

Performance Features

Power amplifier with 200 W or 400 W output power according to the IEC 283-3 standard within a 19" - cabinet (3 HU) providing the following functions:

- supported are 115/230V AC mains as well as 24V DC emergency power source
- power amplifiers DPA 4120 providing 200 W or DPA 4140 providing 400 W output power, idling and short-circuit protection
- output transformer for balanced, floating 100 V speaker networks of optionally 70 V, 50 V or 4 ohms for low-impedance operation
- optional input modules:
 - standard operation INPUT MODULE with level control, electronically balanced input and MONITOR output with optional transformer or
 - REMOTE MODULE for controlling and monitoring the PROMATRIX system, electronic level controls, electronically balanced input and MONITOR output with optional transformer
- integrated stand-by power supply
- mains POWER ON/OFF switch
- ground lift switch
- remotely controllable mains and battery operation with initial current inrush limiter
- power-on switching noise suppression
- status-LED indicators for operation (READY), STANDBY, thermal overload (PROTECT) and occurrence of GROUND FAULT conditions at the power output
- fault message according to the IEC 849 standard
- TEST button to switch between system and average operation, respectively a RESET button to restart after the occurrence of ground fault conditions
- LED level meter instrument with a display range of -13 dB to 0 dB and CLIP
- integrated relays for single call and obligatory reception
- active, temperature controlled ventilation
- pilot tone and ground fault surveillance module according to the DIN/VDE 0800 standard (optional)

The extension-kit NRS 90208 (input transformer) has been integrated in the input module NRS 90222 starting with the serial number 10461 and in the input module NRS 90225 starting with the serial number 12339 and higher.

IMPORTANT SAFETY INSTRUCTIONS

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.		
AVIS: RISQUÉ DE CHOC ELECTRIQUE. NE PAS OUVRIR.		
WARNING: CONNECT ONLY TO MAINS SOCKET WITH PROTECTIVE EARTHING CONNECTION.		



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated „dangerous voltage“ within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufactures instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
15. To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
16. The mains plug of the power supply cord shall remain readily operable.



Management of WEEE (waste electrical and electronic equipment) (applicable in Member States of the European Union and other European countries with individual national policies on the management of WEEE) The symbol on the product or on its packaging indicates that this product may not be treated as regular household waste, but has to be disposed through returning it at a Telex dealer.

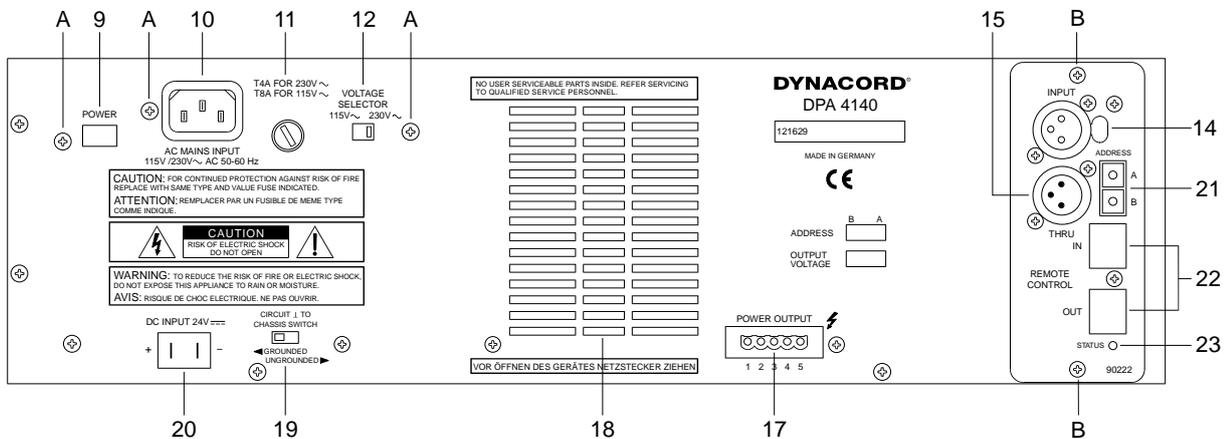
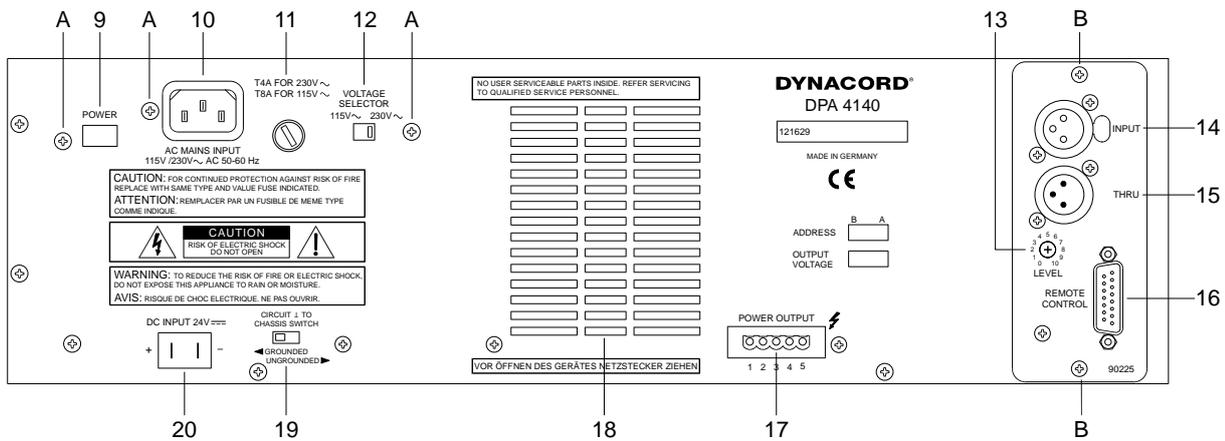
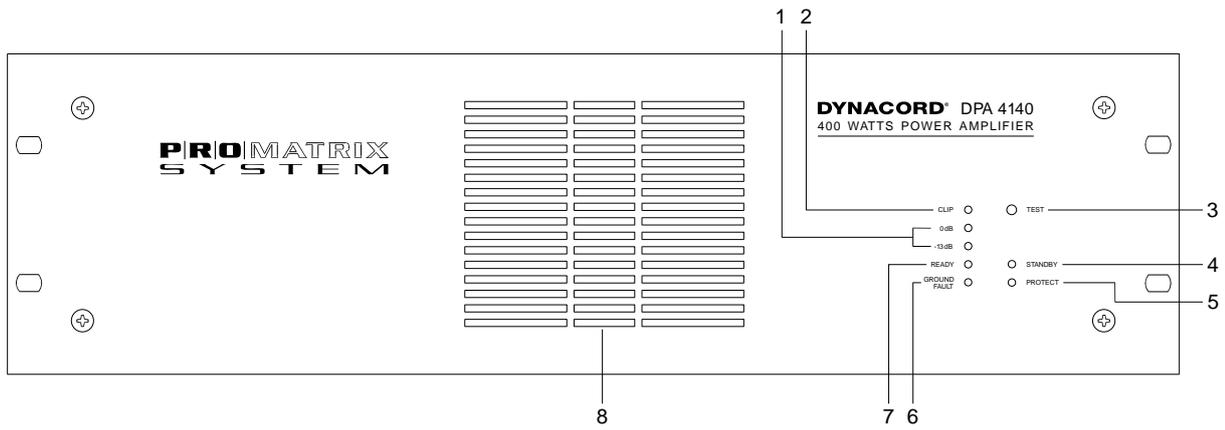
IMPORTANT SERVICE INSTRUCTIONS

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Security regulations as stated in the EN 60065 (VDE 0860 / IEC 65) and the CSA E65 - 94 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains.
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal enclosure), respectively between the mains poles has to be 3 mm and needs to be minded at all times. The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be 6 mm and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the location where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of MOS - circuits have to be observed.

NOTE:  **SAFETY COMPONENT (MUST BE REPLACED BY ORIGINAL PART)**

Indicators, controls and connections



- | | |
|---|---|
| 1 level meter instrument | 16 REMOTE CONTROL connector |
| 2 CLIP indicator | 17 POWER OUTPUT |
| 3 Test and Reset button TEST | 18 Ventilation louvres |
| 4 STANDBY indicator | 19 CIRCUIT ⊥ TO CHASSIS SWITCH |
| 5 Fault indicator PROTECT | 20 DC INPUT 24V = (battery) |
| 6 Fault indicator GROUND FAULT | 21 IDENT ADDRESS switch |
| 7 Mode indicator READY | 22 REMOTE CONTROL connectors |
| 8 Ventilation louvres | 23 STATUS indicator |
| 9 Mains power switch POWER | A locking screws power supply printed board |
| 10 Mains power connector AC MAINS INPUT | B locking screws INPUT MODULE |
| 11 Mains fuse FUSE | |
| 12 Mains VOLTAGE SELECTOR | |
| 13 Input LEVEL control | |
| 14 INPUT socket | |
| 15 THRU socket | |

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1. Utilization

The amplifiers DPA 4120 and DPA 4140 are specially designed for the power-consistent and reliable operation of PA-systems. The DPA 4120 and DPA 4140 are intended to be used in company intercom, alarm and background music transmission installations, offices and commercial areas, congregation and sport centers, schools, churches, hotels, hospitals, shopping malls and super markets, cruise ships, and other similar applications.

2. Installation

When installing the amplifiers, it is important to assure that for ventilation reasons the front-to-rear air circulation is guaranteed (for details on 19"-case or 19"-rack shelf installation please refer to paragraph 9).

To maintain EMC it is necessary that all input, output, and control lines – except for the power cords – are shielded. Within metal housings or closed rack shelf systems, unshielded output and control cabling is allowable. Shielding is accomplished by connecting the individual cable screens to the enclosure or rack shelf ground potential.

The amplifier has to be protected from:

- water drops or splashes
- direct sunlight
- high ambient temperatures and the direct radiation of heat sources
- high humidity and moisture
- heavy dust
- massive vibrations

Moving the amplifier from a cold into a warm environment can result in the occurrence of condensation on inner parts. Operating the appliance is only permissible after it has accommodated to the altered temperature (approximately after one hour).

Should it happen that foreign solid parts or liquids inadvertently intrude the enclosure, unplug the device from the power source and have it checked by a DYNACORD service center, before using it again.

Cleaning the appliance should not be performed using chemical solvents or sprays, as this might damage the finish and moreover could cause hazard fire.

3. Before the first operation

These power amplifiers are designed to be operated with different input modules. The general input module NRS 90225 is meant for all conventional applications. It allows to remotely start the amplifiers via control lines, monitor their operation by use of the incorporated fault relay, and monitor the transmitted audio signals through the monitor output. Using the remote control module NRS 90222, the amplifiers are connected to the PROMATRIX manager DPM 4000 via RS-485 remote interface providing complete remote operation and surveillance. The desired input module has to be inserted into the module shaft on the rear of the power amplifier. It has to be tightened using the two locking screws (B) (refer also to the paragraphs 8.1 and 8.2).

3.1 Mains operation

For normal AC mains operation, the included mains cord has to be connected to a 230V or 115V 50/60Hz wall outlet. On the appliance itself, the cord has to be connected to the 3-pole mains socket (10).

Caution

The appliance is factory preset to **230V AC**. Switching to 115V AC is accomplished using the voltage selector (12).

DPA 4120: For **115V AC** operation, the mains fuse (11) has to be replaced by a **slow blowing 4 ampere type**, labeled "**T4A**" (see also paragraph 11.1).

DPA 4140: For **115V AC** operation, the mains fuse (11) has to be replaced by a **slow blowing 8 ampere type**, labeled "**T8A**" (see also paragraph 11.2).

If the appliance is correctly connected and mains is present the green STANDBY indicator (4) will light. To remotely start the amplifier when it is being operated on the mains, it is necessary to interconnect the contacts 3 - POWER REMOTE and 2 - GROUND STANDBY on the pin terminal strip REMOTE CONTROL (16) (see also paragraph 5.6).

The main power switch POWER (9) on the rear of the appliance is meant for service and maintenance purposes. This allows bridging the mains switching relay, which provides the possibility to operate the amplifier without remote start.

Note The main power switch POWER (9) on the appliance's rear is **only** meant for maintenance. Remotely switching off the device is not possible when the POWER switch is engaged.

Both amplifiers, the DPA 4120 and the DPA 4140, employ power-on switching delays of approximately 3 sec. After this time, the green READY indicator lights and the READY fault message relay picks up when no error is being detected (see also paragraph 6.2).

3.2 Battery operation 24V DC

The amplifiers, DPA 4120 and DPA 4140, use the mains or alternatively an external 24V battery as power source. Switching to battery is performed via integrated relays.

The battery has to be connected on the rear of the amplifiers (20) using **insulated** 6.3x0.8 mm AMP flat plug connectors. The amplifiers are protected against polarity-mismatch. Each, the positive and negative conductors are internally protected by fuses, located on the printed board assembly 85270 (DPA 4120) respectively 85268 (DPA 4140) (see also paragraph 11, figure 10 and 11).

The cable used for battery connection has to be at least 1.5 mm² in diameter (DPA 4120) respectively 2.5 mm² (DPA 4140). Using these diameters, the cable length for the one way distance should not exceed 4.0 m (max. voltage drop <1V).

Caution The DPA 4120 and DPA 4140 are to be operated only using ungrounded batteries or batteries with grounded negative pole. Operation with grounded positive pole is not permissible.

4. INPUT

The electronically balanced INPUT (14) providing a sensitivity of 775mV = 0dBu is meant for the connection of control amplifiers. In case it is intended to supply several power amplifiers with identical input signals, these signals can be taken from the THRU connector (15) (see also figure 1 and 2).

The input is prepared to be retrofitted with a input transformer. In case a floating input is needed, it is necessary to install the optional extension NRS 90208 (see also paragraph 8.3).

On the general input module NRS 90225 the input level is set with the level control (13). For the remote control module NRS 90222 the input level is determined by the setting of the internal electronic level control of the PROMATRIX manager DPM 4000 (please also refer to the PROMATRIX handbook).

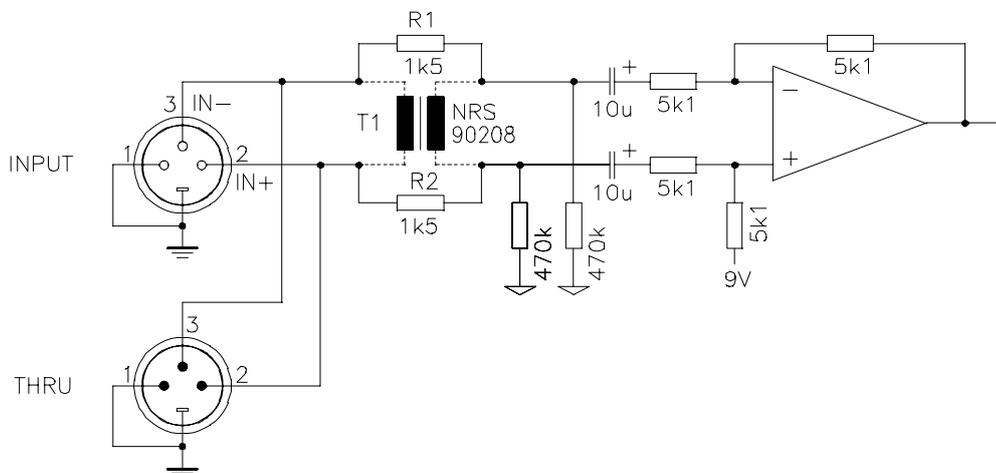


figure 1 connections of the input sockets

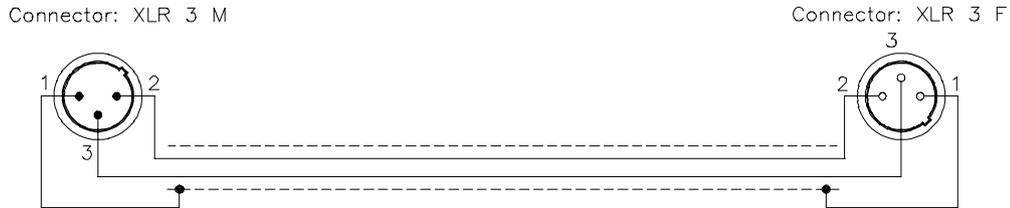


figure 2 LF cable for coupling two amplifiers DPA 41xx

5. Outputs

5.1 POWER OUTPUT

The power output is balanced and off-ground potential. The output is factory-configured for the connection of 100V loudspeaker systems. Connection has to be performed by inserting the supplied 5-pole plug into the power output socket (17). Switching the output voltage to 70V, 50V or to low impedance operation (4 ohms) is possible using the plug-in bridge B411 on the printed board assembly 84187 (DPA 4120) respectively 84175 (DPA 4140) (see also paragraph 7).

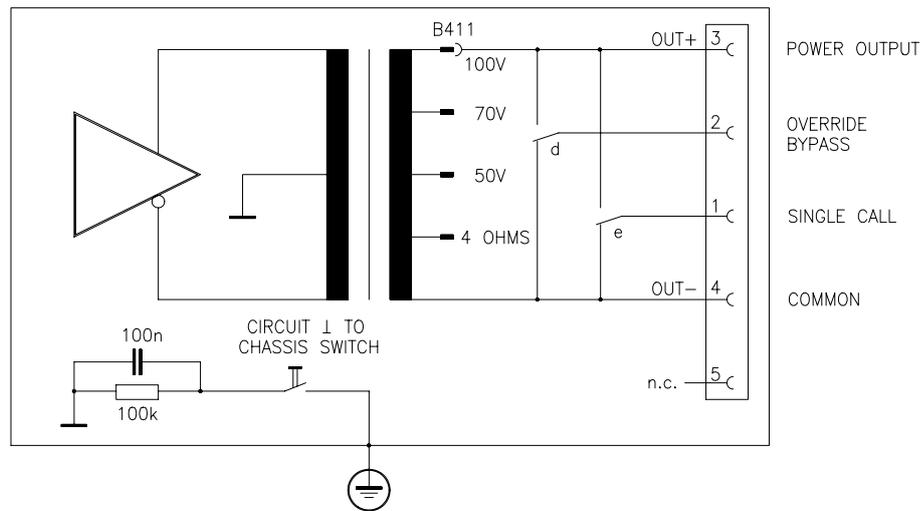


figure 3 connection of the power output

5.2 POWER OUTPUT for 100V (70V or 50V) loudspeaker systems

If the distance between the amplifier and the loudspeakers exceeds 50 m, it is recommended to operate the speaker systems using 100V matching transformers, to reduce line attenuation. This additionally offers a simple way of distributing the output power capacity. In this way it is possible to connect a maximum of as many loudspeaker systems as it takes until the total power consumption of the entire speaker network equals the power output capacity of 200W (connection impedance 50 ohms) with the DPA 4120, respectively 400W (connection impedance 25 ohms) with the DPA 4140. Connection is performed using the 100V output (17) (see also figure 3). In a few special cases it is also possible to operate the loudspeaker systems with 70V or 50V output voltage (see also paragraph 7).

Caution It is possible that during operation shock-hazard output voltages can be present at the POWER OUTPUT connector (>34V peak value). Thus, the connected loudspeaker groups have to be installed in accordance to applicable security standards and regulations (see also paragraph 8.5.2).

5.3 SINGLE CALL and obligatory reception relays OVERRIDE BYPASS

Combined with the PROMATRIX manager DPM 4000 or other external controls it is also possible to transmit single or collective calls with obligatory reception; i. e. bridging of possibly existing volume controls of the loudspeaker systems. For details on how to connect the outputs, please refer to figure 3; for the connection of relays, please refer to paragraph 5.6 respectively the PROMATRIX handbook.

5.4 POWER OUTPUT for low impedance loudspeaker systems

Switching the output to 4 ohms allows the connection of low impedance loudspeaker systems (4-16 ohms) (see also paragraph 7 and figure 3). Because of the occurring line attenuation, the distance between amplifier and loudspeaker system should not exceed 50m. Please make sure that the overall loudspeaker impedance does not decline a value of 4 ohms and that the stated power handling capacity of a single speaker system is not exceeded.

5.5 MONITOR output

The MONITOR output (16) on the NRS 90225 allows the connection of an additional power amplifier for monitoring purposes. The low impedance output is electronically balanced, which offers the possibility to achieve cable lengths of up to 200 m. Connection is performed via the REMOTE CONTROL pin-connector strip (see also figure 4). For the remote control module NRS 90222, the MONITOR output is located on the REMOTE CONTROL connector (22). The PROMATRIX manager DPM 4000 switches the signal to the according the monitor channel. In case a floating output is required, the monitor output is prepared for retrofitting an output transformer; provided through the optional extension NRS 90227 (please also refer to paragraph 8.4).

Note: Functioning changes in the models DPA 4120 (starting with serial numbers: 100 11) and DPA 4140 (starting with serial numbers: 100 11) in association with the input module NRS 90225: To achieve reliable attenuation of switching noise (knacks), the monitor output stays muted as long as the READY-relay is not pulled. Because of circuit design reasons this causes that the monitor output is also muted even when a ground-fault appears at the main output.

5.6 REMOTE CONTROL connector (only NRS 90225)

The 15-pole sub-D REMOTE CONTROL pin-connector strip (16) provides several different control in-/outputs:

- | | |
|---------------------------------------|-----------------------------------|
| - Ground of the stand-by power supply | - negative pole grounded |
| - POWER REMOTE | - via contact to ground potential |
| - BATTERY REMOTE | - via contact to ground potential |
| - MONITOR output | - electronically balanced |
| - READY-message | - with floating contact |
| - Obligatory reception relay D-RELAY | - via contact to ground potential |
| - Single call E-RELAY | - via contact to ground potential |

- | | |
|----|---|
| 2 | ⊥ STANDBY GROUND |
| 3 | POWER REMOTE |
| 4 | BATTERY REMOTE |
| 5 | D - RELAY |
| 6 | E - RELAY |
| 7 |  |
| 8 |  READY |
| 15 |  |
| 9 | + MONITOR |
| 10 | - MONITOR |

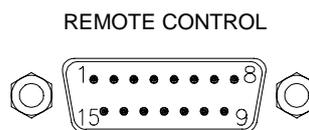


figure 4 connections on the REMOTE CONTROL pin-connector strip

6. Indicators

6.1 STANDBY indicator

When the appliance is correctly connected and mains and/or battery power is present, the green STANDBY indicator (4) will light.

6.2 READY indicator

Both amplifiers, the DPA 4120 and the DPA 4140, employ power-on switching delays of approximately 3 sec. to effectively eliminate power-on switching noise. After this time, the green READY indicator (7) lights and the READY fault message relay picks up when no error is being detected. When the power amplifier's mains transformer exceeds a certain value or, when – with installed NRS 90224 extension – the pilot tone falls below the threshold (see also paragraph 8.5.1), the green READY indicator (7) is not lit and the READY fault message relay drops.

6.3 PROTECT indicator

When thermal overload of the mains transformer or the power amplification stage is encountered, the red PROTECT indicator (5) will light and the READY fault message relay drops. After the amplifier regained normal temperature, the red PROTECT indicator (5) is automatically dimmed and the appliance returns to normal operation. High temperature can be caused by overload, extreme ambient temperatures or faulty functioning of the system's ventilation.

6.4 GROUND FAULT indicator

If, with the NRS 90224 extension installed, a ground fault is being detected at the power output, the red GROUND FAULT indicator (6) will light and the READY fault message relay will drop. During the occurrence of this error normal operation is maintained. After eliminating the cause for the ground fault, pressing the TEST button (3) resets the GROUND FAULT indicator (6) (see also paragraph 8.5.2).

6.5 Level meter and CLIP indicator

The green LED-indicators -13dB and 0dB (1) together with the red CLIP-LED (2) allow to monitor the output level, effectively avoiding overdrive conditions that lead to distortion and overload at the power outputs which could damage the connected loudspeaker systems.

- If the red CLIP-LED (2) shortly lights during program peaks, maximum non-distorted modulation is achieved.
- Continuous lighting or blinking of the red CLIP-LED (2) signals overdrive. In this case the input level has to be reduced.
- If the green LED indicator (1) does not light or is only briefly lit with the red CLIP-LED blinking at the same time, this signals the encountering of an overload or short-circuit condition at the output. In this case the impedance of the connected load has to be checked.

Caution During normal operation the red CLIP-LED should only light briefly and shortly!

7. Switching the output voltage (only to be performed by a qualified service technician!)

The DPA 4120 and DPA 4140 amplifiers allow the connection of 50V, 70V, 100V or low-impedance loudspeaker systems (4 ohms). They are factory-preset to an output voltage of 100 V. Switching the output voltage to 4 ohms, 50V or 70V can be performed by changing the bridge B411 on the power amplifier printed board assembly 84187 (DPA 4120) or 84175 (DPA 4140):

Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

- To open the appliance, the top panel has to be removed.
- The bridge B411 (yellow wire) has to be removed from the contact B407 and re-attached to the desired contact (see table 1) (see also figure 8 respectively figure 9).
- The coding-bridges S405 and S406 for the output recognition have to be inserted according to the illustration in figure 5.
(the inserted coding-bridge is marked in black)
- The top panel has to be re-attached.

Note By using a waterproof marker pen and after switching the output voltage, the newly set value has to be marked in the filed "OUTPUT VOLTAGE" on the rear panel of the appliance.

output	bridge B411 to
100 V	B407
70 V	B408
50 V	B409
4 ohms	B410

table 1 bridge B411 settings switching the output voltage



figure 5 coding-bridges S405 / S406 settings output recognition OUTPUT CONFIG

Caution It is possible that during operation shock-hazard output voltages can be present at the POWER OUTPUT connector (>34V peak value). Thus, the connected loudspeakers have to be installed in accordance to applicable security standards and regulations (see also paragraph 8.5.2).

8. Enhanced application field

8.1 Standard input module NRS 90225

This input module for the power amplifiers DPA 4120 and DPA 4140 is meant for insertion at the power amplifiers' rear. It provides the following functions:

- lockable XLR input connector
- XLR output connector; to patch the input signal through
- gain control; to be adjusted using a screwdriver
- mains remote ON/OFF
- battery remote ON/OFF
- control of the D- and E-relays
- fault messages via the READY relay contact:
 - thermal overload of the mains transformer
 - thermal overload of the power amplification stage
 - ground fault (optional; only with installed NRS 90224)
 - pilot tone signal (optional; only with installed NRS 90224)
- MONITOR output; electronically balanced
- input transformer for floating, balanced input; optional
- output transformer for floating, balanced monitor output; optional

The input module is meant to be used with the power amplifiers DPA 4120 and DPA 4140. The module allows to control and monitor the operation of the power amplifiers using conventional equipment or (with reservations) by the PROMATRIX manager DPM 4000.

Caution: Before installing the input module NRS 90225, you have to unplug the mains connector as well as a presumably connected battery cord.
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Before installing the input module, it is necessary to remove the two locking screws B on the rear panel of the appliance. For installation the printed board assembly first has to be inserted into the guiding rails. After carefully pushing the module in it has to be locked by using the two screws mentioned before.

Note: Functioning changes in the models DPA 4120 (starting with serial numbers: 100 11) and DPA 4140 (starting with serial numbers: 100 11) in association with the input module NRS 90225: To achieve reliable attenuation of switching noise (knacks), the monitor output stays muted as long as the READY-relay is not pulled. Because of circuit design reasons this causes that the monitor output is also muted even when a ground-fault appears at the main output.

8.2 Remote module NRS 90222

This input and remote module for the power amplifiers DPA 4120 and DPA 4140 is meant for insertion at the power amplifiers' rear. It provides the following functions:

- lockable XLR input connector
- XLR output connector; to patch the input signal through
- input level; can be set via a programmable audio level control
- MUTE (via level control)
- mains remote ON/OFF
- battery remote ON/OFF
- control of the D- and E-relays
- surveillance and fault messaging via the PROMATRIX manager DPM 4000 corresponding to IEC 849
 - thermal overload of the mains transformer
 - thermal overload of the power amplification stage
 - ground fault (optional; only with installed NRS 90224)
 - pilot tone signal (optional; only with installed NRS 90224)
 - measurement of the output voltage / level
 - measurement of the output current
 - surveillance of the connected loads via current/voltage measurement
- MONITOR output; electronically balanced
- monitoring: input/output signals can be assigned to the monitor bus
- input transformer for floating, balanced input (optional)
- output transformer for floating, balanced monitor output (optional)
- pilot tone signal ON/OFF (optional)

The remote module allows to remotely control and monitor the operation of the power amplifiers DPA 4120 and DPA 4140 from the PROMATRIX manager DPM 4000 (for further details please refer to the PROMATRIX handbook).

Caution:	Before installing the input module NRS 90222, you have to unplug the mains connector as well as a presumably connected battery cord.
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Before installing the input module, it is necessary to remove the two locking screws B on the rear panel of the appliance. For installation the printed board assembly first has to be inserted into the guiding rails. After carefully pushing the module in it has to be locked by using the two screws mentioned before.

Note	After installing the remote module NRS 90222 it is necessary to set its address according to the description in the PROMATRIX handbook using the two "HEX-code switches" ADDRESS (21) and note the setting within the field ADDRESS on the rear panel of the appliance using a waterproof marker pen.
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8.3 NRS 90208 input transformer for the floating, balanced input

For the case that floating inputs are required, the inputs of the INPUT MODULE NRS 90225 and the REMOTE MODULE NRS 90222 are prepared for retrofitting input transformers. If so, it is necessary to additionally install the extension kit NRS 90208 per each input.

The installation has to be performed as follows (see figure 6 and/or figure 7):

- to remove the input module you have to loosen the two locking screws (B) on the rear panel of the appliance. Now, the module can be easily torn out.
- before installing the input transformer you have to remove the resistors R1 and R2.
- mount the input transformer onto the printed board assembly, so that the marking located on the connector side of the transformer matches with the one on the printed board assembly. To prevent short-circuits place the supplied insulation disc between the transformer and the printed board assembly.
- re-insert the input module and tighten the locking screws (B).

8.4 NRS 90227 output transformer for the floating, balanced monitor output

In case that floating monitor outputs are required, the outputs of the INPUT MODULE NRS 90225 and REMOTE MODULE NRS 90222 are prepared for retrofitting output transformers. If so, it is necessary to additionally install the extension kit NRS 90227 per each output.

The installation has to be performed as follows (see figure 6 and/or figure 7):

- to remove the input module you have to loosen the two locking screws (B) on the rear panel of the appliance. Now, the module can be easily torn out.
- before installing the output transformer you have to remove the resistors R22, R23, R32 and R33 (NRS 90225) respectively the resistors R23, R24, R71 and R72 (NRS 90222).
- now, you can mount the output transformer onto the printed board assembly. Because of the transformer's symmetrical design, polarity is not a critical factor.
- re-insert the input module and tighten the locking screws (B).

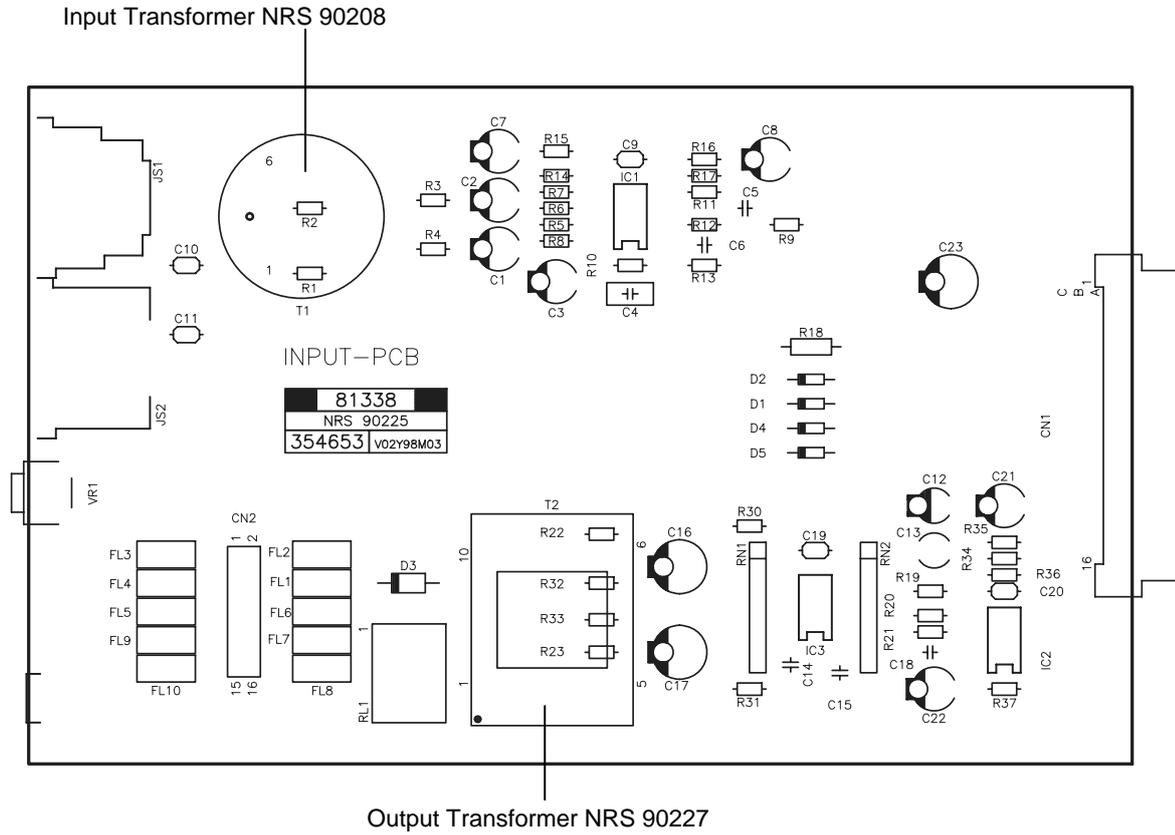


figure 6 printed board assembly 81338 showing the input transformer NRS 90208 and the output transformer NRS 90 227

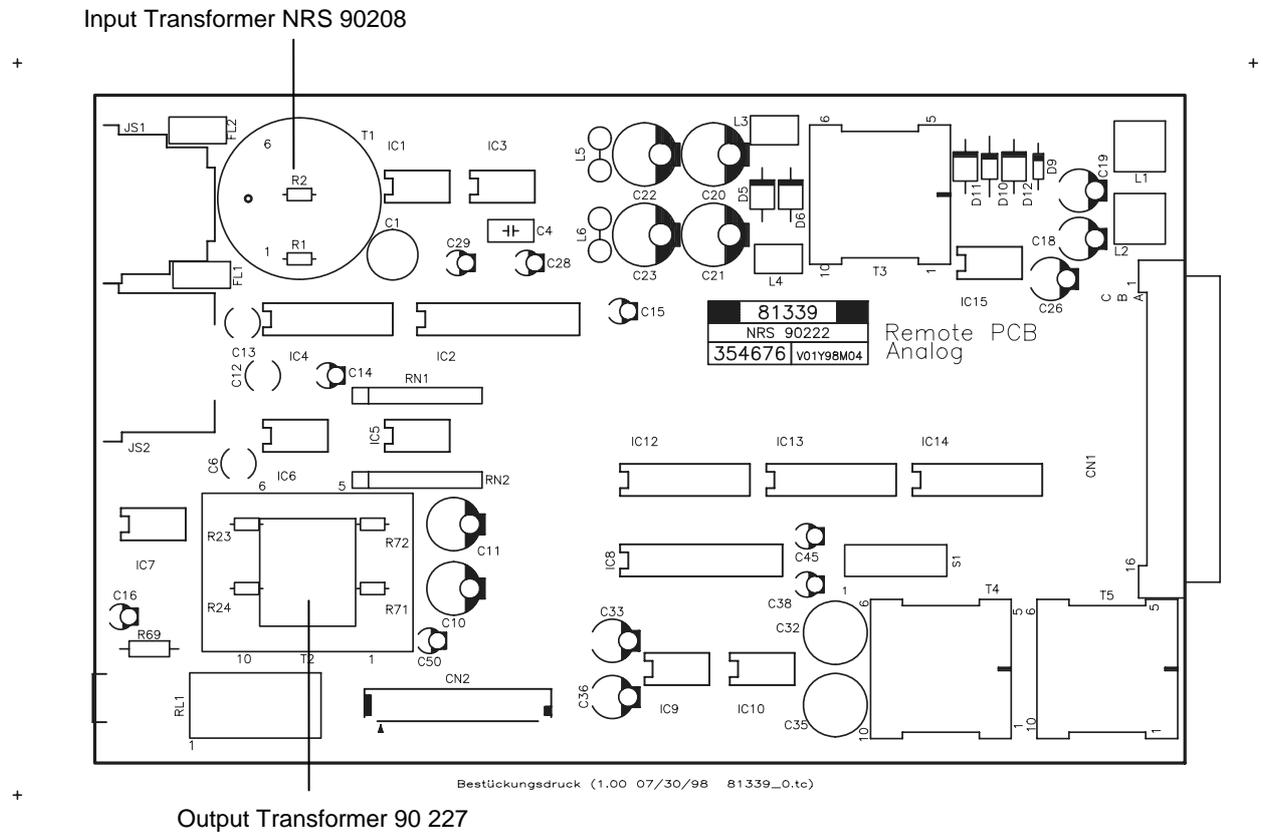


figure 7 printed board assembly 81339 showing the input transformer NRS 90208 and the output transformer NRS 90 227

8.5 NRS 90224 pilot tone & ground fault surveillance

The extension NRS 90224 is meant for insertion. It includes a 19 kHz tone generator and a selective 19 kHz receiver with evaluation stage for pilot tone surveillance. Also incorporated is a monitoring circuit with fault storage and display driver, to guard the cable network connected to the output.

8.5.1 Pilot tone surveillance:

Integration of the extension NRS 90224 provides continuous self-monitoring of the amplifier. This gets accomplished in the way that an extremely low-level 19 kHz pilot tone signal is introduced to the signal path following the input level control LEVEL. After passing the amplifier stages, the pilot tone signal is filtered out at the output and the result is evaluated. If the measured signal declines the pilot tone's predetermined threshold at the output or is not present at all, the READY indicator (7) dims and the READY fault message relay drops. When using the INPUT MODULE NRS 90225, the fault message is output as collective fault message with the floating contact of the READY fault message relay via the REMOTE CONTROL connector (16). When using the REMOTE MODULE NRS 90222, error occurrence is monitored and output by the PROMATRIX manager DPM 4000 (for further details, please refer to the PROMATRIX handbook).

8.5.2 Ground fault surveillance:

When installing and operating 100V-loudspeaker networks, compliance to the VDE regulation DIN VDE 0800 is mandatory. Especially, if 100V-loudspeaker networks are included in alarm system applications, all security standards have to be in accordance to the security class 3 standard.

When off-ground potential loudspeaker cable networks are employed we recommend insulation-monitoring using the ground fault surveillance module NRS 90224. Error recognition: An occurring ground fault either signals that one of the cables is damaged - which most likely point towards a total line interruption in the near future - or that connections have been carried out erroneously which may lead to malfunctioning of the entire system. The fault message GROUND FAULT (6) is also maintained with very short (>5 sec) ground faults, as long as the amplifier is powered-on or a loaded battery is connected. The fault message is displayed via the red GROUND FAULT indicator (6). In case of an inserted INPUT MODULE NRS 90225, it is also outputted as collective fault message with the floating contact of the READY fault message relay via the REMOTE CONTROL connector (16). When using the REMOTE MODULE NRS 90222, error occurrence is monitored and output by the PROMATRIX manager DPM 4000 (for further details, please refer to the PROMATRIX handbook).

The installation has to be performed as follows (see figure 8 and/or figure 9):

Caution	Before opening the appliance, make sure to disconnect the mains and/or battery power source!
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- To open the appliance, the top panel has to be removed.
- The extension kit NRS 90224 has to be inserted with its component side to the left (from the front view) until it clicks in place.
- Re-install the top plate of the enclosure.

NRS 90 224

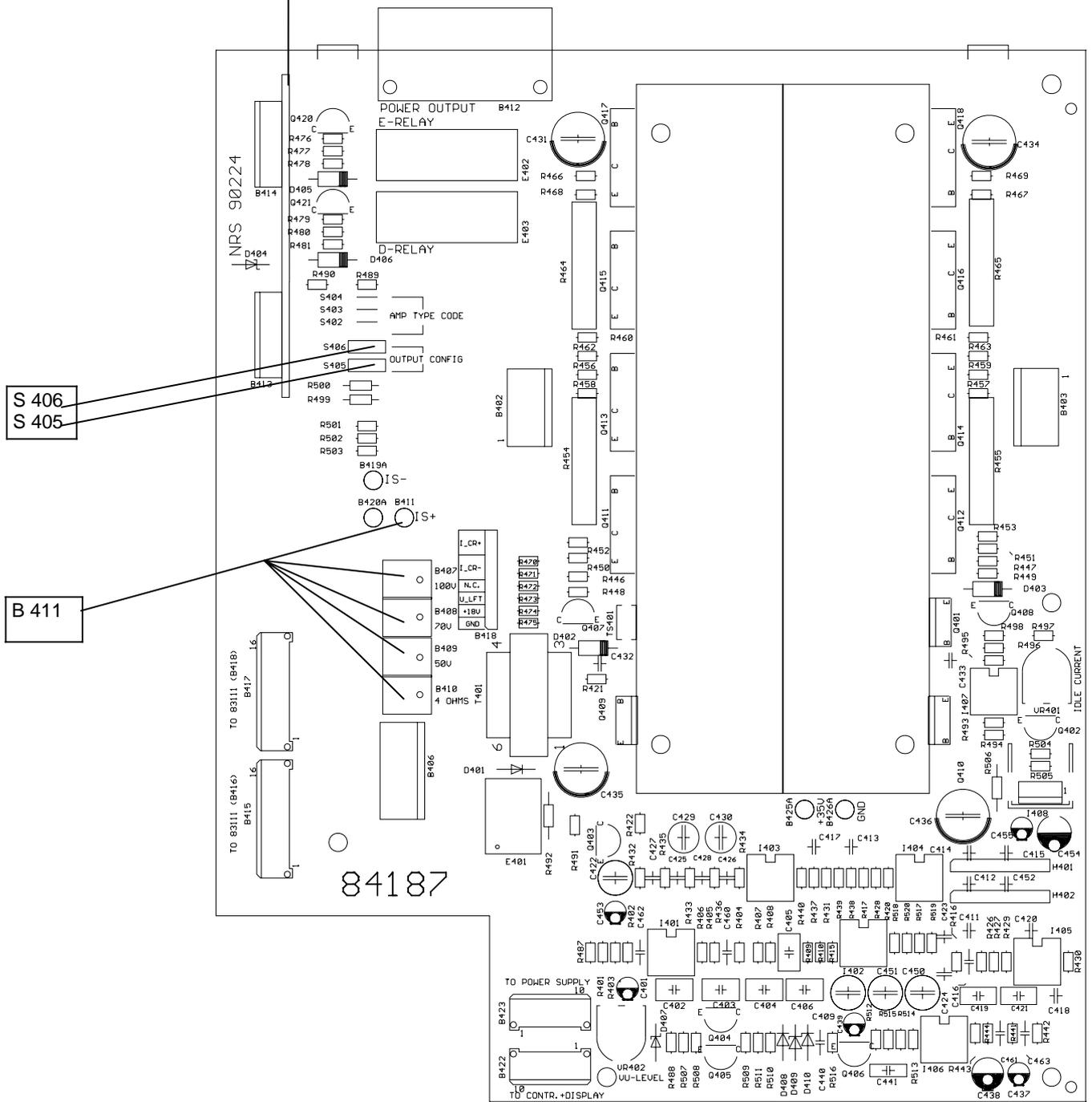


figure 8 printed board assembly 84187 in the DPA 4120 showing the NRS 90224 pilot tone & ground fault surveillance and the bridges B411 and S405, S406 for switching the output voltage; inserted

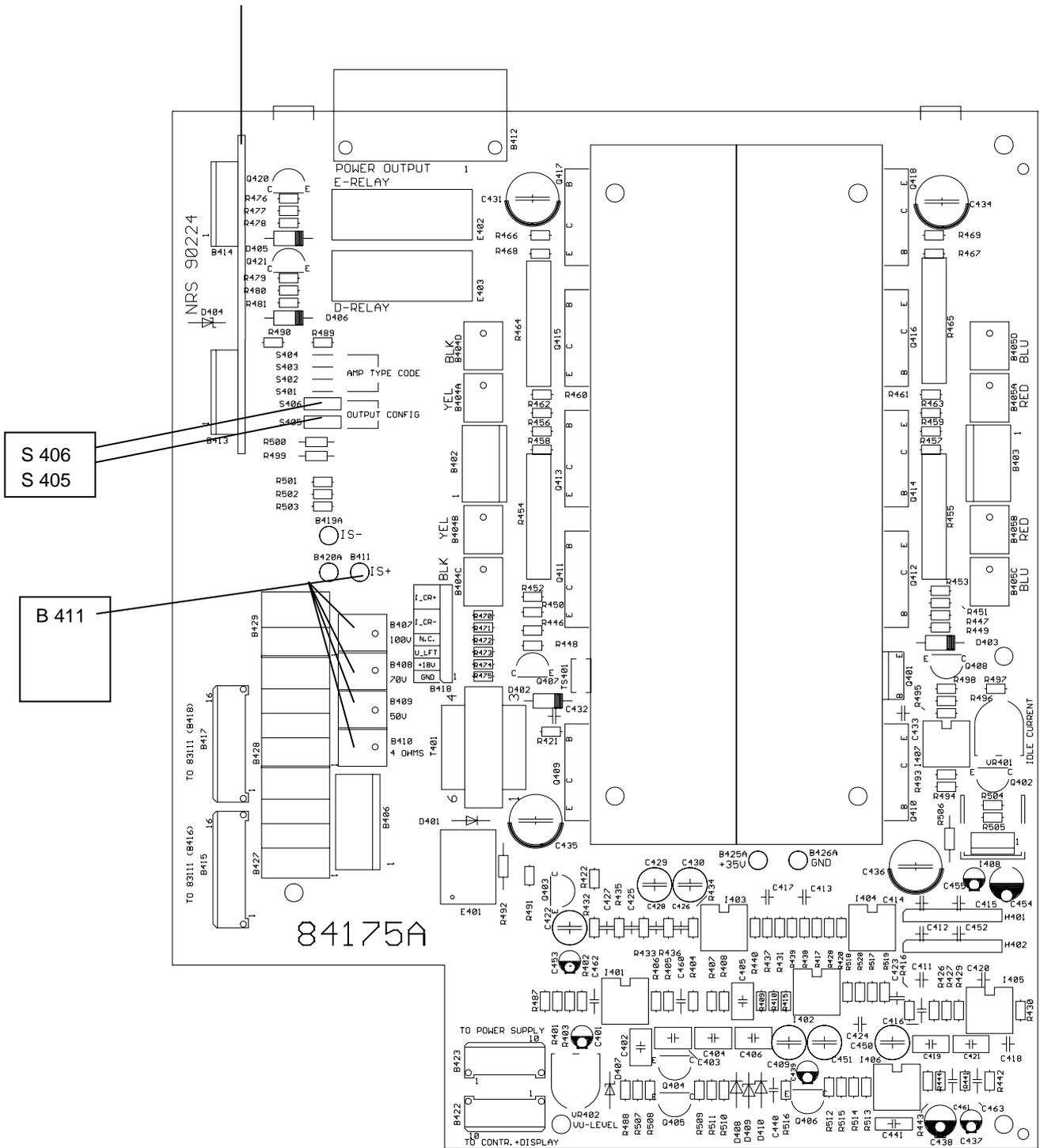


figure 9 printed board assembly 84175 in the DPA 4140 showing the NRS 90224 pilot tone & ground fault surveillance and the bridges B411 and S405, S406 for switching the output voltage; inserted

Checking the pilot tone surveillance function:

When the NRS 90224 is installed and the power amplifier is switched on, the green READY indicator (7) has to light. The testing and reset button TEST (3) serves as a function control for the pilot tone surveillance. With the TEST button being engaged, the 19 kHz generator is inactive. The green READY indicator is off and the READY fault message relay drops. Approximately 3 seconds after releasing the TEST button, the indicator has to light again. This method can also be used to check system configurations with average-switching.

Checking the ground fault surveillance function:

When the NRS 90224 is installed and the power amplifier is switched on, the green READY indicator (7) has to light. Utilizing an external switch to connect one pole of the 100V-loudspeaker network via a 47 k ohms resistor for approximately 5 seconds to ground potential, the corresponding red GROUND FAULT indicator (6) has to light and the READY fault message relay of the INPUT MODULE NRS 90225 drops while the green READY indicator (7) stays lit. After releasing the button, the indication and the fault message are maintained. The TEST button (3) has to be used to reset the ground fault surveillance function. For further details on checking the function with the REMOTE MODULE NRS 90222 being included in your installation, please refer to the PROMATRIX handbook.

9. 19"-case and 19"-rack-shelf system installation

Note	Operation of the power amplifiers DPA 4120 and DPA 4140 with enclosure cover plates detached is strictly prohibited.
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When mounting the power amplifiers within rack-cases or rack-shelf systems make sure to provide sufficient airflow. The space between the rear panel of the amplifier and the inner wall of the rack-case has to be at least 60 mm x 330 mm. A free space of at least 100 mm above the rack-shelf system is needed to provide sufficient air circulation. Since it is possible that during operation the temperature inside the rack system increases by 10° C, the maximum allowable ambient temperatures of the rest of the incorporated modules and appliances within a specific rack-shelf or rack-case have to be taken into careful consideration.

Note	To ensure trouble-free operation of the appliance, the maximum permissible ambient temperature of +40°C is not to be exceeded.
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10. Ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH

The ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH (19) provides the possibility to separate the signal ground from the enclosure (ground potential). This is mainly meant to eliminate noise-problems which are introduced through ground-loops, without jeopardizing the security. In case several appliances within a single rack-case or rack-shelf are furnished with ground lift switches, it is recommended to set all devices but one to "ungrounded". Set one appliance to "grounded". When set to "ungrounded", the impedance between signal ground and enclosure is : 100 k ohms // 100 nF. It is needed to maintain EMV protection.

11. Fuses

11.1 Fuses in the DPA 4120

location	Pos.	purpose	value	dimensions	standard
fuse socket (11)	F601	mains fuse 230V~ AC	T2A	5x20 mm	IEC 127-2-3
fuse socket (11)	F601	mains fuse 115V~ AC	T4A	5x20 mm	IEC 127-2-3
printed board assembly 86243	F602	mains fuse 100V - 250V	T1A	Ø 8.5xRM 5.08mm	IEC 127-3/4
printed board assembly 85270	F502	battery fuse 24V DC	15A	flat fuse	DIN 72581-3
printed board assembly 85270	F503	battery fuse 24V DC	15A	flat fuse	DIN 72581-3

11.2 Fuses in the DPA 4140

location	Pos.	purpose	value	dimensions	standard
fuse socket (11)	F601	mains fuse 230V~ AC	T4A	5x20 mm	IEC 127-2-3
fuse socket (11)	F601	mains fuse 115V~ AC	T8A	5x20 mm	IEC 127-2-3
printed board assembly 86243	F602	mains fuse 100V - 250V	T1A	Ø 8.5xRM 5.08mm	IEC 127-3/4
printed board assembly 85268	F502	battery fuse 24V DC	25A	flat fuse	DIN 72581-3
printed board assembly 85268	F503	battery fuse 24V DC	25A	flat fuse	DIN 72581-3

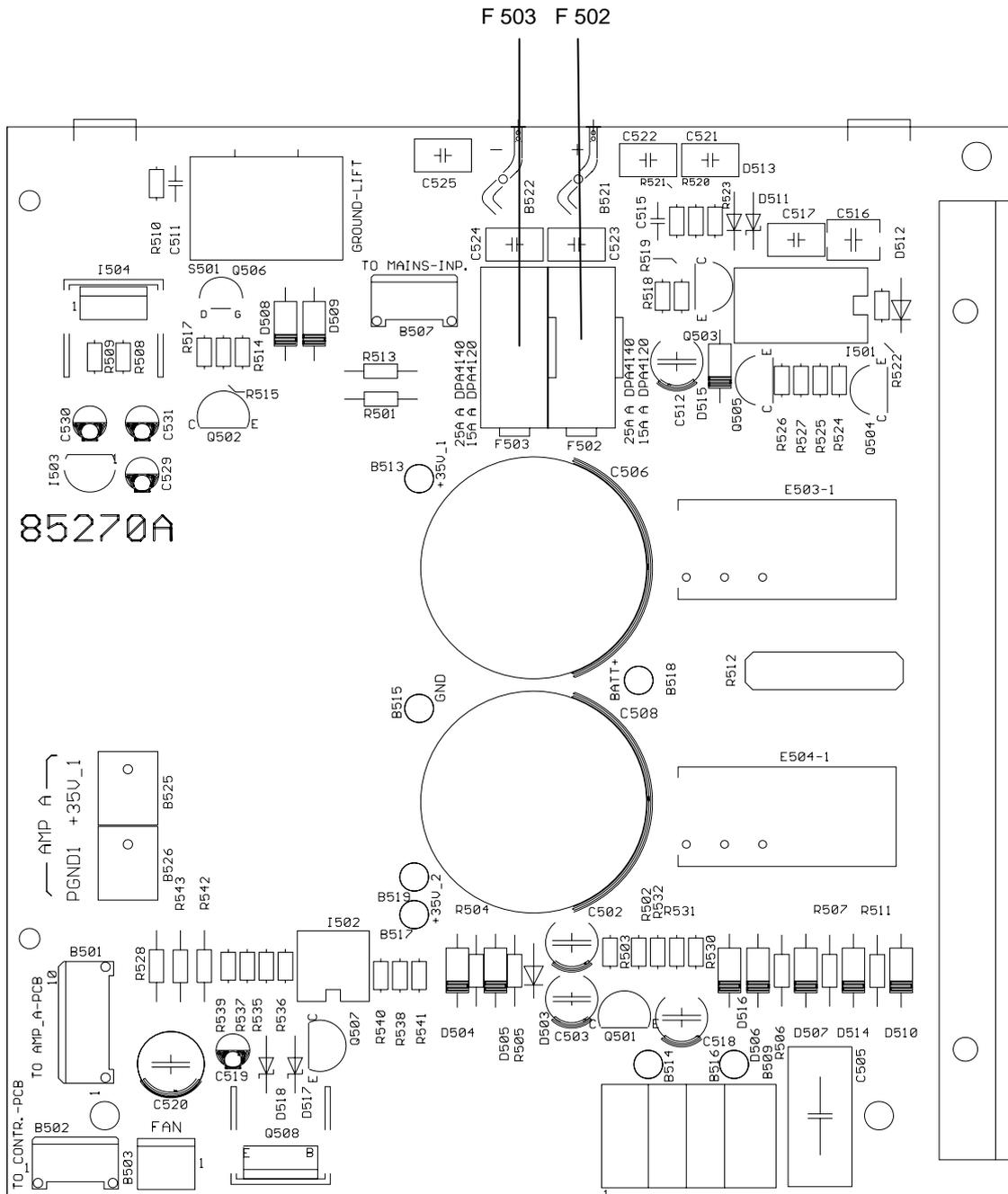


figure 10 printed board assembly 85270 in the DPA 4120 showing the DC fuses F502 and F503

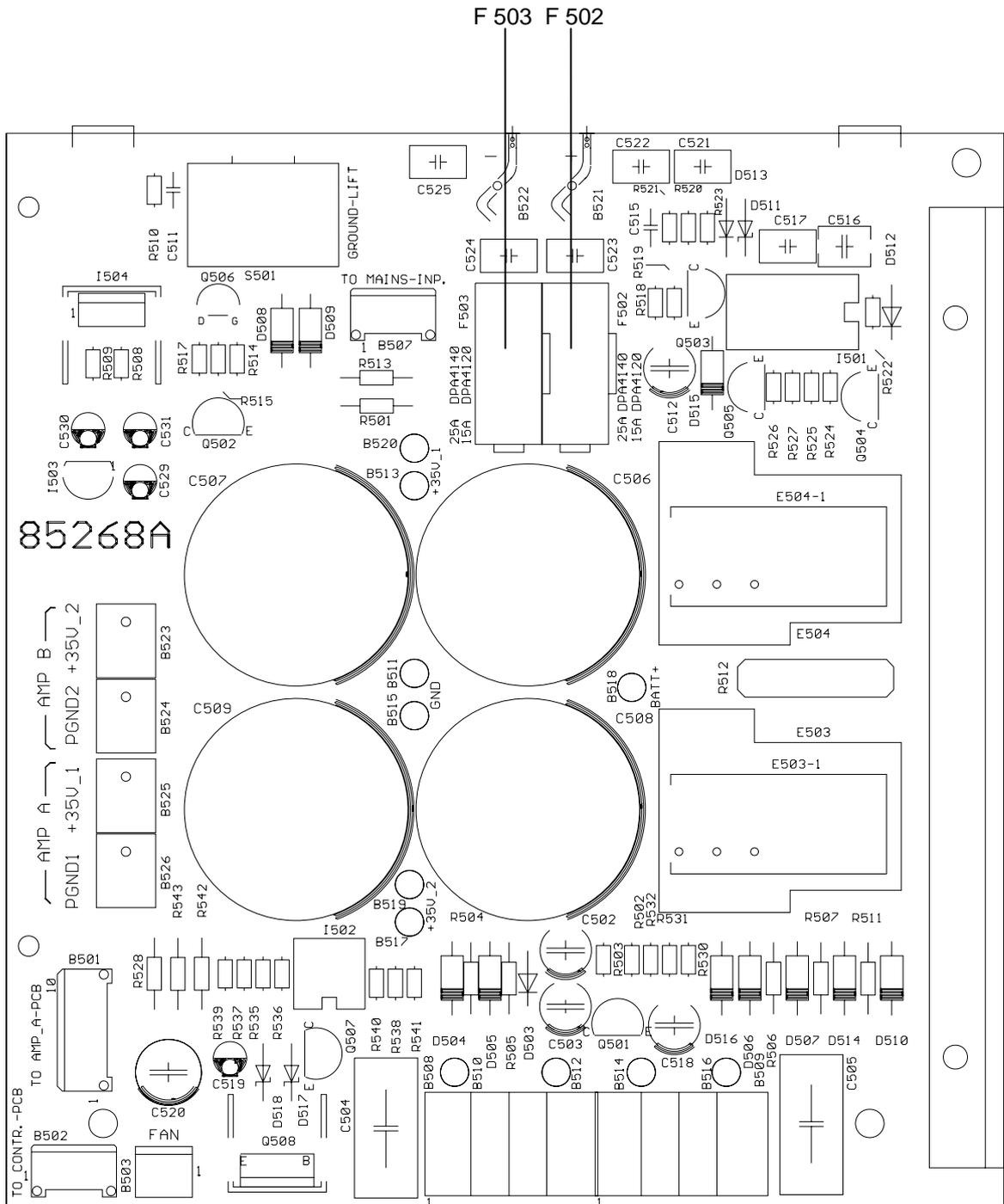


figure 11 printed board assembly 85268 in the DPA 4140 showing the DC fuses F502 and F503

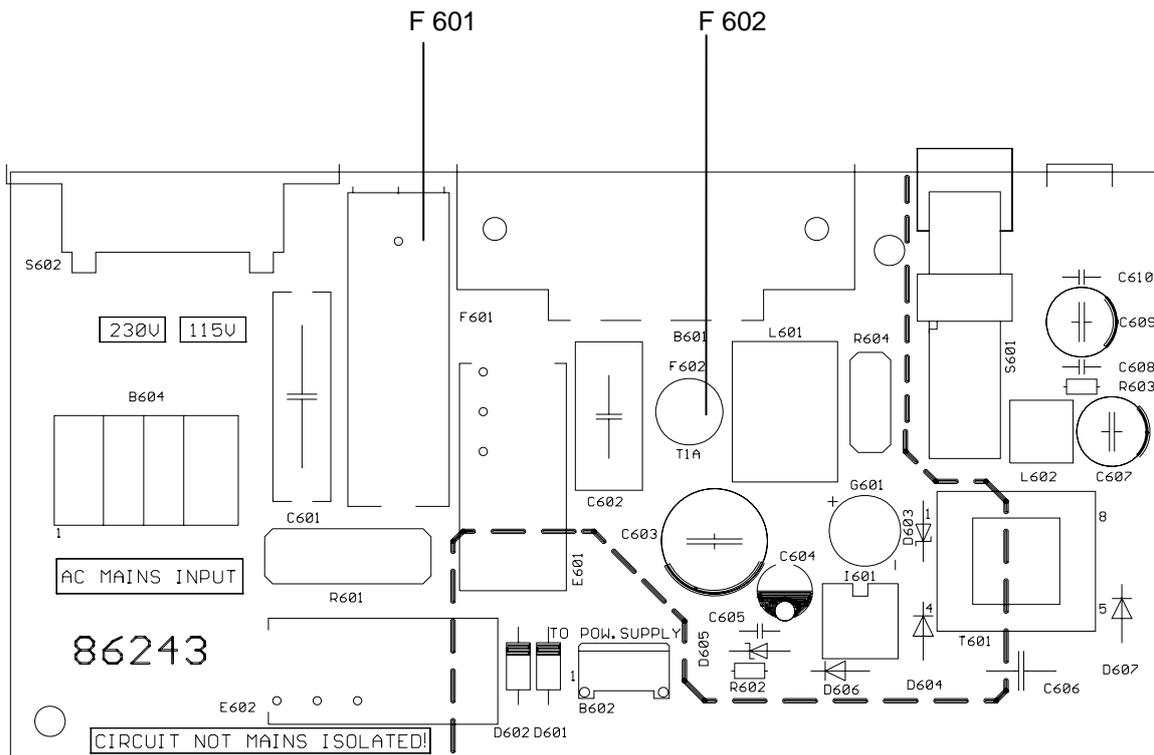


figure 12 printed board assemblies 86243 DPA 4120 and DPA 4140 showing the AC fuses F601 and F602

Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

Replacing the fuses F502 and F503 (only to be carried out by the experienced service technician!)

The battery fuses F502 and F503 are located on the power supply PCBs 85270 (DPA 4120) and 85268 (DPA 4140) behind the AMP battery connectors (see also figure 10 and/or figure 11). To replace these fuses you have to remove the cover plate of the appliance and afterwards the power supply input PCB 86243 which is mounted to the rear panel of the appliance. Therefore detach the yellow/green cable from the ground-connector on the appliance's rear panel. Pressing the lock-strap of the AMP-connector together, it can be removed without applying any force. Now, you have to remove the three screws marked "A" (refer to the diagram of the appliance's rear panel on page 2) which allows you to twist the power supply input PCB 86243 up. Make sure not to damage any wires or any other parts. The fuses F502 and F503 are now accessible and can be removed. To re-install the power supply input PCB 86243, these steps have to be proceeded in the opposite order. The yellow/green cable has to be reconnected to the ground-connector on the rear panel of the appliance. By pulling the cable make sure that it sits snugly. Then you can re-attach the cover plate of the enclosure.

Caution For security reasons it is necessary to ensure that, after the installation is completed, all wiring located beneath the power supply input PCB are within a distance of at least 6 mm to the printed board assembly.

12. Specifications

12.1 DPA 4120 power amplifier 200 W

power supply:

mains operation

mains frequency

security class

115 V / 230 V~ AC, ±10 %

50 - 60 Hz

I

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	230	0.13	30	16	0	16
normal operation (-10 dB)	230	0.83	191	138	20	118
alarm (-3 dB)	230	1.67	384	298	100	198
standard conditions	230	2.27	522	415	200	215
initial current inrush (mains)	< 29 A					

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	115	0.26	30	16	0	16
normal operation (-10 dB)	115	1.67	191	138	20	118
alarm (-3 dB)	115	3.34	384	298	100	198
standard conditions	115	4.54	522	415	200	215
initial current inrush (mains)	< 20 A					

$P_{\text{mains}} / \text{VA}$ = apparent power $U_{\text{mains}} \cdot I_{\text{mains}}$; $P_{\text{mains}} / \text{W}$ = true power; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

battery operation

24 V DC, -10/+30 %

battery operation	U_{B} / V	I_{B} / A	P_{i} / W	$P_{\text{out}} / \text{W}$	P_{V} / W
stand-by	24	2.5m	60m	0	60m
idling	24	0.43	10	0	10
normal operation (-10 dB)	24	3.74	90	20	90
standard conditions	24	9.10	218	131	87
initial current inrush (battery)	< 3.8 A				

P_{i} / W = input power $U_{\text{B}} \cdot I_{\text{B}}$; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

features of the input:

nominal input level

nominal input impedance

features of the power output:

nominal output capacity during mains operation

nominal load impedance

frequency response

distortion at 1 kHz and nominal output power

interfering voltage (A)

features of the monitor output:

nominal output voltage

nominal load impedance

ambient temperature range

dimensions (W x H x D)

depth with / without connections

weight without extensions

finish

electronically balanced

775 mV = 0 dBu

≥ 10 k ohms

balanced, floating

200 W (according to IEC 268-3)

50 ohms / 100V; 25 ohms / 70 V; 12.5 ohms / 50 V
or 4 ohms / 28 V

60 Hz .. 20 kHz

≤ 1 %

≤ 1.2 mV = -56 dBu

electronically balanced

2 V = + 8.2 dBu

600 ohms

+5 °C .. +40 °C

483 x 132 x 345 mm

max. 400 mm / max. 340 mm

13.2 kg

anthracite

12.2 DPA 4140 power amplifier 400 W

power supply:

mains operation

mains frequency

security class

115 V / 230 V~ AC, $\pm 10\%$

50 - 60 Hz

I

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	230	0.19	44	23	0	23
normal operation (-10 dB)	230	1.60	368	263	40	223
alarm (-3 dB)	230	3.10	713	562	200	362
standard conditions	230	4.43	1019	811	400	411
initial current inrush (mains)	< 36 A					

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	115	0.38	44	23	0	23
normal operation (-10 dB)	115	3.19	368	263	40	223
alarm (-3 dB)	115	6.20	713	562	200	362
standard conditions	115	8.86	1019	811	400	411
initial current inrush (mains)	< 21 A					

$P_{\text{mains}} / \text{VA}$ = apparent power $U_{\text{mains}} \cdot I_{\text{mains}}$; $P_{\text{mains}} / \text{W}$ = true power; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

battery operation

24 V DC, -10/+30 %

battery operation	U_{B} / V	I_{B} / A	P_{i} / W	$P_{\text{out}} / \text{W}$	P_{V} / W
stand-by	24	2.5m	60m	0	60m
idling	24	0.62	15	0	15
normal operation (-10 dB)	24	7.1	170	40	130
standard conditions	24	17.3	415	249	166
initial current inrush (battery)	< 3.8 A				

P_{i} / W = input power $U_{\text{B}} \cdot I_{\text{B}}$; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

features of the input:

nominal input level

nominal input impedance

features of the power output:

nominal output capacity during mains operation

nominal load impedance

frequency response

distortion at 1 kHz and nominal output power

interfering voltage (A)

features of the monitor output:

nominal output voltage

nominal load impedance

ambient temperature range

dimensions (W x H x D)

depth with / without connections

weight without extensions

finish

electronically balanced

775 mV = 0 dBu

≥ 10 k ohms

balanced, floating

400 W (according to IEC 268-3)

25 ohms / 100V; 12.5 ohms / 70 V; 6.25 ohms /

50 V or 4 ohms / 40 V

60 Hz .. 20 kHz

$\leq 1\%$

≤ 1.2 mV = -56 dBu

electronically balanced

2 V = + 8.2 dBu

600 ohms

+5 °C .. +40 °C

483 x 132 x 345 mm

max. 400 mm / 340 mm

16.7 kg

anthracite

extension kits for the DPA 4120 and DPA 4140:

NRS 90208 input transformer for floating, balanced input

NRS 90222 remote module

NRS 90224 pilot tone & ground fault surveillance

NRS 90225 standard input module

NRS 90227 output transformer for floating, balanced monitor output

Art. No. 121 641

Art. No. 121 674

Art. No. 121 676

Art. No. 121 677

Art. No. 121 679

13. Extension kit specifications for the power amplifiers DPA 4120 / DPA 4140

13.1 NRS 90225 standard input module

see specifications DPA 4120 / DPA 4140

13.2 NRS 90222 remote module

see specifications DPA 4120 / DPA 4140

13.3 NRS 90208 input transformer for floating, balanced input

frequency response	20 Hz .. 20 kHz
input impedance	≥ 10 k ohms
idling ratio	1:1
winding resistance; primary	1420 ohms at 20°C
winding resistance; secondary	1420 ohms at 20°C

13.4 NRS 90227 output transformer for floating, balanced monitor output

frequency response	40 Hz .. 20 kHz
nominal load impedance	≥ 600 ohms
idling ration	1:1
winding resistance; primary	18 ohms at 20°C
winding resistance; secondary	18 ohms at 20°C

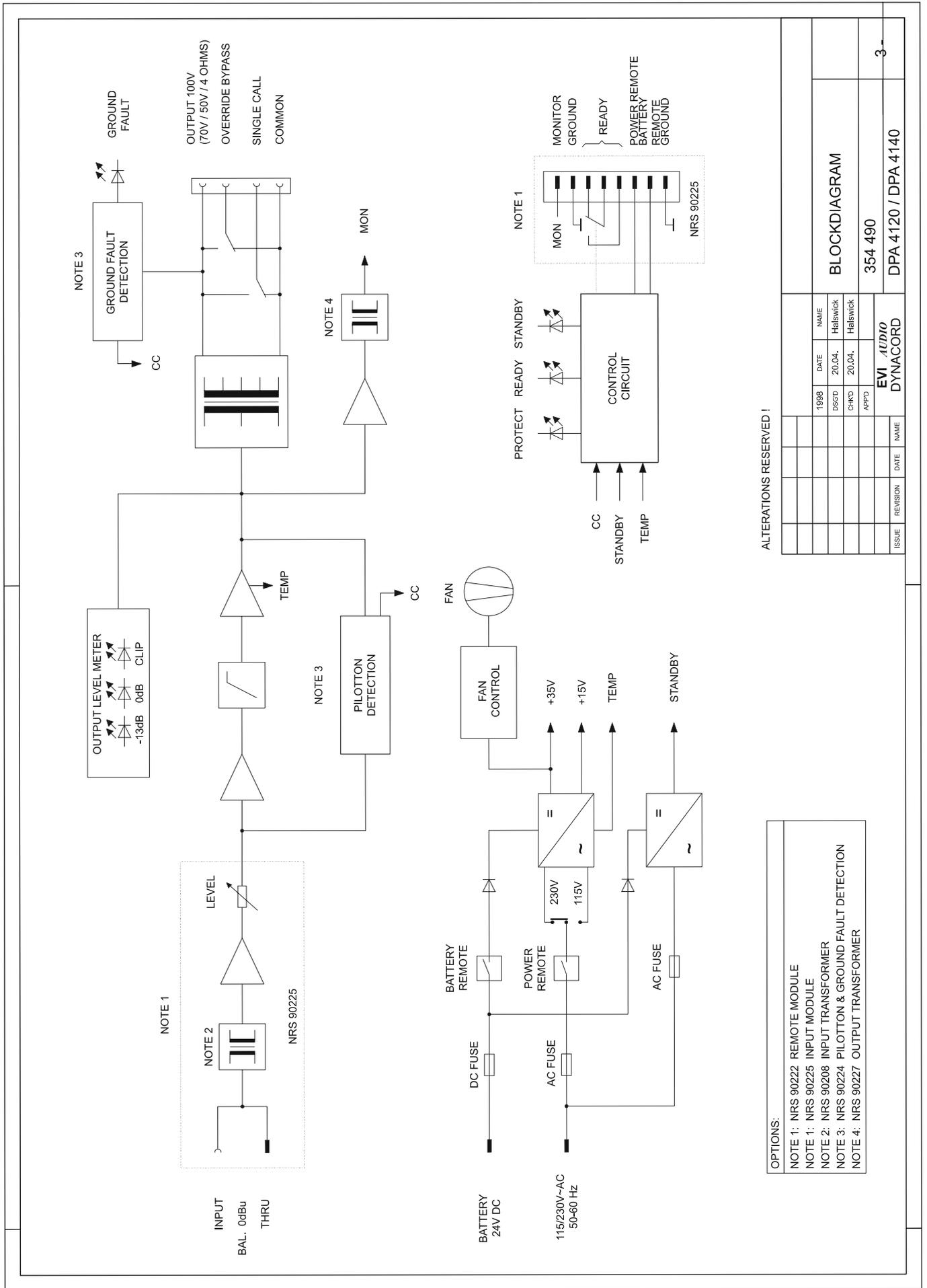
13.5 NRS 90224 pilot tone & ground fault surveillance

13.5.1 pilot tone surveillance

pilot tone frequency	19 kHz ± 1%
error recognition threshold	≤ 12 mV
fault message output via NRS 90225	collective fault message via READY relay
fault message output via NRS 90222	PROMATRIX manager DPM 4000

13.5.2 ground fault surveillance

input loudspeaker line	4 ohms / 50V / 70V / 100V
fault message output via NRS 90225	collective fault message via READY relay
fault message output via NRS 90222	PROMATRIX Manager DPM 4000
disruptive strength	1000 Veff
error recognition threshold	≤ 50 k ohms



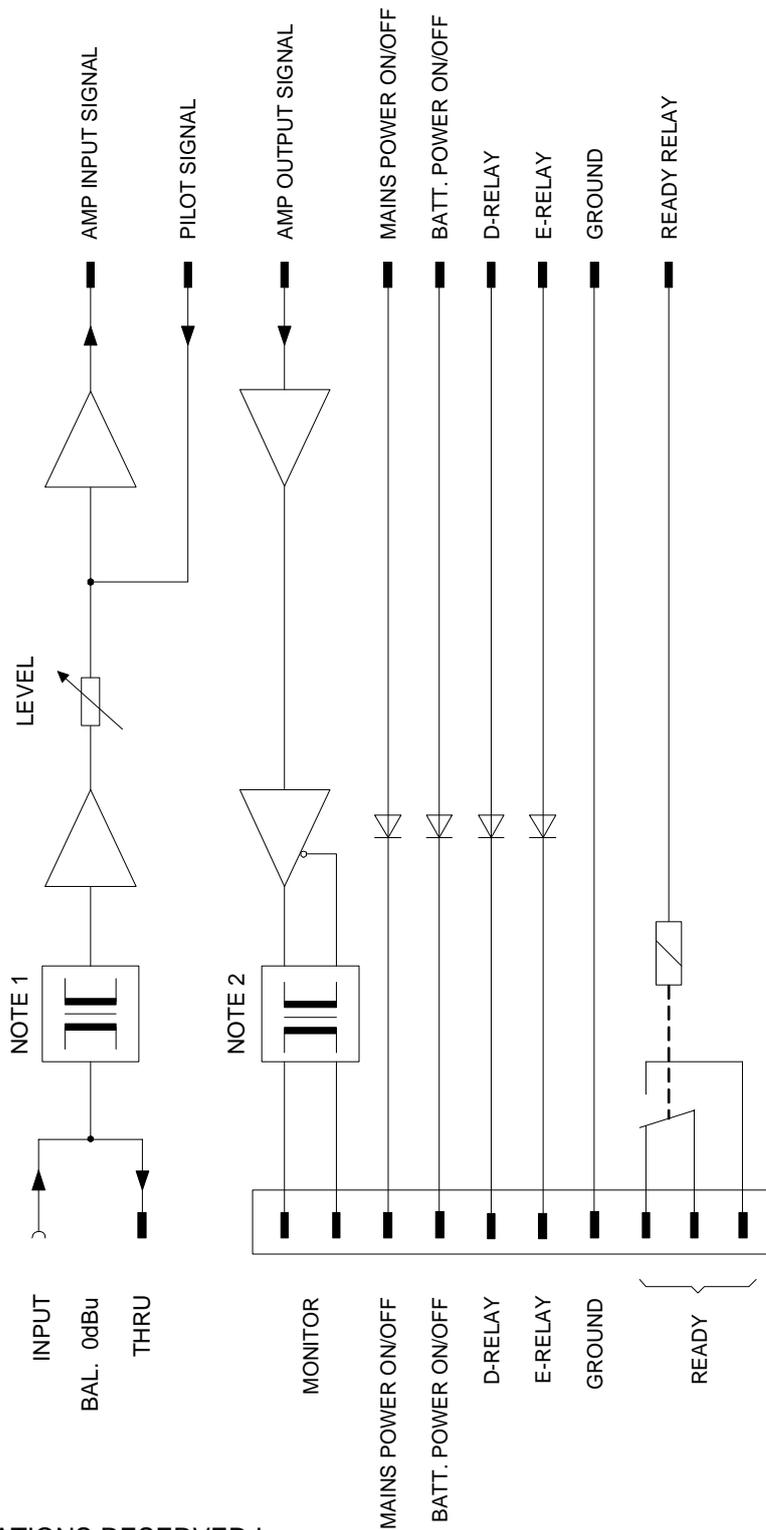
ALTERATIONS RESERVED !

ISSUE	REVISION	DATE	NAME
		1988	NAME
		DS/SD	20.04. Helmswick
		CH/CD	20.04. Helmswick
		APP/D	

EVI Audio	
DYNACORD	
BLOCKDIAGRAM	
354 490	
DPA 4120 / DPA 4140	
3	

- OPTIONS:
- NOTE 1: NRS 90222 REMOTE MODULE
 - NOTE 1: NRS 90225 INPUT MODULE
 - NOTE 2: NRS 90208 INPUT TRANSFORMER
 - NOTE 3: NRS 90224 PILOTTON & GROUND FAULT DETECTION
 - NOTE 4: NRS 90227 OUTPUT TRANSFORMER

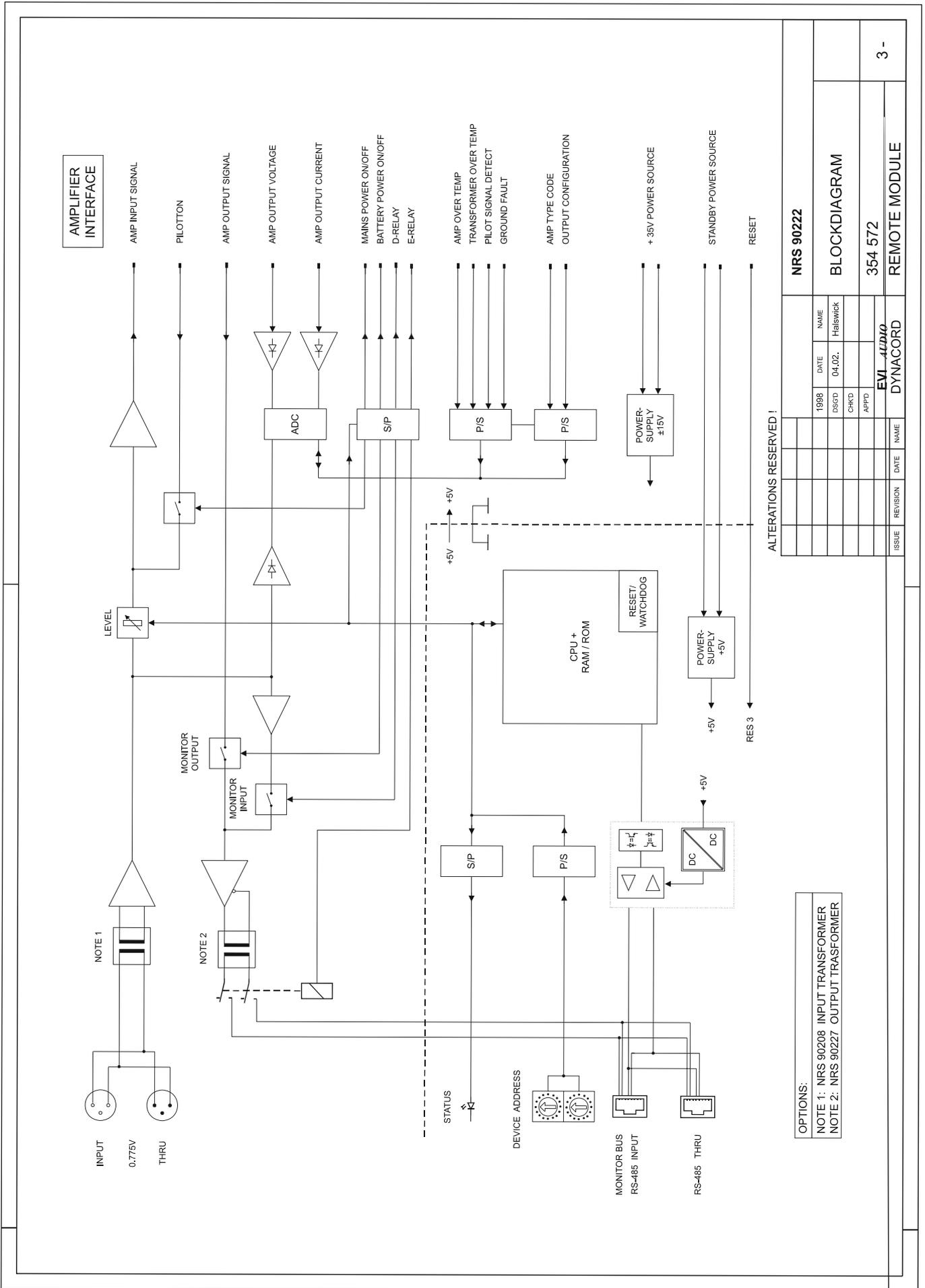
**AMPLIFIER
INTERFACE**



OPTIONS:
 NOTE 1: NRS 90208 INPUT TRANSFORMER
 NOTE 2: NRS 90227 OUTPUT TRANSFORMER

ALTERATIONS RESERVED !

				1998	DATE	NAME	BLOCKDIAGRAM	
				DSGD	20.04.	Halswick		
				CHKD	20.04.	Halswick		
				APPD			354 573	
ISSUE	REVISION	DATE	NAME	EVI AUDIO DYNACORD			INPUT MODULE NRS 90225	4 -



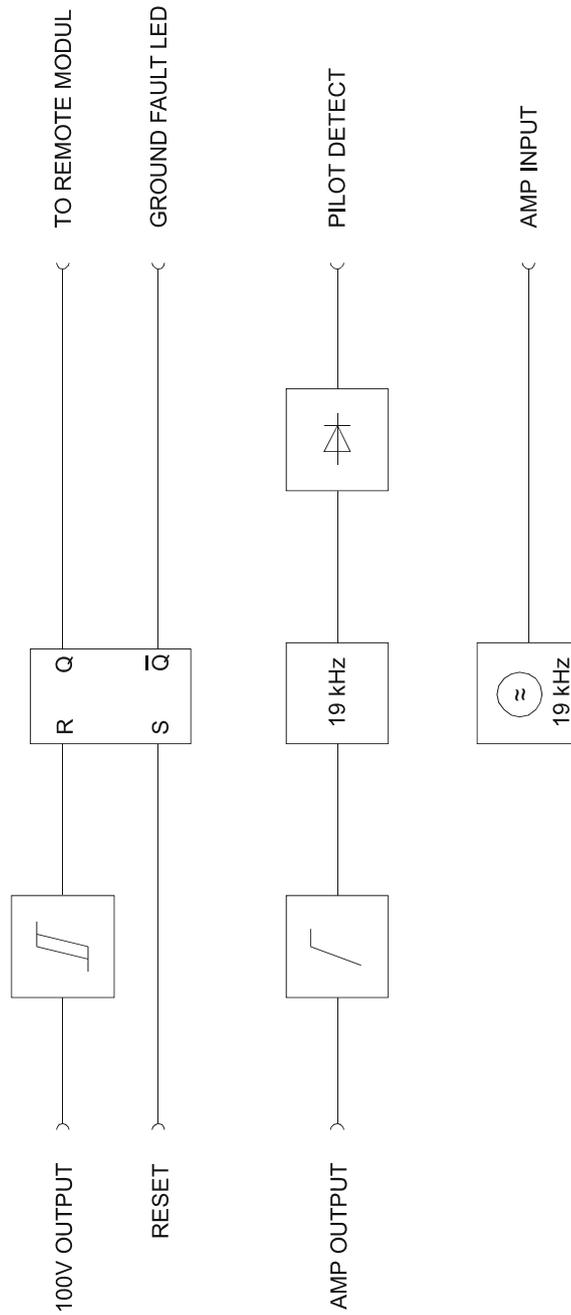
OPTIONS:
 NOTE 1: NRS 90208 INPUT TRANSFORMER
 NOTE 2: NRS 90227 OUTPUT TRANSFORMER

ALTERATIONS RESERVED !

NRS 90222			
1988	DATE	NAME	
04.02.	DSGSD	Halswick	
	CHYCD		
	APFD		
EVI <i>Audio</i>			
DYNACORD			
354 572			3 -
REMOTE MODULE			

BLOCKDIAGRAM

REMOTE MODULE



ALTERATIONS RESERVED !

				1998	DATE	NAME		
				DSG'D	20.04.	Halswick	BLOCKDIAGRAM	
				CHK'D	20.04.	Halswick		
				APP'D				
				EVI AUDIO DYNACORD			354 574	4 -
ISSUE	REVISION	DATE	NAME				PILOTTON + GROUND FAULT NRS 90224	

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