ALDOX™ HGB

Deaeration, Blending & Carbonation

Application

ALDOX™ HGB is a process module for production of deaerated high-quality water for breweries and soft drink manufacturers. All or part of the deaerated water is used for controlled blending into a main product stream, with subsequent carbonation. In the beverage industry, it is employed for blending and carbonation of beer, soft drinks and other beverages. The surplus of deaerated water, if any, can be utilized for other purposes such as flushing of lines, filter pre-coating etc.

Working Principle

The ALDOX™ HGB module is fully automatic with a PLC controlling the plant operation as well as the CIP.

Relevant process data displayed such as:

- Plant status
- Actual process data and setpoints
- Alarm status
- Controller settings
- Accumulated production volume

A fail-safe system is monitoring the operation.

Deaeration

Oxygen is removed in the ALDOX™ HGB column. The high desorption of oxygen is achieved with carbon dioxide (CO_2) over a packed bed operating at atmospheric pressure.

Water is routed via the liquid distributor at the top of the column and travels downward countercurrently with the CO_2. The internal packing material, specifically developed for this application, ensures a large effective contact area between liquid and gas. The benefits being highly efficient oxygen removal at very low gas rates. The majority of CO_2 added to the column is dissolved in the water.

The virtually oxygen-free water is collected at the bottom of the column. Due to the efficient design there is no need for a second column or recirculation of water.

Blending

The blending is carried out by continuously controlling the ratio of flows of the constituent liquids, e.g. beer and water. The blending ratio is pre-selected on the control panel. The PLC receives continuous data from the flow meters in the beer and water lines and regulates the control valve in the water line, so that the preset blending ratio is accurately maintained.

Alternatively, the operator keys in the known and required properties, such as alcohol content or original gravity of the feed and of the end product. The corresponding blending ratio is then automatically calculated and used instead.

Carbonation

CO_2 is injected in the product line directly, without utilizing any porous disc or sinter candle. This means that CIP of the CO_2 injection and product lines can be carried out without reduction of flow. A specially designed mixer/accelerator makes sure that the CO_2 dissolves rapidly into the product by a combination of turbulent flow and increased pressure.

The carbonation is carried out by continuously controlling the added gas amount in relation to the flows of the constituent liquids, e.g. beer and water. The level of carbonation (g/l) is pre-selected on the control panel. The PLC receives continuous data from the flow meters in the CO_2, beer and water lines and regulates the control valve in the gas line, so that the preset carbonation level is accurately maintained.

Alternatively, the operator keys in the known CO_2 content of the feed and the requested CO_2 content of the blended and carbonated product. The corresponding CO_2 amount to be added is then automatically calculated and used instead.

Additional water treatment

Pasteurization
As an option the AldoxTM HGB system can easily be integrated with plate pasteurization to secure a continuously high bacteriological water quality.

The incoming water is regeneratively heated with a high degree of heat recovery. Low-pressure steam, or hot water, is used as final heating medium to pasteurization temperature. The hold-up volume in the system gives the required residence time.

UV treatment
A unit for UV treatment can be installed as an alternative to pasteurization. The water is subjected to a UV dose in order to remove or decrease the content of bacteria.

Chilling
A third option that can be included, independently or in combination with one of the above options, is a plate cooler where the deaerated water is chilled to the required outlet temperature under accurate control. The cooling system is arranged to avoid any risk of freezing in the chilling stage.

Benefits
- Developed in co-operation with the brewing industry
- Automatic control from one operator interface
- Sanitary and compact design
- Hot or cold deaeration system available
- Water DO levels down to less than 0.01 ppm can be achieved
- CO_2 losses from deaeration process below 5%
- Heat recovery up to 95% (if pasteurizer option incl.)
- No heavy duty vessels or vacuum pumps
- Accurate and homogeneous blending of constituent liquids
- Efficient and accurate dissolving of CO_2
- Versatile and adaptable to different process requirements
- Low maintenance

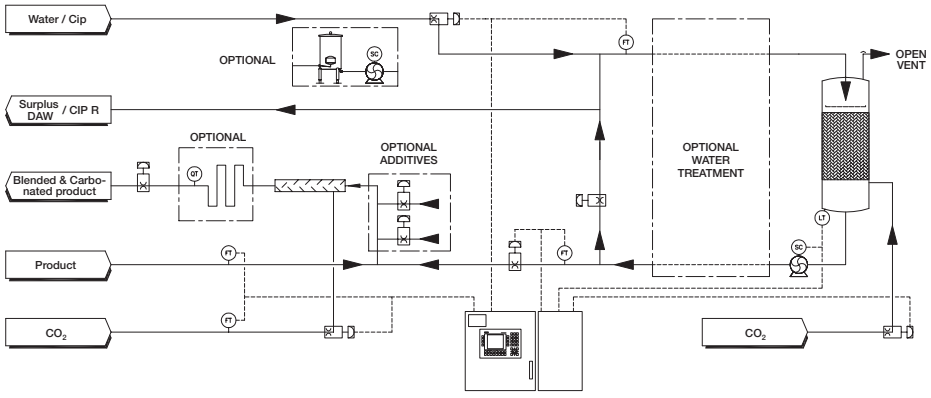
Basic Unit
The AldoxTM HGB module is self-contained and factory pre-assembled on a frame and tested before delivery. In compliance with food industry regulations, all components in contact with the process liquids are made of stainless steel with heat resistant seals. It is designed for CIP.

Technical Data

Capacity ranges, hl/h:	30 / 50-100, 60 / 80-150, 120 / 120-220 (deaeration / blending) Other capacities on request
Deaeration to:	Less than 0.05 ppm (optionally down to less then 0.01 ppm)
Utility data:	Depending on capacity range

Dimensions
Approximate dimensions and weight depending on capacity range, e.g. 60 hl/h deaeration and 150 hl/h blending:
L = 2.6 m W = 2.1 m H = 6.5 m
Weight: 2,000 kg

Optional Equipment
- Inlet water balance tank
- Dual stripping gas usage (CO_2 / N2)
- Pasteurization of water
- UV sterilization of water
- Cooling of water
- Direct ammonia system in final cooling stage
- Control / mixing of more than two blending liquids
- Holding cell for carbonated product
- Integrated CIP
- In-line analyzer for continuous measurement and adjustment of the alcohol content and/or original gravity of the beer after blending. A Brix meter can be supplied for control of syrup content in soft drinks and other beverages.
- Handheld or in-line CO_2 analyzer for monitoring or controlling the carbonation level of the end product.
- Communication with other control systems
- Remote control



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