

Magnus Power

*LP3 3kW Three Phase Variable Frequency
Variable Voltage Frequency Converter - Manual*

LP3 3kW Three Phase Variable Frequency Variable voltage Frequency Converter, Operation and Maintenance.



Magnus Power

29 - 30 Brunel Road, St Leonards on Sea, East Sussex, TN38 9RT. United Kingdom

Telephone +44 (0) 1424 853 013 (Sales & Service)

+44 (0) 1424 853 464 (all other Enquires)

Fax +44 (0) 1424 853 2 268

www.magnuspower.co.uk

magnuspower.sales@akersolutions.com

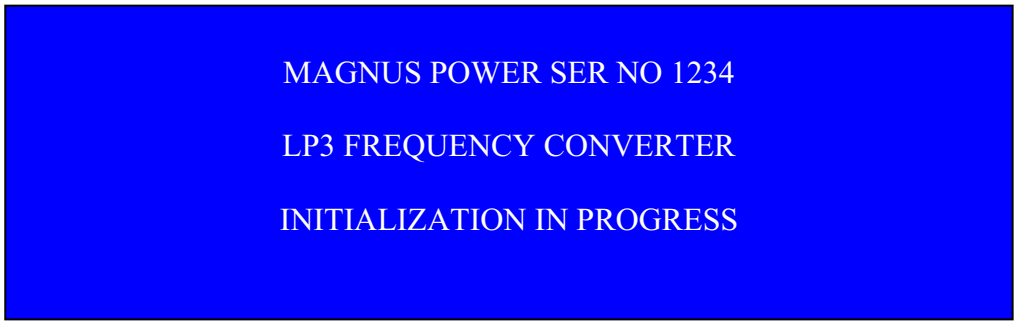
magnuspower.service@akersolutions.com

LP3 OPERATION

Power on

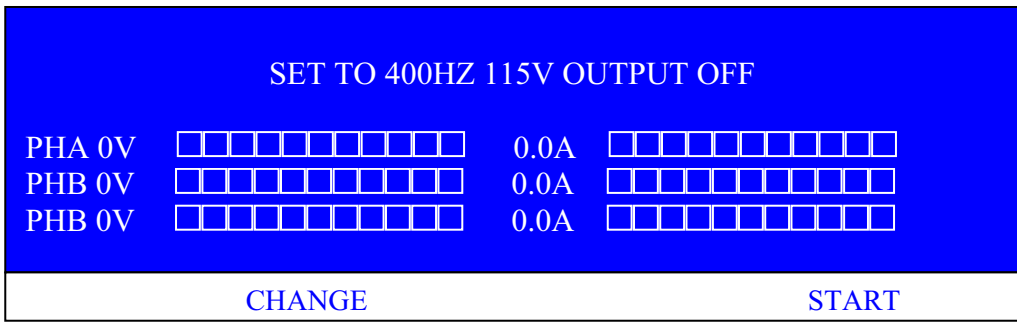
The LP3 does not have a conventional ON/OFF switch. Instead there are two buttons on the front panel 'INPUT ON' and 'STANDBY'. As soon as power is applied to the mains inlet on the rear of the LP3, the electronics enter STANDBY mode. This is indicated by the power LED (situated between 'INPUT ON' and 'STANDBY') glowing red. At this stage, it is best to leave the output cable disconnected (not plugged into the rear of the LP3). With the mains supply connected the LP3 will enter STANDBY mode, red LED on. To turn on the LP3, press 'INPUT ON'. The power LED will change to green and flash at a 1Hz rate. The display backlight will illuminate and the display will read :

1



At the bottom of the display will be a progress bar which will give a visual indication of the time taken to initialise the electronics, typically 3 seconds. The LP3 is now 'stopped' and ready for use. Depending on the last time it was powered up, the display will read something like:-

2



The first Row gives the status of the LP3. As shown, it is set to 400Hz, 115V and the output is OFF. The next 3 rows are the phase volt and ammeters. They consist of two parts. The first is an absolute reading of up to 3 digits. The second part is a bar meter which gives an easy to read indication of the relative output voltage and current. Note. Because the LP3 is not running, there is no output voltage and the voltmeter reads 0V and the ammeter reads 0.0A. The bottom row describes the function of the push buttons immediately below the prompts. The STANDBY button can be operated at any time to shutdown the LP3.

OUTPUT ISOLATOR

The Electronics are switched to the output connector via an electro-mechanical isolator. Control of this isolator is via the OUTPUT ON and OUTPUT OFF buttons. The status of the isolator is given by the indicator between the OUTPUT ON and OFF buttons. There are four possible states:-

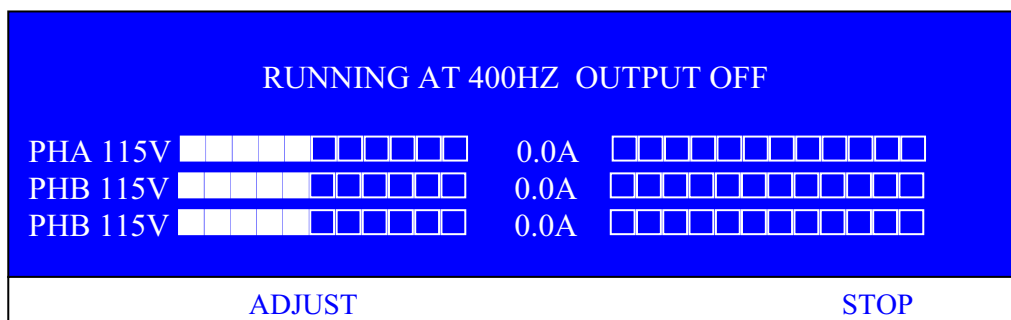
- 1 Indicator flashing red. The output isolator is open and the unit is in STOP mode
- 2 Indicator solid red The output isolator is open but the unit is RUNNING.
- 3 Indicator flashing green. The output isolator is closed and the unit is in STOP mode.
- 4 Indicator solid green The output isolator is closed and the unit is RUNNING.

The isolator can be opened by operating OUTPUT OFF or closed by operating OUTPUT ON.

START

At this point, the output of the LP3 is isolated from the electronics and the output is zero. Operation of the START button will ramp the output voltage up to the SET TO voltage. However, the output is still isolated from the electronics until the output isolator is closed. This is affected as described above by operation of the OUTPUT ON button. The output of the LP3 increases at a rate of 100 volts per second. If the LP3 is set to 115V the LP3 will ramp up in 1.15 seconds, and the display will read:

3

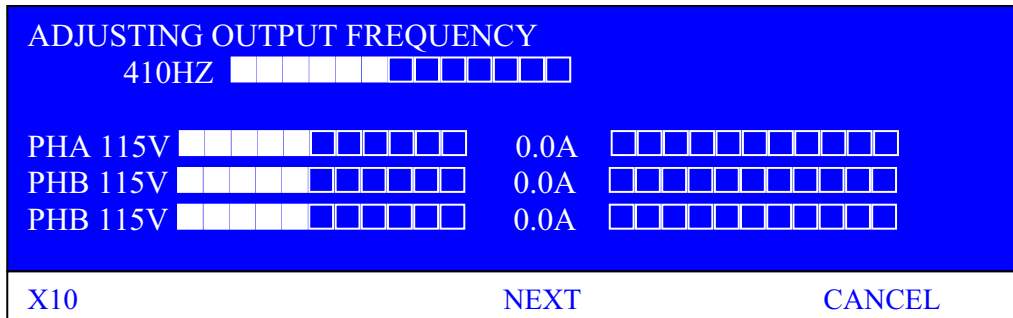


Notice that the function of the two buttons has changed. The START button is now STOP and CHANGE is now ADJUST. The top line displays the frequency and the output status, OUTPUT ON. The voltmeter now displays the measured output voltage as well as a graphical representation of the output voltage. As there is no load connected to the output, there is no current measured. While the LP3 is running, OUTPUT ON, it is possible to ADJUST the output voltage and frequency.

ADJUST

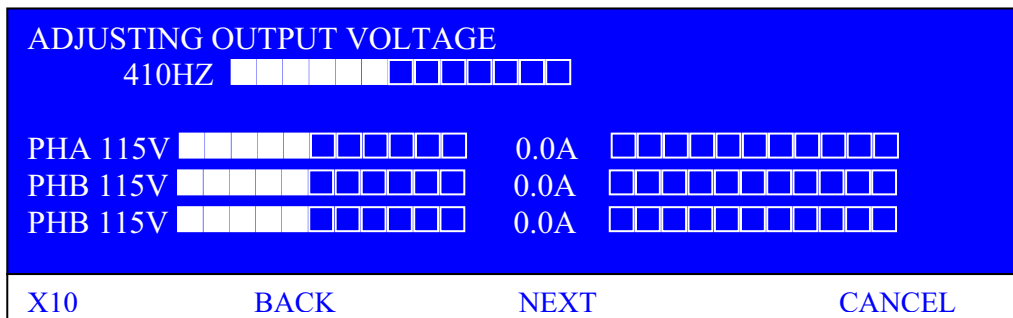
Press ADJUST and the following screen is displayed:-

4



The output frequency can now be adjusted UP or DOWN in 1Hz steps by operating the UP and DOWN arrow buttons to the right of the display. By holding down the x10 button at the same time as operating the arrow buttons, frequency will change in 10Hz steps. In either case, pressing and holding an arrow button will continuously increase and decrease the frequency with the change in frequency accelerating the longer the button is held down. Operating CANCEL at this stage will return the output frequency to its pre-ADJUST setting. Pressing NEXT allows adjustment of output voltage.

5



Adjustment of output voltage is similar to adjustment of output frequency. The UP and DOWN arrow buttons are used to increment and decrement the output voltage in 1V steps with the x10 button giving 10V steps. When you have reached the desired voltage, pressing FINISH will return the display to the basic OUTPUT ON screen (3). Pressing BACK will allow you to go back and readjust the output frequency. Pressing CANCEL will return the output voltage and frequency to that before ADJUST was selected.

STOP

Operating STOP will return the output voltage to zero instantly.. The opening screen is now displayed (2). The set to voltage and frequency will reflect any changes you may have made.

CHANGE

With the LP3 stopped, OUTPUT OFF, it is possible preset the state of the LP3. From the STOPPED screen (2), press CHANGE, the following screen will be displayed.

6

CHANGING OUTPUT FREQUENCY		
410HZ	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■
X10	NEXT	CANCEL

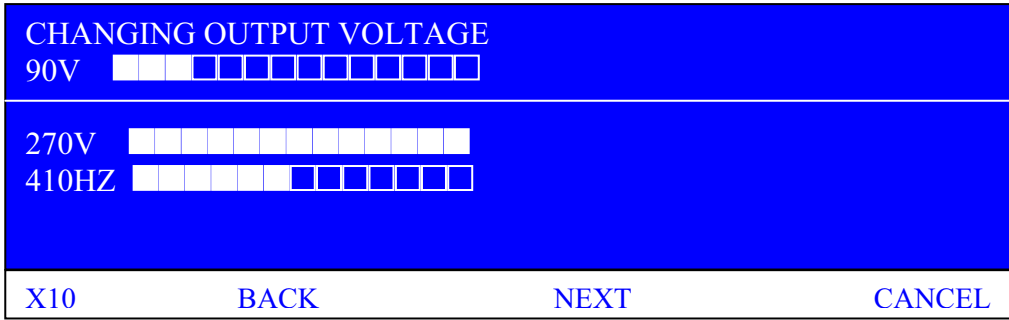
This procedure is exactly the same as ADJUSTING the output frequency, as described above, except that the output is not ON. The output frequency can now be changed UP or DOWN in 1Hz steps by operating the UP and DOWN arrow buttons to the right of the display. By holding down the x10 button at the same time as operating the arrow buttons, frequency will change in 10Hz steps. In either case, pressing and holding an arrow button will continuously increase and decrease the frequency with the change in frequency accelerating the longer the button is held down. When you have set the desired frequency, press NEXT and the following or similar will be displayed.

7

CHANGING OUTPUT RANGE		
270V	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■
410HZ	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■
BACK	NEXT	CANCEL

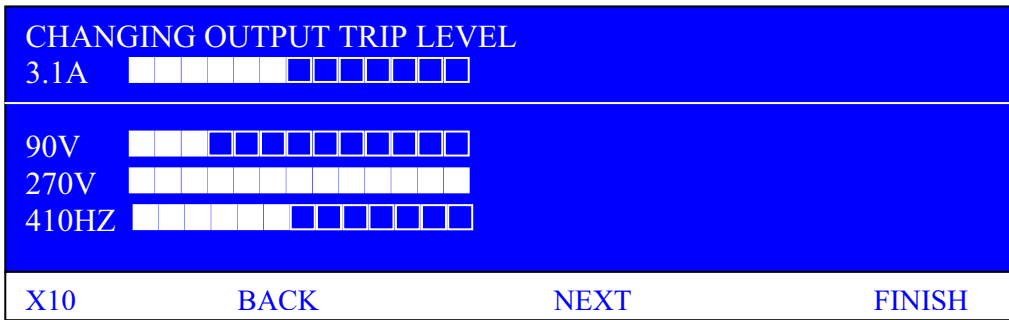
Exactly what is displayed will depend on the output range previously selected. Screen 7, above shows the 0-270V range selected. In this mode, the LP3 will deliver maximum power at 270VAC. It is possible to set the output voltage anywhere in the range 0 to 270V in 1V steps, however, if you will be operating the LP3 at or below 135V, you may wish to change the output range to 135V. This range allows adjustment of the range 0-135V and develops maximum power at 135V. To change range, operate the UP or DOWN arrow button. UP will select 270V range and DOWN will select 135V range. The display will change to show 135V on the second line and the bar graph will only be 50% full. Operation of BACK will ignore the change just made and return to CHANGING OUTPUT FREQUENCY. CANCEL will return the LP3 to its basic STOPPED mode. (Screen 2). Press NEXT and the following screen will be displayed.

8



The UP and DOWN arrow buttons are used to increment and decrement the output voltage in 1V steps with the x10 button giving 10V steps. Operation of BACK will ignore the change just made and return to CHANGING OUTPUT RANGE. CANCEL will return the LP3 to its basic STOPPED mode. (Screen 2). Press NEXT and the following screen will be displayed.

9



This lets you set the over current trip to a level appropriate for your load. The UP and DOWN arrow buttons change the trip in 100mA steps. Holding down x 10 at the same time will adjust in 1.0A steps. If the LP3 had previously been set to the LOW range with a trip level above 4.1A, changing to HIGH range will reduce the trip level to 4.1A. The LP3 over current trip works like a reset able thermal fuse in that a small over current load can be tolerated for a long time whereas a severe over current will shut down the LP3 almost immediately. Operation of BACK will ignore the change just made and return to CHANGING OUTPUT VOLTAGE. CANCEL will return the LP3 to its basic STOPPED mode. (Screen 2). FINISH will return the LP3 to the basic STOPPED mode (Screen 2). Pressing START at this point will release the LP3 from STOP and ramp up to the pre set voltage at the pre set frequency.

CONNECTING A LOAD

If you are happy with the operation of the LP3, you can now connect a load. Put the LP3 into STANDBY mode and disconnect the mains supply. The cable supplied with the LP3 has the following colour scheme:-

- | | |
|---------|--------------|
| Phase A | Red |
| Phase B | Yellow |
| Phase C | Blue |
| Neutral | Black |
| Earth | Green/Yellow |

The LP3 output is fully floating. Connect the output wires to the load and if the earth wire is not required, insulate it and tie it back to the output cable. Connect the mains supply to the LP3 and operate the INPUT ON button as previously described. Unless you have previously set the LP3 to the correct output voltage for your load, you should do so now by following the CHANGE procedure detailed above. If you are happy with the settings you can apply the LP3 output to the load on 1 of 2 ways. If you want the LP3 output to be "ramped up" into the load, first ensure the output isolator is closed by operating OUTPUT ON. The output indicator will flash green. Press START and the LP3 output will ramp up. If you want a "hard start", e.g. the output switches from 0V to the preset level instantly, ensure the output isolator is open by operating OUTPUT OFF. The output indicator will flash red. Press START. The LP3 electronics will ramp up and the display will show the output voltage but this is not yet available at your load. Press the OUTPUT ON button and the output isolator will close, immediately applying power to your load. If the LP3 fails to start correctly and the message OVERCURRENT is displayed it will be necessary to change the current trip level.

10



Press ACKNOWLEDGE and then CHANGE. You will be presented with the current trip setup screen as previously shown. Remember, many items of electronic equipment have a much higher starting current than the specified normal running current. The LP3 is designed to allow for short term overloads but you may still need to increase the overcurrent trip level.

Some loads draw large currents when power is first applied to them. Typically a bridge rectifier and smoothing capacitor will present as a near short circuit when first powered. Even if the nominal load current is within the specified capability of the LP3, these large inrush currents can be problematic. If this appears to be the case with a hard start, try ramp start.

PROTECTION

The LP3 is protected against accidental overload and short circuits applied to the output. The fast response short circuit protection may also be triggered by excessive load currents. If this protection is triggered, the message OVERLOAD is displayed and the LP3 output is returned to zero. There is no facility to increase this overload capability and if triggered, you will be prompted to RESET which returns the LP3 to its ready mode.

COOLING

The LP3 has a thermostatically operated cooling fans which expel air at the rear of the chassis. Under light load conditions, the fans run at low speed. If the LP3 is used at high power levels, the electronics will run warm. This is detected by thermal sensors and when a preset level is reached, the fans will operate at full speed until the electronics temperature reduces. The cooling fan may continue to run for several minutes after the LP3 is put into STANDBY mode.



29 - 30 Brunel Road, St Leonards-on-Sea, East Sussex, TN38 9RT. United Kingdom
Sales - 01424 853013 - All Other Departments - 01424 853464 - Fax - 01424 852268
Registered in England, Registered office Unit 12, Clivemont Road, Cornwallis Ind. Est. Maidenhead SL6 7BZ.
Registration No. 4977339. VAT Registration No. GB 829 4203 28