



CO₂ Absorption System

for RITTER Biogas Batch Fermentation System

Application

RITTER has developed a CO₂ Absorption System which absorbs CO₂ from biogas reliably and binding **more than 99%**. This absorption system combined with the »RITTER Biogas Batch Fermentation System«, provides the ideal solution for professional biogas research.

Features

- Absorption solution:
3-molar sodium hydroxide solution (NaOH 3Mol in aqua dest.)
- Absorption bottle (»bubbler«):
Gas inlet via dip pipe, allowing an absorption of more than 99% (systems with surface wetting only, achieve an absorption of 95-97%)
- Volume of bubbler: 250 ml
- Filling quantity of absorption solution: 200 ml per bubbler
- CO₂ absorption capacity per bubbler: 6 ltr CO₂
- Saturation limit indicator:
Phenolphthalein
- Unbreakable PP screw-type tube couplings at bubbler
- Easy-connect PVC tube fittings allow quick connection to RITTER fermentation bottles (on the gas production side) and to RITTER MilliGascounters (on the measurement side)
- Hanger (optional) made of PVC for 4 or 8 units of 250 ml bubblers

Operating Principle

The biogas generated in the fermentation bottles flows through a dip pipe into the bubbler containing the absorption solution. More than 99% CO₂ absorption will be achieved as a result of the gas bubbles rising to the surface through the absorption solution. The absorption is increased due to the large surface wetting of the bubbles.

Systems with surface wetting only will achieve an absorption rate of 95 to 97% , resulting in a 3-5% error in gas volume measurement.

The indicator solution changes from purple to russet when the saturation limit of the absorption solution has been reached. The gas flows through the bubbler gas outlet to the RITTER MilliGascounter for gas volume measurement. The pressure loss of the bubbler is approximately 4 mbar

Standard Equipment

- Absorption bottle (»bubbler«) 250 ml with PP dip pipe, 2 PP screw-type tube couplings for gas inlet and outlet
- Check valve with tube connection adapters for tubing $\varnothing_i = 4$ mm
- Two each 1m connection tubes made of special PVC

Accessories / Options

- 3-molar sodium hydroxide solution, 1-ltr
- Indicator solution "Phenolphthalein"
- Hanger made of PVC (recommended, requires »Tube distribution frame for MilliGascounters«, suitable for RITTER drying / heating ovens...
 - FD115 (116 ltr) for every 8 bubblers 250 ml
 - FD56 (60 ltr) for every 4 bubblers 250 ml
- Tube distribution frame for MilliGas counters on top panel of drying / heating oven for kink-free tube routing between fermentation bottles, bubblers, and MilliGascounters (recommended)

⁽¹⁾ Please note: After gas production has stopped, some biogas including CO₂ will remain in the headspace of the fermentation bottles. Even without gas flow, this CO₂ fraction will continue to be absorbed by the bubblers. This can lead to under-pressure within the fermentation bottles, which may cause the absorption solution to flow back into the fermentation bottles. To prevent this, a check valve is delivered as standard with the system. It should be located in the tube between the fermentation and absorption bottles.

Technical Specifications

Absorption bottle ("bubbler")	Volume 250 ml, material: Borosilicate Glass Overall dimensions \varnothing 70 mm x H 200 mm, weight 290 g
Absorption solution	3-molar sodium hydroxide solution (NaOH 3Mol in aqua dest.) Filling quantity per bubbler: 200 ml, delivered in 1-liter bottles
Saturation limit indicator	»Phenolphthalein«, solution 1% in ethanol (technical) Filling quantity per bubbler: 200 ml, delivered in 250-ml bottles
CO ₂ absorption capacity	6 ltr CO ₂ per bubbler
Bubbler hanger	Material: light grey PVC, max. of 2 hangers per heating oven Dimensions W 505 x H 680 x D 125 mm, weight 4,6 kg
Gas connections	PP screw-type tube fittings for \varnothing_i 4 mm / \varnothing_o 6 mm tubes
Connection tubes	Low diffusion special PVC, \varnothing_i 4 mm / \varnothing_o 6 mm
Pressure loss per bubbler	approx. 4 mbar

Dr.-Ing. RITTER Apparatebau
GmbH & Co. KG
Coloniastr. 19-23
D-44892 Bochum
Germany
Tel +49-234-92293-0
Fax +49-234-92293-50
mailbox@ritter.de
www.ritter.de



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