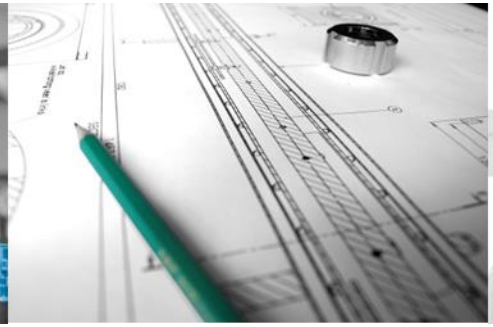
CF

Commissioning Training CF210

Lab & Pilot Equipment

Carbo-Fill Carbonator






- Introduction
- Saturation
- Working Principle
- Operation
- Foamy products
- Beer processing
- Technical information

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Saturation

Carbonisation

CO_2 (g) ⇆ CO_2 (l)

Solubility depends on temperature and pressure

lower T (°C) ➔ higher solubility
higher P (bar) ➔ higher solubility

Saturation

Other influences on CO_2 solubility

- Ingredients, e.g. sugar or wort

Beverages

CO_2 solubility changes per Brix about 1%, e.g. a sugar content of 8 Brix results in 8% lower CO_2 solubility than in water

Beer

CO_2 solubility changes per 3º Plato about 1%, e.g. a original wort of 9° Plato results in 3% lower CO_2 solubility than in water

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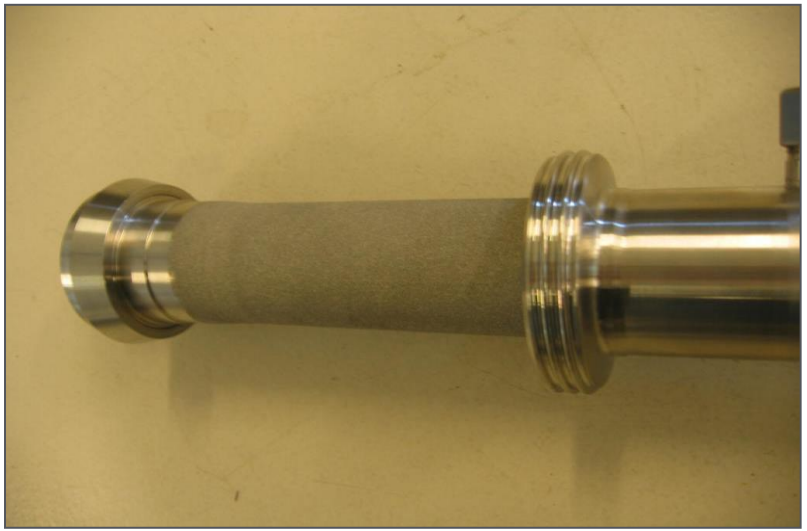
Saturation

The **saturation** is being performed by a sinter tube, a metal cylinder with very small holes



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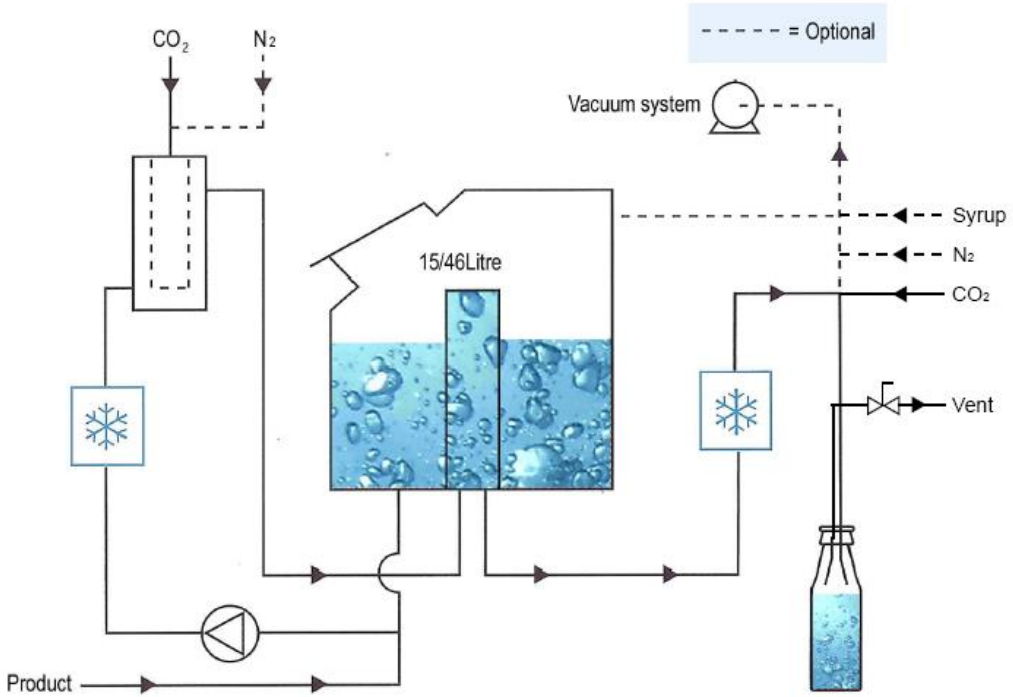
Working principle



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Working principle

Saturation content of the product based on temperature and pressure in the saturation vessel

Filling product due to pressure difference between the vessel and the surrounding atmosphere

Post mix and pre-mix processing

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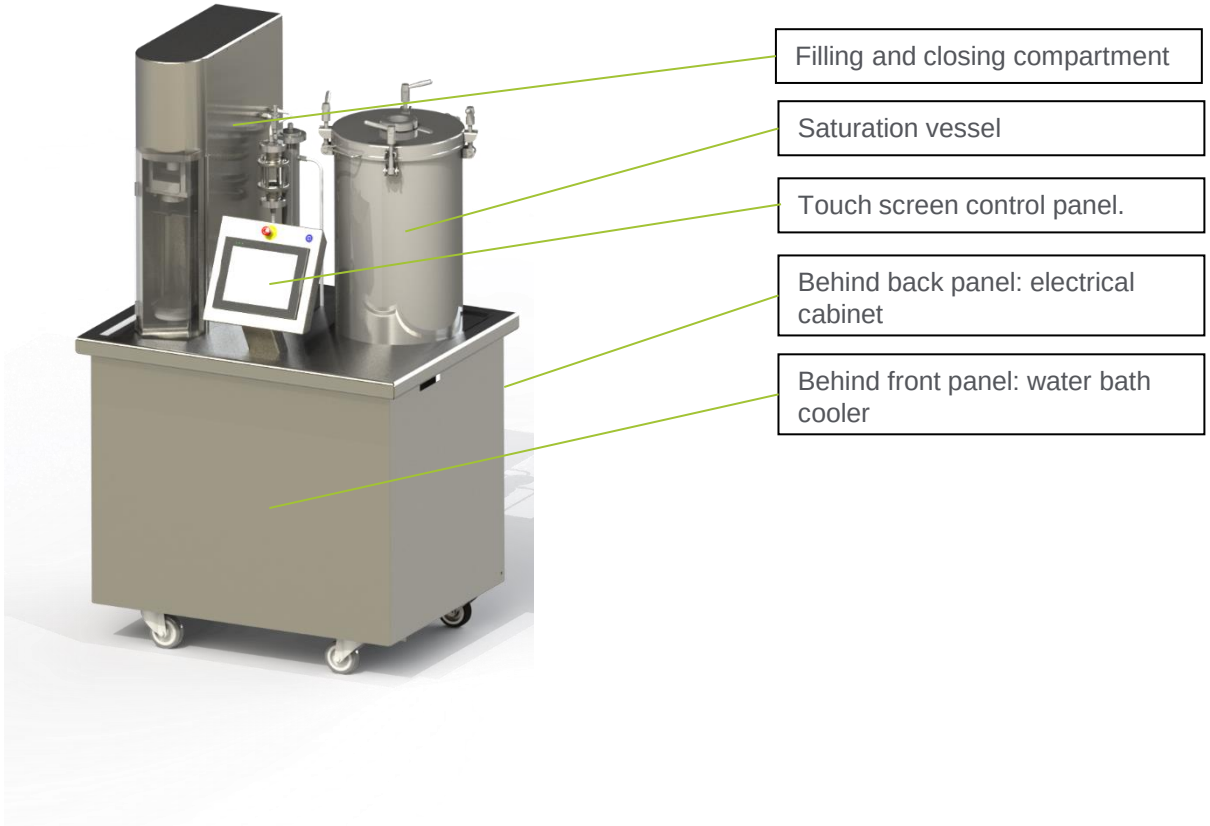
Working principle



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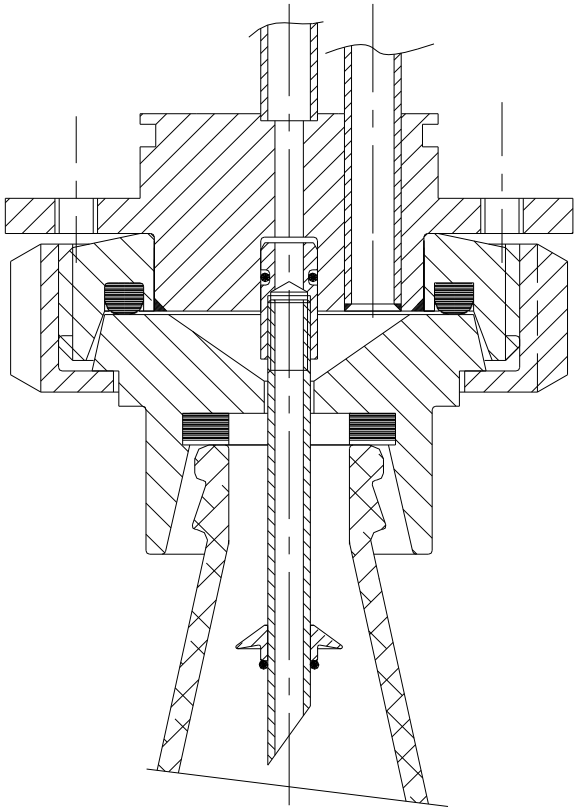
Working principle

- Dosing or hot fill connections
- Sintered CO_2 injector
- Sight glass

Working principle

Filling head



Working principle

Measuring CO_2

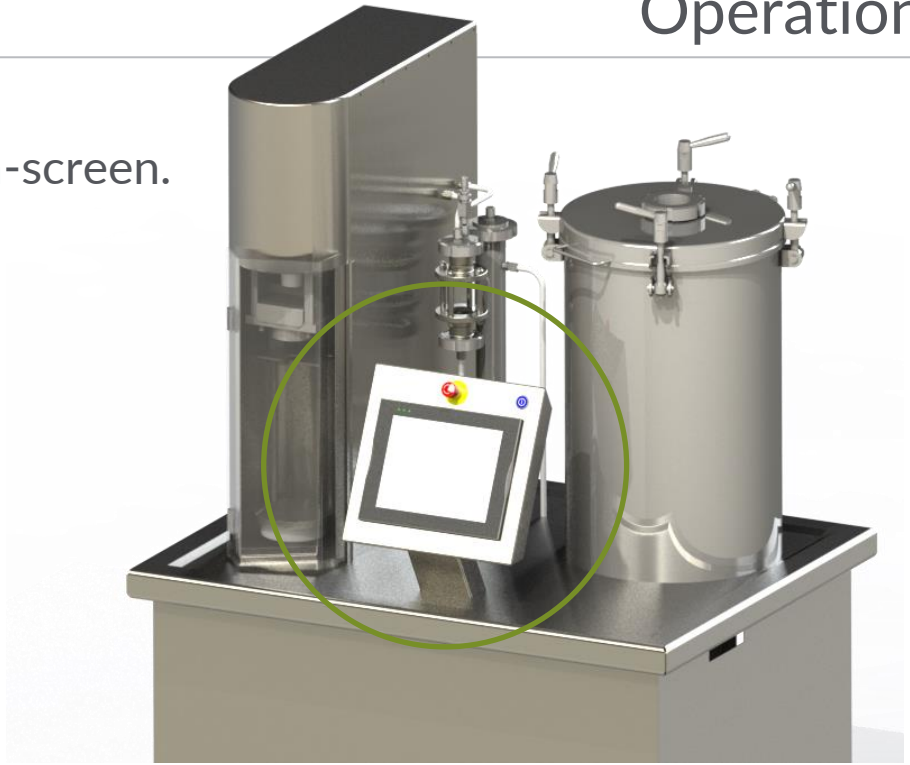
Commonly used method to determine the CO2 content is based on Henry's Law. Determine pressure and temperature in bottle after shaking.

Influence on the measurements

- Headspace
- Material of the bottle
- Filling parameters
- Etc.

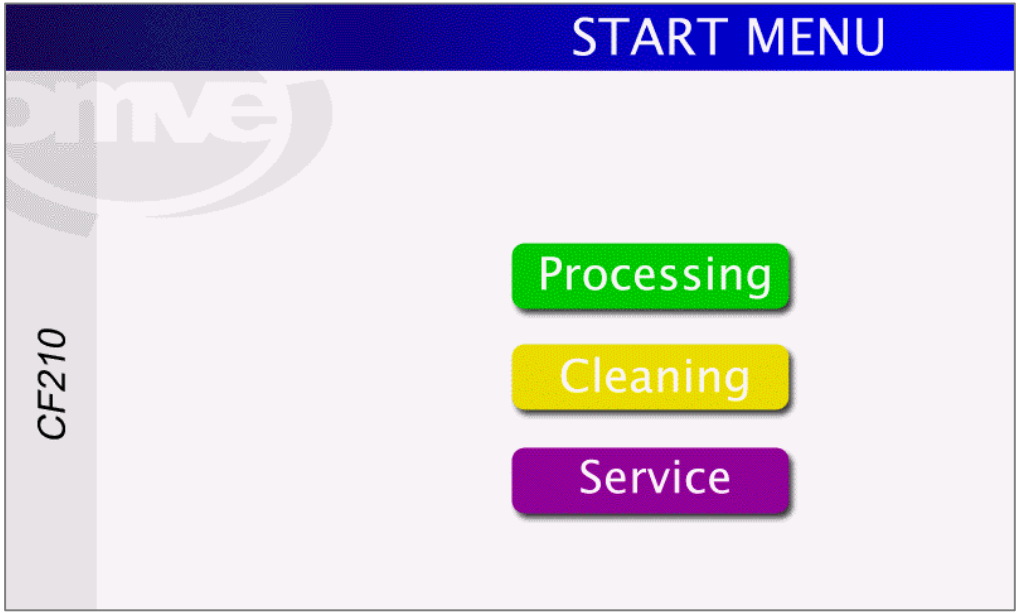
Operation

Carbo-Fill is operated by a touch-screen.

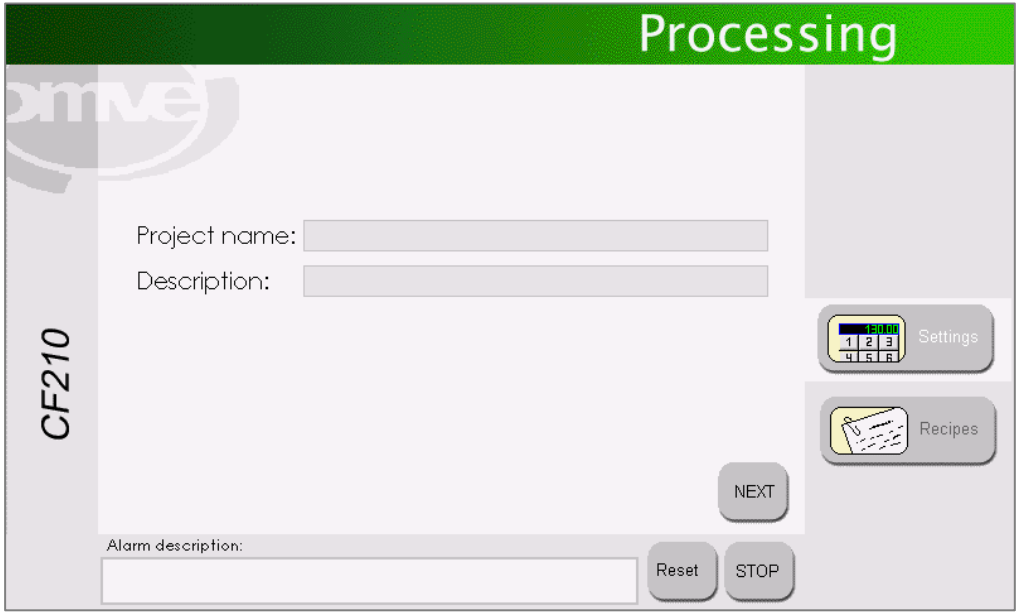


Operation

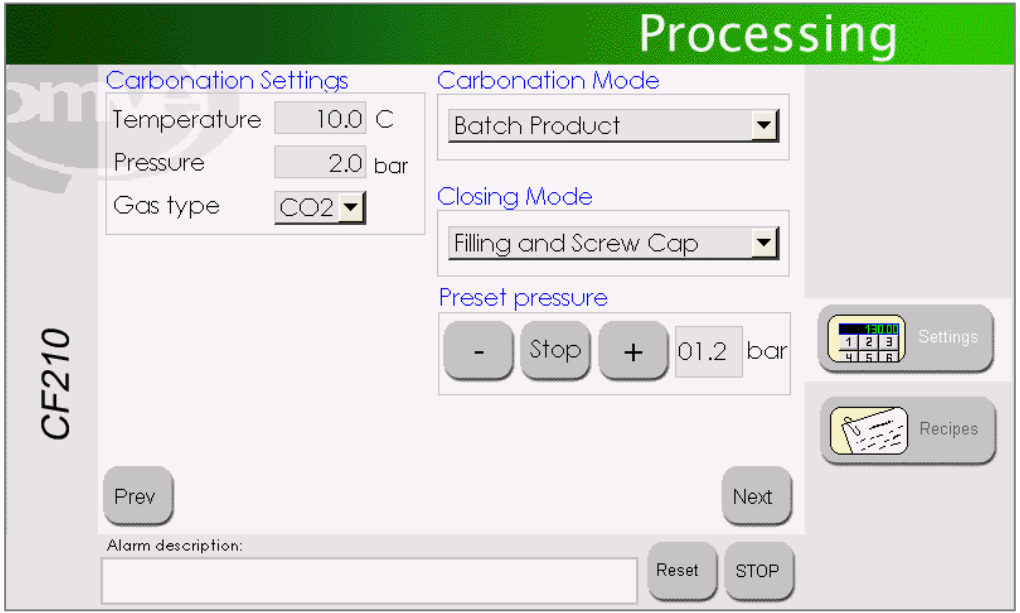
Main menu



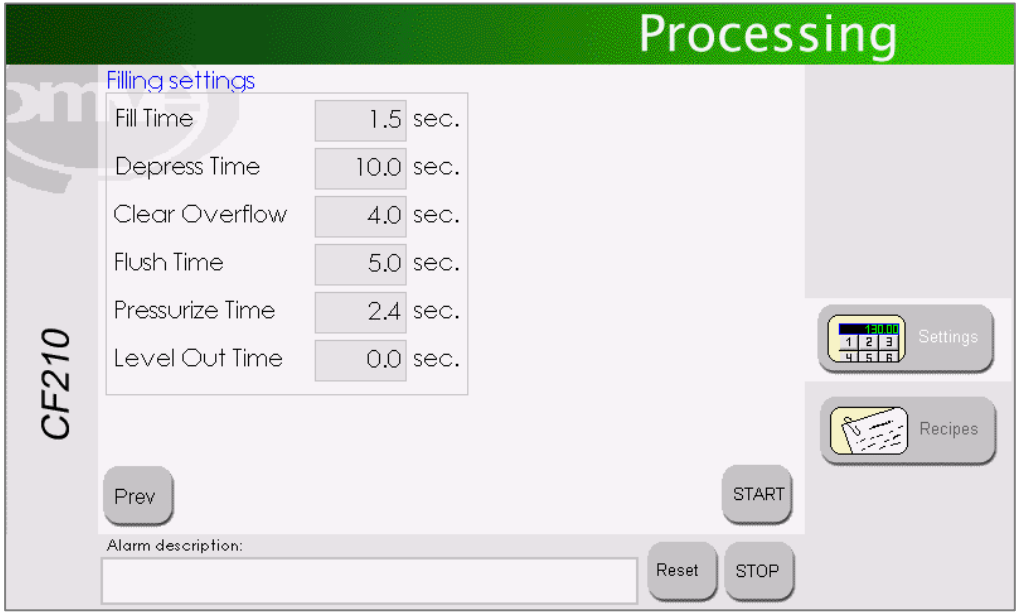
Processing – carbonisation parameters



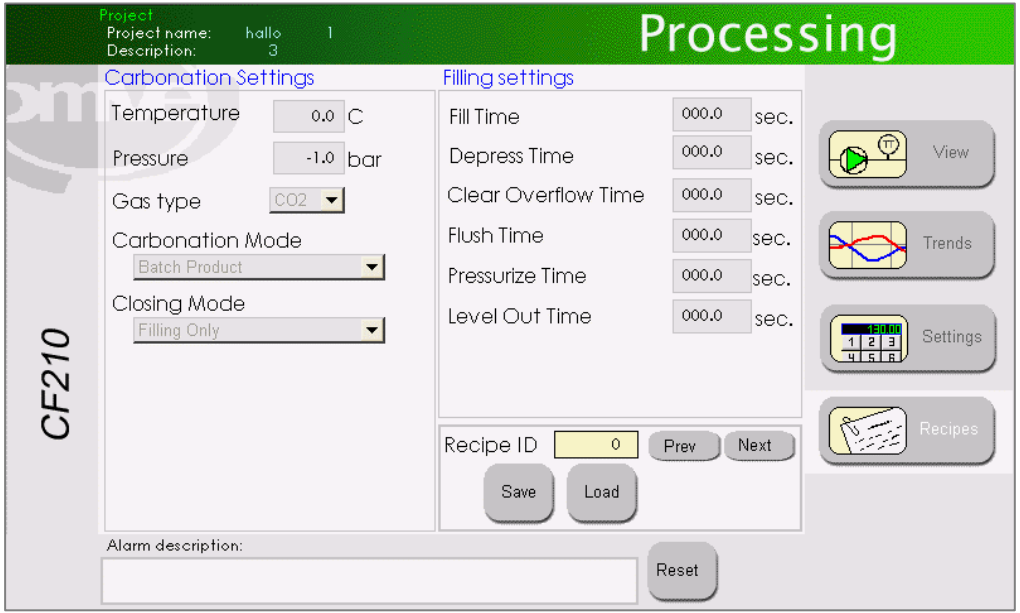
Processing – carbonisation parameters



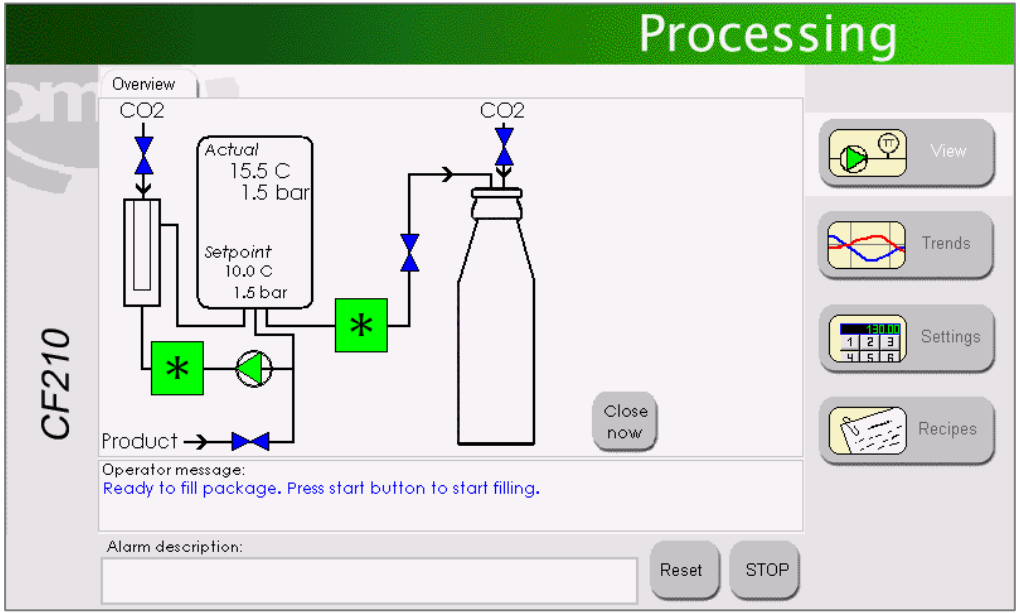
Processing – carbonisation parameters



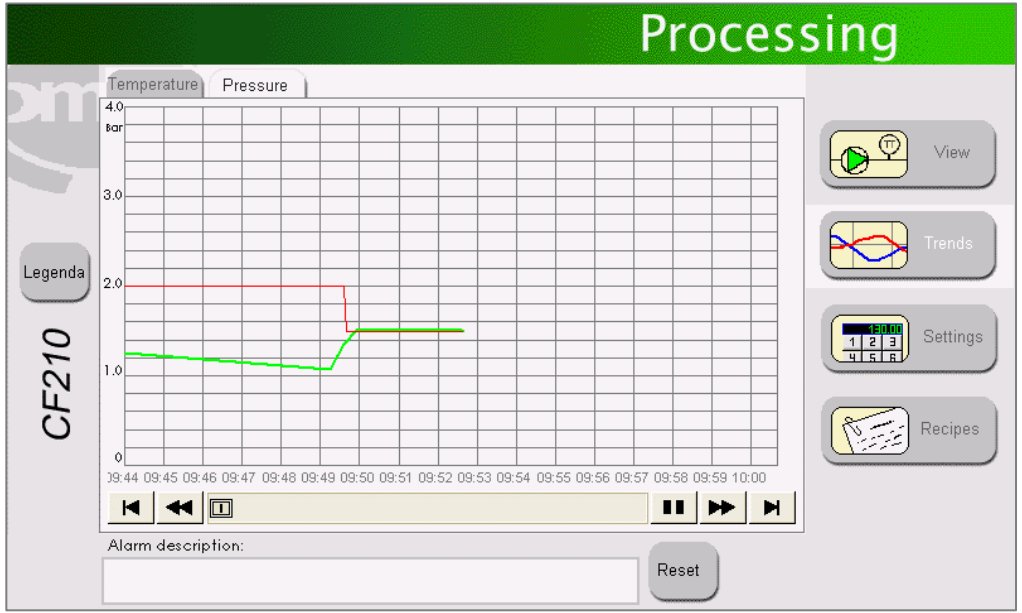
Processing – recipes



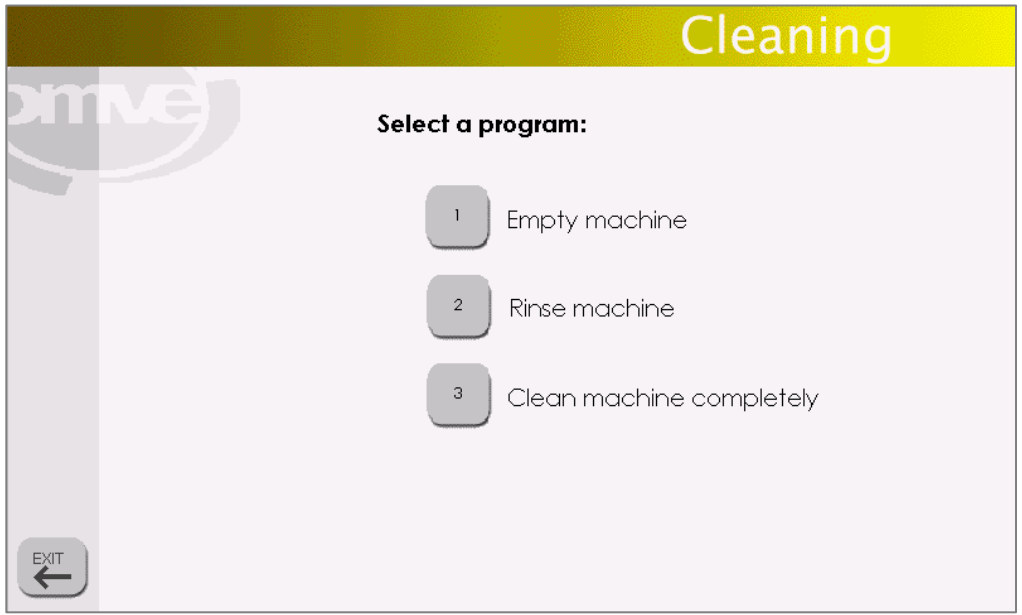
Processing – overview



Processing – trends

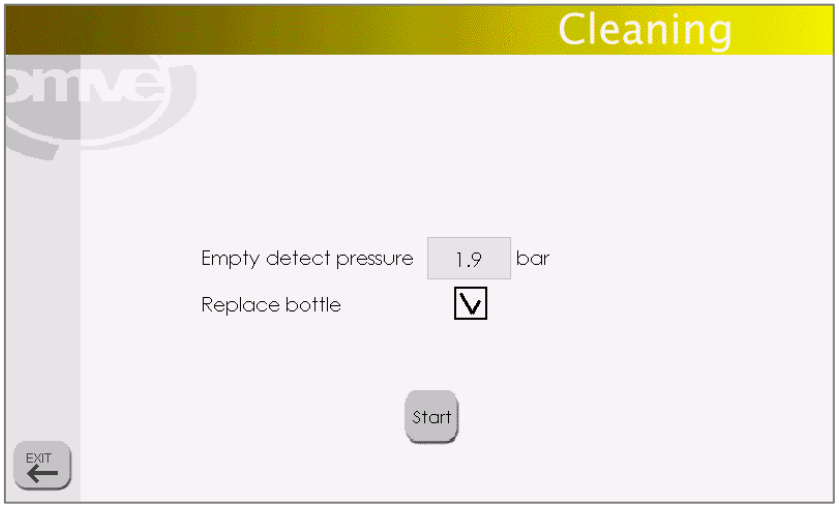


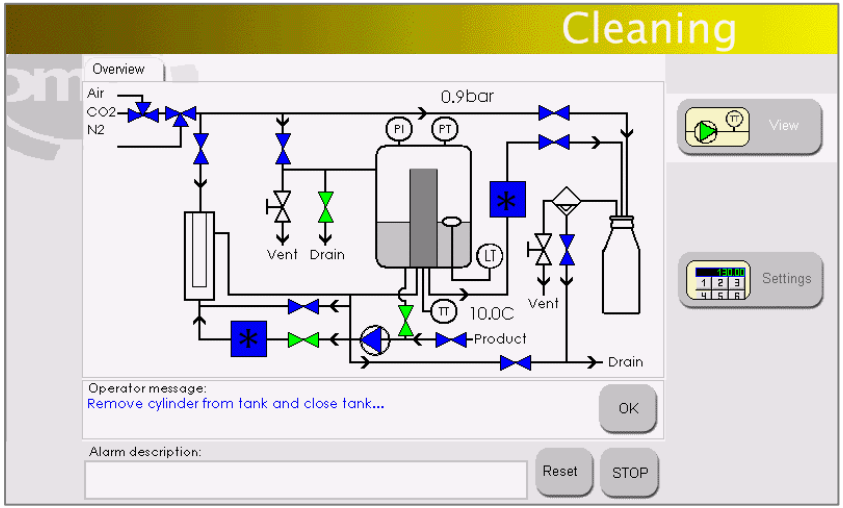
Cleaning


Cleaning
Select a program:
1
Empty machine
2
Rinse machine
3
Clean machine completely
EXIT

Operation

Cleaning





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Operation

Cleaning – programs

Empty machine:

Emptying tank

Rinse machine:

Emptying tank, flushing tank with tap water, emptying tank

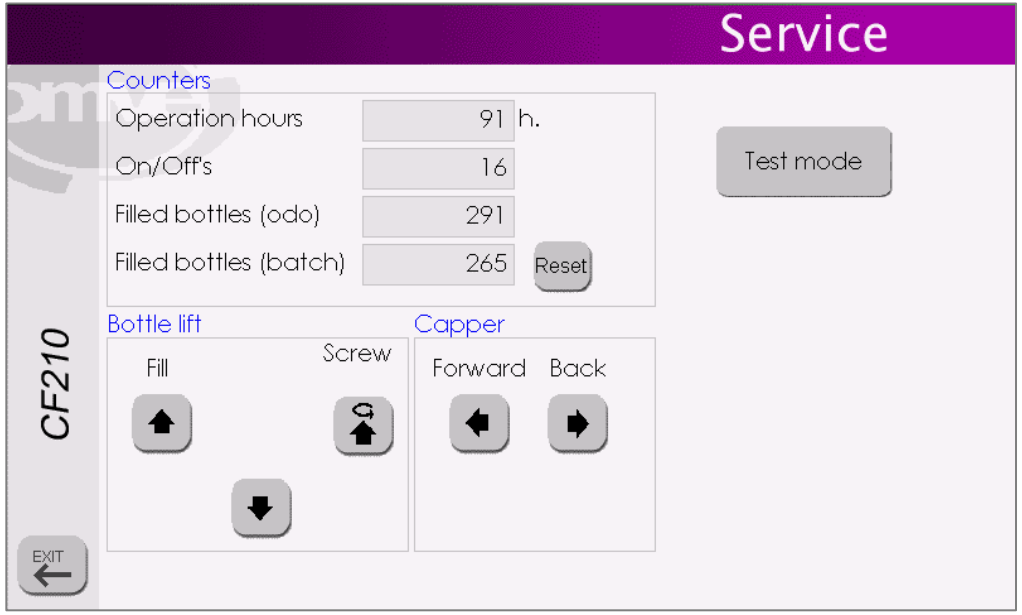
Operation

Cleaning – programs

Clean machine complete:

Emptying tank, flushing tank with tap water and empties again, flushes with manually pored (hot) cleaning fluid and empties again, rinses with water and empties again.

Service


Service
Counters
Operation hours
91 h.
On/Off's
16
Filled bottles (odo)
291
Filled bottles (batch)
265
Reset
Test mode
Bottle lift
Fill
Screw
Capper
Forward
Back
CF210
EXIT

Special products

Foamy products

Examples: Beer, Dairy drinks, Beverages

How to prevent foam in general

- Prevent big changes in pressure and temperature.
- Prevent high product flows.
- Prevent contact with oxygen.
- Give the product time to settle down.

Special products

Foamy products

How to prevent foam in the saturation vessel:

- Pressure on CO2 supply regulator approximately 1 bar higher than desired pressure level.
- Cool down the vessel by cooling it down with water.
- Optional: remove the inner tube of the saturation vessel.

Special products

Foamy products

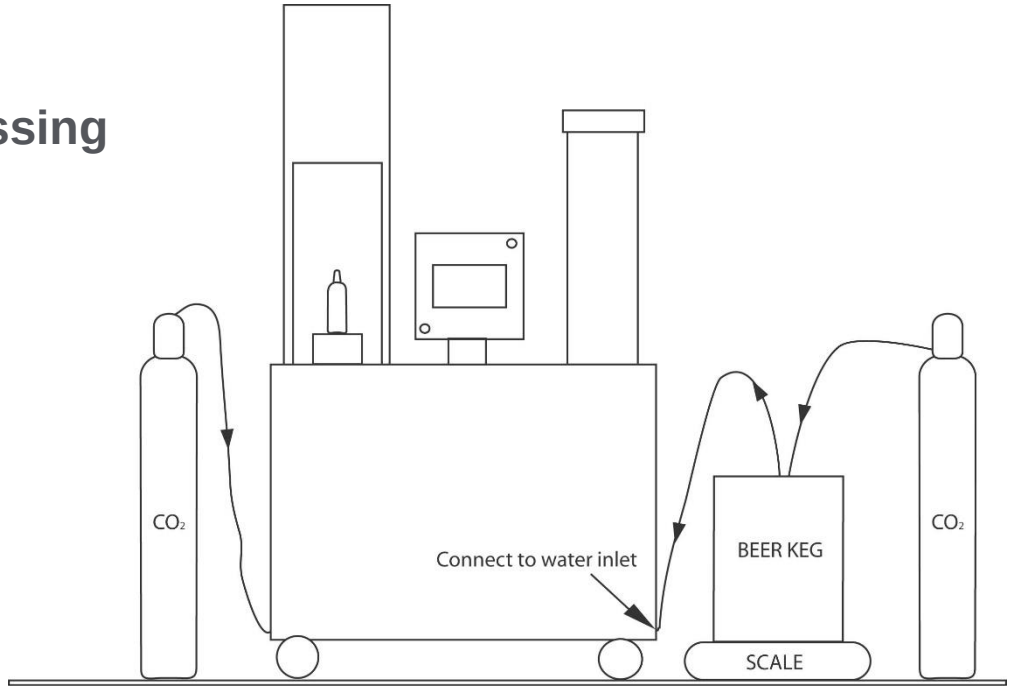
How to prevent foam in the bottle

- Use low filling speeds.
- Increase Level Out time and Sniff time.
- Use the shield on filling tube.
- Use clean bottles.
- Use cold bottles.

Special products

Beer processing

Set-up for beer processing



Special products

Beer processing

Beer processing procedure

1. Fill the saturation vessel with water and cool it down to 4 degrees.
2. Empty the vessel with N2.
3. Remove Oxygen by flushing the system with CO2.
4. Fill the saturation vessel slowly with beer.

Special products

Beer processing

5. Cool the beer to the desired temperature.
6. Stabilise the beer for 5 minutes.
7. Open the CO2 supply slowly.
8. Increase the CO2 pressure by steps of 0.1 bars and let the beer stabilise for 5 minutes after each step.
9. Saturate the beer.
10. Fill the bottles.

Special products

Beer processing - example filling and carbonisation parameters:

Temperature	8.0	ºC
Pressure	1.5	bar
Filling time	36.0	s
Sniff time	22.0	s
Clear Overflow time	1.5	s
Flushing time	2.0	s
Pressurizing time	2.0	s
Level out time	6.0	s
Filling speed valve	2.5	turn
CO2 supply pressure	2.6	bar

Technical information

Utilities

Utility	Flow/Amount	Pressure	Temperature	Connection type	Remarks
Main water supply		Max 2.5 bar	Max 20 °C	Serto Hose ferrule	Protect against water hammering
CO_2		Max 3,5 bar		Serto Hose ferrule	Add a manometer; 6 bar
N2 (optional)		Max 3.5 bar		Serto Hose ferrule	Add a manometer; 6 bar
Compressed air		4-7 bar		Serto Hose ferrule	
Drains			Max 70 °C	Serto Hose ferrule	Open connection. Do not combine
Electricity	220-240V / 50-60 Hz, grounded				

Technical information

Utilities

- CO_2 gas supply with a, non-flow restricting, pressure regulator (max. 3,5 bar)
- N_2 supply (optional) with pressure regulator (max. 3,5 bar).

DO NOT USE A FLOW REGULATOR

Maintenance

The following parts are subjected to wear

- Inner parts valves
- Seals filling head

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Lab & Pilot Equipment

Thank you!

[Name engineer]
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