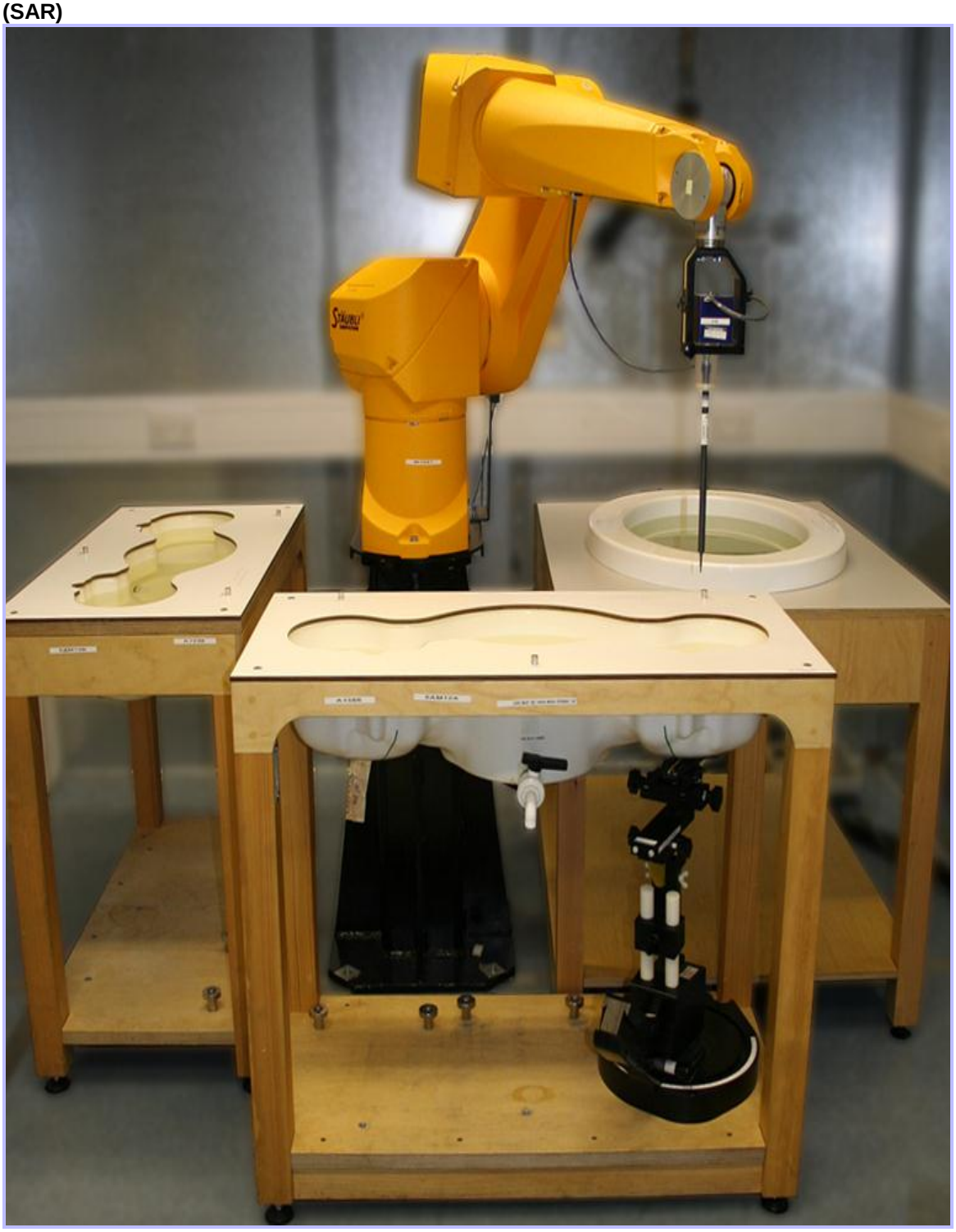
Appendix 4. Photographs

This appendix contains the following photographs:

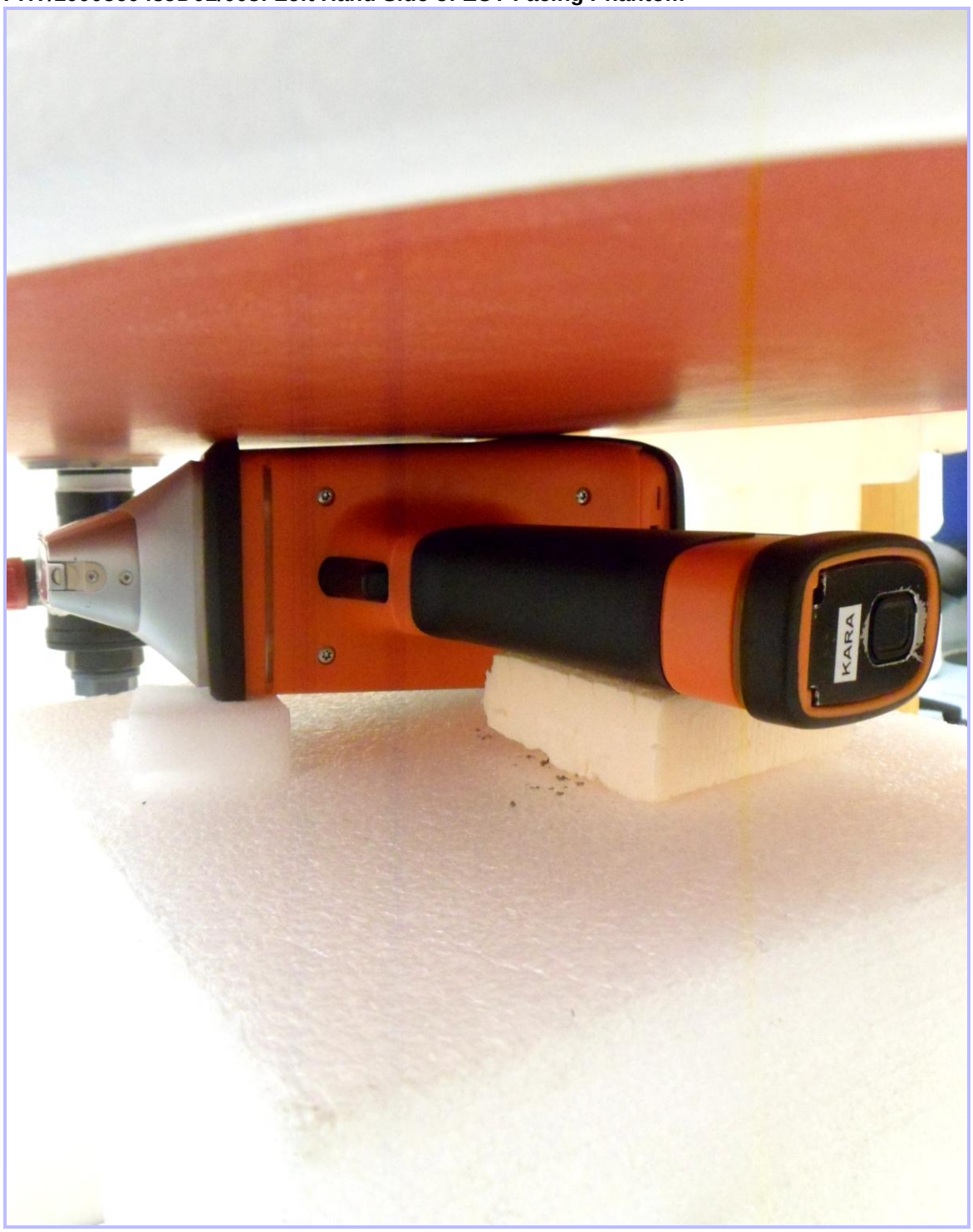
Photo Reference Number	Title
PHT/100056048JD01/001	Test configuration for the measurement of Specific Absorption Rate (SAR)
PHT/100056048JD01/002	Front of the EUT Facing Phantom
PHT/100056048JD01/003	Left Hand Side of EUT Facing Phantom
PHT/100056048JD01/004	Right Hand side of EUT Facing Phantom
PHT/100056048JD01/005	Front View of EUT
PHT/100056048JD01/006	Left Hand Side View of EUT
PHT/100056048JD01/007	Right Hand Side View of EUT
PHT/100056048JD01/008	Internal View of EUT
PHT/100056048JD01/009	Battery View of EUT
PHT/100056048JD01/010	2450MHz Body Fluid Level

PHT/100056048JD01/001: Test configuration for the measurement of Specific Absorption Rate (SAR)



PHT/100056048JD01/002: Front of the EUT Facing Phantom

PHT/100056048JD01/003: Left Hand Side of EUT Facing Phantom



PHT/100056048JD01/004: Right Hand side of EUT Facing Phantom

PHT/100056048JD01/005: Front View of EUT

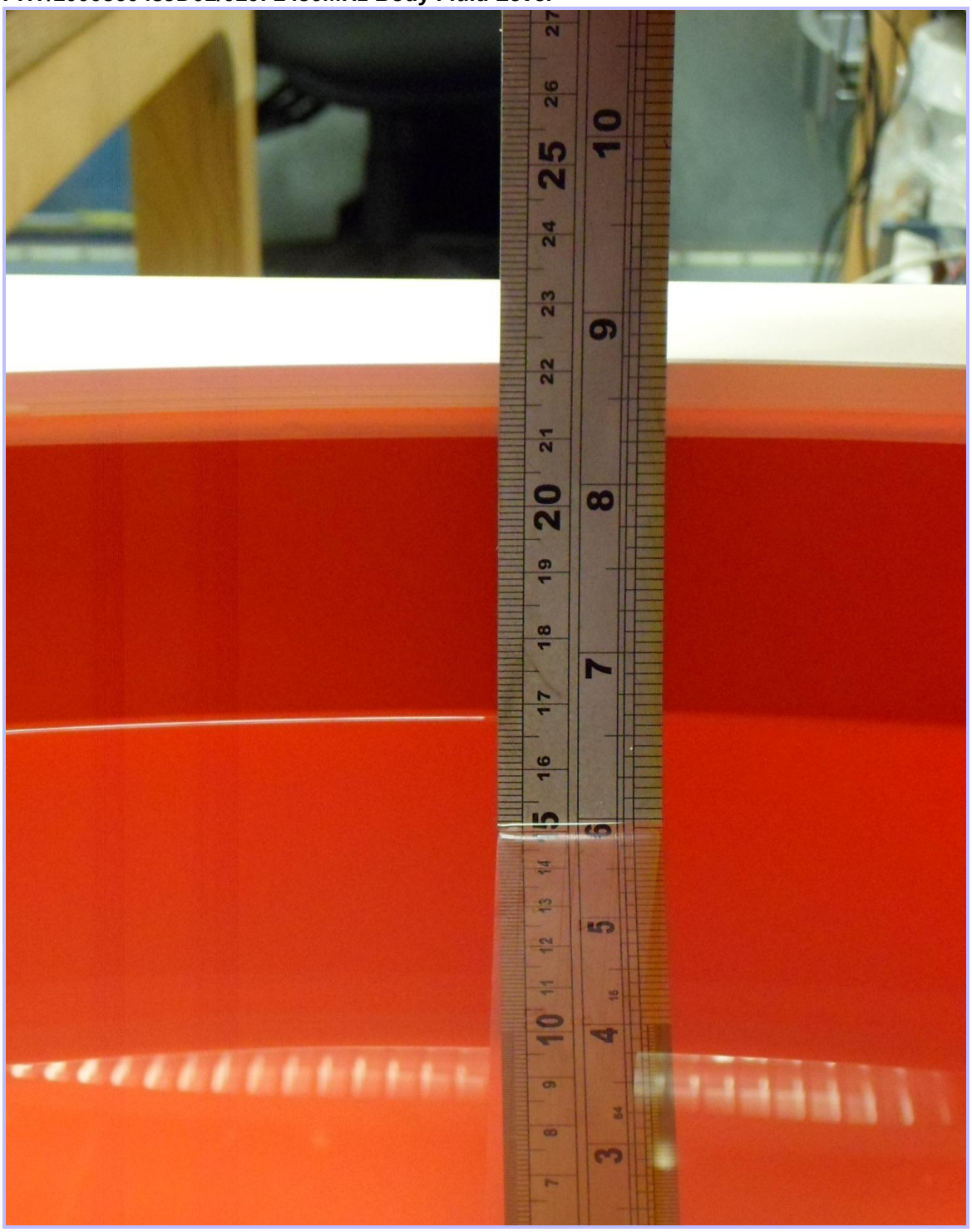
PHT/100056048JD01/006: Left Hand Side View of EUT

PHT/100056048JD01/007: Right Hand Side View of EUT

PHT/100056048JD01/008: Internal View of EUT

PHT/100056048JD01/009: Battery View of EUT

PHT/100056048JD01/010: 2450MHz Body Fluid Level



Appendix 5. System Check

Prior to the assessment, the system was verified in the flat region of the phantom 2450 MHz dipole was used. A forward power of 250 mW was applied to the 2450 MHz dipole and the system was verified to a tolerance of ±5% for the 2450 MHz dipole.

The applicable verification normalised to 1 Watt.

System Check 2450 Body
Date: 18/11/2013
Validation Dipole and Serial Number: D2450V2: SN: 725

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	24.0 ºC	24.0 ºC	ε_r	52.70	51.52	-2.24	5.00
				σ	1.95	2.03	4.28	5.00
				1g SAR	49.90	50.40	1.00	5.00
				10g SAR	23.40	23.20	-0.85	5.00

Date: 20/11/2013
Validation Dipole and Serial Number: D2450V2: SN: 725

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	24.0 ºC	24.0 ºC	ε_r	52.70	50.69	-3.81	5.00
				σ	1.95	2.04	4.84	5.00
				1g SAR	49.90	50.40	1.00	5.00
				10g SAR	23.40	23.36	-0.17	5.00

Appendix 6. Simulated Tissues

The body mixture consists of water, Polysorbate (Tween 20) and salt. Visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

Ingredient (% by weight)	**Frequency 2450/2600 MHz**
	Body
De-Ionized Water	71.70
Polysorbate 20	28.00
Salt	0.30

Appendix 7. DASY4 System Details

A.7.1. DASY4 SAR Measurement System

UL, SAR measurement facility utilises the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, and the SAM phantom containing brain or muscle equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller; teach pendant (Joystick), and remote control. This is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. The data acquisition electronics (DAE) performs signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection etc. The DAE is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilises a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching mulitplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

A.7.2. DASY4 SAR System Specifications

Robot System	
Positioner:	Stäubli Unimation Corp. Robot Model: RX90L
Repeatability:	0.025 mm
No. of Axis:	6
Serial Number:	F01/5J86A1/A/01
Reach:	1185 mm
Payload:	3.5 kg
Control Unit:	CS7
Programming Language:	V+
Data Acquisition Electronic (DAE) System	
Serial Number:	DAE3 SN:432
PC Controller	
PC:	Dell Precision 340
Operating System:	Windows 2000
Data Card:	DASY Measurement Server
Serial Number:	1080
Data Converter	
Features:	Signal Amplifier, multiplexer, A/D converted and control logic.
Software:	DASY Software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock.
PC Interface Card	
Function:	24 bit (64 MHz) DSP for real time processing Link to DAE3 16 nit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.

DASY4 SAR System Specifications (Continued)	
E-Field Probe	
Model:	EX3DV4
Serial No:	3814
Construction:	Triangular core
Frequency:	10 MHz to >6 GHz
Linearity:	±0.2 dB (30 MHz to 6 GHz)
Probe Length (mm):	337
Probe Diameter (mm):	10
Tip Length (mm):	9
Tip Diameter (mm):	2.5
Sensor X Offset (mm):	1
Sensor Y Offset (mm):	1
Sensor Z Offset (mm):	1
Phantom	
Phantom:	Eli Phantom
Shell Material:	Fibreglass
Thickness:	2.0 ±0.1 mm