



LAB.GRUPPEN

2009 LINE UP

LAB.GRUPPEN

30 YEARS IN POWER



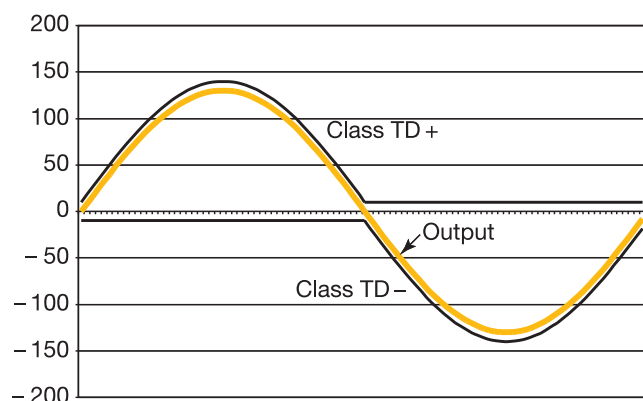
Creativity and innovation, with Swedish craftsmanship

Over the past thirty years, Lab.gruppen power amplifiers – and, more recently, PLM™ Series Powered Loudspeaker Management™ systems – have earned worldwide recognition for outstanding sound quality and remarkable durability in both touring and installed applications. This reputation is based in large part on a centuries-old tradition of meticulous Swedish craftsmanship. Lab.gruppen maintains a strict “no shortcuts” philosophy throughout design, engineering and assembly, with careful attention to every detail. All components are the highest quality available, from connectors and switches to capacitors and output devices. Every amplifier chassis is built to withstand non-stop touring under stressful conditions. And scrupulous QC procedures prior to shipping prevent any unwelcome “out of the box” surprises.

Rigorous engineering works hand-in-hand with creative thinking at Lab.gruppen. Beginning with the company founders, and continuing with today’s extensive R&D department, Lab.gruppen has pioneered a number of technology breakthroughs, including:

Class TD® output stage

A patented breakthrough concept that occupied co-founder Kenneth Andersson for two years, Class TD combines the efficiency of digital Class D topologies with the sonic purity of Class B designs. The audio path remains in the analog domain: it never enters the switching portion of the circuit, and is therefore free from filtering ripple effects. Class TD is bridgeable and maintains a flat response with complex loads as low as 2 ohms nominal.



Regulated Switch Mode Power Supply (R.SMPS™)

The latest generation of R.SMPS technology boosts power output while reducing size and weight. Precise regulation maintains constant voltage on the internal rails, ensuring full output power and undistorted sound even with significant drops in mains voltage.

Adjustable gain + VPL™: Configurable for any signal, any load

All Lab.gruppen power platforms offer adjustable gain to optimize performance with any input signal. In addition, each channel incorporates a Voltage Peak Limiter (VPL) circuit to optimize output characteristics for any type of load (In the PLM Series, these features are digitally implemented and VPL is designated ISVPL™).

Intercooler® for efficient, uniform cooling

The ultra-efficient Intercooler uses thousands of tiny copper cooling fins to increase heat sink exposure to the cooling air flow from twin variable-speed fans. Output devices are mounted transverse to the airflow for uniform cooling: there are no “end of tunnel” transistors subject to greater heating and therefore premature failure.

Comprehensive circuit protection

Lab.gruppen amplifiers incorporate comprehensive protection circuits, including DC at output, short circuit, excessive output current, sustained very high frequency (VHF), and open load. Additionally, a Power Average Limiter (PAL) monitors the current-drawing relationship between the power supply and the mains inlet, limiting current draw as necessary to prevent service interruption.

Planet protection also standard

Lab.gruppen is a leader in building extraordinarily energy-efficient products, and also in manufacturing them with minimal environmental impact. One example: Phantom powering over the NomadLink® network means zero current draw by amplifiers on standby. And in manufacturing, Lab.gruppen’s plant in Sweden is a model for energy efficiency and near 100% waste recycling.

Introducing the PLM 14000

Another way to say 1+1=3





Lab.gruppen's PLM Series of Powered Loudspeaker Management systems present a seamless fusion of cutting-edge technologies from two innovators in live audio: Lake® and Lab.gruppen. Each PLM product combines groundbreaking Lake Processing – the world standard for flexibility and sound quality – with an amplifier platform based on the power density, sonic purity and proven reliability of Lab.gruppen's FP+ Series.

Intelligently merged, these complementary technologies comprise a complete loudspeaker drive system integrating crossover, delay, equalization, limiting, audio networking, and power amplification. In addition, the PLM Series' revolutionary load verification and performance monitoring features assure extended reliability for all system components – loudspeakers included!

PLM Series technology is available in two- and four-channel versions. Optimized for high-power requirements, the two-channel PLM 14000 delivers a massive 7000 W per channel into 2 ohms and 4350 W per channel into 4 ohms, making it ideal for demanding subwoofer and low-end applications. The four-channel PLM 10000Q, a perfect match for line arrays and stage monitors, delivers 2350 W per channel. Both versions also incorporate Dante™ networked audio distribution, and everything is fitted into a single 2 U chassis plus unified software controller.

PLM Series – it's your one box solution for a multitude of challenging audio applications.



PLM SERIES AT A GLANCE					
MAXIMUM OUTPUT POWER/CHANNEL					
Model	Chan.	2 ohms	4 ohms	8 ohms	16 ohms
PLM 10000Q	4	2350 W	2400 W	1300 W	660 W
PLM 14000	2	7000 W	4300 W	2300 W	1150 W



Lab.gruppen power. Lake Processing.

LoadSmart™ takes a load off your mind

Yes, Powered Loudspeaker Management inserts a full-featured Lake processor inside a Lab.gruppen amplifier chassis. But that's only the beginning. The PLM Series also introduces a revolutionary set of tools for fast, accurate load verification and real-time performance monitoring. The key to this breakthrough is LoadLibrary™, a comprehensive database that provides a unique "Fingerprint" (load characteristic) for each loudspeaker model in the system. Using this data and on-board DSP, LoadSmart compares predicted response by applying a brief test signal. Any potential problems are identified instantly. During performance, SpeakerSafe™ monitors driver performance to prevent sonic degradation and provide critical, real-time information about system-wide driver performance.

Dante advanced audio networking

With the PLM Series, there's no need to install separate modules or configure custom software for integrated digital audio networking. Every PLM

comes equipped with Dante, a self-configuring digital audio networking solution from Audinate® of Australia. Based on the newest developments in networking technology, Dante provides extremely reliable, sample accurate, low latency audio distribution over Ethernet. And with Zen™, Audinate's automatic device discovery and system configuration protocol, PLM Series products (as well as discrete Dolby® Lake Processors and other Dante-enabled devices) find each other on the network and configure themselves automatically.

Lake Processing: full-featured and backward compatible

All PLM Series models contain two full-featured Lake Processing modules, each offering precise settings for gain, delay, crossover slope, equalization, and limiting. Exclusive Lake Processing algorithms are included for Raised Cosine Equalization™, linear phase crossovers, LimiterMax™ loudspeaker protection, and Iso-Float™ ground isolation.



Dante networking. And much more.

Regardless of the make or type of loudspeaker system, the venue size or acoustics, or the program material, the integral Lake Processing in the PLM Series will help you create a more consistent sound with less time and hassle in system setup. Lake Controller software provides a unified interface for control and monitoring of PLM functions. In addition to controlling all parameters of Lake Processing, the software also provides control and monitoring of exclusive Lab.gruppen features: digital input gain and attenuation, and comprehensive load verification and monitoring via LoadSmart and SpeakerSafe.

The Lake Controller software is optimized for a Tablet PC, and operates on any newer Windows®

PC equipped with an Ethernet interface. The same Lake Controller software interface also can be used for simultaneous operation of external Dolby Lake Processors, Lake Contour™ and Lake Mesa Quad EQ™ processors.

The Lake Analyser Bridge also allows seamless integration with third-party, real-time sound system measurement tools, enabling you to perform comprehensive measurement routines and adjust your system EQ at the same time, using the same user interface. This measurement plug-in feature is currently implemented for Smaart as well as Live-Capture Light and Pro.



The PLM Series provides a full range of connectivity for Dante network, AES digital, and analog signals.

FP+ Series: Kings of the road.

More power, more choices.

More power from smaller and lighter racks, with more configuration flexibility, and yet with no compromise in the legendary Lab.gruppen sound – that's the promise fulfilled by FP+ Series amplifiers.

The expanded FP+ Series includes seven models, with both two- and four-channel versions spread across a range of power output levels. The flagship FP 14000 produces staggering output power of 14000 W (from a 2 U chassis weighing only 12 kg), making it ideal for powering larger subwoofers. Other FP+ Series models offer power levels and channel configurations scaled to match every conceivable touring application, from band-limited line array drivers to full-range monitor and fill loudspeakers.

To achieve the extraordinary power-to-size ratio in the FP+ Series, Lab.gruppen engineers refined

and upgraded two proprietary technologies: The Regulated Switch Mode Power Supply (R.SMPS) and the patented Class TD output stage. Working together, these new-generation proprietary circuits produce more power from a smaller package while maintaining Lab.gruppen's peerless reputation for sonic excellence. The highs stay crisp and transparent. The mids are warm and natural. And the tight lowend delivers visceral impact.

Information, control, reassurance.

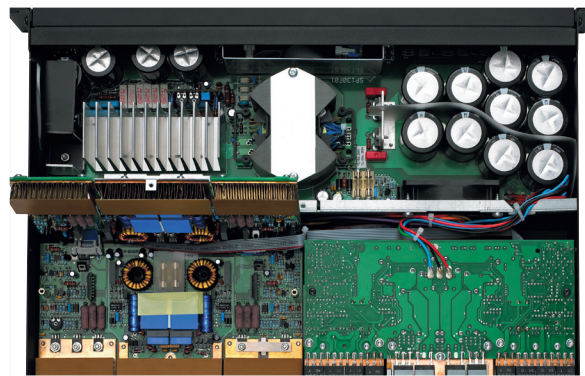
All FP+ Series amplifiers offer real-time monitoring and control via the NomadLink network, with network modules built in as standard equipment. Finally, standing behind Lab.gruppen's reputation for rock-solid reliability is a six-year, no-quibble warranty.



FP+ SERIES AT A GLANCE

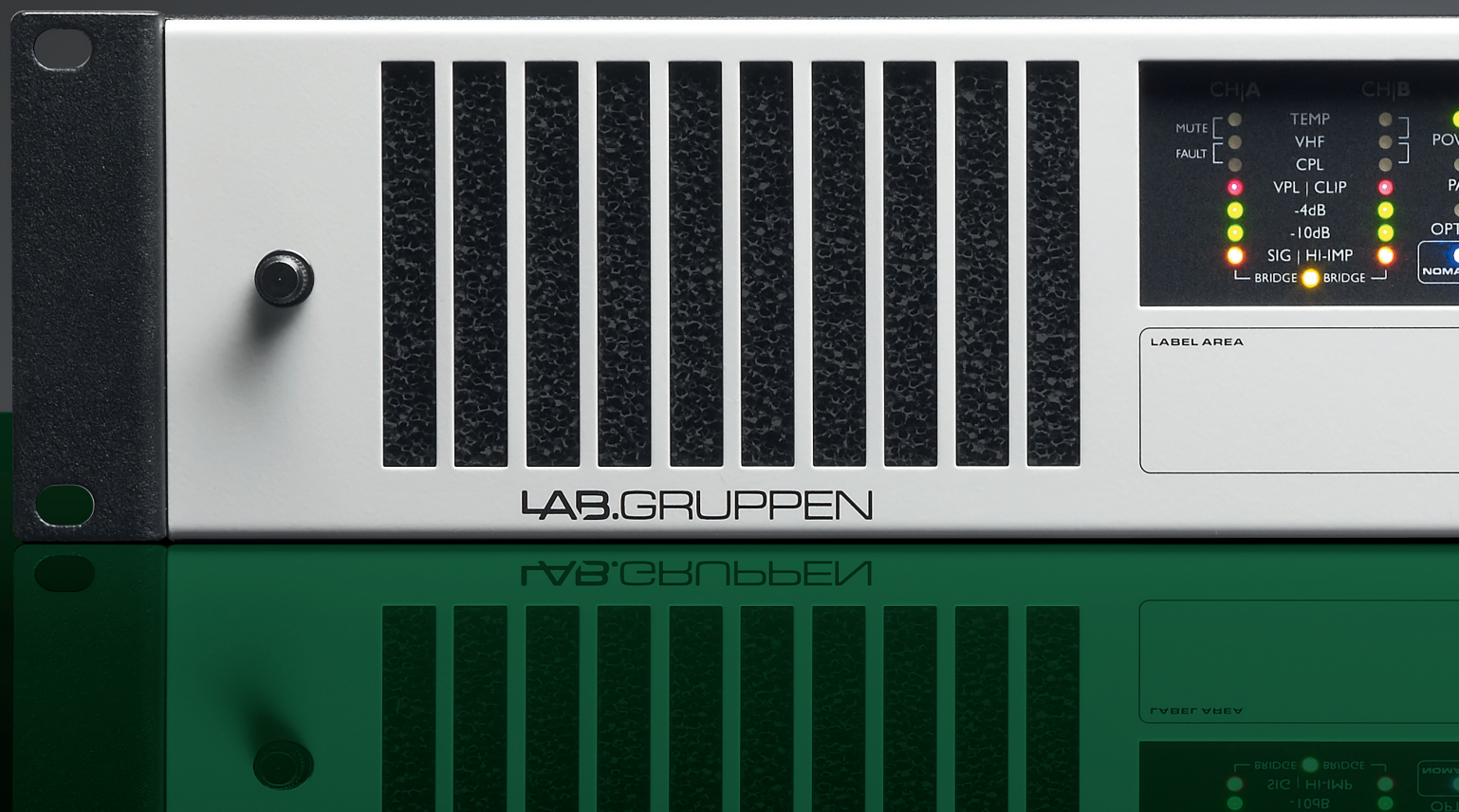
MAXIMUM OUTPUT POWER/CHANNEL

Model	Chan.	2 ohms	4 ohms	8 ohms	16 ohms
FP 14000	2	7000 W	4400 W	2350 W	1200 W
FP 13000	2	6500 W	4400 W	2350 W	1200 W
FP 9000	2	4500 W	3000 W	1600 W	800 W
FP 7000	2	3500 W	2800 W	1450 W	730 W
FP 4000	2	2000 W	1600 W	800 W	400 W
FP 10000Q	4	2500 W	2100 W	1300 W	660 W
FP 6000Q	4	1500 W	1250 W	625 W	320 W



Built to the highest standards of meticulous Swedish craftsmanship.





C Series: Investing in your reputation needn't cost the Earth.

The C Series builds on Lab.gruppen's unsurpassed experience in building the world's finest amplifiers for touring applications. The underlying core technologies are the same in these dedicated installation amplifiers, assuring impeccable performance and rock-solid reliability – even when pushed hard in grueling “24/7” applications.

Go configure...easily.

The C Series also sets new industry benchmarks for power density and configuration flexibility. All nine models are multi-channel, with four or eight channels available as discrete outputs or as bridged pairs. In addition, all channels offer individual adjustments for gain and maximum voltage, and all outputs are separately configurable for either low-Z or high-Z (70 V/100 V) systems.

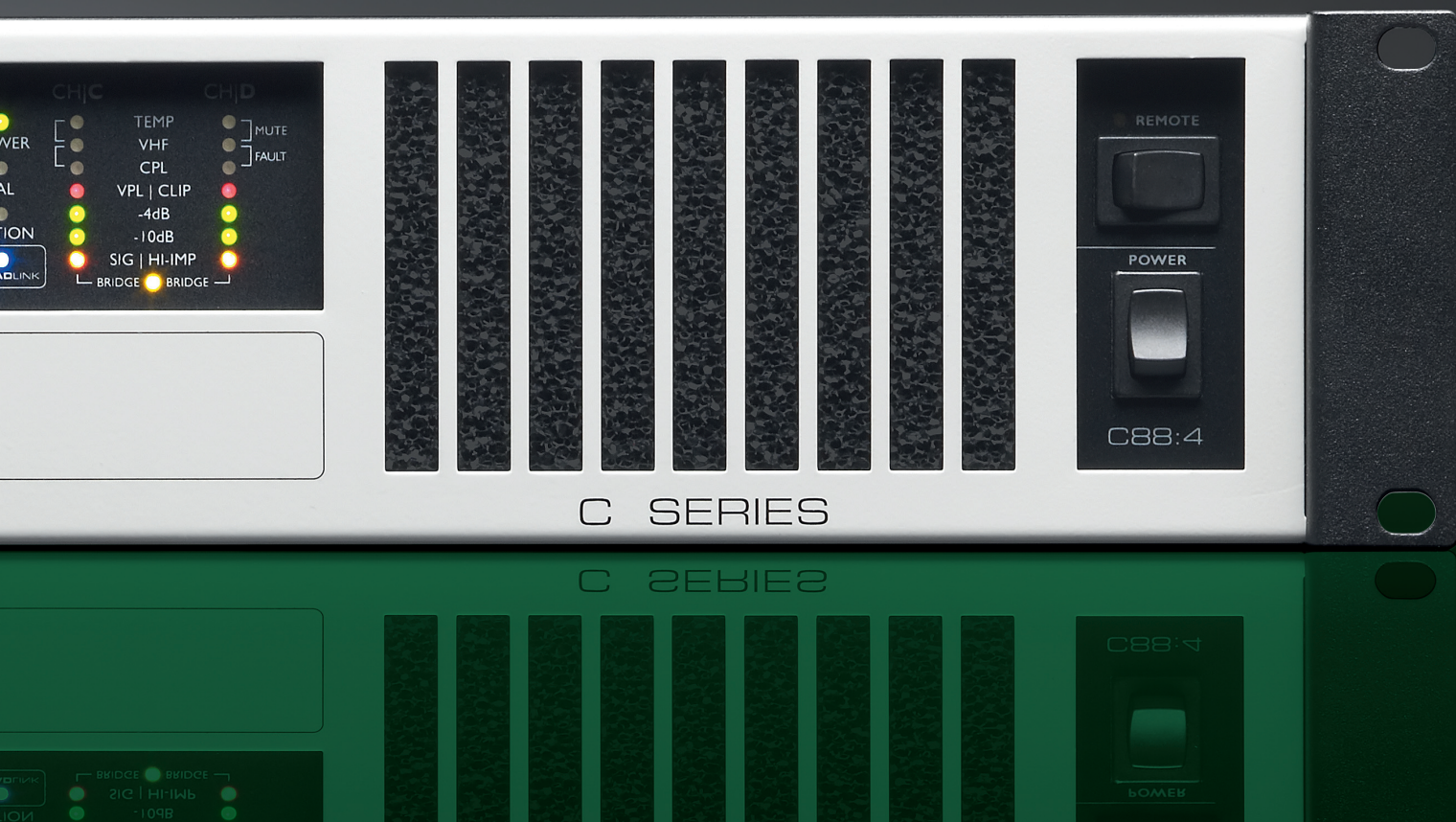
To ensure long-term durability, each C Series amplifier incorporates a suite of seven protection and warning circuits. Exclusive Intercooler heat dissipation technology helps safeguard output

devices. Also, advanced NomadLink networking, with remote monitoring and control facilities, comes as standard. And every amplifier is backed by world-wide technical support as well as Lab.gruppen's no-hassle six-year warranty.

The four C...X models comprise a sub-group of amplifiers ideally suited to a wide range of lower-powered commercial sound applications. Additional standard features include a universal power supply, built-in GPIO facilities, and individually selectable high-pass filters on each channel.

Looks silver, acts green

C Series amplifiers come from Sweden, a country with exceptionally stringent standards for environmentally friendly manufacturing. Also, watt-in for watt-out, Lab.gruppen amplifiers are among the world's most efficient. So your C Series amplifier goes greener into the box, and works greener in the rack.



C SERIES AT A GLANCE

MAXIMUM OUTPUT POWER/CHANNEL

Model	Chan.	4 ohms	8 ohms	16 ohms	70 Vrms / 100 V peak
C 88:4	4	2100 W	1250 W	650 W	2200 W
C 68:4	4	1700 W	1200 W	650 W	1600 W
C 48:4	4	1200 W	1000 W	625 W	900 W
C 28:4	4	700 W	700 W	600 W	700 W
C 16:4	4	300 W	400 W	400 W	400 W
C 20:8X	8	250 W	250 W	250 W	250 W
C 10:8X	8	125 W	125 W	125 W	125 W
C 10:4X	4	250 W	250 W	250 W	250 W
C 5:4X	4	125 W	125 W	125 W	125 W





NomadLink: Know All, Control All

Lab.gruppen's NomadLink Network offers a bulletproof system for comprehensive monitoring and control of many as 960 FP+ Series or C Series amplifiers with a total of 3840 output channels.

To create a NomadLink network, you simply daisy-chain the In and Out network ports of your amplifiers by snapping in standard Cat-5 cables. Then connect the first and last amplifiers to an NLB 60E NomadLink Bridge & Network Controller, forming a loop. That's it. You're done.

Failure: not an option

In this closed loop topology, NomadLink forms a robust and fully redundant network that is essentially fail-safe. Phantom powering through the loop makes it possible to maintain uninterrupted network communication even when an amplifier in the system is powered off or has AC current disconnected.

The NLB 60E functions as a stand-alone unit when needed to provide basic monitoring and control. Large front-panel keys and displays let you power-up and power-down all networked ampli-

fiers, and also provide "in-the-rack" notification of warnings or faults.

However, most users will also use the NLB 60E as an Ethernet-to-NomadLink bridge to remotely access the enhanced feature set of DeviceControl software. DeviceControl is a powerful tool for real-time monitoring and control as well as offline system configuration. The flexible GUI allows multi-level monitoring of amplifier status, from at-a-glance fault monitoring of an entire complex to detailed status reports on a single channel. Amplifier channels may be freely configured in groups for simultaneous on/off, mute or solo commands.

Welcome to the third-parties

The latest upgrades to DeviceControl software, working with new firmware for the NLB 60E, have further enhanced the network's capabilities. Not only is channel-level control and monitoring available via the DeviceControl interface, but detailed fault, warning and subnet status may now be reported to popular third-party control and monitoring applications.

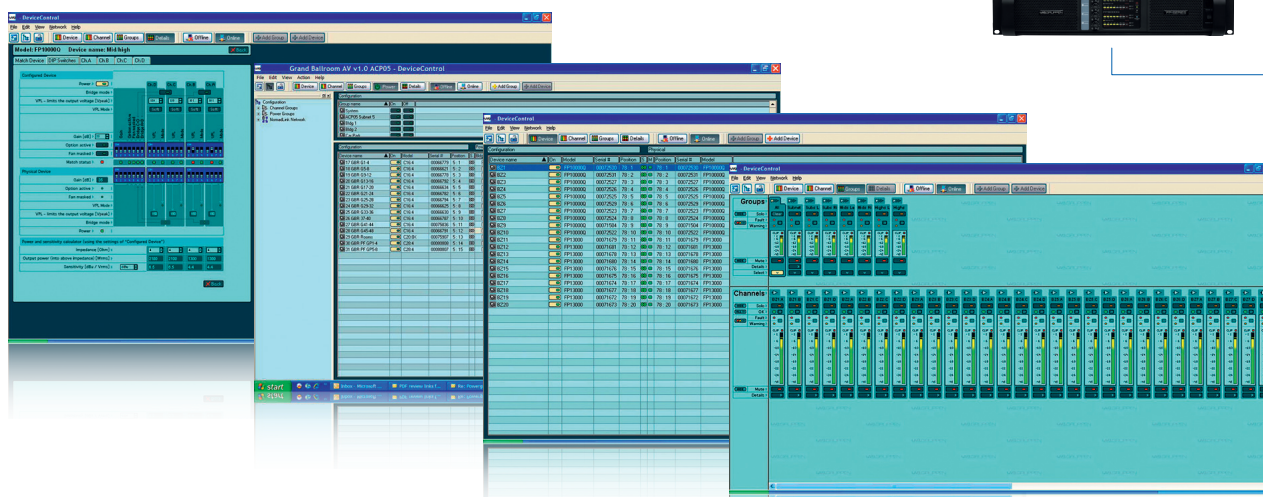
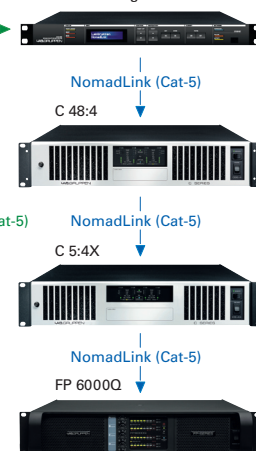


NomadLink[®]
network

PC running DeviceControl software



NLB 60E
NomadLink Bridge & Network Controller





The LCPO Program: More value, one more time.

The quality and durability of Lab.gruppen amplifiers has created a healthy market for pre-owned models worldwide. Now that remarkably high resale value has been further enhanced by the innovative Lab.gruppen Certified Pre-Owned (LCPO) program.

The program works much like those offered by major automakers, although in this case you can choose fully warranted Lab.gruppen amplifiers from a worldwide inventory. Also, we feel there is no need for a "100-point checklist" to assess the product's condition. So confident are we in our amplifiers' long service life and lasting value that we will warrant them for three full years – from the date of sale – with no physical examination!

Certified Pre-Owned amplifiers are listed by current owners in the LCPO database at www.labgruppen.com, where you can quickly register to view and potentially purchase these products. All amplifiers are condition-rated by the seller and

age-identified so you can assess their value. And, if a desired amp package is not immediately available, you can keep up to date on new inventory additions through an RSS feed.

The Certified Pre-Owned warranty covers all parts AND labor required to repair an amplifier in the unlikely event that a manufacturing fault should occur. Lab.gruppen, in cooperation with its distributors will, where possible, additionally offer loan amplifiers while any problem is rectified.

Program benefits:

- ▶ New 3-year, transferable warranty
- ▶ Extremely attractive pricing
- ▶ Access to global inventory of pre-owned Lab.gruppen products
- ▶ Lab.gruppen factory backed
- ▶ Worldwide service support
- ▶ Simple registration and purchasing process

Lab.gruppen. A history.

The Lab.gruppen story begins in 1979, when, co-founders Kenneth Andersson and Dan Bavholm established the company while working out of a cramped electronics repair shop in the Swedish town of Kungsbacka. With a knack for creative circuit design and a passion for better sound, they set about developing technologies – beginning with guitar amplifiers – that soon evolved into the company's first commercial power amplifiers. Over the years, new power supply and output stage technologies further boosted performance, while a zealous dedication to build quality established Lab.gruppen's enviable reputation for reliability under stress.

Within a few years, Lab.gruppen had built a loyal following among Swedish sound rental companies. Distribution next expanded into the rest of Europe, and although demand often threatened to outstrip supply, quality control standards never were compromised in order to ship more product. Only after a larger, highly efficient manufacturing plant (still in Kungsbacka) came on line was product distribution expanded worldwide. Today, the company retains its spirit of innovation while maintaining uncompromising standards for quality and durability.

Headline reads: Tube and transistor amplifiers. The very best of both, together in one box!

Rör-och transistorförstärkarens
allra bästa egenskaper under ett
och samma skal!



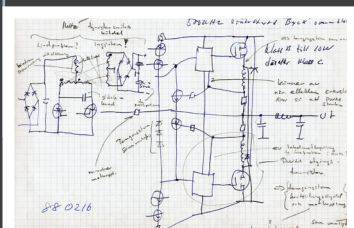
AXE-AMP
Den ultimata kombinationen

LAB.GRUPPEN

Dan Bavholm



*Kenneth Andersson's
hand-drawn Class TD
circuit diagram.*



*Before Lab.gruppen,
the two founders built
a few custom mixers.*

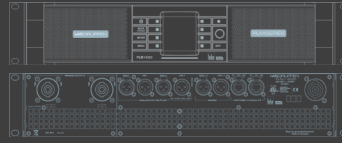


Kenneth Andersson

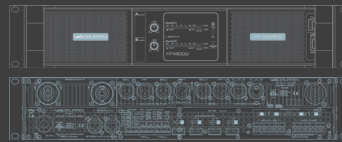


*Endorsement from
legendary guitarist
Johnny Winter.*

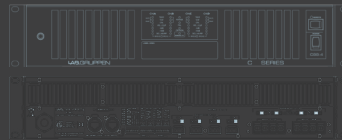
TECHNICAL SPECIFICATIONS



PLM™ SERIES
POWERED LOUDSPEAKER
MANAGEMENT™



FP+ SERIES
TOURING



C SERIES
INSTALLATION

Specifications PLM Series

Model	PLM 14000	PLM 10000Q
Number of input channels	2	2
Number of output channels	2	4
Peak total output all channels driven	14000 W	10800 W
Max. Peak output voltage per channel	193 V	153 V
Max. output current per channel	90 A peak	49 A peak
Max. Output Power		
16 ohms per ch. (all ch.'s driven)	1150 W	660 W
8 ohms per ch. (all ch.'s driven)	2300 W	1300 W
4 ohms per ch. (all ch.'s driven)	4300 W	2300 W
2 ohms per ch. (all ch.'s driven)	7000 W	2350 W
16 ohms (channels A and B, while channels C and D are driven at -3 dB ²⁾)	1150 W	660 W
8 ohms (channels A and B, while channels C and D are driven at -3 dB ²⁾)	2300 W	1300 W
4 ohms (channels A and B, while channels C and D are driven at -3 dB ²⁾)	4400 W	2400 W
2 ohms (channels A and B, while channels C and D are driven at -3 dB ²⁾)	7500 W	2350 W
All channels driven into optimal impedance interval	> 7000 W into 1.8 - 2.1 ohms	> 2700 W into 2.4 - 3.2 ohms
Audio Performance		
THD + N 20 Hz - 20 kHz for 1 W	<0.05%	
THD + N at 1 kHz and 1 dB below clipping	<0.04%	
Dynamic range with digital inputs (for all supported sample rates)	PLM 14000: >114 dB PLM 10000Q >116 dB	
Dynamic range with analog inputs	PLM 14000: >112 dB PLM 10000Q >116 dB	
Frequency response (1 W into 8 ohms, 20 Hz - 20 kHz)	+/-0.05 dB	
Input Common Mode Rejection (CMR) 20 Hz to 1 khz	> 78 dB	
Internal sample rate	96 k	
Internal data path	32 bit floating point	
Product propagation delay, best case (96 kHz AES)	1.61 ms	
Product propagation delay, analog input	1.68 ms	
Sample Rate Converters		
THD + Noise	0.00003 %, 20 Hz - 20 kHz, unweighted	
Analog to Digital inputs		
THD + Noise	0.00022 %, typical at 1 kHz unweighted at +26 dBu headroom setting	
	0.00033 %, typical at 20 Hz and 20 kHz unweighted at +26 dBu headroom setting	
AES / EBU inputs		
Supported resolutions	≤ 24 bit	
Supported sample rates	44.1, 48, 88.2, 96, 176.4, 192 kHz	
Dante™ Audio Network		
Supports redundant paths	Yes	
Flexible topology	Yes	
Network latency	0.8, 1.3 and 4 ms	
Device presets		
Local memory locations for the settings of the product	100	
Limiters		
Adjustable Inter-Sample Voltage Peak Limiter (ISVPL)	PLM 14000: 17.8 - 193 V, step size 0.1 V PLM 10000Q: 17.8 - 153 V, step size 0.1 V	
Current Peak Limiter < 300 ms	PLM 14000: 90 A peak PLM 10000Q: 49 A peak	
Current Average Limiter (CAL) > 300 ms	PLM 14000: 44 Arms PLM 10000Q: 25 Arms	
LimiterMax (rms and peak limiters)		
– MaxRMS (rms voltage limiter)	Yes	
– MaxPeak (peak voltage limiter)	Yes	
Gain		
Amplifier gain	22 - 44 dB, step size 0.1 dB	
Analog attenuator	-Inf to 0 dB, step size 0.25 dB	
Back panel interface		
AES / EBU / I/O (input + link)	2 x 3-pin XLR	
Analog, 2-channel I/O (input + link)	4 x 3-pin XLR, electronically balanced	
Output connectors	PLM 14000: Neutrik Speakon (2 x NLT4) or 4 Binding Posts (pairs) (must be specified upon order) PLM 10000Q: Neutrik Speakon (1 x NLT8, 2 x NLT4) or 4 Binding Posts (pairs) (must be specified upon order)	
Auto 10/100, Auto Uplink	2 x RJ45 EtherCon	
Control and monitoring interface	Via Ethernet for Lake® Controller software	
Detachable mains cord	Neutrik PowerCon 32 A	
Cooling	Two fans, front-to-rear airflow, temperature controlled speed	
Front-panel user interface:		
Display, daylight readable LCD	2.5 inch	
Fault/Warning/Limit/Clip indicators	RGB LEDs	
Mute and soft function buttons	8 provided	
Standby Power button	On/Off	
Mute Enable button	Enables muting of outputs and inputs via soft-button keypad	
Meter button	Toggles through meter views	
Menu button	Provides a menu driven interface for full function front panel control	
Rotary Encoder	Yes	
Exit button	Provides a “back” function	
Power		
Operating voltage, 230 V / 115 V nominal ¹⁾	140-265 V / 70-135 V (45 - 66 Hz)	
Soft start / Inrush Current Draw	Yes / max. 5 A	
Mains Power Average Limiter (PAL)	Yes	
Dimensions (W/H/D)	W: 483 mm (19”), H: 88 mm (2 U), Overall D: 470 mm (18.5”) deep including handles and rear support.	
Weight	13.5 kg (30 lbs.)	
Finish	Black painted steel chassis with black painted steel / aluminum front	
Approvals	CE, ANSI/UL 60065 (ETL), CSA C22.2 NO. 60065, FCC	

Note 1): Separate 230 V or 115 V versions available. Not selectable on the product.

Note 2): Asymmetrically loading the output channels (as shown, for example): If one channel has reduced output power requirements, the voltage drop from the power supply will be reduced, resulting in a higher voltage and power output for the other channel.

All specifications are subject to change without notice.

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Specifications FP+ Series

Model	FP 14000	FP 13000	FP 9000	FP 7000	FP 4000	FP 10000Q	FP 6000Q
Number of channels	2	2	2	2	2	4	4
Peak total output all channels driven	14000 W	13000 W	9000 W	7000 W	4000 W	10000 W	6000 W
Peak output voltage per channel	195 V	195 V	170 V	155 V	121 V	150 V	101 V
Max. output current per channel	90 A peak	82 A peak	70 A peak	59 A peak	50 A peak	50 A peak	38 A peak
Max. Output Power							
16 ohms per ch. (all ch.'s driven)	1200 W	1200 W	800 W	730 W	400 W	660 W	320 W
8 ohms per ch. (all ch.'s driven)	2350 W	2350 W	1600 W	1450 W	800 W	1300 W	625 W
4 ohms per ch. (all ch.'s driven)	4400 W	4400 W	3000 W	2800 W	1600 W	2100 W	1250 W
2 ohms per ch. (all ch.'s driven)	7000 W	6500 W	4500 W	3500 W	2000 W	2500 W	1500 W
16 ohms Bridged per ch.	4700 W	4700 W	3200 W	2900 W	1600 W	2600 W	1250 W
8 ohms Bridged per ch.	8800 W	8800 W	6000 W	5600 W	3200 W	4200 W	2500 W
4 ohms Bridged per ch.	14000 W	13000 W	9000 W	7000 W	4000 W	5000 W	3000 W
2 ohms Bridged per ch.	3)	3)	3)	3)	3)	3)	3)
Performance with Gain	35 dB and VPL: 195 V	35 dB and VPL: 195 V	35 dB and VPL: 170 V	35 dB and VPL: 155 V	35 dB and VPL: 121 V	35 dB and VPL: 150 V	35 dB and VPL: 101 V
THD 20 Hz - 20 kHz for 1 W	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%
THD at 1 kHz and 1 dB below clipping	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
Signal To Noise Ratio	>112 dBA	>112 dBA	>112 dBA	>112 dBA	>112 dBA	>112 dBA	>112 dBA
Channel separation (Crosstalk) at 1 kHz	>70 dB	>70 dB	>70 dB	>70 dB	>70 dB	>70 dB	>70 dB
Frequency response (1 W into 8 ohms) +0/-3 dB	2 Hz - 34.2 kHz	6.8 Hz - 34 kHz	2 Hz - 34.2 kHz	6.8 Hz - 34 kHz	2 Hz - 34.2 kHz	6.8 Hz - 34 kHz	6.8 Hz - 34 kHz
Input Impedance	20 kOhm	20 kOhm	20 kOhm	20 kOhm	20 kOhm	20 kOhm	20 kOhm
Input Common Mode Rejection, CMR	54 dB	54 dB	54 dB	54 dB	54 dB	54 dB	54 dB
Output impedance @ 100 Hz	19 mOhm	19 mOhm	19 mOhm	19 mOhm	32 mOhm	32 mOhm	32 mOhm
Voltage Peak Limiter (VPL™), max. peak output							
VPL, selectable per ch. (V)	195, 170, 140, 116, 100, 80, 66, 54 V	195, 170, 140, 116, 100, 80, 66, 54 V	170, 140, 116, 100, 80, 66, 54 V	155, 121, 101, 83, 70, 56, 47, 38 V	121, 101, 83, 70, 56, 47, 38 V	150, 121, 101, 83, 70, 56, 47, 38 V	101, 83, 70, 56, 47, 38 V
VPL, selectable when bridged (V) ¹⁾	390, 340, 280, 232, 200, 160, 132, 108 V	390, 340, 280, 232, 200, 160, 132, 108 V	340, 280, 232, 200, 160, 132, 108 V	310, 242, 202, 166, 140, 112, 94, 76 V	242, 202, 166, 140, 112, 94, 76 V	300, 242, 202, 166, 140, 112, 94, 76 V	202, 166, 140, 112, 94, 76 V
Voltage Peak Limiter mode (per ch.)	Hard / Soft						
Gain and Level							
Amplifier gain selectable (all channels) ¹⁾ – rear-panel switches	23, 26, 29, 32, 35, 38, 41, 44 dB						
Default gain	38 dB	35 dB	38 dB	35 dB	35 dB	35 dB	35 dB
Level adjustment (per ch.)	Front-panel potentiometer, 31 position detented from -inf to 0 dB						
Connectors and switches							
Input connectors (per ch.)	3-pin XLR, electronically balanced						
Output connectors (per ch.)	Neutrik® Speakon® or Binding Posts (must be specified upon order). BP only on FP 14000, FP 13000, FP 9000.						
Output bridge mode per two ch.'s	A+B - Ch. A is signal input source. A+B, C+D - Ch.'s A and C are input source						
NomadLink® network	2 x RJ45 EtherCon® connectors, IN and OUT						
Intelligent fans (on/off)	Yes, depending on presence of output signal						
Power on/off and Remote enable on/off	Individual switches on front-panel						
Cooling	Two fans, front-to-rear airflow, temperature controlled speed						
Front-panel indicators							
Common	NomadLink network; Power Average Limiter (PAL) ²⁾ ; Power on						
Per channel	Signal present / High-impedance; -20 dB, -15 dB, -10 dB and -4 dB output signal; Voltage Peak Limiter (VPL); Current Peak Limiter (CPL):						
	Very High Frequency (VHF); High temperature; Fault; Mute						
Power							
Operating voltage, 230 V / 115 V nominal ⁴⁾	130-265 V / 65-135 V						
Minimum power-up voltage, 230 V / 115 V	171 V / 85 V						
Power Average Limiter (PAL) ²⁾	Yes						
Soft start / Inrush Current Draw	Yes / max. 5 A						
Mains connector	230 V CE: 16 A, CEE7; 115 V ETL: 30 A Twist lock FP 4000: 230 V CE: 16 A, CEE7; 115 V ETL: 20 A / NEMA 5-20P						
Dimensions (W/H/D)	W: 483 mm (19"), H: 88 mm (2 U), Overall D: 396 mm (15.6"), Mounting D: 358 mm (14.1")						
Weight	12 kg (26.4 lbs.)						
Finish	Black painted steel chassis with black painted steel / aluminum front						
Approvals	CE, ANSI/UL 60065 (ETL), CSA C22.2 NO. 60065, FCC						

Note 1): Automatic -6 dB gain compensation when bridging channels.

Note 2): PAL can reduce the maximum output power to keep the power supply operating safely, and/or to prevent excessive current draw tripping the mains breaker. Refer to section 7.5.8 Power Average Limiter (PAL) for more information.

Note 3): The amplifier will be fully operational at bridge-mode 2 ohm loads, but due to physical constraints in the construction, the max. output power will not be significantly higher than running individual channels and therefore not stated here.

Note 4): Separate 230 V or 115 V versions available. Not selectable on the amplifier.

All specifications are subject to change without notice.

Specifications C Series

Model	C 88:4	C 68:4	C 48:4	C 28:4	C 16:4	C 20:8X	C 10:8X	C 10:4X	C 5:4X
Number of channels	4	4	4	4	4	8	8	4	4
Peak total output all channels driven	8800 W	6800 W	4800 W	2800 W	1600 W	2000 W	1000 W	1000 W	500 W
Peak output voltage per channel	141 V	141 V	141 V	141 V	141 V	100 V / 70 Vrms	100 V / 70 Vrms	100 V / 70 Vrms	100 V / 70 Vrms
Max. output current per channel	35.5 Arms	24.5 Arms	17.5 Arms	12 Arms	8.5 Arms	8 Arms	5.6 Arms	8 Arms	5.6 Arms
Max Output Power									
16 ohms per ch. (all ch.'s driven)	650 W	650 W	625 W	600 W	400 W	250 W	125 W	250 W	125 W
8 ohms per ch. (all ch.'s driven)	1250 W	1200 W	1000 W	700 W	400 W	250 W	125 W	250 W	125 W
4 ohms per ch. (all ch.'s driven)	2100 W	1700 W	1200 W	700 W	300 W	250 W	125 W	250 W	125 W
2 ohms per ch. (all ch.'s driven)	2200 W	1200 W	600 W	300 W	n.r ⁴⁾	125 W	60 W	125 W	60 W
Hi-Z per ch. (all ch.'s driven): 70 Vrms / 100 V peak	2200 W	1600 W	900 W	700 W	400 W	250 W	125 W	250 W	125 W
Hi-Z per ch. (all ch.'s driven): 100 Vrms / 141 V peak	1700 W	1200 W	900 W	700 W	400 W	n.a.	n.a.	n.a.	n.a.
16 ohms Bridged per ch. ¹⁾	2500 W	2400 W	2000 W	1400 W	800 W	500 W	250 W	500 W	250 W
8 ohms Bridged per ch. ¹⁾	4200 W	3400 W	2400 W	1200 W	600 W	500 W	250 W	500 W	250 W
4 ohms Bridged per ch. ¹⁾	4600 W	2400 W	1200 W	600 W	n.r ⁴⁾	250 W	125 W	250 W	125 W
2 ohms Bridged per ch. ¹⁾	n.r ⁴⁾	n.r ⁴⁾	n.r ⁴⁾	n.r ⁴⁾	n.r ⁴⁾	n.r ⁴⁾	n.r ⁴⁾	n.r ⁴⁾	n.r ⁴⁾
Hi-Z Bridged per ch. ¹⁾ : 140 Vrms / 200 V peak	n.r ⁴⁾	3200 W	1800 W	1400 W	800 W	500 W	250 W	500 W	250 W
Performance with Gain:									
THD 20 Hz - 20 kHz for 1 W	35 dB and VPL: 100 V / C 88:4: 35 dB and VPL: 141 V					32 dB and VPL: 100 V			
THD at 1 kHz and 1 dB below clipping	<0.1%					<0.1%			
Signal To Noise Ratio	<0.05%					<0.05%			
Channel separation (Crosstalk) at 1 kHz	>112 dBA					>112 dBA			
Frequency response (1 W into 8 ohms) +0/-3 dB	>70 dB					>70 dB			
Input impedance	2.3 Hz - 56 kHz					2.3 Hz - 56 kHz			
Input Common Mode Rejection, CMR	20 kOhm					20 kOhm			
Output impedance @ 100 Hz	50 dB					50 dB			
	30 mOhm					48 mOhm			
Voltage Peak Limiter (VPL), max. peak output									
VPL, selectable per ch. ³⁾									
VPL, when bridged ^{3) 1)}	141, 118, 100, 85, 71, 59, 50, 42 V					100, 63, 45, 32 V			
Voltage Peak Limiter mode (per ch.)	282, 236, 200, 170, 142, 118, 100, 84 V					200, 126, 90, 64 V			
	Hard / Soft					Hard / Soft			
Gain and Level									
Amplifier gain selectable (all channels) ¹⁾									
– rear-panel switches	23, 26, 29, 32, 35, 38, 41, 44 dB					29, 32, 35, 38 dB			
Default gain	35 dB					32 dB			
Level adjustment (per ch.)	Front-panel potentiometer, 21 position detented from -inf to 0 dB , hidden behind security panel/dust filter grille					Front-panel potentiometer, 21 position detented from -inf to 0 dB , hidden behind security panel/dust filter grille			
Connectors and switches									
Input connectors (per ch.)									
Output connectors (per ch.)	3-pin Phoenix, electronically balanced					3-pin Phoenix, electronically balanced			
Output bridge mode	Barrier strip 2-pole screw terminals					Barrier strip 2-pole screw terminals			
High pass filter	A+B and/or C+D, inputs A and C are input source					A+B, C+D, E+F, G+H, inputs A, C, E, G are signal source			
NomadLink network	-					Fixed at 35 Hz, switchable per channel			
Intelligent fans (on/off)	On board, 2 x RJ45 connectors IN and OUT					On board, 2 x RJ45 connectors, IN and OUT			
Power on/off and Remote enable on/off	Yes, depending on presence of output signal					Yes, depending on presence of output signal			
Cooling	Individual switches on front panel					Individual switches on front panel			
General Purpose Outputs (GPO)	Two fans, front-to-rear airflow, temperature controlled speed					Two fans, front-to-rear airflow, temperature controlled speed			
General Purpose Inputs (GPI)	-					Contact Closure types, 2-pole Phoenix			
	-					Contact Closure types, 2-pole Phoenix			
Front-panel indicators									
Common									
Per channel	NomadLink Network; Power Average Limiter (PAL) ²⁾ ; Power on Signal present / High-impedance; -10 dB and -4 dB output signal; Voltage Peak Limiter (VPL); Current Peak Limiter (CPL): Very High Frequency (VHF); High temperature; Fault; Mute					NomadLink® Network; Power Average Limiter (PAL) ²⁾ ; Power on Signal present / High-impedance; Voltage Peak Limiter (VPL); Current Peak Limiter (CPL): Very High Frequency (VHF); High temperature; Fault; Mute			
Power									
Operating voltage, 230 V / 115 V nominal									
Minimum power-up voltage, 230 V / 115 V	130-265 V / 65-135 V					100-240 V			
Power Average Limiter (PAL) ²⁾	171 V / 85 V					80 V			
Soft-start / Inrush Current Draw	Yes					Yes			
Mains connector ⁵⁾	Yes / max. 5 A					Yes / max. 5 A			
	230 V CE: 16 A, CEE7; 115 V ETL: 20 A / NEMA 5-20P; C16:4: 15A/NEMA 5-15P					IEC Inlet / NEMA 5-15P			
Dimensions (W/H/D)									
Weight	W: 483 mm (19"), H: 88 mm (2 U), D: 343 mm (13.5")					W: 483 mm (19"), H: 88 mm (2 U), D: 343 mm (13.5")			
Finish	12 kg (26.4 lbs.)					8.5 kg (18.75 lbs.)			
	Black painted steel chassis with gray painted steel front					Black painted steel chassis with gray painted steel front			
Approvals									
	CE, ANSI/UL 60065 (ETL), CSA C22.2 NO. 60065, FCC					CE, ANSI/UL 60065 (ETL), CSA C22.2 NO. 60065, FCC			

Note 1): Automatic -6 dB gain compensation when bridging channels. Ch.'s A+B and/or C+D, E+F, G+H, can be bridged individually.

Note 2): PAL can reduce the maximum output power to keep the power supply operating safely, and/or to prevent excessive current draw tripping the mains breaker. Refer to Operation Manual.

Note 3): For sine waves, peak voltage output values translate to Vrms with the formula $V/1.41 = V_{rms}$. E.g. 100 V peak equals app. 70 V peak. Hence, outputs can be set for high-impedance loads without requiring a transformer.

Note 4): Regarding n.r. (not recommended) notes: The amplifier will be fully operational in bridge-mode into 2 ohm and high impedance (Hi-Z) loads, but due to physical constraints in the construction, the max. output power will not be significantly higher than running individual channels and therefore this mode of operation is not recommended.

Note 5): C 88:4 mains connector: 30 A Twist lock.

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