

TCS INDUSTRIES

Plot No:6A, Ever shine Industrial Estate, Near J Nanji Industrial Park, Chiri Road, 3rd Phase, G.I.D.C., VAPI-396195. Dist: Valsad, Gujarat, INDIA. E-mail: tcsindustries2012@yahoo.com, Mob: 09998642044, 09173480650.

YARN CONDITIONING PLANT









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YARN CONDITIONING PLANTS

SPECIFICATIONS FOR YARN STEAMING AUTOCLAVE MODEL : YSA - 500KG.

The Yarn steaming autoclave will consists of following parts:

1.	Autoclave unit.	1 no,
2.	Water ring vacuum pump with electric motor	1 no,
3.	Control panel	1 no,
4.	Pneumatic control valves	1 no,
5.	Necessary piping for the machine	1 lot,
6.	Yarn carrier trolleys	1 set.
7.	Charging trolleys	1 set.

AUTOCLAVE SPECIFICATIONS:

SHELL LENGTH	4000MM
USEFUL INNER DIAMETER	1600MM

THIS MACHINE WILL BE SUITABLE FOR LOADING APPROX. 500 KG YARN IN CHEESE FORM PER BATCH.

THIS YARN STEAMING AUTOCLAVE IS SUITABLE TO WORK ON HIGH TEMPERATURE AND HIGH PRESSURE AT 130 DEGREE CENTIGRADE ON 3KG/CM^2 PRESSURE.

The material of construction of autoclave will be S.S 304. The thickness of the shell and the dished ends will be 6mm. The door of the autoclave is normally hinged on the right hand side and the door locking, unlocking, opening and closings are done by manually.

VACUUM PUMP:

A water ring vacuum pump of 10 HP is provided with the machine. The vacuum pump requires a water pressure of 1.0 to 1.5 kg/cm² as water is used as a sealant in the vacuum pump. The maximum vacuum possible is 650mm of mercury.

CONTROL PANEL:

The control panel is designed to work on 415 volts, 3 phase, and neutral A.C supply and houses the entire instrumentation and electrical controls. The control panel body is manufactured out of 1.5mm m.s sheet and duly powder coated.

Required rotary switches for auto / manual operations, neon lamp indications and mimic diagram are also provided. In automatic operation a microprocessor programmer will be controlling the entire process.

FEW IMPORTANT FEATURES ARE AS FOLLOWS.

- 1. User can program the process as per his need simply with the help of key board.
- 2. User can select any of the standard programs stored in the memory of the instruments.
- 3. It has the facility of deleting any of the stages of the process.
- 4. Continuous display is provided for each progressing stage of the process.
- 5. Memory retentions in case of power failures.
- 6. The entire process control of the yarn steaming autoclave is fully automatic.

The control panel consists of:

- 1. Micro processors based controller
- 2. Electrical control elements.

Micro processors based controller:

This is the brain of the yarn steaming autoclave. It senses and controls different parameters such as vacuum, time, and temperature. Temperature is sensed by pt-100 sensor and pressure and vacuum is sensed by an instrument fixed on the vessel.

All the operating parameters are selected on the controller, time, temperature, and vacuum and safety temperature. These parameters are stored in a program designed by a number.

Electrical control elements:

The output from the controller is all 230vac. These outputs in turn control various solenoid valves and which controls the pneumatic valves with the help of compressed air. Auto / manual switches are provided for all the outputs. This is provided to facilitate manual overriding of the process.

The vacuum pump motor is provided with a starter suitably backed up with fuses and thermal overload relays. All the output from the controllers is protected by 500ma fuses.

PNUEMATIC CONTROL VALVES:

9 no's pneumatic rotary double acting valves will be provided for the following operations.

- 1. Vacuum relief
- 2. Vacuum
- 3. Steam injections
- 4. vessel drain
- 5. Water for vacuum pump
- 6. Safety interlocks for the door.

Apart from these pneumatic rotary valves, 5 no's electrical operated solenoid valves for actuating the pneumatic valves are also provided.

NECESSARY PIPING FOR THE MACHINES:

The yarn steaming autoclave will be supplied complete with all the piping's, hand control bypass valves, steam traps, water strainers etc. Flanges will be provided to connect utilities such as steam, water and air. All the drain pipes would be left open on the right hand side of the vessel.

YARN CARRYING TROLLEY:

The yarn carrier will be manufactured out of s.s sq. pipes and s.s pipes to suit the package size as per the requirements. Along with the machine 1 set yarn carrier trolley are given as standard supply. The yarn carrier trolleys are in the form of creel, designed as per your package size to accommodate maximum material. The base dimensions of the trolleys are approx. 1000mm width x 1000mm length= 4 NOS.

CHARGING TROLLEY:

This trolley facilitates inserting the yarn carrier from out Side to inside the autoclave.

CONTROL POSSIBILITIES:

- 1. With industrial water ring vacuum pump and continuous pilot injection of steam. The effect of evacuation will be the same as laboratory vacuum and therefore oxidation is avoided.
- 2. The range of working pressure adjustment will be 650mm of mercury vacuum to 3.5kg/cm² pressure. For operation under pressure as well as vacuum the vessel is provided with interlock type of door with safety catch. The range of temperature adjustment will be room temperature to 150 degree centigrade. The steam pressure required is about 100psi. an over temperature protection is also provided which will sound a bell in case the temperature goes above the set point.
- 3. An additional heating arrangement working by limpet coils on the shell is provided to further heat the steam contents. It is controlled by the controller.
- 4. Cooling: The cooling is accomplished by the limpet coil in which water is circulated, the condensate can be collected in a trough.

5. The entire process is automatic and at the end of the cycle, air is allowed inside the vessel.

UTILITIES ARRANGEMENTS TO BE MADE BY THE BUYER:

- 1. STEAM: Steam at 7kg/cm² pressure and flow rate of 500kg/hr. required. Expected steam consumption is between 0.35 to 0.5 kg of steam / kg of yarn.
- 2. WATER: Water is required of 1.5 kg/cm² pressure. The expected water consumption would be at the rate of 30 liter. / Min. whenever the vacuum pump is working. The expected "ON" time for the vacuum pump in 1 cycle is approximately 15 minutes. This water can be collected and re-used. Water also would be required for cooling of the autoclave whenever necessary.
- 3. ELECTRIC SUPPLY: Electric supply will be required at 415 volts, 3 phase, 50hz having connected load capacity of 20hp.
- 4. AIR: Air at 7 kg/cm² pressure at 15CFM.
- 5. SPACE: Space required will be approximately 7 mtr. X 3 mtrs. This takes into consideration the loading and unloading area also.

SAFETY FEATURES:

Safety valves are provided on the autoclave vessel and the limpet coils. The autoclave vessel is hydraulically tested up to 7kg/cm^2.

Door interlock is provided with the vacuum pump and steam injection. Limit switch, fitted on the autoclave operates only when the door is fully locked and then only the steam injection is possible.

A second safety lever has to be engaged before the machines can be started. This prevents accidental opening of the door.

A pin actuated by a pneumatic cylinder, whenever the autoclave is pressurized, prevents the door from being opened.

If the lever is disengaged, which has to be done to open the door, then the entire machine will stop and pressure / vacuum will be released.