Translation of the original operating instructions

KÜHLMOBIL

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Foreword

CONGRATULATIONS

You have made a good choice. Thank you for your trust.

You have chosen a KÜHLMOBIL from Van Der Heijden Labortechnik GmbH.

These operating instructions is to familiarize yourself with the operation and capabilities of our KÜHLMOBIL. Remember to follow all instructions and safety information.

Please abide by transportation, operation, maintenance, repair, storage and disposal to this manual.

By intended use of the KÜHLMOBIL, we offer full warranty and liability for our product!

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1.1 Introduction

These operating instructions are an essential aid for the successful and safe operation of the KÜHLMOBIL.

The operating instructions contain important directions for the safe, correct and economical operation of the KÜHLMOBIL.

Adhering to these instructions will help to avoid dangers, reduce repair costs and down-time and to increase the reliability and working life of the KÜHLMOBIL.

The operating instructions must be available at the KÜHLMOBIL at all times, and must be read and applied by every person engaged to work with/on the KÜHLMOBIL, e.g.:

- Operation, troubleshooting during work processing,
- Maintenance (servicing, care, repairs) and/or
- Transport.

1.2 Instructions relating to Copyright and Trademark Rights

These operating instructions are to be treated in confidence.

They should only be made accessible to authorised persons.

They should only be made available to third parties with the expressed, written permission of Van der Heijden Labortechnik GmbH.

All documents are protected in terms of the Copyright Act. Unless expressly allowed in writing, it is prohibited hand over or copy documents, even extracts thereof, or to sell or reveal their contents.

Any contravention is punishable and will incur damages.

We reserve all rights to exercise protection of industrial property rights.

1.3 Instructions for the Operator

The operating instructions form an essential part of the KÜHLMOBIL.

The operator must see to it that operating personnel are aware of these guidelines.

As the operating instructions manual will probably be subject to heavy use at the operating location, the operator is obliged:

- To keep the original safely,
- To ensure that a copy of the operating instructions is always available at the KÜHLMOBIL, and
- That every user reads the operating instructions carefully and follows and adheres to all instructions.

The operating instructions are to be supplemented by the operator to include operating instructions on the basis of existing, national regulations and accident prevention and environmental protection, including information on supervisory and reporting obligations relating to taking account of operational peculiarities, e.g. relating to work organisation and the personnel employed.

In addition to the operating instructions and the regulations on accident prevention that are binding in the user's country and at the operating location, the recognised specialist regulations governing safety and correct work practices are to be observed.

The operator/user may not carry out any extensions/conversion to the KÜHLMOBIL, which could compromise safety, without the authorisation of Van der Heijden Labortechnik GmbH! This applies in particular to the installation and adjustment of safety equipment.

Spare parts that come into use must meet the technical requirements stipulated by Van der Heijden Labortechnik GmbH. This is always guaranteed for original spare parts.

Only use trained or instructed personnel. Clearly specify the responsibilities of personnel for operation, servicing and repairs!

Servicing of the KÜHLMOBIL may only be performed by specially trained Van der Heijden Labortechnik GmbH personnel.

Van der Heijden Labortechnik GmbH reserves the right, in terms of product improvement, carry out technical modifications necessary to contribute to a proper function during the repair process.

1.4 Service and Warranty

We endeavour to handle your questions and orders as quickly as possible. We would ask you to indicate the identification data of your KÜHLMOBIL before every query. This data is entered on the cover sheet of these operating instructions.

Within the warranty period the Van der Heijden Labortechnik GmbH warranty for the KÜHLMOBIL covers damage proven to be as a result of design, material or manufacturing flaws. This does not apply to any parts that are subject to wear and tear as a result of their function.

The warranty is valid for 2 years. It begins on the date of delivery by the manufacturer.

A complete warranty will only be honoured if:

- the KÜHLMOBIL is used in accordance with its intended purpose,
- the maintenance and service regulations are strictly adhered to.

The warranty is limited to the case of a complaint to our choice of the subsequent improvement or a free repair or a new delivery. Defective parts will be repaired or replaced, provided that evidence present in the case of a disturbance or a defect of material or workmanship free of charge.

Any other compensation claims are excluded

The spare-parts prices of Van der Heijden Labortechnik GmbH are applicable.

Subsequently we refer you to the warranty provisions as well as the general terms and conditions of Van der Heijden Labortechnik GmbH.

Please direct any queries to Van der Heijden Labortechnik GmbH. You will find the address on the title page.

2 Safety

2.1 Miscellaneous

The KÜHLMOBIL is constructed in accordance with state-of-the-art technology and recognised safety regulations.

Nevertheless use of the unit can involve dangers for the user or third parties as well as adverse effects on the KÜHLMOBIL itself or other material assets if it:

- Is operated by untrained or non-familiarised personnel,
- Is not used correctly,
- Is maintained or serviced incorrectly.

2.2 Correct Use

The KÜHLMOBIL by Van der Heijden Labortechnik GmbH is used exclusively for cooling externally connected devices and machines, which need to be cooled at a constant supply temperature.

The cooling medium between the KÜHLMOBIL and the devices being cooled is HKF 10.1.

The coolant HKF 15 is to be used, with KÜHLMOBILen which were conceived for outdoor installation and the ambient temperature can amount to -15° C at a stand still. Inlet temperatures <10° C needed also an anti-freeze protection with HKF 15.

Are at a standstill of the KÜHLMOBIL ambient temperatures below -15 ° C expected, please ask at Van Der Heijden Labortechnik GmbH for the accordingly cooling fluid.

The KÜHLMOBIL may only be connected to devices that are water-cooled and correspond to the parameters of the KÜHLMOBIL. The thermal load of the unit to be cooled must not exceed the cooling output of the cooler.

The through-flow resistance of the unit to be cooled must be approx. 15% below the maximum indicated pump pressure. Only those devices to be cooled, which are authorised for the maximum water-pump pressure, may be connected.

A different use or use that goes beyond this description, e.g. as a refrigeration system for food, is considered incorrect.

The operator of the KÜHLMOBIL shall bear sole liability for any damage resulting from incorrect use.

This applies similarly to unauthorised modifications to the KÜHLMOBIL.

Components/spare parts that are not in fault-free condition are to be replaces immediately. Only use original spare parts. Under certain circumstances correct function cannot be guaranteed if non-original spare parts are used!

Correct use also include following the following instructions:

- on safety,
- on operation and
- on maintenance and servicing,

which are described in these operating instructions.

Attention! If a there is a defect in the cooling fluid circuit there is the risk that oil from the refrigeration cycle (compressor) of chiller can get into the coolant!

Observe all laws and regulations of the water-supply company in force at the operation site!

2.2.1 General references coolant secondary

All KÜHLMOBILs, which are equipped with feed pumps may only operated with the coolant „HKF 10,1 “. This applies to temperature ranges in the secondary water advance ≥ +10° C. The coolant can be referred at the company Van der Heijden Labortechnik. With deeper secondary inlet temperatures ask the manufacturer.

The coolant HKF 15 is to be used, with KÜHLMOBILen which were conceived for outdoor installation and the ambient temperature can amount to -15° C at a stand still. Inlet temperatures <10° C needed also an anti-freeze protection with HKF 10.1 or distilled water with sodium bicarbonate.

The KÜHLMOBIL may only be connected to devices that are water-cooled and correspond to the parameters of the KÜHLMOBIL. The thermal load of the unit to be cooled must not exceed the cooling output of the cooler. The through-flow resistance of the unit to be cooled must be approx. 15% below the maximum indicated pump pressure. Only those devices to be cooled, which are authorised for the maximum water-pump pressure, may be connected.

Also every other medium can be used, which has the cooling characteristics of water. The medium must be arrears-free and may not attack metals and plastics of any kind.

With the use of normal drinking water and/or water with e.g. demineralized water, also blended, any guarantee purges on the pump with leakages if by using of the liquid deposits specified on the slide ring seal to be determined. This point does not apply to pumps without sealing (magnet-coupled).

A defect slide ring seal must be therefore always returned to the Van der Heijden - Labortechnik GmbH, so that appropriate investigations can be accomplished.

Likewise the cleanliness of each medium is to be ensured.

The alga protective agent „Thermoclean-DC“ may be used as a appendage in water. The dosage is to be inferred from the data sheet and must absolutely be kept. (Thermoclean can be referred over the Van der Heijden – Labortechnik GmbH.)

Beam of light by all water-prominent parts is to be avoided, this promotes alga growth in the medium. By algae in the water the pumps, which have a slide ring seal, become leaky.

The slide ring seal of the feed pump is a wearing part. Therefore deposits are by e.g. hard water, wrong additives, growth of algae and bacteria etc. Note: Deposits lead inevitably to leakages and malfunctions at the feed pump.

Leakages at the pump can also develop, if start-up were not accomplished according to regulation. Start-up is to be accomplished compellingly after the instruction manual, otherwise it can come to a brief dry run operation of the feed pump. By dry run operation the scoring on the slide ring seal forms. The consequence is a leaky pump.

The use of the following cooling media (even when mixed with water) is considered incorrect:

- Solvents of any kind,
- Flammable liquids,
- Explosive liquids,
- Caustic liquids or
  Fully-desalinated or distilled water.

2.2.2 General references coolant primary **(for all water cooled models)**

With water-cooled KÜHLMOBILs from any kind, which will be connected on a drinking water network, house cooling system or something else, the data sheets for the composition of the necessary cooling water have to be taken from the manual

Despite of high-quality V4 heat exchangers an attack on material or on larder connections can be in disregard.

A primary water filter has to be installed before the water inlet. The filter size should be 90 µm at least. Rust particles of steel lines can also destroy V4A-plates by corrosive behavior.

Guarantees are not possible in these cases. The cause of pitting or something like that results high costs. This applies first of all to KÜHLMOBILs with active cooling.

Fouling

It has to be ensured that the DIN guidelines for drinking water and heating water, Vd-TÜV guidelines for ADFW as well as WTT guidelines have to be observed (see diagram).

Many different factors can influence fouling. These are, for example: velocity, temperature, turbulence, distribution, water quality.

The mediums have to be moved at the highest possible mass flows. In the event of excessively low mass flows (part load) the turbulence in the heat exchanger can decrease and the fouling tendency increases.

Lime deposits in the heat exchanger can be possible at temperatures above 60° C according to the water quality. Turbulent flow and lower temperatures reduce the risk of calcification. During switching-off the KÜHLMOBIL it has to be ensured that the secondary side will be switched-off first and then the primary side. During switching-on the primary side has to be switched-on first and after that the secondary side. In that way overheating of the heat exchanger will be avoided.

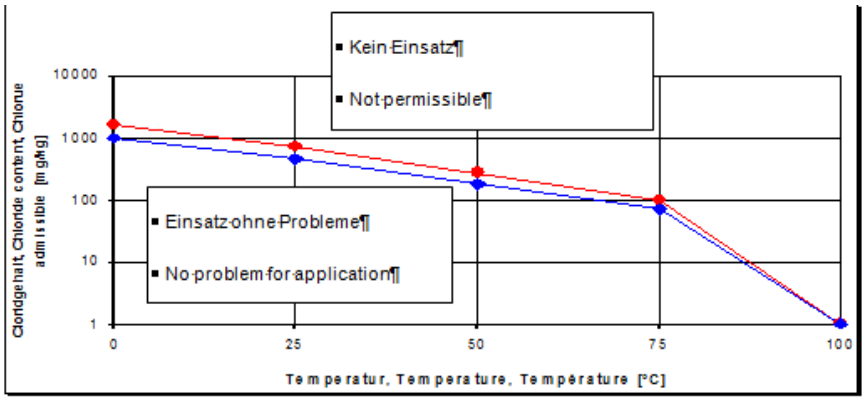
Cleaning

If it should be expected a plaque formation based on the water quality (for example high degree of hardness or strong pollution), a cleaning has to be performed in regular distances. There is the possibility of cleaning by rinse. In that case the heat exchanger has to be rinsed with suitable cleaning solvent against the normal way of flow. If chemicals will be used for cleaning, please note, that there is no indigestibility against stainless steel, copper or nickel. Non-observance can cause the destruction of the heat exchanger.

Corrosion resistance of soldered plate heat exchangers compared with water ingredients

The brazed plate heat exchanger consists of embossed stainless steel plates 1.4404 or SA240 316L. It is thus to be considered the reaction of corrosion of stainless steel and solder copper or nickel.

Water constituent + parameters	Unit	Heat exchanger, copper brazed	Heat exchanger, nickel brazed
pH-value		7 – 9 (considering SI Index)	6 - 10
Saturation-Index SI (delta pH-value)		-0,2 < 0 < +0,2	No specification
Total hardness	°dH	5-7	6 - 15
Conductivity	µS/cm	50…250	No specification
Abfilterbare Stoffe	mg/l	<20	<20
Chlorides	mg/l	See diagram, above 100° C no chlorides permitted	
Free Chlorine	mg/l	<0,3	<0,3
Hydrogen sulphide (H2S)	mg/l	<0,05	No specification
Ammonia (NH3/NH4)	mg/l	<2	No specification
Sulphates	mg/l	<50	<150
Hydrogen carbonate	mg/l	<200	<200
Hydrogen carbonate / Sulphates	mg/l	>1,0	No specification
Sulphide	mg/l	<1	<5
Nitrate	mg/l	<50	No specification
Nitrite	mg/l	<0,1	No specification
Iron	mg/l	<0,2	No specification
Manganese	mg/l	<0,1	No specification
Free aggressive carbonic acid	mg/l	<15	No specification



2.3 Safety instructions in case of external cooling water supply

Due to the design of the as a water-cooled or water - water – version the KÜHLMOBIL is supplied with cooling fluid of the domestic water system or municipal water on the primary circuit. The same applies to the options "emergency cooling" and "automatic refill". Both options must be connected to their function to an external water circuit.

Since the external water supplies are not self locking, it can lead to leakage in the event of an uncontrolled water leakage.

For this reason, the corresponding area on the KÜHLMOBIL, at the hose connections and at the device which have to be cooled must be monitored with moisture sensors. An additional floor drain is recommended.

By a leakage to avoid further damages, it must be ensured that all water supplies and the KÜHLMOBIL shut off immediately and be protected against restart!

2.4 Instructions on Signs and Symbols

In these operating instructions the following designations and signs are used for safety instructions and particularly important details:

Danger!

Draws attention to an immediately threatening danger, which will lead to the most serious personal injuries or to death if the indicated instruction is not followed exactly.

Warning!

Draws attention to a possibly dangerous situation, which could lead to the most serious personal injuries or to death if the indicated instruction is not followed exactly.

Caution!

Draws attention to a possibly dangerous situation or unsafe and dangerous methods of procedure, which could lead to personal injury or to material damage to the KÜHLMOBIL or its environment.

All of these WARNINGS must be precisely adhered too!

This refers to particular circumstances, adherence to which guarantees safe, correct and efficient handling of the KÜHLMOBIL.

All instructions should be followed in the interests of correct use of the KÜHLMOBIL. Pass on all instructions to other users as well!

Note!

This refers to particular circumstances, adherence to which guarantees safe, correct and efficient handling of the KÜHLMOBIL.

All instructions should be followed in the interests of correct use of the KÜHLMOBIL. Pass on all instructions to other users as well!

- The bullet identifies work and/or operating steps. The steps are to be performed in sequence from top to bottom!

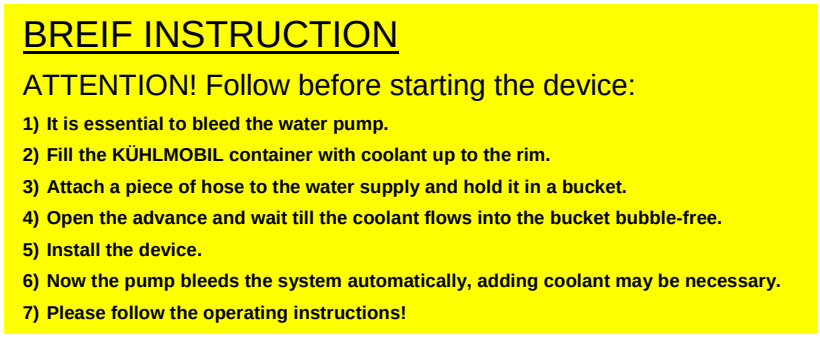
– The mirror hyphen identifies enumerations.

Instructions and symbols such as warning signs, warning stickers, brief instructions, component identifications etc., that are attached directly to the KÜHLMOBIL, absolutely must be adhered to.

Instructions and symbols attached directly to the KÜHLMOBIL must not be removed, and must be maintained in fully legible condition!

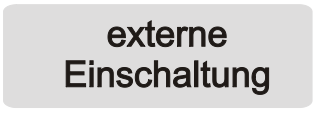
2.5 Instruction Signs on the KÜHLMOBIL

Following instruction signs are on the chiller:



This sticker is attached inside the lift-up cover next to the KÜHLMOBIL rating plate.

This sticker is attached above the mains cable outlet at the rear of the KÜHLMOBIL.



These stickers with different text content naming the respective component are attached to all fittings, connections and cables at the rear of the KÜHLMOBIL.

The CE symbol is also attached at the rating plate of the KÜHLMOBIL.

Rating Plate

The rating plate is attached to the inside of the KÜHLMOBILs; fold-up cover.

You will find a picture of the rating plate in the technical specifications in the appendix of these operating instructions.

2.6 Safety Instructions for Operating Personnel

The KÜHLMOBIL may only be used in a technically fault-free condition as well as in accordance with its intended purpose and in a safety- and danger-conscious manner in accordance with these operating instructions! Any faults, especially those that can negatively influence safety, must be rectified immediately!

Anyone who is engaged with setting-up, starting-up, maintenance or troubleshooting associated with the KÜHLMOBIL must have completely read and understood these operating instructions – especially the *Safety* chapter *before commencing work*.

It is too late during operational use.

This is particularly true for personnel who only occasionally operate the KÜHLMOBIL.

The operating instructions must be kept ready to hand at the KÜHLMOBIL at all times.

No liability will be accepted for damages and accidents resulting from failure to follow the operating instructions.

The relevant accident-prevention regulations as well as the other generally recognised safety-related and work-related medical rules must be observed.

Should malfunctions or safety-related changes become apparent in the behaviour of the KÜHLMOBIL, it should be shut down immediately and the event should be reported to the responsible office/person!

Work on the KÜHLMOBIL may only be performed by reliable and trained personnel.

Only use trained or familiarised personnel!

2.7 Safety Instructions for Operating the KÜHLMOBIL

For all work, which relates to

- operation,
- adjustment of the KÜHLMOBIL and its safety equipment and
- maintenance,

switching on and off must be done in accordance with these operating instructions and the maintenance instructions must be adhered to! The KÜHLMOBIL may only be operated when all protective and safety equipment, e.g. detachable protective equipment, housing locks, etc. are present and functioning!

The KÜHLMOBIL must be examined at least once every six months for externally visible damage. Report any changes (including behaviour-related changes) immediately to the responsible shift foreman or plant manager.

The coolant quality inside of the tank of the chiller had to be controlled one time per month. Chemical or biological dirt had to be cleaned to protect the chiller against damages, specially

on the pump.

For KÜHLMOBILe with active cooling and more than 3.0 kg of refrigerant applied:

The refrigeration cycle is once a year to check by means of pressure testing. The pressure test is independent of the duration of the KÜHLMOBIL The implementation is entrusted to one -authorized service technician in accordance with all safety regulations.

The mains plug is used as a safe disconnecting from the power supply and must be al-ways accessible.

Never operate units with damaged mains power cables

2.8 Maintenance-Related Safety Instructions

Prior to commencement inform the operating personnel of the device to be cooled about performing special and maintenance work.

Adhere to the stipulated deadlines for recurring tests, inspections as well as those indicated in these operating instructions.

For inspection, maintenance and repair of the KÜHLMOBIL and the safety equipment it is essential that the maintenance-work instructions in Chapter 7, *Maintenance*“, be adhered to!

Workshop equipment appropriate to the work is absolutely essential for carrying out maintenance measures.

For servicing, repair and maintenance work the KÜHLMOBIL must be switched off and secured against being unexpectedly switched back on by:

- Switching the KÜHLMOBIL to standby mode by means of the  key and then
- Unplugging the mains cable of the KÜHLMOBIL.
- After the KÜHLMOBIL has been unplugged, allow hot parts to cool down.

Work on electrical equipment may only be performed by trained specialist electricians!

Always retighten screwed joints that have become loose due to service and maintenance work!

If it is necessary to dismantle safety equipment for service or maintenance purposes, this equipment must be reattached and checked *immediately* after completion of the service and maintenance work!

At the beginning of maintenance/repair/care, all soiling and residues, such as dust, operating materials or cleaning agents must be removed from the KÜHLMOBIL, especially from connections and screwed joints.

Only use mild water-based cleaning agents. Follow manufacturer’s instructions. Do not use any organic solvents, as this could cause fire or explosion!

2.9 Instructions relating to Particular Types of Danger

2.9.1 Electric Power

Only use original fuses with specified current on the mains side!

Never perform work on voltage-carrying components.

When carrying out repairs, ensure that design features are never altered in a way that might compromise safety. In particular, creepage and air ways as well as gaps must not be reduced due to insulation.

Fault-free earthing of the electrical system must be guaranteed by means of a protective conductor system.

In the event of interruptions in the electrical power supply, immediately disconnect the KÜHLMOBIL from the mains by:

The perfect grounding of the electrical system must be ensured by a protective grounding system.

An automatic disconnection of the current supply by a fault current protection device must be present, in order to prevent a condition danger-bringing by a contact voltage.

In the event of interruptions in the electrical power supply, immediately disconnect the KÜHLMOBIL from the mains by:

- Switching the KÜHLMOBIL to standby mode by means of the  key, and then
- Unplugging the mains cable of the KÜHLMOBIL from the socket.

2.9.2 Pumps

References to modifications, repairs or changes:

References at the pump consider and keep it readable, e.g. direction of rotation arrow, marking of the coolant connection.

Don’t move parts during the enterprise depart for contact protection for hot and cold.

If necessary use protection equipment.

Work only on the pump when it is off.

At all assembling and maintenance work scoled the motor zero potential and protect it for against restarting.

Install the safety devices again correctly on the pump after all work.

Residual Risk:

Draw in from long, open hair at the protective covers of the pump is possible.

- Carry a hairnet!

Injuries caused by expel objects from the opening of the fan motor cover, which are introduced to the opening.

- Do not introduce any objects!

Burns or scaldings by hot surfaces or hot coolant.

- Do not touch!
- Weare safety gloves!

Injuries caused by cooling liquid contract out of defect sealing.

- Take the pump out of operation!
- Repair the pump!

Special risks:

Magnetic drive

The strong magnetic field within the range of the magnetic couplings or with single magnets can lead to following dangers:

- Mortal danger for persons with cardiac pacemaker
- Damages at magnetic data media (document of identification with magnetic stripes, credit and cheque cards), electrical, electronic, fine-mechanical devices, construction units or instruments (e.g. mechanical, digital clocks, pocket calculator, non removable disks)
- Uncontrolled tightening of magnetic parts (e.g. tools, screws)

NOTE!

- Keep a safety distance of minimum 150 mm to open magnets or magnetic couplings with magnet-sensitive objects.
- For plug-in units which are not installed into the drive unit and not completed drive units keep a safety distance of minimum 150mm for magnet-sensitiv parts and cardiac pacemaker

NOTE!

Distance to the completely installed pump:

The magnetic fields of the magnetic couplings by installed pumps become completely shielded by the enclosing construction units. By magnetic coupling goes neither in the stop nor in the enterprise a danger out.

DANGER!

Strong magnetic field within the range of the magnetic coupling, with single magnets, plug-in units or pump heads.

Mortal danger and damage to property caused by the magnetic field!

- Guarantee that personnel with an cardiac pacemaker does not accomplish work on the pump.
- Protect the workstation, if necessary block the workstation off:
  - Guarantee that personnel with an cardiac pacemaker have > 1 m safety distance.
  - Guarantee that no magnetizable metal parts can be tightened by the magnetic coupling.
  - Guarantee that parts of the magnetic coupling cannot be tightened by magnetizable metal parts
- With magnet-sensitive articles keep a safety distance > 150 mm to the magnetic coupling or pump head**.**

2.9.3 Coolant and other Chemical Substances

When handling chemical substances, observe and adhere to the relevant regulations and safety specifications sheets of the manufacturer of these substances relating to storage, handling, use and disposal!

Eating, drinking, smoking and keeping food in rooms in which chemicals are located is prohibited!

Never keep hazardous materials in food containers or receptacles. Always use and clearly label containers authorised for the respective material.

With regard to the coolant, please adhere to the safety specifications sheet accompanying the device/operating instructions.

2.9.4 Noise

The A-assessed equivalent extended sound pressure level at the operating workplace of the KÜHLMOBIL during normal operation is below 54 dB at the front at a distance of 2 m without reflection.

There may be a high sound pressure level in the vicinity of the KÜHLMOBIL depending on local conditions. This increased sound pressure level can be caused by neighbouring devices/machines, and can cause hardness of hearing.

3 Product Description

Note!

Some of the equipment described in these operating instructions is only available on certain the KÜHLMOBIL models.
This optional equipment is identified by an *.

3.1 Explanation of Terminology

Secondary:

Water supply: Cold water leaving the KÜHLMOBIL or entering the device to be cooled.

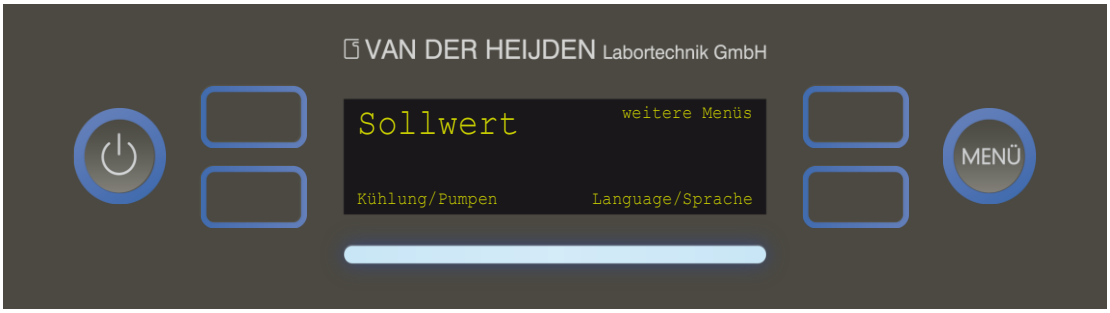
Water return: Heated water leaving the device to be cooled or entering the KÜHLMOBIL.

primary:

Water inlet: Cold water leaving the KÜHLMOBIL or entering the device to be cooled.

Water outlet: Heated water leaving the device to be cooled or entering the KÜHLMOBIL.

3.2 Overview



Operating elements on the touch-pad control panel

Figure main switch on the front panel door (at large Chillers)

3.3 Functional Instructions

1. The appliance is customized for the customer's voltages. Therefore the feeder had to be connected before start up. A clamp box for this is mounted on the back side of the chiller. The connection has only done by an expert!

Caution! Irreparable damage to the compressor are possible

When connecting the supply voltage, the phase rotation must be observed. The KÜHLMOBIL is wired for a right rotating field and must be excluded accordingly.

2. The appliance's coolant circuit is designed as an „open" system. The feed pump draws the cold coolant out of the container and pumps via the coolant supply through the unit to be cooled.

   The heated coolant flows back through the coolant return and into the coolant container, where it is cooled and begins the circuit again.

3. If faults occur in the coolant circuit, the feed pump in the coolant circuit also shuts down.

   The fault is displayed and the status indicator flashes red. In addition, an audible warning signal sounds.

4. As soon as the coolant level in the container drops below the minimum level the status indicator illuminates yellow and additionally an acoustic warning signal sounds.

   The KÜHLMOBIL shuts down in this mode. The coolant container must first be filled with coolant before the KÜHLMOBIL can resume operation.

5. The actual temperature of the coolant in the cooling circuit is regulated by the electric control system. The actual and setpoint temperatures are displayed on the touch-pad control panel on the front of the KÜHLMOBIL.

   This value is the coolant outlet temperature at the plug-in connections labelled as „coolant supply" on the rear of the KÜHLMOBIL

6. Regulated and displayed is the coolant temperature of the cooling vehicle. The setpoint of the thermostat is set on factory side. The cooling liquid outlet temperature is continuously monitored by the temperature controller and compared with the setpoint.

   The coolant outlet temperature is constantly monitored by the temperature controller and compared with the set value

7. ATTENTION ⇒ We suggest that the required factory setting, is not need to be be adjusted in principle. An adjustment is possible, however. The adjustment is discribed in the operation of the thermostat.

8. By reaching of specific coolant flow temperatures of the KÜHLMOBIL switches over the temperature alarm completely off.

   The fault is displayed and the status indicator flashes red. In addition, an audible warning signal sounds.

3.4 Accessories and Options

3.4.1 Floating Contact *

The floating contact is closed when the KÜHLMOBIL is in normal operation. The floating contact opens if the KÜHLMOBIL malfunctions/breaks down.

Especially if the device to be cooled is highly temperature-sensitive, it can be shut down immediately or the shut-down procedure can be initiated in order to prevent further damage.

The floating contact is connected to the KÜHLMOBIL via a two-pin plug-in contact and this work should be done by a trained expert. The plug is supplied with the KÜHLMOBIL.

The rated voltage for the floating contact is 250V AC / DC. The rated current is 10A AC / DC. These data are maximum values and are not to exceeded. (see technical data)

3.4.2 Remote Control *

In the case of a KÜHLMOBIL with remote control, the touch-pad control panel is not mounted on the device itself, but rather in separate console housing with a correspondingly long connection cable to the KÜHLMOBIL.

The same functions can be performed on the remote control as can otherwise be performed directly on the KÜHLMOBIL.

A total cable length of up to 20 metres is possible.

3.4.3 Operating Hours Counter *

The operating house counter indicates the pure operating time excluding standby time.

The operating hours counter is mounted beside the touch-pad control panel on the front of the KÜHLMOBIL.

3.4.4 External Switch-On Control *

With the external switch-on control the KÜHLMOBIL can be switched on and off from any other desired location – e.g. from the electron microscope. When connecting the switching voltage it must be observed to avoid damages to the unit.

If the voltage is present at the back side connections, the external intervention is active and the control panel is deactivated.

Is in the "external switch-on active" on shown.

Is the voltage interrupted the KÜHLMOBIL switched off.

The connection of the external switch-on to the KÜHLMOBIL is via a two-pole plug and should be done by a professional trained for this.

The plug is included by the shipment of the KÜHLMOBIL.

3.4.5 Flow indicator

With the flow indicator is the current water flow in the cooling water return shown. The required flow rate should be by the rear bypass valve.

With several flow indicators the flow is shown separately for each circuit.

Since the flow is available in different versions, is here no application.

3.4.6 Flow control unit

The current coolant flow in the secondary water return is measured with the flow control unit and displayed on the front display.

The required flow rate is adjustable through the bypass valve

The flow meter is internally installed in the device and to adjust only by a professional using.

Note ⇒ the currently funded amount of coolant is visible on the front panel display (temperature).

The display shows the amount in L/min.

3.4.7 Flow monitor

The flow monitor in the secondary water return switchs off the device at a low flow through the cooling device.

The cut-off value is set from factory side to 8,0 l/min. A subsequent adjustment is possible at any time.

The flow monitor is build internal to the device and to adjust only by a professional.

Because the flow switch is available in different versions, is here no application.

3.4.8 Automatically re-fill

An automatic refill within the KÜHLMOBIL ensures that the water tank of the secondary circuit is always filled optimal.

If a water loss can occur, a level switch is activated, which in turn activated a magnetic valve allowing that water flow into the water tank. A prerequisite for this function is, however, a constant supply of connection "refill" water.

The automatic refill with water can cause the flow at temperatures below +10 ° C is not sufficient antifreeze.

In the event of a leak in the cooling system can lead to an uncontrolled automatic refill of the water outlet. For this reason, the corresponding area on the KÜHLMOBIL, at the hose connections and at the device which have to be cooled must be monitored with moisture sensors.

By a leakage to avoid further damages, it must be ensured that all water supplies and the KÜHLMOBIL shut off immediately and be protected against restart!

3.4.9 Time Relay for Run-On *

The time relay is not visibly installed inside the housing. It ensures that the circulating pump runs on for a preset period of time (e.g. to remove the residual heat from the device to be cooled) after the KÜHLMOBIL is switched to standby.

The run-on time (specified by the customer) is usually set prior to delivery to the customer and is subsequently permanently set.

3.4.10 Overflow

In addition, for security reasons, the KÜHLMOBIL is equipped with an overflow.

This serves as protection to prevent an overflow of the water tank during a possibly defective magnetic valve of the automatic refill.

The overflow is carried out on the back of the KÜHLMOBIL. It is a hose nozzle.

Warning ⇒ the overflow must necessarily be connected and be done with gradient in a pressureless process!

The overflow should be rejuvenated in no way!

3.4.11 Bypass *

In the version of the cooling circuit fitted with a bypass, the bypass regulating valve necessary for adjustment is accessible on the back of the housing. This allows the water supply pressure to be regulated by means of the pumped-water volume, thereby influencing the flow rate of the circulation pump.

It should be ensured that for opening the bypass valve of the cooling liquid pressure in any case remain is sufficient.

The supply pressure is to read out on the back site at the pressure gauge (optional) and can be adjusted to the desired value. Right around means pressure increase and left around means pressure reduction.

Please do not adjust unnecessarily high pressures.

As more deeply the pressure at the manometer is indicated, with sufficient litre number, as better is it for the water pump.

In the case of *automatic bypass*, the flow rate is automatically regulated. This involves the coolant quantity not currently required for cooling being diverted from the main coolant supply and fed directly through the bypass into the coolant return.

The automatically Bypass valve is set factory side to an opening pressure. An adjustment is possible any time. Therefore the pump must be switched off. Then lose the protection cap from the valve and solve the lock nut. Is the vavle adjusted please screw the cap again on.

Only then the pump must be turned on.

No picture is supplied here, as the bypass regulating valve is available in different versions.

3.4.12 Manometer

The manometer indicates the coolant pressure in the cooling water return.

In the case of the KÜHLMOBIL with a bypass *, the supply pressure is indicated on the pressure gauge.

No picture is supplied here, as the pressure gauge is available in different versions.

3.4.13 Dirt Filter *

The dirt filter is built into the cooling water supply. It removes any dirt particles from the cooling water before it enters the device to be cooled.

The fine filter is installed in the secondary coolant supply. It cleans the cooling water before it enters the unit which is to be cooled by any existing dirt particles.

No picture is supplied here, as the dirt filter is available in different versions.

3.4.14 Cleaning the dirt filter

With waning performance and/or low flow in the secondary cycle must the filter be cleaned in the water supply.

To clean/replace the filter candle has the device switched off and drained the coolant.

Until then, the filter may be opened. The filter candle be washed out this must be not renewed – cleaning is enough.

3.4.15 Geodetic height difference

The geodetic height difference is an option which in the coolant supply a non-return valve and a solenoid valve is built into the coolant return.

The option must be built if the KÜHLMOBIL lower the cooling unit is at least 3 m.

The valve prevents that collapses after shutdown of the pump(s) of the KÜHLMOBIL the water and overflows coolant tank.

3.4.16 Tank drain

After of the tank drain is a ball valve with hose nozzle.

The tank drain is to connected with gradient to a pressure less drain or a different collection vessel.

The connection of the tank drain is located at the back of the KÜHLMOBIL and is angled down.

Take care to prepare the KÜHLMOBIL so that the water hose is subsequent situated between KÜHLMOBIL and the outlet not in transit routes or cannot be exceeded.

3.4.17 Automatic Switchover to Water Pipe in the Event of a Breakdown *

In the event of a breakdown of the KÜHLMOBIL or a power failure the cooling-water supply and return are switched over to the on-site water supply pipe.

This changeover remains active as long as the malfunction or power failure remains unremedied.

Two connection nozzles protrude from the back of the KÜHLMOBIL to which the pipes for water supply and drainage can be connected.

In the event of a leak in the cooling system can lead to an uncontrolled automatic refill of the water outlet. For this reason, the corresponding area on the KÜHLMOBIL, at the hose connections and at the device which has to be cooled must be monitored with moisture sensors.

By a leakage to avoid further damages, it must be ensured that all water supplies and the KÜHLMOBIL shut off immediately and be protected against restart!

3.5 Protective Equipment

The KÜHLMOBIL is fitted with protective equipment so that there are no hazards to the safety and health of the operator or of third parties when the unit is being used correctly.

The KÜHLMOBIL is designed and built in accordance with state-of-the-art technology and recognised safety rules.

In order to guarantee safe operation for personnel and the environment, the precautions described below have been introduced and safety equipment has been installed.

Unauthorised removal or bypassing of protective equipment constitutes an indictable action.

In the event of damage/injury, any liability claims will be forfeited.

All components, which can become hot or cold, are accommodated inside the housing, and are also secured by means of additional protective panels/grids, which can only be removed using tools.

In the event of a power failure or a reported malfunction, all elements of the control system revert to a safe status for operator, KÜHLMOBIL and the environment.

All voltage-carrying components are secured (insulated) against contact and installed at sufficient spark-over distances.

Voltage-carrying modules are only installed inside the housing, and can only be opened using tools.

All electrical components bear the CE identification for low voltage and/or EMC.

To earth the KÜHLMOBIL, potential equalization (Ø >1.5mm^2) is installed for all conductive components.

The KÜHLMOBIL is designed in accordance with protection class IP 52.

All control-unit connections are clearly marked.

Both the electrical and hydraulic circuit diagrams can be found in the appendix together with their accompanying spare-parts lists.

4 Transportation, Storage and Commissioning

4.1 Transportation

The KÜHLMOBIL is delivered in a vertical position in a wooden crate. The following options are available for transporting the wooden crate :

- Forklift and
- pallet truck.

Danger!

Danger to life due to the wooden crate and the KÜHLMOBIL contained inside falling!

As a result of incorrect transportation of the wooden crate the wooden crate and the KÜHLMOBIL contained inside can fall and cause very serious injuries or death.

Use only suitable lifting equipment and securing elements!

The driver must be entitled to drive the forklift/pallet truck.

Follow the following instructions for transporting of the KÜHLMOBIL:

The forklift/pallet truck must be certified for the total weight of the wooden crate plus the KÜHLMOBIL (see Section 9.1, *Technical Specifications* for weight specifications).

The forks of the forklift/pallet truck must be of sufficient length.

Before the KÜHLMOBIL is lifted, all persons must vacate the working area of the forklift/pallet truck.

The KÜHLMOBIL is a sensitive device and must be transported with corresponding caution in its wooden crate as far as the erection site.

Avoid the wooden crate hitting the ground abruptly when setting it down (e.g. on the loading surface of a transportation vehicle).

The wooden crate is to be secured against sliding and slipping down in the transportation vehicle.

The wooden crate is to be secured against tipping over during transportation.

The wooden crate absolutely must be transported and stored in dry conditions.

Arrows printed on the transportation crates must point upwards. Further instructions on the packaging must also be followed!

Adhere to applicable accident-prevention and work-safety regulations.

4.2 Unpacking/Scope of Delivery

Instructions!

Unpack the KÜHLMOBIL immediately after delivery.
Upon delivery, be sure to look out for sever damage or damage due to incorrect transportation!

Proceed as follows when unpacking the KÜHLMOBIL:

- Slacken all bolts on the lid and on the front of the wooden crate
- Remove the cover and front panel.
- Loosen the screws with those the internal framework for the adjustment of KÜHLMOBIL are screwed on.
- Pull to the frameworks upward from the transportation crate.
- Remove the upper Styrofoam panels from the KÜHLMOBIL (if present).
- Remove the KÜHLMOBIL using appropriate equipment (forklift/pallet truck) from the wooden crate ⇒ See 4.1.
- Remove the Styrofoam elements from the underside of the KÜHLMOBIL (if present) as soon as they are accessible.
- Check that the delivery is complete on the basis of the *delivery docket*.
- Check the entire delivery for external damage that might, for example, have been caused during transportation.
- If transportation damage is discovered, contact the supplier/delivery company immediately.
- **Complaints at a later date will not be accepted!**
- If parts are missing or have been delivered incorrectly, contact Van der Heijden Labortechnik GmbH.

4.3 Erection

Note!

Unpack the KÜHLMOBIL immediately after delivery.

When erecting the unit, ensure that there is sufficient room for manoeuvre while working.

Do not erect the KÜHLMOBIL with the air-intake side directly opposite heating elements/heaters.

Proceed as follows when erecting the KÜHLMOBIL:

- Roll the KÜHLMOBIL carefully and cautiously to the erection site.
- Erect the KÜHLMOBIL on an even, solid base.
- Secure the KÜHLMOBIL against rolling away unintentionally by pushing down the locking brake on the rollers.

Instructions!

The air flowing backwards through the condenser must not be hindered due to an insufficient gap.

The hot air must be able to flow away upwards unhindered.

When erecting the unit, it must be remembered that the KÜHLMOBIL releases its cooling output into the surrounding room as heat.

The produced heat is increased even more by the drive output of the cooling aggregate. The resulting increased room temperature would reduce the cooling capacity of the KÜHLMOBIL.

For this reason sufficient air conditioning of the room in which the unit is erected must be guaranteed.

- Position the KÜHLMOBIL so that the wall is at least 80 cm away from the front of the unit to absorb the cool air.
- Position the KÜHLMOBIL so that the wall is at least 80 cm away from the back of the unit.
- Please take care that the heated air could not be absorbed on the front side.
- When the tank is filled with water please do not move the KÜHLMOBIL anymore.

4.4 Storage

The KÜHLMOBIL must be stored in a vibration-free, dry and as dust-free a location as possible. It must not be stored outside locked rooms.

The air temperature must be within a range of + 5°C and + 32°C.

Relative humidity must not exceed 85 %. Condensation of air-borne water vapour on the surfaces of the KÜHLMOBIL absolutely must be avoided.

4.5 Starting Up the KÜHLMOBIL

Danger of death due to electrocution!

There is a risk of electrocution if incorrect work is carried out on electrical components!

Work on electrical systems may only be performed by specialist electricians.

Caution!

Irreparable damage to the cooling circuit is possible!

The oil in the coolant circuit of the KÜHLMOBIL must first accumulate before switching on.

Do not switch on the KÜHLMOBIL for at least one hour after the unit has been positioned at the erection site.

4.5.1 Bleeding the Circulating Pump

The circulating pump (feed pump) of the coolant circuit must be bled in order to enable the coolant to be pumped:

- Carefully fold open the lid of the KÜHLMOBIL backwards and unscrew the lock stop to the left out of the water tank.
- Fill the coolant container located underneath with water to just below 7,0 cm the lip of the cover.
- Push a length of hose onto one of the supplied plug-on nozzles and insert the latter into the water supply. Hold the free end into a clean (!) buck, or similar, standing on the ground.
- Open the coolant supply.
- As soon as a bubble-free flow of water exits, due to the natural gradient, the bleeding procedure for the KÜHLMOBIL and circulating pump is completed.
- Put the coolant that flowed into the bucket back into the coolant container.
- Close the coolant container with the lock stop.

4.5.2 Cooling-Water Hoses

Instructions!

Both cooling liquid connections are quick-release fastener connections with plug-in nozzles.

The supply pressure is to be taken into account when choosing the cooling-water hoses for *water supply and return*.

Terminology definitions:

Water supply	Cold water leaving the KÜHLMOBIL or entering the devices to be cooled.
Water return:	Heated water entering the KÜHLMOBIL or leaving the devices to be cooled.

- Attach the cooling water hoses for water supply and return between the device to be cooled and the KÜHLMOBIL.
- First connect the cooling water hoses for *water supply and return* to the devices to be cooled (instructions in the operating instructions for the respective device).

Instructions!

The hose nozzles are located securely mounted on the back side of the KÜHLMOBIL.

- Ensure that the KÜHLMOBIL is erected such that the water hoses to be connected between the KÜHLMOBIL and the devices to be cooled do not lie in walkways.
- Ensure that the KÜHLMOBIL is erected such that the water hoses to be connected between the KÜHLMOBIL and the devices to be cooled do not be stood on.

Note!

Temperatures in the cooling-water return (e.g. due to connection of additional devices to be cooled) in excess of + 30°C are to be prevented in order to prevent overloading of or damage to the compressor.

- Secure the cooling water hoses to the respective connection at the rear of the KÜHLMOBIL.
- Do not confuse the *water supply* with the *water return*. If in doubt it is better to double check
- Open the ball valves in the *water supply* with the *water return.*

4.5.3 Floating Contact *

The floating contact is closed during normal operation of the KÜHLMOBIL.

The floating contact opens in the event of a malfunction/breakdown of the KÜHLMOBIL.

In particular if the device to be cooled is highly temperature sensitive, it can be shut down immediately by the switching contact or the shut-down procedure can be initiated in order to prevent further damage.

The floating contact is connected to the KÜHLMOBIL by means of a two-pin plug-in contact.

The plug is supplied with the KÜHLMOBIL.

The floating contact is connected to the back of the KÜHLMOBIL.

- Have the two-core wire for the floating contact attached and subsequently tapped onto the plug by an electrical expert.
- It is essential that the plug then be connected and secured.
- The potential free contact is for a rated voltage 250V AC / DC and a rated current 10A AC / DC.

Note!

If the KÜHLMOBIL is supplied with both a floating contact and an external switch-on unit * (see below), then the two individual connections are brought together in a five-pin plug-in contact, or equipped with two plug-in contacts with different (unmistakable) plug-in connections!

4.5.4 External Switch-On Control *

With the external switch-on control the KÜHLMOBIL can be switched on and off from any other desired location – e.g. from the electron microscope.

The external switch-on control is connected to the KÜHLMOBIL by means of a two-pin plug-in contact. The plug is included with the KÜHLMOBIL.

The external switch-on control is connected at the rear of the KÜHLMOBIL.

- Have the cable for the external switch-on control * attached and subsequently tapped onto the plug by an electrical expert.
- By the connection of the external switch on, note, the predetermined voltage. (see 3.4.4)

Note!

If the KÜHLMOBIL is to be connected to an external switch-on control, the contact (plug-in contact on the KÜHLMOBIL) to the KÜHLMOBIL must not be plugged in until after the unit has been started up, as it would not be possible otherwise to make any adjustments on the touch-pad control panel.
Accordingly the cable is not plugged in until after the KÜHLMOBIL has been switched on.

- So, do **not** insert the plug into the appropriate socket on the KÜHLMOBIL. This is done later when the KÜHLMOBIL is being switched on.

Note!

If the KÜHLMOBIL is supplied with both an external switch-on unit * (see above) and a floating contact, then the two individual connections are brought together in a five-pin plug-in contact, or equipped with two plug-in contacts with different (unmistakable) plug-in connections!

4.5.5 Remote Control *

In the case of a KÜHLMOBIL with remote control, the touch-pad control panel is not mounted on the device itself, but rather in separate console housing with an appropriately long connector cable to the KÜHLMOBIL.

The same functions can be performed on the remote control as can otherwise be performed directly at the KÜHLMOBIL.

The remote control is connected to the KÜHLMOBIL via a 4-core shielded cable.

- Have the remote control cable attached by an electrical expert.

5 Touch-Pad Control Panel

The functions of the touch-pad control panel are described in greater detail, and the actual operation of the KÜHLMOBIL is described in the subsequent chapter.

The KÜHLMOBIL is operated from the touch-pad control panel.

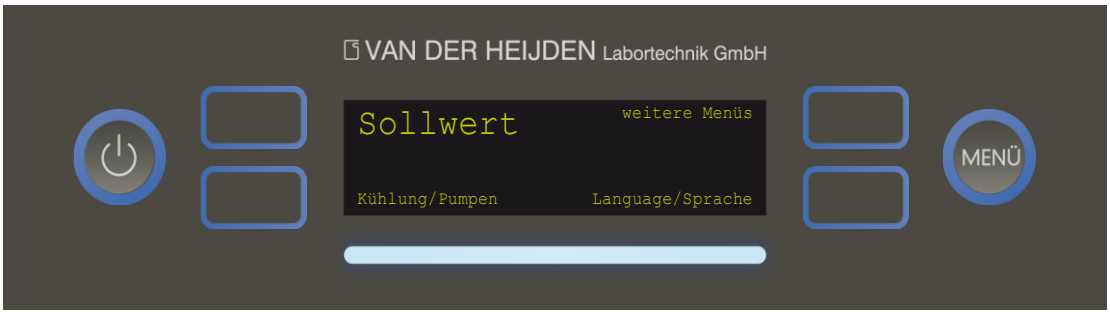
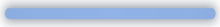


Fig. 1: *Touch-pad control panel*

Operating elements on the touch-pad control panel of the KÜHLMOBIL:

5.1 Operating Features

Illustration	Control Functions
	On/Off Button: the KÜHLMOBIL (Mobile Chiller) is switched 'ON' and 'OFF' via this control. Once the supply voltage is connected to the control facility, this button is illuminated 'blue'. *Exception:* the button is only illuminated 'blue' when the power supply is activated externally, but has no other function than a switch.
	The 'Menü' Button enables a changeover between the Operating Display, the Switch-on- and Parameterage Display and the Information Display. ● The *Operating Display* shows all the operating information - such as the operating state and temperatures - necessary for a disruption-free functioning of the appliance. ● The *Switch-on- and Parameterage Display* enables settings to be made for the nominal parameters and the chiller unit. ● The *Information Display* enables call-ups to be accessed of parameterage, the fault memory and the appliance information.
	The various Menu levels enable functions to be displayed and/or set by up to four function buttons.
	Display state blue: - the appliance is connected to the power supply. - refrigeration and pumps are running. - no disruption message is shown.

	Display state green:
	- flashing green illumination when the regulator unit is on stand-by
	  ○ only the control facility is activated in stand-by.
	  ○ all menu functions can be accessed.
	- the display state switches to continuous green illumination once a pump is running.

	Display state red: - disruption message shown – an acoustic tone is also emitted. - the disruption cause can be shown on the display. - the acoustic tone is switched-off by calling-up the disruption cause via the function button. - the display repeats flashing red. - follow the menu items to rectify the disruption.
	Display state yellow: - the display flashes yellow when the fluid level is low. ○ proceed as with display state red. - once the disruption (display state illumination flashes red or yellow) is rectified, the display state switches to continuous

	yellow illumination. ○ the rectification of a disruption should be acknowledged via the function button. ○ the appliance switches back automatically to the general operational state as before the disruption (display state turns to blue illumination).

6 Operating the Appliance

6.1 General

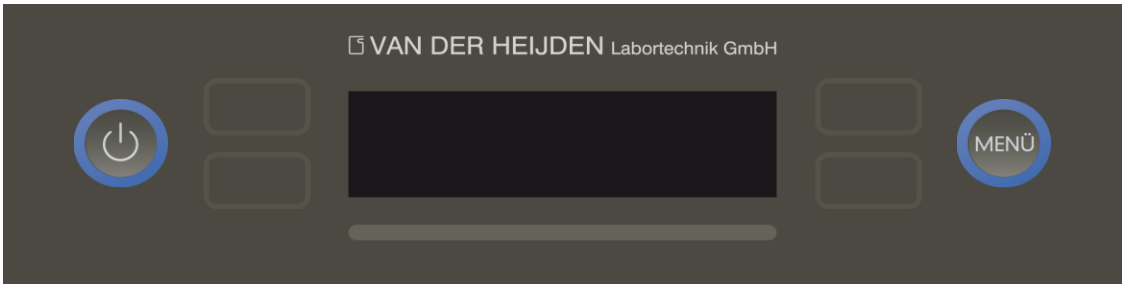
6.1.1 Operating Conditions

The KÜHLMOBIL (Mobile Chiller) appliance is best operated in a dry and dust-free location with no exposure to vibration. The KÜHLMOBIL (Mobile Chiller) should not be operated outside of enclosed roomspace (except when the appliance is fitted for outside use). The ambient air temperature should be in a range of +5°C to +32°C. The relative ambient humidity should not exceed 85%. Any condensation from ambient humidity on the casing surfaces of the KÜHLMOBIL (Mobile Chiller) should absolutely be avoided.

6.2 Switching 'ON'

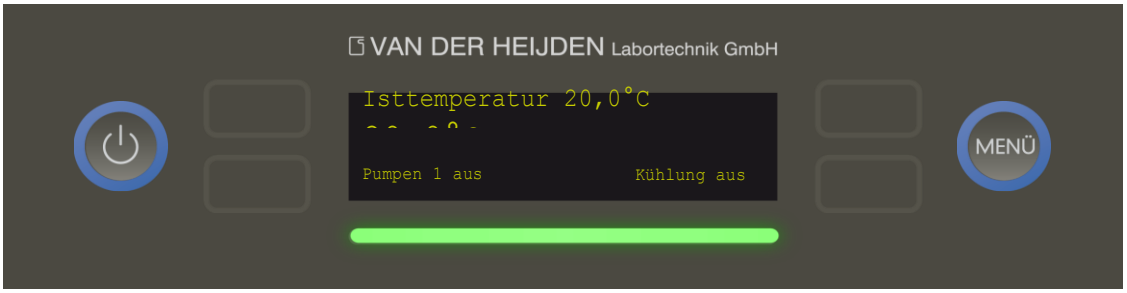
The KÜHLMOBIL (Mobile Chiller) appliance is brought to the stand-by state as follows:

- Connect the KÜHLMOBIL (Mobile Chiller) with the power supply cable provided via the rear refrigeration unit connector to the appropriate power supply.



-Fig. 2: the KÜHLMOBIL (Mobile Chiller) appliance when 'OFF'-

- The operating button and the menu button are illuminated blue and switched to functional.
- Depress the button. The nominal parameter and the operating status of pump and refrigeration are then displayed.



-Fig. 3: 'stand-by'-

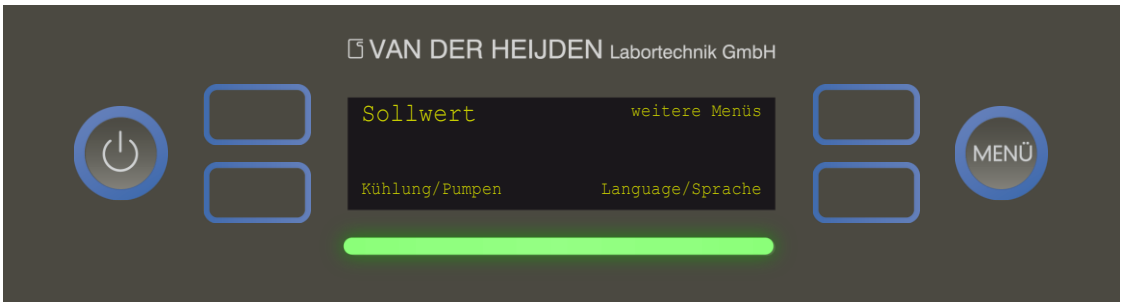
- The display status below the display flashes green.

N.B.

Should a disruption message be displayed, or an acoustic warning tone be emitted, refer to the instructions in Section 6.6. The display status flashes.

- Try opening the faucets, which you have installed in the chiller fluid lead between the KÜHLMOBIL (Mobile Chiller) appliance and the refrigerating unit.

6.3 Parametering and Switching ‘ON’

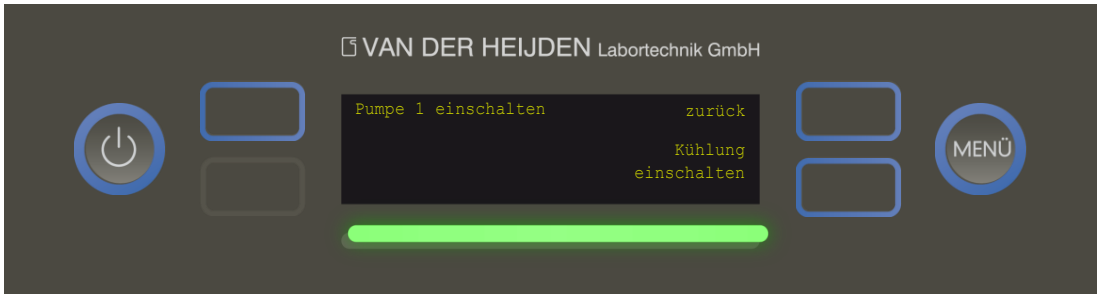


-Fig. 4: ‘Parametering and switching ‘ON’-

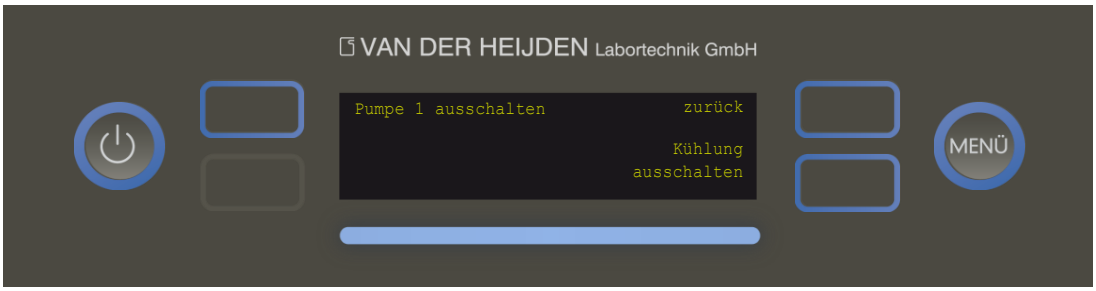
- Depress the menu  button and access the parametering- and switching-on display (see Fig. 4)
- Set the desired language with the …… function button.
- By depressing the function button  set the required nominal temperature.
  Setting range: a nominal temperature range of +16°C to +22°C can be set.
- The KÜHLMOBIL (Mobile Chiller) is now set to the desired user mode and can now be switched-on via the function button: ‘pump/chilling’.

6.4 Switching ‘ON’

- Depress the function button ‘pump/chilling’.



- Depress the function button to switch-on the pump.
- Then, re-depress the function button to switch-on the chilling facility.
- The display state is illuminated blue.



- Use the function button ‘return’ to re-access the menu: ‘parametering and switching ‘ON’’.
- Use the function button 

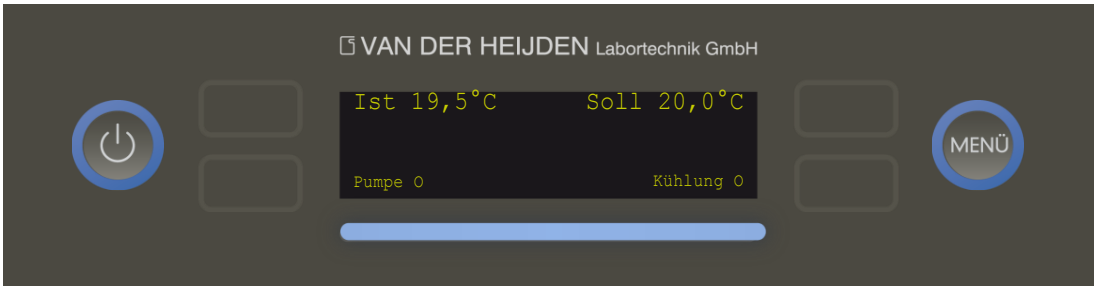
or wait a dwell time of 60 seconds, when the general operating state is displayed with all relevant information.
- In addition to the references to pump and chilling, a symbol is also activated (illustrated here by a circle), which describes the function.
- * Only now connect the plug to the socket of the external switching-on facility (this is an option) on the rear of the KÜHLMOBIL (Mobile Chiller) appliance. When the connection is correctly made, then the display will show the message: ‘external switching-on facility’.

N.B.

The operating buttons at the KÜHLMOBIL (Mobile Chiller) appliance will be deactivated by connecting up the external switching-on facility. This will prevent a third party from being able to access the operating panel directly at the KÜHLMOBIL (Mobile Chiller) appliance.

N.B.

Only the above described switching-on sequence will ensure, that the forementioned settings entered for operating the chiller will be saved in the control facility.



-Fig. 5: when in the 'general operating state'

The KÜHLMOBIL (Mobile Chiller) is now set up for the continuous operating mode.

6.5 Continuous Operating Mode

The following routines are to be carried out regularly during the running of the continuous operating mode:

- Regularly check the fluid level in the chiller fluid tank of the KÜHLMOBIL (Mobile Chiller) appliance.
- In case of any obviously loss of chiller fluid within a short period of time, then the circulation system between the KÜHLMOBIL (Mobile Chiller) and the appliance to be chilled, should be checked and any leakage rectified.
- Regularly check and clean the air inlet of the condenser with oil free Compressed air or nitrogen.
- Regularly check the state of the chiller fluid (for algae and bacterial slime).
- The 'Thermoclean DC' additive should be added to the fluid (see Accessories and Spare Parts. See Section 7.4.4. on servicing and maintenance.

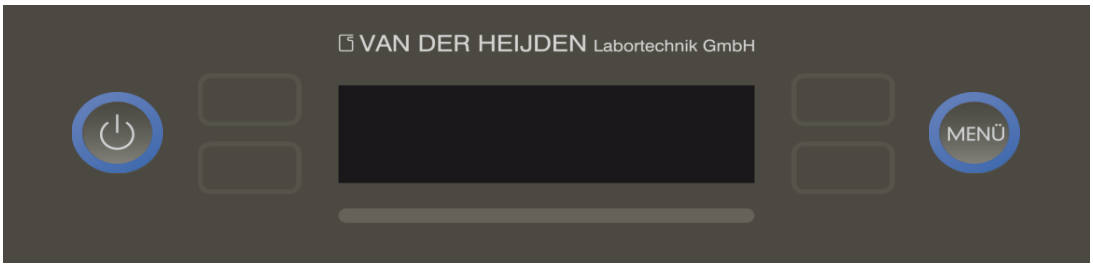
6.6 Switching 'OFF'

N.B.

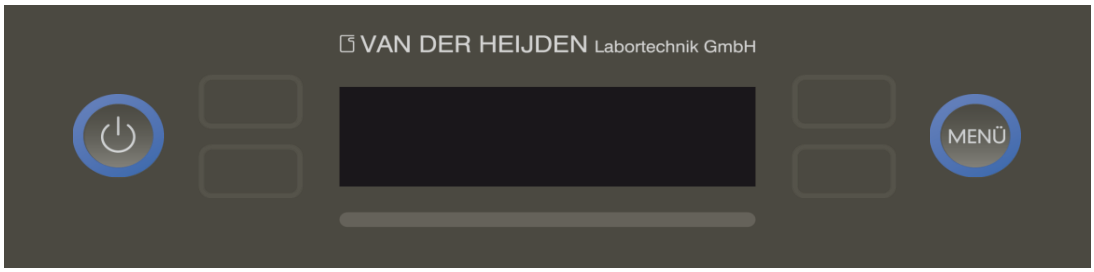
The KÜHLMOBIL (Mobile Chiller) appliance is designed for continuous running. The appliance can thus be operated over a longer period of time without interruption.

To conserve energy, the appliance should be switched-off during longer time periods of inactivity.

- You should ensure, that when switching-off the KÜHLMOBIL (Mobile Chiller) appliance, the operations are not endangered of the connected-up appliance to be chilled.
- Deactivate the external switching-on facility via the electron microscope, or disconnect the electrical connector plug of the external switching-on facility ***** on the rear of the KÜHLMOBIL (Mobile Chiller) appliance. The message on the display: 'external switching-on facility' will then extinguish.
- The chiller unit and the pumps are now switched-off. The KÜHLMOBIL (Mobile Chiller) appliance is now switched-over into the 'OFF' mode.



- In order to switch-off the KÜHLMOBIL (Mobile Chiller) without the Option: ‘external switching-on facility’, depress the button: .
- An additional message will require the procedure to be acknowledged, in order to avoid any inadvertent switching-off of the appliance.
- The chiller and the pumps are now switched-off, and the KÜHLMOBIL (Mobile Chiller) appliance is now switched-over to the ‘OFF’ mode.



- In order to switch-on the KÜHLMOBIL (Mobile Chiller) again, please refer to Chapter 3.8. Once the button is depressed, the KÜHLMOBIL (Mobile Chiller) appliance returns to the operating state in which it was set before switching-off.

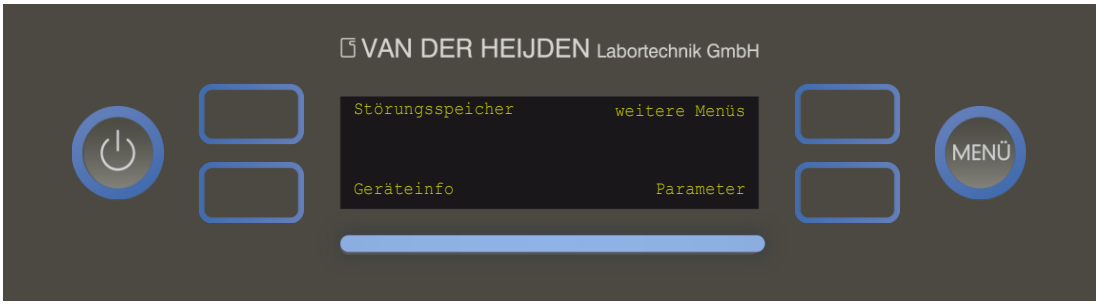
N.B.

In case of an electrical power cut, the following is to be observed:

Once the electrical power supply is restored after a power cut, the KÜHLMOBIL (Mobile Chiller) appliance returns to the operating state, in which it was set before the power cut. No new setting- or control procedures are therefore necessary at the KÜHLMOBIL (Mobile Chiller).

6.7 Information Display

The information display will show parameterage, fault memory, appliance information and display settings when called-up with the function buttons.



-Fig. 6: Information display-

All control settings can be accessed by the function buttons on the parametering level. Any alterations thereto are not possible in this menu mode.

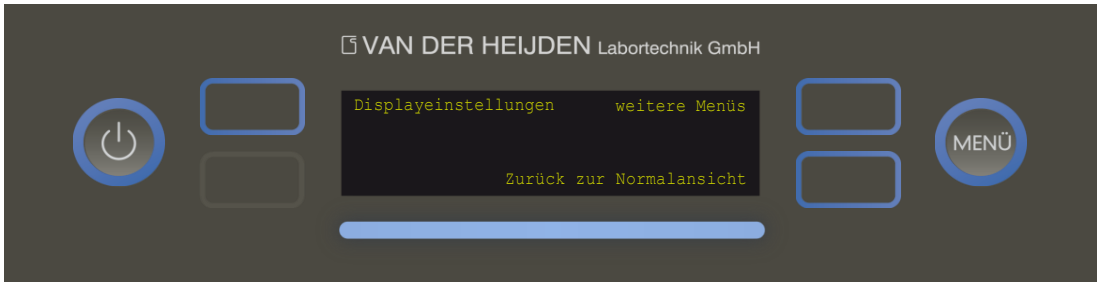
6.7.1 Fault Memory

The fault memory records all disruptions with indication of time-of-day. The memory also records when a fault occurred and when the fault was rectified..

6.7.2 Appliance Data/Details

The date/details of the appliance include the serial number of the KÜHLMOBIL (Mobile Chiller) appliance, among other things, which are the serial number of the control facility, and the postal address and telephone number of the corporation: Heijden Labortechnik GmbH (Inc.).

6.7.3 Display Settings



-Fig. 7: Information display (2nd level)

The brightness of the display can be altered by means of the display settings.

6.8 Fault Messages and Disruption Rectification

Fault messages are indicated by the emitting of an acoustic tone, by- a message report on the nominal temperature display, and –a display state red or yellow.

(the relative alarm states are described in the Table down below).

Caution

Irreparable damage can occur to the KÜHLMOBIL (Mobile Chiller) appliance when the cause of a disruption is not immediately rectified.

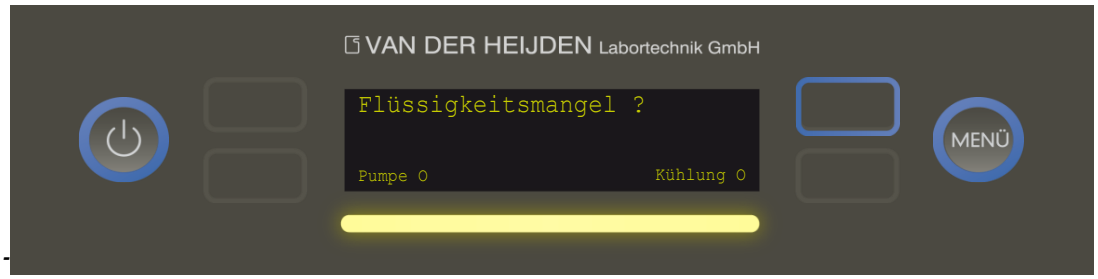
Please rectify the cause of a disruption with immediate effect.

The acoustic alarm tone is switched-off by depressing the function button.

All disruption messages should be reset by means of the function button after disruption rectification.

6.8.1 Schedule of possible Alarm States:

Disruption: Low fluid level



The following changes appear on the display:

- The regulator facility emits a peeping tone and the display status flashes yellow
- The active symbols come to a halt

Disruption rectification:

- The fault should be acknowledged with the function button and the menu accessed for fault rectification.
- Then, follow the instructions.
- Once the fault is rectified, the display status changes to steady illumination and the query of the fault rectification on the display can be acknowledged.
- The display indications return to the disruption-free operational mode.
- The active symbols recommence running and the display status returns to blue..

Other Disruption States:

• *Excess temperature alarm*
• *Deficient temperature alarm*
• *High pressure disruption – chiller-side*
• *Through-flow disruption – water-supply-side*
• *Excess temperature alarm – sensor defect – wiring interruption (sensor)*
• *Deficient temperature alarm disruption (short circuit-ing at the sensor)*

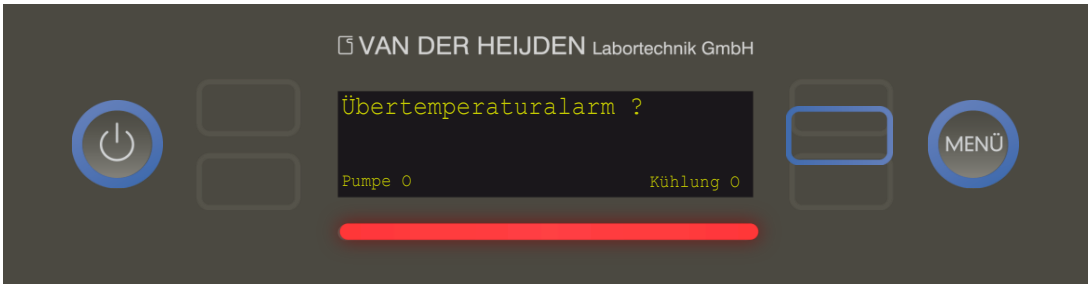
Other disruptions only occurring individually on technical grounds:

• *Low pressure disruption – chiller-side*
• *Disruption - pump thermal contact*
• *Alarm – through-flow monitor*
• *Check fluid level*
• *Motor contactor relay is triggered*
• *E4 alarm*

N.B.

Possible causes and rectification suggestions can be accessed by the function button and found under the menu item ‘fault rectification’. Should a fault rectification not be possible, please contact Van der Heijden Labortechnik GmbH (Inc.). Further information can be found in the information display in appliance data/details.

Disruption – Excess temperature rise alarm *(example)*



-Fig. 9: Disruption – 'Excess temperature rise alarm'

The following changes appear in the display:

- The regulator facility emits a peep tone and the display status flashes red
- The activated symbols come to a halt.

Fault rectification:

- Depress the function button to acknowledge the fault and the menu accessed for fault rectification.
- The, follow the instructions.
- Once the fault is rectified, the display status changes over to continuous yellow and the query of fault rectification can be acknowledged.
- The displays return to the disruption-free operating status.
- The active symbols recommence running and the display status again becomes blue.

6.9 Disruption without Direct Message Reporting

Disruption	Cause	Description / disruption rectification
Pump fails to circulate the refrigerant	*Air in the system*	– Bleed the circulation pump (see the KÜHLMOBIL (Mobile Chiller) appliance).
	Motor defective	– Contact the manufacturer
	Condenser defective	– Contact the manufacturer
	Long downturn time	– Contact the manufacturer  **Caution** **Damage to the feed pump of the refrigerant circulatory system.** **The feed pump should be switched-on once weekly for around 5 minutes, with the circulatory system full of refrigerant).**
Compressor runs but no chilling effect is produced	*Low refrigerant level*	– Contact the manufacturer.
	Start relay defective	– Contact the manufacturer.
	Internal capillary cracking	– Contact the manufacturer.
	Capacity regulation without function	(optional) – Contact the manufacturer.

6.10 Display Indications with Appropriate Options

Two pumps

When an additional chilling circulatory system (optional) is installed with an additional circulation pump (circulation pump ‘2’), this will be indicated by an additional function button on switching-on. It is sufficient for one of both the pumps is switched-on (running) for the KÜHLMOBIL (Mobile Chiller) appliance to be functional.

External switching-on facility

The external switching-on facility is also shown on the display. When this is active, it is not possible to access the KÜHLMOBIL (Mobile Chiller) via the display. The display is only then re-usable when the external switching-on facility is deactivated.

The run-on time after external switching-on

After external switching-off, the run-on time is also shown in the display. When this is active, it is not possible to access the KÜHLMOBIL (Mobile Chiller) via the display. The display only then becomes re-usable when the run-on time has expired.

Run-on time

The run-on time is also shown on the display after switching-off. When this is active, it is not possible to access the KÜHLMOBIL (Mobile Chiller) via the display. The display only then becomes re-usable when the run-on time has expired.

Run-on time

Is this KÜHLMOBIL equipped with a flow meter (optional), the flow quantity is shown in the display in l/min. The display is enabled by installing the flowmeter.

7 Maintenance

7.1 Miscellaneous

The *Maintenance* chapter comprises the areas of Care, Visual Inspection and servicing by operating personnel.

Grouping these areas into different maintenance intervals is intended to make it easier for you to plan the respectively required maintenance measures.

The instructions described in this chapter are to be understood as *minimum recommendations*.

Depending on operating conditions, expansions may be necessary in order to retain the production quality of the KÜHLMOBIL.

The indicated time intervals refer to continuous operation of the KÜHLMOBIL.

Warning!

Possible danger to persons and property assets!

As a result of incorrect inspection or servicing, direct or consequent personal injury and damage to assets are possible.

All maintenance work on the KÜHLMOBIL may only be carried out by qualified specialists, while adhering particularly to Chapter 2, *Safety*.

Note!

Only use spare parts approved by Van der Heijden Labortechnik GmbH!

Van der Heijden Labortechnik GmbH will not accept any liability if non-approved spare or replacement parts and operational equipment are used!

It must be ensured that operational materials and replaced parts are disposed of in and environmentally conscious manner.

Note!

If it is necessary to dismantle safety equipment for the purposes of maintenance work, the safety equipment must be reattached and checked immediately after completion of the work.

Note!

Follow the safety instructions in Section 2.8, *Safety Instructions for Maintenance* in Section 2.8.

7.2 Operating Status

Depending on the nature and extent of the maintenance measures, the KÜHLMOBIL might have to be shut down or have its power completely disconnected.

Danger!

High voltage!

Causes death or life-threatening injuries.

The KÜHLMOBIL's mains cable absolutely must be unplugged.

7.3 Care and Visual Inspection

It is the duty of the operating personnel to check the accessible areas of the KÜHLMOBIL for soiling and damage on a daily basis.

Soiling should, where accessible, be removed and damage should be reported to the responsible maintenance personnel or to Van der Heijden Labortechnik GmbH.

- You should therefore always inspect the KÜHLMOBIL when starting work (see also the *Visual Inspection* table on the next page).

Note!

The writing of operating elements or on warning instructions can become illegible due to unavoidable soiling deposits.

This can result in incorrect operation, which can cause material and consequent damage.

When choosing a cleaning detergent it should be ensured that the detergent must not attack any surfaces, keyboards, plastics or seals.

All liquid industrial cleaners can be used without limitations.

- You should therefore use a damp cloth to wipe off dust and other impurities from all operating elements, displays and warning stickers once a week.

7.3.1 Visual Inspection

Type of Inspection	ACtivity/Components	✓
Check operating behaviour	Monitor KÜHLMOBIL for normal operating behaviour: – Running sounds, – heating, – development of odours. If the KÜHLMOBIL displays irregular operational behaviour, if necessary, shut down and notify maintenance personnel immediately.	
Check for residues	Check KÜHLMOBIL and surrounding area for residues of material and operating materials, and remove if necessary.	
Remove soiling	– Walkways – work surfaces – labelling, – condenser	
Check for wear	– Moving supply and drain pipes, – Externallly recognisable seals, etc. – Replace components if necessary.	
Check for damage	– Externally recognisable damage to all components.	
Check for leaks	– Cooling water hoses, – Fittings, – Plug-in connections.	
Check of cooling liquid	– Clean of viewable dirt in the tank	

7.4 Servicing

7.4.1 General Instructions

All servicing work (if necessary) must be performed within the specified deadline and with the appropriate degree of care.

The components in the Mobile-Cooler housing do not require any servicing.

The only exception to this is the condenser (in the case or air cooling): see also under Section 7.4.3.

Should damage occur, the KÜHLMOBIL ist be sent to Van der Heijden Labortechnik GmbH.

In special cases consultation with Van der Heijden Labortechnik GmbH is to be undertaken.

7.4.2 Setting the Bypass Regulating Valve

The cooling circuit of the KÜHLMOBIL is equipped with an automatically bypass regulating valve, which is accessible at the rear of the housing.

It can be used to regulate the water supply pressure by means of the flow rate, thereby influencing the flow delivery of the circulating pump.

The maximal water supply pressure can be read from the pressure gauge when the water prerun is closed and can therefore be set to the desired value.

- The automatically bypass will be is adjusted using the adjusting screw after the pump is switched off and the cap is loosed:
  rotate anti-clockwise causes a reduction in pressure
  rotate clockwise causes an increase in pressure.

Note!

Please take care the when adjusting the bypass regulation valve the water pressure will be enough.

Please take also care the there will not be adjusted to high pressure, which is not needed.

Adjust the required liter for the appliance which is to be cooled but do not adjust more.

The deeper the pressure on the manometer will be shown, at enough feed quantity, the better for the water pump.

7.4.3 Condenser (for Air Cooling)

Depending on the installation site and freedom from dust of the surrounding air, the condenser lamellae are to be checked for soiling at extended intervals – immediatley in the event of dropping cooling performance - and cleaned, if necessary.

- To do this it is necessary to remove the front metal panel.
- It is necessary to subsequently blow the condenser from back to front using nitrogen or oil-free compressed air.
- Finally, do not forget to re-attach the metal panel.

7.4.4 Cooling liquid

The refrigeration cycle is to check by a pressure test once a year. The pressure test is independent of the duration of the KÜHLMOBIL to perform (annual) at regular intervals.

The treatment is to be carried out under the responsibility of a qualified technician.

7.4.5 Cooling liquid

The quality of the cooling liquid in the tank of the KÜHLMOBIL had to be checked one time per month. Chemical or biological dirt had to be cleaned.

For this the cover had to be opened by releasing the 4 screws.

The water circuit can be cleaned by rinse the hose connection and cleaning of the tank.

The dirty cooling liquid had to be changed.

8 Disposal

Operation of the KÜHLMOBIL results in the accumulation of waste materials and replaced parts, which have to be disposed of in accordance with legal regulations.

8.1 Environmental Protection

Caution!

In the case of all work on the KÜHLMOBIL all legal obligations relating to waste prevention and correct recycling/disposal must be adhered too.

Especially in the case of repair and servicing work, neither the soil nor the drains must be contaminated with materials hazardous to water, such as:

- Lubricating oils and greases and
- Cleaning fluids containing solvents!

These materials must be stored, transported, collected and disposed of in suitable containers!

8.2 Coolant

Caution!

Destruction of the coolant circuit as a result of leaking coolant.

It is prohibited to open the coolant circuit without a reason and without workshop equipment suitable for the job! Opening the coolant circuit may result in it being subsequently impossible to operate the KÜHLMOBIL again.

- Work on the coolant circuit of the KÜHLMOBIL may only be performed by Van der Heijden Labortechnik GmbH.
- Work may only be performed by expert personnel in exceptional circumstances if there is a compelling reason for it.
- Always inform Van der Heijden Labortechnik GmbH before hand!
- The coolant must be correctly soaked up, and must not be allowed to escape into the environment!
- The safety specifications sheet for the coolant must be adhered to!

8.3 Final Decommissioning

If the KÜHLMOBIL is being shut down for the last time, the components and operating materials are to be disposed of in accordance with laws and regulations applicable at the time of disposal.