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SCIENTIF IC & INTELLIGENT
HQHP MAKING FOR GREEN FUTURE

Office Address: No.555,Kanglong Road, High-tech West District, Chengdu, P.R.China 611731
Service Hotline: +86-28-82089086 Web: https://www.hqhp-en.com E-mail: overseas@hqhp.cn

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SCIENTIFIC & INTELLIGENT
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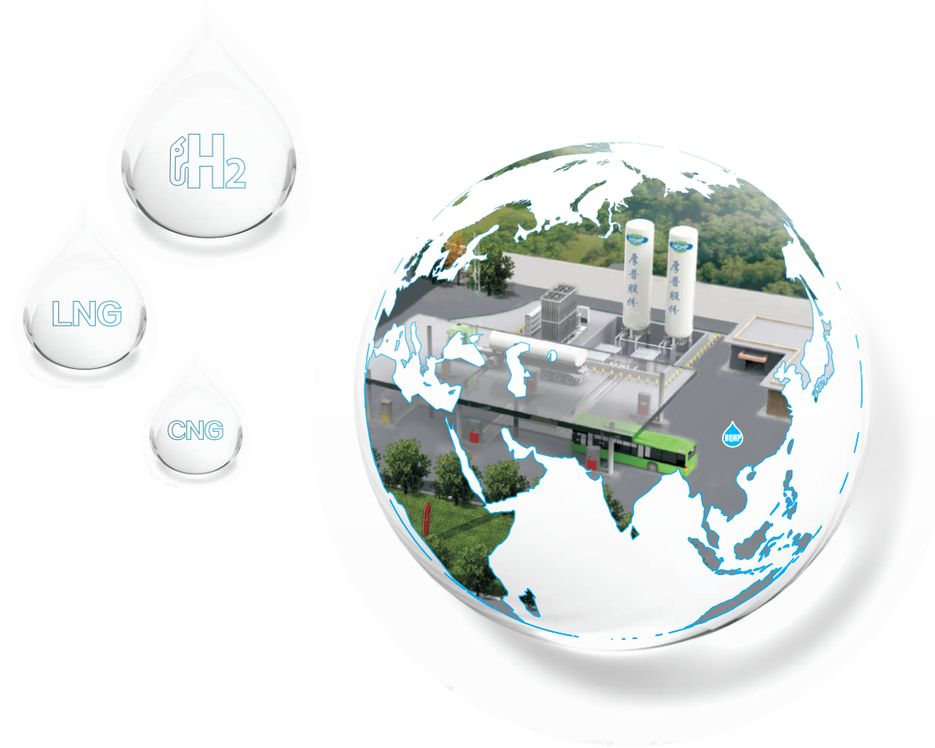
FOR GREEN FUTURE

HOUPU GROUP

TO BECOME A GLOBAL PROVIDER WITH LEADING TECHNOLOGY
OF INTEGRATED SOLUTIONS IN CLEAN ENERGY EQUIPMENT



PRODUCT CATALOGUE

Provide the best quality products
with world-class standards
Provide the best solution for clients

EQUIPMENT MANUFACTURING

VEHICLE APPLICATION

LNG Refueling Station, LNG / L-CNG Refueling Station
Station Control System

HYDROGEN

Hydrogen Refueling Station, Hydrogen Dispenser, Hydraulically-driven Hydrogen Compressor
Hydrogen Diaphragm Compressor, Liquid Hydrogen Vacuum Insulated Cryogenic Pipe
Liquid Hydrogen Ambient Heat Exchanger, Liquid Hydrogen Water-Bath Heat Exchanger
Liquid Hydrogen Storage And Supply Device Using Storage-Grade Metal Hydride
Small Mobile Metal Hydride Hydrogen Storage Cylinder, LP Solid Gas Storage And Supply System

MARINE APPLICATION

Mobile, Barge-Type and Shore Based LNG Bunkering Station, Fuel Gas Supply System
Gas Valve Unit(GVU) , Ship Security Control System, Marine Spare Parts

REGASIFICATION APPLICATION

LNG Regasification Skid
LNG Permanent Regasification Station

CUSTOMIZED PRODUCTS

Customized Skid Equipment

LNG Permanent Refueling Station

Standard One-pump Skid

Standard Double-Pump Skid

Product Description

There are two different types of LNG station，pump skid and permanent refueling station. Permanent refueling station, which means all equipments mounted in LNG station；pump skid, which means all equipments mounted in skid, it's easy to transport.

Performance Features

1. Refueling：through cryogenic pump, refuel LNG to vehicle cylinder.
2. Downloading：download LNG from trailer to storage tank.
3. Pressure boosting：fill vaporized LNG back to storage tank to meet the needed pressure of tank.
4. Temperature adjusting：pump LNG from storge tank by LNG cryogenic pump, through vaporizer into storage tank. Adjusting temperature of tank to setting value.

VEHICLE

APPLICATION

LNG CONTAINERIZED REFUELING STATION

Product Description

LNG skid-mounted refueling installation is an equipment that assembles all the equipment such as storage tank, pump, vaporizer and LNG dispenser on a box skid (with metal coffer), only with the control system and instrument air system configured outside the skid, and may work after simple installation and energization.

Technical Specifications

Model	HPQL60-I	Gasifier Specifications	300+150Nm³/h
Medium	LNG	Max Flow	340L/min
RAWP	1.6MPa	Pipeline Design Temp	-196℃~+55℃
Power Supply	380VAC ± 10%(50Hz)	Max.Power	18kW

Performance Features

1. It covers small area.
2. It's highly integrated for integral transportation.
3. It's convenient for installation, has short construction period and may be put into operation fast.
4. It may occupy the market quickly and relocate at any time.
5. It has high cost performance and less investment.

UNMANNED LNG CONTAINERIZED REFUELING STATION

According to PED, ATEX and MD code, apply to overseas market

Technical Specifications

Model	HPQL020-C33	Gasifier Specifications	400VAC (50Hz)
Medium	LNG	Max Flow	160Kg/min
RAWP	1.76MPa	Pipeline Design Temp	-196℃~+55℃
Test Pressure	2.5MPa	Max.Power	22kW
Ex-Proof	Ex II 3G Ex h IIB T4 Gc	Overall Dimension	(40+5)ft

Performance Features

1. It's of compact structure and highly integrated.
2. It covers small area, and is easy for transportation and installation, and put into operation fast.
3. Integrated intelligent control system: it combines with PLC and SIS control system, with high stability and safety.
4. Zero discharge of BOG.
5. Two-way LNG on-line saturation adjustment: wide temperature adjustment range, high precision and fast response.
6. Intelligent dispenser: It has a fast computing speed, diverse interfaces, large storage space, and supports remote online program updating, 180 languages and communication protocols such as MODBUS and IFSF.
7. Intelligent refueling: It has such functions as voice prompt, intelligent refueling, self-unloading, automatic identification of cylinder pressure grade, automatic pre-cooling, automatic release, and Dead-man function.
8. Complete certification: Certified by TUV, and ATEX, PED, MD, MID and other certificates are obtained.

LNG DISPENSER

Meet ATEX certification requirements	European mid certification (B+D) model is obtained

Product Description

LNG dispenser employs the electronic control system independently developed by the Company and vacuum insulated pipe, is compatible with various flowmeters, and has the functions of one-button refueling and mechanical and electronic double breaking protection.

Technical Specifications

Medium	Liquefied natural gas (LNG)	Working pressure	1.6MPa	Ambient temperature	-25℃~55℃
Flow range	3kg/min- 80kg/min	Power	200W	Max. allowable error	± 1.5%
Ambient atmospheric pressure	86kPa-110kPa	Power supply	220V 50HZ	Unit of measurement	kg,L,Nm^3

Performance Features

1. Smart large screen: Highlight backlight LCD screen, with double-sided display
2. Remote data transmission: Diverse communication interfaces, supporting remote data transmission; power failure protection, sustainable display
3. Super storage: It can save 6,000 refueling bills, and has the functions of searching, printing and parameter encryption.
4. Intelligent settlement: It allows refueling according to preset gas volume and amount of money, and can interact with the clearing centers of different foreign manufacturers to realize automatic settlement and discounting.
5. Self protection: Automatic pressure switching, nozzle-off detection, detection of flowmeter abnormality, self protection in case of overpressure, pressure loss or overcurrent.
6. Intelligent diagnosis: In case of failure, it may automatically stop refueling, monitor the failure, display text information, and prompt maintenance methods.

LNG DISPENSER CALIBRATOR

Product Description

It is composed of high-accuracy mass flowmeter, pipeline system, safety valve, stop valve, pressure gauge and Housing. By connecting with the gas dispenser, it may check the accuracy and repeatability of the dispenser and print out the calibration records according to the calibration data.

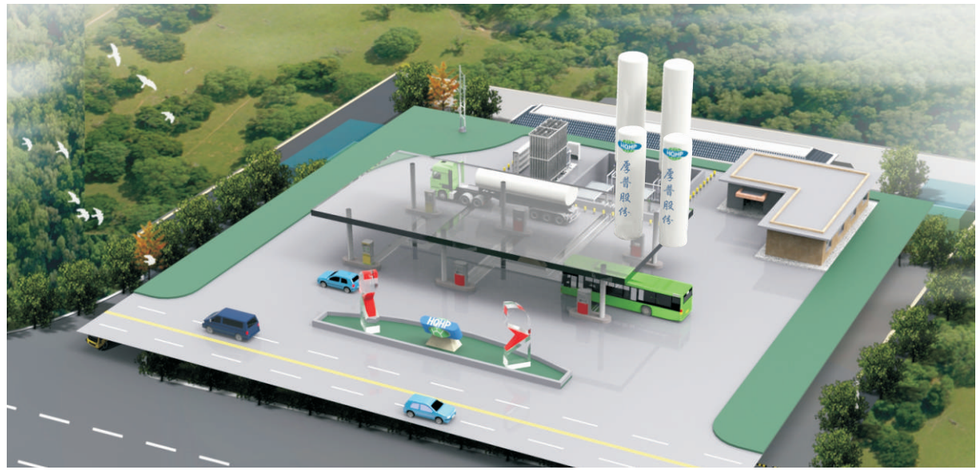
Technical Specifications

Max.Allowable Error	± 0.3 %	Input Voltage	12V DC/24V DC
Maximum Operating Pressure	1.6MPa	Dimension	(Length × width × height)766mm × 660mm × 700mm
Environment Temperature	-20℃ ~ 55℃		

Performance Features

1. It may display calibration data, curve and temperature in real time.
2. It may set the working parameters of the calibrator and the basic information of the station.
3. It may accurately print the calibration notice and records.
4. Calibration records can be imported into EXCEL for query, saving and printing.
5. It may check and compute the measurement error and repeatability of the LNG dispenser.

L-CNG STATION



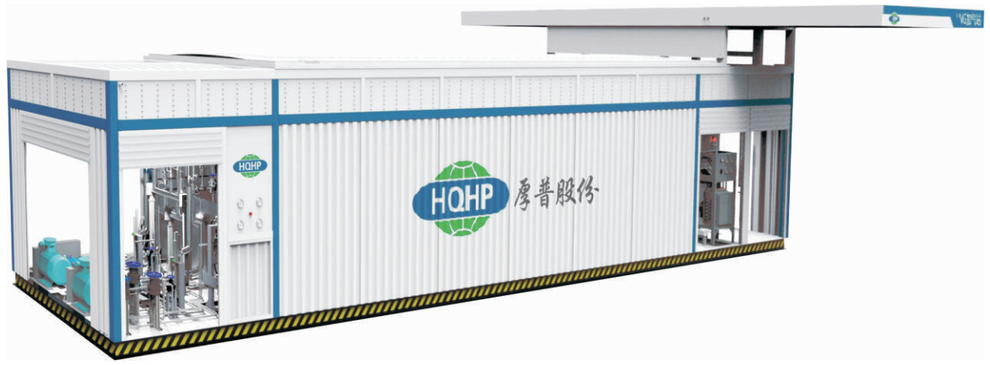
L-CNG Permanent Refueling Station

Standard L-CNG Pump Skid

Product Description

L-CNG station uses cryogenic piston pump to boost LNG pressure up to 20-25MPa,then the pressurzied liquid flows into the high pressure ambient vaporizer and is vaporized to CNG. The advantage is that this type of station has a lower cost than standard CNG station, and energy saved. This station consists of LNG storage tank, Cryogenic high-pressure plunger pump, Air-heated Vaporizer, Water-bath type vaporizer (optional) , Priority panel (optional), CNG cylinders, CNG dispenser, L-CNG control cabinet.

L-CNG SKID-MOUNTED REFUELING STATION



Product Description

L-CNG box-type skid-mounted refueling installation has the storage tank, plunger pump, unloading system, pressurization system and other equipment assembled on a box-type skid with a metal coffer. Only the HP gasification skid, CNG cylinder, instrument air system and control system are equipped outside the skid.

Technical Specifications

Model	HPQL60-I	Gasifier Specifications	300+150Nm³/h
Medium	LNG	Max Flow	340L/min
RAWP	1.6MPa	Pipeline Design Temp	-196℃~+55℃
Power Supply	380VAC ± 10%(50Hz)	Max.Power	18kW

Performance Features

1. It covers small area.
2. It is highly integrated for integral hoisting and transportation.
3. It has short construction period and may be put into operation fast.
4. The investment in the whole station is small.
5. It has optimized process flow and long product life.

CNG UNIVERSAL INTELLIGENT DISPENSER

It obtains ATEX certification

Product Description

CNG universal intelligent dispenser employs the microprocessor control system independently developed by the Company. It is a refueling metering device used for trade settlement, featuring network management and high safety performance, and typically applied to CNG fueling station to meter the refueling of NGV (Natural Gas Vehicle).

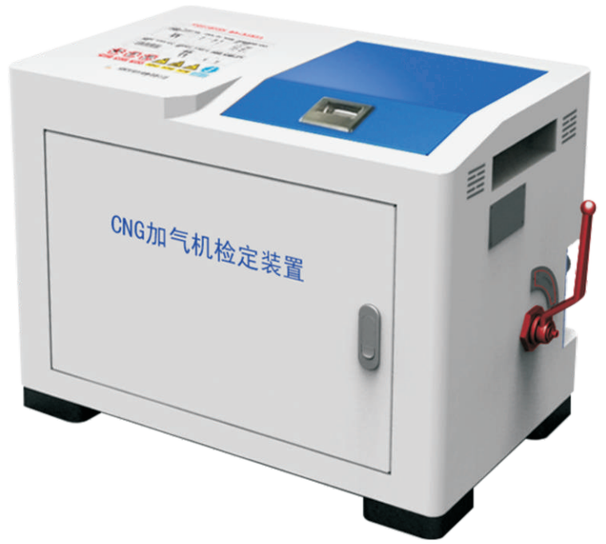
Technical Specifications

Medium	Compressed natural gas	Max. working pressure	25MPa	Unit of measurement	kg, Nm^3
Max. allowable error	± 1.0%	Compressive strength	37.5MPa	Weight	About 225kg
Working power	AC220V^5%,50Hz ± 1Hz	Ambient temperature	−25℃~55℃		
Rated working pressure	20MPa	Rated power	About 240W		

Performance Features

1. Smart large screen: Highlight backlight LCD screen, with double−sided display
2. Remote data transmission: Diverse communication interfaces, supporting remote data transmission; power failure protection, sustainable display
3. Super storage: It can save 6,000 refueling bills, and has the functions of searching, printing and parameter encryption.
4. Intelligent settlement: It allows refueling according to preset gas volume and amount , and can interact with the clearing centers of different foreign manufacturers to realize automatic settlement and discounting.
5. Self protection: Automatic pressure switching, nozzle−off detection, detection of flowmeter abnormality, self protection in case of overpressure, pressure loss or overcurrent.
6. Intelligent diagnosis: In case of failure, it may automatically stop refueling, monitor the failure, display text information, and prompt maintenance methods.

CNG DISPENSER CALIBRATOR



Product Description

This device is composed of high−precision mass flowmeter, high−precision pressure transmitter, 7−inch touch screen and intelligent controller. It can realize touch screen off−line operation or on−line detection of measurement accuracy and repeatability of CNG dispenser by host computer, and print out the calibration records and measurement certificates according to the calibration data.

Technical Specifications

Accuracy	0.2level	Rated working pressure	20MPa
Repetition	0.1%	Max. working pressure	25MPa
Measuring Range Ratio	1:40	Input Voltage	12V DC ~ 24V DC

Performance Features

1. It may set the working parameters of the calibrator and the basic information of the station.
2. It may display real−time calibration data and curves, real−time pressure and temperature.
3. It may check and display the measurement error and repeatability of the CNG dispenser.
4. The calibration records and results can be inquired in various ways.
5. It may sort out and clear redundant records in the database.
6. The queried records can be imported into EXCEL to generate calibration certificates and records.

CNG PRIORITY PANEL

Product Description

CNG priority panel is an automatic control device used in the gas storage system (cylinder, tank, well) of CNG refueling station to realize energy-saving gas storage, i.e. supply gas by groups in sequence to the gas storage system, and directly supply gas to the automobile gas cylinder by the compressor. CNG priority panel has fine assembly, reliable operation performance and reasonable construction, with all indexes reaching the advanced level among similar products at home and abroad.

Technical Specifications

Control Mode	Pneumatic Program Control	MAWP	25MPa
Adjust Pressure	22MPa(Adjustable)	Compressive Strength	37.5MPa

Performance Features

1. High-precision mechanical sequential valve group
2. Grouped sequential filling
3. Efficient gas storage system
4. Less compressor start-ups
5. Energy saving and consumption reduction

STATION CONTROL SYSTEM

Product Description

LNG station control system is not only an important basis for the realization of automatic control, intellectualization and informatization of refueling station equipment, but also the core of safe operation of the refueling station. It monitors and controls all equipment in LNG refueling stations in an all-round way. Its reliability and stability are directly related to the operation and safety of stations and equipment.

Performance Features

1. Complete functions: It includes PLC control system, HIMI man-machine interactive system, SCADA operating system, UPS system, ESD emergency shutdown system, gas alarm system and instrument air system to jointly ensure the safe and stable operation of LNG refueling stations.
2. High integration: LNG station control system is responsible for monitoring the running status and data of all equipment in the station, controlling the process flow during station operation, storing and inquiring the data of equipment in the station, and generating and pushing the alarm information in the station.
3. Man-machine interaction: The man-machine interface with touch screen and host computer mutually redundant is employed, which has beautiful interface, convenient operating process, strict grading of operation authority, and automatic generation of various data curves and reports.
4. Security intelligence: It adopts high-performance PLC and self-designed intelligent gateway, combining with the patented unmanned LNG fueling station control system and using HopNet big data platform, to improve the intelligence level of LNG refueling stations.
5. Diverse interfaces: The control system of LNG refueling station supports RS485/232/422, MODBUS RTU/TCP, PROFINET, EthernetIP, TCP/IP, CANOPEN and other industrial standard communication protocols, which is convenient for interfacing with third-party equipment.

GAS REFUELING STATION LEVEL MANAGEMENT SYSTEM

Product Description

Station–level management system meets the daily operation management of the station and provides data support for enterprise –level management system. The software interface is simple and beautiful, and its human–based management may help users operate fast, improving service quality and work efficiency.

Core functions

1. Real–time monitoring
2. Collection and uploading of refueling data
3. Collection and uploading of shift data
4. Blacklist and whitelist function, download and distribution of unit price
5. Shift data statistics

Performance Features

1. Support multiple languages
2. Support one nozzle under one protocol and multiple nozzle under one protocol
3. Support concurrence of mass data
4. Support data acquisition of multiple nozzle under different protocols in the same station

HYDROGEN

HYDROGEN REFUELING STATION

C Series General Type

The type of station integrates hydrogen compressor, hydrogen refueling dispenser, heat exchange system in a skid, compact in structure and convenient to install, with minimized project land, reduced on-site installation work and installation period.

Suction Pressure	5MPa~20MPa
Max.Discharge Pressure	45/87.5MPa
Refueling Pressure	35/70MPa@15℃
Refueling Temp.	35MPa Paas Low As-10℃/70M Paas Low As-40℃
Refueling Capacity	50-1000kg/12h@12.5MPa

S Series Standard Type

This standard type station adopts modular design concept, it is a suitable option for customers with high requirements on functions,safety protections and automation but has no land space concern.

Suction Pressure	5MPa~20MPa
Max.Discharge Pressure	45/87.5MPa
Refueling Pressure	35/70MPa
Refueling Temp.	35MPa Paas Low As-10℃/70M Paas Low As-40℃
Refueling Capacity	200-5000kg/12h@12.5MPa

E Series Export Type

This export type station is designed according to applicable European standards, it fulfills various requirements in European and Asian countries. This series includes stations both @35MPa and @70MPa.

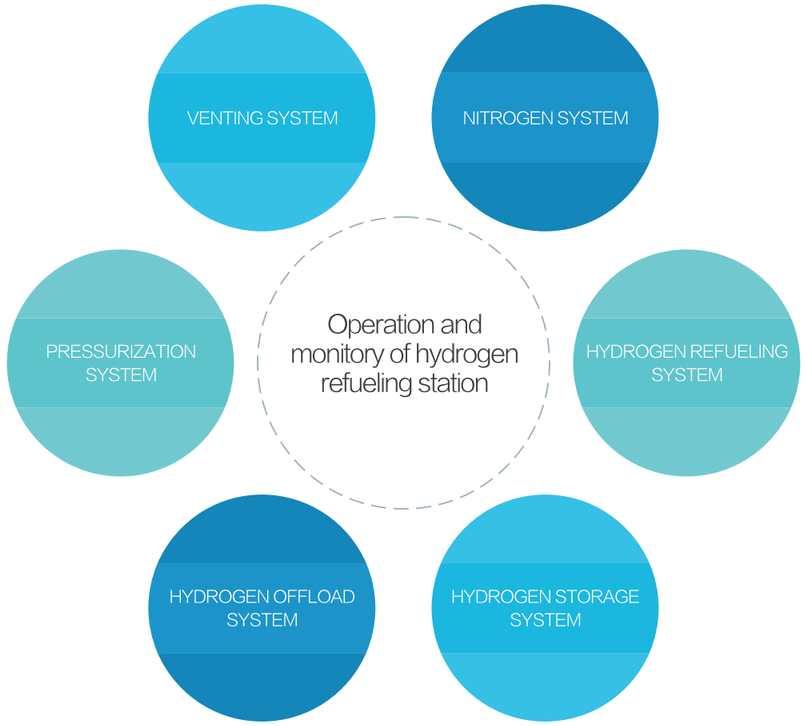
CONTROL SYSTEM

Product Description

Hydrogen refueling station control system consists of station payment management and operation monitor system, fulfilling inquiry and statistic of station transaction data and report output and operation monitor of equipment onsite.

The hydrogen refueling operation monitor system consists of PLC control cabinet, and hydrogen compressor, hydrogen leak alarm system, ESD system, industry computer and SCADA system.

Multiple hydrogen refueling station control systems are linked by internet to carry out unified supervisory.



Function Module

HYDROGEN DISPENSER

Function of operation and monitory system

1. Concentration data display
2. Smart inspection of hydrogen leakage
3. Alarm display and automatic print record
4. Real-time trend analyzing curve
5. Standard software port of data base
6. System maintenance online
7. Process diagram
8. ESD interlock control
9. Automatic create and print report
10. Function of event record and inquiry
11. Perfect authority management
12. Multi-function remote smart interface

System Advantage

Security: Equip components with SIL security grade control special UPS to ensure equipment security and stable running.
Nice interactive: Human machine interface with large touchable screen to clear display process, system situation; easy to operate.
Hydrogen refueling management: Intelligent information hydrogen refueling management system provides monitor function, inquiry and management for hydrogen refueling.
Cloud intelligence: Equip port of cloud to intelligent long distance transportation, monitory and operation.
Remote maintenance: Able to remote maintain for customer. Equipment runs with stable performance.
Remote APP: Install APP for operation and management.

Product Description

Hydrogen dispenser is composed of such main components as mass flowmeter, electronic metering and control system, hydrogen nozzle, shut-off valve and safety valve, and used to intelligently measure the cumulative gas flow.

Technical Specifications

Gas medium	Hydrogen	Rated working pressure	35/70MPa
Working power	AC 185V~245V，50Hz ± 1Hz	Flow range	(0.5-5.0)kg/min (0.5-7.2) kg/min
Applicable ambient temperature	-25℃~55℃	Max. allowable error	± 1.5%
Ex-mark	Ex d e mb ib IIC T4 Gb ⟨Ex⟩ II 2/3G IIB+H_2 T4...T3 Ex h IIB+H_2 T4...T3 Gb/Gc e mb	Repeatability	0.5%
Filtering accuracy	≤5 μ m	Unit of measurement	kg

Performance Features

1. Modular design: Optional on customer's demands.
2. High safety performance: It has the functions of breaking protection, emergency shut-off, overpressure relief, temperature rise control, flow control, self-inspection of hose life, etc.
3. Fully independent R&D: It obtains whole-machine explosion-proof certification, supporting IFSF communication.
4. High intelligence: It has functions of one-button refueling and real-time monitoring of pressure and flow.
5. Encryption protection: Payment data can be protected by encryption and stored locally.
6. Strong data support: The station control system relies on the big data platform to provide real-time data support for customers.

SEQUENCE PANEL

Product Description

Sequence panel is an automatic control device composed of such main components as shut-off valve, safety relief and electrical control systems. It is used to realize the energy-saving gas storage, grouped sequential gas supply, direct charging, etc. of the hydrogen storage system at the hydrogen refueling station.

Technical Specifications

Gas medium	Hydrogen	Working power	AC 185V~245V，50Hz ± 1Hz
Applicable ambient temperature	−25℃ ~55℃	Working pressure	45MPa / 90MPa
Control mode	Mechanical/Electrical	Structure type	Frame/Shell type

Performance Features

1. Modular design: It can be flexibly configured on customer's demands.
2. Graded automatic filling: Graded filling is intelligently realized based on the
3. Energy saving and consumption reduction: The vehicle-mounted gas cylinders can be directly refueled by the tube bundle truck.
4. Intelligent control: Real-time gas supply.

HYDROGEN LOADING/UNLOADING POST

Product Description

Hydrogen loading/unloading post is a special equipment composed of such main components as mass flowmeter, electronic metering and control device, pneumatic valve (solenoid valve), safety relief and electrical control systems, and used to measure and value the cumulative gas flow.

Technical Specifications

Gas medium	Hydrogen	Max. working pressure	25MPa
Working power	AC 185V~245V，50Hz ± 1Hz	Max. allowable error	± 1.5%
Applicable ambient temperature	−25℃~55℃	Repeatability	0.5%
Ex-mark	Ex d e mb ib IIC T4 Gb	Filtering accuracy	≤5 μ m

Performance Features

1. Modular design: Optional on customer's demands.
2. Automatic control and real-time monitoring.
3. Intelligent electronic metering and control system: It realizes remote data transmission and local storage.
4. Automatic fault detection: It displays fault codes.
5. High safety performance: It is provided with nitrogen purging and replacement functions.

HYDROGEN DISPENSER CALIBRATOR

Product Description

This unit is comprised of high precision mass flow meter,pipeline,computer and eletronic measure controller. It is developed specifically for calibrating the vehicle dispensers.

Technical Specifications

Flow Range	0.2kg/min~4kg/min
Max.Allowable Error	± 0.5%
Repeatability	0.25%
Max.Working Pressure	43.8MPa
Rated.Working Pressure	35MPa
Working Temperature	−25℃ ~ 55℃
Input Voltage	DC12V ~ DC24V
Weight	Around60kg
Dimension	650mm × 350mm × 550mm

Performance Features

1. Verify the measurement error of hydrogen dispenser
2. Display flow curve in real time
3. Parameter set avaliable
4. User information set avaliable
5. Query calibration details and records in different ways
6. Print calibration certificate and record Query
7. record and print calibration record

HYDRAULICALLY-DRIVEN HYDROGEN COMPRESSOR

Product Description

Hydrogen compressor is typically applied to hydrogen refueling station to pressurize the LP hydrogen to a certain pressure, and then store it in the hydrogen storage container of the hydrogen refueling station or directly fill it into the vehicle-mounted gas cylinder to meet customer's hydrogen refueling needs.

Technical Specifications

Model	HPQH45-Y500
Medium	H_2
Rated displacement	470Nm³/h(500kg/d)
Motor power	55kW
Max. working pressure	45MPa
Noise	≤85dB(distance 1m)

Performance Features

1. Long sealing life: The cylinder piston is of floating type and the cylinder liner is manufactured by special processes, efficiently extending the service life of the cylinder piston seal under the oil-free lubrication condition;
2. Low failure rate: The hydraulic system consists of metering pump, reversing valve and frequency converter, rendering simple control and low failure rate;
3. Easy maintenance: Simple structure and few parts allow convenient and fast maintenance, i.e. the replacement of a set of cylinder piston can be completed within 30min;
4. High volume efficiency: The cylinder liner is of thin-wall cooling structure, which is conducive to heat transfer, and may efficiently cool the cylinder and improve the volume efficiency of the compressor.
5. High inspection standard: Before delivery, each product is tested with helium for pressure, temperature, displacement, leakage and other performance.
6. Fault prediction and health management: The cylinder piston seal and the oil-cylinder piston rod seal are provided with leakage detection devices, which can monitor the leakage of the seal in real time and prepare for replacement in advance;

HYDROGEN DIAPHRAGM COMPRESSOR

MP Diaphragm Compressor (45MPa)

LP Diaphragm Compressor (22MPa)

Product Description

Hydrogen diaphragm compressor is a kind of dedicated equipment for high-purity hydrogen compression. It is widely applied to the integrated hydrogen generation & refueling station and hydrogen refueling station (MP compressor); primary hydrogen refueling station and hydrogen generation station (LP compressor); petrochemical and industrial gas (compressor with customized process); liquid hydrogen-based refueling station (BOG recovery compressor), etc.

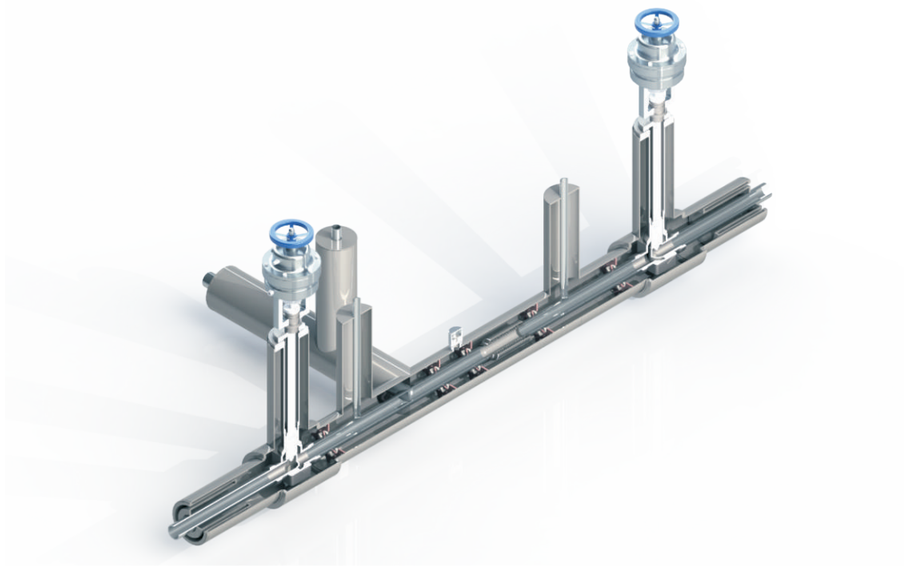
Technical Specifications

model	HDQN-GP3-470/135-450	HDQN-GD4-500/20-220
Rated displacement	500kg/d	500Nm^3/h
Suction temperature	-20℃~+40℃	-20℃~+40℃
Exhaust temperature	≤45℃	≤45℃
Motor Power	30kW	75kW
Rated speed	420r/min	420r/min
Intake pressure	5 ~ 20MPa	2MPa
Maximum exhaust pressure	45MPa	22MPa

Performance Features

1. Good sealing performance: Hydrogen leakage from hydrogen refueling station is a major hazard source, and the oil gas seal is static with excellent sealing performance;
2. High safety performance: It is provided with intelligent systems, software and hardware, complete safety and detection devices, and multiple safety protection measures;
3. High-purity gas: No impurities are generated during normal gas compression, and the purity of the compressed gas may reach 99.999%, without polluting the medium;
4. Long-term stable operation: It is especially suitable for primary stations and stations with large hydrogen refueling capacity, and can run at full capacity for a long time. Long-term operation is more friendly to the service life of diaphragm of the compressor;
5. High volume efficiency: The special curve design of diaphragm cavity may improve the efficiency by 20%, 15-30KW/h lower than that of similar products;
6. Low maintenance cost: Simple structure and few vulnerable parts (mainly diaphragm) reduce follow-up maintenance costs, and the diaphragm may serve for more than 4,000 hours;

LIQUID HYDROGEN VACUUM INSULATED CRYOGENIC PIPE



Product Description

Liquid hydrogen vacuum insulated cryogenic pipe is specially designed for the transfer of liquid hydrogen. Its key components such as multi-layer and multi-screen insulation, cryogenic expansion joint, adsorbent, and cryogenic insulated support are developed to meet the use requirements of liquid hydrogen.

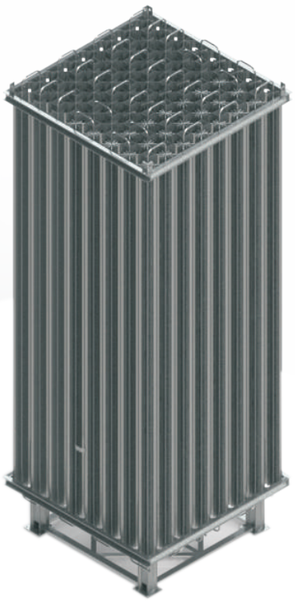
Technical Specifications

--- ---	Inner pipe	Outer pipe
Design pressure (MPa)	≤2.5	-0.1
Design temperature (° C)	-253	Ambient temperature
Main material	022Cr17Ni12Mo2	06Cr19Ni10
Applicable medium	LH_2, etc.	
Design standards	Q/67969343-9.01	
Inlet/outlet connection	Face vacuum flange, welding	

Performance Features

1. Compared with common vacuum tubes, it has higher vacuum degree and better thermal insulation performance.
2. Small evaporation loss, suitable for conveying cryogenic liquid with high economic value
3. With multi-component composite adsorbent inside to well maintain vacuum and extend vacuum life

LIQUID HYDROGEN AMBIENT HEAT EXCHANGER



Product Description

Liquid hydrogen ambient vaporizer is an efficient and energy-saving equipment that utilizes the natural air convection and heat the cryogenic liquid hydrogen in the heat exchange tubes to completely evaporate the liquid hydrogen into hydrogen.

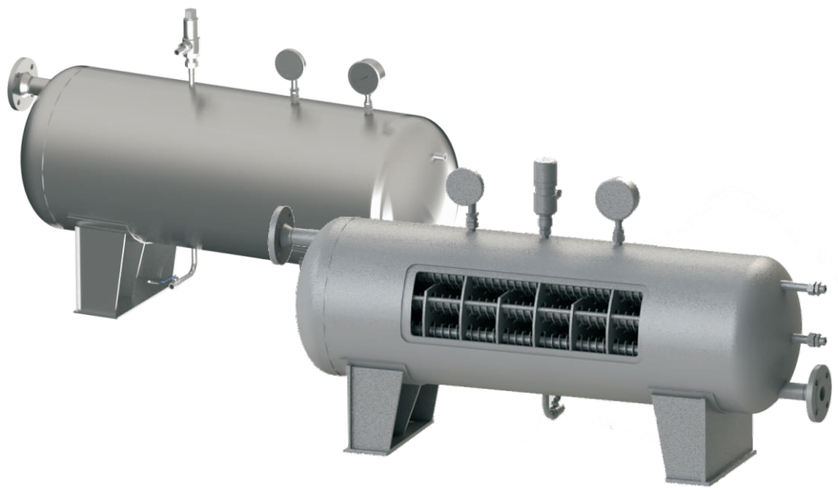
Technical Specifications

Design pressure	≤99MPa	Design flow	≤ 6000Nm^3/h
Design temperature	-253℃ ~ 50℃	Continuous working time	≤ 8h
Outlet temperature	Not lower than the ambient temperature of 15℃	Main material	022Cr17Ni12Mo2+6063-T5

Performance Features

1. Aluminum alloy finned tube is sheathed with stainless steel tube, which meets the requirements of use in ultrahigh pressure environment.
2. The heat exchange fins are integrally formed, and the frost layer on surface has low adhesion, rendering fast defrosting.
3. It has small deformation during equipment operation as rectangular connectors are joined to C-shaped connectors.

LIQUID HYDROGEN WATER-BATH HEAT EXCHANGER



Product Description

Liquid hydrogen water-bath heat exchanger utilizes circulating hot water or electric heating to realize the vaporization and heating of liquid hydrogen, featuring efficient heat exchange, compact structure and low requirements for service environment.

Technical Specifications

--- ---	Tube side	Shell side
Design pressure	≤99MPa	≤1.0MPa
Design temperature	-253℃~90℃	-50℃ ~ 90℃
Main material	022Cr17Ni12Mo2/06Cr19Ni10	
Applicable medium	LH_2, etc.	Hot water/ethylene glycol water solution, etc.

Performance Features

1. Special stainless steel tubes with aluminum alloy fins pressed outside enhances heat exchange capacity.
2. Compact structure covers small area and allows operation indoors and in equipment.
3. High vacuum multi-layer insulation technology improves insulation effect and heat exchange efficiency.
4. The flow directions of cold and hot media are reversely arranged to maximize the heat transfer efficiency.

LIQUID HYDROGEN STORAGE AND SUPPLY DEVICE USING STORAGE-GRADE METAL HYDRIDE (SOLID STATE HYDROGEN STORAGE EQUIPMENT)

Product Description

Liquid hydrogen Using high-performance hydrogen storage alloy as hydrogen storage medium and adopting modular structure design, various hydrogen storage devices adopting metal hydride with a hydrogen storage capacity of 1~20 kg can be customized and developed, integrating 2~100 kg grade hydrogen storage system. It can be widely used in the application fields of high-purity hydrogen sources such as fuel cell electric vehicles, hydrogen energy storage systems and hydrogen storage systems of fuel cell standby power supplies.

Technical Specifications

Rated hydrogen storage capacity (kg)		Design as required	Overall dimension (mm)		Design as required
Hydrogen filling pressure (MPa)	≤5	Design as required	Hydrogen releasing pressure (MPa)	0.1 ~ 5	Design as required
Maximum gas supply flow (g/s)		Design as required	Temperature range of circulating water for hydrogen release (℃)		50-75
Circulated hydrogen filling and releasing life (times)		≥3000	The hydrogen storage capacity is not less than 80%, and the hydrogen filling/releasing efficiency is not less than 90%.		
Hydrogen filling time (min)	60	Design as required	Temperature range of circulating water for hydrogen fill (℃)		-10-30

Features

1.High volumetric hydrogen storage density, could reach liquid hydrogen density;
2.High hydrogen storage quality and high hydrogen releasing rate, ensuring the long-term full-load operation of high-power fuel cells;
3.High purity of hydrogen release, effectively ensuring the service life of hydrogen fuel cells;
4. Low storage pressure, solid-state storage, and good safety;
5. The filling pressure is low, and the hydrogen production system can be directly used to fill the solid hydrogen storage device without pressurization;
6. The energy consumption is low, and the waste heat generated during fuel cell power generation can be used to supply hydrogen to the solid hydrogen storage system;
7. Low hydrogen storage unit cost, long cycle life of solid hydrogen storage system and high residual value;
8. Less investment, less equipment for hydrogen storage and supply system, and small footprint.

SMALL MOBILE METAL HYDRIDE HYDROGEN STORAGE CYLINDER

Product Description

Use high-performance hydrogen storage alloy as the hydrogen storage medium, this product can be used to suck and release hydrogen in a reversible manner at a certain temperature and pressure. It can be widely used in electric vehicles, mopeds, tricycles and other equipment driven by low-power hydrogen fuel cells, and can also be used as a supporting hydrogen source for portable instruments such as gas chromatographs, hydrogen atomic clocks and gas analyzers.

Main Index Parameters

Inner volume of tank	0.5L	0.7L	1L	2L
Tank material	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy
Hydrogen storage pressure (MPa)	≤5	≤5	≤5	≤5
Total mass of hydrogen storage tank (kg)	~3.3	~4.3	~5	~9

Tank size (mm)	Φ60*320	Φ75*350	Φ75*400	Φ108*410
Operating temperature (℃)	5-50	5-50	5-50	5-50
Hydrogen filling time (25℃) (min)	≤20	≤20	≤20	≤20
Hydrogen storage capacity (g)	≥25	≥40	≥55	≥110

Features

1. Small size and easy to carry;
2. High hydrogen storage density and high hydrogen release purity;
3. Low energy consumption;
4. No leakage and good safety.

LP SOLID GAS STORAGE AND SUPPLY SYSTEM

Product Description

The integrated skid-mounted design is adopted, integrating hydrogen storage and supply module, heat exchange module and control module, and integrating 10~150 kg hydrogen storage system. Users only need to connect hydrogen consumption equipment on site to directly run and use the device. It can be widely used in the application fields of high-purity hydrogen sources such as fuel cell electric vehicles, hydrogen energy storage systems and hydrogen storage systems of fuel cell standby power supplies.

Main Index Parameters

Rated hydrogen storage capacity (kg)	Design as required	Overall dimensions (ft)	Design as required
Hydrogen filling pressure (MPa)	1~5		Design as required
Hydrogen releasing pressure (MPa)	≥0.3		Design as required
Hydrogen releasing rate (kg/h)	≥4		Design as required
Circulated hydrogen filling and releasing life (times)	≥3000	The hydrogen storage capacity is not less than 80%, and the hydrogen filling/releasing efficiency is not less than 90%.	

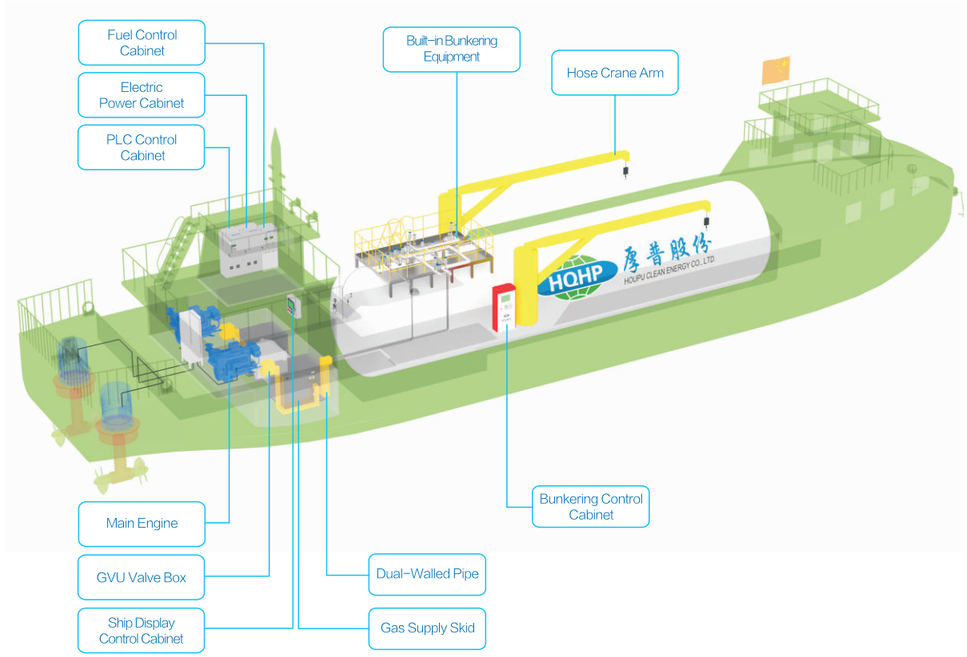
Features

1. Large hydrogen storage capacity, ensuring long-term full-load operation of high-power fuel cells;
2. Low storage pressure, solid-state storage, and good safety;
3. Integrated design, easy to use, and it can be used directly after being connected to the equipment.
4. It is convenient for transfer, and can be lifted as a whole and transferred as needed.
5. The hydrogen storage and supply system is provided with less process equipment and requires a small floor area.
6. It can be customized according to customer demands.

MARINE APPLICATION

MOBILE LNG BUNKERING SOLUTIONS

BUILT-IN PUMP MOBILE BUNKERING SYSTEM



Product Description

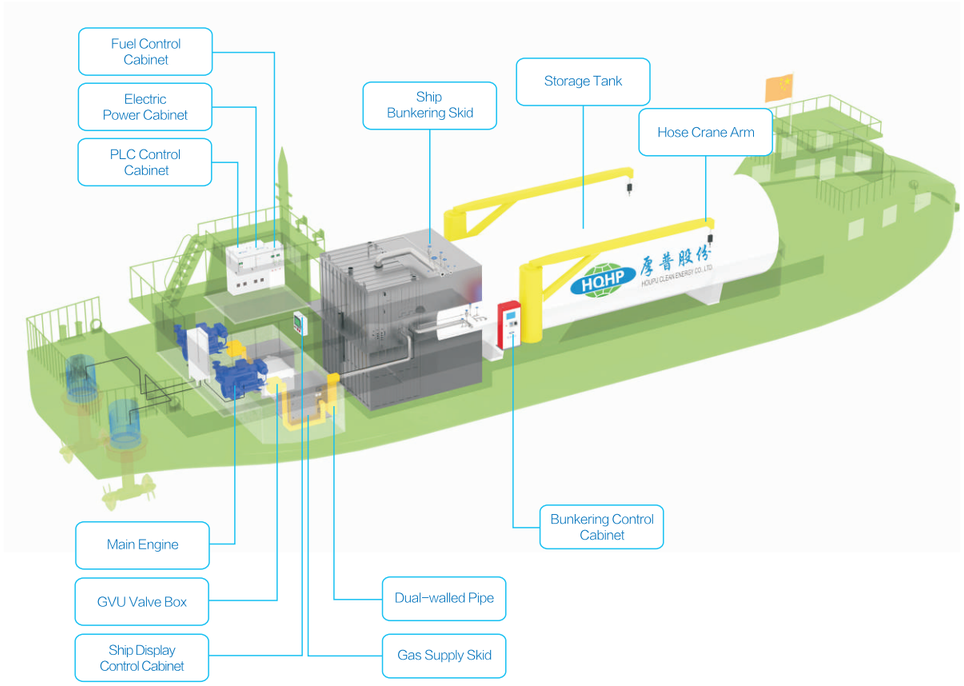
This kind of bunkering system is based on LNG fuel power ship, which has low requirements on water conditions. It can be replenished by shore-base station, barge station and LNG carrier. It has the function of mobile bunkering, and can travel to the receiving ship area to perform bunkering, which is flexible and convenient. At the same time, the LNG mobile refueling ship can realize its own BOG utilization and achieve zero emission.

Technical Specifications

Maximum Dispensing flow	15/30/45/60m³/h (Can be ustomized according to user requirements)
Maximum Bunkering Flow	200m³/h (Can be Customized According to User Requirements)
Working Medium	LNG
System Design pressure	1.6MPa
System Operating Pressure	1.2MPa
Single Tank Capacity	Customized According to User Requirements
Tank Quantity	Customized According to User Requirements
Power System	Customized According to User Requirements
System Design Temperature	-196℃ ~ 55℃

MOBILE LNG BUNKERING SOLUTIONS

PUMP SKID MOBILE BUNKERING SYSTEM

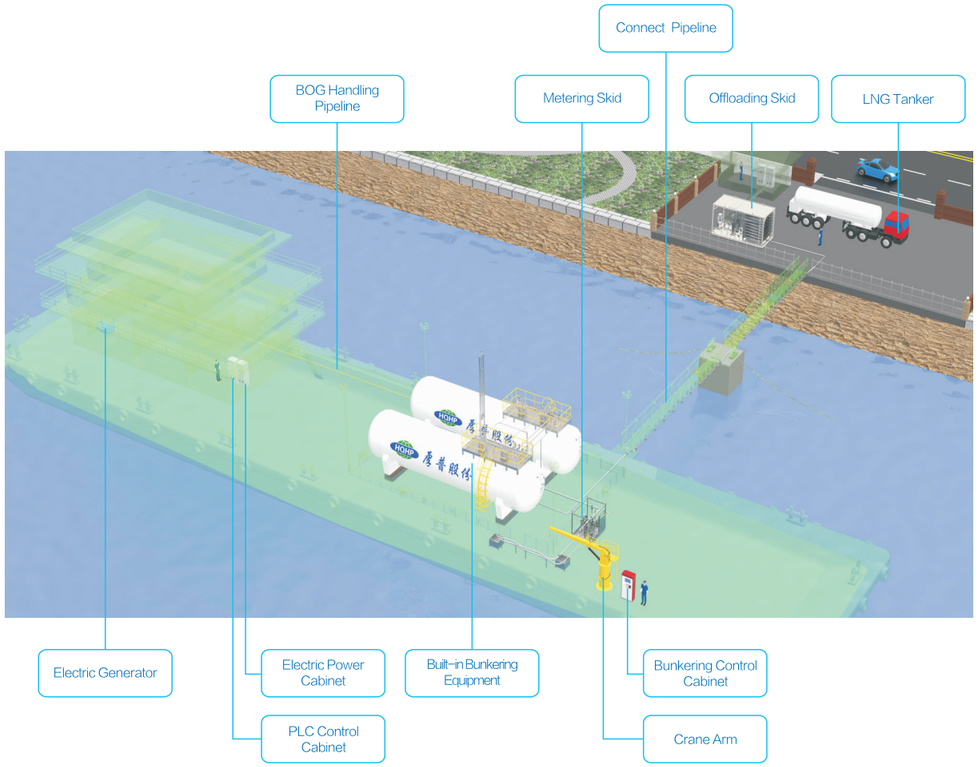


Technical Specifications

Maximum Dispensing flow	15/30/45/60m³/h (Can be ustomized according to user requirements)	System Design pressure	1.6MPa	Tank Quantity	Customized According to User Requirements
Maximum Bunkering Flow	200m³/h (Can be Customized According to User Requirements)	System Operating Pressure	1.2MPa	Power System	Customized According to User Requirements
Working Medium	LNG	Single Tank Capacity	Customized According to User Requirements	System Design Temperature	−196℃ ~ 55℃

BARGE-TYPE LNG BUNKERING SOLUTION

BUILT-IN PUMP BUNKERING SYSTEM



Product Description

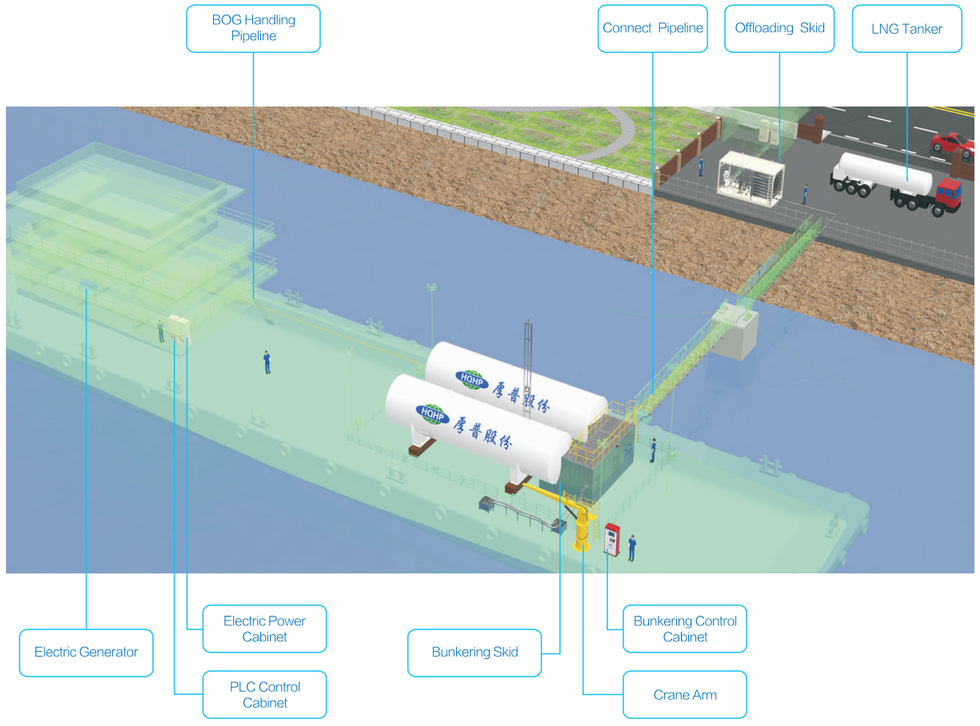
Barge type LNG bunkering station is to mount the bunkering equipment on the motorless barge.It can be built on water area where ship−shore connection not long, with wide sea route,slow water flow,with shelter against wind, with deep water,good bottom conditions, away from the densely populated areas, marine navigation concentration areas, channel, etc., not affect the navigation or environment in an adverse way; compliant with Regulation on the LNG Bunkering Station on water. Such station has dfferent models: barge+shore, barge+pipe rack+offloading onshore;independdent barge station. Barge type LNG bunkering station has proven technology and is flexible, and can be relocated.

Technical Specifications

Maximum Dispensing flow	15/30/45/60m³/h (Can be ustomized according to user requirements)	System Design pressure	1.6MPa	Tank Quantity	1set/2set
Maximum Bunkering Flow	200m³/h (Can be Customized According to User Requirements)	System Operating Pressure	1.2MPa	Power System	Customized According to User Requirements
Working Medium	LNG	Single Tank Capacity	≤300m³	System Design Temperature	−196℃ ~ 55℃

BARGE-TYPE LNG BUNKERING SOLUTION

PUMP SKID BUNKERING SYSTEM

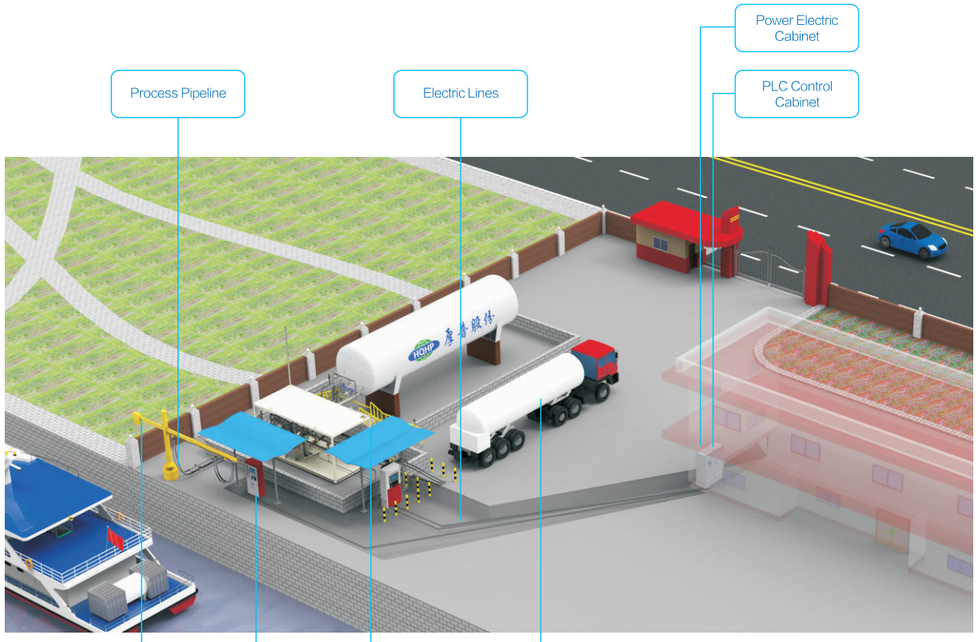


Technical Specifications

Maximum Dispensing flow	15/30/45/60m³/h (Can be ustomized according to user requirements)	System Design pressure	1.6MPa	Tank Quantity	1set/2set
Maximum Bunkering Flow	200m³/h (Can be Customized According to User Requirements)	System Operating Pressure	1.2MPa	Power System	Customized According to User Requirements
Working Medium	LNG	Single Tank Capacity	≤300m³	System Design Temperature	−196℃ ~ 55℃

SHORE-BASED LNG BUNKERING SOLUTION

PUMP SKID SHORE-BASED BUNKERING SYSTEM



Product Description

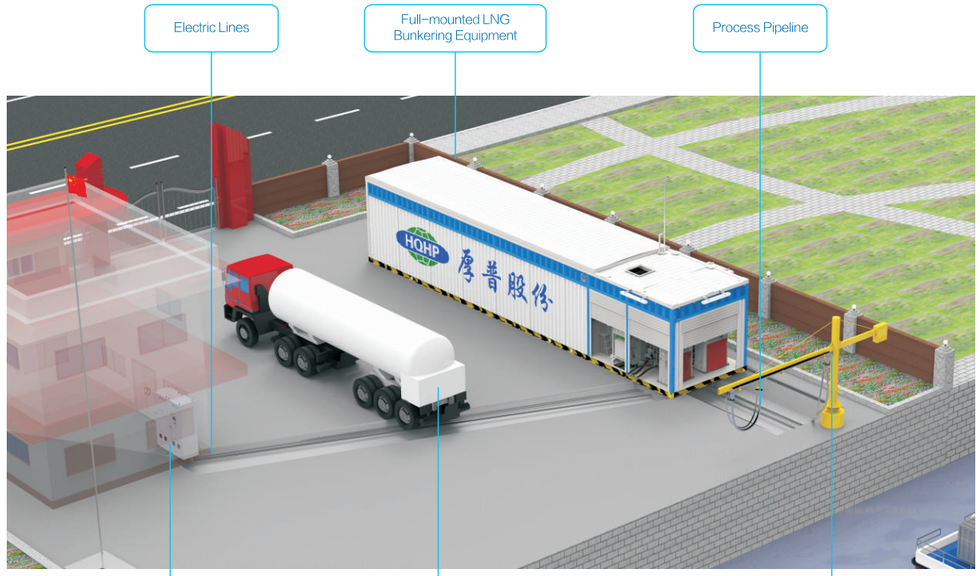
Shore-based LNG bunkering station is built on the shore. It can be built on inland area where there is flat terrain,with relatively short distance between the deep water area and shoreline,with narrow channel and the surrounding environment in accordance with the " liquefied natural gas filling station safety supervision management interim provisions ", this type of station has different models:pipe rack type wharf fixed station; shore-based fixed station. Its main configuration scheme is as follows:

Technical Specifications

Maximum Dispensing flow	15/30/45/60m³/h (Can be ustomized according to user requirements)	System Design pressure	1.6MPa	Tank Quantity	Customized According to User Requirements
Maximum Bunkering Flow	200m³/h (Can be Customized According to User Requirements)	System Operating Pressure	1.2MPa	Power System	Customized According to User Requirements
Working Medium	LNG	Single Tank Capacity	Customized According to User Requirements	System Design Temperature	−196℃ ~ 55℃

SHORE-BASED LNG BUNKERING SOLUTION

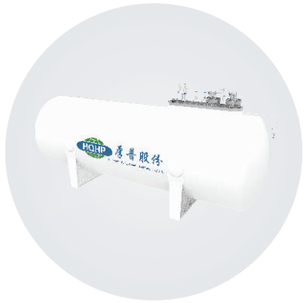
FULL-MOUNTED SHORE-BASED LNG BUNKERING SYSTEM



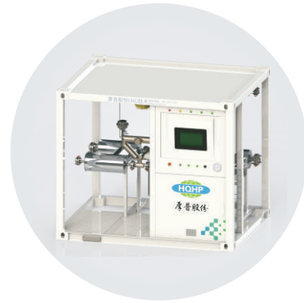
Technical Specifications

Maximum Dispensing flow	15/30/45/60m³/h (Can be ustomized according to user requirements)	System Design pressure	1.6MPa	Tank Quantity	Customized According to User Requirements
Maximum Bunkering Flow	200m³/h (Can be Customized According to User Requirements)	System Operating Pressure	1.2MPa	Power System	Customized According to User Requirements
Working Medium	LNG	Single Tank Capacity	Customized According to User Requirements	System Design Temperature	-196℃ ~ 55℃

LNG-POWERED SHIP BUNKERING SYSTEM


Built-in Pump Bunkering Installation


Barge Refueling skid


Metering Skid


Shore-based Bunkering Skid


Offloading Skid


Containerized LNG Refueling Skid

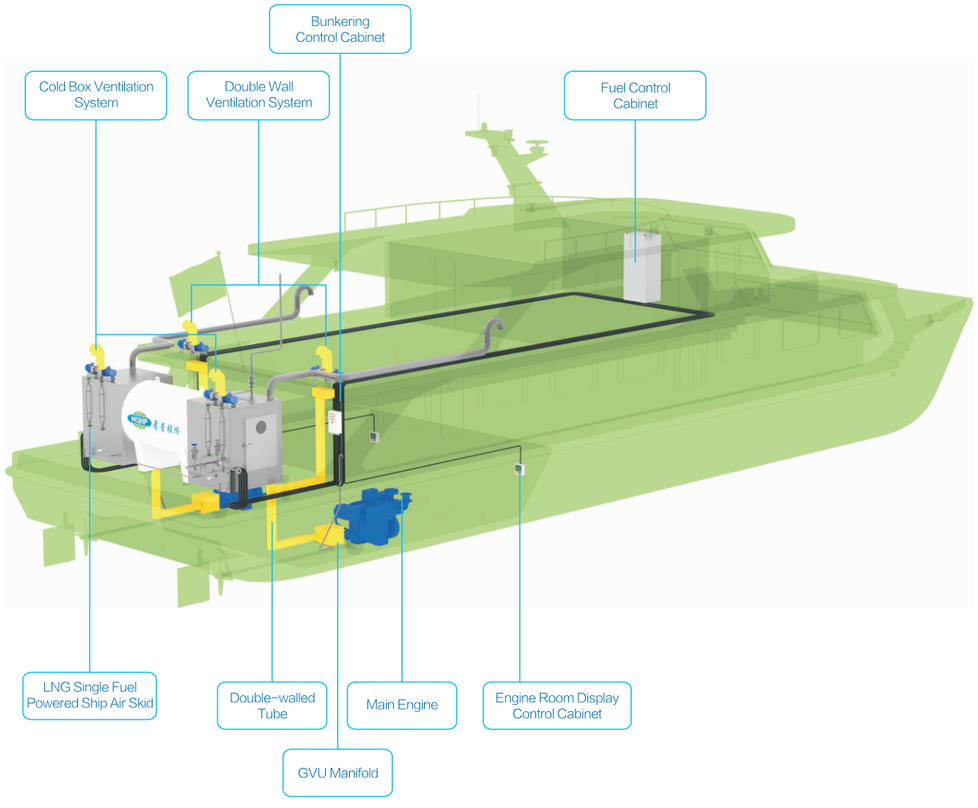

Power Cabinet


PLC Control Cabinet

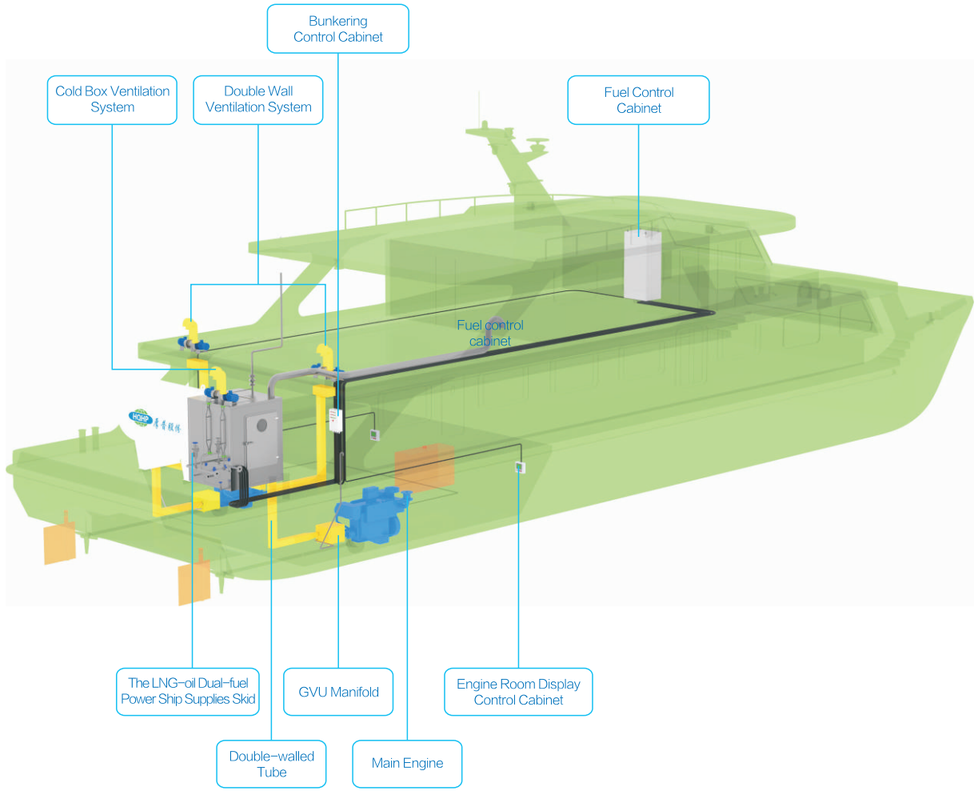

Refueling Control Cabinet

GAS SUPPLY SYSTEM

THE GAS SUPPLY SYSTEM OF LNG SINGLE-FUEL POWER SHIP



THE GAS SUPPLY SYSTEM OF LNG DUAL-FUEL POWER SHIP



Product Description

Gas supply system of LNG fuel-powered ship is able to provide fuel to the ship.

Technical Specifications

Capacity of Storage Tank	Custom-made	Design Temperature	-196℃~55℃
Capacity of Gas Supply	≤400Nm³/h	Working Medium	LNG
Design Pressure	1.2MPa	Capacity of Ventilation	30 times/h
Operation Pressure	<1.0MPa	Remark: *A suitable fan is required to be provided to meet the capacity of ventilation	

Technical Specifications

Capacity of Storage Tank	Custom-made	Design Temperature	-196℃~55℃
Capacity of Gas Supply	≤400Nm³/h	Working Medium	LNG
Design Pressure	1.2MPa	Capacity of Ventilation	30 times/h
Operation Pressure	<1.0MPa	Remark: *A suitable fan is required to be provided to meet the capacity of ventilation	

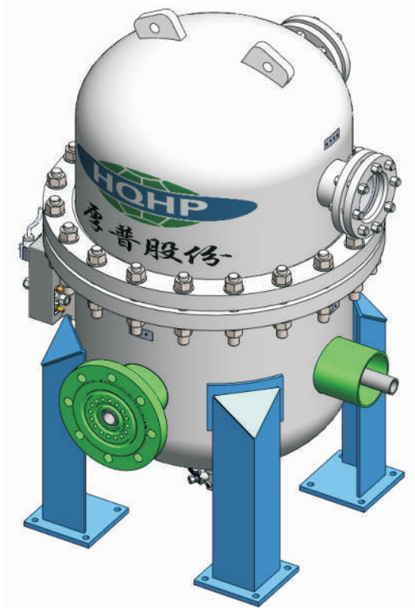
GAS SUPPLY SYSTEM PRODUCT OF LNG POWERED SHIP

Currently, CCS, ABS, DNV-GL
and other classification society certificates have been obtained.

LNG Single/Dual Fuel Gas Supply Skid

LNG Single Fuel Gas Supply Skid

GAS VALVE UNUT(GVU)



Product introduction

GVU includes gas control valve, filter, pressure regulating valve, pressure gauge and other components. It is used to ensure safe, stable and reliable gas supply for the engine, and it also can be used to realize quick cut-off, safe discharge, etc.

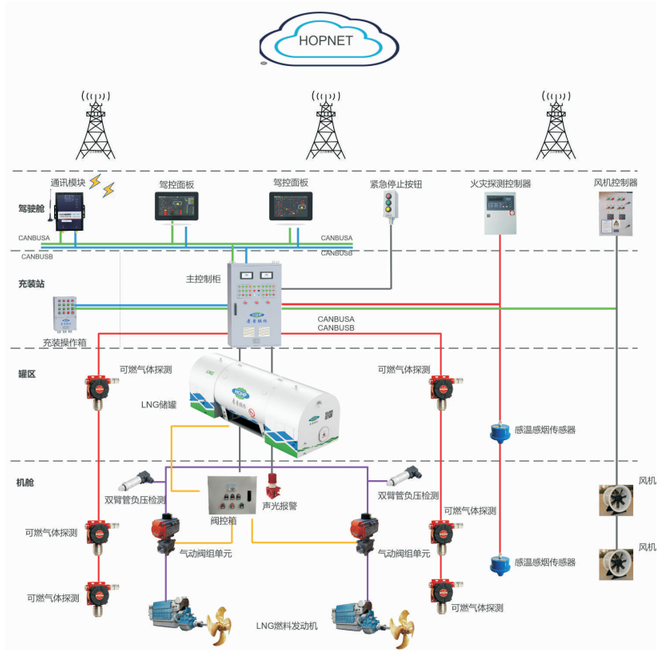
Main index parameters

Design pressure of pipe	1.6MPa	Design pressure of tank	1.0MPa
Inlet pressure	0.6MPa ~ 1.0MPa	Outlet pressure	0.4MPa ~ 0.5MPa
Gas temperature	0℃ ~ +50℃	Maximum particle diameter of gas	5μm ~ 10μm

Performance characteristics

1. The size is small and easy to maintain;
2. Small footprint;
3. The interior of the unit adopts pipe welding structure to reduce the risk of leakage;
4. GVU and the double-wall pipe can be tested for air tightness strength at the same time.

SHIP SECURITY CONTROL SYSTEM



Product introduction

The LNG ship security control system is suitable for natural gas fuel-powered ships. The system consists of an integrated control box, a filling control box and a console operation panel, and is connected with an external fan system, a gas detection system, a fire detection system, a power system and a HopNet IoT platform to realize the intelligent filling, storage and supply of ship fuel. It can be used to realize manual/automatic gas supply, filling, safety monitoring & protection and other functions.

Features

1. The system can be used to realize chip-level, bus-level and system-level redundancy.
2. Meet the requirements of the latest version of Rules for Natural Gas Fuelled Ships. The control system, the security system and the filling system are independent of each other, completely preventing the single point of failure of the system from affecting the control of the whole ship.
3. The system module is designed of intrinsic safety and flameproof safety to meet the requirements of GB3836. The gas explosion caused by system failure shall be avoided.
4. Non-destructive bus arbitration mechanism is adopted, and network paralysis will not occur even in case of heavy bus load.
5. Available for single/dual-fuel ship control. It can be used to realize the control of up to 6 gas supply circuits (up to 6 circuits, covering more than 90% of the domestic ship market).
6. It integrates 4G, 5G, GPS, BEIDOU, RS485, RS232, CAN, RJ45, CAN_Open protocol and other interfaces.
7. Perfectly integrated with the cloud platform to realize Cloud Management.
8. Exchange data with the engine to realize accurate fuel supply.
9. The system is designed in a standardized manner, with high intelligence, less human intervention, and simple operation, effectively reducing artificial misoperation.

MARINE SPARE PARTS

Vent Double-wall Pipe

Product Description

Vent double-wall pipe is typically used for natural gas transmission in LNG dual-fuel power ships. It employs different inner and outer pipe construction and support form according to different working conditions, featuring convenient maintenance and safe and reliable operation.

Technical Specifications

Inner pipe pressure	2.5Mpa	Design temperature	−50℃~+80℃
Outer pipe pressur	1.6MPa	Applicable medium	natural gas, etc.

Performance Features

1. Stress analysis for whole pipeline, directional support, safe and stable design.
2. Double-layer construction, elastic support, flexible pipeline, safe and reliable operation.
3. Convenient monitoring hole, reasonable segmentation, rapid and controllable construction.

VACUUM DOUBLE-WALL PIPE

Product Description

Vacuum double-wall pipe is used for natural gas transmission in LNG dual-fuel power ships. It employs high-vacuum multi-layer multi-screen insulation construction and meet the application requirements of the ship industry.

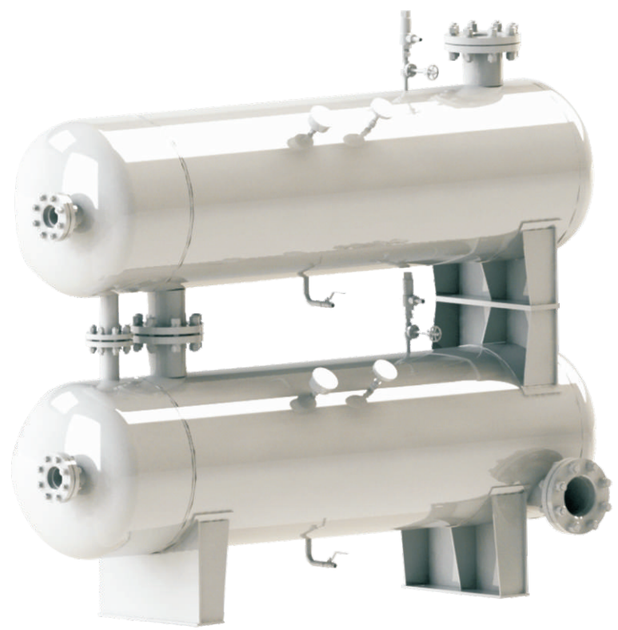
Technical Specifications

Inner pipe pressure	2.5Mpa	Design temperature	−196℃ ~ +80℃
Outer pipe pressure	−0.1MPa	Applicable medium	LNG, etc.
Vacuum	5×10^{-2}Pa		

Performance Features

1. High vacuum insulation technology minimizes heat leakage of medium.
2. Built-in corrugated expansion joint efficiently compensates the displacement caused by working temperature.
3. Factory prefabrication and site assembly improves product performance and shortens installation period.

MARINE HEAT EXCHANGER



Product Description

Marine heat exchanger is used to vaporize and pressurize or heat LNG in LNG power ships to meet the requirements of fuel gas supply system of the ships for fuel gas.

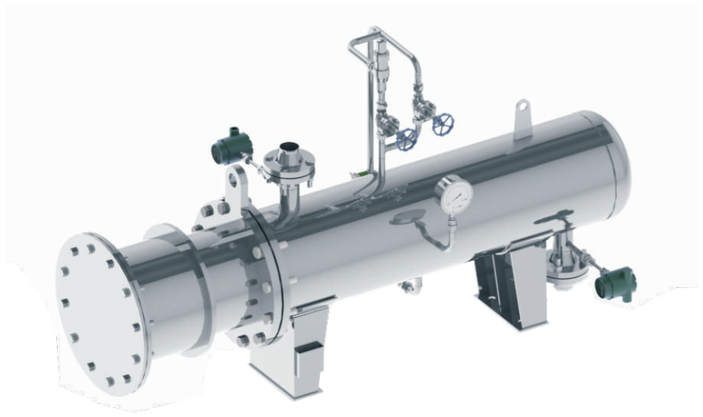
Technical Specifications

--- ---	Tube side	Shell side
Design pressure	≤4MPa	≤1.0MPa
Design temperature	−196℃ ~ 80℃	−50℃ ~ 90℃
Applicable medium	LNG	Water/ethylene glycol water solution
Certification	CCS/DNV/BV/ABS	

Performance Features

1. Integrated helical baffle, allowing small volume space.
2. Composite finned tube construction, providing large heat exchange area and efficient heat transfer.
3. U-shaped heat exchange tube, efficiently eliminating the stress imposed by the expansion and contraction of cryogenic medium.
4. Strong pressure-bearing capacity, high overload capacity and good impact resistance.

MARINE ELECTRIC HEATER



Product Description

Marine electric heater is an active heating device that provides heat sources for power ships. It has two types, i.e. ethylene glycol electric heater and LNG electric heater, both of which are solutions to cold start.

Technical Specifications

Ethylene glycol electric heater

Design pressure	≤1.0MPa	Design flow	Customized as required
Design temperature	−50℃ ~ 90℃	Design power	Customized as required
Medium	Ethylene glycol−water mixture	Certification	CCS/DNV/BV/ABS

LNG electric heater

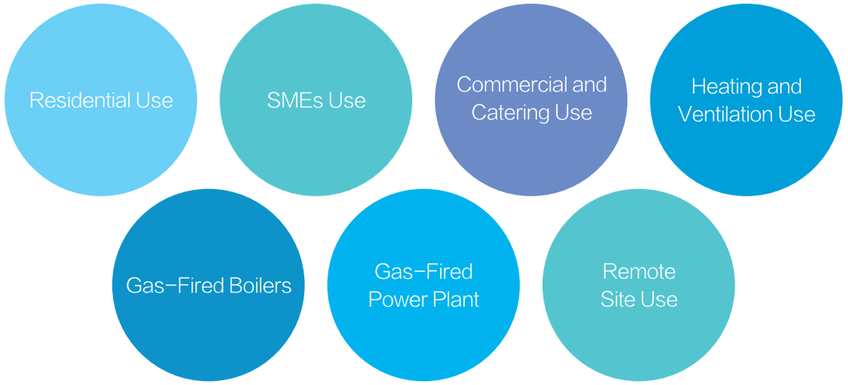
	Tube side	Shell side
Design pressure	≤2.0MPa	Atmospheric pressure
Design temperature	−196℃ ~ 90℃	−50℃ ~ 90℃
Applicable medium	LNG	Ethylene glycol aqueous solution
Design flow	Customized as required	
Design power	Customized as required	
Certification	CCS/DNV/BV/ABS	

Performance Features

1. It may operate in explosive gas atmosphere and has high safety performance.
2. It heats quickly, and is less liable to scaling and free from maintenance in daily use.
3. It has low resistance on water side, efficient heat exchange and high energy utilization rate.
4. It is provided with multi−stage heating elements, and has accurate temperature control and remote control.

REGASIFICATION APPLICATION

APPLICATION SCOPE



Major Functions

Unloading

Gasify LNG in the tanker by vaporizer and return to gas phase of tanker to raise pressure in the tanker,and download LNG into cryogenic storage tank by differential pressure through top filling port.

Pressure regulation of storage tank

When tank pressure is excesssively high, use BOG in the tank preferentially; when pressure is low, pressurize regulating valve is opened automatically, LNG flow into booster and gasified through liquid phase pipeline, after that return to the tank to rise pressure.

Gasification

LNG in storage tank flow into vaporizer through outlet port, after gasified by vaporizer, temperature up to one that not less than ambient tenlperature 5-15℃. Heat exchanger is necessary, where low winter temperature present.

Pressure regulating

Regulate gasified natural gas by regulating device to supply to user with suitable pressure and able to enter pipe network.

Metering

If need to measure flow of natural gas, flow meter needs to be equipped after regulating.

Odorization

Odorizing before natural gas into pipe network by manual or automation, ensure gas leakage can be detected.

Venting

When pressure is higher than MAWP, open safety valve automatically, gas is vented to air through EAG heat exchanger.

LNG REGASIFICATION SKID

LNG CYLINDER REGASIFICATION SKID

Technical Specifications

Design Temperature	-196℃~50℃
Ambient Temperature	-30℃~55℃
Design Volume	As Demanded
Total Volume	≤4m³
Cylinder Working Pressure	1.6MPa
Outlet Pressure	≤0.4MPa
Supply Capacity	Demanded
Recommended Gasify Capacity	50/100/200/300/400Nm³/h

LNG GAS SUPPLY SKID OF ROAD TANKER

(THE TANKER REPLACES STORAGE TANK ,WORKING AS STORAGE)

Technical Specifications

Design Temperature	−196℃~50℃	Weight	Custom− made
Ambient Temperature	−30℃~55℃	Outlet Pressure	≤0.4MPa
Road Tanker	Road Tanker (Customer−supplied)	Capacity of Supply	As Demanded
Type of Skid−mounted	Non−skid Type	Recommended Capacity of Gasification	500/ 600/700/800Nm³/h 1000/1200/1500/2000Nm³/h

LNG SPLIT−TYPE GAS SUPPLY SKID

Technical Specifications

Design Temperature	−196℃~50℃	Weight	Custom− made
Ambient Temperature	−30℃~55℃	Outlet Pressure	≤0.4MPa
Storage Device	Storage Tank / Road Tanker	Capacity of Supply	On Demand
Type of Mounted−skid	Non−skid (Inside a Separate Cofferdam)	Recommended Capacity of Gasification	500/ 600/700/800Nm³/h 1000/1200/1500/2000Nm³/h

LNG COMPLETE INTEGRATED REGASIFICATION SKID

Technical Specifications

Design Temperature	−196℃~50℃	Design Pressure of Tank	0.8MPa
Ambient Temperature	−30℃~55℃	Outlet Pressure	≤0.4MPa
Working Life	15years	Supply Capacity	Demanded
Design Volume	Demanded	Recommended Gasify Capacity	500/800/1000/1200Nm³/h

LNG PERMANENT REGASIFICATION STATION

Performance Features

1. Applicable to civil, industrial, peak shavings with large gas demand
2. It integrates gasification, reheating, pressure regulation, metering, odorizing and electrical control functions of the LNG gas supply station and these functions can be disassembled or reorganized according to the situation.
3. Intrinsically safe, with prompt and automatic processing functions when abnormal conditions occur
4. The control system covers data acquisition, process control, safety and ESD, etc., to implement decentralized control and centralized management of equipment.
5. With complete data storage, query and management functions; flow meter with temperature and pressure compensation
6. The equipment configuration and design parameters are flexibly adjusted according to requirements, with complete functions

CUSTOMIZED PRODUCTS

CUSTOMIZED SKID EQUIPMENT

Product Description

Skidded equipment is to mount all the functional components on a complete structure,it is erected and moved integrally. Its production and assemly is done in workshop,onsite erection work is minimized. Compared with traditional installation, skid type has less footprint, less contruction period and cost as well as more convenient erection and can be relocated; HQHP is a professional skid equipment producer with vast skid equipment assemly experiences and expertise.We are able to assemble different skids according to customer requirements. Meanwhile the control system is also able to be integrated on the skid,which means customers only need to connect the power and pipeline before the equipment to start operation.

Application

Be able to design,develop and produce skidded equipment according to customers flow diagram and other requirements.

INTERNET OF THINGS TECHNOLOGY

- IC CARD MANAGEMENT SYSTEM OF FILLING STATION
- PLATFORM OF HOPNET EQUIPMENT SUPERVISION SYSTEM

IC CARD MANAGEMENT SYSTEM OF FILLING STATION

System Overview

The IC card management system of refueling station is a safe, reliable, unified & efficient and quick responsive information management system that fully utilizes modern high-tech to integrate modern intelligent CPU card technology, micro-processing technology, electronic technology, network technology, industrial control technology and database technology. The system collects and stores the data of varied measuring equipment on the station to generate relevant daily business reports for production in accordance with the actual sales volume and equipment operation conditions, providing data and decision-making basis for the Group management and control.

System functions

1. Permissions application management (agency and site management, user management and authorization)
2. IC card application management (issuing, recharging, loss reporting, loss unregistering, logout)
3. Report application management (station-level report, company-level report), preferential application management (consumption of points, exchange of points)
4. Third-party payment interface (banking, Alipay, WeChat)

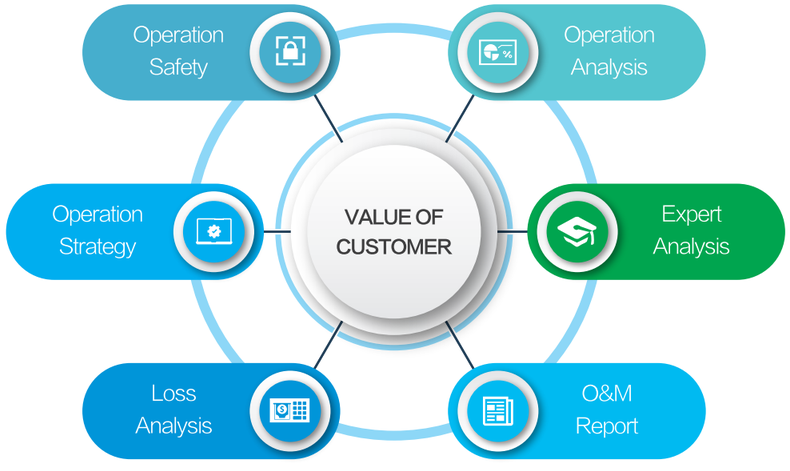
PLATFORM OF HOPNET EQUIPMENT SUPERVISION SYSTEM

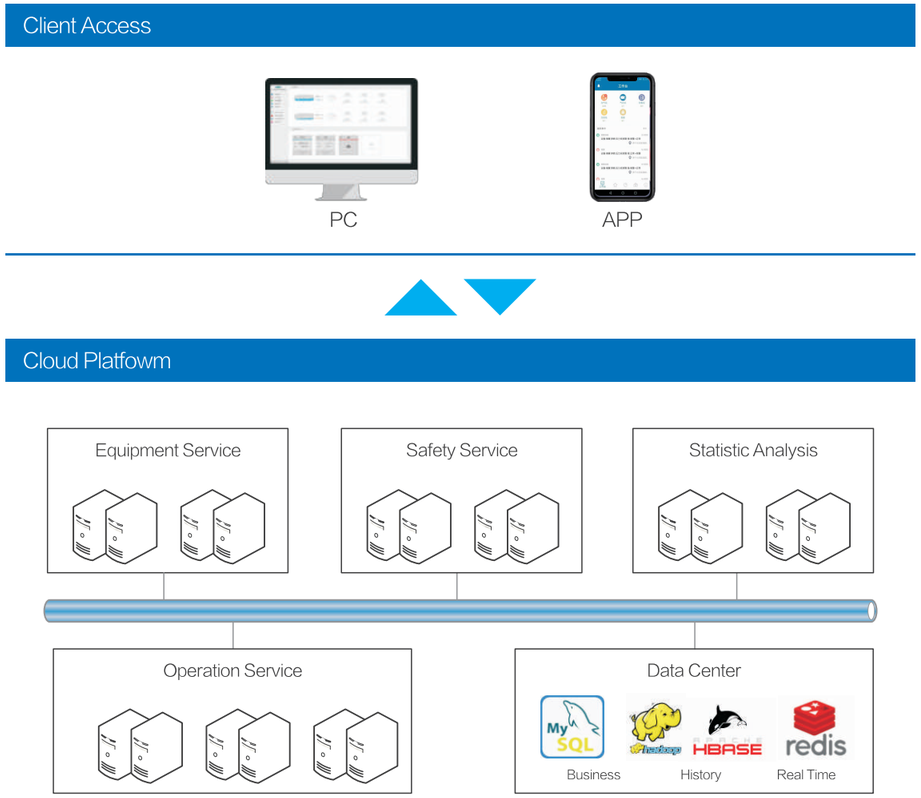
Product Description

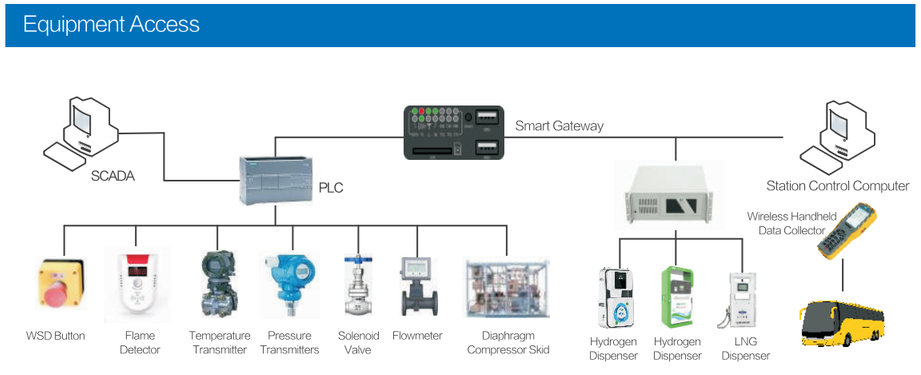
System overview: With the Company's years of industry experience in the field of clean energy, the platform of HopNet equipment supervision system combines with the internet of things technology to provide users with one-stop solutions in the internet of things for the most cutting-edge energy applications, discrete equipment monitoring, remote equipment supervision, equipment maintenance and repair, and internet of things for pan-industrial energy applications, which can be applied to natural gas refueling stations, hydrogen refueling stations, petrol stations, oil depots, ships and the like.

Performance Features

1. Visual data management
2. Real-time equipment monitoring system
3. Equipment maintenance system
4. Equipment warranty system
5. Equipment inspection system
6. Alarm push







Visual Data Display

Mobile Interface

KEY COMPONENT

Through R&D and innovation, core parts and components are produced in by ourselves. contributing to "Smart China Production"

MASS FLOWMETER

Coriolis Mass Flowmeter, Hydrogen Mass Flowmeter, Coriolis Wet Gas FlowMeter
Extended-throat Venturi Tube Gas-Liquid Two-Phase Flowmete
Crescent Orifice Gas-Liquid Two-phase Flowmeterr, Microwave Nozzle Gas-LiquidTwo-phase Flowmeter

CRYOGENIC PUMP

Cryogenic Submerged Centrifugal Pump-Immersed Type
Cryogenic Reciprocating Pump

REFUELING NOZZLE

LNG Refueling Nozzle & Receptacle
35MPa Hydrogen Refueling Nozzle
70MPa Hydrogen Refueling Nozzle

VALVES

HP Hydrogen Breakaway Device, High Pressure Solenoid Valve
High Pressure Breakaway Coupling, Cryogenic breakaway coupling
Dry Disconnect Coupling

VACUUM PRODUCTS

Vacuum Insulated Cryogenic Pipe (exteranational compensation, internal compensation, flexibile)
Vacuum On-line Detection System
Vacuum Insulated Vessl(Pump Sump / Valve Box)

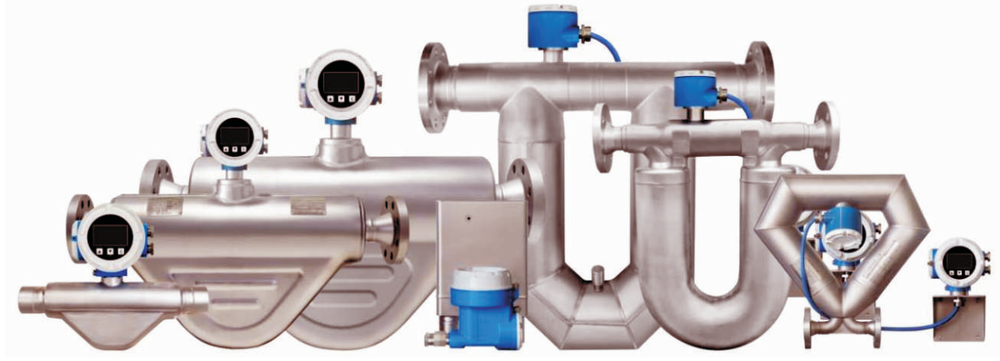
NON-STANDARD CONTAINER

Gas-Liquid Separator
Cryogenic Liquefaction (Subcooling) Device
Electrical Heating Water-bath Vaporizer, Ambient vaporizer

CORIOLIS MASS FLOWMETER

For the measurement of mass flow rate, volume flow rate, temperature and density of cryogenic,high pressure and normal medium.Highest accuracy can reach 0.05 grade

Compliance with ATEX Code Requirements



MASS FLOWMETER

Product Description

Coriolis mass flowmeter can be used to directly measure the mass flow rate, density and temperature of flow meter medium. The flowmeter is an intelligent instrument based on digital signal processing, thus adozen of parameters can be output for the application of users according to the three fundamental quantities above. Featured with flexible configuration, strong function and high cost performance, the Coriolis mass flowmeter is a new generation of high-precision flow instrument.

Technical Specifications

Accuracy	Level 0.15，Level 0.2，level 0.5（default）,Level 1.0...
Repeatability	0.075%、0.1%、0.25%(default)、0.5%
Density	±0.001cm^3
Temp	± 1 ℃ ± 0.5% × reading (℃)
Ambient Temp	-40℃~55℃
Relative Humidity	≤95%
Medium	Gas,Liquid and Multi-phase Flow
Housing Material	304 Stainless Steel, ZL401(Transmitter)
Meter Tube Material	Customizable Materials are Available, Such as Monel 400 and Hastelloy C22 Etc.

Performance Features

1. It passed ATEX, CCS, IECEx and PESO certificates.
2. It can be used to directly measure mass flow rate of fluid in pipeline without the influence of temperature, pressure and flow velocity.
3. High accuracy and excellent repeatability.
4. Wide measurement range ratio (100:1).
5. Cryogenic and high pressure calibration is employed for high-pressure flowmeter.

HYDROGEN MASS FLOWMETER

AMF0056AF

Product Description

Hydrogen mass flowmeter is widely used in hydrogen trade measurement fields such as hydrogen dispenser and hydrogen station.

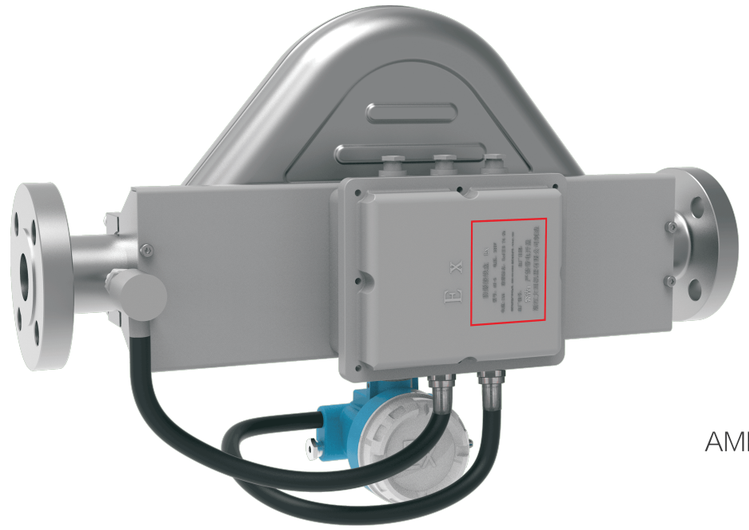
Technical Specifications

Model	AMF006AH	Rated Working Pressure	35MPa/70MPa
DN	DN6	Temp	Medium:−40℃ ~ 70℃ Ambient:−25℃ ~ 55℃
Medium	H_2	Output Signal	Modbus/RS−485/Pulse Output (4−20)mA Current Loop / HART Protocol
Accuracy	Level 0.5,Level 1.0	Power	12VAC ~ 28VAC/15VDC ~ 40VDC
Repeatability	0.25%, 0.5%	Atria	316L
Flow Range	(0.5−5)kg/min		

Performance Features

1. Small flow and high accuracy;
2. IIC explosion−proof certification;
3. Calibration of actual working conditions, highly adaptable to working conditions.

CORIOLIS WET GAS FLOWMETER



AMPF−C050

Product Description

It is used for high precision and consistent measurement and monitoring in real time of the gas content/liquid content,gas flow,liquid flow and total flow in natural gas/well gas.

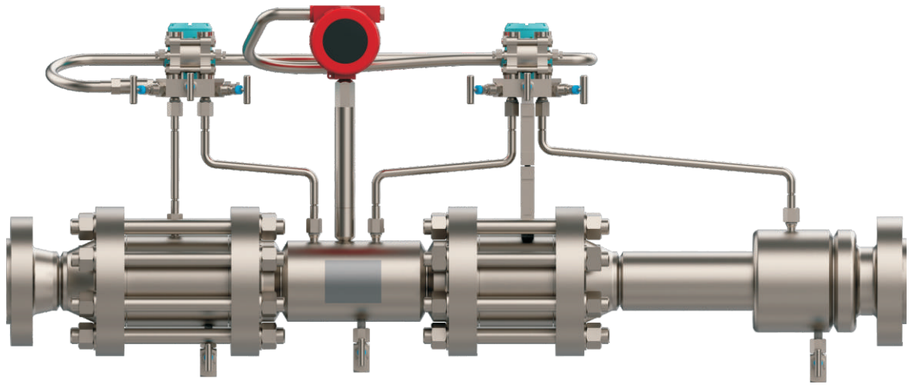
Technical Specifications

DN	DN50~DN100	Ambient Temperature	−40℃ ~ +55℃
Flow Range	Gas phase:(0~5 × 105)Nm^3/d liquid phase:(0~1000)Nm^3/d	Dimension	167mm × 591mm × 715mm
Accuracy	Gas phase: ± 3% liquid phase: ± 5%	Material	304，316L(can be customized)
GVF	(80 ~ 100)%	Explosion−proof grade	Exd II B T5 Gb
Design Pressure	6.3MPa ~ 10MPa	Protection Rating	IP67

Performance Features

1. Designed for the wet gas two−phase flow condition of well gas.
2. Based on Coriolis mass flow sensor.
3. Base on mass phase fraction measurement of Coriolis force, and total flow measurement technology of multi−physical field coupling and hydrodynamic model.
4. Measurement based on gas−liquid two−phase mass flow.
5. The gas mass fraction (GMF) ranges from 30% to 100%, and the gas volume fraction (GVF) ranges from 80% to 100%.

EXTENDED-THROAT VENTURI TUBE GAS-LIQUID TWO-PHASE FLOWMETER



HHTPF-LV

Product Description

Based on theoretical analysis and computational fluid dynamic (CFD) numerical simulation technology, the extended-throat venturi tube gas-liquid two-phase flowmeter is optimally designed as a throttling element. The self-developed holdup metering technology based on double differential pressure ratio method is suitable for the measurement of gas-liquid two-phase flow at natural gas wellhead with medium and low liquid holdup.

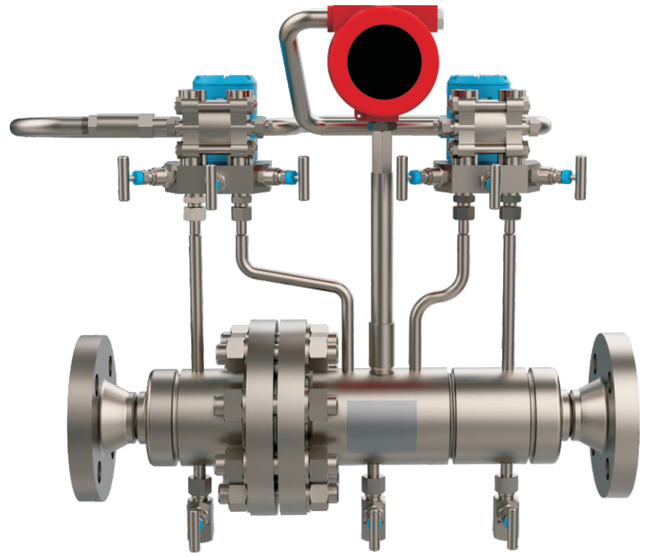
Technical Specifications

Gas-phase measurement accuracy	± 5%	Diameter	DN50, DN80
Liquid-phase measurement accuracy	± 10%	Design pressure	6.3MPa, 10MPa, 16MPa
Liquid holdup measurement range	0~10%	Material	304, 316L, hard alloy, nickel-base alloy

Performance Features

1. Patented technology: Self-developed holdup metering technology based on double differential pressure ratio method
2. Non-separated metering: Measurement of gas-liquid two-phase mixed flow at natural gas wellhead, without using separator
3. Zero radioactivity: Without gamma ray source, safe and environment friendly
4. Wide application: Suitable for conventional gas fields, shale gas fields, tight sandstone gas fields, coalbed methane fields, etc.

CRESCENT ORIFICE GAS-LIQUID TWO-PHASE FLOWMETER



HHTPF-CP

Product Description

Crescent orifice gas-liquid two-phase flowmeter, aiming at the gas-liquid two-phase flow condition of the stratified flow, creatively employs non-axisymmetric crescent orifice throttling element, and combines the self-developed holdup metering technology based on double differential pressure ratio method, which is suitable for gas-liquid two-phase flow measurement at natural gas wellhead with medium and high liquid holdup.

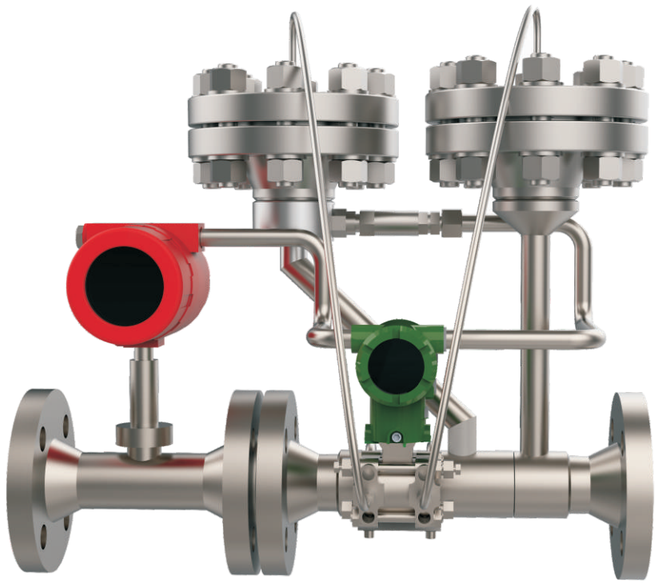
Technical Specifications

Gas-phase measurement accuracy	± 5%	Diameter	DN50, DN80
Liquid-phase measurement accuracy	± 10%	Design pressure	6.3MPa, 10MPa, 16MPa
Liquid holdup measurement range	0~15%	Material	304, 316L

Performance Features

1. Patented technology: World's first non-axisymmetric throttling element for measuring gas-liquid two-phase flow
2. Non-separated metering: Measurement of gas-liquid two-phase mixed flow at natural gas wellhead, without using separator
3. Zero radioactivity: Without gamma ray source, safe and environment friendly
4. Strong adaptability to flow pattern: The non-axisymmetric throttling element design is especially suitable for stratified flow, wavy flow, slug flow and other flow patterns with medium and high liquid holdup.

MICROWAVE NOZZLE GAS-LIQUID TWO-PHASE FLOWMETER



HHTPF-NZ

Product Description

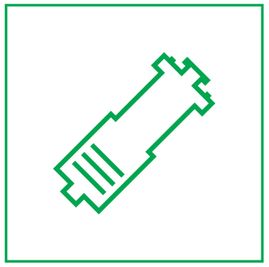
Microwave nozzle gas-liquid two-phase flowmeter efficiently combines microwave technology with nozzle throttling device, and uses nozzle throttling device to measure total gas-liquid flow and microwave technology to measure liquid holdup. It is suitable for gas-liquid two-phase flow measurement at natural gas wellhead with liquid holdup ranging from 0% to 100%. It possesses independent intellectual property rights and home-made core components, providing stable quality and good reliability.

Technical Specifications

Gas-phase measurement accuracy	± 5%~ ± 10%	Diameter	DN50, DN80
Liquid-phase measurement accuracy	± 5%~ ± 10%	Design pressure	6.3MPa, 10MPa, 16MPa
Liquid holdup measurement range	0~10%	Material	304, 316L, nickel-base alloy

Performance Features

1. Patented technology: China's first microwave technology for measuring gas-liquid two-phase flow
2. Non-separated metering: Measurement of gas-liquid two-phase mixed flow at natural gas wellhead, without using separator
3. Zero radioactivity: Without gamma ray source, safe and environment friendly
4. Wide liquid holdup measurement range: Suitable for working conditions with liquid holdup ranging from 0% to 100%



CRYOGENIC PUMP

CRYOGENIC SUBMERGED CENTRIFUGAL PUMP-IMMERSED TYPE

ADSP20-280-15

LFP20-280-15

LFP30-280-22

LFP40-280-25

Product Description

Cryogenic centrifugal pump is a special pump used in ships, petroleum units, air separation plants and chemical plants and for transporting cryogenic liquid (such as liquid nitrogen, liquid argon, liquid hydrocarbon and liquefied natural gas). It is used to transport cryogenic liquid from low-pressure places to high-pressure places.

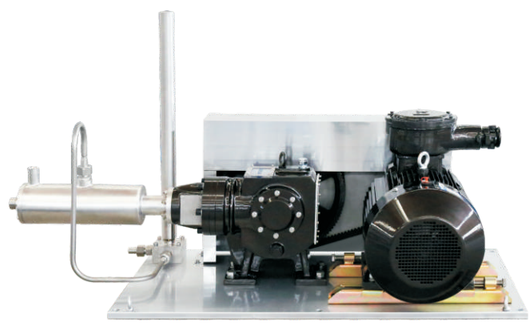
Technical Specifications

Model	ADSP20-280-15	LFP20-280-15	LFP30-280-22	LFP40-280-25
Maximum Flow	25m^3/h	25m^3/h	40m^3/h	50m^3/h
Rated Flow	20m^3/h	20m^3/h	30m^3/h	40m^3/h
Maximum Lift	336m	336m	336m	336m
Rated Lift	280m	280m	280m	280m
Rated Power	15kW	15kW	22kW	25kW
Rated Voltage	380V	380V	380V	380V
Rated Frequency	85Hz	85Hz	85Hz	85Hz
Certificate Requirements	CNEX	CNEX、ATEX	CNEX、CCS	CNEX、CCS

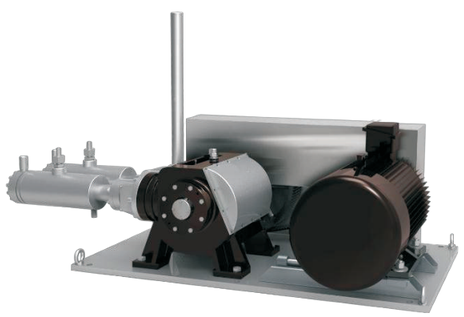
Performance Features

1. Fully-balanced axial force, and long service life of bearing.
2. High flow rate and high refueling efficiency.
3. High lift and wide application scope.
4. Strong installation interchangeability.

CRYOGENIC RECIPROCATING PUMP



LPP1500-250 Horizontal Single-row Type



LPP3000-250 Horizontal Double-row Type

Product Description

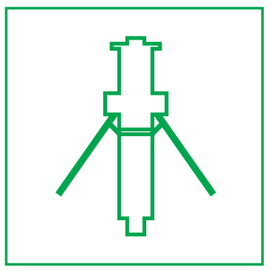
It can be used to fill high-pressure gas cylinder of L-CNG filling station;It is applicable to cryogenic high-pressure pressurization system to pressurize medium for use.

Technical Specifications

Model	LPP1500-250/LPP3000-250	Drive Ratio	3.5:1
Piston Diameter/Stroke	50/35mm	Power	LPP1500-250(30kW) LPP3000-250(55kW)
Motor speed	416r/min	Power Supply Voltage	380V/50Hz
Flow	1500L/h	Phase	3
Suction Pressure	0.2bar~12bar	Cylinder	LPP1500-250(1) LPP3000-250(2)
Max. outlet Pressure	250bar		

Performance Features

1. Made of specially low-temperature filled PTFE, with long service life.
2. Leak detection device ensures safe and reliable use.
3. The transmission box is equipped with oil temperature detection and online alarm device to ensure lubrication safety.
4. Non-failure high vacuum insulation ensures the efficient operation of the pump.



REFUELING NOZZLE

LNG REFUELING NOZZLE & RECEPTACLE

T605 Vacuum Refueling Nozzle

T602 Receptacle

Product Description

Rotate the handle to connect vehicle receptacle;the check valve elements in both the refueling nozzle and the receptacle are forced to open with force from each other, in this way,the refueling route is open; when remove the refueling nozzle,the check valve elements in both the refueling nozzle and the receptacle will resume to its original position under the pressure of medium and spring, to make sure that complete seal in place and not leakage will occur.

Technical Specifications

Model	T605	T602
Max. Filling Pressure	1.6MPa	1.6MPa
Max. Working Pressure	3.5MPa	3.5MPa
Filling Flow	190L/min	190L/min
Type of Seal	Spring Energy Storage Seal Ring	Spring Energy Storage Seal Ring
Interface Size	M36 × 2	M42 × 2
Main Body Material	304 Stainless Steel, Ultralumin	Stainless Steel

Performance Features

1.Vacuum layer design slows down frosting and icing on the surface of the nozzle;
2. Three-claw design with forced claw opening to avoid spring freezing;
3. Safety lock mechanism to prevent nozzle blow;
4. The large filling flow enables faster filling of LNG vehicles;
5. Tile positioning to prevent nozzle dropping;
6. High-performance energy storage sealing ring to avoid leakage during filling.

35MPa HYDROGEN REFUELING NOZZLE

T631–B
T633–B

Product Description

The 35MPa hydrogen refueling nozzle is designed according to international and national regulations.It has good compatibility. Its body material is made of high strength stainless steel, seal mateials use specifically made seal pieces. Its appearance design is ergonomical.

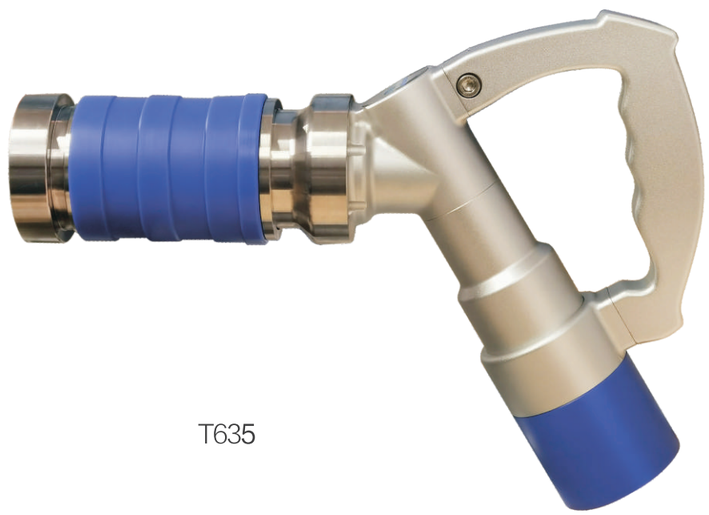
Technical Specifications

Model	T631	T633
Medium	H_2	H_2
Operating Temperature	−40℃ ~ 85℃	−40℃ ~ 85℃
Rated Operating Pressure	35MPa	35MPa
Nominal Diameter	DN8	DN12
Inlet Port Size	9/16” −18 UNF	7/8” −14 UNF
Discharge Port Size	7/16” −20 UNF	9/16” −18 UNF

Performance Features

1. It conforms to relevant standards at home and abroad, and has good compatibility.
2. It is made of high−strength stainless steel and resistant to hydrogen embrittlement.
3. The seal is made of special sealing materials and reliable.

70MPa HYDROGEN REFUELING NOZZLE



T635

Product Description

70MPa hydrogen nozzle is of self−locking mechanism, which can realize the safe refueling of HP hydrogen after being reliably connected with the hydrogen refueling receptacle. The hydrogen nozzle is provided with infrared communication function to communicate with the vehicle−mounted system, so that, in case of emergency, the hydrogen dispenser may receive the signals from the vehicle−mounted system to realize emergency stop function and ensure the refueling safety.

Technical Specifications

Medium	H_2	Nominal Diameter	DN4
Medium temperature	−40℃ ~ +85℃	Inlet Port Size	9/16”−18UNF
Ambient temperature	−40℃ ~ +60℃	Explosion−proof grade	Ex ia IIC T4 Gb
relative humidity	≤95%	Protection Rating	IP65
Rated Operating Pressure	70MPa		

Performance Features

1. It conforms to relevant standards at home and abroad, and has good compatibility.
2. It is made of high−strength stainless steel and resistant to hydrogen embrittlement.
3. The seal is made of special sealing materials and reliable.

T136-N
T137-N

Product Description

T13 series breakaway device, applied to HP hydrogen refueling scenario, is a safety protection product designed to prevent the hydrogen hose or other parts from being damaged by abnormal external force.

Technical Specifications

Model	T136-N	T137-N
Medium	H_2, N_2	H_2, N_2
Working temperature	-40℃ ~ +85℃	-40℃ ~ +85℃
Rated working pressure	35MPa	35MPa
Nominal diameter	DN8	DN12
Size of intake pipe nozzle	9/16"-18UNF	7/8"-14UNF
Size of exhaust pipe nozzle	7/16"-18UNF	9/16"-18UNF
Breaking force	400N~6000N	400N~6000N

Performance Features

1. Quick sealing, safe and reliable
2. Reusable after breakaway, low maintenance cost
3. Customizable design

HIGH PRESSURE SOLENOID VALVE

Compliance with
ATEX Code Requirements

T504

T502

Product Description

Valve element can be driven via electromagnetic force generated by solenoid coil to achieve valve opening and closing and open or cut off medium access. In this way, automation control of gas filling process is achieved.

Technical Specifications

Model	T502	T504
Working Pressure	25MPa	25MPa
Pressure of Strength Test	37.5MPa	37.5MPa
Nominal Diameter	DN10	DN20
Working Temperature	−40℃ ~ 50℃	−40℃ ~ 50℃
Port Size	G3/8"(Customizable)	G1"(Customizable)

Performance Features

1. It obtains ATEX and IECEX certifications.
2. It is more suitable for the complex working conditions of domestic media containing much oil and water and has stable performance.
3. It may automatically control gas filling process and work safely and reliably.

HIGH PRESSURE BREAKAWAY COUPLING

T101

T103

Product Description

It is installed on filling/discharging hose of gas filling/discharging device. When it bears a certain external force, it will be automatically cut off to prevent leakage. In this way, fire, explosion and other safety accidents caused by unexpected fall−down of gas filling device or breaking of filling / discharging hose due to man−made misoperation or violation operation can be also avoided.

Technical Specifications

Model	T101	T103
Working Pressure	⩽25MPa	⩽25MPa
Pressure of Strength Test	37.5MPa	37.5MPa
Pulling Strength	400N~600N	600N~900N
Nominal Diameter	DN8	DN20
Port Size	G3/8" (Customizable)	NPT1" (Customizable)
Material	Stainless Steel/PCTFE	Stainless Steel/PCTFE

Performance Features

1. It has the function of automatic pull−off and rapid seal, which is safe and reliable.
2. It can be repeatedly used by re−assembly after pull−off and its maintenance cost is low.
3. Pulling strength and connection mode can be customized by according to user demands.

CRYOGENIC BREAKAWAY COUPLING

T102

T105

Product Description

It is installed on filling/discharging hose of LNG filling device. When it bears a certain external force, it will be automatically cut off to prevent leakage. In this way, fire, explosion and other safety accidents caused by unexpected fall-down of gas filling device or breaking of filling/discharging hose due to man-made misoperation or violation operation can be also avoided.

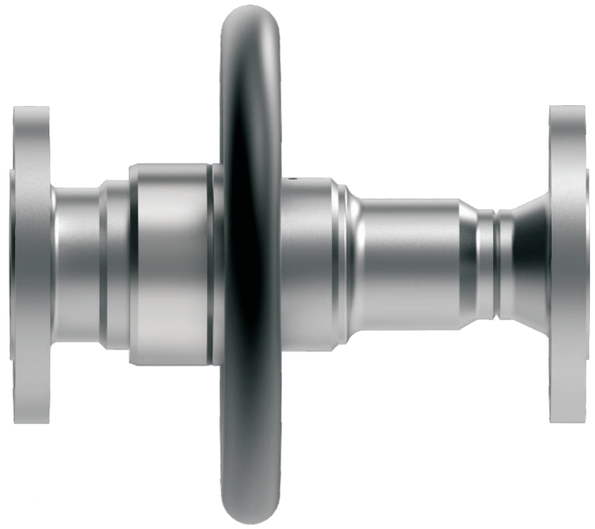
Technical Specifications

Model	T102	T105
Working Pressure	≤1.6MPa	≤1.6MPa
Pulling Strength	400N~600N	400N~600N
Nominal Diameter	DN12	DN25
Port Size	Inlet:Internal Thread Outlet:External Thread(Customizable)	NPT 1(Inlet) $1\frac{15}{16}$-12 UNF (Outlet) (Customizable)
Material/Sealing Material	304 Stainless Steel/Copper	304 Stainless Steel/Copper

Performance Features

1. It has the function of automatic pull-off and rapid seal, which is safe and reliable.
2. It has a simple structure and its flow channel is smooth. Compare with same diameter, its flow is larger.
3. Its pulling strength is stable and it can be repeatedly used by replacing tensile part, which decides that its maintenance cost is low.
4. Pulling strength and connection mode can be customized by according to user demands.

DRY DISCONNECT COUPLING



Product Description

Dry quick coupling is a mechanical device that can quickly connect and disconnect the hose refueling system of the refueling facilities with the header of the refueled vessel safely without using bolts. The dry quick coupling consists of two parts, i.e., coupler (female coupling) and adaptor (male coupling).

Technical Specifications

Product model	T621-DN50/T622-DN50
Medium	Liquefied natural gas (LNG)
Rated working pressure	1.6MPa
Design pressure	2.5MPa
Design temperature	-196℃ ~ +85℃

Nominal diameter	DN25 ~ DN100
Fluid-contacting material	022Cr17Ni12Mo2 (316L)
Interface type	HG/T 20592-2009,RF,DN50,PN40
Radial angle deviation	≤5°
Reference standards	GB/T 39038-2020/ISO 21593:2019 Ship and Marine Technology - Technical Requirements for Liquefied Natural Gas Bunkering Dry-Disconnect/Connect Coupling

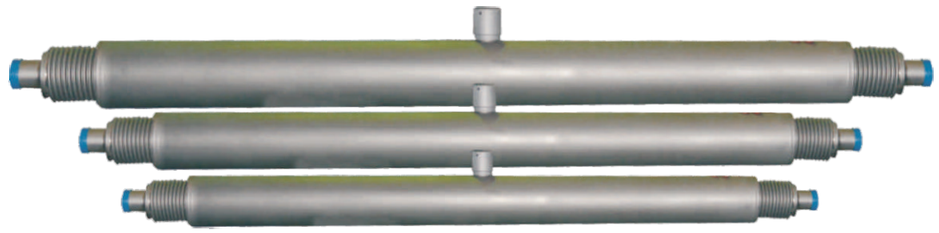
Performance Features

1. Simple operation and quick connection
2. Good low-temperature sealing performance, safe and reliable
3. High flow rate and high refueling efficiency

VACUUM INSULATED CRYOGENIC PIPE

(EXTERNATIONAL COMPENSATION)

VACUUM
PRODUCTS



Product Description

Vacuum insulated cryogenic pipe (built-out compensation) is a kind of cryogenic medium conveying pipe which adopts high vacuum multi-layer and multi-screen insulated technology and places corrugated expansion joints on the outside of the pipe to compensate the displacement load caused by working temperature.

Technical Specifications

--- ---	Inner pipe	Outer pipe
Design pressure	≤4MPa (customizable)	-0.1MPa
Design temperature	-196℃	Ambient temperature
Applicable medium	LN_2, LNG, LO_2, etc.	
Design standards	JB/T 12665, Q/67969343-9.01	
Inlet/outlet connection	Flange, welding, etc.	

Performance Features

1. Expansion joint is externally mounted, and there is no weak point inside the pipe;
2. It is especially suitable for severe working conditions with high pressure and frequent alternating;
3. Standardized products, with short prefabrication and construction period.

VACUUM INSULATED CRYOGENIC PIPE
(INTERNAL COMPENSATION)

Product Description

Vacuum insulated cryogenic pipe (built-in bellos) is a kind of cryogenic medium conveying pipe which adopts high-vacuum multi-layer and multi-screen insulated technology, placing corrugated expansion joints in the pipe and compensating the displacement load caused by working temperature in sections without the need of external pipe system compensation.

Technical Specifications

--- ---	Inner pipe	Outer pipe
Design pressure	≤2.5MPa	-0.1MPa
Design temperature	-196℃	Ambient temperature
Applicable medium	LN_2, LNG, LO_2, etc.	
Design standards	JB/T 12665, Q/67969343-9.01	
Inlet/outlet connection	Flange, welding, etc.	

Performance Features

1. It has high vacuum degree, good insulation performance and less heat leakage;
2. It has high degree of factory prefabrication and less field construction;
3. It is provided with built-in displacement compensation, not requiring external piping compensation;
4. The insulation layer is not thick, efficiently saving the installation space.

VACUUM INSULATED CRYOGENIC PIPE
(FLEXIBILE)

Product Description

Vacuum insulated cryogenic pipe (flexibile) is a kind of cryogenic medium conveying pipe with high vacuum multilayer and multiscreen insulated technology and flexible structure.

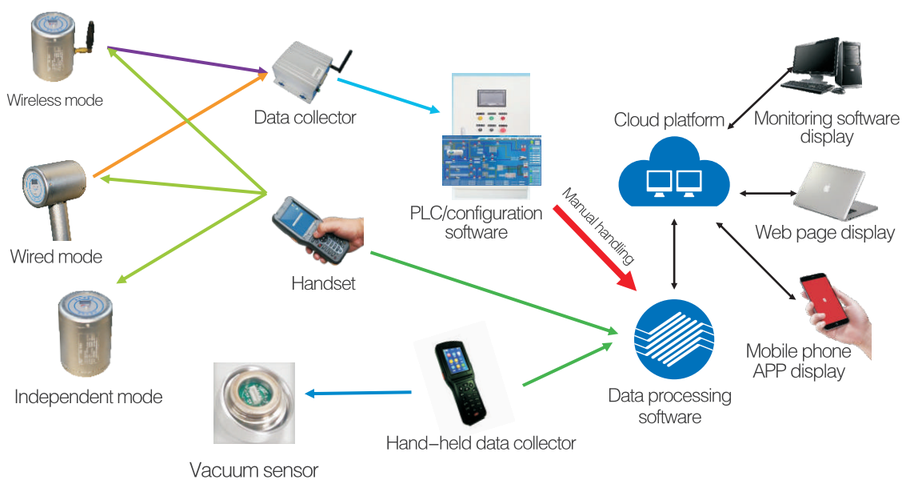
Technical Specifications

--- ---	Inner pipe	Outer pipe
Design pressure	≤4.0MPa	-0.1MPa
Design temperature	-196℃	Ambient temperature
Applicable medium	LN_2, LNG, LO_2, etc.	
Design standards	Q/67969343-9.01	
Inlet/outlet connection	Flange, welding, etc.	

Performance Features

1. It is convenient to connect in case of position deviation of pipe orifice or equipment;
2. It is provided with built-in cryogenic insulation support, efficiently preventing excessive bending damage;
3. It is of certain flexibility as a whole and may absorb partial displacement or vibration.

VACUUM ON-LINE DETECTION SYSTEM



Product Description

The vacuum online detection system can detect the vacuum degree of the product in real time through the vacuum preset vacuum intelligent core inside the product, and the vacuum degree of the product after collection can be transmitted to the cloud center through the transmission link to provide customers with digital display.

Technical Specifications

--- ---	Liner	Shell
Design pressure	≤2.5MPa	−0.1MPa
Design temperature	−196℃	Ambient temperature
Applicable medium	LN_2, LNG, LO_2, etc.	
Category of container	Class II	
Effective volume	85L (customizable)	
Design standards	GB/T 150	
Inlet/outlet connection	Flange, welding, etc.	

Performance Features

1. It may predict vacuum life in real time, helping find problems in advance and make plans;
2. In case of emergency, it can be safely linked to the station control system to reduce losses;
3. The placement of RFID into vacuum intelligent core provides unique ID identification and lifecycle traceability query functions.

VACUUM INSULATED CRYOGENIC PUMP SUMP

Product Description

Vacuum insulated cryogenic pump sump is a kind of cryogenic pressure vessel which adopts high vacuum multilayer and multiscreen insulated technology and provides a good operating environment for cryogenic submersible pump with characteristics of simple structure, compact design and stable performance.

Technical Specifications

--- ---	Liner	Shell
Design pressure	≤2.5MPa	−0.1MPa
Design temperature	−196℃	Ambient temperature
Medium	LN2, LNG, LO2, etc.	
Category of container	Class II	
Main material	06Cr19Ni10, etc.	
Design standards	GB/T 150	
Supervision code	TSG 21	
Inlet/outlet connection	Flange, welding, etc.	

Performance Features

1. It has compact design, covers small area, and is beneficial to equipment integration;
2. It has good insulation performance and is suitable for cryogenic medium conveying;
3. It has simple structure, low use and maintenance costs, stable and reliable operation.

VACUUM INSULATED CRYOGENIC VALVE BOX

NON-STANDARD CONTAINER

Product Description

Vacuum insulated cryogenic valve box is an integrated multifunctional box module that integrates low-temperature valves, pipe fittings and pipes into a closed module using high-vacuum multi-layer and multi-screen insulated technology. It has the characteristics of good adiabatic performance, compact design, convenient operation and stable operation performance.

Technical Specifications

--- ---	Inner pipe	Outer pipe
Design pressure	≤4MPa	-0.1MPa
Design temperature	-196℃	Ambient temperature
Applicable medium	LN_2, LNG, LO_2, etc.	
Design standards	Q/67969343-9.03	
Inlet/outlet connection	Flange, welding, etc.	

Performance Features

1. It's highly integrated and of compact structure, and covers small area;
2. It has good insulation performance, fast precooling and less liquid evaporation;
3. There is no expansion joint inside, and it has integral structure compensation and long service life.

GAS-LIQUID SEPARATOR

Product Description

Gas-liquid separator is a device that separates gas-liquid mixture by gravity sedimentation, baffle separation, centrifugal separation and packing separation.

Technical Specifications

--- ---	Inner container	Shell
Design pressure	≤2.5MPa	-0.1MPa
Design temperature	-196℃	Ambient temperature
Applicable medium	LN_2, LNG, LO_2, etc.	
Category of container	Class II	
Effective volume	Customizable	
Design standards	GB/T 150	
Inlet/outlet connection	Flange, welding, etc.	

Performance Features

1. It has high separation efficiency by integrating multiple separation methods;
2. With small flow resistance, the pressure loss of the equipment is small;
3. High vacuum insulated shell reduces heat leakage and liquid evaporation.

CRYOGENIC LIQUEFACTION (SUBCOOLING) DEVICE

Product Description

Subcooling (liquefaction) device is a device that uses the refrigerant to absorb part of the heat of the media through the heat exchanger to convert the media into subcooled state or make them re-liquefied by saturated gas.

Technical Specifications

--- ---	Tube side	Shell side
Design pressure	≤2.5MPa	≤0.4MPa
Design temperature	-196℃	-196℃
Applicable medium	LNG, LO2, etc.	LN_2, etc.
Temperature difference between inlet and outlet	≥10℃	
Design flow	≤30m^3/h	≤20m^3/h

Performance Features

1. By subcooling the medium, it realizes zero-loss transportation of cryogenic medium;
2. It combines a variety of heat exchange core structures, taking into account efficient heat exchange and working condition requirements;
3. The high vacuum insulated shell reduces refrigerant consumption.

ELECTRICAL HEATING WATER-BATH VAPORIZER

Product Description

Electrical heating water-bath vaporizer is a kind of heat exchange equipment that directly heats water with electric energy, and vaporizes and heats the medium in the equipment with hot water.

Technical Specifications

--- ---	Tube side	Shell side
Design pressure	≤45MPa	Atmospheric pressure
Design temperature	-196℃	100℃
Applicable medium	LN_2, LNG, LO_2, etc.	Water
Design flow	≤ 5000m^3/h (customizable)	
Explosion-proof grade	Exd IIB T4 Gb	

Performance Features

1. It has compact structure, simple installation and maintenance, and covers small area;
2. It realizes water vaporization by heating with electric energy and is not affected by external low temperature;
3. It is provided with high/low level detection to prevent dry burning and overflow;
4. It controls heating power automatically to save energy and reduce emission.

AMBIENT VAPORIZER

Product Description

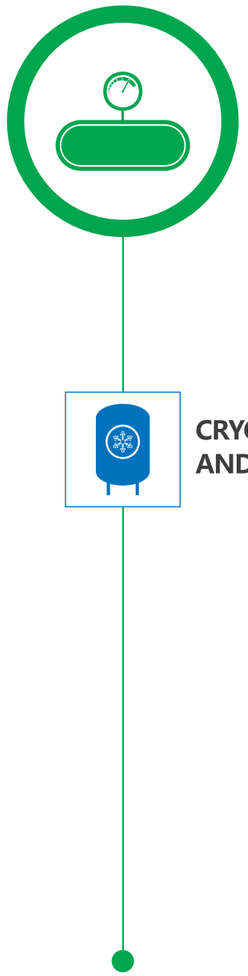
Ambient vaporizer is a kind of heat exchanger that utilizes natural air convection and heat the cryogenic liquid in the heat exchange tubes to completely vaporize the medium and heat it to near ambient temperature.

Technical Specifications

Design pressure	≤4MPa	Outlet temperature	Not lower than the ambient temperature of 15℃
Design temperature	-196℃	Continuous working time	<8h
Applicable medium	LNG, LO_2, LN_2, etc.	Design flow	≤6000m^3/h

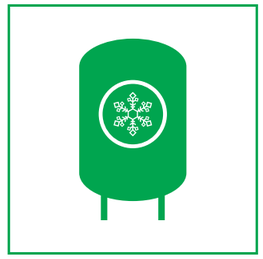
Performance Features

1. It may absorb heat in the air, without additional power, saving energy and protecting the environment;
2. It has simple installation and convenient maintenance;
3. Large fin spacing allows good ventilation effect and fast defrosting;
4. Frame connection in diamond shape and bridge connection impose small internal stress.



PRESSURE VESSEL

CRYOGENIC STORAGE TANKS AND ANCILLARY EQUIPMENT



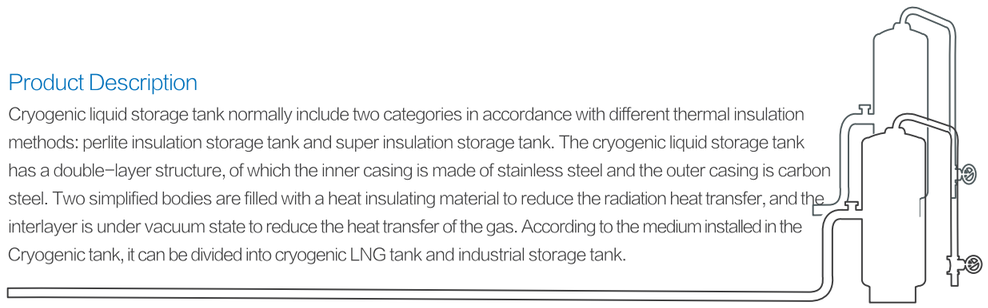
CRYOGENIC STORAGE TANKS AND ANCILLARY EQUIPMENT

CRYOGENIC LIQUID STORAGE TANK

In Compliance with ASME Approval Requirements

Product Description

Cryogenic liquid storage tank normally include two categories in accordance with different thermal insulation methods: perlite insulation storage tank and super insulation storage tank. The cryogenic liquid storage tank has a double-layer structure, of which the inner casing is made of stainless steel and the outer casing is carbon steel. Two simplified bodies are filled with a heat insulating material to reduce the radiation heat transfer, and the interlayer is under vacuum state to reduce the heat transfer of the gas. According to the medium installed in the Cryogenic tank, it can be divided into cryogenic LNG tank and industrial storage tank.



Technical Specifications

Medium	LNG, Liquid Oxygen, Liquid Nitrogen Liquid Argon, Liquid Carbon Dioxide	Insulation Form	Pearlife and High Vacuum Insulation
Volume	$5m^3$~$150m^3$	Type	Vertical/Horizontal
Working Pressure	According to User Requirements	Product Feature	Long Vacuum Life (Around 10 Years)

Performance Features

1. All LNG tanks have root valves with level gauges.
2. Industrial tanks (oxygen, nitrogen, argon) All liquid phase ports with double valves, gas phase ports with single valve, lower self-pressurized vaporizer on equipment, equipment with level gauge.
3. The material of the cylinder in the liquid carbon dioxide storage tank is 16MnDR, and the design pressure is: 2.3Mpa. All the liquid phase joints are equipped with double valves, the gas phase joint port is equipped with a single valve, the lower part of the equipment is not equipped with a self-pressurized vaporizer, and the equipment is equipped with a liquid level meter.
4. Able to detect vacuum degree on-line

MARINE FUEL TANK

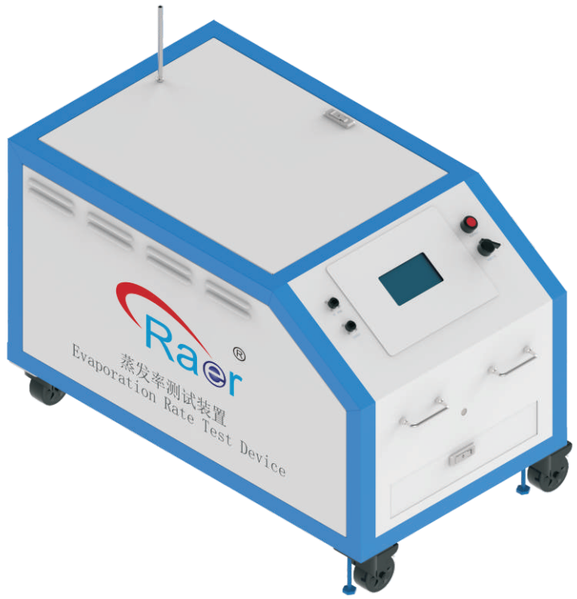
Product Description

Marine fuel tank is the core equipment for fuel storage of natural gas-powered ships, and applied to ships sailing in inland lakes and trunk lines of Yangtze River for gas-powered ships. Marine fuel tank is of a double-layer structure with high vacuum winding, and its inner and outer shells are made of stainless steel. The integrated fuel gas supply system occupies a small space of the ship and has a small load. Geometric volume: 3-50m^3, Design pressure: 1.0~1.2MPa.

Selection Sheet

Model and specification	Working pressure (MPa)	Overall dimensions (diameter x full length mm)
CDW-3/1.0	1.0	ϕ1800*2860
CDW-5/1.0	1.0	ϕ1800*4220
CDW-10/1.0	1.0	Φ2500*4020
CDW-15/1.0	1.0	Φ2500*5490
CDW-20/1.0	1.0	Φ2500*6970
CDW-25/1.0	1.0	Φ2500*8470
CDW-30/1.0	1.0	Φ3100*6600
CDW-50/1.0	1.0	Φ3100*9500

STATIC EVAPORATION DETECTOR



Product Description

The static evaporation detector is used for automatic detection of the evaporation of cryogenic medium storage containers. The evaporation data of cryogenic liquid containers is automatically collected through flowmeter, pressure transmitter and solenoid valve driven by the automatic programs of the device, and the coefficients are corrected by the built-in computing program block to calculate the results and output reports.

Technical Specifications

Explosion-proof grade	Exd IIC T4	Working temperature	Pearlife and High Vacuum Insulation
IP	IP56	Working pressure	Vertical/Horizontal
Rated voltage	AC 220V	Working flow	Long Vacuum Life (Around 10 Years)

Performance Features

1. Its high explosion-proof grade may meet the requirements of detecting evaporation rate of cryogenic media including liquid hydrogen.
2. Replaceable components may realize the monitoring of different flows and pressures.
3. It has such functions as automatic control, automatic detection, automatic data storage and remote transmission.
4. It's highly integrated, of compact structure and convenient for transportation.