

Step 8

Slowdown and End Limits

- 20.200 Slowdown select
 - Either select one incoming signal in both directions or one input for each direction.
- 20.201 Slowdown input 1
- 20.202 Slowdown input 2 (if one input used in each direction)
- 22.200 Slowdown reference (which speed motor should slow down when commanded – engineering/customer determined)
- End limits (this will stop the drive)
 - 20.205 End Limit 1 (Bit input e.g. DI3)
 - 20.206 End Limit 2 (Bit input e.g. DI4)



This is a typical wiring diagram and connection for the VariMax VFD system. Wiring connections should be done by authorized trained personnel with the system powered off. Personnel should follow all lockout tag out procedures.

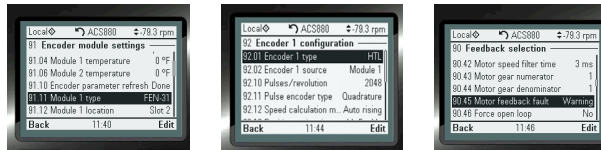
Step 9

Encoder setup

Before installation verify the unit is powered off and no voltage present on the wiring.

Remove front cover of the drive, lift up HMI panel to access the control panel. Install the can in the X203 plug.

- 91.11 Module 1 Type FEN-31
- 91.12 Module Location
- 92.01 Encoder 1 type HTL
 - Parameter list will reset... selecting this option
- 92.02 encoder 1 Source = Module 1
- 92.10 Pulses/revolution
- 91.02 Encoder 1 Status
 - Check to see if both LEDs on the FEN-31 are green
- Open parameter 1.02
 - Check 1.02 & 1.04 w/ motor running – do they have the same value?
- 90.45 Motor feedback fault
 - Set to warning



- Now the drive is set up, the relays/speed functions can be tested
- Start drive, set switch to forward, move potentiometer, or speed switches
 - Does motor speed change?
 - Verify speed on display
- Test limit switches
 - Do they function correctly?
- On hoist control system test power limit bypass system
- Once all functions have been tested, drive setup is complete

HUBBELL®
Industrial Controls

VariMax™ Quick Start Guide



Overview

This is a supplement document for the VariMax variable frequency drive. This is only meant to be a guide for startup and installation of your drive.

Before installation and using our VariMax drive, the operator shall read the hardware and firmware manual, be trained to use the equipment, and know the hazards of operating lifting and crane systems.

⚠ WARNING!

Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do installation or maintenance work

- Clearly identify the work location and equipment.
- Disconnect all possible voltage sources. Make sure that reconnection is not possible. Lock out and tag out.
- Open the main disconnecting device of the drive.
- Protect any other energized parts in the work location against contact.
- Take special precautions when close to bare conductors.
- Measure that the installation is de-energized. Use a quality voltage tester.
- Install temporary grounding as required by the local regulations.
- Make sure that the electrical power network, motor / generator, and environmental conditions agree with the drive data.

Please read all safety instructions in the hardware manual.

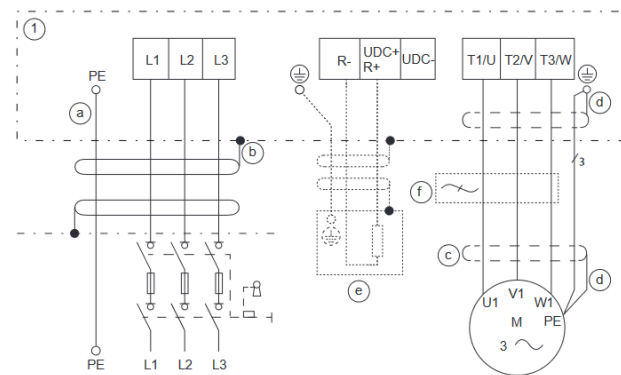
Step 1

Connect the line power and motor leads.

The figure below shows the electrical connection for both the motor and line input connections.

Follow local electrical codes and standard wiring practices.

Connection diagram

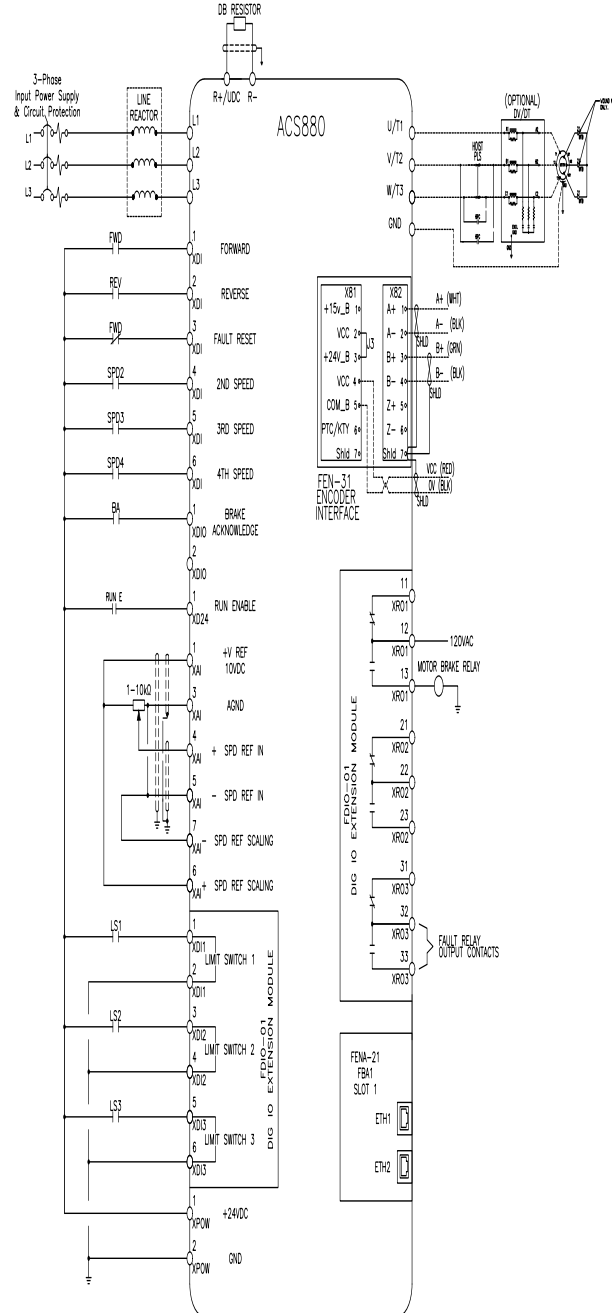


Input power and circuit protection.
(Circuit Breaker or Fuses)

3 - Phase motor

Step 2

This is a typical wiring diagram and connection for the VariMax VFD system. Wiring connections should be done by authorized trained personnel with the system powered off. Personnel should follow all lockout tag out procedures.

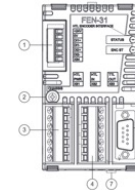
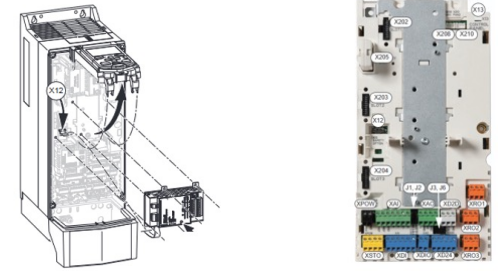


Step 3

FEN-31 Encoder card and wiring connection

Before installation verify the unit is powered off and no voltage present on the wiring.

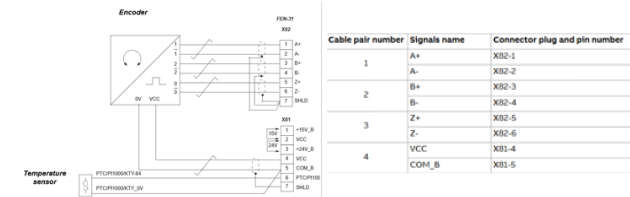
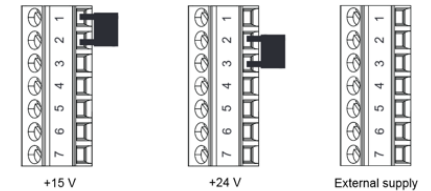
Remove front cover of the drive, lift up HMI panel to access the control panel. Install the can in the X203 plug.



1	Digital latch inputs (X84)
2	Fixing screw
3	HTL encoder supply voltage (X81)
4	HTL encoder input (X82)
5	Diagnostic LEDs
6	TTL emulation output (X83)
7	Locking tab

Two supply voltages are available on pins 4 and 5 in connector X81. Only one of them can be used to supply an encoder. The supply voltage is selected by placing a jumper on connector X81 as described in the figure below. The following supply voltages can be selected:

You can also connect an external 10 - 24 V DC power supply to pins 4 and 5 in connector X81. In that case, the jumper must be removed.



External power supply will be wired to pin 4 and 5 on X81 terminal.

Set up in the parameter will be in the quick start menu.

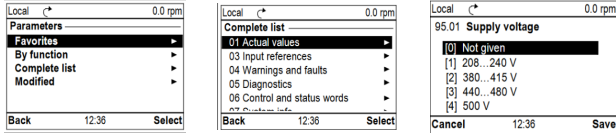
Step 4

HMI Keypad pages and menu locations

This section will show the keypad screens and their purposes.

Access parameter menu and changes

95 parameters: scroll down to 95 HW config, hit select, 95.01 supply down, select appropriate input voltage from list



99 Motor Data:

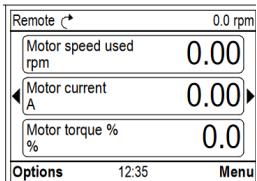
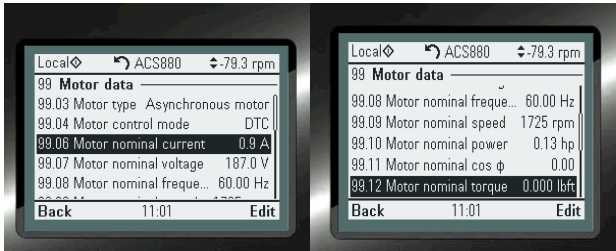
99.04:

- Single motor
- DTC
- Multiple motor
- Scalar (non common for test)

99.06-99.10: requires Motor Nameplate

**If 99.10 is in kW change to HP*

(for below: 96 system - 96.16, power unit "1" = hp, Temperature = "1" = F)



Step 4 (cont'd)

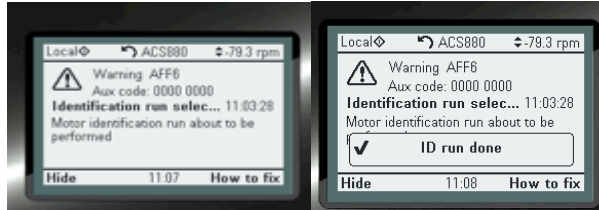
Next: run motor

If motor can spin, run "Normal", otherwise, run "Standstill"

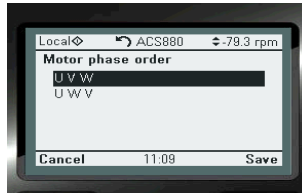
Click back to main screen

Click start button (motor will start moving, check it's in correct direction)

When ID run is finished, it will flash on screen and warning will disappear

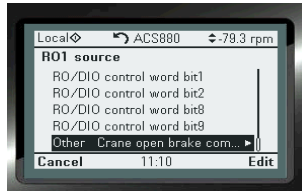


If motor is running in wrong direction, go to 99.16 and change parameter from UVW to U VW

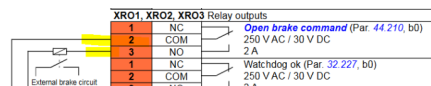


For brake circuit:

- Go into Parameters
 - Go to 10.24 RO1 Source
 - Select 442.210.0 for crane software
 - Select 44.05 brake control enable = Selected
 - Select Energized for non crane
 - If parameter is in read only enter PW 584



- Put drive into Local mode
 - Start the drive
 - Does brake open or relay on panel close?
 - Yes: brake circuit setup done
 - No:
 - Recheck parameters
 - Check voltage into coil (24V)
 - Check wiring to drive



Step 5

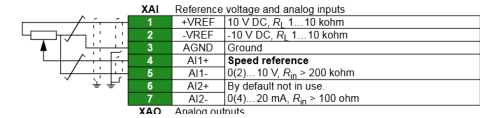
Select a Control Method

This step explains how to configure the VFD for a Hoist or Traverse application.

Speed control A: potentiometer

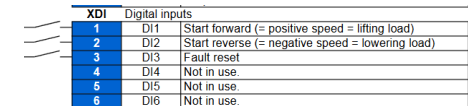
- 0 +/- 10V
- 22.11 Speed Ref 1 Source = AI1
- 12.15 AI1 unit Selection = V
- 12.17 AI1 min = 0
- 12.18 AI1 = 10V
- 12.19 AI1 scaled AI1 min = maximum speed for reverse direction (e.g. -1800 rpm)
- 12.20 AI1 scaled AI1 max = maximum speed for reverse direction (e.g. 1800 rpm)

Photo shown below:



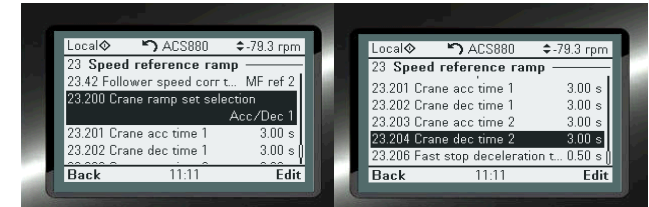
Setting Parameters for Start and Stop control:

- 20.01 Ext 1 Commands
 - Set to In 1 Start FWD, In 2 Start Rev
- 20.03 Ext 1 in1 Source = DI1
- 20.04 Ext1 in2 Source = DI2
- Photo shown below:



Ramp times (required)

- 23.200 Crane Ramp set selection
- 23.201 Crane ACC Time 1
- 23.202 Crane Dec Time 1
- 23.203 Crane ACC Time 2
- 23.204 Crane Dec Time 2



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Remove front cover of the drive, lift up HMI panel to access the control panel. Install the can in the X203 plug.

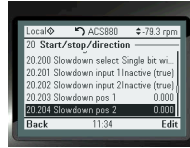
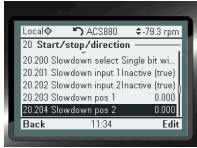
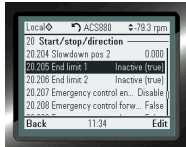
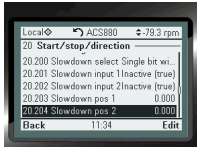
Step 5b

Speed Control Step Reference Logic

Speed Control Step Reference Logic:

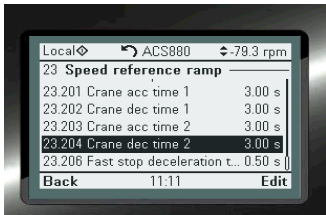
- 20.01 Ext1 Commands
 - IN1 Start Fwd, In2 Start Rev
- 20.03 Ext1 in 1 Source = DI1
- 20.04 Ext1 in 2 Source = DI2
- 20.203 Step Reference Mode = Enabled
- 22.204 Step Reference Select 2 = DI1-DI6 (see drawing)
- 22.205 Step Reference Select 3 = DI1-DI6 (see drawing)
- 22.206 Step Reference Select 4 = DI1-DI6 (see drawing)

XDI	Digital inputs	
1	DI1	Start forward (= positive speed = lifting load)
2	DI2	Start reverse (= negative speed = lowering load)
3	DI3	Fault reset
4	DI4	Not in use
5	DI5	Not in use
6	DI6	Not in use



Speed Control Step Reference Logic:

- 22.207 Step Reference 1 – slowest set speed
- 22.208 Step Reference 2 – set speed
- 22.209 Step Reference 1 – set speed
- 22.2010 Step Reference 1 - fastest set speed

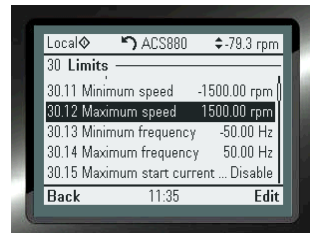
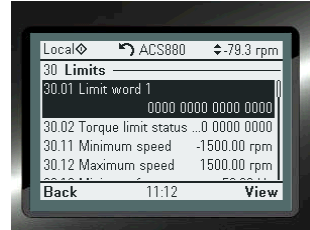


Step 6

Torque & Speed Limits

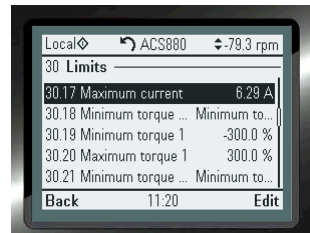
Speed limits:

- 30.11 Minimum speed (same as 12.19)
- 20.12 Maximum speed (same as 12.20)



Torque & Current Limits:

- 30.17 maximum current
 - Value should be nominal motor current
- 30.19 minimum torque 1
 - Nominal motor torque (example -100)
- 30.19 maximum torque 1
 - Nominal motor torque (example 100)



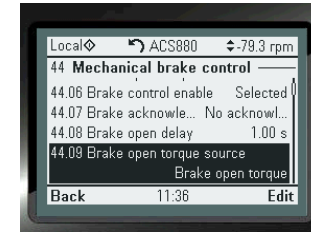
Step 7

Select a Control Method

This step explains how to configure the VFD for a Hoist or Traverse application.

Brake Control:

- 44.06 should already be set from brake circuit setup
- 44.08 brake open delay = 0
- 44.13 brake close delay = 0
- (if equipped) 44.07 brake acknowledge selection (shown below)
 - The input signal: I.E. DI1



XDI	Digital inputs	
1	DI1	
2	DI2	
3	DI3	Fault reset
4	DI4	
5	DI5	
6	DI6	