

Technical Specifications: X1202 / P1202

Amplifier at rated conditions, both channels driven, 8Ω loads, unless otherwise specified.

X1202 / P1202

Load Impedance	8Ω	4Ω	2Ω
Maximum Midband Output Power THD = 1%, 1kHz	2 x 380 W	2 x 600 W	2 x 850 W
Rated Output Power THD < 0.2%, 20Hz ... 20kHz	2 x 250 W	2 x 500W	-----
Max. Single Channel Output Power Dynamic-Headroom, IHF-A	460 W	880 W	950 W
Maximum RMS Voltage Swing THD = 1%, 1kHz		64 V	
Voltage Gain at 1kHz		30 dB	
Slew Rate at 1kHz		30 V/μs	
Power Consumption at 1/8 maximum output power @ 4Ω		870 W	
Input Sensitivity at rated output power @ 4Ω, 1kHz		1,4 V	
THD at rated output power, MBW = 80kHz, 1kHz		< 0.05 %	
IMD-SMPTE 60Hz, 7kHz		< 0.08 %	
DIM30 3.15kHz, 15kHz		< 0.03 %	
Crosstalk Attenuation ref. 1kHz, at rated output power		> 80 dB	
Frequency Response -1dB, ref. 1kHz		13 Hz ... 45 kHz	
Power Bandwidth THD = 1%, ref. 1kHz, half power @ 4Ω		10 Hz ... 50 kHz	
Input Impedance 20Hz ... 20kHz, balanced		20 kΩ	
Damping Factor at 100Hz / 1kHz, 8Ω		> 300 / > 200	
Signal to Noise Ratio A-weighted		106 dB	
Power Requirements	240V,230V,120V,100V / 50Hz ... 60Hz,factory configured		
Protection	Audio limiters, High temperature, DC, HF, Back-EMF, Peak current limiters, Inrush current limiters, Turn-on delay		
Cooling	Front-to-rear, 3-stage-fans		
Safety Class	I		
Dimensions (W x H x D), mm	483 x 132.5 x 426		
Weight	17 kg		
Optional			
Input transformer	NRS 90208 (121 641)		
Rear rack-mount 15,5“	NRS 90235 (112 733)		
Rear rack-mount 18“	NRS 90223 (112 701)		

MEASURED DATA	X1202 / P1202
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The measured data apply to the following appliances:

Unit Model	Unit Number	Mains Voltage	Mains Frequency
X1202	112 737	230V	50 - 60 Hz
X1202		240V	50 - 60 Hz
X1202		100V	50 - 60 Hz
X1202		120V	50 - 60 Hz
P1202	170 151	230V	50 – 60 Hz
P1202	170 150	120V	50 – 60 Hz
P1202	170 196	100V	50 – 60 Hz

MEASURED DATA: X1202 / P1202 power amplifier

Printed boards name and corresponding EDP numbers:

Printed boards EDP numbers			
100V	120V	230V	240V
81344	81 344	81 344	81 344
84 200	84 200	84 193	???

Printed board part	Index
Main PCB	84193/1 / 84200/1
LED PCB	84193/2 / 84200/2
Supply PCB	84193/3 / 84200/3
Bus PCB	84193/4 / 84200/4

Testing Conditions – unless differently stated:

- Measuring tolerance: $\Delta X = \pm 1.5\text{dB}$
- Measuring frequency: $f = 1\text{kHz}$
- Stated level values referred to: $U = 775\text{mV (0dBu)}$
- Level control set to clockwise margin
- XLR – socket pin-assignment:
 - PIN 1 = MASSE/SHIELD
 - PIN 2 = + INPUT
 - PIN 3 = - INPUT
- Source impedance for signal-feed via XLR – socket: $R(Q) = 50\Omega$
- The AMPLIFIER PCB offers **service connectors**.

CNS1X		CNS2X	
PIN	Assignment	PIN	Assignment
1	-Vcc	1	LIM A Switch
2	BIAS +A	2	-15V
3	BIAS -A	3	LIM B Switch
4	FAN Voltage	4	+15V
5	+Vcc	5	AGND
6	BIAS +B	6	Speaker Out A
7	BIAS -B	7	Relay/Protect
8	Temp Heat sink	8	Speaker Out B

1. Operating Voltage:

U(B) = 230V 50Hz ... 60Hz / U(B) = 120V 50Hz ... 60Hz

2. Operating Voltage Deviation Range: -30% +10%**3. Power Consumption****- Driven with sine signal f= 1kHz (both channels driven)**

	X1202 / P1202
Idling Power Consumption	40 - 80 W
Nominal Power Consumption (RL=4Ω)	1900 W
Standard Power Consumption (RL=4Ω)	600 W
Maximum Power Consumption (RL=4Ω)	2100 W
Power Consumption at 1/8 of the Max. Output Power	760 W
Power Consumption at 1/8 of the Max. Output Power at 10% Mains Overvoltage	870 W

4. Settings/Adjustments**4.1. IDLING CURRENT ADJUSTMENT**

Connect a DC-voltmeter to the BIAS measuring points (see service connectors) and adjust the idling current via the trimmers VR101/VR301 (on the Main PCB printed board assembly). Performing the adjustment, set both power amplifier channels to U(DC) = 7.5mV. Adjusting the idling current has to be performed at normal room temperature. If the power amplifier has previously been operated, it has to be given several hours of time for regaining normal temperature.

4.2. VCA - OFFSET

Rhythmically open and short-circuit CNS2X.1 and CNS2X.2 for channel A and CNS2X.3 and CNS2X.2 respectively for channel B on the Main PCB printed board assembly. Use VR100 and VR300 respectively to adjust the power amplifier output to their minimum offset value (with oscilloscope to minimal peak value or to the audible minimum volume of the interfering pulse).

5. Function Test**5.1. OUTPUT – Offset voltage**

DC-measurement at the loudspeaker outputs SPEAKER A/B with U(DC) ≤ ±10mV.

5.2. LIMITER**5.2.1. Attenuation Test**

Both channels separately driven with a 1 kHz signal and up to U(A) = 49V (without load). Increase the input voltage by 10 dB. The LIMITER LED lights and the output voltage ascends by approximately 2dB to approximately 64V while slightly clipping. The distortion rate of the limited signal is at THD = 1.0 ... 1.5%. Further increasing the input signal up to a value of + 20 dBu should not result in remarkably higher clipping.

5.2.2. Attack and Release Times

Tests have to be performed for both power amplifier channels individually and without load resistors connected.

1.) Drive the power amplifier with a burst signal (f = 1kHz, 10 cycles, rate : ≈ 0.5 sec.) and U(E) = +10dBu at the Power Amp Input.

2.) Monitor the output signal via oscilloscope. After 3 to 4 signal periods, the limiter has controlled the high distortion down to a minor residual distortion (THD = 1% 1.5%)

Attack Time: 3-4 ms

Release Time: 30-40 ms

5.3 POWER-ON DELAY

Make sure that the signal is present at the power amplifier input. Switch the power amplifier via the Power-ON switch on. Approximately 2 seconds after switching the power on, the signal will be present at the output.

5.4 FAN CONTROL

Upon switching the power amplifier's power on, the fans will run for approximately 2 seconds and stop when the power amplifier has regained "normal" temperature. In idling condition (Power-ON, no signal present) the fans are switched between SLOW and OFF (0V) mode, depending on the heat sink's temperature. Connecting CNS1.8 via 5k1 resistor to +15V lets the fans run in SLOW mode. Measure the fan voltage 18Vdc between pin CNS2.4 and pin CNS1.4. Removing the connector CN5 lets the fans run in FAST mode. Measure the fan voltage 28Vdc between pin CNS2.4 and pin CNS1.4.

5.5. SOAR-PROTECTION TEST

Channels separately driven up to 49V in 4 Ω . Parallel-connect a 1 resistor. The protection circuit reacts and continuously tries to re-start! The protect-LED lights. Repeat the test with a 2 resistor. The power amplifier should not switch off.

5.6. SHORT-CIRCUIT CURRENT-LIMITING TEST

Tests have to be performed for both power amplifier channels individually and without load resistors connected:

- drive each channel with a burst signal ($f = 1\text{kHz}$, 1-3 cycles, rate $\approx 1\text{ sec.}$), with $U(E) = 0\text{dBu}$
- connect a 1 Ω load resistor
- the short-circuit current-limiter limits the output voltage at the load resistor symmetrically (monitor via oscilloscope) to a peak voltage value of 35V (approximately 35A maximum Peak Output Current).

5.7. DC-VOLTAGE PROTECTION TEST

Tests have to be performed for both power amplifier channels individually:

- feed a test signal ($f = 7\text{ Hz}$) to the power amplifier without load resistors connected.
- starting at an input voltage of approximately 3V_{peak}, the protection circuit reacts and continuously tries to re-start!
The protect-LED blinks in the same frequency.
- Repeat the test with $f = 14\text{Hz}$. The power amplifier should not switch off.

5.8. HF-PROTECTION TEST

Caution: Perform tests without load resistor connected to the power amplifier only.

Individually feed a +20dBu sine burst signal $f = 100\text{kHz}$ (40ms ON, 960ms OFF) to each power amplifier channel input. The protection circuit has to react. The power amplifier continuously tries to re-start. The PROTECT-LED blinks in the same frequency.

Repeat the test with $f = 50\text{kHz}$. The power amplifier should not switch off.

5.9. INDICATOR TEST

Feed a 1kHz sine signal while slowly increasing it. At approximately -25dBu the SIGNAL-LED starts lighting and at approximately +8dBu the LIMIT-LED lights.

6. Levels CHANNEL A & B

6.1. VOLTAGE AMPLIFICATION

Unit	Input	U(E)	Measuring point	U(A)	Load Resistor	Test frequency
X1202 / P1202	CH. A/B	6dBu	SPEAKER A/B	49V		1kHz

6.2. MAXIMUM INPUT LEVEL: $U(E) = +21\text{dBu}$

7. GROUND LIFT-switch

The circuit ground (at the input or output connector) is measured against the enclosure ground (contact on the ground-screw on the rear of the appliance or ground contact on the mains plug).

Switch set to GROUND : R = 0Ω

 UNGROUND : R = 5Ω

8. Amplitude – Non-Linearity

- measured with a 8Ω load resistor connected, Dual Mode

- MBW = 80kHz

Test	At nominal output power	Remarks
	X1202 / PX1202	
THD+N (f = 1kHz)	< 0,05 %	
IMD-SMPTE	< 0,08 %	60 Hz, 7 kHz
DIM 30	< 0,03 %	3,15 kHz, 15 kHz

9. Frequency Response

Linear Frequency Response (mind border frequencies)

	Lower border frequency	Upper border frequency
-3dB	fu < 10Hz	fo = 85kHz
-1dB	fu = 13Hz	fo = 45kHz

10. Noise Interference

- U(F) = extraneous voltage non-weighted with B = 22 Hz ... 22 kHz, effective value (IEC 268-1)

- U(G) = noise voltage, frequency-weighting filter according to CCIR-468-3, quasi peak-weighted (IEC 268-1)

- U(A) = interference voltage A-weighted, dB(A), effective value (IEC 268-1)

- S/N ratio ref. to max. output voltage into 4 ohms = 55.1 V (+37 dBu) and interference voltage A-weighted

Power Amp	Output	U(F) dBu	U(G) dBu	U(A) dBu	GAIN dB	IN(A) dBu	S/N-R. dB	Remarks
X1202 / P1202	SPEAKER OUT A&B	- 67,5	- 58	- 71	30	- 101	106	INPUT A&B R(Q) = 50Ω

11. Heat Sink Temperature

DC-voltages measured between CNS1X.8 and CNS2X.5 (GNDA)

Heat sink temperature	25°C	40°C	60°C	80°C	100°C	120°C	130°C
	1.5 V	3.0 V	6.0 V	9.0 V	12.0 V	13.0 V	13.8 V

The switch-off point is at approx. 130 °C. The power amplifier enters Protect-Mode.

12. SLOT-Specification

The power amplifier X1201 (P1201) is capable of providing a maximum current of ±300mA for individual modules with ± 15V operating voltage.

- measured at 10 % mains undervoltage.

	Power consumption:
Xi-11 / Xi-21 – Input modules	Approx. 18 mA
V – Front modules	Approx. 70 mA
I-1 Input module	Approx. 18 mA
MRx-Front modules	Approx. 70 mA

13. Dimensions and Weight

Power Amplifier	Weight	Dimensions in mm
X1202 / P1202	17 kg	483 x 132.5 x 385.5

14. Input Connector Pin-Assignment - CN7 and Module Slot Connectors - CNSLA/B

CN7		CNSLA/B		CNSLA/B	
PIN	Assignment	PIN	Assignment	PIN	Assignment
1	-15V	1a/1b	SWB1 (Select)	9a	KA1 (Module ID)
2	GNDA	2a/2b	SIGNALB1 (Signal Out)	9b	KA2 (Module ID)
3	Sensout A	3a/3b	LIMINB (Limiter Input)	10a/10b	+15V
4	Return A	4a/4b	AMPB2 (alt. Output 1in2)	11a/11b	AMPA2 (alt. Output 1in2)
5	Sensin A	5a	KA4 (Module ID)	12a/12b	LIMINA (Limiter Input)
6	Signal A	5b	KA5 (Module ID)	13a/13b	BUSREFA
7	GNDA	6a/6b	-15V	14a/14b	SIGNALA1 (Signal Out)
8	GNDA	7a	GNDA	15a/15b	SWA1 (Select)
9	Signal B	7b	KA3 (Module ID)	16a/16b	SIGNAL M (Signal In)
10	Sensin B	8a/8b	GNDA		
11	Return B				
12	Sensout B				
13	GNDA				
14	+15V				

15. Remote Control Connector Pin-Assignment CNRC / CNRC5V

CNRC		CNRC		CNRC5V	
PIN	Assignment	PIN	Assignment	PIN	Assignment
1	AMPA2	18	n.c.	1	GND-D
2	+5V	19	HTSNKTMP	2	GND-D
3	COLD CUR+	20	n.c.	3	POWER-ON
4	+5V	21	HOT CUR- (68Ω/⊥)	4	GND-D
5	COLD CUR-	22	n.c.	5	GND-D
6	KA1	23	HOT CUR+ (68Ω/⊥)	6	+5V
7	LIM-OUTA	24	n.c.	7	+5V
8	KA2	25	AMPB2 (68Ω/⊥)	8	LED-STANDBY
9	n.c.	26	GND-D		
10	KA3	27	GND-D		
11	POWER-ON	28	GND-D		
12	KA4	29	GND-D		
13	STBYLED	30	AID5 (10Ω/⊥)		
14	KA5	31	AID4		
15	TIMER	32	AID3		
16	n.c.	33	AID2		
17	RELAYDRV	34	AID1		

16. Amplifier-ID

AID1:	1	MSB
AID2:	1	↓
AID3:	1	↓
AID4:	1	↓
AID5:	1	LSB

Bin: 11111