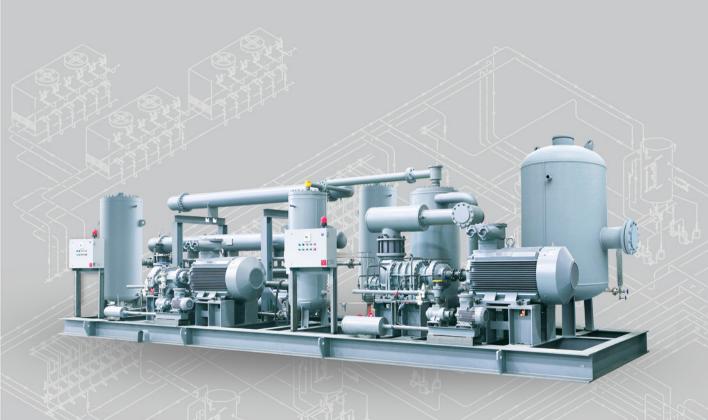


PROCESS GAS SCREW COMPRESSOR UNIT

Energy type process gas compressor unit

Non-energy type process gas compressor unit



冰轮环境技术股份有限公司

With continuous technological and manage has promoted the continuous optimization of resource allocation and reconstruction of core competencies, Moon-TECH accelerated international expansion transformation. We have transformed from a traditional manufacturing enterprise to a modern service-oriented enterprise with strong competitiveness, large scale, wide coverage, complete business chain, and strong comprehensive research and development capabilities





Industrial Park in the US



Baoding Industrial Park



Malaysian Industrial Park



Guxian Industrial Park



Industrial Park in the UK



Laishan Industrial Park



Vietnam Industrial Park



Jinan Center



Low-temperature refrigeration



Central airconditioning



Environmentally friendly heating



Energy and chemical equipment



Precision Casting



Hydrogen Energy Development



Smart Services



Intelligent Packing Machinery and Warehouse Storage System

With devoting to improving the quality of human life as the enterprise mission, MOON-TECH continuously build and enhance competitive advantages in the field of comprehensive energy utilization and accelerate the process of globalization, taking the revitalization of national industry and achievement of customer value as its responsibility, continuously creates and improves its competitive advantage, striving to become an evergreen enterprise with core competitiveness, loved by employees and respected by industrial partners.

















MOON-TECH

(Stock Code of 000811)

Founded in 1956, Moon Environment Technology Co., Ltd (Stock Code: 000811). is a diversified and international comprehensive equipment industrial enterprise. The main business covers low-temperature refrigeration, central air conditioning, environmental protection heating, energy and chemical equipment, precision castings, smart services, hydrogen energy development, etc. In recent years, MOON-TECH has successively won the titles of Top 30 Enterprises with Core Competitiveness in China's Machinery Industry, Top 100 Enterprises of National Machinery Industry, Meritorious Enterprise of Equipment in China, and Demonstration Enterprise for Ozone Layer Protection.

For a longtime, with continuous technological and manage has promoted the continuous optimization of resource allocation and reconstruction of core competencies, accelerated international expansion transformation. We have transformed from a traditional manufacturing enterprise to a modern service-oriented enterprise with strong competitiveness, large scale, wide coverage, complete business chain, and strong comprehensive research and development capabilities

With the synchronous development of refrigeration and heat treatment, and actively expanding energy-saving and environmental protection industry as developing strategy, MOON-TECH is engaged in the technical research and development of low-temperature environment, waste heat recovery, gas compression, industrial heat exchange, urban clean emission and other fields, as well as the production and sales of related complete sets of equipment, and specializes in food refrigeration, chemical process cooling, comfortable environment air conditioning, research temperature control, process gas compression, building aggregated cooling, comprehensive application of heat energy, permafrost drilling, waste treatment, tec. MOON-TECH has production bases, scientific research centers and marketing& service organizations in more than 40 countries around the world. With safe, environmentally friendly, energy-saving, intelligent and Butler-style system integration capabilities, MOON-TECH is providing products with entire product life cycle to users in more than 120 countries and regions around the world.

MOON-TECH has 6 national scientific and technological innovation platforms including the National-Recognized Enterprise Technology Center and 16 provincial scientific and technological innovation platforms including the Shandong Provincial Key Laboratory of Energy Saving and Environmental Protection of Refrigeration Equipment. MOON-TECH has been recognized as a key high-tech enterprise of the China Torch Program, with 326 national patented technologies, and has hosted and participated in the formulation of 25 national standards and 37 industry standards. MOON-TECH has won two national awards, the National Science & Technology Progress Award and the National Technology Invention Award, and has successively won 213 provincial and ministerial scientific and technological achievements awards such as the Special Prize for Scientific and Technological Progress of the Chinese Association of Refrigeration and the First Prize for Scientific and Technological Progress of Shandong Province.

Following the requirements of the environmental policy of harmonious coexistence between human and nature, MOON-TECH is committed to the innovation of artificial environment control technology and comprehensive energy utilization technology to promote a simple, moderate, green and low-carbon mode of social production and operating system, actively building an interconnected and complementary system, including refrigeration, heating, water, gas, electricity, sewage, waste within the -271°C -200°C temperature and 0-90Mpa pressure range, aiming to achieve an energy ecological link between industrial parks and living spaces, and become an intelligent green energy system solution service provider. MOON-TECH also dedicates to develop the utilizations of NH3、CO2、HC、He、H2O and other environmentally friendly substances application technologies, striving to provide professional, high value-added intelligent energy comprehensive utilization solutions.

In recent years, MOON-TECH actively actualized the green and low-carbon developing concept, accelerating the transformation of traditional industries around the dual-carbon goal and energy revolution, promoting the upgrading of the industrial structure to a low-carbon and high-quality level, and set six goals of "low-carbon industry, low-carbon technology, low-carbon manufacturing, low-carbon chain, low-carbon services, low-carbon culture", so as to ultimately realize the industrial structure of high-end, low-carbon consumption of energy, utilization of resources recycling, cleanliness of the production process, and to contribute to the realization of dual-carbon target.





Technical Strength











High-precision and cutting-edge processing and testing equipment



Flexible machining center



Rotor precision machining center



Rotor processing and production line



Comprehensive performance testing cente



Rotor precision machining center



Three-coordinate measuring instrument



Features of screw compressor unit

More efficient

The compressor adopts a rotor profile independently developed by MOON-TECH with national patents (patent No.: ZL02 2 14708.X; ZL02 2 67272.9; 200710013500.9), which has high efficiency, low noise, and is more environmentally friendly.

Higher precision

It is processed by high-precision special CNC grinding machines of the UK and Germany.

Longer service life

The oil-injection screw can effectively prevent corrosion of the rotor and housing, and has a long service life.

The compressor adopts axial force balance technology, and the thrust bearing has a reinforced (phenolic) resin retainer for a long service life.

The rotor has a sliding bearing for radial support, which has no mechanical wear and has higher reliability. The impact on compressor clearance is controllable, and the service life of sliding bearings that withstand radial forces is much higher than that of rolling bearings.

Wider range of applicable working conditions

Single-stage compression still has high efficiency when operating under high pressure ratio conditions. In the case of two-stage compression, the applicable compression ratio is higher (above 40), with high efficiency, simple system, and more stable and reliable operation.

Lower failure rate

The motor is directly connected, without acceleration gears, and there are fewer moving parts.

Stepless regulation

Flow regulation is subject to patented slide valve regulation technology, and 15~100% stepless regulation can be achieved.















Features of screw compressor unit

The oil circulation system combining forced oil supply and differential pressure oil supply has superior lubrication, sealing, cooling, and noise reduction performance.

The oil separation system adopts a patented high-efficiency oil gas separator, which can reduce the exhaust oil content to less than 1ppm when when an efficient oil remover is provided.

The core component of the control system adopts Siemens PLC, which is easy to operate and maintain, with high protection level, strong anti-interference ability, powerful control function, high and stable communication speed, and unattended operation. A MODBUS RS485 communication interface is reserved to achieve DCS communication and remote monitoring and control of the unit on a personal computer terminal, so as to ensure safe operation of the equipment.

Main protection functions:

- Main motor overload protection
- Oil pump motor overload protection
- High exhaust pressure protection
- High exhaust temperature protection
- Low oil pressure protection
- Low suction pressure protection

The lubricating oil filter adopts a dual oil filter, which can be cleaned online without affecting production.

It is designed according to the API619 standard, the whole machine is a skid-mounted structure with reasonable layout, low vibration, low noise, stable operation, convenient operation and maintenance, and unattended operation.

For gases with low molecular weight (such as helium), a MOON-TECH patented semi-sealed screw compressor can be used. The compressor and motor are connected in a closed manner to effectively avoid gas leakage.



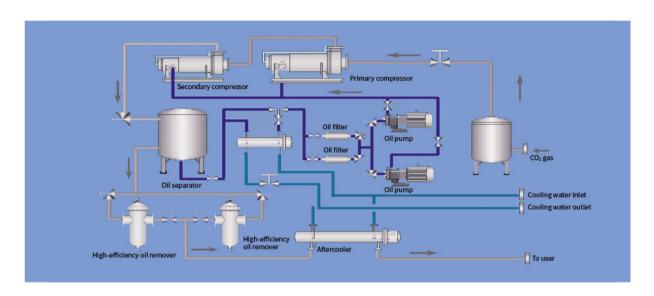




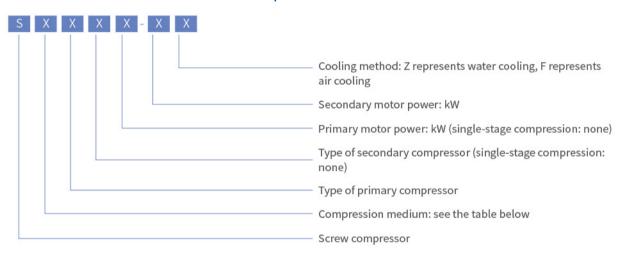




Flow Diagram of Process Gas Screw Compressor Unit



Model of Process Gas Screw Compressor Unit



Medium Code

Medium Name	Natural Gas	Hydrogen	Carbon Dioxide	NH ₃	Nitrogen	Vinyl Chloride	Helium	Sulfur Dioxide
Code	N	Н	R	А	K	V	Н	S

For example: S R 20M 16SH 132 -132 7 Two-stage screw carbon dioxide compressor unit, with a primary compressor of 20M, a secondary compressor of 16SH, a primary motor power of 132 kW, a secondary motor power of 132 kW, and water cooling.







MOON-TECH process gas screw compressor can be used to compress natural gas, coke oven gas, coal bed gas, water gas, flare gas, oil field associated gas, butane, hydrogen, BOG gas, MR (mixed refrigerant), analytical gas, biogas and other process raw gas and plant tail gas recovery gas. It is an important equipment for gas pressurization in special industries such as petrochemical, natural gas, coal, medicine, chemical, power, steel, etc.

Unit Features

High exhaust pressure: the maximum exhaust pressure can reach 5.0MPa

The unit is made of various materials to meet the gas pressurization needs of different processes

Multiple cooling methods: water cooling, air cooling



GB and API standards can be executed separately

Pressure vessels and pipelines can be subject to GB and ASME standards

Use environment: the unit can be equipped with cabins in the machine room or outdoors





Application Scope of the Unit

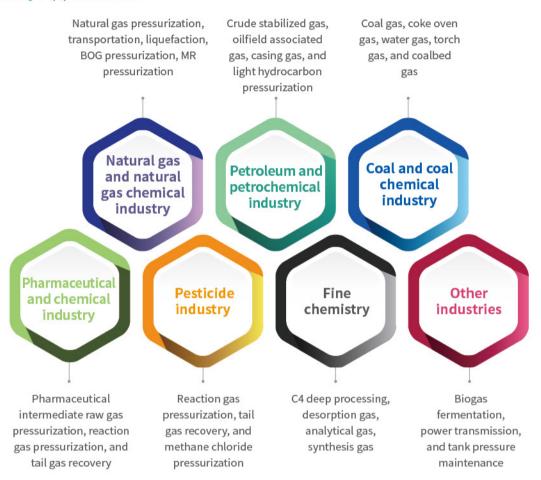
Single inlet flow rate: 100- 9000m³/h
Air inlet pressure: -0.05~2.5MPaG

• Flow regulation method: slide valve regulation

Motor power: 22-3550kWExhaust pressure: 0.1-5.0MPaG

• Flow regulation range: 15-100% stepless regulation

Industry Applications



Processable gases, including but not limited to:

- Natural gas
- Mixed refrigerant
- Flash gas
- Fuel gas
- Butane
- Propane
- Flare gas
- · Coke oven gas

- Water gas
- Coal bed gas
- Methane
- Process raw gas
- Oilfield gas
- Freon propane/propylene
- Hydrogen
- Desorption gas

- Desorbed gas
- Synthesis gas
- Carbon monoxide
- Propylene
- Ethylene
- Ammonia acetylene

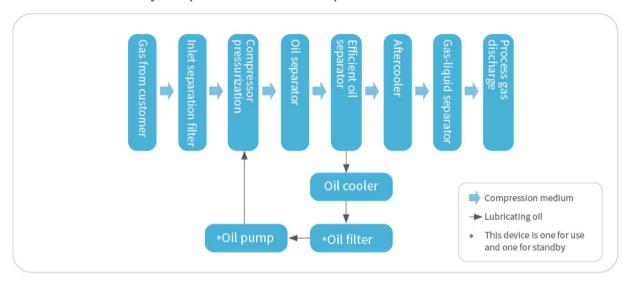




A 1 NATURAL GAS COMPRESSOR UNIT

MOON-TECH natural gas screw compressor unit is a pressurized equipment used in such industries as natural gas, petroleum, petrochemical, coal, chemical, electric power, and steel. It is widely used in natural gas pipeline pressurization, natural gas liquefaction, BOG gas recovery, MR (mixed refrigerant), coal seam gas, biogas and other gas pressurization, and raw material gas pressurization in the production processes.

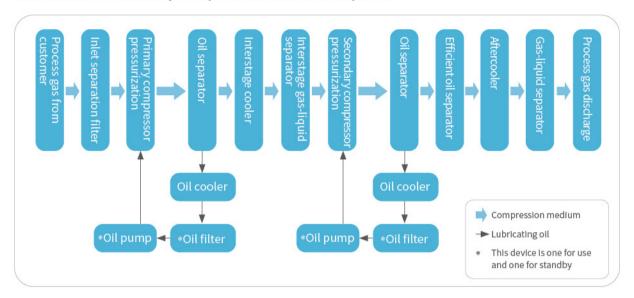
Flow Chart for Primary Compression of Screw Compressor





A C4S deep processing booster unit in Zhejiang

Flow Chart for Secondary Compression of Screw Compressor

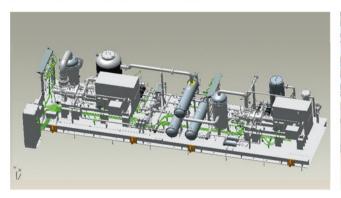




Two-stage natural gas compressor unit



Two-stage BOG compressor unit



3D diagram of water-cooled two-stage compressor unit



Water-cooled two-stage compressor unit







Oilfield gas production plant



Coal bed gas compressor unit



Flare gas recovery unit



Biogas booster unit



Water gas compressor unit



Natural gas compressor unit

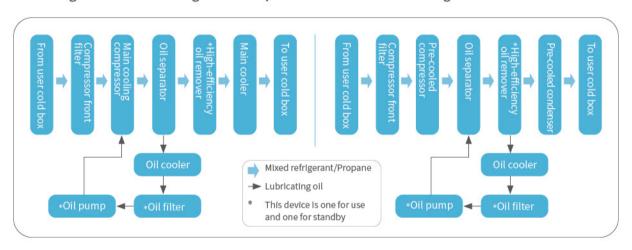
A2 MIXED REFRIGERANT (MR) SCREW COMPRESSOR UNIT

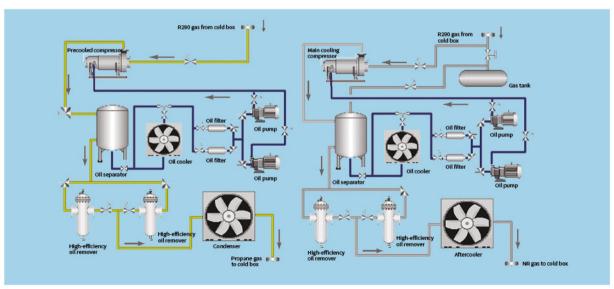
MOON-TECH mixed refrigerant screw compressor unit is mainly used in such industries as small-scale natural gas liquefaction to LNG, light hydrocarbon recovery, BOG gas, helium recovery, etc., and is suitable for easily leaking gases.

The screw compressor has a semi-enclosed structure design, with no shaft seal and zero leakage; the unit is assembled in the factory and transported as a whole, reducing on-site construction volume and shortening the construction cycle.



Flow Diagram of Mixed Refrigerant Compressor Unit with Pre-cooling

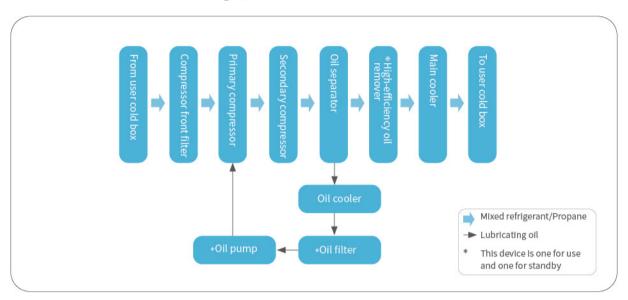


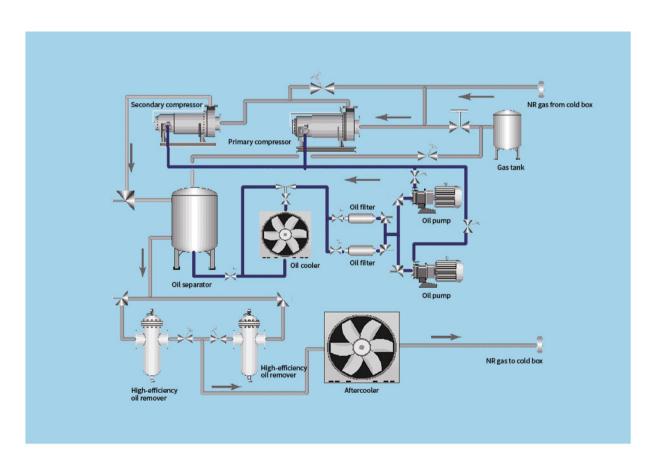






MR Flowchart Without Pre-cooling Cycle







50,000m3 LNG liquefaction semi-sealed MRC unit



30,000m3 LNG liquefaction semi-sealed MRC unit



60,000m³ natural gas liquefaction MRC unit



BOG compressor unit



MRC compressor unit for 30,000 m³ natural gas liquefaction



100,000m³ natural gas liquefied water-cooled MRC unit





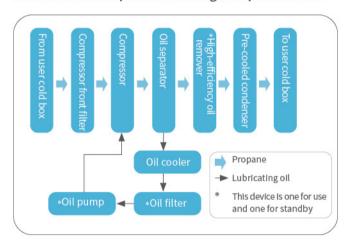
A3 PROPANE PRE-COOLED COMPRESSOR UNIT

Basic process:

This refrigeration cycle uses propane (R290) as the working medium. The low-temperature and low-pressure refrigerant gas from the user cold box is sucked away by the compressor, compressed into high-temperature and high-pressure gas, and enters the oil separator to separate most of the lubricating oil. Then, it enters the condenser for heat exchange with air/water, and the heat released is taken away by the air/water. The propane is condensed into liquid, which is then sent to the cold box to provide pre-cooling for natural gas and mixed refrigerant.



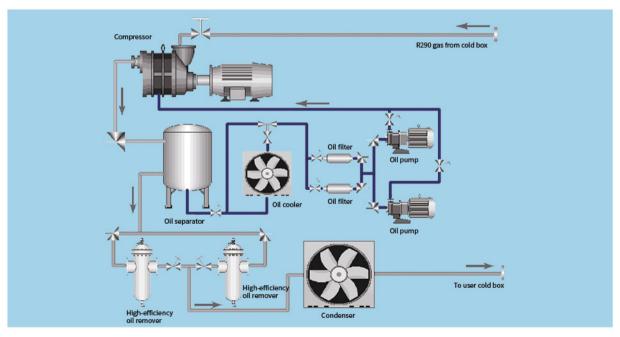
Flow Chart of Propane Precooling Compressor Unit



Unit Operating Conditions

Item	
Inlet pressure	0~0.5
Outlet pressure	0.5~2.0
Inlet temperature	> -50
Outlet temperature	< 90
Flow regulation range	10~100
Compressor flow regulation method	slide valve*

*: Compressor flow rate: can be adjusted by variable frequency + slide valve.



B NON-ENERGY TYPE PROCESS GAS COMPRESSOR UNIT

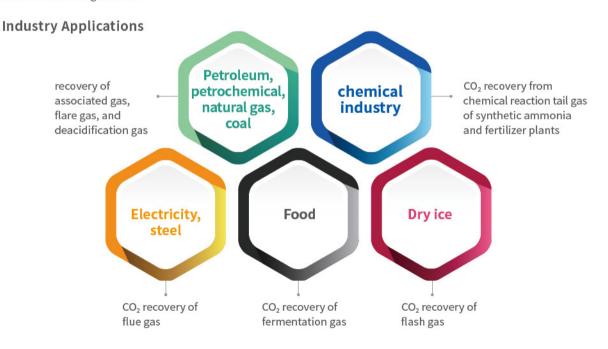
MOON-TECH screw process gas compressor unit can be used for boosting process raw gas such as carbon dioxide, vinyl chloride, ammonia, nitrogen, sulfur dioxide, hydrogen sulfide, helium, water vapor, and recovering factory exhaust gas. It is an important equipment for special gas boosting in such industries as petroleum, petrochemical, natural gas, synthetic ammonia, coal, metal smelting, chemical, power, steel, alcohol fermentation, etc.

B1 screw carbon dioxide compressor unit

The screw carbon dioxide compressor unit is widely used for the recovery and pressurization of carbon dioxide gas in such industries as petroleum, petrochemical, natural gas, coal, chemical, synthetic ammonia, power, steel, and food fermentation. It is one of the important devices for producing industrial or food grade carbon dioxide and has been applied in multiple CCUS projects.

In response to the strict quality requirements of lubricants in the food industry, we have uses food grade lubricants and provided with multi-stage oil separators for oil removal to reduce the oil content of carbon dioxide gas outlet.









Applicable Working Conditions

Suction pressure: 0.04~2.0MPa (a) Exhaust pressure: max5.2MPa (a)

Compression stage: single stage, dual stage Rated gas processing capacity: 150 ~ 10000m³/h

Suction temperature: -50~50° (

Exhaust temperature: Water cooling: ≤ 40° C Air cooling: ambient temperature+15° C
Cooling method: water cooling, air cooling

Slide valve: 15-100%

Slide valve +variable frequency: 10-100%



Engineering project of catalytic cracking flue gas recovery of 100,000 tons of liquid CO₂



Coal chemical tail gas 100, 000 tons food grade CO₂ pressurized liquefaction project



Synthetic ammonia low-temperature methanol washing CO₂ recovery and liquefaction project



Synthetic ammonia carbon dioxide recovery project



Carbon dioxide recovery and oil displacement project



Natural gas treatment plant carbon dioxide recovery and utilization project

B2 SCREW AMMONIA COMPRESSOR UNIT

The screw ammonia compressor unit can be used for ammonia pressurization in acidic water stripping and recovery in such industries as petroleum, petrochemical, natural gas, coal, and chemical engineering. It can also be used for unloading and pressure-maintaining of ammonia liquid, as well as as as an ammonia pressurization equipment for processes.



Applicable Working Conditions

Suction pressure: 0.04~2.0MPa(a) Exhaust pressure: 2.6MPa (a) Suction temperature: -50~50° C Exhaust temperature: 80~90° C

Rated gas processing capacity: 150 ~ 10000m³/h

Cooling method: water cooling, air cooling

Flow regulation method and range (optional)

Slide valve+bypass: 0~100%

Slide valve+variable frequency: 10-100%



 $60 t/h\,sour\,water\,stripping\,unit\,ammonia\,compressor\,unit\,project$



Ammonia compressor unit of acidic water stripping unit



Ammonia compressor unit project for H_2S purification unit



Ammonia booster unit of CO₂ liquefaction project





B3 SCREW SULFUR DIOXIDE COMPRESSOR UNIT

MOON-TECH sulfur dioxide compressor unit is suitable for the purification and pressurization of SO₂ gas in the tail gas of sulfuric acid production in chemical plants, flue gas for nonferrous metal smelting, and deacidification gas for refineries.



Applicable Working Conditions



SO₂ compressor unit



Sulfur dioxide compressor unit for smelting desulfurization liquid SO₂ project



SO₂ compressor unit



Sulfuric acid plant sulfur dioxide compressor unit

B4 CHLORIDE COMPRESSOR UNIT

The vinyl chloride compressor unit is a key equipment in the production of PVC in the chemical chlor alkali industry. MOON-TECH screw vinyl chloride compressor unit is efficient, energy-saving, explosion-proof design, safe and reliable.

The components in contact with gas in the equipment do not contain such media as copper, silver, mercury that are prone to react with gas, thereby ensuring the service life and reliability of the unit.



Applicable Working Conditions

Suction pressure: normal pressure, slightly

Exhaust pressure: 0.6~1.0MPa Suction temperature: 0-40-C

Rated gas processing amount: $150 \sim 10000 \text{m}'/\text{h}$

Compression stage: single stage

Cooling method: water cooling, air cooling

Flow regulation method and range (optional):

Slide valve: 15-100%

Slide valve+bypass: 0-100%

Slide valve + variable frequency: 10-100%



Vinyl chloride compressor unit for resin project



Vinyl chloride compressor unit for chlor alkali project





B5 HELIUM COMPRESSOR UNIT

MOON-TECH screw helium compressor unit is one of the core devices in natural gas recovery and helium extraction, low-temperature superconducting research, and low-temperature liquid helium production. During compressor operation, fluctuations in suction pressure, exhaust pressure, and inlet flow rate are allowed.

As for the characteristics of low molecular weight and easy leakage of helium gas, we have specially designed and adopted special process measures for helium compressors to ensure that the unit is efficient, energy-saving, and not prone to leakage.



Applicable Working Conditions

Suction pressure: 0.04~1.6MPa (a Exhaust pressure: 0.1~2.5MPa (a)

Rated gas processing capacity: $150 \sim 10000 \text{m}^3/\text{h}$

Compression stage: single stage, dual sta

Suction temperature: 0~40° C

Cooling method: water cooling, air cooling

Exhaust temperature:

Water cooling: ≤ 40° (

Air cooling: ambient temperature+15° C

Flow regulation method and range (optional

Slide valve: 15-100%

Slide valve+bypass: 0-100%

Slide valve+variable frequency: 10-100%



Helium screw compressor unit



Helium oil-injection screw compressor unit

B6 NITROGEN COMPRESSOR UNIT

MOON-TECH screw nitrogen compressor unit is suitable for nitrogen pressurization in such fields as nitrogen expansion refrigeration and air separation. It has the characteristics of compact structure, stable operation, low noise, small vibration, safety and reliability, and high degree of automation.



Applicable Working Conditions

Suction pressure: 0.04~L6MPa (a) Exhaust pressure: Max5.2MPa (a)

Rated gas processing capacity: 150 ~ 10000 m³/h

Compression stage: single stage, dual stage

Suction temperature: 0~40° C

Cooling method: water cooling, air cooling

Exhaust temperature:

Water cooling: ≤ 40° C

Air cooling: ambient temperature+15° C

Slide valve: 15-100%

Slide valve+bypass: 0~100%

Slide valve+variable frequency: 10-100%

Project Case



Nitrogen screw compressor unit for gas based LNG project



Nitrogen compressor unit of 200,000 ton/year mixed aromatization reconstruction project



The unit can be subject to explosion-proof design based on the use environment or gas composition

Since the composition and gas source conditions of the raw gas vary according to different user processes, it is necessary to provide reasonable equipment selection and configuration plans based on the actual operating conditions and technical requirements of the user.





B7 OTHER COMPRESSOR UNITS



Water vapor compressor unit



H₂s Compressor unit



CS₂ compressor unit

Due to limited space, this manual does not list all product models; exclusive design can be made based on the user's operating medium and actual flow situation.

Annual Technical Service Plan

- Regular on-site door-to-door service service and committed to providing on-site repair services within 24 hours.
- Provide users with comprehensive diagnosis of process gas compressors, eliminate compressor faults, ensure continuous and complete production lines, and avoid expensive fault losses.
- Absolutely low maintenance costs. Under the premise of abundant spare parts guarantee, contracted customers can receive a minimum 10% discount price for spare parts.

- •5-year warranty plan.
- After the one-year warranty of the standard screw compressor expires, the compression unit warranty is extended for another four years. At the same time, we will provide all users who have signed 5-year warranty contracts with single-machine management files, and provide regular maintenance service reminders.
- Tailored original repair kit



S. East & South Asia

Yantai Moon (Vietnam) Co., Ltd.

Mobile: +84-906893588 Email: jeffchong@moon-tech.com

Pt. Yantai Moon Indonesia (Jakarta)

Mobile: +62-812-8570458

Email: stevenchen@moon-tech.com

Pt. Yantai Moon Indonesia (Surabaya)

Mobile: +62-813-15817758 Email: kevinxu@moon-tech.com

Thailand Office

Mobile: +66-970749735

Email: shimeihao@moon-tech.com

Myanmar Office

Mobile: +95-9795856929

Email: naizengliu@moon-tech.com

Malaysia Office

Mobile: +60-162285069

Email: qingfangma@moon-tech.com

Philippines Office

Mobile: +63-9171171410

Email: xuhangyuan@moon-tech.com

Taiwan Office

Mobile: +886-975096307 Email: hetaoliu@moon-tech.com

India Office

Mobile: +86- 17519968504 Email: jim@moon-tech.com

Africa

Egypt Office

Mobile: +966-548730449 Email: shajc@moon-tech.com

Kenya Office

Mobile: +254-713202388 Email: tenglin@moon-tech.com

South Africa Office

Mobile: +27-638491822

Email: Joechen@moon-tech.com

Mauritania Office

Mobile: +222-41834569

Email: perryxin@moon-tech.com

Latin America

Chile Office

Mobile: +56-994888888

Email: simonliu@moon-tech.com

Peru Office

Mobile: +51-967209708

Email: mingxing@moon-tech.com

Ecuador Office

Mobile: +593-987877420

Email: peterzhang@moon-tech.com

Argentina Office

Mobile: +54-91171008380 Email: javierli@moon-tech.com

Middle East

Saudi Arabia Office

Mobile: +966-504362717

Email: tonydeng@moon-tech.com

Oman office (UAE/Oman /Iran /Turkey)

Mobile: +86- 13964503338 Email: perryxue@moon-tech.com

Russia & UZB

Moscow Russia Office

Mobile: +7-9250566475 Email: yanli@moon-tech.com Email: pengyuanche@moon-tech.com

Vladivostok Russia Office

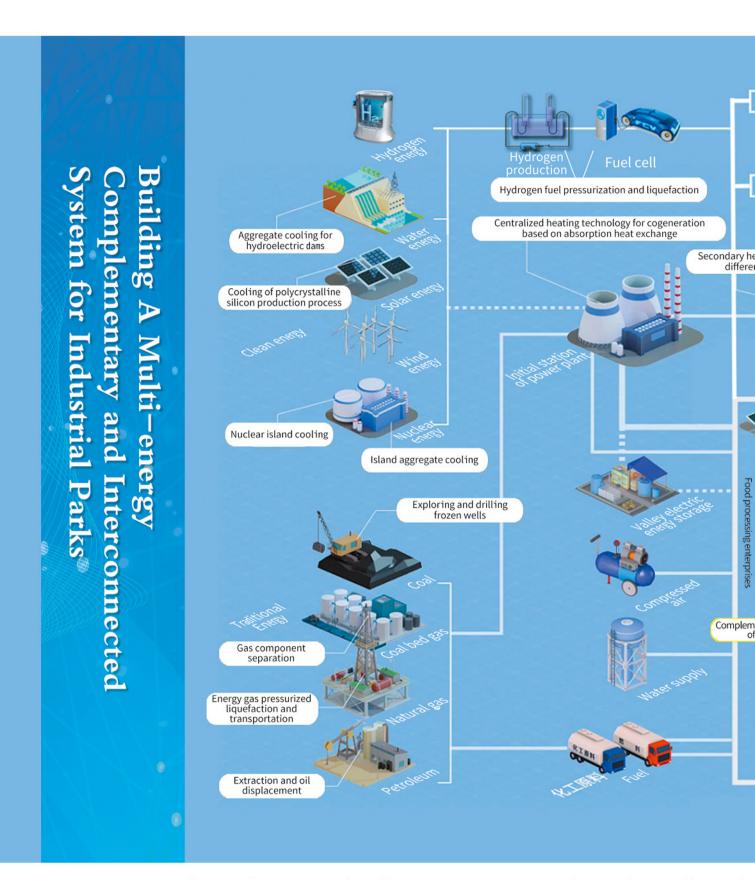
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Email: hongweiwu@moon-tech.com

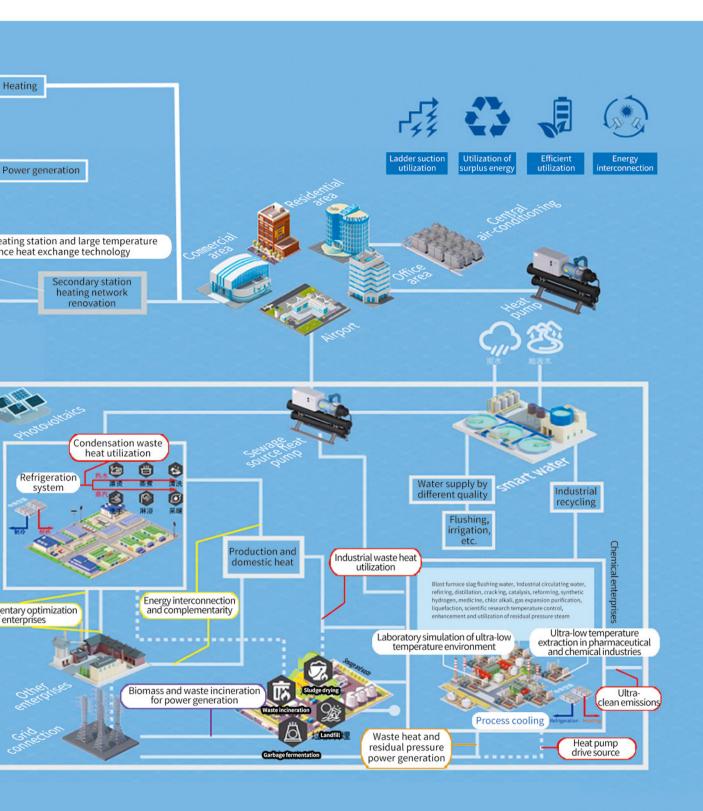
Uzbekistan Office

Mobile: +998-909278908

Email: zhongyao@moon-tech.com



Promoting comprehensive resource conservation and recycling, adversely, and achieving ecological linkage between production and living



ocating a simple and moderate, green and low-carbon social operation g systems



















MOON ENVIRONMENT TECHNOLOGY CO.,LTD.

Add: No.1 Binglun Road, Yantai, China 264002

Tel: +86-535-6697172 Email: info@moon-tech.com Web: www.moonoverseas.com







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