

Schneider Electric – Altivar 312 Variable Freq. Drive (VFD) Programming and Test

1.0 PROCESS

1.1 Definitions – not comprehensive for every Altivar 312 setting, only this work instruction

- ACC.....Acceleration Time
- Atr.....Automatic Restart
- bFr.....Standard Motor Frequency
- CL1.....Current Limitation
- dEC.....Deceleration Time
- drC.....Motor Control Menu
- FCS.....Restore Configuration
- FLt.....Fault Management Menu
- FrH.....Frequency Reference
- I-O-.....Inputs/Outputs Menu
- LEL.....Level State – 0 or 1 is taken into account for run or stop
- LI2.....Logic input LI2
- nCr.....Rated Motor Current
- rEF.....Speed Reference Menu
- rFr.....Output Frequency
- rrS.....Reverse Assignment
- SCS.....Save Configuration
- Set.....Settings Menu
- SP2.....Preset Speed 2
- Str1.....Save Configuration to EEPROM
- SUP.....Monitoring Menu
- tCC.....2/3 Wire Control
- tCt2.....Wire Control
- UnS.....Rated Motor Voltage

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1.2 Wire Connections

WARNING – Verify that every electrical connection is OFF before beginning

- 1.2.1 Connect the appropriate power wires to the input (L1, L2, L3 (Optional), GND). Verify that the voltage input is correct with respect to the data plate of the unit under test - 208VAC/60Hz/1Ø, 220VAC/50Hz/1Ø, 230VAC/60Hz/1Ø, 208VAC/60Hz/3Ø, 380VAC/50Hz/1Ø, 480VAC/60Hz/3Ø, etc...
- 1.2.2 Connect the power wires to the output (T1, T2, T3, GND) and to the 3Ø compressor that will be under test.
- 1.2.3 Connect an 18AWG black jumper wire between terminals +10 and AI1.
- 1.2.4 Connect the VFD Enable wires (from the control board) to terminals LI1 and +24V. If you are not using an control board, connect the Run - ON/OFF Switch to these terminals. Verify that the switch is in the OFF (open) position.

WARNING – Connecting VFD enable wires to the wrong terminal (LI2) can cause the compressor to run backwards, which can cause permanently and irreparable damage.

1.3 Programming the VFD Settings

- 1.3.1 Apply power to the VFD and open the small white control door.

Note: Pressing ENT is the same as depressing the rotary wheel.

- 1.3.2 Return all settings to factory defaults by following the instructions below.
rdy is displayed, Press ENT, bfr (Standard Motor Frequency) or rEF (Speed Reference Menu) is displayed, scroll →, drC (Motor Control Menu) is displayed, press ENT, bFr (Standard Motor Frequency) is displayed, scroll ←, FCS (Restore Configuration) is displayed, press ENT, nO (Restore Configuration Inactive) is displayed, scroll → to change to InI (Factory Settings), press and hold ENT for 3 seconds, display text will flash, press ESC twice, drC (Motor Control Menu) is displayed
- 1.3.3 Set Acceleration Time
Scroll ←, Set (Settings Menu) is displayed, press ENT, ACC (Acceleration) is displayed, press ENT, scroll → to change to 5 (5 seconds), press ENT, display text will flash, press ESC, ACC (Acceleration) is displayed
- 1.3.4 Set Deceleration Time
Scroll →, dEC (Deceleration) is displayed, press ENT, scroll → to change to 5 (5 seconds), press ENT, display text will flash, press ESC, dEC (Deceleration) is displayed

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1.3.5 *Set Preset Speed 2*

Scroll →, **SP2 (Preset Speed 2)** is displayed, press ENT, scroll → to change to **45.0 (45 Hz)**, press ENT, display text will flash, press ESC, **SP2 (Preset Speed 2)** is displayed

Note: The Preset Speed 2 will only be utilized by variable speed compressors.

1.3.6 *Set the Current Limits for the compressor*

Scroll →, **CL1 (Current Limitation)** is displayed, press ENT, scroll → to change to **<drive's data plate current rating>**, press ENT, display text will flash, press ESC, press ESC, **Set (Settings Menu)** is displayed

1.3.7 *Set the compressor frequency*

Scroll →, **drC (Motor Control Menu)** is displayed, press ENT, **bFr (Standard Motor Frequency)** is displayed, press ENT, scroll → to change to **<compressor frequency>**, press ENT, display text will flash, press ESC, **bFr (Standard Motor Frequency)** is displayed

1.3.8 *Set the compressor voltage*

Scroll →, **UnS (Rated Motor Voltage)** is displayed, press ENT, scroll → to change to **<compressor voltage>**, press ENT, display text will flash, press ESC, **UnS (Rated Motor Voltage)** is displayed

1.3.9 *Set the nominal motor current*

Scroll →, **nCr (Rated Motor Current)** is displayed, press ENT, scroll → or ← to change to **<3-phase compressor FLA in heat + 10%>**, OR **<maximum rating of VFD listed on nameplate> (Whichever is lower)**, press ENT, display text will flash, press ESC, press ESC, **drC (Motor Control Menu)** is displayed

NOTE: If the single phase current is provided, please divide by 1.73 for the 3-phase current.

1.3.10 *Set starting frequency*

Scroll →, **SUP (Monitoring Menu)** is displayed, press ENT, **FrH (Frequency Reference)** is displayed, scroll → to change to **rFr (Output Frequency)**, press ENT, **0.0 (Set start frequency to 0.0 Hz)** is displayed, press ENT, display text will flash, press ESC, press ESC, **SUP (Monitoring Menu)** is displayed

1.3.11 *Set the Auto Restart on a fault clear*

Scroll →, **FLt (Fault Management Menu)** is displayed, press ENT, **Atr (Automatic Restart)** is displayed, press ENT, scroll → to change to **YES (Auto Restart upon a cleared fault)**, press ENT, display text will flash, press ESC, **Atr (Automatic Restart)** is displayed

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1.3.12 Set the input supply phase fault action

Scroll →, **IPL (Input Phase Loss)** is displayed, press ENT, scroll → to change to **nO (Single-phase supply power)** or **yES (Three-phase supply power)**, press ENT, display text will flash, press ESC, press ESC, **FLt (Fault Management)** is displayed

1.3.13 Set the wire control type

Scroll ←, **I-O- (Inputs/Outputs Config Menu)** is displayed, press ENT, **tCC (2/3 Wire Control)** is displayed, scroll →, **tCt (2 Wire Type)** is displayed, press ENT, scroll ←, **LEL (Level State – 0 or 1 is taken into account for run or stop)** is displayed, press ENT, display text will flash, press ESC, **tCt (2 Wire Type)** is displayed

1.3.14 Disable reverse operation

Scroll →, **rrS (Reverse Assignment)** is displayed, press ENT, **LI2 (Logic Input 2)** is displayed, scroll ← to change to **nO (Not Assigned)**, press ENT, display text will flash, press ESC, press ESC, **I-O- (Inputs/Outputs Config Menu)** is displayed

1.3.15 Save the configuration

Scroll ←, **drC (Motor Control Menu)** is displayed, press ENT, **bFr (Standard Motor Frequency)** is displayed, scroll ←, **SCS (Saving Config)** is displayed, press ENT, scroll → to change to **Str1 (Saves the current config to the EEPROM)**, press and hold ENT until it flashes and displays **nO (Save confirmed)**, press ESC, press ESC, press ESC, **rdy (Ready)** is displayed

1.3.16 Programming is complete

1.4 Test the VFD

- 1.4.1 Close the run switch or enable the compressor connected to this VFD
- 1.4.2 Verify that the display shows a ramp up from **0.00** to **60.0 (or 50.0)**
- 1.4.3 Open the run switch or disable the compressor
- 1.4.4 Verify that the display shows a ramp down from **60.0 (or 50.0)** to **0.0**.
- 1.4.5 Verify that the compressor is running as intended, not backward.

2.0 PURPOSE AND SCOPE:

- 2.1 Define and describe the process for testing the new Frequency Drives we are introducing.

3.0 RESPONSIBILITIES:

- 3.1 This process is to be performed only by an associate who has completed supervised OJT with this product.

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Appendix A – Programming Quick Reference Guide

1 *Factory Defaults*

bFr/rEF, →, **drC**, ENT, **bFr**, ←, **FCS**, ENT, **nO**, → to **InI**, hold ENT for 3 seconds, text flash, ESC twice.

2 *Acceleration Time*

drC, ←, **Set**, ENT, **ACC**, ENT, → to **5**, ENT, text flash, ESC

3 *Deceleration Time*

ACC, →, **dEC**, ENT, → to **5**, ENT, text flash, ESC

4 *Set Preset Speed 2*

dEC, →, **SP2**, ENT, → to **45.0**, ENT, text flash, ESC

5 *Set the Current Limits for the compressor*

SP2, →, **CL1**, ENT, → to **<drive's data plate current rating>**, ENT, text flash, ESC, ESC

6 *Set the compressor frequency*

Set, →, **drC**, ENT, **bFr**, ENT, → to **<compressor frequency>**, ENT, text flash, ESC

7 *Set the compressor voltage*

bFr, →, **UnS**, ENT, → to **<compressor voltage>**, ENT, text flash, ESC

8 *Set the nominal motor current*

UnS, →, **nCr**, ENT, → or ← to **<3-phase compressor FLA in heat + 10%>**, OR **<maximum rating of VFD listed on nameplate>** (Whichever is lower), ENT, text flash, ESC, ESC

(NOTE: If the single phase current is provided, please divide by 1.73 for the 3-phase current.)

9 *Set starting frequency*

drC, →, **SUP**, ENT, **FrH**, → to **rFr**, ENT, **0.0**, ENT, text flash, ESC, ESC

10 *Set the Auto Restart on a fault clear*

SUP, →, **FLt**, ENT, **Atr**, ENT, → to **YES**, ENT, text flash, ESC

11 *Set the input supply phase fault action*

Atr, →, **IPL**, ENT, → to **nO (1Ø)** or **yES (3Ø)**, ENT, text flash, ESC, ESC

12 *Set the wire control type*

FLt, ←, **I-O-**, ENT, **tCC**, →, **tCt**, ENT, ←, **LEL**, ENT, text flash, ESC

13 *Disable reverse operation*

tCt, →, **rrS**, ENT, **LI2**, ← to **nO**, ENT, text flash, ESC, ESC

14 *Save the configuration*

I-O-, ←, **drC**, ENT, **bFr**, ←, **SCS**, ENT, → to **Str1**, press and hold ENT until flash and displays **nO**, ESC, ESC, ESC, **rdy**