

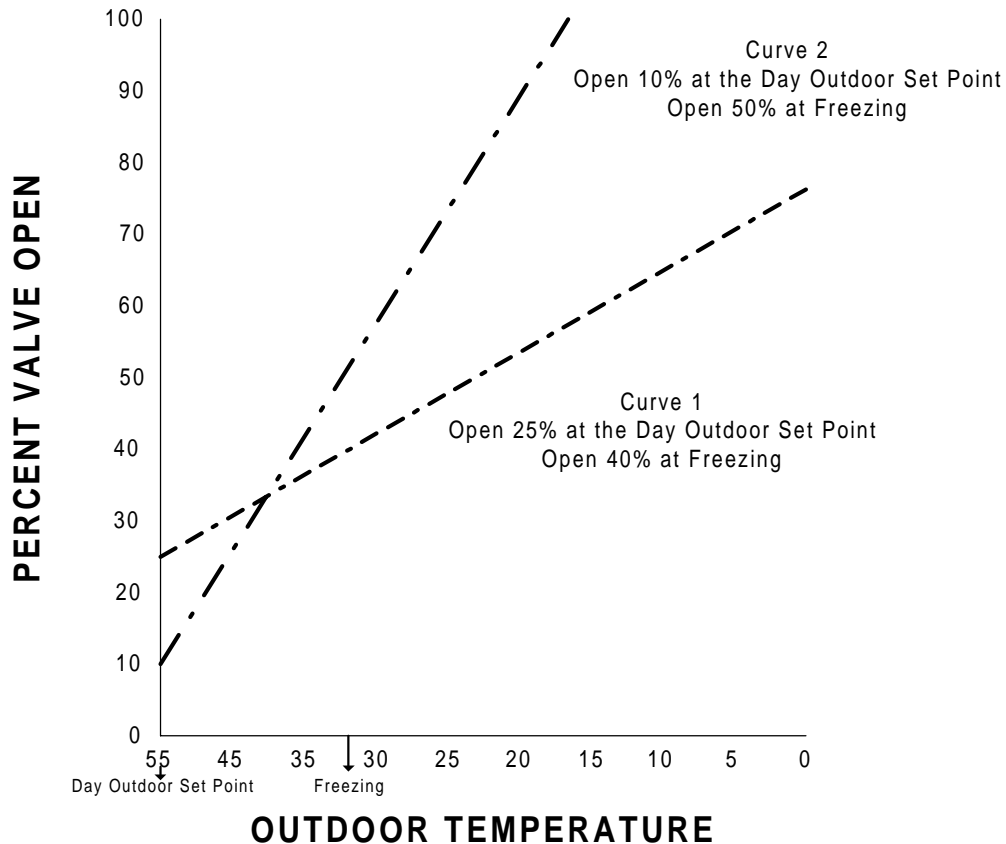
HEAT-TIMER

SRC STEAM RESET CONTROL

An Outdoor Reset Control for Sub-Atmosphere Steam Systems

Heat-Timer's theory of steam reset heating is as follows:

Pulse the valve open to a limited valve position, very slowly filling the system with steam and starting a timed heating period. The valve position will be determined by two adjustable points as shown below. The first point is the percent the valve should be open when the control starts giving heat (ie. at the Day Outdoor Set Point typically 55°F). The second point will be the percent the valve should be open at freezing (ie. at 32°F). The time of the heating period will vary according to the outdoor temperature and the setting of the HEAT ADJUSTMENT knobs (see chart on pg. 8). When this timed heating period is over, the valve will close (either partly or fully as adjusted by the operator). This will cause two things to happen. First, as steam turns back into water, all the energy it carries is released in the form of BTUs which are usable heat energy. Second, condensate occupies approximately 1500 times its volume as vapor. When the vapor condenses it forms a natural vacuum in your system which helps move condensate and also pulls steam through for the next heat cycle.



For example: Two possible valve combinations. Percent Valve Open can be selected individually at both the Day Outdoor Weatherhead Set Point and Freezing.

SRC FRONT PANEL

CURRENT STATUS INDICATORS

- HEAT SOURCE ACTIVATED
- HEAT CIRCULATION ESTABLISHED
- SYSTEM IN CYCLE

HEAT ADJUSTMENT

NORMAL - (DAY) SAVE - (NIGHT)

THESE ALPHABETICAL SETTINGS REACT WITH THE CHANGING OUTSIDE TEMPERATURE TO VARY THE ON DURATION OF A CYCLE TO PROVIDE APPROPRIATE HEAT. SEE CYCLE CHART FOR EXACT DURATION IN MINUTES.

SERIAL NO. **HEAT-TIMER®**
FAIRFIELD, N.J.

MODEL SRC
STEAM RESET
CONTROL

Gold Series

SYSTEM IN NORMAL (DAY) SHIFT SYSTEM IN SAVE (NIGHT)

55 **45**

NORMAL (DAY) SAVE (NIGHT)

OUTDOOR SENSOR SET POINTS

MON TUE WED THU FRI SAT SUN

1:25 **53**

AM PM % VALVE OPEN

BOOST

SHUT DOWN CURVE

PROGRAM LOCK

MANUAL BY-PASS AUTO

WINTER **SUMMER**

CLOCK PROGRAM CONTROLS

HOURS MINUTES DAY DAY COPY

RUN PROGRAM REVIEW ERASE PAIR SHOWN

ADVANCE PAIR SHOWN

READ INSTRUCTIONS BEFORE PROGRAMMING

MORNING BOOST

FOR USE WITH GOLD SERIES SENSORS ONLY

MADE IN U.S.A.

UL TEMPERATURE REGULATING EQUIPMENT LISTED 723E

APPROVED BY N.Y.C. DEPT. OF GEN. SERVICES CALENDAR #29533

USE COPPER WIRE ONLY

OUTPUTS:
120VAC, 6A RESISTIVE
1A PILOT DUTY
15A TOTAL FOR ALL CIRCUITS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

MUST BE CONNECTED

LINE NEUTRAL VACUUM PUMP BURNER AUX. CLOCK CLOSE OPEN MOTORIZED VALVE

CLASS 1 WIRING ONLY

SUPPLY 115V 60HZ POWER CONSUMPTION 20VA MAX.

VACUUM PUMP BURNER AUX CLOCK MOTORIZED VALVE CLOSE OPEN

PRESS TO DISPLAY

OUTSIDE TEMP HEATING SYSTEM SENSOR FAST CYCLE FOR TESTING

HEATING SYSTEM SENSOR PULSE DELAY OFF CYCLE

NO CLOSURE FULLY CLOSED

BOOST PULSE CONT. VALVE CLOSE

MANUAL VARI SHUT DOWN

T TO OUTDOOR WEATHERHEAD SENSOR 904025

I TO HEATING SYSTEM SENSOR 904024

C TO OPTIONAL SPACE SENSOR 904001

S TO OPTIONAL SENSOR

X TO OPTIONAL SENSOR

GROUND CABLE SHIELDS TO THESE TERMINALS DO NOT APPLY ANY VOLTAGE TO SENSOR TERMINALS ALL SENSORS MUST BE GOLD SERIES SENSORS

ROUTE SENSOR AND AUXILIARY WIRES THROUGH THIS KNOCKOUT ONLY

425557-00 REV. A

WARNING:

The Heat-Timer model SRC is strictly an operating control; under no circumstances should it be used as a primary limit or safety control. Each boiler must have its own certified limit and safety controls required by local codes. These are the responsibility of the installing contractor who must verify proper operation and correct any safety problems prior to the SRC installation.

SEQUENCE OF OPERATION

When the SRC is powered up, the control will energize the *MOTORIZED VALVE CLOSE* relay for 360 seconds (six minutes) to synchronize the control and valve. When the control first senses a need for heat, the *VACUUM* pump, *BURNER*, and *MOTORIZED VALVE CLOSE* relays will all energize for **ten minutes** to initialize the system correctly. This time will be displayed in the small right hand display marked *% VALVE OPEN*. To speed through either of these times for testing, simply press the *FAST CYCLE FOR TESTING* button.

Once the SRC has initialized the system, and the outdoor temperature falls below the *OUTDOOR SENSOR SET POINT*, the control will begin to establish heat. This is done to insure that heat has reached all portions of the building. The red *HEAT SOURCE ACTIVATED LIGHT* will come on and the valve will begin to pulse open. The amount the valve is opened will be shown in the small display *% VALVE OPEN* and will be determined by the percent valve open set points and the outdoor temperature (see chart pg. 1). This amount the valve opens will be called the calculated maximum valve opening, and can vary from 0 to 100%. The SRC will continue establishing heat until either the return line sensor is satisfied, or if using the district steam option, a certain time period has elapsed.

At this point, the green *HEAT CIRCULATION ESTABLISHED* light and the yellow *SYSTEM IN CYCLE* light will both come on. The cycle will consist of two parts, an ON part of the cycle, and an OFF part. During the ON part, the valve will remain at calculated maximum and the *HEAT SOURCE ACTIVATED* light will stay lit. The length of the ON part of the cycle will depend on the outdoor temperature and the *HEAT ADJUSTMENT* setting. Once the control reaches the OFF part of the cycle, the yellow *SYSTEM IN CYCLE* light will remain on, but the red *HEAT SOURCE ACTIVATED* light will turn off. The valve will begin closing (either pulsing close, or driving closed see pg. 4 PULSE DELAY). The valve will then close from 0 to 100% (determined by the *OFF CYCLE CLOSURE* knob) of the calculated maximum position.

The OFF part of the cycle will last the remaining cycle time. For example, if the cycle were set to be 60 minutes long, and the ON part of the cycle was 19 minutes, then the OFF part of the cycle would last for 41 minutes. At the end of every fifth cycle, the valve will fully close for the motor time to re-initialize the valve position. The control will then begin establishing heat again and the entire process will be repeated.

CONTROL SETTINGS

MANUAL/AUTO/BYPASS: This switch must be in the *AUTO* position for the SRC to function as described above. The switch functions are as follows:

MANUAL - In the manual position, all the displays are blanked out except for the *SAVE (Night)*. This display will change to show the percent open of the valve. To change the position of the valve, the key lock must be in the *UNLOCK* position. Rotate the knob under the display until the desired valve position is displayed. The valve will then move to that position. The valve can be positioned at any time. However, the *BURNER* and *VACUUM* output will only be active when the SRC is calling for heat (the outdoor temperature is below the *OUTDOOR SENSOR SET POINT*, and the unit is switched to *WINTER*).

AUTO - The control will follow the sequence of operation described in the previous section.

BYPASS - The Burner and Vacuum pump outputs will be active, and the valve will go fully open. When switched to *BYPASS*, the time and *% VALVE OPEN* display will change to show the total amount of time the unit has been switched into *BYPASS*.

OUTDOOR SENSOR SET POINTS: These two temperature settings, one for *NORMAL (Day)* and one for *SAVE (Night)* determine when the SRC will begin giving heat. The SRC will not give any heat until the outdoor temperature falls below the *OUTDOOR SENSOR SET POINT*. Whether the control is in *NORMAL* or *SAVE* will be determined by the preprogrammed settings on the seven day digital clock. The SRC will not give any heat until the outdoor temperature falls below the *OUTDOOR SENSOR SET POINT*. Adjust the *OUTDOOR SENSOR SET POINTS* with the program key in the *UNLOCK* position. Rotate the knobs underneath the displays until the desired outdoor temperature is displayed.

PERCENT VALVE OPEN AT THE DAY OUTDOOR SET POINT: This is the first point of the valve curve (see pg. 1).

To set the percent valve open at the Day Outdoor Set Point, switch the *RUN\PROGRAM* switch to the *PROGRAM* position while the key is in the *UNLOCK* position. Then look at the display above *NORMAL (Day)*. That display will now show the percent valve open at the Day Outdoor Set Point. Simply rotate the knob underneath the display until the desired percentage is shown. When done, be sure to switch the SRC back to *RUN*.

PERCENT VALVE OPEN AT FREEZING: This is the second point of the valve curve (see pg. 1). To set the percent valve open at Freezing, switch the *RUN\PROGRAM* switch to the *PROGRAM* position while the key is in the *UNLOCK* position. Then look at the display above *SAVE (Night)*. That display will now show the percent valve open at Freezing. Simply rotate the knob underneath the display until the desired percentage is shown. When done, be sure to switch the SRC back to *RUN*.

HEAT ADJUSTMENT KNOBS: These adjust the how long the control will be in the ON part of the cycle. The length of time is based on the outdoor temperature (see chart pg. 8). There are separate knobs for the *NORMAL (Day)* and *SAVE (Night)* modes. An *A* setting will provide the least heat, and a *P* setting will provide the most heat at any given outdoor temperature.

BOOST SWITCH and MORNING BOOST KNOB: A boost period allows the building to recover from cooler night time temperatures. During the boost period, the valve will be open 10% more than with a *NORMAL* setting. If the *BOOST SWITCH* is in *MANUAL*, there is no boost period. If the *BOOST SWITCH* is in *VARI*, the control will switch from *SAVE (Night)* into *NORMAL (Day)* before the *1d* clock setting. This means the building should be up to comfortable ambient temperatures at the *1d* time. When the control will begin the boost is determined by the outdoor temperature and the *MORNING BOOST KNOB*. The higher the *BOOST* curve, the longer the boost period (see chart pg 8). The switch setting *VARI w/SHUTDOWN* should be used only in commercial buildings and allows the control to switch into *SAVE* before the last night setting.

HEATING SYSTEM SENSOR (XYZ): The heating system sensor knob determines when the *HEAT CIRCULATION* is established and when the cycle begins. The knob can perform two functions, one for boiler operation and one for district steam operation (set by the dip switch as shown on pg. 5). Typically, the district steam option is used whenever constant header pressure is maintained by the boiler or when using steam from a central plant. The settings are described below:

BOILER OPERATION: The *XYZ* knob is a temperature setting from 70°F to 250°F. When the temperature of the heating system sensor (attached to terminals CC) rises above the temperature set on the *XYZ* knob, the control is satisfied that steam has gotten through the entire distribution system. When this occurs, the green *HEAT CIRCULATION ESTABLISHED* and the yellow *SYSTEM IN CYCLE* light will come on. The green light will stay on until the heating system sensor falls through a fixed 25°F differential.

DISTRICT STEAM: The *XYZ* knob becomes a time delay from 0 to 30 minutes. A sticker (HT #058371) is provided to show the district steam values (instead of *XYZ*). When a cycle is completed, the control will begin counting down the time delay. Once the time delay has concluded, the green *HEAT CIRCULATION ESTABLISHED* and the yellow *SYSTEM IN CYCLE* light will come on.

OFF CYCLE CLOSURE: This knob determines how much the valve will close during the OFF part of the cycle. If the knob is fully counter-clockwise, the valve will remain in the same position during both the ON and the OFF part of the cycle. If the knob is in the center (50%) position, the valve will close halfway (or 50%) during the OFF part of the cycle. For example, if the valve were open to 60% during the ON part of the cycle, then the valve would be open to 30% during the OFF part of the cycle. If the knob is turned fully clockwise, the valve will be fully closed during the OFF part of the cycle. The knob is linear, and can be set to any value from 0 to 100%.

PULSE DELAY: This knob controls the amount of time between valve movements. The valve will pulse open (and can be selected to pulse closed see below) in 10 second intervals. Then the SRC will wait from 0 to 60 seconds as set on the *PULSE DELAY* knob before moving the valve again. The valve will continue to pulse and wait until the valve has been positioned in the appropriate position based on the outdoor temperature and the *VALVE CURVE*.

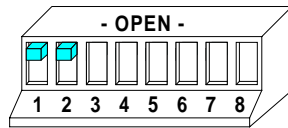
CLOSE PULSE: It may not be necessary to pulse the valve closed. If it is not, simply switch the *CLOSE PULSE* switch to *OFF*. The *MOTORIZED VALVE CLOSE* relay will then stay energized when the valve is to be shut. If the *CLOSE PULSE* switch is *ON*, the *MOTORIZED VALVE CLOSE* relay will pulse the valve closed for ten seconds. Then the relay will de-energize for the time period set by *PULSE DELAY*. This will continue until the valve is in the correct position.

MOTOR TIME: The SRC can work with any floating type valve motor but it must know how long it will take to fully open the valve from the fully closed position. The motor time is set by the dip switch located behind the front panel.

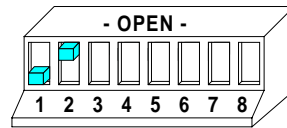
DIP SWITCH CHART

For proper operation, the dip switches must be set properly. The dip switches control the length of a cycle, whether the control operates a boiler or in a district steam mode, and the motor time. The dip switch is located behind the panel on the CPU board next to the coin type battery.

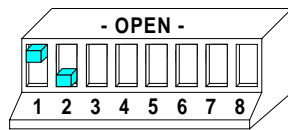
Cycle Time



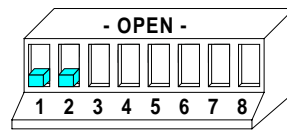
60 Minute Cycle



20 Minute Cycle

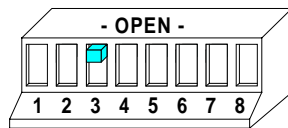


30 Minute Cycle

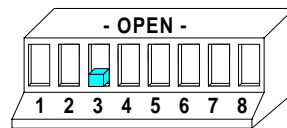


90 Minute Cycle

Boiler/District Steam

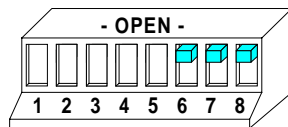


Boiler

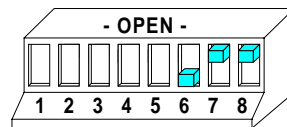


District Steam

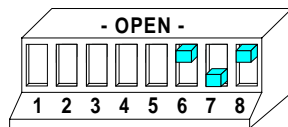
Motor Time



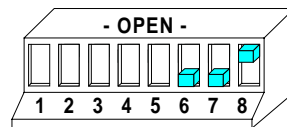
6 Minute Motor



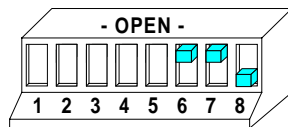
5 Minute Motor



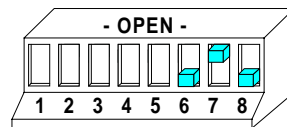
4 Minute Motor



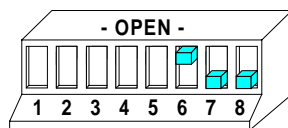
3 Minute Motor



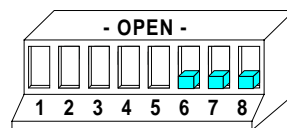
2.5 Minute Motor



2 Minute Motor



1.5 Minute Motor



1 Minute Motor

READING AND INTERPRETING THE DISPLAYS

CURRENT STATUS INDICATORS

HEAT SOURCE ACTIVATED (Red Light) - This indicator light is lit during two periods. The first is while the SRC is establishing heat. Once heat has been established, the red indicator light continues to be lit during the ON part of the cycle. If the SRC is in the OFF part of the cycle, or the SRC is not calling for heat (because it is warm outside or because the *WINTER/SUMMER* switch is in *SUMMER*) then the red light will be off.

HEAT CIRCULATION ESTABLISHED (Green Light) - This indicator light can have different meanings, depending on whether the SRC is controlling a boiler, or is using district steam (see dip switch as shown on pg. 5).

BOILER OPERATION - The green indicator will be on whenever the heating system sensor (attached to terminals CC) registers that the pipes are warm. There is a built in 25°F differential. For example, with the XYZ knob (see pg. 4) set at 140°F, the green indicator light will come on when the heating system sensor reaches 140°F. The light will stay on until the sensor temperature falls below 115°F.

DISTRICT STEAM OPERATION - The green indicator will come on after the control has waited the period of time set by the XYZ knob (see pg. 4). The indicator will stay on until the cycle is completed.

SYSTEM IN CYCLE (Yellow Light) - This indicator light shows the system is in cycle. The SRC will begin a cycle as soon as the *HEAT CIRCULATION ESTABLISHED* is registered. The length of the cycle is set by the dip switches (see pg. 5). During the ON part of the cycle, the red *HEAT SOURCE ACTIVATED* indicator will be lit. During the OFF part of the cycle, the red *HEAT SOURCE ACTIVATED* light will be off.

CLOCK DISPLAY

START-UP - When the control is first powered up, the display will show a six minute countdown. During this time, the *MOTORIZED VALVE CLOSE* relay will be energized. This is to be sure the valve is in the fully closed position on a start-up. If you know the valve is fully closed, you can speed through the countdown by pushing the *FAST CYCLE FOR TESTING BUTTON*.

RUN/PROGRAM switch in the *RUN* position - The clock will show the present time. To set the clock, first put the *PROGRAM LOCK* key to the *UNLOCK* position. Then push the *HOURS*, *MINUTES*, and *DAY* buttons until the correct time and day are shown. Be sure the *AM* and *PM* lights below the time are correct. If the present time is 1:00pm, the red indicator above *PM* should be lit. If the *AM* indicator is lit, you must advance the *HOURS* button 12 times (or just hold it down for auto increment) to get the correct time.

RUN/PROGRAM switch in the *PROGRAM* position - The clock will show your *NORMAL (Day)* and *SAVE (Night)* settings. The small display to the left of the time should show *1d*, *1n*, up to *4d* or *4n*. The small *ds* stand for the *NORMAL (Day)* settings, and the small *ns* for *SAVE (Night)* settings. To change the settings, push the *HOURS*, *MINUTES*, and *DAY* buttons as described above. It is important to remember that any boost comes before the *1d* setting, so make sure that is the first *NORMAL (Day)* setting for each day.

% VALVE OPEN DISPLAY

When the *RUN/PROGRAM* switch is in *RUN* the display will show the percent the valve is presently opened. This will change as the valve itself is moving. This small display also may indicate any of the following:

Ten Minute Countdown - When the outdoor temperature falls below the *OUTDOOR SENSOR SET POINT*, or when the control is switched from *SUMMER* into *WINTER* and there is a need for heat, the *VACUUM PUMP*, *BURNER*, and *MOTORIZED VALVE CLOSE* relays will energize for ten minutes to prepare the system for heating. During this period, the small display will show a time from 10.0 minutes down to 0.0 minutes. The timer will count down in six second intervals. To quickly count down this time period, push the *FAST CYCLE FOR TESTING* button.

Pressing the *OUTDOOR TEMP* button - While this button is pressed, the display will show the outdoor temperature. If the display shows *OPN*, the control does not see a sensor across *TT*. If the display shows *SHT*, the control sees a short across the *TT* terminals. Otherwise, the display should register the correct outdoor temperature.

Pressing the *HEATING SYSTEM SENSOR* button - While this button is pressed, the display will show the temperature at the heating system sensor location. If the display shows *OPN*, the control does not see a sensor across *CC*. (This will be the normal reading if using the district steam option.) If the display shows *SHT*, the control sees a short across the *CC* terminals. Otherwise, the display should register the temperature of the pipe where the heating system sensor is located.

Pressing the *FAST CYCLE FOR TESTING BUTTON* - This will show how many minutes the control is into a cycle. If the yellow indicator light *SYSTEM IN CYCLE* is not lit, the display will show *00* since the control is not in cycle. If the yellow indicator is lit, pushing the button will show from 0 to 90 minutes of a cycle (depending on how long a cycle was selected by the dip switch). Keeping the button pressed will cause the *SRC* to go through the cycle quickly for testing or troubleshooting purposes.

Reading the value of the *XYZ* knob - To do this, first switch the *RUN/PROGRAM* switch to *PROGRAM*. Then push the button *OUTDOOR TEMP*. The display will change to show the value of the *XYZ* knob (either temperature or time depending on whether the district steam option was selected). As the knob is rotated, you will see the display change. Set the desired point on the knob, and then be sure to switch the *RUN/PROGRAM* switch back to *RUN*.

Reading the value of the *PULSE DELAY* knob - To do this, first switch the *RUN/PROGRAM* switch to *PROGRAM*. Then push the button *HEATING SYSTEM SENSOR*. The display will change to show the value of the *PULSE DELAY* knob in seconds. As the knob is rotated, you will see the display change. Set the desired time on the knob, and then be sure to switch the *RUN/PROGRAM* switch back to *RUN*.

Reading the value of the *OFF CYCLE* knob - To do this, first switch the *RUN/PROGRAM* switch to *PROGRAM*. Then push the button *FAST CYCLE FOR TESTING*. The display will change to show the value of the *OFF CYCLE* knob as a percent from no closure to fully closed. As the knob is rotated, you will see the display change. Set the desired point on the knob, and then be sure to switch the *RUN/PROGRAM* switch back to *RUN*.

LIMITED ONE YEAR WARRANTY

This Heat-Timer device was thoroughly tested for defects and workmanship before leaving our factory. We do warrant the equipment to be free of defects under normal use for a period of one year from the date of installation. Transportation charges for factory repairs must be prepaid. Damage to the Heat-Timer device or any of its components due to misuse, abuse, improper installation, or caused by power failures, fire, flood, or lightning are not covered by this warranty. The company assumes no liability for indirect or consequential damages of any nature. This Heat-Timer warranty applies only to the original purchaser/user, is not assignable or transferable, and does not cover damage to the device occurring in shipment. Any service, repairs, modifications or alterations to the unit not expressly authorized by the company will invalidate the warranty. This warranty is in lieu of all other warranties expressed or implied.

For Technical Support or
Additional Product Information Contact:

Heat-Timer Corporation
20 New Dutch Lane Place
Fairfield, NJ 07004

Phone (973) 575-4004 Fax (973) 575 -4052
Internet <http://www.heat-timer.com>

HT #059163 REV A

CYCLE CHART

The duration of the ON part of the cycle varies with the outside temperature, the *HEAT ADJUSTMENT* setting, and the *OUTDOOR SENSOR SET POINT* as shown below. This chart is based on a sixty minute cycle. For a 30 minute cycle, the ON time would be cut in half. For a 20 minute cycle, the ON time would be a third of what shown. For a 90 minute cycle, the ON part would last for 1.5 times the value shown.

Outdoor Sensor Set Point Minus Outdoor Temperature

	Outdoor Sensor Set Point Minus Outdoor Temperature																				
	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	1	
A	45	41	37	33	29	25	22	18	15	13	10	8	5	3	2	0	0	0	0	0	
B	57	51	46	41	37	33	28	25	21	18	15	12	9	7	5	3	1	0	0	0	
C	C	C	59	54	48	43	38	33	29	25	21	18	15	12	9	7	5	3	1	0	0
D	C	C	C	C	55	49	43	38	34	29	25	21	17	14	11	9	6	4	2	1	0
E	C	C	C	C	C	55	49	43	38	33	28	24	20	17	13	10	8	6	4	2	1
F	C	C	C	C	C	C	55	49	43	37	32	27	23	19	15	12	9	7	5	3	2
G	C	C	C	C	C	C	C	54	48	42	36	31	26	22	18	14	11	8	6	4	3
H	C	C	C	C	C	C	C	C	53	47	40	35	29	25	20	16	13	10	7	5	4
I	C	C	C	C	C	C	C	C	59	52	45	39	33	27	23	18	15	11	9	6	5
J	C	C	C	C	C	C	C	C	C	58	50	43	37	31	25	21	16	13	10	7	6
K	C	C	C	C	C	C	C	C	C	C	56	48	41	34	28	23	19	15	11	8	7
L	C	C	C	C	C	C	C	C	C	C	C	53	45	38	32	26	21	16	13	9	7
M	C	C	C	C	C	C	C	C	C	C	C	59	51	43	35	29	23	18	14	11	8
N	C	C	C	C	C	C	C	C	C	C	C	C	56	47	39	32	26	20	16	12	9
O	C	C	C	C	C	C	C	C	C	C	C	C	C	53	44	36	29	23	17	13	10
P	C	C	C	C	C	C	C	C	C	C	C	C	C	59	49	40	32	25	19	15	12

Minutes ON (60 Minute Cycle)

VARI-BOOST CHART

The *BOOST* will start as many minutes before the *Id* setting as shown below. The duration of the boost will depend on the outside temperature and the *VARI-BOOST* knob setting.

