StirLNG-1 Cryogenerator

Liquefier for nano scale LNG conditioning

Stirling Technology

For over sixty 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 two specific fields of application:

- Nano scale production of LNG from a purified gas source such as pipe line or biogas.
- Re-liquefaction of boil off gas to compensate for losses in a cryogenic (storage) system (fuel stations, storage tanks, etc.).
- Re-liquefaction of boil-off gas on vessels. The StirLNG-4 is available in an adapted version specifically for maritime use.

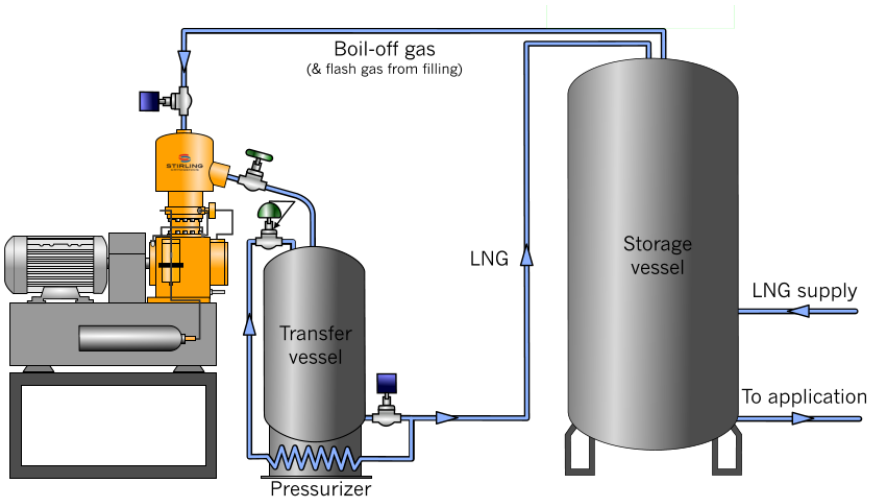
The cooling power of the StirLNG is created by the so called reversed Stirling cycle: compression and expansion of helium gas in a closed cycle by mechanical pistons. The gas to be liquefied is not used to create this cold: it will just flow through a cold heat exchanger where energy is extracted and the gas will liquefy. The gas will only encounter a phase change and there is no pressure difference between the gas and the liquid.

LNG Conditioning with StirLNG-1

The StirLNG-1 is our SPC-1 Cryogenerator specifically modified for small nano scale LNG production and re-liquefaction. Depending on the gas pressure, the StirLNG-1 can re-liquefy around 450 kg/day of LNG (340 gal/day).

The Stirling Cryogenerator operates stand-alone, driven by an electrical motor and has its own control unit. Boil-off gas can be taken from a storage tank, re-liquefied by the StirLNG cooler, and pushed back into the storage tank.

As an alternative, liquid can be taken from the bottom of the storage tank, sub cooled and sprayed back in the tank, reducing the overall pressure of the system, eliminating boil off gas.



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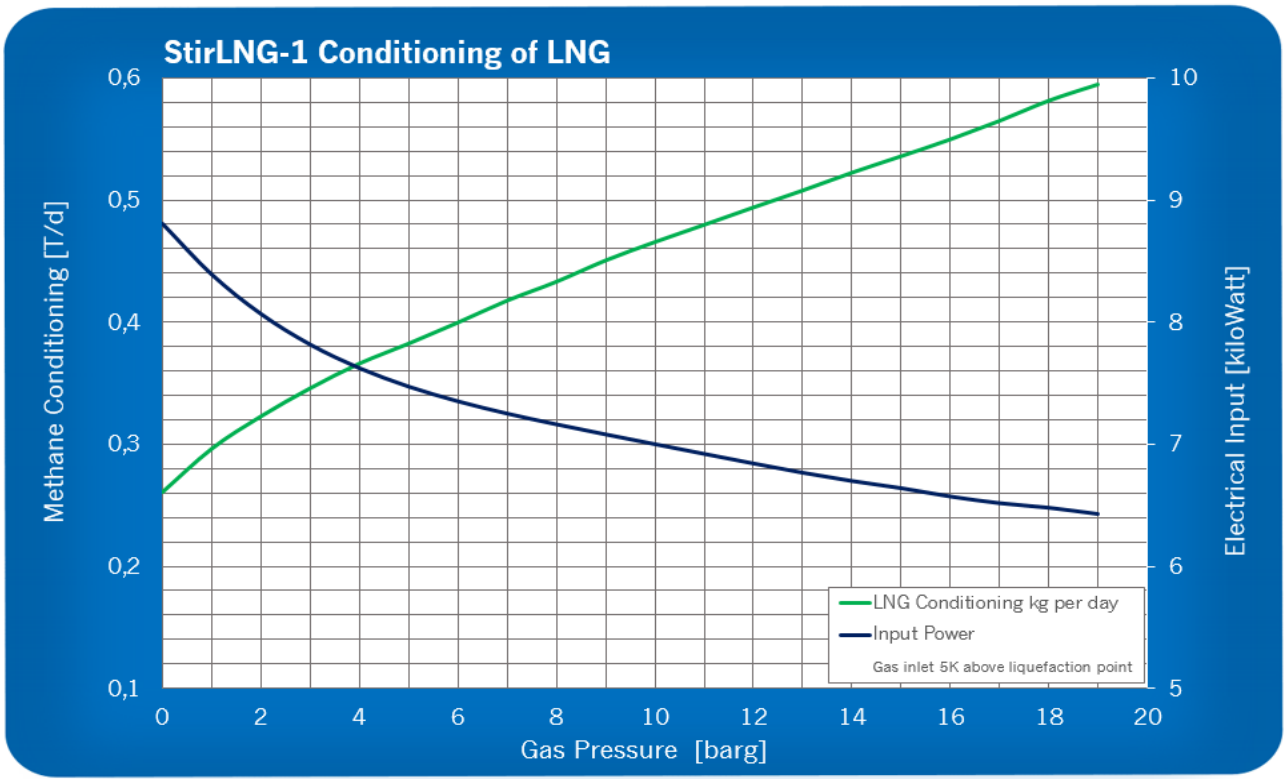
STIRLING CRYOGENICS

StirLNG-1 Specifications



Gas Pressure	Temp. Liquid	CO_2(1)	Cooling Power	Electrical Input	Capacity based on pure methane				
Barg	**K**	**PPM**	**W**	**kW**	**Nm³/hr**	**kg/hr**	**l/hr**	**T/day**	**Gal/day**
0	111	66	1550	8,9	14,9	10,7	25,4	0,26	161
2	126	230	1820	8,1	18,7	13,4	33,5	0,32	213
4	135	486	1980	7,7	21,2	15,2	39,4	0,36	250
6	141	800	2080	7,4	23,1	16,6	44,4	0,40	282
8	146	1213	2170	7,2	25,0	18,0	49,3	0,43	313
10	151	1837	2250	7,0	26,8	19,2	54,1	0,46	343
12	155	2562	2315	6,9	28,5	20,5	58,9	0,49	374
14	158	3287	2360	6,7	30,2	21,6	63,7	0,52	404
16	161	4217	2410	6,6	31,9	22,9	68,9	0,55	437
18	164	5412	2460	6,5	33,7	24,2	74,4	0,58	472
20	167	6944	2505	6,4	35,5	25,4	79,9	0,61	507

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)	750 l/hr @ 15˚C
System size (l x w x h)	1,10 m 0,80 m 1,20 m

Feed gas composition limits	
Deviations from pure methane will affect capacity above. Please contact us with your gas composition for a specific calculation	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/m³ Particles < 0,1 micron N_2/O_2 < 10%,(²)

1: Solubility of CO2 as function of liquid TEMPERATURE.
Pressure for indication only, relative to pure methane. Other components such as N2 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 therefor will reduce the available cooling power and liquefaction

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