

Our Connected Scanner is a Smart Deal: You Care for Your Patients, We Stay Connected to Care for Your MAGNETOM Free.Max

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We are breaking the accessibility barriers thanks to our new scanner design with its light weight, excellent diagnostic image quality, improved remote connection support, and greater sustainability. Almost everything has already been said about MAGNETOM Free.Max, but not quite everything. That's why, today, we are making it about service, and our disruptively innovative approach to how we deliver service. In other words: Why our connected scanner approach is the final touch for your new scanner.

New service features for more MRI affordability and availability

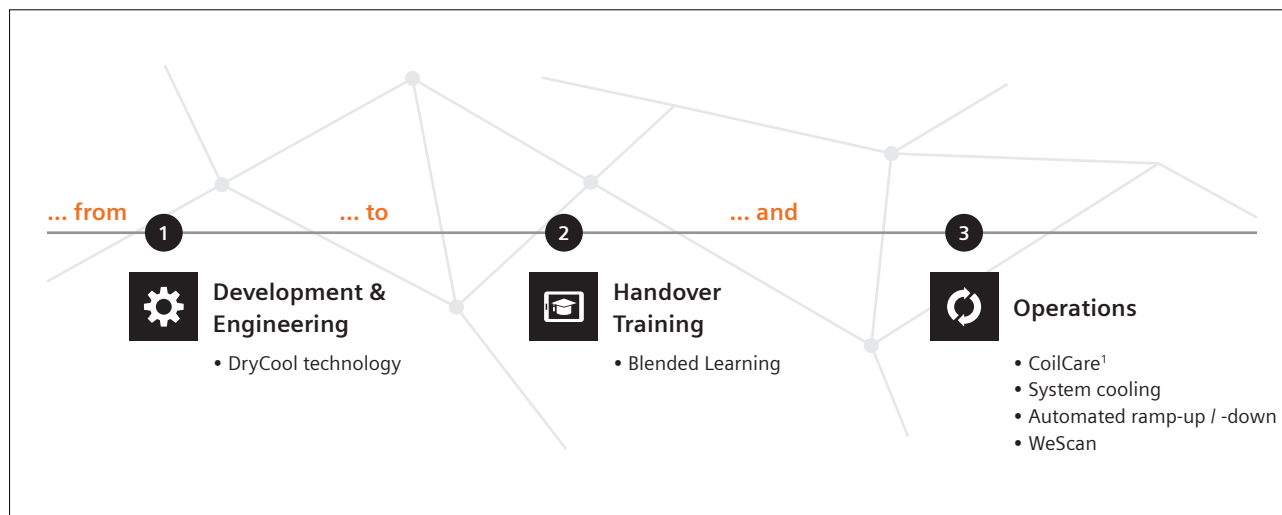
Since day one of the design and development of MAGNETOM Free.Max, our Siemens Healthineers Customer Services (CS) teams have been on board, creating a fitting new service concept. We have worked continuously on numerous cutting-edge innovations, starting with the development and engineering of the scanner itself (1),

moving on to handover training (2) and operations (3). With service in mind, our connected scanner approach accompanies you each step of the way, while reducing the total life cycle cost, and increasing the uptime of MAGNETOM Free.Max. These two keywords, life cycle cost and uptime, ultimately lead us to the topic of remote accessibility, and to the system's service portal. This feature is crucial for troubleshooting current issues and trending parameters to predict future failures, all with one goal in mind: Improving operation.

Development & Engineering

DryCool technology

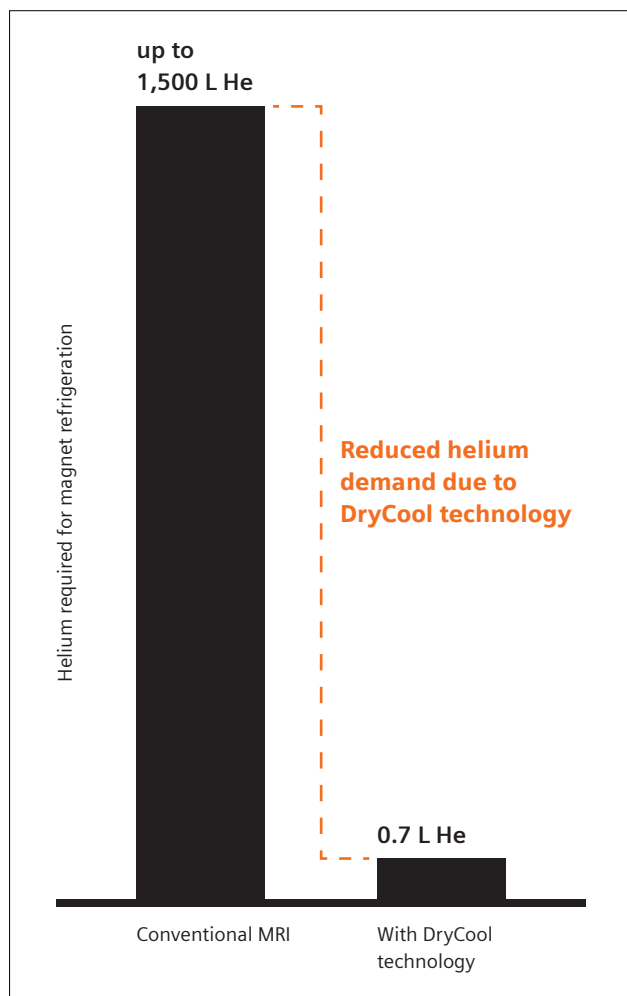
Just like previous MRI scanners from Siemens Healthineers, MAGNETOM Free.Max also uses a superconducting magnet to create the main magnetic field. But, and this is an important but: The magnet and the water cooling design



1 Our new Service concept accompanies each step of the entire equipment life cycle.

have been significantly changed, impacting the way it is serviced throughout its life cycle. Instead of having the coils inside a large helium vessel containing up to 1,500 L of liquid helium (He), they are cooled by conduction to a small helium pot that only contains 0.7 L of liquid He – which means an enormous 99.95% reduction.

The big advantage now is that you only need helium gas to fill the system and no longer depend on liquid helium, which is excellent news for geographical regions where supply of helium is limited. Once the helium refrigeration system is turned on, it cools and condenses the helium gas into liquid. Further, the system is equipped with a buffer tank that stores helium gas, which occurs during the ramp-down of the magnet, for instance. Designed as a self-contained system, all helium remains in a closed cycle and is reused to cool down the magnet again. And last but not least, no quench pipe is needed, which simplifies the site requirements significantly.



- 2** MAGNETOM Free.Max DryCool technology allows you to run your MRI system with just a small fraction of the standard volume of helium – 99.95% less than conventional MRI scanners.

Handover Training

Blended Learning

When it comes to handover training, we support you with an optimal mix of online training formats and onsite hands-on experience, especially designed for MAGNETOM Free.Max. On the one hand, our digital training portfolio is complemented by our online education experience, PEPconnect, which enables basic learning on user interfaces (UI), workflows, postprocessing, and more. On the other hand, our new SmartSimulator performs cloud-based simulation training for software applications and workflows. Therefore, you are given access to a simulator that allows your staff to practice in a safe environment, on a simulator that replicates the same system used in your clinical routine.

The big advantage is that you benefit from practical, highly flexible, and interactive training without the time-consuming interference in the daily routine of your scanner and without compromising on quality [1]. The most suitable content, level of detail, and duration is defined by your individual needs. Training can be started in tandem with the installation, and operations can smoothly begin directly after the handover of the scanner.

Benefits of Blended Learning:

- Access the training material earlier, even before the system delivery
- Learn more flexibly, at the time, location, and pace that suits you best
- Pre-onsite steps, performed via PEPconnect and SmartSimulator, provide you with an early insight into a wide range of topics, available for various levels of experience and interests
- Additional clarification of topics that require more detailed explanation
- Getting the best out of the onsite training and maximizing focus
- Continuous education during the entire life cycle of the system

We do not leave after training is finished. We always stay by your side while you're working with your MAGNETOM Free.Max, accompanying your journey with remote monitoring and companion services.

¹This solution is under development and not yet commercially available. Its future availability cannot be ensured.

"I think the simulator was excellent, and it was good to get some hands on practice. [...] I think a blended approach to learning is good to ensure that all learning styles are catered for. After the training we received I did feel well prepared for the on-site applications training."

Liz Loele, Clinical Lead MRI, Cobalt Health, UK³

In Operation

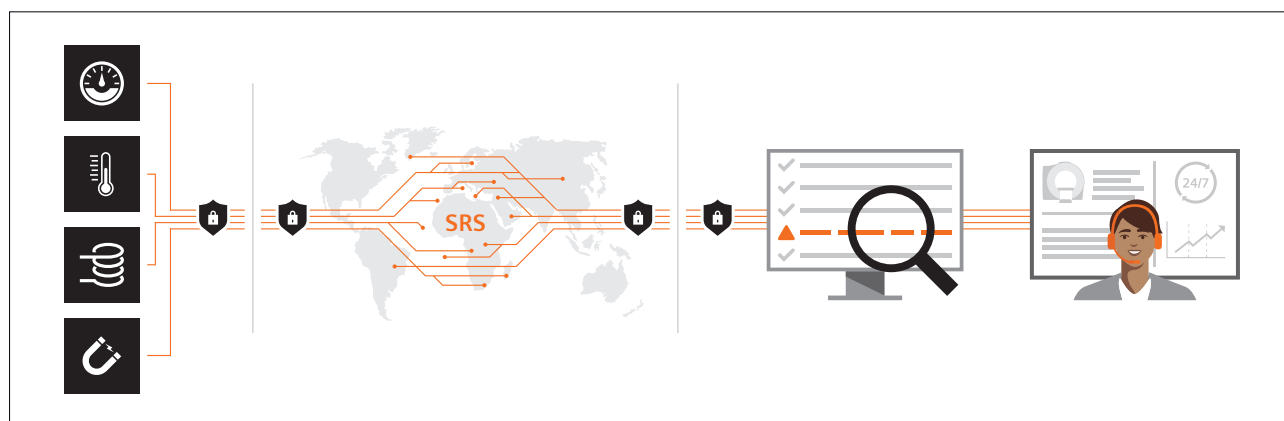
CoilCare¹

Tried and tested for MRI with our Guardian Program we predict possible failure through proactive, real-time, AI-based analysis, monitoring all critical components to increase your MRI uptime. With CoilCare, we now dive even deeper: Connected to your scanner day and night, seamlessly integrating into your daily clinical routine, we monitor and oversee your entire scanner system – from the magnet to crucial system parameters, including temperature and pressure, the cooling chain, and even your local receiver coils. For the latter, we also use machine learning and neural networks-based algorithms, to constantly monitor their performance and quality, identifying any event

before it occurs. You can just sit back and rely on our technology and services, take care of your patients, and achieve excellent and reliable image quality and clinical results. Used with MAGNETOM Free.Max, CoilCare allows even more precise detection of errors by continuously monitoring 50 trend parameters².

²Fifty trend parameters including temperature, voltage, water pressure, and humidity of subcomponents, e.g., magnet, patient table, cooling system, gradient component, or GPA gradient power amplifier.

³The statements by customers of Siemens Healthineers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.



3 We have developed different service features that keep the critical components of your MAGNETOM Free.Max running smoothly over their entire life cycle.

Benefits of CoilCare:

- Machine learning and neural networks-based algorithms
- Monitoring and analysis of local coils performed several times a day
- Enables reliable usage of scanning system without downtime
- Self-learning and intelligent system

System cooling

Redesigned, making the cooling chain even more effective. This is exactly what we did with the cooling system needed for MRI components such as power amplifiers, compressors, and gradient coils. We now offer an indoor unit which combines the cabinet's air conditioning and water separator functions. A 50 L expansion vessel is fitted to compensate for unavoidable water leaks in the cooling system, such as those through bearings. An optional set of two outdoor units can be fitted to provide cooling for the indoor unit. The advantage of this is that the indoor unit is then independent of the customer's water-cooling circuit. And thanks to this new solution, our Customer Service team can now oversee and monitor the entire cooling chain. In the event of any incidents, we react fast, are solution oriented, and fix errors before they occur. This is of utmost importance for any MRI scanner, but especially for MAGNETOM Free.Max, and it helps improve system availability [2].

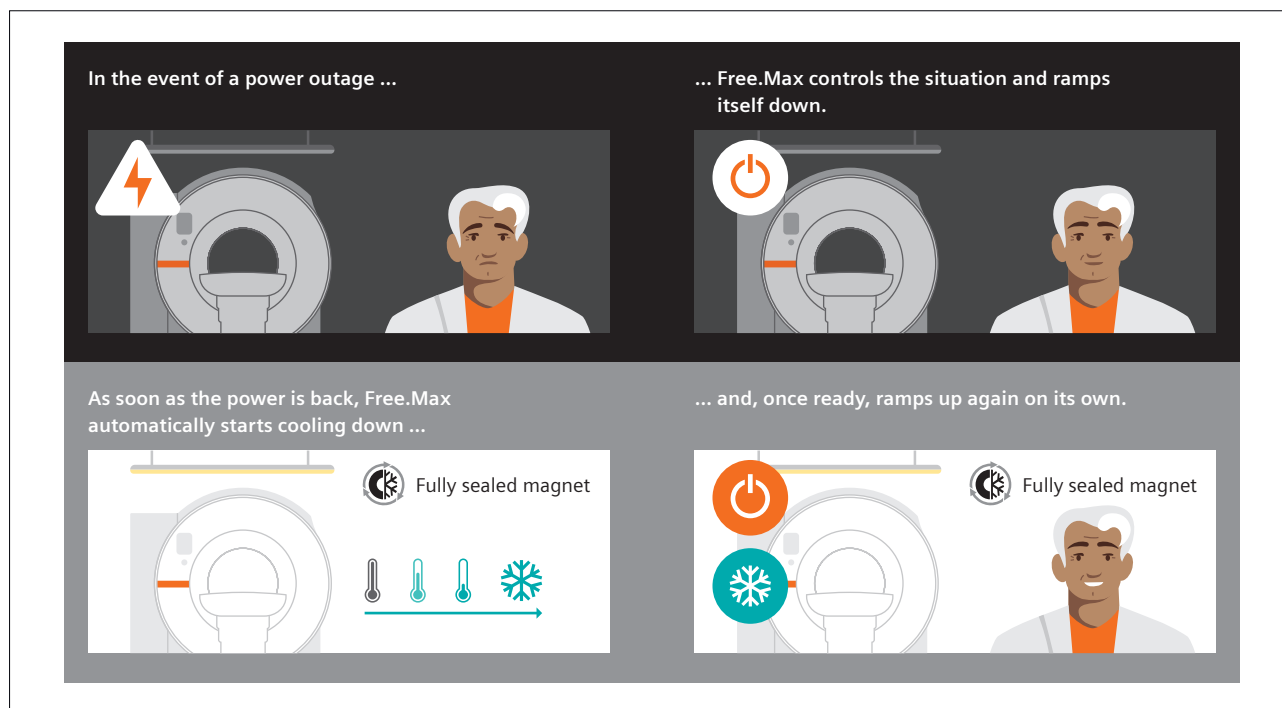
Automated ramping

To support trouble-free operations when you are working with your MAGNETOM Free.Max in your daily routine we have developed an integrated power supply and control enabling automated ramping of the magnet. First, in the event of loss of refrigeration – e.g., due to a power outage – which can, in the worst case, lead to the magnet warming up and quenching, the system starts an automated ramp-down 30 minutes after a refrigeration event is detected. This ramp-down takes 20 minutes and prevents the magnet from experiencing a strong heat load. As soon as the refrigeration is reinstated, the system checks remotely that temperatures and other parameters are stable, before automatically ramping up the magnet again. In a nutshell: No user or service engineer action is needed to initiate the process, as MAGNETOM Free.Max performs the ramp-down and ramp-up automatically.

WeScan⁴ Remote Scanning

Many MRI users are currently experiencing a shortage of technologists, making it increasingly difficult for many radiology departments to cover peak periods and non-core hours, such as late night, and weekend shifts. At the same time, staff stress levels are on the rise, which can lead to high staff turnover and quality fluctuations, jeopardizing economic success and reproducibility of high-quality

⁴WeScan is compatible with most scanners from Siemens Healthineers.



4 Always on the safe side: Intelligent automated ramp-down feature acts faster and smarter than any human could in the event of loss of refrigeration.

“With WeScan, we can compensate for staff shortages in a targeted manner and can therefore continue to offer our entire spectrum of MRI examinations at our two sites. Especially in the event of staff changes, as this allows for real planning, security, and flexibility for our technologists and patients.”

Norbert Wilke, M.D., Radiological Center, Höchstadt/Aisch and Nuremberg, Germany³

outcomes. This is why we have developed WeScan: A remote scanning service for MRI systems, also designed to enable serviceability in remote locations. Qualified technologists either offer your onsite staff remote support with scanning tasks or perform the scan themselves. The system is remotely controlled using syngo Virtual Cockpit and Smart Remote Services (SRS)⁵. To sum up: While your staff focuses on the patient onsite, you can request MRI scan support from a qualified remote MRI technologist.

Benefits of WeScan Remote Scanning:

- Easy staff scheduling
- Flexible access to the expertise of remote MRI technologists thanks to remote scanning technology
- Reliable quality
- Higher revenue thanks to the potential to extend services without additional staff

We are by your side whenever you need us, with a smart combination of personal and digital support

We help safeguard your investment: MAGNETOM Free.Max is connected to Siemens Healthineers to deliver the best performance in a smart way. First, the connectivity enables simulations of the workflow – such as initial training – even before the scanner is handed over. In the next step, during operations, the connectivity enables solution-

oriented monitoring of all critical components, while software updates improve the performance and security of your equipment – all to maximize your equipment uptime. And the icing on top of the cake: With our Advance Plan service agreement, you benefit from our continuous, digitally driven, long-term software update and upgrade service and computing hardware replacements that keep your MAGNETOM Free.Max cybersecure,⁶ protecting your patients' data. Our Advance Plans also enable you to benefit from easy access to clinical and digital innovations, keeping users at the forefront of developments.

More convenient, faster, less expensive

We connect to your world to make service easy. Digitalizing healthcare allows us to be right by your side 24/7, making sure your equipment and knowledge are up to date and clinical processes optimized – so you can focus on what really matters: your patients.

References

- 1 Kasap C. Utilizing Blended Learning for Customer Support During the COVID-19 Pandemic: An Experience from the UK and Ireland. [MAGNETOM Flash \(77\) 2/2020: 68-77.](#)
- 2 Biber S. MAGNETOM Free.Max: Keeping a Hot System Cool. [MAGNETOM Flash \(79\) 2/2021: 95-98.](#)

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⁵Smart Remote Services (SRS) is the fast, secure, and powerful data link that connects your medical equipment to our experts, who provide proactive and interactive services that speed up their running operations. To reduce onsite time and improve remote capabilities, Siemens Healthineers Smart Remote Services (SRS) connectivity should be established from day one to increase uptime and reduce service efforts.

⁶Cybersecurity updates are available for latest system software versions. The products/features and/or service offerings (here mentioned) are not commercially available in all countries and are only available for selected CT and MRI modalities. If the services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details. Prerequisites: stable SRS connection with adequate bandwidth.

