Datasheet

StirLNG-4 Cryogenerator

Liquefier for micro scale LNG conditioning

STIRLING CRYOGENICS

Stirling Technology

For over seventy years Stirling Cryogenics has been designing and manufacturing gas liquefaction systems, serving customers all over the world under all possible conditions. This experience is incorporated in our Methane liquefiers called StirLNG.

They have three specific fields of application:

- Micro scale production of LNG from a purified gas source such as pipeline or biogas.
- Re-liquefaction of boil off gas to minimize losses in a cryogenic (storage) system (fuel stations, storage tanks, etc.).
- Re-liquefaction of boil-off gas on vessels (available in an adapted version for maritime).

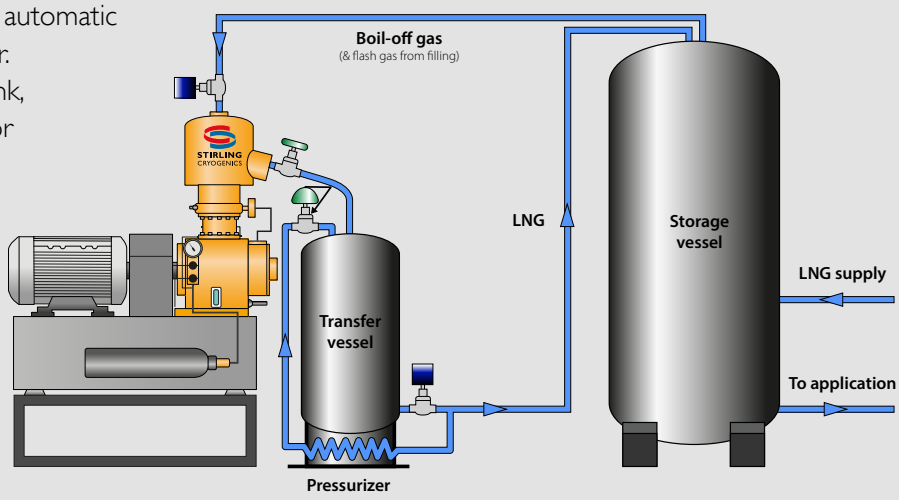
The cooling power of the StirLNG is created by the reversed Stirling cycle: compression and expansion of helium gas in a closed cycle by mechanical pistons. The Methane to be liquefied has no contact with the working of the Stirling Cycle, maintaining a contamination-free flow. The process gas flows through the cold head where thermal energy is extracted, causing the gas to liquefy. The gas only encounters a phase change, and there is no pressure difference between the gas inlet and the liquid outlet.

LNG Conditioning with StirLNG-4

The StirLNG-4 is our SPC-4 Cryogenerator specifically modified for micro scale LNG re-liquefaction. Depending on the gas pressure, the StirLNG-4 can reliquefy around 1800 kg/day of LNG (1,8 metric tpd, 1350 gal/day).

The Stirling Cryogenerator operates with automatic controls and is driven by an electric motor. Boil-off gas is extracted from a storage tank, re-liquefied by the StirLNG Cryogenerator and returned to the storage tank.

Alternatively, LNG can be extracted from the bottom of the storage tank, sub-cooled and sprayed into the tank, thus reducing the overall pressure of the system and eliminating boil off gas.



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StirLNG-4 Specifications

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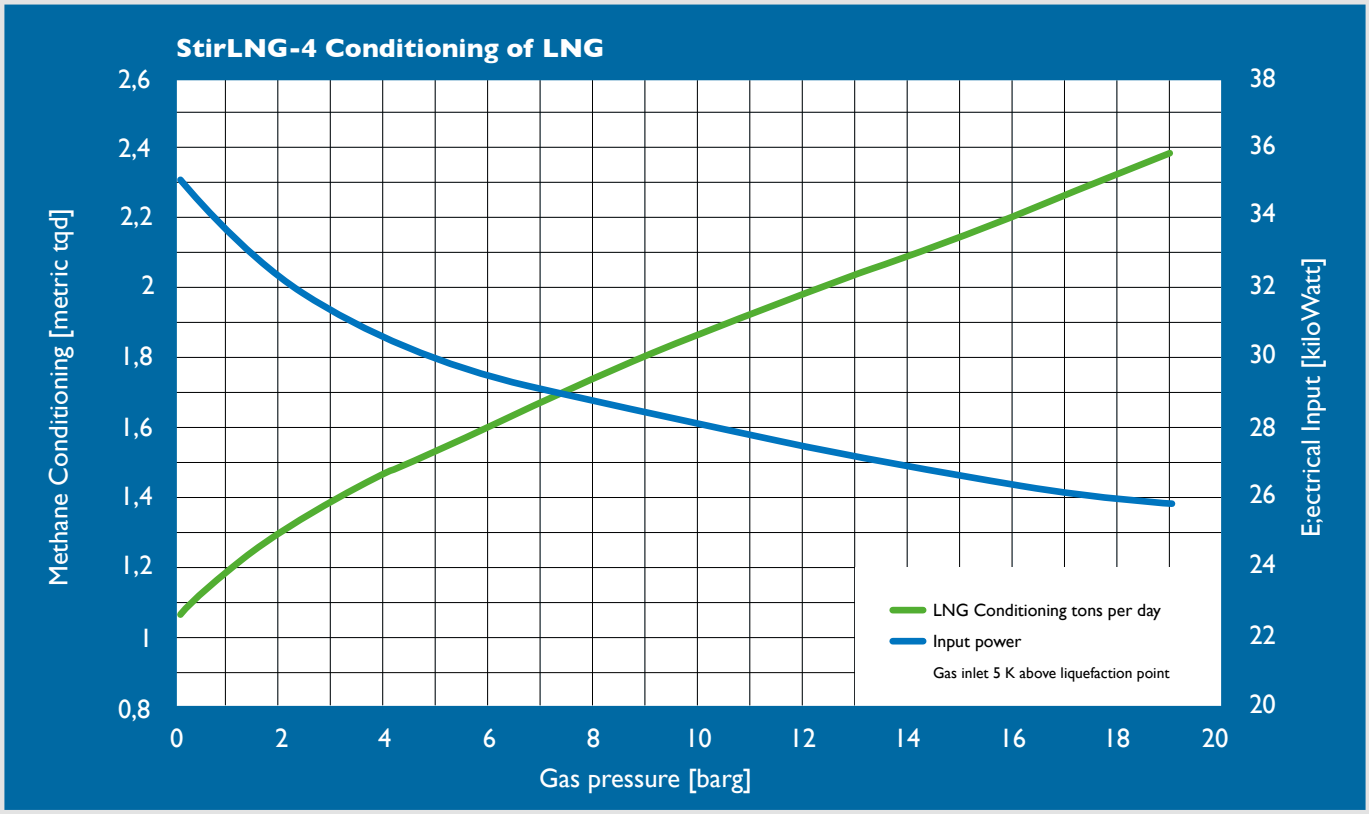

Gas Pressure	Temp. Liquid	CO_2(1)	Cooling Power	Electrical Input	Capacity based on pure methane				
Barg	K	PPM	W	kW	Nm^3/hr	kg/hr	l/hr	T/day	Gal/day
0	111	66	6250	35,4	60,2	43,2	102,3	1,0	648
2	126	230	7350	32,3	75,4	54,1	135,4	1,3	858
4	135	486	7950	30,7	85,0	61,0	158,3	1,5	1004
6	141	800	8400	29,6	93,4	67,0	179,3	1,6	1137
8	146	1213	8750	28,8	100,9	72,4	198,9	1,7	1261
10	151	1837	9050	28,0	107,8	77,3	217,6	1,9	1380
12	155	2562	9300	27,5	114,6	82,2	236,7	2,0	1501
14	158	3287	9500	26,9	121,4	87,1	256,4	2,1	1626
16	161	4217	9700	26,5	128,4	92,2	277,3	2,2	1758
18	164	5412	9900	26,1	135,8	97,4	299,4	2,3	1898
20	167	6944	10050	25,7	142,3	102,1	320,6	2,4	2033

Specifications	
Explosion proof classification	ATEX Zone 2 or 1 Nec 500, Class 1 Div 2 or 1, gas group D Other, upon request
Max. gas pressure	20 barg / 290 psig
Water consumption (incl. 20% EG)	4.000 l/hr @ 15°C
System size (l x w x h)	1,75m x 0,75m x 1,22m

Feed gas composition limits Deviations from pure methane will affect capacity above	Main stream: CH_4 CxHy (C2 to C4) 10% CxHy (C5+) < 1 ppm H_2O < -70°C dew point H_2S < 3,3 ppm Oil content < 0,01 mg/m^3 Particles < 0,1 micron N_2/O_2< 10%,(2)

1: Solubility of CO_2 as function of liquid temperature. Pressure for indication only, relative to pure methane. Other components such as N_2 will lower the liquid temperature relative to the saturated pressure, decreasing the allowable CO_2 level.
2: The actual re-liquefaction capacity might be lower, based on the composition of the boil off gas. Especially N_2 and O_2 will lower the re-liquefaction temperature and therefore will reduce the available cooling power and liquefaction.

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