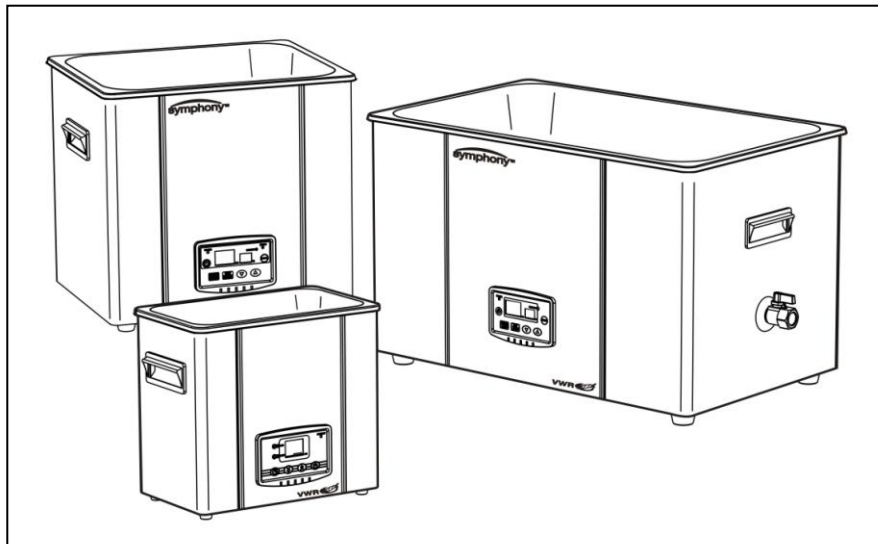# ULTRASONIC CLEANERS

INSTRUCTION MANUAL

MODELS

97043-930, 97043-932, 97043-934, 97043-936, 97043-938, 97043-940, 97043-942
97043-944, 97043-946, 97043-948, 97043-950, 97043-952, 97043-954, 97043-956

97043-958, 97043-960, 97043-962, 97043-964, 97043-966, 97043-968, 97043-970
97043-972, 97043-974, 97043-976, 97043-978, 97043-980, 97043-982, 97043-984

97043-986, 97043-988, 97043-990, 97043-992, 97043-994, 97043-996, 97044-000
97044-002, 97044-004, 97044-006, 97044-008, 97044-010, 97044-012, 97044-014

Content

SYMBOLS：

Alternating Current.

Protective Conductor Terminal. (Always replace the protective conductor after servcing!)

Attention, consult accompanying documents. (Always consult this instruction manual when this symbol is used on the equipment!)

Caution, hot surface.

Item	Quantity	Note
Instrument	1 unit	
Instruction Manual	1 piece	
Cover	1 piece	
Support Rack	1 piece	
Soft Drainpipe	1 piece	9.5L (Include 9.5L) or above model

Cover

Support Rack

Instrument

Soft Drainpipe
[9.5L (Include 9.5L) or above model]
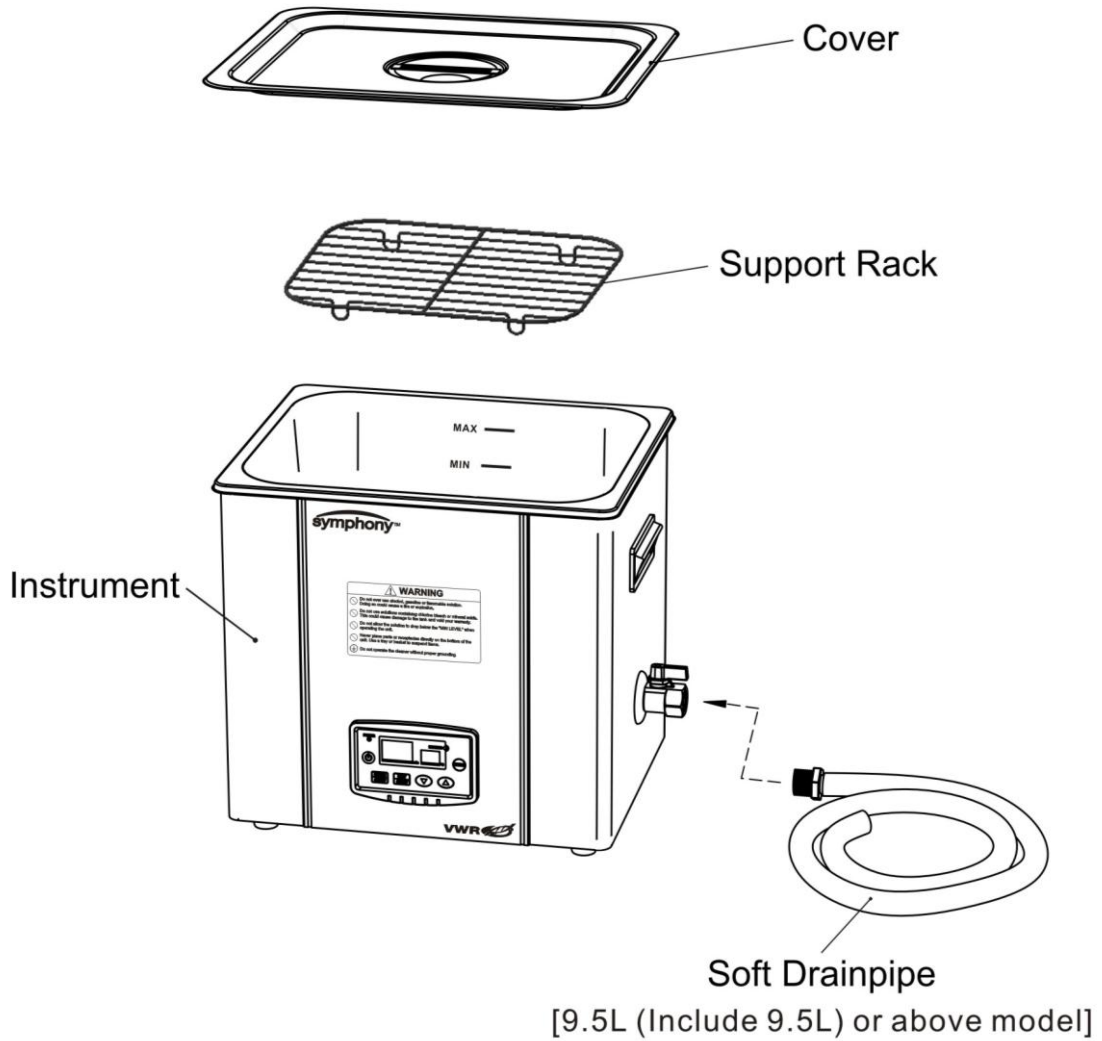
Before using your Ultrasonic Cleaner, please read and thoroughly understand these warnings. Failure to follow them may result in serious personal injury of property damage.

1. *To avoid electrical shock* ⚠

● Only use the cleaner where there is a good grounding connection.

● Unplug from power source before filling or emptying the tank.

● Don't disassemble your cleaner-high voltage inside the cleaner is dangerous.

● Don't immerse the cleaner in water.

2. *To avoid personal injury and property damage* ⚠

● Don't use alcohol, gasoline or other flammable solvents to avoid explosion or fire.

● Cleaning trough or detergent may be hot, don't touch with hand.

● Don't let the temperature of the cleaning liquid to go over 70°C.

3. *Avoid damaging the facility* ⚠

● Don't operate the cleaner dry.

● Don't use strong acid or alkali or other corrosive solution to avoid damaging the cleaning trough.

● Only water soluble detergent should be used.

● The cleaner should not be started while there is no cleaning liquid in the trough.

● The water surface should not be lower than "**MIN.LEVEL**" to prevent damage to heating device.

● Don't directly place the work piece on the bottom of the trough, it should be suspended or placed on a support rack so as to avoid damaging energy converter.

● The cleaning liquid should be changed regularly; otherwise dirt deposits will form at the bottom of the trough which may affect the cleaning results of ultrasonic cleaning. Moreover, many types of detergent lose potency in time; therefore detergent should be added periodically.

Ultrasonic sound is sound transmitted at frequencies generally beyond the range of human hearing. In your ultrasonic cleaner, ultrasonic sound (sonics) is used for cleaning materials and parts.
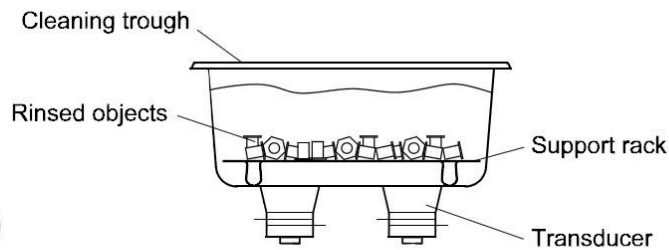
(Figure 1)
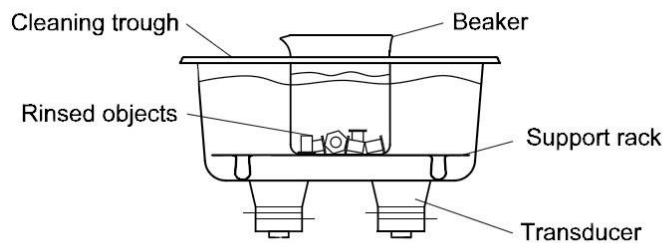
(Figure 2)

Direct cleaning (refer to figure 1)
Place water and detergent in the cleaning trough, then place work piece on the support rack, Lower them into the trough or suspend the work piece then lower them into the liquid.

Indirect cleaning (refer to figure 2)
Place water and detergent into the cleaning trough, and put all the chemicals into a beaker or other suitable container and then put the work piece into the liquid. Now put the container of the chemical detergent and work piece into the trough.

Caution: do not let the container touch the bottom of the trough.

The direct and indirect cleaning methods both have advantages and disadvantages. If you are not sure which one to choose please carry out tests first before making a choice. The advantage of the direct cleaning method is that the cleaning is very efficient and easy to operate. The indirect cleaning also has advantages, which are that the dirt being cleaned off can be clearly seen in the beaker or the container, and then it can be filtered out or disposed of. Also at the same time we can use two or more than two types of cleaning solvents.

1. *Choose the cleaning method:*
- **Direct cleaning:** place the support rack, water, detergent, and work piece into the trough, or suspend the work piece in a bracket and submerge them into the cleaning liquid. It is strictly prohibited to put alcohol, propylene, gasoline or other flammable solvent, or strong acid or alkali, or other corrosive liquid into the trough. If the above mentioned solvent is necessary then we recommend the use of indirect cleaning method.
- **Indirect cleaning:** put water and detergent into trough, put all necessary chemicals into the beaker or other proper container, and submerge them into the cleaning liquid. Then put all the chemical detergent and work piece into the trough.

2. The cleaner is powered by connecting the mains plug to a standard socket-outlet, always place the cleaner in such a way that it is easy for the operator to unplug the mains plug in emergency.

3. Position your cleaner within easy reach of a standard grounded electrical outlet. Do not place the cleaner on a circuit which could become overloaded.

4. These cleaners are NOT floor standing equipment. Always use the cleaners on tables, work benches, and other similar surfaces.

5. Always use the cleaners in an environment of good ventilation. Special care should be taken not to block the bottom fan vent of the relevant models.

6. Please always keep the liquid level between the "**MAX.LEVEL** "and "**MIN.LEVEL**".

7. Adjust the timing to proper time. Work piece of different types require different cleaning times. Most of them only need about a few minutes while others might take a bit longer. The details can be decided via testing.

8. It is faster and more efficient to run several small loads rather than few big loads.

9. Turn power on, wait 10 minutes to let the cleaner liquid to purge the gas, the process of which is only required at the beginning of every day cleaning or after the change of solvent.

10. When you first fill your unit, or refill it with fresh solution, use warm water for the solution. Turn on the heater (press the HEAT switch, if available), turn on the ultrasonics (press the SONICS), add the cover and the solution will heat quickly to temperature.

11. *Rinse, drying and lubrication:*
- Rinse the parts to remove the chemicals which adhere to the parts after cleaning.
- Dry the parts with clean compressed air, hot air blower or in an oven.
- Relubricate parts that need lubrication.

Please call VWR if you have application questions.

⚠ WARNING

Do not use corrosive solutions, such as bleaches, strong acids or powerful caustics, in ultrasonic tanks, or you will void the warranty. Only use non-flammable solutions and water-based solutions.

Solution types:
Water-based solutions are either slightly acidic or alkaline. They include detergents, soaps and industrial cleaners designed to remove specific contaminates.

Acidic water-based solutions:
Remove rust, tarnish or scale. They range from mild solutions that remove tarnish, to concentrated, inhibited acidic solutions that remove investment plaster, milk-stone, zinc oxide and rust from steel and cast iron as well as smut and heat-treat scale from hardened steel.

Alkaline water-based solutions:
Include carbonates, silicates and caustics. These cause emulsifying action, which keeps contaminate from redepositing on the cleaned surface, and improves cleaning action in hard water.

Alkaline strength:	*Removes:*
Mild	Light oils and greases, cutting oils and coolant compounds.
Mild to strong	Heavy grease and oil, waxes, vegetable oils, inks, wax or fat-base buffing and polishing compounds, milk residues and carbohydrates.
Heavy-duty	Mill scale, heat-treat scale, corrosion or oxides.

Change the cleaning solution periodically. Cleaning solutions can become contaminated with suspended contaminate particles which coat the tank bottom. This coating dampens the ultrasonic action and reduces cleaning efficiency. Certain solutions will cavitate better than others. Contact VWR for further information.

Heat and cavitation: increase the chemical activity of cleaning solutions. Some materials may be damaged by this stronger chemical action. When in doubt, test run samples of items to be cleaned.

Caustic solutions: used to remove rust from steels, metal alloy corrosion and a variety of tenacious contaminates.

Solution amounts: solution amounts may vary. The amount you use depends on the detergent and the type of contaminate to be removed. Follow instructions on the solution container and refer to the table below for the effects of solutions on metals.

⚠️ **WARNING**

Free hydrogen may be released if solution comes in contact with reactive metals

Solution Effects on Metals:

Cleaning agent	Steel	Brass	Aluminum	Magne sium	Zinc	S. Steel Copper	Tin
Optical(1)	none	none	none	none**	none**	none	none**
Jewelry Cleaner(1)	none	none	none	none	none	none	none
Buffing(1) compound	none	Slight stain	none	none	attacks	none	none
Oxide Remover	slight etch	none	slight attack	attacks	attacks	none	none
Electronic cleaner(1)	none	none	slight attack	none	none	none	none
General purpose(1)	none	none	slight attack	none	none	none	none
Industrial strength(1)	none	none	slight attack	none	none	none	none
Metal(1) cleaner 1	none	none	none	none	none	none	none
Metal(1) cleaner 2	none	none	slight attack	none	none	none	none
Metal(1) cleaner 3	none	none	none	none	none	none	none
Rust(3) stripper	none	none	attacks	attacks	attacks	none	slight attack

(1)=Alkaline; (2)=Acidic; and(3)=Caustic.
**No effect if solution temperature is less than 60°C

Tanks:

Cleaning - check the tank for contamination whenever you change solution. if necessary, remove contaminants with a nonabrasive cloth and water.

Emptying - always unplug the cleaner before emptying the tank. Empty the solution into a waste disposal unit.

Filling - always unplug the line cord before filling the tank. Fill the cleaner to the operating level (1 inch from the top with beaker/support rack in place), using warm tap water.

Low solution level - will cause the cleaner to fail. When you remove heavy or bulky loads from the cleaner, the solution level may drop below the operating level. If so, be sure to replace lost solution and degas, if necessary, depending on the amount used.

Overload - do not rest any items on the tank bottom. Weight on the tank bottom dampens sound energy and will cause damage to the transducer. Instead, use a support rack and/or beaker positioning cover to support all items. Allow at least 1 inch between the tank bottom and the beaker or receptacle for adequate cavitation.

Covers - allow the cleaner to heat up faster, to a higher temperature, and avoid excessive liquid evaporation.

Shell:

Cleaning- the ultrasonic cleaner may be cleaned using a dry soft towel. Do not use liquids to clean.

Temperature:

Heater - the heater may cause some discoloration of the tank wall. This is normal and will not affect the performance of the unit.

Solution - a cleaner with heater and with a cover will stabilize at 70°C approx, running continuously. Ultrasonics will add heat to the solution.

Solution:

Solution activity- the amount of visible activity is not necessarily related to optimum cavitation for cleaning.

Degassing - fresh solutions contain many dissolved gases(usually air),which reduce effective ultrasonic action. Although solutions will naturally degas over time, using Degas mode speeds up the degassing process. Solutions that have been sitting unused for 24 hours or longer have reabsorbed some gases.

Heat - increases the chemical activity of cleaning solutions.

Surface tension - can be reduced by adding a wetting agent of surfactant to the bath. Reduced surface tension will increase cavitation.

Solvents - never use solvents. Vapors of flammable solutions will collect under the cleaner, where ignition is possible from electrical components.

Renewal - replace cleaning solutions often to increase ultrasonic cleaning activity. Solutions, as with most chemicals, become spent over time. Solutions can become contaminated with suspended contaminate particles which coat the tank bottom, inhibiting ultrasonic activity.

Equipment Specifications

Digital Timer

Model	Input power supply (V~)	Capacity (L)	Tank Size W×H×D (mm)	Max. Power Require (W)	RF-Power (W)	Built-in Drains
97043-958	220V~50/60Hz	1.9	150×100×140	140	48	—
97043-960	117V~ 60Hz					
97043-962	220V~50/60Hz	2.8	240×100×140	240	90	—
97043-964	117V~ 60Hz					
97043-966	220V~50/60Hz	5.7	300×150×150	400	144	—
97043-968	117V~ 60Hz					
97043-970	220V~50/60Hz	9.5	300×150×240	590	180	YES
97043-972	117V~ 60Hz					
97043-974	220V~50/60Hz	13.8	330×150×300	790	240	YES
97043-976	117V~ 60Hz					
97043-978	220V~50/60Hz	20.8	500×150×300	1120	320	YES
97043-980	117V~ 60Hz					
97043-982	220V~50/60Hz	28.4	500×200×300	1450	384	YES
97043-984	117V~ 60Hz					

NOTE :
- Frequency : 35kHz +3.5/−0.5
- Operating temperature range : 5 ~ 40°C; Relative humidity range : RH 0 ~ 90% .
- Operated under altitude up to 2000m and as indoor use.
- Storage/Shipping temperature range : −25 ~ 55°C; Relative humidity range : RH 0 ~ 90%.

Digital Controller,Timer and Heat

Model	Input power supply (V~)	Capacity (L)	Tank Size W×H×D (mm)	Max. Power Require (W)	RF-Power (W)	Heating Power (W)	Built-in Drains
97043-986	220V~50/60Hz	1.9	150×100×140	140	48	64	—
97043-988	117V~ 60Hz						
97043-990	220V~50/60Hz	2.8	240×100×140	240	90	104	—
97043-992	117V~ 60Hz						
97043-994	220V~50/60Hz	5.7	300×150×150	400	144	204	—
97043-996	117V~ 60Hz						
97044-000	220V~50/60Hz	9.5	300×150×240	590	180	326	YES
97044-002	117V~ 60Hz						
97044-004	220V~50/60Hz	13.8	330×150×300	790	240	436	YES
97044-006	117V~ 60Hz						
97044-008	220V~50/60Hz	20.8	500×150×300	1120	320	654	YES
97044-010	117V~ 60Hz						
97044-012	220V~50/60Hz	28.4	500×200×300	1450	384	892	YES
97044-014	117V~ 60Hz						

NOTE :
- The temperature readout accuracy is ±3°C
- Frequency : 35kHz +3.5/−0.5
- Operating temperature range: 5 ~ 40°C; Relative humidity range : RH 0 ~ 90% .
- Operated under altitude up to 2000m and as indoor use.
- Storage/Shipping temperature range: −25 ~ 55°C; Relative humidity range : RH 0 ~ 90%.

Equipment Specifications

Digital Controller,Timer、Heat and Degas

Model	Input power supply (V~)	Capacity (L)	Tank Size W×H ×D (mm)	Max. Power Require (W)	RF- Power (W)	Heating Power (W)	Built-in Drains
97043-930	220V~50/60Hz	1.9	150 ×100 ×140	140	48	64	—
97043-932	117V~ 60Hz						
97043-934	220V~50/60Hz	2.8	240 ×100 ×140	240	90	104	—
97043-936	117V~ 60Hz						
97043-938	220V~50/60Hz	5.7	300 ×150 ×150	400	144	204	—
97043-940	117V~ 60Hz						
97043-942	220V~50/60Hz	9.5	300 ×150 ×240	590	180	326	YES
97043-944	117V~ 60Hz						
97043-946	220V~50/60Hz	13.8	330 ×150 ×300	790	240	436	YES
97043-948	117V~ 60Hz						
97043-950	220V~50/60Hz	20.8	500 ×150 ×300	1120	320	654	YES
97043-952	117V~ 60Hz						
97043-954	220V~50/60Hz	28.4	500 ×200 ×300	1450	384	892	YES
97043-956	117V~ 60Hz						

NOTE :
- The temperature readout accuracy is ±3°C
- Frequency : 35kHz +3.5/−0.5
- Operating temperature range: 5 ~ 40°C; Relative humidity range : RH 0 ~ 90% .
- Operated under altitude up to 2000m and as indoor use.
- Storage/Shipping temperature range: −25 ~ 55°C; Relative humidity range : RH 0 ~ 90%.

Cover（Included in products）

Capacity	1.9L	2.8L	5.7L	9.5L	13.8L	20.8L	28.4L
Product Number	97044-016	97044-018	97044-020	97044-022	97044-024	97044-026	
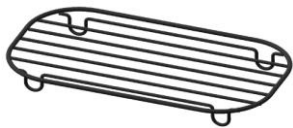
Support Rack（Included in products）

Capacity	1.9L	2.8L	5.7L	9.5L	13.8L	20.8L	28.4L
Product Number	97044-042	97044-044	97044-046	97044-048	97044-050	97044-052	

Basket

Capacity	1.9L	2.8L	5.7L	9.5L	13.8L	20.8L	28.4L
Product Number	97044-028	97044-030	97044-032	97044-034	97044-036	97044-038	97044-040
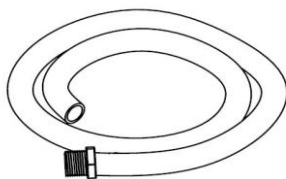
Soft Drainpipe（Included in products）

Capacity	9.5L	13.8L	20.8L	28.4L
Product Number	97044-060			
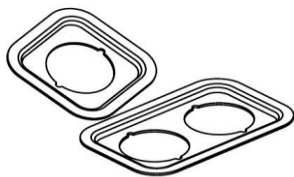
Beaker Positioning Cover
（Applicable to 500ml beaker）

Capacity	1.9L	2.8L	5.7L	9.5L	13.8L	20.8L	28.4L
Product Number	97044-054	97044-056	97044-058				

MODEL:
97043-958, 97043-960, 97043-962, 97043-964, 97043-966, 97043-968, 97043-970
97043-972, 97043-974, 97043-976, 97043-978, 97043-980, 97043-982, 97043-984
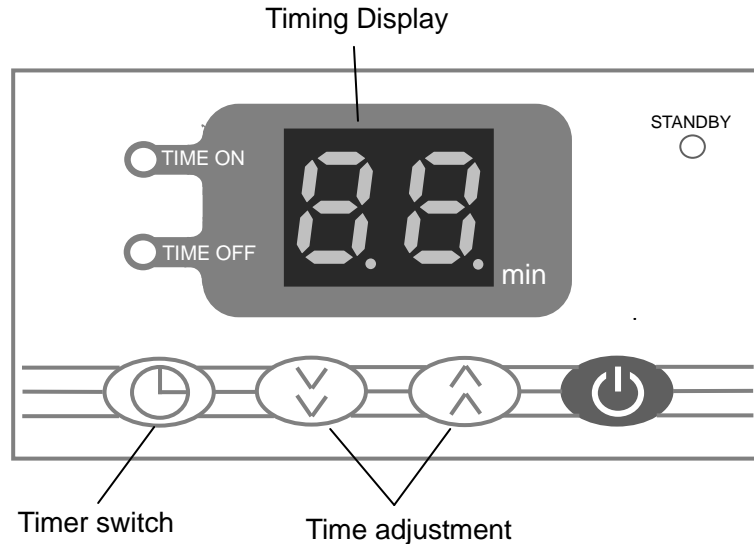
Explanation of controls:

1. Plug in the power supply, "**STANDBY**" light is on.

2. Turn on the power switch, "**STANDBY**" light is off, cleaner starts to work for 15 minutes as default, "**TIME ON**" light is on.

3. Time can be reset during operation to 1-99 minutes. Press the time adjust key and hold for more than 2 seconds,the number displayed will increase or decrease. To stop, press the timer key for over 1 second, the cleaner will resume work.

4. If the time does not need to be set, press the timer switch until the number displayed disappears and "**TIME ON**" light is off.

5. If the unit is turned off when it is in operation and the power is not removed, it will restore the status and setup of the last operation when it is turned on again.

6. There will be 6 buzzes as notification after the set time has expired.

Before you start cleaning:

⚠ **WARNING**

● Don't place parts or containers directly on the bottom of the cleaning tank; use a support rack, wire or beaker cover to suspend items.

● The water surface should not be lower than **"MIN.LEVEL"**.

● Don't ever use alcohol, gasoline or flammable solution. Doing so could cause a fire or explosion. Use only water-based solutions.

● Don't ever use mineral acids or bleaches. These could damage the tank.

Step

1. Select your cleaning solution.

2. Allowing for the volume of the parts you will be cleaning and cleaning solution, fill the tank with warm tap water to the operating level line.

3. Add cleaning solution to the tank water.

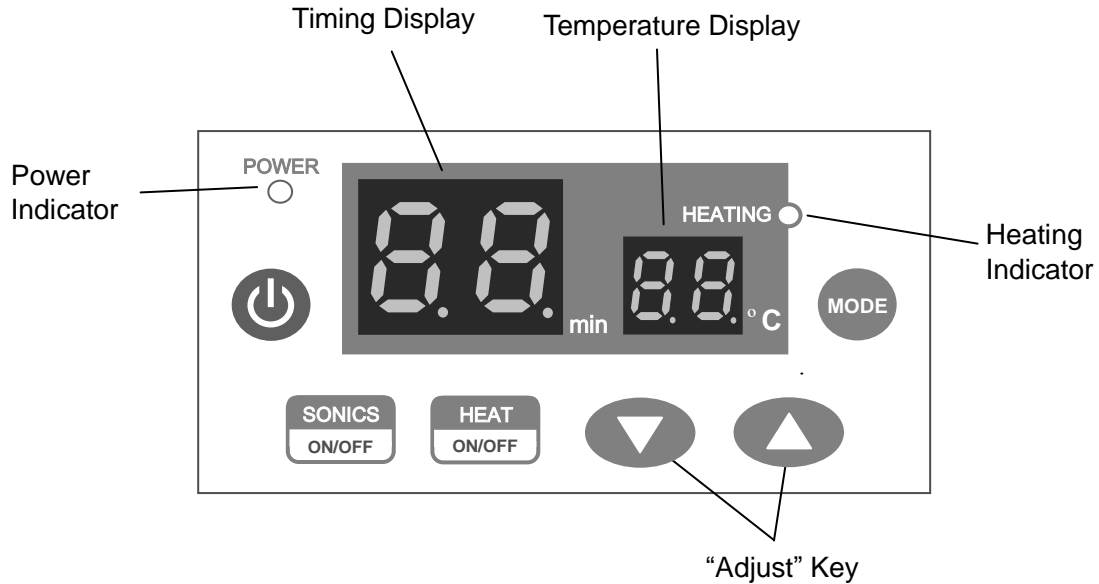**4.** Plug the cleaner into a grounded outlet.

Cleaning items:

Step

1. Set the TIMER for the amount of time you wish the items to be cleaned.

2. Place the items into a basket or beakers in a positioning cover.

3. If using beakers, add cleaning solution to beakers to cover the items.

4. Slowly lower the basket or beakers into the tank. Do not allow items to contact the tank bottom. Do not stir the solution.

5. When items are clean, slowly remove them from the cleaner.

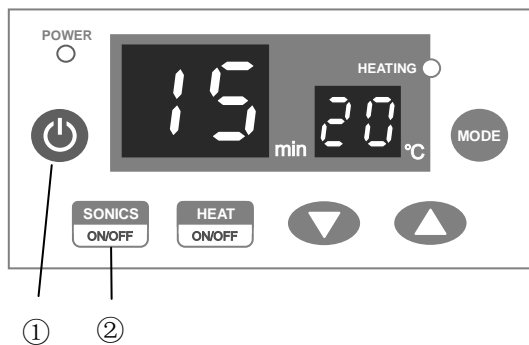**6.** Rinse the clean items with clean water and dry them, if necessary.

MODEL:
97043-986, 97043-988, 97043-990, 97043-992, 97043-994, 97043-996, 97044-000
97044-002, 97044-004, 97044-006, 97044-008, 97044-010, 97044-012, 97044-014

Explanation of controls:

1. Plug in the power and the **Power Indicator** will flash.

2. Switch on the **power** and the **Power Indicator** will be off. The **Timing Display** shows the default ultrasonic timing of **15** minutes and the **Temperature Display** shows real time temperature of the bath. If it is not necessary to adjust these timing, press the **SONICS** key to start operation.

STEP:

① Press the ⏻ key
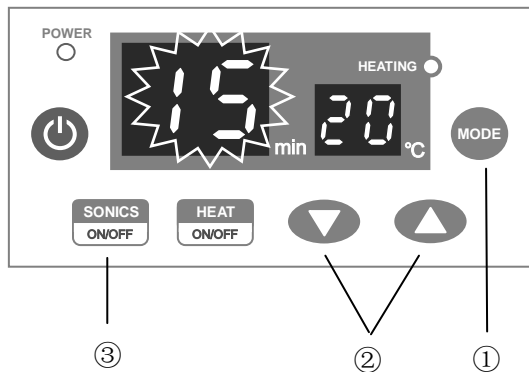
② Press the SONICS ON/OFF key to start ultrasonic

3. Users can use **MODE** key and **Adjust** key to change timing, temperature and degassing setup. The range of timing setup is **1~ 99** minutes and temperature setup is **20 ~ 69°C**

● **Change Ultrasonic Timing Setup**
Press **MODE** key till number on the timing screen flashes. Press the **Adjust** key to change timing. Turn on the **SONICS** key thereafter to start ultrasonic. Press the **Adjust** key for over 2 seconds, the number on the screen will change rapidly. After the set time is expired, there will be a 6 buzz notification.

STEP:
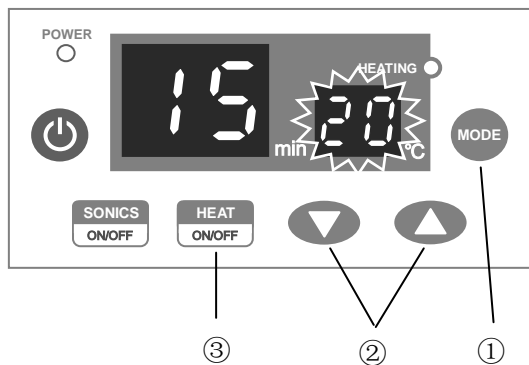
① Press **MODE** key till number on the timing screen flashes
② Press the ▼ ▲ key to change timing
③ Press the **SONICS ON/OFF** key to start ultrasonic

● **Change Set Temperature**

Press **MODE** key till the number on the **Temperature Display** flashes (the shown number at this point is set temperature). Press the **Adjust** key to change set temperature and then turn on the **HEAT** key to start heating. The **Heating Indicator** will flash and the number on **Temperature Display** will show bath temperature (**Temperature Display** usually shows bath temperature and shows set temperature only when adjusting set temperature).

STEP:

① Press **MODE** key till number on the temperature display flashes
② Press the ▼ ▲ key to change set temperature
③ Press the **HEAT ON/OFF** key to start heating

When temperature of solution in the bath reaches set temperature, the machine will stop heating. There will be 2 buzz as notification and the **Heating Indicator** will be on but stop flashing. Press the **Adjust** key for over 2 seconds, the number on **Temperature Display** will change rapidly.

● **Change Set Temperature at Heating Status**

When the machine is in heating status, press the **MODE** key till the number on **Temperature Display** flashes. Press the **Adjust** key to change the number to the desired temperature (the machine will keep at heating status during the setup process). After the setup finishes, the machine will run towards the set temperature automatically without turning on **HEAT** key again.

4. If the unit is turned off when it is in operation and the power is not removed, it will restore the status and setup of the last operation when it is turned on again.

5. Turn on the power and start heating at ultrasonic standby status (ultrasonic is not turned on), the machine will activate ultrasonic device for 5 seconds every 2 minutes to balance solution temperature. The function is not available at degassing standby status.

6. When ultrasonic or degassing finishes, heating stops simultaneously and the machine turns to standby status. To maintain the temperature, simply turn on the machine and then turn on **HEAT** key. The machine will restore the set temperature of the last operation and go to heating status.

NOTE:

You may require an exact/constant temperature for your application. Please note that ultrasonics may continue to heat the solution beyond your set temperature, even though the heater has cycled off and the "Heat On" light is still light. If this happens, turn the cleaner off and allow the solution to cool down. For a fast cool down, replace some of the warm solution with cold solution.

The optimal temperature of the heating solution is **55 ~ 60°C**. When the temperature goes up to **65 ~ 80°C**, ultrasonic internal resistance would increase by **10~20%** and the power would reduce by **24~34%**

Before you start cleaning:

⚠ **WARNING**

● Don't place parts or containers directly on the bottom of the cleaning tank; use a support rack, wire or beaker cover to suspend items.

● The water surface should not be lower than **"MIN.LEVEL"** to prevent damages to heating device.

● Don't ever use alcohol, gasoline or flammable solution. Doing so could cause a fire or explosion. Use only water-based solutions.

● Don't ever use mineral acids or bleaches. These could damage the tank.

Step

1. Select your cleaning solution.

2. Allowing for the volume of the parts you will be cleaning and cleaning solution, fill the tank with warm tap water to the operating level line.

3. Add cleaning solution to the tank water.

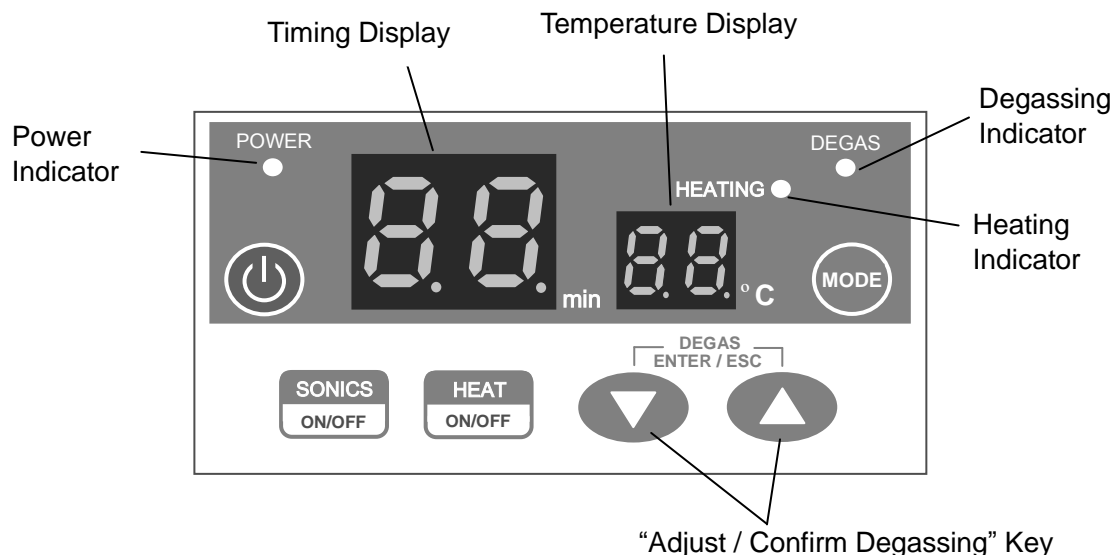**5.** Plug the cleaner into a grounded outlet.

Cleaning items:

Step

1. Set the TIMER for the amount of time you wish the items to be cleaned.

2. Place the items into a basket or beakers in a positioning cover.

3. If using beakers, add cleaning solution to beakers to cover the items.

4. Slowly lower the basket or beakers into the tank. Do not allow items to contact the tank bottom. Do not stir the solution.

5. When items are clean, slowly remove them from the cleaner.

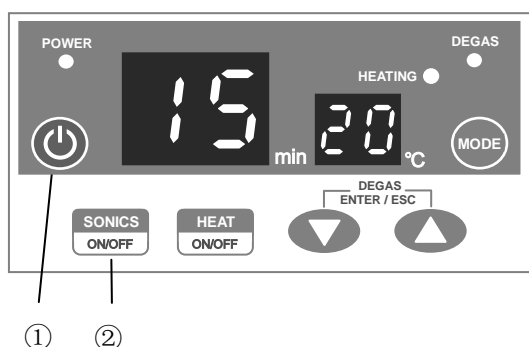**6.** Rinse the clean items with clean water and dry them, if necessary.

MODEL:
97043-930, 97043-932, 97043-934, 97043-936, 97043-938, 97043-940, 97043-942
97043-944, 97043-946, 97043-948, 97043-950, 97043-952, 97043-954, 97043-956

Explanation of controls:

1. Plug in the power and the **Power Indicator** will flash.

2. Switch on the **power** and the **Power Indicator** will be off. The **Timing Display** shows the default ultrasonic timing of **15** minutes and the **Temperature Display** shows real time temperature of the bath. If it is not necessary to adjust these timing, press the **SONICS** key to start operation.

STEP:

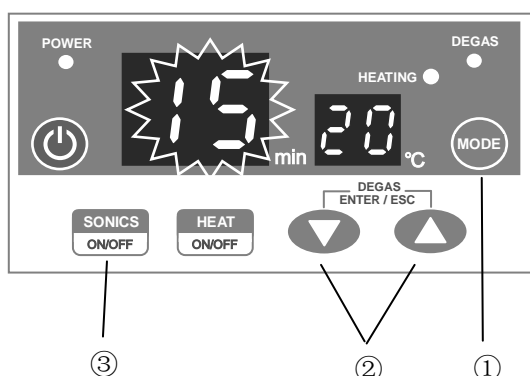| ① Press the ⏻ key |
| --- |
| ② Press the SONICS ON/OFF key to start ultrasonic |

3. Users can use **MODE** key and **Adjust** key to change timing, temperature and degassing setup. The range of timing setup is **1~ 99** minutes and temperature setup is **20 ~ 69°C**

● **Change Ultrasonic Timing Setup**
  Press **MODE** key till number on the timing screen flashes. Press the **Adjust** key to change timing. Turn on the **SONICS** key thereafter to start ultrasonic. Press the **Adjust** key for over 2 seconds, the number on the screen will change rapidly. After the set time is expired, there will be a 6 buzz notification.
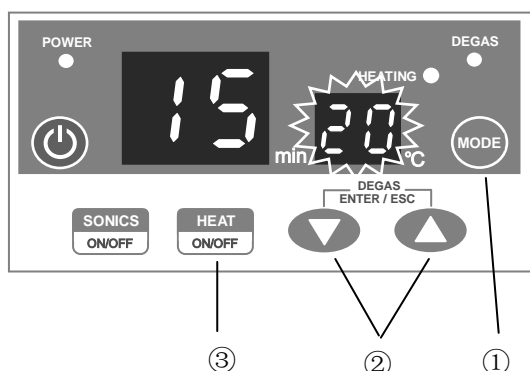
STEP:

① Press **MODE** key till number on the timing screen flashes
② Press the ▽ △ key to change timing
③ Press the **SONICS ON/OFF** key to start ultrasonic

● **Change Set Temperature**

Press **MODE** key till the number on the **Temperature Display** flashes (the shown number at this point is set temperature). Press the **Adjust** key to change set temperature and then turn on the **HEAT** key to start heating. The **Heating Indicator** will flash and the number on **Temperature Display** will show bath temperature (**Temperature Display** usually shows bath temperature and shows set temperature only when adjusting set temperature).

STEP:

① Press **MODE** key till number on the temperature display flashes
② Press the ▽ △ key to change set temperature
③ Press the **HEAT ON/OFF** key to start heating

When temperature of solution in the bath reaches set temperature, the machine will stop heating. There will be 2 buzz as notification and the **Heating Indicator** will be on but stop flashing. Press the **Adjust** key for over 2 seconds, the number on **Temperature Display** will change rapidly.

● **Set Degassing and Adjust Degassing Timing**

Press **MODE** key till the **Degassing indicator** flashes. Press **Adjust** key once (either up or down) to confirm degassing status. The **Degassing Indicator** will be on and the **Timing Display** will show the **5**-minute default degassing timing and flash (users can then press **Adjust** key to select degassing timing within the range of 1~99 minutes). Turn on the **SONICS** key to start degassing.
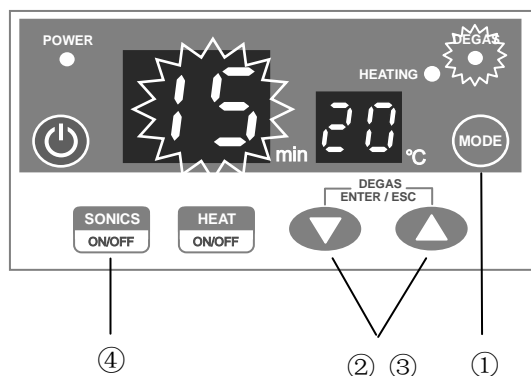
STEP:

① Press [MODE] key till the degassing indicator flashes	
② Press [▼] [▲] key once (either up or down) to confirm degassing status	
③ Press [▼] [▲] key to select degassing timing	
④ Press the [SONICS ON/OFF] key to start degassing	

● **Change Set Temperature at Heating Status**

When the machine is in heating status, press the **MODE** key till the number on **Temperature Display** flashes. Press the **Adjust** key to change the number to the desired temperature (the machine will keep at heating status during the setup process). After the setup finishes, the machine will run towards the set temperature automatically without turning on **HEAT** key again.

4. If the unit is turned off when it is in operation and the power is not removed, it will restore the status and setup of the last operation when it is turned on again.

5. Turn on the power and start heating at ultrasonic standby status (ultrasonic is not turned on), the machine will activate ultrasonic device for 5 seconds every 2 minutes to balance solution temperature. The function is not available at degassing standby status.

6. When ultrasonic or degassing finishes, heating stops simultaneously and the machine turns to standby status. To maintain the temperature, simply turn on the machine and then turn on **HEAT** key. The machine will restore the set temperature of the last operation and go to heating status.

NOTE:

You may require an exact/constant temperature for your application. Please note that ultrasonics may continue to heat the solution beyond your set temperature, even though the heater has cycled off and the "Heat On" light is still light. If this happens, turn the cleaner off and allow the solution to cool down. For a fast cool down, replace some of the warm solution with cold solution.

The optimal temperature of the heating solution is **55 ~ 60°C**. When the temperature goes up to **65 ~ 80°C**, ultrasonic internal resistance would increase by **10~20%** and the power would reduce by **24~34%**.

Before you start cleaning:

⚠ **WARNING**

- Don't place parts or containers directly on the bottom of the cleaning tank; use a support rack, wire or beaker cover to suspend items.

- The water surface should not be lower than **"MIN.LEVEL"** to prevent damages to heating device.

- Don't ever use alcohol, gasoline or flammable solution. Doing so could cause a fire or explosion. Use only water-based solutions.

- Don't ever use mineral acids or bleaches. These could damage the tank.

Step

1. Select your cleaning solution.

2. Allowing for the volume of the parts you will be cleaning and cleaning solution, fill the tank with warm tap water to the operating level line.

3. Add cleaning solution to the tank water.

4. Plug the cleaner into a grounded outlet.

Cleaning items:

Step

1. Set the TIMER for the amount of time you wish the items to be cleaned.

2. Place the items into a basket or beakers in a positioning cover.

3. If using beakers, add cleaning solution to beakers to cover the items.

4. Slowly lower the basket or beakers into the tank. Do not allow items to contact the tank bottom. Do not stir the solution.

5. When items are clean, slowly remove them from the cleaner.

6. Rinse the clean items with clean water and dry them, if necessary.

Troubleshooting

Problem	Reason	Action
Long alarm after power plugged in. Whole screen display or non-display	The instrument is not ready.	Unplug the power plug and plug in after 6 seconds
Can't turn on ultrasonic or heating function.	Power not plugged in	Plug in
	The receptacle has no power	Find a receptacle with power
	Fuse blown	Call qualified maintenance personnel
Weak ultrasonic effect.	Without degas process, the solution is easier to produce bubble after heating.	Turn on for at least 5 minutes
	Higher liquid line after putting in rinsed object	Lower the liquid line to the recommended liquid level
	Dirt covers the trough bottom	Empty the trough and clean the bottom.
	Cleaning solution loses effect after long use.	Replace solution.
Incorrect status after pressing button	Switch failure	Shutdown and restart the instrument

VWR Ultrasonic Cleaners, when used in accordance with manufacturer's instructions and under normal use, are guaranteed for two years after date of shipment. Within the period guaranteed, VWR will repair or replace free of charge, at its sole discretion.

VWR Ultrasonic Cleaners, when used in accordance with manufacturer's instructions and under normal environment conditions as described in equipment specifications, are guaranteed to satisfy the IEC 61010-1:2001 safety provisions or UL61010-1:2004, CAN/CSA C22.2 NO.61010-1:2004 safety provisions.If used in a manner not specified by the manufacturer's instructions, the protection provided by the cleaners may be impaired.

⚠ WARNING

● Don't place parts or containers directly on the bottom of the cleaning tank; use a support rack, wire or beaker cover to suspend items.

● The water surface should not be lower than **"MIN.LEVEL"** to prevent damages to heating device.

● Don't ever use alcohol, gasoline or flammable solution. Doing so could cause a fire or explosion. Use only water-based solutions.

● Don't ever use mineral acids or bleaches. These could damage the tank.

● Don't disassemble your cleaner or you will void the warranty. High voltage inside the cleaner is dangerous.

Failure to comply with these warnings will void your warranty.

VWR's liability, whether based on warranty, negligence or other cause, arising out of and/or incidental to sale, use or operation of the transducer elements, or any part thereof, shall not in any cause exceed the cost of repair or replacement of the defective equipment, and such repair of replacement shall be the exclusive remedy of the purchaser, and in no case shall VWR be responsible for any and/or all consequential damages including without limitation, and/or all consequential damages arising out of commercial losses.

Please check your cleaner and its carton carefully for external or internal damage. If you find damage, contact shipping carrier immediately, before contacting your distributor.
Please retain your packaging for future use.

With normal use，your ultrasonic cleaner should not require servicing, however, if it fails to operate satisfactorily, first try to diagnose the problem by following the suggestions in the Troubleshooting Guide.

If your cleaner needs repair, please contact VWR.