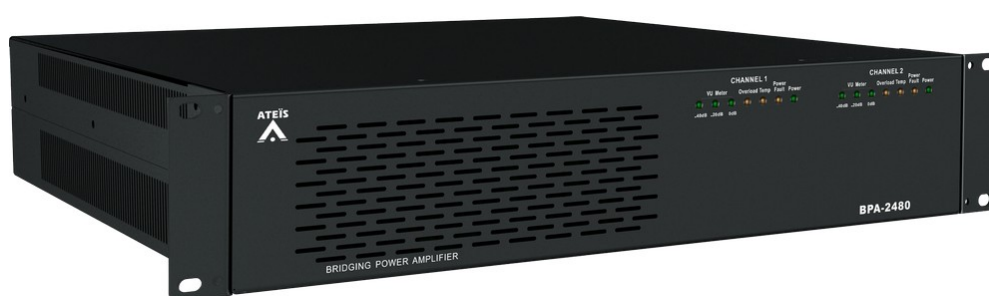




BRIDGING POWER AMPLIFIER



User Manual

MODEL

BPA-1000	BPA-2060
BPA-1240	BPA-2120
BPA-1480	BPA-2240
	BPA-2480

Revision History




v1.15

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1 About this manual

This user manual will explicitly describe the hardware installation and the software configuration, provides installers and users the necessary information to setup and configure the system.

1.1 Notice signs

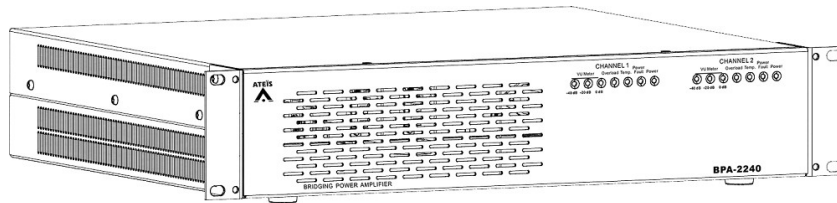
<p align="center">WARNING</p> <p align="center">TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. NO USER SERVICEABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p> <div align="center">  <p>CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN</p> </div>	
<p>** The above warning is located on the back of the unit.</p>	
Explanation of Graphical Symbols	
 <p>The equipment or the property can be damaged, or persons can be lightly injured if the alert is not observed.</p>	 <p>To alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.</p>

1.2 Safety instructions

- Do not expose the device to extreme temperatures, direct sunlight, humidity, or dust, which could cause fire or electrical shock hazard.
- Keep away water or other liquids from the device. Otherwise fire or electrical shock may result.
- Connect the power cord only to an AC outlet of the type stated in this manual or as marked on the unit. Otherwise fire and electrical shock hazard results.
- When disconnecting the power cord from an AC outlet always grab the plug. Never pull the cord. A damaged power cord is a potential risk of fire and electrical shock hazard.
- Avoid touching power plugs with wet hands. Doing so is a potential electrical shock hazard.
- Take care for correct polarity when operating the device from a DC power source. Reversed polarity may cause damage to the unit or the batteries.
- Avoid placing heavy objects on power cords. A damaged power cord is a fire and electrical shock hazard.
- Do not cut, scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard. Ask your ATEİS dealer for replacement.
- Turn off the unit immediately, remove the power cord from the AC outlet and contact your ATEİS dealer in any of the following circumstances. If you continue using the device, fire and electrical shock may result.
 - Smoke, odor, or noise getting out of the unit.
 - Foreign objects or liquids get inside the device.
 - The unit has been dropped or the shell is damaged.

- Do not drop or insert metallic objects or flammable materials into the unit as this may result in fire and electrical shock.
- Do not remove the device's cover, as there are exposed parts inside carrying high voltages that may cause an electrical shock. Contact your ATEİS dealer if internal inspection, maintenance or repair is necessary.
- Do not try to make any modifications to the device. This is a potential fire and electrical shock hazard.
- Avoid the device's ventilation slots to be blocked. Blocking the ventilation slots is a potential fire hazard.
- To prevent the unit from falling down and causing personal injury and/or property damage, avoid installing or mounting the unit in unstable locations.
- Leave enough space above and below the unit to provide good ventilation of the device. If the airflow is not adequate, the device will heat up inside and may cause a fire.
- Operate the device in an environment with a free-air temperature of between $-5^{\circ}\text{C} \sim +55^{\circ}\text{C}$ ($+23^{\circ}\text{F} \sim +131^{\circ}\text{F}$).
- Turn off all audio equipment when making any connections to the device, and make sure to use adequate cables.
- Do not use benzene, thinner or chemicals to clean the device. Use only a soft, dry cloth.
- If the device is moved from a cold place (e.g., overnight in a car) to a warmer environment, condensation may form inside the unit, which may affect performance. Allow the device to acclimatize for about one hour before use.

2 BPA bridging power amplifier



The BPA is a 2U 19" rack-mountable bridging power amplifier with extremely low power consumption during standby mode; and transformer isolated for 100V, 50V, 8 ohm or 70V, 35V, 8 ohm speaker line. There are audio line inputs with a balanced XLR and phoenix connectors. The available models are listed as below:

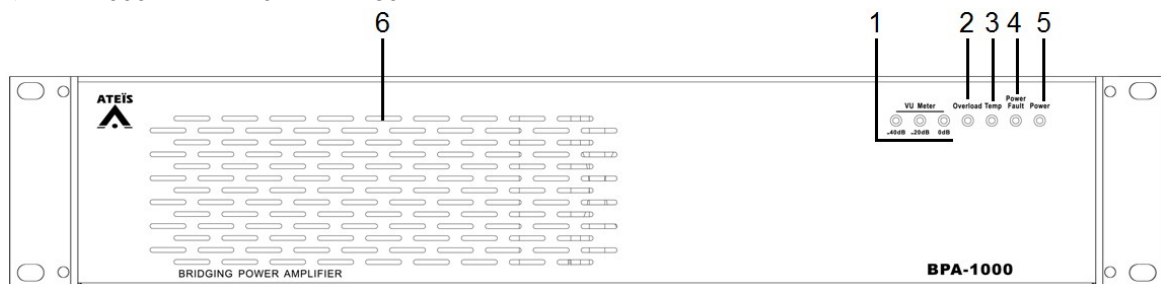
* BPA-1240/BPA-1480/BPA-1000 (240W/480W/1000W x 1CH)

* BPA-2060/BPA-2120/BPA-2240/BPA-2480 (60W/120W/240W/480W x 2CH)

The BPA-2060, BPA-2120, BPA-2240, BPA-2480 can be bridged (recommend) or paralleled to double the wattage for each two channels. The BPA amplifier is designed to have protection of short-to-ground or short circuit, overload and overheat. It also provides an automatic wake-up signal detection, which can automatically wake up the amplifier from standby mode when detects audio input signal (> -40 dB). The BPA amplifier has a 115 VAC or 230 VAC mains supply and a 48VDC battery backup input. The status LED on the front panel include power, fault, overload temp. and VU meter.

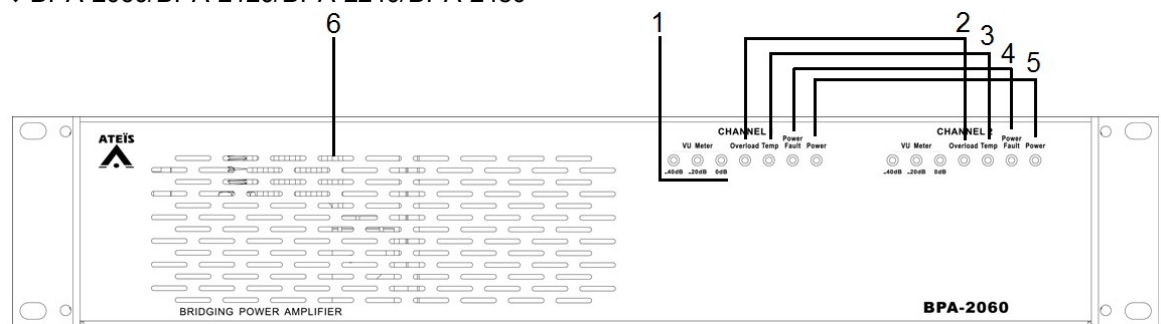
2.1 Front panel

❖ BPA-1000/BPA-1240/BPA-1480



The front panel of BPA-1000/BPA-1240/BPA-1480 is identical.

❖ BPA-2060/BPA-2120/BPA-2240/BPA-2480



The front panel of BPA-2060/BPA-2120/BPA-2240/BPA-2480 is identical.

1. VU meter LED:

The three LEDs indicate the three output levels respectively (-40 dB, -20 dB and 0 dB).

When the input signal reaches $\geq -40\text{dB}$ and $< -20\text{dB}$, the corresponded -40 dB LED will light up, and vice versa.

2. Overload LED:


The overload LED will blink as soon as the output power exceeds the nominal value. If this LED is blinking, check whether the speaker is connected correctly and still in good condition, also check if the level of input signal is too loud.

3. Temp. LED:

If the internal temperature reaches 90°C , the TEMP. LED will light up and stop output. To avoid temperature failure, please be sure the operating temperature in $-5^{\circ}\text{C} \sim +55^{\circ}\text{C}$ ($+23^{\circ}\text{F} \sim +131^{\circ}\text{F}$) and leave enough ventilation space above/below the unit for cooling the BPA amplifier in the rack.

4. Power fault LED:

This LED lights up when one of the power supply (AC mains/DC backup power) is not present.

 To enable this LED, the [DC Power Fault] switch on the rear panel is required to switch "ON".

5. Power LED:

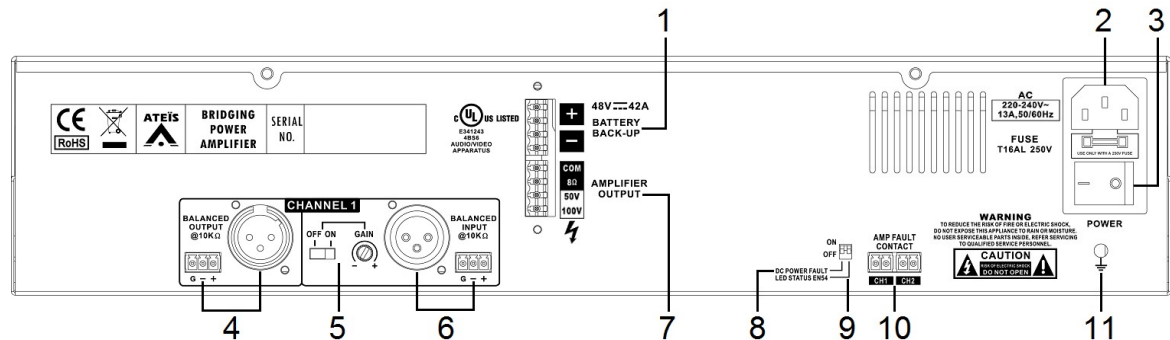
This LED lights up to indicate the amplifier is powered.


6. Air inlet holes:

The BPA has a cooling fan that takes in air from the front panel and exhausts it from the rear panel. Please make sure that these inlet holes are not obstructed.

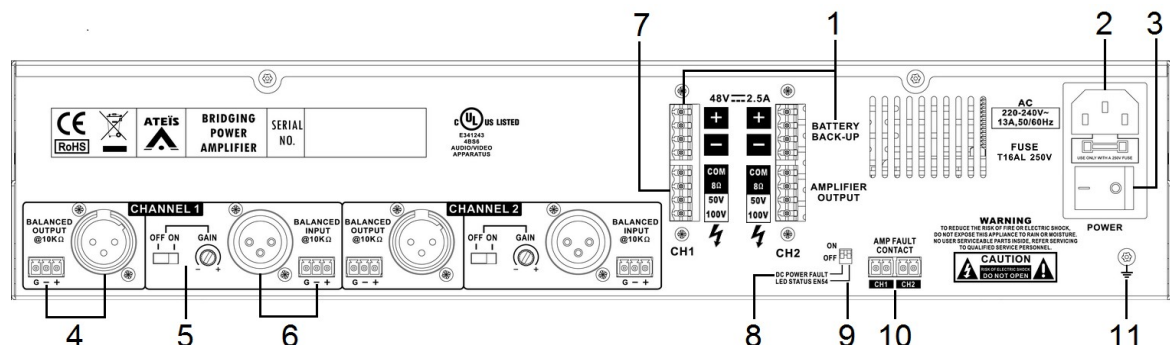
2.2 Rear panel


❖ BPA-1000/BPA-1240/BPA-1480



 Except the AC power supply range and amplifier output are differed from US type and EU type, the rear panel of BPA-1000/BPA-1240/BPA-1480 is identical.

❖ BPA-2060/BPA-2120/BPA-2240/BPA-2480



 Except the AC power supply range and amplifier output are differed from US type and EU type, the rear panel of BPA-2060/BPA-2120/BPA-2240/BPA-2480 is identical.


1. Battery backup input (48VDC):

When AC mains is not present, this 48VDC backup input can be used for power backup by connecting to the battery charger such as BCU-4830A/BCU-4875A. The Power LED will light up, too.

2. AC mains power socket:

Connect the AC mains power to this socket. It accepts a standard mains power lead fitted with an IEC connector.

- EU type: 220V~240V, 50/60Hz with fuse
- US type: 100V-120V, 50/60Hz with fuse


 After the BPA amplifier is turned off, please wait 30 seconds before powering up the BPA amplifier again.

3. Power switch:

The power switch is a two position switch. Switch it to the I position will power on the BPA, switch it to O position will power off the BPA.

4. Balanced output & euro-block terminal:

Each channel will output the corresponded balanced audio input signal either on XLR connector (male) or euro-block terminal.

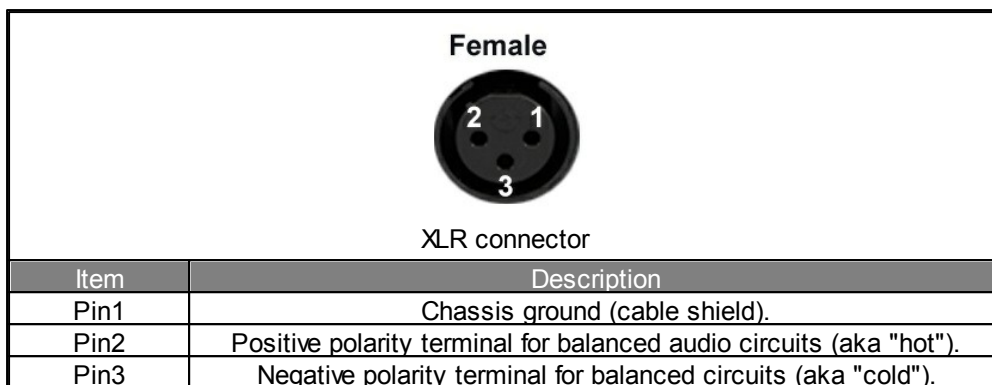
<p>Male</p>  <p>XLR connector</p>	
Item	Description
Pin1	Chassis ground (cable shield).
Pin2	Positive polarity terminal for balanced audio circuits (aka "hot").
Pin3	Negative polarity terminal for balanced circuits (aka "cold").

5. ON/OFF switch & volume gain knob:

The ON/OFF switch is mainly for the bridged/paralleled output and the volume knob is for adjusting the gain of DPA amplifier. For example, if the two channels (CH1 and CH2) on BPA are bridged/paralleled, set "ON" on the channel which connects to an audio input, and its volume knob can be adjusted; set "OFF" on the other channel and its volume knob cannot be adjusted.

6. Balanced input & euro-block terminal:

There is an XLR balanced connector (female) and a euro-block terminal for each channel; and each channel has a input gain with on/off switch that can bypass the input gain.



7. Amplifier output:

Each channel delivers 240W (BPA-1240) / 480W (BPA-1480) / 1000W (DPA-1000) / 60W (BPA-2060) / 120W (BPA-2120) / 240W (BPA-2240) / 480W (BPA-2480), and both EU and US types are available as different models.

Amplifier outputs:	<ul style="list-style-type: none"> • US type: 70V, 35V, 8 ohm • EU type: 100V, 50V, 8 ohm
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model	rated output power	rated load resistance	rated load capacitance
BPA-2060	60W	167 ohm (100V); 82 ohm (70V); 41.6 ohm (50V); 20 ohm (35V)	30 nF (100V); 62 nF (70V)
BPA-2120	120W	83 ohm (100V); 41 ohm (70V); 20 ohm (50V); 10 ohm (35V)	62 nF (100V); 120 nF (70V)
BPA-1240 BPA-2240	240W	41.6 ohm (100V); 20 ohm (70V); 10 ohm (50V); 5.1 ohm (35V)	120 nF (100V); 240 nF (70V)
BPA-1480 BPA-2480	480W	20 ohm (100V); 10 ohm (70V); 5 ohm (50V); 2.6 ohm (35V)	240 nF (100V); 470 nF (70V)
BPA-1000	1000W	10 ohm (100V); 4.9 ohm (70V); 2.5 ohm (50V); 1.2 ohm (35V)	470 nF (100V); 820 nF (70V)

8. DC power fault on/off switch:

Set "ON" to monitor whether the the DC backup input is present. If the DC input is not present, the Power Fault LED on the front panel will light up.

9. LED status EN45 on/off switch:

Set "ON" to enable the EN54-16 mode, which all the LEDs on the front panel will light off.

Set "OFF" to enable the normal mode, which the behavior of LEDs on the front panel will activate based on the current state of BPA.

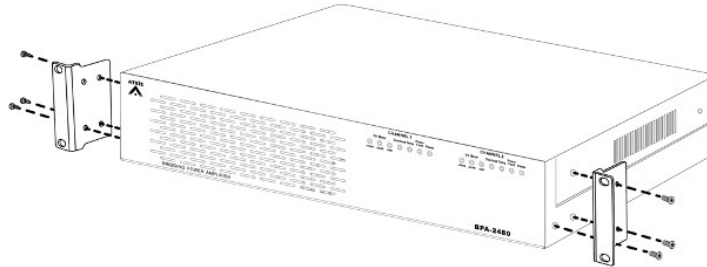
10. Amp fault contact:

This amplifier fault contact is NC (normally close) contact. When Power Fault LED, Overload LED or Temperature LED lights up, this contact is open.

11. Ground (GND) wire socket.

3 Hardware installation

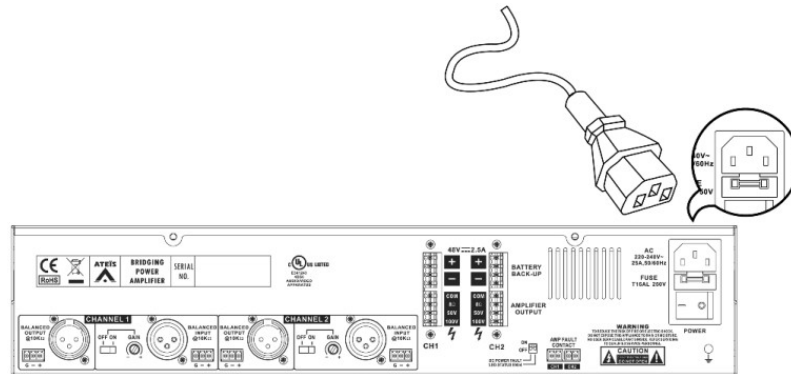
3.1 Mounting



The BPA power amplifier is suitable for 19-inch 2U rack-mounting installation. Attach the two rack-ears to the BPA using the supplied four screws.

Consider leaving enough ventilation space above and below the unit. Do not mount the amplifier directly above the heat generating devices like power supplies or power amplifiers.

3.2 Connect to AC mains power



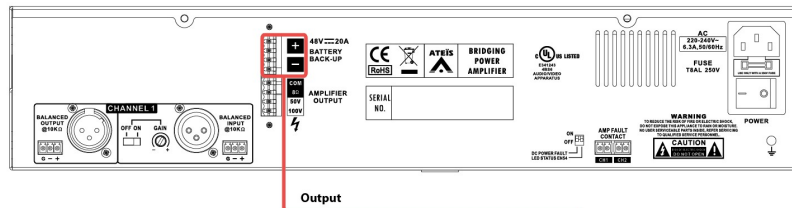
1. The BPA has a 115 VAC or 230 VAC mains power supply, please make sure the voltage is applicable for your country's main voltage.
2. Connect the power cord to the BPA and plug it into the mains outlet.
3. Make sure the power switch is "ON" on the rear panel of BPA unit.

3.3 Connect to battery charger (power sharing)

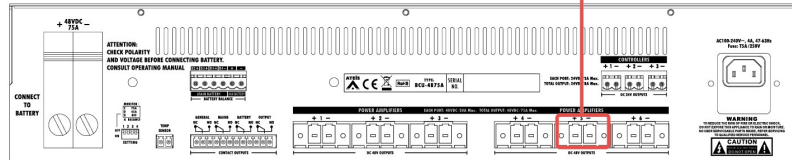
For DC battery backup power sharing, connect the BCU-4830A/BCU-4875A battery charger to BPA power amplifier as the picture below.

❖ BPA-1000/BPA-1240/BPA-1480

BPA-1480

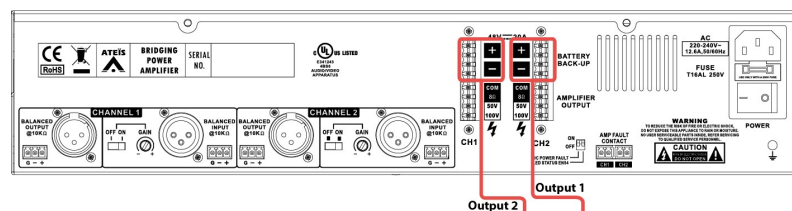


BCU-4875A

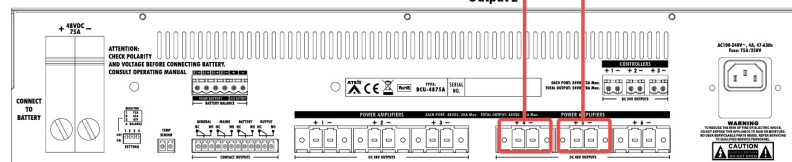


❖ BPA-2060/BPA-2120/BPA-2240/BPA-2480

BPA-2480



BCU-4875A



⚠ Users "MUST" follow the orders below to connect the BPA with BCU-4830A/BCU-4875A battery charger.

1. Connect the four 12VDC batteries to BCU-4830A/BCU-4875A battery charger.
2. Connect the 48VDC backup power input terminals of BPA to the 2 output terminals on BCU-4830A or the 6 output terminals on BCU-4875A.
3. Plug in the AC mains power of BPA.
4. Plug in the AC mains power of BCU-4830A/BCU-4875A.

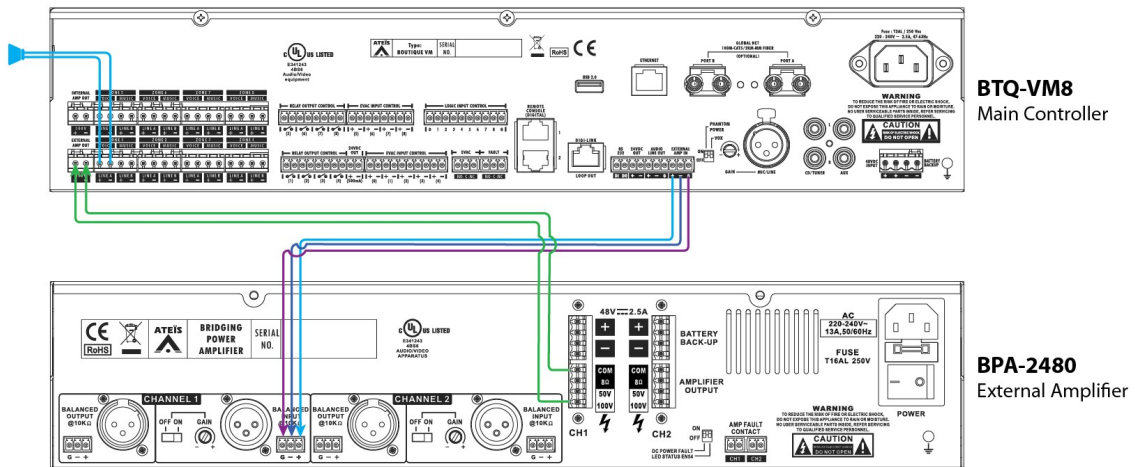
⚠ Once the 48VDC battery backup input of BPA is connected to BPA directly without connecting to AC mains power, it may cause large inrush current. Therefore, install a soft starter device, which protects the electric components and PCB boards of BPA from sudden inrush current. Please choose the correct soft starter device, which fulfills to support the max. DC power consumption (full power) of BPA.

3.4 Audio input/audio output

1. Connect the External Amplifier Input (G, -, +) on BTQ-VM8 controller to the Balanced Audio Input (G, -, +) on BPA amplifier.
2. Connect the Amplifier Output (COM, 100V) on BPA amplifier to the External Amplifier Output (100V) on BTQ-VM8 controller.

⚠ Please note the connection of amplifier output on BPA is varies with EU (100V, 50V, 8 ohm) and US types (70V, 35V, 8 ohm).

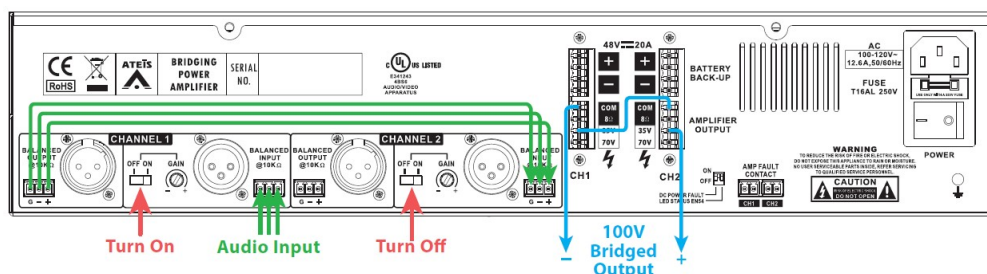
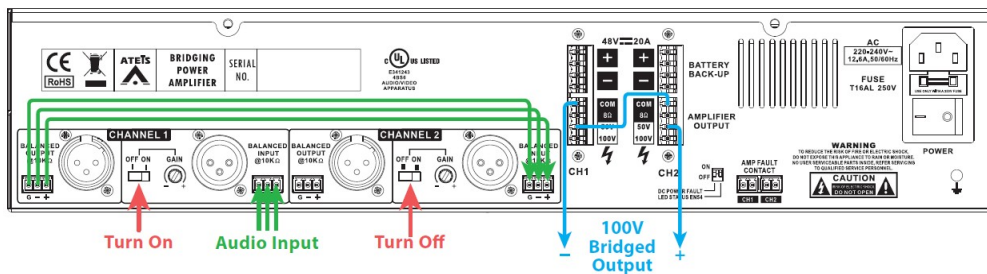
3. Connect and loudspeakers on BTQ-VM8 controller.



3.5 Bridged output

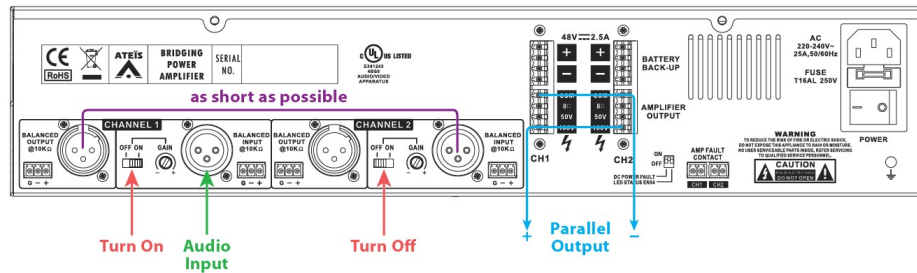
Bridge the two channel of BPA amplifier such as 120W x 2CH (BPA-2120) to 240W x 1CH, 240W x 2CH (BPA-2240) to 480W x 1CH, 240W x 2CH (BPA-2240) to 480W x 1CH, 480W x 2CH. (BPA-2480) to 960W x 1CH. Please see the instruction as below:

1. Connect an audio input on Channel 1.
2. Turn the input gain to "OFF" position on Channel 2, but keep the input gain on Channel 1 be adjustable.
3. For En type of BPA model, connect the [50V pin] amplifier output of Channel 1 to [COM pin] amplifier output of Channel 2.
For Us type of BPA model, connect the [35V pin] amplifier output of Channel 1 to [COM pin] amplifier output of Channel 2.
4. Connect Audio Output of Channel 1 to the Audio Input of Channel 2 to share audio source.

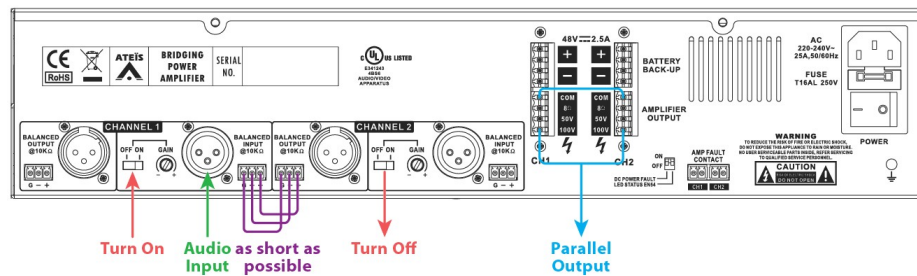


3.6 Parallel output

1. Connect an audio input on Channel 1.
 2. Turn the input gain to "OFF" position on Channel 2, but keep the input gain on Channel 1 be adjustable.
 3. Connect the balanced output on Channel 1 to the balanced input on Channel 2 (XLR connector or euro-block connector).
 4. Parallel the amplifier output of Channel 1 and Channel 2 (COM to COM, 100V line to 100V line).
- Via XLR connectors



- Via euro-block connectors



4 Maintenance

❖ Cleaning

 Make sure to unplug the main power supply of amplifier prior to cleaning.

The panels and chassis can be cleaned with a soft cloth and mild non-abrasive cleaning solution.


Avoid cleaning powders or scrubbing pads, as these will scratch and dull the paint. Do not apply liquid directly to the surface. Dampen the cloth with the cleaning solution and wipe gently.


❖ Dust removal

After used the unit for a long-time, especially in dusty environments, the heat sinks may become clogged with dust. This will interfere with cooling from the air inlets, and lead to higher temperature operation and reduced life.

Dust can be most easily removed by brushing or directing an air jet between the fins of the heat sinks.

❖ User maintenance

 User maintenance should be done by qualified personnel only.

 Dangerous mains voltages are present inside the units. Unplug the main power supply before you do any maintenance.

Users can inspect if any broken connectors, ground, cable connections, or loose screws on the outside of amplifier.

If any loose parts rattle around on the inside when the amplifier is turned over in all directions, please shut down the amplifier immediately, as a loose part could lodge in a dangerous place and cause further damage or shock hazard.

❖ Require service

If the amplifier isn't working properly, please diagnose the problem from [Troubleshooting](#).

If proper operation cannot be restored, the amplifier may require service from ATEİS Technical Support. This must be examined by qualified technical personnel, to avoid shock hazard or improper repairs. Please contact your ATEİS dealer or [ATEİS Feedback](#).

5 Troubleshooting

Problem	Troubleshooting
Amplifier does not start-up when the AC mains is connected.	<ol style="list-style-type: none"> 1. Check if the voltage is under the normal range (115VAC or 230VAC). 2. Check if the AC mains fuse is broken.
No back-up power when 48VDC power supply is connected.	Check if the voltage is under the normal range (48 - 53 VDC).
Power LED does not light up after the AC mains and 48VDC power supply are connected.	Check if the EN54-16 DIP Switch is set "OFF".
Power Fault LED remains yellow.	<ol style="list-style-type: none"> 1. Check the voltage is under the normal range: <ul style="list-style-type: none"> • AC mains: 115VAC or 230VAC • Battery supply: 48 - 53 VDC 2. Check if the AC mains/DC backup power supply is present.
Temp. LED remains yellow.	<ol style="list-style-type: none"> 1. Unplug the power cord, and leave enough ventilation space above/below the amplifier for cooling for a while. 2. Power on the amplifier, and check if this LED continues light up, it means the internal temperature reaches 90°C.
Overload LED remains yellow.	<ol style="list-style-type: none"> 1. Check the loading of speaker output. 2. Check if the input is over 0 dB.
No sound coming from loudspeaker.	<ol style="list-style-type: none"> 1. Check if the volume of gain knob is too small, and its ON/OFF switch is set "ON". 2. Check if the speaker wiring is correct.

6 Technical data

• Electrical

AC power input:	EU type: 220 VAC ~ 240 VAC, 50/60 Hz US type: 100 VAC ~ 120 VAC, 50/60 Hz		
power consumption (AC):	idle	1/2 full power	full power
BPA-1240	23VA	330VA	480VA
BPA-1480	24VA	625VA	872VA
BPA-2060	40VA	212VA	282VA
BPA-2120	30VA	345VA	458VA
BPA-2240	32VA	660VA	960VA
BPA-2480	34VA	1245VA	1745VA
BPA-1000	30VA	1280VA	1795VA
Idle: pilot tone -36 dBu, 1/2 full power: alarm tone			

DC power input:	43 ~ 56 VDC				
power consumption (DC):	standby mode	idle	1/8 full power	1/2 full power	full power
BPA-1240	2.2W	16W	100W	274W	430W
BPA-1480		17W	175W	585W	875W
BPA-2060		28W	53W	154W	212W
BPA-2120		21W	101W	278W	394W
BPA-2240		22W	192W	548W	860W
BPA-2480		23W	350W	1170W	1750W
BPA-1000		20W	343W	989W	1536W
Idle: pilot tone -36 dB, 1/8 full power: speech, 1/2 full power: alarm tone					

Amplifier outputs:	<ul style="list-style-type: none"> • US type: 70V, 35V, 8 ohm • EU type: 100V, 50V, 8 ohm
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• Audio characteristics

Frequency response:	50 Hz and 18 kHz (± 3 dB)
SNR:	> 86 dB
THD+N:	< = 1 % @ 1 kHz
Input impedance:	22k ohm
Crosstalk (100V):	> 80 dB @ 42 dB, 0 dBu (1 kHz) in
Crosstalk (70V):	> 80 dB @ 39 dB, 0 dBu (1 kHz) in

• Loudspeakers outputs (1 min. at 40°C, per CH)

Model	Rated output power	Rated load resistance	Rated load capacitance
BPA-2060	60W	167 ohm (100V); 82 ohm (70V); 41.6 ohm (50V); 20 ohm (35V)	30 nF (100V); 62 nF (70V)
BPA-2120	120W	83 ohm (100V); 41 ohm (70V); 20 ohm (50V); 10 ohm (35V)	62 nF (100V); 120 nF (70V)
BPA-1240 BPA-2240	240W	41.6 ohm (100V); 20 ohm (70V); 10 ohm (50V); 5.1 ohm (35V)	120 nF (100V); 240 nF (70V)
BPA-1480 BPA-2480	480W	20 ohm (100V); 10 ohm (70V); 5 ohm (50V); 2.6 ohm (35V)	240 nF (100V); 470 nF (70V)
BPA-1000	1000W	10 ohm (100V); 4.9 ohm (70V); 2.5 ohm (50V); 1.2 ohm (35V)	470 nF (100V); 820 nF (70V)

- Mechanical

Dimensions (W x H x D):	<ul style="list-style-type: none"> • BPA-1240: 426 x 88 x 295 mm (16.7 x 3.5 x 11.6 inch) • BPA-1480: 426 x 88 x 295 mm (16.7 x 3.5 x 11.6 inch) • BPA-2060: 426 x 88 x 356 mm (16.8 x 3.5 x 14 inch) • BPA-2120: 426 x 88 x 356 mm (16.8 x 3.5 x 14 inch) • BPA-2240: 426 x 88 x 376 mm (16.8 x 3.5 x 14.8 inch) • BPA-2480: 426 x 88 x 435 mm (16.8 x 3.5 x 17 inch) • BPA-1000: 426 x 88 x 390 mm (16.8 x 3.5 x 15.6 inch)
Weight:	<ul style="list-style-type: none"> • BPA-1240: 10.5 kg (23.1 lbs) • BPA-1480: 13.5 kg (29.7 lbs) • BPA-2060: 13 kg (28.6 lbs) • BPA-2120: 13 kg (28.6 lbs) • BPA-2240: 16.2 kg (35.7 lbs) • BPA-2480: 22 kg (48.5 lbs) • BPA-1000: 21 kg (46.2 lbs)
Mounting:	19" 2U rack
Color:	RAL 7016

- Environmental

Operating temperature:	-5 °C ~ +55 °C (+23 °F ~ +131 °F)
Storage temperature:	-40 °C ~ +70 °C (-40 °F ~ +158 °F)
Relative humidity:	20% to 95%
Air pressure:	600 to 1100 hPa
Heat dissipation:	<ul style="list-style-type: none"> • BPA-1240: 1512 BTU/hr • BPA-1480: 3044 BTU/hr • BPA-2060: 767 BTU/hr • BPA-2120: 1587 BTU/hr • BPA-2240: 3019 BTU/hr • BPA-2480: 6090 BTU/hr • BPA-1000: 6347 BTU/hr

7 Standard and certification

The BPA product is approved processing/pending and complied to the following.

Europe	Voice Alarm	EN 54-16 (pending)
Europe	CE/EMI	EN 55032 (in process)
Europe	CE/EMS	EN 61000-4-2 (ESD) (in process)
Europe	CE/LVD	EN 6006 (in process)
USA	Mass Notification Systems	UL 2572 (pending)
USA	Safety	UL 60065 (pending)

8 Contact information

ATEİS Europe B.V.

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