



**Safe ventilation starts at the
medical air plant**
Dräger medical air systems for hospitals



Dräger
Nr. MS14427
Soll adult
Ergeb

Dräger

Vital compressed air supply cannot pause for breath

Saving and protecting patients' lives ranks first in hospitals. In this respect, a continuous supply of compressed air for medical use is of key importance.

Whether for normal care, intensive care, in the emergency ward or the operating room: in all the departments of your hospital patients depend on artificial ventilation. In order that the patient always gets medical compressed air in the proper quality, in the right volume, and with the right pressure, you will require a central compressed air system that satisfies the specific needs of a modern hospital.

To achieve this, it is essential that international regulations as well as normative directives are observed and that the quality of the medical compressed air meets the defined guidelines.

The operational safety of the installation and, consequently, the health and well-being of your patients depend on the fulfilment of all these requirements. We will help you to fulfil this great responsibility. From planning, to construction and certification of your central compressed air installation, all the way up to the ongoing operation, we stand by your side as a reliable partner.

A central system – varied applications

VENTILATION AND OXYGEN SUPPLY

Whether in the intensive care unit or during an operation under anaesthesia: Many hospital patients, from the premature infant to the patient with lung disease, depend on artificial ventilation with medical air and oxygen.



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SURGERY

A number of medical tools for drilling, sawing and milling are driven by compressed air at 7/8 bar, which comes from a central compressed air system.

ANAESTHESIA

Medical compressed air also plays a major role for anaesthesia in the operating room. A pre-determined mix of compressed air and oxygen are added to a precisely defined quantity of nitrous oxide and volatile anaesthesia agents.



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Tailor-made solutions to meet every challenge

NEW HOSPITAL BUILDING

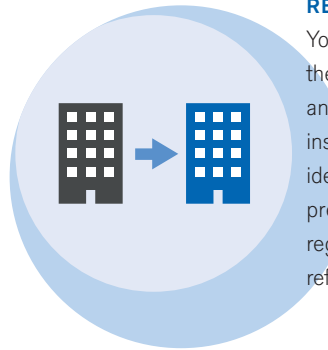
Thanks to our year-long experience in planning compressed air installations, we can help you estimate your new hospital's consumption in order to choose the best possible system. Our wide range of highly efficient, extremely reliable, and flexible system components and concepts are state of the art. At the same time, we consult you regarding a future-proof system design, in order to ensure a long term, economical operation even under changed conditions.

We supply you with all that is necessary from a single source, provide professional project management and ensure timely completion.



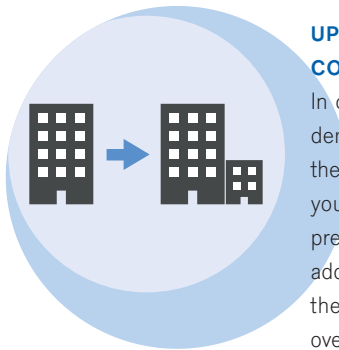
REFURBISHMENT OF AN OLD INSTALLATION

Your installation needs to be refurbished if it no longer corresponds to the state of the art and, due to a lack of efficiency or frequent maintenance requirements, is creating high costs. Based on a thorough inspection of your old installation, including a situation analysis, we will identify any optimisation potential. As experts on central medical compressed air systems, we are very familiar with prevailing norms and regulations, and we can advise you in all aspects to ensure that your refurbished plant meets the highest standards of safety and efficiency.



UPGRADING OR EXPANDING AN EXISTING COMPRESSED AIR SYSTEM

In case of a hospital expansion and the installation of new wards the demand for medical compressed air will change simultaneously. Often the size of the existing system will no longer suffice. We will determine your potential demand and ensure that, after upgrading, your compressed air system will perform sufficiently without being oversized. In addition, we will advise you if and to what extent any customisation of the installation design would be worthwhile in terms of increasing overall efficiency.



Flexible design and reliable operation – an overview of Dräger medical compressed air systems

Our compressed air systems set standards with respect to safety, flexibility and efficiency. A redundant layout of all critical components as well as a stringent validation of each individual component ensure that continuity of compressed air supply is not endangered, even in case of failure. Thanks to our modular system design and our wide product range, we can offer the right solution for each individual demand.

Alarm

All messages, alarms as well as operating or emergency signals that emanate from the components of the medical compressed air system can be displayed locally and transmitted to wherever they are needed: either directly to a Building Management System (BMS) or to the Dräger Alarm Management System (AMS).



Compressed air production

Multiple redundant, highly efficient screw or piston compressors for producing operating pressures from 10 to 15 bar and free air delivery of 17 to 295 m³/h. Energy-saving operational behaviour is achieved by means of an integrated, highly intelligent control unit, which allows operation of up to four aggregates.

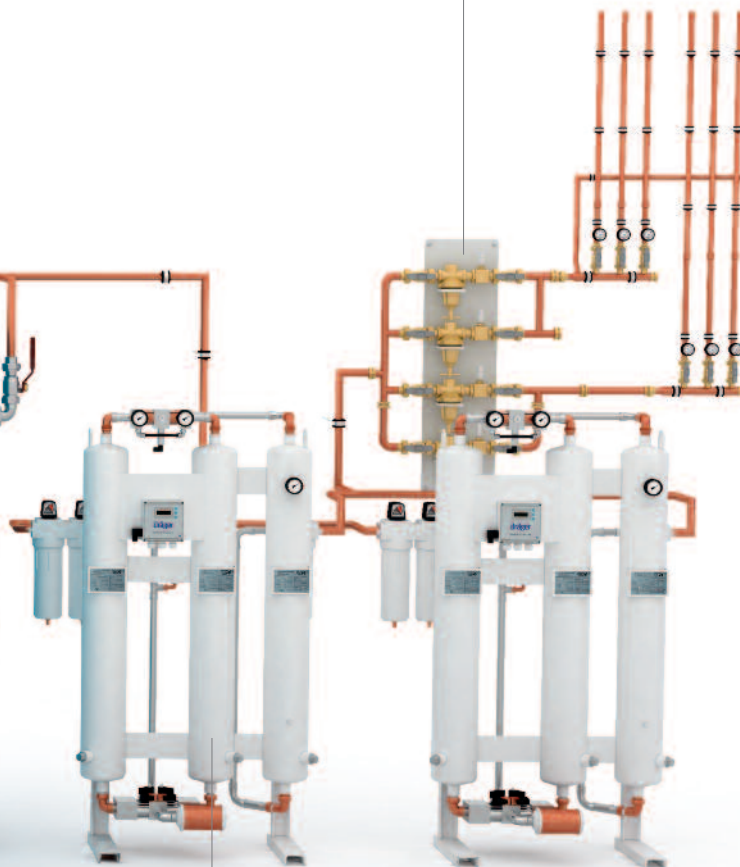
Compressed air storage

Compressed air tanks with a capacity of 270 to 3000 Litres in redundant mode for operating pressures up to 16 bar.



Pressure reduction

Dräger redundant pressure regulator unit for reducing the compressed air pressure to line pressure of 4/5 or 7/8 bar. Suitable for volume flows of up to 300 m³/h.



Medical air conditioning

Production of medical compressed air quality according to the European Pharmacopoeia by means of eightfold cleaning with the redundant conditioning unit Medical Air Ensure. Suitable for operating pressures from 10 to 15 bar and volume flows from 12 to 620 m³/h. Highly efficient operation through intelligent control technology and precise adjustment to the compressors.

Monitoring of the compressed air quality

Medical Air Guard for continuous monitoring of the medical compressed air quality according to the European Pharmacopoeia. The Medical Air Guard VOC additionally detects volatile organic compounds in order to determine the oil vapor concentration. A Medical Air Guard is upgradeable at any time by connection to the 5 bar pipeline.



safe

Dräger compressed air systems: safe, flexible, efficient

Dräger compressed air systems meet the key requirements for the operation of a modern hospital: safety, flexibility and efficiency. Thanks to our comprehensive systems expertise and exact analysis, we can offer you tailor-made solutions to suit your individual requirements.

Safety through comprehensive systems expertise

Especially stringent requirements are set for the operational safety of medical compressed air installations. All critical system components must be redundant or even double redundant to ensure an uninterrupted supply of compressed air to all supply points, even if individual devices fail and the system is simultaneously under maintenance.

Besides vast experience in the design and qualification of components for central compressed air systems, we have comprehensive systems know-how on device interfaces and the interaction between individual components. We use this knowledge in our risk management. This ensures that our systems, including all individual components, meet the required quality standards.

Even after first commissioning, we ensure comprehensive safety. If needed, our service technicians are quickly on site to restore your compressed air system to a safe and normal condition.

Moreover, the compressor control unit contributes to the system's safety. Our intelligent systems control unit was developed according to the standards of IEC 62304 - medical devices software. By means of additional systems pressure sensors the control unit discovers a drop in pressure in the system, whereupon additional compressors are activated and the operator is alerted. In addition, each compressor is fitted with its own integrated control unit to ensure safe operation even if the primary control unit fails.



Compressor control unit Dräger focus control 2.0

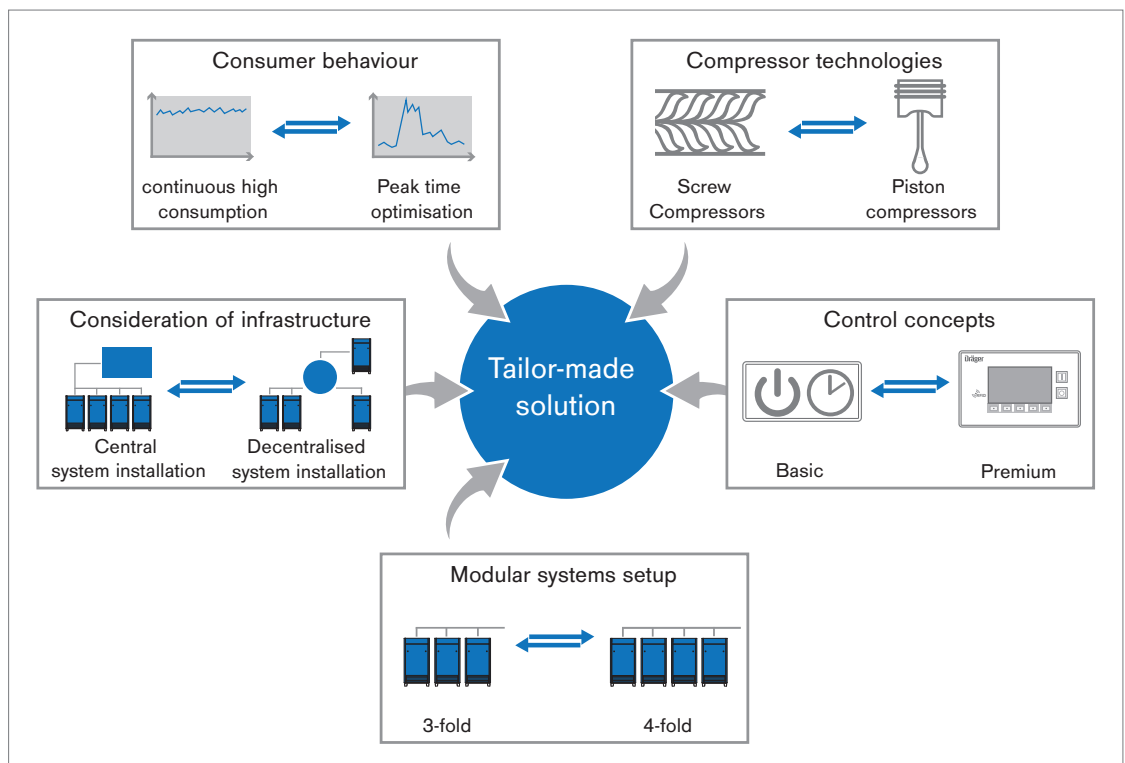
flexible

Flexibility through tailor-made solutions

Each hospital sets its own priorities. This is why the demand for medical compressed air and consumption differs from hospital to hospital. We offer you compressed air systems optimally catered to the specific needs of your hospital. Before deciding on refurbishing, upgrading or expanding your current system, it is important to assess your demands realistically. Based on our comprehensive expertise and experience in the design and conception of compressed air systems, we recommend the ideal solution both from a medical and economic perspective.

Thanks to our wide range of products, we are flexible in satisfying your specific needs. This even holds true of solutions or components that are not in our standard product range: our experts assess their technical feasibility, and make sure that they meet the normative directives as well as all safety requirements.

We offer the right solution for every requirement:



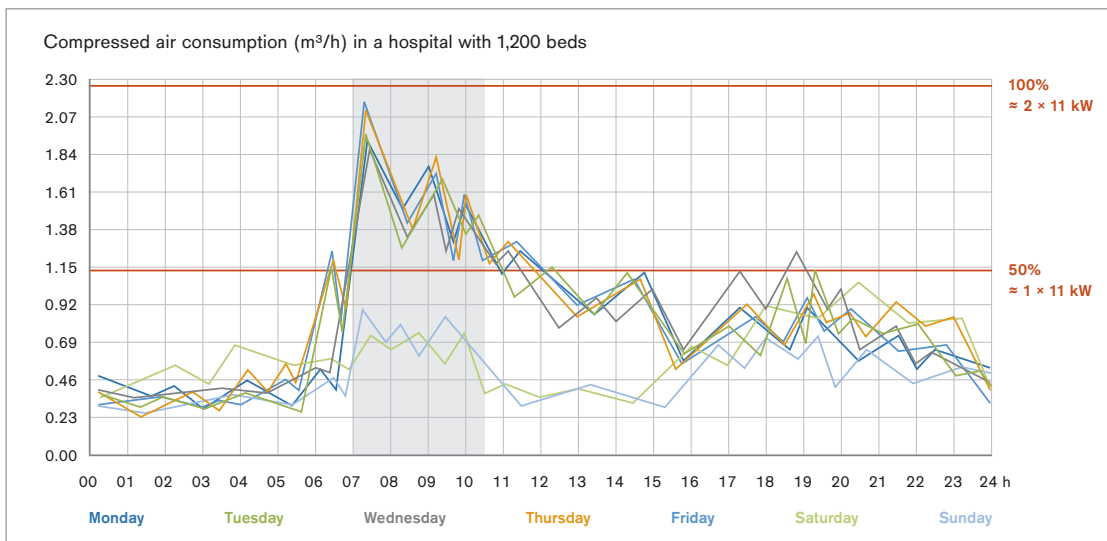
efficient

Efficiency through tailor-made design

An efficient and energy-saving compressed air system contributes to the economic efficiency of your hospital. Since the system runs around the clock, a high degree of efficiency leads to substantial savings for the entire operation. Thanks to our systems know-how, we are in a position to optimise the alignment of both the individual components of the compressed air system, such as compressors, dryer, and pressure vessels, and their interaction with one another to the actual demand of compressed air and the operating conditions of the hospital. For example, by transitioning from a three- to a flexible four-compressor system the installed total output can be substantially decreased, while still main-

taining a sufficient safety margin because one aggregate now only has to cover approx. 50% of the maximum demand for compressed air. By adjusting the pressure band, compressor performance can be further optimised, which leads overall to a more efficient operation and decreases wear and tear.

We also benefit from our comprehensive knowledge of clinical applications when it comes to creating a tailor-made design of the system. We consider the influence of the increase in the efficiency of clinical devices when calculating the maximum compressed air demand of the hospital. We will also gladly help you to improve the efficiency of your current compressed air system.



More than 50% of the maximum compressed air demand is needed only during a few hours per day. By means of an efficient design of the compressed air system, e.g. the deployment of four smaller aggregates, energy consumption can be optimised.

Energy-oriented refurbishment of a compressed air system in the RoMed Clinic in Rosenheim

- + Reconstruction during operation mode
- + 17% energy saving
- + Excellent service



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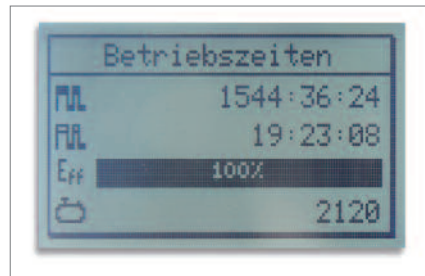
"Dräger is synonymous with confidence." August Schechner, head of the technical department of the RoMed Clinic in Rosenheim, Germany

Since 2016 a new medical compressed air system manufactured by Dräger has been providing patients with vital breathing air in the RoMed Clinic Rosenheim, which was awarded the "Green Hospital of Bavaria" award.

The objective of the refurbishment was an increase in the energy efficiency throughout by installing a modern standardised compressed air system. August Schechner, head of the technical department of the RoMed Clinic for over 10 years, appreciates the safety, efficiency and flexibility of the new installation.



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D-685-2016



D-13064-2016

SAFETY

The RoMed Clinic's new compressed air system fulfils the safety requirements by means of the redundant design of all critical components, as well as system monitoring through integration into the Building Management System (BMS). During the refurbishment period, a reliable and interruption-free supply of medical compressed air was upheld by a fully functional, external emergency supply system. This was most important for Mr. Schechner: "There was never an impairment of the supply during the refurbishment period."

EFFICIENCY AND FLEXIBILITY

In order to determine compressed air demands, Dräger measured consumption under normal operating conditions. This allowed to design an installation tuned to the individual requirements of the RoMed Clinic. The result: a system comprising four compressors with low power input, which operate with a minimised load running time, depending on consumption requirements. By optimising the installation and through heat recovery, it was possible to reduce energy consumption by 17% as compared to the previous system.

SERVICE

"A sense of responsibility toward technology is the most important aspect when it comes to the life of the patients. This is the case with Dräger," says Mr. Schechner. There is close cooperation between the hospital's technical department and the Dräger service engineers, the quality and commitment of which he is convinced of. Permanent security of the system is ensured thanks to the fact that the service engineers are familiar with the workflows and structures prevailing in the clinic, which allows them to perform the required maintenance work responsibly.

Medical compressed air: a vital gas

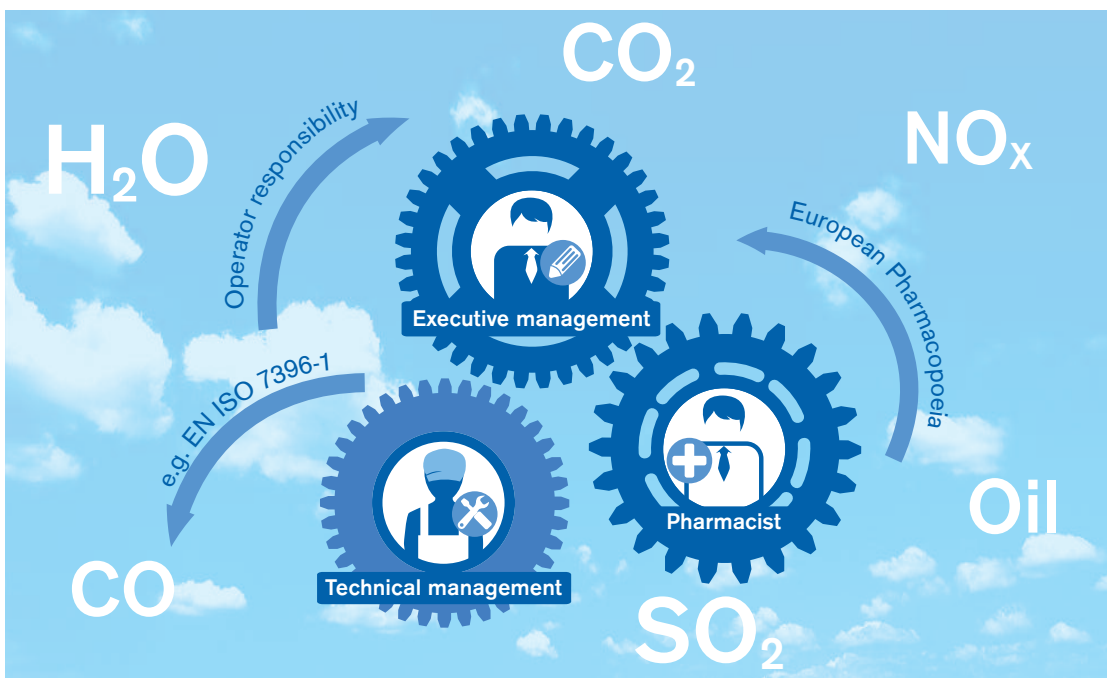
There is hardly a gas, which is so widely used in a hospital such as medical compressed air. Accordingly, the quality standards are high. Dräger technology ensures that relevant norms and limits are observed.

It all comes down to the quality of compressed air.

Medical compressed air is essential for the ventilation of intensive care patients and, as such, is the most important medical gas apart from oxygen. The quality standards are accordingly high. International guidelines such as EN ISO 7396-1 and the European Pharmacopoeia prescribe the guarantee of supply and regular inspection of the quality of compressed air. In addition, they define precise limit values for specific contaminants. Unlike other medical gases, since medical compressed air is produced in the hospital itself, the hospital is also solely responsible for its quality.

We will help you to fulfil this responsibility

Medical compressed air is produced through suction of surrounding air. Its quality can be negatively influenced by a number of factors, such as high CO₂ content, humidity, and impurities. Therefore, regular inspection of the quality of the compressed air is essential. Executive management and technical management must take into consideration possible impairments in risk assessment for the risk and emergency management. Dräger technology will help you to ensure the quality of your medical compressed air and to react immediately to deviations, so that you can fulfil your responsibility entirely.



Innovative technology for top quality compressed air

Thanks to Dräger's innovative solutions you have the medical compressed air quality under control: from production to continuous monitoring, all the way to seamless documentation and immediate alerting if needed.

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RELIABLE CONDITIONING WITH MEDICAL AIR ENSURE

Only through standardised filtering and drying, compressed air becomes an approved medical product. The Dräger Medical Air Ensure (MAE) reliably fulfills this task. The certified conditioning unit is a modern compressed air purification device that meets international requirements and allows for safe mechanical and hygienic operation of the system. The MAE has also been proven to cope easily with high pollution of the surrounding air. Keeping within the limit values under real conditions was carefully tested in the laboratory. The MAE sets standards with regard to energy efficiency as a result of precise design and dimensioning to fit the compressor system, individual adaptation to environmental conditions, and an outstanding ratio of performance to energy usage.

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CONTINUOUS MONITORING WITH MEDICAL AIR GUARD

The Medical Air Guard (MAG) continuously monitors the purity of the medical compressed air in line with the European Pharmacopoeia. Thanks to the proven Dräger sensor technology, gaseous impurities, oxygen content, dew point, and volatile organic compounds (e.g. oil vapours) can be measured precisely. This way, even a brief entry of contaminants can be discovered reliably. The system automatically sets off a warning as soon as a limit value is exceeded. All measurements and alarms are displayed on the device itself and can be made available for further evaluation by means of an interface. This allows for seamless documentation of the compressed air quality in your hospital.

D-796-2016



OPTIMAL OVERVIEW WITH THE GAS COMMUNICATION COCKPIT – GCC 1000

With the Gas Communication Cockpit – GCC 1000 you also get an optimal overview of the quality of the medical compressed air outside of the central compressed air system. Alarms and measurements stemming from the Medical Air Guard or any other medical air system component are clearly visualised on an 8.4-inch touch panel. In addition, the integrated web interface offers supervisors the capability of accessing all data from anywhere. This allows them to react faster to possible crossing of parameters prescribed for the quality of compressed air. Data loggers and additional communication interfaces complete the system and help to ensure security in the supply from the medical compressed air installation. Likewise, they optimise the hospital's alarm and emergency management.

Dräger medical air systems for hospitals: The right choice to be safe

A lot relies on the compressed air system: not only the well-being and the life of your patients, but also your hospital's efficiency and energy footprint. Count on Dräger solutions to ensure optimal quality, safety, and efficiency in patient care.



The medical compressed air system is the foundation of your hospital's ventilation system. It supplies your patient with vital air for breathing, it is indispensable for anaesthesia, and it drives surgical tools in the operating room. Successful patient therapy, as well as the efficiency of your hospital, depend heavily on the reliable and efficient operation of your compressed air system.

Play it safe with Dräger in every respect. With our systems know-how and high quality standards, we can ensure a smooth and uninterrupted compressed air supply under any circumstances. The most modern components and systems for production, cleaning, and monitoring ensure the high quality of medical compressed air and adherence to valid standards and value limits. Our service team is quick to respond any time to support you comprehensively on site.

You can rely on Dräger's wide experience and expertise. We offer you all the services that go with the supply of medical compressed air for your hospital: from demand-oriented planning, through installation, commissioning, and maintenance. Our innovative and comprehensive solutions stand for the highest levels of supply safety, flexibility and efficiency. They present the optimal prerequisite for successfully addressing your central issue: the life and well-being of your patients.

THERE ARE GOOD REASONS TO CHOOSE DRÄGER:

- **Over 50 years' experience** in the planning and construction of medical compressed air systems
- **Comprehensive systems expertise** ensures smooth interaction between all components
- **Extensive clinical applications knowledge** ensures optimal, application-oriented planning and design of our systems
- **Comprehensive solution from one source** from consultancy to planning, through assembly and approval right up to first commissioning and maintenance
- **Highest supply reliability** through consistent quality and risk management as well as high quality and safety standards

Dräger – compressed air systems:
your project is in good hands.



Contact us!

We will be glad to advise you in detail on medical compressed air systems. We look forward to hearing from you!

Further Information and the location of the Dräger partner nearest you can be found at:
www.draeger.com



Also take advantage of our product related information material such as system brochures, product catalogues, and planning documents. The Dräger partner nearest you will be glad to be of service.

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