

DALUM

Beverage Equipment

DALUM
Beverage Equipment

Secure Own Food Grade CO₂ Supply

High quality CO₂ from your
own controlled source

Stainless Steel and Oil Free
Compressor Technology

No Refrigerants in Unit

Food Contact Materials Used

Easy to use and maintain
From 1.000 barrels/Y

DALUM
Beverage Equipment

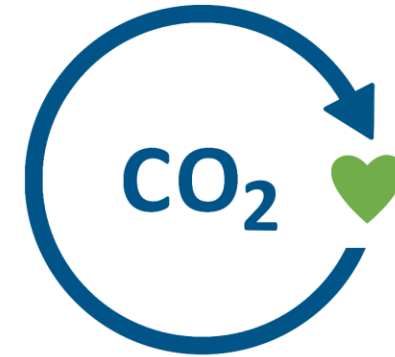


DALUM CO₂ UNIT

DALUM
Beverage Equipment

Craft Scale CO₂ Recovery

Sustainable and natural
CO₂ for your beer



Environmentally Friendly
Financially Feasible

DALUM CO2 recovery plant

Top Quality CO2 and Delivery Safety

- No Oil, Chemicals filters or refrigerants in CO2 Unit
- Stainless Steel and Oli Free DALUM Compressor
- Only Food Contact Materials in contact with CO2
- 99.98% purity and no detectable odor in product
- Oxygen traces in ppb
- Own control of CO2 source and security of supply

Plug and Play unit ready to go

- Fully assembled and tested unit ready to plug inn.
- Water, electricity, coolant and drain to be connected.
- No vendor installation and commissioning hours needed.
- No PED or ASME needed for plant
- ** Storage tanks for liquid CO2 needs approvals and inspections.



**DALUM CO2
RECOVERY
PLANT**

Easy to fit in

- Very small footprint of plant(1m²)
- Low noise level (65 dB) and can be placed anywhere in the brewery
- No balloon due to DALUM Compressor with 100% variable speed
- No hazardous ammonia or CFC refrigerants as external cooling source is used

Environmentally friendly

- Low consumption of power and water
- Improving working environment in brewery
- Eliminates breweries possible largest CO2 emission source, 2 tons less emission per tons recovered
- Eliminates breweries purchase and transport of CO2

**DALUM CO2
RECOVERY
PLANT**

Easy to use and maintain

- Simple and fully automatic operation with self diagnosing software
- Adapts automatically capacity to fermentation cycles
- No consumables to be replaced regularly
- Dashboard on Smartphone and remote access

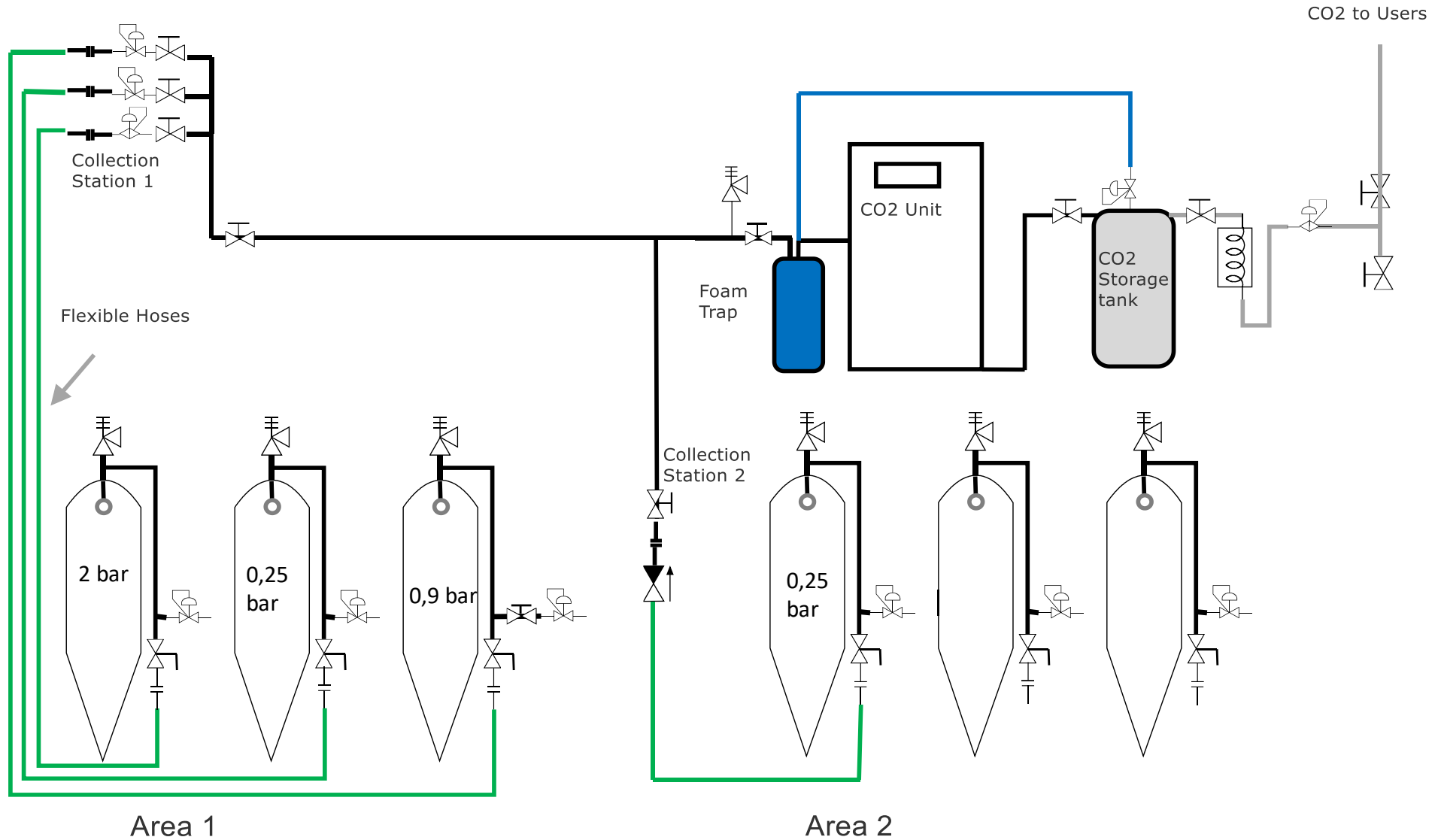
Financially Feasible

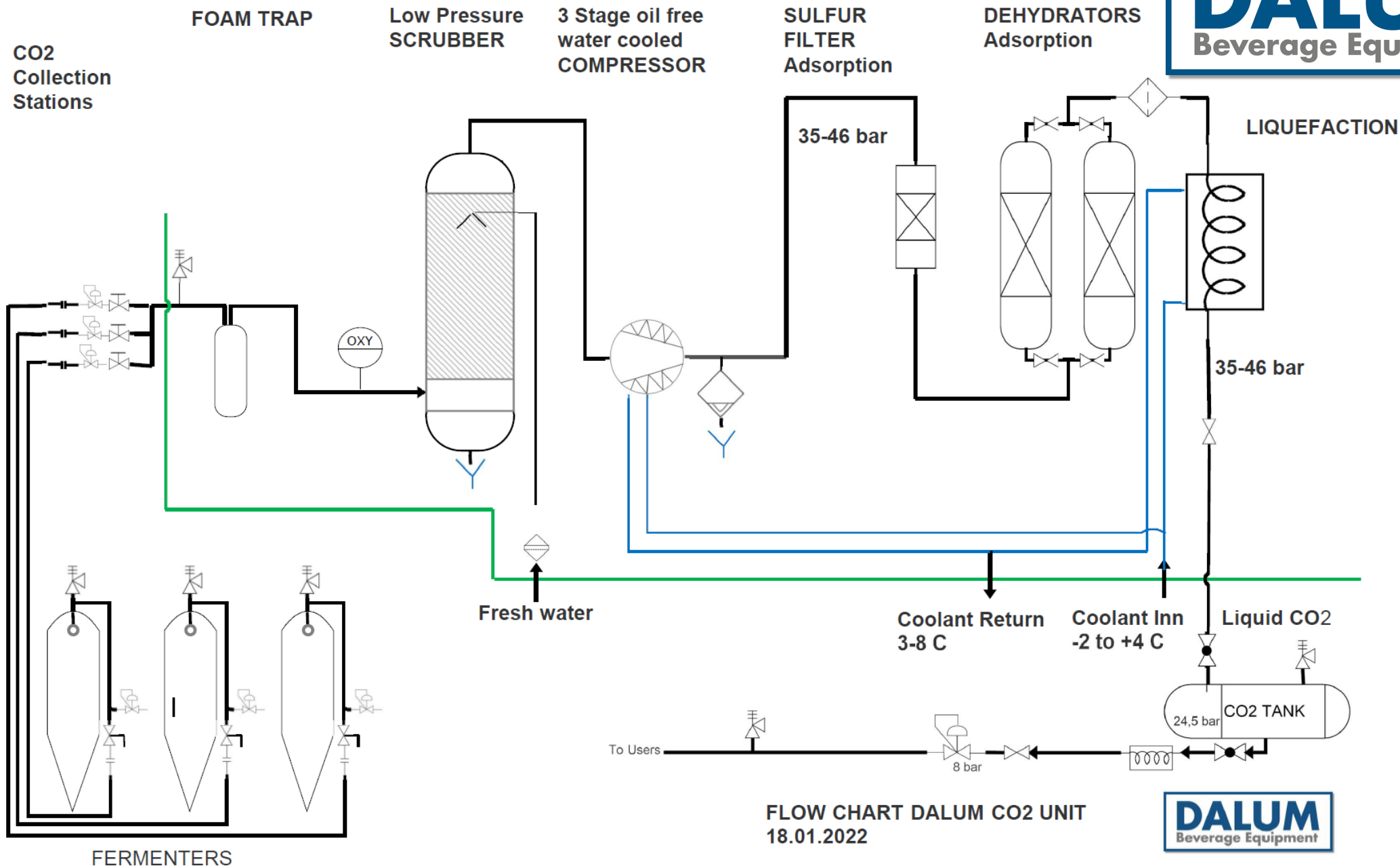
- Low capex and short return on investment for 2.000 - 50.000 hl breweries
- Reduces cost of CO2 considerable and secures supply
- Increase surplus CO2 value by cylinder filling for beer dispensers for draft beer.



CO₂ Unit Overview

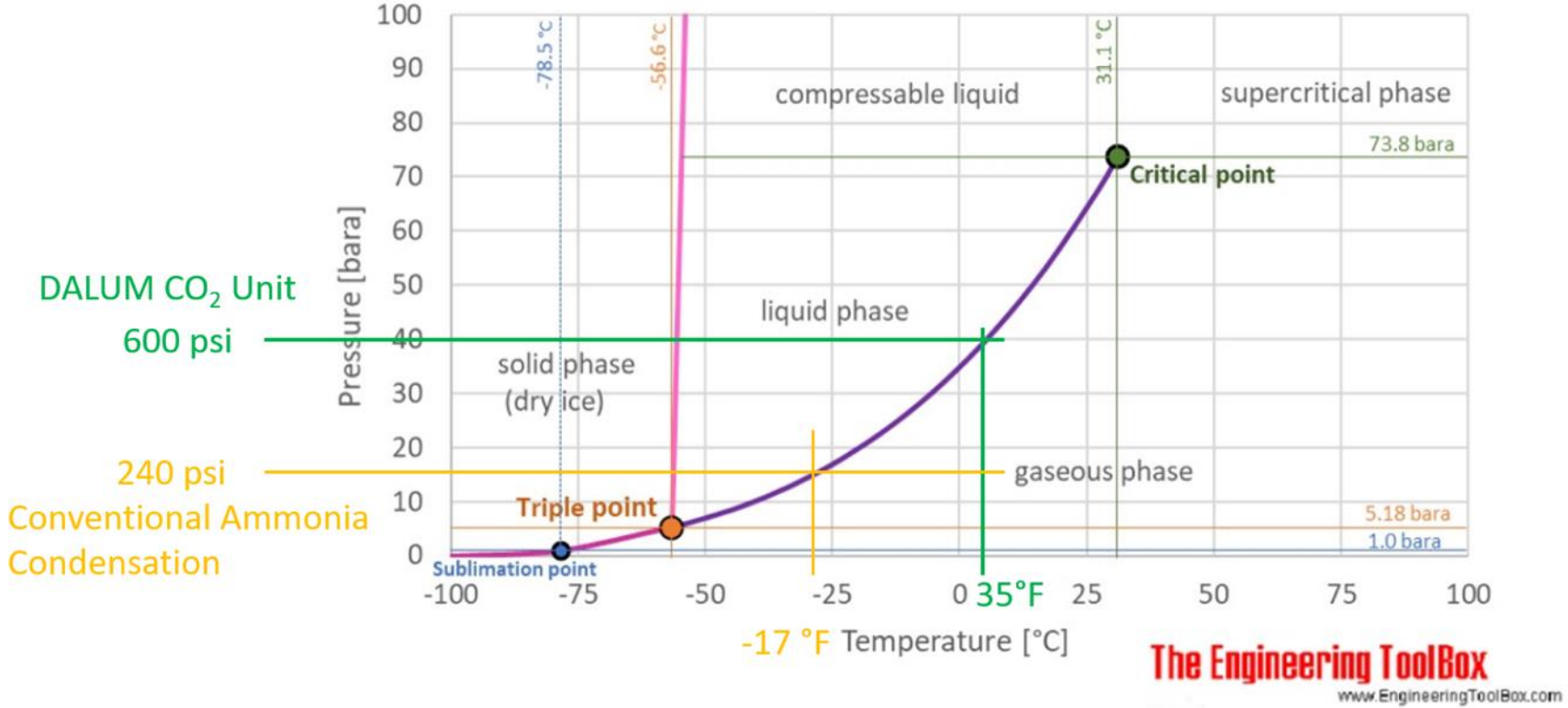
System overview





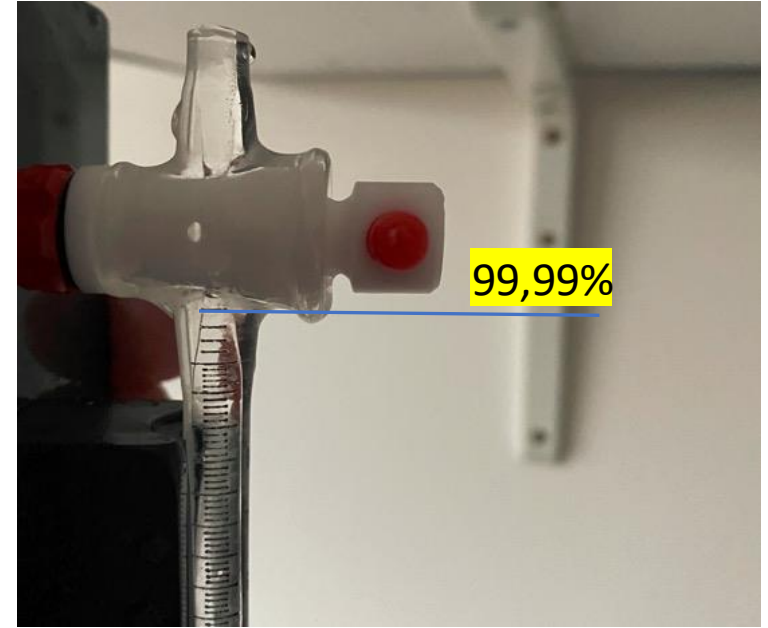
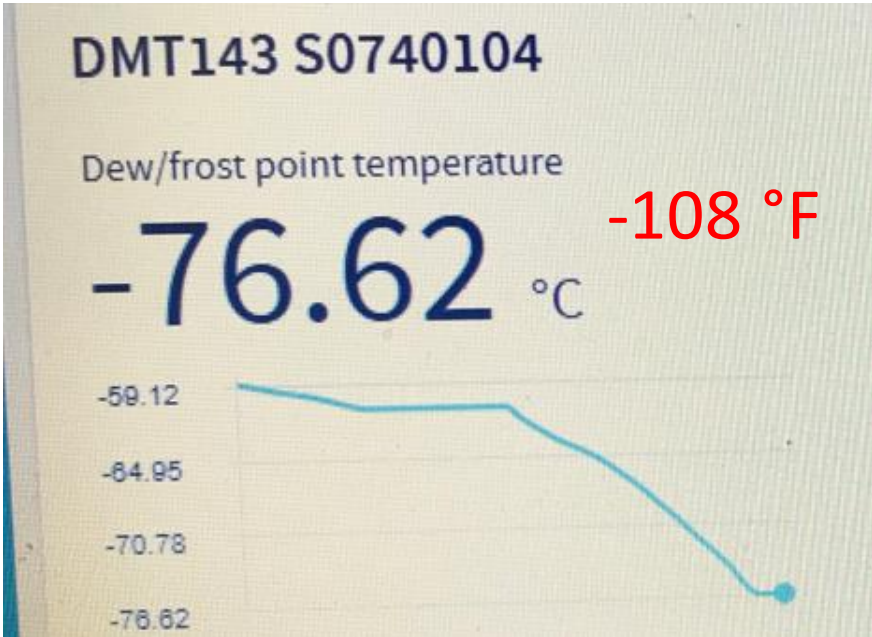
FLOW CHART DALUM CO2 UNIT
18.01.2022

Carbon dioxide phase diagram



No Refrigerants

Three stage compressor produces 45 bars condensation pressure



Eddie Gadd, Ramsgate Brewery:

collection system (generally 16 hours from yeast pitching). Some CO₂ is lost through the initial stage of fermentation, due to high O₂ content, and some remains in the beer at the end. With good management, 75% yields have been achieved, with an oxygen content of <6 ppb, measured with an Orbisphere (wholesale liquid CO₂ at the bottling site measures 16 ppb O₂). A burette is used to demonstrate purity >99.99%.

High Purity and Very Low Oxygen Content

Typical Chemical Profile in CO₂ After Main Process Steps

Typical chemical profile in DALUM CO ₂ recovery					
Component	Presence in feed, ppm	After water scrubber, ppm	After compressor, ppm	After dehydrator and condenser, ppm	ISBT ppm
Acetaldehyde	20	0	0	0,02	0,2
Ethyl Acetate	200	10	8	0,0	
Mercaptans	5	1	0,7	0,0	0,1
Dimethyl Sulfide	35	3	2	0,05*	0,1
Ethanol	2500	5	0	0,0	
Carbon Disulfide CS ₂	0	0	0	<0,05	0,1
Hydrogen Sulphide, H ₂ S	0	0	0	<0,01	0,1
Carbonyl sulphide COS	0	0	0	<0,05	0,1
Oxygen O ₂	1000	1000	1000	0,005 -0,1*	30
Moist H ₂ O	> 10000	>10000	1000	1	20
Carbon dioxide %	96	97	99	99,985-99,995	99,900
Nitrogen	4000	4000	4000	0,1	na
Amonia	na	na	na	<1	2,5
Oil & Grease	na	na	na	<1	5
Hydrocarbon	na	na	na	1,5	50
Benzene	na	na	na	<0,01	2,5
Methanol	na	na	na	0,06	10

ISBT: International Society of Beverage Technologists

Oil free
Sanitary
Variable Speed
Low Noise



Beer Output 5 % alc. Hl	Compressor displacement Size	CO2 recovery (Tons CO2)	Emission reduction (Tons CO2)	Unit Price €	Tank Budget €
7,000	5 kg/h	22	44	32,500	15,000
15,000	10 kg/h	66	132	47,700	20,000
25,000	15 kg/h	99	198	64,000	30,000
50,000	30 kg/h	198	396	99,750	40,000

Emission reductions

- Two tons of emission reduction from each tons CO2 recovered
- Producing and transporting 1 tons CO₂ to a Brewery emits 2 tons CO₂*
- * University of Winnipeg

Financially Feasible- Short Payback Time



Beer output in hl.	Unit model	Theoretical compressor displacement	Unit price	Faire discount**
1.000-5.000 hl/y	Micro	5kg/h	€ 32.500	€ 29.250
5.000-15.000 hl/y	Mini	10kg/h	€ 47.700	€ 42.930
15.000-25.000 hl/y	Craft	15kg/h	€ 64.000	€ 57.600
25.000-50.000 hl/y	Senior	30kg/h	€ 99.750	€ 89.775

*Storage tanks for liquid CO2 need approvals and inspections.

**First 5 units sold.

- Variable cost below € 40 per tons depending on electricity (0,1 €/kW)

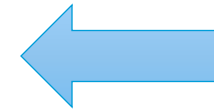
DALUM 15 kg/h CO₂-Unit



3 m²

1 m

1 m



CO₂ gas
max 0,5% O₂ / 96% CO₂

3x 400 V, 50 Hz, 3 kW installed.

Water ca. 1 – 20 liter/h 1 - 10 °C

Cooling -4 to 2 °C, 12 l/min,
2 kW cooling energy (0,5 kW)



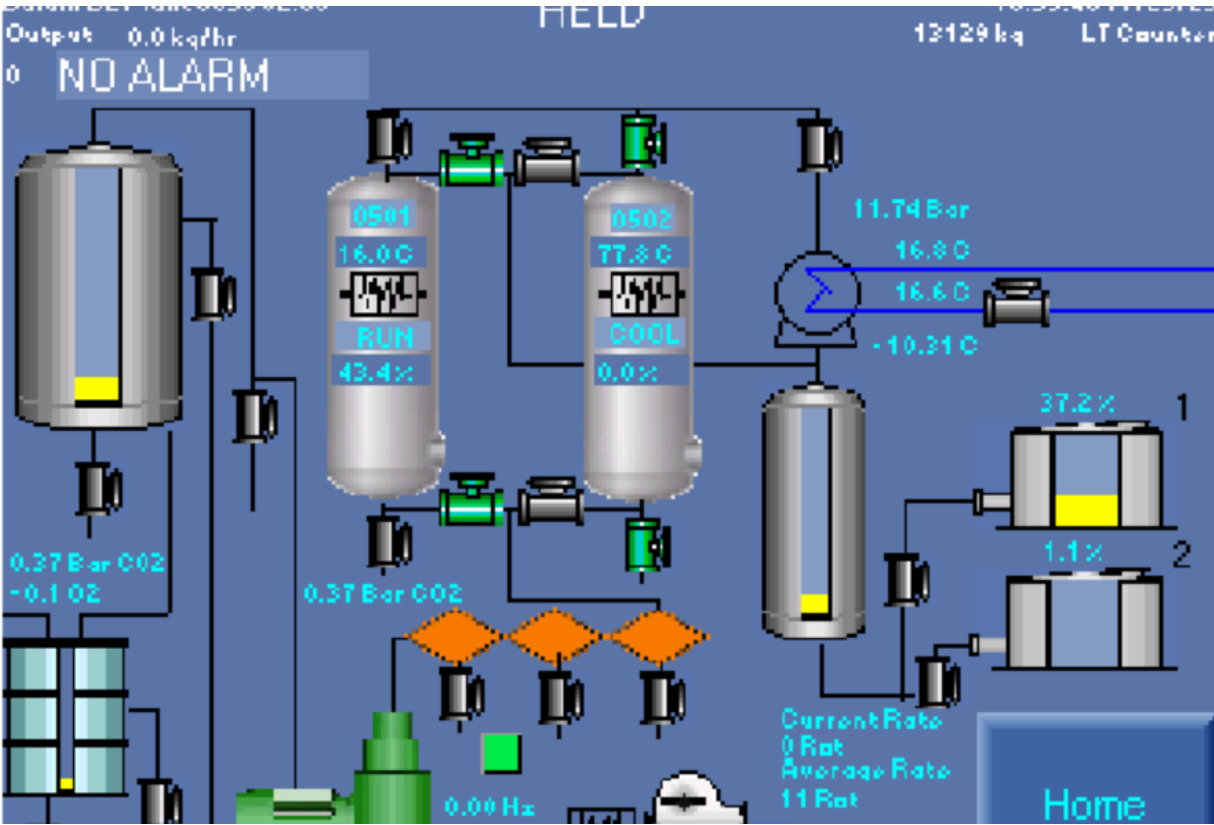
99,98% liquid CO₂,
1 – 15 kg/h, -2 to 3 °C

Cooling return

Drain Water 20 °C

Incondensable gasser

Control System with Unitronics Vision Combi PLC Remote Operator



Dalum Beverage Equipment

1,738

Production Counter

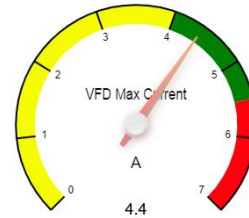
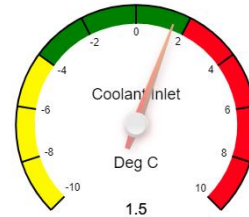
Running

No Alarm

No Alarm

No Alarm

No Alarm



ON

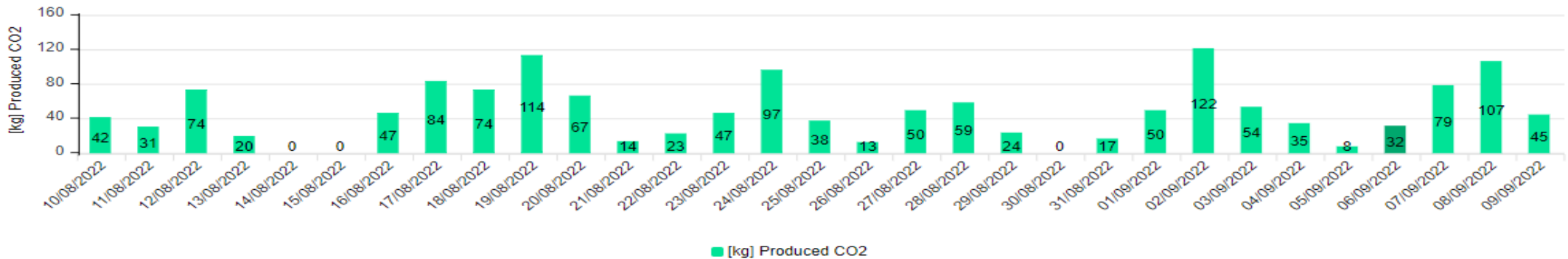
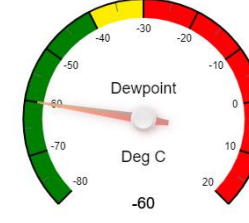
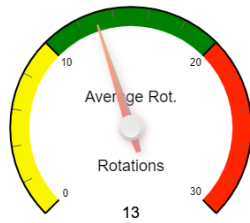
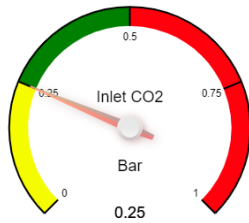
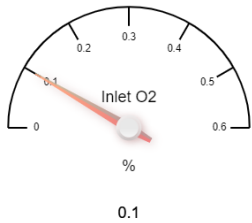
At present there is no Asset selected.

OFF

58%



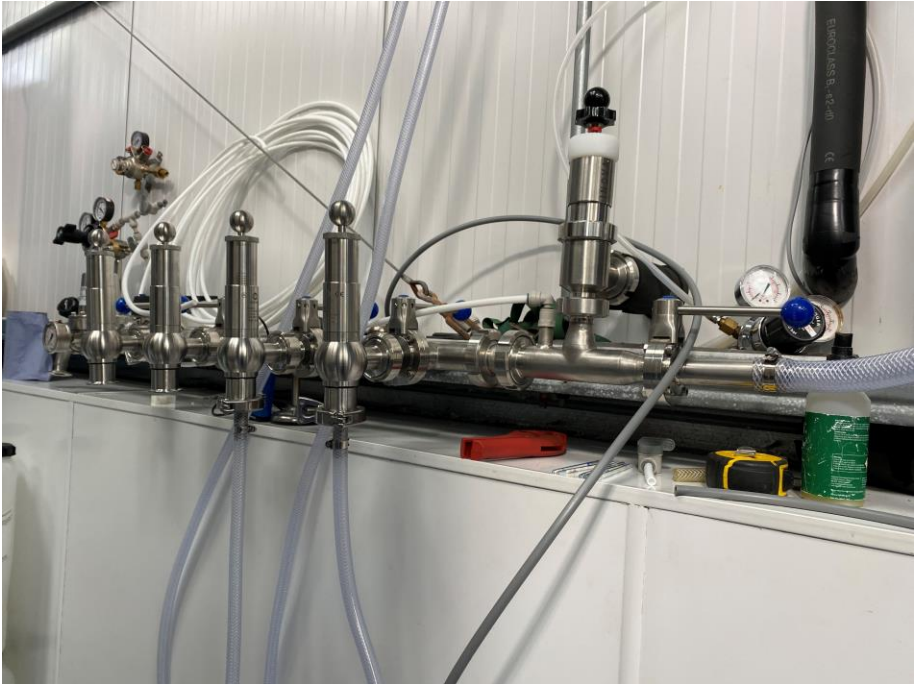
Storage Tank Level



Storage Tanks and Vaporizers for all needs



Collection Stations



Foam Traps and PRV



Excess CO2 Vent and Flash Gas Return

Solutions for user lines and try cock

