Operating Instructions for Ultrasonic Cleaners
Types UR 1 and UR 2

Notes on the operating instructions

These assembly and operating instructions for the ultrasonic cleaners of types UR 1 and UR 2 provide all the necessary information on the topics listed in the table of contents.

They guide the target group(s) defined for the relevant subjects in safe and proper handling. Knowledge of the relevant chapters by the appropriate target group(s) is essential for safe and proper handling.

This technical documentation comprises a reference work and a training guide. The individual chapters are self-contained units.

These operating instructions do not contain any instructions on repairs. Should any repairs become necessary, please contact your supplier or Retsch GmbH direct.

Safety

Target group: All persons dealing with the machine in any way

The UR 1 and UR 2 are modern, powerful products from Retsch GmbH. It reflects the state of the art. When the product is handled correctly by persons familiar with this technical documentation, it is completely safe and reliable in operation.

Notes on safety

You, as the operator, are responsible for ensuring that the persons appointed to work with the ultrasonic cleaners UR 1 and UR 2:

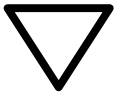
- have read and understood all the stipulations of the chapter on safety,
- are familiar before commencing work with all instructions and regulations for the relevant target group,
- have access to the technical documentation for this machine at all times and without difficulty.

Ensure that new staff have been familiarised with the rules for safe and proper handling before commencing work with the UR 1 or UR 2 either by oral instruction by a competent person and/or by this technical documentation.

Incorrect operation can lead to damage or injury. You are responsible for your own safety and that of your staff.

Ensure that no unauthorised persons have access to the UR 1 and UR 2.

For your own protection, have your staff confirm that they have been instructed in operation of the UR 1 and UR 2. A draft of an appropriate form can be found at the end of the chapter on safety.



No liability in any form will be accepted for damage or injury resulting from failure to observe the following notes on safety.

Warning symbols

We use the following symbols to warn of:

Personal injury

Damage to property

Repairs

These operating instructions do not contain any instructions on repairs. For your own safety, only have repairs performed by Retsch GmbH or an authorised agent (service technicians).

In such a case, please inform**:**

The Retsch agency in your country
Your supplier
Retsch GmbH direct

Your service address:

Confirmation

I have read and understood the foreword and the chapter on safety.

_____

Signature of the operator

_____

Signature of service technician

Technical data

Machine type designation: UR1 and UR2

Use for the intended purpose

The ultrasonic cleaners are suitable for:

- rapid, gentle cleaning with high efficiency,
- intensive homogenisation, dispersion and degassing.

In detail, they:

- are universally usable and take up little space,
- save time and costs,
- are maintenance-free, long-lived and environmentally friendly.

Furthermore, they are notable for their easy handling. The ultrasonic baths are not production machines, but laboratory equipment designed for 8 hour single shift operation.

Never operate ultrasonic equipment without liquid.

The machine may otherwise be damaged.

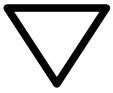
The ultrasonic cleaners are not suitable for cleaning living beings (plants, animals).

Do not use flammable liquids in ultrasonic equipment.

Danger of fire and explosion.

Do not reach into the cleaning fluid in the ultrasonic unit during operation.

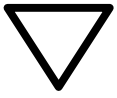
Hazard to health.



Do not make any modifications to the machine and use only RETSCH approved spares and accessories.
Failure to comply will invalidate the CE declaration and guarantee.

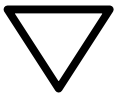
Emissions

Cavitation noise is generated during ultrasonic operation.
Noise data for UR 1:
Noise measurement to DIN 45635-31-01-KL3
Sound power level L_{WA} = 75 dB(A)
Workplace related emission level $L_{p\,eq}$ = 50 dB(A)
Service conditions:
Cleaning fluid: water
Filling: 100%
Object to be cleaned: Analysis sieve 200x50 in basket



Wear **ear protectors** when working continuously within a radius of 2 m around the ultrasonic unit to protect your health!

Noise data for UR 2:
Noise measurement to DIN 45635-31-01-KL3
Sound power level L_{WA} = 86 dB(A)
Workplace related emission level $L_{p\,eq}$ = 80 dB(A)
Service conditions:
Cleaning fluid: water
Filling: 100%
Object to be cleaned: Analysis sieve 400x65



Wear **ear protectors** when working continuously within a radius of 2 m around the ultrasonic unit to protect your health!

Rated voltage
See type plate on rear of machine

HF frequency
35 kHz

Capacities
UR 1 = 5.7 l
UR 2 = 42 l

Current consumption
UR 1 = 0.5 A
UR 2 = 1.3 A

Fuses
UR 1 = F2A / 250V
UR 2 = F4A / 250V

Dimensions
UR 1 :
Height: approx. 260mm x ϕ 260mm // Weight: approx. 5 kg
Internal vibrating trough = ϕ245 mm x H 130 mm
UR 2 :
Height: approx. 460mm x ϕ 570mm // Weight: approx. 21 kg
Internal vibrating trough = ϕ515 mm x H 200 mm

Mounting surface required
UR 1 :
260 mm x 260 mm; no safety clearances necessary.
UR 2 :
570 mm x 570 mm; no safety clearances necessary.

Transport and installation

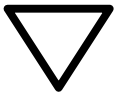
Target group: Operators

Packaging

The packaging is suitable for the mode of transport selected. It complies with the general packaging regulations.

Please keep the packaging for the duration of the guarantee period, as your guarantee claim will be endangered in the case of a complaint or return of the machine in inadequate packaging.

Transport



The ultrasonic cleaner must not be thrown, subjected to impact or shock during transport. The electronic and mechanical components may otherwise be damaged.

Temperature fluctuations

When there are severe temperature fluctuations (e.g. during air transport) the ultrasonic cleaner is to be protected from condensation. The electronic components may otherwise be damaged.

Interim storage

Also ensure that the ultrasonic cleaner is stored in a dry place, even for interim periods.

Parameters for the installation location

Ambient conditions to EN 61 010-1 (IEC 1010-1)
Degree of contamination 2 to IEC 664
Overvoltage category II

Ambient temperature:
5°C to 40°C

When the ambient temperature exceeds or falls below that specified, the electronic and mechanical components may be damaged, and performance data changed to an unknown extent.

Humidity:
Maximum relative humidity 80% at temperatures up to 31°C, decreasing in a straight line to 50% relative humidity at 40°C. Condensation is not permissible.

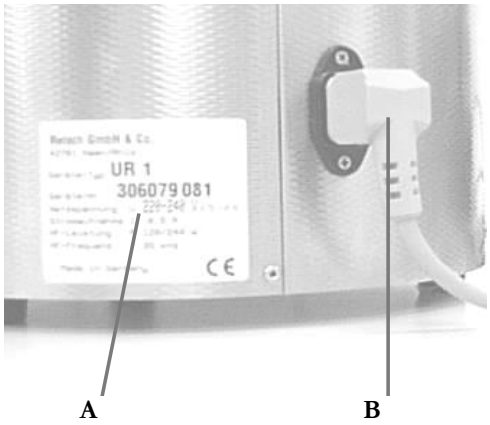
At higher humidity, the electronic components may be damaged.

Site altitude:
max. 2000 m above sea level

Installation

Always set up the ultrasonic cleaner on a dry and firm base.

Electrical connection

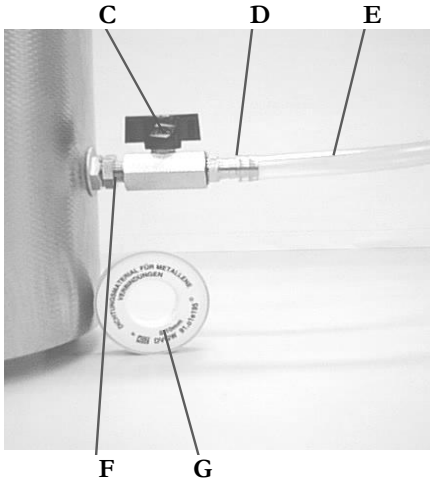


- The voltage and frequency of the ultrasonic cleaner can be found on type plate **A** on the rear of the machine.
- Ensure that the levels match the available mains supply.
- Connect the ultrasonic cleaner to the mains using the connecting cable **B** supplied.
- The mains socket must be fitted with a protective earth contact.
- Ensure that there is an external fuse in accordance with the local regulations when connecting the unit to the mains supply.

Failure to observe the values on the type plate can result in damage to electrical or mechanical components.

When the machine is set up in the immediate vicinity of a water supply, a residual current operated circuit-breaker must also be fitted to the power connection.

Danger of electric shock.



Assembly of the discharge hose

- Fit seal **G** around thread **F** on the machine.
- Screw on ball valve **C**.
- Fit seal **G** around connector **D**.
- Screw connector **D** into ball valve **C**.
- Slide hose **E** onto connector **D**.

Check the discharge hose connection for freedom from leakage. **Escaping water can lead to damage of objects in the vicinity.**
Remove the mains plug from the socket before checking the discharge hose connection for leakage. **Escaping water can cause electric shocks.**

Operation

Target group: Operators

Controls and operation

Graphical representation of the controls:

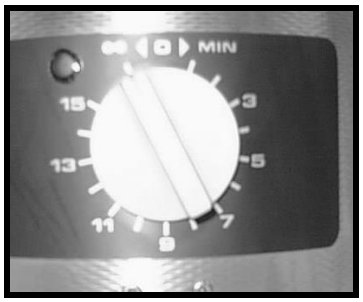
Overview table

No.	Description	Function
1	Power cord	Connects the ultrasonic cleaner to the mains power supply.
2	Ball valve	Open = Liquid can flow off from the vibratory trough Closed = Liquid is prevented from flowing out of the vibratory trough.
3	Discharge hose	Connects the ultrasonic cleaner to a water collecting point.
4	Knob	Switches the ultrasonic cleaner ON or OFF, and permits the setting of machine running times. Anti-clockwise to position ∞ = Continuous operation Clockwise = Running times of 0 to 15 mins. can be set

Operation of the ultrasonic cleaners

Target group: Operators

Switching on and off



The ON/OFF knob is located on the front of the ultrasonic cleaner.

- Turn the knob to the ∞ position.
- The signal lamp lights up in green.

The ultrasonic cleaner is in continuous operation and will not switch off automatically.

- Turn the knob to the **0** position.
- The signal lamp goes out.

The ultrasonic cleaner is then switched off.

Setting the time

Running times of 0 - 15 mins. can be set by turning the ON/OFF knob clockwise.

- Turn the knob to the desired running time.
- The signal lamp lights up in green.

On expiry of the set time, the ultrasonic cleaner switches off automatically.

- The signal lamp goes out.
- The switch is once again in the **0** position.

The running time can be reduced or the ultrasonic cleaner switched off at any time by turning the knob anti-clockwise.

Prior to cleaning operations with the ultrasonic cleaner

In most cases, water with a 5-10% admixture of cleaning agent, e.g. "TICKOPUR RW77" which is available as an accessory, is sufficient as the cleaning fluid.
The cleaning fluid can be degassed in advance to achieve a higher cleaning effect.

Degassing the cleaning fluid

Cleaning and contact fluids contain dissolved gases (e.g. oxygen). Cleaning or contact fluid which is fresh or which has been left to stand for some time in the vibratory trough should be ultrasonically treated (degassed) for approx. 5 to 15 minutes without any parts to be cleaned, or for approx. 30 minutes in vibratory troughs with over 10 l volume. A reduction in the noise level during treatment does not indicate any drop in ultrasonic performance, but rather the end of the degassing process.

Cleaning duration

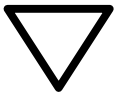
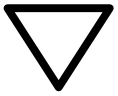
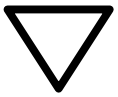
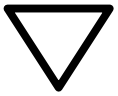
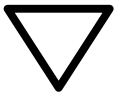
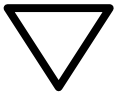
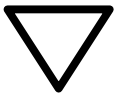
The cleaning duration is always to be set as short as possible. The duration can be approx. 1 to 15 minutes, depending on the degree of contamination and the cleaning or contact fluid used.

Also observe the data on the labels for the cleaning or contact fluid.

Cleaning with the ultrasonic machine

The UR1 is suitable for cleaning of analysis sieves up to 215 mm in diameter, and the UR2 up to 450 mm diameter.
In each cleaning operation, ensure that the material to be cleaned is **completely** covered by the cleaning and contact fluid.

- Fill the vibratory trough to at least 2/3 capacity with cleaning/contact fluid, with 5 - 10% "TICKOPUR RW77" cleaning fluid, available as an accessory, added.
- Place the material to be cleaned in the perforated basket available as an accessory, with the dirtier side facing downwards.
- Insert the perforated basket.
- Switch the ultrasonic cleaner on.

	Fill the vibratory trough to at least 2/3 capacity with fluid, e.g. TICKOPUR RW 77, which is available as an accessory. **No fluid, or too low a level, can lead to damage to the machine.**
	Do not stack the material to be cleaned. **The ultrasonic waves are otherwise absorbed.**
	Fragile parts must not touch each other. **Parts may otherwise be damaged.**
	Ensure that no air bubbles can form in cavities. **Cleaning will otherwise not be sufficient.**
	Do not place any parts directly in the vibratory trough or on its base. **The machine could be damaged.**
	No liability is accepted for damage to machines or instruments caused by the use of unsuitable cleaning or contact fluid.
	Do not use flammable liquids such as petrol or acetone, or chemicals which contain or split off halogen ions as the contact fluid.
	Do not reach into the cleaning fluid during ultrasonic cleaning. **Hazard to health.**

Emptying the vibratory trough

Always remove the mains plug before emptying the vibratory trough.
There are two ways to empty the vibratory trough in the ultrasonic cleaner.

- Grip the UR with both hands and tip the liquid into a sink as with a saucepan

or

- place the ultrasonic cleaner near a sink in such a way that hose **3** reaches into the basin.
- Allow the liquid to drain off by opening ball valve **2**. The position is shown in the figure.

Always remove the mains plug before emptying the vibratory trough. **Danger of electric shock**
When the machine is set up in the immediate vicinity of a water supply, we recommend that a residual current operated circuit-breaker be fitted to the power connection. **Danger of electric shock**
Never operate your ultrasonic cleaner directly in a sink. **Danger of electric shock**

Notes on operation

Target group: Operators

Cleaning

The ultrasonic bath gently and intensively cleans analysis sieves, microprecision sieves, glass and metal parts, and metallographic and geological samples, spectacles, jewellery, coins and many other objects. The ultrasonic bath can also be used for processes other than cleaning.

Homogenising

The RETSCH ultrasonic bath is used in particle metrology for preparation of suspension samples for wet sieving or sedimentation analysis. For this purpose, the initial sample is to be placed in the ultrasonic machine's perforated basket in a separate vessel, e.g. a beaker or plastic bottle. The ultrasonic waves break down particle clumps and distribute the individual particles in the liquid. The addition of dispersants to the suspension accelerates the process. See also DIN 66111.

Dispersing

Dispersing in the ultrasonic machine means ultra-fine distribution of solids in liquid phases. This means improved quality for dispersions and emulsions.
The Retsch ultrasonic cleaners can also be used in chromatography for dispersion of the packing material in the slurry, so as to achieve reproducible separations.

Our application laboratory will be pleased to answer any questions or provide examples of further applications.

General

Target group: Operators

Ultrasonic machine technology

A high frequency generator produces approx. 35,000 oscillations per second which are transmitted to the cleaning fluid and cause it to resonate. The energy density of the sonic field is so high that cavitation takes place.

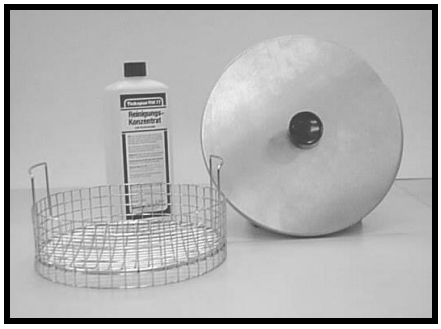
Countless small vacuum bubbles are created and collapse within microseconds as a result of pressure and suction: they implode. The pulses thus released remove contamination even from the deepest, inaccessible points, or lead to homogenisation, dispersion and degassing.

The compact housing and the vibratory trough consist of stainless steel. The cleaning/contact fluid can be easily and safely drained off through the discharge ball valve located on the housing.

In conjunction with the spray water protected design of the unit, this provides a maximum of operational reliability.

Below the vibratory trough, there is the powerful HF generator with a continuous peak power of 2x 240 or 2x 600 watts. The wide beam vibration system with PZT oscillators act on the cleaning fluid evenly, thus achieving an excellent cleaning effect.

Accessories



- Lid in stainless steel for type UR 1
- 1 litre TICKOPUR RW 77 cleaning agent
- Perforated basket in stainless steel for type UR 1
- Perforated basket in stainless steel for type UR 2

Cleaning the machine

The mains plug is to be disconnected before each cleaning operation.

Thoroughly rinse the machine's stainless steel trough from time to time and rub it dry.

If strips of dirt remain on the stainless steel surface of the vibratory trough after a long period of use, these can be removed with a standard commercial steel cleaner without scouring additives.

Do not clean the ultrasonic machines with running water or immerse them in a sink.
Risk of fatal electric shocks

Only use a cloth moistened with water.

Do not use steel wool, scrapers or other abrasive tools.
The vibratory trough can otherwise be damaged.

Maintenance

Target group: Operators

The ultrasonic machines are extensively maintenance-free.

Have any necessary repairs performed by authorised specialists or direct by Retsch GmbH only.

Copyright

Modifications

We reserve the right to make technical modifications without notice.

EU Declaration of Conformity

Translation

ULTRASONIC BATH

UR 1 | 70.791.0001/2

EU DECLARATION OF CONFORMITY

We, represented by the undersigned, hereby declare that the above device complies with the following directives and harmonised standards:

Low Voltage Directive 2014/35/EU

Electromagnetic compatibility 2014/30/EU

Restriction of hazardous substances (RoHS) 2011/65/EU

Authorised person for compilation of the technical documentation:
Julia Kürten (Technical Documentation)

Furthermore, we declare that the relevant technical documentation for the above device has been prepared in accordance with Annex VII Part A of the Machinery Directive and we undertake to submit the documentation to the market surveillance authorities on request.

In the event of a modification of the device not agreed on by Retsch GmbH, as well as the use of non-approved spare parts or accessories, this declaration loses its validity.

Retsch GmbH

Haan, 09/2023

Dr. Stefan Mähler, Technical Manager

CE

EU Declaration of Conformity

Translation

ULTRASONIC BATH

UR 2 | 70.791.0003/4

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We, represented by the undersigned, hereby declare that the above device complies with the following directives and harmonised standards:

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Haan, 09/2023

Dr. Stefan Mähler, Technical Manager

CE