

Standing The
Touring World
On Its Ear...



FP+SERIES

More Power. Less Weight. Zero Sonic Compromises.

Multi-channel Flexibility

The Lab.gruppen FP+ Series was designed and engineered to achieve unprecedented power and channel density in low-impedance applications. Simply put, FP+ Series amplifiers allow you to configure racks for any sound reinforcement application using fewer, smaller and lighter amplifiers. A few compact racks now can power an arena-sized system with headroom to spare. The basic figures tell the story. The power output levels shown here in two- and four-channel versions are continuous ratings into 2 ohms, measured to reflect real-world conditions while amplifying the most demanding program material.

Network Ready

Each FP+ Series amplifier is a slim 2U high and weighs a mere 12 kg (less than 27 lbs). Yet each produces nearly twice the clean, sustained output power of equivalent predecessor FP Series models. Also, we've added more standard features to FP+, including an interface to Lab.gruppen's proprietary NomadLink® network and DeviceControl software for remote amplifier control and monitoring via Ethernet.

FP+ SERIES MODELS

- ▶ FP 13000 2 x 6500 W
- ▶ FP 7000 2 x 3500 W
- ▶ FP 10000Q 4 x 2500 W
- ▶ FP 6000Q 4 x 1500 W



Muscle and Flexibility for Touring Efficiency

FP+ SERIES BENEFITS

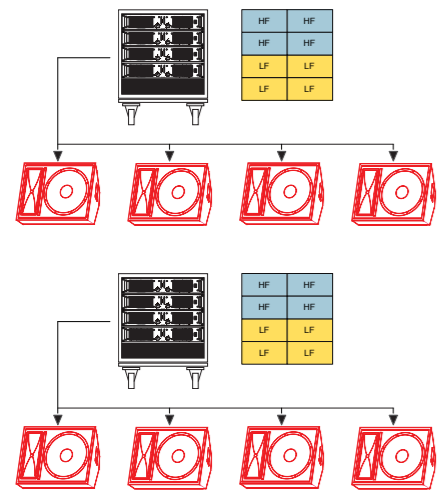
- ▶ Unprecedented power density: higher output, less size and weight
- ▶ Proven reliability in extreme touring conditions
- ▶ Patented Class TD output stages for high efficiency and sonic transparency
- ▶ NomadLink® network monitoring and control capability included standard
- ▶ Two- and four-channel versions
- ▶ All channels bridgeable with automatic -6dB summing compensation
- ▶ Outputs optimized for load conditions with VPL
- ▶ Craftsman-built in Kungsbacka, Sweden

The Incredible Shrinking Amp Rack

Offering the unbeatable combination of increased power and channel density and exceptional efficiency, Lab.gruppen's FP+ Series can dramatically cut the size, weight and external AC power requirements for touring or installed amplifier racks. The examples below illustrate typical applications:

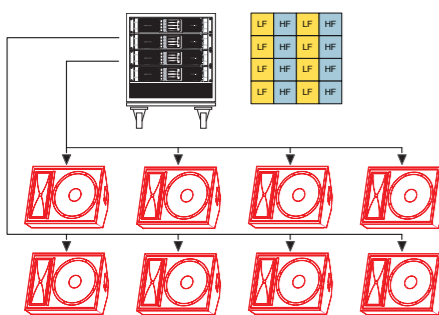
Generic Stage Monitor Configurations

Typical eight-channel bi-amp monitor setup using FP 2600 and FP 3400
 HF: Four FP 2600 providing 840 watts per ch. @ 4 ohms
 LF: Four FP 3400 providing 1500 watts per ch. @ 4 ohms



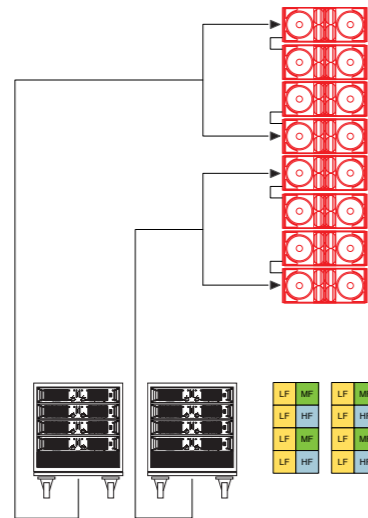
Typical eight-channel bi-amp monitor set-up using four FP 10000Q with VPL-optimized settings:

HF: VPL set to 85 providing 903 watts per ch. @ 4 ohms
 LF: VPL set to 118 providing 1741 watts per ch. @ 4 ohms

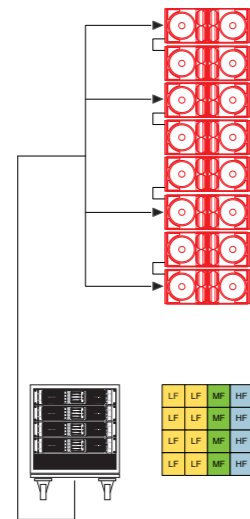


Generic Line Array Configurations

Typical eight-element line array configured with eight FP6400



Typical eight-element line array configured with four FP 10000Q



Beyond fP: A New Generation of Power

To achieve the extreme 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. Both are incorporated in all four FP+ Series amplifiers. Working together, this new generation of proprietary circuits produces more power from a smaller package while at the same time maintaining Lab.gruppen's peerless reputation for sonic excellence. The highs stay crisp and transparent. The mids are warm and natural. And the tight low end delivers visceral impact.

2x2 + 2x4 = Maximum Flexibility

A bridgeable two-channel amplifier makes perfect sense when you need maximum power reserves from one chassis – as when powering hungry subwoofers, for example. The FP+ Series meets this need with the FP 7000 and the awe-inspiring FP 13000. However, when powering multiple low-, mid- or high-frequency drivers (in line arrays or multiple stage monitors for example), four-channel amplifiers make more sense. You have more discrete channels for increased flexibility, yet both space and weight are drastically reduced. The FP+ Series meets this need with two ultra-high power four-channel models: FP 10000Q and FP 6000Q. The FP 10000Q is designed to meet the demanding requirements of mid- to large-sized sound reinforcement systems – including modern line array designs - with ample undistorted power and generous headroom to create a remarkable listening experience. With the FP 10000Q you can run boxes in parallel down to 2 ohms with abundant headroom reserves. The same applies to the FP 6000Q. By stocking your racks with higher-power, two- and four-channel FP+ Series amplifiers, your total amplifier count often can be cut in half (with headroom to spare) when compared to equivalent configurations with other amplifiers. As the diagrams opposite show, a few small racks with a total amplifier weight of less than 100 kg can supply ample power for one side of

an arena-sized system. The same racks also can be easily used for bi-amp monitor systems. When you factor in the size and weight reductions for a total system, the savings in labor and truck space make a substantial difference in your costs.

The Lab.gruppen VPL Advantage

With Lab.gruppen's proprietary VPL (Voltage Peak Limiter) feature, individual FP+ channel outputs can be configured optimally to provide appropriate power ratings for specific speaker cabinets within a sound system. A regional sound company, for example, can standardize on only one amplifier model and, by utilizing the appropriate VPL settings, can tailor the output to match an entire complex rig with ease. Rack wiring, loading and backup amp management can now become easier than ever.

From the Top, a Stronger Bottom Line

Another benefit is your savings on initial investment. Although some internal components of the FP+ Series are more costly than those in the prior fP Series, the advanced design and efficient manufacturing have dramatically reduced the relative cost per watt of output. As a result, with FP+ Series you not only get more power per pound or kilogram, you also get more power per pound, dollar, euro or yen.



Command 12.5 Million Watts with One Mouse Click*



Harness the Power of FP+ Series with NomadLink and DeviceControl

Lab.gruppen's robust NomadLink network with DeviceControl software lets you monitor key functions and also keep close tabs on all key operating parameters. The NomadLink network connects your laptop computer to as many as 960 amplifiers.

Any uncertainty about amplifier performance is eliminated and each channel's corresponding load's integrity can be assured by use of DeviceControl's high-impedance indicator. All accessed remotely. Every FP+ Series amplifier comes network ready as standard. Just add the optional NLB 60E NomadLink Bridge & Network Controller and you can have your network up and running in only minutes. (No separate modules to install!) 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 you connect the first and last amplifiers to an NLB 60E forming a closed loop. Done. NomadLink is a robust, fully redundant network that is essentially bullet-proof. And NomadLink's phantom powered loop technology makes it possible to maintain communication, even if an amplifier in the system should be powered off.

Local Control and Ethernet Extension

The NLB 60E functions as stand-alone unit when needed for basic monitoring and control. Large front-panel keys and displays let you power-up and power-down all networked amplifiers, and provide an on-the-spot check for fault indications.

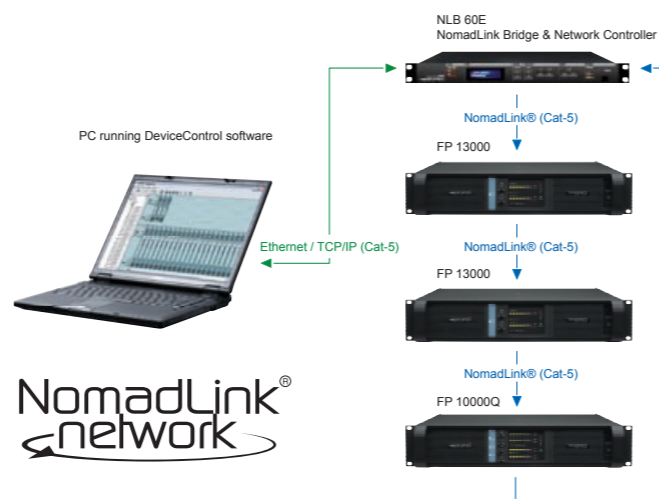
However, most users also will want use the NLB 60E as an Ethernet-to-NomadLink bridge in order to remotely access the enhanced feature set of the DeviceControl software. DeviceControl is a powerful tool for real-time monitoring and control as well as offline system configuration. The flexible GUI allows multi-level monitoring of amplifier status, from basic fault monitoring of entire systems to detailed status reports on a single channel. Amplifier channels may be freely configured in groups for simultaneous on/off, mute or solo commands. Also, a handy "match" feature allows a pre-configured system setup to be compared to the actual setup downloaded from the network, ensuring that the intended design was properly configured as a physical system.

Options Open, Now and in the Future

NomadLink is dedicated exclusively to monitoring and control of Lab.gruppen amplifiers. It works alongside your existing drive chain DSP units and signal distribution systems – and their software control programs, if any – without rendering anything obsolete. You do not have to alter, reprogram, reconfigure or replace anything to accommodate NomadLink.

When you invest in the FP+ Series and NomadLink, you are not locked into one proprietary system, format, or fixed AD/DA conversion standard. You are free to continue using your existing inventory of drive DSP units as well as your digital or analog snake systems. You can upgrade as you please, whenever costs and technological advances suit your particular needs. You can be confident that your FP+ Series amplifiers and NomadLink® network will remain fully compatible at each stage of your future upgrading program.

** If all those amplifiers all happen to be FP 13000s, then indeed you could wield the power of – to be exact – 12,480,000 watts. And if this system is ever created, please notify the Guinness Book of Records immediately!*

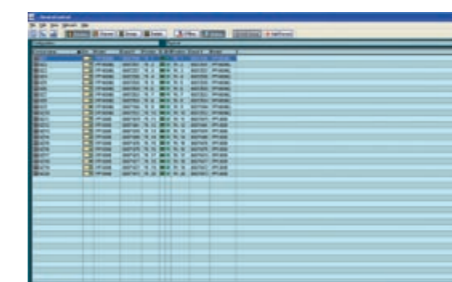


NomadLink®
network



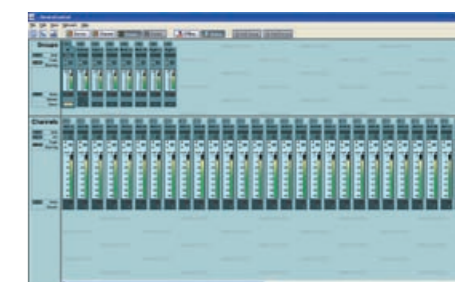
DeviceControl: Details View

This screen allows users to match their customized DeviceControl configurations to the physical amplifiers, and quickly identify any incompatible amp setups. It also contains the Power and Sensitivity Calculator, which allows users to optimize an amp channel to a particular speaker load or configuration by entering specific impedance, output power and sensitivity parameters. This screen can be printed for use as an on-site amplifier setup guide.



DeviceControl: Device View

This screen automatically identifies all of the amplifiers detected by DeviceControl in one or more subnets, including model number, serial number and physical position within the subnet. Power on or off status can be set for each amplifier, and individual amplifiers can be labeled on this screen for specific applications (e.g. stage R subs, stage L array HF, etc.).



DeviceControl: Channel View / Group View Modes

Accurate, at-a-glance status monitoring of 240 amp channels has been a daunting task...until now. In the Channel View screen, individual amp channels are assigned to a group matrix, and can be renamed as needed. In the Group View screen, each group is represented by a single status block that displays all critical information needed to monitor the amplifiers within that group. The status block includes a real time VU meter with peak-hold feature, mute / solo status of grouped and individual amplifiers, as well as amp fault and warning indicators. Groups can be renamed to match specific applications.

Lab.gruppen Breakthrough Technology: Refined and Upgraded for FP+

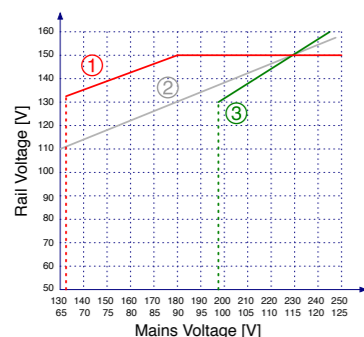
The Inside Story: A Tradition of Craftsmanship

Every FP+ Series amplifier is designed, engineered, assembled, and rigorously tested at Lab.gruppen's manufacturing facility in Kungsbacka, Sweden. The uncompromising dedication to quality and craftsmanship is evident in every detail.



Regulated Switch Mode Power Supply (R.SMPS™)

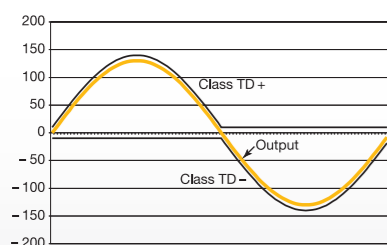
Lab.gruppen pioneered the use of switch mode power supplies in power amplifiers, and the latest generation of this technology plays a key role in enabling the extreme power density of the FP+ Series. Precise regulation maintains constant voltage on the internal rails, ensuring full output power and undistorted sound even when the mains voltage drops as much as 20% below nominal. The FP+ Series power supply also incorporates an enhanced ferrite power transformer core which, compared to its iron core counterparts, dramatically reduce weight and contributes to overall efficiency.



- Characteristics of different power supply designs:**
- 1) R.SMPS provides stable voltage down to 90 V (115 V nominal) or 180 V (230 V nominal).
 - 2) Drops in mains voltage produce proportional drops with typical toroidal power supplies.
 - 3) Other typical supplies show severe rail voltage drops due to semi-conductor losses, potentially causing current limiting or shutdown.

Class TD Output Stage

Lab.gruppen's FP+ Series amplifiers share an output stage that is literally in a class by itself: the patented Class TD. A breakthrough design that occupied Lab.gruppen's co-founder Kenneth Anderson for nearly two years, Class TD combines the high efficiency of a digital Class D with the sonic purity of classic Class B designs. The power supply rails precisely track the audio signal at all times, providing the required voltage plus additional headroom. This process is highly efficient, with only a tiny portion of this voltage emitted as heat in the output stage. The

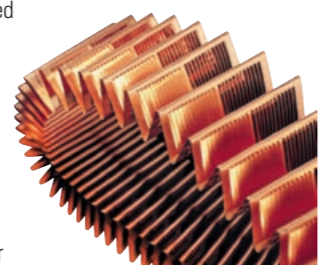


Both superb sound quality and high efficiency are made possible thanks to Class TD technology.

audio path itself remains entirely in the analog domain. It never enters the switching portion of the circuit, and is therefore not subject to the ripple effects of the extreme filtering required by the PWM Class D approach. Class TD is bridgeable, highly reliable, and maintains a flat response with complex loads as low as 2 ohms nominal. Also, it does not interfere with RF equipment such as wireless (radio) microphones.

Intercooler® for Efficient, Uniform Cooling

Compact and ultra-efficient, Intercooler® uses thousands of tiny cooper cooling fins to increase exposure of the heat sink to the cooling air flow. Twin variable-speed fans respond to temperature sensors, forcing air over the Intercooler fins in a front-to-rear flow. All output devices are mounted transverse to the airflow, so the cooling effect is uniform. There are no "end of tunnel" output transistors subject to greater warming and, consequently, possible premature failure.



Pure copper Intercooler® fins.

Configurable for Any Signal, Any Load

Each FP+ Series amplifier offers an eight-position input gain switch to optimize performance with any input signal. In addition, each channel incorporates Lab.gruppen's exclusive Voltage Peak Limiter (VPL) circuit. VPL precisely tailors output for any type of load, from a single massive 2-ohm subwoofer to a series of 16-ohm mid- or high-frequency drivers. Working in concert, adjustable input gain and VPL optimizes each channel for maximum headroom regardless of input signal dynamics or load impedances.

A Full Suite of Protection Features

Lab.gruppen's FP+ Series incorporates comprehensive warning and protection features to safeguard the amplifier and any connected loudspeaker drivers. Front-panel indicators and the DeviceControl GUI give clear warnings when any potential problems are detected. Protection measures are enabled only when critical thresholds are passed: measurements are re-checked every few seconds, and normal operation resumes automatically when nominal conditions are restored. The complete protection/warning suite includes: DC at output, short circuit, excessive output current, sustained very high frequency (VHF), and open load.

The FP+ Series also includes features to guard against inadvertent tripping of the mains fuse or external circuit breakers, either during a performance or at start-up. While in operation, a Power Average Limiter (PAL) constantly monitors the current-drawing relationship between the power supply and the mains inlet. If conditions are detected where the power amplifier could draw more than the mains inlet can supply, PAL limits current draw to prevent power interruption. Additionally, a soft-start circuit limits initial current draw when amplifier is turned on.

- | | |
|----------------------------------|---|
| Per channel: | Common: |
| High Temperature (TEM) | Power on |
| Very High Frequency (VHF) | Power Average Limiter (PAL) |
| Mute | NomadLink® network active |
| Current Peak Limiter (CPL) | Bridge indicator |
| Voltage Peak Limiter (VPL) | Mains power switch |
| -20 through -4 dB signal present | Remote on/off enable |
| Signal present/high impedance | Dust-filters (accessible behind grille) |

Front Panel (FP 10000Q shown)



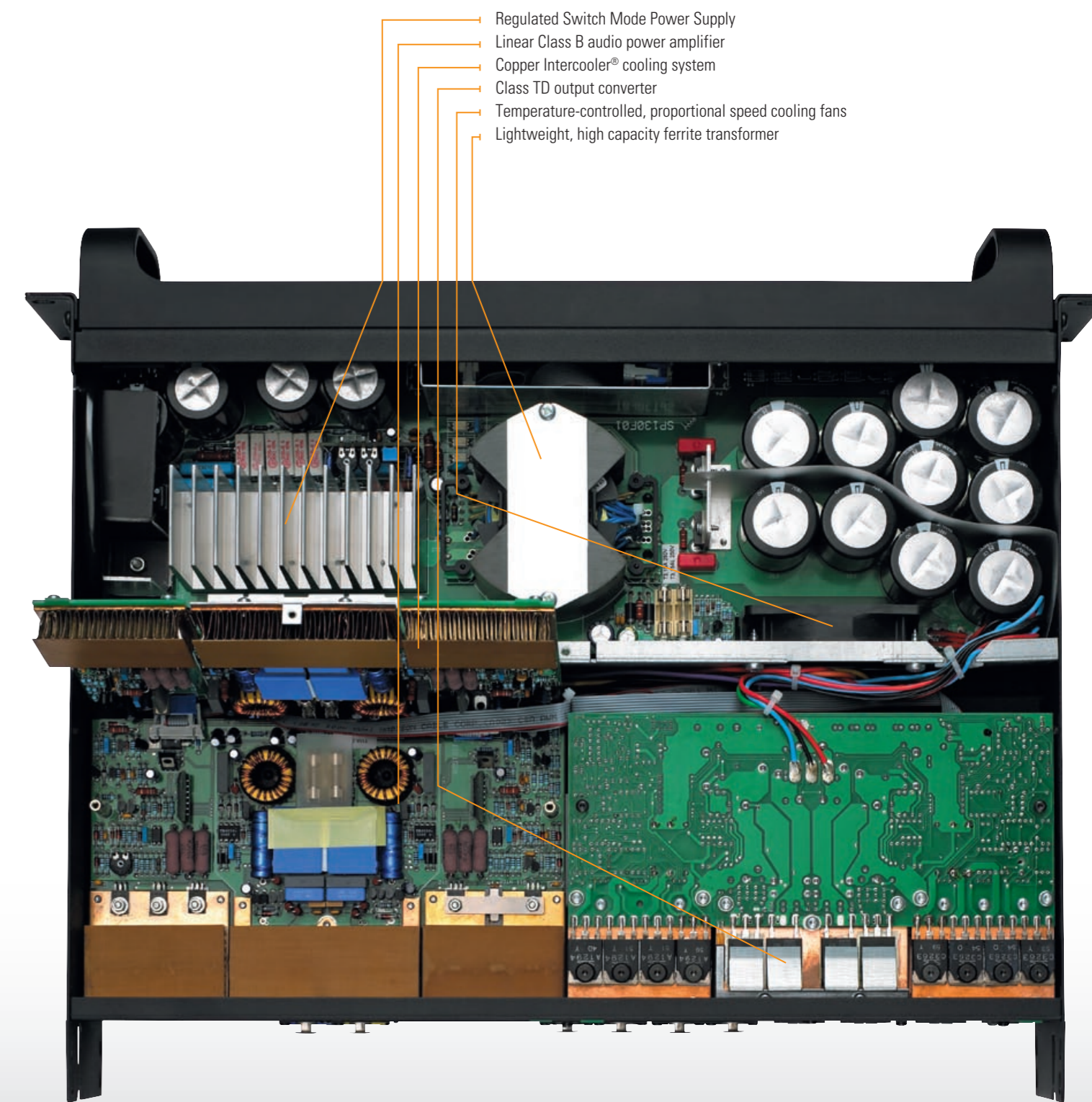
Rear Panel (FP 10000Q / FP 6000Q)



Rear Panel (FP 13000 / FP 7000)



Top / Inside View (FP 10000Q shown)



- Regulated Switch Mode Power Supply
- Linear Class B audio power amplifier
- Copper Intercooler® cooling system
- Class TD output converter
- Temperature-controlled, proportional speed cooling fans
- Lightweight, high capacity ferrite transformer

The Lab.gruppen story

A new touring standard, three decades in the making

Over the past decade, Lab.gruppen amplifiers have rapidly emerged as the benchmark for quality and durability in touring power amplification. Yet the term "overnight success" hardly applies here. The roots of Lab.gruppen technology extend back more than three decades.

Years before the company was established in 1979, co-founders Kenneth Andersson and Dan Bavholm already had earned a reputation as bold innovators with a passion for building better audio equipment. One of their first hand-built products, a custom mixer, was pressed into service for a performance by legendary singer Eartha Kitt

when she visited their hometown of Kungsbacka, Sweden. At the time, the two basement builders were full-time schoolboys still in their mid-teens.

Soon after launching Lab.gruppen, the duo expanded their product line to include AXE-AMP guitar amplifiers. When an OEM output stage used in the earliest models proved unsatisfactory, Kenneth Andersson set out to design and build circuits that sounded better and could not be "smoked". The result was used in all subsequent guitar amplifiers and, in late 1980, incorporated into the SS 300 – Lab.gruppen's first power amplifier.



Building on breakthroughs

Over the following two decades, Lab.gruppen achieved a remarkable number of breakthroughs in power amplifier design. The copper-finned Intercooler® removed heat from amplifiers with unprecedented efficiency. The Regulated Switch Mode Power Supply (R.SMPS) proved that a truly lightweight amplifier could indeed be reliable, sonically transparent, and free of excessive ambient noise. The innovative MLS (now VPL) circuit allowed amplifier outputs to be tailored to load characteristics. And the patented Class TD output stage combined the low distortion of Class B with the high efficiency of Class D designs.

Building on these and other foundational advances, Lab.gruppen steadily built a loyal following among leading sound rental companies. At first distribution was limited to the Swedish market, then



gradually expanded into the rest of Europe. Demand often threatened to outstrip supply, but 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 fully expanded into North America and Asia.

A commitment to the touring industry

Today, Lab.gruppen is committed to developing technology and products that make an impact in an industry facing unprecedented challenges. Fuel costs are escalating, with labor costs close behind. Tight schedules compress load-in/out and rigging time. Budgets aren't expanding to keep pace. To survive (and remain profitable) you need to move quickly, travel light, and maintain an inventory of reliable gear that accommodates maximum flexibility in system configuration. That's the tough reality of touring.

The tough amplifier solution is Lab.gruppen's FP+ Series.



Specifications

Model	FP 13000	FP 7000	FP 10000Q	FP 6000Q
Number of channels	2	2	4	4
Peak total output all channels driven	13000 W	7000 W	10000 W	6000 W
Peak output voltage per channel	195 V	155 V	150 V	101 V
Max output current per channel	58 A _{rms}	42 A _{rms}	38 A _{rms}	27 A _{rms}
Max Output Power				
16 ohms per ch. (all ch.'s driven)	1200 W	730 W	660 W	320 W
8 ohms per ch. (all ch.'s driven)	2350 W	1450 W	1300 W	625 W
4 ohms per ch. (all ch.'s driven)	4400 W	2800 W	2100 W	1250 W
2 ohms per ch. (all ch.'s driven)	6500 W	3500 W	2500 W	1500 W
16 ohms Bridged	4700 W	2900 W	2600 W	1250 W
8 ohms Bridged	8800 W	5600 W	4200 W	2500 W
4 ohms Bridged	13000 W	7000 W	5000 W	3000 W
2 ohms Bridged	3)	3)	3)	3)
Performance with Gain				
THD 20 Hz - 20 kHz for 1 W	35 dB and VPL: 195 V 0.1%	35 dB and VPL: 155 V 0.1%	35 dB and VPL: 150 V 0.1%	35 dB and VPL: 101 V 0.1%
THD at 1 kHz and 1 dB below clipping	0.05%	0.05%	0.05%	0.05%
Signal To Noise Ratio	112 dBA	112 dBA	112 dBA	112 dBA
Channel separation (Crosstalk) at 1 kHz	70 dB	70 dB	70 dB	70 dB
Frequency response (1 W into 8 Ohm) +0/-3 dB	6.8 Hz - 34 kHz	6.8 Hz - 34 kHz	6.8 Hz - 34 kHz	6.8 Hz - 34 kHz
Voltage Peak Limiter (VPL), max. peak output				
VPL, selectable per ch. (V)	195, 170, 140, 116, 100, 80, 66, 54 V	155, 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	310, 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	38 dB	35 dB	35 dB
Level adjustment (per ch.)	Front-panel potentiometer, 21 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 13000			
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 plug type	230 V CE: 16 A, CEE7; 115 V ETL: 30 A Twist lock			
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 Operation Manual.

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.

Item no. BR-FP+