biometra
a part of Analytik Jena

Ts1 ThermoShaker

Order – No. 051-500 (230 V)
Order – No. 051-590 (115 V)

Manual

May 2009

!! Warning !!
Please read these instructions carefully before using this apparatus!

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1 Contents

1 CONTENTS 1

2 SAFETY 2

3 DELIVERY PARTS 4

4 ACCESSORIES 4

5 GENERAL INFORMATION 6

6 INSTALLATION 6

6.1 UNPACK AND CHECK 6
6.2 INSTALLATION 6
6.3 CHANGING BLOCK MODULES 7

7 OPERATION OF TS1 THERMOSHAKER 8

7.1 PARAMETER SETTING 8
7.1.1 Reaction Time (TIME) 9
7.1.2 Shaking Intensity (RPM) 9
7.1.3 Reaction Temperature (T,ºC) 9
7.1.4 Program Execution 9

8 MAINTENANCE 11

8.1 CLEANING 11
8.2 RUBBER BELT REPLACEMENT 11

9 SPECIFICATIONS 12

10 SERVICE 13

11 EQUIPMENT DECONTAMINATION CERTIFICATE 14

12 NOTE FOR DISPOSAL OF ELECTRIC/ELECTRONIC WASTE 15

13 NOTICES 16

14 EC - DECLARATION OF CONFORMITY *EU - KONFORMITÄTSERKLÄRUNG* 17

15 WARRANTY 18

2 Safety

The following symbols mean:

Caution: Read these operating instructions fully before use and pay particular attention to sections containing this symbol.

Caution: Surfaces can become hot during use.

Caution: Instructions for handling.

Always observe the following safety precautions

Do not check the temperature by touch. Use a thermometer.

Do not touch surfaces which become hot during high temperature operation.

Use only as specified by the operating instructions, or the intrinsic protection may be impaired.

After transport or storage in humid conditions, dry out the unit before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.

Connect only to a power supply with a voltage corresponding to that on the serial number label at the rear of the unit.

Do not use other power supply units than recommended by the manufacturer.

Ensure that the mains switch and isolating device (power supply connector) are easily accessible during use.

Before moving, disconnect at the power supply socket.

The unit should be saved from shocks and falling.

Do not operate the unit outside the laboratory premises.

The unit must be placed on a level, non-flammable surface away from flammable materials.

Do not operate the unit in premises with aggressive or explosive chemical mixtures.

Do not impede the platform motion during operation.

Use appropriate vessels / tubes for temperature required.

Never fill liquid directly into the blocks (always use vessels).

To reduce the risk of eye injury during high temperature operation, use safety goggles or spectacles.

Do not put any hot blocks on inflammable surfaces.

Ensure that the operating temperature is less than the maximum operating temperature of your sample material.

If liquid is spilt inside the unit, disconnect it from the power supply and have it checked by a competent person.

It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or inside the equipment.

Clean the unit only with a damp cloth. Do not use chemical cleaning agents.

Before using any cleaning or decontamination method except those recommended in this manual, users should check with the Biometra Service Department that the proposed method will not damage the equipment.

Disconnect the mains before removing the outer cover. Note there are no user serviceable parts inside in the unit. (Warranty is void if cover has been removed by user!)

3 Delivery parts

The Biometra **TS1 ThermoShaker** (Order No. 051-500/590) will be delivered with

Fig. 1: Delivery Parts

1 x ThermoShaker apparatus (Fig. 1/1)
1 x External power supply unit + cable (Fig. 1/2)
2 x Spare rubber belt (Fig. 1/3)
1 x Manual

⚠ *Interchangeable block modules (Fig. 2) have to be ordered separately and will be delivered separately.*

4 Accessories

Interchangeable block-modules

Order No.	**Description**
051-510	Interchangeable block module for 20 x 1.5 ml tubes (Fig. 2/1)
051-511	Interchangeable block module for 20 x 2.0 ml tubes (Fig. 2/2)
051-512	Interchangeable block module for 20 x 0.2 ml + 12 x 1.5 ml tubes (Fig. 2/3)
051-513	Interchangeable block module for 20 x 0.5 ml + 12 x 1.5 ml tubes (Fig. 2/4)

051-510 20 x 1.5 ml tubes

051-511 20 x 2.0 ml tubes

051-512 20 x 0.2 ml + 12 x 1.5 ml tubes

051-513 20 x 0.5 ml + 12 x 1.5 ml tubes

Fig. 2: Interchangeable block modules

5 General Information

The **TS1 ThermoShaker** is a compact bench top shaking incubator, ideal for all applications requiring heating and shaking in microtubes up to 2.0 ml, within the temperature range of 5°C above ambient to 100°C.
The mixing operation and the incubation/heating mode can be used either combined or independently from each other, i.e. the device can work as a thermoshaker, incubator without shaking/mixing or as shaker/mixer without temperature control.
The **TS1 ThermoShaker** is applicable for DNA analysis, extraction of lipids and other cell components, DNA library creation, preparation of samples for electrophoresis, etc..

The **TS1 ThermoShaker** provides:

- Variable speed, variable temperature micro tube thermoshaker
- Gentle to vigorous mixing of samples (2 mm shaking orbit)
- Soft start function
- Even amplitude throughout the shaker platform
- Timed shaking operation (1 min. to 96 hours) with buzzer and automatic switch-off
- Set parameters will be saved
- Low voltage power supply (for safe cold room operation)

6 Installation

6.1 Unpack and Check

Unpack and carefully examine the **TS1 ThermoShaker**. Report any damage to BIOMETRA. Save all packing material if damage is found.

Do not attempt to operate this device if physical damage is present.

If you would like to send the unit back to us, please read the return instructions (page 13).

6.2 Installation

Place the apparatus upon even horizontal surface.

Plug the external power supply unit (AC/DC adapter supplied with the shaker) into the 12 V socket at the rear side of the apparatus.

6.3 Changing Block Modules

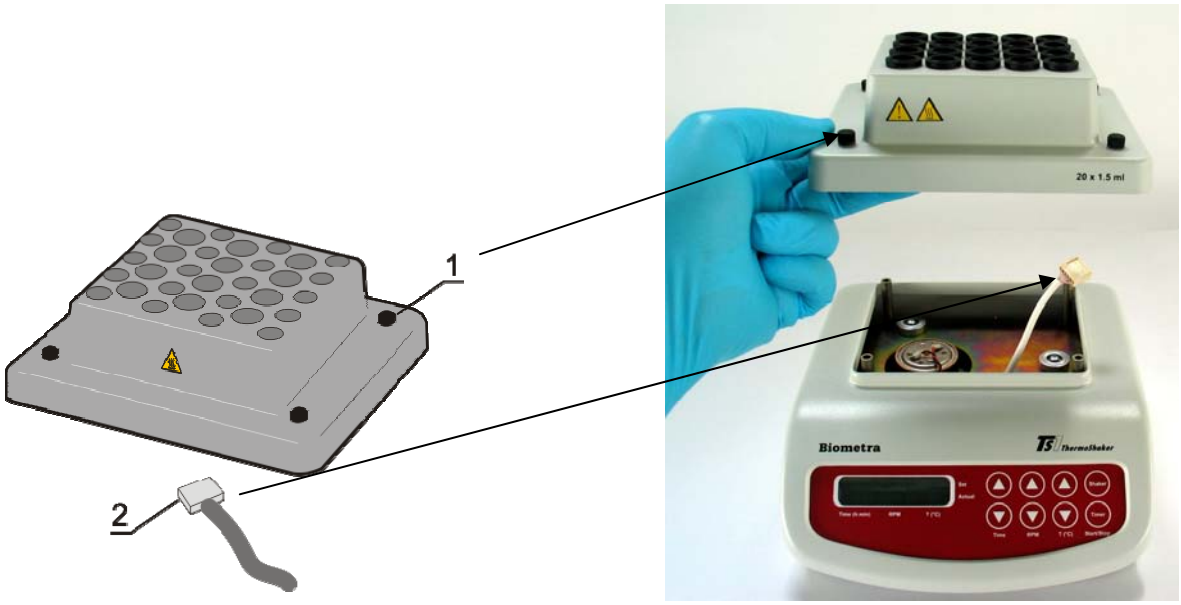


Fig. 3: Changing block modules

Remove the four knurled screws (Fig. 3/1) and disconnect the 6 way plug (Fig. 3/2).

Select the new block module.

Connect the plug.

Align the block-module so that the warning label is facing the front of the unit and secure with the four knurled screws.

Attention:

Please handle the block-modules carefully, do not let them drop.

Please disconnect and connect the 6 way plug carefully, do not damage it.

7 Operation of TS1 ThermoShaker

Connect the power supply unit to the mains. Switch on by using the on-off switch at the rear side of the TS1 (Fig. 4).

Fig. 4: Rear side of the TS1

The upper line of the display (settings) shows time, RPM and temperature set earlier. (Fig. 5)

The lower line of the display (actuals) shows current readings of the same parameters (STOP - time, 000 - RPM, thermoblock temperature °C, which automatically starts rising according to the temperature set in the upper line). (Fig. 5)

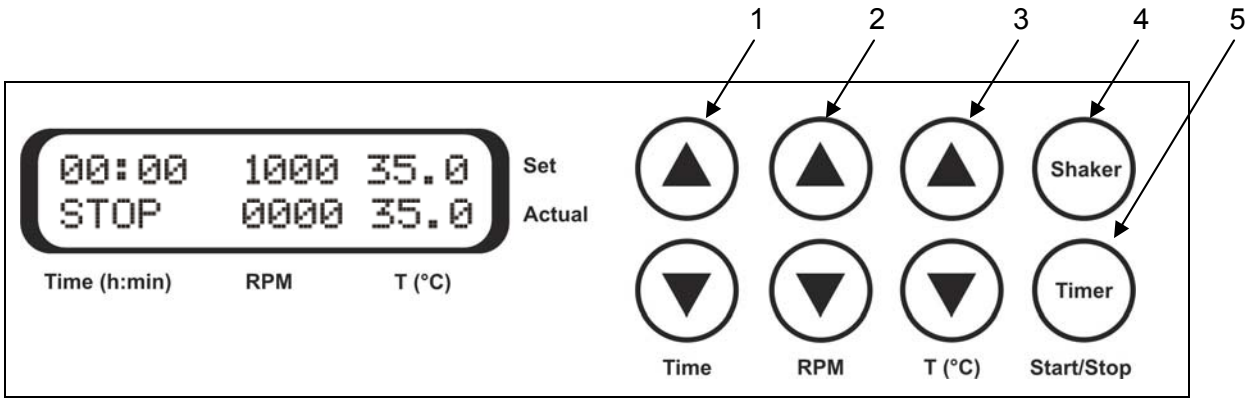


Fig. 5: Control panel

The time of temperature stabilisation depends on the initial temperature but does not exceed 15-20 min if the set temperature is 37.0 °C.

7.1 Parameter Setting

Use the readings in the upper line of the display (set point), while setting the necessary parameters.

7.1.1 Reaction Time (TIME)

With the help of "▲" and "▼" buttons (Fig. 5/1) set the required working time interval in hours and minutes. If the button is pressed for longer time the increment becomes bigger (1 min increments to reach 10, 20, 30, 40, 50 or 60 min, after this 10 min increments until reaching the full hour and finally 1 hour increments).

7.1.2 Shaking Intensity (RPM)

With the help of "▲" and "▼" buttons (Fig. 5/2) set the required shaking intensity in revolutions per minute (increment 10 RPM). If the button is pressed for longer time the increment becomes bigger (10 RPM for the first 10 steps, after these 100 RPM increments to reach 1,400 RPM).

7.1.3 Reaction Temperature (T,ºC)

With the help of "▲" and "▼" buttons (Fig. 5/3) set the necessary temperature (increment 0.1ºC). If the button is pressed for longer time the increment becomes bigger (0.1°C increments to reach 1°C, 2°C, …., after this 1°C increments until reaching 10°C, 20°C,… and finally 10°C increments to reach 100°C).

Notes:

It is possible to turn off heating of the apparatus only by setting the required temperature below 25 °C (the display will show OFF - T,ºC - set point). In this mode the **TS1 ThermoShaker** can be used as a mixing device without thermoregulation.

The set parameters can also be changed during operation.

7.1.4 Program Execution

After the **TS1 ThermoShaker** has reached thermal stabilisation (when the set and current temperature readings become the same) insert tubes into the platform sockets of the interchangeable block module.

Press the "Shaker"-Start/Stop button (Fig. 5/4). The platform will start rotation and the timer indicator will start counting up the time interval (with 1 min precision).

Note:

If the rotation speed is set to zero, pressing "Shaker"-Start/Stop button starts the timer but the platform does not move.

At the end of the program (after the set time elapses) the platform motion stops and the timer shows the flashing reading STOP accompanied by the repetitive sound signal until the “Shaker”-Start/Stop button is pressed.

If the working time is not set (or deleted) and the timer indicator in the upper line shows 00:00, pressing the “Shaker”-Start/Stop button causes the apparatus to operate continuously until the “Shaker”-Start/Stop button is pressed again.

If required, there is possibility to restart the timer when it is running. Press the “Timer”-Start/Stop button once (Fig. 5/5) to stop the timer. Press the “Timer”-Start/Stop button again to restart the timer.

The platform motion can be stopped at any time by pressing the “Shaker”-Start/Stop button. In this case the program and the platform motion stop, the timer is set back to zero and switches into the STOP mode. Press the “Shaker”-Start/Stop” button to repeat the operation with the same time and speed.

Attention:

⚠ At the end of the set time period the platform movement is stopped automatically, but the heating can be stopped only manually by reducing the temperature with the “▼“ T(ºC) key (Fig. 5/3 - lower button) till the OFF sign appears in the upper line of the display.

At the end of operation switch off the unit by using the on-off switch at the rear side of the TS1 (Fig. 4).

8 Maintenance

All products covered in this manual are designed to comply with IEC61010-1 and can be flash tested. As they are fitted with radio frequency interference suppressers it is recommended that only a D.C. test is performed.

No other routine service is required.

8.1 Cleaning

The case can be cleaned with a damp cloth after disconnection. Do not use liquids that contain concentrate organic solvents, alkali or acid nor abrasives.

Standard ethanol (75%) can be used for disinfection.

Attention:

Disconnect the unit from the power supply socket.

Before using any decontamination or cleaning method except that recommended, check with our Service Department that the proposed method will not damage the equipment.

8.2 Rubber belt replacement

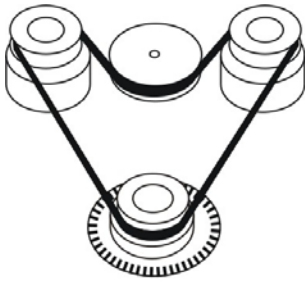


Fig. 6: Rubber belt replacement.

Remove the external power supply unit (AC/DC adapter supplied with the shaker) from the 12 V socket at the rear side of the apparatus.

Remove 4 fixation screws on the shaker bottom and remove the bottom plate.

Replace the rubber belt (Fig. 6).

Assemble the unit.

9 Specifications

Temperature regulation range	+25º C to +100º C (The **TS1 ThermoShaker** provides stable thermoregulation when the set temperature is at least 5ºC higher than the ambient temperature)
Nominal regulation accuracy	±0.1º C
Temperature uniformity over the platform	
temperature range +25º C to +40º C	±0.1º C
temperature range +40º C to +80º C	±1.0º C
temperature range +80º C to +100º C	±2.0º C
Speed range	250 -1,400 RPM (increment 10 RPM)
Orbit	2 mm
Independent timer with sound signal	1 min - 96 hrs (increment 1 min)
Time of block-module heating from room temperature to +37º C	7 min (pre-heating of system) 15 min (average, including temperature stabilisation)
Display	16 x 2 characters, LCD
Capacity of interchangeable block modules	20 x 1.5 ml tubes 20 x 2 ml tubes 20 x 0.5 ml + 12 x 1.5 ml tubes 20 x 0.2 ml + 12 x 1.5 ml tubes
Power	External power supply 12 V, 4.16 A
Dimensions (W x D x H)	205 x 230 x 130 mm
Weight (with power supply)	4.0 kg (at max.)

The **TS1 ThermoShaker** is designed for operation in closed laboratory rooms, cold rooms or incubators at ambient temperature from +5º C to +40º C and maximum relative humidity of 80% for temperatures up to +31° C decreasing linearly to 50% relative humidity at +40° C.

10 Service

Should you have any problems with this unit, please contact our service department or your local Biometra dealer:

Biometra biomedizinische Analytik GmbH
Service Department
Rudolf-Wissell-Straße 14 - 16
D-37079 Göttingen
Germany
Phone: ++49 – (0)5 51 / 50 88 1 – 10 or -12
Fax: ++49 – (0)5 51 / 50 88 1 – 11
e-mail: service@biometra.de

Attention:

If you would like to send the unit back to us, please read the following instructions.

Instructions for return shipment

- Return only defective devices. Please contact the Technical Service Department at **Biometra** (Phone: ++49 – (0)5 51 / 50 88 1 – 10 or -12) to get an Return Authorization Number (**RAN number).**

- Use the original box or a similarly sturdy one.

- Label the outside of the box with “CAUTION! SENSITIVE INSTRUMENT!” and the RAN number sticker. **Deliveries without RAN number cannot be accepted!**

- Please enclose a **precise description of the fault**, which also reveals during which procedures the fault occurred, if possible.

Important:
Clean all parts of the instrument from residues, and of biologically dangerous, chemical and radioactive contaminants. Please **include a written confirmation** that the device is free of biologically dangerous and radioactive contaminants in each shipment. If the device is contaminated, it is possible that **Biometra** will be forced to refuse to accept the device.

- The **sender of the repair order will be held liable** for possible losses resulting from insufficient decontamination of the device.

- Please enclose a note which contains the following:
  a) Sender’s name and address,
  b) Name of a contact person for further inquiries with telephone number.

11 Equipment Decontamination Certificate

To enable us to comply with German law (i.e. §§28 and 80 StrlSchV, §17 GefStoffV and §19 ChemG) and to avoid exposure to hazardous materials during handling or repair, will you please complete this form, prior to the equipment leaving your laboratory

COMPANY / INSTITUTE _____

ADDRESS _____

PHONE NO _____ FAX NO_____

E-MAIL _____

EQUIPMENT	Model	Serial No
	_____	_____
	_____	_____
	_____	_____
	_____	_____

If on loan / evaluation Start Date: _____ Finish Date _____

Hazardous materials used with this equipment

_____

_____

_____

Method of cleaning / decontamination

_____

_____

_____

The equipment has been cleaned and decontaminated:

NAME _____ POSITION _____

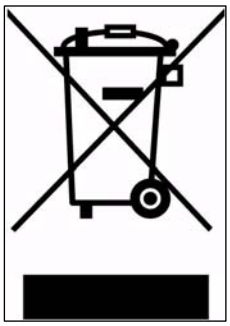
(HEAD OF DIV./ DEP./ INSTITUTE / COMPANY)

SIGNED _____ DATE _____

PLEASE RETURN THIS FORM TO BIOMETRA GMBH OR YOUR LOCAL BIOMETRA DISTRIBUTOR TOGETHER WITH THE EQUIPMENT.

PLEASE ATTACH THIS CERTIFICATE OUTSIDE THE PACKAGING. INSTRUMENTS WITHOUT THIS CERTIFICATE ATTACHED WILL BE RETURNED TO SENDER.

12 Note for Disposal of Electric/Electronic Waste



This symbol (the crossed-out wheelie bin) means, that this product should be brought to the return systems and/or separate systems available to end-users according to yours country regulations, when this product has reached the end of its lifetime!

For details, please contact your local distributor!

This symbol applies only to the countries within the EEA*.
*EEA = European Economics Area, comprising all EU-members plus Norway, Iceland and Liechtenstein.

13 Notices

14 EC - Declaration of Conformity
EU - Konformitätserklärung

April 2007

im Sinne der EG-Richtlinie über elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen 73/23/EWG
following the EC directive about electrical equipment for use within certain limits of voltage 73/23/EEC

und / *and*

im Sinne der EG-Richtlinie für die elektromagnetische Verträglichkeit 89/336/EWG.
following the EC directive about the electromagnetic compatibility 89/336/EEC.

Hiermit erklären wir, dass folgender **Thermoschüttler**,
Herewith we declare that the following ***Thermoshaker****,*

Typ / *type*: **ThermoShaker TS1**
Best.-Nr. / *Order No.* 051-500 (230 V), 051-590 (115 V)

den grundlegenden Anforderungen der
corresponds to the basic requirements of

EG-Niederspannungsrichtlinie 73/23 EWG und der
EC low voltage directive 73/23 EEC and the

EG-Richtlinie über die elektromagnetische Verträglichkeit 89/336 EWG entsprechen.
EC directive about the electromagnetic compatibility 89/336/EEC.

Dr. Juergen Otte
Quality Manager

15 Warranty

This laboratory instrument is produced with the highest practical standards of materials, workmanship, and design. The design and manufacture of parts have been conceived with one purpose - to produce units which will give satisfactory service.

Biometra GmbH guarantees this unit to be free from defects in materials or workmanship under normal use or service for **24 month** from date of shipment.

If, during this time, this unit proves defective in materials or workmanship, Biometra GmbH will repair or replace it free of charge if returned to us prepaid.

This guarantee does not cover damage in transit, damage caused by carelessness, misuse or neglect, or unsatisfactory performance as a result of conditions beyond our control; or consequential losses as a result of failure of our product.

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