

White paper

Healthcare systems in flux: MAGNETOM Free.Max presents opportunities in the face of increased cost pressures

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Contents

Introduction	2
Infrastructure radically simplified	3
MAGNETOM Free.Max provides a cost-effective platform	4
Intuitive operation for streamlined workflows	4
Intelligent service innovations for maximized productive up time	5
MAGNETOM Free.Max can serve as a differentiator in your local market	6

Introduction

Healthcare economics is changing worldwide. Increasing cost pressures have only been amplified by the current global pandemic. As a result, radiology providers around the world need to rethink how they deliver services to drive a successful and profitable business, while maintaining high quality care for the patient.

MAGNETOM Free.Max breaks new ground by improving the overall economics of MR imaging and therefore offers great opportunities within the changing healthcare environment. The following paper provides a concise overview of the variables that influence the lifecycle costs of an MRI scanner and the innovations that MAGNETOM Free.Max introduces to positively impact its lifetime.

The lifecycle costs of an MRI scanner fall into four categories:

- 1 Installation** describes all costs that are associated with siting and installing an MRI. This includes costs related to logistics, room preparation, and general infrastructure adaptations to ensure adequate supply of electricity, water, etc.
- 2 Product** describes the cost directly associated with the purchase of the MRI scanner. The cost of an MRI traditionally scales up with the magnetic field strength and the feature scope.
- 3 Operations** refers to all costs along the course of the lifecycle that are required to operate the MRI scanner. This includes staffing, utility cost, floorspace rental, and others.
- 4 Service** refers to the costs associated with maintaining, updating, and repairing the MRI scanner over the ownership lifecycle. Given that an MRI scanner is a very complex and sophisticated piece of technology, it is economically beneficial to cover those costs through a service contract in order to enable maximum system uptime and mitigate associated risks for the business.

Each of these lifecycle cost categories must be considered when optimizing the overall MRI business case. The new MRI scanner MAGNETOM Free.Max from Siemens Healthineers introduces numerous

innovations that help drive down many of these costs. In the following, those features and their positive financial impact on MRI lifecycle will be described.

Infrastructure radically simplified

MAGNETOM Free.Max offers multiple innovations that help reduce the cost of installation. It sets a new benchmark regarding the footprint of superconducting whole-body MRI scanners with a minimum required space for the entire MRI suite of just **23 m²** and a scanner weight **below 3.2 metric tons**. In comparison with a conventional MRI¹ this translates into **18% less space** and **23% reduced weight**. And it results in savings for the calculated rent as well as potential savings for the structural reinforcements that are frequently required when installing conventional MRI equipment on non-ground floors. Furthermore, with a transportation height of **below 2 meters**, existing corridors and doors within the building can be used. This can considerably reduce the efforts and costs of moving the equipment to the target destination in comparison with conventional MRIs.

In addition, MAGNETOM Free.Max is equipped with **DryCool technology**, an innovative sealed-for-life magnet design, that operates on only **0.7 liters of liquid helium**. This technology eliminates the need for additional helium infrastructure, including the cumbersome installation of a quench pipe. For conventional MRIs that operate on hundreds of liters

of helium, a quench pipe is needed to safely expel the helium out of the building. This can become necessary in emergency cases where the magnet needs to be shut off instantly. The complexity and costs that a quench pipe implies for siting are therefore eliminated from the lifecycle cost equation with MAGNETOM Free.Max.

DryCool technology also removes the risk of costs resulting from such an unlikely, yet possible magnet quench. For conventional MRI scanners without DryCool technology, a quench typically has a significant financial impact caused by the subsequent lengthy scanner downtime. This is linked to the time required for the helium refill and reimbursement shortfalls caused by the rescheduling of patients or if patients simply choose other MRI providers in the meantime.

With DryCool technology, the financial consequences of such a quench are substantially reduced as the magnet can quickly and automatically be ramped up again after the emergency has been resolved, as the 0.7 liters of liquid helium always remain in the magnet. The entire process takes less than a day without any further costs.

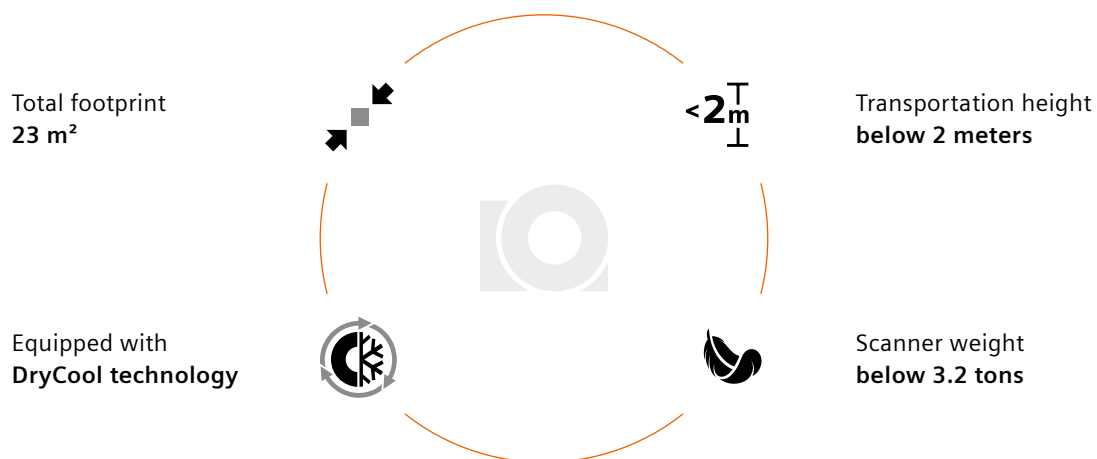


Figure 1: MAGNETOM Free.Max radically simplifies infrastructure requirements for MRI.

MAGNETOM Free.Max provides a cost-effective platform

In the lifecycle cost equation, the largest capital expenditure is the MRI system itself. MAGNETOM Free.Max establishes a new standard in diagnostic imaging with **High-V MRI**. By combining the latest innovations in the field of image processing with a new field strength of 0.55T, High-V MRI not only opens new clinical opportunities, but also breaks new ground in affordable

MRI. Given that the product investment primarily scales up with the magnetic field strength, MAGNETOM Free.Max represents a very cost-effective technological platform with High V MRI. Financially, this translates into a very viable product investment with a positive impact on lifecycle costs.

Intuitive operation for streamlined workflows

The largest operational costs of MRI are the personnel expenses of MRI technicians. This is entirely justified as healthcare professionals play a pivotal role in providing high quality care to patients. MAGNETOM Free.Max supports the operator in this crucial task by assisting with intelligent and AI-based scan automation for consistent high quality results. With **myExam Companion**, which includes the highly automated **myExam Autopilot**, we enable even novice users to perform routine MRI scans with excellent quality and efficiency.

Flexibility in operations is further enhanced by tight integration with **syngo Virtual Cockpit** offering remote scan assistance from wherever and whenever needed. The operational and financial impact of these workflow innovations are significant: from avoidance of rescans to increased productivity along with new and flexible possibilities to optimize staffing. The workflow innovations of MAGNETOM Free.Max are designed to support new operational models to deliver high quality results at lower costs.



Figure 2: myExam Autopilot offers a highly automated and intuitive scan workflow for routine examinations.

Intelligent service innovations for maximized productive up time

Over the equipment lifecycle, servicing an MRI system represents a substantial portion of the total costs. MAGNETOM Free.Max is complemented by innovative service offerings from Siemens Healthineers. These offerings leverage an increased degree of scanner connectedness to provide a more comprehensive service. The new architecture of MAGNETOM Free.Max allows continuously monitoring of the most important scanner parameters and components through the **Guardian Program**.

As a result, potential malfunctions can be resolved ahead of time, sources of errors can reliably be detected remotely, and proactive measures can be initiated to safeguard scanner availability. Together, these intelligent and proactive service capabilities of MAGNETOM Free.Max lead to increased scanner uptime and allow Siemens Healthineers to provide a more efficient service.

Through unique innovations that reduce the lifecycle cost of MRI, MAGNETOM Free.Max expands the potential accessibility of MRI for healthcare providers.

Lifecycle cost

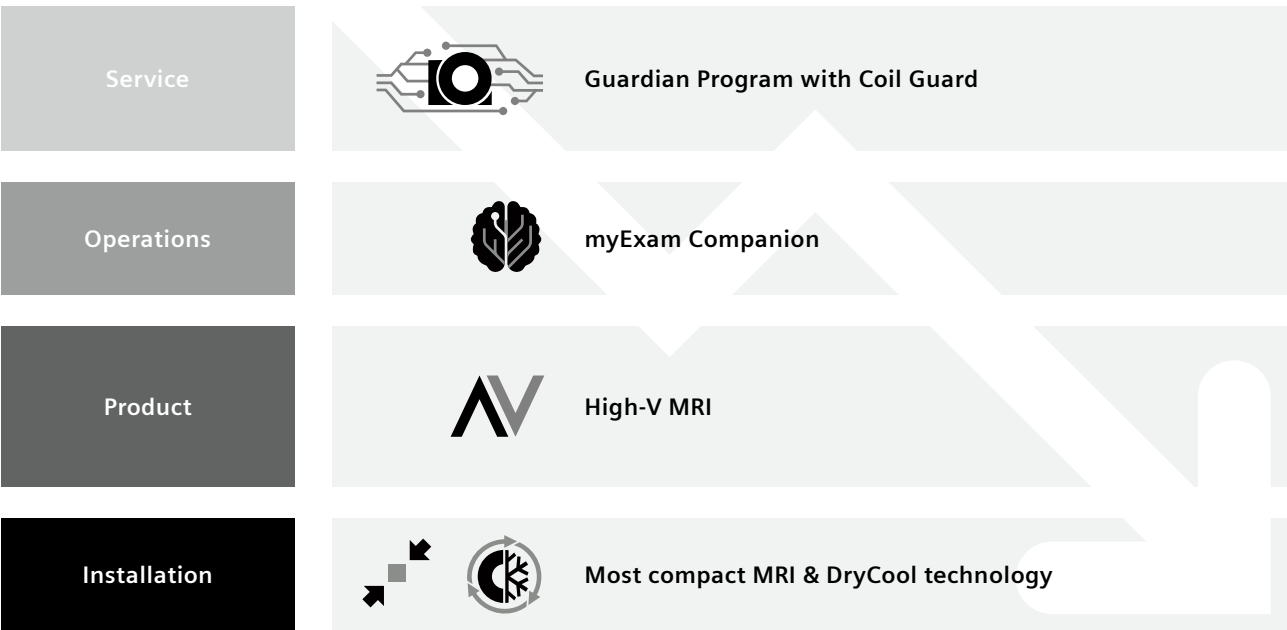


Figure 3: MAGNETOM Free.Max introduces comprehensive innovations that significantly reduce the lifecycle costs of MRI.

MAGNETOM Free.Max can serve as a differentiator in your local market

Besides the cost reductions described above, MAGNETOM Free.Max also offers opportunities to positively differentiate your institute as the provider of the best patient experience in your community.

MAGNETOM Free.Max introduces the world's first 80 cm patient bore, which significantly improves patient comfort and accessibility. This unique feature caters for patient populations that cannot be addressed with conventional MRIs: claustrophobic patients who cannot tolerate the limited space of smaller bore sizes or bariatric patients who also require more space. The first 80 cm patient bore worldwide provides a great opportunity to serve these patient groups and advertise this capability accordingly.

In addition, MAGNETOM Free.Max with High-V MRI and its unique field strength of 0.55T provides inherent physical benefits that support new clinical application fields. The characteristics of High-V MRI allow for improved image quality in both implant and pulmonary imaging in comparison with higher field strengths. This opens up new opportunities



Figure 5: A new paradigm in pulmonary imaging with High-V MRI.

for the clinical use of MRI and accordingly can have a positive impact on the viability of the business case.

In summary, MAGNETOM Free.Max provides added value in the MRI business case, both from a cost and a revenue perspective. Therefore, MAGNETOM Free.Max offers great opportunities to improve the accessibility of MRI as healthcare systems face increased cost pressure.



Figure 4: The world's first 80 cm patient bore.

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¹ MAGNETOM Altea.

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