

Ge Frame 5 Gas Turbine Specifications

Presents the fundamentals of the gas turbine engine, including cycles, components, component matching, and environmental considerations.

This book makes intelligible the wide range of electricity generating technologies available today, as well as some closely allied technologies such as energy storage. The book opens by setting the many power generation technologies in the context of global energy consumption, the development of the electricity generation industry and the economics involved in this sector. A series of chapters are each devoted to assessing the environmental and economic impact of a single technology, including conventional technologies, nuclear and renewable (such as solar, wind and hydropower). The technologies are presented in an easily digestible form. Different power generation technologies have different greenhouse gas emissions and the link between greenhouse gases and global warming is a highly topical environmental and political issue. With developed nations worldwide looking to reduce their emissions of carbon dioxide, it is becoming increasingly important to explore the effectiveness of a mix of energy generation technologies. Power Generation Technologies gives a clear, unbiased review and comparison of the different types of power generation technologies available. In the light of the Kyoto protocol and OSPAR updates, Power Generation Technologies will provide an invaluable reference text for power generation planners, facility managers, consultants, policy makers and economists, as well as students and lecturers of related Engineering courses. · Provides a unique comparison of a wide range of power generation technologies - conventional, nuclear and renewable · Describes the workings and environmental impact of

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each technology · Evaluates the economic viability of each different power generation system This book covers the design, analysis, and optimization of the cleanest, most efficient fossil fuel-fired electric power generation technology at present and in the foreseeable future. The book contains a wealth of first principles-based calculation methods comprising key formulae, charts, rules of thumb, and other tools developed by the author over the course of 25+ years spent in the power generation industry. It is focused exclusively on actual power plant systems and actual field and/or rating data providing a comprehensive picture of the gas turbine combined cycle technology from performance and cost perspectives. Material presented in this book is applicable for research and development studies in academia and government/industry laboratories, as well as practical, day-to-day problems encountered in the industry (including OEMs, consulting engineers and plant operators).

Originating in the process compressor industry, this text primarily addresses: rotating equipment engineers, project engineers, engineering contractors, and compressor user companies in oil and gas field operations, natural gas processing, petroleum refining, petrochemical processing, industrial refrigeration, and chemical industries. It enables the reader to assess compressors and defines the constraints influencing the compressor design. The Gas Turbine Engineering Handbook has been the standard for engineers involved in the design, selection, and operation of gas turbines. This revision includes new case histories, the latest techniques, and new designs to comply with recently passed legislation. By keeping the book up to date with new, emerging topics, Boyce ensures that this book will remain the standard and most widely used book in this field. The new Third Edition of the Gas Turbine Engineering Hand Book updates the book to cover the new generation of Advanced gas

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Turbines. It examines the benefit and some of the major problems that have been encountered by these new turbines. The book keeps abreast of the environmental changes and the industries answer to these new regulations. A new chapter on case histories has been added to enable the engineer in the field to keep abreast of problems that are being encountered and the solutions that have resulted in solving them. Comprehensive treatment of Gas Turbines from Design to Operation and Maintenance. In depth treatment of Compressors with emphasis on surge, rotating stall, and choke; Combustors with emphasis on Dry Low NOx Combustors; and Turbines with emphasis on Metallurgy and new cooling schemes. An excellent introductory book for the student and field engineers A special maintenance section dealing with the advanced gas turbines, and special diagnostic charts have been provided that will enable the reader to troubleshoot problems he encounters in the field The third edition consists of many Case Histories of Gas Turbine problems. This should enable the field engineer to avoid some of these same generic problems

Everything you wanted to know about industrial gas turbines for electric power generation in one source with hard-to-find, hands-on technical information.

Reflecting the developments in gas turbine combustion technology that have occurred in the last decade, Gas Turbine Combustion: Alternative Fuels and Emissions, Third Edition provides an up-to-date design manual and research reference on the design, manufacture, and operation of gas turbine combustors in applications ranging from aeronautical to power generation. Essentially self-contained, the book only requires a moderate amount of prior knowledge of

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physics and chemistry. In response to the fluctuating cost and environmental effects of petroleum fuel, this third edition includes a new chapter on alternative fuels. This chapter presents the physical and chemical properties of conventional (petroleum-based) liquid and gaseous fuels for gas turbines; reviews the properties of alternative (synthetic) fuels and conventional-alternative fuel blends; and describes the influence of these different fuels and their blends on combustor performance, design, and emissions. It also discusses the special requirements of aircraft fuels and the problems encountered with fuels for industrial gas turbines. In the updated chapter on emissions, the authors highlight the quest for higher fuel efficiency and reducing carbon dioxide emissions as well as the regulations involved. Continuing to offer detailed coverage of multifuel capabilities, flame flashback, high off-design combustion efficiency, and liner failure studies, this best-selling book is the premier guide to gas turbine combustion technology. This edition retains the style that made its predecessors so popular while updating the material to reflect the technology of the twenty-first century.

Recent years have seen acceleration in the development of cleaner energy systems. In Europe and North America, many old coal-fired power plants will be shut down in the next few years and will likely be replaced by combined cycle

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plants with higher-efficiency gas turbines that can start up and load quickly. With the revival of nuclear energy, designers are creating smaller nuclear reactors of a simpler integrated design that could expand the application of clean, emission-free energy to industry. And a number of manufacturers now offer hybrid cars with an electric motor and a gasoline engine to charge the batteries on the move. This would seem to be the way forward in reducing transport emissions, until countries develop stronger electricity supply systems to cope with millions of electric cars being charged daily. Greener Energy Systems: Energy Production Technologies with Minimum Environmental Impact tackles the question of how to generate enough electricity, efficiently and with minimum environmental impact, to meet future energy needs across the world. Supplemented with extensive figures and color photographs, this book:

- Traces the development of electricity supply
- Explains energy production risks and how major accidents have influenced development
- Discusses the combined cycle, the preferred system for power capacity expansion in much of the world
- Looks at combined heat and power
- Addresses whether coal can continue to be a fuel for power generation
- Examines nuclear power generation
- Asks why shipping has not followed some of the world's navies into nuclear propulsion
- Considers how to electrify more transport systems
- Reviews the current state of renewable systems, particularly

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hydro and solar The book defines the key elements of greener energy systems, noting that they must be highly efficient, with rapid start up and loading; produce minimum emissions; and use simpler technology. The author has more than forty years of experience as an international journalist reporting on power-generation technologies and energy policies around the world. He concludes that there is no place for coal and that combined cycle, hydro, solar, and biomass must complement nuclear energy, which must serve more applications than just generating electricity.

This book tells the story of the power generation gas turbine from the perspective of one of the leading companies in the field over a period of nearly 100 years, written by an engineer. Especially in times of imminent global economic crises it appears to be worthwhile to reflect on real economic values based on engineering ingenuity and enduring management of technological leadership.

Though the book is primarily designed as a technical history of the BBC/ABB/Alstom power generation gas turbines, its scope is sufficiently broad to cover general development trends, including parallel competitor activities. A special benefit is the historical breakdown to the gas turbine component level, so that the book actually outlines the development of axial compressors from early beginnings, the progress in combustion technology towards extraordinary low

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emission values and that of axial turbines with special emphasis on early turbine cooling innovations. The sheer length of certain engineering developments over several decades allows interesting historic observations and deductions on inherent business mechanisms, the effects of technology preparations and organisational consequences. A look into the mirror of the past provides revelations on the impact of far-reaching business decisions. 2017 Winner of the Historian Engineer Award of the ASME (American Society of Mechanical Engineers)

The gas turbine is a power plant that produces a great amount of energy for its size and weight and thus has found increasing service in the past 20 years in the petrochemical industry and utilities throughout the world. The gas turbine's compactness, weight, and multiple fuel applications make it a natural power plant for offshore platforms. This second edition is not only an updating of technology, which has seen a great leap forward in the 1990s, but also a rewriting of various sections to better answer concerns about emissions, efficiency, mechanical standards and codes, and new materials and coatings. At a time when energy costs are high, this important handbook expertly guides those seeking optimum use of each unit of energy supplied to a gas turbine. In this book, the author has assimilated the subject matter (including diverse views) into a comprehensive,

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unified treatment of gas turbines. The author discusses the design, fabrication, installation, operation, and maintenance of gas turbines. The intent of this book is to serve as a reference text after it has accomplished its primary objective of introducing the reader to the broad subject of gas turbines. Thus it is of use to both students of the subject and similarly to professionals as a desk reference in their daily lives.

As the cleanest source of fossil energy with the most advantageous CO₂ footprint, natural gas continues to increase its share in the global energy market. This book provides state-of-the-art contributions in the area of gas processing. Special emphasis is given to Liquefied Natural Gas (LNG); the book also covers the following gas processing applications in parallel sessions: * Natural Gas processing and treatment * Gas To Power and water * Gas To Liquid (GTL) * Gas To Petrochemicals, including olefins, ammonia and methanol * Provides a state-of-the-art review of gas processing technologies * Covers design, operating tools, and methodologies * Includes case studies and practical applications

Covering basic theory, components, installation, maintenance, manufacturing, regulation and industry developments, *Gas Turbines: A Handbook of Air, Sea and Land Applications* is a broad-based introductory reference designed to give you the knowledge needed to succeed in the gas turbine industry, land, sea and

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air applications. Providing the big picture view that other detailed, data-focused resources lack, this book has a strong focus on the information needed to effectively decision-make and plan gas turbine system use for particular applications, taking into consideration not only operational requirements but long-term life-cycle costs in upkeep, repair and future use. With concise, easily digestible overviews of all important theoretical bases and a practical focus throughout, Gas Turbines is an ideal handbook for those new to the field or in the early stages of their career, as well as more experienced engineers looking for a reliable, one-stop reference that covers the breadth of the field. Covers installation, maintenance, manufacturer's specifications, performance criteria and future trends, offering a rounded view of the area that takes in technical detail as well as well as industry economics and outlook Updated with the latest industry developments, including new emission and efficiency regulations and their impact on gas turbine technology Over 300 pages of new/revised content, including new sections on microturbines, non-conventional fuel sources for microturbines, emissions, major developments in aircraft engines, use of coal gas and superheated steam, and new case histories throughout highlighting component improvements in all systems and sub-systems.

A significant addition to the literature on gas turbine technology, the second

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edition of Gas Turbine Performance is a lengthy text covering product advances and technological developments. Including extensive figures, charts, tables and formulae, this book will interest everyone concerned with gas turbine technology, whether they are designers, marketing staff or users.

The International Conference on New and Renewable Energy Technologies for Sustainable Development held in Ponta Delgada, Azores (2002), Portugal, has provided technology specialists and hardware developers with the opportunity to discuss, review and demonstrate the research directions, the design methodologies, and the production techniques leading to cost-effective energy technologies for sustainable development. This dialog provides the context for more detailed technical presentations and panel discussions on energy systems, renewable resource exploitation, and the engineering design and optimisation for minimum resource consumption. The papers included in this volume are selected from those presented at the conference reflecting to present the state-of-the-art developments in the field. The selection of papers presented in this volume has enlightened various fields of scientific and economic development which should merge efforts in the understanding of the sustainable development concept and technological implications. The book will be of particular interest to engineering practitioners, product developers, researchers, and also economists, political

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scientists and government administrators exploring the multifaceted relationship between renewable energy technologies and sustainable development. Keynote lectures frame the technical and policy issues confronting the sustainable development movement and enrich the dialog between various segments of the community.

This comprehensive, best-selling reference provides the fundamental information you'll need to understand both the operation and proper application of all types of gas turbines. The full spectrum of hardware, as well as typical application scenarios are fully explored, along with operating parameters, controls, inlet treatments, inspection, troubleshooting, and more. The second edition adds a new chapter on gas turbine noise control, as well as an expanded section on use of inlet cooling for power augmentation and NOx control. The author has provided many helpful tips that will enable diagnosis of problems in their early stages and analysis of failures to prevent their recurrence. Also treated are the effects of the external environment on gas turbine operation and life, as well as the impact of the gas turbine on its surrounding environment.

Gas turbine engines will be the dominant essential technology in the next 20-year energy scenarios, either in stand-alone procedures or in combination with other energy generation apparatus. This book gives a comprehensive summary of gas

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turbine technology and describes some of the key developments that feature the gas turbine technology in various applications, like marine and aircraft propulsion, and industrial and stationary power generation. Thus, this book targets design, maintenance, analyst, and material engineers. Also, it will be highly beneficial to manufacturers, researchers and scientists due to the timely and correct knowledge presented in this book.

This book was developed directly from a series of Solar Turbines Incorporated internal short courses that were presented to an audience with a wide range of technical backgrounds, not necessarily related to turbomachinery. Thus, functional principles and physical understanding are emphasized, rather than the derivation of complicated mathematical equations. While the focus of this book is gas turbine theory, it is not intended to provide an in-depth knowledge of gas turbine aerodynamics or thermodynamics, nor is it intended to make the reader an expert in the field of turbomachinery. Readers will benefit from the many topics and theories that pertain to the subject matter. The text emphasizes simplified explanations of complex physical theories. Hopefully, readers will utilize this book to develop an appreciation of the many engineering disciplines that are involved in the design and analysis of gas turbines. Readers are also encouraged to further investigate a wide range of topics by studying more

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specific, subject-matter literature.

Aircraft Propulsion and Gas Turbine Engines, Second Edition builds upon the success of the book's first edition, with the addition of three major topic areas: Piston Engines with integrated propeller coverage; Pump Technologies; and Rocket Propulsion. The rocket propulsion section extends the text's coverage so that both Aerospace and Aeronautical topics can be studied and compared. Numerous updates have been made to reflect the latest advances in turbine engines, fuels, and combustion. The text is now divided into three parts, the first two devoted to air breathing engines, and the third covering non-air breathing or rocket engines.

The availability of fossil fuels required for power plants is reducing and their costs increasing rapidly. This gives rise to increase in the cost of generation of electricity. But electricity regulators have to control the price of electricity so that consumers are not stressed with high costs. In addition, environmental considerations are forcing power plants to reduce CO₂ emissions. Under these circumstances, power plants are constantly under pressure to improve the efficiency of operating plants, and to reduce fuel consumption. In order to progress in this direction, it is important that power plants regularly audit their energy use in terms of the operating plant heat rate and auxiliary power consumption. Energy Audit of Thermal Power, Combined Cycle, and

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Cogeneration Plants attempts to refresh the fundamentals of the science and engineering of thermal power plants, and establishes its link with the real power plant performance data through case studies, and further developing techno-economics of the energy efficiency improvement measures. This book will rekindle interest in energy audits and analysis of the data for designing and implementation of energy conservation measures on a continuous basis.

There have been many developments in the science and technology of thermo chemical biomass conversion since the previous conference on Advances in Thermochemical Biomass Conversion in Interlaken, Switzerland, in 1992. This fourth conference again covers all aspects of thermal biomass conversion systems from fundamental research through applied research and development to demonstration and commercial applications to reflect the progress made in the last four years. All aspects of bioenergy systems are covered from pretreatment through to end-user applications with increased consideration paid to the environmental benefits and problems of implementing bio-energy systems. There was an excellent response with over 200 papers offered and over 180 delegates from 29 countries attending the conference. The programme was divided into five main areas covering pyrolysis, pretreatment, gasification, combustion and system studies and this division is reflected in the structure of these conference proceedings. Each main section was preceded by a state-of-the-art review to provide a focus for the ensuing presentations and an

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authoritative reference. All the papers included have been subject to a full peer review process. As with any international conference, an important aim was to exchange ideas and discuss problems with fellow researchers, as well as to hear about the latest research and development and applications. A workshop programme was included to encourage this interaction in areas of interest selected by participants. The resultant workshop reports provide a summary of topical problems and opportunities.

Proceedings of the 3rd International Gas Processing Symposium; Copyright Page; List of Contents; Preface; International Technical Committee Members (Reviewers); Exercising the Option of CO₂ Slippage to Mitigate Acid Gas Flaring During SRU Expansion Bellow Failure; Abstract; 1. Introduction; 2. Methodology to minimize Acid Gas Flaring; 3. Conclusion; Flare Reduction Options and Simulation for the Qatari Oil and Gas Industry; Abstract; 1. Introduction; 2. Ethylene process overview; 3. Flare Reduction -- Industrial Case Study; 4. Result and discussion; 5. Conclusions; 6. Acknowledgment 7. References Review of Cooling Water Discharge Simulation Models; Abstract; 1. Introduction; 2. Model Comparison; 3. Conclusions; References; Combining post-combustion CO₂ capture with CO₂ utilization; Abstract; 1. Introduction; 2. Carbon capture; 3. Carbon dioxide disposal and utilization; 4. Conclusions; References; Step Change Adsorbents and Processes for CO₂ Capture "STEP CAP"; Abstract; 1. Introduction; 2. ...

Gas turbine engines will still represent a key technology in the next 20-year energy

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scenarios, either in stand-alone applications or in combination with other power generation equipment. This book intends in fact to provide an updated picture as well as a perspective vision of some of the major improvements that characterize the gas turbine technology in different applications, from marine and aircraft propulsion to industrial and stationary power generation. Therefore, the target audience for it involves design, analyst, materials and maintenance engineers. Also manufacturers, researchers and scientists will benefit from the timely and accurate information provided in this volume. The book is organized into five main sections including 21 chapters overall: (I) Aero and Marine Gas Turbines, (II) Gas Turbine Systems, (III) Heat Transfer, (IV) Combustion and (V) Materials and Fabrication.

Includes glossary of terms.

Process Plant Machinery provides the mechanical, chemical or plant engineer with the information needed to choose equipment best suited for a particular process, to determine optimum efficiency, and to conduct basic troubleshooting and maintenance procedures. Process Plant Machinery is a unique single-source reference for engineers, managers and technical personnel who need to acquire an understanding of the machinery used in modern process plants: prime movers and power transmission machines; pumping equipment; gas compression machinery; and mixing, conveying, and separation equipment. Starting with an overview of each class, the book quickly leads the reader through practical applications and size considerations into profusely

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illustrated component descriptions. Where necessary, standard theory is expertly explained in shortcut formulas and graphs. Maintainability and vulnerability concerns are dealt with as well. Fully updated with all new equipment available Comprehensive Coverage Multi-industry relevance

Gas Turbines for Electric Power Generation Cambridge University Press

Over the past decade, the prospect of climate change resulting from anthropogenic CO₂ has become a matter of growing public concern. Not only is the reduction of CO₂ emissions extremely important, but keeping the cost at a manageable level is a prime priority for companies and the public, alike. The CO₂ capture project (CCP) came together with a common goal in mind: find a technological process to capture CO₂ emissions that is relatively low-cost and able to be expanded to industrial applications. The Carbon Dioxide Capture and Storage Project outlines the research and findings of all the participating companies and associations involved in the CCP. The final results of thousands of hours of research are outlined in the book, showing a successful achievement of the CCP's goals for lower cost CO₂ capture technology and furthering the safe, reliable option of geological storage. The Carbon Dioxide Capture and Storage Project is a valuable reference for any scientists, industrialists, government agencies, and companies interested in a safer, more cost-efficient response to the CO₂ crisis. *Succeeds in tackling the most important issues at the heart of the CO₂ crisis: lower-cost and safer solutions, and making the technology available at an industrial

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level. *Contains technical papers and findings of all researchers involved in the CO₂ capture and storage project (CCP) *Consolidates thousands of hours of research into a concise and valuable reference work, providing up-to-the minute information on CO₂ capture and underground storage alternatives.

Combined cycle technology is used to generate power at one of the highest levels of efficiency of conventional power plants. It does this through primary generation from a gas turbine coupled with secondary generation from a steam turbine powered by primary exhaust heat. Generating power at high efficiency thoroughly charts the development and implementation of this technology in power plants and looks to the future of the technology, noting the advantages of the most important technical features – including gas turbines, steam generator, combined heat and power and integrated gasification combined cycle (IGCC) – with their latest applications. Reviews key developments in combined cycle technology Uses examples drawn from plants around the world Looks at how combined cycle technology can evolve to meet future energy needs

Even when the market is cloudy, LNG's future remains bright, with long-term annual growth projected to be steady. Natural gas is the cleanest burning fossil fuel and offers a potential solution to concerns over global warming and air pollution. In this updated and revised second edition, authors Michael D. Tusiani and Gordon Shearer uses everyday language and real-world examples to help readers understand the complex

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LNG industry. It provides the reader with insights into changes in the markets, technological advances, and the commercial evolution of what continues to be one of the most capital-intensive and formidable global industries. Features Include: Explains the technologies utilized: liquefaction, shipping and regasification, onshore and floating Covers existing and proposed worldwide LNG projects Examines the economics and commercial structure of the LNG industry, including synopses gas supply agreements, LNG sales contracts, and financing Discusses shipping conventions and regulations This book is an important resource for energy industry leaders, investment bankers, energy professionals, or anyone looking to expand their knowledge of the LNG industry. Liquefied natural gas (LNG) is a commercially attractive phase of the commodity that facilitates the efficient handling and transportation of natural gas around the world. The LNG industry, using technologies proven over decades of development, continues to expand its markets, diversify its supply chains and increase its share of the global natural gas trade. The Handbook of Liquefied Natural Gas is a timely book as the industry is currently developing new large sources of supply and the technologies have evolved in recent years to enable offshore infrastructure to develop and handle resources in more remote and harsher environments. It is the only book of its kind, covering the many aspects of the LNG supply chain from liquefaction to regasification by addressing the LNG industries' fundamentals and markets, as well as detailed engineering and design principles. A unique, well-documented, and forward-thinking

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work, this reference book provides an ideal platform for scientists, engineers, and other professionals involved in the LNG industry to gain a better understanding of the key basic and advanced topics relevant to LNG projects in operation and/or in planning and development. Highlights the developments in the natural gas liquefaction industries and the challenges in meeting environmental regulations Provides guidelines in utilizing the full potential of LNG assets Offers advices on LNG plant design and operation based on proven practices and design experience Emphasizes technology selection and innovation with focus on a “fit-for-purpose design Updates code and regulation, safety, and security requirements for LNG applications

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