EQUIPO SONORO

Technical Documentation

Building Acoustics System
Software BZ 7204
Power Amplifier Type 2716
OmniPower™ Sound Source Type 4296

For Modular Precision Sound Analyzer Type 2260

Brüel & Kjær

English BB 1078 – 11

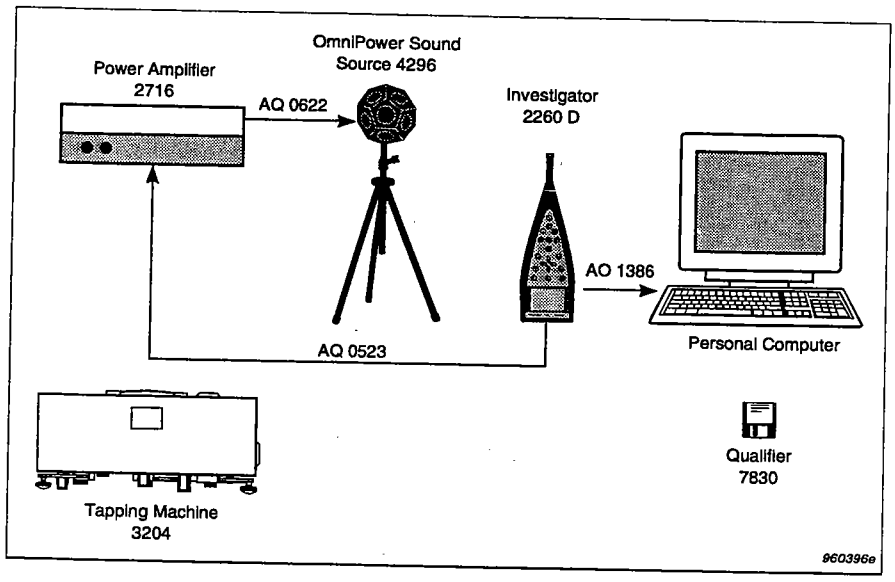

Fig. 1.1 Showing a basic Brüel & Kjær system for covering measurements and analyses of Architectural and Building Acoustics

- **Reverberation**
  sound decay within a room
- **Facade**
  sound insulation through external facades

1.2 The Investigator Type 2260 D

The Investigator Type 2260 D (see Fig. 1.2) is an analyzer which comprises the following:

- Modular Precision Sound Analyzer Type 2260 (platform)
- Building Acoustics Software BZ 7204
- Input Stage ZC 0026
- Microphone Type 4189

Unpacking

Carefully open the shipping carton and check for any noticeable damage. Every LAB.GRUPPEN amplifier is tested and inspected before leaving the factory and should arrive in perfect condition. If found to be damaged, notify the shipping company immediately. Only the consignee may institute a claim with the carrier, for damage incurred during shipping. Be sure to save the carton and packing materials for the carrier's inspection.
It is also advisable, to save the carton and packing material, even if the amplifier is undamaged. Should you ever need to ship the amplifier, use the original packing.

Warnings

Read this before you are operating your amplifier:

- Do not use this amplifier if the power cord is broken or frayed.
- Always operate the unit with the chassis ground wire connected to the electrical safety earth.
- Do not parallel or series connect an amplifier output, with any other amplifier output. Do not connect the amplifier output to any other voltage source, such as battery, mains source, or power supply, regardless of whether the amplifier is turned on or off.
- Do not run the output of any amplifier back into another channel's input.
- Do not block the air intake or exhaust ports. Do not operate the amplifier near heat producing devices such as radiators, stoves etc.
- Do not spill water or other liquids into or on the unit. Do not operate the amplifier if suspected or standing in liquid.
- Do not remove top or bottom covers. Removal of the cover will expose hazardous voltages. There is no serviceable parts inside and removal may void warranty.
- Keep this manual for future reference.

User responsibility

1. **Speaker damage**

Your amplifier is very powerful and can be potentially dangerous to both loudspeakers and humans alike. Many loudspeakers can be easily damaged or destroyed by overpowering, especially with the high power available from a bridged amplifier. Always check the speakers continuous and peak power capabilities.

Even if the gain is reduced by using the amplifier's front panel attenuator, it is still possible to reach full output power, if the input signal level is high enough.

2. **Speaker output hazard**

Power amplifiers are capable of producing hazardous output voltages. To avoid electrical shock, do not touch any exposed speaker wiring, while the amplifier is operating. See page 6 about outputs for proper connection of speakers.

3. **Radio interference**

This product has been tested, and complies with the limits for the European Electro Magnetic Compatibility (EMC) directive. These limits are designed to provide reasonable protection against harmful interference between electrical equipment. However, there is no guarantee for no interference even if the amplifier is EMC approved.
If the amplifier cause interference, which can be easily determined by turning the amplifier on and off, the user can correct the interference by one or more of the following steps:

1. Increase the proximity between the equipment.
2. Connect the AC cord to an outlet on a different circuit from that to which the affected unit is connected.
3. If a radio receiver is interfered (normally amplitude modulation); reorient the antenna.
4. Check if the affected unit complies with the EMC limits for immunity, (CE-labelled).

If not, address the problem with the manufacturer or supplier. All electrical products sold in the EC must be approved for immunity against electromagnetic fields, high voltage flashes, and radio interference.

Introduction

Thank you for purchasing a LAB.GRUPPEN power amplifier. This manual contains important information on operating your amplifier correctly and safely. Please take some time and read this manual to familiarize yourself with the amplifier.

The front panel

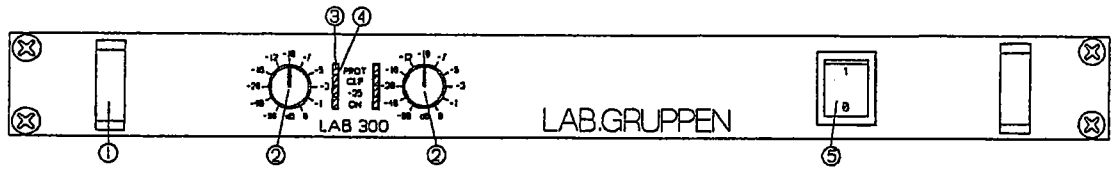

Figure 1. Front panel

1. Carry/protection handle

Both handles can be used to carry the amplifier, they also act as protection for the front panel. If so desired they can be removed (by removing the screws behind the front panel and replacing the handles with nuts) for fixed installations, or racks where the front covers are to shallow.

2. Input level attenuators

These controls are used to alter the signal level entering the amplifier. They are calibrated in dB to help set up active loudspeaker systems or cut down unwanted noise from the input signal.

(See page 7).

3. Protect indicator (Temperature and VHF)

This indicator is lit if the amplifier tries to operate above its maximum operating temperature (90°C). The indicator first comes on as a warning, to either turn down the input level, or check the cooling arrangements after what point the amplifier will mute the input signal. When the cooling has returned the output heat sinks to the normal operating temperature, the input signal is unmuted.

This indicator also lights when constant signals, above 20 kHz at full power, are present at the output terminals. When this happens the input signal is muted and the process cycles until the VHF signal is no longer present. (See page 8).

4. Clip/limit indicator

This indicator tells when the amplifier output is clipping or limiting. The two different states can be told apart:

- When the clip limiter is engaged it flickers briefly. (See page 8).
- When the clip limiter is not engaged it lights for a longer period.

5. Power actuator

This is used to start the amplifier. (See page 4 and 7).

CONECTAR "CD" RUIDO ROSA - MUSICA -
FIJAR CONECTORES Y GIRAR
POTENCIÓMETROS A "CERO" (-80 dB) ANTIHORARIO

The rear panel

CONECTAR RED "220V"
INTERRUPTOR ENCENDIDO "1"

H/V

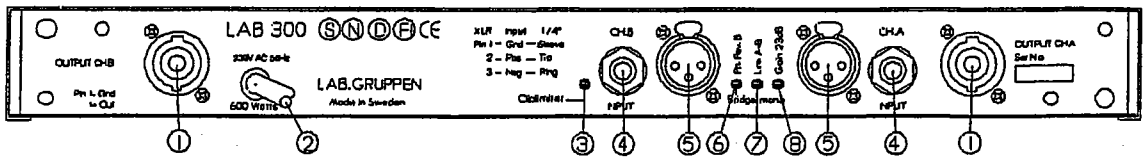

Figure 2. Rear panel

PARA DESCONECTAR CONECTORES - TIRAR DE LA PESTAÑA Y GIRAR.

Please refer to diagram on page 3

1. **Speaker connector**
This type of speaker connector may be unfamiliar to some users. A full description is found in the operation section. (See page 6).

2. **AC line cord** (See page 5).

3. **Clip limiter switch**
Turns the clip limiter on and off. (See page 8).

4. **Input jack**
Alternative to using input XLR or for linking inputs with other amplifiers. (See page 5).

5. **Input signal XLR** (See page 5).

6. **Phase reverse switch for channel B**
For reversing the input signal phase of channel B to allow bridged operation. (See page 7).

7. **Link switch**
Allows a single input to drive both channels simultaneously. (See page 6).

8. **Gain select switch**
Allows amplifier gain to be switched between 23dB and its normal gain at 0.775mV input sensitivity. (See page 7).

Installation

1. Mounting

The amplifier is one rack unit high (1U) and will mount in a standard EIA 19 inch rack. Amplifiers may be stacked directly on top of each other. There is no need for spacing between units. If it is the intention to fill a rack with amplifiers, we recommend racking is started from the bottom of the rack. It is also recommended that rear supports are used for amplifiers mounted in the middle of the rack, especially if used as part of a portable system.

2. Cooling

Should a heat sink get too hot, its sensing circuit will mute the hot channel. If the power supply overheats, another sensing circuit will mute both output channels, until it cools down to a safe operation temperature.
Make sure that there is adequate air supply in the rack and that the space at the rear allows the exhaust to escape.
For fixed installations with a central cooling system, usually found in fixed installations with a dedicated rack room, it may be necessary to calculate the maximum heat emission. Refer to Power consumption on page 5.

3. Operating voltage

A label just below the mains cable on the rear of the amplifier indicates the AC mains voltage, for which the amplifier is wired. Connect the power cable only to the AC source referred to on the label. The warranty will not cover damage caused by connecting to the wrong type of AC mains.
For converting a 230 volt amplifier to 115 volt or vice-versa, see Appendix A.

The amplifier is supplied with an approved European AC line connector. If this connector is not appropriate for your country, it can be cut off and wired to a suitable connector in the following way :

BROWN	**LIVE**
BLUE	**NEUTRAL**
GREEN/YELLOW	**EARTH**

Once the AC connector is connected to a suitable AC supply, the amplifier can be started with the AC actuator.

4. Grounding

There is no ground lift switch or terminal on this amplifier. The signal ground is always floating via a resistor to chassis and the grounding system is automatic. If a potential above 0.6V presents itself between signal ground and chassis ground, a short circuit is introduced between the two, thereby enabling electrical protection. If a unit in the system is faulty, its mains fuse will blow, due to this automatic ground system.
If however you wish to tie the signal ground to chassis, connect the XLR-connector's shell lug to pin 1. In the interest of safety never disconnect the earth pin on the AC cord.
For all units that are EMC approved (radio interference), there is an AC mains filter. This filter needs the chassis ground for reference, otherwise a current loop is formed via the signal ground.
Use the balanced input to avoid hum and interference.

A/A JAIME ESTEVEZ 3 HORAS

Brüel & Kjær
spectris group

MEDIDA DE AISLAMIENTO ACÚSTICO CON INSTRUMENTACIÓN BRÜEL & KJAER

1. Fuente Sonora OmniPower 4296

La Fuente Sonora OmniPower contiene los siguientes elementos para obtener la señal de ruido en el recinto receptor:

- Amplificador de potencia 2716
- Altavoz omnidireccional y trípode 4296

El amplificador 2716 dispone de 2 canales de amplificación independientes pero que pueden usarse a la vez, proporcionando una amplificación mayor. La primera vez que utilicemos el sistema, debemos asegurarnos que el 2716 está ajustado para trabajar con ambos canales (CH.A y CH.B) al mismo tiempo. Para ello, con ayuda de un pequeño destornillador o similar, hemos de fijar los micro-interruptores que se encuentran en la parte posterior del amplificador a los siguientes ajustes:

- 'Clip limiter' debe estar fuera (inactivo)
- 'Gain 23 dB' debe estar fuera (inactivo)
- 'Link A-B' debe estar dentro (activo) (interior)
- 'Ph. Rev B' debe estar dentro (activo) (interior)

La conexión entre el amplificador 2716 y la fuente 4296 es la siguiente:

EL GENERADOR DE SEÑAL ES EL REPRODUCTOR DE CD. SE ACOMPAÑA UN CABLE JACK - JACK

1. Conectar el cable del generador de señal (no suministrado) (salida de ruido rosa o ruido blanco) a la entrada 'INPUT' del amplificador (cualquier canal A o B, ya que trabajarán a la vez).
2. Utilizar el cable puente AQ0621 para unir las salidas de ambos canales 'OUTPUT CH.A' y 'OUTPUT CH.B'
3. Conectar el cable AQ0622 al cable puente AQ0621 y el otro extremo a la fuente 4296.

Spectris España, S.A.
Sede Social: Arturo Soria, 104 - 28027 Madrid - Tel.: 91 368 10 00 - Fax: 91 407 74 56
Delegación: Valencia, 84-86 - Int. - 08015 Barcelona - Tel.: 93 226 42 84 - Fax: 93 226 90 60
Inscrita en el Registro Mercantil de Madrid: Hoja M-209544, Folio 187, Tomo 12995, Libro 0, Sección 8, Inscripción 2ª. N.I.F. A-08349649. Accionista único: Spectris GmbH.

El reproductor de CD puede funcionar a baterías o a la red.

El ~~generador ES5002~~ y el amplificador 2716 deben ser enchufados a la red eléctrica.

¡Antes de encender el amplificador 2716 es recomendable situar los dos atenuadores situados en la parte frontal del 2716 girados totalmente en sentido anti-horario (NO amplificación)!

Encender el generador de señal y el amplificador 2716 y situar la salida del generador de ruido en una posición media. Girar los atenuadores del amplificador 2716 en sentido horario tanto como sea necesario para obtener el nivel de ruido adecuado (tratar que ambos atenuadores estén situados en posiciones similares de amplificación).

Trabajando con ambos atenuadores al máximo (0 dB) y cuando hay una señal presente, el indicador rojo 'CLIP' estará encendido indicando máxima potencia de salida.

Si se hace trabajar al amplificador de forma continua duarnte mucho tiempo, puede suceder un calentamiento del amplificador. El indicador amarillo 'PROT' se encenderá y se apagará el amplificador.

Nota: procure utilizar un nivel sonoro elevado. Tenga en cuenta que hay que "vencer" al ruido de fondo en el recinto receptor.

2. Resumen del procedimiento de medida de Aislamiento

Aunque hay muchas posibilidades, la experiencia indica que el siguiente orden es uno de los más adecuados.

1. Colocación de la fuente sonora en el lugar más adecuado del recinto emisor.
2. Búsqueda de posiciones de medida para el analizador.
3. Medida del ruido de fondo en el recinto receptor, B2
4. Puesta en marcha de la fuente sonora
5. Medida del nivel sonoro en el recinto receptor, L2

6. Comprobación de la diferencia L2-B2 y ajuste, en su caso, del nivel de emisión (atenuación de la fuente sonora)
7. Vuelta al punto 5 hasta que L2-B2 cumpla los requisitos necesarios.
8. Medida del nivel sonoro en el recinto emisor L1

3. Colocación de la fuente emisora

La Fuente Sonora 4296 debe situarse preferentemente en una de las esquinas opuestas a la superficie separadora.

La idea es crear un campo sonoro difuso mediante la excitación de la mayoría de los modos propios del recinto; de ahí la colocación en la esquina. En cualquier caso, la fuente no debe estar en contacto con las paredes. Como regla aproximada, se recomienda que la distancia entre los bordes del recinto y el centro de la fuente no sea menor de 70 centímetros. Así mismo, en el caso de que se utilizaran dos o más posiciones para la fuente sonora (promediando los resultados de cada una) estas estarán separadas al menos 1,4 metros.