Kanadevia INOVA

Datasheet Gas upgrading

Membrane technology and advanced contaminant removal (ACR)

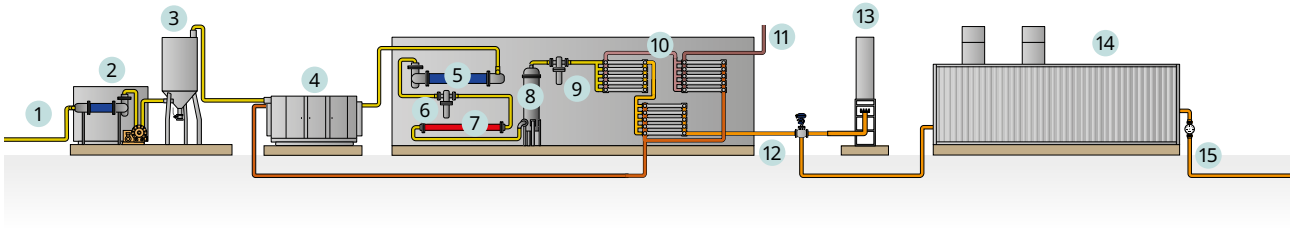
Membrane technology and ACR

Advantages of biomethane technology
Raw gases from a wide range of different sources are suitable for upgrading: the digestion of municipal green waste, organic household waste or agricultural biomass. Sewage and landfill gas can also be converted into energy. This extends a plant's value chain and promotes the circular economy. Depending on the composition, raw gas pretreatment may be required. Then comes the main process, where the carbon dioxide in the stream of gas is separated from the methane, with the resulting biomethane conditioned to the desired quality parameters.

Technical description
In the first step of the process, the raw gas is pretreated and compressed to operating pressure. After drying, heating and fine purification, the gas is fed into the membrane modules. The carbon dioxide is separated from the methane by selective gas permeation, with the CO_2 passing through the surface of the membranes more quickly than the methane, which is retained in the membranes and removed from the modules as product gas. This is a plug-and-play process technology requiring no additional operating resources such as water or heat.

ACR
Depending on the composition of the waste or biomass, biogas may contain impurities, for example volatile organic compounds (VOCs) such as terpenes, ketones and siloxanes. Elevated concentrations can impair the technology and thus the performance of the plant. This is particularly true for membrane equipment. Our innovative pretreatment approach stands out for its ability to handle high levels of VOCs while keeping operating costs low. It's ideal as an add-on to membrane installations or for upgrading existing plants.

Scheme of principal setup



Pretreatment
1 Raw gas piping
2 Drying and precompression
3 Desulphurisation
4 Main compressionn

Raw gas upgrading
5 Cooling and drying
6 Coalescence filter
7 Gas heating
8 Activated carbon filter
9 Particle filter
10 Membrane stages
11 CO_2 for further use
12 Methane

Use of energy
13 Safety flare
14 Gas grid injection
15 Gas grid

Biogas upgrading: M-Series

		Model S	Model M	Model L
Max. biogas upgrading capacity	Nm^3/h scfm	500 311	1,100 685	2,000 1,244

Technical data				
Container		1 x 40' container		1 x 40' 1 x 20'
Length of container	ft	40	40	40 20
Width of container	ft	8	8	8 8
Height of container	ft	9.5	9.5	9.5 9.5
Area of outdoor installation	ft x ft	47' 3'' x 22'	55' 10'' x 26' 3''	57' 5'' x 26' 3''
Connection RBG	''	6	2	3
Connection BM	''	1.5	2	3

Performance data				
Voltage	V	480/600		
Frequency	Hz	60/3 ph		
BM quality	Vol.–% CH_4	> 96		
Inlet pressure BG [1)]	psig	0–3		
Dew point BM [2)]	°F	≤ –67	≤ –67	≤ –67
Power demand [3)]	kWh/Nm^3 RBG	0.26–0.30		
Heat extraction (140°F–176°F) [4)]	BTU/cf RBG	19	14	14
Designed for temperatures	°F	≤ –58	5 –95	≤ –58
Condensate [5)]	~ lbs/h	22	54	90

Emissions		
CH_4 slip	%	≤ 0.5
Sound pressure level at 3 ft distance [6)]	dB(A)	85
Sound pressure level including silencer for compressor	dB(A)	75

[1)]optional increase possible, [2)]@norm conditions, [3)]tolerance of ± 10% according to DIN 1945/VDI 2045/ISO 5389. Electrical consumption depends on operating parameters and environmental conditions, [4)]resulting condensate in g/Nm^3 raw biogas per hour, [5)]optional reduction possible
Abbreviations: RBG = raw biogas, BG = biogas, BM = biomethane

Kanadevia Inova AG

Hardturmstrasse 127
8005 Zurich
Switzerland
P +41 44 277 11 11
F +41 44 277 13 13
info@kanadevia-inova.com
www.kanadevia-inova.com