



MAGNETOM Family – The Perfection of Care

Safety Information

SIEMENS



Dear Customer,

We, at Siemens, give safety top priority.

This accompanying document is an excerpt from the Siemens system manual to help you understand your MAGNETOM® better. It contains a short summary of the most important safety information and conduct guidelines in the area of the MR system. This document does not replace the system or application manual.

We hope you enjoy working with your MAGNETOM system in an efficient and safe working environment.



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1. Signs



Strong Magnetic Field



Radio Frequency Field



Hearing protection



Laser



No entry to persons with implants which may be affected by electromagnetic fields, e.g. cardiac pacemakers, defibrillators, hearing aids, insulin pumps, medication pumps



No entry to persons with implants made of metal and other metal objects with metallic inside the body



No entry with mechanical watches, electronic data carriers such as pocket calculators, digital watches, etc.



No entry with fire extinguishers with magnetic metallic housing



No entry with metallic parts of any kind, e.g. tools and metallic instruments



No entry with electronic data carriers such as credit cards, identification cards with magnetic strips and/or magnetic tapes



No open flame
Smoking prohibited

2. General safety information

- Ensure that your MAGNETOM system is operated by qualified personnel only
- Provide safety training for your medical and non-medical personnel (e.g. electricians or cleaning personnel) on a regular basis
- Affix clearly legible warning signs in conspicuous locations in the MR area
- Ensure that the boundaries of the exclusion zone (0.5 mT) are clearly visible, e.g. by markings on the floor or barriers
- Immediately report accidents to the proper authorities
- Keep the door to the MR area closed
- In case of fire, remove the patient from the area and call the designated fire department.
- Notify the rescue teams about the hazards in the vicinity of the magnetic field and provide non-ferrous rescue equipment
- Create emergency plans and instruct personnel and rescue teams accordingly
- Ensure the system is serviced on a regular basis by a trained customer service engineer
- Use only MR safe/compatible accessories or software which may not affect the safety of patients, personnel, or the environment
- Always call Siemens Service in the event of an emergency to notify them of the incident
- Cryogen refill may be necessary and must be carried out by authorized personnel



Emergency plan

Emergency plans should be devised and discussed with emergency personnel during a safety briefing.

They should include a code of conduct for possible emergency situations, e.g. fire and quench.

Important points are :

- Emergency phone numbers e.g. fire department, police department, physician, Siemens Customer Service etc.
- Facility layout:
 - Exact location of the MRI system e.g. building and room number
 - Exact location of the emergency switches
 - Exact location of the rescue equipment, e.g. nonmagnetizable fire extinguisher, first-aid kit
 - Access routes for rescue vehicles
 - Escape routes



3. Personal safety information

3.1. Non-medical personnel

(e.g. electricians, cleaning personnel, rescue teams)

- Warning signs must be observed by everyone
- Do not enter the MRI room unless authorized personnel accompany you or authorized personnel have granted you permission
- Use only non-ferrous tools, materials and rescue equipment
- Never use ferrous oxygen tanks

3.2. Medical personnel

(e.g. physician, MRI technologist, nurse)

- Warning signs must be observed by everyone
- Do not enter the MRI room unless you are either accompanied or have been granted permission by authorized personnel
- Familiarize yourself with emergency plans, non-ferrous rescue equipment and the exact location and operation of emergency switches
- All equipment you take into the MRI examination room must be MR safe or MR compatible (e.g. gurney, wheelchair, etc.)

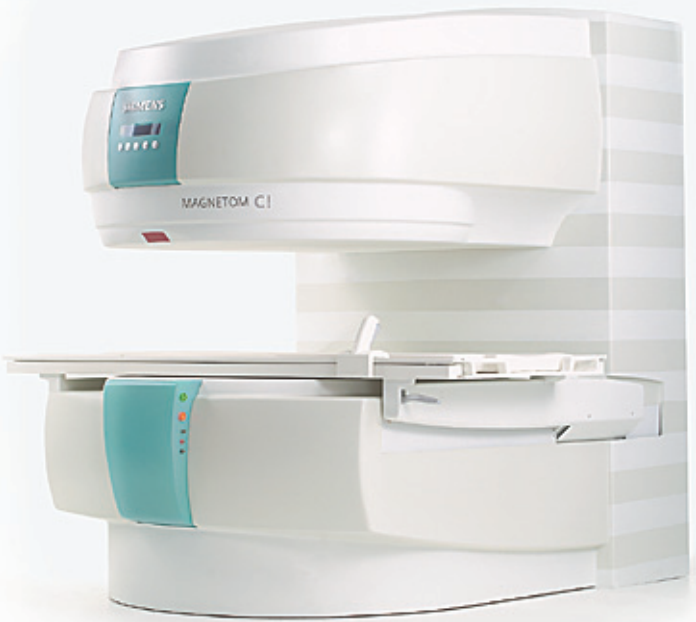
MR safe:

Objects in the MR environment present no additional risk to the patient or other people but may affect the quality of the diagnostic information

MR compatible:

Objects in the MR environment are MR safe and do not significantly affect the quality of the diagnostic information nor is their operation affected by the MR device





CAUTION

- Do not perform an MRI examination
If the patient has metallic and electrically conductive devices or implants that may be affected by electromagnetic fields (e.g. pacemaker, magnetizable aneurysm clips, implanted defibrillator, etc.)
- Proceed with extra caution when examining the following patient groups
 - Claustrophobic patients
 - Children and elderly patients
 - Persons who cannot recognize heat sensations or peripheral nerve stimulation or those who are unable to communicate
 - Unconscious, sedated or intensive-care patients
 - Pregnant women
 - Patients for which the system cannot be operated in the normal operating mode

3.3. Patient screening

- Complete a detailed patient screening questionnaire and have the patient sign it
- Sedated or helpless patients must be accompanied by a trained healthcare professional and receive physiological supervision for the entire duration of the examination
- During patient registration, it is important to record the patient's weight accurately to ensure RF exposure is calculated properly
- Have patients remove all electrically conductive items and pieces of clothing and, if necessary, provide clothing with natural fibers
- Identify tattoos, nicotine patches, cosmetics and cosmetic eyelid surgery





- When positioning the patient, ensure that the arms and legs do not touch
- Use suitable positioning aids
- Ensure that clothing and coils do not protrude from the patient table
- Check proper cable routing
- Provide the patient with appropriate ear protection (headphones or ear plugs)
- Ensure the patient's eyes remain closed during laser positioning
- Provide the patient with a squeeze bulb and instruct him/her about its use
- Keep the intercom switched on during the examination and watch the patient on the monitor

4. Emergency

Familiarize yourself with the location and function of the Emergency shut-down switch, the Magnet Stop button and the Table Stop buttons to be prepared in case of an accident or emergency. This could be part of a safety training.

How to react in the event of an emergency or accident:

- Push the appropriate switch depending on the accident or emergency
- The patient and personnel must vacate the examination room without delay
- Immediately notify the emergency personnel
- When the static magnetic field is still switched on, only use MR-compatible rescue equipment
- Document the accident or emergency
- Notify your service engineer without delay

4.1. Emergency shut-down switch (electrical system without magnet)

This switch disconnects the system from the mains and does not affect the superconductive magnet.

- The appearance and location of this switch varies from site to site



4.2. Patient rescue

For MAGNETOM Harmony, Symphony, Sonata, Allegra and Trio:

In case of an accident or an emergency situation, e.g. heart attack, the tabletop, with the patient still on it, has to be moved out of the magnet bore.

There are several ways of stopping the motorized movement of the patient table:

- Press either the red Table Stop button on the intercom (outside the examination room) or the Table Stop button on the control panel (inside the examination room)
- The table can now be moved manually using the handle at the foot end



Table Stop button on the intercom



Table Stop button on the control panel

Note: For MAGNETOM Avanto, Espree, Trio with Tim and all systems equipped with Tim Technology, a different emergency unlocking procedure must be carried out!



Home Position button on the control panel

In case of **intact power supply and/or drive** press the Home Position key.

The tabletop moves completely out of the magnet and you can rescue the patient.

In case of **power failure and/or malfunctioning of the motorized drive** you have to release the emergency unlocking device to reduce the force required to move the table manually.

Release handle always on the left side of the patient table



Release handle

Reset button



- Pull the release handle all the way up until it locks
- The Table Stop button on the control panel will light up
- Pull the tabletop manually out of the magnet bore, using the handle at the foot end of the tabletop

When the hazardous situation no longer exists reset the emergency unlocking device:

- Press the reset button on the release handle
- The release handle snaps back into its original position
- Move the table manually in either direction until it locks into place
- Press the table movement up/inward key and the down/outward key on the control panel
- The Table Stop button will no longer be red
- Press the Home Position key on the control panel

Now the patient table is ready for operation again.

4.3. Magnet Stop button

This button deenergizes the superconductive magnet (quench).



- Push this switch in emergency situations in the magnetic field and notify Siemens Service immediately
- Only superconductive magnets have a Magnet Stop switch - permanent magnets cannot be switched off

Quench

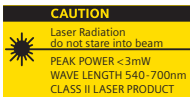
A quench occurs when there is a sudden loss of superconductivity in a magnet coil resulting from local temperature increases in the magnet.

The cryogens used for superconductivity suddenly evaporate causing the magnetic field to lift in less than 20 seconds.

A quench may occur as follows:

- Start-up of the MR system (ramping up or filling the magnet)
- An accident (earthquake, fire, etc.)

A quench may be released by the user in a controlled fashion by activating the Magnet Stop button.



The information in this document contains general technical descriptions of specifications and options as well as standard and optional features which do not always have to be present in individual cases.

Siemens reserves the right to modify the design, packaging, specifications and options described herein without prior notice. Please contact your local Siemens sales representative for the most current information.

Note:

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