

Alsatom MB1A/MC MB1/MC**INDEX**

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.....	rev. september '95

SERVICE MANUAL

EQUIPMENT REQUIRED

DESCRIPTION	FEATURES	EXAMPLE
Double tracking oscilloscope	Passband: DC - 100 MHz	Tektronix mod. 2235A
digital multimeter	Accuracy: DC = 1%, AC = 2%	Hewlett Packard mod. E2373A
Thermoelement	Passband: 10 Hz - 5 MHz	YOKOGAWA mod. 2016
Digital frequency meter	Passband: 10 Hz - 100 MHz	Hewlett Packard mod. HP 5384A
Voltage probe x 10	Passband: DC - 200 MHz	Tektronix mod. P6063B
Voltage probe x 1000	Passband: DC - 10 MHz	Tektronix mod. P6015
Current probe	Passband: DC - 50 MHz	Tektronix mod. A6302/AM 503

A) PRELIMINARY PROCEDURE

- remove the fuse *F3* from the *MAIN BOARD* (board 801260-801260/a).
- insert plug from pedal control into input port *PEDAL*.
- insert neutral plate plug in its appropriate outlet *MONOPOLAR*.
- insert power supply cable in current outlet.

B) LOW VOLTAGE POWER SUPPLY (board 801260-801260/a)

1) TESTING POWER SUPPLY VOLTAGE +5V AND +15V (TP1, TP2).

- short the *R33* resistor (board 801260-801260/a). This prevents activation of the RF power generator, thus preventing possible damage to electronic circuits that have not been tested yet.
- set oscilloscope vertical sensitivity at 1V/div. (in *DC mode*).
- connect the oscilloscope probe to test point *TP1*.
- turn on electrosurgical unit and make sure voltage is between 4.7V e 5.3V.
- with oscilloscope in *AC* mode and sensitivity set at 0.1V/div verify that ripple voltage is not over 10mVpp.
- move oscilloscope probe on test point *TP2* (Vert: 1V/div; *DC*) and make sure voltage is between 14.3V and 15.7V.

C) MICROCONTROLLER (board 801261-801262)

1) TESTING ONCE EQUIPMENT IS TURNED ON

When the electrosurgical unit is turned on, the microcontroller does automatically a selftest (about 15 seconds) to verify anomalies of working (if present). If everything is all right, you'll have in sequence:

- lighting of 5 green LEDs of working mode;
- lighting of power display;
- lighting of timer display (only in *MB1/A-MC* model);
- lighting of red LED (neutral plate alarm), yellow LED (*CUT/BLEND* activation) and blue LED (*FORCED COAG/SOFT COAG/BIPOLAR* activation) with short acoustic signals.

After the selftest procedure, the unit shows what version of the software is being used (with a short acoustic signal) and the display pertaining to output power shows the number '0'.

After turning on the unit, during the selftest or any other condition, the system controls and prevents possible abnormalities shutting down output power and displaying error type with its specific code:

KIND OF PROBLEM	ACOUSTIC SIGNAL	DISPLAY CODE
RAM memory (during the selftest)	1kHz 70ms ON 130ms OFF	ER
EPROM memory (during the selftest)	1kHz 70ms ON 130ms OFF	Eb
Supply voltage (during the selftest)	1kHz 70ms ON 130ms OFF	Ed
RF signal modulation (during the selftest)	1kHz 70ms ON 130ms OFF	EC
Supply voltage (during activation)	1kHz 70ms ON 130ms OFF	Ed
RF signal modulation (during activation)	1kHz 70ms ON 130ms OFF	EC
Internal variables check failure	1kHz 70ms ON 130ms OFF	EE
Foot pedal failure	1kHz 70ms ON 130ms OFF	EF
Neutral plate alarm	1kHz 190ms ON 190ms OFF	-

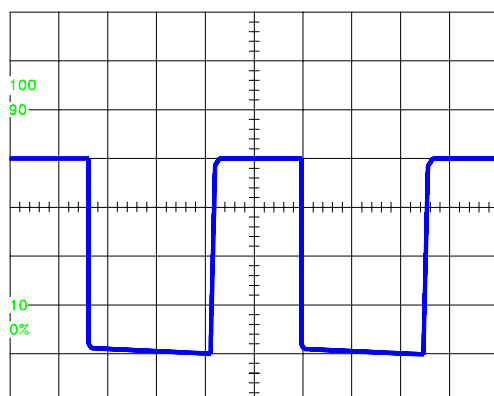
WARNING!!! AFTER TURNING ON THE ELECTROSURGICAL UNIT, IF NO LED LIGHTS, DON'T USE THE UNIT AND CALL THE TECHNICAL SERVICE.

3) CALIBRATING VREF VOLTAGE

- connect the voltmeter to test point *TP3* (board 801261-801262).
- turn trimmers *R57* and *R61* fully clockwise (board 801261-801262).
- set trimmer *R2* (board 801261-801262) so that voltage is exactly at 4.94V.

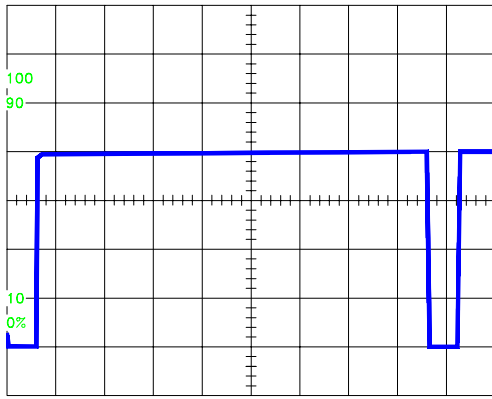
4) TESTING RF MODULATION SIGNAL

- connect oscilloscope probe to test point *TP4* (board 801261-801262).
- set 10W as power index in *BLEND* function.
- with the electrosurgical unit turned on, test the modulation signal taking as reference the following wave-form:

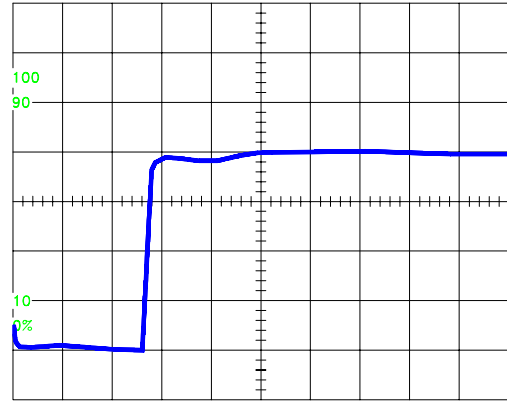


Vert.: (DC) 1V/div
Hor.: 20 μs/div

- set 10W as power index in the *FORCED COAG* function.
- with the electrosurgical unit turned on, test the modulation signal, taking as reference the following wave-forms:



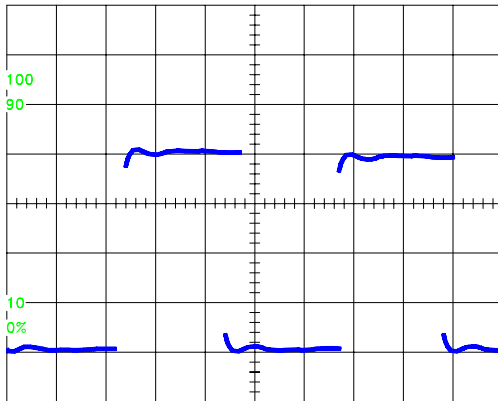
Vert.: (DC) 1V/div
Hor.: 10 μ s/div



Vert.: (DC) 1V/div
Hor.: 2 μ s/div

g) set 10W as power index in the *SOFT COAG* function.

h) with the electrosurgical unit turned on, test the modulation signal, taking as reference the following wave-form:



Vert.: (DC) 1V/div
Hor.: 20 μ s/div

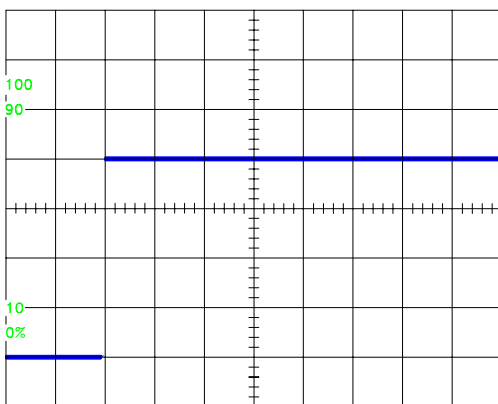
4) ONE SHOT TIMING TEST (SINGLE PULSE)

(only for MB1/A-MC model).

a) always with oscilloscope probe on test point *TP4* (board 801261-801262), set 10W as power index in the *CUT* function.

b) push one time only the push-button "T" of the **TIMER** section. Now the timer display must show "1".

c) with the electrosurgical unit turned on, test the modulation signal, taking as reference the following wave-form:



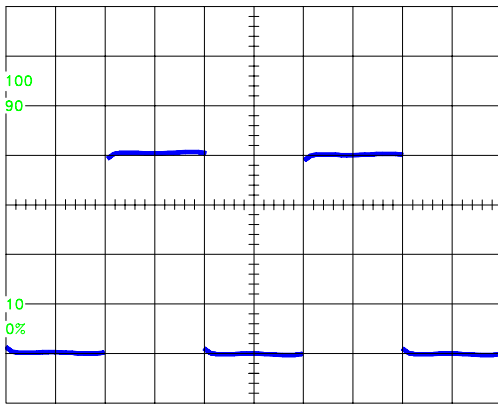
Vert.: (DC) 1V/div
Hor.: 5 ms/div

e) verify the timing accuracy programming timer digits from 1÷99 (10ms÷0.99s).

5) SUPERPULSED TIMING TEST

a) always with oscilloscope probe on test point *TP4* (board 801261-801262) and 10W as power index in the *CUT* function; push several times the push-button "T" until the digit '1' of **TIMER** display begins to flash.

b) verify the timing, taking as reference the following wave-form:



Vert.: (DC) 1V/div
Hor.: 5 ms/div

Verify the duty-cycle is 50%.

- c) push again the push-button "T" to leave the *TIMER* function.
- d) turn off the electrosurgical unit.
- e) remove jumper shorting the *R33* resistor (board 801260-801260/a).

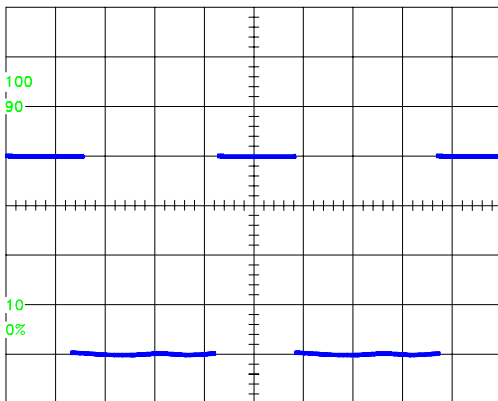
E) POWER SUPPLY (board 801260-801260/a)

1) CALIBRATING REFERENCE VOLTAGE V_{REFA}

- a) connect *TP5* to ground. This prevents activation of the RF power generator, thus preventing possible damage to electronic circuits that have not been tested yet.
- b) insert *F3* fuse.
- c) set trimmer *R4* at center position (board 801260-801260/a).
- d) turn on electrosurgical unit and wait for the display to show '0'.
- e) calibrate trimmer *R6* (board 801260-801260/a) so that voltage at test point *TP6* is exactly 8.0V.

2) TESTING POWER SUPPLY DRIVING PWM SIGNAL

- a) connect oscilloscope probe to test point *TP7* (board 801260-801260/a).
- b) set 100W as power index in the *CUT* function.
- c) activate and make sure the following wave-form appears:



Vert.: (DC) 2V/div
Hor.: 20 μs/div

3) CALIBRATING MINIMUM VOLTAGE

- a) set 2W as power index in the *CUT* function.
- b) make sure that, when the electrosurgical unit is not activated, voltage is lower than 3V in test point *TP8* (board 801260-801260/a).
- c) press the activation pedal and bring voltage to 7V on *TP8*, by using trimmer *R4* (board 801260-801260/a).

4) CALIBRATING MAXIMUM VOLTAGE

- a) set 70W as power index in the *FORCED COAG* function.
- b) press activation pedal and bring voltage to 134V on *TP8*, by using trimmer *R6* (board 801260-801260/a). Calibration of the two voltages, the maximum and the minimum, are interactive; thus, it is necessary to repeat calibrations until the values that have been indicated are reached.
- d) remove the jumper used to create electrical bonding on *TP5* (mosfet drain *Q6* board 801260-801260/a).

F) RADIOFREQUENCY (board 801260-801260/a)

- a) short *R33* resistor (board 801260-801260/a). This prevents activation of the RF power generator, thus preventing possible damage to electronic circuits that have not been tested yet.

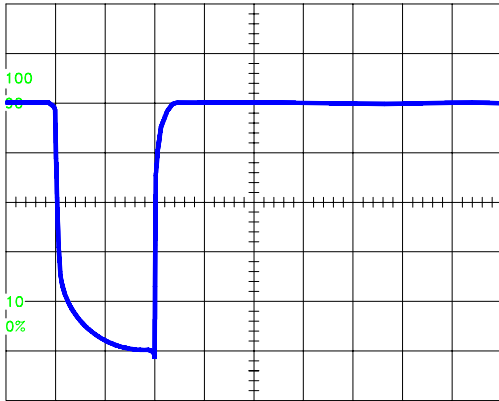
1) TESTING NEUTRAL PLATE CIRCUIT

- a) select *CUT* function.

- b) disconnect the two end conductors in the plate and then insert a 1000 ohm resistor in series.
- c) check that red LED *ALARM* is turned on, at the same time that the LED turns on, a repetitive acoustic signal will give warning of an error in the neutral plate.
- d) once again, short the end conductors on the neutral plate.

2) TESTING WORKING FREQUENCY

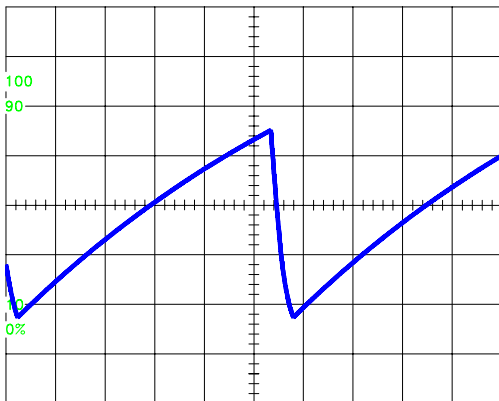
- a) set 10W as power index in the *CUT* function.
- b) connect frequency meter to test point *TP9* (board 801260-801260/a).
- c) with the electrosurgical unit turned on, make sure that working frequency is *950 kHz* ($\pm 10\text{kHz}$).
- d) calibrate the trimming capacitor *C24* (board 801260-801260/a) in such a way that the wave-form is the following:



Vert.: (DC) 1V/div
Hor.: 50 ns/div

3) CALIBRATING THE SLOPED SIGNAL (SAW-TOOTH SIGNAL)

- a) always with the *CUT* function activated, regulate the *R50* trimmer (board 801260-801260/a) in such a way that the wave-form on test point *TP10* will be the following:

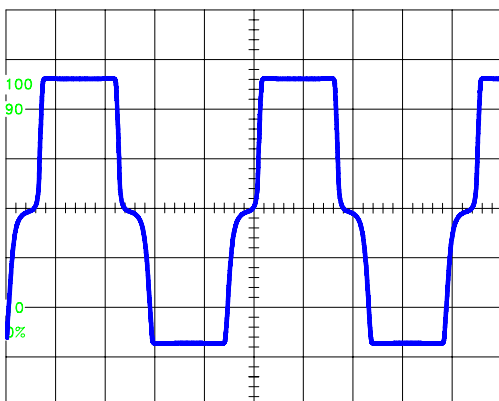


Vert.: (DC) 1V/div
Hor.: 200 ns/div

- b) turn the electrosurgical unit off.
- c) remove jumper shorting the *R33* resistor (board 801260-801260/a) and insert fuse *F3*.

4) CALIBRATING DEAD TIME

- a) connect a load of 500 ohm to the *MONOPOLAR* output hook up.
- b) set 10W as power index in the *CUT* function.
- c) turn the *R59* trimmer fully counterclockwise (board 801260-801260/a).
- d) using both inlets of the oscilloscope, connect probe "1" to test point *TP11*, and probe "2" on test point *TP12*.
- e) with the electrosurgical unit turned on, turn the *R50* trimmer so that dead time (i.e. the time at which both signals are at zero level) is equal to *250ns* (board 801260-801260/a).

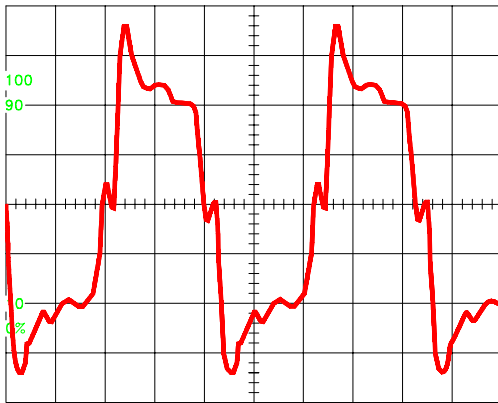


TP11 ADD-TP12 INVERT
Vert.: (DC) 5V/div
Hor.: 500 ns/div

g) increase dead time by another $25ns$ by using trimmer $R59$ (board 801260-801260/a).

5) TESTING THE RF POWER AMPLIFIER

- set 100W as power index in the *CUT* function.
- insert the RF current probe in series in the output.
- activate the electrosurgical unit and make sure it has the following wave-form:



Vert.: (AC) 0.2A/div
Hor.: 500 ns/div

6) CALIBRATING CURRENT LIMITER

- bring output load to 200 ohm.
- set 70W as power index in the *FORCED COAG* function.
- calibrate the $R87$ trimmer (board 801260-801260/a) in such a way that the current flowing through the output load is $580mA$.

7) TESTING OUTPUT POWER

- bring the output load to 500 ohm.
- with power set at 70W in *FORCED COAG*, make sure that effective current in the load is equal to $380mA$ ($\pm 5\%$). If necessary, it is possible to adjust the maximum output power by adjusting the $R6$ trimmer (board 801260-801260/a). Calibrating the $R6$ trimmer is allowed only if the voltage that is supplying the final stage does not exceed $135V$.
- set 10W as power index in the *CUT* function.
- make sure that the effective current in the load is equal to $140mA$ ($\pm 5\%$). If necessary, it is possible to adjust the maximum output power by adjusting the $R4$ trimmer (board 801260-801260/a).
- set 140W as power index in the *BLEND* function.
- make sure that affective current in the load is equal to $520mA$ ($\pm 5\%$).

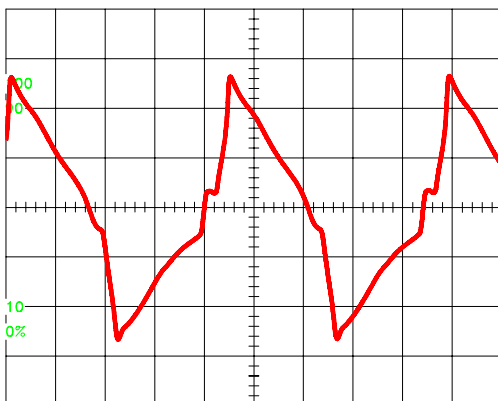
NOTE: This manual contains a chapter (page 9) with output power curves for the electrosurgical unit; for a complete test of the device, refer to these curves.

8) CALIBRATING MAXIMUM RF LEAKAGE CURRENT

- bring load resistor to 1500 ohm.
- set 150W as power index in the *CUT* function.
- connect the oscilloscope probe on test point $TP8$.
- by calibrating the $R116$ trimmer (board 801260-801260/a), find the point in which the tension displayed in the oscilloscope decreases abruptly from $52V$ to $42V$ ($\pm 20\%$).

9) BIPOLAR COAGULATION TEST

- connect the load in the *BIPOLAR* outlets.
- bring load resistor to 100 ohm.
- set 60W as power index in the *BIPOLAR* function.
- turn on the electrosurgical unit and make sure that the effective current in the load is equal to $780mA$ ($\pm 5\%$).



Vert.: (AC) 0.5A/div
Hor.: 500 ns/div

G) CALIBRATING RF PROTECTION SYSTEMS

1) PROTECTION FROM MALFUNCTION CAUSED BY MODULATION SIGNAL

- bring load resistor to 1000 ohm.
- set 40W as power index in the *FORCED COAG* function.
- with the electrosurgical unit activated, turn the *R61* trimmer (board 801261-801262) slowly counterclockwise, until the audio signal becomes intermittent and, at the same time, the RF output signal stops.
- now turn the *R61* trimmer (board 801261-801262) clockwise 15 degrees.
- always keeping the power index at 40W, make sure that all functions are properly activated.
- in order to simulate a malfunction condition, short the *R52* resistor (board 801260-801260/a) and activate in *FORCED COAG*; The audio signal must warn of a malfunction condition.
- remove jumper shorting the *R52* resistor.

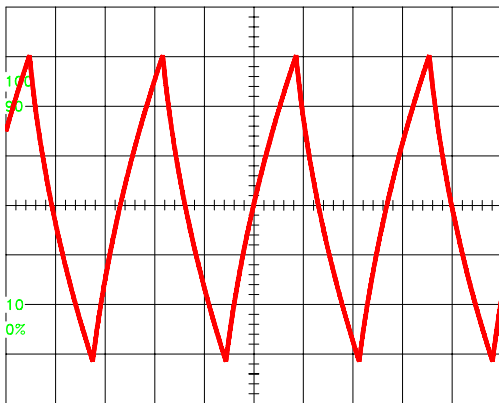
2) PROTECTION FROM MALFUNCTION CAUSED BY POWER SUPPLY

- bring load resistor to 500 ohm.
- set 40W as power index in the *FORCED COAG* function.
- with the electrosurgical unit activated, turn slowly the *R57* trimmer counterclockwise (board 801261-801262) until the audio sound becomes intermittent.
- now, turn the *R57* trimmer (board 801261-801262) clockwise 15 degrees.
- always keeping the power index at 40W, make sure that all functions are properly activated.

H) CHECKING THE AUDIO SIGNAL LEVEL

The audio level has no control. The frequency and amplitude of the signal require no calibrating and are generated directly by the microprocessor. To check, proceed as follows:

- set 2W as power index of the *CUT* function.
- connect the oscilloscope probe to test point *TP13*.
- activate and make sure that the wave-form is the following:



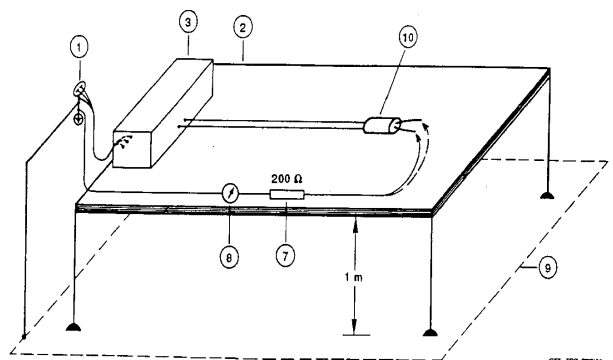
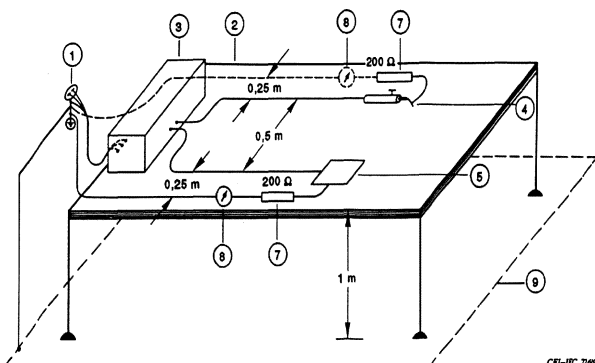
Vert.: (AC) 2V/div
Hor.: 0.5 ms/div

I) CHECKING RF CURRENT LEAKAGE

High frequency current leakage, for insulated equipment, must never exceed 150mA RMS, as required by the CEI EN 60601-2-2 REGULATIONS (IEC 601-2-2). The microprocessor for the electrosurgical unit *MB1/A-MC* has controls allowing it to keep well below such limit. To test the efficiency of these controls, it is indispensable to duplicate the most extreme test conditions, which in the case of the electrosurgical unit *MB1/A-MC* are obtained with the *CUT*, *BLEND*, *FORCED COAG* and *SOFT COAG* at their highest power setting.

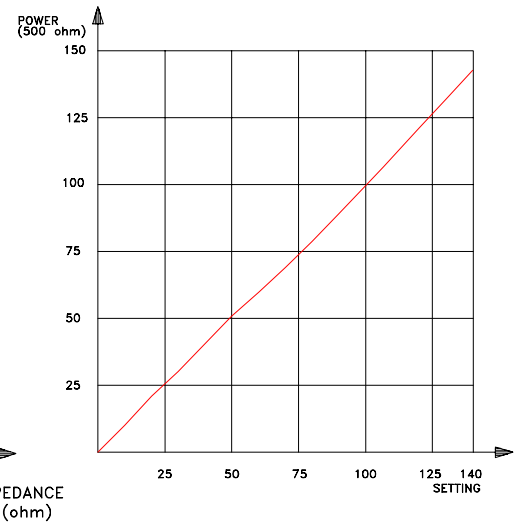
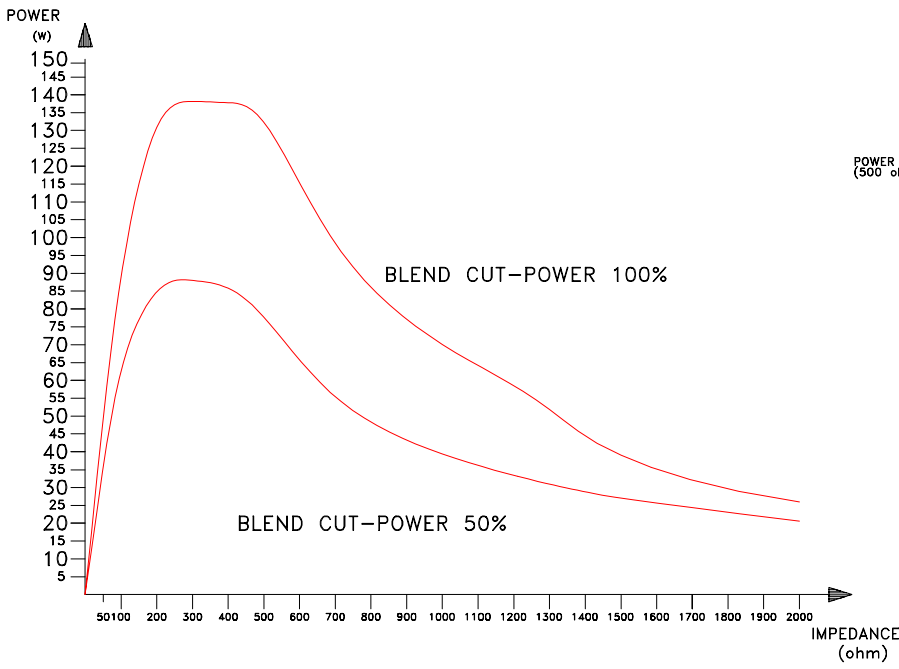
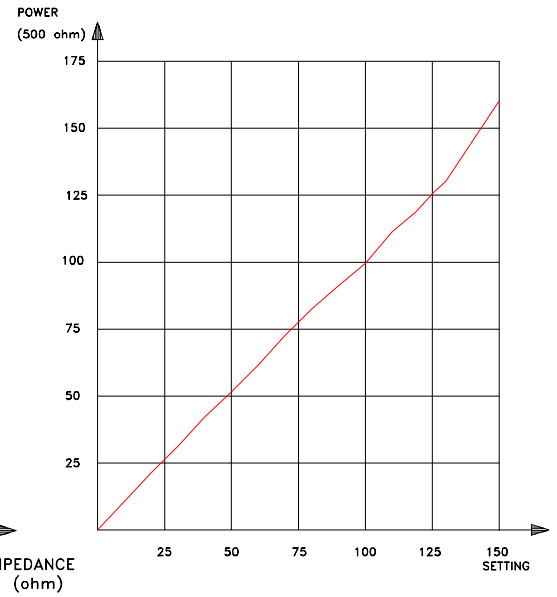
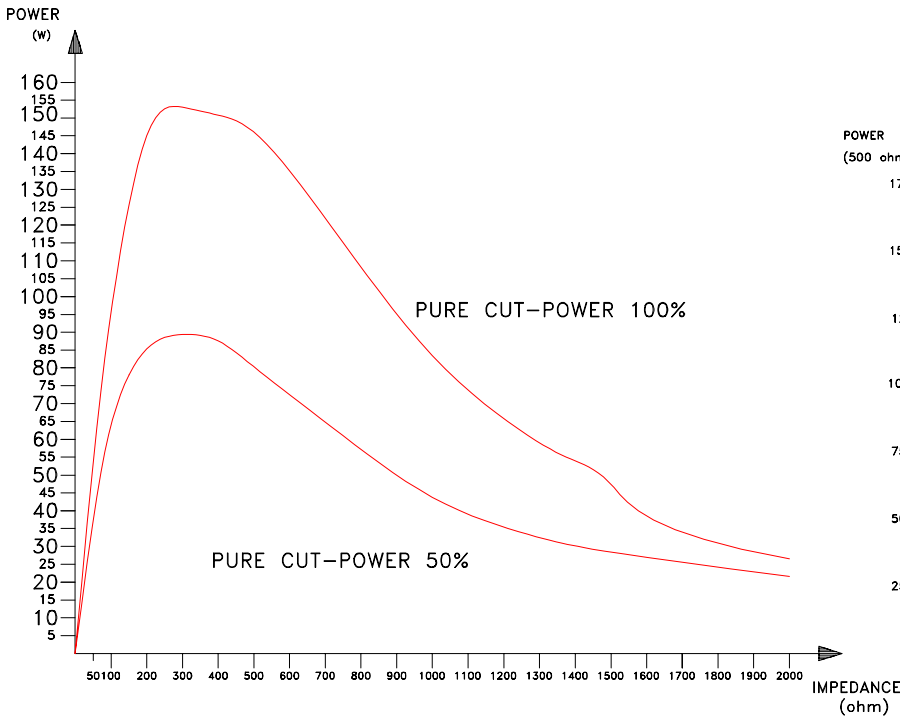
The average figures for leakage current are 110mA.

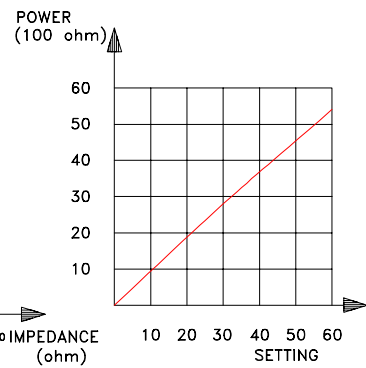
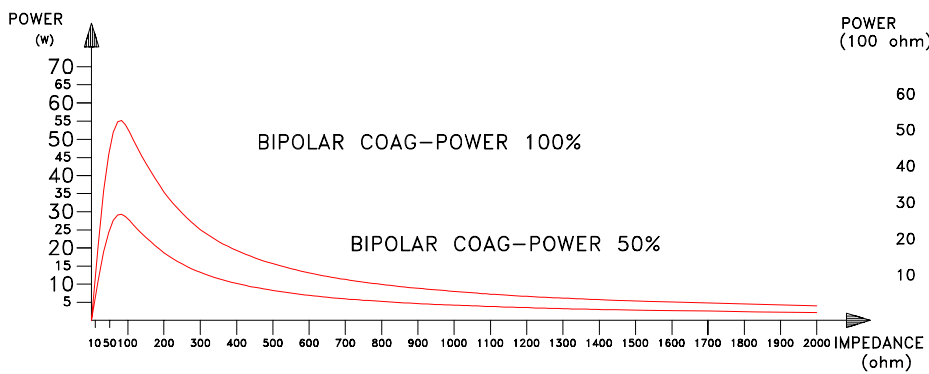
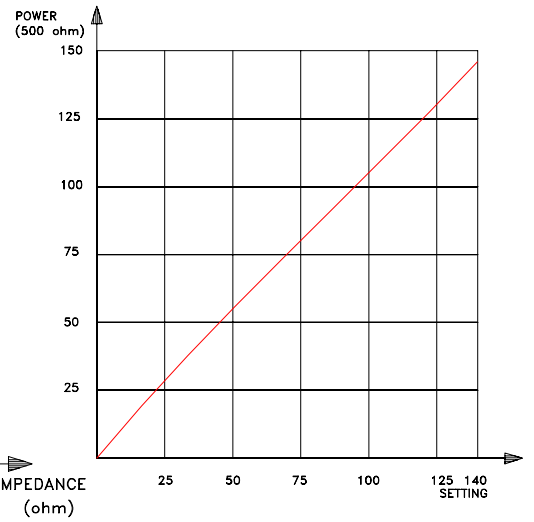
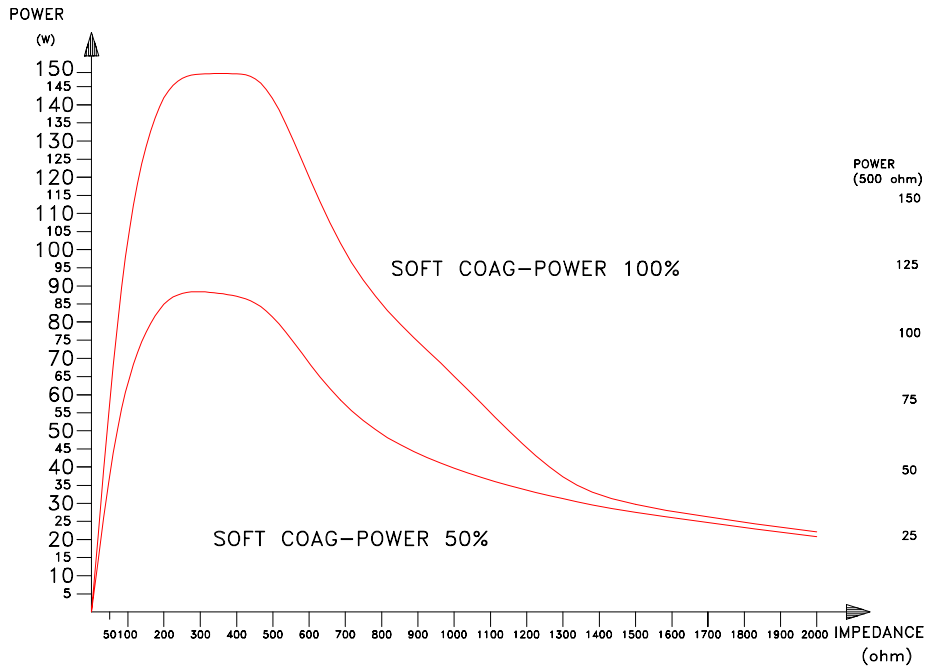
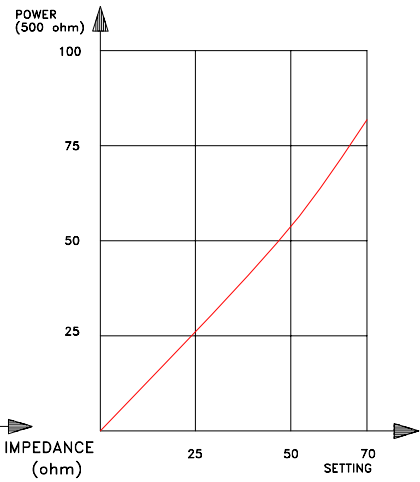
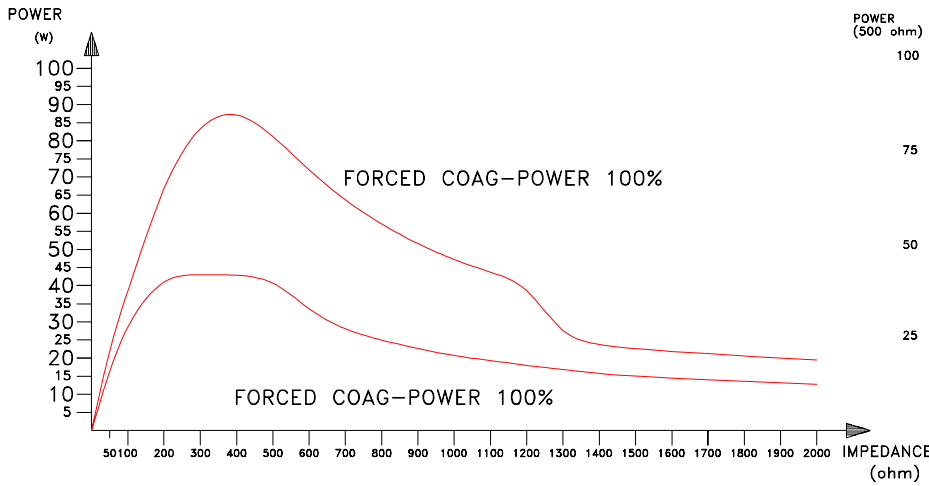
Measurement must be made as indicated by the CEI EN 60601-2-2 REGULATIONS (with insulated equipment).

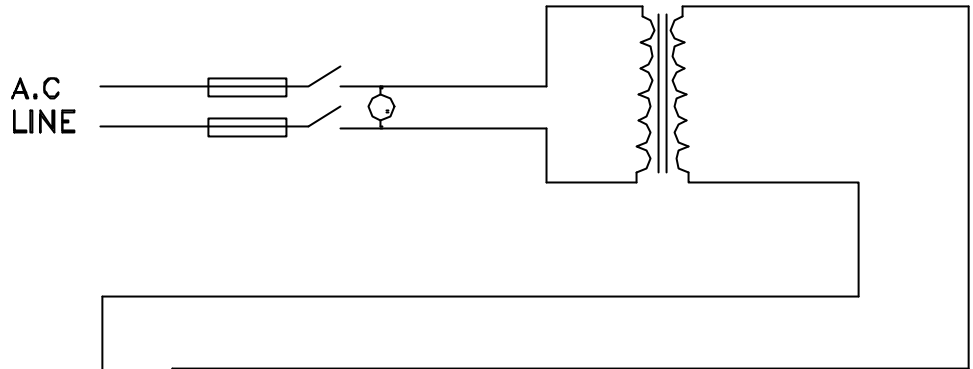


CURVES OF POWER CHANGES BY CHANGING THE LOADS (FROM 50 TO 2000 OHMS)

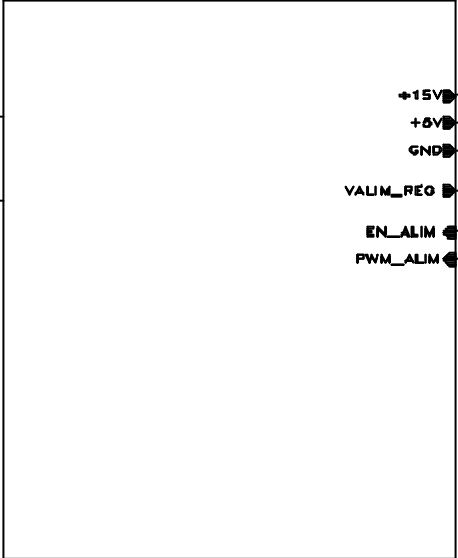
CURVES OF POWER INCREMENT (WITH NOMINAL LOAD)



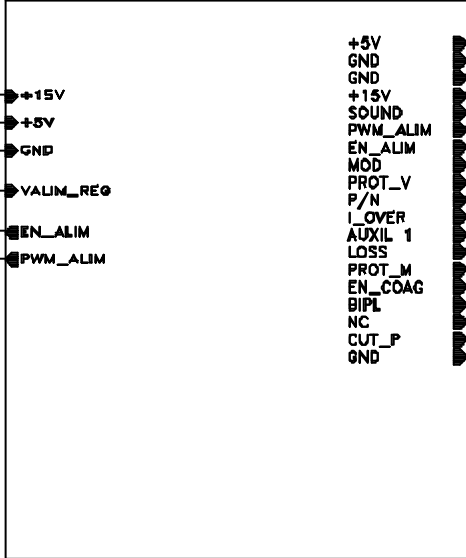




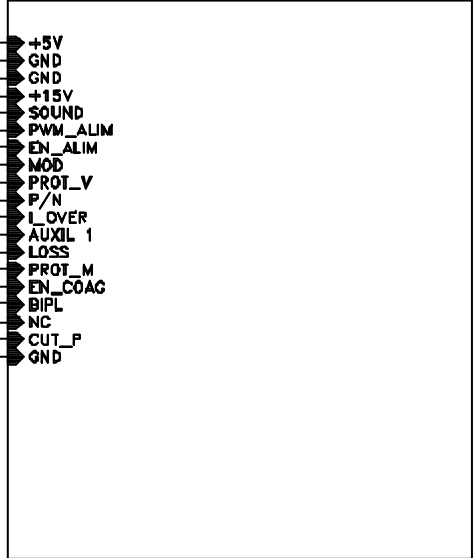
POWER SUPPLY SECTION



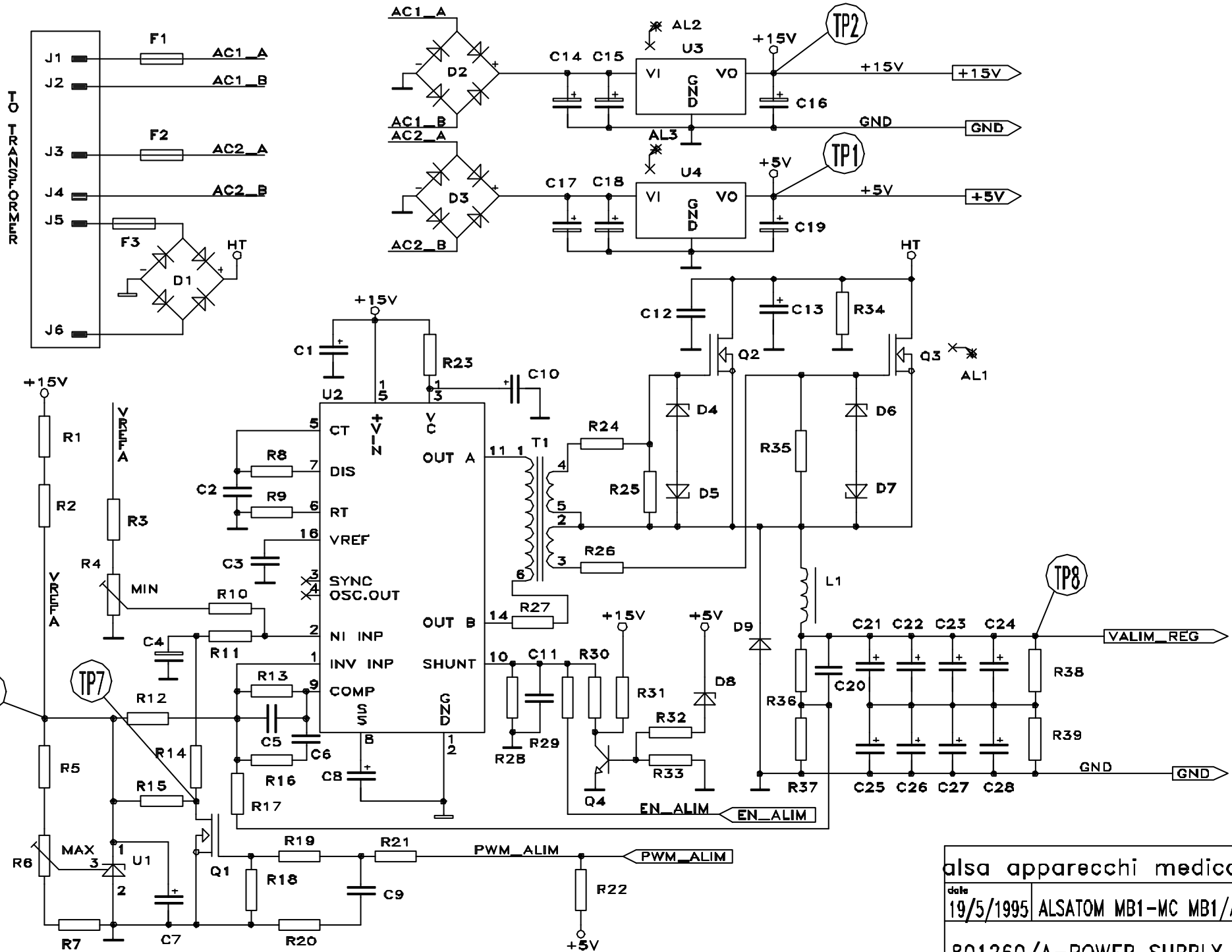
R.F. SECTION



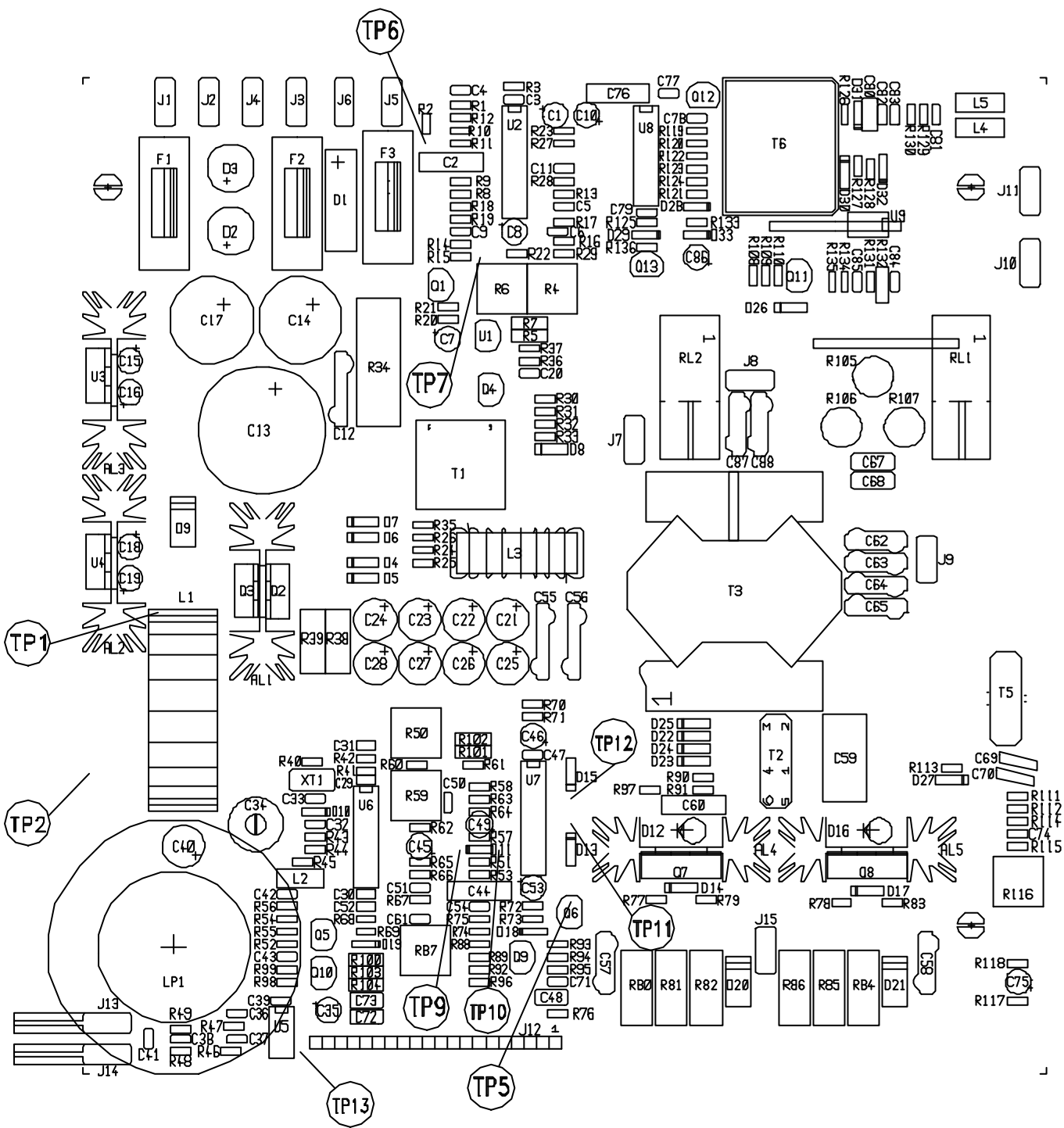
MICROCONTROLLER SECTION



also apparecchi medicali s.r.l.		
data	19/5/1995	ALSATOM MB1-MC MB1/A-MC
		5A
SCHEMATIC BLOCK		



also apparecchi medicali s.r.l.
 date 19/5/1995 ALSATOM MB1-MC MB1/A-MC 5A rev.
 801260/A-POWER SUPPLY SECTION



also apparecchi medicali s.r.l.

date	19/5/1995	ALSATOM MB1-MC MB1/A-MC	rev.	5A
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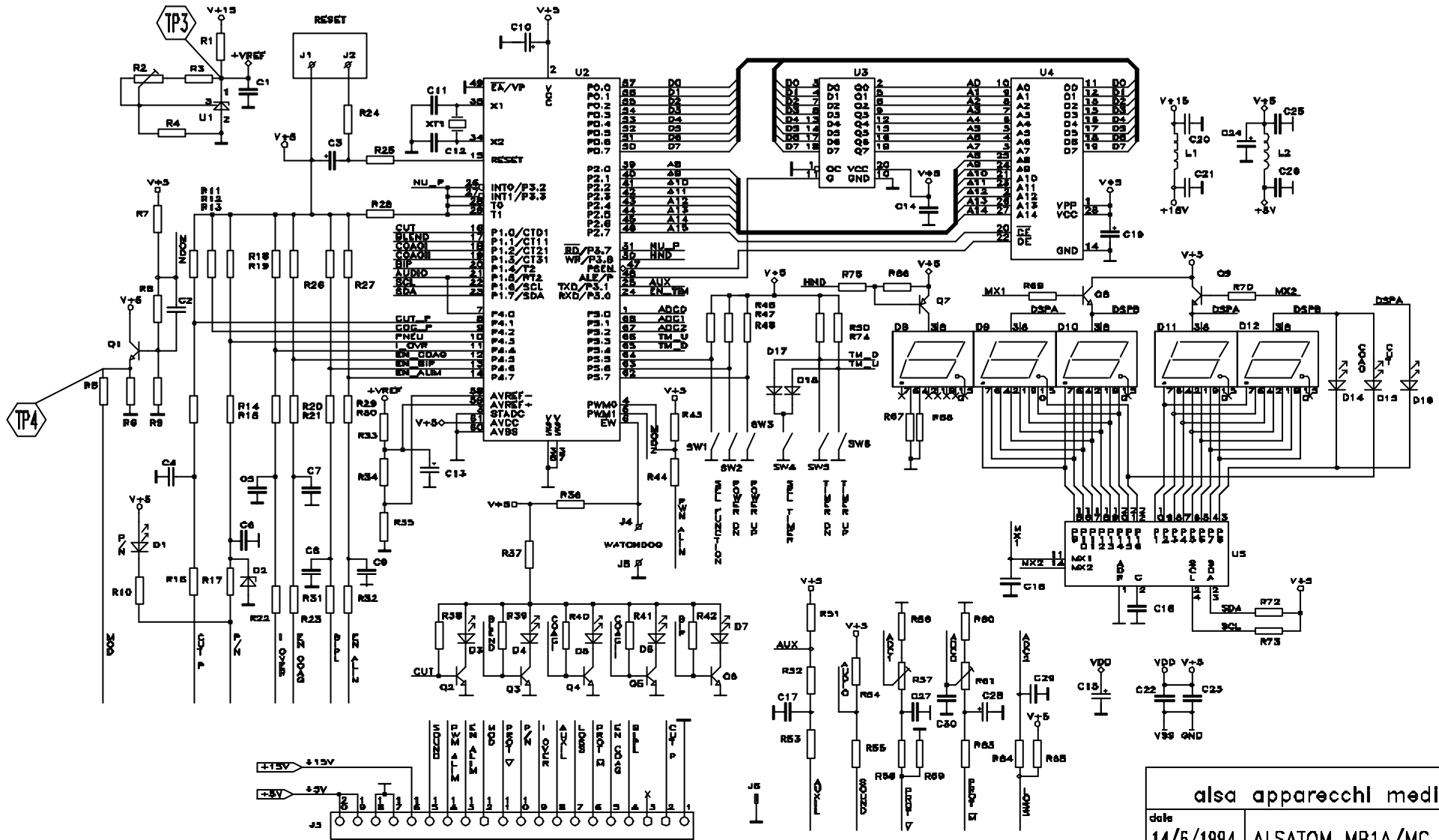
801260/A-MAIN BOARD

Reference Part	Description	Cod. alsa	
R1	330	Resistenza Strato 1/4 W 5%	430171
R2	330	Resistenza Strato 1/4 W 5%	430171
R3	3K9	Resistenza Strato 1/4 W 5%	430350
R4	10KT	Trimmer Cermet	403066
R5	8K/1%	Resistenza di precisione 1% 0.5W	430469
R6	2KT	Trimmer Cermet	403092
R7	3K/1%	Resistenza di precisione 1% 0.5W	430459
R8	10	Resistenza Strato 1/4 W 5%	430180
R9	12K	Resistenza Strato 1/4 W 5%	430351
R10	330K	Resistenza Strato 1/4 W 5%	430173
R11	10K	Resistenza Strato 1/4 W 5%	430339
R12	150K	Resistenza Strato 1/4 W 5%	430360
R13	220K	Resistenza Strato 1/4 W 5%	430352
R14	100K	Resistenza Strato 1/4 W 5%	430177
R15	1K	Resistenza Strato 1/4 W 5%	430170
R16	27K	Resistenza Strato 1/4 W 5%	430340
R17	10K	Resistenza Strato 1/4 W 5%	430339
R18	100K	Resistenza Strato 1/4 W 5%	430177
R19	1K	Resistenza Strato 1/4 W 5%	430170
R20	100	Resistenza Strato 1/4 W 5%	430336
R21	1K	Resistenza Strato 1/4 W 5%	430170
R22	47K	Resistenza Strato 1/4 W 5%	430218
R23	10	Resistenza Strato 1/4 W 5%	430180
R24	56	Resistenza Strato 1/4 W 5%	430444
R25	1K	Resistenza Strato 1/4 W 5%	430170
R26	56	Resistenza Strato 1/4 W 5%	430444
R27	10	Resistenza Strato 1/4 W 5%	430180
R28	10K	Resistenza Strato 1/4 W 5%	430339
R29	10K	Resistenza Strato 1/4 W 5%	430339
R30	22K	Resistenza Strato 1/4 W 5%	430179
R31	47K	Resistenza Strato 1/4 W 5%	430218
R32	4K7	Resistenza Strato 1/4 W 5%	430167
R33	10K	Resistenza Strato 1/4 W 5%	430339
R34	33K/6W/F	Res. 33 Kohm 6W a filo assiale	430463
R35	1K	Resistenza Strato 1/4 W 5%	430170
R36	100K	Resistenza Strato 1/4 W 5%	430177
R37	5K6	Resistenza Strato 1/4 W 5%	430344
R38	10K/1W	Resistenza Strato 1 W	430320
R39	10K/1W	Resistenza Strato 1 W	430320
R40	1K8	Resistenza Strato 1/4 W 5%	430198
R41	100	Resistenza Strato 1/4 W 5%	430336
R42	1K8	Resistenza Strato 1/4 W 5%	430198
R43	1K8	Resistenza Strato 1/4 W 5%	430198
R44	220	Resistenza Strato 1/4 W 5%	430358
R45	1K8	Resistenza Strato 1/4 W 5%	430198
R46	22K	Resistenza Strato 1/4 W 5%	430179
R47	15K	Resistenza Strato 1/4 W 5%	430345
R48	10K	Resistenza Strato 1/4 W 5%	430339
R49	10	Resistenza Strato 1/4 W 5%	430180
R50	10KT	Trimmer Cermet	403066
R51	10K	Resistenza Strato 1/4 W 5%	430339
R52	4K7	Resistenza Strato 1/4 W 5%	430167
R53	47	Resistenza Strato 1/4 W 5%	430334
R54	220	Resistenza Strato 1/4 W 5%	430358
R55	10K	Resistenza Strato 1/4 W 5%	430339
R56	100	Resistenza Strato 1/4 W 5%	430336
R57	1K8	Resistenza Strato 1/4 W 5%	430198
R58	220K	Resistenza Strato 1/4 W 5%	430352
R59	200KT	Trimmer Cermet	403104
R60	33K	Resistenza Strato 1/4 W 5%	430172
R61	27K	Resistenza Strato 1/4 W 5%	430340
R62	1K	Resistenza Strato 1/4 W 5%	430170
R63	560	Resistenza Strato 1/4 W 5%	430178
R64	56K	Resistenza Strato 1/4 W 5%	430176
R65	27K	Resistenza Strato 1/4 W 5%	430340
R66	560	Resistenza Strato 1/4 W 5%	430178
R67	27K	Resistenza Strato 1/4 W 5%	430340
R68	27K	Resistenza Strato 1/4 W 5%	430340
R69	10K	Resistenza Strato 1/4 W 5%	430339
R70	22	Resistenza Strato 1/4 W 5%	430447
R71	22	Resistenza Strato 1/4 W 5%	430447
R72	10	Resistenza Strato 1/4 W 5%	430180
R73	100K	Resistenza Strato 1/4 W 5%	430177
R74	10K	Resistenza Strato 1/4 W 5%	430339
R75	1K	Resistenza Strato 1/4 W 5%	430170
R76	2K2	Resistenza Strato 1/4 W 5%	430343
R77	12	Resistenza Strato 1/4 W 5%	430415
R78	12	Resistenza Strato 1/4 W 5%	430415
R79	1K	Resistenza Strato 1/4 W 5%	430170
R80	1K/3W/A	Res. Antinduttiva 3W assiale	430450
R81	1K/3W/A	Res. Antinduttiva 3W assiale	430450
R82	1K/3W/A	Res. Antinduttiva 3W assiale	430450
R83	1K	Resistenza Strato 1/4 W 5%	430170
R84	1K/3W/A	Res. Antinduttiva 3W assiale	430450
R85	1K/3W/A	Res. Antinduttiva 3W assiale	430450
R86	1K/3W/A	Res. Antinduttiva 3W assiale	430450
R87	5KT	Trimmer Cermet	403052

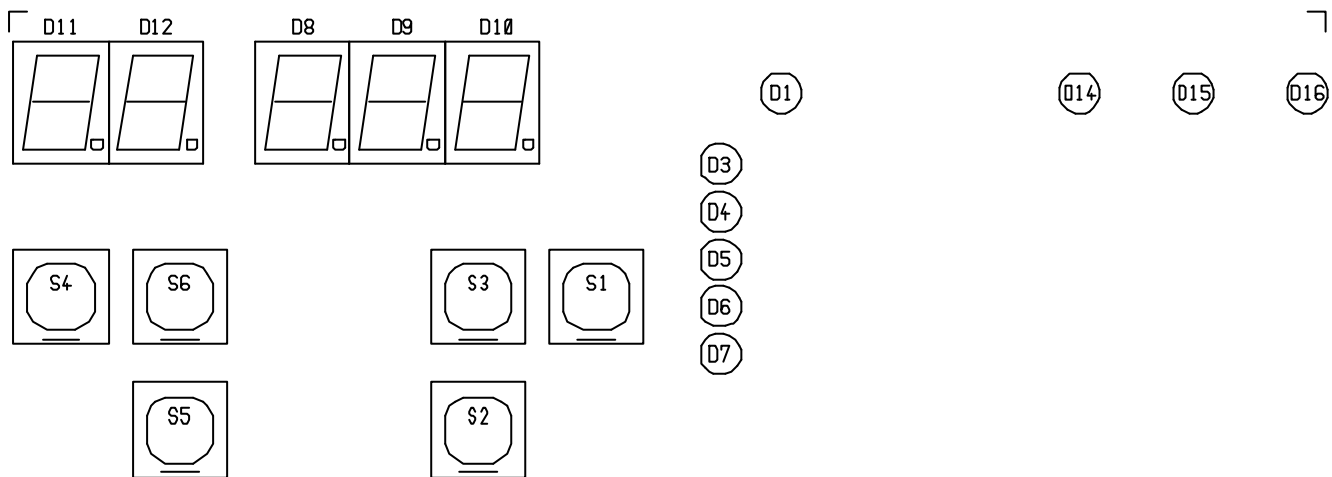
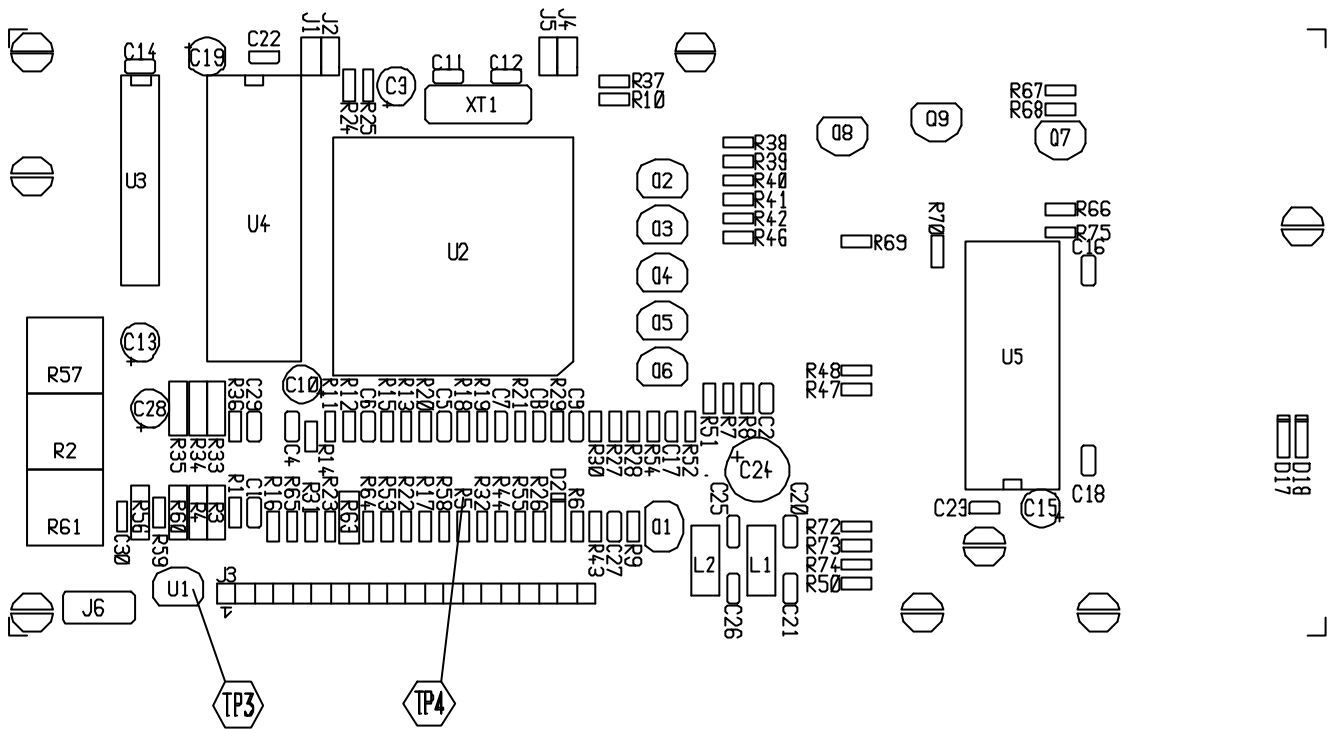
Reference Part	Description	Cod. alsa
R88	1K Resistenza Strato 1/4 W 5%	430170
R89	100 Resistenza Strato 1/4 W 5%	430336
R90	470 Resistenza Strato 1/4 W 5%	430169
R91	470 Resistenza Strato 1/4 W 5%	430169
R92	4K7 Resistenza Strato 1/4 W 5%	430167
R93	47K Resistenza Strato 1/4 W 5%	430218
R94	10K Resistenza Strato 1/4 W 5%	430339
R95	10K Resistenza Strato 1/4 W 5%	430339
R96	100 Resistenza Strato 1/4 W 5%	430336
R97	2K2 Resistenza Strato 1/4 W 5%	430343
R98	470 Resistenza Strato 1/4 W 5%	430169
R99	22K Resistenza Strato 1/4 W 5%	430179
R100	2K/1% Resistenza di precisione 1% 0.5W	430461
R101	11K/1% Resistenza di precisione 1% 0.5W	430467
R102	11K/1% Resistenza di precisione 1% 0.5W	430467
R103	11K/1% Resistenza di precisione 1% 0.5W	430467
R104	33K2/1% Resistenza di precisione 1% 0.5W	430472
R105	10K/5W Resistenza Antind. 5 W	430471
R106	10K/5W Resistenza Antind. 5 W	430471
R107	10K/5W Resistenza Antind. 5 W	430471
R108	47 Resistenza Strato 1/4 W 5%	430334
R109	4K7 Resistenza Strato 1/4 W 5%	430167
R110	10K Resistenza Strato 1/4 W 5%	430339
R111	2K2 Resistenza Strato 1/4 W 5%	430343
R112	2K2 Resistenza Strato 1/4 W 5%	430343
R113	12 Resistenza Strato 1/4 W 5%	430415
R114	4K7 Resistenza Strato 1/4 W 5%	430167
R115	470 Resistenza Strato 1/4 W 5%	430169
R116	5KT Trimmer Cermet	403052
R117	100 Resistenza Strato 1/4 W 5%	430336
R118	1K Resistenza Strato 1/4 W 5%	430170
R119	220 Resistenza Strato 1/4 W 5%	430358
R120	220 Resistenza Strato 1/4 W 5%	430358
R121	22K Resistenza Strato 1/4 W 5%	430179
R122	33K Resistenza Strato 1/4 W 5%	430172
R123	100 Resistenza Strato 1/4 W 5%	430336
R124	680 Resistenza Strato 1/4 W 5%	430194
R125	180 Resistenza Strato 1/4 W 5%	430342
R126	10 Resistenza Strato 1/4 W 5%	430180
R127	470 Resistenza Strato 1/4 W 5%	430169
R128	1K5 Resistenza Strato 1/4 W 5%	430199
R129	560 Resistenza Strato 1/4 W 5%	430178
R130	820 Resistenza Strato 1/4 W 5%	430200
R131	18K Resistenza Strato 1/4 W 5%	430346
R132	10M Resistenza Strato 1/4 W 5%	430431
R133	100K Resistenza Strato 1/4 W 5%	430177
R134	2K2 Resistenza Strato 1/4 W 5%	430343
R135	1M Resistenza Strato 1/4 W 5%	430331
R136	100 Resistenza Strato 1/4 W 5%	430336
C1	10u/T/35V Cond.Tantalio	400134
C2	1n/P Cond.Poliestere	400278
C3	100n Cond.Ceramico multistrato	400139
C4	100n Cond.Ceramico multistrato	400139
C5	100p/NPO Cond.Ceramico NPO	400260
C6	220P/C Cond.Ceramico disco	400240
C7	10u/T/35V Cond.Tantalio	400134
C8	1u/T/35V Cond.Tantalio	400173
C9	22p/C Cond.Ceramico disco	400290
C10	10u/T/35V Cond.Tantalio	400134
C11	100n Cond.Ceramico multistrato	400139
C12	10n/C/1KV Cond.Ceramico disco	400133
C13	470u/E/250V Cond. Elettrolitico Verticale	400304
C14	1000u/E/35V Cond.Elettrolitico	400256
C15	10u/T/35V Cond.Tantalio	400134
C16	10u/T/35V Cond.Tantalio	400134
C17	1000u/E/35V Cond.Elettrolitico	400256
C18	10u/T/35V Cond.Tantalio	400134
C19	10u/T/35V Cond.Tantalio	400134
C20	680p/C/500V Cond.Ceramico	400292
C21	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C22	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C23	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C24	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C25	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C26	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C27	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C28	22u/E/100V/V Cond. Elett. verticale SMPS	400286
C29	100n Cond.Ceramico multistrato	400139
C30	470p/C Cond.Ceramico disco	400242
C31	100p/NPO Cond.Ceramico NPO	400260
C32	220P/C Cond.Ceramico disco	400240
C33	12p/C Cond.Ceramico disco	400269
C34	7 100p Compensatore 7/100p	400289
C35	10u/T/35V Cond.Tantalio	400134
C36	100p/NPO Cond.Ceramico NPO	400260
C37	100n Cond.Ceramico multistrato	400139
C38	68n Cond.Ceramico multistrato	400273
C39	10n Cond.Ceramico multistrato	400251

Reference Part	Description	Cod. alsa	
C40	22u/E/35V	Cond. Elettrolitico verticale	400237
C41	100n	Cond.Ceramico multistrato	400139
C42	47p/NPO	Cond.Ceramico NPO	400255
C43	100p/NPO	Cond.Ceramico NPO	400260
C44	220p/PP/400V/A	Cond.Polipropilene assiale	400280
C45	10u/T/35V	Cond.Tantalio	400134
C46	10u/T/35V	Cond.Tantalio	400134
C47	100n	Cond.Ceramico multistrato	400139
C48	220n/P	Cond.Poliestere metallizzato	400271
C49	10u/T/35V	Cond.Tantalio	400134
C50	100n	Cond.Ceramico multistrato	400139
C51	100n	Cond.Ceramico multistrato	400139
C52	10n	Cond.Ceramico multistrato	400251
C53	1u/T/35V	Cond.Tantalio	400173
C54	100n	Cond.Ceramico multistrato	400139
C55	10n/C/1KV	Cond.Ceramico disco	400133
C56	10n/C/1KV	Cond.Ceramico disco	400133
C57	2n2/C/3KV	Cond.Ceramico disco	400223
C58	2n2/C/3KV	Cond.Ceramico disco	400223
C59	220n/PP/400V	Cond. Polipropilene Siemens	400297
C60	1n/P	Cond.Poliestere	400278
C61	10n	Cond.Ceramico multistrato	400251
C62	1n/C/3KV	Cond.Ceramico disco	400224
C63	1n/C/3KV	Cond.Ceramico disco	400224
C64	1n/C/3KV	Cond.Ceramico disco	400224
C65	1n/C/3KV	Cond.Ceramico disco	400224
C67	47p/C/6KV	Cond. Ceramico disco HT	400301
C68	47p/C/6KV	Cond. Ceramico disco HT	400301
C69	680p/C/500V	Cond.Ceramico	400292
C70	680p/C/500V	Cond.Ceramico	400292
C71	100n	Cond.Ceramico multistrato	400139
C72	220n/P	Cond.Poliestere metallizzato	400271
C73	220n/P	Cond.Poliestere metallizzato	400271
C74	10n	Cond.Ceramico multistrato	400251
C75	1u/T/35V	Cond.Tantalio	400173
C76	1n/P	Cond.Poliestere	400278
C77	100n	Cond.Ceramico multistrato	400139
C78	100n	Cond.Ceramico multistrato	400139
C79	2n2/C	Cond.Ceramico disco	400261
C80	220n/P	Cond.Poliestere metallizzato	400271
C81	100n	Cond.Ceramico multistrato	400139
C82	100n	Cond.Ceramico multistrato	400139
C83	100n	Cond.Ceramico multistrato	400139
C84	100n	Cond.Ceramico multistrato	400139
C85	100n	Cond.Ceramico multistrato	400139
C86	10u/T/35V	Cond.Tantalio	400134
C87	2n2/C/3KV	Cond.Ceramico disco	400223
C88	2n2/C/3KV	Cond.Ceramico disco	400223
D1	KBL06	Ponte Raddrizzatore 4A/600V	420069
D2	WL04	Ponte Raddrizzatore 1A	420013
D3	WL04	Ponte Raddrizzatore 1A	420013
D4	12V/1W	Diode Zener 12V/1W	420019
D5	12V/1W	Diode Zener 12V/1W	420019
D6	12V/1W	Diode Zener 12V/1W	420019
D7	12V/1W	Diode Zener 12V/1W	420019
D8	2V7/0.5W	Diode Zener 2V7-1/2W	420067
D9	BYT03/400	Diode Ultra Fast 3A/400V	420071
D10	BAT83	Diode Schottky	420070
D11	1N4148	Diode	420010
D12	150V/5W	Diode Zener 150V/5W	420091
D13	11DQ06	Diode Schottky	420054
D14	12V/1W	Diode Zener 12V/1W	420019
D15	11DQ06	Diode Schottky	420054
D16	150V/5W	Diode Zener 150V/5W	420091
D17	12V/1W	Diode Zener 12V/1W	420019
D18	BAT83	Diode Schottky	420070
D19	10V/0.5W	Diode Zener 10V-1/2W	420068
D20	BYT03/400	Diode Ultra Fast 3A/400V	420071
D21	BYT03/400	Diode Ultra Fast 3A/400V	420071
D22	11DQ06	Diode Schottky	420054
D23	11DQ06	Diode Schottky	420054
D24	11DQ06	Diode Schottky	420054
D25	11DQ06	Diode Schottky	420054
D26	1N4007	Diode	420001
D27	11DQ06	Diode Schottky	420054
D28	1N4148	Diode	420010
D29	1N4148	Diode	420010
D30	11DQ06	Diode Schottky	420054
D31	10V/0.5W	Diode Zener 10V-1/2W	420068
D32	2V7/0.5W	Diode Zener 2V7-1/2W	420067
D33	1N4148	Diode	420010
Q1	VN10KM	Mosfet N	427054
Q2	IRF740	Mosfet N	427076
Q3	IRF740	Mosfet N	427076
Q4	BC237B	Transistor NPN	427057
Q5	BC237B	Transistor NPN	427057
Q6	VN10KM	Mosfet N	427054
Q7	IRF740	Mosfet N	427076

Reference Part	Description	Cod. alsa
Q8	IRF740	Mosfet N 427076
Q9	BC237B	Transistor NPN 427057
Q10	VN10KM	Mosfet N 427054
Q11	BC237B	Transistor NPN 427057
Q12	VN10KM	Mosfet N 427054
Q13	VN10KM	Mosfet N 427054
L1	520uH	Induttanza toroidale cod. 700 713623
L2	150uH/175mA	Induttanza 422008
L3	713621	Ind. AMIDON T94-2 713621
L4	1mH/100mA	Induttanza 422005
L5	1mH/100mA	Induttanza 422005
U1	LM431	Regolatore 482078
U2	UC3525	PWM UC3525 482060
U3	LM78S15	Regolatore di tensione POS. +15V 482086
U4	LM7805	Regolatore LM7805 482003
U5	LM386	Amplificatore BF LM386 482056
U6	74HCT00	HCT 7400 482049
U7	UC3825	PWM UC3825 482064
U8	4093	CMOS CD4093 482025
U9	SFH600-2	Fotoaccoppiatore SFH600-2 482022
XT1	1MHZ/C	Risuonatore ceramico 252002
RL1	40.52-12VDC	Rele' OMRON 404040
RL2	40.52-12VDC	Rele' OMRON 404040
T1	421026	Trasf. di impulsi (2 secondari) SIRIO 421026
T2	713337	Trasformatore di corrente A.F. 713337
T3	801263/A	Trasf. uscita MB1/MC MB1A/MC 801263/A
T5	713708	Lettore di corrente (T68-2) 713708
T6	421025	Trasf. isolatore 10KV SIRIO 421025
F1	1A/T	Fusibile 1 A T 5x20 mm 433009
F2	1A/T	Fusibile 1 A T 5x20 mm 433009
F3	2A/T	Fusibile 2 A T 5x20 mm 433001
J1	399028	Conn. Faston C.S. Dritto 399028
J2	399028	Conn. Faston C.S. Dritto 399028
J3	399028	Conn. Faston C.S. Dritto 399028
J4	399028	Conn. Faston C.S. Dritto 399028
J5	399028	Conn. Faston C.S. Dritto 399028
J6	399028	Conn. Faston C.S. Dritto 399028
J7	399028	Conn. Faston C.S. Dritto 399028
J8	399028	Conn. Faston C.S. Dritto 399028
J9	399028	Conn. Faston C.S. Dritto 399028
J10	399028	Conn. Faston C.S. Dritto 399028
J11	399028	Conn. Faston C.S. Dritto 399028
J12	strip_10p	Strip 10 pin 446015/10
Jal2	strip_10p	Strip 10 pin 446015/10
J13	399029	Conn. Faston C.S. 90 gradi 399029
J14	399029	Conn. Faston C.S. 90 gradi 399029
J15	399028	Conn. Faston C.S. Dritto 399028
LP1	449125	Altoparlante 8 ohm 0.25 W 449125
AL1	ML73_2	Dissipatore in alluminio 713249
AL2	ML73_2	Dissipatore in alluminio 713249
AL3	ML73_2	Dissipatore in alluminio 713249
AL4	ML73_2	Dissipatore in alluminio 713249
AL5	ML73_2	Dissipatore in alluminio 713249



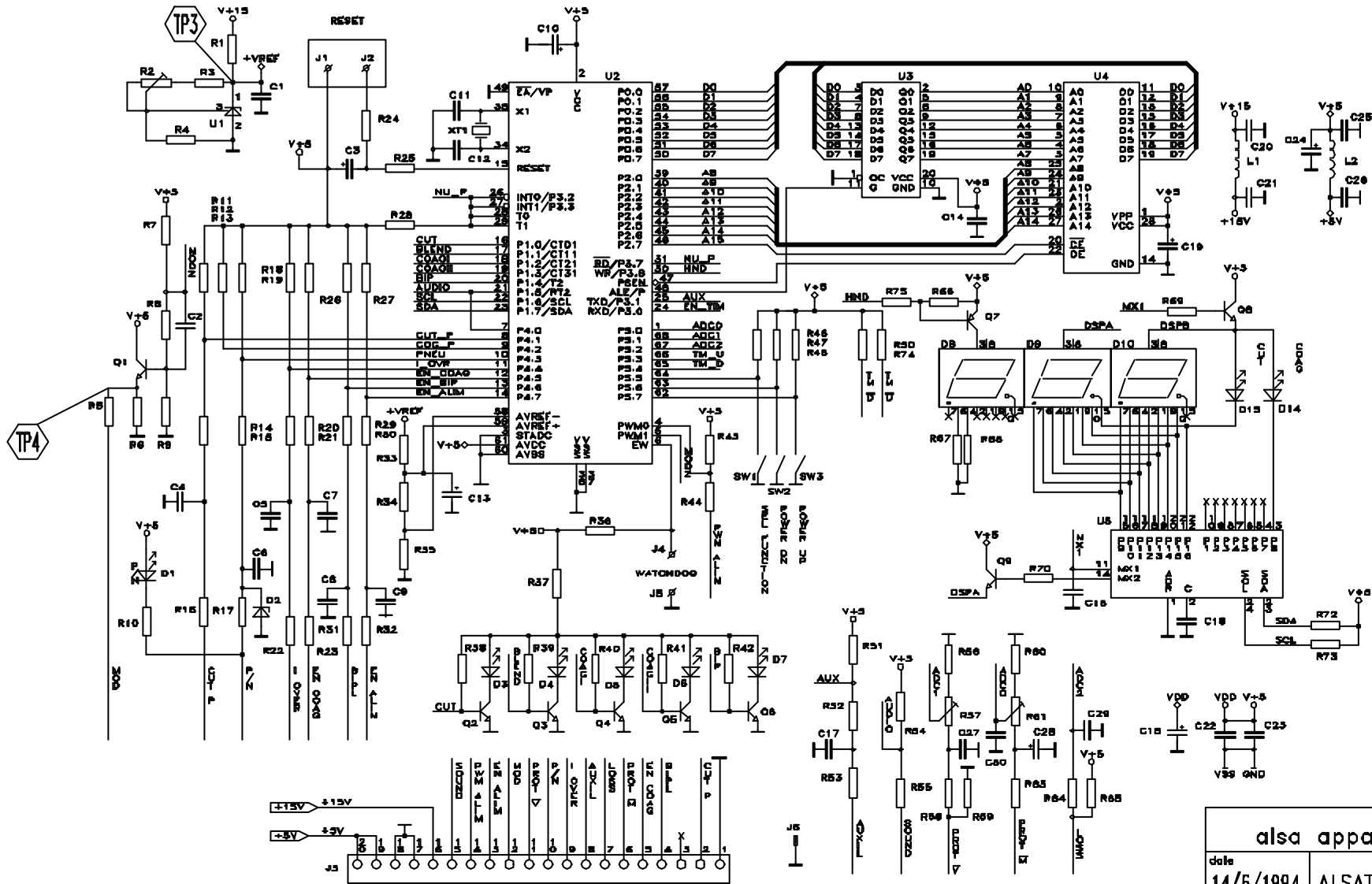
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801261 - MICROCONTROLLER SECTION		



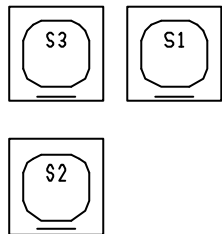
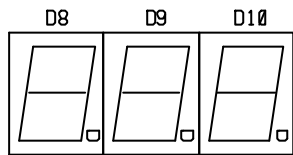
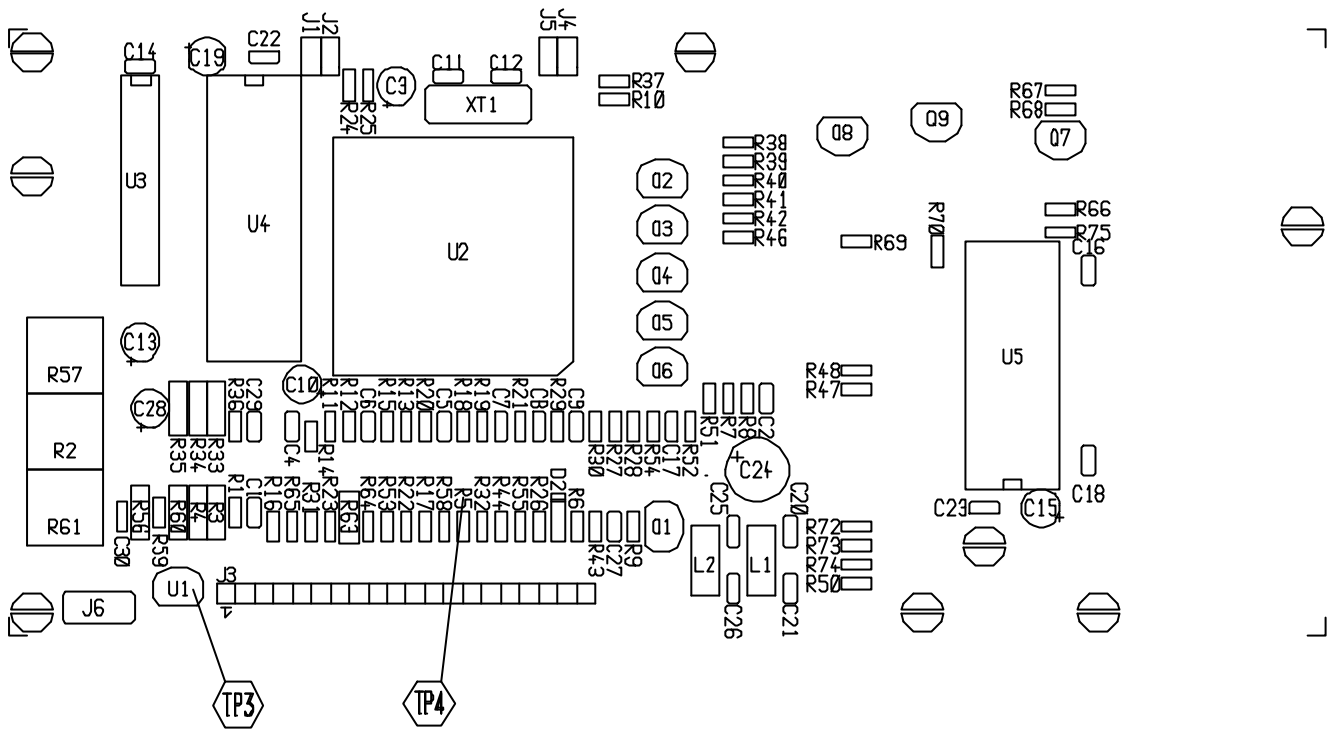
alsa apparecchi medicali s.r.l		
date	ALSATOM MB1A/MC MB1/MC	rev.
14/6/1994		4A
801261 - MICROCONTROLLER SECTION		

Reference Part	Description	Cod. also	
R1	560	Resistenza Strato 1/4 W 5%	430178
R2	5KT	Trimmer Cermet	403052
R3	1K/1%	Resistenza di precisione 1% 0.5W	430458
R4	3K/1%	Resistenza di precisione 1% 0.5W	430459
R5	100	Resistenza Strato 1/4 W 5%	430336
R6	1K	Resistenza Strato 1/4 W 5%	430170
R7	10K	Resistenza Strato 1/4 W 5%	430339
R8	1K8	Resistenza Strato 1/4 W 5%	430198
R9	22K	Resistenza Strato 1/4 W 5%	430179
R10	560	Resistenza Strato 1/4 W 5%	430178
R11	10K	Resistenza Strato 1/4 W 5%	430339
R12	10K	Resistenza Strato 1/4 W 5%	430339
R13	10K	Resistenza Strato 1/4 W 5%	430339
R14	100	Resistenza Strato 1/4 W 5%	430336
R15	100	Resistenza Strato 1/4 W 5%	430336
R16	100	Resistenza Strato 1/4 W 5%	430336
R17	100	Resistenza Strato 1/4 W 5%	430336
R18	10K	Resistenza Strato 1/4 W 5%	430339
R19	10K	Resistenza Strato 1/4 W 5%	430339
R20	1K	Resistenza Strato 1/4 W 5%	430170
R21	1K	Resistenza Strato 1/4 W 5%	430170
R22	100	Resistenza Strato 1/4 W 5%	430336
R23	100	Resistenza Strato 1/4 W 5%	430336
R24	1K	Resistenza Strato 1/4 W 5%	430170
R25	100	Resistenza Strato 1/4 W 5%	430336
R26	10K	Resistenza Strato 1/4 W 5%	430339
R27	10K	Resistenza Strato 1/4 W 5%	430339
R28	10K	Resistenza Strato 1/4 W 5%	430339
R29	1K	Resistenza Strato 1/4 W 5%	430170
R30	1K	Resistenza Strato 1/4 W 5%	430170
R31	100	Resistenza Strato 1/4 W 5%	430336
R32	100	Resistenza Strato 1/4 W 5%	430336
R33	80/1%	Resistenza di precisione 1% 0.5W	430460
R34	3K/1%	Resistenza di precisione 1% 0.5W	430459
R35	80/1%	Resistenza di precisione 1% 0.5W	430460
R36	10K	Resistenza Strato 1/4 W 5%	430339
R37	560	Resistenza Strato 1/4 W 5%	430178
R38	22K	Resistenza Strato 1/4 W 5%	430179
R39	22K	Resistenza Strato 1/4 W 5%	430179
R40	22K	Resistenza Strato 1/4 W 5%	430179
R41	22K	Resistenza Strato 1/4 W 5%	430179
R42	22K	Resistenza Strato 1/4 W 5%	430179
R43	10K	Resistenza Strato 1/4 W 5%	430339
R44	1K	Resistenza Strato 1/4 W 5%	430170
R46	10K	Resistenza Strato 1/4 W 5%	430339
R47	10K	Resistenza Strato 1/4 W 5%	430339
R48	10K	Resistenza Strato 1/4 W 5%	430339
R50	10K	Resistenza Strato 1/4 W 5%	430339
R51	10K	Resistenza Strato 1/4 W 5%	430339
R52	1K	Resistenza Strato 1/4 W 5%	430170
R53	100	Resistenza Strato 1/4 W 5%	430336
R54	10K	Resistenza Strato 1/4 W 5%	430339
R55	100	Resistenza Strato 1/4 W 5%	430336
R56	1K/1%	Resistenza di precisione 1% 0.5W	430458
R57	5KT	Trimmer Cermet	403052
R58	1K	Resistenza Strato 1/4 W 5%	430170
R59	10K	Resistenza Strato 1/4 W 5%	430339
R60	1K/1%	Resistenza di precisione 1% 0.5W	430458
R61	20KT	Trimmer Cermet	403050
R63	1K/1%	Resistenza di precisione 1% 0.5W	430458
R64	1K	Resistenza Strato 1/4 W 5%	430170
R65	NU	NOT USED	-----
R66	22K	Resistenza Strato 1/4 W 5%	430179
R67	470	Resistenza Strato 1/4 W 5%	430169
R68	470	Resistenza Strato 1/4 W 5%	430169
R69	47	Resistenza Strato 1/4 W 5%	430334
R70	47	Resistenza Strato 1/4 W 5%	430334
R72	10K	Resistenza Strato 1/4 W 5%	430339
R73	10K	Resistenza Strato 1/4 W 5%	430339
R74	10K	Resistenza Strato 1/4 W 5%	430339
R75	10K	Resistenza Strato 1/4 W 5%	430339
C1	10n	Cond.Ceramico multistrato	400251
C2	47p/NPO	Cond.Ceramico NPO	400255
C3	10u/T/35V	Cond.Tantalio	400134
C4	100n	Cond.Ceramico multistrato	400139
C5	100n	Cond.Ceramico multistrato	400139
C6	100n	Cond.Ceramico multistrato	400139
C7	100n	Cond.Ceramico multistrato	400139
C8	100n	Cond.Ceramico multistrato	400139
C9	100n	Cond.Ceramico multistrato	400139
C10	10u/T/35V	Cond.Tantalio	400134
C11	22p/C	Cond.Ceramico disco	400290
C12	22p/C	Cond.Ceramico disco	400290
C13	10u/T/35V	Cond.Tantalio	400134
C14	100n	Cond.Ceramico multistrato	400139
C15	10u/T/35V	Cond.Tantalio	400134
C16	1N/C	Cond.Ceramico disco	400252
C17	100n	Cond.Ceramico multistrato	400139

Reference Part	Description	Cod. also
C18	2n2/C	Cond.Ceramico disco 400261
C19	10u/T/35V	Cond.Tantalio 400134
C20	100n	Cond.Ceramico multistrato 400139
C21	100n	Cond.Ceramico multistrato 400139
C22	100n	Cond.Ceramico multistrato 400139
C23	100n	Cond.Ceramico multistrato 400139
C24	47u/E/50V	Cond.Elettrolitico 400296
C25	100n	Cond.Ceramico multistrato 400139
C26	100n	Cond.Ceramico multistrato 400139
C27	10n	Cond.Ceramico multistrato 400251
C28	1u/T/35V	Cond.Tantalio 400173
C29	10n	Cond.Ceramico multistrato 400251
C30	100n	Cond.Ceramico multistrato 400139
D1	GL5HR8	Diodo Led Rosso 5 mm 420025
D2	5V6/0.5W	Diodo Zener 5V6/0.5W 420018
D3	LED_Y3	Led giallo 3mm 420079
D4	LED_Y3	Led giallo 3mm 420079
D5	LED_Y3	Led giallo 3mm 420079
D6	LED_Y3	Led giallo 3mm 420079
D7	LED_Y3	Led giallo 3mm 420079
D8	MAN6760C	Display 7 Segmenti anodo comune 420060
D9	MAN6760C	Display 7 Segmenti anodo comune 420060
D10	MAN6760C	Display 7 Segmenti anodo comune 420060
D11	MAN6760C	Display 7 Segmenti anodo comune 420060
D12	MAN6760C	Display 7 Segmenti anodo comune 420060
D14	GL5HY8	Diodo Led Giallo 5 mm 420036
D15	GL5HB8	Diodo Led Blu 5 mm 420092
D16	NU	NOT USED -----
D17	1N4148	Diodo 420010
D18	1N4148	Diodo 420010
Q1	BC237B	Transistor NPN 427057
Q2	BC237B	Transistor NPN 427057
Q3	BC237B	Transistor NPN 427057
Q4	BC237B	Transistor NPN 427057
Q5	BC237B	Transistor NPN 427057
Q6	BC237B	Transistor NPN 427057
Q7	BC307B	Transistor PNP 427058
Q8	BC237B	Transistor NPN 427057
Q9	BC237B	Transistor NPN 427057
L1	100uH/275mA	Induttanza 422006
L2	6uH8/800mA	Induttanza 422007
U1	LM431	Regolatore 482078
U2	80C552	Microprocessore 482077
U3	74HC373	74HC373 482066
U4	27256	EPROM 256K 482067
U5	SAA1064	Display decoder 482080
XT1	12Mhz/HC18	Quarzo 12 Mhz 252005
SW1	MTG_1241	Pulsante da C.S. SCHURTER 416094
SW2	MTG_1241	Pulsante da C.S. SCHURTER 416094
SW3	MTG_1241	Pulsante da C.S. SCHURTER 416094
SW4	MTG_1241	Pulsante da C.S. SCHURTER 416094
SW5	MTG_1241	Pulsante da C.S. SCHURTER 416094
SW6	MTG_1241	Pulsante da C.S. SCHURTER 416094
J1	PAD_CI	Capocorda realizzato su C.S. -----
J2	PAD_CI	Capocorda realizzato su C.S. -----
J3	JUMP_20P	Jumper 20 poli 384035+384027
J4	PAD_CI	Capocorda realizzato su C.S. -----
J5	PAD_CI	Capocorda realizzato su C.S. -----
J6	399028	Conn. Faston C.S. Dritto 399028



alsia apparecchi medicali s.r.l.		
date	14/6/1994	rev.
	ALSATOM MB1A/MC MB1/MC	4A
801262 - MICROCONTROLLER SECTION		



also apparecchi medicali s.r.l		
date	ALSATOM MB1A/MC MB1/MC	rev.
14/6/1994		4A
801262 - MICROCONTROLLER SECTION		

Reference Part	Description	Cod. also	
R1	560	Resistenza Strato 1/4 W 5%	430178
R2	5KT	Trimmer Cermet	403052
R3	1K/1%	Resistenza di precisione 1% 0.5W	430458
R4	3K/1%	Resistenza di precisione 1% 0.5W	430459
R5	100	Resistenza Strato 1/4 W 5%	430336
R6	1K	Resistenza Strato 1/4 W 5%	430170
R7	10K	Resistenza Strato 1/4 W 5%	430339
R8	1K8	Resistenza Strato 1/4 W 5%	430198
R9	22K	Resistenza Strato 1/4 W 5%	430179
R10	560	Resistenza Strato 1/4 W 5%	430178
R11	10K	Resistenza Strato 1/4 W 5%	430339
R12	10K	Resistenza Strato 1/4 W 5%	430339
R13	10K	Resistenza Strato 1/4 W 5%	430339
R14	100	Resistenza Strato 1/4 W 5%	430336
R15	100	Resistenza Strato 1/4 W 5%	430336
R16	100	Resistenza Strato 1/4 W 5%	430336
R17	100	Resistenza Strato 1/4 W 5%	430336
R18	10K	Resistenza Strato 1/4 W 5%	430339
R19	10K	Resistenza Strato 1/4 W 5%	430339
R20	1K	Resistenza Strato 1/4 W 5%	430170
R21	1K	Resistenza Strato 1/4 W 5%	430170
R22	100	Resistenza Strato 1/4 W 5%	430336
R23	100	Resistenza Strato 1/4 W 5%	430336
R24	1K	Resistenza Strato 1/4 W 5%	430170
R25	100	Resistenza Strato 1/4 W 5%	430336
R26	10K	Resistenza Strato 1/4 W 5%	430339
R27	10K	Resistenza Strato 1/4 W 5%	430339
R28	10K	Resistenza Strato 1/4 W 5%	430339
R29	1K	Resistenza Strato 1/4 W 5%	430170
R30	1K	Resistenza Strato 1/4 W 5%	430170
R31	100	Resistenza Strato 1/4 W 5%	430336
R32	100	Resistenza Strato 1/4 W 5%	430336
R33	80/1%	Resistenza di precisione 1% 0.5W	430460
R34	3K/1%	Resistenza di precisione 1% 0.5W	430459
R35	80/1%	Resistenza di precisione 1% 0.5W	430460
R36	10K	Resistenza Strato 1/4 W 5%	430339
R37	560	Resistenza Strato 1/4 W 5%	430178
R38	22K	Resistenza Strato 1/4 W 5%	430179
R39	22K	Resistenza Strato 1/4 W 5%	430179
R40	22K	Resistenza Strato 1/4 W 5%	430179
R41	22K	Resistenza Strato 1/4 W 5%	430179
R42	22K	Resistenza Strato 1/4 W 5%	430179
R43	10K	Resistenza Strato 1/4 W 5%	430339
R44	1K	Resistenza Strato 1/4 W 5%	430170
R46	10K	Resistenza Strato 1/4 W 5%	430339
R47	10K	Resistenza Strato 1/4 W 5%	430339
R48	10K	Resistenza Strato 1/4 W 5%	430339
R50	10K	Resistenza Strato 1/4 W 5%	430339
R51	10K	Resistenza Strato 1/4 W 5%	430339
R52	1K	Resistenza Strato 1/4 W 5%	430170
R53	100	Resistenza Strato 1/4 W 5%	430336
R54	10K	Resistenza Strato 1/4 W 5%	430339
R55	100	Resistenza Strato 1/4 W 5%	430336
R56	1K/1%	Resistenza di precisione 1% 0.5W	430458
R57	5KT	Trimmer Cermet	403052
R58	1K	Resistenza Strato 1/4 W 5%	430170
R59	10K	Resistenza Strato 1/4 W 5%	430339
R60	1K/1%	Resistenza di precisione 1% 0.5W	430458
R61	20KT	Trimmer Cermet	403050
R63	1K/1%	Resistenza di precisione 1% 0.5W	430458
R64	1K	Resistenza Strato 1/4 W 5%	430170
R65	NU	NOT USED	-----
R66	22K	Resistenza Strato 1/4 W 5%	430179
R67	470	Resistenza Strato 1/4 W 5%	430169
R68	470	Resistenza Strato 1/4 W 5%	430169
R69	47	Resistenza Strato 1/4 W 5%	430334
R70	47	Resistenza Strato 1/4 W 5%	430334
R72	10K	Resistenza Strato 1/4 W 5%	430339
R73	10K	Resistenza Strato 1/4 W 5%	430339
R74	10K	Resistenza Strato 1/4 W 5%	430339
R75	10K	Resistenza Strato 1/4 W 5%	430339
C1	10n	Cond.Ceramico multistrato	400251
C2	47p/NPO	Cond.Ceramico NPO	400255
C3	10u/T/35V	Cond.Tantalio	400134
C4	100n	Cond.Ceramico multistrato	400139
C5	100n	Cond.Ceramico multistrato	400139
C6	100n	Cond.Ceramico multistrato	400139
C7	100n	Cond.Ceramico multistrato	400139
C8	100n	Cond.Ceramico multistrato	400139
C9	100n	Cond.Ceramico multistrato	400139
C10	10u/T/35V	Cond.Tantalio	400134
C11	22p/C	Cond.Ceramico disco	400290
C12	22p/C	Cond.Ceramico disco	400290
C13	10u/T/35V	Cond.Tantalio	400134
C14	100n	Cond.Ceramico multistrato	400139
C15	10u/T/35V	Cond.Tantalio	400134
C16	1N/C	Cond.Ceramico disco	400252
C17	100n	Cond.Ceramico multistrato	400139

Reference Part	Description	Cod. also	
C18	2n2/C	Cond.Ceramico disco	400261
C19	10u/T/35V	Cond.Tantalio	400134
C20	100n	Cond.Ceramico multistrato	400139
C21	100n	Cond.Ceramico multistrato	400139
C22	100n	Cond.Ceramico multistrato	400139
C23	100n	Cond.Ceramico multistrato	400139
C24	47u/E/50V	Cond.Elettrolitico	400296
C25	100n	Cond.Ceramico multistrato	400139
C26	100n	Cond.Ceramico multistrato	400139
C27	10n	Cond.Ceramico multistrato	400251
C28	1u/T/35V	Cond.Tantalio	400173
C29	10n	Cond.Ceramico multistrato	400251
C30	100n	Cond.Ceramico multistrato	400139
D1	GL5HR8	Diodo Led Rosso 5 mm	420025
D2	5V6/0.5W	Diodo Zener 5V6/0.5W	420018
D3	LED_Y3	Led giallo 3mm	420079
D4	LED_Y3	Led giallo 3mm	420079
D5	LED_Y3	Led giallo 3mm	420079
D6	LED_Y3	Led giallo 3mm	420079
D7	LED_Y3	Led giallo 3mm	420079
D8	MAN6760C	Display 7 Segmenti anodo comune	420060
D9	MAN6760C	Display 7 Segmenti anodo comune	420060
D10	MAN6760C	Display 7 Segmenti anodo comune	420060
D14	GL5HY8	Diodo Led Giallo 5 mm	420036
D15	GL5HB8	Diodo Led Blu 5 mm	420092
Q1	BC237B	Transistor NPN	427057
Q2	BC237B	Transistor NPN	427057
Q3	BC237B	Transistor NPN	427057
Q4	BC237B	Transistor NPN	427057
Q5	BC237B	Transistor NPN	427057
Q6	BC237B	Transistor NPN	427057
Q7	BC307B	Transistor PNP	427058
Q8	BC237B	Transistor NPN	427057
Q9	BC237B	Transistor NPN	427057
L1	100uH/275mA	Induttanza	422006
L2	6uH8/800mA	Induttanza	422007
U1	LM431	Regolatore	482078
U2	80C552	Microprocessore	482077
U3	74HC373	74HC373	482066
U4	27256	EPROM 256K	482067
U5	SAA1064	Display decoder	482080
XT1	12Mhz/HC18	Quarzo 12 Mhz	252005
SW1	MTG_1241	Pulsante da C.S. SCHURTER	416094
SW2	MTG_1241	Pulsante da C.S. SCHURTER	416094
SW3	MTG_1241	Pulsante da C.S. SCHURTER	416094
J1	PAD_CI	Capocorda realizzato su C.S.	-----
J2	PAD_CI	Capocorda realizzato su C.S.	-----
J3	JUMP_20P	Jumper 20 poli	384035+384027
J4	PAD_CI	Capocorda realizzato su C.S.	-----
J5	PAD_CI	Capocorda realizzato su C.S.	-----
J6	399028	Conn. Faston C.S. Dritto	399028