MAN Cryo
Marine LNG fuel gas systems

Engineering the Future – since 1758.
MAN Diesel & Turbo
From February 2016, MAN Cryo – formerly known as Cryo AB – became a product brand of MAN Diesel & Turbo. With MAN Cryo, MAN Diesel & Turbo situated in Gothenburg, Sweden, is one of the world’s leading manufacturers of cryogenic equipment for the storage, distribution and handling of Liquefied Natural Gases (LNG).

For more than 50 years Cryo AB has put skills and advanced technology at the service of the gas industry. As such, MAN Cryo products are available for demanding marine and industrial gas companies when it comes to selecting the most efficient and economical cryogenic equipment for marine gas fuel systems as well as for offshore and onshore bunkering systems.

MAN Diesel & Turbo is the world’s leading provider of large-bore diesel engines and turbomachinery. Our product portfolio includes two-stroke and four-stroke engines for marine and stationary applications, turbochargers and propellers, as well as gas and steam turbines, compressors and chemical reactors.

MAN solutions can be found in ship propulsion, engine-based power plants and turbomachinery trains for the oil & gas and process industries. We support our global customers with a comprehensive range of after-sales services under the MAN PrimeServ brand.
Our Marine LNG Fuel Gas System
Customised to your needs

The purpose of the system is to fill, store and vaporise LNG and to supply natural gas to engines on a ship. The system is designed for minimum heat in leakage to guarantee maximum holding time. The gas is fed to the engines using the tank pressure. Hence, no pumps are needed and the maintenance costs are low.

The system mainly includes:
- One or more LNG fuel tanks
- Water-heated vaporiser units for vaporisation of the LNG to gaseous natural gas
- Pressure build-up units for the increase of tank pressure
- Bunker stations
- Control system
- Piping for bunkering LNG and gas feed lines for supply of natural gas to the engines
Operation of the System
A variety of choices

Bunkering LNG to storage tanks
LNG is transported from a truck, bunker terminal or bunker ship to the storage tanks via the bunker station on the ship side. The bunker station is connected to the coldbox of the tank via bunker pipes.

Depending on the existing conditions in the tank, the flow can be routed to the bottom or top of the tank. If the tank has a high pressure, LNG can be discharged at tank gas phase in order to recondense the gas phase and consequently lower the pressure.

LNG vaporisation
For gas supply to the engines, LNG will be evaporated by the dedicated product vaporiser water-heated type (VAP). The capacity of the VAP unit can deliver gas to engines at the required power and temperature of about 10–40 °C depending on the water temperature supplied by the ship.

The LNG supply to the vaporisers is ensured by the inner pressure of the storage tank. The pressure build-up unit (PBU) guarantees a constant pressure level. The vaporisers (VAP and PBU) are essential components for the operation of the ship; therefore, our systems are equipped with vaporisers of MAN Cryo design.

Coldbox (tank connection space)
The coldbox, which is attached to the tank, includes equipment such as VAP+PBU product vaporisers and pressure build-up vaporisers, valves, and instrument valves for controlling the LNG tank. The coldbox is insulated with A-60 insulation.

Vacuum-insulated C-type tank
The cryogenic LNG tank consists of two tanks, i.e. the inner vessel, which contains the liquid LNG, and the outer vessel, which is regarded as a second barrier. The annular space between the inner and outer vessels, which is filled with perlite, is vacuum evacuated. The tank is designed to prevent sloshing in the tank when operating in rough conditions and to ensure maximum holding time.

Ship control system
The LNG system is governed by a stand-alone control system. It includes a PLC and an OP panel installed in a cabinet. The control system receives signals from instruments and performs the desired activities depending on which mode of operation is chosen.
MAN Cryo LNG fuel gas systems are developed to your specific needs without any compromises regarding the well-known safety and quality standards of the formerly known Cryo AB. Our product portfolio includes horizontal as well as vertical LNG fuel gas systems and ranges from 20 m³ to 400 m³ or even larger in volume. It is designed for power levels of up to 50 MW.

All of the above will help you comply with stricter emission thresholds under the IMO emission regulations and under the European Maritime Directive.
Selected References
Satisfied customers

Normand Arctic
- Offshore supply ship for Norway
- Equipped with 1 x 201 m³ horizontal LNG tank

Viking Energy
- The world’s first supply ship fuelled with LNG
- Viking Energy, followed by Stril Pioneer
- Equipped with 1 x 234 m³ horizontal LNG tank

Sortland, Bergen and Barents hav
- Kystvakt 1, 2 and 3
- Three ships for the Royal Norwegian Coastguard
- Equipped with 1 x 234 m³ horizontal LNG tank

M/S Glutra
- M/S Glutra, the world’s first LNG-fuelled car and passenger ferry
- Equipped with 2 x 32 m³ horizontal LNG tanks

Viking Energy

M/S Glutra

Normand Arctic

Sortland, Bergen and Barents hav

Kystvakt 1, 2 and 3
MAN Diesel & Turbo offers world-class MAN Cryo gas equipment and, through MAN PrimeServ, after-sales services for the whole lifecycle of its products. After successful installation of the system, MAN PrimeServ thus also provides long-term maintenance and ensures high reliability of the installation.

MAN Diesel & Turbo – with its MAN Cryo product brand since 2016 – develops and delivers high-tech equipment and supporting services for customers in the industrial gases industry. Broad competence, combined with innovative technologies and extensive experience, puts the company in a unique position to provide technical solutions designed to significantly improve its customers’ profitability.

Core competencies:
- Marine fuel gas systems
- Offshore and onshore bunkering systems

Our services comprise:
- On-site assistance (including overhaul inspections, repair and start-up supervision)
- Training and education
- Maintenance and inspection
- Repair works
- Supply of spare parts
- Refurbishments/Upgrades of cryogenic products

Safety and quality – HSE
Process and occupational health, safety and environment considerations (HSE) always have top priority throughout all MAN Cryo project phases, namely engineering, procurement, construction, start-up and operation.
World-Class Service Network
Marine propulsion, gensets, and stationary plants

The PrimeServ offering
The MAN Diesel & Turbo Group offers worldwide, round-the-clock service, 365 days a year. In addition to MAN Diesel & Turbo’s service headquarters in Augsburg, Copenhagen, Frederikshavn, Saint-Nazaire, Hamburg and Stockport, service centers on all continents provide comprehensive and continuous support.

MAN Diesel & Turbo engines are renowned for their quality and durability. We are a global organization with a strong local presence, delivering exceptional field service management, tailor-made solutions, and first-class technical support.

PrimeServ provides advice and assistance to customers throughout the product life cycle, from delivery to resale. With our far-reaching network of service centers, we respond rapidly to customer needs. Furthermore, we offer outstanding service and unrivalled technical expertise. Plus, we only use genuine spare parts – safeguarding the longevity of your equipment.

PrimeServ’s aim is to provide:
- Prompt delivery of high-demand OEM spare parts within 24 hours
- Fast, reliable and competent customer support
- Individually tailored O&M contracts
- Ongoing training and qualification of operators and maintenance staff
- Global service, 24 hours a day, 365 days a year
- Diagnosis and troubleshooting with our high-performance Online Service