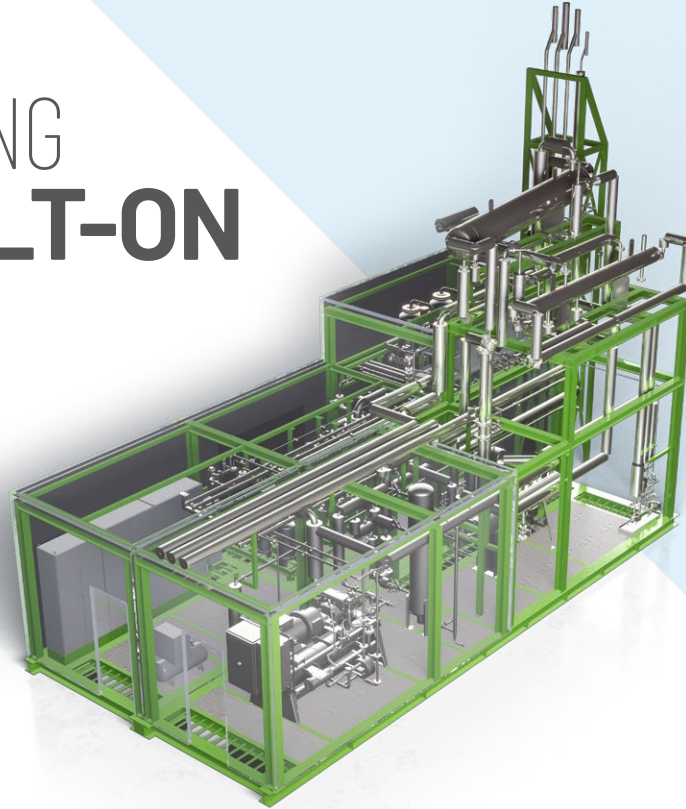
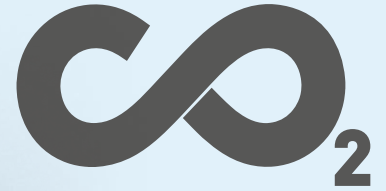


BIOGAS UPGRADING CO₂BOLT-ON



LIQUID CO₂ FROM BIOGAS

Pentair's CO₂Bolt-On is the proper installation to create *green* liquid CO₂ from a renewable, cost-efficient source: upgraded biogas.

The biogas upgrading process vents a waste stream which is a highly concentrated flow of CO₂, with a limited amount of methane and other contaminants, creating the ideal source for cost-efficient production of liquid CO₂. Additionally, the methane slip can be eliminated, creating a higher bio-methane yield for your biogas upgrading installation. The renewable CO₂ can be used in industrial (technical) CO₂ applications (CCS/CCUS to industrial use) or as an ingredient for the food and beverage industry (food-grade CO₂).

With 75+ years of experience in CO₂ equipment and extensive knowledge of CO₂ recovery systems, CO₂ users are assured the CO₂ product from Pentair's systems fulfills market specifications. Customers can confidently rely on the supply of quality liquid CO₂ from a known source.

BENEFITS

- **Decarbonisation, direct production of CO₂ can lead to a negative carbon footprint and lower carbon intensity scores (CI)**
- **No methane-slip: the off-gas can be brought back to the inlet of the biogas upgrading unit, thus increasing the production yield of methane to 100%**
- **Highest uptime availability through a robust design and dedicated service team (24/7 Technical service)**
- **Independent, simple and compact: design allows for reduced installation costs and the option to operate your upgrading system independently from the CO₂ system**
- **Liquid CO₂ quality exceeds global standards to be sold as technical CO₂ or (when certified) as food-grade CO₂**

OPTIONS

- Gas balloon
- Installation and commissioning services

CO₂BOLT-ON

PROCESS DESCRIPTION

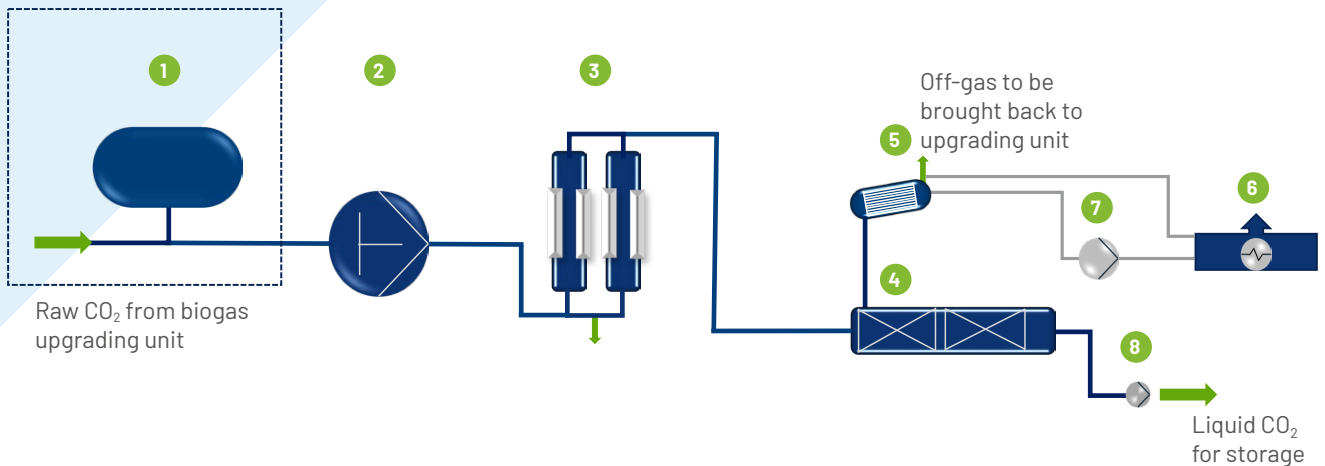
Exhaust CO₂ from the biogas upgrading unit is fed to the bolt-on system, where CO₂ compressor units increase the gas pressure to 18 barg (261 psig) in two stages removing condensate in the process. Next, trace impurities and moisture are removed. The purified CO₂ gas is led into the cooling system where the CO₂ is liquefied. The off-gas containing all non-condensable gases (CH₄, O₂, N₂) is purged as off-gas and can be brought back to the inlet of the upgrading unit. The purified liquid CO₂ end product is fed at 17.5 barg (218 psig) to the onsite storage tank.

WHY PENTAIR?

Pentair's Sustainable Gas Solutions specializes in biogas upgrading and CO₂ recovery systems. With over 1500 installed plants, including more than 50 biogas upgrading systems, Pentair's dedication to this core business is widely recognized within the industry. Our R&D department is constantly researching emerging technologies for improving the efficiency and effectiveness of our biogas upgrading solutions. Most importantly: we are there for you when your system is operating – with global service hubs and dedicated technical support. We diagnose and optimize whenever you need us to keep your plant up and running! *That's why Pentair!*

SCOPE OF SUPPLY

- 1 Gas balloon (optional)
- 2 CO₂ compressor
- 3 Activated carbon filter & drier
- 4 Stripper-reboiler
- 5 Refrigerant cooled CO₂ condenser
- 6 Refrigerant (dry) condenser
- 7 Refrigerant compressor
- 8 Liquid CO₂ pump
- > Main parts skid mounted and controlled by MCC



	INLET GAS CO ₂ CAPACITY	TYPICAL INLET GAS COMPOSITION	FOOTPRINT (L x W x H)	POWER CONSUMPTION	TYPICAL OFF-GAS OUTLET CONDITIONS	LIQUID CO ₂ TO STORAGE TANK
metric	250 – 1800 Nm ³ /h 500 – 3600 Kg/h	>99% CO ₂ , 0,9% CO ₂ , 0,1% N ₂ /O ₂	12,8 x 10 x 2,8 m	~ 110 Wh/Nm ³	30% CH ₄ , 3% N ₂ /O ₂ , 67% CO ₂	CO ₂ >99,997% EIGA 2018
imperial	155 – 2237 SCFM 1102 – 7937 lbs	>95% CO ₂ , 3,6% CO ₂ , 0,4% N ₂ /O ₂	42 X 32,8 X 9,2 ft	~ 220 Wh/kg	45% CH ₄ , 5% N ₂ /O ₂ , 50% CO ₂	

LEARN MORE

Interested in an inquiry or more information: **Click** or **scan** our QR code to contact us or **visit** us at BIOGAS.PENTAIR.COM



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