DRY INERT GAS GENERATOR
SAFE TRANSPORTATION OF DANGEROUS CARGO

Vessels carrying liquefied gas need an inerting solution to prevent explosion on sea-voyage just before and after dry-docking. This can be achieved by keeping the oxygen level below 1% in the cargo area.

In addition, classification societies require that all tank inspections are carried out within a safe atmosphere. This is achieved by aeration operation where the oxygen level is increased up to 21%.

The Maritime Protection Dry Inert Gas Generator for liquefied gas carriers is a new concept based on a proven solution. It is a combination of the traditional inert gas generator based on combustion and a two stage dehumidification system including cooling and adsorption process, where the classical two bed adsorption dryer has been replaced with a compact rotating adsorption dryer. The dew point of the inert gas is lowered to the required specifications below minus 45degC with oxygen content less than 1%.

The Maritime Protection Inert Gas Systems are built in accordance with 1974 SOLAS Convention with latest amendments, and are fulfilling all of Class, IMO’s guidelines and the demanding conditions of shipboard operation.

Vessel application
Dry Inert gas systems are commonly used on:
- LNG carriers
- LPG carriers
- FRSU
- FLNG

Combustible Inert gas is used to:
- Inerting and drying of cargo tanks, cargo piping and machinery
- Purging of tanks
- The dry inert gas generator in fresh air mode:
  - Used for aeration of cargo tanks before inspection
  - Drying and aeration of hold space

Solution benefits
Advantages of the Maritime Protection Dry Inert gas generator include:
- Up to 50% reduction in weight and foot-print compared to conventional systems
- Continuous regeneration of dryer
- Modern design for easy installation and maintenance
- 100% automatic control, no manual adjustments required by operator
- Dew point below minus 45degC reached 20-40 minutes after start, decreasing to below minus 60-65degC
- Constant & uniform dew point during operation
- High grade steel (SST 904) used for the combustion chamber
- Mechanically simple and reliable centrifugal blowers due to low pressure drop in system
- MODBUS communication with IAS
- In dry air mode: no need of IG generator. Only cooler, dryer and dry gas blower in use
**System description**

The complete Dry Inert Gas Generator is made up of three sub systems:

- Inert Gas Generator, utilising Maritime Protection’s well proven inert gas generator
- Cooler and dryer skid with fin type cooler, and Maritime Protection’s new concept – the rotating adsorption dryer
- Refrigeration plant, closed loop type, with no Freon transported into the cooler unit

The Maritime Protection Dry Inert gas generator produces clean and soot free inert gas by combustion of gas oil supplied by the fuel oil pump with air provided by blowers, in the combustion chamber of the inert gas generator. The gas is efficiently cooled in the scrubber tower and the saturated gas is dried in a two stage process:

- A cooler compromising of a finned tube coil reduces the humidity to +5ºC dew point. The cooling effect in the cooler is provided through a glycol/water circuit from a separate water chiller unit
- The final drying is achieved by a continuously rotating adsorption dryer, dew point below minus 45degC

**OPERATION & MAINTENANCE**

- Fully automatic, for unattended operation. No manual adjustments required
- All process parameters displayed on operator panel
- Modes of operation can be selected on operator panel, no manual changes when changing mode.
- Easy maintenance through:
  - Hinged burner front door allowing easy access
  - Filters, dryer rotor and other major components can be easily checked through inspection hatches

**OPTIONS**

- Multiple operator terminals
- Ethernet communication with IAS (modbus is standard)
- Electric or steam regeneration heater

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**SYSTEM CONFIGURATION WITH COMPACT COOLER AND ROTATING ADSORPTION DRYER**

Rotating adsorption dryer
- far more efficient, more compact and require less maintenance than any previous old dual bed dryer.
- Constant regeneration (regenerating saturated desiccant in same rotational cycle)
- 20% of weight compared to "old conventional two bed" dryer

Utilizing the more maintenance friendly centrifugal blowers
- Virtually no maintenance
- Less noise and vibration

Closed loop cooling system provided through a glycol/water circuit from a separate water chiller unit
- Less possibility for leaks of Freon
- Requires less Freon/refrigerant
### Technical specifications
Table based on 1% O₂ content by volume, discharge pressure 2500 mm WG and dew point -45°C.

<table>
<thead>
<tr>
<th>DIGG model</th>
<th>Capacity [Nm³/h]</th>
<th>Seawater consumption [m³/h]</th>
<th>Fuel consumption [kg/h]</th>
<th>Power consumption [kW] (with el. reg heater)</th>
<th>Overall system weight [kg]</th>
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<tbody>
<tr>
<td>MPG - 700 - 084</td>
<td>900 - 2000</td>
<td>45 - 180</td>
<td>42 - 170</td>
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<td>1131 - 1365</td>
<td>28200</td>
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</table>

Gas composition with marine gas oil (MGO)

- CO < 100 ppmv
- NOx < 100 ppmv
- SO₂ < 1 ppmv
- CO₂ approx. 14%
- O₂: 0.5-1%
- Soot content (bacharac): 0

### Service
Service and/or repairs can be carried out in a short notice, worldwide.

### Aftersales
When spare parts or consumables are needed, our aftersales department is at your service 24 hours a day.

### Contact us
E-mail: wts.safety@wilhelmsen.com
wts.spares.IG@wilhelmsen.com
wts.service.IG@wilhelmsen.com

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**MARITIME PROTECTION INERT GAS SOLUTIONS**

**COMBUSTIBLE SOLUTIONS**
- Flue gas system
- Inert gas generator
- Flex-inert system
- Dry inert gas generator
- Dual fuel inert gas generator
- Flue-generator system
- Inert gas deck house modules

**NITROGEN SOLUTIONS**
- Nitrogen system
- Nitrogen cylinder central system
- Nitrogen membrane controlled and modified atmosphere system