

## GENERAL INFORMATION

The Independent Energy Goldline SP-30 is an **ELECTRONIC SETPOINT TEMPERATURE CONTROL**. It utilizes a remotely wired sensor and compares it to an internal setpoint to switch a set of isolated contacts. The SP-30 is engineered to fit virtually any application where control of air or liquid temperature is desired. **EXAMPLES:** boilers, furnaces, ducts, tanks, pipes, solar heating systems, refrigeration, greenhouses, etc.

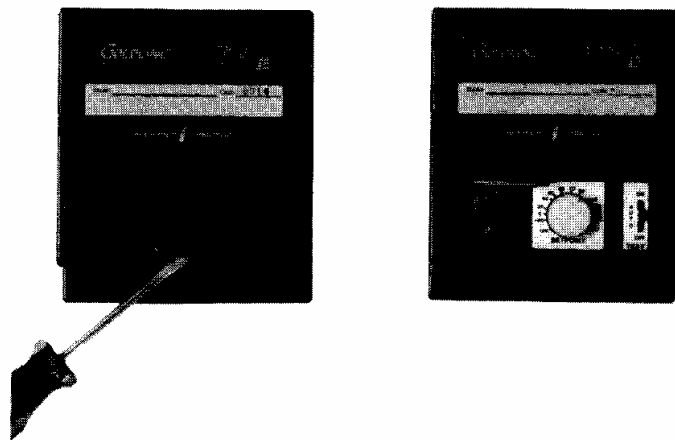
As with the other Goldline solid state controls, the SP-30 is extremely versatile and allows for a single SP-30 model to replace existing lines of electro-mechanical controls

The SP-30 can be directly interfaced - via an Independent Energy Bus Cable - with a Goldline DLX-30 or DM-30 controller. This combination provides for remote, digital temperature and output monitoring, as well as remote temperature setpoint adjustment capability.

### SP-30 FEATURES:

- **Wide temperature range** - adjustable internal setpoint: -26 to 200°F
- **Field selectable external setpoint**
- **Adjustable "turn off" differential** - range: 1.5 to 25°F
- **"power" and "output" indicators**
- **Spring return test switch** for quick, safe testing of output function
- **Digital monitor interface** - plug-in adapter for easy, direct interfacing of DLX-30 or DM-30 controls
- **Remote sensor location** - up to 1,000 ft. from the control via inexpensive bell wire
- **Normally open and normally closed contacts**- (SPDT, make or break on temperature rise), switches high or low voltage
- **Concealed temperature setpoint and differential knobs**
- **Versatile power requirements:** 115 VAC, 230 VAC or 24 VAC
- **U.L. listed**

**CAUTION!** The SP-30 is not to be used as a safety control. Its use is to be limited to operational functions only.



## OPERATION

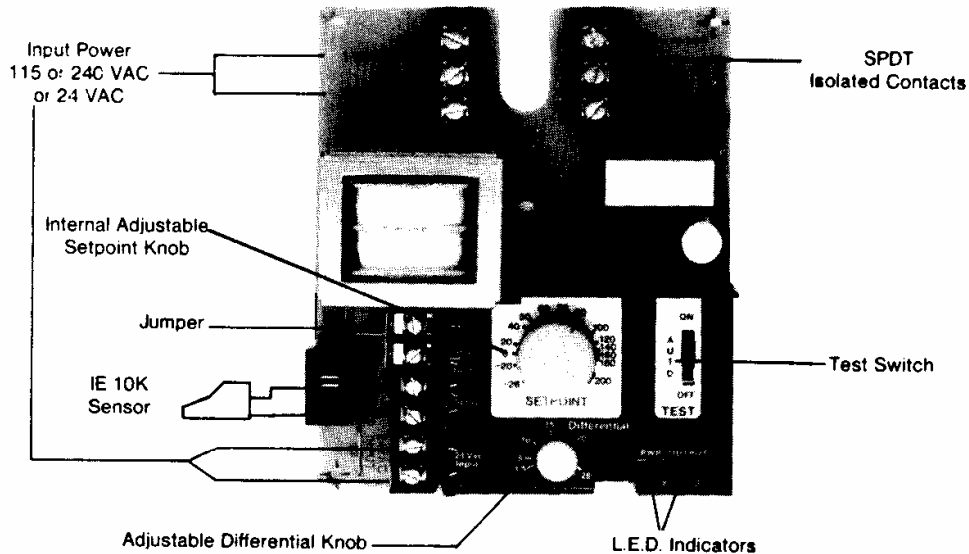


Fig. 1 SP-30

### 1. Operating Voltage...

The SP-30 can run on 24 VAC, 115 VAC or 230 VAC. The "FWR" L.E.D. indicates that there is power to the control.

### 2. SP-30 Output...

This output switches the "B-R-W" isolated contacts (SPDT, see SPECIFICATIONS for rating):

R - B (N.C.) open on a temperature rise  
R - W (N.O.) close on a temperature rise

The output is "on" - as indicated by the L.E.D - whenever the temperature of the sensor wired to terminals 3 and 4 is EQUAL TO OR GREATER THAN THE SETPOINT TEMPERATURE.

### 3. Temperature Setpoint...

The internal adjustable temperature setpoint range is -26 to 200°F.

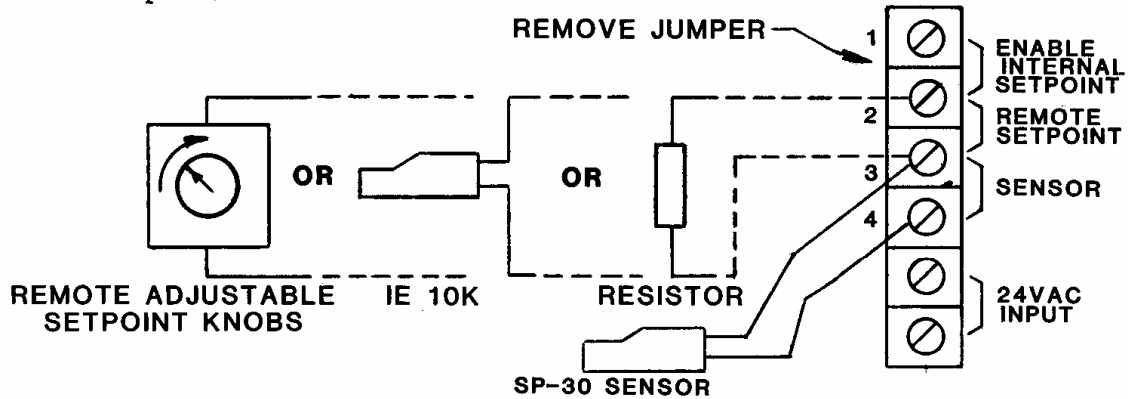
#### IMPORTANT!

The SP-30 INTERNAL ADJUSTABLE SETPOINT CAN BE DISABLED, such as to use a remote, external setpoint. This external setpoint could be:

1. A remote, adjustable setpoint knob,
2. A resistor (see Temperature vs. Resistance Chart, p.7)
3. An IE 10 k sensor
4. The T1 Adjust Knob on a DLX-30 which is interfaced with the SP-30

**OPERATION, cont'd.**

To disable the internal adjustable setpoint, remove the jumper which is factory installed across terminals 1 and 2. Then, to utilize an external setpoint:



OR, to use the DLX-30 T1 Adjust Knob as the external setpoint, see OPERATION 6.

Fig. 2

**4. "Turn off" Differential...**

The temperature setpoint output turns "off" whenever the SP-30 sensor temperature drops to the setpoint temperature, LESS THE DIFFERENTIAL SETTING. The turn "off" differential is adjustable, range: 1.5 to 25°F.

To access this knob, disconnect power to the control and remove entire cover (see Fig. 1).

**5. Test Switch (spring loaded)...**

This switch spring returns to the "auto" position for normal control function. The "on" and "off" positions should be used when servicing or trouble shooting the system.

**6. DLX-30(or DM-30)/SP-30 Systems...**

The SP-30 control can be interfaced directly with a Goldline DLX-30 or DM-30 control via an IE Bus Cable:

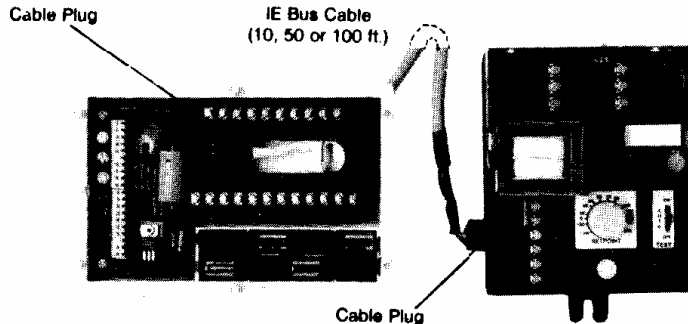


Fig. 3 DLX-30(or DM-30)/SP-30 Interfacing

## OPERATION, cont'd.

This combination provides for remote, digital temperature and output monitoring in the following fashion:

TO READ...

PRESS DLX-30 or DM-30 KEY...

- SP-30 temperature setpoint
  - SP-30 sensor
- T1 (range: -27 to 227 ±2°F)  
T2 (range: -27 to 227 ±2°F)

The SP-30 output "on" status is indicated by the **1** indicator on the DLX-30 or DM-30 display.

In addition, the T1 Adjust Knob on the DLX-30, only, can be used to remotely set the SP-30 temperature setpoint. To do this, the SP-30 internal setpoint must be disabled (see OPERATION 3 of this manual) and the DLX-30 must be set up accordingly (see the DLX-30 manual).

Furthermore, on the DLX-30, only, the EVENT key displays the total number of "off"-to-"on" transitions of the SP-30 output and the RUN TIME key displays the accumulated "on" time of the SP-30 output. See the DLX-30 manual for further details.

## INSTALLATION

Installation must be performed by trained service personnel, and in accordance with N.E.C. and local codes.

**CAUTION! Disconnect all power during installation.**

### MOUNTING:

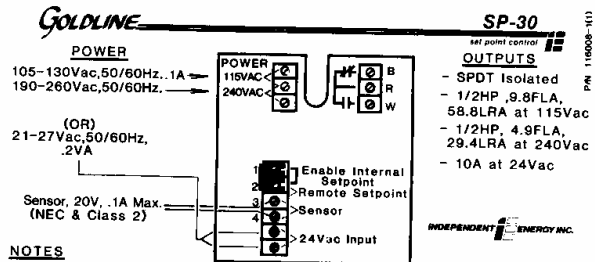
Ensure adequate clearance on left side of control for IE Bus Cable and/or sensor wiring connections to the SP-30. The control is mounted to a surface via two screws (provided).

### WIRING:

NOTE: SP-30 terminal strips have special wire clamps that allow good electrical connection to plain, stripped wire ends. No wire lugs are required.

**1. Input power wiring:**  
115 VAC, 230 VAC or 24 VAC. Refer to wiring label on inside cover.

**2. Output wiring (W-R-B):**  
Isolated contacts, SPDT. Refer to wiring label on inside cover.



- NOTES**
1. Read installation instructions.
  2. All wiring must conform to local and NEC codes.
  3. Power and output terminal suitable for use with copper wire only.
  4. **SETPOINT SELECTION:** (See installation sheet)
    - a) **INTERNAL:** Leave jumper on terminals 1 & 2.
    - b) **REMOTE:** Remove from terminals 1 & 2.
 Wire setpoint to terminals 2 & 3 or use setpoint in DLX-30.

**INSTALLATION, cont'd.**

**3. Sensor mounting and wiring:**

- a. Mechanically mount the sensors (e.g. bolt, hose clamp, etc.) - DO NOT tape or solder. The use of thermally conductive grease applied between sensor and mounting surface will enhance the accuracy of the sensor.
- b. Always insulate the sensor to minimize the effects due to ambient temperature. Sensors located outdoors must be protected from rain and snow.
- c. Sensor wire should be at least 18 AWG. Sensor wires that are exposed to weather should be suitable for the purpose (neoprene jacket).
- d. Shielded wire (e.g. Belden #8760 for indoor use, Belden #8428 for outdoor use) is recommended for sensor wiring runs that travel near other electrical equipment, near A.C. wiring, ham/CB radio transmitters or other sources of electrical interference. Ground the shields to one of the cover screws. DO NOT ground the shields at the sensor end of the sensor wiring.

**4. Wiring an external temperature setpoint:**

This applies only where the internal temperature setpoint is not to be used. See OPERATION 3.

**CHECKOUT PROCEDURE:**

- 1. Before applying power, check all input and output wiring for proper termination.
- 2. Turn on AC power at circuit breaker panel. Verify that "PWR" indicator is on (see Fig. 1).
- 3. Move test switch to "off" position. "Output" indicator should be off and R-W output contacts should be made.
- 4. Move test switch to "on" position. "Output" indicator should be on and R-B contacts should be made.
- 5. Return test switch to "auto" position for normal operation.

**SPECIFICATIONS**

**Power requirements:** 24 VAC  $\pm 10\%$ , 2VA; or 105-130 VAC, 50/60 Hz; or 190-270 VAC, 50/60 Hz

**Output rating:** SPDT isolated contacts, 1/2 HP, 9.8 FLA, 58.8 LRA @ 115 VAC; 1/2 HP, 4.9 FLA, 29.4 LRA @ 230 VAC; 10A @ 24 VAC

**Operating ambient temperature range:** 32 to 122°F

**Temperature sensors:** IE 10 K thermistors @ 77°F

**Temperature accuracy:**  $\pm 1^\circ\text{F}$  (using DLX-30 or DM-30 digital monitor)

**Internal temperature setpoint range:** -26 to 200°F

**Temperature setpoint differential range:** 1 to 25°F

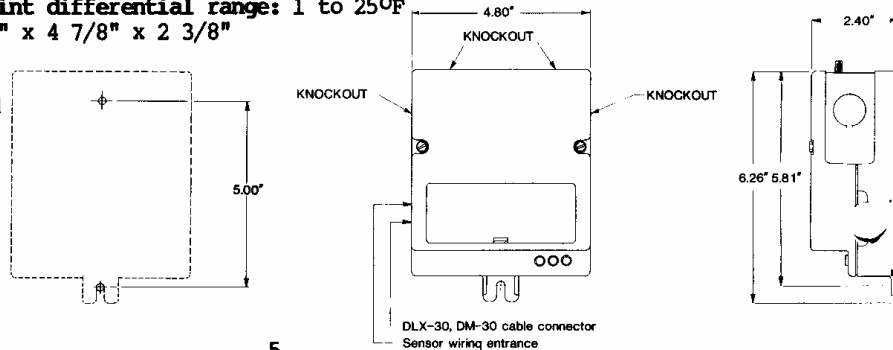
**Dimensions:** 5 5/8" x 4 7/8" x 2 3/8"

**Weight:** 2 lbs.

**ESD protected**

**RFI/EMI protected**

**UL listed**



## TROUBLE SHOOTING

**NOTE:** If any of the items below fail to resolve your particular control problem, call your dealer, Rep or the factory for further assistance and/or instructions for returning the control - 800-343-0826.

PROBLEM	POSSIBLE CAUSE	TEST/CHECK
"power" indicator is not on	No a.c. power to SP-30	Check to see that circuit breaker is on
		Check for proper a.c. connections and voltage at SP-30 input terminals
"output" indicator does not come on	Test switch is in "off" position	Return test switch to "auto" position
	SP-30 sensor temperature not equal to or greater than setpoint temperature	Check sensor resistance (see chart p.7) vs setpoint temperature
	Open in SP-30 sensor wiring	Check for continuity w/ohm meter
	Defective SP-30 sensor	Cross check sensor resistance w/actual temperature
"output" indicator does not go off	Test switch is in "on" position	Return test switch to "auto" position
	SP-30 sensor temperature not less than setpoint temperature, minus the differential setting	Check sensor resistance (see chart p.7) vs setpoint temperature and differential setting
	Short in SP-30 sensor wiring	Check for continuity w/ohm meter
	Defective SP-30 sensor	Cross check sensor resistance w/actual temperature
"output" indicator on (or off) but load (boiler, pump etc.) not operating (or operating)	Load wired incorrectly to output contacts (i.e.N.C. vs. N.O.)	Check for proper wiring of load to output contacts