

Serviceanleitung

Service Manual

Netzgeräte

Power Supplies

TOE 8721-1

TOE 8722

TOELLNER ELECTRONIC INSTRUMENTE GMBH

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WARNUNG!

Beim Betrieb elektrischer Geräte stehen zwangsläufig bestimmte Teile dieser Geräte unter gefährlicher Spannung. Nur entsprechend qualifiziertes Personal darf an diesen Geräten Service- und Abgleicharbeiten durchführen. Dieses Personal muß gründlich mit der Bedienung der Netzgeräte und mit allen Warnungen der Betriebsanleitung vertraut sein und insbesondere bei den Service- und Abgleichtätigkeiten am geöffneten Gerät mit äußerster Vorsicht vorgehen. Bei Nichtbeachten dieser Warnhinweise können ansonsten schwere Körperverletzungen oder Sachschäden auftreten.

Qualifiziertes Personal im Sinne dieser Serviceanleitung sind Personen, die mit Aufstellung, Inbetriebsetzung und Betrieb der Geräte vertraut sind und über die ihrer Tätigkeit entsprechenden Qualifikationen verfügen.

WARNING!

The operation of electrical equipment inevitably means that some parts of the equipment are subject to dangerous voltage levels. Only suitably qualified personnel should carry out servicing and trimming work on electrical equipment. These persons must be thoroughly familiar with the operation of the power supplies and with all warnings in the operation manual and must observe particular caution when carrying out servicing and trimming work. Failure to observe these warning notices may result in severe personal injury or material damage.

Qualified personnel in this service manual means people familiar with the installation, commissioning and operation of the devices and having the appropriate qualifications for these activities.

Abgleichanleitung

Zum Abgleich erforderliche Geräte:

Oszilloskop	z.B. PM 3065 Philips
Digitalvoltmeter	z.B. 8840A Fluke
Präzisionsshunt	z.B. 100 mΩ Tol. 0,02 % Burster Typ 1281-0,1
Digitalamperemeter	z.B. Digitalvoltmeter in Verbindung mit Shunt
Draht-Schiebewiderstand	mit: $R \geq U_{\max} / I_{\max}$

Achtung!

Vor dem Öffnen des Gerätes Netzstecker ziehen!

Zum Öffnen des Netzgerätes müssen die zwei seitlich angebrachten Zierschrauben in der Deckelhalbschale entfernt werden. Quelle I befindet sich von der Gerätefront aus gesehen links, die zugehörigen Trimmer ebenfalls links. Quelle II und deren Abgleichelemente befinden sich rechts.

Vor dem eigentlichen Abgleich muß das Gerät mindestens 30 Minuten in Betrieb gewesen sein!

Die vorgegebene Abgleichreihenfolge ist unbedingt einzuhalten.

1. Quelle I

Digitalvoltmeter an Ausgang I anschließen. Die Potentiometer *VOLTAGE I* und *CURRENT I* auf Rechtsanschlag drehen. Quelle I arbeitet im Spannungsbetrieb, LED *CC I* leuchtet nicht. Mit R 242 die Ausgangsspannung auf 101 % U_{Nenn} (18,18 V/ 36,36 V) abgleichen.

Reihenschaltung aus Digitalamperemeter und Lastwiderstand an Ausgang I anschließen und Widerstandswert von $\approx U_{\max} / I_{\max}$ einstellen. Die beiden Potentiometer *VOLTAGE I* und *CURRENT I* auf Rechtsanschlag drehen. Lastwiderstand verkleinern bis der Ausgang in den Konstantstrommodus wechselt. LED *CC I* leuchtet! Mit R 234 den Ausgangsstrom auf 101 % I_{Nenn} (2,02 A/ 1,01 A) abgleichen. Werden 101 % I_{Nenn} nicht erreicht, ist der Lastwiderstand weiter zu verkleinern.

2. Quelle II

2.1 Quelle II (TOE 8722-1/-2)

Da die Quellen I und II der Netzgeräte TOE 8722-1 und TOE 8722-2 die gleichen Ausgangsgrößen besitzen, erfolgt der Abgleich von Quelle II in gleicher Art und Weise wie der von Quelle I. Die Quellen I und II sind außerdem identisch aufgebaut, so daß auch die Abgleichtrimmer die gleichen Bezeichnungen tragen.

Adjustment Instructions

Equipment required for calibration:

Oscilloscope:	e.g. PM 3065 Philips
Digital voltmeter:	e.g. 8840A Fluke
Precision shunt:	e.g. 100 mΩ, tol. 0.02 % Burster type 1281-0.1
Digital ammeter:	e.g. Digital voltmeter connected with shunt
Wire slide-resistor	with $R \geq V_{\max} / I_{\max}$

Warning!

Remove power plug before opening the device!

To open the power supply unit, the two fastening screws at either side of the lid half must first be removed. Seen from the front of the device, source I is located on the left together with its associated trimmers. Source II and its trimming components are on the right.

Before starting actual adjustment, the device must have been in operation for at least 30 minutes!

The specified sequence of adjustments must be strictly followed.

1. Source I

Connect the digital voltmeter to output I. Turn the potentiometers *VOLTAGE I* and *CURRENT I* against right-hand stops. Source I will then be operating in voltage mode, and the *CC I* LED does not light up. Using R 242, set the output voltage to 101 % V_{Nom} (18.18 V/ 36.36 V).

Connect the series circuit consisting of the digital ammeter and load resistor to output I. Set the resistance to $\approx V_{\max} / I_{\max}$. Turn the potentiometers *VOLTAGE I* and *CURRENT I* against right-hand stops, and reduce load resistance as far as the output is in current mode. The *CC I* LED will be lit! Using R 234, trim the output current to 101 % I_{Nom} (2.02 A/ 1.01 A). If an adjustment of 101 % I_{Nom} is not possible reduce the load resistance once more.

2. Source II

2.1 Source II (TOE 8722-1/-2)

Because sources I and II of the power supplies TOE 8722-1 and TOE 8722-2 have the same output parameters adjust source II in the same manner as source I. Sources I and II are of identical construction therefore the trimming resistors have the same designation.

2.2 Quelle II (TOE 8722-3)

Digitalvoltmeter an Ausgang II anschließen. Die Potentiometer *VOLTAGE II* und *CURRENT II* auf Rechtsanschlag drehen. Quelle II arbeitet im Spannungsbetrieb, LED *CC II* leuchtet nicht. Mit R 305 die Ausgangsspannung auf 101 % U_{Nenn} (7,07 V) abgleichen.

Reihenschaltung aus Digitalamperemeter und Lastwiderstand an Ausgang II anschließen und Widerstandswert von $\approx U_{max} / I_{max}$ einstellen. Die Potentiometer *VOLTAGE II* und *CURRENT II* auf Rechtsanschlag drehen. Lastwiderstand verkleinern bis der Ausgang in den Konstantstrommodus wechselt. LED *CC II* leuchtet! Mit R 318 den Ausgangsstrom auf 101 % I_{Nenn} (2,02 A) abgleichen. Werden 101 % I_{Nenn} nicht erreicht, ist der Lastwiderstand weiter zu verkleinern.

3. Digitalinstrumente

3.1 Digitalinstrument Quelle I (TOE 8722)

Der Abgleichpunkt 1. muß bereits durchgeführt worden sein!

Schalter *V/A I* auf Position "A" stellen. Digitalampere-meter an Ausgang I anschließen. Die beiden Potentiometer *VOLTAGE I* und *CURRENT I* auf Rechtsanschlag drehen. Mit R 200 das Display I auf den Meßwert des Amperemeters abgleichen.

Schalter *V/A I* auf Position "V" stellen. Digitalvoltmeter an Ausgang I anschließen. Die beiden Potentiometer *VOLTAGE I* und *CURRENT I* auf Rechtsanschlag drehen. Mit R 203 Display I auf den Meßwert des Digitalvoltmeters abgleichen.

3.2 Digitalinstrument Quelle II (TOE 8722)

Der Abgleichpunkt 2.1 oder 2.2 muß bereits durchgeführt worden sein!

Der Abgleich erfolgt in gleicher Art und Weise wie unter Punkt 3.1. Die Abgleichtrimmer tragen jedoch nicht die gleichen Bezeichnungen. Der Abgleich des Amperemeters Quelle II erfolgt mit R 238, der des Voltmeters mit R 241.

2.2 Source II (TOE 8722-3)

Connect the digital voltmeter to output II. Turn the potentiometers *VOLTAGE II* and *CURRENT II* against right-hand stops. Source II will then be operating in voltage mode, and the *CC II* LED does not light up. Using R 305, set the output voltage to 101 % V_{Nom} (7.07 V).

Connect the series circuit consisting of the digital ammeter and load resistor to output II. Set the resistance to $\approx V_{max} / I_{max}$. Turn the potentiometers *VOLTAGE II* and *CURRENT II* against right-hand stops, and reduce load resistance as far as the output is in current mode. The *CC II* LED will be lit! Using R 318, trim the output current to 101 % I_{Nom} (2.02 A). If an adjustment of 101 % I_{Nom} is not possible reduce the load resistance once more.

3. Digital Instruments

3.1 Digital Instrument of Source I (TOE 8722)

First, make sure that trimming step 1. has been performed!

Put the *V/A I* switch to position "A". Connect the digital ammeter to output I. Turn the both potentiometers *VOLTAGE I* and *CURRENT I* against right-hand stops. Using R 200, trim display I to the measured value of the ammeter.

Put the *V/A I* switch to position "V". Connect the digital voltmeter to output I. Turn the both potentiometers *VOLTAGE I* and *CURRENT I* against right-hand stops. Using R 203, trim display I to the measured value of the digital voltmeter.

3.2 Digital Instrument of Source II (TOE 8722)

First, make sure that trimming step 2.1 or 2.2 has been performed!

The adjustment is to do in the same manner as explained in section 3.1. The trimming resistors have different designations. Adjust ammeter of source II with R 238 and adjust voltmeter with R 241.

3.3 Digitalinstrumente TOE 8721-1

Das Netzgerät TOE 8721-1 besitzt nur einen Quellausgang. Es hat daher separate Instrumente für Spannung (links) und Strom (rechts). Der Abgleichpunkt 1. muß bereits durchgeführt worden sein!

Der Abgleich erfolgt in gleicher Art und Weise wie unter Punkt 3.1. Die Abgleichtrimmer tragen jedoch nicht die gleichen Bezeichnungen. Das Amperemeter wird mit R 238 und das Voltmeter mit R 203 abgeglichen.

Bedienelemente

Bedienelemente Frontplatte TOE 8721-1

- [1] *LINE ON/OFF*-Schalter
- [2] *VOLTAGE*-Potentiometer
- [3] 3-stelliges LCD-Digitalvoltmeter
- [4] 3-stelliges LCD-Digitalamperemeter
- [5] *CURRENT*-Potentiometer
- [6] Ausgang
- [7] *CC*-LED

Bedienelemente Frontplatte TOE 8722

- [8] *LINE ON/OFF*-Schalter
- [9] *VOLTAGE I*-Potentiometer
- [10] *Meßwerk I*
Volt- und Amperemeter der Quelle I
ausgeführt als 3-stelliges LCD-Digitalinstrument
- [11] Schalter *V/A I*
- [12] *CURRENT I*-Potentiometer
- [13] *VOLTAGE II*-Potentiometer
- [14] *Meßwerk II*
Volt- und Amperemeter der Quelle II
ausgeführt als 3-stelliges LCD-Digitalinstrument
- [15] Schalter *V/A II*
- [16] *CURRENT II*-Potentiometer
- [17] Ausgang I
- [18] *CC I*-LED
- [19] Ausgang II
- [20] *CC II*-LED

Bedienelemente Rückwand

- [21] Typenschild
- [22] Netzeinbaustecker mit Netzsicherung

3.3 Digital Instruments TOE 8721-1

The power supply TOE 8721-1 is only a single output device. Therefore it has separate instruments for voltage (left side) and current (right side). First, make sure that Trimming step 1. has been performed!

The adjustment is to do in the same manner as explained in section 3.1. The trimming resistors have different designations. Adjust ammeter with R 238 and adjust voltmeter with R 203.

Operation Elements

Operation Elements Front Panel TOE 8721-1

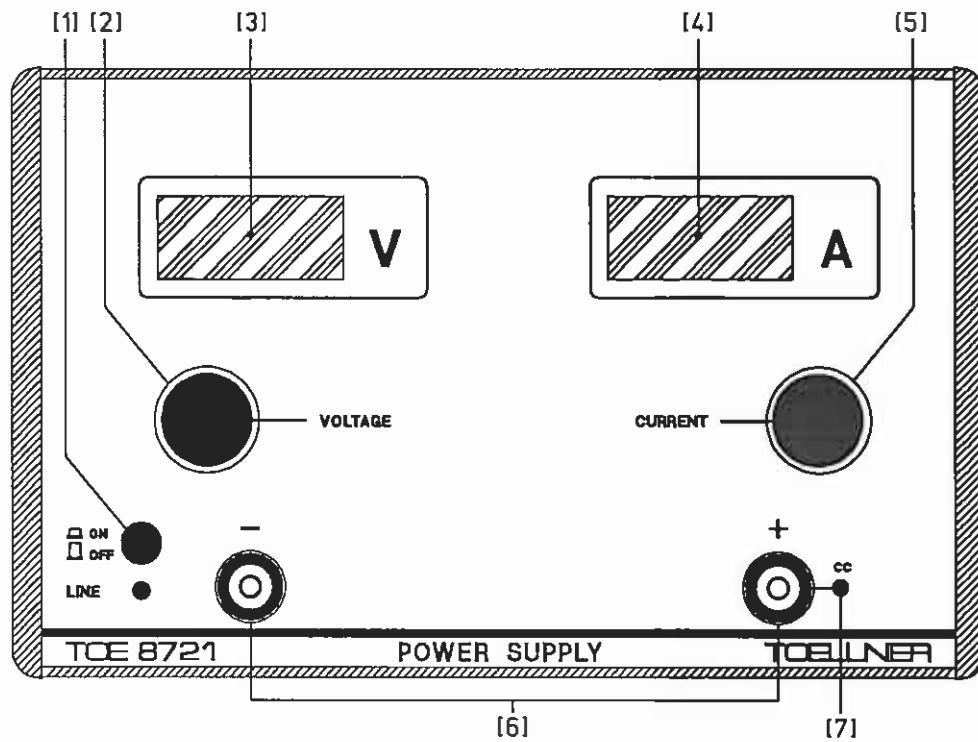
- [1] *LINE ON/OFF* switch
- [2] *VOLTAGE* potentiometer
- [3] 3 digit LCD digital voltmeter
- [4] 3 digit LCD digital ammeter
- [5] *CURRENT* potentiometer
- [6] Output
- [7] *CC* LED

Operation Elements Front Panel TOE 8722

- [8] *LINE ON/OFF* switch
- [9] *VOLTAGE I* potentiometer
- [10] *Measuring Instrument I*
voltmeter and ammeter for source I
designed as a 3 digit LCD digital instrument
- [11] *V/A I* switch
- [12] *CURRENT I* potentiometer
- [13] *VOLTAGE II* potentiometer
- [14] *Measuring Instrument II*
voltmeter and ammeter for source II
designed as a 3 digit LCD digital instrument
- [15] *V/A II* switch
- [16] *CURRENT II* potentiometer
- [17] Output I
- [18] *CC I* LED
- [19] Output II
- [20] *CC II* LED

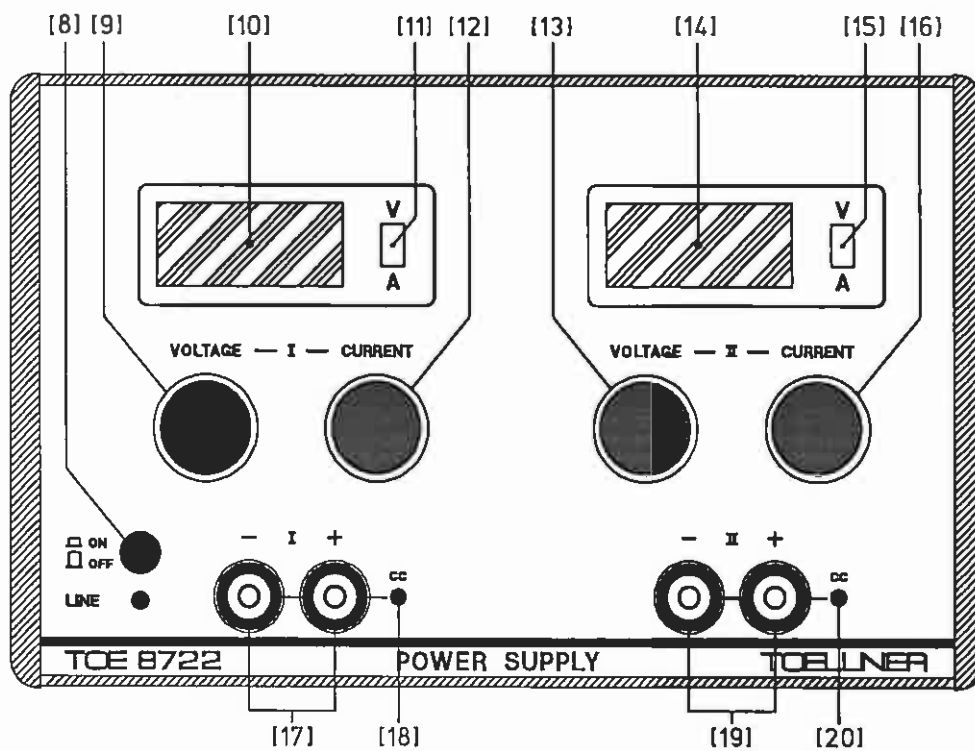
Operation Elements Rear Panel

- [21] Identification plate
- [22] Mains plug with fuse



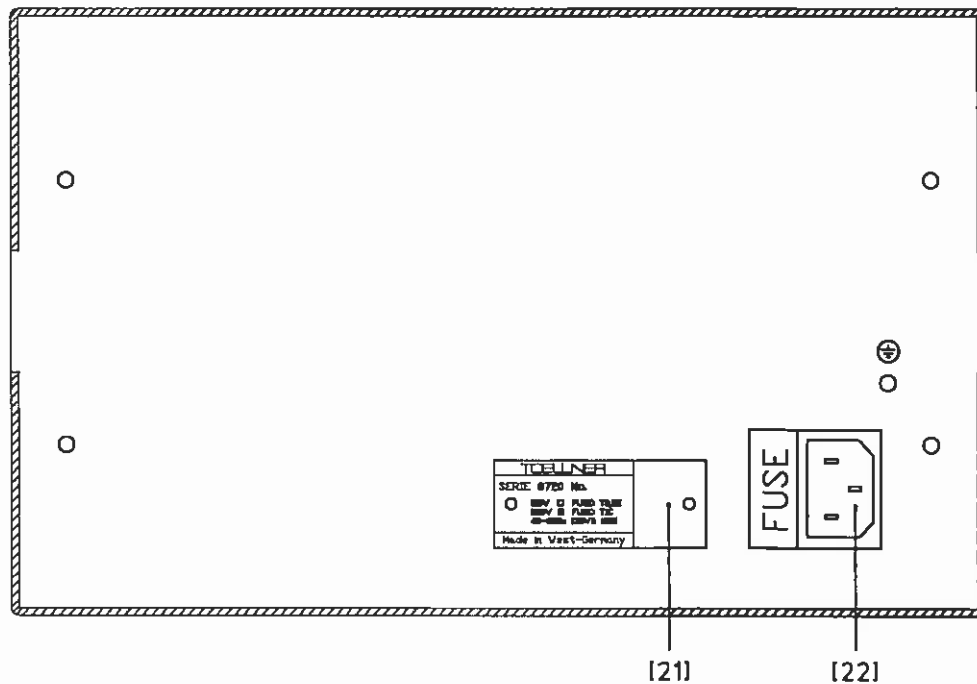
Frontplattenansicht des Netzgerätes TOE 8721-1

Front Panel View of Power Supply TOE 8721-1



Frontplattenansicht der Netzgeräte TOE 8722

Front Panel View of Power Supplies TOE 8722



Rückwandansicht der Netzgeräte
TOE 8721-1 und TOE 8722

Rear Panel View of Power Supplies
TOE 8721-1 und TOE 8722

Stromlaufpläne

Stromlaufpläne

Main Board I	TOE 8722.1	1/2
Main Board II	TOE 8722.1	2/2
Display	TOE 8722.2	
Control 7 V	TOE 8722.3	
Control I/II	TOE 8730.2	

Bestückungspläne

Main Board	TOE 8722.1
Display	TOE 8722.2
Control 7 V	TOE 8722.3
Control I/II	TOE 8730.2

Bauteilelisten

Parts List	TOE 8721-1
Parts List	TOE 8722-1
Parts List	TOE 8722-2
Parts List	TOE 8722-3

Circuit Diagrams

Circuit Diagrams

Main Board I	TOE 8722.1	1/2
Main Board II	TOE 8722.1	2/2
Display	TOE 8722.2	
Control 7 V	TOE 8722.3	
Control I/II	TOE 8730.2	

Component Drawings

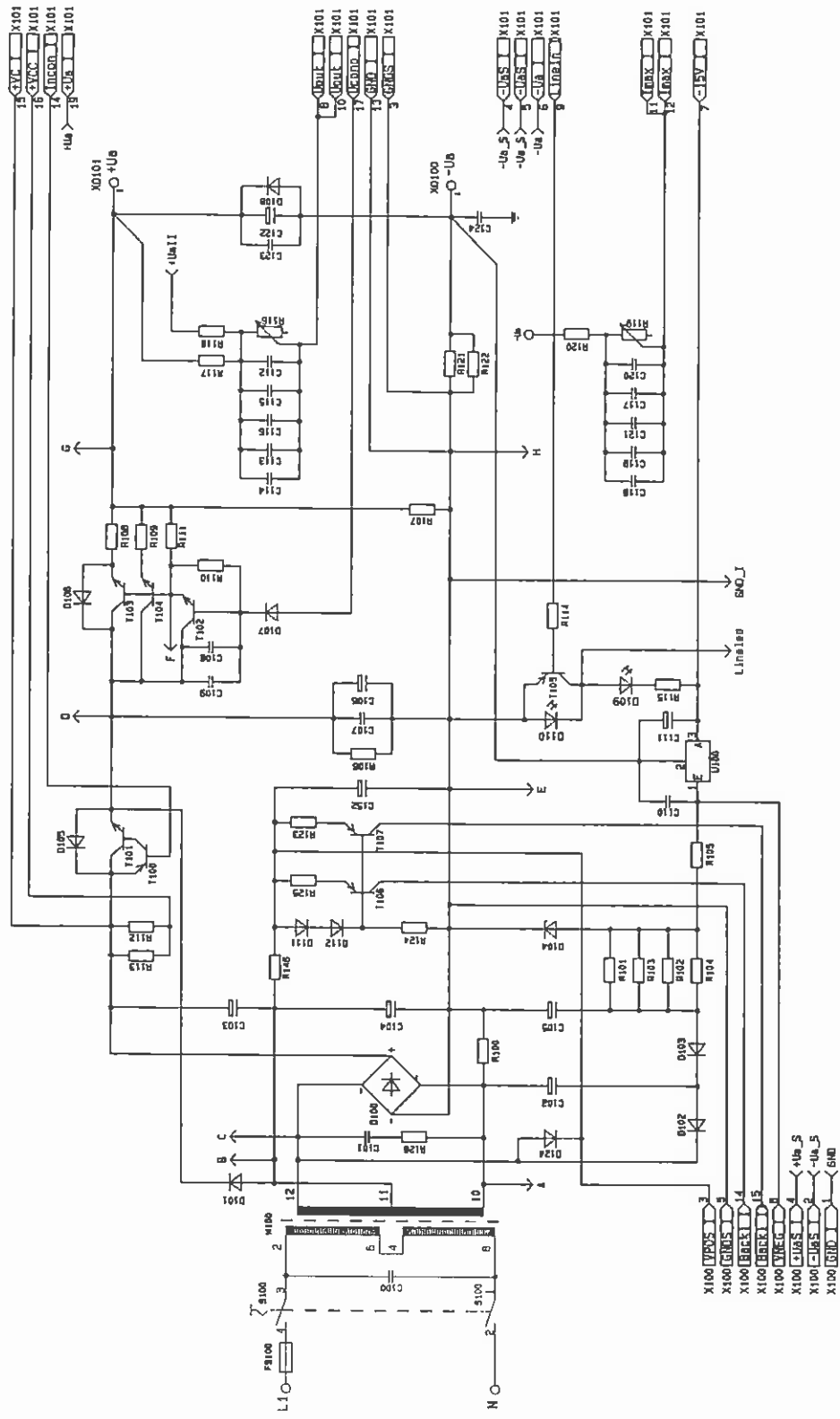
Main Board	TOE 8722.1
Display	TOE 8722.2
Control 7 V	TOE 8722.3
Control I/II	TOE 8730.2

Parts Lists

Parts List	TOE 8721-1
Parts List	TOE 8722-1
Parts List	TOE 8722-2
Parts List	TOE 8722-3

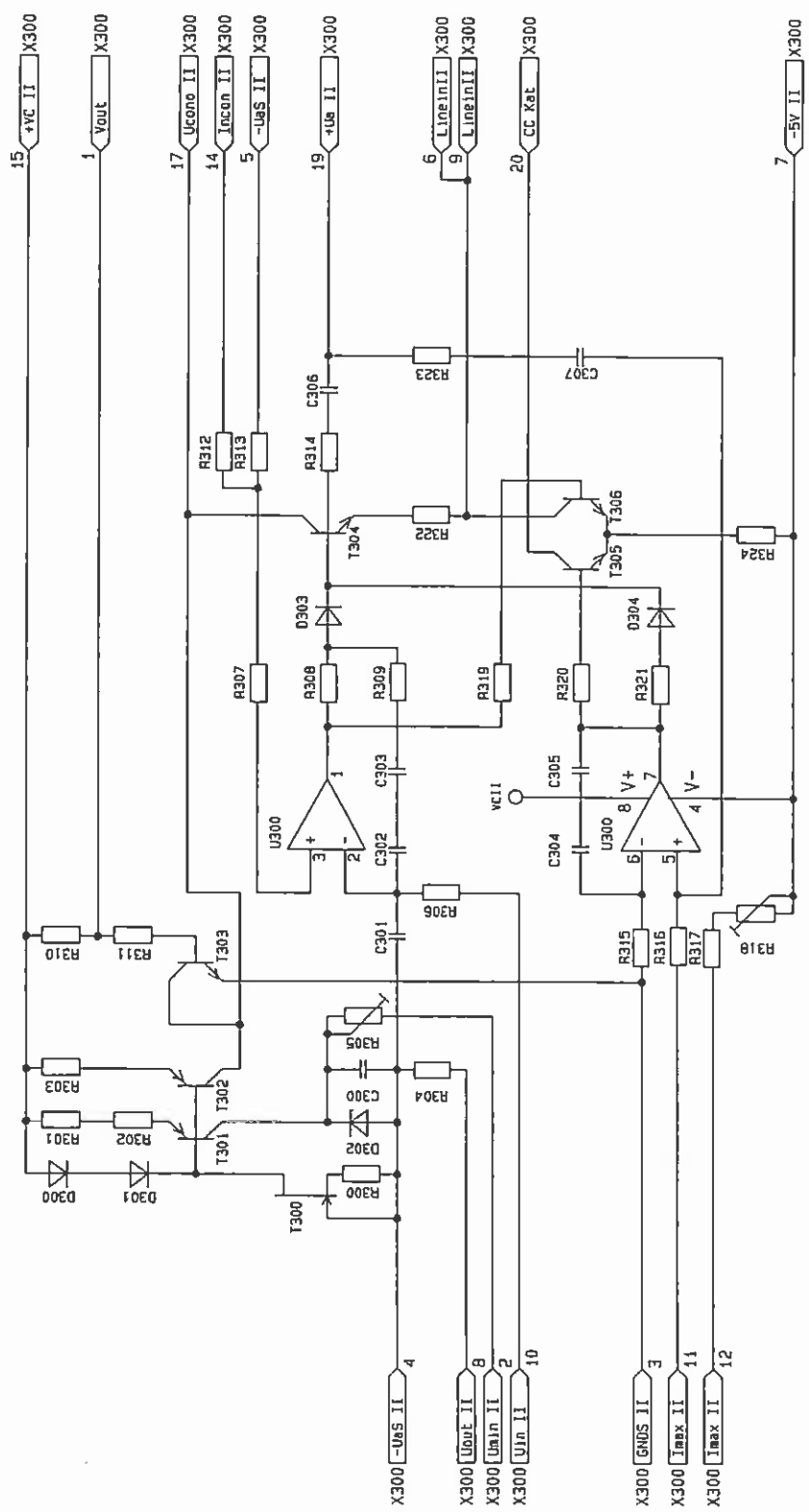
Stromlaufpläne

Circuit Diagrams



APPROVALS		Date		Title	
DRAWN				MAINBOARD I	
CHECKED					
TOELNER		PCB NO. 8722.1		Date	
Electronic-Instr. GmbH				11/92	
Gahlenfeldstr. 31				SHEET 01 OF 2	
5804 Herdecke					
Tel.: 0236/73023-24					

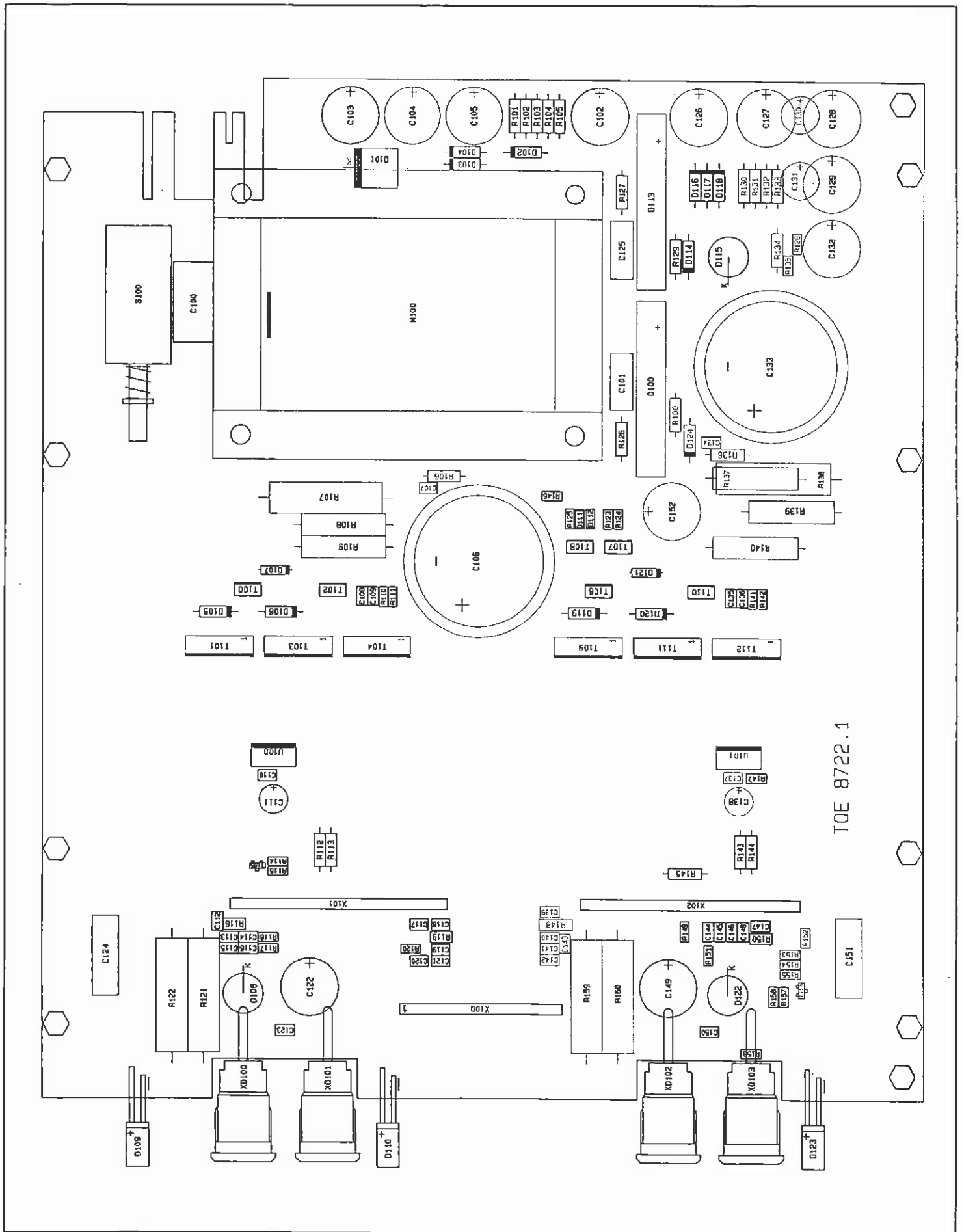




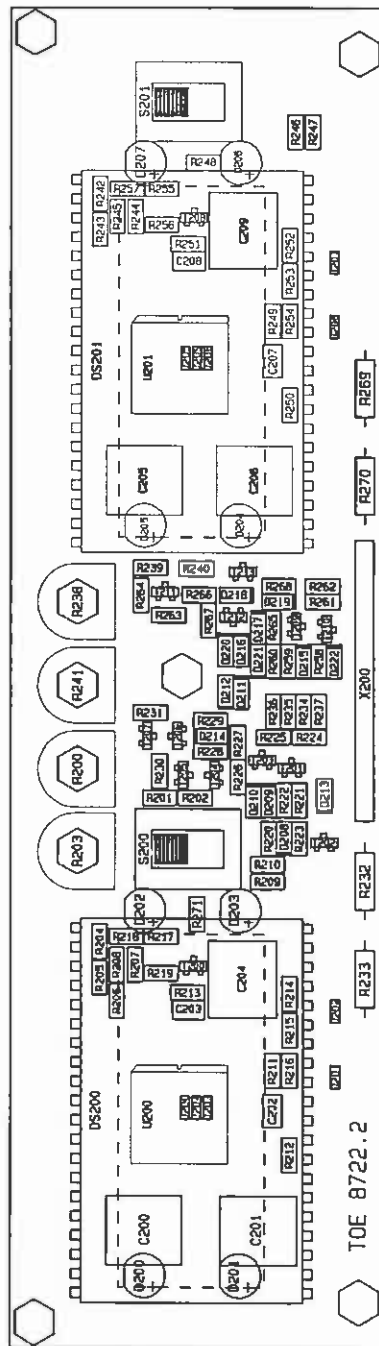
APPROVALS		DATE	Title		CONTROL 7V
DRAWN			PCB NO.	8722.3	Date
CHECKED					11/92
TOELNER			SHEET 01 OF 1		
Electronic-Instr. 5mm					
Schematic Inst. 31					
Tol. 02330/73023-24					

Bestückungspläne

Component Drawings

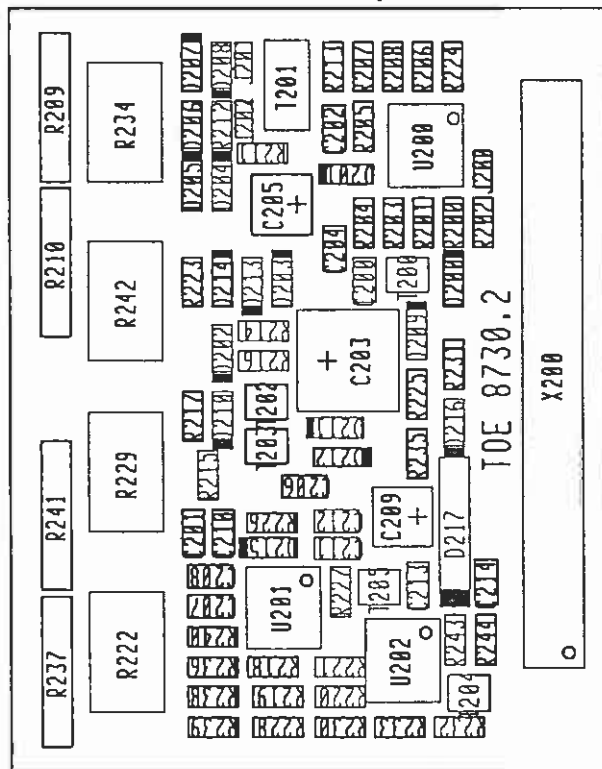


Main Board TOE 8722.1



Display TOE 8722.2





Bauteilelisten

Parts Lists

Parts List Circuit Board: TOE 8722.1/2 -V02-

Part	Description	Value
C100	Capacitor MKP	33nF/1000V RM 15
C101	Capacitor MKC4	100nF/250V RM 10
C102	Capacitor Electrolytic EKM	100µF/63V RM 5
C103	Capacitor Electrolytic EKM	100µF/63V RM 5
C104	Capacitor Electrolytic EKM	470µF/40V RM 5
C105	Capacitor Electrolytic EKM	100µF/63V RM 5
C106	Capacitor Electrolytic ELN	not assigned
C107	Capacitor SMD	100nF/63V
C108	Capacitor SMD	330pF/63V
C109	Capacitor SMD	100pF/63V
C110	Capacitor SMD	100nF/63V
C111	Capacitor Electrolytic	10µF/63V RM 2.5
C112	Capacitor SMD	100nF/63V
C113	Capacitor SMD	100nF/63V
C114	Capacitor SMD	100nF/63V
C115	Capacitor SMD	100nF/63V
C116	Capacitor SMD	100nF/63V
C117	Capacitor SMD	not assigned
C118	Capacitor SMD	not assigned
C119	Capacitor SMD	not assigned
C120	Capacitor SMD	100nF/63V
C121	Capacitor SMD	not assigned
C122	Capacitor Electrolytic EKM	100µF/63V RM 5
C123	Capacitor SMD	100nF/63V
C124	Capacitor MKC4	220nF/250V RM 15
C125	Capacitor MKC4	not assigned
C126	Capacitor Electrolytic EKM	not assigned
C127	Capacitor Electrolytic EKM	not assigned
C128	Capacitor Electrolytic EKM	not assigned
C129	Capacitor Electrolytic EKM	not assigned
C130	Capacitor Electrolytic EKM	not assigned
C131	Capacitor Electrolytic EKM	not assigned
C132	Capacitor Electrolytic EKM	not assigned
C133	Capacitor Electrolytic ELN	4700µF/63V D35
C134	Capacitor SMD	not assigned
C135	Capacitor SMD	not assigned
C136	Capacitor SMD	not assigned
C137	Capacitor SMD	not assigned
C138	Capacitor Electrolytic	not assigned
C139	Capacitor SMD	not assigned
C140	Capacitor SMD	not assigned
C141	Capacitor SMD	not assigned
C142	Capacitor SMD	not assigned
C143	Capacitor SMD	not assigned
C144	Capacitor SMD	not assigned
C145	Capacitor SMD	not assigned
C146	Capacitor SMD	not assigned
C147	Capacitor SMD	not assigned
C148	Capacitor SMD	not assigned
C149	Capacitor Electrolytic EKM	not assigned
C150	Capacitor SMD	not assigned
C151	Capacitor MKC4	not assigned
C152	Capacitor Electrolytic EKM	not assigned
C200	Capacitor MKS01-SMD	470nF/50V
C201	Capacitor MKS01-SMD	220nF/50V
C202	Capacitor SMD	10nF/63V
C203	Capacitor SMD	100pF/63V

Part	Description	Value
C204	Capacitor MKS01-SMD	220nF/50V
C205	Capacitor MKS01-SMD	470nF/50V
C206	Capacitor MKS01-SMD	220nF/50V
C207	Capacitor SMD	10nF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor MKS01-SMD	220nF/50V
D100	Rectifier Bridge	B80C3700/2200
D101	Diode	P600G
D102	Diode	1N4004 RM 10
D103	Diode	1N4004 RM 10
D104	Diode	ZPY30V RM10
D105	Diode	1N4004 RM 10
D106	Diode	1N4004 RM 10
D107	Diode	BAT46 RM 7.5
D108	Diode	P600G
D109	LED green (5mm)	TLSG5201
D110	LED red (3mm)	not assigned
D111	Diode SMD	LL4151
D112	Diode SMD	LL4151
D113	Rectifier Bridge	not assigned
D114	Diode	not assigned
D115	Diode	not assigned
D116	Diode	not assigned
D117	Diode	not assigned
D118	Diode	not assigned
D119	Diode	not assigned
D120	Diode	not assigned
D121	Diode	not assigned
D122	Diode	not assigned
D123	LED red (3mm)	LS3360
D124	Diode	not assigned
D200	LED green (1.8mm)	TLUG2401 OPTION
D201	LED green (1.8mm)	TLUG2401 OPTION
D202	LED green (1.8mm)	TLUG2401 OPTION
D203	LED green (1.8mm)	TLUG2401 OPTION
D204	LED green (1.8mm)	TLUG2401 OPTION
D205	LED green (1.8mm)	TLUG2401 OPTION
D206	LED green (1.8mm)	TLUG2401 OPTION
D207	LED green (1.8mm)	TLUG2401 OPTION
D208	Diode SMD	ZMM12V
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1
D214	Diode SMD	ZMM5V1
D215	Diode SMD	not assigned
D216	Diode SMD	not assigned
D217	Diode SMD	not assigned
D218	Diode SMD	not assigned
D219	Diode SMD	not assigned
D220	Diode SMD	not assigned
D221	Diode SMD	not assigned
D222	Diode SMD	not assigned
DS200	Liquid Crystal Display	SLC30061RSC5

(Parts List Circuit Board: TOE 8722.1/2 -V02- continued)

Part	Description	Value
DS201	Liquid Crystal Display	SLC30061RSC5
FS100	Fuse	T1.6L IEC127-2/III
M100	Mains Transformer	BV T8722-36/1
R100	Resistor TK50/1 %	2k49
R101	Resistor TK50/1 %	1k21
R102	Resistor TK50/1 %	1k21
R103	Resistor TK50/1 %	1k21
R104	Resistor TK50/1 %	1k21
R105	Resistor TK50/1 %	0R22
R106	Resistor TK50/1 %	12k1
R107	Resistor	1k/4W
R108	Resistor	0R47/1W
R109	Resistor	0R47/1W
R110	Resistor SMD TK50/1 %	2k21
R111	Resistor SMD TK50/1 %	332R
R112	Resistor TK50/1 %	6k81
R113	Resistor TK50/1 %	6k81
R114	Resistor SMD TK50/1 %	10k
R115	Resistor SMD TK50/1 %	1k5
R116	Resistor Pot	10k
R117	Resistor SMD TK50/1 %	not assigned
R118	Resistor SMD TK50/1 %	3R32
R119	Resistor Pot	not assigned
R120	Resistor SMD TK50/1 %	12R1
R121	Resistor	0R47/5W
R122	Resistor	0R47/5W
R123	Resistor SMD TK50/1 %	33R2
R124	Resistor SMD TK50/1 %	10k
R125	Resistor SMD TK50/1 %	33R2
R126	Resistor TK50/1 %	1k
R127	Resistor TK50/1 %	not assigned
R128	Resistor SMD TK50/1 %	not assigned
R129	Resistor TK50/1 %	not assigned
R130	Resistor TK50/1 %	not assigned
R131	Resistor TK50/1 %	not assigned
R132	Resistor TK50/1 %	not assigned
R133	Resistor TK50/1 %	not assigned
R134	Resistor TK50/1 %	not assigned
R135	Resistor SMD TK50/1 %	not assigned
R136	Resistor TK50/1 %	12k1
R137	Resistor	not assigned
R138	Resistor	not assigned
R139	Resistor	0R47/1W
R140	Resistor	0R47/1W
R141	Resistor SMD TK50/1 %	not assigned
R142	Resistor SMD TK50/1 %	not assigned
R143	Resistor TK50/1 %	not assigned
R144	Resistor TK50/1 %	not assigned
R145	Resistor TK50/1 %	not assigned
R146	Resistor SMD TK50/1 %	3R32
R147	Resistor SMD TK50/1 %	not assigned
R148	Resistor Pot	not assigned
R149	Resistor SMD TK50/1 %	not assigned
R150	Resistor Pot	1k

Part	Description	Value
R151	Resistor SMD TK50/1 %	12R1
R152	Resistor SMD TK50/1 %	not assigned
R153	Resistor SMD TK50/1 %	not assigned
R154	Resistor SMD TK50/1 %	not assigned
R155	Resistor SMD TK50/1 %	not assigned
R156	Resistor SMD TK50/1 %	3R32
R157	Resistor SMD TK50/1 %	not assigned
R158	Resistor SMD TK50/1 %	3R32
R159	Resistor	not assigned
R160	Resistor	not assigned
R200	Resistor Trimmer HC10P	not assigned
R201	Resistor SMD TK50/1 %	not assigned
R202	Resistor SMD TK50/1 %	not assigned
R203	Resistor Trimmer HC10P	47k/lin
R204	Resistor SMD TK50/1 %	10k
R205	Resistor SMD TK50/1 %	100k
R206	Resistor SMD TK50/1 %	3R32
R207	Resistor SMD TK50/1 %	681R
R208	Resistor SMD TK50/1 %	1k
R209	Resistor SMD TK50/1 %	not assigned
R210	Resistor SMD TK50/1 %	not assigned
R211	Resistor SMD TK50/1 %	1M
R212	Resistor SMD TK50/1 %	100k
R213	Resistor SMD TK50/1 %	100k
R214	Resistor SMD TK50/1 %	3k32
R215	Resistor SMD TK50/1 %	15k
R216	Resistor SMD TK50/1 %	2k21
R217	Resistor SMD TK50/1 %	1M
R218	Resistor SMD TK50/1 %	3R32
R219	Resistor SMD TK50/1 %	1M
R220	Resistor SMD TK50/1 %	3R32
R221	Resistor SMD TK50/1 %	2k21
R222	Resistor SMD TK50/1 %	22k1
R223	Resistor SMD TK50/1 %	22k1
R224	Resistor SMD TK50/1 %	6k81
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	10k
R227	Resistor SMD TK50/1 %	10k
R228	Resistor SMD TK50/1 %	150R
R229	Resistor SMD TK50/1 %	150R
R230	Resistor SMD TK50/1 %	150R
R231	Resistor SMD TK50/1 %	150R
R232	Resistor TK50/1 %	not assigned
R233	Resistor TK50/1 %	not assigned
R234	Resistor SMD TK50/1 %	3R32
R235	Resistor SMD TK50/1 %	3R32
R236	Resistor SMD TK50/1 %	3R32
R237	Resistor SMD TK50/1 %	3R32
R238	Resistor Trimmer HC10P	1k/lin
R239	Resistor SMD TK50/1 %	221R
R240	Resistor SMD TK50/1 %	475R
R241	Resistor Trimmer HC10P	not assigned
R242	Resistor SMD TK50/1 %	not assigned
R243	Resistor SMD TK50/1 %	not assigned
R244	Resistor SMD TK50/1 %	not assigned
R245	Resistor SMD TK50/1 %	not assigned
R246	Resistor SMD TK50/1 %	221R

(Parts List Circuit Board: TOE 8722.1/2 -V02- continued)

Part	Description	Value
R247	Resistor SMD TK50/1 %	1k
R248	Resistor SMD TK50/1 %	3R32
R249	Resistor SMD TK50/1 %	1M
R250	Resistor SMD TK50/1 %	100k
R251	Resistor SMD TK50/1 %	100k
R252	Resistor SMD TK50/1 %	3k32
R253	Resistor SMD TK50/1 %	15k
R254	Resistor SMD TK50/1 %	2k21
R255	Resistor SMD TK50/1 %	1M
R256	Resistor SMD TK50/1 %	1M
R257	Resistor SMD TK50/1 %	3R32
R258	Resistor SMD TK50/1 %	not assigned
R259	Resistor SMD TK50/1 %	not assigned
R260	Resistor SMD TK50/1 %	not assigned
R261	Resistor SMD TK50/1 %	not assigned
R262	Resistor SMD TK50/1 %	not assigned
R263	Resistor SMD TK50/1 %	not assigned
R264	Resistor SMD TK50/1 %	not assigned
R265	Resistor SMD TK50/1 %	not assigned
R266	Resistor SMD TK50/1 %	not assigned
R267	Resistor SMD TK50/1 %	not assigned
R268	Resistor SMD TK50/1 %	not assigned
R269	Resistor TK50/1 %	not assigned
R270	Resistor TK50/1 %	1M82
R271	Resistor SMD TK50/1 %	not assigned
S100	Mains Switch	Type NE 18
S200	U/I-Switch	not assigned
S201	U/I-Switch	not assigned
T100	Transistor PNP	BD140
T101	Transistor NPN	TIP3055
T102	Transistor NPN	BD139
T103	Transistor NPN	TIP3055
T104	Transistor NPN	TIP3055
T105	Transistor SMD PNP	BC856B
T106	Transistor PNP	BD140 OPTION
T107	Transistor PNP	BD140 OPTION
T108	Transistor PNP	not assigned
T109	Transistor NPN	not assigned
T110	Transistor NPN	not assigned
T111	Transistor NPN	TIP3055
T112	Transistor NPN	TIP3055
T113	Transistor SMD PNP	not assigned
T200	Transistor SMD NPN	BC846B
T201	Transistor SMD NPN	BC846B
T202	Transistor SMD NPN	BC846B
T203	Transistor SMD PNP	BC856B
T204	Transistor SMD PNP	BC856B
T205	Transistor SMD PNP	BC856B
T206	Transistor SMD NPN	BC846B
T207	Transistor SMD NPN	BC846B
T208	Transistor SMD NPN	BC846B
T209	Transistor SMD NPN	not assigned
T210	Transistor SMD NPN	not assigned
T211	Transistor SMD PNP	not assigned
T212	Transistor SMD PNP	not assigned

Part	Description	Value
T213	Transistor SMD NPN	not assigned
U100	Voltage Regulator	UA7915
U101	Voltage Regulator	not assigned
U200	3 1/2 Digit A/D Converter	ICL7106CQH
U201	3 1/2 Digit A/D Converter	ICL7106CQH
X100	Control Unit Solder Pins	
X101	Control Unit Solder Pins	
X102	Control Unit Solder Pins	
X200	Control Unit Solder Pins	
XO100	Safety Press-In Socket (blue)	SEB4-R
XO101	Safety Press-In Socket (red)	not assigned
XO102	Safety Press-In Socket (blue)	not assigned
XO103	Safety Press-In Socket (red)	SEB4-R

Parts List Circuit Board: TOE 8730.2 -V02-

Part	Description	Value
C200	Capacitor SMD	1nF/63V
C201	Capacitor SMD	100nF/63V
C202	Capacitor SMD	1nF/63V
C203	Capacitor Electrolytic	220µF/16V RM 3.5
C204	Capacitor SMD	100nF/63V
C205	Capacitor Electrolytic	10µF/63V RM 2.5
C206	Capacitor SMD	47pF/63V
C207	Capacitor SMD	330pF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor Electrolytic	10µF/63V RM 2.5
C210	Capacitor SMD	not assigned
C211	Capacitor SMD	10nF/63V
C212	Capacitor SMD	10nF/63V
C213	Capacitor SMD	100nF/63V
C214	Capacitor SMD	100nF/63V
D200	Diode SMD	ZMM12V0
D201	Diode SMD	ZMM5V1
D202	Diode SMD	ZMM3V0
D203	Diode SMD	ZMM5V1
D204	Diode SMD	LL4151
D205	Diode SMD	LL4151
D206	Diode SMD	ZMM12V0
D207	Diode SMD	ZMM3V0
D208	Diode SMD	ZMM12V0
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1

(Parts List Circuit Board: TOE 8722.2 -V02- continued)

Part	Description	Value
D214	Diode SMD	ZMM3V0
D215	Diode SMD	LL4151
D216	Diode SMD	LL4151
D217	Diode	1N823A RM 10
R200	Resistor SMD TK50/1 %	6k81
R201	Resistor SMD TK50/1 %	22k1
R202	Resistor SMD TK50/1 %	6k81
R203	Resistor SMD TK50/1 %	4k75
R204	Resistor SMD TK50/1 %	6k81
R205	Resistor SMD TK50/1 %	332k
R206	Resistor SMD TK50/1 %	33k2
R207	Resistor SMD TK50/1 %	10k
R208	Resistor SMD TK50/1 %	10k
R209	Resistor TK50/1 %	not assigned
R210	Resistor TK50/1 %	130k
R211	Resistor SMD TK50/1 %	475R
R212	Resistor SMD TK50/1 %	22k1
R213	Resistor SMD TK50/1 %	22R1
R214	Resistor SMD TK50/1 %	332R
R215	Resistor SMD TK50/1 %	100R
R216	Resistor SMD TK50/1 %	33k2
R217	Resistor SMD TK50/1 %	1k5
R218	Resistor SMD TK50/1 %	4k75
R219	Resistor SMD TK50/1 %	10k
R220	Resistor SMD TK50/1 %	681R
R221	Resistor SMD TK50/1 %	332k
R222	Resistor Trimmer VC10P	not assigned
R223	Resistor SMD TK50/1 %	1k
R224	Resistor SMD TK50/1 %	15k
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	47k5
R227	Resistor SMD TK50/1 %	4k75
R228	Resistor SMD TK50/1 %	681k
R229	Resistor Trimmer VC10P	not assigned
R230	Resistor SMD TK50/1 %	681R
R231	Resistor SMD TK50/1 %	1k
R232	Resistor SMD TK50/1 %	1k
R233	Resistor SMD TK50/1 %	10k
R234	Resistor Trimmer VC10P	4k7/lin
R235	Resistor SMD TK50/1 %	100R
R236	Resistor SMD TK50/1 %	150R
R237	Resistor TK50/1 %	2k49
R238	Resistor SMD TK50/1 %	15k
R239	Resistor SMD TK50/1 %	4k75
R240	Resistor SMD TK50/1 %	221R
R241	Resistor TK50/1 %	not assigned
R242	Resistor Trimmer VC10P	470R/lin
R243	Resistor SMD TK50/1 %	1k5
R244	Resistor SMD TK50/1 %	4k75
T200	Transistor SMD NPN	BC846B
T201	Transistor FET	BF245B
T202	Transistor SMD PNP	BC856B
T203	Transistor SMD NPN	BC846B
T204	Transistor SMD NPN	BC846B
T205	Transistor SMD NPN	BC846B

Part	Description	Value
U200	Op Amp SMD	UA741CD
U201	Dual Op Amp SMD	UA1458D
U202	Dual Op Amp SMD	UA1458D
X200	Multipoint Connector 20pins	MGZ 1049-1-28-2020

Parts List Circuit Board: TOE 8722.1/2 -V02-

Part	Description	Value
C100	Capacitor MKP	33nF/1000V RM 15
C101	Capacitor MKC4	100nF/250V RM 10
C102	Capacitor Electrolytic EKM	470µF/40V RM 5
C103	Capacitor Electrolytic EKM	100µF/63V RM 5
C104	Capacitor Electrolytic EKM	470µF/40V RM 5
C105	Capacitor Electrolytic EKM	470µF/40V RM 5
C106	Capacitor Electrolytic ELN	10mF/40V D35
C107	Capacitor SMD	100nF/63V
C108	Capacitor SMD	330pF/63V
C109	Capacitor SMD	100pF/63V
C110	Capacitor SMD	100nF/63V
C111	Capacitor Electrolytic	10µF/63V RM 2.5
C112	Capacitor SMD	100nF/63V
C113	Capacitor SMD	100nF/63V
C114	Capacitor SMD	100nF/63V
C115	Capacitor SMD	100nF/63V
C116	Capacitor SMD	100nF/63V
C117	Capacitor SMD	not assigned
C118	Capacitor SMD	not assigned
C119	Capacitor SMD	not assigned
C120	Capacitor SMD	100nF/63V
C121	Capacitor SMD	not assigned
C122	Capacitor Electrolytic EKM	470µF/40V RM 5
C123	Capacitor SMD	100nF/63V
C124	Capacitor MKC4	220nF/250V RM 15
C125	Capacitor MKC4	100nF/250V RM 10
C126	Capacitor Electrolytic EKM	100µF/63V RM 5
C127	Capacitor Electrolytic EKM	470µF/40V RM 5
C128	Capacitor Electrolytic EKM	470µF/40V RM 5
C129	Capacitor Electrolytic EKM	470µF/40V RM 5
C130	Capacitor Electrolytic EKM	not assigned
C131	Capacitor Electrolytic EKM	not assigned
C132	Capacitor Electrolytic EKM	100µF/63V RM 5
C133	Capacitor Electrolytic ELN	10mF/40V D35
C134	Capacitor SMD	100nF/63V
C135	Capacitor SMD	100pF/63V
C136	Capacitor SMD	330pF/63V
C137	Capacitor SMD	100nF/63V
C138	Capacitor Electrolytic	10µF/63V RM 2.5
C139	Capacitor SMD	100nF/63V
C140	Capacitor SMD	100nF/63V
C141	Capacitor SMD	100nF/63V
C142	Capacitor SMD	100nF/63V
C143	Capacitor SMD	100nF/63V
C144	Capacitor SMD	not assigned
C145	Capacitor SMD	not assigned
C146	Capacitor SMD	not assigned
C147	Capacitor SMD	not assigned
C148	Capacitor SMD	100nF/63V
C149	Capacitor Electrolytic EKM	470µF/40V RM 5
C150	Capacitor SMD	100nF/63V
C151	Capacitor MKC4	220nF/250V RM 15
C152	Capacitor Electrolytic EKM	100µF/63V RM 5
C200	Capacitor MKS01-SMD	470nF/50V
C201	Capacitor MKS01-SMD	220nF/50V
C202	Capacitor SMD	10nF/63V
C203	Capacitor SMD	100pF/63V

Part	Description	Value
C204	Capacitor MKS01-SMD	220nF/50V
C205	Capacitor MKS01-SMD	470nF/50V
C206	Capacitor MKS01-SMD	220nF/50V
C207	Capacitor SMD	10nF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor MKS01-SMD	220nF/50V
D100	Rectifier Bridge	B80C3700/2200
D101	Diode	P600G
D102	Diode	1N4004 RM 10
D103	Diode	1N4004 RM 10
D104	Diode	ZPY30V RM10
D105	Diode	1N4004 RM 10
D106	Diode	1N4004 RM 10
D107	Diode	BAT46 RM 7.5
D108	Diode	P600G
D109	LED green (5mm)	TLSG5201
D110	LED red (3mm)	LS3360
D111	Diode SMD	LL4151
D112	Diode SMD	LL4151
D113	Rectifier Bridge	B80C3700/2200
D114	Diode	ZPY30V RM 10
D115	Diode	P600G
D116	Diode	1N4004 RM 10
D117	Diode	1N4004 RM 10
D118	Diode	1N4004 RM 10
D119	Diode	1N4004 RM 10
D120	Diode	1N4004 RM 10
D121	Diode	BAT46 RM 7.5
D122	Diode	P600G
D123	LED red (3mm)	LS3360
D124	Diode	1N4004 RM 10
D200	LED green (1.8mm)	TLUG2401 OPTION
D201	LED green (1.8mm)	TLUG2401 OPTION
D202	LED green (1.8mm)	TLUG2401 OPTION
D203	LED green (1.8mm)	TLUG2401 OPTION
D204	LED green (1.8mm)	TLUG2401 OPTION
D205	LED green (1.8mm)	TLUG2401 OPTION
D206	LED green (1.8mm)	TLUG2401 OPTION
D207	LED green (1.8mm)	TLUG2401 OPTION
D208	Diode SMD	ZMM12V
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1
D214	Diode SMD	ZMM5V1
D215	Diode SMD	ZMM12V
D216	Diode SMD	LL4151
D217	Diode SMD	LL4151
D218	Diode SMD	LL4151
D219	Diode SMD	LL4151
D220	Diode SMD	ZMM5V1
D221	Diode SMD	ZMM5V1
D222	Diode SMD	not assigned
DS200	Liquid Crystal Display	SLC30061RSC5

(Parts List Circuit Board: TOE 8722.1/2 -V02- continued)

Part	Description	Value
DS201	Liquid Crystal Display	SLC30061RSC5
FS100	Fuse	T1.6L IEC127-2/III
M100	Mains Transformer	BV T8722-18
R100	Resistor TK50/1 %	1k
R101	Resistor TK50/1 %	82R5
R102	Resistor TK50/1 %	not assigned
R103	Resistor TK50/1 %	not assigned
R104	Resistor TK50/1 %	not assigned
R105	Resistor TK50/1 %	0R22
R106	Resistor TK50/1 %	3k32
R107	Resistor	1k/4W
R108	Resistor	0R33/1W
R109	Resistor	0R33/1W
R110	Resistor SMD TK50/1 %	2k21
R111	Resistor SMD TK50/1 %	332R
R112	Resistor TK50/1 %	2k21
R113	Resistor TK50/1 %	2k21
R114	Resistor SMD TK50/1 %	10k
R115	Resistor SMD TK50/1 %	1k5
R116	Resistor Pot	10k
R117	Resistor SMD TK50/1 %	5R62
R118	Resistor SMD TK50/1 %	not assigned
R119	Resistor Pot	1k
R120	Resistor SMD TK50/1 %	12R1
R121	Resistor	0R47/5W
R122	Resistor	0R47/5W
R123	Resistor SMD TK50/1 %	33R2
R124	Resistor SMD TK50/1 %	10k
R125	Resistor SMD TK50/1 %	33R2
R126	Resistor TK50/1 %	1k
R127	Resistor TK50/1 %	1k
R128	Resistor SMD TK50/1 %	not assigned
R129	Resistor TK50/1 %	1k
R130	Resistor TK50/1 %	82R5
R131	Resistor TK50/1 %	not assigned
R132	Resistor TK50/1 %	not assigned
R133	Resistor TK50/1 %	not assigned
R134	Resistor TK50/1 %	0R22
R135	Resistor SMD TK50/1 %	not assigned
R136	Resistor TK50/1 %	3k32
R137	Resistor	not assigned
R138	Resistor	1k/4W
R139	Resistor	0R33/1W
R140	Resistor	0R33/1W
R141	Resistor SMD TK50/1 %	2k21
R142	Resistor SMD TK50/1 %	332R
R143	Resistor TK50/1 %	2k21
R144	Resistor TK50/1 %	2k21
R145	Resistor TK50/1 %	0R22
R146	Resistor SMD TK50/1 %	not assigned
R147	Resistor SMD TK50/1 %	1k5
R148	Resistor Pot	10k
R149	Resistor SMD TK50/1 %	5R62
R150	Resistor Pot	1k

Part	Description	Value
R151	Resistor SMD TK50/1 %	12R1
R152	Resistor SMD TK50/1 %	not assigned
R153	Resistor SMD TK50/1 %	3R32
R154	Resistor SMD TK50/1 %	not assigned
R155	Resistor SMD TK50/1 %	10k
R156	Resistor SMD TK50/1 %	not assigned
R157	Resistor SMD TK50/1 %	not assigned
R158	Resistor SMD TK50/1 %	not assigned
R159	Resistor	0R47/5W
R160	Resistor	0R47/5W
R200	Resistor Trimmer HC10P	1k/lin
R201	Resistor SMD TK50/1 %	221R
R202	Resistor SMD TK50/1 %	475R
R203	Resistor Trimmer HC10P	47k/lin
R204	Resistor SMD TK50/1 %	10k
R205	Resistor SMD TK50/1 %	100k
R206	Resistor SMD TK50/1 %	not assigned
R207	Resistor SMD TK50/1 %	33k2
R208	Resistor SMD TK50/1 %	4k75
R209	Resistor SMD TK50/1 %	221R
R210	Resistor SMD TK50/1 %	1k
R211	Resistor SMD TK50/1 %	1M
R212	Resistor SMD TK50/1 %	100k
R213	Resistor SMD TK50/1 %	100k
R214	Resistor SMD TK50/1 %	3k32
R215	Resistor SMD TK50/1 %	15k
R216	Resistor SMD TK50/1 %	2k21
R217	Resistor SMD TK50/1 %	1M
R218	Resistor SMD TK50/1 %	not assigned
R219	Resistor SMD TK50/1 %	1M
R220	Resistor SMD TK50/1 %	3R32
R221	Resistor SMD TK50/1 %	2k21
R222	Resistor SMD TK50/1 %	22k1
R223	Resistor SMD TK50/1 %	22k1
R224	Resistor SMD TK50/1 %	6k81
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	10k
R227	Resistor SMD TK50/1 %	10k
R228	Resistor SMD TK50/1 %	150R
R229	Resistor SMD TK50/1 %	150R
R230	Resistor SMD TK50/1 %	not assigned
R231	Resistor SMD TK50/1 %	not assigned
R232	Resistor TK50/1 %	not assigned
R233	Resistor TK50/1 %	1M82
R234	Resistor SMD TK50/1 %	not assigned
R235	Resistor SMD TK50/1 %	not assigned
R236	Resistor SMD TK50/1 %	not assigned
R237	Resistor SMD TK50/1 %	not assigned
R238	Resistor Trimmer HC10P	1k/lin
R239	Resistor SMD TK50/1 %	221R
R240	Resistor SMD TK50/1 %	475R
R241	Resistor Trimmer HC10P	47k/lin
R242	Resistor SMD TK50/1 %	10k
R243	Resistor SMD TK50/1 %	100k
R244	Resistor SMD TK50/1 %	33k2
R245	Resistor SMD TK50/1 %	4k75
R246	Resistor SMD TK50/1 %	221R

(Parts List Circuit Board: TOE 8722.1/2 -V02- continued)

Part	Description	Value
R247	Resistor SMD TK50/1 %	1k
R248	Resistor SMD TK50/1 %	not assigned
R249	Resistor SMD TK50/1 %	1M
R250	Resistor SMD TK50/1 %	100k
R251	Resistor SMD TK50/1 %	100k
R252	Resistor SMD TK50/1 %	3k32
R253	Resistor SMD TK50/1 %	15k
R254	Resistor SMD TK50/1 %	2k21
R255	Resistor SMD TK50/1 %	1M
R256	Resistor SMD TK50/1 %	1M
R257	Resistor SMD TK50/1 %	3R32
R258	Resistor SMD TK50/1 %	3R32
R259	Resistor SMD TK50/1 %	2k21
R260	Resistor SMD TK50/1 %	22k1
R261	Resistor SMD TK50/1 %	22k1
R262	Resistor SMD TK50/1 %	22k1
R263	Resistor SMD TK50/1 %	6k81
R264	Resistor SMD TK50/1 %	10k
R265	Resistor SMD TK50/1 %	10k
R266	Resistor SMD TK50/1 %	10k
R267	Resistor SMD TK50/1 %	150R
R268	Resistor SMD TK50/1 %	150R
R269	Resistor TK50/1 %	not assigned
R270	Resistor TK50/1 %	1M82
R271	Resistor SMD TK50/1 %	3R32
S100	Mains Switch	Type NE 18
S200	U/I-Switch	SWT-627
S201	U/I-Switch	SWT-627
T100	Transistor PNP	BD140
T101	Transistor NPN	TIP3055
T102	Transistor NPN	BD139
T103	Transistor NPN	TIP3055
T104	Transistor NPN	TIP3055
T105	Transistor SMD PNP	BC856B
T106	Transistor PNP	BD140
T107	Transistor PNP	BD140
T108	Transistor PNP	BD140
T109	Transistor NPN	TIP3055
T110	Transistor NPN	BD139
T111	Transistor NPN	TIP3055
T112	Transistor NPN	TIP3055
T113	Transistor SMD PNP	BC856B
T200	Transistor SMD NPN	BC846B
T201	Transistor SMD NPN	BC846B
T202	Transistor SMD NPN	BC846B
T203	Transistor SMD PNP	BC856B
T204	Transistor SMD PNP	BC856B
T205	Transistor SMD PNP	not assigned
T206	Transistor SMD NPN	BC846B
T207	Transistor SMD NPN	not assigned
T208	Transistor SMD NPN	BC846B
T209	Transistor SMD NPN	BC846B
T210	Transistor SMD NPN	BC846B
T211	Transistor SMD PNP	BC856B
T212	Transistor SMD PNP	BC856B

Part	Description	Value
T213	Transistor SMD NPN	BC846B
U100	Voltage Regulator	UA7915
U101	Voltage Regulator	UA7915
U200	3½ Digit A/D Converter	ICL7106CQH
U201	3½ Digit A/D Converter	ICL7106CQH
X100	Control Unit Solder Pins	
X101	Control Unit Solder Pins	
X102	Control Unit Solder Pins	
X200	Control Unit Solder Pins	
XO100	Safety Press-In Socket (blue)	SEB4-R
XO101	Safety Press-In Socket (red)	SEB4-R
XO102	Safety Press-In Socket (blue)	SEB4-R
XO103	Safety Press-In Socket (red)	SEB4-R

Parts List Circuit Board: TOE 8730.2 -V02-

Part	Description	Value
C200	Capacitor SMD	1nF/63V
C201	Capacitor SMD	100nF/63V
C202	Capacitor SMD	1nF/63V
C203	Capacitor Electrolytic	220µF/16V
C204	Capacitor SMD	100nF/63V
C205	Capacitor Electrolytic	10µF/63V
C206	Capacitor SMD	47pF/63V
C207	Capacitor SMD	330pF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor Electrolytic	10µF/63V
C210	Capacitor SMD	not assigned
C211	Capacitor SMD	10nF/63V
C212	Capacitor SMD	10nF/63V
C213	Capacitor SMD	100nF/63V
C214	Capacitor SMD	100nF/63V
D200	Diode SMD	ZMM12V0
D201	Diode SMD	ZMM5V1
D202	Diode SMD	ZMM3V0
D203	Diode SMD	ZMM5V1
D204	Diode SMD	LL4151
D205	Diode SMD	LL4151
D206	Diode SMD	ZMM12V0
D207	Diode SMD	ZMM3V0
D208	Diode SMD	ZMM12V0
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1

(Parts List Circuit Board: TOE 8730.2 -V02- continued)

Part	Description	Value
D214	Diode SMD	ZMM3V0
D215	Diode SMD	LL4151
D216	Diode SMD	LL4151
D217	Diode	1N823A RM 10
R200	Resistor SMD TK50/1 %	6k81
R201	Resistor SMD TK50/1 %	22k1
R202	Resistor SMD TK50/1 %	6k81
R203	Resistor SMD TK50/1 %	4k75
R204	Resistor SMD TK50/1 %	6k81
R205	Resistor SMD TK50/1 %	332k
R206	Resistor SMD TK50/1 %	33k2
R207	Resistor SMD TK50/1 %	10k
R208	Resistor SMD TK50/1 %	10k
R209	Resistor TK50/1 %	14k7
R210	Resistor TK50/1 %	not assigned
R211	Resistor SMD TK50/1 %	475R
R212	Resistor SMD TK50/1 %	22k1
R213	Resistor SMD TK50/1 %	22R1
R214	Resistor SMD TK50/1 %	332R
R215	Resistor SMD TK50/1 %	100R
R216	Resistor SMD TK50/1 %	33k2
R217	Resistor SMD TK50/1 %	1k5
R218	Resistor SMD TK50/1 %	4k75
R219	Resistor SMD TK50/1 %	10k
R220	Resistor SMD TK50/1 %	681R
R221	Resistor SMD TK50/1 %	332k
R222	Resistor Trimmer VC10P	not assigned
R223	Resistor SMD TK50/1 %	1k
R224	Resistor SMD TK50/1 %	15k
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	47k5
R227	Resistor SMD TK50/1 %	4k75
R228	Resistor SMD TK50/1 %	681k
R229	Resistor Trimmer VC10P	not assigned
R230	Resistor SMD TK50/1 %	681R
R231	Resistor SMD TK50/1 %	1k
R232	Resistor SMD TK50/1 %	1k
R233	Resistor SMD TK50/1 %	10k
R234	Resistor Trimmer VC10P	4k7/lin
R235	Resistor SMD TK50/1 %	100R
R236	Resistor SMD TK50/1 %	150R
R237	Resistor TK50/1 %	14k7
R238	Resistor SMD TK50/1 %	15k
R239	Resistor SMD TK50/1 %	4k75
R240	Resistor SMD TK50/1 %	221R
R241	Resistor TK50/1 %	not assigned
R242	Resistor Trimmer VC10P	1k/lin
R243	Resistor SMD TK50/1 %	1k5
R244	Resistor SMD TK50/1 %	4k75
T200	Transistor SMD NPN	BC846B
T201	Transistor FET	BF245B
T202	Transistor SMD PNP	BC856B
T203	Transistor SMD NPN	BC846B
T204	Transistor SMD NPN	BC846B
T205	Transistor SMD NPN	BC846B

Part	Description	Value
U200	Op Amp SMD	UA741CD
U201	Dual Op Amp SMD	UA1458D
U202	Dual Op Amp SMD	UA1458D
X200	Multipoint Connector 20pins	MGZ 1049-1-28-2020

Parts List Circuit Board: TOE 8722.1/2 -V02-

Part	Description	Value
C100	Capacitor MKP	33nF/1000V RM 15
C101	Capacitor MKC4	100nF/250V RM 10
C102	Capacitor Electrolytic EKM	100µF/63V RM 5
C103	Capacitor Electrolytic EKM	100µF/63V RM 5
C104	Capacitor Electrolytic EKM	470µF/40V RM 5
C105	Capacitor Electrolytic EKM	100µF/63V RM 5
C106	Capacitor Electrolytic ELN	4700µF/63V D35
C107	Capacitor SMD	100nF/63V
C108	Capacitor SMD	330pF/63V
C109	Capacitor SMD	100pF/63V
C110	Capacitor SMD	100nF/63V
C111	Capacitor Electrolytic	10µF/63V RM 2.5
C112	Capacitor SMD	100nF/63V
C113	Capacitor SMD	100nF/63V
C114	Capacitor SMD	100nF/63V
C115	Capacitor SMD	100nF/63V
C116	Capacitor SMD	100nF/63V
C117	Capacitor SMD	not assigned
C118	Capacitor SMD	not assigned
C119	Capacitor SMD	not assigned
C120	Capacitor SMD	100nF/63V
C121	Capacitor SMD	not assigned
C122	Capacitor Electrolytic EKM	100µF/63V RM 5
C123	Capacitor SMD	100nF/63V
C124	Capacitor MKC4	220nF/250V RM 15
C125	Capacitor MKC4	100nF/250V RM 10
C126	Capacitor Electrolytic EKM	100µF/63V RM 5
C127	Capacitor Electrolytic EKM	100µF/63V RM 5
C128	Capacitor Electrolytic EKM	470µF/40V RM 5
C129	Capacitor Electrolytic EKM	100µF/63V RM 5
C130	Capacitor Electrolytic EKM	not assigned
C131	Capacitor Electrolytic EKM	not assigned
C132	Capacitor Electrolytic EKM	not assigned
C133	Capacitor Electrolytic ELN	4700µF/63V D35
C134	Capacitor SMD	100nF/63V
C135	Capacitor SMD	100pF/63V
C136	Capacitor SMD	330pF/63V
C137	Capacitor SMD	100nF/63V
C138	Capacitor Electrolytic	10µF/63V RM 2.5
C139	Capacitor SMD	100nF/63V
C140	Capacitor SMD	100nF/63V
C141	Capacitor SMD	100nF/63V
C142	Capacitor SMD	100nF/63V
C143	Capacitor SMD	100nF/63V
C144	Capacitor SMD	not assigned
C145	Capacitor SMD	not assigned
C146	Capacitor SMD	not assigned
C147	Capacitor SMD	not assigned
C148	Capacitor SMD	100nF/63V
C149	Capacitor Electrolytic EKM	100µF/63V RM 5
C150	Capacitor SMD	100nF/63V
C151	Capacitor MKC4	220nF/250V RM 15
C152	Capacitor Electrolytic EKM	not assigned
C200	Capacitor MKS01-SMD	470nF/50V
C201	Capacitor MKS01-SMD	220nF/50V
C202	Capacitor SMD	10nF/63V
C203	Capacitor SMD	100pF/63V

Part	Description	Value
C204	Capacitor MKS01-SMD	220nF/50V
C205	Capacitor MKS01-SMD	470nF/50V
C206	Capacitor MKS01-SMD	220nF/50V
C207	Capacitor SMD	10nF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor MKS01-SMD	220nF/50V
D100	Rectifier Bridge	B80C3700/2200
D101	Diode	P600G
D102	Diode	1N4004 RM 10
D103	Diode	1N4004 RM 10
D104	Diode	ZPY30V RM10
D105	Diode	1N4004 RM 10
D106	Diode	1N4004 RM 10
D107	Diode	BAT46 RM 7.5
D108	Diode	P600G
D109	LED green (5mm)	TLSG5201
D110	LED red (3mm)	LS3360
D111	Diode SMD	LL4151
D112	Diode SMD	LL4151
D113	Rectifier Bridge	B80C3700/2200
D114	Diode	ZPY30V RM 10
D115	Diode	P600G
D116	Diode	not assigned
D117	Diode	1N4004 RM 10
D118	Diode	1N4004 RM 10
D119	Diode	1N4004 RM 10
D120	Diode	1N4004 RM 10
D121	Diode	BAT46 RM 7.5
D122	Diode	P600G
D123	LED red (3mm)	LS3360
D124	Diode	not assigned
D200	LED green (1.8mm)	TLUG2401 OPTION
D201	LED green (1.8mm)	TLUG2401 OPTION
D202	LED green (1.8mm)	TLUG2401 OPTION
D203	LED green (1.8mm)	TLUG2401 OPTION
D204	LED green (1.8mm)	TLUG2401 OPTION
D205	LED green (1.8mm)	TLUG2401 OPTION
D206	LED green (1.8mm)	TLUG2401 OPTION
D207	LED green (1.8mm)	TLUG2401 OPTION
D208	Diode SMD	ZMM12V
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1
D214	Diode SMD	ZMM5V1
D215	Diode SMD	ZMM12V
D216	Diode SMD	LL4151
D217	Diode SMD	LL4151
D218	Diode SMD	LL4151
D219	Diode SMD	LL4151
D220	Diode SMD	ZMM5V1
D221	Diode SMD	ZMM5V1
D222	Diode SMD	not assigned
DS200	Liquid Crystal Display	SLC30061RSC5

(Parts List Circuit Board: TOE 8722.1/2 -V02- continued)

Part	Description	Value
DS201	Liquid Crystal Display	SLC30061RSC5
FS100	Fuse	T1.6L IEC127-2/III
M100	Mains Transformer	BV T8722-36/1
R100	Resistor TK50/1 %	2k49
R101	Resistor TK50/1 %	1k21
R102	Resistor TK50/1 %	1k21
R103	Resistor TK50/1 %	1k21
R104	Resistor TK50/1 %	1k21
R105	Resistor TK50/1 %	0R22
R106	Resistor TK50/1 %	12k1
R107	Resistor	1k/4W
R108	Resistor	0R47/1W
R109	Resistor	0R47/1W
R110	Resistor SMD TK50/1 %	2k21
R111	Resistor SMD TK50/1 %	332R
R112	Resistor TK50/1 %	6k81
R113	Resistor TK50/1 %	6k81
R114	Resistor SMD TK50/1 %	10k
R115	Resistor SMD TK50/1 %	1k5
R116	Resistor Pot	10k
R117	Resistor SMD TK50/1 %	3R32
R118	Resistor SMD TK50/1 %	not assigned
R119	Resistor Pot	1k
R120	Resistor SMD TK50/1 %	12R1
R121	Resistor	0R47/5W
R122	Resistor	not assigned
R123	Resistor SMD TK50/1 %	33R2
R124	Resistor SMD TK50/1 %	10k
R125	Resistor SMD TK50/1 %	33R2
R126	Resistor TK50/1 %	1k
R127	Resistor TK50/1 %	1k
R128	Resistor SMD TK50/1 %	3R32
R129	Resistor TK50/1 %	2k49
R130	Resistor TK50/1 %	1k21
R131	Resistor TK50/1 %	1k21
R132	Resistor TK50/1 %	1k21
R133	Resistor TK50/1 %	1k21
R134	Resistor TK50/1 %	0R22
R135	Resistor SMD TK50/1 %	not assigned
R136	Resistor TK50/1 %	12k1
R137	Resistor	not assigned
R138	Resistor	1k/4W
R139	Resistor	0R47/1W
R140	Resistor	0R47/1W
R141	Resistor SMD TK50/1 %	2k21
R142	Resistor SMD TK50/1 %	332R
R143	Resistor TK50/1 %	6k81
R144	Resistor TK50/1 %	6k81
R145	Resistor TK50/1 %	0R22
R146	Resistor SMD TK50/1 %	3R32
R147	Resistor SMD TK50/1 %	1k5
R148	Resistor Pot	10k
R149	Resistor SMD TK50/1 %	3R32
R150	Resistor Pot	1k

Part	Description	Value
R151	Resistor SMD TK50/1 %	12R1
R152	Resistor SMD TK50/1 %	not assigned
R153	Resistor SMD TK50/1 %	3R32
R154	Resistor SMD TK50/1 %	not assigned
R155	Resistor SMD TK50/1 %	10k
R156	Resistor SMD TK50/1 %	not assigned
R157	Resistor SMD TK50/1 %	not assigned
R158	Resistor SMD TK50/1 %	not assigned
R159	Resistor	not assigned
R160	Resistor	0R47/5W
R200	Resistor Trimmer HC10P	1k/lin
R201	Resistor SMD TK50/1 %	221R
R202	Resistor SMD TK50/1 %	475R
R203	Resistor Trimmer HC10P	47k/lin
R204	Resistor SMD TK50/1 %	10k
R205	Resistor SMD TK50/1 %	100k
R206	Resistor SMD TK50/1 %	not assigned
R207	Resistor SMD TK50/1 %	681R
R208	Resistor SMD TK50/1 %	1k
R209	Resistor SMD TK50/1 %	100R
R210	Resistor SMD TK50/1 %	475R
R211	Resistor SMD TK50/1 %	1M
R212	Resistor SMD TK50/1 %	100k
R213	Resistor SMD TK50/1 %	100k
R214	Resistor SMD TK50/1 %	3k32
R215	Resistor SMD TK50/1 %	15k
R216	Resistor SMD TK50/1 %	2k21
R217	Resistor SMD TK50/1 %	1M
R218	Resistor SMD TK50/1 %	not assigned
R219	Resistor SMD TK50/1 %	1M
R220	Resistor SMD TK50/1 %	3R32
R221	Resistor SMD TK50/1 %	2k21
R222	Resistor SMD TK50/1 %	22k1
R223	Resistor SMD TK50/1 %	22k1
R224	Resistor SMD TK50/1 %	6k81
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	10k
R227	Resistor SMD TK50/1 %	10k
R228	Resistor SMD TK50/1 %	150R
R229	Resistor SMD TK50/1 %	150R
R230	Resistor SMD TK50/1 %	not assigned
R231	Resistor SMD TK50/1 %	not assigned
R232	Resistor TK50/1 %	not assigned
R233	Resistor TK50/1 %	1M82
R234	Resistor SMD TK50/1 %	not assigned
R235	Resistor SMD TK50/1 %	not assigned
R236	Resistor SMD TK50/1 %	not assigned
R237	Resistor SMD TK50/1 %	not assigned
R238	Resistor Trimmer HC10P	1k/lin
R239	Resistor SMD TK50/1 %	221R
R240	Resistor SMD TK50/1 %	475R
R241	Resistor Trimmer HC10P	47k/lin
R242	Resistor SMD TK50/1 %	10k
R243	Resistor SMD TK50/1 %	100k
R244	Resistor SMD TK50/1 %	681R
R245	Resistor SMD TK50/1 %	1k
R246	Resistor SMD TK50/1 %	100R

(Parts List Circuit Board: TOE 8722.1/2 -V02- continued)

Part	Description	Value
R247	Resistor SMD TK50/1 %	475R
R248	Resistor SMD TK50/1 %	not assigned
R249	Resistor SMD TK50/1 %	1M
R250	Resistor SMD TK50/1 %	100k
R251	Resistor SMD TK50/1 %	100k
R252	Resistor SMD TK50/1 %	3k32
R253	Resistor SMD TK50/1 %	15k
R254	Resistor SMD TK50/1 %	2k21
R255	Resistor SMD TK50/1 %	1M
R256	Resistor SMD TK50/1 %	1M
R257	Resistor SMD TK50/1 %	not assigned
R258	Resistor SMD TK50/1 %	3R32
R259	Resistor SMD TK50/1 %	2k21
R260	Resistor SMD TK50/1 %	22k1
R261	Resistor SMD TK50/1 %	22k1
R262	Resistor SMD TK50/1 %	22k1
R263	Resistor SMD TK50/1 %	6k81
R264	Resistor SMD TK50/1 %	10k
R265	Resistor SMD TK50/1 %	10k
R266	Resistor SMD TK50/1 %	10k
R267	Resistor SMD TK50/1 %	150R
R268	Resistor SMD TK50/1 %	150R
R269	Resistor TK50/1 %	not assigned
R270	Resistor TK50/1 %	1M82
R271	Resistor SMD TK50/1 %	not assigned
S100	Mains Switch	Type NE 18
S200	U/I-Switch	SWT-627
S201	U/I-Switch	SWT-627
T100	Transistor PNP	BD140
T101	Transistor NPN	TIP3055
T102	Transistor NPN	BD139
T103	Transistor NPN	TIP3055
T104	Transistor NPN	TIP3055
T105	Transistor SMD PNP	BC856B
T106	Transistor PNP	BD140
T107	Transistor PNP	BD140
T108	Transistor PNP	BD140
T109	Transistor NPN	TIP3055
T110	Transistor NPN	BD139
T111	Transistor NPN	TIP3055
T112	Transistor NPN	TIP3055
T113	Transistor SMD PNP	not assigned
T200	Transistor SMD NPN	BC846B
T201	Transistor SMD NPN	BC846B
T202	Transistor SMD NPN	BC846B
T203	Transistor SMD PNP	BC856B
T204	Transistor SMD PNP	BC856B
T205	Transistor SMD PNP	not assigned
T206	Transistor SMD NPN	BC846B
T207	Transistor SMD NPN	not assigned
T208	Transistor SMD NPN	BC846B
T209	Transistor SMD NPN	BC846B
T210	Transistor SMD NPN	BC846B
T211	Transistor SMD PNP	BC856B
T212	Transistor SMD PNP	BC856B

Part	Description	Value
T213	Transistor SMD NPN	BC846B
U100	Voltage Regulator	UA7915
U101	Voltage Regulator	UA7915
U200	3½ Digit A/D Converter	ICL7106CQH
U201	3½ Digit A/D Converter	ICL7106CQH
X100	Control Unit Solder Pins	
X101	Control Unit Solder Pins	
X102	Control Unit Solder Pins	
X200	Control Unit Solder Pins	
XO100	Safety Press-In Socket (blue)	SEB4-R
XO101	Safety Press-In Socket (red)	SEB4-R
XO102	Safety Press-In Socket (blue)	SEB4-R
XO103	Safety Press-In Socket (red)	SEB4-R

Parts List Circuit Board: TOE 8730.2 -V02-

Part	Description	Value
C200	Capacitor SMD	1nF/63V
C201	Capacitor SMD	100nF/63V
C202	Capacitor SMD	1nF/63V
C203	Capacitor Electrolytic	220µF/16V RM 3.5
C204	Capacitor SMD	100nF/63V
C205	Capacitor Electrolytic	10µF/63V RM 2.5
C206	Capacitor SMD	47pF/63V
C207	Capacitor SMD	330pF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor Electrolytic	10µF/63V RM 2.5
C210	Capacitor SMD	not assigned
C211	Capacitor SMD	10nF/63V
C212	Capacitor SMD	10nF/63V
C213	Capacitor SMD	100nF/63V
C214	Capacitor SMD	100nF/63V
D200	Diode SMD	ZMM12V0
D201	Diode SMD	ZMM5V1
D202	Diode SMD	ZMM3V0
D203	Diode SMD	ZMM5V1
D204	Diode SMD	LL4151
D205	Diode SMD	LL4151
D206	Diode SMD	ZMM12V0
D207	Diode SMD	ZMM3V0
D208	Diode SMD	ZMM12V0
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1

(Parts List Circuit Board: TOE 8730.2 -V02- continued)

Part	Description	Value
D214	Diode SMD	ZMM3V0
D215	Diode SMD	LL4151
D216	Diode SMD	LL4151
D217	Diode	1N823A RM 10
R200	Resistor SMD TK50/1 %	6k81
R201	Resistor SMD TK50/1 %	22k1
R202	Resistor SMD TK50/1 %	6k81
R203	Resistor SMD TK50/1 %	4k75
R204	Resistor SMD TK50/1 %	6k81
R205	Resistor SMD TK50/1 %	332k
R206	Resistor SMD TK50/1 %	33k2
R207	Resistor SMD TK50/1 %	10k
R208	Resistor SMD TK50/1 %	10k
R209	Resistor TK50/1 %	not assigned
R210	Resistor TK50/1 %	130k
R211	Resistor SMD TK50/1 %	475R
R212	Resistor SMD TK50/1 %	22k1
R213	Resistor SMD TK50/1 %	22R1
R214	Resistor SMD TK50/1 %	332R
R215	Resistor SMD TK50/1 %	100R
R216	Resistor SMD TK50/1 %	33k2
R217	Resistor SMD TK50/1 %	1k5
R218	Resistor SMD TK50/1 %	4k75
R219	Resistor SMD TK50/1 %	10k
R220	Resistor SMD TK50/1 %	681R
R221	Resistor SMD TK50/1 %	332k
R222	Resistor Trimmer VC10P	not assigned
R223	Resistor SMD TK50/1 %	1k
R224	Resistor SMD TK50/1 %	15k
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	47k5
R227	Resistor SMD TK50/1 %	4k75
R228	Resistor SMD TK50/1 %	681k
R229	Resistor Trimmer VC10P	not assigned
R230	Resistor SMD TK50/1 %	681R
R231	Resistor SMD TK50/1 %	1k
R232	Resistor SMD TK50/1 %	1k
R233	Resistor SMD TK50/1 %	10k
R234	Resistor Trimmer VC10P	4k7/lin
R235	Resistor SMD TK50/1 %	100R
R236	Resistor SMD TK50/1 %	150R
R237	Resistor TK50/1 %	2k49
R238	Resistor SMD TK50/1 %	15k
R239	Resistor SMD TK50/1 %	4k75
R240	Resistor SMD TK50/1 %	221R
R241	Resistor TK50/1 %	not assigned
R242	Resistor Trimmer VC10P	470R/lin
R243	Resistor SMD TK50/1 %	1k5
R244	Resistor SMD TK50/1 %	4k75
T200	Transistor SMD NPN	BC846B
T201	Transistor FET	BF245B
T202	Transistor SMD PNP	BC856B
T203	Transistor SMD NPN	BC846B
T204	Transistor SMD NPN	BC846B
T205	Transistor SMD NPN	BC846B

Part	Description	Value
U200	Op Amp SMD	UA741CD
U201	Dual Op Amp SMD	UA1458D
U202	Dual Op Amp SMD	UA1458D
X200	Multipoint Connector 20pins	MGZ 1049-1-28-2020

Parts List Circuit Board: TOE 8722.1/2/3 -V02-

Part	Description	Value
C100	Capacitor MKP	33nF/1000V RM 15
C101	Capacitor MKC4	100nF/250V RM 10
C102	Capacitor Electrolytic EKM	100µF/63V RM 5
C103	Capacitor Electrolytic EKM	100µF/63V RM 5
C104	Capacitor Electrolytic EKM	470µF/40V RM 5
C105	Capacitor Electrolytic EKM	100µF/63V RM 5
C106	Capacitor Electrolytic ELN	4700µF/63V D35
C107	Capacitor SMD	100nF/63V
C108	Capacitor SMD	330pF/63V
C109	Capacitor SMD	100pF/63V
C110	Capacitor SMD	100nF/63V
C111	Capacitor Electrolytic	10µF/63V RM 2.5
C112	Capacitor SMD	100nF/63V
C113	Capacitor SMD	100nF/63V
C114	Capacitor SMD	100nF/63V
C115	Capacitor SMD	100nF/63V
C116	Capacitor SMD	100nF/63V
C117	Capacitor SMD	not assigned
C118	Capacitor SMD	not assigned
C119	Capacitor SMD	not assigned
C120	Capacitor SMD	100nF/63V
C121	Capacitor SMD	not assigned
C122	Capacitor Electrolytic EKM	100µF/63V RM 5
C123	Capacitor SMD	100nF/63V
C124	Capacitor MKC4	220nF/250V RM 15
C125	Capacitor MKC4	100nF/250V RM 10
C126	Capacitor Electrolytic EKM	not assigned
C127	Capacitor Electrolytic EKM	not assigned
C128	Capacitor Electrolytic EKM	not assigned
C129	Capacitor Electrolytic EKM	not assigned
C130	Capacitor Electrolytic EKM	220µF/16V RM 3.5
C131	Capacitor Electrolytic EKM	220µF/16V RM 3.5
C132	Capacitor Electrolytic EKM	470µF/40V RM 5
C133	Capacitor Electrolytic ELN	22mF/16V D30
C134	Capacitor SMD	100nF/63V
C135	Capacitor SMD	100pF/63V
C136	Capacitor SMD	330pF/63V
C137	Capacitor SMD	100nF/63V
C138	Capacitor Electrolytic	10µF/63V RM 2.5
C139	Capacitor SMD	not assigned
C140	Capacitor SMD	not assigned
C141	Capacitor SMD	not assigned
C142	Capacitor SMD	100nF/63V
C143	Capacitor SMD	not assigned
C144	Capacitor SMD	not assigned
C145	Capacitor SMD	not assigned
C146	Capacitor SMD	not assigned
C147	Capacitor SMD	not assigned
C148	Capacitor SMD	100nF/63V
C149	Capacitor Electrolytic EKM	470uF/40V RM 5
C150	Capacitor SMD	100nF/63V
C151	Capacitor MKC4	220nF/250V RM 15
C152	Capacitor Electrolytic EKM	not assigned
C200	Capacitor MKS01-SMD	470nF/50V
C201	Capacitor MKS01-SMD	220nF/50V
C202	Capacitor SMD	10nF/63V
C203	Capacitor SMD	100pF/63V

Part	Description	Value
C204	Capacitor MKS01-SMD	220nF/50V
C205	Capacitor MKS01-SMD	470nF/50V
C206	Capacitor MKS01-SMD	220nF/50V
C207	Capacitor SMD	10nF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor MKS01-SMD	220nF/50V
C300	Capacitor SMD	100nF/63V
C301	Capacitor SMD	100nF/63V
C302	Capacitor SMD	10nF/63V
C303	Capacitor SMD	10nF/63V
C304	Capacitor SMD	not assigned
C305	Capacitor SMD	not assigned
C306	Capacitor SMD	100nF/63V
C307	Capacitor SMD	100nF/63V
D100	Rectifier Bridge	B80C3700/2200
D101	Diode	P600G
D102	Diode	1N4004 RM 10
D103	Diode	1N4004 RM 10
D104	Diode	ZPY30V RM10
D105	Diode	1N4004 RM 10
D106	Diode	1N4004 RM 10
D107	Diode	BAT46 RM 7.5
D108	Diode	P600G
D109	LED green (5mm)	TLSG5201
D110	LED red (3mm)	LS3360
D111	Diode SMD	LL4151
D112	Diode SMD	LL4151
D113	Rectifier Bridge	B80C3700/2200
D114	Diode	not assigned
D115	Diode	not assigned
D116	Diode	1N4004 RM 10
D117	Diode	1N4004 RM 10
D118	Diode	1N4004 RM 10
D119	Diode	not assigned
D120	Diode	1N4004 RM 10
D121	Diode	BAT46 RM 7.5
D122	Diode	P600G
D123	LED red (3mm)	LS3360
D124	Diode	not assigned
D200	LED green (1.8mm)	TLUG2401 OPTION
D201	LED green (1.8mm)	TLUG2401 OPTION
D202	LED green (1.8mm)	TLUG2401 OPTION
D203	LED green (1.8mm)	TLUG2401 OPTION
D204	LED green (1.8mm)	TLUG2401 OPTION
D205	LED green (1.8mm)	TLUG2401 OPTION
D206	LED green (1.8mm)	TLUG2401 OPTION
D207	LED green (1.8mm)	TLUG2401 OPTION
D208	Diode SMD	ZMM12V
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1
D214	Diode SMD	ZMM5V1
D215	Diode SMD	ZMM5V1
D216	Diode SMD	LL4151

(Parts List Circuit Board: TOE 8722.1/2/3 -V02- continued)

Part	Description	Value
D217	Diode SMD	LL4151
D218	Diode SMD	LL4151
D219	Diode SMD	LL4151
D220	Diode SMD	ZMM5V1
D221	Diode SMD	ZMM5V1
D222	Diode SMD	ZMM3V
D300	Diode SMD	LL4151
D301	Diode SMD	LL4151
D302	Diode SMD	1N823A RM 10
D303	Diode SMD	LL4151
D304	Diode SMD	LL4151
DS200	Liquid Crystal Display	SLC30061RSC5
DS201	Liquid Crystal Display	SLC30061RSC5
FS100	Fuse	T1.6L IEC127-2/III
M100	Mains Transformer	BV T8722-8
R100	Resistor TK50/1 %	2k49
R101	Resistor TK50/1 %	1k21
R102	Resistor TK50/1 %	1k21
R103	Resistor TK50/1 %	1k21
R104	Resistor TK50/1 %	1k21
R105	Resistor TK50/1 %	68R1
R106	Resistor TK50/1 %	12k1
R107	Resistor	1k/4W
R108	Resistor	0R47/1W
R109	Resistor	0R47/1W
R110	Resistor SMD TK50/1 %	2k21
R111	Resistor SMD TK50/1 %	332R
R112	Resistor TK50/1 %	6k81
R113	Resistor TK50/1 %	6k81
R114	Resistor SMD TK50/1 %	10k
R115	Resistor SMD TK50/1 %	1k5
R116	Resistor Pot	10k
R117	Resistor SMD TK50/1 %	3R32
R118	Resistor SMD TK50/1 %	not assigned
R119	Resistor Pot	1k
R120	Resistor SMD TK50/1 %	12R1
R121	Resistor	0R47/5W
R122	Resistor	not assigned
R123	Resistor SMD TK50/1 %	33R2
R124	Resistor SMD TK50/1 %	10k
R125	Resistor SMD TK50/1 %	33R2
R126	Resistor TK50/1 %	1k
R127	Resistor TK50/1 %	1k
R128	Resistor SMD TK50/1 %	not assigned
R129	Resistor TK50/1 %	not assigned
R130	Resistor TK50/1 %	not assigned
R131	Resistor TK50/1 %	not assigned
R132	Resistor TK50/1 %	not assigned
R133	Resistor TK50/1 %	not assigned
R134	Resistor TK50/1 %	not assigned
R135	Resistor SMD TK50/1 %	3R32
R136	Resistor TK50/1 %	1k
R137	Resistor	470R/1W

Part	Description	Value
R138	Resistor	not assigned
R139	Resistor	0R33/1W
R140	Resistor	0R33/1W
R141	Resistor SMD TK50/1 %	2k21
R142	Resistor SMD TK50/1 %	332R
R143	Resistor TK50/1 %	not assigned
R144	Resistor TK50/1 %	not assigned
R145	Resistor TK50/1 %	not assigned
R146	Resistor SMD TK50/1 %	3R32
R147	Resistor SMD TK50/1 %	not assigned
R148	Resistor Pot	10k
R149	Resistor SMD TK50/1 %	not assigned
R150	Resistor Pot	1k
R151	Resistor SMD TK50/1 %	12R1
R152	Resistor SMD TK50/1 %	3R32
R153	Resistor SMD TK50/1 %	not assigned
R154	Resistor SMD TK50/1 %	not assigned
R155	Resistor SMD TK50/1 %	not assigned
R156	Resistor SMD TK50/1 %	not assigned
R157	Resistor SMD TK50/1 %	3R32
R158	Resistor SMD TK50/1 %	not assigned
R159	Resistor	0R47/5W
R160	Resistor	0R47/5W
R200	Resistor Trimmer HC10P	1k/lin
R201	Resistor SMD TK50/1 %	221R
R202	Resistor SMD TK50/1 %	475R
R203	Resistor Trimmer HC10P	47k/lin
R204	Resistor SMD TK50/1 %	10k
R205	Resistor SMD TK50/1 %	100k
R206	Resistor SMD TK50/1 %	not assigned
R207	Resistor SMD TK50/1 %	681R
R208	Resistor SMD TK50/1 %	1k
R209	Resistor SMD TK50/1 %	100R
R210	Resistor SMD TK50/1 %	475R
R211	Resistor SMD TK50/1 %	1M
R212	Resistor SMD TK50/1 %	100k
R213	Resistor SMD TK50/1 %	100k
R214	Resistor SMD TK50/1 %	3k32
R215	Resistor SMD TK50/1 %	15k
R216	Resistor SMD TK50/1 %	2k21
R217	Resistor SMD TK50/1 %	1M
R218	Resistor SMD TK50/1 %	not assigned
R219	Resistor SMD TK50/1 %	1M
R220	Resistor SMD TK50/1 %	3R32
R221	Resistor SMD TK50/1 %	2k21
R222	Resistor SMD TK50/1 %	22k1
R223	Resistor SMD TK50/1 %	22k1
R224	Resistor SMD TK50/1 %	6k81
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	10k
R227	Resistor SMD TK50/1 %	10k
R228	Resistor SMD TK50/1 %	150R
R229	Resistor SMD TK50/1 %	150R
R230	Resistor SMD TK50/1 %	not assigned
R231	Resistor SMD TK50/1 %	150R
R232	Resistor TK50/1 %	not assigned
R233	Resistor TK50/1 %	1M82

(Parts List Circuit Board: TOE 8722.1/2/3 -V02- continued)

Part	Description	Value
R234	Resistor SMD TK50/1 %	not assigned
R235	Resistor SMD TK50/1 %	not assigned
R236	Resistor SMD TK50/1 %	not assigned
R237	Resistor SMD TK50/1 %	not assigned
R238	Resistor Trimmer HC10P	1k/lin
R239	Resistor SMD TK50/1 %	221R
R240	Resistor SMD TK50/1 %	475R
R241	Resistor Trimmer HC10P	47k/lin
R242	Resistor SMD TK50/1 %	10k
R243	Resistor SMD TK50/1 %	100k
R244	Resistor SMD TK50/1 %	33k2
R245	Resistor SMD TK50/1 %	4k75
R246	Resistor SMD TK50/1 %	221R
R247	Resistor SMD TK50/1 %	1k
R248	Resistor SMD TK50/1 %	not assigned
R249	Resistor SMD TK50/1 %	1M
R250	Resistor SMD TK50/1 %	100k
R251	Resistor SMD TK50/1 %	100k
R252	Resistor SMD TK50/1 %	3k32
R253	Resistor SMD TK50/1 %	15k
R254	Resistor SMD TK50/1 %	2k21
R255	Resistor SMD TK50/1 %	1M
R256	Resistor SMD TK50/1 %	1M
R257	Resistor SMD TK50/1 %	3R32
R258	Resistor SMD TK50/1 %	not assigned
R259	Resistor SMD TK50/1 %	2k21
R260	Resistor SMD TK50/1 %	22k1
R261	Resistor SMD TK50/1 %	22k1
R262	Resistor SMD TK50/1 %	22k1
R263	Resistor SMD TK50/1 %	6k81
R264	Resistor SMD TK50/1 %	10k
R265	Resistor SMD TK50/1 %	10k
R266	Resistor SMD TK50/1 %	10k
R267	Resistor SMD TK50/1 %	150R
R268	Resistor SMD TK50/1 %	150R
R269	Resistor TK50/1 %	not assigned
R270	Resistor TK50/1 %	not assigned
R271	Resistor SMD TK50/1 %	not assigned
R300	Resistor SMD TK50/1 %	221R
R301	Resistor SMD TK50/1 %	10R
R302	Resistor SMD TK50/1 %	68R1
R303	Resistor SMD TK50/1 %	221R
R304	Resistor SMD TK50/1 %	12R1
R305	Resistor Trimmer VC10P	2k2/lin
R306	Resistor SMD TK50/1 %	4k75
R307	Resistor SMD TK50/1 %	4k75
R308	Resistor SMD TK50/1 %	10k
R309	Resistor SMD TK50/1 %	1k
R310	Resistor SMD TK50/1 %	22k1
R311	Resistor SMD TK50/1 %	22k1
R312	Resistor SMD TK50/1 %	6k81
R313	Resistor SMD TK50/1 %	33k2
R314	Resistor SMD TK50/1 %	475R
R315	Resistor SMD TK50/1 %	6k81
R316	Resistor SMD TK50/1 %	475R
R317	Resistor SMD TK50/1 %	6k81
R318	Resistor Trimmer VC10P	10k/lin

Part	Description	Value
R319	Resistor SMD TK50/1 %	15k
R320	Resistor SMD TK50/1 %	15k
R321	Resistor SMD TK50/1 %	10k
R322	Resistor SMD TK50/1 %	33R2
R323	Resistor SMD TK50/1 %	10k
R324	Resistor SMD TK50/1 %	475R
S100	Maina Switch	Type NE 18
S200	U/I-Switch	SWT-627
S201	U/I-Switch	SWT-627
T100	Transistor PNP	BD140
T101	Transistor NPN	TIP3055
T102	Transistor NPN	BD139
T103	Transistor NPN	TIP3055
T104	Transistor NPN	TIP3055
T105	Transistor SMD PNP	BC856B
T106	Transistor PNP	BD140
T107	Transistor PNP	BD140
T108	Transistor PNP	not assigned
T109	Transistor NPN	not assigned
T110	Transistor NPN	BD139
T111	Transistor NPN	TIP3055
T112	Transistor NPN	TIP3055
T113	Transistor SMD PNP	not assigned
T200	Transistor SMD NPN	BC846B
T201	Transistor SMD NPN	BC846B
T202	Transistor SMD NPN	BC846B
T203	Transistor SMD PNP	BC856B
T204	Transistor SMD PNP	BC856B
T205	Transistor SMD PNP	not assigned
T206	Transistor SMD NPN	BC846B
T207	Transistor SMD NPN	not assigned
T208	Transistor SMD NPN	BC846B
T209	Transistor SMD NPN	BC846B
T210	Transistor SMD NPN	BC846B
T211	Transistor SMD PNP	BC856B
T212	Transistor SMD PNP	BC856B
T213	Transistor SMD NPN	BC846B
T300	Transistor FET	BF245B
T301	Transistor SMD PNP	BC856B
T302	Transistor SMD PNP	BC856B
T303	Transistor SMD NPN	BC846B
T304	Transistor SMD NPN	BC846B
T305	Transistor SMD NPN	BC846B
T306	Transistor SMD NPN	BC846B
U100	Voltage Regulator	UA7915
U101	Voltage Regulator	UA7905
U200	3½ Digit A/D Converter	ICL7106CQH
U201	3½ Digit A/D Converter	ICL7106CQH
U300	Dual Op Amp SMD	UA1458D
X100	Control Unit Solder Pins	
X101	Control Unit Solder Pins	
X102	Control Unit Solder Pins	
X200	Control Unit Solder Pins	

(Parts List Circuit Board: TOE 8722.1/2/3 -V02- continued)

Part	Description	Value
X300	Multipoint Connector 20pins	MGZ 1049-1-28-2020
XO100	Safety Press-In Socket (blue)	SEB4-R
XO101	Safety Press-In Socket (red)	SEB4-R
XO102	Safety Press-In Socket (blue)	SEB4-R
XO103	Safety Press-In Socket (red)	SEB4-R

Parts List Circuit Board: TOE 8730.2 -V02-

Part	Description	Value
C200	Capacitor SMD	1nF/63V
C201	Capacitor SMD	100nF/63V
C202	Capacitor SMD	1nF/63V
C203	Capacitor Electrolytic	220µF/16V RM 3.5
C204	Capacitor SMD	100nF/63V
C205	Capacitor Electrolytic	10µF/63V RM 2.5
C206	Capacitor SMD	47pF/63V
C207	Capacitor SMD	330pF/63V
C208	Capacitor SMD	100pF/63V
C209	Capacitor Electrolytic	10µF/63V RM 2.5
C210	Capacitor SMD	not assigned
C211	Capacitor SMD	10nF/63V
C212	Capacitor SMD	10nF/63V
C213	Capacitor SMD	100nF/63V
C214	Capacitor SMD	100nF/63V
D200	Diode SMD	ZMM12V0
D201	Diode SMD	ZMM5V1
D202	Diode SMD	ZMM3V0
D203	Diode SMD	ZMM5V1
D204	Diode SMD	LL4151
D205	Diode SMD	LL4151
D206	Diode SMD	ZMM12V0
D207	Diode SMD	ZMM3V0
D208	Diode SMD	ZMM12V0
D209	Diode SMD	LL4151
D210	Diode SMD	LL4151
D211	Diode SMD	LL4151
D212	Diode SMD	LL4151
D213	Diode SMD	ZMM5V1
D214	Diode SMD	ZMM3V0
D215	Diode SMD	LL4151
D216	Diode SMD	LL4151
D217	Diode	1N823A RM 10
R200	Resistor SMD TK50/1 %	6k81
R201	Resistor SMD TK50/1 %	22k1
R202	Resistor SMD TK50/1 %	6k81
R203	Resistor SMD TK50/1 %	4k75

Part	Description	Value
R204	Resistor SMD TK50/1 %	6k81
R205	Resistor SMD TK50/1 %	332k
R206	Resistor SMD TK50/1 %	33k2
R207	Resistor SMD TK50/1 %	10k
R208	Resistor SMD TK50/1 %	10k
R209	Resistor TK50/1 %	not assigned
R210	Resistor TK50/1 %	130k
R211	Resistor SMD TK50/1 %	475R
R212	Resistor SMD TK50/1 %	22k1
R213	Resistor SMD TK50/1 %	22R1
R214	Resistor SMD TK50/1 %	332R
R215	Resistor SMD TK50/1 %	100R
R216	Resistor SMD TK50/1 %	33k2
R217	Resistor SMD TK50/1 %	1k5
R218	Resistor SMD TK50/1 %	4k75
R219	Resistor SMD TK50/1 %	10k
R220	Resistor SMD TK50/1 %	681R
R221	Resistor SMD TK50/1 %	332k
R222	Resistor Trimmer VC10P	not assigned
R223	Resistor SMD TK50/1 %	1k
R224	Resistor SMD TK50/1 %	15k
R225	Resistor SMD TK50/1 %	10k
R226	Resistor SMD TK50/1 %	47k5
R227	Resistor SMD TK50/1 %	4k75
R228	Resistor SMD TK50/1 %	681k
R229	Resistor Trimmer VC10P	not assigned
R230	Resistor SMD TK50/1 %	681R
R231	Resistor SMD TK50/1 %	1k
R232	Resistor SMD TK50/1 %	1k
R233	Resistor SMD TK50/1 %	10k
R234	Resistor Trimmer VC10P	4k7/lin
R235	Resistor SMD TK50/1 %	100R
R236	Resistor SMD TK50/1 %	150R
R237	Resistor TK50/1 %	2k49
R238	Resistor SMD TK50/1 %	15k
R239	Resistor SMD TK50/1 %	4k75
R240	Resistor SMD TK50/1 %	221R
R241	Resistor TK50/1 %	not assigned
R242	Resistor Trimmer VC10P	470R/lin
R243	Resistor SMD TK50/1 %	1k5
R244	Resistor SMD TK50/1 %	4k75
T200	Transistor SMD NPN	BC846B
T201	Transistor FET	BF245B
T202	Transistor SMD PNP	BC856B
T203	Transistor SMD NPN	BC846B
T204	Transistor SMD NPN	BC846B
T205	Transistor SMD NPN	BC846B
U200	Op Amp SMD	UA741CD
U201	Dual Op Amp SMD	UA1458D
U202	Dual Op Amp SMD	UA1458D
X200	Multipoint Connector 20pins	MGZ 1049-1-28-2020