

Hanwha Power

Headquarters	Korea	6, Pangyo-ro 319beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do	Tel +82.70.7147.8000
	USA	1440 W. Indiantown Rd. Jupiter, FL 33458	Tel +1 561.354.1100
Factory	Changwon 1	1204, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea	
	Changwon 2	69, Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea	
	Busan 3	31, Gwahaksandan 2-ro, Gangseo-gu, Busan, Korea	

Global Network

• Asia-Pacific

Shanghai, China
200233 20/F, New Caohejing International Business Center A,
No391, Guiping Road, Shanghai, China
Tel +86.21.5427.1155 (8510)

Tianjin Office
300385 2/F, Building 2, No.16, Weier Road, microelectronics
industrial zone, Xiqing district, Tianjin City, China

Vietnam Office
6F, Star Tower, Cau Giay new urban area, Duong Dinh Nghe Street,
Yen Hoa Ward, Cau Giay District, Hanoi, Vietnam
Tel +84.24.3201.2450

• Americas

Houston, USA
580 Westlake Park Blvd, Suite 500, Houston TX 77079, USA
Tel +1.281.599.3377 ext.204

• Middle East

Abu Dhabi, UAE
PO BOX 33586, Plot #35-WR43, ICAD 3 Musaffah South, Abu Dhabi, UAE
Tel +971.2.627.0151

Khobar, KSA
Unit 4, 12TH Floor, Al fardan Tower, Khobar 31952, KSA
Tel +966.1.3812.3155

• Europe

Milan, Italy
Via de Vizzi 93/95, Cinisello Balsamo 20092, Milan, Italy
Tel +39.02.8410.2193

• CIS

Moscow Office
5F, Bolshaya Serpukhovskaya Str., 7., Moscow, Russia 115191
Tel +7.495.11.5260

Website : www.hanwhapower.com
E-mail : hanwhapower@hanwha.com



Turbo Compressor Certification Status

- ISO 9001
- ISO 14001
- ISO 45001
- CE(DOC)
- PED
- UL

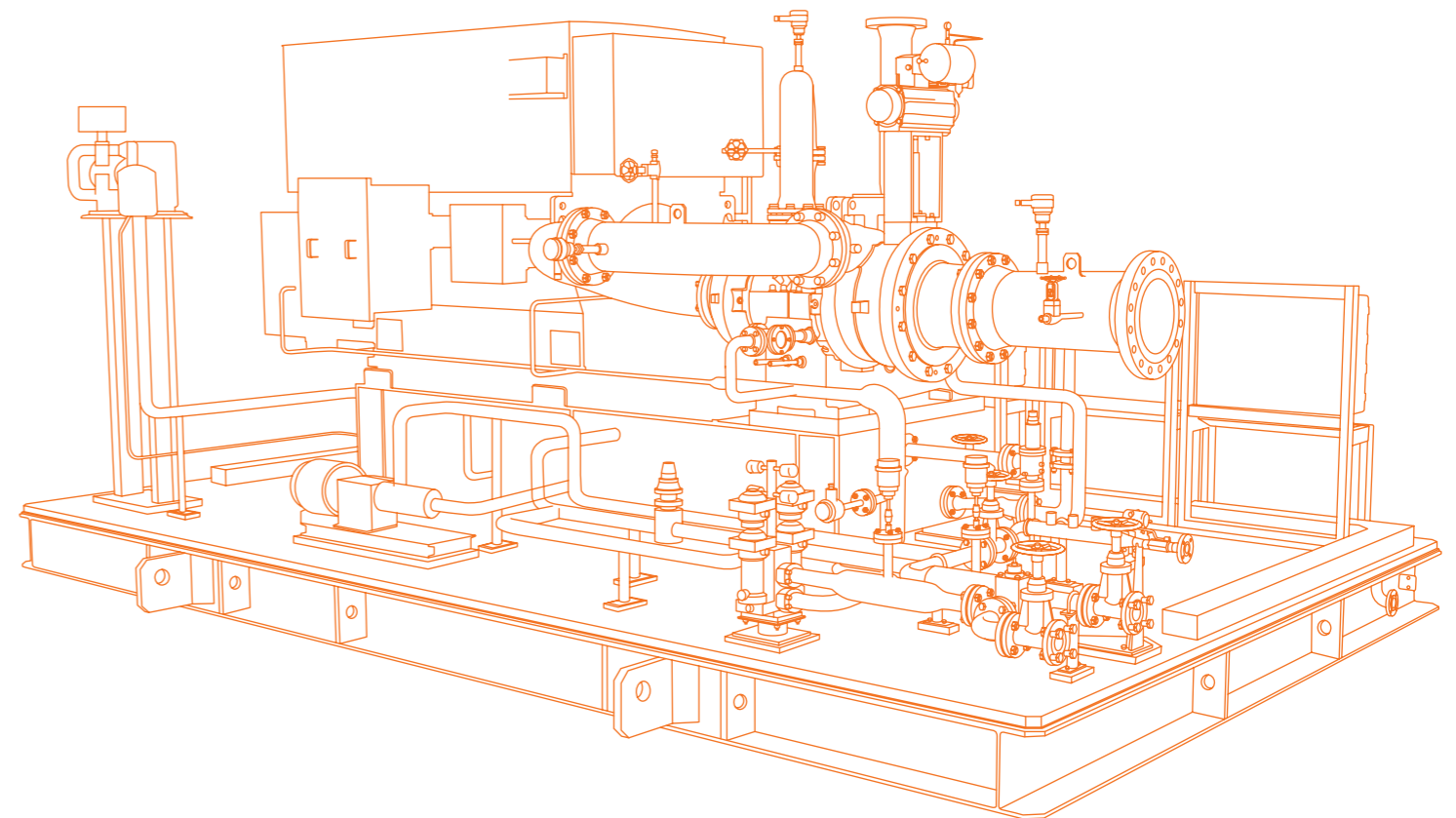
The information contained in this document is subject to change without prior notice.

Worldwide Network



- Global Entities & Offices
- Service Center

PROCESS & GAS CENTRIFUGAL COMPRESSOR



Introduction of Hanwha Power

Leveraging its long-accumulated, reliable technology and expertise in gas turbine engines, Hanwha Power entered the industrial energy equipment market in 1997. The company has grown into a global leader, boasting sales of over 9,000 units worldwide.

9,000

Cumulative sales volume (as of end of 2025)

We drive a sustainable future through innovative energy equipment, smart technology and solutions.

History

- 1977 Company Establishment
- 1979 Aircraft Gas Turbine Engine Overhaul Business Launch
- 1996 Industrial Gas Turbine Development
- 1997 Industrial Air Compressor Business Start
- 2011 Gas Compressor Market Entry
- 2013 Launch of the world's largest air-cooled turbo compressor (SA3100)
- 2014 Marine Compressor Market Entry
Signing of the world's first supply contract for offshore VRU (vapor recovery) turbo compressor
- 2016 Approved vendor registration with Saudi Aramco (API 617 process compressors & blowers)
- 2018 Launch of eco-friendly, high-efficiency energy solution pressure reducing generator (TEG)
- 2020 Supply contract signed for hydrogen charging system at KOGAS complex energy supply hub
- 2021 Received and achieved DOE (Department of Energy) national project for sCO₂ power system
- 2022 sCO₂ power system wins global R&D100 Award
Entry into ethylene compressor and CO₂ compressor markets
- 2023 Successfully demonstrated world's first full combustion of hydrogen turbine
- 2024 174K LNGC vessel Nitrogen Re-liquefaction System technology approved (ADNOC)
- 2025 Joint Development and Cooperation Agreement with Baker Hughes for ammonia gas turbine
New air compressor product launch (SM100 Pro)
- 2026 Company name changed to **Hanwha Power**

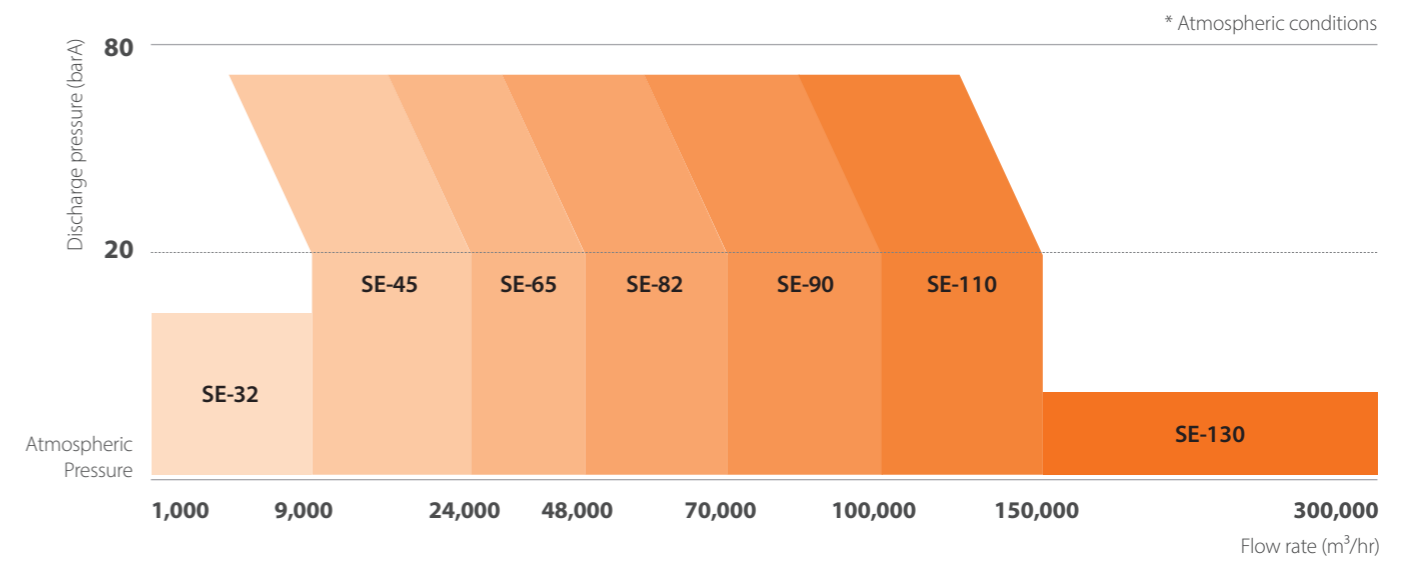


Applications & Solutions Guide Map



Hanwha Power combines precision machinery technology with integrated solution capabilities to offer a comprehensive lineup of compressors. These include fuel gas compressors for Oil & Gas, Air Separation, and power plants; Boil Off Gas (BOG) compressors for LNG terminals and plants; Cryogenic compressors; Compenders; and marine compressors for shipbuilding—all optimized for diverse industrial applications. Through high-performance products and customized solutions, we enhance customer productivity and achieve energy savings across sectors.

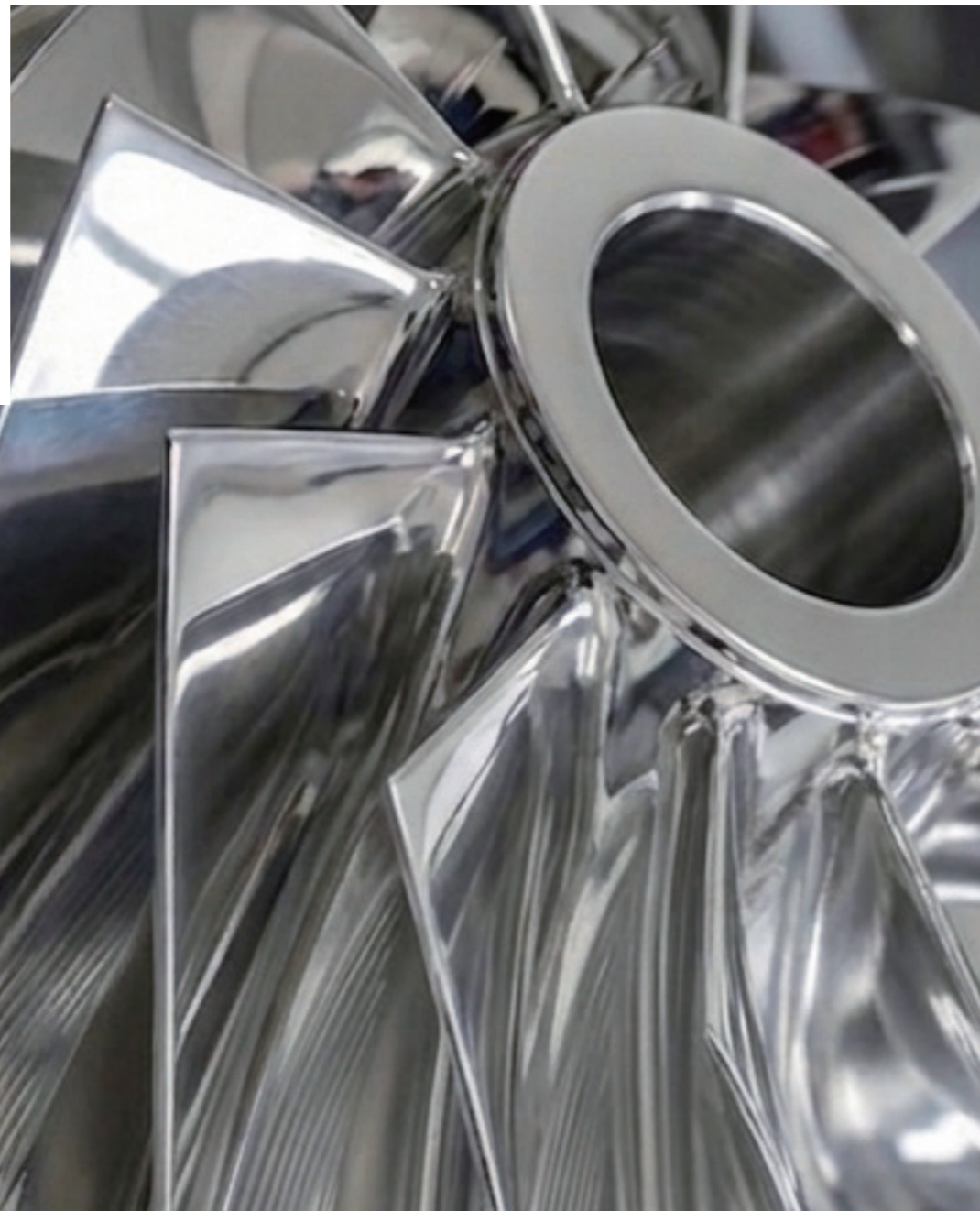
SE Series Product Range



- Gas Types: Air/N₂, mixtures of hydrocarbons and other gases
- Stages: 1st to 6th stage geared multi-stage compressor (maximum pressure: 200 barA, compatible with up to 8-stage CO₂ compression)
- Performance Range: Max flow rate 300,000 m³/hr, max pressure 75 barA
- International Standards: Compliance with API 617, API 672, API 614 and other international standards

Engineering You Can Rely On

From Core Design to Lifecycle Value



The Power to Withstand Extremes, Aero DNA

High-speed rotor control technology and ultra-precision machining applied to aero engines are fully integrated into the compressor's core—the impeller.

High-Performance, High-Efficiency Compressors

- Aerodynamically optimized aerospace technology minimizes energy loss and delivers unmatched compression performance.
- Ultra-precision machined impellers and optimal cooling design drastically reduce power consumption while maintaining superior energy efficiency.

Non-stop Operation Guaranteed

- Optimized aerodynamic components and package design based on Hanwha's extensive operational data to enhance equipment reliability and uptime.
- Unwavering technology delivers 24/7 superior performance even in extreme environments

Engineered-to-Order, 100% Customized Design

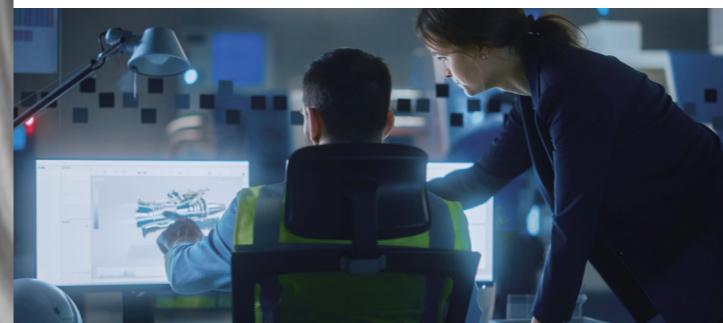
We deliver high-end compressors and integrated engineering solutions optimized for customer processes through precise, custom designs aligned with international standards.

Flexible Customization

- Combines master impellers, standard parts, and customization to optimize for customer-specific flow rates, pressures, and gas compositions.
- Enables multiple compression stages and diverse gas handling within a single package for design flexibility.

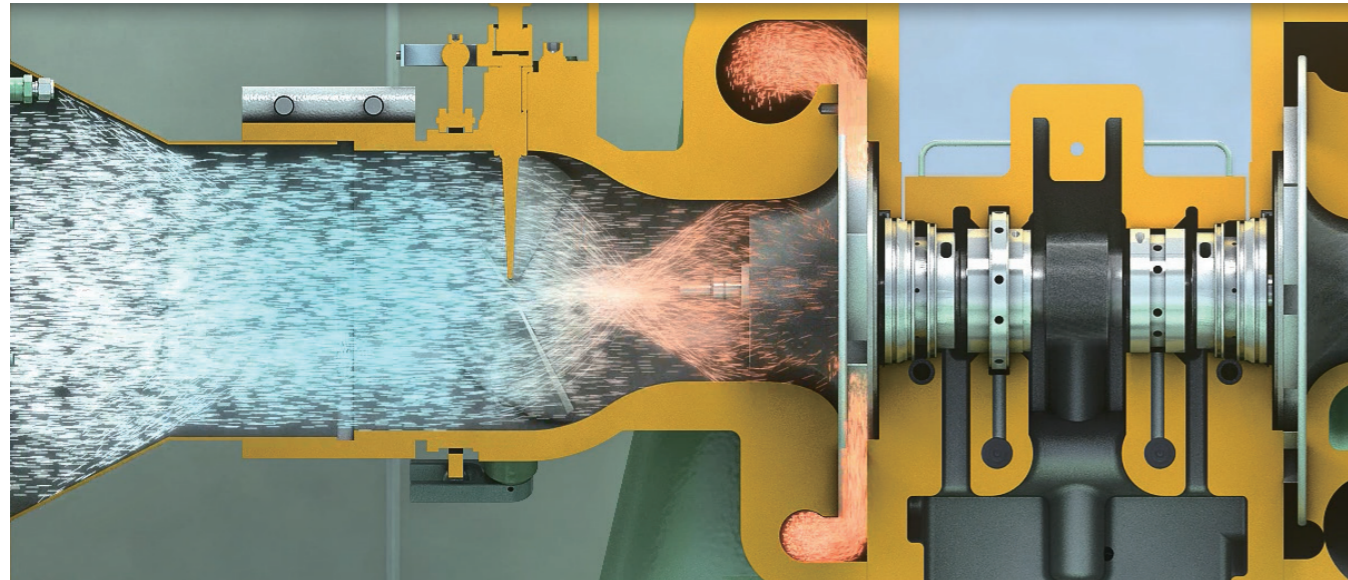
Global Standards Compliance

- Meets API 617, API 672, API 614, ASME, and other international standards to satisfy global major project requirements.
- Provides tailored services with process-optimized package design (skid, oil system, instrumentation, control) and optimal piping.



End-to-End Engineering Excellence

Delivering Total Solutions from Core Design to Operation



Performance Excellence

Superior Performance, Wider Operating Range

Hanwha's compressors leverage in-house developed aerodynamic analysis technology (CFD) to optimize impeller and diffuser designs, delivering unmatched compression performance not only at design points but also across off-design conditions. Efficiency improves by up to 3% and flow range by up to 4% compared to conventional models, maximizing process flexibility. The high-performance cooling system enhances heat transfer efficiency while minimizing contamination, maintaining peak energy efficiency, and delivering outstanding performance even under harsh operating conditions.

Reliability & Mechanical Integrity

Unwavering Endurance

Thoroughly validated through long-term real-world operations, the integrally geared structure and bearing arrangement maintain top stability under high loads, ensuring rock-solid reliability during high-speed, high-load operations. Optimized rotating components minimize vibration and mechanical energy loss at the source, while robust seal designs completely prevent gas leaks and are tailored for extended runtime. This precise rotor balancing and vibration reduction enable zero-downtime mechanical integrity in industries that require continuous, long-term operation.

Operability & Lifecycle Value

Easy Operation, Simple Maintenance

The integrated smart system combines lubrication, monitoring, and control functions to enable real-time equipment management and energy-optimized control, maximizing operational efficiency. Beyond mere equipment supply, Hanwha Power provides process-tailored package designs and optimal piping engineering. From design prioritizing maintenance accessibility to reduce service complexity, we offer comprehensive energy-saving services—including installation, commissioning, data analysis, and load interlocking—to enhance plant stability and reduce noise. Experience more economical lifecycle management of your equipment with Hanwha Power.



Applications & Solutions Guide Map



Oil & Gas



Oil & Gas plants require high-pressure, high-flow gas processing and continuous long-term operation as standard, where compressor reliability directly impacts production continuity.

Design completion that considers operating variability and extreme environments, is key to overall plant reliability.

Hanwha Power delivers custom turbo compressors compliant with API 617 and API 672 standards, precisely reflecting each process's pressure and flow conditions.

Upstream

- Instrument Air Compressor
- Regeneration Gas Compressor
- Vapor Recovery Unit (VRU) Compressor
- Flash gas

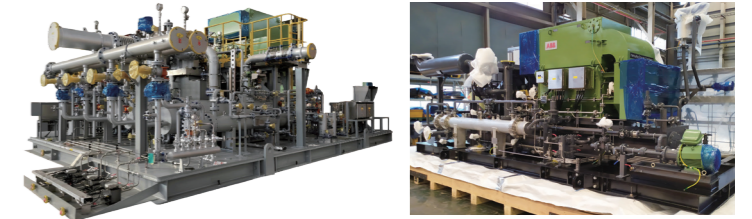
Downstream

- Instrument Air Compressor
- Process Air Blower
(Combustion air, Stripping Air)
- Ethylene Compressor
- Propane Compressor
- Decoking Air Compressor (DAC)
- Flue Gas Compressor

Upstream / Downstream

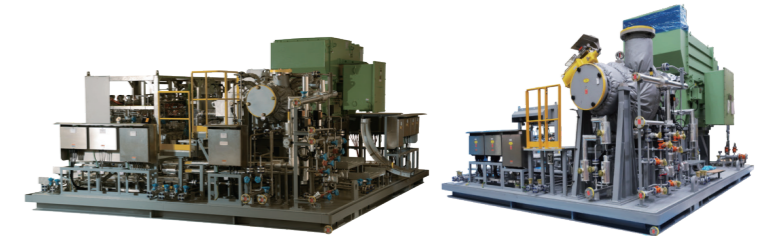
Instrument Air Compressor

Compressors designed to API 672 standards for crude oil and gas production facilities to refining and petrochemical processes, delivering optimal stability and efficiency. Proven product with hundreds of supply records.



Regeneration Gas Compressor

High-efficiency turbo compressor solution for boosting gases required in catalyst regeneration for petrochemical processes and refinery facilities. Provides superior stability and performance tailored to process conditions.



Vapor Recovery Unit (VRU) Compressor

Provides Vapor Recovery Units (VRUs) that enhance operational efficiency on offshore platforms and contribute to environmental protection.



Process Air Blower

An integrally geared blower that handles critical processes requiring high reliability. Discover high-efficiency design that reduces operating costs and boosts productivity.



Ethylene Compressor

Ethylene cracked gas compressor optimized for cryogenic processes, ensuring high efficiency and reliability.





LNG

The LNG market demands solutions with high reliability based on cutting-edge technology to ensure stable operations. LNG processes handle fluids at -160°C , requiring specialized measures to prevent low-temperature brittleness and to control thermal distortion. LNG stored as a liquid absorbs heat during storage or transport, generating Boil Off Gas (BOG)—part of which is reliquefied and part used as fuel for ship engines and power systems.

Hanwha Power leads innovation and growth in the global LNG value chain with unrivaled expertise in gas compressors for Nitrogen Re-liquefaction Systems (NRS[®]), process compressors, and expanders.

Onshore (LNG Terminal)

- Instrument Air Compressor
- Boil Off Gas (BOG) Compressor
- Regeneration Gas Compressor
- Mixed Refrigerant Compressor

Offshore (FLNG, FSU)

- Instrument Air Compressor
- Maintenance Compressor (Warmup)
- Regeneration Gas Compressor
- Boil Off Gas (BOG) Compressor
- Comander (Liquefaction)
- BOG Re-liquefaction System (NRS[®] with Hanwha Ocean)

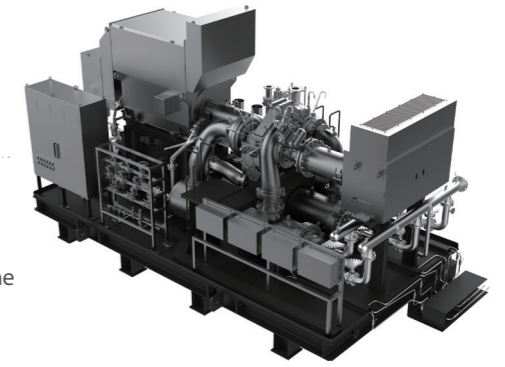
Marine (LNGC, FSRU)

- BOG Re-liquefaction System (NRS[®] with Hanwha Ocean)
- Low Duty Compressor (LD)
- High Duty Compressor (HD)
- Subcooling (Re-liquefaction System)

Instrument Air Compressor

Target : LNG

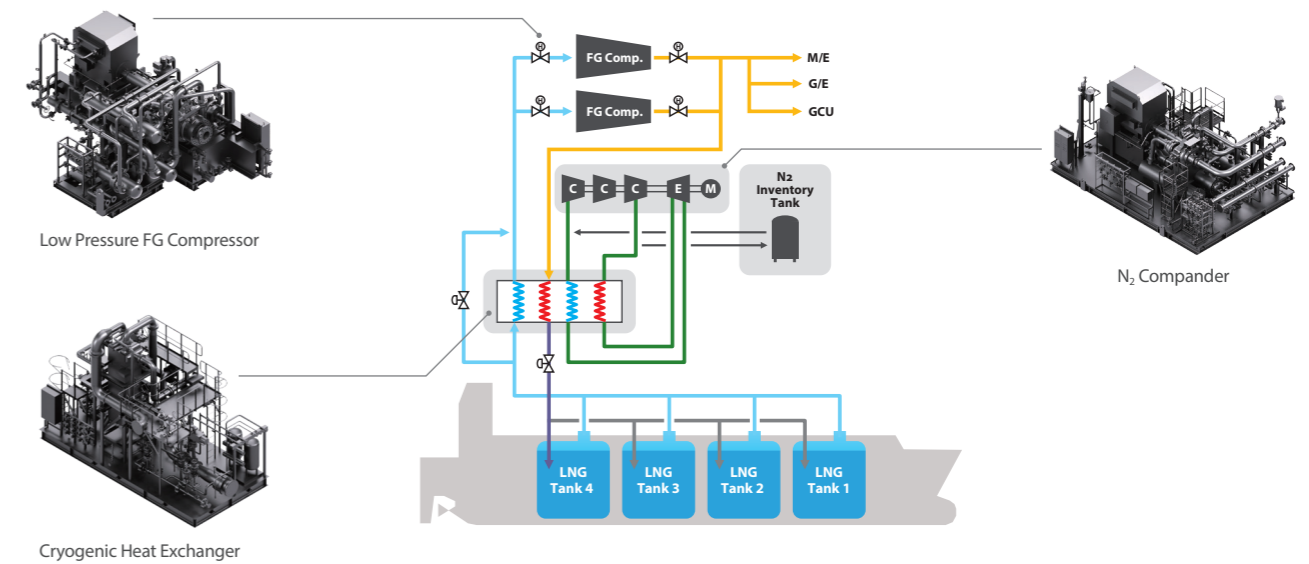
Essential equipment supplying compressed air for the control and operation of LNG facilities, with growing technical importance amid the trend toward larger-scale LNG plants.



BOG Re-liquefaction System (NRS[®] with Hanwha Ocean)

Target : LNGC, FSRU, FSU

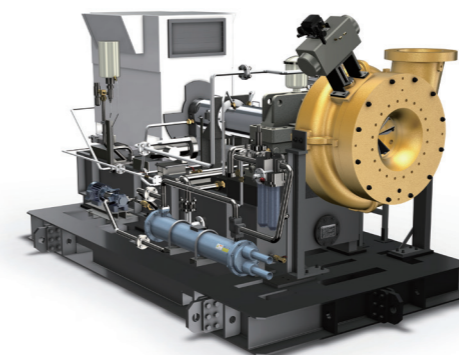
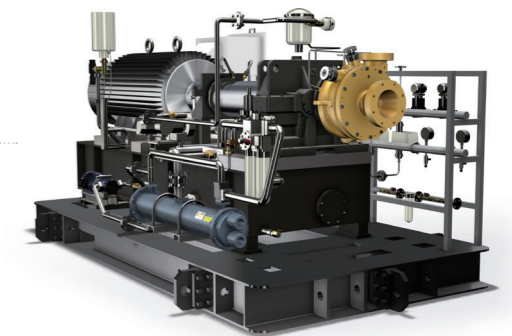
A nitrogen refrigerant system that reliquefies Boil Off Gas (BOG) using cryogenic nitrogen cooling technology to maintain optimal pressure in cargo tanks.



Low Duty Compressor (LD)

Target : LNGC, FSRU

The LD compressor supplies fuel gas to LNG carriers, maintains cargo tank pressure, and feeds Boil Off Gas (BOG) generated during voyages to the dual-fuel engines.



High Duty Compressor (HD)

Target : LNGC, FSRU

The HD compressor recirculates gas in LNG carriers and terminals, returns heated gas to cargo tanks for preheating, and sends LNG vapor and gas generated during loading or initial cooling back onshore.

Industrial Solutions

Industrial plants like semiconductors, batteries, steel, chemicals, and food, as well as Air Separation Units (ASUs), demand high-volume air handling and 24/7 continuous operation, where cleanliness and reliability directly affect process stability.

Hanwha Power's custom turbo compressors offer 100% oil-free solutions meeting ISO 8573-1 Class 0 standards. Optimized for operating conditions, they minimize energy use with high-efficiency designs, proven reliability for long-term runs, and consistent quality via validated package engineering.

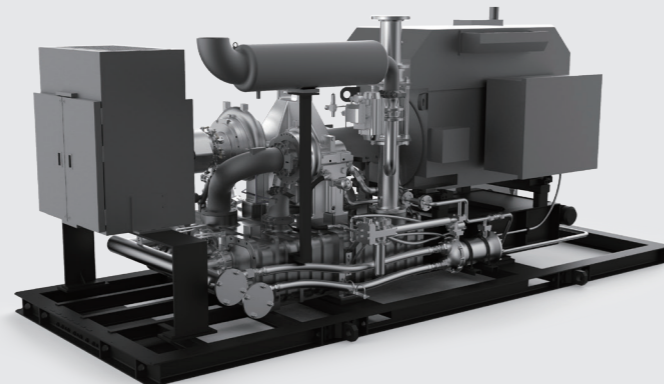


Standardized Solutions

SMX Pro

Hanwha Power's representative Air Compressor offers high performance and reliability, providing optimal solutions tailored to industry-specific operating conditions and environments.

It supplies '100% oil-free (ISO 8573-1 Class 0 certified)' clean, dry air that complies with strict environmental regulations while maintaining top production conditions.



Main Air Compressors (MAC)

Compressor delivering top stability and efficiency, our flagship product backed by hundreds of proven deliveries.



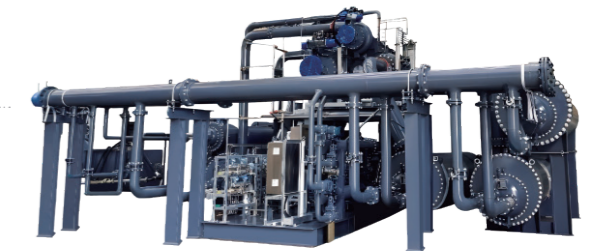
Boosting Air Compressors (BAC)

Booster compressor that boosts existing compressed air to design pressure (25 barA) for high-pressure air supply in specific process sections.

Multi-stage compression optimized for inlet pressure conditions minimizes energy loss.

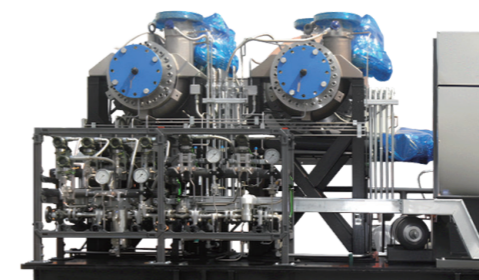
MAC-BAC Combo

Enables independent control for multiple processes with varying pressure and flow conditions within a single gearbox, offering flexible response and simplified installation through equipment integration.



Cryogenic Expander

Designed and manufactured for natural gas liquefaction processes using nitrogen refrigerant, ensuring stable performance in cryogenic environments below -150°C. The combined Warm and Cold Expander configuration maximizes cold recovery, with customized designs precisely meeting customer specifications.



Power Generation

The global power market is rapidly shifting from coal to LNG-based gas power amid decarbonization and energy transition trends. Flexible and stable gas power operation compensates for variability of renewable energy output.

Hanwha Power's custom turbo compressors support key process stability, enabling high-efficiency operation and long-term reliability through optimized designs and platform-based packages.



Fuel Gas Compressor

With over 100 Fuel Gas Boosters supplied worldwide to various gas turbine manufacturers, we design and deliver solutions perfectly matched to turbine operating conditions. Custom designs ensure stable pressure and flow control, providing a reliable fuel supply across load changes and diverse operations.



MENA Power Plant FGC



Americas Power Plant FGC



De-carbonization & Efficiency

As energy transition and decarbonization accelerate, key equipment for carbon reduction and efficiency gains plays a vital role across the energy sector.

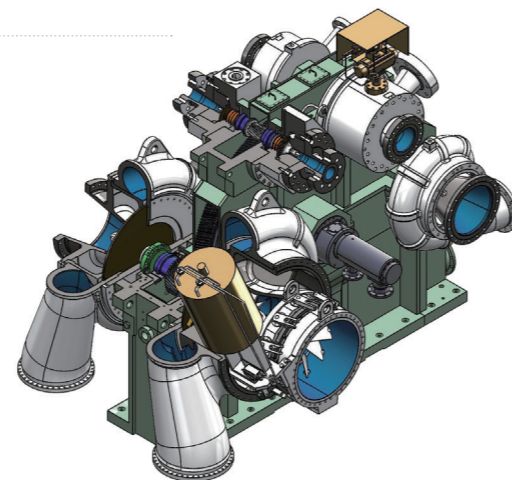
Hanwha Power provides comprehensive decarbonization solutions—from CO₂ and sCO₂ compression, Mechanical Vapor Recompression, to Air Lubrication Systems—spanning CCUS, energy recovery, and fuel efficiency. Custom designs optimized for process conditions, backed by proven high-reliability operations, support next-generation clean energy systems.

De-Carbonization

CO₂ Compressor

We provide essential high-pressure, large-capacity compression solutions for Carbon Capture and Sequestration (CCS) processes, ensuring uninterrupted operation and maximum reliability.

Hanwha Power offers an extensive lineup designed to meet demanding industrial needs, supporting flow rates of up to 240 tons/hour and high-pressure environments reaching 200 barA.



Design Capability		
Stages		8
Flow	Ton/h	~240
Power	kW	~25,000
	HP	~33,500
Discharge Pressure	barA	~200
	PsiA	~2,900

Efficiency

MVR Compressor

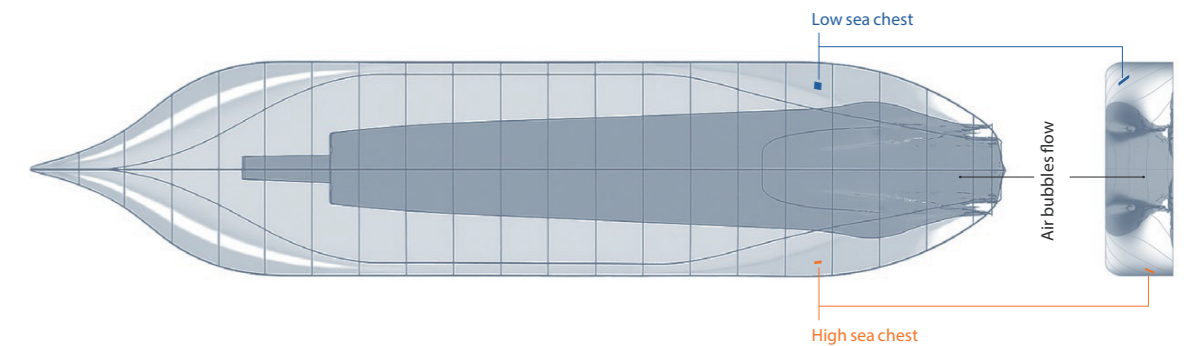
MVR compressors are an energy-saving solution that recycles low-pressure steam by compressing it into high-temperature, high-pressure steam. This process significantly reduces overall steam consumption and maximizes energy efficiency.

* In recent European CCUS processes, low-pressure steam generated from CO₂ absorbers (strippers) is recovered and recompressed for reuse as a heat source. This innovation lowers reliance on traditional steam-based reboilers and dramatically reduces operational expenditures (OPEX).



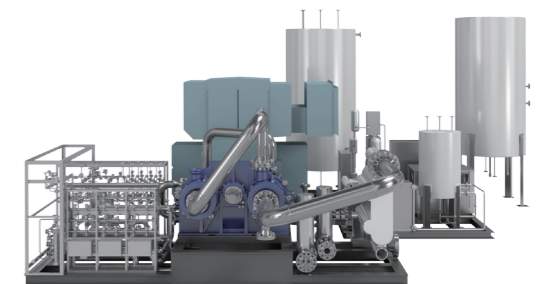
Air Compressor for Air Lubrication System

The Air Lubrication System is a technology that creates an air cushion beneath a ship's hull to reduce frictional resistance to seawater and improve fuel efficiency. Within this system, Hanwha Power's compressor delivers a massive volume of air in real time, precisely matching the process design pressure to maintain a consistent air carpet beneath the vessel.



sCO₂ Power Systems

sCO₂ (supercritical Carbon Dioxide) is an innovative energy solution that utilizes carbon dioxide in a "supercritical" state—possessing both the high density of a liquid and the low viscosity of a gas—as its working fluid. By recovering high-temperature waste heat (above 450°C) from gas turbines and industrial processes and converting it into electricity, this technology significantly reduces plant energy costs. Furthermore, its compact design provides a much smaller footprint than conventional steam turbines, enabling immediate integration into the limited spaces of existing facilities.





Energy Recovery

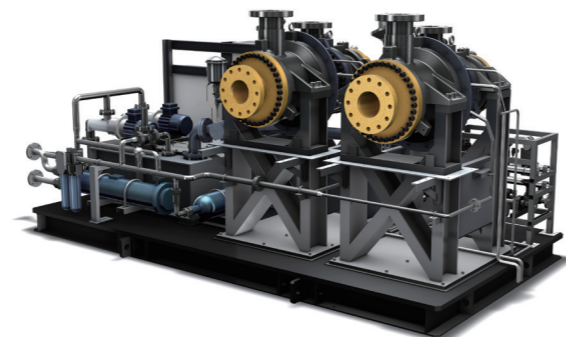
In industrial plants, sections where high-pressure gas expands and fluid energy is lost are inevitable. Efficiently recovering this energy has become a core element in improving overall facility efficiency.

Hanwha Power transforms surplus energy within processes into tangible value through our Turbo Expanders and Componders, which convert pressure energy into power, as well as our TEG (Turbo Expander Generator) solutions capable of electricity generation.

Leveraging our extensive experience in high-speed rotating machinery design and platform-based engineering, we deliver stable performance and proven reliability across a wide range of operating conditions.

H-EX Series (Hanwha Expander)

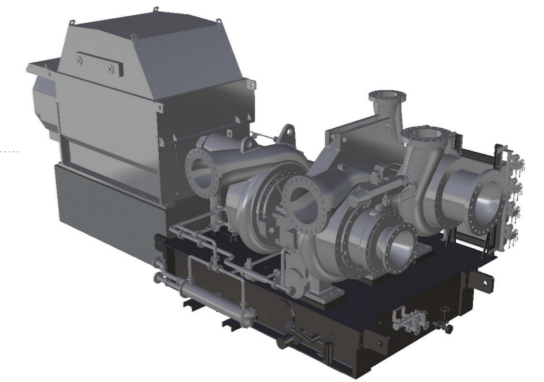
The Hanwha Expander maximizes plant efficiency by recovering expansion energy from high-pressure process gases and converting it into powerful rotational energy. By integrating our solution, you can significantly reduce overall plant energy consumption and lower your carbon footprint.



Model	HEX-200	HEX-400	HEX-600	HEX-800
Max Capacity (m ³ /min)	5	10	66	66
Temp (°C)	-200 ~ 200			
Expansion Ratio	1.2 ~ 18			
Power (kW) (Max, Input)	290	530	3,500	7,200

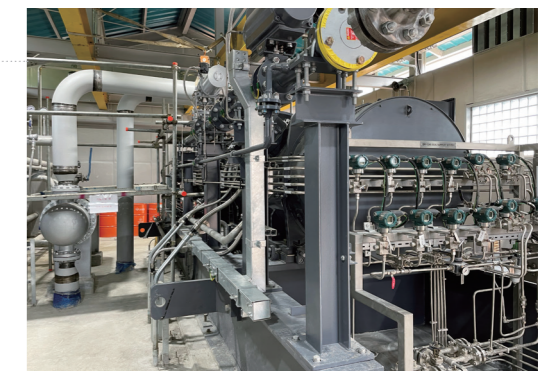
Componder

A Componder (Compressor-Expander) is an energy self-sufficient solution that integrates a compressor and an expander into a single gearbox, allowing the energy generated during gas expansion to be directly recycled back into the compression process.

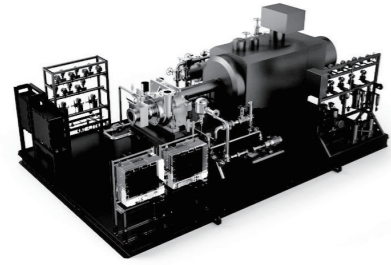


Turbo Expander Generator (TEG)

A TurboExpander-Generator is an eco-friendly, high-efficiency power generation solution that converts pressure energy—typically wasted during pressure reduction—into electrical energy. By being implemented in gas regulation stations, power plants, and chemical facilities, it significantly enhances overall energy efficiency.



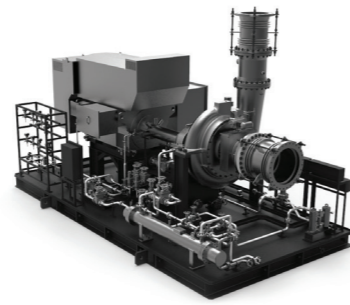
Other Major References



Oil & Gas

VRU(Vapor Recovery Unit) Compressor

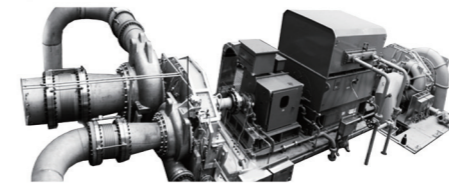
- Model : SE-45G (Single-stage)
- Capacity : 65 ton/h
- Discharge temperature : -163 °C
- HP & LP expander + Comp.
- Cryogenic Turbo Expander for natural gas liquefaction



Refinery

Process Air Blower

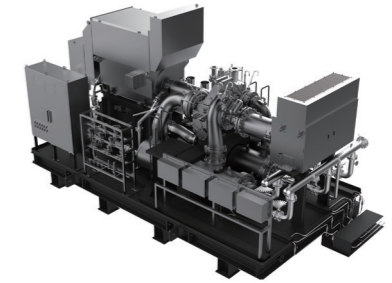
- Model : SE-45A
- Capacity : 59,544 kg/hr
- Discharge pressure : 1,753 kg/cm²A



Petrochemical (PTA)

Compressor Expander Package

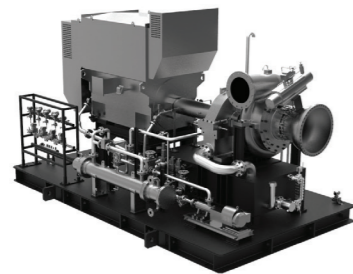
- Model : SE-110A (Four-stage)
- Capacity : 102,000 Nm³/h
- Discharge pressure : 16 barA



FLNG

Instrument Air Compressor

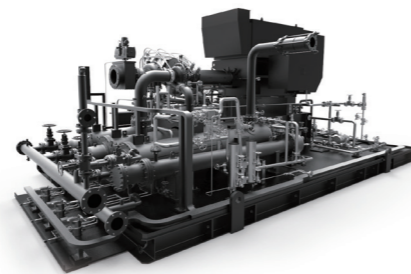
- Model : SE-45A (Three-stage)
- Capacity : 10,000 Nm³/h
- Inlet pressure : 1 barA
- Discharge pressure : 10.5 barG
- Inlet temperature : 50 °C



Petrochemical

Process Air Blower (Oxidation)

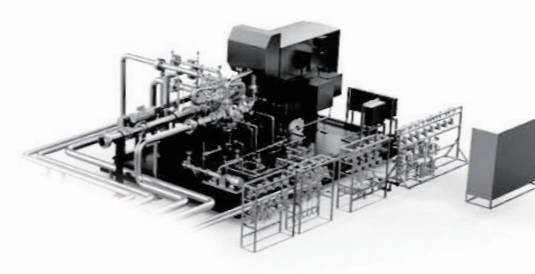
- Model : SE-45A
- Capacity : 45,926 kg/hr
- Discharge pressure : 2.692 kg/cm²A



Oil & Gas

Instrument Air Compressor

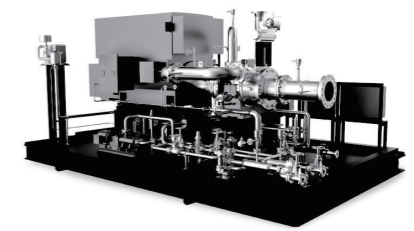
- Model : SE-45A (Four-stage)
- Capacity : 6,800 m³/h
- Inlet pressure : 1 barA
- Discharge pressure : 10 barG
- Inlet temperature : 55 °C



LNG Storage

High Pressure Gas Compressor

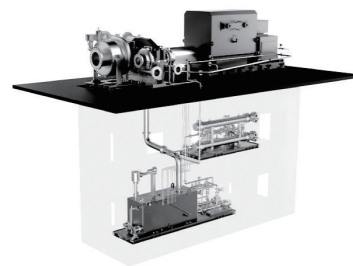
- Model : SE-45G (Six-stage)
- Capacity : 20 ton/h
- Inlet pressure : 9 barA
- Discharge pressure : Max. 75 barA
- Inlet temperature : -30 - 80 °C



LNG Storage

Boil Off Gas (BOG) Compressor

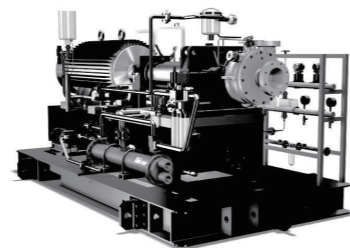
- Model : SE-45G (Three-stage)
- Capacity : 12,000 Nm³/h
- Inlet pressure : 1 barA
- Discharge pressure : 11 barG
- Inlet temperature : -115 °C



Petrochemical

Steam Compressor for Mechanical Vapor Recompression

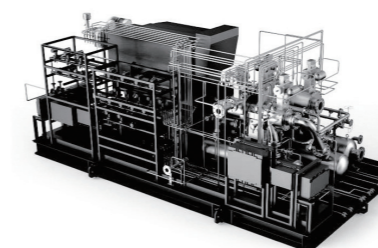
- Model : SE-82V (Four-stage)
- Capacity : 55 ton/h
- Inlet pressure : 2.7 barA
- Discharge pressure : 19 barA



Petrochemical

Process Gas Compressor (API 617)

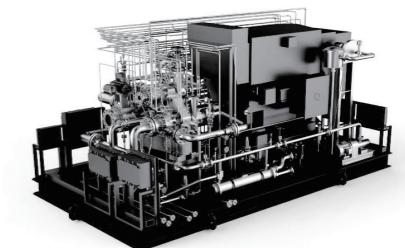
- Model : SE-32N
- Capacity : 31,345 kg/hr
- Discharge pressure : 6.8 kg/cm²A



LNG Liquefaction

C3 (Propane) Compressor

- Model : SE-45G (Four-stage)
- Capacity : 1,700 Nm³/h
- Inlet pressure : 1.1 barA
- Discharge pressure : 19 barG
- Inlet temperature : -36 °C

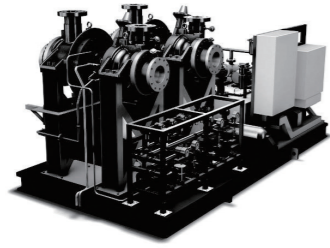


LNG Liquefaction

MR (Mixed Refrigerant) Compressor

- Model : SE-45G (Six-stage)
- Capacity : 9,800 Nm³/h
- Inlet pressure : 4 barA
- Discharge pressure : 64 barA
- Inlet temperature : -36 °C

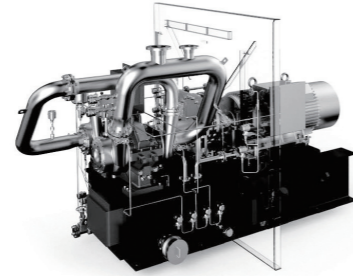
Other Major References



LNG Liquefaction

Expander for Cryogenic or Refrigerant Cycle

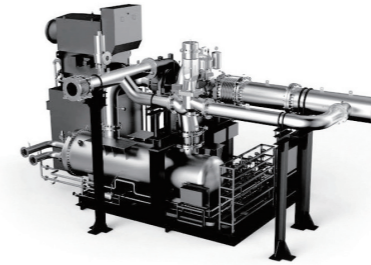
- Model : SE-45N (Four-stage)
- Capacity : 65 ton/h
- Discharge temperature : -163 °C
- HP & LP expander + Comp.
- Cryogenic Turbo Expander for natural gas liquefaction



LNG Transportation

Low Duty Compressor

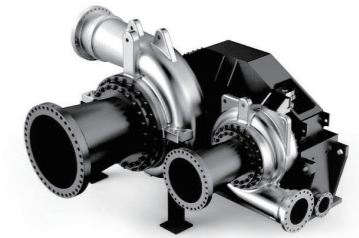
- Model : SE-32G (Three-stage)
- Capacity : 4,750 m³/h
- Inlet pressure : 1 barA
- Discharge pressure : 5.0- 6.5 barA
- Inlet temperature : -140- 40 °C



Power Generation

Flue Gas Compressor

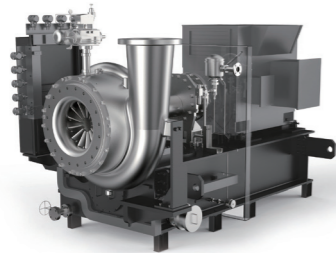
- Model : SE-82G (Two-stage)
- Capacity : 24,000 Nm³/h
- Inlet pressure : 0.05 barA
- Discharge pressure : 1.5 barA
- Inlet temperature : 80 °C



Power Generation

Hot Gas Expander for Power Recovery

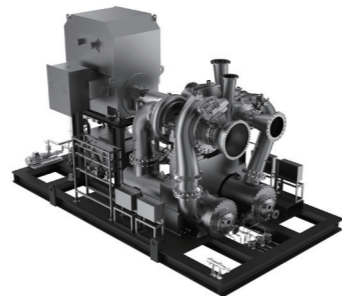
- Model : SE-110G (Two-stage)
- Capacity : 113,000 Nm³/h
- Inlet pressure : 9.3 barA
- Discharge pressure : 1 barA
- Inlet temperature : 140 °C



LNG Transportation

High Duty Compressor

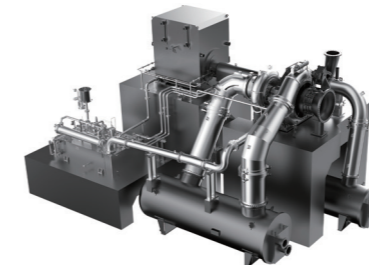
- Model : SE-32G (Single-stage)
- Capacity : 34,000 m³/h
- Inlet pressure : 1 barA
- Discharge pressure : 2 barA
- Inlet temperature : -140 °C



Chemical

Companer

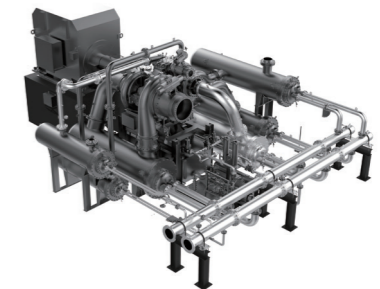
- Model : SE-65A/N
- Compressor
 - Capacity : 26,000 Nm³/hr
 - Pressure : 1 → 7.76 barA
- Expander
 - Capacity : 21,000 Nm³/hr
 - Pressure : 6.2 → 1.15 barA



Air Separation

Main Air Compressor (MAC)

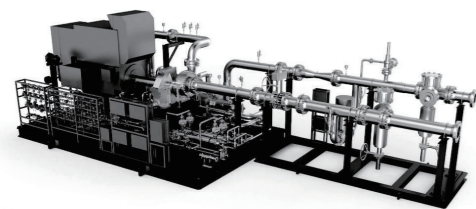
- Model : SE-110A (Three-stage)
- Capacity : 126,000 Nm³/h
- Discharge pressure : 6.2 barA



Air Separation

MAC/BAC Combo

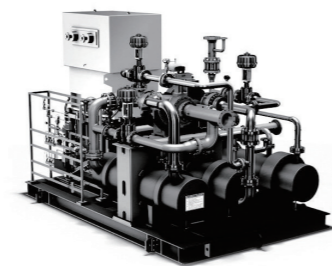
- Model : SE-82A (Six-stage, 4+2)
- Capacity : 39,000 Nm³/h & 16,000 Nm³/h
- Discharge pressure : 13.5 barA & 39 barA



Power Generation

Fuel Gas Booster

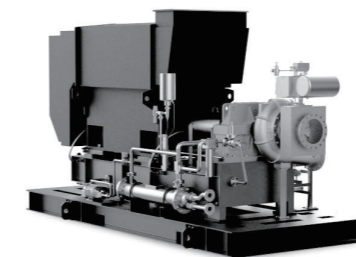
- Model : SE-45G (Single-Stage)
- Capacity : 70 ton/h
- Inlet pressure : 28 barA
- Discharge pressure : 40 barG



Power Generation

Fuel Gas Booster

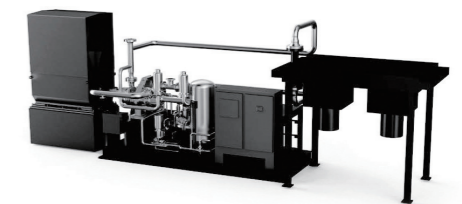
- Model : SE-45G (Three-Stage)
- Capacity : 15 ton/h
- Inlet pressure : 6 barA
- Discharge pressure : 58 barA
- Inlet temperature : 42 °C



Air Separation

Nitrogen Booster Compressor

- Model : SE-45N (Single-stage)
- Capacity : 62,500 Nm³/h
- Inlet pressure : 5 barA
- Discharge pressure : 9.1 barG



Wind Tunnel Test

High Pressure Air Booster

- Model : SE-45A (Two-stage)
- Capacity : 63,000 Nm³/h
- Inlet pressure : 35 barA
- Discharge pressure : 75 barA