

SP-32
SP-33
SP-34



**Single Stage
Temperature Control**

Description

The SP-3x series of controls are single stage, general purpose, temperature controls with wide application in HVAC, refrigeration, and industrial applications. The controls are identical except for the setpoint temperature range:

- SP-32 -26°F to +90°F
- SP-33 40°F to 104°F
- SP-34 90°F to 200°F

The controls provide isolated SPDT relay contacts which are controlled by comparing the thermistor temperature sensor to a setpoint. The SP-3x series allows the installer to select either "heat" Mode (relay operates on temperature fall) or "cool" Mode (relay operates on temperature rise). The control

setpoint can be set using the internal "setpoint" dial (factory setting) or you can wire a remote setpoint (see Goldline RSP series of remote setpoints) or you can wire a fixed setpoint (see Goldline ESP series of fixed setpoints) which provides high accuracy and prevents unauthorized tampering with the setting. The SP-3x series controls also features a plug in connector for a TD-SP Digital Display Monitor which displays sensor and setpoint temperatures.

Power can be provided from a 24VAC, 24VDC, 115VAC or 240VAC power source. The relay contacts are completely isolated so the output can switch any voltage, regardless of the SP-3x power source.

Specifications

<p>Power: Approx. 2VA required from any power source:</p> <p>21-27VAC, 50/60Hz 21-27VDC 105-130VAC, 50/60Hz 195-250VAC, 50/60Hz</p>	<p>Setpoint: SP-32 -26 to +90°F SP-33 40 to 104°F SP-34 90 to 200°F</p>
<p>Output: SPDT isolated (dry) contacts</p> <p>1HP@115VAC, 2HP@240VAC rating @240VAC: 20A on NO contacts 10A on NC contacts</p>	<p>Differential: SP-32 1-25°F SP-33 1-15°F SP-34 1-25°F</p>
<p>Sensors: Thermistor, 10K @ 25°C/77°F Type SW supplied with control Interchangeable with any IE temperature sensor 1000 ft. maximum wire run</p>	<p>Accuracy: +/- 1°F</p> <p>Environment: -30 to +130°F 0-95% rH, non-condensing</p>

Installation

1. Mounting

The SP-3x is designed for mounting indoors, protected from the weather and with non-condensing humidity. For outdoor use or in moist environments use a Goldline RE-1 raintight enclosure. Use the mounting screws supplied or optional mounting bracket (consult IE factory).

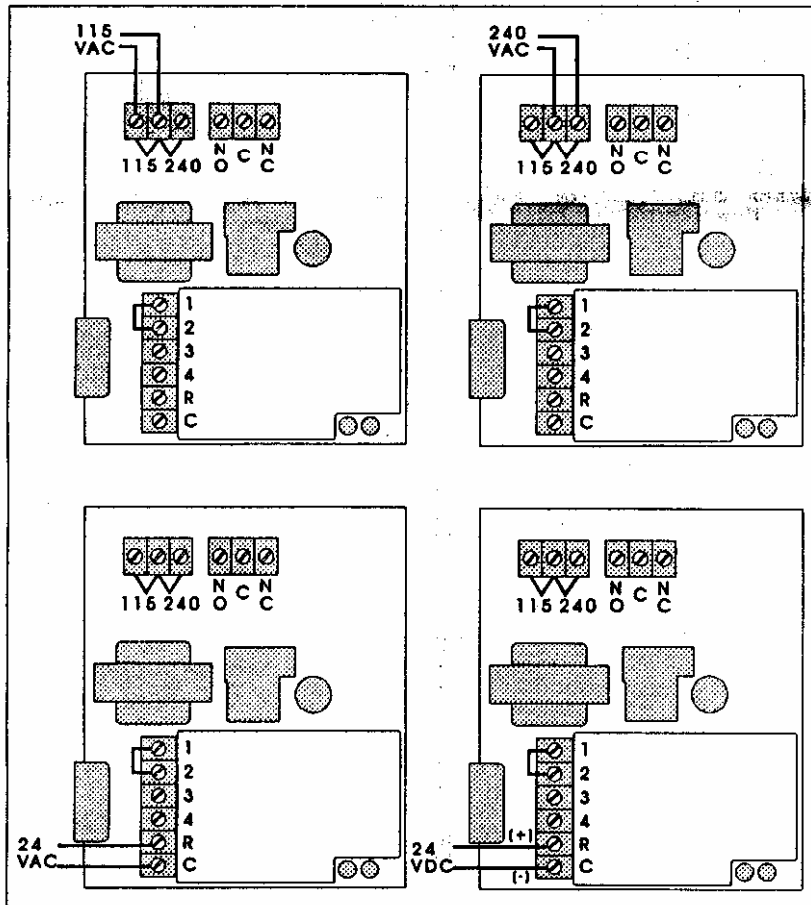
2. Sensor Mounting and Wiring

To maximize temperature measurement accuracy securely mount the sensor and then insulate it to protect it from the effects of ambient temperature. 18 AWG twisted pair wire should be used for normal indoor wiring runs. Sensor wiring run outdoors must be rated for outdoor use and ensure that wire connections are protected from the weather. For long runs or runs near other electrical wiring use shielded cable (Belden 8760 for indoor

use or Belden 8428 for outdoor use). Ground the shields to one of the SP-3x cover screws. If the SW sensor supplied with the control does not meet your needs, contact your distributor for information on the wide range of interchangeable Goldline temperature sensors.

3. Power Input

The SP-3x control requires power to operate. You may either connect 24VAC to the "R" and "C" terminals; 24VDC to the "R" (+) and "C" (-); 115VAC to the terminals marked "115VAC" or 208/240VAC to the terminals marked "240VAC". Connect grounds to the green screw provided or use grounding clips (eg Steel City "Gee clips" or Raco #975). Refer to wiring diagram.

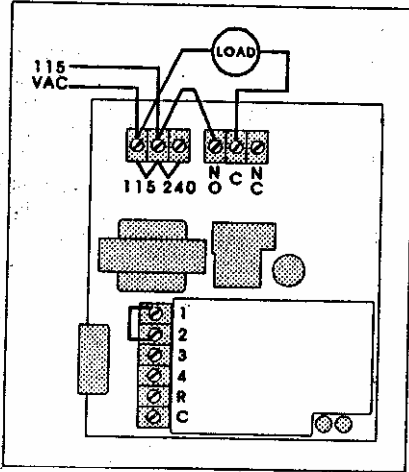


Installation (Continued)

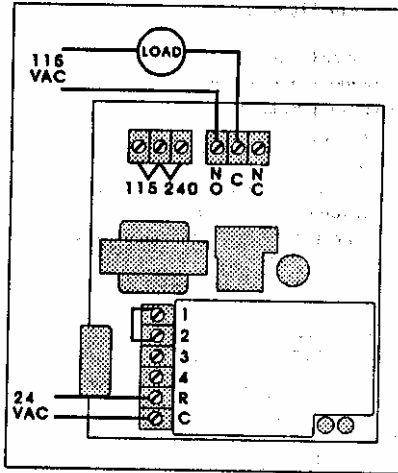
4. Output wiring

The SP-3x controls have isolated (dry) contacts which are ideal for many control applications. Because there is no output voltage, if you are directly controlling a load (eg pump, blower, valve, etc) then you must connect a source of power

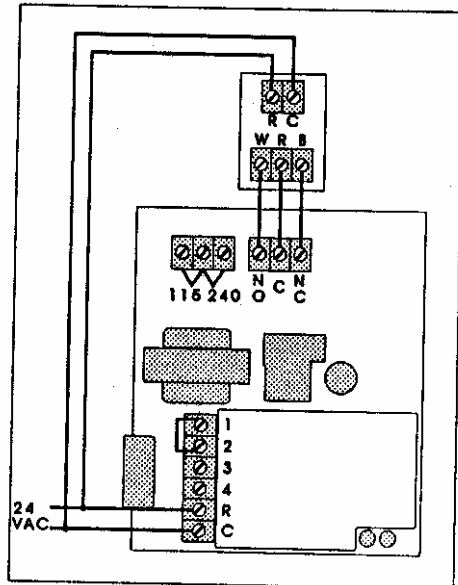
through the SP-3x output relay. "NO" are normally open contacts which close when the control output is on. "NC" are normally closed contacts which open when the control output is on. Refer to example diagrams below.



115 VAC Applied to Load When Output is ON, Control Powered by 115 VAC



115 VAC Applied to Load When Output is ON, Control Powered by 24 VAC



24 VAC Powerisolated Output to 3 Wire Motorized Valve (Two Position Valve Action)

SP30MB-CDR

Installation (Continued)

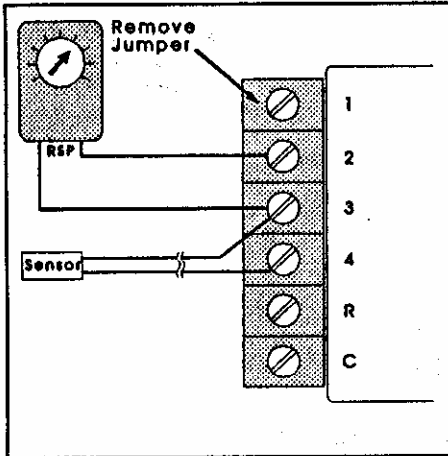
5. Setpoint

The SP-3x controls are shipped from the factory set up to use the internal setpoint adjustment knob. The internal setpoint adjustment can be disabled if you would like to use a remote setpoint or a fixed setpoint. To accomplish this remove the jumper from terminals "1" and "2" and connect an RSP (potentiometer) or an ESP (fixed resistor) to terminals

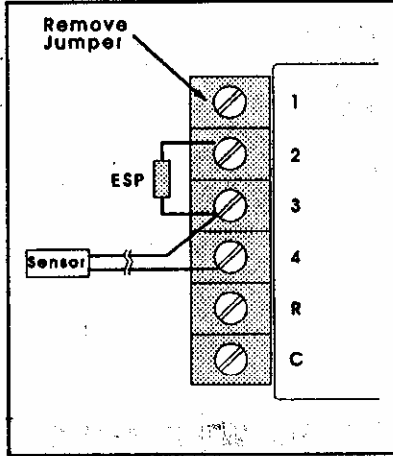
"2" and "3". Setback can also be accomplished with the use of any single pole double throw timer. Refer to diagram below.

6. Adjustments

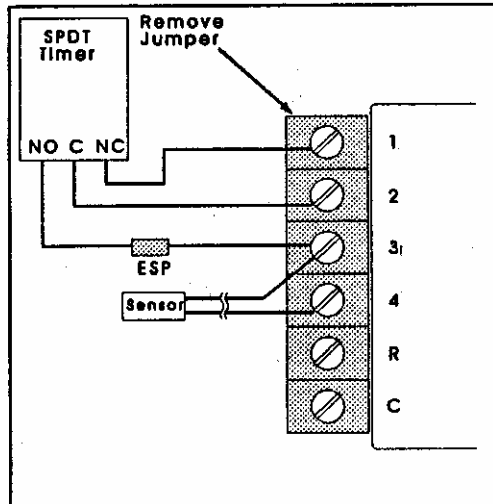
Set the mode jumper into the "heat" or "cool" position. Adjust the setpoint and differential to the desired settings.



Remote Setpoint Using RSP



Fixed Setpoint Using ESP



Setback Using a Single Pole Double Throw Timer and ESP. Internal Setpoint Adjustment Used During "Normal" Hours and ESP Temperature is Setpoint During "Setback" Hours

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Operation

The SP-3x test switch should normally be left in the "AUTO" position in which case operation is completely automatic with no operator intervention required. The "Power" indicator should always be on, the "Output" indicator will show the status of the control output relay. When the test switch is in the "ON" position the output is forced on (relay energized) and when in the "OFF" position the output is forced off (relay de-energized).

In "cool" mode the control output will turn on when the sensor temperature rises to the setpoint plus the differential. In "heat" mode the control output will turn on when the temperature falls to the setpoint minus the differential. The control output always turns off at the setpoint.

Technical Assistance

For help in installing, operating, or troubleshooting this control, you may call for technical assistance at 800-343-0826. Independent Energy's technicians are available from 8:00AM to 5:00PM

Eastern Time, Monday through Friday. You may call at other times and leave a message, and a technician will call you back as soon as possible.