RUSKIN

Zone Control Solutions

Installation & Maintenance Manual

Model: Z2000RT

Wall Mount Thermostat

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! WARNING

THIS ACCESSORY IS TO BE INSTALLED BY A QUALIFIED SERVICE TECHNICIAN. TO AVOID UNSATISFACTORY OPERATION OR DAMAGE TO THE PRODUCT AND POSSIBLE UNSAFE CONDITIONS, INCLUDING ELECTRICAL SHOCK AND FIRE, THE INSTALLATION INSTRUCTIONS PROVIDED WITH THIS ACCESSORY MUST BE STRICTLY FOLLOWED AND THE PARTS SUPPLIED USED WITHOUT SUBSTITUTION. DAMAGE TO THE PRODUCT RESULTING FROM NOT FOLLOWING THE INSTRUCTIONS OR USING UNAUTHORIZED PARTS MAY BE EXCLUDED FROM THE MANUFACTURER'S WARRANTY COVERAGE.

! WARNING

DISCONNECT ELECTRICAL POWER PRIOR TO SERVICING THIS UNIT. FAILURE TO DO SO CAN RESULT IN ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

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Telephone: 816-761-7476
www.ruskin.com

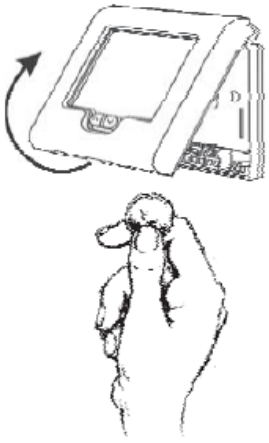
PRIMARY APPLICATION AND INTRODUCTION

Ruskin model Z2000RT thermostat is designed to work with the Z2000 modulating zone control system and all Ruskin "Stand-Alone" zone control solutions. Please take time to read and understand this manual so that installation and testing is undertaken in an efficient and effective manner. Although great care has been taken in the preparation of this manual, Ruskin takes no responsibility for errors or omissions contained herein. It is the responsibility of the installer to ensure that this thermostat and the equipment connected to it operate in a safe and efficient manner.

Due to ongoing product enhancement, Ruskin reserves the right to change the specifications of the Z2000RT without notice.

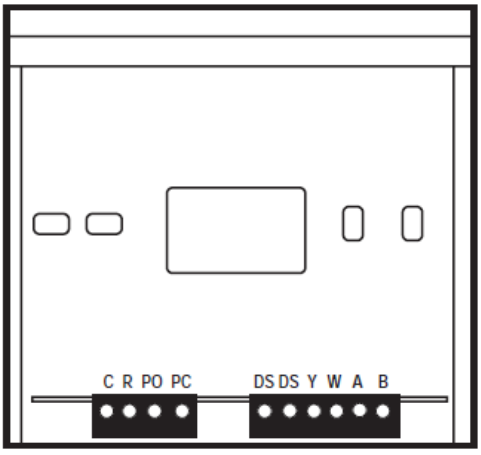
DISASSEMBLY

Insert a small coin in the release slot located on the bottom of the thermostat. Gently twist the coin to release the thermostat from the sub-base. Avoid twisting the case, as this may stress the LCD and cause it to crack or bend the terminal pin connectors.



TERMINAL DESIGNATIONS

The Z2000RT has dedicated screw terminals located on the sub-base to facilitate ease of wiring to the actuator logic card mounted on all Z2000 and "Stand-alone" dampers. When wiring the Z2000RT to the actuator logic card, use standard 18-8 thermostat wire (verify with local codes if plenum rated wire is required).



Sub-Base Detail

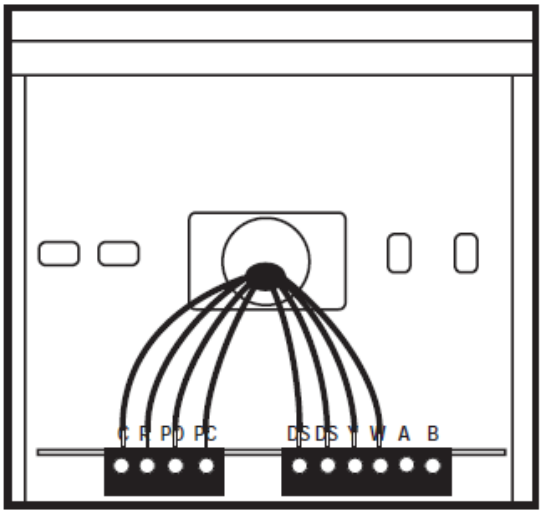
C	24 Volt Common
R	24 Volt Hot
PO	Power Open
PC	Power Close
DS	Duct Sensor
DS	Duct Sensor
Y	Cooling Relay
W	Heating Relay
A	Modbus
B	Modbus

THERMOSTAT LOCATION

The Z2000RT should be installed in a location that represents the ambient space temperature. Do not install the thermostat in an area where drafts are present, near the floor, behind doors or on an external wall. Avoid placing the thermostat in areas where the air movement is limited, affected by direct sunlight or other areas not typical of the temperature in the space.

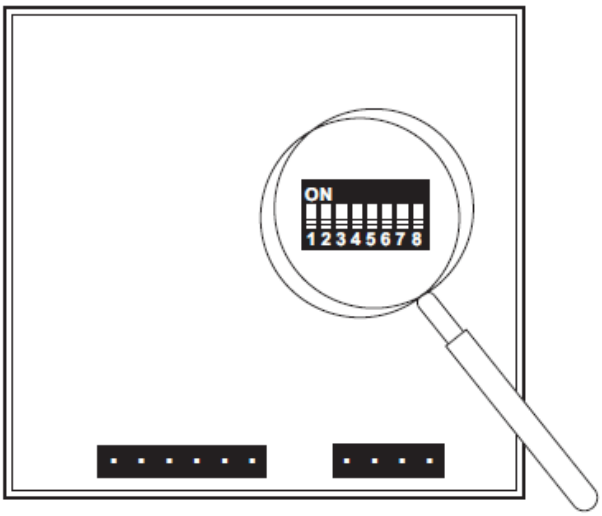
MOUNTING THE SUBBASE

When mounting the Z2000RT, be aware that drafts may travel down wall cavities and enter the back of the thermostat through the control wire hole in the wall. It is important to seal the hole to prevent any drafts that might affect the internal temperature sensor. Pull the control wires through the large opening in the thermostat sub-base then level and mount the sub-base on the wall using the supplied anchors and screws. Do not over-tighten the mounting screws as the sub-base may warp causing improper seating of the thermostat connecting pins to the terminal blocks. Use a properly sized screwdriver and terminate each wire to its dedicated terminal. Do not over-tighten the terminal screws. Check to see that all wires are landed correctly and dressed properly to prevent any shorts.



SWITCH FUNCTIONS

The Z2000RT contains a set of dip switches numbered 1 through 8. Only dip switches 1, 2 and 3 are active.

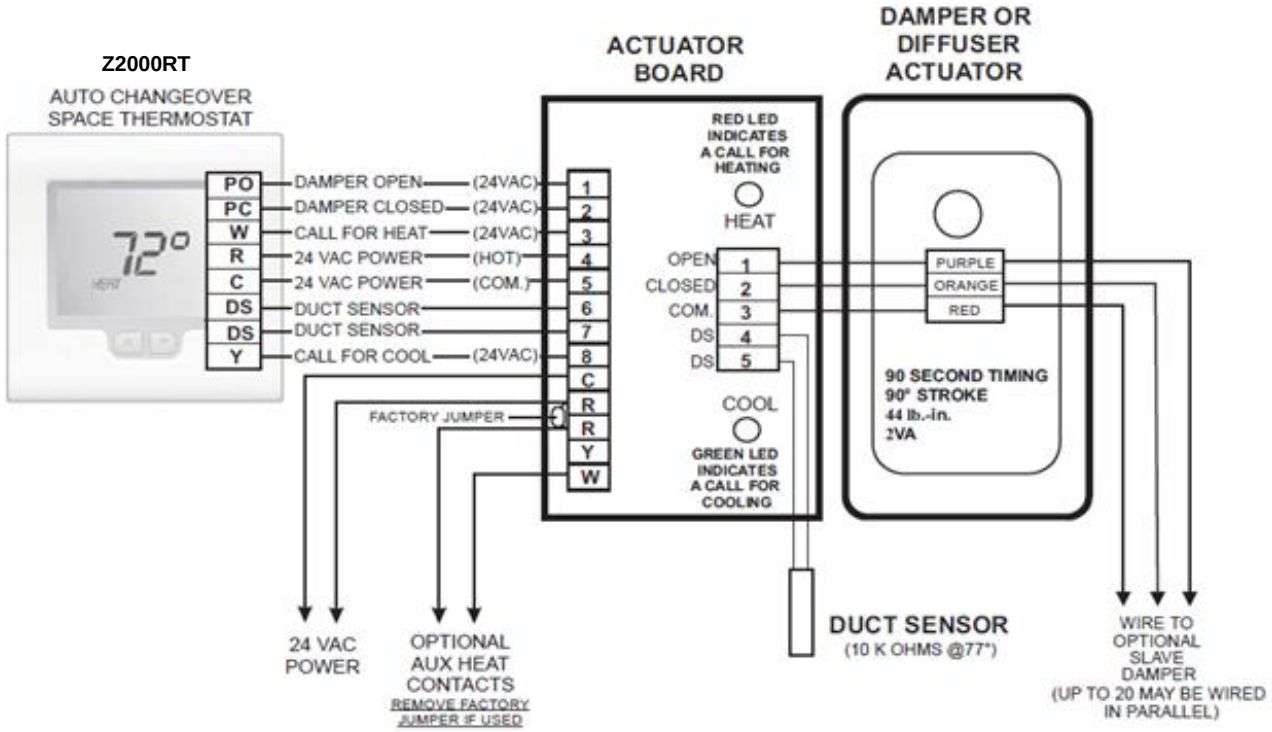


Switch 1 is used to lock the thermostat after setup is completed. When the thermostat is locked (ON position) a padlock icon will show on the LCD. When locked, only setpoint changes and status functions can be accessed by the user. Do not set Switch 1 in the ON position until all setup functions are completed.

Switch 2 is used to display the space temperature, duct temperature and setpoint in Celsius (ON position) or Fahrenheit (OFF position). Select Celsius or Fahrenheit before proceeding to the thermostat setup menu.

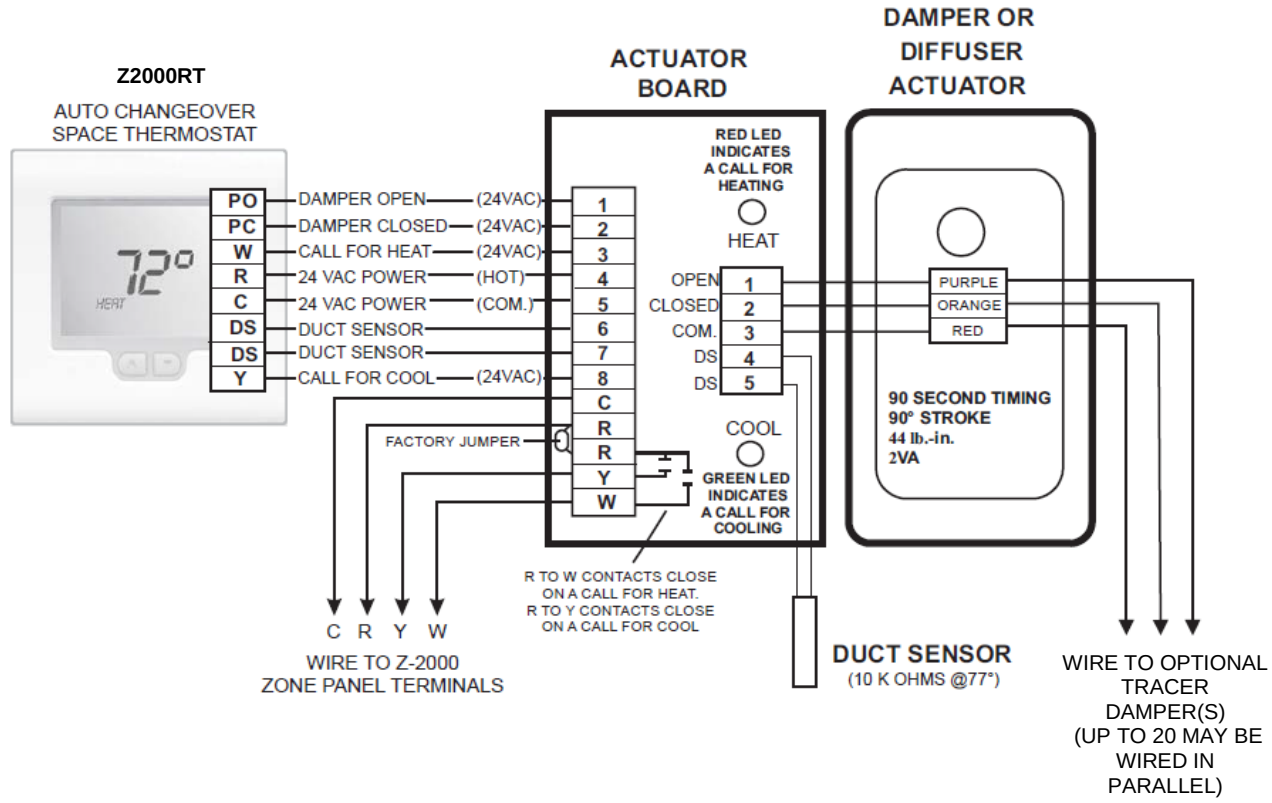
Switch 3 is used to select two-position (ON position) or fully modulating (OFF position) damper control to best suit the specific application requirement.

SYSTEM WIRING DIAGRAMS



PARALLEL)

Stand-Alone Modulating Damper or Diffuser System



Z2000 Modulating Zone Control System

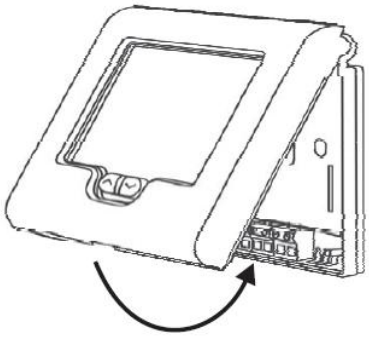
KEY FUNCTIONS

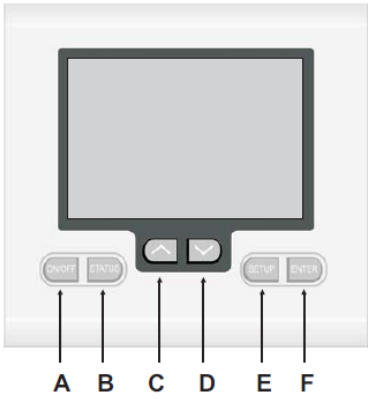
The A = ON/OFF KEY - When the Z2000RT is not locked, this key allows the thermostat to be turned ON or OFF. When in the OFF position, the damper is also driven closed.

B = STATUS KEY - Pressing the STATUS key displays the UNIT number, ZONE number, DUCT temperature and DAMPER position.

C and D = UP and DOWN KEYS - These keys are used to increase or decrease the setpoint as well as change thermostat setup values.

E = SETUP KEY - This key is used to toggle through the thermostat
setup menu.





ATTACHING THE THERMOSTST TO THE SUB-BASE

When attaching the thermostat to the sub-base, first place the hinged access cover on by fitting the plastic molded pins into the grooves at the top of the thermostat. Carefully align the two standoffs located at the top of the thermostat with the slots in the top of the sub-base. Allow the thermostat to swing downward and gently push until the connector pins are fully seated into the terminal blocks.

THERMOSTAT SETUP

Apply 24 Volts power to the thermostat. The LCD Display will momentarily display all icons as shown in Figure 1.

FIGURE 1

ENTERING THE SETUP MENU

Press twice and hold the SETUP key until the word DAMPER appears on the LCD screen as indicated on Figure 2.

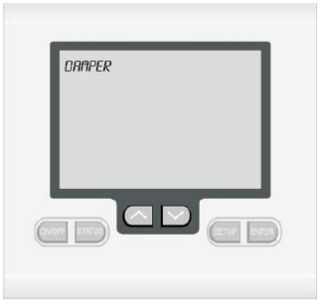


FIGURE 2

SETTING THE MINIMUM DAMPER POSITION

Press the SETUP key again and the LCD will display the minimum damper position. The factory default is 10% which means the damper is driven 90% closed after a heating or cooling call is satisfied. Press the UP and DOWN keys to change the minimum damper position. Position may be adjusted in 10% increments (see Figure 3).

FIGURE 3

SETTING THE MAXIMUM DAMPER POSITION

Press the SETUP key again and the LCD will display the maximum damper position for heating and cooling. The factory default is 100% which means the damper can drive fully open with a call for heating or cooling. Position may be adjusted in 10% increments using the UP and DOWN keys as shown in Figure 4.

FIGURE 4

SETTING A UNIT NUMBER

Press the SETUP key again and the LCD will display the word UNIT. The factory default is 00. This number can be used to assign the Z2000RT to a particular HVAC unit. Use the UP and DOWN keys to assign a UNIT number from 00 to 99. (Figure 5)

FIGURE 5

SETTING A ZONE NUMBER

Press the SETUP key again and the LCD will display the word ZONE. The factory default is 00. This number can be used to identify each Z2000RT thermostat wired to a Z2000 zone control panel or when used in multiple stand-alone applications. Use the UP and DOWN keys to assign a ZONE number from 00 to 99. (Figure 6)

FIGURE 6

SETTING THE HEATING LIMIT

Press the SETUP key again and the LCD will display the heating limit. The factory default is 76° F. Press the UP and DOWN keys to change the heating limit setting. It is strongly recommended that the limit not be set Above Thefactory default setting. (Figure 7)

FIGURE 7

SETTING THE COOLING LIMIT

Press the SETUP key again and the LCD will display the cooling limit. The factory default is 68° F. Press the UP keys to change the cooling limit setting. It is strongly recommended that the limit not be set below the factory default setting. Refer to Figure 8.

FIGURE 8

SETTING THE ACTUATOR SPEED

Press the SETUP key again and the LCD will display the actuator speed. The factory default is 90 seconds which is the time it takes the actuator to drive the damper blade fully open or fully closed. This is a critical step in the Z2000RT setup since the thermostat can be used with a variety of 24 Volt actuators. If you are unsure of the actuator speed, place the actuator in the fully closed position and then apply 24 Volts to common and normally open. The time it takes to drive the damper blade fully open equals the actuator speed setting. (Figure 9)

FIGURE 9

SETTING THE MODBUS ADDRESS

Press the SETUP key again and the LCD will display the Modbus communications address. The factory default is 01. The Z2000RT has integrated Modbus communications capability for remote monitoring and control. For more information on Modus Communications, contact Ruskin (Figure 10).

FIGURE 10

TEMPERATURE CALIBRATION OFFSET

Press the SETUP key again and the LCD will display the temperature calibration offset as shown on Figure 11. The factory default setting is 0. Typically, it is not necessary to adjust the temperature calibration offset as the Z2000RT has been factory calibrated. If calibration is necessary, a high quality electronic digital thermometer must be used. Place the thermometer sensor probe next to the thermostat sensor and allow five minutes before comparing the temperature readings. Use the UP and DOWN keys to adjust the temperature calibration. The range is +/- 9° F.

FIGURE 11

SENSOR LOCATION

SAVING SETTINGS AND EXITING THE SETUP MENU

Press the ENTER key and the Z2000RT will save the setup menu settings and exit the program. The LCD will display the space temperature along with other normal operating functions. To review the thermostat settings, simply press and hold the SETUP key until the setup menu is displayed and then toggle through the settings. Press the ENTER key to exit the setup menu. Remove the thermostat from the sub-base and set Switch 1 in the ON position to lock the thermostat which will prevent setup changes from being made. When the thermostat is locked, a padlock icon will be displayed on the LCD as shown on Figure 12.

FIGURE 12

HELPFUL HINT

If it is necessary to exit the setup menu before all setup functions are completed, simply press the ENTER key and all settings will be saved. To re-enter the setup menu, press and hold the SETUP key until the word DAMPER appears and then continue pressing the SETUP key to toggle through the functions to where you left off

CHECKING THERMOSTAT STATUS POINTS

After the thermostat is locked and operational, its status functions can be checked by pressing the STATUS key twice and toggling through the following status points:

UNIT - Displays the HVAC unit number assigned to thermostat.

ZONE - Displays the thermostat zone number.

DUCT - Displays the duct temperature.

DAMPER - Displays the damper position in one degree increments. (0% = fully closed and 100% = fully open)

THERMOSTAT OPERATION

The Z2000RT is designed to provide accurate but simple temperature control for the user. When the thermostat is not calling, only the space temperature is displayed on the LCD along with the padlock icon that confirms the thermostat setup functions cannot be changed. The user can use the UP and DOWN keys to change the thermostat setpoint within the setpoint limits and review the status points by pressing the STATUS key (Figure 13).

FIGURE 13

FIGURE 14

CHANGING THE SETPOINT

When the UP and DOWN keys are pressed, the thermostat will display the word SET. The setpoint then can be changed within the setpoint limits (Figure 14).

CALL FOR HEATING

When the thermostat calls for heating, the word HEAT will be displayed on the LCD as shown on Figure 15.

FIGURE 15

CALL FOR COOLING

When the thermostat calls for cooling, the word COOL will be displayed on the LCD as indicated on Figure 16

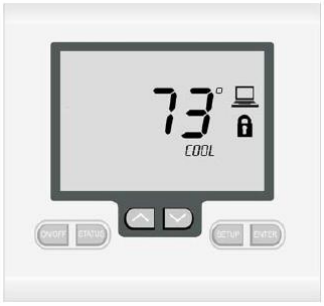


FIGURE 16

DAMPER POSITION OVERRIDE

The Z2000RT has a damper position override feature to assist in air balancing and bypass damper setup. With the thermostat unlocked, press twice and hold the SETUP key until the word DAMPER appears on the LCD as reflected on Figure 17.

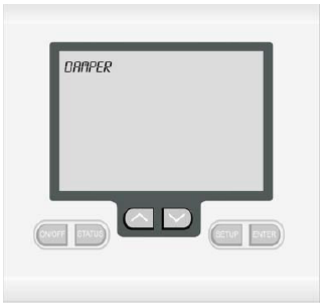


FIGURE 17

OVERRIDE TO OPEN

Press the UP and DOWN keys until the word OPEN appears on the LCD and then press the ENTER key. The damper will drive open and remain in the open position until the override is cancelled. See Figure 18 for details.

FIGURE 18

OVERRIDE TO CLOSE

Press the UP and DOWN keys until the word CLOSED appears on the LCD and press the ENTER key. The damper will drive closed and remain in the closed
position until the override is cancelled. (Figure 19)

FIGURE 19

ADVANCED FUNCTIONS

CANCELLING THE DAMPER OVERRIDE

In order for the Z2000RT to control normal damper operation, the override must be cancelled. Press and hold the SETUP key until the word DAMPER OPEN or DAMPER CLOSE appears on the LCD. Use the UP or DOWN key until only the word DAMPER is displayed and then press the ENTER key. The thermostat will then resume normal operation. Refer to Figure 20.

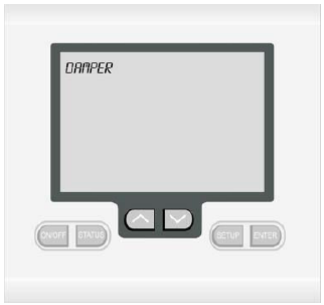


FIGURE 20

Z2000RT SPECIFICATIONS

Input Voltage	24 VAC 50/60 Hz
Relay Rating	24 VAC @ 1Amp per relay
Operating Temperature	23° F to 122° F Operating RH 0-
95% (non-condensing)	
Size	4-7/16” W x 4-1/16” H x 7/8” D LCD
Display Size	2-3/4” W x 1-7/8” H Temperature
Sensor	10K NTC type 3
Accuracy	+/- 1° F @ 77° F Display
Resolution	1° F
Control Range	36° F to 96° F
Back Light	Blue EL (Electro Luminescent) Back
Light Life	3,000 hours to half brightness
Communications Protocol	Modbus
Approvals	FCC (Part 15) (Pending) C-tick
Warranty	5 years

RoHS Compliant

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