



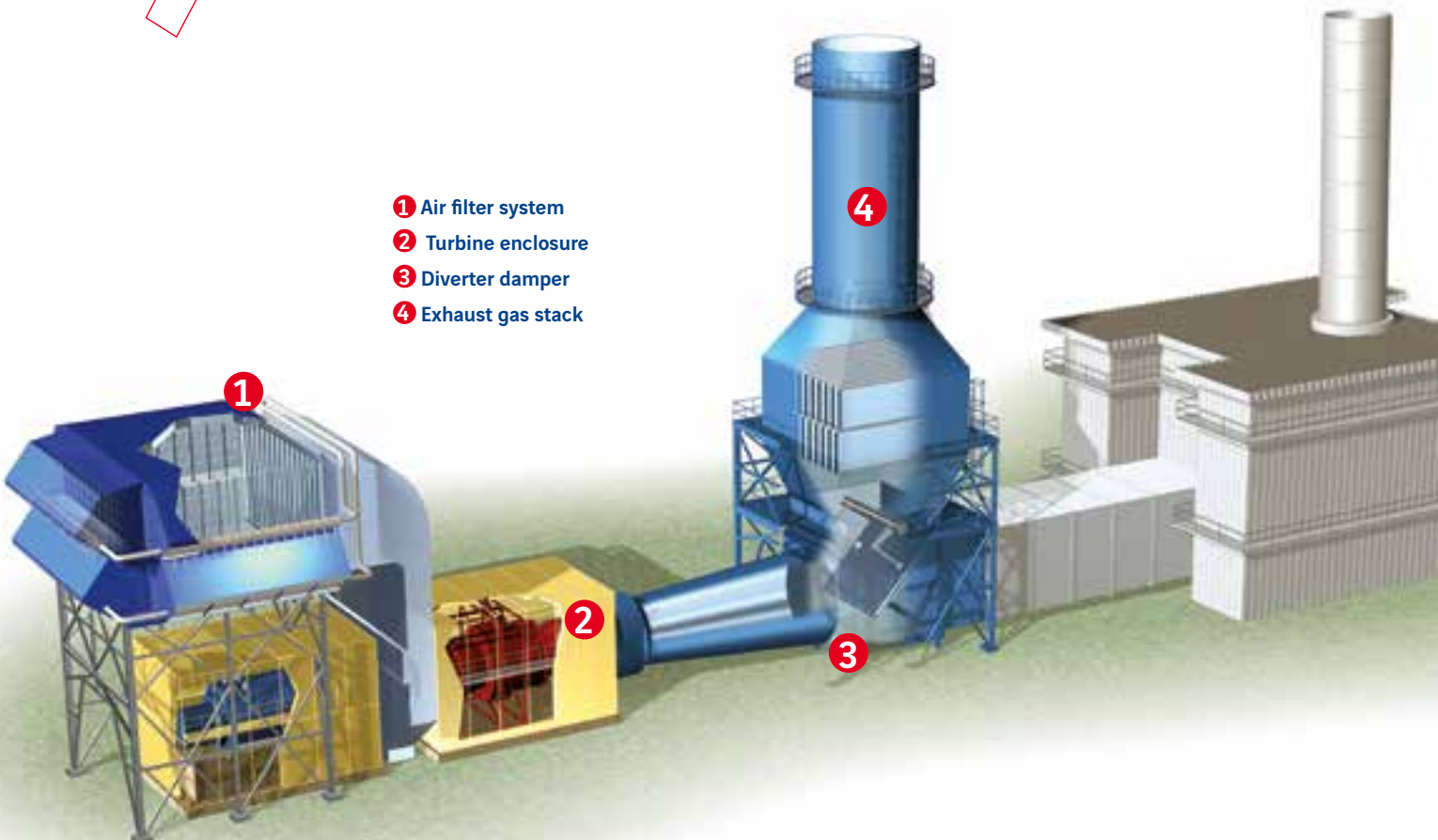
G+H solutions for quieter power plants

Expertise from a single source for power plants across the globe



We offer our customers a whole range of reliable and customized services – from engineering, through the supply of state-of-the-art components for gas turbines, right up to turnkey solutions.

- ① Air filter system
- ② Turbine enclosure
- ③ Diverter damper
- ④ Exhaust gas stack





In addition to doing their utmost to protect the environment, operators of gas turbine power plants also set great store by ensuring their systems deliver maximum availability and high efficiency. That's why our services extend far beyond pure noise protection. As an experienced partner in plant engineering specializing in power plants, we plan, deliver and install complete systems – for new plants, retrofitting and modernization projects.

- Our air intake systems and filter houses ensure that combustion air achieves the level of purity necessary for efficient operation of gas turbines – no matter which climate zone the power plant is located in.
- Our exhaust gas systems and complete exhaust gas stacks minimize noise emissions from gas turbines.
- Our acoustical enclosures ensure efficient insulation of turbines and other noisy machinery.
- Our silencers are extremely efficient in reducing noise emissions – even in the case of dusty media, extreme temperatures and flow conditions.


We support our customers through the entire project, providing a complete range of services from a single source – across the globe.

- Our engineers are dedicated to the development of customized system solutions for power plant components.
- A project manager with overall responsibility coordinates the team, providing a single point of contact for customers.
- We have our own production facilities and a global network of certified suppliers, allowing us to supply our customers at all times anywhere in the world both quickly and cost-effectively.
- Our construction site services are tailored to customer requirements, taking in everything from supervision to the turnkey installation of noise protection systems.

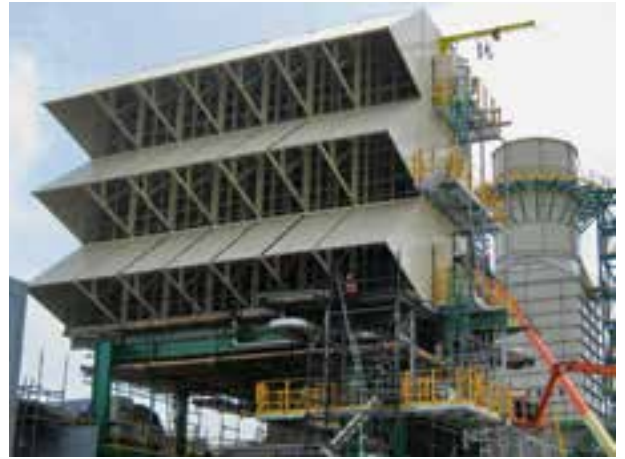
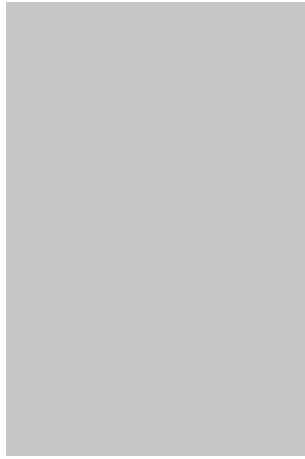
Air intake systems from G+H: High efficiency, low noise exposure



Our intake and air filter systems for gas turbines protect people and the environment against high noise exposure and the gas turbines themselves against impurities in the intake air.

A photograph of a large, industrial air intake system. It features a tall, rectangular structure with multiple horizontal louvers or slats, designed for air filtration and noise reduction. The structure is made of dark metal and is set against a light background.

Modern gas turbines have to meet strict requirements in terms of efficiency and reliability. These demands can only be met if the combustion air fully satisfies the turbine requirements. We take all critical parameters into account – be it the air volume, humidity, particle load or the maximum pressure drop permitted across the filter system – and ensure optimum system functionality, regardless of whether it is installed in mild climates, desert areas, the tropics, or in icy regions.



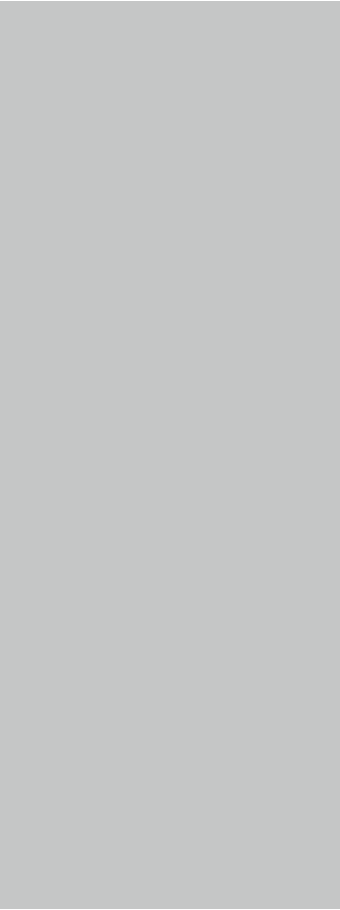


Our intake systems combine guaranteed acoustic and flow engineering results with high filtration efficiency and reliability. We offer the perfect intake system, no matter which climate zone the power plant is located in.

Tailored to the ambient conditions and turbine characteristics, we plan and develop a compatible intake and filter system to meet your requirements. Our customers can choose from turnkey systems or a combination of individual components.

Our product portfolio includes solutions for new installations and retrofitting projects:

- Air intake ducts with sound-deadening wall superstructures
- Single- or multi-blade shut off dampers
- Flow-optimized silencers
- Filter houses for all application areas such as:
 - Filter houses with static filters
 - Pulse filter houses
- Droplet catchers
- Evaporative coolers
- Anti-icing systems
- Heat exchangers
- Full range of measurement and instrumentation technology
- Complete range of operating and maintenance equipment



Exhaust gas systems and stacks from G+H: Perfect solutions for every gas turbine power plant



Exhaust gas systems and stacks for gas turbines are complex technical systems. We can draw on more than 50 years of expertise in the design and construction of these components.

The exhaust systems of gas turbines either emit the gases directly into the atmosphere via a stack or divert them through exhaust ducts into a heat recovery steam generator downstream. In both cases, the exhaust gas systems are subject to high loads through temperature, flow volumes, and other mechanical stresses. Compliance with acoustical regulations requires the installation of heavy-duty absorption silencers and, under certain circumstances, an acoustical housing or sound barrier for the exhaust system. Acoustics, fluid mechanics, heat transfer, statics and vibration technology – these and other often opposing requirements have to be factored into the design of an exhaust system and harmonized.

Our exhaust gas systems, with internal or external insulation, don't just protect the environment against noise – they also minimize heat loss, thus helping to raise the efficiency of the entire power plant.

Thanks to our extensive expertise in this area, our customers can be sure that they will receive solutions tailored precisely to their requirements.

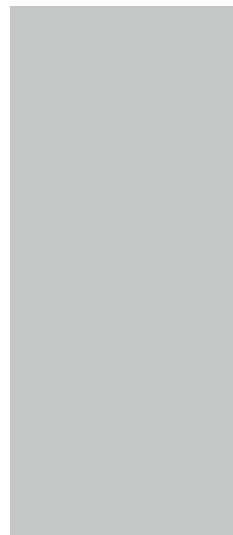
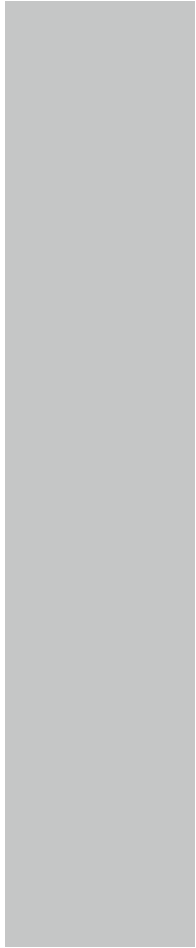




We offer our customers a complete range of components for the operation of heavy duty and aeroderivative gas turbines – from diffusers, exhaust ductwork and diverter dampers to stacks, stack valves and all the corresponding noise protection equipment. Therefore, our product portfolio includes double-walled stacks for small gas turbines, as used in industry or in natural gas compressor stations, and stacks with internal insulation for the world's largest gas turbines used in power plants.

Our portfolio for exhaust gas systems:

- Exhaust ducts, exhaust gas ductwork and diffusers
- Stacks of different shapes and heights
- Flow-optimized, high temperature resistant exhaust silencers
- Heat and sound absorbing internal and external insulation for exhaust ducts and heat recovery steam generators
- Diverter dampers
- Stack valves
- Metal and fabric expansion joints
- Flow guide vanes



Acoustical enclosures and silencers from G+H – experience pays dividends



Silencers and acoustical enclosures are essential for effectively reducing noise emissions from power plants. Our systems are the result of decades of research and development, and they set standards in the field of power plant noise control.

Without special silencers, gas turbine power plants would not fulfill the high requirements for environmental protection. The demands placed on engineering, material selection and production differ depending on whether the components are used on the intake or exhaust side.

The high purity requirements of gas turbines must be taken into account as early as during the silencer design and production stage.

Intake silencers absorb mainly high frequencies, whereas exhaust silencers are designed to absorb low frequencies and withstand flow forces and operating temperatures of up to 650 degrees Celsius (1200° F).

Our silencers are custom-made for each application and meet even the most demanding technical requirements.

We use the following types of silencers:

- Absorptive splitter type silencers for noise sources with very wide frequency bands, such as gas turbines or cooling towers,




- Resonator silencers based on the Helmholtz and/or Lambda/4 principle for use with dusty media, such as coal-fired power plants or flue gas desulfurization systems,
- Blow-off silencers for use, for example, in combined cycle or steam turbine power plants when gaseous media under high pressure have to be released into the atmosphere.

Gas turbines used in power plants and in the oil and gas industry are incredibly noisy. Therefore, the demands

placed on acoustical enclosures for these turbines are particularly high. In this area, too, we ensure optimum acoustical insulation. Our enclosures can either be mounted directly on the frame of the turbine (on-base) or on a separate supporting structure with a wraparound platform (off-base). Off-base assembly enables access to the turbines for maintenance, without having to remove sections of the enclosure. We equip each acoustical enclosure with the requisite interfaces and, on request, can fit them with additional functions, such as fire protection, electrical equipment or waste heat recovery.

Know-how has a name: G+H Noise Control



We are one of the leading companies in the technical acoustics industry. Our solutions are the result of over half a century of research, development and project experience.

We are a global player and our products can be found in power plants and industrial systems, in factories and production sites, and in measuring rooms and test facilities around the world. In other words, anywhere the environment has to be protected against noise and vibrations.

We are a full-service provider, supplying our customers with a complete range of services for technical acoustics – from analysis and application-oriented development in our own acoustic laboratory to consulting, planning, project management and turnkey installation. However, we keep our eye on the bigger picture at all times. Our services extend beyond pure noise protection, particularly with projects for large-scale technical systems.

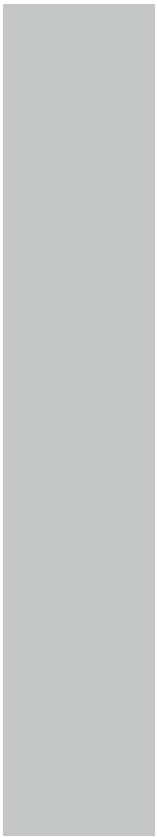
Other sectors of industry also rely on our expertise. We are a professional partner for leading automobile manufacturers and suppliers to the automotive industry, the fully enclosed run-up pens for civil aircrafts at Hamburg and Leipzig airports demonstrate our expertise in the aviation industry, and our vibration-insulation elements

protect people, machinery and buildings against structure-borne noise and vibrations.

Our projects worldwide are coordinated at our headquarters in Mannheim. We are certified to DIN EN ISO 9001:2000. G+H Noise Control thus combines flexibility with all the resources and potential of a global player.

We are part of the international VINCI S. A. group, the world's leading company for concessions, construction and related services.

We can therefore rightly claim to be a highly reliable and professional partner able to take on projects of any size.



S I C H E R H E I T S
C E R T I F I K A T
C O N T R A K T O R E N





G+H NOISE CONTROL

Customized Engineering Solutions



G+H Schallschutz GmbH

Janderstr. 3

68199 Mannheim

Germany

Tel: +49 621 502-591

Fax +49 621 502-593

info-noise-control@guh-group.com

www.guh-group.com