

MD 12-2,5

DELTA ELEKTRONIKA BV



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## REGULATED POWER SUPPLIES

M and MT series

Module	Bench model	Voltage	Current	Panel width
M 5-10	MT 5-10	5 V	10 A	1/4 of 19"
M 12-5	MT 12-5	12 V	5 A	
M 15-5	MT 15-5	15 V	5 A	
MD 12-2.5	MDT 12-2.5	24 V or $\pm 12$ V	2.5 A	
MD 15-2.5	MDT 15-2.5	30 V or $\pm 15$ V	2.5 A	
M 24-10	MT 24-10	24 V	10 A	1/2 of 19"
M 60-4	MT 60-4	60 V	4 A	
MV 15-10	MVT 15-10	4-15 V	10 A	
MV 30-6	MVT 30-6	15-30 V	6 A	



## DESCRIPTION

**M 5-10** is designed to power **5 V logic systems**. It has a built-in 6.5 V over voltage protector for additional safety of the load in case of power supply failure.

**MD 12-2.5** and **MD 15-2.5** are symmetrical dual power supplies to power  $\pm 12\text{ V}$  and  $\pm 15\text{ V}$  linear systems. The current limits of the pos. and neg. supply are coupled. In case of overloading or short circuiting one output both voltages drop equally. These power supplies can also be used for 24 V and 30 V.

**M 12-5**, **M 15-5**, **M 24-10** and **M 60-4** are general purpose power supplies with a fixed output voltage and only a small adjustment range.

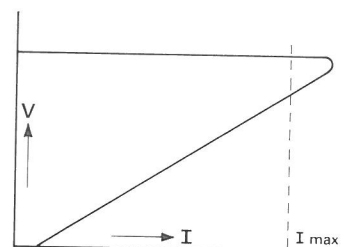
**MV 15-10** and **MV 30-6** are also intended to be used as fixed output power supplies. However, the transformers of these units have several taps on the secondary winding, which enable the user to adjust the output voltage over a large range. It is important to select the right transformer tap to avoid overheating of the series pass transistor.

## SPECIFICATIONS

<b>Input voltage</b>	110–117–220–234 V AC 50–400 Hz. Except M 5-10 which is standard only 220 V AC.
<b>Voltage regulation</b>	0.02% for $\pm 10\%$ line variation. 0.02% + 1 mV for 0–100% load change.
<b>Temp. coeff.</b>	0.01% per °C.
<b>Drift</b>	Less than 0.1% per 8 hours under constant ambient and load conditions, after 30 minutes warm-up.
<b>Ripple</b>	0.1 mV r.m.s. 0.5 mV p-p.
<b>Output imp.</b>	Less than 100 milli-ohm at 100 kHz load frequency.
<b>Recovery time</b>	20 micro-seconds for recovery to within 30 mV of steady state voltage after a step load change from 10% to 100%.
<b>Voltage adj. range</b>	M 5-10 has a voltage adj. range of $\pm 20\%$ with a current derating of 25% at the upper and lower end of the range. M 12-5, M 15-5, MD 12-2.5, MD 15-2.5, M 24-10 and M 60-4 have an adj. range of $\pm 5\%$ with a current derating of 20% on each end. MV 15-10 and MV 30-6 are fully adjustable without derating.

**Current limit and lamp load**

All described units have a fold back current limit. In spite of this characteristic these units, except M 5-10, MD 12-2.5 and MD 15-2.5, can be used with non linear loads like incandescent lamps, provided the lamp rating does not exceed 80% of the maximum current of the power supply. Even series connected units can be switched on with a lamp load.



**Remote sensing**

All units have connections for remote sensing to enable regulation at the load point. If remote sensing is not used the terminals S + and S - have to be connected to + and - respectively.

**Parallel and series connection**

Parallel and series connection is permitted under any load condition.

**Static screens**

Transformers have two screens. The first is connected to the case, the second to the output circuit.

**Over voltage protector**

Optional for all models except M 5-10 which has a built-in o.v.p.

**Size  
W x H x D**

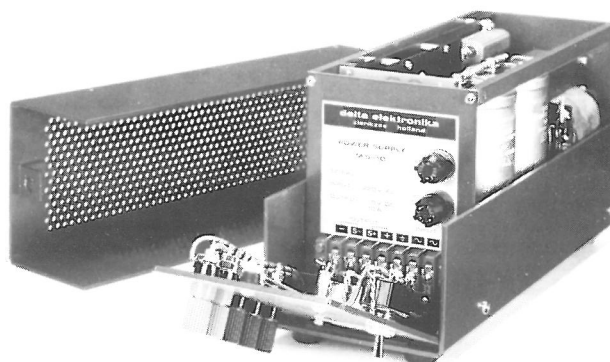
103 x 132.5 x 260 mm (M 5-10, M 12-5, M 15-5, MD 12-2.5, MD 15-2.5)  
206 x 132.5 x 260 mm (M 24-10, M 60-4, MV 15-10, MV 30-6).

**Weight**

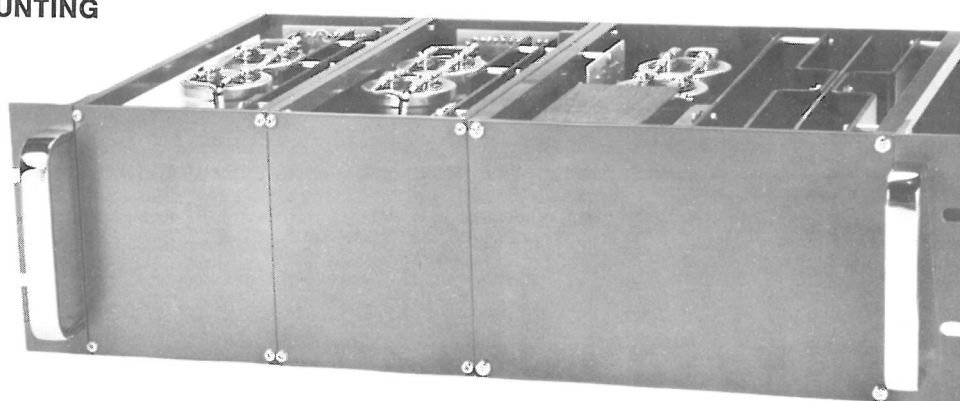
5 kgs (M 5-10 etc.).  
8.8 kgs (M 24-10 etc.).

**BENCH MODELS**

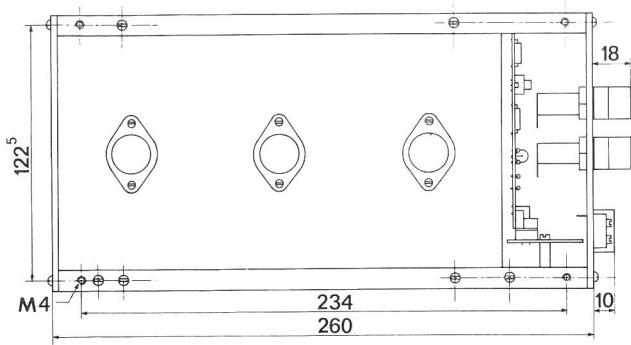
A unique construction is used to enable the conversion of a basic unit into a bench model. The maximum ambient temperature for the bench models is 35 °C.



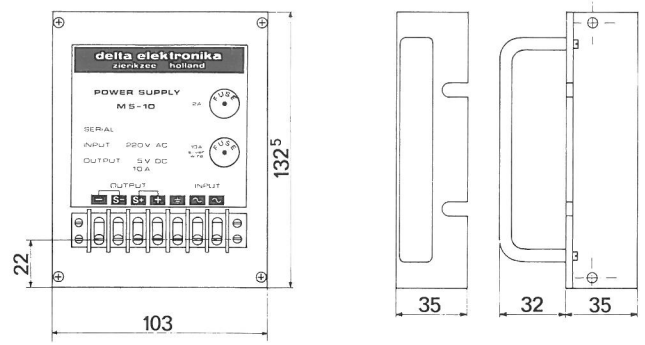
**RACK MOUNTING**



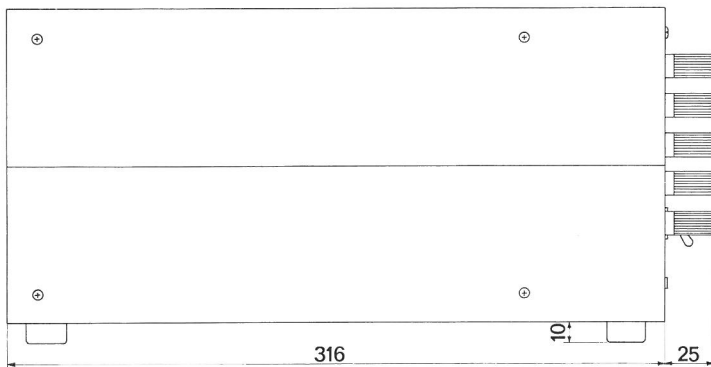
Several units can be mounted together and are, with the help of two brackets H 7, suited for 19" rack mounting.



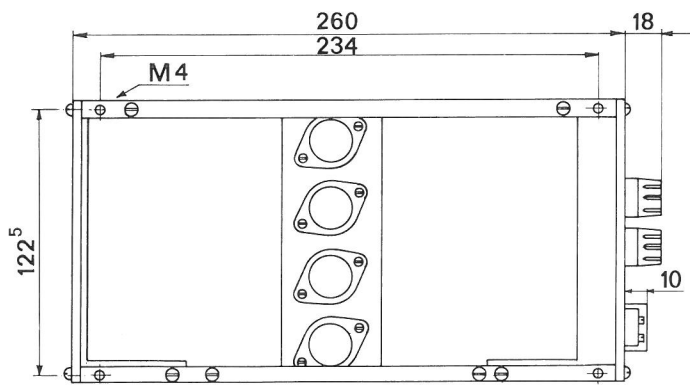
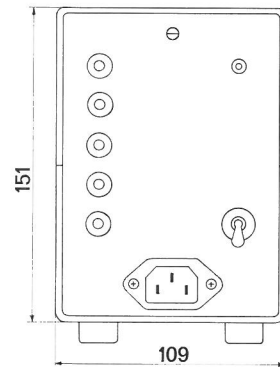
M 5-10 M 12-5 M 15-5 MD 12-2.5 MD 15-2.5



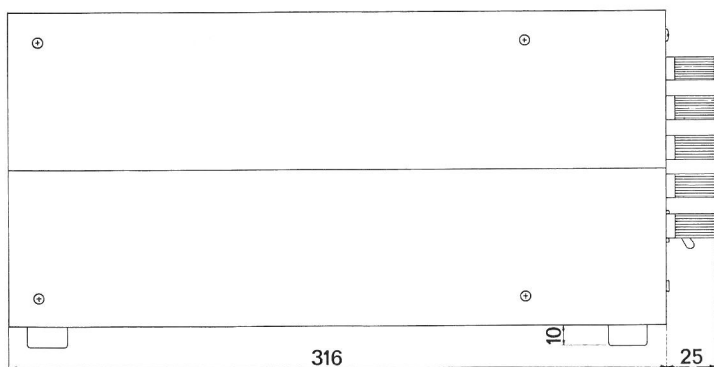
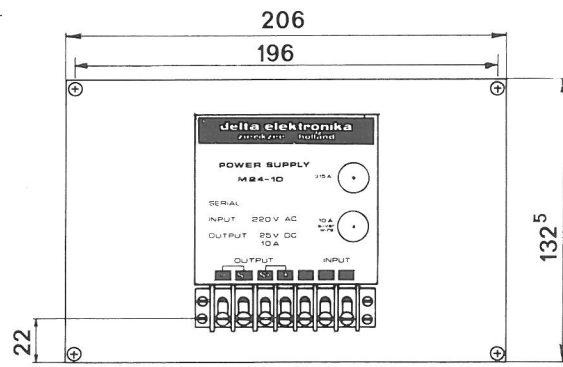
H 7



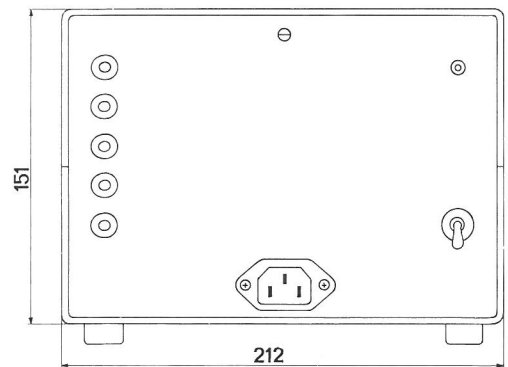
MT 5-10 etc.

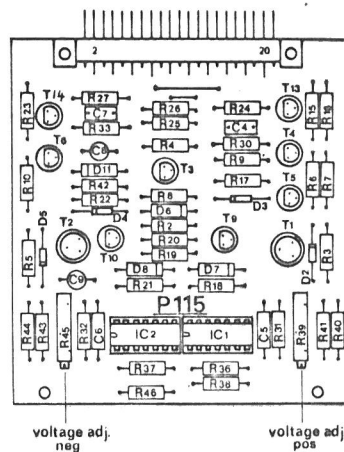
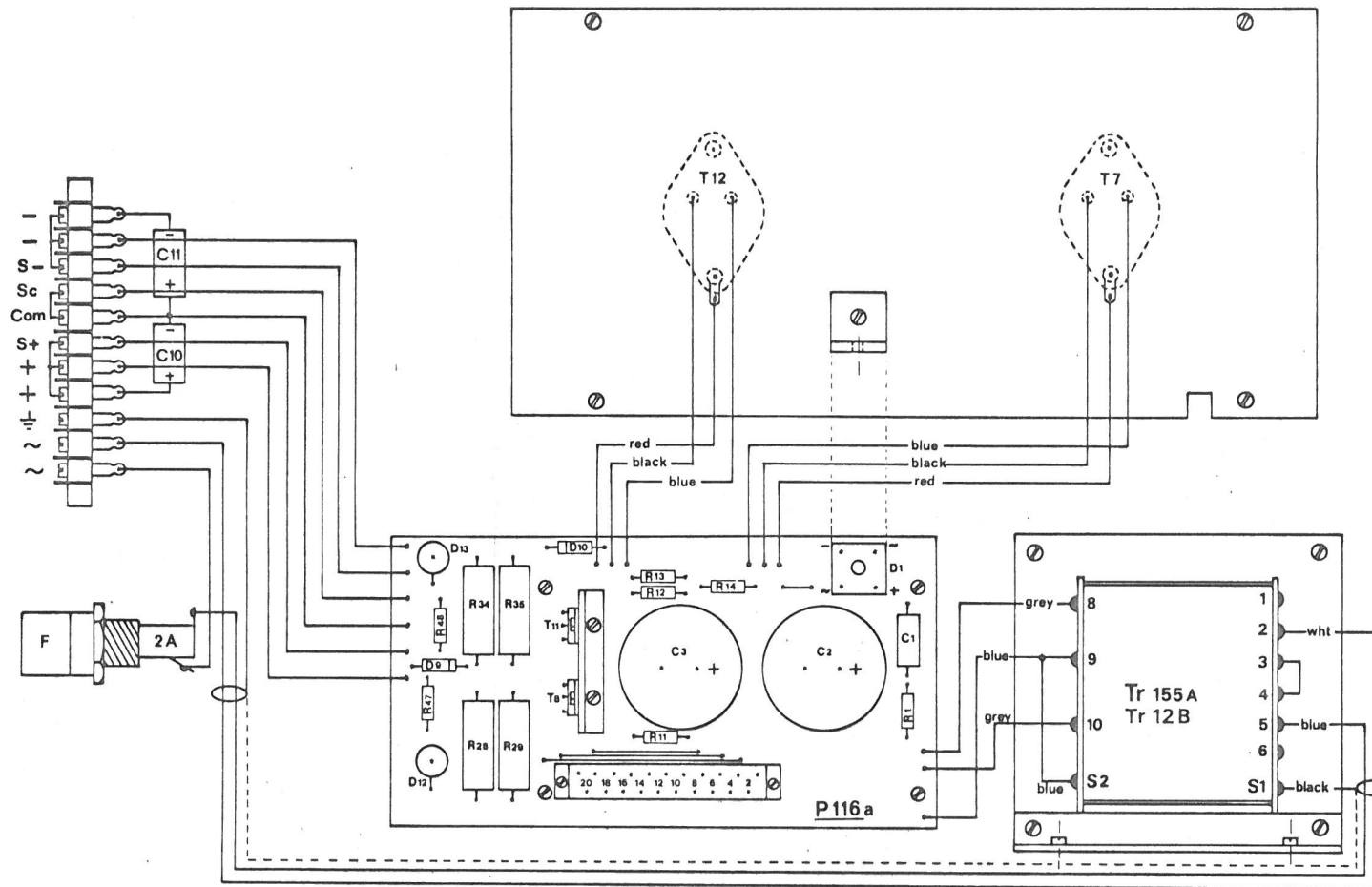


M 24-10 M 60-4 MV 15-10 MV 30-6

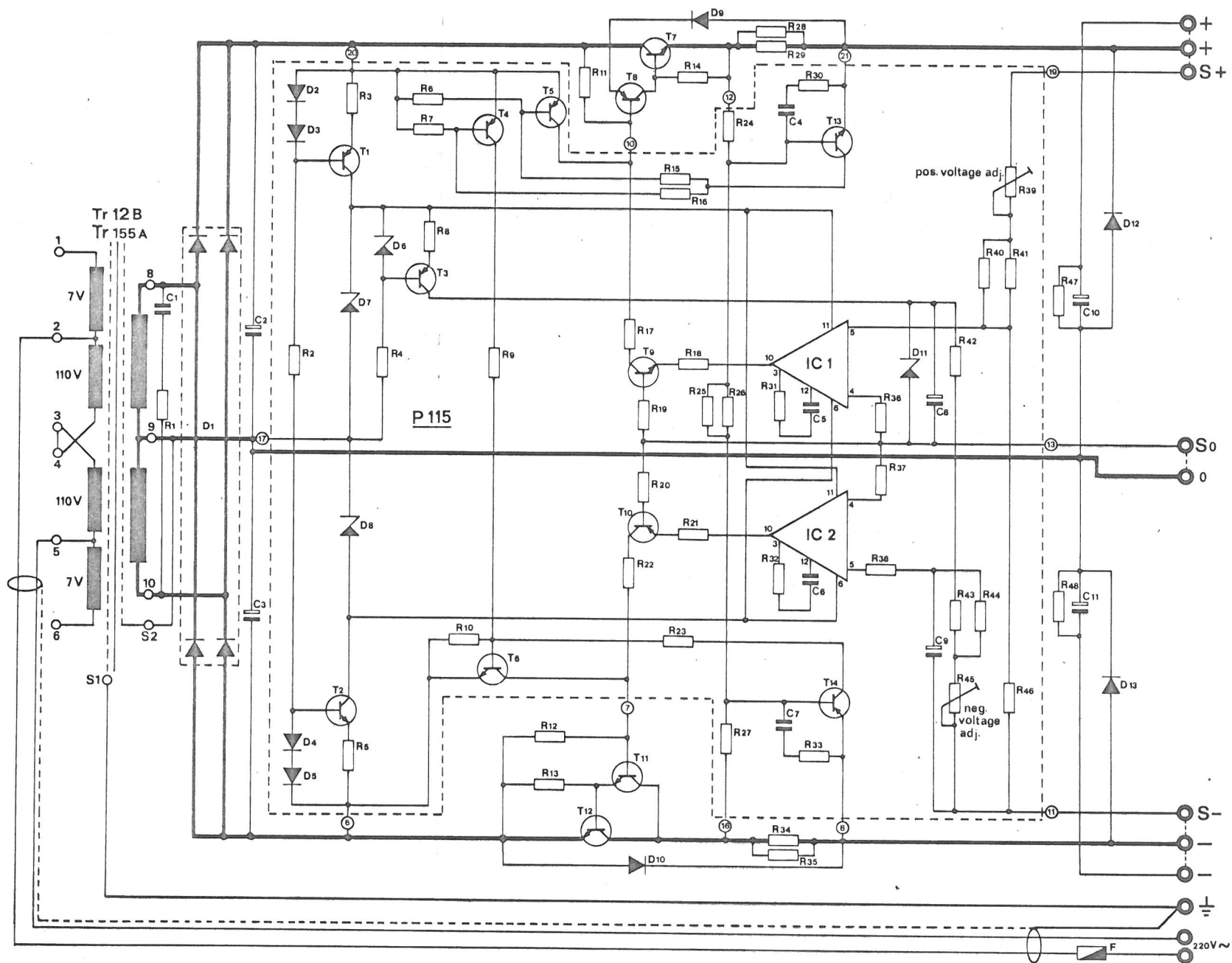


MT 24-10 etc.





wiring diagram MD 15-2,5  
MD 12-2,5



circuit diagram MD 15-2,5  
MD 12-2,5

5-3-73

R (Ohm)

1 = 47  
 2 = 33 k  
 3 = 39  
 4 = 5,6k  
 5 = 39  
 6 = 3,3k  
 7 = 3,3k  
 8 = 560  
 9 = 1 k  
 10 = 3,3k  
 11 = 2,2k  
 12 = 2,2k  
 13 = 47  
 14 = 47  
 15 = 1 k  
 16 = 1 k  
 17 = 1 k  
 18 = 1 k  
 19 = 1 k  
 20 = 1 k  
 21 = 1 k  
 22 = 1 k  
 23 = 1 k  
 24 = 470  
 25 = CR  
 26 = 15 k  
 27 = 470  
 28 = 1 7 W WW  
 29 = 1 7 W WW  
 30 = 47  
 31 = 390  
 32 = 390  
 33 = 47  
 34 = 1 7 W WW  
 35 = 1 7 W WW  
 36 = 1 k  
 37 = 1 k  
 38 = 1 k  
 39 = 5 k tr. potm.  
 40 = 12 k  
 41 = CR  
 42 = 5,6k  
 43 = 12 k  
 44 = CR  
 45 = 5 k tr. potm.  
 46 = 15 k  
 47 = 470  
 48 = 470

C (microfarad)

1 = 0,22 250 V  
 2 = 4700 40 V  
 3 = 4700 40 V  
 4 = 0,22 63 V  
 5 = 0,01 250 V  
 6 = 0,01 250 V  
 7 = 0,22 63 V  
 8 = 10 35 V Tantaal  
 9 = 10 35 V Tantaal  
 10 = 220 40 V  
 11 = 220 40 V

D

1 = VH 148 VARO  
 2 = 1N 4148 ITT  
 3 = 1N 4148 ITT  
 4 = 1N 4148 ITT  
 5 = 1N 4148 ITT  
 6 = ZP 6,2 ITT  
 7 = ZY 12 ITT  
 8 = ZY 12 ITT  
 9 = 1N 4003 ITT  
 10 = 1N 4003 ITT  
 11 = 1N 825 Dickson  
 12 = MR 1031 B Mot.  
 13 = MR 1031 B Mot.

T

1 = 2N 4037 RCA  
 2 = 2N 3053 RCA  
 3 = BC 212 TI  
 4 = BC 212 TI  
 5 = BC 212 TI  
 6 = BC 182 TI  
 7 = 2N 3055 RCA  
 8 = TIP 30 A TI  
 9 = BC 182 TI  
 10 = BC 212 TI  
 11 = TIP 29 A TI  
 12 = 2N 3055 RCA  
 13 = BC 182 TI  
 14 = BC 212 TI

IC

1 = SN72709N TI  
 2 = SN72709N TI

F = fuse 2 A - 6 x 32 mm

CR = Calibration resistor

WW = Wire wound resistor

All other resistors metalfilm  $\frac{1}{2}$  W 2%