



Everything in control



Brewing Industry



Beverage Industry



**Chemical and Pharmaceutical
Industry**



Biotechnology

About us

the company

corosys Prozeßsysteme und Sensoren GmbH has been founded in 2001 by partners with long time experience in the field of process technology, automation and instrumentation. Focus is the production and supply of high quality sensors, components, complete process systems and process automation to the Brewing, Beverage and Pharmaceutical Industry.

the group

Together with NORMAG Labor- und Prozesstechnik GmbH, a highly specialized supplier of borosilicate glass components, equipment and plants to the Chemical and Pharmaceutical Industry, we form a small company group, cooperating in several fields like for example process automation.

looking back

Today we already look back on more than seven very successful years with partly above average growth, establishing corosys as a leading supplier in key product ranges.

This is documented by the large number of more than 200 installed process systems as well as by outstanding projects, marking the steady growth and development of the company.

project highlights

- Process and detail engineering, supply of key components, automation and control of one of the biggest bio ethanol distillation plants in Germany.
- Supply of the complete range of process system products for one of the worldwide biggest green field brewery projects in Middle America.
- Process automation soft- and hardware from brew house to cold block for a 3.0 Mio. hl/year brewery.

partners

It is impossible to cover all specific aspects and technical requirements of our customers. Therefore cooperation with partners with very specific know how and capabilities is one important factor of our success.

environmental statement

It is our permanent aim to minimize negative impact of our daily work and our products on the environment by

- preventing unnecessary energy and resource consumption
- purchasing equipment and consumables based on ecological criteria
- preferring materials and products made of environmentally sustainable materials
- minimizing the energy consumption, resource consumption and emissions of our products
- promoting eco-consciousness among employees



Degassing

Water Deaeration and Treatment, Product Degassing

Mixing

Carbonation, Blending, Dosing, Dissolving, Aeration

Pasteurization

Flash Pasteurization, Autolyzation

Cleaning

CIP, Sterilization

Filtration

DE-Filter, Trap Filter

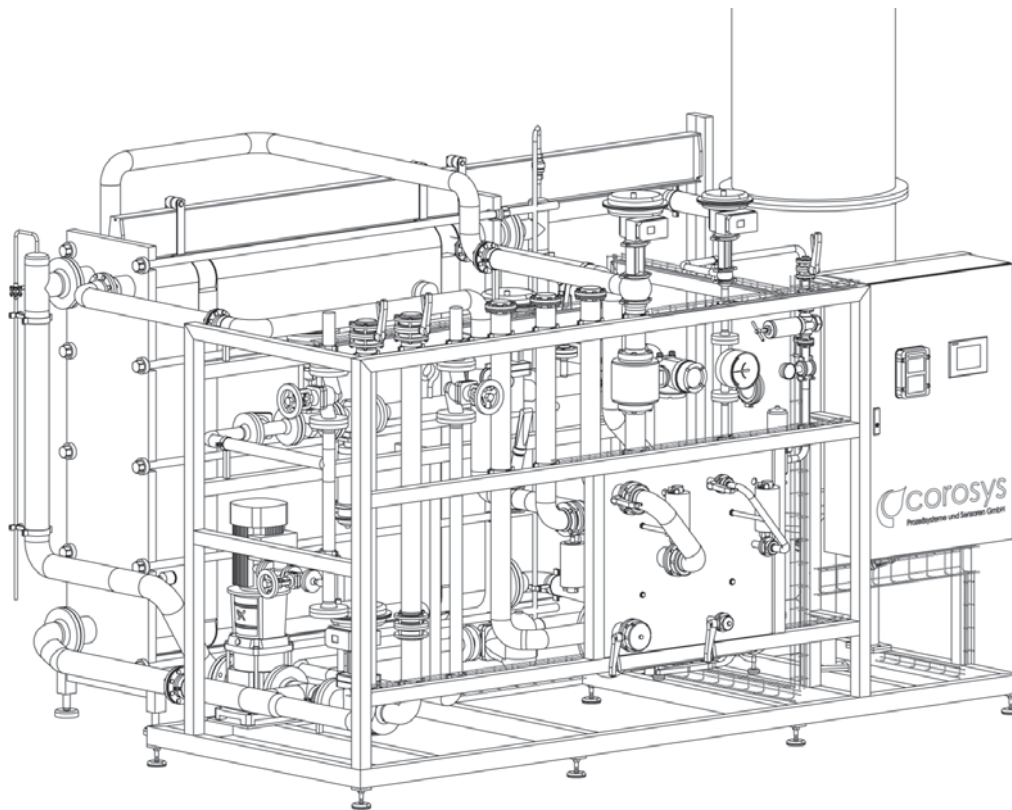
Instrumentation

Instruments, Automation, Control

Automation

Control, Programming, Visualization, Data Acquisition

Hot Water Deaeration HWD

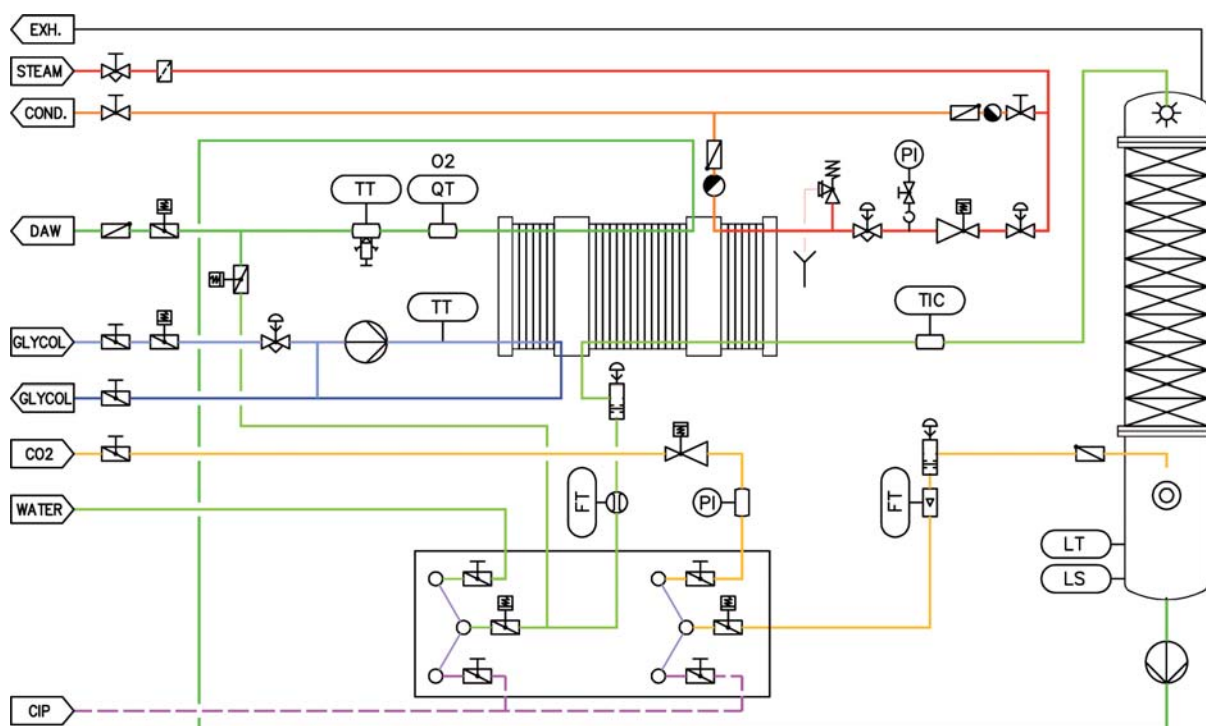


- Hot water deaeration by stripping with CO₂
- Very low residual oxygen values < 10 ppb
- Simultaneous pasteurization / sterilization of the water
- High heat recuperation up to 95%
- Optional In-line oxygen analyzer, filtration or carbonization
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Hot Water Deaeration (HWD) deaerates water down to a residual oxygen concentration below 10 ppb. At the same time the water is pasteurized. Optionally it can be cooled down, filtered or pre-carbonized. The function of the unit can be monitored and documented by an in-line oxygen analyzer at the outlet of the unit.

The process is employed in the brewing, beverage, food and chemical-pharmaceutical industries, wherever water with lowest oxygen content is required to assure high product quality and stability.

The system is characterized by high operational reliability, high heat recuperation up to 95% and low consumption. Microbiological safety is ensured by the simultaneous pasteurization of the water.



Technical Description

The water is heated up to 74°C in a 3-zone plate heat exchanger by the already deaerated water coming from the stripping column and by low pressure steam. The water is distributed homogeneously to the structured packing at the top of the column. The water slowly flows downwards through the structured packing in counter current flow to the CO₂. The CO₂ is fed in at the bottom of the column. A long and intensive contact between water and stripping gas is ensured by the high-performance structured packing. CO₂ is dissolved in the water up to a level of 0.5 g/l and at the same time suppresses the oxygen. Optionally, nitrogen can be used as stripping gas.

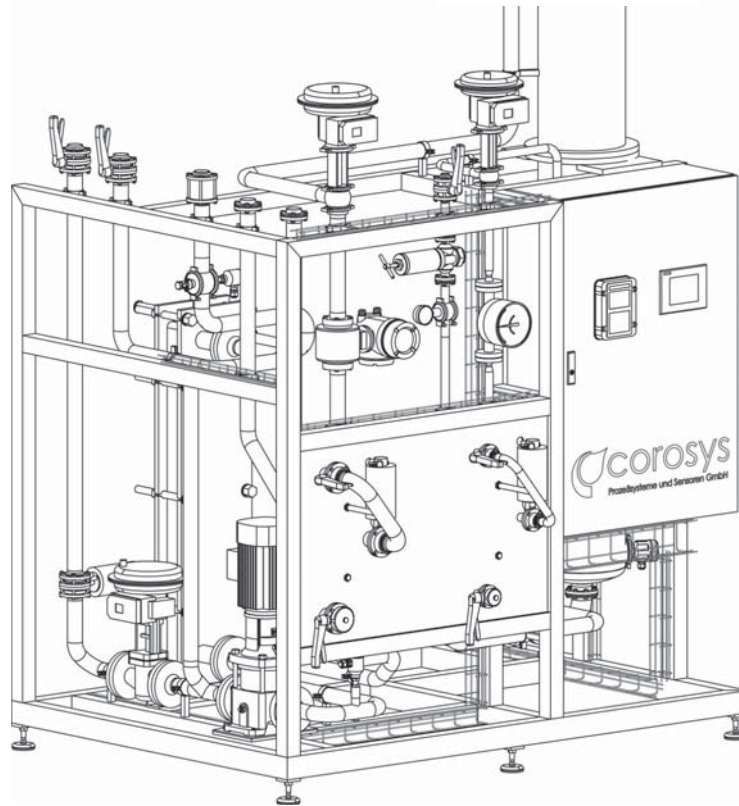
The deaerated water is pumped from the bottom of the column through the plate heat exchanger, where it is cooled by the incoming water. Finally the water is cooled to 2°C in the plate heat exchanger by glycol or ammonia. Sensors for oxygen, level, flow and temperature monitor the proper functioning of the system.

The unit can be controlled by a local PLC with a touch panel or by a process control system. Designed for high hygienic standards, all common cleaning agents in the beverage and chemical-pharmaceutical industry can be used for CIP cleaning.

Technical Specification

Capacity	25 to 1,000 hl/h / 2.5 to 100 m³/h
Residual oxygen content	< 10 ppb / 0.01 ppm
Heat recovery	up to 95 %
CO ₂ consumption	0.8 g/l
CO ₂ supply	min. 6 barg / ≥ 99.98 % purity
Heating media	steam or hot water
Cooling media	glycol or ammonia

Cold Water Deaeration CWD

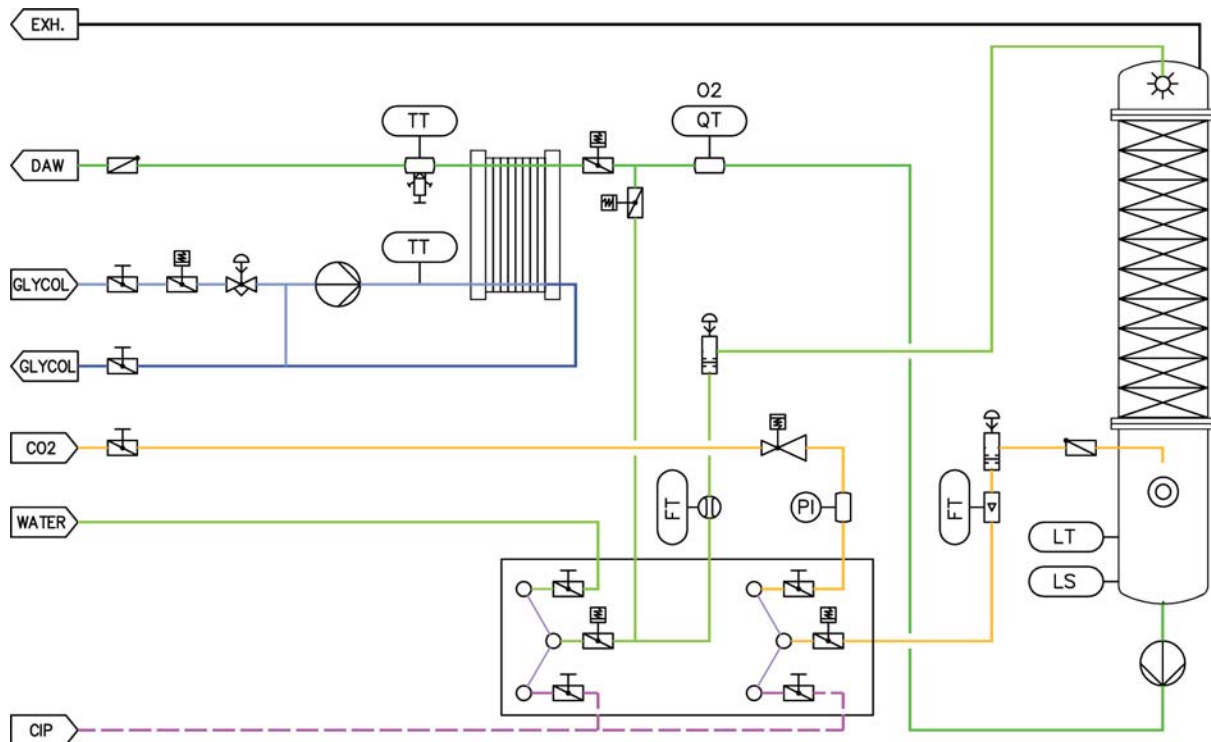


- Cold water deaeration by stripping with CO₂
- Low residual oxygen values < 50 ppb
- Simultaneous carbonation of the water
- Low energy consumption
- Optional In-line oxygen analyzer, filtration or carbonization
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Cold Water Deaeration (CWD) deaerates water down to a residual oxygen concentration below 50 ppb. At the same time the water is saturated with 2 g/l CO₂. Optionally it can be cooled down, filtered or sterilized with ultraviolet light. The function of the unit can be monitored and documented by an in-line oxygen analyzer at the outlet of the unit.

The process is employed in the brewing, beverage, food and chemical-pharmaceutical industries, wherever water with low oxygen content is required to assure high product quality and stability.

The system is characterized by high operational reliability, simple functionality and low investments. Due to the carbonization of water, the unit is especially suitable for the production of carbonated beverages.



Technical Description

The water is distributed homogeneously to the structured packing at the top of the column. The CO₂ is fed in at the bottom of the column. The water slowly flows downwards through the structured packing in counter current flow to the CO₂. A long and intensive contact between water and stripping gas is ensured by the high-performance structured packing. CO₂ is dissolved in the water up to a level of 2.0 g/l and at the same time suppresses the oxygen. Optionally, nitrogen can be used as stripping gas.

The deaerated water is pumped out of the bottom of the column with a frequency controlled pump. Optionally the water can be cooled down in a plate heat exchanger by glycol or ammonia.

Sensors for oxygen, level, flow and temperature monitor the proper functioning of the system.

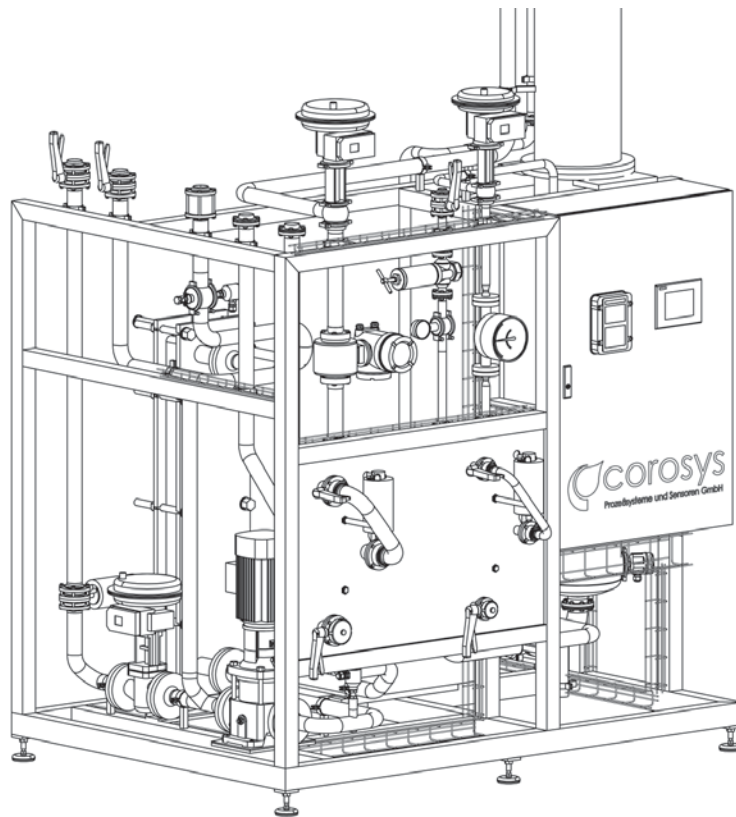
The unit can be controlled by a local PLC with a touch panel or by a process control system.

Designed for high hygienic standards, all common cleaning agents in the beverage and chemical-pharmaceutical industry can be used for CIP cleaning.

Technical Specification

Capacity	25 to 1,000 hl/h / 2.5 to 100 m³/h
Residual oxygen content	< 50 ppb / 0.05 ppm
CO ₂ consumption	2.4 g/l
CO ₂ supply	min. 6 barg / ≥ 99.98 % purity
Cooling media	glycol or ammonia

Vacuum Water Deaeration VWD

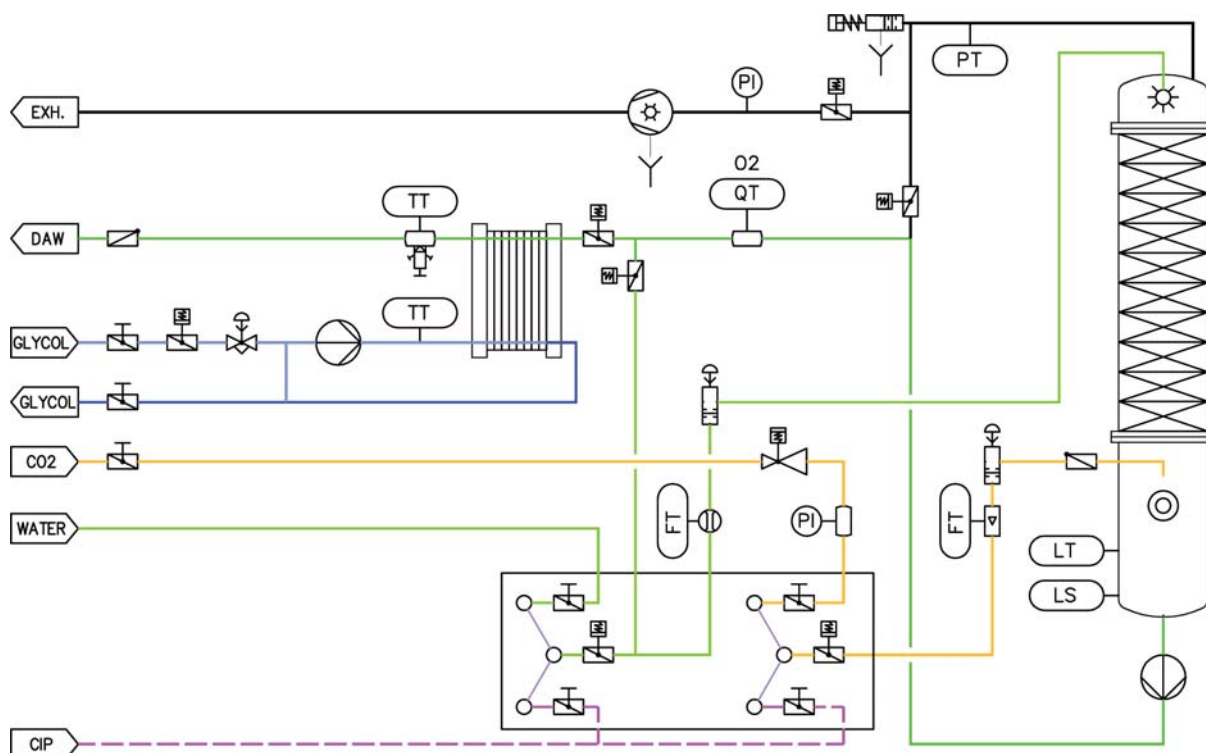


- Vacuum water deaeration by stripping with CO₂
- Very low residual oxygen values < 20 ppb
- Low CO₂ consumption
- Low energy consumption
- Optional In-line oxygen analyzer, filtration or carbonization
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Vacuum Water Deaeration (VWD) deaerates water down to a residual oxygen concentration below 20 ppb. Optionally the water can be cooled down, filtered or sterilized with ultraviolet light. The function of the unit can be monitored and documented by an in-line oxygen analyzer at the outlet of the unit.

The process is employed in the brewing, beverage, food and chemical-pharmaceutical industries, wherever water with lowest oxygen content is required to assure high product quality and stability.

The system is characterized by high operational reliability, low CO₂ and energy consumption.



Technical Description

The water is distributed homogeneously to the structured packing at the top of the column. The CO₂ is fed in at the bottom of the column. The water slowly flows downwards through the structured packing in counter current flow to the CO₂. A long and intensive contact between water and stripping gas is ensured by the high-performance structured packing. CO₂ is dissolved in the water up to a level of 0.2 g/l and at the same time suppresses the oxygen. The operation of the column under vacuum, with a pressure about 80 mbar, reduces the partial pressure of gas. Low oxygen values and CO₂-consumption are reached. Optionally, nitrogen can be used as stripping gas.

The deaerated water is pumped out of the bottom of the column with a frequency controlled pump. Optionally the water can be cooled down in a plate heat exchanger by glycol or ammonia. Sensors for oxygen, level, flow and temperature monitor the proper functioning of the system.

The unit can be controlled by a local PLC with a touch panel or by a process control system. Designed for high hygienic standards, all common cleaning agents in the beverage and chemical-pharmaceutical industry can be used for CIP cleaning.

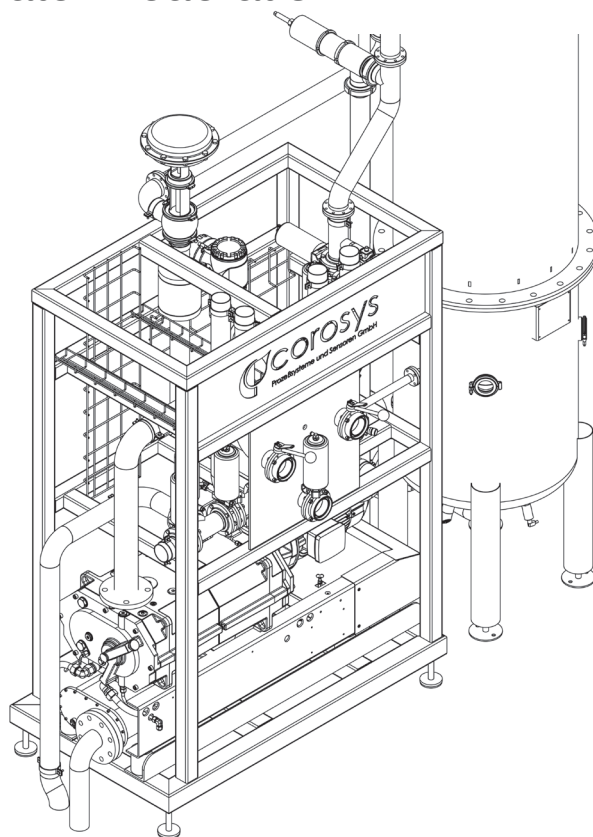
Technical Specification

Capacity	25 to 1,000 hl/h / 2.5 to 100 m³/h
Residual oxygen content	< 20 ppb / 0.02 ppm
CO ₂ consumption	0.4 g/l
CO ₂ supply	min. 6 barg / ≥ 99,98 % purity
Cooling media	glycol or ammonia

High Vacuum Water Deaeration V2WD



NEW

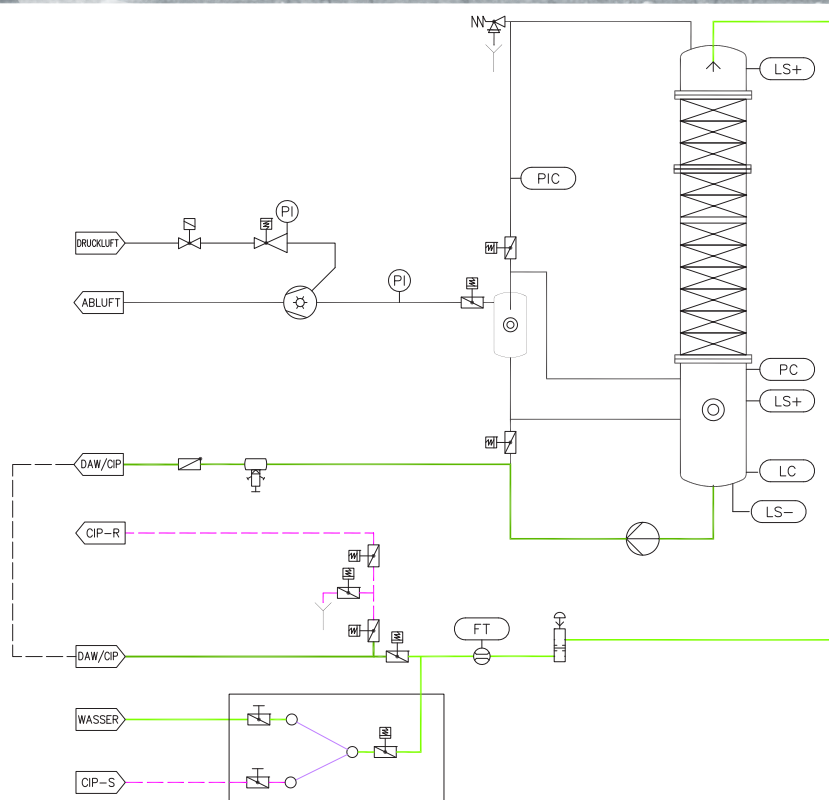


- Water deaeration with a two step vacuum process without stripping gas, CO₂ or N₂
- Zero Emission of greenhouse gases
- Very low residual oxygen values < 10 ppb
- Low energy consumption
- Optional In-line oxygen analyzer, filtration or carbonization
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The High Vacuum Water Deaeration (V2WD) is a new development by corosys GmbH. It de-aerates water down to a residual oxygen concentration below 10 ppb without use of stripping gas. Optionally the water can be cooled down, filtered or sterilized with ultraviolet light. The function of the unit can be monitored and documented by an in-line oxygen analyzer at the outlet of the unit.

The process is employed in the brewing, beverage, food and chemical-pharmaceutical industries and the power industry, wherever water with lowest oxygen content is required to assure high product quality and stability and to avoid corrosion.

The system is characterized by high operational reliability and low energy consumption.



Technical Description

The water is distributed homogeneously to the structured packing at the top of the column. It slowly flows downwards through the structured packing. An excellent distribution of the water in the column is ensured by the high-performance structured packing. The resulting enlargement of the contact surface of water causes an optimal removal of oxygen. Due to the combination of two degassing steps operated at different pressures, lowest oxygen values are reached.

No stripping gas is used and zero greenhouse gas is emitted.

The deaerated water is pumped out of the bottom of the column with a frequency controlled pump. Optionally the water can be cooled down in a plate heat exchanger by glycol or ammo-nia. Sensors for oxygen, level, flow and temperature monitor the proper functioning of the system.

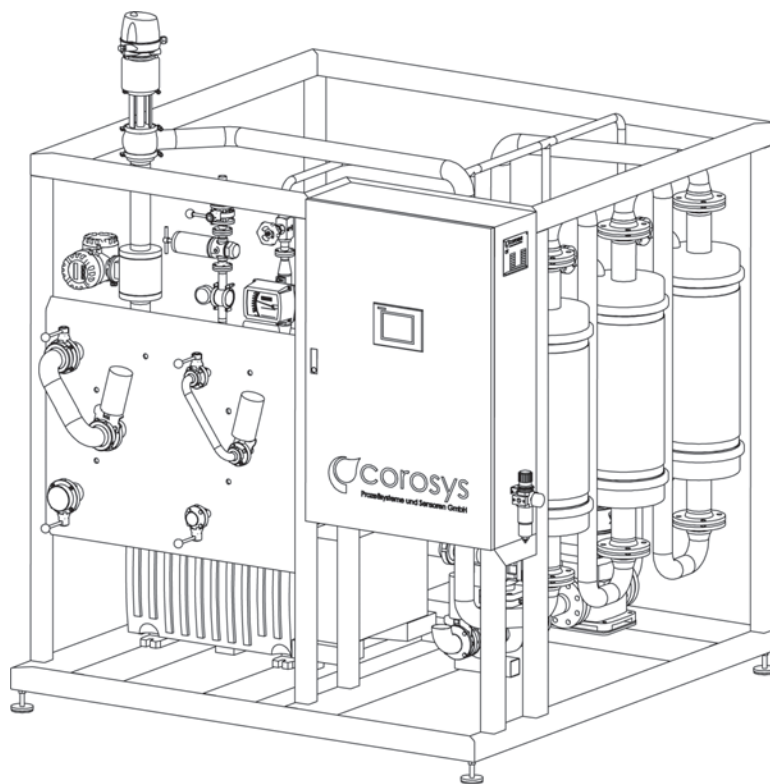
The unit can be controlled by a local PLC with a touch panel or by a process control system.

Designed for high hygienic standards, all common cleaning agents in the beverage and chemicalpharmaceutical industry can be used for CIP cleaning.

Technical Specification

Capacity	25 bis 1000 hl/h / 2,5 bis 100 m³/h
Residual oxygen content	< 10 ppb / 0.01 ppm
CO ₂ consumption	0,00 g/l
Cooling media	glycol or ammonia

Membrane Water Deaeration MWD

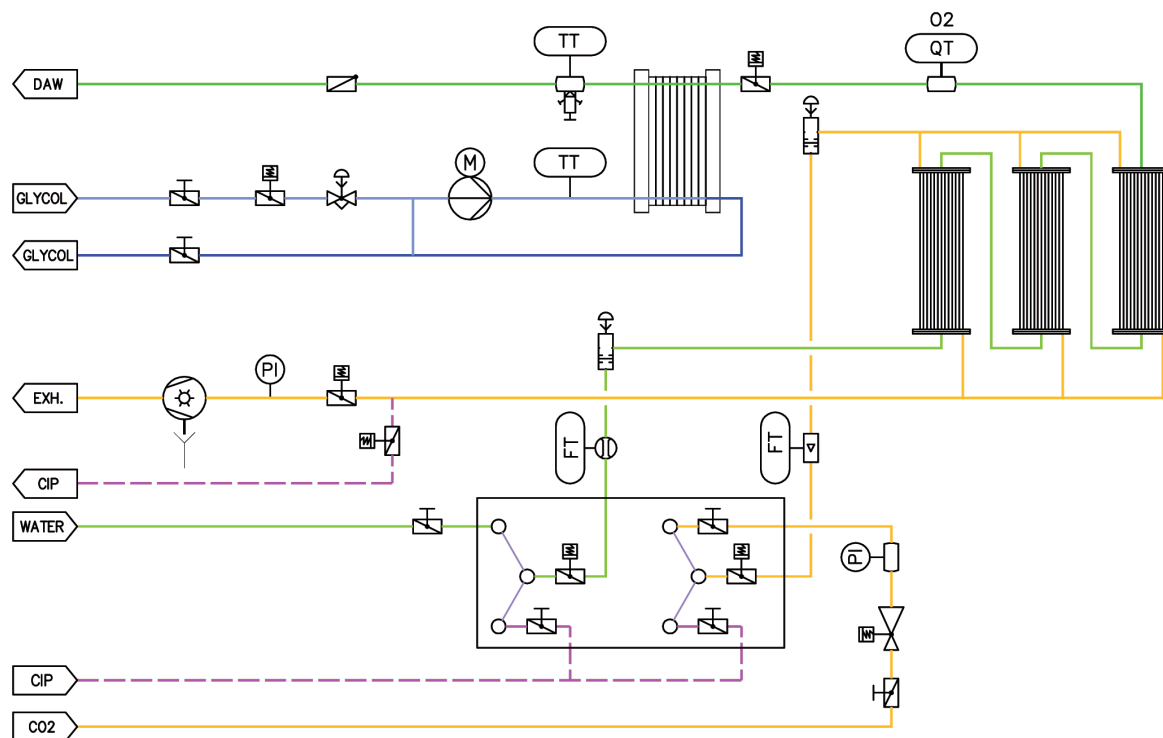


- Deaeration of water with highly efficient hollow fibre membranes
- Very low residual oxygen values < 10 ppb
- Low CO₂ consumption
- Low energy consumption
- Optional in-line oxygen analyzer, filtration or carbonization
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Membrane Water Deaeration (MWD) deaerates water down to a residual oxygen concentration below 10 ppb, using highly efficient hollow fibre membrane modules. Optionally, the water can be cooled down, filtered or sterilized with ultraviolet light. The function of the unit can be monitored and documented by an in-line oxygen analyzer at the outlet of the unit.

The process is used in the brewing, beverage, food and chemical-pharmaceutical industries, wherever water with very low oxygen content is required to ensure high product quality and stability.

The system is characterized by high operational reliability as well as low CO₂ and energy consumption.



Technical Description

Inside the modules, water flows on the outside around the hydrophobic hollow fibres; inside, in counter-current flow, stripping gas flows. The hollow fibres create an extremely large contact surface between the stripping gas and the deaerated water and let gas through, but no water. The generated vacuum on the gas side of approx. 65 mbar sucks the gas mixture from the modules. Because of the high differential partial pressure caused by the vacuum and the stripping gas, the oxygen molecules diffuse from the water into the vacuum. Nitrogen or CO₂ can be used as stripping gas.

After passing the membrane modules, the water can optionally be cooled down in a plate heat exchanger. Sensors for oxygen, flow and temperature monitor the proper functioning of the system. By arranging the modules parallel and in series, almost any capacity and residual oxygen value can be achieved.

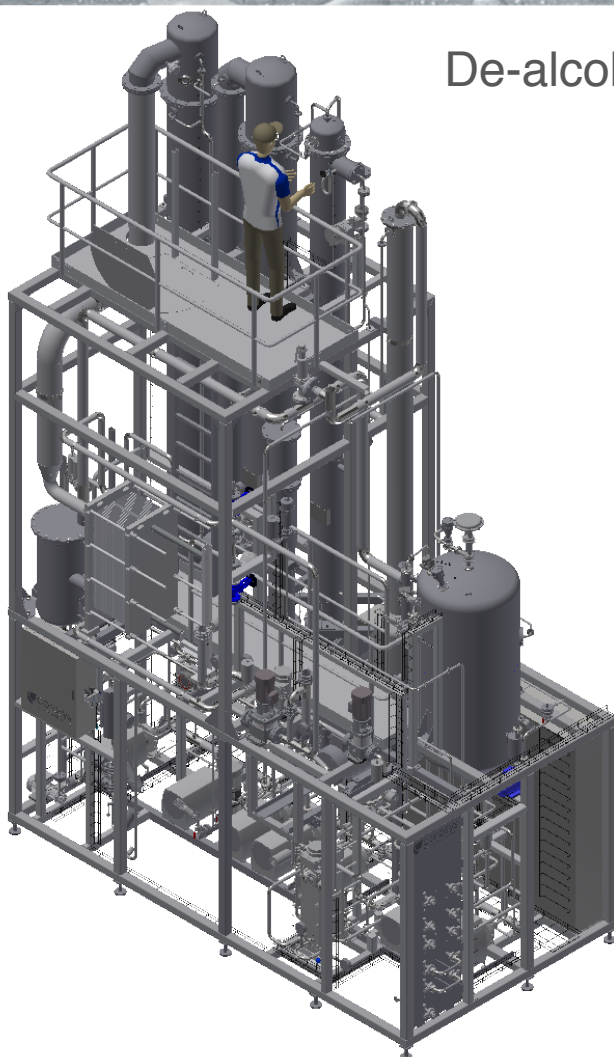
The unit can be controlled by a local PLC with a touch panel or by a process control system.

Designed for high hygienic standards, all common cleaning agents in the beverage and chemical-pharmaceutical industry can be used for CIP cleaning.

Technical Specification

Capacity:	5 to 1,000 hl/h / 0.5 to 100 m ³ /h
Residual oxygen content:	< 10 ppb / 0.01 ppm
CO ₂ consumption:	0.6 g/l
CO ₂ supply:	min. 6 barg / ≥ 99.98% purity
Cooling media:	glycol or ammonia

De-alcoholization DAS



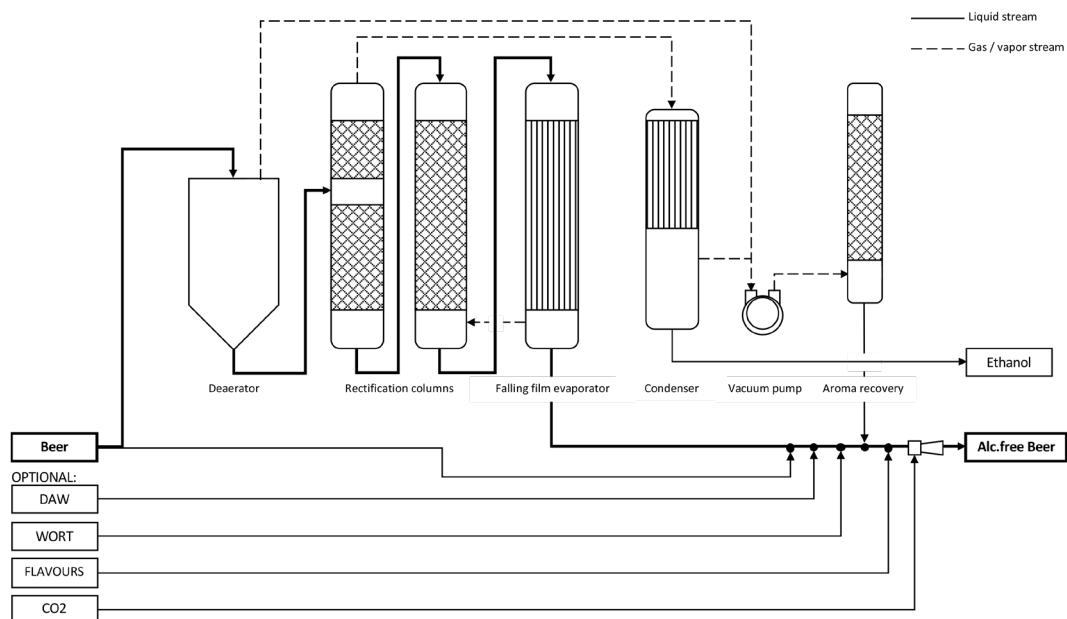
NEW

- Product-friendly de-alcoholization of beer, wine and other alcoholic beverages
- Vacuum rectification at low temperatures
- Concentration of ethanol for further use
- Optional aroma recovery and dosing
- Mixing of the de-alcoholized product with water, mother beer, raw material, etc.
- Optionally with downstream carbonation and flash pasteurization
- Hygienic design with integrated CIP system
- Fully automatic operation with standard PLC control and touch panel
- High process reliability due to high-precision measurement technology for alcohol, CO₂ and O₂
- Optional integration in process control system and remote maintenance

The DAS de-alcoholization plant removes ethanol from alcoholic beverages such as beer or wine by means of continuous vacuum rectification. Extremely low residual alcohol contents of less than 0.04 vol% can be achieved in a product-friendly manner.

The process is established in the brewing and beverage industry for the production of non-alcoholic beverages and is suitable for all common alcoholic starting products such as top- and bottom-fermented beer, wine or sparkling wine.

Since the de-alcoholization process is applied at low temperatures under vacuum, the product is treated gently without loss of quality. Highly accurate and reliable measuring technology and precise control algorithms guarantee high product quality and process reliability. By integrating all upstream and downstream processes, corosys supplies all steps for the production of non-alcoholic beers and mixed beer beverages from a single source.



Technical Description

During de-alcoholization of carbonated products, degassing takes place in a first process step.

The alcoholic beverage is then fed uniformly at the top of a rectification column and trickles down in countercurrent to the upflowing vapors. The alcohol is removed from the product in the form of steam, accumulates in the rising vapours and condenses shortly afterwards in a heat exchanger to a higher concentration. Optionally, an ethanol meter can be used to collect the alcohol obtained in this way. A downstream aroma recovery system washes out the aroma components discharged with the gas phase and returns them into the product.

The precipitated product is fed from the bottom of the rectification column into a falling film evaporator. The

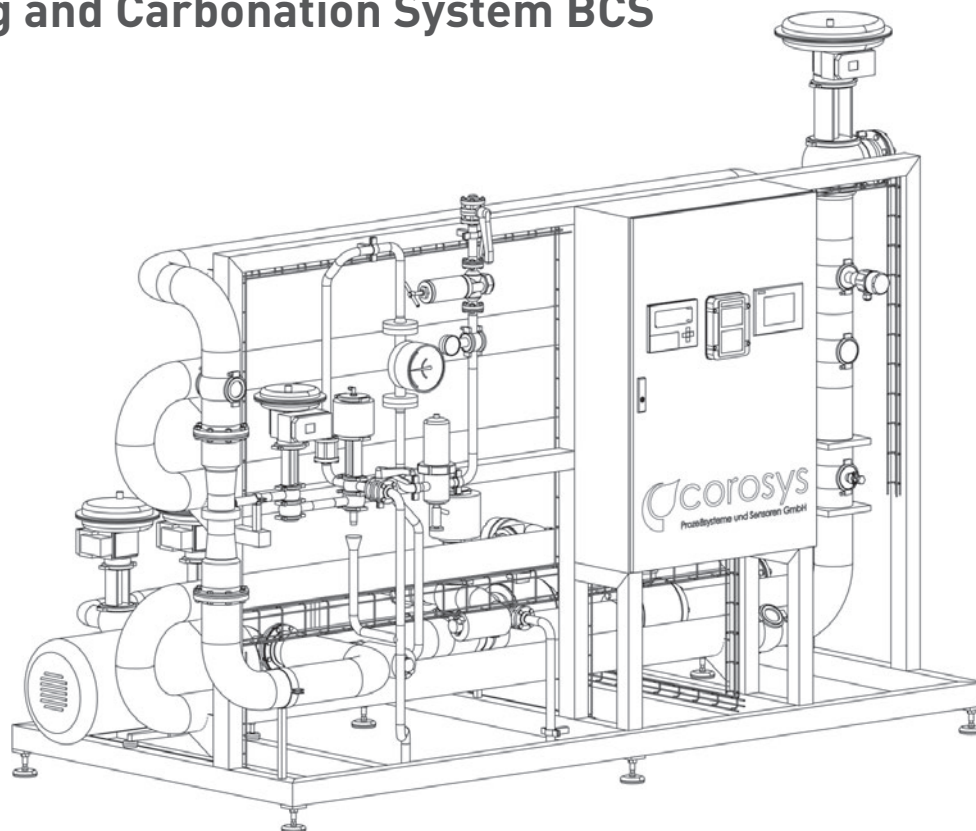
vapors required for rectification are generated in this evaporator and is returned to the column. Due to the vacuum, this process can be carried out at very low temperatures in a particularly gentle manner.

The de-alcoholized product removed from the falling film evaporator is then cooled by the incoming product which is still to be de-alcoholized. The subsequent blending with various components such as mother beer, water, recovered aroma, wort or basic material, as well as carbonation and, if necessary, flash pasteurization, enable the complete production of alcohol-free beers and mixed drinks in one plant.

Technical Specification

Capacity	5 – 200 hl/h
Initial alcoholic strength by volume	max. 10 % vol
Residual alcohol content	< 0,04 % vol
Heating medium	Steam, Hot water
Cooling medium	Glycol, Ammonia

Blending and Carbonation System BCS

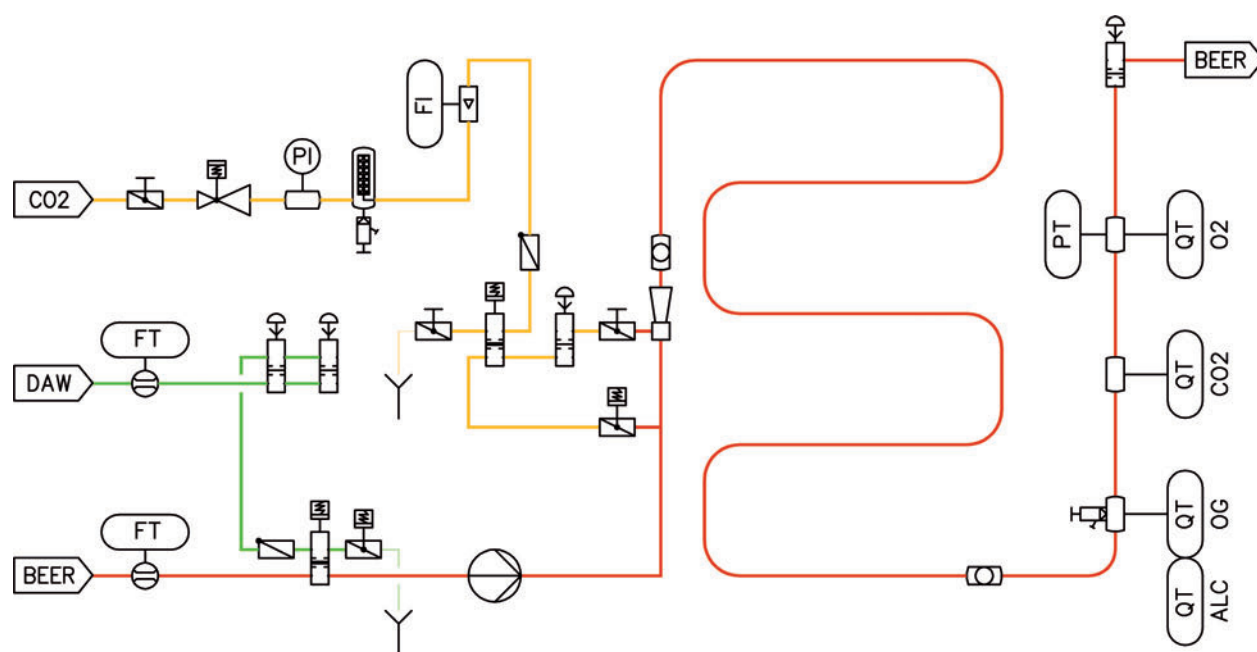


- Continuous, highly accurate adjustment of original gravity, alcohol and CO₂ content
- Highly efficient CO₂ injector, low pressure drop, complete dissolving of CO₂
- Highly precise dosing of deaerated water via two parallel control valves
- Optional in-line oxygen analyzer
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Blending and Carbonation System (BCS) continuously and highly accurately controls the original gravity, alcohol and CO₂ content of beer by the precisely regulated blending of deaerated water and dosing of CO₂. Optionally malt extract, hops extract, flavouring or syrup dosing can be integrated in the system.

The process is well established in the brewing industry for blending and carbonation wherever beer is brewed according to the high gravity process, the wort or alcohol content is exactly controlled, or for the production of beer mix drinks.

The system is characterized by highly accurate and reliable analyzers and precise control algorithms. The corosys CO₂ gas injector splits the CO₂ into very small bubbles and ensures dissolving.



Technical Description

The flow of beer and water is measured by electromagnetic flow meters at the inlet of the system. Two parallel control valves of different size adjust the flow of deaerated water as a percentage of the beer flow. The follow-on centrifugal pump pumps the beer through the carbonization to the BBT and at the same time mixes beer and water homogenously.

Afterwards CO₂ is injected into the beer via the GDI gas injector developed by corosys. The gas injector splits the CO₂ into very small bubbles and ensures that the CO₂ completely dissolves in a very short time. This can be monitored by a sight glass situated at the outlet of the dissolving path.

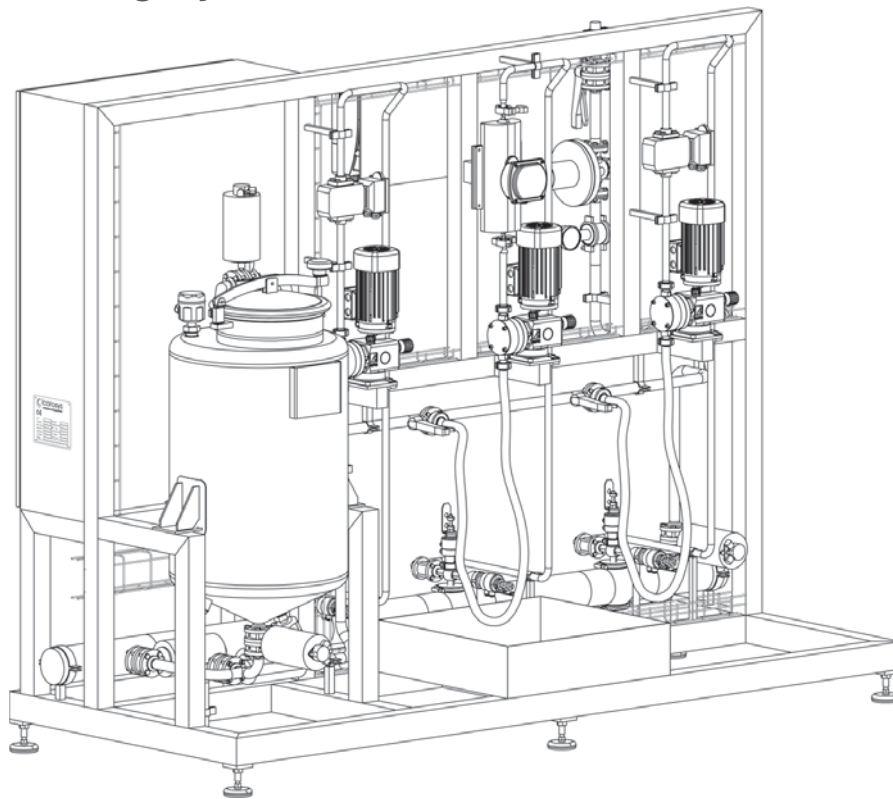
Original gravity, alcohol and CO₂ content are continuously measured in-line by the beer monitor at the outlet of the unit. The blending and carbonation ratios are continuously adjusted by a control algorithm.

The unit can be controlled by a local PLC with a touch panel or by a process control system. Designed for high hygienic standards, all common cleaning agents in the brewing and beverage industry can be used for CIP cleaning.

Technical Specification

Capacity	50 to 1,500 hl/h
Measuring range – original gravity	0 - 20 °P, +/- 0.05
Measuring range – alcohol	0 - 10 % vol. , +/- 0.3
Measuring range – CO ₂	0 - 10 g/l, +/- 0.1
CO ₂ supply	min. 6 barg / ≥ 99,98 % purity

Additive Dosing System ADS



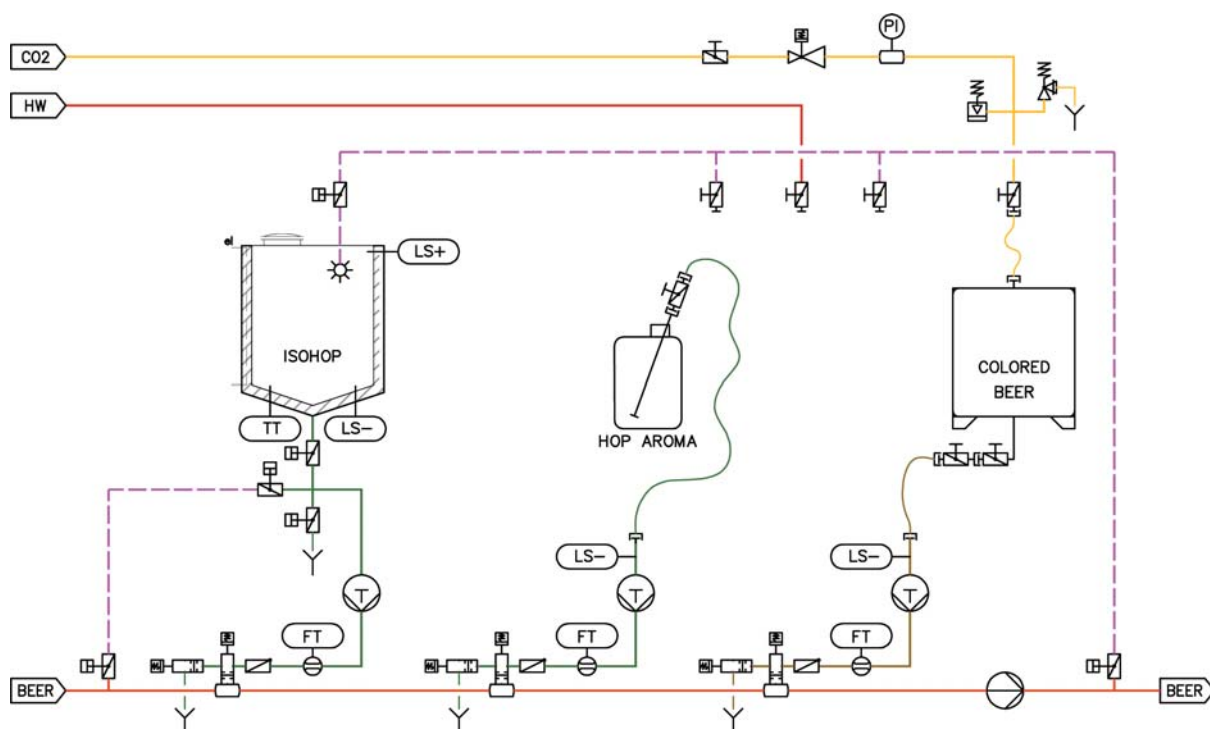
- Continuous dosing of additives, such as malt extract, hops products, and flavours
- Precise dosing in relation to the amount of product, with set point in g/hl or ml/hl
- Optional in-line color measurement and control in EBC units
- Automatic ejection of product and rinsing of system after each production batch
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Additive Dosing System (ADS) continuously and accurately doses malt extract, hops products, flavours, enzymes and other additives to beer, beer wort and other beverages.

The additives can be dosed from containers, canisters or a dosing vessel with optional heating jacket.

Additive dosing systems are commonly used in the brewing and beverage industry, but also in the chemical-pharmaceutical industry. Making use of this technology provides the greatest possible production flexibility.

The systems are characterized by highly accurate metering systems for volume and mass flow and precise control algorithms. Optionally the dosing can be controlled by in-line color sensors or other suitable in-line analyzers.



Technical Description

The flow of product is measured by an electromagnetic flow meter at the inlet of the system. The system doses the additives according to product flow and in a fixed rate given by the recipe for malt extract, hops products, flavours or enzymes. The flow of additives is controlled by frequency controlled metering pumps or by control valves.

The dosing takes place directly in-line and via a hygienic valve combination. CO₂ can also be applied to the container or the dosing vessel to avoid contamination with oxygen. At the end of production, the complete dosing system can be rinsed with water and cleaned via a CIP station.

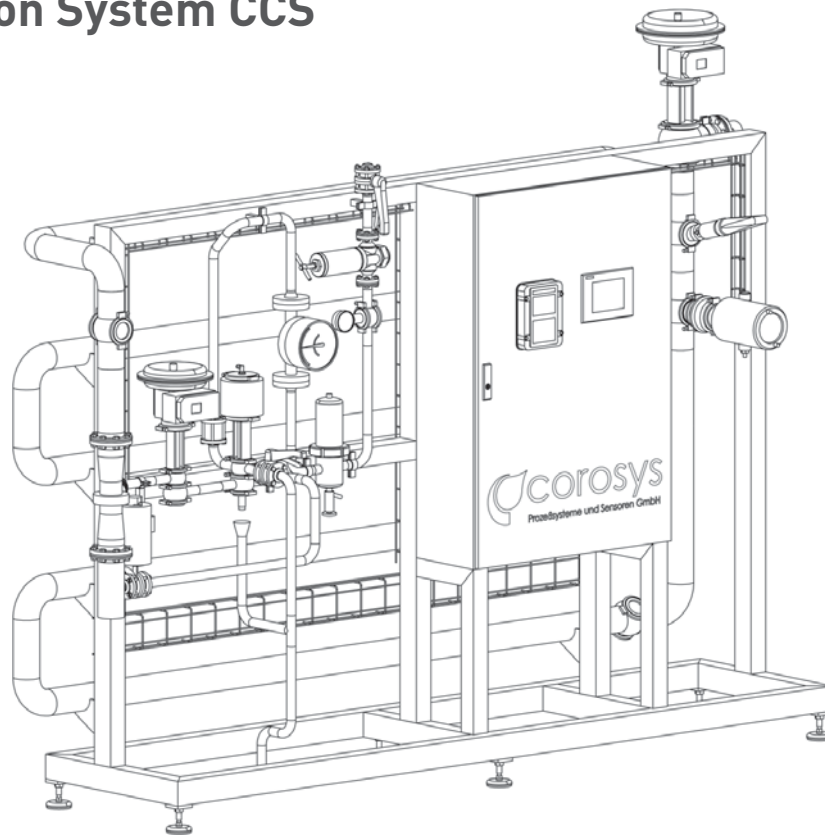
The unit can be controlled by a local PLC with a touch panel or by a process control system.

Designed for high hygienic standards, all common cleaning agents in the beverage and chemical-pharmaceutical industry can be used for CIP cleaning.

Technical Specification

Capacity	0.5 - 5,000 l/h or kg/h additive
Measuring range – color	5 - 160 EBC, +/- 0.2
CO ₂ supply	min. 6 barg / ≥ 99,98% purity

Carbonation System CCS

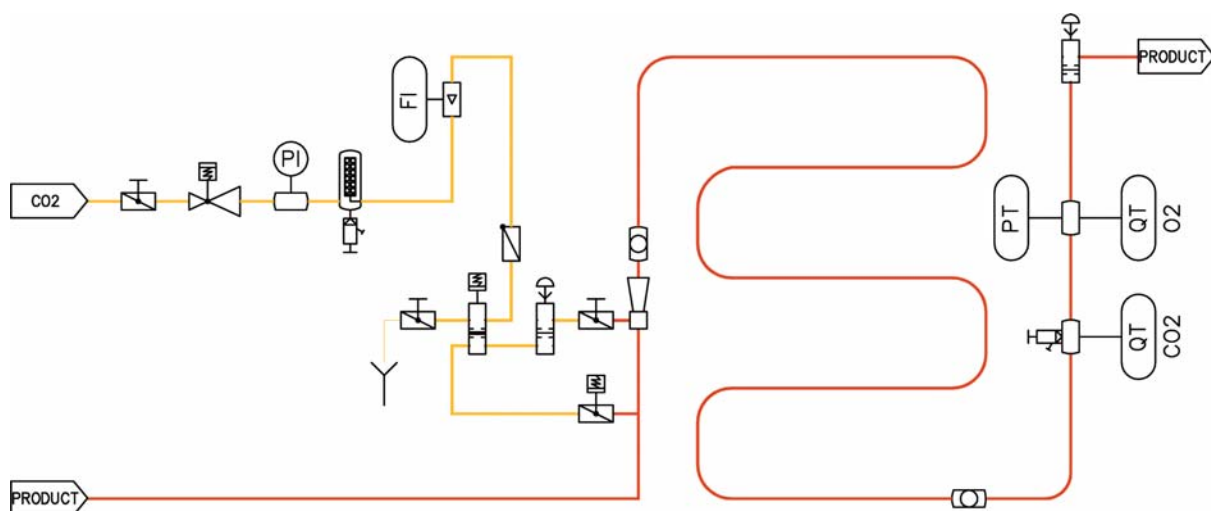


- Continuous, highly accurate adjustment of the CO₂ content
- Highly efficient CO₂ injector, low pressure drop, complete dissolving of CO₂
- Optional in-line oxygen analyzer
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Carbonation System (CCS) continuously and highly accurately controls the CO₂ content of beer, beer mix drinks, soft drinks and mineral water by precisely regulated dosing of CO₂.

The process is well established in the brewing and soft drink industry for the production of carbonated beverages. It can be installed between beer filtration and BBT as well as directly before the filler. A blending system or a premixer can be combined with the unit.

The system is characterized by highly accurate and reliable analyzers and precise control algorithms. The corosys CO₂ gas injector splits the CO₂ into very small bubbles and ensures dissolving.



Technical Description

CO₂ is injected into the beer via the GDI gas injector developed by corosys. The gas injector splits the CO₂ into very small bubbles and ensures that the CO₂ completely dissolves in a very short time. The system works without using a static mixer. The homogeneous dispersion and the absence of gas bubbles can be monitored by a sight glass situated at the outlet of the dissolving path.

The CO₂-content is continuously measured in-line at the outlet of the unit. The product specific set point is compared with the process value and the CO₂ flow is adjusted accordingly by a control algorithm.

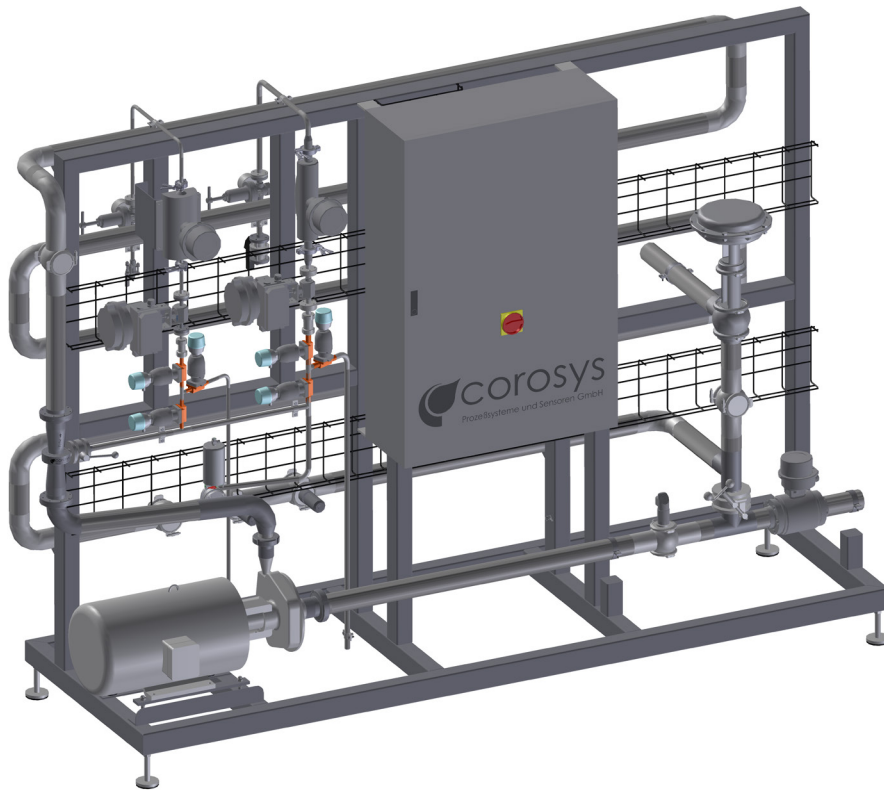
The control valve, which is located at the end of the dissolving path, keeps the pressure in the system constant, even if the flow is unsteady.

The unit can be controlled by a local PLC with a touch panel or by a process control system. Designed for high hygienic standards, all common cleaning agents in the brewing and beverage industry can be used for CIP cleaning.

Technical Specification

Capacity	50 to 1,500 hl/h / 5 to 150 m³/h
Measuring range – CO ₂	0 - 10 g/l, +/- 0.1
Measuring range – O ₂	0 - 2000 ppb, +/- 1
CO ₂ supply	min. 6 barg / ≥ 99,98 % purity

Carbonation and Nitrogenation System CCNS

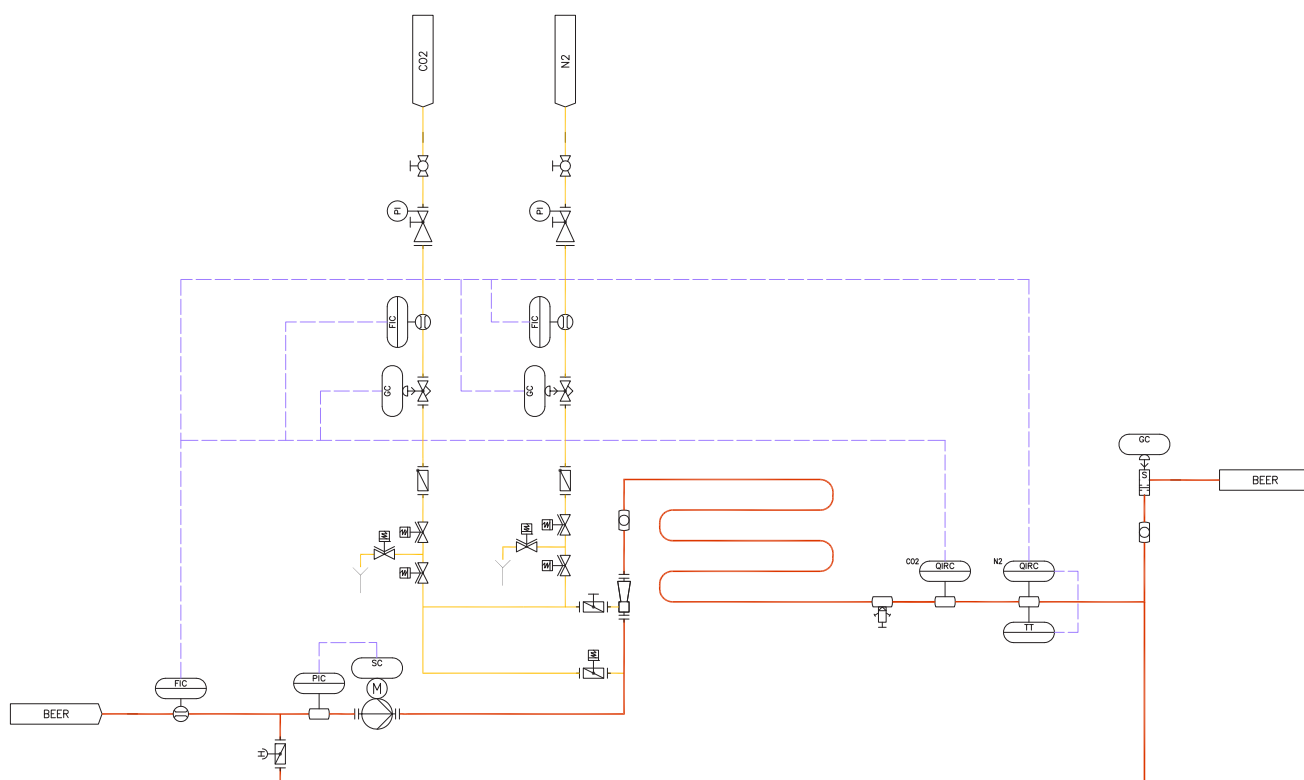


- Continuous, highly accurate adjustment of N_2 and CO_2 content
- Highly efficient CO_2 injector, low pressure drop, complete dissolving of CO_2 and N_2
- Highly precise dosing of deaerated water via two parallel control valves
- Optional in-line oxygen analyzer
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Carbonation- and Nitrogenation System (CCNS) continuously and highly accurately controls the CO_2 and N_2 content of beer, beer mix drinks, soft drinks and mineral water by precisely regulated dosing of CO_2 and N_2 .

The process is well established in the brewing and soft drink industry for the production of carbonated beverages. It can be installed between beer filtration and BBT as well as directly before the filler. A blending system or a premixer can be combined with the unit. The system is characterized by highly accurate and reliable analyzers and precise control algorithms.

With these control algorithms the unit, like the displayed unit, is able to run directly after a centrifuge without using any buffertank. The corosys gas injector splits the CO_2 and N_2 into very small bubbles and ensures dissolving.



Technical Description

CO₂ and N₂ is injected into the beer via the GDI gas injector developed by corosys. The gas injector splits the gases into very small bubbles and ensures that the CO₂ completely dissolves in a very short time. The system works without using a static mixer.

The homogeneous dispersion and the absence of gas bubbles can be monitored by a sight glass situated at the outlet of the dissolving path.

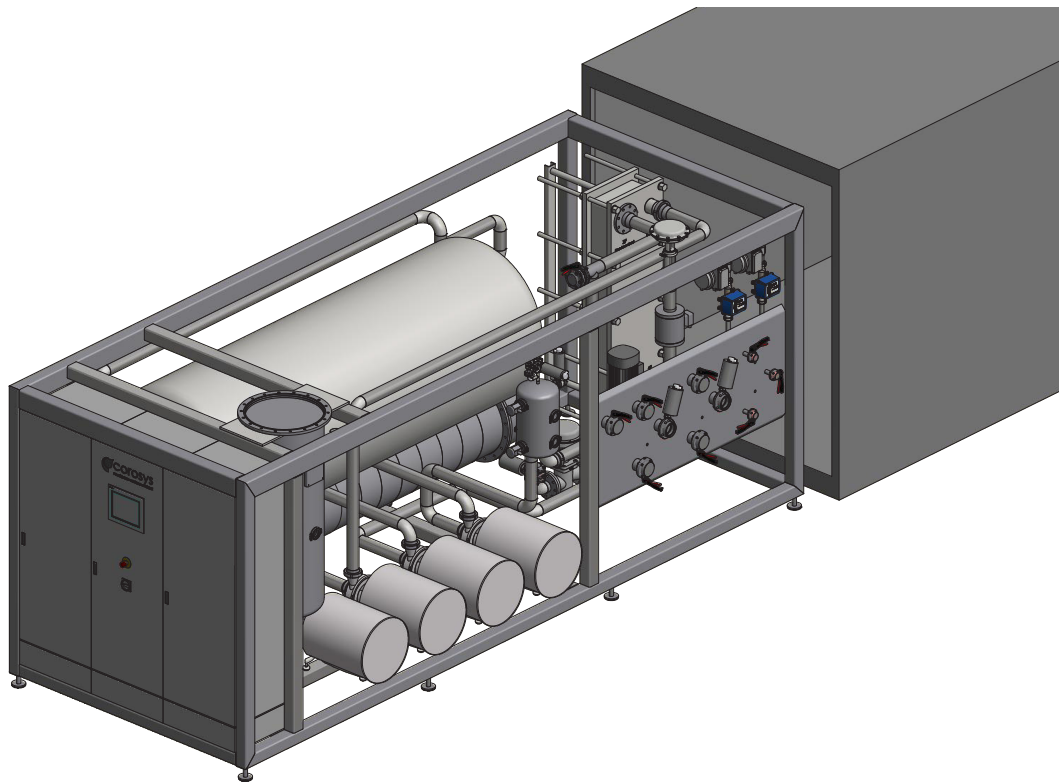
The CO₂-and N₂ content is continuously measured in-line at the outlet of the unit. The product specific set point is compared with the process value and the CO₂ and N₂ flow is adjusted accordingly by a control algorithm. The control valve, which is located at the end

of the dissolving path, keeps the pressure in the system constant, even if the flow is unsteady. The displayed unit is integrated and controlled in a process control system. Designed for high hygienic standards, all common cleaning agents in the brewing and beverage industry can be used for CIP cleaning.

Technical Specification

Capacity	max. 300 hl/h
Measuring range – N ₂	0-100 mg/l
Measuring range – CO ₂	0 - 10 g/l, +/- 0,1
CO ₂ /N ₂ -supply	min. 6 barg / ≥ 99,98% purity

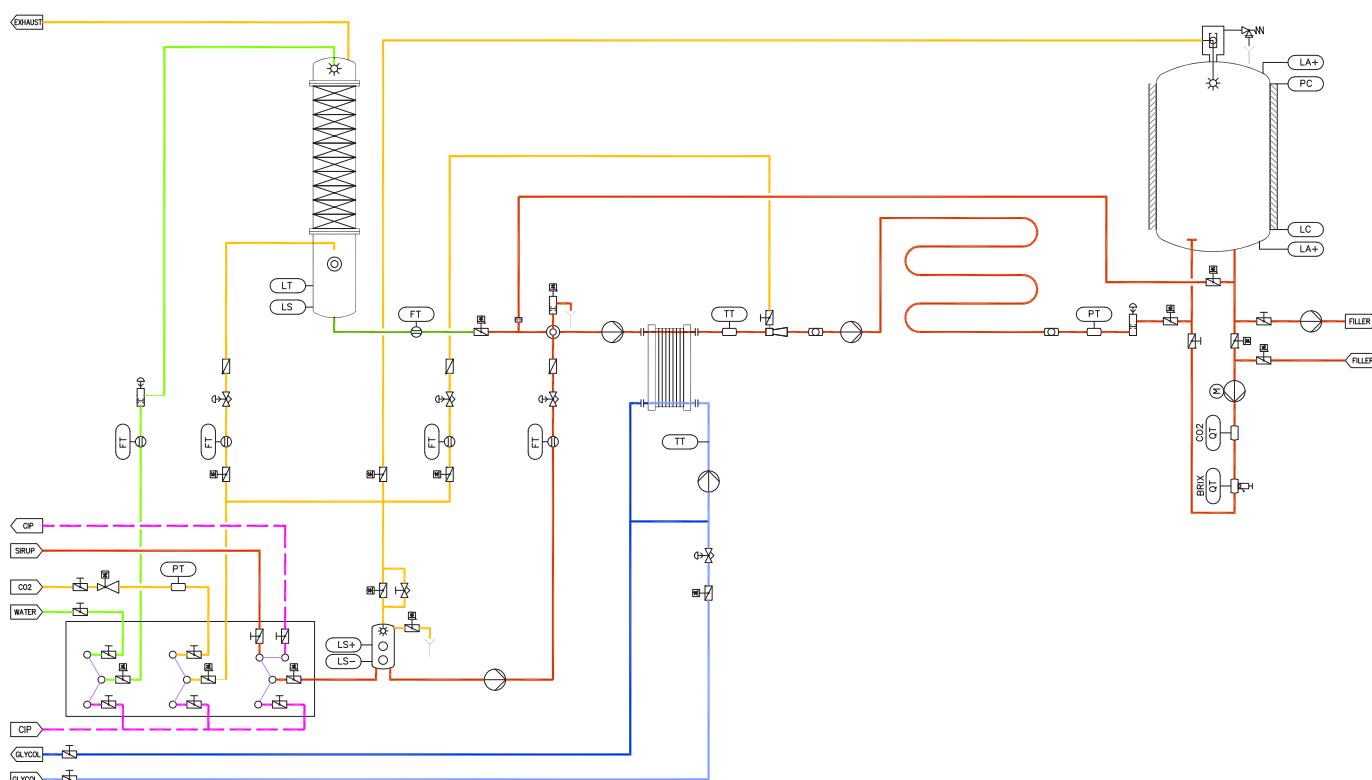
Softdrink Mixing System COROBEV



- Continuous and highly accurate production of carbonated and still soft drinks
- The system combines all necessary process steps of water degassing, syrup dosing, cooling, inline carbonation and surge tank for the filler
- High flexibility, high performance and wide capacity range
- Fast and automatic product changeover sequence
- Lowest oxygen content in the finished beverage thanks to efficient degassing of the water and superimposition of the syrup with CO₂
- Hygienic design, full CIP-capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Remote maintenance and service via VPN modem
- Customized engineering and design
- Skid mounted unit for container shipping ensures very short installation and commissioning time

The two- and multi-component Corobev mixing system continuously and precisely produces carbonated soft drinks as well as sugar-free beverages. It combines the process steps of degassing, mixing, cooling and carbonisation into one compact system. The pre-assembled and tested unit can be packed into a container and quickly installed and put into operation on-site.

The system is characterised by its highly flexible production options and its performance. The entire portfolio of soft drinks can be produced in a wide capacity range from 40 to 100%. High accurate, state of the art instruments monitor and control the essential quality parameters and guarantee the highest product quality.



Technical description

The beverage water is degassed in a column under normal pressure by stripping with CO₂ to residual oxygen values below 50 ppb. Here, the water is pre-carbonised with approx. 2 g/l CO₂.

The syrup is metered inline into the water via a special valve combination. The water-syrup ratio is adjusted by means of a high-precision mass flowmeter and a control valve it is monitored and readjusted by the integrated °Brix measurement and control. Afterwards a centrifugal pump ensures optimum mixing of syrup and water. Optionally, the blended product can now be cooled.

During the subsequent carbonation, CO₂ is injected in a constant ratio into the beverage. The corosys GDI injector ensures the complete dissolving of CO₂ without any static mixers in the product pipe.

In the outlet of the surge tank, the essential quality parameters, the CO₂ content and °Brix are accurately measured and monitored. Only the finished product that meets all quality requirements is released for filling. A product recycling from the buffer tank to the syrup dosage allows adjustment of CO₂ and °Brix at the system startup. Syrup and product losses are thus avoided.

Designed for high hygienic standards, the mixing system is suitable for all typical CIP agents used in the beverage industry and is fully CIP capable.

Technical specification

Capacity	1,000 – 50,000 l/h product
Residual oxygen content:	< 50 ppb, optionally < 10 ppb
CO ₂ -consumption:	0.4 g/l
CO ₂ -supply:	min. 6 barg / ≥ 99,98% purity
CO ₂ -content product:	2 – 9 g/l, optionally still soft drinks
Brix control accuracy:	+/- 0.05 °Brix
CO ₂ control accuracy:	+/- 0.1 Vol%

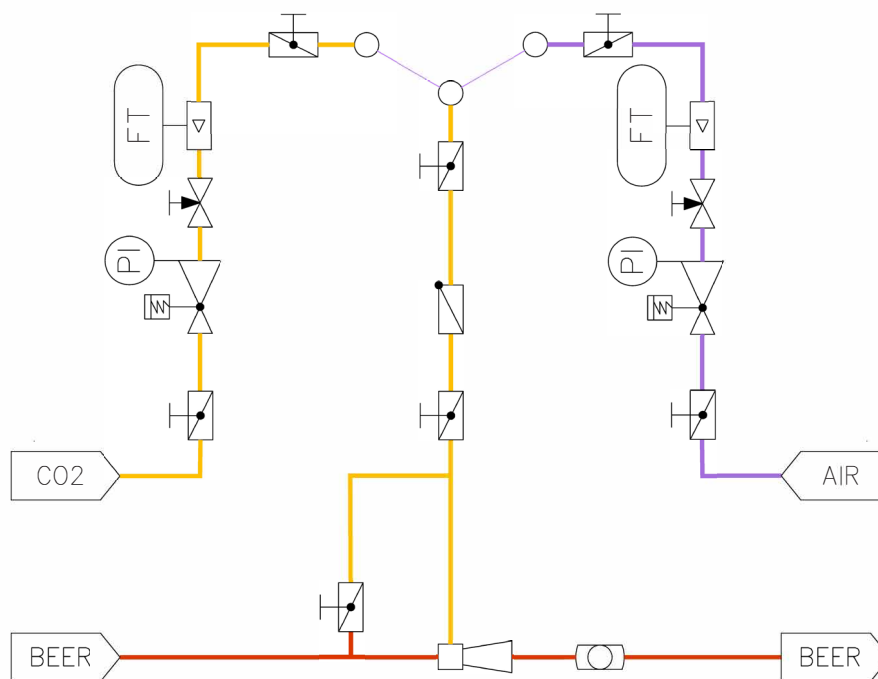
Carbonation & Wort Aeration device CCS M / CWA M



- Continuous adjustment of the CO₂ content
- Continuous aeration of wort
- Highly efficient gas injector, low pressure drop
- Optional flow meter for measuring and counting product flow
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Individually dimensioned and designed for each specific application
- Compact tubular-frame system, (skid mounted), mobile thanks to swivel castors

The carbonation device CCS M is our solution especially designed for small craft breweries, who require a simple and inexpensive alternative to our highly accurately carbonation system CCS. Like our CCS, the CCS M continuously controls the CO₂ content of beer and beer mix drinks. This is done via manual regulation of the flow rate ratio of beer and CO₂ respectively wort / air.

An advantage of the mobile carbonation device CCS M is the possibility to use it for two applications. By adding another dosing line for air, an overall solution can be created to combine the usage for the carbonation of product with the usage for the aeration of wort. All CCS M units are equipped with the corosys gas injector GDI, which splits the CO₂ or air into very small bubbles and ensures dissolving.



Technical Description

Like our carbonation system CCS, the corosys gas injector GDI is the heart of the carbonation device CCS M. The gas injector splits the CO₂ into very small bubbles and ensures that the CO₂ completely dissolves in a very short time in the following pipe line. The system works without using a static mixer.

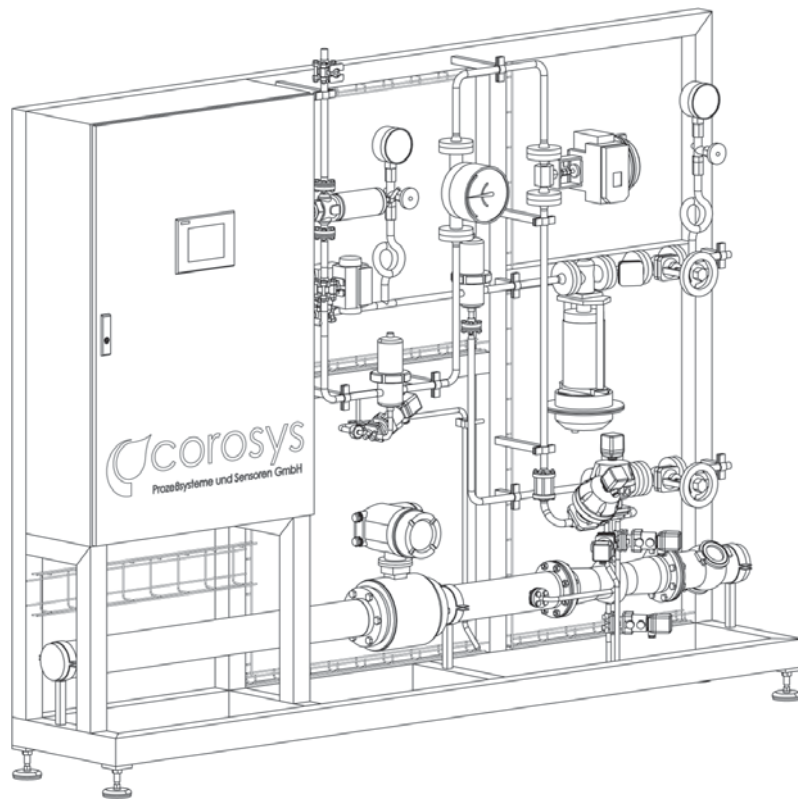
The homogeneous dispersion can be monitored by a sight glass situated at the outlet of the product pipe. For the optional usage of the injector for wort aeration, another gas inlet as well as another analogue flow meter for air are required. Depending on the use, the inlet of air and CO₂ can be switched at a swing bend panel and the unit can be brought to the chosen location via the mounted swivel castors. The unit is operated ma-

nually and designed for flexible application in smaller breweries. All common cleaning agents in the brewing and beverage industry can be used for CIP cleaning.

Technical Specification

Capacity:	5 – 300 hl/h / 0,5 – 30 m³/h
CO ₂ supply:	min. 6 barg / ≥ 99,98 % purity
Sterile air supply:	min. 6 barg

Continuous Wort Aeration CWA

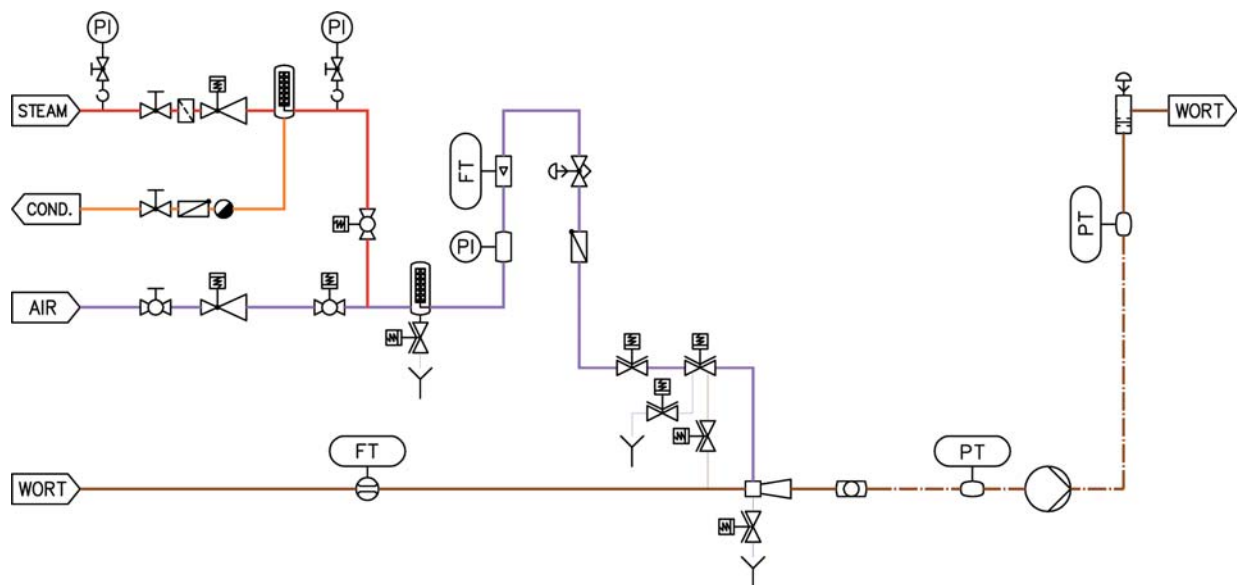


- Continuous, accurate aeration of wort with sterile air or oxygen
- Highly efficient gas injector, low pressure drop, maximum dissolution
- Optional in-line oxygen analyzer
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Continuous Wort Aeration (CWA) continuously and highly accurately injects sterile air or oxygen into beer wort. The corosys GDI gas injector splits the air into extremely small bubbles, maximizes the oxygen saturation and in this way provides reliable and reproducible fermentation.

The continuous process is employed in the brewing process between wort cooler and fermenter while transferring the wort.

The system is characterized by highly accurate and reliable flow measurement technology and precise control algorithms. The corosys GDI gas injector ensures quick and complete saturation of the air.



Technical Description

Sterile air or oxygen is injected into the wort via the GDI gas injector developed by corosys. The gas injector splits the air / oxygen into very small bubbles and provides quick and complete saturation. The wort pipe between wort cooler and fermenter functions as a holding pipe.

The volume flow of wort and the mass flow of air / oxygen are measured. The mass flow of air / oxygen is adjusted in a specified relationship to the wort flow by a control algorithm.

The unit can be controlled by a local PLC with a touch panel or by a process control system.

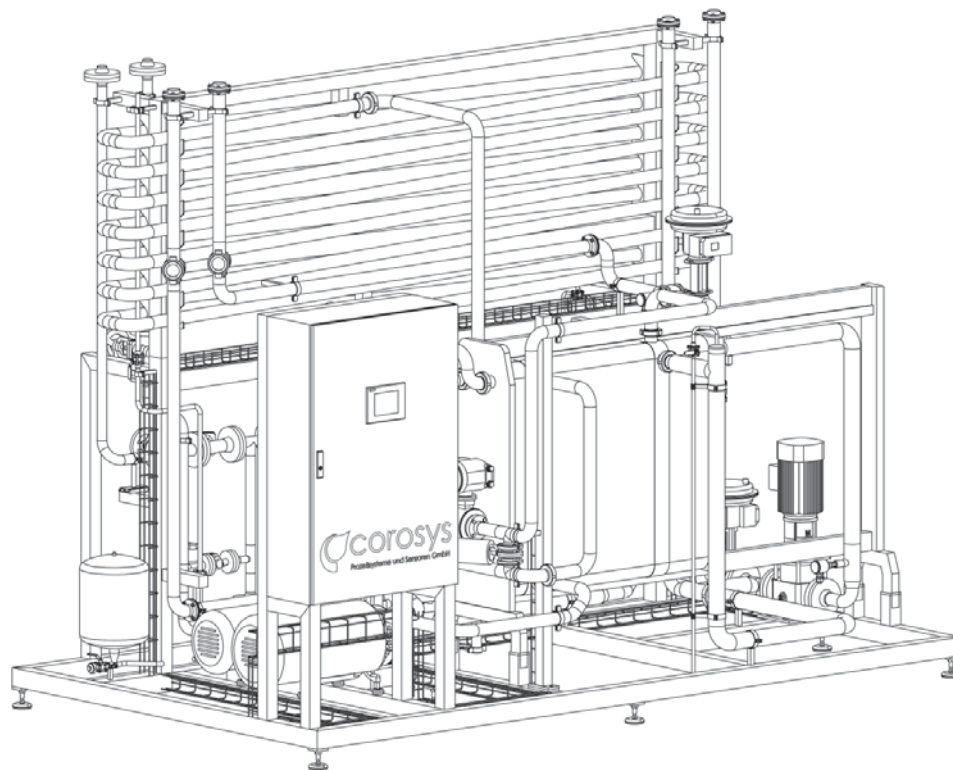
Designed for high hygienic standards, all common cleaning agents in the brewing and beverage industry can be used for CIP cleaning.

The injector is cleaned with every CIP of the wort pipe via a bypass. The air / oxygen piping is sterilized with steam.

Technical Specification

Capacity	50 to 1,800 hl/h
Aeration of oxygen	0 - 30 mg/l O ₂
Aeration of sterile air	0 - 30 NI/hl air
Sterile air supply	min. 6 barg

Flash Pasteurization System FPS

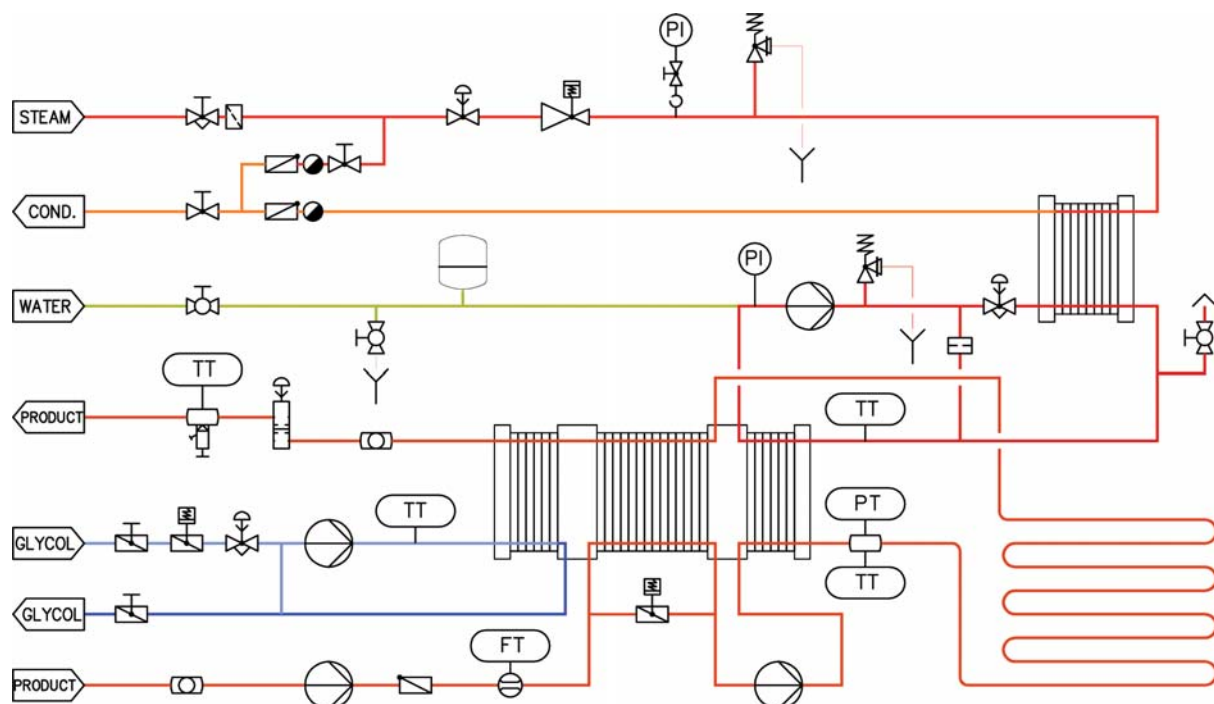


- Very gentle pasteurization of beer and carbonated beverages
- Exact control of programmed pasteurization units (PU)
- High heat recuperation up to 95 %
- Broad capacity range of 40 - 100 % of nominal capacity
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Flash Pasteurization System (FPS) pasteurizes beer, beer mix drinks and carbonated beverages. The product is gently heated up to the pasteurization temperature regeneratively and then via a hot water circuit. Then it is cooled down regeneratively and further cooled with glycol or ice water after passing the holding pipe.

The process is well established in the brewing and beverage industry for providing long product stability and high quality.

The system is characterized by gentle product treatment, exact control of pasteurization units, high operational reliability and high heat recuperation up to 95 %.



Technical Description

The product is gently heated up to the pasteurization temperature regeneratively and then via a hot water circuit. Temperature and flow are controlled to keep the pasteurization units within very narrow limits. Then the product is cooled down regeneratively and further cooled with glycol or ice water after passing the holding pipe.

The two centrifugal pumps in serial arrangement maintain the pressure significantly above saturation pressure at the pasteurization temperature to keep all CO₂ dissolved. Due to the second booster pump, the pressure in the pasteurized product is always higher

than the pressure in the non-pasteurized product in order to avoid contamination due to leakage.

If the filler stops, the product is ejected with deaerated water, controlled by volume or conductivity. If filling runs up again, the deaerated water is ejected again with the product.

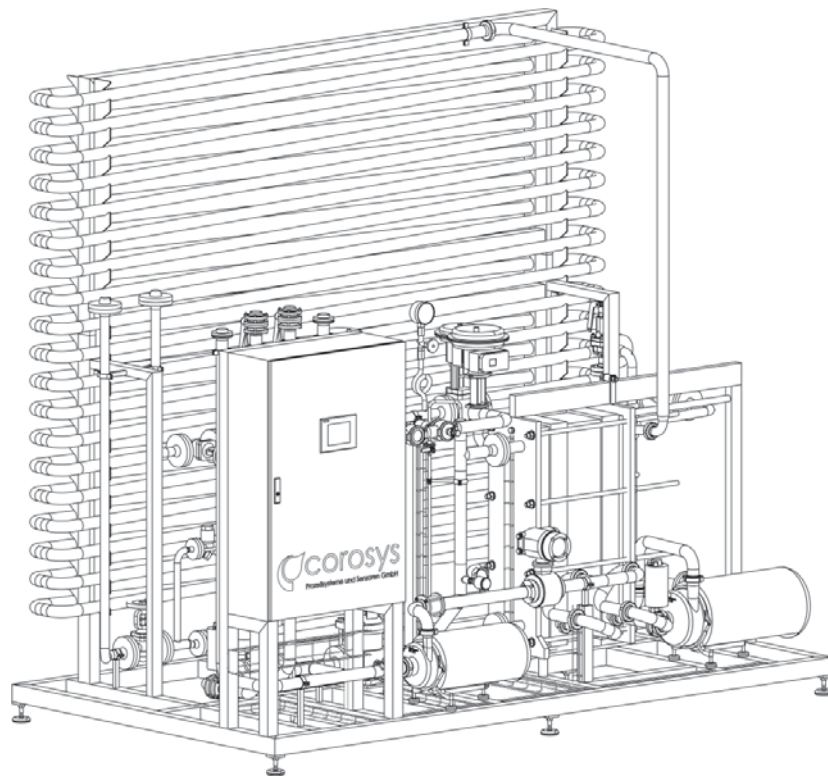
The unit can be controlled by a local PLC with a touch panel or by a process control system.

Designed for high hygienic standards, all common cleaning agents in the brewing and beverage industry can be used for CIP cleaning.

Technical Specification

Capacity	15 to 500 hl/h / 1.5 to 50 m ³ /h
Pasteurization units	according to customer specification
Heat recovery	up to 95 %
Heating media	steam or hot water
Cooling media	glycol or ammonia

Wort Sterilization System CWS

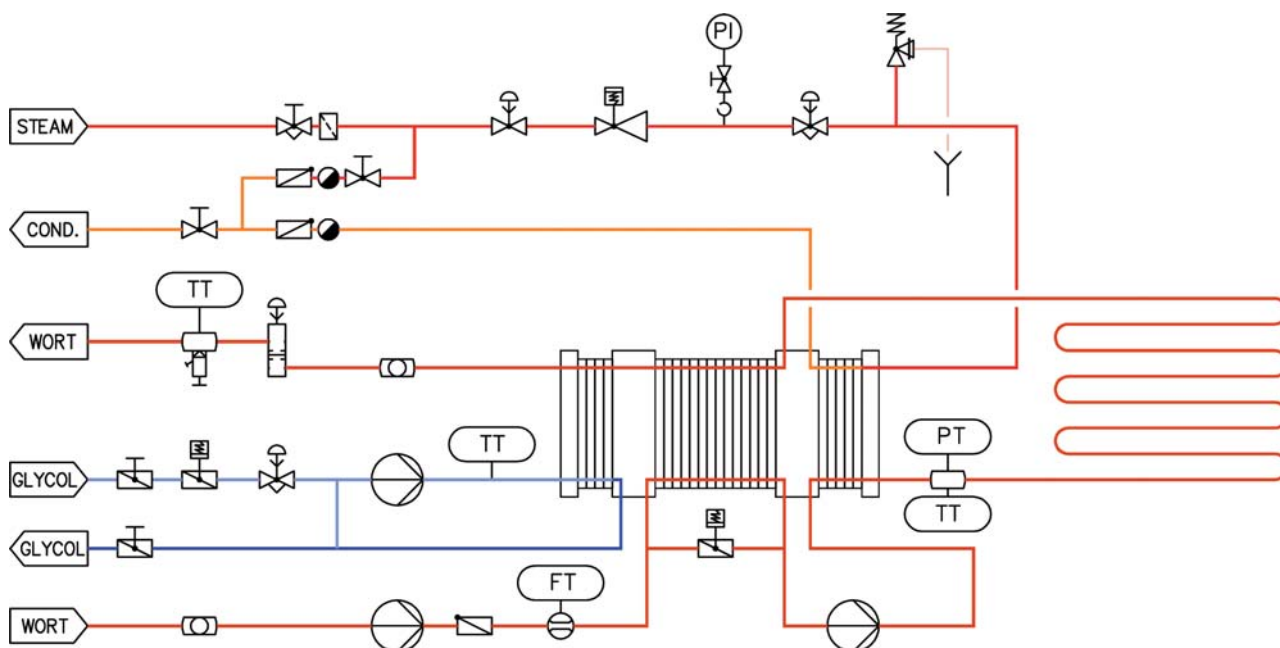


- Production of absolutely sterile beer wort
- Exact control of programmed sterilization temperature
- High heat recuperation up to 95 %
- Hygienic design, full CIP capability
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification
- Compact tubular-frame system (skid mounted)

The Wort Sterilization System (CWS) is used for the production of cold sterile beer wort. The beer wort is heated up to 110°C to ensure absolute sterility. The temperature is kept for a specified time while the wort is flowing through the holding pipe. Then the wort is cooled down regeneratively and further cooled with glycol or ammonia.

The process is well established in the brewing industry for providing sterile beer wort for the reliable and continuous operation of the yeast propagation.

The system is characterized by exact control of sterilization temperature, high operational reliability and high heat recuperation up to 95 %.



Technical Description

The wort is gently heated up to the sterilization temperature regeneratively and then via steam. Then it is flowing through a holding pipe to keep the sterilization temperature for a specified time and to reach the required germ reduction. After this the wort is cooled down regeneratively and further cooled with glycol or ammonia.

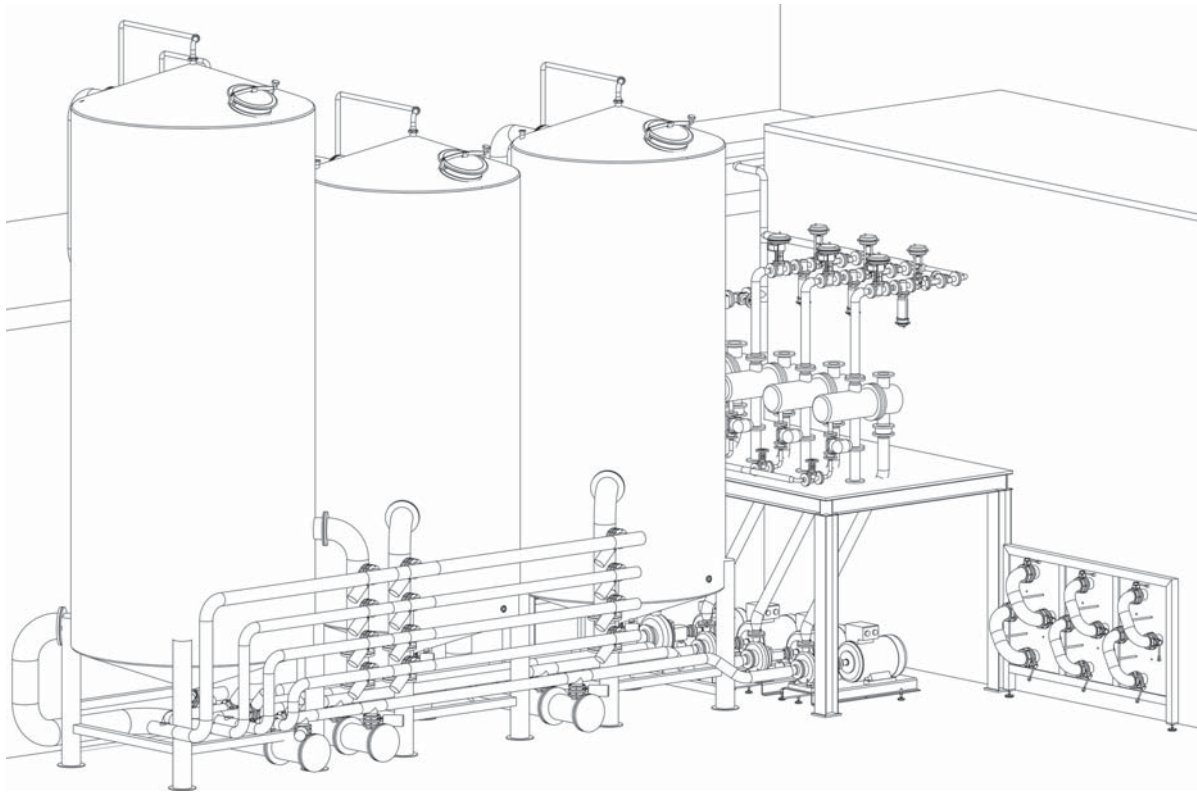
Due to the second booster pump, the pressure in the sterilized wort is always higher than the pressure in the non-sterilized wort in order to avoid contamination due to leakage.

The unit can be controlled by a local PLC with a touch panel or by a process control system. Designed for high hygienic standards, all common cleaning agents in the brewing and beverage industry can be used for CIP cleaning.

Technical Specification

Capacity	10 to 100 hl/h
Sterilization temperature	110° C
Heat recovery	up to 95 %
Heating media	steam or hot water
Cooling media	glycol or ammonia

CIP Plant

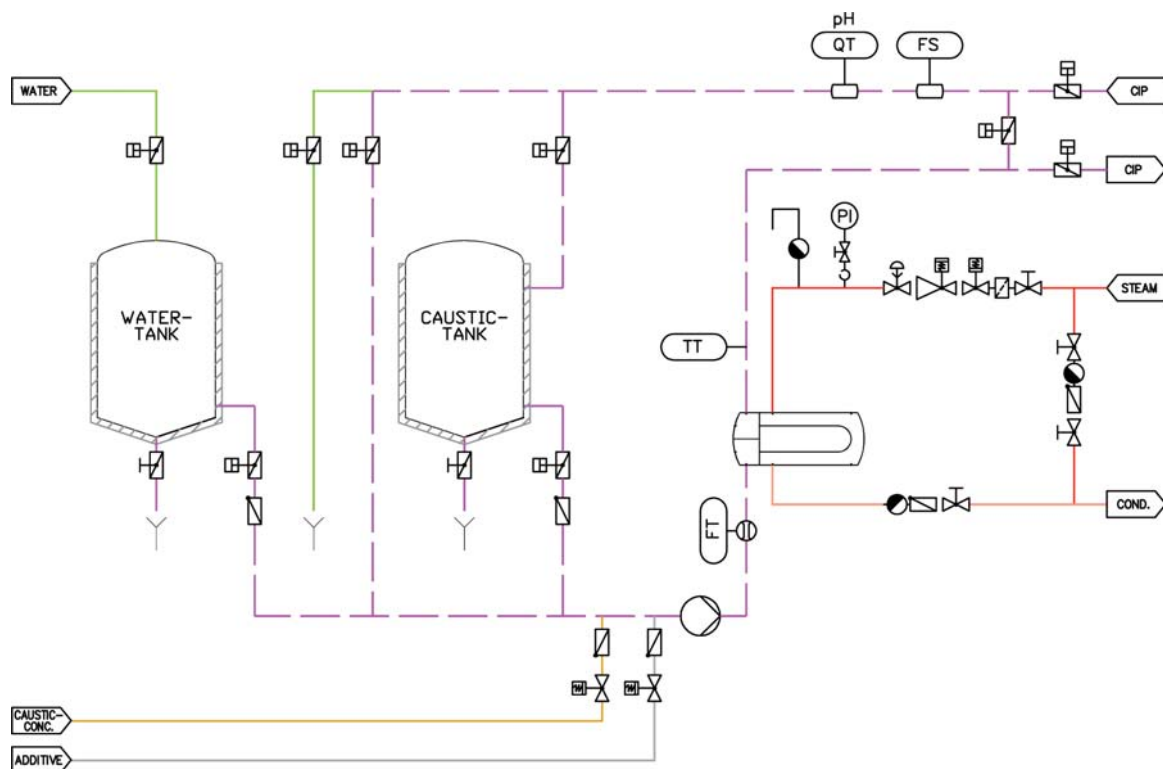


- CIP cleaning of process plants, filling systems and tanks
- Individual design and engineering
- Minimized chemical consumptions
- Minimized energy consumption
- Internal CIP cleaning (CIP in CIP)
- Easy operation, low maintenance effort, long service life
- Fully automatic operation with standard PLC and touch panel
- Optional integration in process control system and remote maintenance
- Individually dimensioned and designed for each specific application
- Equipment and components according to customer specification

The corosys CIP plant cleans hot or cold by using various cleaning detergents and accessories, process plants, tanks and filling systems. The CIP plant has to remove mineral and biological residues, any other dirt and germs and finally disinfect and sterilize the plant components.

CIP cleaning is well established in the brewing, beverage, food and chemical industry as well as in bio technology, anywhere where fully automatic and reliable cleaning and disinfection is required.

The CIP plants are designed, dimensioned and engineered in close dialogue with the customer and adapted to his specific needs for providing a safe and economic CIP cleaning.



Technical Description

The CIP plants are designed and equipped with tanks for storage of cleaning agents or designed for lost CIP with one or more cleaning circuits, depending on the cleaning task. Different cleaning circuits and programs can be stored with their specific parameters and run fully automatically. Flow velocities are optimally adapted to each cleaning task and the system dimensions.

Conductivity, temperature and flow of each CIP circuit are measured and controlled.

The mixing of different cleaning agents or the contamination of fresh water or product by any cleaning agents is prevented by optimized process technology.

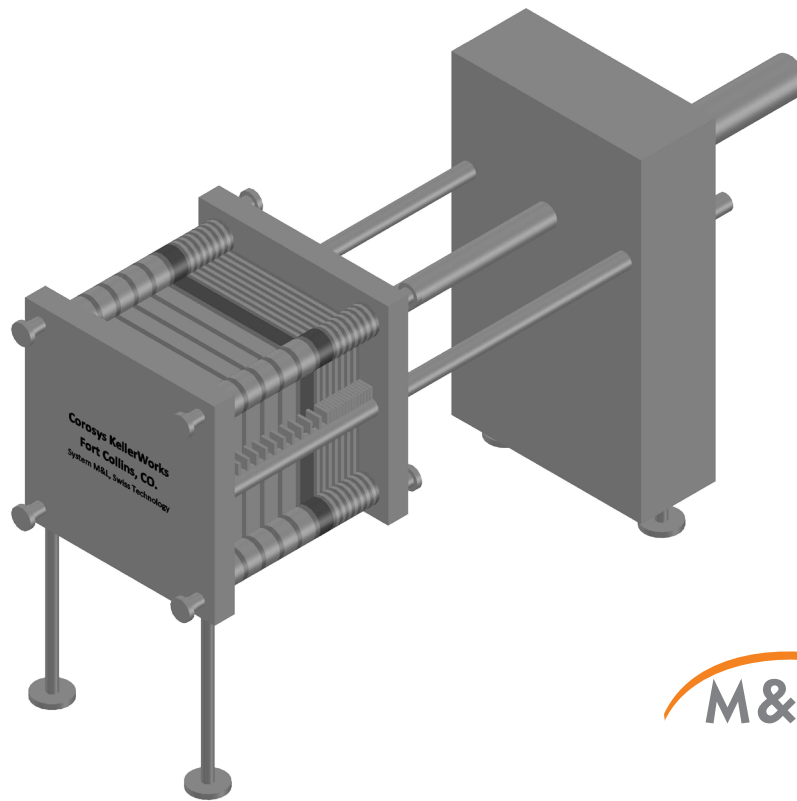
The unit can be controlled by a local PLC with a touch panel or by a process control system.

Designed for high hygienic standards, all common cleaning agents in the beverage and chemical-pharmaceutical industry can be used for CIP cleaning. The CIP plant can be equipped with an internal cleaning program and respective piping.

Technical Specification

Capacity	10 to 300 m³/h
Heating media	steam or hot water
Number of CIP tanks	max. 7
Volume of CIP tanks	up to 40 m³

Plate & Frame Polishing and DE-Filter



M&L Consulting
Your filtration specialist

- Excellent filtration quality based on low specific filtration capacity
- Lowest DE consumption of all existing filtration system
- Highly reliable and cost efficient
- Maintenance free and very long lifetime
- Hygienic design, full CIP capable
- Easy extendable / adding of additional sludge frames and filter elements
- Compact tubular frame system, skid mounted
- Low installation cost
- Short start up / commissioning

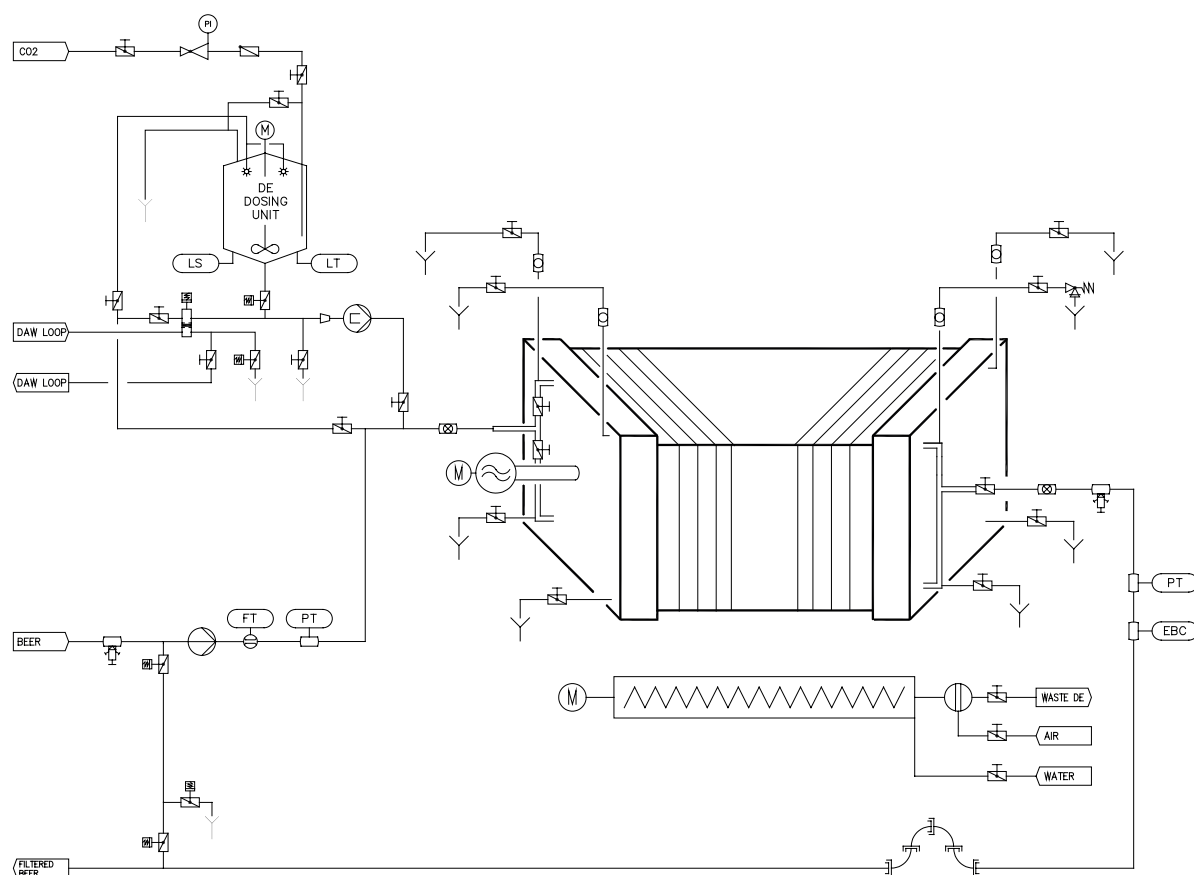
The DE plate & frame Filter System filters all types of beers, provides lowest turbidity values, reliable and cost efficient.

Based on the low specific filtration flow per square meter and hour there are long filtration cycles with lowest DE consumptions possible.

The low filter volume stands for minimised beer water interfaces and minimizes beer losses.

The system comes in a standard executions and capacity's with semi or even full automatic automation.

It can be customized to your process and capacity requirements, combined with Trap Filters, buffer tanks, carbonation, blending, CIP system and all other equipment in the vicinity of the filter.



Technical Description

To achieve excellent filtration results stainless steel filter elements (stainless steel frames) are used as the carrier for the DE (Kieselguhr). The filter elements are first covered with coarse and subsequently with finer DE type.

The so-called „pre-coat“ is the basis for the good beer filtration effect. The first pre-coat with coarse DE type is injected into the filter internal recirculation loop filled with de-aerated water, and the whole process takes approx. 15 minutes. The same happens with second pre-coat where medium and/or fine DE types are used.

After the pre-coat has been done, the de-aerated water

inside the filter is pushed out with unfiltered beer until the necessary sales gravity at the inlet of the bright beer tank has been reached.

The re-use (re-covering) of the beer/de-aerated water mix guarantees very low extract losses and very short down times.

During whole filtration process some DE is injected into the main beer flow at the inlet of the candle filter to avoid a fast blocking (delta p) of the DE cake.

At the end of the filtration process beer is pushed out with de-aerated water, and as soon as the extract value is below sales gravity, the beer / de-aerated water mix is recovered for adding it during the next filtration cycle.

Technical Specification

Capacity	25 to 250 bbl/h (others on request)
Power supply	460 VAC, 60 Hz
PLC	Rockwell or Siemens
Pumps	EVOGUARD / Fristam / Bredel

Trap Filter



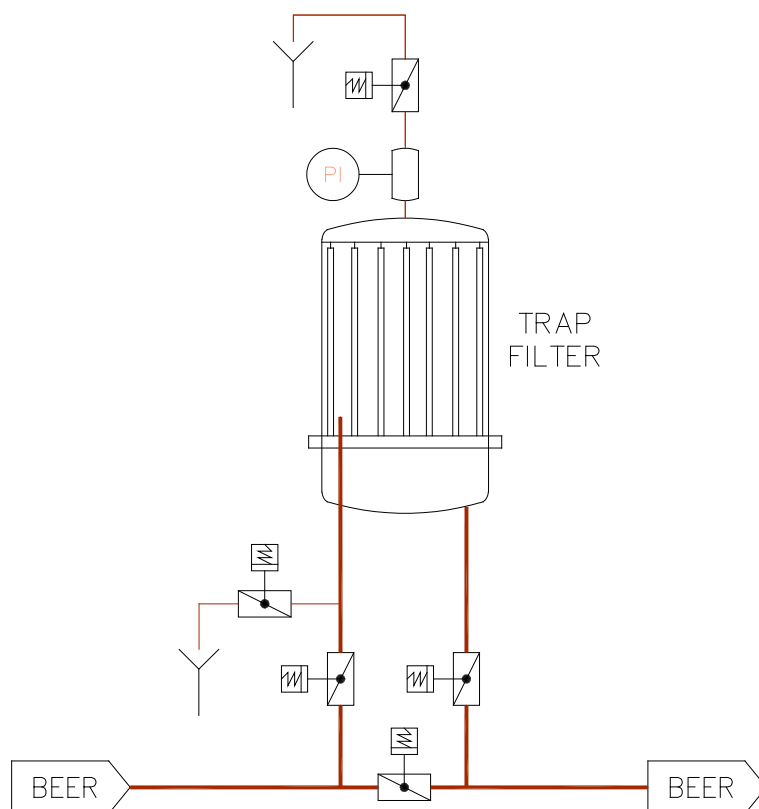
- Excellent filtration quality
- Highly reliable and cost efficient
- Hygienic design according FDA
- Low installation cost
- Short start up / commissioning

corosys filter cartridges contain of up to five pleated layers of polypropylene non-woven with decreasing porosity and high effective filtration area. corosys kellerworks filter cartridges offer precise and controlled filter ratings with efficiency of 99,98%.

All components in polypropylene are assembled by thermo welding process without any binders and adhesives.

Typical applications are water treatment, food & beverage, RO pre-treatment, etc.

corosys filter cartridges meet European Directives for food contact and FDA regulations. Manufacturing is performed in a clean room, class 10,000.



Technical Specification

Capacity	25 to 500 bbl/h (others on request)
Number of catridges	3 to 52
Pore size	0.6 to 40 µm absolute
Cartridge length	10 to 30 in
Cartridge adapter	Code 7

DE Candle Filter System DEF



M&L Consulting
Your filtration specialist

- Excellent filtration quality with lowest turbidity values
- Highly reliable and cost efficient
- Maintenance free and very long lifetime
- Hygienic design, full CIP capable
- Semi to full automatic operation with standard Rockwell or Siemens PLC
- Remote maintenance and service option with VPN router
- Compact tubular frame system, skid mounted
- Low installation cost
- Short start up / commissioning

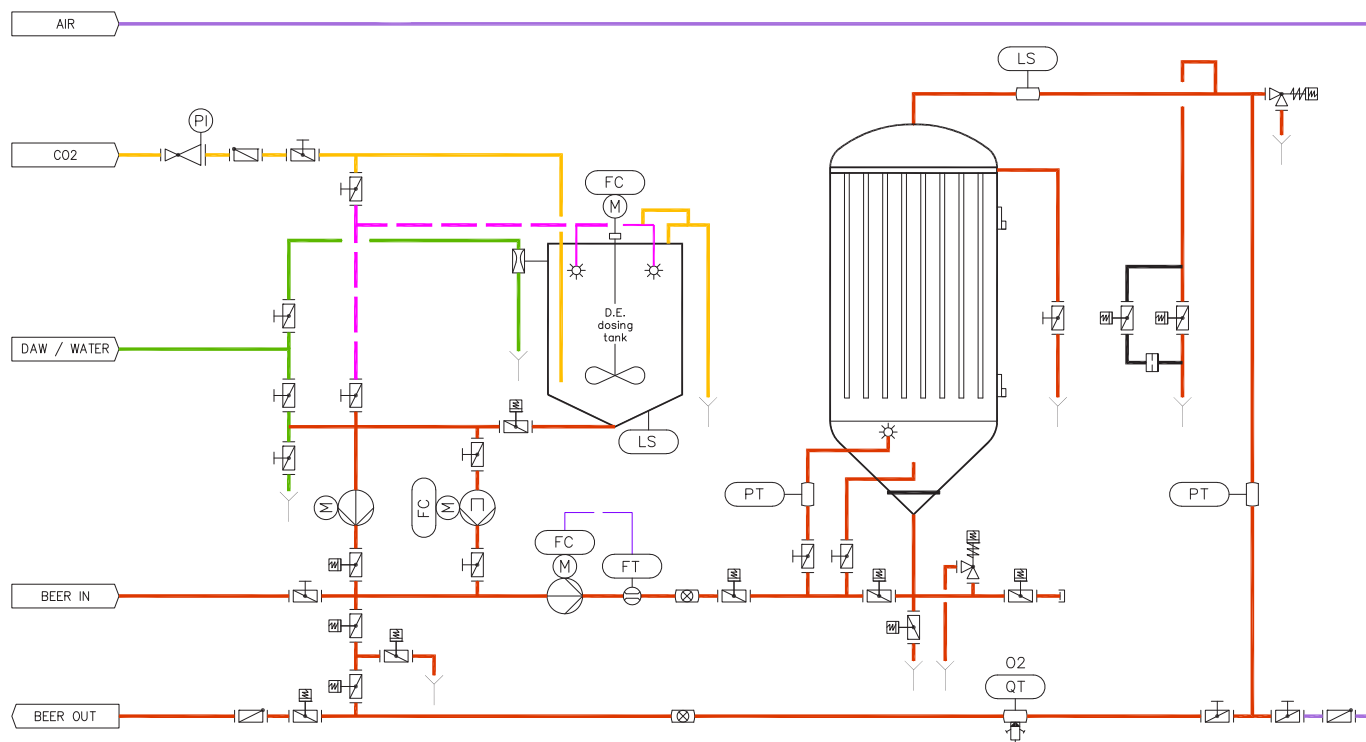
The DE Candle Filter System DEF filters all types of beers, provides lowest turbidity values, reliable and cost efficient.

The state of the art metallic filter candles are maintenance free and have a very long lifetime.

The long slim design of the filter vessel stands for reduced volume of beer water interfaces and minimizes beer losses.

The system comes in a standard execution and capacities with semi or full automatic automation.

It can be customized to your process and capacity requirements, combined with Trap Filters, buffer tanks, carbonation, blending, flash pasteurizer, CIP system and all other equipment between fermentation and bright beer tank cellar.



Technical Description

To achieve excellent filtration results stainless steel filter candles are used as the carrier for the DE (Kieselguhr). The candles are first covered with coarse and subsequently with finer DE type.

The so-called „pre-coat“ is the basis for the good beer filtration effect. The first pre-coat with coarse DE type is injected into the filter internal recirculation loop filled with de-aerated water, and the whole process takes approx. 15 minutes.

The same happens with second pre-coat where medium and/or fine DE types are used.

After the pre-coat has been done, the de-aerated water inside the filter is pushed out with unfiltered beer

until the necessary sales gravity at the inlet of the bright beer tank has been reached.

The re-use (re-covering) of the beer/de-aerated water mix guarantees very low extract losses and very short down times.

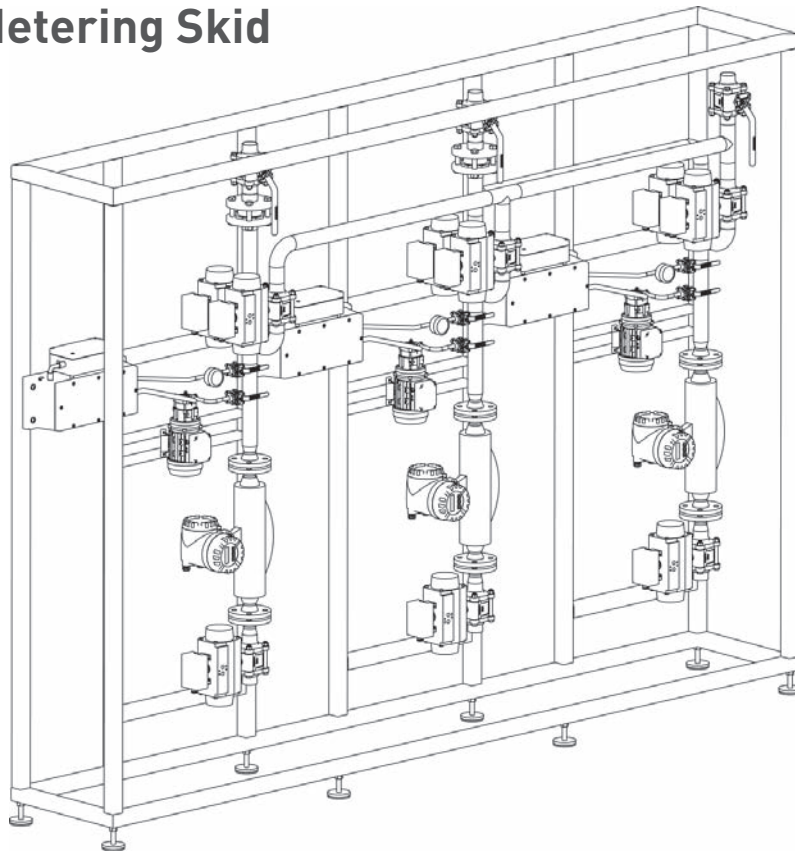
During whole filtration process some DE is injected into the main beer flow at the inlet of the candle filter to avoid a fast blocking (delta p) of the DE cake.

At the end of the filtration process beer is pushed out with de-aerated water, and as soon as the extract value is below sales gravity, the beer / de-aerated water mix is recovered for adding it during the next filtration cycle.

Technical Specification

Capacity	30 / 50 / 90 bbl/h (others on request)
Expected filtration volume / batch	330 / 550 / 1000 bbl
Production per year	48,000 bbl / 80,000 bbl / 140,000 bbl
Power supply	460 VAC, 60 Hz
PLC	Rockwell or Siemens
Pumps	EVOGUARD / Fristam / Bredel

Ethanol Metering Skid

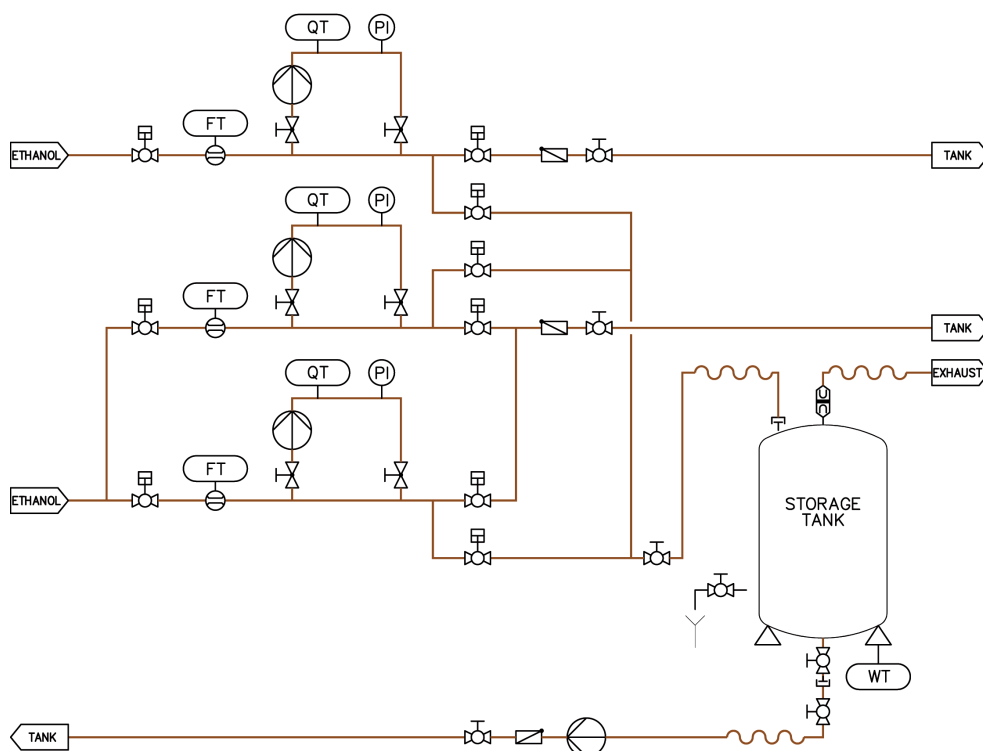


- Extremely accurate metering of mass flow and ethanol concentration
- Calculation of produced ethanol volume at a reference temperature of 20 °C
- Individually dimensioned and designed for each specific application
- System prepared for lead sealing by authorities
- Easy operation, low maintenance effort, long service life
- Fully automatic operation
- Optional integration in process control system
- Highest availability due to redundancy

The corosys ethanol metering skid continuously measures both the mass flow and the ethanol concentration with extremely high precision. The system calculates and counts the produced volume of alcohol water mixture (AWM) and pure ethanol at a reference temperature of 20 °C, for registration by the customs office. Additionally, the average alcohol concentration is calculated and displayed.

The ethanol metering skid is used in ethanol fuel production, distilleries or dealcoholisation systems for recording the ethanol production volume for customs registration. A more simple system can be used to measure and control alcohol concentration and flow in any production process.

The ethanol metering skid can be installed with a second redundant metering track if operational availability is of importance. A third metering track can be added for feeding non spec ethanol back into the production plant.



Technical Description

A Coriolis mass flowmeter measures the mass flow of ethanol in the main stream. The alcohol concentration is measured in a bypass by an extremely precise density meter of Anton Paar, Graz, Austria. The signals of both instruments are evaluated by a flow computer. The volume of the alcohol / water mixture and the volume of pure ethanol at a reference temperature of 20 °C is calculated, counted and stored.

The calibration of the metering skid can be carried out with a special tank standing on calibrated load cells.

Instruments, valves and pumps are built into a stainless steel frame. The flow computer, a protocol printer and mechanical counters are installed in a switch cabinet outside the explosion proof area. Metering skid and switch cabinet are prepared for lead sealing.

Technical Specification

Measuring range alcohol concentration	0 – 100 % (v/v) or (w/w)
Accuracy/repeatability	0.03/0.01 w/w [90 – 100 %] 0.05/0.02 w/w [0 – 100 %]
Measuring range mass flow	6 – 270,000 kg/h
Accuracy/repeatability	0.10/0.05 % of measured value
System repeatability	better than 0.03 %
Temperature range	+5 – + 40 °C

Process Automation



- End-to-end solution for Hard- und Software
- Extensive repertoire of PLC hardware and HMI / Scada Software
- Reliable integration in existing system and control technology
- Tailor made solutions for our customer needs
- Close dialogue with our customers during development and installation of the automation system
- Professional solutions for production data acquisition, production reports and user specific recording
- Increased reliability by the use of redundant systems
- Full service from planning to acceptance
- Own support portal (support.corosys.com) for support and service
- Warranty on all components used

We supply innovative complete solution packages based on leading control systems and software for the automation, visualization and documentation of your processes. Our special focus is on the brewing and beverage industry. Based on our long-term experience, we also supply automation solutions to the chemical-pharmaceutical and biotechnology industries.

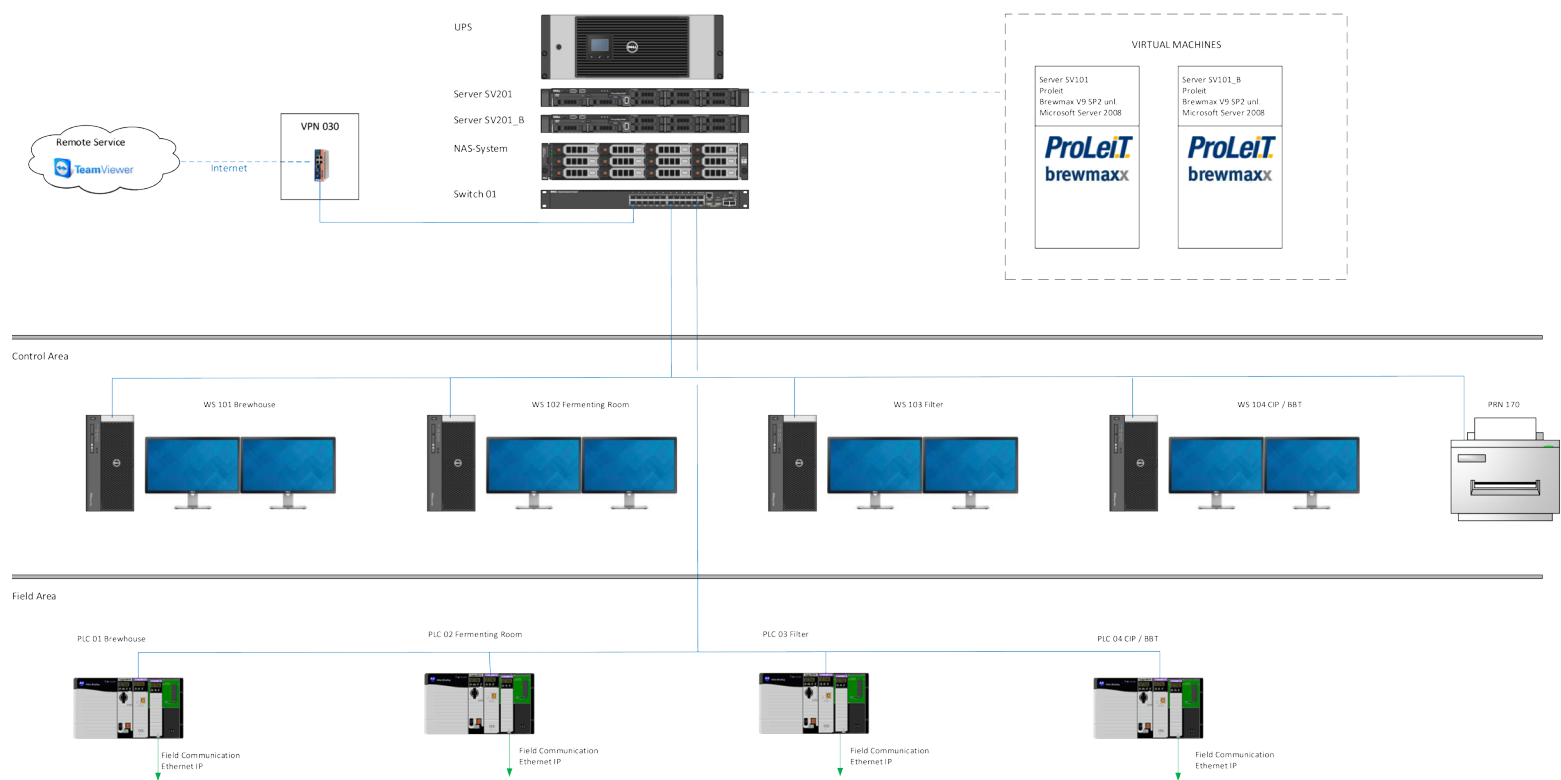
We can automate the entire brewing process from malt intake to bright beer tank area. Everything is available from a single source – planning and delivery of the electrical switch cabinet and operator stations, the development and implementation of the software as well as production assistance after the commissioning.

With more than 15 years of experience and corresponding know-how in the area of automation, we are perfectly able to integrate our process systems in any other existing automation and process automation system

Our industry alliances are your benefit. For example, we can deliver our process expertise as a turnkey plant with precisely the same automation system employed as a standard in your facilities!



Automation structure



Services

PLC Hardware	Siemens, Rockwell
HMI / Scada Software	Proleit Brewmaxx (Partner Status), Siemens WIN CC, Wonderware Intouch GE IFIX, Factory Talk
Services	Electrical Engineering, Turnkey Supply, Process description, Software Project, Commissioning and Final Acceptance