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AC Motor and VFD for Material Handling

AC Motor and VFD Guide

This guide covers commissioning and setup of the AC motor and VFD kit. This kit is a lower-cost alternative to our stepper drives for powering your material-handling operations. The VFD (variable frequency drive) powers a 1/2/HP three-phase AC motor, which is paired to a 3:1 gestrox, with Vention's standard NEMA34 output. It comes pre-wired for mains power, motor power, and three Machi Tech specs: Motor and VFD Motion digital input co

Tech specs, motor and wr.D			
Specification	Value		
Compatible conveyor mounts	MO-CV-003-0001, MO-CV-009-0001, MO-CV-016-XXXX		
Max power	1/2 HP (0.37kW)		
Motor speed range	431.25 RPM @ 15 Hz to 1725 RPM @ 60Hz		
Motor output torque	5.5 Nm*		
Gearbox reduction ratio options	3:1, 8:1, 10:1, 15:1		
Max conveyor speed	HD: 1200, O-ring: 1500, Belt: 700 (mm/s)		
Motor input voltage	230 V		
Motor cooling method	Air-cooled with fan		
Gearbox input flange	NEMA 56-C		
Gearbox output flange	NEMA 34		
VFD input voltage	120 V (North America), 240 V (Europe)		
VFD IP rating	IP31		
Control type	Manual / MachineMotion		
Combined weight	12.5 kg		
Certifications	Motor: CE, CSA; VFD: CE, UL, CSA, EAC, RoHS2, IE2		
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Safety

Important: Take the following safety precautions when doing any maintenance:

1. Never work on energized equipment.
 2. Aways establish the motor connection first before energizing the VFD.
 3. Routinely inspect the motor and gearbox to ensure all bolts are tightened properly.

Mounting the motor

The motor-gearbox combination come pre-assembled.

To mount the motor:

Notif the music. 1. Active the conveyor rollers, by hand, to align the drive input keyway with the gearbox output shaft's orientation. 2. Apply as small amount of grasse to the gearbox output shaft so that is lightly costed. This will reduce the possibility of fretting corrosion occurring during operation, making future removal easier. 3. Mole the service to most the pearbox the convergence of the possibility of the total service of the service of the cost the pearbox output shaft so the roll service of the output devices of the pearbox the convergence of the pearbox the mole and pearbox will induce a substantial bending moment on the molor mount due to its length and mass. It must also be noted that hole pattern of the base mount does not respect Vention's 45 mm increment standards.

ome important design considerat

1. The motor multisupport mult be designed in away to allow for bet tensioning, such as is required with the HD roller conveyor. For that, it is recommended to use hav vertical eduations as seen below, whereby the MB fasteners can be loosened, tension adjusted, and then re-secured along that vertical plane. 2. With an appropriate motor mount support designed, muure that the motor power cabe, which is modelined in Machinebulder, does not intervert with the eduations. The cable will not be able to sustain very tight bend radii, which may damage it. 3. Via du that ello add 2 extructions to support the routine motor. The facture below show you come suggested designs fromtor mount support design.







Mounting the VFD

The VFD supplies the motor with p To mount the VFD: ver and controls its speed. MachineMotion can co cate with the VFD and control up to three digital inputs, such as the VFD start-stop function, via the digital IO module.

 Select the placement area. Cho
 Attach the VFD with the 2 provided and the VFD withe VFD with the 2 p dry place, like the side of the structure supporting the conveyor. Leave 150 mm of clearance below the VFD for its electrical cables, and ensure the VFD is within reach of the 2.5 m-long motor power cable. ST-rusts and bolts. Insert them along the same horizontal i-slot. The fasteners are slightly long, so they can extend from the i-slot and serve as a perch to hook the VFD in to for easy access.



Connecting electronics

Internally, both the AC motor and VFD cor wired and configured for basic motor operations. To complete the electrical installation, follow the wiring diagram below



Motor, VFD and Digital IO Wiring

Controlling and programming the VFD

The Lenze VFD is an extremely feature-rich frequency drive allowing for highly config are pre-set and do not need changing. rs are values, stored in the VFD, that control how the motor and VFD behave. Most of the param n. This is p led for basic You can perform operations using the VFD keypad, as described in the table below

Key Actuation Action Press briefly • Navigation in the menu • Parameter alteration Press briefly • Go to Menu/Parameter • Go to Menu/Parameter Press briefly Go to Monu/Parameters Confirm parameters Press and hold for 3s Press briefly Press briefly Quit Monu/Parameters ates that the parameters have bee Press briefly Press briefly Press briefly Activate keypad control Press briefly Start motor Press briefly Change rotating direction **•** Press briefly Stop motor Table 1: Keypad conti

ever, you may need to manually configure some parameters if you are modifying motor operating characteristics or setting up certain digital in To change a parameter:

- Press Enter Orbeity.
 With the up and down arrow keys, select the group the parameter is in. Parameters are formatted as PXYYZZ, where the first digit after P indicates the group. (For example, parameter P400.01 is in group 4.) Press Enter.
 With the up and down arrow keys, select the parameter. Press Enter.
 With the up and down arrow keys. Charge the parameter is in. Parameters are formatted as PXYYZZ, where the first digit after P indicates the group. (For example, parameter P400.01 is in group 4.) Press Enter.
 With the up and down arrow keys. Charge the parameter value. Press Enter to input the change.
 To save the new parameter value, parameter value.

- Caution: Incorrect parameters can damage the motor or VFD.

Starting and stopping the motor

You can control the motor directly from the VFD - which is the default, manual option or through MachineMotion, which requires further integra

Enabling VFD keypad control

1. Press CTRL briefly. The screen displays "Keypad Full CTRL?" and then indicates the desired state (e.g.: "ON" will be displayed as the desired state). 2. Press Enter briefly to change from OFF to ON. A red error light will begin to flash when keypad control is enabled, this is normal.

Control via VFD keypad

To control the motor directly from the VFD, press the following buttons:

(I) (key. Start hour press briefly, a contrary granted.
 (I) (key. Start hour press briefly,
 2. UP and DOWN arrow keys. Change frequency (motor RPM). There is no direct RPM feedback.
 3. R-F key. Change directions.
 4. (6) key (in red). Stop motor.

Control via MachineMotion

To control the motor remotely via MachineMotion, you will need to set up remote triggering of digital inputs (such as a start-stop function). This requires a MachineMotion, the Digital IO Module (CE-MD-001-0000_2) and M12 Cable for Digital IO Module v2 - Female to 3x Female (5m) (CE-CA-951-5000), all sold separately ion Software Conflug

The AC Motor and VFD is an actuator controlled via digital outputs and not the MachineMotion drives. Therefore there are additi nal setup steps to take, in order to have your VFD being stopped by the system upon an emergency stop event. It is important to note that it is NOT a safety rated actuator

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6. Save the file and then reboot your MachineMotion controller to apply the changes

VFD Configuration

The following guide will run through the example of setting up the "start-stop" and "forward-reverse" digital inputs

- te following uide will run through the earnie of setting up the "start-stop" and "forward-evener" (signal public):
 1. Establish the connection of the Digital Dinotot is to the Machinedian via any of the four available control ports.
 2. Doncet the triple uplike rule bits and bits via the Digital Diapot of testing the start stop" and the source of the Start stop" and the source of the Start stop" and the source of the Start stop" and the Start s
- For a list of additional available digital inputs and a step-by-step programming guide, see Lenze's i510 commissioning guide, section 6.2: lenze.o If you have any questions or concerns about configuring VFD parameters, Vention's customer success team can assist with troubleshooting.

M12 S-Key 4 pins Female Connector

Pin	Description
Pin 1	Phase U
Pin 2	Phase V
Pin 3	Phase W
Pin 4	EARTH

M12 A-Key 5 pins Male Connector

Pin	Description
Pin 1	VFD Input 1
Pin 2	VFD Input 2
Pin 3	ov
Pin 4	VFD Input 3
Pin 5	Not Connected