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Heating and Cooling Basics – Thermostat Control

UNI-LINE® PRODUCT KNOWLEDGE

NATE-Recognized



Training Provider

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invensys
Controls

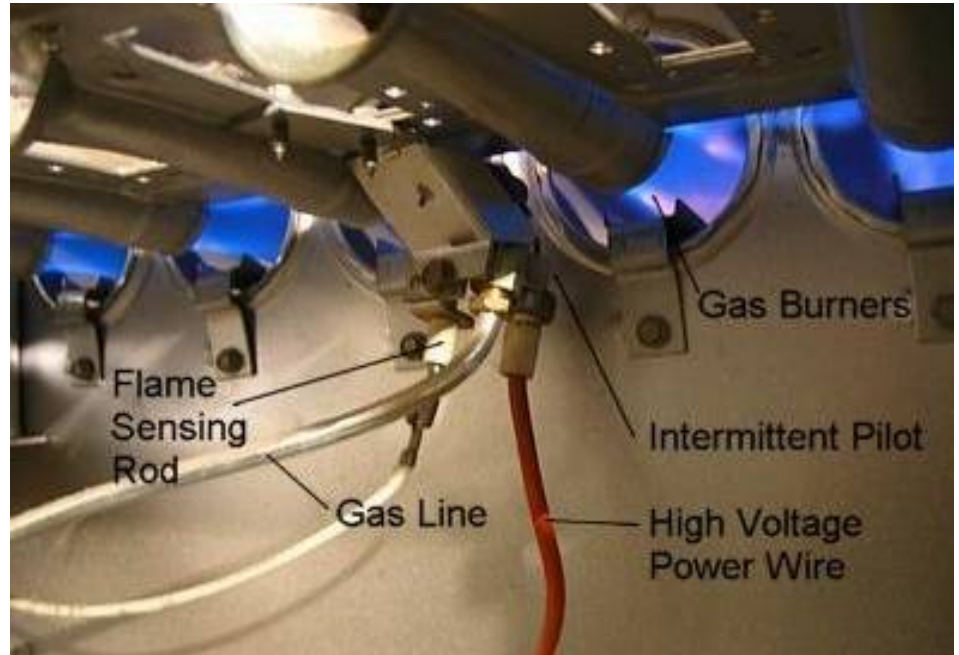
Subjects We Will Cover In This Session

- HVAC Overview
- Thermostat Definitions
- Product Line & Features
- Troubleshooting
- Manufacturer Analysis
- Where to Find Information
- Q&A

HVAC - Heating



- **W1** - 1st stage Heating
- **W2** - 2nd Stage Heating
- **E** - Emergency Heating
- **Aux** - Auxiliary Heating
- **Y** - Heat pump Heating
- **G** - Fan



HVAC – Ventilation Opportunities

UV Lights



Ventilators



Air Filters



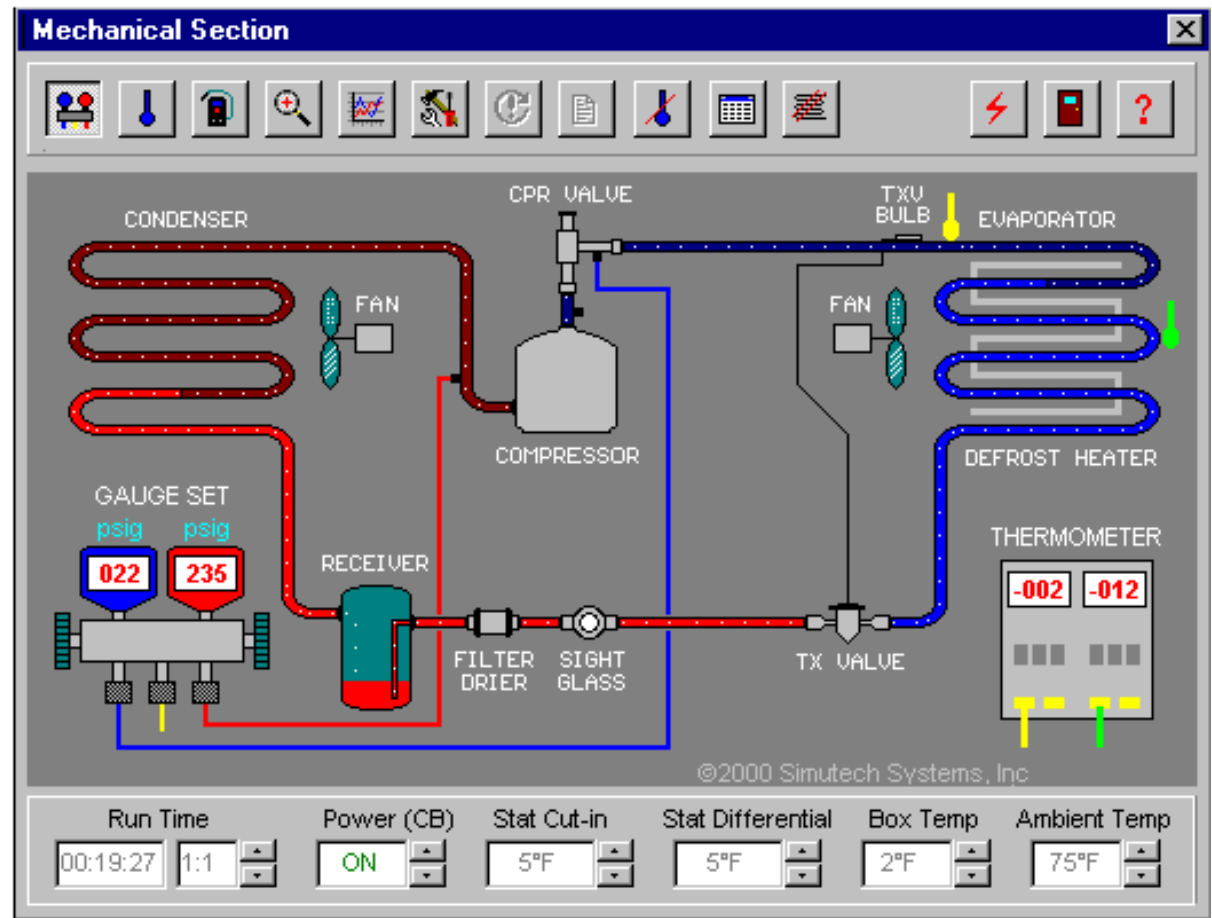
Humidifiers



HVAC – Air Conditioning

Cooling Air Conditioning System Components

- Condenser
- Evaporator
- Compressor
- TXV
- Blower motor
- Heater
- Receiver
- Drier



Thermostat Training Topics

- Contractor ID
- Short Cycle Delay
- Remote Sensors
- Time of Day Zoning
- Residual Fan
- Intermittent Fan
- Staging
- Humidity Controls
- Differentials
- Balance Point
- Fossil Fuel and Heat Pump
- Enthalpy
- Zoning
- Indoor Air Quality
- i2 Terminal Designations
- RS Thermostat Series

Contractor ID Service

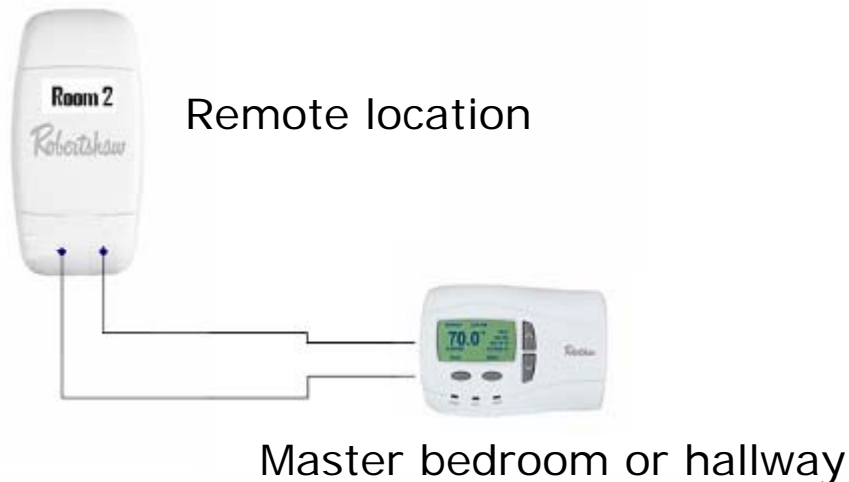
- Contractor enters contact information
 - Name, Address, Phone, Website
 - Text Only Available
- Contractor provides quantities and shipping information
- Simple-to-use online form
- Information automatically downloaded to new laser equipment
- Doors printed and shipped to contractor
- 3-5 Day turn around
- Thermostats must be ordered separately from wholesaler
- Access via Customer Toolbox Website
- www.toolbox.invensyscontrols.com
 - Password required

Short Cycle Delay

- Protection of compressor to reduce excessive cycling
- Adjustable 0 to 5 minute short cycle delay
 - 1 minute increments
- Applied after call for compressor is deactivated
- Used for minimum off time
- Not needed by some systems
 - Feature provided by another control

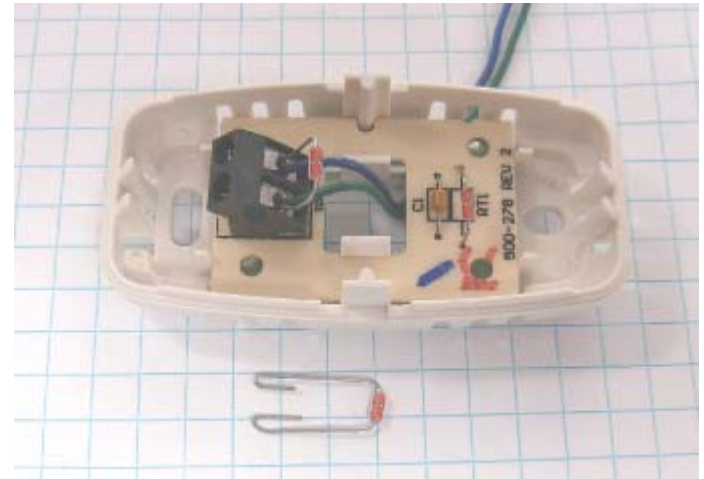
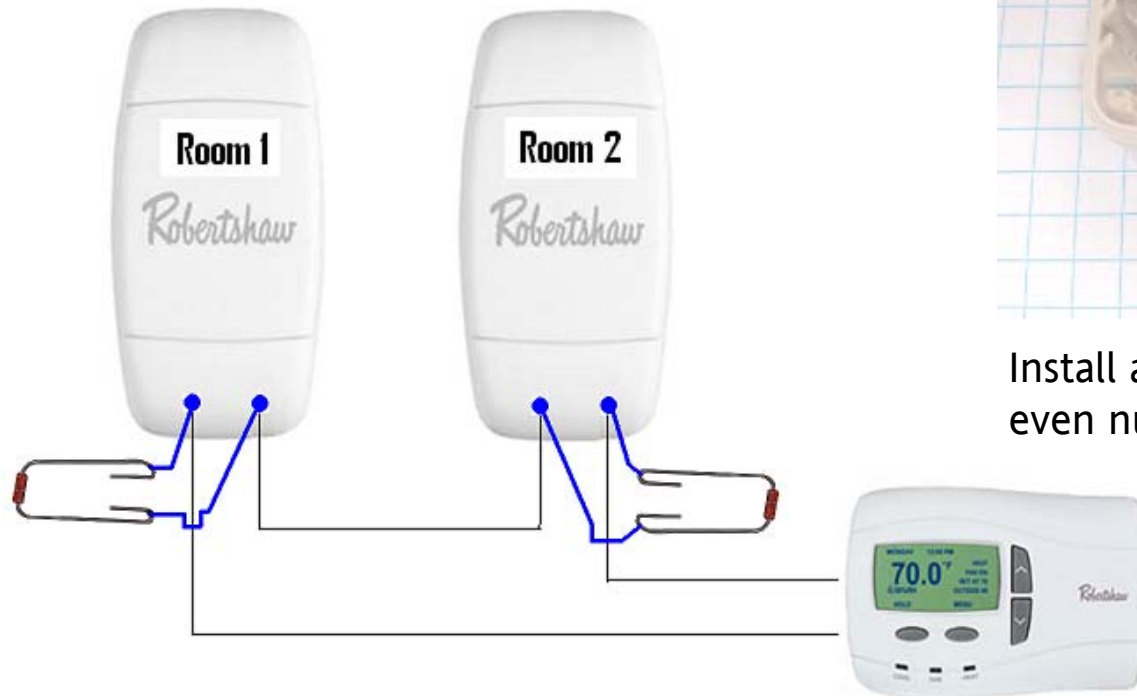
Remote Sensors

- Protection of compressor to reduce excessive cycling
- Remote sensors sense temperature in different spaces
 - Outside
 - Inside (such as a bedroom)
- Sensors serve as control points and information source
- Remote sensors are used in Time of Day Zoning



9020i Indoor Sensor
9025i Outdoor Sensor

Remote Indoor Sensor



Install additional Thermistors for even number configurations

Note: Similar configuration can be used for outdoor sensors 9025i.

Time of Day Zoning

- Time of Day Zoning allows user to prioritize the temperature in a room during a selected event
- Depends on Rooms:
 - Upstairs vs. Downstairs
 - Basement
 - Living Room
 - Bedrooms
- Depends on Events:
 - Wake
 - Day
 - Evening
 - Sleep
- For example, user wants heat in bedroom during wake event, regardless of temperature needs for other areas

Time of Day Zoning

- Required Components
 - Robertshaw® 9701i2, 9725i2, 9801i2 or 9825i2 thermostat
 - Remote Indoor Sensor, part number 9020i
- In the Schedule / Programming Menu
- Programming the event TIME and TEMPERATURES
- Scroll to **SNSR** (Sensor) Column
- Select **Next** button
- Choose **LCL** (local thermostat), **RMT** (Remote) or **AVG** (Averaging) using the UP and DOWN buttons
- By choosing **RMT** (Remote), the temperature will be controlled by the remote sensor

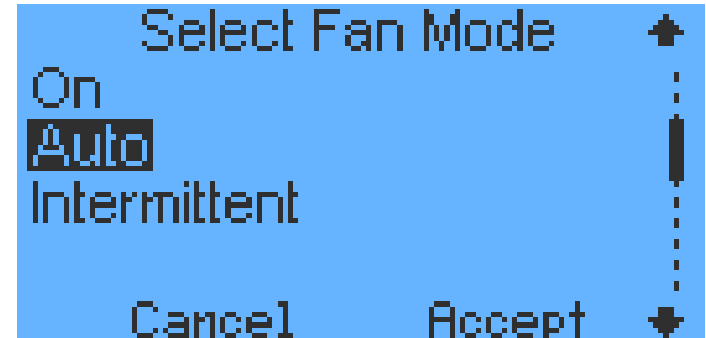


Fan Modes

- Typical selections are:

- Fan On
- Auto Fan
- Intermittent Fan

- On: Provides 24 / 7 continuous fan activated
- Auto: Provides fan when air handler is on in heat or cool mode
- Intermittent: Provides ability to operate in predetermined cycles
- The fan can also be programmed to run continuously during a specified event or scheduled period



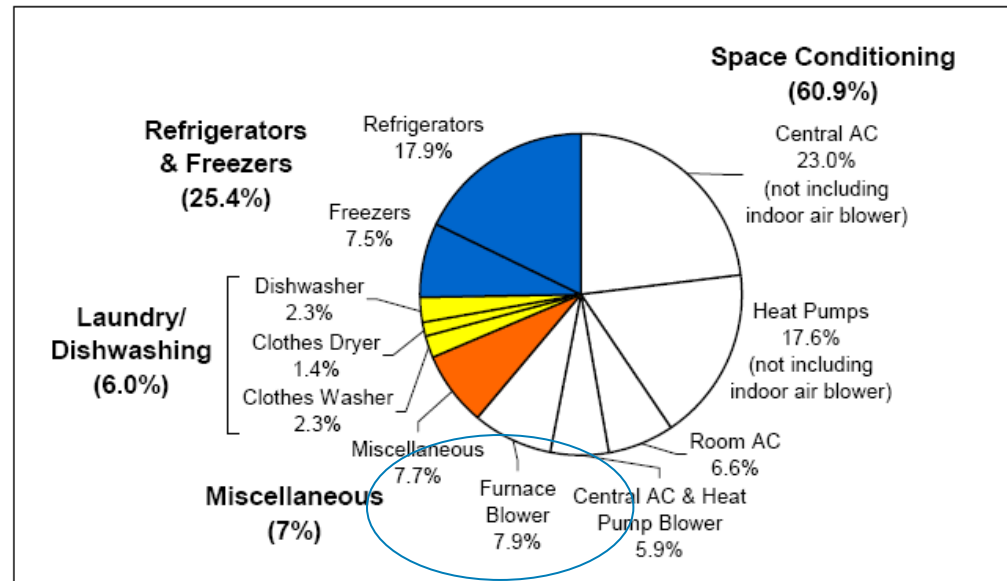
Advantages Of Fan Modes

- Advantages of Intermittent Fan
 - Improve comfort with constant moving air
 - Less cost due to less compressor run time
 - For example, On 10 minutes, Off 20 minutes
- Advantages of Continuous On Fan
 - Continuous fan life of 5 years
 - Replacement cost is low
 - Continuous run: (24 hrs/day, 8760 hrs/year)

System Settings - Residual Fan

- Applies to forced air systems only
- Allows fan to run after cooling or heating call
- Pulls built up cool or heat from HVAC system into living space
- Maximum extended fan run time is 120 seconds
 - Selections include Off, 30, 60, 90 or 120 seconds
- Used more frequently as residual cooling
 - A/C does not control air handler
- Not required on systems with advanced electronic furnace controls

Typical Home Energy Usage



- Continuous Fan is minimal kWh usage
- Energy saving on Furnace Blower is worth monetary savings
- Opportunities to Save Energy:
 - Zoning
 - Indoor Air Quality
 - Variable Speed (ECM) Motors

Staging

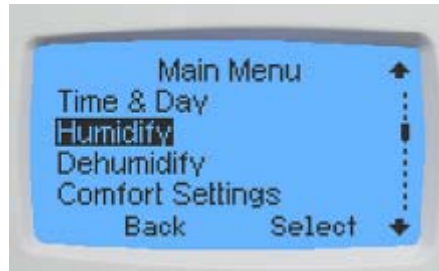
- Staging is a control feature where a higher or lower power consumption level of heating or cooling is enabled
- Staging can be automatic or manual
- W1 is typically considered 1st stage of Heating
- W2 is typically considered 2nd stage
- Upstaging will occur if the current stage output BTUH of the system is not sufficient to meet the needs of the user
- Staging also occurs in Zone systems automatically when the number of zone calls exceeds a preset value

Humidity Control

- Humidity adds moisture to the air during a heat call
- Dry air can cause dry skin and discomfort
- Adding humidity makes the air more comfortable
- The latent heat in the moisture can add heat allowing the user to run thermostat at more efficient settings
- Adding too much moisture during very cold outdoor temperatures can cause condensation on windows
- To prevent condensation the thermostat can automatically disable the humidity below a programmed temperature setpoint

Humidity Control Setup

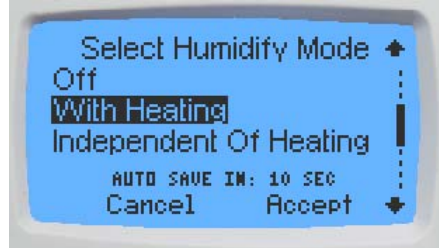
Select Humidity menu



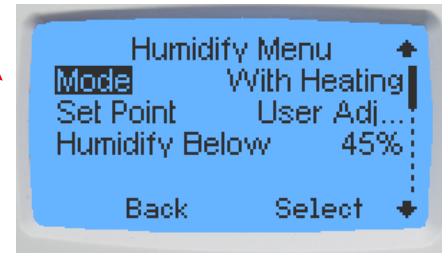
Now select Mode menu.
Note: Set Point is User Adjustable



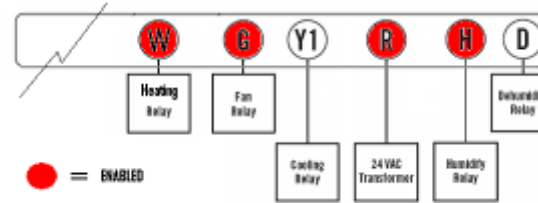
Select 'Call With Heating' option



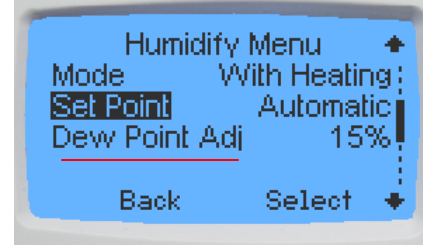
Set Point Set up as User Adjustable (15 – 45%).
Setting currently set at 45%



Humidity Set-up Summary



Terminal Status with Hum running. Thermostat MUST be in Heat mode.



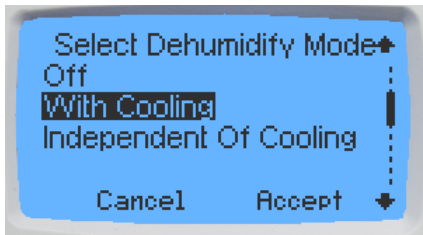
Set point changed from User Adjustable to Auto – ie HUM set point will be automatically set based on outdoor temp to prevent condensation. The user being given small offset adjustment of +/- 15% RH (called "Dew point adj").



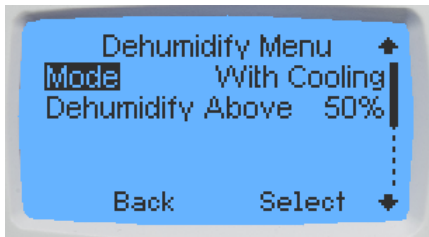
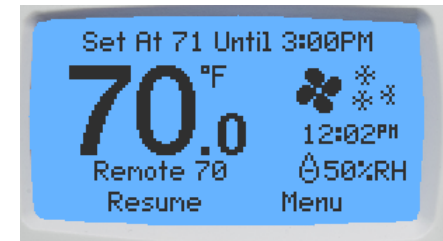
Automatic Set-point selected



Dehumidification Setup






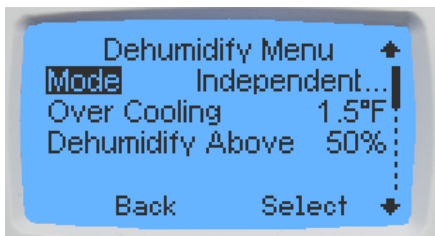
De-humidify with or without the AC (cooling) unit ON.



“With Cooling” Mode enables dehumidify **only** during a call for Cooling.

The user can adjust the RH between **45% and 60%**.

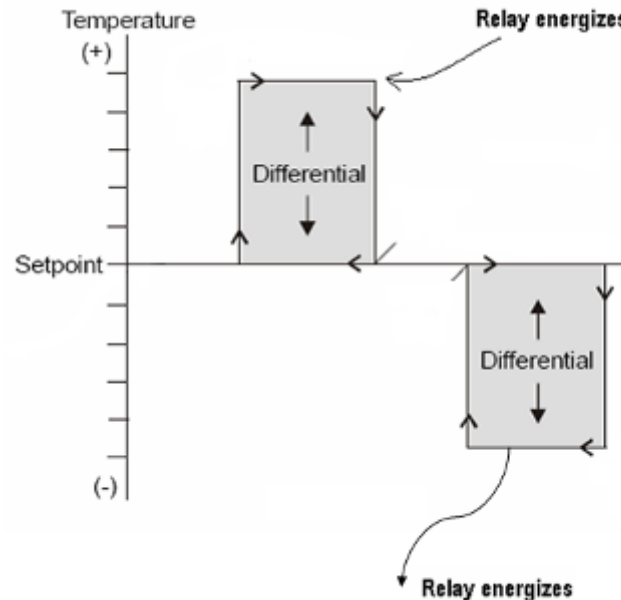
Note icons:   
The “D” terminal is enabled. This terminal is NOT a “dry” normally open contact but **will** have 24V when disabled.



“Independent” Mode will attempt to Dehumidify whether there is a call for Cooling or not.

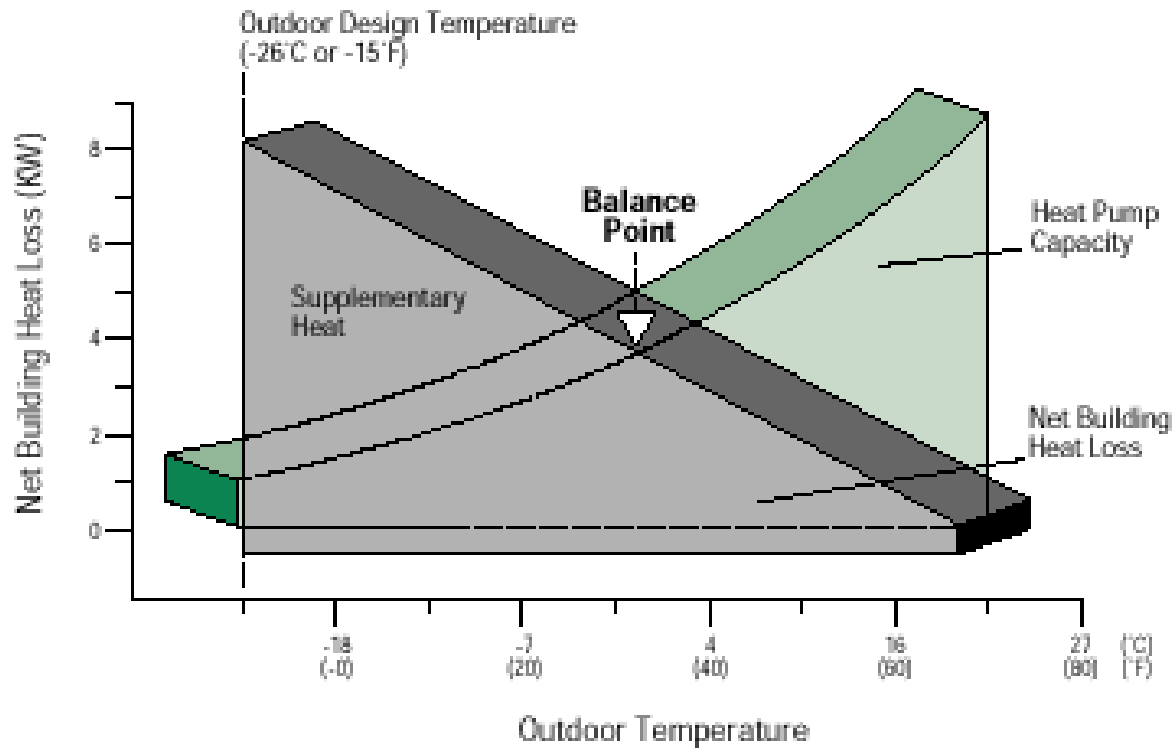
Differential Settings

- Differential is the difference between the setpoint and the maximum allowed deviation from setpoint before the system calls for Heating or Cooling
- Differentials are usually between 1 and 8 degrees F



Balance Point

- Balance Point control is used to turn OFF inefficient equipment and turn ON more efficient equipment



Balance Point Operation



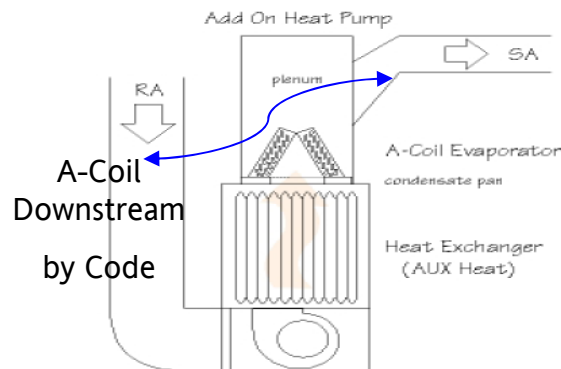
Heat Pump On

```
Equipment Setup Menu ↕  
1st Stg Heat Heat Pump ↓  
2nd Stg Heat Furnace :  
3rd Stg Heat None :  
Comp. Type Standard :  
Back Select ↕
```

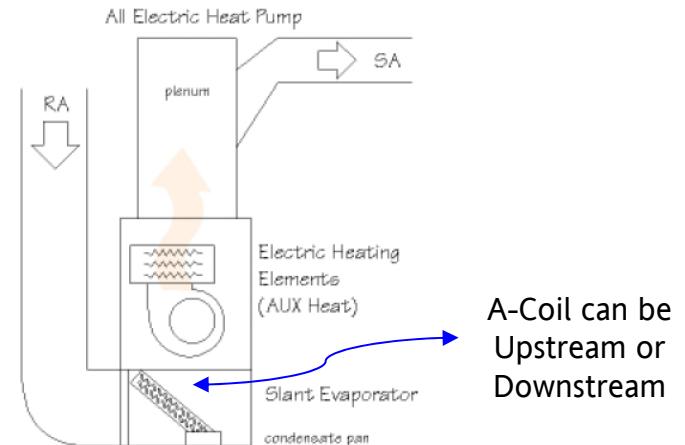
Equipment Configuration

Fossil Fuel and Heat Pump

Fossil Fuel or Add-On



Electric Supplementary Heat



- Indoor coils are available in a number of configurations to fit various types of heating systems. Coils are supplied for upflow, horizontal and downflow furnaces
- The Robertshaw® i2 thermostat controls the A-coil with W1 in 1H/1C version and with W2 in multistage models
- Honeywell TH8321 permits heat pump and fossil fuel to be enabled simultaneously (even with fossil fuel selected as add-on) which could compromise equipment life expectancy

Integrated Fossil Fuel kit

- Fossil Fuel Kit applies to Dual Fuel systems only
- Uses outdoor temperature to determine if HP or Furnace is the preferable source of heat
- When outdoor temperature gets too low for HP to operate efficiently, the Kit will change the call for heat from the HP to furnace
- Some Fossil Fuel Kits have a safety heat exchanger discharge temp switch which prevents the heat pump and fossil fuel furnace from running simultaneously
- With the outdoor sensor installed the i2 thermostat integrates the Fossil Fuel Kit



Dual Fuel Kit **not needed** when using the i2



Heat Pump Indoor Coil Operation

1st Stage Cooling Mode Operation

12 SEER System Model

i2 Controller

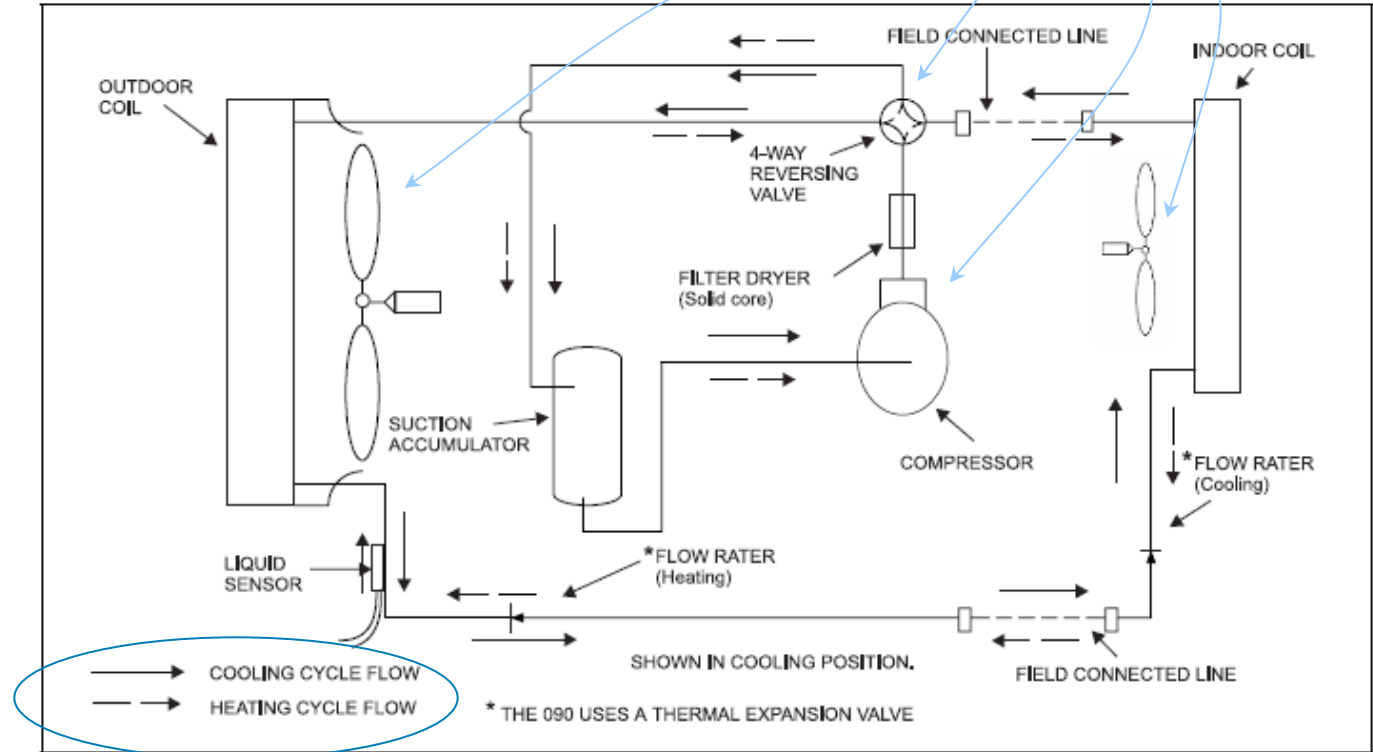


Tstat
Terminals

O Y G



Reversing
Valves

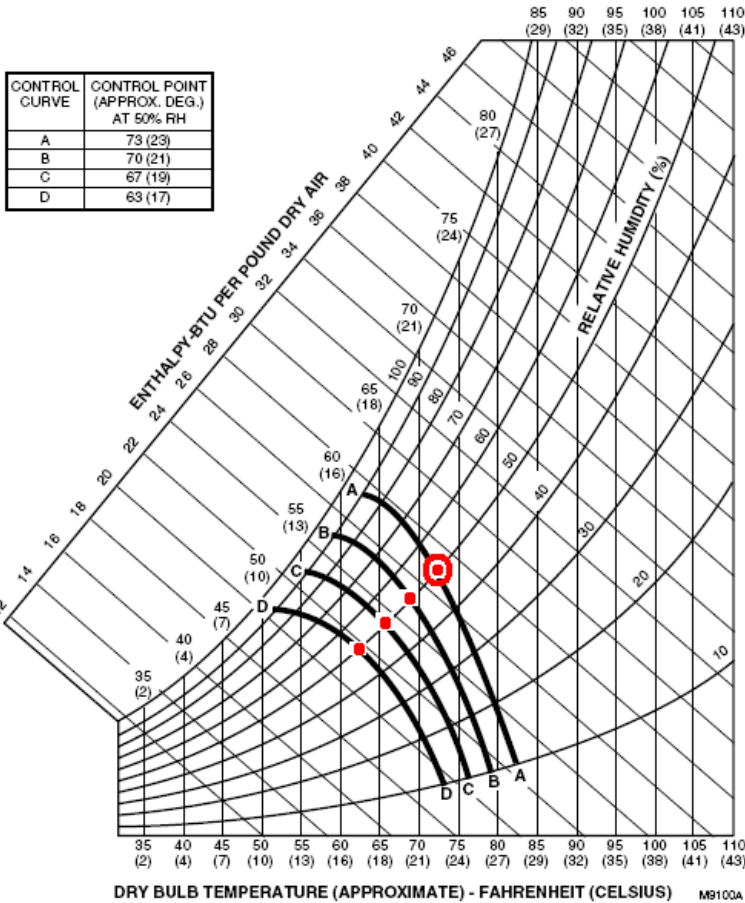


Seasonal Energy Efficiency Ratio (**SEER**) = Total BTU cooling / Total Watt hour per year

Enthalpy Control

- **Enthalpy** - Total amount of heat in one pound of substance calculated from accepted temperature base, expressed in BTUs per pound mass
- **Enthalpy of Dry Air** - Sensible heat
- **Enthalpy of Evaporated Water** - Latent heat
- **Psychometric Chart** - Chart which has the properties of air under varying conditions of temperature, water vapor content, and volume
- **Specific Heat** - Amount of heat necessary to change the temperature of one pound of a substance 1° F
- **Specific Enthalpy** - h - (kJ/kg) Defined as the total enthalpy of the dry air and the water vapor mixture per kilogram of moist air
- **Dry Bulb Temperature** - Temperature read with an ordinary thermometer

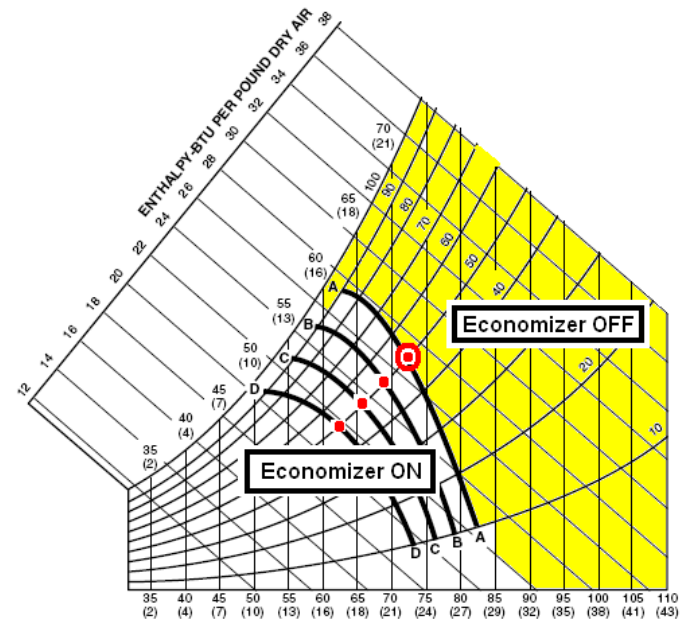
Enthalpy Control



Performance characteristics for enthalpy changeover settings A,B,C and D.

Enthalpy Changeover Setpoint

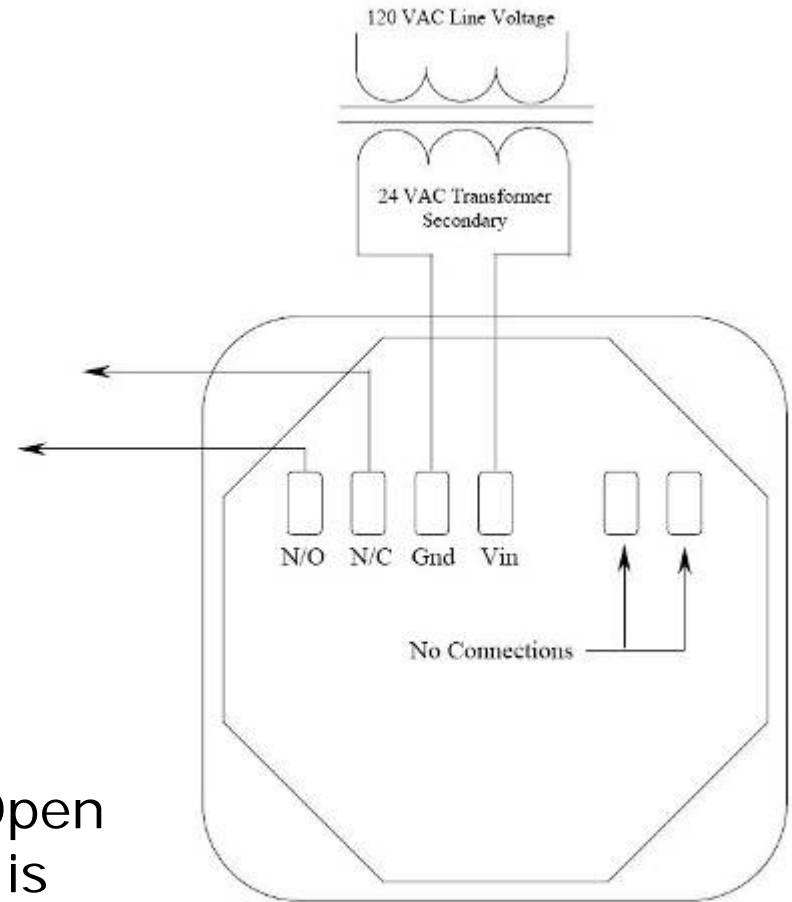
The A,B,C,D enthalpy setpoints adjust enthalpy changeover characteristics. The “A” setting provides the greatest energy savings.



Enthalpy Sensor and Wiring



- 24 VAC output from Normally Closed contact when outdoor Enthalpy is less than 27 BTUs
- 24 VAC output from Normally Open contact when outdoor Enthalpy is greater than 27 BTUs



Beyond Standard HVAC to Zoning

- Zoning uses multiple thermostats
- Single HVAC equipment
- Dampers control airflow to each zone
- Most zone controllers work with standard thermostats
- Zone controller takes requests from thermostats and determines how to control system
- The i2 thermostat works with Robertshaw® Classic and Deluxe Zone controllers



Beyond Standard HVAC to – Indoor Air Quality (IAQ)

- Robertshaw® RS & i2 thermostats include:
 - Reminder to change Filter
 - Reminder to change UV Light Bulb
 - Reminder to change Humidifier Pad
 - Control 24 Volts to Humidifier Solenoid
 - (9801i2 and 9825i2 models only)



Filter



UV Lamp



Humidifier



Thermostat Series – Product Overview

•Robertshaw® i2 Deluxe Series

- Setup Wizard in multi-languages (English, Spanish and French)
- Humidity Control
- Independent remote and outdoor sensor terminals

Best

•Robertshaw RS 4000/5000/6000 Value Series

- Pop-up Configuration Wizard
- Auto Changeover
- Circulating Fan

Better

•Robertshaw RS 2000/3000 Economy Series

- Adjustable Temperature Differential
- Worry-Free Memory Retention
- Low Temperature Freeze Protection
- Filter reminder

Good

•9400 & 9600 Series

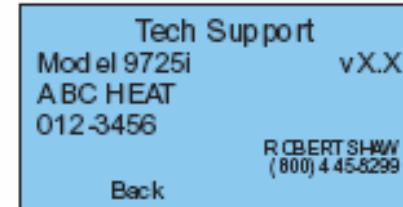
- Legacy product offering limited due to micro-processor discontinuance

Legacy

Thermostat Features for i2 Series

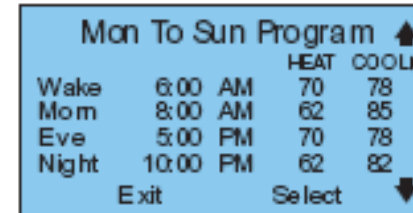
Contractor ID Feature

Set your name and phone number in the display to remind customers to call you for service.



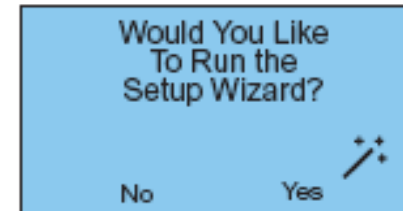
Conversational Menus

Take the programming step by step in plain, easy to understand language.



Fully Programmable

Incorporates the most flexible programming options in one device to fit all lifestyles – 7 day, 5/2, 5/1/1, or 24 hour.

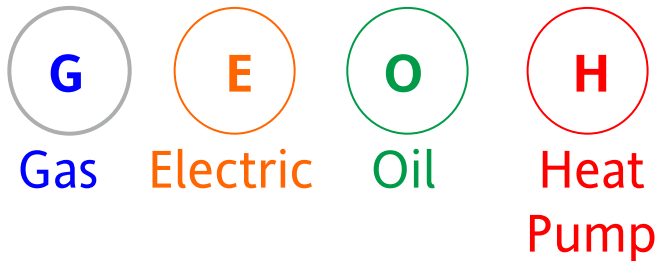


Worry-Free Memory Storage

Even during a power outage, the thermostat maintains setpoint and programmed parameters.

Deluxe 9800i2 Thermostat Series

Dot Matrix Display



9801i2

- 1 Heat / 1 Cool
- Menu Driven Display
- Set-up Wizard
- Humidity Control
- Temperature override
 - 10 minutes to 365 days



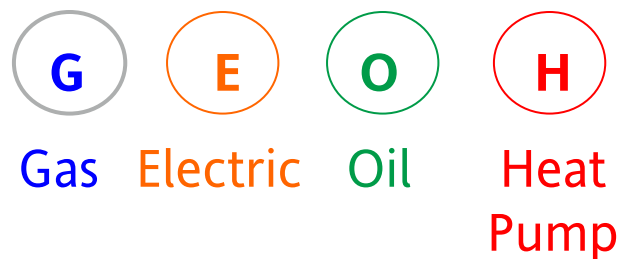
9825i2

- Same as above
- 3 Heat / 2 Cool



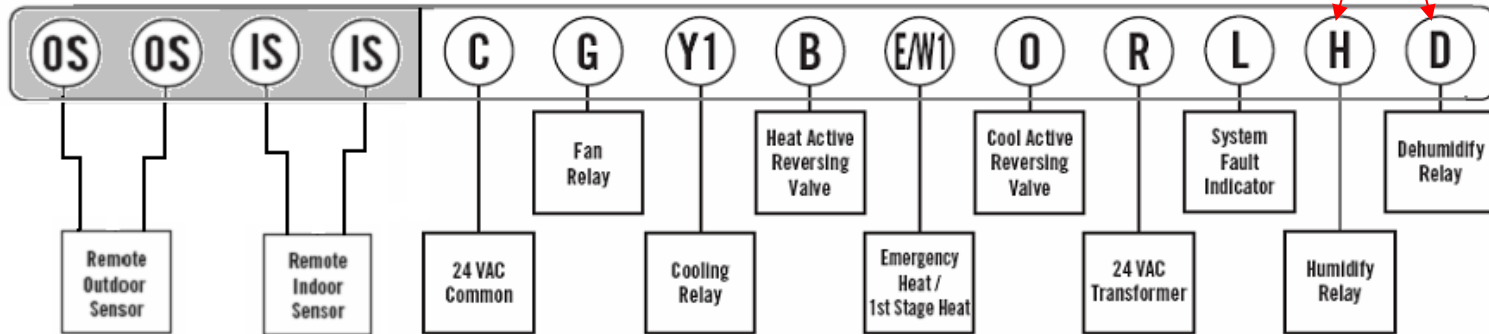
Deluxe 9700i2 Thermostat Series

- Differentiating Features:
 - Adjustable, blue backlit display
 - Time of day zoning control
 - LED status indicators
 - Set-up wizard
 - Programmable fan
 - Temperature recalibration
 - Night light capable
 - Multiple indoor and outdoor sensors
 - Active icons of equipment status displayed
 - Contractor ID
- Typical Features:
 - 1H/1C; 2H/2C; 3H/2C heat pump
 - Adjustable differential
 - Auto Daylight Saving
 - Fossil fuel kit converter for heat pump application
 - Auto changeover



i2 Series Terminal Designations

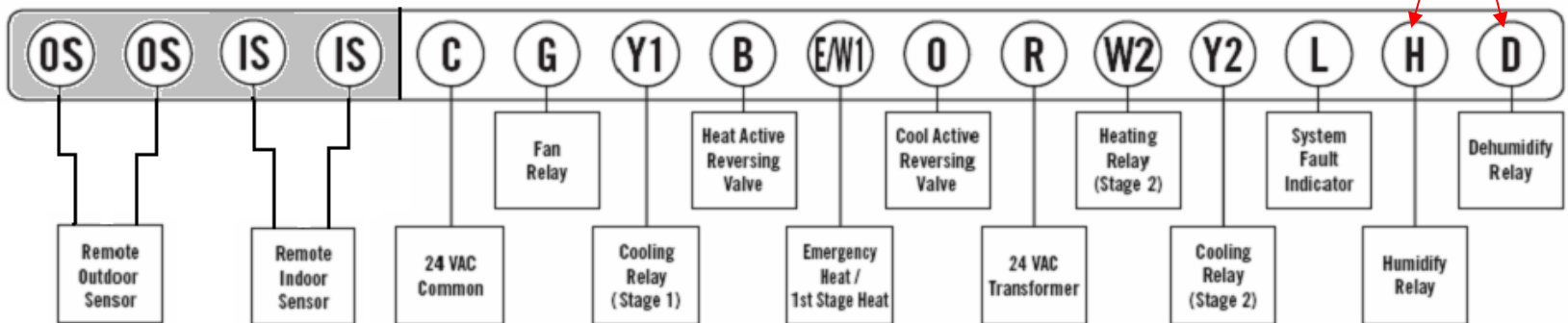
9801i2 wiring contacts



9701i2 same except missing



9825i2 wiring contacts



9725i2 same except missing

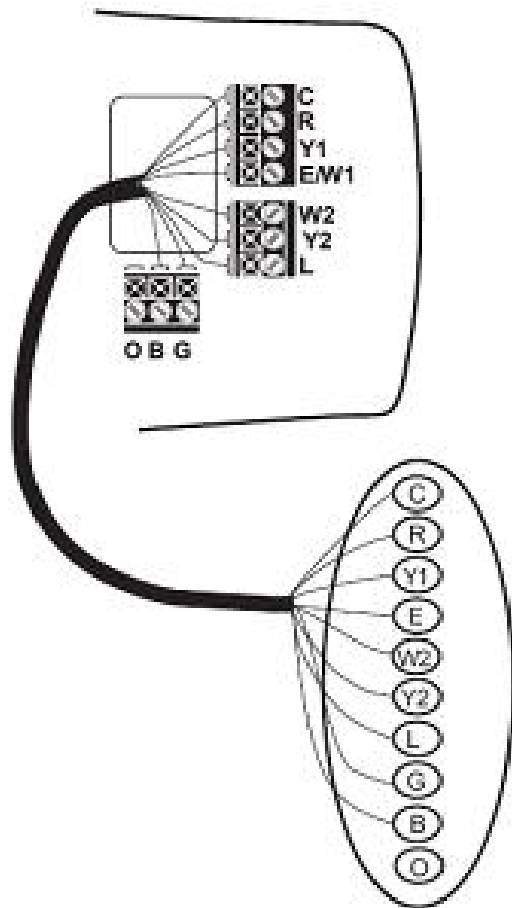


The i2 Thermostat Wiring Terminations

- Contractor-friendly terminations
- All i2 models include:
 - “O” and “B” terminals for heat pumps
 - Indoor & outdoor sensor terminals
- The 98xxi2 models include:
 - 24 Volt Humidification (H) contacts
 - 24 Volt Dehumidification (D) contacts



Typical Connection Between Thermostat and Equipment



- C: 24 VAC Common
- R: 24 VAC
- Y1: 1st stage cooling
- E/W1: Emergency heat / 1st stage heating
- W2: 2nd stage heating
- Y2: 2nd stage cooling
- L: System fault indicator
- O: Cool active reversing valve
- B: Heat active reversing valve
- G: Fan

Digital Versus Dot Matrix Display



i2 Series



Nomenclature for RS Series

RSX110

- 2 = Non Programmable, Economy Series
- 3 = 5-2 Day Programmable, Economy Series
- 4 = Non Programmable, Value Series
- 5 = 5-2 Day Programmable, Value Series
- 6 = 7-Day Programmable, Value Series

Application

0 = Standard thermostat

Number of Cooling Stages

Number of Heating Stages

RS4000/5000/6000 Value Series



Robertshaw® Value Series Thermostats

- RS4000 Series; Non-programmable
 - RS4110 1 Heat / 1 Cool; Universal Application*
 - RS4220 2 Heat / 2 Cool; Universal Application*
 - RS4320 3 Heat / 2 Cool; Universal Application*
- RS5000 Series; Programmable; (5-2 Day Schedule)
 - RS5110 1 Heat / 1 Cool; Universal Application*
 - RS5220 2 Heat / 2 Cool; Universal Application*
- RS6000 Series; Programmable (7 Day Schedule)
 - RS6110 1 Heat / 1 Cool; Universal Application*
 - RS6220 2 Heat / 2 Cool; Universal Application*
 - RS6320 3 Heat / 2 Cool; Universal Application*




















* Electric, Gas, Oil, Heat Pump and Millivolt Systems

Features Of RS4000, RS5000 And RS6000 Series Thermostats

- Pop-up Wizard
- Engineered *True Blue* backlight display
- Largest Temperature Display Character Size
- Soft Touch Keys
- Set-up Test Mode
- Auto Changeover
- Circulating Fan
- Low temperature Freeze Protection
- High Temperature Protection
- High / Low Temperature Limits
- Easy Change Battery Access



Installation for RS6320 Thermostat

Installation Tests for Multi-Stage Models				
	Conventional (Non-HP)		Heat Pump (HP)	
Demand	Terminal	Display	Terminal	Display
First Stage Heat	W1 + G*	 	Y1 + G + B	 
Second Stage Heat	W1 + W2 + G*	 	Y1 + W2 + G + B	 
Third Stage / Emergency Heat	N/A		E + G	 
First Stage Cool	Y1 + G	 	Y1 + G + O	 
Second Stage Cool	Y1 + Y2 + G	 	Y1 + Y2 + G + O	 
* G,  will be off (not displayed) for Non-HP with Gas				

Sales Tools for the Value Series

- Sell Sheet Part Numbers: 150-2089, 150-2090, & 150-2091



RS4110
RS4220
RS4320

VALUE SERIES
DIGITAL NON-PROGRAMMABLE
THERMOSTATS



RS4110 – 1 Heat / 1 Cool
RS4220 – Universal Control up to 2 Heat / 2 Cool
RS4320 – Universal Control up to 3 Heat / 2 Cool



Comfort Control Made Simple

The Robertshaw® RS4000 thermostat family is *Simply the Right Choice™* when it comes to automated temperature controls.

With the comfort, convenience, and efficiency features that homeowners and contractors want, the RS4000 family provides custom program options in value-packed thermostats for an affordable price.

- Quick connect wiring feature to save up to 15 minutes on every installation.
- Pop-up Wizard to customize thermostat settings with an instant start-up menu.
- Fully adjustable differentials to maintain optimal heating and cooling comfort year-round.

All RS4000 thermostats are fully compatible with all standard 24V AC heating and cooling systems. Additional compatibility with multi-stage gas/electric furnaces and heat pump systems are available in the RS4220 and RS4320 models.

Add in easy installation, Contractor ID option, and quality you can depend on, and you have the Robertshaw RS4000 thermostat family - *Simply the Right Choice.*

An ISO 9001 – 2000 Certified Company




RS5110
RS5220

VALUE SERIES
DIGITAL PROGRAMMABLE
THERMOSTATS



5 - 2 Day Programmable
RS5110 – 1 Heat / 1 Cool
RS5220 – Universal Control up to 2 Heat / 2 Cool



Comfort Control With Energy Savings

The Robertshaw® RS5000 thermostat family is *Simply the Right Choice™* when it comes to programmable temperature controls that can save energy and money.

With the comfort, convenience, and efficiency features that homeowners and contractors want, the RS5000 family provides EnergyStar® and California Title 24 compliant features for an affordable price.

- Fully programmable with soft touch keys to easily set four events per day AND 5-2 day scheduling.
- Pop-up Wizard to customize thermostat settings with an instant start-up menu.
- Vacation setback override to reduce energy use while away from home.

The RS5000 thermostats are fully compatible with all standard 24V AC heating and cooling systems. Additional compatibility with multi-stage gas/electric furnaces and heat pump systems is available in the RS5220 model.

Add in easy installation, Contractor ID option, and quality you can depend on, and you have the Robertshaw RS5000 thermostat family - *Simply the Right Choice.*

An ISO 9001 – 2000 Certified Company




RS6110
RS6220
RS6320

VALUE SERIES
DIGITAL PROGRAMMABLE
THERMOSTATS



7 Day Programmable
RS6110 – 1 Heat / 1 Cool
RS6220 – Universal Control up to 2 Heat / 2 Cool
RS6320 – Universal Control up to 3 Heat / 2 Cool



Features and Benefits

Universal Control up to 2 Heat / 2 Cool – RS6220 only
Universal Control up to 3 Heat / 2 Cool – RS6320 only
Operates on both multi-stage gas/electric furnaces and heat pumps means less inventory.

Auto Changerover
Switches automatically between heating and cooling for constant home comfort.

Pop-Up Wizard
Launches instant installation menu to quickly enter the settings for programmed thermostat functions.

Bigger Brighter Backlight with Nightlight Option
Makes viewing and setting the temperature easier any time of the day.

Worry-Free Memory Retention
Maintains set point and programmed parameters, even during power outages.

Easy Change Battery Access
Provides drop down removable compartment for quick battery replacement.

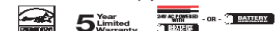
Circulating Fan
Maintains optimal air circulation between demand cycles for improved comfort with minimal energy use.

Low Temperature Freeze Protection
Turns on heat automatically when temperature goes below 41°F. Protects pipes from freezing.

Adjustable Temperature Differential and Upstaging
Provides for full selection of parameters to deliver maximum comfort or energy savings.

High and Low Setpoint Limits
Protects the heating and cooling systems by limiting temperature settings.

An ISO 9001 – 2000 Certified Company



Seven Day Comfort Control Simplified

The Robertshaw® RS6000 thermostat family is *Simply the Right Choice™* when it comes to daily programmable temperature controls that can save energy and money.

With the comfort, convenience, and efficiency features that homeowners and contractors want, the RS6000 family provides EnergyStar® and California Title 24 compliant features for an affordable price.

- Fully programmable with soft touch keys to easily set four events per day AND 7 day scheduling.
- Copy command that makes programming simple to set up and flexible to use.
- Pop-Up Wizard to customize thermostat settings with an instant start-up menu.

The RS6000 thermostats are fully compatible with all standard 24V AC heating and cooling systems. Additional compatibility with multi-stage gas/electric furnaces and heat pump systems are available in the RS6220 and RS6320 models.

Add in easy installation, Contractor ID option, and quality you can depend on, and you have the Robertshaw RS6000 thermostat family - *Simply the Right Choice.*

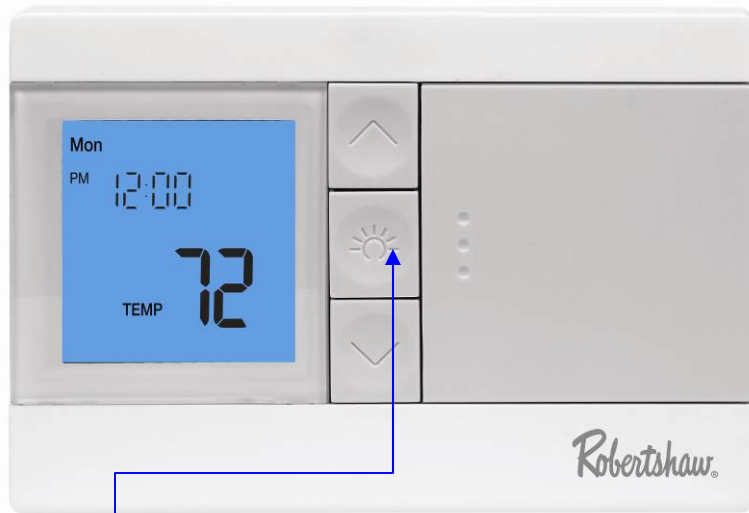
More Features + Less Cost = Value Series



RS456 Series



Robertshaw® RS2000 And RS3000 Economy Series



RS3110

Note the Light symbol. Differentiates RS3110 cover from other Economy series



Robertshaw® Economy Series Thermostats

RS2000 Series; Non-programmable

- RS2110 1 Heat / 1 Cool; Universal Application*
- RS2210 2 Heat / 1Cool; Universal Application*

RS3000 Series; Programmable

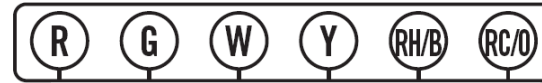
- RS3110 1 Heat / 1 Cool; Universal Application*
- RS3210 2 Heat / 1Cool; Universal Application*

* Electric, Gas, Oil, Heat Pump and Millivolt (RS2110 & RS3110 only) Systems

Wiring Summary



RS2110



RS2210



RS3110



RS3210



Features Of RS2000 And RS3000 Series

- Bigger, Brighter Display with blue backlight
- Adjustable Temperature Differential
- Automatic Compressor Short Cycle Protection
- Separate "O" and "B" terminals
- Front Access Battery Compartment
- Two level Low Battery warning
- Filter Change Indicator
- Easy Access Reset
- Automatic Cut-off
- Low temperature Freeze Protection (RS2110 & RS3110)



Sales Tools For Economy Series

- Sell Sheet Part Numbers: 150-2080 & 150-2082

Robertshaw.

RS2110/RS2210

ECONOMY SERIES
DIGITAL NON-PROGRAMMABLE THERMOSTATS

ELECTRIC GAS OIL HEAT PUMP RELIEF VALVE

RS2110 – 1 Heat / 1 Cool
RS2210 – Multi-Stage 2 Heat / 1 Cool

Features and Benefits

Multi-Stage 2 Heat / 1 Cool – RS2210 only
Operates on both multi-stage gas/electric furnaces and heat pumps to reduce inventory needed.

Bigger Brighter Backlight
Makes viewing and setting the temperature easier.
Adjustable Temperature Differential
Maintains optimal outdoor comfort.

Worry-Free Mercury Retention – RS2210 only
Maintains set point and programmed parameters, even during power outages.

Filter Monitor
Provides notice when filters need changing.

Low Temperature Freeze Protection – RS2110 only
Turns on heat automatically when temperature goes below 27°F. Protects pipes from freezing.

Automatic Compressor Short Cycle Protection
Reduces wear and tear of HVAC equipment with this system safeguard.

0 and 8 Fan speeds
Provides greater system flexibility.

Zone System Compatible
Acts as a sensor within the system.

Quick Wire Terminal Block
Uses sturdy wire clamps – no wrap-around of screws for fast and easy installation.

Affordable Comfort Control

The Robertshaw® RS2000 thermostat family is Simply The Right Choice when it comes to non-programmable temperature control.

With the comfort, convenience, and efficiency features that homeowners and contractors want, the RS2000 family provides value-packed thermostats for an economical price.

- Bigger brighter backlight makes it easy to read any time of the day.
- A fully adjustable temperature differential provides increased comfort control.
- The front load battery door makes it simple to replace the batteries.

All RS2000 thermostats are fully compatible with all standard 24V AC heating and cooling systems. Additional compatibility with multi-stage and heat pump systems are available in the RS2210 model.

Get in easy installation, expert technical service, and quality you can depend on, and the Robertshaw RS2000 thermostat family is Simply The Right Choice.

An ISO 9001 – 2000 Certified Company

Robertshaw.

RS3110 RS3210

ECONOMY SERIES
DIGITAL PROGRAMMABLE
THERMOSTATS

ELECTRIC GAS OIL HEAT PUMP RELIEF VALVE

RS3110 – 1 Heat / 1 Cool
RS3210 – Multi-Stage 2 Heat / 1 Cool

Features and Benefits

6 - 2 Day Programming
Set the weekly program once with four time and temperature settings. The four set points are followed by five consecutive days. On the weekend, four different set points can be set for all day comfort.

Multi-Stage 2 Heat / 1 Cool – RS3210 only
Operates on both multi-stage gas/electric furnaces and heat pumps to reduce inventory needed.

Bigger Brighter Backlight
Makes viewing and setting the temperature easier.

Adjustable Temperature Differential
Maintains optimal outdoor comfort.

Worry-Free Mercury Retention – RS3210 only
Maintains set point and programmed parameters, even during power outages.

Filter Monitor
Provides notice when filters need changing.

Low Temperature Freeze Protection – RS3110 only
Turns on heat automatically when temperature goes below 27°F. Protects pipes from freezing.

Automatic Compressor Short Cycle Protection
Reduces wear and tear of HVAC equipment with this system safeguard.

0 and 8 Fan speeds
Provides greater system flexibility.

Zone System Compatible
Acts as a sensor within the system.

Quick Wire Terminal Block
Uses sturdy wire clamps – no wrap-around of screws for fast and easy installation.

Affordable Comfort Control

The Robertshaw® RS3000 thermostat family is Simply The Right Choice when it comes to programmable temperature control that can help reduce energy costs up to 25%.

With the comfort, convenience, and efficiency features that homeowners and contractors want, the RS3000 family provides custom program options in value-packed thermostats for an economical price.

- Single touch button controls to set weekly programs for summer and winter.
- Automated temperature settings for increased heating/cooling comfort.
- Worry-free memory retention to maintain temperature settings even during power outages.

All RS3000 thermostats are fully compatible with all standard 24V AC heating and cooling systems. The RS3210 offers additional compatibility with single and multi-stage gas/electric furnaces and heat pump systems.

Get in easy installation, expert technical service, and quality you can depend on, and you have the Robertshaw RS3000 thermostat family – Simply The Right Choice.

An ISO 9001 – 2000 Certified Company

When Price Matters Pick Economy Series

RS2000 Series



RS3000 Series



Troubleshooting Furnaces

There is NO HEAT!

Switch on side of furnace

- ✓ Most furnaces will have an ON/OFF wall switch next to them

Fuses and/or circuit breaker

- ✓ Make sure fuses and/or circuit breaker have been checked

Front furnace cover

- ✓ Many furnaces will not operate with cover off

Furnace filter

- ✓ Make sure furnace filter is clean and clear

Troubleshooting Thermostats

There is NO HEAT!

Thermostat settings

- ✓ Is thermostat in HEAT mode and calling for heat?

Wiring

- ✓ Is thermostat wired properly and is jumper there?

Relays (if applicable)

- ✓ Are relays clicking on a call for heat?

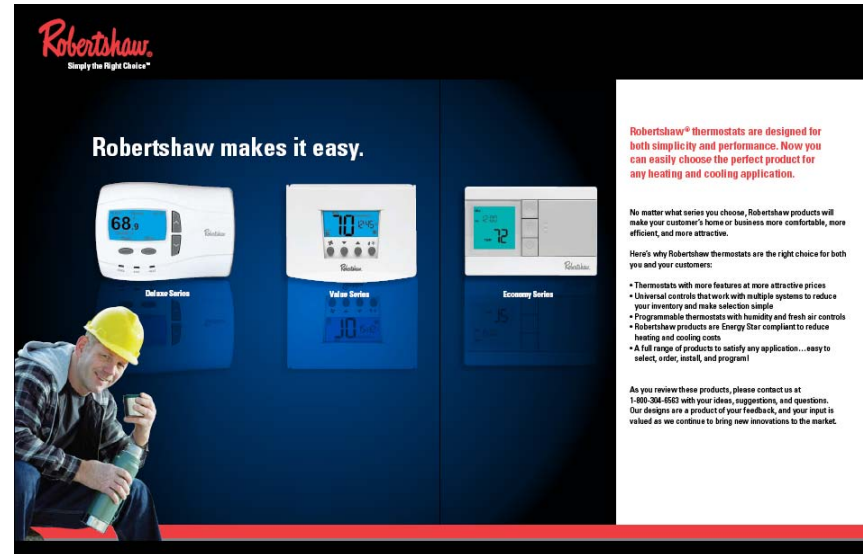
Jumping terminals

- ✓ Does furnace cycle if the Ground and W terminals are jumped?

NOTE: Remember most all gas furnaces will run the inducer fan for a couple of minutes before the actual blower turns on. This inducer fan may not be heard if the furnace is in a remote location.

Promotional Materials

New Thermostat Catalog: 150-2206



- New Thermostat Catalog
- Updated cross reference chart
- Updating sell sheets for all featured thermostats with competitive information

Choosing the Right Thermostat



- **Trusted Brand** – Dependable and reliable with a history of innovative products.
- **Universal Products** – The right product for the job. Simplifies inventory. Assured compatibility.
- **Availability** – Where you need it, when you need it.
- **Quality** – Works right the first time.
- **Contractor Friendly** – Simple set-up and programming menus. Saves time & money. Eliminates second guessing.
- **Support** – Sales and technical support for all your needs.
- **Innovative** – Leading technology for maximum performance.

Website Tools: www.Uni-Line.com

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Websites:

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