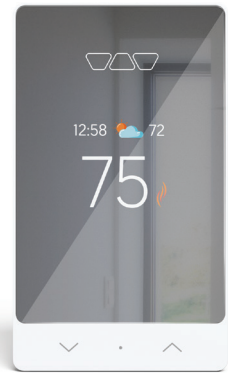




P R O F I L E   O F   I N N O V A T I O N

# White Paper

## Using the Option of Second Stage Heating with the Schluter®-DITRA-HEAT-E-RS1 Smart Thermostat



### INTRODUCTION

This document explains how to set the Schluter®-DITRA-HEAT-E-RS1 smart thermostat to introduce second stage heating, describes the necessary additional electrical devices required, the application options, and provides an installation diagram of the system.

### BACKGROUND

Second stage heating provides supplemental heating to an existing or primary heating system in a room or house, when the existing or primary heating system is not sufficient in maintaining the desired ambient temperature. Various methods can be used to accomplish second stage heating, and one of them is with the use of the Schluter®-DITRA-HEAT-E-RS1 smart thermostat.

When floor warming is the preferred primary heating method, with maximum feet and radiant heating comfort, the Schluter®-DITRA-HEAT-E-RS1 smart thermostat can be used to supply second stage heating, for those cold days when floor warming is insufficient. To use this feature, the thermostat must be in ambient temperature control mode and a maximum floor temperature must be set. When the maximum floor temperature is reached, but the ambient temperature is not, the thermostat will activate the second stage heating.

### REQUIREMENTS AND LIMITATIONS

**A.** Using the Schluter®-DITRA-HEAT-E-RS1 smart thermostat to provide second stage heating requires the following additional electrical devices:

**1.** A listed/certified transformer:

- Output (secondary voltage): 24 Volt DC or AC at a minimum current of 100 mA, or minimum 2.4 watts
- Input (primary voltage): Equivalent to the required voltage for the second stage heating device, whether it be:
  - i. a baseboard heater, or
  - ii. a wall convactor/radiator without a fan, or
  - iii. a wall convactor with a fan, or
  - iv. a radiant cove heater, or other radiant unit heater, or

- v. a motorized air vent damper of a central heating system. In this case, if the supply voltage to the motor is 24 Volt, a transformer is not needed. Please consult the vendor or installer of your central heating system prior to installing any of them, as dampers may unbalance the duct air flows of the whole system.

**2.** An electromechanical relay, or a solid-state relay which is listed/certified:

- An electromechanical relay is preferred for the cases where the relay will have little room and/or no air vents to dissipate its heat.
- A solid-state relay makes no noise and will last longer compared to an electromechanical relay, but is larger as it has a heat sink to dissipate its heat. It therefore requires more space to install and some additional room or air vents to dissipate its heat.
- An electromechanical relay (Long) ...
  - i. is recommended for use with:
    - a. Any heater equipped with a fan
    - b. A motorized air vent damper (See No. 1 above)
  - ii. can be used with any other type of heater
- A solid-state relay (Fast) ...
  - i. is not recommended for use with:
    - c. Any heater equipped with a fan
    - d. A motorized air vent damper (See No. 1 above)
  - ii. can be used with any other type of heater.

OR

**3.** A combination of a transformer and relay in a single listed/certified device:

- Transformer section as No. 1 above
- Relay section as No. 2 above

AND

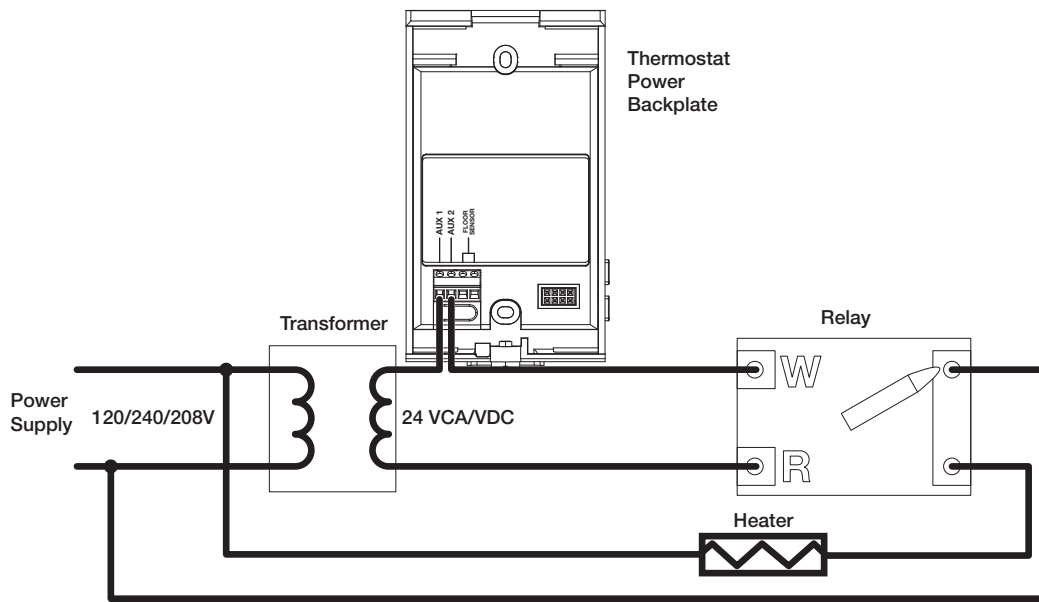
**4.** An enclosure to contain No. 1 and No. 2, or No. 3, above with all the wiring and connections, which could be:

- the inside of one of the junction compartments of a baseboard heater, or a radiant cove heater, or
- the inside of the junction compartment of a wall convactor/radiator, or radiant unit heater, or
- a listed/certified junction box or enclosure with the space and location to install it and have access to it.

**B.** Setting the Auxiliary Output function of the thermostat, there are three (3) choices which can be chosen from either the menu of the thermostat itself, or from the App:

1. EXP (Thermostat)/Power Module (App): Should be used only when using the Schluter-DITRA-HEAT-ERRS power module(s), or when second stage heating is not desired.
2. FAST (Thermostat)/2nd Stage SSR-Fast (App): Is a short cycle (15 seconds) control output function to be used only with solid-state relays.
3. LONG (Thermostat)/2nd Stage Relay-Long (App): Is a long cycle (15 minutes) control output function to be used with electromechanical relays, or with solid-state relays, or when the heater is equipped with a fan or a motor.

# INSTALLATION DRAWING



## RECOMMENDATIONS

Use a transformer-relay combination device such as the following:

- For 240 volt or 208 volt heaters
  - o Honeywell/Aube RC840T-240 for heaters requiring a maximum of 22 amps
- For 120 volt heaters
  - o Honeywell/Aube RC840T-240 for heaters requiring a maximum of 22 amps

## WIRING CONNECTIONS USING HONEYWELL/AUBE RC840T TRANSFORMER-RELAY DEVICES

