Hitachi Double-Beam Spectrophotometer

UH5300

Smart

Simple

Easy

Printed in Japan (H)

HTB-E094

2013.6

CAUTION: For correct operation, follow the instruction manual when using the instrument.

Specifications in this catalog are subject to change with or without notice, as Hitachi High-Technologies Corporation continues to develop the latest technologies and products for our customers.

NOTICE: The system is For Research Use Only, and is not intended for any animal or human therapeutic or diagnostic use.

Tokyo, Japan

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For technical consultation before purchase, please contact:

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The technology for spectrophotometers continues to advance....

Hitachi designs spectrophotometers encompassing technologies for the future.

- Providing the best-in-its-class levels of performance and unprecedented operability.*1-

Operability never before achieved

**Tablet Terminal**

The UH5300 can be controlled through the use of a tablet terminal*2 (iPad®). The user interface making full use of the tablet provides new, unprecedented operability.

The UH5300 is controlled via wireless connection*3, utilizing a thin and lightweight tablet terminal: Allows for future updating of its applications.

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*1: Survey by Hitachi High-Technologies Corporation. Models offered for sale in the Japanese market as of August, 2012
*2: Windows PCs can be used to control the UH5300.
*3: Use of a Windows PC allows wired connection. For further information on system configuration, see page 13.
The technology for spectrophotometers continues to advance. Hitachi designs spectrophotometers encompassing technologies for the future.

**Feature**

**Smart**
- Use of long-life xenon flash lamp
  - Light source is guaranteed for seven years*4, resulting in lower operation cost
- Double-beam optical system
  - Ensures extended periods of data stability compared with the single-beam optical system

**Simple**
- Operation by use of tablet terminals
  - Simple and intuitive user interface
- Remote control through wireless communication
  - Flexible operating environment

**Easy**
- Simple and easy-to-understand performance check function
  - Assures the accuracy of data
- Automatic 6-cell turret as standard equipment
  - Improved efficiency and increased sample throughput

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* Registration of the product is required. For further information, please ask your dealer. The lamp is guaranteed against failure for seven years after the date of delivery or for a specified number of lamp illuminations, whichever comes first.

The specified number of illuminations is represented as a percentage (%), depending on the working conditions of the lamps, in the maintenance menu of the UH5300, in reference to a lamp working condition of 100%.

Assuming that the spectrophotometer is used for seven years, 240 days a year, the lamp working condition of 100% corresponds to 300 measurement events of absorbance measurement per day (number of wavelengths: one wavelength) or 20 measurement events per day for wavelength scan measurement per day (scan range: 190 to 1,100 nm, scan speed: 200 nm/min).
Performance

Hitachi has achieved the best-in-its-class*1 performance spectrophotometer using a combined xenon flash lamp and a stable double beam optical system.

This level of performance allows for highly accurate data to be obtained.

Xenon flash lamps as long-life light sources
- Hitachi UH5300 guarantees the light sources for seven years*4.

Long Life

- Unlike conventional systems*5, the use of xenon flash lamps reduces the frequency of lamp replacement.
- Xenon flash lamps of the Hitachi UH5300 are guaranteed for 7 years*4.

Wide Wavelength Range

- The UH5300 can make measurements in the entire wavelength range of 190 to 1,100 nm using a single light source.
- There is no concern about measurement error often associated with transition between light sources.

Short Stabilization Time

- Less heat emission from the lamps reduces the need for stabilization of the lamps unlike conventional devices.
- Due to its environmentally conscious design, the UH5300 consumes 25% less electricity than conventional devices*5.

Best-of-class levels*1 of resolution of 1 nm have been achieved.
- A uniquely designed wavelength drive system achieves a good balance between high-speed scanning and high wavelength accuracy.

High Resolution

- Best-of-class*1 resolution at 1 nm has been achieved.
- The European Pharmacopoeia specifies, as a standard of the resolution, an absorbance ratio of 1.5 or higher at the designated peaks of 0.02% (V/V) toluene solution. The absorbance ratio of the UH5300 is 2.04, surpassing the standard, as shown in the figure below.

High Speed & High Wavelength Accuracy

- The improved wavelength drive system results in a high scan speed of 6000 nm/min, while the xenon lamp-equipped system attains the highest levels*1 of wavelength accuracy : ±0.3 nm.
- Using a certified reference material such as holmium filter enables to check the wavelength accuracy using the peak detection function.
Stable optical system by using double beam - Allows extended periods of stable measurements-

High Stability

Light dispersed through a monochromator is divided into two luminous fluxes by a half mirror. The drift of the system is reduced by comparing the photometric values of the sample light and the reference light.

Features

Due to its symmetrical optical system, deviations in light intensity are corrected with high accuracy.

Actual optical system may be slightly different

Schematic view of the UH5300 optical system

High-throughput measurement by using the 6-cell turret - the “Intelligent Start” function makes it easier to use the device-

High Throughput

- UH5300 has a 6-cell turret as standard.
- UH5300 has measurement modes that allow automatic measurement of up to 6 samples in one step.

Intelligence

The Intelligent Start function provides superior operability and results in a reduction of measurement time.
- Place a sample cell in the sample chamber and close the sample chamber door to trigger an automatic measurement. [*6]
- The 6-cell turret, when used in auto start mode, may reduce measurement time.

Hitachi offers a new type of operation in laboratories.

### Remote Control

Remote control via wireless LAN allows the user to check the data in real time while away from the instrument. This is especially useful when running multiple samples or a time scan using an extended period of time.

### Multi Access

Routers, if used, allow the connection of more than one tablet terminal or PC*7. Instrument control and access to data can be achieved through control terminal devices, while access to the data stored in the device can be made through other connected terminals.

### Data Retention/Printing

Measurement data are stored in the internal memory of the UH5300. The data can be transferred to a USB memory drive through the USB ports. It can also be transferred to storage devices on the network.

### AirPrint

An AirPrint-compatible printer, if used, allows a direct print over a wireless LAN from a tablet terminal.

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*7: For further information on system configuration, see page 13.
Functions
Advanced touch screen user interface
Resulting in intuitive operation

Offering a new level of user simplicity

The UH5300 can be controlled using a tablet terminal (iPad®). The user interface for making full use of the tablet terminals provides new, unprecedented operability.

Touch panel operation

Touch Panel
Provides touch operation, pinch-zoom-in/out operation, and flick operation that are unique to touch panels. In the spectrum display screen, for example, pinch-zoom-in operation contracts a graphic image, while pinch-zoom-out operation expands it. Flick operation on the 6-cell turret on the screen also allows interlocking of the control software screen and cell movement.

Character Input Tool
Characters can be input by using the touch keyboard displayed on a tablet terminal, and numeric characters can be input by using the slider bar. Provides flexible input operations, both by mouse-click operation on a PC and tap operation on a tablet terminal.

Visual Icon
Visual icons of universal design make the operation simple. Even novice operators will find it intuitive and easy to use the instrument.
Software

Simple and easy-to-use control software
Expand measurement possibilities just by touching the screen.

Main functions of application software -Main Menu-

The main menu provides access to various functions. The control software is designed with emphasis on simple and intuitive operability, providing an easy-to-follow measurement flow, even for someone who is unfamiliar with a spectrophotometer.

Measurement
Various measurement modes are available, including concentration, wavelength scan, and time change measurement. For details, see page 8.

Method File
Used to locate method files by specifying specific information such as analyst, sample name, etc.

Data file
Used to locate data files by specifying measurement information such as analyst, sample name, etc.

Maintenance
Mode for performance check and wavelength calibration. Lamp conditions can also be checked.

Basic Settings
Basic Settings of the spectrophotometer Used to specify a network destination for auto-saving files as well as the selection of display colors for graphs.

Simplified operational flow

Measurement can be accomplished in three steps: analysis parameters setting, measurement, and data processing. Measurement data are saved in the internal memory of the UH5300. The stored data can also be printed out via commercially available printers or converted into the CSV file format for storage in the USB memory, PC, or external storage devices on networks.
Various measurement modes are available to accommodate a wide range of applications.

**Concentration measurement**
Measures standard solutions to prepare a calibration curve and uses it to perform quantitative analysis of unknown samples. Also, provides quantitative determination using entering coefficients.

**Absorbance/Transmittance measurement**
Used for continuous measurement of single-wavelength or multiple-wavelength absorbance (transmittance). Allows selection of up to 6 wavelengths.

**Nucleic Acid measurement**
Makes quantitative determination of nucleic acids or proteins or purity determination of nucleic acids by two-wavelength or three-wavelength absorbance.

**Wavelength scan measurement**
Measures an absorption/transmission spectrum in a range between 190 and 1,100 nm

**Time change measurement**
Measures a change in the photometric value (absorbance/transmittance) over time at a fixed wavelength for up to 100,000 seconds.

**Monitor measurement**
This mode is a useful mode for the measurement of either absorbance or transmittance at a single wavelength while reading the results.

**Measurement supporting functions**
Helps to provide intuitive operation and includes support functions when required.

**File search function**

**Data Search Function**
The file search function provides access to stored data and a search capability. Data of interest can be searched by entering a keyword using the keyboard.

**Electronic operation manual**
The UH5300 is shipped with a CD-ROM that contains an electronic operation manual. Because it is in PDF format, it can be viewed directly with an iPad® or PC*. A keyword search in the electronic operation manual provides the necessary information, when needed.

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*8 : To browse from an iPad, the free iBooks application, which is available from Apple, is required.
Application

The UH5300 supports various measurement applications.

Environmental Field

Quantitative determination of hexavalent chromium (diphenylcarbazide - absorption photometric method)

Shown on the right is an example of quantitative determination of hexavalent chromium using the diphenylcarbazide - absorption photometric method. Plating by trivalent chromate treatment used to comply with the RoHS Directive can be analyzed for the presence of hexavalent chromium.

Foods Industry

Quantitative determination of D-glucose (enzyme method)

D-glucose is widely found in plants and animals and is an essential component in metabolic pathways. An example of measurement by the enzyme method using F-kit® is shown. Making use of an enzyme reaction, coenzyme NADH or NADPH is measured for absorbance at 340 nm to determine an increase or decrease.
Bio-Technology Field

Quantitative determination of salmon testicle DNA (ultraviolet absorption method)

The absorption spectrum of a nucleic acid solution shows a minimum absorption at around 230 nm and a maximum absorption at around 260 nm. Use of the nucleic acid measurement mode allows for determination of purity from the two-wavelength ratio as well as determination of the DNA concentration from absorbance at 260 nm.

Example of absorption spectrum measurement in the wavelength scan mode

Example of purity and nucleic acid concentration determination using the nucleic acid measurement mode

Quantitative determination of protein (Warburg-Christian method)

Protein (BSA) was subjected to quantitative analysis using the ultraviolet absorption method. The nucleic acid measurement mode has a built-in formula for protein concentration calculation which uses the Warburg-Christian method, thus allowing easy determination of protein concentrations.

Example of absorption spectrum measurement in the wavelength scan mode

Example of protein concentration determination in nucleic acid measurement mode
Option

A wide range of accessories is available to support various applications.

Sample Handling Accessories

The UH5300 offers a variety of accessories to meet your analytical needs. These accessories support your measurement effort for a wide range of applications.

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single cell holder (P/N 3J1-0106)</td>
<td>Used for measuring samples placed in a 10 mm path length cell</td>
</tr>
<tr>
<td>Rectangular long path cell holder (P/N 210-2107)</td>
<td>Used for measuring samples placed in rectangular long path cells of up to 100 mm path length</td>
</tr>
<tr>
<td>Holder base (P/N 3J1-0109)</td>
<td>Used as a base when the following samples holders are used in the instrument</td>
</tr>
</tbody>
</table>

| Options that require the holder base |
|-------------------------------------|------------------------------|
| Product name                        | P/N                          |
| Single cell holder                  | 3J1-0106                     |
| Rectangular cell holder             | 210-2107                     |
| Glass filter holder                 | 210-2109                     |
| Film holder                         | 210-2112                     |
| Light polarizer holder              | 210-2130                     |

<table>
<thead>
<tr>
<th>Ultra-micro volume sample measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra-micro volume cells are used in the sample chamber of the UH5300 in combination with the holder base (3J1-0109), single cell holder (3J1-0106), and trace sample cell mask (3J1-0116). It is suited for the measurement of a trace sample of about 1.5 to 90 µL.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product name</th>
<th>P/N</th>
<th>Capacity (µL)</th>
<th>Light path length name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 µL trace sample cell</td>
<td>3J1-0120</td>
<td>1.5 to 4.0 µL</td>
<td>1 mm</td>
</tr>
<tr>
<td>12 µL trace sample cell</td>
<td>3J1-0121</td>
<td>12 to 40 µL</td>
<td>5 mm</td>
</tr>
<tr>
<td>50 µL trace sample cell</td>
<td>3J1-0122</td>
<td>50 to 90 µL</td>
<td>10 mm</td>
</tr>
<tr>
<td>Mask for trace sample cell</td>
<td>3J1-0116</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Micro cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro cells are used in the sample chamber of the UH5300 in combination with the holder base (3J1-0109), single cell holder (3J1-0106), and micro cell mask (200-1537). It is suited for the measurement of a small amount of sample of about 340 to 600 µL.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product name</th>
<th>P/N</th>
<th>Capacity (µL)</th>
<th>Light path length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro quartz cell, 10 mm</td>
<td>124-0357</td>
<td>340 to 600 µL</td>
<td>10 mm</td>
</tr>
<tr>
<td>Black quartz micro cell, 10 mm</td>
<td>200-0551</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Mask for micro cell</td>
<td>200-1537</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
Auto sipper
(P/N 3J1-0101)
Effective for quick measurement of multiple samples. When the lever is depressed, the automatic sipper takes a sample from a test tube and measures it automatically.

Minimum sample volume: 0.6 mL
Carry over: 1% or less
Cell capacity: Approximately 50 µL

Water circulated cell holder with stirrers
(P/N 3J1-0104)
A magnetic stirrer agitates the sample solution, allowing measurement with high temperature accuracy. Using Starna’s magnetic stirred micro cells allows for measuring a small amount of sample.

Operating temperature range: 5°C to 60°C
Compatible cells: 10 mm square cell
Capacity: 2.4 to 3.5 mL
Starna’s magnetic stirring cell:
- 9-Q-10-MS, 20-Q-10-MS
- 18-Q-10-MS, 28-Q-10-MS
- 600 to 800 µL

Glass filter holder
(P/N 210-2109)
Used to measure the transmittance or absorbance of a plate-like solid sample such as a glass filter.

Sample thickness: 0.5 to 5 mm
Sample size: 12 × 25 mm to 55 × 100 mm

Film holder
(P/N 210-2112)
Used to measure a film-shaped sample

Film frame: width: 25 mm, height: 30 to 50 mm
Opening for light flux: width: 10 × height: 20 mm

Polarizer holder
(P/N 210-2130)
Linearly polarizes light flux sample and measures polarization.

Wavelength range: 400 to 750 nm
Sample thickness: 0.5 to 5 mm
Sample size: Minimum: 12×25 / Maximum: 55×100 mm

4 Position rectangular long path cell holder
(P/N 150-0940)
Four rectangular absorption cells can be mounted on the sample side, and these cells can be switched from the outside. This accessory requires a front panel (P/N: 3J1-3214). Ordered separately.

Cell length: 100 mm, 50 to 10 mm long path cells are usable
System

Choosing system configurations - Available systems -

LAN connection

The UH5300 is equipped with LAN ports that not only provide a wireless connection through wireless LAN routers but also direct the connection via LAN cables (cross type) to other equipment. Use of a router provides flexible building systems to suit customers’ requirements.

(a) Tablet terminal control (wireless LAN connection)

(b) PC control (wired LAN connection)

(c) PC control (network connection)

(a) An example of a system configuration under the tablet terminal control (customer-supplied items)

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet terminal</td>
<td>Fourth generation iPad® installed iOS 6 (as of May 2013**10) (Activate or authenticate your iPad® in your Internet environment before using it.)</td>
</tr>
<tr>
<td>Wireless LAN router</td>
<td>Wi-Fi (802.11a/b/g/n) - compatible router</td>
</tr>
<tr>
<td>LAN cable (straight cable)</td>
<td>Category 5e or higher cable (not required if it is supplied with a wireless LAN router).</td>
</tr>
<tr>
<td>Printer</td>
<td>For connection to iPad : AirPrint-compatible printer</td>
</tr>
</tbody>
</table>

(b) An example of a system configuration under PC control (customer-supplied items)

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows® PC</td>
<td>PC meeting the recommended specifications in the table below</td>
</tr>
<tr>
<td>LAN cable (cross cable)</td>
<td>Category 5e or higher cable</td>
</tr>
<tr>
<td>Printer</td>
<td>Windows-compatible printer that can be used with your PC</td>
</tr>
</tbody>
</table>

(c) An example of a system configuration under PC control (customer-supplied items)

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows® PC</td>
<td>PC meeting the recommended specifications in the table below</td>
</tr>
<tr>
<td>Router</td>
<td>Router-compatible with your PC or network environment</td>
</tr>
<tr>
<td>LAN cable (straight cable)</td>
<td>Category 5e or higher cable</td>
</tr>
<tr>
<td>Printer</td>
<td>Windows-compatible printer that can be used with your PC</td>
</tr>
</tbody>
</table>

Recommended Windows® PC specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>Windows® 7 Professional (32 bit or 64 bit)</td>
</tr>
<tr>
<td>CPU</td>
<td>CPU compatible with the above OS</td>
</tr>
<tr>
<td>Memory</td>
<td>Minimum of 2 GB or more recommended</td>
</tr>
<tr>
<td>Hard disk</td>
<td>Free space of 5 GB or more</td>
</tr>
<tr>
<td>Display</td>
<td>Display with a possible resolution of 1024 x 768 pixels or more</td>
</tr>
<tr>
<td>CD-ROM drive</td>
<td>24x or more recommended</td>
</tr>
<tr>
<td>Interface</td>
<td>Wired LAN : Pursuant to Standards IEEE802.3ab (1000BASE-T), IEEE802.3u (100BASE-TX), IEEE802.3 (10BASE-T)</td>
</tr>
<tr>
<td>Web browser software</td>
<td>Safari® 5.1.7</td>
</tr>
<tr>
<td>Mouse</td>
<td>Wheel-fitted mouse</td>
</tr>
</tbody>
</table>

**10 : Please ask your dealer the latest compatible version and revision of iOS for the UH5300.
### Performance check

- Simple and easy-to-understand performance check feature is available.
- Assures the accuracy of data.

### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical system</td>
<td>Czerny-Turner mount, Double beam monochromator</td>
</tr>
<tr>
<td>Wavelength range</td>
<td>190 to 1,100 nm</td>
</tr>
<tr>
<td>Spectral band width</td>
<td>1 nm</td>
</tr>
<tr>
<td>Stray light</td>
<td>198 nm (KCl) : 1.0 % or less 220 nm (NaI) : 0.05 % or less 340 nm (NaNO3) : 0.05 % or less</td>
</tr>
<tr>
<td>Wavelength accuracy</td>
<td>±0.3 mm (λe : 260.6, 484.3, 881.9 nm, Hg : 253.7, 435.8, 546.1 nm)</td>
</tr>
<tr>
<td>Wavelength repeatability</td>
<td>±0.1 nm</td>
</tr>
<tr>
<td>Photometric range</td>
<td>Abs : -3.3 to 3.3 %T : 0 to 300</td>
</tr>
<tr>
<td>Photometric accuracy</td>
<td>±0.002 Abs (0 to 0.5 Abs)</td>
</tr>
<tr>
<td>Photometric repeatability</td>
<td>±0.004 Abs (0.5 to 1.0 Abs)</td>
</tr>
<tr>
<td>Photometric repeatability</td>
<td>±0.002 Abs (0 to 1.0 Abs)</td>
</tr>
<tr>
<td>Scan speed</td>
<td>10, 40, 100, 200, 400, 800, 1,200, 2,400, 4,800, 6,000 nm/min</td>
</tr>
<tr>
<td>Response</td>
<td>Fast, Medium, Slow</td>
</tr>
<tr>
<td>Baseline stability</td>
<td>0.0005 Abs/h (250 nm after a two-hour warm-up period)</td>
</tr>
<tr>
<td>Noise level</td>
<td>0.0001 Abs RMS (280 nm, 0 Abs)</td>
</tr>
<tr>
<td>Baseline flatness</td>
<td>±0.0003 Abs (200 to 950 nm)</td>
</tr>
<tr>
<td>Light source</td>
<td>Xenon flash lamp</td>
</tr>
<tr>
<td>Detector</td>
<td>Silicon photodiode</td>
</tr>
<tr>
<td>Cell holder</td>
<td>Automatic 6-cell turret</td>
</tr>
<tr>
<td>Printer output</td>
<td>For connection to iPad : AirPrint-compatible printer</td>
</tr>
<tr>
<td></td>
<td>For connection to PC : PC-compatible printer</td>
</tr>
<tr>
<td>Interface</td>
<td>LAN port : connected to a router or PC</td>
</tr>
<tr>
<td></td>
<td>USB port : connected to USB memory for use when transferring CSV-format files</td>
</tr>
<tr>
<td>Size (main Unit)</td>
<td>510 (W) × 490 (D) × 280 (H) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>19 kg</td>
</tr>
<tr>
<td>Power</td>
<td>100, 115, 220, 230, 240V, 50/60 Hz, 150VA</td>
</tr>
<tr>
<td>Power consumption</td>
<td>70 W or Less</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>15 to 35 °C</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>25 to 80 % no condensation, to be 70 % or less at temperatures exceeding 30 °C</td>
</tr>
</tbody>
</table>

### Software functions

- **Basic functions**
  - 6-cell mode setting function
  - Automatic monitor power-off time setting function
  - Intelligent start function
- **Measurement modes**
  - Concentration measurement
  - Absorbance/transmittance measurement
  - Nucleic acid measurement (nucleic acid purity, nucleic acid concentration, protein concentration calculation)
  - Wavelength scan
  - Time change
  - Monitor measurement
- **Data/measurement condition saving functions**
- **File search function**
- **Maintenance functions**
  - Wavelength calibration
  - Lamp usage time monitoring
  - Sample chamber opening/closing detection
  - Performance evaluation
  - Performance evaluation using mercury lamps
  - Maintenance history storage
- **Data processing functions**
  - Scale changing
  - Trace
  - Statistical calculation
  - Spectrum overwriting
  - Peak detection
  - Smoothing
  - Differentiation
  - Area calculating
  - Rate calculating
- **Output capability**
  - File output in CSV format
  - Report output

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*Operation software is built into the UH5300.*
*iPad, AirPrint, iPad, and Safari are registered trademarks or trademarks of Apple Inc. in the U.S. and other countries.*
*For information on AirPrint-compatible devices, see the Apple website.*
*The latest iPad and Safari can be downloaded from the Apple website.*
*Microsoft and Windows are registered trademarks or trademarks of Microsoft Corporation in the U.S. and other countries.*
CAUTION: For correct operation, follow the instruction manual when using the instrument.
Specifications in this catalog are subject to change with or without notice, as Hitachi High-Technologies Corporation continues to develop the latest technologies and products for our customers.
NOTICE: The system is For Research Use Only, and is not intended for any animal or human therapeutic or diagnostic use.

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contact@nst.hitachi-hitec.com