

Headway has established more than **120** sales/after-sales service stations in **56** countries and regions around the world.



 **海德威科技集团（青岛）有限公司**
HEADWAY TECHNOLOGY GROUP CO., LTD.

TEL: +86 532 8578 8888
FAX: +86 532 8310 7816
Email: info@headwaytech.com
<http://en.headwaytech.com>



OCEANGUARD[®]
FUEL GAS SUPPLY SYSTEM

HEADWAY TECHNOLOGY GROUP CO., LTD.

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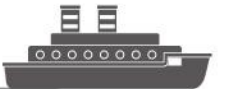
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ABOUT HEADWAY >>>

Headway is a high-tech enterprise with the purpose of scientific and technological innovation, dedicated into providing low carbon solutions and technical service worldwide. Headway owns independent R&D center and production base in Qingdao, China.

Headway established independent R&D centers and manufacturing facilities. The BWMS manufacturing facility has an annual production capacity of 1,000 sets. With branches in Shanghai, Singapore, Japan and Greece, 15 agencies in Guangzhou, Dalian, Zhoushan, and more than 120 service/technical support stations in 56 countries and regions, Headway built a comprehensive global service network.

Headway's product portfolio includes 3 segments: Carbon Neutralization, Water Treatment and Smart Shipping, which are all developed under the long adherent R&D ideology of "Be Innovative, Stay Excelsior".

Headway is willing to continue the cooperation with global partners based on mutual trust and benefit, to embrace the future of green shipping and sustainable development, pioneer in decarbonization strategy, zero-emission shipping and marine environmental protection.





SIL CERTIFICATE >>>

Taking safety as the priority, Headway has obtained the first Functional Safety Certificate in the industry.

Functional Safety Certificate is an internationally recognized functional safety certification that is based on IEC 61508, IEC 61511, IEC 61513, ISO 13849-1, IEC 62061, IEC 61800-5-2, and other international standards. With the purpose of protecting the personal safety, environment, and property, the SIL certificate is to manage and control all stages of the product's entire lifetime by utilizing the proven methods, so as to reduce the likelihood of system failure and improve the reliability, utility and safety of the system. The key components of OceanGuard® FGSS are designed and produced according to the international standards and specifications required by the SIL certificate to ensure the safety of the ship, environment and crew as well as escort the operation of the ship.



BACKGROUND >>>

-20%
CO₂

-85%
NO_x

-99%
SO_x

-99%
Particals

Compared with conventional marine fuels, LNG fuel can reduce at least 20% of carbon emissions, 85% of NO_x emissions, and 99% of SO_x emissions. Also, LNG can increase the ship energy efficiency design index (EEDI) by 20%.

OceanGuard® FGSS is an independent intellectual property of Headway Technology Group. Utilizing the resources of leading research institutes and universities, Headway is providing an advanced solution that is compatible with Medium-Speed/Low-Speed Dual-Fuel marine engines, inland river single/dual-fuel engines, and generators. With the support of branch companies and 120 service stations across 56 countries and regions, Headway is capable of providing localized, comprehensive, and timely technical service and solutions for LNG fuel supply.

APPROVALS >>>

R&D >>>



Adhering to the technical route of "independent development on core technology, cooperative exploration of key equipment", since 2016, Headway has been actively carrying out the research and development of dual-fuel systems and acting as the key participator involved as a leading researcher of hydrate flow safety/technical energy saving and environmental protection technology. After several years of technological improvement and continuous accumulation, OceanGuard® Fuel Gas Supply System with independent intellectual property can meet the diversified technical specifications of marine low-speed engine/marine medium-speed engine and dual-fuel generator/boiler/GCU, etc., providing the customized technical solution.

BOG compressor unit and small/medium-sized BOG re-liquefied unit can provide customers with the boil-off gas solution per actual ship technical specifications, which can be widely used in the ultra-large LNG-Powered ships, and natural gas transport ships/bunkering ships under 50,000m³.

System Process

Combine the configuration/ship layout plan and technical requirements of the project, matching customized technical proposal and the development and design of FGSS main and auxiliary system, skilled in the application of professional heat exchange calculation software like Pro II/ASPEN HYSYS for design verification, to ensure that the most reliable, optimized, reasonable technical solution.

Pressure Vessel

According to system requirements, design pressure vessels such as low-temperature LNG cryogenic storage tanks, high and low-pressure heat exchangers, and engineers are familiar with ASME codes, low-temperature material characteristics, and welding process requirements. By virtue of software, analyze and calculate temperature field distribution, sloshing load, crack propagation on cryogenic vessels.

Electrical Control

Guided by the process flow chart, the FGSS control monitoring system and FGSS safety control system are independently designed by the electronic control team, which fully meets the technical goals of independent design-model selection-manufacturing and commissioning, with high system redundancy, safety, and reliability.

Pipe-Spool Design

With many years of experience in hull design and familiarity with the requirements of ship piping layout, the pipe spooling team can design to avoid the adverse effects of pipeline low-temperature shrinkage and stress concentration, by use of 3D design, stress analysis, and integrated skid-mounted design.



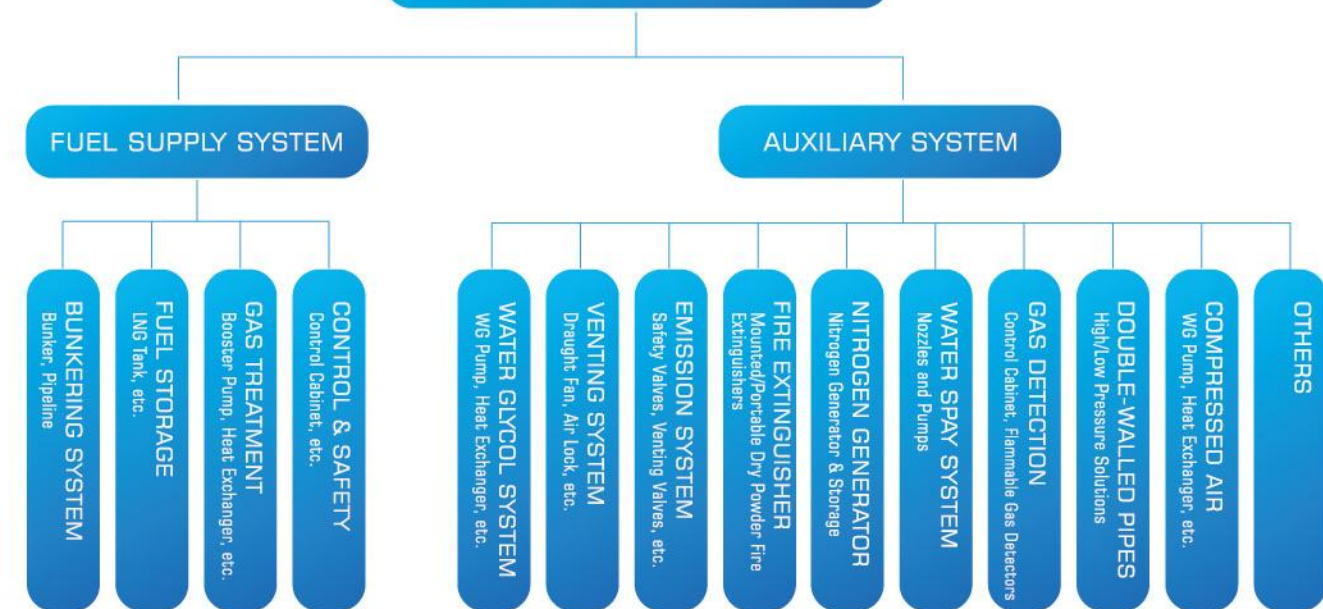
ADVANTAGES >>>

OceanGuard® Fuel Gas Supply System provides a one-stop solution for customers. The system integration scope includes fuel bunkering, gas storage, gas treatment, pre-adjustment and other main configurations, as well as nitrogen purge, auxiliary heating, dry powder fire extinguish, and other auxiliary gas supply systems. The whole gas process package adopts customized development/modular design. The layout is optimized according to the ship arrangement. The natural gas is heated by an intermediate medium to reduce the risk of cross leakage between natural gas and heat source and to ensure the flexibility and stability of the gas supply system and heating unit under different environmental conditions in different navigation areas.

As the core of FGSS, the control and monitoring unit and safety control unit are the key components of the fine regulation of the system. The main control system and safety system use a safety controller and adopt a redundant diversity structure. Combined with hardware and software, the equipment can detect its working state at any time, which can ensure the redundancy reliability, and safety of the control and security system.

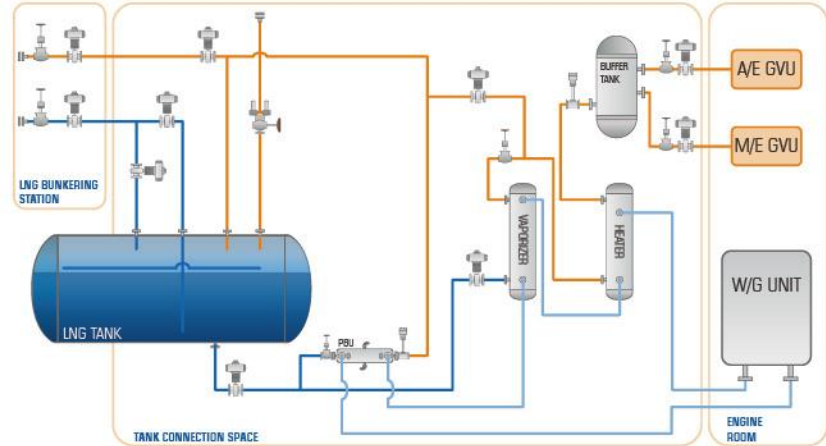


FUEL GAS SUPPLY SYSTEM

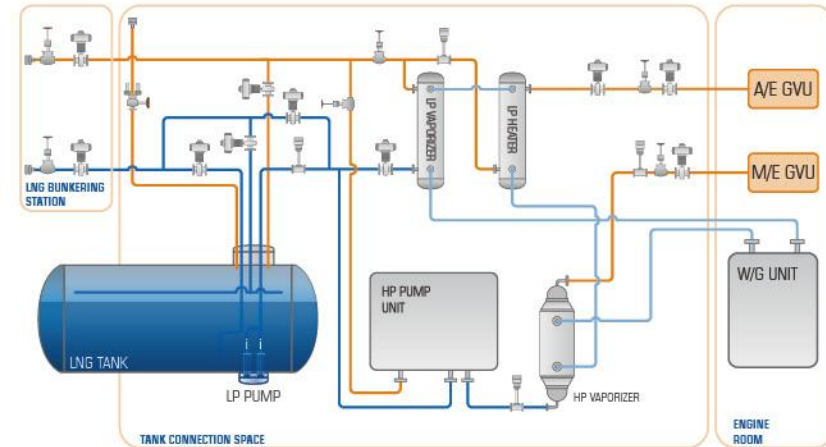


SOLUTIONS >>>

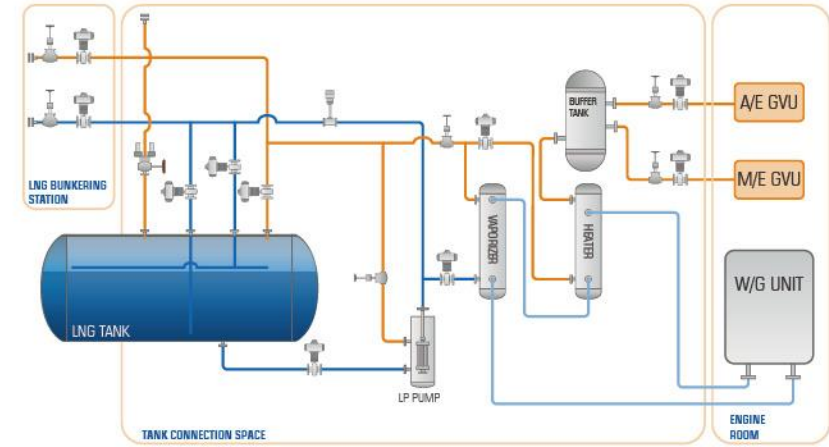
Self-Pressure-Built-Up FGSS



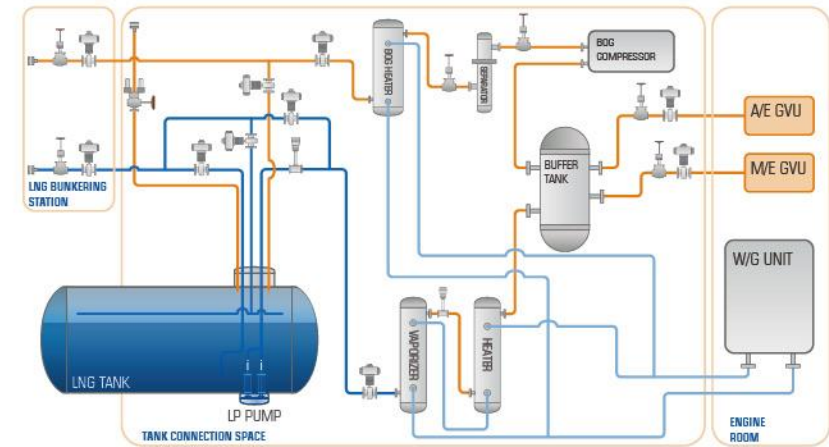
High-Pressure FGSS



Low/Medium Pressure FGSS



BOG FGSS



GAS VALVE UNIT >>>

Gas Valve Unit (GVU) is a vital component between the Fuel Supply System and Engines. GVU includes Double Block Bleed Valves, Gas Control Valve, Gas Filters, etc. When fuel supply system or engine normally/emergently stopped, GVU will automatically cut out the gas supply, venting and purging to prevent the fuel gas from back flow.



NITROGEN GENERATOR >>>

The Nitrogen Generator can generate required volume of nitrogen at rated purity to be used in fuel gas supply pipelines. With the permeation process, water, oxygen and some of the argon exit through the membrane sides of the fibers. Only nitrogen will remain as product.

The Nitrogen Generator can meet the nitrogen requirement of most vessels with low power consumption, small size and high purity (no less than 99.5%).



LNG TANK >>>

OceanGuard® FGSS is compatible with different types of LNG tanks. With the combination of compressor and BOG regasification system, OceanGuard® FGSS is capable of extending the tank holding time. Headway can provide type C tank that was approved by IMO, which is recognized by its stable performance and advanced technology. Headway can provide vacuum tanks and polyurethane coated tanks based on the situation and requirement of the ship.



RESEARCH ON ALTERNATIVE FUELS >>>

To meet the increasing urgency of decarbonization, OceanGuard® Marine Fuel Supply System is expanding the technical research into vast alternative fuels. Fuel Supply System for Ammonia, Methanol and LPG are now available for customers.



INTELLIGENT MANAGEMENT SYSTEM >>>

OceanGuard® FGSS provides customers with advanced operation model including "One-Key Start" together with "Cloud-based Control". Headway builds a shore-based ship intelligent platform for customers, through remote signal transmission, making all key parameters and operating indicators in a real-time, cloud-based monitoring state.



OceanGuard



REFERENCE >>>

APPROVAL IN PRINCIPLE

as requested by:
HEADWAY TECHNOLOGY GROUP CO., LTD.

109.8m DUAL FUEL LNG CONTAINER SHIP

General
 Ship Name: TBD
 Ship Owner: Rui Neng Ocean Shipping
 Ship Builder: Zhejiang Hongsheng Shipbuilding Co., Ltd.
 Classification: CCS

Main
 Length O.A.: 109.8 m
 Length P.P.: 107.3 m

Particulars
 Breadth Moulded: 25.0 m
 Draught Scantling: 4.2 m
 LNG Capacity: Abt. 100 m³ at 95%

Information
 PBU Heating Capacity: 20 kW
 NG Heating Capacity: 65kW
 Bunkering Rate: 120 m³/h

FGSS
 M.E Model: CW8250C2395DF9 Four Stroke Dual Fuel Engine
 M.E MCR.: 2 × 1,760 kW

LNG Tank: 1 × 100m³ Double Walled

LNG Vaporizing Capacity: 100 kW
Manifold Type: L-V

REFERENCE LIST
 海洋卫士®LNG燃料供气系统
 业绩表

HEADWAY TECHNOLOGY GROUP CO., LTD.

109.8m DUAL-FUEL LNG CONTAINER SHIP

General	Ship Name: TBD Ship Owner: Rui Neng Ocean Shipping Ship Builder: Zhejiang Hongsheng Shipbuilding Co., Ltd. Classification: CCS CSA DECK Cargo Ship, R1, ICE CLASS B. Equipped with Container Securing Arrangements CSM BRC	Hull No.: HS2020003 Year Built: 2021/2022 Quantity: 5 Sets
Main	Length O.A.: 109.8 m	Length P.P.: 107.3 m
Particulars	Breadth Moulded: 25.0 m	Depth Moulded: 6.8 m
	Draught Scantling: 4.2 m	Cargo Capacity: 5,628 tons at design draught
	LNG Capacity: Abt. 100 m³ at 95%	
FGSS	M.E Model: CW8250C2395DF9 Four Stroke Dual Fuel Engine	LNG Tank: 1 × 100m³ Double Walled
	M.E MCR.: 2 × 1,760 kW	
Information	PBU Heating Capacity: 20 kW	LNG Vaporizing Capacity: 100 kW
	NG Heating Capacity: 65kW	Manifold Type: L-V
	Bunkering Rate: 120 m³/h	

145.8m DUAL – FUEL LNG CONTAINER SHIP

General			
Ship Name:	TBD	Hull No.:	HS2020006
Ship Owner:	Rui Neng Ocean Shipping	Year Built:	2021/2022
Ship Builder:	Zhejiang Hongsheng Shipbuilding Co., Ltd.	Quantity:	5 Sets
Classification:	CCS CSA DECK Cargo Ship, PSPC(B), ICE CLASS B. Equipped with Container Securing Arrangements Loading Computers (S.I), EEDI (II+), Natural Gas Fuel		
Main			
Length O.A.:	145.8 m	Length P.P.:	142.8 m
Particulars			
Breadth Moulded:	32.6 m	Depth Moulded:	8.8 m
Draught Scantling:	5.7 m	Cargo Capacity:	14,000 tons at design draught
LNG Capacity:	Abt. 170 m ³ at 95%		
FGSS			
M.E Model:	5-RT - flex 5ODF Four Stoke Dual Fuel Engine		
M.E MCR.:	1 × 5,850 kW	LNG Tank:	1 × 170m ³ Double Walled
Information			
LNG Pump Capacity:	No Less than 2.5m ³	LNG Vaporizing Capacity:	160 kW
NG Heating Capacity:	105kW	Manifold Type:	L-V
Bunkering Rate:	200 m ³ /h		

130m DUAL – FUEL CARGO CARRIER

General			
Ship Name:	TBD	Hull No.:	CG-H37
Ship Owner:	NIL	Year Built:	2021
Ship Builder:	ZE Sheng Chongqing Investment Group Shipbuilding Co., Ltd.	Quantity:	2 Sets
Classification:	CCS		
Main			
Length O.A.:	122.9 m	Length P.P.:	127.6 m
Particulars			
Breadth Moulded:	16.26 m	Depth Moulded:	7.0 m
Draught Scantling:	6.05 m	Cargo Capacity:	3,000 tons at design draught
LNG Capacity:	Abt. 30 m ³ at 95%		
FGSS			
M.E Model:	6WH20LC1520DF1A0		
M.E MCR.:	2 × 1,118 kW	LNG Tank:	1 × 30m ³ Double Walled
Information			
PBU Capacity:	10kW	LNG Vaporizing Capacity:	60 kW
NG Heating Capacity:	90kW	Manifold Type:	L-V
Bunkering Rate:	40 m ³ /h		