

## SMALL, FULLY AUTOMATED VINEGAR PRODUCTION PLANT UP TO 900 LITERS ANNUALLY



Fermenter SF6 for the production of speciality vinegars as well as lab application. For the production of vinegar with an acidity of up to 15 % (semi-batch process).

### Fermenter Performance:

The Fermenter has a yearly performance of 900l vinegar, based on vinegar with 10% acetic acid at a filling volume of 6l.

### Function

#### The Semi-Batch Process:

The Semi-Batch-Process for the production of wine / cider / fruit / alcohol vinegar is a fermentation process at which 1/3 of the fermentation liquid is discharged when reaching a residual alcohol content of ~0,3% and replaced by charging fresh mash.

The alcohol concentration is measured online by our patented on-line system ALCOCONTROL (optional item).

### Cooling:

As the acidification is an exothermic process, cooling is one part of the process. The system will need a maximum cooling capacity of 0,12 kW, which has to be provided by the customer.

A cooling water valve is included in the scope of supply.

Tank with cooling coil

Tank material: Glass

Tank dimensions:

Diameter: 200 mm

Height: approx. 570 mm

Total volume: 10 l

Fermentation volume: 6 l

Cooling coil: material stainless steel AISI 316Ti / AISI 316L designed for the maximum heat production of the fermenter and a maximum cooling water temperature at max. 15°C.

High-performance aerator



Oxygen transfer and distribution are the most important factors in submerge vinegar fermentation. An intensive mixing of air, alcohol, water and nutrients as well as the homogenous distribution of this mixture within the entire working volume of the fermenter are the basic principles for modern and high-performing vinegar production. Cetotec aerators offer you all these factors finely tuned to perfection.

Function

The oxygen supply and distribution is based on a carefully designed aerator architecture consisting of a hydrodynamically optimized rotor and stator couple. The goal is to introduce the highest quantity possible of small air bubbles into the fermenter and therewith bring the aeration as well as the homogenous distribution of the mixture to perfection. This highly efficient supply to the vinegar bacteria enables the achievement of an optimal yield to energy consumption ratio.

Measuring and control equipment: stainless steel control cabinet with SIEMENS PLC, touch panel and CETO-SEMI software for the Semi-Batch process.

The Siemens PLC with user-friendly colour display controls the activation of motors, pumps, sensors and the actual process control. Operating the software via the touch panel is comprehensive and logically structured thus can be mastered efficiently in a very short time.

Important data are displayed such as:

- Temperature
- Alcohol concentration (with ALCOCONTROL)
- Filling level
- Process status (fermentation phase)
- Alcohol degradation rate (alcohol % / h with ALCOCONTROL)

The following functions are controlled by the PLC:

- Temperature control
- Fermentation cycle
- Error messages

Scope of supply

- Stainless steel control cabinet including all motor switches to control motors and pumps
- SIEMENS PLC controller S7 1214 C
- SIMATIC touch panel TP700 (7')
- License fermentation software CETO-SEMI for the production of vinegar with the Semi-Batch process
- The electrical control cabinet will be built according to the VDE specifications. Supply voltage will be adapted to your local specifications.
- Advantages
- Reliable and robust Siemens PLC process control
- User-friendly interface with Simatic Touch Panel
- Trend display in order to trace past batches
- Applicable for all production processes
- Fully-automized process control in combination with the Alcocontrol system
- Remote supervision via visualization software (optional).

#### Air piping system

- 2-way manual valve for intake air
- Manual valve for circulating air
- Mechanical flow meter
- Piping (stainless steel / PVC)

#### Sensors

- Temperature sensor with 4-20mA signal
- Pressure probe for filling level control