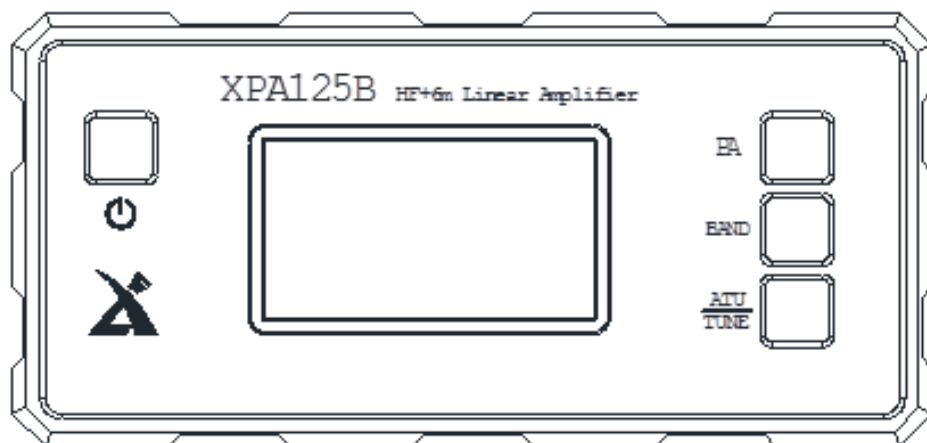




100 W Solid-State Linear Power Amplifier

# XPA125B

## Instruction Manual



V-1.00.0

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### **Important reminder:**

Before operating the equipment please study this instruction manual carefully, and retain it for future reference.

### **Features:**

- RF power amplifier with inbuilt antenna tuner (ATU).
- Maximum RF output power of 100 Watts.
- Auto tuning function.
- Wide frequency range of 0.5 – 54 MHz.
- Harmonic suppression of 50 dB
- The maximum output power is automatically constant (currently, only for Yaesu FT817 , X108G, X5105 , G90, G1M, and XIEGU follow-up models).

### **Safety considerations:**



Do not use equipment during an electrical storm.



Do not expose the unit to moisture.



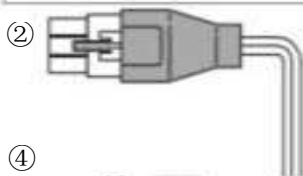
Use this device responsibly and observe all local laws and regulations.



Caution! High RF voltage at antenna connector!

### **Packing list:**

- ① XPA125B.. . . . .1
- ② Power supply cable.....1
- ③ Date cable..... 1
- ④ Communication cable.....1
- ⑤ Service card.....1



## **1 XPA125B Specifications**

### **1.1 Amplifier:**

Frequency range: 1.8 – 54 MHz

Maximum output power: 1.8 - 30MHz ≥100W  
50 - 54MHz ≥80W

Maximum operating ambient temperature: 55°C

Gain: 13dB (±1dB)

Spurious suppression: ≥ 50dB

Supply voltage: 12 - 15 V DC

Current draw @ maximum output:

Standby: 700 mA @Max

Transmit: 30A @Max

### **1.2 ATU:**

Tuning frequency range: 1.8 – 30 MHz/50 – 54 MHz

Maximum tuning range: 14 - 500Ω

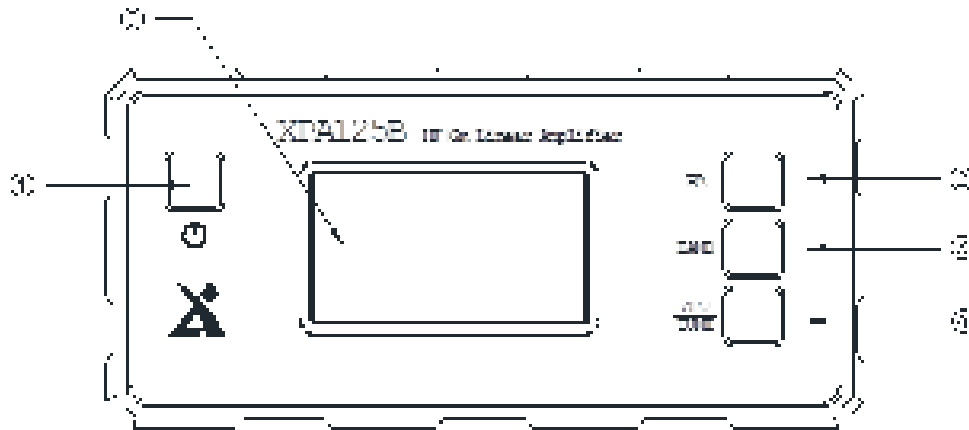
### **1.3 Product specifications:**

Dimensions: 260 x 160 x 70 mm (not including control knobs, feet, handles, etc.)

Weight: 3 Kg(host only)

## 2 Equipment description

### 2.1 Front panel layout:



#### ① Power key

When XPA125B is turned on, press this button and hold for 2 seconds, XPA125B will shut down.

When XPA125B is turned off, press this button and hold for 2 seconds, XPA125B will turn on.

#### ② ATU function key

Via this button you can access the automatic antenna tuning function.

#### ③ BAND selection key

Using this button you can select between manual band switching or automatic band switching.

In manual band switching mode, the XPA125B will change bands in the following order:

160m→80m→60m→40m→30m→20m→17m→15m→12m→10m→6m

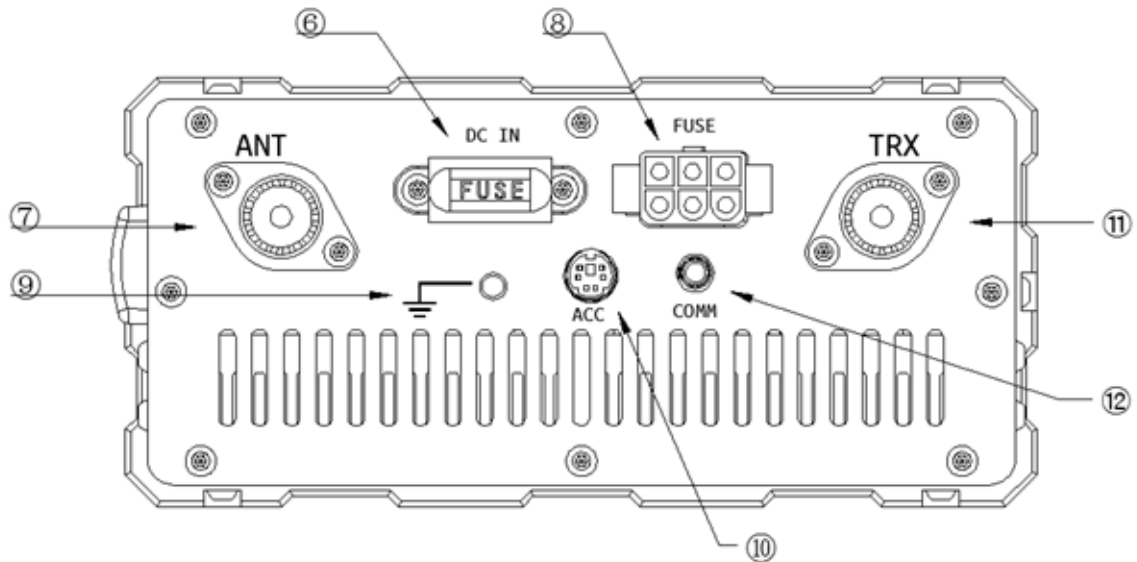
#### ④ PA key

Used to switch the power amplifier into or out of circuit.

## ⑤ LCD

All working status information is displayed here. The display is covered by an organic glass protective plate.

## 2.2 Rear panel layout:



### ⑥ DC IN Power supply socket:

The XPA125B requires a 12 - 15 V DC supply

### ⑦ ANT Connector:

The ANT socket is connected to the antenna, the connector model is SL16-K.

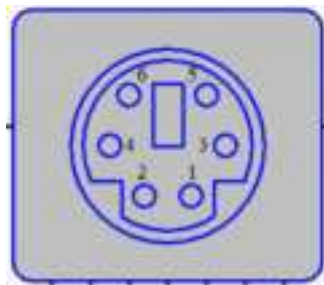
### ⑧ FUSE Holder:

Internal fuse holder. Fuse rating is DC 30A.

### ⑨ Ground

### ⑩ ACC socket:

The data interface connections are as follows:



|                          |                 |
|--------------------------|-----------------|
| PIN1: NC                 | PIN4: ALC input |
| PIN2: PTT Signal input   | PIN5: NC        |
| PIN3: Band voltage input | PIN6: GND       |

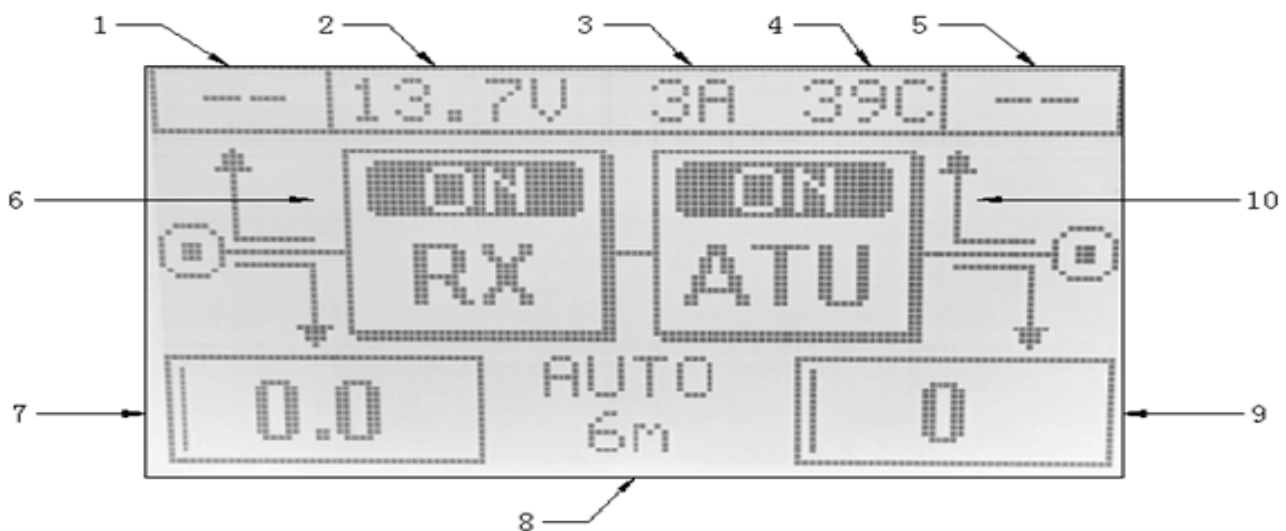
#### ⑪ TRX Socket:

The TRX interface is connected to the transceiver output, the connector model is SL16-K.

#### ⑫ CIV interface:

This interface is for XPA125B firmware updates and connection to a PC.

### 2.3 Display interface layout:



#### (1) Input SWR value:

Displays the SWR value of the XPA125B input.

#### (2) Operating voltage:

Displays the value of DC voltage supply to the XPA125B.

#### (3) Operating current value:

Displays the current being drawn by the XPA125B.

#### (4) Output stage temperature:

Displays the current temperature of the PA stage.

#### (5) Output SWR value:

Displays the SWR value of the XPA125B output.

(6) Power amplifier status:

**ON:** The current signal is connected to the power amplifier unit.

**OFF:** Indicates that bypass mode is selected, the power amplifier is switched out of circuit.

Indicates that the power amplifier is operational.

**RX** Indicates that the unit is in receive mode.

**TX** Indicates that the unit is in the transmit mode.

(7) Input power value:

Displays the power input value to the XPA125B in Watts.

(8) Current working band status:

Displays the current working band, and whether automatic or manual mode is selected.

The figure above shows the 6 meter band.

(9) Output power value:

Displays the output power being delivered by the XPA125B in Watts.

(10) Automatic antenna tuner unit (ATU) status:

Displays the status of the automatic antenna tuner.

**OFF:** Indicates that the XPA125B is not connected to the automatic antenna tuner unit. (BYPASS)

**ON:** Indicates that the XPA125B is connected to the automatic antenna tuner unit. (IN USE)

When tuning is successful, The output standing wave value will display stably.  
If tuning fails, The output standing wave value will flash.

### 3. Operating instructions

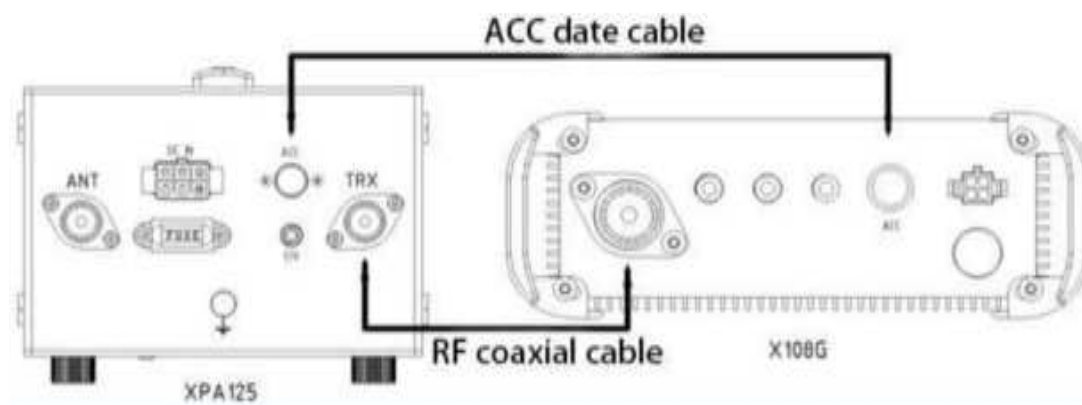
#### 3.1 Wiring connection method

##### 3.1.1 Method for connecting XPA125B with X108G

The XPA125B can be directly connected to an X108G, which can then control the band switching and ALC functions of the amplifier.

- The ACC data cable supplied with the XPA125B is connected between the ACC ports of the two units. Both connectors are the same so either end of the cable can be connected to either socket.
- Use suitable RF coaxial cable to connect the X108G ANT port to the XPA125B TRX port.
- XPA125B ANT port should be connected to the antenna.

**Note:** The early version of the X108 cannot be directly connected to the XPA125B because it does not have an ACC interface.



##### 3.1.2 Method for connecting XPA125B with X5105

Use the dedicated connector CE-19 to connect. Also, set the ALC switch on the CE-19 to the ON position.

### 3.1.3 Connection method between XPA125B and other QRP radio

If you want to start the XPA125B power amplifier and put it into the transmit mode, you need to set the PTT port to a low level [**level $\leq$ 0.1V**].

If the PTT output signal of the transceiver is at high level, the high level needs to be converted into a low level, and then input to the XPA125B [ACC-PTT] port.

**Note: If a voltage of  $\geq 3.2V$  is applied to the PTT port of the XPA125B, the internal processor will be permanently damaged!**



Pin 2 of the XPA125 ACC port is the PTT input port

In order to achieve automatic band switching, the corresponding band voltage is needed. XPA125B band control voltage information is as follows.

| BAND     | LEVEL(mV) | BAND     | LEVEL(mV) | BAND     | LEVEL(mV) |
|----------|-----------|----------|-----------|----------|-----------|
| 1.8 MHz  | 230       | 14.0 MHz | 1380      | 50.0 MHz | 2530      |
| 3.8 MHz  | 460       | 18.0 MHz | 1610      | ----     | ----      |
| 5.0 MHz  | 690       | 21.0 MHz | 1840      | ----     | ----      |
| 7.0 MHz  | 920       | 24.0 MHz | 2070      | ----     | ----      |
| 10.0 MHz | 1150      | 28.0 MHz | 2300      | ----     | ----      |

## 3.2 Procedure:

### 3.2.1 Using the power amplifier unit [PA unit] (ATU unit is set to OFF)



- Press the PA key, so that the state of the amplifier is **[ON]**.
- If your connected transceiver is an X108G or X5105, please set the output power to 5 W.
- If you are using any other QRP transceiver, please set the output power to 1 W.
- Set your transceiver to CW mode, press the CW key to transmit, and the XPA125B amplifier will be activated.
- The output power of the XPA125B can be adjusted by adjusting The output power of the connected transceiver.

**Warning:**

1. Do not allow the maximum output power of the amplifier to exceed 100 W.
2. Using the XPA125B at high power levels for extended periods can lead to overheating and potential damage to the PA stage.

**3.2.2 Band switching**

- You can switch between the two modes of **[AUTO-MANUAL]** via this key.
- If you want to connect the XPA125B to an X108G or X5105, please set XPA125B to **[AUTO]** mode.
- If you want to connect the XPA125B to other devices, please set XPA125B to **[MANUAL]** mode and manually switch to the desired frequency band.

Manual switching of frequency bands follows this order:

160m→80m→60m→40m→30m→20m→17m→15m→12m→10m→6m

**3.2.3 Using the automatic antenna tuner unit [ATU] (PA unit is set to OFF state).**

- Press the **[ATU]** button so that the current state of the amplifier is **[ON]**.
- Set the transceiver mode to CW & set the output power to 5 W.
- Press the CW key to transmit, Press and hold the ATU button, the ATU unit will start tuning;
- If tuning is successful, The output standing wave value will be displayed stably.
- If tuning fails, The output standing wave value will flash.

If you need to re-tune, you can press the [ATU] button for two seconds to force the XPA125B ATU unit to start re-tuning.

After successful tuning, switch the transceiver to the desired state for use.

### 3.2.4 Combined use of power amplifier + automatic antenna tuner

- Press the [PA] button so the current state of the PA unit displays [ON].
- Press the [ATU] button so the current state of the ATU unit displays [ON].
- Set the transceiver mode to CW, the output power to 5 W, and press the CW key, switching on transmitting for 2 seconds..
- If the current SWR value is more than 3.0, the ATU unit will start Tuning automatically. At this time the PA unit will be disabled.
- If the current SWR value is less than 3.0, the ATU unit will start Tuning automatically, and the PA unit will be activated.
- If the current SWR value is more than 3.0, and automatic tuning fails, the XPA125B will automatically switch to bypass mode and display this information on the screen.

### 3.2.5 Flexible configuration of PA unit and ATU unit

The ATU unit and PA unit of XPA125B can be used independently of each other. You can therefore use the XPA125B as either an automatic antenna tuner or a separate power amplifier. You can also bypass both units, and your transceiver will then be connected directly to the antenna.

### 3.2.6 Protection and warning

The XPA125B incorporates a variety of intelligent protection functions to ensure as far as possible the safety of the equipment in daily use. When the XPA125B enters an abnormal state, it will immediately enter protection mode and switch to bypass mode.

Release the PTT button. Protection will be disabled and the XPA125B will return to the receiving state.

**When high SWR, high current, high voltage, over temperature and other error states are detected, the XPA125B's internal sensors will trigger the protection function beyond a certain threshold. The threshold of each sensor is as follows:**

- High SWR:  $\geq 3.0$
- High current:  $\geq 25A$
- High voltage:  $\geq 15V$  DC
- Over temperature:  $\geq 100^{\circ}C$

**Warning :**

*When the XPA125B current draw is too high (more than 25A), or a short circuit occurs, the fuse on the rear panel may blow. The unit will then no longer turn on. Please check the status of the fuse if this occurs.*

## After-sales service policy

### 1. Warranty:

This product has a one-year warranty effective from the date of purchase.

This warranty covers only manufacturing- and parts defects. It does not cover damage caused by lightning, excess voltage on the power supply, accidental damage or purposeful damage or misuse.

If the product needs warranty repair within two weeks of receiving the product, XieGu will pay for the shipping both ways. After two weeks XieGu will pay only for return shipping.

If the product is not covered under warranty, the customer pays for shipping both ways plus the cost of the repair.

### 2. Warranty limitations:

Any of the following will void the warranty applicable to the product and its accessories:

- A. Modification-, removal-, or maintenance of the internal circuitry, without permission and authorization;
- B. Unauthorized change of product's embedded software;
- C. Immersion in liquid or signs of external damage;
- D. Warranty period expired;
- E. Product's serial number is missing, torn or blurred so we cannot determine if

the radio is under warranty;

**F.** Product was not bought from XieGu or authorized distributor of XieGu.

\*None of the following conditions, are covered by the warranty:

**A.** Damage caused by improper use by the user;

**B.** Damage caused by an accident;

**C.** Damage due to incorrect testing, maintenance, debugging, or other changes;

**D.** Damage is not caused by the material or the quality of production;

**E.** Damage to the shell or other external components due to improper use.

**Available From:**



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