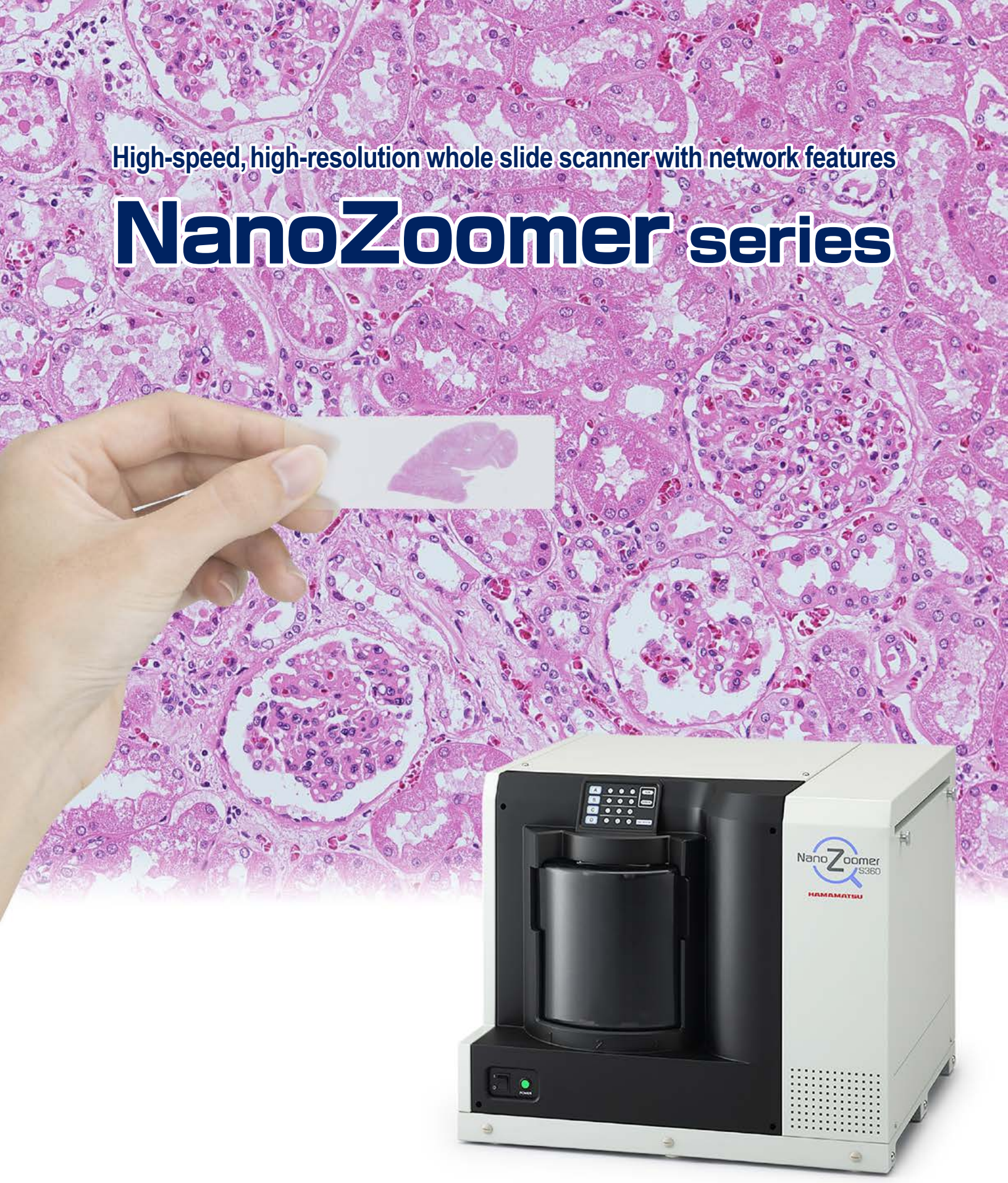
High-speed, high-resolution whole slide scanner with network features

NanoZoomer series



HAMAMATSU

PHOTON IS OUR BUSINESS

Quickly converts glass slides into high-definition digital data by high-speed scanning!

Views the entire image of a sample and magnifies images to any size or detail just the same as microscope observation.

The NanoZoomer series is a family of whole slide scanners that convert glass slides into high-resolution digital data by high-speed scanning. The NanoZoomer comes with a variety of functions such as image acquisition of fluorescence samples and multilayer acquisition. Scanned data can be viewed on a PC monitor by using the dedicated viewer software, and patented navigation map technique* delivers slide viewing environment just as if operating a microscope.

*This product is covered by US Patent (Reissued Patent) RE42,220.

Whole slide imaging have many advantages!

Copying and Sharing

Digitized slides can be copied and shared. This feature of whole slide imaging can be used in a variety of applications. For example, a large group of people can observe and discuss a single sample.

Slide Storage

Digital data does not deteriorate, and it is more secure from damages and losses than glass slides. You can view digital data in its original quality anytime and anywhere.

Databases

Large numbers of whole slide imaging can be stored into a database and incorporated into a laboratory information system. You can share data and construct slide libraries with distant facilities and research institutes.

Networks

Using the Internet or a local area network, you can observe and evaluate slides from a distant location.

High-throughput model
NanoZoomer S360

S360

Automated scanning up to 360 slides and high throughput of 82 slides/h*

- Scanning speed 20× mode (15 mm × 15 mm) : Approx. 30 s
  40× mode (15 mm × 15 mm) : Approx. 30 s
- Max. 360 slides

*In the case of 5 focus points

Standard model
NanoZoomer S210

S210

Automated scanning up to 210 slides and a solid history of stable performance

- Scanning speed 20× mode (15 mm × 15 mm) : Approx. 60 s
  40× mode (15 mm × 15 mm) : Approx. 150 s
- Max. 210 slides

Research-use model
NanoZoomer S60

S60

Fluorescence imaging

Automated scanning up to 60 standard size slides and 30 double size slides

- Scanning speed 20× mode (15 mm × 15 mm) : Approx. 60 s
  40× mode (15 mm × 15 mm) : Approx. 150 s
- Max. 60 slides

Compact model
NanoZoomer -SQ

SQ

Easy to use and affordable model

- Scanning speed 20× mode (15 mm × 15 mm) : Approx. 150 s
  40× mode (15 mm × 15 mm) : Approx. 275 s
- Max. 1 slides

Specifications

Product name		NanoZoomer S360	NanoZoomer S210	NanoZoomer S60	NanoZoomer-SQ
Part number		C13220-01	C13239	C13210	C13140
Scanning speed	20× mode (15 mm ×15 mm)	Approx. 30 s	Approx. 60 s	Approx. 60 s	Approx. 150 s
	40× mode (15 mm ×15 mm)	Approx. 30 s	Approx.150 s	Approx. 150 s	Approx. 275 s
Objective lens		20× (N.A. 0.75) User can select 20× or 40× mode at start of scanning			
Compatible glass slide		26 mm × 76 mm Thickness 0.9 mm to 1.2 mm	26 mm × 76 mm Thickness 0.9 mm to 1.2 mm	26 mm × 76 mm 52 mm × 76 mm (Option) Thickness 0.9 mm to 1.2 mm	26 mm × 76 mm Thickness 0.9 mm to 1.2 mm
Slide loader	Standard size slide	360 slides (30 slides × 12 cassettes)	210 slides (30 slides × 7 cassettes)	60 slides (20 slides × 3 cassettes)	1 slide
	Double size slide	-	-	30 slides (10 slides × 3 cassettes: option)	-
Scanning resolution	20× mode	0.46 µm/pixel			
	40× mode	0.23 µm/pixel			
Focusing method		Pre-Focus map			
Z-stack feature		Included			
Fluorescence imaging module		No	No	Option	No
Barcode reader		1D barcode (standard feature), 2D barcode (option)			
Slide format		JPEG compressed image + slide information			
Power supply		AC 100 V to AC 240 V			
Power consumption (Scanner only)		Approx. 200 VA	Approx. 160 VA	Approx. 225 VA	Approx. 72 VA

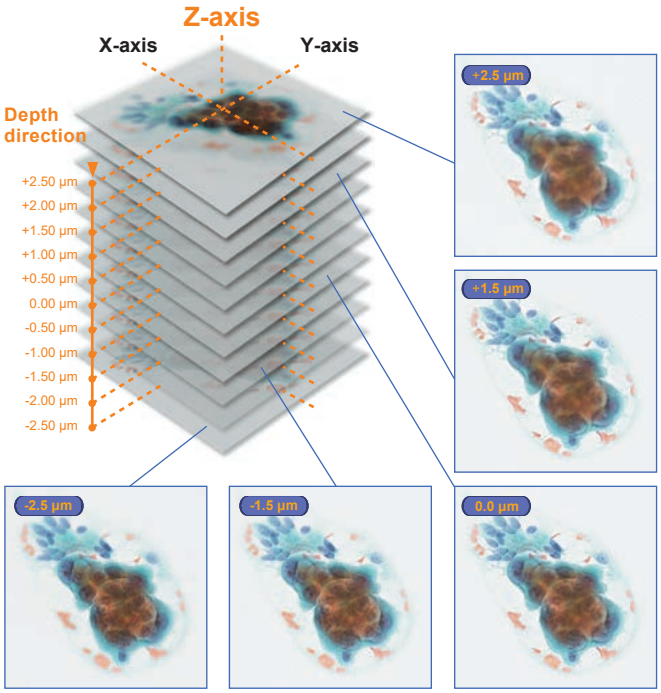
S360 S210 S60 SQ

NanoZoomer series scanning features

The scan units in the NanoZoomer series employ "Z-stack function" to acquire the high resolution digitized images of thick samples.

Z-stack feature for thick samples

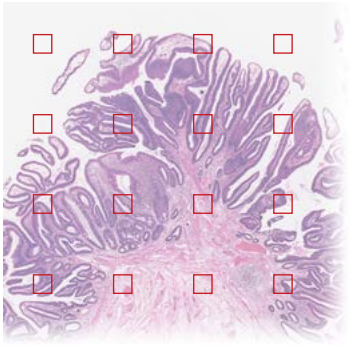
There are samples which have 3D structures such as clumps of cells and thick tissues. They require focus adjustment during observation. To handle these kinds of slides, the NanoZoomer series is equipped with the Z-stack feature that allows you to focus on different depths in the sample.
The NDP.view2 viewer software lets you adjust the focus on a Z-stack slide much like you would adjust the focus of a microscope. You can also point to an area of interest and let NDP.view2 apply autofocus for maximum clarity.



Optimized scanning condition provided by the superior and unique automated features.

Automatic focus scoring

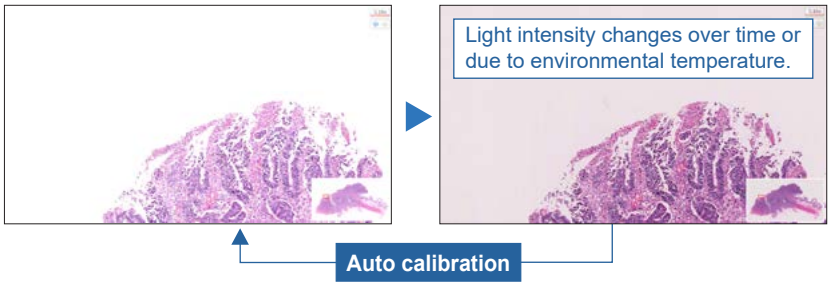
Slide quality check is often conducted manually after scanning to avoid scanning failure caused by dirt on a slide or sample folding. The NanoZoomer series evaluate scanned whole slide imaging automatically and generate the focus score of each slide's quality for your review. Focus check points within a scanned slide are automatically determined, at each check point. Then a focus score is generated and displayed on a monitor screen.



Automatic focus scoring is conducted at each of those points in red squares selected from all over the sample.

Automatic system calibration

To maintain optimized condition of the scanner, routine calibrations of light intensity, white balance and shading are required. The NanoZoomer series automatically and periodically conducts a system calibration using a calibration slide located in a slide cassette, and keeps the system optimized. Whenever you scan, you will get the best whole slide imaging it can deliver.

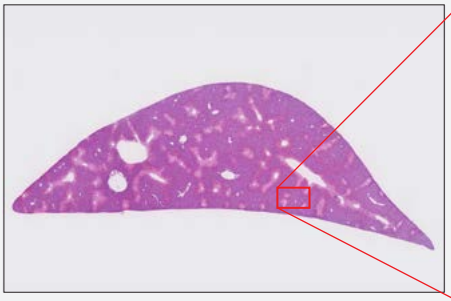


Auto calibration assures slides get scanned under optimized conditions.

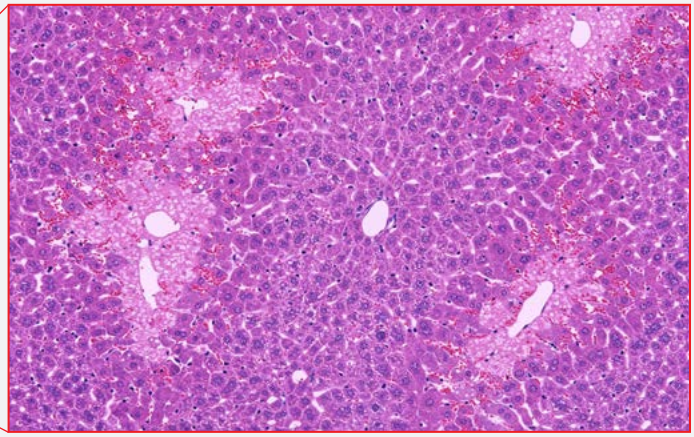
Examples

Toxicity test using H&E staining

NanoZoomer is available for a wide range of applications including toxicity evaluation.



Liver in mouse with a dose of acetaminophen in 4 hours (Whole Image)

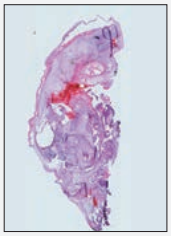


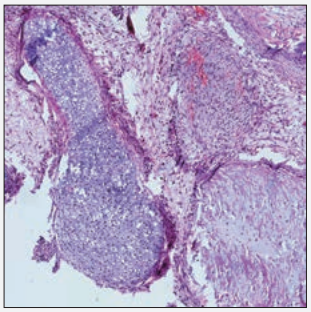
Liver in mouse with a dose of acetaminophen in 4 hours (Magnified Image)

Provision of Glass Slide
Courtesy of Dr.June Kanno, Division of Toxicology, Biological Safety Research Center, National Institute of Health Sciences, Japan

Application for iPS cells research

NanoZoomer is great for testing iPS cell differentiation ability by observation of teratoma tissue samples ranging from overall views to high-magnification images.

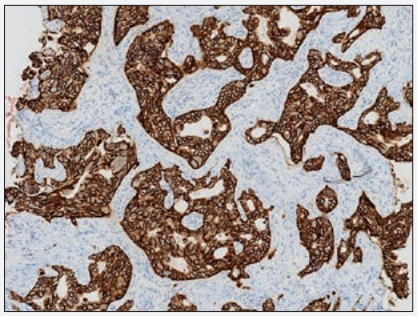




Teratoma formation by using mouse iPS cells (HE-stain)
Courtesy of Center for iPS Research and Application, Kyoto University, Japan

Protein localization analysis using immunostaining

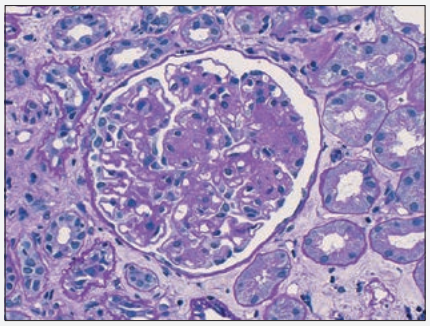
NanoZoomer is ideal for observing localization of various types of proteins by using immunostaining techniques and so opens a host of diverse new applications.



Specimen of needle biopsy stained by IHC(HER2)
Courtesy of Dr.Kurozumi M, the Department of Pathology, Saitama Cancer Center, Japan

Conferences by whole slide imaging

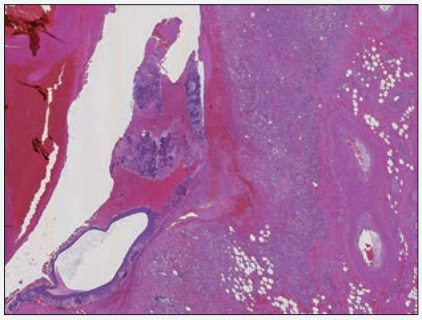
With whole slide imaging, you can share the same sample among many people without worrying about sample deterioration.



PAS stained kidney biopsy sample
Courtesy of Hiroshi Uozaki, M.D., Ph.D., Department of Pathology, The University of Tokyo Hospital, Japan

Observing H&E stained samples

This is the basic staining method for tissue samples and is widely used for pathological examinations and tissue anatomy.



Pancreatic AVM with anisakiasis, resulting in pancreatic bleeding
Courtesy of Yukihiro Imai, MD Ph.D., Department of Pathology, KobeCity Medical Center General Hospital, Japan

Option S60

Fluorescence imaging module L13820

Digitization of fluorescence samples enables long-term observation with no worries about fading, discoloration, or photobleaching.

The Fluorescence Imaging Modules combined with the NanoZoomer Series are able to scan the entire image of fluorescence-stained samples at high speed and high resolution. The scanned images are saved as digital data which allows long-term observation without photobleaching which has been a difficult problem on conventional fluorescence microscopes.

NanoZoomer S60 + L13820-01/-02/-03

Features

Adding a Fluorescence Imaging Module captures a diverse range of fluorescence images

Scans samples stained with multiple fluorescence probes

The Fluorescence Imaging Modules scan and generate digital data for samples stained with multiple fluorescence probes such as Q-dots, fluorochromes, fluorescence proteins, and others. The filter wheel unit automatically selects and switches 6 filters for excitation and fluorescence wavelengths to allow sequential image acquisition at single or multiple wavelengths.

Uses dark field illumination for sample identification

Fluorescence sample locations on a slide are usually difficult to find using transmitted illumination, so the Fluorescence Imaging Modules use dark field illumination* to pinpoint sample locations. This makes it easy to detect samples of interest.

*Patent registered

Superimposes images of entire tissues

The Fluorescence Imaging Modules can superimpose a bright field image and a fluorescence image or superimpose two or more fluorescence images at tissue levels. This allows observing target protein localization and expression levels across the entire image.

Uses the scientific CMOS sensor (L13820)

NanoZoomer S60 uses the scientific CMOS sensor to acquire the detailed fluorescence images, which improved the sensitivity and scanning time compared to the conventional models.

Uses high-power and long-life light source that needs no optical axis alignment

The FL-illumination lamp unit can offer an extremely long service life of 2000 hours as well as high power and high stability. No optical axis alignment is required even when the lamp is replaced.

■ Fluorescence imaging module specifications

Product number	L13820-01
Applicable model	NanoZoomer S60
Light source	FL-illumination lamp unit for S60 L13820-03 *1
Number of filter cubes installed *2	3
Filter wheel	L13820-02: 6ExΦ25 / 6EmΦ32

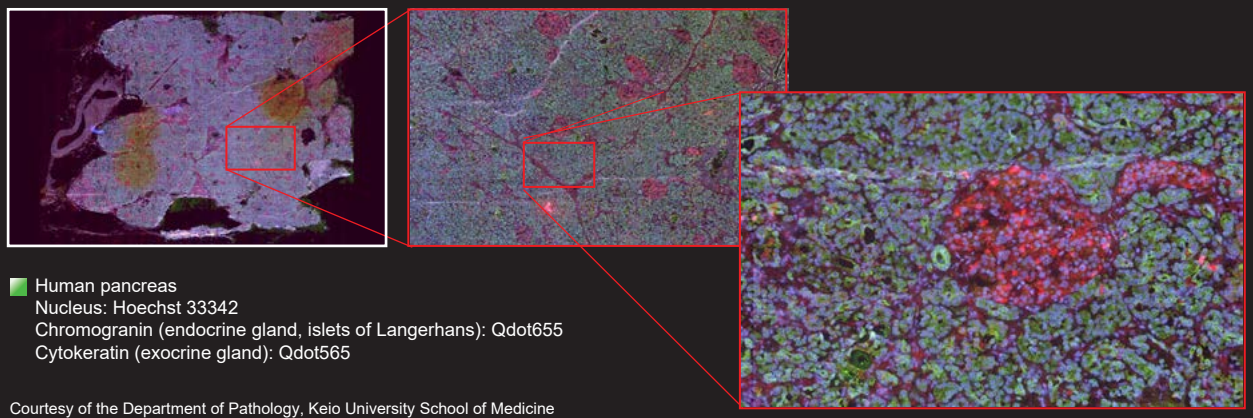
*1 See the table below for L13820-03 specifications.
*2 Filter cubes and filters are sold separately. Please consult us.

FL-illumination lamp unit for S60 L13820-03 specification

Dimensional outline	180 mm(W) × 299 mm(D) × 227 mm(H)
Weight	Approx. 6.8 kg
Power consumption	300 VA

Examples

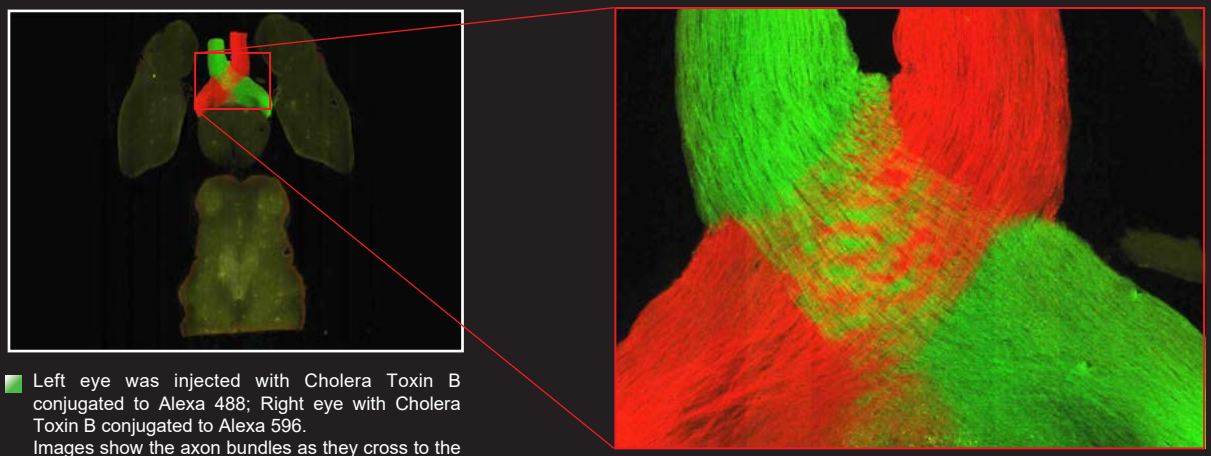
Rapid and High-Fidelity Imaging of Fluorescence-Labeled Q-dots



- Human pancreas
  Nucleus: Hoechst 33342
  Chromogranin (endocrine gland, islets of Langerhans): Qdot655
  Cytokeratin (exocrine gland): Qdot565

Courtesy of the Department of Pathology, Keio University School of Medicine

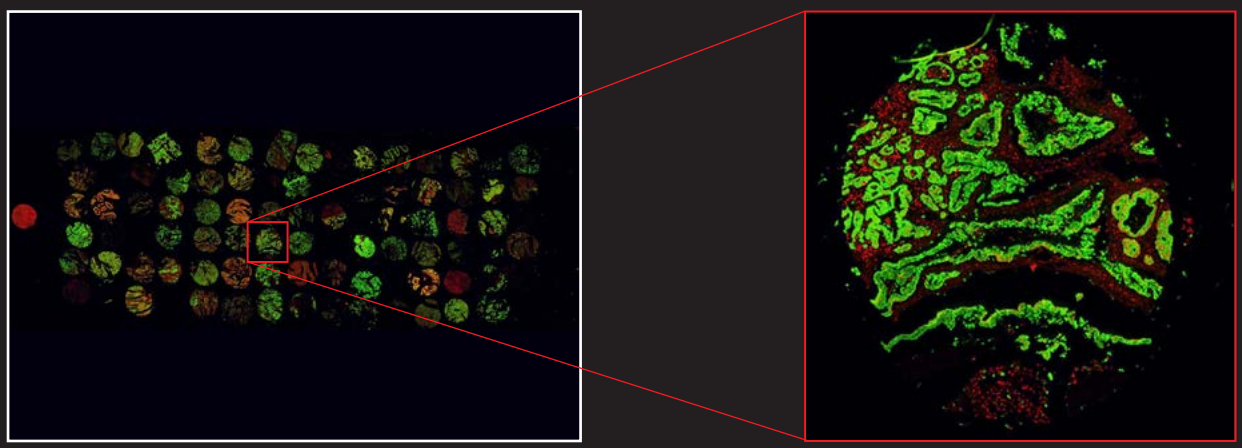
Horizontal Section of the Nile Rat Brain Showing the Crossing of Retinal Axons in the Optic Chiasm



- Left eye was injected with Cholera Toxin B conjugated to Alexa 488; Right eye with Cholera Toxin B conjugated to Alexa 596.
  Images show the axon bundles as they cross to the opposite sides of the brain.

Courtesy of the Harvey Karten, University of California-San Diego, USA; Yves Sauve, University of Alberta, Canada; Frederic Gaillard, Universite de Poitiers, Poitiers, France

Observing multi-wavelength fluorescence image of TMA



- TMA images

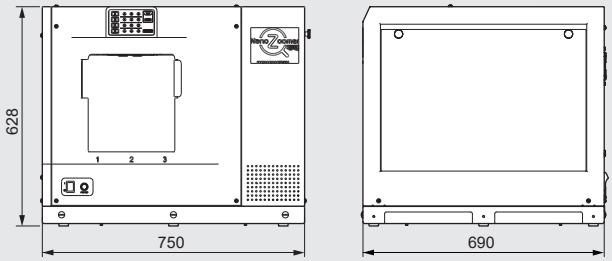
Courtesy of the Department of Chemotherapy and Department of Pathology, National Cancer Center Research Institute

Dimensional outlines

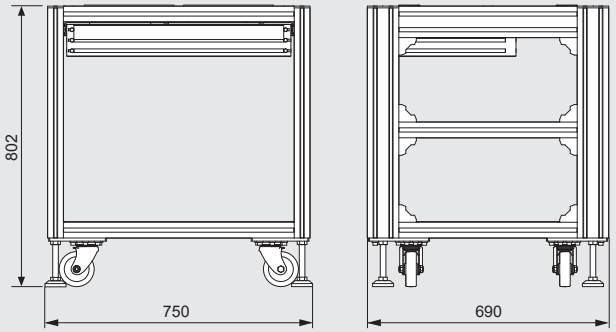
(Unit: mm)

■ NanoZoomer S360 C13220-01

Weight
Main unit: Approx.116.5 kg
Dedicated rack: Approx. 72.5 kg

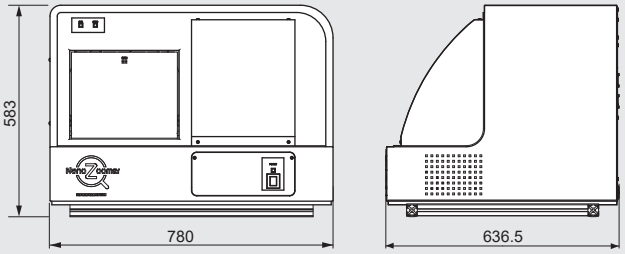


(Dedicated rack supplied as standard equipment)



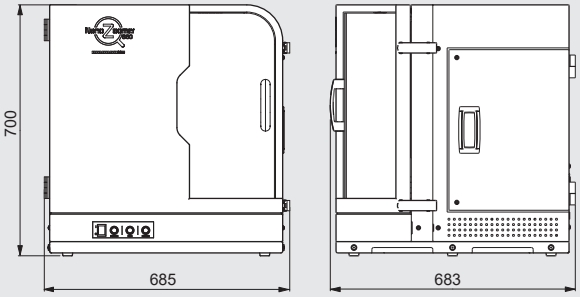
■ NanoZoomer S210 C13239

Weight
Main unit: Approx.69 kg



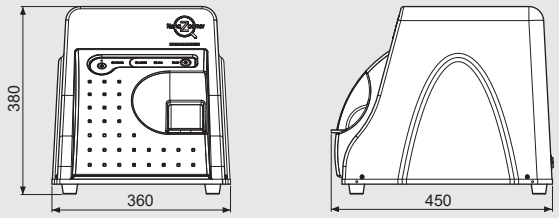
■ NanoZoomer S60 C13210

Weight
Main unit: Approx.79.1 kg (not inlcuding the optional fluorescence module)



■ NanoZoomer-SQ C13140

Weight
Main unit: Approx.20 kg



* In EU, four types of NanoZoomer (NanoZoomer-SQ, NanoZoomer S210, NanoZoomer S60, NanoZoomer S360), NDP.view2 (U12388-21), NDP.view2 Plus (U12388-22) and NDP.serve3 software are CE marked under EU's In Vitro Diagnostics Directive (IVDD) for in vitro diagnostic use.
In China, five types of NanoZoomer (NanoZoomer 2.0-HT, NanoZoomer2.0-RS, NanoZoomer-SQ, NanoZoomer S210, NanoZoomer S60) are registered for in vitro diagnostic use.
In the US, Japan and other countries, NanoZoomer is for research use only and is not permitted to use for clinical diagnostic purposes.

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