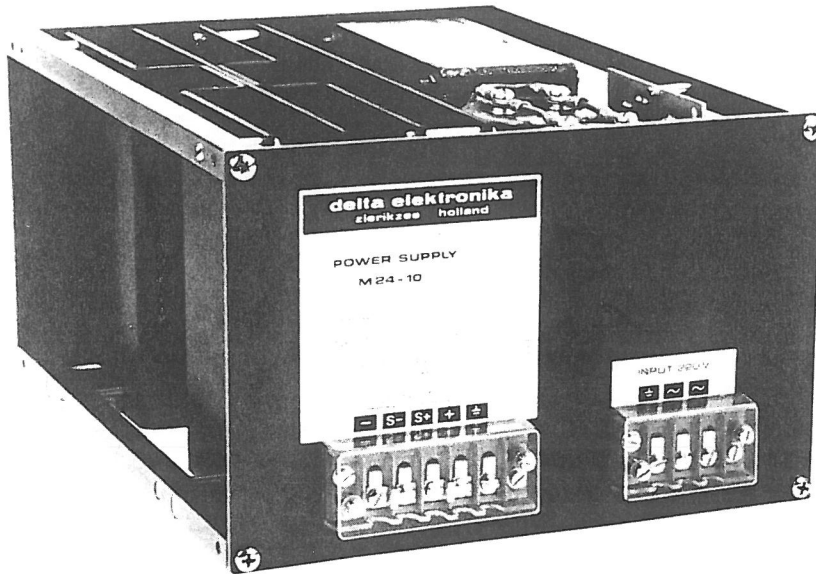


DELTA ELEKTRONIKA BV

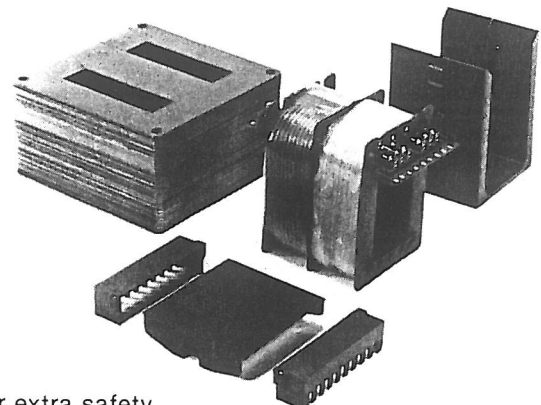
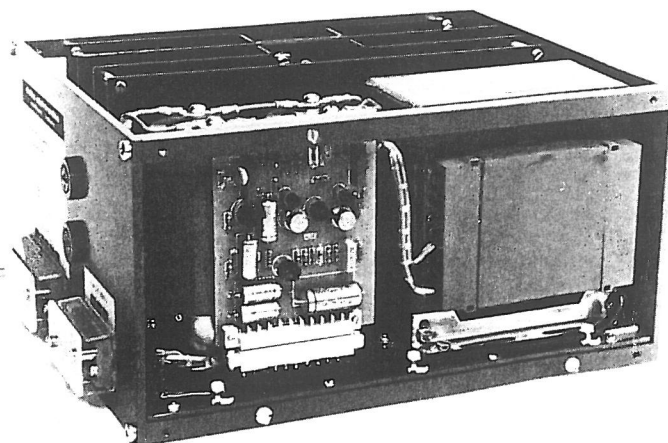


P.O. BOX 27  
 4300 AA ZIERIKZEE  
 NETHERLANDS  
 TEL. (01110) 3656 TLX 55349



LINEAR REGULATED POWER SUPPLIES M – SERIES

HALF 19"	206 x 132.5 x 260 mm	QUARTER 19"	103 x 132.5 x 260 mm
M 24 – 10	24 V 10 A	M 5 – 10	5 V 10 A
M 48 – 5	48 V 5 A	M 12 – 5	12 V 5 A
M 60 – 4	60 V 4 A	M 15 – 5	15 V 5 A
MV 15 – 10	4 – 15 V 10 A	MD 12 – 2.5	+ 12 V 2.5 A - 12 V 2.5 A or 24 V 2.5 A
MV 30 – 6	15 – 30 V 6 A	MD 15 – 2.5	+ 15 V 2.5 A - 15 V 2.5 A or 30 V 2.5 A



Transformer with split bobbin for extra safety

### Input voltage

110 - 117 - 220 - 234 V 50-60 Hz

### Insulation voltage

a) M24-10, M48-5, M60-4

According to IEC 380 / VDE 0806

Input-output 3.750 Vrms

Input-case 3.750 Vrms

Output-case 500 V DC

These units have a split bobbin transformer acc. to VDE0551, CEE15.

Safety is acc. to VDE0100 part 1 §6.2

b) MV15-10, MV30-6, M5-10, M12-5, M15-5, MD12-2.5, MD15-2.5

Input-output 1.500 Vrms

Input-case 1.500 Vrms

Output-case 400 V DC

Some of these models are available with a split bobbin transformer.

Safety is acc. to VDE0100 part 1 §6.2

### RFI suppression

According to VDE 0875 grade k

### Voltage regulation

Line regulation +/- 10%: 0.02%

Load regulation 0-100%: 0.02% + 1 mV

### Ripple

0.1 mV rms, 0.5 mV p-p

### Temperature coefficient

0.01% per °C

### Drift

Less than 0.1% per 8 hours under constant ambient and load conditions, after 30 minutes warm up.

### Recovery time

20 microseconds for a 10-100% load step

### Ambient temperature

Max. 50 °C at full load and nominal input voltage. Derate max. output current linearly to 20% from 50 to 85 °C

### Voltage adjustment

The M-series is meant for use as a fixed output voltage power supply with a small

adjustment range. The MV models have a larger adj. range, however they have taps on the transformer secondary. It is important to select the right tap to avoid overheating of the series pass transistor.

The adjustment ranges are:

MV15-10	M24-10	23-28 V
tap15 4-7 V	M48-5	46-54 V
14 7-10 V	M60-4	58-64 V
13 10-12 V	M5-10	4-6 V
12 12-14 V	M12-5	11-13.5 V
11 14-15 V	M15-5	14-16 V

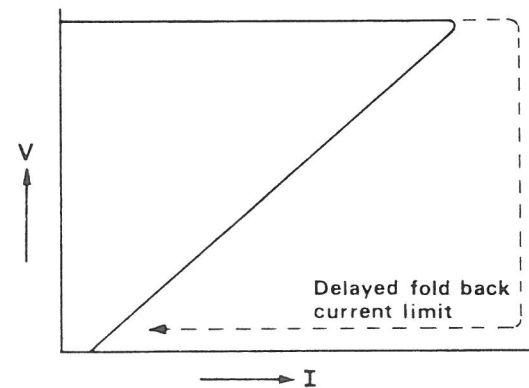
### MV30-6

tap15 15-19 V	MD12-2.5	11-14 V
14 19-23 V	MD15-2.5	14-16 V
13 23-26 V		
12 26-28 V		
11 28-30 V		

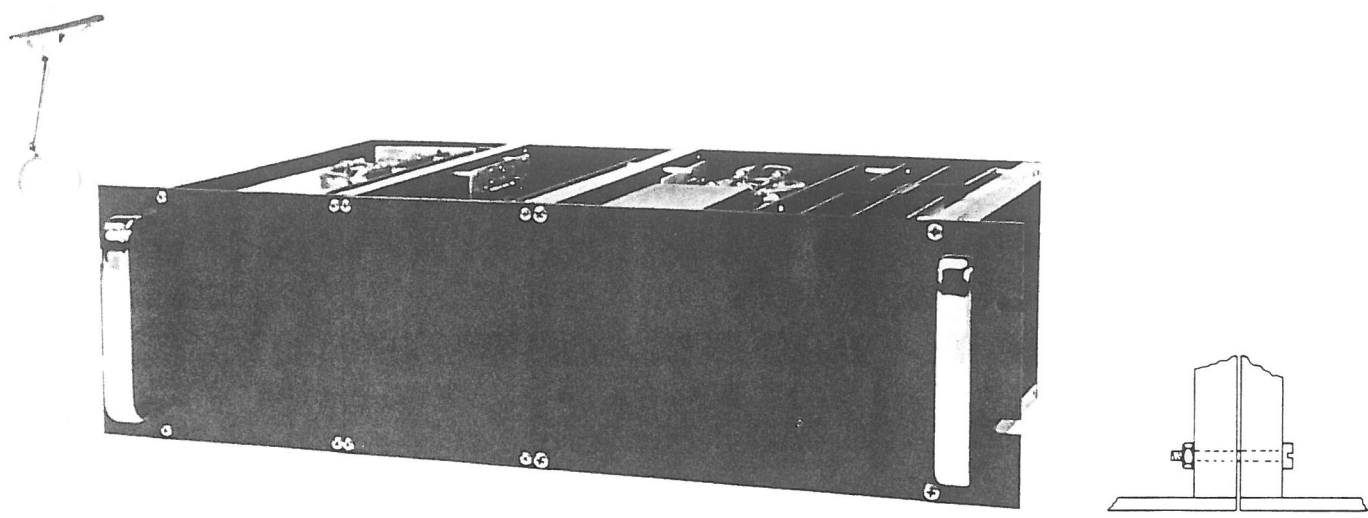
### O.V.P

Only the M5-10 has a built-in overvoltage protector. For all other models the OVP is optional. Also external OVP's like the PR60-3 can be used.

### Current limit and lamp load

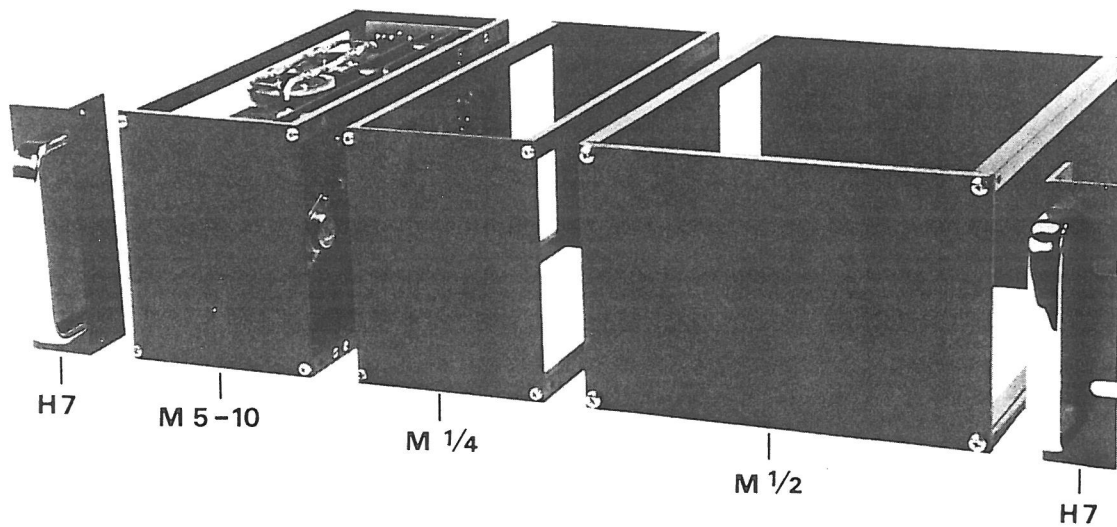


All units can continuously be overloaded and short circuited. In spite of the fold back overload characteristic, all units (except M5-10 and MD's) can be used to power non linear loads like incandescent lamps, provided the load is below 80% of maximum current. Even series connected units can be switched on in a loaded condition. This is possible because in overload it first goes into constant current and after a short delay of about 0.5sec. into fold back (to protect for overheating).



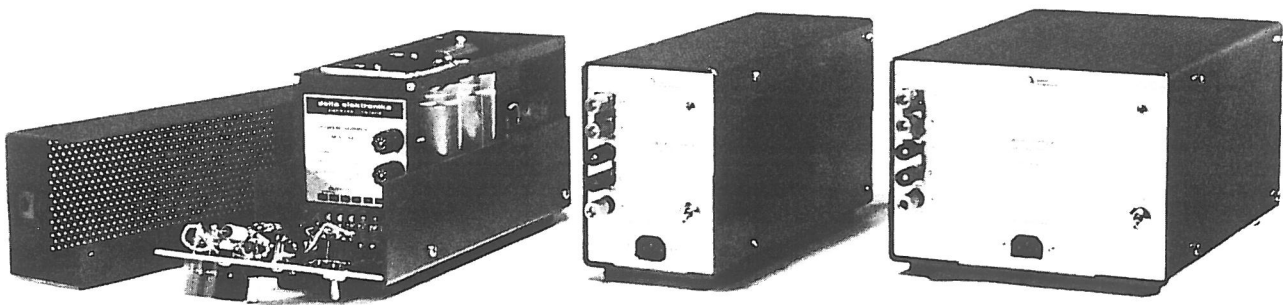
### Rack mounting

On each side the beams have tapped holes M4 to mount the brackets H7. However to bolt units together in the middle use steel M3 bolts and nuts through the M4 holes. The brackets H7 can be mounted optionally against the front or the rear panel to form a 19" rack unit.



<b>Dimensions and weight:</b>	Half 19"	206 x 132.5 x 260 mm	8.8 kg
	Quarter 19"	103 x 132.5 x 260 mm	5.0 kg

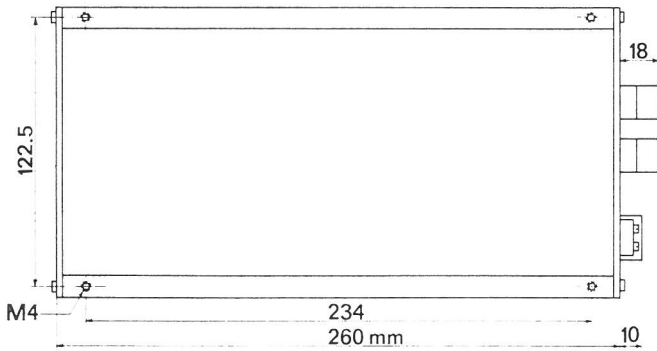
Also empty half 19" and quarter 19" modules are available.



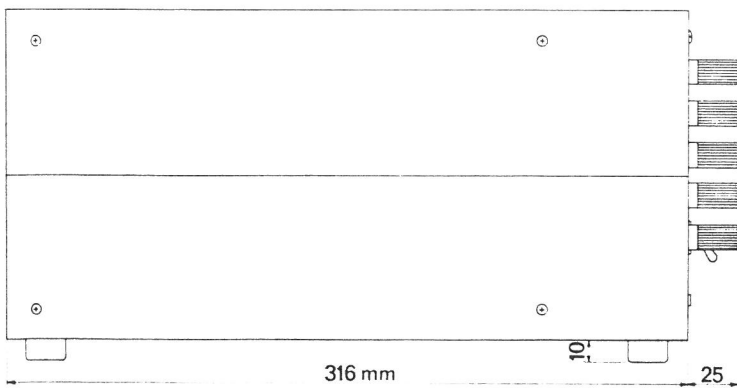
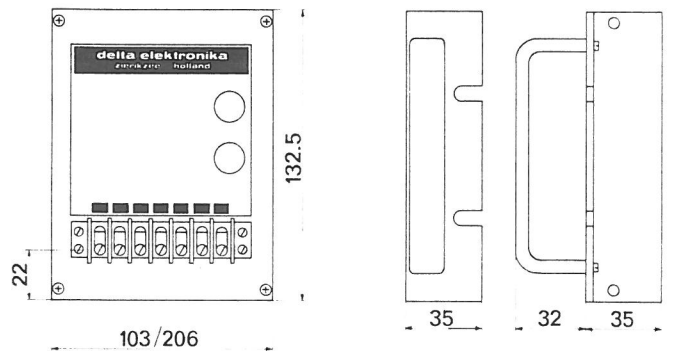
### Bench models

A unique construction enables a basic module to be converted into a bench model. The type number of a bench model is modified by the addition of a T, c.f. MT 24-10, etc.

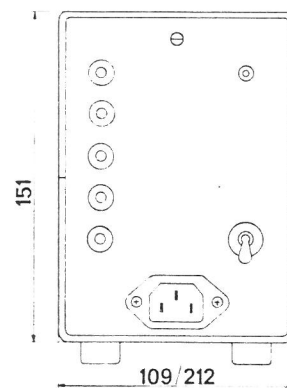
	Hold up time (220V, full load) typical	Efficiency (220V, full load) typical	Input current (220V, full load) typical	Adjustment range
M 24-10	15 mS	63 %	2.4 A rms	23-28 V
M 48-5	15 mS	66 %	2.3 A rms	46-54 V
M 60-4	15 mS	67 %	2.3 A rms	58-64 V
MV 15-10	15 mS	54 %	1.7 A rms	4-15 V
MV 30-6	15 mS	63 %	1.8 A rms	15-30 V
M 5-10	18 mS	40 %	0.8 A rms	4- 6 V
M 12-5	15 mS	50 %	0.75 A rms	11-13.5 V
M 15-5	15 mS	51 %	0.9 A rms	14-16 V
MD 12-2.5	10 mS	50 %	0.75 A rms	11-14 V
MD 15-2.5	10 mS	51 %	0.9 A rms	14-16 V



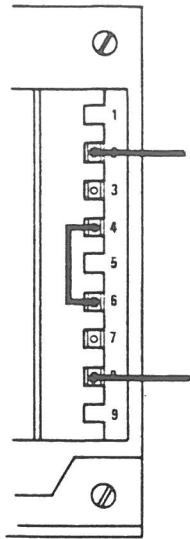
M - series



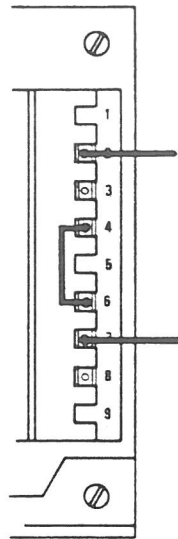
MT - series



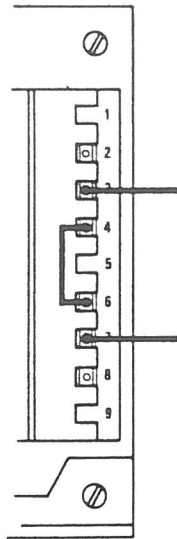
### Transformer connections (T 93B)



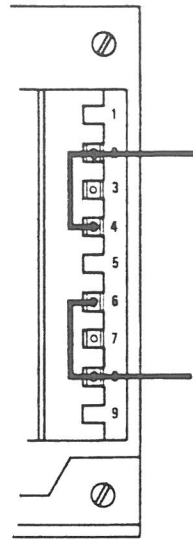
234 V~  
Fuse 3.15 A



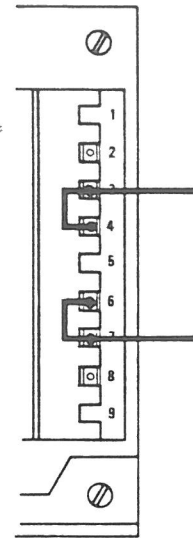
227 V~  
Fuse 3.15 A



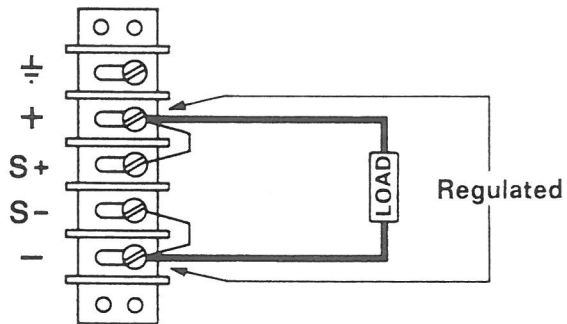
220 V~  
Fuse 3.15 A



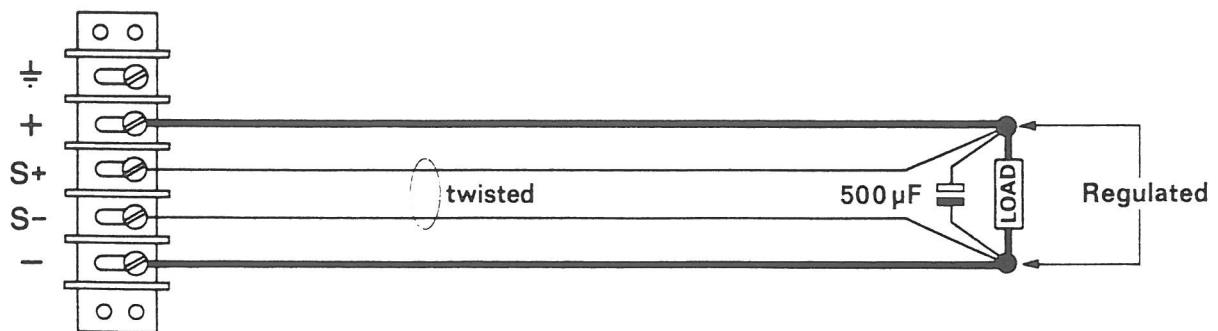
117 V~  
Fuse 5 A



110 V~  
Fuse 5 A



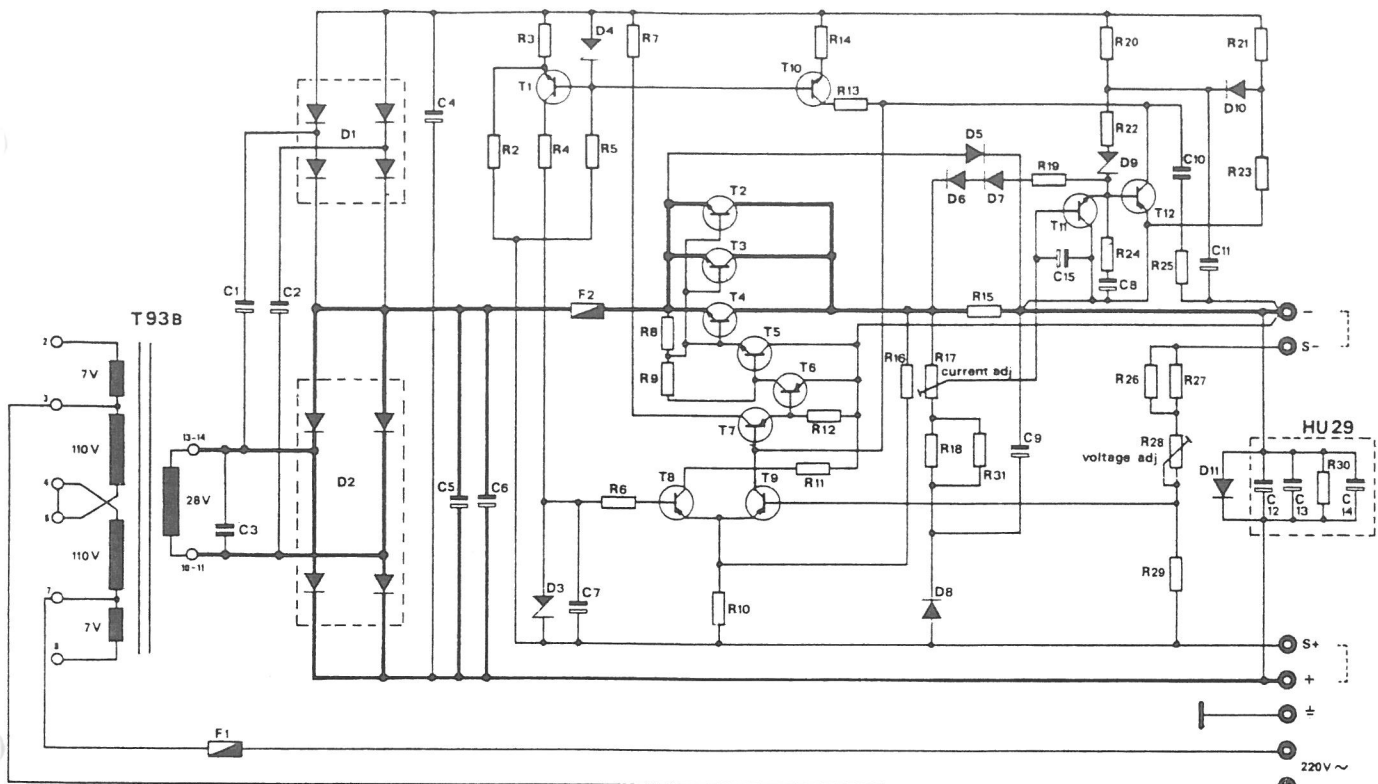
Normal operation with sense points connected to the + and - output terminals



Remote sensing to compensate voltage drop over load line

			Title: M 24 - 10
			Date: 8 - '82
Modifications	Date	App.	delta elektronika bv





R = Ohm

C = Microfarad

T

1 = -	1 = 22 63 V	1 = 2N3053 RCA
2 = CR	2 = 22 63 V	2 = 2N3055 RCA
3 = 820	3 = 0,1 250 V	3 = 2N3055 RCA
4 = 3,3 k	4 = 100 100 V	4 = 2N3055 RCA
5 = 15 k	5 = 12000 40 V	5 = 2N3055 RCA
6 = 1 k	6 = 12000 40 V	6 = 2N4037 RCA
7 = 1 k 0,7W	7 = 10 35 V	7 = BC 556 A Siemens
8 = 10	8 = 2,2 16 V	8 = BC 556 A Siemens
9 = 120	9 = 47 35 V	9 = BC 556 A Siemens
10 = 1,8 k	10 = 0,22 63 V	10 = BC 546 A Siemens
11 = 820	11 = 22 63 V	11 = BC 546 A Siemens
12 = 3,3 k	12 = 100 63 V	12 = BC 556 A Siemens
13 = 22 k	13 = 100 63 V	
14 = 10 k	14 = 100 63 V	
15 = 0,1 50W WW		
16 = CR		
17 = 1 k 20 t. potm.	D	
18 = 22 k	1 = KB10-B80C1000 Hermann	
19 = 820	2 = VT 200/T VARO	
20 = 47 k	3 = 1 N 825	
21 = 6,8 k	4 = ZP 6,8 ITT	
22 = 100 k	5 = 60 S 1 IR	
23 = 8,2 k	6 = 1N4148 TI	
24 = 1,5 k	7 = 1N4148 TI	
25 = 150	8 = 1N4003 TI	
26 = CR	9 = ZY 12 ITT	
27 = 3,3 k	10 = 1N4148 TI	
28 = 1 k 20 t. potm.	11 = 1 N 249 C	
29 = 1 k	F <sub>1</sub> = Fuse 3,15 A - 6 x 32 mm	
30 = 1 k 1W	F <sub>2</sub> = Fuse 10 A - 6 x 32 mm silverwire	
31 = CR		

All other resistors metalfilm 0,4W 2%

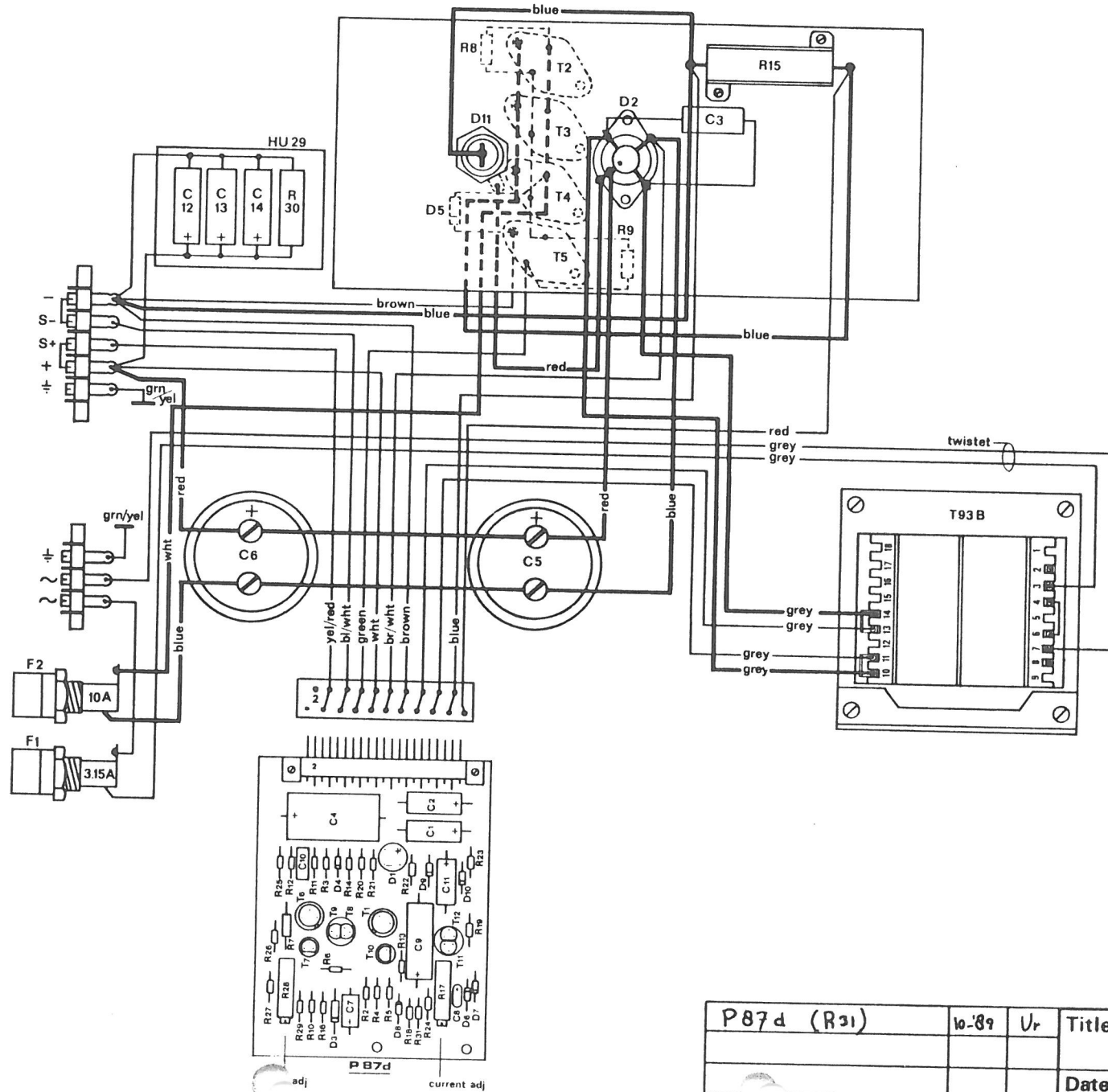
WW = Wire wound

CR = Calibration resistor

tt = tantalum

P87d (R31)	10-'82	V <sub>r</sub>	Title:
			M 24 - 10
			Date: 8 - 82
Modifications	Date	App.	delta elektronika bv

δ



P87 d (R3)	10-89	U <sub>r</sub>	Title: Wiring diagram M 24 - 10
			Date: 8 - 89
Modifications	Date	App	delta elektronika, bv

