SMARTRISE

MADE STRONG

DRIVE STARTUP MANUAL

Magnetek HPV900AF Drive

PM Motor Installation

www.smartrise.us | 2601 Fair Oaks Blvd., Sacramento, CA 95864 | 916.457.5129

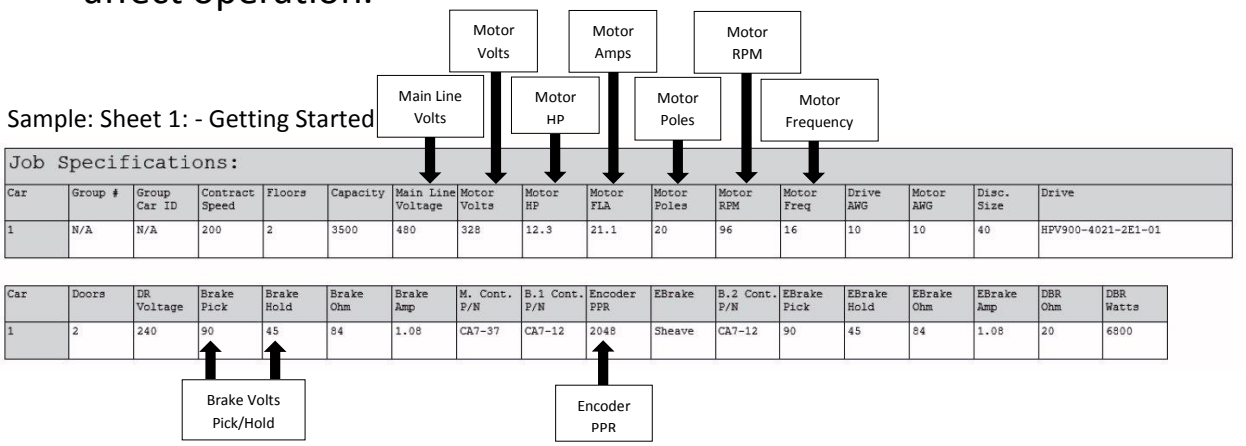
Magnetek HPV900AF Drive

EQUIPMENT/SETTINGS VERIFICATION

Verify that the Job Specification parameter table on the drawings "Sheet 1: Getting Started" matches the actual equipment.

Below is a sample table showing the important values that will affect operation.

Sample: Sheet 1: - Getting Started



Job Specifications:

Car	Group #	Group Car ID	Contract Speed	Floors	Capacity	Main Line Voltage	Motor Volts	Motor HP	Motor FLA	Motor Poles	Motor RPM	Motor Freq	Drive AWG	Motor AWG	Disc. Size	Drive
1	N/A	N/A	200	2	3500	480	328	12.3	21.1	20	96	16	10	10	40	HPV900-4021-2E1-01

Car	Doors	DR Voltage	Brake Pick	Brake Hold	Brake Ohm	Brake Amp	M. Cont. P/N	B.1 Cont. P/N	Encoder PPR	EBrake	B.2 Cont. P/N	EBrake Pick	EBrake Hold	EBrake Ohm	EBrake Amp	DBR Ohm	DBR Watts
1	2	240	90	45	84	1.08	CA7-37	CA7-12	2048	Sheave	CA7-12	90	45	84	1.08	20	6800

MAGNETEK PARAMETER LOCATION REFERENCE

ADJUST A0

DRIVE A1

Encoder Pulses (Follow procedure in Axial Flux manual Pg. 9)

POWER CONVERT – A4

Input L-L Volts

MOTOR – A5

Rated Mtr Power (Kw)

Rated Mtr Volts (VAC)

Rated Exit Freq (60Hz)

Rated Motor Curr (FLA – Amps)

Motor Poles

Rated Mtr Speed (RPM)

CONFIGURE C0

USER SWITCHES – C1

Encoder Select

"Axial Flux"

CONTROLLER GROUNDING REQUIREMENTS

NOTE – For the controller to function properly it is very important to provide proper building ground connections to the controller.

- Examples of a proper building-to-controller ground connection is to attach the ground cable to:
  - The street side of the incoming water main.
  - To a grounding rod that has been driven into the pit flooring.
- The controller has a common ground bus terminal connection.

- All grounds need to land at this common point including building, motor, transformer, and filter grounds. This prevents ground loops, and will limit the impedance between the grounds and noise will be channeled back to building ground.

Providing a proper ground is mandatory and will improve the performance of the controller.

WIRING – (Check off box when complete)

** Refer to the Appendix for the following connections **

Power – (Sheet 3: Machine Room connections)

- ☐ Connect main line power to terminal block L1/L2/L3.
- ☐ Connect the ground wire to the yellow/green terminal block next to L1-L3.

Brake – (Sheet 5: Brakes)

- ☐ Connect the main brake wiring to terminals K1 / K2 and the secondary brake wiring to terminals J1 / J2 located on the terminal block between the M contactor and the L1~L3 terminal blocks.
- ☐ Jump EB to the terminal listed in the Construction box located on "Sheet 01 – Getting Started" and connect either the rope gripper or sheave brake to EBR (if installed).

Motor Leads

- ☐ Connect motor leads to the M contactor at T1/T2/T3.

Encoder Cable – (Sheet 4: Drive and Motor)

- ☐ Connect the encoder cable to terminal block TB1 located under the lower cover to terminals 1, 2, 3, 4, 5, 17, & 18 (see table below).

Proximity Sensor – (Sheet 4: Drive and Motor)

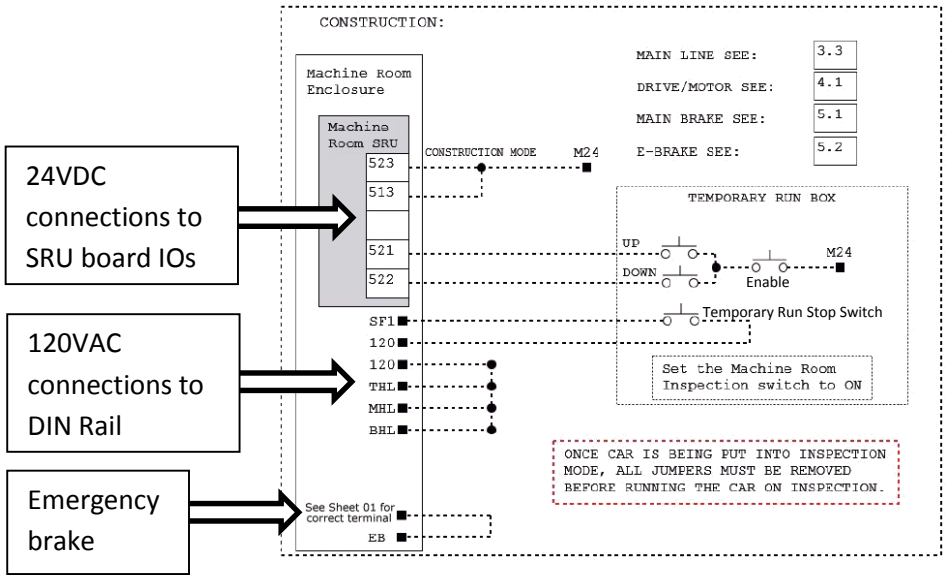
- ☐ Install the proximity sensor per the instructions in the Axial Flux manual TM7354 - (pp. 6-8).
- ☐ Connect the proximity sensor to terminal block TB1 located under the lower cover to terminals 5, 17, 18, & 19 (see table below).

Terminal # on TB1	Motor Encoder	Proximity Sensor
1	A	
2	/A	
3	B	
4	/B	
5	Shield	Shield
17	+VDC	+VDC
18	COM	COM
19		Z

CONSTRUCTION – (Sheet 1: Construction)

The following instructions are from the job drawings: “Sheet 1 – Construction”. Refer to the job’s specific drawings for connections.

Construction Box (Sample)



24v DC connections

- ☐ Install jumpers between M24 and the IOs listed on “Sheet 1: Getting Started – Construction”.
- ☐ Install jumpers between M24 any additional IO’s (if required):
  * Pre-Transfer
  * Emergency Power
  * Governor
- ☐ IMPORTANT! REMOVE FACTORY WIRES ON INPUTS 521/522
  - Install the Run Bug Up/Down Switch to IO’s 521/522
- ☐ Install the Run Bug Up/Down Enable switch to M24

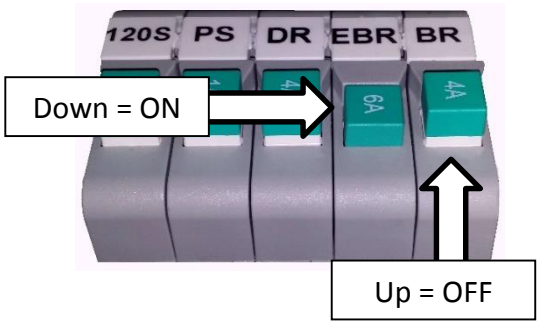
120v AC connections

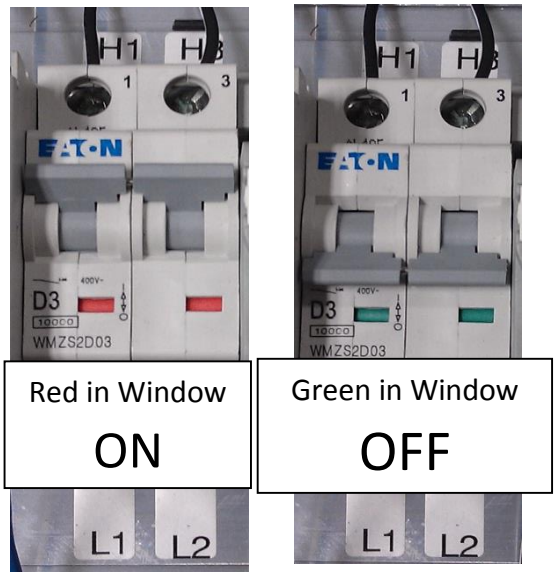
- ☐ Install the temporary run switch between 120 and terminal SF1 and 120 to THL/MHL/BHL terminals on the DIN rail.
- ☐ Install a jumper between EB and the terminal listed on the drawings on “Sheet 1: Getting Started – Construction”.

POWERING UP

(Check off box when complete)

- ☐ Apply external power by closing the main disconnect.
- ☐ Close the L1/L2 breaker, the M24, PS, BR and EBR breakers.
- ☐ Verify that the LCD on the Smartrise board and the Magnetek Drive should come on.





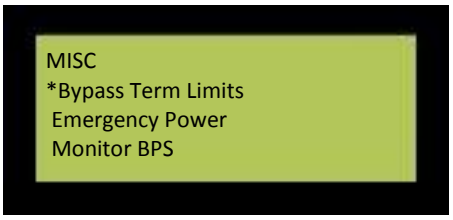
FINAL SETUP

(Check off box when complete)

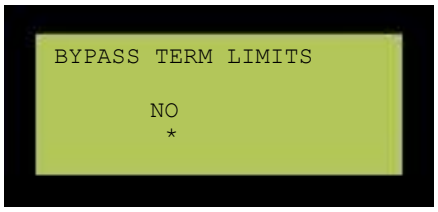
- ☐ Toggle the Inspection/Normal switch to the “INSP” position.
- ☐ Set **BYPASS TERM LIMITS** to **YES**:
  - On the Smartrise Machine Room controller board, press the Left Arrow (ESC) button several times to get to the **MAIN SCREEN**.
  - Press the Right Arrow to go to **MAIN MENU.** Use the Up / Down Arrow keys and move the asterix to **SETUP** and press the enter key.

- Use the Up / Down Arrow keys and move the asterix to **MISC** and press the enter key.

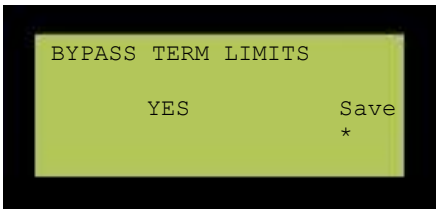
- **BYPASS TERM LIMITS** should be the first item listed. If it's not there use the Up / Down Arrow keys and move the asterix to **BYPASS TERM LIMITS** and press the enter key.



- Use the Up / Down Arrow keys to change the word **"NO"** to "**YES**".



- Use the RIGHT Arrow key and move the asterix under the word "SAVE" and press enter.



- Hit the LEFT Arrow (ESC) button several times to get to the **MAIN SCREEN**.

☐ Verify the LCD displays "Construction" Mode on the **MAIN SCREEN**.

☐ Verify that the Magnetek drive is not showing a "Setup Fault One" on the display.

- Go to "**Troubleshooting – Setup Fault One**" for corrective actions.

AUTO TUNING

The auto tune function must be performed for a PM motor to properly operate. The two functions are Encoder Alignment and Motor Alignment.

** During the alignment process the Smartrise SRU board may display several faults. These are normal and won't affect the alignment procedure. **

MOTOR ALIGNMENT

(Check off box when complete)

- ☐ Use the Left|Right arrow buttons to select the "**AUTOTUNE SEL U12**" menu and then use the Up|Down arrow buttons to change **AUTOTUNE SELECT** to "***YES***" but **DON'T PRESS THE ENTER BUTTON YET**!
- ☐ Press and hold the M contactor button in.
- ☐ Press the Enter button on the drive to start the alignment.

ENCODER ALIGNMENT (NON-ROTATIONAL)

(Check off box when complete)

- ☐ On the drive: in the ROTOR ALIGN U10 menu change the following parameters:
  - ○ ALIGNMENT METHOD to either "*HF Inject*" or "*AUTO ALIGN*" and press Enter.
  - ○ ALIGNMENT from DISABLED to *ENABLE.*
  - ○ BEGIN ALIGNMENT to "*YES*" but **DON'T PRESS THE ENTER BUTTON** yet!
- ☐ Press in and hold the M contactor button.
- ☐ Press the Enter Button on the drive to start the alignment.

If the drive displays the error message "**CAN NOT CHANGE AT THIS TIME**" make sure U10 ROTOR ALIGN – ALIGNMENT is set to *ENABLE*.

If there are other faults during this process, refer to the fault section of the Magnetek technical manual for diagnostic information.

HPV900AF DRIVE MENU TABLE

BASICS U9

PARAMETER	DESCRIPTION	CHOICES
DRIVE MODE	DRIVE OPERATION	OPEN LOOP CLOSED LOOP **PM**

AUTOTUNE SEL U12

PARAMETER	DESCRIPTION	CHOICES
AUTOTUNE SELECT	ALLOW AUTOTUNE TO RUN	DISABLE ON RUN **YES**

ROTOR ALIGN U10

PARAMETER	DESCRIPTION	CHOICES
ALIGNMENT	ALLOW ALIGNMENT TO BE PERFORMED	**ENABLE** DISABLE
BEGIN ALIGNMENT	DETERMINE WHEN TO PERFORM ALIGNMENT	**YES** ON RUN NO
ALIGNMENT METHOD	HOW ALIGNMENT WILL BE PERFORMED	OPEN LOOP AUTO ALIGN **HF INJECT [SEE NOTE]**

DRIVE INFO U6

PARAMETER	DESCRIPTION	CHOICES
DRIVE VERSION	SHOWS THE SOFTWARE VERSION OF THE DRIVE SOFTWARE	*SA4810-030-xxx.xx*

OPERATION

(Check off box when complete)

Run the car and verify the following:

No Faults

- ☐ Make sure the car is moving without triggering a fault either on the Smartrise SRU or the drive. If the SRU board displays a "Drive Fault" on the SRU, look at the drive to see what the fault is. The most common fault is "Encoder Flt".
  - Go to "***Troubleshooting – Drive Fault / Encoder Flt***" for corrective actions.

Proper Direction

- ☐ Make sure the car is moving in the same direction as the control switch on the Run Bug.
  - Go to "***Troubleshooting – Wrong Direction***" for corrective actions.

At Speed

- ☐ Make sure that the car is moving at the proper inspection speed (approx. 50 FPM).
  - Go to "***Troubleshooting – Car Moving Too Slow or Rough***" for corrective actions.

Under Control

- ☐ Make sure that the car is moving under full control. The car should stop when commanded from the Run Bug. Verify that the car runs with no faults for 10 seconds or more.
  - Go to "***Troubleshooting – Brake Not Lifting***" for corrective actions.

TROUBLESHOOTING

DRIVE FAULT / ENCODER FLT

1. The most common fault at startup with a Magnetek drive is the Encoder fault. Perform the following checks to correct this fault:
    a. Check for a solid *shield-to-ground* connection at the motor and drive.
    b. Check for correct colored encoder wires to the terminals.
    c. Verify that "C1 - Encoder Select" is set to "***Axial Flux***".
    d. Swap A+ / A- on terminal TB2 – #1 (A) and #2 (/A).
        i. After changing any encoder wiring the Encoder Alignment must be ran again (See page 6).

BRAKE NOT LIFTING

1. If the brake is not picking make sure that it is wired according to Sheet 5 – Brakes and verify that the EB terminal is jumped to the terminal listed on "Sheet 01 – Getting Started". If it has the proper voltage check the following:
    a. During a run command, check for DC voltage between points K1 / K2 and J1 / J2. Verify the voltages are also at the Brake Coil(s) when commanded to pick.
    b. Verify that the voltages match the Brake Coil voltages shown on "Sheet 1: Getting Started" table.

WRONG DIRECTION

1. If the car is moving in the wrong direction:
    a. On the Smartrise controller board make sure that IO 521 comes on when commanding the **UP** direction and IO 522 comes on when commanding the **DOWN** direction.
    b. Change the direction of the motor in the drive by going to "C1 – Motor Rotation" and toggling between FORWARD/ REVERSE.
    c. Swap two of the motor leads (T1 with T2). After swapping the motor wires it may be necessary to change C1 – Motor Rotation again. Run the U12 Auto Tune again.

CAR MOVING TOO SLOW OR ROUGH

1. Swap the encoder wires A+ and A- on drive TB2 (terminals 1 & 2).
2. Verify the brakes are lifting fully.

SETUP FAULT ONE

This is caused when the HPV is programmed with motor data (A5) that conflicts with drive software.

1. Unplug the CAT5 cable from the DRIVE port on the machine room SRU board. This will restore access to the HPV LCD screen.
2. Go to A5 – Motor Parameters – Motor Poles and verify that you have the correct number of poles listed.
3. Next, go to A5 – Motor Parameters – Rated Motor Speed and lower the RPM 15-20 rpms and save.
4. Plug the CAT5 cable back into the DRIVE port on the SRU.

APPENDIX

Terminal Locations