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# Use and maintenance manual

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## SONICA ETH / EP new S4 series



(Ed. 1 Rev. 0-04/04/2022)



Company with Quality  
Management System certified  
ISO 9001  
ISO 13485

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### **Dear Customer,**

First of all thank you for choosing to purchase ultrasound equipment model SONICA® serie S4 manufactured by SOLTEC® Srl in Milan.

All the ultrasound equipment used in mod. SONICA® are reliable and all the components are designed and produced to ensure the best performances at all times.

Please carefully complete the Warranty Certificate enclosed in the instruction manual and send it immediately to your place of purchase to validate a twelve months warranty from the purchase date according to the conditions described in the warranty certificate.

The instruction manual is an integral and essential part of the equipment; it contains important information about safety during installation, use and maintenance. The manual must be kept with care. If sold or transferred, make sure that the instructions remain with the equipment.

Incorrect installation or use could cause damage to people, animals or objects for which the manufacturer cannot be held responsible.

**Please read the instruction before positioning, installing and starting the equipment to avoid any damage to you and to the equipments.**

**SOLTEC® Srl reserves the right to carry out technical modifications without updating this manual.**

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**EU DECLARATION OF CONFORMITY**

We undersigned SOLTEC S.r.l., single registration number (SRN): IT-MF-000018179  
with recorded office addressed in MILANO, Via G. Röntgen 16 – 20136, as manufacturer of medical  
devices:

Product name	Codes	Basic UDI-DI
SONICA Ultrasonic Cleaner	1200MS3ZZVW	805108418FT002ST2M
	2200X(X)(X)YYZZVW	
	2400X(X)(X)YYZZVW	
	3200X(X)(X)(X)YYZZVW	
	3200LX(X)(X)(X)YYZZVW	
	3300X(X)(X)(X)YYZZVW	
	4200X(X)(X)(X)YYZZVW	
	4300X(X)(X)(X)YYZZVW	
	5200X(X)(X)(X)YYZZVW	
	5300X(X)(X)(X)YYZZVW	
	45XX(X)YYZZVW	
	60XX(X)YYZZVW	
	90XX(X)YYZZVW	
	ATXX(X)YYZZVW	

intended for cleaning of surgical instruments, risk class I (Not Sterile), according to the rule 13 of the EU Regulation 2017/745, Annex VIII, declare under its own responsibility that the medical devices:

- comply with safety and performance requirements and dispositions of the EU Regulation 2017/745 and further amendments as per technical file kept on the premises of the company;
- no common specifications were used for the compliance of the aforementioned medical devices;
- comply with Directive 2011 /65 / EU and Directice RoHS III 2015/863/UE about the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- are manufactured according to the Quality System which satisfies requirements of Annex II + III of the above mentioned Regulation;
- comply with following standards: EN 61326-1:2013, EN 61010-1:2010,

Milan, date 03<sup>rd</sup> January 2022

**SOLTEC S.r.l.**  
The CTO  
[Chief Technical Officer]

**Pietro Angelo Falbo**



## Warranty

The information contained in this document can vary without prior notice.

SOLTEC S.r.l. cannot be held responsible for any mistakes contained in this document nor for any accidental damage nor any damage due to the supply, the performance or the use of this material.

The warranty covers all manufacturing and material defects for a period of 12 (twelve) months since the purchase date according to the provisions indicated in the relevant warranty certificate. During the warranty period, SOLTEC S.r.l., in case of failure of the equipment, can decide whether to repair or replace the defective product.

### Warranty service

To obtain warranty service or repair this equipment must be sent to SOLTEC S.r.l. through the dealer CARRIAGE FREE. Once the equipment has been repaired, it will be sent to the customer CARRIAGE FORWARD.

The warranty does not cover the technicians' travelling expenses, the shipping costs or the transport risks, which must be paid by the Customer. Moreover, all the shipping costs from another country, included taxes, of SOLTEC S.r.l. products must be paid by the Customer.

The repairs under manufacturer's warranty do not effect it.

### Limitation of liability

The warranty includes the replacement or the repair of the defective components, included the necessary work.

It does not include the faults due to an improper use or maintenance by the Customer, or unauthorized modifications, or the use in different environmental conditions from the ones indicated in the manual or an inadequate preparation of the installation site.

No compensation will be due during the replacement or the repair of the equipment. Nevertheless, the manufacturer will decide to replace the equipment only if it cannot be repaired.

No compensation will be given for any direct or indirect damage of any kind to people or object because of the use or the suspension of the use of the equipment.

### Warranty forfeiture

The warranty expires in the following cases:

- in case of arrearage or other breaches of contract.
- whenever the Customer does not inform SOLTEC Srl about the defect within 8 (eight) days from the discovery
- whenever changes or repairs are carried out on our equipment without our prior authorization.
- whenever the serial number is tampered with or cancelled.
- whenever the electrical connections of the equipment are wrong or do not comply with the current regulations, or whether the supply connections are not protected, or there is no ground line, or the wire section is wrong...
- whenever the damage is caused by an incorrect use, mistreatment, hits, falls and other causes not due to normal working conditions.
- whenever the equipment appears to be tampered with, dismantled or previously repaired by unauthorized staff.
- use of non original components or spare parts manufactured and supplied by SOLTEC Srl
- installation by an UNAUTHORIZED technician.

- whenever the completed copy of the warranty certificate is not sent together with a proper commercial document (invoice or receipt) and the original installation report.
- whether the equipment is used for purposes that are different from the ones described in this manual.
- whenever the equipment has holes in the tank due to corrosion caused by the use of cleaning solutions not compatible with the equipment itself and in any case not recommended by the manufacturer SOLTEC Srl.

**All disputes will be settled in the court of justice of Milan (Italy).**

## General supply conditions

### Introduction

The supply of the SONICA S4 series equipment is regulated by the general conditions on after-sale technical support and they are intended to be accepted by the customer at the order.

### Starting and maintenance

The preventive inspection of the installation site, the assembly, the correct preparation of the equipment installation site, included the electrical and water connections, must be paid by the Customer. Routine maintenance and daily care of the equipment are shown in **SECTION 7** of this manual and they must be paid by the Customer.

### Testing

Except special dispensations established at the order confirmation, the testing is carried out at our site before delivery according to our quality standards and complying with the EC standards.

Whenever other tests beyond the ones carried out in our factory are required, they must be paid by the Buyer. The costs include the travelling expenses, the costs for the time that our technician has not worked and the labour cost. The time required for the additional testing does not extend the payment terms and it cannot last more than 15 days.

Any eventual claim must be held in an inner partes proceeding.

### Warranty

Eventual complaints of any kind must be lodged by registered letter with advice of delivery within 8 (eight) days from the receipt of the goods. If the Customer must inform SOLTEC Srl about any eventual manufacturing defect he must send a registered letter with advice of delivery within 8 (eight) days from the discovery. Please refer to the proper section of this manual for all the warranty conditions.

### Dispensations

Any eventual agreement or modification to these general supply and warranty conditions will be valid only if they are written and accepted by SOLTEC s.r.l.

### Final provisions

Only the Court of Milan will be competent notwithstanding art. 32 et seq. of the Italian Code of Civil Procedure for any claim about the execution and the interpretation of every contract with a third part.



## SECTION 1 – TRANSPORT

### 1.0 Unpacking

The multifunction equipment SONICA® S.A.M. 3 Basic USB has been packed carefully with a proper high density polyurethane foam and protected with a corrugated board box.

Keep it in a dry and protected environment with a temperature between +5°C and +30°C. The package and the equipment are fragile, handle them with care, move them avoiding shaking, any impact and do not put them upside down.

Package material: polyurethane foam

Weight of the packed equipment: see weight (according to the model purchased) in the appropriate table on pages 49-50

#### WARNING

The original package must be kept during the warranty period. SOLTEC® Srl does not accept returned items without the original package.



Picture 1

The package must not be hit, it must be handled with care. Be careful not to make it roll or fall down.

The package handling during transport must be carried out in safety conditions by means of a truck. To lift it manually at least two people are needed (**see picture 1**) and they must take it correctly in compliance with the standards in force.

Open the corrugated board box, remove the polyurethane foam protection and remove the equipment with care.

#### WARNING

Never take the equipment from the control panel nor turn it over to take it out. Incorrect operation could damage the equipment.

## SECTION 2 – EQUIPMENT DESCRIPTION

### 2.0 Labelling

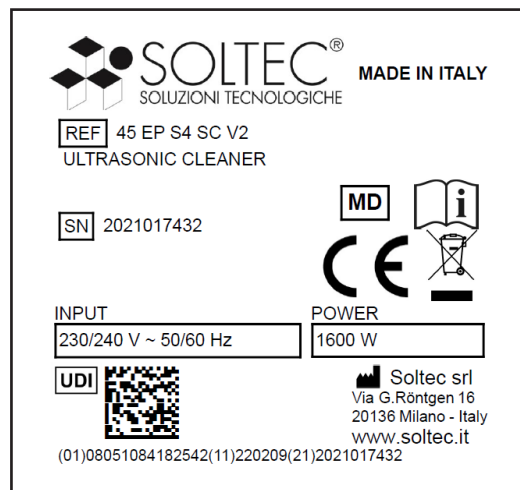
The manufacturer's identification plate complying with the provisions in force (**see picture 2**) is on the rear protection of the equipment.

The plate must not be removed, even if the equipment is resold.

Always refer to the serial number (written on the plate itself) when contacting the manufacturer.

Several safety warnings are placed on some components of the equipment; they must be strictly followed by everyone dealing with the equipment.

The company is not to be held responsible for damage to property or accidents to people which might occur if the above-mentioned warnings are not observed. In such a case, the operator is the only person responsible.



Picture 2

### Safety





To keep the product always safe, the Customer must not replace any part nor make any change without the manufacturer's authorization.

#### WARNING








This symbol focuses the attention on one or more procedures which can damage the product partially or completely or cause damage to the operator if they are not observed.

Before carrying out the procedures described after this symbol, make sure that the specified conditions have been understood and respected completely.

**Safety symbols**

	<b>Read the instruction manual symbol</b> - Consult the instructions for use before using the equipment. Consult the manual to prevent any eventual damage to the product or the operator.
	<b>High voltage symbol</b> - Do not open or tamper with the equipment. There are electrical components under voltage inside the equipment.
	<b>Hot surface symbol</b> - During the thermal drying cycle the water inside the tank becomes very hot (over 65°C). The equipment is designed to prevent the operator from touching the liquid in the tank. Do not force the locking device. Danger of burning.
	<b>Earth terminal symbol</b> Never disconnect the cables connected to the protective earth terminals.

**Other symbols**

	<b>CE symbol</b> - Medical device complying to Directive 93/42/EEC and further amendments.
	<b>Product code symbol</b>
	<b>Serial number symbol</b>
	<b>Manufacturer symbol</b>
	<b>Medical Device Symbol</b>
	<b>UDI (Unique Identification Number) symbol of the device</b>
	<b>DataMatrix Code</b> <b>(includes GTIN code - date of manufacture - device serial number)</b>

## 2.1 Equipment description

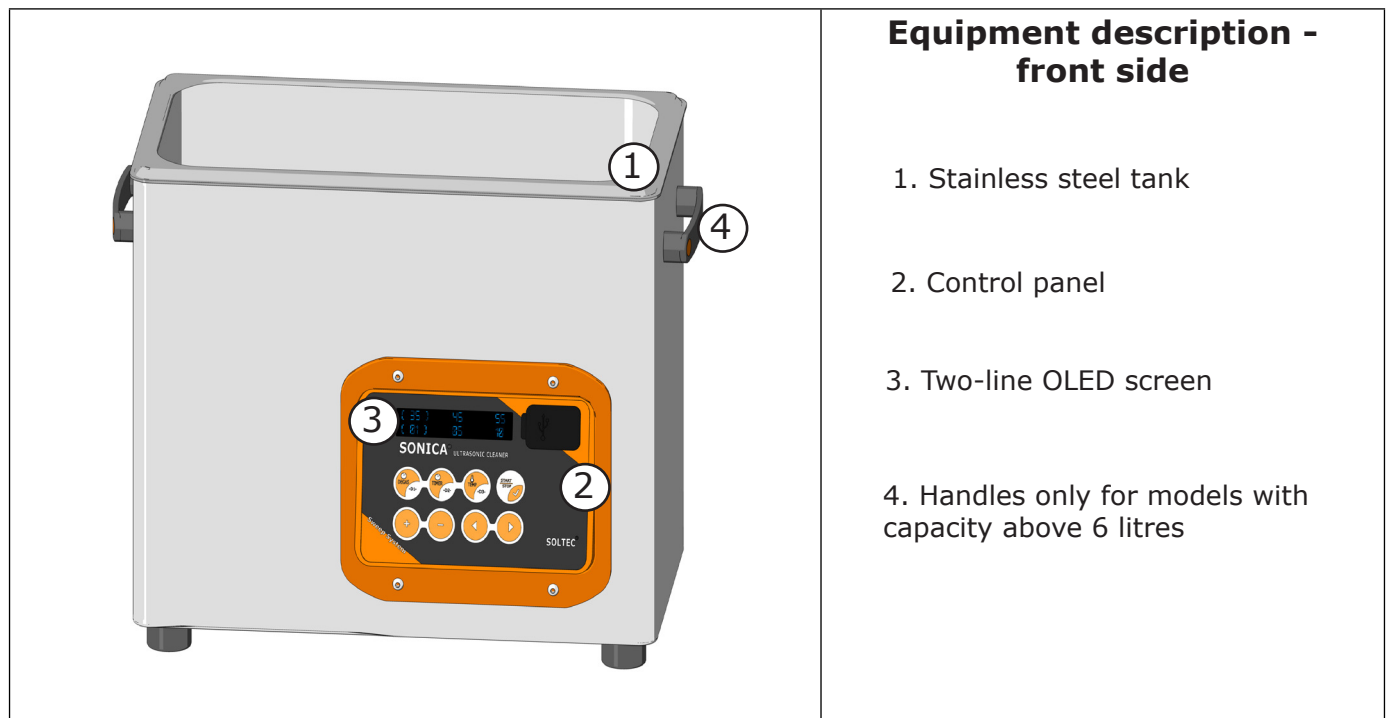
The SONICA S4 series ultrasonic cleaner has been classified by the manufacturer, SOLTEC Srl, as a Class 1 Medical Device.

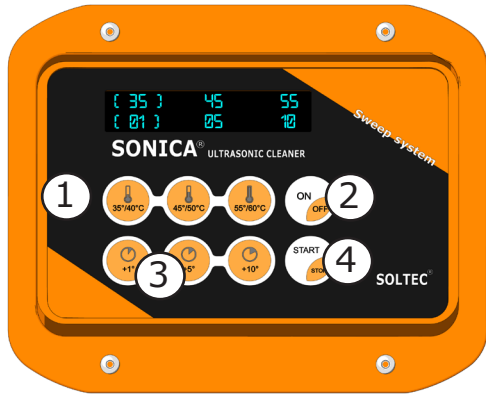
This device, through the effectiveness of ultrasonic cleaning, allows to clean complex surfaces that would be difficult to reach with manual cleaning, eliminating the risks caused by handling contaminated objects. To achieve thorough cleaning, the objects to be cleaned must be fully immersed in the liquid of the tank.

SONICA ultrasonic cleaners are not suitable for cleaning hollow instruments such as cannulated instruments, suction cannulas, needles or turbines as it would not be possible to guarantee proper washing and rinsing inside them.

Such medical devices, if designed by the manufacturer as reusable, require specific manual washing techniques or the use of automatic machines specifically designed for this purpose, and in any case in accordance with the instructions in the user manual and/or in the technical data sheet of the medical device itself.

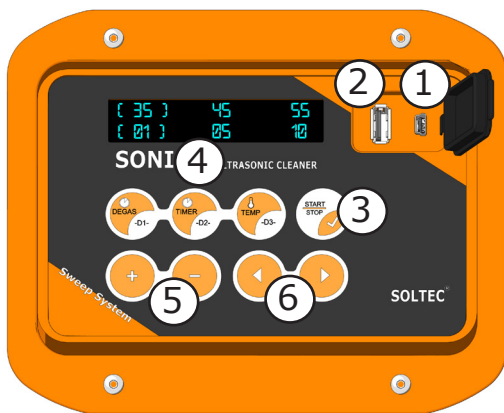
Any disposable instrument, precisely because it is a "disposable" object, must never be cleaned with SONICA ultrasonic cleaning devices.





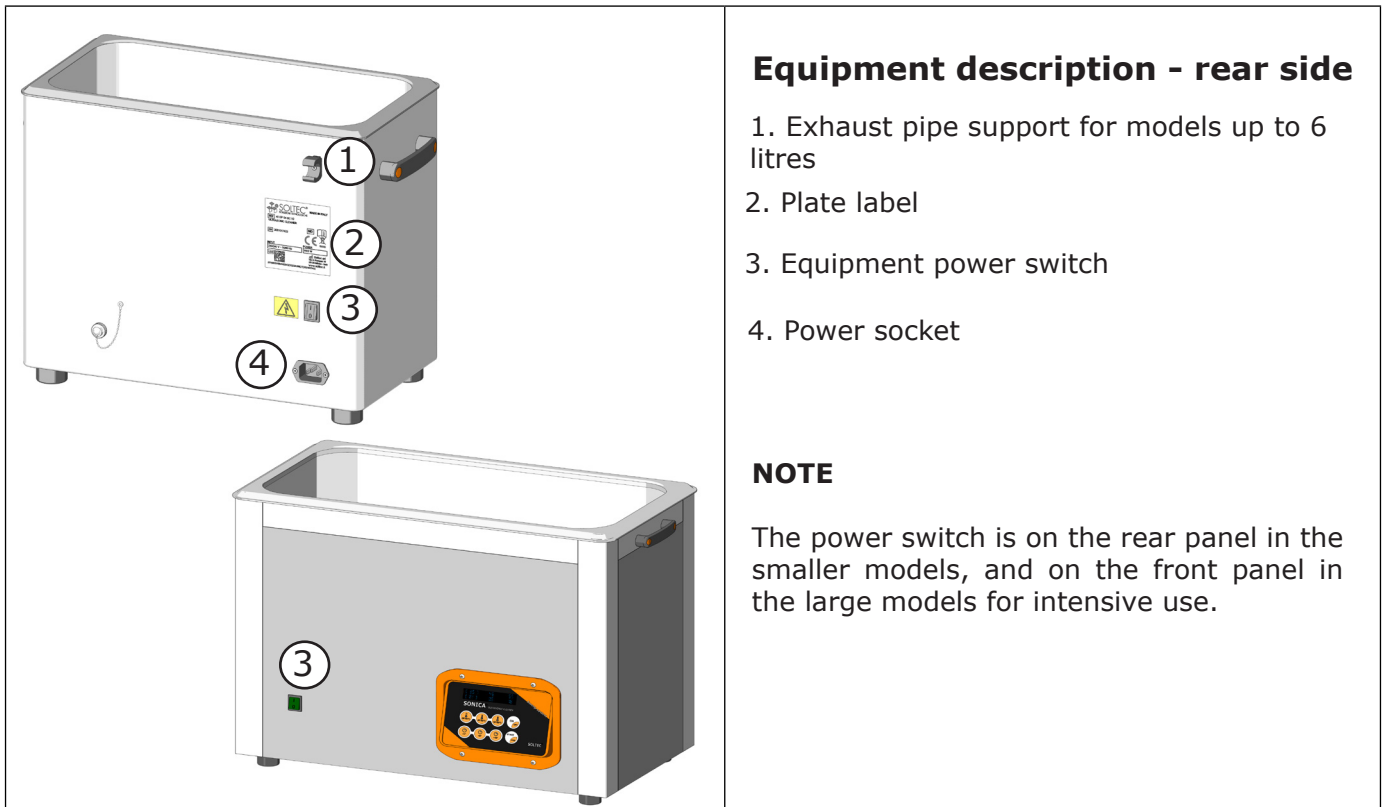
### Description of the ETH series control panel

1. Ultrasonic washing fluid temperature keys
2. **On/Off** key for switching on or off the heating
3. Ultrasonic cycle timing keys
4. **Start/Stop** key for starting/stopping the ultrasound cycle



### Description of the EP series control panel

1. Mini USB socket for external temperature sensor connection
2. USB socket for external drive connection
3. **Start/Stop** key for starting/stopping the program and confirming set data
4. DEGAS / TIMER / TEMP programming keys
5. +/- and scroll left/right keys
6. Keys for moving between menus



## Equipment description - rear side

1. Exhaust pipe support for models up to 6 litres
2. Plate label
3. Equipment power switch
4. Power socket

## NOTE

The power switch is on the rear panel in the smaller models, and on the front panel in the large models for intensive use.

## ⚠ WARNING

The SONICA ultrasonic cleaner must only be used to clean instruments and materials that are compatible with the ultrasonic cleaning system and exclusively for the uses indicated by the manufacturer.

## ⚠ WARNING

**DO NOT USE**, under any circumstances, alkaline/acid detergents, as they would damage the stainless steel tank of the equipment.

- SONICA equipments are not designed to be used in combination with flammable liquids.
- Do not use SONICA equipments in environments with a potentially explosive atmosphere.
- Do not place objects directly on the bottom of the tank. Always use the basket or the appropriate glasses or stainless steel auxiliary tanks.

## 2.2 Equipment dimensions and overall dimensions

For the dimensions of each SONICA equipment, please refer to the appropriate data sheet that can be obtained from the manufacturer, SOLTEC Srl.

On **page 15 of this manual** you will find the general guidelines.

Other characteristics:

MINIMUM BRIGHTNESS FOR WORKING OPERATIONS: LUX 400

NOISE: dB (A) < 80 dB\*

\*NOISE TESTS HAVE BEEN CARRIED OUT IN ACCORDANCE WITH STANDARD CEI 61010-1.

## 2.3 Technical characteristics

For the technical characteristics of each SONICA equipment, please refer to the appropriate technical reference sheet that can be obtained from the manufacturer SOLTEC Srl, to the tables on pages 49-50 or consult the following table with the main characteristics:

Modello SONICA serie S4	Codice Prodotto	Dimensioni vasca mm	Capacità Litri	Dimensioni esterne mm	Frequenza	Potenza Picco US W	Potenza Riscaldamento W	Rubinetto di scarico
Models SONICA S4 series	Product Code	Tank dimension mm	Capacity Litres	External dimension mm	Frequency	US Peak Power W	Power Heating W	Drain cock
<b>2200 ETH S4</b>	090.027.0001	240X140X100	3	270X170X260	37-39 kHz	260	175	1/4"
<b>2200 EP S4</b>	090.027.0002	240X140X100	3	270X170X260	37-39 kHz	260	175	1/4"
<b>2400 ETH S4</b>	090.027.0003	300X150X100	4,5	325X175X260	37-39 kHz	260	175	1/4"
<b>2400 EP S4</b>	090.027.0004	300X150X100	4,5	325X175X260	37-39 kHz	260	175	1/4"
<b>3200 ETH S4</b>	090.027.0005	300X240X100	6	325X270X260	37-39 kHz	360	175	1/4"
<b>3200 EP S4</b>	090.027.0006	300X240X100	6	325X270X260	37-39 kHz	360	175	1/4"
<b>3200 L ETH S4</b>	090.027.0007	500X140X100	6	540X165X260	37-39 kHz	360	175	1/4"
<b>3200 L EP S4</b>	090.027.0008	500X140X100	6	540X165X260	37-39 kHz	360	175	1/4"
<b>3300 ETH S4</b>	090.027.0009	300X240X150	9,5	400X270X370	37-39 kHz	400	300	1/2"
<b>3300 EP S4</b>	090.027.0010	300X240X150	9,5	400X270X370	37-39 kHz	400	300	1/2"
<b>4200 ETH S4</b>	090.027.0011	330X300X150	14	440X340X410	37-39 kHz	600	500	1/2"
<b>4200 EP S4</b>	090.027.0012	330X300X150	14	440X340X410	37-39 kHz	600	500	1/2"
<b>4300 ETH S4</b>	090.027.0013	330X300X200	18	440X340X410	37-39 kHz	600	500	1/2"
<b>4300 EP S4</b>	090.027.0014	330X300X200	18	440X340X410	37-39 kHz	600	500	1/2"
<b>5200 ETH S4</b>	090.027.0015	500X300X150	21	600X330X410	37-39 kHz	800	1000	1/2"
<b>5200 EP S4</b>	090.027.0016	500X300X150	21	600X330X410	37-39 kHz	800	1000	1/2"
<b>5300 ETH S4</b>	090.027.0017	500X300X200	28	600X330X410	37-39 kHz	1000	1000	1/2"
<b>5300 EP S4</b>	090.027.0018	500X300X200	28	600X330X410	37-39 kHz	1000	1000	1/2"
Modello SONICA Serie Uso Intensivo	Codice Prodotto	Dimensioni vasca mm	Capacità Litri	Dimensioni esterne mm	Frequenza	Potenza Picco US W	Potenza Riscaldamento W	Rubinetto di scarico
Models SONICA Heavy Duty series	Product Code	Tank dimension mm	Capacity Litres	External dimension mm	Frequency	US Peak Power W	Power Heating W	Drain cock
<b>45 EP S4</b>	090.027.0019	500X300X300	45	600X340X525	37-39 kHz	1200	1000	1/2"
<b>45 ETH S4</b>	090.027.0020	500X300X300	45	600X340X525	37-39 kHz	1200	1000	1/2"
<b>60 EP S4</b>	090.027.0021	1100X300X200	60	1160X360X425	37-39 kHz	1400	1500	1/2"
<b>60 ETH S4</b>	090.027.0022	1100X300X200	60	1160X360X425	37-39 kHz	1400	1500	1/2"
<b>AT EP S4</b>	090.027.0023	600X320X350	67	660X380X570	37-39 kHz	1200	1500	1/2"
<b>AT ETH S4</b>	090.027.0024	600X320X350	67	660X380X570	37-39 kHz	1200	1500	1/2"
<b>90 EP S4</b>	090.027.0025	600X500X300	90	660X560X510	37-39 kHz	2000	2000	1/2"
<b>90 ETH S4</b>	090.027.0026	600X500X300	90	660X560X510	37-39 kHz	2000	2000	1/2"
<b>130 EP S4*</b>	090.027.0027	637X366X550	130	860X604X911	37-39 kHz	2400**	7200**	3/4"
<b>130 ETH S4*</b>	090.027.0028	637X366X550	130	860X604X911	37-39 kHz	2400**	7200**	3/4"

Tutti gli apparecchi ad Ultrasuoni SONICA (eccetto il modello SONICA 130) sono classificati dal fabbricante SOLTEC come Dispositivi Medici Classe 1 in conformità al regolamento MDR (EU) 2017/745.  
All SONICA Ultrasonic equipment (except model SONICA130) are classified from the Manufacturer SOLTEC as Medical Devices Class 1 according to MDR (EU) 2017/745.

\*Modello non classificato come dispositivo medico/ Model available not in medical device version

\*\*Alimentazione 400V AC Trifase/Main connection 400V AC Three-phases

**Environmental conditions:** Temperature from 5 to 40°C; relative humidity 80% up to 31°C with a linear decrease up to 50% at 40°C

**Installation conditions:** Class II according to EN 61010-1

## 2.4 Information for use as “Medical Device”

**Denomination:** Ultrasonic Cleaning Equipment EMDN: Z12011302

**Field of application:** Ultrasonic cleaning equipment for surgical and dental instruments

**Classification:** MDR 2017/745/UE Medical Device Regulation Class 1 Rule 13, Active Medical Device, Non-Invasive Medical Device, Non-Implantable Medical Device

### Reference Directives and Standards

93/42/CEE and further amendments Medical Device Directive

MDR 2017/745 and further amendments Medical Device Directive

2014/35/UE Low Voltage Directive

2014/30/UE EMC Directive

CEI EN 61010-1

CEI EN 61326-1

## 2.5 Contents

The supply of the SONICA ultrasonic cleaner includes the following products:




- SONICA ultrasonic cleaning equipment
- Instruction manual and warranty
- Power cable

### If applicable for the specific model

- Drain cock
- Rubber exhaust hose

## 2.6 Accessories and spare parts

For the operator’s safety and for a good operation of the equipment, use only original accessories and spare parts produced by the manufacturer himself.

Product	Description	Code
	Stainless steel basket	Refer to the appropriate list according to model
	Stainless steel basket to insert in the glass beaker	<b>090.004.0016</b>
	Drain pipe kit for SONICA 1/4" series 2200-3200-3200L	<b>090.004.0077</b>



## SONICA ETH / EP - S4 SERIES

	Drain pipe kit for SONICA 1/2" series 3300-90L	<b>090.004.0076</b>
	Stainless steel lid	Refer to the appropriate list according to model
	1 litre bottle of SONICA CL4% concentrated disinfectant detergent (Consumable - we suggest to purchase about 12 bottles)	<b>090.005.0017</b>
	Stainless steel auxiliary tank for washing with aggressive solutions	Refer to the appropriate list according to model
	400 ml glass beaker	<b>090.004.0033</b>
	Stainless steel holder for glass, plastic or stainless steel beaker	Refer to the appropriate list according to model
	Stainless steel beaker for washing small parts with cap and filter	<b>090.004.0074</b>
	250 ml plastic beaker	<b>090.004.0032</b>
	External temperature probe (optional)	<b>091.002.0001</b>
	Remote control connection cable (optional)	<b>091.002.0002</b>

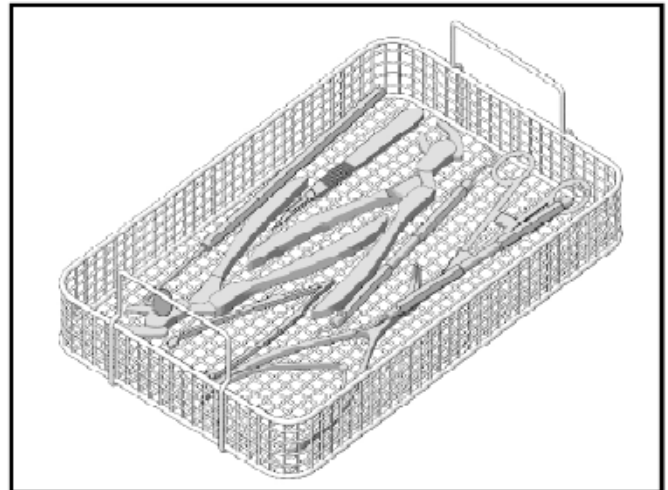
## SECTION 3 - INSTALLATION

### 3.0 Installation

The installation is essential for the use and correct operation of the equipment. Below you can find the operations to be carried out for a correct installation.

- Make sure that the equipment is not damaged. Do not use damaged equipment, in case of doubt ask the dealer or the manufacturer.
- The equipment must be installed in an area where only authorized staff can enter.
- Place the equipment in a flat and solid surface which can support the equipment weight and keep it away from heat sources.
- The area where the equipment is installed must be ventilated.
- Do not install the equipment near areas where there are liquid splashes, and do not place it where liquids can be spilled even accidentally. The outer structure of the equipment is not waterproof.
- Do not place trays, newspapers, liquid containers on the equipment.
- Install the equipment so that the feeding cable is not folded.
- Make sure that the equipment feet are positioned correctly to ensure the air circulation.
- Make sure that the electrical system to which the equipment is connected complies with the laws in force and that it is suitable for the equipment; see paragraph "ELECTRICAL CONNECTION" in this manual.
- Do not use the equipment if the feeding cable or the plug are damaged, if the equipment does not work correctly, or if it is damaged or it has fallen down. In these cases an electric shock, a fire or other accidents could happen. Only address to a skilled technician or to the manufacturer.
- Do not dip the feeding cable or the plug into the water. Keep the feeding cable away from hot surfaces.
- Do not let the cable hang from the edge of tables or pieces of furniture.
- Do not leave nor use this equipment outside.
- Never connect the equipment plug to reducers of any kind. The earthing system could become insufficient.
- Never tamper with the equipment electronic system for any reason. Danger of electric shock. For repairs always contact the manufacturer's technical service. Do not replace the feeding cable. If the cable is worn or damaged, turn off the equipment immediately and contact the assistance service.
- This equipment can be used only in the cases described in this manual and for the purposes for which it has been designed. It must be used only by properly trained staff. People who have not been trained properly must not use this equipment.

- No object must be in contact with the bottom of the tank. Only use the basket provided by the manufacturer. It is advisable to correctly place the instruments to be cleaned on the basket surface in such a way that they do not touch each other (**see picture on the side**).
- The producer is to be held responsible for the product launched on the market according to the regulations in force. The manufacturer is no more liable for operations on the equipment carried out by unskilled staff or using non original spare parts.
- Place the equipment so that it is easy to disconnect the power supply by means of the disconnecter, the switch or the feeding cable.



### 3.1 Electrical connection

Before connecting the equipment plug to the socket, check that the voltage indicated on the identification plate corresponds to the voltage of your workplace.

Connect the equipment to an electrical system compliant with the regulations in force and provided with a differential circuit breaker with an intervention time of  $\leq 50$  ms.

The earthing system is compulsory according to the law.

This product is connected to earth by means of the earth conductor of the feeding cable. Any intentional disconnection of the earth wire inside or outside the equipment or from the plug is forbidden, as it makes it dangerous to use the equipment itself.

The manufacturer denies any liability for damage caused to people or objects due to the lack of enforcement of this law.

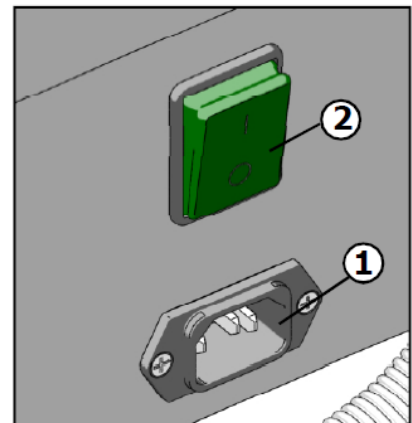
The electrical safety of this equipment is ensured only when it is connected to an efficient earthing system, in compliance with the provisions of the electrical safety regulations in force.

If the electrical system is not provided with a compliant earthing system, do not connect the equipment to the socket and contact a skilled electrician as soon as possible. Never connect the plug to reducers of any kind.

The earthing system could be insufficient.

Equipments from model 2200 to model 45 are fitted with an IEC 320 plug "1" on the back for connecting the power cable. The power switch "2" is above the plug, except for the model 2200, where it is located next to the plug, on the left.

Models 60, AT, 90 and 130 have a fixed power cable, and the power switch is on the front panel.



#### **⚠ WARNING**

**Equipment belonging to Class I. THE EARTHING SYSTEM IS COMPULSORY.**

### 3.2 Drain pipe kit connection

See the leaflet supplied separately in the bag containing the drain pipe and ball valve kit.

Before operating the equipment, connect correctly the ball valve and the drain pipe as indicated in the appropriate assembly and using instructions.

## SECTION 4 - ORDINARY USE

### 4.0 Warnings for the use

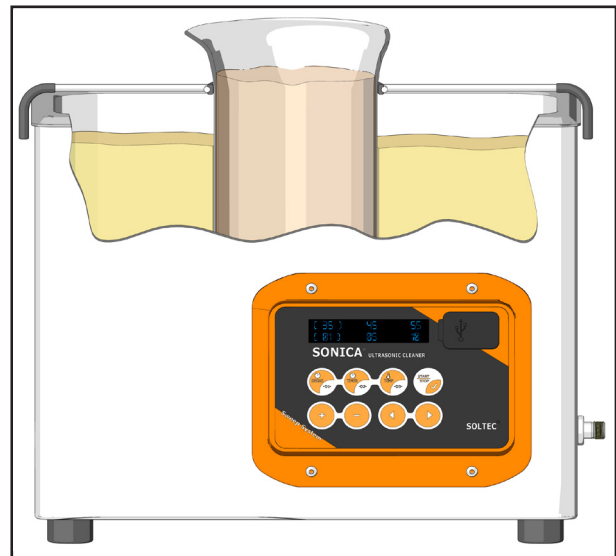
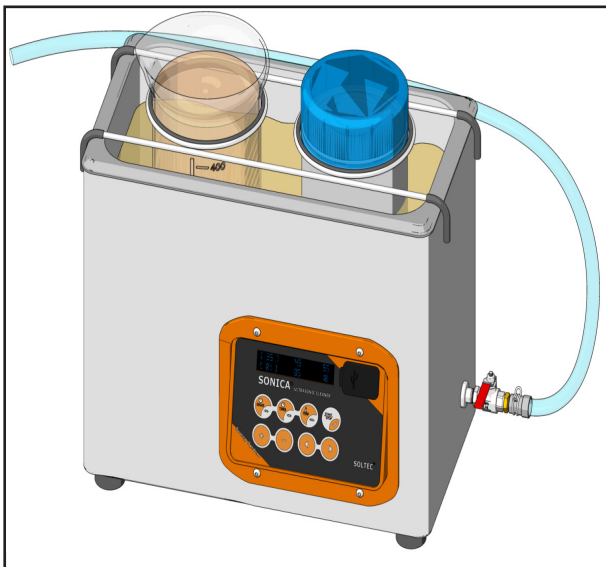
#### WARNING

This ultrasonic cleaning unit only operates with water or detergents for ultrasonic treatments recommended by the manufacturer.

Only pour the quantity of liquid required for washing. Do not use acid or highly alkaline solutions such as sodium hypochlorite as these substances, coming directly into contact with the steel tank, cause a series of microscopic holes which are irreparable and above all of hazardous consequences for the operation of your unit.

Indeed, all acid substances or those alkaline substances which may release corrosive compounds such as chloride or other chemical compounds, or disinfecting substances with a glutaraldehyde base, used together with strong ultrasonic cavitation, cause highly accelerated corrosion even in stainless steel such as the grade 304 and 316Ti that are usually resistant in static conditions.

If you must necessarily use substances which could damage the steel tank, it must be used the indirect washing technique through glass beakers, plastic ones or the auxiliary original tanks provided by the producer SOLTEC (see examples below, in the two figures).



Remember that hydrofluoric acid breaks glass beakers and that its use is highly dangerous for your health.

Remember that any acid particles, micronised by intense ultrasonic cavitation, are dispersed in the work area, corroding your equipment and damaging your health too.

**Do not use substances such as petrol, benzol or benzene, or other harmful or explosive or flammable solvents.** Only use solutions suitable for the type of work to be performed and suggested by the manufacturer.

To prevent damage to the ultrasonic cleaner, change the solution regularly, don't operate the cleaner dry, don't place parts or containers directly on the bottom of the cleaning tank to avoid the damage of ultrasonic transducers; use a tray supplied by the producer or wire to suspend items.

Don't allow the solution to drop more than 1 cm below the operating level line with heat or ultrasonics on.

Failure to comply may cause transducers and/or heater damage and will null and void your warranty.

### WARNING

Do not place your hands in the ultrasonic tank during operations.

When the heating function reaches temperatures higher than 50°C, do not place your hands in the washing liquid as there is a risk of scolding and burns.

Use gloves and adequate means of protection

Before switching on the unit pour water and/or cleaning liquid into the stainless steel tank until a maximum level of 3 cm from the upper edge of the tank; if the version of your unit is equipped with liquid drain device, check that the tap is fully turned off.

In this way accidental leakage of liquid substances will be avoided.

Always check the level of liquid so that it does not go below 2/3 of the total height of the tank.

If this should happen, the heating element, ultrasonic transducers and the electronic circuit could suffer serious damage.



Aggressive liquids which could damage the tank should be placed in a special beaker which is then placed in the tank containing water which transmits the ultrasonic waves to the beaker and hence to the solution it contains.

Remember not to rest the glass beaker on the bottom of the tank; a special perforated support for these glass containers is available from the manufacturer (consult the accessories chapter and spare parts chapter in this manual).

Only use this unit for professional use as described in this manual and for the purpose for which it has been designed. This unit has been designed for washing and detaching surplus materials from instruments, prostheses, drills, probes, forceps, metal objects and metal parts in general, objects and test-tubes in glass,

This unit can be used also for cleaning crystals, stones and archaeological objects, rings, spectacles, parts which are difficult to reach by hand etc.

The SONICA cleaning units also provide ideal solutions for emulsion, accelerating chemical reactions, mixing solutions, degassing liquids, protein extraction technique, for dissolving sediments and for the decontamination of surgical instruments if used in combination with a disinfecting cleaning fluid.

### **NOTE for temperature control**

The temperature reading of the ultrasonic tank measured by the sensor inside the device has a tolerance of  $\pm 2^{\circ}\text{C}$  even when the ultrasounds are in operation.

Kindly note the fact that operation of the ultrasounds may cause an increase in the temperature of the cleaning fluid caused by the intense ultrasonic energy produced by piezoelectric transducers. The increase of the temperature is directly proportional to the operating time of the ultrasounds.

## Detergent disinfectant solution SONICA CL4%

SONICA CL 4% is a concentrated aqueous disinfectant and detergent solution for medical devices, particularly recommended for SONICA decontamination tanks and SONICA Ultrasonic instrument cleaners.

### **The solution is concentrated.**

Dilution ratio from 2% to 4% according to the field of use (Consult the specific technical file supplied by SOLTEC)

**Note:** with a dilution ratio of 2% with tap water it is possible to obtain 50 liters of disinfectant solution.

### **Application Fields**

Decontamination and simultaneous detergency of surgical instruments, medical devices and surfaces. Temporary sterile conservation of surgical instruments.

### **Action Mechanism**

Chlorexidine reacts with the negatively charged groups that are found on the cell surface. For this reason, when it comes into contact with bacterial suspensions, it is absorbed immediately, causing an irreversible loss of cytoplasm components, which damages the cell membrane and inhibits enzymes. Cetrimide is a quaternary ammonium salt that reduces surface tension in the point of contact and has precipitant, complexing and denaturing effects on bacteria proteins, causing enzyme changes in the cytoplasm membrane.

### **Germicidal Activity**

Chlorexidine acts on vegetative bacteria, yeasts, fungi, several protozoa, viruses (HIV) and salmonella. Cetrimide acts as a bactericide above all on gram-positive bacteria; it has varying fungistat properties and acts as a virucide against lipophilic viruses.

The action of the product is superior to that of its single components. Its bactericidal actions are reduced by the presence of organic material (serum).

In hospital usage SONICA CL 4% is mainly recommended for its action against gram-negative and gram-positive bacteria, as well as lipophilic viruses (HIV).

From tests carried out, SONICA CL 4% has shown that it acts against such bacteria as *Citrobacter freundii*, *Serratia marcescens*, *Pseudomonas aeruginosa* ATCC 15442, *Pseudomonas aeruginosa* ATCC 14502, *Proteus rettgeri*, *Staphylococcus aureus* ATCC 114, *Staphylococcus aureus* ATCC 6538, and *Klebsiella pneumoniae*.

### **Composition**

100 g of solution contain: Active Ingredients: Chlorexidine gluconate g 1,50; Cetrimide g 15,00; Excipients: Isopropyl alcohol (F.U.I.) g 6,00; Essence g 2,00; Colouring E110 g 0,10; Purified water q.b. to g 100,00

### **Abstract:**

The efficiency of a decontamination procedure by sonication for different dental instruments after experimental microbic and viral contamination was tested.

Both germicidal and virucidal activity of sonication in presence or absence of a cationic bio-biguanid disinfectant was assessed following three different disinfection/sterilisation protocols.

Dental instruments were contaminated with a mixed culture of *Streptococcus faecium*, *Staphylococcus* sp., *Pseudomonas aeruginosa*, *Mycobacterium* sp., *Escherichia coli* and *Bacillus subtilis*, or with Polio virus type 1 and Herpesvirus simplex type 1 (HHV1, following the new herpesvirus denomination), exposed to ultrasonic treatment in an ultrasonic bath and the surviving microorganisms titered.

The results showed that an effective disinfection of dental instruments, expressed by an equal or higher than 4 logs microbial and viral reduction, can be obtained after 15 min or 10 min sonication in the ultrasonic cleaner equipped with a Sweep System Technology. Conversely, by the combined action of chemical disinfection and ultrasonic treatment in the same device, a sterilising effect was obtained after only 5 min for microbial and after 10-15 min for virally contaminated instruments.

The synergistic effect of chemical and physical means, as already accepted as an effective cleaning procedure of medical instruments, can therefore be applied as preamble to the final autoclave sterilization process of dental instruments (surgical) potentially contaminated by organic uids and dental material harbouring pathogenic microbes and viruses.

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*The complete study is available on request by sending an email to the following address:  
**info@soltec.it***

## Useful advice and suggestions

### **The type of detergent to be used**

In order to wash any instrument or object, use tap water as the main substance and dissolve in it a quantity of detergent or solution which varies according to the type of material residue to be removed from the object. Only use pure detergent if expressly specified in the instructions for use of the product. If for example an object soiled with greasy or fatty material is to be cleaned, use a small quantity of SONICA UG or SONICA ML solution, diluting it in water as indicated in the instructions for the product and clean in ultrasounds.

The SONICA® detergents are formulated and especially tested through many years for the removal of many types of impurities without damaging the tank and the parts that has to be cleaned.

A complete list of detergents supplied by SOLTEC with the technical characteristics and compatibility with the materials is available on request

### **When many objects have to be cleaned.**

Do not overload the ultrasonic cleaning unit. Preferably arrange the objects rationally on the base of the rectangular basket, place the latter in the tank and clean as appropriate. Too many objects washed at the same time reduce the efficiency of cleaning with ultrasounds.

### **When the objects are very dirty.**

Utilizzare tempi di lavaggio lunghi con il riscaldamento del liquido di lavaggio compatibile con l'oggetto da pulire.

### **When to replace the detergent solution.**

To achieve efficient cleaning change the detergent solution often, above all if it is used to clean surgical instruments.

### **Shape and size.**

There are no special rules for the shape of objects to be cleaned, however avoid inserting particularly heavy and large objects in the tank.

The liquid must always cover the entire object.

### **Cleaning time.**

The cleaning time always depends on the type of object, and the type and quantity of the material to be removed.



## 4.1 Before operating the equipment

### WARNING

Make sure that the electrical connection and the connection of the drain pipe and the ball valve have been carried out correctly as indicated in the previous paragraphs.

- Make sure that the ball valve is closed (it must be perpendicular to the liquid outlet direction).
- Only fill the tank if the power socket is disconnected. Accidental spillage of liquid could cause a short circuit or electrocution, and thus be dangerous for the operator.
- Fill the steel tank with water or cleaning liquid up to a maximum level of 3 cm from the upper edge. In any case, the liquid level when objects to be cleaned are inside the equipment must never be less than 2/3 of the total volume. An insufficient liquid level can damage the resistor and the ultrasonic transducers (see warnings on page 22).
- When the tank has been filled, connect the power cable to the equipment power socket and then the plug to the electrical socket of your electrical system. If the equipment has a fixed power cable, always disconnect it from the power socket before filling the tank with liquid.

The responsible operator, in addition to properly training the personnel in charge of using the equipment, must hold regular refresher courses, record the expected level of learning and demonstrate evidence of proper understanding of the procedures for proper use of the equipment by personnel.

## 4.2 SONICA ETH S4 series introduction

The ETH S4 version is the fourth evolution of the simplest version of our electronically controlled ultrasonic tanks.

The new **ETH** model is equipped with a two-line OLED screen that makes the setting of the operating parameters more intuitive; this makes it possible to increase the setting values and, at the same time, it allows the display and monitoring of the set parameters during the machine functioning.

The new ETH S4 version too is equipped with the **Sweep System** function to improve performance during washing.

The ETH S4 version can be supplied with the **(optional) Remote Control** function that can be activated from the control panel. This option requires the positioning of a circular connector on the rear side of the equipment casing and the supply of a connection cable complete with a connector on one end for connection to the equipment and on the other end with individual wires for connection to the controller. This option can be supplied on all models of the S4 series.

## 4.3 ETH series functioning

The ultrasonic tank allows to set the liquid temperature and ultrasonic cleaning duration independently.

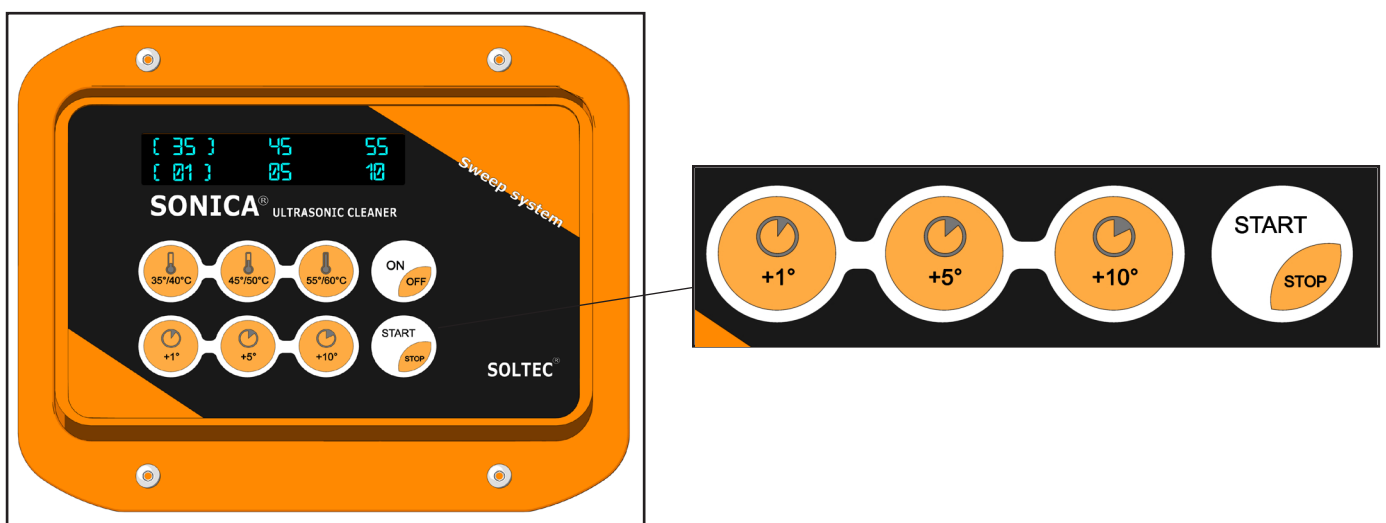
## 4.4 ETH series display

The first line of the display shows the temperature information. The second line shows the ultrasonic cycle information.



## 4.5 ETH series ultrasounds

The duration of the ultrasonic cycle is set using the first 3 keys at the bottom of the control panel (+1') (+5') (+10'), which correspond to the first 3 values in the second line of the display. The selected value is indicated by [ ] .



By pressing the first key you can scroll between **1, 2, 3** and **4** minutes.  
 By pressing the second key you can scroll between **5, 10, 15** and **20** minutes.  
 By pressing the third key you can scroll between **10, 20, 30** and **40** minutes.

## 4.6 ETH series ultrasonic cycle

You can start or stop the ultrasound cycle by pressing **Start/Stop**.

During the ultrasound cycle, the second line of the display shows the set time and, then, the remaining time.

At the end of the cycle, the machine beeps at regular intervals and "**PE**" appears on the display to indicate the end of the cycle.

By pressing **Start** again, the machine repeats the previously set cycle. By pressing the other keys on the second line of the control panel, the setting can be changed.

## 4.7 ETH series "DEGAS" cycle

The "DEGAS" cycle can be set by using the same 3 keys on the second line and holding down the Start/Stop key for 2 seconds. This activates the "DEGAS" cycle, and the letter D is shown on the display. The "DEGAS" function is used for example for degassing water and detergent solutions (deaeration, degassing) or for certain applications in the sonochemistry field, for example for degassing liquid samples before analysis (e.g. HPLC).

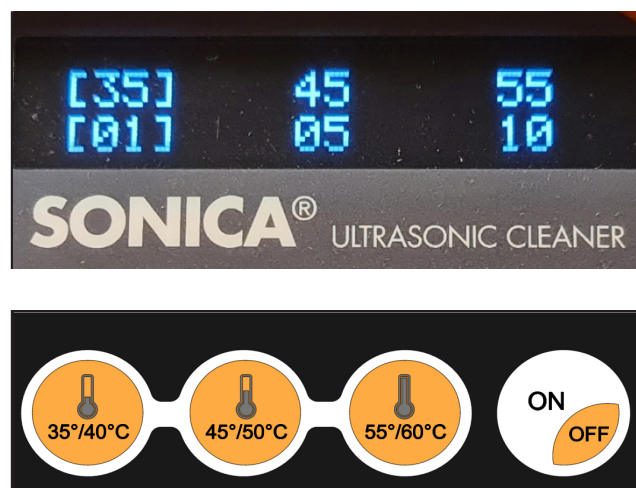
During this function, solutions are freed of air bubbles that prevent effective propagation of ultrasound waves. Each time a new solution of water and detergent is used, it is recommended to make a degassing cycle to bring the air bubbles to the surface, referring to the following table:

3 to 9.5 litre tanks	recommended time: 10 minutes
14 to 28 litre tanks	recommended time: 20 minutes
Tanks with a capacity of over 28 litres	recommended time: 40 minutes

## 4.8 ETH series heating

The liquid temperature is set using the first 3 keys on the top line of the control panel, which correspond to the first 3 values on the top line of the display.

The selected value is indicated by [ ].



By pressing the corresponding key twice, the selected temperature can be increased by **5°C**.

With the first key you can select temperatures of **35°C** and **40°C**, with the second **45°C** and **50°C**, with the third **55°C** and **60°C**.

Once the temperature has been set, the heating can be switched on by pressing the **On/Off** key on the first line.

To switch the heating off, just press the **On/Off** button again.

### 4.9 ETH series accelerated heating and temperature homogenisation

The accelerated heating function consists of an on/off ultrasound cycle every 1 minute until the set temperature is reached. The use of ultrasounds during the heating phase, compared to static heating, generates the movement and stirring of the washing liquid, thus reducing the heating time and ensuring a more homogenous inner temperature.

To activate the accelerated heating function, simply press long on the **On/Off** key.

Once the set temperature is reached, the accelerated heating function is automatically deactivated and the machine continues to maintain the set temperature using only the resistor.

To deactivate the accelerated heating function, simply switch the heating off and then on again, if necessary.

If ultrasounds are activated, the accelerated heating function is disabled.

### 4.10 ETH series display during heating

When the heating function is activated, the set temperature is shown in the first line of the display, followed by the current liquid temperature. The activation of the heating resistor is indicated by the asterisk flashing.



## 4.11 SONICA EP S4 series introduction

The EP S4 model is the fourth evolution of the most advanced electronically controlled model of our SONICA ultrasonic tanks.

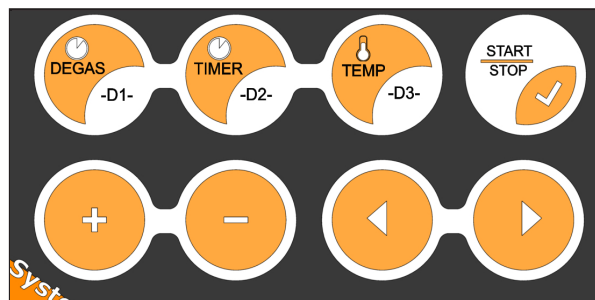
In this new version, which has a more informative and intuitive two-line OLED display, a menu with several process control functions has been added to reduce operator errors and to keep track of machine usage and check its efficiency. The machine can record process data (**log**) on a USB flash drive and it is equipped with a sensor to control the lid closure.

This model is also equipped with a mini USB socket that allows the connection of an (optional) external thermometer, to more accurately measure temperature in specific positions in the tank (e.g., immersed beakers).

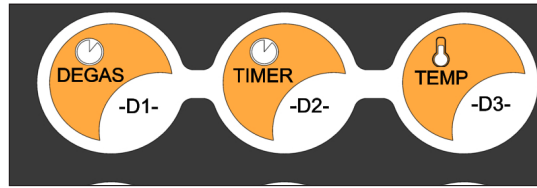
## 4.12 General functioning of EP series keypad, display and menu



### EP series keypad



The first three keys of the first line allow to select the digits for setting the values.



The first key allows to set the digits on the left side of the display, the second key allows to set the digits in the center, and the third key allows to set the digits on the right side.



The rightmost key allows, when setting values, to confirm the selected data or to **start/stop** the washing cycle.



The first two +/- keys of the second line allow to increase/decrease the set values or to scroll through the available settings. Keeping the +/- keys pressed, you can scroll fast through the values. The last two left/right < > arrow keys allows to move through the **menus**.

## EP series display



The picture above shows the information that appears on the display when the equipment is switched on.

The values "00" refer to P0, the first of the 10 programmes (from P0 to P9), which has no settings. Once the values of P0 have been set and stored, they will be shown when the machine is switched on and the washing cycle can be started.



During the setting phase, the first line of the display shows the values that can be set, and the second line shows the selected menu.

The selected value is indicated by square brackets [ ].

In the second line, the selected menu is always in the centre and it is indicated by the arrows > <.

During the functioning phase, the first line of the display generally shows the set values, and the second line the current values (**temperature and remaining time for the degas and ultrasonic phase**) or information on the machine status.



In the image above, the display shows - in the first line - that the **DEGAS [D00']** cycle (minutes) has been completed; the remaining time (11 minutes) of the Ultrasonic cycle [**U11'**]; that the bath temperature has been set to 30°C [**T30°C**] through a manual program [**PM**]; and that the "LOG" [**L**] have been set.

The second line shows that the resistor [**\***] is running and that the temperature is [**28°C**].

## Log status for EP series only

The setting and log status of the program being executed is indicated with a specific character on the right of the first line.

- **L**: logs activated
- **\_**: space for logs running out
- **!**: space for logs exhausted

If no character appears, the logs are deactivated. If the logs are active but there is no more space left, it will be not possible to start a washing cycle.

## Heating and temperature sensor for EP series

When the heating is on, "**\***" flashes on the display next to the current temperature.

If the machine is using the external thermometer, "**e**" is shown next to the current temperature.

## EP series menu

The machine functions are managed through a menu that appears in the second line of the display. You can scroll through the different menus using the <> arrows.

The menus are:

<b>man</b>	manual free program
<b>prg</b>	preset programs
<b>set</b>	storage program setting
<b>log</b>	log management
<b>lid</b>	lid alarm setting
<b>date</b>	date setting
<b>time</b>	time setting
<b>clk</b>	clock
<b>test</b>	ultrasound functionality check
<b>rc</b>	remote control

## EP series >man< (manual free program) menu

This menu allows to carry out extemporaneous cycles, not previously saved in the machine memory. We recommend to prefer pre-programmed cycles, described in the chapter "**Menu prg**", in order to speed up the setting of the most commonly used cycles and the standardisation of washing procedures.

The first line of the display shows, from left to right:

1. The set "**DEGAS**" minutes
2. The set "**ULTRASOUNDS**" minutes
3. The washing "**TEMPERATURE**"
4. The "**LOG**" status indicator

To set the "**DEGAS**" minutes of the manual cycle, press the first key of the first line. Then by pressing +/- you can select the duration of the "**DEGAS**" phase.

Similarly, by pressing the second and third keys on the first line, you can set the duration of the **ULTRASOUNDS** cycle and the washing **TEMPERATURE** respectively.

By pressing **START**, the washing cycle will start.

**If the logs are active but there is no more space left, it will be not possible to start a washing cycle.**

Once the cycle has started, by pressing "**TEMP**" you can activate the accelerated heating and temperature homogenisation function. By pressing "**TEMP**" again, you can deactivate it.

The washing cycle can be interrupted prematurely by pressing "**STOP**".



**⚠ WARNING**

When more than one function is set and the **logs** are activated, the microprocessor will automatically execute the individual set functions according to the following functioning cycle:

reaching of the set "**TEMP**" temperature; execution of the "**DEGAS**" cycle; start of the ultrasonic washing cycle for the set "**TIMER**" time. The machine will only start the ultrasonic cleaning cycle once the set temperature has been reached and the "**DEGAS**" cycle (if previously set) has been carried out.

## Procedure for deactivating an automatic cycle function

When more than one function is set, the functioning cycle is executed automatically as described above. Should it be necessary to start a set function immediately, regardless of whether the temperature has been reached, just press the desired function key.

**This procedure can only be executed if "log" management is deactivated.**

### **Example:**

Set a "**TEMP**" temperature of 50 °C, 10 minutes of "**DEGAS**", 15 minutes of "**TIMER**" ultrasonic cleaning. Press the **START/STOP** button.

The machine will only start the "**DEGAS**" cycle and then the ultrasonic cleaning once the exact temperature of 50 °C has been reached.

If the "**DEGAS**" or "**TIMER**" key is pressed, it is possible to exclude the automatic procedure of reaching the set temperature by starting the "**DEGAS**" or ultrasonic "**TIMER**" cycle.

In any case, the machine will reach the set temperature of the liquid.

## EP series >prg< (preset programs) menu

In this menu you can select one of the programs saved in the memory of the equipment.

By pressing **+/-** it will be possible to select one of the **10** preset programs, from P0 to P9.

In the first line, the previously set values will appear in the same order as in the **man** menu.

Start, stop cycle and control of the heating acceleration function work in a similar way to the manual cycle.

**If the logs are active but there is no more space left, it will be not possible to start a washing cycle.**

## EP series >set< (storage program setting) menu

In this menu you can save in the equipment memory the settings of the 10 most commonly used cycles.

To set a program, select it in the **prg** menu.

Then select the **set** menu.

The program can be edited following the same procedure as in the **man** menu.

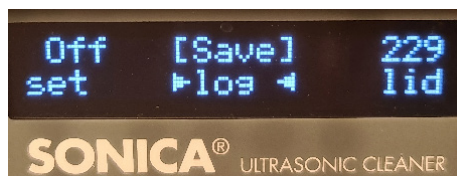
Once editing is done, with a long press on the "**START**" key the program will be saved in the equipment memory, and you will be automatically returned to the **prg** menu.

## EP serie >log< (log management) menu

Through a specific procedure, the equipment allows process data [**log**] to be stored in the microprocessor memory and subsequently downloaded to an external memory via a USB port on the control panel. By selecting the first value it is possible to decide whether to activate [**On**] or deactivate [**Off**] the logs. To save the setting, press long the "**START**" key.



By selecting the second value, you can save the logs on an external USB memory [**Save**] or delete them from the machine memory [**Del**].



To proceed with the selected action, press long the "**START**" key.

The rightmost value indicates the number of logs still available.

The machine only saves successfully terminated programs (without errors or alarms) in the memory. If the logs could not be saved on the external USB memory, a warning will be displayed. For further details, see the "**EP series warnings**" section (pages 38-39).

## EP series >lid< (lid alarm setting) menu

If you wish the program execution to be interrupted with a warning if the lid has been opened during a cycle, you can set the value of this menu to [**Stop**], otherwise to [**Off**], using the +/- keys.

To save the settings, press the "**START**" key.

If the menu is set to [**Stop**], not placing the lid on the equipment will not allow the cycle to start, and a **Lid open** warning will appear on the display.

Opening the lid will stop the washing cycle, and **L02** code will appear on the display.



## EP series >date< (date setting) menu

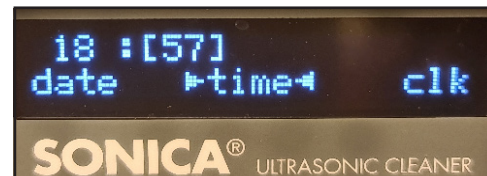
**D1**, **D2** and **D3** keys allow to select the year, month and day values respectively, which can be edited with the +/- keys.



To save the date setting, press and hold the "START" key. You will automatically be moved to the **time** menu.

## EP series >time< (time setting) menu

**D1** and **D2** keys allow to select the hour and minute values respectively, which can be edited with the +/- keys.



To save the time setting, press and hold the "START" key. You will automatically be moved to the **clk** menu.

## EP series >clk< (clock) menu

This menu shows date and time.



### WARNING

The date and clock setting is necessary for correct time storage of process data **[log]**.

## EP series &gt;test&lt; (ultrasound functionality check) menu



The machine has a special cycle for checking the correct functioning of the ultrasounds through a tester. The cycle is started by pressing "**START**" and consists of the following phases:

1. Preparation of the bath. The display shows **T1** and the current bath temperature.
2. Insertion of the tester. The display shows **Pause** and the current bath temperature.
3. Ultrasonic cycle. The display shows **T2**, the remaining time of the ultrasonic cycle and the current bath temperature.
4. End of cycle and tester check. The display shows the end of the cycle (**END**).

When the test starts, the machine "degasifies" and heats the water.

Once the bath preparation cycle is complete, the machine issues an acoustic warning signal and "**Pause**" appears on the display.

The tester is then inserted and '**START**' is pressed again to continue the cycle.

When the cycle is complete, the machine issues another acoustic warning signal and "**END**" appears on the display.

At this point, the status of the tester must be checked.

**The test cycle is always carried out with the thermometer inside the machine.**

## EP series &gt;rc&lt; (remote control) - only available on demand



It is possible to remotely control the switching on/off of the ultrasounds and of the heating resistor. For details on how to activate the RC function, see section 5.2 on page 41.

## EP series external temperature sensor (optional)

The machine can regulate the bath temperature through an optional external sensor too. The optional external sensor must be inserted before the start of a cycle.

**If the external sensor is inserted after the cycle has started, it will simply be ignored.**

If the external sensor is removed during the execution of the cycle, the machine interrupts the cycle and shows a **T03 code** warning.

The external sensor is however ignored if the machine is set to interrupt the cycle when the lid is open or the test programme is running.

Problems with the correct functioning of the temperature sensors are signalled with a **T04 code** warning.

*In short:*

External sensor connecting mode	Type of measurement
External sensor inserted before the start of the cycle	The machine takes the temperature through the external sensor connected to the USB port
External sensor connected to the USB port during the execution of a cycle	The machine ignores the connection of the external sensor to the USB port
External sensor removed from the USB port during the execution of a cycle	The display shows a warning with <b>code T03</b>

## EP series log format

The machine saves process data [**log**] in a format easily importable from a spreadsheet.

The first line shows the machine model and serial number.

The second line shows the time when the log file has been saved.

From the fourth line onwards, all successfully terminated cycles are recorded line by line. The values are separated by commas and they follow this order:

1. Date and time: YEAR/MONTH/DAY HOUR:MINUTES
2. DEGAS minutes
3. ULTRASOUND minutes
4. Washing TEMPERATURE
5. **e** if the external sensor has been taken as reference; **space** for the internal sensor
6. **!** if the lid has been left open or was opened during the cycle, otherwise **space**
7. **\*** the accelerated heating function has been activated

## EP series printing example of two saved logs

```
SONICA EP S4 5300 | SN 1234567890
2021/06/09 09:25:33
-----
2021/06/09 08:40,degas 5,US 10,Temp. 35°C,e,!,*
2021/06/09 09:00,degas 0,US 10,Temp. 35°C, , ,
```

**⚠ WARNING**

In order to work properly, the USB key must be formatted FAT and must not have a memory capacity greater than 8 gigabytes.

## 4.13 EP series functioning cycle

The functioning cycle includes:

1. Reaching the set temperature
2. A "**DEGAS**" phase of set duration
3. The activation of the ultrasounds for the selected time.

## 4.14 EP series accelerated heating and temperature homogenisation

Optionally, during the heating phase, a heating acceleration and temperature homogenisation cycle can be started: the ultrasounds are switched on at intervals, until the temperature is reached.

## 4.15 EP serie end of the cycle

At the end of the cycle, the machine:

- Turns off the ultrasounds
- Maintains the set temperature until the operator stops the cycle
- Issues an acoustic signal at regular intervals
- Shows on the display that a cycle has been completed.

It is possible to prematurely interrupt the cycle by pressing "**STOP**".

## EP series warnings

### Warnings shown on the display at the start of the cycle

Warning	Meaning
<b>Log full</b>	Log exhausted
<b>Lid open</b>	Lid not in place at the start
<b>Overheated</b>	MOSFETs overheated at cycle start *

\* When this warning appears, the equipment does not allow the activation of the ultrasounds. It will only be possible to reactivate them when the safety temperature is reached.

**Warnings shown on the display during the execution of the cycle**

<b>Warning code</b>	<b>Meaning</b>
<b>Warning L02</b>	Lid open during the cycle
<b>Warning H06</b>	MOSFETs overheated during functioning
<b>Warning T03</b>	External sensor disconnected during the cycle
<b>Warning T04</b>	Temperature sensor malfunction or external sensor positioned outside the tank

During the saving of logs on the flash drive, other values are shown for the use of technicians. Check that the USB memory still has enough free space, is correctly formatted and properly inserted.

## SECTION 5 – S4 SERIES ETH/EP VERSION REMOTE CONTROL FUNCTION MANAGEMENT

### 5.1 How to activate the Remote Control function - ETH version

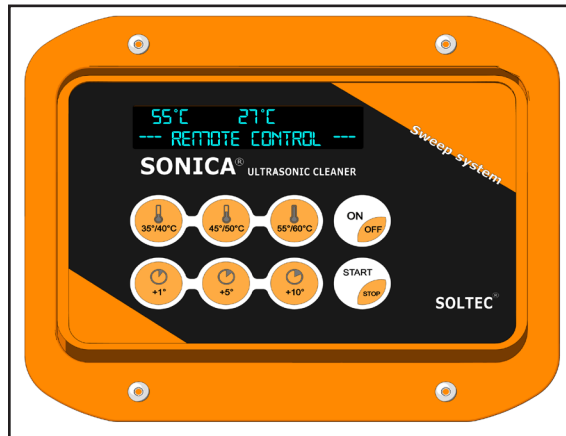
In the machines equipped with this function it is possible to remotely control the activation of the ultrasounds.

If necessary, the temperature is set as previously shown and the heating is switched on.

**By pressing "10" and simultaneously "START", the machine enters remote control mode.**

The second line of the display shows "remote control".

The first line shows the set temperature, followed by the current liquid temperature.



If the liquid heating is not activated, the first line of the display shows -- °C instead of the set temperature, followed by the current liquid temperature.



At this point the keyboard is disabled, except for the "START/STOP" key, and the machine can be controlled remotely.

**To disable the remote access function, press and hold down the "START/STOP" key.**



### 5.2 How to activate the Remote Control function - EP version

Menu >rc< (remote control)



It is possible to remotely control the functioning of the machine.

This menu allows to set the machine to be remotely controlled.

Use the right/left arrow keys to select the > **RC** < menu.

Set the temperature through the - and + keys.

Press "**START**".

The machine signals on the display that it is ready to be controlled remotely and disables local control.

The display shows the set temperature on the right, the symbol **RC** (remote control) and the current temperature at the bottom right.

To exit the remote control mode, press long the "**STOP**" key.

## SECTION 6 – REMOTE CONTROL TECHNICAL SPECIFICATIONS

### 6.1 Introduction

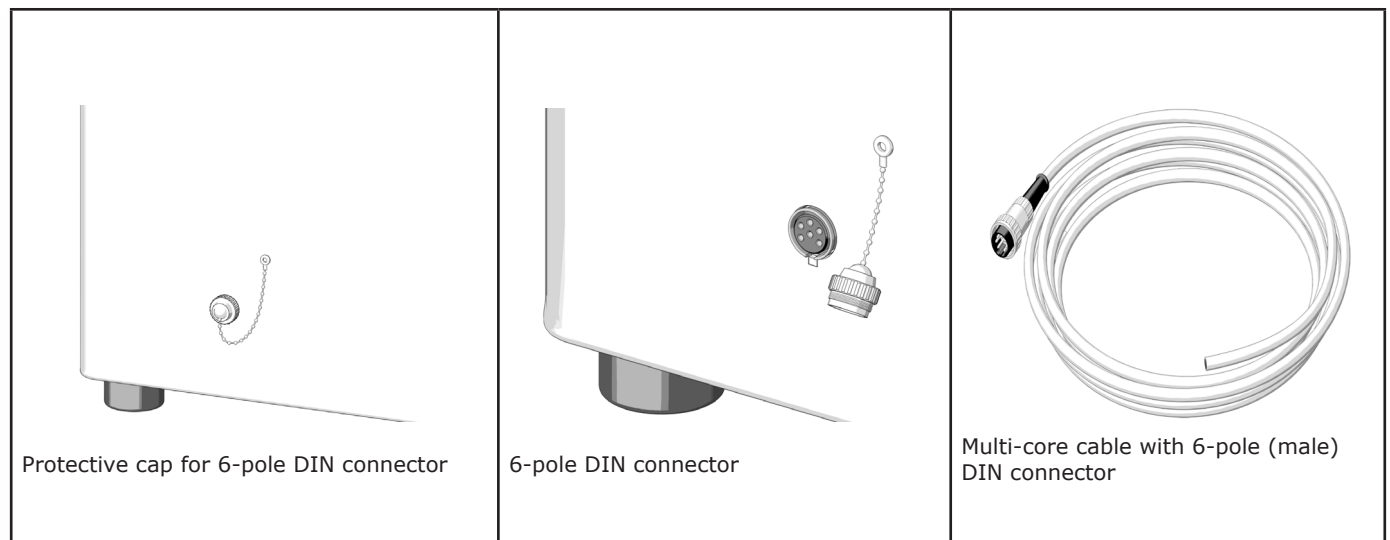
In the new SONICA S4 series it is possible to optionally provide the **Remote Control** function for both EP and ETH S4 versions. This option on request can be supplied on all models, from 3 litre to 90 litre machines - a feature difficult to find on the market for small and medium-sized "stand alone" ultrasonic cleaners.

This function allows to activate the ultrasounds and deactivate the heating resistor of the equipment if a temperature has been set remotely through a controller or PLC.

### 6.2 REMOTE CONTROL mode use and electrical connections

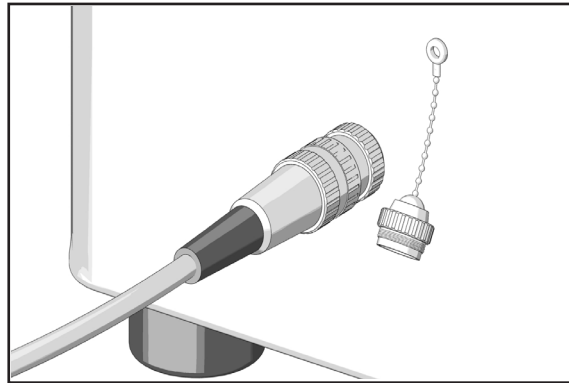
The machines preset for the **Remote Control** mode are equipped with a 6-pole (female) DIN connector on the back of the equipment, covered by a protective cap.

A multi-core cable with a 6-pole (male) DIN connector is also supplied with the equipment. The opposite end the cable is unsheathed and individual cables can be connected to the controller.



## 6.3 Equipment connection to the controller

Before setting the **Remote Control** function from the menu (EP version) or through the key sequence on the panel (ETH version), unscrew the protective cap from the connector at the back of the machine, insert the connector and screw on the cable ring nut.



The individual wires at the other end of the cable must be connected to the controller.

## 6.4 Control logic and connection to the controller

Before moving on to the connection to the controller, let's explain in more detail the functioning logic of the equipment in the remote control function (this logic is valid for both the EP and ETH versions).

The main function is the possibility of activating the ultrasounds independently of the equipment controller, making thus possible to decide the activation and duration of the washing time according to the needs of any work cycle.

The ultrasonic switch-on control (US-ON white wire) is a high logic signal (H), a DC voltage that can be chosen from +5 to +24 V maximum. The return to 0 V turns the ultrasounds off. The duration of this transition determines the washing time. The optimal washing time is to be evaluated for each individual requirement.

Switching off the heating resistor is a secondary function, because it always requires the temperature of the washing liquid to be set and the heating to be switched on from the equipment panel, as seen in the previous chapters, since the temperature control is always managed by the equipment controller. This function can be useful if you need to control the temperature of the bath using an external temperature sensor, connected to the controller and immersed in the tank containing the washing liquid.

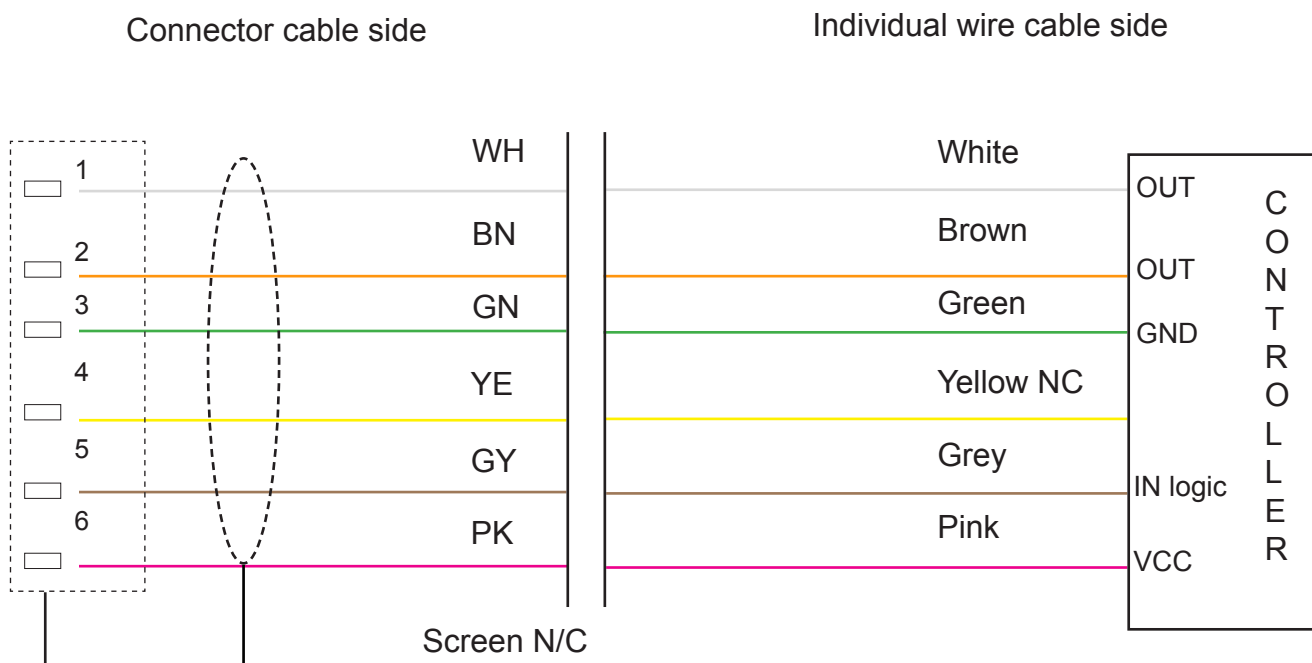
To implement this type of control, first activate the equipment heating by setting the maximum selectable temperature (70°C for EP and 60°C for ETH), then start a programme from the external controller, which adjusts the temperature through the external sensor. When the desired temperature is reached, the value must be 5°C lower than the temperature set on the equipment, the programme activates the resistor switch-off command, and an ON/OFF cycle of the resistor is carried out to maintain the temperature.

The resistor switch-off command (Heater OFF brown wire) is a high logic signal (H), a continuous voltage that can be chosen from +5 to +24 V maximum. The return to 0 V turns on the resistor.

The activation of the two previous functions depends on a control signal generated by the equipment when the Remote Control function is set. The signal is a DC voltage (ERROR, grey wire, logic output H) from +5 to +24 V indicating the correct functioning of the equipment, and it must be connected to a controller digital input. A value of 0 (logic output L) indicates that the equipment is switched off, that the Remote Control function has not been set or that the equipment is not functioning correctly.

**For the connections to the controller, please refer to the following diagram.**


## Connection diagram to the external controller for remote control.



- 1) White wire US-ON (logic input level H ) Volt IN min +5V / max +24V DC
- 2) Brown wire Heater OFF (logic input level H ) Volt IN min +5V / max +24V DC
- 3) Green wire GND from the controller
- 4) Yellow wire NC not connected
- 5) Grey wire ERROR (logic output H) Volt +5 / +24 DC
- 6) Pink wire VCC supply min +5V / max +24V DC from the controller

## SECTION 7 – MAINTENANCE AND CARE

### 7.1 Routine maintenance and daily care

 <b>WARNING</b>	<p>Disconnect the supply plug before carrying out any maintenance work!</p>
<b>Electrical safety</b>	<p>SONICA ultrasonic cleaners are maintenance-free.</p> <p>Regularly control the tank, the outer structure and the power cable for damage to prevent electrical accidents.</p>
<b>Care of the tank</b>	<p>Cleaning the tank is the only maintenance operation normally required. It must be carried out with the equipment switched off electrically and the cable always disconnected from the electric network.</p> <p>Drain the liquid as soon as it is dirty or when the equipment is not in use for a long time. Only use mild detergents to clean the inside of the tank and remove residual dirt.</p> <p><b>DO NOT LEAVE ANY DIRT INSIDE THE TANK</b></p>
<b>Care of the external parts</b>	<p>Only use mild detergents and a soft cloth for cleaning the external parts, such as the control panel and the stainless steel casing.</p> <p><b>DO NOT PUT THE EQUIPMENT UNDER A JET OF WATER!</b></p>
<b>Disinfection</b>	<p>If the equipment is used for medical purposes, it is necessary to regularly disinfect the ultrasonic tank and surfaces.</p> <p>Use standard surface disinfectants.</p> <p><b>DO NOT USE CORROSIVE SOLUTIONS</b> such as sodium hypochlorite, as these substances, coming into direct contact with the stainless steel tank and the ultrasounds, would cause a series of irreparable microscopic holes and, above all, would have dangerous consequences for the functioning of the equipment.</p>

## 7.2 Duration of the ultrasonic tank

<b>Additional information</b>	<p>The ultrasonic tank, and in particular the ultrasonic transmission surfaces (the inner surface of the tank), are parts subject to wear.</p> <p>Surface changes that occur after a certain period of functioning are visible first as grey areas due to stress on the stainless steel, and then as abrasions on the material, the so-called “cavitation erosion”.</p> <p>To further prolong the service life of your ultrasonic equipment, we recommend you to observe the following instructions:</p> <ul style="list-style-type: none"> <li>• Regularly remove any cleaning residues, in particular metal particles and rust deposits.</li> <li>• Use suitable cleaning chemical products, paying particular attention to the type of contamination to be removed (see section 4).</li> <li>• <b>Chlorides are dangerous. Chlorides dissolved in water, if present in high concentrations, are particularly aggressive substances, as they tend to cause pitting corrosion even on stainless steel instruments. Organic residues (body fluids such as blood), chloride content (3,200-3,550 mg/lit)</b></li> <li>• <u>Change the cleaning fluid before it becomes too contaminated.</u></li> <li>• Do not use ultrasounds unnecessarily; switch them off after the cleaning process.</li> </ul>
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## 7.3 Assistance

### If the equipment does not work, check the following points:

1. Check if the plug is inserted correctly into the socket..
2. Make sure that the switch on the rear side of the equipment is on.



After carrying out these operations, if the equipment still does not work, disconnect the feeding cable from the network socket and contact the technical assistance.


The assistance service must be carried out only by technicians trained by the manufacturer. If other people carry out the repair they can be in danger.

If you need any help contact your dealer as soon as possible, and he will send the equipment to the manufacturer for the proper repairs, or you can contact the manufacturer directly at this address:

**SOLTEC Srl**  
Via Castelbarco, 17 20136 MILANO  
Tel. +39 0258308378 r.a. Fax +39 0258308595  
Email: [info@soltec.it](mailto:info@soltec.it)  
<http://www.soltec.it>

The equipment is protected by safety fuses placed inside the container. The fuses or the electrical, mechanical or electronic parts must be replaced only by the manufacturer or the Assistance Service, who will use original components so that the electrical safety of the equipment is not jeopardized.

## 7.4 Equipment repair

 <b>WARNING</b> <b>DANGER</b>	<p>Repair and maintenance work requiring electrical connection and the opening of the equipment may only be carried out by authorised and trained personnel.</p> <p><b>Risk of electric shock from live parts inside the equipment!</b> <b>Disconnect the power plug before opening the equipment!</b></p> <p>The manufacturer cannot be held liable for any damage caused by unauthorised maintenance or repair work on the equipment.</p> <p>In case of breakdown, contact the manufacturer or the supplier.</p> <p>To be open only by specialist personnel authorised by the manufacturer SOLTEC Srl.</p>
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## SECTION 8 – DECOMMISSIONING

### 8.0 Product disposal



The crossed-out wheelevator bin symbol on the equipment and its packaging indicates that, at the end of its useful life, the product must be collected separately from other waste.

The separate collection of this end-of-life equipment is organised and managed by the manufacturer. Users who wish to discard this equipment should therefore contact the manufacturer and follow the manufacturer's system for separate collection of end-of-life equipment.

The proper separate collection for subsequent disposal of the discarded equipment for recycling, treatment and environmentally compatible disposal helps to avoid possible negative effects on the environment and health and favours the reuse and/or recycling of the materials from which the equipment

is made.

Unauthorised disposal of the product by the holder entails the application of administrative sanctions as provided for by current legislation.

The Declaration of Conformity to Directive 2012/19/EU must be requested by sending an email to:

[info@soltec.it](mailto:info@soltec.it)

### 8.1 Service life of the equipment

According to the EN 13306 standard, service life is the time interval beginning at a given instant and ending when the failure rate is unacceptable, or when the equipment is deemed to be beyond repair due to failure or other relevant factors.

"SONICA" ultrasonic systems have a service life of 6 years.



### TECHNICAL CHARACTERISTIC TABLE

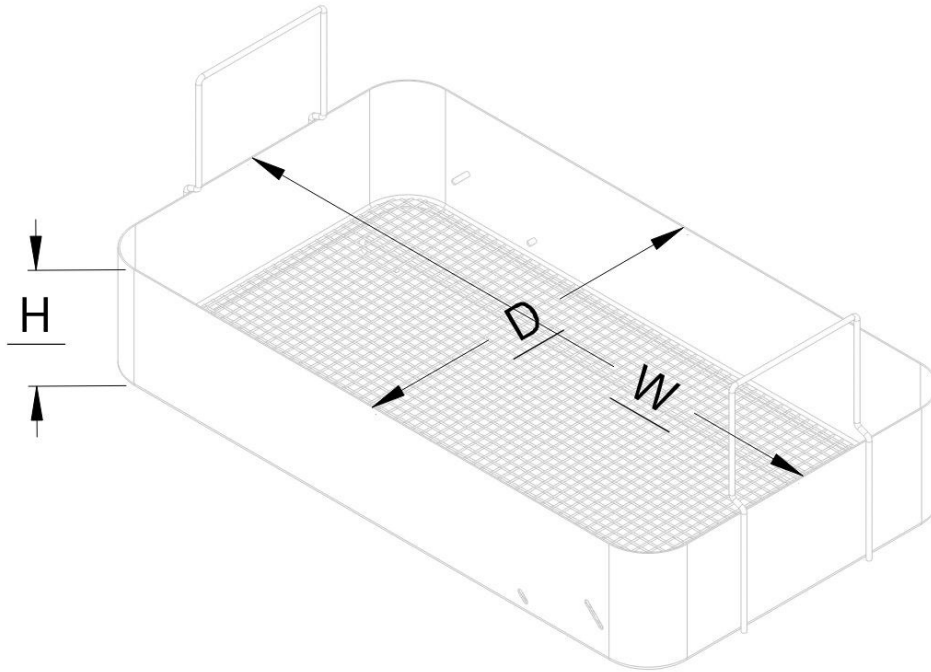
#### Standard series

SONICA Model	2200	2400	3200	3200L	3300	4200	4300	5200	5300
Total capacity <b>V (l)</b>	3	4,5	6	6	9,5	14	18	21	28
Maximum effective capacity <b>Va (l)</b>	2,35	3,8	4,3	4,9	8,6	11,8	16,8	18	25
Equip. external dimensions <b>W/D/H (mm)</b>	270 170 260	325 175 260	325 270 260	540 165 260	400 270 370	440 340 425	440 340 425	600 330 425	600 330 425
Tank internal dimensions <b>W 1/D1/H1(mm)</b>	240 140 100	300 150 100	300 240 100	500 140 100	300 240 150	330 300 150	330 300 200	500 300 150	500 300 200
Weight ( <b>kg</b> )	3,5	3,8	4,3	5,1	6	6,8	7,5	14,5	15
Drain internal diameter ( <b>mm</b> )	7	7	7	7	14	14	14	14	14
Basket inner dimensions <b>W/D/H (mm)</b>	205 110 45	265 120 45	265 210 45	475 110 45	255 200 85	285 260 85	285 260 85	460 260 90	460 260 90
Basket maximum load ( <b>kg</b> )	1	2	5	5	6	8	8	10	10
Supply voltage ( <b>V~</b> )	230/240V ~ 50/60Hz 115V ~ 60Hz available only on request for some models								
Mains frequency ( <b>Hz</b> )	50/60Hz								
Average power consumption ( <b>W</b> )	130	130	180	180	200	300	300	400	500
Average power with heating ( <b>W</b> )	305	305	355	355	500	800	800	1400	1500
Ultrasonic HF peak power ( <b>W</b> )	260	260	360	360	400	600	600	800	1000
Ultrasound frequency ( <b>kHz</b> )	39 kHz ± 1 kHz with SWEEP SYSTEM Technology								
Installation category	Class II in accordance to EN 61010-1								
Environmental conditions	Temperature from 5 to 40°C; relative humidity 80% up to 31°C with a linear decrease up to 50% at 40°C								
IP code	IP22								
Piezo double ceramic transducers	2	2	3	3	3	4	4	8	10
Tank steel	AISI Stainless Steel 304 - 8/10 mm thickness								
Casing steel	AISI Stainless Steel 304 - 8/10 mm thickness								

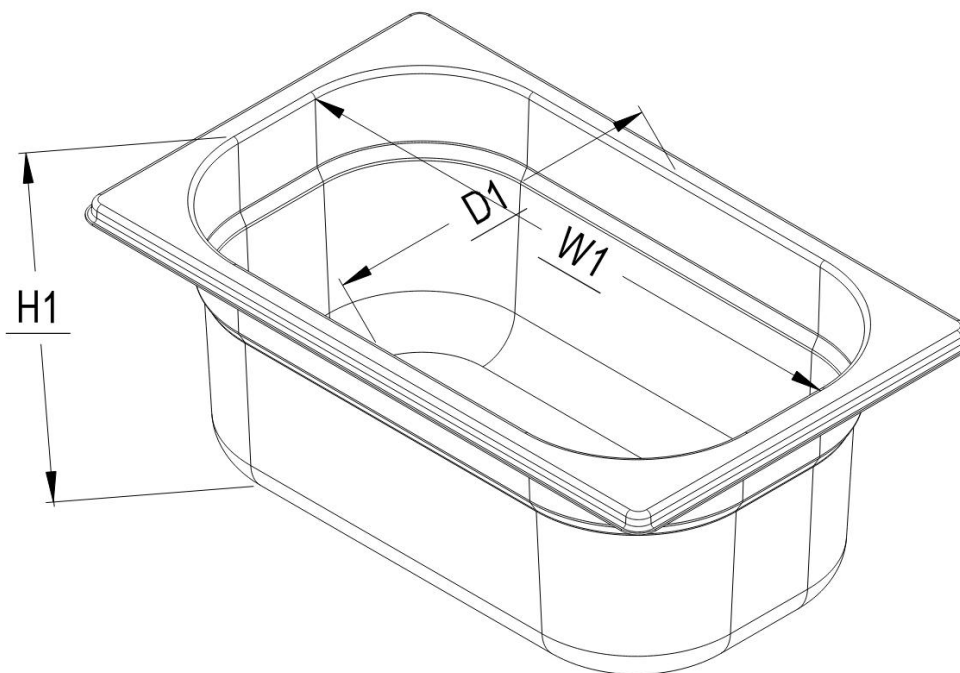
**TECHNICAL CHARACTERISTIC TABLE**  
**Heavy Duty series**

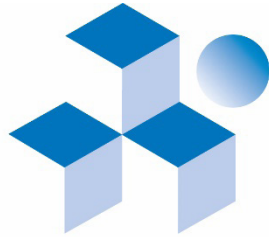
<b>SONICA Model</b>	<b>45</b>	<b>60</b>	<b>AT</b>	<b>90</b>	<b>130</b>
Total capacity <b>V (l)</b>	45	60	67	90	138
Maximum effective capacity <b>Va (l)</b>	40	56	61	81	127
Equip. external dimensions <b>W/D/H (mm)</b>	600 340 525	1160 360 425	660 380 570	660 560 525	860 604 911
Tank internal dimensions <b>W 1/D1/H1(mm)</b>	500 300 300	1100 300 200	600 320 350	600 500 300	637 366 550
Weight <b>(kg)</b>	21	30	30	40	80
Drain internal diameter <b>(mm)</b>	14	14	14	14	19
Basket inner dimensions <b>W/D/H (mm)</b>	460 260 190	1070 290 150	600 320 350	575 475 190	589 349 306
Basket maximum load <b>(kg)</b>	15	18	18	20	30
Supply voltage <b>(V~)</b>	230/240V ~ 50/60Hz			400V~3P+N+PE 50/60Hz	
Mains frequency <b>(Hz)</b>	50/60Hz				
Average power consumption <b>(W)</b>	600	700	600	1000	1200
Average power with heating <b>(W)</b>	1600	2200	2100	3000	7200
Ultrasonic HF peak power <b>(W)</b>	1200	1400	1200	2000	2400
Ultrasound frequency <b>(kHz)</b>	39 kHz ± 1 kHz with SWEEP SYSTEM Technology				
Installation category	Class II in accordance to EN 61010-1				
Environmental conditions	Temperature from 5 to 40°C; relative humidity 80% up to 31°C with a linear decrease up to 50% at 40°C				
IP code	IP22				
Piezo double ceramic transducers	12	16	14	24	15 sul fondo + 21 laterale
Tank steel	AISI Stainless Steel 316 Ti - 20/10 mm thickness				
Casing steel	AISI Stainless Steel 304 - 8/10 mm thickness				

**References for basket inner dimensions (tables on pages 49-50)**



**References for tank inner dimensions (tables on pages 49-50)**





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