



Instruction Manual
incl. Spare Parts Catalogue

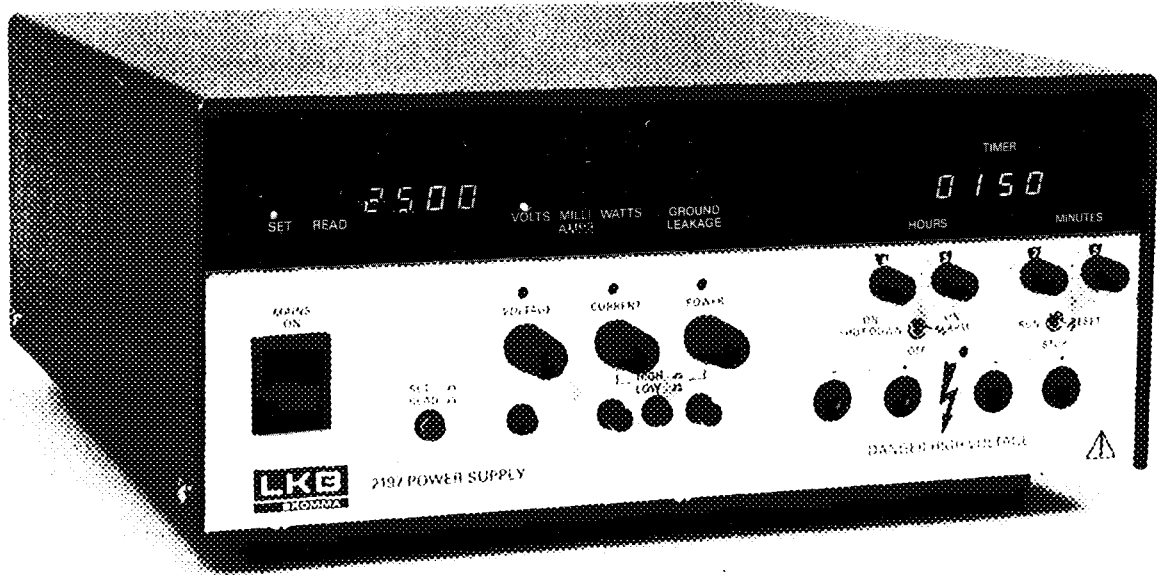
**LKB 2197 Electrofocusing
Constant Power Supply**


90 01 5412

Instruction Manual
incl. Spare Parts Catalogue

LKB 2197 Electrofocusing Constant Power Supply

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NOTE
The symbol  on the front panel of the instrument is an international symbol meaning "REFER TO OPERATING INSTRUCTIONS".

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Please read this manual before attempting to use the device

This manual describes the LKB 2197 Electrofocusing Constant Power Supply. The sections deal with the appearance and usage of this unit and contain information regarding installation and operation.

If you have any comments on this manual, we will be pleased to receive them at:

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Since product development and improvement is a continuous process, LKB reserves the right to make changes in the specifications without notice.

Warranty and Liability

LKB-Produkter AB guarantee that their delivered product has been thoroughly tested to ensure it meets its published specification.

The warranty included in the conditions of delivery is valid only if the unit has been used according to the instructions supplied by LKB-Produkter AB.

LKB-Produkter AB can accept no liability for loss or damage, however caused, arising from the faulty or incorrect use of their product.

Introduction

The LKB 2197 Electrofocusing Constant Power Supply is designed for safe and simple operation of an electrofocusing experiment and due to the versatility of this unit it is ideal also for other electrophoretic techniques, in particular DNA-sequencing and gel electrophoresis with discontinuous buffers.

The Electrofocusing Constant Power Supply can control four parameters: time, power, current and voltage and will allow fully automatic programming of an electrofocusing experiment.

The instrument is simple to operate, features an accurate LED display, and contains a built-in timer with an acoustic alarm to signal the completion of an experiment.

The Electrofocusing Constant Power Supply has been designed to comply with relevant safety standards (pending). Unique safety features include optical sensors in the recessed dual outlets which ensure that power leads remain securely attached.

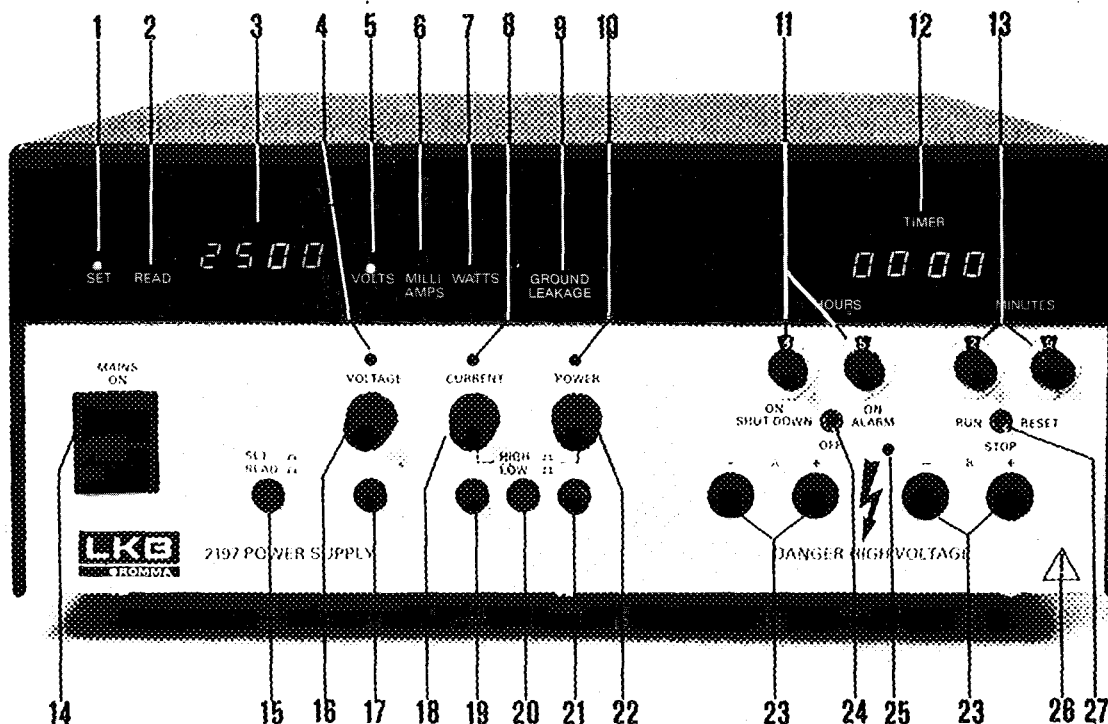


Fig. 1


Physical Description

Please refer to Figure 1 for the front of the unit, and Figure 2 for the back.

Front Panel (Fig 1)

No.	Item	Description
1.	SET INDICATOR	This lamp is lit when preset limit values for voltage, current or power (as selected by push-buttons 17, 19, or 21) are set. The value is shown in the LED-display 3.
2.	READ INDICATOR	This lamp is lit when the actual values for voltage, current or power (as selected by push-buttons 17, 19 or 21) are being read and the value is shown in the LED-display 3.
3.	LED-DISPLAY	Four-digit LED-display for voltage, current or power as selected by push-buttons 17, 19 or 21. Voltage: 10-2500 V Current: 1,0-250 mA Power: 0,5-100 W
4.	CONSTANT VOLTAGE INDICATOR	This lamp is lit during constant voltage operation.

No.	Item	Description
5.	VOLTS INDICATOR	When this lamp is lit it indicates that volts are shown in the LED-display 3.
6.	MILLI AMPS INDICATOR	When this lamp is lit it indicates that milliamps are shown in the LED-display 3.
7.	WATTS INDICATOR	When this lamp is lit it indicates that watts are shown in the LED-display 3.
8.	CONSTANT CURRENT INDICATOR	This lamp is lit during constant current operation.
9.	GND LEAKAGE INDICATOR	This lamp flashes and the Power Supply shuts down as soon as there is a ground leakage of >0,5 mA.
10.	CONSTANT POWER INDICATOR	This lamp is lit during constant power operation.
11.	TIMER	For setting and display of hours needed for the experiment (0-59 hours).
12.	TIMER LED-DISPLAY	Four-digit LED-display (two for hours and two for minutes) showing time elapsed since start of experiment.
13.	TIMER SELECTOR DIALS	For setting and display of minutes needed for the experiment (0-59 minutes).
14.	MAINS SWITCH	The Power Supply is turned on by pressing the upper half of the rocker switch. The LED-display and indicators will light to show that mains is on.
15.	SET/READ SELECTOR	<p>Position SET: Preset limit values for voltage, current or power (as selected by pushbuttons 17, 19 or 21) will be shown in the LED-display 3 and can be checked or adjusted.</p> <p>Position READ: The actual output values for voltage, current or power (as selected by pushbuttons 17, 19 or 21) will be shown in the LED-display 3.</p>
16.	VOLTAGE ADJUST	Ten-turn potentiometer to adjust the preset limit value for voltage.
17.	VOLTAGE SELECTOR	The LED-display 3 will display actual or preset voltage when this is pressed.
18.	CURRENT ADJUST	Ten-turn potentiometer to adjust the preset limit value for current.
19.	CURRENT SELECTOR	The LED-display 3 will display actual or preset current when this is pressed.
20.	HIGH/LOW SELECTOR	<p>Range switch for higher accuracy in the low range.</p> <p>Position HIGH: max current 250 mA max power 100 W</p> <p>Position LOW: max current 25.0 mA max power 10.0 W</p>
21.	POWER SELECTOR	The LED-display will display actual or preset power when this is pressed.
22.	POWER ADJUST	Ten-turn potentiometer for adjusting the preset limit value for power.
23.	OUTLETS	<p>Outlets A and B connected in parallel. Note: These two outlets are equipped with optical sensors for your safety. The Power Supply will operate only if both pairs of optical sensors are activated. This means that when only one pair of outlets is being used, the dummy-plugs supplied must be inserted into the other outlets.</p> <p>The instrument will accept standard length banana plugs. Short banana plugs (supplied with some LKB 2117 Multiphors) will not activate the optical sensors and must be changed. Safety shielded banana plugs are provided for this purpose.</p>

No.	Item	Description
24.	TIMER OVERRIDE SWITCH	<p>IMPORTANT: Any electrical wiring changes including banana plug replacements should be performed by a qualified service engineer because of the risk of lethal electrical shock.</p> <p>Position ON SHUT DOWN: When LED-display 12 reaches the same numbers as shown by Selector Dials 11 and 13, LED-display 12 flashes, an acoustic alarm signals, and the Power Supply outputs are shut down.</p> <p>Position OFF (middle): The Power Supply operates without the timer.</p> <p>Position ON ALARM: The same as in position ON SHUT DOWN, but here the Power Supply outputs do not shut down.</p>
25.	HIGH VOLTAGE	<p>This lamp is lit when the Power Supply delivers high voltage.</p> <p>WARNING: The voltage that is delivered from this Power Supply can give a lethal electric shock. Check on a regular basis the insulation on connecting cables, that the instrument is not broken and that no one can come in contact with uninsulated parts of the high voltage circuitry.</p>
26.		This symbol is an international symbol meaning "REFER TO OPERATING INSTRUCTIONS".
27.	TIMER SWITCH	<p>Position RUN: With Override switch 24 in position ON SHUT DOWN, the Power Supply operates until LED-display 12 reaches the same numbers as shown by Selector Dials 11 and 13.</p> <p>With Override switch 24 in position OFF (middle), the Timer will not operate.</p> <p>With Override switch 24 in position ON ALARM, the Timer will operate until LED-display 12 reaches the same number as shown by Selector Dials 11 and 13.</p> <p>Position STOP: The Timer will stop counting and the Power Supply outputs are shut down with Timer Override switch 24 in position ON SHUT DOWN.</p> <p>With Timer Override switch 24 in position ON ALARM the outputs do not shut down.</p> <p>Position RESET: Reset the Timer LED-display 12 to 00 hours and 00 minutes</p>

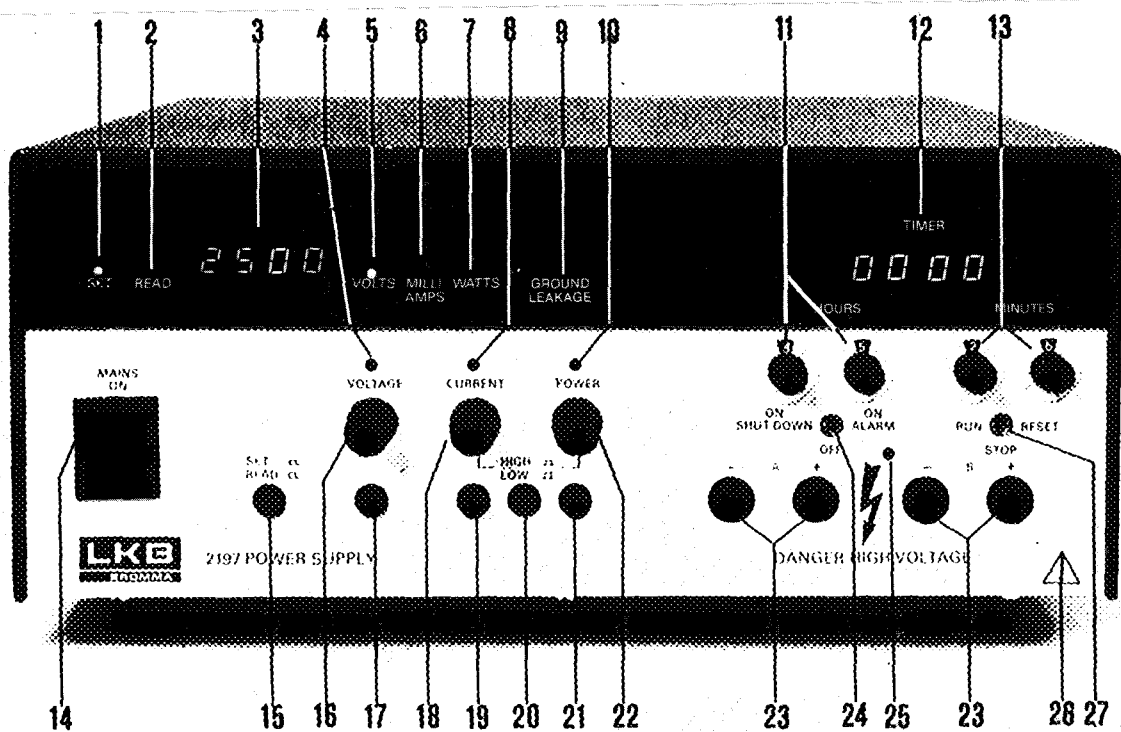


Fig. 1

Back Panel (Fig 2)

No.	Item	Description
1.	REMOTE CONTROL SOCKET	For connection of an external safety circuit, which minimizes the risk that operators touch the uninsulated high-voltage parts of apparatus connected to the Power Supply. For connection of external reference voltage on limit values for voltage, current and power. For connection of a recorder giving a permanent record of actual voltage, current and power throughout the whole experiment. Note: If no external safety circuit is required (e.g. using LKB 2117 Multiphor) the interlock supplied must be connected to this REMOTE CONTROL SOCKET.
2.	FUSES	For connecting external circuitry see chapter REMOTE CONTROL. Mains fuses 2 × 2A for 220–240 V, 50 Hz 2 × 3A for 100–120 V, 60 Hz
3.	MAINS SELECTOR	Select mains voltage 110, 115, 120, 220, 240 V ±10%
4.	MAINS INLET	Inlet for mains cable

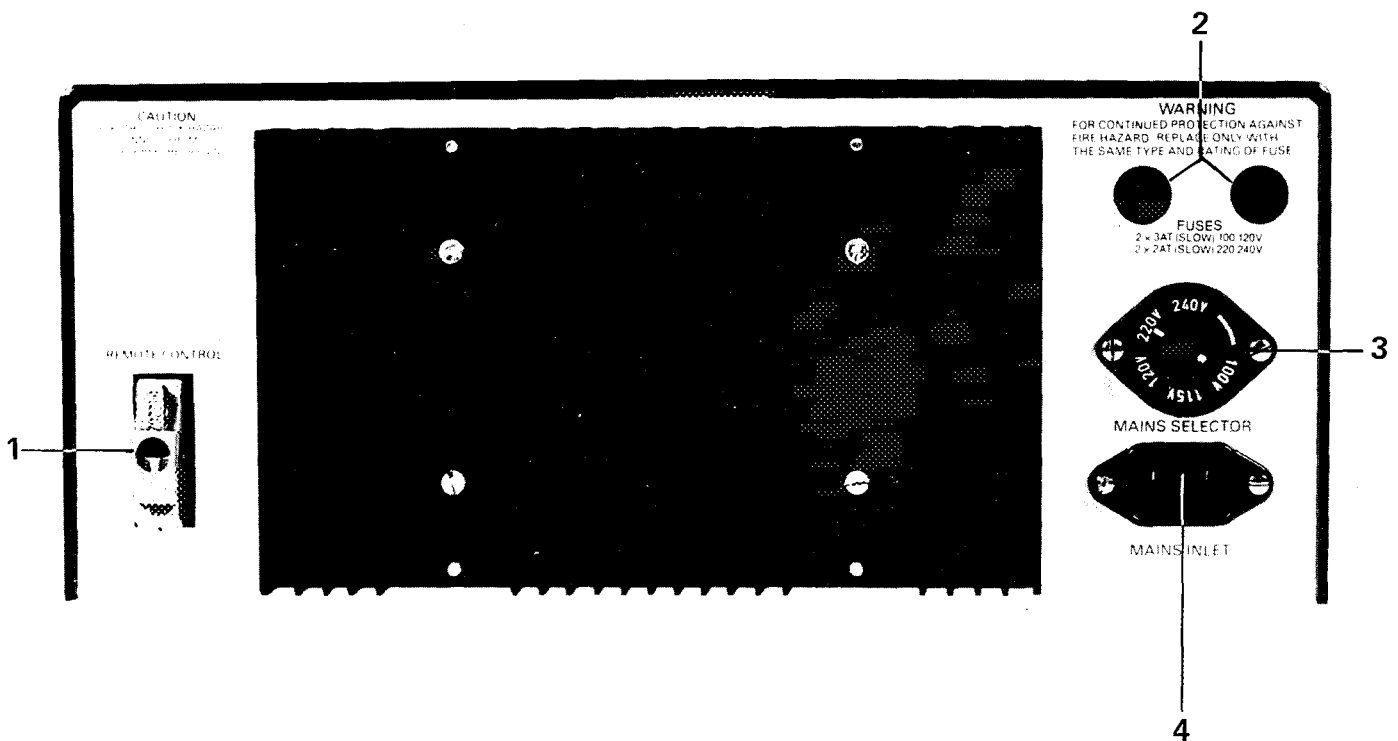


Fig. 2

Installation

1. Select the appropriate mains voltage on the MAINS SELECTOR (3 in Fig 2) on the back panel.
2. Insert the proper fuses (2 in Fig 2) on the back panel.
2 × 3A Slow for 100–120 V, 60 Hz or
2 × 2A Slow for 220–240 V, 50 Hz
3. Connect the electrophoresis unit to the outlet A (23 in Fig 1).

NOTE:

These two outlets are equipped with optical sensors for your safety. The Power Supply will operate only if both pairs of optical sensors are activated. This means that when only one pair of outlets is being used, the dummy-plugs supplied must be inserted into the other outlets.

The instrument will accept standard length banana plugs. Short banana plugs (supplied with some LKB 2117 Multiphors) will not activate the optical sensors and must be changed. Safety shielded banana plugs are provided for this purpose.

WARNING:

The voltage delivered from this Power Supply can give a lethal electrical shock. Check therefore on a regular basis the insulation on connecting cables, that the instrument is not broken and that no one can come in contact with uninsulated parts of the high voltage circuitry.

4. If a safety switch is needed this should be connected to the REMOTE CONTROL (1 Fig 2). See chapter REMOTE CONTROL.

NOTE:

Connection of this safety switch must be made by a qualified service engineer, because of the risk of lethal electrical shock.

5. If you are using LKB 2117 Multiphor there is no need for a safety switch: just connect the supplied interlock to the REMOTE CONTROL (1 Fig 2), otherwise the Power Supply will not work.
6. Be certain to plug the mains cable into a fully grounded mains outlet.

Operation

The numbers refer to Figure 1.

1. Connect the electrophoresis unit to outlet A (23).

NOTE:

If outlet B is not used, insert the supplied dummy-plugs otherwise the Power Supply will not work.

2. Put Timer Override Switch (24) in the ON SHUT DOWN position.

3. Switch on the Mains Switch (14) and if necessary reset Timer LED-display (12) by pressing Timer Switch (27) to the RESET position. The LED-displays (3 and 12) are now lit up but there is no output voltage.
4. Choose the SET position on the SET/READ Selector. Press in the Voltage Selector (17). You can now adjust the preset limit value for voltage by turning the Voltage Selector (16) and reading the value on the LED-display.
5. With (15) in the SET position, press the Current Selector (19). With the High/Low Selector (20) you can choose two ranges, 1–25.0 mA and 2–250 mA. Use the low range for better accuracy if you do not require more than 25 mA. Adjust the preset limit value for current by turning the current selector (18) and reading the value on the LED-display.
6. With (15) still in the SET position press the Power Selector (21). With the High/Low Selector (20) an appropriate range, 0–10.0 W or 0–100 W can be chosen. Use the low range for better accuracy if you do not need more than 10 W. (Note: in this position, the Power Supply is limited to 25 mA.) You can now adjust the preset limit value for power by turning the Power Adjust (22) and reading the value on the LED-display.
7. Turn the Timer Selector Dials (11 and 13) to the desired experimental time (0–59 h and 0–59 min). The Power Supply will now start operating as soon as the Timer Switch (27) is put in the RUN position. When the experimental time has elapsed, the LED-display (12) will start to flash, an acoustic signal will be heard and the Power Supply outputs are shut down.

By putting Timer Override Switch (24) in position ON ALARM, the Power Supply will not shut down when the experimental time has elapsed.

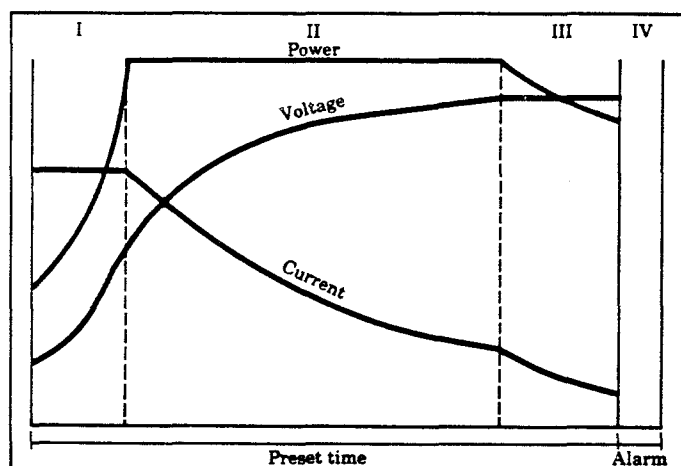
With Timer Override Switch (24) in the OFF (middle) position, the Timer does not work and the Power Supply operates without the Timer. Temporarily stop of experiment for adjustments, sample application etc. is possible: with the Timer Override Switch (24) in either of the two ON positions, just put Timer Switch (27) in STOP position. Continue the experiment by putting Timer Switch (27) in RUN position.

8. You can read output voltage on the LED-display at any time with the Set/Read Selector (15) in the READ position and the Voltage Selector (17) depressed.
9. You can read output current on the LED-display at any time with (15) in the READ position and the Current Selector (19) depressed.
10. You can read output power on the LED-display at any time with (15) in the READ position and the Power Selector (21) depressed.
11. The operating mode of constant voltage, constant current or constant power is indicated by lamps (4), (8) and (10) respectively. Two lamps can be lit up at the same time when a crossover is taking place.

Typical Application

With this versatile Electrofocusing Constant Power Supply you have four modes of regulation: constant power, constant voltage, constant current and time.

During the electrofocusing experiment, the power supply automatically adapts itself to the changing conditions in the gel. As the resistance builds up, the operating mode will switch from an initial limiting current (I) to constant power (II). During constant power operation, maximum focusing efficiency is achieved. Near the end of the run, the mode changes again to constant voltage (III), to avoid overheating in low conductivity regions of the gel. Finally, an alarm signal announces that the run is completed (IV).



When using the LKB Electrofocusing system (2117 Multiphor, 2197 Electrofocusing Constant Power Supply and 2209 Multitemp) together with the ready-made LKB 1804 Ampholine® PAG plates, each PAG-plate instruction will give you the experimental time, max power, max voltage and max current as well as the cooling temperature. If you make your own gels using LKB equipment (LKB 2117-101) you will find this information in our Application Note 250. As a rule of thumb: if you have a lot of water condensing on the inner surface of the electrofocusing lid, the preset limit values should be reduced. With condensation during constant current mode (I), reduce preset limit value on current. With condensation during constant power

mode (II), reduce preset limit value on power. With condensation during constant voltage mode (III), reduce preset limit value on voltage.

Constant voltage throughout the whole experiment is used in ordinary gel electrophoresis because the resistance of the system does not change markedly. The electrophoretic migration rate is a function of voltage and thus running at constant voltage will give a constant migration rate.

Constant current throughout the whole experiment is mainly used when running isotachopheresis or when you use a discontinuous buffer system. Constant current operation is essential to maintain equal velocities for all ions.

Safety Precautions

Because this instrument will develop sufficient voltage and current to produce a lethal shock, caution should be taken in its operation. LKB has taken this into account and the Electrofocusing Constant Power Supply is designed to comply with relevant safety standards (pending). This means for example:

1. There is complete protection for any overload condition, including short circuit of output.
2. Ground leakage greater than 0.5 mA will be detected in less than 0.5 milliseconds and the power supply will be shut down while discharging less than 0.4 millicoulombs residual charge.
3. A wrap-around cover guards against spills.
4. Optical sensors (4) in the outlets will automatically shut off the power supply when output leads are disconnected.
5. The dual outlets are recessed.
6. The safety interlock can disconnect the power supply when an electrophoresis apparatus is opened.
7. A heavy mains transformer effectively isolates the entire circuitry.
8. Special shielded banana plugs are supplied.

NOTE:

The instruments must always be used with the earth wire correctly grounded.

Use only apparatus and associated wiring specified for use at 2.500 V.

Before touching any of the electrical leads, turn off the Power Supply and wait 60 seconds.

Remote Control

NOTE:

To avoid risk of lethal electric shock, all connections to the REMOTE CONTROL (1 Fig 2) should be made by a qualified service engineer.

The Power Supply will not operate unless the connections marked with a line in Figure 3 are made. The supplied interlock plug has these connections.

An external safety switch, if required, is connected between pins 1 and 2 (Fig 3).

External control of voltage, power and current limits is possible by connecting an external voltage limiting signal (0-10 V) to pins 8, 10 and 12 (Fig 3).

Voltage signals (0-10 V) proportional to output voltage, power, current and suitable for connection to a recorder are found on pins 15, 6 and 14 (Fig 3). The output resistance is 1 kΩ each.

Common ground for all these inputs and outputs is pin 1 (Fig 3). Note: This pin must not be connected to any

other instrument or utility ground, because this will cause the ground leakage detector to become inoperable.

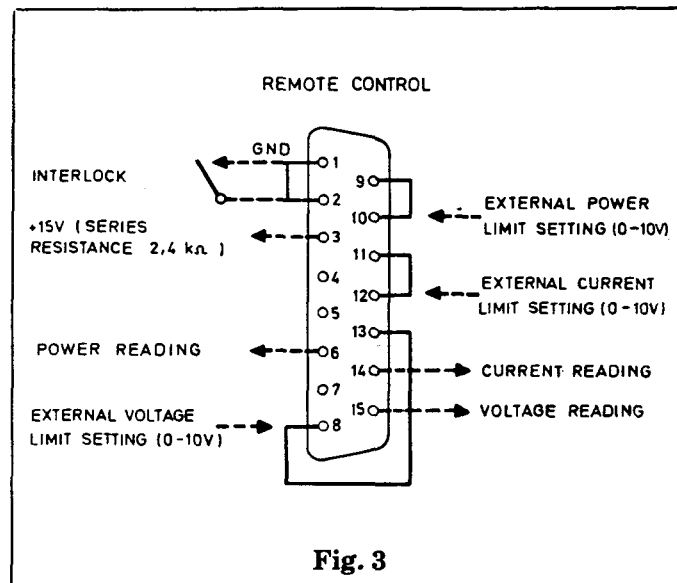


Fig. 3

Basic Circuit Description Power Supply 2197

The block diagram (Fig 4) shows the principal circuits of the instrument.

A secondary winding on the mains transformer T1 feeds through rectifier V81 and filters the two power switches V71 and V72. Other windings on T1 supply through rectifiers, filters and voltage regulators all other circuits.

Both power switches are fed with pulses with a frequency of about 22 kHz from the pulse width modulator N4. The power converted by T3 and T4 is regulated by varying the width of these pulses. T3 and T4 each have four secondary windings connected to rectifiers and filters. The circuits from each transformer are connected in such a way that an output voltage symmetric to ground results.

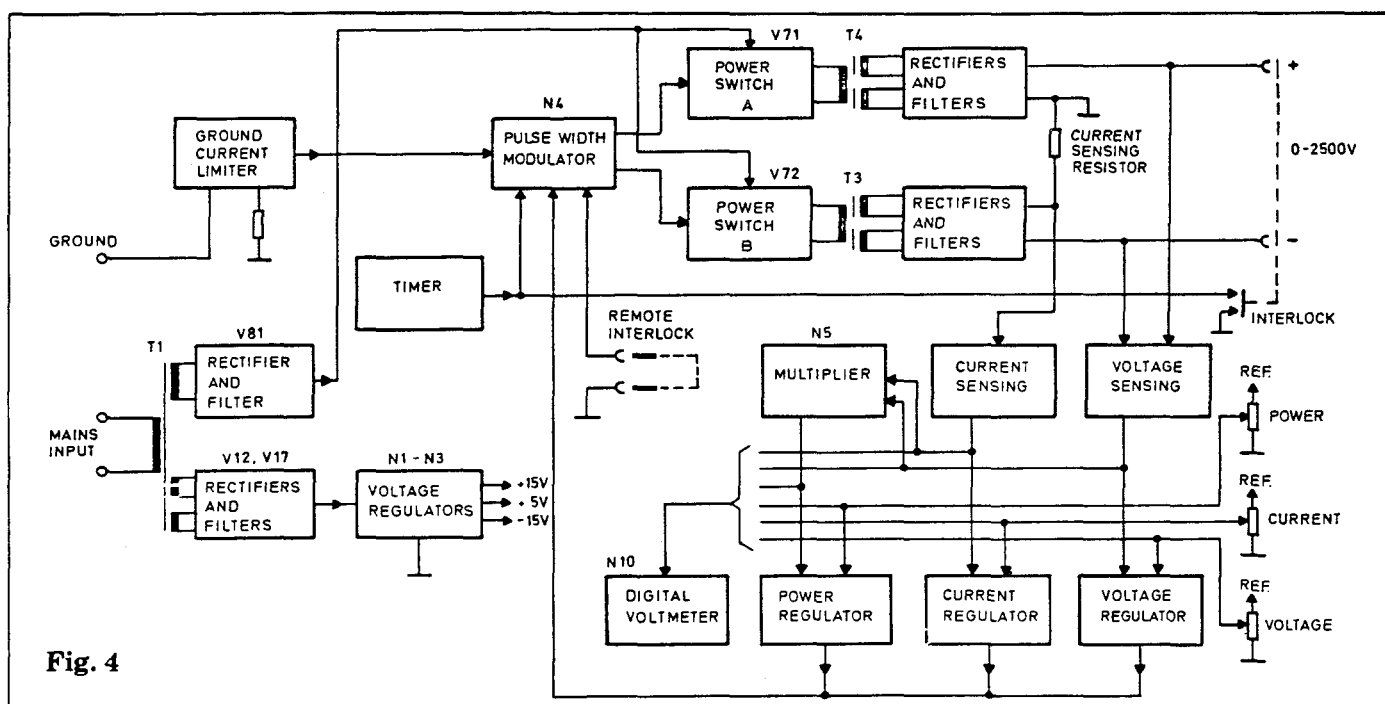


Fig. 4

Voltage and current are sensed by circuits for voltage and current sensing, resulting in voltages proportional to output voltage and current. A voltage proportional to the power is obtained by the multiplier N5. These voltages are compared with set values for voltage, current and power in the respective regulators. The output voltages from the regulators are connected to the pulse width modulator N4.

If there should be a leakage current from the positive or the negative pole to ground, a circuit functions and limits this current to less than 0.5 mA.

Interlock circuits block the modulator until all output plugs are inserted and remote safety circuits are closed.

A digital timer can be used to shut off the output after a preset time up to 59 hours and 59 minutes.

Setting of voltage, current and power limits, as well as reading of output voltage, current and power can be made with the help of a digital voltmeter N10.

Technical Specification

Regulation	constant power, constant current and constant voltage with automatic cross-over at any preset limit.
Timer	provided as standard, 0-59 hours and 0-59 minutes with optical and acoustic signals.
Output	<i>voltage</i> 10-2500 V D.C. continuously variable <i>current</i> 1.0-25.0 mA continuously variable 2-250 mA continuously variable <i>power</i> 0.5-10.0 W continuously variable 1-100 W continuously variable
Ambient operating temperature	0-40°C.
Warm-up time	none, can be used immediately.
Accuracy	voltage (>200 V) better than $\pm 1\%$ of set value ± 1 volt. current better than $\pm 1\%$ of set value. power better than $\pm 2\%$ of set value ± 1 W.
Stability against load variation	voltage better than $\pm 1\%$. current better than $\pm 2\%$. power better than $\pm 2\%$.
Protection	<ul style="list-style-type: none">- Complete protection for any overload condition, including short circuit of output.- Ground leak detection (>0.5 mA) automatically responds within 0.5 m sec.- Optical sensors automatically shut off power supply when output leads are disconnected.- Safety interlock disconnects power supply when electrophoresis apparatus is opened.
Line voltage	110, 115, 120, 220, 240 V $\pm 10\%$, 50 or 60 Hz.
Power consumption	Maximum 200 W.
Dimensions (W×D×H)	335×380×135 mm.
Weight	13 kg.

Spare Parts Catalogue

General

This Spare Parts Catalogue describes your new LKB instrument by means of drawings and photographs. It enables you to find the order number for the items that you may require.

Usually the LKB Order Departments can supply you with most of these spare parts, however certain parts may have to be ordered from LKB Bromma, Sweden and we will try to supply these as quickly as possible.

LKB guarantees the function of your new instrument. The terms of the guarantee are given in the purchase contract. This guarantee is only valid if service is provided by LKB and if LKB parts are used.

Since product development and improvement are a continuous process, LKB reserves the right to make changes in the specifications without notice.

How to use the catalogue

1. Using the index, locate the figure where the wanted part is shown.
2. Locate the part and its item No.
3. Turn to the parts list and note the part No and description which correspond to the item No. Always state the part No when ordering spare parts.
4. The following information can be found under "Notes".
 - A) Reference to instrument serial number where changes and modifications have been made.
 - B) Identification of electrical components is listed for LKB service engineers with numbers which appear on drawings for internal use.
5. If there is something in this catalogue which you think should be clarified or corrected, we would be very grateful for your help.

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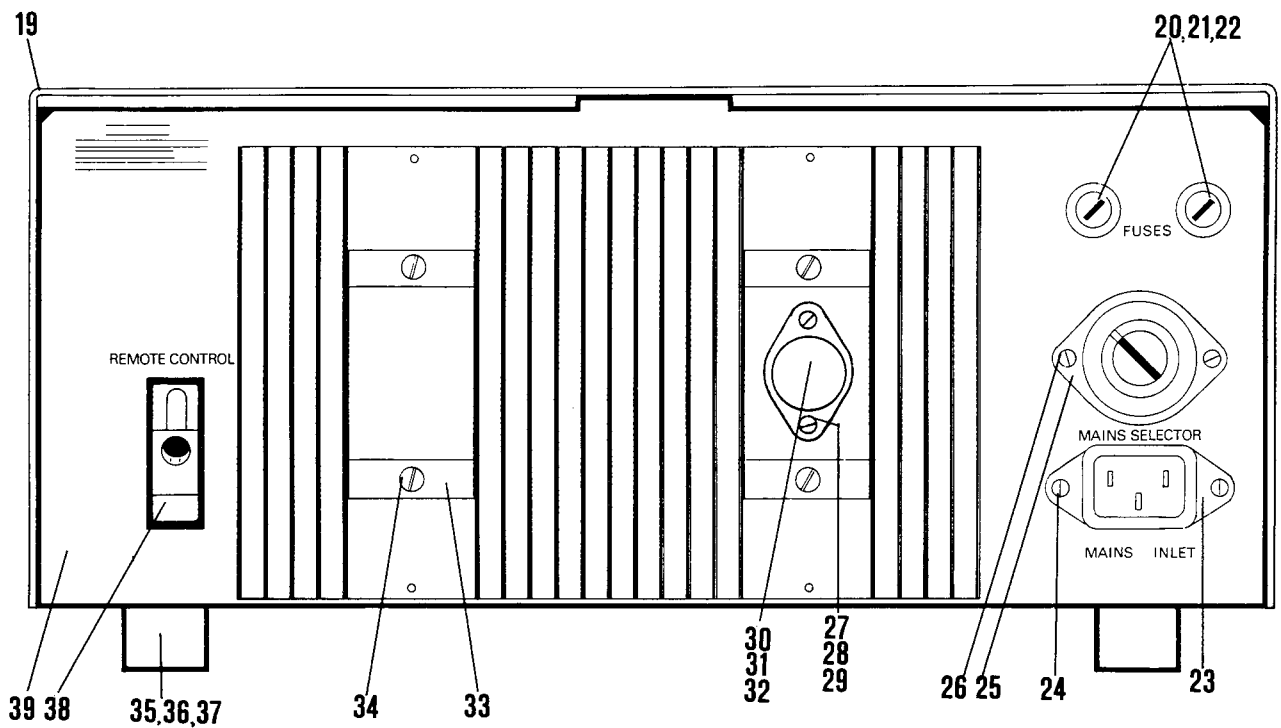
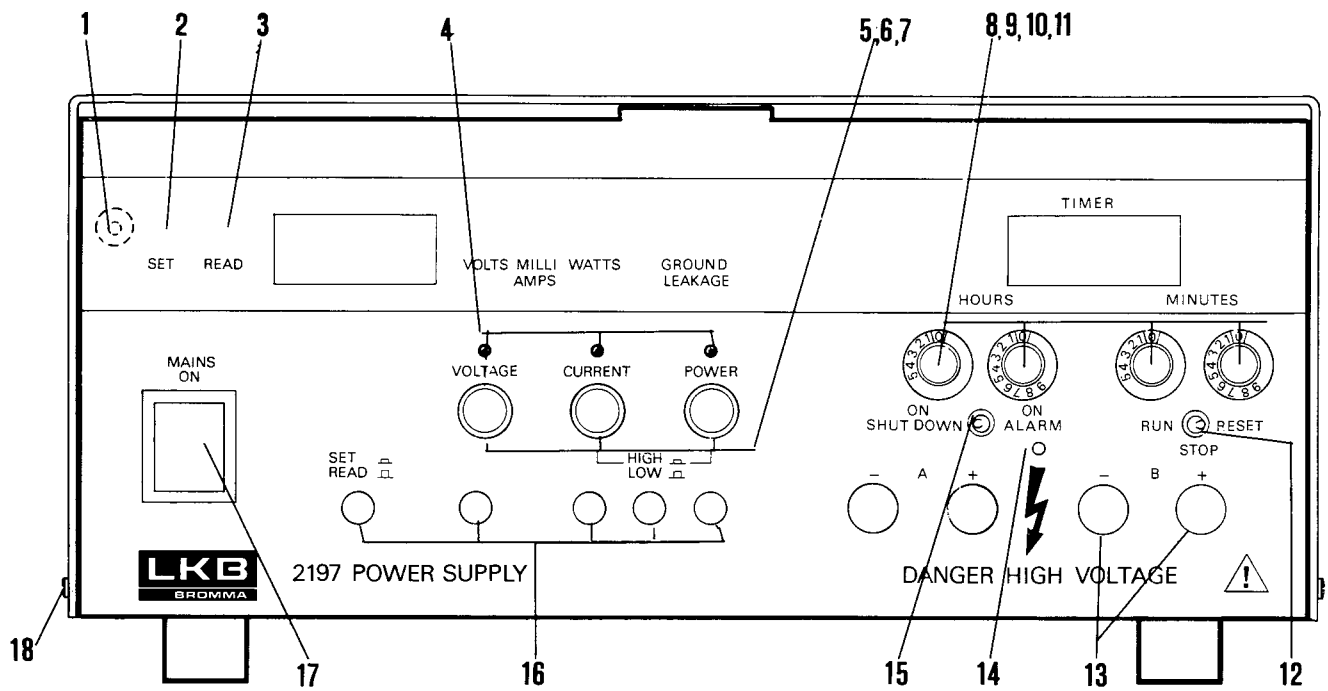


Fig. 1

Front side/rear side

Item	Part no	Description	Notes
001	95 25 1002	Locking washer (pkt/10)	
002	90 01 3536	Front panel	
003	90 01 3540	Window	
004	95 78 0214	Led, red	
005	95 37 0135	Cover for knob	
006	95 37 0140	Knob	
007	95 61 0177	Potentiometer 2 kohm	R116-R118
008	95 37 0134	Cover for knob	
009	95 37 0170	Knob	
010	90 01 3601	Scale disc 0-5	
011	90 01 3590	Scale disc 0-9	
012	95 84 1021	Switch	
013	90 01 0968	Dummy plug	
014	95 78 1006	Led, yellow	
015	95 84 1020	Switch	
016	95 84 1006	Switch unit	
017	95 84 0175	Mains switch	
018	95 27 0127	Screw LKCS 4×10 (pkt/10)	
019	90 01 0936	Cover	
020	95 88 1001	Fuse holder	
021	95 88 1002	Fuse cap EU	
	95 88 1003	Fuse cap US	
022	95 83 0014	Fuse EU 2A (pkt/10)	
	95 83 0056	Fuse US 3A (pkt/10)	
023	95 86 1006	Mains inlet	
024	95 27 0185	Screw KFS 3×5 (pkt/10)	
025	95 84 1004	Voltage selector	
026	95 27 0115	Screw LKCS 3×6 (pkt/10)	
027	95 27 0037	Screw MCS 3×12 (pkt/10)	
028	95 25 0063	Washer AZ 3.2 (pkt/10)	
029	95 27 0370	Nut ML6M3 (pkt/10)	
030	95 80 1000	Transistor BUX 41	
031	95 73 0023	Isolation bushing	
032	95 73 0025	Isolation washer	
033	90 01 0945	Cover	
034	95 27 0055	Screw MCS 4×5 (pkt/10)	
035	95 39 0004	Rubber feet (pkt/5)	
036	95 27 0574	Screw MC6S 6×20 (pkt/10)	
037	95 27 0373	Nut ML6M6 (pkt/10)	
038	90 01 0972	Remote control plug	
039	90 01 0940	Rear panel	

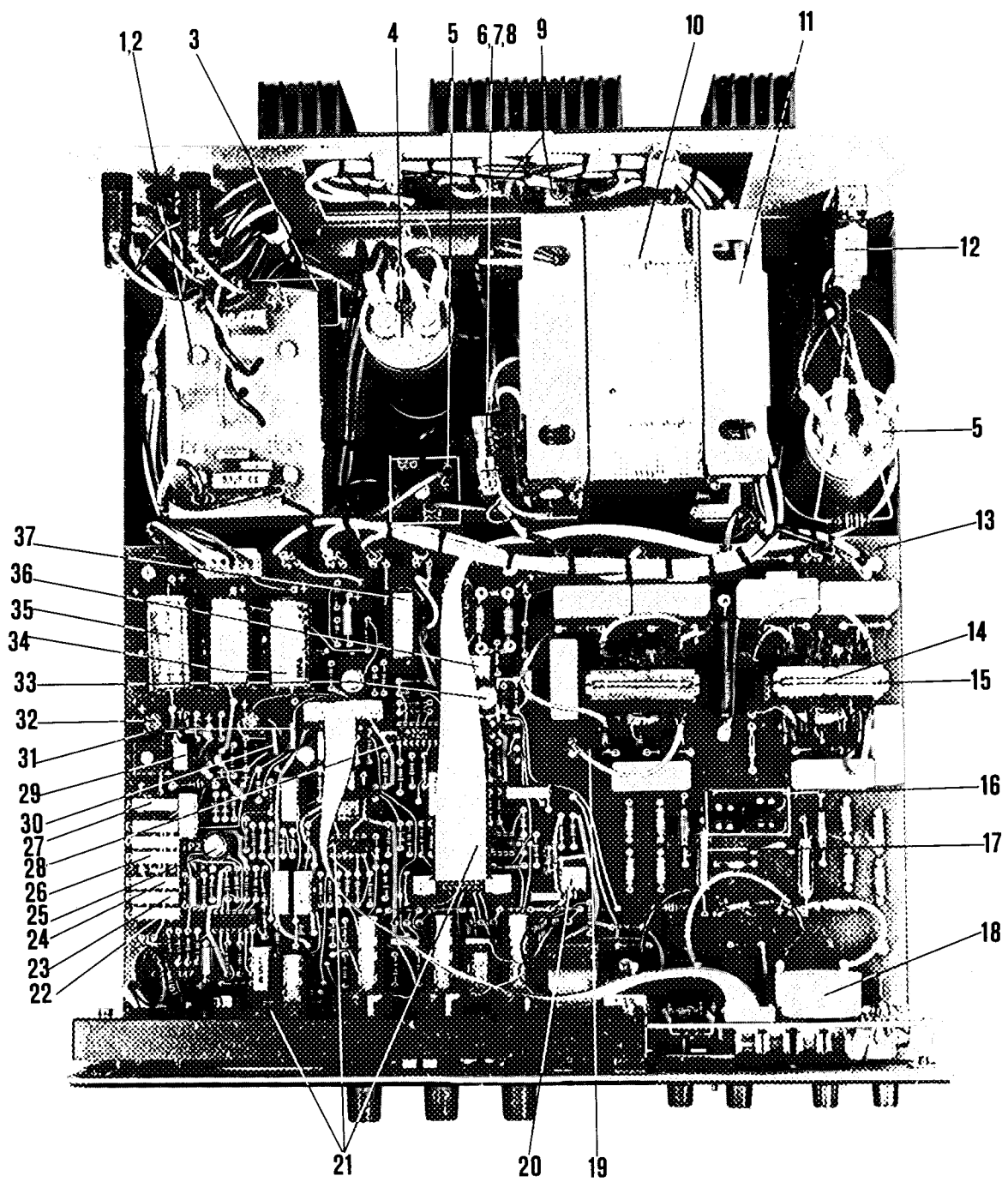
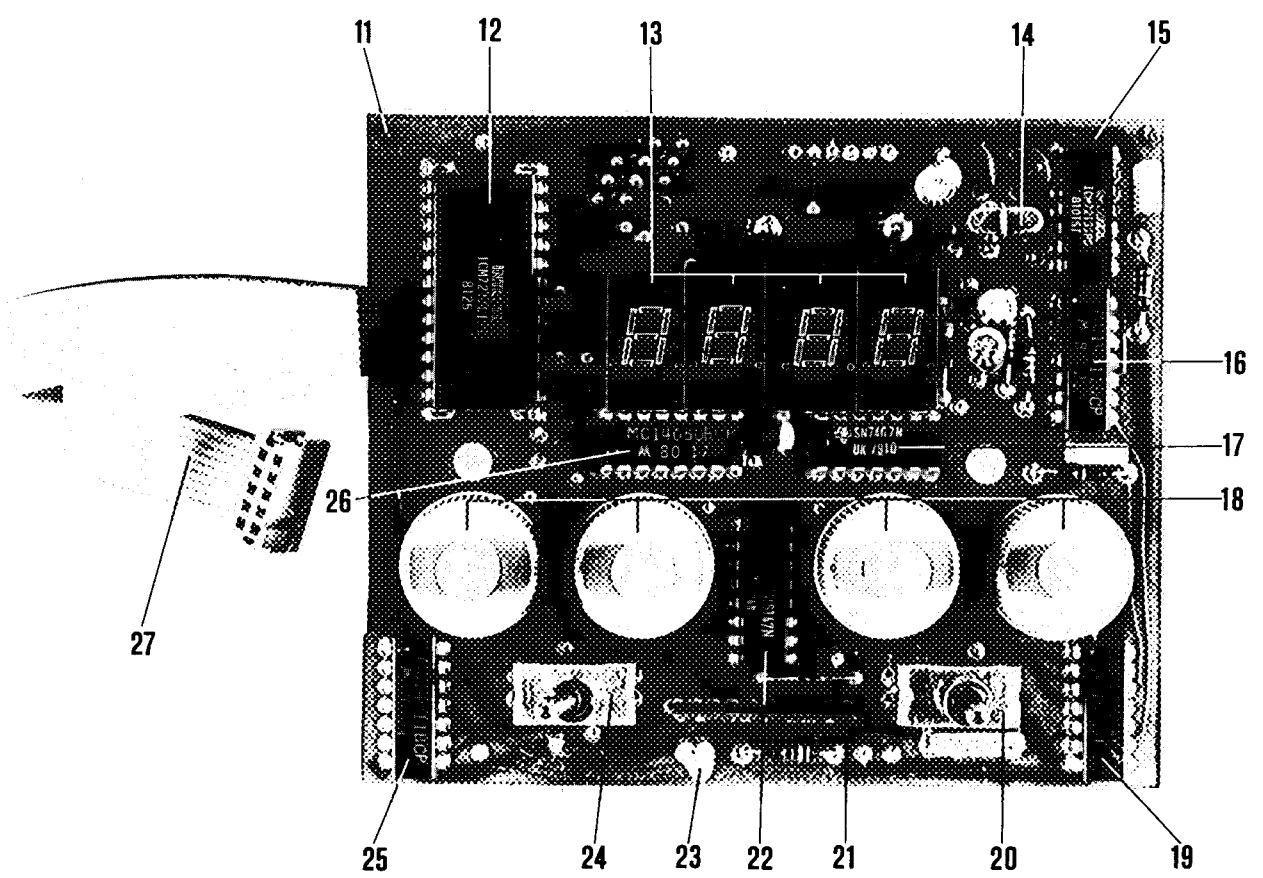
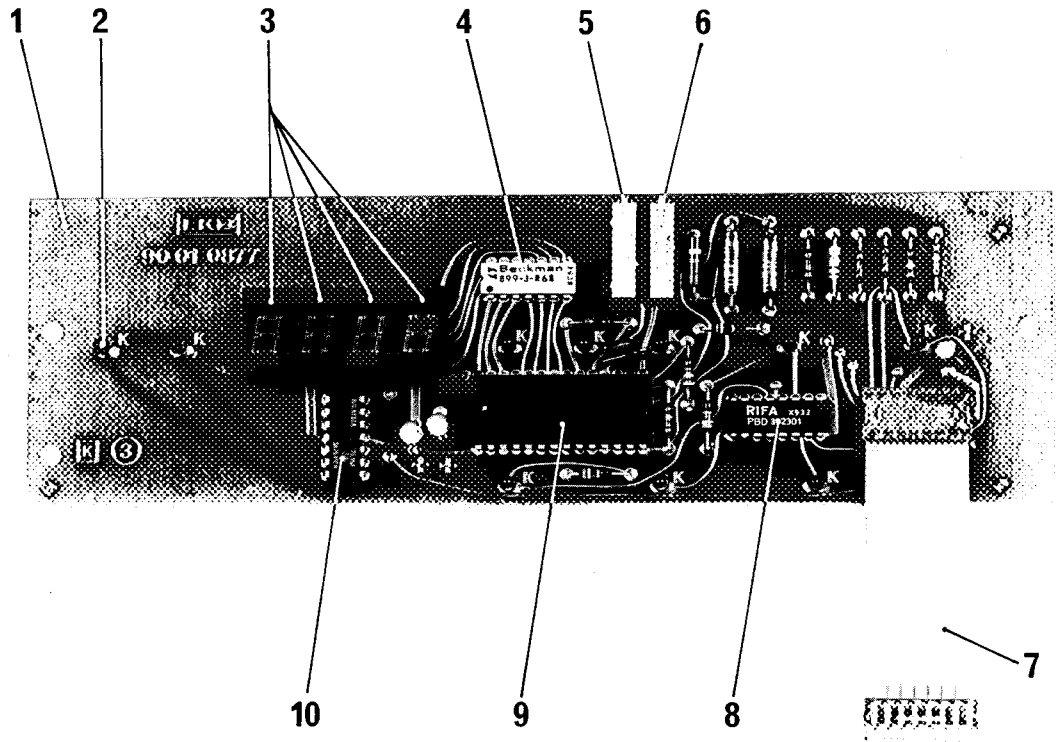


Fig. 2

Mother PC-Board

Item	Part no	Description	Notes
001	95 27 0320	Screw CSK B 6×12 (pkt/10)	
002	90 01 0944	Distance	
003	95 65 1006	Choke	
004	95 63 1010	Capacitor ELY 63V/4700 μF	C81-C82
005	95 78 1002	Bridge rectifier	V82
006	95 83 0074	Fuse 200 mA/EU (pkt/10)	F3-F4
007	95 83 0036	Fuse 500 mA/EU (pkt/10)	F5
008	95 83 0041	Fuse 6.3 A/EU (pkt/10)	F6
009	95 60 0142	Resistor 10 W/220R	R165-R166
010	95 65 1005	Transformer	T1
011	95 27 0254	Screw MC6S 6×10 (pkt/10)	
012	90 01 0948	Cable with connector	
013	90 01 0847	Mother PC-board	
014	95 73 1003	Mounting kit	
015	90 01 3606	Transformers (matched pair)	T3, T4
016	95 60 1131	Varistor	R98-R101
017	95 65 1004	Coil 470 μH	L1-L2
018	95 72 1000	Buzzer	
019	95 78 1004	Diode	V39-V48
020	95 61 1002	Potentiometer 0.5 W/50 K	R56
021	95 81 0265	Integrated circ. 3403A	N6-N8
022	95 61 0161	Potentiometer 0.4 W/5 K	R94
023	95 61 0157	Potentiometer 0.4 W/50 K	R59
024	95 61 0088	Potentiometer 0.4 W/10 K	R58
025	95 81 1032	Integrated circ. AD 533 TH	N5
026	95 81 0162	Potentiometer 0.4 W/20 K	R34-R36
027	95 61 0161	Potentiometer 0.4 W/5 K	R33
028	95 81 1016	Integrated circ. SG 3524	N4
029	95 81 0048	Voltage reg. 7805	N1
030	95 81 0061	Voltage reg. 7815	N2
031	95 81 0237	Voltage reg. 7915	N3
032	95 78 0105	Bridge rectifier	V12, V17
033	95 80 0081	Transistor BSW 67	V4, V9
034	95 63 0203	Capacitor ELY 1000 μF/25 V	C2, C3
035	95 63 1009	Capacitor ELY 2200 μF/16 V	C1
036	95 61 1003	Potentiometer 0.5 W/500 R	R13
037	90 01 0778	Transformer	T2
038	90 01 1516	Mains filter PC-board	



Display PC-board/timer PC/board

Item	Part no	Description	Notes
001	90 01 0877	Display PC-board	
002	95 78 0214	Led red	H1-H2,
003	95 76 0041	Display 7-segment	H3-H6 H7-H14
004	94 60 1012	Resistor 7×68R	R131
005	95 61 0158	Potentiometer 0,4W/200R	R133
006	95 61 0088	Potentiometer 0,4W/10K	R134
007	90 01 0954	Cable with connectors	
008	95 81 1011	Int. circuit PBD 3523-01	D2
009	95 81 1018	Int. circuit add 3701	N10
010	95 81 0145	Int. circuit SN 75482	D1
011	90 01 3055	Timer PC-board	
012	95 81 1053	Integrated circ. ICM 7217C	D3
013	95 76 0041	Display	H16-H19
014	95 74 1002	Crystal	Z1
015	95 81 1052	Integrated circ. ICM 7213	D6
016	95 81 0246	Integrated circ. MC14011	D7
017	95 81 0125	Integrated circ. 7407	D5
018	95 84 1003	Switch	S8-S11
019	95 81 0169	Integrated circ. 4023	D10
020	95 84 1021	Switch	S13
021	95 60 1038	Resistor 9×47k	R157
022	95 81 1014	Integrated circ. 74S147	D8
023	95 78 1006	Led, yellow	H20
024	95 84 1020	Switch	S12
025	95 81 0246	Integrated circ. 4011	D9
026	95 81 0168	Integrated circ. 4050	D4
027	90 01 0947	Flat cable compl.	
028	90 01 1474	Axle	

QUALITY STATUS REPORTS

Please fill in one of the Quality Status Reports and return to:

LKB-Produkter AB
Quality Control Dept.
Box 305
S-161 26 BROMMA
Sweden

IMPORTANT!
Any safety aspects or faults that can cause a hazardous situation shall be described in a written detailed report.

To: LKB-Produkter AB, Quality Control Dept., Box 305, S-161 26 Bromma, Sweden

Product No. _____ Serial No. _____ Date:

Year	Month

Time from delivery to customer:

month	0	0-3	3-12	12-36
code	1	2	3	4

 Warranty:

	yes
--	-----

Check for appropriate failure code below

Sales company (representative)/serviceman: _____

Faulty components	0	Badly assembled or adjusted components	1	Missing components or accessories	2	Damage intransport	3
Spare part No.	Qty	Spare part No.	Qty	Spare part No.	Qty	Insufficient instructions for handling	4
						Incorrect handling	5
						Environmental influence	6
						SAFETY (report)	7
						Below specification	8
						Other fault	9

To: LKB-Produkter AB, Quality Control Dept., Box 305, S-161 26 Bromma, Sweden

Product No. _____ Serial No. _____ Date:

Year	Month

Time from delivery to customer:

month	0	0-3	3-12	12-36
code	1	2	3	4

 Warranty:

	yes
--	-----

Check for appropriate failure code below

Sales company (representative)/serviceman: _____

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To: LKB-Produkter AB, Quality Control Dept., Box 305, S-161 26 Bromma, Sweden

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code	1	2	3	4

 Warranty:

	yes
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Check for appropriate failure code below

Sales company (representative)/serviceman: _____

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						Incorrect handling	5
						Environmental influence	6
						SAFETY (report)	7
						Below specification	8
						Other fault	9

Fault description (Fault caused by and action to cure the fault):

Comments on serviceability (or usability):

Fault description (Fault caused by and action to cure the fault):

Comments on serviceability (or usability):

Fault description (Fault caused by and action to cure the fault):

Comments on serviceability (or usability):



THE INCENTIVE GROUP

LKB-Produkter AB, Box 305, S-161 26 Bromma, Sweden

Stockholm Antwerp Athens (Middle East) Bangkok Copenhagen London Lucerne Madras Moscow Munich Paris Rome Turku Vienna Washington Zoetermeer
Representatives in 60 countries