LabCon-C

Meter and Sensor Calibration System

Temperature

Conductivity

Pressure

Flow

Frequency - pH - Voltage

User Manual

Version E1.0

Preliminary Version

Foreword

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Revisions

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SAFETY INSTRUCTIONS

For your and the user safety read and consider the safety instructions below carefully

- **Read this documentation carefully and entirely before using the LabCon-C devices.**
- **Read carefully the entire documentation " Calibration Background HDM-Meters"**
- **Read carefully the entire documentation of the reference devices used in LabCon-C devices**
- **Read carefully the entire manual of the meter to calibrate before using the LabCon-C devices.**
- **Keep the devices away from unauthorised persons.**
- **Only use the LabCon-C devices for the calibration of dialysis reference meters and sensors.**
- **Only use the LabCon-C devices in conjunction with high accuracy references.**
- **Make sure that all reference meters have valid calibration certificates.**
- **Only use the LabCon-C devices in a dry environment and do not touch it with wet hands.**
- **Prevent every mechanical overstraining of electrical wires.**
- **If the acquired values seem to be not believable, make sure that the no device is defective.**
- **Prevent electrostatic discharge on the connectors. This can lead to substantial damage of the LabCon-C devices devices and devices to calibrate. Make sure to be completely discharged before touching the connectors or cables connected to the instrument.**
- **Potentials above 42V against earth ground are dangerous. This potentials can lead to electrical shock and therefore to health hazards. Make sure that none of the connectors has higher voltage than mentioned before.**
- **Never open a device of the LabCon-C devices. There are no parts inside you can repair.**

1 Introduction

This documentation describes how to install and use the hard- and software of the different LabCon DMCS configurations for the calibration of measuring dialysis meters and sensors.
For the procedures to calibrate the device refer to the calibration instructions.

The systems described here are used to provide reference values. The following values are supported.

- Temperature
- Conductivity
- Pressure
- Flow
- pH/Voltage/Frequency

The modules each consist of hardware and, except for the module for pH / Voltage / Frequency, also of software that controls the modules.

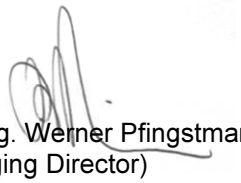
1.1 **Intended use**

The LabCon-C devices is intended to provide or prepare reference values for the calibration of meters and sensors used in biomedical, laboratory and environmental applications.

1.2 **Regulatory**

EC DECLARATION OF CONFORMITY

We hereby declare, that the following products conform to the below mentioned European Directive.

Manufacturer	IBP Medical GmbH Ikarusallee 15 30179 Hannover
Products	**LabCon-UWHD Conductivity Source** **LabCon-UPHD Pressure Source** **LabCon-UPPH Pressure Pump** **LabCon-UFHD Flow Source** **LabCon-USHD Voltage Signal Source** **LabCon-CLRP Cleaning Recirculation Pump**
Relevant EC-Directives	**2004/108/EG EMV-Richtlinie** **2006/95/EG Niederspannungs-Richtlinie**
Compliance with	**EN60601-1:2006** **EN61000-4-2:1996** **EN62353:2008** **VDE 0750-1:2006** **VDE 0751-1:2008**
Place and Date	**Hannover 19.05.15**
Legally binding signature	 Dipl. Ing. Werner Pfingstmann (Managing Director)

2 Installation

2.1 Hardware

If you install LabCon-C components make sure, especially for devices with voltage switching, that the switches are in the correct position.

Power supply	
LabCon-UPHD	90....264 VAC, 50/60 Hz
LabCon-UFHD	90....264 VAC, 50/60 Hz
LabCon-CLRP	90....264 VAC, 50/60 Hz
LabCon-USHD	220...240V / 110...120 VAC, **switchable**
LabCon-CLRP	90....264 VAC, 50/60 Hz
Julabo Water Bath	230 VAC, 50/60 Hz, max. 12 A
Agilent 34460A Multimeter	100/120 (127)/ 220 (230)/240 VAC, **switchable**
Heater Caso 2200	230 V, 50 Hz, 2000 W
Environmental	
Operating temperature	16 ºC to 30 ºC (Best accuracy 20 ºC to 26 ºC)
Operating humidity	5% to 85% not condensing

2.2 General System Material List

Item	Type
Multiple Socket	11 EU Schuko Outlet / Australian Plug

3 Temperature

The LabCon Temperature calibration system allows to control the water bath temperature. The functionality includes:

- Profiling bath temperature
- Stabilizing status information

The system consists of a water bath for tempering of sensors to be calibrated, associated software that takes a simple and safe control of the bath and pretending the waiting time to settle the sensors and a reference device.

3.1 System Overview

The following diagram shows the combination of water bath, reference meter including reference sensor and computer with software.

3.2 **Water Bath**

Technical Data

Model	Julabo F26-ME Refrigerated/Heating Circulator
Temperature operating range	-28 ... 200 °C
Temperature consistency	±0.01 °C
Setting/ Display Resolution	0.01 °C
Power supply	230 VAC, 50/60 Hz, max. 12 A
Dimensions and weight	42 x 42 x 42 cm (W x L x H), 31 Kg

3.3 Temperature Reference Device

HDU-Pt100 is used as a reference for calibrating the temperature.

SAFETY INSTRUCTIONS

Make sure that your reference device has a valid calibration certificate.

3.3.1 General Specifications

Measuring Range	0 °C to 100 °C
Accuracy with sensor	25 ... 40°C ± 0.015 °C, otherwise ± 0.025 °C DKD calibrated for high accuracy
Optimal Operating temperature	13 ºC to 33 ºC
Interface	USB with special interface cable

3.4 System Material List

Item	Type
Water Bath	Julabo F26-ME
Reference Sensor Temperature	HDU-Pt100 including Sensor
Cables	1 x USB 2.0 to RS485 for sensor 1 x USB to RS232 for water bath  Type UC-232A or equivalent
Software	CD with LabCon-UTHD or LabCon-UWHD
Sensor holder for water bath	Holder for 5 IBP HDM-Sensors

3.5 Equipment maintenance

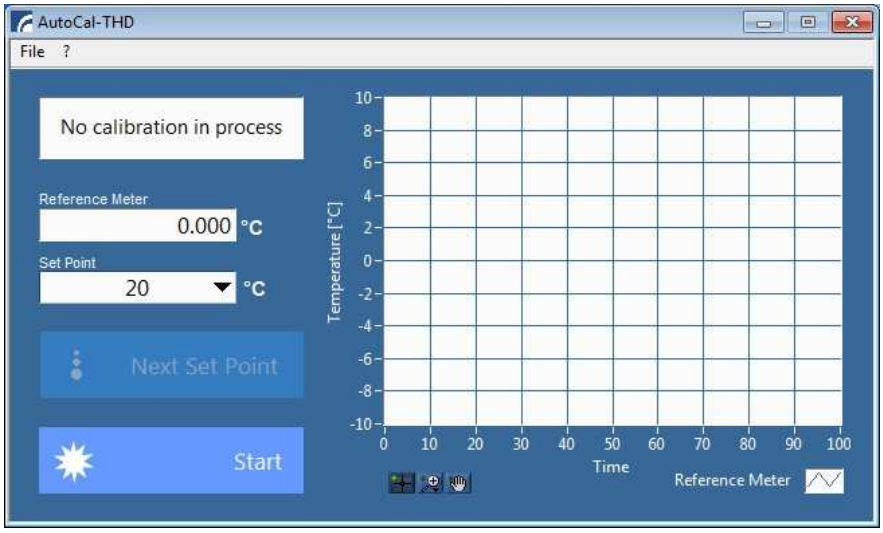
The water bath should be cleaned every four weeks. For cleaning purposes, water mixed with 10% citric acid is poured in to the tank which is then heated to 80 °C. After 80 °C has been attained and has stabilized, the temperature must be maintained for a period of 30 minutes.

3.6 Software

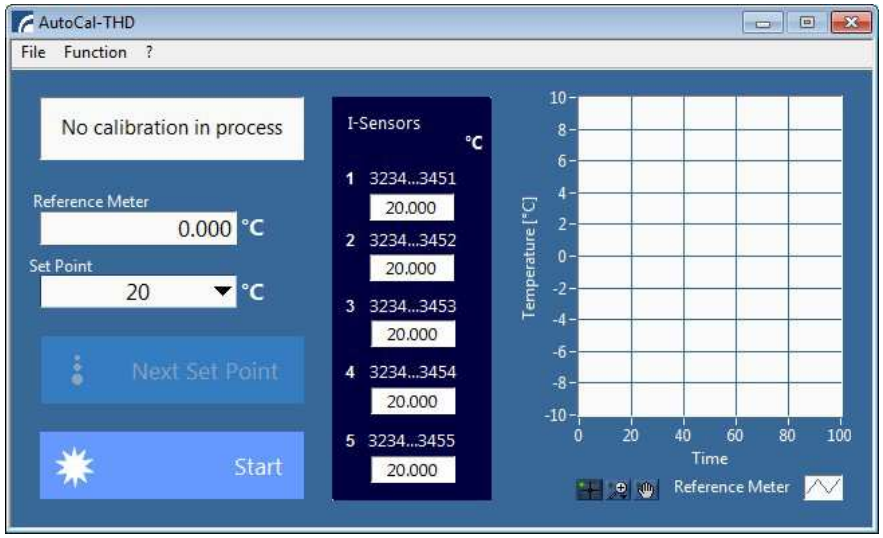
The LabCon-UTHD software allows the easy and safe control of the water bath. Set points can be set or selected from a list. The stability of the bath and the settling time of the sensor to be calibrated are monitored.

At start-up and whenever the Start button is pressed the program scans the USB ports of the computer for intelligent sensors. Active sensors from type HDU- and DIA-Sensors are recognized.

If no Active sensors are detected provides the user interface as follows.



The program interface when active sensors are found.



3.6.1 Installation and Settings

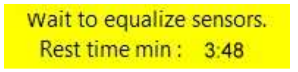
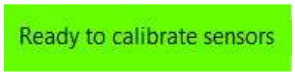
After software start the program will scan the USB-Ports to locate the water bath and the reference meter. You will get a message in case a device is missing.
In case the program is not able to find a list of set points it will create a default list.
No additional settings are needed.

3.6.2 Display, Controls and Functions

Pull Down Menu

File	
Setpoint	
New	Adds a new set point to the list
Delete	Deletes a set point from the list
Sort ascending	
Sort descending	
Export bath data	Saves collected bath values into a EXCEL sheet
Terminate	Terminates the program
Function	
Adjust Active-Sensor	Allows to adjust sensors, available after at least two points are calibrated
All	Adjusts sensor with calibration data
1	Adjusts sensor no 1
2	
3	
4	
5	
?	
Info	Shows program info

Window

	Status display for operating status and system messages.
	The water bath is not yet settled. Please wait.
	This phase ensures that the sensors to be calibrated are completely settled. The remaining time is displayed.
	The bath is stable and the sensors are settled. The sensors can be calibrated.
	The measured value of the external reference monitor.
	Set point of the bath temperature. A value can be selected from the list or entered directly into the field. If the value is changed, it will be transmitted to the water bath. If the temperature of the bath is settled, a single correction to the temperature indicated by the reference instrument is performed.
	Selects the next target value from the list and send this value to the water bath.
	Starts the water bath. The state of the button switches in the picture below.
	Stops the water bath. The state of the button switches in the above image.

	Allows the customization of the graph.
	Allows you to adjust the measured value colour.
	Display of a connected sensor. In the headline of the value display the serial number of the sensor is displayed.

4 Conductivity - Preparation Calibration System

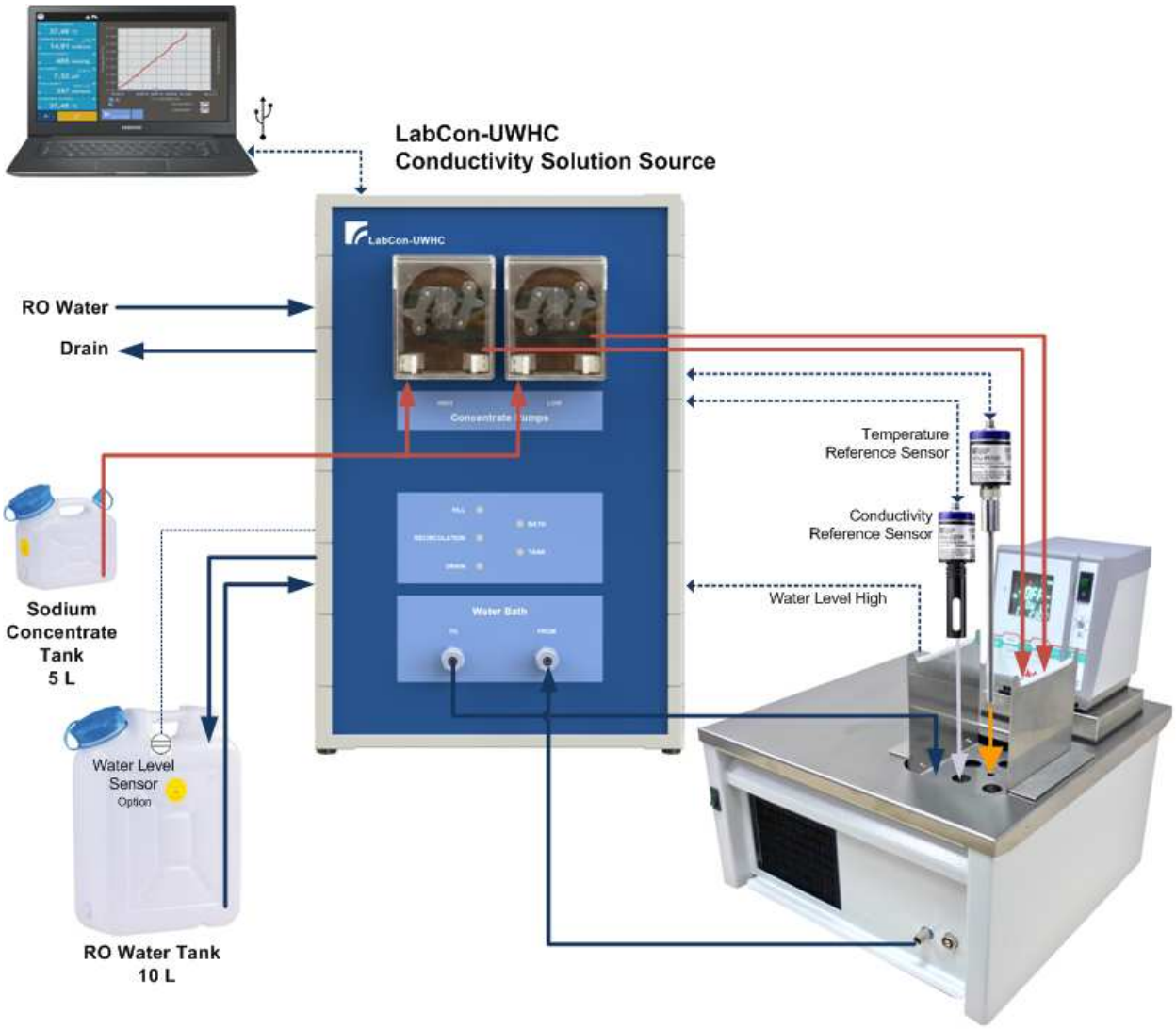
The LabCon Conductivity/Temperature calibration system allows controlling the water bath conductivity and temperature. The functionality includes:

- Fill procedure of water bath
- Recirculation and degassing of water bath
- Drain procedure of water bath
- Recirculation and degassing of water tank
- Profiling water bath temperature
- Profiling water bath conductivity

The system consists of a water bath, reference sensors for temperature and conductivity, the UWHC-Module and associated software that takes a simple and safe control of the bath and solution preparation.

4.1 System Overview

The following diagram shows the combination of water bath, reference sensor and computer with software.



4.2 Water Bath and Temperature Reference Device

Please refer to the chapter *3 Temperature* above.

4.3 System Material List

Item	Type
Water Bath	Julabo F26-ME
Reference Sensor Temperature	HDU-Pt100 including external Pt100 sensor
Reference Sensor Conductivity	HDU-CDTP
Cables	1 x USB 2.0 A to B 2 x USB 2.0 to RS485 for sensors 1 x USB to RS232 for water bath  Type UC-232A or equivalent
Sensor holder for water bath	Holder for 5 IBP HDM-Sensors
Module water handling	LabcCon-UWHC - 10.0560.00
Software	CD with LabCon-UWHD
Sodium Concentrate Tank	5 Liter
Water Tank	10 Liter
Graduated Beaker	5 L
Sodium Chloride	Sodium Chloride, purified Quality

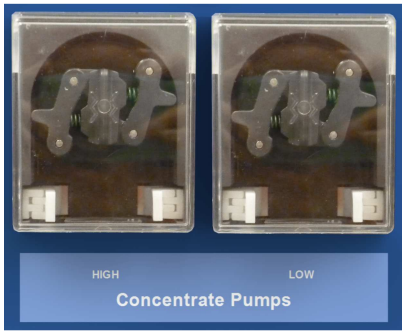
4.4 Equipment maintenance

The system including water bath, LabcCon-UWHC and sensors should be cleaned and disinfected every four weeks.
First drain the water tank. Fill water tank with water mixed with 10% citric acid. Fill water bath with water from the tank and start menu *Cleaning/Disinfection* at LabCon-UWHD software.
The system will be then heated up to 80 °C. After 80 °C has been attained and has stabilized, the temperature must be maintained for a period of 30 minutes. After that drain the system and fill the tank with ultra pure water.

4.5 LabCon-UWHC Controller Hardware

4.5.1 Controls and Ports

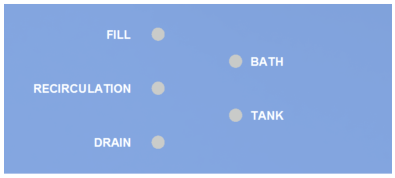
Frontside



Concentrate Pumps for the control of the solution conductivity

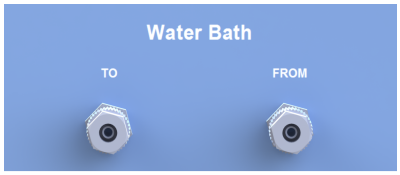
Pump HIGH
To be used with silicon pump tubing AD/ID 6/3 mm

Pump LOW
To be used with silicon pump tubing AD/ID 1/1 mm



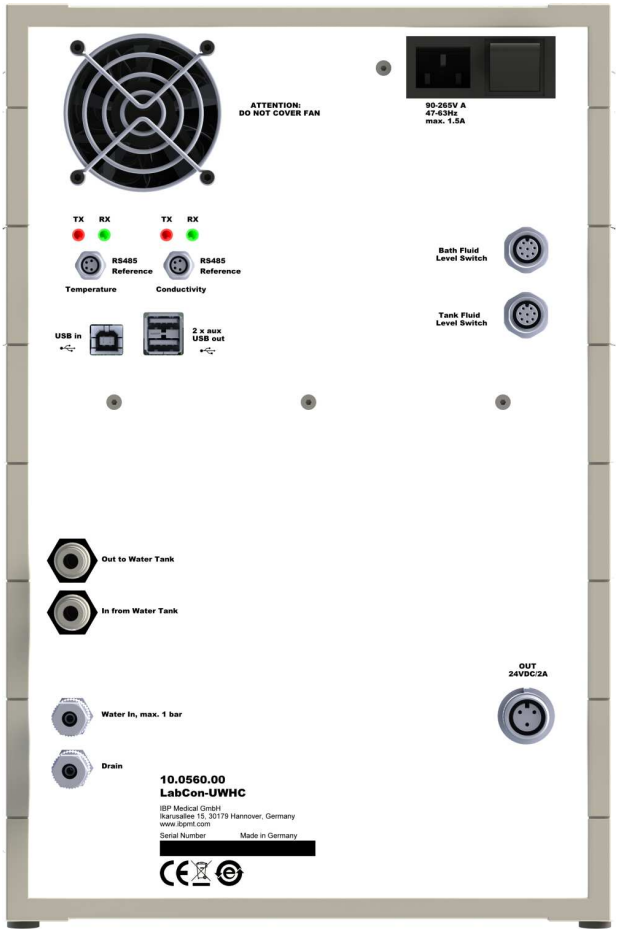
Indicates the current hydraulic status

Mode: Fill or Recirculation or Drain
Device: Water Bath or Water Tank

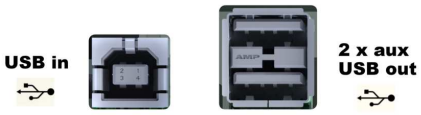
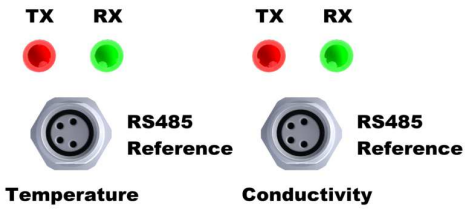


Fluid Connections TO/FROM Water Bath
Silicon Tube 6/9 mm

Rear side



Details

	USB-In to control the device USB-Aux to connect additional USB-Devices.
	Connectors for external temperature and conductivity reference sensors.  Make sure that both reference-sensors are connected according the to labelling.
	This connector is for future use.

Connector for the water bath fluid level switch.

Connector for the water tank fluid level switch.

This connector is only used in conjunction with automatically water tank fill procedure.

The water supply of the system is based on the external water tank. The recommended size is 10 Liter.

Outlet to external water tank.

Inlet from external water tank.

The water inlet is an option. If not connected the water tank is used as water source. If RO-Water is connected, the external water tank can be filled automatically.

Drain - Please make sure to have free outflow.

Fluid Connector for tube with 8 mm outer and inner 6 mm diameter.

Power in and switch

4.5.2 Technical Data

Control Interface	USB
Water Supply	Input pressure max. 1 bar The water inlet is an option. If not connected the water tank is used as water source.
Temperature measuring	Range: 0...100 °C Resolution: 0.001 °C Accuracy: 25 ... 40°C ± 0.01 °C otherwise ± 0.02 °C
Temperature setpoint accuracy	0,5 % from Set point
Conductivity measuring	Range: 0…200.00 mS/cm Accuracy: 0…199 uS/cm ± 0.2 uS/cm 200…1999 uS/cm ± 2 uS/cm 2...11.99 mS/cm ± 0.02 mS/cm 12...19.99 mS/cm ± 0.01 mS/cm 20...200 mS/cm ± 0.2 mS/cm
Conductivity mixing accuracy	0,5 % from Set point
Drain	Free outflow needed
Tube for water supply and Drain	Tube AD/ID 6/8 mm. Tubing material: FEP, PFA, Nylon, Polyurethane
10 L Water Tank In/Out	Tube AD/ID 6/8 mm. Tubing material: Silicone, FEP, PFA, Nylon, Polyurethane
5 L Concentrate Tank	Tube AD/ID 6/8 mm. Tubing material: Silicone, Pump HIGH: Silicon pump tubing AD/ID 6/3 mm Pump LOW: Silicon pump tubing AD/ID 1/1 mm
Water Bath TO/FROM	Tube AD/ID 6/8 mm. Tubing material: Silicone,
Connector 1 x 24 V	Bulgin PX413 Pin L 24 V N NC E GND
Control Interface	USB
Power supply	90....264 VAC, 50/60 Hz max. 150 W
Dimensions and weight	30 x 31 x 27 cm (W x H x D) 5,9 Kg without accessories

4.6 **Modification of Water Bath**

In order to integrate the water bath in the automated water processing the water bath gets the following modifications.

- Float switch to detect maximum water level
- Two nozzle for sodium concentrate injection

The concentrate injection takes place via bulkhead fittings with male Luer adapter at the water side and additional nozzles with femail Luer adapter. The nozzle are standard syringe needles with dimensions described below.

Concentrate Pump LOW 24G 0,55 x 25 mm
Concentrate Pump HIGH 19G 1,1 x 30 mm

4.7 Preparation of Concentrate Solution

For the preparation of reference conductivity solution a concentrate solution is needed.
1000 gr Sodium Chloride, dissolve in 4 liters of RO-Water results in conductivity solution of about 190 mS/cm. The final conductivity of the concentrate is not important. The following procedure is based on measurement of volume and is sufficiently accurate.

SAFETY INSTRUCTIONS

Use Sodium Chloride in purified quality only.

Take a 5 L graduated beaker and fill it with 4000 ml water. Pour slowly, with stirring 1000 gram Sodium Chloride into the beaker and stir until the salt is completely dissolved.

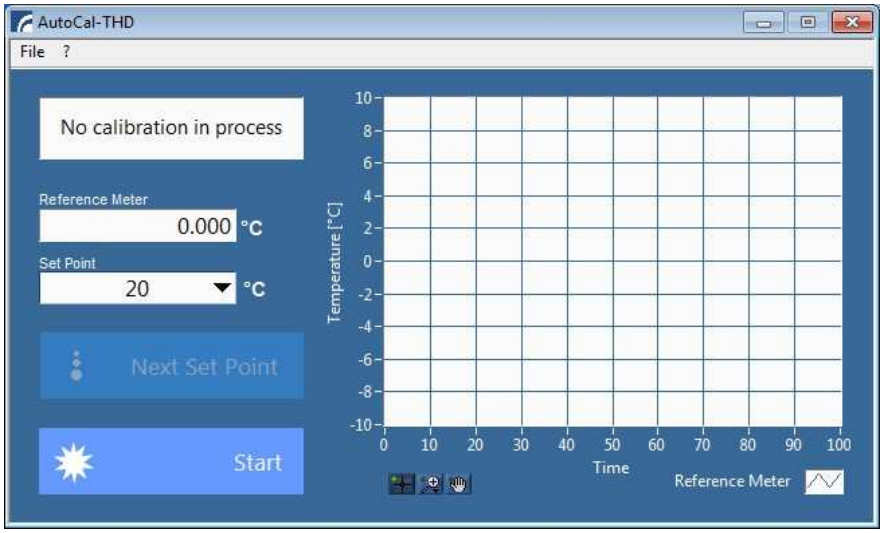
Fill the concentrate into the 5 L concentrate tank.

4.8 Software

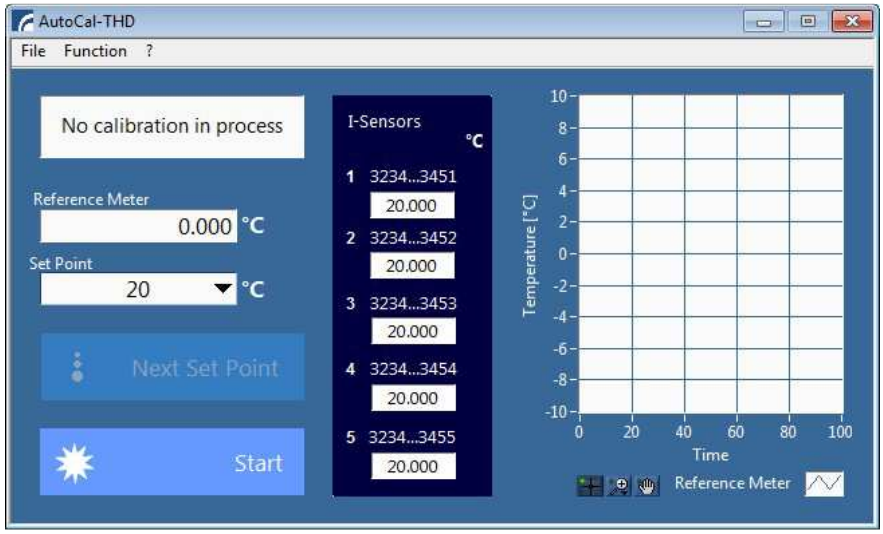
The LabCon-UTHD software allows the easy and safe control of the water bath. Set points can be set or selected from a list. The stability of the bath and the settling time of the sensor to be calibrated are monitored.

At start-up and whenever the Start button is pressed the program scans the USB ports of the computer for intelligent sensors. Active sensors from type HDU- and DIA-Sensors are recognized.

If no Active sensors are detected provides the user interface as follows.



The program interface when active sensors are found.



4.8.1 Installation and Settings

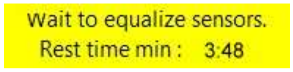
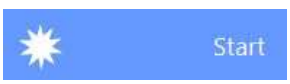
After software start the program will scan the USB-Ports to locate the water bath and the reference meter. You will get a message in case a device is missing.
In case the program is not able to find a list of set points it will create a default list.
No additional settings are needed.

4.8.2 Display, Controls and Functions

Pull Down Menu

File	
Set point	
New	Adds a new set point to the list
Delete	Deletes a set point from the list
Sort ascending	
Sort descending	
Export bath data	Saves collected bath values into a EXCEL sheet
Terminate	Terminates the program
Function	
Adjust Active-Sensor	Allows to adjust sensors, available after at least two points are calibrated
All	Adjusts sensor with calibration data
1	Adjusts sensor no 1
2	
3	
4	
5	
?	
Info	Shows program info

Window

	Status display for operating status and system messages.
	The water bath is not yet settled. Please wait.
	This phase ensures that the sensors to be calibrated are completely settled. The remaining time is displayed.
	The bath is stable and the sensors are settled. The sensors can be calibrated.
	The measured value of the external reference monitor.
	Set point of the bath temperature. A value can be selected from the list or entered directly into the field. If the value is changed, it will be transmitted to the water bath. If the temperature of the bath is settled, a single correction to the temperature indicated by the reference instrument is performed.
	Selects the next target value from the list and send this value to the water bath.
	Starts the water bath. The state of the button switches in the picture below.
	Stops the water bath. The state of the button switches in the above image.

	Allows the customization of the graph.
	Allows you to adjust the measured value colour.
	Display of a connected sensor. In the headline of the value display the serial number of the sensor is displayed.

5 Pressure Calibration

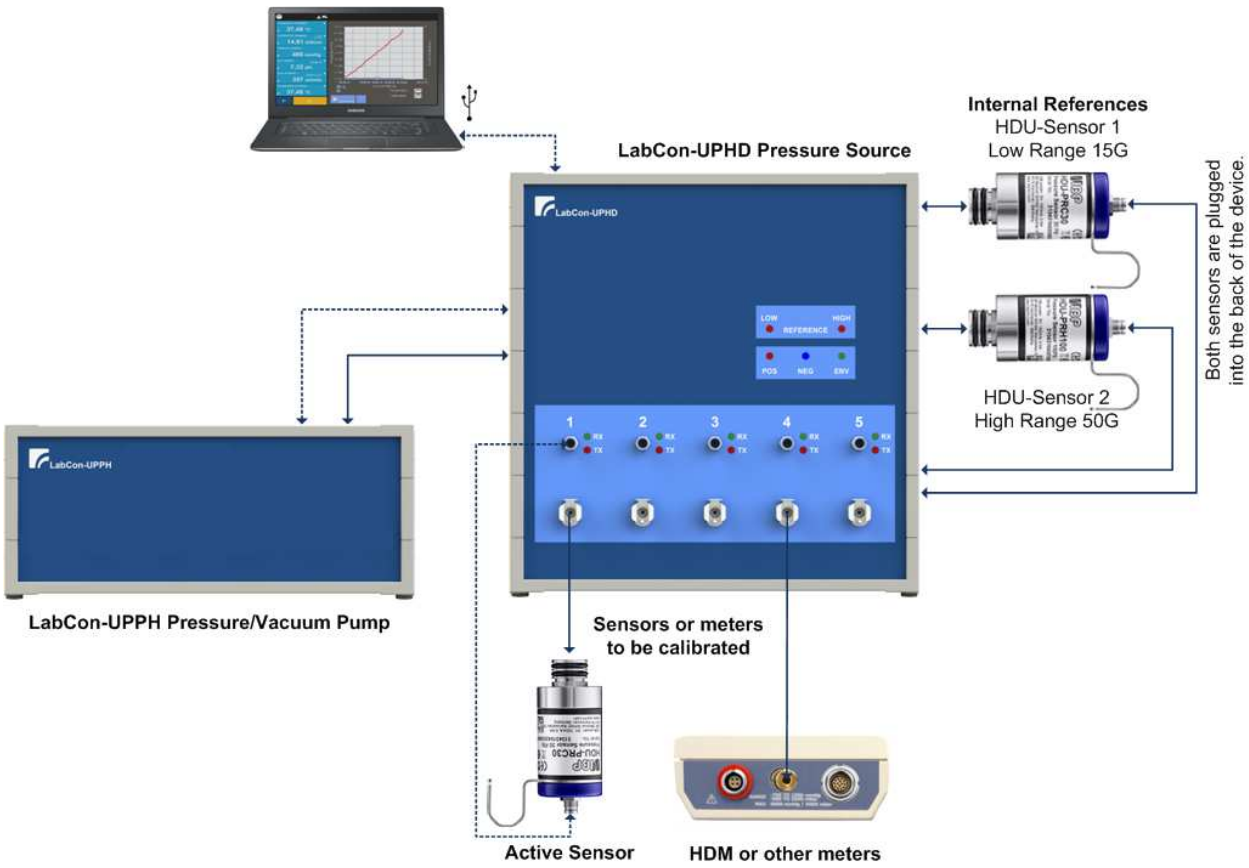
The LabCon DMCS pressure calibration system allows controlling the pressure for up to five devices. The functionality includes:

- Control of pressure and vacuum pumps
- Read of active sensors
- Adjust of active sensors

The system consists of the LABCON-UPHD controller for generating the reference pressure, the corresponding software, the LABCON-UPPH with compressor and a vacuum pump and two pressure reference measuring devices.

5.1 System Overview

The following diagram shows pressure calibration system.



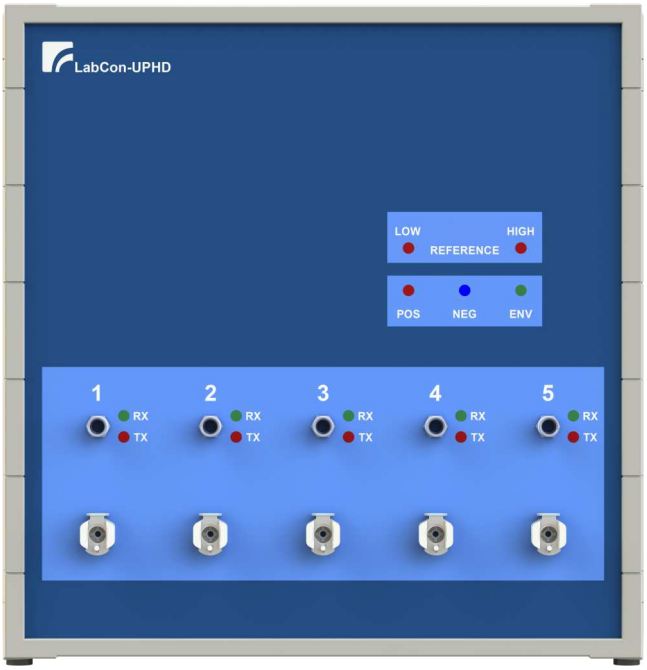
5.2 **System Material List**

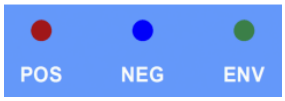
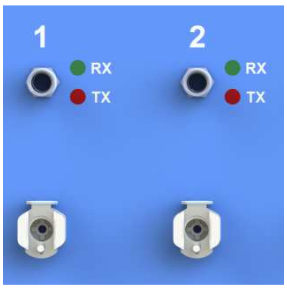
Item	Type
Pressure Controller	LabcCon-UPHD Pressure Controller - 10.0500.00
Pressure/Vacuum Pump - Option	LabcCon-UPPH Pressure/Vacuum Pump - 10.0505.00
Reference Sensors	HDU-PRH15 HDU-PRH50
Software CD	LabCon-UPHD
Cables	1 x USB 2.0 A to B
Sets of tubing and connector for 5 Sensors	50 cm Norprene flexible tubing PMC Connector male PMC Connector Female
Tubing's pressure connection between LabCon-UPHD and LabCon-UPPH	6/8 mm tubing Tubing material: FEP, PFA, Nylon, Polyurethane

5.3 LabCon-UPHD Controller Hardware

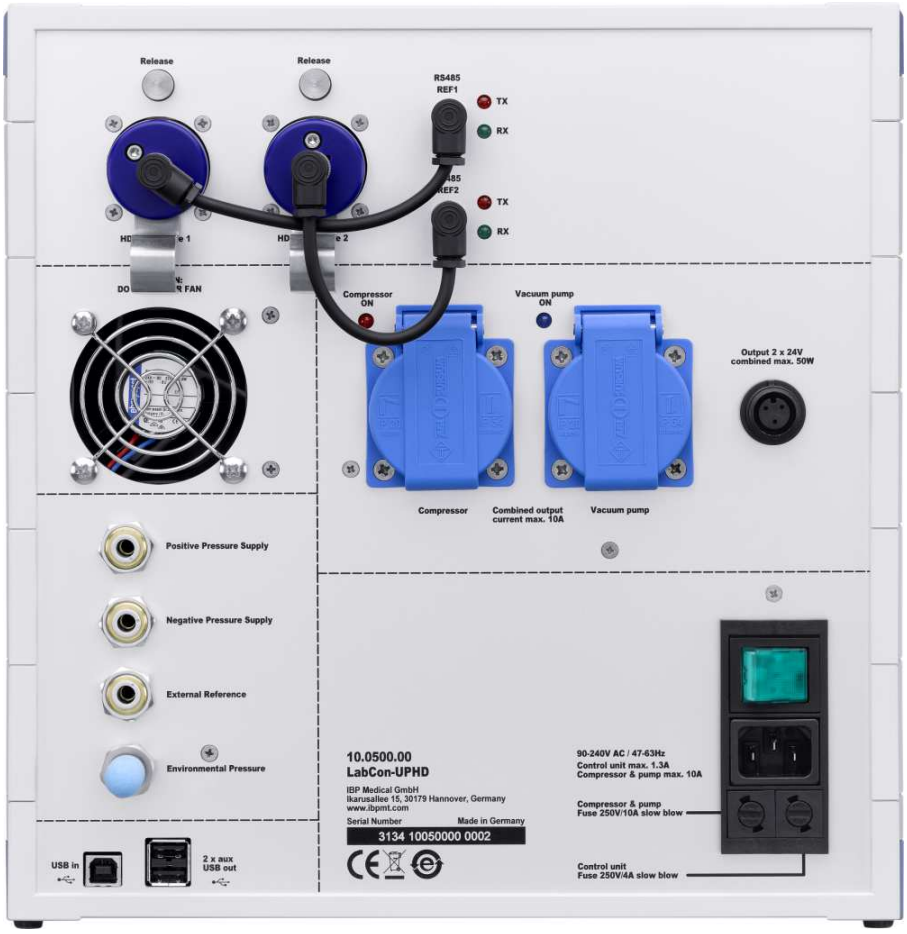
5.3.1 Controls and Ports

Front side



	Indicates which internal reference sensor is in use.
	Indicates if **POS**itive, **NEG**ative or **ENV**ironmental pressure is applied to the sensors under calibration
	Number of sensor Connector for Active-Sensors Communication LED's - Data- RX receive, TX transmit Pressure Port - Type: Colder PMC

Rear side



Details

Internal pressure references sensors

Pressing the Release-Button releases the sensor.

Note that the sensors are different in their ranges and may not be swapped.

Reference 1: HDU-PRH15
Reference 2: HDU-PRH50

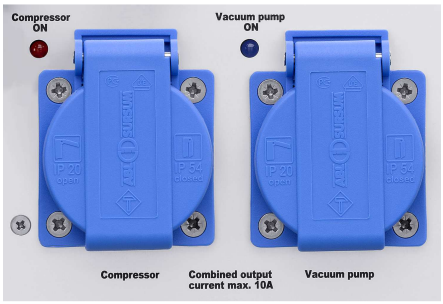
Connectors for internal pressure references sensors.

Make sure that Reference-Sensor 1 is connected to RS485 REF1 and Reference-Sensor 2 is connected to RS485 REF2.

In case the connections are incorrectly this can cause damage to the unit and the connected calibration equipment.

On this connector are two switched 24 VDC signals can be used as the switched outlets for supply of compressor and vacuum pump.

The pump module LabCon-UPPH is using these signals.



Switched outlets for compressor and vacuum pump.

This is useful if the pumps have no automatic pressure shutdown. The particular socket is turned on/off by the LabCon-UPHD software as necessary.

Input positive pressure supply
min. 2,5 bar .... max. 3 bar

Input negative pressure supply
min. - 700 mbar

Outlet for external Reference if needed

All pneumatic connectors One-Touch fitting 6 mm.
Suitable for use with tubing material: FEP, PFA, Nylon, Polyurethane

Two environmental pressure inlet.

Must be used with an air filter.

USB-In to control the device
USB-Aux to connect additional USB-Devices.

Power switch

Output voltage of the network is connected with the main switch of the unit.

Fuses

5.3.2 Technical Data

Pressure Output Range	-600 mmHg ... 1800 mmHg	
Pressure Output Stability	1 mmHg	
Pressure Measurement	Range: -0,85 to 3,4 Bar Resolution: 0.01 mmHg Accuracy: 0 to 300 mmHg, ± 0.1 mmHg otherwise ± 0,3 mmHg in temperature range 20 to 23 °C	
Pressure Supply	Input positive pressure supply min. 2,5bar (1875 mmHg) max. 3 bar (2250 mmHg) Input negative pressure supply min. - 820 mbar (-615 mmHg)	
Connectors Pressure Front	Colder PMC	
Connectors Pressure Rear	One-Touch fitting 6/8 mm Suitable for use with tubing material: FEP, PFA, Nylon, Polyurethane	
Connector 2 x 24 V	Bulgin PX413	Pin L 24 V Compressor N 24 V Vacuum pump E GND
Control Interface	USB	
Power supply	90....264 VAC, 50/60 Hz max. 150 W max. 1200 W, if external pumps are connected at socket outlets	
Dimensions and weight	30 x 31 x 27 cm (W x H x D) 5,9 Kg without accessories	

5.4 Pump Module LabCon-UPPH

The pump module LabCon-UPGD generates the positive and negative pressure.

5.4.1 Technical Data

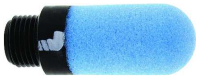
Control Interface

Connector 2 x 24 VDC, max. 2A	Bulgin PX413	Pin L 24 V Compressor N 24 V Vacuum pump E GND

Pressure out	Max. 2,8 bar
Vacuum out	Max. -820 mbar
Pneumatic Connector	One-Touch fitting 6/8 mm. Suitable for use with tubing material: FEP, PFA, Nylon, Polyurethane
Dimensions and weight	30 x 13 x 27 cm (W x H x D) 3,9 Kg without accessories

5.4.2 Controls and Ports

Rear Side

	Connector 2 x 24 V supply for both pumps
	Positive pressure limitation switch. Factory adjustment 2,5 bar.
	Two environmental pressure inlet. Both must be used with an air filter. 
	Negative pressure outlet. Pneumatic One-Touch fitting 6 mm. Suitable for use with tubing material: FEP, PFA, Nylon, Polyurethane
	Positive pressure outlet. Pneumatic One-Touch fitting 6 mm. Suitable for use with tubing material: FEP, PFA, Nylon, Polyurethane

5.5 **References**

The reference sensors are integrated on the rear of the unit and can be easily removed for calibration.

SAFETY INSTRUCTIONS

Make sure that your reference meter has a valid calibration certificate.

5.5.1 General Specifications

HDU-PRH15	**Reference 1** Technical data with special calibration procedure
Measuring Range	Range: - 12 to 15 psi -0.85 to 1 bar -650 to +775 mmHg
Resolution	0.001 mmHg
Accuracy	General 0.05% full scale 0 to 300 mmHg ± 0.2 mmHg,
Over Pressure	2 x full scale

HDU-PRH50	**Reference 2** Technical data with special calibration procedure
Measuring Range	Range: - 12 to 50 psi -0.85 to 3,4 bar -650 to +3500 mmHg
Resolution	0.01 mmHg
Accuracy	General 0.015% full scale
Over Pressure	2 x full scale

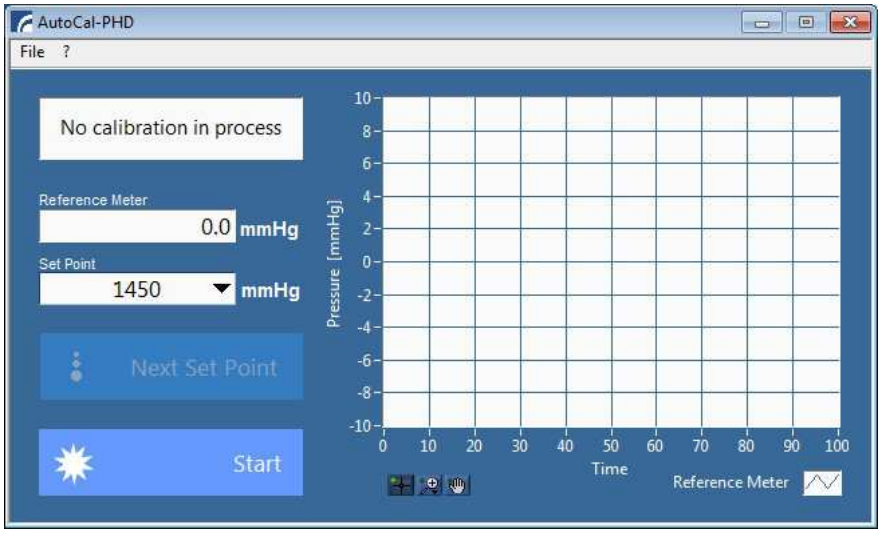
Both Sensors	
Power supply	3,3 to 5 V, max. 60 mA via RS485- or USB-Interface
Environmental conditions	Operating Temperature Range: 0 to 50°C Storage Temperature Range: -40 to 80°C Operating and Storage Humidity: 85% max relative humidity non-condensing from 0 to 50°C

5.6 **Software**

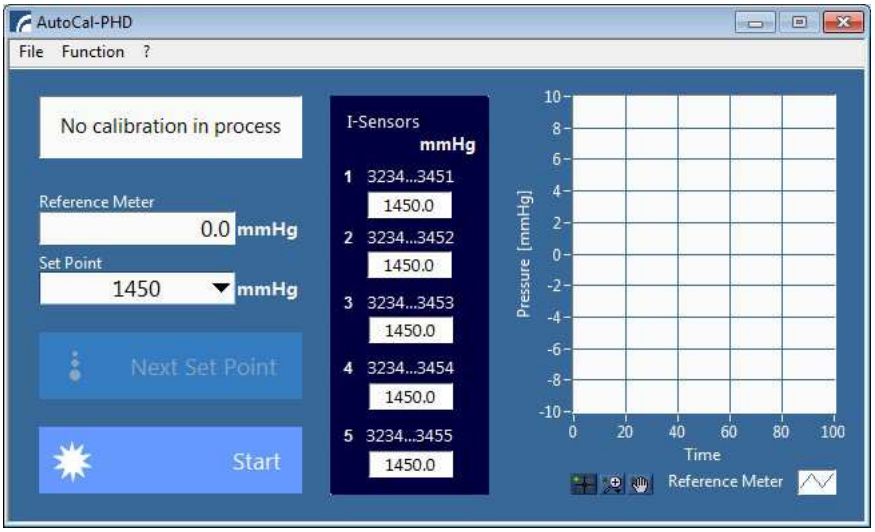
The LabCon-UPHD software allows controlling the LabCon-UPHD module. After software start the program will scan the USB-Ports to locate the LabCon-UPHD device and the reference sensors. You will get a message in case a device is missing. In case the program is not able to find a list of set points it will create a default list. Set points can be set or selected from this list.

Whenever the Start button is pressed the program scans the RS485 interfaces at the front of the device searching active sensors from HDU- and DIA sensors types.

If no Active sensors are detected provides the user interface as follows.



The program interface when active sensors are found.

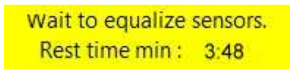
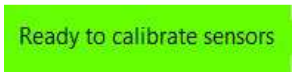
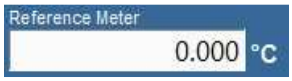
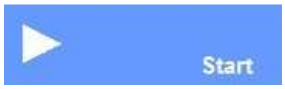


5.6.1 Display, Controls and Functions

Pull Down Menu

File Exit	Terminates the program
Function Set point's Adjust HDM Set point's Calibrate HDM	Selects the set point's values for the Adjustment of HDM99XP and HDM97*Pocket* Calibration of HDM99XP and HDM97*Pocket*
? Info	Shows program info

Window

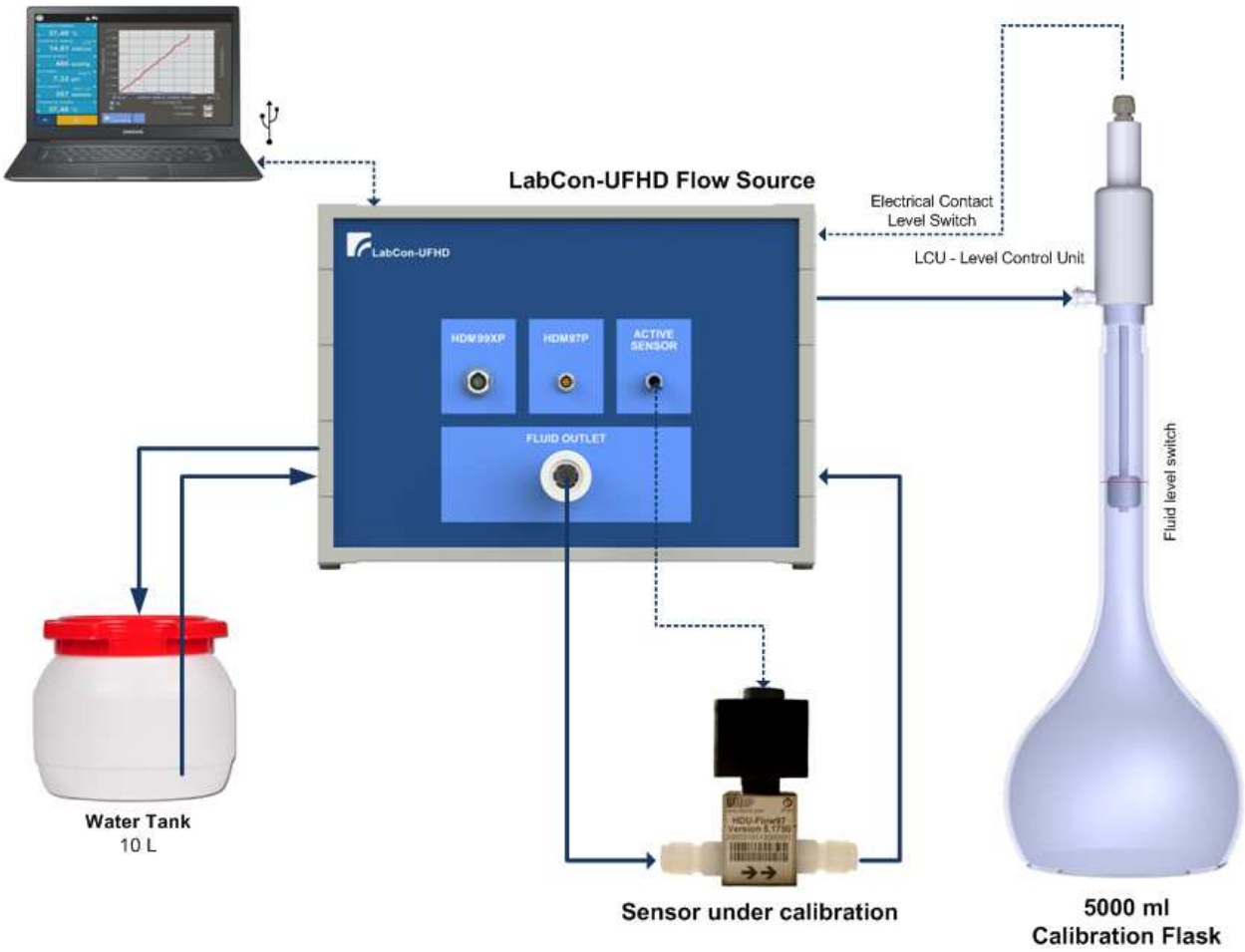
	Status display for operating status and system messages.
	The water bath is not yet settled. Please wait.
	This phase ensures that the sensors to be calibrated are completely settled. The remaining time is displayed.
	The bath is stable and the sensors are settled. The sensors can be calibrated.
	The measured value of the external reference monitor.
	Set point of the bath temperature. A value can be selected from the list or entered directly into the field. If the value is changed, it will be transmitted to the water bath. If the temperature of the bath is settled, a single correction to the temperature indicated by the reference instrument is performed..
	Selects the next target value from the list and send this value to the water bath.
	Starts the water bath. The state of the button switches in the picture below.
	Stops the water bath. The state of the button switches in the above image.
	Allows the customization of the graph.
	Allows you to adjust the measured value colour.
	Display of a connected sensor. In the headline of the value display the serial number of the sensor is displayed.

6 Flow Calibration

The LabCon-C flow calibration system consists of the LABCON-UFHD controller for adjusting the flow rate, the associated software to control the flow and a calibrated measuring flask with level switch.

6.1 System Overview

The following diagram shows LabCon-UFHD System.



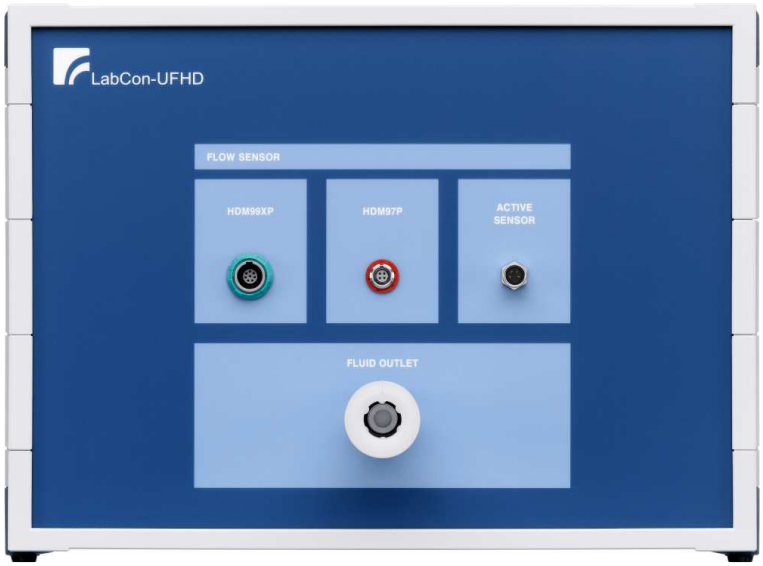
6.2 System Material List

Item	Type
Flow Source	LabCon-UFHD Flow Calibrator - 10.0510.00
Software CD	LabCon-UFHD
Cables	1 x USB 2.0 A to B
Water Tank	10 L
Calibration Flask	5000 ml
Flask and Level Control Unit	LCU5000
Adapter	Rinse Adapter
Tubing for water tank, Calibration Flask and sensor connection.	SMC 6 mm Tube connector for SMC Tubing TU0604C or Silicon Tubing 6x9 mm

6.3 LabCon-UFHD Controller Hardware

6.3.1 Controls and Ports

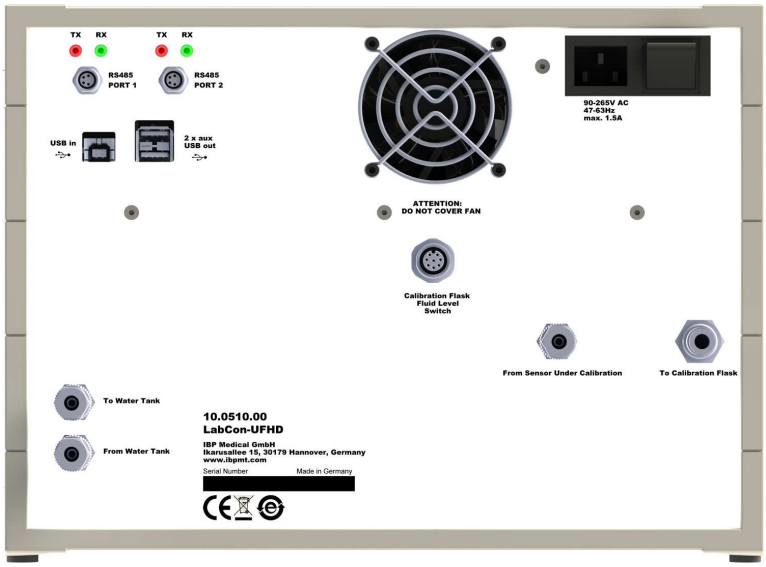
Front side



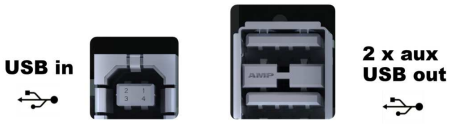
Details

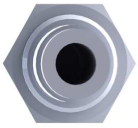
	Measuring fluid outlet. Quick-disconnect coupling as used in conjunction with Hemodialyser. Sensors with dialysis fluid connectors can be connected directly.
	Connector for HDM99XP sensors
	Connector for HDM97*Pocket* sensors
	Connector for active IBP sensors like HDU-FL

Rear side



Details

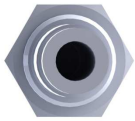
	These connections are for future use.
	USB-In to control the device USB-Aux to connect additional USB-Devices.
	Fluid connector to and from water tank. Depending on version: Fluid Connector for tube with 8mm outer and inner 6 mm diameter or SMC 6 mm Tube connector for SMC Tubing TU0604C
	Connector for Fluid Level Switch of the Calibration Flask



From Sensor Under Calibration

Fluid inlet for measuring fluid.

Fluid Connector for tube with 8 mm outer and inner 6 mm diameter.



To Calibration Flask

Fluid outlet to calibration flask.

SMC 6 mm Tube connector for SMC Tubing TU0604C

90-265V AC
47-63Hz
max. 1.5A

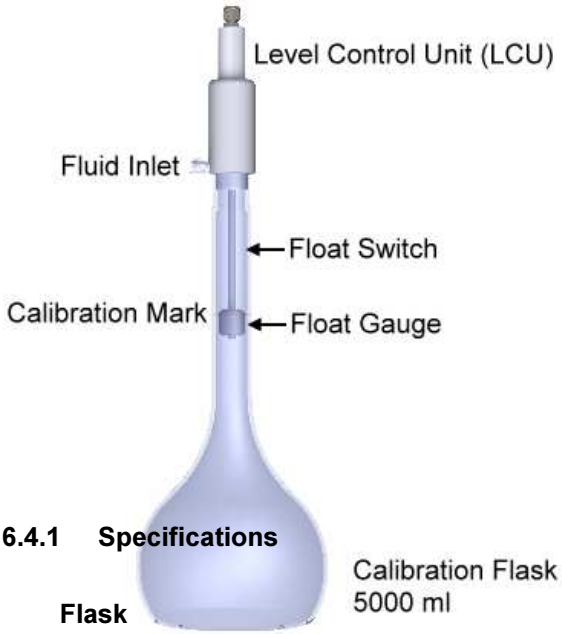
Power inlet and power switch.

6.3.2 Technical Data

Flow Rate	100 to 2000 ml/min
Power supply	90....264 VAC, 50/60 Hz, max. 150 W
Dimensions and weight	31 x 23 x 32 cm (W x H x D) 6,6 Kg without accessories

6.4 Flask and Level Control Unit

The unit consists of the calibration bottle and the Level Control Unit (LCU). The LCU gives the signal to interrupt the fluid flow once the bottle is filled to the calibration mark.



SAFETY INSTRUCTIONS

Make sure that your flask has a valid calibration certificate.

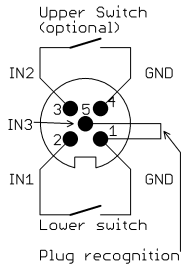
6.4.1 Specifications

Flask

Volume	5000 ml
Product ID	DURAN® Volumetric Flasks, Class A Article ID: 24 679 73 56
Accuracy	± 1,2 ml

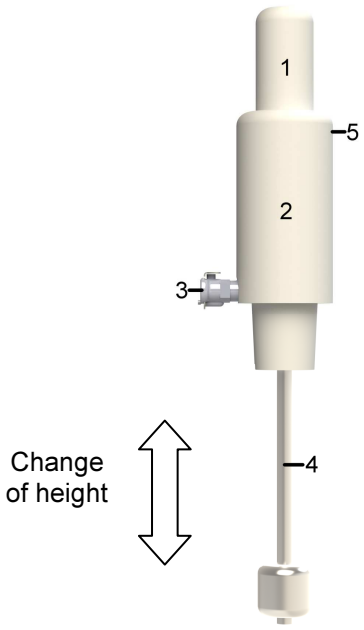
LCU - Level Control Unit

Material	Body: Pom Natural white Switch: Stainless Steel 316 grade SS
Switching power Max.	25 VA
Adjust Range	± 60 mm
Cable & Connector	Cable length: 2 m, Connector: M12, 5 Pin Pinning:



Connector Pinning
on flow switch

6.5 Adjust LCU - Level Control Unit



The LCU is used to stop the supply once the bottle is filled.

The LCU consists of four components

1. LCU Head
2. LCU Body
3. Connector fluid inlet
4. Float switch
5. Locking screw

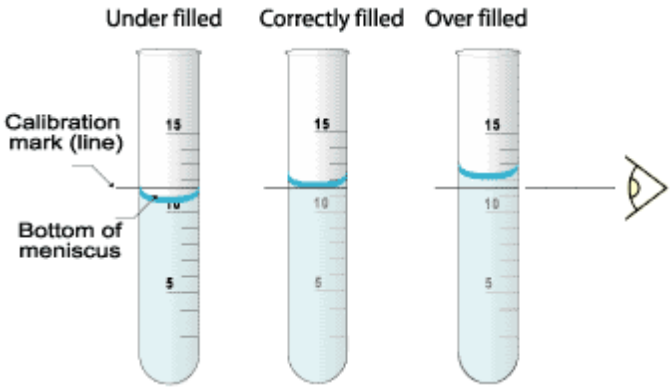
The LCU was designed to be used in conjunction with Duran 5000 ml Calibration Flask Article ID: 24 679 73 56.

The height of the float switch can be adjusted. For this purpose the locking screw must be released.

Height adjustment of the Float Switch works as follows:

Hold the LCU Head (1) and turn LCU Body (2)
Rotation left: The float switch moves down
Rotation right: The float switch moves up

Adjust Instructions
To install flask and level control unit please follow the steps below.

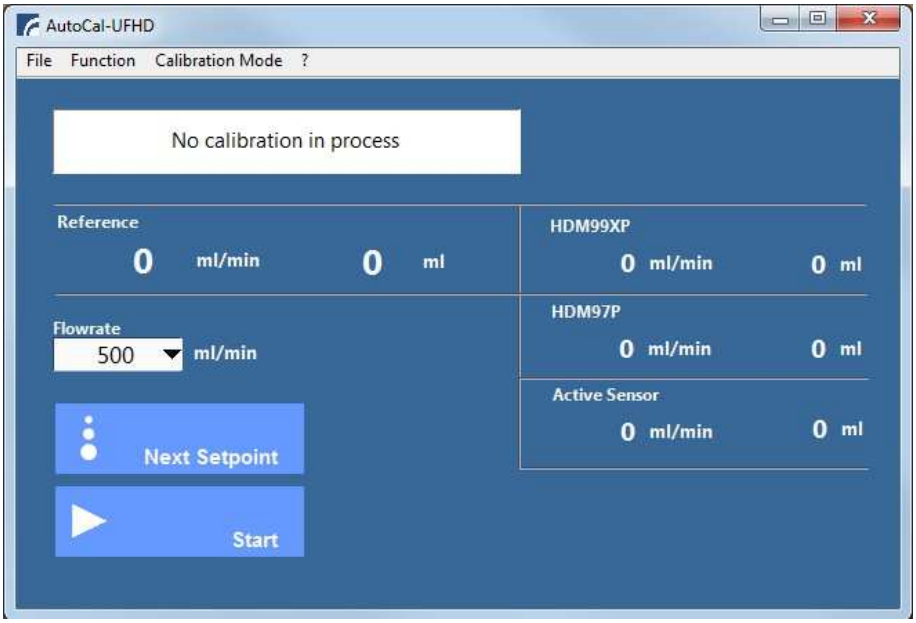
1	Put the flask on a non-slip surface
2	Fill the bottle with approx. 25°C water exactly to the calibration mark Controlling whether the bottle is filled correctly. 
3	Connect the cable of the level control unit (LCU) to the Floating Switch Connector on the rear of the LabCon-UFHD controller.
4	Start the LabCon-UFHD software.
5	Move the Float Gauge up from the lowest position of the Float Switch and make sure that on the program surface a light is indication (PSL) the changing switch status.
6	Insert the LCU into the flask. Make sure that the LCU is resting on the rim of the bottle. Make sure that the Float Gauge of the LCU does not touch the flask.

7	If the PSL is off, adjust the LCU that the Float Switch moves down until the PSL wends on Continue on step 9
8	If the PSL is on, adjust the LCU that the Float Switch moves up until the PSL wends off. Adjust the LCU that the Float Switch moves down until the PSL wends on.
9	Remove the LCU from the flask, empty the Calibration Flask and insert the LCU into the flask again.
10	Connect the fluid outlet on the front of the LabCon-UFHD controller to the fluid inlet of the LCU.
11	Select in the pull down menu Setup Calibration Mode With calibration flask Select set point 500 ml/min Press Button *Start*
12	Wait until the flask is filled and the LCU stops pumping
13	Remove the LCU and control whether the bottle is filled correctly If not filled correctly adjust the LCU accordingly. Remove some water from the bottle. Restart with step 6.
14	If filled correctly
15	Fix the Locking Screw (5)
16	Double Check the adjustment by filling the bottle again, step 6 to 13
17	Adjustment finished.

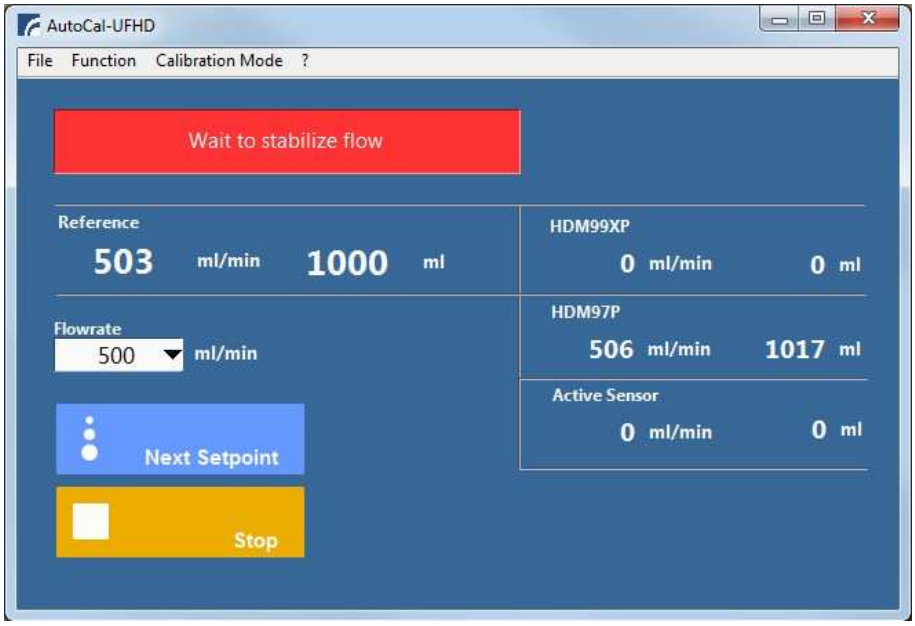
6.5.1 Software

The LabCon-UFHD software allows controlling the LabCon-UFHD module. After starting the software the program will scan the USB-Ports to locate the LabCon-UPFD device and all internal sensors. You will get a message in case a device is missing. In case the program is not able to find a list of set points it will create a default list. Set points can be set or selected from this list.

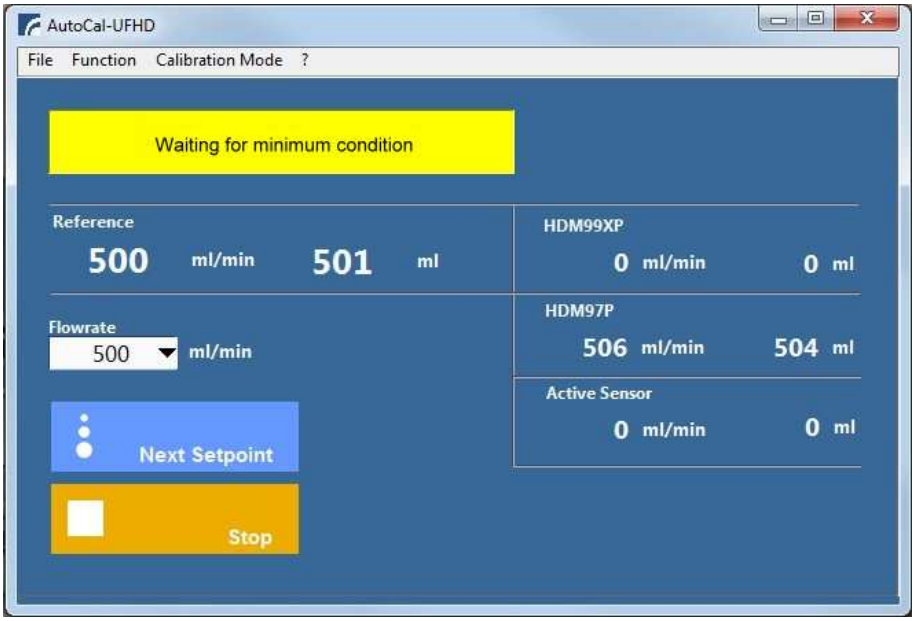
Whenever the Start button is pressed the program scans the sensor interfaces at the front of the device searching flow sensors for HDM99XP, HDM97 and active HDU- and DIA sensors types.



After starting the calibration procedure the user interface looks as follows.
From the detected sensor the readings will be shown.

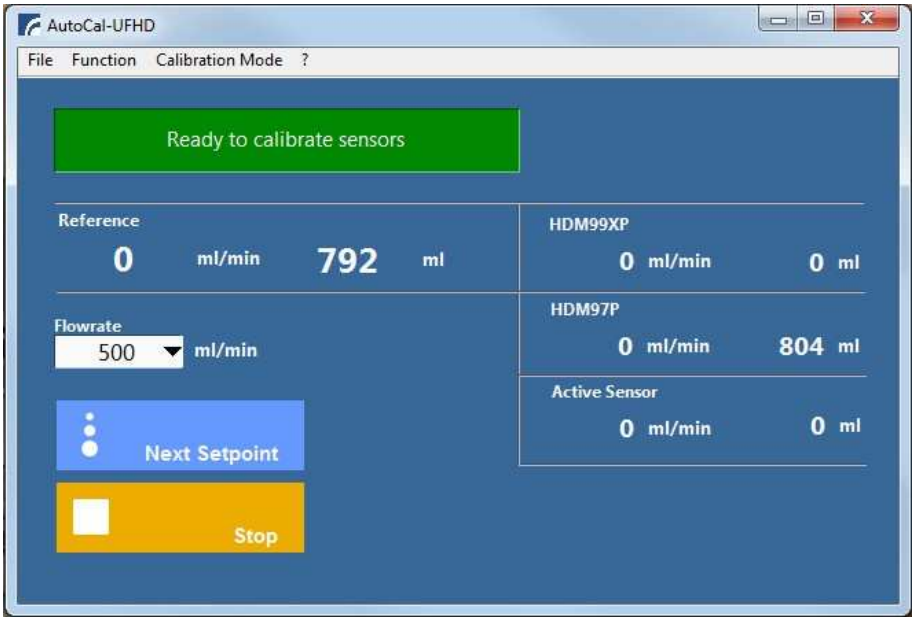


Once the flow reading is stable the user interface looks as follows.



Calibration Mode	The minimum condition
Calibration with flask	Flask filled with 5000 ml
Calibration with internal reference sensor	2 minute stable pump time

Once the flow the minimum condition is fulfilled
the user interface might look as follows.



In case the calibration is performed with the flask the system will stop automatically.
Otherwise the flow can be stopped at any time.
Longer pump time increases the accuracy of the calibration.
Once the flow is stopped, the calibration values can be taken or the sensors can be adjusted.

6.5.2 Display, Controls and Functions

Pull Down Menu

File	
Exit	Terminates the program.
Function	
Rinse Flask Head	Allows rinsing and filling the tubing and flask switch head. The function will be switched off automatically after 30 sec.

Reset accumulated Volume Reset all	Allows to reset the accumulated volumes of the sensors.

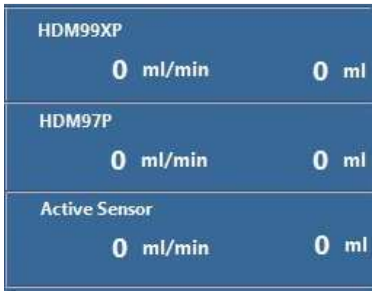
Reset HDM99 Sensor Reset HDM97 Sensor Reset Active Sensor Reset Internal Sensor	
Adjust to Flask Volume Active Sensor HDM97 Sensor HDM99XP Sensor	Allows to adjust sensors, this function is available after at least one point is calibrated. The selected sensor is adjusted to the flask volume.
Adjust to Internal Sensor Active Sensor HDM97 Sensor HDM99XP Sensor	The selected sensor is adjusted to the internal flow sensor.

Adjust Internal Sensor	The internal flow sensor is adjusted to the flask volume.

Degas Tank Water	Degasses the tank water, all other functions are disabled. More powerful if the fresh water is heated to around 40°C.
Calibration Mode	
With internal sensor	Calibration with internal flow sensor.
With calibration flask	Calibration with flask.
?	
Info	Shows program info.

Window

No calibration in process	Status Message: No calibration in process
Rinse	Status Message: Rinse, removes air out of the system
Wait to stabilize flow	Status Message: Wait to stabilize flow
Waiting for minimum condition	Status Message: Waiting for minimum condition Conditions see on previous page.
Ready to calibrate sensors	Status Message, the calibration values can be taken.
System pressure to high	Status Message, System pressure to high This message appears if the flow is impeded in the system or

	sensor.
	Readings from the internal reference sensor. Left: Current Value Right: Accumulated Value
	Readings from the external sensors under calibration. Left: Current Value Right: Accumulated Value The accumulated values are set to 0 ml once the calibration process is started. If the calibration process is not started the accumulated values can be set to 0 ml via the Pull Down menu Function.
	Flow rate set point
	Selects the next target value from the list
	Starts the water flow. The state of the button switches in the picture below.
	Stops the water flow. The state of the button switches in the above image.

6.6 **Equipment maintenance**

The test rig used for flow testing should also be cleaned every four weeks. For this purpose, the tank liquid should be drained away in order to purge the system, then the tank must be filled with 50 °C water mixed with 10% citric acid. Rinse the system for 30 minutes.

After rinsing drain tank and system.

After draining the system, fill the tank with ultra pure water and add 20 ml of saturated iodine solution. Rinse the test rig for 5 minutes. A sticker should then be placed on the test rig displaying the date the next cleaning is due.

6.7 **Placing out of operation**

If case the device is unused for a longer period the device should be emptied. To do this remove the tube from the water tank and press the *Start* button. Stop the process once no more liquid comes out.

6.8 Saturated Iodine solution

The saturated Iodine solution is used to avoid biochemical growth in the system. The solution can easily produced by putting some Iodine crystals and water in a bottle. The water can refilled as long Iodine Crystals are visible.

Iodine Crystals

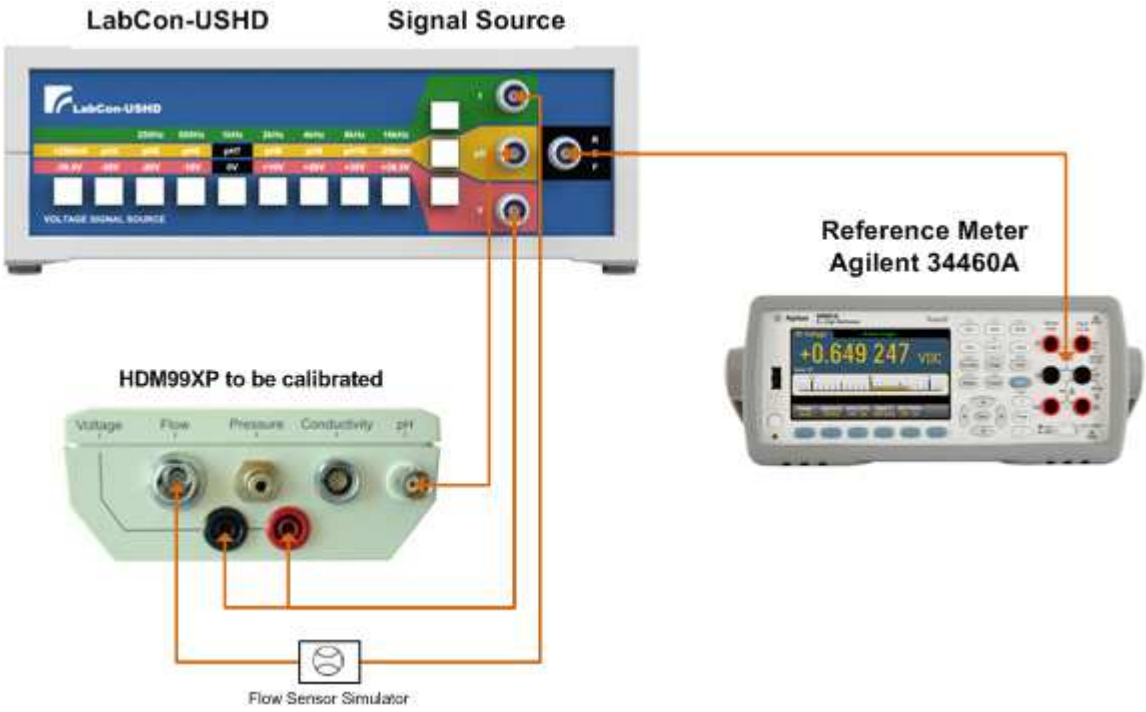
7 Frequency - pH - Voltage Calibration

7.1 Hardware

The LabCon-C signal calibration system consists of the LabCon-USHD source and the reference meter Agilent 34460A.

7.2 System Overview

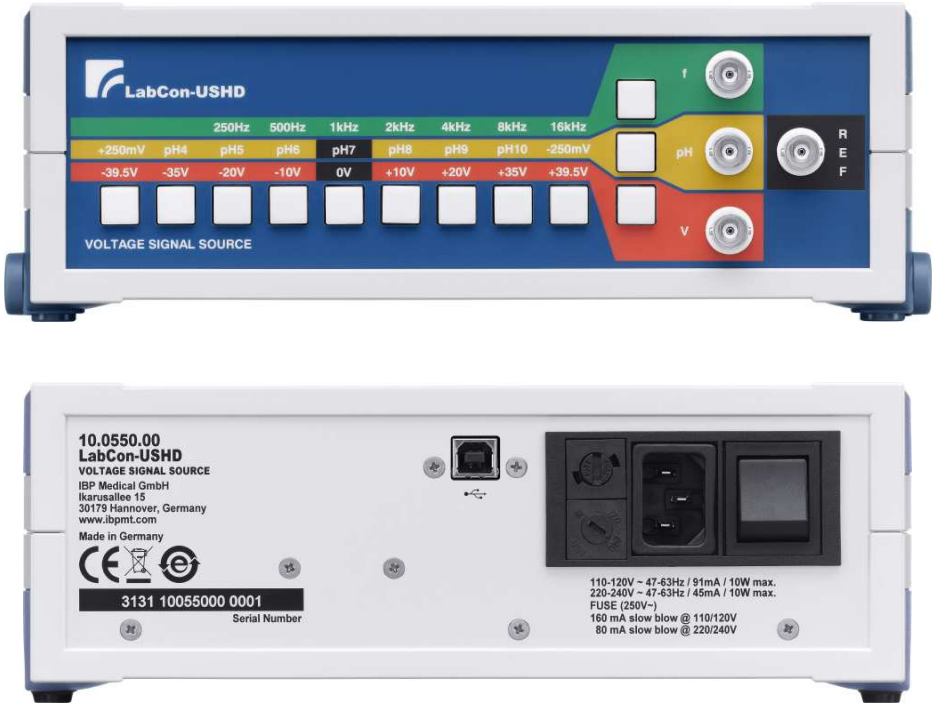
The following picture shows the combination of the LabCon-USHD reference, reference meter and the connected HDM99XP to be calibrated.



7.3 System Material List

Item	Type
Signal Source	LabcCon-USHD Voltage/pH/frequency source - 10.0550.00
Voltage Reference Meter	Multimeter Agilent 34460A
Cable 1	Voltage - BNC to 4 mm Banana Plug Red/Black
Cable 2	pH - BNC to BNC
Cable 3	Flow Sensor Simulator - BNC to 8 Pin HDM99XP Flow Plug The Flow Sensor Simulator shows 1000 ml/min at 1 kHz from the signal source.

7.4 LabCon-USHD Signal Source

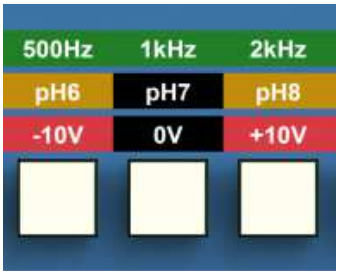


7.4.1 Technical Data

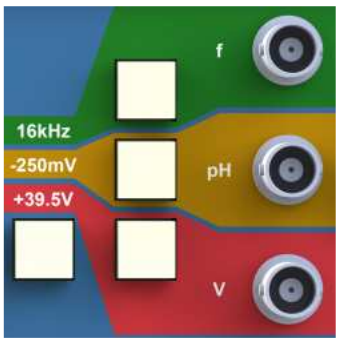
Voltage	Selectable with push buttons: Voltage 0, ±10, ±20, ±35 and ±39.50 Volt Accuracy <±50µV at 0V Accuracy <±0.01V > 10V
pH	Selectable with push buttons: pH 4,5,6,7,8,9,10, Accuracy >±0.01 pH ±250mV, Accuracy <±20µV
Frequency	Selectable with push buttons: 250, 500, 1000, 2000, 4000, 8000, 16000 Hz TTL Level Accuracy: <±30ppm
Connectors	All BNC
Power supply	220...240V / 110...120V AC, switchable, max. 10W, typ. 4W
Dimensions and weight	241 x 81 x 198 mm (L x H x D) 1,4 Kg without accessories

7.4.2 Controls and Ports

Details

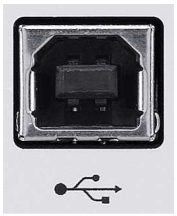


Use the buttons below the values for Hz, pH and V the desired values are selected. The selected button is illuminated.



With the vertically arranged buttons is selected whether Hz, pH or V should be used. The selected button is illuminated.

BNC Output to Reference meter



USB-Connector for future use

Fuses, power in and power switch.

7.5 Voltage Reference

As a reference for the voltage the multimeter Agilent 34460A is used.

SAFETY INSTRUCTIONS

Make sure that your reference meter has a valid calibration certificate.

7.5.1 General Specifications

Resolution	6½ digits
Accuracy	1-year DCV ±(% of reading + % of range) 0.0075 + 0.0005
Power supply	100/120 (127)/ 220 (230)/240 VAC ± 10%, CAT II, 50/60/400 Hz ± 10%
Dimensions	(W x H x D): 261.2 mm x 103.8 mm x 303.2 mm
Weight	3.68 kg

8 Sensor Disinfection and Decalcification System

The sensor disinfection and decalcification system allow to prepare the conductivity and flow sensors for calibration.

8.1 System Overview

The following picture shows the system parts.

8.2 System Material List

Item	Type
Heater	Caso 2200 Slim Line 2000 Induction hob, 230 V, 50 Hz, 2000 W
Simmering Pot	ELO 99414
Temperature Meter	TFA LT-101
Sensor Holder	Electrode Holder - 68.9943.00
Recirculation pump for flow through sensors	LabCon-CLRP Cleaning Recirculation Pump - 10.0570.00
Tubing and connector for recirculation pump	Tube adapter for LabCon-CLRP Silicon tubing with Dialyser Coupling Connectors
Multiple Socket	Three EU Schuko Outlet / Australian Plug

Chemicals	
Disinfection solution	Cleanisept
Citric Acid	Food Grade, granules C6H8O7

8.3 General

All sensors coming in contact with dialysate must be disinfected and decalcificated before calibration. This are conductivity sensors and possibly the flow sensors. Both need be disinfected in 10% citric acid solution for 30 min at about 80°C.
The conductivity electrodes are processed by immersion in a water pot. Flow through sensors as the flow sensors are flushed with a recirculation pump.

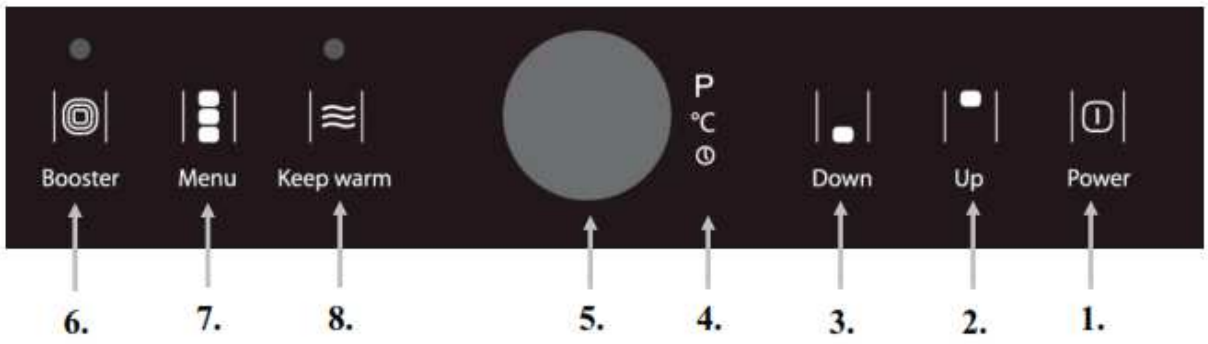
SAFETY INSTRUCTIONS

- Read carefully the user manuals from both the Heater and the Simmering Pot.
- To avoid overheating the HDM-Sensors, use always the simmering pot to produce the cleaning/disinfection solution.
- Use always a temperature meter to double check the solution temperature.

8.4 Heater Function

The Caso 2200 heater is used to heat the cleaning/disinfection solution. The device is programmable and allows to automatically switching off the device after 30 min.

Operation Panel



1. Power switch
2. Selection button (+), increase of the power stage, temperature or duration
3. Selection button (-), reduction of the power stage, temperature or duration
4. LED display: power stage (P) / temperature (°C)
5. LED display: timer
6. Function key **Booster**
7. Menu press 1x: **power stage**
Menu press 2x: **timer**
keep Menu pressed**: change between power stage and temperature**
8. Function key **Keep Warm**

8.4.1 Programming 8o°C for 30 minutes

Press Menu until °C is selected.
Select 80°C using the Up/Down buttons.
Press Menu until Timer is selected.
Select 30 min using the Up/Down buttons.

8.5 Preparing disinfection and decalcification solution

The Simmering Pot avoids overheating the conductivity sensors.

SAFETY INSTRUCTIONS

- Use always a simmering pot to clean and disinfect the HDM-Sensors.
- Never heat up the simmering pot without water in the double boiling container.
- Take care that always sufficient water is in the double boiling container.
- Avoid filling other than clean water into the double boiling container.
- After using and cleaning make sure that the double boiling container is empty.
- Do not place the simmering pot in a hot baking oven.
- Material which are not made of synthetic materials may become hot,

Before using the pot, pour about 0,25 l water through the inlet into the hollow space until the water level indicator reaches full.

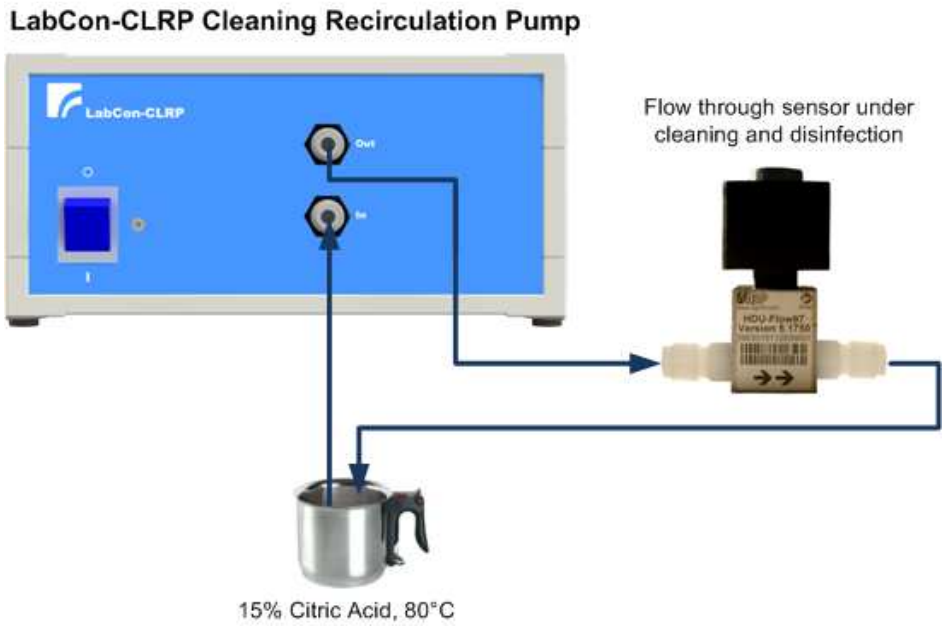
Fill the pot with clean water to the extent that the conductivity electrodes, stuck in the holder, up to a maximum of up to the O-Rings of the conductivity sensor in the water. Add 150 ml citric acid and heat the solution with maximal power up to 80°C. Stirring the solution until the citric acid is dissolved. To heat up you can press the Booster-Button. Coming close to 80°C you can reduce the power to set point 80°C for 30 minutes.

8.6 Disinfection and decalcification of conductivity sensors

The solution should be prepares as described above.
Put the sensor holder with the conductivity electrodes on the pot. Make sure that the conductivity sensors to the O-rings are in the solution at a maximum.
As water evaporates, from time to time it is necessary to fill up water in the pot.

8.7 **Disinfection and decalcification of flow through sensors**

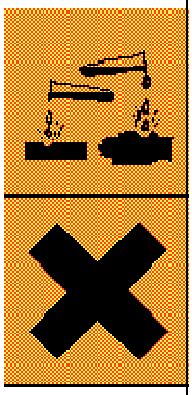
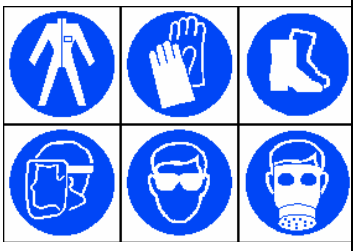
The solution should be prepares as described above.



To clean and disinfect a flow through sensor, connect the sensor as shown above. Make sure the pump direction also corresponds to the flow through direction of the sensor. The tubing of the suction side of the pump and the outlet of the sensor lead into the pot.

9 Attachments

9.1 IODINE Hazard Communication Sheet

DESCRIPTION	Bluish-black crystals with a sharp, pungent odour; m.p. 114°C; sublimes at 183°C. Almost insoluble in water. CAS: 7553-56-2. UN number: None.
HEALTH HAZARDS	**CAUTION : CORROSIVE** **Harmful by inhalation and in contact with skin** Exposure to high vapour concentrations causes **lung damage** which may be fatal. Symptoms of **lung oedema** (**coughing, shortness of breath)** may be delayed for some hours after exposure ceases. Long-term exposure may cause the disease **'iodism'** with **tremor, weight loss, insomnia, diarrhoea, conjunctivitis and bronchitis**. Crystals and strong solutions cause **burns to eyes, skin and body tissues**. **May cause dermatitis.** Vapour is **irritating to the eyes and respiratory system**. 
FIRST-AID	**OBTAIN IMMEDIATE MEDICAL ATTENTION IN CASES OF SKIN CONTACT** **Inhalation:** Remove from source of exposure. If breathing stops or shows signs of failing apply artificial respiration. Use oxygen if breathing is laboured. Obtain medical help. **Skin Contact:** Remove contaminated clothing and flush affected area with water for at least 15 minutes. Treat patient as for inhalation. Obtain medical help. **Eyes:** Flood with eyewash or water for at least 15 minutes. Obtain medical help. **Ingestion:** Wash out mouth with water. Treat as for inhalation. Obtain medical help.
SAFETY HAZARDS	**INCOMPATIBLE with ammonia, powdered metals, alkali metals, or strong reducing agents. Reaction can be violent or explosive with acetaldehyde and acetylene. Reacts with ammonium hydroxide to form shock-sensitive iodides on drying. A strong oxidizer and its heat of reaction with reducing agents or combustibles MAY CAUSE IGNITION. Store separately from combustible materials, reducing agents and other incompatible materials.**
FIRE	**NOT COMBUSTIBLE. REACTS EXOTHERMICALLY with reducing materials creating a fire hazard. Heating produces toxic fumes.**
SPILLAGE	**Refer to local spillage/emergency procedures.** Solutions can be contained using sand/proprietary adsorbent or transferred to a suitable container. Contaminated adsorbent or powder should be put into a double polythene lined or other suitable container and disposed of as contaminated waste. Clean up spills immediately, observing precautions in the **Exposure Controls** section. **TOXIC TO AQUATIC ORGANISMS** **Prevent Spillage From Contaminating Water Courses.** **Do Not Wash To Surface Water Drain.** 
EXPOSURE CONTROLS *CONTAINMENT LEVEL 3*	**Refer to local procedures/risk assessment for specific personal protective equipment requirements. Chemical Protective Clothing and Eye Protection must be worn where there is risk of body contact. Respiratory Protective Equipment and Local Exhaust Ventilation may be required to protect against vapour. Health surveillance is required where exposure may be significant.** 
OCCUPATIONAL EXPOSURE LIMIT	Health & Safety Executive : **Workplace Exposure Limit** 8-Hour TWA : None 15 minute STEL : 0.1 ppm (1.1 mgm^{-3})

ISSUE DATE:	2005	REF. NUMBER:	100C99

9.2 Sodium Chloride MSDS

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Revision Date 11.03.2015 Version 7.7

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Catalogue No.	106404
Product name	Sodium chloride for analysis EMSURE® ACS,ISO,Reag. Ph Eur
REACH Registration Number	A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.
CAS-No.	7647-14-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Reagent for analysis For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.com).

1.3 Details of the supplier of the safety data sheet

Company	Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0
Responsible Department	EQ-RS * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number **Please contact the regional company representation in your country.**

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

This substance is not classified as dangerous according to European Union legislation.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	NaCl ClNa (Hill)
EC-No.	231-598-3
Molar mass	58,44 g/mol
Remarks	No disclosure requirement according to Regulation (EC) No. 1907/2006

3.2 Mixture
Not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures
After inhalation: fresh air.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

After eye contact: rinse out with plenty of water.

After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed
Nausea, Vomiting

4.3 Indication of any immediate medical attention and special treatment needed
No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Not combustible.
Ambient fire may liberate hazardous vapours.
Fire may cause evolution of:
Hydrogen chloride gas

5.3 Advice for firefighters
Special protective equipment for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information
Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling
Advice on safe handling
Observe label precautions.

Hygiene measures
Change contaminated clothing. Wash hands after working with substance.

7.2 Conditions for safe storage, including any incompatibilities
Storage conditions
Tightly closed. Dry.

Recommended storage temperature see product label.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures
Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures
Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection
Safety glasses

Hand protection
full contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 480 min

splash contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 741 Dermatril® L (full contact), KCL 741 Dermatril® L (splash contact).
The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.
This recommendation applies only to the product stated in the safety data sheet<(>,<)> supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Respiratory protection
required when dusts are generated.
Recommended Filter type: Filter P 1 (acc. to DIN 3181) for solid particles of inert substances
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls
Do not let product enter drains.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	solid
Colour	colourless
Odour	odourless
Odour Threshold	Not applicable
pH	4,5 - 7,0 at 100 g/l 20 °C
Melting point	801 °C
Boiling point/boiling range	1.461 °C at 1.013 hPa
Flash point	Not applicable
Evaporation rate	No information available.
Flammability (solid, gas)	The product is not flammable.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapour pressure	1,3 hPa at 865 °C
Relative vapour density	No information available.

Density	2,17 g/cm³ at 20 °C
Relative density	No information available.
Water solubility	358 g/l at 20 °C
Partition coefficient: n-octanol/water	No information available.
Auto-ignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	Not classified as explosive.
Oxidizing properties	none

9.2 Other data

Ignition temperature	Not applicable
Bulk density	ca.1.140 kg/m³

SECTION 10. Stability and reactivity

10.1 Reactivity
See section 10.3

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Risk of explosion/exothermic reaction with:
Alkali metals
Exothermic reaction with:
Lithium

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
no information available

10.6 Hazardous decomposition products
in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity
LD50 Rat: 3.000 mg/kg (RTECS)

Acute inhalation toxicity
This information is not available.

Acute dermal toxicity
LD50 Rabbit: > 10.000 mg/kg (RTECS)

Skin irritation
Rabbit
(ECHA)
No skin irritation

Eye irritation
Rabbit
(ECHA)
No eye irritation

Sensitisation
This information is not available.

Germ cell mutagenicity
Genotoxicity in vitro
Mutagenicity (mammal cell test): micronucleus.
Result: negative
(IUCLID)

Ames test
Result: negative
(IUCLID)

Carcinogenicity
This information is not available.

Reproductive toxicity
This information is not available.

Teratogenicity
This information is not available.

Specific target organ toxicity - single exposure
This information is not available.

Specific target organ toxicity - repeated exposure
This information is not available.

Aspiration hazard
This information is not available.

11.2 Further information

Systemic effects:
After swallowing of large amounts:
Nausea, Vomiting
No toxic effects are to be expected when the product is handled appropriately.

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to fish
LC50 Pimephales promelas (fathead minnow): 7.650 mg/l; 96 h (IUCLID)

Toxicity to daphnia and other aquatic invertebrates
EC50 Daphnia magna (Water flea): 1.000 mg/l; 48 h (IUCLID)

12.2 Persistence and degradability
Biodegradability

The methods for determining the biological degradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential
No information available.

12.4 Mobility in soil
No information available.

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects
Additional ecological information
Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

Waste treatment methods
See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Sea transport (IMDG)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not relevant

SECTION 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations
Major Accident Hazard 96/82/EC
Legislation Directive 96/82/EC does not apply

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	not regulated
Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC	not regulated
Regulation (EC) No 689/2008 concerning the export and import of dangerous chemicals	not regulated
Substances of very high concern (SVHC)	This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of ≥ 0.1 % (w/w).

National legislation
Storage class 10 - 13

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

SECTION 16. Other information

Training advice
Provide adequate information, instruction and training for operators.

Labelling (67/548/EEC or 1999/45/EC)
The product does not need to be labelled in accordance with EC directives or respective national laws.

Key or legend to abbreviations and acronyms used in the safety data sheet
Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation
This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

9.3 Conductivity Reference Solution MSDS

Material Safety Data Sheet

according to Regulation (EC) No. 1907/2006

Secondary Reference Solution Sodium Chloride

Date 12.01.2012
Version 1.0

Section 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Catalogue No.	32.0000.74 / 32.0014.00 / 32.0027.70 / 32.0140.00 / 32.0019.50
Product name	Secondary Reference Solution Sodium Chloride 74 µS/cm, 1410 µS/cm, 2,77 mS/cm, 14,00 mS/cm, 19,50 mS/cm
REACH Registration Number	This product is a mixture. REACH Registration Number see section 3.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Solution for calibrating conductivity measurement devices.

1.3 Details of the supplier of the safety data sheet

Company	IBP Medical GmbH Ikarusallee 15 30179 Hannover Germany Phone: +49 511 651647
Responsible Department	europe@ibpmedical.com

1.4 Emergency telephone number

See 1.3

Section 2. Hazards identification

2.1 Classification of the substance or mixture

The substance is not classified as dangerous according to European Union legislation.

2.2 Label elements

Labeling/Regulation(EC) No. 1272/2008)
Not a dangerous substance according to GHS.

Labeling (67/548/EEC or 1999/45/EC)
The product does not need to be labeled in accordance with EC directives or respective national laws.

2.3 Other hazards

None known.

Section 3. Composition/information on ingredients

Chemical nature	Aqueous solution
Remarks	No disclosure requirement according to Regulation (EC) No. 1907/2006

Section 4. First aid measures

4.1 Description of first aid measures

After inhalation	Fresh air.
After skin contact	Wash off with plenty of water. Remove contaminated clothing.
After eye contact	Rinse out with plenty of water.
After swallowing	Make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed

We have no description of any toxic symptoms.

4.3 Indication of any immediate medical attention and special treatment needed

No information available.

Section 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Not combustible.

5.3 Advice for firefighters

Special protective equipment for firefighters
In the event of fire. Wear self-contained breathing apparatus.

Section 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Evacuate the danger area, observe emergency procedures, consult an expert.
Advice for emergency responder: Protective equipment see section 8.

6.2 Environmental precautions

No special precautionary measures necessary.

6.3 Methods and materials for containment and cleaning up

Observe possible material restrictions (see section 7.2 and 10.5).
Take up with liquid-absorbent material. Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

Section 7. Handling and storage

7.1 Precautions for safe handling

Observe label precautions.

7.2 Conditions for safe storage, including any incompatibilities

Tightly closed. Store at 2 °C to 25 °C

7.3 Specific end uses

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Contains no substances with workplace limit values.

8.2 Exposure controls

Engineering measures
Technical measures and appropriate working operations shoul be given over the use of personal protective equipment.

See section 7.1.

Individual protection measures
Protective clothing needs to be selected specifically for the workspace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Hygiene measures
Change contaminated clothing. Wash hand after working with substance.

Eye/face protection
Safety glasses

Hand protection
Not required.

Respiratory protection
Not required.

Section 9. Physical and chemical properties

9.1 Information om basic physical and chemical properties

Form	Liquid
Colour	Colourless
Odour	Odourless
Odour Threshold	No information available.
pH	7 at 20 °C
Melting point	No information available.
Boiling point/boiling range	100 °C at 1.013 hPa
Flash point	No information available.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapour pressure	No information available.
Relative vapour density	No information available.
Relative density	No information available.

Water solubility	No information available.
Partion coeffizient: n-octanol/water	No information available.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	No information available.
Oxidizing properties	No information available.

9.2 Other data

None.

Section 10. Stability and reactivity

10.1 Reactivity

See section 10.3

10.2 Chemical stability

The product is chemical stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions

Violent reactions possible with:
The generally known reaction partners of water.

10.4 Conditions to avoid

No information available.

10.5 Incompatible materials

No information available.

10.6 Hazardous decomposition products

No information available.

Section 11. Toxicological information

11.1 Information on toxicological effects

Specific target organ toxicity – single exposure
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ toxicity – repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard
Based on available data the classification criteria are not met.

11.2 Further information

Quantitative data on the toxicity of this product are not available.
Further toxicological data:
Hazardous properties cannot be excluded, but are relatively improbable due to low concentration of the dissolved substance(s).
Further data:
Handle in accordance with good industrial hygiene and safety practice.

Section 12. Ecological information

12.1 Toxicity

No information available.

12.2 Persistence and degradability

No information available.

12.3 Bioaccumulative potential

No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

PBT(vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects

Discharge into the environment must be avoided.

Section 13. Disposal considerations

Waste treatment methods
No measures necessary. Ship it back to IBP Medical GmbH.

Section 14. Transport information

Land transport (ADR/RID)
14.1 – 14.6
Not classified as dangerous in the meaning of transport regulations.

Inland waterway transport (AND)

Not relevant.

Air transport (IATA)
14.1 – 14.6
Not classified as dangerous in the meaning of transport regulations.

Sea transport (IMDG)
14.1 – 14.6
Not classified as dangerous in the meaning of transport regulations.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not relevant.

Section 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations Major Accident Hazard Legislation	96/82/EC Directive 96/82/EC does not apply
National legislation Storage class	10-13

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

Section 16. Other information

None.

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the safety precautions. It does not represent a guarantee of any properties of the product.

9.4 pH Buffer Solution MSDS

Section 1 - Chemical Product and Company Identification

MSDS Name:
Buffer Solutions pH 6.0 to 8.0

Catalog Numbers:
32.7006.00, 32.7006.09, 32.7007.00, 32.7007.09, 32.7008.00, 32.7008.09

Synonyms:
Phosphate Buffer Solutions, pH Adjusted

Company Identification:
IBP Medical GmbH
Ikarusallee 15
30179 Hannover
Germany
Phone: +49 511 651647

Company Phone Number:
+49 511 651647

Emergency Phone Number:
+49 511 651647

Section 2 – Composition, Information on Ingredients

CAS#	Chemical Name:	Percent
7732-18-5	Water	>80
7558-79-4	Sodium phosphate dibasic	<4
7778-77-0	Potassium phosphate monobasic	<11
7758-11-4	Potassium phosphate dibasic	<8
1310-73-2	Sodium hydroxide	<1

Section 3 - Hazards Identification

Emergency Overview
Appearance: Clear, colorless solution (LC12380 is color-coded with yellow dye.)
Caution! May cause eye and skin irritation.
Target Organs: None known.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: May cause gastrointestinal tract irritation with nausea, vomiting, and diarrhea.

Inhalation:
Inhalation of mists may cause respiratory tract irritation.
Chronic: May cause adverse kidney effects

Section 4 - First Aid Measures

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids until no evidence of chemical remains. Get medical aid.

Skin:
Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion:
Do not induce vomiting. Give conscious victim 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation:
Move victim to fresh air immediately. Get medical aid if irritation or other symptoms appear.

Notes to Physician:
Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media:
For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.

Autoignition Temperature:
No information found.

Flash Point:
No information found.

NFPA Rating:
Health- 1, Flammability- 0, Instability- 0

Explosion Limits:
Lower: n/a Upper: n/a

Section 6 - Accidental Release Measures

General Information:
Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:
Absorb spill with inert material such as sand, vermiculite, or diatomaceous earth, and transfer to a suitable container labeled for later disposal.

Section 7 - Handling and Storage

Handling:
Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage:
Store tightly capped in a cool, dry, well-ventilated area away from incompatible materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:
Facilities using or storing this material should be equipped with an eyewash and safety shower. Provide local exhaust or general dilution ventilation to keep airborne levels below the permissible exposure limits.

Exposure Limits:

Chemical Name:	ACGIH	NIOSH	OSHA
Water	None of the components are on this list.	None of the components are on this list.	None of the components are on this list.
Sodium phosphate dibasic	None of the components are on this list.	None of the components are on this list.	None of the components are on this list.
Potassium phosphate monobasic	None of the components are on this list.	None of the components are on this list.	None of the components are on this list.
Potassium phosphate dibasic	None of the components are on this list.	None of the components are on this list.	None of the components are on this list.
Sodium hydroxide	2 mg/m3 Ceiling	2 mg/m3 Ceiling 10 mg/m3 IDLH	2 mg/m3 TWA

OSHA Vacated PELs:
Sodium hydroxide: 2 mg/m3 Ceiling
Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133. Do not wear contact lenses when working with chemicals.

Skin:
Wear appropriate protective gloves to prevent skin exposure.

Clothing:
Wear appropriate protective clothing to prevent skin exposure.

Respirators:
Follow the OSHA respirator regulations found in 29 CFR 1910.134. Always use a NIOSH-approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid
Color: Colorless
Odor: Odorless
pH: 6-8

Vapor Pressure: No information found. **Vapor Density:** No information found.
Evaporation Rate: No information found. **Viscosity:** No information found.

Boiling Point: No information found.
Freezing/Melting Point: No information found.
Decomposition Temperature: No information found.
Solubility in water: Soluble.
Specific Gravity/Density: 1.0
Molecular Formula: No information found.
Molecular Weight: No information found.

Section 10 - Stability and Reactivity

Chemical Stability:
Stable under normal temperatures and pressures.

Conditions to Avoid:
Incompatible materials, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids.
Hazardous Decomposition Products: Oxides of phosphorus, sodium and potassium oxides.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

CAS# 7732-18-5: ZC0110000
CAS# 7558-79-4: WC4500000
CAS# 7778-77-0: TC6615500
CAS# 7558-11-4: Not available
CAS# 1310-73-2: WB4900000

CAS# 7732-18-5: Oral, rat: LD50 = >90 gL/kg
CAS# 7558-79-4: Oral, rat: LD50 = 17 g/kg
CAS# 7778-77-0: Oral, rat: LD50 = 1700 mg/kg Dermal, rabbit: LD50 = 4640 mg/kg
CAS# 7758-11-4: Oral, rat: LD50 = 8 g/kg
CAS# 1310-73-2: Dermal, rabbit: LD50 = 1350 mg/kg

Carcinogenicity:
None of the chemicals in this product are listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive: No information found
Mutagenicity: No information found
Neurotoxicity: No information found

Section 12 - Ecological Information

No information found

Section 13 - Disposal Considerations

Dispose of in accordance with Federal, State, and local regulations.

Section 14 - Transport Information

US DOT

Shipping Name: Not regulated.
Hazard Class: UN Number: Packing Group:

Section 15 - Regulatory Information

US Federal

TSCA:
CAS# 7732-18-5 is listed on the TSCA Inventory. CAS# 7558-79-4 is listed on the TSCA Inventory.
CAS# 7778-77-0 is listed on the TSCA Inventory.
CAS# 7758-11-4 is listed on the TSCA Inventory. CAS# 1310-73-2 is listed on the TSCA Inventory.

SARA Reportable Quantities (RQ):
CAS# 7558-79-4: final RQ = 5000 pounds (2270 kg) CAS# 1310-73-2: final RQ = 1000 pounds (454 kg)

CERCLA/SARA Section 313:
None of the components are on this list.

OSHA - Highly Hazardous:
None of the components are on this list.

US State

State Right to Know:
Sodium phosphate dibasic can be found on the following state Right-to-Know lists: California, New Jersey, Pennsylvania, Massachusetts.
Sodium hydroxide can be found on the following state Right-to-Know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
California Regulations: None

European/International Regulations

Canadian DSL/NDSL:
All of the components of this product are listed on Canada's DSL List.

Canada Ingredient Disclosure List:
CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.
CAS# 7558-79-4 is not listed on Canada's Ingredient Disclosure List. CAS# 7778-77-0 is not listed on Canada's Ingredient Disclosure List. CAS# 7758-11-4 is not listed on Canada's Ingredient Disclosure List. CAS# 1310-73-2 is listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

Information in this MSDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and IBP Medical GmbH assumes no liability resulting from the use of this MSDS. The user must determine suitability of this information for his application.

MSDS Creation Date: 12.01.2012
Revision Date: 12.01.2012 V1.0

9.5 Citric Acid MSDS

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 22.01.2014 Version 15.13

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Catalogue No.	100243
Product name	Citric acid monohydrate powder, suitable for use as excipient EMPROVE® exp Ph Eur,BP,JP,USP,E 330,FCC
REACH Registration Number	A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.
CAS-No.	5949-29-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Pharmaceutical production, Cosmetic raw material For additional information on uses please refer to the Merck Chemicals portal (www.merck-chemicals.com).

1.3 Details of the supplier of the safety data sheet

Company	Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0
Responsible Department	EQ-RS * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number **Please contact the regional company representation in your country.**

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Eye irritation, Category 2, H319

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification (67/548/EEC or 1999/45/EC)

Xi	Irritant	R36

For the full text of the R-phrases mentioned in this Section, see Section 16.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms

Signal word

Warning

Hazard statements
H319 Causes serious eye irritation.

Precautionary statements
Response
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Reduced labelling (≤125 ml)

Hazard pictograms

Signal word
Warning

CAS-No. 5949-29-1

2.3 Other hazards
None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	$C_6H_8O_7 * H_2O$ (Hill)
EC-No.	201-069-1
Molar mass	210,14 g/mol

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical Name (Concentration)

CAS-No.	Registration number	Classification
Citric acid monohydrate *(<= 100 %)*		
5949-29-1	*)	Eye irritation, Category 2, H319

*) A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

For the full text of the H-Statements mentioned in this Section, see Section 16.

Hazardous components (1999/45/EC)

Chemical Name (Concentration)

CAS-No.	Classification
Citric acid monohydrate *(<= 100 %)*	
5949-29-1	Xi, Irritant; R36

For the full text of the R-phrases mentioned in this Section, see Section 16.

3.2 Mixture
not applicable

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No.	100243
Product name	Citric acid monohydrate powder, suitable for use as excipient EMPROVE® exp Ph Eur,BP,JP,USP,E 330,FCC

SECTION 4. First aid measures

4.1 Description of first aid measures

After inhalation: fresh air.

After skin contact: wash off with plenty of water. Remove contaminated clothing.

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed

irritant effects, pain, Bloody vomiting

4.3 Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water, Carbon dioxide (CO2), Foam, Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.
Risk of dust explosion.

5.3 Advice for firefighters

Special protective equipment for firefighters

In the event of fire, wear self-contained breathing apparatus.

Further information

Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Avoid inhalation of dusts. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

6.2 Environmental precautions

Do not empty into drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.
Observe possible material restrictions (see sections 7 and 10).
Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Observe label precautions.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers
No metal containers.

Storage conditions
Tightly closed. Dry.

Recommended storage temperature see product label.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures
Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures
Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection
Safety glasses

Hand protection

full contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 480 min

splash contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 741 Dermatril® L (full contact), KCL 741 Dermatril® L (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment
protective clothing

Respiratory protection
required when dusts are generated.
Empfohlener Filtertyp: Filter P 1 (acc. to DIN 3181) for solid particles of inert substances
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls
Do not empty into drains.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	solid
Colour	white
Odour	odourless
Odour Threshold	not applicable
pH	No information available.
Melting point	135 - 152 °C
Boiling point/boiling range	(decomposition)
Flash point	not applicable
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapour pressure	< 0,1 hPa at 20 °C (anhydrous substance)
Relative vapour density	No information available.

Relative density	1,54 g/cm³ at 20 °C
Water solubility	ca.1.630 g/l at 20 °C
Partition coefficient: n-octanol/water	log Pow: -1,72 (20 °C) OECD Test Guideline 117 (anhydrous substance) Bioaccumulation is not expected.
Auto-ignition temperature	No information available.
Decomposition temperature	> 170 °C
Viscosity, dynamic	No information available.
Explosive properties	not applicable
Oxidizing properties	none

9.2 Other data

Bulk density	ca.800 - 1.000 kg/m³

SECTION 10. Stability and reactivity

10.1 Reactivity
Risk of dust explosion.

10.2 Chemical stability
releases water of crystallisation when heated.

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Metals, Oxidizing agents, Bases, Reducing agents

10.4 Conditions to avoid
Temperatures above melting point.

10.5 Incompatible materials
Metals

10.6 Hazardous decomposition products
no information available

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity
LD50 rat: 3.000 mg/kg (anhydrous substance) (RTECS)

Symptoms: In high doses:, Irritation of mucous membranes, Pain, Bloody vomiting

Acute inhalation toxicity

Symptoms: Possible damages:, Irritation symptoms in the respiratory tract.

Acute dermal toxicity
This information is not available.

Skin irritation
rabbit
Result: No irritation
OECD Test Guideline 404
(anhydrous substance)

Eye irritation
rabbit
Result: Severe irritations
OECD Test Guideline 405
(anhydrous substance)
Causes serious eye irritation.

Sensitisation
This information is not available.

Germ cell mutagenicity
Genotoxicity in vitro
Ames test
Result: negative
(Lit.)

Carcinogenicity
This information is not available.

Reproductive toxicity
No impairment of reproductive performance in animal experiments. (Lit.)

Teratogenicity
Did not show teratogenic effects in animal experiments. (Lit.)

Specific target organ toxicity - single exposure
This information is not available.

Specific target organ toxicity - repeated exposure
This information is not available.

Aspiration hazard
This information is not available.

11.2 Further information

Substance which occurs in the human body under physiological conditions.
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to fish
LC50 Leuciscus idus (Golden orfe): 440 - 760 mg/l; 96 h (anhydrous substance) (IUCLID)

Toxicity to daphnia and other aquatic invertebrates
EC5 E.sulcatum: 485 mg/l; 72 h (anhydrous substance) (maximum permissible toxic concentration) (Lit.)

EC50 Daphnia magna (Water flea): ca. 120 mg/l; 72 h (anhydrous substance) (IUCLID)

Toxicity to algae
IC5 M.aeruginosa: 80 mg/l; 8 d (anhydrous substance) (maximum permissible toxic concentration) (Lit.)

Toxicity to bacteria
EC5 Pseudomonas putida: > 10.000 mg/l; 16 h (anhydrous substance) (Lit.)

12.2 Persistence and degradability
Biodegradability
98 %; 2 d
OECD Test Guideline 302B
(anhydrous substance)
Readily eliminated from water

Biochemical Oxygen Demand (BOD)
481 mg/g (5 d)
(External MSDS)

Chemical Oxygen Demand (COD)
685 mg/g
(External MSDS)

Theoretical oxygen demand (ThOD)
686 mg/g
(Lit.)

12.3 Bioaccumulative potential
Partition coefficient: n-octanol/water
log Pow: -1,72 (20 °C)
OECD Test Guideline 117
(anhydrous substance) Bioaccumulation is not expected.

12.4 Mobility in soil
No information available.

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects
Additional ecological information
Harmful effect due to pH shift.
Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

Waste treatment methods
See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Inland waterway transport (ADN)
Not relevant

Air transport (IATA)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Sea transport (IMDG)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not relevant

SECTION 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Major Accident Hazard	96/82/EC
Legislation	Directive 96/82/EC does not apply
Occupational restrictions	Take note of Dir 94/33/EC on the protection of young people at work.
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	not regulated
Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC	not regulated
Regulation (EC) No 689/2008 concerning the export and import of dangerous chemicals	not regulated
Substances of very high concern (SVHC)	This product does not contain substances of very high concern above the respective regulatory limit (> 0.1 % (w/w) Regulation (EC) No 1907/2006 (REACH), Article 57).

National legislation

Storage class	10 - 13

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

SECTION 16. Other information

Full text of H-Statements referred to under sections 2 and 3.

H319	Causes serious eye irritation.

Full text of R-phrases referred to under sections 2 and 3

R36	Irritating to eyes.

Training advice
Provide adequate information, instruction and training for operators.

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No.	100243
Product name	Citric acid monohydrate powder, suitable for use as excipient EMPROVE® exp Ph Eur,BP,JP,USP,E 330,FCC

Labelling (67/548/EEC or 1999/45/EC)

Symbol(s)	Xi	Irritant
R-phrase(s)	36	Irritating to eyes.
S-phrase(s)	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
EC-No.	201-069-1	

Reduced labelling (≤125 ml)

Symbol(s)	Xi	Irritant

Key or legend to abbreviations and acronyms used in the safety data sheet
Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation
This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

9.6 Cleanisept MSDS

Safety Data Sheet according to Regulation (EC) No 1907/2006
Dr. Schumacher GmbH
Revision date: 10.05.2012 No: 1,07

CLEANISEPT

00320-0024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

CLEANISEPT

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture

Disinfection and cleaning of medical inventory and surfaces

1.3. Details of the supplier of the safety data sheet

Dr. Schumacher mbH
Postfach 11 62
D-34201 Melsungen

Telephone: +49 (0) 5664/9496-0
Telefax: +49 (0) 5664/8444

Emergency telephone :+49 (0) 6132 / 84463 (GBK Gefahrgut Buero GmbH, Ingelheim)
Responsible for the safety data sheet: sds@gbk-ingelheim.de

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Indications of danger : Irritant, Dangerous for the environment

R-phrases:
Irritating to skin.
Risk of serious damage to eyes. Very toxic to aquatic organisms.

2.2. Label elements

Danger symbols: Xi - Irritant; N - Dangerous for the environment

Xi - Irritant

N - Dangerous for the environment

R phrases

38	Irritating to skin.
41	Risk of serious damage to eyes.
50	Very toxic to aquatic organisms.

S phrases

26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
35	This material and its container must be disposed of in a safe way.
39	Wear eye/face protection.
60	This material and its container must be disposed of as hazardous waste.
61	Avoid release to the environment. Refer to special instructions / Safety data sheets.

2.3. Other hazards

Not known.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical characterization

Aqueous surfactant solution

Hazardous components

EC No	Chemical name	Quantity
CAS No	Classification	
Index No	GHS classification	
REACH No		
270-325-2	Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	< 10 %
68424-85-1	C, Xn, N R21/22-34-50	
	Acute Tox. 4, Acute Tox. 4, Skin Corr. 1B, Aquatic Acute 1; H312 H302 H314 H400	
	Fattyalcoholethoxylate	< 5 %
	Xn, Xi R22-41	
	Acute Tox. 3, Eye Dam. 1; H301 H318	
230-525-2	Didecyldimethylammonium chloride	< 5 %
7173-51-5	C, Xn, N R22-34-50	
	Acute Tox. 4, Skin Corr. 1B, Aquatic Acute 1; H302 H314 H400	
200-578-6	Ethanol	< 2 %
64-17-5	F R11	
603-002-00-5	Flam. Liq. 2; H225	
01-2119457610-43		

Full text of R- and H-phrases: see section 16.

Further Information

Concentration of quarternary ammonium compounds < 10%

SECTION 4: First aid measures

(see also in chapter 16: Other information)

4.1. Description of first aid measures

General information

Remove contaminated soaked clothing immediately. If you feel unwell, seek medical advice.

After inhalation

Move to fresh air in case of accidental inhalation of vapours or decomposition products. In the event of symptoms refer for medical treatment.

After contact with skin

Wash off immediately with soap and plenty of water . Consult a doctor if skin irritation persists.

After contact with eyes

Rinse immediately with plenty of water, also under the eyelids. Seek medical treatment by eye specialist.

After ingestion

Do not provoke vomiting. Consult physician. Attention in case of vomiting - acute danger of suffocating, produced by foaming ingredients. Rinse mouth. Make drink some glasses of water. The decision whether to provoke vomiting is to be taken by a physician.

4.2. Most important symptoms and effects, both acute and delayed

Irritating to skin.
Risk of serious damage to eyes.
Watch out. Beware, hazard of foam aspiration.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptoms.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Product does not burn, fire-extinguishing activities according to surrounding.

Extinguishing media which must not be used for safety reasons

5.2. Special hazards arising from the substance or mixture

Fire may produce:
Chlorine compounds.
Carbon monoxide (CO), carbon dioxide (CO2) and nitrogen oxides (NOx).

5.3. Advice for firefighters

Use breathing apparatus with independent air supply. Protective suit.

Additional information

Cool containers at risk with water spray jet.
Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

In case of vapour formation use respirator. Ensure adequate ventilation.
Use personal protective clothing.

6.2. Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder). Shovel into suitable container for disposal.

6.4. Reference to other sections

Observe protective instructions (see Sections 7 and 8). Information for disposal look up chapter 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Keep container tightly closed.
Use only in thoroughly ventilated areas. Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion

No special protective measures against fire required.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep containers tightly closed in a dry, well-ventilated place. Keep at temperatures between 5°C and 40°C.

Advice on storage compatibility

Incompatible with oxidizing agents.

Further information on storage conditions

Keep away from food, drink and animal feeding stuffs.

7.3. Specific end use(s)

Disinfection and cleaning of medical inventory and surfaces

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits (EH40)

CAS No	Chemical name	ml/m³	mg/m³	F/ml	Category	Origin
64-17-5	Ethanol	1000	1920		TWA (8 h)	WEL
		-	-		STEL (15 min)	WEL

8.2. Exposure controls

Occupational exposure controls

Ensure adequate ventilation, especially in confined areas.

Protective and hygiene measures

Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.
Avoid contact with skin, eyes and clothing.
Remove and wash contaminated clothes before re-use.

Respiratory protection

In case of insufficient ventilation wear suitable respiratory equipment (gas filter type A).

Hand protection

Also suitable are gloves made of:
Natural rubber (NR; 0,5 mm): Breakthrough time > 8 h
Polychloropren - CR (0,5 mm): Breakthrough time > 8 h
Nitrile rubber/nitrile latex - NBR (0,35 mm): Breakthrough time > 8 h
Butyl rubber - Butyl (0,5 mm): Breakthrough time > 8 h
Fluoro-rubber - FKM (0.4 mm): Breakthrough time > 8 h Polyvinyl chloride - PVC (0.5 mm): Breakthrough time > 8 h
This recommendation refers exclusively to the chemical compatibility and the lab test conforming to EN 374 carried out under lab conditions.
Requirements can vary as a function of the use. Therefore it is necessary to adhere additionally to the recommendations given by the manufacturer of protective gloves.

Eye protection

Tightly fitting goggles.
Eye wash bottle with pure water.

Skin protection

Long sleeved clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	Liquid
Colour:	Colourless
Odour:	Mild

		Test method
pH-Value (at 20 °C):	6 - 8,5	Concentrate

Changes in the physical state

Melting point:	< - 10 °C
Boiling point:	Approx. 100 °C
Flash point:	n.a.
Lower explosion limits:	n.a.
Ignition temperature:	n.a.
Density (at 20 °C):	Approx. 0,99 g/cm³
Water solubility: (at 20 °C)	Miscible
Viscosity / dynamic:	7 - 9 mPa·s

SECTION 10: Stability and reactivity

10.1. Reactivity

No decomposition if stored and applied as directed.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Reactions with oxidizing agents.

10.4. Conditions to avoid

To avoid thermal decomposition, do not overheat.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon monoxide (CO), carbon dioxide (CO2) and nitrogen oxides (NOx). Chlorine compounds.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

No toxicological data available.

CAS No	Chemical name			
	Exposure routes	Method Dose	Species	h
68424-85-1	Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides			
	Acute oral toxicity	LD50 795 mg/kg	Rat	
	Acute dermal toxicity	LD50 1560 mg/kg	Rat	
	Fattyalcoholethoxylate			
	Acute oral toxicity	ATE 100 mg/kg		
7173-51-5	Didecyldimethylammonium chloride			
	Acute oral toxicity	LD50 238 mg/kg	Rat	
	Acute dermal toxicity	LD50 3342 mg/kg	Rabbit	
64-17-5	Ethanol			
	Acute oral toxicity	LD50 6200 mg/kg	Ratte	

Irritation and corrosivity

Skin irritation: Irritant

Eye irritation: Irritant - risk of serious damage to eyes.

Sensitising effects

Not classified.

Severe effects after repeated or prolonged exposure

STOT - Single exposure: Not classified.

STOT - Repeated exposure: Not classified. Aspiration hazard: Not classified.

Carcinogenic/mutagenic/toxic effects for reproduction Carcinogenicity: Not classified.

Mutagenicity: Not classified.

Reproductive toxicity: Not classified.

Additional information on tests

Classification in compliance with the assessment procedure specified in the EC guidelines 1999/45/EG.

Empirical data on effects on humans

Watch out. Beware, hazard of foam aspiration.

SECTION 12: Ecological information

12.1. Toxicity

Ecological data are not available.

Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides

LC50/Oncorhynchus mykiss/96 h = 0,93 mg/l [US- EPA]

LC50/Pimephales promelas/96 h = 0,28 mg/l [US- EPA]

EC50/Daphnia magna/48 h = 0,025 mg/l [EPA-FIFRA]

ErC50/Selenastrum capricornutum/72 h = 0,049 [OECD 201] EC50/Activated sludge/ 3 h = 7,75 mg/l [OECD 209]

LC50/earthworms/14 d = 7070 mg/kg [OECD 207]

CAS No	Chemical name				
	Aquatic toxicity	Method	Dose	Species	h
68424-85-1	Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides				
	Acute fish toxicity	LC50	1,7 mg/l	Oncorhynchus mykiss	96
	Acute crustacea toxicity	EC50	0,03 mg/l	Daphnia	48
7173-51-5	Didecyldimethylammonium chloride				
	Acute fish toxicity	LC50	0,19 mg/l	Pimephales promelas	96
	Acute algae toxicity	ErC50	0,026 mg/l	Pseudokirchneriela subcapitata	
	Acute crustacea toxicity	EC50	0,062 mg/l	Daphnia magna	48
64-17-5	Ethanol				
	Acute fish toxicity	LC50	8140 mg/l	Golden orfe	96
	Acute crustacea toxicity	EC50	9268 - 14221 mg/l	Daphnia magna	48

12.2. Persistence and degradability

The surfactant(s) contained in this preparation complies(comply) with the biodegradability criteria as laid down in Regulation (EC) No.648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.

12.3. Bioaccumulative potential

No data available.

Partition coefficient n-octanol/water

CAS No	Chemical name	Log Pow
64-17-5	Ethanol	- 0,31

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

No data available.

12.6. Other adverse effects

Hazardous water pollutant.
Very toxic to aquatic organisms.

Further information

This concentrate is not allowed to be released into the sewerage, surface water or groundwater.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal

Where possible recycling is preferred to disposal.
Can be incinerated, when in compliance with local regulations.

Waste disposal number of waste from residues/unused products

070699 WASTES FROM ORGANIC CHEMICAL PROCESSES; wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics; wastes not otherwise specified

Contaminated packaging

Empty containers should be taken for local recycling, recovery or waste disposal.
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.
Packaging that cannot be cleaned should be disposed of like the product.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number: UN3082

14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides)

14.3. Transport hazard class(es): 9

14.4. Packing group: III

Hazard label: 9

Classification code: M6
Limited quantity: 5 L / 30 kg
Transport category: 3
Hazard No: 90
Tunnel restriction code: E

Inland waterways transport

14.1. UN number: UN3082

14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides)

14.3. Transport hazard class(es): 9

14.4. Packing group: III

Hazard label: 9

Classification code: M6
Limited quantity: 5 L / 30 kg

Marine transport

14.1. UN number: UN3082

14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides)

14.3. Transport hazard class(es): 9

14.4. Packing group: III

Hazard label: 9

Marine pollutant: P
Limited quantity: 5 L / 30 kg
EmS: F-A, S-F

Air transport

UN/ID number: UN3082

14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides)

14.3. Transport hazard class(es): 9

14.4. Packing group: III

Hazard label: 9

Limited quantity Passenger: Y964 / 30 kg G
IATA-packing instructions - Passenger: 964
IATA-max. quantity - Passenger: 450 L
IATA-packing instructions - Cargo: 964
IATA-max. quantity - Cargo: 450 L

14.5. Environmental hazards

Dangerous for the environment: yes

9.7 Freezer Spray MSDS

RS CLP/GHS revision date 01/02/15

Report Date : 25/11/2013
Revision Date NOVEMBER 2013
Revision 2

CP0968 v2.5 RS 846-682

SAFETY DATA SHEET
FREEZER

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name FREEZER
Product No. RS 846-682

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Manufacture of electrical equipment
Uses advised against At this moment in time we do not have information on use restrictions. They will be included in this safety data sheet when available

1.3. Details of the supplier of the safety data sheet

Supplier
RS COMPONENTS
BIRCHINGTON ROAD
CORBY
NORTHANTS NN17 9RS UK
+44 (0) 1536 402888
+44(0) 1536 401588
technical.help@rs-components.com

1.4. Emergency telephone number

+44 (0)1530 419600 between 8.30am - 5.00pm GMT Mon – Fri

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Not classified.
Environment	Not classified.

Classification (1999/45/EEC) Not classified.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Human health

Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

Physical and Chemical Hazards

Aerosol containers can explode when heated, due to excessive pressure build-up. When sprayed on a naked flame or any incandescent material the aerosol vapours can be ignited.

2.2. Label elements

Label In Accordance With (EC) No. 1272/2008

No pictogram required.

Precautionary Statements

P102	Keep out of reach of children.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P251	Pressurized container: Do not pierce or burn, even after use.
P260	Do not breathe vapour/spray.
P410+412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122°F.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

1,1,DIFLUOROETHANE R152A		10-30%
CAS-No.: 75-37-6	EC No.: 200-866-1	
Classification (EC 1272/2008) Flam. Gas 1 - H220 Press. Gas, Liquefied - H280	Classification (67/548/EEC) F+;R12.	

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments

Ingredients not listed are classified as non-hazardous or at a concentration below reportable levels.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. Keep the affected person warm and at rest. Get prompt medical attention.

Ingestion

DO NOT INDUCE VOMITING! Rinse mouth thoroughly.

Skin contact

Wash the skin immediately with soap and water. Get medical attention if any discomfort continues.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

This product is not flammable. Use fire-extinguishing media appropriate for surrounding materials.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

Unusual Fire & Explosion Hazards

Aerosol cans may explode in a fire.

Specific hazards

Vapours are heavier than air and may travel along the floor and in the bottom of containers. Vapours may be ignited by a spark, a hot surface or an ember.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Move container from fire area if it can be done without risk.

Protective equipment for fire-fighters

Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Avoid inhalation of vapours and contact with skin and eyes.

6.2. Environmental precautions

Do not discharge into drains, water courses or onto the ground.

6.3. Methods and material for containment and cleaning up

Absorb in vermiculite, dry sand or earth and place into containers.

6.4. Reference to other sections

Wear protective clothing as described in Section 8 of this safety data sheet. See section 11 for additional information on health hazards. Collect and dispose of spillage as indicated in section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level.

7.2. Conditions for safe storage, including any incompatibilities

Store at moderate temperatures in dry, well ventilated area.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.2. Exposure controls

Process conditions

Use engineering controls to reduce air contamination to permissible exposure level. Provide eyewash station.

Engineering measures

Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

Respiratory equipment

In case of inadequate ventilation use suitable respirator. EN14387

Hand protection

Use suitable protective gloves if risk of skin contact. Nitrile gloves are recommended. Gloves should conform to EN374

Eye protection

Wear approved safety goggles. EN166

Other Protection

Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Use appropriate skin cream to prevent drying of skin. When using do not eat, drink or smoke. DO NOT SMOKE IN WORK AREA!

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Aerosol. Liquid
Colour	Colourless.
Odour	Characteristic.
Solubility	Insoluble in water
Initial boiling point and boiling range (°C)	-26.5 (-15.7 F)
Relative density	1.13 @ 25 °c (77 F)
Vapour pressure	449 kPa @ 20 °c (68 F)

9.2. Other information

Volatility Description	Volatile

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Not available.

Hazardous Polymerisation

Will not polymerise.

10.4. Conditions to avoid

Avoid heat, flames and other sources of ignition. Avoid contact with acids and alkalis.

10.5. Incompatible materials

Materials To Avoid

No specific, or groups of materials are likely to react to produce a hazardous situation.

10.6. Hazardous decomposition products

Fire or high temperatures create: Carbon monoxide (CO). Carbon dioxide (CO_2). Hydrogen fluoride (HF). Carbonyl fluoride

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Toxicological Information

No information available.

Other Health Effects

This substance has no evidence of carcinogenic properties.

General Information

No specific health warnings noted.

Inhalation

High concentrations of vapours may irritate respiratory system and lead to headache, fatigue, nausea and vomiting. Move the exposed person to fresh air at once. Keep the affected person warm and at rest. Get prompt medical attention.

Ingestion

DO NOT INDUCE VOMITING! Rinse mouth thoroughly.

Skin contact

Wash the skin immediately with soap and water. Get medical attention if any discomfort continues.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

Health Warnings

Contact with liquid form may cause frostbite.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Not regarded as dangerous for the environment.

12.1. Toxicity

12.2. Persistence and degradability

Degradability

There are no data on the degradability of this product.

12.3. Bioaccumulative potential

Bioaccumulative potential

No data available on bioaccumulation.

12.4. Mobility in soil

Mobility:

The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces.

12.5. Results of PBT and vPvB assessment

This product does not contain any PBT or vPvB substances.

12.6. Other adverse effects

Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

General information

Do not puncture or incinerate even when empty.

13.1. Waste treatment methods

Empty containers must not be burned because of explosion hazard. Dispose of waste and residues in accordance with local authority requirements.

SECTION 14: TRANSPORT INFORMATION

General	This product is packed in accordance with the Limited Quantity Provisions of CDGCPL2, ADR and IMDG. These provisions allow transport of aerosols of less than 1litre packed in cartons of less than 30kg gross to be exempt from control providing that they are labelled in accordance with the requirements of these regulations to show that they are being transported as Limited Quantities. Aerosols not so packed must show the following

14.1. UN number

UN No. (ADR/RID/ADN)	1950
UN No. (IMDG)	1950
UN No. (ICAO)	1950

14.2. UN proper shipping name

Proper Shipping Name	AEROSOLS

14.3. Transport hazard class(es)

ADR/RID/ADN Class	2.2
ADR/RID/ADN Class	Class 2: Gases
ADR Label No.	2.2
IMDG Class	2.2
ICAO Class/Division	2.2

Transport Labels

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

EMS	F-D, S-U
Tunnel Restriction Code	(E)

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not relevant

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Statutory Instruments

The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (S.I 2009 No. 716). Control of Substances Hazardous to Health.

Guidance Notes

Workplace Exposure Limits EH40.

EU Legislation

Commission Directive 2000/39/EC of 8 June 2000 establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with amendments.

Authorisations (Title VII Regulation 1907/2006)

No specific authorisations are noted for this product.

Restrictions (Title VIII Regulation 1907/2006)

No specific restrictions of use are noted for this product.

15.2. Chemical Safety Assessment

SECTION 16: OTHER INFORMATION

Revision Date	NOVEMBER 2013
Revision	2
SDS No.	13082
Risk Phrases In Full	
R12	Extremely flammable.
NC	Not classified.
Hazard Statements In Full	
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.