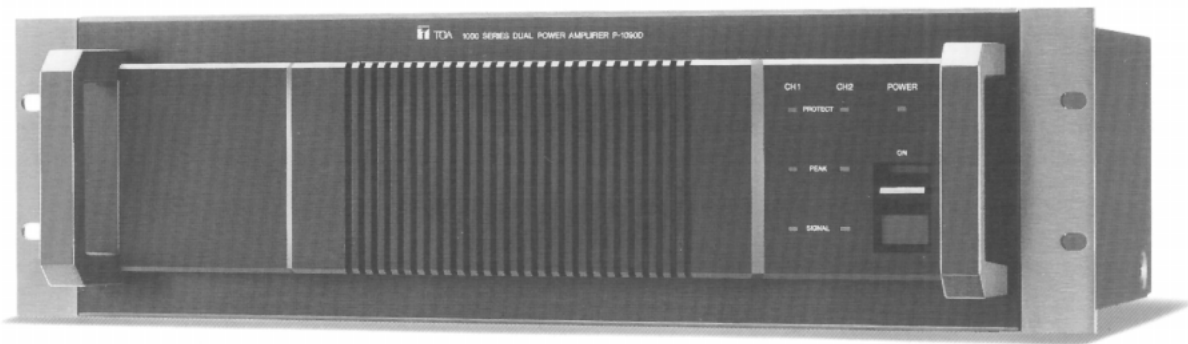


TOA PROFESSIONAL SOUND SYSTEMS

Dual Channel Power Amplifier

P-1030D/P-1060D/P-1090D



P-1090D

DESCRIPTION

The TOA P-1000 professional series P-1030D, P-1060D and P-1090D dual channel power amplifiers are designed for use in a wide variety of permanent installation applications for high quality, reliable audio amplification. These extremely durable amplifiers provide power outputs to fit the needs of both small and large scale sound reinforcement systems with nominal outputs, into 8-ohm loads at less than 0.1% THD (total harmonic distortion), of 300W+300W (P-1090D), 200W+200W (P-1060D) and 100W+100W (P-1030D) and in BTL (bridged mono) mode over 900W (P-1090D), 600W (P-1060D) and 300W (P-1030D).

The TOA P-1090D, P-1060D and P-1030D offer a wide range of features, including a mode select switch for Stereo, BTL or Parallel operation, a combination main power switch/circuit breaker/LED power on indicator; signal presence and clip/overload LED's; barrier strip connectors and infra-sonic filters. Output relays and

LED protection indicators actuate in the presence of short circuits, excessive heat sink temperature, or excessive DC in the outputs. Rear panel ports accept a wide range of plug-in modules including 2-way and bandpass crossovers, electronic balancing and transformer isolation.

The TOA P-1090D, P-1060D and P-1030D chassis are constructed of durable dark gray steel, mechanically reinforced by a rugged aluminum front panel with a black ABS resin finish. The amplifiers have been designed for easy installation in standard 19" equipment racks, each taking 3 rack spaces.

The P-1030D is convection cooled while the P-1060D and P-1090D use 2-speed forced air cooling.

Optional output transformers (300W MT-1030M, 200W MT-1020M, 100W MT-1010M) are available.



FEATURES

- Power outputs applicable to a variety of requirements. Minimum power into 8-ohm loads at less than 0.1% THD (total harmonic distortion), of 300W+300W (P-1090D), 200W+200W (P-1060D), 100W+100W (P-1030D). Minimum power when driving 4-ohm loads at less than 0.3% THD at any power level is 450W+450W (P-1090D), 300W+300W (P-1060D), 150W+150W (P-1030D). In BTL (bridged mono) mode the amplifiers provide outputs of over 900W (P-1090D), 600W (P-1060D) and 300W (P-1030D) into 8-ohm loads.
- Operation for 25V, 50V, 70V and 100V systems with optional output transformers for complete load isolation. 300W, 200W and 100W models for the P-1090D, P-1060D and P-1030D respectively.
- MODE SWITCH to select STEREO, BTL or PARALLEL operation. In STEREO mode the two channels operate independently. In BTL mode, the two channels are configured for mono bridge operation as a single monaural amplifier. In PARALLEL mode the channel 1 input feeds both output channels. In both BTL and PARALLEL modes, only the channel 1 input is active.
- Front panel ON/OFF switch that doubles as a circuit breaker, in the event of excessive AC current draw, and has an integral power on indicator LED.
- Green SIGNAL PRESENCE LED's that indicate a -30dB or larger signal at the inputs. These indicators are independent of the input level control settings.
- Red CLIP LED's that light when the amplifier reaches clipping level.
- Dependable limiting and protective circuitry to guard against damage to both amplifiers and speakers from a variety of causes. Separate protection circuits for each channel sense short circuits, excessive heat sink temperature and excessive DC offset at the outputs. Output relays are provided for delayed power turn on and for disconnecting the load in the event a protection circuit is activated.
- 15Hz high-pass input filters to prevent damage to speakers from infra-sonic frequencies. When input modules are used, their filter is modifiable to provide a higher frequency roll-off for "constant voltage" system operation when using the optional output transformers. (Depending on the combination of output and speaker line transformers, such systems can approach zero impedance at very low audio frequencies).
- Two rear panel ports that accept a wide range of plug-in modules including electronically balanced inputs, low/high/bandpass filters, input transformers and unique combinations of master/slave inputs and outputs.
- Barrier strip type screw terminals for positive input and output connections with bare or lugged wires.
- Input level attenuators for each channel, rear panel mounted to discourage tampering. These are located prior to the first input stage, thus the amplifiers can accommodate any high level of input signal.
- The P-1030D is convection cooled while the P-1060D and P-1090D have 2-speed fans that respond to the heat sink temperatures. Air flow is from front to back. The P-1060D and P-1090D each have a front panel mounted, reusable dust filter that is readily hand removable and easy to clean with vacuum cleaner.

SPECIFICATIONS

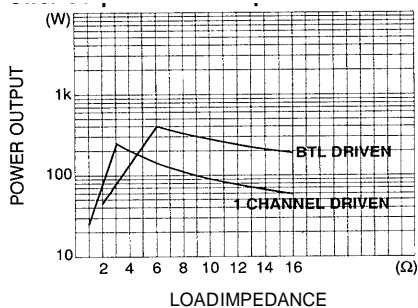
For STEREO Operation	
Power Outputs	P-1030D: More than 150 watts per channel, 4 ohms, 1kHz More than 100 watts, 8 ohms, 1kHz P-1060D: More than 300 watts per channel, 4 ohms, 1kHz More than 200 watts, 8 ohms, 1kHz P-1090D: More than 450 watts per channel, 4 ohms, 1kHz More than 300 watts, 8 ohms, 1kHz
Frequency Response	+0dB, -2.0dB, 8 ohms, 20Hz to 20kHz
Total Harmonic Distortion	Less than 0.01%, at 8 ohms, 1kHz Less than 0.3%, at 8 ohms, 20Hz to 20kHz
Intermodulation Distortion	0.03% using frequencies of 60Hz and 7kHz, mixed in a ratio of 4:1, at 8 ohms
input Sensitivity	An input of +4dB (1.23V), ± 0.5 dB, at 8 ohms, INPUT LEVEL CONTROL set for maximum level
Input Impedance	10k ohms (unbalanced)
Damping Factor	P-1030D: More than 100, 8 ohms at any frequency from 20Hz to 1kHz More than 50, 8 ohms at any frequency from 20Hz to 20kHz P-1060D: More than 110, 8 ohms at any frequency from 20Hz to 1kHz More than 40, 8 ohms at any frequency from 20Hz to 20kHz P-1090D: More than 130, 8 ohms at any frequency from 20Hz to 1kHz More than 35, 8 ohms at any frequency from 20Hz to 20kHz

Output Impedance	P-1030D: Less than 0.08 ohm at any frequency from 20Hz to 1kHz Less than 0.16 ohm at any frequency from 20Hz to 20kHz P-1060D: Less than 0.07 ohm at any frequency from 20Hz to 1kHz Less than 0.2 ohm at any frequency from 20Hz to 20kHz P-1090D: Less than 0.06 ohm at any frequency from 20Hz to 1kHz Less than 0.23 ohm at any frequency from 20Hz to 20kHz
Hum and Noise	110dB below rated output (20Hz to 20kHz) 115dB below rated output (IHF-A weighted)
Phase Shift	20Hz to 20kHz, ± 15 degrees
Offset Voltage	Less than ± 10 mV DC
AC Line Voltage	AC Mains, 50/60Hz
Power Consumption	P-1030D: 300 VA 640 VA maximum at rated output (4 ohms) P-1060D: 720 VA 1,300 VA maximum at rated output (4 ohms) P-1090D: 760 VA 1,740 VA maximum at rated output (4 ohms)
Material and Finish	Panel: Aluminum, ABS resin, black Case: Steel, dark gray
Dimensions	482.6 (W) x 132.7 (H) x 418.5 (D) mm 19.00 (W) x 5.22 (H) x 16.48 (D) inches
Weight	P-1030D: 18kg (39.68 lb.) P-1060D: 20kg (44.09 lb.) P-1090D: 21kg (46.30 lb.)

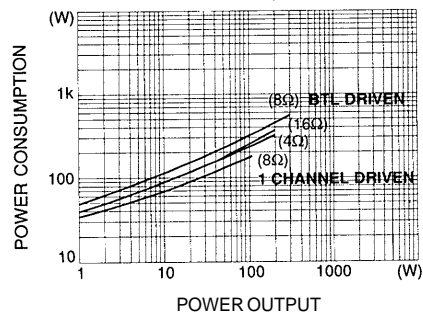
PERFORMANCE GRAPHS

P-1030D

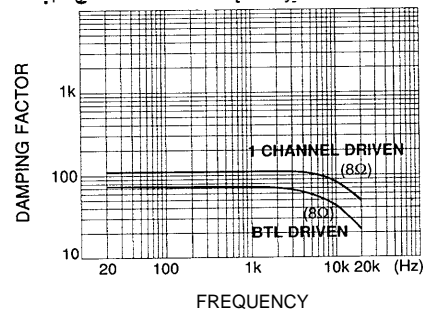
Power Output vs Load Impedance



Power Consumption (One Channel and BTL Driven)

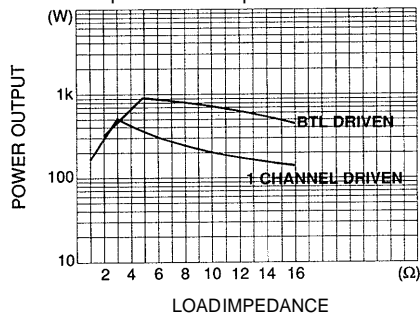


Damping Factor vs Frequency

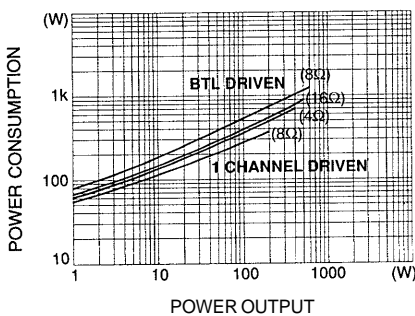


P-1060D

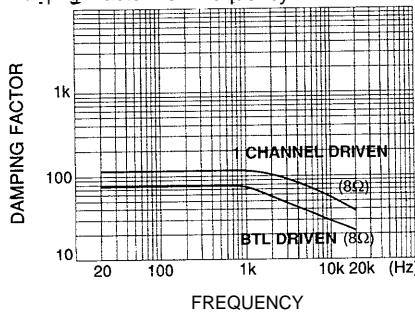
Power Output vs Load Impedance



Power Consumption (One Channel and BTL Driven)

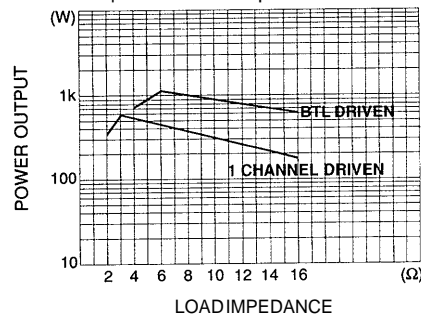


Damping Factor vs Frequency

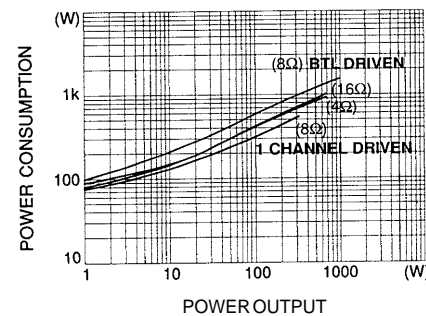


P-1090D

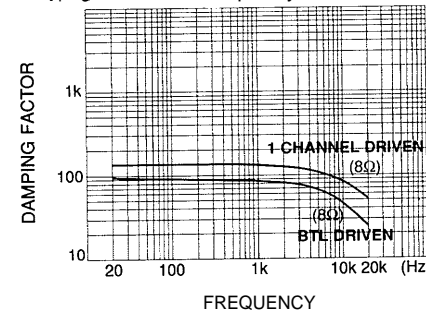
Power Output vs Load Impedance



Power Consumption (One Channel and BTL Driven)



Damping Factor vs Frequency



For BRIDGE Operation

Power Output	P-1030D: More than 300 watts, 8 ohms, 1kHz More than 200 watts, 16 ohms, 1kHz
	P-1060D: More than 600 watts, 8 ohms, 1kHz More than 400 watts, 16 ohms, 1kHz
	P-1090D: More than 900 watts, 8 ohms, 1kHz More than 600 watts, 16 ohms, 1kHz
Frequency Response	+0dB, -2.0dB, 8 ohms, 20Hz to 20kHz
Total Harmonic Distortion	Less than 0.05%, at 8 ohms, 1kHz
Intermodulation Distortion	0.05% using frequencies of 60Hz and 7kHz, mixed in a ratio of 4:1, at 8 ohms
Damping Factor	P-1030D: More than 70, 8 ohms at any frequency from 20Hz to 1kHz More than 20, 8 ohms at any frequency from 20Hz to 20kHz
	P-1060D: More than 75, 8 ohms at any frequency from 20Hz to 1kHz More than 20, 8 ohms at any frequency from 20Hz to 20kHz
	P-1090D: More than 90, 8 ohms at any frequency from 20Hz to 1kHz More than 25, 8 ohms at any frequency from 20Hz to 20kHz

Output Impedance P-1030D: Less than 0.11 ohm at any frequency from 20Hz to 1kHz
Less than 0.4 ohm at any frequency from 20Hz to 20kHz

P-1060D: Less than 0.1 ohm at any frequency from 20Hz to 1kHz
Less than 0.4 ohm at any frequency from 20Hz to 20kHz

P-1090D: Less than 0.09 ohm at any frequency from 20Hz to 1kHz
Less than 0.3 ohm at any frequency from 20Hz to 20kHz

Hum and Noise 110dB below rated output (20Hz to 20kHz)
115dB below rated output (IHF-A weighted)

* 0dB=0.775Vrms

* Specifications are subject to change without notice

ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The amplifier shall be a dual channel model incorporating all solid state circuitry. Power output per channel shall be a minimum of 300W (200W) [100W] with an 8-ohm load, both channels driven, at less than 0.1% THD and 0.03% IMD at or below rated output; 450W (300W) [150W] with a 4-ohm load, both channels driven, at less than 0.3% THD and 0.03% IMD at or below rated output; 900W (600W) [300W] BTL (bridged mono) mode into an 8-ohm load at less than 0.3% THD and 0.05% IMD at or below rated output.

An optional output transformer MT-1030M (MT-1020M) [MT-1010M] shall provide electrically isolated outputs for 25V, 50V, 70V and 100V systems with 300W (200W) [100W] capability at each nominal output voltage.

Hum and noise shall be 110dB below rated output over the 20Hz to 20kHz bandwidth and 115dB IHF-A weighted below rated output. Frequency response shall be +0dB, -2dB (ref. 1kHz) from 20Hz to 20kHz at any power up to rated output. Damping factor shall be greater than 130 (110) [100] for any frequency below 1kHz and greater than 35 (40) [50] below 20kHz. Input sensitivity and impedance shall be 1.23V=+4dB (ref. 0dB=0.775V) and 10k ohms. Phase shift shall not exceed ±15 degrees from 20Hz to 20kHz.

A rear panel Mode Select Switch shall provide the following modes of operation: STEREO where the two channels operate independently; PARALLEL where input 1 controls and is fed to both channels and input 2 is made inoperative; BTL where the two channels are connected in bridged configuration as a monaural amplifier controlled by input 1 and input 2 is made inoperative. The rear panel shall have the following: an input attenuator for each channel; barrier strip type screw terminals for input and output connections; a jumper to separate the signal ground from the chassis.

There shall be a rear panel port for each input that accepts optional, plug-in input modules including balancing and low/high/bandpass filter modules. All module inputs shall be electronically balanced with

provisions for optional plug-in input isolation transformer (LT-101 10k ohms). The use of an input module shall automatically provide post input level control slave outputs.

The front panel shall have one control: a combination power on/off switch and 20A (13A) [8A] circuit breaker with an integral LED power on indicator. The front panel shall have the following LED indicators for each channel: SIGNAL PRESENCE independent of the input level control that indicates a -30dB (ref. 0dB=0.775V) or greater signal at the inputs; CLIP that indicates a clipped signal; PROTECT that indicates excessive heat sink temperatures, short circuits and excessive DC voltage at the output.

Each channel shall have its own protect sensing and activation circuits including a relay on each output that disconnects the load in protect mode. Protect modes shall include heat sink temperatures over 95°C (203°F), load less than 0.5ohm/short circuit and output DC offset over ±1.2V. The relay shall also provide a 3-second turn on delay before connecting the amplifier outputs to their loads. A 15Hz high-pass filter on each input shall limit the reproduction of infra-sonic frequencies.

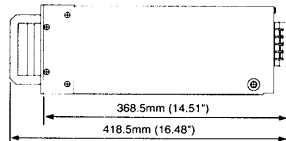
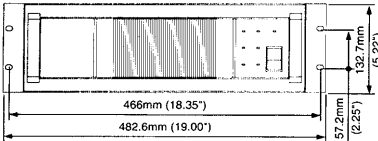
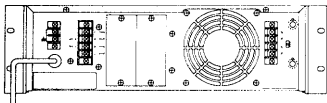
Power consumption at rated output with 8-ohm loads shall be 760VA (720VA) [300VA] and maximum for 4-ohm loads or in BTL mode shall be 1,740VA (1,300VA) [640VA]. The P-1090D (P-1060D) shall be forced air cooled with 2-speed exhaust fans and a hand removable, washable, front panel air filter. [The P-1030D shall be convection cooled].

The amplifier shall be enclosed in a durable, painted, dark gray, 1.0mm gage steel enclosure mechanically reinforced by a 2.0mm (0.787") thick aluminum front panel with a black ABS resin finish. Overall dimensions shall be 482.6W x 132.7H x 418.5Dmm (19H x 5.22W x 16.48Din.). Depth behind the front panel, including rear panel hardware, shall be 368.5mm (14.51 in.). Weight shall be 21kg (46.3lb.) (20kg (44.1 lb.)) [18kg (39.68 lb.)]. Standard E.I.A. equipment rack mounting shall be provided.

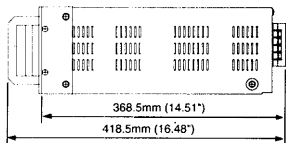
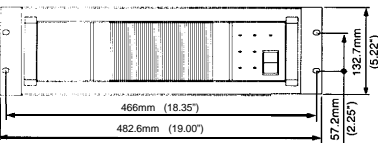
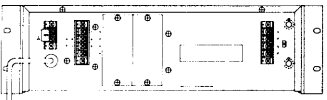
The amplifier shall be the TOA model P-1090D (P-1060D) [P-103001].

APPEARANCE AND DIMENSIONAL DIAGRAMS

P-1060D/P-1090D



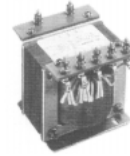
P-1030D



Note: Dimensions of P-1030D are the same as P-1060D and P-1090D, and its case and rear panel are slightly different from them.

OPTIONAL MATCHING TRANSFORMERS

MT-1010M/1020M/1030M Output Transformer



SPECIFICATIONS

Model No.	MT-1010M	MT-1020M	MT-1030M
Applicable Amplifier	P-1030D	P-1060D	P-1090D
Capacity	100W	200W	300W
Primary Impedance	8 ohms	8 ohms	8 ohms
Secondary Impedance	100 ohms (100V) 50 ohms (70V) 25 ohms (50V) 6.3 ohms (25V)	50 ohms (100V) 25 ohms (70V) 13 ohms (50V) 3.1 ohms (25V)	33 ohms (100V) 17 ohms (70V) 8.3 ohms (50V) 2.1 ohms (25V)
Frequency Response	50Hz to 20,000Hz ± 3dB		
Weight	2.4kg (5.29 lbs.)	3.2kg (7.05 lbs.)	5.2kg (11.46 lbs.)

*Specifications are subject to change without notice