Application for Certificate of Need

Barnes-Jewish St. Peters Hospital
Replace MRI Unit

Project #6188 HT

Submitted to
Missouri Health Facilities Review Committee

March 2025

Certificate of Need Program

EQUIPMENT REPLACEMENT APPLICATION

Applicant's Completeness Checklist and Table of Contents

Project Name: Barnes-Jewish St. Peters Hospital--replace MRI Project No: 6168HT

Project Description: replace MRI

Done	Page	N/A	Description
Divider I.			**Application Summary:**
__	4	__	1. Applicant Identification and Certification (Form MO 580-1861)
__	5	__	2. Representative Registration (From MO 580-1869)
__	6	__	3. Proposed Project Budget (Form MO 580-1863) and detail sheet with documentation of costs.
Divider II.			**Proposal Description:**
__	7	__	1. Provide a complete detailed project description, CON project number of the existing equipment (if prev. CON approved), and include the type/brand of both the existing equipment and the replacement equipment.
__	11	__	2. Provide a listing with itemized costs of the medical equipment to be acquired and bid quotes.
__	8	__	3. Provide a timeline of events for the project, from CON issuance through project completion.
Divider III.			**Service Specific Criteria and Standards:**
__	9	__	1. Describe the financial rationale for the proposed replacement equipment.
__	9	__	2. Document if the existing equipment has exceeded its useful life.
__	9	__	3. Describe the effect the replacement unit would have on quality of care.
__	9	__	4. Document if the existing equipment is in constant need of repair.
__	9	__	5. Document if the lease on the current unit has expired.
__	10	__	6. Describe the technological advances provided by the new unit.
__	10	__	7. Describe how patient satisfaction would be improved.
__	10	__	8. Describe how patient outcomes would be improved.
__	10	__	9. Describe what impact the new unit would have on utilization.
__	10	__	10. Describe any new capabilities that the new unit would provide.
__	10	__	11. By what percent will this replacement increase patient charges.

(If replacement equipment was not previously approved, also complete Divider IV below.)

Divider IV.			**Financial Feasibility Review Criteria and Standards:**
__		✔	1. Document that sufficient financing is available by providing a letter from a financial institution or an auditor's statement indicating that sufficient funds are available.
__		✔	2. Provide Service-Specific Revenues and Expenses (Form MO 580-1865) projected through three (3) **FULL** years beyond project completion.
__		✔	3. Document how patient charges are derived.
__		✔	4. Document responsiveness to the needs of the medically indigent.

DIVIDER I. APPLICATION SUMMARY:

1. APPLICATION IDENTIFICATION AND CERTIFICATION FORM (FORM MO 580-1861)

   See Attached Form.

2. REPRESENTATIVE REGISTRATION (FORM MO 580-1869)

   See Attached Form.

3. PROPOSED PROJECT BUDGET (FORM MO 580-1863) AND DETAIL SHEET

   See Attached Form.

Certificate of Need Program

APPLICANT IDENTIFICATION AND CERTIFICATION

*The information provided must match the **Letter of Intent** for this project, without exception.*

1. Project Location *(Attach additional pages as necessary to identify multiple project sites.)*

Title of Proposed Project	Project Number
Barnes-Jewish St. Peters Hospital--replace MRI	6188HT
Project Address *(Street/City/State/Zip Code)*	**County**
10 Hospital Dr, St Peters, MO 63376	St. Charles

2. Applicant Identification *(Information must agree with previously submitted Letter of Intent.)*

List All Owner(s): *(List corporate entity.)*	Address (Street/City/State/Zip Code)	Telephone Number
Barnes-Jewish St. Peters Hospital	10 Hospital Dr, St Peters, MO 63376	314-323-1231

List All Operator(s): *(List entity to be licensed or certified.)*	Address (Street/City/State/Zip Code)	Telephone Number
Barnes-Jewish St. Peters Hospital	10 Hospital Dr, St Peters, MO 63376	314-323-1231

3. Ownership *(Check applicable category.)*

☑ Nonprofit Corporation ☐ Individual ☐ City ☐ District

☐ Partnership ☐ Corporation ☐ County ☐ Other_____

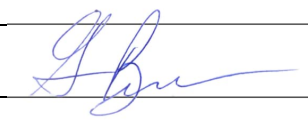
4. Certification

In submitting this project application, the applicant understands that:

(A) The review will be made as to the community need for the proposed beds or equipment in this application;
(B) In determining community need, the Missouri Health Facilities Review Committee (Committee) will consider all similar beds or equipment within the service area;
(C) The issuance of a Certificate of Need (CON) by the Committee depends on conformance with its Rules and CON statute;
(D) A CON shall be subject to forfeiture for failure to incur an expenditure on any approved project six (6) months after the date of issuance, unless obligated or extended by the Committee for an additional six (6) months:
(E) Notification will be provided to the CON Program staff if and when the project is abandoned; and
(F) A CON, if issued, may not be transferred, relocated, or modified except with the consent of the Committee.

We certify the information and date in this application as accurate to the best of our knowledge and belief by our representative's signature below:

5. Authorized Contact Person *(Attach a Contact Person Correction Form if different from the Letter of Intent.)*

Name of Contact Person		Title
Greg Bratcher		Dir., Government Relations
Telephone Number	**Fax Number**	**E-mail Address**
314-323-1231		gbratcher@bjc.org
Signature of Contact Person		**Date of Signature**
		3/2/205

MO 580-1861 (03/13)

Certificate of Need Program

REPRESENTATIVE REGISTRATION

*(A registration form must be completed for **each** project presented.)*

Project Name	Number
Barnes-Jewish St. Peters Hospital--replace MRI	6188HT

(Please type or print legibly.)

Name of Representative	Title
Greg Bratcher	Dir., Gov. Relations

Firm/Corporation/Association of Representative (may be different from below, e.g., law firm, consultant, other)	Telephone Number
BJC HealthCare	314-323-1231

Address (Street/City/State/Zip Code)

4901 Forest Park Ave, Suite 1220, MS 90-75-574, St. Louis, MO 63108

Who's interests are being represented?
(If more than one, submit a separate Representative Registration Form for each.)

Name of Individual/Agency/Corporation/Organization being Represented	Telephone Number
BJC HealthCare	314-323-1231

Address (Street/City/State/Zip Code)

4901 Forest Park Ave, Suite 1220, MS 90-75-574, St. Louis, MO 63108

Check one. Do you:

- ☑ Support
- ☐ Oppose
- ☐ Neutral

Relationship to Project:

- ☐ None
- ☑ Employee
- ☐ Legal Counsel
- ☐ Consultant
- ☐ Lobbyist
- ☐ Other (explain):

Other Information:

I attest that to the best of my belief and knowledge the testimony and information presented by me is truthful, represents factual information, and is in compliance with §197.326.1 RSMo which says: *Any person who is paid either as part of his normal employment or as a lobbyist to support or oppose any project before the health facilities review committee shall register as a lobbyist pursuant to chapter 105 RSMo, and shall also register with the staff of the health facilities review committee for every project in which such person has an interest and indicate whether such person supports or opposes the named project. The registration shall also include the names and addresses of any person, firm, corporation or association that the person registering represents in relation to the named project. Any person violating the provisions of this subsection shall be subject to the penalties specified in § 105.478, RSMo.*

Original Signature	Date
	3/2/2025

MO 580-1869 (11/01)

Certificate of Need Program

PROPOSED PROJECT BUDGET

Description	**Dollars**
COSTS:*	*(Fill in every line, even if the amount is "$0".)*
1. New Construction Costs ***	
2. Renovation Costs ***	
3. Subtotal Construction Costs (#1 plus #2)	$0
4. Architectural/Engineering Fees	
5. Other Equipment (not in construction contract)	
6. Major Medical Equipment	$2,303,426
7. Land Acquisition Costs ***	
8. Consultants' Fees/Legal Fees ***	
9. Interest During Construction (net of interest earned) ***	
10. Other Costs ***	
11. Subtotal Non-Construction Costs (sum of #4 through #10	$2,303,426
12. Total Project Development Costs (#3 plus #11)	$2,303,426 **
FINANCING:	
13. Unrestricted Funds	
14. Bonds	
15. Loans	
16. Other Methods (specify)	
17. Total Project Financing (sum of #13 through #16)	$0 **
18. New Construction Total Square Footage	
19. New Construction Costs Per Square Foot *****	
20. Renovated Space Total Square Footage	
21. Renovated Space Costs Per Square Foot ******	

* *Attach additional page(s) detailing how each line item was determined, including all methods and assumptions used. Provide documentation of all major costs.*

** *These amounts should be the same.*

*** *Capitalizable items to be recognized as capital expenditures after project completion.*

**** *Include as Other Costs the following: other costs of financing; the value of existing lands, buildings and equipment not previously used for health care services, such as a renovated house converted to residential care, determined by original cost, fair market value, or appraised value; or the fair market value of any leased equipment or building, or the cost of beds to be purchased.*

***** *Divide new construction costs by total new construction square footage.*

****** *Divide renovation costs by total renovation square footage.*

DIVIDER II. PROPOSAL DESCRIPTION

1. PROVIDE A COMPLETE DETAILED PROJECT DESCRIPTION

Barnes-Jewish St. Peters Hospital proposes to replace an eighteen-year-old Siemens Espree MRI unit. The proposed replacement is a Siemens Magnetom Sola MRI unit. Both the old and new units are rated at 1.5 tesla. The current unit was previously approved as CON #3978HT.

MRI is an essential tool in modern medicine. Making use of the abundant hydrogen atoms in our body, an MRI unit generates a strong magnetic field to align the hydrogen atoms. Radio waves are rapidly pulsed to rhythmically disrupt this alignment. Between pulses, the hydrogen atoms emit their own radio signals, which are collected, amplified, and reconstructed with computers to create MRI images.

The proposed unit will offer several technological advantages:

- A larger opening that will accommodate obese patients.
- Innovative BioMatrix technology compensates for anatomical and physiological differences to deliver more precise imaging.
- New algorithms account for anatomical and physiological differences to deliver more precise imaging. Patient variability, such as obesity, can make MRI imaging challenging. The new machine would compensate for this "biovariability."

- Sensors that help technicians set up and conduct MRI exams more consistently. This helps ensure that when comparing one MRI study with another conducted a month later, the differences are a result of biology and not technology.

- Respiratory sensors in the patient table that reduce or eliminate the need for a patient's breath hold.

Overall, these advancements offer more detailed imaging, accommodate a broader range of patients, and provide greater flexibility.

The projected cost of the system is $2,303,426.

2. PROVIDE A LISTING WITH ITEMIZED COSTS OF THE MEDICAL EQUIPMENT TO BE ACQUIRED AND BID QUOTES.

The equipment to be acquired is a Siemens Sola 1.5T MRI unit.

See the attached equipment bid quotes.

3. PROVIDE A TIMELINE OF EVENTS FOR THE PROJECT, FROM CON ISSUANCE THROUGH PROJECT COMPLETION.

Order machine	Upon CON approval
Delivery	Q3 of 2025
Operational	End of Q3 or early Q4 of 2025

DIVIDER III. COMMUNITY NEED CRITERIA AND STANDARDS

1. DESCRIBE THE FINANCIAL RATIONAL FOR THE PROPOSED PRICE OF THE EQUIPMENT.

   BJC HealthCare has negotiated aggressive pricing with most healthcare equipment vendors. The system purchases major medical equipment using a multi-year, multi-hospital bidding system. The entire health system estimates its equipment needs in two-year cycles and asks vendors to provide their best deal based on a winner-take-all agreement. This has resulted in significant reductions in pricing.

2. DOCUMENT THAT THE EXISTING EQUIPMENT HAS EXCEEDED ITS USEFUL LIFE.

   According to the standard for healthcare accounting, *Estimated Useful Lives of Depreciable Hospital Assets,* the useful life of an MRI unit is five years. The equipment proposed for replacement is eighteen years old.

3. DESCRIBE THE EFFECT REPLACEMENT WILL HAVE ON QUALITY OF CARE.

   The proposed machine will offer more refined imaging, which in turn improves quality through more timely and consistent test results.

   The advanced software also has algorithms that improve constancy from scan to scan in those patients who undergo a series of scans...many being cancer patients.

4. DOCUMENT THAT THE EXISTING EQUIPMENT IS IN CONSTANT NEED OF REPAIR.

   The existing unit will be out of service. This means the availability of parts will no longer be guaranteed. It is the judgment of our clinical staff that the replacement of this machine now, before a catastrophic failure, is the prudent choice, both financially and clinically.

5. DOCUMENT THAT THE LEASE ON THE CURRENT EQUIPMENT HAS EXPIRED.

   NA

6. DESCRIBE THE TECHNICAL ADVANCES PROVIDED BY THE NEW UNIT.

Greater reliability will be the most valued "technical" advance. More specific advances will provide the ability to perform functional studies and magnetic resonance angiography.

The proposed unit will provide greater flexibility to perform advanced MRI studies, such as:

MRA (magnetic resonance angiography) capabilities, which provide imaging that shows blood flow, commonly used in diagnosing stroke.

Functional studies, which provide imaging of brain activity for surgical planning.

7. DESCRIBE HOW PATIENT SATISFACTION WOULD BE IMPROVED.

- Improved positioning gives patients of all sizes access to the machine.
- During more complex testing, faster magnets would shorten procedure times.

8. DESCRIBE HOW PATIENT OUTCOMES WOULD BE IMPROVED.

Improved imaging increases the effectiveness of treatment plans derived from the images. This helps improve outcomes.

9. DESCRIBE THE EFFECT IT WOULD HAVE ON UTILIZATION.

There is no expected direct impact on overall utilization since this is a replacement unit.

10. DESCRIBE ANY NEW CAPABILITIES THE NEW UNIT WOULD PROVIDE.

- Ability to perform functional studies.
- Ability to perform magnetic resonance angiography.

11. BY WHAT PERCENT WILL THIS INCREASE PATIENT CHARGES?

Patient charges will not be impacted by this project.

MRI CON costs

MRI final addendum (1 of 3)	2,123,426.00 +
Accessory	30,000.00 +
BJC est shielding	150,000.00 +
(3 Items)	**2,303,426.00**

CONTRACT ADDENDUM
09/26/2024

Sales Agreement Quotation CPQ-423714 for BJC HEALTH SYSTEM AP, Siemens Sales Order Number 0030257232, Purchase Order Number 1050274332, for a MAGNETOM Sola - KMAT.

This Addendum shall become part of the Sales Agreement CPQ-423714 (equipment) between Siemens Medical Solutions USA, Inc. ("Siemens") and BJC HEALTH SYSTEM AP (Customer). If there is any conflict between the terms of this Addendum and the terms of Agreement, the terms of this Addendum shall control. Capitalized terms used herein and not otherwise defined herein, unless the context otherwise requires, shall have the same meanings set forth in the Agreement.

This Addendum is valid for 60 days from date of issuance.

Customer proposes to make the following changes to quote:

This change will add:

Product Number	Product Name	Quantity	Price
14468976	ZOOMit PRO	1	$11,099.00

The contract total will change from $2,112,327 to $2,123,426.

Please sign below and revise your Purchase Order to account for proposed changes and the new Sales Agreement contract total. This Contract Addendum is specific to the Sales Agreement referenced above. Other Sales Agreements may be referenced and included on your Purchase Order that are not impacted by this Contract Addendum.

Customer must, where applicable, fully and accurately report any change in the net price of this purchase in the applicable cost reporting mechanism or claim for payment filed with the U.S. Department of Health and Human Services (DHHS) or a state agency and must provide, upon request of the Secretary of the DHHS or state agency, the information contained in the Contract Addendum.

If your organization does not plan to issue a revised Purchase Order based on the financial changes outlined in this Contract Addendum, please initial here indicating your agreement to pay the adjusted final invoice based on the terms and conditions of the original agreement _____.

Siemens Medical Solutions USA, Inc.
By (sign): _____
Name: Heather Lewis
Date: 09/26/2024

BJC HEALTH SYSTEM AP
By (sign): _____
Name: BJC HEALTH SYSTEM AP
Date: 09/26/2024

Thank you,

Heather Lewis

CONTRACT ADDENDUM
06/21/2024

Sales Agreement Quotation CPQ-423714 for BJC HEALTH SYSTEM, Siemens Sales Order Number 0030257232, Purchase Order Number 1050274332, for a MAGNETOM Sola - KMAT.

This Addendum shall become part of the Sales Agreement CPQ-423714 (equipment) between Siemens Medical Solutions USA, Inc. ("Siemens") and BJC HEALTH SYSTEM (Customer). If there is any conflict between the terms of this Addendum and the terms of Agreement, the terms of this Addendum shall control. Capitalized terms used herein and not otherwise defined herein, unless the context otherwise requires, shall have the same meanings set forth in the Agreement.

This Addendum is valid for 60 days from date of issuance.

Customer proposes to make the following changes to quote:

This change will add:

Product Number	Product Name	Quantity	Price
MR_TRADE_IN_ALLOW	MR Trade-in-Allowance	1	-$20,000.00
HASKRISBACNET	Haskris BACnet capability via RS-485	1	$1,560.00

The contract total will change from $2,130,767 to $2,112,327.

Please sign below and revise your Purchase Order to account for proposed changes and the new Sales Agreement contract total. This Contract Addendum is specific to the Sales Agreement referenced above. Other Sales Agreements may be referenced and included on your Purchase Order that are not impacted by this Contract Addendum.

Customer must, where applicable, fully and accurately report any change in the net price of this purchase in the applicable cost reporting mechanism or claim for payment filed with the U.S. Department of Health and Human Services (DHHS) or a state agency and must provide, upon request of the Secretary of the DHHS or state agency, the information contained in the Contract Addendum.

If your organization does not plan to issue a revised Purchase Order based on the financial changes outlined in this Contract Addendum, please initial here indicating your agreement to pay the adjusted final invoice based on the terms and conditions of the original agreement _____.

Siemens Medical Solutions USA, Inc.
By (sign): _____
Name: Heather Lewis
Date: 06/21/2024

BJC HEALTH SYSTEM
By (sign): _____
Name: BJC HEALTH SYSTEM
Date: 06/21/2024

Thank you,

Heather Lewis

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard, Malvern, PA 19355

SIEMENS REPRESENTATIVE
Gregory Thudium - +1 (314) 604-8452
gregory.thudium@siemens-healthineers.com

Customer Number: 0000004627

Date: 09/28/2023

BJC HEALTH SYSTEM
4249 CLAYTON AVE STE 310
SAINT LOUIS, MO 63110

Siemens Medical Solutions USA, Inc. is pleased to submit the following quotation for the products and services described herein at the stated prices and terms, subject to your acceptance of the terms and conditions on the face and back hereof, and on any attachment hereto.

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Contract Total: $ 2,130,767
(total does not include any Optional or Alternate components which may be selected)

Proposal valid until 09/30/2023

Estimated Delivery Date: 12/31/2024

Estimated delivery date is subject to change based upon factory lead times, acceptance date of this quote, customer site readiness, and other factors. A Siemens representative will contact you regarding the final delivery date.

Delay on Delivery. If Purchaser does not take delivery within 24 months of the date of the quotation, then Seller may, at its option, adjust the prices in the quotation by written notice. In such event, Purchaser will then have the option to cancel the order provided Purchaser notifies Seller within ten (10) days of the date of Seller's notice of the price adjustment.

This quote CPQ-959023 represents a conversion of Siemens quote # CPQ-423714 Rev. 0 dated 09/24/2021, BJC HEALTH SYSTEM Purchase Order #NP CPQ-423714 dated 09/24/2021, and Siemens Sales Order # 30257232, from a MAGNETOM Free.Max system to a MAGNETOM Sola system as quoted herein. Pricing is as quoted herein and terms and conditions are in accordance with those included in this quotation. Any change in price from the MAGNETOM Sola system will require a new or revised PO from BJC HEALTH SYSTEM.

This is a CONFIDENTIAL, one-time multi-modality bundle offer which may not be shared with any third parties, buying evaluation groups or anyone not directly employed by customer. The Siemens Executive Summary presented to the Customer is incorporated herein and made a part hereof. This offer is only valid if firm, non-contingent purchase orders for all quotations identified in the Siemens Executive Summary are received by Siemens on or before 09/30/2023. This date supersedes any other validity date indicated in the proposal.

This offer is only valid if a firm, non-contingent order is placed with Siemens and a signed POS contract must accompany the equipment order.

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard, Malvern, PA 19355

SIEMENS REPRESENTATIVE
Gregory Thudium - +1 (314) 604-8452
gregory.thudium@siemens-healthineers.com

This quote is based upon standard delivery terms and conditions (e.g., standard work hours, first floor delivery, etc.), basic rigging, mechanical installation and calibration. Siemens Medical Solutions USA, Inc., Project Management shall perform a site-specific assessment to ascertain any variations that are out of scope and not covered by the standard terms (examples such as, but not limited to: larger crane, nonstandard work hours, removal of existing equipment, etc.). Any noted variations identified by Siemens Project Management shall remain the responsibility of the customer and will be subject to additional fees.

Accepted and Agreed to by:

Siemens Medical Solutions USA Inc.		**BJC HEALTH SYSTEM**	
By (sign):	_____	By (sign):	_____
Name:	Gregory Thudium	Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

By signing below, signor certifies that no modifications or additions have been made to the Quotation. Any such modifications or additions will be void.

By (Sign): _____

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard, Malvern, PA 19355

SIEMENS REPRESENTATIVE
Gregory Thudium - +1 (314) 604-8452
gregory.thudium@siemens-healthineers.com

Quote Nr:	**CPQ-959023 Rev. 0**
Terms of Payment:	**00% Down, 80% Delivery, 20% Installation** **Free On Board: Destination**
Purchasing Agreement:	VIZIENT SUPPLY LLC VIZIENT SUPPLY LLC terms and conditions apply to Quote Nr CPQ-959023 Customer certifies, and Siemens relies upon such certification, that : (a) VIZIENT MRI XR0885 is the sole GPO for the purchases described in this Quotation, and (b) the person signing this Quotation is fully authorized under the Customer's policies to choose and indicate for Customer such appropriate GPO.

MAGNETOM Sola - System

All items listed below are included for this system:

Qty	Part No.	Item Description
1	14460300	**MAGNETOM Sola - System** MAGNETOM Sola - the first 1.5T BioMatrix system - leverages the intelligent combination of Tim 4G and Siemens unique BioMatrix technology to embrace the unique challenges that every patient brings to the MRI exam. System Design - Short and open appearance (157 cm total system length cover-to-cover and 70 cm Open Bore Design) to reduce patient anxiety and claustrophobia - Whole-body superconductive Zero Helium Boil-Off 1.5T magnet - Weight-optimized magnet technology based on high performance 3T and 7T magnet design - Actively Shielded water-cooled Siemens gradient system for maximum performance BioMatrix Technology to address intrinsic biovariability in humans. Built on three technological pillars: - BioMatrix Sensors: anticipate challenges before they happen with respiratory sensors, which measure a patient's respiratory signal as soon as the patient lies on the table. - BioMatrix Tuners: adapt and correct field inhomogeneities induced by patient anatomy with CoilShim and SliceAdjust. - BioMatrix Interfaces: easily manage any type of patient with intelligent interfaces like Select&GO to accelerate workflow. Tim 4G (Total imaging matrix in the 4th generation) for excellent image quality and speed - Siemens unique DirectRX technology enabling all digital-in/digital-out design - Dual-Density Signal Transfer Technology Push-button exams with GO technologies

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Qty	Part No.	Item Description
		Select&GO DotGO Recon&GO MR View&GO Tim Application Suite enabling excellent head-to-toe imaging - Neuro Suite - Angio Suite - Cardiac Suite - Body Suite - Onco Suite - Breast Suite - Ortho Suite - Pediatric Suite - Scientific Suite Further included: - High performance host computer and measurement and reconstruction system - Patient communication including headphones - Turbo Suite Essential - syngo MR software including: - 1D/2D PACE - BLADE - Phoenix - Inline Diffusion - MDDW (Multiple Direction Diffusion Weighting) - CISS - DESS - TGSE - Offline Composing
1	14460161	**MR General Engine #Vi** syngo.MR General Engine extends Numaris/X by adding dedicated workflows and tools for routine and advanced reading of MR examinations. A generic MR Basic workflow is provided, as well as specific MR Neurology, MR Prostate Reading, MR Breast Reading, and MR Cardio-Vascular workflows.
1	14475308	**myExam Brain Assist** myExam Brain Assist provides guided and flexible workflows. Optimized scan strategies are provided and can be selected based on the patient's condition, which allows for reproducible, high image quality and time efficient exams. The built-in flexibility allows users to change predefined strategies at any time during the brain workflow, and to personalize to the individual patient's condition and clinical need. myExam Brain Assist is customizable to the site-specific standards of care.
1	14475309	**myExam Spine Assist** myExam Spine Assist provides guided and flexible workflows for cervical, thoracic and lumbar spine. Optimized scan strategies are provided and can be selected based on the patient's condition, which allows for reproducible, high image quality and time efficient exams. The built-in flexibility allows users to change predefined strategies at any time during the spine workflow, and to personalize to the individual patient's condition and clinical need. myExam Spine Assist is customizable to the site-specific standards of care.
1	14475310	**myExam Large Joint Assist** myExam Large Joint Assist provides guided and flexible workflows for knee, hip and shoulder. Optimized scan strategies are provided and can be selected based on the patient's condition, which allows for reproducible, high image quality and time efficient exams. The built-in flexibility allows users to change predefined strategies at any time during the scan workflow, and to personalize to the individual patient's condition and clinical need. myExam Large Joint Assist is customizable to the site-specific standards of care.

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Qty	Part No.	Item Description
1	14482834	**myExam Brain Autopilot** myExam Brain Autopilot enables less experienced staff to scan brain MRI at high quality with just a few simple clicks. By using automation and AI, it takes away burdensome routine tasks for all technologists. Predefined automated protocols allow users to scan with no manual adjustments. A new and intuitive user interface simplifies scanning so that exams can be performed, or strategies can be changed easily. This new approach to operate MRI helps any user to generate consistent, comprehensive results. myExam Brain Autopilot is customizable to the site-specific standards of care.
1	14482835	**myExam Knee Autopilot** myExam Knee Autopilot enables less experienced staff to scan knee MRI at high quality with just a few simple clicks. By using automation and AI, it takes away burdensome routine tasks for all technologists. Predefined automated protocols allow users to scan with no manual adjustments. A new and intuitive user interface simplifies scanning so that exams can be performed, or strategies can be easily changed. This new approach to operate MRI helps any user to generate consistent, comprehensive results. myExam Knee Autopilot is customizable to the site-specific standards of care.
1	14441748	**Quiet Suite #T+D** Quiet Suite enables complete, quiet examinations for neurology and orthopedics with at least 70% reduction in sound pressure levels.
1	14460162	**Tim Whole Body Suite #Vi** Tim Whole Body Suite puts it all together. This suite enables table movement for imaging of up to 205 cm (6' 9") FoV without compromise. In combination with Tim's newly designed ultra-high density array higher spatial and temporal resolution can be achieved along with unmatched flexibility of any coverage up to Whole Body. For faster exams and greater diagnostic confidence.
1	14460227	**Tim Planning Suite #Vi** With the Tim Planning Suite, multiple regions in the entire body can be examined in a minimum of time through measurement planning on a single FoV of any desired size.
1	14456329	**syngo TimCT FastView #Vi** TimCT FastView is the "one go" localizer for the whole body or large body regions such as the whole spine or the whole abdomen. It acquires the complete extended Field of View in one volume with isotropic resolution. Transverse, coronal and sagittal reformats of the volume are calculated Inline and displayed for planning subsequent exams. - Inline reconstruction of the localizer images during the scan. - Localizing images in three planes over the maximum Field of View available for subsequent planning in all orientations. - TimCT FastView runs without laser light positioning to further streamline the workflow for several indications.
1	14460160	**Advanced Diffusion #Vi** QuietX DWI and RESOLVE together make up the Advanced Diffusion package. QuietX DWI enables quieter diffusion-weighted imaging of the brain with up to 70% reduction in sound pressure relative to conventional diffusion-weighted imaging. RESOLVE (Readout Segmentation Of Long Variable Echo-trains) is a multi-shot, readout segmented EPI sequence for high-resolution, low-distortion diffusion-weighted imaging (DWI). This technique is largely insensitive to susceptibility effects, providing anatomically accurate diffusion imaging for the brain, spine, breast and prostate. In combination with syngo.MR Tractography, RESOLVE enables excellent white-matter tract imaging even in regions of high susceptibility, such as the spine.
1	14456327	**WARP & Advanced WARP #Vi**

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Qty	Part No.	Item Description
		WARP and Advanced WARP (SEMAC) integrates different techniques tailored to reduce susceptibility artifacts caused by orthopedic MR-conditional metal implants.
1	14456237	**Advanced Cardiac incl. PSIR #Vi** This package contains special sequences and protocols for advanced cardiac imaging including 3D and 4D BEAT functionalities. It supports advanced techniques for ventricular function imaging, dynamic imaging, tissue characterization, coronary imaging, and more.
1	14456323	**Inline Composing syngo #Se** Automatic anatomical or angiographic composing of multiple adjacent coronal or sagittal images for presentation and further evaluation. Composed images can be automatically loaded into Graphical Slice Positioning for scan planning purposes.
1	14475447	**syngo Expert-i XA50/XA51** This software application enables remote access to the system (connected via local area network) for planning and processing.
1	14460304	**Tim [204x64] XQ Gradient #So** Tim [204x64] XQ-gradients performance level Tim 4G's RF system and innovative coil architecture enables high-resolution imaging and increased throughput. The system provides a maximum number of 204 channels (coil elements) that can be connected simultaneously. Flexible parallel imaging is achieved by the standard 64 independent RF channels that can be used simultaneously in one single scan and in one single FOV, each generating an independent partial image. This option includes also Advanced High Order Shim. XQ - gradients The XQ 45/200 gradients are designed for high performance and linearity to support clinical whole body imaging at 1.5T. The XQ gradients combine 45 mT/m peak amplitude with a slew rate of 200 T/m/s. The force compensated gradient system minimizes vibration levels and acoustic noise. High-performance measurement and reconstruction system.
1	14470777	**Coil Package Tim [204x64] #So** This package includes (if not exchanged with different variants via respective quote items): - BioMatrix Head/Neck 20 tiltable with CoilShim - BioMatrix Spine 48 with Respiratory Sensors - Body 18 - Flex Large 4 - Flex Small 4 - Flex Coil Interface
1	14456328	**BioMatrix Technology #Vi** The new and unique BioMatrix technology addresses the different aspects of patient bio-variability. It is based on three technological clusters: - BioMatrix Sensors address patient physiology, in order to anticipate challenges - BioMatrix Tuners address patient anatomy, in order to adapt to all patients, especially critical ones. - BioMatrix Interfaces address user interaction with the patient, to accelerate the workflow in the face of patient variability.
1	14470783	**BioMatrix Respiratory Sensors#Vi,So** Highly integrated BioMatrix Respiratory sensors measure the patient's breathing cycle in head-first and feet-first orientation.
1	14470785	**BioMatrix Beat Sensor #Vi, So** The BioMatrix Beat Sensor measures the motion of the heart and enables Cardiac triggering without the need of ECG triggering.

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Qty	Part No.	Item Description
1	14470792	**BioMatrix Coil Shim #Vi,So** BioMatrix CoilShim helps to reduce patient induced strongly localized B0 inhomogeneities by dedicated local shim channels.
1	14470794	**BioMatrix SliceAdjust #BM** BioMatrix SliceAdjust helps to avoid station boundaries and apparent broken spine artifacts as well as to preserve the SNR for whole-body diffusion.
1	14460415	**BioMatrix Dock. Table w/ eDrive #So** The BioMatrix Dockable Table with eDrive is designed for maximum patient comfort and smooth patient preparation. The BioMatrix Dockable Table with eDrive can support up to 250 kg (550 lbs) without restricting the vertical or horizontal movement. The BioMatrix eDrive provides motorized assistance for easy maneuverability of the table.
1	14470795	**BioMatrix Select & GO #Vi,So** The BioMatrix Select&GO interface enables fast and easy single-touch patient positioning from both sides of the patient table. The interfaces are integrated left and right into the front covers. Correct positioning saves unnecessary wasted time for repositioning and additional adjustments, therefore shortening the total room time.
1	14460410	**Silver & White Design #So** MAGNETOM Sola is available in two different light and appealing design variants which perfectly integrate into different environments. The Silver &White Design Variant comprises a brilliant white front design ring with integrated unique Select&GO panels. The smoothly embracing deco area on the left side and the outer rings in the front and the back of the system is colored in brilliant silver. The table cover is presented also in the same color and material selection.
1	14456270	**PC Keyboard US English #Vi** Standard PC keyboard with 105 keys.
1	14460420	**High-End Computing [204x64] #So** Tim 4G power computing upgrade for MAGNETOM Sola Tim [204x64]. This upgrade brings a high-end image reconstruction computer to the Tim [204x64] configuration.
1	14456238	**Peripheral Pulse Unit #Vi** Peripheral Pulse Unit for Pulse Triggering
1	14460313	**Dual Monitor Package #BM** The Dual Monitor Package provides a second 24” LCD monitor for the acquisition workplace, identical to the system main host monitor. The two monitors provide space for protocol planning and exam progress on the left monitor, as well as viewing and post-processing functionalities on the right monitor. The Dot Cockpit can be used on both monitors as a floating window. This improves the MR examination workflow by a smoother and more comfortable work space that avoids interruptions between planning, scanning, viewing and post-processing. It allows to keep running patient examinations always in sight to allow for fast interactions.
1	14482823	**SW syngo MR XA51A** syngo MR XA51A is the new software platform, bringing the latest features and functionality for daily clinical excellence. syngo MR XA51A guides and enables the user throughout the entire workflow: from patient registration; patient set up with guided workflows on the Select&GO; protocol management and selection; image acquisition and viewing; data handling; and post processing and reporting. This software together with the hardware enables diagnostic excellence for your daily clinical needs. The syngo MR XA51A platform offers myExam Companion which introduces a new MRI operation philosophy by providing built-in expertise and automation for users and clinical questions. myExam Companion provides different workflow modes for tailored assistance: myExam Autopilot, myExam Assist and myExam Cockpit. No matter the user or patient, myExam Companion helps generate consistent,

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Qty	Part No.	Item Description
		comprehensive results.
1	14475450	**myExam Assist XL Package USA** The myExam Assist XL Package includes: - myExam Angio Assist - myExam Abdomen Assist - myExam Cardiac Assist - myExam Breast Assist The myExam Assist XL package offers a comprehensive set myExam Companions for the maximum coverage of MR examination requests. Robust image quality can be achieved efficiently and consistently in the clinical areas of Neuro, MSK, Vascular, Cardiac and Oncology. The myExam Angio Assist provides semi-automatic detection of arterial and venous timing windows using a test bolus technique. This information is feedback for next planning steps automatically adapting scan parameters to the individual patient and patient's condition. The myExam Abdomen Assist offers intuitive guidance and a high level of automation. It allows automatic sequence scaling according to physiological characteristic. The myExam Cardiac Assist uses anatomical landmarks, standard views of the heart, such as dedicated long axis and short-axis views - easily generated and reproduced. The myExam Breast Assist provides lesion detection, implant evaluation and breast biopsy. The myExam Companions support various breast coils, head-first or optional feet-first positioning and examination approaches (fatsat, nonfatsat).
1	14461619	**Turbo Suite Essential #BM** Turbo Suite Essential comprises established acceleration techniques to maximize productivity for all contrasts, orientations and all routine imaging applications from head-to-toe.
1	14469015	**Turbo Suite Elite #BM** Turbo Suite Elite comprises cutting edge Compressed Sensing applications for advanced abdominal and cardio-vascular imaging with dynamic 2D and dynamic 3D applications to significantly reduce scan times, counter patient motion and expanding the patient population eligible for MRI.
1	14469016	**Turbo Suite Elite Support #BM** Turbo Suite Elite Support provides Future Security for Turbo Suite Elite: - In consideration of Customer's purchase of the MAGNETOM MR scanner and simultaneous purchase of a 4 year point of sale Service Agreement with Evolve, and should such Evolve Upgrade installed during the term of the Service Agreement enable operation of dynamic Compressed Sensing options and/or Simultaneous Multi-Slice options, then Customer may choose to receive one such dynamic Compressed Sensing or Simultaneous Multi-Slice application option at no additional cost.
1	14475508	**Turbo Suite Excelerate** Turbo Suite Excelerate comprises access to cutting edge acceleration techniques such as Simultaneous Multi-Slice, Compressed Sensing and Wave-CAIPI for static 2D and static 3D imaging applications in Neuro, MSK and Body MRI.
1	14475525	**Deep Resolve Pro Package** The Deep Resolve Pro Package combines the three applications Deep Resolve Gain, Deep Resolve Sharp and Deep Resolve Boost which use intelligent reconstruction algorithms and Deep Learning networks to reconstruct accelerated images with higher signal to noise ratio and better image sharpness.
1	14402527	**SWI #Tim**

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Qty	Part No.	Item Description
		Susceptibility Weighted Imaging is a high-resolution 3D imaging technique for the brain with ultra-high sensitivity for microscopic magnetic field inhomogeneities caused by deoxygenated blood, products of blood decomposition and microscopic iron deposits. Among other things, the method allows for the highly sensitive proof of cerebral hemorrhages and the high-resolution display of venous cerebral blood vessels.
1	14441849	**Diffusion Tensor Imaging #T+D** Diffusion Tensor Imaging provides a Single Shot EPI sequence for measuring diffusion-weighted data sets with up to 256 directions of diffusion weighting. Based on these data sets, the diffusion tensor itself and parametric maps derived from it (e.g. fractional anisotropy) are calculated automatically and in real-time. The package supports both clinical applications regarding diseases of the white matter (e.g. multiple sclerosis, brain maturation disorders, or displacement of nerve fiber tracts through masses) and advanced research applications. Diffusion spectrum imaging (DSI), an extension of diffusion tensor imaging, is included in this package. DSI expands on the DTI acquisition capabilities by providing the ability to resolve white matter fiber crossings.
1	14416946	**Neuro Perfusion Package #T+D** The Neuro Perfusions Package helps to streamline the clinical workflow by inline post-processing in dynamic susceptibility contrast (DSC) based perfusion imaging. This makes it possible to see perfusion maps immediately. Perfusion parameter maps are based on a Local Arterial Input function. A corrected relCBV map calculation and motion correction is provided.
1	14405341	**Mapit syngo #Tim** Based on the T1, T2 or T2* properties of the cartilage syngo ParametricMap allows the early detection of osteoarthritic break down of cartilage structures even before morphological changes occur. The method supports therapeutic decisions in individual patients and can be used to control treatments non-invasively, replacing surgeries or biopsies. The assessment of T1, T2 and T2* properties of tissues in other body regions is also possible. syngo ParametricMap provides very fast 2D and 3D high-resolution imaging sequences and the Inline calculation of parametric maps for the T1, T2 and T2* properties of the imaged tissue.
1	14441761	**LiverLab #T+D** LiverLab is a system guided workflow to examine the hepatic fat and iron status, as part of the Abdomen Dot Engine.
1	14470766	**MR Elastography incl. HW** MR Elastography offers a new diagnostic tool for all Tim+Dot systems that allows identifying variations in liver tissue stiffness. This option includes the HW starter set for Elastography (3rd party HW) and the Elastography SW.
1	14405316	**fMRI Trigger Converter** An optical trigger signal is available to trigger external stimulation devices in fMRI experiments. With the "fMRI Trigger Converter" this signal can be converted to an electrical signal (TTL/BNC and RS 232 interface for PC; modes: toggle or impulse).
1	14409198	**Native syngo #Tim** Integrated software package with sequences and protocols for non-contrast-enhanced 3D MRA with high spatial resolution. syngo NATIVE particularly enables imaging of abdominal and peripheral vessels and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency.
1	14441813	**QISS #T+D** Software package with QISS sequence, protocols and Dot AddIn for non-contrast-enhanced peripheral MRA. QISS particularly enables higher reproducibility than

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Qty	Part No.	Item Description
		existing methods and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency.
1	08464740	**Flow Quantification #Tim** Special sequences for quantitative assessment of flow i
1	14456247	**syngo.MR Cardiac Flow #1** syngo.MR Cardiac Flow processes velocity-encoded MR images to evaluate blood flow dynamics e.g. in the heart and the great vessels. The application generates quantitative results for physicians in the diagnostic process. The MR cardiac interactive reporting template is included.
1	14470965	**High bandwidth inversion recovery** High bandwidth inversion recovery for reduction of susceptibility-induced artifacts.
1	14441747	**MyoMaps #T+D** This package contains special sequences and protocols for inline T1,T2 and T2* calculation at the heart. The generation of T1 and T2 parametric maps is enhanced by the use of motion correction. T1,T2 and T2* parametric maps could be used to support assessment of cardiovascular disease.
1	14469205	**Breast Biopsy #BM** The Breast Biopsy Software is a professional solution for a fast and accurate MR biopsy workflow.
1	14430491	**Body 18 long #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 18 channels (inherent) or more, if the coil is combined with other coils - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology The 18-channel coil with its 18 integrated pre-amplifiers ensures excellent signal-to-noise ratio. The 18 coil elements provide extensive coverage in all directions. The single SlideConnect plug allows for fast and easy patient preparation. The coil's extended cable allows for more flexibility in connector selection which is especially helpful if multiple flexible coils need to be combined and challenging imaging set-ups need to be supported like in therapy imaging (e.g. for combined head-neck exams). The light-weight coil ensures highest patient comfort. The Body 18 1.5T long features: - 18-element design with 18 integrated preamplifiers (3 clusters of 6 elements each) - Operates in an integrated fashion with the Spine 32 as an 30 channel body coil (not in combination with the Combi Dockable Table) - Can be combined with further coils for larger coverage - Can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations - No coil tuning - iPAT compatible in all directions The highly flexible design supports a wide variety of applications including: - Thorax (incl. heart) - Abdomen - Pelvis - Hip
1	14469199	**Body 18 -> BioMatrix Body 18** This option exchanges the Body 18 coil from the standard coil configuration for the improved BioMatrix Body 18. Beside the same technical key benefits from the Body 18 coil, this coil has a new highly flexible and light-weight design. The BioMatrix Body 18 features:

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Qty	Part No.	Item Description
		- 18-element design with 18 integrated preamplifiers (3 clusters of 6 elements each) - Operates in an integrated fashion with the system's spine coil - Can be combined with further Body 18 or BM Body 18 coils for larger coverage - Can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations - Requires no coil tuning - iPAT compatible in all directions The highly flexible design enables a wide variety of applications including: - Thorax (incl. heart) - Abdomen - Pelvis - Hip - Vascular The BioMatrix Body 18 is typically combined with: - BM Head/Neck 20 - BM Spine coil - Additional Body 18 coil(s) or BM Body 18 coils (optional) - Peripheral Angio 36 (optional) - Flex Large 4 - Flex Small 4 - UltraFlex Large 18 (depending on availability, optional) - UltraFlex Small 18 (depending on availability, optional) - Loop coils (optional) - Endorectal coil (optional)
1	14460315	**Shoulder Shape 16 #So** The Shoulder Shape 16 combines the known benefits of Tim 4G coil technology with new highly flexible materials, resulting in unmatched image quality, high patient comfort and easy handling. The Shoulder Shape 16 for examinations of the left or right shoulder consists of an iPAT-compatible 16-channel shoulder coil in a flexible shoulder cup that can be shaped around small and large shoulders. An L-shaped cushion for easy positioning of the patient is included. The 16-element coil with 16 integrated pre-amplifiers ensures maximum signal-to-noise ratio. Shoulder Shape 16 will be connected via a SlideConnect plug for fast and easy coil set-up and patient preparation.
1	14416961	**Hand/Wrist 16 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Hand/Wrist 16 for examinations of the left or right hand and wrist region consists of a base plate and an iPAT compatible 16-channel coil and allows high-resolution imaging of the wrist and the hand within one examination. Hand/Wrist 16 will be connected via a SlideConnect plug for fast and easy patient preparation.
1	14460423	**Tx/Rx Knee 18 #So** New 18-channel transmit/receive coil optimized for knee imaging. The spacious design with a flared opening towards the thigh allows scanning even of large and swollen knees with exceptional image quality and signal to noise ratio. Main features : - 18-element design (3x6 coil elements) with 18 integrated preamplifiers - iPAT-compatible - SlideConnect Technology
1	14416962	**Foot/Ankle 16 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and DirectConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Foot/Ankle 16 for examinations of the left or right foot and ankle region consists of a base plate and an iPAT compatible 16-channel coil and allows high-resolution

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Qty	Part No.	Item Description
		imaging of the foot and ankle within one examination. Foot/Ankle 16 is a cable-less coil and will be connected via DirectConnect for fast and easy patient preparation.
1	14416958	**Peripheral Angio 36 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 36 channels - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology The 36-channel coil includes 36 integrated pre-amplifiers for excellent signal-to-noise ratio. The single SlideConnect Plug allows for fast and easy patient preparation. The Peripheral Angio 36 features: - 36-element design with 36 integrated preamplifiers, distributed over 6 planes with 6 elements each - Operates in an integrated fashion with Body 18 coils and with the Spine 32 . For Whole-Body examinations also with the Head/ Neck 20 - Automatic table feed and active coil switch - Can be utilized head and feet first - Both legs are independently covered with coil elements, maximizing the coil filling factor and the signal-to-noise ratio - No coil tuning - iPAT-compatible - Dual-Density Signal Transfer enables ultra-high density coil designs by integrating key RF components into the local coil - SlideConnect technology for easy coil set up - One cable only for easy handling - Includes special non-ferromagnetic coil cart for safe, user-friendly storage Applications: - High-resolution angiography of both legs incl. Pelvis (by additional use of the Body 18) with highest signal-to-noise ratio - Visualization of the iliac arteries and aorta in combination with Body 18 - Bilateral examinations of long bones of the legs Typically combined with: Head/ Neck 20, Body 18, Spine 32, and all flexible coils such as Flex Large 4 or Flex Small 4
2	14416972	**Tim Coil Interface 1.5T** Coil adapter plug for up to 8 receive and 1 transmit channels. This adapter will be required if the following Tim coils will be used on a compatible 1.5T MAGNETOM system with Tim 4G technology.
1	14426332	**Tx/Rx CP Head Coil #Ae** Circularly polarized no-tune transmit/receive coil with an open patient-friendly design. The integrated transmit mode allows volume selective excitation. Integrated, extremely low-noise pre-amplifiers permit very high signal-to-noise ratio. Furthermore, the coil is outfit with SlideConnect Technology, allowing for easier patient preparation and less table time for the patient.
1	14469229	**Flex -> UltraFlex Upgrade #1.5T** This option exchanges the Flex Small & Large 4 coils incl. the Flex Coil Interface from the standard coil configuration for the superior UltraFlex Small & Large 18. These are two lightweight, iPAT compatible, 18-element no-tune receive coils made of highly flexible and soft material. UltraFlex Large 18 Ideal for examinations of larger extremities (e.g. medium to large shoulder, hip, knee, ankle and hand) and for abdominal examinations. Dedicated positioning aids

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Qty	Part No.	Item Description
		for larger extremities are delivered with the coil. UltraFlex Small 18 Ideal for examinations of smaller extremities (e.g. small to medium shoulder, smaller ankle, elbow and hand) and for abdominal examinations. Dedicated positioning aids for smaller extremities are delivered with the coil.
1	14456282	**Positioning Aids Shoulder&Ankle #Vi** This package contains additional positioning aids that can be used for the UltraFlex Large 18 and UltraFlex Small 18.
1	14456241	**Separator 60kW/75kW #Vi** The SEP (Separation cabinet) has to be used if a central hospital chilled water supply is available or if a chiller of any brand/type is already available. The SEP is the interface between the on-site water chiller (of any brand or type) or the interface to the central hospital cooling water supply. For the above-mentioned cases the SEP is mandatory! In these cases, the primary water specifications must fulfill the requirements: XJ: 45kW; water temperature: 6 - 14°C XQ: 60kW; water temperature: 6 - 14°C XT: 75kW; water temperature: 6 - 12°C For all gradient systems: Flow: 100+-10l/min; pH value 6-8; max working pressure 6 bar. Dimensions: 1950mm x 650mm x 650mm (height x width x depth) Weight: approx. 350kg
1	14460249	**UPS system #Vi** UPS system Liebert GXT5 3000IRT2UXLE for MAGNETOM NumX systems for safeguarding computers. Including Power Cable of 9 m for connecting the UPS. Power output: 3.0 kVA / 3 kW Bridge time: 3 min full load / 12 min half load Input voltage: 230 VAC
1	14456316	**UPS Battery module (Libert GXT4 BATT)** UPS battery module Liebert GXT5 72VBATTE for MAGNETOM Aera, Skyra, Prisma, ESSENZA, Amira, Spectra, C! for safeguarding computers. Extension for: Liebert GXT5 3000IRT2UXLE (14456315) Battery type: Closed, maintenance-free Extension of the bridge time to: 21 minutes full load / 48 min half load with one module Dimensions (H x D x W): Battery module: 430 x 540 x 85 mm Weight: approx. 30 kg
1	14456228	**System Start Timer #Vi** Timer clock that can be installed together with the MAGNETOM MR system to start the system automatically at user-definable times, eliminating waiting times during system boot up.
1	14407259	**MR Workplace Table, height adjust.** The table is suitable for the syngo Acquisition Workplace and the syngo MR Workplace based on syngo hardware. This 110V version has motorized table height adjustment.
1	14407261	**MR Workplace Container, 50cm** 50 cm wide extra case for the syngo host computer with sliding front door to allow change of storage media (CD/DVD/USB).
1	MR_STD_RIG_INST	**MR Standard Rigging and Installation** MR Standard Rigging and Installation This quotation includes standard rigging and installation of your new MAGNETOM

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Qty	Part No.	Item Description
		system Standard rigging into a room on ground floor level of the building during standard working hours (Mon. – Fri./ 8 a.m. to 5 p.m.) It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents Any rigging requiring a crane over 80 tons and/or special site requirements (e.g. removal of existing systems, etc.) is an incremental cost and the responsibility of the Customer. All other “out of scope” charges (not covered by the standard rigging and installation) will be identified during the site assessment and remain the responsibility of the Customer.
1	MR_BTL_INSTALL	**MR Standard Rigging & Install**
1	MR_PREINST_DOCK	**T+D Preinstall kit for dockable table**
1	MR_CRYO	**Standard Cryogens**
1	MR_PM	**MR Project Management** A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemen’s equipment. The assigned PM will work with the customer’s facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.
1	HASKRISFG23041	**Haskris OPC24 Chiller- 63kW** The Haskris outdoor, air-cooled, water/glycol chiller has been specially designed for medical applications to provide stable, fully dedicated cooling to a single MR system. The Haskris chiller must be used in combination with a Siemens SEP cabinet. The Haskris chiller is suitable for use in all siting conditions: normal, coastal, low-ambient, and/or OSHPD-compliant locations. Specifications Cooling Capacity: 63kW Fluid Supply Temp: 43°F (6°C) to 59°F (15°C) Pump Capacity: 32 GPM (120 LPM) Condenser: Air-cooled (heat dissipated into ambient air) Outdoor ambient air temperature: -40°F (-40°C) to 122°F (50°C) Electrical: 460V-3Ø-60Hz Dimensions: 77”W x 40”D x 74”H (196cm x 102cm x 188cm) Siemens’ Pricing Also Includes: Delivery Chiller Start-Up (Post Installation) 1x Preventative Maintenance Service Visit Remote Monitoring Panel with 1-Year Cellular Connectivity and Cloud Service Installation: Customer is responsible for the rigging and installation of the chiller. Customer is responsible for providing a 35% solution of propylene glycol with water; 25 gal (95 L) for the chiller plus 1 gal (3.8 L) per 10 ft (3m) external pipe run assuming 1 ½” pipe diameter. Warranty: 12 months from date of Start-Up

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Qty	Part No.	Item Description
1	HASKRIS_STARTUP	**Haskris Chiller Start-Up** Chiller start-up by Haskris vendor after installation of chiller and completion of paperwork.
1	MR_GOKNEE3D	**GOKnee3D** GOKnee3D is a 10-minute, push-button examination for diagnostic imaging of the knee developed and clinically validated by the US board certified MSK radiologists at John Hopkins University Hospital. GOKnee3D exam consists of AutoAlign localizer in the knee, PD weighted contrast and T2 weighted contrast with fat suppression. The AutoAlign technology provides a push-button functionality and ensures consistency in imaging. The 3D protocols are high resolution and isotropic, enabled by SPACE sequence with CAIPIRINHA techniqueExamination time for 3T system is 10 minutes, for a 1.5T system is up to 11 minutes. All given examination times are examination only, adjustments have been excluded. When using GOKnee3D one of two software and coil combinations is required. Measurements made with GOKnee3D using the 15 channel knee coil require software version syngo MR E11C AP04 or higher. Measurements made with GOKnee3D using the 18 channel knee coil require software version syngo MR Numaris VA11A or higher.
1	MR_GOBRAIN	**GOBrain** GOBrain delivers reliable quality at exceptional speed. It enables clinically validated, push-button brain exams, with multiple orientations and all relevant contrasts. This fast exam is more tolerable for patients, and helps reduce motion-related artifacts and the need for rescans and sedation. As a result, GOBrain potentially doubles throughput and reduces costs per scan. Supported by our Tim 4G technology and DotGO, it delivers consistently high quality and maximizes the productivity of your MRI scanner - while improving patient care.
1	MRIMAB_100	**MRI Armboard w/ Pad**
1	ML11685	**MR Wall sign -English** Highly durable 1mm PVC wall signs with high-tack, double-back tape. Sticks to most any surface. English. 12" x 18".
1	MRISMNS0001	**MRI Patient Audio System** The MRI Patient Audio System is to be installed in the technologist room and is connected to the Siemens intercom system. The package provides the following benefits: • Create custom, commercial-free radio stations based on artist, song or genre preferences • Avoid any AM/FM tuning issues that may occur in RF-shielded rooms • Compatible with all popular audio apps Includes all cables and adapters; Bose Companion 2 technologist speakers; 3.5 mm to RCA cable; and customized iPAD Mini with all original accessories and iPad stand. The MR Stereo can play internet radio (depending on quality of and access to Wi-Fi signals) and device (iPAD) stored audio content. Optimal performance requires access to Wi-Fi signal for Internet radio through the facility's wireless network. The audio system is not MR safe and is only intended for use outside the MRI suite. Installation is not included unless purchased with the Siemens system. Includes 3 year limited liability warranty on all system components through MRI Med.
1	MR14460428	**ACR Phantom Holder (USA)** An MR compatible cradle device used to consistently and precisely position the American College of Radiology (ACR) MRI Accreditation phantom, for use with Siemens MAGNETOM standard Head Coil during test measurements for ACR

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Qty	Part No.	Item Description
		system accreditation or QA testing
1	MR_ADDL_RIGGING	**Additional Rigging MR $40,000**
1	MR_BUND_LV2	**MR EDU Bundle - New to System or 3T/7T** This flexible Essential Education Bundle is designed to support you as an existing customer with a Siemens MAGNETOM system in your facility but may be new to system/software. This bundle of training elements launches with a Customer & Clinical Education Specialist (CES) Consultation. This CES will be your point of contact & act as a Concierge throughout your 1st year of the system's lifecycle to ensure the following: •Development of a full training plan for delivery during year 1 of system installation •Ensure all training goals/objectives are met •Full support for all your education needs with regular touchpoints throughout the year •All education sold with your system is delivered using the most appropriate method •Advice on additional education that will be valuable to you beyond year 1 The elements in this bundle are designed to be flexible & provide the right balance/blend of delivery methods to meet the training needs/goals set during the initial consultation. Depending on the goals & experience levels of your staff, education will be delivered using a variety of methods including e-learning, in-person/virtual classroom or workshop, & onsite/live remote training. Bundled items include: •Customized Education Planning & Consultation •12-Month e-learning Subscription •Dedicated Protocol Optimization •FlexEd(x2) – Choose 1 from Classroom, Live Remote Support (12-hours), Customized Workshop (4-hours), Innovations for Imaging Education Symposium Ticket, or e-learning •Onsite Initial Training(Up to 28 Hours) •Onsite Follow-up Training(Up to 24 Hours) •Remote System Follow-Up Training(Up to 8 Hours) •Virtual Trainer(x2) – 2-hour didactic training or scanning session •Ongoing Clinical Check-ins by your Clinical Consultation Specialist This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens' obligation to provide the training will expire without refund.
1	MR_ELEARN	**e.learning CEU subscription (12 mths)** This (12) month multi-modality e.learning subscription will provide access for (10) imaging professionals at the customer site to utilize up to (50 CEUs). This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	MR_PR_TXRX_HEAD	**TX/RX Head Coil Promo Offset**
1	MR_GREEN_PKG	**MR Green Package** MRI Green Package Enhances environmental sustainability of equipment by reducing emissions. Eco Power Mode reduces power consumption by up to 12% with Eco Power Mode alone. Eco Gradient Mode reduces scope 2 emissions by up to 7%. System Start-Up Timer reduce scope 2 emissions in non-productive times. Zero Helium Boil-Off technology - No helium refill for a lifetime and up to 37 % reduction in helium inventory compared to the previous scanner generation. Environmental Product Declaration provides environmental relevant information of product and packaging material, operating, cleaning and disposal data as well as life cycle impact information. Results were achieved by Siemens Healthineers using both standard and optional features. There can be no 'typical' hospital setting (case mix, system type, etc.) and

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Qty	Part No.	Item Description
		so results by users may vary with no guarantee that the same results can be achieved.

System Total **$ 2,130,767**

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FINANCING: The equipment listed above may be financed through Siemens. Ask us about our full range of financial products that can be tailored to meet your business and cash flow requirements. For further information, please contact your local Sales Representative.

ACCESSORIES: Don't forget to ask us about our line of OEM imaging accessories to complete your purchase. All accessories can be purchased or financed as part of this order. To purchase accessories directly or to receive our accessories catalog, please call us directly at 1-888-222-9944 or contact your local Sales Representative.

COMPLIANCE: Compliance with legal and internal regulations is an integral part of all business processes at Siemens. Possible infringements can be reported to our communication channel “Let Us Know”.

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Siemens Medical Solutions USA, Inc. General Terms and Conditions

1. GENERAL

1.1 Contract Terms and Acceptance. These terms and conditions constitute an integral part of any contract between Seller and Purchaser identified on the first page hereof and shall govern the sale of the products identified in such contract ("Products"). Purchaser acknowledges that this is a commercial and not a consumer transaction. Purchaser shall be deemed to have assented to, and to have waived any objection to, this Agreement upon the earliest to occur of any of the following: Purchaser's completion or execution of this Agreement; Purchaser's acceptance of all or any part of the Products; Purchaser's issuance of a purchase order for any Products identified on Seller's quotation or proposal; or delivery of the Products to the common carrier for shipment pursuant hereto.**1.2 Refurbished/Used Products.** For Products identified on this Agreement as used or refurbished Products, these Products have been previously owned and used. When delivered to Purchaser, such Products will perform in accordance with the manufacturer's specifications. Since pre-owned Products may be offered simultaneously to several customers, the availability of such Products to Purchaser cannot be guaranteed. If the Products are no longer available, Seller will use its best efforts to identify other suitable products in its inventory. If substitute products are not acceptable to Purchaser, then Seller will cancel the order and refund to Purchaser any deposits previously paid. The warranty period for any used or refurbished Products will be separately stated on the quotation. **1.3 Third Party Products.** If this Agreement includes the sale of third party products not manufactured by Seller, then Purchaser agrees and acknowledges that (a) Purchaser has made the selection of these products on its own, (b) the products are being acquired by Seller solely at the request of and for the benefit and convenience of Purchaser, (c) no representation, warranty or guarantee has been made by Seller with respect to the products, (d) the obligation of Purchaser to pay Seller for the products is absolute and unconditional, (e) use of the products may be subject to Purchaser's agreement to comply with any software licensing terms imposed by the manufacturer; and (f) unless otherwise indicated by Seller in writing, Seller is not responsible for any required installation, validation, product recall, warranty service, maintenance, complaint handling, or any other applicable FDA regulatory requirements, and the Purchaser will look solely to the manufacturer regarding these services and will assert no claim against Seller with respect to these products.

2. PRICES

2.1 Quotations. Unless otherwise agreed to in writing or set forth in the quotation, all prices quoted by Seller and amounts payable by Purchaser are in U.S. dollars, and include Seller's standard packaging. The prices quoted to Seller assume that the Seller is located in, and will use the Products in, the U.S. If not, such quotation will be void. Unless otherwise stated, the quotation shall only be valid for forty-five (45) days from the date of the quotation.**2.2 Delay in Acceptance of Delivery.** Should the agreed delivery date be postponed by Purchaser, Seller shall have the right to deliver the Products to storage at Purchaser"s risk and expense, and payments due upon delivery shall become due when Seller is ready to deliver.

3. TAXES

3.1 Any sales, use or manufacturer"s tax which may be imposed upon the sale or use of Products, or any property tax levied after readiness to ship, or any excise tax, license or similar fee (excluding the Medical Device Excise Tax as set forth in Section 4191 of the Internal Revenue Code of 1986, as amended) required under this transaction, shall be in addition to the quoted prices and shall be paid by Purchaser. Notwithstanding the foregoing, Seller agrees to honor any valid exemption certificate provided by Purchaser.

4. TERMS OF PAYMENT; DEFAULT

4.1 Payments; Due Date. Unless otherwise set forth in the quotation, Purchaser shall pay Seller as follows: an initial deposit of 10% of the purchase price for each Product is due upon submission of the purchase order, an additional 80% of the purchase price is due upon delivery of each Product, and the final 10% of the purchase price is due upon completion of installation or when the Products are available for first patient use, whichever occurs first. Unless otherwise agreed, all payments other than the initial deposit are due net thirty

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(30) days from the date of invoice. Seller shall have no obligation to complete installation until the payment due upon delivery is received. Partial shipments shall be billed as made, and payments for such shipments will be made in accordance with the foregoing payment terms.**4.2 Late Payment.** A service charge of 1½% per month, not to exceed the maximum rate allowed by law, shall be made on any portion of Purchaser"s outstanding balance which is not paid when due. Payment of such service charge shall not excuse or cure Purchaser's breach or default for late payment.**4.3 Payment of Lesser Amount.** If Purchaser pays, or Seller otherwise receives, a lesser amount than the full amount provided for under this Agreement, such payment shall not constitute or be construed other than as on account of the earliest amount due Seller. No endorsement or statement on any check or payment or elsewhere shall constitute or be construed as an accord or satisfaction. **4.4 Where Payment Due Upon Installation or Completion.** Should any terms of payment provide for either full or partial payment upon completion of installation or thereafter, and completion of installation is delayed for any reason for which Seller is not responsible beyond the installation date set forth in the Notice to Manufacture Letter issued by Seller, as applicable, then the balance of payments shall be due on the day following such installation date.**4.5 Default; Termination.** Each of the following shall constitute an event of default under this Agreement: (i) a failure by Purchaser to make any payment when due; (ii) a failure by Purchaser to perform any other obligation under this Agreement within thirty (30) days of receipt of written notice from Seller; or (iii) the commencement of any insolvency, bankruptcy or similar proceedings by or against Purchaser. Upon the occurrence of any event of default, at Seller's election: (a) the entire amount of any indebtedness and obligation due Seller under this Agreement and interest thereon shall become immediately due and payable; (b) Seller may suspend the performance of any of Seller's obligations hereunder, including, but not limited to, obligations relating to delivery, installation and warranty services; (c) Purchaser shall put Seller in possession of the Products upon demand; (d) Seller may sell or otherwise dispose of all or any part of the Products and apply the proceeds thereof against any indebtedness or obligation of Purchaser under this Agreement; (e) if this Agreement or any indebtedness or obligation of Purchaser under this Agreement is referred to an attorney for collection or realization, Purchaser shall pay to Seller all costs of collection and realization (including, without limitation, a reasonable sum for attorneys' fees); and Purchaser shall pay any deficiency remaining after collection of or realization by Seller on the Products. In addition, Seller may terminate this Agreement upon written notice to Purchaser in the event that Purchaser is not approved for credit or upon the occurrence of any material adverse change in the financial condition or business operations of Purchaser.**4.6 Financing.** Notwithstanding any arrangement that Purchaser may make for the financing of the purchase price of the Products, the parties agree that any such financing arrangement shall have no effect on the Purchaser's payment obligations under this Agreement, including but not limited to Sections 4.1 and 4.2 above.

5. EXPORT TERMS

5.1 Unless other arrangements have been made, payment on export orders shall be made by irrevocable confirmed letter of credit, payable in U.S. dollars against Seller's invoice and standard shipping documents. Such letter of credit shall be in an amount equal to the full purchase price of the Products and shall be established in a U.S. bank acceptable to Seller. Purchaser shall have sole responsibility to procure all necessary permits and licenses for shipment and compliance with any governmental regulations concerning control of final destination of Products.**5.2** Purchaser agrees that Products shall not at any time directly or indirectly be used, exported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with applicable export Control and US Sanction laws and regulations. If Purchaser purchases a Product at the domestic price and exports such Product, or transfers such Product to a third party for export, outside of the U.S., Purchaser shall pay to Seller the difference between the domestic price and the international retail price of such Product. Purchaser shall deliver to Seller, upon Seller's request, written assurance regarding compliance with this Section in form and content acceptable to Seller.

6. DELIVERY, RISK OF LOSS

6.1 Delivery Date. Delivery and installation dates will be established by mutual agreement of the parties as set forth in the Notice to Manufacture Letter issued by the Seller, as applicable. Seller shall make reasonable efforts to meet such delivery date(s).**6.2 Risk of Loss;**

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Title Transfer. Unless otherwise agreed to in writing, the following shall apply: (a) For Products that do not require installation by Seller, and for options and add-on products purchased subsequent to delivery and installation of Products purchased under this Agreement, delivery shall be complete upon transfer of possession to common carrier, F.O.B. Shipping Point, whereupon title to and all risk of loss, damage to or destruction of the Products shall pass to Purchaser. (b) For Products that require installation by Seller, delivery shall be complete upon delivery of the Products to Purchaser's designated site, F.O.B. Destination; whereupon title to and all risk of loss, damage to or destruction of such Products shall pass to Purchaser upon completion of delivery. (c) All freight charges and other transportation, packing and insurance costs, license fees, custom duties and other similar charges shall be the sole responsibility of Purchaser unless included in the purchase price or otherwise agreed to in writing by Seller. In the event of any loss or damage to any of the Products during shipment, Seller and Purchaser shall cooperate in making any insurance claim.

7. SECURITY INTEREST/FILING

7.1 Purchaser grants to Seller a security interest in the Products until payment in full by Purchaser. Purchaser shall sign any financing statements or other documents necessary to perfect Seller's security interests in the Products. Purchaser further represents and covenants that (a) it will keep the Products in good order and repair until the purchase price has been paid in full, (b) it will promptly pay all taxes and assessments upon the Products or the use thereof, (c) it will not attempt to transfer any interest in the Products until the purchase price has been paid in full, and (d) it is solvent and financially capable of paying the full purchase price for the Products.

8. CHANGES, CANCELLATION, AND RETURN

8.1 Orders accepted by Seller are not subject to change except upon Seller's written agreement.**8.2** Orders accepted by Seller are non-cancellable by Purchaser except upon Seller's written consent and payment by Purchaser of a cancellation charge equal to 10% of the price of the affected Products, plus any shipping, insurance, inspection and refurbishment charges; the cost of providing any training, education, site evaluation or other services completed by Seller; and any return, cancellation or restocking fees with respect to any Third Party Products ordered by Seller on behalf of Purchaser. Seller may retain any payments received from Purchaser up to the amount of the cancellation charge. In no event can an order be cancelled by Purchaser or Products be returned to Seller after shipment.**8.3** Seller reserves the right to change the manufacture and/or design of its Products if, in the judgment of Seller, such change does not alter the general function of the Products.

9. FORCE MAJEURE

9.1 Seller shall not be liable for any loss or damage for delay in delivery, inability to install or any other failure to perform due to causes beyond its reasonable control including, but not limited to, acts of God or the public, war, civil commotion, blockades, embargoes, calamities, floods, fires, earthquakes, explosions, storms, strikes, lockouts, labor disputes, or unavailability of labor, raw materials, power or supplies. Should such a delay occur, Seller may reasonably extend delivery or production schedules or, at its option, cancel the order in whole or part without liability other than to return any unearned deposit or prepayment.

10. WARRANTY

10.1 Seller warrants that the Products manufactured by Seller and sold hereunder shall be free from defects in material or workmanship under normal use and service for the warranty period. The final assembled Products shall be new although they may include certain used, reworked or refurbished parts and components (e.g., circuit boards) that comply with performance and reliability specifications and controls. Seller's obligation under this warranty is limited, at Seller's option, to the repair or replacement of the Product or any part thereof. Unless otherwise set forth in the Product Warranty attached hereto and incorporated herein by reference ("Product Warranty"), the warranty period shall commence upon the earlier of the date that the Products have been installed in accordance with Section 12.5 hereof (which date shall be confirmed in writing by Seller) or first patient use, and shall continue for twelve (12) consecutive months. Seller makes no warranty for any Products made by persons other than Seller or its affiliates, and Purchaser's sole warranty therefor, if any, is the original manufacturer"s warranty, which Seller agrees to pass on to Purchaser, as applicable. The warranty provided by Seller under this Section 10 extends only to the original Purchaser,

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unless the Purchaser obtains the Seller's prior written consent with respect to any sale or other transfer of the Products during the term of the warranty.**10.2** No warranty extended by Seller shall apply to any Products which have been damaged by fire, accident, misuse, abuse, negligence, improper application or alteration or by a force majeure occurrence as described in Section 9 hereof or by the Purchaser's failure to operate the Products in accordance with the manufacturer's instructions or to maintain the recommended operating environment and line conditions; which are defective due to unauthorized attempts to repair, relocate, maintain, service, add to or modify the Products by the Purchaser or any third party or due to the attachment and/or use of non-Seller supplied parts, equipment or software without Seller's prior written approval; which failed due to causes from within non-Seller supplied equipment, parts or software including, but not limited to, problems with the Purchaser's network; or which have been damaged from the use of operating supplies or consumable parts not approved by Seller. In addition, there is no warranty coverage for any transducer or probe failure due to events such as cracking from high impact drops, cable rupture from rolling equipment over the cable, delamination from cleaning with inappropriate solutions, or TEE bite marks. Seller may effectuate any repairs at Purchaser's facility, and Purchaser shall furnish Seller safe and sufficient access for such repair. Repair or replacement may be with parts or products that are new, used or refurbished. Repairs or replacements shall not interrupt, extend or prolong the term of the warranty. Purchaser shall, upon Seller's request, return the non-complying Product or part to Seller with all transportation charges prepaid, but shall not return any Product or part to Seller without Seller's prior written authorization. Purchaser shall pay Seller its normal charges for service and parts for any inspection, repair or replacement that falls outside of Seller's warranty. Seller's warranty does not apply to consumable materials, disposables, supplies, accessories and collateral equipment, except as specifically stated in writing or as otherwise set forth in the Product Warranty.**10.3** This warranty is made on condition that immediate written notice of any noncompliance be given to Seller and Seller's inspection reveals that Purchaser"s claim is covered under the terms of the warranty (i.e., that the noncompliance is due to traceable defects in original materials and/or workmanship).**10.4** Purchaser shall provide Seller with both on-site and remote access to the Products. The remote access shall be provided through the Purchaser's network as is reasonably necessary for Seller to provide warranty services under this Agreement. Remote access will be established through a broadband internet-based connection to either a Purchaser owned or Seller provided secure end-point. The method of connection will be a Peer-to-Peer VPN IPsec tunnel (non-client based) with specific inbound and outbound port requirements.**10.5** Warranty service will be provided without charge during Seller"s regular working hours (8:30-5:00), Monday through Friday, except Seller's recognized holidays. If Purchaser requires that service be performed outside these hours, such service can be made available at an additional charge, at Seller's then current rates. The obligations of Seller described in this Section are Seller's only obligations and Purchaser's sole and exclusive remedy for a breach of product warranty.**10.6 SELLER MAKES NO WARRANTY OTHER THAN THE ONE SET FORTH HEREIN AND IN THE PRODUCT WARRANTY. SUCH WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSES, AND SUCH CONSTITUTES THE SOLE AND EXCLUSIVE WARRANTY MADE WITH RESPECT TO THE PRODUCTS, SERVICE OR OTHER ITEM FURNISHED UNDER THIS AGREEMENT.10.7** In the event of any inconsistencies between the terms of this Section 10 and the terms of the Product Warranty, the terms of the Product Warranty shall prevail.

11. LIMITATION OF LIABILITY

11.1 In no event shall Seller's liability hereunder exceed the actual loss or damage sustained by Purchaser, up to the purchase price of the Products. The foregoing limitation of liability shall not apply to claims for bodily injury or damages to real property or tangible personal property to the extent arising from Seller's negligence or a product defect.**11.2 SELLER SHALL NOT BE LIABLE FOR ANY LOSS OF USE, REVENUE OR ANTICIPATED PROFITS; COST OF SUBSTITUTE PRODUCTS OR SERVICES; LOSS OF STORED, TRANSMITTED OR RECORDED DATA; OR FOR ANY INDIRECT, INCIDENTAL, UNFORESEEN, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY**

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OTHER THEORY OR FORM OF ACTION, EVEN IF SELLER HAS BEEN ADVISED OF THE POSSIBILITY THEREOF, ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT OR THE SALE OR USE OF THE PRODUCTS. THE FOREGOING IS A SEPARATE, ESSENTIAL TERM OF THIS AGREEMENT AND SHALL BE EFFECTIVE UPON THE FAILURE OF ANY REMEDY, EXCLUSIVE OR NOT.

12. INSTALLATION - ADDITIONAL CHARGES

12.1 General. Unless otherwise expressly stipulated in writing, the Products shall be installed by and at the expense of Seller except that Seller shall not provide rigging or site preparation services unless otherwise agreed to in writing by Seller for an additional charge. Seller will not install accessory items such as cabinets, illuminators, darkroom equipment or processors for X-Ray and CT equipment, unless otherwise agreed to in writing by Seller.**12.2 Installation by Seller.** If Seller specifies it will install the Products, the following applies: subject to fulfillment of the obligations set forth in Section 12.3 below, Seller shall install the Products and connect them to the requisite safety switches and power lines to be installed by Purchaser. Except as otherwise specified below, if such installation and connection are performed by Seller‘s technical personnel, prices shown include the cost thereof, provided that the installation and connection can be performed within the Continental United States or Puerto Rico and during normal business hours. Any overtime charges or other special expenses shall be additional charges to the prices shown.**12.3 Purchaser"s Obligations.** Purchaser shall, at its expense, provide all proper and necessary labor and materials for plumbing service, carpentry work, conduit wiring, and other preparations required for such installation and connection. All such labor and materials shall be completed and available at the time of delivery of the Products by Seller. Additionally, Purchaser shall provide free access to the installation site and, if necessary, safe and secure space for storage of Products and equipment prior to installation by Seller. Purchaser shall be responsible, at its sole cost and expense, for obtaining all permits, licenses and approvals required by any federal, state or local authorities in connection with the installation and operation of the Products, including but not limited to any certificate of need and zoning variances. Purchaser shall provide a suitable environment for the Products and shall ensure that its premises are free of hazardous conditions and any concealed or dangerous conditions and that all site requirements are met. Seller shall delay its work until Purchaser has completed the removal of any hazardous materials or has taken any other precautions and completed any other work required by applicable regulations. Purchaser shall reimburse Seller for any increased costs and expenses incurred by Seller that are the result of or are caused by any such delay. In the event that Seller is requested to supervise the installation of the Products, it remains the Purchaser"s responsibility to comply with local regulations. Seller is not an architect and all drawings furnished by Seller are not construction drawings. If local labor conditions, including a requirement to use union labor, require the use of non-Seller employees to participate in the installation of the Product or otherwise causes delays or any additional expenses, then any such additional costs shall be at Purchaser’s expense. **12.4 Regulatory Reporting.** In the event that any regulatory activity is performed by anyone other than Seller’s authorized personnel, then Purchaser shall be responsible for fulfilling any and all reporting requirements.**12.5 Completion of Installation.** Installation shall be complete upon the conclusion of final calibration and checkout under Seller’s standard procedures to verify that the Products meet applicable written performance specifications. Notwithstanding the foregoing, first use of the Products by Purchaser, its agents or employees for any purpose after delivery shall constitute completion of installation.

13. PATENT, COPYRIGHT AND OTHER INFRINGEMENT CLAIMS

13.1 Infringement by Seller. Seller warrants that the Products manufactured by Seller and sold hereunder do not infringe any U.S. patent or copyright. If Purchaser receives a claim that any such Products, or parts thereof, infringe upon the rights of others under any U.S. patent or copyright, Purchaser shall notify Seller immediately in writing. Provided that Purchaser gives Seller information, assistance and exclusive authority to evaluate, defend and settle such claims, Seller shall at its own expense and option: indemnify and defend Purchaser against such claims; settle such claims; procure for Purchaser the right to use the Products; or remove or modify them to avoid infringement. If none of these alternatives is available on terms reasonable to Seller, then Purchaser shall return the Products to Seller and Seller shall refund to

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Purchaser the purchase price paid by Purchaser less reasonable depreciation for Purchaser's use of the Products. The foregoing states Seller's entire obligation and liability, and Purchaser's sole remedy, for claims of infringement.**13.2 Infringement by Purchaser.** If some or all of the Products sold hereunder are made by Seller pursuant to drawings or specifications furnished by Purchaser, or if Purchaser modifies or combines, operates or uses the Products other than as specified by Seller or with any product, data, software, apparatus or program not provided or approved by Seller, then the indemnity obligation of Seller under Section 13.1 shall be null and void.

14. DESIGNS AND TRADE SECRETS; LICENSE; CONFIDENTIALITY

14.1 Any drawings, data, designs, software programs or other technical information supplied by Seller to Purchaser in connection with the sale of the Products shall remain Seller's property and shall at all times be held in confidence by Purchaser.**14.2** For all Products which utilize software for their operation, such "Applications Software" shall be licensed to Purchaser under the terms of Seller's Software License Schedule attached hereto.**14.3** Seller and Purchaser shall maintain the confidentiality of any information provided or disclosed to the other party relating to the business, customers and/or patients of the disclosing party, as well as this Agreement and its terms (including the pricing and other financial terms under which the Purchaser will be purchasing the Products). Each party shall use reasonable care to protect the confidentiality of the information disclosed, but no less than the degree of care it would use to protect its own confidential information, and shall only disclose the other party's confidential information to its employees and agents having a need to know this information. The obligations of confidentiality set forth herein shall not apply to any information in the public domain at the time of disclosure or that is required to be disclosed by court order or by law.

15. ASSIGNMENT

15.1 Neither party may assign any rights or obligations under this Agreement without the prior written consent of the other, which shall not be unreasonably withheld. Any attempt to do so shall be void, except that Seller may assign this Agreement without consent to any subsidiary or affiliated company, and may delegate to authorized subcontractors or service suppliers any work to be performed under this Agreement so long as Seller remains liable for the performance of its obligations under this Agreement. This Agreement shall inure to and be binding upon the parties and their respective successors, permitted assigns and legal representatives.

16. COSTS AND FEES

16.1 In the event that any dispute or difference is brought arising from or relating to this Agreement or the breach, termination or validity thereof, the prevailing party shall be entitled to recover from the other party all reasonable attorneys' fees incurred, together with such other expenses, costs and disbursements as may be allowed by law.

17. MODIFICATION

17.1 This Agreement may not be changed, modified or amended except in writing signed by duly authorized representatives of the parties.

18. GOVERNING LAW; WAIVER OF JURY TRIAL

18.1 This Agreement shall be governed by the laws of the state where the Product(s) will be installed, without regard to that state's choice of law principles.**18.2 EACH OF THE PARTIES EXPRESSLY WAIVES ALL RIGHTS TO A JURY TRIAL IN CONNECTION WITH ANY DISPUTE UNDER THIS AGREEMENT.**

19. COST REPORTING

19.1 Purchaser agrees that it must fully and accurately report prices paid under this Agreement, net of all discounts, as required by applicable law and contract, including without limitation 42 CFR §1001.952(h),in all applicable Medicare, Medicaid and state agency cost reports. Purchaser shall retain a copy of this Agreement and all other communications regarding this Agreement, together with the invoices for purchase and permit agents of the U.S. Department of Health and Human Services or any state agency access to such records upon request.

20. INTEGRATION

20.1 These terms and conditions, including any attachments or other documents incorporated by reference herein, constitute the entire, complete and exclusive statement of agreement with respect to the subject matter hereof, and supersede any and all prior agreements, understandings and communications between the parties with respect to the Products. Purchaser's additional or different terms and conditions stated in a purchase order, bid documents or any other

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document issued by Purchaser are specifically rejected and shall not apply to the transactions contemplated under this Agreement.

21. SEVERABILITY; HEADINGS
21.1 No provision of this Agreement which may be deemed unenforceable will in any way invalidate any other portion or provision of this Agreement. Section headings are for convenience only and have no substantive effect.

22. WAIVER
22.1 No failure and no delay in exercising, on the part of any party, any right under this Agreement will operate as a waiver thereof, nor will any single or partial exercise of any right preclude the further exercise of any other right.

23. NOTICES
23.1 Any notice or other communication under this Agreement shall be deemed properly given if in writing and delivered in person or mailed, properly addressed and stamped with the required postage, to the intended recipient at its address specified on the face hereof.

24. RIGHTS CUMULATIVE
24.1 The rights and remedies afforded to Seller under this Agreement are in addition to, and do not in any way limit, any other rights or remedies afforded to Seller by any other agreement, by law or otherwise.

25. END USER CERTIFICATION
25.1 Purchaser represents, warrants and covenants that it is acquiring the Products for its own end use and not for reselling, leasing or transferring to a third party (except for lease-back financings).

26. ACCESS TO BOOKS AND RECORDS
26.1 To the extent required by Section 1861(v)(1)(I) of the Social Security Act and the regulations promulgated thereunder, until the expiration of four (4) years after the furnishing of any Product or service pursuant to this Agreement, Seller shall make available, upon written request by the Secretary of Health and Human Services (the "Secretary"), or upon request by the Comptroller General (the "Comptroller"), or any of their duly authorized representatives, copies of this Agreement and any books, documents, records or other data of Seller that are necessary to certify the nature and extent of any costs incurred by Purchaser for such Products and services. If Seller carries out any of its duties under this Agreement through a subcontract with a related organization involving a value or cost of ten thousand dollars ($10,000) or more over a twelve (12) month period, Seller will cause such subcontract to contain a clause to the effect that, until the expiration of four (4) years after the furnishing of any Product or service pursuant to said contract, the related organization will make available upon the written request of the Secretary or the Comptroller, or any of their duly authorized representatives, copies of records of said related organization that are necessary to certify the nature and extent of cost incurred by Purchaser for such Product or service.

27. DISPOSITION OF PRODUCTS
27.1 Purchaser expressly agrees that should Purchaser sell, transfer or otherwise dispose of the Products, Purchaser shall notify Seller in writing and give Seller the opportunity to purchase such Products. With Purchaser's notice, Purchaser shall provide Seller with a copy of the third party's binding offer to purchase the Products and Seller shall have seven (7) days to notify the Purchaser of an offer to purchase the Products.
05/15 Rev.

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Software License Schedule
to the Siemens Medical Solutions USA, Inc General Terms and Conditions

1. DEFINITIONS: The following definitions apply to this Schedule:

"**Agreement**" shall mean the attached (i) Quotation for Products and/or Services including the Terms and Conditions of Sale and applicable schedules; and/or (ii) Software License Agreement describing the software licensed herein and the specific system for which the license is issued.
"**Licensor**" shall mean Siemens Medical Solutions USA, Inc.
"**Licensee**" shall mean the end-user to whom Licensor provides Software or Documentation for its internal use under the Agreement.
"**Software**" shall mean the software described in the attached Agreement, including the following as contained therein: (i) software programs consisting of a series of statements or instructions to be used directly or indirectly in a programmable controller or computer to bring about a certain result and (ii) databases consisting of systemized collections of data to be used or referenced directly or indirectly by a programmed controller or computer. Notwithstanding the foregoing, "Software" does not include "firmware" as such term is conventionally understood. Diagnostic/Maintenance Software also is not included within the scope of the Software licensed under this Schedule, and is available only as a special option under a separate Diagnostic Materials License Agreement and may be subject to a separate licensing fee.
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"**Designated Unit**" shall mean a single control unit or computer identified on the first page of the Agreement, on which Software licensed hereunder may be used by Licensee.

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a new capability for which the Licensee will be charged. In addition, some updates may require Applications Training performed by Licensor's personnel that will be offered at Licensor's prevailing rates. Licensor retains the sole right to determine whether an update requires such training.

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Revised 03/15/05

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TRADE-IN EQUIPMENT REQUIREMENTS

TRADE-IN EQUIPMENT REQUIREMENTS

THE FOLLOWING APPLIES ONLY TO THE EXTENT THAT THE QUOTATION INCLUDES AN EQUIPMENT TRADE IN OR IF A TRADE-IN IS LATER ADDED TO THS QUOTATION VIA A CHANGE ORDER. THESE REQUIREMENTS ARE IN ADDITION TO ANY OTHER REFERENCED TERMS AND CONDITIONS OF THE QUOTATION AND SHALL REMAIN IN EFFECT REGARDLESS OF ANY CONTRARY LANGUAGE IN THE QUOTATION.

This Quotation includes the trade-in equipment described herein and referenced by either the Project Number identified in the Quotation hereof (non-Ultrasound) or the Trade In Part Number (Ultrasound) as further described in the associated Trade Sheet which is incorporated herein by reference. Purchaser certifies that the description of the trade-in equipment as set forth on the Trade Sheet is a true and accurate representation of the equipment, and that the equipment is in good working condition unless otherwise noted on the Trade Sheet.

The trade-in equipment must be made available for removal no later than turnover of the new equipment. Purchaser must vacate the room of all items not listed on the Trade Sheet, or otherwise clearly identify all items listed on the Trade Sheet, prior to the start of the de-installation. If this is not done, Seller will have no liability for items which are subsequently removed or scrapped. If the de-installation or return of the trade-in equipment is delayed by Purchaser for reasons other than a force majeure event, or if upon inspection by Seller it is determined that the equipment does not meet the manufacturer's operating specifications, or if any items listed as included on the Trade Sheet are not made available at the time of de-installation, then trade-in value will be re-evaluated and any loss in value or additional costs incurred by Seller shall be deducted from the established trade-in value and the pricing set forth on this Quotation will be adjusted by change order. In the event that access to the non-ultrasound trade-in equipment is denied past 14 days from turnover, or access to ultrasound trade-in equipment is denied past 30 days from turnover, then Purchaser shall pay to Seller a rental fee in the amount 3.5% of the total trade-in value plus any additional value provided by an Elevate/Promotional program included in this quotation (no less than $1000) for each month, or part thereof, that access is denied. In addition, if the purchase and installation of the new equipment covered by this Quotation is not completed, then Seller shall invoice Purchaser for all costs and expenses incurred by Seller in connection with the de-installation and removal of the trade-in equipment, including but not limited to labor, materials, rigging out, and transportation, which costs shall be paid by Purchaser within thirty (30) days of the invoice date.

Purchaser further acknowledges and agrees that (i) the trade-in equipment will be free and clear of all liens and encumbrances including, but not limited to, unpaid leases and loans, and that upon request, it will execute a bill of sale or other documents reasonably satisfactory to Siemens to transfer title and ownership of the equipment to Seller, (ii) it is Purchaser's sole responsibility to delete all protected health information and any other confidential information from the equipment prior to de-installation, without damaging or cannibalizing the equipment or otherwise affecting the operation of the equipment in accordance with its specifications, (iii) the equipment, including all updates, upgrades, modifications, enhancements, revisions, software, S/W disks and manuals, shall be returned to Siemens in good operating condition, reasonable wear and tear excepted, and (iv) to the extent not prohibited by applicable law, Purchaser shall indemnify and hold Seller harmless from and against any and all claims, demands, causes of action, damages, liability, costs and expenses (including reasonable attorney's fees) resulting or arising from Purchaser's failure to comply with item (i) above.

FOR MR SYSTEMS: cryogen levels must be least 65% upon time of de-installation. FOR MOBILE SYSTEMS: system must be road worthy and a state issued title transferring ownership to Seller (or Designee) must be received prior to the removal of the mobile system. FOR MODALITY TRADE SYSTEMS (non-ultrasound): The trade-in equipment must be available for inspection within two weeks of the scheduled de-installation date. In addition, Purchaser must provide a clear path for the removal of the trade-in equipment and on the date of de-installation after final inspection and test by the Seller (or Designee) has occurred, the Purchaser must supply licensed tradespeople to disconnect the power and plumbing (including draining and removing and disposing of any hazardous materials including, but not limited to glycol from the chiller and oil from the transformer, as examples.) Any additional costs due to the need to use a larger rig (other than a standard 80 ton rig), as well as any construction activities, street closings, permits, etc., required to de-install/remove the equipment are out-of-scope costs and will be the responsibility of Purchaser. FOR ULTRASOUND SYSTEMS – Purchaser may provide transducers with the ultrasound unit being traded in, but will not receive additional credit for such transducers.

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MR Warranty Information

Product	**Period of Warranty[1]**	**Coverage**	**Note**
New Systems and "ECO" Refurbished Systems Only (Not including consumables)	12 months	Full Warranty (parts & labor)[1] Principal Coverage Period 8am-5pm Monday through Friday [2]	1. MAGNETOM Sempra/Free.MAX/Free.STAR requires Smart Remote Services (SRS) Connection prior to system installation or requires purchase of "No SRS" option.
FIT Upgrades – MAGNETOM_Avanto/Skyra_Fit_BioMatrix, MAGNETOM_Sola/Vida_Fit (Not including consumables)			1.Fit Upgrade warranty excludes Magnet, Magnet Refrigeration System (CryoCare), Liquid Helium Refills and Gradient Coil (if the Gradient Coil is not replaced with the Fit upgrade). These coverages can be purchased separately.

Post-Warranty (after expiration of system warranty) – Replacement of parts prorated only. Does not include labor.			
Magnet	12 months	Parts only	
Spare Parts	6 months	Parts only	
Consumables	Refer to warranty of consumable item		

DNA Warranty Information for On-premise perpetual Applications only

Product	**Period of Warranty**	**Coverage**	
syngo plaza, syngo workflow, syngo Dynamics, syngo Carbon	6 months Software	Remote Phone Support, Remote Software Upgrades & Updates, Remote Education	Requires Smart Remote Services (SRS) Connection prior to system installation
Upgrades related to syngo Dynamics, syngo Carbon, Medicalis Workflow Orchestrator, Medicalis Clinical Decision Support, Medicalis Referral Management	No Additional Warranty Included for upgrades	Remote Phone Support, Remote Software Upgrades & Updates, Remote Education	Upgrades via the ESA are a contract component and do not have a separate warranty.

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Hardware	OEM Warranty for Hardware	Parts & Labor (Not Applicable)	
Spare Parts & Consumables	Not Applicable	Not Applicable	
Post-Warranty (after expiration of system warranty) – Replacement of parts prorated only. Does not include labor.			
Spare Parts & Consumables	Not Applicable	Not Applicable	

DNA Warranty Information for On-premise term licenses/Subscriptions & Cloud based Applications

Product	**Period of Warranty**	**Coverage**	
syngo Virtual Cockpit, teamplay, AI-Rad Companion	No warranty	Remote Phone Support, Remote Software Upgrades & Updates, Remote Education	
Incremental purchases on Applications, Upgrades related to syngo Virtual Cockpit, teamplay, AI-Rad Companion	No Warranty	Remote Phone Support, Remote Software Upgrades & Updates, Remote Education	Upgrades and incremental purchases on Applications do not have a separate warranty
Hardware	OEM Warranty for Hardware	Parts & Labor (Not Applicable)	
Spare Parts & Consumables	Not Applicable	Not Applicable	

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Detailed Technical Specifications

MAGNETOM Sola - System

Part No./Product	Description
14460300 MAGNETOM Sola - System	MAGNETOM Sola - the first 1.5T BioMatrix system - leverages the intelligent combination of Tim 4G and Siemens unique BioMatrix technology to embrace the unique challenges that every patient brings to the MRI exam. System Design - Short and open appearance (157 cm total system length cover-to-cover and 70 cm Open Bore Design) to reduce patient anxiety and claustrophobia - Whole-body superconductive Zero Helium Boil-Off 1.5T magnet - Weight-optimized magnet technology based on high performance 3T and 7T magnet design - Actively Shielded water-cooled Siemens gradient system for maximum performance BioMatrix Technology to address intrinsic biovariability in humans. Built on three technological pillars: - BioMatrix Sensors: anticipate challenges before they happen with respiratory sensors, which measure a patient's respiratory signal as soon as the patient lies on the table. - BioMatrix Tuners: adapt and correct field inhomogeneities induced by patient anatomy with CoilShim and SliceAdjust. - BioMatrix Interfaces: easily manage any type of patient with intelligent interfaces like Select&GO to accelerate workflow. Tim 4G (Total imaging matrix in the 4th generation) for excellent image quality and speed - Siemens unique DirectRX technology enabling all digital-in/digital-out design - Dual-Density Signal Transfer Technology Push-button exams with GO technologies Select&GO DotGO Recon&GO MR View&GO Tim Application Suite enabling excellent head-to-toe imaging - Neuro Suite - Angio Suite - Cardiac Suite - Body Suite - Onco Suite - Breast Suite - Ortho Suite - Pediatric Suite - Scientific Suite Further included: - High performance host computer and measurement and reconstruction system - Patient communication including headphones

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Part No./Product	Description
	- Turbo Suite Essential - syngo MR software including: - 1D/2D PACE - BLADE - Phoenix - Inline Diffusion - MDDW (Multiple Direction Diffusion Weighting) - CISS - DESS - TGSE - Offline Composing MAGNETOM Sola - the first 1.5T BioMatrix system - leverages the intelligent combination of Tim 4G and the Siemens unique BioMatrix technology to be ready to embrace the unique set of challenges that each and every patient brings to the MRI exam. The system includes: **BioMatrix Technology** In order to meet the requirements of the changing healthcare market, Tim® is now further enhanced with the ability to address patient biovariablity: Evolving from Total imaging matrix, BioMatrix® technology addresses the intrinsic biovariability in humans. BioMatrix can anticipate challenges in MR examinations, for example, the limited ability to hold one's breath, to manage growing patient populations and increasing exam complexity in MRI. BioMatrix can adapt to all patients and their anatomic individuality, even the critical ones, to make MRI more predictable and consistent for all patients, even critical ones. BioMatrix can accelerate the workflow, without compromising quality of care by assisting interactions between the patient and the user, to improve MRI cost-effectiveness and patient outcomes. BioMatrix anticipates, adapts and accelerates to embrace human nature. **Tim 4G** Tim 4G provides excellent image quality and speed in MRI combined with increased patient comfort and optimized workflow efficiency. Only one patient setup, no repositioning, no changing of coils. Ultra-light-weighted coils with high density of coil elements for maximized patient comfort and increased SNR. Feet-first positioning reduces claustrophobia. Tim 4G with its 4G flexibility, 4G accuracy and 4G speed brings image quality and acquisition speed to a new level. **Magnet:** - Short 145 cm long (157 cm with covers), whole-body superconductive 1.5T magnet with active shielding (AS) technology with counter coils - External Interference Shielding (E.I.S.) - Excellent homogeneity enabled magnet design which allows for a cylindrically optimized homogeneity volume resulting in higher image quality (50 × 50 × 45 cm³ DEV, typ. 2,8 ppm based on the 24-plane plot method) - Temperature sensors with real time correction algorithm for unmatched long-term stability at 70 cm - The magnet has a typical Helium boil-off rate of 0 l/yr during typical, undisturbed clinical operation depending on the sequences used and examination time, and provided the system is serviced in regular intervals. - It has an integrated magnet cooling system.

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Part No./Product	Description
	- The combination of standard active shim and passive shim allows for maximized magnetic field homogeneity and consistent high image quality for a wide range of applications - Integrated Eco-Power technology to save around 30% of energy during standby of the system. **Gradient system:** - Actively shielded water-cooled world-class gradient system - All axes force compensated for lowest vibrations and acoustic performance **DirectRF - RF Transmit/Receive System:** - Fully integrated Transmit- and Receive path in the magnet housing including extremely compact water-cooled solid state amplifier with 37.5 kW peak power - High dynamic range - Immediate feedback loop for real-time sequence adaptation - Integrated no tune transmit/receive Body Coil - The revolutionary Tim 4G technology allows connecting 204 channels (coil elements) simultaneously enabling higher SNR and iPAT in all directions. No repositioning of patients is needed even for large Field of View examinations. Dual-Density Signal Transfer enables ultra-high density coil design by integrating key RF components into the local coil. **GO technologies** Select&GO The Select&GO interface enables fast and easy single-touch patient positioning. Correct positioning saves unnecessary wasted time for repositioning and additional adjustments, therefore shortening the total room time. - The ergonomically designed Select&GO touch panels are integrated into the front cover on each side of the patient tunnel for controlling table movement, guidance for patient setup and comfort features. They are well illuminated for easy visual recognition. - Automated table move to upmost position, to center position or Home position facilitate smooth patient preparation and will reduce table time - Variable (6 levels) ventilation and lighting inside the magnet bore or volume adjustments are possible for increased patient comfort The Select&GO touch panels provide on board guidance for patient set up where it's needed - directly at the scanner. Information such as patient name or exam type or required patient position, guidance for ECG set up and immediate visualization of physiological curves will be provided for convenient operation. - Almost all table control functions, including ventilation and illumination of the magnet bore, can be also controlled from the operator console for convenient operation. DotGO Go for consistent results, efficiently with Dot Engines. Dot offers a customizable framework for patient personalization, user guidance and exam automation. Optimized scan strategies are provided and can be selected based on patient condition, which allow for high quality exams even when conditions change. Integrated decision points allow the user to easily add or remove one or a group of protocols with one click. Step by step image and text guidance guides novice users even through the most complicated exams. Exam automation allows optimal timing for breathing, scanning, planning or contrast arrival. Dot can be easily customized to follow the individual standards of care. Dot is personalized, guided and automated and designed to improve workflow efficiency and image consistency. Dot Cockpit The central tool to continuously build knowledge into standardized exams strategies and to make those available for every user in the MRI department. Dot Cockpit is the new starting point for every

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	exam. Recon&GO The Recon&GO technology encompasses a wide range of in-line functionalities automizing reconstruction and post-processing steps to provide ready-to-read results for the radiologist. Examples are Inline ADC calculation, inline subtraction of dynamic contrastenhanced series, up to Inline Launch of advanced post-processing applications. MR View&GO MR View&GO is MAGNETOM Sola's all-in-one viewing and reading solution for fast and intuitive quality check and result distribution. It receives the images directly as they come on the scanner, giving the user a clear overview of the quality of images scanned, without being distracted by constant context switches. Once the images have been checked for acceptable quality, they can easily be sent to the PACS with minimal user interaction. Beyond that, MR View&GO offers the additional advantage to perform extended post-processing, directly at the scanner. In-line launching of post-processing applications makes it possible to fully automate the evaluation of, for example, perfusion maps, permeability or cardiac function, all without additional user interaction. This makes it possible to save radiologist time by delivering quantitative, ready-to-read results, directly to the PACS. **Tim Application Suite** The Tim Application Suite offers a complete range of clinically optimized examinations for all regions. The Tim Application Suite -allowing excellent head-to-toe imaging - is provided standard on MAGNETOM Sola. · Neuro Suite · Angio Suite · Cardiac Suite · Body Suite · Onco Suite · Breast Suite · Ortho Suite · Pediatric* Suite · Scientific Suite * MR scanning has not been established as safe for imaging fetuses and infants less than two years of age. The responsible physician must evaluate the benefits of the MR examination compared to those of other imaging procedures. **Neuro Suite** Comprehensive head and spine examinations can be performed with dedicated programs. High-resolution pulse sequences and motion-insensitive pulse sequences for patients which have difficulties to lay still are provided. The Neuro Suite also includes pulse sequences for diffusion imaging, perfusion imaging, and fMRI. It includes for example: · Fast 2D imaging with SE, TSE, GRE pulse sequences for high-resolution imaging · BLADE for motion-insensitive TSE imaging EPI pulse sequences and protocols for diffusion imaging, perfusion imaging, and fMRI for advanced neuro applications. Diffusionweighted imaging is possible with up to 16 b-values in the orthogonal directions. For reduced distortions and homogeneous signal intensity even in the presence of challenging susceptibility interfaces and at station boundaries, SliceAdjust (slice-by-slice adjustments) can be selected. · 3D TOF for non-contrast enhanced angiography · 3D isotropic resolution volume imaging using T1 3D MPRAGE / 3D

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	- FLASH, SPACE DarkFluid, T1 SPACE and T2 SPACE pulse sequences - High-resolution T2 SPACE pulse sequence optimized for inner ear examinations - Double Inversion Recovery 3D pulse sequences (DIR SPACE) with two user-selectable inversion pulses for the simultaneous suppression of e.g. cerebro-spinal fluid and white matter - MP2RAGE (Magnetization Prepared 2 Rapid Acquisition Gradient Echoes) provides homogeneous tissue contrast for segmentation and applications such as voxel-based morphometry. In combination with MapIt*, it also provides T1 mapping functionality. - Whole-spine pulse sequences in multiple steps with software controlled table movement - 2D and 3D MEDIC pulse sequences for T2-weighted imaging, particularly for C-spine examinations in axial orientation where reproducibility is difficult due to CSF pulsations and blood flow artifacts - RESOLVE (Readout Segmentation Of Long Variable Echo-trains) delivers high-resolution, low-distortion diffusion-weighted imaging (DWI) for accurate depiction of lesions. - BioMatrix's CoilShim helps to reduce patient induced strongly localized B0 inhomogeneities as may arise, e.g., in the neck region. - 3D Myelo with 3D HASTE for anatomical details - 3D CISS (Constructive Interference in Steady State) for excellent - visualization of fine structures such as cranial nerves. High-resolution imaging of inner ear - TGSE sequence used primarily for T2-weighted imaging for shorter measurement time, decreased RF power deposition, and high-resolution imaging of the brain - AutoAlign Head LS providing a fast, easy, standardized, and reproducible patient scanning supporting reading by delivering a higher and more standardized image quality. **Angio Suite** Excellent MR Angiography can be performed to visualize arteries and veins with or without contrast agent. - 3D MRA pulse sequences for carotid arteries, abdominal arteries, and peripheral arteries, with short TR and TE. The strong gradients make it possible to separate the arterial phase from the venous phase. - Dynamic MRA for 3D imaging over time Signal from Respiratory Sensor can be selected to actively trigger MR image acquisition, e.g. with NATIVE*. *Contrast-enhanced MRA* 3D contrast-enhanced MRA pulse sequences for dynamic carotid, abdominal, and peripheral arteries, shortest TR and TE. The strong gradients make it possible to separate the arterial phase from the venous phase - TestBolus workflow for optimal bolus timing and excellent image quality - CareBolus functionality for accurate determination of the bolus arrival time and the “Stop and Continue” of the 3D ce-MRA pulse squenece after the 2D bolus control scan - Dynamic ce-MRA for 3D imaging over time *Non-contrast-MRA and venography* - Time-of-Flight (ToF) pulse squeneces for MRA for the Circle of Willis, carotids and neck vessels; can be adapted for venography, and Breath-hold protocols for abdominal vessels - Triggered 2D ToF sequences for non-contrast MRA in the legsMR venography and arteriography with Phase-Contrast - TONE (Tilted optimized non-saturating excitation) techniques for improved - Contrast-to-Noise Ratio (CNR) *Image processing tools* - Inline MIP for immediate results

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	- Inline subtraction of pre- and post-contrast measurements - Inline standard deviation maps of Phase-Contrast measurements for delineation of arteries and veins **Cardiac Suite** The cardiac suite covers comprehensive 2D routine cardiac applications, ranging from morphology and ventricular function to tissue characterization. It moreover features BEAT 2D in conjunction with iPAT, T-PAT and e-PAT techniques. *Cardiac views* - Fast acquisition of the basic cardiac orientations for further examination planning - Cardiac scouting provides users with a step-by-step procedure for the visualization and planning of typical cardiac views, e.g. based on TrueFISP or Dark Blood TurboFLASH: short axis, 4-chamber and 2-chamber views. *BEAT* - Unique tool for fast and easy cardiovascular MR imaging - E.g. 1 click change from FLASH to TrueFISP for easy contrast optimization - 1-click to switch arrhythmia rejection on / off - 1-click change from Cartesian to radial sampling to increase effective image resolution (e.g. in pediatric patients) and avoid folding artifacts in large patients *Visualization of structural cardiovascular pathologies with CMRBEAT* - Breath-hold and free breathing techniques for strong contrast between the blood and vascular structures. Dark Blood TSE and HASTE imaging are available for the structural evaluation of the cardiothoracic anatomy, including vessels or heart valves. Cine techniques (FLASH & TrueFISP) for high-resolution valve evaluation. - Multiple contrasts such as T1- and T2-weighted imaging for use in diseases such as myocarditis (inflammation / hyperaemia), ARVD (fibrous-fatty degeneration) or acute myocardial infarction (edema) - Dark-blood TSE with motion compensation for high-quality vessel wall imaging in small or large vessels *Tools for rapid evaluation of left or right ventricular function* - Acquisition of a stack of short-axis slices (standard: advanced segmented TrueFISP) - Automatic adjustment of the acquisition window to the current heart rate - Use of the Inline ECG for graphical ECG triggering setup - Retrospective gating with cine sequences (TrueFISP, FLASH) - Pulse sequences for whole-heart coverage - Integration of Compressed Sensing Cardiac Cine (optional) for highest temporal and spatial resolution (segemented and realtime pulse sequences) - Real-time imaging in case the patient is not able to hold his breath *4D imaging and tissue characterization with BEAT; pulse sequences for high-contrast and high-resolution tissue characterization* - Pulse sequences for stress and rest imaging with TurboFLASH contrast support the acquisition of multiple slices with high resolution and arbitrarily adjustable slice orientation for each slice T-PAT and e-PAT with mSENSE and GRAPPA for advanced parallel imaging provides fast high-resolution dynamic imaging - Segmented IR TrueFISP / FLASH with TI scout for optimization of tissue contrast - Advanced tissue characterization with 2D phase-sensitive IR (PSIR) pulse sequences with TrueFISP and FLASH contrast. Magnitude and phase-sensitive images with one acquisition. - Simple: no adjustment of inversion time (TI) necessary with PSIR technique - Motion correction/averaging of multiple measurements with iPAT or tPAT accelerated single-shot TrueFISP or GRE images of the heart, for free-breathing acquisition.

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	Physiological Measurement Unit (PMU) - Wireless Physio Control · Synchronizes the measurement with the physiological cycles (triggering to minimize motion artifacts caused by cardiac and respiratory movements) · Wireless Sensors · Wireless Vector ECG / respiration for physiologically synchronized imaging, rechargeable battery-powered - for optimized patient handling · Physiological Signals Display · ECG (3 channels) · Respiration · External Trigger Input Display ECG Triggering: · Acquisition of multiple slices, e.g. of the heart, at different phases of the cardiac cycle · Excellent image quality by synchronizing data acquisition with cardiac motion · Respiratory Triggering: Excellent image quality by synchronizing data acquisition with the respiratory motion · External Triggering: Interface for trigger input from external sources (e.g. Patient Monitoring System) inside the examination room · Interface for trigger input from external sources (e.g. pulse generator, trigger sources for fMRI) outside the examination room · Optical trigger output for fMRI · Retrospective gating for ECG, peripheral pulse, and external trigger input **Breast Suite** MR imaging provides excellent tissue contrast that may be useful in the evaluation of the breasts. Extremely high spatial and temporal resolution can be achieved in very short acquisition times by using iPAT with GRAPPA and CAIPIRINHA. Customized pulse sequences (e.g. with fat saturation or water excitation or silicone excitation), as well as flexible multiplanar visualization allow a fast, simple and reproducible evaluation of MR breast examinations. This package includes: · High-resolution 2D pulse sequences for morphology evaluation · High-resolution 3D pulse sequences covering both breasts simultaneously · Pulse sequences to support interventions (fine needle and vacuum biopsies, wire localization) · Pulse sequences for evaluating breasts with silicone implants · Automatic and manual frequency adjustment, taking into account the silicone signal · Detection of the silicone signal either to suppress the silicone signal, if the surrounding tissue is to be evaluated, or to suppress the tissue signal in order to detect an implant leakage · SPAIR - robust fat sat (robust fat suppression using an adiabatic frequency selective inversion pulse) · DIXON - 2-point Dixon with 3D VIBE, the following contrasts can be obtained: in-phase, opposed phase, fat and water image iPAT with GRAPPA for maximum resolution in short time · iPAT² with CAIPIRINHA that allows state-of-the-art sagittal breast imaging and further improvement of the temporal resolution in dynamic scans while maintaining spatial resolution · Inline subtraction and MIP display · Offline subtraction, MPR and MIP display · REVEAL: diffusion imaging for breast exams. In pulse sequences with multiple b-values individual numbers of averages may be specified per b-value. · RESOLVE: Diffusion-weighted, readout-segmented (multi shot) EPI sequence for high-resolution susceptibility-insensitive DWI of the breast

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	- RADIANT: Ultrasound-like reconstruction around the nipple The Breast Suite also includes: ***syngo* VIEWS (Volume Imaging with Enhanced Water Signal)** - Bilateral - both breasts are examined simultaneously - Axial - the milk ducts are directly displayed - fat-saturated or water-excited - fat complicates clinical evaluation and is suppressed - Near-isotropic 3D measurement - the same voxel size in all three directions for reconstruction in any slice direction - Submillimeter voxel - highest resolution for precise evaluation **Body Suite** The Body Suite is dedicated to clinical body applications. Ultra-fast high-resolution 2D and 3D pulse sequences are provided for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, and MR Urography applications. 2D PACE technique makes body imaging easy, allowing for multibreath- hold examinations as well as free breathing during the scans. Motion artifacts are greatly reduced with 2D PACE Inline technology. This package includes: - Free breathing 2D PACE applications with 2D HASTE (RESTORE) and 2D / 3D TSE- it is possible to use a phase navigator, which measures respiratory induced off-resonance effects. The positioning can be done automatically for most pulse sequences. - Optimized fast single shot HASTE pulse sequences and high-resolution - 3D pulse sequences based on SPACE and TSE for MRCP and MR Urography examinations - REVEAL: diffusion imaging for abdomen and whole body exams. - For reduced distortions and homogeneous signal intensity even in the presence of challenging susceptibility interfaces and at station boundaries, SliceAdjust (slice-by-slice adjustments) can - be selected. - In pulse sequences with multiple b-values, individual numbers of averages may be specified per b-value. Inline calculation of ADC maps, exponential ADC maps and inverted b-value images can be selected. Inline calculation (extrapolation) of high b-values (up to b=5000 s/mm²) is possible. - Signal from Respiratory Sensor can be selected to actively trigger MR image acquisition. ***ABDOMEN:*** *2D:* - T1 (FLASH) breath-hold scans with and without FatSat (SPAIR, Quick FatSat, in- / opp-phase) - T2 (HASTE, TSE / BLADE, EPI) breath-hold scans with and without FatSat (SPAIR, FatSat, STIR) - T1 (TFL) triggered scans (2D PACE free breathing) in- / opp-phase T2 (HASTE, TSE / BLADE, EPI) triggered scans (2D PACE free breathing) with and without FatSat (SPAIR, FatSat, STIR) as well as HASTE- and TSE-multi-echo - Optimized fast single-shot HASTE pulse sequences and high-resolution pulse sequences based on SPACE and TSE for MRCP and MR urography examinations 3D: - Dixon (VIBE 2pt-Dixon) breathhold scans, following contrasts can be obtained: in-phase, opposed phase, fat and water image - Dynamic (VIBE and Quick-FatSat) pulse sequences with Inline motion correction for visualization of focal lesions with high spatial and temporal resolution - Colonography dark lumen with T1-weighted VIBE - REVEAL: Diffusion-weighted imaging of the prostate, cervix, rectum and other organs with multiple b-values. Inline calculation of - ADC maps, exponential ADC maps and inverted b-value images can be selected. Inline

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	calculation (extrapolation) of high bvalues (up to b=5000 s/mm2) is possible. ***PELVIS:*** · High-resolution T1, T2 pelvic imaging · Isotropic T2 SPACE 3D pulse sequences · Dynamic volume examinations with 3D VIBE ***THORAX:*** · High-resolution T1, T2 thorax imaging · Motion-insensitve pulse sequences (BLADE, HASTE) · TrueFISP pulse sequences for imaging of respiratory mechanics · Dynamic imaging with TWIST (optional), TWIST-VIBE (optional) · Non-contrast-enhanced vessel visualization with SPACE pulse · sequences · STIR pulse sequences for the evaluation of lymph nodes · Diffusion-weighted imaging with REVEAL **Onco Suite** MR imaging provides excellent soft-tissue differentiation, multiplanar capabilities, and the possibility of selectively suppressing specific tissue, e.g. fat or water. The Onco Suite features a collection of pulse sequences and evaluation tools that may be used for a detailed assessment of a variety of oncological conditions. General features: · STIR TSE, HASTE, and FLASH in-phase and opposed-phase pulse sequences for highly sensitive visualization of focal lesions · Dynamic imaging pulse sequences for assessment of the kinetic behavior of tissue · Quantitative evaluation and fast analysis of the data with colorized · Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement- Integral, MIP-time and combination maps with Inline technology · Display and analysis of the temporal behavior in selected regions of interest with the included MeanCurve postprocessing application. · This includes the capability of using additional datasets as a guide for defining regions of interest even faster and easier than before. · REVEAL: Diffusion-weighted imaging with multiple b-values. In pulse sequences with multiple b-values, individual numbers of averages may be specified per b-value. Inline calculation of ADC maps, exponential ADC maps and inverted b-value images can be selected. Inline calculation (extrapolation) of high b-values (up to b = 5000 s / mm2) is possible. For reduced distortions and homogeneous signal intensity even in the presence of challenging susceptibility interfaces and at station boundaries, · SliceAdjust (slice-by-slice adjustments) can be selected. · RESOLVE: high-resolution, low-distortion diffusion-weighted imaging (DWI). In pulse sequences with multiple b-values, individual numbers of averages may be specified per b-value. Inline calculation of ADC maps, exponential ADC maps and inverted bvalue images can be selected. Inline calculation (extrapolation) of high b-values (up to b=5000 s / mm2) is possible. Prostate: · Dedicated prostate pulse sequences for a variety of clinical scenarios · T1-weighted 3D VIBE pulse sequences with high temporal resolution (VIBE, TWIST (optional) and TWIST-VIBE (optional)) allow time course evaluation · Prostate spectroscopy (3D CSI (optional) volume scan) with up to 8 sat bands (suppression of water and fat signal) Whole-body imaging:

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	- TSE STIR pulse sequences for head-to-toe and head-to-pelvis imaging - Dedicated pulse sequences for focus regions head, neck, thorax, abdomen and pelvis - Diffusion-weighted imaging with REVEAL including SliceAdjust **OrthoSuite** Ortho Suite is a comprehensive collection of pulse sequences for joint and spine imaging. This package includes: - 2D TSE pulse sequences for PD, T1, and T2-weighted contrast with high in-plane resolution and thin slices - 3D MEDIC, 3D TrueFISP pulse sequences with water excitation for T2-weighted imaging with high in-plane resolution and thin slices - High-resolution 3D VIBE pulse sequences for MR Arthrography (knee, shoulder, and hip) - 3D MEDIC, 3D TrueFISP, 3D VIBE pulse sequences with Water Excitation having high isotropic resolution optimized for 3D postprocessing - T1 and PD SPACE 3D imaging with high isotropic resolution, optimized for post-processing Single-step, and multi-step pulse sequences - Excellent fat suppression in off-center positions, e.g. in the shoulder due to high magnet homogeneity - Dynamic TMJ pulse sequence (different joint positions) - Multi Echo SE sequence with up to 32 echoes for T2 mapping - High-resolution 3D DESS (Double Echo Steady State): T2 / T1- weighted imaging for excellent fluid-cartilage differentiation - 2-point Dixon technique for fat and water separation - Turbo Spin Echo sequence - WARP - 2D TSE sequence combining optimized high-bandwidth pulse sequences and View Angle Tilting (VAT), tailored to reduce susceptibility artifacts caused by orthopedic MRConditional implants. This helps in evaluation of soft tissue in proximity of the implants. Available pulse sequences include T1- weighted, T2-weighted, proton density and STIR contrast. - Advanced WARP enables the reduction of gross artifacts (i.e. through-plane artifacts) caused by large MR-Conditional* implants. It contains the 2D TSE based SEMAC technique and is especially useful in the case of hip and knee joint replacements. - Available pulse sequences include T1-weighted, proton density and T2 TSE STIR contrast. ***Pediatric Suite** Tissue relaxation times and examination conditions in pediatrics are very different compared to those of adults. The reasons for these differences range from developing tissues, body size and faster heart rates to non-compliance with breathhold commands. Pulse sequences can be easily adapted for imaging infants. * MR scanning has not been established as safe for imaging fetuses and infants less than two years of age. The responsible physician must evaluate the benefits of the MR examination compared to those of other imaging procedures. **Scientific Suite** MAGNETOM Sola - the first 1.5T BioMatrix system - leverages the intelligent combination of Tim 4G and the Siemens unique BioMatrix technology to be ready to embrace the unique set of challenges that each and every patient brings to the MRI exam. The system includes: **BioMatrix Technology** In order to meet the requirements of the changing healthcare market, Tim® is now further enhanced with the ability to address patient biovariablity: Evolving from Total imaging matrix, BioMatrix®

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	technology addresses the intrinsic biovariability in humans. BioMatrix can anticipate challenges in MR examinations, for example, the limited ability to hold one's breath, to manage growing patient populations and increasing exam complexity in MRI. BioMatrix can adapt to all patients and their anatomic individuality, even the critical ones, to make MRI more predictable and consistent for all patients, even critical ones. BioMatrix can accelerate the workflow, without compromising quality of care by assisting interactions between the patient and the user, to improve MRI cost-effectiveness and patient outcomes. BioMatrix anticipates, adapts and accelerates to embrace human nature. **Tim 4G** Tim 4G provides excellent image quality and speed in MRI combined with increased patient comfort and optimized workflow efficiency. Only one patient setup, no repositioning, no changing of coils. Ultra-light-weighted coils with high density of coil elements for maximized patient comfort and increased SNR. Feet-first positioning reduces claustrophobia. Tim 4G with its 4G flexibility, 4G accuracy and 4G speed brings image quality and acquisition speed to a new level. **Magnet:** - Short 145 cm long (157 cm with covers), whole-body superconductive 1.5T magnet with active shielding (AS) technology with counter coils - External Interference Shielding (E.I.S.) - Excellent homogeneity enabled magnet design which allows for a cylindrically optimized homogeneity volume resulting in higher image quality (50 × 50 × 45 cm³ DEV, typ. 2,8 ppm based on the 24-plane plot method) - Temperature sensors with real time correction algorithm for unmatched long-term stability at 70 cm - The magnet has a typical Helium boil-off rate of 0 l/yr during typical, undisturbed clinical operation depending on the sequences used and examination time, and provided the system is serviced in regular intervals. - It has an integrated magnet cooling system. - The combination of standard active shim and passive shim allows for maximized magnetic field homogeneity and consistent high image quality for a wide range of applications - Integrated Eco-Power technology to save around 30% of energy during standby of the system. **Gradient system:** - Actively shielded water-cooled world-class gradient system - All axes force compensated for lowest vibrations and acoustic performance **DirectRF - RF Transmit/Receive System:** - Fully integrated Transmit- and Receive path in the magnet housing including extremely compact water-cooled solid state amplifier with 37.5 kW peak power - High dynamic range - Immediate feedback loop for real-time sequence adaptation - Integrated no tune transmit/receive Body Coil - The revolutionary Tim 4G technology allows connecting 204 channels (coil elements) simultaneously enabling higher SNR and iPAT in all directions. No repositioning of patients is needed even for large Field of View examinations. Dual-Density Signal Transfer enables ultra-high density coil design by integrating key RF components into the local coil.

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	GO technologies Select&GO The Select&GO interface enables fast and easy single-touch patient positioning. Correct positioning saves unnecessary wasted time for repositioning and additional adjustments, therefore shortening the total room time. - The ergonomically designed Select&GO touch panels are integrated into the front cover on each side of the patient tunnel for controlling table movement, guidance for patient setup and comfort features. They are well illuminated for easy visual recognition. - Automated table move to upmost position, to center position or Home position facilitate smooth patient preparation and will reduce table time - Variable (6 levels) ventilation and lighting inside the magnet bore or volume adjustments are possible for increased patient comfort The Select&GO touch panels provide on board guidance for patient set up where it's needed - directly at the scanner. Information such as patient name or exam type or required patient position, guidance for ECG set up and immediate visualization of physiological curves will be provided for convenient operation. - Almost all table control functions, including ventilation and illumination of the magnet bore, can be also controlled from the operator console for convenient operation. DotGO Go for consistent results, efficiently with Dot Engines. Dot offers a customizable framework for patient personalization, user guidance and exam automation. Optimized scan strategies are provided and can be selected based on patient condition, which allow for high quality exams even when conditions change. Integrated decision points allow the user to easily add or remove one or a group of protocols with one click. Step by step image and text guidance guides novice users even through the most complicated exams. Exam automation allows optimal timing for breathing, scanning, planning or contrast arrival. Dot can be easily customized to follow the individual standards of care. Dot is personalized, guided and automated and designed to improve workflow efficiency and image consistency. Dot Cockpit The central tool to continuously build knowledge into standardized exams strategies and to make those available for every user in the MRI department. Dot Cockpit is the new starting point for every exam. Recon&GO The Recon&GO technology encompasses a wide range of in-line functionalities automizing reconstruction and post-processing steps to provide ready-to-read results for the radiologist. Examples are Inline ADC calculation, inline subtraction of dynamic contrastenhanced series, up to Inline Launch of advanced post-processing applications. MR View&GO MR View&GO is MAGNETOM Sola's all-in-one viewing and reading solution for fast and intuitive quality check and result distribution. It receives the images directly as they come on the scanner, giving the user a clear overview of the quality of images scanned, without being distracted by constant context switches. Once the images have been checked for acceptable quality, they can easily be sent to the PACS with minimal user interaction. Beyond that, MR View&GO offers the additional advantage to perform extended post-processing, directly at the scanner. In-line launching of post-processing applications makes it possible to fully automate the evaluation of, for example, perfusion maps, permeability or cardiac function, all without additional user interaction. This makes it possible to save radiologist time by delivering quantitative, ready-to-read results, directly to the PACS.

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	Tim Application Suite The Tim Application Suite offers a complete range of clinically optimized examinations for all regions. The Tim Application Suite -allowing excellent head-to-toe imaging - is provided standard on MAGNETOM Sola. - Neuro Suite - Angio Suite - Cardiac Suite - Body Suite - Onco Suite - Breast Suite - Ortho Suite - Pediatric* Suite - Scientific Suite * MR scanning has not been established as safe for imaging fetuses and infants less than two years of age. The responsible physician must evaluate the benefits of the MR examination compared to those of other imaging procedures. **Neuro Suite** Comprehensive head and spine examinations can be performed with dedicated programs. High-resolution pulse sequences and motion-insensitive pulse sequences for patients which have difficulties to lay still are provided. The Neuro Suite also includes pulse sequences for diffusion imaging, perfusion imaging, and fMRI. It includes for example: - Fast 2D imaging with SE, TSE, GRE pulse sequences for high-resolution imaging - BLADE for motion-insensitive TSE imaging EPI pulse sequences and protocols for diffusion imaging, perfusion imaging, and fMRI for advanced neuro applications. Diffusionweighted imaging is possible with up to 16 b-values in the orthogonal directions. For reduced distortions and homogeneous signal intensity even in the presence of challenging susceptibility interfaces and at station boundaries, SliceAdjust (slice-by-slice adjustments) can be selected. - 3D TOF for non-contrast enhanced angiography - 3D isotropic resolution volume imaging using T1 3D MPRAGE / 3D - FLASH, SPACE DarkFluid, T1 SPACE and T2 SPACE pulse sequences - High-resolution T2 SPACE pulse sequence optimized for inner ear examinations - Double Inversion Recovery 3D pulse sequences (DIR SPACE) with two user-selectable inversion pulses for the simultaneous suppression of e.g. cerebro-spinal fluid and white matter - MP2RAGE (Magnetization Prepared 2 Rapid Acquisition Gradient Echoes) provides homogeneous tissue contrast for segmentation and applications such as voxel-based morphometry. In combination with MapIt*, it also provides T1 mapping functionality. - Whole-spine pulse sequences in multiple steps with software controlled table movement - 2D and 3D MEDIC pulse sequences for T2-weighted imaging, particularly for C-spine examinations in axial orientation where reproducibility is difficult due to CSF pulsations and blood flow artifacts - RESOLVE (Readout Segmentation Of Long Variable Echo-trains) delivers high-resolution, low-distortion diffusion-weighted imaging (DWI) for accurate depiction of lesions. - BioMatrix's CoilShim helps to reduce patient induced strongly localized B0 inhomogeneities as may arise, e.g., in the neck region. - 3D Myelo with 3D HASTE for anatomical details - 3D CISS (Constructive Interference in Steady State) for excellent

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	- visualization of fine structures such as cranial nerves. High-resolution imaging of inner ear - TGSE sequence used primarily for T2-weighted imaging for shorter measurement time, decreased RF power deposition, and high-resolution imaging of the brain - AutoAlign Head LS providing a fast, easy, standardized, and reproducible patient scanning supporting reading by delivering a higher and more standardized image quality. **Angio Suite** Excellent MR Angiography can be performed to visualize arteries and veins with or without contrast agent. - 3D MRA pulse sequences for carotid arteries, abdominal arteries, and peripheral arteries, with short TR and TE. The strong gradients make it possible to separate the arterial phase from the venous phase. - Dynamic MRA for 3D imaging over time Signal from Respiratory Sensor can be selected to actively trigger MR image acquisition, e.g. with NATIVE*. *Contrast-enhanced MRA* 3D contrast-enhanced MRA pulse sequences for dynamic carotid, abdominal, and peripheral arteries, shortest TR and TE. The strong gradients make it possible to separate the arterial phase from the venous phase - TestBolus workflow for optimal bolus timing and excellent image quality - CareBolus functionality for accurate determination of the bolus arrival time and the “Stop and Continue” of the 3D ce-MRA pulse squenece after the 2D bolus control scan - Dynamic ce-MRA for 3D imaging over time *Non-contrast-MRA and venography* - Time-of-Flight (ToF) pulse squeneces for MRA for the Circle of Willis, carotids and neck vessels; can be adapted for venography, and Breath-hold protocols for abdominal vessels - Triggered 2D ToF sequences for non-contrast MRA in the legsMR venography and arteriography with Phase-Contrast - TONE (Tilted optimized non-saturating excitation) techniques for improved - Contrast-to-Noise Ratio (CNR) *Image processing tools* - Inline MIP for immediate results - Inline subtraction of pre- and post-contrast measurements - Inline standard deviation maps of Phase-Contrast measurements for delineation of arteries and veins **Cardiac Suite** The cardiac suite covers comprehensive 2D routine cardiac applications, ranging from morphology and ventricular function to tissue characterization. It moreover features BEAT 2D in conjunction with iPAT, T-PAT and e-PAT techniques. *Cardiac views* - Fast acquisition of the basic cardiac orientations for further examination planning - Cardiac scouting provides users with a step-by-step procedure for the visualization and planning of typical cardiac views, e.g. based on TrueFISP or Dark Blood TurboFLASH: short axis, 4-chamber and 2-chamber views. *BEAT* - Unique tool for fast and easy cardiovascular MR imaging - E.g. 1 click change from FLASH to TrueFISP for easy contrast optimization - 1-click to switch arrhythmia rejection on / off

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	- 1-click change from Cartesian to radial sampling to increase effective image resolution (e.g. in pediatric patients) and avoid folding artifacts in large patients *Visualization of structural cardiovascular pathologies with CMRBEAT* - Breath-hold and free breathing techniques for strong contrast between the blood and vascular structures. Dark Blood TSE and HASTE imaging are available for the structural evaluation of the cardiothoracic anatomy, including vessels or heart valves. Cine techniques (FLASH & TrueFISP) for high-resolution valve evaluation. - Multiple contrasts such as T1- and T2-weighted imaging for use in diseases such as myocarditis (inflammation / hyperaemia), ARVD (fibrous-fatty degeneration) or acute myocardial infarction (edema) - Dark-blood TSE with motion compensation for high-quality vessel wall imaging in small or large vessels *Tools for rapid evaluation of left or right ventricular function* - Acquisition of a stack of short-axis slices (standard: advanced segmented TrueFISP) - Automatic adjustment of the acquisition window to the current heart rate - Use of the Inline ECG for graphical ECG triggering setup - Retrospective gating with cine sequences (TrueFISP, FLASH) - Pulse sequences for whole-heart coverage - Integration of Compressed Sensing Cardiac Cine (optional) for highest temporal and spatial resolution (segemented and realtime pulse sequences) - Real-time imaging in case the patient is not able to hold his breath *4D imaging and tissue characterization with BEAT; pulse sequences for high-contrast and high-resolution tissue characterization* - Pulse sequences for stress and rest imaging with TurboFLASH contrast support the acquisition of multiple slices with high resolution and arbitrarily adjustable slice orientation for each slice T-PAT and e-PAT with mSENSE and GRAPPA for advanced parallel imaging provides fast high-resolution dynamic imaging - Segmented IR TrueFISP / FLASH with TI scout for optimization of tissue contrast - Advanced tissue characterization with 2D phase-sensitive IR (PSIR) pulse sequences with TrueFISP and FLASH contrast. Magnitude and phase-sensitive images with one acquisition. - Simple: no adjustment of inversion time (TI) necessary with PSIR technique - Motion correction/averaging of multiple measurements with iPAT or tPAT accelerated single-shot TrueFISP or GRE images of the heart, for free-breathing acquisition. Physiological Measurement Unit (PMU) - Wireless Physio Control - Synchronizes the measurement with the physiological cycles (triggering to minimize motion artifacts caused by cardiac and respiratory movements) - Wireless Sensors - Wireless Vector ECG / respiration for physiologically synchronized imaging, rechargeable battery-powered - for optimized patient handling - Physiological Signals Display - ECG (3 channels) - Respiration - External Trigger Input Display ECG Triggering: - Acquisition of multiple slices, e.g. of the heart, at different phases of the cardiac cycle - Excellent image quality by synchronizing data acquisition with cardiac motion - Respiratory Triggering: Excellent image quality by synchronizing data acquisition with the respiratory motion

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	- External Triggering: Interface for trigger input from external sources (e.g. Patient Monitoring System) inside the examination room - Interface for trigger input from external sources (e.g. pulse generator, trigger sources for fMRI) outside the examination room - Optical trigger output for fMRI - Retrospective gating for ECG, peripheral pulse, and external trigger input **Breast Suite** MR imaging provides excellent tissue contrast that may be useful in the evaluation of the breasts. Extremely high spatial and temporal resolution can be achieved in very short acquisition times by using iPAT with GRAPPA and CAIPIRINHA. Customized pulse sequences (e.g. with fat saturation or water excitation or silicone excitation), as well as flexible multiplanar visualization allow a fast, simple and reproducible evaluation of MR breast examinations. This package includes: - High-resolution 2D pulse sequences for morphology evaluation - High-resolution 3D pulse sequences covering both breasts simultaneously - Pulse sequences to support interventions (fine needle and vacuum biopsies, wire localization) - Pulse sequences for evaluating breasts with silicone implants - Automatic and manual frequency adjustment, taking into account the silicone signal - Detection of the silicone signal either to suppress the silicone signal, if the surrounding tissue is to be evaluated, or to suppress the tissue signal in order to detect an implant leakage - SPAIR - robust fat sat (robust fat suppression using an adiabatic frequency selective inversion pulse) - DIXON - 2-point Dixon with 3D VIBE, the following contrasts can be obtained: in-phase, opposed phase, fat and water image iPAT with GRAPPA for maximum resolution in short time - iPAT² with CAIPIRINHA that allows state-of-the-art sagittal breast imaging and further improvement of the temporal resolution in dynamic scans while maintaining spatial resolution - Inline subtraction and MIP display - Offline subtraction, MPR and MIP display - REVEAL: diffusion imaging for breast exams. In pulse sequences with multiple b-values individual numbers of averages may be specified per b-value. - RESOLVE: Diffusion-weighted, readout-segmented (multi shot) EPI sequence for high-resolution susceptibility-insensitive DWI of the breast - RADIANT: Ultrasound-like reconstruction around the nipple The Breast Suite also includes: ***syngo* VIEWS (Volume Imaging with Enhanced Water Signal)** - Bilateral - both breasts are examined simultaneously - Axial - the milk ducts are directly displayed - fat-saturated or water-excited - fat complicates clinical evaluation and is suppressed - Near-isotropic 3D measurement - the same voxel size in all three directions for reconstruction in any slice direction - Submillimeter voxel - highest resolution for precise evaluation **Body Suite** The Body Suite is dedicated to clinical body applications. Ultra-fast high-resolution 2D and 3D pulse sequences are provided for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, and MR Urography applications. 2D PACE technique makes body imaging easy, allowing for multibreath- hold examinations as well as free breathing during the scans. Motion artifacts are greatly reduced with 2D PACE Inline technology.

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	This package includes: - Free breathing 2D PACE applications with 2D HASTE (RESTORE) and 2D / 3D TSE- it is possible to use a phase navigator, which measures respiratory induced off-resonance effects. The positioning can be done automatically for most pulse sequences. - Optimized fast single shot HASTE pulse sequences and high-resolution - 3D pulse sequences based on SPACE and TSE for MRCP and MR Urography examinations - REVEAL: diffusion imaging for abdomen and whole body exams. - For reduced distortions and homogeneous signal intensity even in the presence of challenging susceptibility interfaces and at station boundaries, SliceAdjust (slice-by-slice adjustments) can - be selected. - In pulse sequences with multiple b-values, individual numbers of averages may be specified per b-value. Inline calculation of ADC maps, exponential ADC maps and inverted b-value images can be selected. Inline calculation (extrapolation) of high b-values (up to b=5000 s/mm²) is possible. - Signal from Respiratory Sensor can be selected to actively trigger MR image acquisition. ***ABDOMEN:*** *2D:* - T1 (FLASH) breath-hold scans with and without FatSat (SPAIR, Quick FatSat, in- / opp-phase) - T2 (HASTE, TSE / BLADE, EPI) breath-hold scans with and without FatSat (SPAIR, FatSat, STIR) - T1 (TFL) triggered scans (2D PACE free breathing) in- / opp-phase T2 (HASTE, TSE / BLADE, EPI) triggered scans (2D PACE free breathing) with and without FatSat (SPAIR, FatSat, STIR) as well as HASTE- and TSE-multi-echo - Optimized fast single-shot HASTE pulse sequences and high-resolution pulse sequences based on SPACE and TSE for MRCP and MR urography examinations 3D: - Dixon (VIBE 2pt-Dixon) breathhold scans, following contrasts can be obtained: in-phase, opposed phase, fat and water image - Dynamic (VIBE and Quick-FatSat) pulse sequences with Inline motion correction for visualization of focal lesions with high spatial and temporal resolution - Colonography dark lumen with T1-weighted VIBE - REVEAL: Diffusion-weighted imaging of the prostate, cervix, rectum and other organs with multiple b-values. Inline calculation of - ADC maps, exponential ADC maps and inverted b-value images can be selected. Inline calculation (extrapolation) of high bvalues (up to b=5000 s/mm2) is possible. ***PELVIS:*** - High-resolution T1, T2 pelvic imaging - Isotropic T2 SPACE 3D pulse sequences - Dynamic volume examinations with 3D VIBE ***THORAX:*** - High-resolution T1, T2 thorax imaging - Motion-insensitve pulse sequences (BLADE, HASTE) - TrueFISP pulse sequences for imaging of respiratory mechanics - Dynamic imaging with TWIST (optional), TWIST-VIBE (optional) - Non-contrast-enhanced vessel visualization with SPACE pulse - sequences - STIR pulse sequences for the evaluation of lymph nodes - Diffusion-weighted imaging with REVEAL **Onco Suite** MR imaging provides excellent soft-tissue differentiation, multiplanar capabilities,

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	and the possibility of selectively suppressing specific tissue, e.g. fat or water. The Onco Suite features a collection of pulse sequences and evaluation tools that may be used for a detailed assessment of a variety of oncological conditions. General features: - STIR TSE, HASTE, and FLASH in-phase and opposed-phase pulse sequences for highly sensitive visualization of focal lesions - Dynamic imaging pulse sequences for assessment of the kinetic behavior of tissue - Quantitative evaluation and fast analysis of the data with colorized - Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement- Integral, MIP-time and combination maps with Inline technology - Display and analysis of the temporal behavior in selected regions of interest with the included MeanCurve postprocessing application. - This includes the capability of using additional datasets as a guide for defining regions of interest even faster and easier than before. - REVEAL: Diffusion-weighted imaging with multiple b-values. In pulse sequences with multiple b-values, individual numbers of averages may be specified per b-value. Inline calculation of ADC maps, exponential ADC maps and inverted b-value images can be selected. Inline calculation (extrapolation) of high b-values (up to b = 5000 s / mm2) is possible. For reduced distortions and homogeneous signal intensity even in the presence of challenging susceptibility interfaces and at station boundaries, - SliceAdjust (slice-by-slice adjustments) can be selected. - RESOLVE: high-resolution, low-distortion diffusion-weighted imaging (DWI). In pulse sequences with multiple b-values, individual numbers of averages may be specified per b-value. Inline calculation of ADC maps, exponential ADC maps and inverted bvalue images can be selected. Inline calculation (extrapolation) of high b-values (up to b=5000 s / mm2) is possible. Prostate: - Dedicated prostate pulse sequences for a variety of clinical scenarios - T1-weighted 3D VIBE pulse sequences with high temporal resolution (VIBE, TWIST (optional) and TWIST-VIBE (optional)) allow time course evaluation - Prostate spectroscopy (3D CSI (optional) volume scan) with up to 8 sat bands (suppression of water and fat signal) Whole-body imaging: - TSE STIR pulse sequences for head-to-toe and head-to-pelvis imaging - Dedicated pulse sequences for focus regions head, neck, thorax, abdomen and pelvis - Diffusion-weighted imaging with REVEAL including SliceAdjust **OrthoSuite** Ortho Suite is a comprehensive collection of pulse sequences for joint and spine imaging. This package includes: - 2D TSE pulse sequences for PD, T1, and T2-weighted contrast with high in-plane resolution and thin slices - 3D MEDIC, 3D TrueFISP pulse sequences with water excitation for T2-weighted imaging with high in-plane resolution and thin slices - High-resolution 3D VIBE pulse sequences for MR Arthrography (knee, shoulder, and hip) - 3D MEDIC, 3D TrueFISP, 3D VIBE pulse sequences with Water Excitation having high isotropic resolution optimized for 3D postprocessing - T1 and PD SPACE 3D imaging with high isotropic resolution, optimized for post-processing Single-step, and multi-step pulse sequences

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	- Excellent fat suppression in off-center positions, e.g. in the shoulder due to high magnet homogeneity - Dynamic TMJ pulse sequence (different joint positions) - Multi Echo SE sequence with up to 32 echoes for T2 mapping - High-resolution 3D DESS (Double Echo Steady State): T2 / T1- weighted imaging for excellent fluid-cartilage differentiation - 2-point Dixon technique for fat and water separation - Turbo Spin Echo sequence - WARP - 2D TSE sequence combining optimized high-bandwidth pulse sequences and View Angle Tilting (VAT), tailored to reduce susceptibility artifacts caused by orthopedic MRConditional implants. This helps in evaluation of soft tissue in proximity of the implants. Available pulse sequences include T1- weighted, T2-weighted, proton density and STIR contrast. - Advanced WARP enables the reduction of gross artifacts (i.e. through-plane artifacts) caused by large MR-Conditional* implants. It contains the 2D TSE based SEMAC technique and is especially useful in the case of hip and knee joint replacements. - Available pulse sequences include T1-weighted, proton density and T2 TSE STIR contrast. ***Pediatric Suite** Tissue relaxation times and examination conditions in pediatrics are very different compared to those of adults. The reasons for these differences range from developing tissues, body size and faster heart rates to non-compliance with breathhold commands. Pulse sequences can be easily adapted for imaging infants. * MR scanning has not been established as safe for imaging fetuses and infants less than two years of age. The responsible physician must evaluate the benefits of the MR examination compared to those of other imaging procedures. **Scientific Suite** The Scientific Suite supports scientific users by providing easy access to application-specific data for further processing and advanced image calculus. - Support of USB Memory sticks - Anonymization of patient data - Easy creation of AVIs and screen snapshots to include in presentations or teaching videos - Export of tables, statistics and signal time courses to communal exchange formats like e.g. tabulated text files (MeanCurve, Spectroscopy evaluation, DTI evaluation) - Advanced image calculus including, addition, subtraction, multiplication, and division of images This *syngo* software version provides security settings to protect the scanner against known security threats. - User management with authentication to prohibit unauthorized access - Privileges to grant rights and define functionality based on user/role Hardened operating system and restricted network communication - Whitelisting (Embedded Control) against manipulation of scanner software - Security Delivery process to frequently distribute security updates Option to protect customer pulse sequences trees against unauthorized modifications - Audit trail to log system and data access by the defined users and service - Support of customers to implement their security policy including compliance with HIPAA (Health Insurance and Accountability Act) The sequences, features and techniques for acquisition and reconstruction included in the Tim Application Suite are described in detail below. **Sequences**

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	Spin Echo family of sequences: - Spin Echo (SE) - Single, Double, and Multi Echo (up to 32 echoes); Inversion Recovery (IR) - 2D / 3D Turbo Spin Echo (TSE) - Restore technique for shorter TR times while maintaining excellent T2 contrast; TurboIR: Inversion Recovery for STIR, DarkFluid, T1 and T2, TrueIR - 2D TSE with multiple average - it is possible to acquire T2-weighted TSE images during shallow breathing, in a time efficient manner - 2D / 3D HASTE (Half-Fourier Acquisition with Single-Shot Turbo - Spin Echo) - Inversion Recovery for STIR and DarkFluid contrast - SPACE for 3D imaging with high isotropic resolution with T1, T2, PD, and DarkFluid Contrast - 2D Optimized high bandwidth TSE (T1, T2, and PD weighted and STIR) with WARP for the reduction of susceptibility artifacts caused by MR Conditional metal* implants. Gradient Echo family of sequences: - 2D / 3D FLASH (spoiled GRE) - dual echo for in- / opposed phase imaging 3D VIBE (Volume Interpolated Breathhold Examination) - quick fat saturation; double echo for in-phase / opposed phase 3D imaging; DynaVIBE: Inline 3D elastic motion correction for multi phase data sets of the abdomen; Inline Breast Evaluation - 2D / 3D MEDIC (Multi Echo Data Image Combination) for high-resolution T2 weighted orthopedic imaging and excellent contrast - 2D / 3D TurboFLASH - 3D MPRAGE; single shot T1 weighted imaging e.g. for abdominal imaging during free breathing - 3D GRE for field mapping - 2D / 3D FISP (Fast Imaging with Steady State Precession) - 2D / 3D PSIF - PSIF Diffusion - Echo Planar Imaging (EPI) - diffusion-weighted; single shot SE and FID e.g. for BOLD imaging and perfusion-weighted imaging; 2D / 3D Segmented EPI (SE and FID) - RESOLVE (Readout Segmentation Of Long Variable Echo-trains) delivers high-resolution, low-distortion diffusion-weighted imaging (DWI) for accurate depiction of lesions. - ce-MRA sequence with Inline subtraction and Inline MIP - 2D / 3D Time-of-Flight (ToF) Angiography - single slab and multi slab; triggered and segmented - 2D / 3D Phase Contrast Angiography - BEAT Tool - TrueFISP segmented; 2D FLASH segmented; Magnetization-prepared TrueFISP (IR, SR, FS); IR TI scout; Retrogating Standard Fat/Water Imaging - Fat and Water Saturation. Additional frequency selective RF pulses used to suppress bright signal from fatty tissue. Two selectable modes: weak, strong - Quick FatSat - SPAIR: robust fat suppression for body imaging using a frequency selective inversion pulse - Fat / Water Excitation. Spectral selective RF pulses for exclusive fat / water excitation - Dixon technique for fat and water separation - available both based on VIBE (2 point Dixon) Standard Techniques - True Inversion Recovery to obtain strong T1-weighted contrast - Dark Blood inversion recovery technique that nulls fluid blood signal - Saturation Recovery for 2D TurboFLASH, gradient echo, and T1- weighted 3D TurboFLASH with short scan time (e.g. MPRAGE) - Freely adjustable receiver bandwidth, permitting studies with increased signal-to-noise ratio - Freely adjustable flip angle. Optimized RF pulses for image contrast enhancement and increased signal-to-noise ratio - MTC (Magnetization Transfer Contrast). Off-resonance RF pulses to suppress signal from certain tissues, thus enhancing the contrast. Used e.g. in MRA

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	- Analysis Tools for addition, subtraction, division, multiplication, calculations of ADC maps and b-value images - Image Filter - 3D post-processing MPR, MIP, MinIP, VRT - Data storage of images on CD / DVD with DICOM viewer - Export of cine AVI files on external media - Selectable centric elliptical phase reordering via the user interface - Inversion Recovery to nullify the signal of fat, fluid or any other tissue - Multiple Direction Diffusion Weighting (MDDW) - diffusion tensor imaging measurements can be done with multiple diffusion-weightings and up to 12 directions for generating data sets for diffusion tensor imaging. - WARP - 2D TSE sequence combining optimized high-bandwidth protocols and View Angle Tilting (VAT), tailored to reduce susceptibility artifacts caused by orthopedic MR-Conditional* implants. - Advanced WARP - 2D TSE based Slice Encoding for Metal Artifact Correction (SEMAC) technique for the reduction of through-plane distortions from large MR conditional* implants. Standard techniques for Flow Artifact reductions - LOTA (LongTerm Data Averaging) technique to reduce motion and flow artifacts - Pre-saturation techniques using RF saturation pulses to suppress flow and motion artifacts - Tracking SAT bands maintain constant saturation of venous and/or arterial blood flow eg. for 2D/3D sequential MRA - TONE (Tilted Optimized Non-saturating Excitation - variable excitation flip angle to compensate inflow saturation effects in 3D - MRA - selectable on desired flow direction and speed GMR (Gradient Motion Rephasing). Sequences with additional bipolar gradient pulses, permitting effective reduction of flow artifacts Standard Motion Correction - BLADE - improves image quality by minimizing and correcting for the effects of motion during an MR sequence acquisition. e.g. head, spine, orthopedic imaging and the abdomen - 1D PACE (Prospective Acquisiton CorrEction) allows examination of patients with free breathing - 2D PACE (Precise Motion Correction) detects and corrects respiratory motion eg of the heart or liver - PSIR HeartFreeze (Phase-Sensitive Inversion Recovery) - Motion correction/averaging of multiple measurements with iPAT or tPAT accelerated single-shot TrueFISP or GRE images of the heart, for free-breathing acquisition MAGNETOM Sola runs on *syngo* MR XA11 software that offers an acquisition workplace with a large 16:10 24” monitors, one keyboard and one mouse. The MR acquisition workplace provides environments for scheduling, scanning and basic quality assurance as well as viewing, basic and advanced post-processing, and data handling (Export, Import, Transfer, Record to media). The acquisition workplace can host one MR View&GO for viewing, basic postprocessing, and data distribution and up to three post-processing applications in parallel. For faster data transfer and reduced storage demand *syngo* MR XA11 uses the DICOM Enhanced MR Image format for its scanning result. Features like Online Help, DICOM MPPS autocomplete, inline technologies, and scan@center additionally support the workflow. **Patient Communication** - The intercom system includes an ergonomically designed patient - communication unit for desktop positioning on the *syngo* - Acquisition Workplace and pneumatic headphones for the

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	- patient. - It controls emergency table stop, volume control of speaker and headphones in the examination room, volume control of speaker in the control room, response to the patient's activation of the assistance-call button and provides a connection to an external audio system (external audio system is not included in the basic unit) for music playback. **Computer System** The PC-based computer system uses the intuitive *syngo* MR user interface and allows the usage of up to 3 advanced *syngo*.via applications at the scanner workplace. High-performance host computer: - Intel Xeon processor ≥ E5-1650 (6 core) - Clock rate ≥ 3.5 GHz - Main Memory (RAM) ≥ 64 GB - SSD ≥ 480GB - DVD-R writer for CD-R (approx. 4000 images 2562 DICOM Standard, ISO 9660) and DVD-R (approx. 25 000 images 2562 - DICOM Standard, ISO 9660) storage of DICOM data or other data like AVI files - DVD-ROM drive - Electronic mouse - One high-resolution 24” color LCD flatscreen monitors with 1920 x 1200 pixel display, integrated gamma correction for optimum display of radiographic grayscale images and automatic backlight control for longterm brightness stability. **Installation** - The relatively light-weight design of MAGNETOM Sola eliminates in most cases the need for structural building reinforcements and also facilitates installation in upper floors. - The compact integrated design allows for short installation times and reduces the required space to less than 28 sqm (302 sq. ft.) for the entire installation. The minimum room height clearance is only 2.40 m (7' 10"). - MAGNETOM Sola allows siting of the system without a dedicated computer room - no additional cooling or floor requirements. - MAGNETOM Sola combines state-of-the-art performance with peace of mind. High system availability is ensured by the expert - highly trained Siemens MR service engineers - Your Siemens service contract (not included in the basic unit) offers a comprehensive range of benefits such as Uptime Remote Diagnostics for improved productivity and maximum uptime.

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MR General Engine #Vi
	syngo.MR General Engine extends Numaris/X by adding dedicated workflows and tools for routine and advanced reading of MR examinations.
	A generic MR Basic workflow is provided, as well as specific MR Neurology, MR Prostate Reading, MR Breast Reading, and MR Cardio-Vascular workflows.
	Main functionalities of *syngo*.MR General Engine:
	- MR Basic workflow with Easy Reading mode for easy, fast, and intuitive MR reading, based on single-click and drag&drop interactions:
	  - single-click interaction to navigate through the series
	  - intelligent layout adaptation to compare series together
	  - single-click fusion between different contrasts
	- MR Cardio-Vascular Workflows: Cardiac Reading, Angio Single Station, Angio Multi Station, Angio TimCT and Angio TWIST
	- MR Evaluation tools: Subtraction, MeanCurve, Image Filter, 2D/3D Distortion Correction. ADC and b-value tool (for extrapolated b-values), Multiplication, Division, Addition, Elastic Motion Correction. Workflow optimized report templates.

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	Scope of delivery: *syngo*.MR General Engine software package with MR Radiology workflows, MR Cardio-Vascular workflows and MR Evaluation for a workstation-based server.
14475308 **myExam Brain Assist**	myExam Brain Assist provides guided and flexible workflows. Optimized scan strategies are provided and can be selected based on the patient's condition, which allows for reproducible, high image quality and time efficient exams. The built-in flexibility allows users to change predefined strategies at any time during the brain workflow, and to personalize to the individual patient's condition and clinical need. myExam Brain Assist is customizable to the site-specific standards of care. myExam Brain Assist incorporates step-by-step user guidance which is seamlessly integrated into the exam. Example images and guidance texts are displayed for each individual step of the scanning workflow and are easily configurable by the user. AutoAlign Head uses AI to provide automated positioning and alignment of slice groups to the anatomy, relying on multiple anatomical landmarks. This provides fast, easy, and reproducible patient scanning to consistently deliver high image quality with a standardized slice orientation. AutoAlign Head can also automatically position and align for other structures within the head, such as the inner ear, orbits and optic nerve. Inline Diffusion automatically calculates trace-weighted images and ADC maps in real time.
14475309 **myExam Spine Assist**	myExam Spine Assist provides guided and flexible workflows for cervical, thoracic and lumbar spine. Optimized scan strategies are provided and can be selected based on the patient's condition, which allows for reproducible, high image quality and time efficient exams. The built-in flexibility allows users to change predefined strategies at any time during the spine workflow, and to personalize to the individual patient's condition and clinical need. myExam Spine Assist is customizable to the site-specific standards of care. myExam Spine Assist incorporates step-by-step user guidance which is seamlessly integrated into the exam. Example images and guidance texts are displayed throughout the scanning workflow and are easily configurable by the user. AutoAlign Spine, with intervertebral disc detection, uses AI to provide automated positioning and alignment of slice groups to the anatomy, relying on multiple anatomical landmarks. This provides fast, easy, and reproducible patient scanning to consistently deliver high image quality with a standardized slice orientation. Furthermore, it includes AutoCoverage, AutoSatPosition, as well as initial and interactive snapping. Users gain efficiency with AutoLabeling of vertebrae, automatic curved multiplanar reconstructions of 3D datasets and Inline Composing.
14475310 **myExam Large Joint Assist**	myExam Large Joint Assist provides guided and flexible workflows for knee, hip and shoulder. Optimized scan strategies are provided and can be selected based on the patient's condition, which allows for reproducible, high image quality and time efficient exams. The built-in flexibility allows users to change predefined strategies at any time during the scan workflow, and to personalize to the individual patient's condition and clinical need. myExam Large Joint Assist is customizable to the site-specific standards of care. myExam Large Joint Assist incorporates step-by-step user guidance which is seamlessly integrated into the exam. Example images and guidance texts are displayed throughout the scanning workflow and are easily configurable by the user. AutoAlign uses AI to automate the positioning and alignment of slice groups to the anatomy, relying on multiple anatomical landmarks. This provides fast, easy, and reproducible patient scanning by consistently delivering high image quality with a standardized slice orientation. AutoCoverage maximizes the speed of the examination by automatically setting the number of slices and the FoV to

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	fully cover knee, hip or shoulder anatomy. Inline Multi Planar Reconstruction (MPR) can be easily configured to automatically generate any required 2D images from high-resolution 3D acquisitions using the position information from the AutoAlign algorithm. For Knee and Hip, examinations using protocols with WARP to reduce artefacts caused by large orthopedic implants are included.
14482834 **myExam Brain Autopilot**	myExam Brain Autopilot enables less experienced staff to scan brain MRI at high quality with just a few simple clicks. By using automation and AI, it takes away burdensome routine tasks for all technologists. Predefined automated protocols allow users to scan with no manual adjustments. A new and intuitive user interface simplifies scanning so that exams can be performed, or strategies can be changed easily. This new approach to operate MRI helps any user to generate consistent, comprehensive results. myExam Brain Autopilot is customizable to the site-specific standards of care. myExam Brain Autopilot uses AutoAlign Head with AI to provide automated positioning and alignment of slice groups to the anatomy, relying on multiple anatomical landmarks. This provides fast, easy, and reproducible patient scanning and consistently delivers high image quality with standardized slice orientations. AutoAlign Head can also automatically position and align for other brain structures such as the inner ear, the orbits and the optic nerve. Automatic real-time calculation of trace-weighted images and ADC maps with Inline Diffusion Technology is performed on the fly. Users can switch to myExam Assist at any time to personalize the exam to the individual patient.
14482835 **myExam Knee Autopilot**	myExam Knee Autopilot enables less experienced staff to scan knee MRI at high quality with just a few simple clicks. By using automation and AI, it takes away burdensome routine tasks for all technologists. Predefined automated protocols allow users to scan with no manual adjustments. A new and intuitive user interface simplifies scanning so that exams can be performed, or strategies can be easily changed. This new approach to operate MRI helps any user to generate consistent, comprehensive results. myExam Knee Autopilot is customizable to the site-specific standards of care. myExam Knee Autopilot uses AutoAlign with AI to provide automated positioning and alignment of slice groups to the anatomy, relying on multiple anatomical landmarks. This provides fast, easy, and reproducible patient scanning and consistently delivers high image quality with standardized slice orientations. Furthermore, it provides AutoCoverage for consistent coverage of the patient's anatomy by automatically setting the number of slices and the FoV to fully cover knee. Users can switch to myExam Assist at any time to further personalize the exam to the individual patient.
14441748 **Quiet Suite #T+D**	Quiet Suite enables complete, quiet examinations for neurology and orthopedics with at least 70% reduction in sound pressure levels. Effective noise reduction is achieved through Quiet Suite by targeting the main source of MRI noise - rapid switching in the gradient coils. Quiet Suite consists of QuietX, an intelligent algorithm which effectively reduces noise through summation of gradients and reduction of slew rates while keeping timing parameters within the same range. QuietX has been enabled for TSE, SE and GRE sequences for T1, T2 and DarkFluid contrasts. Within the TSE-sequence, the parameter “Echo-spacing” allows the user to further lower the gradient slew-rates. QuietX has also been enabled for susceptibility and diffusion-weighted imaging and these sequences are available with the SWI and Advanced Diffusion licenses (not available for MAGNETOM ESSENZA), respectively. The automated algorithm runs in parallel to normal protocol handling. All features and contrasts of the TSE, SE, and GRE sequences

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	remain available. In addition, Quiet Suite contains PETRA, a 3D T1 UTE sequence. The PETRA sequence allows for even lower gradient switching. With its unique gradient trajectories, no acoustic noise associated with gradient switching is generated during a PETRA scan. Residual noise may arise due to radio frequency switching. With Quiet Suite, optimized quiet protocols for imaging the brain and large joints are also provided.
14460162 **Tim Whole Body Suite #Vi**	Tim Whole Body Suite puts it all together. This suite enables table movement for imaging of up to 205 cm (6' 9") FoV without compromise. In combination with Tim's newly designed ultra-high density array higher spatial and temporal resolution can be achieved along with unmatched flexibility of any coverage up to Whole Body. For faster exams and greater diagnostic confidence. Tim and the Tim Whole Body Suite enable for true whole body MR scanning for head-to-toe imaging. Whole body imaging with highest image quality without patient repositioning and without the need to change a single coil, not even once, this means whole body imaging without compromise. The Tim Whole Body Suite features: - The all-new Tim Table or Tim Dockable Table enable a full Field-of-View with coverage up to 205 cm (6' 9"). The table top has the same length as the standard system without whole body capabilities. Additional free space is required at the rear part of the magnet to ensure, that the table movement is not limited by the rear wall. - Table movement to its full extent can be remotely controlled from the operator console either by the operator or by sequence protocols. - Protocols and programs for whole body MR angiography and morphology e.g. for metastasis visualization and preventive care examinations. - Whole body MR Angiography is possible with high speed, high resolution and high image contrast on the entire volume combining high speed gradients and iPAT. - The large FoV of 205 cm supports the assessment of metastases distribution in the body with sequences such as TIRM (Turbo Inversion Recovery).
14460227 **Tim Planning Suite #Vi**	With the Tim Planning Suite, multiple regions in the entire body can be examined in a minimum of time through measurement planning on a single FoV of any desired size. The dedicated Tim Planning Suite user interface has been optimized for these comprehensive measurement requirements. Set-n-Go protocols for entirely automated examinations in each body region in one work step are available. For example, for orthopedic, oncological or angiographic imaging. - Easy planning on a FoV of any desired size (up to 205 cm). - Planning of multiple steps simultaneously, e.g. on a whole-body image, with only one Set-n-Go protocol - which includes several steps. - Tim Planning Suite UI: Dedicated user interface and exclusive tools for effective and smooth working on a large FoV. - Multiple slice groups with their overlap are displayed together and can be easily arranged. - All steps can have independent sets of parameters. - All steps are displayed together with a single mouse click. - Easy positioning of all steps, for example, through Align FoV. - Full support of Phoenix, thus maximum reproducibility, for example, for follow-up studies, multi-centric studies or exchange of experiences across different institutions. - Dedicated protocols are provided for the Tim Planning Suite, for example, for orthopedic, oncological or angiographic indications.

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	- It is highly recommendable to order application training!
14460160 Advanced Diffusion #Vi	QuietX DWI and RESOLVE together make up the Advanced Diffusion package. QuietX DWI enables quieter diffusion-weighted imaging of the brain with up to 70% reduction in sound pressure relative to conventional diffusion-weighted imaging. RESOLVE (Readout Segmentation Of Long Variable Echo-trains) is a multi-shot, readout segmented EPI sequence for high-resolution, low-distortion diffusion-weighted imaging (DWI). This technique is largely insensitive to susceptibility effects, providing anatomically accurate diffusion imaging for the brain, spine, breast and prostate. In combination with syngo.MR Tractography, RESOLVE enables excellent white-matter tract imaging even in regions of high susceptibility, such as the spine. RESOLVE is a diffusion-weighted, readout-segmented EPI sequence optimized towards high-resolution imaging with reduced distortions. The sequence uses a very short echo-spacing compared to single-shot EPI, substantially reducing susceptibility effects. A 2D-navigator correction is applied to avoid artefacts due to motion-induced phase errors. This combination allows diffusion weighted imaging of the breast, prostate (SEEit sequence for prostate DWI), brain and spine with a high level of detail and spatial precision. Additionally, an automatic reacquisition of data with large phase errors can be used to ensure that diffusion-weighted images of the brain are not affected by CSF pulsation. QuietX DWI protocols for the brain utilize QuietX, an intelligent algorithm which effectively reduces noise through summation of gradients and reduction of slew rates while keeping timing parameters within the same range. All features and contrasts of DWI remain available, delivering image quality comparable to a conventional single shot diffusion sequence, while providing at least 70% sound pressure reduction for increased patient comfort.
14456327 WARP & Advanced WARP #Vi	WARP and Advanced WARP (SEMAC) integrates different techniques tailored to reduce susceptibility artifacts caused by orthopedic MR-conditional metal implants. 2D TSE sequence combining optimized high-bandwidth protocols and View Angle Tilting (VAT) technique helps in evaluation of soft tissue in proximity of the implant. SEMAC (Slice Encoding for Metal Artifact Correction) is a technique to correct through-plane distortions by means of additional phase encoding in slice direction. It is especially useful in the case of hip and knee joint replacements. WARP and Advanced WARP help in evaluation of soft tissue in proximity of the implant. Available protocols include T1-weighted, T2-weighted, proton density and STIR contrast. Main Features: - Can be switched on in the standard TSE sequences - For each slice, additional phase encoding is performed to better characterize the distortion - Distorted signals are corrected by dedicated inline processing
14456237 Advanced Cardiac incl. PSIR #Vi	This package contains special sequences and protocols for advanced cardiac imaging including 3D and 4D BEAT functionalities. It supports advanced techniques for ventricular function imaging, dynamic imaging, tissue characterization, coronary imaging, and more. Combining the unique advantages of Tim and BEAT with iPAT and powerful gradients, it allows performing cardiac MR examinations without compromise in image resolution or acquisition speed. BEAT is a unique tool for fast and easy cardiovascular MR imaging. It provides 1-click switch from cine imaging to tagging for wall motion evaluation and 1-click switch from 2D to 3D imaging. BEAT automatically adjusts all parameters associated with the changes. **Cardiac and Vessel Morphology** - 3D aortopathy imaging with free breathing (SPACE)

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	Global or Regional Wall Motion Analysis with BEAT - 3D cine acquisition for full CT-like heart coverage - 2D segmented FLASH for visualization of the regional wall motion using various tagging techniques (grid or stripes) **Dynamic myocardial imaging with BEAT** - Ultra-fast, high-SNR sequence for dynamic imaging with GRE EPI contrast for stress and rest exams **Tissue characterization with BEAT** - Robust myocardial tissue characterization with 3D PSIR (phase-sensitive inversion recovery) - Fast and complete coverage of the myocardium with IR 3D FLASH and TrueFISP - Including PSIR HeartFreeze (motion correction) for free-breathing measurements **Coronary imaging with BEAT** - 3D Whole-Heart non-contrast Coronary MRA - 3D Whole-Heart MRA with advanced free-breathing navigator compensating diaphragm shifts during the acquisition (motion-adaptive respiratory gating)
14456323 **Inline Composing syngo #Se**	Automatic anatomical or angiographic composing of multiple adjacent coronal or sagittal images for presentation and further evaluation. Composed images can be automatically loaded into Graphical Slice Positioning for scan planning purposes. **Inline Technology - Processing Instead of Post-processing** The Inline Composing option includes the following functions: - Inline calculation of full-format images of the spine, the central nervous system or the vessel tree, for example, combined from multiple overlapping steps. - Dedicated composing algorithms, optimized for the generation of anatomical or angiographic full-format images. - Data sets with different FoV, resolution, matrix and slice thickness can be combined. - Generation of full-format images from inline-computed MIPs. Different inline functions can be combined; e.g. in case of multiple-step angios, Inline subtraction, Inline MIP and Inline Composing can be performed fully automatically. Full-format acquisitions from Inline Composing are ideal for further measurement planning on large FoV, e.g. with the Tim Planning Suite.
14475447 **syngo Expert-i XA50/XA51**	This software application enables remote access to the system (connected via local area network) for planning and processing. The option is integrated in the *syngo* user interface thus enables easy access to the user interface of the *syngo* Acquisition Workplace for planning and processing support purposes. The access is protected by appropriate security mechanisms (active enabling prior to every connection through the user present on site, password protection), in order to prevent unwanted connections. The client software can be operated on any commercial PC with the following specification: - Operating system: Windows 7/8.1/10 - .NET Framework version 4.5 or higher
14460304 **Tim [204x64] XQ Gradient #So**	Tim [204x64] XQ-gradients performance level Tim 4G's RF system and innovative coil architecture enables high-resolution imaging and increased throughput. The system provides a maximum number of 204 channels (coil elements) that can be connected simultaneously. Flexible parallel imaging is achieved by the standard 64 independent RF channels

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	that can be used simultaneously in one single scan and in one single FOV, each generating an independent partial image. This option includes also Advanced High Order Shim. XQ - gradients The XQ 45/200 gradients are designed for high performance and linearity to support clinical whole body imaging at 1.5T. The XQ gradients combine 45 mT/m peak amplitude with a slew rate of 200 T/m/s. The force compensated gradient system minimizes vibration levels and acoustic noise. High-performance measurement and reconstruction system. **Tim [204x64] performance level** BioMatrix builds on DirectRF - The all digital-in/ digital-out design integrates all RF transmit and receive components at the magnet, eliminating analog cables for true signal purity. This compact and efficient design enables a dynamic feedback control for temporal stability and power linearity. The innovative architecture packs more coil elements in a smaller space and the system provides a maximum number of 204 channels (coil elements) that can be connected simultaneously. Advanced iPAT capabilities and SNR are enabled by the 64 independent RF channels that can be used simultaneously in one single scan and in one single FOV, each generating an independent partial image. An additional benefit of multiple coil elements and receiver channels is improved performance in multi-directional, i.e. three dimensional, high-speed, high-resolution iPAT in the head-feet, anterior-posterior or left-right directions. **XQ gradients** Siemens XQ gradients provide actively shielded, water cooled world-class gradients. All axes are force-compensated. The XQ gradients have: - Maximum gradient amplitude of 45 mT/m, per axis, i.e. 78 mT/m vector summation gradient performance, - Maximum slew rate 200 T/m/s per axis, i.e. 346 T/m/s vector summation, - Minimal rise time 225 µs, from 0 to 45 mT/m amplitude - Maximum output voltage for each of the gradient axes 2250 V - Maximum output current for each of the gradient axes 900 A - Separate cooling channels that simultaneously cool primary and secondary coils allow the application of extremely gradient intensive techniques in a new class of performance. - 100% duty cycle for fast and demanding techniques such as ultrashort TE MRA in continuous operation, thin slice single breath-hold liver studies and EPI imaging techniques (all optional in appropriate clinical packages). - Variable Field-of-View selection from 0.5 cm to 50 cm (up to 50 cm in z direction) for optimal coverage and highest spatial resolution in diagnostic imaging. The minimum slice thickness in 2D and 3D is 0.1 mm and 0.05 mm, respectively. - Acquisition of sagittal, transverse, coronal, single oblique and double oblique slices with highest resolution. - The extremely compact water-cooled gradient amplifier features a modular expandable design with excellent linearity and pulse reproducibility. It is digitally controlled and has very low switching losses due to ultrafast solid state technology. **Computer system** The specifications of the high-performance measurement and reconstruction computer can be found within the data sheet.

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	The combination of host computer and the measurement and reconstruction system offers a truly powerful imaging system designed for large image matrix sizes of up to 1024 x 1024. The unrestricted multitasking capability allows time-saving parallel scanning and reconstruction.
14470777 **Coil Package Tim [204x64] #So**	This package includes (if not exchanged with different variants via respective quote items): - BioMatrix Head/Neck 20 tiltable with CoilShim - BioMatrix Spine 48 with Respiratory Sensors - Body 18 - Flex Large 4 - Flex Small 4 - Flex Coil Interface **Tim 4G & BioMatrix Coils** The coils in the standard coil package combine the new BioMatrix functionalities CoilShim and Respiratory Sensor with the Tim 4G coil technology with Dual-Density Signal Transfer, DirectConnect and SlideConnect technology. The result are key imaging benefits: Excellent image quality, high patient comfort, and unmatched flexibility. The Tim 4G & BioMatrix coils are designed for highest image quality combined with easy handling. BioMatrix's CoilShim helps to reduce patient induced localized B0 inhomogeneities. Respiratory sensors, embedded in the BioMatrix Spine 48, detect the breathing pattern of the patient as soon as he/she is on the table. The high coil element density increases SNR and reduces examination times. DirectConnect and SlideConnect™ technology reduce patient set up time significantly. The coils are designed with the patient in mind. Light weight coils with an open design ensure highest patient comfort resulting in better patient cooperation and image quality. No coil changing with multi-exam studies saves patient setup- and table time. AutoCoilSelect for dynamic, automatic, or interactive selection of the coil elements within the Field of View fastens the exam preparation at the host. All coils are time-saving “no-tune” coils. A comprehensive set of pads for comfortable and stable patient positioning together with safety straps are included. **BioMatrix Head/Neck 20 tiltable with CoilShim** The 20-channel coil with its 20 integrated pre-amplifiers ensures excellent signal-to-noise ratio. The unique DirectConnect technology allows users connecting the 20 coil elements of the Head/Neck 20 without cables. The possibility to tilt the coil in 3 different positions together with the patient friendly open design allows for maximum patient comfort which is supported in addition by a look-out mirror for claustrophobic patients. The high channel coil is iPAT compatible in all directions. The open and light design of the upper coil part increases patient comfort and is removable for easy patient handling. The integrated CoilShim is located in the lower coil part which may remain on the table for most of the examinations and can be used without the upper part. The BioMatrix Head/Neck 20 and BioMatrix Spine 48 are smoothly integrated into the patient table, thus enabling high flexibility in imaging and fewer coil changes and easy handling when switching patients. The BioMatrix Head/Neck 20 coil is equipped with two removable cushioned head stabilizers for stable and comfortable patient positioning. The BioMatrix Head/Neck 20 can be used for applications like head examinations, neck examinations, MR Angiography, combined head/neck examinations or for imaging of the TMJ (temporomandibular joints). Typically combined with the BioMatrix Spine 48 and Body 18 but also other combinations e.g. with flexible coils like the Flex Large 4 are possible. Whole-body set ups from Head to Toe are possible with the combination of BioMatrix Head/Neck 20, BioMatrix Spine 48, Body 18 coils, and Peripheral Angio 36 in one MR examination. **BioMatrix Spine 48 with Respiratory Sensors**

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	The 48-channel coil with its 48 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The unique integrated BioMatrix Respiratory Sensors measure the patient's respiratory signal in head-first and feet-first position. The DirectConnect technology allows connecting the 48 coil elements of the BioMatrix Spine 48 without the need to plug in any cable. The patient friendly ergonomical design allows for maximum patient comfort. The high element coil is iPAT compatible in all directions. Smoothly integrated into the patient table the BioMatrix Spine 48 can remain on the patient table for nearly all exams. The BioMatrix Spine 48 is typically combined with Body 18, BioMatrix Head/Neck 20, Peripheral Angio 36 (optional) or Flex Large 4, Flex Small 4. **Body 18** The 18-channel coil with its 18 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The 18 coil elements of the Body 18 with only one SlideConnect Plug allows for fast and easy patient preparation resulting in less table time. Fast acquisition times enabled by iPAT in all directions. The light-weighted coil ensures highest patient comfort. Body 18 operates in an integrated fashion with the BioMatrix Spine 48 resulting in a 34-channel body imaging setup. Body 18 can be combined with further Body 18 coils for larger coverage and can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations. The Body 18 is typically used in combination with the BioMatrix Spine 48 for examinations of the thorax, abdomen, pelvis or hip and operates as a 34-channel body coil. The Body 18 can also be used for cardiac or vascular applications. Through the perfect combinability of the BioMatrix Spine 48, further Body 18 Coils (optional), the Peripheral Angio 36 (optional), but also the BioMatrix Head/Neck 20 and all flexible coils (e.g. Flex Large 4, Flex Small 4, UltraFlex Large 18 (optional) or UltraFlex Small 18 (optional) a broad range of indications up to whole-body imaging are covered. **Flex Large 4/ Flex Small 4** Light-weight, very flexible, iPAT compatible, 4-element no-tune receiver coils which are made of soft and smooth material. The coils can be wrapped around or used flat. Both coils can be connected via Flex Coil interface. One Flex Coil interface is already delivered as standard. The coils can be used for different examinations ranging from examinations of the extremities to abdominal examinations.
14456328 **BioMatrix** **Technology #Vi**	The new and unique BioMatrix technology addresses the different aspects of patient bio-variability. It is based on three technological clusters: - BioMatrix Sensors address patient physiology, in order to anticipate challenges - BioMatrix Tuners address patient anatomy, in order to adapt to all patients, especially critical ones. - BioMatrix Interfaces address user interaction with the patient, to accelerate the workflow in the face of patient variability. **BioMatrix Sensors anticipate challenges before they happen.** Respiratory sensors are integrated in the BioMatrix Spine coils and measure the patient's respiratory signal in head-first and feet-first position. The sensor loops measure the change in impedance resulting from the shift of the tissue and organs during the inhaled and exhaled phase of the patient's respiration as soon as the patient is lying on the table. **BioMatrix Tuners – adapt to all patients, even critical ones.** The BioMatrix Tuners are CoilShim and SliceAdjust. BioMatrix's CoilShim helps to reduce patient induced strongly localized B0 inhomogeneities by generating the respective anatomy-specific B0 field with 4 independent shim channels built into the system. Calculation and fine-tuning of local CoilShim currents integrated into global shim algorithm. BioMatrix Head/Neck 20 tiltable with CoilShim and the Head/Neck 64 with CoilShim have local shim

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	elements integrated into the posterior part, addressing patient induced B0 distortions in the neck region. BioMatrix SliceAdjust enables precise slice-by-slice tuning of resonance frequency, transmitter voltage, and first order B0-shim and B1-shim. For whole-body diffusion, the SliceAdjust technology helps to avoid station boundaries and apparent broken spine artifacts as well as to preserve the SNR for whole-body diffusion. **BioMatrix Interfaces – accelerate workflow without compromising quality of care** The BioMatrix body model, leveraged by the Select&GO panel on the front of the system, is able to derive the precise location of the organs based on the patient's individual characteristics. With a single touch, the technologist can quickly position the body part of interest at the isocenter and start the examination. To simplify and speed up patient transportation, the BioMatrix table with eDrive (optional) and AutoDocking (optional) functionalities is motorized, making patient management easy in all situations: no matter their size or strength, all technologists can handle all patients. By facilitating patient transport and accelerating patient positioning using individual characteristics, the BioMatrix Interfaces accelerate the complete workflow without compromising image quality.
14470783 BioMatrix Respiratory Sensors#Vi,So	Highly integrated BioMatrix Respiratory sensors measure the patient's breathing cycle in head-first and feet-first orientation. Respiratory sensors are integrated in the BioMatrix Spine coils and measure the patient's breathing cycle in head-first and feet-first orientation. The sensor loops measure the change in impedance resulting from the shift of the patient's tissue and organs during the inhalation and exhalation phase of the breathing cycle. They do not require preparation and are active as soon as the patient is lying down on the coil.
14470785 BioMatrix Beat Sensor #Vi, So	The BioMatrix Beat Sensor measures the motion of the heart and enables Cardiac triggering without the need of ECG triggering. The BioMatrix Beat Sensor is seamlessly integrated into the BioMatrix Body 12 and BioMatrix Body 18 coil. When positioning these coils on the patient's chest, the Beat Sensor extracts a heart motion signal that can be used to trigger cardiac sequences to the cardiac cycle in order to minimize heart motion artifacts. Please note that in versions XA31 and XA50 only cardiac cine sequences are supported. From version XA51 a full cardiac exam is supported.
14470792 BioMatrix Coil Shim #Vi,So	BioMatrix CoilShim helps to reduce patient induced strongly localized B0 inhomogeneities by dedicated local shim channels. BioMatrix CoilShim helps to reduce patient induced strongly localized B0 inhomogeneities by generating the respective anatomy-specific B0 field with 4 independent shim channels built into the system. Calculation and fine-tuning of local CoilShim currents is integrated into the global shim algorithm.
14470794 BioMatrix SliceAdjust #BM	BioMatrix SliceAdjust helps to avoid station boundaries and apparent broken spine artifacts as well as to preserve the SNR for whole-body diffusion. BioMatrix SliceAdjust enables precise slice-by-slice tuning of resonance frequency, transmitter voltage, and first order B0-shim and B1-shim. For whole-body diffusion, the SliceAdjust technology helps to avoid station boundaries and apparent broken spine artifacts as well as to preserve the SNR for whole-body diffusion.
14460415 BioMatrix Dock. Table w/ eDrive #So	The BioMatrix Dockable Table with eDrive is designed for maximum patient comfort and smooth patient preparation. The BioMatrix Dockable Table with eDrive can support up to 250 kg (550 lbs) without restricting the vertical or horizontal movement. The BioMatrix eDrive provides motorized assistance for easy maneuverability of the table. The new BioMatrix Dockable Table with eDrive with its light appealing design allows for a fast patient preparation and maximized patient comfort. The BioMatrix eDrive provides motorized assistance for

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	easy maneuverability of the table making patient transportation easy in all situations. The user only needs to apply slight pressure to the table grip in order to start propulsion support. The table can adjust its speed based on the pressure applied by the user. With its newly designed AutoDocking functionality the table can be smoothly docked and undocked with just one click on the BioMatrix table interface. It provides unobstructed foot space for attending staff and direct access to the patient. The patient table can be lowered to a minimum height of 56 cm (18.5") from the floor, for easier moving of immobile patients and better access for geriatric, pediatric patients or immobile patients. The BioMatrix Dockable Table with eDrive can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter. The tabletop travels beyond the rear end of the system, enabling additional patient access. Multiple Tim 4G and BioMatrix coils can be connected at once for efficient patient set up and patient friendly examinations. The seamless integration of multiple Tim 4G and BioMatrix coils is possible via 4 SlideConnect and 4 DirectConnect connector slots, which are embedded in the table. This allows for comprehensive examinations without the need of repositioning. The BioMatrix Dockable Table with eDrive is easily adjustable for height even in the undocked state. A minimum height of 56 cm allows for easy wheelchair access or easy patient movement to the hospital bed. The integrated infusion stand and arm rests allow for fast patient set up anywhere and also for critical patients.
14470795 **BioMatrix Select & GO #Vi,So**	The BioMatrix Select&GO interface enables fast and easy single-touch patient positioning from both sides of the patient table. The interfaces are integrated left and right into the front covers. Correct positioning saves unnecessary wasted time for repositioning and additional adjustments, therefore shortening the total room time. The two BioMatrix Select&GO interface enables fast and easy single-touch patient positioning from both sides of the patient table. The interfaces are integrated left and right into the front covers. Correct positioning saves unnecessary wasted time for repositioning and additional adjustments, therefore shortening the total room time. - The ergonomically designed Select&GO touch panels are integrated into the front cover on each side of the patient tunnel for controlling table movement, guidance for patient setup and comfort features. They are well illuminated for easy visual recognition. - Automated table move to upmost position, to center position or Home position facilitate smooth patient preparation and will reduce table time - Variable (6 levels) ventilation and lighting inside the magnet bore or volume adjustments are possible for increased patient comfort The Select&GO touch panels provide on board guidance for patient set up where it's needed - directly at the scanner. Information such as patient name or exam type or required patient position, guidance for ECG set up and immediate visualization of physiological curves will be provided for convenient operation. - Almost all table control functions, including ventilation and illumination of the magnet bore, can be also controlled from the operator console for convenient operation
14460410 **Silver & White Design #So**	MAGNETOM Sola is available in two different light and appealing design variants which perfectly integrate into different environments. The Silver &White Design Variant comprises a brilliant white front design ring with integrated unique Select&GO panels. The smoothly embracing deco area on the left side and the outer rings in the front and the back of the system is colored in brilliant silver. The table cover is presented also in the same color and material selection. The unique color and material selection enhances the visual appeal of the new system design, thereby creating an enticing, patient friendly impression. The unique Select&GO panels are neatly integrated into the front design ring. The aesthetically pleasing and ergonomically designed control elements are well illuminated for easy visual recognition. In particular, the table cover and the smoothly embracing colored system cover parts have been designed to promote a modern visual appearance. This combination of ingenuity and practical design as presented with the “Silver & White” design with

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	its brilliant white and silver makes MAGNETOM Sola an overall visually appealing system and creates a patient-friendly environment.
14456270 **PC Keyboard US English #Vi**	Standard PC keyboard with 105 keys. The keys of the numerical key panel are assigned to *syngo*-specific functions and labeled with the corresponding *syngo* icons. The keyboard supports the country specific special characters.
14460420 **High-End Computing [204x64] #So**	Tim 4G power computing upgrade for MAGNETOM Sola Tim [204x64]. This upgrade brings a high-end image reconstruction computer to the Tim [204x64] configuration. The high-end computing option brings high-end image reconstruction performance to the MAGNETOM Sola Tim [204x64]. The high-end image reconstruction computer offers faster processing power for intensive algorithms, high amount of data storage for large data sets acquired over long-term measurements, a large amount of main memory for fast processing of measurement data, and a general purpose graphic processing unit for highly intensive computational calculations. The specifications of the high-end image reconstruction computer can be found within the data sheet.
14456238 **Peripheral Pulse Unit #Vi**	Peripheral Pulse Unit for Pulse Triggering Peripheral Pulse Unit for Pulse Triggering: - Reduces flow artifacts caused by pulsatile blood flow. - Excellent image quality by synchronizing data acquisition to the pulsatile blood flow.
14460313 **Dual Monitor Package #BM**	The Dual Monitor Package provides a second 24” LCD monitor for the acquisition workplace, identical to the system main host monitor. The two monitors provide space for protocol planning and exam progress on the left monitor, as well as viewing and post-processing functionalities on the right monitor. The Dot Cockpit can be used on both monitors as a floating window. This improves the MR examination workflow by a smoother and more comfortable work space that avoids interruptions between planning, scanning, viewing and post-processing. It allows to keep running patient examinations always in sight to allow for fast interactions.
14482823 **SW syngo MR XA51A**	syngo MR XA51A is the new software platform, bringing the latest features and functionality for daily clinical excellence. syngo MR XA51A guides and enables the user throughout the entire workflow: from patient registration; patient set up with guided workflows on the Select&GO; protocol management and selection; image acquisition and viewing; data handling; and post processing and reporting. This software together with the hardware enables diagnostic excellence for your daily clinical needs. The syngo MR XA51A platform offers myExam Companion which introduces a new MRI operation philosophy by providing built-in expertise and automation for users and clinical questions. myExam Companion provides different workflow modes for tailored assistance: myExam Autopilot, myExam Assist and myExam Cockpit. No matter the user or patient, myExam Companion helps generate consistent, comprehensive results. *syngo* MR XA51A provides environments for: scheduling; scanning and basic quality assurance as well as viewing; basic and advanced post-processing; and data handling (Export, Import, Transfer, Record to media). For faster data transfer and reduced storage demand *syngo* MR XA51A uses the DICOM Enhanced MR Image format for its scanning result. Features like Online Help, DICOM MPPS autocomplete and inline technologies additionally support the workflow. For scanning, myExam Companion provides tailored assistance enabling consistent image quality regardless of the operator’s experience: - **myExam Autopilot** helps users to automate intelligently. It enables less trained staff to scan with just a few simple clicks. By using automation and AI, it takes away burdensome routine tasks for all technologists. - **myExam Assist** provides guided and flexible workflows. Optimized scan strategies are provided and can be selected or flexibly adapted based on the patient’s condition.

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	- **myExam Cockpit** provides a central workspace for protocol management and customization. Users can set up and maintain protocols intuitively, build knowledge into standardized exams and make those continuously available for every user.
14475450 **myExam Assist XL Package USA**	The myExam Assist XL Package includes: - myExam Angio Assist - myExam Abdomen Assist - myExam Cardiac Assist - myExam Breast Assist The myExam Assist XL package offers a comprehensive set myExam Companions for the maximum coverage of MR examination requests. Robust image quality can be achieved efficiently and consistently in the clinical areas of Neuro, MSK, Vascular, Cardiac and Oncology. The myExam Angio Assist provides semi-automatic detection of arterial and venous timing windows using a test bolus technique. This information is feedback for next planning steps automatically adapting scan parameters to the individual patient and patient's condition. The myExam Abdomen Assist offers intuitive guidance and a high level of automation. It allows automatic sequence scaling according to physiological characteristic. The myExam Cardiac Assist uses anatomical landmarks, standard views of the heart, such as dedicated long axis and short-axis views - easily generated and reproduced. The myExam Breast Assist provides lesion detection, implant evaluation and breast biopsy. The myExam Companions support various breast coils, head-first or optional feet-first positioning and examination approaches (fatsat, nonfatsat). **myExam Angio Assist** myExam Angio Assist guides the user through angiographic single or multi station examinations by providing semi-automatic detection of arterial and venous timing windows using a test bolus technique. This information is fed back into the next planning steps automatically adapting scan parameters to the individual patient and patient's condition. *Guidance View* - Step-by-step user guidance is seamlessly integrated. - Example images and guidance text are displayed for each individual step of the scanning workflow. - Both images and text are easily configurable by the user *Test bolus* - Automatic detection of arterial / venous timing window *Feedback of bolus timing information* - Timing information is fed back into planning steps and parameters are adapted automatically *Auto Bolus Detection* - Optionally selectable functionality for easy interaction and operator-independent timing of the dynamic scan. - Determination of the bolus arrival time in the heart (by Care Bolus sequence) and automatic initiation of the dynamic protocol. - Visual monitoring of signal intensity allows manual override function. *Auto Voice Commands*

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	- Integrated into the scanning workflow. - The system plays them automatically at the right point in time. - This ensures optimal timing of scanning, breathing and contrast media. - The user can monitor which breath hold or pauses are actually played, and could add pauses between the automatic breath hold commands if necessary *Customization* Existing myExam Companions can be modified by the user to their individual standard of care. - Add/remove protocol steps - Change guidance content (images and text) - Change or add myExam Strategies and Decision Points - Modify the Parameter View Application Packages: *syngo* Inline Composing - Automatic anatomical or angiographic composing of multiple adjacent coronal or sagittal images - Composed images can be automatically loaded into Graphical Slice Positioning for scan planning purposes Tim Planning Suite With the Tim Planning Suite, multiple regions in the entire body can be examined in a minimum of time through measurement planning on a single FoV of any desired size. **myExam Abdomen Assist** The myExam Abdomen Assist offers a comprehensive set of guidance and automation, so that robust image quality can be achieved fast and independently from the user. *Patient View* - Within the Patient View the user can easily tailor the exam to each individual patient. - Several pre-defined myExam Strategies are integrated. The user just selects the appropriate strategy with one click and the queue and the complete scan set-up are automatically updated. Furthermore protocols tailored for use of contrast media are integrated. myExam Strategies allows personalizing the workflow to the individual patient condition and clinical need. The following predefined strategies are included: - Standard with breath-hold - Standard with PACE triggering - Limited patient capabilities using *syngo* BLADE and PACE triggering. *Guidance view* - Step-by-step user guidance is seamlessly integrated. - Example images and guidance text are displayed for each individual step of the scanning workflow. - Both images and text are easily configurable by the user *Parameter View* - This new view displays the parameters that are really needed for this scan set-up. - This reduced set of protocol parameters allows the user to concentrate on the essentials. - The Parameter View can be opened at any time during an examination

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	Additional functionalities: Automatic sequence scaling according to physiological characteristic. (Auto FoV, AutoNavigator, breath-hold adaptations). Auto Navigator based automatic breathing pattern detection and scaling of triggered scans. Automatic FoV: the optimal FoV is automatically estimated based on the localizer images. *myExam Decisions* Decisions are seamlessly integrated into the scanning workflow. The user just selects the queue and the appropriate pulse sequences are added automatically. For the abdomen MRCP and Diffusion decision points are offered. Timeline setup and monitoring for best overview of multi-phase breath-hold examinations and CM enhancement curve visualization. *Auto Voice Commands* The system plays them automatically at the right time point. This ensures optimal timing of scanning, breathing and contrast media. The user can monitor which breath hold or pauses are actually played and could add pauses between the automatic breath hold commands if necessary. Auto Bolus Detection initiates automatically the dynamic upper abdomen examination based on bolus detection. The user can override this function. *Inline radial range calculation for MRCP* MRCP is measured and Inline Radial Ranges are automatically generated. *Inline Subtraction* Within the contrast-enhanced abdomen exam, multiple phases are acquired: native, arterial phase, portal-venous phase and late-phase. The scanner automatically subtracts the native measurement from the arterial, portal-venous and late phase. *Inline Registration* For best visualization of lesions, the system automatically performs a registration / alignment of the anatomy for the different dynamic phases. The importance of registration / correction can be seen when examining nodular enhancing pathologies. *Customization* Existing myExam Companions can be modified by the user to their individual standard of care. - Add / remove protocol steps - Change guidance content (images and text) - Change or add myExam Strategies and Decision Points - Modify the Parameter View **myExam Cardiac Assist:** myExam Cardiac Assist supports the user in many ways. Using anatomical landmarks, standard views of the heart, such as dedicated long axis and short-axis views, are easily generated and can easily be reproduced using different scanning techniques. Scan parameters are adjusted to the patient's heart rate and automatic voice commands are given. *Guidance View* - Step-by-step user guidance is seamlessly integrated. - Example images and guidance text are displayed for the individual steps of the scanning

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	workflow. - Both images and text are easily configurable by the user *Patient View* - Within the Patient View the user can easily tailor the exam to each individual patient (e.g. patient with arrhythmia, breath hold capability). - Pre-defined myExam Strategies are integrated. The user just selects the appropriate strategy with one click and the queue and the complete scan set-up are automatically updated *AutoFoV (automatic Field of View calculation)* - Based on the localizer images the optimal FoV is automatically estimated. - In case the patient moves during the examination, this step can be repeated at any time *Automated parameter adaptation* - Scan parameters are automatically adapted to the patient's condition (e.g. heart rate) *Novel heart localization method* - On-board guidance visually facilitates anatomic landmark settings which are used for calculation - Automated localization - Automated localization of short-axis views *Guided slice positioning* - Easy way to match slice positions (short-axis) between different types of cardiac sequences. (e.g. function, morphology and tissue characterization.) *Cardiac Views* - Easy selection of cardiac views (e.g. 3 chamber view) during scan planning *Inline Ventricular Function Evaluation* - *syngo* Inline VF performs volumetric evaluation of cardiac cine data fully automatically right after image reconstruction. - No user input necessary. If desired, inline calculated segmentation results can be loaded to 4D Ventricular Function Analysis for further review or processing *Inline Time Course Evaluation* - Automatic, real-time and motion corrected calculation of parametric maps with inline technology *Cardiac specific layout for the Exam task* - Automatically chosen layouts show the new physio display and are configured for every step of the exam - Automatic display of images - Automatic display of images in dedicated cardiac image orientations in contrast to standard DICOM orientations *Adaptive triggering* - Acquisition adapts in realtime to heart rate variations for non cine applications *Automated Naming* - Automated naming of series depending on cardiac views and contrast

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	Auto Voice Commands - Auto Voice Commands are seamlessly integrated into the scanning workflow. The system plays them automatically at the right time point. This ensures optimal timing of scanning, breathing and contrast media. The user can monitor which breath-hold or pauses are actually played, and could add pauses between the automatic breath hold commands if necessary *myExam Strategies* The workflow can be personalized to the individual patient condition and clinical need. The following predefined strategies are included. They can be changed at any time during the workflow: - Standard: Segmented acquisition techniques - Limited patient capabilities: switch to realtime and single shot imaging if breath-hold is not possible or arrhythmias occur *Customization* Existing myExam Companions can be modified by the user to their individual standard of care. - Add/remove protocol steps - Change guidance content (images and text) - Change or add myExam Strategies and Decision Points - Modify the Parameter View **myExam Breast Assist:** A set of pre-defined myExam Breast Assists are provided for lesion detection, implant evaluation and breast biopsy. The myExam Companions support various breast coils, head-first or optional feet-first positioning and examination approaches (fatsat, nonfatsat). The following myExam Breast Assist configurations will be provided: - 4-channel coils - 4-channel coils Care Bolus - BI 4ch - BI 4ch Care Bolus - Biopsy 4ch BI *Patient View* - Within the Patient View the user can easily tailor the exam to individual patient conditions (e.g. patient with breast implants) and define the examination approach (Carebolus, Autocoverage, frequency adjustment confirmation mode). *Implant Type/ Implant Situation* - Based on an “implant type identification" scan, the user can visually select or modify the exam dependent on the actual implant type and laterality. The system automatically modifies the scan queue and the frequency adjustment setting of the protocols is changed (assume dominant fat or silicone). *Guidance View* - Example images and guidance text are displayed for individual steps of the scanning workflow. They are configurable by the user. *Parameter View* - This view displays the parameters that are really needed for the examination at a glance. The displayed parameters are easily configurable by the user.

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	Auto Coverage - Based on the localizer data an automatic segmentation is performed, which allows the estimation of the optimal FoV (entire FoV for both breasts, right or left breast, breast with chest). - The user can predefine for every protocol individually which parameters shall be automatically adjusted, e.g. whether time or slice thickness shall remain constant. Additional functionalities: *Inline MPR Planning* - For user-selected protocols, e.g. the high-resolution “delayed VIEWS”, adjustable MPRs are automatically calculated. *Biopsy support* - Two Biopsy myExam Companions support interventions with 4-ch BI Breast coils. The target coordinates of the lesion are displayed on the display at the scanner (in case a Siemens biopsy planning software is used). *Customization* The myExam Breast Assists can be modified by the user to their individual standard of care. - Add / remove protocol steps - Change guidance content (images and text) - Change or add myExam Strategies and Decision Points - Modify the Parameter View
14461619 **Turbo Suite Essential #BM**	Turbo Suite Essential comprises established acceleration techniques to maximize productivity for all contrasts, orientations and all routine imaging applications from head-to-toe. Turbo Suite Essential contains: - iPAT and iPAT² parallel imaging capabilities for all contrasts, orientations and body regions - T-PAT (temporal iPAT) for advanced parallel imaging provides fast high-resolution dynamic imaging in cardiac exams by distributing reference scans over time - CAIPIRINHA for advanced iPAT² is a unique k-space reordering scheme that improves the g-factor significantly and therefore improves the SNR, which can be translated into higher imaging speed. - CAIPIRINHA SPACE – high-resolution, fast 3D imaging with isotropic, sub-millimeter resolution, all contrasts. Protocols optimized for joints are provided. - CAIPIRINHA VIBE – T1 weighted 3D imaging for high-resolution imaging throughout the body and significantly shortened breath-hold scans.
14469015 **Turbo Suite Elite #BM**	Turbo Suite Elite comprises cutting edge Compressed Sensing applications for advanced abdominal and cardio-vascular imaging with dynamic 2D and dynamic 3D applications to significantly reduce scan times, counter patient motion and expanding the patient population eligible for MRI. **Turbo Suite Elite contains:** - CS Cardiac Cine with incoherent subsampling and iterative through-time regularization captures the full cardiac cycle and provides functional assessment within one short breathhold. It is robust against arrhythmia and breathing artifacts. - TWIST is a Siemens unique sequence for time-resolved (4D) MR angiographic and dynamic imaging in general with high spatial and temporal resolution. - TWIST-VIBE is a fast, high-resolution 4D imaging sequence, e.g. for multi-phase arterial liver imaging. - StarVIBE is a motion-insensitive VIBE sequence using a stack-of-stars trajectory. - CS GRASP-VIBE with incoherent subsampling and iterative through-time regularization extends the patient population suitable for dynamic liver MRI through free-breathing exams for patients

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	who cannot reliably hold their breath.
14469016 **Turbo Suite Elite Support #BM**	Turbo Suite Elite Support provides Future Security for Turbo Suite Elite: - In consideration of Customer's purchase of the MAGNETOM MR scanner and simultaneous purchase of a 4 year point of sale Service Agreement with Evolve, and should such Evolve Upgrade installed during the term of the Service Agreement enable operation of dynamic Compressed Sensing options and/or Simultaneous Multi-Slice options, then Customer may choose to receive one such dynamic Compressed Sensing or Simultaneous Multi-Slice application option at no additional cost. **Turbo Suite Elite Support provides Future Security for Turbo Suite Elite:** - In consideration of Customer's purchase of the MAGNETOM MR scanner and simultaneous purchase of a 4 year point of sale Service Agreement with Evolve, and should such Evolve Upgrade installed during the term of the Service Agreement enable operation of dynamic Compressed Sensing options and/or Simultaneous Multi-Slice options, then Customer may choose to receive one such dynamic Compressed Sensing or Simultaneous Multi-Slice application option at no additional cost.

14475508
Turbo Suite Excelerate
	Turbo Suite Excelerate comprises access to cutting edge acceleration techniques such as Simultaneous Multi-Slice, Compressed Sensing and Wave-CAIPI for static 2D and static 3D imaging applications in Neuro, MSK and Body MRI.
	Turbo Suite Excelerate contains:
	- Simultaneous Multi-Slice (SMS) acceleration
	  - SMS DWI / DTI helps bringing advanced DWI applications into routine neuro, breast, liver and pelvic imaging. It can be seamlessly combined with iPAT to achieve total acceleration factors of up to 8.
	  - SMS TSE for up to 46% faster routine MSK exams, supporting all TSE contrasts and orientations. It can be seamlessly combined with iPAT to achieve total acceleration factors of 4-6.
	  - SMS RESOLVE enables high resolution distortion free DWI with up to 50% time savings.
	  - SMS BOLD can enable increased temporal sampling of BOLD data acquisitions and/or improved slice coverage/resolution (prerequisite Inline BOLD license).
	  - SMS TSE DIXON for faster routine MSK exams, supporting all TSE DIXON contrasts and orientations. It can be seamlessly combined with iPAT to achieve total acceleration factors of 4-6.
	- Compressed Sensing (CS) static imaging
	  - CS TOF with incoherent subsampling is designed to accelerate Time-of-Flight imaging by up to 50% without compromising diagnostic quality.
	  - CS SPACE with incoherent subsampling is designed to significantly accelerate SPACE imaging for neuro and body application. CS SPACE is designed to enable high-resolution 3D MRCP scans in one breath-hold and isotropic, high-resolution imaging of the brain, such as T1 DIR SPACE in 3 minutes.
	  - CS SEMAC with incoherent subsampling is designed to significantly accelerate imaging of MR conditional implants with time savings up to 50%.
	- Wave-CAIPI acceleration:
	Wave-CAIPI SWI is a new sequence technique that improves head imaging with SWI contrast. With the Wave-technique, the sequence plays out sinusoidal gradients during readout. Applying these Wave readout gradients results in corkscrew k-space trajectories. This strategy combined with already existing parallel imaging acceleration technique CAIPIRINHA allows optimizing g-factor penalty during reconstruction which allows for higher acceleration factors and more homogeneous noise distribution.
	Prerequisite for Wave-CAIPI SWI is the SWI license.

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14475525 **Deep Resolve Pro Package**	The Deep Resolve Pro Package combines the three applications Deep Resolve Gain, Deep Resolve Sharp and Deep Resolve Boost which use intelligent reconstruction algorithms and Deep Learning networks to reconstruct accelerated images with higher signal to noise ratio and better image sharpness. With the Deep Resolve Pro Package you get access to our advanced image reconstruction environment which features deep learning methods. Deep Resolve Gain uses a targeted algorithm to detect and remove noise in the image. Noise detection and removal is performed optimized for the individual scan thus addressing spatially varying noise of the specific acquisition. The method allows to gain SNR which can be turned into either improved resolution or into higher productivity, e.g. by reducing the number of averages or by increasing the acceleration factor of the scan. Deep Resolve Gain can be combined with standard GRAPPA and SMS acceleration and is available for following sequences: - TSE, TSE DIXON, SE Deep Resolve Boost is a deep learning reconstruction algorithm, which has been trained on a large amount of data sets to reconstruct high signal to noise ratio images from under-sampled raw data. The network has been optimized to work on highly accelerated scans, thus enabling fast acquisitions. It can be seamlessly applied to data acquired from head-to-toe with different contrast weightings and orientations. Deep Resolve Boost shows highest potential when combined with GRAPPA and SMS acceleration and is available for following sequences: - TSE Deep Resolve Sharp is a deep neural network, which has been trained on a large amount of high-resolution MR data to reconstruct sharp images from low resolution data. The reconstruction algorithm also reduces the Gibbs ringing which is present around edges. Consistency with the acquired raw data is ensured in the reconstruction process. It can be seamlessly applied to data acquired with different contrast weightings and orientations. Deep Resolve Sharp offers up to a factor of two in in-plane resolution. Deep Resolve Sharp can be combined with Deep Resolve Gain or Deep Resolve Boost and is available for following sequences: - TSE, TSE DIXON, SE
14402527 **SWI #Tim**	Susceptibility Weighted Imaging is a high-resolution 3D imaging technique for the brain with ultra-high sensitivity for microscopic magnetic field inhomogeneities caused by deoxygenated blood, products of blood decomposition and microscopic iron deposits. Among other things, the method allows for the highly sensitive proof of cerebral hemorrhages and the high-resolution display of venous cerebral blood vessels. Despite a strong sensitivity for local magnetic field inhomogeneities Susceptibility Weighted Imaging (SWI) as a 3D technology keeps up the signal near large susceptibility leaps due to very thin slices and high resolution in the slice (high image quality e.g. in the area of the forebrain near the frontal sinus). Moreover, the phase information of the MR signal is integrated in the image display. In order to further increase sensitivity for localized microscopic magnetic field inhomogeneities, large-area magnetic field inhomogeneities (e.g. caused by susceptibility leaps near the sinus) are specifically suppressed in the phase images. This allows even small amounts of deoxygenated hemoglobin (e.g. in cerebral veins) or from products of hemoglobin decomposition (e.g. from hemorrhages) to be displayed. Interesting measuring times for the ultra-high-resolution 3D protocols are achieved through parallel imaging with iPAT (GRAPPA). The Susceptibility Weighted Imaging package includes: - SWI measuring sequence, iPAT compatible - optimized measuring protocols for the head

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	- inline-postprocessing for automatic calculation of relevant images within the scope of image reconstruction:
	  - calculation of susceptibility-weighted images
	  - venous angiography: MIP of a thin slice block
	SWI has been optimized for clinical use to support diagnostics with cerebrovascular diseases (e.g. cerebral insult), venous malformation, brain trauma and tumors.
	
	Prerequisite: Software syngo MR B13

14441849 Diffusion Tensor Imaging #T+D	Diffusion Tensor Imaging provides a Single Shot EPI sequence for measuring diffusion-weighted data sets with up to 256 directions of diffusion weighting. Based on these data sets, the diffusion tensor itself and parametric maps derived from it (e.g. fractional anisotropy) are calculated automatically and in real-time. The package supports both clinical applications regarding diseases of the white matter (e.g. multiple sclerosis, brain maturation disorders, or displacement of nerve fiber tracts through masses) and advanced research applications. Diffusion spectrum imaging (DSI), an extension of diffusion tensor imaging, is included in this package. DSI expands on the DTI acquisition capabilities by providing the ability to resolve white matter fiber crossings. Diffusion Tensor Imaging allows for a complete description of the diffusion properties of the brain within the scope of the tensor diffusion model, both for anisotropic and isotropic diffusion. Efficient diffusion direction schemes are pre-defined to allow for optimal diffusion directional resolution. Schemes with up to 256 directions can be selected. Inline technology enables automatic and immediate calculation of the diffusion tensor, including grey-scale and colored “fractional anisotropy" (FA) map derived from it. With the addition of Diffusion Spectrum Imaging (DSI), it is possible to acquire diffusion data in up to 514 different directions each with independent b-values. Details: - Measurements with up to 256 different directions and with up to 16 different b-values - Inline calculation of tensor, grey-scale and colored FA map, ADC map and trace-weighted image - Support of parallel imaging (iPAT) - Clinical protocols with full head coverage, incl. inline calculation of tensor, FA, ADC and trace-weighted images in 4 minutes.
14416946 Neuro Perfusion Package #T+D	The Neuro Perfusions Package helps to streamline the clinical workflow by inline post-processing in dynamic susceptibility contrast (DSC) based perfusion imaging. This makes it possible to see perfusion maps immediately. Perfusion parameter maps are based on a Local Arterial Input function. A corrected relCBV map calculation and motion correction is provided. Neuro Perfusion Package provides a modified sequence and image reconstruction for motion correction and post-processing in dynamic susceptibility contrast (DSC) based perfusion imaging. Depending on whether motion correction is switched on, the following uncorrected or motion corrected perfusion maps can be calculated: time-to-peak (TTP), relative cerebral blood volume (relCBV), relative cerebral blood flow (relCBF), relative mean transit time (MTT), relative corrected cerebral blood volume (relCCBV) and bolus plots. Perfusion parameter maps are calculated based on a Local Arterial Input Function. The algorithm selects many AIFs per slice and volume based on a number of built-in criteria. This removes the need for manual selection of AIF voxels to calculate the cerebral perfusion parameters and allows the calculation to be performed in-line at the end of the measurement. It also minimizes deconvolution errors due to the effects of delay and dispersion of the contrast agent bolus. Additionally, in cases of contrast extravasations due to a disrupted blood-brain barrier, the postprocessing allows a correction to be applied during calculation of the relCBV maps.

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14405341 **Mapit syngo #Tim**	Based on the T1, T2 or T2* properties of the cartilage syngo ParametricMap allows the early detection of osteoarthritic break down of cartilage structures even before morphological changes occur. The method supports therapeutic decisions in individual patients and can be used to control treatments non-invasively, replacing surgeries or biopsies. The assessment of T1, T2 and T2* properties of tissues in other body regions is also possible. syngo ParametricMap provides very fast 2D and 3D high-resolution imaging sequences and the Inline calculation of parametric maps for the T1, T2 and T2* properties of the imaged tissue. Features: - 3D VIBE sequence for Inline T1 mapping - Multiecho spin echo sequence for Inline T2 mapping - 3D Multiecho gradient echo sequence for Inline T2* mapping - iPAT compatibility - Protocols for Inline parametric mapping Using iPAT the 3D sequences provide isotropic imaging extremely high-resolution while maintaining clinical measurement times. These data sets allow for the multi planar reconstruction of all planes. 3D is necessary to properly visualize the whole articular cartilage since it typically has a complex shape. In addition the accuracy of isotropic high-resolution 3D data sets is superior because partial volume effects between e.g. synovial fluid and cartilage are minimized. For the visualization of the parametric maps in the anatomical context the maps can be displayed as a colored overlay onto anatomical images using the optional package "*syngo* Image Fusion"
14441761 **LiverLab #T+D**	LiverLab is a system guided workflow to examine the hepatic fat and iron status, as part of the Abdomen Dot Engine. Main Features: - The inline screening Dixon sequence gives the user a first overview of possible fat and/or iron overload in the whole liver. - Based on the result images, liver segmentation runs without user interaction. - If further evaluation is needed, the user can choose from two methods: 1. HISTO is a pushbutton single breath-hold single voxel spectroscopy method to calculate fat fraction as well as water R2. 2. Multi-echo Dixon is an image based method to calculate maps such as water, fat, fat signal percentage, and R2*.
14470766 **MR Elastography incl. HW**	MR Elastography offers a new diagnostic tool for all Tim+Dot systems that allows identifying variations in liver tissue stiffness. This option includes the HW starter set for Elastography (3rd party HW) and the Elastography SW. The HW starter set includes these major specific components of the MR Elastography option: - The active driver, which creates the mechanical waves - Two (2) passive driver, which applies the mechanical waves to the patient's body - The diameter of the applicator (passive driver) is 18 cm. The thickness is 3.5 cm. - Long and short plastic tubings for mechanical wave transfer from active to passive driver - Applicator belt for securing the passive driver to the patient's body - Cords and cables for connecting the trigger box with the active driver and the components with the scanner electronics The Elastography SW consists of protocols, sequences, reconstruction algorithms and inline reconstruction. Please note: the Elastography HW and SW are exclusively tied to the individual MR scanner for which

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	it is purchased. The transfer of elastography functionality between MR scanners is not supported.
14409198 **Native syngo #Tim**	Integrated software package with sequences and protocols for non-contrast-enhanced 3D MRA with high spatial resolution. syngo NATIVE particularly enables imaging of abdominal and peripheral vessels and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency. *syngo* NATIVE offers: - Non-contrast-enhanced MRA - Separate imaging of arteries and veins - Visualization of - e.g. - renal arteries or peripheral vessels The *syngo* NATIVE package comprises: - *syngo* NATIVE TrueFISP - *syngo* NATIVE SPACE
14441813 **QISS #T+D**	Software package with QISS sequence, protocols and Dot AddIn for non-contrast-enhanced peripheral MRA. QISS particularly enables higher reproducibility than existing methods and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency. QISS offers: - Non-contrast-enhanced peripheral MRA - Higher robustness when compared to other non-contrast-enhanced peripheral MRA methods - Improved usability provided by the Dot AddIn which enables easier multi-stage planning The QISS package comprises: - QISS sequence - QISS Dot AddIn - Non-contrast-enhanced peripheral vessels protocols
08464740 **Flow Quantification #Tim**	Special sequences for quantitative assessment of flow i Flow Quantification enables the acquisition of flow encoded images and the evaluation of blood as well as of cerebro-spinal fluid (CSF). Sequences include: - ECG triggered 2D phase contrast with iPAT support - Retrospective reconstruction algorithms for full R-R interval coverage - Maxwell Term Compensation - 4D Flow protocols including retrospective triggering and navigator based respiratory gating for free-breathing 4D Flow acquisitions.
14456247 **syngo.MR Cardiac Flow #1**	syngo.MR Cardiac Flow processes velocity-encoded MR images to evaluate blood flow dynamics e.g. in the heart and the great vessels. The application generates quantitative results for physicians in the diagnostic process. The MR cardiac interactive reporting template is included. This application provides velocity- and flow-related data of an examined patient quickly and easily. **Image Display** - Two large screen segments for viewing magnitude and phase Images - Synchronized movie display - Application of color look-up tables similar to Doppler-ultrasound **Automated Segmentation Tools** - Semi-automatic edge detection for vessel lumen from initial user input

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	- Automatic compensation of in-plane motion as well as vessel size or shape changes **Quantitative Analysis** - Through-plane and in-plane flow analysis - Background phase correction - Display of value and location of peak velocity on each image - Calculation of: Mean and peak velocity; mean, cumulative, forward and retrograde flow; regurgitation fraction - Changes in vessel size **Digital and Paper Reports** - Various graphs: Velocity vs. time, flow rate vs. time, integral flow vs. time, area vs. time - Summary tables - Export of result images including segmented contours - Dedicated reporting of flow evaluation results. Scope of delivery: - 1 x *syngo*.MR Cardiac Flow software
14470965 **High bandwidth inversion recovery**	High bandwidth inversion recovery for reduction of susceptibility-induced artifacts. This option enables a high bandwidth inversion pulse in inversion recovery sequences for tissue characterization with the aim to reduce susceptibility artifacts.
14441747 **MyoMaps #T+D**	This package contains special sequences and protocols for inline T1,T2 and T2* calculation at the heart. The generation of T1 and T2 parametric maps is enhanced by the use of motion correction. T1,T2 and T2* parametric maps could be used to support assessment of cardiovascular disease. The MyoMaps package enables the calculation of quantitative T1, T2 and T2* parametric maps at the heart. The calculation is available shortly after the measurement is finished without the need of post-processing. **T1 Parametric Map** - Acquisition based on ECG triggered modified look-locker inversion recovery (MOLLI) - T1 parametric maps could be used to enhance the characterization of both ischemic and non-ischemic heart disease. **T2 Parametric Map** - Acquisition based on T2-prepared TrueFISP sequence - T2 parametric maps could be used to enhance the evaluation of myocarditis and heart transplant rejection. **T2* Parametric Map** - Acquisition based on multi-echo GRE sequence - T2* parametric maps could be used in the evaluation of iron overload for hemochromatosis patients.
14469205 **Breast Biopsy #BM**	The Breast Biopsy Software is a professional solution for a fast and accurate MR biopsy workflow. The Breast Biopsy Software offers an effective guide for breast interventions such as vacuum biopsy and wire localization. It supports both the grid method and the post/pillar method. The software automatically extracts the coordinates of the selected target and calculates the required point of entry, angulation (for post/pillar method) and penetration depth. For control, the needle path is projected on the planning images. Graphical instructions support the coil-specific guidance. For an optimized workflow, the instructions are also displayed on the touch display at the scanner.

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	Multi Lesion support: Targeting of multiple lesions in one planning step is supported. The Breast Biopsy Software supports most common MR interventional accessories and the following MR breast coils: - Breast BI 7 - 2-/4-/8-Channel Sentinelle Breast Coil - 2-/10-/16-Channel Sentinelle Breast Coil - Breast BI 4 (from XA30A)
14430491 **Body 18 long #Ae**	The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 18 channels (inherent) or more, if the coil is combined with other coils - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology The 18-channel coil with its 18 integrated pre-amplifiers ensures excellent signal-to-noise ratio. The 18 coil elements provide extensive coverage in all directions. The single SlideConnect plug allows for fast and easy patient preparation. The coil's extended cable allows for more flexibility in connector selection which is especially helpful if multiple flexible coils need to be combined and challenging imaging set-ups need to be supported like in therapy imaging (e.g. for combined head-neck exams). The light-weight coil ensures highest patient comfort. The Body 18 1.5T long features: - 18-element design with 18 integrated preamplifiers (3 clusters of 6 elements each) - Operates in an integrated fashion with the Spine 32 as an 30 channel body coil (not in combination with the Combi Dockable Table) - Can be combined with further coils for larger coverage - Can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations - No coil tuning - iPAT compatible in all directions The highly flexible design supports a wide variety of applications including: - Thorax (incl. heart) - Abdomen - Pelvis - Hip The Body 18 1.5T long has a 18-element design with 18 integrated preamplifiers that are arranged in 3 clusters of 6 coil elements each. This ensures excellent signal-to-noise ratio. It can be positioned in different orientations and addresses the requirement range for the examinations of obese patient to pediatric patients. The light weight coil improves patient comfort and can be easily connected via SlideConnect technology. The coil's extended cable allows for more flexibility in connector selection which is especially helpful if multiple flexible coils need to be combined and challenging imaging set-ups need to be supported like in therapy imaging (e.g. for combined head-neck exams). No tuning of the fully iPAT-compatible Body 18 1.5T long is necessary allowing for efficient and patient friendly set-up. In case of Radiation Therapy imaging, the Body 18 1.5T long will be typically combined with : - Flex 4 coil(s) - Body 18 coil(s) - Spine 32 coil In case of imaging in the context of neuro- and cardiovascular interventions, the Body 18 1.5T long

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	will be typically combined with: - Body 18 coil(s) - Combi Coil Base (only in combination with the Combi Dockable Table; allows to combine the Body 18 long with a Body 18 (standard cable length) and to use the combination as spine coil in situations where the patient is positioned on a transfer board so that the regular Spine 32 cannot be used) The dimensions of the Body 18 1.5T long are 385 mm × 590 mm × 65 mm (L x W x H). Its weight is about 1.6 kg (3.5 lbs), whereas the patient feels as little weight as 1.1 kg (2.5 lbs). The cable length is 168 cm, which compared to the Body 18 1.5T (with standard cable length) is 70 cm more.
14469199 **Body 18 -> BioMatrix Body 18**	This option exchanges the Body 18 coil from the standard coil configuration for the improved BioMatrix Body 18. Beside the same technical key benefits from the Body 18 coil, this coil has a new highly flexible and light-weight design. The BioMatrix Body 18 features: - 18-element design with 18 integrated preamplifiers (3 clusters of 6 elements each) - Operates in an integrated fashion with the system's spine coil - Can be combined with further Body 18 or BM Body 18 coils for larger coverage - Can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations - Requires no coil tuning - iPAT compatible in all directions The highly flexible design enables a wide variety of applications including: - Thorax (incl. heart) - Abdomen - Pelvis - Hip - Vascular The BioMatrix Body 18 is typically combined with: - BM Head/Neck 20 - BM Spine coil - Additional Body 18 coil(s) or BM Body 18 coils (optional) - Peripheral Angio 36 (optional) - Flex Large 4 - Flex Small 4 - UltraFlex Large 18 (depending on availability, optional) - UltraFlex Small 18 (depending on availability, optional) - Loop coils (optional) - Endorectal coil (optional) The BioMatrix Body 18 has an 18-element design with 18 integrated preamplifiers that are arranged in 3 clusters of 6 coil elements each. The BioMatrix Body 18 will be typically used together with the system's BM Spine coil with which it operates in an integrated fashion as a 30-element coil, resulting in 3 rings of 10 elements each for highest SNR and fast imaging. It can be positioned in different orientations and addresses the requirement range for the examinations of obese patient to pediatric patients. The highly flexible and light weight coil improves patient comfort and can be easily connected via SlideConnect technology. No tuning of the fully iPAT-compatible BioMatrix Body 18 is necessary, allowing for an efficient and patient friendly set-up. For examinations requiring larger anatomical coverage, up to four BM Body 18 can be used simultaneously. Typically two BM Body 18 will be used for coverage of the entire abdomen or in the case of large patients.

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	The BioMatrix Body 18 is typically used in combination with a BM Spine coil for examinations of the thorax, abdomen, pelvis or hip and is also well suited for cardiac or vascular applications. In addition, the BM Body 18 can be combined with further BM Body 18 (optional) or Body 18 (optional), the Peripheral Angio 36 (optional), but also the BM Head/Neck20, the 4-channel flex coils (e.g. Flex Large 4, Flex Small 4) and the 18-channel UltraFlex coils (e.g. UltraFlex Large 18, UltraFlex Small 18, depending on availability, optional). The dimensions of the BioMatrix Body 18 are 385 mm × 590 mm × 65 mm (L x W x H). Its weight is about 2 kg (4.5 lbs), whereas the patient feels as little weight as 1kg (2,25 lbs).
14460315 **Shoulder Shape 16 #So**	The Shoulder Shape 16 combines the known benefits of Tim 4G coil technology with new highly flexible materials, resulting in unmatched image quality, high patient comfort and easy handling. The Shoulder Shape 16 for examinations of the left or right shoulder consists of an iPAT-compatible 16-channel shoulder coil in a flexible shoulder cup that can be shaped around small and large shoulders. An L-shaped cushion for easy positioning of the patient is included. The 16-element coil with 16 integrated pre-amplifiers ensures maximum signal-to-noise ratio. Shoulder Shape 16 will be connected via a SlideConnect plug for fast and easy coil set-up and patient preparation. The iPAT compatible Shoulder Shape 16 is ergonomically designed and adapted to the shape of the shoulder. The flexibility in size obtains maximum image quality for different body sizes. The opening of the coil can be adjusted between 16 cm - 27 cm to cover small, medium and large shoulders. The coil can be used either for left or right shoulders. It features an L-shaped cushion than can easily be placed for comfortable positioning. The coil excels in highest resolution imaging with exceptional signal-to-noise ratio.
14416961 **Hand/Wrist 16 #Ae**	The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Hand/Wrist 16 for examinations of the left or right hand and wrist region consists of a base plate and an iPAT compatible 16-channel coil and allows high-resolution imaging of the wrist and the hand within one examination. Hand/Wrist 16 will be connected via a SlideConnect plug for fast and easy patient preparation. The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions. Hand/Wrist 16 is ergonomically designed and adapted to the shape of the hand/wrist region. The coil features a hinged design of the upper part and slidable attachment to the base plate. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning.
14460423 **Tx/Rx Knee 18 #So**	New 18-channel transmit/receive coil optimized for knee imaging. The spacious design with a flared opening towards the thigh allows scanning even of large and swollen knees with exceptional image quality and signal to noise ratio. Main features : - 18-element design (3x6 coil elements) with 18 integrated preamplifiers - iPAT-compatible - SlideConnect Technology Thanks to its 18-channel design this coil is perfectly suited for high-resolution images with excellent SNR. With the arrangement of the antennas in three rings of 6 elements each, the coil is specially designed for parallel imaging with high acceleration factors. The coil is positioned on a laterally movable support and therefore allows for comfortable patient positioning of both legs for off-center examinations. SlideConnect Technology allows for fast and easy patient preparation, resulting in less table time. Furthermore, the upper part can be removed for easier patient positioning. Additional cushions allow for optimum patient immobilization.

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	The integrated transmission function makes volume-sensitive excitation with greatly reduced RF power possible on the one hand and, on the other, prevents aliasing artifacts (e.g. due to the other knee). The housing of this coil has a flared opening towards the patient's thigh, as well as an easy coil sliding and opening mechanism.
14416962 Foot/Ankle 16 #Ae	The new Tim 4G coil technology with Dual Density Signal Transfer and DirectConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Foot/Ankle 16 for examinations of the left or right foot and ankle region consists of a base plate and an iPAT compatible 16-channel coil and allows high-resolution imaging of the foot and ankle within one examination. Foot/Ankle 16 is a cable-less coil and will be connected via DirectConnect for fast and easy patient preparation. The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions. Foot/Ankle 16 is ergonomically designed and features a boot-like coil design. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning.
14416958 Peripheral Angio 36 #Ae	The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 36 channels - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology The 36-channel coil includes 36 integrated pre-amplifiers for excellent signal-to-noise ratio. The single SlideConnect Plug allows for fast and easy patient preparation. The Peripheral Angio 36 features: - 36-element design with 36 integrated preamplifiers, distributed over 6 planes with 6 elements each - Operates in an integrated fashion with Body 18 coils and with the Spine 32 . For Whole-Body examinations also with the Head/ Neck 20 - Automatic table feed and active coil switch - Can be utilized head and feet first - Both legs are independently covered with coil elements, maximizing the coil filling factor and the signal-to-noise ratio - No coil tuning - iPAT-compatible - Dual-Density Signal Transfer enables ultra-high density coil designs by integrating key RF components into the local coil - SlideConnect technology for easy coil set up - One cable only for easy handling - Includes special non-ferromagnetic coil cart for safe, user-friendly storage Applications: - High-resolution angiography of both legs incl. Pelvis (by additional use of the Body 18) with highest signal-to-noise ratio - Visualization of the iliac arteries and aorta in combination with Body 18 - Bilateral examinations of long bones of the legs Typically combined with: Head/ Neck 20, Body 18, Spine 32, and all flexible coils such as Flex Large 4 or Flex Small 4 The Peripheral Angio 36 has a 36-element design with 36 integrated preamplifiers distributed over 6 planes with 6 elements each.

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	A uniquely designed non-ferromagnetic coil cart for safe coil storage is included. The PA Matrix Coil is also shipped with a set of positioning cushions for proper handling. No tuning of the fully iPAT-compatible Peripheral Angio 36 is required. With a length of about 1m both legs are covered from the iliac artery level down to the foot arch vessels using multiple, flexible wings. For the visualization of the abdominal aorta and the iliac bifurcation it can be combined with the Body 18 and Spine 32. For larger body coverage eg whole body with up to 205 cm possible coverage, it can be combined with Head/Neck20 or a further Body18 to allow for large Field of View examinations with high patient comfort. Patient set up is done once and no repositioning is necessary For peripheral Angiography the PA Matrix coil will be typically used in feet-first position, but also head-first positioning for whole-body examinations is possible (optional Tim Whole Body Suite required). The dimensions of the Peripheral Angio 36 are: 860 mm × 300 - 640 mm × 280 mm
14416972 **Tim Coil Interface 1.5T**	Coil adapter plug for up to 8 receive and 1 transmit channels. This adapter will be required if the following Tim coils will be used on a compatible 1.5T MAGNETOM system with Tim 4G technology. - Tx/Rx 15-channel Knee Coil (two adapters required) - CP Extremity Coil - 4-channel BI Breast Coil - 16-channel AI Breast Coil (two adapters required) - (2/4)/8-channel Sentinelle BreastCoil - (2/10)/16-channel Sentinelle BreastCoil (two adapters required) The adapter can be plugged in any the SlideConnect plug of the system. The Tim Coil Interface has a compact design and measures only approx. 190 mm x 90 mm x 33 mm (W x H x D).
14426332 **Tx/Rx CP Head Coil #Ae**	Circularly polarized no-tune transmit/receive coil with an open patient-friendly design. The integrated transmit mode allows volume selective excitation. Integrated, extremely low-noise pre-amplifiers permit very high signal-to-noise ratio. Furthermore, the coil is outfit with SlideConnect Technology, allowing for easier patient preparation and less table time for the patient. This enables studies with very high spatial resolution and very short scan time. The upper part of the coil is detachable and can be fitted with a mirror allowing the patient a rear view out of the magnet. Displaceable cushions are provided with the coil for positioning. The coil is suited for head proton imaging and brain spectroscopy.
14469229 **Flex -> UltraFlex Upgrade #1.5T**	This option exchanges the Flex Small & Large 4 coils incl. the Flex Coil Interface from the standard coil configuration for the superior UltraFlex Small & Large 18. These are two lightweight, iPAT compatible, 18-element no-tune receive coils made of highly flexible and soft material. UltraFlex Large 18 Ideal for examinations of larger extremities (e.g. medium to large shoulder, hip, knee, ankle and hand) and for abdominal examinations. Dedicated positioning aids for larger extremities are delivered with the coil. UltraFlex Small 18 Ideal for examinations of smaller extremities (e.g. small to medium shoulder, smaller ankle, elbow and hand) and for abdominal examinations. Dedicated positioning aids for smaller extremities are delivered with the coil. This option exchanges the Flex Small & Large 4 coils incl. the Flex Coil Interface from the standard coil configuration for the superior UltraFlex Small & Large 18.

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	UltraFlex Large 18 The UltraFlex Large 18 can be wrapped around or placed flat on top of the area of interest. This rectangular coil measures approx. 29 cm x 59 cm and connects with only one SlideConnect plug which allows for fast and easy patient preparation. The positioning aids that come with the coil enhance positioning flexibility and help minimize involuntary patient motion artifacts. **UltraFlex Small 18** The UltraFlex Small 18 can be wrapped around or placed flat on top of the area of interest. This rectangular coil measures approx. 19 cm x 41 cm and connects with only one SlideConnect plug which allows for fast and easy patient preparation. The positioning aids that come with the coil enhance positioning flexibility and help minimize involuntary patient motion artifacts.
14456282 **Positioning Aids Shoulder&Ankle #Vi**	This package contains additional positioning aids that can be used for the UltraFlex Large 18 and UltraFlex Small 18. This package contains a wedge shaped cushion that can be used together with the UltraFlex Large 18 or UltraFlex Small 18, e.g. for shoulder imaging and an L-shaped holder that can be used together with the coil holder of the UltraFlex Small 18 or UltraFlex Large 18 for ankle imaging to achieve a 90° angle of the patient's ankle.
14456241 **Separator 60kW/75kW #Vi**	The SEP (Separation cabinet) has to be used if a central hospital chilled water supply is available or if a chiller of any brand/type is already available. The SEP is the interface between the on-site water chiller (of any brand or type) or the interface to the central hospital cooling water supply. For the above-mentioned cases the SEP is mandatory! In these cases, the primary water specifications must fulfill the requirements: XJ: 45kW; water temperature: 6 - 14°C XQ: 60kW; water temperature: 6 - 14°C XT: 75kW; water temperature: 6 - 12°C For all gradient systems: Flow: 100+-10l/min; pH value 6-8; max working pressure 6 bar. Dimensions: 1950mm x 650mm x 650mm (height x width x depth) Weight: approx. 350kg Function: - Interface between the on-site water chiller (of any brand/type) or - Interface to the central hospital chilled water supply. Delivery volume: - Separator - Two 3.0 m hoses (forward and return) for connecting the SEP to the local cooling water supply system - Separation cabinet - With the SEP configuration, the helium compressor is built into the SEP cabinet and connected internally - Regional specific adapter for connection to the hospital installation
14460249 **UPS system #Vi**	UPS system Liebert GXT5 3000IRT2UXLE for MAGNETOM NumX systems for safeguarding computers. Including Power Cable of 9 m for connecting the UPS. Power output: 3.0 kVA / 3 kW Bridge time: 3 min full load / 12 min half load Input voltage: 230 VAC Voltage range: 115 - 280 V

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Part No./Product	Description
	Input frequency: 40 / 70 Hz Output voltage: 230 VAC Dimensions (H x D x W): UPS 430 x 540 x 85 mm incl. 9 m Power Cable Weight: approx. 30 kg
14456228 **System Start Timer #Vi**	Timer clock that can be installed together with the MAGNETOM MR system to start the system automatically at user-definable times, eliminating waiting times during system boot up. The System Start Timer allows the user to define three different startup times for different days. The time switch can be programmed one year in advance. A programmed weekly schedule is repeated unless it is modified or suspended.
14407259 **MR Workplace Table, height adjust.**	The table is suitable for the syngo Acquisition Workplace and the syngo MR Workplace based on syngo hardware. This 110V version has motorized table height adjustment. The table design matches the MED-wide uniform design with silver-finished rim, use of friendly colors for MAGNETOM and SOMATOM. This table can electrically be adjusted to the ergonomically most suitable height via buttons at the front. - Width 138 cm - Depth 80 cm - Height electrically adjustable between 71 cm and 110 cm
14407261 **MR Workplace Container, 50cm**	50 cm wide extra case for the syngo host computer with sliding front door to allow change of storage media (CD/DVD/USB). The table design matches the MED-wide uniform design with silver-finished rim, use of friendly colors matching the Siemens color pattern for MAGNETOM and SOMATOM. Table height 72 cm, matching the *syngo* Acquisition Workplace and *syngo* MR Workplace console table, for installation in the operator room either directly to the left or right of the *syngo* Acquisition Workplace or *syngo* MR Workplace console table or separately. - Width 50 cm - Depth 80 cm - Height 72 cm Alternatively this casing is also suited for the Recon image processor (except for the MR systems with the Tim generation: there the Recon image processor is always placed inside the electronics cabinet).