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ARI-550H Medical Waste Sterilization System's USER&OPERATION Manual

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1- INTRODUCTION TO ARI-550H MEDICAL WASTE TREATMENT SYTEM

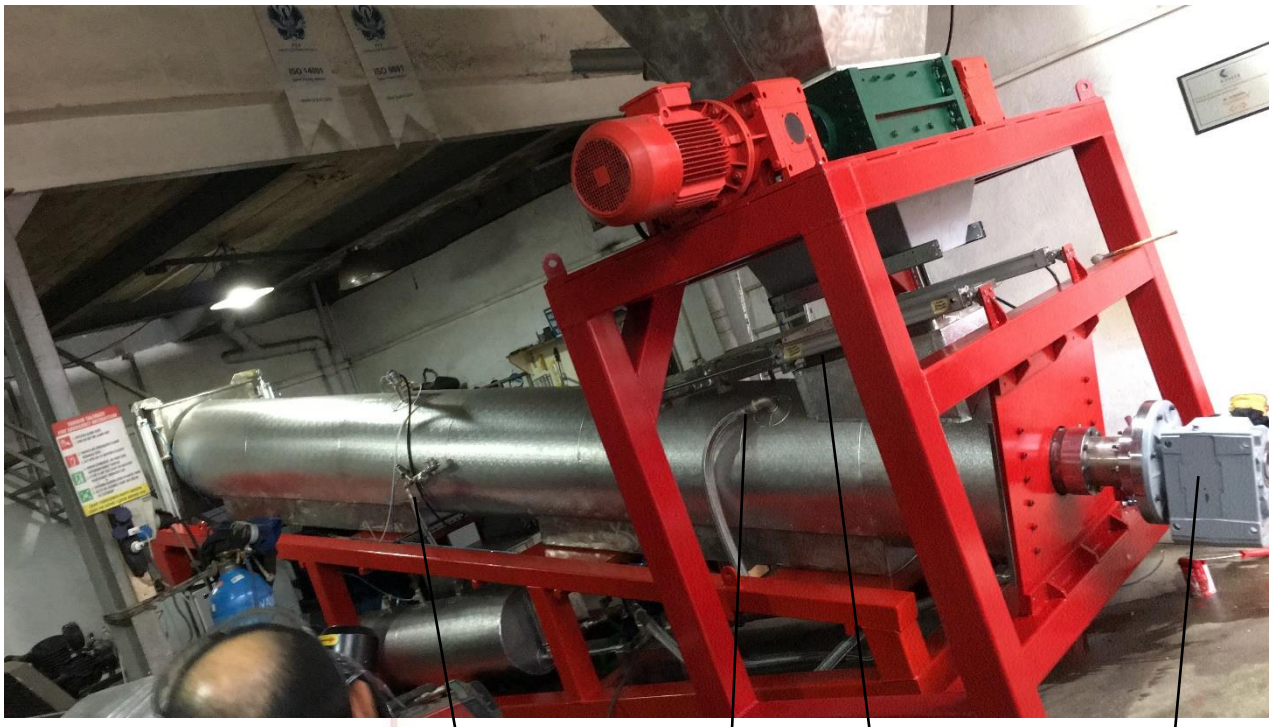
Product Description

ARI-550H systems are an integrated; shredder, solid & liquid medical waste sterilizer, drying unit and steam generator designed for treatment of medical waste.

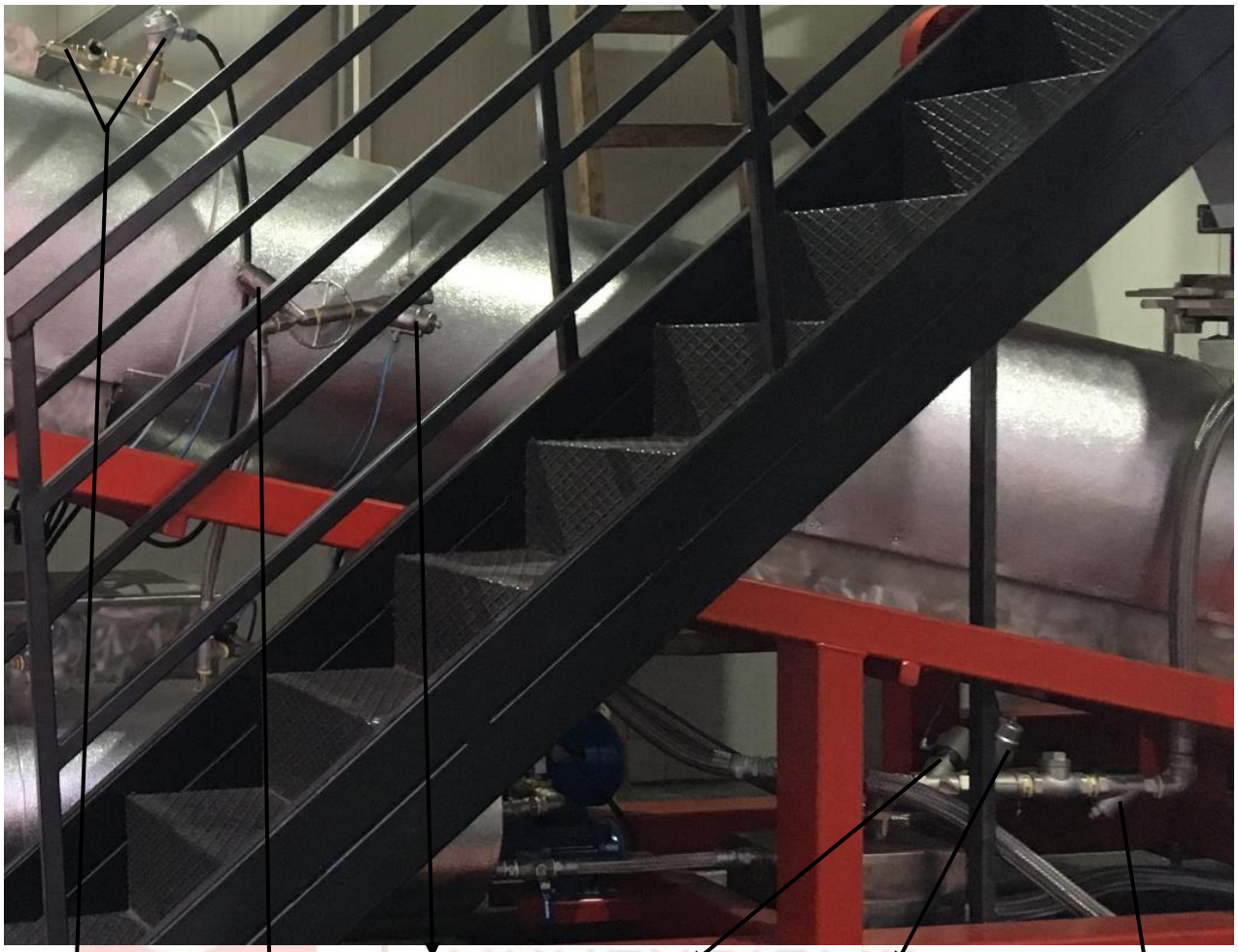
Size reduction of the medical waste carried out outside the sterilization vessel (SV). The SV is fitted with a motor-driven screw conveyor which provides the loading from shredder and unloading through discharge door. Saturated steam supply to SV for sterilizing is generated in a steam generator that has capacity of 60 kw. The SV is designed as a Large Steam Sterilizer in accordance with EN-13445 and EN-285.

ARI is the most innovative model in the field of "medical waste disposal" and has been designed by using only the best features of the well accepted sterilizers in the market. ARI-550H design absolutely ensures that hot steam at ideal sterilization conditions of temperature and pressure, contacts entirely with shredded and cut waste materials during the sterilization cycle.

Picture.1. ARI-550H



Picture.2. *ARI-550H*



Steam Inlet Valve

Air Inlet Valve

Vacuum Valve

Drain Valve

Drain Steam Filter

Temperature Sensor, and pressure safety valve

1.1. Steps in a Treatment Cycle of ARI:550H medical waste Treatment System in Automatic Mode:

a) First step in the treatment cycle is the transfer of the 2 containers of unsterilized medical waste to the shredder bunker via elevator. Then close the bunker door.

b) Secondly, start automatic operation: Feeding gate will automatically open and shredder and screw conveyor starts to operation. After shredding and arrangement of shredded waste is completed, feeding gate will be closed with sealing.

c) Thirdly, preheating of vessel will be carried out until a preset pressure reached, then proper vacuum is applied to remove the air bubbles and steam so that steam can penetrate deep in the inner volumes of the waste material before sterilization process.

d) Then hot steam is sent to the sterilization section to achieve the ideal sterilization conditions of temperature and pressure. After having reached to the plato stage, sterilization conditions are hold and maintained for sufficient time.

e) After enough time of exposure to steam, sterilization expires, and vacuum is applied to dry and cool down the sterile material and empty the steam inside through the vacuum pump.

f) Finally, air is fed into the vessel through air valve and atmospheric pressure is ensured then the seal and the discharge gate is opened automatically to empty the sterilize waste inside with screw conveyor.

Semi-Automatic Method:

In Semi-Automatic method, shredding and arrangement of medical waste inside sterilization vessel can be carried out separately from sterilization process. In this case, the cycle parameters of “shredder process time” can be set to 0. Then, shred and arrange the waste to the SV, finally start automatic operation.

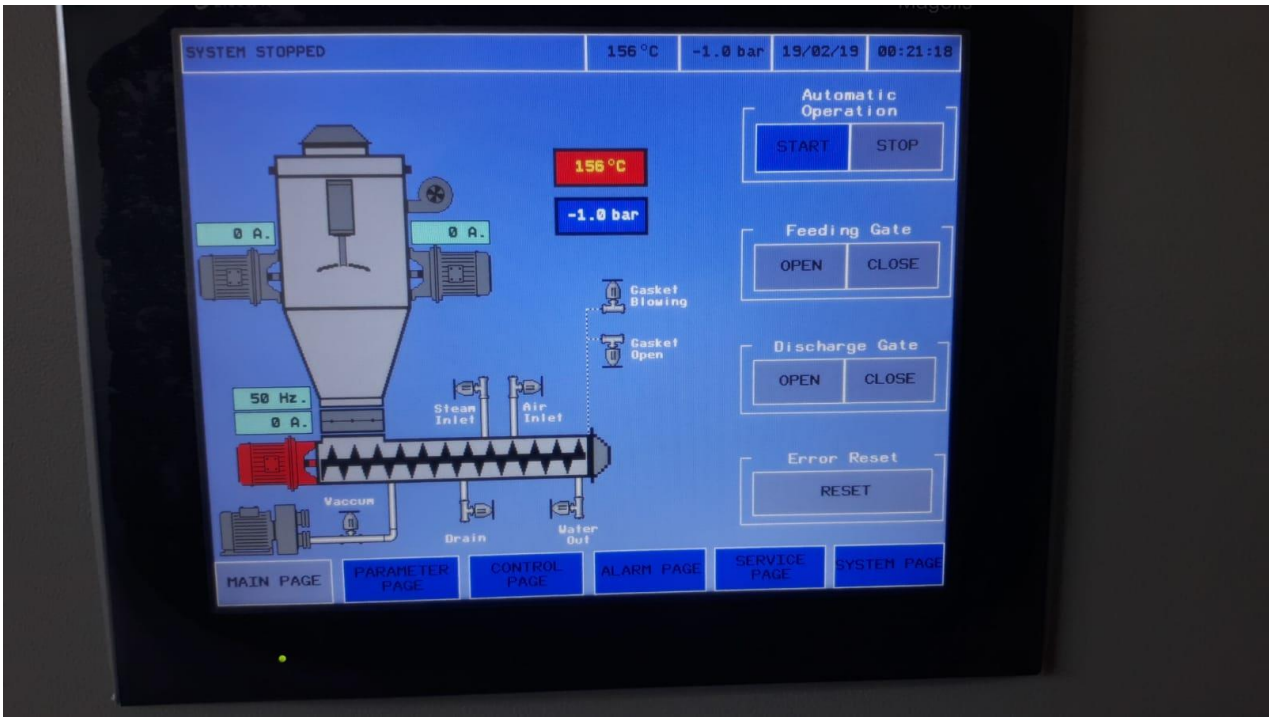
Control Panel of ARI-550H

2- PAGES OF ARI TOUCH-SCREEN PANEL

2.1 MAIN PAGE: In "MAIN PAGE" you can:

a) Start and stop automatic operation,
b) Open and close feeding gate, and
c) Open and close discharge gate
d) And, reset the system

*** In case, there is pressure inside vessel, the doors cannot be opened; In an emergency situation (electricity cut, stop operation during process, etc.): *open the manual ball valve which is under the sterilization vessel and wait until pressure decreases to atmospheric value*



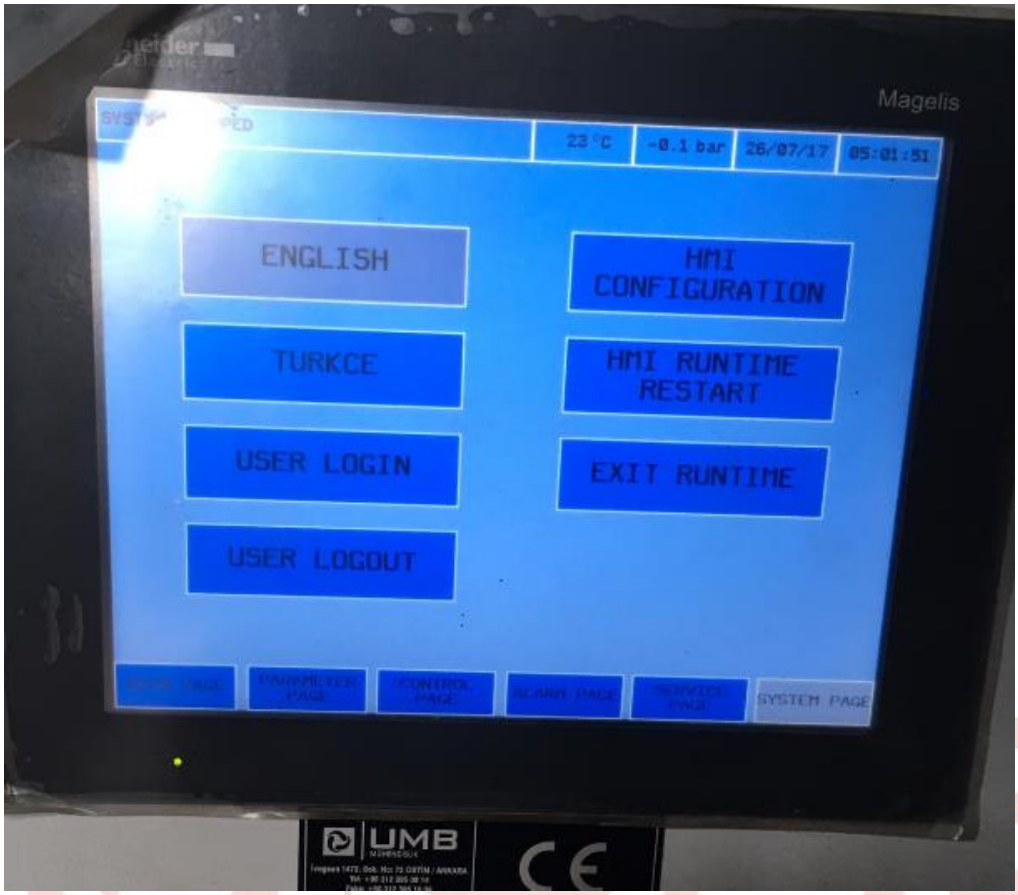
Picture. MAIN PAGE

2.2. PARAMETER PAGE: In the parameter page, the sterilization and cycle parameters are set:

IDEAL PARAMETERS ARE:
Set Sterilization Temperature: 134 C
Set Sterilization Pressure: 2.2 Bars
Set Pre-Heating Pressure: 1.4 Bars
Set Pre-Discharge Pressure: 0.2 Bars
Shredder Max. Current: 28 A.
Shredder Min. Current: 21 A.
Shredder Min. Finishing Time: 8 Sc.
Pre-Heating Vacuum Time: 2 Mn.
Sterilization Process Time: 6 Mn.
Vacuum Process Time: 3 Mn.
Shredder Process Time: 7 Mn.
Water Out Pause Time: 110 Sc.
Water Out Time: 5 Sc.
Pre-Heating Repeat Quantity: 1
Press Push Time: 7 Sc.
Press Pull Time: 7 Sc.

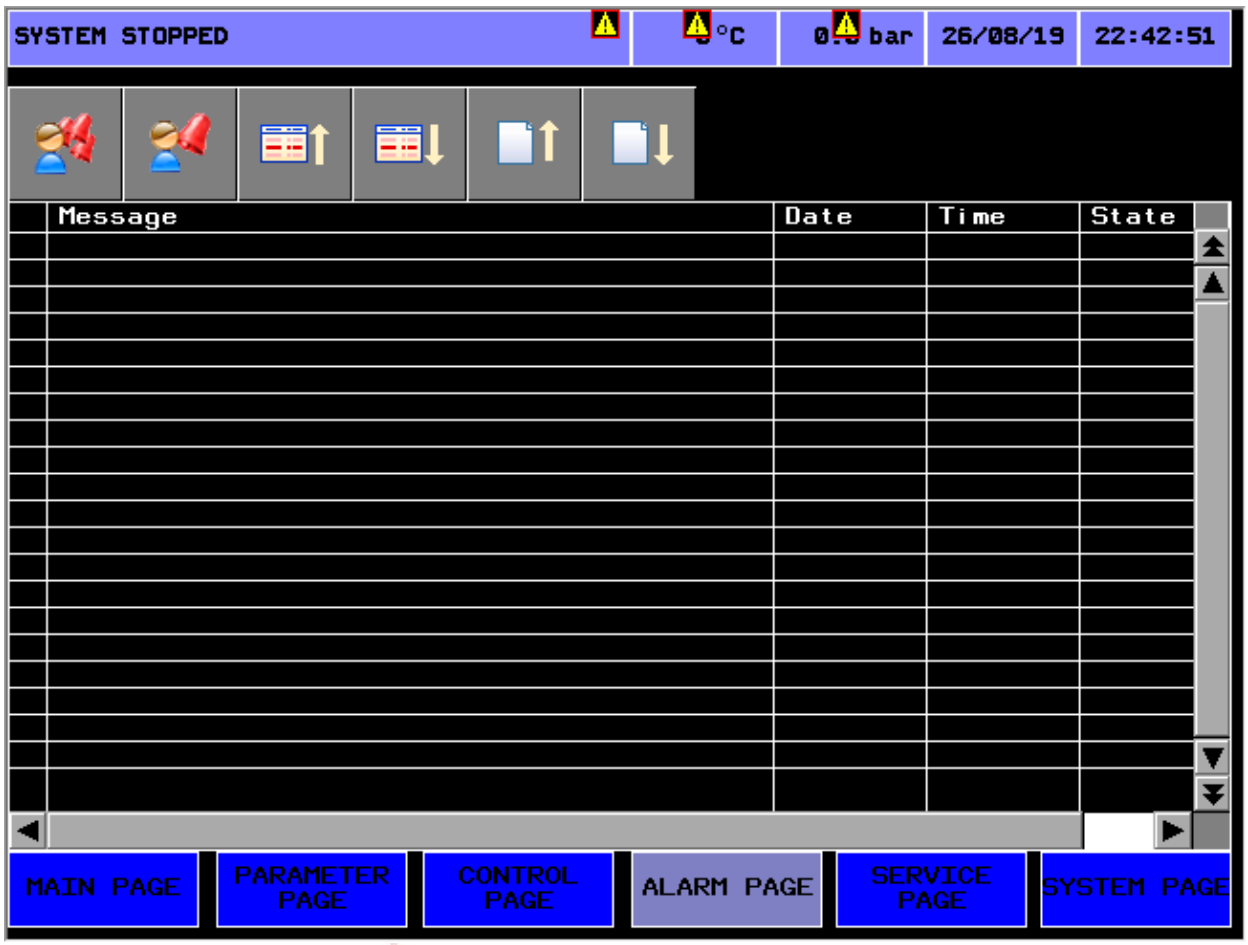
FOR STEAM GENERATOR: Pressure is 3 bars and Temperature is 139 C.

2.3. SYSTEM PAGE



In the system page, the language (Serbian, Turkish or English) can be selected. And log in, or out, from the system.

2.4. ALARM PAGE

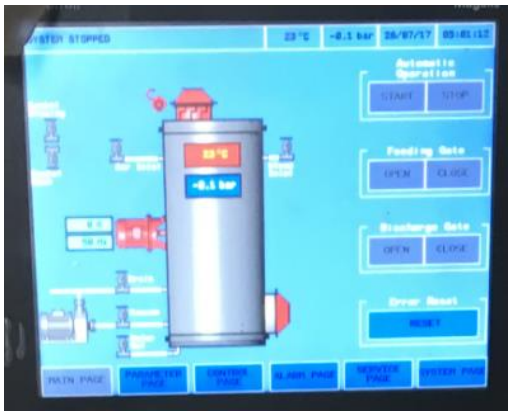


If there is any error in the system, it can be seen in the “ERROR PAGE”. The system will not start automatic operation until the error is solved. Frequently made mistakes are “customer forget to open air compressor”,

The error signal can also be seen in the main page as red or yellow color.

In the picture, the shredder motor, top door and bottom door are red. That means doors not closed. And no electricity transfer to motor.

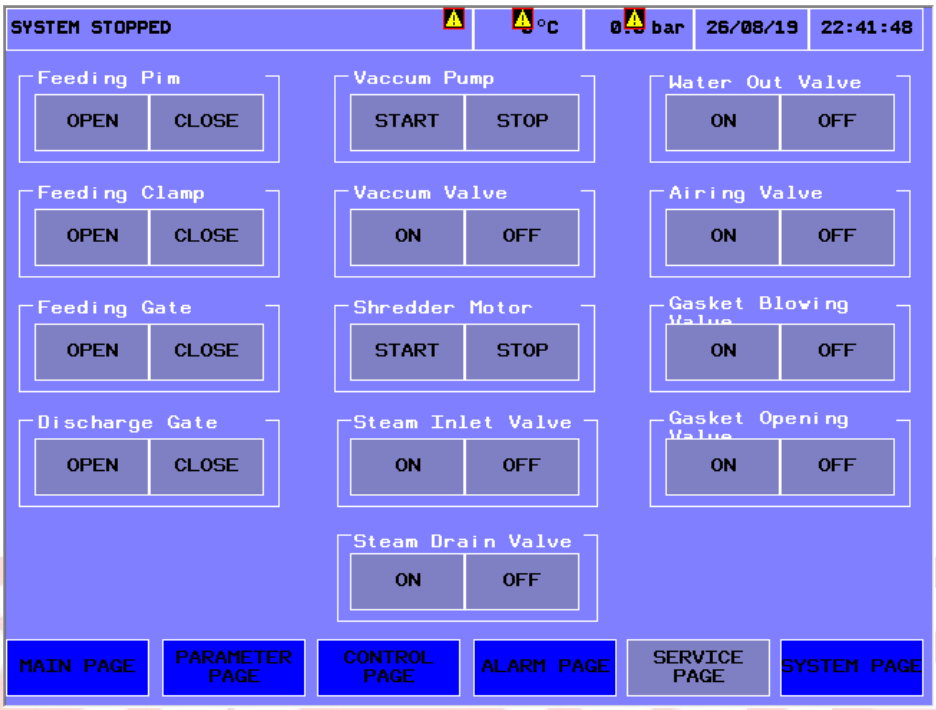
In this case, if these in red color, open the contactor of motor and check the door sensors. If sensors do not light, adjust them. Then all will turn into green color. If problem continue reset the PLC from the button inside electrical panel.



If sign is yellow, then push reset button in the main page.

2.5. SERVICE PAGE:

In the service page all the motors, valves, pistons, etc. can be actuated manually. It is not allowed for the operators to work in Service page. Call the service person of the machine, if there is a fault that you cannot solve.

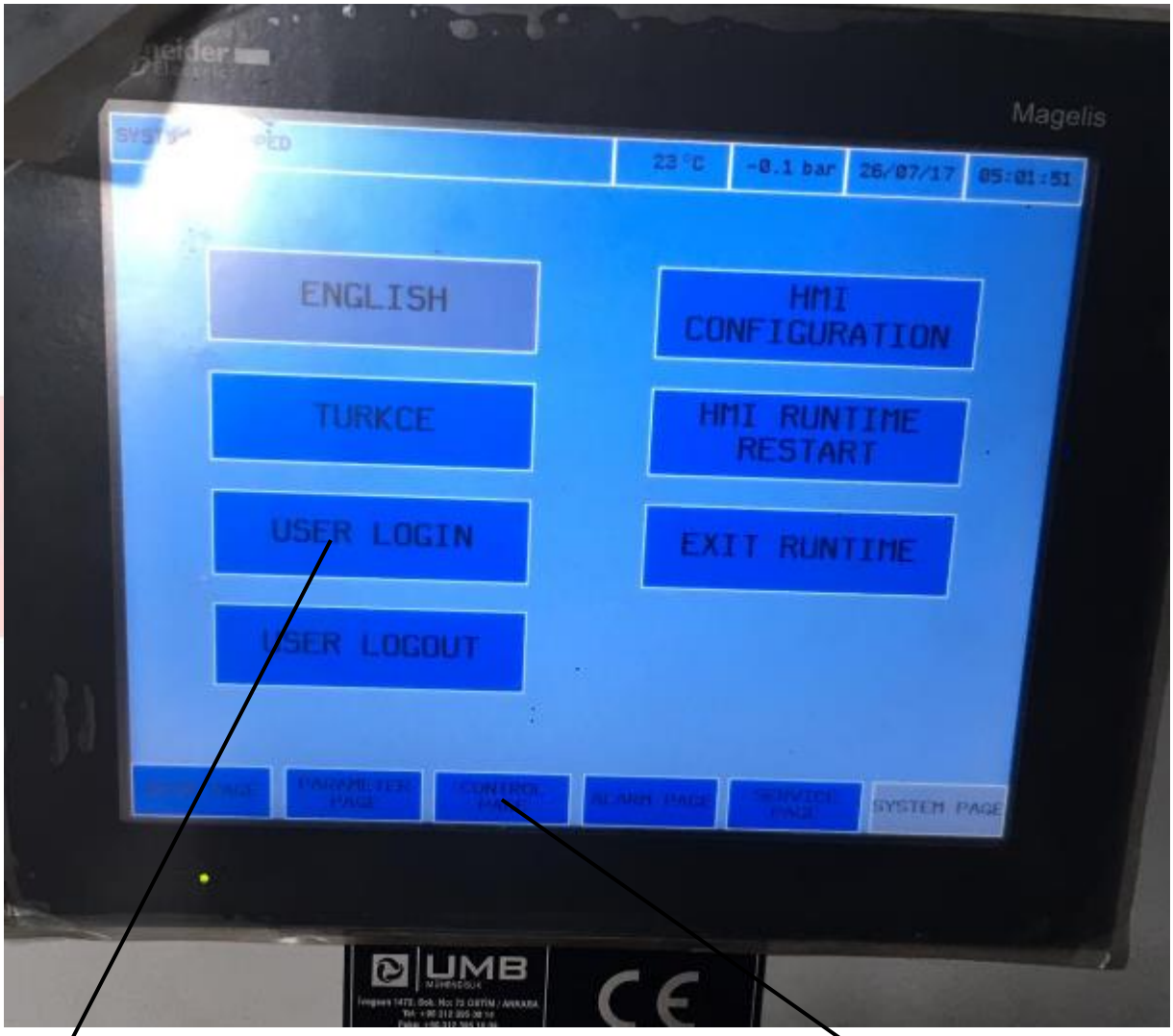


3- OPERATION IN AUTOMATIC MODE

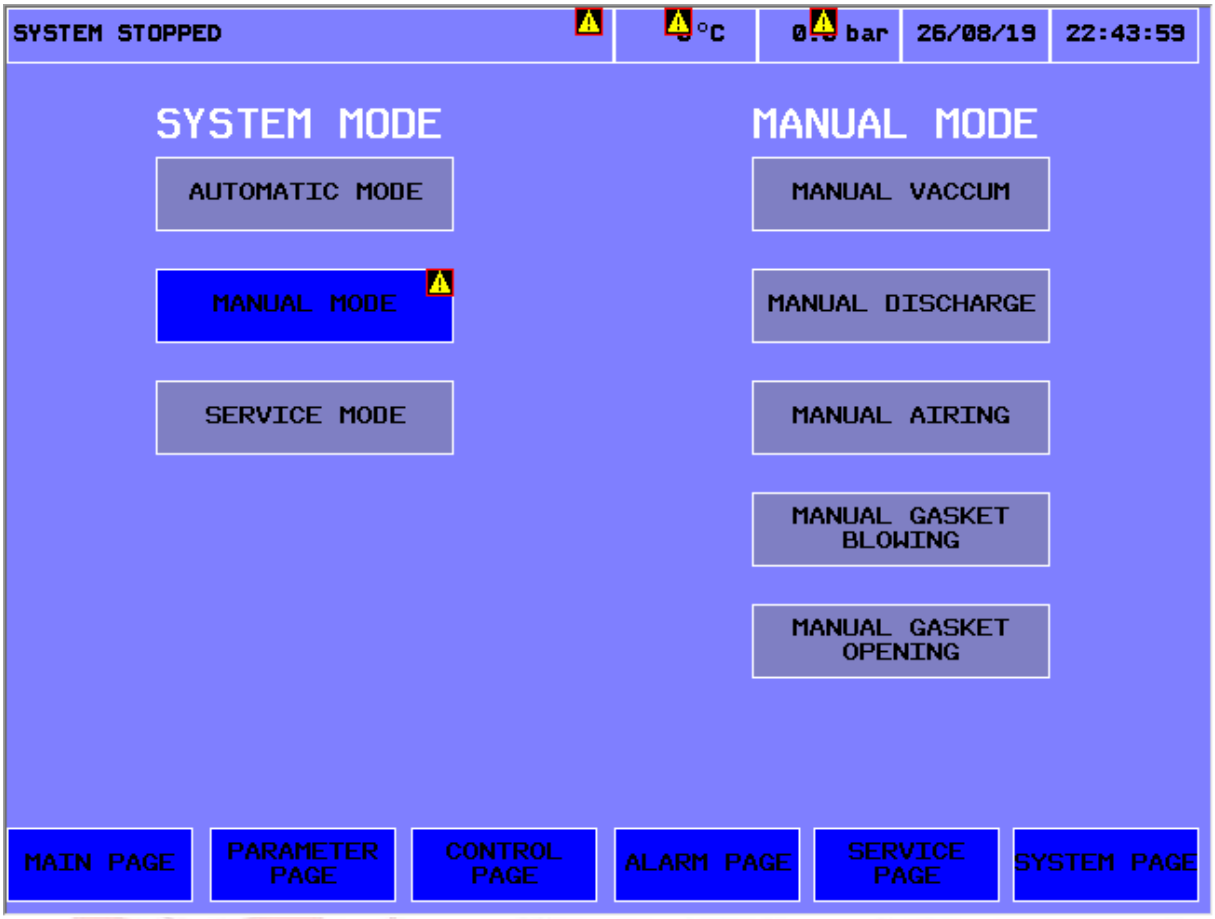
I. Start steam generator: Before starting treatment there must be enough steam for the process. First heating of steam generator, will take 30-35 minutes, then all day it will generate enough steam. Steam generator pressure set value must be "***3 bars***" and temperature "***139 C***".

II. Open the energy of the shredding autoclave, and touch the touchscreen to open the system,

III. Secondly, from the "SERVICE PAGE" log in as user (Username: super Password: 2158),



Push "USER LOGIN", then enter username and password. And open "CONTROL PAGE"



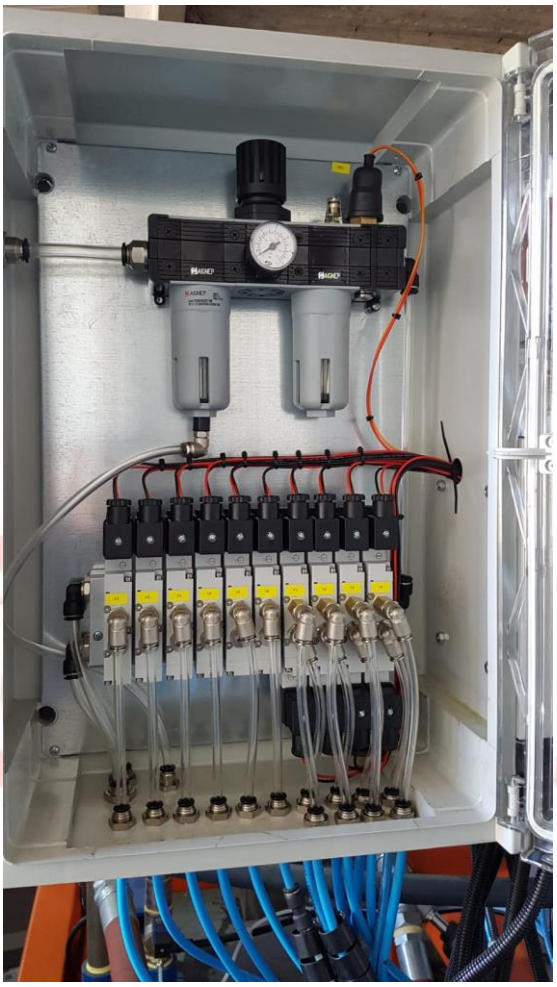
IV. Then from the “CONTROL PAGE” select automatic mode.
***Service Mode is used for actuating every part manually (pistons, valves, motors, etc.).

V. Open the Shredder bunker door from the “MAIN PAGE”. And load 2 containers of unsterilized waste.

VI. Finally, close the bunker door and start “automatic operation” from the “MAIN PAGE”.

4- MINOR MAINTENANCES OF ARI-550H

There are 5 greasing points in the equipment, which includes 4 bearings of shredder and the bearing assembly of screw conveyor motor. In every 30 days, it is required to grease those bearings.



First minor maintenance is cleaning the "drain steam filter" in every 2 days which takes 2-3 minutes. Second one is the filling oil and discharging the water filter of air service unit in every 6 months.

Break Down or Power Failure Situation:

This could be in several ways.

In case of power failure, operator must wait until power is on, and continue operation from the beginning.

Another possibility is the drain steam filter could be filled with waste because of operator forget the minor maintenance, and the pressure during sterilization process could not be decreased. In this situation, the manual valve near the water discharge valve will be opened, and the pressure decrease to atmospheric value. Then could clean the drain steam filter, and continue sterilization from the beginning.

Assume for some reason machine is blocked, and the pressure is high in the sterilization vessel. There is a manual ball valve near the water discharge valve which is under the loading door of sterilization vessel. If open this valve the pressure inside the vessel will decrease to atmospheric value and then the doors can be opened safely, and the waste can be taken out. By the way, if there is pressure inside vessel the doors cannot be opened.

5- TECHNICAL SPECIFICATIONS OF ARI-550H	
1. Treatment method	Outer-shredder Type, Pressurized Steam Sterilization
2. Average Treatment Capacity	350 kg / h
3. Shredder Bunker Volume	2000 liters
4. Sterilization Vessel Volume	1600 liters
5. Waste Feed System	With an elevator from the shredder bunker door
6. Shredder Type and Power	2 shafts, 30 Kw
7. Feed & Discharge Lid Systems	Fully Automatic, With 4 Kw Vacuum Motor
8. Supporting Lock System for Feed & Discharge Lids	Pneumatic, sliding type, Fully Automatic
9. Duration of One Cycle of ARI-550	28-34 minutes
10. Sterilization Temperature	134-142 ºC
11. Air Compressor	430 Liters/min. Capacity
12. Steam Generator Capacity (electrical)	100 kg / h
13. Water Supply Connection	1”
14. Water Consumption (average)	70 Liters/h
15. Power Connection	380 V, 50 Hz, 3-phase
16. Connected Power (including steam generator)	102 kW
17. Electricity Consumption (Except steam generator)	17 kw/cycle
19. Weight	8500 kg
20. Drying of Sterilized Waste	Vacuum mechanism with 4 kw vacuum motor
21. Sterile Waste Discharge	Automatically from the discharge door, Via screw conveyor
22. PLC, Automation System & Software	Schneider, Siemens, UMB