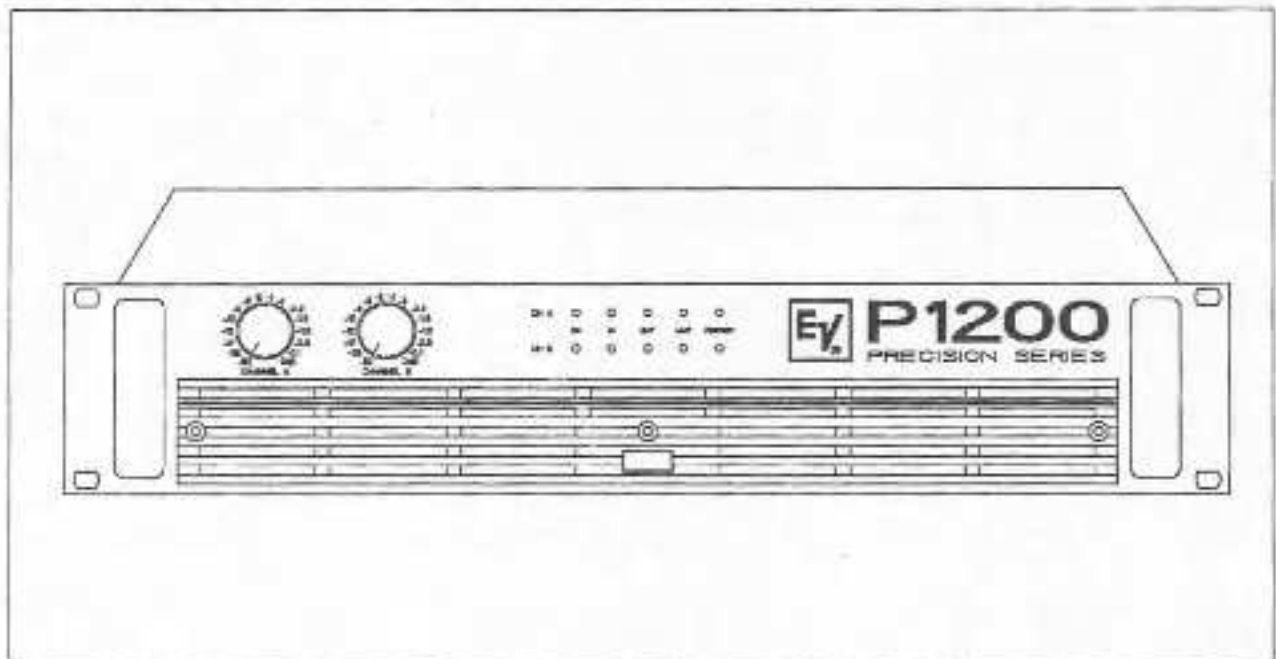


## **OWNER'S MANUAL**



**P 1200**

**PRECISION SERIES**

**DESCRIPTION**

Thank you very much for choosing an EV PRECISION SERIES amplifier. We are sure it will give you many years of satisfying performance.

EV power amplifiers of the PRECISION SERIES meet the stringent requirements of tough touring applications. They are protected against over-temperature, overload, shorted outputs, radio frequency interference and DC faults. The power transistors are protected from damage from reverse feeding of electrical energy by means of an additional special protective circuit. For the so-called soft-start, the power outputs are switched on delayed via relays. An inrush current limiter circuit prevents the mains fuses from being blown.

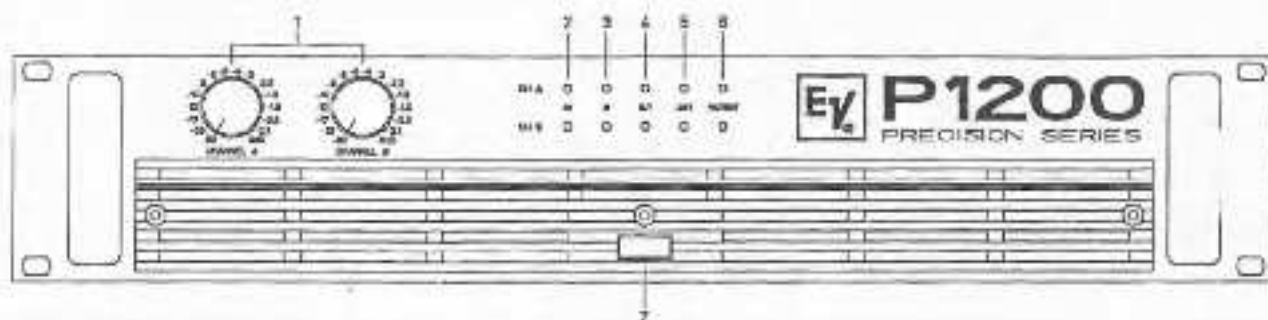
Maximum precision is also guaranteed as regards mechanical construction and finish. The robust steel chassis features remarkable torsion resistance and is specially designed to cope with the tough wear and tear associated with going on tour. Thermal stability is guaranteed by several low noise 3-stage fans which also means that they can be used inside the studio.

Comparator circuits constantly compare the power amplifiers' input and output signal and control the limiters under non-linear operating conditions. They protect the loudspeakers from overload due to power stage clipping. The PRECISION SERIES power amplifiers feature excellent transmission properties. The power amplifier topology also makes for extremely low distortion rates. Distortion factor (THD), intermodulation distortion (SMPTE-IM) and transient intermodulation distortion (DIM 30 and DIM 100) are so low that they are only detectable with the most sophisticated measuring equipment. Generously dimensioned power supplies with low-leakage toroidal-core transformers provide considerable headroom well above the nominal ratings. V/I foldback limiter circuits were deliberately not included in the PRECISION SERIES power amplifiers to facilitate operation at complex loads up to a phase angle of  $\pm 90^\circ$ .

The inputs are electronically balanced on XLR connectors. (Isolation transformers can be retrofitted). Direct Outs in the form of XLR connectors (male), to loop the signal through, are also standard features. The modes DUAL/Stereo or PARALLEL/Mono can be selected via the Input Routing Switch. Furthermore, the PRECISION SERIES power amplifiers can also be operated in "Mono Bridged" mode.

The front panel accommodates the dB-calibrated input Gain controls which are designed as especially precise and safe-to-operate detented potentiometers. The LED display provides information about the power amplifiers' operating status. For the two channels, they demonstrate readiness to operate, whether there is a signal at the input or output, when the Limiters have been activated and whether one of the protective features has been triggered. The power outputs Channel A, Channel B and Bridged Out are available on Speakon connectors. The rear side of the unit accommodates the ON/OFF switches for the integrated Hi and Lo cut filters, a groundlift switch which separates the housing from the circuit ground thus helping to prevent hum loops and the operating modes selector to mono bridged operation. They also feature extremely quiet fans with front-to-rear airflow, facilitating operation in large and narrow amplifier racks.

This Owner's Manual is meant to help you familiarize yourself with all the PRECISION SERIES' other features. Please read it through carefully and we guarantee that your new power amplifier of the PRECISION SERIES from EV will give you great pleasure.



### 1. Level Control

Calibrated detented potentiometers to alter the total gain of the power amplifier. In order to avoid distortion in mixing consoles upstream, these controls should normally be positioned between 0 dB and -6 dB. The calibrated markings show the additional attenuation directly.

### 2. Power ON indication

This LED lights up when the mains switch is pressed. If it does not light up, the unit is not connected to the mains or the mains fuse has blown.

### 3. Input indication

This LED lights up if a signal is present at the power amplifier input. The indicator does not light up when the input controls are turned down completely.

### 4. Output indication

This LED lights up if a signal is present at the power amplifier output. The indicator goes off when the speaker line has shorted or a protective circuit has been activated thus indicating that there is no signal at the speaker output terminals.

### 5. LIMIT

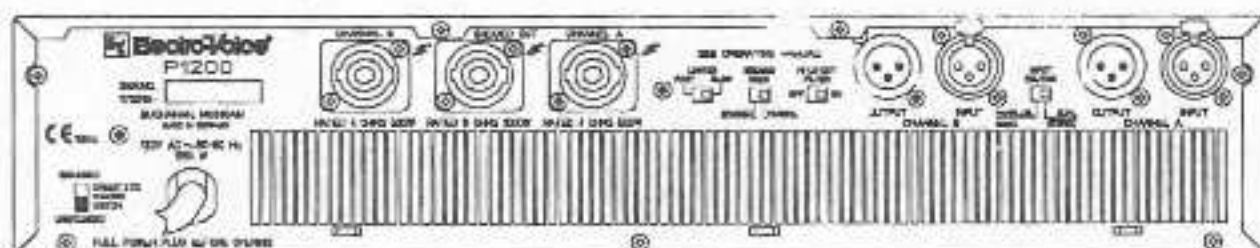
This LED lights up if the limiter has been activated and the power amplifier is being operated at the clip level. If the LED flashes briefly, this is not a cause for concern. If this LED is lit permanently, the volume should be reduced to avoid overload damages to the connected loudspeaker systems.

### 6. PROTECT

When this LED lights up during operation, one of the protection circuits against over-temperature, overload, shorted outputs, radio frequency interference or DC faults has been triggered. The cause of the error e.g. a shorted loudspeaker line must be remedied. In case of overheating, wait a little until the amplifier switches back to operating mode itself.

### 7. POWER Switch

The unit is switched on via the power switch. The loudspeaker outputs are switched on via delayed relays so that no startup transients are audible. A current limiter prevents startup peaks on the mains line and prevents the mains fuse from blowing.



## REAR SIDE

### Power amplifier input connectors

XLR connectors (male) are provided for "Looping" the signal to other power amplifiers. These are wired parallel to the XLR input connectors in each channel.

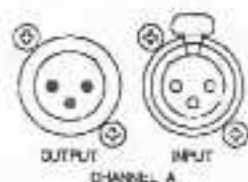
The inputs of the power amplifier are electronically balanced and wired according to IEC 268. Isolation transformers can be retrofitted in order to avoid hum interference in larger sound reinforcement systems. Please contact your dealer if you have any problems.

### Input wiring XLR

- PIN 1: SHIELD
- PIN 2: a, +, hot
- PIN 3: b, -, cold

The inputs are electronically balanced.

The input sensitivity is set to 0dBu (775 mV) by the factory. Please contact your local dealer if you want to change to 6dBu or 26 dB gain.



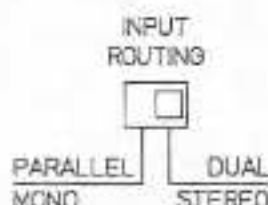
## INPUT ROUTING

### PARALLEL MONO

If the mode selector is in position PARALLEL MONO, the input connectors channel A and B are directly wired in parallel, but the volume for channel A or B can be adjusted independently using the input controls A or B.

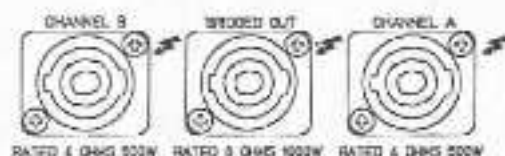
### DUAL STEREO

If the mode selector is in position DUAL STEREO, channel A and B are amplified separately.



Many mixing consoles have XLR connectors in the outputs, but are wired in such a way that they are unbalanced. If a mixer is used with unbalanced outputs, PIN 1 and PIN 3 of the power amplifier's input connectors must be connected by a jumper or PIN 3 must not be connected to the connection cable.

If signals are taken from unbalanced units via PIN 3 (b, -, cold) and PIN 2 (a, +, hot), strange hum interference or high frequency oscillations can occur. These effects can cause power amplifiers or loudspeakers to malfunction.



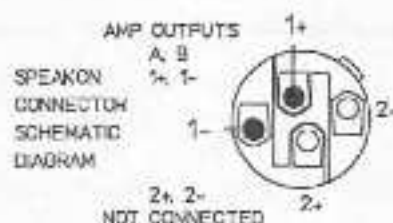
## POWER AMPLIFIER OUTPUT CONNECTORS

SPEAKON output connectors are provided for the power amplifier channels A (left) and B (right).

The Bridged Out connector for bridged operation is sealed with a plastic cover to prevent connection errors.

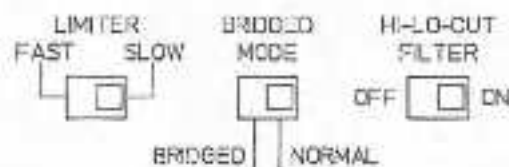
### WARNING:

Please make sure not to hook Speakers up to the BRIDGED OUTPUT in NORMAL mode or damage will result.



### LIMITER

The time constant of the built-in limiter to avoid overdriving is adjustable. Position "SLOW" is the factory preset and this should also be the normal position.



If the power amplifier is used as a MID/HI-frequency amplifier in active multi-way systems, the limiter switch should be set to "**FAST**".

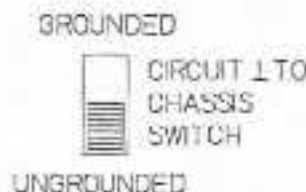
If the power amplifier is used as LOW-frequency amplifier in active multi-way systems, the limiter switch should be set to "**SLOW**".

### BRIDGED MODE

Slide switch to change from Normal Stereo mode to Bridged mode. In Bridged mode the built-in power amplifiers operate in "push-pull" and the double output voltage from channel A and B appears at the Bridged output connector. The phases of Channel A and B are in opposite and therefore the individual channels must not be used as loudspeaker outputs.

### HI-LO-CUT FILTER

This filter attenuates subsonic and high frequency signals so that the power amplifiers are not modulated with these signals. This switch should normally always be in position ON. The OFF position is only for applications where an upstream unit, e.g. a crossover or a equalizer, has integrated HI-Cut and LO-Cut filters.



### GROUND LIFT SWITCH

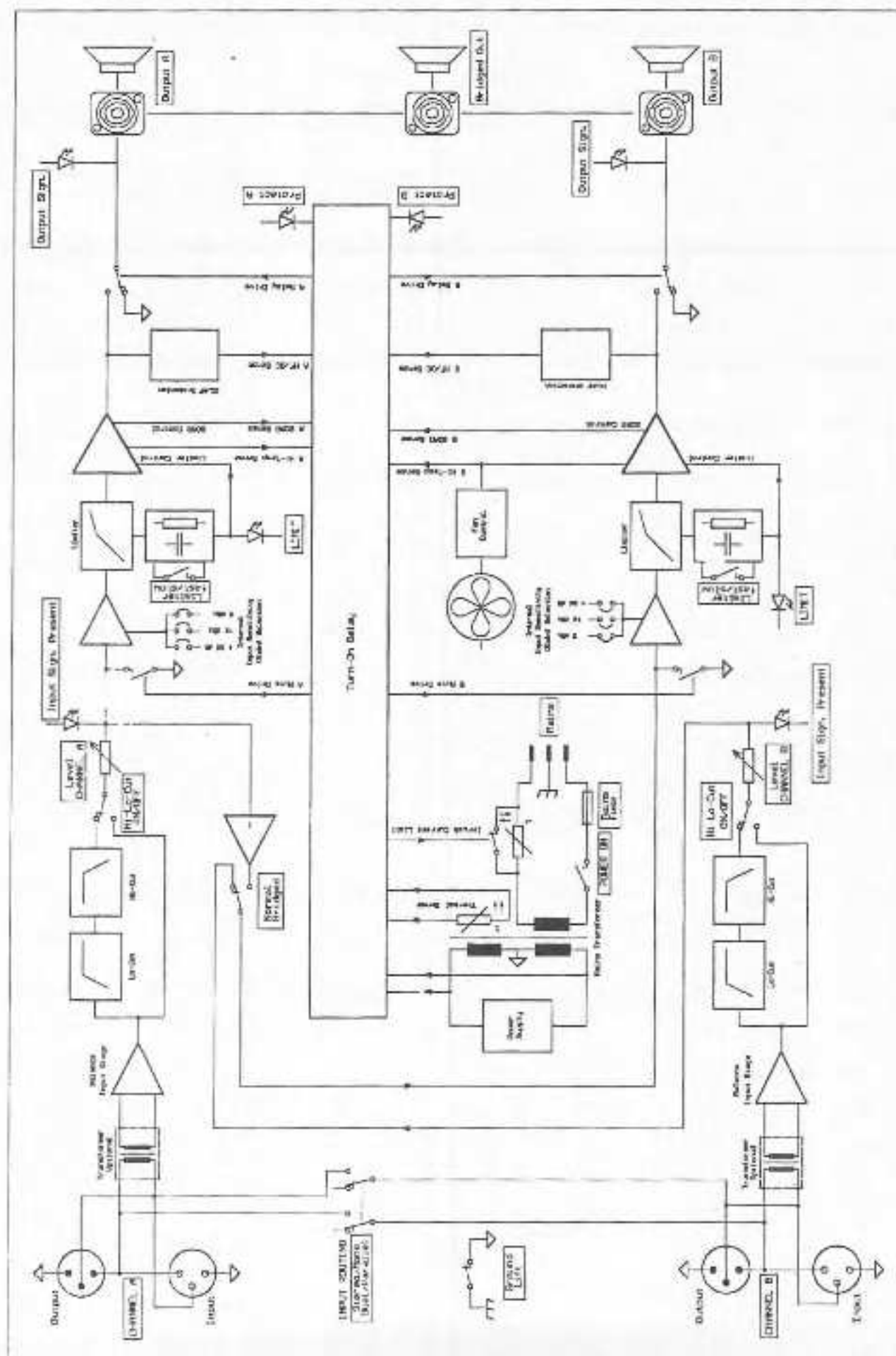
Hum loops can be avoided with the groundlift switch. If the power amplifier is operated together with other units in one 19" rack, the switch should be in GROUNDED position. If the power amplifier is used with units which have different earthing potentials, the switch should be adjusted to the UNGROUNDED position.



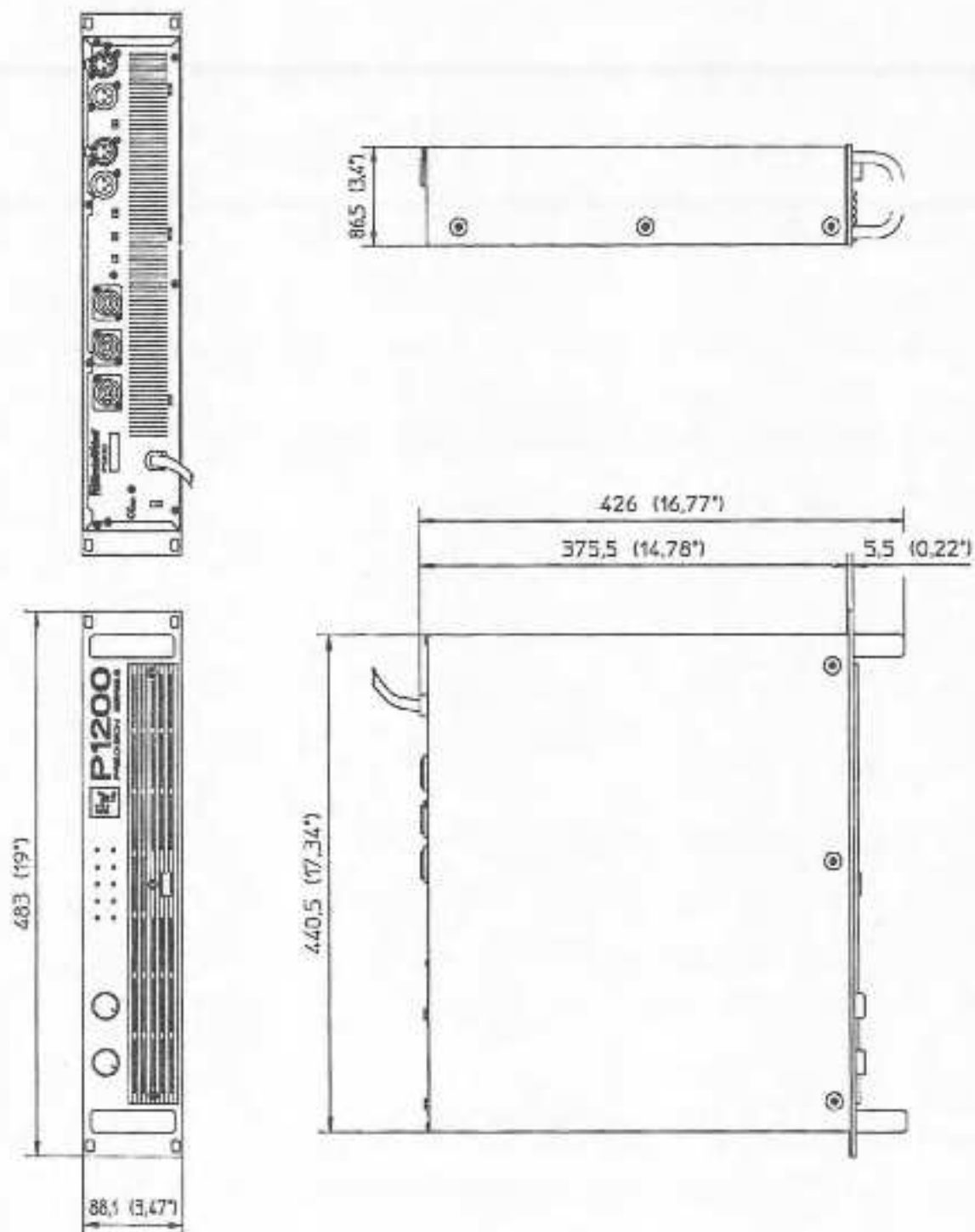
**TECHNICAL SPECIFICATIONS** at rated output power 8ohms, one channel driven, unless otherwise specified

<b>Model</b>	<b>P 1200</b>
<b>Output Power</b> (20Hz - 20kHz / THD = 0.1%)	
Into 8 Ohms	2 x 350 W
Into 4 Ohms	2 x 500 W
Into 8 Ohms bridged	1 x 1000 W
<b>Output Power</b> (1kHz / THD = 1.0%)	
Into 8 Ohms	2 x 370 W
Into 4 Ohms	2 x 550 W
Into 8 Ohms bridged	1 x 1100 W
<b>Technical Specification</b>	
Frequency Response	10 Hz - 30 kHz / -1dB
Max. Output Level before Clipping, reference 1 kHz / THD = 1%	66V / RMS
Voltage Gain reference 1kHz	26 dB (constant gain option)
Input Sensitivity at rated output power 4 ohms, reference 1 kHz	0 dBu/0.775 V 6 dBu/1.55 V
Maximum Input Level	21 dBu / 9 V
Input Impedance active balanced	20 kOhm
THD at rated output power MBW = 80 kHz, f = 1kHz	< 0.05%
IMD - SMPTE 60 Hz, 7 kHz	< 0.01%
Signal / Noise Ratio A-weighted, RMS, input sensitivity 6 dBu	> 105 dB
Crosstalk at rated output power reference 1 kHz	< -70 dB
Damping Factor Internal, 1kHz	> 300
DIM 30	< 0.01%
DIM 100	< 0.01%
Slew Rate Internal	> 30 V / $\mu$ s
Power Consumption 1/8 rated output power 4 Ohm	660 VA
Dimensions (WxHxD)	483 x 88.1 x 426 mm 19 x 3.47 x 16.77 (in)
Weight	17 kg (37.4 lbs)
Optional Input Transformer	90176

### BLOCKDIAGRAM



Dimensions in mm (inch)





## SPECIFICATIONS: P 1200 complete unit

Standard specifications: IEC 268 part 3, IHF-A

0 dBu = 775 mV (RMS)

### A. POWER SUPPLY

1. Mains:	AC
2. Rated mains voltage:	120 V
3. Rated mains frequency:	50 - 60 Hz
4. Rated power consumption:	1900 watts
5. Normal power consumption:	600 watts
6. Tolerance of mains voltage:	+/-10%

### B. INPUT CHARACTERISTICS

Input sockets	Rated Input Level *1	Max. Input Level
CHANNEL A/B	0dBu (775mV)	+21dBu (9.0V)
CHANNEL A/B *2	+6dBu (1.55V)	+21dBu (9.0V)
CHANNEL A/B *3	+9dBu (2.24V)	+21dBu (9.0V)

\*1: All level controls fully opened

\*2: Internally jumpered to +6dBu

\*3: Internally jumpered to 26dB total gain

### C. OUTPUT CHARACTERISTICS

Output sockets	Rated Load Impedance	Output Power	
		Rated Value	Max. Power before clipping
SPEAKER (A, B)	4 ohms	500W	560W
	8 ohms	250W	380W
SPEAKER BRIDGED	8 ohms	1000W	1100W

### SINGLE CHANNEL OUTPUT POWER

(measured with "Dynamic Headroom" test signal according IHF-A: 1 kHz tone burst, 20 ms ON, 480 ms OFF, 4 ohms load)

SPEAKER (A or B)	800 W
------------------	-------

### D. FREQUENCY RESPONSE

-3 dB loss against level at norm frequency

1. INPUT → SPEAKER : 6 Hz - 65 kHz  
- HI-LO-CUT off
2. INPUT → SPEAKER : 20 Hz - 40 kHz  
- HI-LO-CUT on

## E. PHASE RESPONSE

+/- 22.5 degrees (10 Hz - 30 kHz)

## F. INPUT IMPEDANCE

20 kohms

## G. AMPLITUDE NON-LINEARITIES

1. Rated Total Harmonic Distortion (1 kHz)	$k \leq 0.05 \%$
2. IMD - SMPTE - 60 Hz, 7 kHz	$k \leq 0.01 \%$
3. DIM 30	$k \leq 0.01 \%$
4. DIM 100	$k \leq 0.01 \%$

## H. CROSSTALK

- at  $f = 1$  kHz and rated power  $< -70$  dB

## I. DAMPING FACTOR

- internal at  $f = 1$  kHz

$> 300$

## J. SLEW RATE

- internal

$> 30$  V/ $\mu$ s

## K. NOISE

- $E_{(F)}$  = Noise voltage, unweighted with B = 20 Hz ... 20 kHz, RMS (IEC 268-1)
- $E_{(G)}$  = Noise voltage, frequency weighting filter according CCIR, quasi peak-weighted (IEC 268-1)
- $E_{(A)}$  = Noise voltage, dB(A) frequency-weighted, RMS (IEC 268-1)
- S/N ratios ref. rated output voltage
- HI/LO-CUT ON

### 1. Rated noise level (typ.)

	Noise-Voltage	S/N-Ratio	equiv. input noise voltage	equiv. input noise level
1.1 $E_{(F)}$	370 $\mu$ V	102 dB	6.5 $\mu$ V	- 102 dBu
1.2 $E_{(G)}$	1.1 mV	93 dBqp	17 $\mu$ V	- 93 dBu (G)
1.3 $E_{(A)}$	230 $\mu$ V	106 dBp	4.0 $\mu$ V	- 106 dBu (A)

### 2. Residual output noise (All level controls fully counterclockwise)

- 2.1  $U_{(F)}$  = 270  $\mu$ V
- 2.2  $U_{(G)}$  = 800  $\mu$ V
- 2.3  $U_{(A)}$  = 180  $\mu$ V

## L. Dimensions

Height : 88.1mm (3.47 in)  
Width : 483 mm (19 in)  
Depth : 426 mm (16.77 in)

## M. Weight

17 kg (37.4 lbs)

## TEST DATA: P 1200 complete unit

General measuring conditions unless specified otherwise elsewhere:

* Measuring Tolerance:	$\Delta X = 1.5 \text{ dB}$
* Test Frequency:	$f = 1 \text{ kHz}$
* All Levels referred to:	$E = 775 \text{ mV (0dBu)}$
* Level controls fully to the right	
* Pinning of the XLR - socket:	PIN 1 = SHIELD, GROUND PIN 2 = + INPUT PIN 3 = - INPUT
* Source impedance for feed-in via XLR socket:	$R(S) = 50 \text{ ohms}$

### 1. MAINS VOLTAGE:

$$E(P) = 120V / 60Hz$$

- can be plugged to 100V

### 2. POWER CONSUMPTION:

2.1. without load

$$P(B) = 80 - 120 \text{ W}$$

2.2 at nominal operation

$$P(B) = 1950 \text{ W}$$

### 3. ADJUSTMENTS:

#### 3.1. ADJUSTMENT OF IDLE CURRENT:

Connect a test resistor 4.7 ohms to the double jumpers J1 and J2 at pcb 84154 and measure the DC voltage over this resistor and adjust it (without load).

Adjust with VR2 or VR302

$$U_- = 5.0 \text{ mV}$$

at room temperature

Room temperature: the unit must be left to cool down for several hours, after it has been in operation.

#### 3.2. PROCESSOR (VCA) - OFFSET:

Open and close service switches S001 and S301 at the power amplifier pcb 84154 periodically and adjust with VR001 or VR301 to a minimum offset (with oscilloscope to minimum peak or by ear to minimum noise volume) at the amplifier output.

#### 3.3 Adjustment of indications

- Level control fully clockwise

-  $f = 1 \text{ kHz}$

Feed in a signal E(I) via Input A or B, until the IN LED lights up. Adjust the corresponding OUT LED to the same brightness via trimmer VR3 or VR4 on pcb 81303.

#### 4. FUNCTION TESTS:

##### 4.1 Output Offset Voltage

DC measurement at the loudspeaker outputs CHANNEL A/B

$$U_{-} \leq \pm 10 \text{ mV}$$

##### 4.2 LIMITER TEST:

###### 4.2.1 Clip Test

Drive both channels until  $E(O) = 44.7 \text{ V}$  (without load);

increase input voltage by 10 dB - LIMITER LED will light up, the output voltage will only rise by approx. 3 dB to 65 V and is slightly clipped.

###### 4.2.2 FAST/SLOW Test

Test both power amplifier channels separately:

- drive the power amplifier with a burst signal ( $f = 1 \text{ kHz}$ , 1 - 10 cycles, rate = 1 sec.),  $E(I) = 10 \text{ dB}$  higher than nominal input voltage
- monitor the output signal with an oscilloscope and switch over the FAST/SLOW switch
- SLOW: after 2 - 3 signal periods the limiter responds to the strong distortion and regulates it to a small residual distortion
- FAST: after 1-2 signal periods the limiter has already regulated the strong distortion to a small residual distortion

Position SLOW is the factory preset!

##### 4.3 POWER-ON DELAY

After approx 2 sec. the relays E001 (current limiter, pcb 85246), E001 and E301 (AF Output, pcb 84154) will pick up together.

##### 4.4. FAN CONTROL:

The fan does not run when the power amplifier is cold!

The fan can be tested with the service switch S1 on pcb 85246 by closing it briefly.

##### 4.5. SOAR PROTECTION CIRCUIT TEST:

Drive both channels separately to 44.7 V into 4 ohms . Connect a 0.1 ohm resistor parallel; protection circuit responds and always tries to switch on again!

The Protect LED flashes at the same rhythm.

##### 4.6 SHORT CIRCUIT - CURRENT LIMITER TEST:

Test the two channels individually:

- drive the power amplifier to maximum output ( $E(O) = 65 \text{ V}$ ) with a burst signal ( $f = 1 \text{ kHz}$ , 1 - 10 cycles, rate: = 1 sec.), without load
- terminate with load resistor 1 ohm:
- the short circuit current limiter limits the output voltage over the load resistor symmetrically (monitor with oscilloscope) to a peak value of approx. 30 V (approx. 30 amps).

#### 4.7 DC VOLTAGE PROTECTION CIRCUIT TEST

Test the two channels individually:

- drive the power amplifier with a test signal ( $f = 10 \text{ Hz}$ ) (without load resistor)
- the protection circuit responds at a loudspeaker output voltage of  $E(O) \approx 63 \text{ V}$  and always tries to switch on again!

The Protect LED flashes at the same rhythm.

#### 4.8 RF PROTECTION CIRCUIT TEST

Only for power amplifier pcb test!

#### 5. LEVELS CHANNEL A and B

- \* Level control fully clockwise
- \* INPUT ROUTING switch into position DUAL/STEREO
- \* HI-LO-CUT switch: ON (factory preset)
- \* BRIDGED MODE: NORMAL
- \* LIMITER: SLOW (factory preset)

##### 5.1 Nominal Levels

Input	E(I)	Test point	E(O)	Comment
CH. A/B	775 mV	SPEAKER A/B	44.7 V	
CH. A/B	1.55 V	SPEAKER A/B	44.7 V	J2/5 jumpered internally
CH. A/B	2.24 V	SPEAKER A/B	44.7 V	J3/6 jumpered internally

##### 5.2 Max. Input Levels

Input	E(I)	Test point	E(O)	Comment
CH. A/B	9.0 V	SPEAKER A/B		
CH. A/B	9.0 V	SPEAKER A/B		J2/5 jumpered internally
CH. A/B	9.0 V	SPEAKER A/B		J3/6 jumpered internally

#### 6. INPUT ROUTING Switch

DUAL/STEREO (factory preset!)

- Channels A and B must be driven separately

PARALLEL/MONO

- Channels A and B are switched in parallel at the input; both channels can be driven by one signal source.

#### 7. BRIDGED MODE Switch

NORMAL (factory preset!)

BRIDGED: The double output voltage is available at the BRIDGED OUT socket  
The CHANNEL A input socket must be used; the CHANNEL B input socket has no function

## 8. GROUND LIFT Switch

GROUNDING : factory preset

Check the correct function of the switch with an ohm-meter:

- Circuit ground (at the input or output socket) is connected or disconnected with chassis ground (contact at the earth-terminal screw at the rear or protective-conductor of the mains cable)

## 9. Harmonic Distortion

9.1 Rated Total Harmonic Distortion (1 kHz; 8 ohms load)

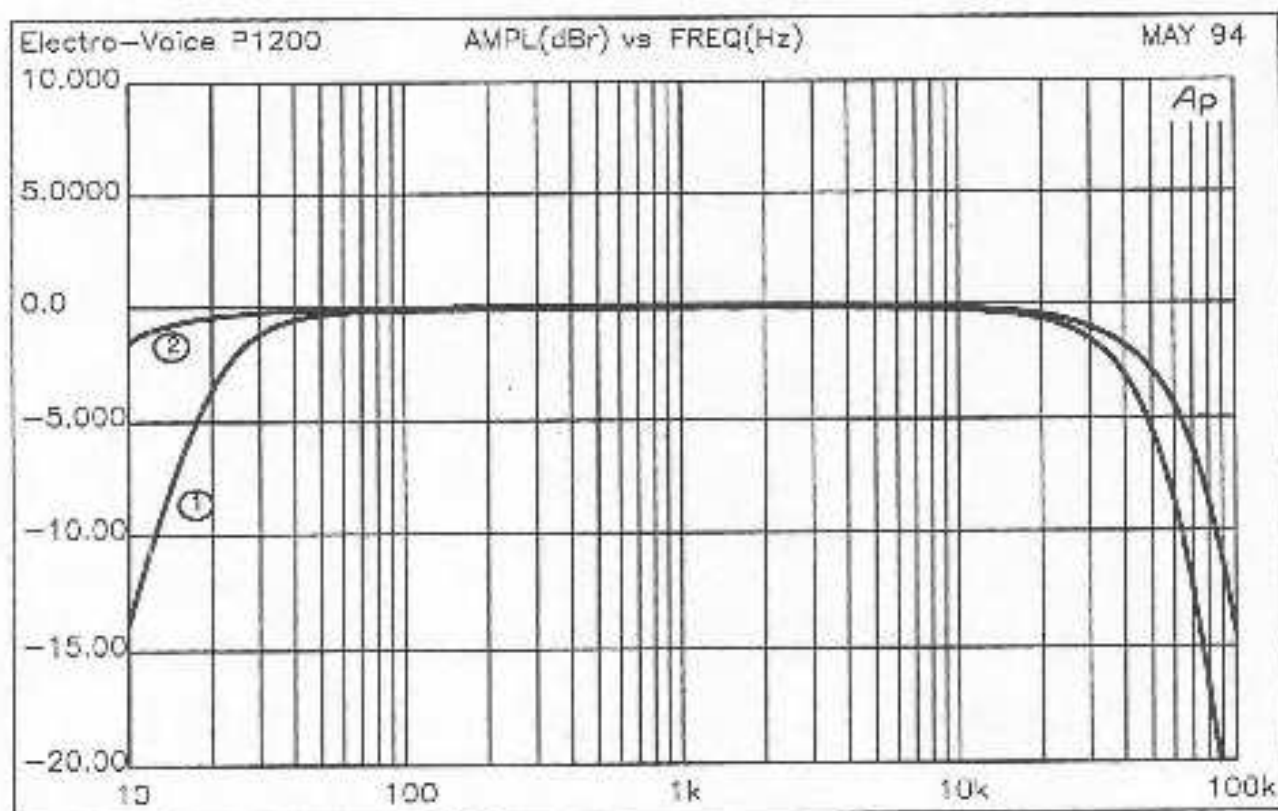
$$k \leq 0.005 \%$$

9.2 Norm Total Harmonic Distortion (1 kHz; -10dB; 8 ohms load )

$$k \leq 0.009 \%$$

## 10. Frequency responses

- Feed in E(I) via input
- E(O) at SPEAKER A/B
- Curve 1: HI-LO-CUT ON
- Curve 2: HI-LO-CUT OFF





## # SERVICE INFORMATION

**WARNING:** No user serviceable parts inside. Extremely hazardous voltages and currents may be encountered within the chassis. The servicing information contained within this document is only for use by Electro-Voice Authorized warranty repair stations and qualified service personnel. To avoid electric shock DO NOT perform any servicing other than that contained in the Operating instructions unless you are qualified to do so. Otherwise, refer all servicing to qualified service personnel.

**NOTICE:** Modification to Electro-Voice products is not recommended. Such modifications shall be at the sole expense of the person(s) or company responsible, and any damage resulting therefrom shall not be covered under warranty or otherwise.

### #.1 ORDERING REPLACEMENT PARTS

TO ORDER REPLACEMENT PARTS, LOOK UP THE ORDERING NUMBER FROM THE COMPONENT PARTS LISTING AND CALL E. S. T. (616) 695-6831, FAX (800) 685-6386, OR WRITE:

ELECTRO-VOICE SERVICE  
600 CECIL STREET  
BUCHANAN, MICHIGAN 49107  
U. S. A.

### #.2 ELECTRO-VOICE UNIFORM LIMITED WARRANTY STATEMENT

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/685-2606). **Incidental and Consequential Damages Excluded:** product repair or replacement and return to the customer are only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Electro-Voice Electronics** are guaranteed against malfunction due to defects in materials or workmanship for a period of three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

### #. 3 Technical Assistance

For applications assistance or other technical information, contact the Applications Engineer. You can call (616) 695-6831, FAX (616) 695-1304, or write:

Electro-Voice Applications Engineer 600 Cecil Street Buchanan, MI 49107 U. S. A.

Electro-Voice a MARK IV company



600 Cecil Street, Buchanan, Michigan 49107, Phone (616) 695-6831, Fax: 616-695-1304  
8234 Doe Avenue, Visalia, California 93291, Phone (209) 651-7777, Fax: (209) 651-0164  
Mark IV Audio Canada, Inc. 345 Herbert St., Genanoke, Ontario, Canada K7G 2V1, Phone (513)382-2141,  
Fax (513)382-7466