



Every breath is vital

Dräger – Gas Management Systems
for hospitals



»Every breath
is vital.«

A reliable Gas Management System is vital

The Gas Management System is a key element of every hospital. It is at the beginning of a supply chain whose last link is the patient and provides vital medical gases. This involves a great deal of responsibility, which we are happy to take on for you – with specialist knowledge, outstanding system expertise, and a comprehensive range of services.

Living means breathing. People breathe constantly, mostly without even noticing. They often do not realize how important breathing is to their lives until it is under threat. Accordingly, ventilation of patients during treatment in hospital is of vital importance: When a new-born baby receives oxygen through the nose, every breath must be monitored. The same applies when a coma patient is artificially ventilated or a patient is anaesthetized for an operation.

In all such cases, the health and life of the person being treated depends on reliably functioning ventilation and anaesthesia machines as well as a safe and constant supply of medical gases. This requires a Gas Management System that can meet the demands of everyday life in a hospital at all times.

Dräger assumes responsibility for every breath. We have been planning and building Gas Management Systems for hospitals for more than 50 years and we continue to set trends with our pioneering technology. As market leader in Germany, we supply customized system solutions from one single source and are on hand to advise you every step of the way, from planning and installation to after-sales service. This is how we make sure that medical gases and vacuum are always supplied to patients in the prescribed quality and at the right pressure – around the clock, 365 days a year.

What is a Gas Management System?

The Gas Management System from Dräger is made up of many different components that all smoothly interconnect to ensure that compressed air, oxygen, and other medical gases as well as vacuum are permanently available in every department.

GAS

Examples of medical gases include oxygen, compressed air, nitrous oxide, and carbon dioxide. The Gas Management System is also responsible for the vacuum supply.

MANAGEMENT

The medical gases and vacuum are produced, distributed, and monitored within the hospital.

SYSTEM

Dräger offers you a fully integral solution for supplying medical gases centrally in the hospital.



Gas Management System



Medical gases are indispensable to everyday life in a hospital

Medical gases are used in many different situations and in all areas of a hospital – in the operating theatre, on intensive care units, and for therapeutic treatment. A well-functioning Gas Management System is essential for all of these uses.



VENTILATION AND OXYGEN SUPPLY

Whether on the intensive care unit or during an operation under anaesthetic, many hospital patients – from premature babies to patients with serious lung disease – rely on artificial ventilation with **medical air** and **oxygen**.



ANAESTHESIA

For the anaesthesia in the operating theatre, a defined quantity of **nitrous oxide** and volatile anaesthetic agents are added to the set mix of compressed air and oxygen. The concentration of the anaesthetic gas is carefully monitored at all times.



THERAPY

Medical gases are used in various forms of therapy. One such example is oxygen therapy to improve the **oxygen supply** to patients with restricted lung function.



SURGERY

During minimally invasive surgery the stomach of the patient is filled with **carbon dioxide** to create space to examine the affected area. In addition, some surgical instruments are driven by **medical compressed air at seven or eight bar** which is also supplied by the Gas Management System. Special air motor terminal units are installed for this purpose. **Vacuum** is also regularly needed in the operating theatre to suction the wound area and airway.



»When it comes to
central gas supply,
safety is a matter
of experience and
system competence.«

A safe supply rests on joined-up thinking

A Gas Management System is more than the sum of its individual parts. It takes extensive system expertise to manage it reliably. As an experienced system supplier, Dräger offers you integral solutions that ensure a safe supply of medical gases in your hospital at all times.

Supplying the right quality and quantity of medical gases at the right pressure forms the basis for the functional operation of ventilation and anaesthesia machines in the operating theatre, on intensive care units and in treatment rooms. In order to ensure that all the required gases are available at the many different terminal units at all times, a complex Gas Management System is needed that can permanently produce, distribute, and monitor them.

Around 300 m³ of medical gases are needed every day for ventilation and anaesthesia in a medium-sized hospital. Approximately 20 kilometres of copper piping are installed to distribute them to patients at around 2,000 gas terminal units. More than 100 operating and emergency signals must be read, transmitted, and displayed for monitoring purposes. These figures provide some idea of the capability and complexity of a modern Gas Management System.

All components are systematically designed to provide an uninterrupted supply. Each one not only has to meet the highest standards, but also work perfectly with the others in order to ensure that the medical gases are of the same quality when they reach the patients as when they left the central supply unit. In addition, we offer highly secure system concepts that ensure an uninterrupted supply even in the event of the loss of entire equipment rooms, for instance as a result of a fire.

Many different elements, one main purpose: To preserve life

The Gas Management System (GMS) extends throughout the entire hospital, from the basement, where the gases are produced, via the pipeline system, the Area Control Units on the corridors, the monitoring screens, and the control room to the terminal units in the operating room, on intensive care units, and in treatment rooms. The critical system components are designed to be multiple redundant so that the entire system continues to function in the event of a fault or during maintenance work.



AREA CONTROL UNITS

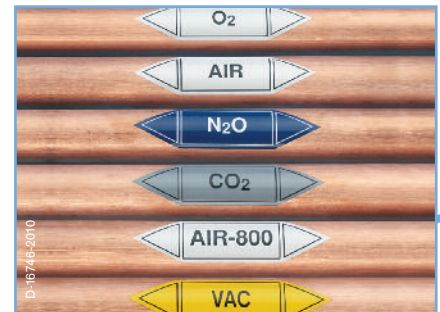
All clinical areas must be individually monitored by Area Control Units. The extremely compact Area Control Units from Dräger can control up to five gases while occupying minimal space. Electronic pressure sensors provide highly precise measurement values and activate a visual and acoustic alarm in the event of abnormal pressure changes.

An emergency button permits fast access in case of an emergency so that the gas supply can be interrupted at the shut-off valves and connected to external gas sources at the emergency inlet points. The optional consumption monitoring VoluCount records gas consumption for individual areas. This allows you to monitor the consumption of medical gases more precisely to increase the system transparency and identify potential savings.



TERMINAL UNITS

When planning your Gas Management System, we make sure that the terminal units are located exactly where they are needed to ensure a patient supply that is both ergonomic and suited to the clinical workflows. Different gases are needed in different hospital areas, depending on the clinical discipline and application, and the number of units provided must correspond to the processes and machines used there. Dräger has been building world-renowned terminal units for more than 40 years and supplies connections in line with DIN and British Standards, as well as other international types.



DISTRIBUTION SYSTEM

The role of the pipeline distribution network is to send the medical gases and vacuum where they are needed. The safety of the entire hospital is compromised without a professionally designed, installed, and maintained distribution system. Accordingly, Dräger only ever uses thoroughly tested copper piping with a defined degree of purity that has been approved for medical applications in accordance with EN 13348.

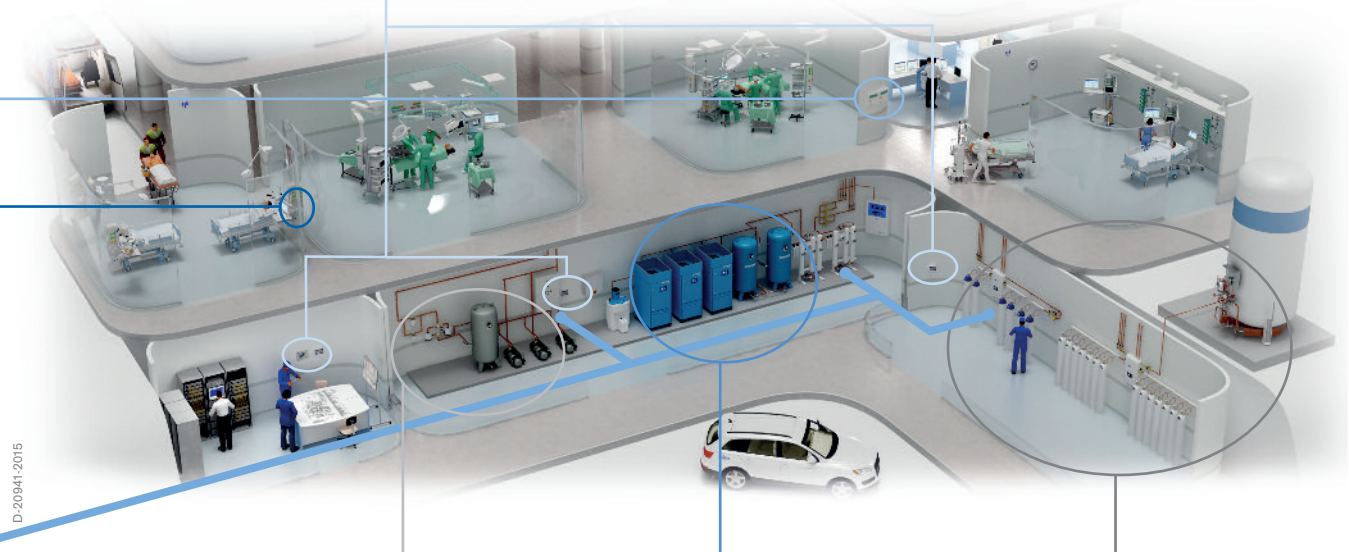
The quality and performance of the entire system is ensured by professional system planning in accordance with Dräger design guidelines and international standards as well as extensive testing and high-quality installation (e.g. inert gas soldering).



ALARM MANAGEMENT SYSTEM

The Alarm Management System makes sure that technical and clinical personnel are kept informed about the status of the central gas supply at all times. It monitors the GMS in all areas and records all signals such as operating and emergency alarms. Analogue operating values (e.g. pressure and flow rate) can be easily integrated.

All information is clearly displayed on LED, text, or touch-screen monitors, which means that messages and measurement values are always available exactly where you need them. It is also possible to access all information via your internal network and store it for your documentation. Furthermore, relevant alarm messages can be forwarded via SMS and e-mail so that you are always immediately informed of a fault wherever you are and can react quickly.



VACUUM SYSTEM

Vacuum is indispensable for surgical applications (wound area suction) and for suctioning airways in anaesthesia and intensive care. Dräger vacuum systems conform to ISO 7396-1 (Medical gas pipeline systems) and meet all safety and efficiency requirements.

Depending on the design, three or four pumps, each with power consumption ranging from 1.1 to 18.5 kW, generate the necessary vacuum. With the Dräger Medical Vacuum Control™ each vacuum system has a modern and intelligent control unit that ensures fully automatic operation and maximum safety.



COMPRESSED AIR SYSTEM

Dräger compressed air systems provide a continuous supply of medical compressed air for ventilation purposes and for operating surgical instruments. They comply with all relevant standards, particularly ISO 7396-1. The quality of breathing air as a pharmaceutical is governed by the quality standards set out in the European Pharmacopoeia. Its purity can be monitored continuously and fully automatically by the Dräger Medical Air Guard.

Our flexible system concepts enable us to take your individual requirements into consideration during the planning stage and provide you with the most efficient solution for your needs. The system is designed to ensure smooth and reliable operation as well as maximum security of supply. It has also been designed to ensure that maintenance and repair work can be carried out without interrupting operations.



CYLINDER MANIFOLD SYSTEMS

Cylinder manifold systems ensure the supply of medical gases such as oxygen, nitrous oxide, and carbon dioxide from cylinder manifolds or a liquid gas tank. At the heart of the system is the Gas Control Station (GCS), which reduces and monitors the gas pressure and automatically switches between various sources. It is capable of a flow rate of up to 120 m³/h. All GCS operating parameters are displayed centrally on the electronic control unit or on analogue gauges.

In addition, the GCS can be incorporated in the Alarm Management System and linked to the building management system via interfaces. Thanks to the upgradable platform concept the cylinder manifold system can be individually configured to meet gas supply requirements in your hospital and even adapted at a later stage while still in operation in the event of any changes.

A professional portrait of a woman with short, wavy, reddish-brown hair. She is wearing a dark, possibly black, top with a subtle V-neckline and a thin silver necklace with a small pearl pendant. She has a slight smile and is looking directly at the camera. The background is a soft, out-of-focus light color.

»Completion on time
and future-proofness
makes Dräger a
commercially profitable
partner.«

Extensive expertise from one single source

A Gas Management System is a complex structure, but it must function as one coherent unit. That is why we offer you everything from one single source: consulting, planning, project management, installation, testing and commissioning as well as after-sales service. Our total service pays off for you in three different ways – when it comes to quality, safety, and efficiency.

As a system supplier geared towards integral solutions, we keep a constant eye not only on the individual components of your Gas Management System, but also the complex way in which they work together as well as legal requirements. This allows us to give you both comprehensive and specific advice from the very start and provide one contact person to deal with all matters. In addition, our experts possess the necessary experience to carry out all work swiftly and reliably throughout all project phases and at all levels.

Beyond actually building the systems, we have extensive practical expertise in clinical areas such as ventilation, anaesthesia, and neonatology. Close internal dialog between our departments produces synergy effects from which you directly benefit. For instance, the latest findings and innovations in relation to ventilation and anaesthesia machines influence the planning of central medical supply systems. On the basis of this knowledge we produce state-of-the-art systems that are optimally configured to the clinical applications in your hospital.

Word of the lasting success of our solutions has spread. More than 1,000 Gas Management Systems from Dräger are now in use all over the world. Why not also rely on our extensive expertise. Whether constructing, extending, or renovating a building, or updating old existing systems, we will assist you in all matters concerning central medical gas supply as well as related product and application fields.

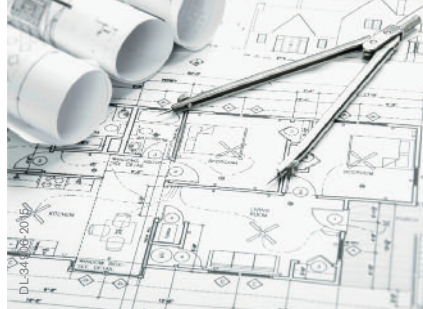
Step by step towards a customized system solution

A Gas Management System that perfectly meets your needs requires wide-ranging expertise – from consulting and planning to installation and after-sales service. We offer you every service from one single source.



CONSULTING

We are on hand to offer advice throughout every project phase and take a flexible approach to your requirements. Thanks to our extensive sales and service infrastructure, there is always a contact person in your area. It goes without saying that we intensively instruct your employees on how to operate all elements of the system. In addition, we can advise you on how to handle alarms correctly.



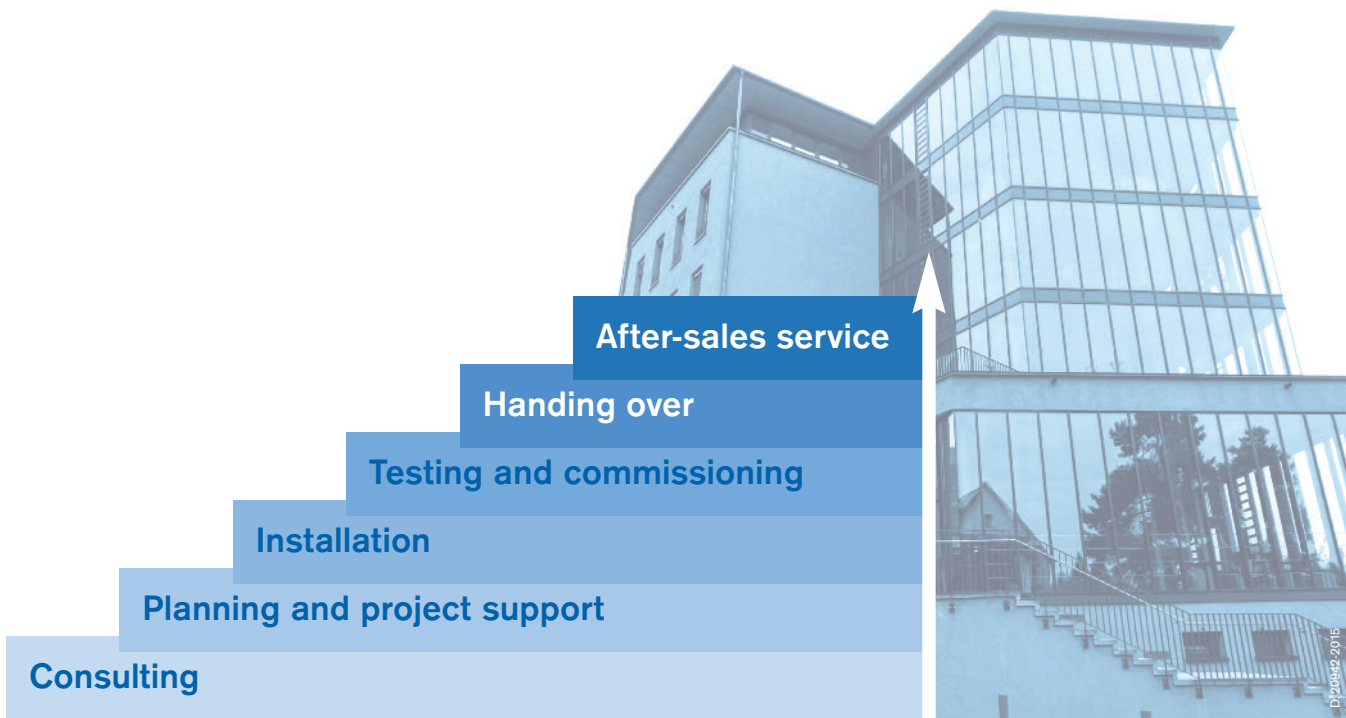
PLANNING AND PROJECT SUPPORT

Our technically accomplished and experienced project experts take care of the planning, dimensioning, and design of the systems in line with the framework conditions at your hospital. In doing so, they ensure that all the project guidelines in relation to approval, quality, and risk management are observed. Even when certain specifications are tendered out, we always check whether the customer's requirements comply with statutory standards and regulations. Finally, once the project has been completed and approved, we certify the entire set-up and ensure that you commission a tested and safe system.



INSTALLATION

The installation of medical systems requires highly specialized knowledge and tools. Accordingly, at Dräger only experienced, Dräger-certified installers who specialize in building Dräger systems are charged with this task. Through regular follow-up training at the Dräger Academy we make sure that our installers and service technicians are always familiar with the latest requirements in relation to Gas Management Systems and optimally prepared for the task. After all, real quality often only shows after installation.



TESTING AND COMMISSIONING

It goes without saying that we only use components in our systems that have been approved in line with the relevant standards and provisions and are of the required quality. Dräger inspects and approves the installed systems before they are handed over to the operator and commissioned. Since we are highly familiar with statutory provisions, with us as your partner you avoid potential approval-related problems from the very start and prevent the risk of having to subsequently modify the system.



HANDING OVER

After installation, Dräger Service carefully inspects all the system’s functions in accordance with detailed approval protocols and inspection instructions. The system is only handed over once all the provisions have been met. As part of the handover, we give your employees detailed instructions on how to operate the entire system. This means that you can be one hundred percent sure that your Gas Management System is fully functional when handed over, and your employees know how to operate it.



AFTER-SALES SERVICE

We offer our customers comprehensive services for medical gas supply systems. Regular inspections by Dräger Service ensure that the systems are permanently ready for operation. Our service technicians are quickly on-site when repairs are needed.



»When it comes
to a patient life,
there can be
no compromise.«

Quality is a question of responsibility

Gas management systems are an essential part of any medical infrastructure and are subject to a number of different standards and provisions. We ensure compliance with these not only with consistent quality and risk management, but also with our internal safety standards.

Vital medical systems are governed by the strictest quality and risk management requirements. As a manufacturer of medical systems, we test and analyze every single component used in our Gas Management Systems in line with strict uniform standards, regardless of whether it has been made by Dräger or another manufacturer. If necessary, modifications are made to ensure that all components work optimally together and to minimize risks. Only components that meet the relevant standards for medical products and our own strict quality criteria are approved for use in our systems.

Equally strict guidelines also apply to every task performed. We ensure compliance with all provisions and standards in every project phase by adhering to defined processes when planning, installing, and commissioning systems. In addition, we set standards in relation to the quality and reliability of Gas Management Systems with our own strict safety requirements. By doing so, we ensure maximum safety and efficiency throughout every stage, from planning and installation to approval as well as during operation.

We set standards when it comes to patient safety

The quality and reliability of your medical gas supply is our top priority. Accordingly, we not only strictly adhere to the relevant standards, but often also exceed them with our own safety requirements.

QUALITY MANAGEMENT

Dräger has an integral and certified quality management system for medical products based on EN ISO 13485, which governs all processes related to the planning, testing, and documentation down to the last detail. Regulated documents such as technical specifications, planning and project guidelines, installation instructions, and maintenance and commissioning documentation ensure constant compliance with the provisions at the project planning stage, in the area of sales, and during installation and servicing.

This gives you the peace of mind that all systems and products in your Gas Management System have undergone a detailed approval process and meet the strictest international regulations as well as Dräger's high internal quality standards.

RISK MANAGEMENT

As part of our risk management concept, we subject every GMS product and system to a detailed risk assessment in accordance with EN ISO 14971 (Application of risk management to medical devices). If necessary, we draw up and implement suitable measures for minimizing and monitoring risks.

Dräger appoints risk managers with long-standing experience and extensive technical expertise for each product area. They not only assess every single component individually, but also how it affects the entire system in terms of compatibility. Through regular updates, we make sure that our risk management concept always takes into consideration the latest technical developments when assessing components and systems.

QUALITY AND SAFETY STANDARDS

Dräger is a pioneer in safety and quality matters. Our own high standards sometimes even exceed statutory provisions. For example, Dräger's internal regulation on the purity of parts that come into contact with gas is much stricter than the corresponding international standard.

Our technical innovations consistently exceed existing safety standards. With the **Medical Air Guard**, for instance, we have developed a solution for continuously and comprehensively monitoring the purity of medical compressed air in accordance with the European Pharmacopoeia. The uninterrupted monitoring offers you greater transparency in relation to the quality of your compressed air. This allows you to react more quickly if thresholds are exceeded in order to protect the health of your patients.





Medical Air Guard

- Continuous monitoring of purity in accordance with the European Pharmacopoeia
- Automatic alarm when limits are exceeded
- Complete documentation possible



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BROAD RESPONSIBILITY

As a system supplier with long-standing experience, we possess the necessary expertise and authorization to verify compliance with provisions and issue approvals. EC certification in accordance with EC Directive 93/42/EEC authorizes us to issue a medical CE conformity declaration in accordance with ISO 7396-1 for the products used in our medical gas supply systems.

Critical components in our Gas Management Systems are extensively tested in physical and chemical processes at our own accredited and independent testing centre. Hence we assume broad responsibility for ensuring that our systems and all their individual components are suitable for medical use.

APPROVAL OF INDIVIDUAL COMPONENTS

In its entirety, the Gas Management System is a medical system whose individual components do not necessarily have to originally come from a medical environment. Accordingly, as a system supplier we carry out the vital assessment and approval of each individual component in accordance with medical standards.

One such example is the compressor control unit. It is responsible for the reliable and efficient operation of compressed air systems and is thus a key part of any Gas Management System. If it breaks down or malfunctions, the supply of medical compressed air is directly compromised. In order to minimize this risk, we make sure that the control software meets the requirements of IEC 62304 (Medical device software) before using it in our systems and also incorporate additional safety mechanisms, if necessary. This ensures that the supply of medical compressed air automatically continues even in the event of the control unit malfunctioning.

At your side in a mission to protect life

Dräger medical technology is renowned for being extremely reliable. Our solutions safeguard the health and lives of your patients. We help you to improve the productivity and quality of patient care on a lasting basis with our extensive range of products and services.



Modern hospitals are complex, highly technical service centres. They not only need profound medical knowledge to ensure optimal patient care, but also an extensive range of systems and devices. Our integral solutions provide optimal support for your clinical staff and make their job easier.

For over 100 years our innovations have been pushing the boundaries of medical technology. We help hospitals to improve the quality and productivity of their patient care in more than 190 countries. As market leader in German-speaking countries, we set standards in relation to security of supply and efficiency with our Gas Management Systems.

Furthermore, we possess comprehensive expertise in key clinical product and application areas such as anaesthesia, ventilation, monitoring, surgical lights, and supply units. As a supplier of system solutions, we optimally harmonize individual application areas and improve work processes with integral and application-based solutions.

Trust in our wealth of experience in planning, installing, and operating Gas Management Systems. As a reliable partner by your side, we help you to fully meet your responsibility for the lives of your patients.

REASONS FOR CHOOSING DRÄGER:

- **Over 50 years of experience** in planning and installing medical Gas Management Systems
- **Extensive system expertise** ensures that all components work together smoothly
- **Comprehensive clinical application knowledge** ensures that systems are optimally planned and designed for their intended use
- **An integral solution from one single source**, including planning, installation, testing, commissioning, and after-sales service
- **Maximum security of supply** thanks to consistent quality and risk management and high standards of quality and safety

Dräger – Gas Management Systems for hospitals:

Your project in good hands.



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Talk to us!

We will be happy to give you detailed advice on the subject of Gas Management Systems.

We look forward to your enquiry!

You can find further information and your nearest Dräger partner at: www.draeger.com



Why not take a look at our detailed information material, including system brochures, product catalogues, and planning documentation.

Your nearest Dräger partner will be pleased to advise you.

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