

# Manual

## LNF-PBA

Low Noise Power Block





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## 1. Introduction

LNF-PBA is a  $\pm 12V$  low noise linear power supply designed to power LNF's line of HEMT power supplies. It accepts a mains voltage of either 115 or 230 VAC selectable on the rear panel. Please consult factory for other voltage options. The front panel has 8 output connectors, all delivering the  $\pm 12V$  VDC.

## 2. Specifications

Input					
Parameter	Description	Minimum	Nominal	Maximum	Unit
AC Input voltage range	Voltage selector at 115V Voltage selector at 230V	104 209	115 230	132 264	VAC
AC Input Power	Voltage selector at 115V Voltage selector at 230V			100 100	W
Input Frequency	AC input frequency	47		63	Hz

Output					
Parameter	Description/Conditions	Minimum	Nominal	Maximum	Unit
Efficiency			55		%
Noise	Ripple and noise		2	3	mV <sub>PK-PK</sub>
Maximum Output Current	+12V -12V		1.7 1.7		A
Load Regulation	Output change for 50% load change	-0.05		0.05	%

Environmental					
Parameter	Description/Conditions	Minimum	Nominal	Maximum	Unit
Storage Temperature		-40		85	°C
Operating Temperature		5		40	°C
Relative Humidity <sup>1</sup>	Non-Condensing	5		80	%RH

<sup>1</sup> The LNF-PBA is for indoor use only, pollution degree 2.

Physical	
Weight	3.21 kg
Dimensions	256 (W) x 98 (H) x 156 (D) millimeters

### Safety

- IEC 61010-1:2010 3<sup>rd</sup> edition

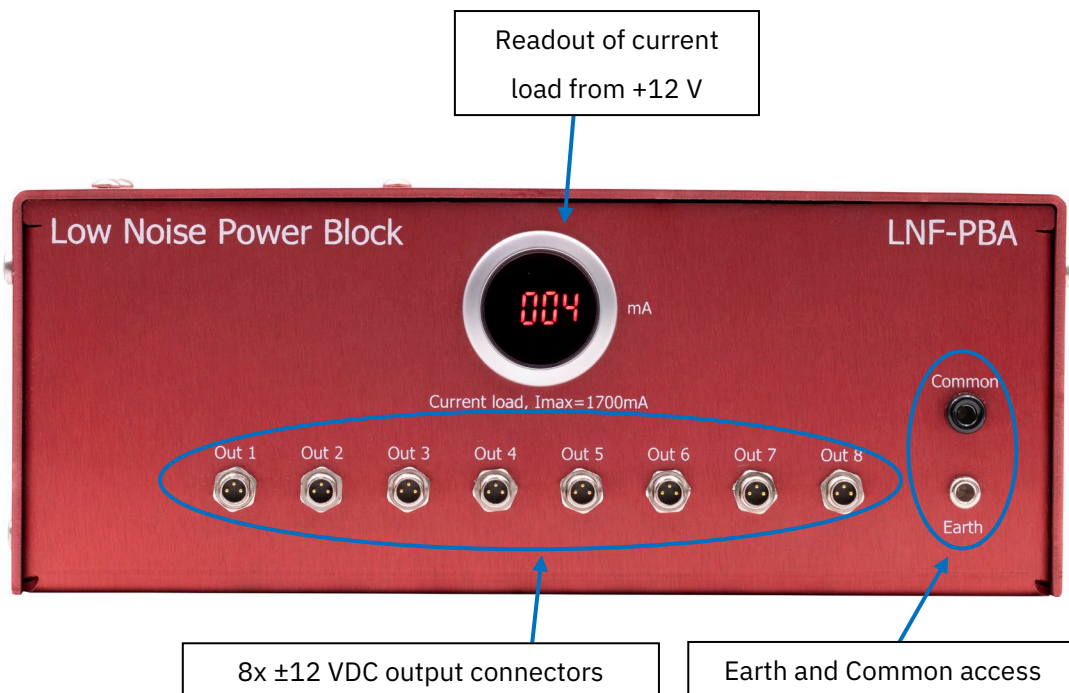
### Electromagnetic Compatibility

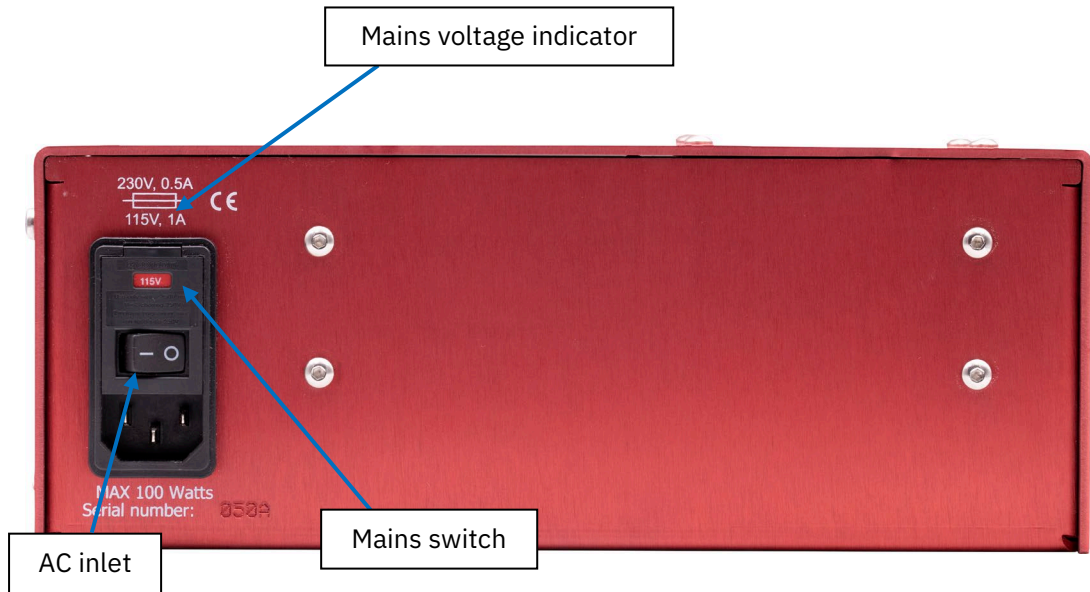
- Compliant with EMC directive IEC 61326-1:2012

## 3. Safety Information

After unpacking, make a visual inspection that there is no damage to the unit. If any damage is found, please contact the factory prior to taking it into operation.

Before first use, make sure the mains voltage selector is set in the correct position.





## 4. Installation

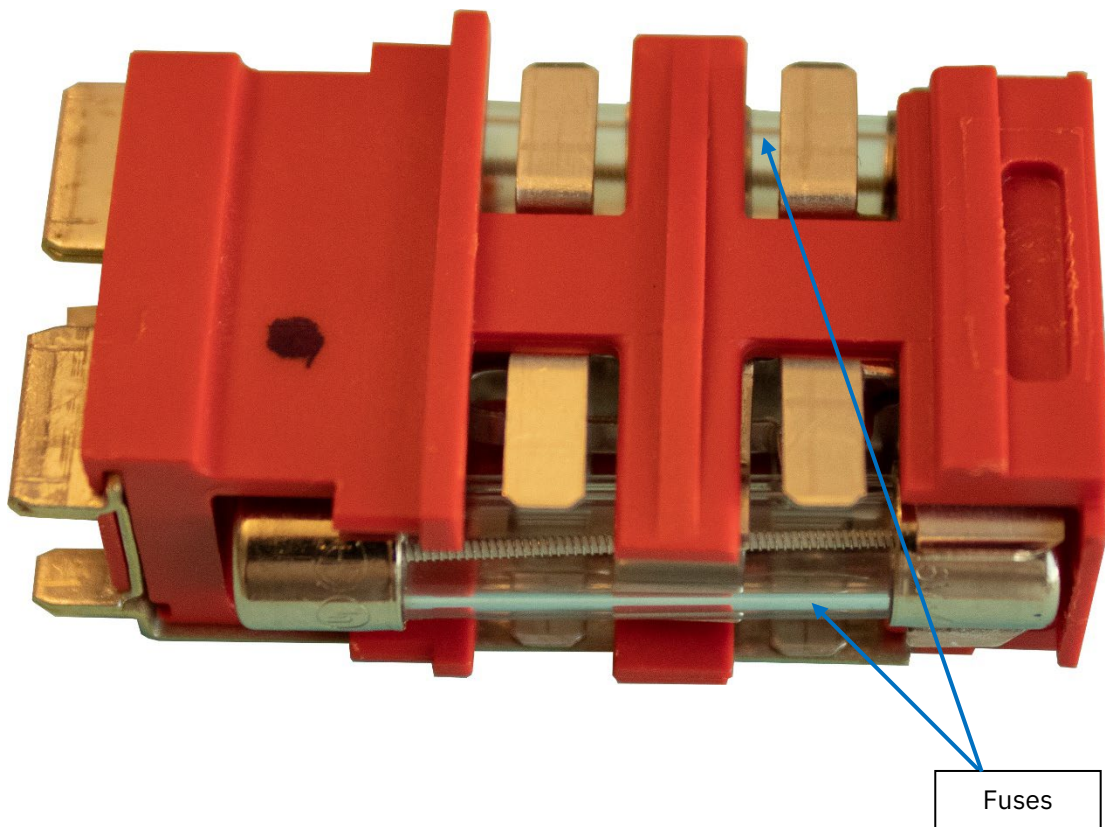
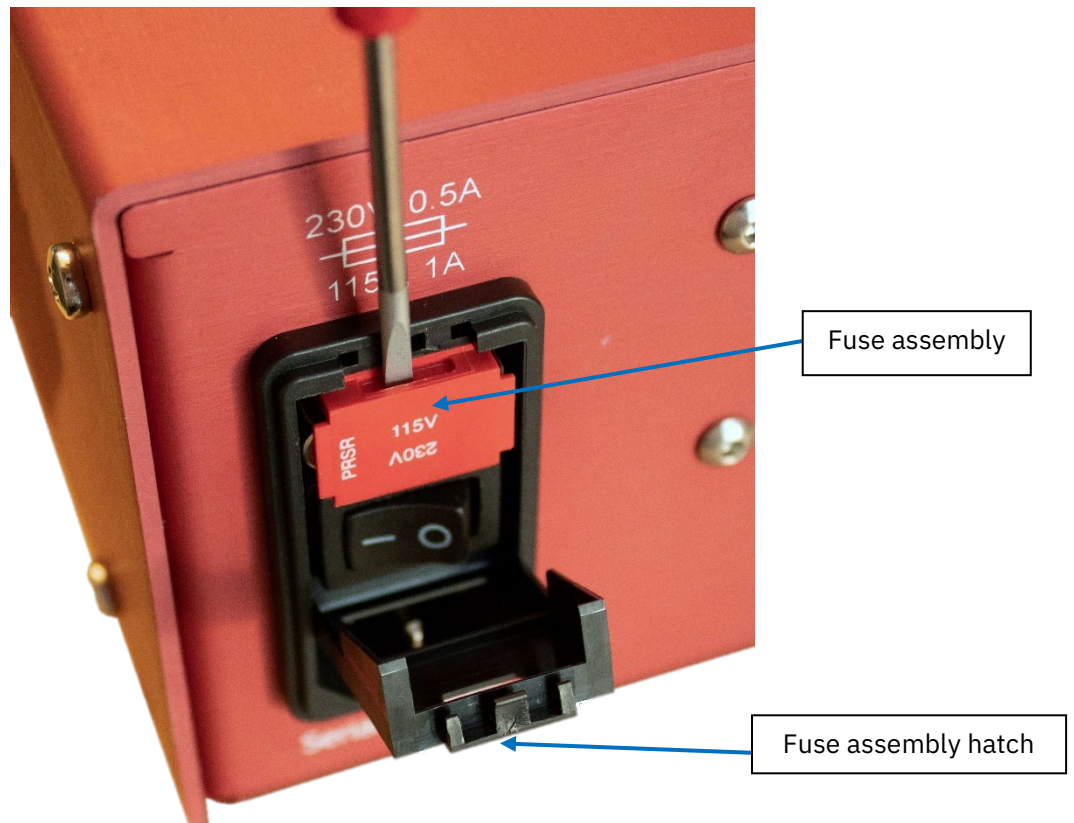
The instrument must be installed in a flat and solid surface with at least 5 cm of clearance on the topside and right side where the air-intake and outlet are located.

The connection to the mains must be done with a cord compatible with IEC 60320-C14 with an earth prong. The instrument must be connected to an outlet with earth.

## 5. Mains Voltage and Fusing

The instrument can be used with either 115 or 230 V mains voltage. The mains voltage is selected on the rear panel. It is preconfigured to the voltage of your country when you receive the instrument. Should you have to change it you need to follow the below procedures:

1. Disconnect the power cable from the instrument.
2. Open the hatch for the fuse assembly with a slot screwdriver. See photo below for details.
3. Use a slot screwdriver to carefully pry out the red fuse assembly.
4. Replace both fuses according to the markings on the instrument. For 230 V use 0.5 A slow blow fuse and for 115 V use 1 A slow blow. The fuse size is  $\frac{1}{4}$ " x  $1\frac{1}{4}$ ".
5. Rotate the fuse assembly 180 degrees and reinsert it into the power entry module.
6. Close the hatch.
7. Double check that the mains voltage indicator shows the right voltage.





## 6. Using the Instrument

The LNF-PBA uses a transformer, rectifiers and regulators to convert mains AC to  $\pm 12V$  DC needed for LNF's HEMT power supplies. There are 8 identical output connectors on the front panel providing the  $\pm 12V$  to the HEMT power supplies. All 8 outputs are connected in parallel and are not isolated from each other. There is a panel instrument on the front panel indicating how much current is drawn from the +12V rail. Since all LNF's current and future HEMT power supplies mainly draw current from the positive rail, this current will always be the limiting factor to how many power supplies the LNF-PBA can drive. The maximum current the instrument can deliver is 1700 mA. The instrument has automatic current limit/foldback. When the current exceeds 1700 mA, the voltage will drop below 12V. When this happens all HEMT power supplies connected to the instrument will be affected and will not operate properly.

The table below lists typical current draw from LNF's HEMT power supplies. It is important to place the instrument so that the panel meter can easily be read and the mains switch can easily be reached. Only use the supplied cable to connect the instrument to LNF's power supply or the accessory cable LNF-PBA-C.

Power supply model	+12V current at $I_{ds} = 0$ mA	+12V current at maximum $I_{ds}$
LNF-PS_3	70 mA	120 mA
LNF-PS3b	70 mA	150 mA
LNF-PS_EU2	35 mA	235 mA

There is access to circuit common and earth on the instrument's front panel. There is also a jumper plug included with the instrument which can be used to connect circuit common to earth. With this feature, the instrument can be configured to be floating or non-floating. It is highly recommended to always use it non-floating, i.e. with the jumper plug installed, when connecting or disconnecting LNAs to your system. Once the system is in operation, the jumper plug can be removed if a floating system is desired. This could be the case in complex electrical systems with many ground return paths to prevent ground loops. If there is no specific reason to use it floating, it is recommended to always leave the jumper plug installed. In floating operation, the instrument common can float several Volts over earth (depending on your lab's electrical system) which could cause LNA failures when connecting or disconnecting an LNA if the  $V_d$  or  $V_g$  pin engages before the ground pin. It is therefore important to always use the jumper plug when connecting or disconnecting LNAs.

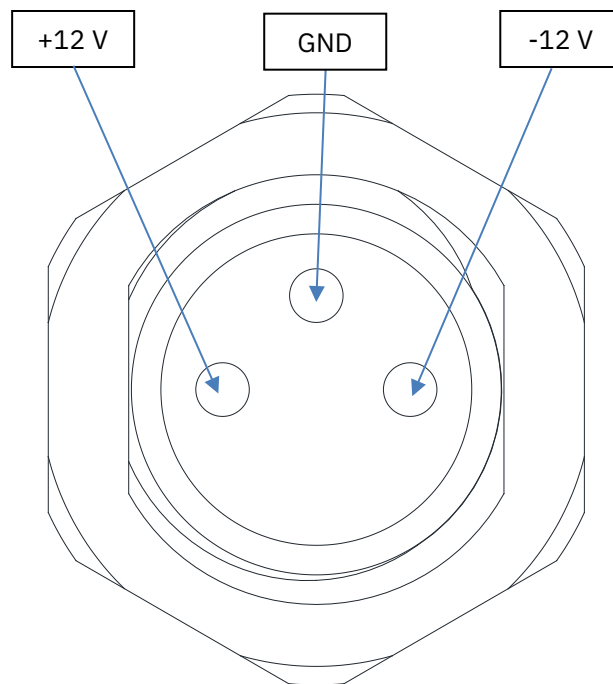


Jumper plug

## 7. Maintenance and Service

There are no serviceable parts in the instrument. If the ventilation holes are clogged with dust, disconnect the instrument from the mains supply and use a dry cloth to gently clear the ventilation holes.

## 8. Pinout



3-Pin male M8 connector seen from outside LNF-PBA chassis