

**CO<sub>2</sub> - PRODUCTION PLANTS**

## CO<sub>2</sub> - PRODUCTION PLANTS - SYSTEM BUSE ERZ

CO<sub>2</sub>-production plants “**System BUSE ERZ**” are compact plants of high reliability, built in modular design. The CO<sub>2</sub>-gas is generated by combustion of natural gas or fuel oil and separated from the flue gas by means of a special absorption agent (monoethanolamine), processed and subsequently liquefied. Based on the long standing experiences of BUSE as CO<sub>2</sub> producer, consumer and plant manufacturer, these plants are provided with all necessary components to ensure a safe and economical production of purest carbon dioxide.

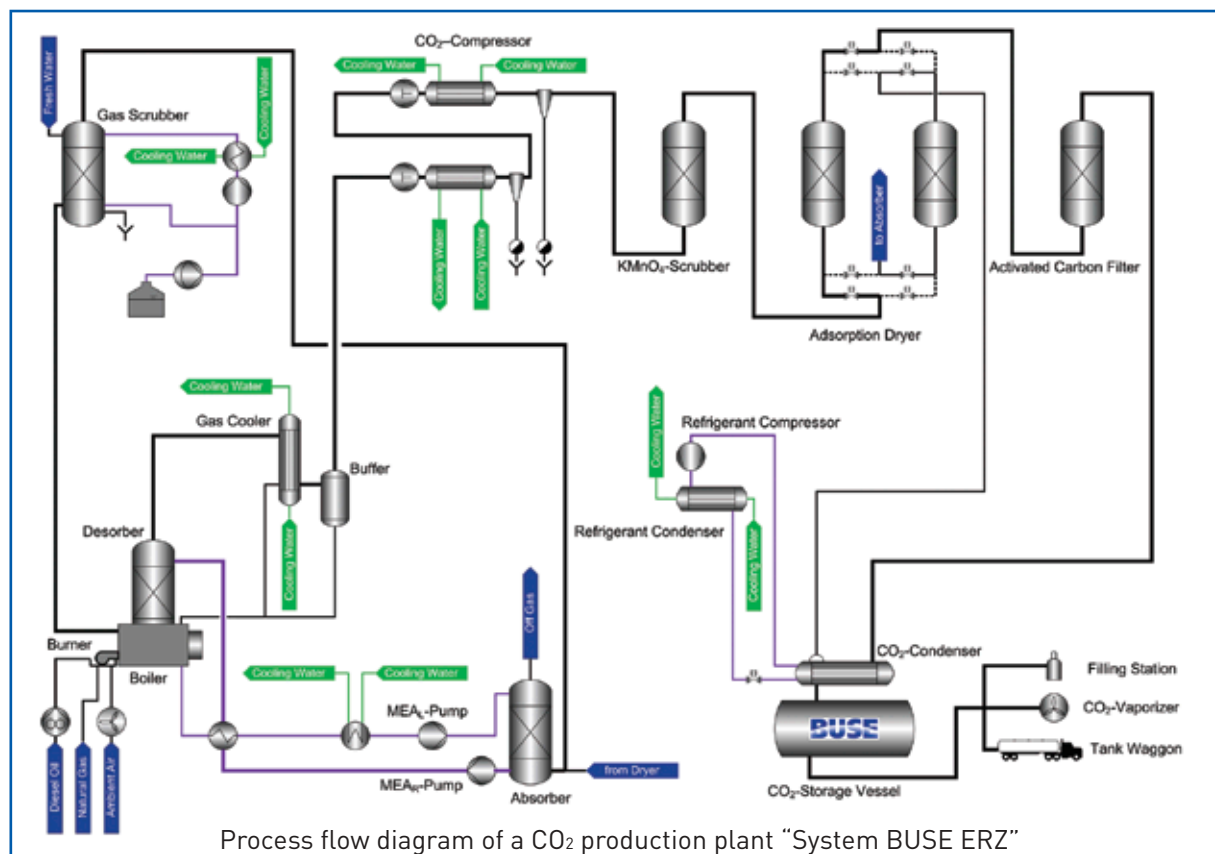


CO<sub>2</sub>-production plant “System BUSE ERZ 1000”

CO<sub>2</sub>-production plants allow an independent CO<sub>2</sub>-production, and therefore are used wherever CO<sub>2</sub> is needed and CO<sub>2</sub>-suppliers or useable sources are not adequately available.

CO<sub>2</sub> production plants are used:

- in the beverage industry
- at producers of industrial gases
- in sea water desalination plants



Process flow diagram of a CO<sub>2</sub> production plant “System BUSE ERZ”



Stainless steel reboiler with special burner for natural gas (System BUSE ERZ 0500)



“The carbon dioxide produced in our CO<sub>2</sub>-production plants meets highest standards.

All prevalent specifications and requirements of the beverage and industrial gases industry are unproblematically complied with.”

Dipl. Ing. Fritz Langrock,  
Technical Manager - BUSE Gastek

## PROCESS DESCRIPTION

### FLUE GAS PRODUCTION AND – SCRUBBING

CO<sub>2</sub>-gas is produced by combustion of natural gas, diesel oil or kerosine. In a special burner, combustible and air are combusted under almost stoichiometric conditions, and generate a low-emission flue gas which is rich in CO<sub>2</sub>. At first, the flue gas is being conveyed through a tube bundle inside the stainless steel reboiler in order to heat up the MEA-solution in the shell side. Then the flue gas flows through a combined stainless steel gas scrubber where it is purified, cooled and desulfurized by means of NaOH-dosing. A special wash water circuit saves valuable fresh water!

### ABSORPTION AND DESORPTION

The flue gas gets into the absorber where the CO<sub>2</sub> is almost completely absorbed by means of an aqueous solution of monoethanolamine (MEA). The MEA-solution charged with CO<sub>2</sub> is preheated and then pumped to the stainless steel desorber. In the desorber, the CO<sub>2</sub> is released as a humid gas due to the heating of the MEA-solution. After leaving the desorber, the humid CO<sub>2</sub> is cooled in a stainless steel gas cooler and led to the CO<sub>2</sub>-compressor. After desorption, the MEA- is chilled and purified in a special MEA-filter station before entering again the absorber.

### CO<sub>2</sub>-COMPRESSION, GAS PURIFICATION AND GAS DRYING

In dry-running piston compressors, the humid CO<sub>2</sub> is compressed absolutely free of oil to approx. 16 to 17 barg. In a potassium permanganate-scrubber (stainless steel), impurities are removed by oxidation. The CO<sub>2</sub>-gas is then dried and remaining impurities are finally removed in a special activated carbon filter.

### CO<sub>2</sub>-LIQUEFACTION AND –STORAGE

In the CO<sub>2</sub>-liquefaction plant, the dried and purified CO<sub>2</sub> is cooled down to below -25°C and then liquefied. In our refrigeration plants we use screw or piston compressors for different refrigerants, e. g. NH<sub>3</sub>, R507 or R404a, depending on customer's request resp. case of application. Finally, the liquid and food grade pure CO<sub>2</sub> is stored in an insulated CO<sub>2</sub>-storage tank.



Pump and filter station for MEA-solution

## QUALITY ALWAYS PROVING ITS VALUE

CO<sub>2</sub>-production plants “**System BUSE ERZ**” are quality products of very high reliability and durability. These characteristics are guaranteed by the application of special BUSE-construction components made of stainless steel, e. g. the reboiler – “the core” of each CO<sub>2</sub>-production plant.

Apart from the careful and high quality material selection, further systems and processes developed by BUSE are applied, e. g. a special MEA-purification and filtering station, in order to decrease the MEA-consumption and utility costs as well.

BUSE-plants are characterized by an excellent manufacturing quality as well as by modern technology. These attributes guarantee that our CO<sub>2</sub>-plants are very stable in value for the customer and make possible a good return on investment right from the beginning of its operation.



## FROM ENGINEERING RIGHT UP TO TURN-KEY PRODUCTION FACILITIES

### ENGINEERING AND PLANT CONSTRUCTION

- Standard plants from 30 kg/h to 3.000 kg/h
- Special custom-tailored plants upon request
- Overhauling and upgrading of existing plants
- Turn-key supply

### AFTER SALES SERVICE

- Competent service engineers
- Quick and long-lasting provision with original spare parts
- Technical support during the entire lifetime of the plant

### ENGINEERING SERVICES

- Basic and detail engineering
- Process and plant optimization of existing facilities
- Expertise and consulting on CO<sub>2</sub> applications

### WIDE RANGE OF EQUIPMENT FOR CO<sub>2</sub>-HANDLING AND APPLICATIONS

- CO<sub>2</sub>-storage tanks, CO<sub>2</sub>-evaporators and CO<sub>2</sub>-supply systems
- Gas analyzers and quality control equipment
- Dry ice production machines
- Dry ice blasting equipment for efficient and environment- friendly industrial cleaning
- Cryogenic freezing plants
- And much more...



## CO<sub>2</sub> IS OUR WORLD...

...and has been for over 120 years. The BUSE-position on the beverage and gas-industry is characterized by a close competence chain, that has been earned over 120 years- from a German mineral water producer to a gas producer and distributor, right up to a reputable engineering and service specialist for the gases and beverage industry.

## BUSE – MORE THAN 120 YEARS OF KNOWLEDGE IN CO<sub>2</sub>-TECHNOLOGIES

### BUSE Gastek GmbH & Co.KG

Sprudelstrasse 3  
D-53557 Bad Honningen / Germany  
Tel. +49 2635 781 0  
Fax +49 2635 781 192  
E-Mail: [info@buse-gastek.com](mailto:info@buse-gastek.com)  
[www.buse-gastek.com](http://www.buse-gastek.com)

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Certification

