# Tech Tip

**May 2023**

# TWE Odyssey Air Handler with Variable Frequency Drive(VFD) single or 2 speed operation

TRANE TECHNOLOGIES

Identifying via model number the unit will be equipped with a Variable Frequency Drive(VFD) see the 15th digit of the model number which will either be C or D.

If the 15th digit is D; 2 stage airflow/Single zone VAV. Mod Bus and IMC communication wiring will be needed, twisted shielded 18 AWG. Depending on control, verify in Symbio configuration space controller setting for appropriate control - zone sensor or conventional.

If there is a need to change a unit that has the 15th digit as D to use as a single or 2 stage airflow without communication wire. This will require wiring harness change as well as configuration changes to VFD parameters.

| TWE Air Handler with Symbio |
|---|
| **Digit 15 — Controls** |
| **1** = Constant Volume |
| **C** = 2 Stage Airflow (Electromechanical Condenser Only) |
| **D** = 2 Stage Airflow/Single Zone VAV (Symbio Condenser Only) |

C = VFD - Start + Full Speed Binary Inputs
D = VFD - Mod Bus + IMC Communication
2 twisted / shielded pair

**TRANE PURPLE WIRE Recommended**

| Part Number | Business Unit | Description |
|---|---|---|
| CAB01568 | US Manufacture | CABLE; COMLINK CABLE WITH A PVC JACKET, 18/1 PR, STRANDED SHIELD, 25PF PLENUM, 100 FOOT LENGTH |

| Part Number | Business Unit | Description |
|---|---|---|
| CAB01569 | US Manufacture | CABLE; COMLINK CABLE WITH A PVC JACKET, 18/1 PR, STRANDED SHIELD, 25PF PLENUM, 1000 FOOT LENGTH |

*Good practice before installation date: Know the models you will be installing, if any changes need to be done and how will the system be wired with what is available on Jobsite.*

Click here for link to Light Commercial Help Center

**Field Service Representative Contact**

**SW FL 239-277-0344; Option 3** **SE FL 954-421-7133; Option 2**
**N FL 844-358-7263; option 2**

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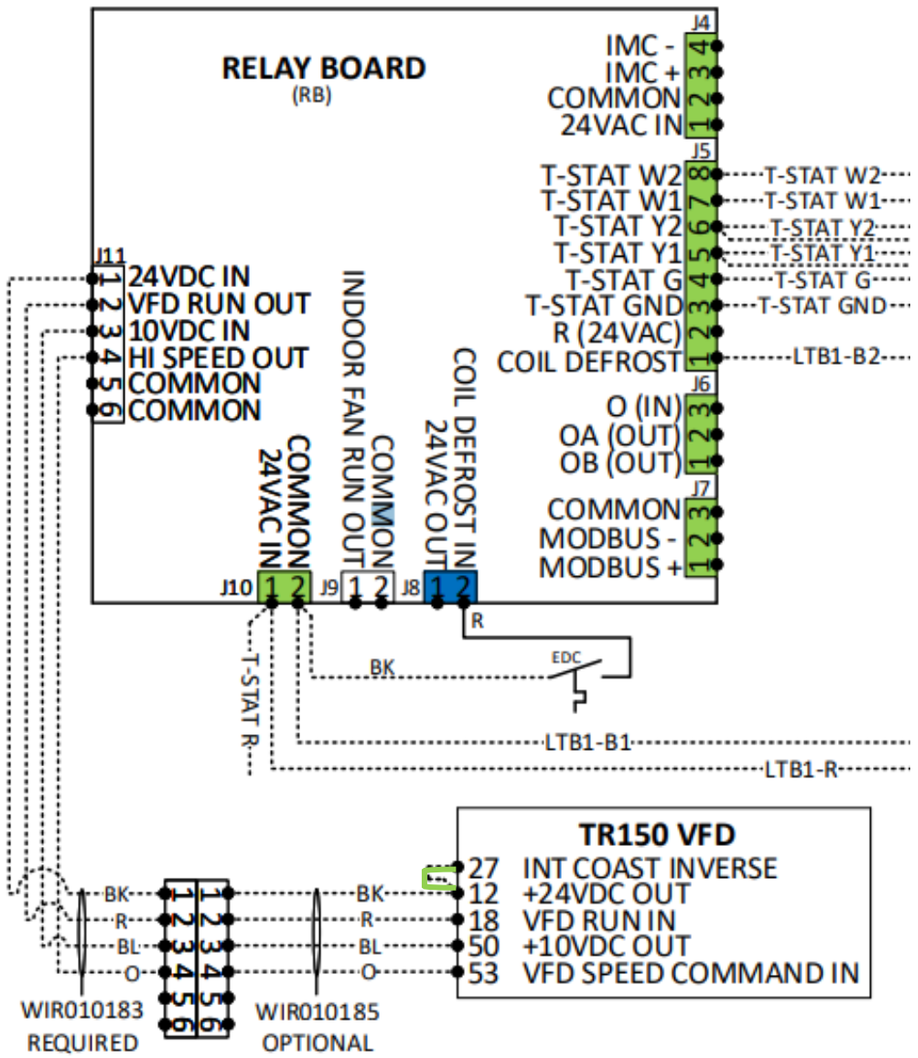



2 speed Operation <u>without communication wiring</u> -

You will need one of the following harnesses

Relay Board(RB) to drive connector [length] - required

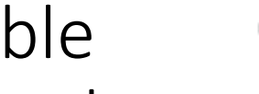
WIR010190 or WIR010096[87”] or WIR10183[124”]

Connector to drive - optional

WIR010185

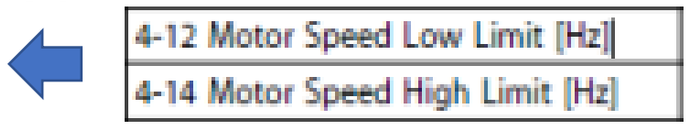
Harness connection to VFD as shown. Terminals 12, 18, 50 and 53 are used with a jumper between terminals 12 and 27.

Verify Symbio configuration:




Following changes need to be made to the parameters of the VFD TR150.

A. Change 0-40 from [0] Disabled to [1] Enable
B. Change 3-15 from [11] local bus reference to [1] Analog Input
C. Change 5-10 from [11] No Operation to [8] Start
D. Change 5-12 from [0] No Operation to [2] Coast Inverse
E. Change 8-01 from [2] Control Word Only to [0] Digital & Control Word
F. Change 8-02 from [1] FC Port to [0] None
G. Change 8-04 from [2] Stop to [0] Off
H. Verify 4-12 is set to [25 Hz]
I. Verify 4-14 is set to [60 Hz]
J. Verify 6-10 is set to [0.07V]
K. Verify 6-11 is set to [10.00V]
L. Verify 6-14 is set to [25 Hz]
M. Verify 6-15 is set to [60 Hz]




<u>Click here to view/download - Odyssey with Symbio Controls wiring and Startup – SS-SVN016*-EN reference pages 12-13</u>

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## Navigating VFD Keypad

| | |
|---|---|
| 1 | Parameter number and name. |
| 2 | Parameter value. |
| 3 | Set-up number shows the active set-up and the edit set-up. If the same set-up acts as both active and edit set-up, only that set-up number is shown (factory setting). When active and edit set-up differ, both numbers are shown in the display (set-up 12). The number flashing, indicates the edit set-up. |
| 4 | Motor direction is shown to the bottom left of the display – indicated by a small arrow pointing either clockwise or counterclockwise. |
| 5 | The triangle indicates if the keypad is in status, quick menu or main menu. |

**Table 1.13 Legend to *Illustration 1.17***

**B. Menu key**

Use the menu key to select between status, quick menu or main menu.

The keypad is divided into four functional sections.

A. Alphanumeric display

B. Menu key

C. Navigation keys and indicator lights (LEDs)

D. Operation keys and indicator lights (LEDs)

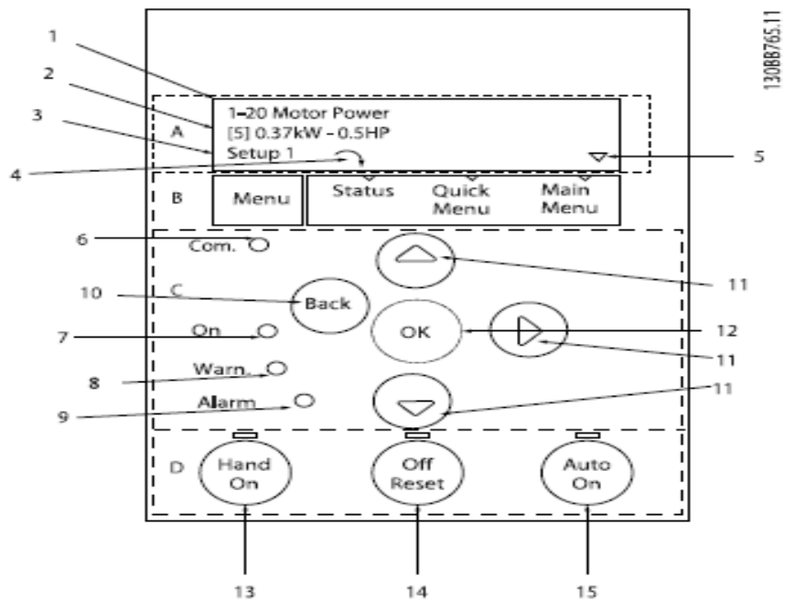


**Illustration 1.17 Keypad**

**C. Navigation keys and indicator lights (LEDs)**

| | |
|---|---|
| 6 | Com LED: Flashes when bus communication is communicating. |
| 7 | Green LED/On: Control section is working. |
| 8 | Yellow LED/Warn.: Indicates a warning. |
| 9 | Flashing Red LED/Alarm: Indicates an alarm. |
| 10 | [Back]: For moving to the previous step or layer in the navigation structure |
| 11 | [▲] [▼] [►]: For maneuvering between parameter groups, parameters and within parameters. Can also be used for setting local reference. |
| 12 | [OK]: For selecting a parameter and for accepting changes to parameter settings |

**Change 0-40 from [0] Disabled to [1] Enable - Hand on**
**This will allow control of the blower via Hand on button on Keypad**

**D. Operation keys and indicator lights (LEDs)**

| | |
|---|---|
| 13 | [Hand On]: Starts the motor and enables control of the frequency converter via the keypad.<br>**NOTICE**<br>**Terminal 27 Digital Input (*5-12 Terminal 27 Digital Input*) has coast inverse as default setting. This means that [Hand On] does not start the motor if there is no 24 V to terminal 27. Connect terminal 12 to terminal 27.** |
| 14 | [Off/Reset]: Stops the motor (Off). If in alarm mode the alarm will be reset. |
| 15 | [Auto On]: frequency converter is controlled either via control terminals or serial communication. |

**ALWAYS VERIFY VFD PARAMETER SETTINGS PRIOR TO OPERATING BLOWER**

Click here to view/download - Symbio VFD Parameter chart

Ref Manual: TR150 Quick Guide

BAS-SVX58A-EN

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## Open loop and VFD Electrical Overview

The built-in wizard menu guides the installer through the set-up of the frequency converter in a clear and structured manner to set-up an open loop application. An open loop application is here an application with a start signal, analog reference (voltage or current) and optionally also relay signals (but no feed back signal from the process applied).

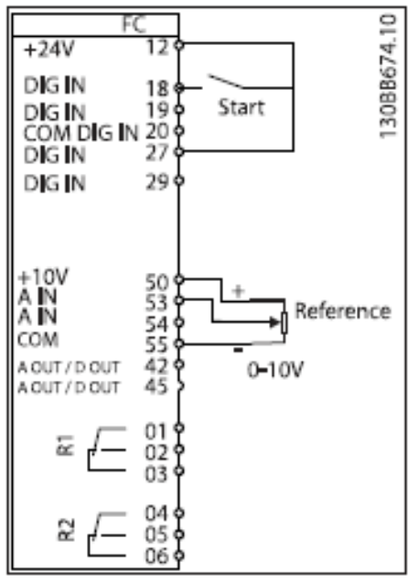



**Illustration 1.18 Open Loop Application**

The wizard will initially be shown after power-up until any parameter has been changed. The wizard can always be accessed again through the quick menu. Press [OK] to start the wizard. Press [Back] to return to the status screen.

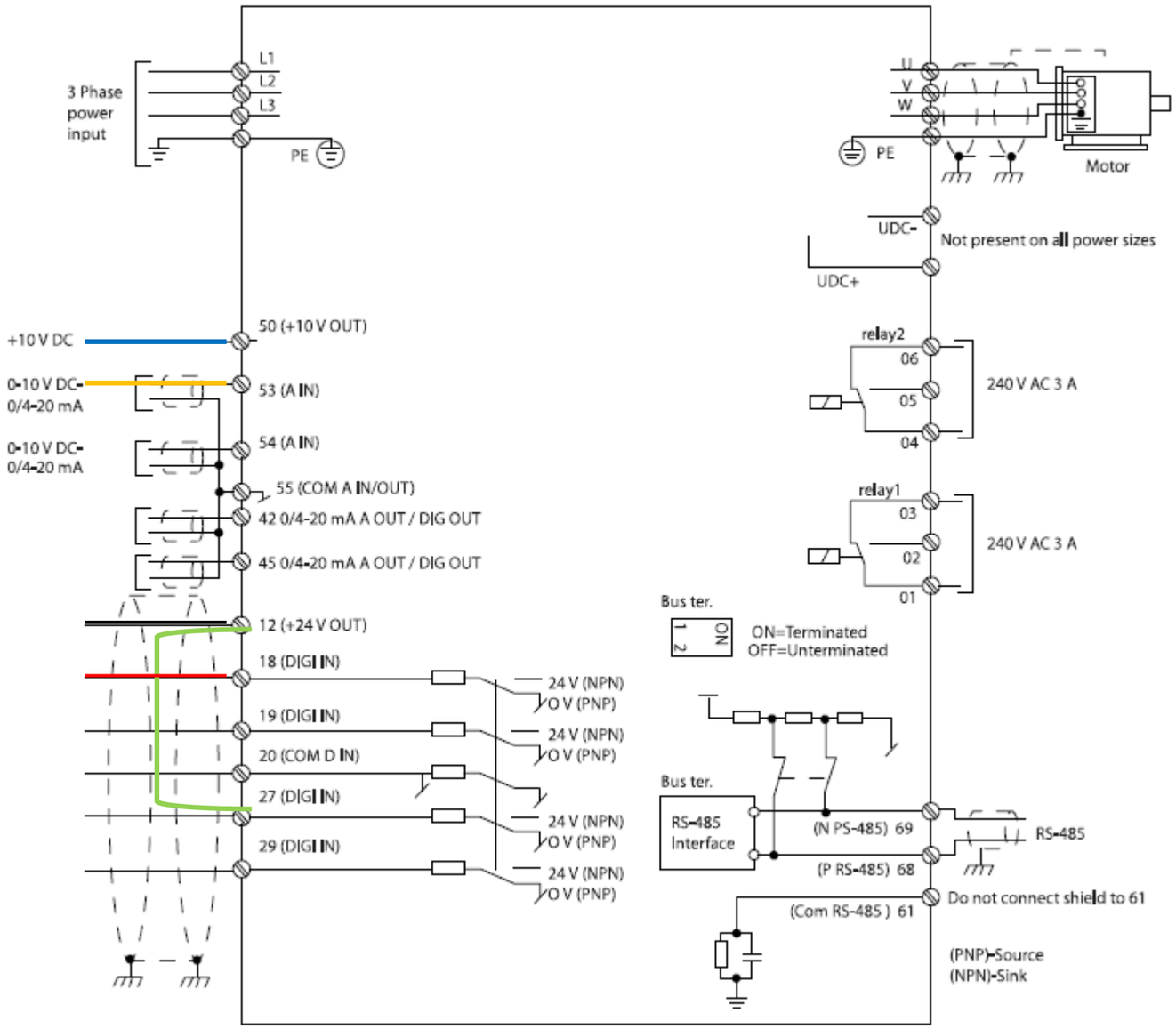
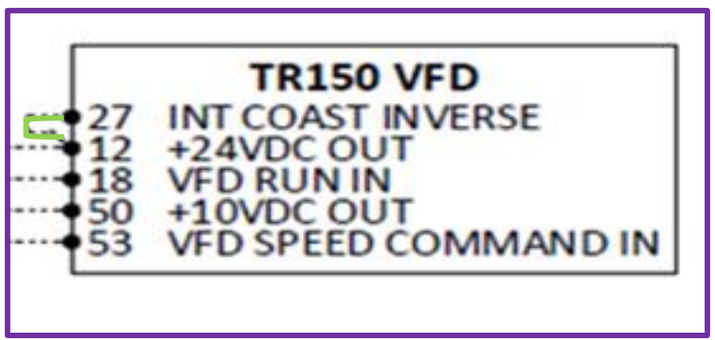



**Illustration 1.16 Basic Wiring Schematic Drawing**




Ref Manual: TR150 Quick Guide

BAS-SVX58A-EN

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Temporary operation no comm wire without wire harnesses – single speed.

You will need to use a relay and make changes to specific parameters.

A. Install jumper between 12 and 27 terminal at VFD
B. Change 0-40 from [0] Disabled to [1] Enable
C. Change 3-15 from [11] local bus reference to [1] Analog Input
D. Change 5-10 from [11] No Operation to [8] Start
E. Change 5-12 from [0] No Operation to [2] Coast Inverse
F. Change 8-01 from [2] Control Word Only to [0] Digital & Control Word
G. Change 8-02 from [1] FC Port [0] None
H. Change 8-04 from [2] Stop to [0] Off
I. Change 4-12 From [25 Hz] to desired speed in Hz [45-60 Hz]
J. Verify 6-10 is set to 0.07V
K. Verify 6-11 is set to 10.00V

If using electric heat, with no options board. Symbio configuration for primary heat needs to be set to not installed.

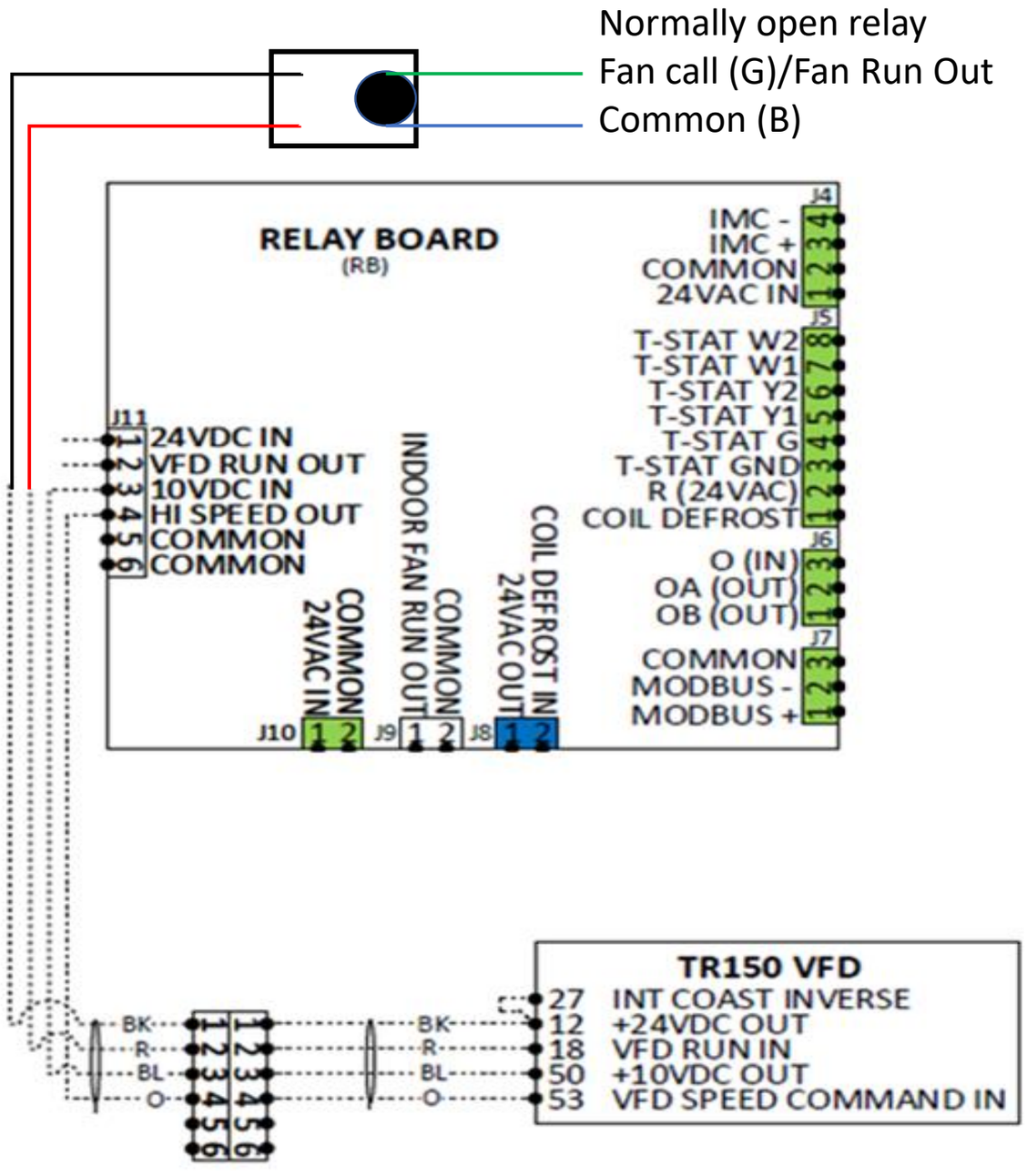
Verify Symbio configuration:

System Type
CVZT

J10 – 1&2 will need to be wired, to power relay board

J5 – 4 will need to be wired for fan call

J5 – 7 will need to be wired for electric heat call



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# TWE Odyssey Air Handler with Variable Frequency Drive(VFD) single or 2 speed operation

TRANE TECHNOLOGIES

Temporary operation no comm wire without wire harnesses – 2 speed.

You will need to use a relays and make changes to specific parameters.

A. Install jumper between 12 and 27 terminal at VFD
B. Change 0-40 from [0] Disabled to [1] Enable
C. Change 3-15 from [11] local bus reference to [1] Analog Input
D. Change 5-10 from [11] No Operation to [8] Start
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