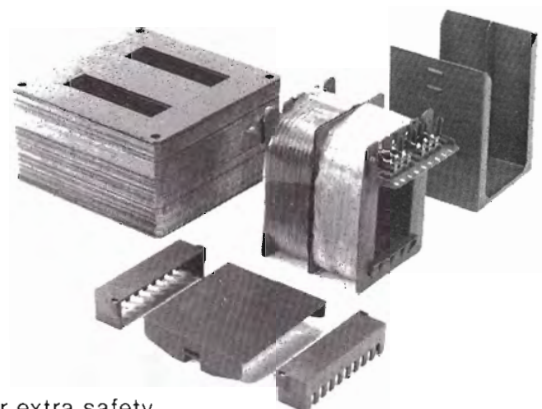
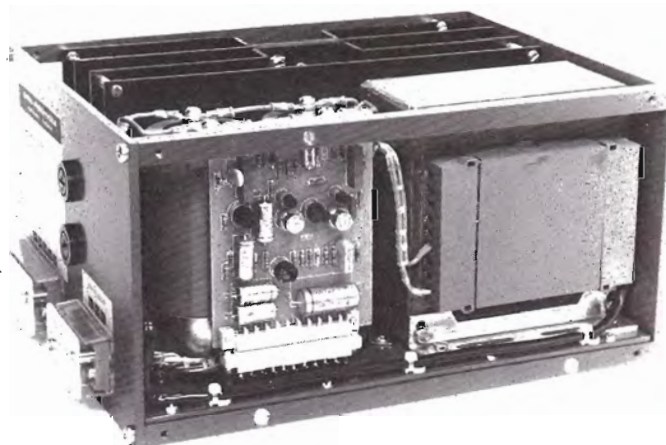


LINEAR REGULATED POWER SUPPLIES M – SERIES

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 VDE0875 grade k

Voltage regulation

Line regulation +/- 10%: 0.02%

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

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.

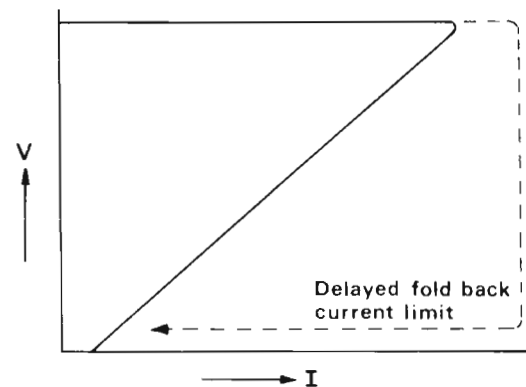
The adjustment ranges are:

MV15-10	M24-10	23-28	V	
tap15	4-7	M48-5	46-54	V
14	7-10	M60-4	58-64	V
13	10-12	M5-10	4-6	V
12	12-14	M12-5	11-13.5	V
11	14-15	M15-5	14-16	V
		MD12-2.5	11-14	V
MV30-6	MD15-2.5	14-16	V	
tap15	15-19			
14	19-23			
13	23-26			
12	26-28			
11	28-30			

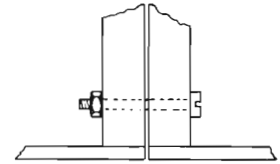
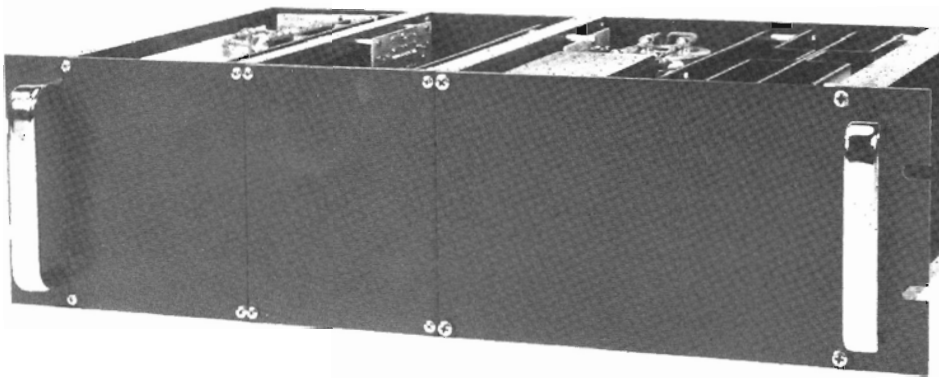
O.V.P

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

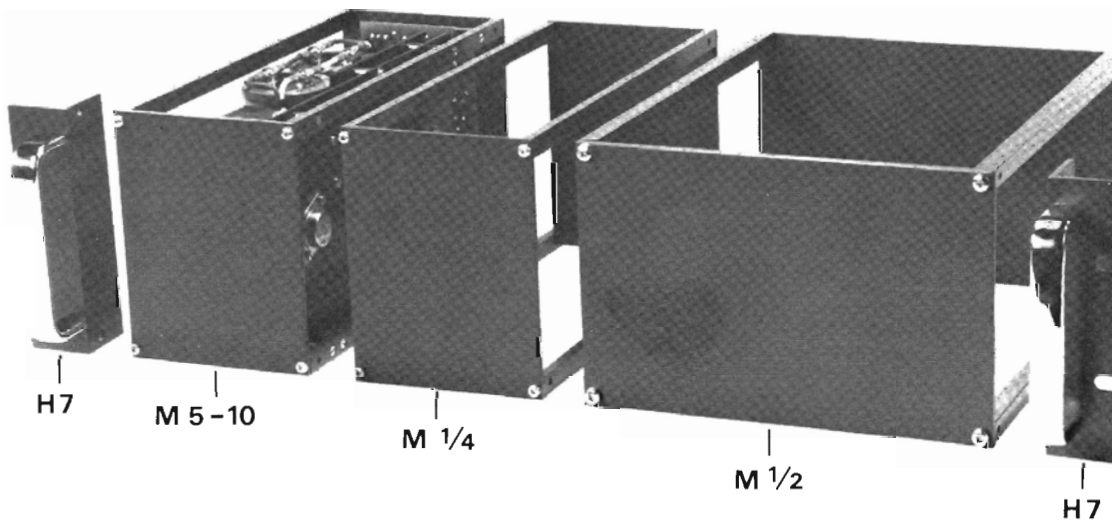


All units can continuously be overloaded and short circuited. In spite of the fold back overload characteristic, all units (except M5-10 and MD's) can be used to power non linear loads like incandescent lamps, provided the load is below 80% of maximum current. Even series connected units can be switched 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).



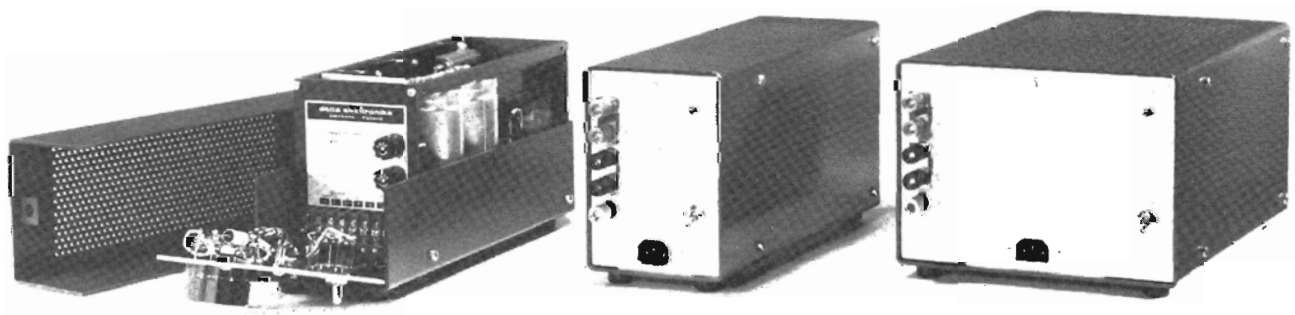
Rack mounting

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.



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

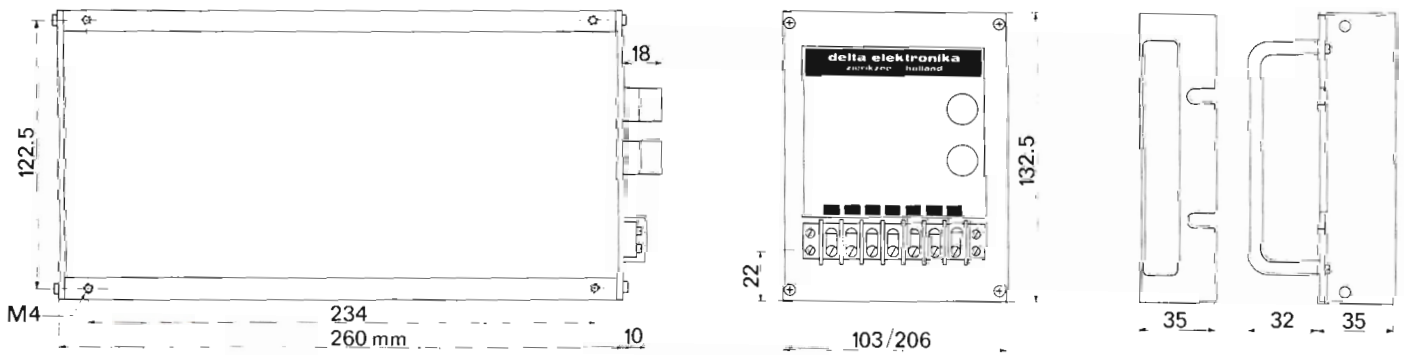
Also empty half 19" and quarter 19" modules are available.



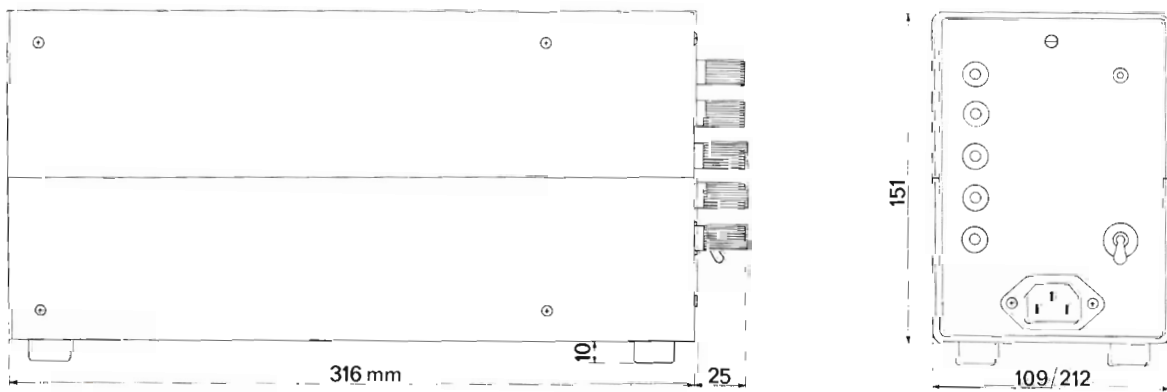
Bench models

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.

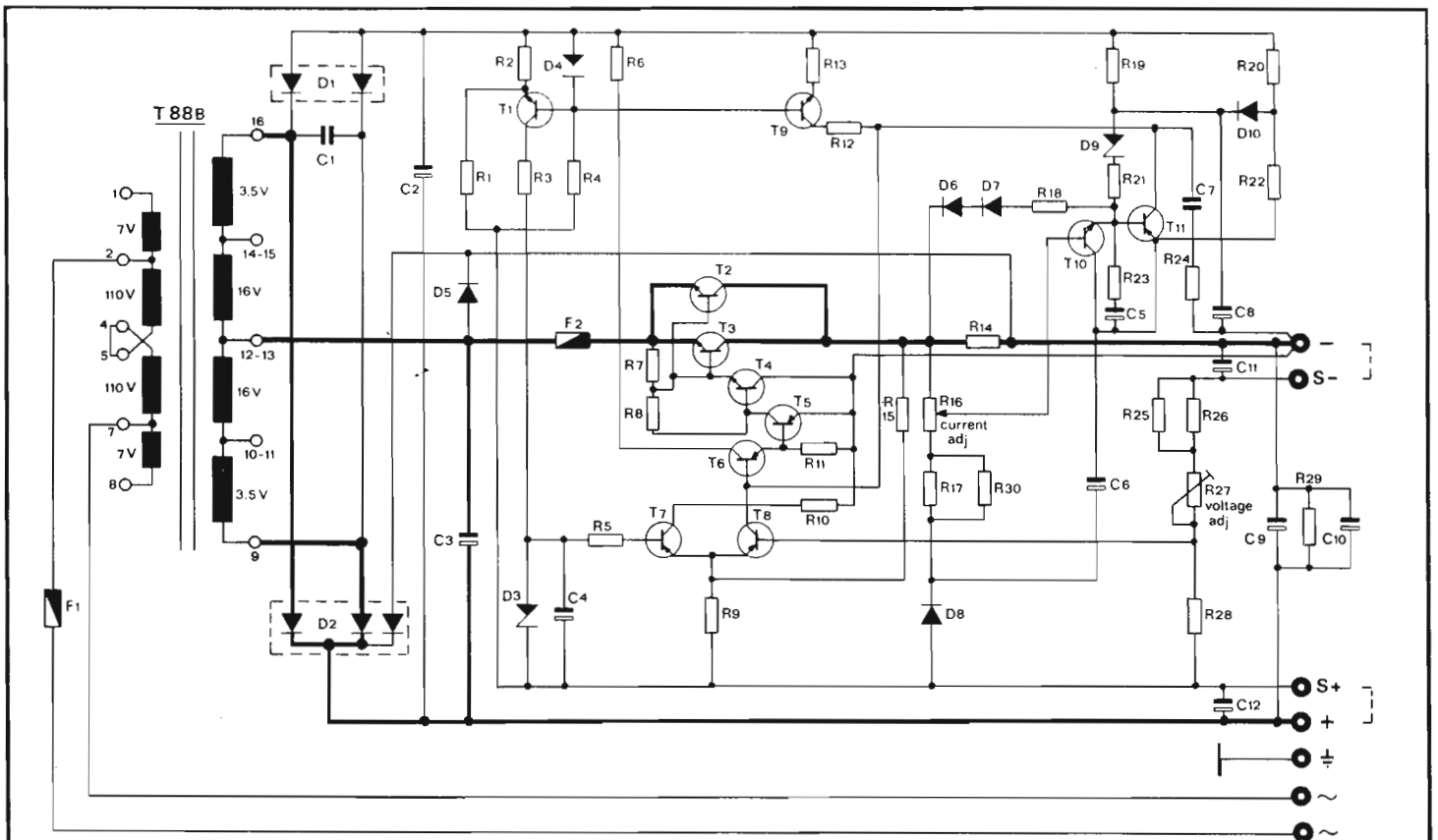
	Hold up time (220V, full load) typical	Efficiency (220V, full load) typical	Input current (220V, full load) typical	Adjustment range
M 24-10	15 mS	63 %	2.4 A rms	23-28 V
M 48-5	15 mS	66 %	2.3 A rms	46-54 V
M 60-4	15 mS	67 %	2.3 A rms	58-64 V
MV 15-10	15 mS	54 %	1.7 A rms	4-15 V
MV 30-6	15 mS	63 %	1.8 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



R = Ohm

1 =	330	k
2 =	820	
3 =	1,2	k
4 =	6,8	k
5 =	1	k
6 =	1	k 0,7W
7 =	10	
8 =	120	
9 =	1,8	k
10 =	100	
11 =	3,3	k
12 =	10	
13 =	10	k
14 =	0,2	50W WW
15 =	CR	
16 =	1	k 20 t. potm.
17 =	15	k
18 =	820	
19 =	47	k
20 =	2,7	k
21 =	22	k
22 =	3,3	k
23 =	1,5	k
24 =	33	
25 =	CR	
26 =	2,2	k
27 =	1	k 20 t. potm.
28 =	1,8	k
29 =	680	
30 =	CR	

C = Microfarad

1 =	1	250 V
2 =	100	100 V
3 =	14000	30 V
4 =	10	40 V
5 =	2,2	35 V tt
6 =	250	15 V
7 =	0,22	63 V
8 =	47	40 V
9 =	220	40 V
10 =	220	40 V
11 =	10	35 V tt
12 =	10	35 V tt

D

1 =	KB10-B80C1000	Hermann
2 =	VTC 200 T	VARO
3 =	1 N 825	Mot.
4 =	ZP 6,8	ITT
5 =	60 S 1	IR
6 =	1N4148	TI
7 =	1N4148	TI
8 =	1N4003	TI
9 =	ZP 6,8	ITT
10 =	1N4148	TI

F₁ = Fuse 2 A delay-220 V 6x32 mm

F₂ = Fuse 5 A silverwire 6x32 mm

tt = tantalum

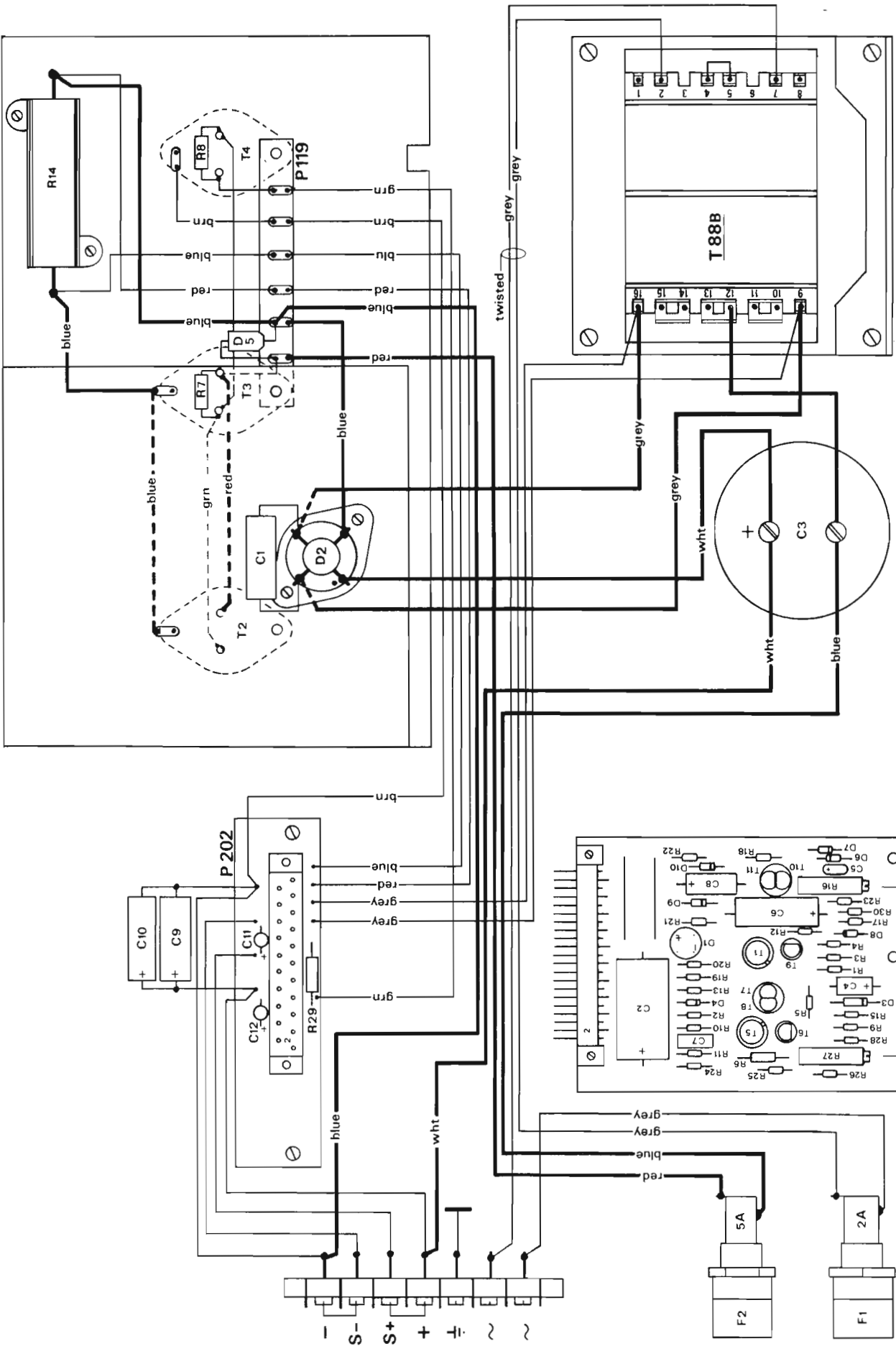
T

1 =	2N3053	RCA
2 =	2N3055	RCA
3 =	2N3055	RCA
4 =	2N3055	RCA
5 =	2N4037	RCA
6 =	BC 556 A	Siemens
7 =	BC 556 A	Siemens
8 =	BC 556 A	Siemens
9 =	BC 546 A	Siemens
10 =	BC 546 A	Siemens
11 =	BC 556 A	Siemens

WW = Wire wound resistor
 CR = Calibration resistor
 All other resistors metalfilm 0,4W
 2%

P87d (R30)	10-82	Vr	Title: M 15 - 5
T88B	11-82	Vr	
Modifications			Date: 5-78
Date	App.	delta elektronika bv	

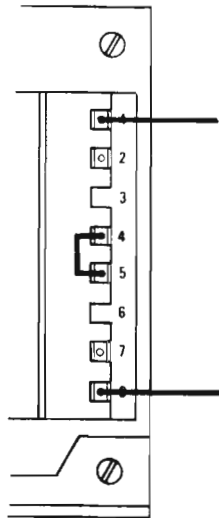




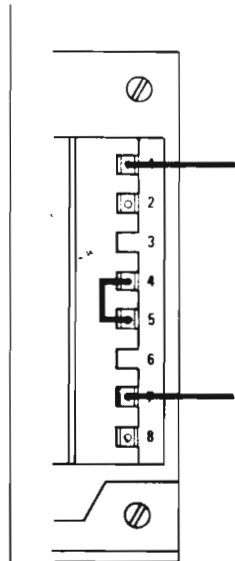
P87d (R30) T88B	10-'82	Vr.	Title: Wiring diagram M15 - 5
	11-'82	Vr.	
Modifications	Date	App	delta elektronika bv

P87d
voltage adj
current adj

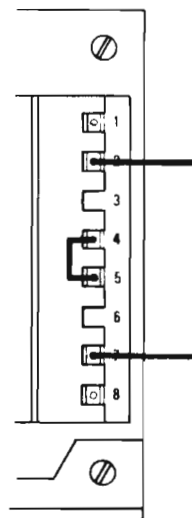
Transformer connections (T 88B)



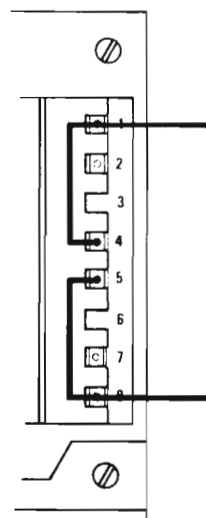
234 V~
Fuse 2 A



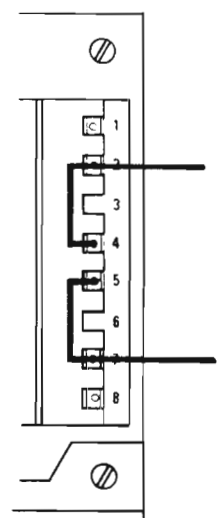
227 V~
Fuse 2 A



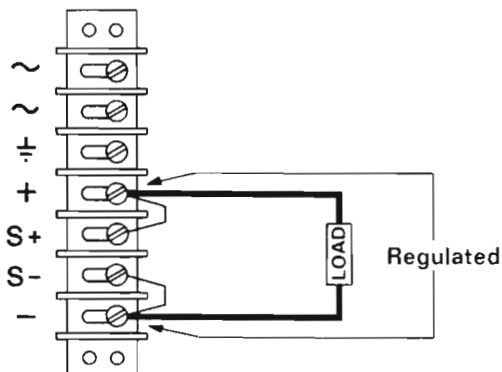
220 V~
Fuse 2 A



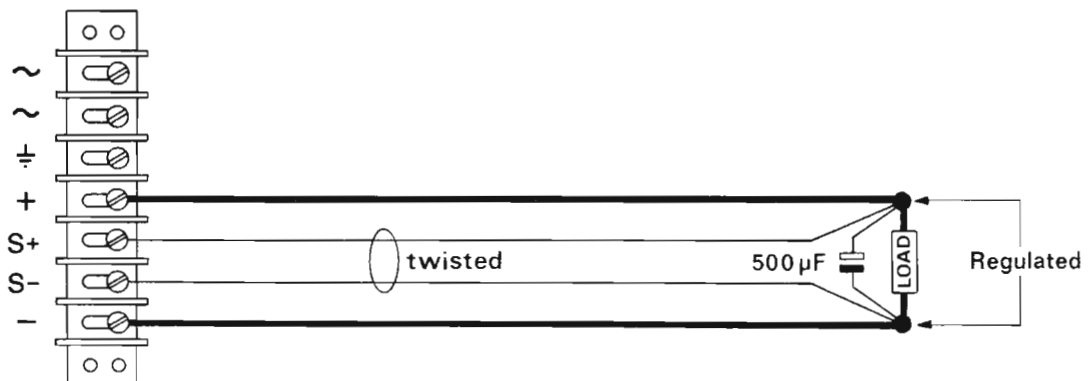
117 V~
Fuse 3.15 A



110 V~
Fuse 3.15 A



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



Remote sensing to compensate voltage drop over load line

			Title: M 15 - 5
			Date: 11-'82
Modifications	Date	App.	delta elektronika bv

