Quantum Technology

Hydrogen & Helium systems since 1981

CRYO DIFFUSION

Product Catalogue

www.quantum-technology.com

ISO 9001:2015 CERTIFICATION

intertek

CRYO DIFFUSION

Quantum Technology

Quantum Technology

Quantum Technology is a global leader in specialized industrial gas applications, specializing in Helium and Hydrogen technologies.

Founded in 1981, we design and manufacture premium Helium and Hydrogen liquefaction units, recovery systems, and Helium production plants. Our extensive portfolio includes standard and custom solutions for gas recovery, separation, purification, and liquefaction.

Cryo Diffusion

www.cryodiffusion.fr

Acquired by Quantum Technology in 2023, Cryo Diffusion has been a leading manufacturer of cryogenic equipment since 1965. Specializing in the production of:

- Cryogenic tanks, piping, valve boxes, and loading stations for air and helium gas liquefaction plants.
- Helium dewars and transfer rods for laboratories and nuclear magnetic resonance (NMR) applications.
- Cryogenic equipment for major scientific endeavors, including particle gas pedals and university laboratories.

Key products include cryostats, super-insulated vacuum transfer lines and multilines, as well as cryogenic valve boxes and phase separators. We also offer tanks and transfer lines for hydrogen, along with custom liquid hydrogen products.

With a team of qualified technicians, Cryo Diffusion provides a comprehensive range of after-sales cryogenic services, including installations, on-site refurbishments, upgrades, and de-bottlenecking.

All products sold by Cryo Diffusion meet the highest quality and safety standards, earning recognition worldwide for their reliability and performance.

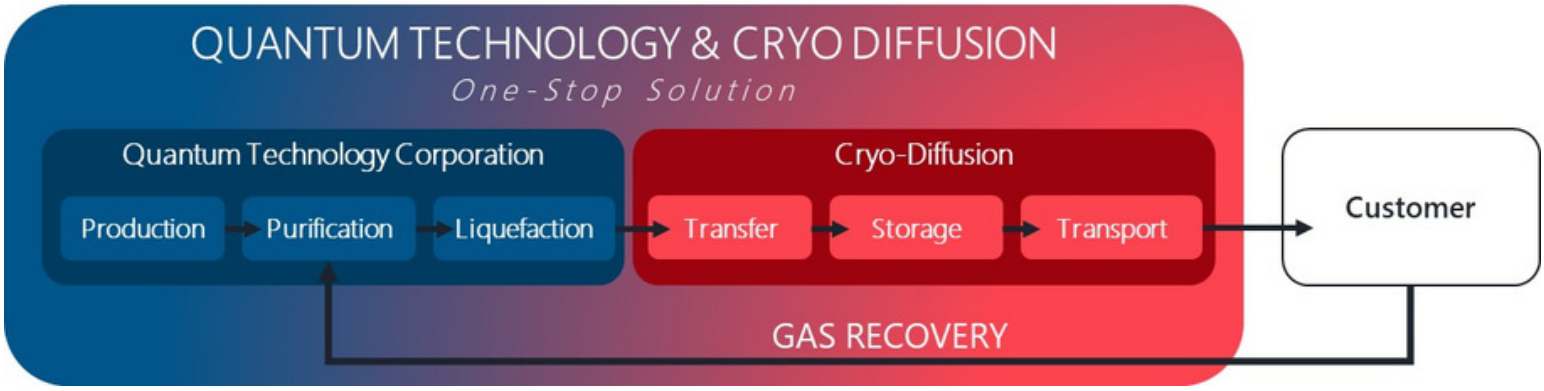
CRYO DIFFUSION

Quantum Technology

Your Comprehensive Gas Solutions Provider

Discover the future of gas management with Quantum Technology and Crydiffusion, your one-stop shop for all your gas production, purification, liquefaction, recovery, storage, transport, and transfer needs. Our state-of-the-art solutions are designed to meet the highest industry standards, ensuring exceptional performance and reliability.

Whether you're dealing with hydrogen, helium, nitrogen, or other industrial gases, we offer a full spectrum of services tailored to your specific requirements. From high-efficiency production and ultra-pure purification processes to advanced liquefaction techniques and reliable recovery systems, our technology is at the forefront of innovation.



Our storage solutions guarantee the integrity and safety of your gases, while our transport and transfer services ensure seamless and efficient delivery. With Quantum Technology and Crydiffusion, you gain a partner committed to optimizing your gas handling operations, enhancing productivity, and reducing operational costs.

Choose Quantum Technology and Crydiffusion for a comprehensive, integrated approach to gas management that drives excellence and sets new industry benchmarks.

ENVIRONMENTAL IMPACT OF QUANTUM'S PRODUCTS

At Quantum Technology Corp, we make a substantial contribution to environmental sustainability through the recovery and reuse of helium, a non-renewable natural resource. Our process involves recovering helium from our customers' processes, purifying it, and returning it to the customer. In many cases, this includes liquefying the helium on-site to return it as cold liquid helium.

Moreover, in our helium production business, our Kansas project is focused on producing helium while also recovering energy from natural gas through the operation of generators, and subsequently selling the electricity generated. While the recovery of energy from natural gas is incidental to our main business of helium recovery, we adhere to Environmental, Social, and Governance (ESG) guidelines, and take measures to minimize CO2 equivalent emissions. Importantly, we do not vent methane.

In the hydrogen business, we contribute by providing materials, equipment, and expertise for projects that convert green electrical energy into hydrogen. We then purify and process the hydrogen. By enabling on-site production of hydrogen, our process reduces transportation CO2 emissions. This is what we refer to as "bright green hydrogen."

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PRODUCT CATALOGUE

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Hydrogen


Quantum Technology
Q1.4 LH2-1.5TPD
HYDROGEN LIQUEFIER
www.quantum-technology.com
DANGER
DANGER
DANGER
KAISER

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Q1.4-QLH2-7500

Q1.4-QLH2-7500 - Hydrogen Liquefier

Features

- Rapid cool down
- Proven turbo expansion technology with high reliability and up time
- HMI touch screen + Ethernet connection
- Auto-control including computerized pressure control, safety protection unit
- Pressure, temperature, level PLC controls
- Electrically safe design
- Emergency Shut Down Interlock
- Turbine Speed Control for lower production
- Built-in analysis for purity monitoring and safety

Options

- Hydrogen purification
- Raw hydrogen gas compressors
- Hydrogen recycle compressors with VFD
- LH2 storage tanks and filling stations
- Additional equipment available, including storage vessels and transfer lines

Main Equipment Specifications

Liquefaction Rate	7,500 kg/day guaranteed at 20 bar feed H2
LN2 Consumption	Up to 4500 L/hr
LN2 Supply Pressure	3 bara
LN2 Supply Max Pressure	5 bara
Hydrogen Feed Pressure	20 bara (suitable for operation at 12-40 bara)
Heat Exchanger Pressure Rating and Cooling Rate	40 bara, max 2° C/min
Liquid Hydrogen Filling Pressure	> 1.5-2.5 bara
Power Requirement	2,000 kW
Cooling Water Temperature	< 30° C
Cooling Water Pressure	> 3 bara
Cooling Water Flow	240 m3/hr
H2 Gas Purity	> 99.999%
Instrument Air	30 Nm3/hr
Vacuum Requirement	10-3 mbar abs
Dimensions	4 x 4 x 5m
	20,000 kg

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Q16.4-QPure-H2 - Hydrogen Purification System

Q16.4-QPure-H2

Product Description

Introducing our state-of-the-art hydrogen purification system. With our customizabe technology, tailored to your process, we are able to extract hydrogen from green, grey, or blue sources - proudcing saleable 99.7+% hydrogen. Trusted by clients worldwide, we have a proven track record of delivering tailored solutions, making us go-to experts in hydrogen purification technology. Unlock the full potential of your hydrogen resources with Quantum's reliable and efficient purification system.

Features

- Fast start up and shut down
- Compact design
- Long design life for valves and vessels
- Suitable for outdoor operation
- Integrated inlet and discharge filters
- Integrated condensation disposal lines
- Pre-installed pressure safety system
- Pre-installed sampling ports

Options

- H2 purity measurement
- Raw gas compressors
- Product gas booster compressor
- Storage tanks and filing stations
- Liquefaction system

Specifications (Typical)

Hydrogen Product Purity	>99.97%
Feed Gas Flow Rate	100-3000 SCFM
Hydrogen Feed Pressure	1-40 bara
Typical H2 Recovery Rate	70-90%
Quantity of Vessels	4-12 based on system requirement
Contaminants to remove	N2, O2, H2O, CO2
Hazardous area classification	Class 1, Zone 2, Group B/ATEX Zone II
Code compliance	ASME, CRN, NEC
Electrical Requirement	480V / 60 Hz / 3ph 1 kW

If you have a source of hydrogen, QUANTUM may have a solution for you.
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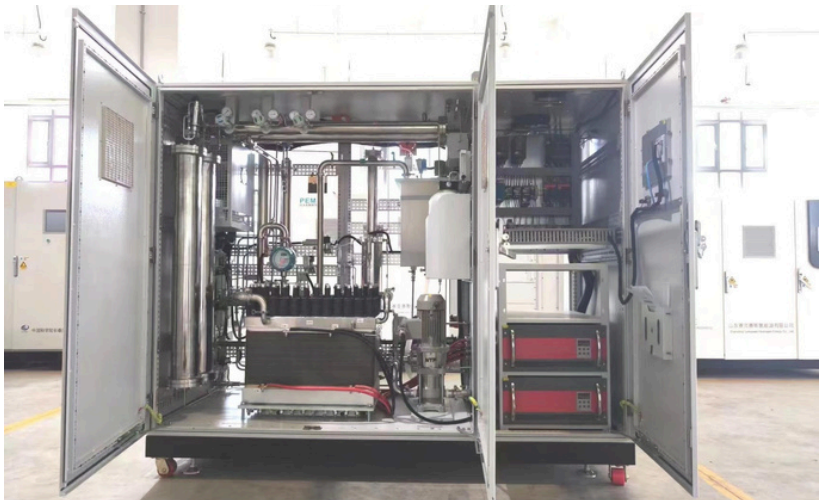
Q7.4 H2-MOD-GEN

Q7.4-H2-MODGEN - Modular Hydrogen Generation, Purification, Compression and Distribution System



Product Description

This system combines state-of-the-art water electrolysis technology with efficient and compact hydrogen purification, compression, storage and distribution.

• Production at distribution site saves hydrogen (H2) transportation costs

• Modular design reduces unit cost and provides ease of installation

• Smaller-scale units break down barriers for small-to-medium sized companies to adopt

Main System Components

- **Electrolyser Stack**
  - Utilizes green energy source and sustainable water supply to produce 18 kg/hr hydrogen
- **Hydrogen Purifier**
  - Proven technology, reliably produces fuel-cell grade hydrogen 99.999%
- **High Pressure Compressor**
  - Multiple stage compressor, boosts hydrogen pressure from 100 psig to up to 14,000 psig
- **High Pressure Storage**
  - high pressure storage vessels designed to store hydrogen gas up to 15,000 psig
- **H2 Filling Station**
  - Can be customized for end user specifications

Main Equipment Specifications

Electrolyser Stack

Electrolyser Capacity	900 kW DC
Type	Alkaline
Hydrogen rated flow	18 kg/hr
Operation Pressure	3.0 Mpa

Power Supply Unit

Frequency	60 Hz
Control Mode	CC / CV
Cooling	Water
IP Grade	IP2X
Operating temperature range	0-50 C
Operating humidity range	15%-85%

Controls System

PLC	Siemens S7-1200
HMI	Siemens KTO series touch screen

Plant Specifications

Hydrogen Gas Generation Capacity	18 kg/ hr
Hydrogen Gas Pressure at final output	10,000 psi
Hydrogen Gas Purity at final output	99.999% v/v
Grade of hydrogen	fuel cell grade
Oxygen in final output Hydrogen Gas	<5 ppmv
Space required	40' container (prel.)
Turndown	40-100%
Plant Operation	Automatic
Construction	Containerized
Plant Design life	Minimum 25 years
Ambient Temperature	-40 C - 45 C

Utilities Requirements

Power	Client to inform
Make up Water for Cooling Tower	
Consumption	approx. 1500 LPH
Inlet Temperature	38 C max
pH	6.5-8.5
TDS limit	500 ppmw
Nitrogen Gas (for purging)	
Purity	>99.5%
Inlet Pressure	5 to 6 kg/cm2 (g)
Make-up water for DM Unit	
Quality	Potable
Flow	Max 6m3/hr
Pressure	1.0 to 1.5 kg/cm2 (g)

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Q12.4 H2-FS

Q12.4-H2-FS - Hydrogen Fueling Station

Product Description

This system dispenses hydrogen for fast, easy-to-operate refueling of hydrogen fuel-cell passenger vehicles and trucks.

• Fueling station for cars has a 700-bar (70-MPa) hose.

• Fueling station for trucks has a high flow rate to minimize delays for high capacity vehicles.

Main System Components

- **Compressed Gas Storage**
  - Complex storage with multiple vessel trans-fill system
  - Carbon fibre high pressure cylinders
  - Additional external storage optional
- **User Interface**
  - Easy-to-use touchscreen interface
- **Safety Features**
  - Industry standard infrared vehicle communication
  - Flame- and gas-leak-detecting sensors
  - Emergency stop and automatic shutdown

Can be customized for end user specifications

Filling Station Specifications

Fill Pressure	700 bar at 15°C
Max. Fill Rate	3.6 kg/min
Hydrogen Gas Storage Capacity	Customizable
Hydrogen Gas Purity	99.999%
Installation Requirements	Outdoors
Ambient Temperature	-20 to 50°C (-4 to 122°F)
Operation	Touchscreen interface
Service Life	Minimum 10 years

If you're looking to produce high grade hydrogen, QUANTUM may have a solution for you.
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Q12.4 H2-UPS

Q12.4 H2-UPS - Hydrogen Uninterruptible Power Supply (UPS)

Product Description

The Hydrogen UPS is a hydrogen-fueled, zero-emission uninterruptible power supply for backup power.

• Replaces a diesel/gasoline backup generator

• Noiseless electrical power generation

• Emissions-free energy source

Main System Components

- **Fuel Cell Stack**
  - Array of cells that combine hydrogen and oxygen in electrochemical reactions to produce zero-emission electricity.
- **Fuel Tank**
  - Customizable in capacity, it holds the hydrogen fuel until it is ready to be used.
- **Fuel Filler Receptacle**
  - Designed for maximum compatibility with standard vehicle fueling nozzles or bottled hydrogen.
- **Power Conditioner**
  - Adjusts current, voltage, frequency and other characteristics of the generated electricity to suit the application
- **User Interface**
  - Integrated computer controlled system with easy-to-use interface (HMI)

Customizable Output Specifications

Power	Up to 3 kW
Type	AC or DC

Main Equipment Specifications

Fuel Cell Stack

Rated power	41 W/cell
Rated current	65 A
DC voltage	660 mV/cell
Coolant	Air

Fuel

Hydrogen	99.95% or better
Supply pressure	0.16 to 0.56 barg
Flow rate	0.5 slpm/cell

Temperature

Operating	-40°C to 50°C (-40°F to 122°F)
Start up	-10°C to 50°C (14°F to 122°F)

If you're looking for a green power supply, QUANTUM may have a solution for you.
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Q1.1.4- QPure-H2He

Q1.1.4-LHeH2 - Helium and Hydrogen Liquefaction System

QLHe100 Quantum Helium / Hydrogen Liquefier 100L/day

Product Description

Introducing the Quantum Helium and Hydrogen Liquefaction System. Designed to liquefy and recycle helium and liquefy hydrogen, this system can be coupled with a custom-made cryostat to create a temperature controlled environment of 20K for hydrogen and between 5-30K for helium, +/- 1K. Our bespoke cryostats can be designed for materials testing, such as diffusion experiments or mechanical strength tests at a set cryogenic temperatures. Recover and reliquefy the helium boil-off for efficient waste reduction.

Features

- Dual gas (Helium & Hydrogen) liquefaction capabilities
- Can liquefy gas either from cylinder or experimental equipment
- Hydrogen liquefaction to EU standards
- New safety features
- ATEX certified design

Options

- Adjustable layouts to fit into most lab spaces.
- Manual to fully automatic options available.
- Dual bed purifier for around the clock operation.
- Mobile liquefier or extra long transfer line available for direct instrument transfers.
- Liquid nitrogen and cryogen free purifier options available.

Specifications (Typical)

Liquefaction Rate	100L/day
Dewar size	350 liters
Cooldown Time	< 40hrs
Cooling Water	35l/min
Power @60Hz	39kW
Power @50Hz**	32kW
Weight	2,247 lbs (1,019 kg)
Maintenance Interval:	
Compressor	>3 Years
Coldhead	>2 Years

If you are looking to liquefy Helium or Hydrogen for your experiments, QUANTUM may have a solution for you. Call +1 604 222 5539 to connect with our technical/sales staff.

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Q8.1.4-QCS-HeH2 - Helium and Hydrogen Cryostat

Cryostat & cryostat internals

Product Description

Introducing the helium or hydrogen cryostats - these temperature controlled environments are ideal for cryogenic experiments using liquid helium or hydrogen to provide the cooling power. Our bespoke cryostats can be designed for materials testing, such as diffusion experiments or mechanical strength tests at a set cryogenic temperatures.

Options

- Depending on the application, a variety of cryogenic liquids can be used for cooling, i.e. helium, hydrogen or nitrogen depending on the required temperature
- For inert gases, heaters can be used to adjust and fine tune the cryostat temperature
- For hydrogen applications, pressure control is used to maintain a stable cryostat temperature
- Various levels of automation
  - Manual
  - Automatic

Specifications (typical)

Temperature Range	4 - 30K
Materials	Stainless steel and copper

Features

- Vacuum pressure transducers provide pressure feedback on the vacuum space
- Cryogenic temperature sensors to provide accurate temperature readings at various locations
- Vacuum insulated dewar with super insulation to maintain stable temperatures
- Monitoring and controls system
- Independent safety system
- Vacuum port couple with vacuum pump for removing air from the system
- Mechanical supports for test apparatus
- Vacuum jacketed transfer lines

If you are interested in cryostats, QUANTUM may have a solution for you.
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Q8.10 QCS-4-100K

Q8.4-QCS - Cryostat

Product Description

Introducing the Quantum Technology bespoke cryostat - these temperature controlled environments are ideal for cryogenic experiments. Our custom made designs can be used for many cryogenic test-bed applications such as materials testing, or for precisely controlling process gas line temperatures. Our configurable designs allow for plug and play experiments and full customization.

Options

- Depending on the application, a variety of cooling methods are possible:
  - Cold head cooling with a helium refrigerant compressor
  - Cryogenic liquid, i.e. helium, hydrogen or nitrogen depending on the required temperature
  - Cryogenic fluid and cold head combination
- Various levels of automation
  - Manual
  - Automatic
  - Double cooling method

Specifications (typical)

Temperature Range	20 - 120K
Materials	Stainless steel and copper
Cooling Water	2GPM at < 80F
Electrical Requirement	480V / 60 Hz / 3ph, 10 kW, (May vary with system specifics)

Features

- Turbomolecular pump paired with a mechanical vacuum pump for high vacuum cryostats
- Vacuum pressure transducers provide pressure feedback on the vacuum space
- A cryocooler made up of a cold head and water cooled compressor assembly to provide cooling power, or cryogenic liquid cooling available
- Cryogenic temperature sensors to provide accurate temperature readings at various locations
- Heat shielding to reduce heat radiation losses
- Controls and monitoring system
- Independent safety system
- Thermal anchoring to cold heads at different temperatures in multiple cold head systems

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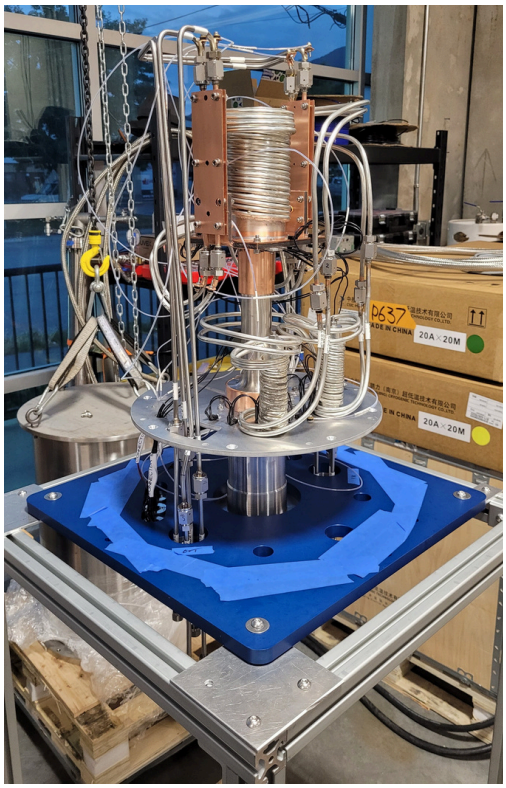
Q8.4-QCS-20K-CH - Ortho-Para Hydrogen Conversion Cryostat



Example of cryostat internals

Specifications (typical)

Temperature Range	20 - 120K
Maximum Gas Flow Rate	10 SLPM
Hydrogen Feed Pressure	1-30 barg
Materials of Construction	Stainless steel and copper
Cooling Water	2GPM at < 80F
Electrical Requirement	480V / 60 Hz / 3ph, 10 kW, may vary with specific system sizing

Product Description

Quantum Technology provides custom systems to perform ortho-para hydrogen conversion research and experiments. The cryostat is a vacuum sealed chamber that provides a stable, temperature controlled environment for ortho-para conversion experiments. The full system can include temperature, pressure and flow rate monitoring and control and analysis equipment.

Options

- Analysis of catalyst samples at our in-house laboratory
- Custom lab-scale systems made to your specifications to meet the needs of your facility
- Custom catalyst beds of different sizes and temperatures
- Cryostat inlet and outlet gas manifold
- Hydrogen vent stack
- Oven for catalyst bake out

Features

- Turbomolecular pump paired with a mechanical vacuum pump to pull a high vacuum within the cryostat
- Vacuum pressure transducers provide pressure feedback on the vacuum space
- A cryocooler made up of a cold head and water cooled compressor assembly
- Cryogenic temperature sensors to provide accurate temperature readings at various locations
- A heat shield to reduce heat radiation losses
- Removable, configurable catalyst beds
- Analyzer to measure the ortho-para hydrogen ratio
- Controls and monitoring system
- Independent safety system
- Manifold for process gas monitoring and control
- Ortho-para hydrogen anaylzers
- Optional hydrogen vent stack

If you're looking to perform hydrogen ortho-para research, QUANTUM may have a solution for you.
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Q7.4 H2LAB - Custom Hydrogen Laboratory

Lab setup for ammonia cracking and purification test setup

Lab setup for ortho to para hydrogen research

Product Description

Quantum Technology offers a set of complete laboratories for hydrogen research. All laboratories include:

- Vacuum pump
- Pressure transducers
- Full tool kit
- Voltmeters
- Power supply
- Electronics parts kit
- Soldering station
- Tubing fittings
- Valves and gauges
- Safety equipment - LEL detector & personal monitor

Experimental Setups

- Lab 1 - Setup for demonstration of hydrogen electrolyzer including water purification system
- Lab 2 - Setup for demonstration of hydrogen fuel cell
- Lab 3 - Setup for demonstration of hydrogen liquefier
- Lab 4 - Orth-para conversion of hydrogen and analysis of ortho-para ratio
- Lab 5 - Setup for high pressure storage of hydrogen including booster compressor to 700 bar
- Lab 6 - Setup for detailed analysis of hydrogen purity including mass spectrometer gas analyzer
- Lab 7 - Setup for hydrogen purifation PSA from 98% to 99.999%
- Lab 8 - Setup for ammonia cracking and purification to produce pure hydrogen
- Lab 9 - Setup for ammonia synthesis from hyroden and nitrogen
- Lab 10 - Customized laboratory setup

If you're looking to perform hydrogen research or testing, QUANTUM may have a solution for you. Call +1 604 222 5539 to connect with our technical/sales staff.

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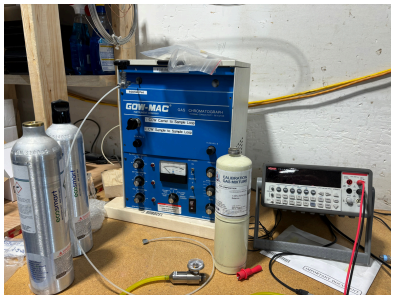
Q7.4 H2LAB - Custom Hydrogen Laboratory

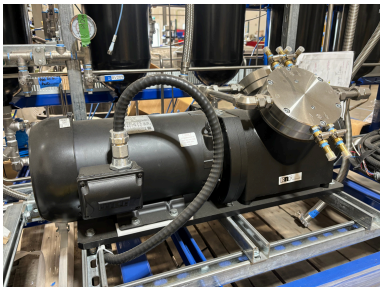
Experimental Setups Details

- **Lab 1 - Setup for demonstration of hydrogen electrolyzer including water purification system**
  - DC power supply
  - Water purification system
  - Water purity analysis, including conductivity and pH measurements
  - Electrolyzer
  - Purity measurement for hydrogen and oxygen produced from electrolyzer



Gas chromatograph

- **Lab 2 - Setup for demonstration of hydrogen fuel cell**
  - Fuel cell stack with multiple cells in series
  - Voltage monitoring for each individual cell
  - Nitrogen purge for safety
  - Voltage current control and measurements for power output
- **Lab 3 - Setup for demonstration of hydrogen liquefier**
  - Closed cycle helium refrigerator to liquefy hyrogen in a vacuum insulated vessel
  - Vacuum insulated transfer line and vacuum insulated liquid hydrogen dewar
- **Lab 4 - Orth-para conversion of hydrogen and analysis of ortho-para ratio**
  - Hydrogen flow controller
  - Ortho-para hydrogen meter
  - Closed cycle refrigerator
  - Ortho-para TCD meter or optional Ramen-spectrometer
- **Lab 5 - Setup for high pressure storage of hydrogen including booster compressor to 700 bar**
  - First stage compressor to go from atmospheric pressure to 350 bar
  - Second stage booster compressor to go from 350 to 750 bar
- **Lab 6 - Setup for detailed analysis of hydrogen purity including mass spectrometer gas analyzer**
  - Gas chromatograph
  - Mass spectrometer and gas analyzer
  - Calibrated gases, sample gas cylinders, and sample gas mixing equipment



Hydrogen explosion-proof compressor

- **Lab 7 - Setup for hydrogen purifation PSA from 98% to 99.999%**
  - Deoxo unit: heated catalyst to remove oxygen and convert to water
  - Dehydration unit
  - Pressure Swing Adsorption Unit (PSA) system to achieve 99.999% purity
- **Lab 8 - Setup for ammonia cracking and purification to produce pure hydrogen**
  - Heated catalyst
  - Purification bed
  - Ammonia analyzer
- **Lab 9 - Setup for ammonia synthesis from hydrogen and nitrogen**
  - Catalyst system for synthesizing ammonia from hydrogen and nitrogen
- **Lab 10 - Customized laboratory setup**
  - Quantum is an expert in designing and building customize systems to suit your testing needs

If you're looking to perform hydrogen research or testing, QUANTUM may have a solution for you. Call +1 604 222 5539 to connect with our technical/sales staff.

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H2 Technician Training Course

Training Course for Technicians - Green Hydrogen

Introducing our Green Hydrogen Technician Training Program, tailored for high school graduates seeking practical skills in hydrogen systems.

Informed by real-world experiences, this hands-on course features 6 units covering safety, piping, purification, electrolysis, compressors, and liquefaction, with specific equipment for each section.

With a focus on practical training, including hands on experience on a 1kg per day scale, and comprehensive learning materials like notes, photos, videos, quizzes, exams, laboratory procedures, reports, and hands-on skill tests, graduates will emerge equipped with the expertise needed for success in the field.

Course Overview

Prepare yourself for a career in the hydrogen industry with our comprehensive course designed for high school graduates. From safety protocols to hands-on practice, you'll gain the skills needed to work confidently in hydrogen and helium plants.

Course Highlights

Safety Laboratory: Learn about personal protective equipment, gas detection, incident procedures, and witness demonstrations of hydrogen flames and explosions.

Hydrogen Piping Laboratory: Gain practical experience with different classes of piping, pressure testing, leak detection, and repair techniques using advanced equipment.

Hydrogen Purification Laboratory: Work hands-on with hydrogen purity meters, gas analyzers, and purification methods such as pressure swing adsorption.

Hydrogen Electrolysis and Fuel Cells Laboratory: Explore electrolysis, fuel cell operation, and safety procedures for starting, testing, and shutting down systems.

Hydrogen Compressors Laboratory: Master the operation, troubleshooting, and maintenance of hydrogen compressors essential for plant operations.

Hydrogen Liquefier Laboratory: Utilize state-of-the-art equipment to produce, purify, and liquefy hydrogen, with a focus on safety and efficiency.

Equipment Overview

- Personal safety gear including monitors, eye protection, and non-flammable clothing.
- Site safety equipment such as fixed gas monitors and ventilation systems.
- Demonstration equipment for hands-on learning.
- Various laboratory equipment for each specialized area, including piping, purification, electrolysis, compressors, and liquefaction.

Join us and dive into the world of green hydrogen with practical training and hands-on experience to kickstart or enhance your career as a certified technician!

Helium

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Q1.1 - QLHeXX - Helium Liquefier Series

QLHe20 Quantum Helium Liquefier 40L/day

Features

- GM cold head: more cooling power/ less energy consumption
- Automated to operate with minimal user intervention
- Large HMI touch screen + Ethernet connection
- Comes with all required safety devices
- Easy to install, small footprint
- Can liquefy gas either from cylinder or experimental equipment
- 2 years warranty for cold head and compressors and one year for balance of equipment

Options

- Manual or Automatic LHe transfer line
- Designed to be coupled with Quantum's complete Helium Recovery System
- **Custom solutions for large industrial applications up to 50,000L per day**

Specification/ Model	QLHe20	QLHe40	QLHe60	QLHe80	QLHe100	QLHe200
Liquefaction Rate	20L/day	40L/day	60L/day	80L/day	100L/day	200L/day
Dewar size	100 liters*	150 liters*	150 liters*	250 liters*	350 liters*	500 liters*
Cooldown Time	< 30hrs	< 30hrs	< 30hrs	< 30hrs	< 30hrs	< 30hrs
Cooling Water	7 l/min	14 l/min	21 l/min	28l/min	35l/min	70l/min
Power @60Hz	7.8kW	15kW	23kW	31kW	39kW	78kW
Power @50Hz**	6.5kW	13kW	19kW	26kW	32kW	64kW
Weight	582 lbs (254 kg)	1,074 lbs (487 kg)	1,406 lbs (638 kg)	1,828 lbs (829 kg)	2,247 lbs (1,019 kg)	4,270 lbs (1,937 kg)
Maintenance Interval:						
Compressor	>3 Years	>3 Years	>3 Years	>3 Years	>3 Years	>3 Years
Coldhead	>2 Years	>2 Years	>2 Years	>2 Years	>2 Years	>2 Years
Dimensions (WxLxH)	60"x40"x80"	76"x46"x88"	76"x46"x88"	80"x48"x98"	80"x48"x98"	67"x90"x107"

*Different dewar sizes are available upon request
**Liquefaction rate is reduced by approximately 20% when running at at 50Hz

If your helium bill is significant, QUANTUM may have a solution for you.
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HELIUM RECOVERY SYSTEM

A full closed-loop system that effectively recovers helium from a variety of scientific processes such as NMRs, cryostats and more. Quantum Technology's proprietary recovery systems remove contamination through purification, reliquefies and stores recycled helium; drastically reducing helium costs and creating a sustainable system.

A	Recovery Compressor	Medium or high-pressure recovery compressors varying in power and pressure.
B	Liquefier	Various liquefaction instruments reaching 4K temperature to produce 20LPD to 200LPD and greater.
C	QuantumPure™ Purifier	Automatic and manual cryogenic and cryo-free purifiers producing 99.995+% pure helium.
D	Transport Dewar	Allows for flexible floor layout with removable transfer line.
E	Accessories	Upgrade your system with a range of accessories.
F	Storage	Medium or high-pressure helium gas storage options to meet your sizing and volume requirements.
G	Customer Instrument	Integrates seamlessly with NMRs, Cryostats and other helium-based instruments.

**Customization available*

COMPACT & RELIABLE
Our systems are compact and reliable with an overall recovery rate of >90% helium.

SAFETY FEATURES
Equipped with a number of safety features to prevent any over- pressure and vacuum protection

HIGH PURITY
Purity levels of 99.999%+ and higher are achieved by preventing air or H20 contamination.

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ALL METAL HELIUM RECOVERY SYSTEM

A full closed-loop system that effectively **recovers helium** from a variety of scientific processes such as NMRs, cryostats and more. Quantum Technology's proprietary **all-metal** recovery systems, purify, reliquefy and store recovered helium, drastically reducing helium cost and creating a more sustainable system.

Quantum Technology ALL- METAL Helium Recovery System
A – Helium Recovery Compressor; B – Helium Recovery Liquefier; C – QuantumPure™ Purifier

Features

- Integrates seamlessly with customer's instruments.
- Stable and adjustable recovery pressure of 0.1 to 0.3 psi.
- Minimal purification required due to all-metal design.
- • Real time parameter monitoring.
- Automatic recovery "start" and "stop" means less monitoring.
- • Due to eliminating plastic bags, the result being a more robust system with an overall recovery rate of >90%.

Options

- Adjustable layouts to fit into most lab spaces.
- Manual to fully automatic options available.
- Dual bed purifier for around the clock operation.
- Mobile liquefier or extra long transfer line available for direct instrument transfers.
- Liquid nitrogen and cryogen free options available.

If you are tired of seeing your helium vented, QUANTUM TECHNOLOGY may have a solution.
Call +1 604 222 5539 to connect with our technical/sales staff.

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MONET - All Metal Helium Recovery System

A full closed-loop system that effectively **recovers helium** from a variety of scientific processes such as NMRs, cryostats and more. Quantum Technology's proprietary **all-metal** recovery systems, purify, reliquefy and store recovered helium, drastically reducing helium cost and creating a more sustainable system. - Captures normal Boil off

Quantum Technology ALL- METAL Helium Recovery System
A – Helium Recovery Compressor; B – Helium Recovery Liquefier; C – QuantumPure™ Purifier

Features

- Integrates seamlessly with customer's instruments.
- Stable and adjustable recovery pressure of 0.1 to 0.3 psi.
- Minimal purification required due to all-metal design.
- • Real time parameter monitoring.
- Automatic recovery "start" and "stop" means less monitoring.
- • Due to eliminating plastic bags, the result being a more robust system with an overall recovery rate of >90%.

Options

- Adjustable layouts to fit into most lab spaces.
- Manual to fully automatic options available.
- Dual bed purifier for around the clock operation.
- Mobile liquefier or extra long transfer line available for direct instrument transfers.
- Liquid nitrogen and cryogen free options available.

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GAS BAG HELIUM RECOVERY SYSTEM

A full closed-loop system that effectively **recovers helium** from a variety of scientific processes such as NMRs, cryostats and more. Quantum Technology's **gas bag** recovery system removes contamination through purification, reliquefies and stores recycled helium; drastically reducing helium costs and creating a sustainable system.

1- Purifier 2- Liquefier 3- Customer instrument
4- gas bag 5- HP recovery compressor 6- Gas Storage

Features

- Integrates seamlessly with customer's instruments. Atmospheric recovery pressure.
- • Real time parameter monitoring.
- Automatic recovery "start" and "stop" means less monitoring.

Options

- Adjustable layouts to fit into most lab spaces.
- Manual to fully automatic options available.
- Dual bed purifier for around the clock operation.
- Mobile liquefier or extra long transfer line available for direct instrument transfers.
- Liquid nitrogen and cryogen free options available.

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A. Q9.1HR3-XX - Helium Recovery compressor 7.5/10/15 HP

HR3-XX Helium recovery compressor

Features

- Full flow of recovered gas
- Different sizes to fit production needs.
- Fully automated and operates with no/minimal monitoring.
- Ideal for QuantumPure™ All Metal Recovery, Purification and Liquefaction System
- Recovers full boil-off (regular and flash) in a liquid system
- (helium, neon, etc.)
- Easy to install, small floor footprint
- Base Models are air-cooled. Quantum offers a water-cooled version as well.
- All models have coalescing and charcoal filters for purification.
- Pressure controller
- Low energy Solution
- When ordering, please specify power frequency (50/60Hz) and voltage (208/230/460).
- Model number is: HR3-7.5/10/15-50/60-208/230/460.

Specifications

	HR3-7.5	HR3-10	HR3-15
Power Consumption	7.5 HP	10 HP	15 HP
Flowrate @210psig	19 cfm	28 cfm	36 cfm
Dimensions (W H)	29” x 41” x 76”	29” x 41” x 76”	29” x 41” x 76”
Weight	1,100 lbs	1,150 lbs	1,150 lbs
Noise Level	65 dB	67 dB	68 dB

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A. Q9.1HRHP-XX - High Pressure Helium Recovery Compressor 10/12/15/17 HP

HRHP-XX Helium recovery compressor

Features

- High pressure Helium Recovery Compressor to take the full flow of recovered gas.
- High-purity recovery with room temperature purification.
- Ideal for high-purity recovery.
- Air cooling system.
- •Different sizes to fit production needs.
- Fully automated and operates with no/minimal monitoring.
- Ideal for QuantumPure™ HP Recovery, Purification and Liquefaction System. Easy to install and operate, small floor footprint. 3-phase power, specifications of local power to be provided with order.

Specifications

Model Number:	**Q9.1HRHP-17**	**Q9.1HRHP-21**	**Q9.1HRHP-25**	**Q9.1HRHP-29**
Capacity	10.4 SCFM	12.4 SCFM	15.0 SCFM	16.9 SCFM
Power	10 HP (7.5kW)	12 HP (9kW)	15 HP (11kW)	20 HP (15kW)
MCA/MOP	33A/50A	39A/60A	48A/80A	65A/100A
Type	4 stage 3 phase Squirrel Cage Motor			
Inlet Pressure	Atmospheric			
Cooling Method	Air Cooled			
Discharge Pressure	Adjustable to 3000 PSIG			
Inlet He Temp.	40°F – 115°F			
Oil Content	<1 ppm after outlet filtration			
Dimensions/Weight	935 x 1302 x 1735 mm / 445kg			
Protection Electrics	IP55 (TEFC)			
Oil Change Interval	230V/60Hz/3Φ			
Purification System	every year/ 1,000h 2 x HYPERFILTER			

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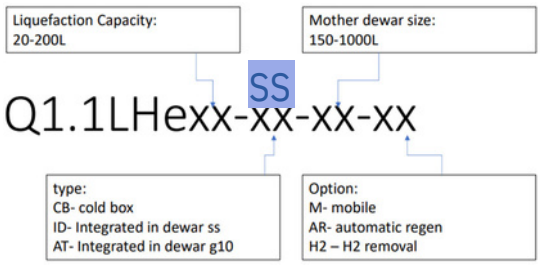
B. Q1.1LHeXX-SS - Helium Liquefier Integrated Stainless Steel Dewar (SS)

QLHe20 Quantum Helium Liquefier 20L/day

Features

- GM cold head: more cooling power/ less energy consumption
- Integrated stainless steel Dewar (SS). Fully automated and operates with no/minimal monitoring Large HMI touch screen + Ethernet connection
- Operates in a range of 1 to 10 PSI.
- Automatic Transfer Lines available. Easy to install, small floor footprint
- Can liquefy gas either from cylinder or experimental equipment
- <30 hours cooldown time



Specifications

Specification/ Model	QLHe20	QLHe40
Liquefaction Rate	20L/day	40L/day
Dewar size	• 100 liters* • 150 liters* • 200 liters* • 250 liters* • 350 liters*	
Options	• Mobile unit (MU) • Manual LHe transfer line (ML) • Automatic LHe transfer line (AT)	
Model Number	Example: Q1.1LHe20-200-AT or Q1.1LHe40-350-ML	
Cooling Water Requirement	> 1.8 GPM (7 l/min)	> 3.6 GPM (14 l/min)
Power Consumption	7.8kW@60Hz 6.5kW@50Hz	15kW@60Hz 13kW@50Hz
Weight	~582 lbs (254 kg)	~1,074 lbs (487 kg)
Dimensions (WxLxH)	76”x46”x100”	76”x46”x100”

Different Dewar sizes are available upon request.*Dimensions are an estimate and depend on selections.

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B. Q1.1LHexx-G10 - Helium Liquefier Metal G10

QLHe40 Quantum Helium Liquefier 40L/day

Features

- Features:
- GM cold head: more cooling power/ less energy consumption • Metal G10 (G10) cooling.
- Fully automated and operates with no/minimal monitoring Large HMI touch screen + Ethernet connection
- Operates in a range of 1 to 10 PSI.
- Automatic Transfer Lines available. Easy to install, small floor footprint
- Can liquefy gas either from cylinder or experimental equipment
- <30 hours cooldown time.

Specifications

Liquefaction Rate	20L/day
Dewar size	30L
Options	• Mobile unit (MU) • Manual LHe transfer line (ML) • Automatic LHe transfer line (AT)
Model Number	Example: Q1.1LHe20-G10-30-AT
Cooling Water Requirement	> 1.8 GPM – 7 l/min
Power Consumption	7.8kW@60Hz 6.5kW@50Hz
Weight	~ 582 lbs (254 kg) ~1,828 lbs (829 kg)
Dimensions (WxLxH)	76”x46”x100”

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*Dimensions are an estimate and depend on selections

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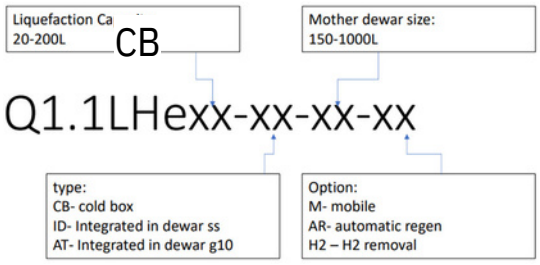
B. Q1.1LHeXX-CB - Helium Liquefier Cold Box (CB)

QLHe20 Quantum Helium Liquefier 20L/day

With Cold Box.

Features

- GM cold head: more cooling power/ less energy consumption
- Cold Box cooled.
- Fully automated and operates with no/minimal monitoring Large HMI touch screen + Ethernet connection
- Operates in a range of 1 to 10 PSI.
- Automatic Transfer Lines available. Easy to install, small floor footprint
- Can liquefy gas either from cylinder or experimental equipment
- <30 hours cooldown time.



Specification/ Model	QLHe60	QLHe80	QLHe100	QLHe200
Liquefaction Rate	60L/day	80L/day	100L/day	200L/day
Dewar size	100 liters* 150 liters* 200 liters* 250 liters*		350 liters* 500 liters* Customized*	
Cooling Water Requirement	> 5.4 GPM - 21 l/min	> 7.2 GPM - 28l/min	> 9.0 GPM - 35l/min	> 18 GPM - 70l/min
Power Consumption	23kW@60Hz 19kW@50Hz	31kW@60Hz 26kW@50Hz	39kW@60Hz 32kW@50Hz	78kW@60Hz 64kW@50Hz
Weight	~ 1,406 lbs (638 kg)	~1,828 lbs (829 kg)	~ 2,247 lbs (1,019 kg)	~ 4,270 lbs (1,937 kg)
Dimensions (WxLxH)	76”x46”x100”	80”x48”x100”	80”x48”x100”	67”x90”x110”

*Different Dewar sizes are available upon request.

*Dimensions are an estimate and depend on selections.

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C. Q16.1QPure-CH - QuantumPure Cryogen-Free Purifier

QuantumPureTM Cryogen-Free Purifier ideal for Quantum Recovery, Purification and Liquefaction Systems

Features

- Cryogen-Free Cryogenic Purifier for small and medium capacity systems (~60LPD helium).
- Cools gas to LN2 temperatures to remove air and moisture.
- Purifies gas to over 99.995%, sufficient for inlet of liquefier.
- Ideal for QuantumPureTM Recovery Purification and
- Liquefaction Systems.
- Easy to install, small floor footprint.

Options

- Various footprints available
- Fully automatic option
- Dual bed for continuous operation
- Movable option
- LN2 purifier available

Specifications

Operating Pressure	12 psig (maximum 15 psig)
Type of Adsorbents	Proprietary mix
Volume of Adsorbents	14 L
Volume of Adsorbed Impurities	2500 L
Regeneration at Ambient Temperature	~24 hrs
Cooling Power	200W at 70K
Power Required	7.5 kW @60Hz
Cooling Water	7 LPM @27C
Dimensions	26.5” x 33” x 90”

If you are tired of seeing your helium vented, QUANTUM TECHNOLOGY may have a solution.
Call +1 604 222 5539 to connect with our technical/sales staff.

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intertek

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www.cryodiffusion.fr

C. Q16.1QPure - LN2 Cryogenic Purifier

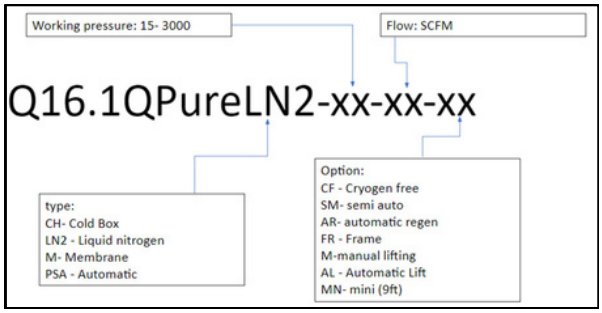
QuantumPure™ Cryogenic Purifier ideal for Quantum Recovery, Purification and Liquefaction Systems

Features

- • Cryogenic Purifier for small and medium capacity systems (~60LPD helium).
- • Cools gas to using liquid nitrogen.
- Ideal for QuantumPureTM Recovery Purification and Liquefaction Systems. Easy to install, small floor footprint.
- • No power required.

Options

- Various footprints available
- Semi-automatic option
- Dual bed for continuous operation



Specifications (typical)

Operating Pressure	12 psig (maximum 15 psig)
Type of Adsorbents	Proprietary mix
Volume of Adsorbents	19 L
Volume of Adsorbed Impurities	3600 L
Regeneration at Ambient Temperature	~12 hrs
Power Required	None
Cooling Water	None
Dimensions	35” x 120” (Subject to change)
Weight	90lbs

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Q18.1- He-PP - Helium Production Plant

Main System Components

Quantum production plants use both room temperature and cryogenic purification processes to refine to desired purity.

Quantum plants integrate membrane technologies, PSA/VSA/TSA in proprietary combinations.

- **Upstream purification and liquid separation**
- **Pressure swing adsorption**
- **Membrane purification & compression**
- **High pressure compression & filling station**
- **PLC and controls system**
- **Plant Safety System**

Options

- Helium liquefaction system
- Methane separation & enrichment

Product Description

Quantum utilizes our own proprietary technologies to enable refinement of helium from different types of wells including Inert gas wells and Hydrocarbon-based wells.

- Quantum production plants are highly automated and remotely monitored
- Quantum can produce low-purity, high-purity gas or liquid products.
- Quantum owns its own fleet of tube trailers and delivers helium to its customers all across North America
- Range of plants between 1 and 200MMscfd raw gas with more than 1% He content.
- Quantum works with customers on a Build-Own-Operate (BOO) or Sale-of-Equipment (SOE) basis.

Specifications

Feed Gas Flow (per train)	1-40 MMscfd
Helium Feed Pressure	10-150 bara
Helium Product Pressure	Up to 300 bara
Helium Product Purity	95-99.995%
Typical He Recovery Rate	70-95%
Contaminants to remove	N2, O2, H2O, CO2, CxHy
Material of Construction	Carbon or stainless steel
Hazardous area classification	Class 1, Zone 2, Group B/ATEX Zone II
Code compliance	ASME/CRN/ATEX/CE
Electrical Requirement	480V / 60 Hz / 3ph or 400V / 50 Hz / 3ph

If you have a helium-bearing source, QUANTUM may have a solution for you.
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Q18.2-He-PPNG

Q18.2-HePPNG - Helium Capture at Natural Gas Power Plant

Product Description

Quantum employs exclusive technologies to capture trace amounts of helium from natural gas sources within power plants. This process allows us to refine and sell the helium efficiently.

- Quantum capture and purification plants are fully automatic, unmanned/lightly manned
- Quantum will provide a plant tailored to your flow, helium concentration and gas composition.
- Quantum proprietary state-of-the-art technology allows economic recovery of helium at the ppm level.
- Quantum works with customers on a Build-Own-Operate (BOO) or Sale-of-Equipment (SOE) basis.

Main System Components

Quantum production plants use both room temperature and cryogenic purification processes to refine to desired purity.

Quantum plants integrate membrane technologies, PSA/VSA/TSA in proprietary combinations.

- **Upstream purification and liquid separation**
- **Pressure swing adsorption**
- **Membrane purification & compression**
- **High pressure compression & filling station**
- **PLC and controls system**
- **Plant Safety System**

Optional Sub-Systems

- High pressure Helium tube trailer
- Liquid helium production and storage system
- High precision gas analysis system
- Local or integrated control system

Specifications

Feed Gas Flow (per train)	1-40 MMscfd
Helium Feed Pressure	10-150 bara
Helium Product Pressure	Up to 300 bara
Helium Product Purity	95-99.995%
Typical He Recovery Rate	70-95%
Contaminants to remove	N2, O2, H2O, CO2, CxHy
Material of Construction	Carbon or stainless steel
Hazardous area classification	Class 1, Zone 2, Group B/ATEX Zone II
Code compliance	ASME/CRN/ATEX/CE
Electrical Requirement	480V / 60 Hz / 3ph or 400V / 50 Hz / 3ph

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QHRS.1-CS™

QuantumPure QHRS.1-CS™ and QuantumPure QHRS.1-CS – TRI-GAS
Helium Recovery and Purification Systems with Nitrogen Generation Applications

PROVISIONAL APPLICATION PATENT APPLICATION # 63/635,979

Helium Recovery and Nitrogen Generation System at North Eastern University

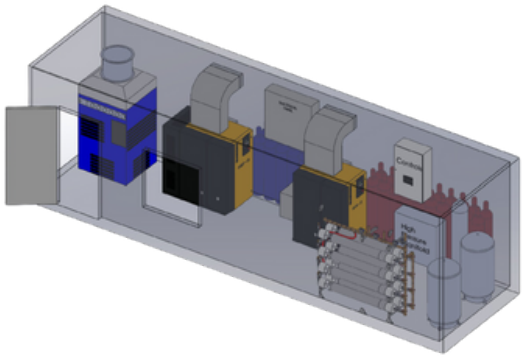
Main System Components

- **Compressor Sets** with oil removal and bypass
- **QuantumPure CSTM Membrane system** equipped with automatic valves and precision flow controllers designed for 99% Helium outlet purity
- **Helium Purity Meters** measuring 0.0 -99.9% He
- **System sensors and transducers** including Pressure transducers, flow meters, and temperature sensors
- **Programmed Logic Controller** for automatic operation
- **High-Pressure Storage**
- **Patented Hermetic Spray Booth** equipped with a dry dust collector and heat exchanger for Spray Booth cooling
- **Gas Bag** and controls

Product Description

Introducing QuantumPure CS™, the cutting-edge solution for cold spray applications. Deployed across the US, our next-generation QuantumPure CS – TriGas™ system not only recovers helium but also generates nitrogen and supplies air, all in one seamless operation.

Tailored to meet diverse customer needs, QuantumPure systems offer both high and low-purity processes. Whether you prefer a Build-Own-Operate (BOO), Lease, or Sale-of-Equipment (SOE) arrangement, we collaborate with you to find the perfect solution.



30' contanerized system as installed in the US.

System Specifications

- Flowrate: 50-200 cfm
- Pressure; up to 3000 PSI
- Initial purity: ~3% Helium
- Final purity: >98.5% Helium and above
- Helium recovery rate: ~85-90%

If your industrial gas bill is significant, QUANTUM may have a solution for you.
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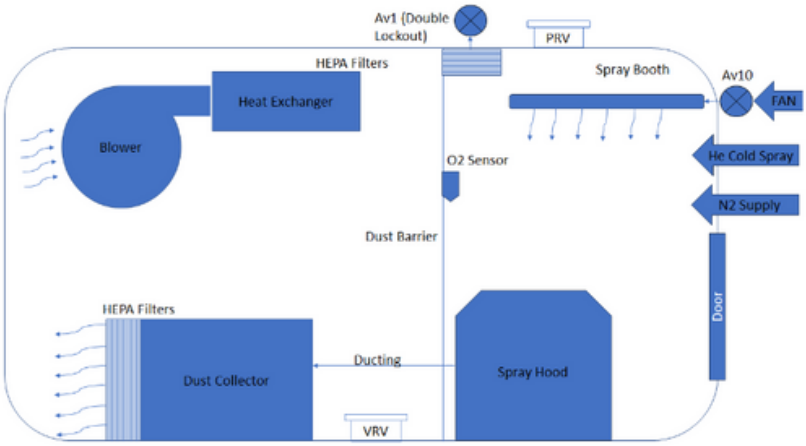
QHRS.1-CS™

QuantumPure QHRS.1-CS™ and QuantumPure QHRS.1-CS – TRI-GAS
Helium Recovery and Purification Systems with Nitrogen Generation Applications

PROVISIONAL APPLICATION PATENT APPLICATION # 63/635,979

Cold Spray Booth



Block Diagram of Cold Spray Booth System

Leak-tight booth for Cold spray applications

Introducing our innovative leak-tight booth, maintaining precise pressure levels with minimal loss.

Divided into two compartments, it efficiently contains metal spray process powder. The main process area features powder injection under a spray hood, with excess powder directed to a dust collector for filtration and heat regulation before evacuation. Gas recirculation maintains optimal thermal conditions.

This compact solution, ideal for various processes like cold and thermal spray, 3-D printing, etc., conserves space and investment while ensuring efficient gas recovery (argon, nitrogen, helium, etc.). By reducing floor space and piping needs, it cuts installation costs by an estimated 25-50%."

Booth Specifications

Sample Table (LxWxH)	1m x 0.5m x 0.6m
Lab Floor Weight restriction	2.5 metric tons per square meter
Six-axis robot arm inside of booth	ABB IRB2600-10/1.45
Robot weight	ABB mass: 250 kg
Forklift Capacity	7 tons
Laboratory Door Size (WxH)	2.5 x 2.8m (Can be enlarged)

If your industrial gas bill is significant, QUANTUM may have a solution for you.
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Specialty gases

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Q16.1/9-QPure-He/Ne

Q16.1/9-QPure-He/Ne - Helium and Neon Dual Purification Plant

Product Description

Quantum Technology's helium and neon dual purification plants produce high pressure and high purity helium and neon gas from a plant process stream.

The overall purification steps used are:

- Hydrogen removal
- Moisture removal
- Nitrogen gas removal
- Neon and helium cryogenic separation
- High pressure gas compression to product pressure

Example System Specifications

Helium Product Purity	>99.999%
Neon Product Purity	>99.999%
Feed Gas Flow Rate	11 Nm3/hr, other flow rates available on request
Typical He Recovery Rate	>95%
Typical Ne Recovery Rate	>95%
Contaminants to remove	Nitrogen, hydrogen, water, residual impurity gases
Code compliance	ASME, CRN, NEC
Electrical Requirement	400V / 3ph, 120 kW, 50 or 60 Hz available
Cooling Water	50 LPM, 20 - 30 degrees C
Liquid Nitrogen	30 LPM for cooling
Oxygen Gas for H2 Removal	0.2 Nm3/hr
Instrument Air	2Nm3/hr, dry, 10 bara
Approximate Size	2.4m (W) x 12m (L) x 2.9m (H)
Approximate Weight	5000 kg

Main System Components

Quantum Technology's helium and neon dual purification plants use both room temperature and cryogenic purification processes to refine the helium and neon to the desired purity. Technologies used include:

- Catalytic hydrogen removal system
- Twin tower regenerative drying system
- Liquid nitrogen cooled nitrogen gas removal
- Distillation column for neon purification
- Final stage helium purifier

Options

- Recycle compressor to ensure high purity
- Gas purity analyzers to confirm the purity specifications are met
- Removal of additional or different impurities specific to each customer's process
- Liquid nitrogen system to compensate cooling capacity for the cryogenic separation and to provide purge gaseous nitrogen for system regeneration
- Product gas filling systems
- Centralized plant control and monitoring system

If you're looking to recover neon or helium QUANTUM may have a solution for you.
Call +1 604 222 5539 to connect with our technical/sales staff.

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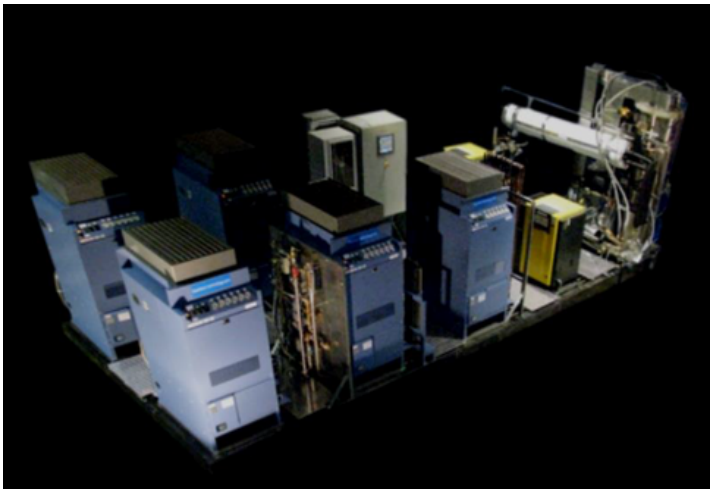
Q16.10-QPure-Kr/Xe - Krypton and Xenon Dual Purification Plant



Product Description

Quantum Technology's krypton and xenon dual purification plants produce high pressure and high purity krypton and xenon gas from liquified oxygen.

The overall purification steps used are:

- Hydrocarbon removal
- Moisture and carbon dioxide removal
- Krypton and xenon cryogenic separation
- High pressure gas compression to product pressure

Example System Specifications

Krypton Product Purity	>99.999%
Xenon Product Purity	>99.9995%
Feed Gas Flow Rate	142 Nm3/hr
Typical Recovery Rate	Around 90%, specific system dependent
Contaminants to remove	Oxygen, methane, water, carbon dioxide
Code compliance	ASME, CRN, NEC
Electrical Requirement	380V / 3ph, 100 kW, 50 or 60 Hz available
Cooling Water	3t/hr, 5bara
Liquid Nitrogen	270Nm3/hr
Gaseous Nitrogen	520 Nm3/hr
Instrument Air	100Nm3/hr, dried, 5-7bara
Approximate Size	60m x 24m (1440m2)

Main System Components

Quantum Technology's krypton and xenon dual purification plants use both room temperature and cryogenic purification processes to refine the krypton and xenon to the desired purity. Technologies used include:

- Vaporizer to bring gas to ambient temperature
- Catalytic hydrocarbon removal system
- Molecular sieve purification bed
- Purification cold box with distillation columns
- Product compression and filling system

Options

- Recycle compressor to assure high purity
- Gas purity analyzers to assure the purity specifications are met
- Removal of additional and different impurities specific to each customer's process
- Liquid nitrogen system to compensate cooling capacity for the cold box and to provide purge gaseous nitrogen for system regeneration
- Centralized plant control and monitoring system

If you're looking to recover krypton or xenon QUANTUM may have a solution for you. Call +1 604 222 5539 to connect with our technical/sales staff.

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Q16.4-QPure-H2

Q16.4-QPure-H2 - Fuel Cell Grade Hydrogen from Ammonia Purifier

Product Description

Quantum Technology uses carbon adsorption, membrane and pressure swing adsorption technologies to extract fuel cell grade hydrogen from the product of ammonia decomposition.

- Hydrogen production at the distribution site saves hydrogen (H2) transportation costs
- Ammonia transportation is well defined and utilized commercially
- Pilot sized system for proof of concept to scale up to production size

Options

- Recirculation of waste streams to increase hydrogen recovery
- Purity analysis of product down to ppm N2 and ppm NH3
- Couple with high pressure hydrogen compression and storage
- Hot water, vacuum or warm gas carbon filter regeneration

Features

- Fast start up and shut down
- Compact design
- Long design life for valves and vessels
- Fully automatic during purification
- Some manual intervention required for carbon filter regeneration
- Pre-installed sampling ports
- Hydrogen leak detection, ammonia leak detection, and infrared flame detector included

Specifications (typical)

Hydrogen Product Purity	>99.99% (Fuel Cell Grade)
Feed Gas Flow Rate	3-10 SCFM
Hydrogen Feed Pressure	1-20 bara
Typical H2 Recovery Rate	70-80%
Quantity of PSA Vessels	4-12 based on system requirement and size
Contaminants to remove	N2, NH3
Material of Construction	Carbon or stainless steel
Hazardous area classification	Class 1, Division 2, Group B/ATEX Zone 1 Group IIC
Code compliance	ASME, CRN, NEC
Electrical Requirement	480V / 60 Hz / 3ph, 10 kW Dependent on system size

If you're looking to produce high grade hydrogen, QUANTUM may have a solution for you. Call +1 604 222 5539 to connect with our technical/sales staff.

Quantum Technology

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N2-Zero

Quantum Cooler™ N2-Zero

Quantum Cooler™ N2-Zero

Need

- • NMR magnets and other laboratory equipment consume liquid nitrogen.
- • This costs time and money and is inconvenient as systems need to be filled on a regular schedule not allowing for holidays or supply issues.

Solution

- Quantum's Quantum Cooler™ N2-Zero product eliminates the boiloff.
- Fill the NMR with liquid nitrogen once and let the Quantum Cooler™ N2-Zero keep it cold indefinitely by reliquefying the boiloff nitrogen.

Components

Q: Quantum Cooler™ N2-Zero cold head
• F: Flexible vacuum jacketed hose
• C: Quantum Cooler™ closed cycle compressor
• H: Hoses from compressor to Quantum Cooler™ N2-Zero cold head

Specification/ Model	N2-Zero
Boiloff	Zero > 7.5 L/min (2 GPM)
Cooling Water Requirement	480V, 60Hz, 3ph, 7kW
Power Consumption	
Compressor	
Footprint	0.6mx0.9m (24" x 36")
Maintenance Interval: Compressor	> 3 years
Coldhead	> 2 years
Shipping Weight	~180kg (400 lbs)

Call +1 604 222 5539 or email sales@quantum-technology.com to connect with our technical/sales staff.
Made in Canada.

Quantum Technology

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Q1.3LN2-9000 Nitrogen Liquefier

Quantum Technology Corp. offers a wide range of Nitrogen Liquefiers with liquefaction capacities between 10 litres/day to 15,000 liters/day, or larger customized sizes. The operating cycle for the larger units utilizes a cryogenic turbo expander to be extremely energy efficient. The QuantumCooler™ Nitrogen Liquefier Systems automatically start and stop as required to maintain liquid nitrogen level in the bulk tank.

Product Description

- The QuantumCooler™ Q1.3 Nitrogen Liquefier is skid mounted for ease of installation.
- A cryogenic turbo expander and cycle compressor with electric motors provide
- the power required.
- Nitrogen gas is generated at high purity directly from air.

Main System Components

1. Compressors
Rotary Screw / 380V 50 Hz or 460 V 60 Hz AC 3 phase
2. Dryer: Regenerative desiccant
3. Nitrogen Generator: Included in QuantumCooler™ system
4. Liquefier
Proprietary cryogenic cycle / 380 V 50 Hz or 460 V 60 Hz AC 3 phase / Automatic start/stop
5. Liquid Nitrogen Dewar
Can directly fill customer's dewar – Quantum manufactures a wide range of dewar sizes

Control System

Automatic start when customer's liquid nitrogen reservoir is low. Automatic stop when liquid reservoir is full.

Technical Parameters Large Unit

Model	QuantumCooler™ Q1.2LN2-9000
Production capacity:	9000 litres LN2/day; (7200 kg/day)
Product temperature	82K (0.7 barg saturated liquid)
Cooling Cycle System	250 kW
Electrical rating	380VAC/3ph/50Hz or 480VAC 3ph 60Hz
Liquid storage tank	Optional (Can connect directly to Customer's Liquid Nitrogen Tank)
N2 GAS PRODUCTION	7200 kg/day
N2 gas purity	99.995%
Dew point	Less than -60C
Power	75 kW
Cooling	Cooling water or glycol is required to remove 325kW of heat (DN100 pipe)
Shipping	Ships to site as 3 sea containers

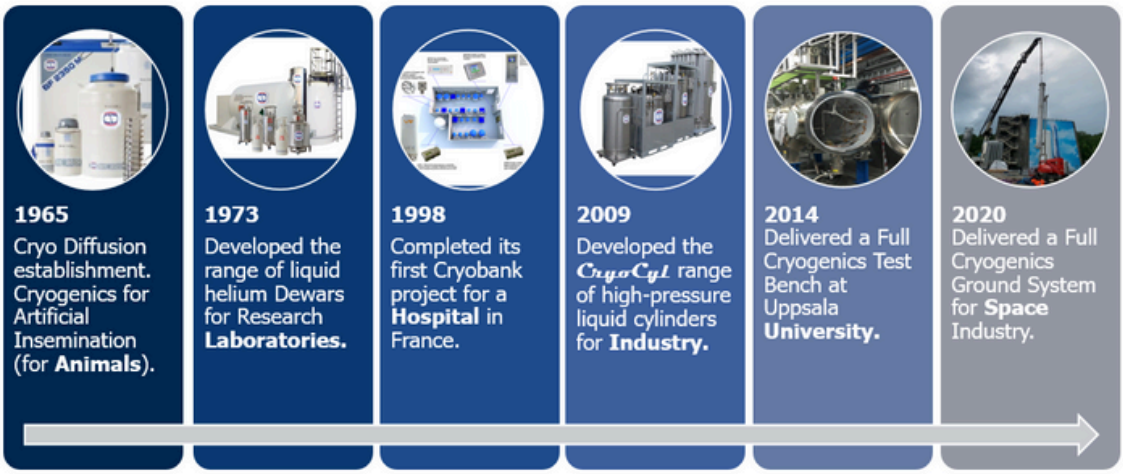
CATALOG

CRYO DIFFUSION

2024

SUMMARY

HISTORY


1965
Cryo Diffusion establishment. Cryogenics for Artificial Insemination (for **Animals**).
1973
Developed the range of liquid helium Dewars for Research **Laboratories.**
1998
Completed its first Cryobank project for a **Hospital** in France.
2009
Developed the *CryoCyl* range of high-pressure liquid cylinders for **Industry.**
2014
Delivered a Full Cryogenics Test Bench at Uppsala **University.**
2020
Delivered a Full Cryogenics Ground System for **Space** Industry.

OUR PRODUCTS

Main products and applications

Cryogenic tanks, piping, valve boxes and loading stations for air and helium gas liquefaction plants
Helium dewars and transfer rods for laboratories and nuclear magnetic resonance (NMR)
Cryogenic equipment for "big science", such as particle gas pedals and university laboratories. Key products include cryostats, super-insulated vacuum transfer lines and multilines, and cryogenic valve boxes and phase separators.
Tanks and transfer lines for hydrogen, liquid and custom products for liquid hydrogen

Thanks to its qualified technicians, Cryo Diffusion also offers a full range of after-sales cryogenic services, including turnkey projects, installations, commissioning, maintenance services, on-site calibrations, diagnostics, repairs, refurbishments, upgrades and de-bottlenecking.

The products sold by Cryo Diffusion meet the most stringent quality and safety standards, and are recognized worldwide.

HYDROGEN WHERE YOU WANT IT, WHEN YOU WANT IT

Our versatile range of hydrogen tanks.
PED-certified, this tank offers capacities ranging from 150 to 1500L.
Equipped with ATEX instrumentation, a standard ACME 2" connection, and designed for easy handling by pallet truck, hoist or hook..

Safe and easy hydrogen storage.

MASTERING HYDROGEN

Cryo Diffusion expands its offer with state-of-the-art equipment. Discover our new liquefaction machines, including the 1500 Kgpd model, guaranteeing optimum performance in gas management.

As the world enters a new phase of renewable and sustainable alternatives to fossil fuels, green hydrogen is a cost-effective and scalable solution. Our decades of experience in the purification and liquefaction of noble gases (including hydrogen) have enabled us to evolve our laboratory equipment business.

We provide small and large-scale hydrogen liquefaction and purification solutions to our customers worldwide. Hydrogen liquefiers up to 15 tons/day, based on the hydrogen or helium cycle, as well as hydrogen purifiers up to 15 tons/day, to remove impurities from raw hydrogen before the liquefaction process.

STORAGE OF SMALL QUANTITIES OF LIQUID NITROGEN

PRODUCT INFORMATION

Aluminum cryogenic tanks for liquid nitrogen storage. Lightweight, high-performance and sturdy, equipped with a PNEUROP NW50 flange (25-liter model and larger).

They can be filled by gravity and can be fitted with a filling head or an electric pump.

USE

The L2000 series has been specially designed for storage.

ACCESSORIES

Wheelie bag

Level gauge INJC1 with display

Electric pump

Flexible / Handle for easy and safe transport

TN mobile head

TS moving head

PRODUCTS

L 2000 series

25000806	L2012 WITHOUT FLANGE + PLUG
25000812	L2012 WITH NW50 PNEUROP FLANGE + PLUG
25000807	L2025 WITH NW50 PNEUROP FLANGE + PLUG
25000809	L2050 WITH NW50 PNEUROP FLANGE + PLUG
25000810	L2100 WITH NW50 PNEUROP FLANGE + PLUG

Accessories for sale transport

10015478	ROLLER BASE 4 CASTORS FOR L2012 AND 2025
10015560	ROLLER BASE 5 CASTORS - 2 STOPPERS - FOR L2050 AND L2100

Withdrawal device : Mobile head derma (NW50)

20002832	MOBILE HEAD DERMA TYPE FOR É(LITERS CONTAINER

Withdrawal device : Mobile head TN (NW50)

20002550	MOBILE HEAD TN

Withdrawal tubes for TN head - for L2025 & L2050

20002544	U SHAPE TUBE WITHOUT VALVE WITHOUT COUPLING FOR 25/50 LITERS CONTAINER
25000632	U SHAPE TUBE WITH VALVE WITHOUT COUPLING FOR 25/50 LITERS CONTAINER
25000631	U SHAPE TUBE WITHOUT VALVE WITH COUPLING 3/4 BSW FOR 25/50 LITERS CONTAINER
25000634	U SHAPE TUBE WITH VALVE WITH COUPLING 3/4 BSW FOR 25/50 LITERS CONTAINER
25000635	U SHAPE TUBE WITH SOLENOID VALVE WITHOUT COUPLING FOR 25/50 LITERS CONTAINER
25000637	U SHAPE TUBE WITH SOLENOID VALVE WITH COUPLING 3/4 BSW FOR 25/50 LITERS CONTAINER
25000638	L SHAPE TUBE WITHOUT VALVE WITH COUPLING 3/4 BSW FOR 25/50 LITERS CONTAINER
25000639	L SHAPE TUBE WITH VALVE WITHOUT COUPLING FOR 25/50 LITERS CONTAINER
25000633	L SHAPE TUBE WITH VALVE WITH COUPLING 3/4 BSW FOR 25/50 LITERS CONTAINER
25000640	L SHAPE TUBE WITH SOLENOID VALVE WITHOUT COUPLING FOR 25/50 LITERS CONTAINER
25000636	L SHAPE TUBE WITH SOLENOID VALVE WITH COUPLING 3/4 BSW FOR 25/50 LITERS CONTAINER

Withdrawal tubes for TN head for L2100 liquid nitrogen dewar

25000621	U SHAPE TUBE WITHOUT VALVE WITHOUT COUPLING FOR 100 LITERS CONTAINER
25000649	U SHAPE TUBE WITH VALVE WITHOUT COUPLING FOR 100 LITERS CONTAINER
25000648	U SHAPE TUBE WITHOUT VALVE WITH COUPLING 3/4 BSW FOR 100 LITERS CONTAINER
25000650	U SHAPE TUBE WITH VALVE WITH COUPLING 3/4 BSW FOR 100 LITERS CONTAINER
25000651	U SHAPE TUBE WITH SOLENOID VALVE WITHOUT COUPLING FOR 100 LITERS CONTAINER
25000652	U SHAPE TUBE WITH SOLENOID VALVE WITH COUPLING 3/4 BSW FOR 100 LITERS CONTAINER
25000653	L SHAPE TUBE WITHOUT VALVE WITH COUPLING 3/4 BSW FOR 100 LITERS CONTAINER
25000654	L SHAPE TUBE WITH VALVE WITHOUT COUPLING FOR 100 LITERS CONTAINER
25000655	L SHAPE TUBE WITH VALVE WITH COUPLING 3/4 BSW FOR 100 LITERS CONTAINER
25000656	L SHAPE TUBE WITH SOLENOID VALVE WITHOUT COUPLING FOR 100 LITERS CONTAINER
25000657	L SHAPE TUBE WITH SOLENOID VALVE WITH COUPLING 3/4 BSW FOR 100 LITERS CONTAINER

1.5 BAR STAINLESS STEEL FIXED CRYOGENIC TANKS

PRODUCT INFORMATION

XRP open-neck cryogenic tanks are 1.5 bar tanks for storing and filling liquid nitrogen.

They are equipped with an automatic pressurization device, a pressure regulator adjustable from 0.5 to 1.5 bar, and a safety valve.

The NW 50 dewar interface enables a mobile head to be attached for liquid filling. Tanks are supplied with an insulating cap as standard.
CE marking: in compliance with PED 2014-68 EU.

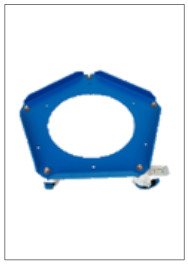
USE /

Self-pressurized liquid nitrogen or oxygen storage tank for constant-pressure liquid supply.
The open neck allows gravity filling and accommodates various models of mobile heads.

For road transport, see the cryostoc series.

A flexible solution for storing and filling liquid nitrogen in laboratories

ACCESSORIES



roller base

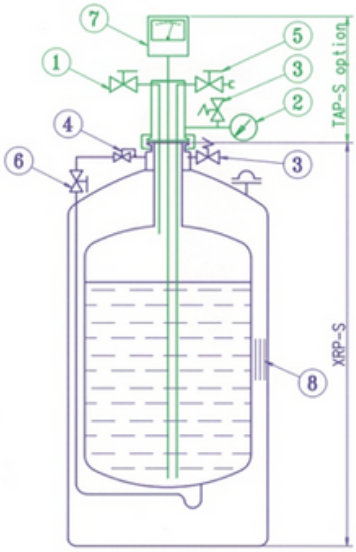
INJC1 level gauge with display

Flexible / Handle for easy and safe transport

TAP S-mobile head

SCHEMATIC DIAGRAM :

1- Vent valve
2- Pressure gauge
3- Safety valve
4- Pressure regulator
5- Fill / drain valve
6- Pressurization valve
7- Capacitive level gauge (optional)
8- Super insulation



CRYO DIFFUSION

FIXED TANK

TECHNICAL SPECIFICATIONS

SPECIFICATIONS	XRP60 S	XRP120 S	XRP200 S
Usable capacity	58	120	203
Total capacity	60	127	210
Overall height	915	1045	1411
Interior height	698	853	1292
Outside diameter	460	570	570
Empty weight	38	62	95
Full weigh	86.5	159	259
Static consumption	1.8	1.3	1.2
NW50 flange	Yes	Yes	Yes
Max. pressure	1.5	1.5	1.5

PRODUCTS

XRP S série - sans dispositif de retrait

25000967	XRP 60 - WITH WHEELS (2 WITH STOPPERS)
25000968	XRP 120 - WITH WHEELS (2 WITH STOPPERS)

Withdrawal devices : Mobile head TAP

25001101	MOBILE HEAD TAP S FOR XRP 60
25001102	MOBILE HEAD TAP S FOR XRP 120

Level indicators with 4-20 mA output, fit on Mobile head TAP

60000061	CAPACITIVE GAUGE INJC1 FOR XRP 60
60000062	CAPACITIVE GAUGE INJC1 FOR XRP 120

Standard withdrawal flexible hoses, to fit on Mobile head TAP

10017732	FLEXIBLE HOSE LN2 L. 1,20M X Ø 10MM (3/4"BSW)
10017788	FLEXIBLE HOSE LN2 L. 1,50M X Ø 10MM (3/4"BSW)
10017782	FLEXIBLE HOSE LN2 L. 2,00M X Ø 10MM (3/4"BSW)
10017783	FLEXIBLE HOSE LN2 L. 3,00M X Ø 10MM (3/4"BSW)
10017828	FLEXIBLE HOSE LN2 L. 2,00M X Ø 10MM (3/4"BSW) PVC INSULATED WITH EXTERNAL HOSE
10017929	FLEXIBLE HOSE LN2 L. 3,00M X Ø 10MM (3/4"BSW) PVC INSULATED WITH EXTERNAL HOSE

Withdrawal pipes, to fit on flexible hose (3/4" BSW)

25001054	PHASE SEPERATOR 1/2" WITH TUBE (3/4" BSW)
25001050	WITHDRAWAL PIPE LN2 WITH HANDLE (3/4" BSW)
25001098	WITHDRAWAL PIPE LN2 WITH HANDLE, PHASE SEPERATOR AND DEFLECTOR (3/4" BSW)

Others

60000141	PROTECTION GLASSES
35002126	SAFETY VISOR
60000140	PROTECTION GLOVES
10015281	HIGH QUALITY LEATHER PROTECTION GLOVES
60000142	APRON
10013075	MOBILE OXYGEN DETECTOR

3.9 BAR STAINLESS STEEL FIXED CRYOGENIC TANKS: RBP VLN SERIES

PRODUCT INFORMATION

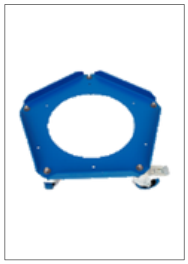
Vertical tank equipped with a pressurization device and a regulator adjustable from 0.5 to 3.9 bar, and with valves for filling and discharging liquefied gases (nitrogen, oxygen, argon).

Marquage CE : selon DESP 2014-68 UE.

USE :

These are storage tanks for liquid nitrogen, oxygen or argon, used in laboratories to supply liquid at constant pressure.

ACCESSORIES



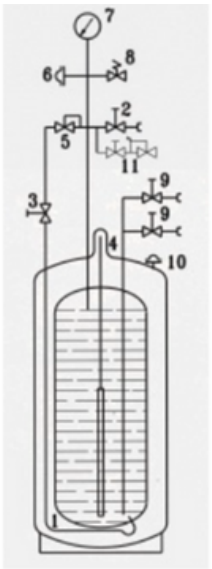
Base on wheels

INJC1 level gauge with display

Flexible / Handle for easy and safe transport

SCHEMATIC DIAGRAM :

1. Pressurization circuit
2. Vent valve
3. Pressurization valve
4. Level indicator
5. Pressure regulator
6. Gas phase rupture disc
7. Pressure gauge
8. Safety valve
9. Filling/withdrawal valve
10. Rupture disc
11. Economizer with isolation valve (optional)



CRYO DIFFUSION

FIXED TANK

TECHNICAL SPECIFICATIONS

SPECIFICATIONS	RBP120 VLN	RBP200 VLN
Usable capacity (l)	120	200
Total capacity (l)	127	210
Overall height (mm)	1205	1640
Outside diameter (mm)	570	570
Empty weight (kg)	92	112
Full weight (kg) - LN2 - LAr	 189 260	 273 390
Statistical consumption (%/J) - LN2 - LAr	 1.7 1.25	 5 1.05
Connector types	¾ BSW	¾ BSW
Handling	5 wheels	Base on wheels
Max. pressure (Bar)	3.9	3.9

PRODUCTS

Series RBP

25000950	RBP 120 VLN - WITH WHEELS (AVEC 2 BUTÉES) - 3/4" BSW
25000951	RBP 200 VLN - 3/4" BSW

Accessories for safe transport

20004051	CASTOR BASE 5 CASTORS (2 WITH STOPS) FOR RBP 200 VLN
25001053	HANGING CART FOR RBP 200 VLN

Level indicators with 4-20 mA output, suitable for RBP series

60000058	INJCI CAPACITIVE GAUGE FOR RBP 120 VLN
60000052	INJCI CAPACITIVE GAUGE FOR RBP 200 VLN

Standard withdrawal flexible hoses, to fit on Mobile head TAP

10017732	FLEXIBLE HOSE LN2 L. 1,20M X Ø 10MM (3/4"BSW)
10017788	FLEXIBLE HOSE LN2 L. 1,50M X Ø 10MM (3/4"BSW)
10017782	FLEXIBLE HOSE LN2 L. 2,00M X Ø 10MM (3/4"BSW)
10017783	FLEXIBLE HOSE LN2 L. 3,00M X Ø 10MM (3/4"BSW)

Standard withdrawal flexible hoses, to fit on Mobile head TAP

10017828	FLEXIBLE HOSE LN2 L. 2,00M X Ø 10MM (3/4"BSW) PVC INSULATED WITH EXTERNAL HOSE
10017929	FLEXIBLE HOSE LN2 L. 3,00M X Ø 10MM (3/4"BSW) PVC INSULATED WITH EXTERNAL HOSE
10017733	FLEXIBLE HOSE LN2 L. 1,20 X Ø20MM (3/4" BSP)

Withdrawal pipes, to fit on flexible hose (3/4" BSW)

25001054	PHASE SEPERATOR 1/2" WITH TUBE (3/4" BSW)
25001050	WITHDRAWAL PIPE LN2 WITH HANDLE (3/4" BSW)
25001098	WITHDRAWAL PIPE LN2 WITH HANDLE, PHASE SEPERATOR AND DEFLECTOR (3/4" BSW)

Série RBP

10013167	SYSTÈME CAN -ELECTRONIC LN2 AUTOMATIC FILLING STOP MODULE
25000643	CAN SYSTEM -FILLING DETECTOR FOR OPEN-NECK CONTAINERS

Others

60000141	PROTECTION GLASSES
35002126	SAFETY VISOR
10015281	HIGH QUALITY LEATHER PROTECTION GLOVES
60000142	APRON
10013075	MOBILE OXYGEN DETECTOR

TRANSPORTABLE TANKS FOR CRYOGENIC FLUIDS

PRODUCT INFORMATION

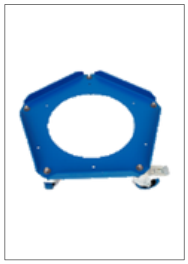
Vertical tanks for transporting liquid nitrogen, oxygen and argon. Made of non-magnetic stainless steel.

USE :

The CRYOSTOC and CRYOTRANS can be installed in a vehicle to dispense nitrogen or oxygen: the Cryotrans version features front-mounted valves for ease of use.

These tanks can be transported full on public roads.

ACCESSORIES



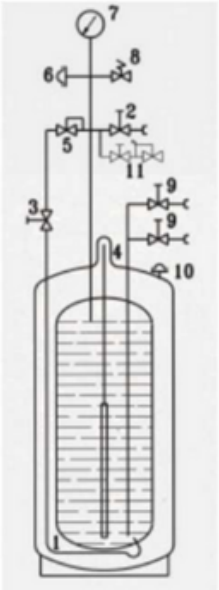
Base on wheels

INJC1 level gauge with display

Flexible / Handle for easy and safe transport

SCHEMATIC DIAGRAM :

1. Pressurization system
2. Vent valve
3. Pressure valve 4. Level indicator
5. Pressure regulator
6. Gas phase rupture disc
7. Pressure gauge
. Safety valve
9. Filling/withdrawal valve
10. Vacuum rupture disc 11. Economizer with shut-off valve (optional)



CRYO DIFFUSION

TRANSPORTABLE TANK

TECHNICAL SPECIFICATIONS

Model (Volume/Pressure)	CRYOSTOC
Usable capacity (l)	200
Total capacity (l)	210
Empty weight (kg)	151
Full weight (kg) - LN2 - LAr	 312 431
Overall height (mm)	1640
Outside diameter (mm)	570
Statistical consumption (%/J) - LN2 - LAr	1.5
Connection	¾ BSW
Max. pressure (Bar)	3.9

PRODUCTS

TPED cylinders for liquid nitrogen and argon

25000955	CRYOSTOC 200 - 3/4" BSW - 3,9 BAR

Filling hose and phase separators for safe tank filling with nitrogen

25001050	WITHDRAWAL PIPE LN2 WITH HANDLE (3/4 "BSW)
25001098	WITHDRAWAL PIPE LN2 WITH HANDLE, AND PHASE SELECTOR AND DEFLECTOR (3/4 "BSW)
25001111	PHASE SELECTOR 1/2" WITHOUT PIPE (3/4" BSW)
25001054	PHASE SELECTOR 1/2" WITH PIPE (3/4" BSW)

Standard oxygen sampling equipment

25000664	FLEXIBLE HOSE LO2 L. 1,20M X Ø10MM (2 CONNECTION M22X150)
25001088	WITHDRAWAL PIPE LO2 WITH HANDLES FOR FLEXIBLE HOSE Ø10MM

Standard oxygen sampling equipment

10013167	SYSTÈME CAN - LN2 ELECTRONIC AUTOMATIC FILLING STOP MODULE
25000643	CAN SYSTEM - FILL DETECTOR FOR OPEN-NECK CONTAINERS

Others

6000141	PROTECTION GLASSES
35002126	SAFETY VISOR
10015281	HIGH QUALITY LEATHER PROTECTION GLOVES
60000142	APRON
10013075	MOBILE OXYGEN DETECTOR

CRYOROLL 230

AIR GASES AND LNG / LIQUID USE TRANSPORTABLE

TRANSPORTABLE STAINLESS STEEL CRYOGENIC TANKS

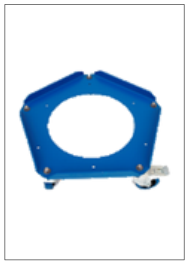
PRODUCT INFORMATION

Cryo Diffusion offers a new vertical cryogenic tank in non-magnetic stainless steel for storing and transporting liquid nitrogen, oxygen and argon.
The Cryoroll 230 is a transportable, self-pressurized 3.9b cryogenic tank.

USE :

The Cryoroll 230 is a compact tank fitted with a wheeled base.
It can be transported or mounted in a vehicle to dispense liquefied gases.

ACCESSORIES



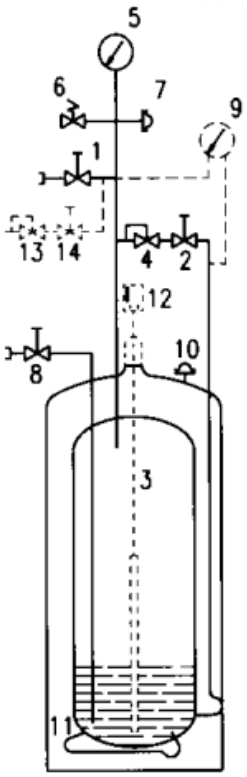
Base on wheels

INJC1 level gauge with display

Flexible / Handle for easy and safe transport

SCHEMATIC DIAGRAM :

1. Vent and overflow valve
2. Pressurization valve 3. Level indicator (optional)
4. Pressure regulator
5. Pressure gauge
6. Safety valve
7. Rupture disc
8. Filling and draining valve
9. Differential pressure level gauge (optional)
10. Vacuum rupture disc 11. Pressurization system
12. Capacitive gauge (option) 13. Economizer (optional)
14. Economizer isolation valve (optional)



CRYO DIFFUSION

TRANSPORTABLE TANK

CARACTÉRISTIQUES TECHNIQUES

SPECIFICATION	Cryoroll 230
Usable capacity (l)	222
Total capacity (l)	234
Overall height (mm)	1354
Outside diameter (mm)	670
Empty weight (kg)	146
Full weight (kg) - LN2 - LAr	326 400 457
Statistical consumption (%/J) - LN2 - LAr	1.6 1.2 1.2
Manual transport	Handle + Base on wheels
Max. pressure (Bar)	3.9

PRODUITS

	TPED cylinders for liquid nitrogen and argon
25000979	CRYOROLL 230 - WITH WHEELS (2 WITH STOPPERS) - 3/4" BSW - 3,9 BAR
	TPED cylinders for liquid oxygen
25000980	CRYOROLL 230 - LO2 - WITH WHEELS (2 WITH STOPPERS) - M22 X 150 - 3,9 BAR
	Level indicators with 4-20 mA output, fit on TPED series
60000064	CAPACITIVE GAUGE INJC1 FOR CRYOROLL 230
	Filling hose and phase separators for safe tank filling with nitrogen
25001050	WITHDRAWAL PIPE LN2 WITH HANDLE (3/4 "BSW)
25001098	WITHDRAWAL PIPE LN2 WITH HANDLE, AND PHASE SELECTOR AND DEFLECTOR (3/4 "BSW)
25001111	PHASE SELECTOR 1/2" WITHOUT PIPE (3/4" BSW)
25001054	PHASE SELECTOR 1/2" WITH PIPE (3/4" BSW)
	Standard oxygen sampling equipment
25000664	FLEXIBLE HOSE LO2 L. 1,20M X Ø10MM (2 CONNECTION M22X150)
25001088	WITHDRAWAL PIPE LO2 WITH HANDLES FOR FLEXIBLE HOSE Ø10MM
	Standard oxygen sampling equipment
10013167	SYSTÈME CAN - LN2 ELECTRONIC AUTOMATIC FILLING STOP MODULE
25000643	CAN SYSTEM - FILL DETECTOR FOR OPEN-NECK CONTAINERS
	Others
6000141	PROTECTION GLASSES
35002126	SAFETY VISOR
10015281	HIGH QUALITY LEATHER PROTECTION GLOVES
60000142	APRON
10013075	MOBILE OXYGEN DETECTOR

TRANSPORTABLE TANKS FOR CRYOGENIC GASES

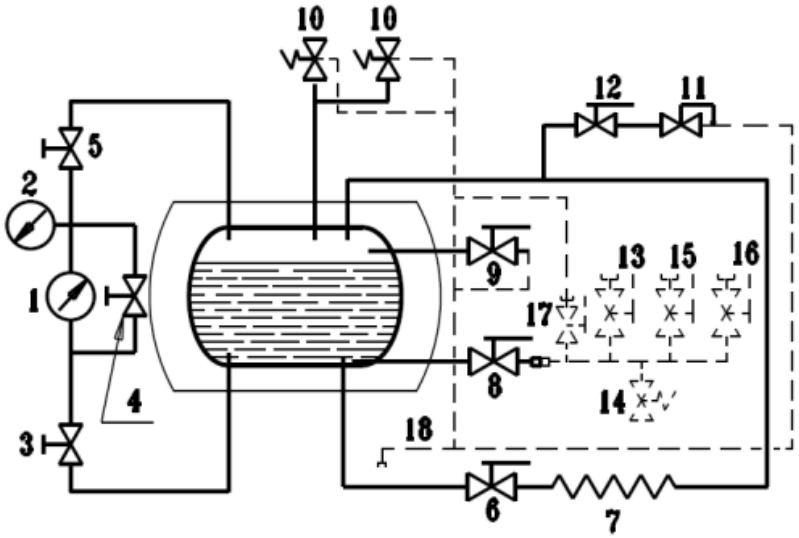
PRODUCT INFORMATION

The RBP or RMP HLR transportable cryogenic tanks are easy to handle, thanks to fork passages (except for the 2000-liter version).

They can also be installed in a vehicle.

SCHEMATIC DIAGRAM :

1- Level indicator
2- Pressure gauge
3- Liquid phase isolation valve
4- Balancing valve
5- Gas phase isolation valve
6- Pressurization valve
7- Heater
8- Draught isolation valve
9- Overflow vent valve
10- Safety valve
11- Saturation kit
12- Overflow isolation valve
13-15-16 Filling/draw-off valve (optional)
14- Line valve (Optional)
17- Drain valve (Optional)
18- Special discharge piping (Optional)



TECHNICAL SPECIFICATIONS

SPECIFICATION	RBP850 HLR	RBP1000 HLR	RMP2000 HLR
Usable capacity (l)	828	945	1900
Total capacity (l)	871	995	2000
Overall height (mm)	1195	1195	1375
Outside diameter (mm)	1100	1100	1250
Total length	1750	1930	2764
Empty weight (kg)	508	540	1158
Full weight (kg) - LIN - LOX - LAr	 11 777 1453 NA	 1.5 1 NA	 2689 3322 3802
Statistical consumption (%/J) LIN LOX LAr	 1.7 1.2 NA	 1.5 1 NA	 1.3 0.85 0.9
Handling	Fork passage	Fork passage	Fork passage
Max. pressure (Bar)	3.9	3.9	3.9

CRYOPACK CONTAINER

AIR GASES AND LNG / LIQUID USE TRANSPORTABLE

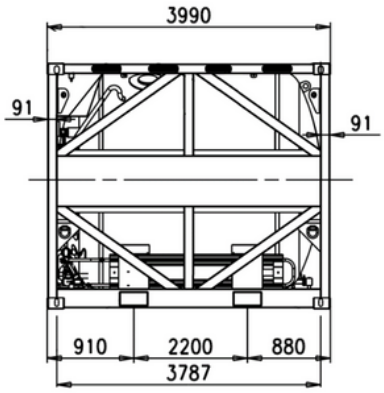
CRYOGENIC CONTAINER FOR TRANSPORT AND STORAGE OF LIQUEFIED GASES

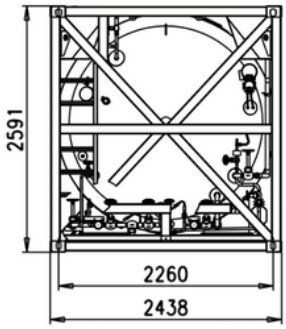
PRODUCT INFORMATION

He Cryopack is a super-insulated vacuum tank with a frame. It is designed for the storage and transport of liquid nitrogen and oxygen. It offers a choice of operating pressures: 5.2 or 6 bar as standard (other pressures on request) for liquid filling.
The tank withstands the most severe conditions of use and can be transported by truck, train, ship, etc.

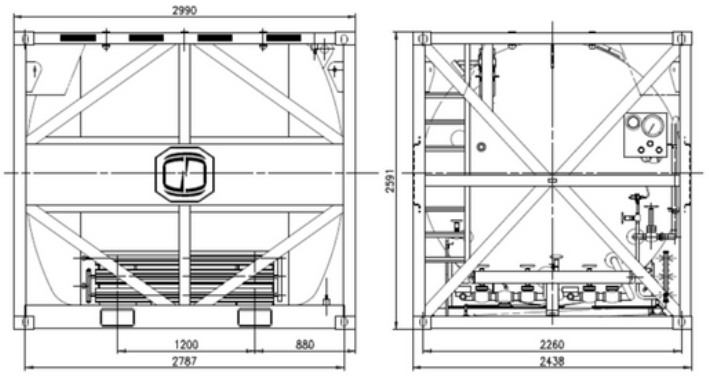
USE :

This tank meets the demands of the oil and gas industries, through offshore service. Other tanks are available Cryopack HP (16b) for nitrogen/oxygen/LNG equipped with vaporizer for gas withdrawal.





Design and dimensions of Cryopack 3000G (Frame 15FT)



Cryopack 10FT design and dimensions

CRYO DIFFUSION

TRANSPORTABLE TANK

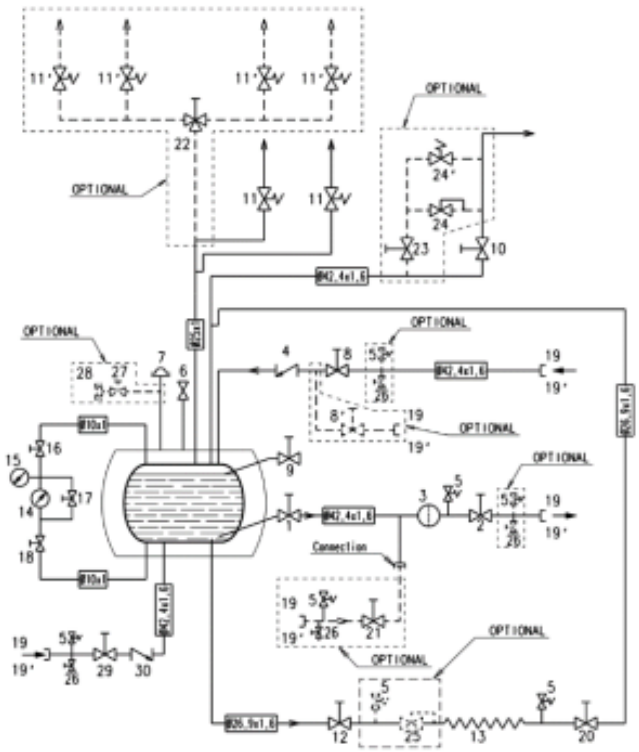
TECHNICAL SPECIFICATIONS

SPECIFICATION	Cryopack 3000G	Cryopack 10FT
Gross capacity	11 650 L	7 800 L
Net capacity	11 068 L	7 410 L
Weight (tare)	5 830 Kg	5 000Kg
Full weight (LN2)	14 800 Kg	10 990 Kg
Max. pressure	5/6 Bar	5,2/6 Bar
Evaporation rate	⩽ 0,3%/jour	0,5%

Other versions available:

- Cryopack HP (medium pressure): 16b with vaporizer for gas filling

PID :



CRYOGENIC TANKS FROM 16 TO 37 BAR FOR GAS FILLING

PRODUCT INFORMATION

Super-insulated tanks for liquefied gases : LN2, LO2, Lar, LCO2

Range: 600 to 3000 L - 16 to 37 b - self-pressurized with vaporizer: 50, 100 or 130 Nm3/H
Design and manufacturing code: EN13458
Can be handled when empty with forklift or crane

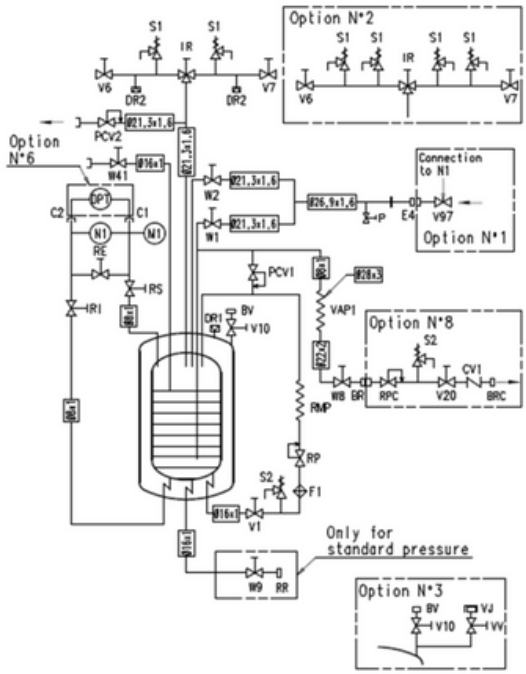
CE marking: in compliance with EU PED 2014-68.

USE :

Liquefied-gas storage units for supplying nitrogen, oxygen, argon or CO2 gas to plants at adjustable pressure.

The 600 and 1000L models are also DESPT-certified for transport.

SCHEMATIC



TAG	Fonction	Dimension	Dimension
BR	Raccord d'alimentation de gaz	DN15	1/2"
BV	Pompe pour faire le vide	Per MFG	Per MFG
C1.C2	Compression fitting caps	DN8	1/4"
DPT	Capteur de niveau de liquide	Per MFG	Per MFG
DR1	Disque de rupture du vide	Per MFG	Per MFG
DR2	Disque de rupture du réservoir	Per MFG	Per MFG
E4	Raccord de remplissage	Per MFG	Per MFG
F1	Crépine (Peut être intégré dans RP)	DN15	1/2"
IR	3 dérivations	Per MFG	Per MFG
LP	Espace de décompression	Per MFG	Per MFG
M1	Gauge mécanique de pression	100 mm Min	4"
N1	Indicateur mécanique de niveau	160 mm Min	6"
P	Vanne de purge	DN10	1/4"
PCV1	Economiser	Per MFG	Per MFG
PCV2	Régulateur de retour de pression	Per MFG	Per MFG
RE	Level Gauge Manifold: Equalizing	DN10	1/4"
RI	Level Gauge Manifold: Liquid	DN10	1/4"
RMP	Vaporisateur de montée en pression	Per MFG	Per MFG
RP	Regulateur de pression	Per MFG	Per MFG
RR	Connection pour utilisation liquide	DN15	1/2"
RS	Level Gauge Manifold: Gas	DN10	1/4"
S1	Vanne de sécurité du reservoir	Per MFG	Per MFG
S2	Thermal Expansion Valve	Per MFG	Per MFG
V1	Pressure Buil-up Valve (With Cryogenic Extention)	DN15	1/2"
V10	Vanne d'isolation sous vide	Per MFG	Per MFG
V6,V7	Vanne d'évent	DN5	1/8"
VAP 1	Vaporisateur atmosphérique	DN15	1/2"
VJ	Gauge sous vide	Per MFG	Per MFG
VV	Vacuum Probe Isolation Valve	DN5	1/8"
W1	Remplissage de liquide	DN15	1/2"
W2	Remplissage de gaz	DN15	1/2"
W41	Full Trycock	DN10	3/8"
W8	Vanne d'approvisionnement en gaz	DN15	1/2"
W9	Bottom liquid valve (With Cryogenic Extention)	DN15	1/2"
Optional pressure regulation on customer line			
RPC	Regulateur de pression Client	DN15	1/2"
V20	Vanne d'isolation Client	DN15	1/2"
CV1	Clappet anti retour Ligne Client	DN15	1/2"
BRC	Connection Alimentation en gaz Ligne Client	DN15	1/2"
Optional protection valve			
V97	Valve de protection pour surpression	DN25	1"

CRYO DIFFUSION

TRANSPORTABLE TANK

TECHNICAL SPECIFICATIONS

Modèle (Volume/Pression)	600 – 24/37	1000 – 24/37	2000 – 24/37
Capacité			
Liquide : volume totale (l)	592 / 583	970 / 954	2024 / 2000
Liquide : volume utile (l)	562 / 524	922 / 859	1923 / 1800
N2 Gaz volume (Nm3)*	369 / 344	605 / 564	1262 / 1182
O2 Gaz volume (Nm3)*	456 / 425	748 / 697	1560 / 776
AR Gaz volume (Nm3)*	446 / 416	731 / 681	1525 / 509
Performances			
(%/J)	1.4	1.2	0.6
Débit gaz N2, O2, AR (Nm3/h)	20	30	42
Debit Gaz CO2, N2O (Nm3/h)	7	10	14
Pression max. (bar)	24 / 37	24 / 37	24 / 37
Application	Statique ou Mobile	Statique ou Mobile	Statique
Norme de fabrication	PED / TPED	PED / TPED	PED
Dimensions & Poids			
Diamètre extérieur	1050	1050	1250
Dimension (mm)	L : 1130 W : 1200 H : 1710	L : 1130 W : 1200 H : 2195	L : 1300 W : 1440 H : 2660
Poids tank sans cadre (kg)	690 / 800	970 / 1020	-
Poids tank avec cadre (kg)	550 / 660	820 / 870	1030 / 1170

Modèle (Volume/Pression)	3000/16	3000/37
Liquide : Volume Brut (litres)	2956	2906
Liquide : Volume Net (litres)	2808	2615
N2 Gaz volume (Nm3)*	1880	1739
O2 Gaz volume (Nm3)*	2324	2150
AR Gaz volume (Nm3)*	2272	2102
NER** (%/jour) LN2	0,7	0,7
LO2	0,45	0,45
Débit de gaz N2 (Nm3/h)	100 (130***)	100(130***)
Débit de gaz O2/Ar (Nm3/h)	88/110	88/110
MAWP (bar)	16	34
Diamètre du réservoir (mm)	1500	1500
Dimensions totales avec la base (LxlxH)	1590x2140x2750	
Réservoir vide avec base (kg)	1590	2090

PRODUCTS

Cryocyl 3000

25001937	CRYOCYL 3000/16 - 30 NM3/H - PED
25001938	CRYOCYL 3000/37 - 30 NM3/H - PED

Options pour le Cryocyl 3000

OPTION 1	ADDITION OF TWO BURSTING DISC, TWO VALVES AND ONE THREE-WAYS VALVE
OPTION 2	ADDITION OF TWO RELIEF VALVES, TWO VALVES AND ONE THREE-WAYS VALVE
OPTION 3	ANNULAR SPACE VACUUM DETECTION
OPTION4	SATURATION KIT
OPTION 5	LIQUID WITHDRAWAL VALVE (ONLY FOR 16 BAR TANKS)
OPTION 6A	ADDITION OF TRANSMITTER ON THE DIFFERENTIAL PRESSURE LEVEL GAUGE
OPTION 6B	ADDITION OF TRANSMITTER ON THE DIFFERENTIAL PRESSURE AND PRESSURE LEVEL GAUGE
OPTION 7A	ATMOSPHERIC VAPORIZER 60NM3/H
OPTION 7B	ATMOSPHERIC VAPORIZER 100NM3/H
OPTION7C	ATMOSPHERIC VAPORIZER 130NM3/H
OPTION 8	EASY MAINTENANCE

CRYOVAP 200

CRYOGENIC RESERVOIRS FOR NITROGEN, OXYGEN AND ARGON TRANSPORT

AIR GASES AND LNG / USE TRANSPORTABLE GAS

PRODUCT INFORMATION

Cryovap is a super-vacuum-insulated stainless steel tank designed for road transport of cryogenic fluids and for use in the gas phase. It features an integrated pressurization system with regulator and economizer.

ACCESSORIES

Base on wheels

INJC1 level gauge with display

Flexible / Handle for easy and safe transport

TECHNICAL SPECIFICATIONS

SPECIFICATION	Cryostoc 200
Usable capacity	200
Total capacity	210
Total height	1638
Outside diameter	570
Empty weight (kg)	156
Full weight (kg) - LN2 - LO2 - LAr	 317 384 436
Statistical consumption (%/J) - LN2 - LO2 - LAr	 2.1 1.4 1.5
Connection type - LN2 - LO2 - LAr	 ¾ BSW M22 x 150 ¾ " BSW
Max. pressure (Bar)	15

CRYO DIFFUSION

TRANSPORTABLE TANK

SUPER-INSULATED VACUUM LINES (VIL)
VACUUM JACKETED LINES (VJ)

PRODUCT INFORMATION

We use stainless steel tubing for the inner part of the line.

Standard operating pressure: 10 bar. Higher pressure on request.
On-site installation and commissioning on request.
Best vacuum quality on the market, requiring no special maintenance.

Wide range of options and accessories available.

External part remains at ambient temperature, ensuring a high level of safety against cryogenic burns.

Cryo Diffusion offers a complete range of custom-made super-insulated vacuum transfer lines, whether rigid or flexible / single or multiline.

TECHNICAL SPECIFICATIONS

Materials:	Inner part: 304 or 304L stainless steel with compensators
External part:	304L stainless steel
Spacer:	Fiberglass
Insulation:	Multi-layer aluminum and fiberglass
Connections:	Johnston bayonet connection or vacuum-welded sleeve
Operating pressure :	With 16-bar bayonet and with 40-bar sleeve
Design:	Compliant with PED 2014/68/UE or ASME B31.3 regulations
Length max:	10m per section
Accessories:	PU-insulated or vacuum valve / manual or motorized

Diameter	Flow P:3bar L/H	Size (mm) Inside	Size (mm) Outside	Weight kg/m	Connection	Warming W/m	Warming(W) / connection (M+F)
DN 10	350	16 x 1	63,5 x 1,5	3,2	Bayonet	0,35	1,4
DN 20	1500	25 x 1,5	63,5 x 1,5	3,4	Bayonet	0,42	1,4
DN 25	2500	34 x 1	76,1 x 1,5	5,5	Bayonet	0,67	2,3
DN 32	4000	42,4 x 1,6	88,9 x 1,5	6,3	Manchon	0,71	2,9
DN 40	7500	53 x 1,5	114,3 x 1,6	7,3	Manchon	0,78	4
DN 50	9000	63 x 1,6	114,3 x 1,6	8	Manchon	0,82	4

SERIES HELIUM MSB

HELIUM / TRANSPORTABLE

STAINLESS STEEL TANKS

PRODUCT INFORMATION

Benefiting from Cryo Diffusion's experience in the application of ultra-low temperature techniques, this new generation of tanks combines..:

- Robustness: all stainless steel construction
- Performance: low losses thanks to Cryo Diffusion's improvements in multi-screen technology
- Amagnetism: ultra-low-carbon austenitic stainless steel for MRI
- Wide range: capacities from 30 to 5000 liters (other capacities available on request)

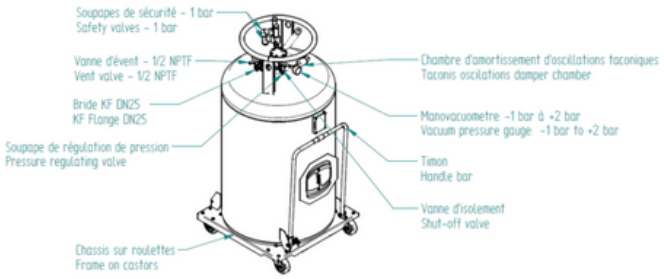
USE :

Exceptionally reliable, these tanks are the perfect answer to the requirements of nuclear research centers, various research laboratories, university centers, and medical and biological applications using MRI.

For transporting, storing and handling liquid helium

TECHNICAL SPECIFICATIONS

Specification MSB	100	250	500
Net capacity (l)	100L	250	500
Empty weight (kg)	90	206	258
Full weight (kg)	103 .2	240	320
Height (mm)	1 600	1 724	1 667
Diameter (mm)	570	814	1 050
Connexion tête mobile	NW50	NW50	NW50
Type de tête mobile	A	A	B, C, D
Normal Evaporation (%/J)	1	1.2	0.9
Max Pressure (Bar)	0.5	1	1

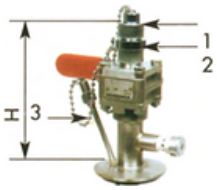


The new msb250 is equipped as standard with a handle and a fork passage for even easier handling.

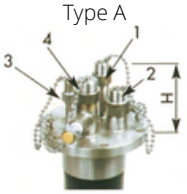
CRYO DIFFUSION

TRANSPORTABLE TANK

MOBILE HEAD

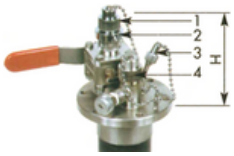


Type A

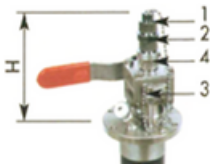


Type B

Mobile Head	Type	1	2	3	4	H
MSB 100 MSB 250	A	10	12/12,7	2,5	-	143
MSB 500	B	10	12/12,7	2,5	16	81
	C	10	12/12,7	2,5	16	108
	D	10	12/12,7	2,5	16	147



Type C



Type D

PRODUCTS

Dewar MSB, without mobile head

25001018	MSB 100 - LHE - NECK Ø25,4MM WITH WHEELS
25005270	MSB 250 - LHE - NECK Ø72MM WITH CASTORS AND FORK PASSAGE
25003999	MSB 250 - LHE - NECK Ø72MM WITH CASTORS AND FORK PASSAGE AND SIDE FILLING VALVE
25004465	MSB 250 - LHE - NECK Ø72MM WITH CASTORS AND SIDE FILLING VALVE AND DIFFERENTIAL LEVEL GAUGE AND FORK PASSAGE
25001020	MSB 500 - LHE - Ø72 NECK WITH WHEELS
25001021	MSB 500 - LHE - NECK Ø72MM WITH CASTORS AND FORK ELEVATOR
25001022	MSB 500 - LHE - NECK Ø72MM WITH CASTORS AND SIDE FILLING VALVE

Mobile head

25001069	MOBILE HEAD TYPE A - WITH NW50 FLANGE FOR MSB250/500 (PED) WITH FIBERGLASS TUBE Ø43X525MM - RELIEF VALVE 0,5BAR - QUICK COUPLING 10&12MM - SENSOR PORT 2,5MM
25001051	MOBILE HEAD TYPE A - WITH NW50 FLANGE FOR MSB100 (TPED) WITH FIBERGLASS TUBE Ø17X472MM - DISCHARGE VALVE 0,5BAR - FAST COUPLING 10&12MM - SENSOR PORT 2,5MM
25001095	MOBILE HEAD TYPE B - WITH CONNECTION BRIDGE FOR MSB250/500 (TPED) WITH COLUMN FOR 72MM - WITH FIBERGLASS TUBE Ø65X592MM - DISCHARGE VALVE 1,2BAR - FAST COUPLING 10/12/16MM - SENSOR PORT 2,5MM
25001087	MOBILE HEAD TYPE C - WITH CONNECTION BRIDGE FOR MSB250/500 (TPED) WITH COLUMN FOR 72MM - WITH FIBERGLASS TUBE Ø65X592MM - DISCHARGE VALVE 1,2BAR - FAST COUPLING 10/12/16MM - SENSOR PORT 2,5MM
25001094	MOBILE HEAD TYPE D - WITH CONNECTION FLANGE FOR MSB250/500 (TPED) WITH COLUMN FOR 72MM - WITH FIBERGLASS TUBE Ø65X592MM - DISCHARGE VALVE 1,2BAR - FAST COUPLING 10/12/16MM - SENSOR PORT 2,5MM

Helium transfer lines

25001164	HELIUM TRANSFER LINES - 1X1,2X1M - Ø10MM LIRIGID LINE WITHOUT MANIFOLD
25001163	HELIUM TRANSFER LINES - 2X1,2X1M - Ø12MM RIGID LINE WITHOUT MANIFOLD

CRYOGENIC TANKS FOR STORING, TRANSPORTING AND HANDLING LIQUID HELIUM

PRODUCT INFORMATION

These multi-screen vacuum tanks are made of aluminum alloy with a fiberglass/epoxy neck. These tanks feature the following characteristics: Lightweight, compact, low power consumption and non-magnetism. This last feature is particularly advantageous for all applications involving high magnetic fields.

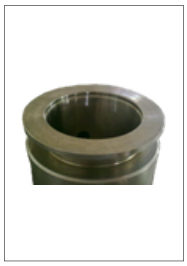
USE :

NMH series tanks are designed for storing and transporting liquid helium.

ACCESSORIES

Base on wheels

Protective ring

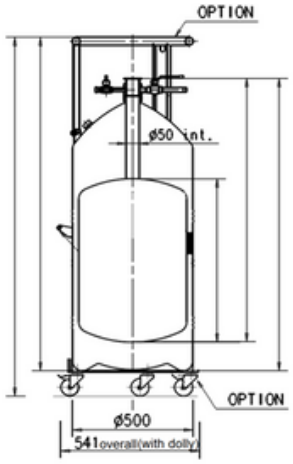


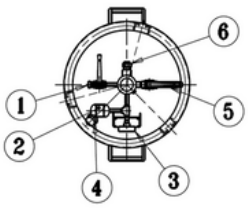
Capacitive gauge
INJC1

TRANSFER ROD FOR LHE :

A wide variety of models are available, with designs specific to each application. These rods are built to customer specifications.

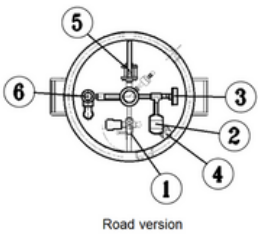
If you have any special requirements, please do not hesitate to contact us. We'll provide you with a detailed quotation and help you realize your project.



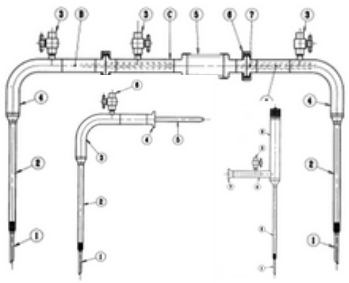


Laboratory version

1- 35 g/cm2 safety valve
2- Anti-oscillation system
3- Pressure gauge
4- Vacuum retention valve
5- Vent valve
6- 0.5 barg safety valve



Road version



TRANSPORTABLE TANK

CRYO DIFFUSION

TECHNICAL SPECIFICATIONS

SPECIFICATION NMH	65	100
Total capacity (l)	65	100
Empty weight (kg)	24	30
Filled weight (kg)	32	42,5
Dimensions (mm)		
A	476	701
B	918	1142
C	1044	1269
D	1149	1371
E	1222	1447
Moving head connection	NW50	NW50
Moving head type	A	A
Static evaporation (%/J)	1,5	1
Max. pressure (Bar)	0,5	0,5

PRODUCTS

NMH cylinder without mobile head

25001007	NMH 65 - LHE - COL Ø50 SANS ANNEAU DE PROTECTION - STATIQUE
25001014	NMH 65 - LHE - COL Ø50 AVEC ANNEAU DE PROTECTION - TRANSPORTABLE TPED
25001006	NMH100- LHE - COL Ø50 SANS ANNEAU DE PROTECTION - STATIQUE
25001015	NMH100 - LHE - COL Ø50 AVEC ANNEAU DE PROTECTION - TRANSPORTABLE TPED

Mobile head

25001085	TÊTE MOBILE TYPE A AVEC NW50 BRIDE POUR NMH65/100 AVEC TUBE EN FIBRE DE VERRE Ø43X420MM - SOUPAPE DE SÉCURITÉ 0,5BAR - RACCORD RAPIDE 10&12MM - PORT DU CAPTEUR 2,5MM

Accessories for safe transport

25001086	PROTECTIVE HANDRAIL WITH 3 SUPPORTS SUITABLE FOR NMH65 AND NMH 100
10015560	ROLLER BASE 5 CASTORS - 2 STOPPERS - EXTENDABLE FROM 480 TO 500MM

Helium transfer lines

25001164	HELIUM TRANSFER LINE - 1X1,2X1M -Ø10MM RIGID LINE WITHOUT MANIFOLD
25001163	HELIUM TRANSFER LINE - 2X1,2X1M -Ø12MM RIGID LINE WITHOUT MANIFOLD

Quantum Technology

Hydrogen & Helium systems since 1981

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CRYO DIFFUSION

ISO 9001:2015 CERTIFICATION intertek