

SD-3PB Thermostat and Interval Timer in one Unit.

This microcomputer based controller consists of two sections:
The Digital Timer and Digital Thermostat, working together to control the power switched to the load.



Front view of the SD-3PB controller (with Grey and Black face plate). The LED display colors available in Super RED, Green and Blue.

relays are controlled to close when the temperature is lower than the preset . In the models for cooling, the relays action is reversed. The controller has an "Anti-Cycle" function built in, that prevents the relays from switching too frequently when the temperature is near the switching point.

The temperature preset may be changed at any time by pressing the UP and DN keys . The display will also indicate the current preset temperature.

NOTE that a variety of standard and custom temperature ranges are available.

There are many other options available for this controller. Please see the "List of Options" document for details.

ADDITIONAL functions:

Two additional keys "User" (or Fan) and "AUX" (or Light) may be used to control some OPTIONAL functions. A model with such options installed may have up to two additional relays on-board that can be used to control such outputs like Fan, Light, Radio CD Player or other. In standard models these keys may either be inactive or perform some other functions if custom modifications are requested.

Main Controller and Remote Control / Display Panel:

An optional Remote panel may be connected with the Main Controller using a single multi-conductor, low voltage cable. The remote panel has all the same functions and displays the same information as the Main Controller. Both panels can be ordered with either type of Face Plates mounting and any color of the face label. The display colors can also be different or mixed to be Red, Green or Blue.



Main Controller and optional Remote Control / Display Panel connected with a cable.



SD-3PB Controller Set including Main Controller, Remote Panel, Sensor Probe, cable and mounting hardware with two different mounting plates : Semi-Flush and Flush.

TIMER section:

The Interval Timer is programmed with UP and DN keys located under the "TIME" display. Models are available with 1, 5, 10 or 15 minutes increments. Custom modifications upon request.

An additional ON/OFF key will Start and Stop the timer when pressed.

In standard models, the ON/OFF key will automatically preset the controller to the maximum Time and maximum Temperature. Even if the user changed the timer and/or the temperature first, then this key will start the controller with the maximum values.

Also in standard models, without the Fan switch option, an additional "USER" key may be pressed (instead of the ON/OFF key) to start the controller. In this case, the preset value will be half of the maximum time and half of the maximum temperature preset value if this key is pressed without prior manual readjustment of these presets. If the timer and/or temperature however have been preset previously, the USER key will just recall these presets.

NOTE that the above functions are customizable and may be changed upon request to perform differently.

After the count down starts, the display shows the current time remaining till the expiry.

A flashing "-" sign indicates that the countdown is pending.

During the countdown, the thermostat section is enabled. When the timer is not running the on-board relays are off and the time display shows text "OFF or "0".

The Timer may be stopped or reset at any time by pressing the OFF key.

Note, that a variety of standard and custom time ranges are available.

THERMOSTAT section:

The Digital Thermostat section is programmable with UP and DN keys located under the "TEMP" display. During programming the display shows the preset temperature in either Celsius or Fahrenheit, depending upon the model or the position of the selection jumper located in the back of the unit. When the thermostat is operating, the display shows the current temperature reading and flashes the target preset temperature every several seconds. In the models for heating, the on-board

Temperature Sensor PROBE:

A number of standard Temperature Probes is available for this controller depending upon the application. Most probes are small in size. The most popular is a black anodized housing appx. 25 mm long and 5 mm diameter (1"lg. x 0.2" dia.). The probes have two thin wires attached at one end.

The wiring may be extended with *any type of a 2-conductor cable* up to appx. 150 m (500 ft.).

Standard probes have 1% accuracy and the operating ranges vary from -4F to +248F (-20C to +120C) up to -60F to +480F (-50C to +250C).

The probes are enclosed in a non-corrosive housing that may be Stainless Steel, chrome plated, black anodized or brass with two PVC or Teflon jacketed leads, sealed with epoxy resin to prevent moisture penetration. Please note that it is advisable to protect the leads with additional coat of, for instance, silicon sealant against possible excessive moisture condensation.

Electrical:

SD-3 controller models are available for 120Vac, 208-240Vac, 12Vac, 24Vac, 50Hz or 60Hz as well as 12V or 24V DC. The supply voltage must be specified when ordering. The controller electronics is protected by one on-board 20 mm, removable fuse that can be serviced in the field.

Standard models have two on-board relays, each Single Pole, Normally Open. The two relays can switch loads up to 30Amp, 240Vac max. each (40 Amp is optional). The contacts of both relays may be completely isolated from the controller supply and from each other depending upon the chosen method of wiring.

The Power Relays switching is synchronized with the power line "Zero-Crossing" points giving them increased reliability and eliminating the contacts arcing during the high power switching. This considerably limits any generated interference and increases the life of the relays contacts.

Options:

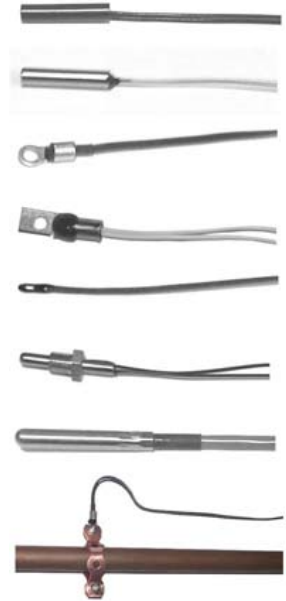
Various additional options are available for the SD-3 controllers including: *Stand-by Preheat, Delay-Before-Start, Auto-Manual Light/Fan/CD Relay, Adjustable Differential, High Limit Probe, Remote Stop/Pause, Alarm Buzzer*, etc... See the Complete "List of Options" for details.

Many Temperature and Timer ranges, as well as various types of relays and wiring methods may be supplied upon the customer request.

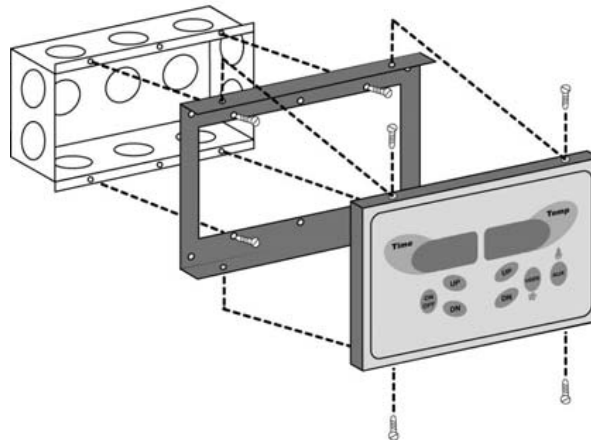
Installation:

SD-3 controllers are normally shipped without enclosures (optional) and are designed to fit in a standard 3-gang electrical box or in a panel. The plastic overlay may be installed on either a customer supplied face plate or the standard Mounting Plate included in the kit. All mounting hardware, screws and wiring connectors are attached. When correctly installed, there are no screws visible on the face plate.

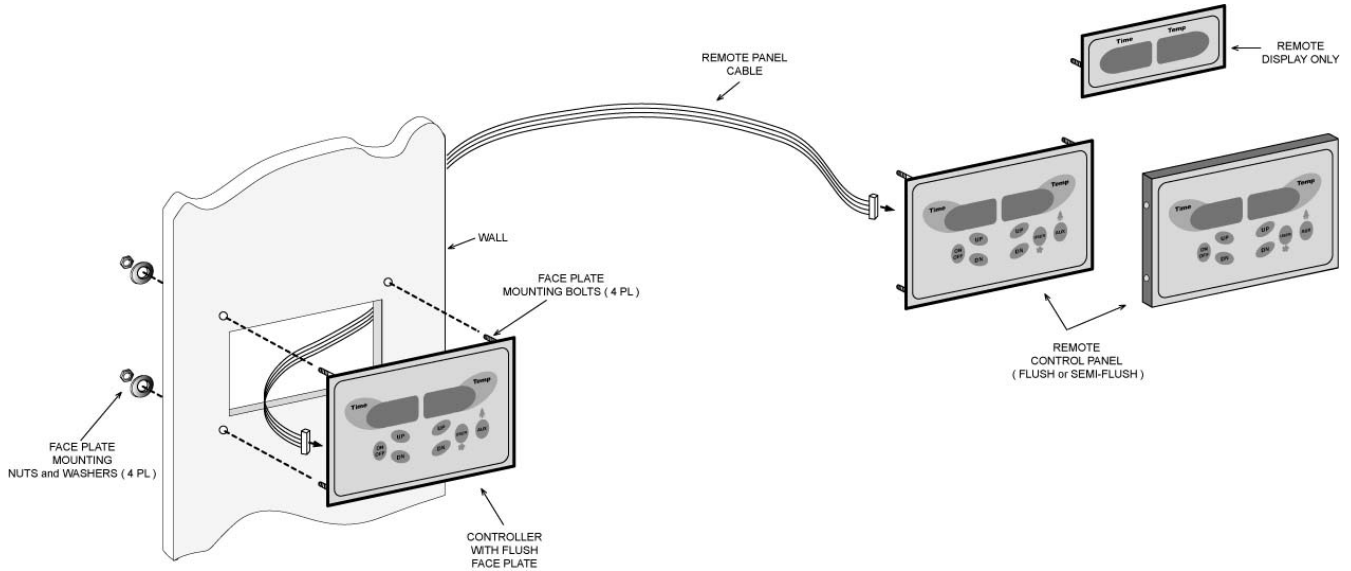
Applications: Sauna, Heaters, Coolers, Steam rooms, Smokers, etc...



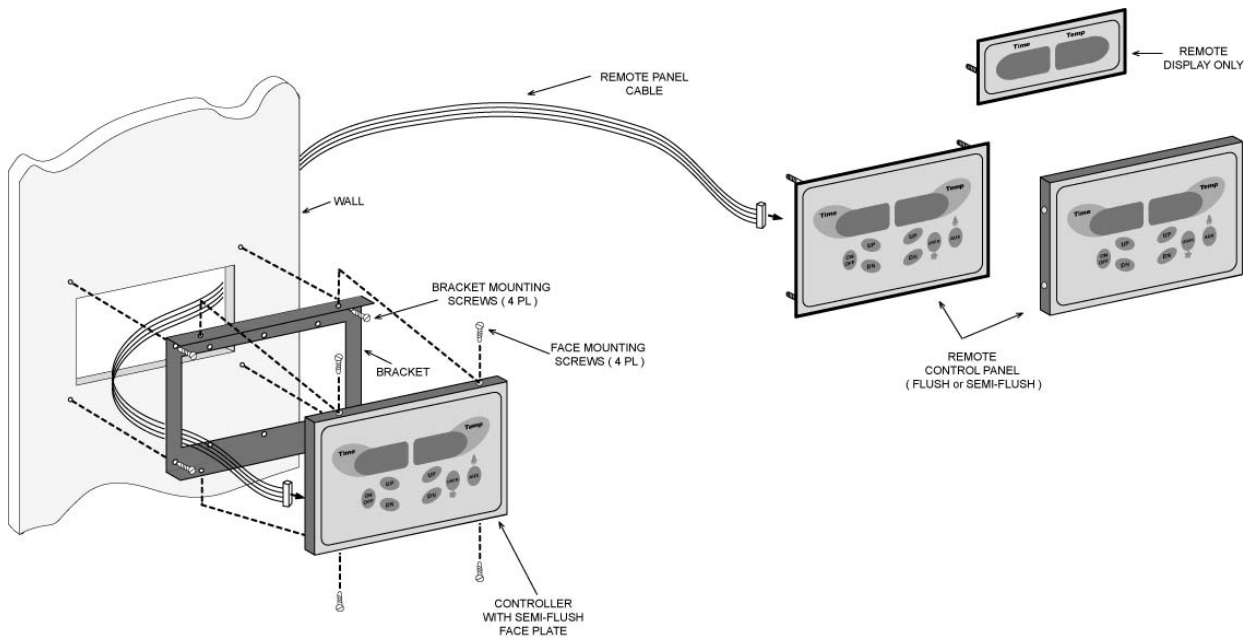
Variety of available temperature sensor probes.



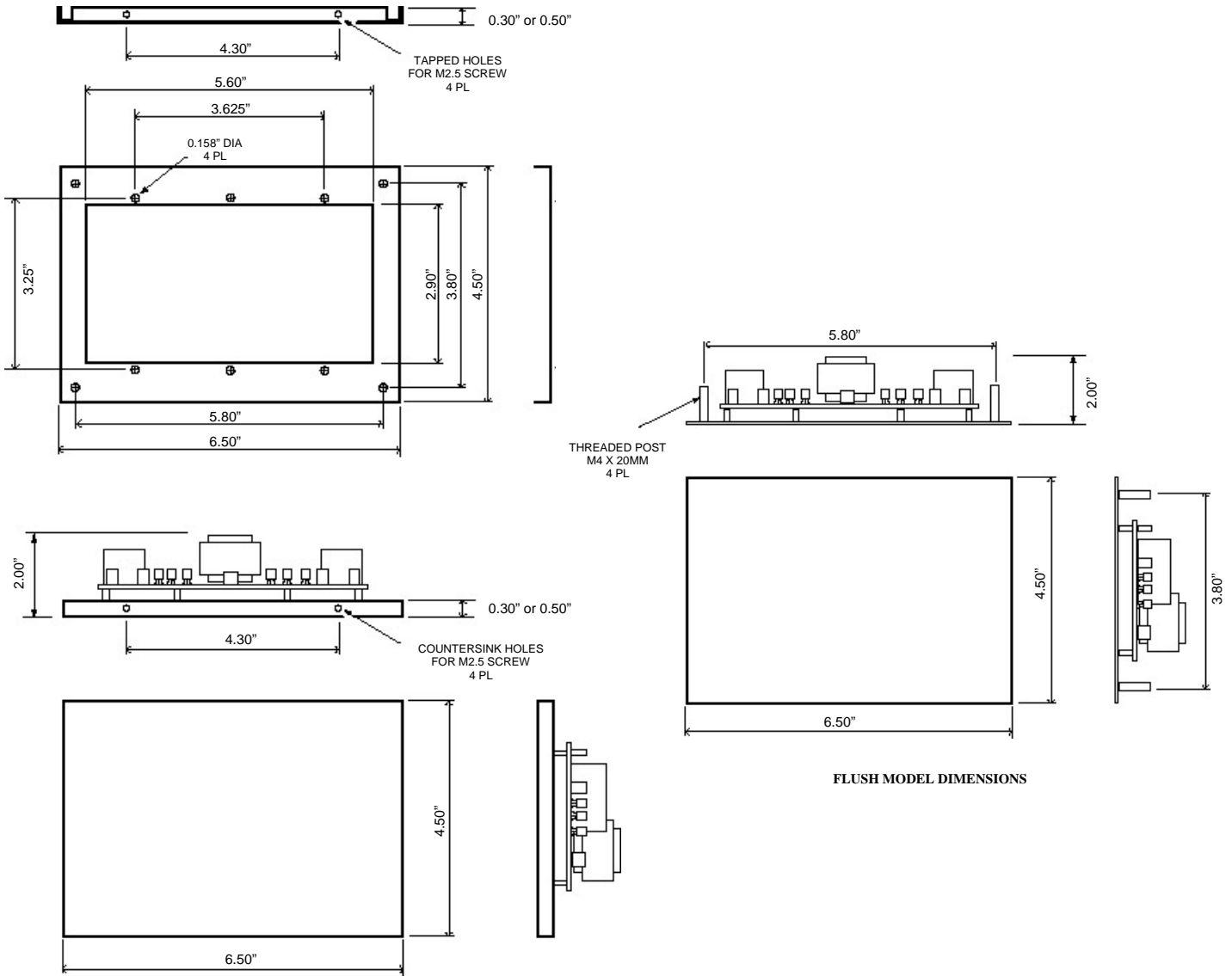
INSTALLATION EXAMPLE: SEMI-FLUSH IN A 3-GANG ELECTRICAL BOX.



INSTALLATION EXAMPLE: FLUSH IN A WALL



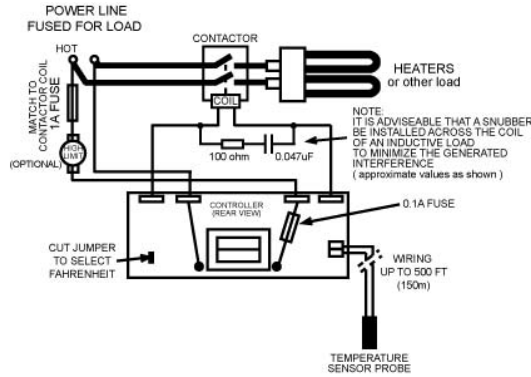
INSTALLATION EXAMPLE: SEMI-FLUSH IN A WALL



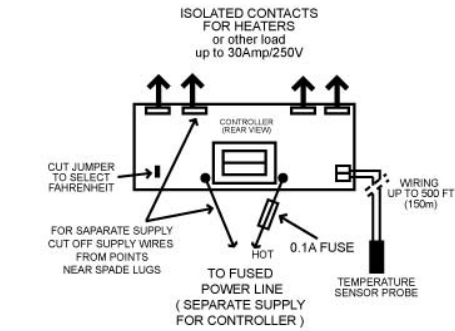
SEMI-FLUSH MODEL DIMENSIONS

FLUSH MODEL DIMENSIONS

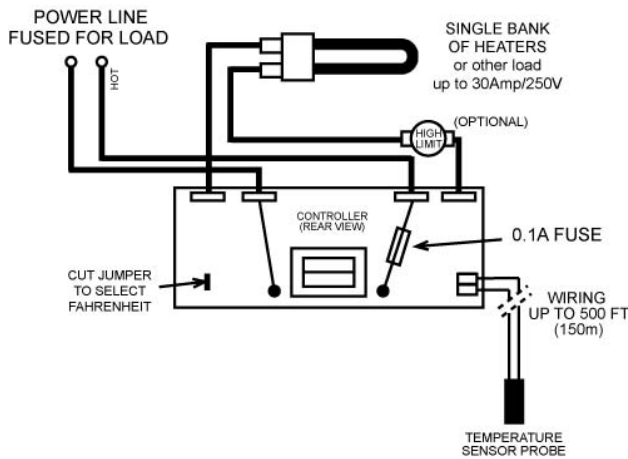




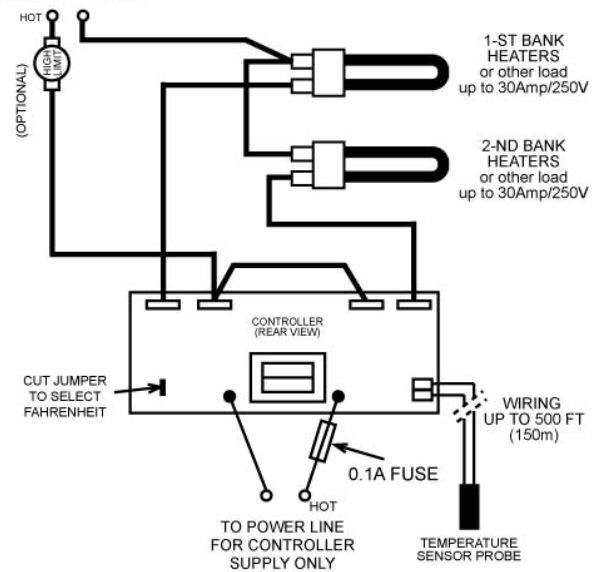
WIRING EXAMPLE WITH EXTERNAL CONTACTOR TO BOOST THE LOAD POWER



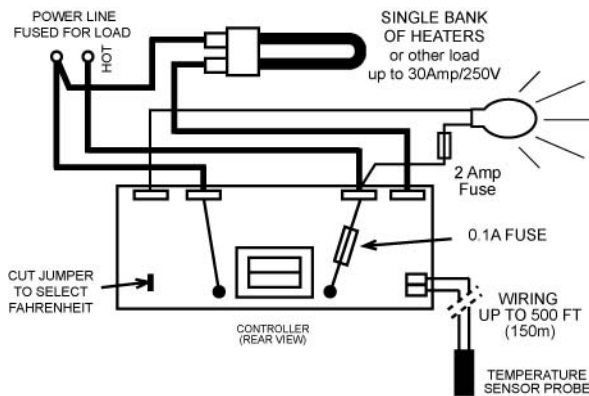
WIRING EXAMPLE WITH POWER LINE SUPPLY SEPARATED FROM THE RELAYS CONTACT



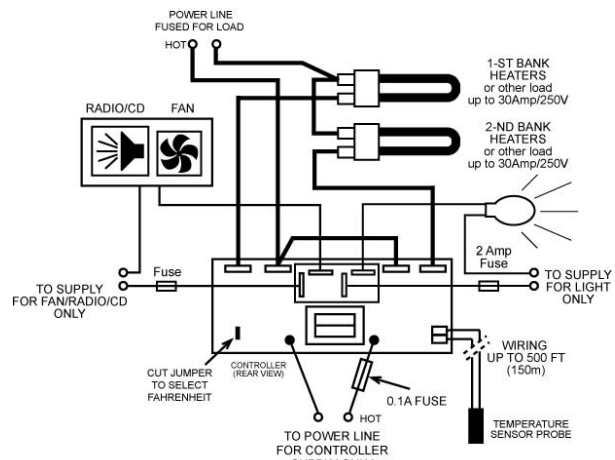
WIRING EXAMPLE WITH POWER LINE SUPPLY COMMON FOR THE CONTROLLER AND THE LOAD



WIRING EXAMPLE WITH 2 BANKS OF LOADS (TO INCREASE THE POWER) AND SEPARATE SUPPLY FOR THE CONTROLLER AND THE LOAD



WIRING EXAMPLE WITH POWER LINE SUPPLY COMMON FOR THE CONTROLLER AND THE LOAD AND WITH OPTIONAL LIGHT CONTROL



WIRING EXAMPLE WITH POWER LINE SUPPLY SEPARATE FOR THE CONTROLLER AND THE HIGH LOAD IN 2 BANKS AND WITH OPTIONAL LIGHT AND FAN/RADIO/CD CONTROL

Example model: **SD-3PB-I-2HP-120-56-SN (preconfigured for Sauna applications)**

OPERATING INSTRUCTIONS:

HOW TO START :

Press the "ON/OFF" key to start or stop the timer.

NOTE: After starting, the controller will begin the count down from the MAXIMUM time preset and the preset temperature will be automatically set to the MAXIMUM allowed preset point.

The user may readjusted the timer at any point by pressing the UP or DN key.

NOTE: For as long as the supply power is present, the readjusted TIMER preset value is saved in a temporary memory and may be recalled later on by pressing the "USER" key to restore that value.

TEMPERATURE ADJUSTMENT :

The user may readjusted the temperature preset at any time by pressing the UP or DN key.

NOTE: For as long as the supply power is present, the readjusted TEMPERATURE preset value is saved in a temporary memory and may be recalled later on by pressing the "USER" key to restore that value.

CONTROL OPERATION :

1. The controller switches the load ON and OFF as required to maintain the preset temperature value as compared to the sensor reading while the Count Down Timer is running.
2. Every several seconds the display will show the preset temperature value and then return to the current temperature reading.

AUTOMATIC STOP :

The controller stops automatically when the preset time expires or a malfunction is detected.

OPTIONAL LIGHT / FAN / RADIO control:

Several **optional** keys may be active to control some additional loads like : Light, CD/Radio, Fan etc...

IDLE/MONITORING OPERATION :

The timer display shows "OFF" or "0" to indicate that the controlled load is switched OFF.

After the TIMER expired or after it was STOPPED, the controller enters the "IDLE" state. It will continue to monitor the current temperature reading on the display.

CELSIUS/FAHRENHEIT SELECTION :

The controller is normally preset for Celsius degrees. To set the Fahrenheit degrees, cut the "C/F" jumper on the back of controller as shown in the drawing. NOTE: in some models this jumper may be set permanently to either units.

CAUTION : All installation and adjustments of the controller options **MUST** be done **ONLY** when **ALL POWER** to load and controller is disconnected.

TROUBLESHOOTING :

The sensor wiring and controls are continually checked for proper operation. If a malfunction is detected, the controller will automatically switch OFF the load and deactivate itself. At the same time the display will show "Err".

The controller cannot be reactivated until all causes of the malfunction are fixed.

Following is an example of specifications for a selected model. Note that all Timer and Thermostat ranges, electrical as well as mechanical specifications may be modified to the customer requirements.

Example model: **SD-3PB-I-2HP-120-56-SN (preconfigured for Sauna applications)**

<i>SPECIFICATIONS:</i>	<i>VALUE</i>	<i>NOTES, COMMENTS</i>
<i>Electrical:</i>		
Supply Voltage:	105-130Vac, 60 Hz	208-240Vac, 50/60Hz, 12/24V AC/DC
Supply Current (controller):	50 mA RMS max.	May be lower for different voltages, relays and display brightness or color
Max. Switched Load:	30 Amp, 240Vac max.	May be different for other relay models
Switching Reliability:	10,000,000 electrical 10,000,000 mechanical	For AC load
Switching Anti-Cycle:	10 sec. On ON action	May be preset to other value on request
Electr. Ambient temperature:	0 to +70C (32 to +158F) (standard)	0 to +90C extended with high temp LEDs
Control temperature F:	0 to +255F (standard)	May be extended
Control temperature C:	-16 to +140C (standard)	May be extended
Temp. Preset Range:	+37C to +90C (+100 to +194F) (Sauna)	Other ranges available for other models
Temp. reading accuracy:	+/- 1%	Over the operating range
Hysteresis (differential):	+0.5C, -0C (+1F, -0F)	May be set to any value on request
Temp. Display resolution F:	1 F	Other available on request
Temp. Display resolution C:	1 C	Other available on request
Probe Temperature Range:	-40 to +140C (-40 to +284F) (standard)	Extended temp. avail. on custom orders
Probe wiring distance:	500 Ft. (150 m) max.	May be extended on special order
Probe dimensions:	25mm lg. x 5mm dia. (1" x 0.2" dia)	Black, Chrome plated or brass housing
Timer Preset Range:	5 to 60 minutes (for sauna models)	Custom ranges available
Timer Display resolution:	1 minute	Custom resolutions on request
Display color:	Super RED, GREEN or BLUE	Different colors upon request
<i>Mechanical:</i>		
Face plate:	Painted Metal	Flush or Semi-Flush mounted face plate
Face plate dimensions:	165mm x 115mm (6.5" x 4.5")	
Mounting Front plate:	Fiber Glass or Metal	Used to install, depending upon the model
Mounting plate dimensions:	136mm x 92mm (5.35" x 3.62")	
Controller dimensions::	136mm x 70mm x 48mm (LxWxD) (5.35" x 2.76" x 1.89")	Models with line transformer
Overall weight:	350 gm	Models with line transformer
Shipping Packaging:	Carton padding 6 pcs per volume of 255mm x 152.5mm x 120mm (14" x 6" x 4.75")	6 sets per volume, 4 sets per carton
Accessories pack:	Crimp Spade connector: 4 pcs, Mounting screws: 4 pcs (if needed) Face plate and Lexan Label: 1 pc each	