

Danfoss VFD Startup Procedure (FC102 HVAC)

Drake Refrigeration

February-2016



IMPORTANT

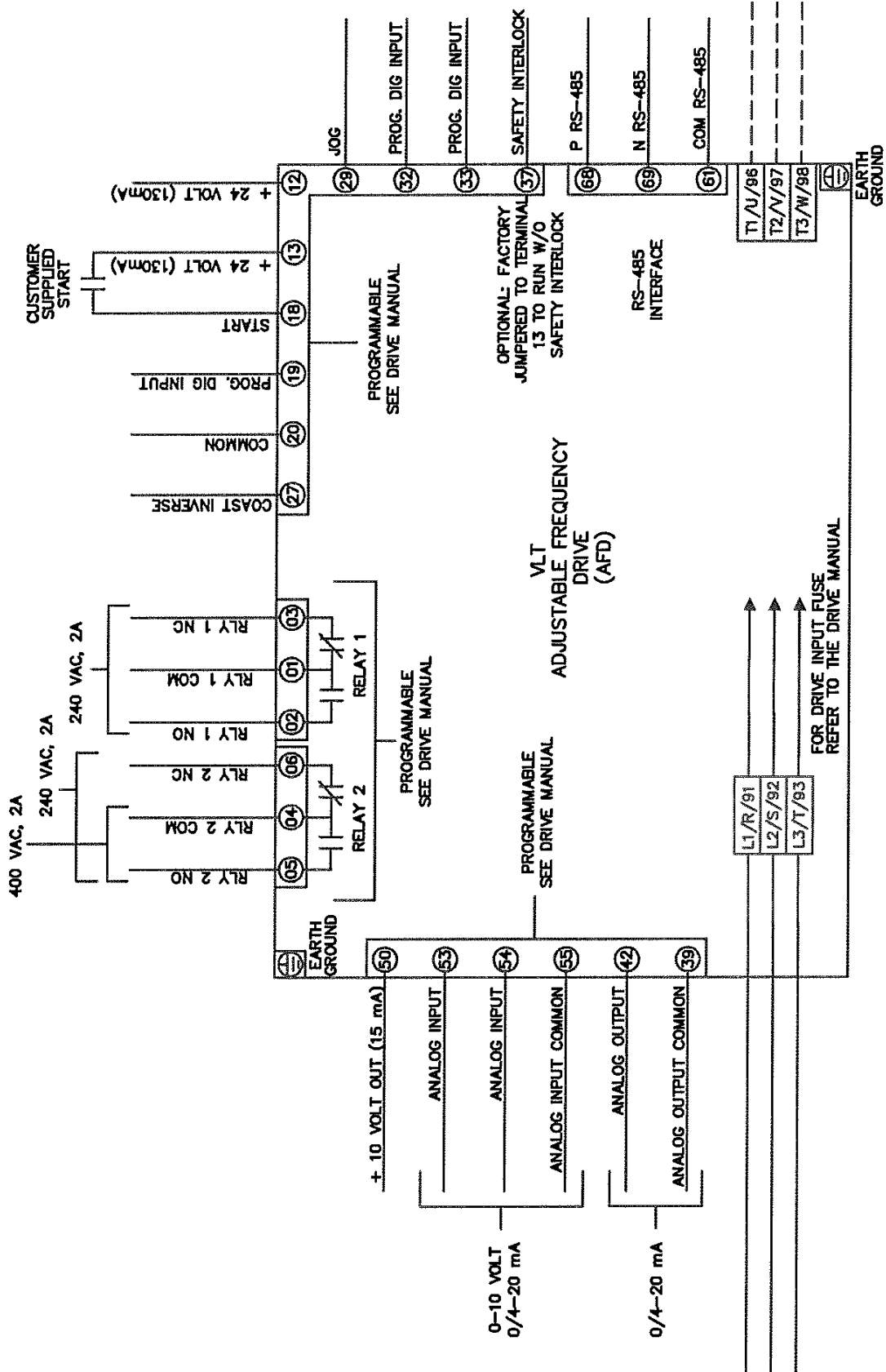
Confirm that terminal block 18 is connected to terminal block 13 (or put through a switch). This connection initiates the VFD. If the circuit is open the VFD will stay at 0Hz with no indication of error.

Before locating menu items in the following pages read this example:

- If looking for menu '6-24' press Main Menu button
- Scroll down to 6-**
- Scroll to 6-2*
- Press down until you get to 6-24
- Hit OK once at 6-24
- UP/down buttons will adjust value
- Hit OK to set
- New value will show in the center of the screen
- Old value will show at the bottom-right of the screen
- Back button will step back in menus

This is the procedure for changing each setpoint





MAMAC Temperature sensor based:

- Set the 0-10V output for sensor using the DIP switches on the sensor (**see sensor manual**)
 - Sensor range is -30F to 130F
 - Pumps should never go below 8Hz
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How to Configure for Temperature

Start with Smart Start if possible (in the QUICK MENU):

1. Set Horsepower, Motor Voltage, Motor FLA, Nominal RPM and Asynchronous (use data plate values on the pump motor)
2. Minimum Reference = -30 ; Maximum Reference = 130
3. Default ramp times (10s and 20s) are usually acceptable
4. AMA ON (follow on-screen instructions)
5. AEO OFF

Other settings after Smart Start is complete:

1. Press **Off** (soft button on bottom row)
2. Go to **Main Menu** (soft button on top row)
3. Go to '0-20' (Disp. Line 1.1) and set to **[1654] Feedback 1 [Unit]**
4. Go to '1-00' (Configuration Mode) and set to **[3] Closed Loop**
5. Go to '3-15' (Reference 1 Source) and set to **[0] No Function**
6. Go to '4-12' (Motor Speed Low Limit [Hz]) and set Min Hz = **8.00 Hz**
7. Go to '4-14' (Motor Speed High Limit [Hz]) and set Max Hz = **60.00 Hz**
8. Go to '4-18' (Current Limit) and set at **114%**
9. Go to '5-10' (Terminal 18 Digital Input) and set to **[8] Start**
10. Go to '5-12' (Terminal 27 Digital Input) and set to **[0] No Operation**
11. Go to '6-20' (Terminal 54 Low Voltage) and set to **0.00V**
12. Go to '6-21' (Terminal 54 High Voltage) and set to **10.00V**
13. Go to '6-24' (Terminal 54 Low Ref./Feedb. Value) and set Low Ref = **-30.000**
14. Go to '6-25' (Terminal 54 High Ref./Feedb. Value) and set High Ref = **130.000**
15. Go to '20-00' (Feedback 1 Source) and set to **[2] Analog Input 54**
16. Go to '20-12' (Reference/Feedback Unit) and set to **[160]°F**
17. Go to '20-21' (Setpoint 1) and set to return system fluid temp for tank/chiller (on run sheet)
18. Go to '20-81' (PID Normal/Inverse Control) and set to **[1] Inverse**
19. Press the 'Status' button, the Press the 'Auto On' button. Done.

MAMAC Pressure sensor based:

- Set the 0-10V output for sensor using the DIP switches on the sensor (**see sensor manual**)
 - Sensor range is **adjustable (refer to sensor manual and set to 50psi)**
 - Pumps should never go below 8Hz
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How to Configure for Pressure

Start with Smart Start if possible (in the QUICK MENU):

1. Set Horsepower, Motor Voltage, Motor FLA, Nominal RPM and Asynchronous (use data plate values on the pump motor)
2. Minimum Reference = 0 ; Maximum Reference = (adjustable from MAMAC sensor) usually 50
3. Default ramp times (10s and 20s) are usually acceptable
4. AMA ON (follow on-screen instructions)
5. AEO OFF

Other settings after SMART Start is complete:

1. Press **Off** (soft button on bottom row)
2. Go to **Main Menu** (soft button on top row)
3. Go to '0-20' (Disp. Line 1.1) and set to **[1654] Feedback 1 [Unit]**
4. Go to '1-00' (Configuration Mode) and set to **[3] Closed Loop**
5. Go to '3-15' (Reference 1 Source) and set to **[0] No Function**
6. Go to '4-12' (Motor Speed Low Limit [Hz]) and set Min Hz = **8.00 Hz**
7. Go to '4-14' (Motor Speed High Limit [Hz]) and set Max Hz = **60.00 Hz**
8. Go to '4-18' (Current Limit) and set at **114%**
9. Go to '5-10' (Terminal 18 Digital Input) and set to **[8] Start**
10. Go to '5-12' (Terminal 27 Digital Input) and set to **[0] No Operation**
11. Go to '6-20' (Terminal 54 Low Voltage) and set to **0.00V**
12. Go to '6-21' (Terminal 54 High Voltage) and set to **10.00V**
13. Go to '6-24' (Terminal 54 Low Ref./Feedb. Value) and set Low Ref = **0.000**
14. Go to '6-25' (Terminal 54 High Ref./Feedb. Value) and set High Ref = (adjustable from MAMAC sensor) usually **50**
15. Go to '20-00' (Feedback 1 Source) and set to **[2] Analog Input 54**
16. Go to '20-12' (Reference/Feedback Unit) and set to **[170] psi**
- 17. Go to '20-21' (Setpoint 1) and set to desired pressure in PSI**
18. Go to '20-81' (PID Normal/Inverse Control) and set to **[0] Normal**
19. Press the 'Status' button, the Press the 'Auto On' button. Done.

MCS as the VFD Controller:

How to Configure for MCS

Start with Smart Start if possible (in the QUICK MENU):

1. Set Horsepower, Motor Voltage, Motor FLA, Nominal RPM and Asynchronous (use data plate values on the pump motor)
2. Default ramp times (10s and 20s) are usually acceptable
3. AMA ON (follow on-screen instructions)
4. AEO OFF

Other settings after SMART Start is complete:

1. Press **Off** (soft button on bottom row)
2. Go to **Main Menu** (soft button on top row)
3. Go to '0-20' (Disp. Line 1.1) and set to **[1664] Analog Input 54**
4. Go to '3-15' (Reference 1 Source) and set to **[2] Analog Input 54**
5. Go to '4-12' (Motor Speed Low Limit [Hz]) and set Min Hz = **8.00 Hz**
6. Go to '4-14' (Motor Speed High Limit [Hz]) and set Max Hz = **60.00 Hz**
7. Go to '4-18' (Current Limit) and set at **114%**
8. Go to '5-10' (Terminal 18 Digital Input) and set to **[8] Start**
9. Go to '5-12' (Terminal 27 Digital Input) and set to **[0] No Operation**
10. Go to '6-20' (Terminal 54 Low Voltage) and set to **0.07V**
11. Go to '6-21' (Terminal 54 High Voltage) and set to **10.00V**
12. Go to '6-24' (Terminal 54 Low Ref./Feedb. Value) and set Low Ref = **0.000**
13. Go to '6-25' (Terminal 54 High Ref./Feedb. Value) and set High Ref = **60.000**
14. Press the 'Status' button, the Press the 'Auto On' button. Done.