ERV-24

Technician Settings & Operating Manual

Protected by one or more of the following patents:
US 5,547,017; 5,881,806; 6,431,268; CA 2,245,135

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Introduction

General

The ERV-24-HC11 thermostat with FanCycler® has enhanced features to compliment controlled mechanical ventilation systems.

These features were configured for use by your installing technician.

(For more information please refer to the technician manual or visit www.scillc.com and www.fancycler.com).

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Introduction

Fan Cycling

The purpose of fan-cycling is to assure that the central air handler fan will run just enough to distribute ventilation air and mix the air evenly throughout the house when there is no demand for the heating or cooling operation to activate.

Rather than cycle the fan continuously, or intermittently by a timer (which doesn't consider prior operating conditions), the FanCycler method saves energy, and wear and tear on equipment by operating the fan only when necessary

3

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Introduction

Ventilation Damper Cycling

The purpose of cycling the ventilation damper is to limit the possibility of over-ventilation that would cause unnecessary space-conditioning energy to be used.

The damper will automatically close when the programmed ventilation requirement has been met.

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Options & Accessories

Remote sensor option

RS01:   For remote temperature sensing (1 required);
          for averaging temperature at 4 locations (4 required)
          – the thermostat will control on the average
          temperature of all 4 locations

RS02:   For averaging temperature at 2 locations (2 required)
          – the thermostat will control on the average
   temperature of both locations

For details on where to purchase accessories, please contact SCI for your nearest location or visit our web site at www.scillc.com
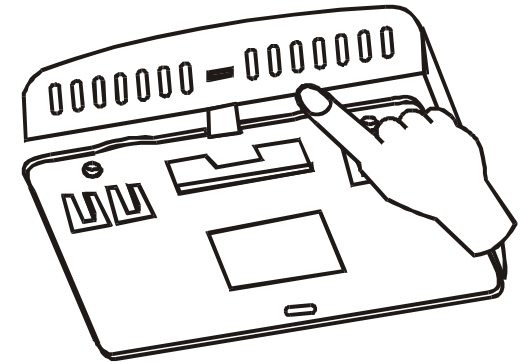
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Technician Settings ▶▶▶

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Installation

1 Separate the front panel from back panel by depressing the tongue located in the top of the unit.
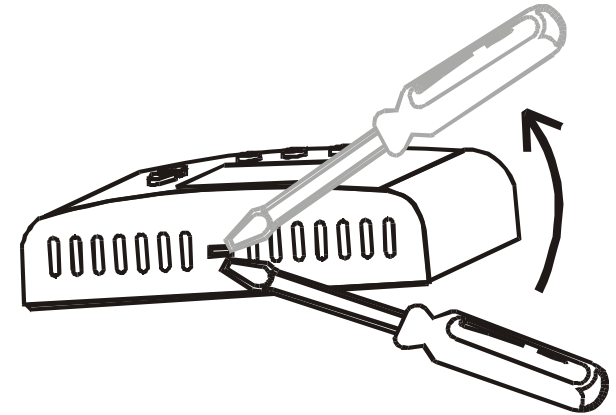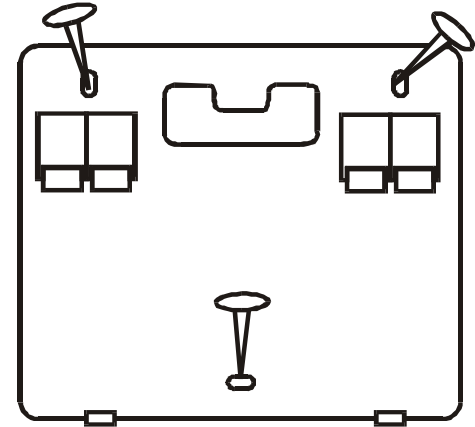

2 Pull the back panel out.

3 Make electrical connections

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Installation (Cont.)

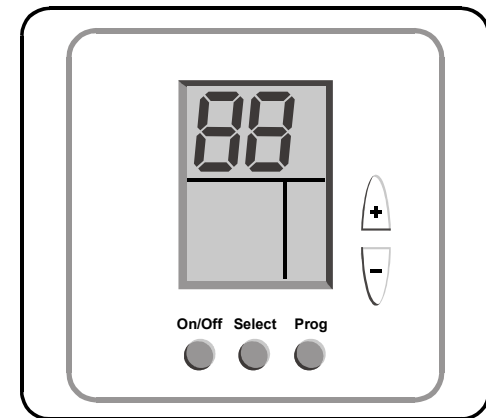**4** Line the back panel up against the wall or flat surface. Install three screws as required.

5 Install the cover to the back panel.

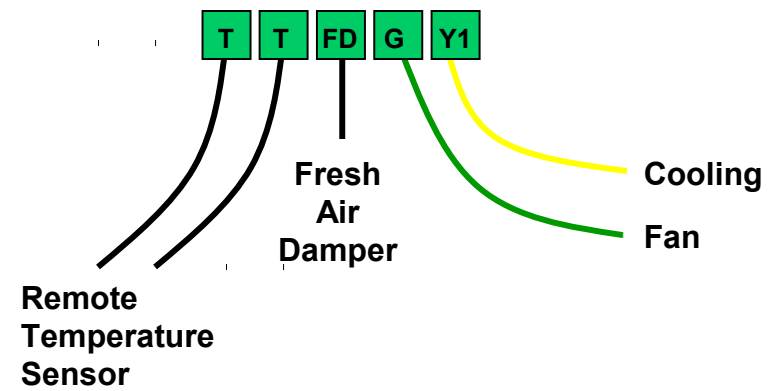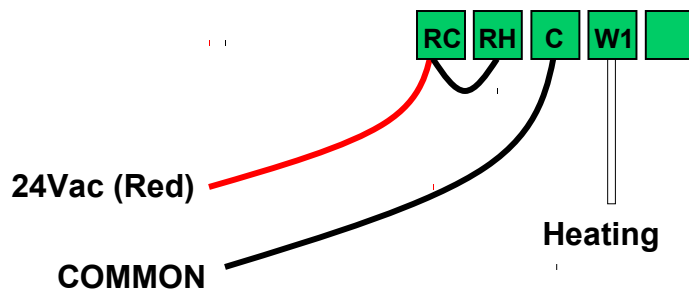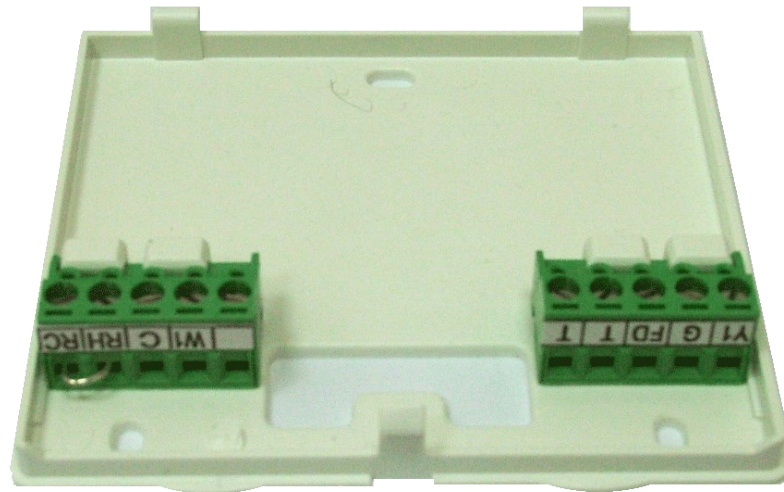First the two tabs on the bottom and then the top tongue.

6 Push until tight against the wall.

Wait for 15 seconds for the LCD display to appear (completion of power circuit charging and for self-diagnostics).

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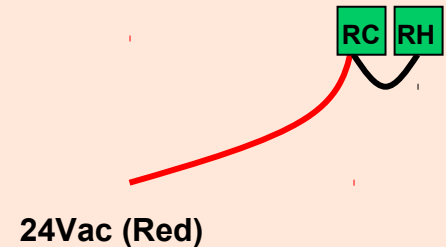Instruments, L.L.C.

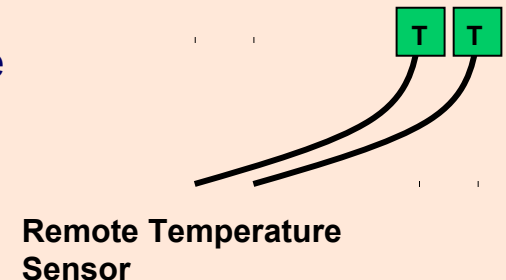# Wiring Connections

RC **RH** **C** **W1**   **T** **T** **FD** **G** **Y1**

24Vac (Red)

COMMON

Heating

Fresh Air Damper

Cooling

Fan

Remote Temperature Sensor

Wiring Connections

1 The Rc/Rh terminals are bridged at the factory.

RC **RH**

24Vac (Red)

2 "T" Terminals can be used for connection of a SCI remote sensor (Option).

T **T**

Remote Temperature Sensor

3 Fresh-Air Damper connection - 24Vac/1Amp. The damper type must be Power Open, Spring Close.

FD

Fresh Air Damper

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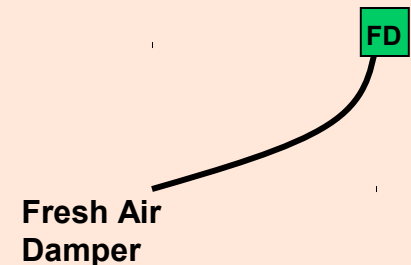
DIP switch & Jumpers

DIP Switch

JMP1

A   B

JMP2

Not in use.

Leave it shorted!

A

B

JMP10

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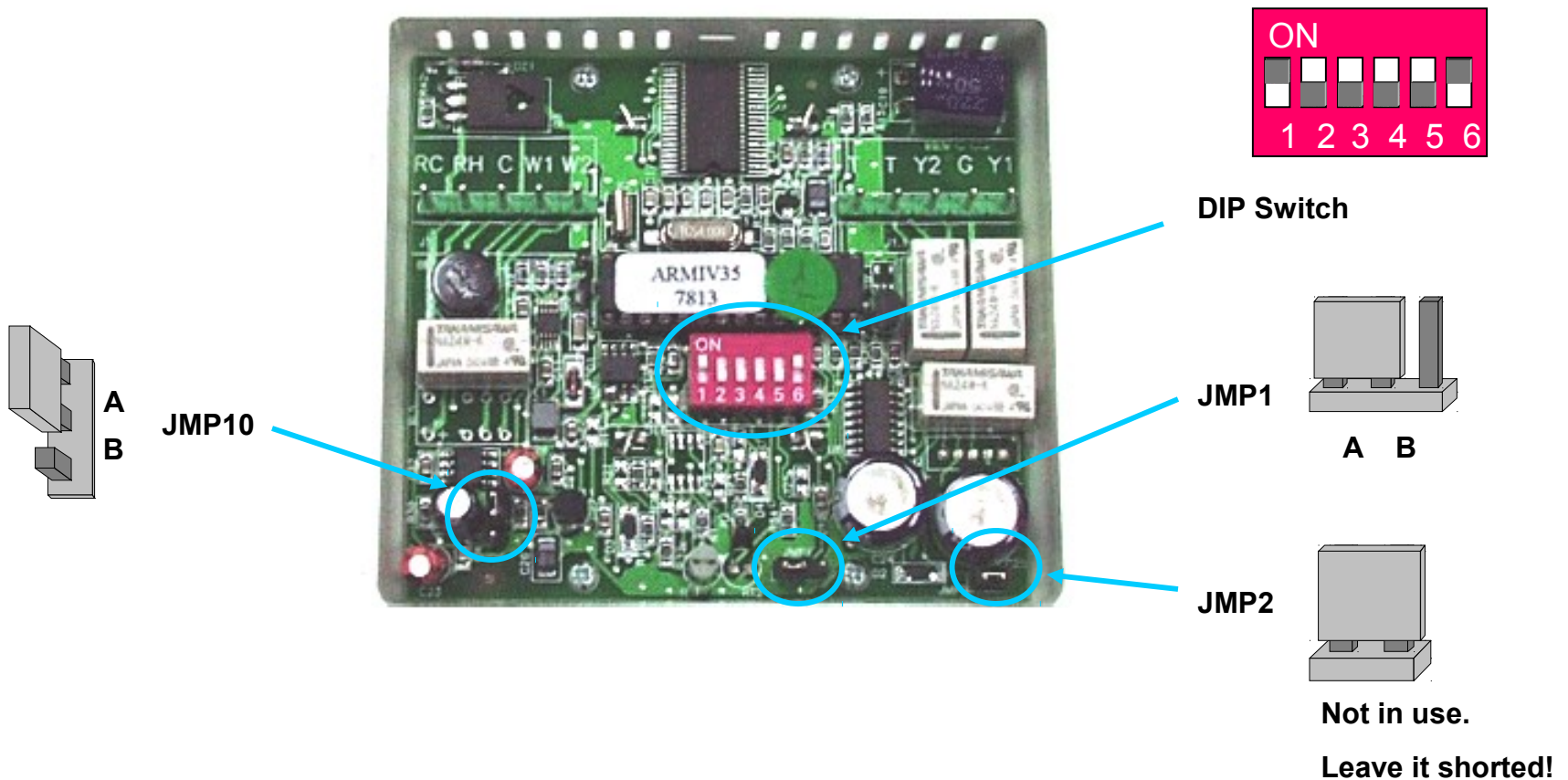
DIP switch settings

1 Internal or Remote Sensor

(Switches 1,5,6)

ON	
1	5 6
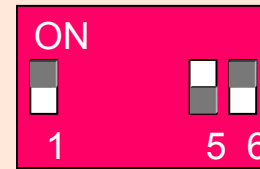
Internal Sensor (default)

ON	
1	5 6
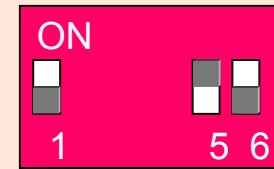
Remote Sensor

2 Programmable or Non-Programmable

(Switch 2)

ON	
2	
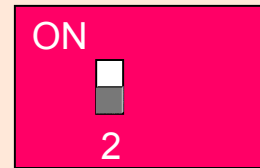
Programmable (default)

ON	
2	
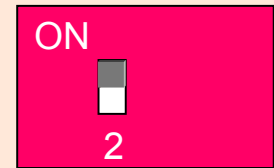
Non-Programmable

3 Fan Control Electric or Oil/Gas

(Switch 3)

ON	
3	
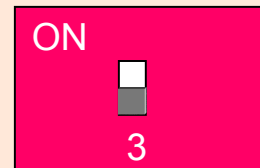
Electric (default)

ON	
3	
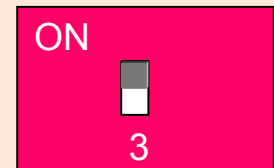
Oil/Gas

4 3 Minute delay for compressor

(Switch 4)

ON	
4	
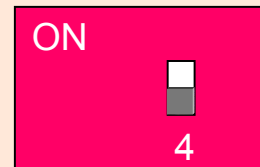
With Delay (default)

ON	
4	
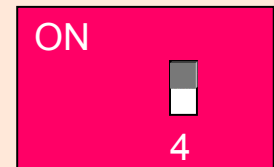
Without Delay (for test)

Jumpers settings

1

JMP1 - Complete Reset of the unit

- Move JMP1 to position B

- Wait 15 seconds

- Return JMP1 to position A

A   B
(default)   →   A   B   →   **Wait 15 seconds**   →   A   B
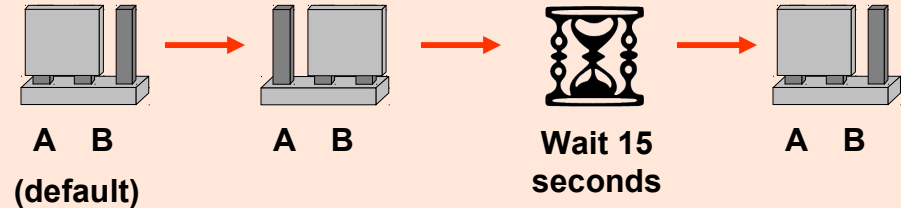
2

JMP2 - Not in Use

Leave it shorted !
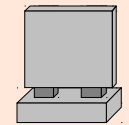
(default)

10

JMP10 - Enable or Disable
Auto change-over capability

A
B
Enable (default)

A
B
Disable

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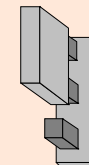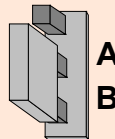
Remote Temperature Sensor

Installation Instructions

⚠ IMPORTANT ! The Remote Temperature Sensor must be from SCI.

1 Set DIP Switch configuration as shown before

2 Connect the temperature sensor leads to the T-T terminals

3 Reconnect the front half of the thermostat to the base (applies 24Vac power)

4 Verify that the displayed temperature responds to the remote sensor

📌 The wire length for the remote sensor can be up to 100 feet (30 meters) with standard thermostat cable (not less than 22 gauge)

📌 If the distance is greater than 100 feet then the wire MUST be shielded type, 20-22 gauge, twisted pair

Remote Temperature Sensor

Wiring Configurations

1 Connection of one remote sensor (RS01)

2 Connection of two remote sensors for **average measuring** (2XRS02)
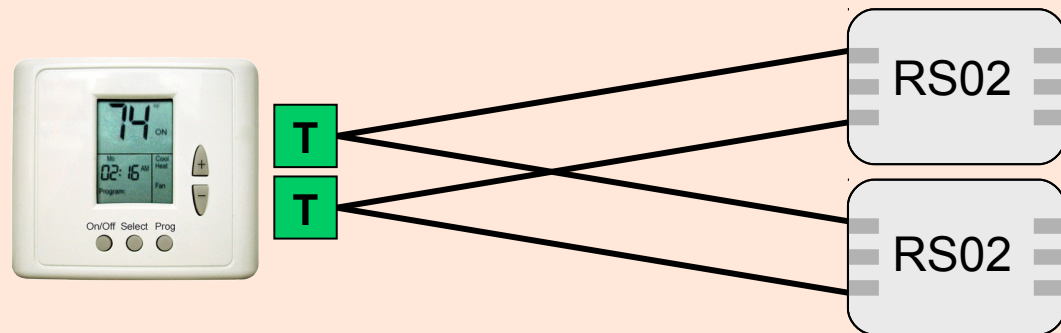
Advanced Setup

The **ERV-24-HC11 thermostat with FanCycler**® has enhanced features to compliment controlled mechanical ventilation systems and combination space and domestic hot water heating systems

1 Press and hold the On/Off button to turn the thermostat off

2 Using the "+" or "-" buttons, set the temperature to 50

3 Wait until display stop flashing

4 Press and hold the Select button until the display changes, entering Advanced Setup
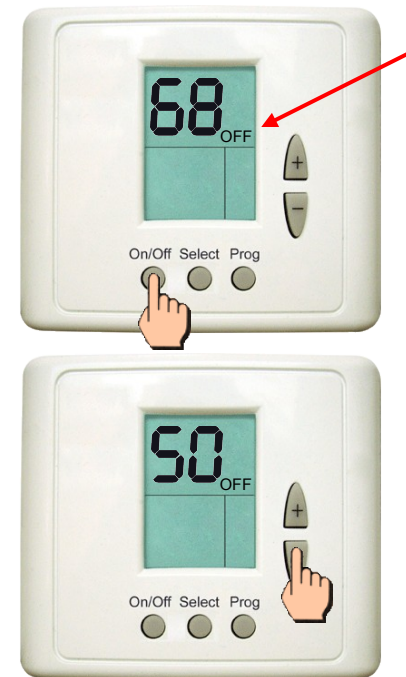
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Fan Cycling Configuration

The purpose of fan cycling is to assure that the central air handler fan will run enough to distribute ventilation air and evenly mix air throughout the house, even when there is no demand for heating or cooling.

Rather than operate the fan continuously or by a simple timer that doesn't consider prior operation, the FanCycler method saves energy and wear and tear on equipment by only operating the fan if it hasn't already operated enough.

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Fan Cycling Configuration

You can set this up in either of two ways:

A *Set the fan cycling ON time and OFF time*

B *Set the fan duty cycle percentage and the total period*

OR

For example, setting a fan cycling ON time of 10 and a fan cycling OFF time of 20 will cause the fan to operate for 10 minutes if it has not operated for 20 minutes.

Or, setting the fan duty cycle for 33 percent and the total period for 30 minutes will cause the fan to operate for at least 10 minutes out of every 30 minutes.

(Using the duty cycle method, the thermostat will skip turning the fan on if the time would be less than 2 minutes). The results are similar, but you can choose the path.

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Fan Cycling Configuration

A - fan cycling ON time and OFF time

A

1 Press and hold the Select button until "LI" or "UnLI" or "CALC" appears on display.
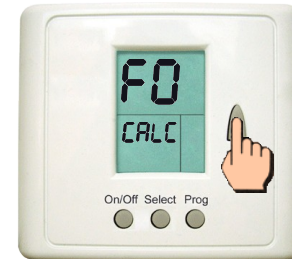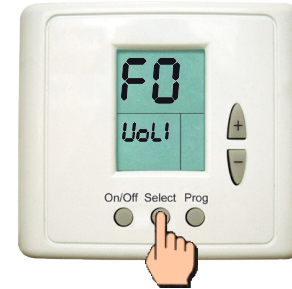
2 Using the "+" or "-" buttons, choose between:

✿ **"LI"** Fan cycling limited (default)

✿ **"UnLI"** Fan cycling unlimited ON time

Fan will be energized continuously after no fan activity for the fan OFF time

✿ **"CALC"** Fan cycling calculated.

Fan cycling times will be calculated based on the fan duty cycle ("Fd") and total period ("Ft")

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Fan Cycling Configuration

A - fan cycling ON time and OFF time (cont.)

A

3 Press the Select button again – four digits will appear on display

4 Using the "+" or "-" buttons adjust the **fan cycling limited ON time**
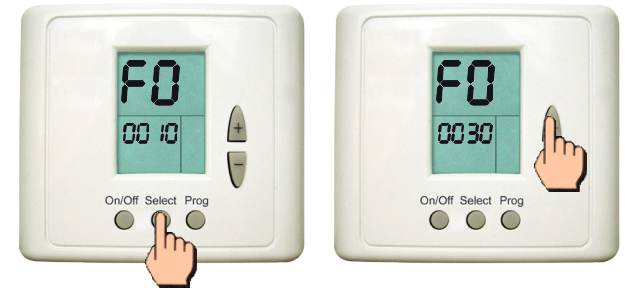
The number represents the number of minutes the fan will be energized after no fan activity for the fan OFF time.

A value of 0 disables this option.

Range 0-480 minutes - Default 10 minutes

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Fan Cycling Configuration

A - fan cycling ON time and OFF time (cont.)

A

5 Press the Select button again – "FF" will appear on display

6 Using the "+" or "-" buttons adjust the **fan cycling limited OFF time**

FF
0020
On/Off Select Prog

FF
0053
On/Off Select Prog
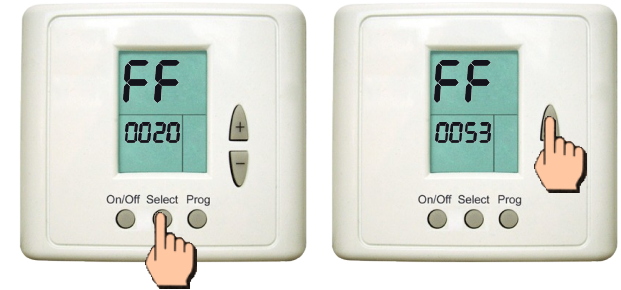
The number represents the number of minutes the fan will be off before energizing the fan again.

Range 1-480 minutes – Default 20 minutes.

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Fan Cycling Configuration

B - fan duty cycle percentage and the total period

B

1 Repeat steps 1 and 2 in "Set the fan cycling ON time and OFF time"

Select "CALC" – Fan cycle calculated
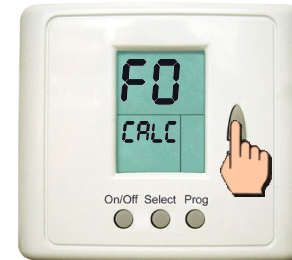
2 Using the "+" or "-" buttons adjust the **fan duty cycle**
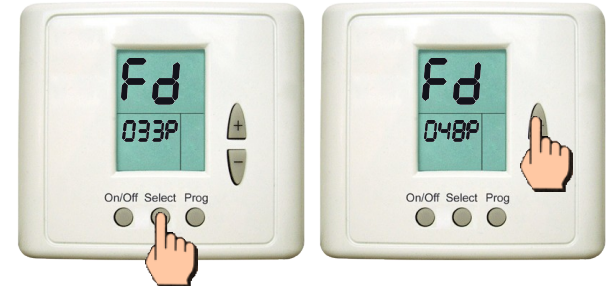
The Number is the percent of time fan will be energized during each total period

(Period – "Ft" - will be set later)

0 disables this option

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Fan Cycling Configuration

B - fan duty cycle percentage and the total period (cont.)

B

3 Press the Select button again – "Ft" will appear on display

4 Using the "+" or "-" buttons adjust the **total period**
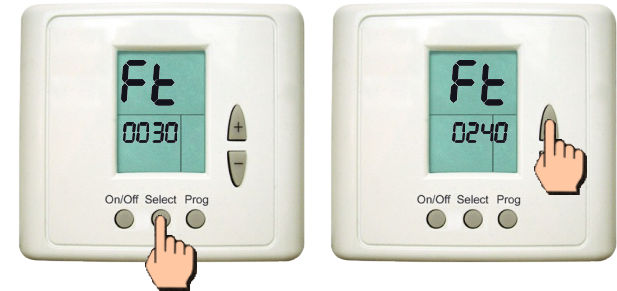
The The Number is the time period that the fan duty cycle pertains to.

Range 0-1440 minutes – Default 30 minutes

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Ventilation Damper Cycling

The purpose of cycling the ventilation damper is to limit the possibility of over-ventilating, which could cause unnecessary space conditioning energy to be used.

The damper will open when the fan comes on, but if the fan stays on longer than needed for the introduction of ventilation air, the damper will automatically close and open, allowing just the right amount of ventilation.

The damper OPEN and CLOSED will be set later.

However, if "CALC" was selected there is no need to set the damper OPEN and CLOSED times, and damper cycling times will be automatically calculated according to the fan duty cycle and total period ("Fd" and "Ft")

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Ventilation Damper Cycling

Set the damper cycling OPEN time

1 Press the Select button until "dO" appears on display

2 Using the "+" or "-" buttons adjust the **damper cycling OPEN time**
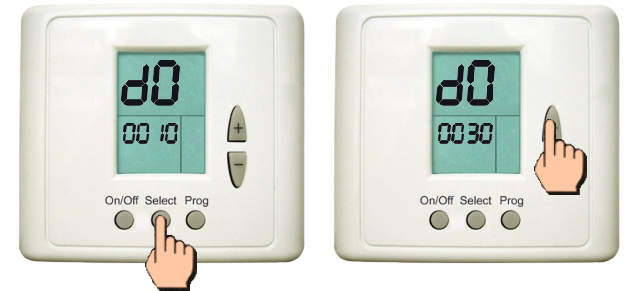
The number is the maximum minutes the ventilation damper will be open each time the fan is energized.

0 disables damper cycling – meaning the damper will never open.

Range 0-480 minutes – Default 10 minutes.

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Ventilation Damper Cycling

Set the damper cycling CLOSE time

3 Press the Select button until "dC" appears on display

4 Using the "+" or "-" buttons adjust the **damper cycling CLOSE time**
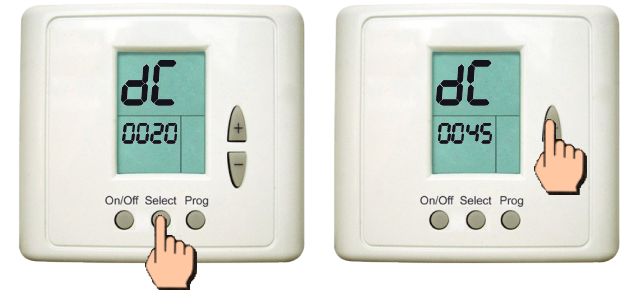
The number is the minutes the ventilation damper will be closed after the damper had been open and the fan is still operating for any reason.

Range 1-480 minutes – Default 20 minutes.

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Fan over-run after cooling status

The purpose of not allowing the fan to operate immediately after a cooling operation is to reduce moisture re-evaporation from the cooling coil back into the living space.

For climates where the cooling coil generally remains dry, this option can be turned ON to cause the fan to operate for an additional 60 seconds after a cooling operation to get more cooling effect.

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Fan over-run after cooling status

Set fan over-run after cooling status

1 Press the Select button until "FC" appears on display

2 Using the "+" and "-" buttons adjust the fan over-run after cooling status – select ON or OFF
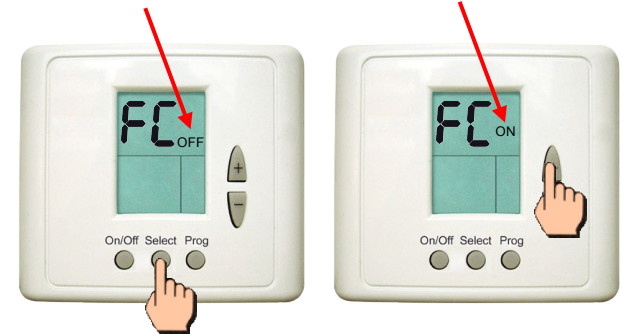
ON causes the fan to continue to run for 60 sec after a cooling operation has ended.

Default – OFF

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Fan cycling at night while in heating mode

General

Depending on the duct system design and the occupants, it may be desirable to not allow fan cycling at night during the heating season.

If this option is turned OFF fan cycling will be disabled between the hours of 9 pm and 8 am while the thermostat system mode is HEAT .

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Fan cycling at night in heating mode status

Set Fan cycling at night in heating mode status

1 Press the Select button until "Fn" appears on display

2 Using the "+" and "-" buttons adjust the fan cycling at night in heating mode status – select ON or OFF
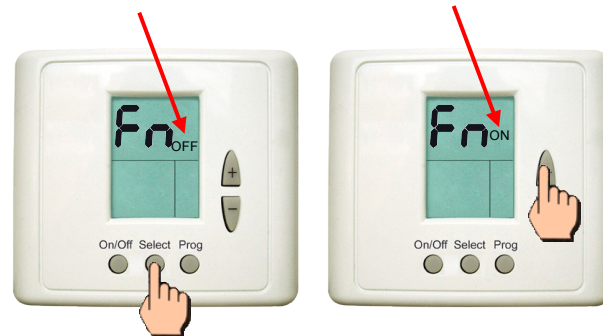
OFF causes fan cycling to be inactive between the hours of 9 pm and 8 am while the system mode is HEAT.

Default – ON

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Pump cycling for combination space and domestic hot water heating systems

General

As building enclosures become more energy efficient and heating loads are small, a single hot water heater can often supply hot water for both domestic use and space heating.

This type of heating system is especially popular in multi-family housing.

For such systems, this option can be turned ON to avoid potential microbial buildup in the space heating plumbing loop during periods of inactivity.

This feature assures that the heating circulator operates for at least one minute out of every 24 hours.

Pump cycling for combination space and domestic hot water heating systems

Set Pump status

1 Press the Select button until "FE" appears on display

2 Using the "+" and "-" buttons adjust the pump status – select ON or OFF

3 Press the Select button again to return to normal display mode
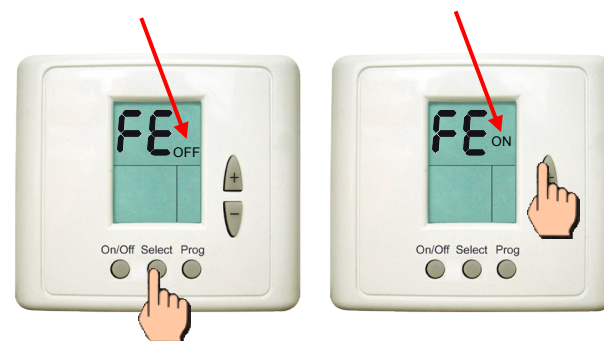
ON causes the circulator pump (W terminal) to be energized for 1 minute if it has not been energized for 24 hours.

Default - OFF

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Data storage for system diagnostics

The following data is stored by the thermostat to allow advanced system diagnostics:

✴ Average cooling set-point while cooling is active ("SC")

✴ Average heating set-point while heating is active ("SH")

✴ Average number of cooling cycles per day while in cooling mode ("CC")

✴ Average number of heating cycles per day while in heating mode ("CH")

✴ Average length of cooling cycle in minutes ("LC")

✴ Average length of heating cycle in minutes ("LH")

These values are cumulative from the time the thermostat is placed into service

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Data storage for system diagnostics

Access the stored values

1 Press and hold (6 seconds) the On/Off button to set the system mode to OFF

2 Using the "+" and "-" buttons set the temperature set-point to 55°F

3 When the display stops flashing, press and hold the Select button

4 Use the Select button to advance through the steps

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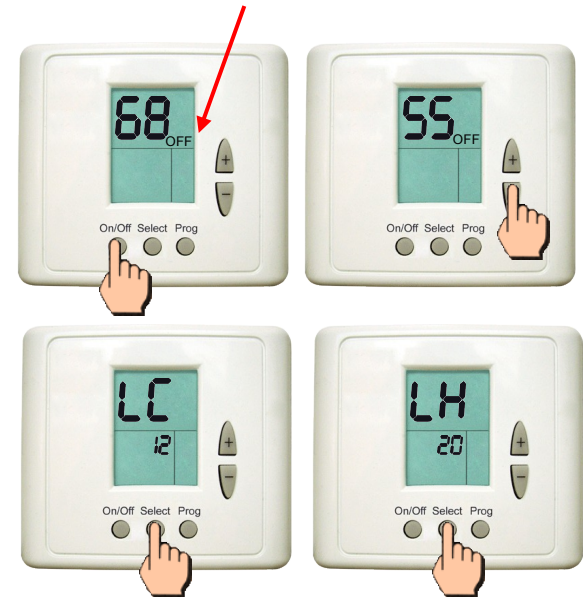
Data storage for system diagnostics

Clear average values

1 Press and hold (6 seconds) the On/Off button to set the system mode to OFF

2 Using the "+" and "-" buttons set the temperature set-point to 90°F

3 When the display stops flashing, press and hold (8 seconds) the Select button until "Unlo" disappears from the display
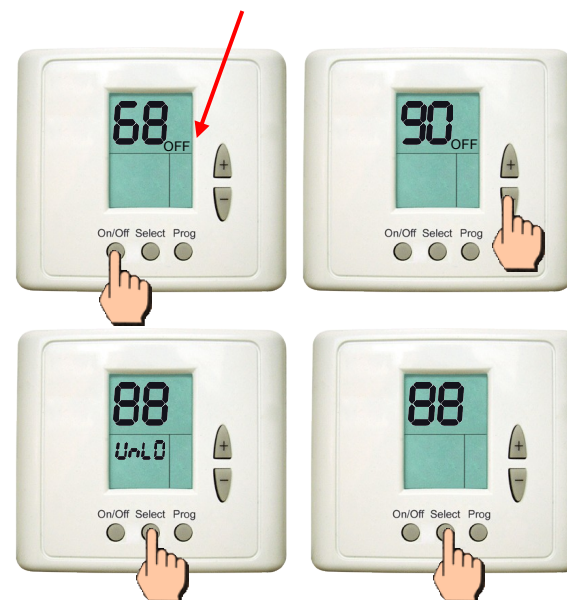
Lock the thermostat's buttons

Lock the thermostat's buttons to prevent any unwanted changes made by any unauthorized person.

1   Press and hold the On/Off button to turn the thermostat ON

2   Press and hold (25 seconds) the Select button until "LOC" appears on display

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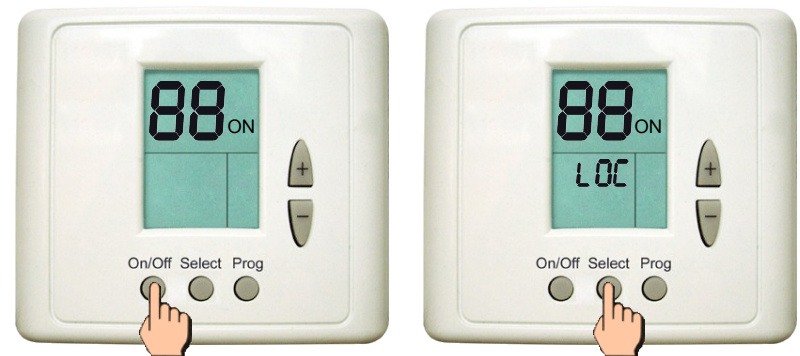
Unlock the thermostat's buttons

1 Press and hold (25 seconds) the Select button until "UnLO" appears on display

2 Press the Select button 2 more times to return to normal display mode

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Offset settings

The Offset is used for field calibration of the measured temperature if necessary

1 Press and hold (6 seconds) the On/Off button to turn the thermostat OFF

2 Using the "+" and "-" buttons set the temperature set-point to 60°F, and wait until the display stops flashing

3 Press and hold the Select button (10 sec.) until "OFFS" and the Offset number (a number between –6…+6) will appear (not flashing) on the display

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Offset settings

4 Change the Offset for ambient temperature using the "+" and "-" buttons

5 Press the Select button again to return to normal display mode

The default offset is "0"

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Troubleshooting for technician

Problem

The display is blank

Solution

Check the thermostat for 24 VAC,

remove the front cover and test between Rc/Rh to C

Check for good wiring connections at:

Rh (24 VAC for heat), Rc (24 VAC for cool), C (common)

If you are using one transformer for cool and heat, check that the jumper is installed between Rc and Rh.

Check that all screws terminals are tight

Troubleshooting for technician

Problem	Solution
Cool does not switch on	Check the Rc connection
	Check the Y1 connection
Heat does not switch on	Check the Rh connection
	Check the W1 connection
In heat mode, unit blows cool air	Check the Auto Fan settings. The unit may be set to FAN (shown in the display)

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Troubleshooting for technician

Problem	Solution
The unit displays low temperature (32°F) all the time	The unit is not sensing the remote sensor
The unit displays high temperature (92°F) all the time	The unit is has a short circuit in the remote sensor
The display shows the word "PROGRAM" without the name of the program period (wake, sleep, etc)	The unit is in Override mode because the temperature set-point was manually adjusted. The name of the program period will reappear when the next program period starts

Troubleshooting for technician

Problem

Solution

The word "FAN" flashes without Heat or Cool

This does not indicate a fault. It indicates that fan cycling is active for ventilation and whole-house comfort mixing

Displayed ambient temperature is not accurate

Adjust the offset

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User
Manual ▶▶▶

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On/Off Button

Turn the thermostat On or Off

1 Press the On/Off button to activate the thermostat - The word "ON" will appear in the display next to the measured temperature.

2 **Press and hold** (4 sec) the On/Off button to deactivate the thermostat - The word "OFF" will appear in the display.

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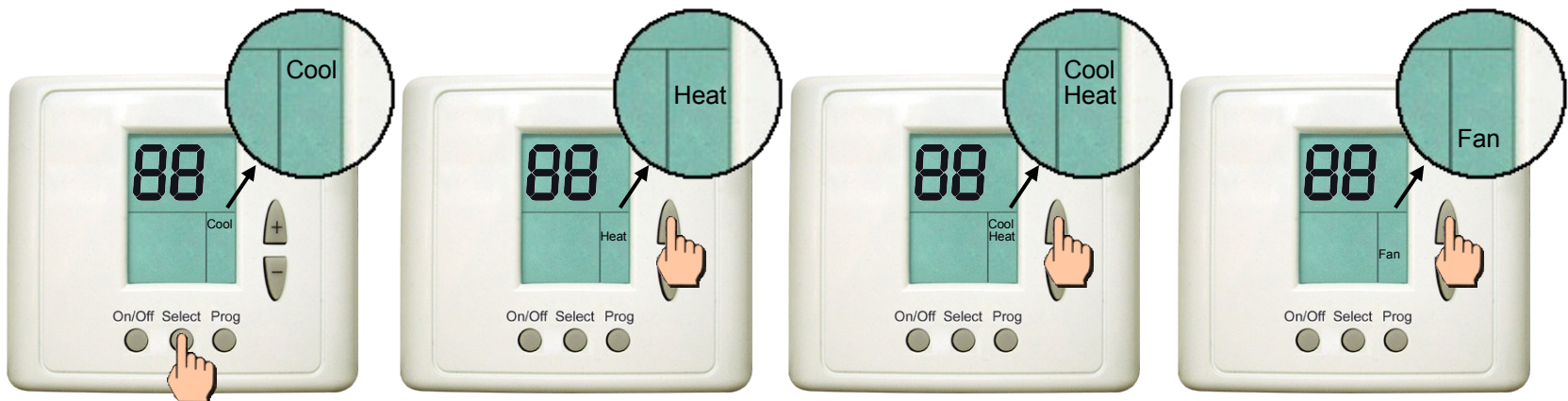
Select Button

Change system mode

1 Press the Select button once.

2 Use the (+) or (-) buttons to switch between modes:

- **Cool**   **Cool/Heat (Auto change-over)**
- **Heat**   **Fan**

Select Button

3 Press the Select button again.

4 Use the (+) or (-) buttons to switch between modes:

- **Fan** - The fan will work continuously

  - **Auto Fan** - The fan will work depending on cooling or heating demand

5 Press the Select button again to return to normal display mode.
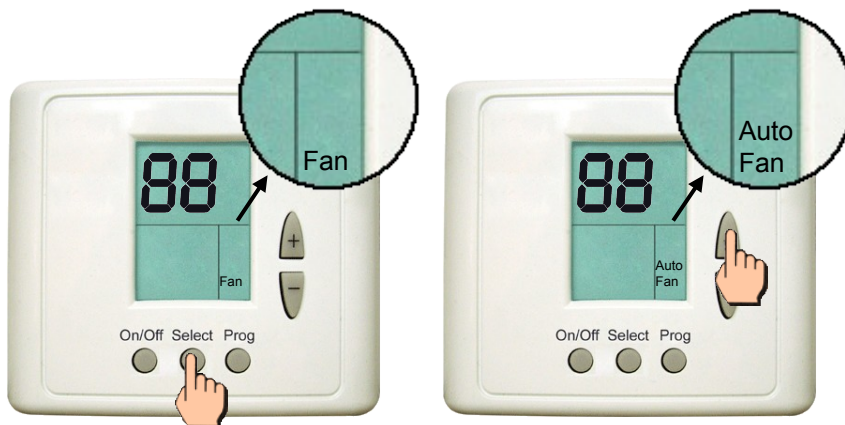
The unit will automatically return to normal display mode when no changes are made within 30 seconds

Systems
Controls &
Instruments, L.L.C.

Temperature set-point

In cool mode

1 Press the (+) or (-) buttons the temperature will flash and "COOL" and "SET" will appear on display

2 Change the cooling set-point temperature using the (+) or (-) buttons

3 Press the Select button or wait to return to normal display mode

The unit will automatically return to normal display mode when no changes are made within 30 seconds

Systems Controls & Instruments, L.L.C.

Temperature set-point

In heat mode

1 Press the (+) or (-) buttons the temperature will flash and "HEAT" and "SET" will appear on display

2 Change the heating set-point temperature using the (+) or (-) buttons

3 Press the Select button or wait to return to normal display mode

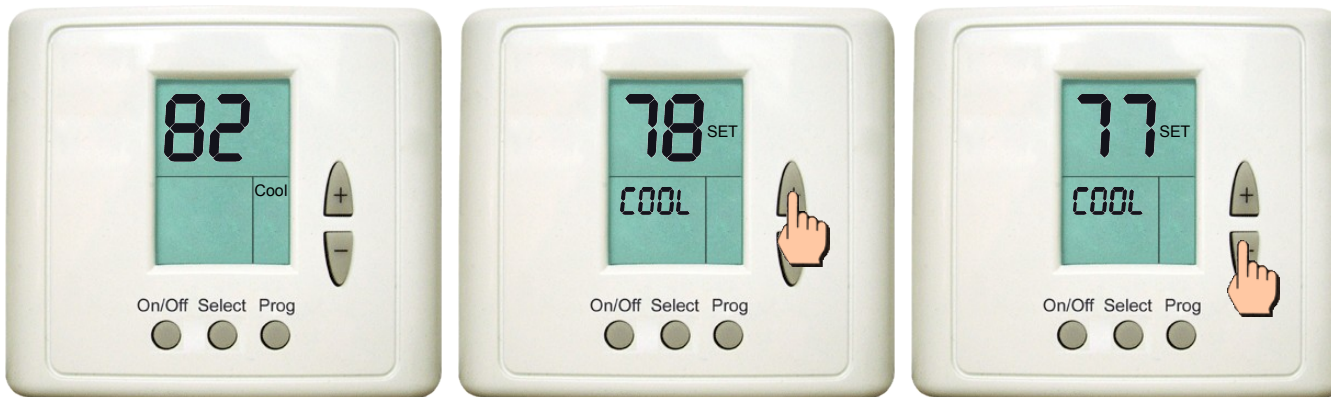The unit will automatically return to normal display mode when no changes are made within 30 seconds

Systems Controls & Instruments, L.L.C.

Temperature set-point

In auto-change mode (cool/heat)

1 Set the cooling set-point the same way as in cool mode

2 Press the Select button

3 Set the heating set-point the same way as in heat mode

4 Press the Select button or wait to return to normal mode

The thermostat keeps a minimum differential of at least 1 degree between the Heat set-point and the Cool set-point, with Heat always being less than Cool.

Systems Controls & Instruments, L.L.C.

Lock/Unlock the Buttons

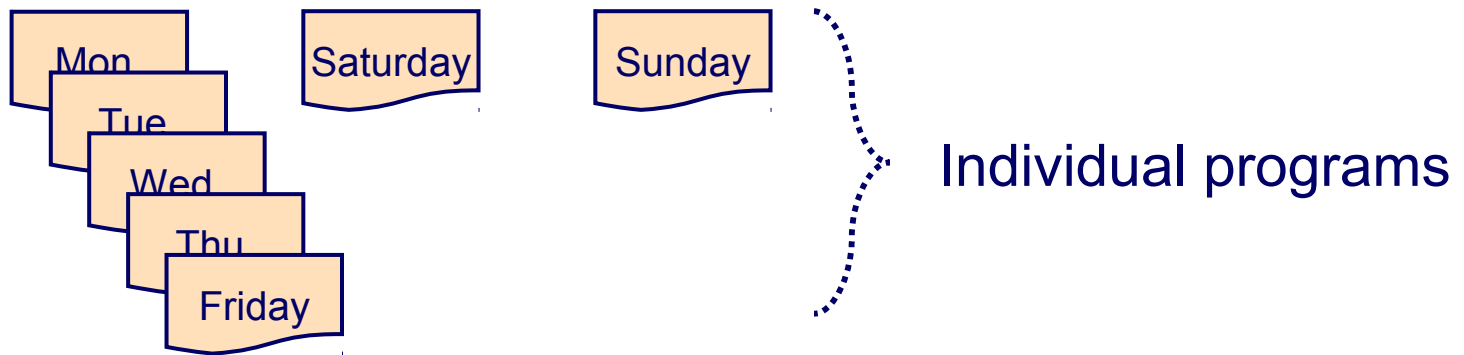Lock the thermostat's buttons to prevent any unwanted changes made by any unauthorized person

1 Press the On/Off button to turn the thermostat ON

2 Press and hold (15 sec.) the Select button until "LOC" appears on display

3 Press and hold (15 sec.) the Select button until "UnLO" appears on display

4 Press the Select button 2 more times to exit to normal display mode

Systems
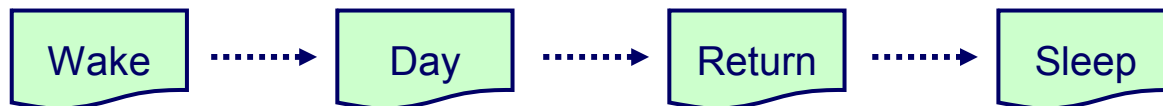Controls &
Instruments, L.L.C.

Programming

The thermostat is 5-1-1 programmable:

| Mon | | | | | Saturday | Sunday |

Mon
Tue
Wed
Thu
Friday

Saturday

Sunday

Individual programs

4 program periods per day:
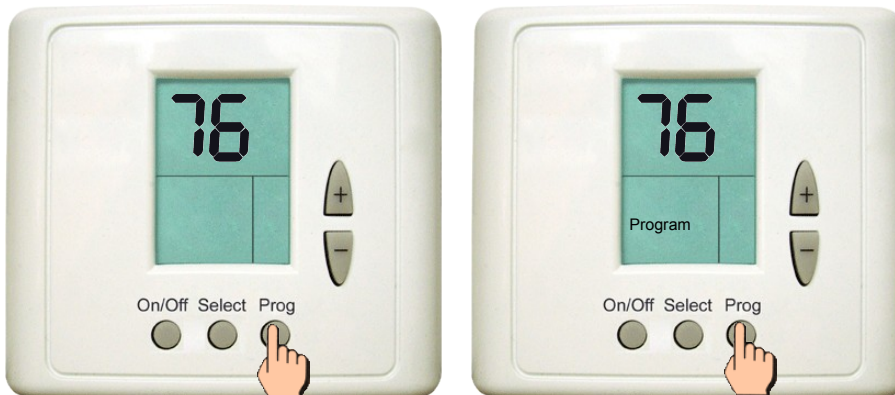
Wake ┄┄➤ Day ┄┄➤ Return ┄┄➤ Sleep

Programming

Disable/Re-enable programming

If you want to operate the thermostat manually - without the program, you can easily disable programming.

1 To disable the program, press and hold (5 seconds) the Prog button. The word Program will disappear from the display

2 To re-enable the program, press and hold the Prog button again

If the thermostat was setup to be Non-Programmable by the installing technician, contact the installer, or refer to the Technician Settings document for enabling the Program by the internal DIP switch

Programming

1. Temperature digits

The normal display will show the temperature in the room. When (+) or (-) is pressed, it will flash and show the set-point for the selected system mode
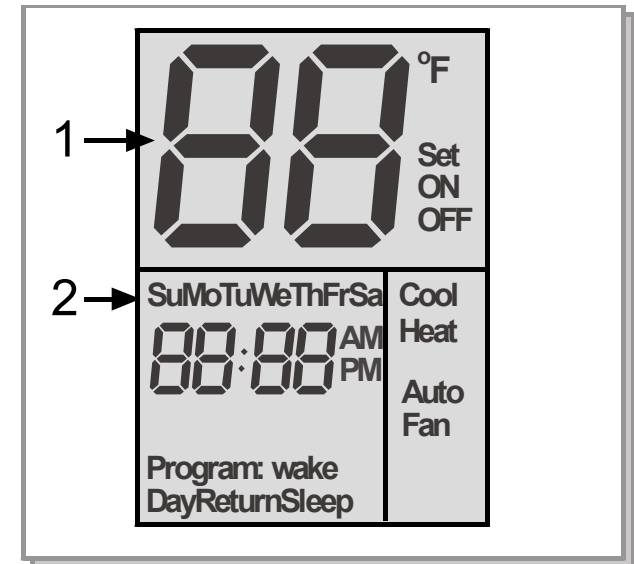
2. Days of the week

When setting the program, it will display the period that you are setting.

Example: When display shows: MON-TUE-WED-THU-FRI, you are setting the weekdays program.

(The program will repeat on each of these days).

In normal display mode, the actual day of the week will be displayed

Programming

3. Real time clock, AM/PM.

Note: When changing the program, "COOL" or "HEAT" will be displayed in place of the time to indicate which system mode you are setting the temperature for.

4. Program period

(the one currently being adjusted will be indicated)

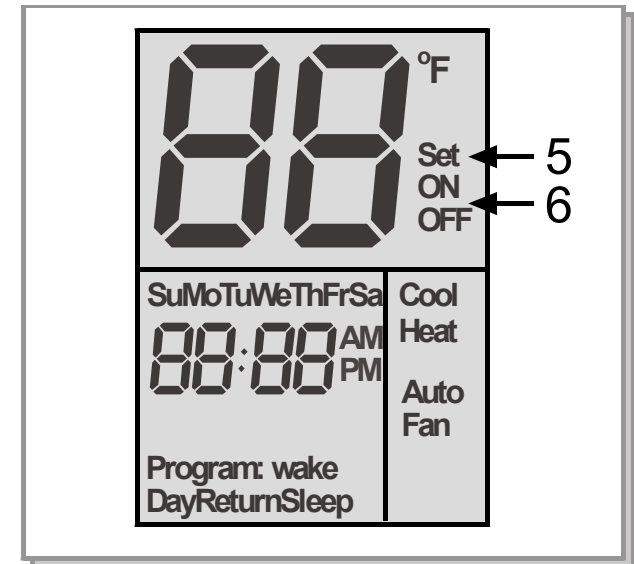|	
Wake	1st program of day
Day	2nd program of day
Return	3rd program of day
Sleep	4th program of day

55

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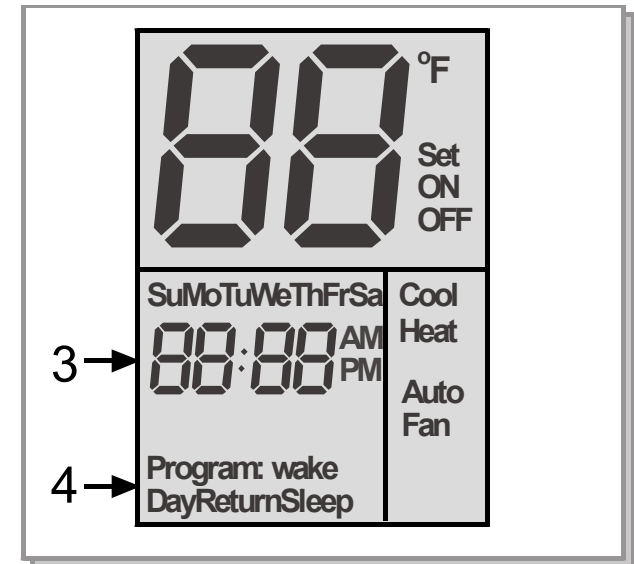
Programming

5. Set

When changing the temperature set-point, the temperature digits will flash, and "Set" will appear in the display

6. ON/OFF

thermostat active or deactivated

Programming

7. System Modes

Heat: Heating mode

Cool: Cooling mode
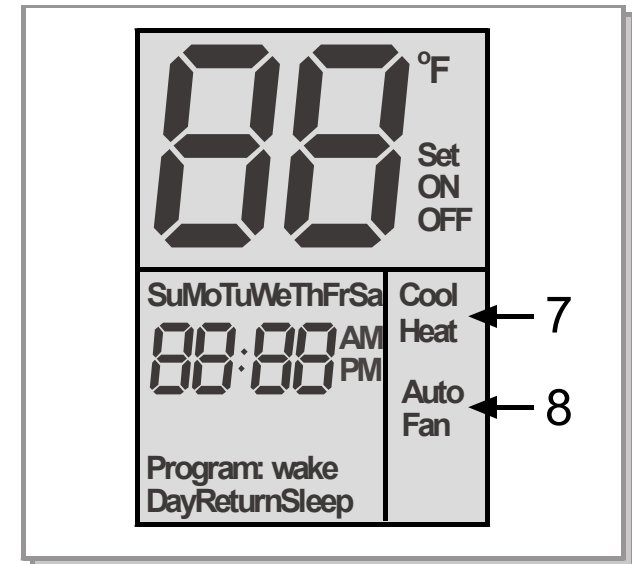
Auto change-over – both Heat and Cool

Fan: Continuous Fan mode.

The current active mode will flash when the equipment is operating

8. Fan Mode

When the display shows "Auto Fan" - the Fan will operate automatically with heating and cooling.

When the display shows "Fan" – the Fan will operate continuously.

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Programming

Normal display

In normal display mode, the display will show:

Measured temperature in the room

Thermostat ON or OFF

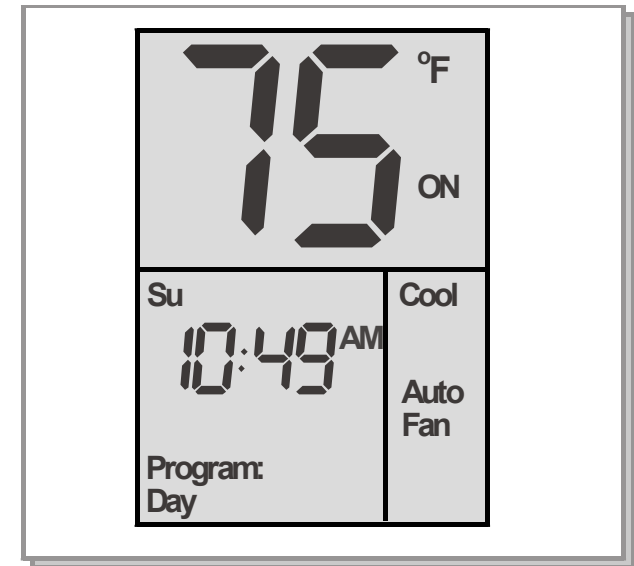Current day of the week

Current time of day

Current active program period

System Mode

Fan Mode.

75 °F ON

Su Cool

10:49 AM

Auto Fan

Program: Day

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Programming Defaults

Defaults from factory

Monday to Friday	1 (Wake)	2 (Day)	3 (Return)	4 (Sleep)
Start time	6:30 AM	8:00 AM	5:30 PM	10:00 PM
Cool Set-point	78°F	85°F	78°F	82°F
Heat Set-point	70°F	62°F	70°F	62°F

Saturday & Sunday	1 (Wake)	2 (Day)	3 (Return)	4 (Sleep)
Start time	7:30 AM	12:30 PM	6:00 PM	11:30 PM
Cool Set-point	76°F	74°F	72°F	78°F
Heat Set-point	70°F	70°F	70°F	65°F

Programming Procedure

1 Press the Prog button

2 Adjust the hours using the '+' and '-' buttons

3 Press the Prog button again

4 Adjust the minutes using the '+' and '-' buttons

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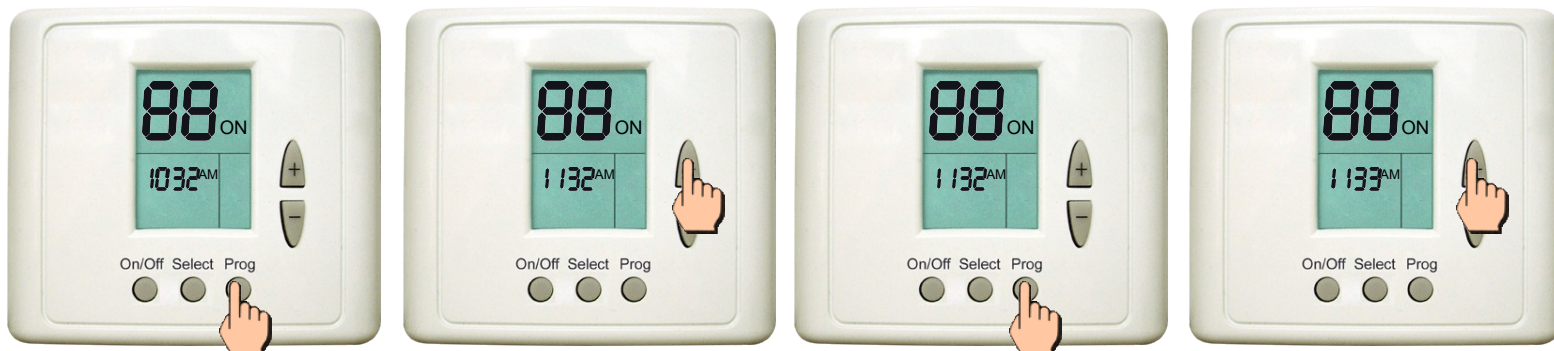
Programming Procedure

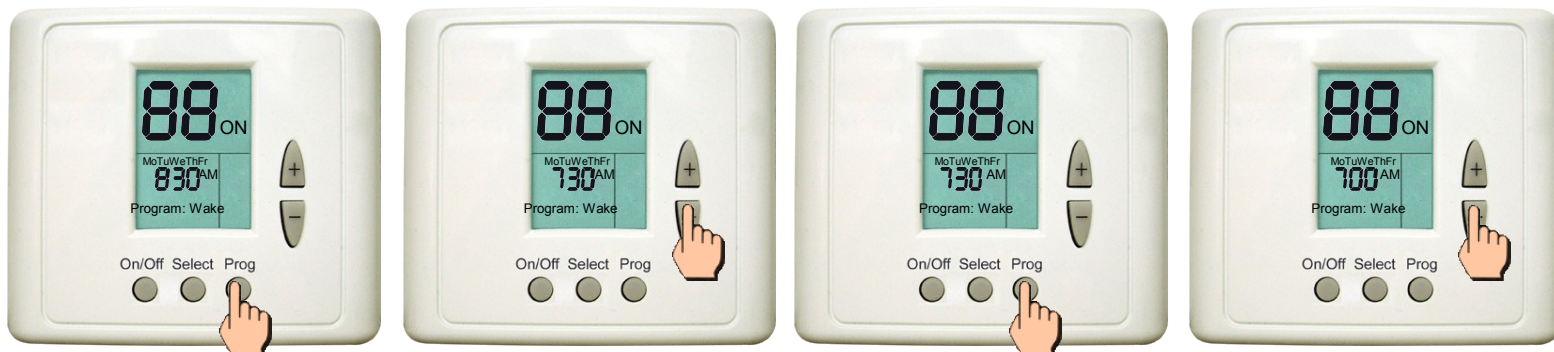## Monday to Friday - Program 1 – wake – start time

5 Press the Prog button again

6 Adjust the hours using the '+' and '-' buttons

7 Press the Prog button again

8 Adjust the minutes using the '+' and '-' buttons

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Programming Procedure

Monday to Friday - Program 1 – wake – set cool & heat temp.

9 Press the Prog button again

10 Adjust set temperature for cooling using the '+' and '-' buttons

11 Press the Prog button again

12 Adjust set temperature for heating using the '+' and '-' buttons

The thermostat keeps a minimum differential of at least 1 degree between the Heat set-point and the Cool set-point, with Heat always being less than Cool.

75 SET ON
700 AM Cool
Program: Wake
On/Off Select Prog

76 SET ON
700 AM Cool
Program: Wake
On/Off Select Prog

72 SET ON
700 AM Heat
Program: Wake
On/Off Select Prog

73 SET ON
700 AM Heat
Program: Wake
On/Off Select Prog

Programming Procedure

Monday to Friday - Programs 2,3,4 – Day, Return, Sleep

13 Repeat the procedures of program 1 for all the other 3 programs of the day:

- Day

- Return

- Sleep

14 Repeat the procedures of Monday to Friday for:
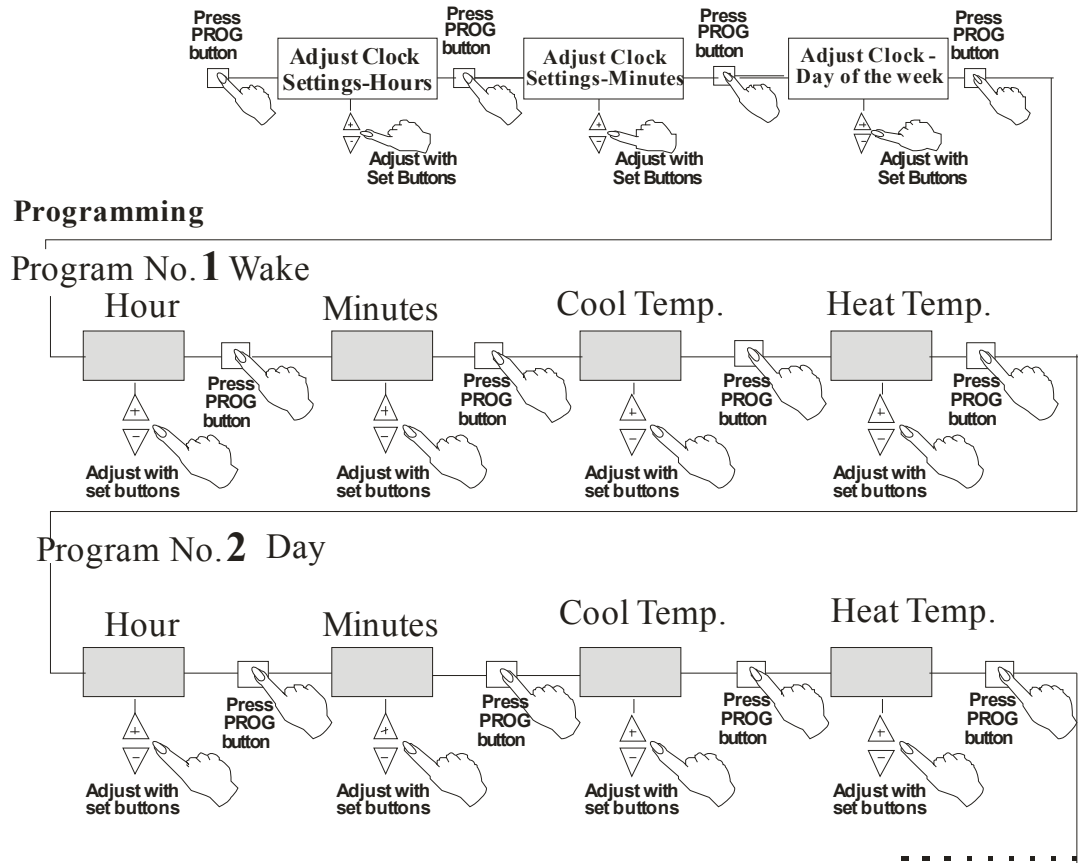
- Saturday

- Sunday

At any time during the programming you can exit to normal display mode by pressing the Select button

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Programming Procedure

The User operating manual book contains a program chart that can assist the user in setting the program.

We recommend to fill out the chart BEFORE setting the weekly program

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<u>Override Set-Point Temp.</u>

You can manually override the set-point temperature for the current program period without stepping into the programming procedure.

When you override the set-point, it will only be applicable until the end of the current program period.

To change the set-point temperature at any time:

Press the (+) or (-) buttons until the temperature you desire appears on the display

The new temperature will be retained until the next program period starts

When overriding a program period – no program period name will appear on the display

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Hold The Program

The thermostat can be operated manually – without the program – at anytime, and the program can be reactivated again anytime later

1 Turn the thermostat ON

2 Press and hold (5 seconds) the Prog button until the hours in the display stop flashing.

The word 'Program' will disappear from display

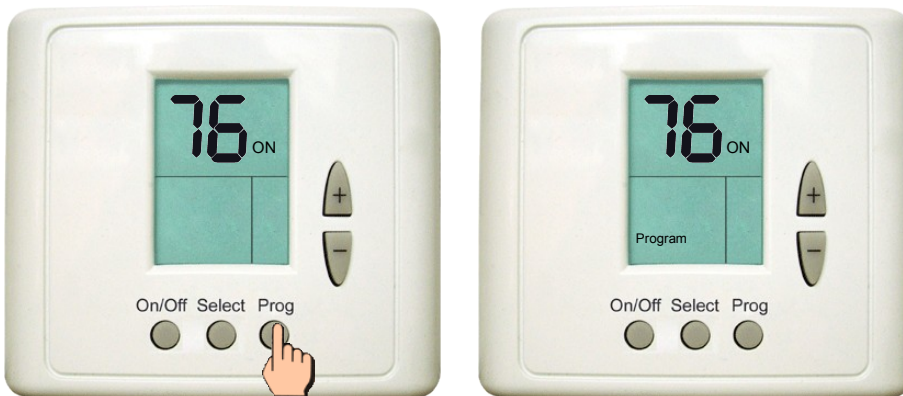Systems
Controls &
Instruments, L.L.C.

Reactivate The Program

The thermostat can be operated manually – without the program – at anytime, and the program can be reactivated again anytime later

1 Press and hold (5 seconds) the Prog button until the hours in the display stop flashing.

The word "Program" will appear on the display

The thermostat will remain in Override mode until the next program period begins

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can offer a WIDE range of products for the HVAC industry, Such as:

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To obtain more information or technical support:

Tel : (800) 663-8107.   E-mail : support@scillc.com   Web site: www.scillc.com

Your suggestions or comments regarding these units would be appreciated.

At our web site, you can find technical details regarding the units, as well as, operating manuals, electrical drawings, Etc.

The company reserves the right to change the specifications any time without prior notice.