



PS AUDIO

Owner's Reference

DirectStream PowerPlant 20

Instructions for Use



DirectStream Power Plant 20

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Rev A



PS AUDIO

Introduction

DirectStream PowerPlant 20

Important Safety Instructions



Read these instructions
Heed all warnings
Follow all instructions



WARNING. TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN NOR MOISTURE.

Clean only with a dry cloth.

Do not place flammable material on top of or beneath the component.

The PS Audio Power Plant 20 is a passively cooled component that requires adequate ventilation at all times during operation.

Do not remove or bypass the ground pin on the end of the AC cord. All PS products ship with a grounding-type plug. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. Unplug this apparatus during lightning storms.

When making connections to this or any other component, make sure all components are powered off. Turn off the system's power before connecting the PS Audio component to any other component. Make sure all cable terminations are of the highest quality.

THERE ARE NO USER-SERVICEABLE PARTS INSIDE THIS PS AUDIO PRODUCT. REFER ALL SERVICE NEEDS TO QUALIFIED SERVICE PERSONNEL.

Please contact your authorized dealer, your distributor, or PS Audio directly if you have any questions or concerns that are not addressed in this reference manual.

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Warnings

WARNING: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPARATUS TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.







WARNING: TO REDUCE THE RISK OF ELECTRICAL SHOCK, THIS APPLIANCE MUST BE CONNECTED TO A MAINS SOCKET OUTLET WITH A PROTECTIVE EARTH CONNECTION.

The European Union has harmonized the Mains Supply Voltage at 230V~50Hz. Previously, this nominal voltage was 220V~ for continental Europe and 240V~ for the United Kingdom. Since the output receptacles are Nationally Approved Mains Socket-Outlets, we have to restrict the Operator set Output Voltage Range to 220-240V~.

Unit is shipped with the Mains Output Socket-Receptacles applicable to the country of installation as specified by the customer. Please verify the marked Mains Supply ratings of the powered equipment before making any AC connections. If there is a mix of marked Voltages (e.g. 220V, 230V and 240V), please set the output voltage to 230V.

Symbols Found on the P20

Explanation of Symbols found on the PerfectWave Power Plant 20

-  Indicates compliance with European Union Legislation for relevant safety (Low Voltage Directive 2006/95/EC) and EMC (EMC Directive 2004/108/EC) requirements.
-  Is intended to tell the user that parts inside the product are a risk of electric shock to persons.
-  Is intended to tell the user that important operating and servicing instructions are in the papers with the appliance.
-  Signifies that the instrument complies with European Union Waste Electrical and Electronic Equipment Directive.
-  Indicates that the unit is in compliance with the European Union Reduction of Hazardous Substances Directive.
-  Indicates the connector location for Ethernet connection to the network.



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Getting Started

DirectStream PowerPlant 20

Thank You!

Thank you for your purchasing PS Audio's DirectStream Power Plant 20 AC Regenerator. This is your comprehensive Operator's Guide. This guide is intended to provide a full overview of the P20's functions and capabilities. It is our intention to provide full details about the P20 and to answer any and all questions you may have. If there is something that you feel was not covered in this guide or additional questions for us you are welcome to reach out to us at:

Service@psaudio.com

(720) 406-8946

We'll be happy to assist you.

Welcome

The Power Plant 20, also known as the P20, will provide regulated AC power regardless of the condition of your home's power. Clean, regulated AC is essential to optimize the performance of your connected equipment.

The P20 removes the miles of power cables between your home and the power station. The P20 is the world's first device that is the equivalent of moving your home to within 50 feet of the city power station.





Getting Started

DirectStream PowerPlant 20

Installation Considerations

Location

Once your new Power Plant 20 is unpacked, you'll need to find a convenient place to set it.

Mounting

The Power Plant 20 should be placed with consideration of providing air circulation to the unit. If wishing to install the P20 into your component rack, the purchase of an aftermarket, custom-designed shelf may be necessary.

If your equipment is located a long distance from the Power Plant 20, it is preferable to use a long, heavy gauge shielded power cable between the AC receptacle in the wall and the Power Plant. This is better than long individual power cables between the connected components and the Power Plant 20.

Conditioners

We discourage the use of any other power conditioning equipment before or after the P20 without considerable evaluation. A critical determination will have to be made as to whether there are any sonic or visual shortcomings. The P20 has a significant input & output passive filter design, and adding extra power cables to its input or additional filtering to its output may, in fact, be undesirable.

Dual Power Inputs

The P20 is capable of delivering up to 2000 VA of pure, clean power. All of the 230V models will deliver this power using the normal 230 volt 10 amp supply cable. However in North America, the electrical building codes will only allow 1440 VA to be drawn from a standard receptacle. When using the standard (15 amp IEC C14) AC cable supplied with the P20, the maximum output power is limited to 1200 VA. You will still receive all the performance benefits of the P20 regenerator, but if your system actually draws more than 1200 VA the Power Plant will shut down the outputs in order to avoid overloading the supply from your wall.

NOTE

If your system needs to utilize the full 2000 VA capability of your P20, it will be necessary to have an electrician install a dedicated 20A circuit to feed your Power Plant. In order to comply with the North American electrical codes, this circuit should have one single (not duplex) receptacle and cannot be connected to any other devices. To connect your P20 to this dedicated circuit, first disconnect the standard 15A power cable. Slide the door covering the 20A inlet to the left. Now the 15A inlet is safely covered and the 20A inlet is available for powering your unit. You will need to purchase a power cord with a 20A (Nema 5-20) plug to match your dedicated receptacle and a 20A (IEC C19) connector to match your P20. The P20 will automatically detect the position of the door and enable the full power capabilities of your Power Plant.



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Getting Started

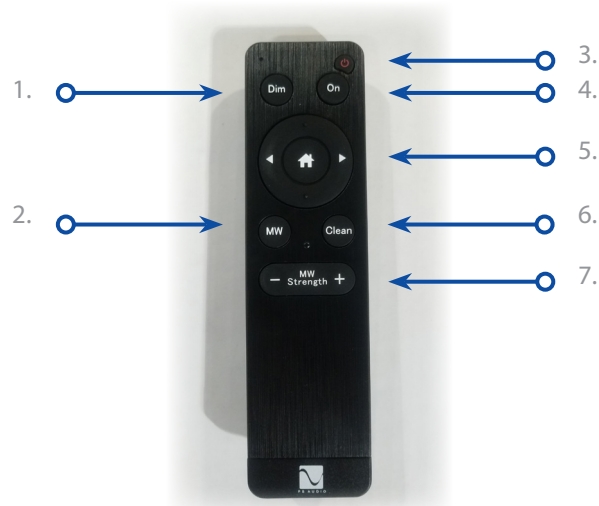
DirectStream PowerPlant 20

Included with the P20

Accessories:

- Remote Control
- Power Cable: 6ft
- Owner's Reference
- SD Card
- Ferrite noise suppressor

The Remote

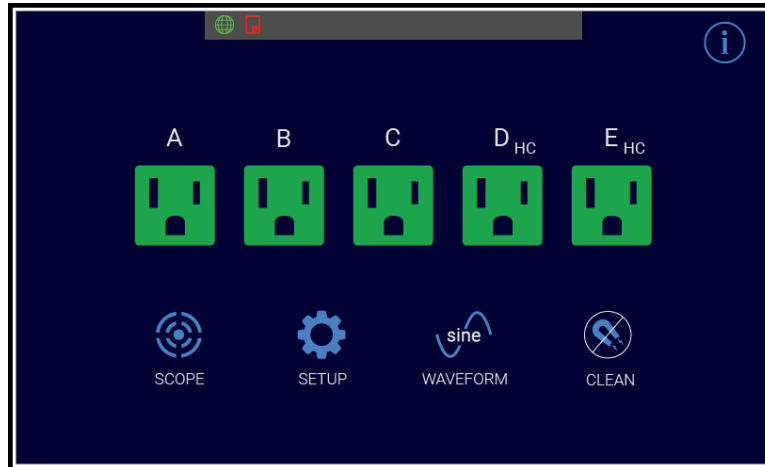


1. The Dim button turns the P20's display on and off.
2. Multi Wave toggle button turns the Multi Wave on and off.
3. The power button puts the P20 into standby.
4. The On button turns the unit on and brings the screen back on if dimmed.
5. The home button and arrows allow you to navigate the on-screen menu.
6. Clean engages the Clean Wave feature.
7. MW Strength +/- increases and decreases the Multi Wave level in the setup menu.

Powering the P20 On

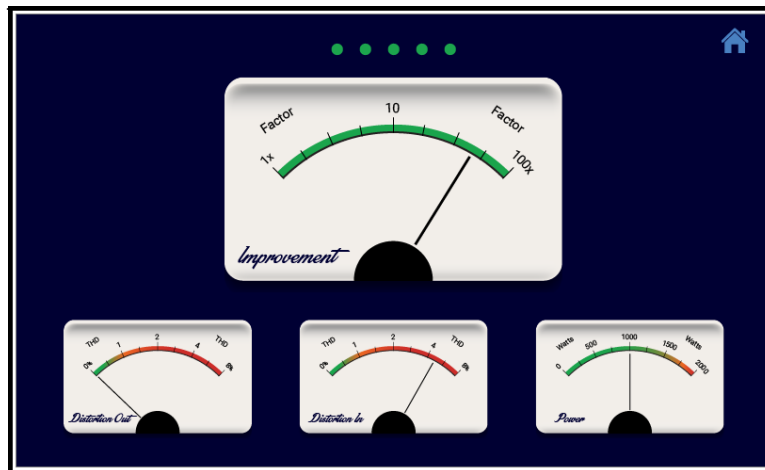
Once connected to power simply flip the rear power switch to the on position and allow the unit to initialize. Once complete the unit will present the Main Screen:

Home Screen



This image features outlet images of the US socket type. Units in different regions will have different outlet images. Pressing the green image will make it red and turn off the correlated zone.

Meter Screen



It Metering Screen:

Pressing any of the lower meter images will bring them to the top. This is an extremely handy display as it gives a continuous status indication for the P20.

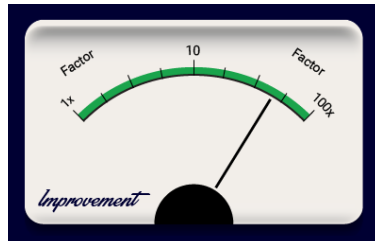


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Improvement Factor



The Improvement Factor is an average of the Voltage Output and the THD output. It gives you a factor of how much the AC power is improved by the P20.

Distortion Out



The Distortion Out is a measure of the THD (Total Harmonic Distortion) present in your AC Output voltage.

Distortion In



The Distortion In is a measure of the THD (Total Harmonic Distortion) present in your AC input voltage.

Power



The Power Meter shows the total wattage output from the P20.

NOTE

Overloading the P20 will result in shutdown. More than an 80% continuous load reduces the overhead for potential peaks in the power requirements from your audio system. The P20 can operate continuously at full power but you simply won't have any extra room for potential spikes in power draw.



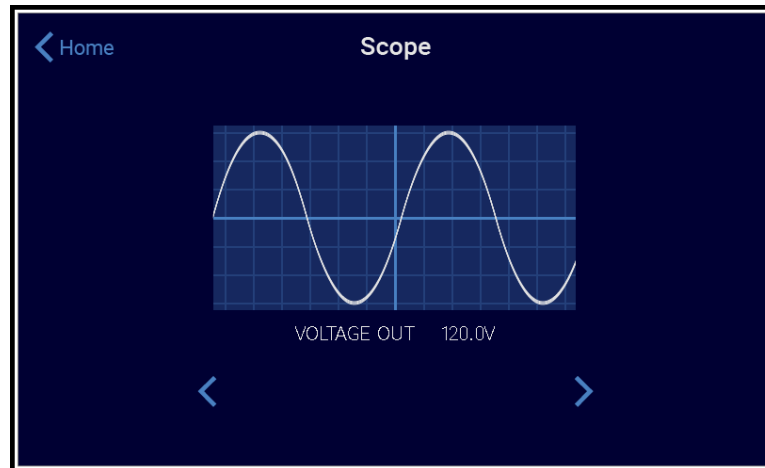
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Operation Guide

DirectStream PowerPlant 20

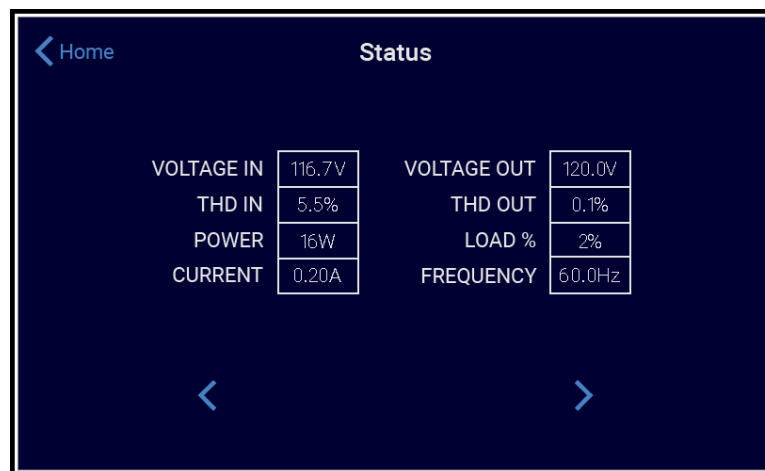
Scope

From the home screen press the Scope button to open the Scope window.



This is a fully functional oscilloscope that you can use to view the incoming AC waveform. Pressing either of the arrow buttons will scroll through the voltage in, voltage out and the difference windows. In this way you can see the degree to which the P20's output waveform is superior to the incoming AC Sine wave.

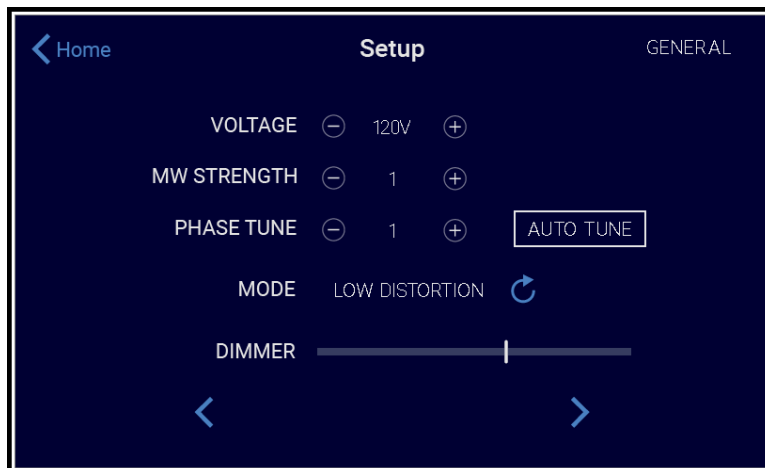
Status



Here you can see the P20's overall performance data. Note how in the above image the THD output is significantly reduced and the output voltage is a stable 120 Volts. Press the Home button to return to the Home screen.

Status

Pressing the Setup button on the Home screen brings you to the Setup screen:



Voltage

Here you can globally adjust the output voltage for the P20. Bear in mind that the P20 will output the same voltage from all zones. They are not individually adjustable.

MW Strength

Variable MultiWave Strength adjustment is available here. This feature can be enabled by pressing the MultiWave button on the Home screen. Variable MultiWave empowers users to vary the strength of the MultiWave output according to the needs of the equipment and the resulting performance benefits. To toggle this feature on and off simply press the Waveform Button in the Main screen.

Phase Tuning

Phase tuning is the next adjustment. Increasing or decreasing this will move the point at which the P20 detects the incoming waveform as the wave crosses the 0 Voltage point. In places where the AC power is especially poor making small adjustments to this setting can potentially lower the THD output. The best recommendation would be to keep this at zero unless you are seeing THD output higher than 1-2%.

Auto Tune

Pressing the 'auto-tune' button will calibrate the phase setting to the optimum setting for your input power. This only needs to be performed whenever the unit is moved to a new area to maintain optimal performance.

Mode

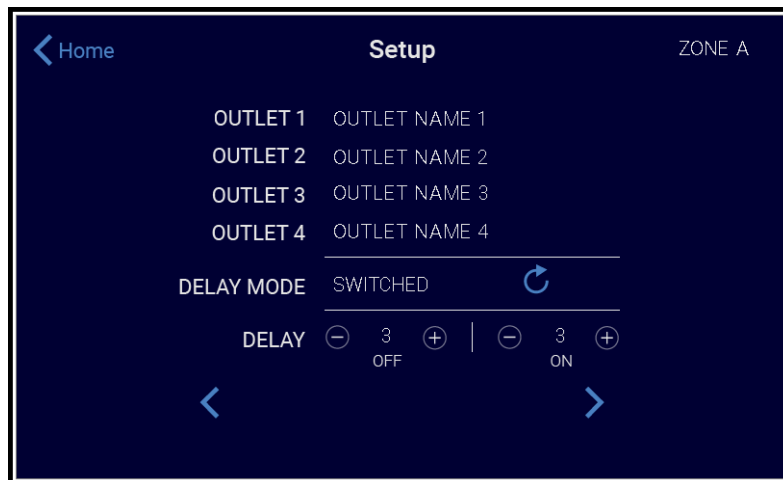
The Mode setting gives you the choice of High Regulation or Low Distortion. High Regulation is the default mode and ensures that the P20 will output the voltage very precisely at the expense of potentially higher Distortion (THD). Low distortion mode ensures that the P20 will output the lowest possible distortion at the expense of more fluctuations in the output voltage. Choose the option that best suits your needs.

Dimmer

The Dimmer slider allow you to manually adjust the brightness of the screen. Simply move the slider left or right to choose the brightness setting that is suitable for you.

Setup

Pressing the right arrow pulls up the next menu of the Setup section.



Outlets

The P20 has a lot of outlets. 16 total in the US version, (other regions will have different amounts as outlet sizes vary). The outlets are grouped into Zones that can be personalized to fit your specific system requirements.

Delay Mode

The Power Plant 20 allows for six different power sequencing options. The default setting for all zones is SWITCHED. All of these selections are only activated by the front-panel power button.

1. SWITCHED: As the front-panel power button is engaged, any zone set to SWITCHED will power up with no delay, and power down with a three-second delay.
2. DELAYED: As the front-panel power button is engaged, any zone set to DELAYED will power up with a three-second delay, and power down with a zero-second delay.
3. PROGRAMMED: As the front-panel power button is engaged, any zone set to PROGRAMMED will power up with a delay in the number of seconds desired, as well as power down with a delay in the number of seconds desired.
4. REBOOT: As the front-panel power button is powered down, any zone set to REBOOT will power down accordingly, and will after a three-second delay power back on. This mode is independent of the front power button.

Delay Mode Continued

5. **AUTO-REBOOT:** If your Power Plant 20 is connected to the network, and if the network's router is being powered by the Power Plant 20, you may want to set that zone to AUTO-REBOOT. At this setting, the Power Plant 20 will use the router and the network to ping the PS Audio Server, essentially saying "hello, I'm an active network device and the router is working." If the ping does not reach our server after several tries, the Power Plant 20 will assume that the router has frozen up, and will automatically reboot that zone, thereby resetting the router and restoring connectivity. One may wish to power the network's modem on this zone as well, for the same reason. This mode is independent of the front power button.

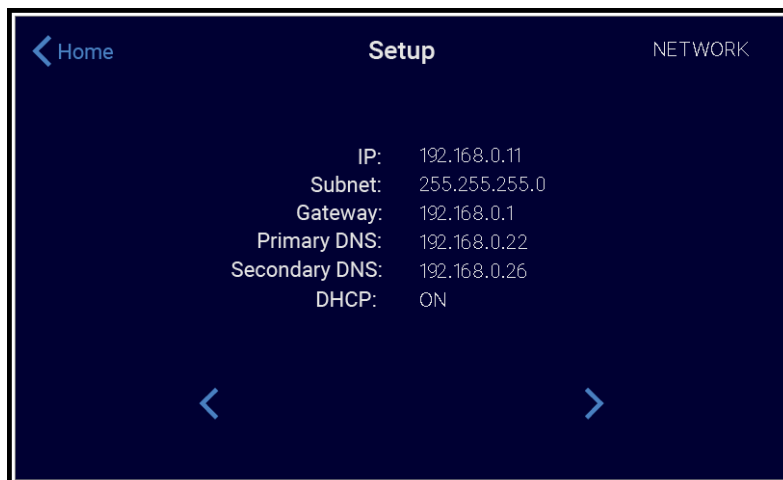
6. **ALWAYS ON:** In this setting, the P20 will output power from this zone regardless of whether the front-panel power button is engaged. As long as the Power Plant 20 is plugged in and the back-panel power switch is set to on, any zone set to ALWAYS ON will output regulated, regenerated AC power.

Note

that pressing the right or left arrow buttons will take you from control parameters for Zone A to the parameters for Zone B, C, D, and E respectively. All Zone settings can be made with the same instructions and suggestions as described above for Zone A.

Network Screen

The final screen in this section is the Network Screen. Here you can see the P20 IP address and other network information. Connecting your Power Plant 20 to the network is an option that provides extended functionality benefits. It is recommended that the Power Plant 20 be connected to the router via hard-wire connection. In addition, in order to make sure your Power Plant is fully compliant with international regulations, please install the included ferrite noise suppressor onto the Ethernet cable close to the unit.



Network Screen Continued

If a network connection is not available for the Power Plant 20 it will in no way affect the P20's performance in your system in terms of the quality of regenerated, regulated AC. Connecting your P20 to the network allows functionality benefits only, not performance based benefits.

The online interface is user friendly and can be accessed by registering one's P20 at the following link: powerplay.psaudio.com. You will find a multitude of usability features including:

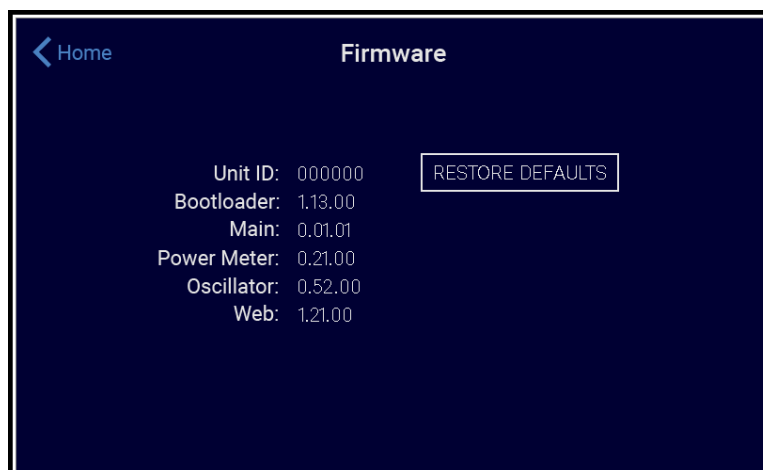
- P20 consumption records and performance tracking.
- Individualized zone control.
- System alerts and notifications.

Firmware Screen

From the Main screen press the settings button in the upper right corner.



This will open the Firmware screen:



NOTE Your firmware screen may differ from the above image as firmware releases come out. Make sure you visit our downloads page and make sure that your P20 firmware is up to date:

<http://www.psaudio.com/support/downloads/>

Unit ID

The unit ID is the unique, numeric identifier for the P20. It is the last 6 digits of the serial number and it is used to allow our online resource PowerPlay to track and collate the P20's performance data. For more information on this go to:

<http://powerplay.psaudio.com/>

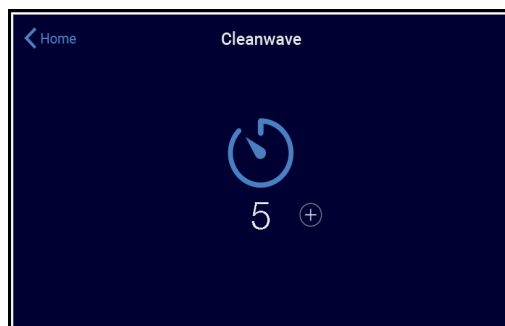
Firmware Screen The Bootloader / Firmware / Power Meter / Oscillator / Web versions are listed next. On occasion PS Audio will release firmware updates for the P20. It is important that you keep your P20 fully up to date. Look for firmware releases in our Newsletter or at:

<http://www.psaudio.com/support/downloads/>

Restore Defaults The restore defaults button resets the user defined settings back to the factory settings.

CleanWave By selecting the icon labeled CLEAN the Power Plant 20 will activate the CleanWave function and the display of the P20 will begin to countdown the time left as the P20 is applying the CleanWave signal. CleanWave injects a series of higher frequencies that ride on the main sine wave to help “degauss” connected magnetics.

To ensure that CleanWave is effective, make sure all connected equipment is on and functioning. CleanWave can be used between CD's, movies and vinyl. It is not recommended to activate CleanWave while you are listening as it may not sound correct until the CleanWave cycle has finished. The option exists for a 5 second or a 60 CleanWave cycle by touching the Add Time button.





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Specifications

DirectStream PowerPlant 20

Specifications of the P20 per country.



Environment Specification	US/JP	Europe/Asia
Location	Indoor use only	Indoor use only
Duty Cycle	Suitable for continuous operation	Suitable for continuous operation
Moisture Sensitivity	Not sealed against moisture	Not sealed against moisture
Operating Humidity	<80%rh	<80%rh
Storage Temperature	-40C to +40C	-40C to +40C
Operating Temperature	0C to 40C	0C to 40C
Electrical Supply Nominal Rating	US - 120V 15A / 20A 60Hz JP - 100V 15A / 20A 50/60Hz	230V 20A 50 / 60Hz



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Specifications

DirectStream PowerPlant 20

Instrument Specification	JP/US	Europe / Asia
Unit Dimensions	17" W x 14" D x 11" H (43cm W x 36cm D x 27.9 cm H)	17" W x 14" D x 11" H (43cm W x 36cm D x 27.9 cm H)
Unit Weight	96 lbs (43.5kg)	96 lbs (43.5kg)
Shipping Dimensions	23" x 22" x 17" (58cm x 55.8cm x 43 cm)	23" x 22" x 17" (58cm x 55.8cm x 43cm)
Shipping Weight	105 lbs (47kg)	105 lbs (47kg)
Nominal Input Voltage	US - 95 – 145 VAC JP - 75 – 120 VAC	200 –285 VAC
Maximum Continuous Load	US - 2000 VA w/20A supply US - 1500 VA w/15A supply JP - 1700 VA w/20A supply JP - 1200 VA w/15A supply	2000VA
Maximum Peak Load	3600VA	3600VA
Voltage Regulation	>1V	>3V
Output Distortion (Resistive Load)	<0.5%	<0.5%
Output Distortion (Reactive Load)	<0.5%	<0.5%
Output Impedance	<0.005 ohm	<0.005 ohm
Efficiency @1500 VA	>85%	>85%



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Specifications

DirectStream PowerPlant 20

Standby power consumption	35 Watts	30 Watts
Input Frequency	45 – 65 Hz	45 – 65 Hz
Under Voltage Limit	US-90 Volts JP-75 Volts	174 Volts
Over Voltage Limit	US-144 Volts JP-120 Volts	275 Volts
Energy Dissipation	2040J	5040J
Peak Current Surge	180,000A	180,000A
Clamp Level	340V	775V
DC Trigger Configuration	Tip Positive	Tip Positive
DC Trigger Voltage	5 – 15Vdc	5 – 15Vdc



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Service

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Rev A

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Limited Three Year Warranty

Registering

Should I Register My Product?

- Registering your product validates the warranty start date.
- If you do not register your product within 30 days of service, a copy of your purchase receipt from an authorized PS Audio dealer may be used as a proof of purchase to establish the warranty start date.
- If no proof of purchase from an authorized PS Audio dealer or registration is provided, the production date of the product will be used to determine the warranty start date.
- Registration can be completed online, by phone, by mail, or by email.

Coverage

What Does this Warranty Cover?

This warranty covers defects in material and workmanship for products purchased from PS Audio or its authorized dealers and agents.

What Will PS Audio Do to Correct the Problem?

In the event your product fails your sole remedy under this limited warranty shall be to return the product to PS Audio or an authorized PS Audio repair center. The product will be repaired without charge for parts or labor, replaced, or the purchase price refunded through the original point of purchase, at the option of PS Audio.

What is the Period of Coverage?

This limited warranty is in effect for 3 years from the date the unit was first purchased from PS Audio or its dealers and agents.

Shipping

Who Pays for Shipping?

You are responsible to pay for the safe and proper shipment of the warranted product to PS Audio or its authorized repair center.

The PS Audio authorized repair center will pay the cost of returning the repaired or replacement product to you under this warranty.

Not Covered

What Does this Warranty Not Cover?

This warranty does not cover damage due to:

- Accidents, carelessness, improper transportation, misuse, neglect, or abuse.
- Failure to follow the operating instructions that are provided by PS Audio in the owner's manuals (available for download at psaudio.com).
- Use in any manner inconsistent with PS Audio's operating instructions (available for download at psaudio.com).
- Lack of routine maintenance.
- Connection to an improper voltage supply.
- Alterations or modifications to the unit.
- Improper or unauthorized repair, including repairs not authorized by PS Audio or a PS Audio authorized repair center.
- Fire, lightning, flood, "acts of God," or other contingencies beyond the control of PS Audio.
- Products purchased through an unauthorized source (if you have questions as to whether or not a dealer is authorized, please contact customer support at psaudio.com).
- Products with a factory-applied serial number that has in any way been altered, defaced, or removed.

Limitations

Limitations on PS Audio's Obligations Under this Warranty

- In no event will PS Audio's liability to you exceed the original purchase price of the unit.
- This warranty does not cover the cost of custom installation, customer instruction, setup adjustments, or signal reception problems.
- This warranty does not cover consequential and incidental damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
- In the event your warranted product cannot be repaired, PS Audio will replace or refund the unit. We reserve the right to replace any out-of-stock, discontinued, or limited edition products with a comparable product. Discontinued products may not be available for warranty replacement.

Warranty Transfer

How Can the Warranty be Transferred?

This warranty is for the benefit of the original purchaser of the product. The warranty may be transferred to a subsequent purchaser during the 3 year warranty period. To do this, you must contact PS Audio directly to set up transfer of registration.

If you require service in North America

How Do I Get Warranty Service?

To locate an authorized PS Audio repair center, for service assistance, or for help with the operation of a product or just for information, please contact PS Audio customer support.

Obtain an RMA number

Warranty Service Within the US

- You must first obtain a Return Merchandise Authorization Number (RMA#) to receive warranty service and prior to returning any item. Contact PS Audio or an authorized PS Audio repair center to receive an RMA#.
- You must put the RMA# on all returns. If it is not clearly marked, PS Audio will return the package back to you, freight collect.
- Original packaging should be used for the safe transit of your PS Audio unit to the repair center. If you do not have the original packaging, PS Audio can sell and ship to you replacement packaging.
- You are responsible for the cost of shipping the product to a PS Audio authorized repair center. You should insure the product for its full retail cost in the event it gets lost or damaged in transit. PS Audio is not responsible for damage incurred in products sent to us.
- Shipping your product in non-PS Audio packaging may void this warranty. PS Audio reserves the right to charge you for new factory packaging to return your product after a repair.

Use original packing

State law

How State Law Applies

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If you are outside the US

Warranty Service Outside of the US

PS Audio has authorized distribution in many countries of the world. In each country, the authorized importing distributor has accepted the responsibility for warranty of products sold by that distributor. Warranty service should be obtained where the product was purchased.



Changes to Our Products

PS Audio reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any products without notice or obligation to any person.

Your Serial
Number

Your Purchase
Information

Date of Purchase

 P S A U D I O

