



燃气轮机发电机组

Gas Turbine Generator Set

斯奥动力集团

SOAR POWER GROUP

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斯奥动力集团(中国)有限公司

SOAR POWER GROUP (CHINA) CO., LIMITED

公司简介 Introduction

斯奥动力集团成立于 1989 年，主要经营发电机组、船舶动力、油气田动力、工业动力及电站建设。公司被评定为国际品质、服务、诚信 AAA 企业，斯奥(SOAR)系列产品被评为中国著名品牌。

斯奥致力于为电站、船舶和油气田工业提供安全、可靠、耐用的发动机设备，其卓越的品质和出色的表现赢得了世界各地用户的信任和赞赏。公司在电站设计和建设方面积累了丰富的经验。从事火电站、热电联产电站、联合循环电站的建设、运营、EPC 总包工程以及提供电站、海洋工程的主设备供应是我们的核心业务。

公司建立了健全的销售网络，树立了良好的服务声誉，与 MAN、HHI、AECC 等世界一流的企业均有良好的合作关系。通过长期合作伙伴遍布全球的服务网络，为设备用户提供售后服务、备件和故障排除的建议。

公司以市场为主导，以服务客户为中心，以不断提高产品质量为重点。坚持质量胜过低价，以质量求生存，以创新图发展是斯奥动力集团一贯的经营理念。

Soar Power Group founded in 1989, and run the business of Generator Sets, Marine Power, Oil & Gas power, Industrial Power, Construction equipment and Power Plant Engineering.

Soar have won the confidence and satisfaction of client around the world through prominent quality and outstanding performance. We have rich experience in Power Plant design and Construction. Our core business activities are Construction, EPC and operation of thermal power plant, Co-generation power plant and combined cycle power plants, as well as the supply of main equipment for power plants and offshore projects.

We have established a perfect market network and won excellent reputation. Maintain good cooperation with world-class companies in this field such as MAN, HHI, AECC and so on. After-sales service is provided to customers through a global service network of long-term partners, which provide after-sales service, spare parts and a trouble shooting advice on our machines.

The company will be market-driven, relying on high quality service, continuously improve quality and service level. Surviving on Quality, Insisting on quality rather than low price, Achieving development with innovation is Soar Group's tenet.



※经营范围※

1. 内燃机发电机组、轮机发电机组及电站 EPC 工程。
2. 船用柴油机、船用发电机组及船用推进系统。
3. 油气田用发动机、发电机组及海洋工程。
4. 工业用发动机、工业机械。

Business Scope

1. I.C.E gensets, Turbine gensets and Power plant EPC project.
2. Marine engines, Marine gensets and Propulsion system.
3. Engines, Generator sets for the Oil & Gas industry and Offshore projects.
4. Industrial engine and Industrial machinery.
5. Excavators, loaders, bulldozers, forklifts and other construction machinery.

中航简介 AECC Introduction

源于航空 服务能源
FROM AVIATION FOR ENERGY



AECC



中航动力是国内唯一一家拥有以航空发动机技术所衍生产品为主的高科技公司，以燃机成套产品、工业余热集成产品、燃机、余能和节能工程总包及服务为主营业务。其中：燃气轮机成套及工业余热集成产品在国内已形成了轻重并举，系列化发展的产品格局，处于国内技术领先、行业主导地位。

AECC Power is a high-tech company with its unique aero-derivative gas turbine energy saving service and intellectual property in China. The main businesses include: gas turbine packaging, gas turbine and energy recovery equipment EPC, gas turbine maintenance and overhaul, power plant operation & maintenance management and technical consultant etc.

技术优势 Technological superiority



- 1 专业化的科研团队
Professional R&D team
- 2 坚实的技术基础
Solid technical foundation

- 3 先进的试验设备
Advanced test equipment
- 4 丰富的经验
Wildly experiences



专业化的科研团队 Professional product development team

大量的专业人才以及高素质的开发团队，严格的质量管理流程。

吸收和借鉴先进的燃气轮机发电机组的成套技术，积累了丰富的燃气轮机发电机组的工程实际经验。

A great number of experts, highly qualified business development team and the strict QC management programs. Our products have assimilated and utilized advanced gas turbine-generator packaging technologies and have accumulated a lot of gas turbine engineering experiences.



经营模式 Business model

利用公司在航空、能源产业的影响力，以EPC、BOT、BT、O&M、EMC、融资租赁等多种方式进行燃气轮机及节能环保综合项目。

The company utilizes its advantages in the energy industry and adopts multiple operating modes to conduct the turnkey EPC, BOT, BT, O&M, EMC, financing leases and other energy saving and environmental protection projects.

EPC BOT BT O&M EMC FL

为客户提供高效环保的能源动力综合解决方案
Customized solutions for
energy-saving and environmental
friendly.

Services

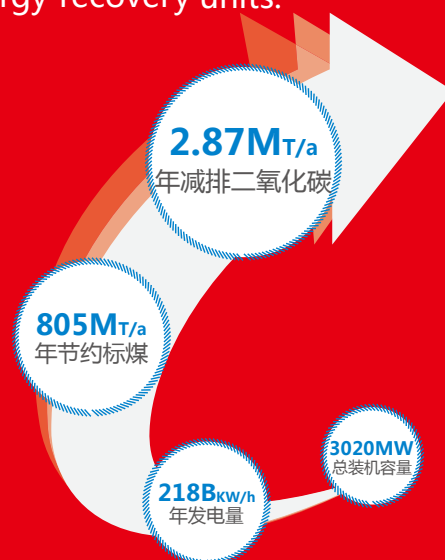
Services

- A 核心设备供货
Supplies Core Equipments
- B 系统成套
Package
- C 工程总包
Engineering Procurement
Construction (EPC)
- D 技术咨询
Technical Consulting
- E 融资租赁
Financial Leasing
- F 建设-运行-移交
Build、Operate、Transfer (BOT)
- G 运行-维护服务
Operate、Maintenance、Service (O&M)
- H 合同能源管理 (EMC)
Energy Management Contract

社会责任 Social responsibility

截至2012年底，我公司已向国内外客户提供中、小型燃气轮机发电机组300余套，安装及检修燃气轮机机组400余套，安装余压余热回收利用及高效节能设备300余台套。

As the end of 2013, we have already provided more than 300 medium-size and small-size gas turbine generator sets for domestic and oversea market, installed and repaired more than 400 units of gas turbine and 300 waste energy recovery units.

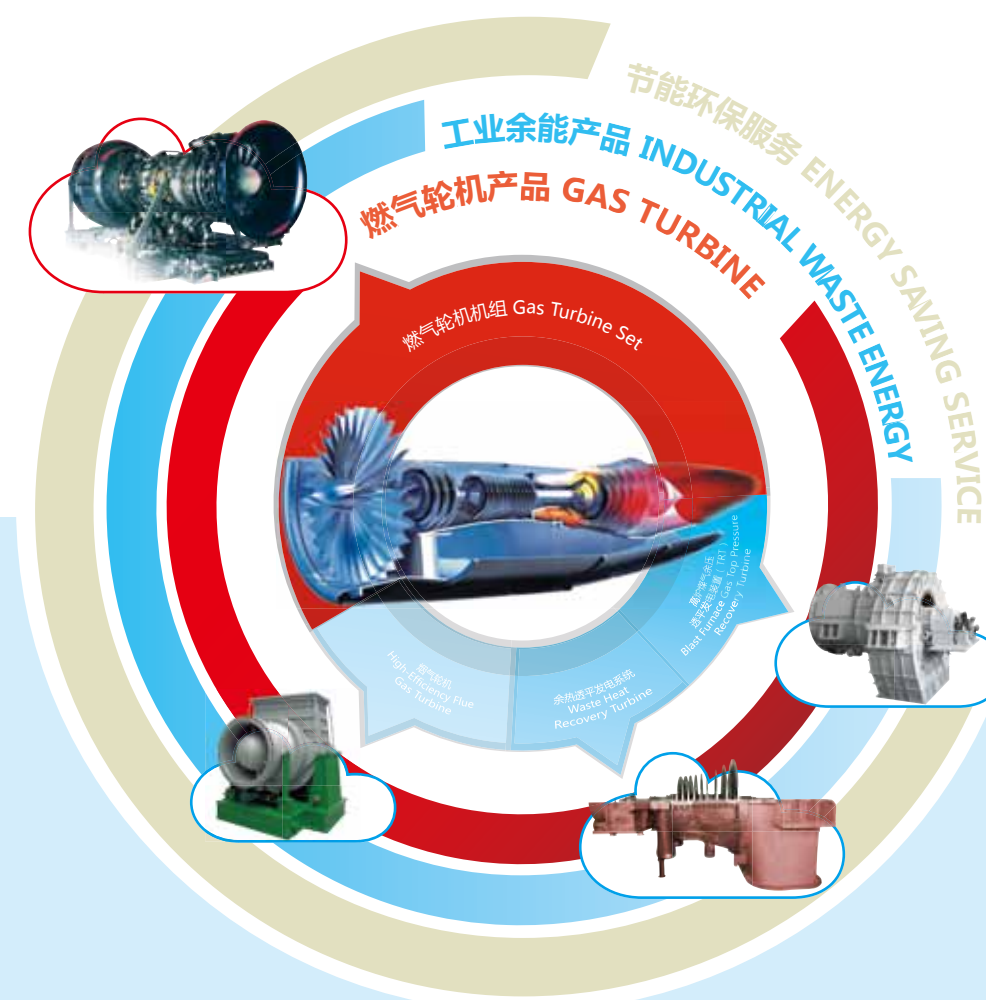


产品背景 Product background



燃气轮机产品 Gas turbine

利用航空发动机技术，派生出燃气轮机成套产品。
Gas turbine is derived from aviation engine technology.



工业余能产品 Industrial waste energy

节能环保服务 Energy saving service

利用航空发动机涡轮技术，派生出余热、余压透平，烟气轮机。
TRT、waste energy recovery and high-efficiency flue gas turbine are derived from aero-engine technology.

利用航空发动机压气机技术，派生出轴流压缩机。
Axial compressor is derived from aviation compressor technology.

燃气轮机

1.

1. AECC 燃气轮机发电机组
Gas Turbine Generator Set

我公司供应 AECC 燃气轮机发电机组，机组功率范围从 5-110MW，型号有：QD50,QD70,QD128, QD280,QD300,QD500,RO110 等。AVIC 燃气轮机具有可靠性高、效率高、结构紧凑、操作维护简便、使用寿命长等优点。可用于陆海发电、机械驱动、燃气压缩等。广泛应用于石油化工、钢铁、生物合成、IGCC、分布式能源等领域的电力生产及电驱压缩机。可使用天然气、焦炉煤气、工业废气或轻油等多种燃料。我公司既可为您提供燃机电站主、辅机设备的供应、安装、调试、培训及售后维修服务，也可提供电站工程总包等多样化解决方案。

Soar supply AECC Gas turbine generator set, which power range from 5 MW up to 110 MW. There are different which models as below: QD50, QD70, QD128, QD280, QD300, QD500, RO110 etc. The gas turbine has many advantage such as high reliability, high efficiency, compact structure, easy operation and maintenance, long service life etc. they can be used for available Land & offshore power generation, Mechanical drive, Gas compression etc, and can be widely applied in varied electric power production field such as petrochemical, steel, biosynthesis, IGCC, distributed energy and electric displacement compressor. They can burn natural gas, coke oven gas, industrial waste gas or light oil and other fuels.

Soar can provide main and auxiliary equipment of gas turbine power plant, and the follow-up service include installation, commissioning, training and after-sales maintenance services. Of course we can also provide power plant EPC service and other diversified solutions.

燃气轮机/GAS TURBINE



Gas Turbine Generator Set
燃气轮机发电机组

燃气轮机发电机组型号规格表
Gas Turbine Genset Specifications

机组型号 GT model	输出功率 Output power	热耗率 Heat rate	发电效率 Efficiency	压缩比 Pressure ratio	排气温度 Exhaust temp.	排气流量 Exhaust flow
	(MW)	(KJ/kW.h)	(%)		℃	(kg/s)
QD50	5.05	11740	30.5	14.8	574	19.6
QD70	7.2	11691	30.8	12.7	560	27.6
QD100	11.25	11481	31.4	15.6	482	47.5
QD128	11.5	13337	28	11.76	495	60.47
QDR144	14.4	10234	35.2	18.9	540	44.3
QD280	26.7	9838	36.6	20.5	480	91.1
QD300	31.5	10249	35.12	17	511.6	103.2
QD500	50.5	9400	38.3	21	553	134
RO110	110	10002	34.5	14.82	517	362

备注：
1、性能参数基于天然气燃料，ISO 工况(1013hPa，15℃，R.H. 60%)、普通燃烧室、简单循环；
2、除天然气外，燃机可通过配置低热值燃烧器等，燃用轻油、生物质气、转炉煤气、合成气、焦炉煤气等中低热 值燃料。

Notes:
1. Above data based on ISO condition (1013hPa, 15℃, R.H. 60%), Conventional combustor and simple cycle. With low NOx combustor, the emission of NOx will be reduced to 25ppm.
2. Besides of NG, with low BTU combustor etc, variable fuel (such as light oil, Biogas, LDG, Syngas, COG etc.).



RO110



QD128

2. 车载式燃气轮机发电机组

Vehicular Gas Turbine Generator Set

我公司供应车载式燃气轮机发电机组，输出功率从 1.0 MW~2.0 MW。机组采用航发集团研制的燃气轮机，运用控保技术、集成技术和静音技术。具有工作可靠、操作简单、易维护、体积小、重量轻、机动灵活、噪音低等特点。可广泛应用于城市应急、灾害求援、电力保障、军事装备等诸多领域的应急电源。一般由发电车和辅助车组成。

We supply Vehicular gas turbine generator sets, power output 1.0 MW-2.0 MW. adopts AECC gas turbine, advanced control and protection technology, integrated technology and low noise technology. It features reliable function, simple operation, easy maintenance, small size, light weight, high level of motility, low noise and good quality of the electricity produced etc. and is used on many fields of urban emergency power supply, rescuing operation, emergency power supply and military equipment etc. Usually Consists by the Power generation vehicle and auxiliary vehicle.

- 已应用于上海电信、北京电力、江苏电力、天津电力、河南电力、秦皇岛电力、黑龙江移动等；
- 每年为“北京两会”、“国家两会”提供应急电源保障；
- 完成“十七大”、“绕月工程”、“神六发射”、2008北京奥运会、2009哈尔滨大冬会、济南全运会、上海世博会电力保障任务。
- Established cooperation with Shanghai Telecom, Beijing, Jiangsu, Tianjin and Henan power grid corporations and Heilongjiang Mobile to provide the emergency power supply.
- Emergency power supports for Beijing Two Sessions and NPC&CPPCC.
- Power support for the 17th CPC National Congress, Lunar Project, Shenzhou VI launch and the 2008 Olympiad.



燃气轮机/GAS TURBINE



Truck-carried Gas Turbine Generator Set
车载式燃气轮机应急发电机组

车载式燃气轮机发电机组型号规格表
Vehicular Gas Turbine Genset Specifications

机组型号 GT Model	输出功率 Output power	发电机转速 Gen.speed	热耗率 Heat rate	电压 Voltage	外形尺寸(mm) Dimension	重量 Weight
	(kW)	(r/min)	(KJ/kW.h)	V	LxWxH	(kg)
QD10B	1000	1500	17170	400	10985x2500x3500	<25000
QD12B	1200	1500	17170	400	10985x2500x3500	<25000
QD14B	1400	1500	17170	400	10985x2500x3500	<25000
QD16B	1600	1500	17170	400	10985x2500x3500	<25000
QD20B	2000	1500	16100	6600	13200x2500x3950	<40000

备注：

- 1、机组频率 50HZ，功率因数 0.8，如需详细技术参数，请联系我们。
- 2、机组噪声≤85 dB(A)，是指距隔声厢体周围 1m 处、高度为离地面 1.6m 处。

Note:

1. Frequency 50HZ, power factor 0.8, For detailed technical data, please contact us.
2. Genset noise ≤85 dB(A), refers to noise of 1m, around the van body, height of 1.6 m above the floor.



3. 集装箱式燃气轮机发电机组

Containerised Gas Turbine Generator Set

我公司供应集装箱式燃气轮机发电机组，输出功率从 1.0MW~3.0MW。机组外形按照标准集装箱设计，具有可靠性高、输出功率大、加载时间快等特点，兼有固定式发电机组和车载式发电机组的优点，运输便捷、适应能力强、可在露天独立工作，不需建造专用机房。该机组除了可以作为一般备用电源使用外，还可以作为抢险救灾和特种电源使用。斯奥集团既可为您提供燃机电站主、辅机设备的供应、安装、调试、培训及售后维修服务，也可提供电站工程总包等多样化解决方案。

We supply Containerised gas turbine generator sets, power output 1.0 MW-3.0 MW. designed in accordance with the standard container, has the character of high reliability, large output power and short load time, and has the advantages of stationary power generation units and vehicular power generation units, such as convenient transportation, high adapt ability, they can work independently in the open circumstance, do not need dedicated room. The generator sets in addition to can be used as a general standby power, and also can be used as rescue and special power.



燃气轮机/GAS TURBINE



Containerised Gas Turbine Generator Set

集装箱式燃气轮机发电机组

集装箱型燃气轮机发电机组型号规格表
Containerised Gas Turbine Genset Specifications

机组型号 Genset model	QD15A	QD25A	QD30A
额定功率(kW) Rated power	1500	2500	3000
发电机转速(r/min) Gen. speed	1500	1500	1500
额定电压(V) Rated voltage	400	400	400
外形尺寸(mm) Dimension	12192×2438×2591	12192×2438×2896	12192×2438×2896
总重量(kg) Total weight	<25000	<30000	<32000

- 备注：
- 1、机组频率 50HZ，功率因数 0.8，如需详细技术参数，请联系我们。
 - 2、机组噪声在箱体外 1m 处≤90 dB (A)。

- Note:
- 1. Frequency 50HZ, power factor 0.8. For detailed technical data, please contact us.
 - 2. 1m noise: ≤90 dB (A).

4. 分布式能源

Distributed Energy Resources

分布式能源 (Distributed Energy Resources) 是指分布在用户端的能源综合利用系统。一般采用小规模、小容量、模块化、分散式的方式布置在用户附近,可独立地输出电、热、冷的能源。以燃气为燃料的热电联供及冷热电联供电站是分布式能源的主要形式。

纵观西方发达国家能源产业的发展过程,可以发现,经历了分散-集中-分散的演变。从目前能源产业的发展情况来看,集中式供能得到了充分的发展;但从长远看,构造一个集中式与分布式相结合的合理的能源系统,以增加城市能源网络的安全性及可靠性,将为能源产业发展打下坚实的基础。现在中国政府正大力发展、支持、鼓励分布式能源项目建设,势必对分布式能源事业带来无限的发展空间。

燃气轮机发电机组可以与余热锅炉或溴化锂机组一起组成热电联供、冷热电联供或冷电联供的分布式电站;也可以用锅炉回收蒸汽的二次能源利用进行发电(联合循环发电)。不但提高了能源的综合利用效率,还能有效减少环境污染。在分布式供能领域具有广阔的应用前景。

Distributed energy Resources, refers to the energy comprehensive utilization system distributed in the user side. Distributed energy generally adopt small scale, small volume, modular and distributed way, installed near the users, can output power, heat and cold sources independently. Using gas as fuel and trigeneration is the main form of distributed energy.

The development process of energy industry in the Western Developed Countries, has experienced the evolution process of distributed-concentration-distributed. In the case of the energy industry development at present, the centralized energy got fully development. But in the long run, for the sake of increasing the security and reliability of urban power network, constructing a reasonable combination of centralized and distributed energy system, will lay a solid foundation for the energy industry development. Now, the Chinese government is developing the distributed energy projects actively, will bring infinite development space for distributed energy system.

Combined with waste heat boiler and lithium bromide units, gas turbine generator can compose cooling heating and power generation system, and can compose combined cycle with waste heat boiler. The above system not only can improve the comprehensive utilization efficiency of energy, but also effectively reduce the pollution of the environment, will has a broad prospect in the field of distributed power.

分布式能源发电机组型号规格表
Distributed Energy Gas Turbine Genset Specifications

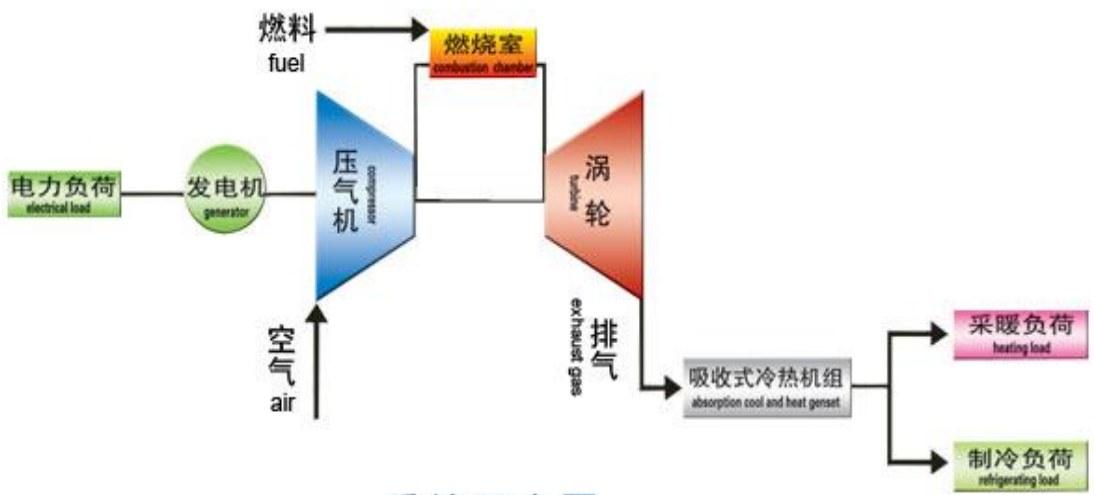
机组型号 Genset model	RO110	QD280	QD128	QD60	QD30	QD14
电站输出功率(MW) Plant Output power	155/160	38	16	9	4	1.35
燃气轮机功率(MW) Gas turbine power	110	26	11	6	2.7	1.35
汽轮机功率(MW) Steam turbine power	45/50	12	5	3	1.3	-
排气温度(℃) Exhaust temperature	517	480	495	565	430	430
排气流量(kg/s) Exhaust flow	362	91.1	60.47	26.1	26.4	13.2
热耗(KJ/kWh) Heat rate	10002	9838	13337	12250	17170	17170

备注:

1. 上述性能参数基于天然气燃料, ISO 工况(1013hPa, 15℃, R.H. 60%);
2. 由于分轴布置, 汽轮机的布置相对灵活;
3. 电站实际布置根据系统和设备配置确定;
4. 定期检修时, 须考虑放置检修设备的空间。

Notes

1. Natural Gas, ISO Base Load Operation(1013hPa, 15℃, R.H. 60%).
2. The steam turbine is split axis arrangement with gas turbine, the plant layout is flexible.
3. The actual layout will be variable by system and device configuration.
4. The space for disassembly device while maintenance should be considered.



系统示意图
System Diagrammatic Sketch

5. 小型燃气轮机发电机组
Small Gas Turbine Generator Set

我公司供应 AECC 小型燃气轮机发电机组，机组功率范围从 1.2-6MW，型号有：QD12,QD14,QD16,QD20,QD30C,QD60 等。机组采用在航空发动机基础上研制的燃气轮机作动力，具有体积小、重量轻、噪音低、自动化程度高、起动可靠、不需要水冷却及维护简单等优点。燃气轮机发电机组能为用户提供连续供电和应急电源，是集无人值守、快速响应、自动控制、稳定可靠、安全环保于一体的高科技产品。输出电压、频率稳定，抗谐波及负载突变能力强。可使用天然气、焦炉煤气、工业废气或轻柴油、煤油等多种燃料。

We supply AECC Small gas turbine generator sets. Gas turbine generator sets power range from 1.2 MW up to 6 MW. Gas turbine generator sets can provide users with continuous operation of the unit and emergency power is unattended, fast response, automatic control, stable and reliable, safety and environmental protection in one of the high-tech products. The power unit is developed on the basis of the aero-engine gas turbines, small size, light weight, low noise, high degree of automation, reliable starter, does not require water cooling and maintaining the advantages of simple unit output voltage, frequency stability, anti-harmonic spread the load mutation ability. Can used a variety of fuels for natural gas, coke oven gas, and industrial emissions or light diesel oil, kerosene.



QD20

燃气轮机/GAS TURBINE



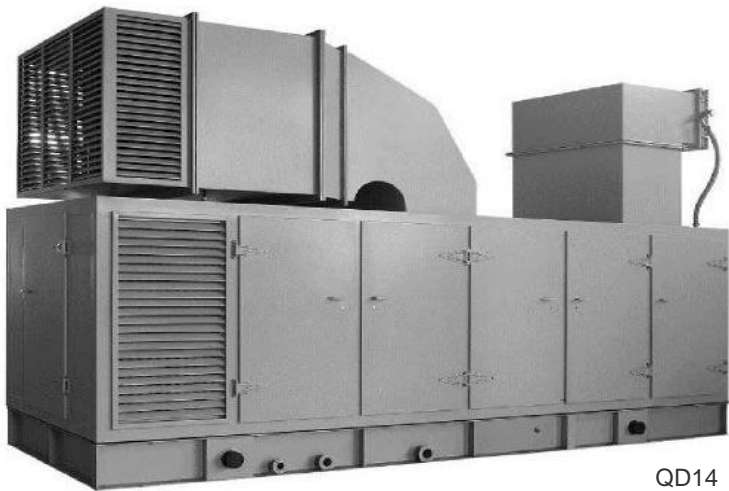
Small Gas Turbine Generator Set
备用燃气轮机发电机组

小型燃气轮机发电机组型号规格表
Small Gas Turbine Genset Specifications

机组型号 Genset model	额定功率 Rating	热耗率 Heat rate	排气温度 Exhaust temp.	排气流量 Exhaust flow	外形尺寸(mm) Dimension	重量 Weight
	(kW)	(KJ/kW.h)	℃	(kg/s)	LxWxH	(kg)
QD12	1200	17170	420	12	5500x2000x3353	<11000
QD14	1400	17170	425	13.1	5500x2000x3353	<11000
QD16	1600	17170	426	14	5500x2000x3353	<11000
QD20	2000	15650	449	21	9000x2430x5500	<22000
QD30C	3000	17170	428	28	7200x2600x3700	<22000
QD60	6000	12250	565	26.1	9000x2600x4940	<60000

- 备注：
- 1、机组频率 50HZ，功率因数 0.8，如需详细技术参数，请联系我们；
 - 2、机组噪声在箱体外 1m 处≤85dB (A)。

- Note:
- 1. Frequency 50HZ, power factor 0.8. For detailed technical data, please contact us.
 - 2. 1m noise: ≤85 dB(A).



QD14

燃气轮机/GAS TURBINE



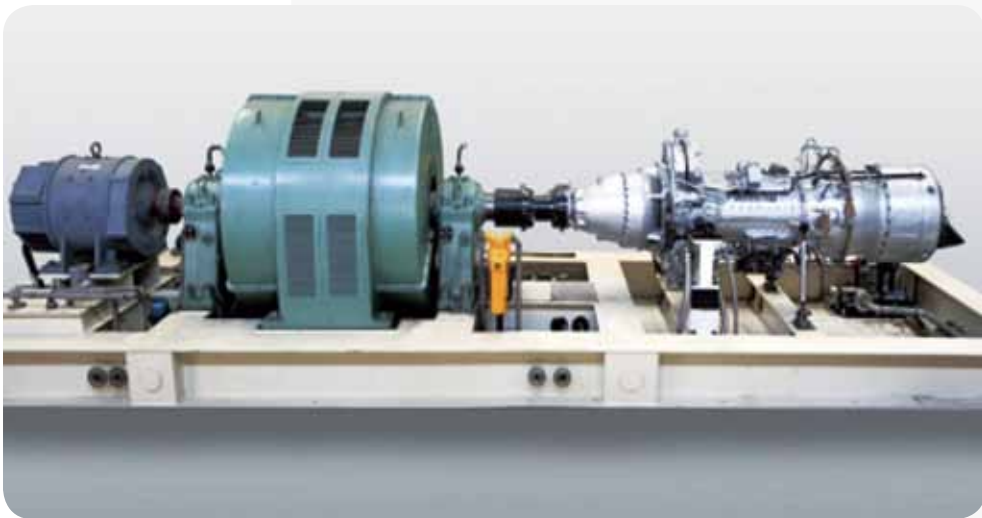
QDR20 Gas Turbine Generator Set QDR20燃气轮机发电机组

QDR20燃气轮机发电机组是中航工业拥有自主知识产权的小功率燃气轮机发电机组，是国家三部一委推荐的节能、环保、资源综合利用的高科技产品。被国内首个楼宇式分布式供能示范站所选用。该机组燃料适应性强，设备一次投资少，维护费用低。至今已为国内外用户提供160余台套。

适用燃料：航空煤油、轻质柴油、天然气、焦炉煤气、煤气层、油田伴生气、化工尾气、黄磷尾气、甲醇弛放气等。

QDR20 is one of the small duty power GT-Gen sets, which is developed and manufactured by AECC. As a kind of high – tech product, China National Development and Reform Commission, Ministry of Industry & Information Technology of PRC, Ministry of Science & Technology of PRC and Ministry of Finance of PRC have encouraged QDR20 to be used in the areas of energy saving, environmental protection and the natural resource comprehensive utilization in China. Also, it has been selected as the domestic building-distribution power supply model unit. More than 160 sets have been delivered to the costumers of both domestic and overseas by now.

The suitable fuels: kerosene, light diesel, natural gas, coke oven gas, coal bed methane, associated gas, chemical gas, yellow phosphorus tail gas and methanol purge gas etc.



在ISO条件下，燃料为天然气，燃机主要参数如下：

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	2
效率Efficiency	%	23
压比Pressure Ratio		7.45
排气温度Exhaust Temp	℃	450
排气流量Exhaust Flow	kg/s	20.3
热耗Heat Rate	kJ/kWh	15650

- 使用单位：徐州伟天化工有限公司
- 机型：QDR20
- 数量：6台
- 燃料：焦炉煤气
- 交付时间：2011年
- Customer: Xuzhou weitian chemical industry co.,ltd
- Model: QDR20
- Quantity: 6
- Fuel: coke oven gas
- Operation time: 2011



燃气轮机/GAS TURBINE



QD70燃气轮机发电机组

QD70燃气轮机体积小、起动快、运行维护方便、便于集中控制、适宜燃用多种燃料及污染排放量小，可广泛的应用于陆地工业发电、备用发电、海上平台、机械驱动等领域，市场应用前景广泛。

With the advantages of small size, starts fast, easy to operation and maintenance, burning various fules and low emissions, QD70 can be widely used in the areas, such as on/off shore power generation and mechanical drive etc.

QD70燃气轮机主要性能状态

(ISO工况下，进气损失100mmH2O，排气损失200mmH2O，燃用天然气)
(ISO condition with 100 mmH2O inlet loss and 200 mmH2O exhaust loss)

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	7.2
效率Efficiency	%	30.8
压比Pressure Ratio		12.15
排气温度Exhaust Temp	℃	560
排气流量Exhaust Flow	kg/s	31.6
热耗Heat Rate	kJ/kWh	11691

双燃料，快速切换
高可靠性
高环境适应性，可耐盐雾腐蚀



孤网精确运行模式
突增突减负荷
结构紧凑，重量轻



燃气轮机/GAS TURBINE

QD128 Gas Turbine Generator Set
QD128燃气轮机发电机组

QD128燃气轮机是中航工业自主研制成功的我国首台拥有完全自主知识产权10MW级燃气轮机发电机组。该机组具有效率高、结构紧凑、安全可靠、使用维护简便、使用寿命长等优点。可用于天然气发电、热电联供、管线增压、分布式能源等领域。

QD-128 gas turbine is the first 10MW gas turbine with fully independent intellectual property rights by AECC. This unit has the merits of high efficiency, compact structure, safe and reliable, easy use and maintenance and long service life etc. QD-128 gas turbine can be used for generation, co-generation, and pipeline pressure boost station and other power device.



- 项目名称：河南文留QD128项目
- Name: Henan wenliu QD128 project
- 机型：QD128
- Model : QD128
- 数量：2台
- Quantity: 2
- 投运时间：2000年
- Operation time: 2000



在ISO条件下，燃料为天然气，燃机主要参数如下：

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	11.5
效率Efficiency	%	28
压比Pressure Ratio		11.76
排气温度Exhaust Temp	°C	495
排气流量Exhaust Flow	kg/s	60.47
热耗Heat Rate	kJ/kWh	13337



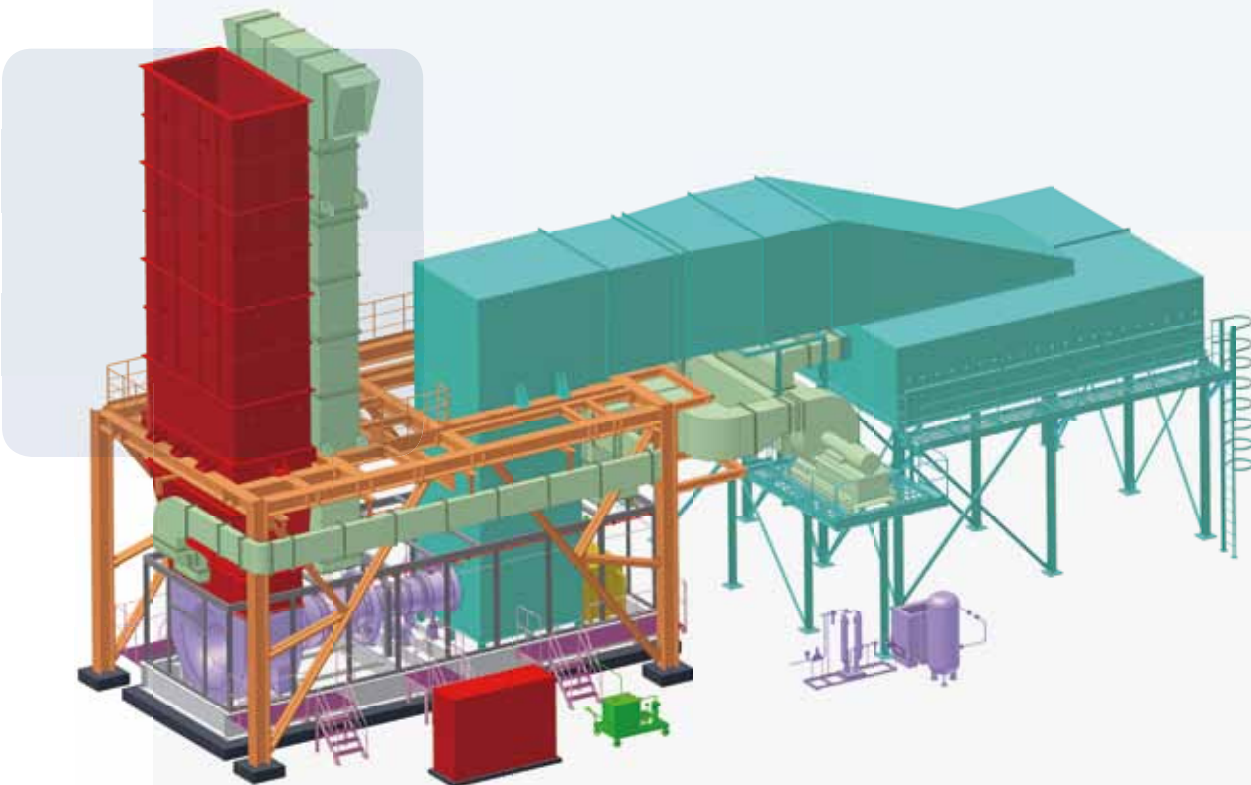
燃气轮机/GAS TURBINE

QD280 Gas Turbine Generator Set
QD280燃气轮机发电机组

QD280燃机性能在国际上同等功率的燃机中属领先水平。由于其结构新颖，性能优良，不仅可用作大、中型水面舰艇的动力装置，同时作为天然气压缩输送、发电的动力装置被广泛应用于民用发电、天然气输送等领域。

QD280燃机的多台原型机已累计运行200,000小时，实践证明其具有极高的可靠性和可用性。

Because of the innovative engine structure and the good performance, QD280 gas turbine has been in the international leading position among those with the similar power capacity. It can be used in power generation, natural gas pipeline compressor station, as well as marine power system etc. The operation hour of marine type QD280 has been over 200,000 hours and that has proofed its high reliability and availability.



在ISO条件下，燃料为天然气，燃机主要参数如下：

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	26.7
效率Efficiency	%	36.5
压比Pressure Ratio		20.5
排气温度Exhaust Temp	°C	480
排气流量Exhaust Flow	kg/s	91.124
热耗Heat Rate	kJ/kWh	9850



燃气轮机/GAS TURBINE

R0110 Gas Turbine Generator Set
R0110燃气轮机发电机组

R0110型燃气轮机机组是公司通过开展国际合作，开发的具有自主知识产权的110MW燃气轮机。获得国家科技部“十五”863计划能源领域燃气轮机重大专项，可广泛用于天然气发电、舰船动力等领域。

R0110 is a kind of 100MW gas turbine with independent intellectual property rights, which is co-developed by Liming Corporation and the combination of many famous domestic research units and enterprise and institute.

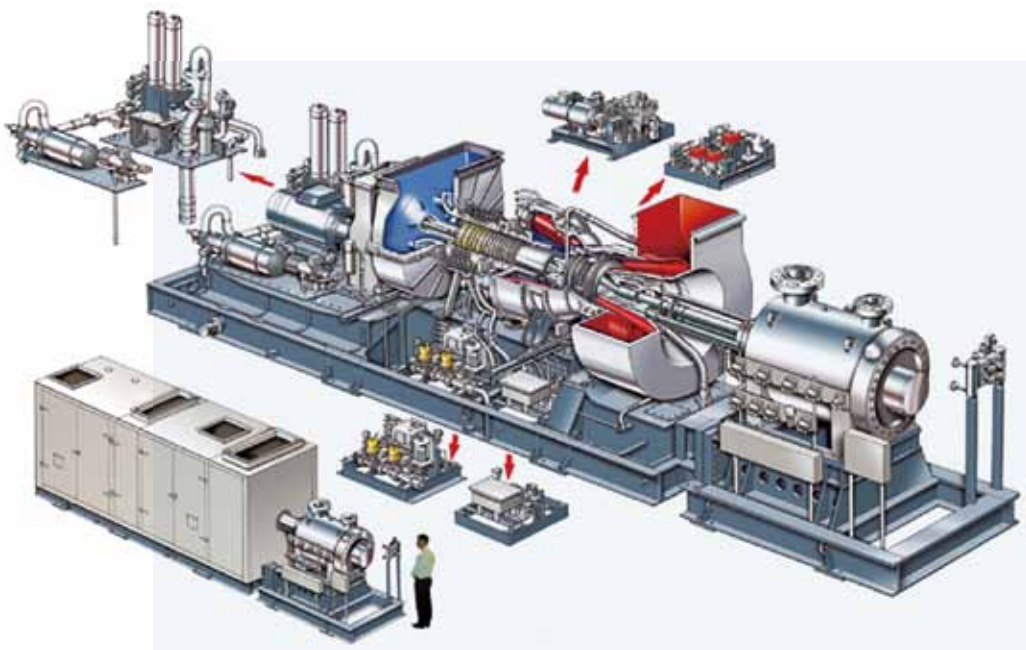
在ISO条件下，燃料为天然气，燃机主要参数如下：

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	110
效率Efficiency	%	34.5
压比Pressure Ratio		14.82
排气温度Exhaust Temp	℃	517
排气流量Exhaust Flow	kg/s	362
热耗Heat Rate	kJ/kWh	10002



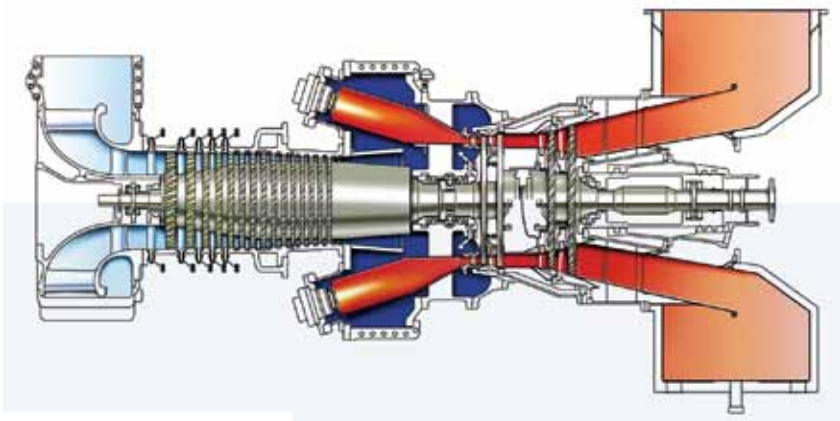
燃气轮机/GAS TURBINE ▶ 成套国外机组

QDR70 Gas Turbine Generator Set
QDR70燃气轮机发电机组



QDR70型热电联供机组是中航工业采用西门子SGT200型燃气轮机为核心机，自主成套燃气轮机发电机组，该机组主要适用于住宅小区、医院、宾馆、大型超市、机场等大型公共场所集的热、电、冷联供。是我公司面向中、高端开发的高效、稳定、可靠的燃气轮机产品。
适用燃料：航空煤油、轻质柴油、天然气、焦炉煤气等。

QDR70 GT-Gen set is a co-product, the gas turbine adopts SIEMES SGT200 and the whole set is packaged by AECC. As the power, heat and refrigeration sources, this unit can be used in the areas in residence community, hospital, hotel, super market and airport etc.
The suitable fuel: kerosene, light diesel, natural gas, coke oven gas, etc.



在ISO条件下，燃料为天然气，燃机主要参数如下：

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	6.75
效率Efficiency	%	31.5
压比Pressure Ratio		12.2
排气温度Exhaust Temp	℃	466
排气流量Exhaust Flow	kg/s	29.3
热耗Heat Rate	kJ/kWh	11419



- 使用单位：山东铁雄冶金科技有限公司
- 机型：QDR70
- 数量：2
- 交付时间：2011年
- 燃料：焦炉煤气

- Customer: Shandong tiexiong metallurg company
- Model: QDR70
- Quantity: 2
- Fuel: coke oven gas
- Operation time: 2011

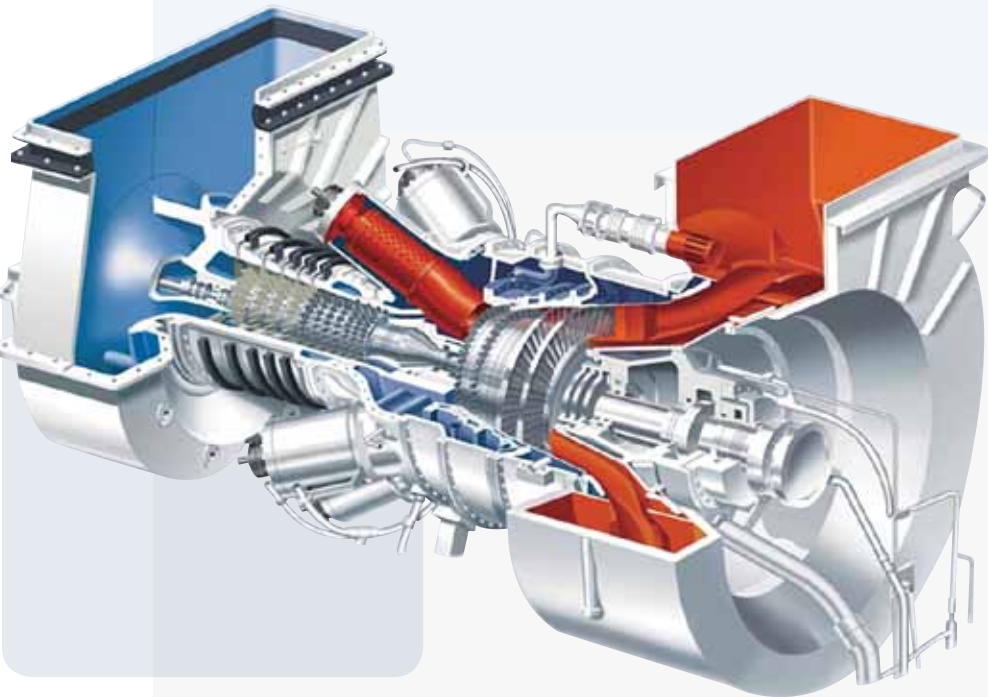


燃气轮机/GAS TURBINE 成套国外机组

QDR129/144 Gas Turbine Generator Set
QDR129/144燃气轮机发电机组

QDR129/144型热电联供机组是中航工业基于西门子SGT400型燃气轮机，为国内新兴的“分布式供能市场”而开发的燃气轮机成套机组，主要适用于工业园区等场所的热、电、冷联供。
适用燃料：航空煤油、轻质柴油、天然气、工业沼气等。

QDR129/144 Gas turbine generator set is a co-product, the gas turbine adopts SIEMES SGT400 and the whole set is packaged by AECC. It is suitable to the economic industrial zone for the power, heat and refrigeration supply.
The suitable fuels: kerosene, light diesel, natural gas and methane etc.



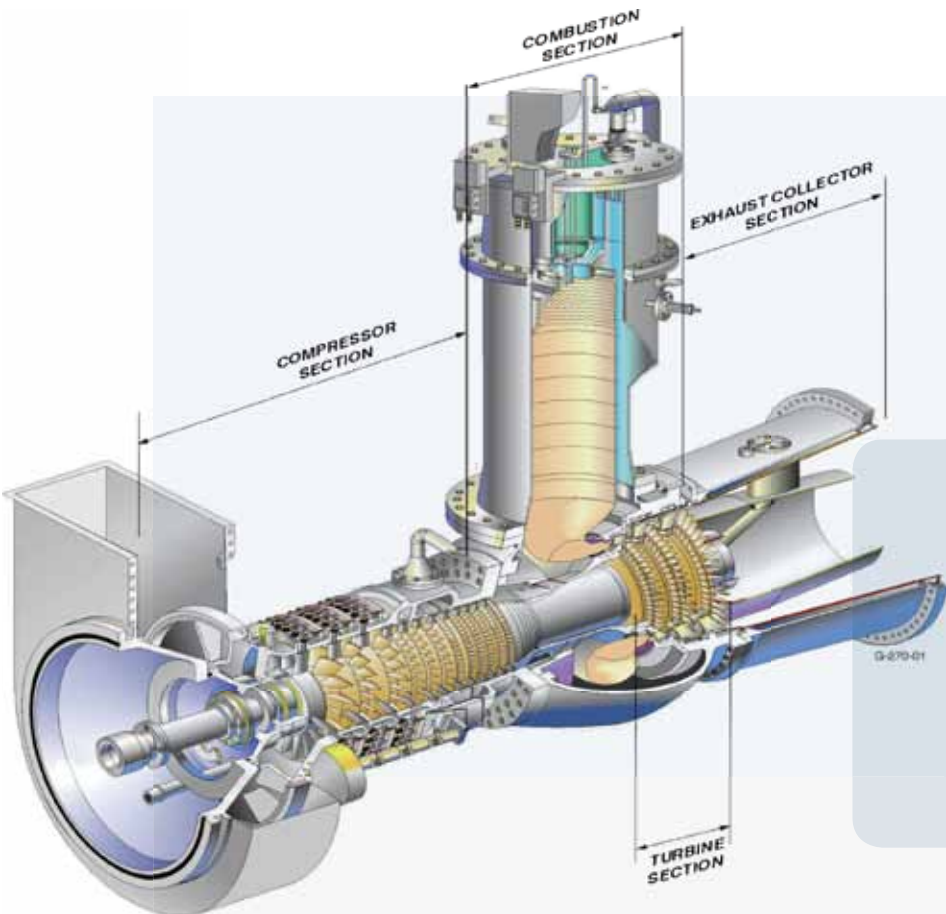
在ISO条件下，燃料为天然气，燃机主要参数如下：

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	12.9 / 14.4
效率Efficiency	%	34.8 / 35.2
压比Pressure Ratio		16.8 / 18.9
排气温度Exhaust Temp	℃	555 / 555
排气流量Exhaust Flow	kg/s	39.4 / 44.3
热耗Heat Rate	kJ/kWh	10356 / 10234



燃气轮机/GAS TURBINE ▶ 成套国外机组

QD100 Gas Turbine Generator Set
QD100燃气轮机发电机组



QD100系列燃气轮机发电机组由公司与美国通用电气石油和天然气公司合作开发，采用自主成套技术开发的高效、环保、可燃用中低热值燃料的燃气轮机发电机组。具有热效率高、可靠性好、低排放、便于使用和维护、燃料适用性广、环境适用性强等特点。

QD100 series gas turbine power generator set was co-developed by the company with GE Oil&Gas. The gas turbine adopts highly reliable and maintainable GE10-1 engine which is provided by GE, and the whole gas turbine generating set is packaged by the company with high efficiency, environmental friendly and it can also burn mid/low heat value fuels.

在ISO条件下，燃料为天然气，燃机主要参数如下：

名称Item	单位Unit	性能指标Performance index
额定功率Base Rating	MW	11.25
效率Efficiency	%	31.4
压比Pressure Ratio		15.6
排气温度Exhaust Temp	℃	482
排气流量Exhaust Flow	kg/s	47.5
热耗Heat Rate	kJ/kWh	11481

- 项目名称：中石油哈萨克斯坦阿克纠宾QD100项目
- 机型：QD100
- 数量：3台
- 交付时间：2004年
- Name: AKTOBE QD100 project
- Model : QD100
- Quantity: 3
- Operation time: 2004



工业余能

ENERGY RECOVERY EQUIPMENT

- ▶ 高炉煤气余压透平发电装置 (TRT)
Blast Furnace Gas Top Pressure Recovery Turbine
- ▶ ACL系列轴流压缩机
Axial Compressor
- ▶ 余热透平发电系统
Waste Heat Recovery Turbine
- ▶ 转炉轴流子午加速风机
Converter Axial Meridian Accelerating Blower
- ▶ 烟气轮机
High-Efficiency Flue Gas Turbine
- ▶ 炭黑设备及压力容器
Converter Axial Meridian Accelerating Blower



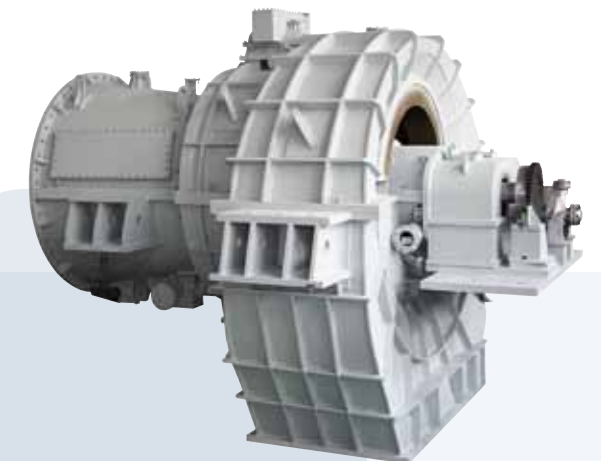
工业余能/ENERGY RECOVERY EQUIPMENT

Blast Furnace Gas Top Pressure
Recovery Turbine
高炉煤气余压透平发电装置 (TRT)

TRT是回收高炉煤气压力能的系统装置，不改变煤气的化学成份，不影响后续利用。
目前公司利用航空发动机涡轮技术成功研制出了GT系列十余种型号的TRT装置，包括两座高炉共用一套设备的两炉一机，以及与轴流压缩机、电动机串联的三机组。装机容量从3MW到38MW，已投运200余套，覆盖全世界所有规模的高炉。

TRT is a system device for recoving the gas pressure from blast furnace, which does not change the chemical composition of the gas and does not affect the follow-up use. It use of aero-engine turbo technology.

At present, the company's GT Series of TRT cover all kinds in the world of the blast furnace, installed capacity from 3MW to 38MW, more than 200 sets have already been put into operation.



公司首台TRT机组唐钢1#于1993年投运，运行十余年未更换一次叶片，创下国内TRT叶片寿命最长的记录。在97年冶金部召开的鉴定会上，明确将唐钢1#TRT列为行业示范性机组。

Paradigmatic TRT in TANGGANG. Blades of this TRT has running more than 10 years with good performance.



公司首台干式TRT于2004年在唐山不锈钢厂投运，从设计到项目投运仅用了7个月时间，创造了国内同类机组交付时间最短的记录。

The one of our TRT product in TANGGANG, from design to operation just used 7monthes.



山东日照钢铁集团八套TRT系统总包项目全部成功投运，总装机约50MW。拉开了公司该产业系统总包的序幕。

Shandong Rizhao Iron and Steel Group, the eight sets of TRT system turnkey projects are all successfully put into operation, the total installed capacity of about 50MW.



2008年，首批两台套国产最大、高效轴向排气、干湿两用型TRT应用于鞍钢鲅鱼圈4200m³高炉，总装机容量50MW。其技术水平和运行效率均达到国际先进水平，成为国产重装设备取代进口的一个成功案例。

4200m³ blast furnace supporting GT200 Angang bayuquan two TRT, the total installed capacity of 50MW.

工业余能/ENERGY RECOVERY EQUIPMENT

ACL系列轴流压缩机

轴流压缩机利用航空发动机压气机技术研制而成，为高炉和石化炼油装置提供压缩空气，还可用于风洞等试验平台，是冶金、石化行业的核心设备，属于高精尖重大装备。公司成功研制了ACL系列十余种型号的轴流压缩机，其排气压力最高超过1MPa，风量最大超过15000Nm³/min，适用于380m³以上所有高炉和石化领域所有催化裂化装置，目前年生产量约30套。

The axial flow compressor developed & manufactured is use of aviation engine compressor technology, which supply compressive air into blast furnace and petrochemical refinery device. At the same time also used in the wind tunnel test platform, which is the heart of equipment in metallurgy, petrochemical industry. The produces amount is around 30 sets in currently.



我公司为河北辛集奥森钢铁提供的两套三机组（TRT+轴流压缩机+电机）运行现场。该项目从签订到机组投运仅用七个月时间，创下了行业之最。目前，公司已取得了数十套三机组订单业绩。

Two set of TRT/axial compressor/Generator units are delivered to Aosen Steel Company, XinJi, Hebei Province, Aosen is our long term corporation cleint.



由我公司自主研制的国内首台具有自主知识产权的大型轴流压缩机，ACL80-17型于2012年3月在唐山燕山钢铁公司已正式投运，成为公司工程总包领域又一典范。

The ACL80-17 axial flow compressor has been installed on the 2560m³ blast furnace in Tangshan Yanshan Steel Company.



工业余能/ENERGY RECOVERY EQUIPMENT

Waste Heat Recovery Turbine 余热透平发电系统



余热透平回收所有中低温工业废气的热能，针对单独或综合热源，利用有机或无机介质将余热转换为压力能，用于发电，属于非标设计。目前投运的最大余热回收电站装机容量50MW。

The waste heat turbine to recover all in low-temperature industrial residual energy of emissions gas, against the alone or comprehensive heat source, using organic or inorganic medium to convert waste heat into pressure energy for power generation, which is a kind of non-standard design. At present, running of waste heat recovery the largest power plant installed capacity is 50MW.



四川德胜集团煤气燃烧发电项目，总装机容量65MW。发电功率超过设计指标，得到客户高度认可。

Sichuan Desheng Group gas combustion for power generation projects with a total installed capacity of 65MW.



攀煤干熄焦、江苏联峰石灰窑及螺杆泵、溧阳水泥等余热发电项目的成功投运。标志着公司已全面进入建材余热回收利用领域。

Dry quenching project at Panzhihua Coal Co., the lime kiln and the screw pump power projects at Lianfeng in Jiangsu.

Converter Axial Meridian Accelerating Blower

转炉轴流子午加速风机



轴流子午加速风机应用于冶金行业转炉煤气干法净化回收系统。动叶和转速可调，在中国属于新型高技术装备。我公司所研发转炉轴流子午加速风机广泛适用于各种型号转炉。

Axial flow meridian accelerating blower used in metallurgical industry's converter gas dry cleaning and recovery system. The rotor blades and speed is adjustable, which belongs in a new modle of high-tech equipment in China.



为提高能源利用效率，减少排放，提升设备技术水平，公司开始在冶金、炭黑等行业针对低热值尾气推广CCPP。山西立恒焦化项目一次使用4套TITAN130燃机，是采用融资租赁和工程总包方式介入该领域的成功案例。

In order to improve energy efficiency, reduce emissions, improve the technical level of equipment, the company started in metallurgy, carbon black and other industries for the LHV exhaust for promotion of CCPP. Li Heng in Shanxi Coking project uses four sets of TITAN130 Gas Turbine by one time. It adopted financing leases and the total engineering package project involved in the field, which is successful case.

工业余能/ENERGY RECOVERY EQUIPMENT

High-Efficiency Flue Gas Turbine 烟气轮机



烟气轮机是回收石化行业催化裂化装置中再生烟气压力能的设备，转子部件都采用高温合金，和燃气轮机的动力涡轮非常相似。
公司研制的CFT系列二十余种型号的烟气轮机及（风机+烟气轮机+电机）三机同轴产品，输出功率从3MW至38MW，适用于国内外所有催化裂化装置。

Flue gas turbine is the renewable gas pressure energy of equipment of catalytic cracking device in the petrochemical industry. The rotor components use high temperature alloy, and the flue gas turbine is very similar to the power turbine of gas turbine.

The company developed the CFT series of output power from 3MW to 38MW, for all the catalytic cracking unit at home and abroad.



公司为中石化济南炼油厂提供的10MW烟气轮机发电机组运行现场，目前已稳定运行2年多时间，而且效率明显高于前期运行机组。

Cooperation with Sinopec Nanjing oil refinery. A 10MW turbine running good more than 2 years.



2010年，公司首台具有自主知识产权的CFTII 10-A型高效烟气轮机在中石油股份有限公司茂名分公司成功投运，各项运行指标均达设计标准，赢得了用户的好评。

Cooperation with CNPC maoming branch. The type of turbine is CFTII10-A.

Converter Axial Meridian Accelerating Blower

炭黑设备及压力容器



公司专业设计、制造BR1级特殊材料压力容器、炭黑设备、非标和专用设备。产品涉及石化、核电、航天、化工（橡胶）、深海作业、制盐等行业。
主要用户：美国SPX公司、伊朗SADAF公司、河北龙星化工公司、台湾中橡公司、四川长虹集团等。

The company specializes in design, manufacturing BR1 grade pressure vessel of special materials, carbon black equipment, non-standard and special equipment. The company is involved in petrochemical, nuclear, aerospace, chemical (rubber), deep-sea fishing, salt making and other industries.

The main users are: SPX Corporation in USA, Iran SADAF, Hebei Lone Star Chemical Company, Taiwan Synthetic Rubber Corporation, Sichuan Changhong Group.



河北龙星化工炭黑尾气发电总包工程于2011年投运。各项指标均达到设计标准，获得业主的高度认可。

The Hebei Lone Star carbon black tail gas power generation turnkey projects put into operation in 2011.

能源工程服务

- ▶ 节能环保技术
Energy saving technology
- ▶ 电力工程服务
Power engineering project services

Energy saving technology 节能环保技术

粮食深加工企业节能增效 Grain deep processing enterprise energy efficiency

用膜处理技术对玉米浸泡废液进行处理，取代高能耗的传统蒸发处理方式，降低蒸汽和电的消耗，同时用膜处理及喷雾干燥技术从废液中提取蛋白粉，变废为宝。

To replace the traditional technology of evaporating process with the osmotic membranes to separate water from soaked corn waste liquid has saved lot of steam and power. Also, to extract protein powder from the waste by means of the osmotic membranes and spray drying technology can change the waste to useful products.





Power engineering project services 电力工程服务



**LM5000及MS6001B
二手燃机搬迁项目**
LM5000&MS6001B
used Gas Turbine
relocated project

机型：LM5000 & MS6001B
原厂：深圳沙头角、浙江余姚
搬迁至：宁波绿源
建设规模：100MW
运行方式：蒸汽回注、联合循环、
热电联产
投产日期：2009年9月
我公司在该项目中完成了设计、拆
卸、搬迁、修理、安装

Model: LM5000&MS6001B
Tasks: Power units relocation
From: Shenzhen Shatoujiao and
Zhejiang Yuyao
To: Ningbo Ivyuan
Capacity: 100MW
Operation time: Sep 2009

**西藏拉萨二手MS9001E燃机
搬迁项目**
Tibet used MS900E
gas turbine relocation
project

机型：MS9001E
原厂：广东南沙
搬迁至：西藏拉萨
建设规模：125MW
运行方式：联合循环
交付时间：2010年
创造了高原地区安装最快记录

Model: MS9001E
Task: Unit relocation
From: Guangdong Nansha
To: Lhasa, Tibet
Capacity: 125MW
Operation time: 2010

**深圳福华德MS9001E
燃机安装**
Shen zhen MS9001E
installation project

机型：MS9001E
数量：2台
交付时间：2004年

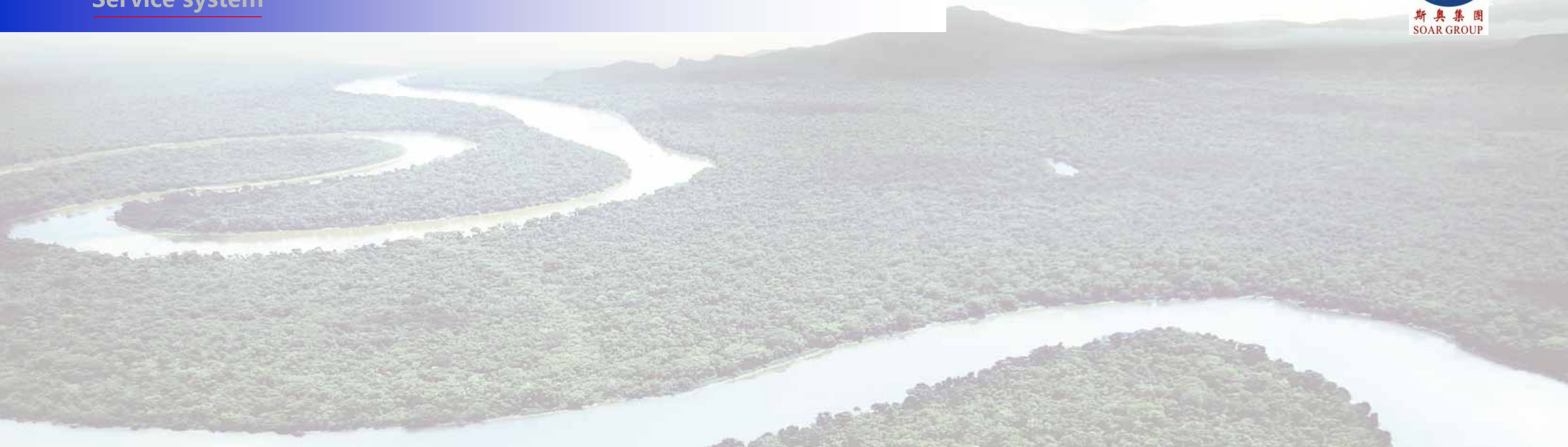
Model: MS9001E
Quantity: 2
Performance time: 2004

▲ **LM6000PA修理**
LM6000PA overhaul

▼ **巴基斯坦9E机组搬迁**
9E gas turbine installation in Pakistan

MS5001修理
MS5001 overhaul





- ➡ 1 为最大限度保障用户机组安全、稳定运行，中航对于重点机组建立了二十四小时远程技术支持服务机制。建立了设备远程监测和故障诊断中心，大大提高了服务质量和效率。
24hours remote monitoring service system and fault diagnosis center for each of our units.
- ➡ 2 依托在燃气轮机领域积累的丰富经验，可为客户提供全方位的技术培训。
Full range of gas turbine operation & maintenance training is provided.
- ➡ 3 具有经验丰富的现场售后服务人员100多名，可在内、外提供专业化的现场维护服务。
More than 100 site representatives are providing very good service.