INSTALLATION

1. Locate the thermostat 4 to 6 feet above the floor where it will be exposed to the average temperature of the controlled area. Do not mount the unit where it will be affected by unusual heat or cold, such as direct sunlight or by windows or doors or an outside wall. Choose a location where the unit will not be damaged or impacted by moving equipment.
2. Determine the desired thermostat mounting orientation and which knockouts will be used for wiring connection. The thermostat may be oriented with the coiled sensor at top, bottom, or either side as needed for the specific installation.
3. Remove the desired knockout(s) by impacting near the inside edge of the knockout to be removed. Using a hammer to hit the end of a punch rod or screwdriver, held against the knockout will facilitate removal. CAUTION: when removing the end knockout, do not support the thermostat on the coiled sensor, support on the long mounting legs. Do not impact, dent or bend the coiled sensor or the thermostat could be damaged.
4. Four slotted mounting feet are provided - on a rough, uneven or curved mounting surface only two mounting screws need be used. Do not over tighten mounting screws. The thermostat may be installed using conduit, suitable flexible cable or other code approved wiring method. All fittings and materials used for the installation should be approved and suitable for the application and installed in accordance with their instructions. CAUTION: The conduit hub should be U.L. listed and be marked 4X. The conduit hub is to be tightened onto the conduit before installing into the enclosure.
5. Whichever wiring method is used a drip loop should be provided to prevent water or other liquids from entering the thermostat housing. The cable or conduit connections to the enclosure must be water and dust tight. Even though the TF-115 is sealed, water or dust could enter through improperly sealed wiring. CAUTION: The failure to use suitable water tight connections and suitable drip loop could result in water entering the enclosure which could cause control failure, personal injury and/or property damage.
6. Complete the wiring by connecting the lead wires in the wiring box as shown in the wiring diagram using wire nuts (not provided). A green lead wire is provided for connection to the line and equipment ground wire. After connection, all wiring should be pushed back into the wiring compartment.
7. Install the wiring compartment cover and fasten using all four screws provided - do not substitute other screws. The cover is provided with a resilient gasket. The cover screws must be tightened securely to compress the gasket and provide a water tight seal. After tightening screws, a gap of approximately 1/32 to 1/16 will exist between the rim of the removable cover and the thermostat body.



The diagram above shows the in-line wiring for 120 or 240 volt installation. The basic procedure is to interrupt a power wire on its way to the heating or cooling equipment. This will allow the current to complete the circuit only if the temperature falls out of the desired comfort zone. In the diagram above, notice that the power in wire is cut and passes through the thermostat's internal switch and back out through either the blue wire for cooling or the red wire for heating.

# OPERATION AND CHECK OUT

## TO CHECK OPERATION OF HEATING SYSTEMS

1. Disconnect power.
2. Place the heat/cool selector switch (if applicable) in the heat position.
3. Adjust the thermostat setpoint ten or more degrees below the temperature of the controlled space.
4. Restore power.
5. Slowly adjust the thermostat knob to raise the setpoint. When the setpoint reaches the approximate temperature of the controlled space, the heating equipment should start.

## TO CHECK OPERATION OF COOLING SYSTEMS

1. Disconnect power.
2. Place the heat/cool selector switch (if applicable) in the cool position.
3. Adjust the thermostat setpoint ten or more degrees above the temperature of the controlled space.
4. Restore power.
5. Slowly adjust the thermostat knob to lower the setpoint. When the setpoint reaches the approximate temperature of the controlled space, the cooling equipment should start.

The thermostat may be affected by heat from the hands of the installer and the temperature to which it was exposed prior to installation. Allow a necessary amount of time for the thermostat and system to stabilize for normal operation.

The TF-115 thermostat is completely manufactured in the United States by experienced control specialists. The unit is accurately calibrated and should require no tweaking or correction on site. If dust or dirt from the environment should coat the coiled stainless steel sensor the operation may be affected.

Do not bend, crimp or damage the coiled stainless steel sensor - the calibration and operation may be affected.

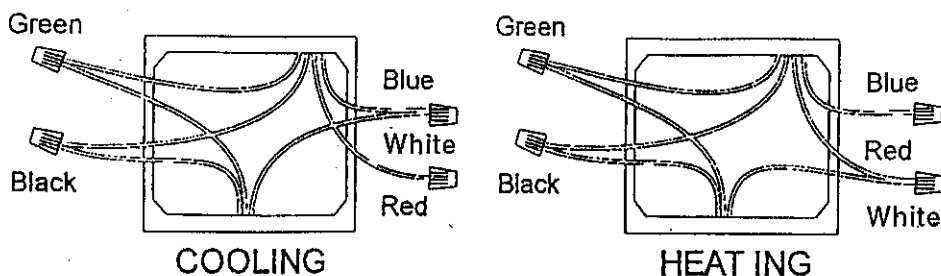
## PREWIRED POWER CORD MODEL TF-115P TEMPSTAT

The TF-115P is equipped with a pre-wired piggy back receptacle power cord. Plug cord end into 120 volt outlet and plug heating or cooling equipment into back side of cord end receptacle. Do not exceed the power handling capacity of the controller, outlet, or wiring circuit. See below for operation mode conversion instructions.

## CONVERTING FROM COOLING TO HEATING OPERATION

1. Disconnect power
2. Remove four screws holding the wiring compartment cover and open junction box.
3. Remove the wire nut connecting the blue cooling lead (from the thermostat) to the white power cord wire.
4. Connect the white wire from the power cord to the red heating wire coming from the thermostat.
5. Tape or wire nut the end of the unused wire.
6. The thermostat is now ready to operate heating equipment.

Reverse procedure to return to the cooling mode.



# ELECTRICAL RATING

RATING	120 VAC	240 VAC	277 VAC	480 VAC
Full Load	16.0 AMP	12.0 AMP	10.0 AMP	-----
Locked Rotor	80.0 AMP	60.0 AMP	50.0 AMP	-----
Non-inductive	25.0 AMP	25.0 AMP	22.0 AMP	5.0 AMP
Pilot Duty	125 VA	125 VA	125 VA	125 VA

## WIRING

\*If thermostat is to control only heating, insulate end of blue lead wire.

\*If thermostat is to control only cooling or ventilating, insulate end of red lead wire.

## CAUTION:

Green ground lead wire must be connected to wiring system ground as required by applicable codes. Failure to do this could result in the hazard of electrical shock.

## SAFETY INFORMATION

1. Be certain that the electrical load to be controlled does not exceed the thermostat rating.
2. Disconnect all power before installing or servicing.
3. Installation must be made by a trained, experienced service person.
4. This thermostat is intended for permanent installation and must be installed in accordance with the National Electrical Code (NEC) and all applicable local codes and ordinances. Use copper wire only, insulate or wire nut all unused leads.
6. This thermostat is suitable for NEMA 4X application and is NOT to be used in potentially flammable or explosive atmospheres.
7. In cases in which property damage may result from malfunction of the thermostat a backup system should be used. Where critical or high value products are to be maintained, an approved temperature limit should be wired in series with this thermostat. In less critical applications, a second thermostat with alarm contacts can be used to provide redundancy.
8. A separate S.P.D.T. load switch (not supplied) must be used in applications requiring control of both heating and cooling. Failure to provide the load transfer switch could result in control failure and equipment damage.
9. The TF-115 thermostat is designed to prevent entry of water or dust inside the enclosure. If the cover is missing or the enclosure is cracked or broken, do not install, use or operate, as this could result in personal injury and/or property damage.