

## Headquarters

### Hanwha Power Systems

6, Pangyo-ro 319beon-gil, Bundang-gu,  
Seongnam-si, Gyeonggi-do, 13488, Korea  
Tel +82.70.7147.5452  
Fax +82.31.8018.3727

### Changwon Plant

1204, Changwon-daero, Seongsan-gu,  
Changwon-si, Gyeongsangnam-do, 51542, Korea  
Tel +82.55.260.2100  
Fax +82.55.260.2113

## Global Network

### ■ Americas

#### Hanwha Power Systems Americas

580 Westlake Park Blvd, Suite 500, Houston TX 77079, USA  
Tel +1.281.599.3377 ext.204  
Fax +1.281.599.7734

### ■ 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  
Fax +86.21.5423.5122

### Tianjin Office

300385, 2nd Floor, No.2 Warehouse, No.16, Weier Road,  
Microelectronics Industrial Zone, Xiqing District, Tianjin, 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

### ■ Europe

#### Hanwha Power Systems - Milan

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 +7.499.750.1733

### ■ 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  
Fax +971.2.627.0152

Website : [www.hanwhapowersystems.com](http://www.hanwhapowersystems.com)

E-mail : [powersystems@hanwha.com](mailto:powersystems@hanwha.com)

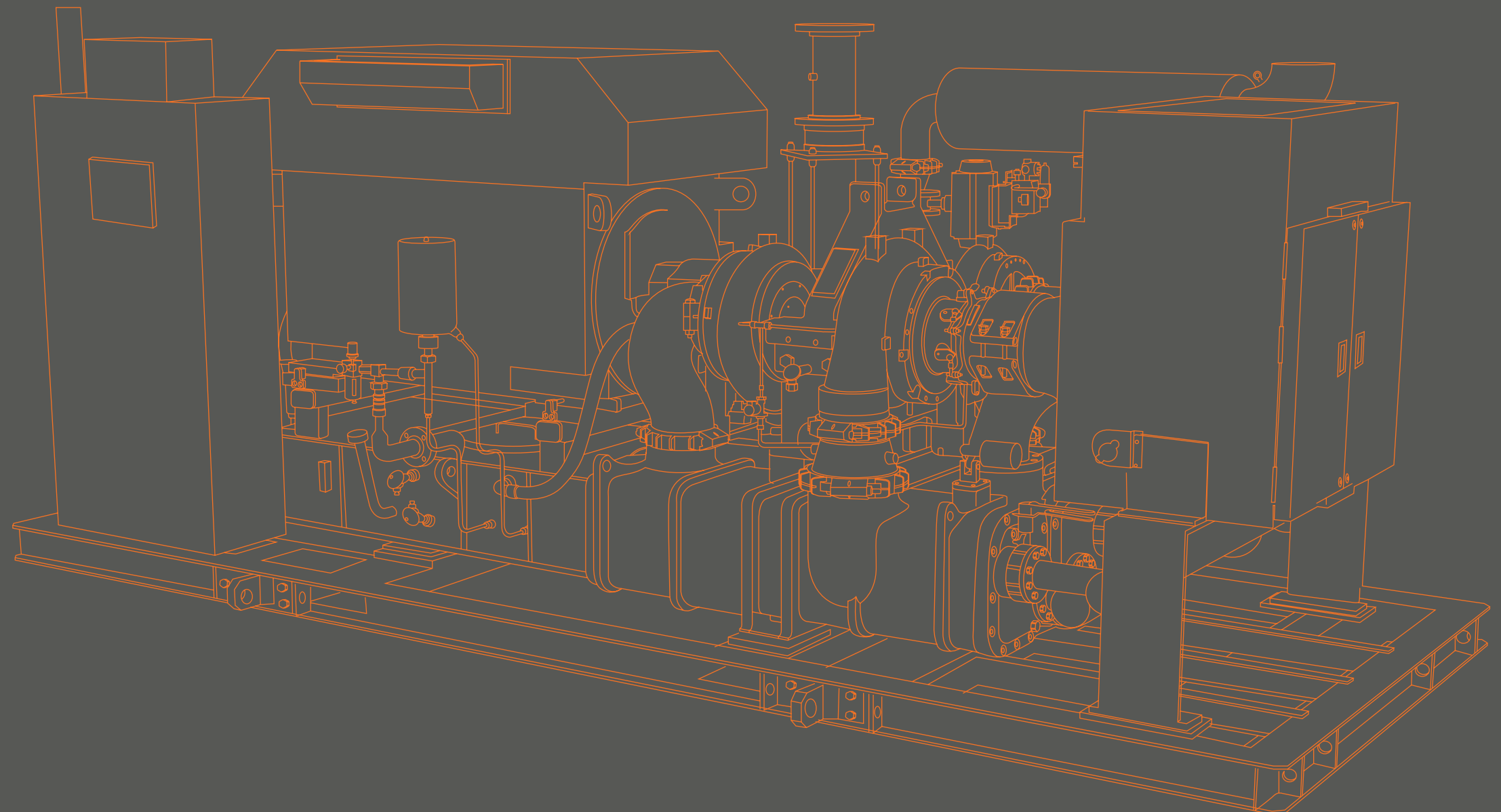


Present State of Hanwha Power Systems  
Turbo Compressor Authentication

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

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

# OIL-FREE CENTRIFUGAL AIR COMPRESSOR SM / SM100 SERIES

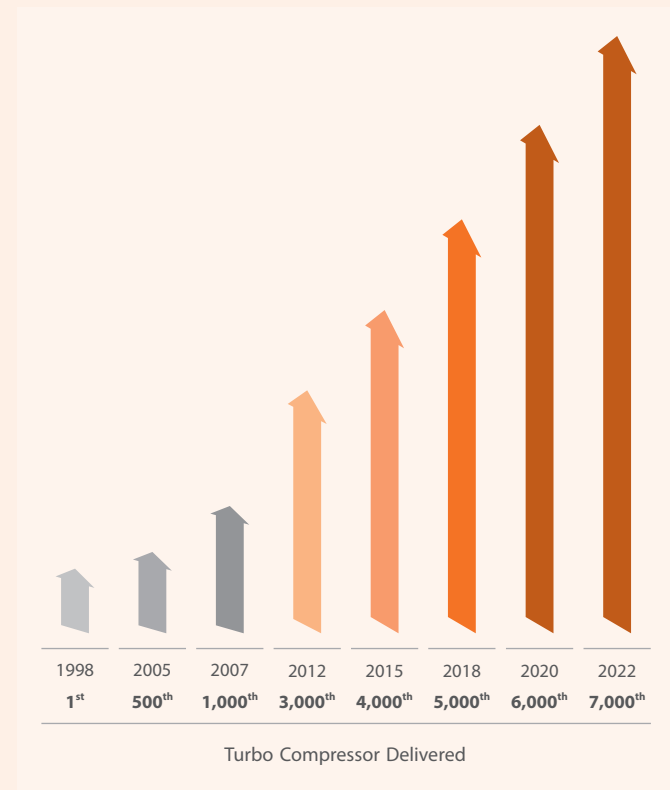


## History

Based on over 40 years of accumulated experience in precision machine industry from Gas Turbine to Compressor Business, Hanwha Power Systems has been chosen by more than 1,500 customers worldwide.

- **1977** · Company Established (Samsung Techwin) in Samsung Group
- **1979** · Overhaul and Repair of Aircraft Gas Turbine Engines
- **1992** · Started Developing Industrial Gas Turbine
- **1997** · First model of Turbo Compressor Introduced
- **2011** · Penetrated into Gas Compressor Market
- **2013** · SA3100, the World's Largest Capacity of Air Cooled Compressor, Introduced  
· ISO8573-1 (Class 0) Certified
- **2014** · Contract to Supply the World 1st Integrally Geared Centrifugal Compressor for Offshore VRU Application 2015
- **2015** · New Beginning in Hanwha group as "Hanwha Techwin"  
· Penetrated into the Offshore Market with Turbo Air & Gas Compressors  
· Launched Long-term Aftermarket Service Program
- **2016** · Saudi Aramco Approved Vendor registered (AP1617 Process Compressor & Blower)
- **2017** · MOU Signed with KEPCO to Jointly Develop Oxy-Fuel Gas Turbine Technology  
· New Beginning as "Hanwha Power Systems"
- **2018** · Launched Turbo Expander Generator (TEG), an Environment friendly Energy Solution  
· Hydrogen Compressor Packager Agreement with PDC
- **2019** · Authorized Service Center Agreement (for Korean market) with Baker Hughes  
· ADNOC (Abu Dhabi National Oil Company) Approved Service Vendor Registered
- **2020** · Contract to supply a hydrogen refueling system for a Korea Gas Corporation (KOGAS) energy complex
- **2021** · Achieved sCO<sub>2</sub> engine US DOE national project goal
- **2022** · Changed the holding company to 'Hanwha Power Systems Holdings Corp.', a subsidiary of Hanwha Impact  
· Awarded Global R&D 100 for sCO<sub>2</sub> Engine Development for the first time  
· Entering the Ethylene Compressor and CO<sub>2</sub> Compressor Market

Hanwha Power Systems is one of the fastest growing solution providers in its industry since 1997. During the last two decades Hanwha Power Systems delivered over 7,000 units of turbo compressors worldwide.



## Industries & Applications



### Upstream & Offshore

- Flash Gas, LP, MP
- Vapor Recovery / Instrument Air



### Refinery

- Make-up, Recycle, Booster (H<sub>2</sub>, Wet)
- Sulfur Recovery / Process Air / Instrument Air



### LNG

- Boil off gas (Terminal, LNG Plant)
- High Pressure (Terminal)
- Low / High duty (LNGC, LNG FPSO)



### Power Generation

- Fuel Gas Booster / N<sub>2</sub> booster (IGCC)
- Syngas / Instrument Air



### Air Separation

- Main Air / Booster Air or N<sub>2</sub>
- Cryogenic Expansion



### Fertilizer / Gas Processing

- Process Air / Process Gas (NG, NH<sub>3</sub>, CO<sub>2</sub>)
- N<sub>2</sub> Booster / Instrument Air / NGL



### Petro-chemical

- High Pressure (Terminal)
- Refrigeration (Propane, Propylene)
- PTA / Boil off gas / Process Air / Instrument Air

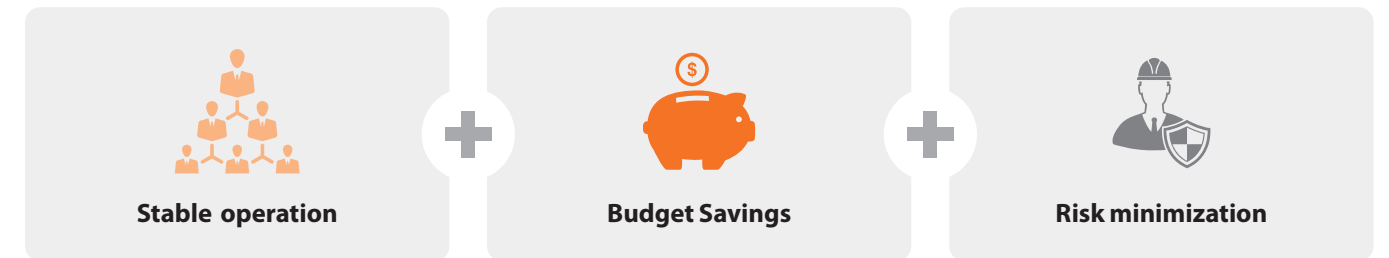


### Environment & Energy Saving

- Aeration for wastewater treatment
- Pneumatic conveying materials
- Mechanical vapor recompression

## Way to ease your mind

Excellent solution and thorough service will guarantee customer's peace of mind



### Stable Operation

- Complying with global industry standards as ISO9001, API672 and customer specific requirements
- 100% Oil-Free compressed air without any contamination: ISO 8573-1 Class 0 certification



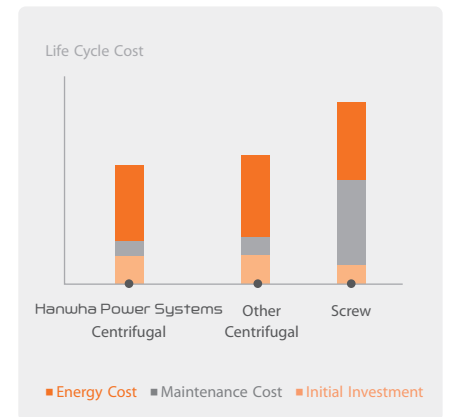
\* ISO 8573-1 specifies purity classes of compressed air with respect to particles, water and oil independent of the location in the compressed air system at which the air is specified or measured

- Using three-dimensional design system to eliminate potential design flaws in the design phase
- Thorough quality control system to reduce any risk exposure
- The fastest growing in the industry since 1997
- Certified by major players in various industries in the Middle East, Europe, Americas, etc.



### Budget Savings

- High efficiency oriented components and low maintenance design will provide customers with lower life-cycle cost
  - Flexible IGV adjusting the flow rate in accordance with the fluctuation of air consumption to reduce energy consumption up to 7%
  - Wear resistance materials as stainless steel for minimizing abrasion and corrosion
  - Precise 5-Axis machined impeller and long life guaranteed oil and gas seals
  - Simple and no wearing structure leads minimized maintenance effort and cost
- Energy saving analysis to diagnose current status and find the root cause of energy waste can minimize the unnecessary cost and keep customers' profit high



### Risk Minimization

- Preventive maintenance program provides a guideline or an actual check service for keeping customer's equipment healthy
- Remote Monitoring System does daily check of customer's equipment, and provides prompt alarm / notification service once any problem happens
- RUSH112 service and wide range of service network minimizes downtime when emergency situation occurs

## Optimized design to maximize customer benefit

Low maintenance and highly efficient design play a key role to maximize customer profit



### Energy Saving Inlet Guide Vane

- Precise control of air flow by efficient inlet air control
- Reduction of power consumption through partial load control
- Low pressure loss with airfoil profiled vanes



### Durable Coolers

- Water-in-tube inter & aftercooler bundles allow simple maintenance and easy cleaning
- Corrosion / erosion resistant material applied for protecting damage of other components
- Minimizing pressure drop by optimized airflow



### Simple & Neat Package

- Complete full package for plug & run provides easy and low-cost installation
- Full enclosure is applicable for clean appearance and quiet operation which creates a comfortable work environment (Low noise with sound enclosure)
- Minimizing maintenance cost by simple structure



### Leak-Free Lubrication System

- Minimum air leakage reduces losses and increases overall efficiency
- Leakproof gearbox prevents impurities from entering the process
- Complete lubrication system package (Including Oil reservoir, Auxiliary oil pump, Oil heater, Oil demister)



### Maintenance Friendly Gearbox

- Easy maintenance by horizontally split structure
- Minimum cost for inspection and maintenance

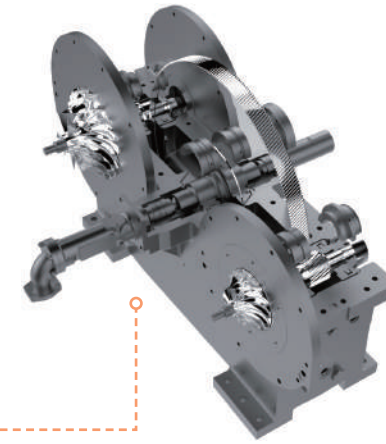


### Highly Efficient Main Drive Motor

- Highly efficient package saves energy
- Custom motors are available reflecting client requirements (option)

## Concentrating on efficiency with reliability

Core Unit is the heart of SM Series to achieve high efficiency and reliability by strictly selected optimized components and simple design



### State-of-the-art 5-Axis Machined Impeller

- Precisely balanced and designed for stability and high efficiency
- Wide operational flexibility with turndown ratio of 30-40%
- 115% over-speed spin test to guarantee reliability
- SUS impellers for extended life cycle with low vibration and low noise



### Long Life Thrust Bearing

- Tilting pad journal bearings applied on pinion gears offer reliable operation and almost permanent life without replacement
- Low friction loss sleeve journal and taper landed thrust bearings are applied on bull gear



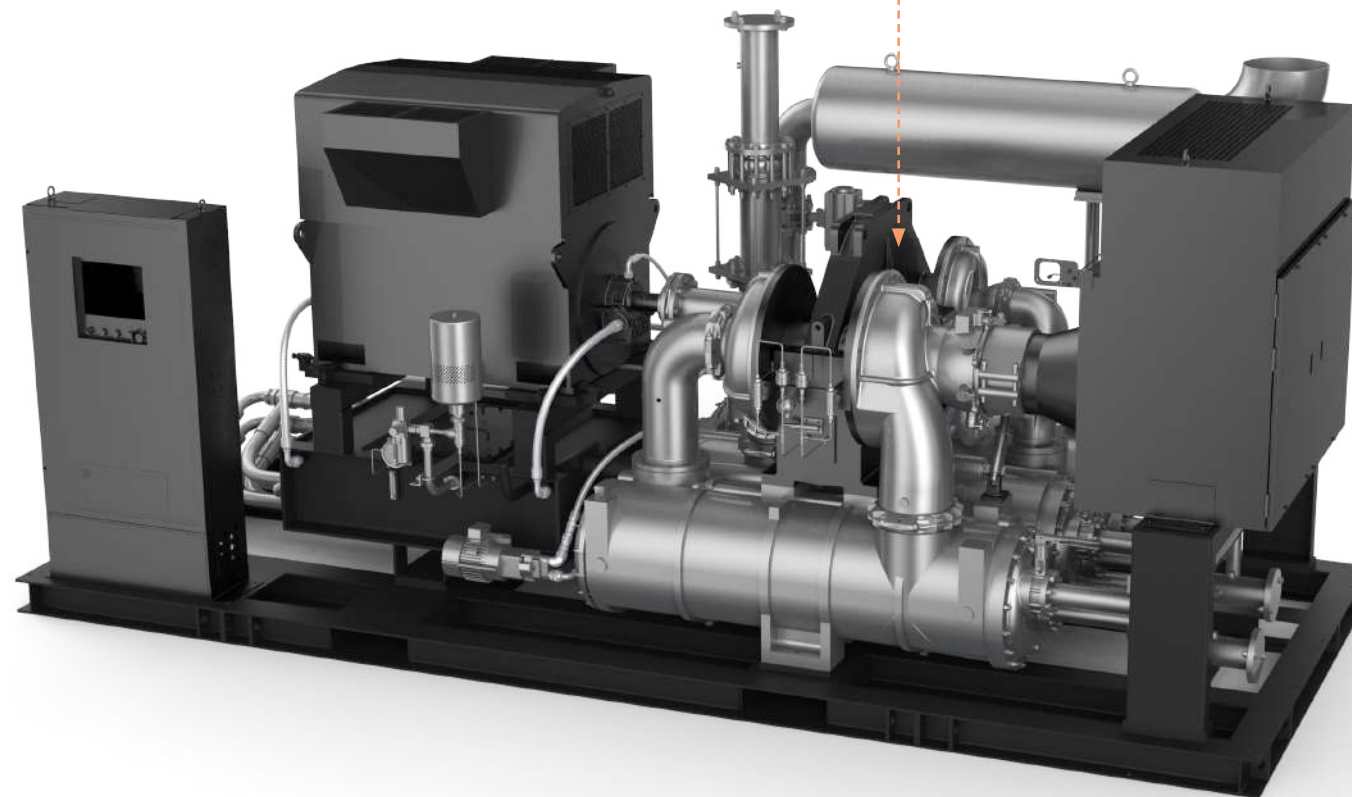
### Precise Bull Gear and Pinions

- High precision gear system provides long-life time, low vibration and low noise
- Taper land bearings effectively support axial loads delivered from pinion gears that improve stability of rotation and efficiency
- Easy inspection of gear system without stage disassembly



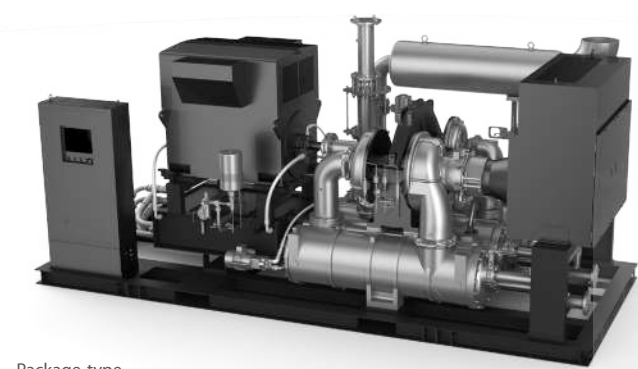
### Leak-Free Oil & Gas Seals

- Supplies 100% oil-free air in accordance with ISO8573-1 class zero for minimizing loss from downtime
- 4 stages of sealing which satisfies API specification
- Split structure for easy check and maintenance

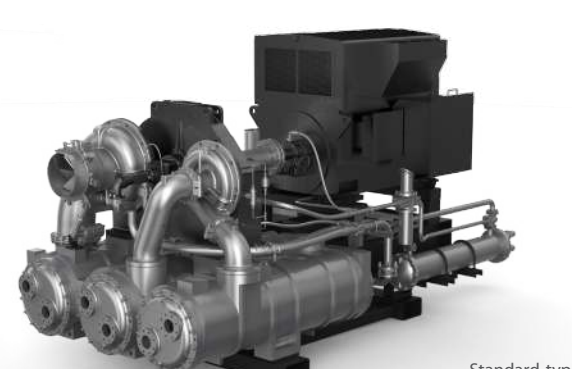


Model		SM3000	SM4000	SM5000	SM6000	
Flow Rate	m <sup>3</sup> /hr	3,300 - 5,300	5,300 - 8,400	8,400 - 15,000	15,000 - 21,000	
	CFM	1,950 - 3,100	3,100 - 4,950	4,950 - 8,850	8,850 - 12,400	
Power	kW	210 - 680	310 - 1,010	490 - 1,540	780 - 2,350	
	HP	282 - 913	410 - 1,350	660 - 1,800	1,050 - 3,150	
Discharge Pressure	bar A	3.5 - 18				
	Psi A	50 - 265				
Dimension (LxWxH)	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
	inch	P	187 x 83 x 98	201 x 89 x 98	215 x 89 x 98	244 x 91 x 100
		S	124 x 78 x 83	149 x 82 x 84	156 x 83 x 93	176 x 87 x 99
Weight	kg	P	8,700	10,250	12,950	17,550
		S	7,050	8,400	10,900	15,250

P Package type S Standard type



Package type



Standard type

## Scope of Supply

- |                                     |                                     |   |
|-------------------------------------|-------------------------------------|---|
| P                                   | S                                   | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Air intake filter               |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Inlet guide vanes               |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Blow off valve                  |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Silencer                        |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Check valve and expansion joint |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Complete lubrication system     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Aftercooler                     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Drain traps on all coolers      |

- |                                     |                                     |  |
|-------------------------------------|-------------------------------------|--|
| P                                   | S                                   | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Main motor             |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> PLC control system     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Base frame             |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Cooling water manifold |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Sound enclosure        |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Dual oil filter        |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Block valve            |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Companion flange       |

- |                                     |                                     |  |
|-------------------------------------|-------------------------------------|--|
| P                                   | S                                   | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Hot air piping                     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Auto trap                          |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> MODBUS / PROFIBUS Interface        |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Motor winding / bearing protection |

P Package type S Standard type  
 Standard  Options  Not applicable

## Customer Oriented Monitoring System

Provides convenient operation and accurate control

### High-resolution Color LCD Touch Screen Panel

- Touch screen size : 7.0" Wide or 10.2" Wide
- Resolution / Color : WVGA 800 x 480 / 65k Color

### Automatic Control

- Optimization of surge control margin : High turndown ratio through minimizing surge margin
- Precise pressure control in overall operation range
- Local / Remote control function
- Self check and automatic resolution logic against errors

### Reliable and Stable Control System

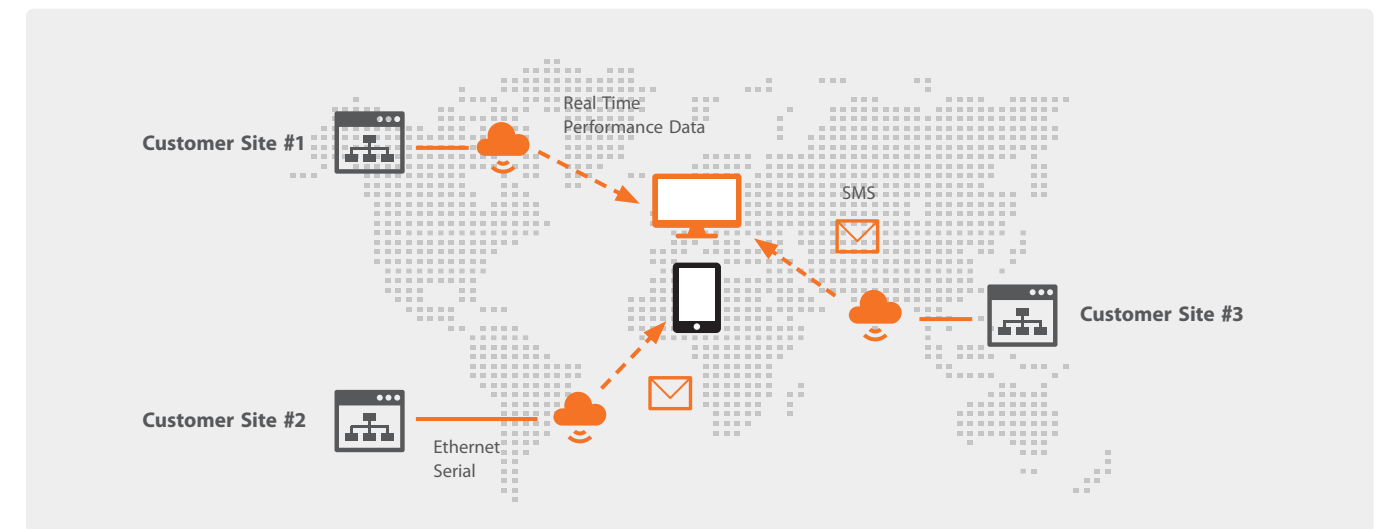
- Conforms to EMC international standard during in operation: CE, RE, CS, RS, ESD, Surge, Burst (CISPR 11 Class A, IEC 61000-4)

### User Friendly Interface with Improved Operability and Legibility

- Conversion to ICON / animation of main information as operation / stop, valve status etc.
- Quickly and easily switchable screen by navigation bar



### Complete Control Package



- Real-time monitoring by PC and smartphone
- Warning and trouble shooting message transferred once alarm or shutdown occurs

- Compressor remote management and energy saving solution

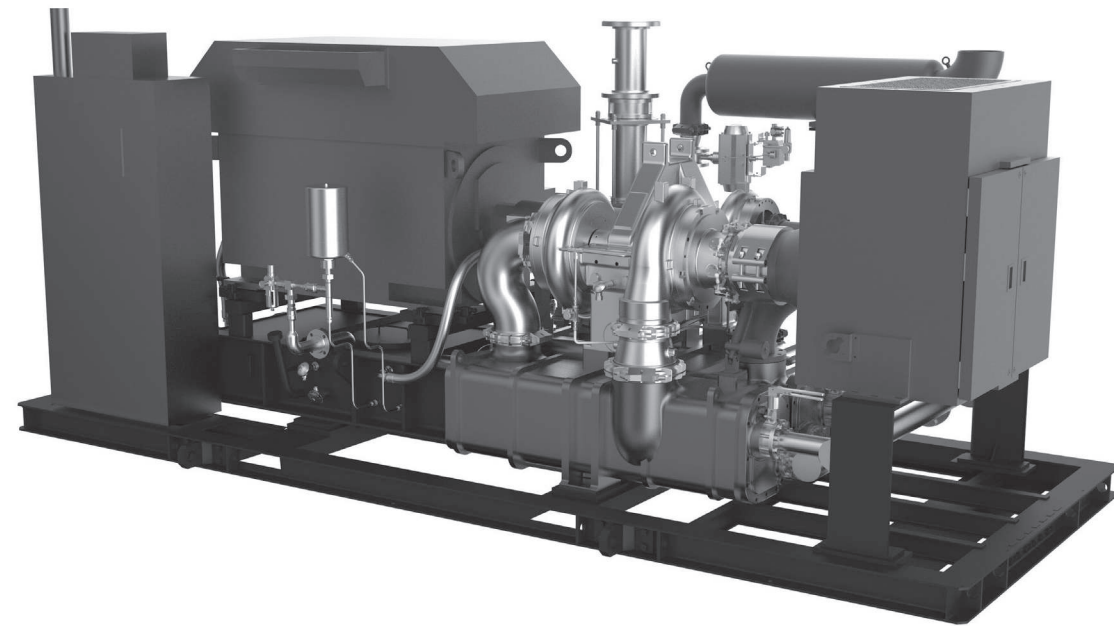
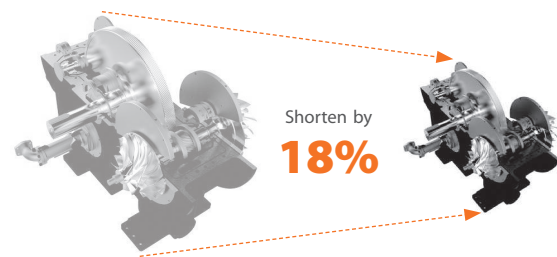
SM100 series focuses on accomplishing enhanced performance and efficiency to satisfy customers particularly seek performancecentered products.

## Flexible packages according to your needs

- Packaged plug & play type for easy installation
- Standard type without base frame, silencer, cooling water manifold and enclosure
  - Silencer and cooling water manifold can be added as an option

## Advanced efficiency and performance through design modification

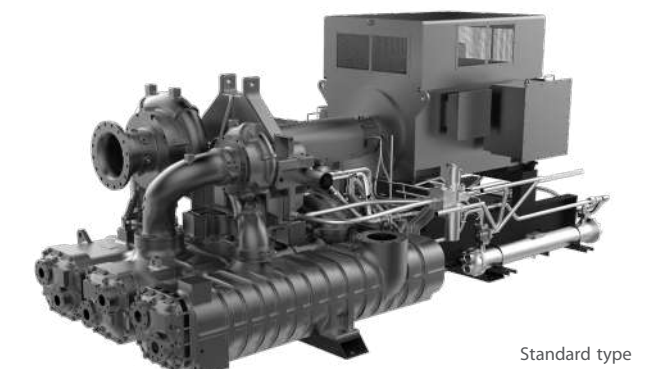
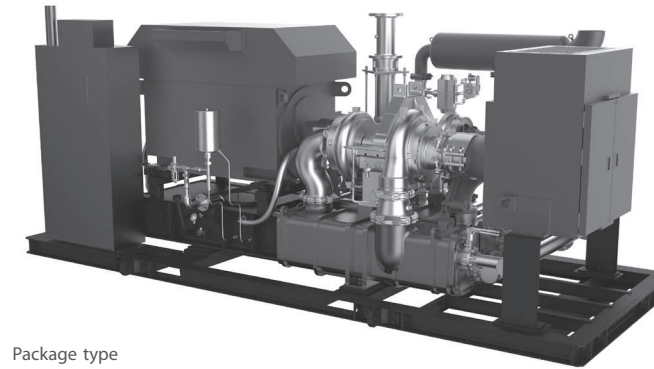
- Thrust collar applied to enhance operation reliability and mechanical efficiency by reducing mechanical loss and oil consumption
- Labyrinth seal of non-contacting type minimizes mechanical loss and needs of replacement
- Reduced distance between shafts to minimize oil mist friction and mechanical loss for improved performance and isothermal efficiency



## Specification

Model		SM3100	SM4100	SM5100	SM6100	SM7100	
Flow Rate	m <sup>3</sup> /hr	3,300 - 5,500	5,500 - 9,000	9,000 - 15,000	15,000 - 24,500	24,500 - 32,000	
	CFM	1,950 - 3,250	3,250 - 5,300	5,300 - 8,850	8,850 - 14,400	14,400 - 18,800	
Power	kW	200 - 580	300 - 930	500 - 1,500	800 - 2,500	1,000 - 3,100	
	HP	270 - 780	400 - 1,200	670 - 2,010	1,070 - 3,350	1,340 - 4,155	
Discharge Pressure	Bar A	3.5 - 13				3.5 - 11.4	
	Psi A	50 - 188				50 - 165	
Dimension (LxWxH)	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
	inch	P	207 x 89 x 98	217 x 89 x 98	246 x 89 x 100	244 x 89 x 100	-
		S	126 x 85 x 76	150 x 91 x 81	187 x 98 x 84	208 x 95 x 95	224 x 110 x 106
Weight	Kg	P	8,600	9,500	13,150	17,900	-
		S	6,900	7,500	10,300	14,450	20,500

P Package type S Standard type



## Scope of Supply

- |                                     |                                     |  |
|-------------------------------------|-------------------------------------|--|
| P                                   | S                                   | <input checked="" type="checkbox"/> <input type="checkbox"/> Air intake filter |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Inlet guide vanes                          |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Blow off Valve                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> Silencer                                   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Check valve and expansion joint            |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Complete lubrication system                |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Aftercooler                                |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Drain traps on all coolers                 |

- |                                     |                                     |  |
|-------------------------------------|-------------------------------------|--|
| P                                   | S                                   | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Main motor |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> PLC control system                             |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Base Frame                                     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Cooling water manifold                         |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Sound Enclosure                                |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Dual oil filter                                |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Block Valve                                    |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Companion Flange                               |

- |                                     |                                     |   |
|-------------------------------------|-------------------------------------|---|
| P                                   | S                                   | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Auto trap |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> MODBUS / PROFIBUS Interface                   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Motor winding / bearing protection            |

P Package type S Standard type

Standard  Options  Not applicable

# Driving Performance & Low Flow SM2100

SM2100 applied by new technology of Hanwha Power Systems, is a best-fit product for customers who need low flow compressors with high efficiency.

## Customized options based on your needs

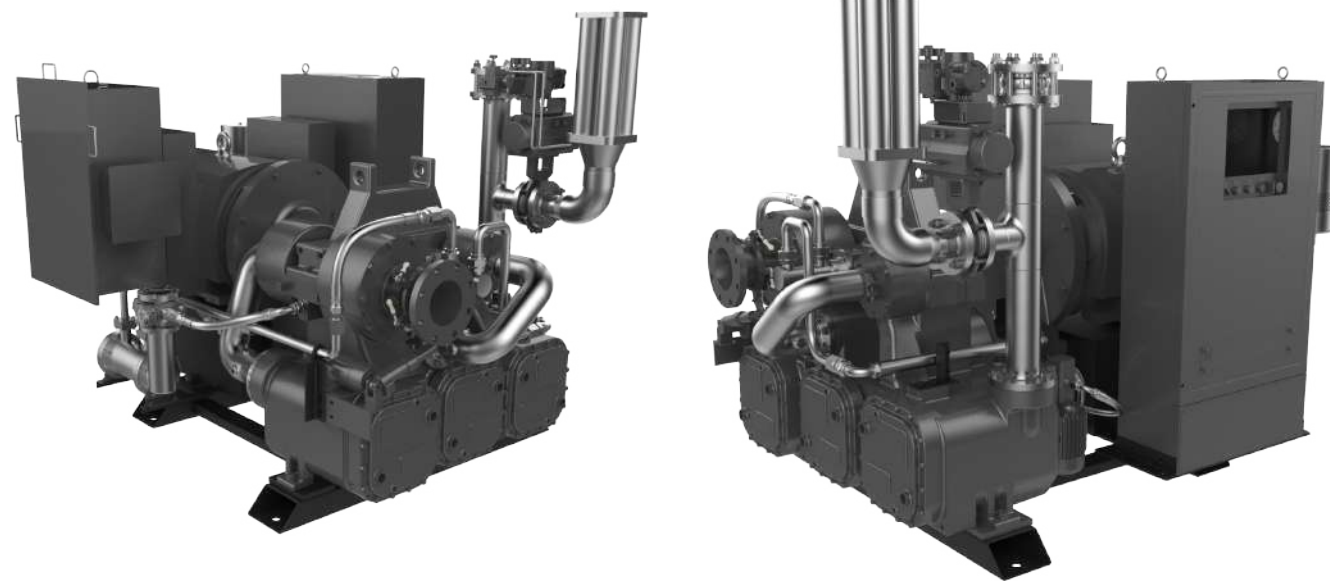
- Available to provide customized solutions from standard type for extendability to packaged plug & play type for easy installation according to your selection of options
  - Base frame, cooling water manifold and enclosure can be added as an option.

## Easy maintenance and superior standard features

- Tilting pad journal bearings applied on pinion gears offer reliable operation and long life cycle. (Depending on the conditions of usage, the only bearings may need to be replaced.)
- Compact design for minimal foot print
- Standard features include three stage vibration probes, an oil heater, and a vacuum gauge in an oil tank.

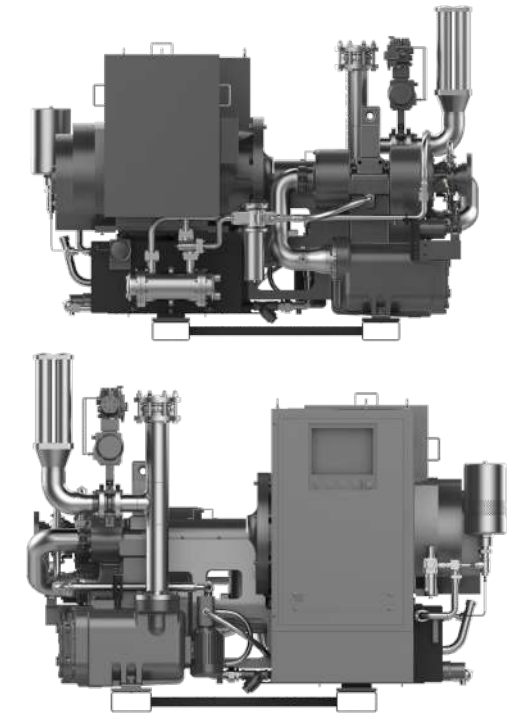
## Advanced efficiency and performance for low flow compressor

- Sealing system with 4 stages which satisfies API specification to minimize gas leaks
- Highly efficient inlet guide vanes to improve the performance of compressor at part load and to reduce power consumption
- State-of-the-art 5-axis machined impeller for stability and high efficiency

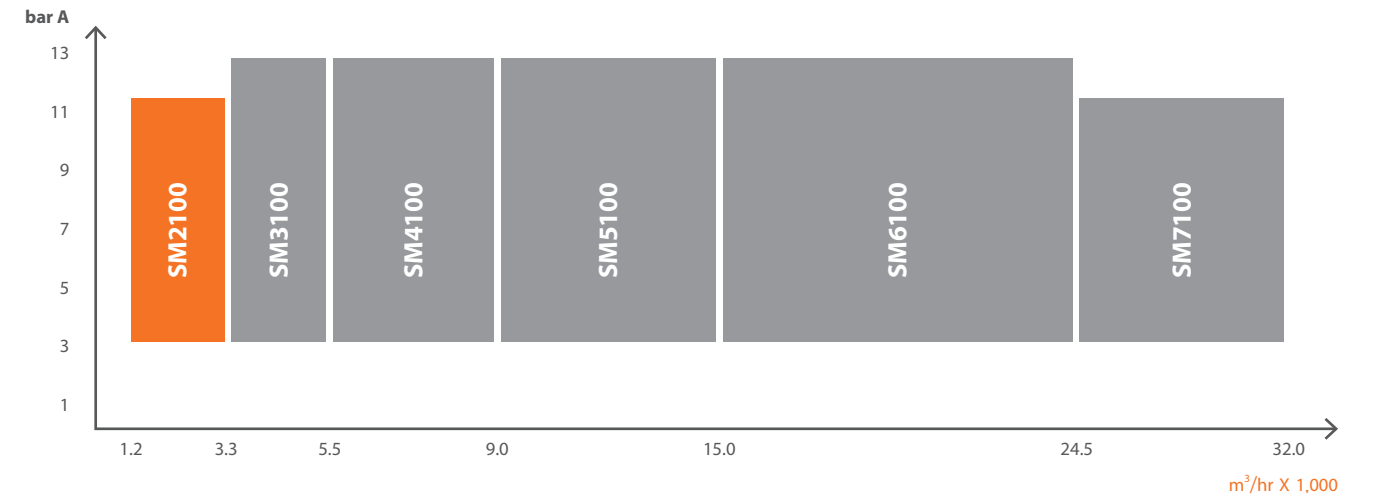


## Specification

Model	SM2100	
Flow Rate	m <sup>3</sup> /hr	1,200 - 3,300
	CFM	700 - 1,950
Power	kW	150 - 335
	HP	200 - 450
Discharge Pressure	bar A	3.5 - 11.4
	psi A	50 - 165
Dimension (LxWxH)	mm	2,360 x 1,660 x 1,770
	inch	93 x 65.4 x 70
Weight	kg	3,700
	lb	8,160



## Product Range

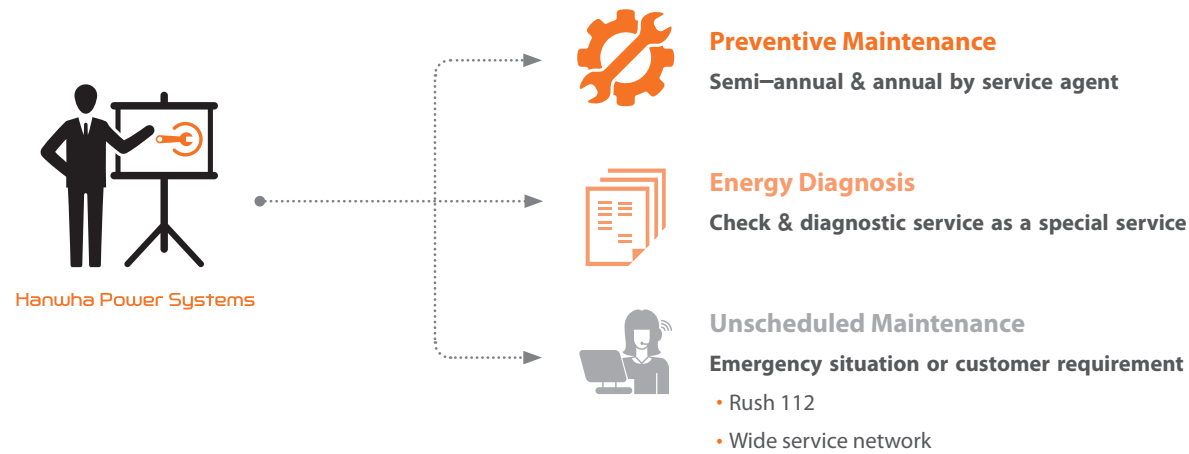


## Scope of Supply

- |   |  |  |
|---|--|--|
| <input checked="" type="checkbox"/> Inlet guide vanes                           | <input checked="" type="checkbox"/> PLC control system               | <input type="checkbox"/> MODBUS / PROFIBUS Interface |
| <input checked="" type="checkbox"/> Blow off valve and silencer                 | <input type="checkbox"/> Air intake filter                           |  |
| <input checked="" type="checkbox"/> Discharge check valve                       | <input type="checkbox"/> Base frame                                  |  |
| <input checked="" type="checkbox"/> Complete lubrication system                 | <input type="checkbox"/> Cooling water manifold                      |  |
| <input checked="" type="checkbox"/> Aftercooler                                 | <input type="checkbox"/> Sound enclosure (available with base frame) |  |
| <input checked="" type="checkbox"/> Drain ports with ball valves on all coolers | <input type="checkbox"/> Dual oil filter                             |  |
| <input checked="" type="checkbox"/> Main motor                                  | <input type="checkbox"/> Companion flange                            |  |
| <input checked="" type="checkbox"/> Motor winding / bearing protection          | <input type="checkbox"/> Auto trap                                   |  |

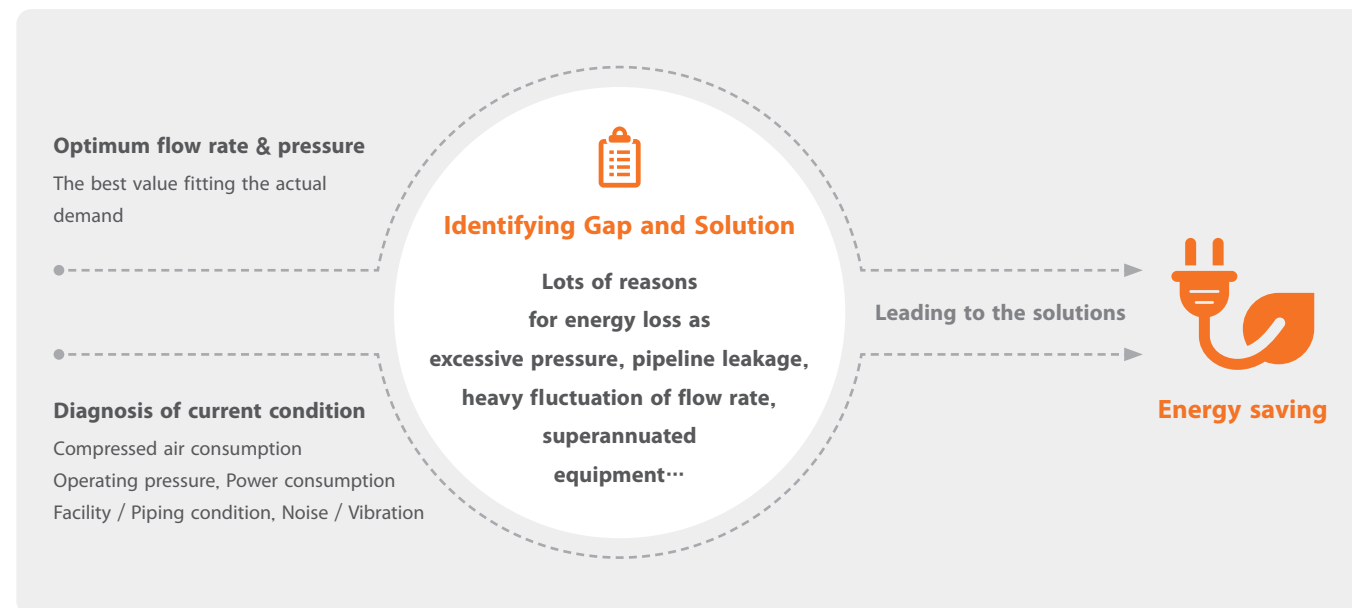
✓ Standard      ● Options

Hanwha Power Systems provides total care service, called Smart Care, ranging from current equipment diagnosis to urgent repair service to get rid of customer risks. This prevents unnecessary energy loss and minimizes downtime that may occur.



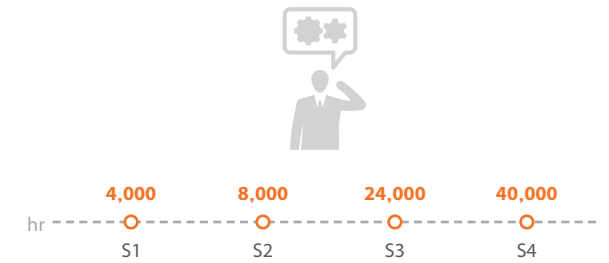
## Energy Diagnosis

Operators expect equipment to run in an optimized mode. In many cases, however, it is hard to notice small changes leading to inefficiencies in its operation. Hanwha Power Systems provides diagnosis service inspecting if current equipment is being operated properly and efficiently. Through this Service, customers can learn which part causes energy loss and how to improve the efficiency. Ultimately customers minimize waste and maximize profitability.



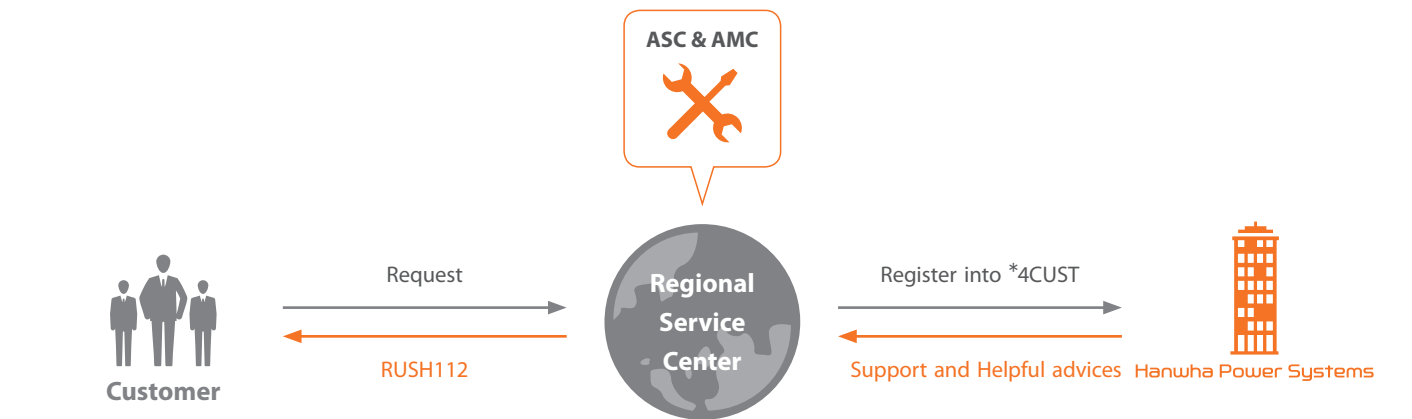
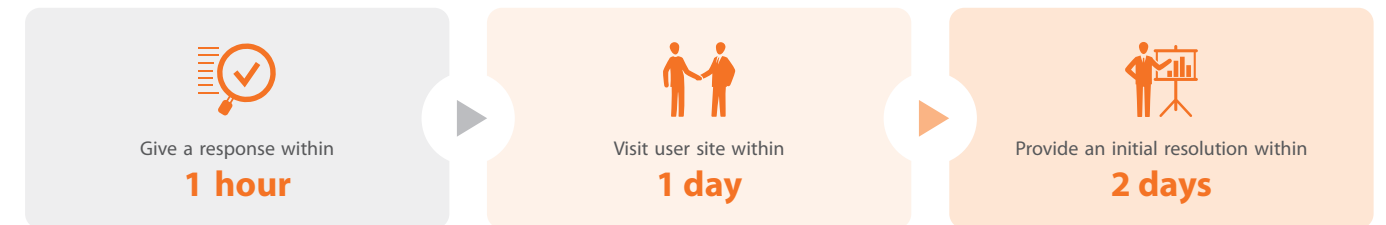
## Preventive Maintenance program

To prevent malfunction during operation, Hanwha Power Systems provides 4 programs by operating time and specific programs are customized per each customer's requirements. This program will enable customer equipment running stably without any problem so that customers can minimize downtime, low life cycle cost through saving additional trouble shooting cost.



## Rush 112 Worldwide

Hanwha Power Systems is willing to provide immediate service to customers worldwide based on RUSH 112 philosophy.



\* 4CUST : Customer-centric 4C oriented system (4C: Consumer, Cost, Convenience, Communication)

\* ASC : Authorized Service Center

\* AMC : Authorized Maintenance Center

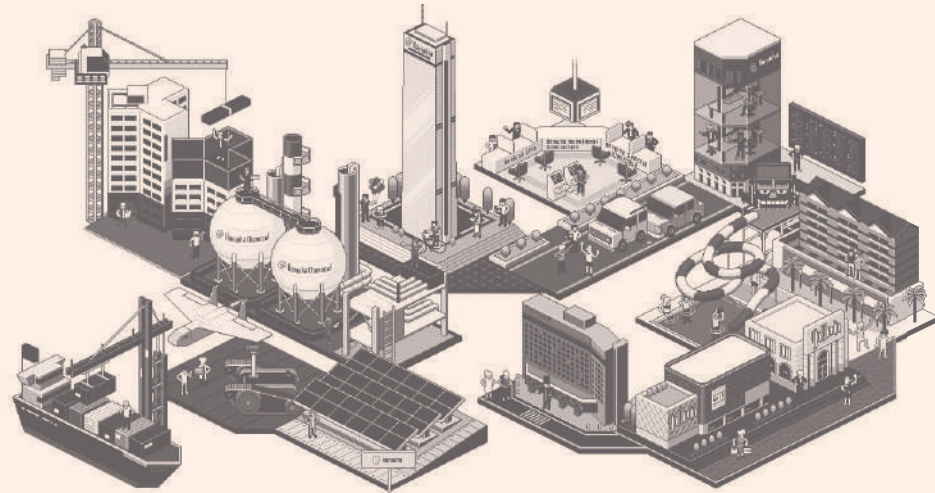
# Introduction to Hanwha Group

## Hanwha Businesses

a FORTUNE Global 500 Company

70 years of business experience with 616 global networks

2021 Total assets of \$225billion and total sales of \$69billion



### Aerospace

- Hanwha Corporation
- Hanwha Aerospace
- Hanwha Systems
- Hanwha Vision
- Hanwha Precision Machinery

### Energy & Materials

- Hanwha Solutions
- Hanwha Energy
- Hanwha Impact
- Hanwha Power Systems**
- Hanwha Total Energies Petrochemical
- YEOCHUN NCC

### Finance

- Hanwha Life
- Hanwha General Insurance
- Hanwha Asset Management
- Hanwha Investment & Securities
- Hanwha Savings Bank
- Hanwha Life Financial Services
- Carrot General Insurance

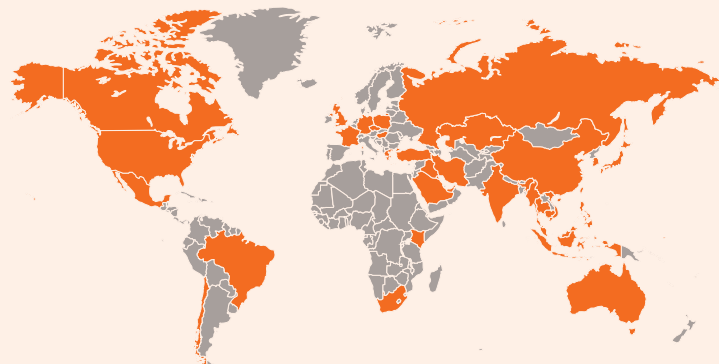
### Retail & Services

- Hanwha Hotels & Resorts
- Hanwha Solutions Galleria Division
- Hanwha Solutions Insight Division
- Hanwha Connect

## Global Network

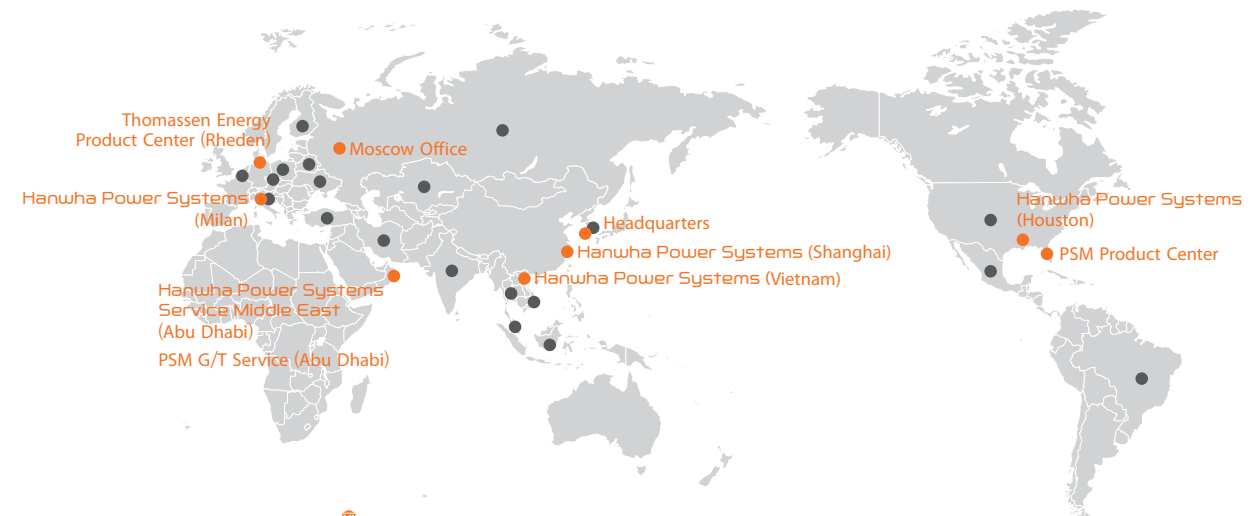
616 Global Networks (December 2021)

- |             |                   |              |              |          |
|-------------|-------------------|--------------|--------------|----------|
| Bakersfield | Aix-en-Provence   | Johannesburg | Beijing      | Seoul    |
| Bremen      | Athens            | Nairobi      | Chongqing    | Nagasaki |
| Cerritos    | Berlin            |              | Dongguan     | Tokyo    |
| Chicago     | Bitterfeld-Wolfen | Cyberjaya    | Guangzhou    |          |
| Forest      | Bolzano           | Ho Chi Minh  | Hangzhou     |          |
| Franklin    | Budapest          | Jakarta      | Hong Kong    |          |
| Hawaii      | Chertsey          | Kuala Lumpur | Lianyungang  | Perth    |
| Irvine      | Dietfurt          | Manila       | Ningbo       | Sydney   |
| Monroe      | Eschborn          | Muara Teveh  | Quidong      |          |
| New York    | Frydek-Mistek     | Mumbai       | Shanghai     |          |
| Opelika     | Istanbul          | New Delhi    | Shenzhen     |          |
| Pontiac     | London            | Samut Prakan | Tianjin      |          |
| Saipan      |                   | Singapore    | Zhangjiagang |          |
| Shelby      | Moscow            | Taipei       |              |          |
| Teaneck     | Stuttgart         | Tehran       |              |          |
| London      | Warsaw            | Yangon       |              |          |
| Vancouver   |                   | Bangkok      |              |          |
| Monterrey   | Al Khobar         |              |              |          |
| Santiago    | Almaty            |              |              |          |
| São Paulo   | Baghdad           |              |              |          |
|             | Bismayah City     |              |              |          |
|             | Doha              |              |              |          |
|             | Dubai             |              |              |          |
|             | Kuwait City       |              |              |          |
|             | Mod'in            |              |              |          |
|             | Maccabim-Re'ut    |              |              |          |



## Wide Service Network

Provides prompt service for customers around the world, Hanwha Power Systems has built a large number of centers globally. Customers can ask for service at anytime through those centers and get solutions in time.



- Hanwha Power Systems**
- ✕ ASC (Authorized Service Center) & AMC (Authorized Maintenance Center)
- |         |            |            |          |
|---------|------------|------------|----------|
| Belarus | India      | Malaysia   | Thailand |
| Brazil  | Indonesia  | Mexico     | Turkey   |
| China   | Italy      | Netherland | Ukraine  |
| Czech   | Kazakhstan | Poland     | USA      |
| Finland | Korea      | Russia     | Vietnam  |