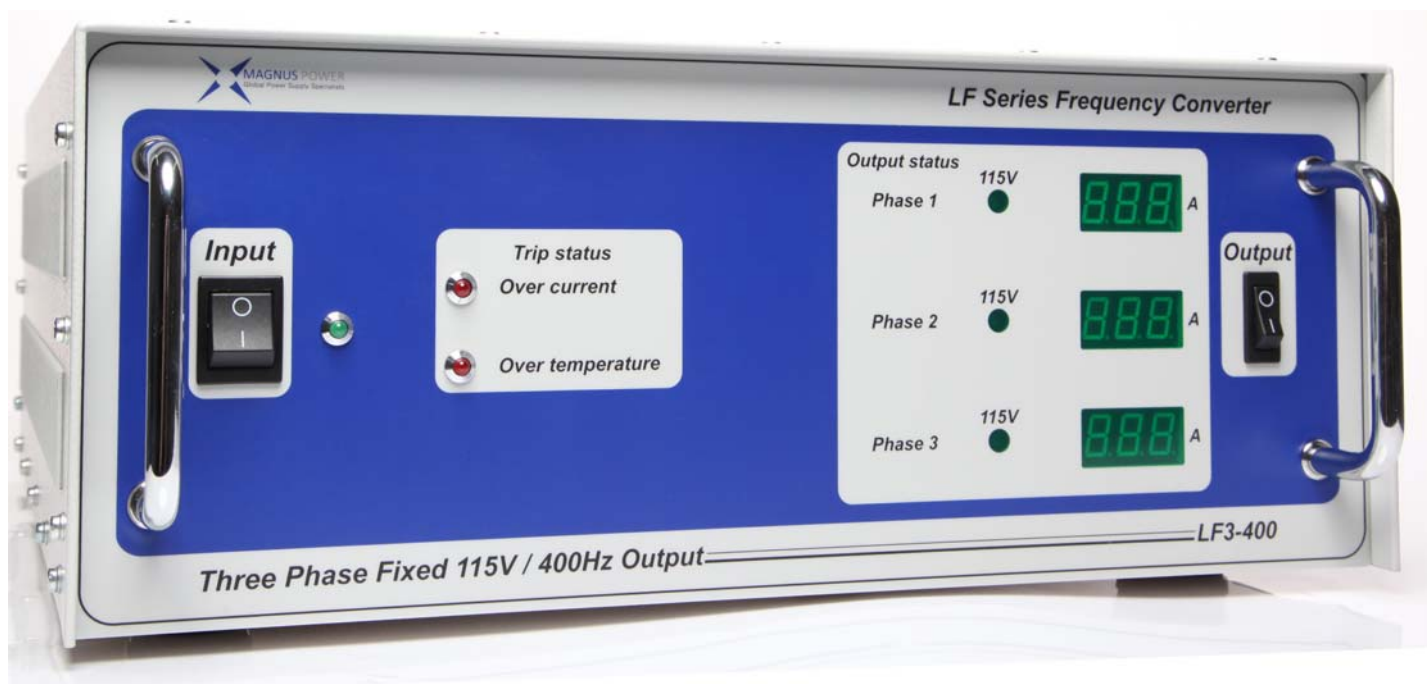


Magnus Power

LF3-400 Frequency Converter - Manual

LF3-400 Three Phase Frequency Converter, Operation and Maintenance.



Magnus Power

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Important!

Please note: when switching the LF3-400 on turn the switch at the rear of the unit on first

When switching the LF3-400 off please ensure that the switch on the rear of the unit is switched off last

Introduction

This is a condensed version of the Installation, Operation and Maintenance Manual for the LF3-400. If you prefer to read the manual later, then please read this sheet before using the converter.

In the Box

LF3-400 Frequency Converter

Input Power Cable, with bare ends

Output Cable, with bare ends for termination by user (see below)

Quick-Start Guide / Installation / Operation and Maintenance Manual (This Manual)

Safety Warning – Risk of Electric Shock

Before connecting input power, ensure that the bare ends of the output cable have been either properly connected to the load (see below) or insulated.

Important!

Please note: when switching the LF3-400 on turn the (primer) switch at the rear of the unit on first. When switching the LF3-400 off please ensure that the (primer) switch on the rear of the unit is switched off last

Warranty Invalidation

Removal of the top cover of this product will invalidate the warranty that comes with this unit, only authorised Magnus Power personnel should remove the top cover.

Product Information

If the unit has been supplied in rack-mounting form, it must be supported in the rack by a shelf, or by a bracket at each side - it must not be left to hang on its front panel fixings.

The output cable is a screened five conductor type with 4 power cores and a earth . All the power cores are coloured black but have repeating number legend printed on the core's insulation sheath.

- 1 - L1, Phase A
- 2 - L2, Phase B
- 3 - L3, Phase C
- 4 - Neutral, common to all three phases.
- 5 - Earth

The input indicator will flash during the power-up sequence.

Title:

LF3-400 Frequency Converter

Page 2 of 2

The output is protected against over current, and an over temperature detector will operate if airflow through the unit is impeded. Either fault will be indicated on the front panel, and the output will shut down until the unit has been reset by switching input power off and then on again.

The readings given by the output voltage and output current meters are for guidance only. If accurate measurements are required, include calibrated instruments in the load circuit.

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MAGNUS POWER - LF3-400 PERFORMANCE SPECIFICATION

Input Requirement	Single Phase + Neutral	230V 50/60Hz
	Voltage Tolerance	+10%/- 6%
Output Voltage	Three Phase + Neutral	115/200V
Output Frequency	400Hz	
Maximum Output	3kW (8 ³ / ₄ A per phase)	
Output Grounding	The converter output is floating (isolated from supply ground or earth). The output neutral may be grounded externally if required.	
Output Protection	Over Current	
	Over Temperature	
Overload Capability	120% Full Load (1.2kW)	
	on any phase for up to ½ second	
Load Power Factor	0.5 Lag – Unity – 0.5 Lead	
Operating Environment	0 to 40 Degrees Celsius	
	0 to 90% Relative Humidity (non-condensing)	
Storage Environment	-15 to +70 degrees	
	0 to 95% Relative Humidity (non-condensing)	
Dimensions	476 x 449 x 177 (4U) 36kg	
	Front handles to rear handles 562 x 449 x 117	

OPERATING RESTRICTIONS

If the Converter has been stored under conditions outside its operating limits, allow it to stand within the operating environment for at least one hour before use. Ensure adequate air circulation around the unit in normal operation, for correct function of the cooling fans.

Do not attempt parallel operation of the Converter output with any other power source.

INSTALLATION PROCEDURE

If the converter is to be rack mounted:

Check that the mounting space has a shelf or a support bracket at each side, strong enough to take the weight of the converter. Rack-mounting hardware is not supplied with the converter, as dimensions will depend on the type of rack or cabinet being used. The converter must not be left to hang on its front panel fixings.

Make sure there will be sufficient airflow for the converter's cooling fans to do their job. Air is drawn in at both sides, and discharged at the rear.

Output cable:

The output cable supplied with the converter has bare wires at one end, for connection to your load. Before connecting this cable to the converter, make sure that the bare wires are either properly connected to the load, or insulated. The output cable is a screened five conductor type with 4 power cores and an earth.

The cable screen is connected to the chassis, which in turn is earthed. The cable screen should not be used as a current path.

Cable core identification:

Earth is the standard yellow/green bi-colour stripe. Earth is connected to the incoming mains supply earth.

All the power cores are coloured black but have repeating number legend printed on the core's insulation sheath.

- 1 - L1, Phase A
- 2 - L2, Phase B
- 3 - L3, Phase C
- 4 - Neutral, common to all three phases.
- 5 - Earth

If connecting to a three phase system the connections may typically be as follows but the colours used are dependent on the age of the Equipment / system:

LF3	Signal	Phase colours	
Cable	Type	Pre 2006	IEC 60446 (current)
1	L1 Phase A	Red	Blue
2	L2 Phase B	Yellow	Brown
3	L3 Phase C	Blue	Black
4	Neutral	Black	Grey
5	Earth	Green/Yellow	Green/Yellow

WARNING:

Incorrectly interpreting and identifying these conductors could be dangerous.

The colour blue was previously used as a phase colour. It is now the colour for neutral. Black was previously used for neutral but now indicates a phase.

Note that colours used in equipment may not follow the current IEC 60446 standard nor previous schemes.

It is important that consideration is given to correct identification of the phase cables and connections, the use of marker tags or similar in addition to colour coding may be preferable.

CAUTION:

Neutral is common to all three phases and thus connections to it must be suitably rated for the potential maximum current from all of those three phases.

LF3-400 Output type:

The phase and neutral outputs from the LF3-400 are floating in respect to earth.

CAUTION:

The LF3-400 only operates from a 240V 50/60Hz AC supply.

Under full load the LF3-400 may draw up to 15A from the incoming mains supply. The unit should be connected to a supply that is suitably rated for this power.

SAFETY: WARNING:

The LF3-400 generates voltages both internally and externally via the output connector and output cable that are dangerous and potentially fatal. Observe extreme caution when working with the equipment.

WARNING:

LF3-400 is a class 1 piece of equipment. It therefore MUST always be connected to a protective earth input from the incoming source mains power supply.

Connections should not be touched with the LF3-400 running.

All connections from the output connector via the output cable MUST be connected or isolated/insulated before the LF3-400 is switched on. No bare ends should be present.

The output connector and any connections from the output cable to equipment MUST not be disconnected when the LF3-400 is running and under load.

NOTE:

Periodic checks should be made to ensure the cooling fans are operating normally and that they and the air vents on the sides of the LF3-400 are free of obstruction.

Indicators:

The front panel, from left to right, consists of

Green system/power indicator

Red over current & over temperature indicators

Green 115V indicators, one for each phase

Green 3 x 8 segment current reading for each phase

When applying power to the unit the indicators may briefly flash.

When the input switch is activated the system/power indicator will flash as the system starts. The 115V indicators will then also flash as the LF3-400 ramps up the voltage to 115V. The 115V indicators will remain steady once the output is stable.

115V indicators will flash slowly if the voltage drops below 115V.

115V indicators will flash fast should the voltage be over 115V.

NOTE:

The readings given by the output voltage and output current indicators on the LF3-400 are for guidance only. If accurate measurements are required, use calibrated instruments in the load circuit.

Switches:

On the rear of the LF3-400 is a mains power switch (main power switch). This will disconnect all the power from the unit and stop the cooling fans running.

On the left of the LF3-400's front panel is the 'input switch'. This turns on the control system and starts the system generating 115V 400Hz on the output. The switch is also used to turn off the LF3-400 so that it shuts down the control system in a controlled way in order to discharge the internally generated high potential.

On the right of the LF3-400's front panel is the 'output switch'. This enables the output voltage on the output connector and thus output cable.

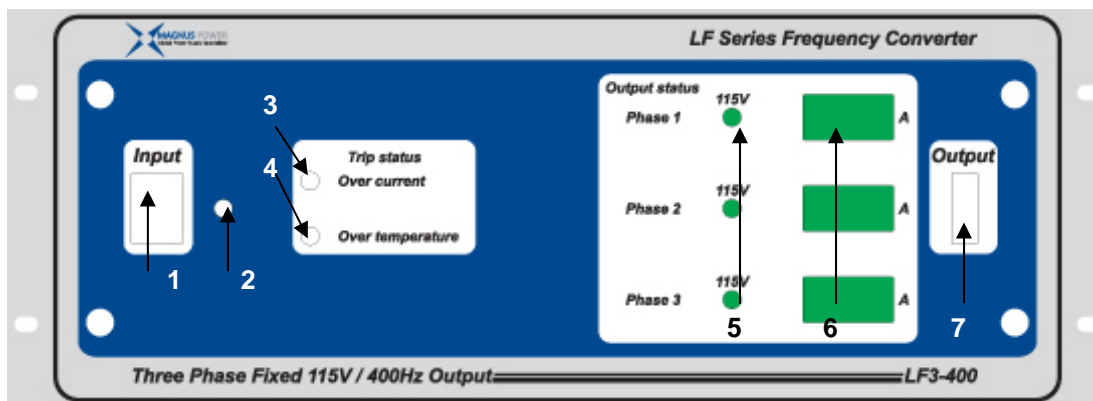
For instances where the LF3-400 is being used to drive a large load switch on the output switch prior to the input switch. This will avoid placing a sudden large current draw on the unit due to inrush on the connected equipment. Sudden large current may trip the over-current protection within the LF3-400.

When shutting down the LF3-400 the output switch [right] should be turned off first, then the input switch [left].

Wait until the system/power indicator extinguishes, then the main power switch on the rear can be switched off and/or mains power removed from the unit.

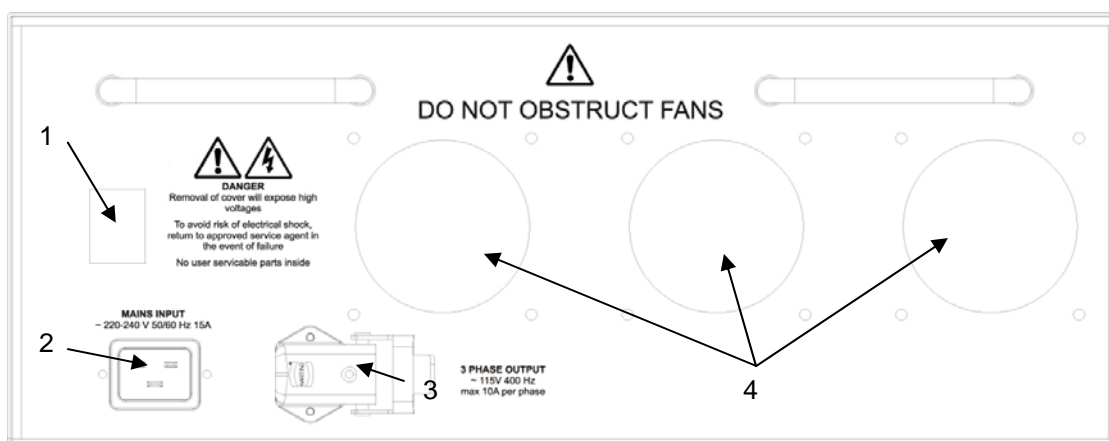
It is not recommended to use the rear mains switch to remove power without first switching off the output and input front panel switches and waiting for the system indicator to go out.

ARRANGEMENT OF FRONT PANEL



- 1 Input Switch
- 2 Input Indicator
- 3 Over Current Indicator
- 4 Over Temperature Indicator
- 5 Output Voltage Meters
- 6 Output Current Meters
- 7 Output Switch

ARRANGEMENT OF REAR PANEL



- 1 Main Power Switch (**Important** - Please note: when switching the LF3-400 on turn the main power switch at the rear of the unit on first. When switching the LF3-400 off please ensure that the main power switch on the rear of the unit is switched off last)
- 2 Input Connector
- 3 Output Connector
- 4 Air Outlets (Do Not Block)

FAULT CONDITIONS

Over Current

Converter output will cease, and the Over Current Indicator will flash. Investigate the cause of the fault, and take appropriate corrective action. Restart the converter by switching input power off and then on again. If the cause of the fault has not been remedied, it will be repeated.

Over Temperature

Converter output will cease, and the Over Temperature Indicator will flash. Investigate the cause of the fault, which will most likely be blocked airflow or a failed fan. Restart the converter by switching input power off and then on again. If the cause of the fault has not been remedied, it will be repeated.