Hanwha Power Systems

Headquarters
6, Pangyo-ro 319beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488, Korea
Tel +82.70.7147.8000

Changwon Plant
1204, Changwon-daero, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, 51542, Korea
Tel +82.55.260.2100

Global Network

- **Asia-Pacific**

Hanwha Power Systems Shanghai
200233 20/F, New Caohejing International Business Center A,
No391, Guiping Road, Shanghai, China
Tel +86.21.5427.1155

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

Hanwha Power Systems Vietnam
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**

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

- **Middle East**

Hanwha Power Systems Service Middle East
PO BOX 33586, Plot #35-WR43, ICAD 3 Musaffah South, Abu Dhabi, UAE
Tel +971.2.627.0151

- **Europe**

Hanwha Power Systems Europe
Via de Vizzi 93/95, Cinisello Balsamo 20092, Milan, Italy
Tel +39.02.8410.2193

Website : www.hanwhapowersystems.com
E-mail : powersystems@hanwha.com

Present State of Hanwha Power Systems
Turbo Compressor Authentication

- ISO9001
- ISO14001
- ISO8573-1 Class0
- OHSAS18001
- CE
- ASME
- A Member of CAGI

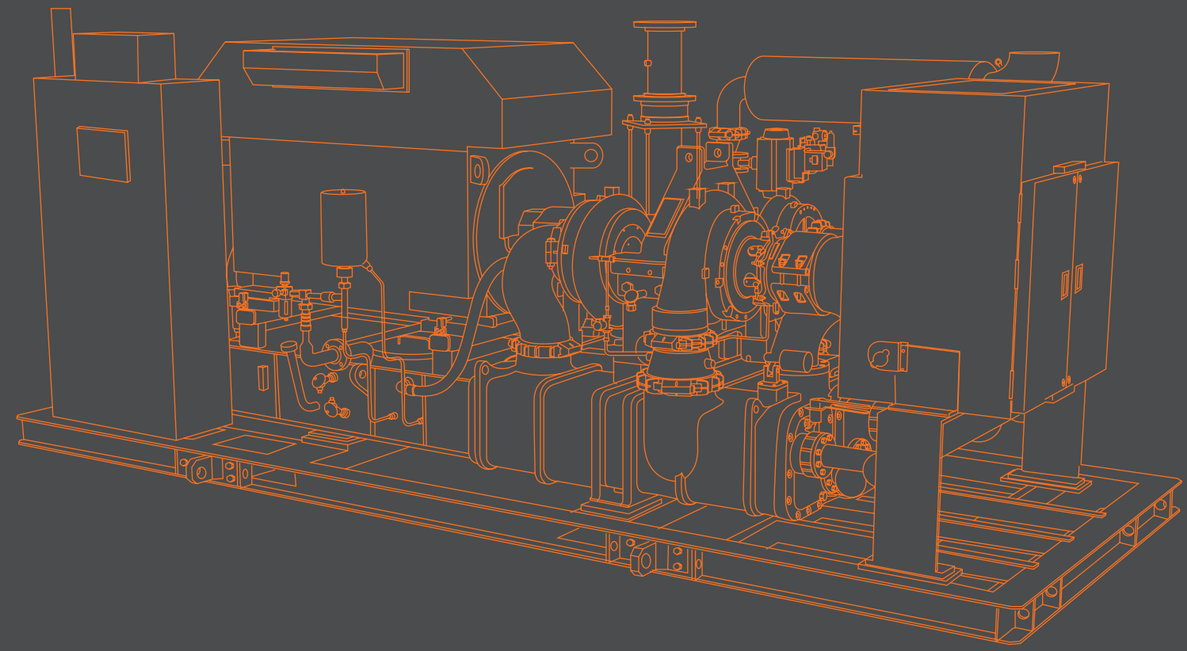
The information in this publication is subject to change without a notice.

Worldwide Network

Overseas Subsidiaries
Service Center

Hanwha Power Systems

OIL-FREE CENTRIFUGAL AIR COMPRESSOR



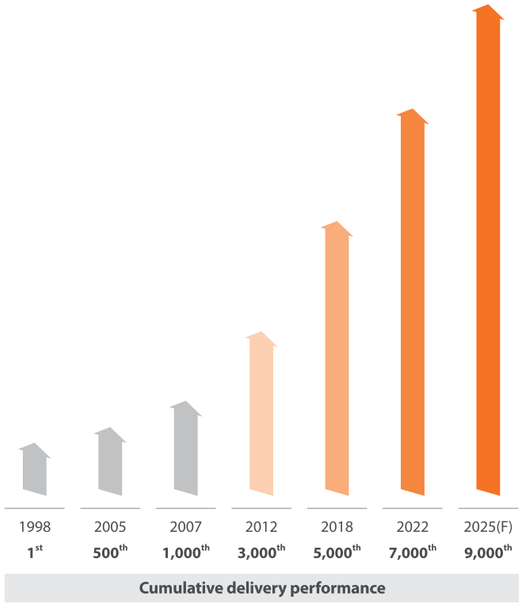
Hanwha Power Systems

Introduction to Hanwha Power Systems

With a solid foundation of long-term reliability and experience in the gas turbine engine field, Hanwha Power Systems entered the industrial energy equipment market in 1997. Since then, it has grown into a global company, with a sales record of over 9,000 units worldwide. The company's product range, which includes air compressors for various industries, oil & gas, air separation, and fuel gas compressors for power plants, BOG (Boil Off Gas) compressors for LNG terminals, cryogenic compressors, companders, and shipbuilding and marine compressors, is a reflection of its enduring commitment to high added value.

History

- **1977** Company Established
- **1979** Overhaul and Repair of Aircraft Gas Turbine Engines
- **1996** Industrial Gas Turbine Development
- **1997** First model of Turbo Compressor Introduced
- **2011** Penetrated into Gas Compressor Market
- **2013** SA3100 introduced in the World's Largest Capacity of Air Cooled Compressor
- **2014** Enter the Marine Compressor Market
  Contract to Supply the World 1st Integrally Geared Centrifugal Compressor for Offshore VRU Application
- **2016** Saudi Aramco Approved Vendor registered (AP1617 Process Compressor & Blower)
- **2018** Launched Turbo Expander Generator (TEG), an Environment friendly Energy Solution
- **2020** Contract to supply a hydrogen refueling system for a Korea Gas Corporation (KOGAS) energy complex
- **2021** Power Generation System DOE (Department of Energy) National Project Award and Achievement
- **2022** Power Generation System Global R&D 100 Award
  Entering the Ethylene Compressor and CO_2 Compressor Market
- **2023** World's first successful demonstration of hydrogen turbine combustion



Cumulative delivery performance

Applicable Industries

Oil & Gas
- Instrument Air
- API 617 & API 672

Petrochemical
- Ethylene
- Polymers
- EO/EG
- Fine Chemicals
- Fertilizers
- PTA
- PDH

Power Plant
- CCPP (Combined Cycle Power Plant)
- Instrument Air

General Industry
- Electronic
- Industrial Manufacturing Facilities (Automobile, Shipbuilding)
- Mining, Construction & Others
- Food, Glass, Paper, etc.

Air Separation
- Gas Processing & Treatment
- LNG Terminal & Liquefaction
- Cryogenic Solutions

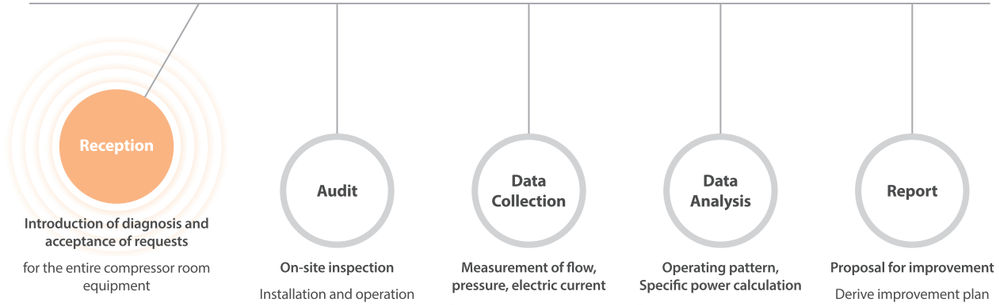
Steel/Metal
- Steel Mills
- Non-Ferrous Plants(Al, Copper, Nickel, etc)
- Air Separation

Total Solution

Compressor Room Total Solution

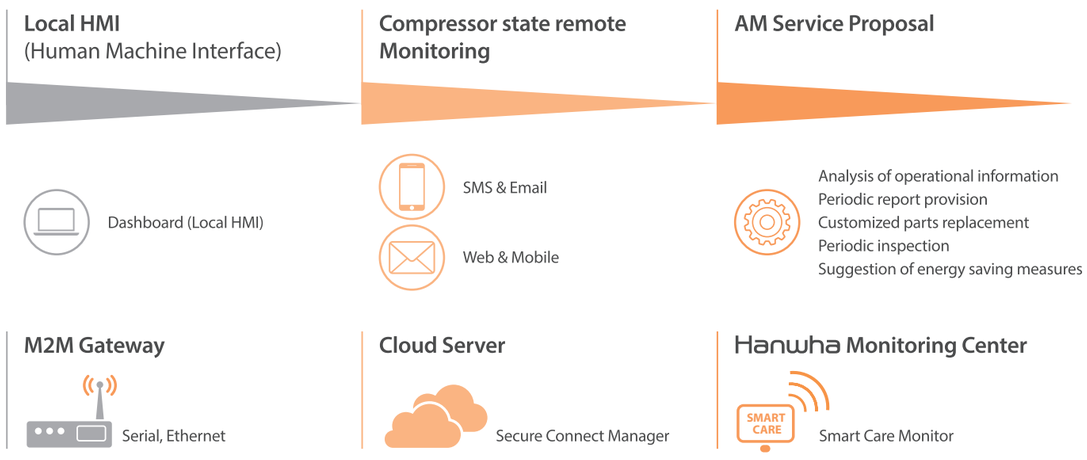
We check the operating status of the customer's entire compressor room air system to recommend the most efficient equipment operation plan. We also measure and analyze actual operating data, such as flow rate and power consumption, to suggest an economical compressor operation plan that reduces energy usage. Diagnosis takes up to 2 weeks.

Process



Monitoring

Extend compressor life, maximize availability, and minimize downtime through remote monitoring.



Dependable Products Lineup

Integrally Geared Type

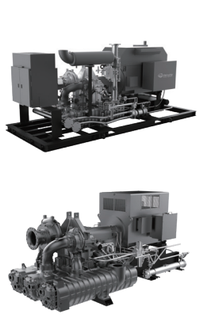
Hanwha Power Systems' turbo compressor (Integrally Geared Type) promises excellent performance and efficiency through proprietary technology.
We supply clean, dry '100% Oil-Free' air to maintain optimal production conditions while complying with strict environmental regulations. This is why we are recognized for safety and reliability as the best-customized solution in various industries.

100% Oil-Free

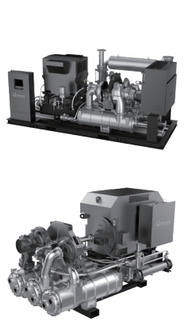
ISO8573-1 Class 0 Clean Air Supply

Our products have achieved the prestigious ISO8573-1 Class 0 certification, representing the highest quality standard for compressed air. They are extensively utilized across industries that demand high reliability, including advanced sectors such as semiconductors and batteries, as well as steel, chemical, and food industries.

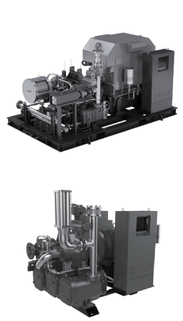
NEW **SM100 Pro Series**



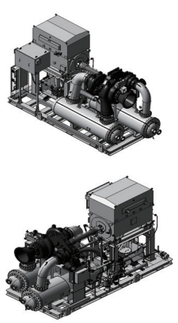
SM Series



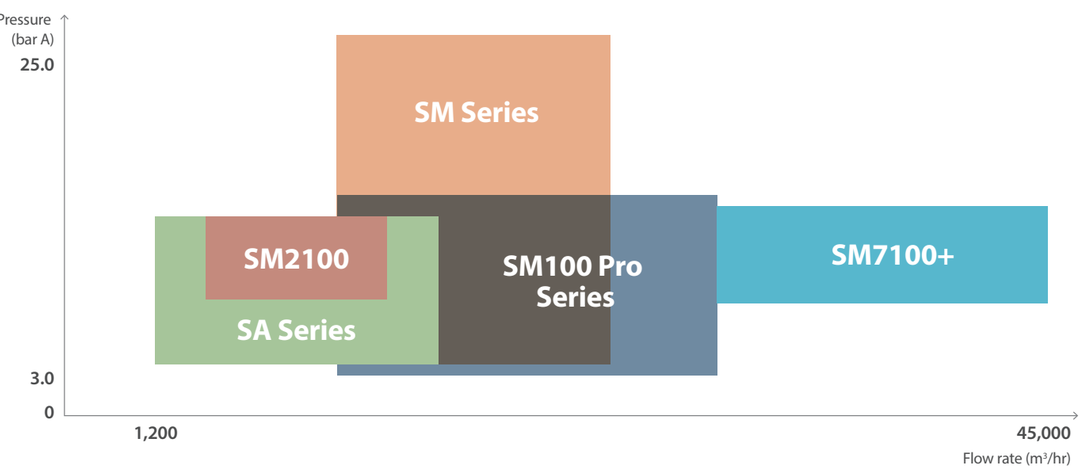
SM2100



NEW **SM7100+**



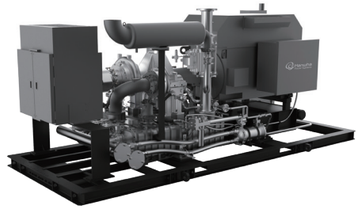
SA Series



Key Technical Feature

Concentrating on Efficiency with Reliability

Optimized components and simple design ensure high efficiency and stable operation.

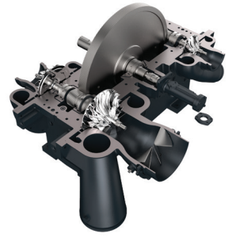


Customized high-performance, high-reliability of turbo compressors

- Achieving high efficiency and energy saving through proprietary designs and technologies
- Compliant with various international standards including API, ASME, PED, and KOSHA
- Providing 100% Oil Free solution (ISO8573-1 Class 0)
- Simple structure offering easy installation/maintenance
- Customized solutions including complete compressed air systems per specific user requirements

High-durability gear system based on sophisticated technology

- Delivering peak performance based on over 30 years of accumulated design expertise
- High reliability and durability verified through numerous operating experiences
- Reduced maintenance time through easy disassembly on site

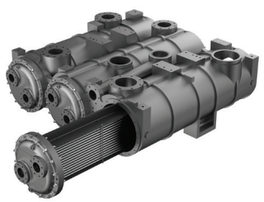


Impeller manufactured based on proprietary/advanced design technology

- Maximize optimal stability and energy efficiency through sophisticated design
- High reliability through low vibration and low noise achievement
- Implementation of optimized customer-specific designs

High-durability Coolers

- Optimal airflow design to minimize pressure drop
- Excellent durability achieved by applying materials suitable for the user environment
- Easy to clean and maintain with a water-in-tube type



Provide the best interface for users

- Provide user-oriented convenience (high-resolution color application)
- Apply a wide touch-screen for customer convenience
- Implemente a compressor diagnosis and alarm provision system through real-time monitoring

High Efficiency & High Profit

SM100 Pro Series NEW

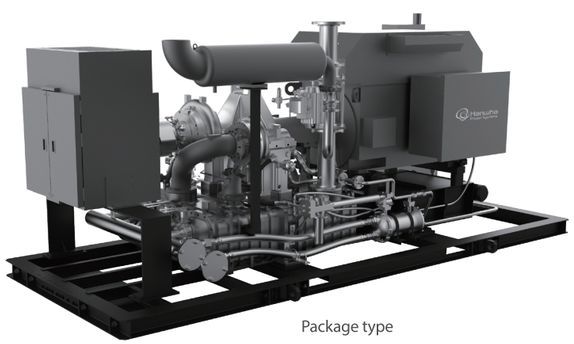
Features

- Provide environmentally friendly solutions that contribute to reducing CO_2 emissions through improved energy efficiency
- Improve efficiency and expanding flow range by optimizing aerodynamic components
- Up to 5% efficiency improvement compared to our existing products
- Provide various options and solutions according to customer operating conditions and environments
  - Provide secondary battery-oriented Cu-Zn Free solutions
  - Possible to operate in outdoor environments
  - Manufacture Combo compressors
  - Possible to design according to customer-required discharge temperature conditions
  - Possible to manufacture products certified required by each country (KGS/PED/TRCU/UKRSEPRO/CRN/CSA)

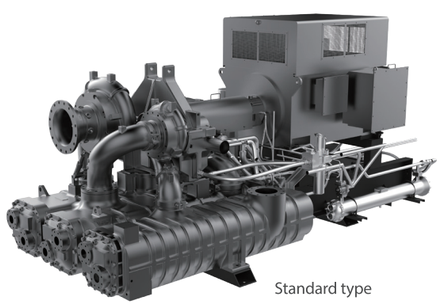
Specifications

Model			SM3100 Pro	SM4100 Pro	SM5100 Pro	SM6100 Pro	SM7100 Pro
Capacity	m^3/hr		3,300 ~ 5,690	4,340 ~ 9,030	7,350 ~ 15,150	11,630 ~ 25,890	24,500 ~ 32,000
	CFM		1,950 ~ 3,240	2,480 ~ 5,160	4,200 ~ 8,670	9,800 ~ 14,800	14,400 ~ 18,800
Power	kW		250 ~ 600	460 ~ 900	570 ~ 1,500	870 ~ 2,520	1,000 ~ 3,100
	HP		270 ~ 800	620 ~ 1,220	770 ~ 2,015	1,170 ~ 3,380	1,340 ~ 4,155
Discharge Pressure	bar A		3.0 ~ 13				3.5 ~ 11.4
	Psi A		43 ~ 188				50 ~ 165
Dimension (L x W x H)	mm	P	5,250 x 2,250 x 2,500	5,500 x 2,250 x 2,500	6,250 x 2,250 x 2,550	7,100 x 2,250 x 2,550	-
		S	3,210 x 2,150 x 1,920	3,800 x 2,300 x 2,050	4,750 x 2,490 x 2,130	5,290 x 2,400 x 2,420	5,700 x 2,800 x 2,950

* P : Package type / S : Standard type



Package type



Standard type

Driving Performance

SM Series

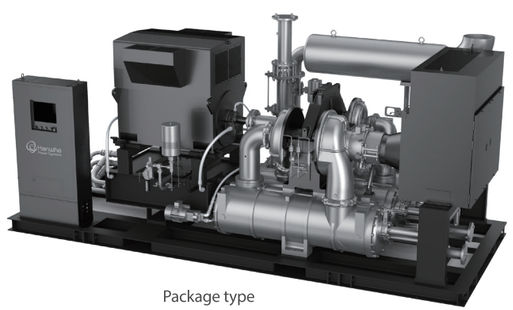
Features

- Standard for industrial air compressors based on high stability and operational reliability
- High-quality air compression system based on API672 Code design
- Customized equipment is available
  - High-pressure compressors of 14 bar A or higher can be manufactured
  - Nitrogen compressors can be manufactured (Carbon Seal Type applied)
  - Combo compressors can be manufactured
  - Booster compressors can be manufactured
  - Country-specific certified products can be manufactured (KGS/PED/TRCU/UKRSEPRO/CRN/CSA)
- High compatibility / Fast service response
  - Respond with the shortest lead time through compatibility of consumable parts for all models (minimizing troubleshooting period)

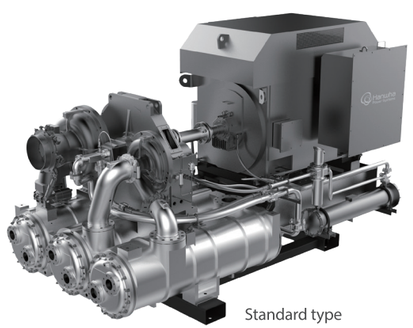
Specifications

Model			SM3000	SM4000	SM5000	SM6000
Capacity	m^3/hr		3,300 ~ 5,300	5,300 ~ 8,400	8,400 ~ 15,000	15,000 ~ 21,000
	CFM		1,950 ~ 3,100	3,100 ~ 4,950	4,950 ~ 8,850	8,850 ~ 12,400
Power	kW		230 ~ 710	360 ~ 1,200	560 ~ 1,800	940 ~ 2,650
	HP		300 ~ 950	480 ~ 1,600	750 ~ 2,410	1,260 ~ 3,550
Discharge Pressure	bar A		3.5 ~ 25			
	Psi A		50 ~ 364			
Dimension (L x W x H)	mm	P	4,750 x 2,100 x 2,500	5,100 x 2,250 x 2,500	5,450 x 2,250 x 2,500	6,200 x 2,300 x 2,550
		S	3,150 x 1,980 x 2,100	3,780 x 2,080 x 2,130	3,960 x 2,100 x 2,350	4,480 x 2,220 x 2,520

* P : Package type / S : Standard type



Package type



Standard type

Driving Performance & Low Flow

SM2100

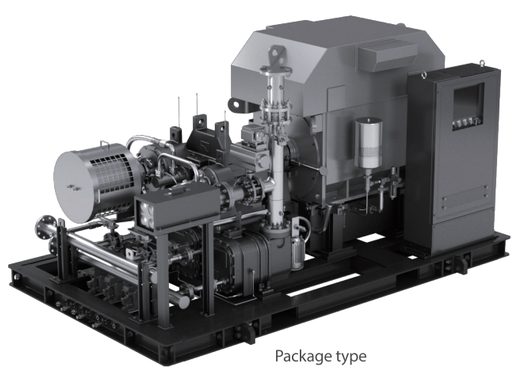
Features

- Customized options tailored to specific customer requirements
- Solutions available from basic expandable models to plug-and-play package configurations, with selectable options
  - Optional components: Base Frame, Cooling Water Manifold, Enclosure - inclusion or exclusion per requirements
- Tilting pad journal bearing applied to Easy Pinion Gear for stable operation and extended service life
  (Bearings replacement recommended based on operating conditions)
- Compact design for minimal installation footprint
- Vibration sensor, oil heater, oil tank vacuum gauge included as standard
- Four-stage API-compliant sealing system for minimized gas leakage
- High-efficiency inlet guide vanes for reduced power consumption via partial load control
- Five-axis machined impeller for optimal stability and efficiency

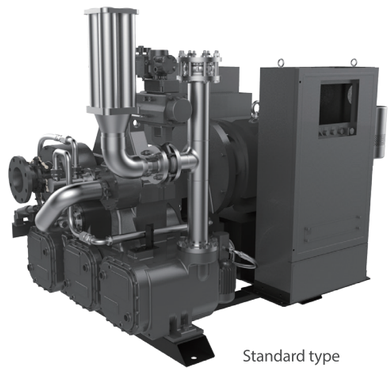
Specifications

Model			SM2100
Capacity	m^3/hr		1,400 ~ 3,550
	CFM		824 ~ 2,089
Power	kW		150 ~ 335
	HP		200 ~ 450
Discharge Pressure	bar A		5.0 ~ 11.4
	Psi A		72 ~ 165
Dimension (L x W x H)	mm	P	3,400 x 2,200 x 2,066
		S	2,360 x 1,660 x 1,770

* P : Package type / S : Standard type



Package type



Standard type

High-tech Intensive

SM7100+ NEW

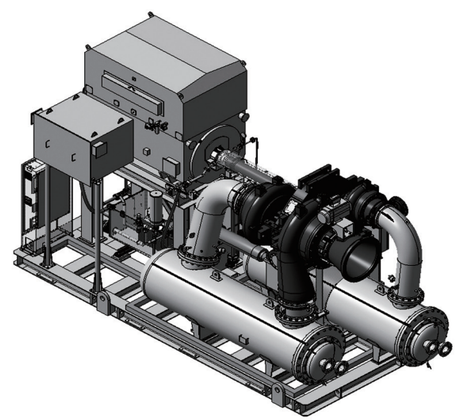
Features

- Standard design basis for high-flow compressors enables optimized product recommendations
- Advanced engineered compressor design by Hanwha Power Systems ensures superior durability, validated by extensive proven references
- Master impeller precision-manufactured with 4th-generation CNC 5-axis machining minimizes energy loss via optimized aerodynamic design
- Compact equipment footprint enhances on-site accessibility and inspection efficiency

Specifications

Model			SM7100 +
Capacity	m^3/hr		32,000 ~ 45,000
	CFM		18,835 ~ 26,487
Power	kW		2,300 ~ 4,000
	HP		3,038 ~ 5,361
Discharge Pressure	bar A		5.0 ~ 11.5
	Psi A		72 ~ 166
Dimension (L x W x H)	mm	S	6,201 x 3,234 x 3,816

* S : Standard type



Designed to Modern Engineered

SA Series

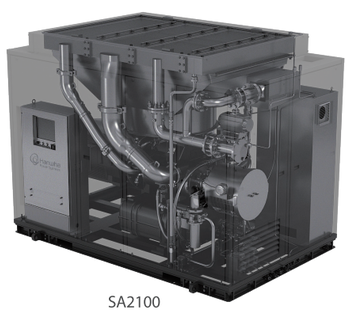
Features

- High-precision AGMA 12 & 13 gear system ensures noise reduction and extended service life
- Easy maintenance with individually replaceable pinion and bull gears
- Master impeller made of 17-4 PH stainless steel
- High-efficiency impeller, 5-axis machined, with a wide turndown range (meets API 672 standard)
- High-quality split-type tilting pad journal bearing for stable operation of the pinion gear
- Sleeve journal and taper-landed bearing design to minimize friction loss
- Bearings compatible with RTD (SA3100 option available)
- Sealing system compliant with API standards
- No separate compressed air required for sealing, effectively preventing air and oil leakage
- Split-type design allows inspection and maintenance without rotor disassembly

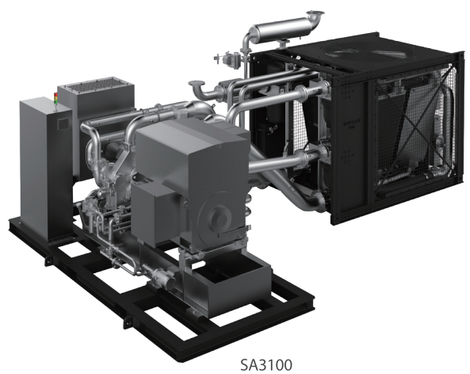
Specifications

Model			SA2100	SA3100
Capacity	m^3/hr		1,200-2,890	3,750-5,500
	CFM		700-1,680	2,200-3,250
Power	kW		150-260	400-580
	HP		200-350	540-780
Discharge Pressure	bar A		3.5-11.4	3.5-11
	Psi A		50-165	50-160
Dimension (L x W x H)	mm	Compressor	3,000x2,500x1,900	4,650 x 2,050 x 1,990
		Cooler	-	4,420 x 2,110 x 2,290

* Flexible cooler options are available (SA3100).



SA2100



SA3100

Services

Smart Care Service

We provide fast and innovative care services using Hanwha's high-quality genuine parts and advanced technology, enabling you to focus on stable maintenance and equipment operation.

Minimize Equipment Downtime

RUSH 112 Worldwide

Hanwha Power Systems is committed to minimizing equipment downtime through our RUSH 112 policy, which ensures rapid and reliable service for our customers.

Customer First

Maximizing Equipment Operation Time

Smart Care

Hanwha Power Systems operates four preventive maintenance programs based on accumulated operating hours to prevent unexpected equipment failures.

Response within **1 hour**

On-site visit within **1 day**

Initial solution provided within **2 days**

AM Solutions

Operational Services

Parts	Maintenance	Periodical Maintenance	Monitoring	Total Solutions
Supply and replacement of parts subject to wear and tear	Appropriate solutions are provided in response to product performance issues.	Stable operation through proactive risk prevention and effective countermeasures	Real-time management service for proactive maintenance and enhanced operational efficiency via continuous monitoring.	Comprehensive management of compressor equipment, including customer-owned operating units.

Operational Objectives

- **Establishment of Management System**
  Rapid and accurate system implementation through designated management personnel
- **Risk Management**
  Comprehensive oversight via regular inspections and diagnostics
- **Cost Reduction**
  Enhancing equipment efficiency while extending service life