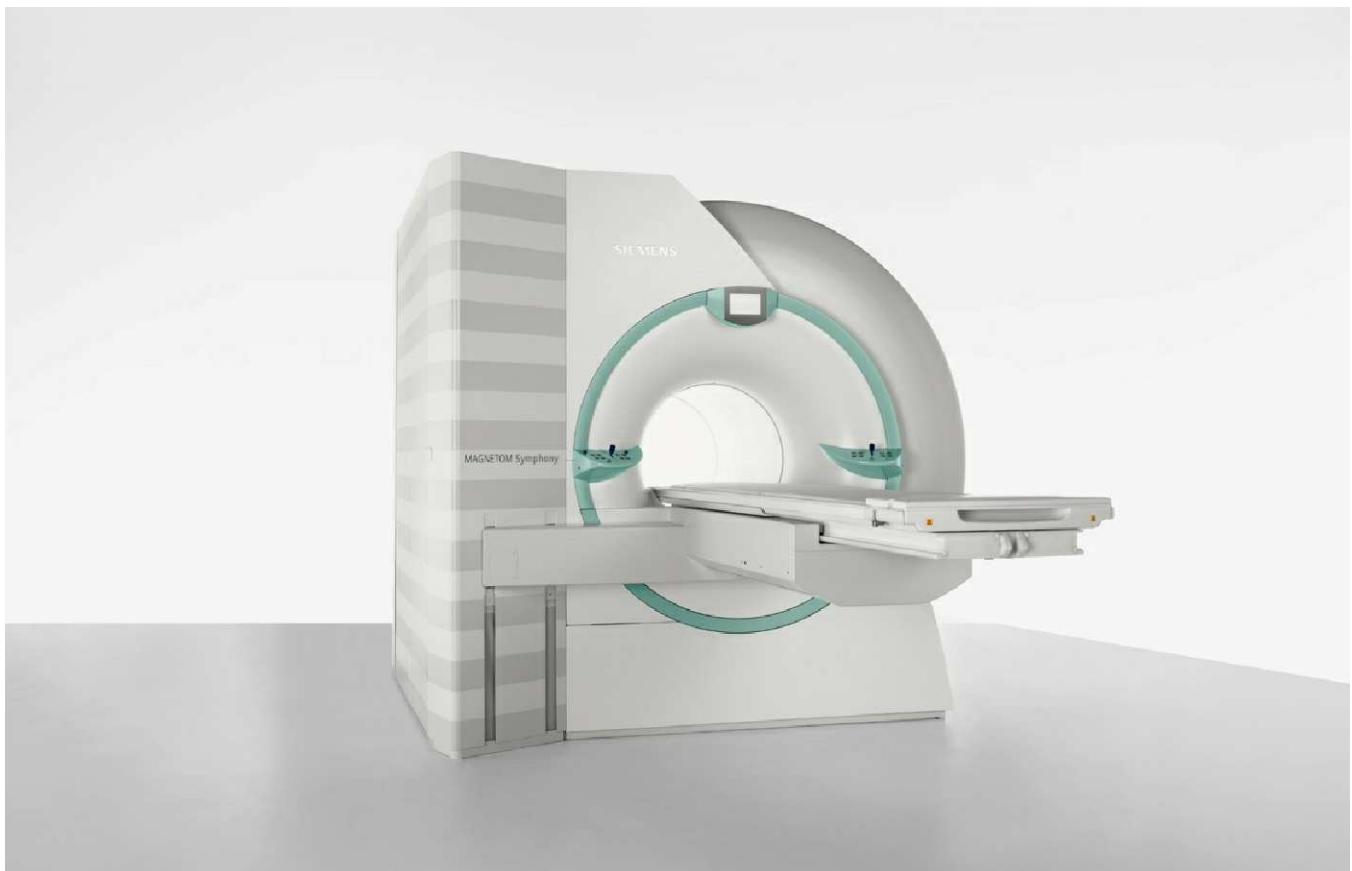


# SIEMENS

## MAGNETOM SYMPHONY TIM UPGRADE TIM UPGRADE ASSIST PACKAGE

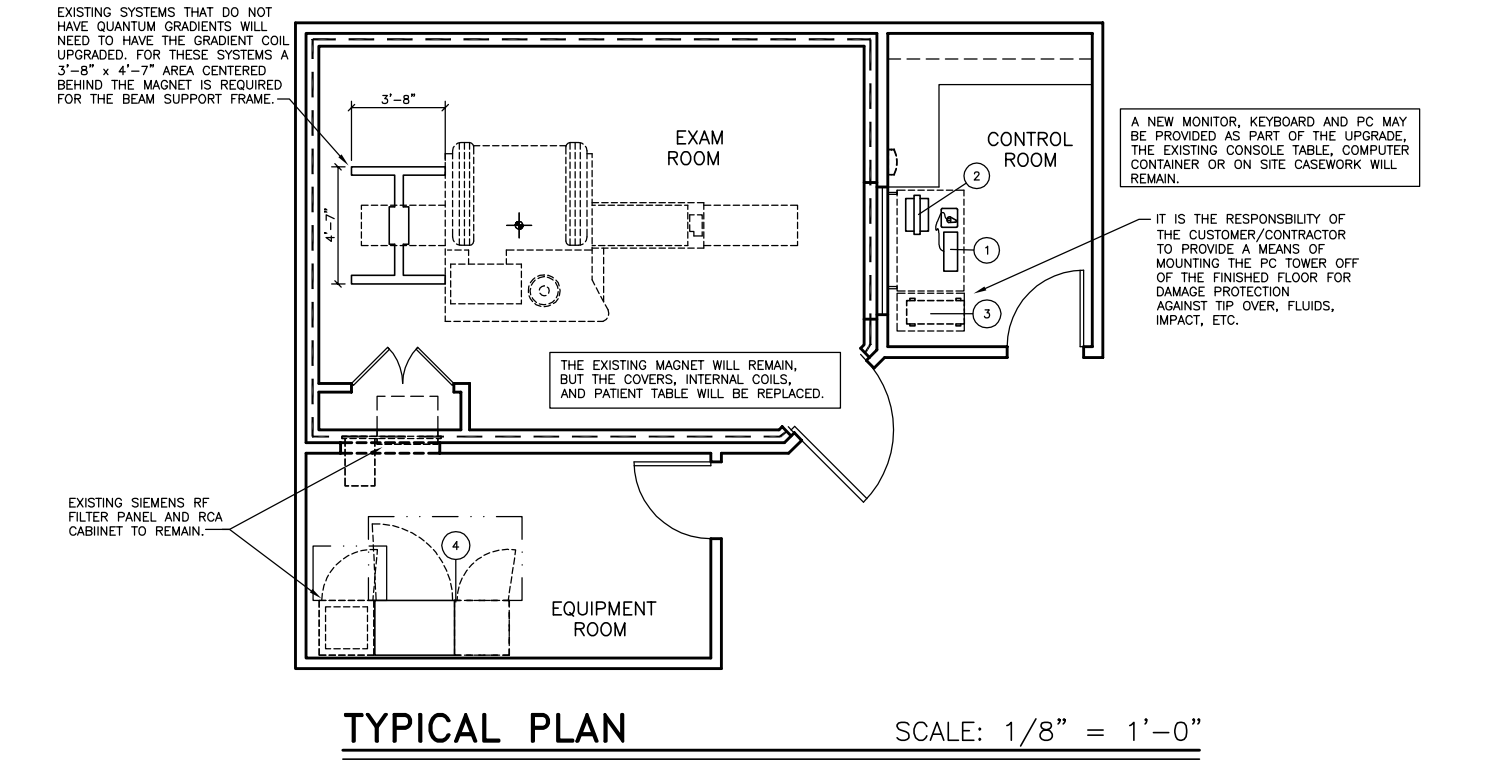
MR



The purpose of this document is to provide the system specification changes that are required to upgrade your existing system to TIM technology. Site specific drawings are not necessary for this upgrade. A typical room plan, equipment legend, special clearance requirements and notes are provided to communicate the changes to existing impacted components. This document also contains the requirements for electrical power, chilled water, environmental, cryogen exhaust, RF shielding and information regarding the magnetic field that are associated with the upgrade.

MAGNETOM SYMPHONY TIM UPGRADE  
TYPICAL ROOM PLAN

MR



EQUIPMENT LEGEND

NO	DESCRIPTION	SMS SYM	WEIGHT (LBS)	BTU/HR TO AIR	DIMENSIONS (INCHES)			REMARKS
					W	D	H	
①	MRC KEYBOARD		5	---	27 1/4	10 1/8	1 3/4	
②	COLOR MONITOR FOR MRC		22	239	18 5/16	16 15/16	4 3/4	
③	HOST PC MRC		49	2,389	11	27	18 1/8	
—	OLD ELECTRONICS CABINET TO BE REPLACED		2,425	17,060	63	26	78 1/2	
④	ELECTRONICS CABINET FOR UPGRADE		2,756	13,649	63	26	78 1/2	
—	IMAGER PC - TO BE REMOVED		55	1,364	18 1/2	18 1/8	7 3/4	

NOISE LEVELS

SYSTEM ROOM	NOISE LEVEL
CONTROL ROOM	APP. 55 dB(A)
EXAMINATION ROOM	APP. 91 dB(A)
EQUIPMENT ROOM	APP. 65 dB(A)

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL/ STATE/OSHA NOISE REGULATIONS ARE ADHERED TO. ADDITIONAL NOISE DATA MAY BE PROVIDED BY SIEMENS PROJECT MANAGER UPON REQUEST.

UPGRADE NOTES

THIS DRAWING SET CONTAINS SITE PREPARATION REQUIREMENTS FOR THE UPGRADE OF THE MR SYSTEM TO TIM TECHNOLOGY. SIEMENS IS NOT RESPONSIBLE FOR UPGRADES TO ELECTRICAL POWER, CHILLED WATER, HVAC, QUENCH VENT TUBE CONSTRUCTION, ELECTRICAL CABLE TRAYS, ETC. LISTED ON THIS DRAWING SET THAT ARE NEEDED TO MEET THE REQUIREMENTS OF THE TIM UPGRADE.

STAGING REQUIREMENTS

A 40' x 40' CLEAR AREA IS REQUIRED FOR UNCRATING AND ASSEMBLING THE UPGRADE COMPONENTS. ADDITIONAL DELIVERY AND RIGGING MAY BE REQUIRED TO BRING IN THE NEW COMPONENTS AND TO TAKE AWAY THE DISMOUNTED PARTS. SUFFICIENT STORAGE SPACE IS REQUIRED FOR NEW PATIENT TABLE, ELECTRONICS, GRADIENT AND BODY COILS, COVERS AND MISCELLANEOUS HARDWARE.

# MAGNETOM SYMPHONY TIM UPGRADE

## SPECIFICATIONS

### MR

### POWER REQUIREMENTS

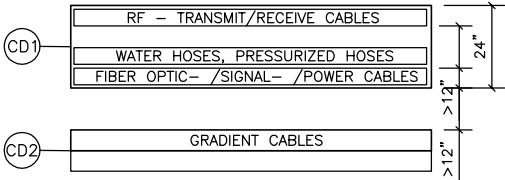
DEMAND AND CAPACITY REQUIREMENTS NOTES

- 1) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS, AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET.
- 2) OVERCURRENT PROTECTION IS SPECIFIED FOR SYSTEMS WITHOUT AN UNINTERRUPTIBLE POWER SUPPLY (UPS). ADDITION OF A UPS REQUIRES A HIGHER CAPACITY MAINS CONNECTION (DEPENDENT UPON UPS MODEL AND SIZE). MAXIMUM FAULT CURRENT IS DEPENDENT UPON THE IMPEDANCE OF THE FACILITY ELECTRICAL SYSTEM. CUSTOMER'S ARCHITECT OR ELECTRICAL CONTRACTOR TO SPECIFY AIC RATING OF OVERCURRENT PROTECTION BASED ON FACILITY IMPEDANCE CHARACTERISTICS.
- 3) MOMENTARY POWER IS BASED ON A MAXIMUM RMS VALUE FOR A PERIOD NOT TO EXCEED FIVE (5) SECONDS, AS DEFINED IN NEC 517.2. STAND-BY AND AVERAGE CURRENT ARE SUBSTANTIALLY LOWER.
- 4) THE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VOLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS USED TO OBTAIN THE PROPER EQUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.
- 5) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.
- 6) A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (>8x RATED CURRENT) IS REQUIRED TO PERMIT SWITCH-ON OF THE UPS SYSTEM WITHOUT SPURIOUS TRIPPING. CIRCUIT BREAKERS WITH AN ADJUSTABLE MAGNETIC TRIP (SIEMENS FD6 SERIES OR SIMILAR) ARE HIGHLY RECOMMENDED.

### POWER REQUIREMENTS

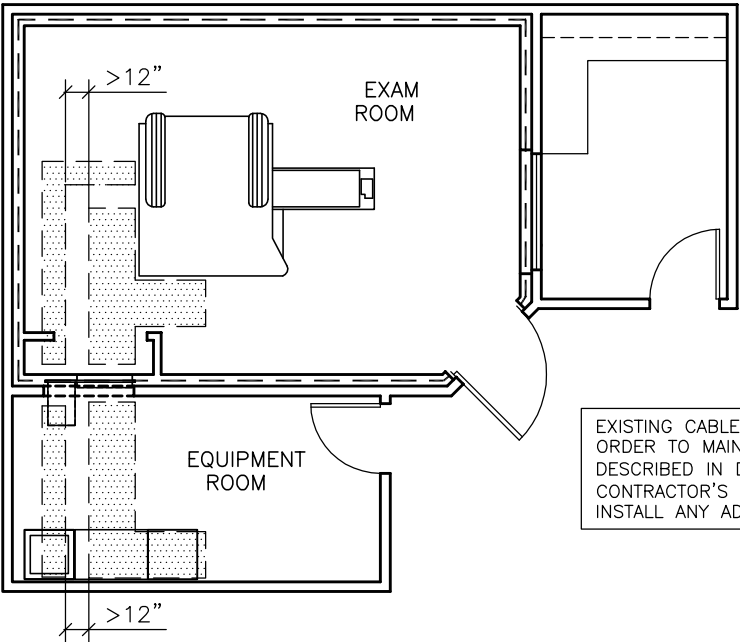
VOLTAGE RANGE: 480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS.	
VOLTAGE BALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES	
FREQUENCY:	60 Hz ± 1.0 Hz
LINE IMPEDENCE:	0.20 OHMS
STAND BY POWER:	16 KW
LONG TIME POWER (HEAVY SCAN PROTOCOLS)	30 KW
MAXIMUM POWER (LESS THAN 5 MINUTES)	70 KVA
MOMENTARY POWER	85 KVA
RECOMMENDED TRANSFORMER	112 KVA
RECOMMENDED UPS	100 KVA
MR SYSTEM OVERCURRENT PROTECTION	100 A
UPS SYSTEM OVERCURRENT PROTECTION	200 A
MAXIMUM ALLOWABLE VOLTAGE DROP AT MAX. POWER	6.0%

THE PROPER ROUTING OF CABLES IS ESSENTIAL TO ACHIEVE GOOD IMAGE QUALITY. RF CABLES MUST BE SEPARATED FROM FIBER OPTIC BY AT LEAST 12" AND FROM THE GRADIENT CABLES BY AT LEAST 12". FIBER OPTIC CABLES MUST ALSO BE SEPARATED FROM THE GRADIENT CABLES BY AT LEAST 12". THIS SHOWS RACEWAY/CABLE ROUTING.



### 1 CABLE SEPARATION

SCALE: NONE



EXISTING CABLE TRAYS MUST BE UPGRADED IN ORDER TO MAINTAIN CABLE SEPARATION AS DESCRIBED IN DETAIL 1. IT IS THE CUSTOMER/ CONTRACTOR'S RESPONSIBILITY TO SUPPLY AND INSTALL ANY ADDITIONAL CABLE TRAY.

### 2 CABLE TRAY LAYOUT

SCALE: NONE

# MAGNETOM SYMPHONY TIM UPGRADE SPECIFICATIONS

# MR

## CHILLED WATER

THE CHILLED WATER REQUIREMENTS ARE TO BE MET 24 HOURS A DAY, YEAR ROUND, AT THE RCA CABINET, FOR THE COLD HEAD AND GRADIENT SYSTEMS.

### EXISTING CHILLERS:

KPC208 – ONLY POSSIBLE FOR SIEMENS PROTOCOLS.  
KPS212, KPC215, KOOLANT 15T, KOOLANT 25T – CAN USE SIEMENS PROTOCOLS, RESEARCH, AND IDEA COLLABORATIONS.  
FOR CHILLERS THAT DO NOT MEET THESE REQUIREMENTS, BUT WORKED FOR THE SYMPHONY – ONLY POSSIBLE FOR SIEMENS PROTOCOLS.

## CHILLED WATER REQUIREMENTS

WATER REQUIREMENTS TO BE MEASURED AT THE RCA CABINET.

WATER SUPPLY FLOW RATE REQUIRED: 0% OR 38% GLYCOL (CCS – WATER)	15.85 GPM MINIMUM
WATER TEMPERATURE:	48°F ±4°F
BTU DISCHARGE TO THE WATER	153,684 BTU/HR
WATER PRESSURE	58–87 PSI
PRESSURE DIFFERENTIAL	22 PSI WITHOUT GLYCOL 36 PSI WITH GLYCOL
CHILLED WATER ACIDITY RANGE	6 pH TO 8 pH
CHILLED WATER HARDNESS	107 ppm TO 142 ppm CALCIUM CARBONATE
ALLOWABLE TEMPERATURE FLUCTUATION	LESS THAN 2°F PER 5 MINUTES

- 1) APPROXIMATELY 30 GALLONS OF DISTILLED WATER IS REQUIRED FOR THE SECONDARY CHILLED WATER LOOP. THIS WATER IS TO BE SUPPLIED BY THE CUSOTMER/CONTRACTOR AND SHOULD BE AVAILABLE AT THE SITE PRIOR TO THE INSTALLATION.
- 2) ETHYLENE GLYCOL MAY BE ADDED TO THE PRIMARY CHILLED WATER LOOP UP TO 38% OF THE TOTAL VOLUME. IT IS TO BE SUPPLIED BY THE MECHANICAL CONTRACTOR. AUTOMOTIVE ANTIFREEZE IS NOT ACCEPTABLE UNDER ANY CONDITION.
- 3) LOSSES IN PRESSURE AND TEMPERATURE ASSOCIATED WITH A CHILLER IS NOT INCLUDED IN THESE VALUES.
- 4) THE CHILLED WATER SUPPLY IS REQUIRED TO THE RCA CABINET 24 HOURS A DAY, YEAR ROUND.

## ENVIRONMENTAL REQUIREMENTS

- 1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE EXAM ROOM, 70°F±10°F IN THE EQUIPMENT & CONTROL AREAS, RELATIVE HUMIDITY OF 40–60% (NON–CONDENSING) IS REQUIRED EXAMINATION ROOM AND 40–80% (NON–CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK.
- 2) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS RECOMMENDED FOR THE EXAM ROOM. A MINIMUM FRESH AIR EX–CHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED. AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED CONTROL AND SENSOR TO MONITOR AND ADJUST THE AIR.
- 3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 6,824 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 20,473 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENTS ONLY. AUXILIARY SUPPORT EQUIPMENT (ie UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.
- 4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST AIR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST AIR SHOULD BE INSTALLED AT LEAST 6’–6” ABOVE FINISHED FLOOR.
- 5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.
- 6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING, IT IS RECOMMENDED TO INSTALL AN ON–SITE FILTER TO REMOVE DUST PARTICLES GREATER THAN 10 MICRONS.

## MAGNETIC FIELD PRECAUTIONS

THE TIM UPGRADE WILL NOT ALTER THE MAGNETIC FIELD DISTRIBUTION OF THE MAGNET, NOR WILL IT CHANGE THE SENSITIVITY OF THE MAGNET TO EXTERNAL INFLUENCES. RESTRICTIONS TO PERSONS AND EQUIPMENT DUE TO THE MAGNETIC FIELD SHOULD REMAIN IN PLACE.

### PROTECTING THE MAGNETIC FIELD

THE SIEMENS MAGNETOM UTILIZES A SUPERCONDUCTIVE MAGNET WITH AN EXTREMELY HOMOGENEOUS FIELD WITHIN THE MAGNET TO PROVIDE DISTORTION–FREE IMAGING. THE PRESENCE OF FERROMAGNETIC MATERIAL WITHIN THE VICINITY OF THE MAGNET CAN ADVERSELY AFFECT THE UNIFORMITY OF THE USEFUL MAGNETIC FIELD. THIS APPLIES TO STATIONARY FERROUS MATERIAL (STRUCTURAL STEEL) WHICH IS TO BE MINIMIZED. STATIONARY STEEL COMPENSATION MAY BE ACHIEVED BY MAGNET POSITIONING AND SELECTIVE USE OF SHIMS. FIELD DISTORTION ENCOUNTERED BY MOVING FERROMAGNETIC OBJECTS IS MORE DIFFICULT TO COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

### PROTECTING THE ENVIRONMENT

PROTECTING THE IMMEDIATE ENVIRONMENT FROM THE EFFECT OF THE MAGNETIC FIELD REQUIRES CONSIDERATION. INFORMATION STORED ON MAGNETIC DATA CARRIERS SUCH AS DISKS, TAPES, AND CREDIT CARDS MAY BE ERASED IF IN CLOSE PROXIMITY. CAUTION WITH REGARD TO HEART PACEMAKERS MUST BE EXERCISED. MOST PACEMAKER UNITS EMPLOY A REED RELAY WHICH MAY CHANGE OPERATING MODE WHEN EXPOSED TO AN EXTERNAL MAGNETIC FIELD. THEREFORE, PACEMAKER USERS MUST BE KEPT AT A SPECIFIED DISTANCE FROM THE MAGNET WHICH IS DETERMINED BY THE MAGNETIC FIELD STRENGTH.

## RF SHIELDING

THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15–128 MHz. IF CO–SITING TWO SYSTEMS EACH ROOM SHOULD BE 100 dB.

THE RF–SHIELDING MUST BE INSULATED FROM ALL GROUNDS SUCH THAT THE ONLY GROUND IS THE SINGLE POINT GROUND ON THE OUTSIDE OF THE RF–ROOM WALL. RESISTANCE > 100 OHMS.

ALL ELECTRICAL LINES INTO THE RF ROOM MUST BE ROUTED THROUGH RF FILTERS (PROVIDED BY RF SHIELDING SUPPLIER). ALL ELECTRICALLY NON–CONDUCTIVE SUPPLY LINES (E.G. OXYGEN) INTO THE RF ROOM MUST BE ROUTED THROUGH RF SEALED WAVE GUIDES (PROVIDED BY RF SHIELDING SUPPLIER).

FOR PRESSURE EQUALIZATION PURPOSES THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. AS AN ALTERNATIVE A 24”X24” OPENING IN THE RF ROOM FOR PRESSURE EQUALIZATION IS REQUIRED.

THE RF ROOM MUST BE TESTED TO ASSURE IT MEETS CURRENT SPECIFICATIONS. SIEMENS IS NOT RESPONSIBLE FOR RF ROOM TESTING OR SUBSEQUENT REPAIRS REQUIRED TO AREAS OTHER THAN THE FILTER PANEL.

MAGNETOM SYMPHONY TIM UPGRADE

SPECIFICATIONS

MR

NOISE/VIBRATION ABATEMENT

THE SYLOMER PADS AND THE MATERIAL TO FILL THE RECESS IN THE RF ROOM, IF PRESENT ARE INCLUDED IN THE UPGRADE KIT. THE MAGNET MUST BE LIFTED TO INSTALL THE 50mm (2") PADS. THE QUENCH VENT MUST BE REWORKED TO COMPENSATE FOR THE CHANGE IN MAGNET ELEVATION. SIEMENS IS NOT RESPONSIBLE FOR REQUIRED ADJUSTMENTS TO THE QUENCH VENT.

NOISE ABATEMENT SOLUTIONS

STRUCTURE BORNE NOISE

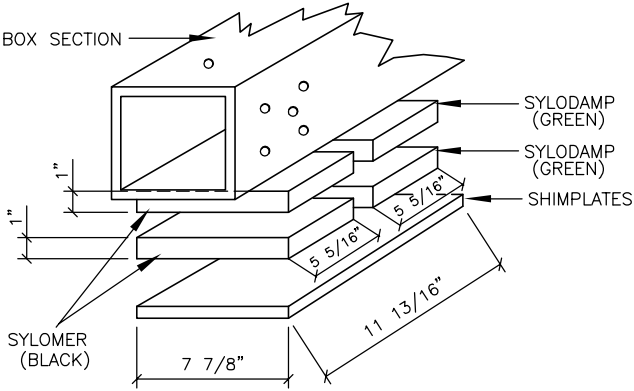
FOR THE REDUCTION OF STRUCTURAL NOISE, SYLOMER V25 PADS, SIZE 200mm x 300mm x 25mm MAY BE PLACED UNDER EACH SUPPORT POINT OF THE EXISTING SYMPHONY MAGNET. TWO PADS SHOULD BE STACKED TOGETHER FOR A TOTAL HEIGHT OF 50mm (2") WHICH GIVES A RESONANCE FREQUENCY OF 10 Hz.

PLEASE NOTE THAT THE SHIMS FOR HEIGHT ADJUSTMENT SHOULD BE MOVED UNDERNEATH THE PADS. THE SURFACE AREA OF THE MAGNET ON THE SYLOMER PADS IS THEN 150mm x 300mm. THE PADS TEND TO BULGE OUT UNDER THE LOAD OF THE MAGNET SO A FREE SPACE OF 20mm (7/8") AROUND THE PLATES MUST BE ENSURED.

THE FOOT SUPPORT OF THE PATIENT TABLE (IN FRONT, TO THE LEFT) ALSO REQUIRES A SYLOMER V25 PAD, 100mm x 100mm x 25. LOWER THE FOOT SUPPORT BY HAND UNTIL IT RESTS ON THE PAD. SUBSEQUENTLY LOWER IT BY ANOTHER 2.5mm TO 5mm TO CREATE A CONTACT LOAD OF APPROXIMATELY 440 POUNDS.

AIRBORNE NOISE

NOISE FROM AN MR SYSTEM CAUSES THE SURROUNDING AIR TO VIBRATE. THE VIBRATION ESCAPES VIA (A) AIR LEAKS IN ENCLOSURES OR (B) IS TRANSMITTED DIRECTLY THROUGH THE WALLS, FLOOR AND CEILING TO NEIGHBORING ROOMS. TO REDUCE AIRBORNE NOISE, PRECAUTIONS MAY BE TAKEN USING MINERAL WOOL TO INSULATE THE BUILDING STRUCTURE OR A DOUBLE-WALLED ENCLOSURE MAY BE INSTALLED. THE RF SHIELDING MAY BE CONSIDERED TO BE A SECONDARY ENCLOSURE. ALSO NOTE THAT NOISE WILL ESCAPE FROM THE CONTROL DOOR (RF DOOR) AND THE CONTROL WINDOW. SPECIAL DOORS AND WINDOWS AS WELL AS SPECIAL NOISE REDUCING SEALS ARE AVAILABLE THROUGH MOST SHIELDING SUPPLIERS.



SYLOMER/SYLODAMP

3

PAD POSITIONING

SCALE:  
NONE

PADS DELIVERED WITH SYSTEM

SYLOMER S720 (BLACK)	8 PCS. 200x150x25mm	BOX SECTION
SYLOMER HD 300 (GREEN)	8 PCS. 200x150x25mm	BOX SECTION
SYLODAMP V25 (GREY)	2 PCS. 100x100x25mm	SUPPORT DISC

BUILDING VIBRATIONS

EXTERNAL VIBRATIONS OR SHOCKS AFFECTING THE MAGNET MAY DEGRADE IMAGE QUALITY. VIBRATIONAL ACCELERATION  $a_{max}$  TRANSFERRED THROUGH BUILDING VIBRATIONS TO THE MAGNET MAY NOT BE EXCEEDED IN THE THREE SPATIAL ORIENTATIONS IN THE FREQUENCY RANGE FROM 0 TO 70 Hz.  
BUILDING VIBRATION SPECIFICATION:  $a_{max} = -70\text{dB g}$   
THE REQUIREMENT FOR  $a_{max}$  IS  $-70\text{dB g}$  MEASURED AS MAX. RMS VALUE IN THE FOURIER TRANSFORMATION OF THE RECORDED SIGNAL SPECTRUM.

MAGNETOM SYMPHONY TIM UPGRADE

SPECIFICATIONS

MR

QUENCH VENT NOTES

LIQUID AND GASSEOUS HELIUM ARE USED IN THE OPERATION OF A SUPERCONDUCTING MRI SYSTEM. A QUENCH VENT IS REQUIRED TO EXHAUST GASSEOUS HELIUM FROM THE MAGNET TO OUTSIDE THE BUILDING. THERE WILL BE AN EXISTING QUENCH VENT ATTACHED TO THE EXISTING SYMPHONY MAGNET. THE EXISITING QUENCH VENT MUST BE EXAMINED TO ENSURE THAT IT MEETS CURRENT REQUIREMENTS, OR THE REQUIREMENTS THAT WERE CURRENT AT THE TIME OF THE ORIGINAL INSTALLATION, IF APPROVED BY SIEMENS.

IF THE ORIGINAL QUENCH VENT IS TO BE RE-USED, THE OWNER SHALL PROVIDE A DETAILED DESCRIPTION OF THE EXISTING PIPE RUN TO THE SIEMENS PROJECT MANAGER. THIS SHALL INCLUDE ALL ELBOWS, DIAMETERS, TYPE OF MATERIAL AND LENGTHS OF RUN FOR EACH DIAMETER. IF THE QUENCH VENT IS REQUIRED TO BE UPDATED , IT IS THE RESPONSIBILITY OF THE OWNER TO MODIFY THE QUENCH VENT TO MEET THE REQUIREMENTS.

IF THE QUENCH VENT IS NOT CONFIGURED CORRECTLY THERE IS A RISK OF DANGER THAT MAY LEAD TO DEATH, SERIOUS INJURY, AND CAN RESULT IN STRUCTURAL DAMAGE. IT IS THE OWNER'S RESPONSIBILITY TO ENSURE THAT THE QUENCH VENT IN MAINTAINED IN AN OPERABLE CONDITION.

REQUIREMENTS:

1) THE QUENCH VENT TUBE MUST BE NON-MAGNETIC STAINLESS STEEL (≥16 GAUGE RECOMMENDED) GRADES AISI304, 309, 316 OR 321 ONLY. THERMAL CONDITIONS MAY CAUSE THE TUBE TO CONTRACT UP TO 3mm/METER SO A STAINLESS STEEL BELLOWS OR FLEXIBLE SECTION MUST BE INSTALLED A MINIMUM OF EVERY 32'-9" NOT TO EXCEED 2% OF THE OVERALL LENGTH. THE MOVEMENT OF THE BELLOWS MUST BE RESTRICTED TO PREVENT EXCESSIVE EXPANSION DUE TO PRESSURE. THE WEIGHT OF THE TUBE MUST BE SUPPORTED BY THE BUILDING AND BE FLEXIBLE ENOUGH TO ALLOW MOVEMENT FROM THERMAL CONTRACTION.

2) THE MAXIMUM INTERNAL PRESSURE IS CALCULATED AT 1.45 PSI. THE MAXIMUM PRESSURE SHOULD BE ENGINEERED FOR 6.5 PSI.

3) THE QUENCH TUBE MUST NOT EXCEED THE MAXIMUM LENGTH AND NUMBER OF ELBOWS, REFER TO SIEMENS PROJECT MANAGER FOR DETAILS. ALL BENDS MUST BE SMOOTH WALLED AND HAVE A CENTERLINE TO INTERNAL PIPE DIAMETER RATION OF 1.5 TO 5.0. EXPANSION TO PIPE DIAMETER CAN BE DONE WITH A DIFFUSER. ONLY ROUND TUBE SECTIONS MAY BE USED, RECTANGULAR SECTIONS ARE NOT ALLOWED.

4) THERE MUST BE A FLEXIBLE SECTION OF PIPE CONNECTED TO THE QUENCH VALVE AT THE MAGNET ABLE TO WITHSTAND 6.5 PSI. SECTIONS OF THE QUENCH TUBE CAN ONLY BE JOINED BY WELDED OR BOLTED FLANGES ONLY, ROTARY FLANGES ARE PERMITTED, VEE CLAMPED FLANGES MUST NOT BE USED.

5) THE QUENCH VENT MUST END AT A POINT WHERE ACCESS BY PEOPLE IS NOT POSSIBLE. THE EXHAUST MUST NOT BE VENTED INTO AN ENCLOSED SPACE.

THE END OF THE TUBE MUST BE PROTECTED FROM RAIN, SNOW AND FOREIGN OBJECTS. PROTECTION AT THE END OF THE TUBE SHALL BE 3/8" WIRE MESH COVERING AN AREA AT LEAST 2.5 TIMES THE CROSS SECTION AHEAD OF THE QUENCH TUBE. A RAIN COVER MUST ALSO BE FITTED WITH A DIAMETER TO BE TWO TIMES THAT OF THE TUBE. A DEFLECTOR PLATE SHOULD BE WELDED TO THE TUBE WHERE IT EXITS THE ROOF TO PREVENT HELIUM FROM RE-ENTERING THE BUILDING. THE DEFLECTOR SHOULD BE AT LEAST THE DIAMETER OF THE RAIN GUARD AND LOCATED TWO PIPE DIAMETERS ABOVE THE ROOF AND TWO PIPE DIAMETERS BELOW THE RAIN GUARD.

6) THE OPERATOR OF THE SYSTEM MUST PREPARE AN EMERGENCY PLAN IN THE EVENT OF A QUENCH. TO AVOID INJURY FROM COLD BURNS AND ASPHYXIATION, ACCESS TO THE QUENCH TUBE EXIT MUST BE RESTRICTED BY 9'-11" ON EACH SIDE AND BELOW, 19'-9" ABOVE WITH WARNING SIGNS. THE EXIT SHOULD NOT BE LOCATED WHERE HEILM GAS COULD BE DRAWIN INTO AN AIR INLET OR OPEN WINDOW.

7) THE QUENCH TUBE MUST BE INSULATED FOR THE FULL LENGTH. AND HAVE A WARNING POSTED ALONG IT'S ENTIRE LENGTH FOR EXTREMELY COLD HELIUM GAS – AUTHORIZED PERSONNEL ONLY. INSULATION MUST NOT TOUCH THE MAGNET COVERS.

8) GALVANIC SEPARATION MUST BE PROVIDED BETWEEN THE MR SYSTEM, THE RF ROOM, AND THE BUILDING. TWO SEPARATIONS ARE REQUIRED USING STAINLESS STEEL BOLTS, INSULATING BUSHES AND LOCKING NUTS. NO OTHER DESIGNS ARE PERMITTED FOR SAFETY.

SITE READINESS GUIDELINES

THE FOLLOWING GENERAL CONDITIONS ARE NECESSARY TO HAVE THE STATUS OF "READY SITE":

- 1) PROPER POWER AVAILABLE AT SIEMENS EQUIPMENT POWER CABINET LOCATION AND ALL POWER OUTLETS FUNCTIONING.
- 2) AIR CONDITIONING/HUMIDIFICATION SYSTEMS COMPLETE, TESTED, AND FUNCTIONING PROPERLY ACCORDING TO SIEMENS SPECIFICATIONS.
- 3) PLUMBING COMPLETE EXCEPT FOR ANY FINAL CONNECTIONS TO SIEMENS EQUIPMENT.
- 4) ALL CABLE TRAYS/DUCTS/CONDUITS CORRECTLY SIZED, LOCATED, AND INSTALLED ACCORDING TO THE SIEMENS DRAWINGS.
- 5) ROOM FOR EQUIPMENT INSTALLATION AND IMMEDIATE VICINITY IS DUST-FREE AND IS TO REMAIN SO FOR THE DURATION OF THE INSTALLATION.
- 6) A SECURE AREA (APPROXIMATELY 10' x 10') IS AVAILABLE AT EQUIPMENT DELIVERY FOR PARTS AND INSTALLATION TOOLS.
- 7) CUSTOMER APPROVAL FOR SIEMENS REMOTE SERVICES (SRS) CONNECTION, AND CUSTOMER'S I.T. CONTACT INFORMATION AND IP ADDRESSES ESTABLISHED.

IF THESE CONDITIONS ARE NOT MET, THE SIEMENS PROJECT MANAGER AND THE DESIGNATED SIEMENS INSTALLATION SUPERVISOR SHALL RESCHEDULE THE INSTALLATION START DATE. NOTE: ADDITIONAL COST MAY BE INCURRED BY THE CUSTOMER/CONTRACTOR AND DELIVERY DATES MAY NEED TO BE RESCHEDULED, WHEN THE SIEMENS SITE READINESS GUIDELINES ARE NOT MET.