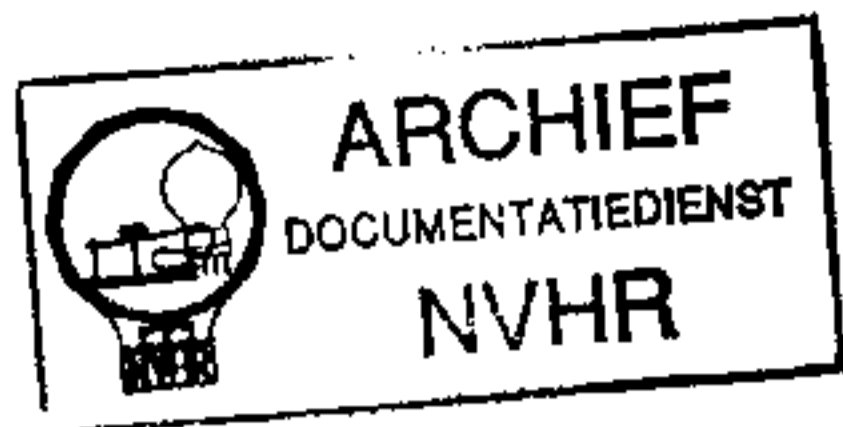


Met dank aan A.R.A. van Rossum

Ned. Ver. v. Historie v/d Radio



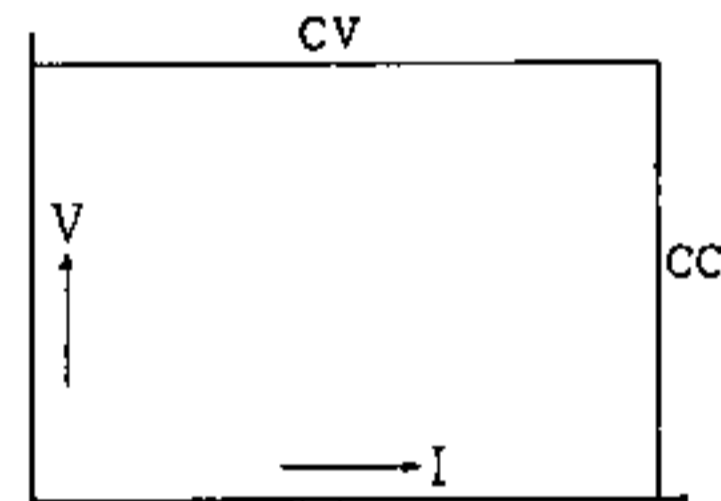
E 015-2 / E 030-1 / E 060-0.6

E - SERIES LINEAR LABORATORY POWER SUPPLIES

DELTA ELEKTRONIKA B.V.
 Postbus 27 - Vissersdijk 4
 4300 AA Zierikzee - Nederland
 Tel. (0111) 413658
 Telefax (0111) 416919



E 015 - 2	0 - 15 V	0 - 2 A
E 030 - 1	0 - 30 V	0 - 1 A
E 060 - 0.6	0 - 60 V	0 - 0.6 A
E 0300 - 0.1	0 - 300 V	0 - 0.1 A
E 018 - 0.6 D	± 0 - 18 V	0.6 A (dual output)



10-turn potentiometer for voltage control.
 High resolution single turn potentiometer for current control.

Series and parallel connection is possible.
 In series up to 600 V for E 0300 - 0.1 and up to 300 V for other models.

Input 230 V 50 Hz.

Insulation (VDE 0550)

- Input / output : 1500 Vrms
- Input / case : 1500 Vrms
- Output / case : 500 V DC

Operating temp. : Max. 45 °C

Safety

EN 60950 EN 61010

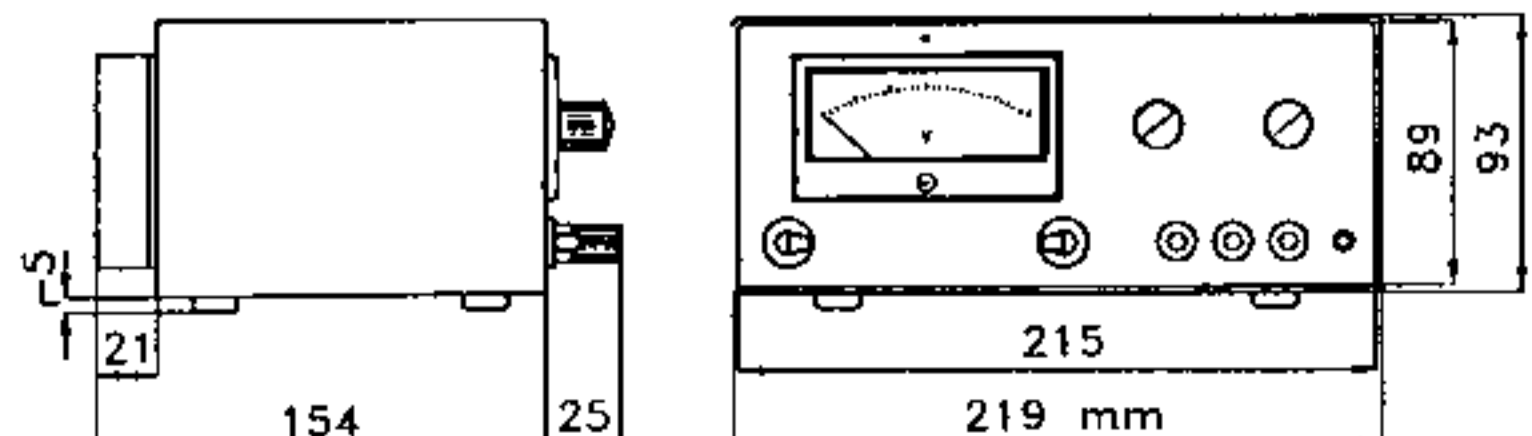
EMC

- EN 50081-1 EN 50082-1
- EN 55022-B EN 61000-3-2
- VDE 0871 B at input and output
- EN 61000-4-2/-4-4/-4-5/-4-11
- ENV 50140 ENV 50141 ENV 50204

Dimensions and weight
 219 x 93 x 154 mm, 2.8 kg

Specifications:

	E 015 - 2 etc.		E 0300 - 0.1	
	CV	CC	CV	CC
Regulation				
Load 0 - 100%	5 mV	4 mA	20 mV	0.5 mA
Line 198 - 242 V AC	5 mV	0.4 mA	10 mV	0.03 mA
Ripple + noise, rms (BW=300kHz)	0.1 mV	0.1 mA	0.5 mV	0.1 mA
Temp. coeff., per °C	1.10 ⁻⁴	5.10 ⁻⁴	1.10 ⁻⁴	5.10 ⁻⁴
Stability during 8 hrs after 1 hr warm up	1.10 ⁻³	5.10 ⁻³	1.10 ⁻³	5.10 ⁻³
Output imp. up to 100 kHz	0.1 Ohm	—	10 Ohm	—
Recovery time				
10 - 100% load step	15 μs	—	30 μs	—
Remote programming	0 - 5 kOhm	—	—	—



E 015-2

E 030-1

E 060-0.6

C = microfarad

1 =	100	63 V	100	63 V	100	63 V	EB
2 =	22	25 V	22	25 V	22	25 V	EB
3 =	0,047	250 V	0,047	250 V	0,047	250 V	MKT1818
4 =	2,2	35 V sal	2,2	35 V sal	2,2	35 V	sal
5 =	CC		CC		CC		
6 =	22	25 V	22	25 V	22	25 V	EB
7 =	CC		CC		CC		
8 =	0,22	250 V	0,22	250 V	0,22	250 V	MKT1822
9 =	4700	40 V	2200	63 V	1000	100 V	EYV
10 =	10	40 V	10	45 V	10	45 V	EB
11 =	10	100 V	10	100 V	1	250 V	EB
12 =	2 x 100	35 V	2 x 100	63 V	2 x 100	100 V	EB
13 =	0,01	500 V	0,01	500 V	0,01	500 V	GEX
14 =	0,01	500 V	0,01	500 V	0,01	500 V	GEX
15 =	0,0001	250 V	0,0001	250 V	0,0001	250 V	GEB
16 =	0,0001	250 V	0,0001	250 V	0,0001	250 V	GEB
17 =	0,0001	250 V	0,0001	250 V	0,0001	250 V	GEB
18 =	0,01	250 V	0,01	250 V	0,01	250 V	MKT1818
19 =	0,022	250 V	0,022	250 V	0,022	250 V	MKT1818

D

1 =	1N4004G	1N4004G	1N4004G	Philips
2 =	ZPY 6,2	ZPY 6,2	ZPY 6,2	ITT
3 =	1N825 A	1N825 A	1N825 A	Thom.
4 =	1N4148	1N4148	1N4148	ITT
5 =	1N4148	1N4148	1N4148	ITT
6 =	1N4148	1N4148	1N4148	ITT
7 =	1N4148	1N4148	1N4148	ITT
8 =	VH 148	VH 148	VH 148	Varo
9 =	1N4004G	1N4004G	1N4004G	Philips
10 =	MR751	MR751	MR751	Motorola
11 =	1N4148	1N4148	1N4148	ITT
12 =	133 HR	133 HR	133 HR	Sloan

T

1 =	BC 546 A	BC 546 A	BC 546 A	Siemens
2 =	BD 239 A	BD 239 A	BUX 84	Philips
3 =	2N3055	2N3055	2N3442	RCA

IC 1 =	TL 081 IP	TL 081 IP	TL 081 IP	TI
IC 2 =	TL 082 IP	TL 082 IP	TL 082 IP	TI

Fuse : 1 A - 5 x 20 mm

tt = tantalum
CC = Calibration Capacitor

			Title: Part list
K1,2, D10	2'86	Vr.	E015-2, E030-1, E060-0.6
Serial no 14661 and up	2'82	Vr.	Date: Apr. '78
Modifications	Date	App.	delta elektronika bv



E 015-2E 030-1E 060-0.6

R	=	Ohm			
1	=	680	PR52	560	PR52
2	=	270		270	
3	=	CR		CR	
4	=	470		470	
5	=	3,9 k		3,9 k	
6	=	6,8 k		6,8 k	
7	=	1,8 k		1,8 k	
8	=	470 k		470 k	
9	=	470		470	
10	=	470		470	
11	=	18 k		22 k	18 k
12	=	CR		CR	
13	=	470		470	
14	=	47		47	39
15	=	470		470	
16	=	470		470	1 k
17	=	47 k		33 k	15 k
18	=	CR		CR	-
19	=	3,3 k		1,8 k	1,8 k
20	=	CR		CR	
21	=	CR		CR	
22	=	3,3 k		3,3 k	3,3 k
23	=	0		0	0
24	=	10		10	47
25	=	560	PR37	1,5 k	5,6 k PR37
26	=	2,7 M		1,2 M	1,2 M
27	=	CR		CR	CR
28	=	1	7W WW 16ER	1,8	7W WW 16ER
29	=	1,2 M		680 k	330 k
30	=	1 k	trim.	1 k	trim.
31	=	1,5 k		1,5 k	1,5 k
32	=	15 k		39 k	68 k
33	=	CR		CR	CR
34	=	2 k	trim.	2 k	trim.
35	=	5 k	potm.	5 k	potm.
36	=	5 k	10 t. potm.	5 k	10 t. potm.
37	=	270		270	270

CR = Calibration resistor

WW = Wire wound resistor

MRS 25 = metal film 0,4W 1%

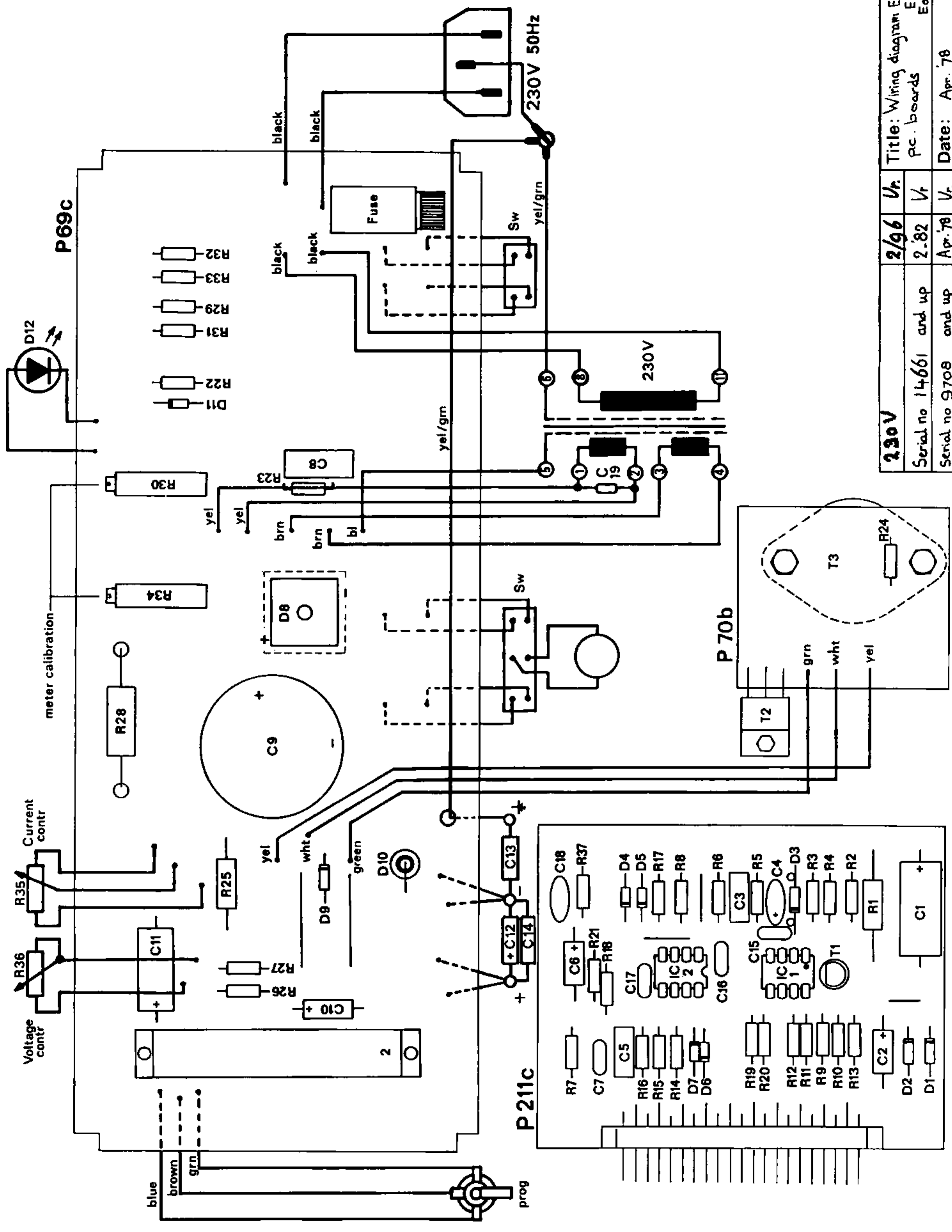
PR 37 = metal film 1,6W 5%

PR 52 = metal film 2,5W 5%

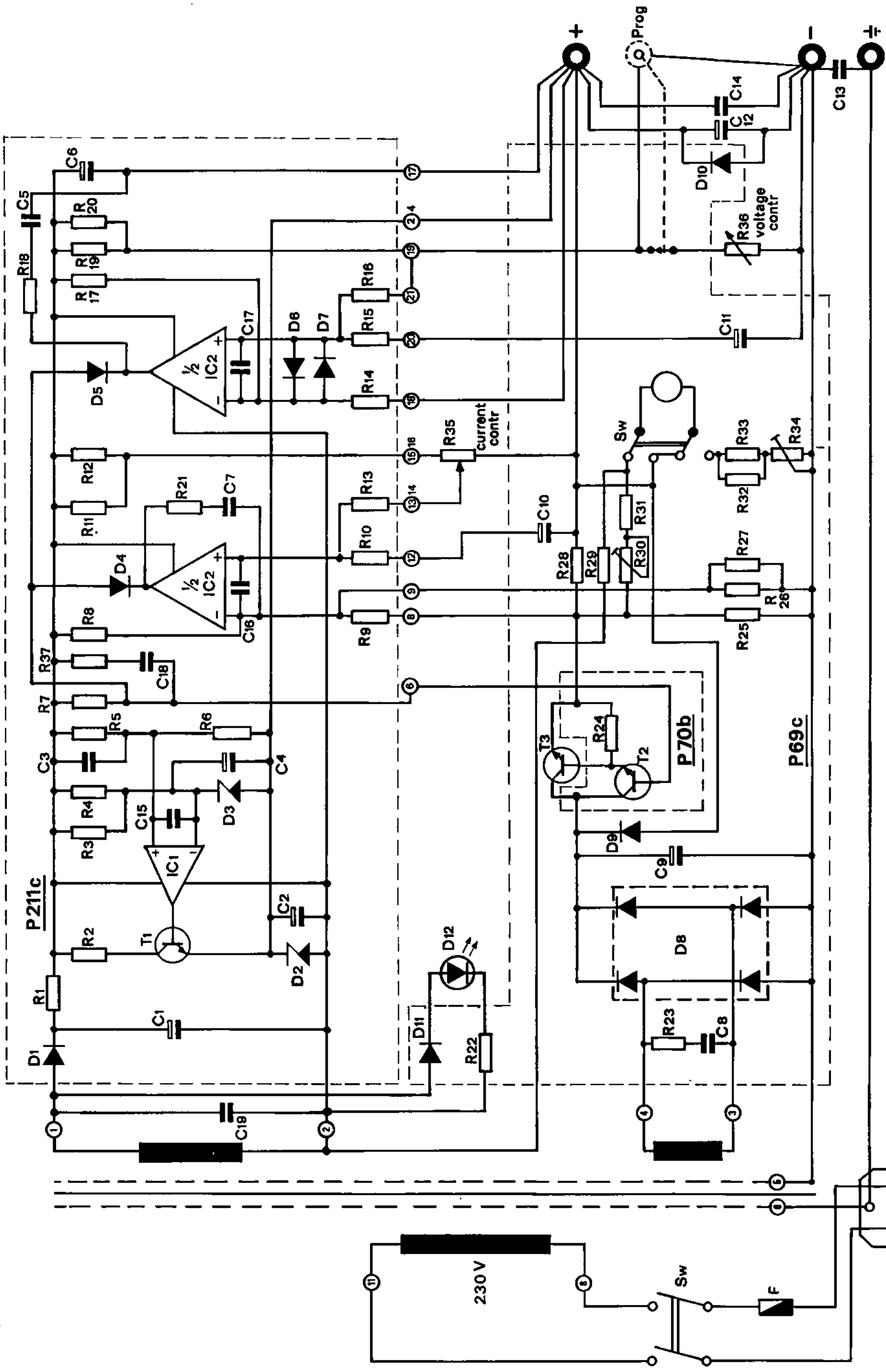
All non specified resistors are of MRS 25.

			Title: Part list
R1 = PR52.	7-85	Vr	E015-2, E030-1, E060-0.6
Serial no. 14661 and up	2-82	Vr	Date: Apr. '78
Modifications	Date	App.	delta elektronika bv





230V		Ur	Date	App
Serial no 14661 and up	2/96	2.82	Apr. '78	Modifications
Serial no 9708 and up	Vr	Vr	Vr	
Title: Wiring diagram E015-2		pc. boards		
E030-1		Date: Apr. '78		
E060-96		delta elektronika bv		



230 V	Serial no 14661 and up Serial no 9708 and up	2/96	Vr.	2.82	Apr. '78	Date	App	Title:		
								E015-2		
								Circuit diagram		
		Vr.		U.		Date:		Apr. '78		
Modifications		Date		App		delta elektronika by				

230 V 50Hz

Sw

F

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⊖

**EC Declaration of Conformity**

We

Delta Elektronika
P.O. BOX 27
4300 AA Zierikzee
The Netherlands

declare under sole responsibility that the following Power Supplies:

E 015 - 2
E 030 - 1
E 060 - 0.6
E 0300 - 0.1
E 018 - 0.6 D

meet the intent of Directives 89/336/EEC; 92/31/EEC; 93/68/EEC for Electromagnetic Compatibility and Directives 73/23/EEC; 93/68/EEC regarding Electrical Safety. Compliance was demonstrated to the following specification as listed in the official Journal of the European Communities:

EN 50081-1 Generic Emissions: (residential, light industrial)EN 55022 Radiated, Class B
EN 55022 Conducted, Class B
EN 60555-2 Power Harmonics**EN 50082-1 Generic Immunity: (residential, light industrial)****EN 50082-2 Generic Immunity: (industrial environment)**

EN 61000-4-2	Electrostatic Discharge	Level 3.
EN 61000-4-4	Electrical Fast Transients / Bursts	Level 4.
ENV 50140	Radiated electromagnetic fields	Level 3.
ENV 50141	Conducted electromagnetic fields	Level 3.
EN 61000-4-5	Surge on DC output	Level 2.
EN 61000-4-5	Surge on line input	Level 4.
EN 61000-4-11	Voltage variations and dips	

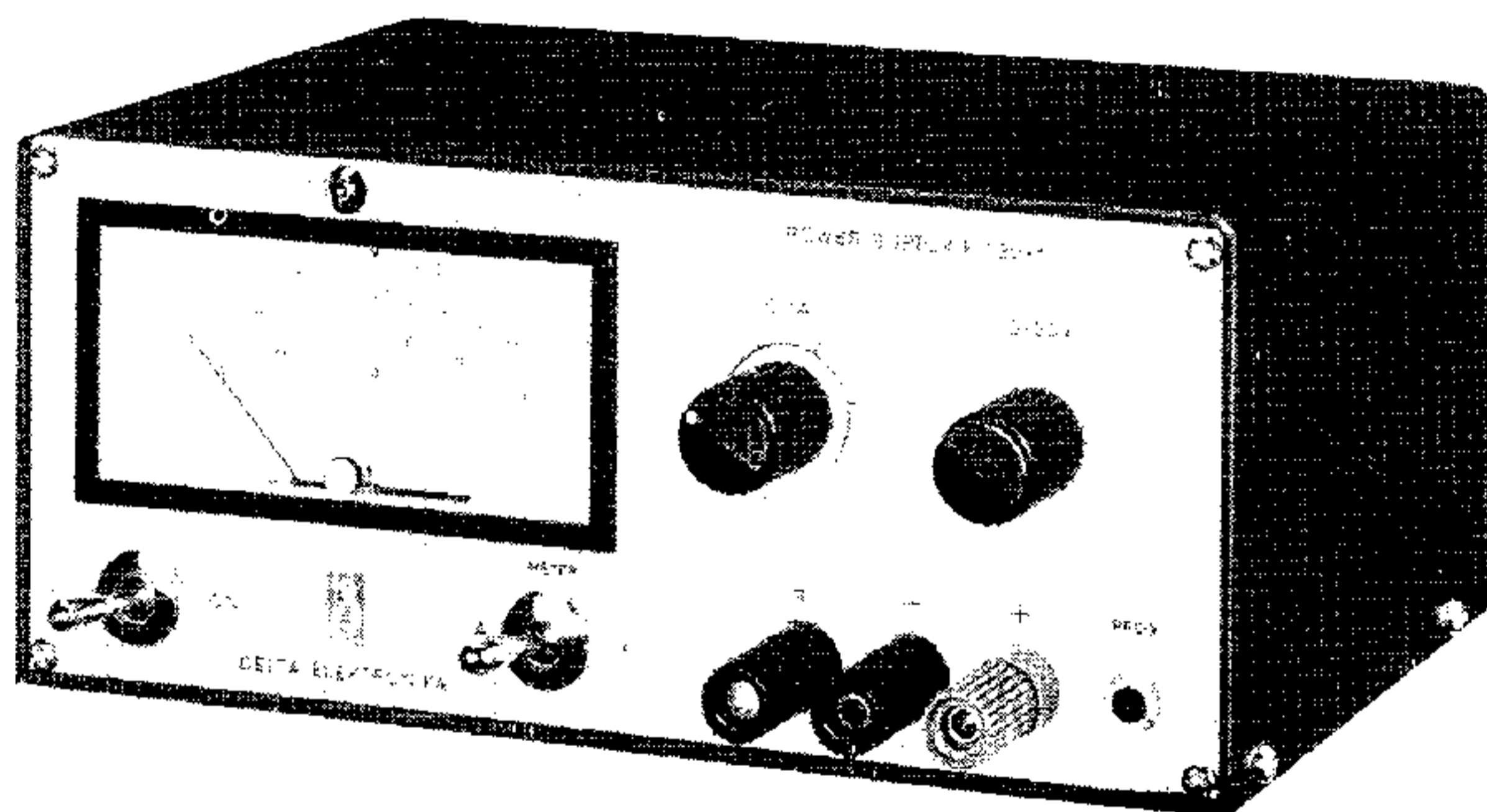
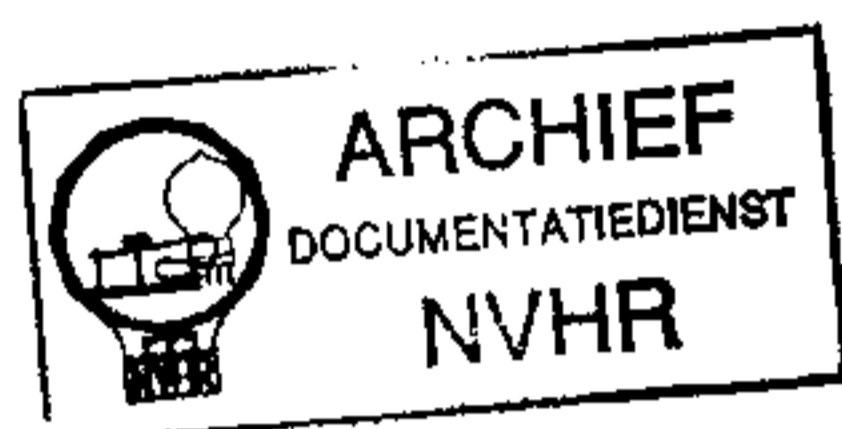
EN 60950 Safety of IT equipment

Managing director

NV DELTA ELEKTRONIKA



Ned. Ver. v. Historie v/d Radio



E 015-2

E 030-1

E 060-0.6

REGULATED DC POWER SUPPLIES

E 015-2 0-15 V, 0-2 A

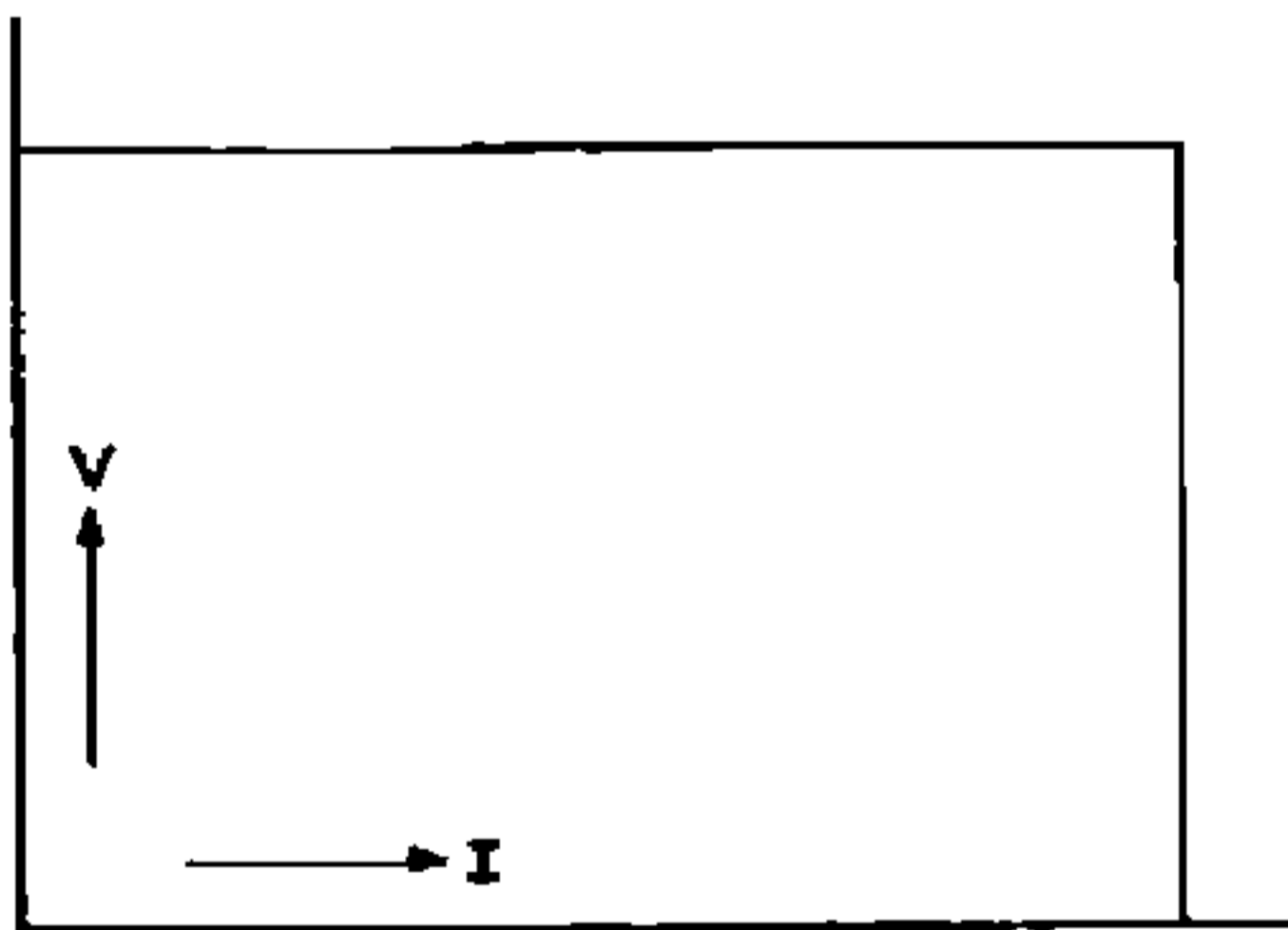
E 030-1 0-30 V, 0-1 A

E 060-0.6 0-60 V, 0-0.6 A

DESCRIPTION

The power supplies E 015-2, E 030-1 and E 060-0.6 have voltage and current regulation.

The voltage regulation changes sharply into current regulation if the setted current limit is reached.



These power supplies can be used as a constant voltage source with a limited current or as a constant current source with a limited open voltage.

Both limits are continuously variable.

The constant voltage/constant current design provides complete protection against all overload and short circuit conditions.

CONSTANT VOLTAGE OPERATION

Voltage control

10-turn potentiometer, range 0-100 %.

Remote programming

The voltage can be programmed by an external variable resistor of 0-5000 Ohm. Input on front panel. (10 k Ω for E 060-0.6).

Voltage regulation

5 mV for a + or - 10 % AC input voltage variation.
10 mV for a 0-100 % load variation.

Temp. coeff.

$2 \cdot 10^{-4}$ per $^{\circ}\text{C}$ from maximum output voltage.

Ripple voltage

0.1 mV r.m.s., 0.5 mV p-p.

Output impedance

Maximum 0.1 Ohm up to 100 kHz.

Recovery time

15 micro seconds for recovery to within 30 mV after a step load change from 10 % to 100 %.

CONSTANT CURRENT OPERATION

Current control

Single turn potentiometer, range 0-100 %.

Current regulation

0.3 mA for a + or - 10 % AC input voltage variation.
2 mA for a maximum output voltage swing.

Temp. coeff.

$5 \cdot 10^{-4}$ per °C from maximum output current.

Ripple current

0.1 mA r.m.s.

REMAINING SPECIFICATIONS**Input voltage**

220 V, 50 Hz. Other input voltages at special order.

Parallel and series connection

Special design enables parallel and series operation without precaution.

Ambient temp.

- 20 to + 45 °C (to + 35 °C for E 015-2 if used at 2 A below 10 V).

Meter

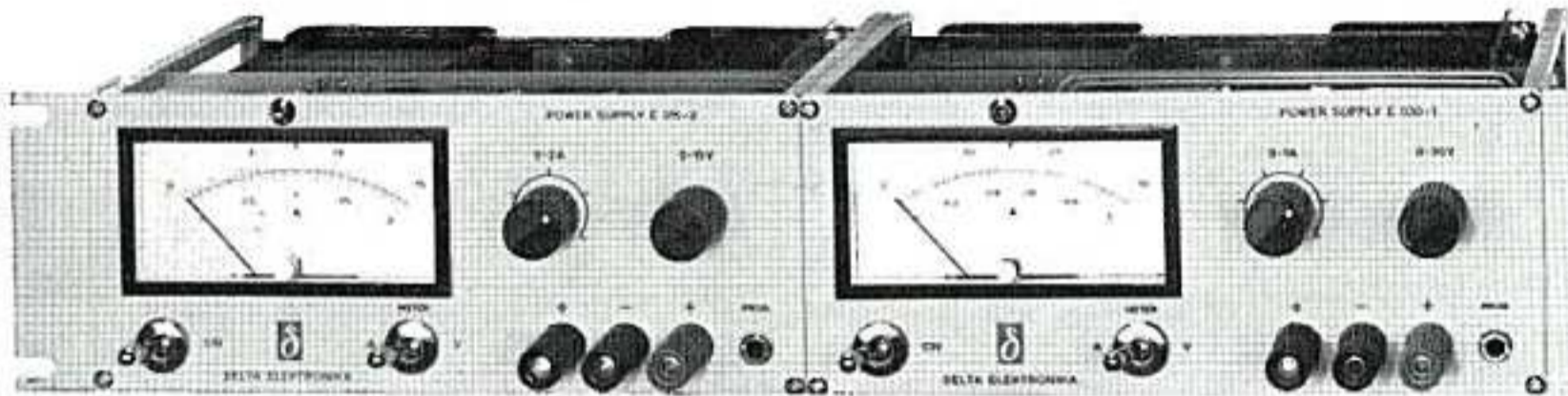
Meter with selector switch for voltage and current, accuracy 1.5 % f.s.

Finish

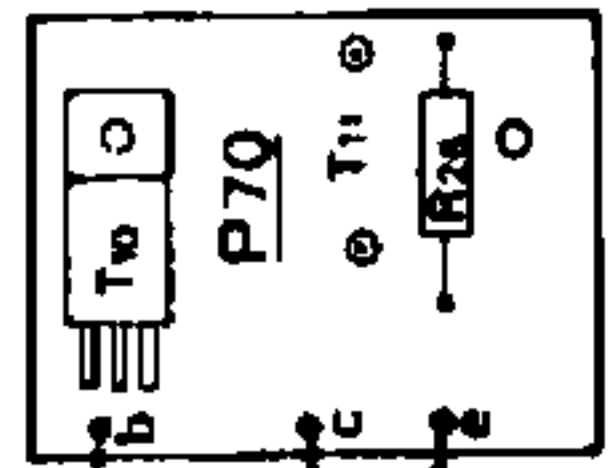
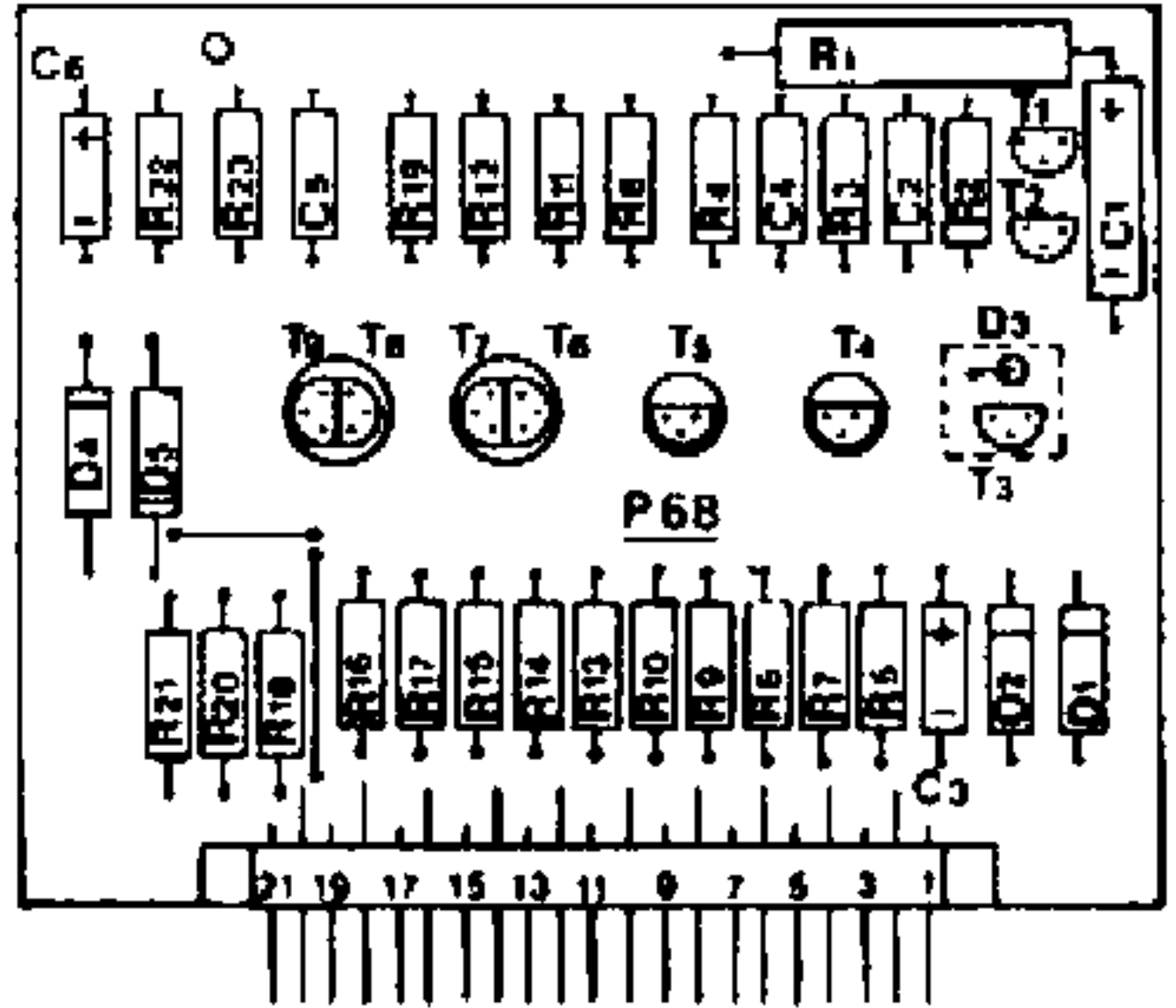
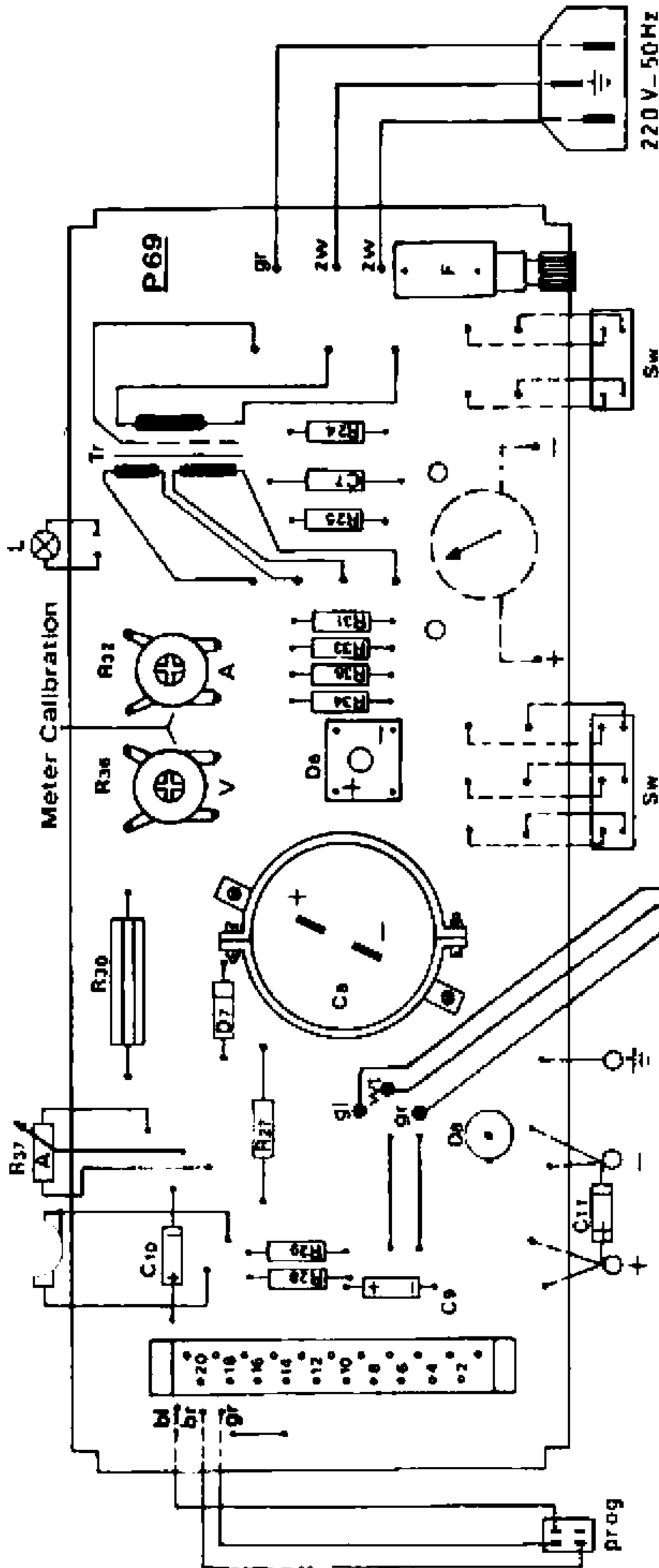
Light grey front panel with dark grey case.

Weight and size

2.7 kg 219 x 93 x 154 mm.



Two uncased units can be mounted side by side and with the addition of two H 6 brackets can be inserted in a 19" rack.



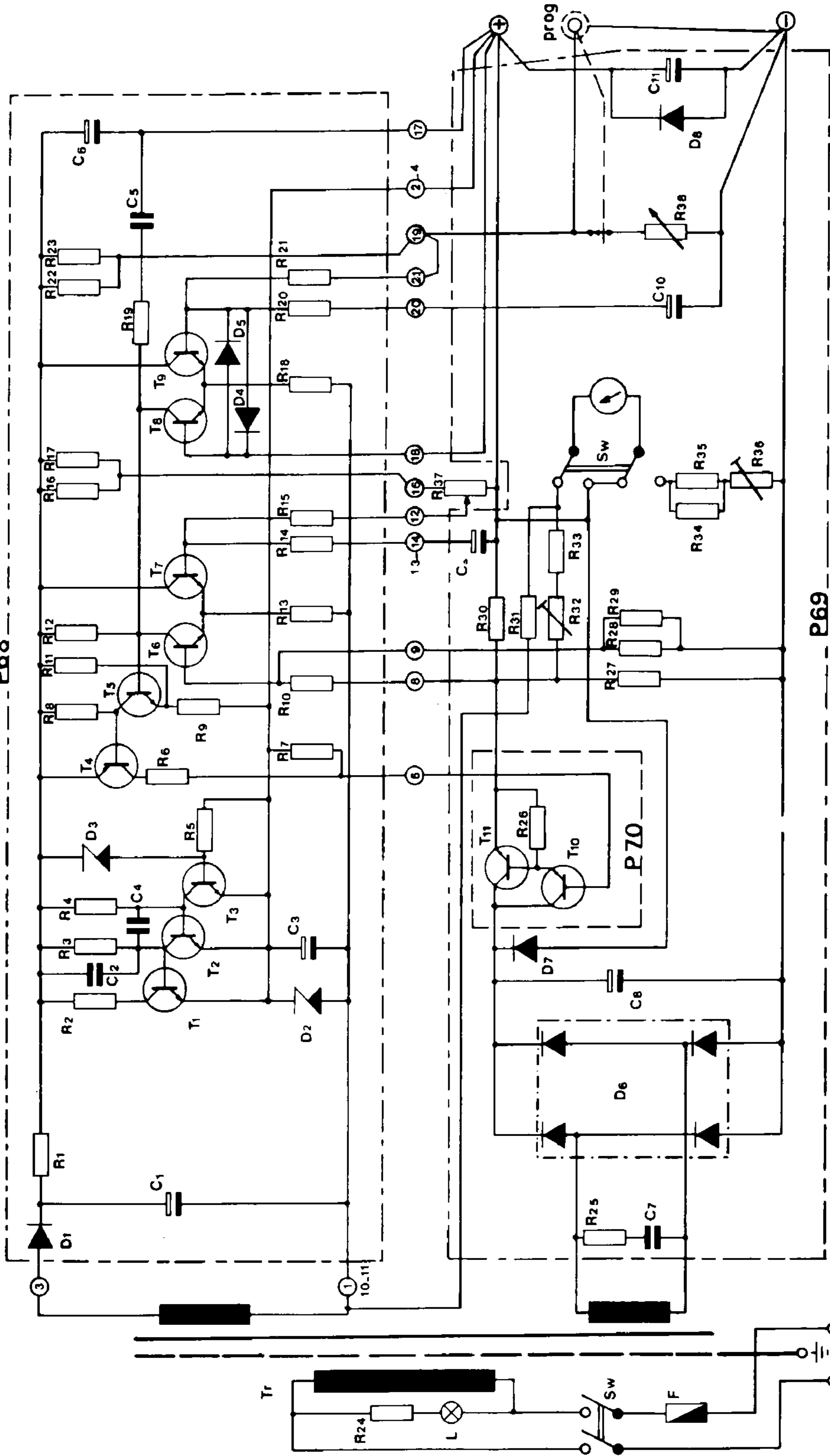
Wiring diagram and printed
circuit boards

E 015-2

E 030-1

E 060-0.6

P68



P69

E 015-2, E 030-1 and E 060-0.6

220 V-50 Hz

PART LIST

E 015-2

E 030-1

E 060-0.6

R (Ohm)

1 = 820	680	680	1W	
2 = 150	150	150		
3 = 10 k	10 k	10 k		
4 = 10 k	10 k	10 k		
5 = 150	150	150	MF	
6 = 33	33	33		
7 = 1 k	1 k	1 k		
8 = 2,2 k	2,2 k	2,2 k		
9 = 2,2 k	2,2 k	2,2 k	MF	
10 = 470	470	470		
11 = 2,7 k	2,7 k	2,7 k	MF	
12 = 22 k	22 k	22 k		
13 = 6,8 k	6,8 k	6,8 k		
14 = 470	470	470		
15 = 470	470	470		
16 = CR	CR	CR	MF	
17 = 12 k	12 k	12 k	MF	
18 = 6,8 k	6,8 k	6,8 k		
19 = 150	150	150		
20 = 470	470	470		
21 = 470	470	470		
22 = CR	CR	CR	MF	
23 = 2,2 k	1,2 k	1,2 k	MF	
24 = 560 k	560 k	560 k		
25 = 82	82	82		
26 = 10	10	10		
27 = 560	1,5 k	5,6 k	1W	
28 = 2,7 M	1,2 M	820 k		
29 = CR	CR	CR		
30 = 1	1,8	3,3	7W	WW
31 = 1,2 M	680 k	330 k		
32 = 1 k	1 k	1 k	var.	
33 = 1,5 k	1,5 k	1,5 k	MF	
34 = 15 k	33 k	68 k	MF	
35 = CR	CR	CR	MF	
36 = 1 k	1 k	1 k	var.	
37 = 5 k	5 k	5 k	var.	WW
38 = 5 k	5 k	10 k	10t. potm.	

C (microfarad)

1 =	50	70 V	50	70 V	50	70 V
2 =	0,01	250 V	0,01	250 V	0,01	250 V
3 =	25	15 V	25	15 V	25	15 V
4 =	0,01	250 V	0,01	250 V	0,01	250 V
5 =	0,047	250 V	0,047	250 V	0,047	250 V
6 =	25	15 V	25	15 V	25	15 V
7 =	0,22	250 V	0,22	250 V	0,22	250 V
8 =	5000	35 V	2500	70 V	1000	100 V
9 =	10	35 V	10	35 V	10	35 V
10 =	10	100 V	10	100 V	10	100 V
11 =	50	35 V	50	70 V	50	100 V

D

1 =	TS 2	TS 2	TS 2	Diode Inc.
2 =	ZD 6,2	ZD 6,2	ZD 6,2	ITT
3 =	ZP 6,2	ZP 6,2	ZP 6,2	ITT
4 =	1N4148	1N4148	1N4148	ITT
5 =	1N4148	1N4148	1N4148	ITT
6 =	VH148	VH148	VH148	VARO
7 =	TS 2	TS 2	TS 2	Diode Inc.
8 =	MR 1031 B	MR 1031 B	MR 1031 B	Motorola

T

1 =	BC 182	BC 182	BC 182	Texas I.
2 =	BC 182	BC 182	BC 182	Texas I.
3 =	BC 182	BC 182	BC 182	Texas I.
4 =	BC 212	BC 212	BC 212	Texas I.
5 =	BC 182	BC 182	BC 182	Texas I.
6 =	BC 182	BC 182	BC 182	Texas I.
7 =	BC 182	BC 182	BC 182	Texas I.
8 =	BC 182	BC 182	BC 182	Texas I.
9 =	BC 182	BC 182	BC 182	Texas I.
10 =	TIP 29 A (Texas I.)	TIP 29 A (Texas I.)	MJE 340	Motorola
11 =	2N3055	2N3055	2N3442	RCA

F = Fuse 1 A - 5 x 20 mm
 WW = Wire wound resistor

MF = Metalfilm resistor
 CR = Calibration resistor.
 All other resistors carbon
 $\frac{1}{2}$ W 5%