



Dräger Gas Management Systems for hospitals

Every breath is vital

Dräger

Technology for Life





D-25330-2020


Dräger assumes responsibility for every breath

Living means breathing. Accordingly, ventilation of patients during treatment in hospital is of vital importance. 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.**

We have been planning and building Gas Management Systems for hospitals for more than 60 years. As **market leader in Germany**, we supply customised 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.

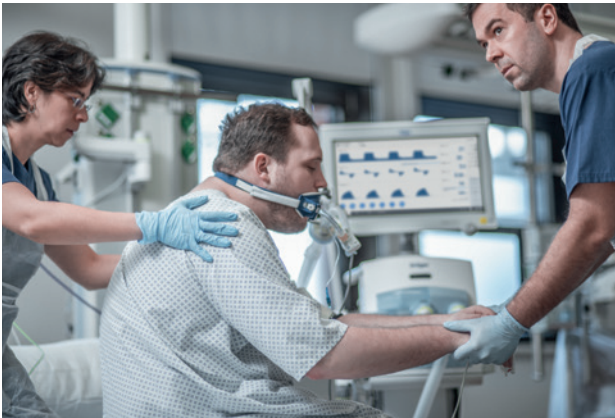
A safe supply rests on joined-up thinking 

Quality is a question of responsibility 

Extensive expertise from one single source 

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**.



D-2724-2019

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.



D-7202-2019

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.



D-5043-2023

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.



D-40562-2021

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.

Many different elements, one main purpose: To preserve life

The Gas Management System (GMS) extends throughout the entire hospital, from the basement, from where the gases are supplied, 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

In all clinical areas, individual monitoring through Area Control Units is essential. Dräger's Area Control Units offer intuitive operation through a clearly structured digital display. This not only ensures precise monitoring of up to five gases and flow measurements but also provides additional information to help medical staff anticipate critical situations and respond quickly. High-precision electronic sensors allow precise control of the current pressure of all monitored gases and vacuum within the Area Control Unit, and, at deviations, activate visual and acoustic alarms, ensuring reliable safety.

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.

A remote monitoring is possible through the integration of the ACU into the Dräger Alarm Management System. Alarms can be shown on various selected displays and be transmitted to external systems.

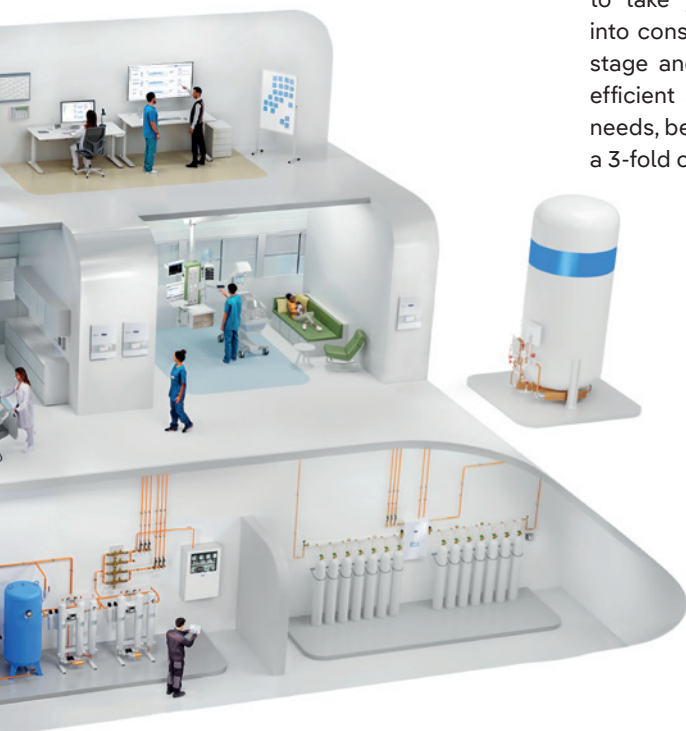
Terminal Units

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 suits 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 builds world-renowned Terminal Units 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.





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 and secure solution for your needs, be it a central or de-centralized, a 3-fold or a 4-fold system.

Gas Control System

The Gas Control System supplies medical gases like oxygen, nitrous oxide or carbon dioxide via manifold systems with cylinders, cylinder bundles or from liquid gas tanks. The central component of the system is the **Gas Control Station (GCS)**, that reduces and monitors the gas pressure and switches between the sources to provide an uninterrupted supply. 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, all relevant alarms and messages can be incorporated in the Alarm Management System and linked to a 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.

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, in accordance to the requirements of ISO 7396-1. Analogue operating values (e.g. pressure and flow rate) can be easily processed. All information is clearly displayed on LED monitors, optionally with text display, which means that alarms are always available exactly where you need them. It is also possible to access all information via your internal network.

GMS Analytics

GMS Analytics lets you record, visualise and analyse the central medical gas supply in your hospital. The dashboard gives you a clear overview of the Gas Management System's current status. The application shows you all messages, readings and trends, so you can fully monitor your Gas Management System at all times and from any location. Additional messages can help you to identify gradual changes in the system, helping you to spot upcoming irregularities before they might cause damage. The option to access data via your internet browser enables you to monitor your system and prepare for inspections remotely from any device. It also eliminates the need for recording data by hand. Trend projections for collected data help you monitor the system efficiently and helps to optimise processes and staff organisation.

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 applicable 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.



»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.

The integration of single components, as for example the Area Control Units, into the Alarm Management System enables you to monitor and supervise the whole system. Special interface modules are used to transmit all signals and readings from the Alarm Management System to a Building Management System. In that way the status of the GMS can be tracked and analysed centrally, so that the safety is ensured continuously.

With GMS Analytics you even have more analysing options for your individual system. For instance, you can display all kind of gas parameters and check whether they deviate from the recommended target values. Regarding the components of your Gas Management System, you can track if they operate optimally, or if there are deviations from the original constructional layout. In that way, the application GMS Analytics enables you to optimise the facility. With the help of data analyses, you are able to predict uncertainties in your gas management facility before problems even arise.

Furthermore, we have implemented certain mechanical safety features in our products. For example, in the Area Control Unit, there's an emergency access button, and for more clarity we have separated pneumatics from electronics. The Gas Control Station, which is the heart of the cylinder manifolds, also enables a fast and easy access to the inner part in case of an emergency, or just for visual control.

All our components for a Gas Management System are conform to the risk management approach of ISO 7396-1.



»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.

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.

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.

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.

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. This ensures that the supply of medical compressed air automatically continues even in the event of the control unit malfunctioning.

Quality and safety standards

Dräger is a pioneer in safety and quality matters. Our own high standards sometimes even exceed statutory provisions. 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.



»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 customised 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

- Advice throughout every project phase
- Extensive sales infrastructure for consultation issues



Planning and Project Support

- Planning, dimensioning, and design of the system in line with the framework conditions at your hospital
- Check whether the customer's requirements comply with statutory standards and regulations



Installation

- Dräger-certified installers
- Regular follow-up training at the Dräger Academy



Testing and Commissioning

- Dräger inspects and approves the installed systems before they are handed over
- Usage of components in our systems that have been approved in line with the relevant standards and provisions



Handing over

- Careful inspection of all the system's functions in accordance with detailed approval protocols
- Detailed instructions for your employees on how to operate the entire system



After-Sales Service

- Regular inspections by Dräger Service
- Through our extensive service network, our service technicians are quickly on-site



D-193-2022

We service your gas supply

Up and running

- Delivery of 100%-customised gas systems
- Qualified on-site installation without interruption of medical department

Full workplace performance potential

- Training & educational offerings for clinical and technical excellence in Gas Management System
- Best usage of system's capabilities

Operations with peace of mind

Increase uptime of your gas supply

- Yearly inspection and regular preventive maintenance ensure maximum uptime and budget security
- A modular repair strategy enables cost efficient replacement of parts onsite by our experienced service technicians
- Seamless documentation and test history in adherence to national and international quality and test standards
- Easily accessible technical support, from first line service assistance to rapid on-site technician deployment

Manage your products and lifecycle costs

- Service contracts ensure uptime of your medical devices and have a 100% planning reliability
- Service offerings that are precisely tailored to your gas system configurations

Choose your contract

Partnering with Dräger gives you the support you need. To find out more about the manufacturer's service and our offerings, please visit [our website](#).

InspectionCare: fulfilment of legal regulations

InspectionCare is our service package for comprehensive device inspections at planned intervals to ensure your medical devices operate safely – fulfilling and documenting all legal regulations.

- Reduce administrative costs with timely planning and coordinated inspection visits for safe operation of your technical equipment

PreventiveCare: increase device uptime and lifetime

PreventiveCare is our proactive maintenance package that ensures the continuous reliability and performance of your medical devices. In addition to the regular inspection, preventive maintenance is performed, and parts that are subject to wear are proactively replaced.

- Safe and continuously reliable operation of your medical equipment due to regular preventive maintenance with original maintenance parts
- Timely planning and clustering of maintenance visits to reduce your administrative effort and device downtime

TotalCare: full-service package

TotalCare is our comprehensive maintenance package covering the entire service for your medical devices, including all repairs, preventive maintenance, and inspections. Assuring optimal uptime of your medical devices together with maximum budgetary security.

- Budget security and minimal risk due to fixed costs for all-round service
- Timely planning and clustering of maintenance visits to reduce your administrative effort and device downtime
- Regular service with original spare parts gives you high operational readiness of your medical equipment

PartnerCare: customer self-service support package

PartnerCare is our service package if you would like to service your medical equipment with your own maintenance staff on-site.

- Our experts will provide you with the technical training needed to understand and service our devices professionally and with confidence. Additionally, you will also receive up-to-date access to service documentation



Reasons for choosing Dräger:

- More than 60 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

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