



Anesthesia as advanced as your MRI

FABIUS® MRI

The MRI challenge



Flexibility is a great thing. In the proper setting, flexibility can help save both time and money, helping to improve overall efficiency. Every now and then, however, the need for a dedicated solution arises. Some applications are so demanding, so specialized, that they require a solution that was designed solely to serve that special purpose.

MRI is one of those specialized tasks. Restricted access, high throughput, limited space and strong magnetic fields can pose challenging work flow problems. In many parts of the world, hybrid diagnostic/therapeutic suites are emerging as the new gold standard for advanced treatment strategies. When one considers the high cost and complex logistics of building a modern MRI suite, it quickly becomes obvious that there is little or no margin for error. Once you build it, it's pretty much set in stone. It has to be done right the first time.

ANESTHESIA AND MRI

There are many reasons why anesthesia plays such a pivotal role in MRI diagnostics. A significant number of patients are critically ill and require ventilation support during both transport and imaging. Small children and neonates generally require sedation in order to eliminate motion artifacts. Neurosurgeons are now using MRI directly in the operating room to provide integrated planning and guidance for new and complex procedures. Other patients, while otherwise stable, suffer from claustrophobia and can't tolerate the confined conditions inside a tomography unit without sedation. There's no doubt: to get the most out of any MRI diagnostic unit, you need integrated anesthesia. But the question remains: Is your anesthesia workstation up to the challenge of the MRI environment?

ADVANCED ANESTHESIA

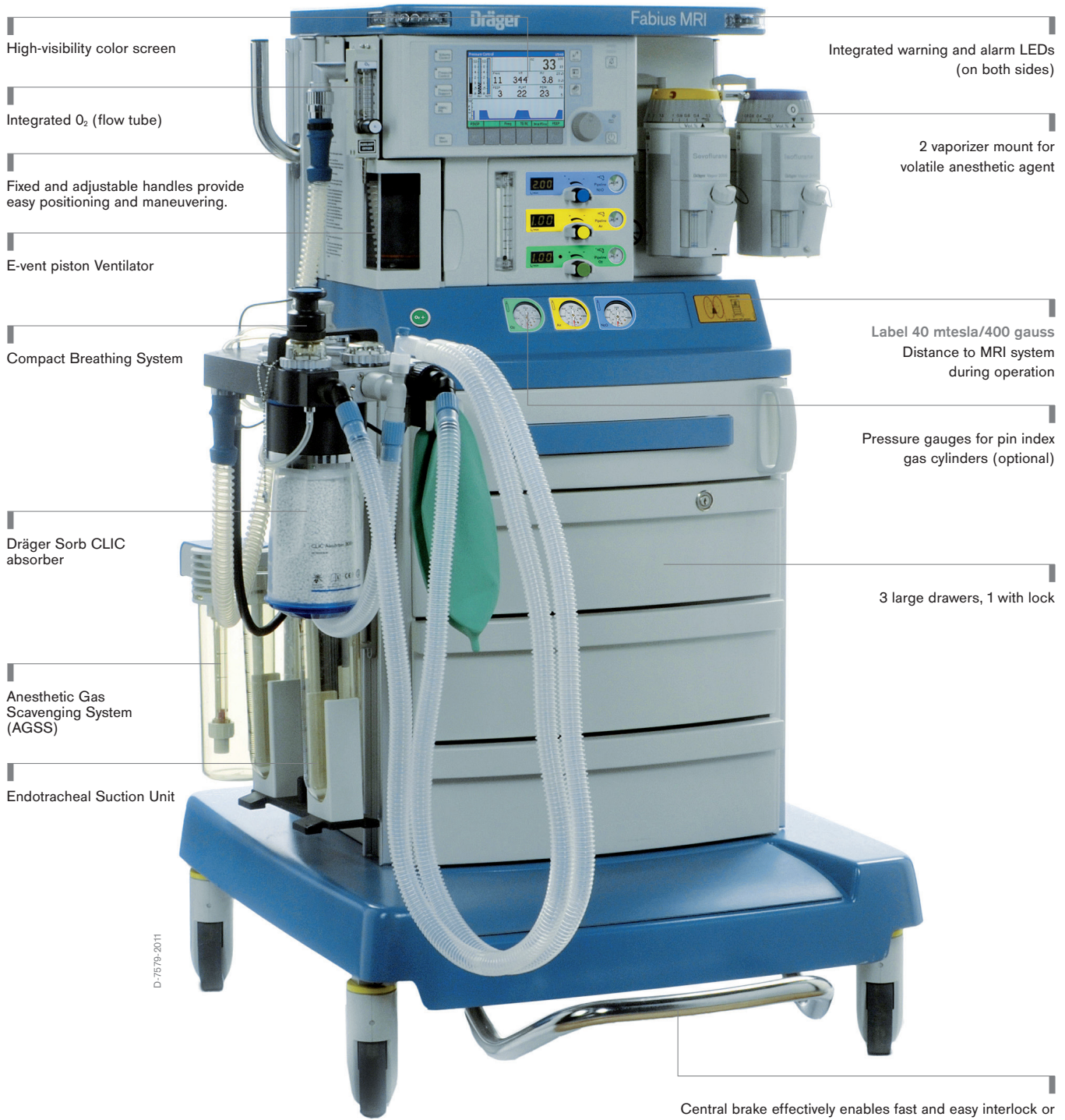
FOR ADVANCED APPLICATIONS: THE FABIVS MRI

The Fabius MRI features our high-precision E-Vent piston ventilator technology, renowned for both performance and safety. Its electronically controlled, electrically driven ventilator requires no drive gas, making it particularly well suited for the typical MRI environment. The Fabius MRI puts all the major ventilation modes at your fingertips, from volume and pressure controlled, pressure support and SIMV/PS. It lets you ventilate with ICU-like performance, providing enhanced safety, confidence and control and is equally suited for adult, pediatric and neonatal patients. With advanced features such as dynamic compliance compensation, fresh gas decoupling and a pop-up APL release valve, you can rest assured that ventilation is gentle, safe and precise. With its leak-tight breathing system, you can even use the Fabius MRI for low flow anesthesia. But that's just the beginning. To make the Fabius MRI the ventilator of choice for MRI applications, it's been engineered and built especially for use in powerful magnetic fields. In fact, the MR conditional Fabius MRI has been tested for use with MRI systems of 1.5 and 3 Tesla and can be safely operated at field strengths of 40 mtesla (400 gauss) from the tomography unit. This puts an end to extra-long breathing circuits with all the compliance and dead space issues involved. Now you can perform valuable diagnostics with enhanced confidence and safety.



MADE WITH ERGONOMICS IN MIND

The Fabius MRI doesn't just provide excellent ventilation. It was also designed to enhance your workflow. A large, high-visibility color screen keeps you informed on patient and ventilator status even from a distance. Integrated warning and alarm LEDs provide additional visual support. The intuitive menu structure and the familiar, 3-step Dräger operating philosophy – select, adjust, confirm – will move you almost effortlessly through its systems. Three large drawers built in to the trolley provide ample storage space for additional equipment and consumables. The external COSY breathing system features a simple design with very few parts for easy assembly and cleaning. It can be mounted on either side to precisely complement your individual needs. Equipped with our standard CLIC absorber, you can change soda lime canisters quickly and cleanly with no interruption of operation.



High-visibility color screen

Integrated warning and alarm LEDs (on both sides)

Integrated O₂ (flow tube)

2 vaporizer mount for volatile anesthetic agent

Fixed and adjustable handles provide easy positioning and maneuvering.

E-vent piston Ventilator

Compact Breathing System

Label 40 mtesla/400 gauss
Distance to MRI system during operation

Pressure gauges for pin index gas cylinders (optional)

Dräger Sorb CLIC absorber

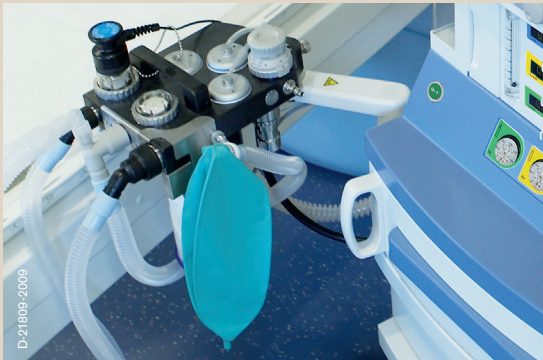
3 large drawers, 1 with lock

Anesthetic Gas Scavenging System (AGSS)

Endotracheal Suction Unit

Central brake effectively enables fast and easy interlock or release for enhanced safety especially in magnetic fields.

D-7579-2011



COMPACT BREATHING SYSTEM "COSY 2.6"

- Clic-Adapter ready (Single use absorber)
- Short, flexible COSY mounting arm for enhanced ergonomics
- Integrated cable management
- Left- and right side mounting possible for optimal adaption and support of your MRI environment



HIGH RESOLUTION TFT COLOR DISPLAY

- Enhanced visibility thanks to optimized brightness and contrast
- A single screen controls all functions and monitors ventilation
- Oxygen monitoring
- Toggle between control and curve screen
- Standard Dräger user interface and operation



2 POWERFUL ADDITIONAL LEDS INTEGRATED IN THE TOP PLATE

- WARNING (yellow-flashing)
- ALARM (red-flashing)
- Visibility from different angles and from a distance e.g. the control room

D-21804-2009

D-21804-2009

D-21795-2009



MRI Suite and control room

The cockpit's view from the operator control area. Everything in view and under control.

WE UNDERSTAND

Over the years, Dräger products have made such an impact on hospital design that it's hard to imagine life without them. The name Dräger stands for quality and innovation the world over. So when you decide it's time to add an MRI suite at your hospital, consider Dräger. We understand the special challenges involved in designing and building an MRI environment. Critical factors such as sufficient shielding, adequate access, ferro-magnetic materials and the need for specialized equipment – anesthesia workstations, monitors and even light bulbs – all have to be taken into account. Architectural considerations for the control room, patient holding area, changing rooms and of course the tomography unit itself have to be carefully thought through in order to achieve the best possible workflow for any given situation. The goal is to create an environment which lets you work smoothly and efficiently in spite of all the restrictions, helping you to get the most out of your suite.

NEW FRONTIERS

Modern advances in medical technology have brought about changes in medical philosophy. In many disciplines, the line between diagnostics and therapy is slowly disappearing. So-called "hybrid suites" or "hybrid theatres" are beginning to emerge as the method of choice to provide integrated high-resolution imaging and precision therapy in a single package. Here too, Dräger can assist you with both the technology and the know-how to create just such a solution for your hospital.

Anesthesia as advanced



Induction Room
Induction of anesthesia in a patient before entering the Neurosurgical MRI-OR

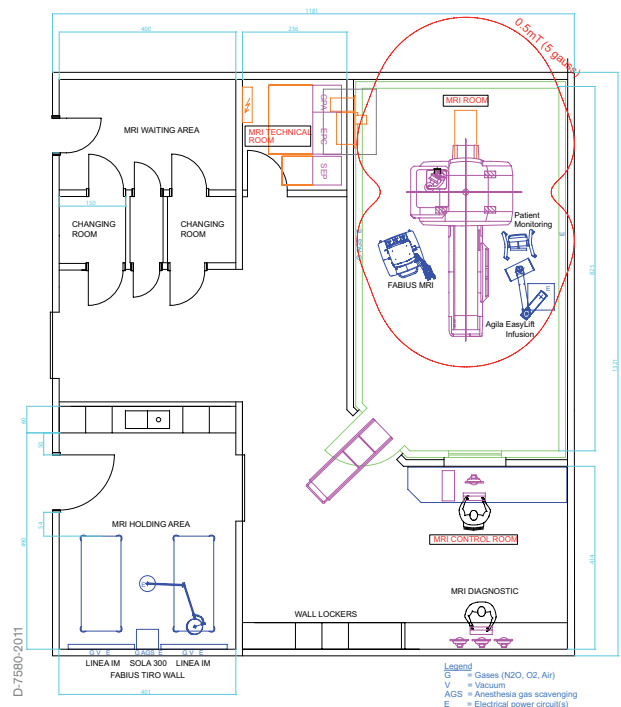


Patient transport
Transport patient into the MRI-OR

SPACE PLANNING IN THE MRI ENVIRONMENT

Today, the framework for anesthesia in the MRI environment is quite different from that found in the operating room. Anesthesia management for MRI doesn't just involve simply duplicating comparable operating room requirements. Instead, its workflow design includes a dedicated space for patient pathways (this applies in particular to intensive care patients) which allows for proper patient care depending on the individual conditions and challenges involved. For this reason, a comparable space reserve and at least the device assembly space available in an operating room area have to be taken into account. In addition to the separate areas for patient preparation and recovery, the design of the transport path to the MRI must be barrier-free. The most direct access possible, as well as the paths between the rooms (e.g. preparation room, MRT room, recovery), which are generally separated by sliding doors, must be designed to accommodate patients on transport stretchers.

Further information regarding space planning and planning support can be found in the separate product information brochure for space planning in MRI environments.



as your MRI



Neurosurgical MRI-OR
Anesthesia maintenance phase. Patient monitoring during MR sequences
(Anesthesia Device, Patient Monitor, Syringe Pumps)



Anesthesia maintenance phase
Fabius MRI in use during neurosurgery procedure.

DRAWING ON A WORLD OF KNOWLEDGE

To do this, we not only rely on our own extensive experience. We also draw on the expertise of strong partners who specialize in patient monitoring and infusion technology for MRI environments. We work together closely with architects and contractors to develop a highly efficient and ergonomic design that is best suited to your individual needs.

By taking advantage of a dedicated MRI solution, you can increase your overall efficiency by reducing transfer and setup times in the MR room. The time you save here can be put to better use – performing diagnostics.

PUTTING IT ALL TOGETHER

Let Dräger help you plan, build and run the MRI solution that's right for you. It's an investment in the future you won't regret. Our representatives will be happy to show you the most efficient and effective answer to your MRI challenge.





**NOW MAKE THE RIGHT CHOICE FOR SERVICE:
DRÄGERSERVICE®**

DrägerService offers a wide range of flexible service options which you can select and combine to meet your individual needs – from technical support to complete, fixed-budget service contracts. Remote Service solutions offer additional potential to improve the uptime of devices.

Accessories & Consumables

A wide array of MRI conditional accessories and consumables are available to choose from, giving you the possibility to tailor the Fabius® MRI to create exactly the anesthesia solution you need:



D-559-2009

VentStar® MRI 300

Disposable breathing circuit, consisting of 2 smoothbore hoses, Y-piece and LuerLock elbow.

Suitable for use in MRI environment.

Length:
300 cm (118 inch).

Latex free.



D-34434-2009

VentStar® MRI (N) 300

Disposable neonatal breathing circuit, consisting of 2 smoothbore hoses (Ø 10 mm), angled Y-piece with LuerLock.

Suitable for use in MRI environment.

Length:
300 cm (118 inch).

Latex free.



MT-2667-2004

Spirolog® Flowsensor

Spirolog Flowsensor is a hot-wire sensor for measuring volumetric gas flow delivered by Dräger anesthesia devices and ventilators.



MT-2004-2008

CLIC Absorber 800+

Disposable CLIC Absorber 800+ is filled with Dräger sorb 800+, 1.2 l (42.2 fl oz.).

TECHNICAL DATA

BASE UNIT

Trolley Version (Cart) with COSY

Fabius MRI Trolley (with COSY)

POWER AND BATTERY BACKUP

Power Input

Dimensions (W × H × D): approximately 39 × 55 × 35.5 in. (99 × 140 × 90 cm)

Weight and load without supplementary cylinders and vaporizers: 365 lbs. (165.8 kg)

Operation time with fully charged batteries

100 to 240 VAC, 50 / 60 Hz, 70 VA, including additional power outlets

> 45 min

ANESTHESIA GAS SUPPLY MODULE

Range of fresh gas flow indicators

0.0 to 12.0 L/min

Total fresh gas flowmeter

0 to 10 L/min

O₂ flush

at 87 psi (6 bar): max 75 L/min; at 41 psi (2.8 bar): min. 25 L/min

Vaporizer

2 position Dräger mount (Interlock 2 - System): Dräger Isoflurane Vapor 2000, Dräger Sevoflurane Vapor 2000, Dräger Halothane Vapor 2000, Dräger Enflurane Vapor 2000

VENTILATOR OPERATING SPECIFICATIONS

Ventilator E-vent®

Electronically controlled, electrically driven

Operating modes

Volume Controlled Ventilation, Pressure Controlled Ventilation, Pressure Support, SIMV/PS, Manual Ventilation, Spontaneous Breathing

CONTROL INPUT RANGES

Breathing Frequency (rate)

4 to 60 bpm

Positive End Expiratory Pressure (PEEP)

0 to 20 cmH₂O (hPa)

Inspiration/expiration ratio (Ti:Te)

4:1 to 1:4

Pressure limiting (Pmax)

15 to 70 cmH₂O (hPa)

Tidal Volume (Vt)

20 to 1400 mL in Volume Control, 20 to 1100 mL in SIMV/PS

Inspiration pause (Tip:Ti)

0 to 50 %

SIMV Inspiratory time

0.3 - 4.0 sec

Inspiratory pressure (Pinsp)

PEEP + 5 to 65 cmH₂O (hPa)

Inspiratory Flow (InspFlow)

10 to 75 L/min in Volume and Pressure Control modes, 10 to 85 L/min in Pressure Support and SIMV/PS modes

Pressure Support Level (PPS)

PEEP + 3 to 20 cmH₂O (hPa)

Min. frequency for apnoe-ventilation (Freq. Min.)

3 to 20 bpm and "OFF"

Trigger level

2 to 15 L/min

Integrated Safety Functions

Sensitive Oxygen Ratio Controller (S-ORC) ensures a minimum O₂ concentration of 23% in an O₂/N₂O mixture. N₂O cut-off if O₂ fresh gas valve is closed or if O₂ flow is less than 0.2 L/min. Audible and visual (flashing red LED) indication in case O₂ pressure drops below 1.38 bar (20 psi) ± 0.27 bar (4 psi). In case of electricity and battery failure, manual ventilation, gas delivery and agent delivery are possible. Positive pressure relief valve opens at 75 ± 5 cmH₂O. Negative pressure relief valve opens at -7.5 to -9 cmH₂O.

VENTILATOR MONITORING

Monitoring

Continuous monitoring of inspiratory O₂ concentration, breathing frequency, tidal volume (expiratory), minute volume (expiratory), peak airway pressure, PEEP, and selection of mean or plateau pressure. In addition, all fresh gas flow information is displayed as virtual flow tubes.

Expiratory Minute Volume range

0 to 99 L/min

Control Screen

6.5 in (16.5 cm) color screen

BREATHING SYSTEM AND GAS SUPPLY

Volume of entire compact breathing system

1.7 L + bag

Volume of CO₂ absorber

1.5 L (standard) [option: Prefilled Dräger Sorb CLIC absorber with 1.2 Liter]

Gas Supply

O₂, N₂O and Air

Cylinder Yokes

Pin Index

OTHER

Writing surfaces

Pull-out tray (standard)

Additional accessories

Secretion suction, anesthetic gas scavenging system

CORPORATE HEADQUARTERS

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