

X-ray Flat Panel Detector

SFD-1717AF







Operation Manual

Read the instruction manual thoroughly before you use the product.
Keep this instruction manual for future reference.

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About the symbols appearing in this operation manual

Throughout the text in this manual, warnings and other information essential when using this unit, such as cautionary or prohibited items, appear classified as per the following:

Declare	Description
 DANGER	States a direct danger that may cause death or serious injury if it is not avoided.
 WARNING	States an indirect or potential danger that may cause death or serious injury if it is not avoided.
 CAUTION	States a danger that may cause slight or medium injury or may cause damage in equipment or fire if it is not avoided.
 NOTE	States the information which helps to use the system correctly.
	Indicates information for better performance of the product.
	States reference information.

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Operating Precautions

Please observe the following "Operating Precautions (for Both the Safety and the Prevention of Danger) in the Use of Electric Medical Equipment" below.)

"Operating Precautions (for Both the Safety and the Prevention of Danger) in the Use of Electric Medical Equipment"

1. Only an experienced technician should operate the equipment.
2. When installing the equipment, pay attention to the following items:
 - (1) Do not install it near water faucet or similar equipment.
 - (2) Install it away from potential sources of problems such as abnormal pressure, temperature or humidity, drafts, direct sunlight, dust, chlorine or sulfur gas.
 - (3) During transportation and operation of the equipment, avoid tilting, vibration and sharp impact against it.
 - (4) Keep the equipment away from the areas where chemicals or gases are stored.
 - (5) Use only the correct electrical power source with matching frequency, voltage and current (or wattage).
 - (6) Check the condition of the battery power source (power and polarity) before operating the equipment.
 - (7) Properly ground the equipment.
3. Before operating the equipment, pay attention to the following items:
 - (1) Check the conditions of switch contacts, polarity, dial settings, and meters, and make sure the equipment performs correctly.
 - (2) Confirm that the ground is connected properly.
 - (3) Check all wiring for proper and correct connections.
 - (4) Pay attention when using more than one unit at a time as this may lead to an incorrect diagnosis and cause danger.
 - (5) Check the condition of the external electric circuit, which will be directly connected to a patient.
 - (6) Check the condition of the battery power source.
4. While operating the equipment, pay attention to the following items:
 - (1) Do not over-exceed time or the amount of equipment use needed for diagnosis or therapy.
 - (2) Observe the equipment and patient continuously for early detection

of problems.

- (3) When a problem is detected with the equipment or patient, take proper action to stop the equipment without harming the patient.
- (4) Do not let the equipment touch the patient.

5. After operating the equipment, pay attention to the following items:

- (1) Turn off the switches and return the dial to their original before use in the prescribed order. Then, turn off the main power switch.
- (2) Do not pull the power cable forcibly from the outlet.
- (3) When storing the equipment, pay attention to the following factors:
 - (i) Keep it away from the water.
 - (ii) Store it away from the potential causes of problems such as abnormal pressure, temperature or humidity, draft, direct sunlight, dust, chlorine or sulfur gas.
 - (iii) During transportation and storage of the equipment, avoid tilting, vibration and sharp impact against it.
 - (iv) Store the equipment away from areas where chemicals and gases are stored.
- (4) Clean all attachments, cables and contacts, and store them in one place.
- (5) Keep the equipment clean to avoid problems during the next use.

6. When the equipment is found to be out of order, do not try to repair it.

Display an appropriate sign to indicate that the equipment is out of order, and call a certified repair technician for repair.

7. Do not modify any part of the equipment.

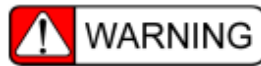
8. Preventive maintenance

- (1) The equipment and its parts should be periodically checked.
- (2) If the equipment has not been in operation for an extended period of time, test it prior to actual operation to make sure it works correctly and safely.

9. Concerning other items, operate properly according to the operating manual

Precautions in Use

When using this equipment, please observe the following precautions for the safety of the operator and patient.



The medical equipment is restricted to only be used and managed by, or on the order of, a diagnostic radiology technician or a person with a certificate indicating equal proficiency.

Repair and inspection for the inside of the equipment is dangerous. Be sure to contact your Shimadzu Service Representative for repair and inspection.



Do NOT modify the equipment.

In general, almost all modifications are strictly prohibited by the Regulatory requirements of the country where the equipment is installed.

Contact your Shimadzu Service Representative if any modification is necessary.

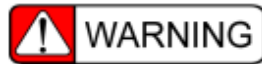


Perform periodical maintenance.

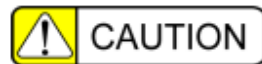
Preventive maintenance is required to maintain system safety and performance over a long period of time.

This manual gives detailed description of occasional/periodic maintenance and inspection that the user should perform.

Concerning the maintenance and inspection that specially trained specialists can exclusively perform, utilize the maintenance agreement offered by our company.



Do not allow operation of this apparatus by any person other than qualified personnel (physicians, radiotherapy engineers and clinical X-ray engineers) or under observation by them.



If the operator has no experience in operating the equipment, be sure that he or she receives instruction on how to operate it from our engineers or someone who has enough experience to use the equipment.

In order to operate the equipment safely, an explanation of the operation needs to be lectured. When installing the equipment, our engineers explain the operating procedure. Follow their directions and operate the equipment correctly.

Shimadzu Limited Product Warranty

The system is warranted to be free from defects in material and workmanship for one year from the date of delivery. If found to be defective, the system must be offered to Shimadzu for inspection and examination. Upon examination, Shimadzu, at its sole option, will repair or replace at no charge, the system or any part found to be defective. Components which wear are not warranted.

This warranty extends to original purchaser or the lessee of the new system only. If the system is to be resold or delivered to a third party, such third party must be provided with a copy of this manual, the installation manual and the technical manual supplied with the system.

This warranty does not apply to the following:

1. Failure or damage due to any installation, relocation, or service not provided by the SHIMADZU service representative or a SHIMADZU designated contractor.
2. Failure or damage caused by the product of other companies (except those purchased from SHIMADZU).
3. Failure or damage due to repairs using non-SHIMADZU certified service parts.
4. Failure or damage due to non-compliance with the notices and procedures set forth in this manual.
5. Failure or damage due to any operating environment deviating from the requirements set forth in this manual.
6. Failure or damage due to natural disasters such as power surge, rain, fire, earthquake, flood, and thunder.

Service after the expiration of the warranty is available at a reasonable cost and should be performed by the SHIMADZU service representative.

IN NO EVENT SHALL SHIMADZU AND ITS AFFILIATED ENTITIES BE LIABLE TO ANY PERSON OR ENTITY FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, ANY DAMAGES RESULTING FROM LOSS OF USE, BUSINESS INTERRUPTION, LOSS OF PROFITS, LOSS OF SAVINGS, THE COST OF PROCUREMENT OF SUBSTITUTED GOODS, SERVICES OR TECHNOLOGIES OR FOR ANY MATTER ARISING OUT OF OR IN CONNECTION WITH THE USE OR INABILITY TO USE THE SYSTEM.

In some jurisdictions, some of the foregoing warranty disclaimers or damage limitations may not apply.

Shimadzu will be indemnified for any claim, liability, or damage arising out of the misuse or non-compliance with this manual by the purchaser or lessee of the system.

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Revision History

Rev.	Date	Comment
–	Jan. 15, 2013	Create first edition.
A	Feb. 4, 2015	Add Chapter 6 Adaptability for Standard
B	2018-11-02	Change standards in the Chapter 6

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1. Introduction

This book is the SFD-1717 AF system operation manual.

2. Outline

The SFD-1717 AF system consists of the FPD (Receptor) and the CP (Command processor) for reading data.

The FPD (receptor) has the CsI scintillator for converting X-rays into light, and then the light is converted into charge by the photodiode.

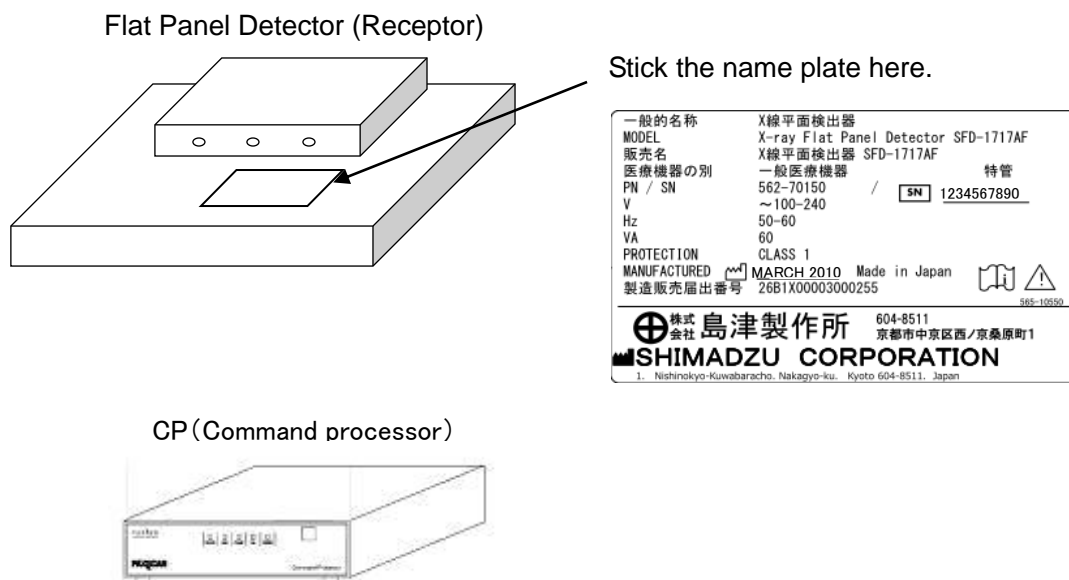
The charge is accumulated in the condenser of the pixels arrayed in the two dimensional format. Pixels will be selected with the TFT switch and charge quantity of the condenser is read as a pixel signal. The read pixel signal is sent to the CP (command processor) through the optical fiber.

3. Specification

Item		Content
Fluorescent screen		CsI
Pixel area		427 mm (V) X 427 mm (H)
Pixel array		3072 (V) X 3072 (H)
Pixel effective area		421.5 mm (V) X 421.5 mm (H)
Active pixel array		3032 (V) X 3032 (H)
Pixel pitch		139 μ m
MTF		50% or more (@1.0 lp/mm)
DQE		65% or more (@DQE (0))
Energy width		40-150kVp
A/D conversion		16bit
Usage	Ambient temperature	+ 10 °C - 30 °C
Environment	Ambient humidity	10% - 90% Non condensing
Storage	Ambient temperature	-20 °C - +70 °C
environment	Ambient humidity	10% - 90% Non condensing
Rated supply voltage		AC, single phase 100-240V
Rated supply frequency		50-60 Hz
Power supply input		35W
Outside dimension (Receptor)		470 X470 X 59.1 (mm)
Outside dimension (Command processor)		280 X260 X 70 (mm)

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4. Components and Name Plate Sticking Position



5. Precaution for Use

- (1) Use under the "Usage Environment" in the Specification.
- (2) Perform the Gain Calibration at least once every three months.
- (3) For information not found here, refer to the instruction manual of the system in which this product is incorporated.
- (4) In the event of failure, contact your Shimadzu representative.

6. Adaptability for Standard

This equipment complies with all of the following safety agency standards and be appropriately labeled.

- ANSI/AAMI ES60601-1:2005 /(R)2012 and A1:2012, C1:2009/(R)2012 and A2:2010/(R)2012
- CAN/CSA C22.2 NO 60601-1-14:2014
- IEC 60601-1:2005 + A1:2012

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