

# The Automatic Ultrasonic Series

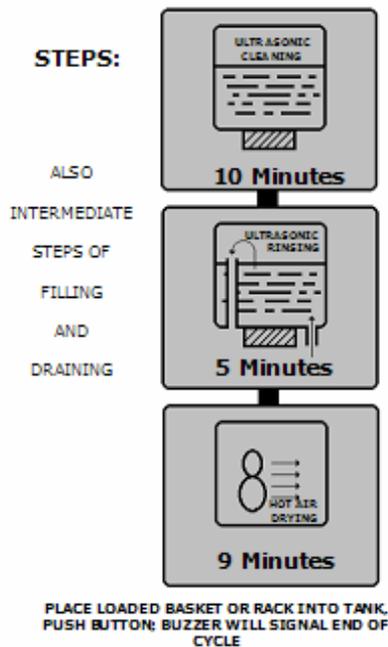
*AUTOMATIC ULTRASONIC WASHER-9G*

**MODEL E700**



P.O. Box 734  
450 Taft Drive  
South Holland, IL 60473  
**800-276-2466**  
[www.esmainc.com](http://www.esmainc.com)  
Email: [sales@esmainc.com](mailto:sales@esmainc.com)

## A "HANDS-OFF" PROCEDURE



The Esma E700 is an automated computer controlled system which runs a timed cycle of ultrasonic cleaning, ultrasonic rinsing, and hot air drying, all at the push of a button. The cycle time is approximately 30 minutes from start to finish and the 9 gallon tank can handle a large quantity of parts. The dimensions on the tanks are 18 x 12 x 10.

As an automated system, cleaning solution needs to be added for each wash cycle. An automated metering pump device can be added to the system which will meter in concentrated cleaning solution for each wash cycle, further automating the cleaning process and reducing opportunity for operator error. The unit is equipped with standard plumbing fittings allowing it to be easily installed and the casters make the whole unit mobile, conditional on the length of plumbing hoses which are used.

The ultrasonic system runs on standard 110 volt service due to the circuit board frequency and the hot air dryer runs on 230 volt service.

Some of the features of our equipment are as follows:

- All stainless steel construction
- Separate ultrasonic generators contained in console
- RFI filtered
- UL Listed
- **900 watts, 110VAC**, 40 kHz piezoelectric ultrasonic power Square wave ultrasonic circuitry
- 3,000 watts, 230VAC hot air dryer
- Omron programmer can be used to connect to the computer (PLC) to monitor the "on-line" operation, modify the program or "force on" any step of the program.
- Indicator lights monitor the status of the program.
- Low level protection to shut off ultrasonics if water supply is interrupted.
- High level protection to shut off water input if the drain is blocked.
- End of cycle light and alarm for dryer

**Automatic Ultrasonic Washers** are designed to simplify the cleaning process. The preprogrammed cycles are very similar to that of a dishwasher but our process incorporates high-powered ultrasonic technology. Esma's ultrasonic washers create a **hands-off** procedure that includes all the steps; ultrasonic cleaning, ultrasonic rinsing and hot air drying. **Load it and push a button! It's that simple.**

- **Virtually eliminates hand scrubbing** — risk to personnel is reduced as well as cross contamination that can result from multiple cleanings in the same ultrasonic tank.
- **No more rinsing in sink under running water** — ultrasonic rinsing eliminates the inefficiencies of tap rinsing where ragout contaminants from the cleaner are never fully flushed away.
- **No more open air towel drying** — The messy drip trails created from ultrasonic-to sink-to counter are eliminated and the infection control area of the office is streamlined.

**Automatic Ultrasonic Washers** create savings in many areas; time, space and aesthetics with the most significant savings being in direct labor dollars and all the hidden costs associated in this area. **Payback of capital purchase is measured in months!**

MODEL E700			
CABINET DIMENSIONS:	28"W x 22"L x 39"H	ULTRASONIC POWER:	900 WATT
TANK DIMENSIONS:	18"W x 12"L x 10"D	UNIT POWER:	2000W 15A 120V 3000W 15A 230V
TANK VOLUME:	9 GALLON	CYCLE TIME:	30 MINUTES

- ✓ UNPRECEDENTED WARRANTY
- ✓ SINGLE PUSH-BUTTON ACTIVATION
- ✓ LONG-LASTING POTTED TRANSDUCERS

- ✓ OVER 10 YEARS OF SUCCESSFUL IN-FIELD HISTORY
- ✓ PLC CONTROLLED, CUSTOM PROGRAMMING AVAILABLE

- ✓ ALL STAINLESS STEEL CONSTRUCTION
- ✓ SQUARE WAVE ULTRASONIC CIRCUITRY
- ✓ RFI FILTERED

FEATURES & SPECS

ESMA, INC.

# 30 Gallon Heated Storage Tank



ESMA, INC.

450 Taft Drive  
South Holland, IL 60473

Phone: 708-331-1855  
Fax: 708-331-8919  
Email: [esmainc@ameritech.net](mailto:esmainc@ameritech.net)

**The 30-gallon storage system is  
designed to be fully integrated with  
Automatic Ultrasonic Washers  
(Models E291, E992)  
reclaiming for subsequent reuse  
concentrated cleaning solutions or  
rinse water.**



# FACTS AND FEATURES



1. A BALL VALVE DRAIN ALLOWS FOR EASY DRAINING OF CONTENTS OF STORAGE TANK INDEPENDENT OF THE SYSTEM INTEGRATION



2. A PUMP/SOLENOID ASSEMBLY FULLY INTERGRATED INTO THE PROGRAM OF THE CLEANING SYSTEM ALLOWS FOR QUICK FILLS FROM STORAGE TO CLEANING UNIT. A SIMILAR ASSEMBLY IS BUILT INTO THE CLEANING UNIT TO REFILL THE STORAGE TANK

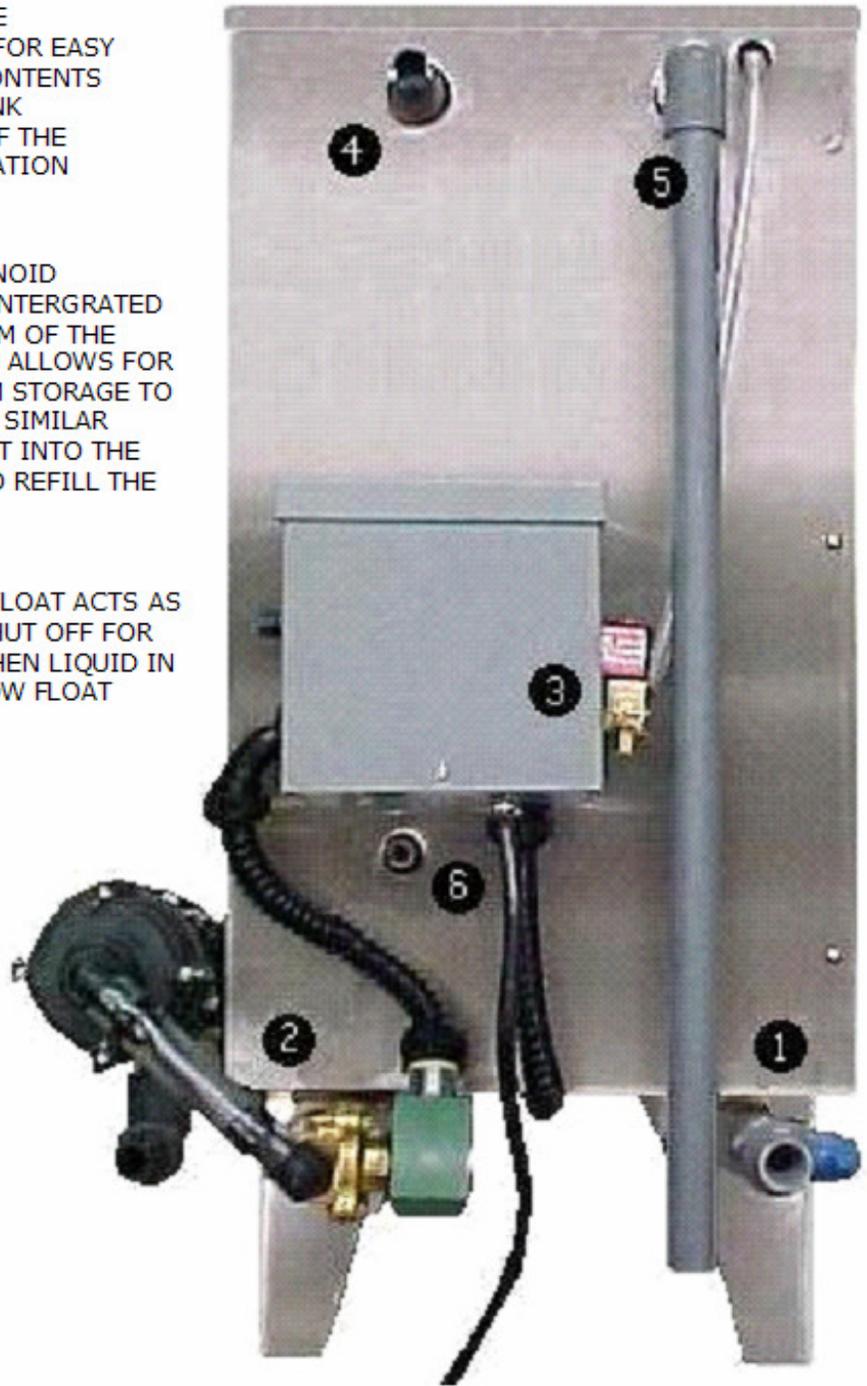


3. AN INTERNAL FLOAT ACTS AS AN EMERGENCY SHUT OFF FOR TANK HEATERS WHEN LIQUID IN TANK DROPS BELOW FLOAT LEVEL.

4. THE STORAGE SYSTEM INPUT PORT IS INTEGRATED TO CLEANING UNIT WITH A SERIES OF SOLENOIDS, CHECK VALVE AND PUMP WITH PLC CONTROL FOR REFILLING THE STORAGE TANK FROM THE CLEANING TANK. THE INPUT PORT IS PLUMBED INTERNALLY TO FEED FROM BOTTOM ELIMINATING EXCESSIVE FOAMING

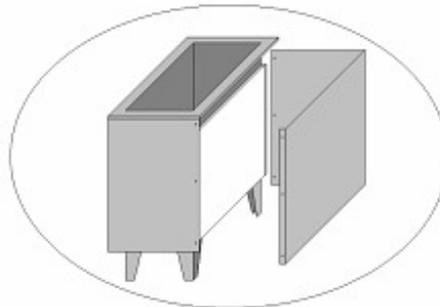
5. AN EMERGENCY OVERFLOW IS BUILT INTO THE SYTEM AS A SAFETY PRECAUTION

6. SHOWN IS THE THERMOCOUPLE PORT. 1400 WATTS OF HEAT WITH VIARIABLE TEMPERA-TURE CONTROL LOCATED ON CLEANING UNIT EN-ABLE THE STORAGE SYSTEM TO MAINTAIN TEMPERATURES UP TO 180°F



**Overall Dimensions: 19"W x 32"L x 30"H**  
(Includes pump and control box)

**Tank Dimensions: 12"W x 24"L x 24"D**  
**Tank Volume: 30 Gallons**  
**Electrical: 120VAC, 1500W**  
**All Stainless Steel Construction**



THE STORAGE SYSTEM FEATURES DOUBLE WALLED CONSTRUCTION WITH 1/2" FOAM INSULATION IN BETWEEN EFFICIENTLY MAINTAINING DESIRED TEMPERATURES

# Esma Inc.

PO Box 734 450 W. Taft Drive  
South Holland, IL 60473  
708-331-1855 800-276-2466 FAX 708-331-8919

## Instructions for Model E700 Ultrasonic Washer

### Introduction

The Model E700, nine gallon ultrasonic washer is equipped with a 30 gallon heated storage system.

The unit is housed in a 304 stainless steel console. The tank is manufactured from SS 316 with 24 double potting transducers mounted on the bottom. The tank is fitted with a SS hinged cover, which houses the fans and heaters for air drying.

Inside the console is the power module and pumps. The power module contain self-tuning modular circuit boards, a programmable controller, high velocity fans to cool the electronics, and RFI filters to eliminate any high frequency interference.

A separate sump pump and reservoir has been included with the unit. This will allow the rinse discharge from the unit to be pumped overhead to plant reclamation.

PLEASE READ THESE INSTRUCTIONS THOROUGHLY BEFORE  
INSTALLATION AND OPERATION. CALL (800) 276-2466 IF YOU HAVE  
ANY QUESTIONS.

## Installation

When the unit is removed from skid, the supplied casters must be installed on bottom of unit. Place casters with locking brakes on front corners of unit.

The unit has been thoroughly bench-tested and is shipped to the customer ready to operate. Move the unit into position and lock Caster wheels. Once the position of the unit has been established, the electrical and plumbing requirements must be completed by the customer.

The power module inside the unit has been bolted to the bottom of chassis for shipping. The module can remain bolted, however, if it has to be removed for any reason, the filter screen door on the back of the unit has to be opened. Once the filter is removed, the screws and bolts in hold-down brackets can be removed. These need not be replaced for normal use and movement of unit. Leave hold-down bracket fixed to power module.

## Plumbing Hook-Up

### 1. Inputs

Two solenoids are mounted on the back of the unit to be connected to the storage tank and the water source. Hoses and fittings have been supplied. ( see flow diagram)

-Solenoid S1 is to be connected to the out put of the pump located on the storage tank with  $\frac{3}{4}$ " hose.

-Solenoid S3 is to be connected to your water source. The solenoid is equipped with  $\frac{3}{4}$ "NH fitting. -

### 2. Outputs

Two,  $\frac{3}{4}$ " couplings at the rear of the unit are for draining. One coupling is connected with  $\frac{3}{4}$ " hose to the input of the storage tank and the other coupling is connected with  $\frac{3}{4}$ " hose to drain.

Solenoid S6 on the storage tank, the ball valve drain on the storage tank and the output drain from the unit can all be connected to a single hose that discharges into the sump pump reservoir.

## Electrical

### 1. Unit

The unit is wired for both 120VAC and 208-230vac lines. The ratings are 1300 watts, 120VAC, 50/60HZ and 3000 watts, 208-230VAC, 50/60HZ single phase.

The power cords are supplied for plugging into your electrical sources.

The 230 volt line is supplied with a NEMA 6-15 plug with a 15amp, 250 volt fuse located at the rear of unit.

The 120 volt power cord has a NEMA 5-15 plug with a separate 15amp, 125 volt fuse located at the rear of unit.

### 2. Storage System

The storage system is rated for 1,650 watts, 120VAC, 50/60HZ and is supplied with a cord with a NEMA 5-15 plug. A 15 amp, 125 volt fuse is located on the control box.

### 3. Sump Pump

The sump pump to deliver the rinse and solution to your plant storage is rated for 615 watts, 120VAC, 50/60 HZ and is supplied with a NEMA 5-15 plug.

### Storage Tank

After plumbing is completed, fill storage tank with cleaning solution. The storage has a cord with an amphenol connector to be plugged into the rear of the E700 unit.

After plumbing is completed, fill storage tank with water or cleaning solution. The 30gallon storage tank is double walled insulated. The storage system has 1440 watts of heat applied to the bottom of tank controlled by Athena temperature controllers located on the control box. Turn ON the temperature control and set the dial to the desired temperature. The red light is ON when calling for heat and the green light is ON when the control temperature is reached. If tank is full, the liquid heat-up rate is 20degrees F/hour. Because of the double wall insulated tank the overnight cool down is minimized if the tank is covered.

**The storage tank is equipped with a low level switch that will shut off the heaters if the solution level in the tank gets to low.**

## Control Function

1. Main Switch: When unit is ready for operation, turn the main switch to ON and the indicator light will be ON.

2. Start Button: With main switch ON push start button and the process will begin.

3. Emergency Stop: Depressing the emergency stop switch will shut down the system. Rotating the knob will restore the power to the unit.

4. Program Selector Switch: Two programs have been inserted into the controller. The **Cleaning** program is given below. The **Storage Drain** program allows transferring the solution in the storage tank to the sump pump.

## Operation-First Time

1. Storage tank must be plugged into a 120 VAC outlet and the solution heated.
2. Select program and push START button and liquid will be pumped into the tank.

The Cleaning program will continue as follows:

<u>Step</u>	<u>Function</u>	<u>Time,seconds</u>
1	Fill from Storage	150
2	Ultrasonic Cleaning	600
3	Drain to Storage	120
4	Flush to Drain	0
5	Flush to Storage	0
6	Drain to Storage	0
7	Fill with Rinse Water	125
8	Ultrasonics	60
9	Ultrasonic-Rinse	60
10	Ultrasonics	60
11	Ultrasonic-Rinse	60
12	Ultrasonics	60
13	Drain	120
14	Dry	120
15	Dry, Pump	30
16	Dry	450
17	Cool Down	120
18	Alarm	5

## Draining Storage Tank

The solution in the storage tank can be drained to the sump pump reservoir. Turn the program selector switch to **Drain Storage** position and push the Start button. The program is set up to drain the storage for 300 seconds using pump 1 and solenoid 6.

## Programmable Controller

An OMRON CPM 1A programmable controller is used to control the process. The unit has a flash memory backup without a battery. The controller has indicator lights for inputs and outputs which are lit during process. The outputs are as follows:

<u>Output:</u>	<u>Controls:</u>
1000	Solenoid 1,
1001	Ultrasonics
1002	Solenoid 2, Pump 2
1003	Solenoid 3
1004	Solenoid 4
1005	Solenoid 5
1006	Pump 3
1007	Solenoid 6
1100	Dryer
1101	Dryer Fan
1102	Alarm
1103	Pump 1

## .High and Low Level Controls

The tank has two high level controls, one each for the primary and secondary input solenoids and one low level control. The controls function as follows:

- 1.Low Level – located in the tank wall, the low level control will not allow the ultrasonics to come ON unless there is 3 inches of liquid in the tank.

2. High Level – high level controls are used for the fill and rinse solenoids. These sensors are mounted in the tank wall above the overflow drain outlets. If the level gets to high the solenoids will be turned off.

## Drying

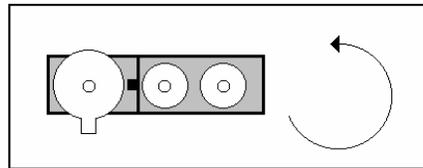
In the drying portion of the programs, the incoming air is heated in the tank cover to 160-180 degrees F. and forced by the fan through the tank cover. CAUTION: Do not touch the cover during the drying cycle because some areas of the cover will be hot.

Drying time will vary depending on the number of parts to be dried, if hot or cold water was used to rinse parts before drying and if the cover is closed on oven. Generally parts should be dry in 10 minutes.

NEVER place any towel or obstruction over the fan intake on cover. After 10 minutes of hot air drying, a buzzer sounds the end of the program. The air temperature, during the Hot Air Drying, can be increased or decreased by adjusting two thermostats located in cover at hot air exit.

The thermo-switches are adjusted as shown below.

1. Disconnect unit from 120VAC and 230VAC supplies.
2. Remove top plate of dryer cover.
3. Thermostat is located in front of heater.
4. See drawing . Turn control knob slightly counter-clockwise to decrease temperature.
5. Replace top plate and check air temperature. Repeat steps 1-4 if not satisfactory.



## Maintenance

Filter-Periodically the filter cartridges in the chambers of the storage tank need to be changed. The filter chamber is higher than the liquid level of the storage units so the liquid does not need to be drained to change the cartridges.

Drain Screens-Periodically the drain screen in the Y-strainer located under tank will have to be removed and cleaned. Accumulated lint and debris could slow down the draining, resulting in the incomplete removal of cleaning solution before the rinse cycle starts. .

The tank and modules are manufactured of 316 and 305 stainless steel. Clean with a commercially available cleaner for stainless kitchen appliances.

## Power Module

The power module contain the four circuit boards, programmable controller, fans, relays, RFI filters etc. There are four lights, one per circuit board to indicate if the circuit boards are operating. To check if all circuit boards are operating, open door slightly when unit is ultrasonically cleaning: all indicator lights must be ON. If a light is out, the corresponding circuit board will have to be repaired.

## Cleaning of Solenoids

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary, depending on media and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive leakage, or noise indicate that cleaning is required. A bulletin with maintenance instructions is enclosed.

FOR ASSISTANCE CALL: 800-276-2466

WARRANTY: Unit has one year guarantee, circuit boards two years and transducer bonds and tank weld seams a lifetime guarantee.

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