

INSTRUCTION MANUAL
DIGITAL CAMERA UNIT

DC-3

INTRODUCTION

Thank you for purchasing the Digital Camera Unit DC-3.

This instrument is used in combination with a slit lamp and used to take digital pictures and records of the observed images.

This instrument has the following features:

- Simple operation and high-quality digital image
 - Optimized functions for slit lamp photography
 - Compact body and streamlined cable arrangement
 - All operations software driven via P.C.
-

This Instruction Manual covers an overview of the basic operations, troubleshooting, checking, maintenance and cleaning of the Digital Camera Unit DC-3.

To get the best usage from the instrument, read "Safety Indications" and "Safety Cautions."

Keep this Instruction Manual accessible for reference.

PRECAUTIONS

- This Instruction Manual does not cover the methods for operating personal computer and Microsoft Windows®. Descriptions are based on the assumption that the user is familiar with the personal computer and Microsoft Windows®.
 - For the methods for operating the slit lamp, the personal computer, Microsoft Windows® and special software (optional accessory), refer to the instruction manual of each device.
 - TOPCON shall not bear any responsibility for any effect as a result of using this software and Instruction Manual.
 - Clinical treatment actions shall be the responsibility of the doctor. TOPCON shall not bear any responsibility for the result of diagnosis.
 - Contents of software and the Instruction Manual are subject to future changes without prior notice.
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DC-3 is a trademark of TOPCON.

Microsoft and Windows are the registered trademarks of the United States Microsoft Corporation.

Pentium is the registered trademark of the United States Intel Corporation.

WORKING ENVIRONMENT

Temperature : 10°C – 40°C
Humidity : 30% – 75% (no dewing)
Atmospheric Pressure: 700hPa – 1,060hPa

STORAGE METHOD

1. Environmental Conditions (without package)
Temperature : 10°C – 40°C
Humidity : 30% – 75% (no dewing)
Atmospheric Pressure: 700hPa – 1060hPa
2. Place of Storage
 - (1) Keep the instrument dry.
 - (2) Do not expose to high temperature, moisture, sunlight, dust, salt content, sulfur, etc.
 - (3) Keep the instrument on a stable surface protected from vibrations, shocks (including transportation), etc.
 - (4) Prevent contact with chemicals and corrosive gases.

PERMISSIBLE ENVIRONMENTAL CONDITIONS FOR TRANSPORT AND STORAGE (WITH PACKAGE)

Temperature : -20°C – 50°C
Humidity : 10% – 95%

MAINTENANCE AND CHECKS



1. Regularly maintain and check equipment and parts.
2. When using equipment for the first time in a while, check in advance that everything is operating as it should.
3. Before using the instrument, connect all cables correctly.
4. Connect the power cable to the slit lamp power supply.
5. When not is use, protect the instrument with the dust cover.

DISPLAYS FOR SAFE USE


In order to encourage the safe use of the product and prevent any danger to the operator and others or damage to property, important warnings are placed on the product and inserted in the instruction manual.

We suggest that everyone understand the meaning of the following displays and icons before reading the "Safety Cautions" and text.

DISPLAYS







DISPLAY	MEANING
 WARNING	Ignoring or disregarding this display may lead to death or serious injury.
 CAUTION	Ignoring or disregarding this display may lead to personal injury or physical damage.
<ul style="list-style-type: none">• Injury refers to cuts, bruises, sprains, fractures, burns, electric shocks, etc.• Physical damage refers to extensive damage to buildings or equipment and furniture.	

ICONS

ICON	MEANING
	This icon indicates Hazard Alerting (Warning). Specific content is expressed with words or an icon either inserted in the icon itself or located next to the icon.





SAFETY CAUTIONS

WARNING

Icons	Prevention item	Page
	To avoid electric shocks, do not attempt disassembling, rebuilding or repairing.	19
	To avoid electric shocks, do not open the cover.	—
	To avoid fires and electric shocks, do not install the instrument in a place where it may get water or a liquid.	—
	To avoid fires and electric shocks, do not place cups and liquid containers nearby.	—
	To avoid electric shocks, do not insert metals through clearances.	—
	In the event of an instrument malfunction, immediately turn OFF the Start switch and unplug the cable. This will prevent the possibility of fire.	—



CAUTION

Icons	Prevention item	Page
	To prevent short-circuiting, connect cables correctly.	14
	To avoid injury, install the instrument on a flat level surface.	—
	To avoid electric shocks, do not touch the power plug with wet hands.	—
	Required memory and hard disc capacities may differ by the computer CPU and the environment.	—

MAINTENANCE

USER MAINTENANCE

To maintain the safety and performance of the equipment, never attempt to perform maintenance on your own. Ask our serviceman for repair except for the items specified here which can be maintained by the user. For details, follow the instructions.

ESCAPE CLAUSE

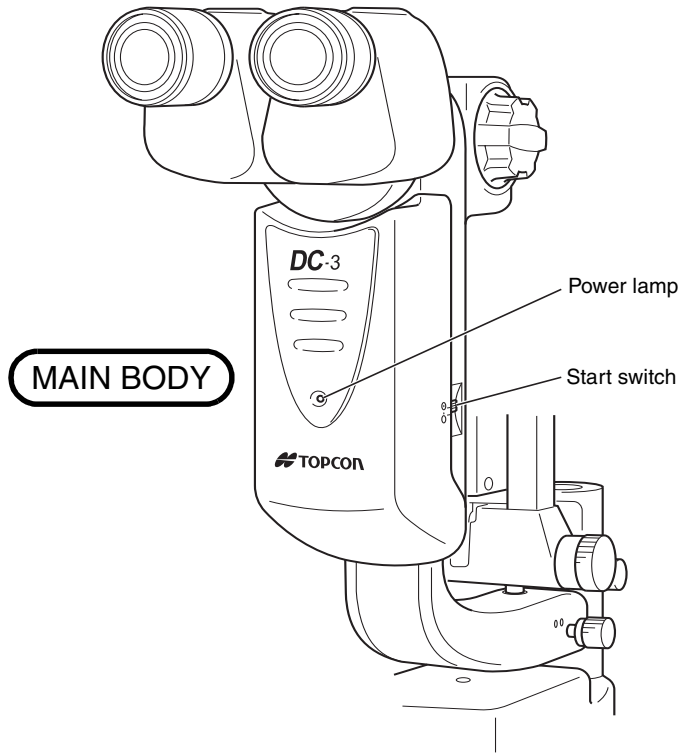
- TOPCON shall not take any responsibility for damage due to fire, earthquakes, actions by a third party or other accidents, or the negligence and misuse of the user and use under unusual conditions.
- TOPCON shall not take any responsibility for damage derived from the inability to use this equipment, such as a loss of business profit and suspension of business.
- TOPCON shall not take any responsibility for damage caused by operations other than those described in this Instruction Manual.
- Diagnoses shall be made on the responsibility of pertaining doctors and TOPCON shall not take any responsibility for the results of such diagnoses.

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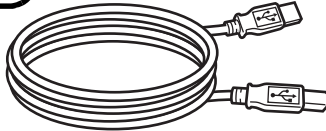
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COMPONENTS

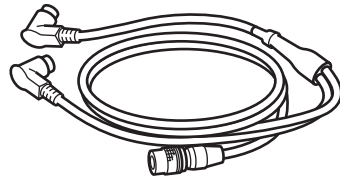
NAMES OF MAIN BODY COMPONENTS



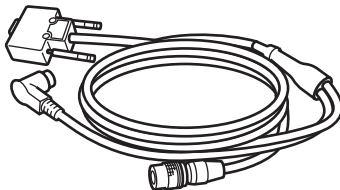
CABLE UNIT



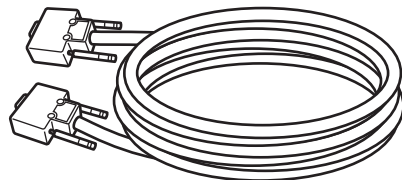
USB cable



Power/Interface cable



Power/Interface cable
(FD type)



Extension cable
(FD type)

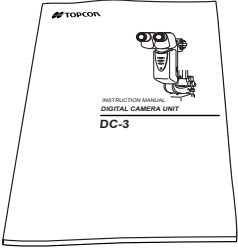
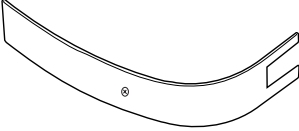
- The cable unit is composed of the following combination:
- USB cable and Power/Interface cable
 - or
 - USB cable, Power/Interface cable (FD type) and extension cable.
(Sometimes the extension cable is not provided.)



If you use others except the USB cable, which is the component of DC-3, a communication trouble or improper contact occurs from time to time. Use the USB cable, the component accessory.

STANDARD ACCESSORIES

Make sure that all the following standard accessories are packed.
Number in parentheses are the quantities included.

<p>Instruction Manual (1)</p>  <p>The image shows the cover of an instruction manual. At the top left is the TOPCON logo. In the center is a line drawing of a camera. Below the drawing, the text reads: "INSTRUCTION MANUAL", "DIGITAL CAMERA UNIT", and "DC-3".</p>	<p>Arm cover (1)</p>  <p>The image shows a curved, C-shaped arm cover. It has a small notch on the right side and a small circle with a registered trademark symbol (®) on the bottom curve.</p>
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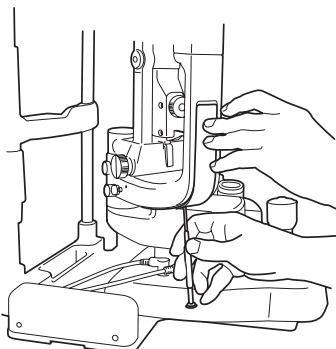
ASSEMBLY PROCEDURE

Tools

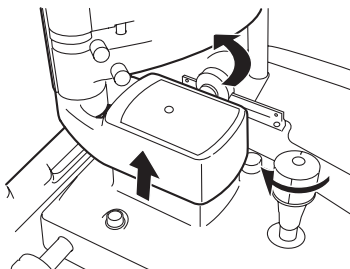
- A 3mm Phillips screwdriver is required.

PASSING CABLES THROUGH THE SLIT LAMP

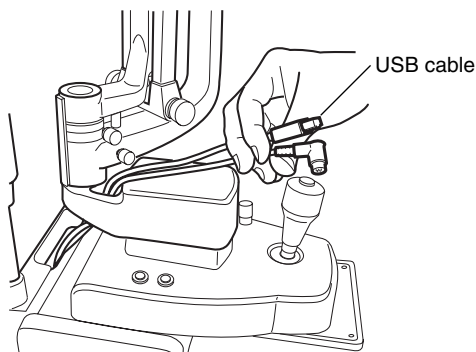
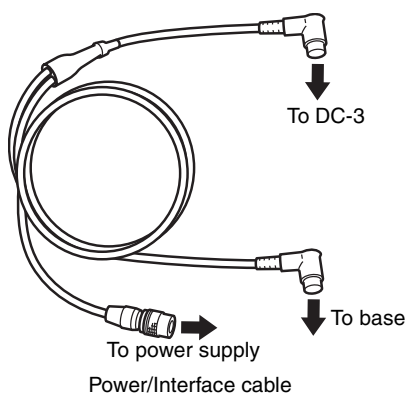
- 1** Using a Phillips screwdriver, remove the arm cover of the slit lamp.



- 2** Turn the control lever of the slit lamp and bring the arm to the top. Turn the arm aside so that holes of the base can be seen.

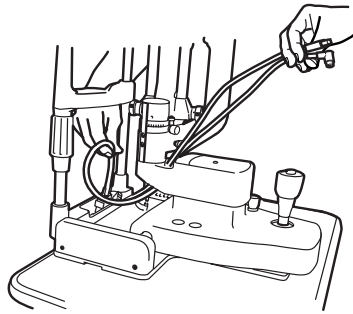


- 3** Pass the Power/Interface cable (connector side for the body) and USB (type B side) cable through the holes of the chinrest and base of the slit lamp.

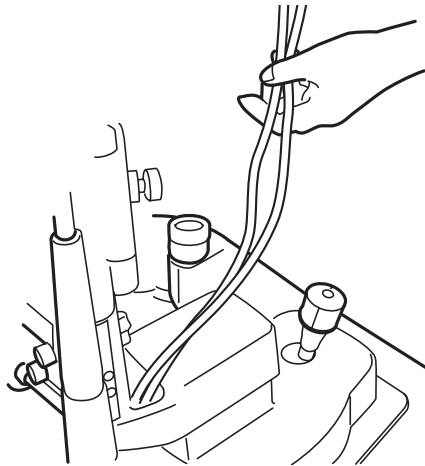




Do not pull the cables, as they may be damaged.

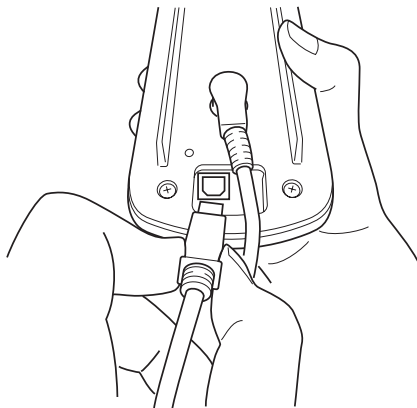


Remove kinks so that the cables are not twisted.



FITTING THE CABLE

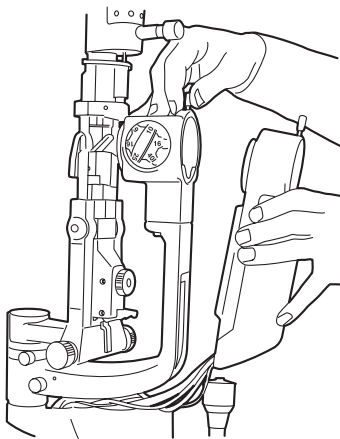
- 1 Connect the Power/Interface cable and USB cable to the body.



MOUNTING THE BODY

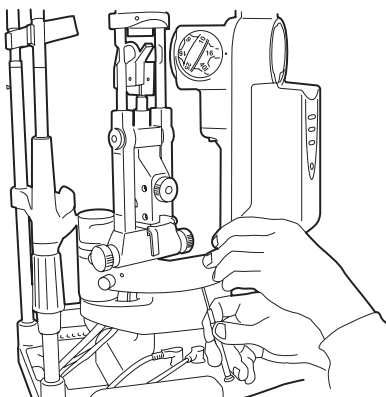
When necessary, attach the optional adapter cover.

- 1 Screw down the body to the microscope mount.



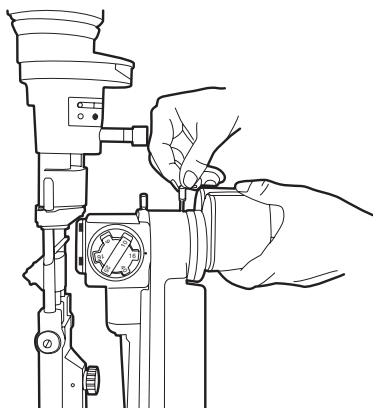
Hold cables inside the arm to prevent slacking.

- 2** Insert the arm cover into the arm from underneath, taking care not to catch cables. Fasten screws.




- 3** Unkink cables under the table. Move the base to the left end and lock. Fix cables under the table, allowing enough slack. Verify that the base moves smoothly.

- 4** Attach the binocular tube of the slit lamp to the mount of the instrument with screw.



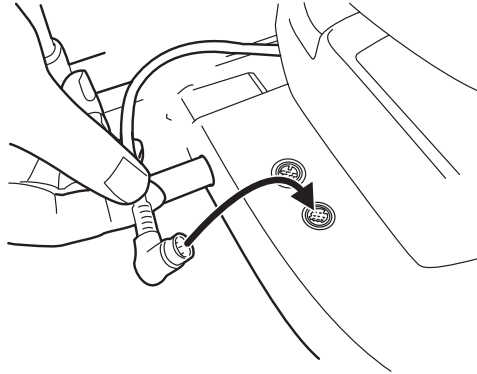
CONNECTION WITH EXTERNAL UNITS

WIRING CABLES

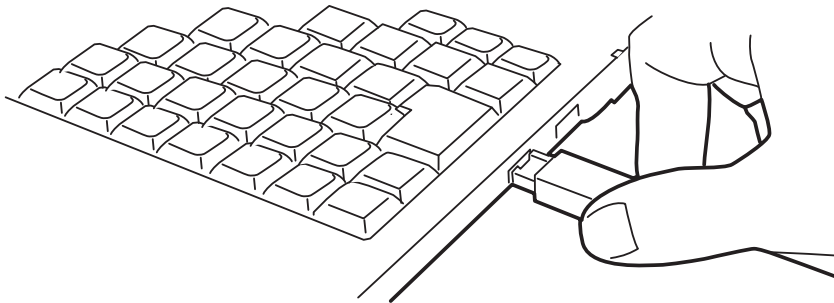
 CAUTION	To prevent short-circuiting, connect cables correctly.
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CONNECTING THE POWER/INTERFACE CABLE TO SLIT LAMP BASE UNIT

Connect the Power/Interface cable to the slit lamp base unit.

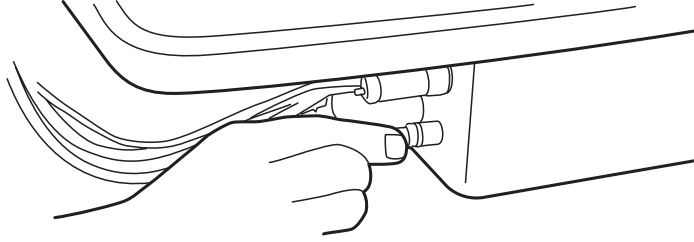


CONNECTING THE USB CABLE TO A PERSONAL COMPUTER WITH IMAGEnet SOFTWARE INSTALLED



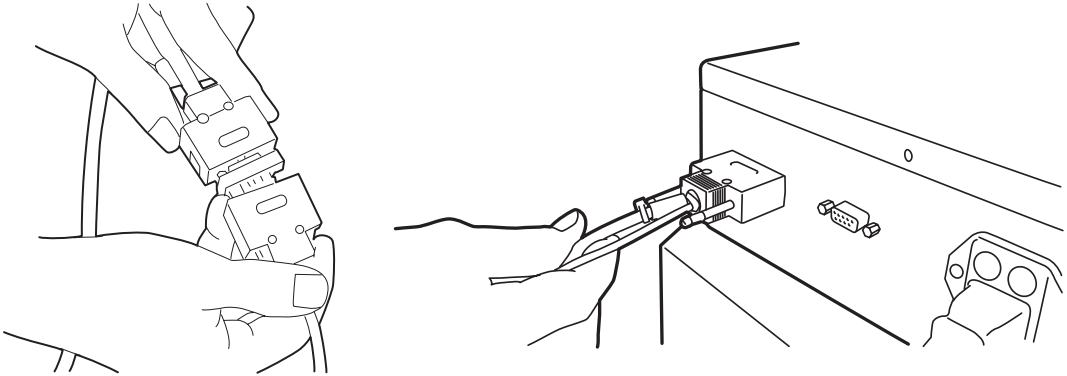
CONNECTING THE POWER/INTERFACE CABLE TO TABLE POWER SUPPLY

- 1** Make sure that the POWER switch of the slit lamp is OFF.
- 2** Connect the Power/Interface cable to the table power supply.

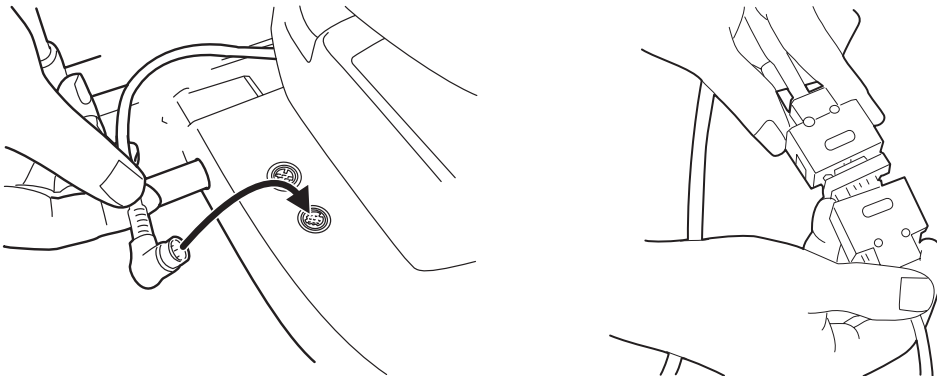


CONNECTING THE INTERFACE CABLE TO PHOTO POWER SUPPLY FD-21

- 1** When connecting the photo power supply FD-21, connect the extension cable to the Power/Interface cable, and connect the connector of the opposite side to the OUT terminal of FD-21.



- 2** Connect the cable (SL-DCABLE2) from the IN terminal of FD-21 to the cable (SL-DCABLE1) for the slit lamp base.



CONNECTING TO THE PERSONAL COMPUTER



Use a personal computer which conforms to UL 60950/UL 60950-1 or IEC 60950/IEC 60950-1.

DC-3 must be connected to a personal computer to perform equipment operations and image controls.

To operate DC-3 and capture images with a P.C., IMAGEnet software (optional accessory) needs to be installed.

BASIC OPERATIONS

WHEN ONLY THE SLIT LAMP IS CONNECTED:


- 1** Install the USB cable and the power/interface cable, which are the accessories, to the main unit.
- 2** Install the main unit to the slit lamp.
- 3** Connect the USB cable to the commercial personal computer.
- 4** Connect the power/interface cable to the base unit and power unit of the slit lamp.
- 5** Turn on the power switch of the slit lamp.
- 6** Turn on the start switch of the main unit and make sure that the power lamp is ON.
- 7** Turn on the power of the personal computer.
- 8** Start the software installed to the personal computer and set the photography functions.
- 9** When you have decided the part to be photographed, press the photography switch of the slit lamp to take a picture.
- 10** After taking the required pictures, operate the personal computer to store the images.
- 11** Turn off the start switch of the main unit.
- 12** Turn off the power switch of the slit lamp.
- 13** Turn off the power of the personal computer.

WHEN THE SLIT LAMP AND ITS ACCESSORY (PHOTOGRAPHY DEVICE) ARE CONNECTED:

- 1** Install the USB cable and power/interface cable (FD type), which are accessories, to the main unit.
 - 2** Install the main unit to the slit lamp.
 - 3** Connect the USB cable to the commercial personal computer.
 - 4** Connect the power/interface cable (FD type) to the power unit of the slit lamp. Connect another terminal to the extension cable. Connect the extension cable to the photography device (photography power supply).
(Sometimes the extension cable is not used because of the arrangement.)
 - 5** Turn on the power switches of the slit lamp and photography device.
 - 6** Turn on the start switch of the main unit and make sure that the power lamp is ON.
 - 7** Turn on the power of the personal computer.
 - 8** Start the software installed to the personal computer and set the photography functions.
 - 9** When you have decided the part to be photographed, press the photography switch of the slit lamp to take a picture.
 - 10** After taking the required pictures, operate the personal computer to store the images.
 - 11** Turn off the start switch of the main unit.
 - 12** Turn off the power switches of the slit lamp and photography device.
 - 13** Turn off the power of the personal computer.
- For the methods for operating the slit lamp, the personal computer, Microsoft Windows® and special software (optional accessory), refer to the instruction manual of each device.

TROUBLESHOOTING

TROUBLESHOOTING GUIDE

 WARNING	To avoid electric shocks, do not attempt disassembling, rebuilding or repairing.
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When a trouble is suspected, check the condition following the check list below.
If remedies following the instructions cannot restore the normal condition, or if the problem does not fall on any of the conditions in the check list, contact your dealer or TOPCON (see the back cover).

Trouble	Typical condition	Check	Page
Does not work	Power is not turned on.	Connect power cable to slit lamp power supply. Power on slit lamp and the start switch of DC-3.	8, 10

SPECIFICATIONS AND PERFORMANCE

SPECIFICATIONS AND PERFORMANCE

BASIC SPECIFICATION

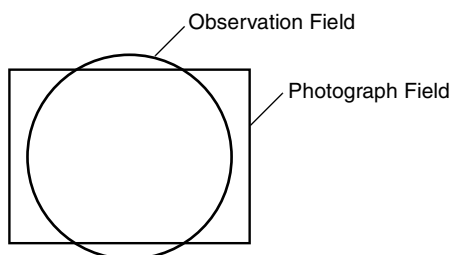
System	Beam flux division by beam splitter
Beam splitter division ratio	Patient side: 50%; Camera side: 50%
Focus distance	45.50mm
Image pickup device	1/1.8 type CCD; Effective pixel number: 8.13 million pixels
Power input	DC12V±0.5V 1A
Dimensions	71mm(W)×183mm(D)×302mm(H)
Weight	640g

OPTICAL PERFORMANCE

Picture magnification (SL-D7)

Displayed magnification	Picture magnification	Picture field (mm)
6	0.17	31.8×42.3
10	0.27	20.4×27.2
16	0.43	12.7×17.0
25	0.69	7.97×10.6
40	1.07	5.10×6.81

OBSERVATION FIELD AND PHOTOGRAPH FIELD



Observation Field: $\phi 6.03\text{mm}$
Photograph Field: $7.28 \times 5.46\text{mm}$

- For product improvements, the specification and design are subject to changes without prior notice.

ELECTRIC RATING

- Source voltage: 12V DC
- Power input : 12W

SPECIFICATIONS OF PERSONAL COMPUTER (COMMERCIAL PRODUCT) TO BE CONNECTED

- Platform : DOS/V PC
- CPU : Pentium 4 or higher
- Memory : 2GB or larger
- Hard disk : 40GB or larger
- OS : Windows XP Professional
- Connecting interface : USB 2.0

SYSTEM CLASSIFICATION

- Grade of protection against electric shocks: not applicable.
DC-3 does not have any part against electric shocks.
- Degree of protection against harmful ingress of water: IPx0
DC-3 has no protection against ingress of water. (The degree of protection against harmful ingress of water defined in IEC 60529 is IPx0)
- Classification according to the methods of sterilization or disinfection recommended by the manufacturer: not applicable.
DC-3 has no part to be sterilized or be disinfected.
- Methods of sterilization or disinfection recommended by the manufacturer: DC-3 does not have any part to be sterilized or disinfected.
- Classification according to the degree of safety of application in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide: Equipment not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide.
DC-3 should be used in environments where no flammable anesthetics and/or flammable gases are present.
- Classification according to the mode of operation: Continuous operation.
- Continuous operation is the operation under normal load for an unlimited period, without the specified limits of temperature being exceeded.



PURPOSE OF USE

- This instrument is used for acquiring digital images of the anterior and posterior segments of the eye.

OPERATION PRINCIPLES

- This instrument is used in combination with a slit lamp and used to take digital pictures and records of the observed images.

SYMBOL

Symbol	IEC Publication	Description	Description (French)
	60417-5265	Off (power: part of equipment)	Mise en service d'une partie d'appareil
	60417-5264	On (power: part of equipment)	Mise hors service d'une partie d'appareil

MAINTENANCE


DAILY CHECKUPS

CLEANING THE INSTRUMENT

- When the cover and operation panel become stained, clean them with a dry soft cloth. Do not use benzine, thinner or a chemical duster.

DAILY CARE

Protect instrument from dust. When not in use, protect it with the attached dust cover.

When not in use, turn OFF() the start switch.

CLEANING THE COVER

NOTICE	To prevent the instrument body from discoloring and deterioration, do not use volatile solvents for cleaning, including benzine, thinner, ether, gasoline, etc.
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- 1** When the cover and operation panel become stained, clean them with a dry soft cloth.
- 2** If the cover is badly stained, prepare a lukewarm solution of neutral detergent for dish, moisten the cloth and thoroughly wring it. Wipe the cover with this cloth.



If stains are persistent and cannot easily be removed, contact your dealer or TOPCON (see the back cover).

DISPOSAL OF THE PRODUCT

NOTICE	When disposing the instrument, either ask a professional waster disposer, or contact your dealer or TOPCON (see the back cover).
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When calling for service please provide us the following information about your unit:

- Instrument type: DC-3
- Serial number (Shown on the rating plate on the right side of the body.)
- Period of Usage (Please give us the date of purchase).
- Description of Problem (as detailed as possible).

DIGITAL CAMERA UNIT DC-3

INSTRUCTION MANUAL

Version of 2007 (2007.09-100TH[®])

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DIGITAL CAMERA UNIT

DC-3

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