MAGNETEK
ELEVATOR

HPV1000-App_Note_26

Open Loop Vf Control Start Guide (Using the JVOP180 Keypad)

Guide to set up HPV1000 drive in Open Loop Vf Control

NOTE: This quick start-up guide just outlines the general parameters that should be changed / verified when a drive is installed with information that are readily available. The drive will **not** run if **only** these parameters are set. Because different controller manufacturers have different interfaces, it is recommended that the parameters in the drive be set to what is recommended by the elevator controller in their technical manual.

Open-Loop Operation Set-up

1) Enter / verify that the drive is set to run in VF Control in the Drive Mode menu (Selection 0 in the A1-02 menu).

Hoistway Parameter Set-up

2) Enter / verify the following parameters:
- CONTRACT CAR SPD (O1-25) *parameter should be the lift contract speed in m/s. This can be verified with a hand tachometer if required and adjusted if required.*
- CONTRACT MTR SPD (O1-26) *parameter should be set to the RPM that is required to make the lift travel at contract car speed*

NOTE: The above two parameters are utilised by the drive for many purposes regarding speed control of the lift, therefore its important these are set correctly prior to continuing any further.

Input Voltage

3) Enter the Line Voltage:
- INPUT VOLTAGE (E1-01) parameter should be set to the measured incoming phase to phase voltage.

Autotune

4) The autotune can now be performed by navigating to the Autotune menu. The drive has several options for autotuning the motor, however as usually the motor is roped we recommend the 'Terminal Resistance (Static) method is used.

First, ensure parameter S1-12 is set to 2.

Navigate to the autotune menu and enter the following information:
- 'Terminal Resistance' (T1-01 TUNING MODE SEL)
- Rated Motor Power in kW (T1-02 MTR RATED POWER)
- Rated Current in A (T1-04 RATED CURRENT)

Stop at this point in the menu and begin running your lift UP on test control. The drive will ignore the run input until you press the up arrow on the keypad once more, at which point it will begin the autotune. During this process the drive will display motor current on the right hand side of the screen for reference. Maintain the test run until the drive displays "END Tune Successful". The test run UP button can then be released.

The drive will then automatically populate the following parameters in the A5 menu:
- Rated Mtr Power (E2-11)

- Rated Motor Curr (E2-01)
- Term Resistance (E2-05) – *calculated from autotune*

Then the following parameters should be set in the A5 menu manually:

- Motor Voltage (E1-05)
- Motor Frequency (E1-04)
- Motor Slip (E2-02)
- No of Motor Poles (E2-04)
- No Load Current (NO-LOAD CURRENT(E2-03) - *Enter a value of about half of the motors rated current*
- Motor Mid Volts (E1-08) *Use a value of 40*

Low speed inspection mode

- Run the lift using inspection controls and verify direction is correct. If the direction is incorrect, this can be reversed with the MOTOR ROTATION (B1-14) parameter if required.

Key Drive Parameters

Drive Menu

Parameter	Description	Default	Units	Suggested Adjustment
CONTRACT CAR SPD O1-25	Elevator contract speed	0.0	m/s	Adjust to speed the installation is rated to run at.
CONTRACT MTR SPD O1-26	Motor speed at elevator contract speed	1130.0	rpm	Adjust this value to ensure the actual running speed of the car matches the parameter above. If the car is traveling too fast then reduce this value, if too slow then increase it.
DC START LEVEL S1-02	Determines the amount of DC Injection at start, as a percentage of drive rated current	50	%	Increase if rollback occurs at start
DC STOP LEVEL S1-03	Determines the amount of DC Injection at stop, as a percentage of drive rated current	50	%	Increase if rollback occurs at stop
DC STOP FREQ S1-01	Determines the speed to begin applying DC injection at stop, as a percentage of contract speed	1	%	Increase to begin DC injection sooner at the end of travel
DC BRK TIMESTART S1-04	Determines how long the drive should apply DC BRK I @ START current	0.4	Sec	Increase to lengthen DC Injection time at start
DC BRK TIMESTOP S1-05	Determines how long the drive should apply DC BRK I @ STOP current	0.6	Sec	Increase to lengthen DC Injection time at stop
SLIPCOMP GAIN M S2-02	Slip compensation for levelling in the motoring direction	0.7	None	

Parameter	Description	Default	Units	Suggested Adjustment
SLIPCOMP GAIN R S2-03	Slip compensation for levelling in the regenerative direction	1	None	
TORQ COMP GAIN C4-01	Sets the gain for the automatic torque compensation parameter	1	None	Use this function to improve holding torque
TORQ COMP TIME C4-02	Time filter for the Torque Compensation function	50	mSec	Adjust in conjunction with TORQ COMP GAIN to improve torque at start

Table 3 OL: Important parameters to set/check when setting up a drive in open-loop vf control

Power Convert

Parameter	Description	Default	Units	Suggested Adjustment
INPUT VOLTAGE E1-01	Nominal line-line AC input Voltage, RMS	0	Volts AC	Adjust to match the voltage across R, S, and T of the drive. The drive uses this value for its undervoltage alarm and fault detection circuit
UV DETECT LEVEL L2-05	DC Bus Voltage level for undervoltage fault	500	Volts DC	Usually set to around 70% of the DC Bus voltage while idle (Can be monitored in the L2-05 menu)
PWM FREQUENCY C6-03	Carrier frequency	8.0	kHz	Setting this parameter to 8kHz is a good starting value to ensure low motor noise. Increasing this value will derate the drive.

Table 4 OL: Important parameters to set/check when setting up a drive in open-loop vf control

Motor

Parameter	Description	Units	Suggested Adjustment
RATED MTR POWER E2-11	Rated motor output power	kW	Set to motor kW rating as per the motor nameplate (Should be set in E2-11 during autotune)
RATED MTR VOLTS E1-05	Rated Motor Voltage	VAC	Set to motor VAC rating as per the motor nameplate (Should be set in E1-05 during autotune)
RATED MOTOR FREQ E1-04	Rated excitation frequency	Hz	Set to motor frequency rating as per the motor nameplate (Should be set in E1-04 during autotune)
RATED MOTOR CURR E2-01	Rated motor current	Amps	Set to motor nameplate rated current (Should be set in E2-01 during autotune)
NUMBER OF POLES E2-04	Motor poles	none	Adjust to set number of motor poles as per nameplate (Should be set in E2-04 during autotune)
MOTOR RATED SLIP E2-02	The slip frequency of the motor	Hz	Set to the slip frequency of the motor. May not be available from the motor nameplate. (Should be set in E2-02 during autotune)
NO-LOAD CURRENT E2-03	No Load Current	A	If it is not known, use the default value in the E2-03 menu (Should be set in E2 during autotune)
LEAK INDUCTANCE E2-06	Leakage Inductance	%	
TERM RESISTANCE E2-05	Phase to phase resistance of motor	%	These parameters should be set during the autotune
MOTOR MIN VOLTS E1-10	Sets the lowest voltage point on the V/Hz curve	V	

Parameter	Description	Units	Suggested Adjustment
MOTOR MIN FREQ E1-09	Sets the lowest frequency point on the V/Hz curve	Hz	
MOTOR MID VOLTS E1-08	Sets the middle point on the V/Hz curve	V	
MOTOR MID FREQ E1-07	Sets the middle point on the V/Hz curve	Hz	

Basics

Parameter	Description	Default	Choices	Suggested Adjustment
DRIVE MODE A1-02	Drive operation	'0' - VF Control	V/f Control Open Loop Vector Closed Loop Vector PM ClosedLoop Vct	Set to '0' - VF Control for open loop

Table 6 OL: Important parameter to set/check when setting up a drive in open-loop