

3. Measurement and Inspection Methods

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
1. Checking installation site						For the remarks with ☆ mark listed below, related information is available on M506-E345
(1) Measurement of temperature/humidity	Measure the temperature/humidity (for allowable range, refer to the specifications of the instrument to be inspected)	Measure with a thermometer and hygrometer	*	*		
(2) Measurement of power supply voltage	Measure the power supply voltage (single-phase 100-V or single-phase 200-V)	Measure with a voltmeter (RMS) If the value fluctuates over time, enter the amplitude of fluctuation	*	*		
(3) Checking grounding	Check the earth connection	Check the fixing of ground wire	*		@	
2. Checking instrument state						
(1) Instrument exterior appearance	Check whether it is heavily dirtied/damaged	Check the exterior appearance	*	*		
(2) Instrument rating plate	Check whether it is lost or whether it is heavily dirtied/damaged	Check the rating plate	*	*		
(3) Instrument cleaning	Clean it with a cleaner	Clean the instrument with a cleaner	*			
(4) Checking cable connection state	Check the connection of each cable terminal/connector	Check each cable terminal/connector part	*			
(5) Checking cable state	Check each cable state (whether rubbing, twisting, pulling, and others exist or not)	Check each cable (for details refer to the section 3 and later)	*			
(6) Checking state of the area surrounding FPD	Check the connection/state of the FPD box, sensor (FPD), and sensor cables	Check whether the trim or the side cushion of the FPD box are damaged, and if damaged replace them.	*	*	@	Refer to SVHI-E16E022
(7) Checking whether mechanical parts are correctly mounted	Check the mounting state of each mechanical part	For details, refer to the section 3 and later	*	*	@	

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
3. X-ray control						
(1) Radiography circuit operation	Control circuits, operation switches, etc.	Instrument operates normally	*	*		
(2) Starter circuit operation	Control circuits, operation switches, etc.	Instrument operates normally	*	*		
(3) X-ray tube protective circuit operation	Check that instrument operates normally.	Check that instrument operates normally.	*	*		
(4) Tube voltage accuracy and reproducibility	For measurement method, see Supplemental Explanations.	For measurement method, see Supplemental Explanations.	*			
(5) Tube current accuracy and reproducibility	Control circuits, operation switches, etc.	Instrument operates normally	*			
(6) Radiography time accuracy and reproducibility	Control circuits, operation switches, etc.	Instrument operates normally	*			
(7) High-voltage cables and bushings	Check for discharge marks. Check the amount of the grease and condition of the packing.	Check for abnormalities.	*			When the error F14, F17, F18 or F19 is identified.
4. X-ray tube unit						
(1) X-ray tube unit	Oil leaks, noise from rotation	Check for abnormalities.	*	*		
(2) High-voltage cables and bushings	Check for discharge marks. Check the amount of the grease and condition of packing.	Check for abnormalities.	*	*		When the error F14, F17, F18 or F19 is identified.
(3) Low-voltage cables	Check for rubbing, twisting, and pulling.	Check for abnormalities.	*	*		

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
5. Main Body						
(1) Support arm vertical movement	a. Check the operation.	Check for abnormalities.	*	*		
	b. Wire rope damage and attachment.	Check for abnormalities. Replace if damaged. Apply grease.	*	*	@	☆ Refer to ZCHIE-6E0001
	c. Check the brake.	Check for abnormalities.	*			
	d. Check the function of arm up/down position detector ASSY	Check for abnormalities. Roller must rotate in a full stroke	*			DaRt MX8,MX9 Only. Check when D62 error is identified.
(2) Support arm lateral movement	a. Check the operation.	Check for abnormalities.	*	*		
	b. Chain damage and attachment.	Check for abnormalities.	*			
	c. Check the brake.	Check for abnormalities.	*			
	d. Check the tightness of rail and bearing mounting screws.	Check for abnormalities.	*	*	@	
(3) Column rotation	a. Check the operation.	Check for abnormalities.	*	*		
	b. Check the brake.	Check for abnormalities.	*			
	c. Check the tightness of the column mounting screws.	Check for abnormalities. Check also whether the column base is cracked/inclined	*	*	@	
(4) Tube rotation about arm	a. Check the operation.	Check for abnormalities.	*	*		
	b. Check the fixing force.	Check for abnormalities.	*			
	c. Check the tightness of the tube support mounting screws.	Check for abnormalities.	*	*	@	
(5) Tube rotation about tube axis	a. Check the operation.	Check for abnormalities.	*	*		
	b. Check the fixing force.	Check for abnormalities.	*			
	c. Check the tightness of the tube support mounting screws.	Check for abnormalities.	*	*	@	
(6) Arm catch operation	a. Check the arm fixing.	Check for abnormalities.	*	*		
	b. Check the tightness of the arm catch mounting screws.	Check for abnormalities.	*	*	@	
(7) Operation switches and displays	a. Check the switch operation.	Check for abnormalities.	*		@	
	b. Check the contact of terminals and connectors.	Check for abnormalities.	*	*		

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
6 Travel unit						
(1) Travel operation	a. Check the operation (handle).	Check for abnormalities.	*	*	@	
	b. Check the operation (inch-mover switches)	Check for abnormalities.	*	*		
	c. Check the brake.	Check for abnormalities.	*	*	@	
	d. Detector switch operation	Check for abnormalities.	*	*	@	
	e. Emergency stop switch operation	Check for abnormalities.	*	*	@	
	f. Check the tightness of the mounting screws for the travel-wheel and the caster.	Check for abnormalities.	*	*	@	
	g. Check the emergency brake release operation	Check for abnormalities.	*	*	@	
	h. Check the looseness of the driveshaft of the motor.	Check if there is abnormal sound or vibration during driving on the floor. In case that there is abnormality, lift up the wheels from the floor to check the looseness of the driveshaft of the motor. If the wheel plays more than 10 deg. in rotation direction, replace the motor.	*	*	@	
7 Collimator						
(1) Open/close mechanism	a. Check for abnormal noise.	Check for abnormalities.	*			
	b. Wire rope damage and attachment.	Check for abnormalities. Apply grease after inspection.	*			☆
	c. Check the damage and fixing of Front/ Intermediate leaves.	Check for abnormalities.	*			
(2) Dimensions of the effective irradiation field	Check the dimensions.	Check for abnormalities.	*			
(3) Fixing of main unit	Check the tightness of the mounting screws.	Check for abnormalities.	*	*	@	
(4) Rotation mechanism	Check abrasion of the rotary ring and collimator rotation operation.	Check for abnormalities. Apply grease after inspection. If the rotary ring assembly has a gap of 1 mm or more, replace it to the improved type.	*	*	@	Refer to SVHI-11E010 and SVHI-17E036

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
8 Others • Option						
(1) Battery	a. Check the charging operation. b. Residual battery level display	Check for abnormalities.	*			
	a. Check the cassette storage operation. b. Check the mounting.	Check for abnormalities.	*			
(2) Cassette box	a. Check the cord storage operation. b. Check the cable and plug.	Check for abnormalities.	*		@	Art Evolution only
(3) Cord reel	a. Check the communications operation.	Check for abnormalities.	*			
(4) Infrared Remote controller	a. Check the display of area dose.	Check for abnormalities. Readjust if necessary. (Check the accuracy referring to item k./m. of "Supplemental Explanation - Measurement Method".)	*		@	Refer to SVHI-E16E010
(5) Dose Area Product Meter/ Dose Calculation Unit	a. Check the keyless entry function. a. Check the communications operation.	Check for abnormalities.	*			
(6) Keyless entry	a. Check the function. a. Check the function.	Check for abnormalities.	*			
(7) Wireless LAN	a. Check the function.	Check for abnormalities.	*			
(8) External monitor I/F	a. Check the function.	Check for abnormalities.	*			
(9) Barcode reader	a. Check the function.	Check for abnormalities.	*			
(10) Additional/Luminous hand switch	a. Check the function.	Check for abnormalities.	*			
(11) Folding-type Protective Screen	a. Check the damage and opening / folding operation of Protective Screen. b. Check the mounting.	Check for abnormalities and damage. Check for abnormalities.	*			
(12) FPD lock function	a. Check FPD lock function.	Check for abnormalities.	*			MX8, MX9 Version only
(13) Wireless hand switch	a. Check the function. (Radiography operation, lock function) a. Check the handle up/down operation and holding force b. Check the function of the handle height detection switch	Check for abnormalities.	*			MX8, MX9 Version only
(14) Changing the Grip Bar Height	a. Check the function.	Check for abnormalities.	*			MX8, MX9 Version only
(15) IC Card Authentication	a. Check the condition.	Check for abnormalities.	*			DaRt MX8/9 only
(16) Protective Film	a. Check the condition.	Check for abnormalities.	*			DaRt MX8/9 only

9. DR (for MobileDaRt Evolution only)
In case of CXDI wired type of FPD

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(1) Sensor (FPD)	a. Grid attachment function	Check for abnormalities. Confirm grid detection function, too. Must be attached/detached smoothly and locked/released securely	*	*		
	b. Sensor Cable	Check for abnormalities Check also the connection and looseness of the connection connector (only for 55/60 series) No crushing, twisting, and sheath breakage	*	*		
	c. Shock Sensor	Must not become red by detecting a shock	*	*		
	d. Firmware/PLD Code Version	Confirm Firmware/PLD Code Version	*	*		Refer to the CXDI service manual
	e. Confirmation of Sensor IP address	Confirm IP address	*	*		
(2) Power Box	a. Connector	Check for abnormalities Must be securely connected	*	*		
	b. Power switch	Check for abnormalities Must be able to turn the power ON/OFF securely	*	*		
	c. POWER LED	Check for abnormalities Must illuminate by turning the power ON	*	*		
	d. ERROR LED	Check for abnormalities Must illuminate when turning the power ON with the sensor cable connection connector removed	*	*		
(3) Remote switch	a. Remote switch	Check for abnormalities Must be attached/detached smoothly and locked/released securely	*	*		
	b. POWER LED	Check for abnormalities Must illuminate by turning the power ON	*	*		
	c. ERROR LED	Check for abnormalities Must illuminate when turning the power ON with the sensor cable connection connector removed	*	*		
(4) Control PC	a. Connector	Check for abnormalities Must be securely connected	*	*		

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(5) System Connection	a. Starting	Check for abnormalities Must turn the power ON with Power ON of the control PC	*	*		
	b. Booting up of CXDI Software	Check for abnormalities Must start with no error	*	*		
	c. Each status lamps	Check for abnormalities Must appropriately illuminate based on the sensor state	*	*		
	d. Termination	Check for abnormalities Must turn the control PC power OFF when exiting CXDI software	*	*		
	a. Perform FPD calibration	Check for abnormalities	*	*		Refer to the CXDI service manual
(6) Calibration	a. Perform Self Diagnosis.	Check for abnormalities	*	*		
(7) Self Diagnosis	a. Phantom radiography	Check for abnormalities No problems such as artifact, shading, or grid stripe	*	*		
(8) Image quality	a. PING test	Check with the Ping command	*	*		
(9) Network test	a. PC dust	Check for abnormalities	*	*		
(10) PC related	b. Confirmation of Event Viewer	Check for abnormalities No error in event log and application log	*	*		
	c. Confirmation of System LOG and CPU3 LOG	Check for abnormalities No error	*	*		
	d. Touch panel	Check for abnormalities No problems such as shifting	*	*		
	e. Date, time	Confirm that date and time is correct.	*	*		
	f. CXDI Software Version	Confirm CXDI Software Version	*	*		
	g. Back up of CCR Folder	Store in the external media.	*	*		
			*	*		

Caution: This is a mobile system, so please **tighten all the screws that can be checked.**

9. DR (for MobileDaRt Evolution only)
In case of CXDI wireless type of FPD

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(1) Wireless environment	a. Interference with other radio wave (external wave)	Check for abnormalities Wireless communication must be possible	*	*		
	b. Operation/settings of the Access point	Check for abnormalities Confirmation of channel setting Check with the Ping command	*	*		
(2) Battery	a. Battery charging function	Check for abnormalities Charging must be possible	*	*		
	a. Battery attachment	Check for abnormalities Locking/releasing must be possible	*	*		
(3) Sensor (FPD)	b. Sensor LED (blue, green, blue-green)	Check for abnormalities Blue lamp must illuminate by turning the power ON	*	*		
	c. Confirmation of Firmware/FPGA Version	Confirm Firmware/FPGA Version	*	*		
	d. Confirmation of Sensor IP address	Confirm Sensor IP address (Wireless / Wired) For wired communication, confirm the address only when wiring option is being used	*	*		Refer to the CXDI service manual
(4) Sensor recognition	a. Infrared communication	Check for abnormalities Sensor must be successfully recognized	*	*		
(5) Calibration	a. Perform FPD calibration	Check for abnormalities Sensor must be successfully recognized	*	*		
(6) Self Diagnosis	a. Perform Self Diagnosis	Check for abnormalities Must pass all items	*	*		
(7) Performance Test	a. Perform Performance Test	Check for abnormalities Must pass the test	*	*		
(8) System connection condition	a. Image Capture Computer	Check for abnormalities Power must be successfully turned ON/OFF	*	*		
	a. Each connectors	Check for abnormalities Must be securely connected	*	*		
(9) X-ray I/F Box (Multi Box)	b. Earth cable	Check for abnormalities Must be securely connected	*	*		
	c. Power cable, adapter	Check for abnormalities No cable disconnection or connector breakage	*	*		
	d. POWER LED	Check for abnormalities Must illuminate	*	*		
	e. Confirmation of IP address	Check for abnormalities	*	*		

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(10) Wiring unit (Option)	a. Each connector	Check for abnormalities Must be securely connected	*	*		
	b. POWER LED	Check for abnormalities Must illuminate	*	*		
	c. Status Indicator	Check for abnormalities LED must appropriately illuminate based on the operation state	*	*		
	d. Sensor cable	Check for abnormalities Must be securely connected	*	*		
(11) Image quality	a. Phantom radiography	Check for abnormalities No problems such as artifact, shading, or grid stripe	*	*		
(12) PC related	a. Data storage	Collect by using Collection Tool	*	*		
	b. Date, time	Confirm that date and time is correct.	*	*		
	c. CXDI Software Version	Confirm CXDI Software Version	*	*		
	d. Residual battery level display	Check for the residual battery level display on the GUI	*	*		
(13) FPD docking mechanism	a FPD battery charge with FPD docking mechanism	Check that the FPD can be charged	*	*		MX8c with this mechanism only
	b Status check	Check mechanism for damage	*	*		MX8c with this mechanism only

Caution: This is a mobile system, so please **tighten all the screws that can be checked.**

9. DR (for MobileDaRt Evolution only)
In case of DR-ID wireless type of FPD

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(1) Wireless environment	a. Interference with other radio wave (external wave)	Check for abnormalities Wireless communication must be possible	*	*		
	b. Operation/settings of the Access point	Check for abnormalities Confirmation of channel setting Check with the Ping command	*	*		
(2) Battery	a. Battery charging function	Check for abnormalities Charging must be possible	*	*		
	a. Battery attachment	Check for abnormalities Locking/releasing must be possible	*	*		
(3) Sensor (FPD)	b. Sensor LED (green, green, orange)	Check for abnormalities Green lamp must illuminate by power ON	*	*		
	c. Confirm Firmware/FPGA Version	Confirm Firmware/FPGA Version	*	*		
	d. Confirmation of Sensor IP address	Confirm Sensor IP address (Wireless, Wired) For wired communication, confirm the address only when wiring option is being used	*	*		Refer to the DR-ID service manual
(4) Calibration	a. Perform calibration	Check for abnormalities	*	*		
(5) System Connection Condition	a. Image Capture Computer	Check for abnormalities Power must be successfully turned ON/OFF	*	*		
	b. Booting up of DR-ID Control Software	Check for abnormalities Must start with no error	*	*		
(6) DR-ID800IU	a. Each connector	Check for abnormalities Must be securely connected	*	*		
	b. Earth cable	Check for abnormalities Must be securely connected	*	*		
	c. Power cable, adaptor	Check for abnormalities No cable disconnection or connector breakage	*	*		
	d. POWER LED	Check for abnormalities Must illuminate	*	*		
	e. Confirmation of IP address	Check for abnormalities	*	*		

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(7) SE Cable 7.5MT (Option)	a. Each connector	Check for abnormalities Must be securely connected	*	*		
	b. Sensor cable	Check for abnormalities Must be securely connected	*	*		
(8) Image quality	a. Phantom radiography	Check for abnormalities No problems such as artifact, shading, or grid stripe	*	*		
(9) PC related	a. Data storage	Collect by using Collection Tool	*	*		
	b. Date, time	Confirm that date and time is correct.	*	*		
	c. DR-ID Software Version	Confirm DR-ID Software Version	*	*		
	d. Residual battery level display	Check for the residual battery level display on the GUI	*	*		

Caution: This is a mobile system, so please **tighten all the screws that can be checked.**

9. DR (for MobileDaRt Evolution only)
In case of AeroDR wireless type of FPD

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(1) Wireless environment	a. Interference with other radio wave (external wave)	Check for abnormalities Wireless communication must be possible	*	*		
	b. Operation/settings of the access point	Check for abnormalities Confirmation of channel setting Check with the Ping command	*	*		
(2) Battery	a. Battery charging function	Check for abnormalities Charging must be possible	*	*		
(3) Sensor (FPD)	a. Sensor LED (green, green, orange)	Check for abnormalities Green lamp must illuminate by turning the power ON	*	*		
	b. Confirmation of Sensor IP address	Confirm Sensor IP address (Wireless, Wired) For wired communication, confirm the address only when wiring option is being used	*	*		
(4) Calibration	a. Perform FPD calibration.	Check for abnormalities Refer to the service manual	*	*		
(5) System connection condition	a. Image Capture Computer	Check for abnormalities Power must be successfully turned ON/OFF	*	*		
	b. Booting up of DR-200m(for MX8i)/CS-7 (for MX8k) Software	Check for abnormalities Must start with no error	*	*		

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(6) RF Unit2	a. Each connector	Check for abnormalities Must be securely connected	*	*		
	b. Earth cable	Check for abnormalities Must be securely connected	*	*		
	c. Power cable, adaptor	Check for abnormalities No cable disconnection or connector breakage	*	*		
	d. POWER LED	Check for abnormalities Must illuminate	*	*		
	e. Confirmation of IP address	Check for abnormalities	*	*		
(7) I/F Cable2 2M	a. Each connector	Check for abnormalities Must be securely connected	*	*		
	b. Sensor cable	Check for abnormalities Must be securely connected	*	*		
(8) Image quality	a. Phantom radiography	Check for abnormalities No problems such as artifact, shading, or grid stripe	*	*		
	a. Data storage	Collect by using Collection Tool	*	*		
(9) PC related	b. Date, time	Confirm that date and time is correct.	*	*		
	c. Version of DR-200m(for MX7i/8i) /CS-7 (for MX8k)	Confirm DR-200m/CS-7 Software Version.	*	*		
	d. Residual battery level display	Check for the residual battery level display on the GUI	*	*		
	a. Check remote desktop connection function	Check for abnormalities	*	*		MX7i/8i only
(10) Remote Desktop Option	a FPD battery charge with FPD docking mechanism	Check that the FPD can be charged	*	*		MX8k with this mechanism only
	b Status check	Check mechanism for damage	*	*		MX8k with this mechanism only

Caution: This is a mobile system, so please **tighten all the screws that can be checked.**

9. DR (for MobileDaRt Evolution only)
In case of VVIX type of FPD(Vieworks)

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(1) Wireless environment	a. Interference with other radio wave (external wave)	Check for abnormalities Wireless communication must be possible	*	*		
	b. Operation/settings of the access point	Check for abnormalities Confirmation of channel setting Check with the Ping command	*	*		
(2) Battery	a. Battery charging function	Check for abnormalities Charging must be possible	*	*		
(3) Sensor (FPD)	a. Sensor LED (green, green, orange)	Check for abnormalities Green lamp must illuminate by turning the power ON	*	*		
	b. Confirmation of Sensor IP address	Confirm Sensor IP address (Wireless, Wired) For wired communication, confirm the address only when wiring option is being used	*	*		
(4) Calibration	a. Perform FPD calibration.	Check for abnormalities Refer to the service manual	*	*		
(5) System connection condition	a. Image Capture Computer	Check for abnormalities Power must be successfully turned ON/OFF	*	*		
	b. Booting up of Vxvue Software	Check for abnormalities Must start with no error	*	*		

Inspection Item	Inspection Details	Measurement and Inspection Methods	Inspection timing (period)		Safety	Remarks
			1	2		
(6) Image quality	a. Phantom radiography	Check for abnormalities No problems such as artifact, shading, or grid stripe	*	*		
(7) PC related	a. Data storage	Collect by using Collection Tool	*	*		
	b. Date, time	Confirm that date and time is correct.	*	*		
	c. Version of Vxvue Software	Confirm Vxvue Software Version.	*	*		
	d. Residual battery level display	Check for the residual battery level display on the GUI	*	*		
	e. DICOM Storage	Check DICOM Storage	*	*		
	f. DICOM MWL	Check DICOM MWL	*	*		
(8) FPD docking mechanism	a. FPD battery charge with FPD docking mechanism	Check that the FPD can be charged	*	*		MX8v with this mechanism only
	b. Status check	Check mechanism for damage	*	*		MX8v with this mechanism only

Caution: This is a mobile system, so please **tighten all the screws that can be checked.**