Gerhardt

Extraction Systems

Soxtherm

Soxtherm - Automatic Rapid Extraction Systems

Modern Laboratory Management

C.Gerhardt has been known for dacades for manufacturing state-of-the-art rapid extraction units for all kinds of laboratories round the globe. The current range of Soxtherm models, are an asset for any lab and prepare the user for the future.

Soxtherm meets the requirements of efficient quality control and opens the way for modern laboratory management.

The new controlling software 'Soxtherm-Manager' has further improved work flow, offering a vast variety of documentation tools.

Comfortable Operation

The operation can either be done using the controlling software Soxtherm-Manager or using the external controller Multistat. Both can operate and control up to 4 Soxtherm units independently, no matter how many places they have. The fully automated process ensures highest precision with lowest effort.

2-, 4- or 6 Place Unit

Gerhardt offers a solution for any size of laboratory regardless of the sample throughput. 3 models are available, with 2, 4 or 6 places. They can be operated as either stand-alone units or combined.
When taking advantage of the maximum capacity of four 6-place units. 24 samples may be run simultaneously. When combined each extraction unit can be used independently, thus different types of sample can be extracted with various solvents at the same time.

Safety First

- The construction ensures a high standard of security when handling solvents
- Front door made of safety glass opens and closes automatically upon start or end of program
- Continous monitoring of all services ensures additional safety
- Temperature is controlled twice: by the software and by the safety temperature plug for 135 °C, 200 °C und 300 °C
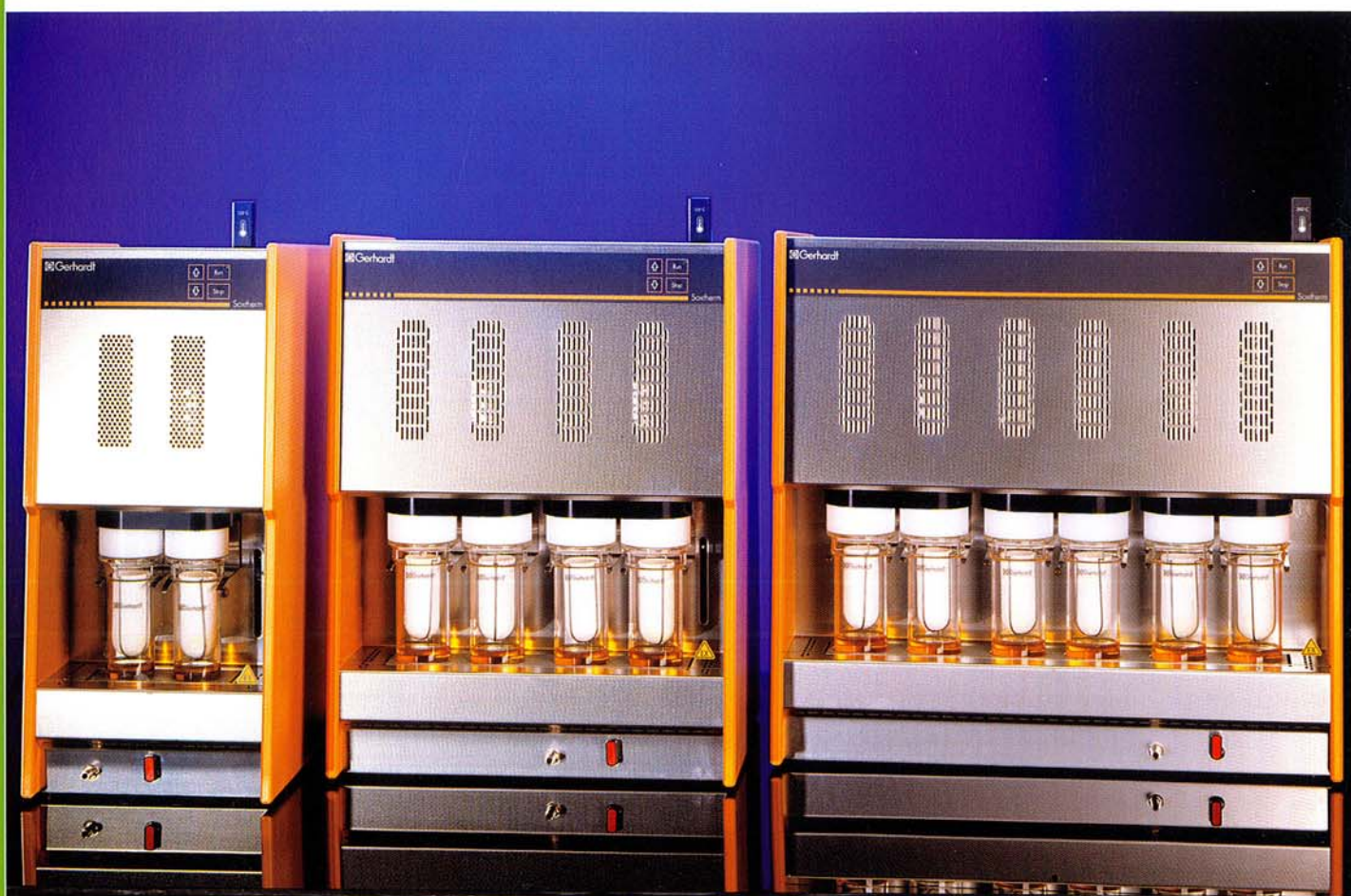
Versatile

- A serial group of Soxtherms can be set up handling up to 24 samples for various types which can be analyzed simultaneously
- Fat determination of food and feeds
- Extraction for sample preparation
- Various solvents can be used

Economic

- Automatic and efficient solvent recovery, thus solvents may be re-used
- Control of the amount of cooling water ensures low water consumption
- Compact design saves precious bench space in the laboratory
- Up to 4 units can be controlled by only one controller, allowing cheaper upgrades.

The Extraction Unit - One Step Ahead

Convincing Arguments

- 2-, 4- and 6-place units give the widest range of options
- Solvent recovery reduces running costs
- Water and compressed air control gives unattended operation and saves water making the system environmentally friendly
- Fast and accurate, allowing increased sample throughput compared to the traditional Soxhlet
- Capable of being used with all solvents giving flexibility of applications
- Fully programmable with automatic start-up and shut down for unattended operation
- Only 3 moving parts and no internal seals mean no routine maintenance is required
- 4 different sizes of thimbles can be used
- Single button operation for easy use

Safety Features

- Cooling water and air monitoring (shuts down the system in the event of a service failure)
- Safety front window protects the operator from hot surfaces
- Over temperature cut-off prevents flash point of the solvent being exceeded
- Optical sensor on solvent recovery tank prevents overfilling
- Acoustic and visual warnings inform operator of system problems
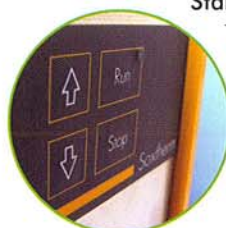- Illuminated glass beakers allow easy visual inspection of extraction progress

Improved Monitoring of Extraction

The extraction beakers are illuminated during the extraction thus providing an excellent visual check as well.
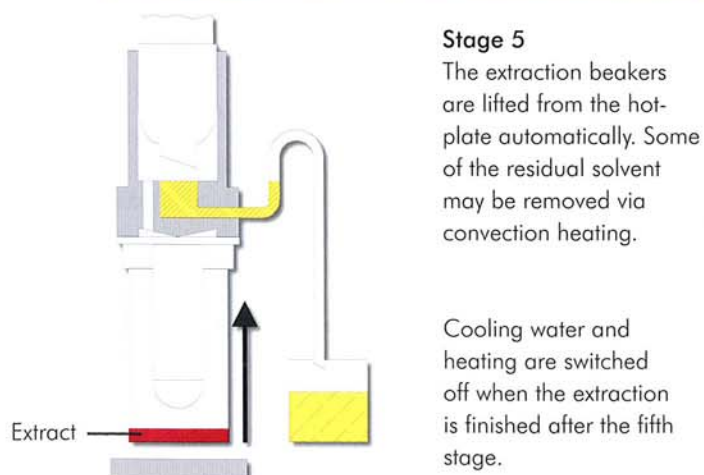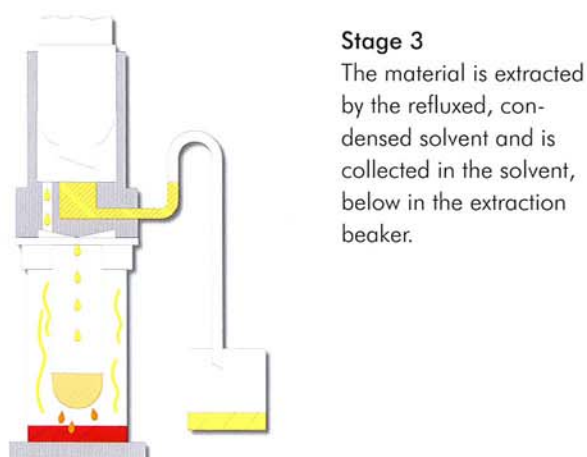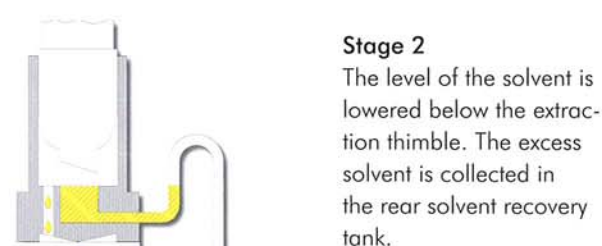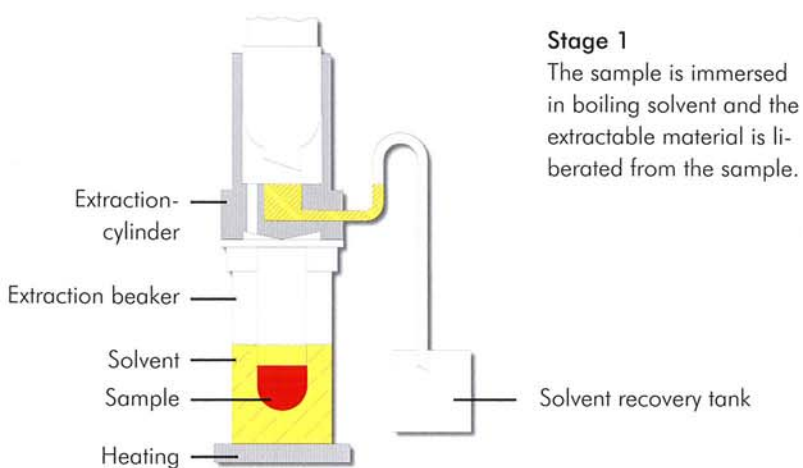
Stand-Alone-Operation

The program which has been used last is stored in the extraction unit till it is overwritten by a new program. Thus, an extraction is started immediately by pushing the key "run".

Principle

Gentle Treatment of Sample - Fully Automatic

The extraction process is performed in 5 programmable steps which ensures complete extraction of the samples. The patented process is fully automatic and especially suitable for fat determination and residue analysis.

Stage 1
The sample is immersed in boiling solvent and the extractable material is liberated from the sample.

Extraction-cylinder

Extraction beaker

Solvent

Sample

Heating

Solvent recovery tank

Stage 2
The level of the solvent is lowered below the extraction thimble. The excess solvent is collected in the rear solvent recovery tank.

Stage 3
The material is extracted by the refluxed, condensed solvent and is collected in the solvent, below in the extraction beaker.

Stage 4
The bulk of the solvent is distilled over into the rear storage tank for later recovery.

Stage 5
The extraction beakers are lifted from the hotplate automatically. Some of the residual solvent may be removed via convection heating.

Cooling water and heating are switched off when the extraction is finished after the fifth stage.

Extract

Easy Operation

Controlling with Multistat or via PC with Soxtherm Manager

To operate the Soxtherm extraction units comfortably and reliably, the user has the choice between the small and compact Mulitstat controller or Soxtherm-Manager the convenient controlling PC software. Both Mulitstat controller or Soxtherm-Manager can monitor and control up to 4 units simultaneously. The controlling units are not included in the delivery of the Soxtherm basic units and have to be ordered separately.
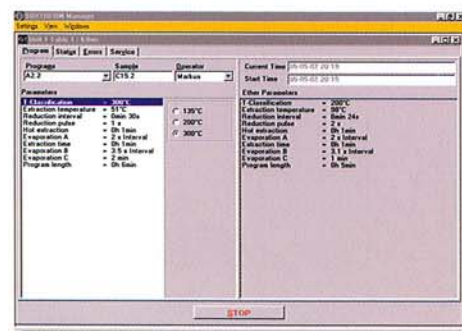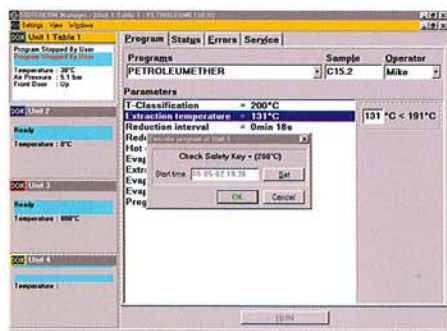
Multistat - Control Unit

- One Multistat controls up to 4 units which gives lower cost upgrades
- Different programs for various extractions can be stored and recalled
- The alphanumerical multifunctional display with 32 characters guides the user through the program steps
- The compact design saves precious bench space in the laboratory
- The maintenance free, chemical resistant keypad is conveniently designed and can be easily cleaned
- Program start time can be programmed for unattended operation
- Different languages at your disposal: English, German, French

Soxtherm Manager – Modern Controlling Software

Soxtherm can be operated and monitored completely by the sophisticated controlling software Soxtherm- Manager. In addition, the program is easier to handle and offers more options than the Multistat. Error messages are produced by the software and if necessary, the extraction is even stopped when a problem occurs. This reduces the presence of a human operator tremendously and facilitates the daily routine. Furthermore, the software contains powerful diagnosis- as well as documentation functions, which allow the handling of all parameters of the instrument and extraction. May be operated by any PC in the lab using Microsoft Windows 98, 2000, or XP.

Everything under control

- Each Soxtherm unit has a program window and a status window
- At any given time, the user has a perfect overview of all functions and programs in use
- Diagnosis function for an ideal extraction process
- Up to 4 Soxtherm units are displayed on one screen

Start immediately

You are working with a windows user interface, so that the program looks familiar right away. This saves time consuming familiarization periods.

Individual settings

It is up to you to determine, which functions should be displayed permanently in the status window. These windows can be displayed side by side, or one after the other, can be shown or hidden.

Programming

The program window offers a quick view of all extraction steps. Gerhardt can provide you with application notes for general samples.

Quality Documentation

Thanks to vast logging functions, the Soxtherm-Manager offers a wide variety of possibilities for quality documentations, like e.g. starting time, operator name, entire running time, error messages, comments and much more.

Order Information | Consumables | Accessories

Soxtherm

Order No.	Type	Description
840250	SOX 412	Soxtherm basic unit 2-place, complete
840450	SOX 414	Soxtherm basic unit 4-place, complete
840650	SOX 416	Soxtherm basic unit 6-place, complete

Multistat

Order No.	Type	Description
8500	MS	Programmable control unit for the control and monitoring of up to 4 Soxtherm basic units.

Soxtherm Manager

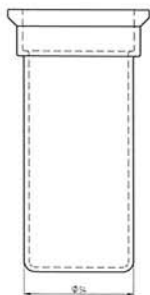| Order No.	Type	Description
8510	SX PC	Software for the monitoring and controlling of 1 – 4 Soxtherm basic units. Soxtherm Manager CD in German and English language, short user manual and GerBus adapter.

Compressor

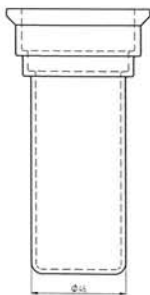| Order No.	Type	Description
8123	KOM	For the compressed air supply of the basic units Soxtherm. Soxtherm can also be connected to an in-house compressed air supply. However, this air has to be dried and filtered (5μ). In such a case, no compressor is needed.

Consumables and Accessories

Make sure to use only **original C. Gerhardt spare parts** in order to obtain the best possible results. These parts have been tested thoroughly in the Gerhardt application lab. The glass extraction beakers are produced by a highly specialized glass blower with whom Gerhardt has been cooperating for many years. Thus, only these original Gerhardt extraction beakers guarantee a trouble free automatic extraction process without any loss of solvent.

Extraction Beakers Glass

Order No.	Type	Description
8400	SEB MA	Beaker 54 x 130 mm **Version Macro** Standard model, to be used for Soxtherm models 412, 414, and 416

Order No.	Type	Description
8402	SEB MIMA	Beaker 46 x 130 mm **Version Micro** Model with smaller diameter of cylinder to be used for Soxtherm models 412, 414, and 416. Only to be used for small sample sizes to save solvent.

Extraction Thimbles (25 per box)

Order No.	Type	Description
8310	SE33A	Extraction thimbles 33 x 80 mm
8317	SE33B	Extraction thimbles 33 x 94 mm
8315	SE25	Extraction thimbles 25 x 75 mm
8316	SE40	Extraction thimbles 40 x 85 mm

Insert Rack for Extraction Beaker

Order No.	Type	Description
8466	SEGMa	for 6 extraction beakers

Holder for Extraction Thimbles Type SE

Order No.	Type	Description
8323	SH K2	For thimbles 33 mm to be used with extraction beaker 8400 and 8402
8322	SHK1	For thimbles 25 mm to be used with extraction beaker 8400 and 8402
8324	SHK3	For thimbles 40 mm to be used with extraction beaker 8400

O-Rings

The standard delivery for Soxtherm includes Viton O-rings which can be used e.g. petrol ether and hexane. When working with other solvents or solvent mixtures, Gerhardt offers parofluor or silicone o-rings.

Boiling Stones

Order No.	Type	Description
18310	SIE	Box of boiling stones 250 g

Extraction Thimble Glass

Order No.	Type	Description
8318	EHG	34 x 95 mm, e.g. for fibres and foams

Configuration | Technical Data

Standard configuration	SOX 412	SOX 414	SOX 416	Multistat	Sox-Manager
Extraction places	2	4	6		
Extraction beaker glass macro	4	8	12		
Holder for extraction thimbles	2	4	6		
Extraction thimbles 33 x 80 mm	25	25	25		
Pair of tongs for extraction beaker	●	●	●		
Box of boiling stones 250 g	●	●	●		
Insert rack for 6 extraction beaker	●	●	●		
Tubing set complete	●	●	●		
Line filter 16 A (just for 230V)	●	●	●	●	
Plug for safety temperature 135 °C	●	●	●		
Plug for safety temperature 200 °C	●	●	●		
Plug for safety temperature 300 °C	●	●	●		
Level control for solvent tank	●	●	●		
Acoustic and visual error messages	●	●	●		
RS-485 interface	2	2	2	2	
RS 232 interface				●	
Data cable RS-485	●	●	●		
Data cable RS-232					●
RS-Adapter					●
USB / RS 232 Adapter					●
Language selection				●	●
Programmable methods				20	any
CSV Data export					●
Data base with tables					●
User names can be defined					●

Technical Data	SOX 412	SOX 414	SOX 416	Multistat	Compressor
Cooling water consum.	ca. 3 l/min	ca. 3 l/min	ca. 3 l/min	-	-
Cooling water pressure	min 0,3 bar	min 0,3 bar	min 0,3 bar	-	-
Nominal voltage	230 VAC[1]	230 VAC[1]	230 VAC[1]	230 VAC[1]	230 VAC[1]
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Nominal wattage	400 W	800 W	1200 W	6 W	130 W
Weight	28 kg	36,5 kg	43 kg	2,5 kg	14 kg
Dimens. (B x T x H) mm	250 x 410 x 580	405 x 410 x 580	565 x 410 x 580	180 x 260 x 125	340 x 220 x 390
Temperature	max. 300 °C	max. 300 °C	max. 300 °C		
Max. pressure	-	-	-	-	8 bar

1) other voltages on request

System requirements for using Soxtherm Manager
- Operating system Microsoft Windows 98, XP or Vista
- Serial or USB interface for connecting Soxtherm or PC

Versatility

Soxtherm observes international and national norms and extraction standards and thus, meets the requested analysis qualities. Soxtherm can be used for nearly all analytical areas. Application notes for various extractions are available on request.

Fat Determination

Almost all food contains fat. When working with the Gerhardt Soxtherm, the determination of the fat content in food and feeds is simple, fast, and reliable.

- Milk and dairy products
- Cereals and cereal products
- Meat and meat products
- Chocolate and cacao products
- Oil and oil seeds
- Fruits
- Fat in feeds
- Lipids in eggs and egg products
- Fat in dietary products and many more...

Sample Preparation

Soxtherm can be used for the determination of pollutants in environmental samples. The data obtained can then be used to make fast environmental decisions.

- Mineral oil in rocks
- Oil and lubricants
- Pesticides
- Phenols
- PCB
- Dioxins
- Softeners and additives in plastic and rubber
- Colorant on textile fibers
- Explosives
- Coatings of fertilizers
- PAH - Poly aromatic hydrocarbons
- EOX - Extractable organic halides according to EPA method 3541 and many more