

type 2712

180 VA Power Amplifier

FEATURES:

- Direct coupled solid state
- 180 VA power output
- Adjustable RMS output current limit
- Front panel control for Low or High output impedance
- Low distortion over wide frequency range
- Internally protected against current overload
- Extensive built-in protection with three indicator lights
- Front panel voltage and current monitor points

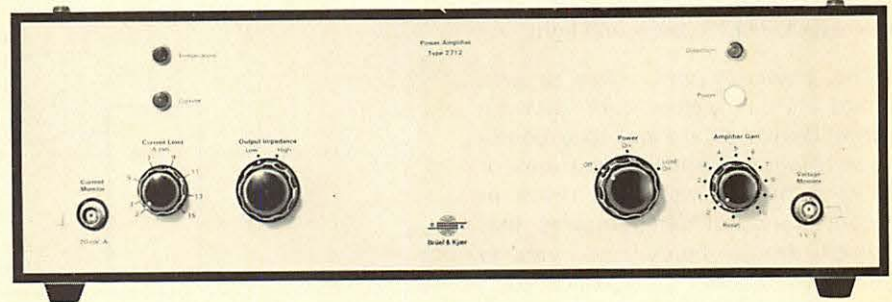
USES:

To drive

- Vibration Exciter Type 4808
- Vibration Exciter Type 4809 safely to full rating
- Vibration Exciter Type 4805 with associated heads at reduced rating

The Power Amplifier Type 2712 has been designed to drive small vibration exciters, particularly the 25 lbf (112 N) Vibration Exciter Type 4808. The RMS output current limit is adjustable, by a front panel control, and therefore this Power Amplifier will also drive the 10 lbf (45 N) Vibration Exciter Type 4809 safely to full rating. (The 2712 can also be used to drive the Vibration Exciter Type 4805 with associated heads at reduced rating.)

The Power Amplifier has a useable frequency range from DC to 100 kHz. The full AC output capability is 180 VA into a $0,8 \Omega$ exciter or resistor load and is available in the frequency range 40 Hz to 10 kHz. The maximum voltage gain is 14 dB. Harmonic content of the output is very small as heavy negative feedback is used. A balanced preamplifier and the use of silicon transis-



tors results in an instrument which can tolerate temperature and supply line variations while maintaining good stability.

Type 2712 can be used as a voltage generator with low output impedance and a flat voltage to frequency response, or as a current generator with high output impedance and a flat current to frequency response.

Description

A simplified block diagram of the Power Amplifier is shown in Fig.1. The instrument consists of an input stage, a preamplifier, a power amplifier and various warning and safety circuits with indication lamps.

Input

Both a capacitively coupled AC input and a direct coupled DC input are provided. Under normal working conditions the signal passes through a FET gate to the preamplifier stage. When the built-in protective circuitry is activated, however, the gate is triggered and disconnects the input signal from the preamplifier.

Preamplifier Section

The type of feedback from the output to the preamplifier stage is selected by the output impedance switch. Voltage feedback is used in the low impedance mode giving constant output voltage and very low output impedance. Feedback proportional to the current flowing in the

load is used in the high impedance mode resulting in a constant output current and high output impedance.

Excessive signal levels will saturate the preamplifier and cause distortion of the output waveform. This will trigger the clipping detector which then lights the yellow DISTORTION warning lamp on the front panel. The instrument remains operative in this condition.

Power Output Section

From the preamplifier, the signal is fed to the power output stage. This is directly coupled to the output, and hence to a connected vibration exciter, to eliminate the need for a bulky output transformer. A current limiting circuit prevents instantaneous excessive positive and negative output current peaks.

As well as power amplification the 2712 provides system control and protection functions. During operation the voltage and current levels and waveforms can be inspected at the monitor points provided.

Protection

The Power Amplifier Type 2712 contains protection functions for the Power Amplifier itself and the connected vibration exciter. When triggered, they turn off the FET gate at the input thus disconnecting the input signal. Each triggered protective circuit also lights a red lamp which gives an indication of the reason for equipment shut-down.

Overload protection is provided for excessive coil drive current. This feature enables the 2712 to safely drive vibration exciters with different maximum current ratings. A front panel control is used to preset the true RMS output current at which the circuitry trips. The limit can be set anywhere between 2 A and 15 A RMS. The signal to the exciter is switched off if the preset driving coil current is exceeded, and the red CURRENT lamp will light.

The power output stage is protected by a temperature sensing safety device. Abnormal load conditions, high ambient temperatures or short circuited output can result in output transistor temperatures that exceed design limits and lead to transistor failure. To prevent such damage the temperature protective circuitry blocks the amplifier input signal, and the red TEMPERATURE lamp will light. Also excessive temperature of a power transistor trig-

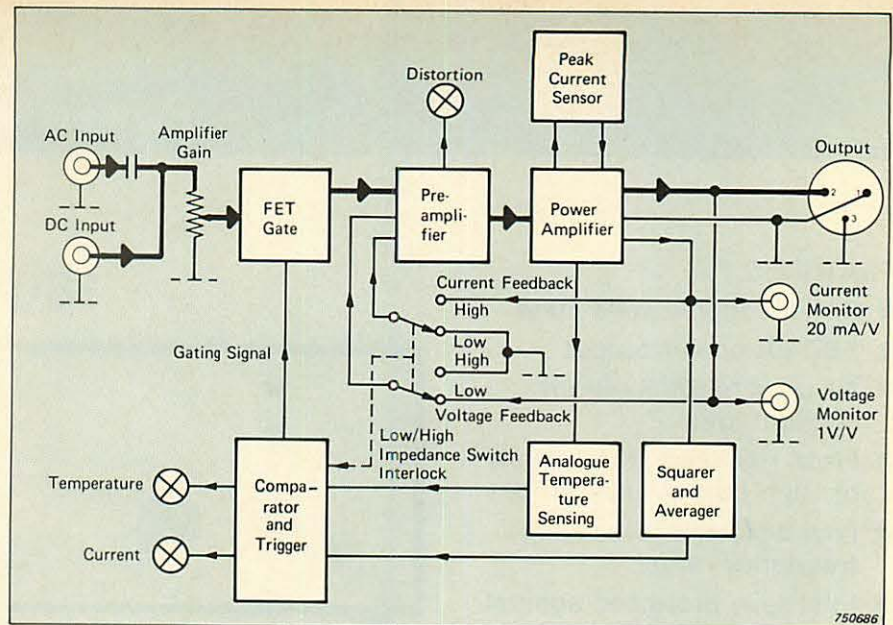


Fig.1. Simplified block diagram of the Power Amplifier

gers the protective circuitry and lights the lamp. Resetting after both current and temperature shutdown

is made simply by turning the amplifier gain control fully counter-clockwise.

Specifications 2712

Power Output Capacity:

180 VA into a 0,8 Ω exciter or resistor load at 25°C and nominal mains voltage
144 VA into a 1 Ω exciter or resistor load at 40°C or at 10% above nominal mains voltage
(3-pin Cannon socket at rear panel)

Output Voltage Capacity:

12 V RMS, DC to 15 kHz

Output Current Capacity:

7,5 A RMS at or below 5 Hz
15 A RMS, 40 Hz to 10 kHz
12 A RMS at 15 kHz

Frequency Range:

Full capacity: 40 Hz to 10 kHz
Reduced capacity: DC to 100 kHz

Frequency Response:

Typical small signal response in low im-

pedance mode:

DC Input: DC to 15 kHz ± 0,5 dB
DC to 100 kHz ± 3 dB
AC Input: 15 Hz to 15 kHz ± 0,5 dB
(2 separate BNC sockets at rear panel)

Input Impedance:

> 10 kΩ

DC Stability:

Less than 50 mV drift from 0 V for ± 10% variation of mains supply from nominal, and for 10 to 40°C (50 to 104°F) variation in ambient temperature

Protection:

Input signal is removed and an indicator lamp is lit when the following parameters exceed preset limits:
Driver Coil Current—true RMS adjustable limit 2 to 15 A
Power Transistor Temperature

Heat Sink Temperature

Front panel indication is provided for Output Signal Distortion — no shut-down

Other Features:

Electronic peak current limiting
Voltage and Current monitor points (front panel BNC sockets)

Temperature Range:

5 to 40°C (41 to 104°F)

Power Requirements:

Single phase 100, 115, 127, 220, 240, V RMS, ± 10%
Approx. 400 VA with full load
Complies with safety class I of IEC 348

Cabinet:

Supplied as model A (light-weight metal cabinet), B (model A in a mahogany cabinet) or C (as A but with flanges for standard 19" racks)

Dimensions: (model A)

(excluding feet, knobs etc.):
Height: 133 mm (5,2 in)
Width: 430 mm (16,9 in)
Depth: 200 mm (7,9 in)

Weight: (model A)

14,5 kg (32 lb)

Accessories Included:

1 3-pin Cannon Plug JP 0308
3 BNC Plugs JP 0035
1 Mains Cable AN 0010
Various fuses

Low and High Impedance:

	Low Impedance	High Impedance
Gain at 1 kHz	5 V/V ± 2 dB	8 A/V ± 2 dB
Output Impedance	< 0,02 Ω 5 Hz to 1 kHz < 0,05 Ω DC to 15 kHz	> 20 Ω 5 Hz to 1 kHz > 50 Ω 20 Hz to 300 Hz > 80 Ω 40 Hz to 100 Hz
Harmonic Distortion (full capacity)	< 0,2% 5 Hz to 5 kHz < 0,5% 5 kHz to 15 kHz	< 0,4% 5 Hz to 2 kHz < 1% 2 kHz to 15 kHz
Noise and Hum (below full output)	at least 80 dB	at least 70 dB