I/O - External Input and Outputs (Indoor Units)

This Application Engineering provides explanation of Airstage indoor unit external input and output use. I/O functions are available for common control applications, which require an accessory connector to facilitate control circuit wiring. For complete I/O use and function, please refer to the applicable Indoor Unit Installation Manual or Design and Technical Manual. For wiring and set up of specific I/O tasks, please refer to the Service Bulletin table in 6.

1. External input description
   a. Operation / Stop (Start / Stop)- Indoor unit operates until normally closed (NC) contacts OPEN, then the indoor unit is OFF. Indoor unit resumes operation upon contact closure. Example use to include PIR passive infrared sensor (occupancy sensor) or window casing (proximity) sensor.

Input signal	Unit Operation
CLOSED	ON
OPEN	OFF

   b. Emergency Stop- Indoor unit operates until normally open (NO) contacts CLOSE, then the respective refrigeration system shuts down immediately. All ID and OD units within the same REF AD remain OFF until both conditions are met:
      • Contacts OPEN
      • Unit ON command from Remote Control, System Controller, etc.
   Examples to include a smoke detector, fire control panel, etc.

Input signal	Unit Operation
OPEN	ON
CLOSED	OFF

   c. Forced Stop- Indoor unit operates until NO contacts CLOSE, then the designated unit is turned OFF, and EEV is driven to the fully closed (45P) position. Indoor unit resumes operation when both conditions are met:
      • Contacts OPEN
      • Unit ON command from Remote Control, System Controller, etc.

   Examples to include a 3rd party condensate pump, float, drain sensor, etc.

Input signal	Unit Operation
OPEN	ON
CLOSED	OFF

    d. Forced thermostat OFF- Unit operates (indoor unit EEV pulsed normally) until NO contacts close. EEV is driven closed, indoor fan operates [as normal with default setting]. When contacts OPEN, the EEV resumes normal pulse control.

2. External output description

    a. Operation / Stop- 12 VDC output from indoor unit control board anytime the indoor unit status is ON, even if no demand is present. 0 VDC when the unit is OFF.

    b. Normal / Error- 12 VDC output from indoor unit control board anytime an error occurs with the indoor unit. 0 VDC when the error is no longer active.

    c. Indoor fan stop / operation- 12 VDC output from indoor unit control board anytime the indoor unit FAN is ON. 0 VDC when the unit FAN is OFF.

    d. External heater- 12 VDC output from indoor unit control board CNB01 anytime the indoor temperature is 5.4° F. (-3°C) AND the unit is in HEAT mode. (Heater ON and OFF conditions are adjustable via Remote Control Function Code) Temperature 0 VDC when the indoor temperature is equal to or less than .9° F. from the heat setpoint. Use of this function to operate existing or new heat source as deemed necessary. Output from CNB01 to energize a field provided DC relay to provide control circuit operation to a zone valve, circulator relay or auxiliary heat contactor, etc.

Indoor Unit External Output Logic

Operation	Pins	Volts DC
Stop	1 - 2	0 V
Start (Operation)	1 - 2	12 V
Normal	1 - 3	0 V
Error	1 - 3	12 V
Fan OFF	1 - 4	0 V
Fan ON	1 - 4	12 V
External heater OFF	1 - 5	0 V
External heater ON	1 - 5	12 V

3. Installation- Table 1 on p. 3 details the requires Fujitsu accessory connector for the desired I/O function. Please note that all external input functions herein are considered dry contacts using the "edge" control type.
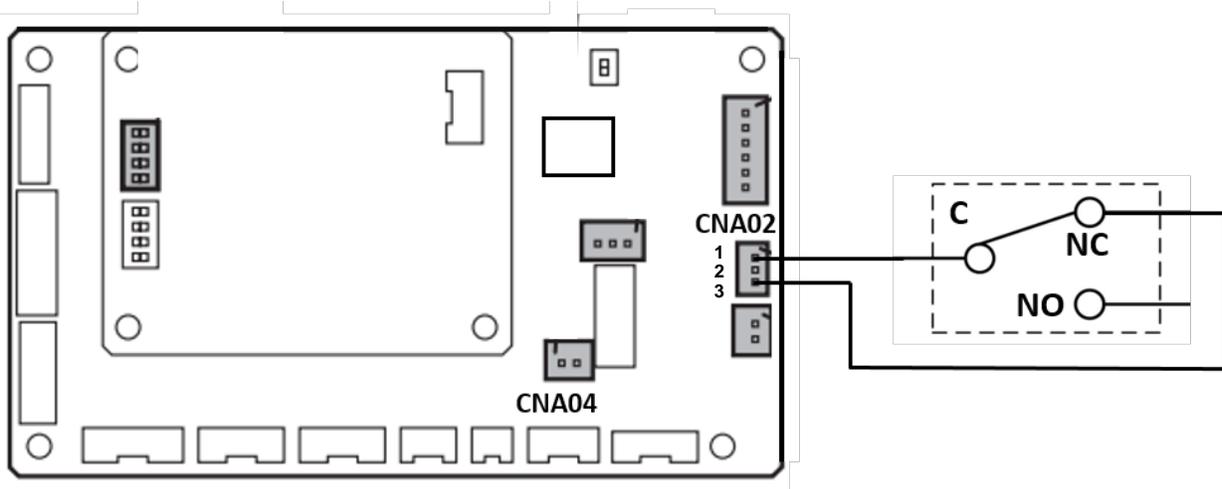
Table 1.

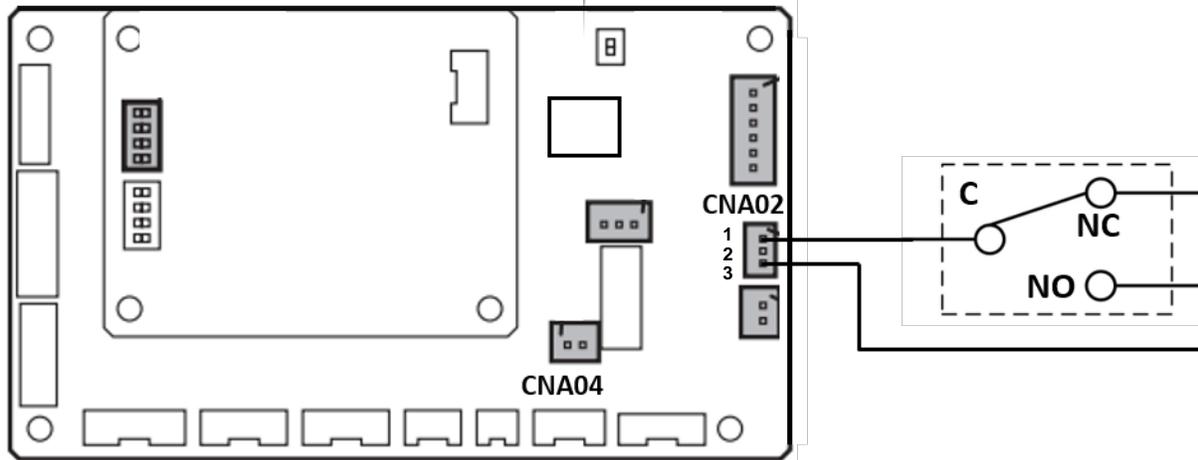| Function	Connector	Pins	State	Accessory	Type	Function Code
Stop / Start	CNA02	1 - 3	NC	UTY-XWZXZD	Input - Dry	46 / 00 (default)
Emergency Stop	CNA02	1 - 3	NO	UTY-XWZXZD	Input - Dry	46 / 01
Forced Stop	CNA02	1 - 3	NO	UTY-XWZXZD	Input - Dry	46 / 02
Forced Thermostat Off	CNA04	1 - 2	NO	UTY-XWZXZE	Input - Dry	
3rd Party Condensate Shutdown	CN5	1 - 3	NO	K9702290016	Input - Dry	
Operation / Stop	CNB01	1 - 2		UTY-XWZXZC	Output - 12 VDC	
Normal / Error	CNB01	1 - 3		UTY-XWZXZC	Output - 12 VDC	
Indoor Fan Stop / Operation	CNB01	1 - 4		UTY-XWZXZC	Output - 12 VDC	
External Heater	CNB01	1 - 5		UTY-XWZXZC	Output - 12 VDC	62 / 00 - 05

4. Connection

    a. External input- Refer to the following diagrams for connection typical. Note CNA** connector locations will vary upon unit model number:
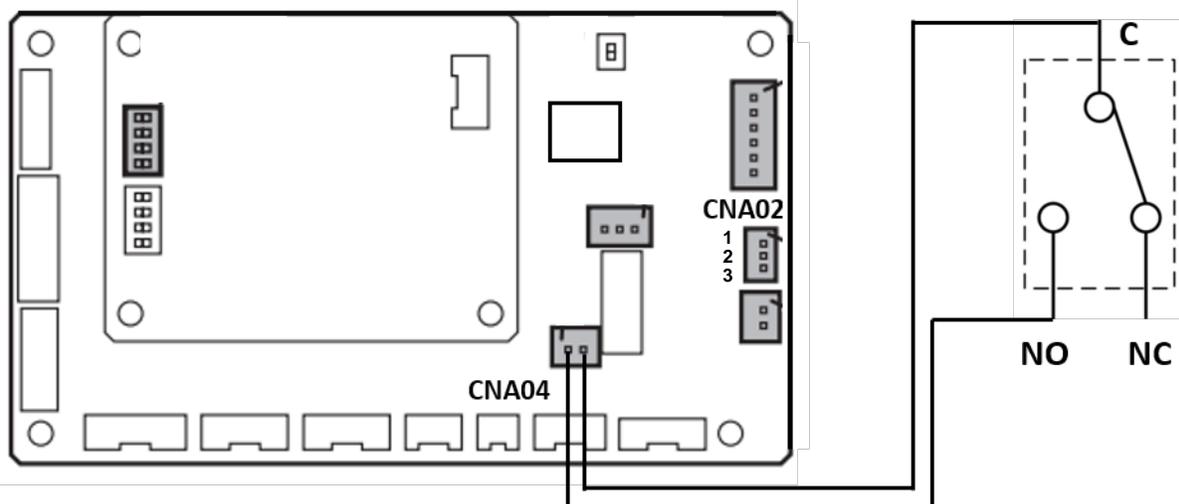
        1. Stop / Start- Connect CNA02 pins 1 – 3 to the normally closed (NC) contacts on the device.

2. Emergency Stop and Forced Stop- Connect CNA02 pins 1 – 3 to the normally open (NO) contacts on the device:

3. Forced Thermostat OFF- Connect CNA04 pins 1 – 2 to the normally open (NO) contacts on the device.
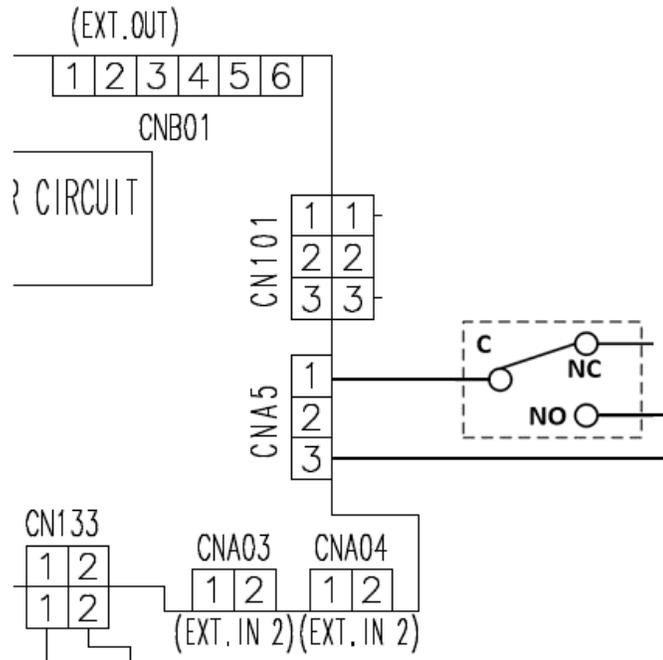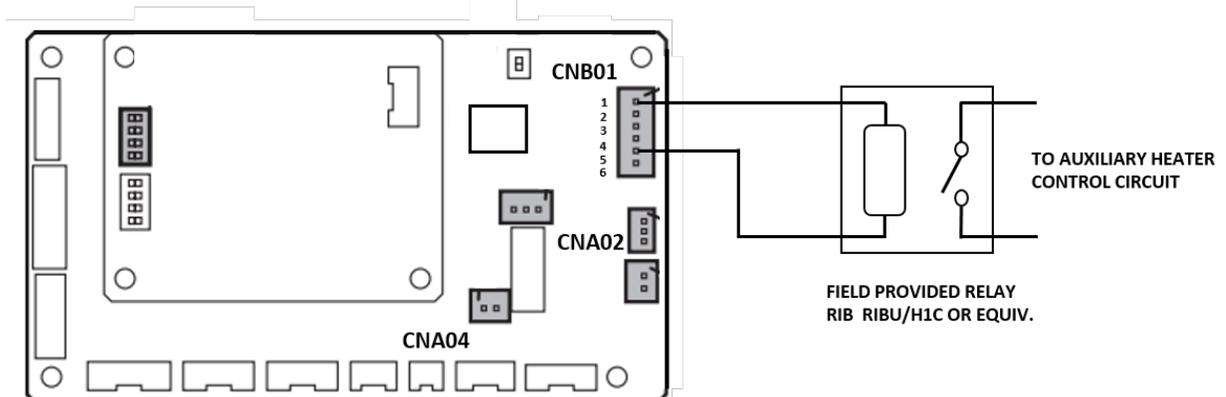
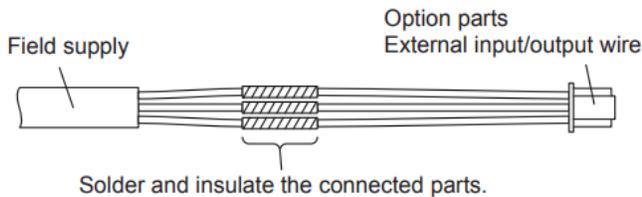4. Float Switch "FLOAT SW"- Connect CNA5 pins 1 – 3, to the NO, normally open, contacts of the condensate device.

b. External outputs- A field provided relay is required, 12 VDC coil with a holding current not to exceed 50mA. RIB relay model RIBU1C or equivalent.

Auxiliary heat connection shown, refer to Figure 1 for the pin connections for the desired external output function.

5. Wiring

      a. Use twisted pair cable, 22 AWG minimum.

      b. Keep input wiring separate from line voltage wiring.

      c. All UTY-XWZ*** connections should be soldered and insulated, or made with insulated, butt type crimp connectors.

NOT APPROVED   APPROVED

- External input- Maximum length 492' (150 m).
- External output- Maximum length 82' (25 m).

6. Service Bulletins- Service Bulletins for specific I/O tasks may be used for field use:

Indoor Unit Function	Service Bulletin
Auxiliary Heat Control	S030a
3rd 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

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

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