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**BULLETIN**

**S030a**

**June 2018**

## **Indoor Unit Auxiliary Heater Control**

This Bulletin provides explanation of, and field instruction for, using an indoor unit external output for auxiliary heater operation. For complete I/O use and function, please refer to the applicable Indoor Unit Installation Manual and Design and Technical Manual.

Items required: (See also 2. Control Circuitry)

- (1) Fujitsu accessory part # UTY—XWZXZC
- (1) 12 DC relay, RIBU1C / RIBH1C or equivalent

### **1. External output description**

a. Airstage indoor units provide an auxiliary heat output that can be used to control operation of a 3<sup>rd</sup> party heat source. This may include, but not be limited to:

- Duct heater (In-line)
  - i. Electric
  - ii. Gas
- Hydronic
  - i. Hot water baseboard
  - ii. Cast iron radiation
  - iii. Hot water coil (duct)
- Infrared

2. Control circuitry- The 12 volt DC output from the Airstage indoor unit is used to energize a 3<sup>rd</sup> party DC delay. The relay NO (normally open) contacts are used to complete the auxiliary heat control circuit.

- a. Field provided accessory- Fujitsu recommends use of the RIB relay, model series RIBU1C or RIBH1C, as the relay coil meets the voltage and current requirements of:
  - i. 12 VDC
  - ii. 50 mA maximum holding current
- b. Fujitsu accessory- An external output accessory wiring harness is required:
  - i. UTY-XWZXZC

- c. Control signal- The 12 VDC output from indoor unit connector CNB01 to energize the field provided DC relay. The isolated relay contacts to complete the control circuit operation for a zone valve, circulator relay or auxiliary heat contactor, etc.
3. External heater sequence of operation- (Referencing factory default Indoor Unit Function Settings 61, 62)
- a. Aux Heat ON- 12 VDC output from indoor unit control board CNB01, pins 1 & 5, when the indoor temperature is 5.4° F. (-3°C) below the heat setpoint AND the unit is in HEAT mode.
    - i. Heater ON conditions are adjustable via Remote Control Function Code 62. See Indoor Unit Installation Manual for details.
  - b. Auxiliary Heat OFF- 0 VDC when the indoor temperature is equal to or less than 1.8° F. from the heat setpoint.
  - c. External output logic:

Operation	Pins	Volts DC
External heater ON	1 - 5	12 V
External heater OFF	1 - 5	0 V

4. Auxiliary Heat Control Wiring- See Fig. 1, page 3.
- a. Connect Fujitsu accessory UTY- XWZXZC to indoor unit control board connector CNB01 (connector locations may vary upon unit model number)
  - b. Wire the DC relay coil CNB01 pins 1 and 5.
  - c. Wire the NO (normally open) relay contacts to the auxiliary heat control circuit.
  - d. Wiring notes:
    - i. Use 22 AWG twisted pair wiring from the indoor unit to the DC relay (“Fujitsu Pink” Honeywell Catalog # 3254 acceptable)
    - ii. Cable maximum length from indoor unit to relay: 82’ (25m)
    - iii. Keep twisted pair wiring separate from line voltage wiring
    - iv. All accessory UTY-XWZXZC connections should be soldered and insulated, or made with butt type crimp connectors.

1. Wire nuts not permitted

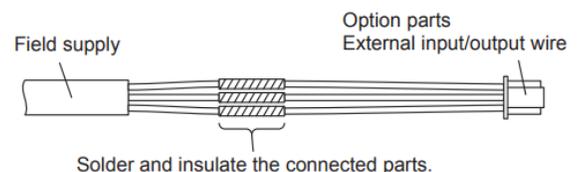
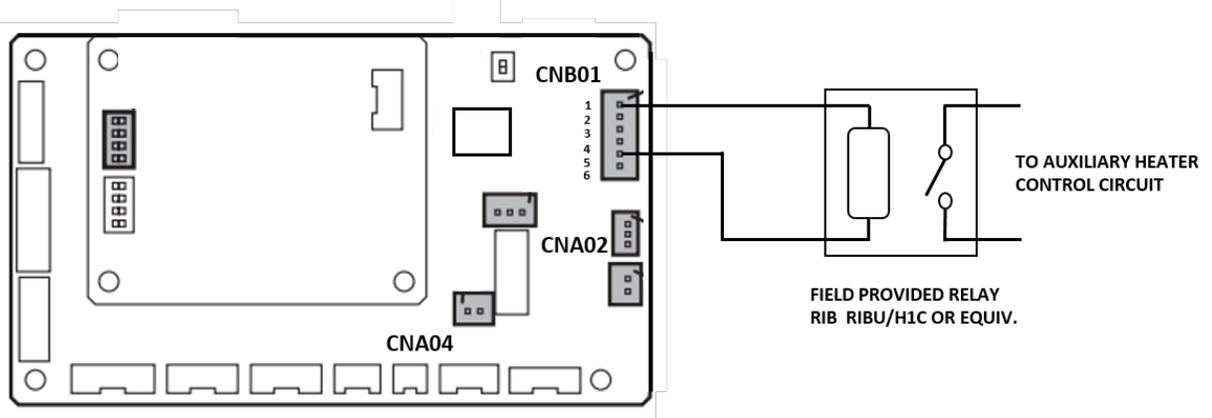


Fig. 1



5. Auxiliary Heat operation

- a. Auxiliary heat set point- In many cases, the factory default settings can be used for auxiliary heat control depending upon desired operation.

Heat sequence of operation summary:

- i. Primary heat- VRF system
- ii. Auxiliary heat (Control temperatures are adjustable, see Installation Manual Function Code 62) Default settings:
  1. Energized- Auxiliary heat ON 5.4° F. below set point
  2. Denergized- Auxiliary heat OFF at 1.8° F. below set point

- 6. Auxiliary Heat Control- There are multiple options for auxiliary heat control, defined below and configured as a Function Code 61 from the Remote Control or Service Tool: (See D&T Manual for complete description)

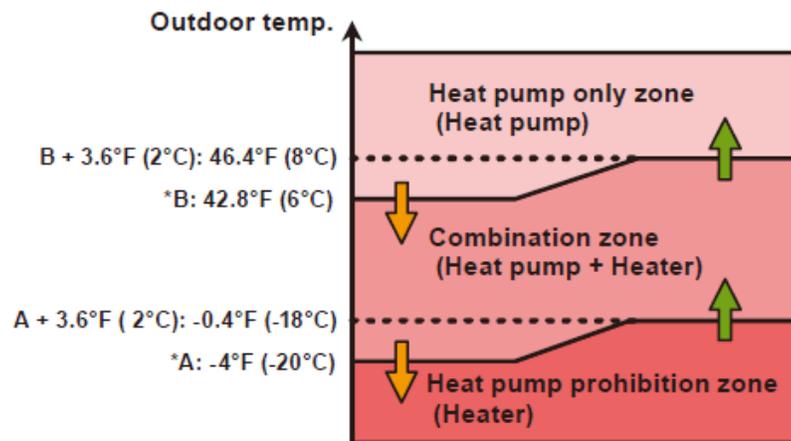
Control switching of external heaters	61	00	Auxiliary heater control 1	●
		01	Auxiliary heater control 2	
		02	Heat pump prohibition control	
		03 *3	Heater selection control using external temperature 1	
		04 *3	Heater selection control using external temperature 2	

- a. Function 61, “Control Switching of External Heaters”
  - i. Setting 00 (default)- Aux Heat Control 1 – Aux heat initiated by heat set point deviation
    - 1. Aux heat lockout when room temp is 21.6° F. below heat setpoint.
  - ii. Setting 01- Aux Heat Control 2- Same as Aux Heat Control 1, however no aux heat lockout
  - iii. Setting 02- “Heat Pump Prohibition Control”- The auxiliary heat source is the primary heat (No VRF heat operation)
  - iv. Setting 03- HSCOT- “Heater Selection Control by Outdoor Temperature 1” HSCOT 1- Uses 3 heat sequence strategies based upon selectable OD temperatures (Function Code 62)

See Figure 2:

- 1. Heat Pump Only Zone- Aux heat inhibit
- 2. Combination Zone (Heat Pump and Auxiliary heat)
- 3. Heat Pump Prohibition Zone (Auxiliary heat only)

Fig. 2



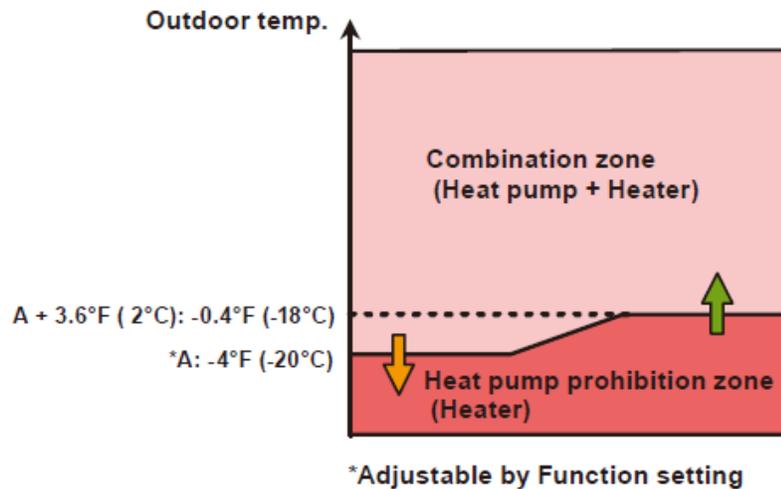
\*Adjustable by Function setting

- v. Setting 04- HSCOT 2- Uses 2 heat sequence strategies based upon selectable OD temperatures. (Function Code 62)

See Figure 3:

1. Heat Pump and Auxiliary heat
2. Auxiliary heat only

Fig. 3



- b. Function Code 61-03, 61-04- Control switching of external heater notes:
  - i. Applicable to VR-II Heat Recovery systems only.
  - ii. Outdoor unit function code 35 "Presence of Heater Selection.." must be enabled.

3	5	Presence of heater selection control using outdoor temperature	0	0	Disable	●	○	- *1	Setting required to validate the setting of heater selection control using outdoor temperature 1 and 2 (setting value: 03 or 04) in field setting 61 (indoor unit) for heater control switching. For details, refer to Chapter 8. 1-2-2. EXTERNAL OUTPUT.
			0	1	Enable				



# Service

# BULLETIN

S030a

June 2018

7. Additional notes:

- a. Indoor fan operation
  - i. In-line heater- Fan may be configured to operate during inline duct heater use.
    - 1. Indoor unit control board DIP switch 2-3 to ON
  - ii. Other than in-line hater use- Function code 61-02, 61-03, 61-04
    - 1. Indoor unit control board DIP switch 2-3 to OFF
    - 2. When the individual Remote Control on-board “thermosensor” is not enabled, the fan setting will remain ON for safety purposes.
  - iii. Remote temperature sensing option- Indoor units may also use a remote analog temperature sensor accessory:
    - a. Remote Sensor UTY-XSZX
- b. Design and Technical Manual (D&T)- Please refer to the model series D&T Manual for complete auxiliary heat set up and use details.
- c. Fujitsu General America is not liable for auxiliary heating control design.

8. Additional indoor unit control option references:

Indoor Unit Function	Service Bulletin
Auxiliary Heat Control	S030a
3 <sup>rd</sup> Party Condensate Pump Shutdown	S030b
Occupancy Sensor Control	S030c
Proximity Sensor Control	S030d
Smoke Detector / Emergency Stop Control	S030e
Fresh Air / Exhaust Interlock	S030f
Indoor Unit External Error Notification	S030g

Application Engineering Bulletin	AE Bulletin
I/O External Input and Output Use	AE030

Please contact your local Airstage Distributor or Fujitsu General America Incorporated for technical assistance:

FGAI Technical Support- (866) 952-8324 8:00 a.m. – 8:00 p.m. EST, Monday - Friday



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