Digital Angiography System

BRANSIST *safire*

VB9 Slender

SHIMADZU

Solutions for Science
since 1875

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External Dimensions (Unit:mm)
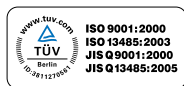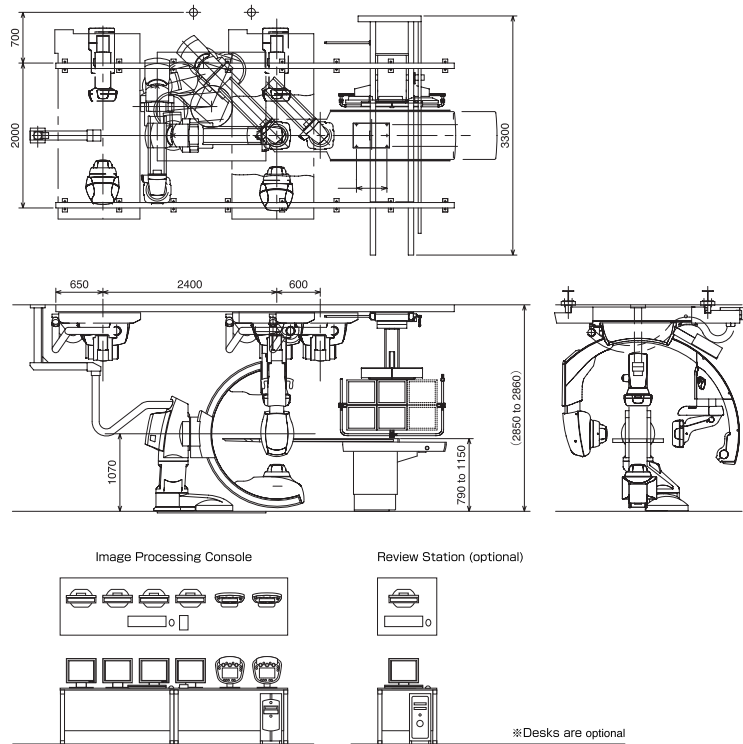
Image Processing Console

Review Station (optional)

※Desks are optional

ISO 9001:2000
ISO 13485:2003
JIS Q 9001:2000
JIS Q 13485:2005

TÜV
Berlin
ID 9811270061
www.tuv.com

Shimadzu Corporation Medical Systems Group has been certified by TÜV Rheinland as a manufacturer of medical equipment and systems in compliance with ISO9001:2000 Quality Management Systems and ISO13485:2003 Medical Equipment Quality Management Systems.

Remarks;
※Every value in this catalogue is a standard value, and it may vary a little from the actual at each site.
※The appearances and specifications are subject to change for reasons of improvement without notice.
※Certain configurations may not be available pending regulatory clearance. Contact your Shimadzu representative for information on specific configurations.
※Before operating this system, you should first throughly review the Instruction Manual.

SHIMADZU

Introducing a new, advanced bi-plane system
that delivers ultra-high image quality
thanks to direct-conversion
flat panel detectors (FPDs)
and an intervention-optimized design

Digital Angiography System

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Direct Conversion Provides Outstanding Image Sharpness

Fast, Easy, and Precise Positioning

Leading-Edge 3D Application Provides a Valuable IVR Tool

Carefully Designed Technology to Help Reduce Exposure Levels to Patients and Medical Staff

System Design Improves Workflow Efficiency

State-of-the-Art Digital Technology Ensures Faster Response

Shimadzu, a pioneer in angiography systems using direct-conversion FPDs, has developed a bi-plane system that produces even higher quality images and ensures interventional procedures are safe and smooth.
The ultra-high-definition images provided by safire's direct conversion technology are outstanding for rendering fine blood vessels in the head, as well as showing clearly all guide wires, microcatheters, coils, and other sensitive devices.
And installation of our new image processor SUREengine has made it possible to improve image quality even further.
Perform advanced-level treatments (interventions) using slender C-arms that, together with this system's ultra-compact design, ensure easy positioning during bi-plane operation, together with a multiprocessor-equipped digital system for fast response.
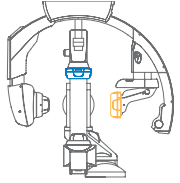
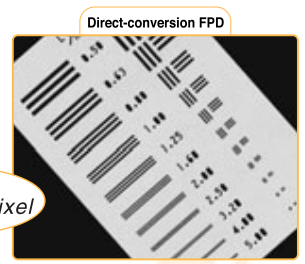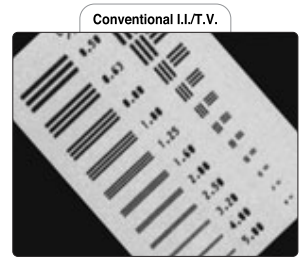# *Direct Conversion Provides Outstanding Image Sharpness*

Based on a concept completely different from conventional detectors, Shimadzu's development of a unique direct-conversion FPD has produced a dramatic step forward in image rendering capability. Now with SUREengine, our next-generation high-speed real-time image processor, Shimadzu has further increased the visibility of devices such as wires and stents as well as blood vessels, providing optimal images for interventional procedures.

Ultra-High-Definition Real-Time DSA

A direct-conversion FPD makes ultra-high-definition real-time DSA possible and can be applied not only to intervention procedures in head regions, but the entire body as well, including the chest and extremities.

1024² matrix

12 bit

Advanced Real-Time Image Processor SUREengine Further Improves Visibility (optional)

Compared to images produced by other angiography systems, BRANSIST safire's direct-conversion FPD delivers the highest quality.
SUREengine, our real-time image processor designed specifically to enhance image quality, performs real-time contrast enhancement and noise reduction on the respective frequency bands of fluoroscopic and radiographic images, ensuring improved visibility of intervention devices and blood vessels.
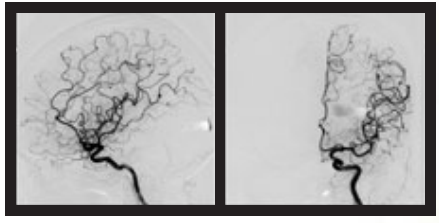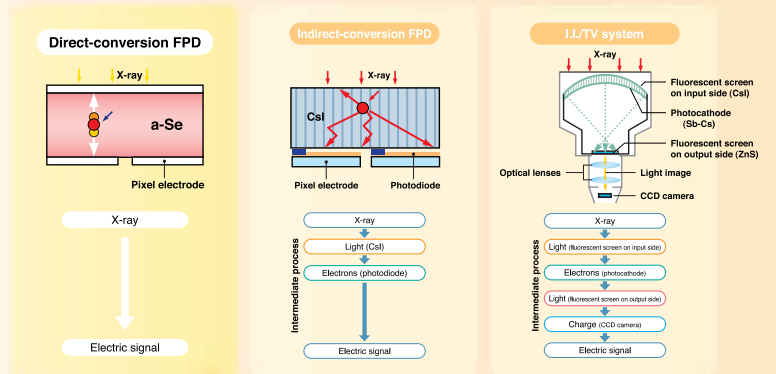
Superior Sharpness

To render micro-vessels and devices clearly, the design of this system's direct-conversion FPD uses extremely small pixels of just 150 µm.
BRANSIST safire's clear rendering of micro-vessels and sensitive devices used for interventional procedures provides a powerful tool for examinations and treatments.

Conventional I.I./T.V.

Direct-conversion FPD

150 µm/pixel

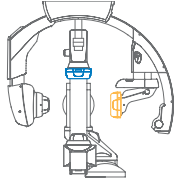## Equipped with a Next-Generation X-Ray Detector to Create the Ideal Imaging Chain

Direct-conversion detection, which converts X-rays directly to electrical signals, eliminates the blurring that results from the scattered light generated in conventional imaging processes, realizing "pure digital imaging".
It also features the smallest pixel size in its class – 150 µm – to provide fluoroscopy/radiography images with exceptional visibility.

Direct-conversion FPD

X-ray → a-Se → Pixel electrode

X-ray → Electric signal

Intermediate process

Indirect-conversion FPD

X-ray → CsI → Pixel electrode / Photodiode

X-ray → Light (CsI) → Electrons (photodiode) → Electric signal

Intermediate process

I.I./TV system

X-ray
- Fluorescent screen on input side (CsI)
- Photocathode (Sb-Cs)
- Fluorescent screen on output side (ZnS)

Optical lenses / Light image / CCD camera

X-ray → Light (fluorescent screen on input side) → Electrons (photocathode) → Light (fluorescent screen on output side) → Charge (CCD camera) → Electric signal
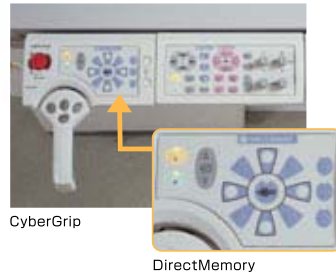
Intermediate process

Fast, Easy, and Precise Positioning

Intervention Support

Compared to single-plane systems, bi-plane system C-arm positioning and entry of settings are more complicated. However, BRANSIST safire is equipped with proprietary features such as CyberChase, CyberGrip, DirectMemory, and TriplePivot, which ensure fast C-arm positioning.

Utilize a Wide Coverage Range and Efficient Workspace

Six axes for C-arm and C-arm base movement ensure stable C-arm rotation, a wide coverage range and an efficient workspace.
In particular, the C-arm base's triple-pivot design allows free arm setting, while our Hand Access feature is especially effective for transradial and brachial catheterizations.
Additionally, the Multi Position setting provides a large amount of open space near the head, ensuring patient approaches and equipment handling are easy, even during bi-plane system operation.

The six rotational axes

Hand Access

Transverse Coverage 140 cm

Home Position — Pivot Turn — Multi Position

Pivot Turn — Peripheral Position — Pivot Turn

Longitudinal Coverage 190 cm

Versatile, One-Hand Control of the C-Arm via CyberGrip

The CyberGrip one-hand controller allows the X-ray technologists to move the high-speed C-arm freely.
This controller is equipped with a grip-type handle that provides intuitive operation so that the C-arm, table, and FPD can all be moved without changing your grip.
This frees X-ray technologists to concentrate on the actual procedures, without having to worry about the position of their hand.
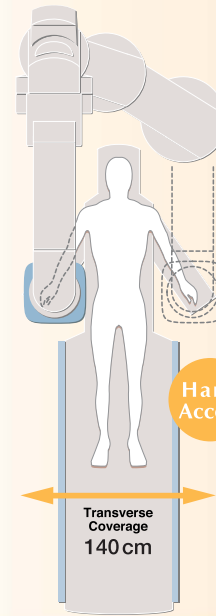
CyberGrip

DirectMemory

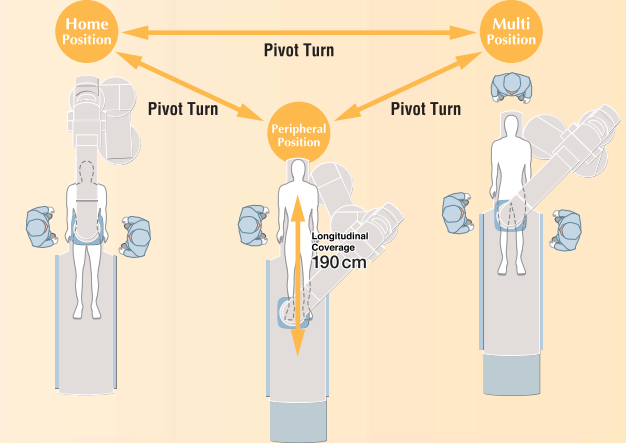## New Concept Auto Positioning [DirectMemory]

The new DirectMemory unit intuitively calls up C-arm clinical angles for a patient and allows rapid repositioning.
DirectMemory provides powerful support for smooth, stress-free diagnostic catheterization and interventional procedures.

High-Speed C-Arms Ensure Quick Examinations

The C-arms are capable of single-plane positioning at 25°/s (frontal arm) and bi-plane positioning at 15°/s.
You can also quickly switch between single-plane motion and bi-plane motion.

Bi-plane
High-speed positioning at
15°/s
Bi-plane

High-speed switching

High-speed single-plane positioning at
25°/s
Single plane
Single plane
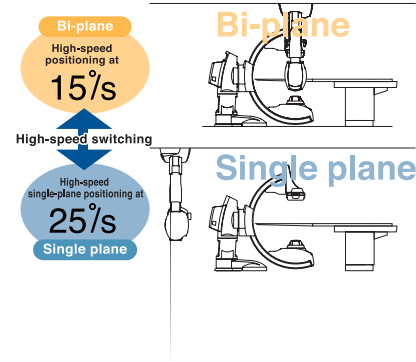
CyberChase Automatically Tracks the Area of Interest

The imaging chain for the lateral C-arm moves vertically up to 17.5 cm, allowing you to quickly adjust the bi-plane position to a new area of interest, without changing table height.
Even if the C-arm angle is changed, CyberChase automatically tracks the area of interest and allows even complicated C-arm positioning to be performed quickly and accurately.

17.5 cm
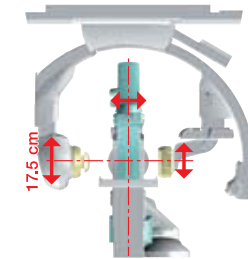
Leading-Edge 3D Application Provides a Valuable IVR Tool

BRANSIST safire includes state-of-the-art 3D imaging software, effective for complicated interventions that require super-selective catheterization and wide-ranging therapy.
Thanks to this, you can perform high-level medical procedures reliably, safely, and efficiently.

3D Angiography
Safire 3D-A (optional)

The combination of ultrahigh-definition rotational DA and DSA images obtained via direct-conversion FPDs and a state-of-the-art 3D reconstruction workstation (NaviDAS+ 3D-Recon) equipped with a wide range of functions ensure that this option produces superior diagnostic images. Additionally, our Max Scan function quickly rotates the C-arm at 60º/second, shortening the time required for large-range radiography. This in turn reduces injection time and usage volume of contrast medium, helping to lower patient stress.

Neuro (Safire 3D-A)　　　Carotid (Safire 3D-A)
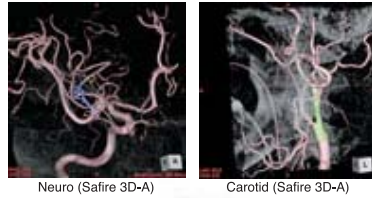
New Standard-Equipment Motion-Tolerant RSM-DSA System

Based on Shimadzu high-speed digital image processing technology, this new RSM-DSA system provides extremely motion-tolerant DSA without requiring a mask run, by subtracting digital frequency processed mask images from live images.
This makes Shimadzu's RSM-DSA especially effective when performing contrast examinations on patients who have difficulty holding their breath, and for 3D contrast examinations that combine bolus chase examinations of lower limbs with precession, pendular, or other C-arm movements.

Pendulum mode

Precession mode
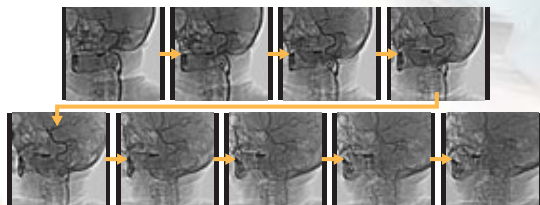
Composite image using RSM-DSA (chasing) mode during a single injection of contrast medium

Examine multiple views from a single injection of contrast medium
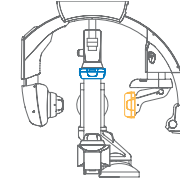
Carefully Designed Technology to Help Reduce Exposure Levels to Patients and Medical Staff

With treatments involving intervention procedures on the increase, exposure levels to physicians, X-ray technologists and patients cannot be ignored.
The BRANSIST safire system does not rely merely on its high-performance direct-conversion FPD to determine a trade-off between low exposure and high image quality, but rather accomplishes a balance using the entire system.
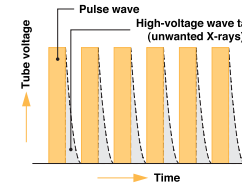
Built-In MBH Filter Excludes Soft X-Rays

BRANSIST safire has MBH (Multi Beam Hardening) filters built into the front end of the X-ray tube.
Automatically select the optimum filter for examination or operation and to exclude soft X-rays that do not contribute to the image.
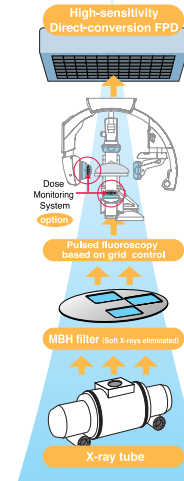
X-ray　　　MBH filter
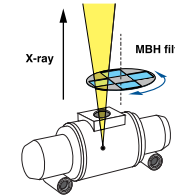
Wave-Tail Elimination via Grid Control

The X-ray generator uses grid control to enable the ideal form of wave-tail elimination. In low-dose pulsed fluoroscopy mode, accurately eliminating X-rays corresponding to wave tails helps reduce exposure even further.
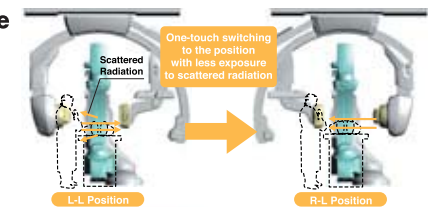
Tube voltage

Pulse wave

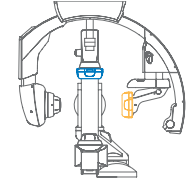High-voltage wave tail (unwanted X-rays)

Time

Reducing the Operator's X-Ray Exposure LL↔RL Positioning

One touch of a button is all that is needed to position the lateral arm's X-ray tube on the opposite side of the physician (R-L position) so as to minimize the scattered radiation.
"It meets ICRP* Pub.85" *ICRP:International Commission on Radiological Protection.

Overall Reduction in Exposure

High-sensitivity Direct-conversion FPD

Dose Monitoring System
option

Pulsed fluoroscopy based on grid control

MBH filter (Soft X-rays eliminated)

X-ray tube

Scattered Radiation

One-touch switching to the position with less exposure to scattered radiation

L-L Position　　　R-L Position

System Design Improves Workflow Efficiency

*Equipped with state-of-the-art digital technology
and a parallel microprocessor, BRANSIST safire
systems can simultaneously process fluoroscopy
and radiography images.
Together with a large-capacity tube and larger image
storage capacity, this facilitates a more efficient workflow.*

Equipped with High-Capacity Liquid-Bearing X-Ray Tube

A 3.0-MHU, high-capacity, liquid-bearing X-ray tube
(LX-3081) is a standard feature, provides a quiet
examination room and eliminates the need for cooling
time between repeated examinations.
This allows efficient operation at facilities performing large
numbers of examinations.

Multiprocessor for Parallel Processing

The system includes a multiprocessor capable
of processing image data, such as archiving images,
sending images via a network, or processing or measuring
images, even while collecting radiographic
or fluoroscopic images.

High-Speed Image Acquisition

BRANSIST safire can acquire images during bi-plane
operation at up to 30 fps using alternating exposures.

Seamless Interface with DICOM Network

BRANSIST safire provides flexible handling of image
networking processes (DICOM storage, storage commitment,
Query/Retrieve services) and HIS management
(optional DICOM MWM service), making it possible
to interface seamlessly with the facility network.

Seamless Network Interface

Storage
Storage Commitment
Query/Retrieve

Image Server

MWM

Worklist Server

Print

Laser Imager
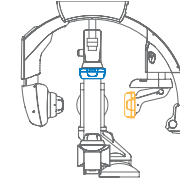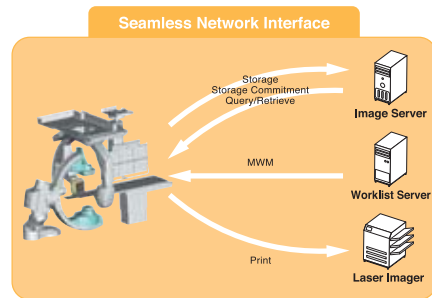
# State-of-the-Art Digital Technology Ensures Faster Response

*The speed at which X-ray technologists can display necessary or desired images is an extremely
important factor in performing neurointervention procedures that are free of stress.
Using state-of-the-art digital technology and multiprocessors, BRANSIST safire can instantly select
and display both still and moving reference images.
Also, multiprocessor technology provides the benefit of improved image data security through the use
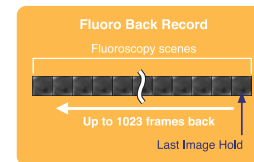of parallel image processing and data mirroring.*

Fast Bedside Imaging

The joystick type IVR NEO bedside image controller includes only
the features that are essential for intervention procedures.
Thanks to outstanding responsiveness in reference image selection,
multi-image display, fluoroscopy/radiography mode switching,
map mode selection, fluoroscopy log, and high speed replay,
X-ray technologists are free to perform procedures in any manner
they desire.

IVR NEO enables flexible control
of the digital system
IVR NEO
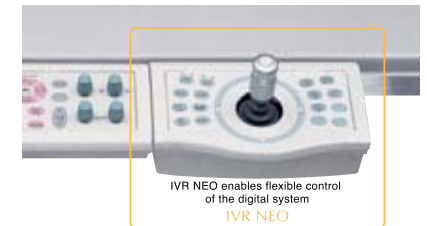
Fluoro Back Record

This feature keeps a record of scenes up to 1023 frames
back and allows retroactively recording any
of these scenes onto the hard drive.
This is especially useful for recording
the important fluoroscopy scenes or MAP images.
These images can also be stored as DICOM images
on external media or transferred to other locations via a network.

Fluoro Back Record

Fluoroscopy scenes

Up to 1023 frames back

Last Image Hold

Data Mirroring

By installing two hard drives
for storing data, images
are instantaneously mirrored
to a second computer,
which allows not only
processing in parallel,
but also provides a backup
for peace of mind.

Mirroring
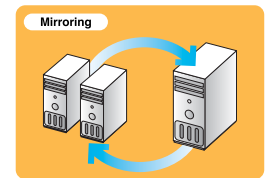
Dual Road Mapping

Standard features of this system include two types of road mapping
functions. One type is a superimposed mapping of a fluoroscopic
image overlaid on a DSA image.
The other type is a subtraction mapping where a peak-hold image
is flashed during fluoroscopy processing and then subtracted
from the live fluoroscopic image. This allows easy selection of
the optimal mapping mode for a specific technique or objective.