

MANUAL
for
THERROLL
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SBMEDIC Electronics

Schultzvägen 39
S-170 63 Solna, SWEDEN
phone: Int+46 8 356827, fax: Int+46 8 356874
e-mail: info@sbmedic.se
www.sbmedic.se



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Chapter 1. DESCRIPTION OF THERROLL

THERROLL is an instrument for tempering metalrolls for investigation of temperature sense acc. to “LINDBLOM-FRUHSTORFER”.

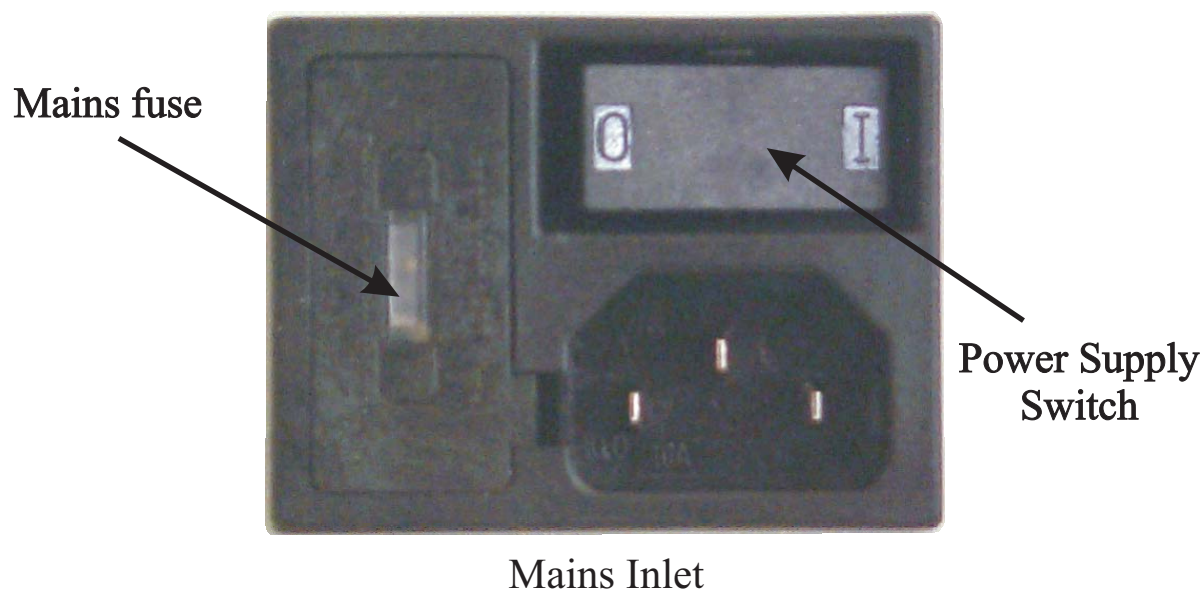
The instrument consists of a metalbox containing microprocessor equipped electronics, fans and a powerful power supply.

On the top there are two “aluminium bowls” for tempering the rolls. The rolls can there lean on a removable metalbow.

Both the “bowls” have their own electronics, which makes it possible to set different temperatures for the rolls.

At the front of **THERROLL** is a control panel containing two identical parts. Each part contains two push-buttons for controlling the electronics for each part and a two-digit display for temperature presentation.

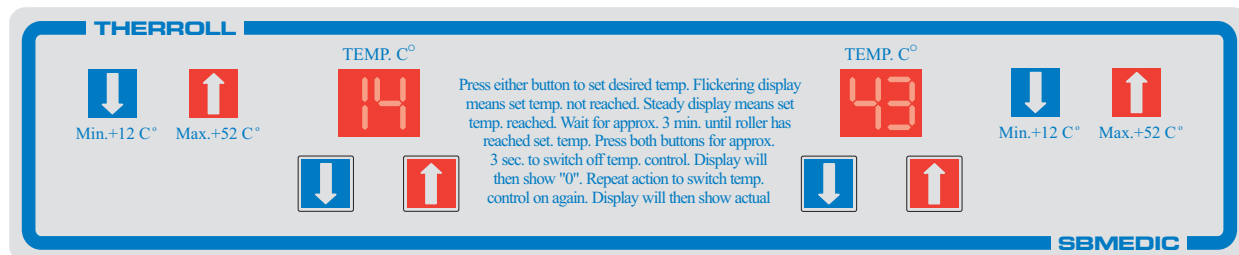
At the back of **THERROLL** is the mains inlet together with power supply switch and a lamp. Inside the inlet is the mains fuse. Serial number and technical data is on a metal plate to the right of the mains inlet.



NOTE!! IT IS VERY IMPORTANT THAT THE METALROLLS BEING USED ARE FROM THE BRAND “LINDBLOM-FRUHSTORFER”. THESE ROLLS HAVE THE RIGHT DIAMETER AND THE RIGHT MASS TO FIT THERROLL . WHEN USING ROLLS FROM ANOTHER BRAND, THERE IS A RISK FOR BAD CONTACT AT THE “BOWLS” WHICH COULD RESULT IN WRONG TEMPERATURE OF THE ROLLS.

Chapter 2. CONTROLLING THERROLL



Below is a picture of **THERROLL's** control panel.




To start the instrument switch the power on at the back.


After being switched on, both displays will show 

That means that the tempering of the “bowls” is inactivated.

By pushing both  and  simultaneously for approx. 3 sec. the tempering will be active.

The temperature of the “bowls” will then try to reach the preset temperature of 
The displays will twinkle for a couple of seconds before the preset temperature has been reached. They will then shine with a constant light.

To change the temperature setting, use the buttons according to below.

The button marked  is used for lowering the temperature. (Min +12 ° C)

The button marked  is used for raising the temperature. (Max + 52 ° C)

By pressing one of the buttons, the display will step to the desired temperature, after which the button is released. The display will then with a twinkling light step to the set temperature. When the set temperature has been reached, the display will shine with constant light.

After that moment it takes a couple of minutes before the roll has reached the set temperature. Everything of course depending on room temperature, difference between roll temperature and set temperature and so on.

CONTROLLING THERROLL cont.

To inactivate the tempering of one roll, simply press both   for approx. 3 sec.

The display will then show 

To activate the tempering again repeat action

When **THERROLL** is shut off by means of the power switch at the back, the last set temperature will be stored in the electronic memory. When **THERROLL** the next time is switched on, it will consequently start with the previously set temperature. NOTE! If one roll has been deactivated before switching the power off, that condition will remain after being switched on again. At the control panel is a short description of how to control **THERROLL**

Chapter 3. OVER TEMPERATURE PROTECTION

To prevent that one or both metalrolls can achieve a temperature that can damage human tissue, the instrument has been equipped with two temperature measuring systems. The function is as below:

The ordinary regulating system consists of two identical systems where every system regulates its own unit and the temperature is monitored in the bowl. The monitoring system has got two temperature sensors, one in each bowl. If the temperature should rise above +55 ° C the monitoring system will shut off the internal power supply to the ordinary regulating systems.

The monitoring system is also continuously communicating with the two ordinary regulating systems. If the communication is broken, if any or both of the ordinary regulating systems doesn't answer, the internal power supply to the regulating systems will shut off.

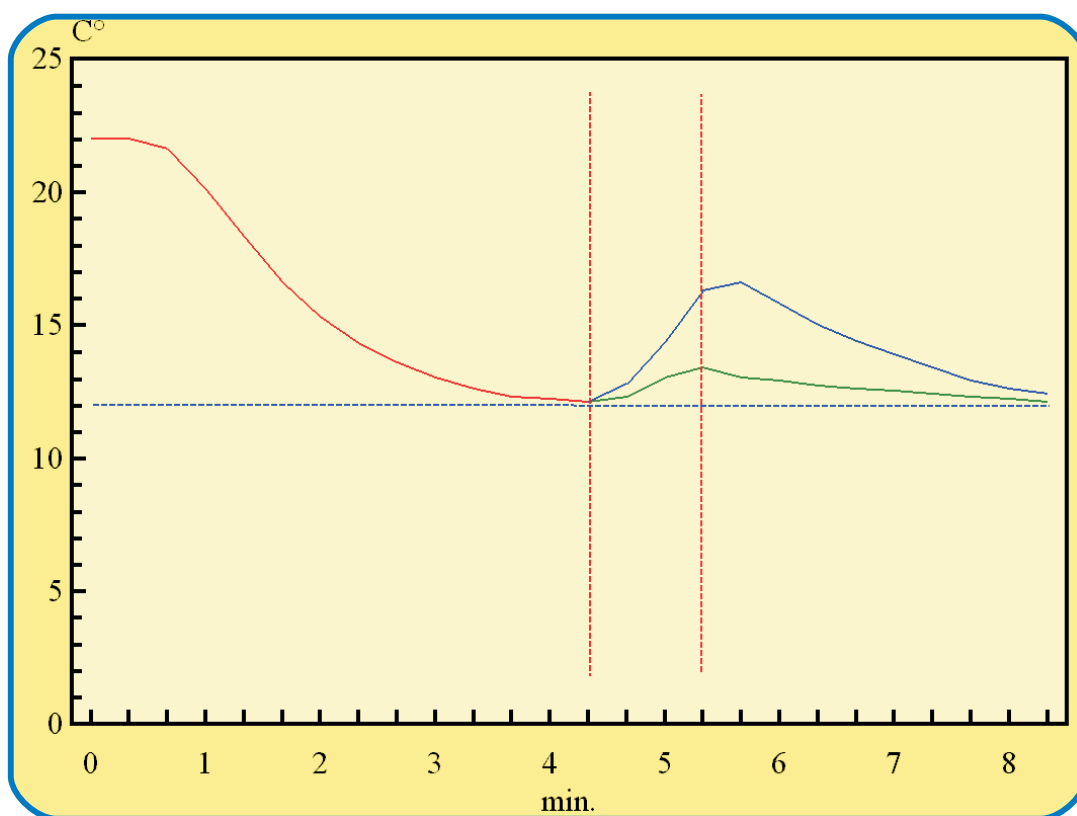
If the monitoring system for some reason doesn't work as expected, even then the internal power supply to the regulating systems will be shut off. The probability for both the ordinary regulating system and the monitoring system to break down is very much unlikely.

If the instrument is shut off by the monitoring system, the display will be switched off, and the temperature regulating systems will be shut off. The fans will continue to be active. The lamp in the power inlet will be on as long as the mains fuse is unbroken and the mains switch is on.

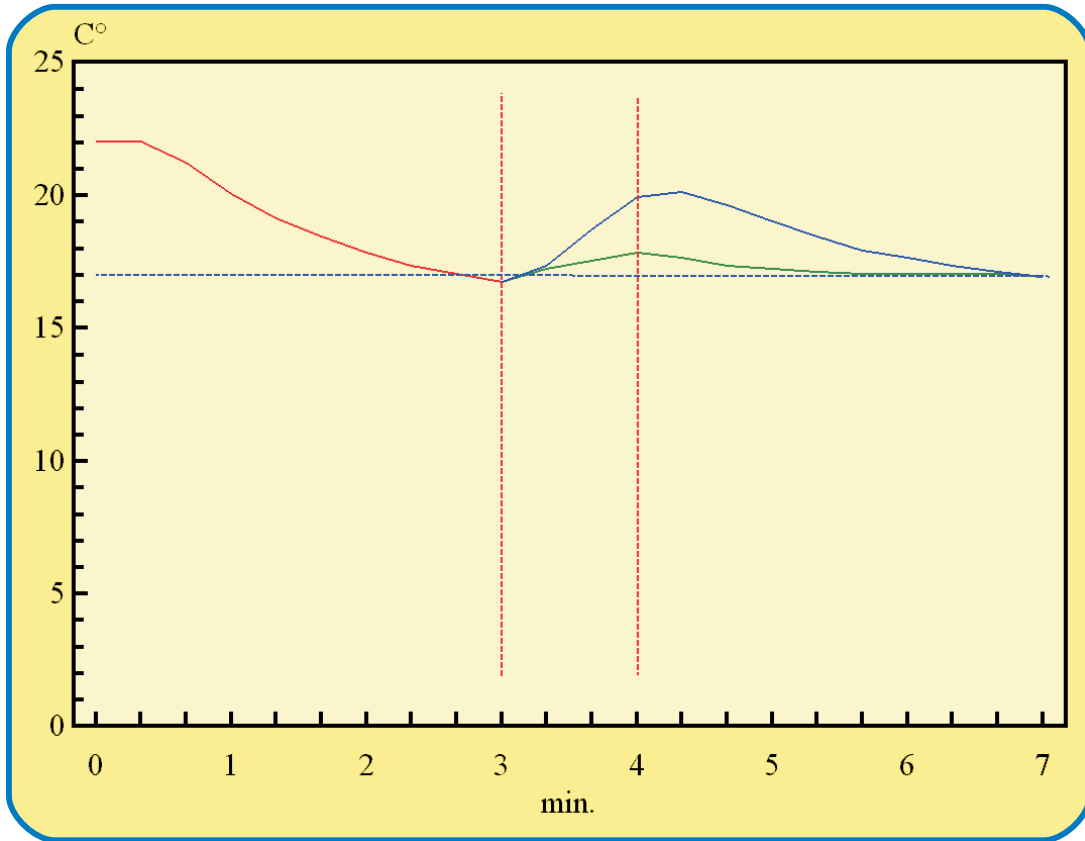
To restart the instrument, the mains switch must be switched off and on again. If the instrument starts but goes off after a short while, there is probably a permanent failure. Contact must immediately be taken with the responsible technician or with the representative for the apparatus.

Chapter 4. TEMPERATURE CURVES

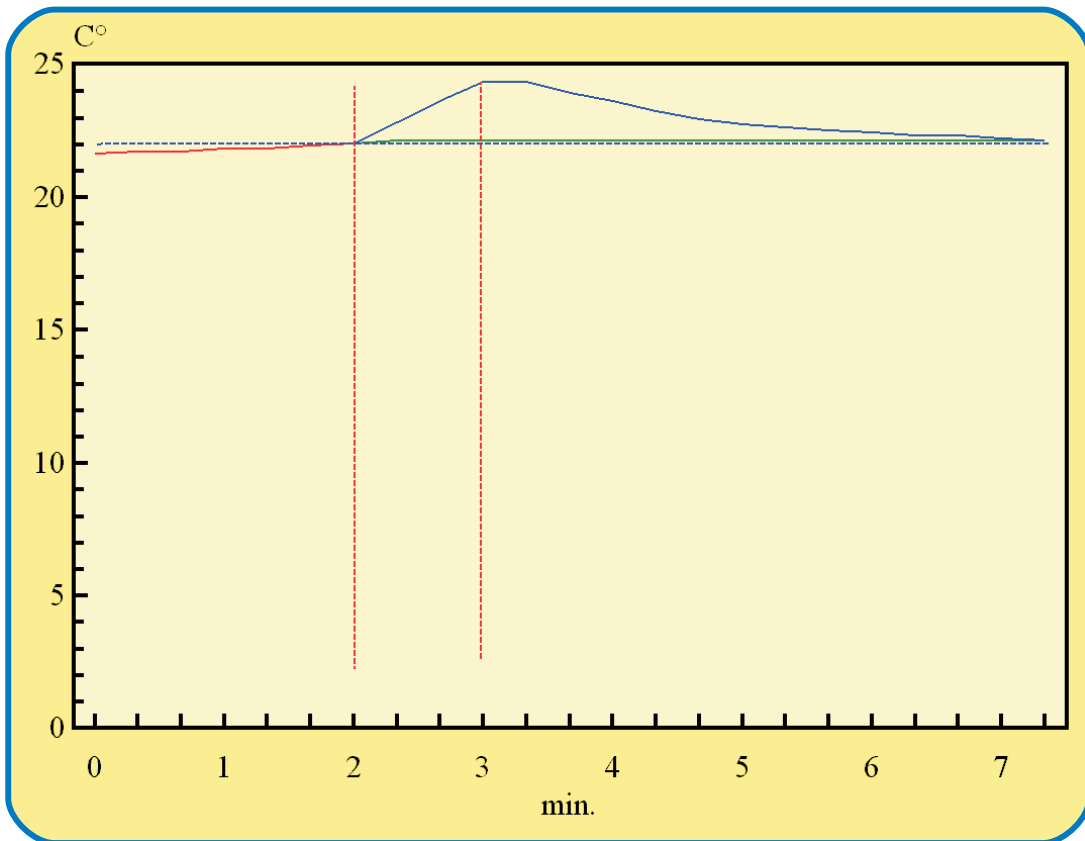
The following 9 diagrams shows the temperature change of the metal roll at different temperatures. The red part of the curve shows the temperature at start from room temperature (+22 C °) until the set temperature has been reached. The first vertical line indicates the time for reached temperature. The blue part of the curve shows the temperature change when rolling the metal roll on normal tissue (approx. +33 C °). The green part of the curve shows the temperature change when slowly (approx. 1m/s) moving the metal roll in air (approx. +22 C °). The second vertical line shows the time when the metal roll is placed in its holder after 1 min. The blue horizontal line shows the set temperature.



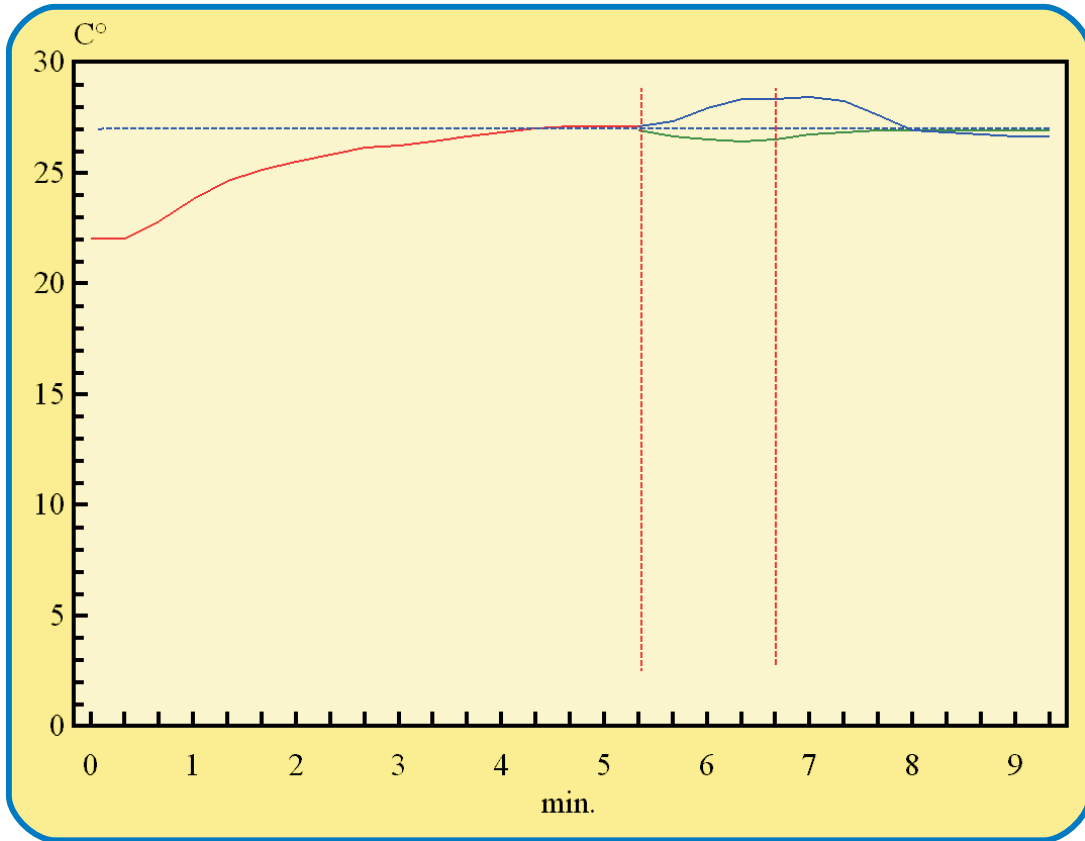
Set temp.: +12 C°



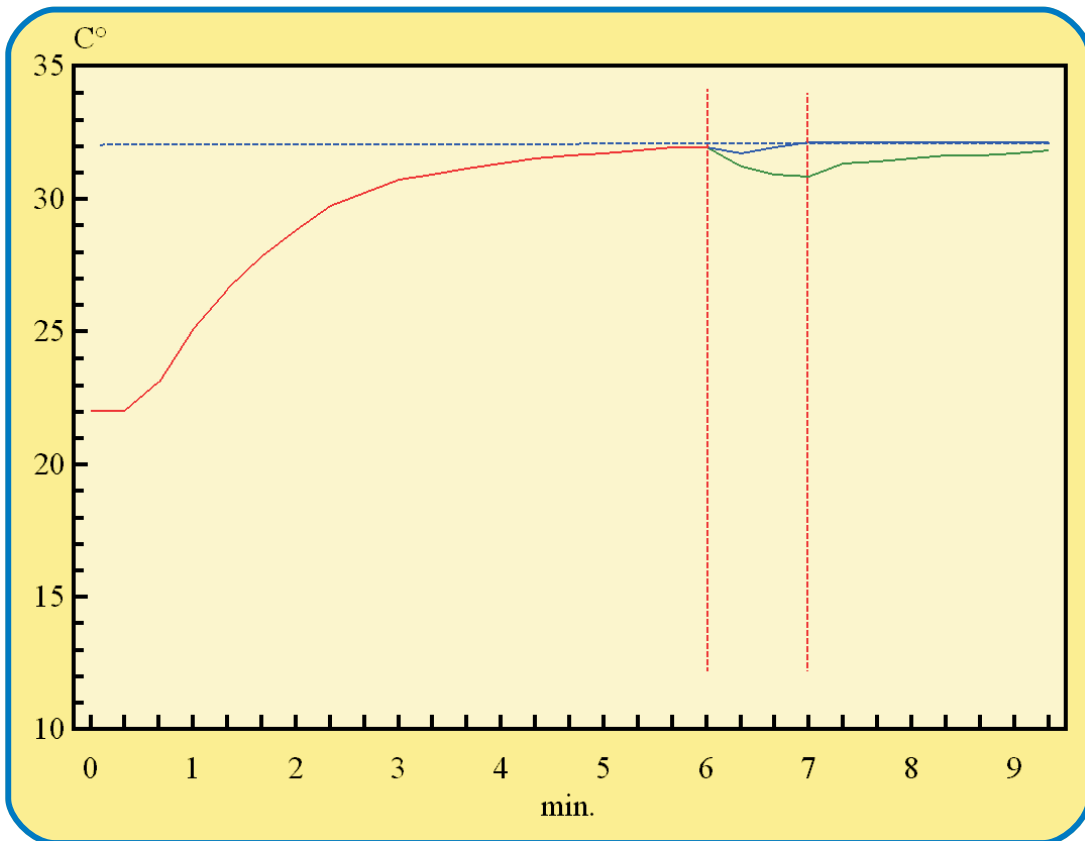
Set temp.: +17 C°



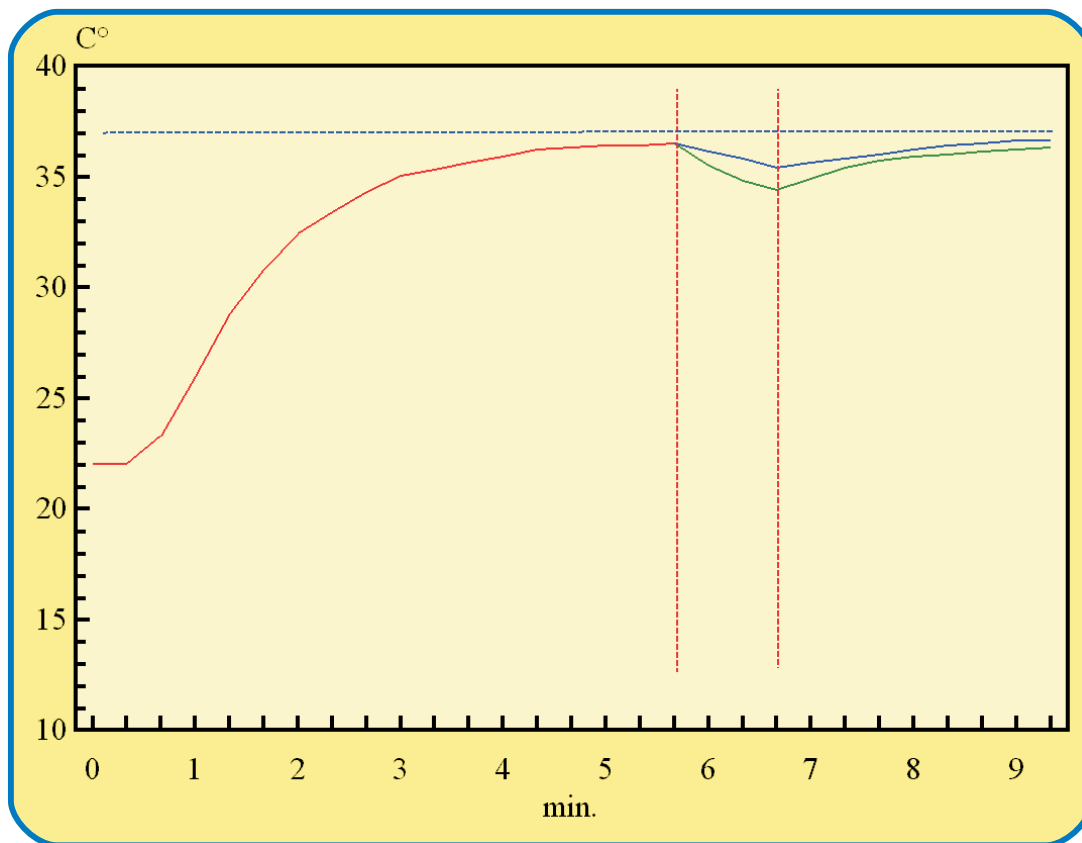
Set temp.: +22 C°



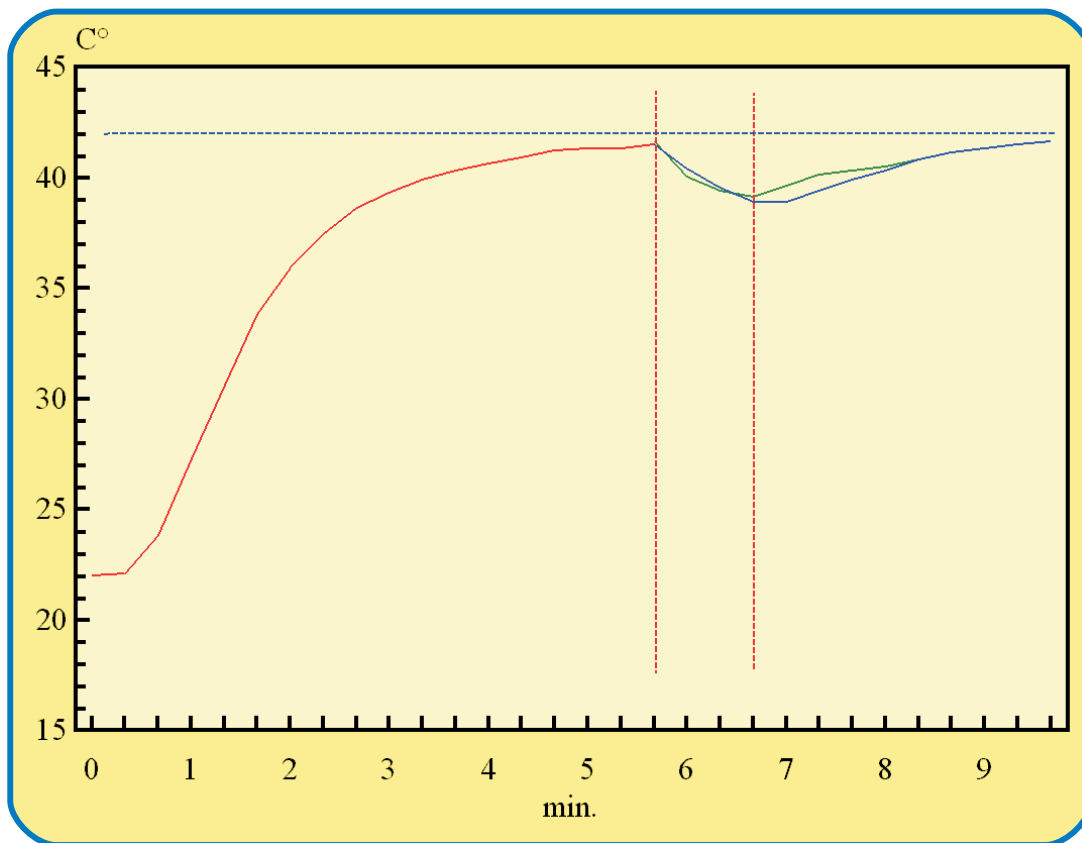
Set temp.: +27 C°



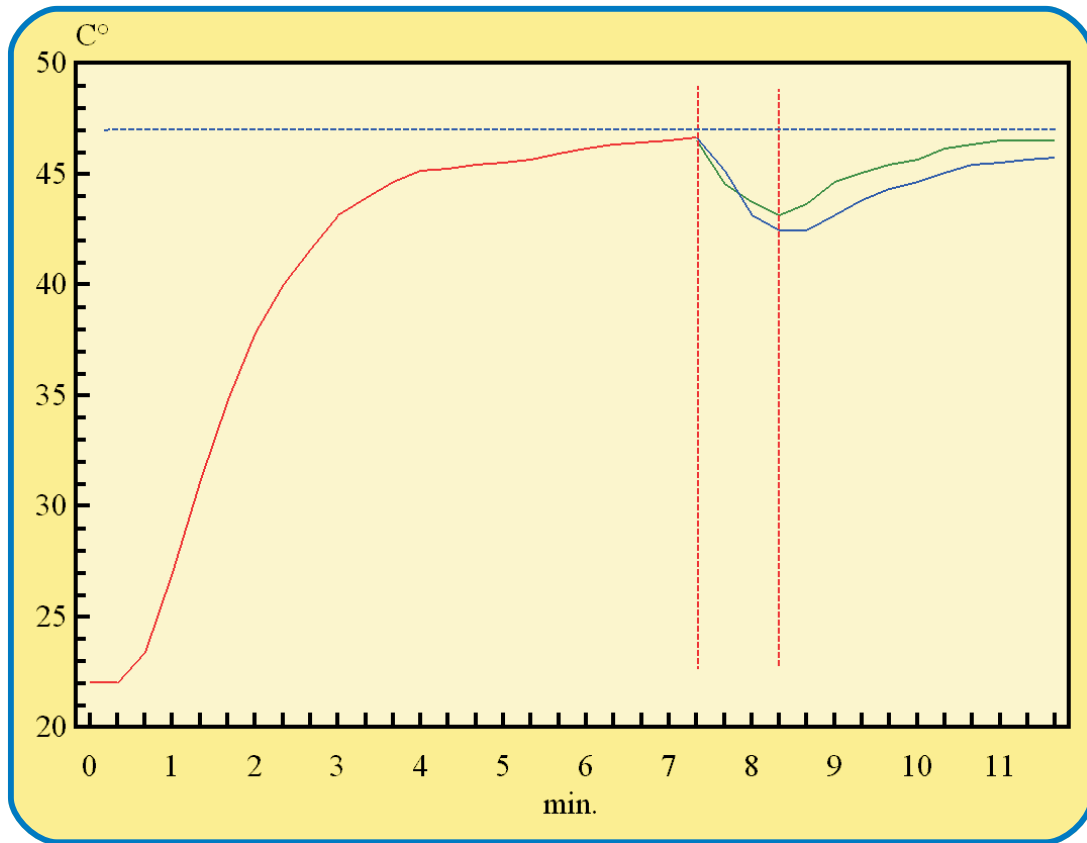
Set temp.: +32 C°



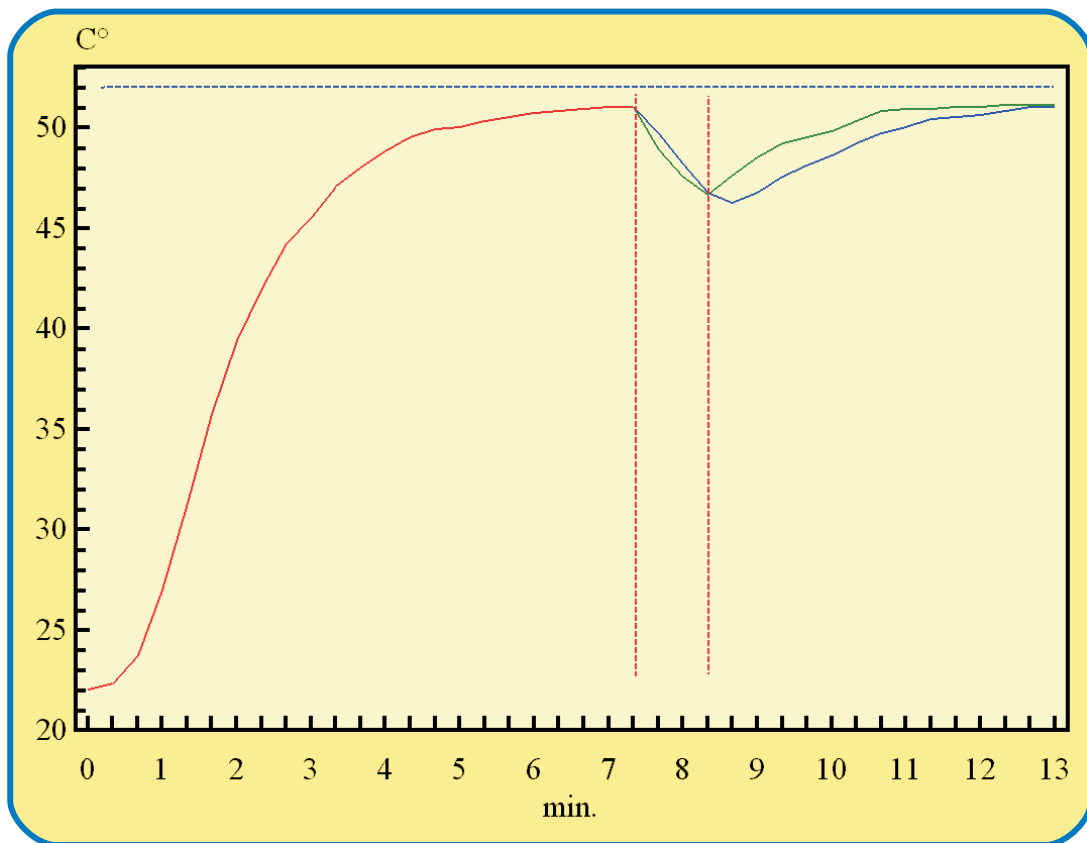
Set temp.: +37 C°



Set temp.: +42 C°



Set temp.: +47 C°



Set temp.: +52 C°

Chapter 5. MAINTENANCE OF THERROLL

THERROLL does not demand any maintenance. Anyway, the aluminium bowls and the metalrolls should be cleaned from time to time to prevent bacterial heap.

BEFORE CLEANING, THE POWER SUPPLY SWITCH MUST BE SWITCHED OFF, AND THE POWER CORD TAKEN AWAY.

Most detergents available on the market could be used for cleaning.

The metalbox can also be cleaned as above. Be careful not to spill liquid at the apparatus. If that is the case, the apparatus may not during any circumstance be connected to the mains. Contact must immediately be taken with the responsible technician or with the representative for the apparatus.

TECHNICAL DATA

Physical

Width	:268 mm
Depth	:205 mm
Height excl. metalbow	:87 mm
Weight	:3.5 kg

Functional

Accuracy displayed temperature	:±2° C
Set temperature limits	:+12 ° C - +52 ° C
Maximum temperature settling time “worst case”	:5 min

Electrical

Mains voltage	:115-230 V AC
Power consumption	:60 VA
Fuse	:115 V 1,5A slow blow
	:230 V 800mA slow blow

CHAPTER 6. INFORMATION ON RECYCLING OF ELECTRICAL EQUIPMENT



NOTE! DO NOT DISCARD THIS PRODUCT IN THE TRASH!

Used electrical and electronic equipment must be treated in accordance with applicable environmental laws and recycling regulations.

EU-countries

Under current EU rules, all have the opportunity to submit electrical equipment for recycling. This equipment contains batteries that must first be removed and handled in accordance with local environmental regulations.

By handling the product in accordance with these regulations, it will be disposed of and recycled in the appropriate manner, thus preventing potential adverse health and environmental effects.

If the product should be discarded:

Contact SBMEDIC Electronics or its distributors for information on how to go about returning the product. It may be a charge for transportation and recycling. Small products (in the case of a few) may be returned to local recycling facilities.

Countries outside the EU

Please contact your local authorities and ask for the correct method of disposal.