FUJITSU AIRSTAGE

V-Series
J-Series

APPLICATION BULLETIN

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Supersedes A20220517B

Subject: Condensate Shutdown Options for Airstage VRF Indoor Units

Introduction:

Recent production changes to all –TLAV2 indoor units provide the option to reverse external input logic to facilitate common 3rd party condensate devices, using normally closed or normally open dry contacts. This bulletin provides explanation and field instruction for using dry contact, external input options using (3) different Fujitsu cable accessories to shutdown a J-Series or V-Series indoor unit upon a condensate overflow event. For complete external input and output use and function, please refer to the applicable indoor unit Installation Manual and Design and Technical Manual, D&T.

Note– Airstage VRF indoor unit models ARUL**TLAV2 incorporate a factory installed, internal condensate pump and float switch connections. However, external inputs to connector CNA02 or CNA04 may still be used for an auxiliary condensate device.

Discussion:

Airstage indoor units provide multiple external input functions that can be used to shut down the indoor unit and drive the EEV closed upon a condensate event, when connected to a 3rd party condensate device. Field provided condensate devices may include, but are not limited to:

- Condensate pump float contacts
- Auxiliary drain pan sensor or switch
- Drain sensor

External input control options and cable accessory for condensate shutdown

The table below details the available external input options for condensate shutdown. Current production –TLAV2 indoor units which use PCB connector CNA02 have the option of reversing the logic to facilitate common condensate device contact configurations:

Input function	PCB connector	Pins	Logic	Option	Accessory	Function Setting	Reverse logic option
FLOAT SW	CNA5 / CNA05	1 – 3	NO		9702290016		
Operation/Stop	CNA02	1 – 3	NC	NO	UTY-XWZXZD	46-00 (default)	46-10
Emergency Stop		1 – 3	NO	NC		46-01	46-11
Forced Stop		1 – 3	NO	NC		46-02	46-12
Forced Thermostat OFF	CNA04	1 – 2	NO		UTY-XWZXZE		

Dry contact logic:

- NC = Normally Closed
- NO = Normally Open

External input control summary

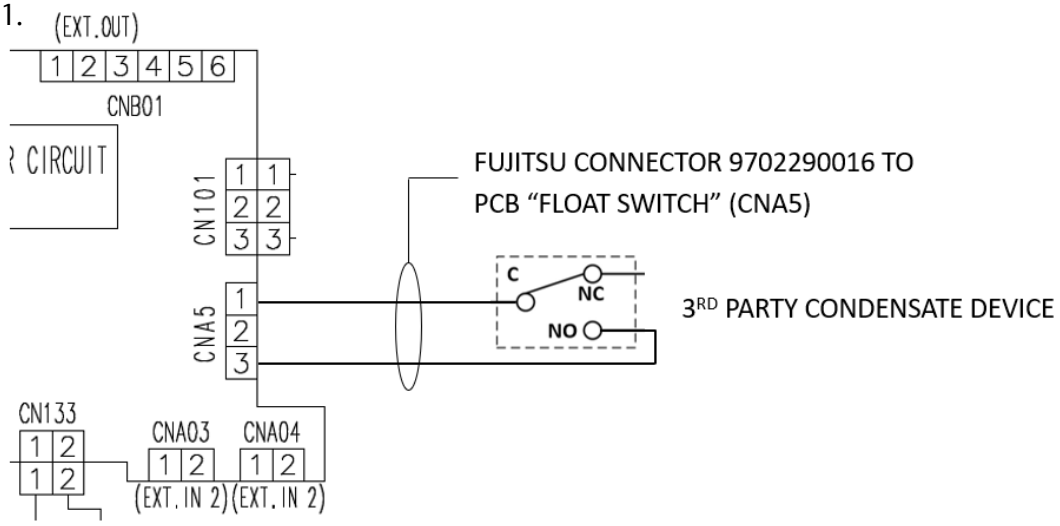
1. "FLOAT SWITCH"- normally open contacts only. Provides error notification upon a condensate event.
2. Operation / Stop– normally closed, with normally open option. No error notification.
3. Emergency Stop– normally open, with normally closed option. Provides error notification, all indoor units in the refrigerant circuit and the outdoor unit shut down.
4. Forced Stop– normally open, with normally closed option. No error notification.
5. Forced thermostat OFF– Normally open only, no error notification.

Control circuitry:

1."FLOAT SWITCH"- The 3rd party condensate device is wired as an external input to the Airstage indoor unit control board, connector labeled as "FLOAT SW". The 3rd party condensate device must be equipped with a set of NO, normally open, dry contacts also referred to as "alarm" contacts. Logic reversal is not available when using this option.

- Fujitsu item required– Connector cable part # 9702290016. Cut and discard the plug on the pump end of the wire accessory.
- Wire the condensate device NORMALLY OPEN contacts to indoor unit connector CNA5 pins 1 and 3, labeled, "FLOAT SWITCH". (FLOAT SWITCH CN* number may vary upon unit model number) See Fig. 1.:

Fig. 1.



- Sequence of operation- The Airstage indoor unit operates normally until a condensate overflow is detected by the 3rd party condensate device. When the device normally open contacts close, the indoor unit is turned OFF, and EEV is driven to the fully closed (40 or 45P) position to prevent refrigerant flow into the indoor unit coil.

  Indoor unit will resume operation when both conditions are met:

  1. Condensate device contacts OPEN:
  2. Time delay– After the condensate device contact state has been restored, the system will resume normal operation within 3 minutes.

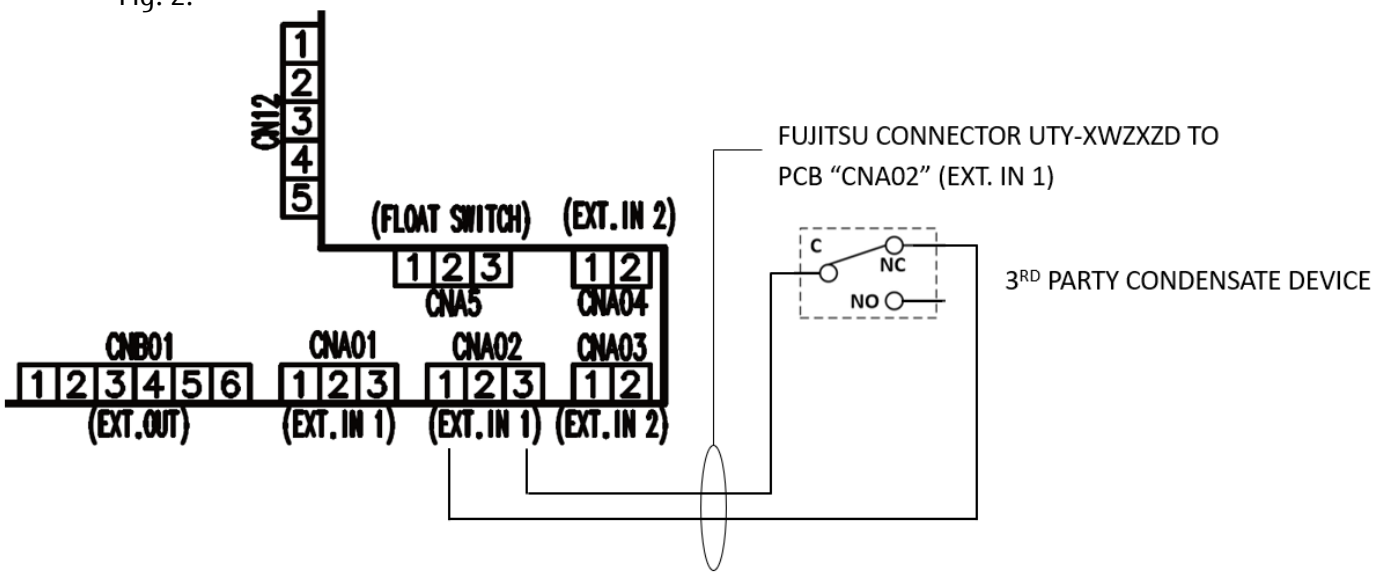
- Alarm notification– After (3) consecutive minutes of device contact closure, a "53" series error code is generated at:
  1. Remote control- Notification is displayed at the remote control screen; access to error notifications may vary depending upon remote control type.
  2. Other control accessories- Error code 53 is also displayed within applicable Fujitsu controllers (Touch Panel Control, Central Remote Control, etc.) and within Service Tool.

2. "Operation / Stop"- The 3rd party condensate device is wired as an external input to the Airstage indoor unit control board, connector labeled as "CNA02". The 3rd party condensate device NC, normally closed, dry contacts are connected to the indoor unit PCB.

Fujitsu item required– Connector cable part # UTY-XWZXZD

- Control signal- The 3rd party condensate device NC contacts are wired as an input to the indoor unit connector labeled, "CNA02", pins 1 & 3. See Fig. 2.:

Fig. 2.



- Sequence of operation- The Airstage indoor unit operates normally until a condensate overflow is detected by the 3rd party condensate device. When the device normally closed contacts open, the indoor unit is turned OFF, and EEV is driven to the fully closed (40 or 45P) position to prevent refrigerant flow into the indoor unit coil, and the wired remote control , RC, will go blank. Only the indoor unit, or indoor units in the same RC group, which receive the STOP command will turn OFF.

  Indoor unit will resume operation when:

  1. Condensate device contacts CLOSE:
- Alarm notification– There are no alarm notifications with this input option.
- Function setting– For the "Operation / Stop" function to operate, there are no indoor unit function setting changes required. The default setting 46, option 00 should be checked and adjusted back to the default, if necessary (46-00).
- Reverse logic– If a normally open (NO) contact use is required, the logic may be reversed from normally closed, NC, to normally open, NO, by changing indoor unit function setting 46 to option 10 (46-10).

Input function	PCB connector	Pins	Logic	Option	Accessory	Function Setting	Reverse logic option
Operation/Stop	CNA02	1 – 3	NC	NO	UTY-XWZXZD	46-00 (default)	46-12

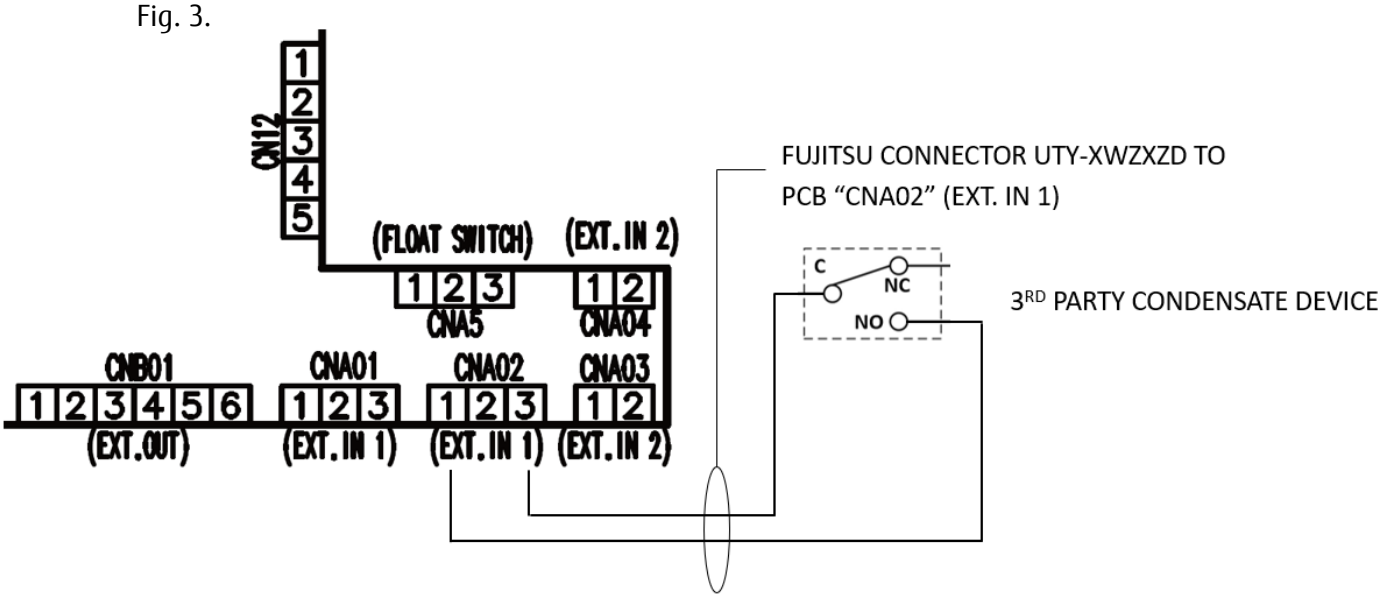
- User override– In the event of a condensate event, the end user may override the external input by manually turning the RC back ON. The last command received will have priority to turn the system ON or OFF. If the ability to have user override is not desired, select the "Forced Stop" mode.

3. "Emergency Stop"- The 3rd party condensate device is wired as an external input to the Airstage indoor unit control board, connector labeled as "CNA04". The 3rd party condensate device NO, normally open, dry contacts are connected to the indoor unit PCB.

Fujitsu item required– Connector cable part # UTY-XWZXZD

- Control signal- The 3rd party condensate device NO contacts are wired as an input to the indoor unit connector labeled, "CNA04", pins 1 & 2. See Fig. 3.:

Fig. 3.



- Sequence of operation- The Airstage indoor unit operates normally until a condensate overflow is detected by the 3rd party condensate device. When the device normally open contacts close to any indoor unit, ALL indoor units in the same refrigerant system are turned OFF, and EEV is driven to the fully closed (40 or 45P) position. Any indoor unit, individual or in the same RC group, which receives the STOP command will turn all indoor units and the outdoor unit OFF.

  Indoor unit will resume operation when:

  1. Condensate device contacts OPEN:
  2. Any ON command manually initiated from a RC or Central Controller.
- Alarm notification– Upon an Emergency Stop input, "Emergency Stop" will be displayed on the RC, and broadcast to the Fujitsu Central Controller, if used.
- Function setting– For the "Emergency Stop" function to operate, an indoor unit function setting change is required. Adjust setting 46 from 00 (default) to 01 (46-01).
- Reverse logic– If a normally closed (NC) contact use is required, the logic may be reversed from normally open, NO, to normally closed, NC, by changing indoor unit function setting 46 to option 11 (46-11).

Input function	PCB connector	Pins	Logic	Option	Accessory	Function Setting	Reverse logic option
Emergency Stop	CNA02	1 – 3	NO	NC	UTY-XWZXZD	46-01	46-11

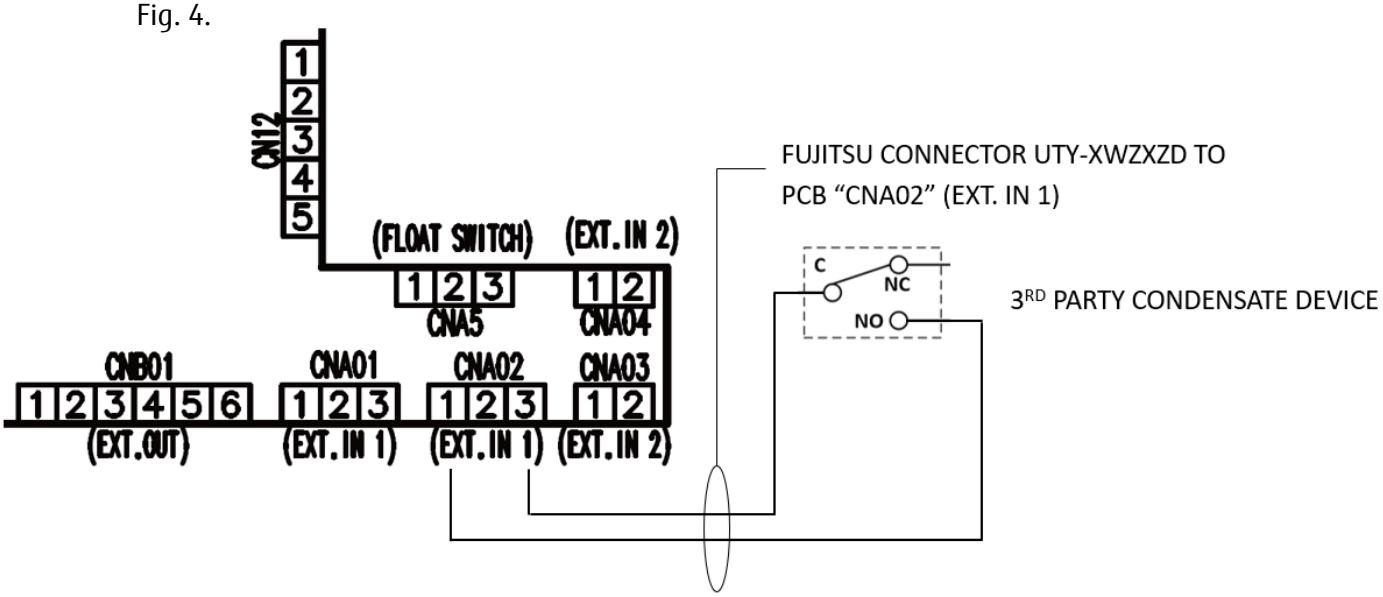
- User override– Upon an "Emergency Stop" input, the entire refrigerant system will shut down, and user override is prohibited.
- NOTE– ALL indoor units and the outdoor unit in the same refrigerant circuit will have an immediate shutdown upon a condensate event when using the Emergency Stop input option.

4. "Forced Stop"- The 3rd party condensate device is wired as an external input to the Airstage indoor unit control board, connector labeled as "CNA02". The 3rd party condensate device NO, normally open, dry contacts are connected to the indoor unit PCB.

Fujitsu item required– Connector cable part # UTY-XWZXZD

- Control signal- The 3rd party condensate device NO contacts are wired as an input to the indoor unit connector labeled, "CNA02", pins 1 & 3. See Fig. 4.:

Fig. 4.



- Sequence of operation- The Airstage indoor unit operates normally until a condensate overflow is detected by the 3rd party condensate device. When the device normally open contacts close, the indoor unit is turned OFF, and EEV is driven to the fully closed (40 or 45P) position to prevent refrigerant flow into the indoor unit coil. Only the indoor unit, or indoor units in the same RC group, which receive the STOP command will turn OFF.

  Indoor unit will resume operation when:

  1. Condensate device contacts OPEN:

- Alarm notification– There are no alarm notifications with this input option.
- Function setting– For the "Forced Stop" function to operate, an indoor unit function setting change is required. Adjust setting 46 from 00 (default) to 02 (46-02).
- Reverse logic– If a normally closed (NC) contact use is required, the logic may be reversed from normally open, NO, to normally closed, NC, by changing indoor unit function setting 46 to option 12 (46-12).

Input function	PCB connector	Pins	Logic	Option	Accessory	Function Setting	Reverse logic option
Forced Stop	CNA02	1 – 3	NO	NC	UTY-XWZXZD	46-02	46-12

- User override– End user override is disabled in when using the "Forced Stop" mode.

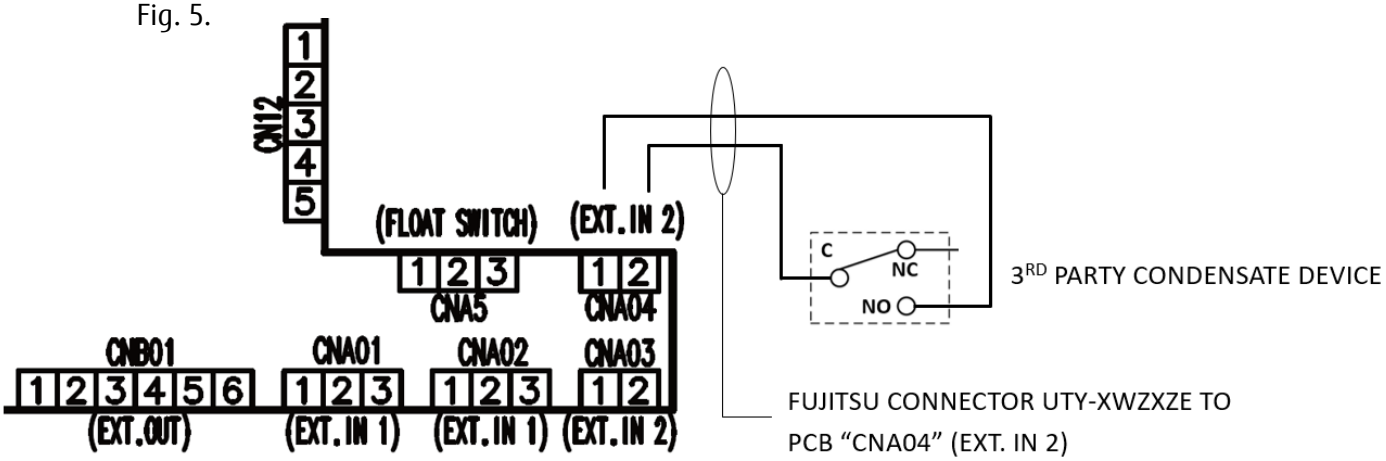
5. "Forced Thermostat OFF"- The 3rd party condensate device is wired as an external input to the Airstage indoor unit control board, connector labeled as "CNA04". The 3rd party condensate device NO, normally open, dry contacts are connected to the indoor unit PCB. "Forced thermostat OFF" is only enabled in the COOL mode.

   IMPORTANT– Forced thermostat OFF is only recommended in 1:1, single zone applications. When used with multiple indoor units in the same refrigerant system, this function may delay compressor operation when other indoor unit demand is present.

Fujitsu item required– Connector cable part # UTY-XWZXZE

- Control signal- The 3rd party condensate device NO contacts are wired as an input to the indoor unit connector labeled, "CNA04" (EXT. IN 2), pins 1 & 2. See Fig. 5.:

Fig. 5.



- Sequence of operation- The Airstage indoor unit operates normally until a condensate overflow is detected by the 3rd party condensate device. When the device normally open contacts close, the indoor unit EEV is driven to the fully closed (40 or 45P) position, and the outdoor unit will turn OFF. This indoor unit fan may remain ON depending upon indoor unit function (49) settings.

  Indoor unit will resume operation when:

  1. Condensate device contacts OPEN:

- Alarm notification– There are no alarm notifications with this input option.
- Function settings–
  - ◊ Forced thermostat OFF- No function setting changes are required. However, it is recommended to check function setting 60 and verify the default setting of 00 (60-00) remains. Adjust setting option back to 60-00 if needed. This function is enabled in the COOL mode only.
  - ◊ Indoor fan operation– The indoor unit fan may remain ON according to function setting 49:
    1. 49-00– The fan will follow the speed as selected at the RC
    2. 49-01– The fan will stop upon a Forced Thermostat OFF input.
- Reverse logic– There is no provision to reverse the input logic for the "Forced thermostat off" function.

Input function	PCB connector	Pins	Logic	Option	Accessory	Function Setting	Reverse logic option
Forced thermostat OFF	CNA04	1 – 2	NO		UTY-XWZXZE	60-00	

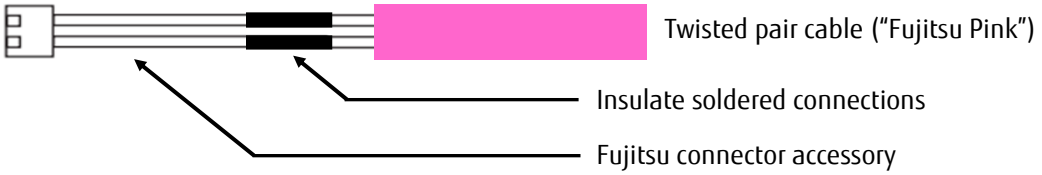
- User override– User override– End user override is disabled in when using the "Forced thermostat OFF" mode.

Wiring notes- The wiring notes below are applicable to all external input functions listed within this bulletin, when wiring 3rd party condensate devices:

1. Use 22 AWG twisted pair wiring from the indoor unit PCB to the 3rd party condensate device ("Fujitsu Pink" or Honeywell Catalog # 3254 acceptable)
2. Cable maximum length from indoor unit PCB to 3rd party condensate device: 492' (150 m)
3. Keep twisted pair wiring separate from line voltage wiring
4. Wire connections between the Fujitsu cable accessory and 3rd party condensate device should be made by using either:
    - ◊ Butt type crimp connectors
    - ◊ Soldered and insulated

NOT RECOMMENDED

RECOMMENDED



3rd party condensate pump– When installing a 3rd party condensate pump, please refer to the manufacturers instructions for power wiring connection details.

Additional notes

When a ducted indoor unit is installed over a finished ceiling, or other areas where condensate overflow may result in potential damage, use of a field supplied auxiliary drain pan is recommended regardless of code requirements.

The information in this bulletin is subject to change without notice. Fujitsu General America, Inc., is not responsible for 3rd party circuit design.

Reference literature

For a complete description of Airstage VRF indoor unit external input and output use and functions, please log onto the Fujitsu **CONNECT** site for Installation and Design & Technical Manual downloads.

For additional support, please contact your regional Distributor TSA, Technical Service Advisor, or Fujitsu General America Applications Department, **applicationsupport@fujitsugeneral.com**