

SDH-2 and SDH-3RT Digital Thermostat .



Front view of the SDH-3RT thermostat (with Grey and Black face label). The LED display colors available in Super RED, Green and Blue.



Front view of the SDH-2 thermostat (with small grey label).

This microcomputer based controller is a 100% duty programmable thermostat for Heating or Cooling with externally wired temperature sensor probe. Available in Celsius and Fahrenheit.

The thermostat is programmed with one rotary pot located on the face. Models are available with temperature preset ranges from -40F (-40C) to +300F (+150C) with thermistor probes and up to +480F (+250C) with RTD probes. The probe wiring is extendable up to 500 ft. (150 m) with any type of a 2 conductor cable. Custom temperature ranges and probes are available upon request.

The face knob, when placed in the fully counter-clockwise position, will Stop the thermostat .

After the power-up in standard models, the thermostat will be automatically preset to the target temperature as set by the position of the control knob. Alternately, the customer may request that the controller not start automatically after the power up.

The user can alter the knob position at any time during the operation and the target will be immediately set to the new value.

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

During the operation, the display indicates the current temperature reading and every several seconds it will show the preset target value.

A flashing “.” or “On” sign indicates that the thermostat is active.

When the thermostat is not running, the on-board relay is off and the display shows the text “OFF” .

There are many other options available for this controller. Please see the “List of Options” document for details. In the models for heating, the on-board relay is controlled to close when the temperature is lower than the preset . In the models for cooling, the relays action is reversed.

The thermostat has an “Anti-Cycle” function built in, that prevents the relay from switching too frequently when the temperature is near the switching point.



SDH-3RT thermostat with Semi-Flush face and with grey label.



SDH-2 Digital Thermostat Set including the Sensor Probe, in-line fuse holder and the mounting hardware. Stainless Steel face plate shown.



SDH-3RT Digital Thermostat Set including the Sensor Probe, in-line fuse holder and the mounting hardware. Semi-Flush face shown.



SDH-3RT Flush face plate with Grey Label.

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 -40F to +300F (-40C to +150C) 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:

SDH-2 and SDH-3RT 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 should be installed in the included in-line fuse holder. Standard models have one on-board relay, Single Pole, Normally Open. The relay can switch loads up to 30Amp, 240Vac max. (40 Amp is optional). The contacts of the relay may be completely isolated from the controller supply depending upon the chosen method of wiring. The Power Relay switching may be synchronized with the power line "Zero-Crossing" points giving an increased reliability and eliminating the contacts arcing during the high power switching. This considerably limits any generated interference and increases the life of the relay contacts.

Options:

Various additional options are available for the SDH-2 and SDH-3RT controllers including:

- Stand-by Preheat,*
- Proportional control,*
- High Limit,*
- Adjustable Differential,*
- Alarm Buzzer, etc...*
- Heating or Cooling,*
- Permanent Cycle Timer,*
- Low Limit,*
- Remote Start/Stop/Enable or Pause,*

See the Complete "List of Options" for details.

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

Installation:

SDH-2 and SDH-3RT controllers are normally shipped without enclosures (optional) and are designed to fit in a standard 1-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.

NA7100KB4100BLK



NA7100KB4100CHR



NA7100KB4100RDT



NA7100KB4100SQT



NA7100KB4100DRP



NA7100KB4100SHD

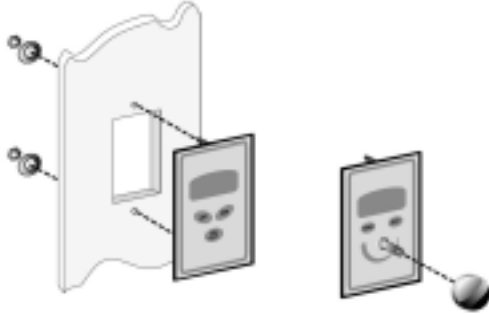


PT10038550MM

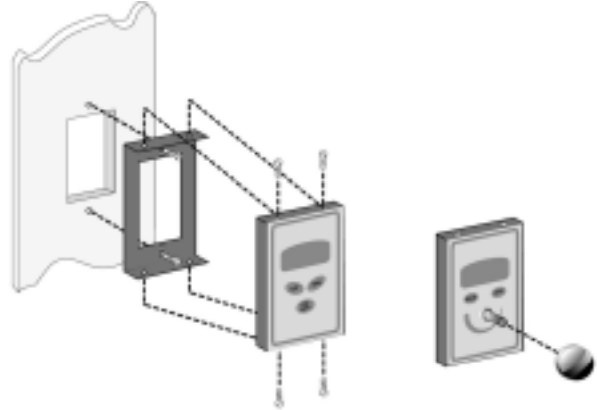


NA7100KB4100PIP

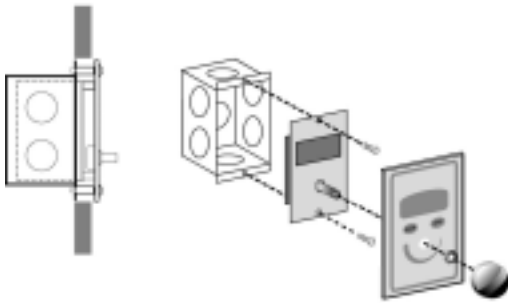




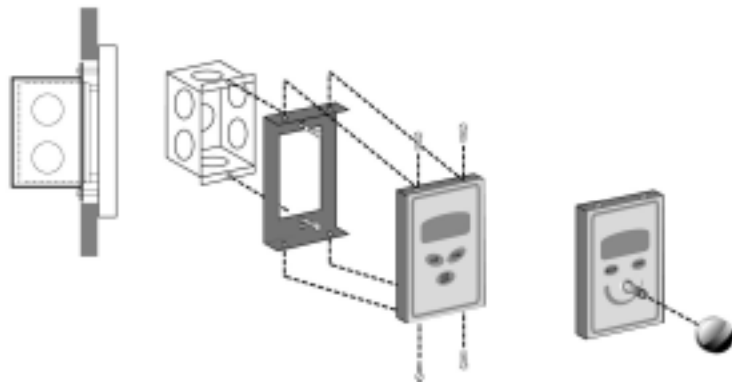
INSTALLATION EXAMPLE: FLUSH IN A WALL



INSTALLATION EXAMPLE: SEMI-FLUSH IN A WALL



INSTALLATION EXAMPLE: SDH-2 FLUSH IN A BOX



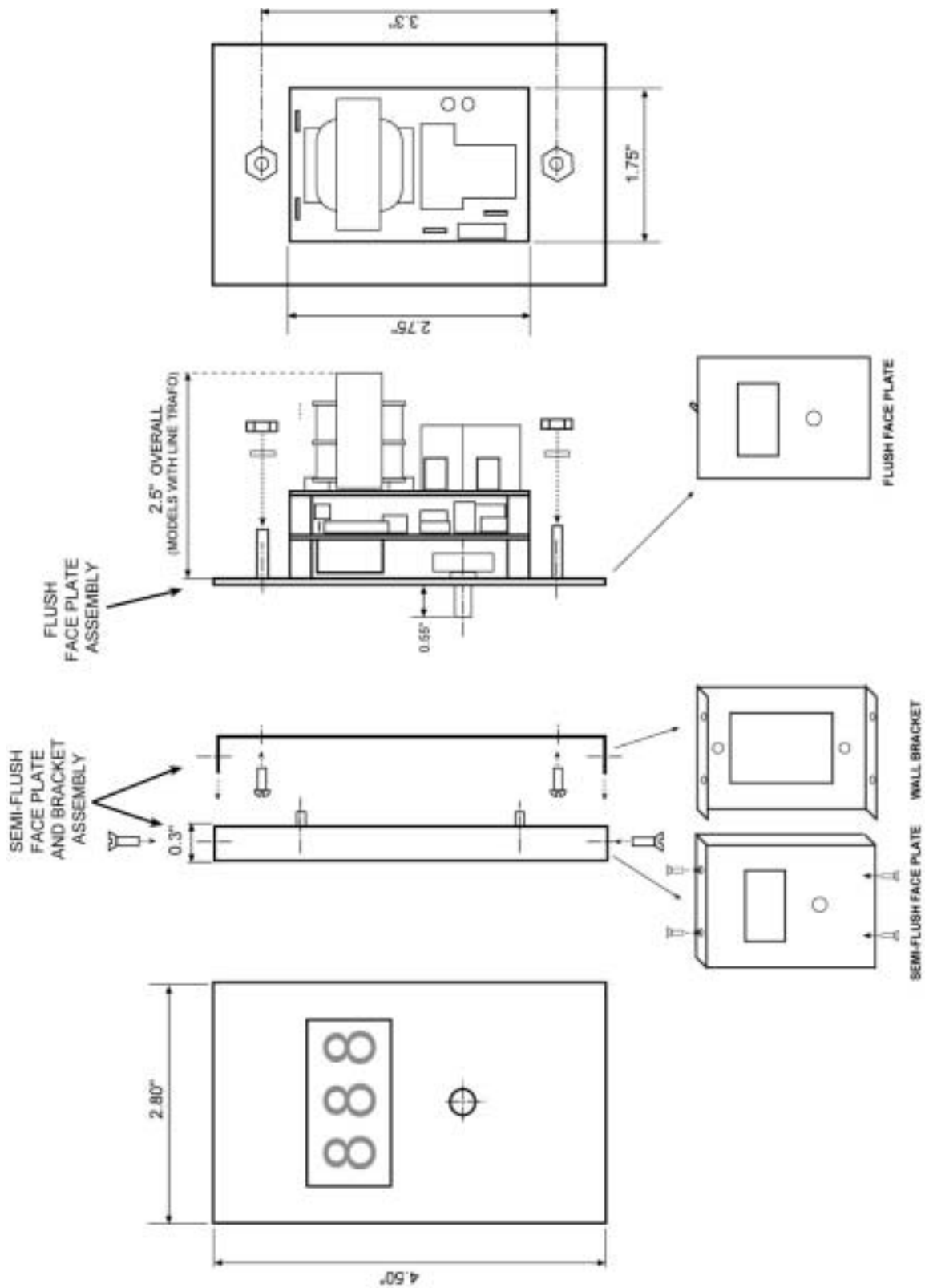
INSTALLATION EXAMPLE: SEMI-FLUSH IN A BOX

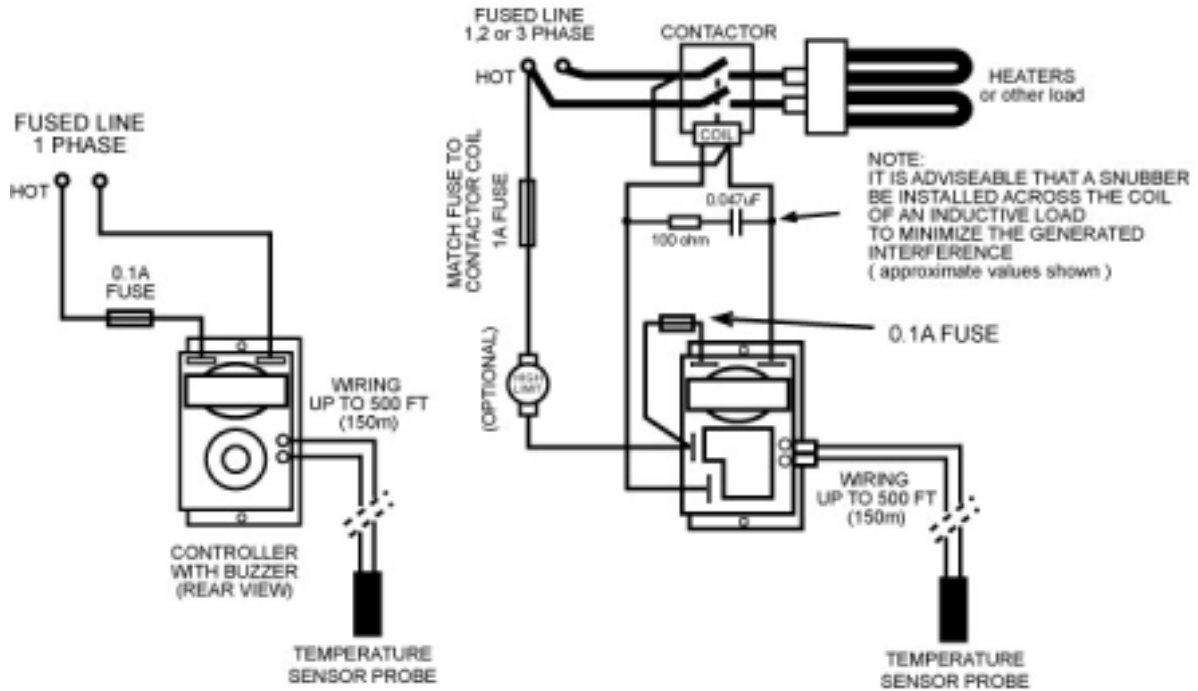


OPTIONAL SENSOR PROBE PLATES
(PLASTIC PPP-4 or STAINLESS STEEL PPS-4)



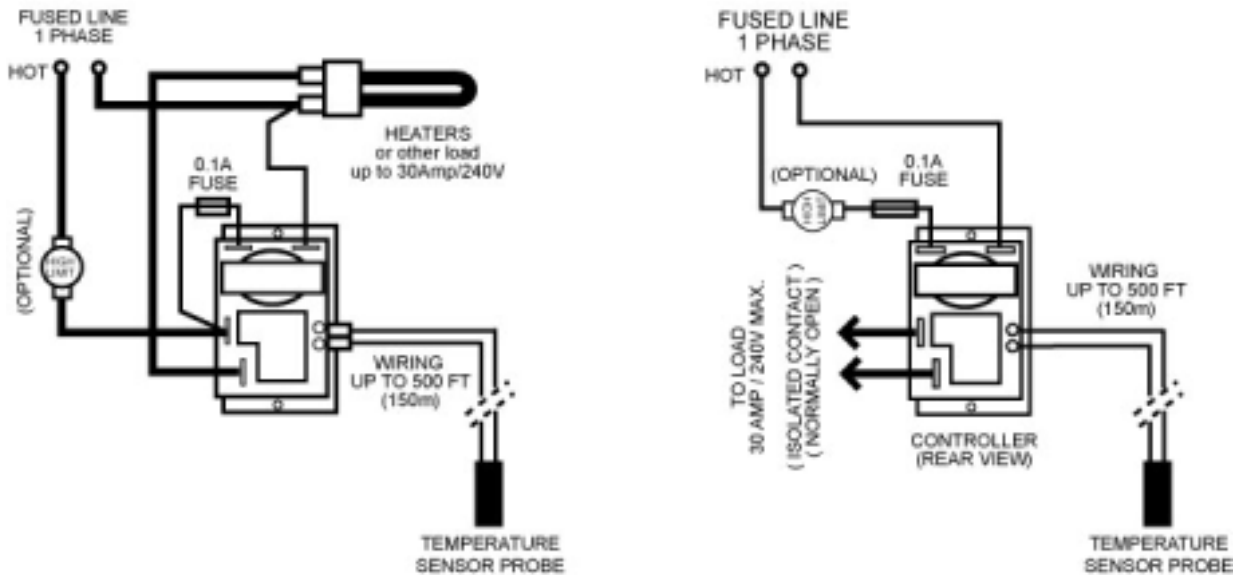
OPTIONAL SENSOR PROBE PROTECTIVE SHIELD (PG-5)





WIRING EXAMPLE WITH ON-BOARD BUZZER

WIRING EXAMPLE WITH EXTERNAL CONTACTOR TO BOOST THE LOAD POWER



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

POWER LINE SUPPLY SEPARATE FOR THE CONTROLLER AND THE LOAD

OPERATING INSTRUCTIONS:

HOW TO START:

1. Turn the preset knob to "LOW" then rotate it until the display reads the desired preset temperature.
2. The controller will remain in the Preset mode as long as the knob is operated.
3. After several seconds the preset value will be locked-in automatically and the controller will start.

TEMPERATURE ADJUSTMENT DURING OPERATION:

User may readjust the temperature by rotating the preset knob to "LOW" and then setting a new 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.
2. Every several seconds the display will show the preset temperature value and then return to the current temperature reading.

MANUAL STOP:

Turn the knob to "LOW" or activate the optional REMOTE STOP switch for few seconds. The controller will automatically stop. The load will be switched OFF.

AUTOMATIC STOP:

The controller stops automatically when a malfunction is detected or the temperature exceeds the controller limits.

IDLE/MONITORING OPERATION:

The display shows "OFF" to indicate that the controlled load is switched OFF. When the preset knob is at "LOW" and after several seconds of "no-action", the controller enters the "IDLE" state to monitor and display the current temperature reading .

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 indicate "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 thermostat ranges, electrical as well as mechanical specifications may be modified to the customer requirements.

Example model: **SDH-3RT-HP-120-56-H1-FP0P255-RFP0P254...**

SPECIFICATIONS:	VALUE	NOTES, COMMENTS
Electrical:		
Supply Voltage:	105-130Vac, 50/60 Hz	208-240Vac, 50/60Hz, 12/24V AC/DC
Supply Current (controller):	25 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:	-16C to +140C (standard)	May be extended
Temp. Preset Range:	-16C to +140C (or 0 to +254F)	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
Display color:	Super RED, GREEN or BLUE	Different colors upon request
Mechanical:		
Face plate:	Painted Metal	Flush or Semi-Flush mounted face plate
Face plate dimensions:	70mm x 115mm (2.75" x 4.5")	
Mounting Front plate:	Fiber Glass or Metal	Used to install, depending upon the model
Mounting plate dimensions:	70mm x 115mm (2.75" x 4.5")	Flush or Semi-Flush face models
Controller dimensions::	115mm x 70mm x 64mm (HxWxD) (4.5" x 2.75" x 2.5")	Models with line transformer
Overall weight:	300 gm	Models with line transformer
Accessories pack:	Mounting screws and nuts if needed, Face plate and Plastic Label: 1 pc each In-line fuse holder + 20mm fuse: 1 pc	