BRÜEL & KJÆR® Power Amplifiers

Power Amplifier Type 2721

Power Amplifier Type 2721 has been designed to drive Modal Exciter Type 4826 (400 N (90 lbf) sine peak), Type 4827 (650 N (146 lbf) sine peak) and Type 4828 (1000 N (225 lbf) sine peak).

Type 2721 provides a flat frequency response and low harmonic distortion over a wide frequency range and has extensive control and monitoring capabilities.

The power amplifier can operate in voltage or current mode with low and high output impedance, respectively.

120378

Uses

- Drives Modal Exciter Types 4826, 4827 and 4828 safely to full force rating
- Drives other modal and vibration exciters requiring up to 1250 VA in 4 Ω

Features

- 1250 VA power output capacity in 4 Ω
- Adjustable RMS output-current limit
- Low or high output impedance (voltage/current mode)
- Low distortion over wide frequency range
- Extensive built-in protection, including interlock
- LEDs on front panel showing distortion (clipped output signal), temperature overload, current overload, output signal phase (0° or 180°), operating mode (current or voltage), interlock and power status
- Liquid crystal display (LCD) showing output current and voltage
- Monitor output connectors (voltage and current) on back panel

Description

Power Amplifier Type 2721 has been designed to drive Modal Exciter Types 4826, 4827 and 4828, but can be used with other 4 Ω vibration or modal exciters requiring a 1250 VA power amplifier. For proper functioning, Modal Exciter Types 4827 and 4828 require Power Amplifier Type 2721 together with Field Power Supply Type 2830 and DC Static Centering Unit Type 1056.

The power amplifier has a usable frequency range from 40 Hz to 10 kHz (full capacity) or DC to 50 kHz (reduced capacity). The power output capacity is 1250 VA into a 4 Ω exciter or resistive load, in the frequency range DC to 15 kHz (± 0.5 dB). Harmonic content of the output is very small as heavy negative feedback is used. The instrument can tolerate temperature and supply line variations while maintaining excellent stability.

Type 2721 can be used as a voltage generator with low output impedance and a flat voltage frequency response, or as a current generator with high output impedance and a flat current frequency response. The RMS output-current limit is adjustable.

Protection

Power Amplifier Type 2721 features extensive protection circuits for itself and the connected vibration exciter. When triggered, the protection circuits disconnect the input signal and an LED lights up, indicating the reason for the instrument shutdown.

Overload protection against excessive coil current is provided by setting the RMS output current to between 1 A and 18 A. This feature enables Type 2721 to safely drive modal and vibration exciters, with different maximum current ratings. The signal to the exciter is switched off if the preset current limit is exceeded, and the red current LED lights up.

The power output stage is protected by a temperature-sensing safety device to prevent output transistor temperatures that exceed design limits and lead to transistor failure. The temperature-protection circuit blocks the amplifier input signal, lighting up the red temperature LED.

Further protection is provided by an interlock relay that disconnects the input if the operator switches between voltage mode and current mode during operation of Type 2721. Resetting after current, temperature and interlock shutdown is made by simply turning the amplifier gain control fully anticlockwise.

COMPLIANCE WITH STANDARDS

The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EU directives

RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME

China RoHS mark indicates compliance with administrative measures on the control of pollution caused by electronic information products according to the Ministry of Information Industries of the People's Republic of China

WEEE mark indicates compliance with the EU WEEE Directive

Safety, EMC Emission and Immunity: According to relevant standards: EN/IEC 61010–1, UL 61010–1, EN/IEC 61000–6–2, EN/IEC 61000–6–4, CISPR32 Class A limit, FCC Rules Part 15, EN/IEC 61326
Temperature: According to IEC 60068–2–1 & IEC 60068–2–2
- Operating temperature: +5 to +40 °C (41 to 104 °F)
- Storage temperature: –25 to +70 °C (–13 to 158 °F)

Humidity: According to IEC 60068–2–78, Damp Heat: 93% RH (non-condensing at 40 °C (104 °F))
Mechanical: Non-operating according to IEC 60068–2–6, IEC 60068–2–27, IEC 60068–2–29

POWER OUTPUT CAPACITY
1250 VA into a 4 Ω exciter or resistive load, at 25 °C and nominal mains voltage
Connector: 8-pin Neutrik® speakON® (back panel)

OUTPUT VOLTAGE CAPACITY
71 V RMS, DC to 15 kHz (without load)

OUTPUT CURRENT CAPACITY
7 A RMS at or below 5 Hz
17.75 A RMS, 40 Hz to 10 kHz
15 A RMS, at 15 kHz

FREQUENCY RANGE
Full Capacity: 40 Hz to 10 kHz
Reduced Capacity: DC to 50 kHz (–20 dB)

FREQUENCY RESPONSE
Typical small signal response (–20 dB) in low impedance mode:
- DC Input: DC to 15 kHz ±0.5 dB; DC to 50 kHz ±3dB
- AC Input: 15 Hz to 15 kHz ±0.5 dB

INPUT IMPEDANCE
>10 kΩ

INPUT CAPACITY
<47 pF

THD AT FULL OUTPUT CAPACITY
Low-impedance Mode:
- <0.2% (40 Hz to 5 kHz)
- <0.3%, 5 kHz to 10 kHz

High-impedance Mode:
- <0.3% (40 Hz to 2 kHz)
- <0.8% (2 kHz to 10 kHz)

DC STABILITY
Less than ±0.1 V 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

CONTROLS
Power On/Off
Continuously variable gain control, 0 to Cal. with integral reset
Continuously variable current limit control 1 to 18 A (RMS)
Switch for voltage mode or current mode operation
Switch for phase inversion (0° or 180°) between input and output

GAIN AT 1 KHZ
Low Impedance Mode: 28.7 V/V ±2 dB
High Impedance Mode: 18.7 A/V ±2 dB

NOISE AND HUM (BELOW FULL OUTPUT)
Low Impedance: at least 95 dB
High Impedance: at least 85 dB

INDICATOR LAMPS (LEDs)
Power on
Distortion
Temperature overload
Current overload
Phase shift (0° or 180°)
Mode (Voltage or Current)
Interlock

MULTIFUNCTION DISPLAY (LCD)
Voltage (RMS) readout accuracy ±5% (40 Hz to 10 kHz)
Current (RMS) readout accuracy ±5% (40 Hz to 10 kHz)
Air Control, Overdrive Control, Switch Mode

PROTECTION
Input signal is removed and an indicator lamp is lit when following parameters exceed preset limits:
- Driver Coil Current – true RMS adjustable limit 1 to 18 A (RMS)
- Control input for reduced capacity
- Shutdown Control Output
- Reset Control Output
- Power Transistor Temperature
- Heat Sink Temperature
- Output Signal Distortion – no shutdown

OTHER FEATURES
Electronic peak current limiting

MONITOR OUTPUT (5 HZ TO 15 KHZ)
Voltage: 0.1 V/V ±3%
Current: 0.1 V/A ±3%
Connectors: 2 separate BNC sockets (back panel)

POWER REQUIREMENTS
Single phase 100, 120, 230 V AC, ±10%, 50 – 60 Hz, factory preset. Approx. 1900 VA at full load

FUSES
Fuse cartridge (back panel)
100 V or 120 V: T 20 A slow blow
230 V: T 10 A slow blow

DIMENSIONS
Height: 176 mm (6.9 in) equivalent to 4 RU (rack unit)
Width: 482.6 mm (19 in) with flanges for standard 19-inch rack mounting
Depth: 610 mm (24 in)

WEIGHT
39.2 kg (84.4 lb.)

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Ordering Information

Type 2721 **Power Amplifier**
includes the following accessories:
- Mains cable

OPTIONAL ACCESSORIES

AQ-0659	Cable, two 8-pin Neutrik speakON connectors, length 5 m (16.4 ft), for connection to Modal Exciter Type 4826 (included with Modal Exciter Type 4826)
AQ-0650	Cable, two 8-pin Neutrik speakON connectors, length 1 m (3.3 ft), for connection from Field Power Supply Type 2830 to Power Amplifier Type 2721 (included with Field Power Supply Type 2830)
AO-0087-D-006	Cable, single-screened coaxial, BNC plug to BNC plug, length 0.6 m (2 ft), for connecting DC Static Centering Unit Type 1056 to Power Amplifier Type 2721

Note: Cables are available in different lengths.

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