

# SERVICE MANUAL



## RODEC

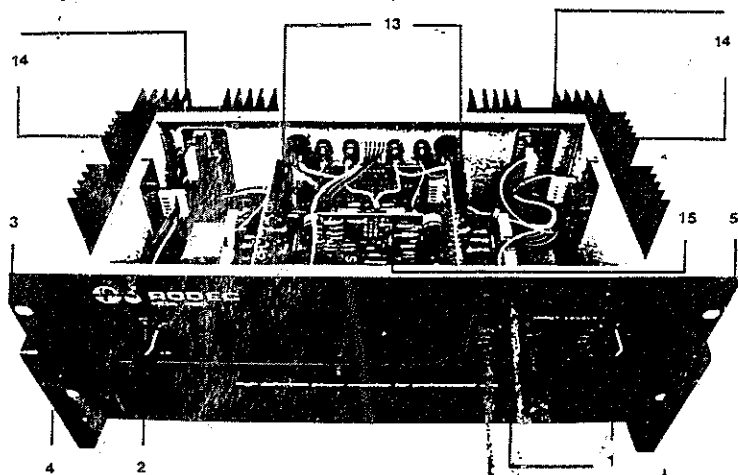
## HDA 450(SL)

### HDA 450 - TECHNICAL DATA

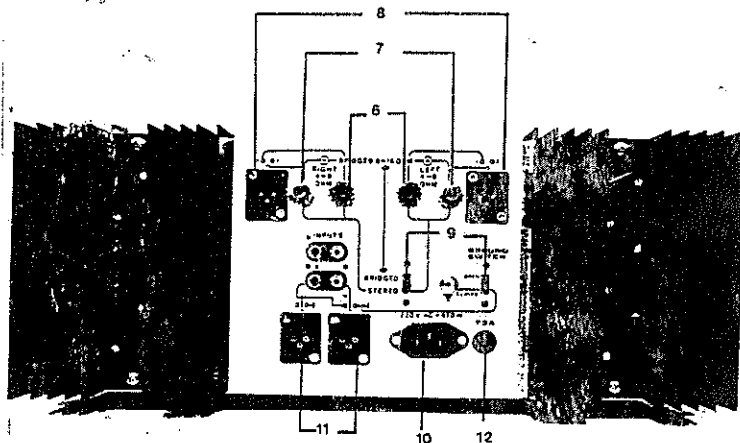
The manufacturer reserves the right to alter specifications without notice.

|                                                                               |                                                                                                                                 |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Power in Stereo mode<br>(both channels driven)<br>(Ambient temp° below 55° C) | : 2 x 240 W RMS on 4 Ohm / 0,775 V input<br>: 2 x 150 W RMS on 8 Ohm / 0,9 V input<br>: 2 x 100 W RMS on 16 Ohm / 1 V input     |
| Power bridged mode<br>(Ambient temp° below 55° C)                             | : 1 x 500 W RMS on 4 Ohm / 0,775 V input<br>: 1 x 450 W RMS on 8 Ohm / 0,775 V input<br>: 1 x 300 W RMS on 16 Ohm / 0,9 V input |
| Minimum input impedance                                                       | : 68 KOhm                                                                                                                       |
| Input sensitivity                                                             | : variable up to 0,775 V                                                                                                        |
| Bandwidth                                                                     | : 10Hz-200kHz / +0, -3dB                                                                                                        |
| Frequency response after filter                                               | : 20Hz-20kHz / ± 1 dB                                                                                                           |
| THD 400 Hz 1 dB prior to clipping                                             | : 0,07 %                                                                                                                        |
| TIM/TID Distortion                                                            | : neglectable                                                                                                                   |

|                    |                                                                         |
|--------------------|-------------------------------------------------------------------------|
| Signal/noise       | : 99 dB under full Power "A" weighted                                   |
| Power requirements | : 230V-50/60 Hz 670 W. (15 W without signal)                            |
| Stability          | : Unconditional into all loads                                          |
| Speaker protection | : DC cut-off with relays                                                |
| Protections        | : Open circuit, short circuit, current limiting and fuses.              |
| Dimensions         | : Chassis 422 x 238 x 165<br>Frontplate 483 x 177 (standard rack)       |
| Connectors         | : Inputs XLR + double RCA cinch sockets<br>Outputs XLR + Terminal posts |
| Weight             | : Net= 13 Kg Packed= 14,5 Kg                                            |
| Packed dimensions  | : 55 x 36 x 26 cm                                                       |



FRONT ASSY



| Ref. No | Description     | Qty | RC Number | HDA 450 SL |
|---------|-----------------|-----|-----------|------------|
| 1-2     | KNOB 22 mm      | 3   | RC 05 035 |            |
| 3       | POWER INDICATOR | 1   | RC 05 124 |            |
| 4       | HANDLE 120 mm   | 2   | RC 05 125 | RC05 128   |
| 5       | FRONT BLACK     | 1   | RC 05 016 | RC05 116   |

### SWITCHES - POTENTIOMETERS AND CONNECTORS

|    |                       |   |           |          |
|----|-----------------------|---|-----------|----------|
| 1  | POT. ROTATIF 100 Klin | 2 | RC 08 017 |          |
| 2  | POWER SWITCH          | 1 | RC 08 114 | RC08 129 |
| 6  | CONNECTOR BLACK       | 2 | RC 10 016 |          |
| 7  | CONNECTOR RED         | 2 | RC 10 015 |          |
| 8  | CONNECTOR XLR M       | 2 | RC 10 024 |          |
| 9  | SWITCH BRIDGED STEREO | 2 | RC 08 104 |          |
|    | GROUND SWITCH         |   |           |          |
| 10 | MAINS SOCKET          | 1 | RC 12 015 |          |
| 11 | CONNECTOR XLR F       | 2 | RC 10 023 |          |
| 12 | FUSE HOLDER           | 1 | RC 12 018 |          |
| 13 | DRIVER BOARD          | 2 | RC 27 036 |          |
| 14 | HEAT SINKS            | 2 | RC 27 002 |          |
| 15 | PROTECTION UNIT       | 1 | RC 27 037 |          |
| 16 | INPUT CIRCUIT         | 1 | RC 27 038 |          |

| Ref. No.          | Description         | Qty. | RC Number | Remarks |
|-------------------|---------------------|------|-----------|---------|
| <u>heat sinks</u> |                     |      |           |         |
|                   | TRANSISTOR MJ 15001 | 3    | RC 17 011 |         |
|                   | SILICON PAD         | 3    | RC 20 010 |         |
|                   | TRANSISTOR COVER    | 3    | RC 20 012 |         |

| RC 25 035 BASIC BOARD |                        |    |           |  |
|-----------------------|------------------------|----|-----------|--|
| F1-F4                 | FUSE 5A T              | 4  | RC 12 011 |  |
|                       | RELAIS 1 POL 8A        | 2  | RC 12 027 |  |
| D1-D2                 | SILICIUM DIODE 1N 4448 | 2  | RC 17 105 |  |
| D3-D4                 | ZENER DIODE 12V/400 mW | 2  | RC 17 112 |  |
| D5-D10                | RECTIFIER 1 A          | 6  | RC 17 116 |  |
| C1-C6                 | POLYESTER CAP.220N     | 6  | RC 22 108 |  |
| C7-C8                 | ELKO 220M/16V          | 2  | RC 22 215 |  |
| C9                    | ELKO 47M/63V           | 1  | RC 22 217 |  |
| R15-R16               | RESISTOR 1/3W 10K      | 2  | RC 23 021 |  |
| R17-R18-R31           | RESISTOR 1,6W 10R      | 3  | RC 23 511 |  |
| R13-14                | RESISTOR 1,6W 2K2      | 2  | RC 23 514 |  |
| R19-R30               | WIREW.RES. 5W 1R       | 12 | RC 23 518 |  |
| R1-R12                | FUSE RES. 1/3W 10R     | 12 | RC 23 601 |  |
| F1-F4                 | FUSE HOLDER FOR PCB    | 4  | RC 32 011 |  |

| RC 25 036 DRIVER BOARD |                      |   |           |                                                                                     |
|------------------------|----------------------|---|-----------|-------------------------------------------------------------------------------------|
| P1-P2-P3               | TRIMMER VERT. 1 K    | 3 | RC 08 021 |                                                                                     |
| Q4-Q5                  | TRANSISTOR BF422     | 2 | RC 17 005 |                                                                                     |
| Q6-Q7                  | TRANSISTOR BF423     | 2 | RC 17 006 |                                                                                     |
| Q1-Q2-Q8-Q9-Q10        | TRANSISTOR BC546A    | 5 | RC 17 007 |                                                                                     |
| Q3-Q11-Q12-Q13         | TRANSISTOR BC556A    | 4 | RC 17 008 |                                                                                     |
| Q14                    | TRANSISTOR MJE 15030 | 1 | RC 17 009 | Older models can have 40871-1C 03- 1C 12 40872-1C 04- 1C 13 and are to be replaced! |
| Q15                    | TRANSISTOR MJE 15031 | 1 | RC 17 010 |                                                                                     |
| D1-D6                  | SILICIUM DIODE       | 6 | RC 17 105 |                                                                                     |
| D7-D8-D9-D10           | STABISTOR BA314      | 4 | RC 17 106 |                                                                                     |
| C1                     | CERAMIC CAP. 2N2     | 1 | RC 22 008 |                                                                                     |
| C2-C3                  | CERAMIC CAP 470P     | 2 | RC 22 005 |                                                                                     |
| C4-C5                  | CERAMIC CAP. 150P    | 2 | RC 22 019 |                                                                                     |
| C6-C7                  | POLYESTER CAP. 22N   | 2 | RC 22 104 |                                                                                     |
| C8                     | POLYESTER CAP.220N   | 1 | RC 22 108 |                                                                                     |
| C9                     | ELKO 47M/25V         | 1 | RC 22 214 |                                                                                     |
| R1-R2-R3-R4            | FUSE RES. 1/3W 100R  | 4 | RC 23 603 |                                                                                     |
| R5-R6-R7-R8            | RESISTOR 1/3W 180R   | 4 | RC 23 004 |                                                                                     |
| R9-R10                 | FUSE RES. 1/3W 270R  | 2 | RC 23 605 |                                                                                     |
| R11                    | RESISTOR 1/3W 390R   | 1 | RC 23 007 |                                                                                     |
| R12-R13                | RESISTOR 1/3W 680R   | 2 | RC 23 008 |                                                                                     |
| R14                    | RESISTOR 1/3W 820R   | 1 | RC 23 009 |                                                                                     |
| R15-R16-R17-R18        | RESISTOR 1/3W 1K     | 4 | RC 23 010 |                                                                                     |
| R19-R20                | FUSE RES. 1/3W 1K    | 2 | RC 23 610 |                                                                                     |
| R21-R22                | FUSE RES. 1/3W 2K7   | 2 | RC 23 613 |                                                                                     |
| R23-R24-R25-R26        | FUSE RES. 1/3W 4K7   | 4 | RC 23 616 |                                                                                     |
| R27                    | RESISTOR 1/3W 4K7    | 1 | RC 23 016 |                                                                                     |
| R28-R29                | RESISTOR 1/3W 22K    | 2 | RC 23 025 |                                                                                     |
| R30-R33                | RESISTOR 1/3W 39K    | 4 | RC 23 028 |                                                                                     |
| R34-R37                | FUSE RES. 1/2W 22R   | 4 | RC 23 502 |                                                                                     |

| Ref. No.                       | Description        | Qty. | RC Number | Remarks |
|--------------------------------|--------------------|------|-----------|---------|
| RC 25 037 PROTECT UNIT HDA 450 |                    |      |           |         |
| Q1-Q4                          | TRANSISTOR BC546   | 4    | RC 17 007 |         |
| D1-D5                          | SILICIUM DIODE     | 5    | RC 17 105 |         |
| D6                             | GERMANIUM DIODE    | 1    | RC 17 108 |         |
| D7-D8                          | ZENER DIODE 12V    | 2    | RC 17 112 |         |
| IC 1                           | DUAL COMP. LM393N  | 1    | RC 18 003 |         |
| C1-C2                          | ELKO 2M2/63V       | 2    | RC 22 205 |         |
| C4                             | ELKO 100M/10V      | 1    | RC 22 209 |         |
| C3-C5                          | ELKO 47M/25V       | 2    | RC 22 214 |         |
| R1                             | RESISTOR 1/3W 82 R | 1    | RC 23 118 |         |
| R2                             | RESISTOR 1/3W 1K   | 1    | RC 23 010 |         |
| R3-R6                          | RESISTOR 1/3W 3K3  | 4    | RC 23 014 |         |
| R7                             | RESISTOR 1/3W 8K2  | 1    | RC 23 019 |         |
| R8-R12                         | RESISTOR 1/3W 1.5K | 5    | RC 23 023 |         |
| R13                            | RESISTOR 1/3W 10K  | 1    | RC 23 021 |         |
| R14-19                         | RESISTOR 1/3W 100K | 7    | RC 23 103 |         |
| R20                            | RESISTOR 1/3W 150K | 1    | RC 23 513 |         |
| R21                            | RESISTOR 1,6W 1K   | 1    | RC 23 124 |         |
| R22                            | RESISTOR 1,6W 2K2  | 1    | RC 23 514 |         |

|                               |                     |   |           |  |
|-------------------------------|---------------------|---|-----------|--|
| RC 25 038 INPUT CIRCUIT BOARD |                     |   |           |  |
| STEREO/<br>BRIDGED            | SLIDE SWITCH 2x2POS | 1 | RC 08 104 |  |
| IC1                           | IC TL074CN/LF347N   | 1 | RC 18 009 |  |
| C1-C2                         | CERAMIC CAP. 100P   | 2 | RC 22 004 |  |
| C3-C4                         | CERAMIC CAP. 1N0    | 2 | RC 22 006 |  |
| C5-C9                         | POLYESTER CAP.100N  | 5 | RC 22 107 |  |
| C10-C11                       | POLYESTER CAP.220N  | 2 | RC 22 108 |  |
| R1-R2                         | RESISTOR 1/3W 18K   | 2 | RC 23 024 |  |
| R3-R4                         | RESISTOR 1/3W 33K   | 2 | RC 23 027 |  |
| R5-R11                        | RESISTOR 1/3W 220K  | 7 | RC 23 105 |  |

|                 |                          |   |           |                           |
|-----------------|--------------------------|---|-----------|---------------------------|
| DIFFERENT PARTS |                          |   |           |                           |
|                 | MAINS TRANSFORMER 2x42V  | 1 | RC 21 006 | from N° 199 723 on<br>" " |
|                 | RECTIFIER BRIDGE 80V/25A | 1 | RC 17 121 |                           |
|                 | CAPACITOR 22000µF/63V    | 2 | RC 22 201 |                           |
|                 | MAINS CORD               | 1 | RC 12 002 |                           |
|                 | POTENTIOMETER PRINT      | 1 | RC 25 078 |                           |
|                 | FLAT CABLE 6 POLE        | 1 | RC 29 040 |                           |

## ADJUSTMENT PROCEDURE :

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Measuring the idling current is determined by the voltage over the 1 Ohm resistors R19-R30 each mV = 1 mA.

### 1. IDLING CURRENT

Adjust p1 on RC25 036 so that the voltage across R19-R30 is between 5 mA and 15 mA.

### 2. CURRENT LIMITTING

Load the output with a 2 Ohm load. Turn the input up to have 22V RMS on the output. Adjust p2 & p3 on RC25 036 until a very slight flat occurs on the sinusoidal tops.

### 3. SHORT CIRCUIT TEST

Change the 2 Ohm load into 4 Ohm load, the 22 Volt remaining. An Amperemeter in the primary will indicate a certain current, when the channel is shorted. This current will remain constant or drop slightly, if the current increase, p2 and p3 has to be re-adjusted !!

## SERVICE NOTES :

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1. When servicing an amplifier fitted with drivers of type 40871-1C03-1C12 / 40872-1C04-1C13 it is advised to replace them with a MJ 15030/MJ 15031 even when they are not defective.
2. If the amplifier protection do not connect the amplifier output to the output terminals (relais not switched on) you can connect an oscilloscope to the point marked with an X to measure directly on the output stage of the amp.