

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

TIMER section:

The Interval Timer is programmed by a single rotary knob located on the left hand side of the controller face plate under the 3-digit LED display indicating the time preset during programming. The Timer may be activated by rotating the knob to the fully counterclockwise position and back to the desired preset reading, or alternately by pressing the START key to preset the timer with the value currently set by the knob position. 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 rotating the control knob to the OFF position. Note, that a variety of standard and custom time ranges are available.

THERMOSTAT section:

The Digital Thermostat section is programmable by rotating the knob on the right hand side. 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 relays contacts 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 or the thermostat action may be suspended by rotating the knob to the desired position. 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.

Main Controller and Remote Display Panel:

An optional Remote panel may be connected to the Main Controller using a single multi-conductor, low voltage cable. The remote panel can display the same information as the Main Controller. Both panels can be ordered with either type of the 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.

ADDITIONAL functions:

An additional “AUX” (or Light) key may be used to control some OPTIONAL functions. A model with such option installed may have an additional relay on-board that can be used to control such outputs like Fan, Light, Radio, CD Player or other. In standard models this key may either be inactive or perform some other functions if custom modifications are requested.

Temperature Sensor PROBE:

A number of standard Temperature Probes is available for this controller depending upon the application. Most probes are small in size, for instance a black anodized probe appx. 25 mm long and 5 mm in 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.



Variety of available temperature sensor probes.

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.

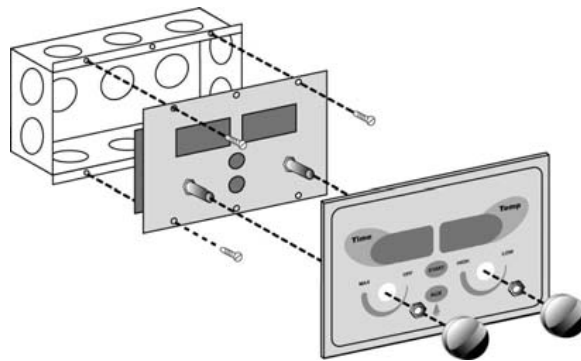
Options:

Various additional options are available for the SD-3 controllers including: *Stand-by Preheat, Delay-Before-Start, Auto-Manual Light/Fan 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.

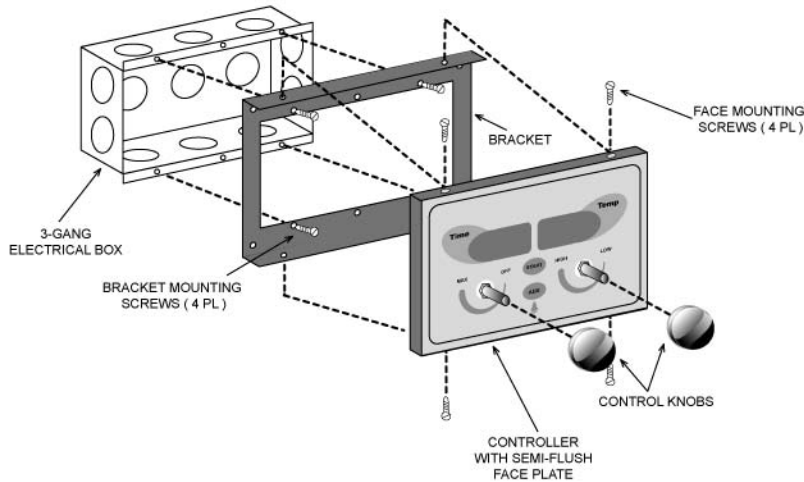
Installation:

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 separate plastic overlay may be installed on either a customer supplied face plate or the standard Stainless Steel or painted metal plate included in the kit. All mounting hardware, knobs, screws and wiring connectors are attached. When correctly installed, there are no screws visible on the face plate.

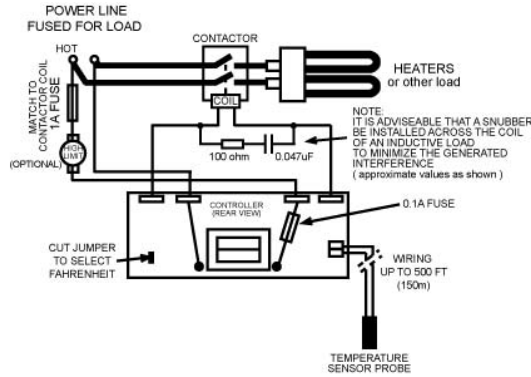
Applications: Sauna, Heaters, Coolers, Steam rooms, Smokers, etc...



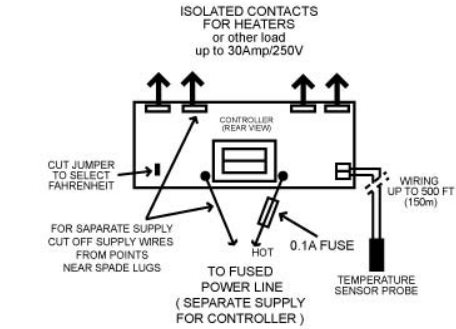
INSTALLATION EXAMPLE: FLUSH IN A 3-GANG ELECTRICAL BOX.



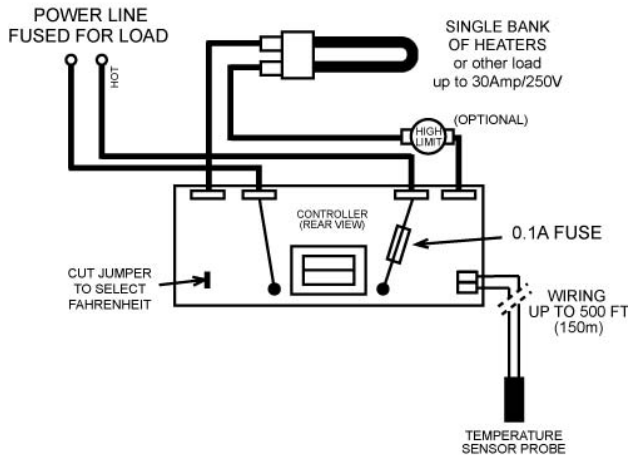
INSTALLATION EXAMPLE: SEMI-FLUSH IN A 3-GANG ELECTRICAL BOX.



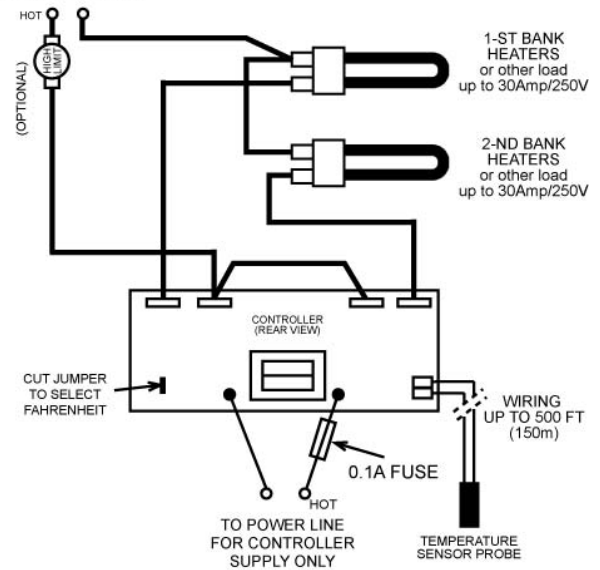
WIRING EXAMPLE WITH EXTERNAL CONTACTOR TO BOOST THE LOAD POWER



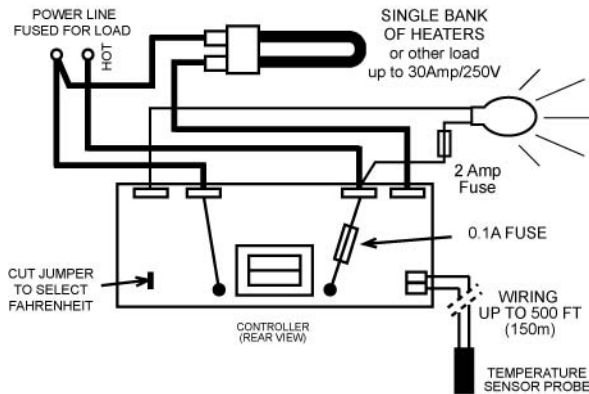
WIRING EXAMPLE WITH POWER LINE SUPPLY SEPARATED FROM THE RELAYS CONTACT



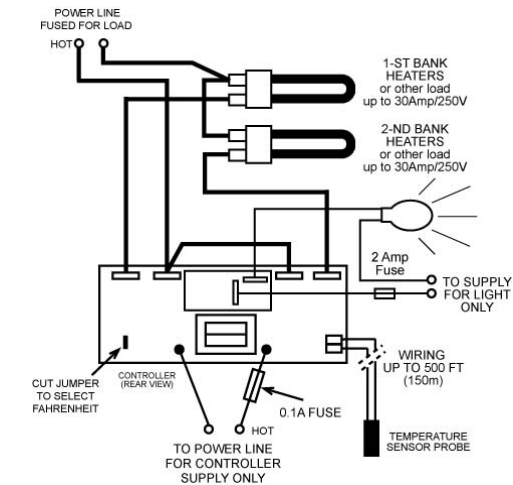
WIRING EXAMPLE WITH POWER LINE SUPPLY COMMON FOR THE CONTROLLER AND THE LOAD



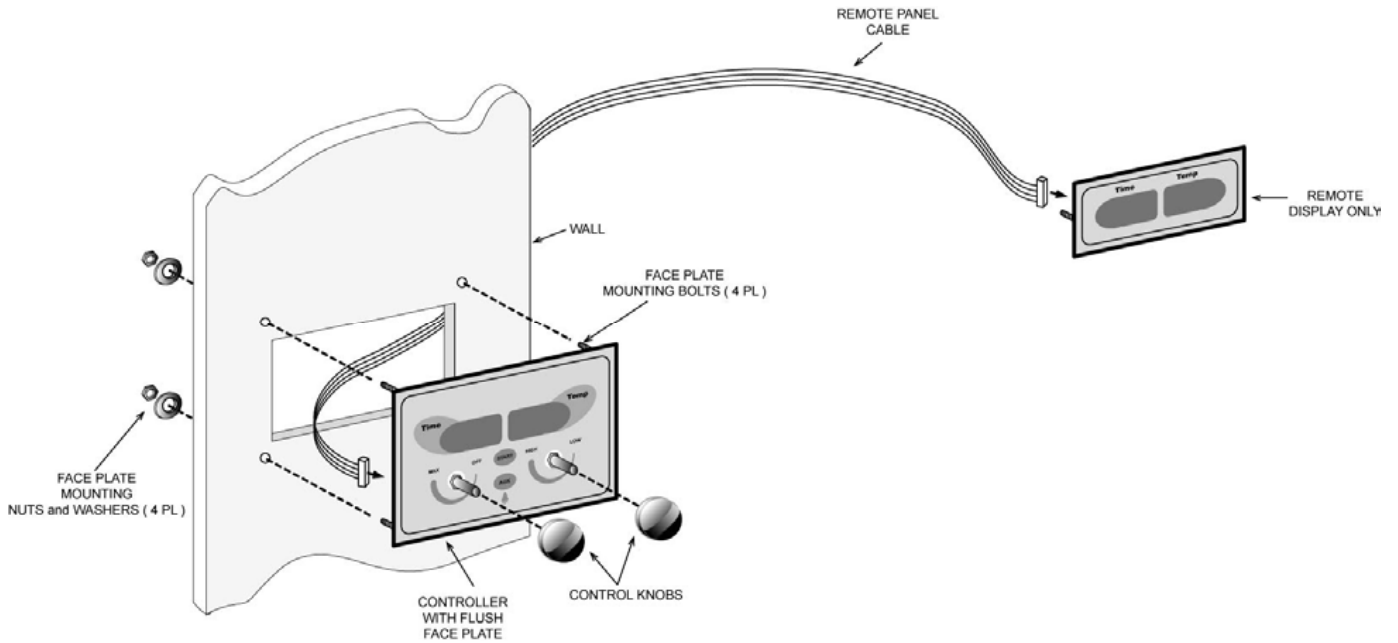
WIRING EXAMPLE WITH 2 BANKS OF LOADS (TO INCREASE THE POWER) AND SEPARATE SUPPLY FOR THE CONTROLLER AND THE LOAD



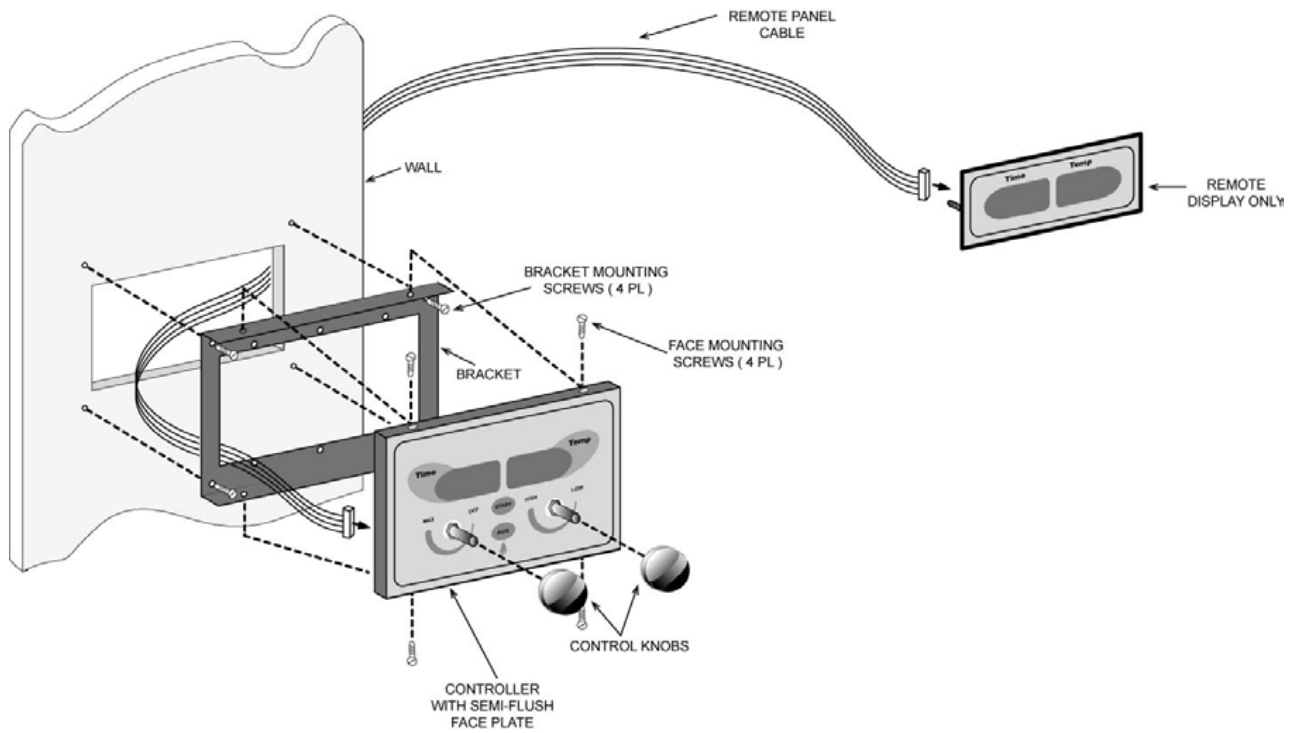
WIRING EXAMPLE WITH POWER LINE SUPPLY COMMON FOR THE CONTROLLER AND THE LOAD



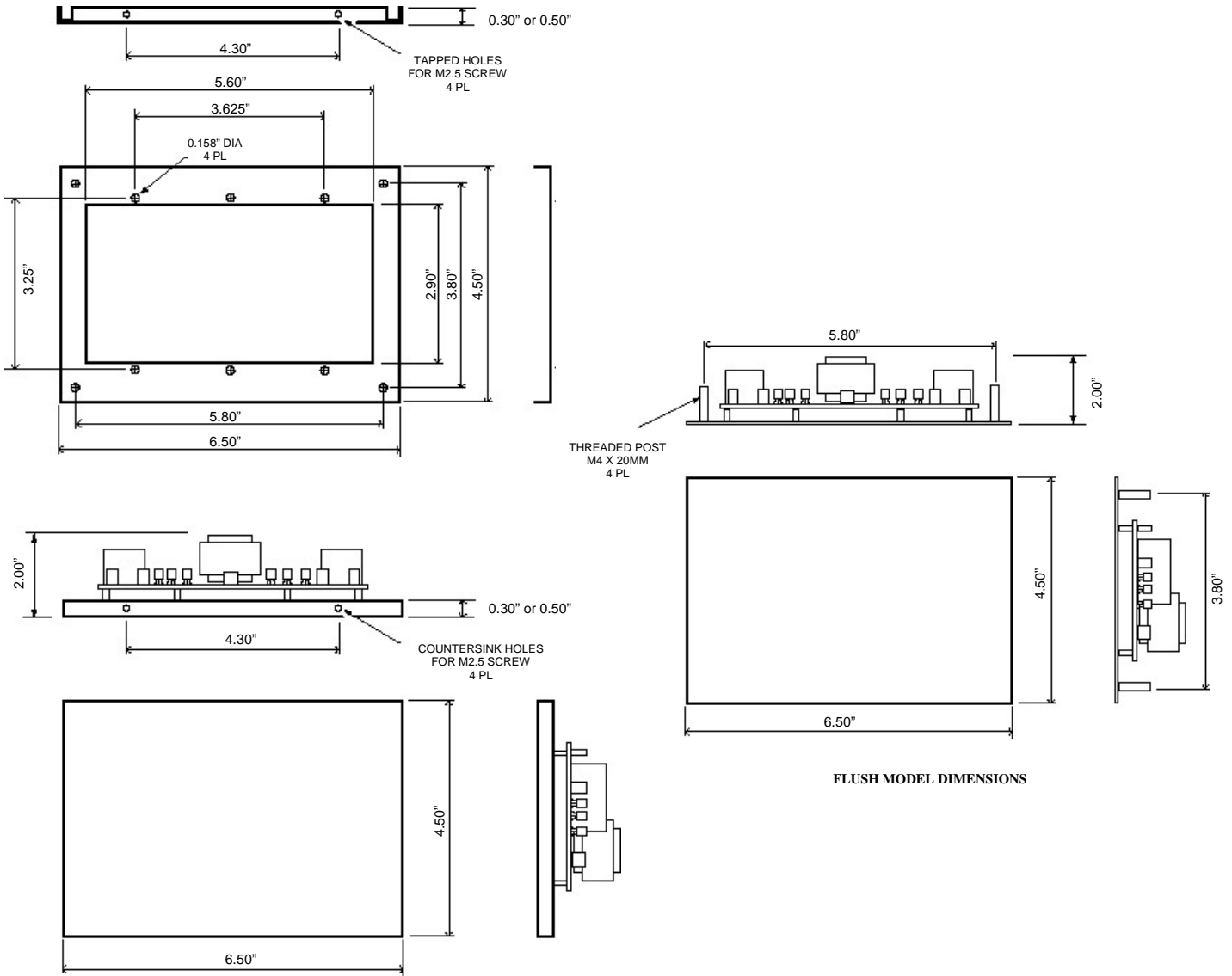
WIRING EXAMPLE WITH POWER LINE SUPPLY SEPARATE FOR THE CONTROLLER AND THE HIGH LOAD IN 2 BANKS AND WITH OPTIONAL LIGHT or FAN/RADIO/CD CONTROL



INSTALLATION EXAMPLE: FLUSH IN A WALL



INSTALLATION EXAMPLE: SEMI-FLUSH IN A WALL



SEMI-FLUSH MODEL DIMENSIONS

FLUSH MODEL DIMENSIONS



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

OPERATING INSTRUCTIONS:

HOW TO START :

1. Set the Temperature with "Temp." knob or leave it as is to continue at previous setting. To reset, first turn the knob to "LOW".
2. A) Turn the "TIME" knob to "OFF" then rotate it until the display reads the desired time.
B) Alternately, Press the START key.
3. After several seconds the preset time will be locked-in automatically and the controller will start.

TEMPERATURE ADJUSTMENT :

User may readjust the temperature by rotating the "TEMP" knob while the controller is operating. To make the display show the preset value, first turn the knob to "LOW".

CONTROL OPERATION :

1. The controller switches the load ON and OFF as required to maintain the preset temperature value 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.
3. The Timer readjustment during operation is not possible. It may only be done by first terminating the count-down (rotate the "TIME" knob to "OFF") and restarting the controller.

MANUAL STOP :

Turn the "TIME" knob to "OFF" or activate optional REMOTE STOP switch for few seconds. The Count-down timer will automatically stop and reset to "0". The load will be switched OFF.

AUTOMATIC STOP :

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

OPTIONAL LIGHT / FAN / RADIO control:

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

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 the load and the 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-3RT-I-2HP-120-56-SN (preconfigured for Sauna applications)**

SPECIFICATIONS:	VALUE	NOTES, COMMENTS
Electrical:		
Supply Voltage:	105-130Vac, 60 Hz	208-240Vac, 50/60Hz, 12/24V AC/DC
Supply Current (controller):	50 mA RMS max. (at 120VAC)	May be lower for different voltages, relays and display brightness or color
Max. Switched Load:	30 Amp, 240Vac max. (per Relay)	May be different for other relay models
Switching Reliability:	10,000,000 electrical 10,000,000 mechanical	For AC load (resistive)
Switching Anti-Cycle:	10 sec. On ON action	May be preset to a different 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
Mechanical:		
Face plate:	Stainless Steel or Painted Metal	Controller may be installed without face plate
Face plate dimensions:	165mm x 115mm (6.5" x 4.5")	Typical (see documentation for other models)
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")	Typical (see documentation for other models)
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 volumes per carton
Accessories pack:	Pointer Knobs: 2 pcs Crimp Spade connector: 4 pcs, Mounting screws: 4 pcs (if needed) Face plate and Lexan Label: 1 pc each	