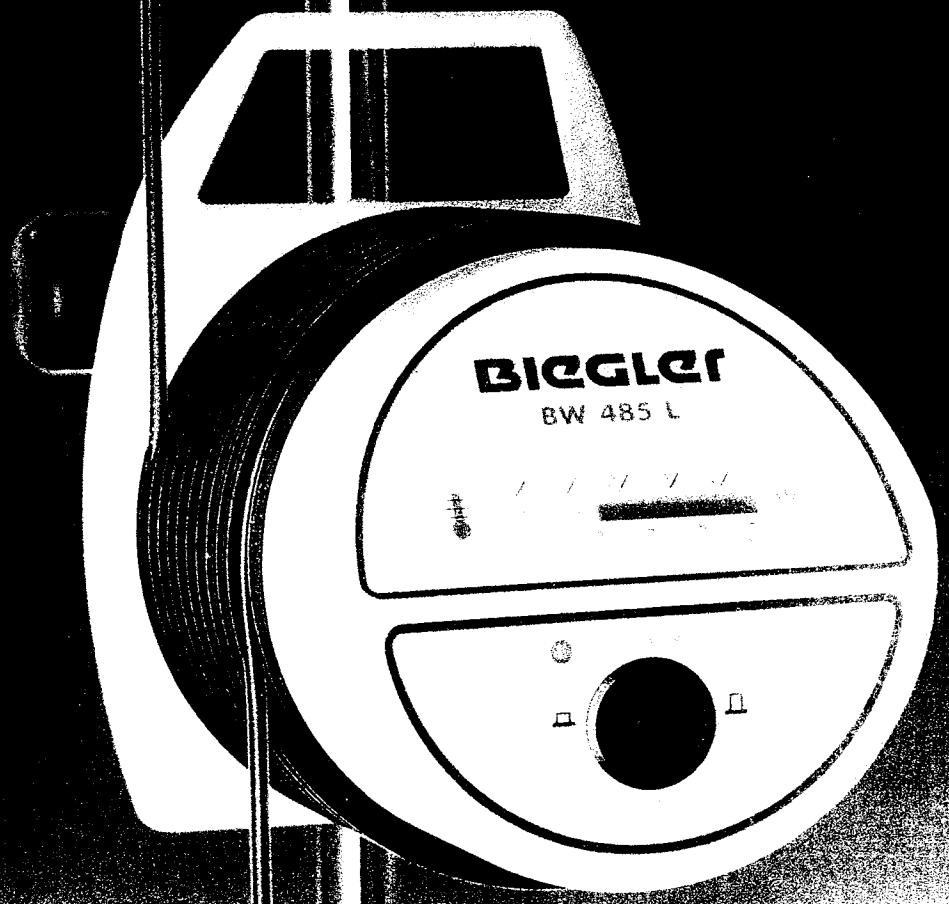
BW 485/L

Blut- und Infusionswärmer
Blood and infusion warmer



- anwenderfreundlich
- mikroprozessorgesteuert
- hohe Durchflußraten
- geringer Energieverbrauch
- Untertemperaturalarm

- user friendly
- microprocessor controlled
- high transfusion rates
- minimized energy consumption

Service Manual

QM-System nach DIN EN ISO
TÜV PRODUCT SERVICE

EG
(DR) 5

1. CONTINUOUS TEST

1.1 General

- Start-up
- After approx. 15 min. measure the temperature at the heat exchanger
- After 24 h measure the temperature again

During this test the initial and final values must be within the tolerance range and the measurements must be taken under the same ambient conditions.

The final temperature may deviate from the initial value by ±0.5°C.

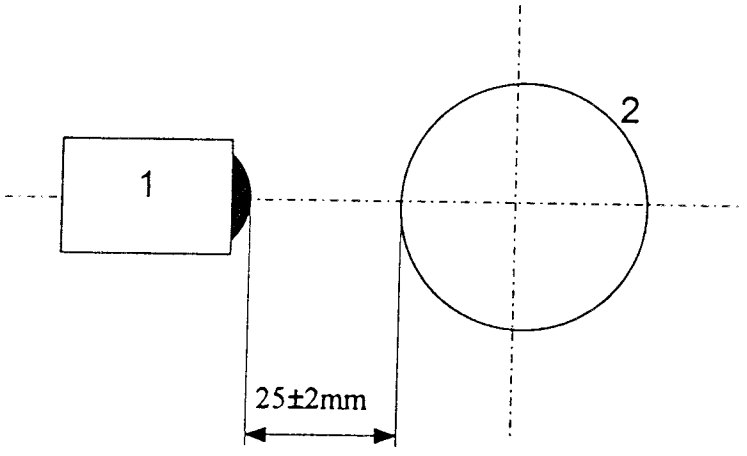


Fig. 1.1.1Measurement set-up

1 IR thermometer
2 Heat exchanger (BW ring)

Measuring instrument used:	HORIBA infrared thermometer IT 330 Accuracy: ±1%, ±1 digit at full scale Emission: black body

Temperature Adjustment

- Connect adapter box to computer and start terminal program (e.g.Procomm)
- Connect adapter box to BW 485 CON2 (on PCB)
- Set switch to „TEST" position. Device then emits an audio signal at regular intervals
- Preset spindle trimmer:

P3	Gain 1	right-hand end position
P6	Gain 2	left-hand end position
P5	Alarm limit 41°C	left-hand end position
P4	Set temperature	right-hand end position

- Switch on BW 485
- Set temperature controller (P4) to required temperature (display on PC: „Set"). For fast presetting, press „SET" key on adapter box in order to display set temperature on bar chart.
- Set current externally measured heater temperature with spindle trimmer P6 (display on PC: „SENS2")
- Turn spindle trimmer P3 slowly to left until device starts to heat up. When heating is on L13 is illuminated. Slowly increase heater temperature to set value.

The two temperatures displayed on the PC as „Sens1" and „Sens2" must be as close to each other as possible (± 0.3) otherwise an alarm is triggered.

The difference between the two temperatures is displayed on the PC under „Diff1". Because measurements are taken at different points, the internally and externally measured temperatures may deviate slightly from one another.

Setting the high temperature alarm limit:

1. Set switch in adapter box to „Test" position
2. Set temperature to 41,5°C with P4 and wait until temperature is constant
3. Turn P5 s l o w l y to right until relays drop out and alarm is triggered
4. Let device cool down. Heat it up again and check cut-off point again
5. Increase set temperature (39°C) s l o w l y to 41°C and control alarm shut off
6. Reset at previous temperature

4. Temperature Adjustment

Service interface:

The BW 485 is equipped with a service interface. This serial interface outputs a range of data which can be very useful for trimming and trouble shooting.
Connect the BW485 to your PC or terminal with the adapter box. The data can be displayed using any common terminal program e.g. Procomm.
Data format: 4800,n,8,1

Key to serial output data:

Set	Set value
Sens2	Temperature measured by Sensor2 (temperature signal for display and 41°C safety cut-off)
Sens1	Temperature measured by Sensor 1 (control temperature)
Diff	Difference between set and actual (only when actual < set, otherwise 00.0)
P%	Current heating output in % of maximum power-rating
Diff 1	Difference between Sens1 and Sens2
Err	Error counter
t	Time until low temperature alarm is activated (0=on)

Error codes:

The BW485 indicates various errors and displays them on the bar chart as follows:

■□□□□□□□□ Low temperature alarm (1st LED flashes)

□■□□□□□□■ Temperature difference between Sens1 and Sens2>0.5°C

□□■□□□□□■ Sens1>41°C

□□□■□□□□■ Sens2>41°C

BW 485

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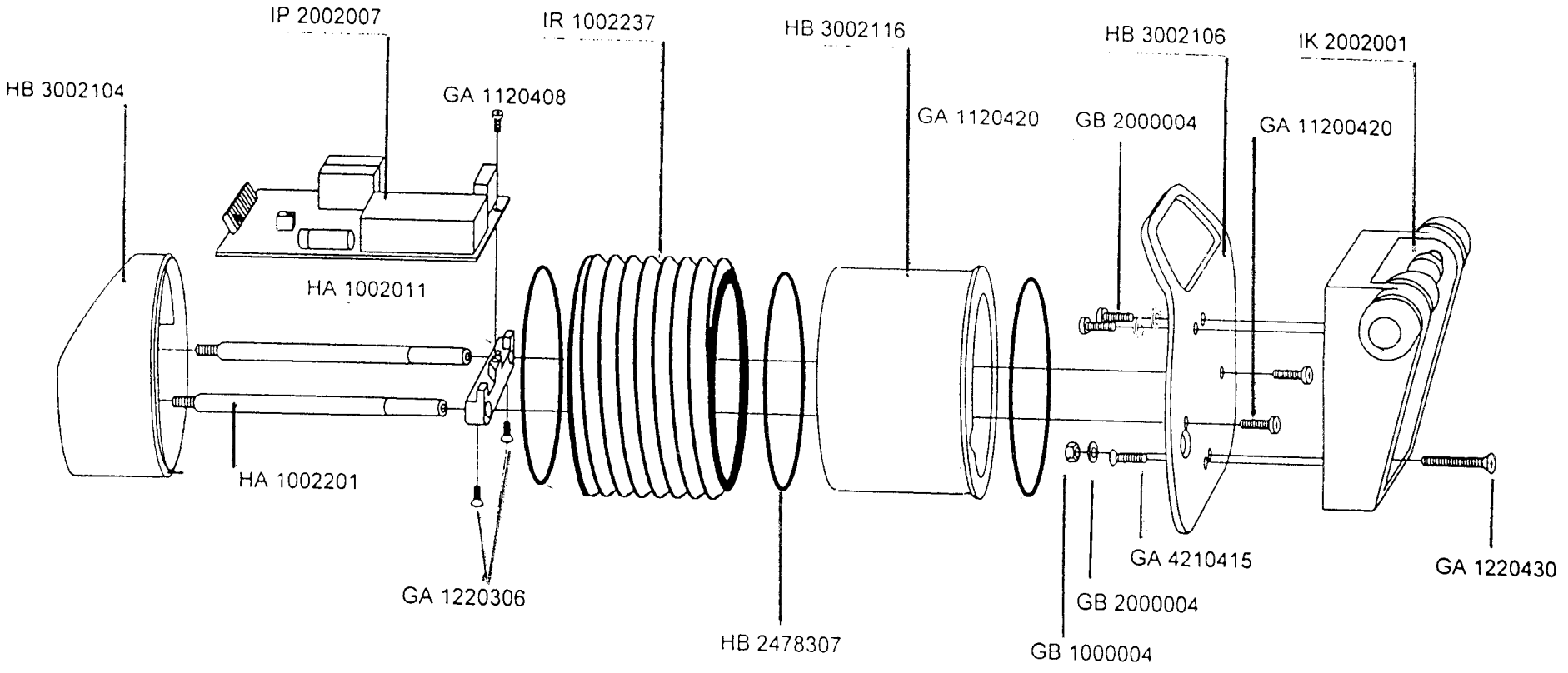
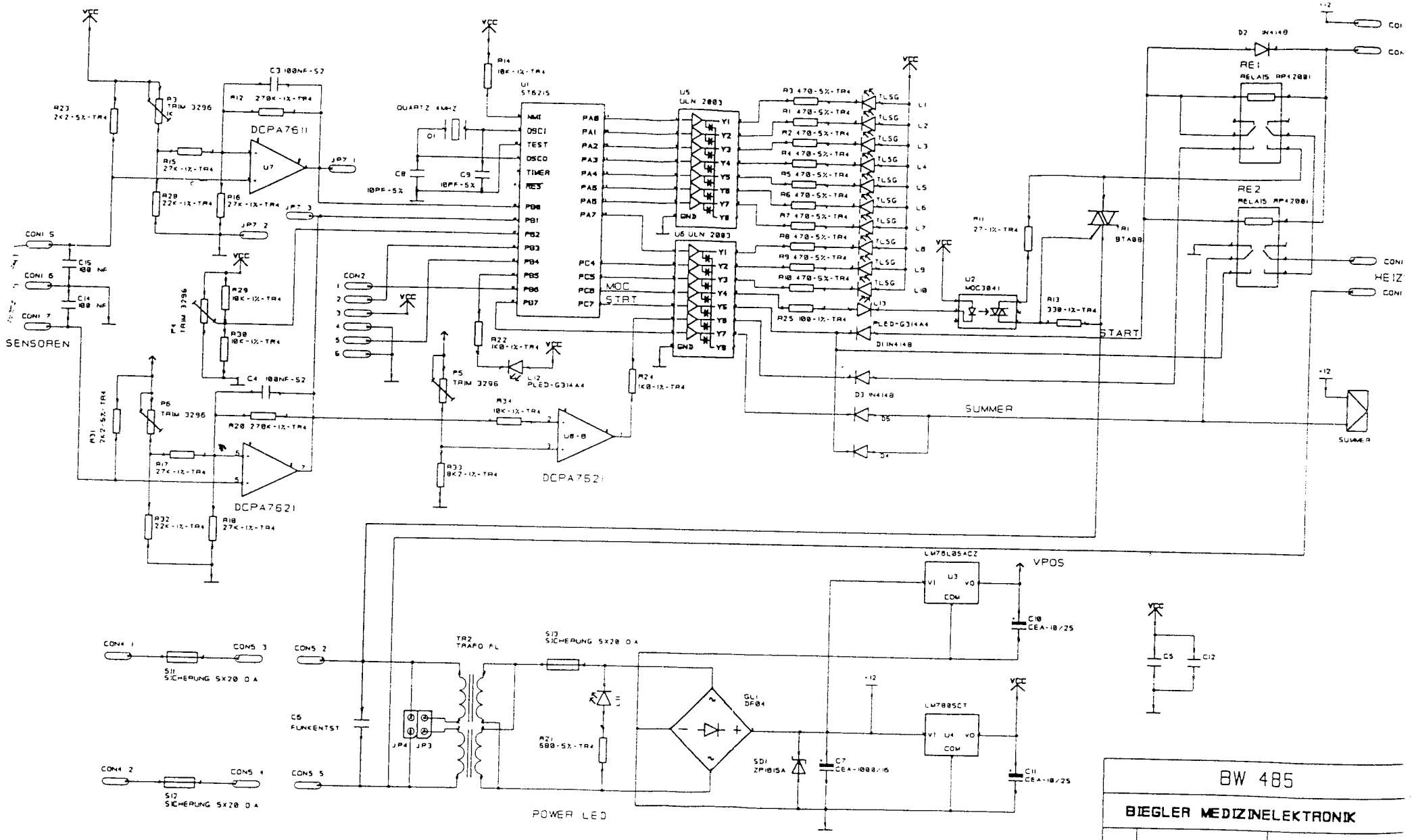
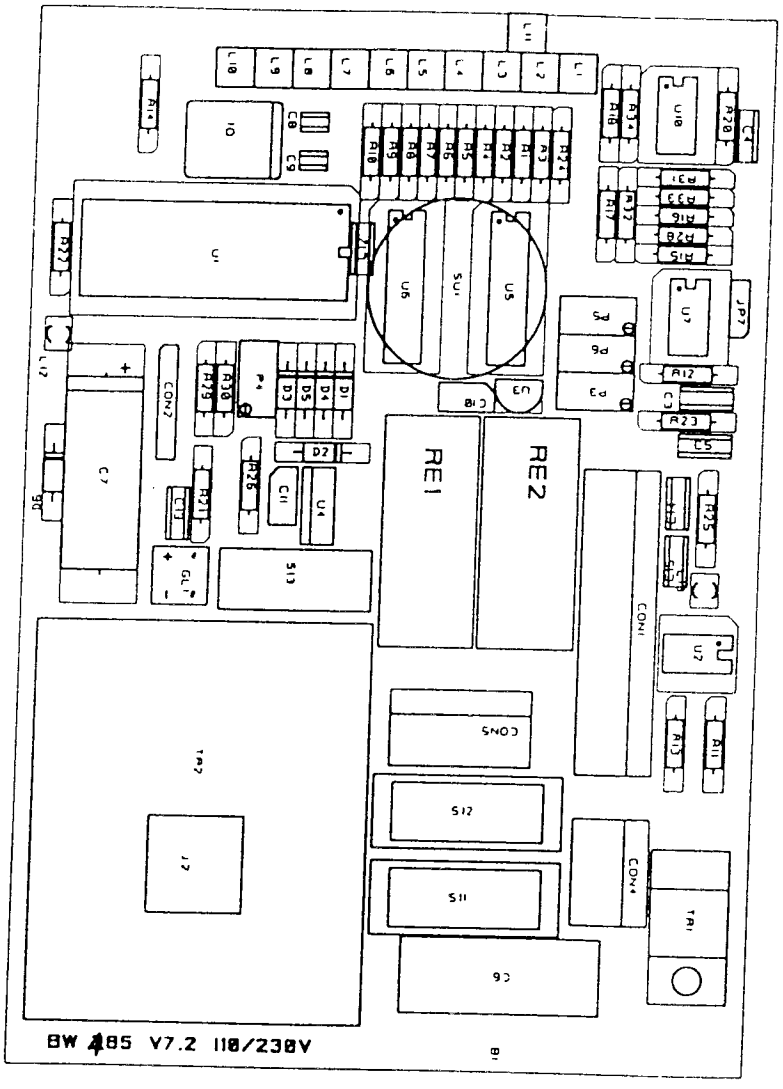
MEDIZINELEKTRONIK





	BW 485
	BIEGLER MEDIZINELEKTRONIK
Print v V1.2	
Datum: 10.12.1996	Name: F.NETAUSCHEK


RE1
RE2
BW 485 V7.2 110/230V

PARTS LIST

BW 485 / L (385 V7)	1	3

PART	NO.	DESCRIPTION	PART NO.	ITEM
diode	D1	1N4148	BD 1004148	B3
diode	D2	1N4148	BD 1004148	C3
diode	D3	1N4148	BD 1004148	B3
diode	D4	1N4148	BD 1004148	B3
diode	D5	1N4148	BD 1004148	B3
RFI capacitor	C6	1.40.00MKTX2 0,47µF	BB 3011447	E1-2
rectifier	GL1	DF04	BE 1000004	C4
LED	L12	∅ 3mm red	BD 4020004	B4
LED	L13	∅ 3mm red	BD 4020004	C1
LED	L1	□ 5mm green	BD 4205300	A1-2
LED	L2	□ 5mm green	BD 4205300	A2
LED	L3	□ 5mm green	BD 4205300	A2
LED	L4	□ 5mm green	BD 4205300	A2
LED	L5	□ 5mm green	BD 4205300	A2
LED	L6	□ 5mm green	BD 4205300	A3
LED	L7	□ 5mm green	BD 4205300	A3
LED	L8	□ 5mm green	BD 4205300	A3
LED	L9	□ 5mm green	BD 4205300	A3
LED	L10	□ 5mm orange	BD 4305300	A3-4
microcontroller	U1	microcontroller ST62T15	AG 1000625	A1-2, B1-2
optocoupler	U2	MOC3041	AI 1003041	C1-D1
oper. amplifier	U10	ICL7621DCPA	AT 1007621	A1
oper. amplifier	U7	ICL7611DCPA	AT 1007611	B1
PCB		SKM	JP 1204857	
quartz	Q1	4 MHz	AJ 1000046	A3-4
relay	RE2	JW2SN	CB 1212000	B2,C2
relay	RE1	JW2SN	CB 1212000	B2-3,C2-3
capacitor	C8	15 pF RM2,5	BB 1010151	A3
capacitor	C9	15 pF RM2,5	BB 1010151	A3
capacitor	C7	electrolytic 470 µF/40 V	BC 1154477	B4,C4
capacitor	C10	foil 100 nF	BB 1020015	B2
capacitor	C12	foil 100 nF	BB 1020015	B3
capacitor	C13	foil 100 nF	BB 1020015	C4
capacitor	C14	foil 100 nF	BB 1020015	C1
capacitor	C15	foil 100 nF	BB 1020015	C1
capacitor	C3	foil 100 nF	BB 1020015	B1
capacitor	C4	foil 100 nF	BB 1020015	A1
capacitor	C5	foil 100 nF	BB 1020015	B1,C1
capacitor	C11	tantalum 4µ7/35 V	BC 3302475	C3

PART	NO.	DESCRIPTION	PART NO.	ITEM
resistor	R25	100 Ω	BA 1020101	C1
resistor	R14	10k Ω	BA 1020103	A4
resistor	R29	10k Ω	BA 1020103	B4, C4
resistor	R30	10k Ω	BA 1020103	B3, C3
resistor	R34	10k Ω	BA 1020103	A1
resistor	R22	1k Ω	BA 1020102	A4, B4
resistor	R24	1k Ω	BA 1020102	A2
resistor	R26	1k Ω	BA 1020102	C3
resistor	R28	22k Ω	BA 1020223	B1
resistor	R32	22k Ω	BA 1020223	A1, B1
resistor	R11	27 Ω	BA 1020270	D1
resistor	R12	270k Ω	BA 1020274	B1
resistor	R20	270k Ω	BA 1020274	A1
resistor	R15	27k Ω	BA 1020273	B1
resistor	R16	27k Ω	BA 1020273	A1
resistor	R17	27k Ω	BA 1020273	A1, B1
resistor	R18	27k Ω	BA 1020273	A1
resistor	R23	2k2 Ω	BA 1020222	B1
resistor	R31	2k2 Ω	BA 1020222	A1
resistor	R13	330 Ω	BA 1020331	D1
resistor	R1	470Ω	BA 1020471	A2
resistor	R10	470Ω	BA 1020471	A3
resistor	R2	470Ω	BA 1020471	A2
resistor	R3	470Ω	BA 1020471	A2
resistor	R4	470Ω	BA 1020471	A2
resistor	R5	470Ω	BA 1020471	A2
resistor	R7	470Ω	BA 1020471	A2
resistor	R8	470Ω	BA 1020471	A2-3
resistor	R9	470Ω	BA 1020471	A3
resistor	R6	470Ω	BA 1020471	A2
resistor	R21	680Ω	BA 1020681	C4
resistor	R33	8k2 Ω	BA 1020822	A1

BW 485 / L (385 V7)	3	3

PART	NO.	DESCRIPTION	PART NO.	ITEM
pin-connector	CON1	8p SPOX 5281 08A	CC 1852818	C1, D1
pin-connector	CON2	6p/2,54	CC 1000001	B4, C4
pin-connector	CON4	3p SPOX 5281 03A	CC 1352813	D1, E1
pin-connector	CON5	4p SPOX 5281 08A	CC 1452818	D2-3
pin connector	JP7	3p/2,54	CC 1000002	B1
fuse	S11	1,6 A T	CE 1201600	E2-3
fuse holder	S11		CE 9510062	E2-3
fuse holder	S11		CE 9510062	E2-3
fuse	S12	1,6 A T	CE 1201600	D2-3
fuse holder	S12		CE 9510062	D2-3
fuse holder	S12		CE 9510062	D2-3
fuse	S13	250 mA T	CE 1200250	C3
fuse holder	S13		CE 9510062	C3
fuse holder	S13		CE 9510062	C3
voltage regulator	U3	LM78L05	AB 1034006	B2
voltage regulator	U4	LM7805	AB 1034105	C3
spindle trimmer	P3	3296 1k	BA 7120102	B1-2
spindle trimmer	P4	3296 20k	BA 7120203	B3
spindle trimmer	P5	3296 20k	BA 7120203	B1-2
spindle trimmer	P6	3296 1k	BA 7120102	B1-2
buzzer	SU1	KPE-214A	CH 1214001	A2,B2-3
supressor-diode	D6	P6KE 15A C549	BD 6615549	C4
triac	TR1	BTA 08-700	AA 3008700	D1, E1
driver	U5	ULN2003A	AT 1002003	A2,B2
driver	U6	ULN2003A	AT 1002003	A2-3,B2-3
transformer	TR2	Myra 9V 4VA	BG 1002094	C3-4, D3-4, E3-4

BIEGLER
MEDIZINELEKTRONIK

EC Certificate of Conformity

No. 0001 V1 / 08.96

Authorized agent:	E. BIEGLER G.m.b.H. Medical Electronics
Address:	Allhangstrasse 18 a 3001 Mauerbach Austria
Manufacturer:	E. BIEGLER G.m.b.H. Medical Electronics 3001 Mauerbach Austria
Product description:	BW 485 from serial no. V7 2001 BW 485L from serial no. V7 7001

The product described above is a medical product (as per 93/42/EEC Section 1, Para. 2a) and conforms to the provisions of the following European Directives:

93/42/EEC **Council Directive on the harmonization of statutory provisions for medical products.**

E. Biegler G.m.b.H.

Mauerbach, Austria, 28.05.97
(Date)

F. Netauschek/Development Manager .... (Signature)
(Name, Position)

I. Biegler/Managing Director .... (Signature)
(Name, Position)

This document certifies conformity with the above directives but does not constitute warranty of a quality as defined by the Austrian product liability law.

The safety regulations in the product documentation supplied must be observed.

STAATLICH AUTORISIERTE

VERSUCHSANSTALT FÜR RADIOTECHNIK

PRÜFSTELLE FUNKENTSTÖRUNG PFE und FUNKGERÄTE-SICHERHEIT PFS

Mitteilung von Prüfergebnissen

geprüft im Auftrag von	Biegler Medizin Elektronik Allhangstr. 18a 3001 Mauerbach
Prüfgut	**Blut- und Infusionswärmer BW 485 (L)**

Eingelangt am	22. August 96	Auftrags-Nr.	24013/R
Beendet am	22. August 96		
Geprüft nach	EN 60601-1-2		

Ing. Thun
Sachbearbeiter

Staatlich autorisierte Versuchsanstalt für Radiotechnik am 16/4 Wien

Dipl. Ing. Dr. techn. K. Tögel
Gutachter

Test Report

Zertifikat

Nr.: AL 96 07 14553 006

TÜV PRODUCT SERVICE

Ernst Biegler Ges. mbH
Medizinelektronik
Allhangstr. 18 a
A - 3001 Mauerbach

mit der(n) Fertigungsstätte(n)
14553

ist berechtigt, nachfolgend genanntes Produkt mit den
Prüfzeichen A,B oder L
gemäß Zeichenliste zu kennzeichnen. Umseitige Hinweise sind zu beachten.

Produkt: Blut- und Infusionswärmer
Blood and infusion heater

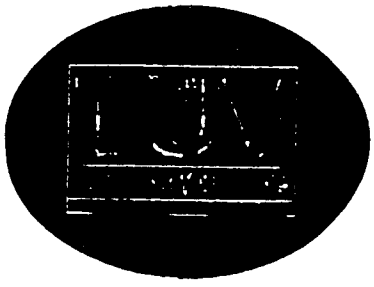
Modell: BW 485 L

Kenndaten:

Nennspannung: Rated Voltage:	230 V
Nennstrom: Rated Current:	1,5 A
Nennfrequenz: Rated Frequency:	50 Hz
Schutzgrad: Degree of Protection against electric shock:	B
Schutzklasse: Protection Class:	I
Schutzart: (spritzwassergeschützt) Protection against ingress of liquids: (splash proof)	IPX 4

Das Produkt entspricht den Anforderungen des deutschen Gerätesicherheitsgesetzes und wurde geprüft nach:

EN 60601-1 1990



Bericht Nr.: 01320603001

Freigegeben mit der obigen Zertifikatsnummer durch die Zertifizierungsstelle von TÜV PRODUCT SERVICE GMBH.

Organisationseinheit: MUCMED1 / jk
Datum: 10.07.1996

QUALITY ASSURANCE

TÜV PRODUCT SERVICE

CERTIFICATE OF COMPLIANCE OF THE
QUALITY SYSTEM WITH
STANDARDS MENTIONED BELOW

Certificate No.: Q1 95 03 14553 005

The Certification Body for Quality Systems
of TÜV PRODUCT SERVICE GMBH certifies that

Biegler GmbH
Allhangstr. 18a
A-3001 Mauerbach

in the facility:

Biegler GmbH
Allhangstr. 18a
A-3001 Mauerbach

for the following area:

Ventilators and respiratory training apparatus,
Blood and infusion warmers,
Fibrin sealant application systems,
Cooling systems for medical solutions,
Olfactometers, Electrical stimulation therapy devices
Laboratory and diagnosis equipments

has established and is operating a quality system
which meets the requirement(s) of

ISO 9001 : 1994 / EN 46 001 : 10/93

as documented in the audit report no. 01/338-5-003/02

This certificate is valid until March 1998,
provided that a periodical surveillance is conducted.

Munich, March 24, 1995

TÜV PRODUCT SERVICE GMBH
ACCREDITED CERTIFICATION BODY
for Quality Systems

PRODUCT SERVICE

Deutscher AkkreditierungsRat
DAR
TGA - ZQ - 008/93

TÜV PRODUCT SERVICE GMBH, Ridlerstrasse 31, 80339 Munich, Germany