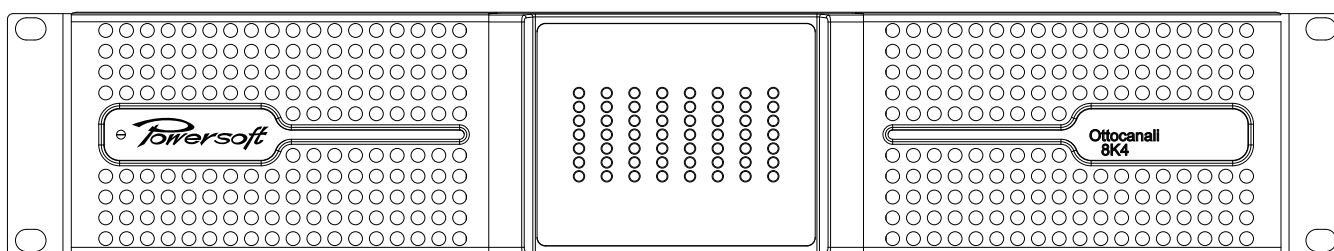




Ottocanali 4K4 Ottocanali 8K4 Ottocanali 12K4



USER GUIDE

REV 2.0 November 2013

Ottocanali 4K4 / 8K4 / 12K4

User Guide

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I Important safety instructions



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT ATTEMPT TO OPEN ANY PART OF THE UNIT. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS.

TO COMPLETELY DISCONNECT THIS APPARATUS FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE.

THE MAINS PLUG OF THE POWER SUPPLY CORD MUST REMAIN READILY ACCESSIBLE.

SAFEGUARDS: This unit has been engineered and manufactured to assure your personal safety. Improper use can result in potential electrical shock or fire hazards. In order not to defeat the safeguards, observe the following instructions for its installation, use and servicing.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this amplifier near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stover or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



13. Unplug this amplifier during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

NOTES: This equipment has been tested and found to comply by Competent Body (Directive 2004/108/EC) pursuant to the product family standard for audio professional use: EN 55103-1 and EN 55103-2 standard.

This equipment has been tested and found to comply by Notified Body 2014 (Directive 2006/95/EC) pursuant to the audio apparatus safety requirements: EN 60065 and EN 60065/A1 standard.

EXPLANATIONS OF GRAPHICAL SYMBOLS



The Lightning Flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.



The Exclamation Point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

2 Precautions regarding installation

2.1 Location



Install the amplifier in a well-ventilated location where it will not be exposed to high temperature or humidity.

Do not install the amplifier in a location that is exposed to direct sun rays, or near hot appliances or radiators. Excessive heat can adversely affect the cabinet and internal components. Installation of the amplifier in a damp or dusty environment may result in malfunction or accident.



Placing and using the amplifier for long periods of time on heat generating sources will affect its performance. Avoid placing the amplifier on heat generating sources. Install this amplifier as far as possible from tuners and TV sets. An amplifier installed in close proximity of such equipment may experience noise or generic performance degradation.



No naked flame sources such as lighted candles should be placed on the amplifier.

Do not spill water or other liquids into or on the amplifier.



WARNING

To prevent fire or electric shock:

- ▶ The ventilation openings must not be impeded by any item such as newspapers, tablecloths, curtains etc; keep a distance of at least 50 cm from the front and rear ventilation openings of the amplifier.
- ▶ Do not expose this amplifier to rain or moisture.
- ▶ This equipment must not be exposed to dripping or splashing liquids: objects filled with liquids, such as vases, must not be placed on the amplifier.

2.2 Wiring



This device must be powered exclusively by earth connected mains sockets in electrical networks compliant to the IEC 364 or similar rules. It is absolutely necessary to verify this fundamental requirement of safety and, in case of doubt, require an accurate check by qualified personnel.

POWERSOFT cannot be considered responsible for eventual damages caused to persons, things or data due to an improper or missing ground connection.

- ▶ Before powering this amplifier, verify that the correct voltage rating is being used.
- ▶ Verify that your mains connection is capable of satisfying the power ratings of the device.
- ▶ Do not use this amplifier if the electrical power cord is frayed or broken.
- ▶ Do not remove the cover. Failing to do so will expose you to potentially dangerous voltage.
- ▶ Provide a sectioning breaker between the mains connections and the amplifier. The suggested device is a 16A/250V AC, C or D curve, 10 kA.
- ▶ Switching mode amplifier is capable of producing hazardous output voltages- To avoid electrical shock, do not touch any exposed speaker wiring while the amplifier is operating.



CLASS3 WIRING

Output terminals are hazardous: wiring connection to these terminals require installation by an instructed person and the use of ready made leads.

2.3 Speaker damage



Powersoft switching mode amplifiers are among the most powerful professional amplifiers available and are capable of producing much more power than many loudspeakers can handle. It is the user's responsibility to use speakers suitable to the amplifier and to use them in a sensible way that will not cause damage.

Powersoft will not be held responsible for damaged speakers. Consult the speaker manufacturer for power handling recommendations.

Even if you reduce the output volume using the amplifier's front panel attenuation controls, it is still possible to reach full output power if the input signal level is high enough.

A single high-power tone can damage high frequency drivers almost instantaneously, while low frequency drivers can usually withstand very high, continuous power levels for a few seconds before they fail. Reduce power immediately if you hear any speaker "bottoming out": harsh pops or cracking distortion that indicate that the speaker voice coil or diaphragm is striking the magnet assembly.

Powersoft recommends that you use amplifiers in this power range for more headroom (cleaner sound) rather than for increased volume.

This manual contains important information on operating your Powersoft amplifier correctly and safely. Please read it carefully before operating your amplifier. If you have any questions, contact your Powersoft dealer.

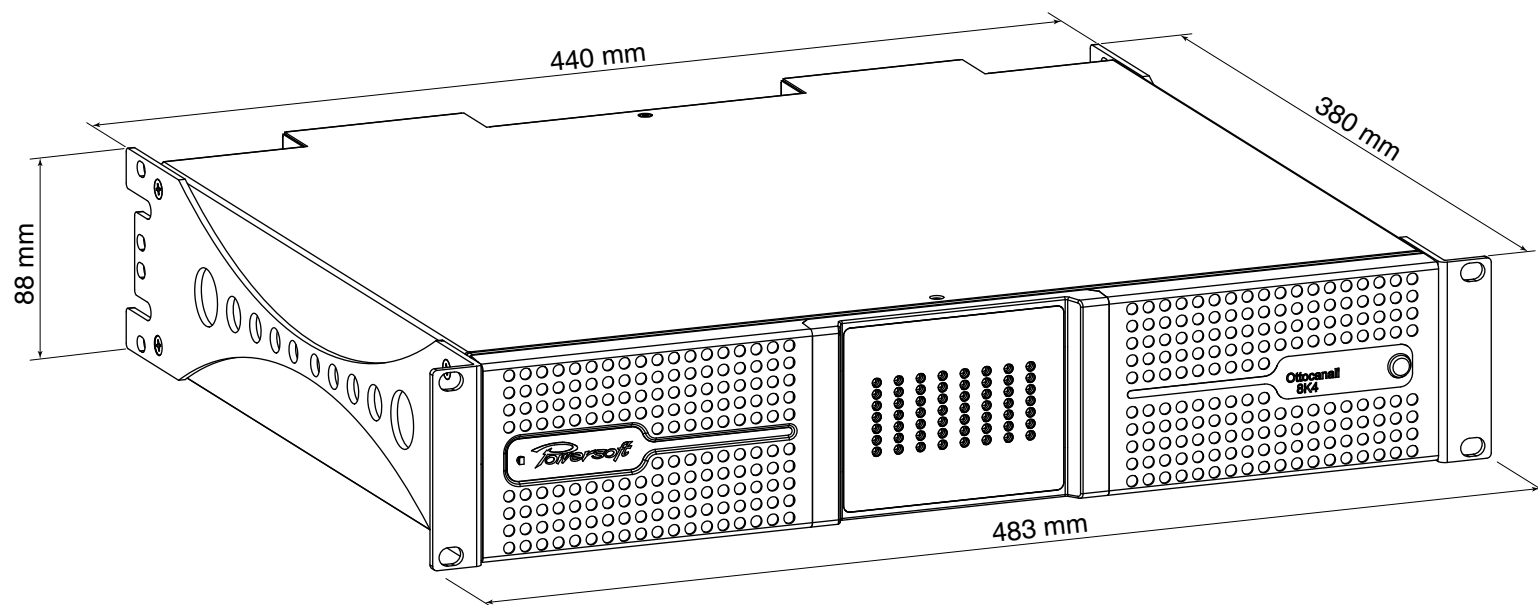


FIGURE 1: Ottocanali footprint. All dimensions in millimeters.

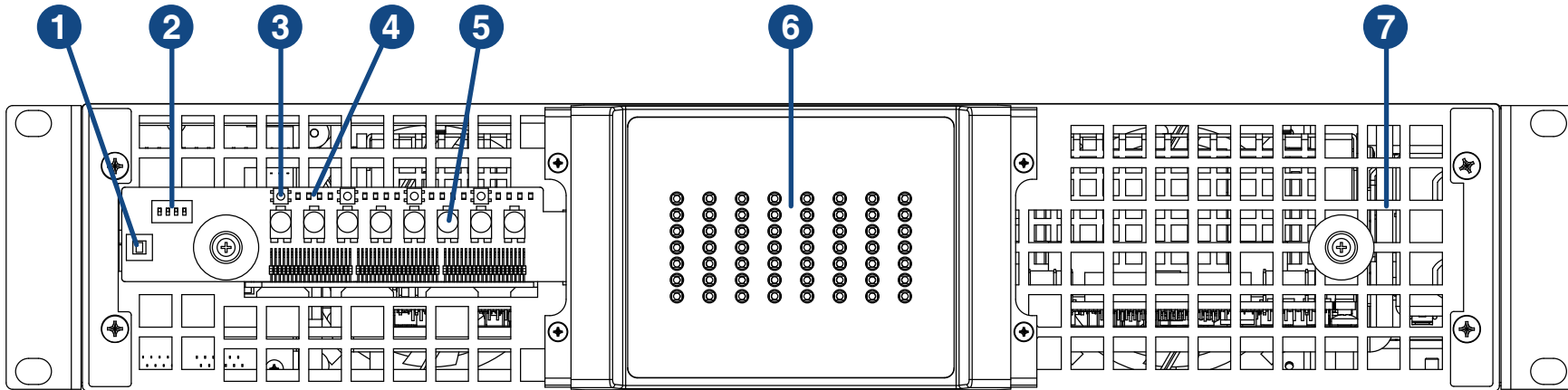



FIGURE 2: Ottocanali front panel view.

- | | | |
|---|--|---|
| 1. 24 V _{DC} PWS OUT toggle switch | 8. On/off power switch | 14. Multi function DIP switch (Impedance, voltage, filters) |
| 2. Energy save DIP switch (per channel pair) | 9. Audio outputs – HAZARDOUS VOLTAGE  | 15. AUX input |
| 3. Preset selection switches (DSP version only) | 10. Audio Inputs | 16. AUX input selector plug |
| 4. DSP LEDs (DSP version only) | 11. Alarm output channels 1-4 | 17. 24 V _{DC} PWS OUT plug |
| 5. Output attenuators | 12. Alarm output channels 5-8 | 18. Remote AUX supply plug (DSP version only) |
| 6. Multifunction LEDs | 13. AC Mains power plug | 19. Remote on/off switch plug |
| 7. Air vents | | |

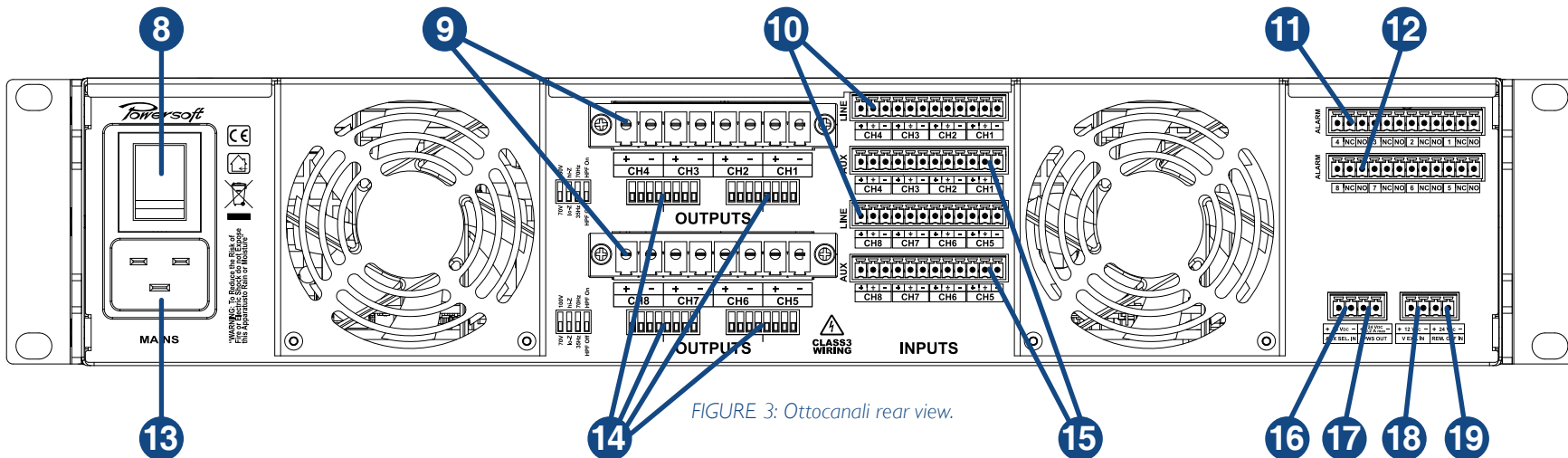


FIGURE 3: Ottocanali rear view.

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Ottocanali 4K4 / 8K4 / I2K4

User Guide

5 Welcome

Congratulations on buying a Powersoft Ottocanali amplifier! Powersoft is a leading company in the field of high efficiency audio power management. The Powersoft Class D technology has changed the way the world looks at professional audio amplification: no other amplifier's performance comes close for applications demanding high power and long term reliability. Thanks to amazing reductions in heat output and weight, without sacrificing output powers, Powersoft amplifiers can be used in an unlimited range of PA applications such as opera houses, theaters, churches, cinema, and theme parks.

5.1 The Ottocanali Series

The Ottocanali series of amplifiers are specifically designed for installation applications. The amplifiers in this series offer smaller dimensions, lighter weight and the traditionally amazing sound quality and reliability of all Powersoft products. The PFC (Power Factor Correction) feature allows flawless worldwide operation with any AC mains voltage, including 100, 110, 115, 220, 230 and 240V.

More Sound and Less Weight Class D technology based amplifiers are highly efficient, delivering greater power to speakers with reduced heat dissipation: typical running efficiency of output stages is 95%, with only 5% of input energy dissipated as heat. This allows for smaller dimensions, weight and power consumptions.

Contrary to conventional amplifiers which achieve highest efficiency only at full rated power output, Class D efficiency is almost independent of output level. Music has an average power density of 40% of its peak value; this means that other (non-class D) amplifiers can easily generate 10 times more heat than Powersoft products for the same sound pressure level. This unit is designed to work with lo-Z (from 2Ω) and with 70V/100V distributed lines.

Powersoft amplifiers deliver crystal-clear highs, and a tight, well-defined low end: the most accurate reproduction of an audio signal. Solid time proven design features ensure extremely high performance in terms of super low total harmonic distortion, optimal frequency response, high power bandwidth and damping factor across a vast number of application scenarios. Powersoft's multi patented application of Pulse Width Modulation (PWM) high frequency sampling techniques is just one of the many factors contributing to the Ottocanali's high performance ratings across the audio bandwidth.

Patented SRM (Smart Rails Management) technology allows to maximize the efficiency of the system and drastically reduce power consumption at any load and usage condition. This system automatically alters the rails working level according to the instantaneous power requirements of the system. Low power output requires a lower rails voltage value which in turn yields lower power consumption while at the same time guaranteeing lightning fast switching to full rails voltage when the system requires full power. This Powersoft exclusive technology is the key to the incredibly low power consumption of the Ottocanali amplifiers.

The Ottocanali series offers complete protection against any possible operation error. Every amplifier in this series is designed to work under a large range of possible conditions, delivering maximum power with maximum safety and an outstanding long term reliability. Two universal switch mode power supplies with PFC (Power Factor Correction) each independently powering a set of 4 channels. Anticipating potential problems at the design stage means your show always goes on!

6 Installation

6.1 Unpacking

Carefully open the shipping carton and check for any noticeable damage; FIGURE 4 shows the packing view. Every Powersoft amplifier is completely tested and inspected before leaving the factory and should arrive in pristine condition. In the unlikely event that you should encounter any damage, please notify the shipping company immediately. Be sure to save all packing materials for the carrier's inspection.

The Ottocanali box contains the following:

- ▶ 1 Ottocanali amplifier;
- ▶ 1x AC Mains cord with 3-pin plug 20 A for US, IEC 'Schuko' 16 A for every other nation;
- ▶ 2x 8pin Phoenix DFK-PC 4/8-ST-7.62 1804962 – Audio output connectors;
- ▶ 6x 12pin Phoenix MC 1.5/12-ST-3.81 1803675 – Audio input connectors;
- ▶ 2x 4pin Phoenix MC 1.5/4-ST-3.81 1803594 connectors – Alarm and remote control connectors.

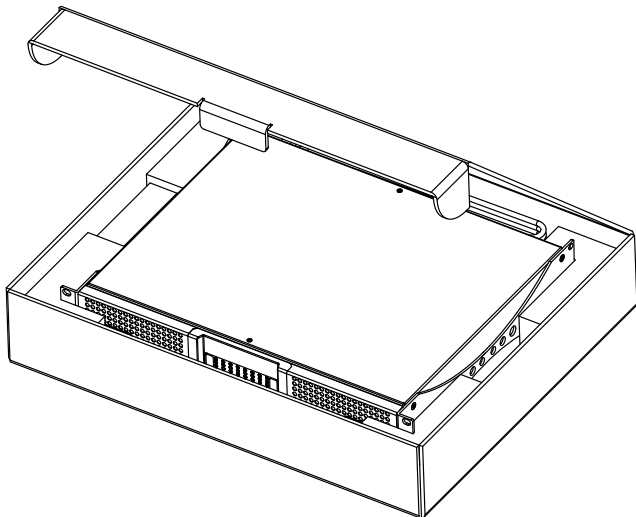


FIGURE 4: Ottocanali packaging.

6.2 Mounting

All Powersoft amplifiers are designed for standard 19" rack mounting; there are four front panel holes and two rear-lateral holes. In order to limit the risk of mechanical damages, amplifiers must be fixed to the rack using both frontal as well as rear mounting holes (FIGURE 5).

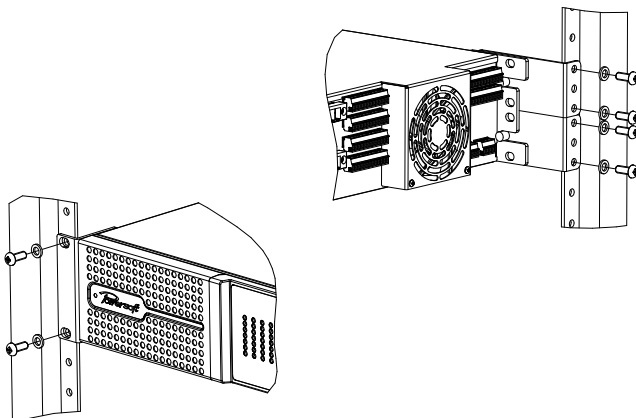


FIGURE 5: Amplifier's mounting brackets; front and rear view.

6.3 Cooling

All Powersoft amplifiers implement a forced-air cooling system to maintain low and constant operating temperatures. Drawn by an internal fan, air enters through the slots in the front panel and is forced over all components, exiting at the back of the amplifier.

The amplifier's cooling system features an "intelligent" variable-speed DC fan which is controlled by heat sink temperature sensing circuits: the fan speed will increase only when the temperature recorded by the sensors rises over carefully predetermined values. This ensures that fan noise and internal dust accumulation are kept to a strict minimum. Should however the amplifier be subject to an extreme thermal load, the fan will force a very large volume of air through the heat sink. In the extremely rare event that the amplifier should dangerously overheat, sensing circuits shut down all channels until the amplifier cools down to a safe operating

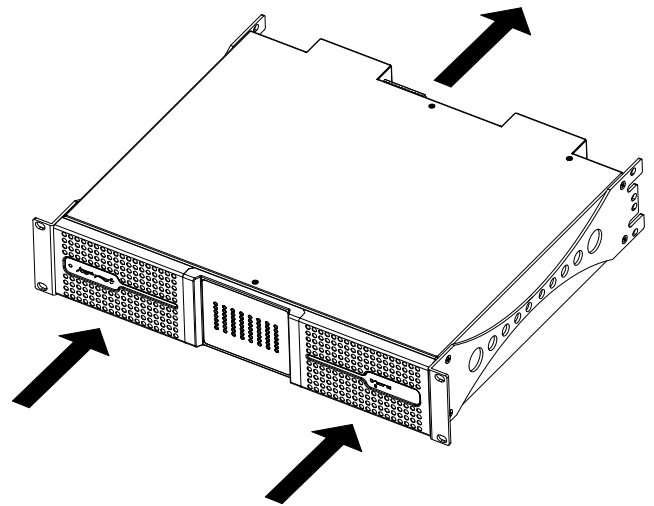


FIGURE 6: Forced air cooling: front to back airflow.

temperature. Normal operation is resumed automatically without the need for user intervention.

When mounting Ottocanali amplifiers, the exhaust heat should be taken into consideration. Exhaust cooling air is forced out through the rear of the chassis (FIGURE 6); make sure there is enough space around the back of the amplifier for this air to escape. Ottocanali amplifiers can be stacked one on top of the other due to the efficient cooling system they are equipped with. There is however a safety limit to be observed: in case a rack with closed back panels is used, leave one rack unit empty every four Ottocanali amplifiers installed to guarantee adequate air flow.

6.4 Operating precautions

Make sure the power switch is off before attempting to make any input or output connections.

Make sure the AC mains voltage used is within the acceptable operating voltage range specified in the Ottocanali documentation (100V-240V $\pm 10\%$). Damage caused by connecting the amplifier to an improper AC mains voltage is not covered by the warranty.

By using good quality input and speaker cables, the likelihood of erratic signal behavior is reduced to a minimum. Whether you make them or buy them, look for good quality wires, connectors and soldering techniques.

6.5 Grounding

There is no ground switch or terminal on the Ottocanali Series amplifiers. All shield terminals of input connections are directly connected to the chassis. This means that the unit's signal grounding system is automatic. In order to limit hum and/or interference entering the signal path, use balanced input connections.

In the interests of safety, the unit **MUST** always operate with electrical safety earth connected to the chassis via the dedicated wire in the 3-wire cable. Never disconnect the ground pin on the AC mains power cord.

6.6 AC mains connection

The AC Mains connection is made via the IEC type connector on the back of the amplifier. The PFC feature allows the Ottocanali to work within a range of different AC mains voltages without the need to adjust any settings; however, make sure your AC mains power source operates within the voltage limits indicated on this manual (100V-240V $\pm 10\%$).

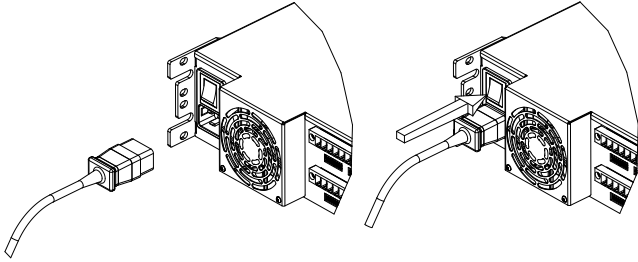


FIGURE 7: Mains connector and on/off power switch.

SAFETY WARNING!

Ground wires must be connected!

Do not use adapters that disable grounding.

7 Connections and operation

This section provides information on amplifier connection and operation. For optimal amplifier performance, it is important to understand the meaning of the information that the Ottocanali amplifier can provide regarding its status and configuration. This information is available to the user both via front panel indicators as well as through specific alarm signals broadcasted from dedicated connectors on the back of the unit. This chapter will break down all the front panel operations and monitoring functions the Ottocanali is capable of. The remaining part of the chapter will explain how to correctly connect the amplifier's inputs and outputs.

7.1 Front panel controls access

A number of important controls can be accessed by removing the front left hand side protective panel bearing the Powersoft logo. Both silver colored metal panels are attached to the chassis magnetically and can therefore be removed quickly without the aid of any specific tool.

The following procedure can be used to remove both the left as well as the right hand front panels. Removing the right hand panel, however, does not grant access to any controls and is useful only for air filter access (see Section 9.3).

To remove the left hand side front panel bearing the Powersoft logo:

1. Firmly grip the outermost left hand side of the silver colored panel and pull outwards at an angle, as if opening a door hinged on the right hand side.
2. Carefully slide the metal panel away from the chassis. When the front panel is removed, the air filter (looking like a shiny black plastic sponge) will be exposed.

To reposition the left hand side silver panel:

1. Secure the air filter to the amplifier chassis by placing it in its designated area and press lightly, so that the filter's central cut hole can brace the magnetic snap mechanism.

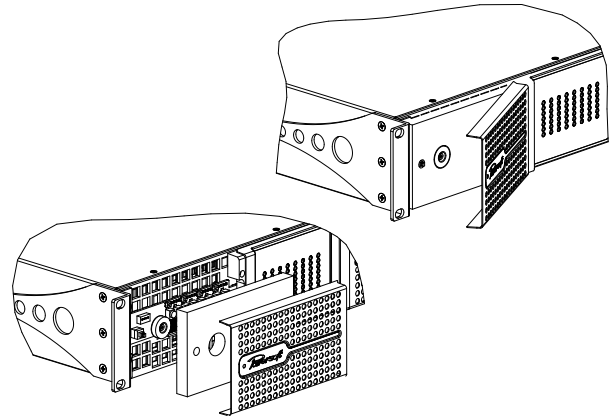


FIGURE 8: Magnetic side panel removal.

2. Align the silver panel's right hand side to the chassis at the same angle used to remove it.
3. When correctly positioned, the magnetic snap mechanism will automatically secure the metal panel in place.

The controls positioned behind the left hand side silver colored Powersoft logo panel allow access to a series of important features:

- Output channel attenuation adjustment (see Section 7.2.1)
- AUX Input/Line Input toggle (see Section 7.5)
- GPIO operations (see Section 7.9)
- Channel pair energy save mode selection (see Section 7.2.2).

7.2 Front panel adjustments

There are two types of adjustments that are possible from the Ottocanali front panel: output level attenuation and energy save mode.

7.2.1 Output level adjustments

Removing the left hand side metallic panel exposes one attenuator knob for each channel, numbered one through eight starting from the left hand side. Each channel's output attenuation level can be set to any value from 0 to ∞ . Attenuation level increases by rotating the blue knob counterclockwise.

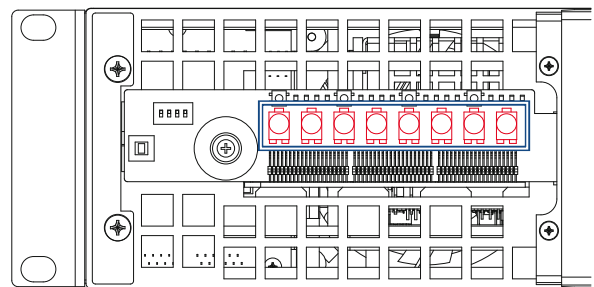


FIGURE 9: Front panel pot attenuators.

7.2.2 Energy save

Energy save capabilities can be activated for each channel pair. When the energy save mode is activated on a channel pair, the Ottocanali enters a low power consumption idle state when no signal activity is detected for more than 4 seconds. Normal operation is resumed in a matter of milliseconds when an incoming signal is detected on the channel pair.

Idle Power Consumption Energy Save Mode OFF				
AC Mains Voltage (V)	Current (A)	Real Power (W)	Apparent Power (VA)	Power Factor
115	0.90	52	103.5	0.5
230	0.84	58	193	0.3
Idle Power Consumption Energy Save Mode ON				
AC Mains Voltage (V)	Current (A)	Real Power (W)	Apparent Power (VA)	Power Factor
115	0.65	30	75	0.4
230	0.76	35	175	0.2

TABLE 1: Energy save mode on/off; idle power consumption chart for the Ottocanali 4K4, 8K4, 12K4.

In order to enable energy saving mode for a channel pair, the DIP switch on the left hand side of the front panel must be set to OFF (down). The first switch to the left is relative to channels 1 and 2, the second to channels 3 and 4 and so on.

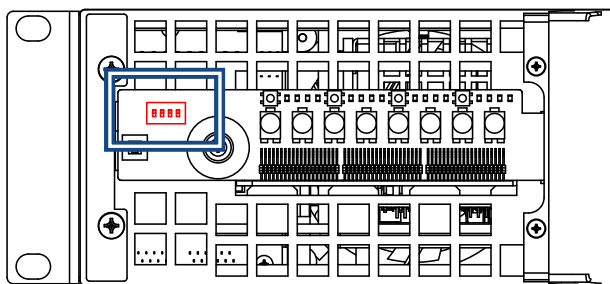


FIGURE 10: Front energy save DIP switch.

7.3 Front panel monitoring

The Ottocanali front panel provides important information on the state of the amplifier. It is important to know and understand the meaning of every front panel indicator in order to have crucial information on the operational state of the amplifier.

On the central portion of the front panel of the Ottocanali are 8 columns of 7 LEDs each, one column for each channel.

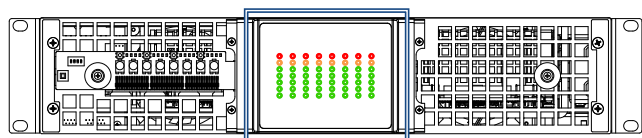


FIGURE 11: Front panel LEDs.

Some of these LEDs have multiple signaling modes, e.g. metering or alarm modes. Their function is summarized in TABLE 2.

LED	Color	Solid ON	Blinking
	RED	Channel output level has reached clipping limits OR Channel has been muted due to heat sink temperature rising above 80°C *	—
	YELLOW	Channel output level is above -6dB of max output level OR Thermal warning: heat sink temperature is above 70°C **	—
	GREEN	Channel output level is above -12dB of max output level	—
	GREEN	Channel output level is above -24dB of max output level	—
	GREEN	Input signal presence: Input signal is above -60dBV	—
	GREEN	Channel is ready	—
	GREEN	—	AUX inputs are selected

* Even if only one channel causes thermal overload, all channels are muted and all red LEDs are on.

** Even if only one channel causes thermal warning, all yellow LEDs are on.

TABLE 2: Front panel LEDs chart.

7.4 Connecting audio inputs

Audio input connections are made via two 12-pin Phoenix MC 1.5/12-ST-3.81 1803675 terminal block connectors; input connectors are placed on the back of the Ottocanali and grouped in four rows.

- ▶ The first row is for audio line inputs – channels 1 through 4.
- ▶ The second row of connectors is for auxiliary audio inputs – channels 1 through 4.
- ▶ The third row is for line audio inputs – channels 5 through 8.
- ▶ The fourth row of connectors is for auxiliary audio inputs – channels 5 through 8.

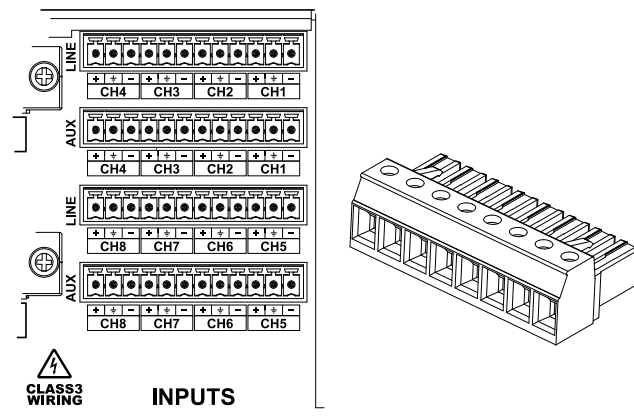


FIGURE 12: Rear audio input plugs (left) and Phoenix connector (right).

7.5 Toggle line input/aux input

The amplifier switches from line inputs to auxiliary inputs when a constant voltage in the 12V to 30V range is applied to the “AUX SEL” plug. When this voltage is removed from the “AUX SEL” plug, the unit switches back from auxiliary inputs to line inputs.

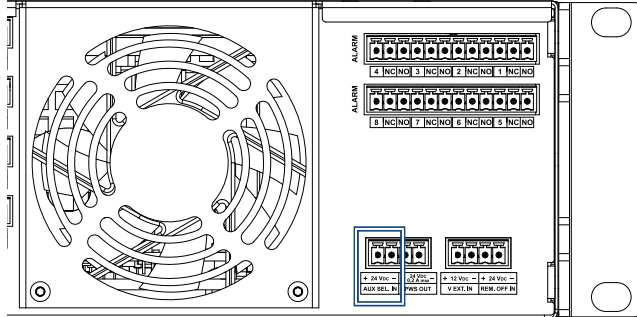


FIGURE 13: AUX input selector plug.

The Ottocanali amplifier provides an additional procedure to switch from line inputs to auxiliary inputs. The “PWS OUT” connector can provide a 24V DC (0.2 A max, symmetrical with respect to ground) when enabled by the left hand front panel toggle switch.

By connecting the “PWS OUT” connector to the “AUX SEL” (see FIGURE 14) the front panel switch will toggle between line inputs and auxiliary inputs. The diagram shown on FIGURE 16 explains the relationship between the front panel toggle switch and the PWS OUT port.

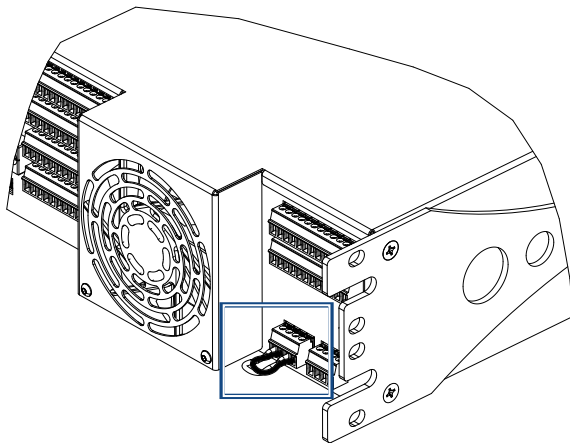


FIGURE 14: AUX SEL and PWS OUT jumper.

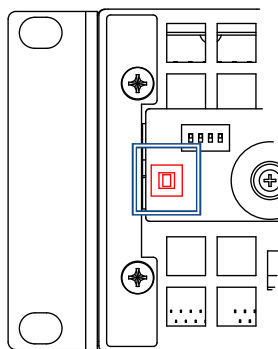


FIGURE 15: Front panel PWS OUT toggle switch.

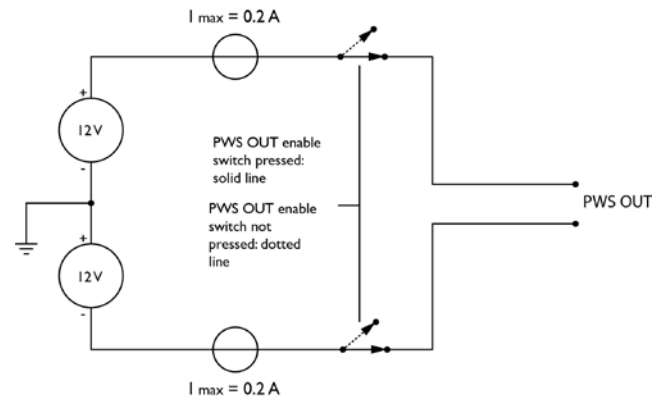


FIGURE 16: PWS OUT toggle switch and PWS OUT plug diagram.

7.6 Connecting audio outputs

Two 8 pin Phoenix DFK-PC 4/8-ST-7.62 1804962 terminal block connectors are provided for the amplifier’s output connections.

WARNING!

Lethal voltage levels may be present at the loudspeaker connectors when the amp is turned on!

Ensure that the speakers are connected to the Ottocanali output with the correct polarity: the + pins of the connector corresponds to the positive output of the channels.

Both bridge as well as single end output connection modes are possible and can be mixed: for example, channels 1 and 2 can be connected in bridge mode, while channels 3 and 4 can be connected single end.

TABLE 3 and TABLE 4 summarize common connection modes with corresponding connection polarities. Speaker cables polarity are labeled as Spk#++ and Spk#-- , where # represents the speaker number.

	CH 1		CH 2		CH 3		CH 4	
	+	-	+	-	+	-	+	-
Single end Lo-Z 70V/100V	Spk1+	Spk1-	Spk2+	Spk2-	Spk3+	Spk3-	Spk4+	Spk4-
Bridge Lo-Z	Spk1+	NC	NC	Spk1-	Spk2+	NC	NC	Spk2-

TABLE 3: Output connection chart channels 1-4.

	CH 5		CH 6		CH 7		CH 8	
	+	-	+	-	+	-	+	-
Single end Lo-Z 70V/100V	Spk5+	Spk5-	Spk6+	Spk6-	Spk7+	Spk7-	Spk8+	Spk8-
Bridge Lo-Z	Spk3+	NC	NC	Spk3-	Spk4+	NC	NC	Spk4-

TABLE 4: Output connection chart channels 5-8.

7.7 Hi-Z 70V/100V operations

Any channel of the Ottocanali amplifier can drive a so called “constant voltage” 70V/100V (hi-Z) line of loudspeakers. In order to connect any channel's output to a 70V/100V line, the rear panel DIP switch corresponding to the channel must be correctly set.

Powersoft recommends using a HPF (High Pass Filter) when the amplifier is set to drive a distributed line to prevent loudspeaker transformer saturation which can considerably degrade sound performance. Please see Section 7.7.1 for a detailed explanation of the channel specific options that can be set via the DIP switches.

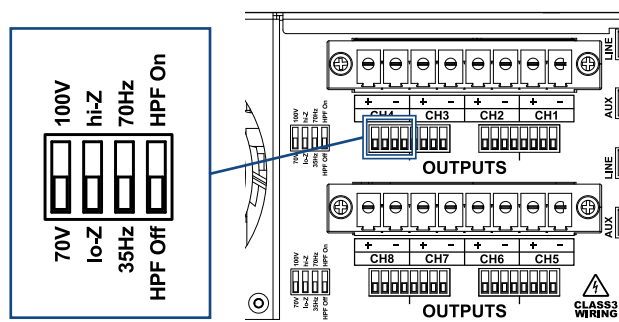


FIGURE 17: Rear output connection and DIP switch.

7.7.1 Rear panel DIP switches

The rear of the Ottocanali has 4 slide-style DIP switches for each channel, yielding a total of 32 switches. These DIP switches allow the selection of channel specific parameters which must be properly set when using the amplifier to drive, for example, a 70 V/100 V distributed line.

The first switch from the left hand side allows to select whether the channel will drive a 70 V or 100V line.

The second switch from the left allows to select the lo-Z or hi-Z mode of the amplifier. If the amplifier is set to work in lo-Z mode, the settings of all the other three DIP switches are ignored.

The third switch from the left allows to select the cut off frequency of the input high pass filter. The two options are 35 Hz or 70 Hz.

The last switch allows to turn on or turn off the aforementioned high pass filter. If the HPF is set to off, the 35Hz/70Hz setting is ignored.

7.8 Bridge mode connection

Bridge mode connection of outputs is possible only in lo-Z operational mode. Bridging of adjacent channels is allowed for the following pairs: channels 1 with 2, 3 with 4, 5 with 6, 7 with 8. Bridging is NOT possible for other pairs, for example channels 4 and 5. In order to obtain a bridge connection of the outputs, inputs must be connected in parallel and outputs in series on a minimum load of 8 Ω . See FIGURE 18 for a connection diagram example.

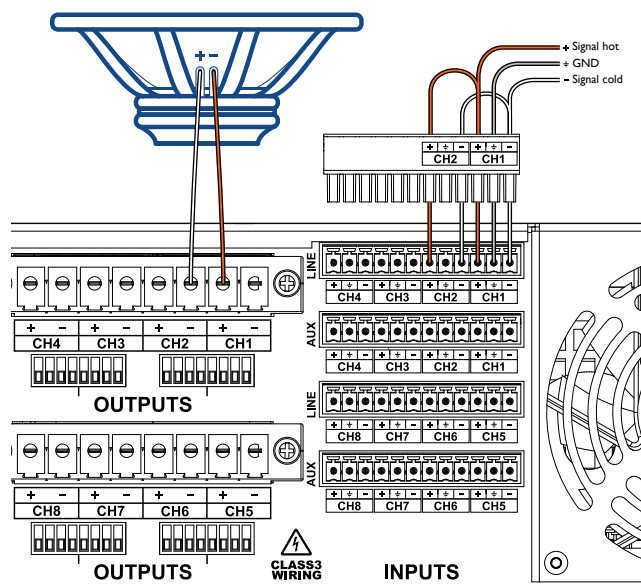


FIGURE 18: Output BRIDGE connection; Input PARALLEL connection.

7.9 GPIO Operations

General Purpose Input/Output Operation (GPIO) refers to a generic two pin contact (balanced or unbalanced) that can control or can be controlled by another system. The Ottocanali's GPIO system implements digital trigger signals to broadcast alarms or allow remote unit on/off switching.

7.9.1 Alarms

To ensure problem-free and efficient interaction with external devices, the Ottocanali provides two 12-pin Phoenix MC 1.5/12-ST-3.81 1803675 alarms connectors on the back panel.

These contacts are used to report potentially dangerous faults or generally unsafe operation conditions by toggling alarm switches relative to events such as:

- ▶ DC presence at the output: when a dangerous DC component is present in the output power signal;
- ▶ thermal stress: when heat dissipation is not sufficient and heat sink temperature rises.

For a detailed account of protective measures relative to these alarms, please see Section 8.

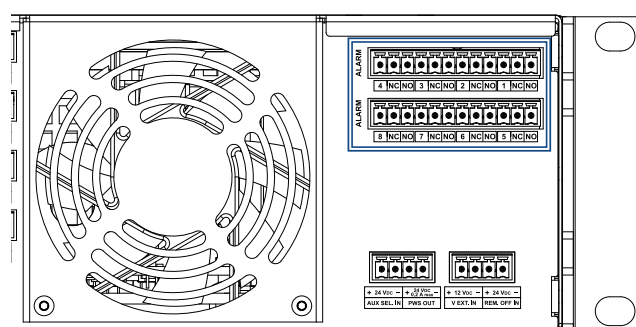


FIGURE 19: Alarm output connectors.

7.10 Remote ON/OFF

By switching a DC voltage of $24\text{ V}_{\text{DC}} \pm 10\%$, 10 mA applied to the "REM OFF" connector located at the back of the Ottocanali, the amplifier can be remotely switched on and off.

When a 24 V_{DC} voltage is applied, the amplifier switches off immediately. When the 24 V_{DC} voltage is removed, the amplifier switches back on as per normal boot up operation.

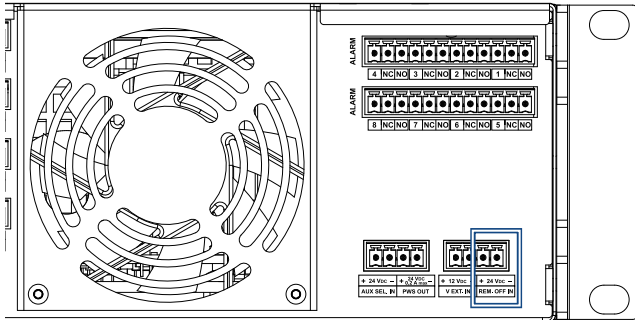


FIGURE 20: Remote on/off switch connector.

Thanks to the remote soft start up, multiple amplifiers on a system can be switched on at the same time, i.e. there is no need for a sequential switching system.

8 Protection

In order to protect your device and your speakers from accidental damage, the Ottocanali amplifier includes an extensive automatic protection system. In the following sections, potentially dangerous scenarios and the amplifier's corresponding protective response are explained in detail.

8.1 Turn on/Turn off muting

Class D amplifier may cause severe speaker damage at power up due to the high voltage levels at the output stage. In order to avoid this, the outputs are muted for less than 2 seconds after turn on. Similarly, turning off the amplifier can cause the same problem: outputs are muted immediately at turn off.

8.2 Short circuit protection

Short circuits or very low impedance loads may destroy the output stage of any amplifier. In order to protect the amplifier from the dangerously high current surges arising from accidental output short circuits or low impedance loads, the Ottocanali blocks channel activity when the current drawn from the load rises above a set value.

8.3 Thermal protection

All Powersoft amplifiers have variable speed fans to assist cooling. If for some reason the cooling system can't dissipate the produced heat correctly, a thermal protection system is automatically activated to avoid permanent damages. Every

channel pair of the Ottocanali has a temperature sensor on the output stage heat sink. Two different protection strategies are implemented depending on the severity of the overheating. In order to protect internal components, the amplifier may automatically reduce output power until the internal temperature returns to safe levels.

8.3.1 Thermal warning

If the heat sink temperature reaches 70°C the front panel yellow LEDs turn on to warn the user of a potentially dangerous thermal event.

8.3.2 Thermal shutdown

If the heat sink temperature rises above 80°C , the thermal sensing circuitry will mute each power section of each channel. All the red front panel LEDs light on to indicate thermal halt and a thermal event switch toggles all the alarm outputs at the back of the amplifier. Only after the heat sink has cooled down to below 70°C the channels will automatically unmute, the LEDs turn off and the rear switch toggles again.

8.4 DC fault protection

In order to protect your speakers from mechanical damage caused by a DC signal coming from the amplifier's output, a DC detection circuit is placed between the Ottocanali's output stage and power supply. If a DC signal or excessive subsonic energy appears at a channel output an instantaneous protection circuit will mute the compromised channel pair.

8.5 Input/Output protection

Interference protection is implemented in the Ottocanali to limit out of band noise carried by the input lines. Disturbing frequencies can interact with the output stage, causing unpredictable amplifier behavior. A filtering system is used to stop infrasonic and VHF signals from entering the signal path.

9 User Maintenance

9.1 Cleaning

Before attempting to clean any part of the amplifier, first disconnect the AC main source. Use a soft cloth and mild non-abrasive solution to clean the faceplate and chassis.

WARNING!

Never let any liquid reach the internal parts of the amplifier.

9.2 Service

There are no user-serviceable parts in your amplifier. Refer servicing to qualified technical personnel.

In addition to having an in-house service department, Powersoft supports a network of authorized service centers. If your amplifier

needs repair contact your Powersoft dealer (or distributor). You can also contact the Powersoft Technical Service department to obtain the location of the nearest authorized service center.

9.3 Dust Removal

In dusty environments, the front side air filters clog with dust after prolonged use. The dust gathered in the filters will interfere with cooling. You may use compressed air to remove the dust from filters. To remove air filters please refer to the front panel removal procedure (see Section 7.1). Air filter cleaning should be scheduled according to the dust levels in the amplifier's operating environment.

10 Warranty

10.1 Product warranty

Powersoft guarantees its manufactured products to be free from defective components and factory workmanship for a period of 48 (forty eight) months, starting from the date of purchase printed on Powersoft's (or any of its Authorized Dealer's) invoice to the end customer. All warranty repairs and retrofits must be performed at Powersoft facilities or at an Authorized Service Center at no cost for the purchaser. Warranty exclusion: Powersoft's warranty does not cover product malfunctioning or failure caused by: misuse, abuse, repair work or alterations performed by non-authorized personnel, incorrect connections, exposure to harsh weather conditions, mechanical damages (including shipping accidents), and normal wear and tear. Powersoft will perform warranty services provided that the product is not damaged during transportation.

10.2 Return of Goods

Goods can be returned to Powersoft only after they have been granted a Return Merchandise Authorization (RMA) number to be attached to the external packaging. Powersoft (or its Authorized Service Center) has the right to refuse any returned good without a RMA number.

10.3 Repair or replacement

Powersoft reserves the right to repair or replace any defective goods covered by product warranty at its sole discretion and as it deems best.

10.3.1 Cost and responsibility of transport

The purchaser (or end user/customer) is solely responsible for all transportation costs and risks associated with sending warranty covered goods to Powersoft or its Authorized Service Center. Powersoft will assume full responsibility and cover all costs incurred to send the goods back to the purchaser (or end user/customer).

10.4 Assistance

Even though most product malfunctioning can be solved at your premises through Powersoft Customer Care or your direct knowledge, occasionally, due the nature of the failure, it might be necessary to return defective products to Powersoft for repair. In the latter case, before shipping, you are kindly asked to follow step by step the procedure described below: Obtain the "Defect Report Form" by contacting our Customer Care Department via email: service@Powersoft.it or download the "Defect Report Form".

Fill out one "Defect Report form" for each returned item (the form is an editable tab guided document) and save as your name, amp model and serial Number (for example: `distributorenamek10sn17345.doc`) providing all required information except the RMA code/s and send it to service@powersoft.it for Powersoft approval.

In case of defect reports approved by the Powersoft Customer Service Representative you will receive an RMA authorization code (one RMA code for each returning device). Upon receiving the RMA code you must package the unit and attach the RMA code outside the pack, protected in a waterproof transparent envelope so it is clearly visible.

All returning items must be shipped to the following address:

Powersoft
Via Enrico Conti, 13-15
50018 Scandicci (FI) Italy

In case of shipment from countries NOT belonging to the European Community make sure you have also followed the instructions described in the document available for download at the TEMPORARY EXPORTATION / IMPORTATION PROCEDURE link at <http://www.Powersoft-audio.com/en/support/service.html>

Thank you for your understanding and cooperation and continued support as we work to improve our partnership.

II Specifications

Ottocanalì 4K4 specifications

General									
	Number of channels		8 mono, bridgable per channel pair						
	Max output power per channel*		single channel mode				bridge mode		
			2 Ω / Ch	4 Ω / Ch	8 Ω / Ch	70 V	100 V	4-8Ω / Ch pair	16Ω / Ch pair
			450 W	500 W	250 W	500 W	500 W	900-1000 W	500 W
	Max output voltage		65 V _{peak}		100 V _{peak}		141 V _{peak}		135 V _{peak}
Max output current		15 A _{peak}			10 A _{peak}	7 A _{peak}	15 A _{peak}		
AC Mains Power									
Power supply		Two redundant, universal, regulated switch mode with PFC (Power Factor Correction)							
Nominal power requirements		AC 100 V - 240 V, 50/60 Hz with PFC							
Operating range		AC 90 V - 264 V							
Consumption / current draw		> 0.90 @ 4 Ω full power							
		230 V			115 V				
Idle		35 W		0.8 A		30 W		0.6 A	
1/8 of max power @ 4 Ω		750 W		3.9 A		740 W		6.6 A	
1/4 of max power @ 4 Ω		1405 W		6.9 A		1400 W		12.4 A	
Thermal									
Environmental operating temperature		0° - 45° C / 32° - 113° F							
Thermal dissipation		Fan, variable speed, temperature controlled front to rear airflow							
		230 V			115 V				
Idle		118 BTU/h		30 kcal/h		103 BTU/h		26 kcal/h	
1/8 of max power @ 4 Ω		839 BTU/h		211 kcal/h		801 BTU/h		202 kcal/h	
1/4 of max power @ 4 Ω		1340 BTU/h		338 kcal/h		1340 BTU/h		338 kcal/h	
Audio									
Gain (dB/voltage)		32 dB / x40 V							
Frequency response		20 Hz - 20 kHz ±0.5 dB @ 1 W, 4 Ω							
S/N ratio (amplifier section)		> 107 dB (20 Hz - 20 kHz, A weighted)							
Noise floor		-70 dB (20 Hz - 20 kHz, A weighted)							
Crosstalk separation		> 65 dB @ 1 kHz, 4 Ω							
Input sensitivity @ 8 Ω		1.94 V _{rms} / +8 dBu							
Max input level		6 V _{rms} / +17.8 dBu							
Input impedance		10 kΩ balanced							
THD+N / DIM100 IMD		< 0.08% (typically <0.05%) @ 4 Ω							
Slew rate		50 V/μs @ 8 Ω input filter bypassed							
Damping factor		> 10000 @ 100 Hz							
Front panel									
Indicators		7 multifunction LEDs per channel: 4 x green, 2 x yellow, 1 x red							
Controls		Pushbutton enables 24 V DC at back PWS OUT connector (can also toggle LINE/AUX inputs). 8 output attenuators, energy save mode activation (per channel pair) DIP switch							
Maintenance		Dust filter foam behind frontal silver colored panels							
Rear panel									
Controls		4 DIP switches for each channel (allows selection of 70 V/100 V modes, hi-Z/lo-Z modes, 35 Hz/70 Hz LPF, HPF on/off)							
Input / Output connectors		4x 12 pin Phoenix MC 1.5/12-ST-3.81 1803675 / 2x 8 pin Phoenix DFK-PC 4/8-ST-7.62 1804962							
Fault alarm connections		2 x 12 pin Phoenix MC 1.5/12-ST-3.81 1803675							
Aux command (triggering aux inputs)		4 pin Phoenix MC 1.5/4-ST-3.81 1803594							
Aux voltage for remote no/off switching									
Aux front switch enabling		4 pin Phoenix MC 1.5/4-ST-3.81 1803594							
External 24V _{DC} auxiliary supply									
AC mains		IEC C19/22.2 20 A – AC mains cord with 20 A 3-pin plug 20 A for US, IEC Schuko 16 A for every other nation							
Construction									
Dimensions		L x W x H: 483 mm x 89 mm x 360 mm / 19" x 3.5" x 14.2"							
Weight		14 kg (30.8 lb)							

* EIAJ Test Standard, 1 kHz, 1% THD, all channels driven.

Ottocanalì 8K4 specifications

General							
Number of channels	8 mono, bridgable per channel pair						
Max output power per channel ¹	single channel mode					bridge mode	
	2 Ω / Ch	4 Ω / Ch	8 Ω / Ch	70 V	100 V	4-8Ω / Ch pair	16Ω / Ch pair
	850 W	1000 W	600 W	1000 W	1000 W	1700-2000 W	1200 W
Max output voltage	90 V _{peak}		100 V _{peak}		141 V _{peak}	180 V _{peak}	
Max output current	23 A _{peak}			20 A _{peak}	14 A _{peak}	23 A _{peak}	
AC Mains Power							
Power supply	Two redundant, universal, regulated switch mode with PFC (Power Factor Correction)						
Nominal power requirements	AC 100 V - 240 V, 50/60 Hz with PFC						
Operating range	AC 90 V - 264 V						
Consumption / current draw	> 0.90 @ 4 Ω full power						
	230 V			115 V			
Idle	35 W		0.8 A		30 W		0.6 A
1/8 of max power @ 4 Ω	1425 W		6.6 A		1425 W		12.6 A
1/4 of max power @ 4 Ω	2760 W		12.3 A		2800 W		24.5 A
Thermal							
Environmental operating temperature	0° - 45° C / 32° - 113° F						
Thermal dissipation	Fan, variable speed, temperature controlled front to rear airflow						
	230 V			115 V			
Idle	118 BTU/h		30 kcal/h		103 BTU/h		26 kcal/h
1/8 of max power @ 4 Ω	1504 BTU/h		379 kcal/h		1480 BTU/h		373 kcal/h
1/4 of max power @ 4 Ω	2722 BTU/h		686 kcal/h		2792 BTU/h		704 kcal/h
Audio							
Gain (dB/voltage)	32 dB / x40 V						
Frequency response	20 Hz - 20 kHz ±0.5 dB @ 1 W, 4 Ω						
S/N ratio (amplifier section)	> 107 dB (20 Hz - 20 kHz, A weighted)						
Noise floor	-70 dB (20 Hz - 20 kHz, A weighted)						
Crosstalk separation	> 65 dB @ 1 kHz, 4 Ω						
Input sensitivity @ 8 Ω	1.94 V _{rms} / +8 dBu						
Max input level	6 V _{rms} / +17.8 dBu						
Input impedance	10 kΩ balanced						
THD+N / DIM100 IMD	< 0.08% (typically <0.05%) @ 4 Ω						
Slew rate	50 V/μs @ 8 Ω input filter bypassed						
Damping factor	> 10000 @ 100 Hz						
Front panel							
Indicators	7 multifunction LEDs per channel: 4 x green, 2 x yellow, 1 x red						
Controls	Pushbutton enables 24 V DC at back PWS OUT connector (can also toggle LINE/AUX inputs). 8 output attenuators, energy save mode activation (per channel pair) DIP switch						
Maintenance	Dust filter foam behind frontal silver colored panels						
Rear panel							
Controls	4 DIP switches for each channel (allows selction of 70 V/100 V modes, hi-Z/lo-Z modes, 35 Hz/70 Hz LPF, HPF on/off)						
Input / Output connectors	4x 12 pin Phoenix MC 1.5/12-ST-3.81 1803675 / 2x 8 pin Phoenix DFK-PC 4/8-ST-7.62 1804962						
Fault alarm connections	2 x 12 pin Phoenix MC 1.5/12-ST-3.81 1803675						
Aux command (triggering aux inputs)	4 pin Phoenix MC 1.5/4-ST-3.81 1803594						
Aux voltage for remote no/off switching							
Aux front switch enabling	4 pin Phoenix MC 1.5/4-ST-3.81 1803594						
External 24V _{DC} auxiliary supply							
AC mains	IEC C19/22.2 20 A – AC mains cord with 20 A 3-pin plug 20 A for US, IEC Schuko 16 A for every other nation						
Construction							
Dimensions	L x W x H: 483 mm x 89 mm x 360 mm / 19" x 3.5" x 14.2"						
Weight	14 kg (30.8 lb)						

* EIAJ Test Standard, 1 kHz, 1% THD, all channels driven.

Ottocanali I2K4 specifications

General								
	Number of channels		8 mono, bridgable per channel pair					
	Max output power per channel*	single channel mode				bridge mode		
		2 Ω / Ch	4 Ω / Ch	8 Ω / Ch	70 V	100 V	4-8Ω / Ch pair	16Ω / Ch pair
		1000 W	1500 W	850 W	1500 W	1500 W	2200-3000 W	1600 W
	Max output voltage	150 V _{peak}		100 V _{peak}		141 V _{peak}	300 V _{peak}	
	Max output current	54 A _{peak}		30 A _{peak}		21 A _{peak}	54 A _{peak}	
AC Mains Power								
	Power supply							Two redundant, universal, regulated switch mode with PFC (Power Factor Correction)
	Nominal power requirements	AC 100 V - 240 V, 50/60 Hz with PFC						
	Operating range	AC 90 V - 264 V						
	Consumption / current draw	> 0.90 @ 4 Ω full power						
		230 V			115 V			
	Idle	35 W		0.8 A		30 W		0.6 A
	1/8 of max power @ 4 Ω	2115 W		9.7 A		2075 W		18.5 A
	1/4 of max power @ 4 Ω	4230 W		18.6 A		4150 W		36 A
	Thermal							
	Environmental operating temperature							0° - 45° C / 32° - 113° F
	Thermal dissipation	Fan, variable speed, temperature controlled front to rear airflow						
		230 V			115 V			
	Idle	118 BTU/h		30 kcal/h		103 BTU/h		26 kcal/h
	1/8 of max power @ 4 Ω	1937 BTU/h		488 kcal/h		2141 BTU/h		540 kcal/h
	1/4 of max power @ 4 Ω	3874 BTU/h		977 kcal/h		4283 BTU/h		1080 kcal/h
Audio								
	Gain (dB/voltage)							32 dB / x40 V
	Frequency response	20 Hz - 20 kHz ±0.5 dB @ 1 W, 4 Ω						
	S/N ratio (amplifier section)	> 109 dB (20 Hz - 20 kHz, A weighted)						
	Noise floor	-70 dB (20 Hz - 20 kHz, A weighted)						
	Crosstalk separation	>65 dB @ 1 kHz, 4 Ω						
	Input sensitivity @ 8 Ω	1.94 V _{rms} / +8 dBu						
	Max input level	6 V _{rms} / +17.8 dBu						
	Input impedance	10 kΩ balanced						
	THD+N / DIM100 IMD	< 0.08% (typically <0.05%) @ 4 Ω						
	Slew rate	50 V/μs @ 8 Ω input filter bypassed						
	Damping factor	> 10000 @ 100 Hz						
	Front panel							
		Indicators						
Controls		Pushbutton enables 24 V DC at back PWS OUT connector (can also toggle LINE/AUX inputs). 8 output attenuators, energy save mode activation (per channel pair) DIP switch						
Maintenance		Dust filter foam behind frontal silver colored panels						
Rear panel								
	Controls							4 DIP switches for each channel (allows selction of 70 V/100 V modes, hi-Z/lo-Z modes, 35 Hz/70 Hz LPF, HPF on/off)
	Input / Output connectors	4x 12 pin Phoenix MC 1.5/12-ST-3.81 1803675 / 2x 8 pin Phoenix DFK-PC 4/8-ST-7.62 1804962						
	Fault alarm connections	2 x 12 pin Phoenix MC 1.5/12-ST-3.81 1803675						
	Aux command (triggering aux inputs)	4 pin Phoenix MC 1.5/4-ST-3.81 1803594						
	Aux voltage for remote no/off switching							
	Aux front switch enabling	4 pin Phoenix MC 1.5/4-ST-3.81 1803594						
	External 24V _{DC} auxiliary supply							
AC mains	IEC C19/22.2 20 A – AC mains cord with 20 A 3-pin plug 20 A for US, IEC Schuko 16 A for every other nation							
Construction								
	Dimensions							L x W x H: 483 mm x 89 mm x 360 mm / 19" x 3.5" x 14.2"
	Weight	14 kg (30.8 lb)						

* EIAJ Test Standard, 1 kHz, 1% THD, all channels driven.



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