



Ammonia

Fuel System

**MODULAR, INSTALLATION-FRIENDLY FUEL SUPPLY SYSTEM
FOR ENGINES AND OTHER AMMONIA CONSUMERS**

Auramarine

Ammonia Fuel System

Auramarine has 50 years of experience in delivering fuel supply systems for a variety of different fuels. These fuels include marine fuel oils (distillates and heavy residuals), natural gas, biofuels and methanol. The latest addition to this product offering is our ammonia fuel systems.

Why ammonia? If produced in a sustainable way, ammonia can be a zero-carbon fuel and, together with methanol, a key part of shipping's energy transition to net zero. This is also what makes it a valuable addition to Auramarine's green portfolio.

Our primary focus is to deliver a safe, reliable and high quality fuel supply system. We are, therefore, part of ongoing ammonia research and development projects and are actively co-operating with different ammonia experts to ensure we're at the forefront of industry innovation.

The scope of our delivery is tailored to our customers' specific needs but, as with our methanol systems, we can provide holistic solutions that cover a comprehensive scope of delivery. Auramarine's ammonia fuel supply system is suitable for both two-stroke and four-stroke engines as well as other consumers. All safety, design and material requirements are strictly followed. Dedicated designs are available for both high-and low-pressure arrangements.

System scope

Auramarine's most comprehensive scope includes all necessary equipment from bunkering through to fuel delivery for onboard fuel consumers. Full scope includes bunkering units, fuel supply units, master fuel valve manifold, reliquefying system, ammonia mitigation system (ARMS), gas and leak detection, bunkering water safety system, ammonia control and safety system, nitrogen generation system, as well as tank design. Features of some main components are presented next.

Functions and Safety Features

Bunkering station

- Leak detection, water safety system and a ship-to-shore link.

Auramarine tank design

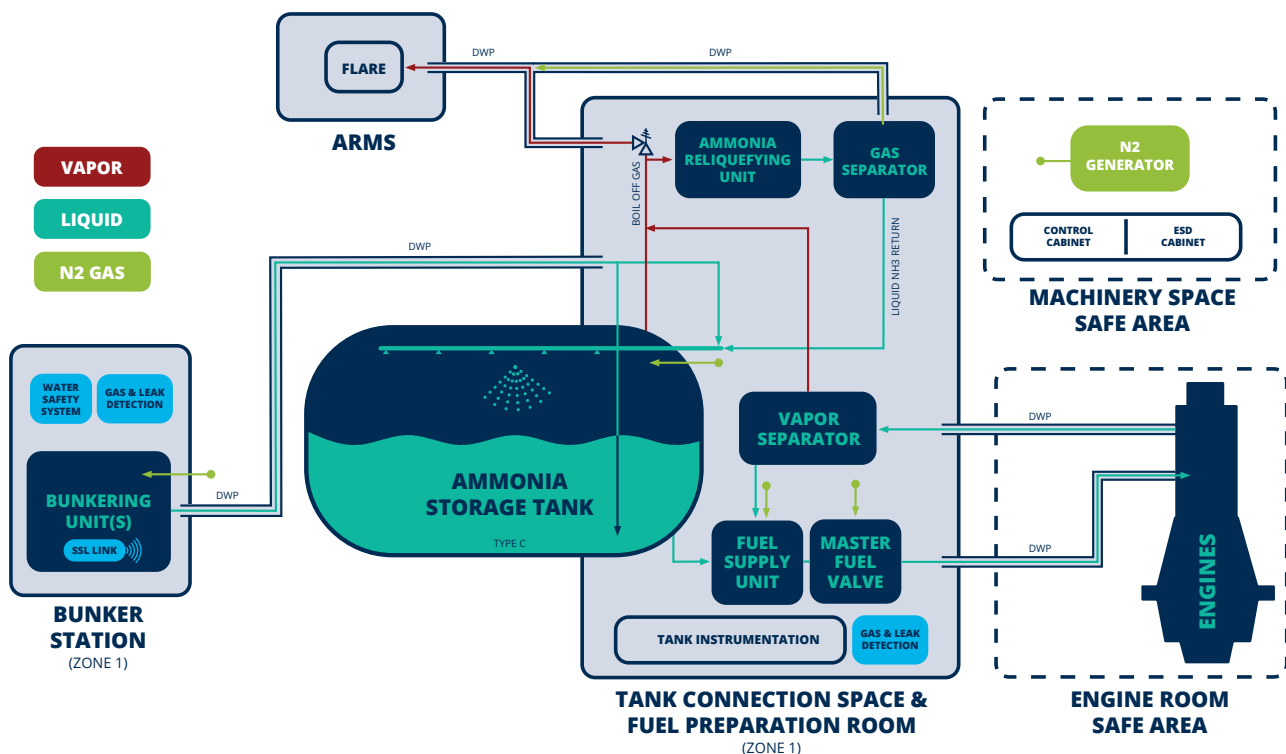
- Design for tank connection space (TCS) to C-type tanks.
- Integration allows for compact installation.

Ammonia fuel supply unit

- Actively regulates and maintains the correct fuel pressure and temperature.
- Measures fuel consumption.
- Filters impurities from liquid ammonia that could damage the consumer.

Master fuel valve manifold

- Allows for isolating and nitrogen purging



Example of a liquid ammonia system arrangement

of one or several consumer(s) from the system by utilizing double block-and-bleed arrangements.

Nitrogen generator

- For purging & inerting of the ammonia system.

Vapour & gas separators

- Separates ammonia vapour from liquid ammonia, where needed.
- Extraction of nitrogen and other trace gases from the ammonia system.

Ammonia reliquefying unit

- Reliquefies boil-off gases from the ammonia storage tank and other vapour sources.

Ammonia release mitigation system (ARMS)

- Featuring controlled combustion, capable of handling ammonia release from the system.

- Ammonia content measurement.

Ammonia gas detection system

- Detects possible gaseous leaks.
- Alarm levels for personnel protection and explosive atmosphere prevention.

Automation system

- Control of fuel supply unit and master fuel valve manifold functions.
- Automatic purging of block-and-bleed valves.
- ESD functions.

Pilot fuel supply & diesel backup system

- Auramarine can offer pilot fuel supply system and fuel supply system for the ships first fuel (e.g. bio-diesel).

Auramarine is your trusted fuel and auxiliary systems expert for marine, power and process industry. Our proud heritage stems from the founding of the company in Finland in the early 1970's. Since then we have delivered over 16 000 robust and reliable auxiliary systems to our customers all over the world, continuously aiming for superior service and customer value.

WE ARE THE PIONEERS IN FUEL SYSTEMS.

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