

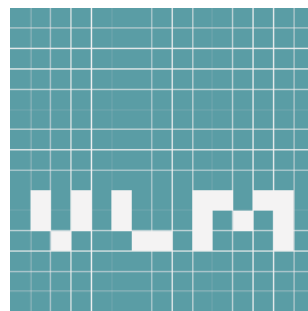


# Operating Manual

*Metalblock thermostats*

*Productlines*

*HP, BIO, EC, LS, QS*



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## 1. Generalities

### 1.1 Purpose of the document

The purpose of this operating manual is to familiarise the user of the VLM Metal Block Thermostat with:

- function,
- operation
- safety instructions
- maintenance of the unit
- diagnostic of malfunction and trouble shooting

This manual must always be within reach of the user!

**Read these instructions carefully before installing the unit and putting into operation!**

### 1.2 General indications

The operation manual instructs the operator to handle this test cabinet with safety and only for the purpose it is designed for. Knowledge of the relevant chapters is an imperative precondition for the safe and correct use.

Operators are duty bound to familiarise themselves with the safety instructions and operating conditions in order to avoid injury and damage.

Claims and liabilities will be rejected if they are due to incorrect operation and/or incorrect use.

Necessary maintenance works may only be carried out by personnel of VLM or their representatives resp. authorized experienced persons. Otherwise all claims and liabilities will be rejected.

Our indications are based on the state of our current knowledge. Legal rules have to be observed on own responsibility. Shown devices and details can partly be presented with options.

Subject to technical alterations.

### 1.3 Operators

VLM-Metal Block Thermostats may only be used by personnel trained and authorised by the operator.

### 1.4 User's assessment

Dear readers,

our operating manuals are regularly updated and may be downloaded from our web site [www.vlmgmbh.de](http://www.vlmgmbh.de). Please ask for your password to get access to this protected area.

Your suggestions for improvements will help us to provide user-friendly operating manuals. Please inform us by e-mail ([info@vlmgmbh.de](mailto:info@vlmgmbh.de)) or by fax +49 5205 87 963-50.

### 1.5 Copyright

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**Reproduction, even partial, is only allowed with the authorisation by the Company.**

## 2. Basic safety instructions

This operating manual contains the main instructions allowing the safe use of VLM Metal Block Thermostats.

### 2.1 Safety symbols

The following designations and symbols are used for safety indications throughout this manual:



Fig. 1  
Signification: immediate danger to life and health of persons.  
Ignoring these indications will result in severe health hazards



Fig. 2:  
Signification: possibly dangerous situation.  
Ignoring these indications may result in slight injuries or cause material damage

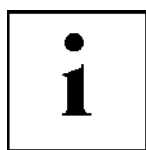


Fig. 3  
Signification: important indications for the correct use of the unit.  
Ignoring these indications may cause malfunctions of the unit or problems in the vicinity of the latter

## 2.2 Obligations and liability



Please follow the instructions imparted in this manual.  
For the safe and unproblematic operation of the VLM Metal Block Thermostat, knowledge of the basic safety instructions and regulations is imperative.  
This operating manual and especially the safety instructions must be respected by all persons who work with the unit. Furthermore, all rules and regulations concerning the prevention of accidents, which are valid at the site of use of the unit, are binding.

## 2.3 Dangers related to the use of metal block thermostats



VLM-Metal Block Thermostats have been designed and manufactured according to the state of the art and to recognised safety technological rules. However, the use of the units may cause dangers to the life and health of the user or of third persons, or damages to the unit or to other property.

### **VLM Metalblock-Thermostats may only be used**

- **for the purpose they were designed for**
- **in perfect safety technologic conditions**

**Failures which may impair safety must be corrected immediately!**

## 2.4 Claims and liability

Basically, our "General Sales and Delivery Conditions" (<http://www.vlmgmbh.de>).  
Claims and liabilities toward personal and material damages will be categorically rejected if they are due to one or more of the following causes:

- incorrect use of the units
- incorrect set-up, start-up, operation and maintenance of the units
- operation of units with faulty safety and protective systems
- ignoring the instructions of the operating manual concerning transport, storage, set-up, start-up, operation and maintenance of the units
- unauthorised constructive changes to the units
- incorrect repairs
- catastrophes due to the action of foreign bothes and force majeure.

As a rule, provisions and indications stated on the warranty card provided together with the unit apply.

## 2.5 Correct use

VLM Metal Block Thermostats are temperature regulated heating devices for use in laboratories. They are used to heat analysis samples to predefined temperatures, without using heat transfer fluids. Keeping and following all instructions and indications from the operating manual are part of the correct use.



VLM Metal Block Thermostats may only be used by persons authorised by the operator.  
Users are responsible towards third persons within the working area.

## 2.6 Incorrect use



Use for any other purpose as those indicated above is not authorised.  
The incorrect use of the unit may generate risks.

## 2.7 Organisational measures

The operator will provide personal protective equipment.

## 2.8 Informal safety measures



- Always keep this operating manual together with the unit.
- Keep the general and local regulations for prevention of accidents and for environmental protection at hand and follow them.
- Keep all safety and risk indications on the unit in legible conditions, renew if necessary.

## 2.9 Particular points of danger



The following constitute particular points of danger:

- the hot metal blocks
- the emptied hot heating bathes
- the surface of the thermostats in the vicinity of the hot metal block
- closed test tubes or reaction vessels

## 2.10 Modifications to the unit



- Do not carry out modifications to the unit nor to the settings which may not be changed without the manufacturer's authorisation!
- Exchange parts which are not in perfect conditions at once (e. g. main power cable)!

Only use original spare parts!

In case of parts purchased from other manufacturers it cannot be assured that they will meet the requirements, nor that they have been designed and manufactured so as to fulfil technical and safety requirements.

## 2.11 Cleaning of the unit and waste disposal



- Only clean the unit if it is switched off and cold
- Only clean variable metal blocks if they are cold
- Clean stainless steel surfaces and metal blocks only with neutral laboratory cleansing products
- Use products and materials correctly and dispose of them accordingly once they are used

## 2.12 Fire fighting

In case of fire, it is imperative to switch off the unit and to pull the main plug, as otherwise fires caused by electricity cannot be fought effectively!  
Observe fire fighting instructions at the working place!

## 2.13 Safety instructions related to the use of the unit



**Make sure to follow safety instructions for laboratory work!  
Follow safety instructions valid for the samples to be processed.  
Read the safety sheets of hazardous reagents applied**



**The metal blocks are only foreseen to receive the sample containers.  
No samples may be introduced directly into the holes drilled in the metal blocks**



**Never touch hot surfaces of the heat block or in its vicinity! Attention:  
sample containers can also be hot when taken. Use protective gloves and  
adequate tools to take samples!**



**Avoid defervescence and risks of projections through hot sample material. Wear protective gloves and facial protection! Avoid risks of injury through pressurised sample containers! Let closed sample container cool down after the end of chemical disintegration!**



**If toxic gases or vapours may be generated or set free, work in a fume cabinet. Make sure to respect valid safety regulations for work in fume cabinet!**



**Explosive and lightly flammable materials may not be brought into the vicinity of hot surfaces or sample containers!**

### 3. Transportation / Packaging

Metalblock thermostat are packed by VLM according to their demand with largest care, wrapped usually in air cushion foil and set in cardboard box protected strengthened with polystyrene inserts.

#### 3.1 Acceptance of parcels and unpacking

- In case of damages caused by impacts during transportation claims are made exclusively with the respective forwarder, parcel service or post office. If there is any doubt about the integrity confirm the acceptance only under the reservation of the following examination of the content.
- Open the transport package and remove the filling material.
- Take out the unit and accessories carefully, put all the items on a table and compare them with the delivery note.
- Please note that according to our terms of business the completeness of the consignment has to be checked without any delay. Late claims of missing parts will be rejected.

#### 3.2 Forwarding or sending back

Note: VLM Metalblock Thermostats are highly sensitive electronic devices. For that reason special precautions have to be met in case of forwarding or sending back :

- Make sure that no filling material can enter into the device for instance through the aeration holes in the case. For this reason we recommend to wrap the device into paper or plastic foil. Note that otherwise any costs for decontamination will be charged.
- Use only a sufficient sturdy packaging material for the transport and label it outside “High sensitive electronic equipment, handle with care”
- Do not apply only plastic foam flakes as filling material. Otherwise the device could move to the walls caused by vibrations during the transport. Take care the the device is well protected at all sides.



In accordance with the general terms of business of the company (s. <http://www.vlmgmbh.de>) VLM will not take over any liability for damages caused by insufficient sturdy packing or any other reasons.



**Note:**  
**The return or acceptance of metalblock-thermostats contaminated with hazardous medical, biological, chemical or radioactive substances are basically excluded.**

## 4. Installation of the device

### 4.1 Space requirements



Put the metalblock-thermostat on a solid and steady floor.

Note, that a falling down unit caused severe risks to life and health.



Operation mode (*Regulation*) may be negatively influenced through:

- strong and fast temperature fluctuations
- direct exposure to sun rays
- draughts



**VLM-Metallblock-Thermostats are designed for normal use in laboratories. If there are any risks to the health of the operator or third persons or the environment appropriate safety precautions have to be applied, such as putting the thermostat into a fume cabinet, using safety hoods or sucking off of hazardous vapours.**

**“Guidelines for Laboratories” and safety sheets have to be followed strictly .**



Safety hood for EC-Thermostats

### 4.2 Set-up and connection

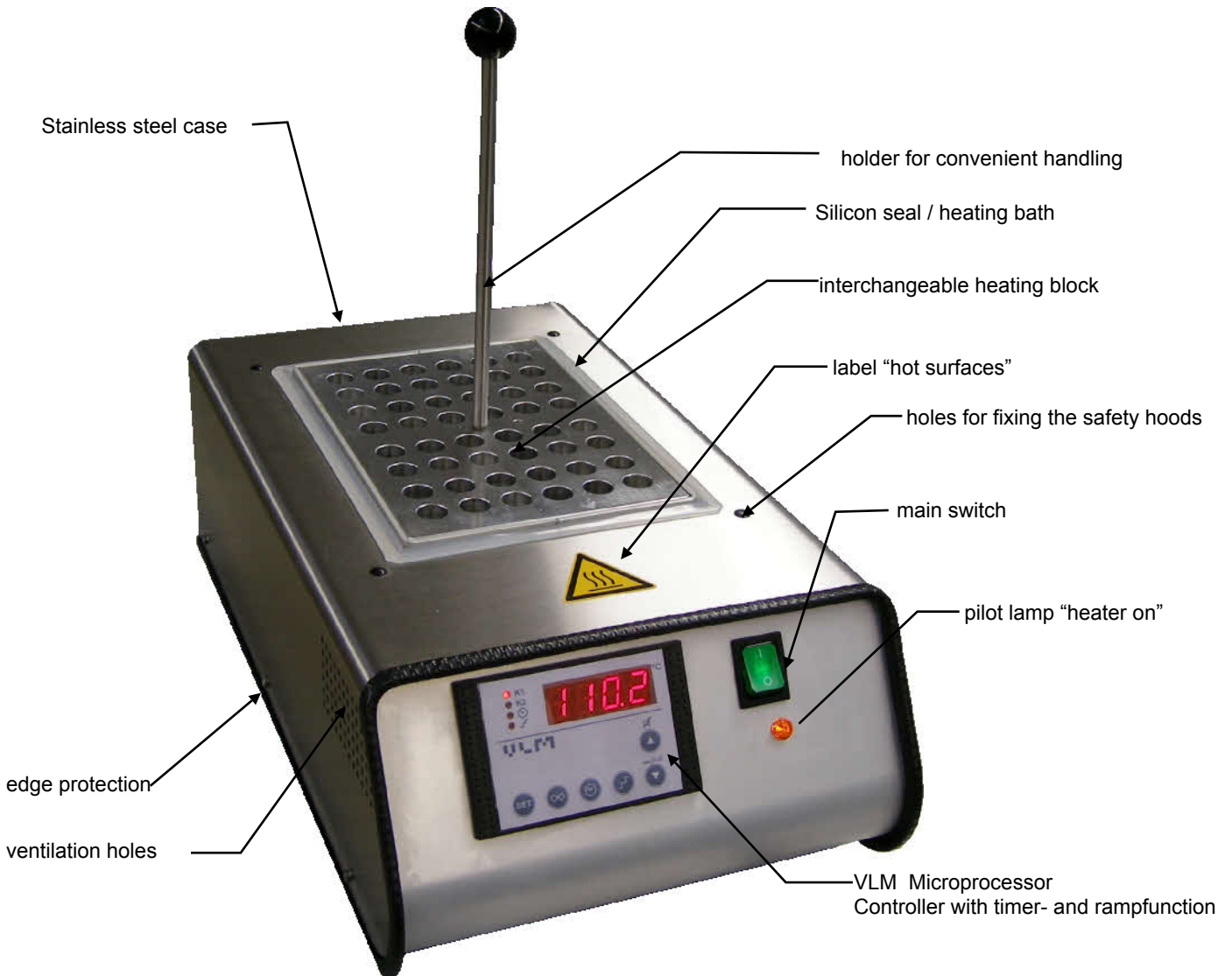
Set-up and connection



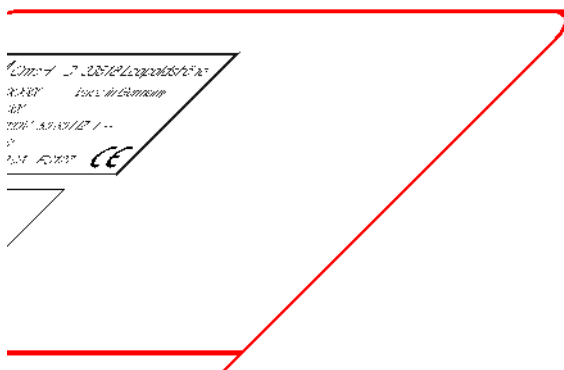
- Set up the unit near an electric plug.
- Check nominal voltage (*cf. nameplate at the back of the unit*); this must be the same as the public grid voltage.
- Read the operating manual before setting-up and connecting the unit.

## 5. Description

### 5.1 Total view

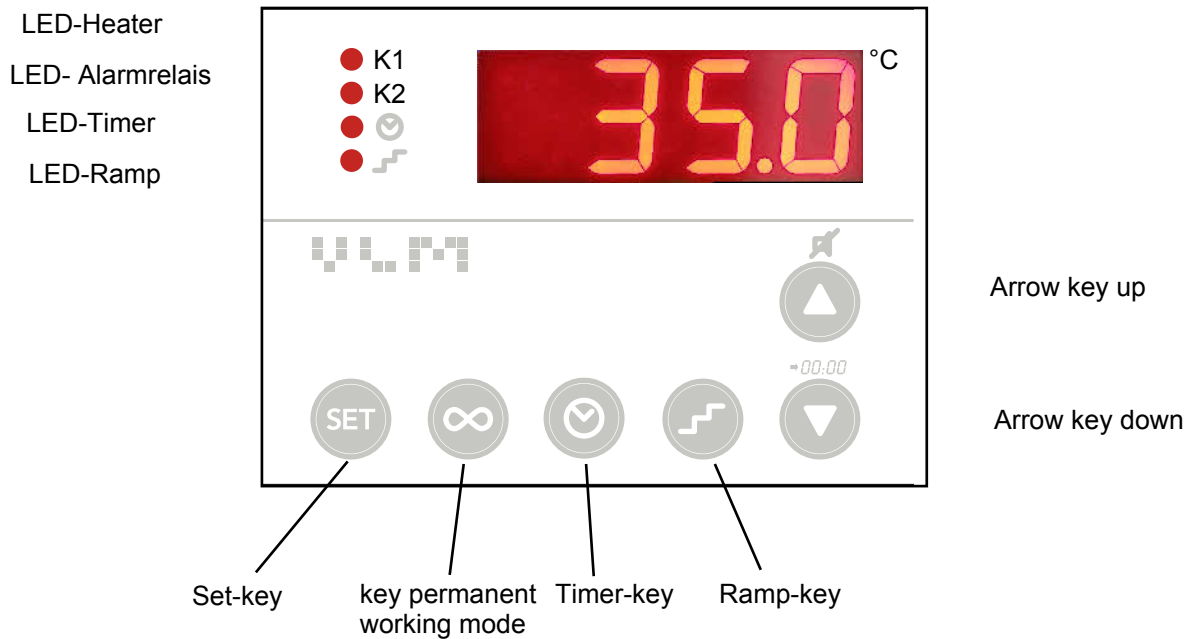


### Back of the case



The type plate showing the serial number and the CE-mark are on the back side above the mains socket.

## 5.2 Funktion of the Microprocessor-Controller (PID)



## 5.3 Basic Advices

6 keys provide a convenient operating of the controller which works either in standard mode, the means carrying out of the following basic functions

- permanent working mode (unlimited heating)
- timer working mode (limited heating)
- Standby-Modus (heater cut off)

or the controller will be switched into the adjusting mode by pressing the "Set" key for > 3 seconds thus the following settings can be changed

- set-point value (SPP)
- timer duration (t)
- ramp gradient (Gr)
- 

Please note: **The change of the setting-mode is only possible in the stand-by mode.**

All output relays will be cut off in the setting mode, that means a previous active regulating respectively heating will be stopped until returning into the standard working mode.

Is a key not pressed within one minute the controller changed automatically into the standard working mode. The return into the working mode is also possible by pressing both arrow keys simultaneously.



## 5.4 The Function Keys of the microprocessor-controller (PID)

### **SET-Key**

actuates the setting mode by pressing the SET-Key (>3 s ). Moreover it allows the setting of new values. The setting value will appear by holding the SET-Key and can be changed by pressing the up- or down arrow keys.

### **Permanent-Key**

The permanent heating will be turned on or cut off by pressing the permanent key.

### **Timer-Key**

the timer function will be turned on or cut off by pressing this key. Moreover this key allows setting of the time hh:mm

While the timer is active (LED Timer is illuminated red ) the rest time can be read from the display by pressing the down key.

The thermostat switch over to the stand-by mode after the set duration of the tempering elapsed. The heater will be cut off and an acoustic alarm is initiated. It can be switched off by pressing the arrow key "up".

### **Ramp -Key**

The ramp function will be switched off or on in the standard working mode. After switching over to setting mode the key allows the adjusting of the ramp gradient (Temperature increase °C/min)

### **Arrow Keys**

allows the up and down change of values.

## 5.5 Operating the Microprocessor-Controller (PID)

### 5.5.1 Permanent working mode

After switching the thermostat on the actual temperature appears in the display alternating with "End". The controller is in the stand-by mode.

If necessary you can change the actual value by change of the SET-Key > 3 s. You will get access to the setting mode. "SPP" appears in the display. Hold the SET-Key pressed and adjust the desired set-point value by the arrow keys. To return into the Stand-by mode by pressing both arrow keys simultaneously.

Press the permanent key. The controller change from the standby- into the permanent working mode. The thermostat is heating up to the set-point value indicated in the display.

You can stop the permanent mode or stop by pressing the permanent key. The controller will return into the stand-by mode.

If you have selected the permanent mode during the heating up phase in order to temper the samples for a limited time you can change over to the timer mode by pressing the timer-key.

Besides you can activate the ramp function, for instance to approach the set-point value smoothly in order to avoid any exothermal of digestion reactions.

### 5.5.2 Timer Working mode

If you want to temper your samples for a limited duration you can activate the timer function by pressing the timer key. The timer LED is illuminated red in order to indicate the limited heating.

Please note: The timer function is starting when the set-point temperature has been reached.

You can stop or cut off the timer function by pressing the timer key for more than 3 s. The controllers returns to the stand-by mode automatically. Please note that the beeper will not be actuated.

You can read the elapsed time of the timer from the display by pressing the "Down" arrow key.

After passing the timer duration an beeping sound will be initiated. The timer LED distinguished. The display shows alternating "End" and the actual temperature. The beeper can be switched off by pressing the "UP" key.

You can adjust the time (max. 99h 99 min) by pressing the SET-key > 3 s. "SPP" appears in the display. Press the timer key. "t" appears in the display. Hold the SET key pressed and adjust the time by the arrow keys.

### 5.5.3 Ramp function

You can activate or deactivate the ramp function at any time by pressing the Ramp key thus the corresponding LED is on or respectively out. This feature allows you to reduce the power of the heating up period.

After starting the ramp function the controller measures the actual temperature and increases this value by the setting the ramp gradient °C/ min. This is the new intermediate set-point value, valid for only one minute. After this minute this value will be increased until the set-point values is reached. Afterwards the set-point value will be hold constant.

You can adjust the ramp gradient by pressing the SET-key > 3 s . So you get access to the setting mode In the display appears "SPP". Press the ramp key. "Gr" appears in the display. Hold the SET-key pressed in order to change the ramp gradient °C/min.

### 5.5.4 Brief instruction : operating of the microprocessor controller (PID)

After pressing the SET key >3 s, press the key	Display zeigt	Change of	Adjusting: Hold SET Key pressed, the press
Set	SSP	Set-point value Temperature °C	△ ▽
Timer	t	duration of tempering hh:min	△ ▽
Ramp	Gr	Ramp °C/min	△ ▽

### 5.6 Safety devices

Safety element	responds when	Signal	Assistance
Overheating protection	Heating block temperature exceeds the maximum adjustable set-point of 130/210°C by more than 20°C	see chapter "Malfunction"	Switch off unit. Failure corrective action only through authorised person or manufacturer
Unit fuse	electric failure occurs	No unit functions	Failure corrective action through authorised person or manufacturer, replace fuse
Controller fuse	electric failure of the controller	No unit functions	Failure corrective action through authorised person or manufacturer, replace fuse

### 5.7 Conformity

Model	Metalblock-Thermostats
HP-Thermostat	Type HP-1V... Type HP-2V... Type HP-1F... Type HP-2F...
EC-Thermostat	Type EC-1V... Type EC-2V...
BIO-Thermostat	Type BIO-1V... Type BIO-2V... Type BIO-1F... Type BIO-2F...
LS-Thermostat	Type LS-1V... Type LS-2V...
QS-Thermostat	Type QS-1V... Type QS-1F...
Guidelines or designation of standards	Laboratory units to heat materials
Standards	DIN EN 61010-1 (VDE 0411 Part1) DIN EN 61010-2-010 (VDE

### 5.8 Normal supplies

- Metalblock-Thermostat
- Mains cable
- Spare fuses
- interchangeable heating blocks with holders if ordered
- operating manual

Special accessories:

- Polycarbonate-covers
- Safety hoods made of polycarbonate

## 5.9 Products lines - interchangeable heating blocks



HP-Thermostats 130°C/210°C



Type HB-HP1  
L/W/H 139 x 98 x 75 mm  
24 test-tubes Ø 16 mm



Type HB-HP2  
L/W/H 198 x 139 x 75 mm  
48 test-tubes Ø 16 mm



BIO-Thermostats 130°C



Type HB-BIO1  
L/W/H 139 x 98 x 46 mm  
38 microcentr.tubes 1,5 ml



HB-BIO2  
L/W/H 198 x 139 x 46 mm  
96 microcentr.tubes 1,5 ml



EC-Thermostats 130°C/210°C



Type HB-EC1  
L/W/H 148 x 107 x 75 mm  
24 test-tubes Ø 16 mm



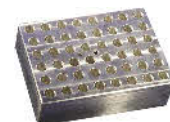
Type HB-EC2  
L/W/H 214 x 148 x 75 mm  
48 test-tubes Ø 16 mm



LS-Thermostats 130°C



Typ HB-LS1H  
L/W/H 148 x 53 x 46 mm  
24 microcentr.tubes 1,5 ml



Type HB-LS1  
L/W/H 148 x 107 x 46 mm  
48 microcentr.tubes 1,5 ml



QS-Thermostats 130°C /210 °C



Type HB-QS  
L/W/H 92x92 x 75/46 mm  
16 testubes 16 mm  
24 microcentrif. tubes 1,5//2,0 ml



Type HB-LS2  
L/W/H 214 x 148 x 46 mm  
96 microcentr.tubes 1,5 ml

## 5.10 Technical data

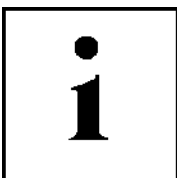
Thermostat Type	Power rating Watt	Case Dimensions LxWxH (mm)	Unit fuse in the mains cable	Weight ca. Kg	Dimensions heating bath LxWxT (mm)	Heating blocks capacity
HP-1V	300	382 x 212 x 140	T 4,0 A	6	140 x 99 x 75	1 HB-HP1
HP-2V	600	440 x 253 x 140	T 6,3 A	8	198 x 140 x 75	2 HB-HP1 oder 1 HB-HP-2
HP-1F	300	382 x 212 x 140	T 4,0 A	6	-	permanently installed
HP-2F	600	440 x 253 x 140	T 6,3 A	8	-	permanently installed
EC-1V	300	382 x 212 x 140	T 4,0 A	6	148 x 107 x 75	1 HB-EC1
EC-2V	600	440 x 253 x 140	T 6,3 A	8	214 x 107 x 75	2 HB-EC1 oder 1 HB-EC2
BIO-1V	300	335 x 193 140	T 4,0 A	5	140 x 99 x 46	1 HB-BIO1
BIO-2V	600	395 x 233 140	T 6,3 A	7	198 x 140 x 46	2 HB-BIO1 oder 1 HB-BIO2
BIO-1F	300	335 x 193 140	T 4,0 A	5	-	permanently installed
BIO-2F	600	395 x 233 140	T 6,3 A	7	-	permanently installed
LS-1V	300	335 x 193 140	T 4,0 A	5	148 x 107 x 60	1 HB-LS1 or 2 HB-LS1H
LS-2V	600	395 x 233 140	T 6,3 A	7	214 x 107 x 60	1 HB-LS2 or 2 HB-LS1 oder 4 HB-LS1H
QS-1V					91 x 91 x 65	1 HB-QS
QS-1F						

Technical modifications reserved!

<b>Voltage</b>	<b>230 V/50,60 Hz</b>
Max. Set-points acc. to units:	
HP, EC, QS-Thermostats	130°C oder 210°C
BIO, LS-Thermostats	130°C
Protective system acc. to IEC 529	IP 20
EMV-indications concerning failure classes	EN 50081-1 EN 50082-2
Length of Mains cable	2m
Controller fuse	T 2,0 A

## 6. Putting into operation / Operation

### 6.1 Sample vessels

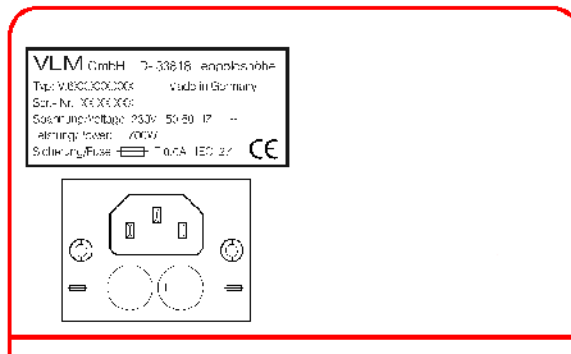


Note that the diameter of the used test-tubes is less smaller than the diameter of the hole thus there is only a very narrow gap between the aluminium wall and the tube. This precondition provides a good heat transfer from the heating block into the sample and the maximum performance of the tempering system can be guaranteed.

Note the limited temperature stability of plastic vessels.

## 7. Maintenance and repairs

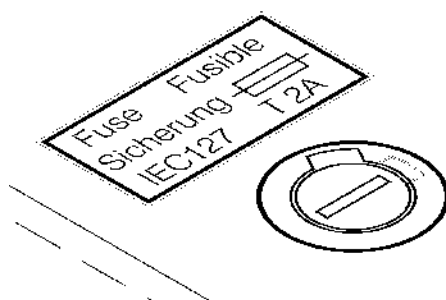
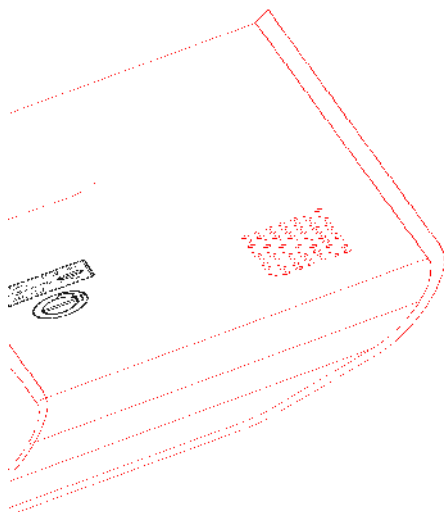
### 7.1 Replacement of a fuse



- Pull out main plug
- Screw off closing cap with a screwdriver
- Remove failed fuse and set in new fuse. The current intensity of the fuse must correspond to the indications on the nameplate.
- Screw in the closing cap again

Unit fuses are situated on the back panel of the unit, in the cold unit plug

The controller fus (T 2 A) is situated at the bottom of the unit.



- Pull out main plug
- Screw off closing cap with a screwdriver
- Remove failed fuse and set in new fuse. Make sure the current intensity of the fuse is correct!
- Screw in the closing cap again



## 7.2 Decontamination

The user is responsible for the decontamination of the thermostat in case hazardous material has been spilled.

## 7.3 Spare part list

A spare part list will be provided to authorized persons on request. Please let us know the serial number of the unit to your order.

## 8. Malfunction displays

### 8.1 Diagnosis alarms Microprocessor-Controller

Display	Description	Measures
F1L F1H	Temperature sensor short circuit Temperature sensor break	Replacement of the sensor by authorized expert or manufacturer
FFF	Excess of the measuring range of the temperature sensor	contact manufacturer
F99	memory error	contact manufacturer

### 8.2 Malfunction displays

Heating control light (yellow)	Controller Display	Effect
on	on	Heater on; Normal working mode
off	off	Heater off; Normal working mode
off	on	Over temperature protection released, unit failure
on (glooming)	off	heater failure

## 8. Malfunction displays

### 8.1 Diagnosis alarms Microprocessor-Controller K1R

Abbreviation	Explanation	Failure corrective action
see: Over Range	Sensor break	Replacement of sensor by authorised person or by VLM
oooo	Over Range	Contact VLM
_ooo	Under Range	Contact VLM

### 8.2 Malfunction displays

Heating control light (yellow)	Controller Display	Effect
on	on	Heater on; Normal working mode
off	off	Heater off; Normal working mode
off	on	Over temperature protection released, unit failure
on (glooming)	off	heater failure

## 9. Appendix

Declaration of Conformity  
Wiring diagram



## EG - Konformitätserklärung

CE - Declaration of conformity  
Déclaration CE de conformité  
Declaración CE de conformidat

Hersteller: VLM GmbH  
Manufacture: Heideblümchenweg 50  
Fabricant: 33689 Bielefeld  
Fabricante: Deutschland

Produkte: Metallblock Thermostate Produktlinien HP, BIO, EC, LS, QS  
Products: Metalblock Thermostats Productlines HP, BIO, EC, LS, QS  
Produits: Thermostats Métal Bloc Modèle HP, BIO, EC, LS, QS  
Productos: Termostatos de bloque metálico tipo HP, BIO, EC, LS, QS

Die bezeichneten Produkte sind in Übereinstimmung mit folgenden Richtlinien und Normen hergestellt worden:

The products in question have been manufactured in accordance with the following guidelines and standards:

Les produits dénommés sont fabriqués en conformité aux directrices et normes suivants:

Los mencionados productos son fabricados de acuerdo con las siguientes directrices y normas:

73/23/EWG abgeändert durch 93/68/EWG,  
89/336/EWG abgeändert durch 92/31/EWG und 93/68/EWG,  
EN 61010-1, EN 61010-2

73/23/EWG amended by 93/68/EWG,  
89/336/EWG amended by 92/31/EWG and 93/68/EWG,  
EN 61010-1, EN 61010-2

73/23/EWG modifié par 93/68/EWG,  
89/336/EWG modifié par 92/31/EWG et 93/68/EWG,  
EN 61010-1, EN 61010-2

73/23/EWG modificada por 93/68/EWG,  
89/336/EWG modificada por 92/31/EWG y 93/68/EWG,  
EN 61010-1, EN 61010-2

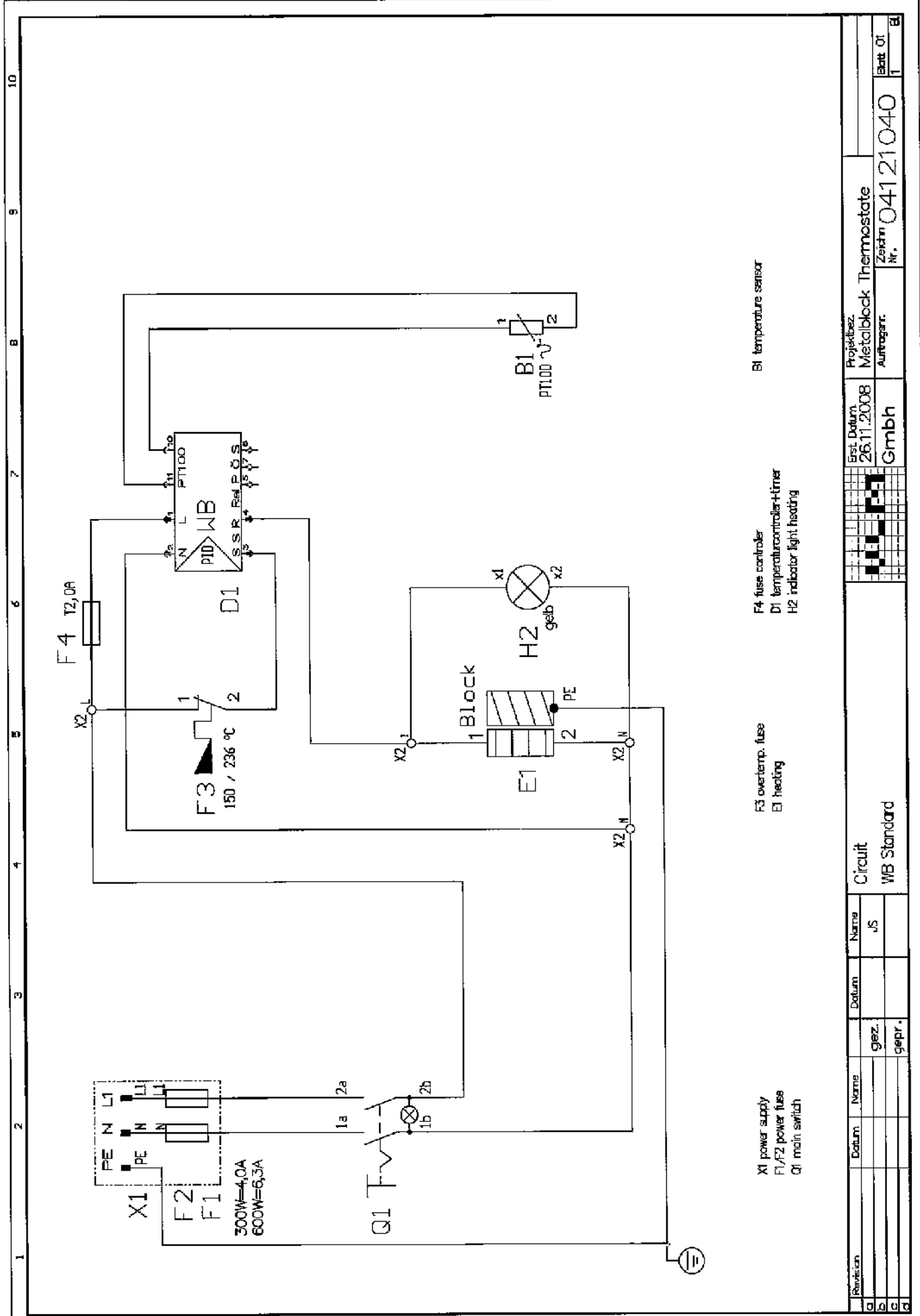
Bielefeld, den 19.01.2009

(Josef Schubert)  
(Geschäftsführer / Managing Director / Gérant / Gerente)

### **VLM GmbH**

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- X1 power supply
- F1/F2 power fuse
- Q1 main switch
- F3 overtemp. fuse
- E1 heating
- F4 fuse controller
- D1 temperaturcontroller+timer
- H2 indicator light heating
- B1 temperature sensor

Revision	Datum	Name	Datum	Name
0				uS
0		gez.		
0		gepr.		

Circuit  
WB Standard

Erst Datum 26.11.2008	Projektbez. MetalBlock	Thermostate	Zeichn. Nr. 04121040	Blatt 01
Gmbh	Auftragnr.			1

