

StirLNG-4 Cryogenerator

Liquefier for micro 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 three specific fields of application:

- Micro 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.



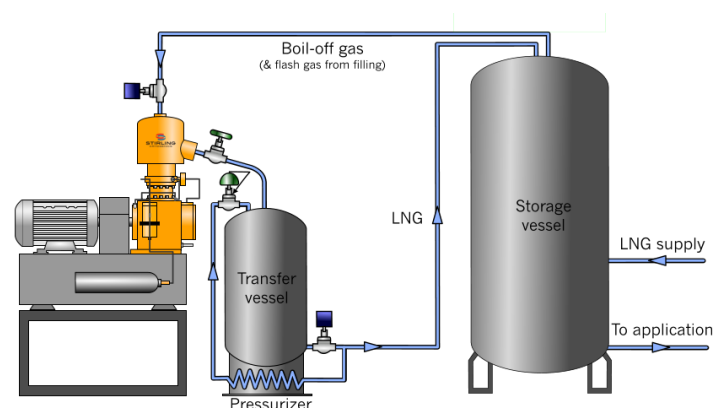
The cooling power of the StirLNG is created by the so called reversed Stirling cycle: compression and expansion of helium gas in a closed cycle by mechanical pistons. The gas to be liquefied is not used to create this cold: it will just flow through a cold heat exchanger where energy is extracted and 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

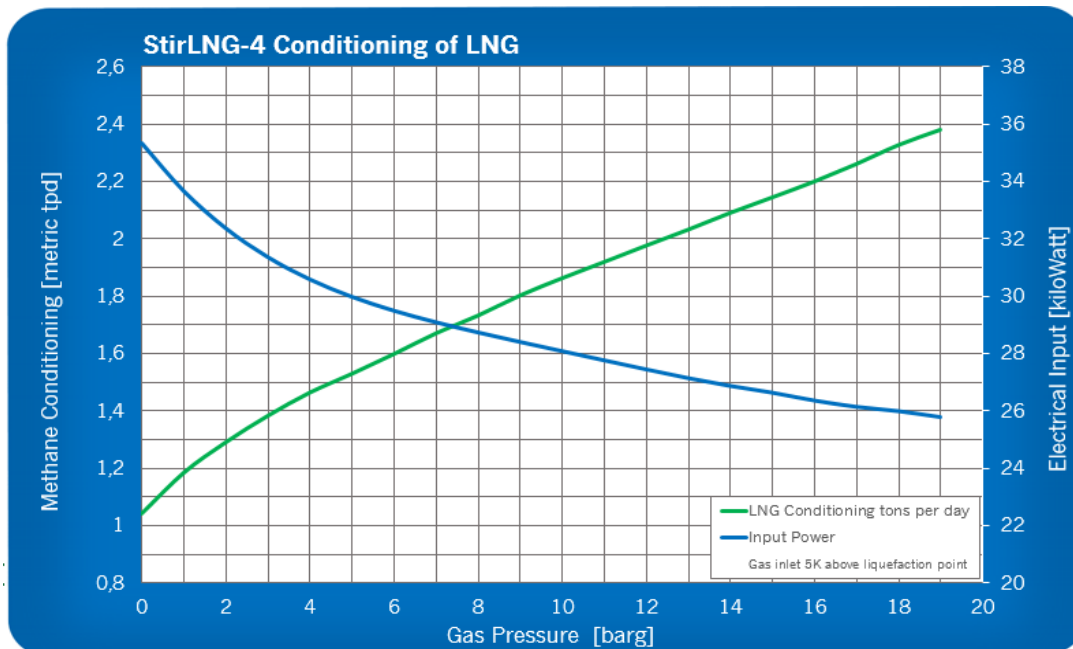
The StirLNG-4 is our SPC-4 Cryogenerator specifically modified for micro scale LNG re-liquefaction. Depending on the gas pressure, the StirLNG-4 can re-liquefy around 1800 kg/day of LNG (1,8 metric tpd, 1350 gal/day).

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 and fed 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.



StirLNG-4 Specifications



| Gas Pressure | Temp. Liquid | CO (') | Cooling Power | Electrical Input | Capacity based on pure methane | | | | |
|--------------|--------------|--------|---------------|------------------|--------------------------------|-------|-------|-------|---------|
| | | | | | N m ³ /hr | kg/hr | l/hr | T/day | Gal/day |
| Barg | K | PPM | W | kW | | | | | |
| 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) | 1,75 m 0,75 m 1,22 m |
| Feed gas composition limits | Main stream: CH C _x H _y (C2 to C4) 10% C _x H _y (C5+) < 1 ppm H ₂ O < -70°C dew point H ₂ S < 3,3 ppm Oil content < 0,01 mg/m ³ Particles < 0,1 micron N ₂ / O ₂ < 10% (²) |
| Deviations from pure methane will affect capacity above. | |
| Please contact us with your gas composition for a specific calculation | |
| 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 level. | |