

INSTRUCTION MANUAL DIGITAL CAMERA UNIT

DC-4

INTRODUCTION

Thank you for purchasing the DIGITAL CAMERA UNIT DC-4.

INTENDED USE / INDICATIONS FOR USE

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

FEATURES

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
 - Infrared photography in combination with the BACKGROUND ILLUMINATION BG-5(optional accessory)
-

PURPOSE OF THIS MANUAL

To get the best usage from the instrument, please read "DISPLAYS FOR SAFE USE" and "GENERAL SAFETY INFORMATION".

Keep this Manual with the instrument for future reference.



- This manual does not cover the methods for operating a 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 the capturing software, refer to the instruction manual of each device.
 - TOPCON shall not bear any responsibility for any effect as a result of using the capturing software and User Manual.
 - Clinical treatment actions shall be the responsibility of the doctor. TOPCON shall not bear any responsibility for the result of such diagnoses.
 - Contents of the capturing software and the User Manual are subject to future changes without prior notice.
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Microsoft and Windows are the registered trademarks of the Microsoft Corporation.

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1. No part of this manual may be copied or reprinted, in whole or in part, without prior written permission.
 2. The contents of this manual are subject to change without prior notice and without legal obligation.
 3. The contents of this manual are correct to the best of our knowledge. Please inform us of any ambiguous or erroneous descriptions, missing information, etc.
 4. Original Instructions
This instruction manual was originally written in English.
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CONTENTS

INTRODUCTION	1
INTENDED USE / INDICATIONS FOR USE	1
FEATURES	1
PURPOSE OF THIS MANUAL	1
GENERAL SAFETY INFORMATION	4
GENERAL MAINTENANCE INFORMATION	5
DISCLAIMERS	5
DISPLAYS AND SYMBOLS FOR SAFE USE	6
CONFIGURATION	7
NAME OF PARTS	7
STANDARD ACCESSORIES	8
ASSEMBLY PROCEDURE	9
WIRING CABLES	9
MOUNTING THE BODY	12
OPERATION PROCEDURE	13
BASIC OPERATIONS	13
OPERATING THE IR SELECTOR LEVER	13
MAINTENANCE	14
DAILY CHECKUPS	14
CLEANING THE COVER	14
TROUBLESHOOTING	15
TROUBLESHOOTING GUIDE	15
SPECIFICATIONS AND PERFORMANCE	16
SPECIFICATIONS AND PERFORMANCE	16
PATIENT'S ENVIRONMENT	17
SPECIFICATIONS OF PERSONAL COMPUTER (COMMERCIAL PRODUCT) TO BE CONNECTED	18
SPECIFICATIONS OF THE INSULATION TRANSFORMER (COMMERCIAL PRODUCT) TO BE CONNECTED	18
GENERAL INFORMATION ON USAGE AND MAINTENANCE	19
INTENDED PATIENT POPULATION	19
INTENDED USER PROFILE	19
ENVIRONMENTAL CONDITIONS FOR USE	19
STORAGE, USAGE PERIOD	19
ENVIRONMENTAL CONDITIONS FOR PACKAGING IN STORAGE	20
ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTAION	20
ELECTRIC RATING	20
DIMENSIONS AND WEIGHT	20
SYSTEM CLASSIFICATION	20
OPERATION PRINCIPLES	20
DISPOSAL	21
OPTIONAL ACCESSORIES	21
ADAPT COVER SO-AC6, 7	21

GENERAL SAFETY INFORMATION



WARNINGS

Preventing Electric Shock and Fire

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 be exposed to 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.



CAUTIONS

Ensuring the Safety of Patients and Operators

To avoid injury, install the instrument on a flat level surface.

Preventing Electric Shock and Fire

To avoid electric shocks, do not touch the power plug with wet hands.

Electromagnetic Compatibility (EMC)

This instrument has been tested (with 100/120/230V) and found to comply with IEC60601-1-2 Ed.3.0: 2007 as class B (classified according to CISPR11).

This instrument radiates radio frequency energy within standard and may affect other devices in the vicinity.

If you have discovered that turning on/off the instrument affects other devices, we recommend you change its position, keep a proper distance from other devices, or plug it into a different outlet.

Please consult your authorized dealer if you have any additional questions.

GENERAL MAINTENANCE INFORMATION

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.





DISCLAIMERS

- TOPCON is not responsible for damage due to fire, earthquakes, actions or inactions of third persons or other accidents, or damage due to negligence and misuse by the user and any use under unusual conditions.
- TOPCON is not responsible for damage derived from inability to properly use this equipment, such as loss of business profits and suspension of business.
- TOPCON is not responsible for damage caused by operations other than those described in this user manual.
- The device does not provide a diagnose of any condition or lack thereof or any recommendation for appropriate treatment. The relevant healthcare provider is fully responsible for all diagnosis and treatment decisions and recommendations.

DISPLAYS AND SYMBOLS FOR SAFE USE

To encourage safe and proper use and to prevent injury to the operator and others or potential damage to property, important messages are put on the instrument body and inserted in the instruction manual. We suggest that everyone understand the meaning of the following displays, icons and text before reading the "GENERAL SAFETY INFORMATION" and observe all listed instructions.

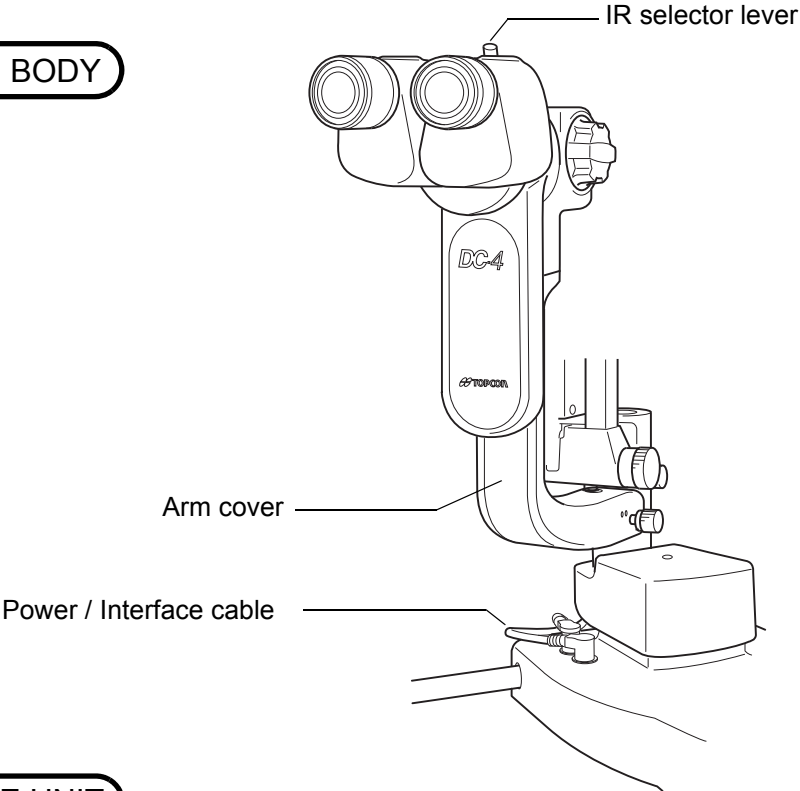
DISPLAYS

Display	Meaning
 CONTRAINDICATIONS	Situations in which the device should not be used because the risk of use clearly outweighs any possible benefit.
 WARNINGS	Incorrect handling by ignoring this display may lead to a risk of death or serious injury.
 CAUTIONS	Incorrect handling by ignoring this display may lead to personal injury or physical damage.
 NOTES	Useful functions to know. Paying attention to these will prevent the noted problems.

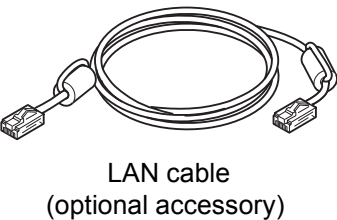
CONFIGURATION

NAME OF PARTS

MAIN BODY



CABLE UNIT

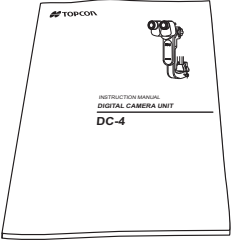
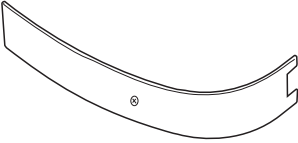
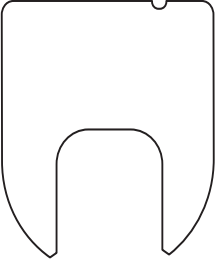
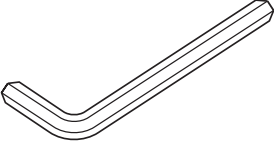

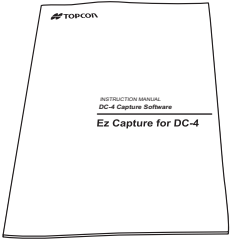
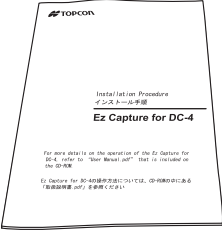


NOTE

If you use other cables besides the supplied LAN cable, which is an optional accessory, a communication issue or improper connection may occur. Be sure to use the supplied LAN cable only.

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>Arm cover (1)</p> 	<p>Rear seal (1)</p> 
<p>Hexagon wrench (1)</p> 	<p>Capturing software (Ez Capture for DC-4) DVD (1)</p> 	<p>Capturing software (Ez Capture for DC-4) Instruction Manual (1)</p> 
<p>Capturing software (Ez Capture for DC-4) Installation procedure(1)</p> 		

ASSEMBLY PROCEDURE

Tools

A 3mm crosshead screwdriver is required.

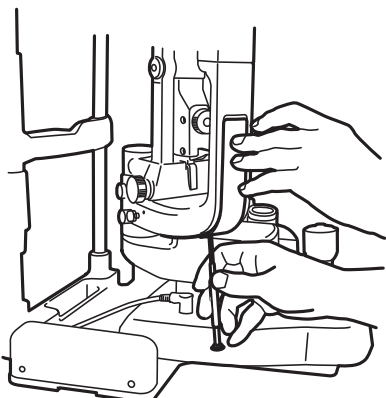
WIRING CABLES



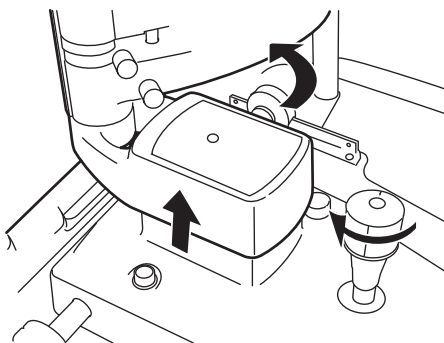
CAUTION

- Turn off the power switch of the slit lamp, before connecting the cables.
- To prevent short-circuiting, connect the cables correctly.

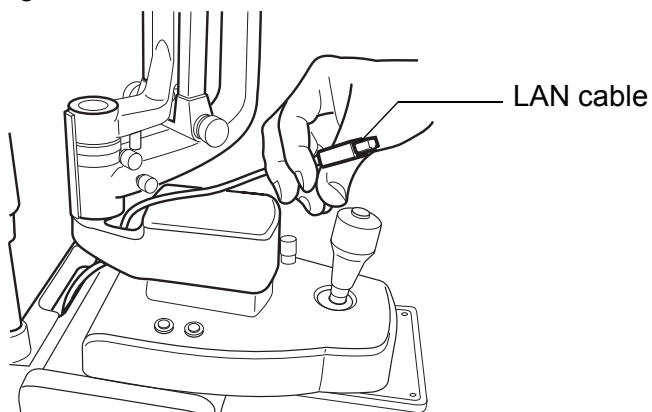
- 1** Using a crosshead screwdriver, remove the arm cover of the slit lamp.



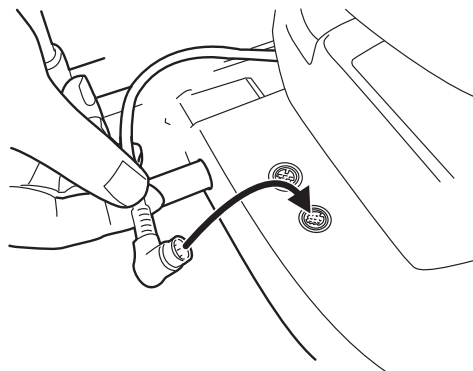
- 2** Turn the control lever of the slit lamp and bring the arm to the top. Turn the arm to the side so that the holes of the base can be seen.



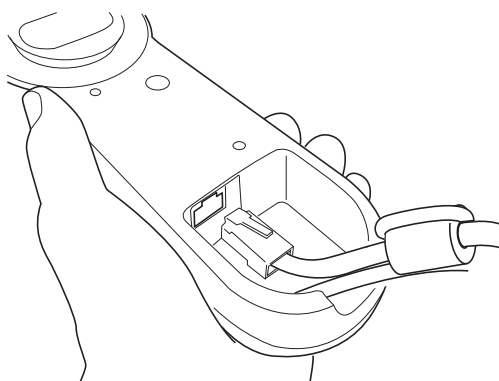
- 3** Pass the LAN cable through the holes of the chinrest and base of the slit lamp.



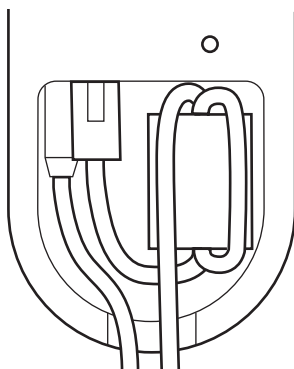
- 4** Pass the Power/Interface cable through the holes of the base of the slit lamp. Connect the Power/Interface cable to the base of the slit lamp.



- 5** Connect the LAN cable to the body.

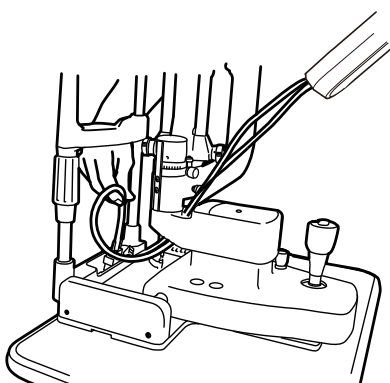


- 6** Fold the cable as follows.



NOTES

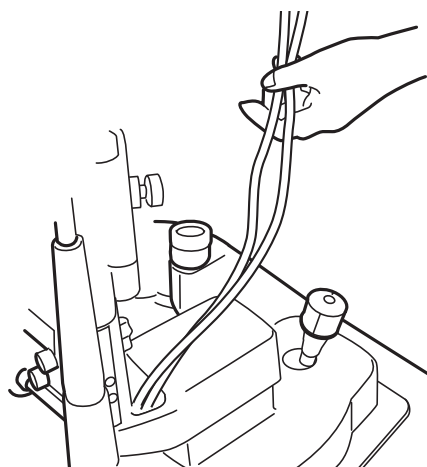
Do not pull the cables, as they may be damaged.



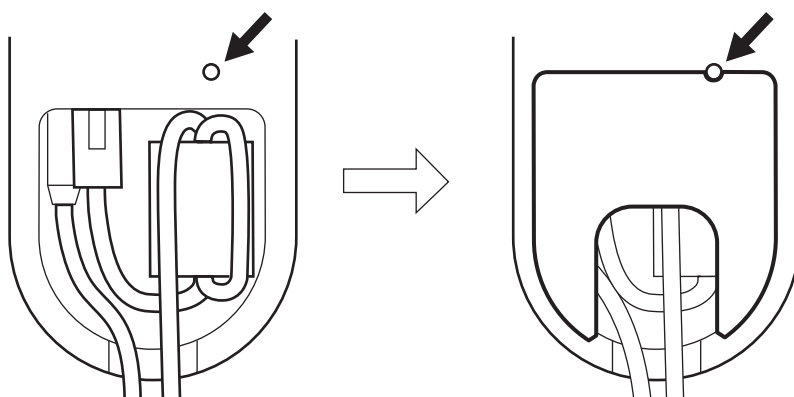


NOTES

Remove kinks so that the cables are not twisted.



7 Put the rear seal on as indicated by the arrow.



8 Connect the LAN cable to a personal computer.



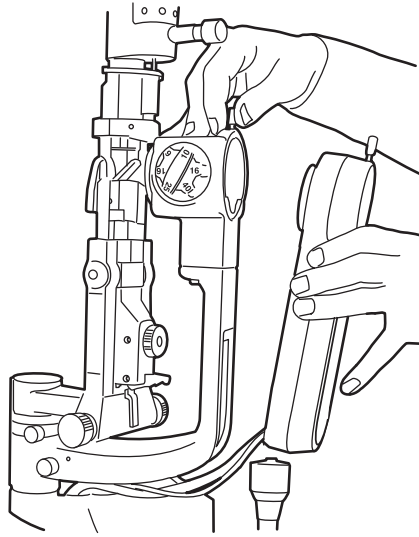
NOTES

- The DC-4 must be connected to a personal computer to perform equipment operation and image control.
- To operate the DC-4 and capture images with a PC, capturing software needs to be installed.

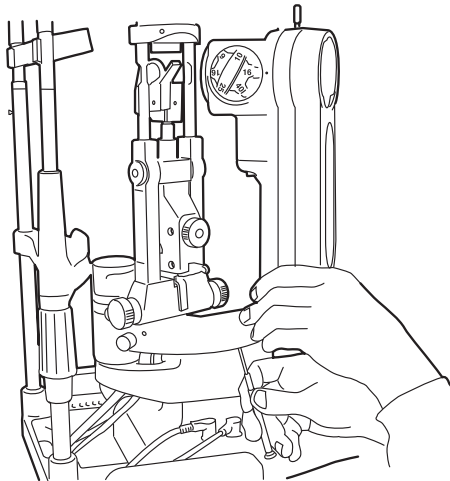
MOUNTING THE BODY

When necessary, attach the adapter cover SO-AC6,SO-AC7(optional accessory).

- 1** Screw down the body to the microscope mount.

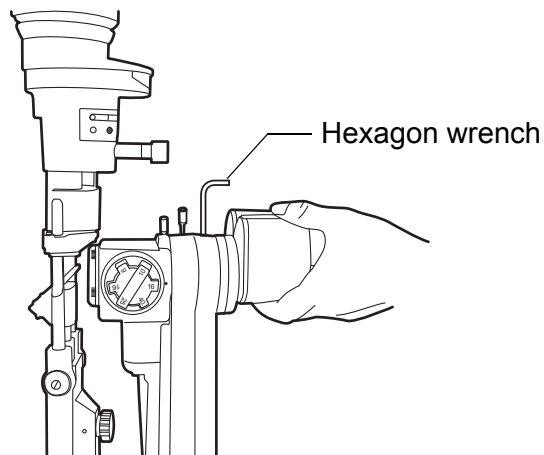


- 2** Insert the arm cover into the arm from underneath, taking care not to catch the cables. Fasten the screws.



- 3** Unkink cables under the table. Move the base to the left end and lock it. Fix the 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 a hexagon wrench.



OPERATION PROCEDURE

BASIC OPERATIONS

- 1** Turn on the power switch of the slit lamp.
 - 2** Turn on the power of the personal computer.
 - 3** Start the capturing software installed to the personal computer and set the photography functions.
 - 4** Once you selected the area to photograph, press the photo switch on the top of the slit lamp control lever.
 - 5** After completing the photography session, save the images using the save function in the computer software.
 - 6** Turn off the power switch of the slit lamp.
 - 7** Turn off the power of the personal computer.
- For the methods for operating the slit lamp, the personal computer, Microsoft Windows® and the capturing software, refer to the instruction manual of each device.

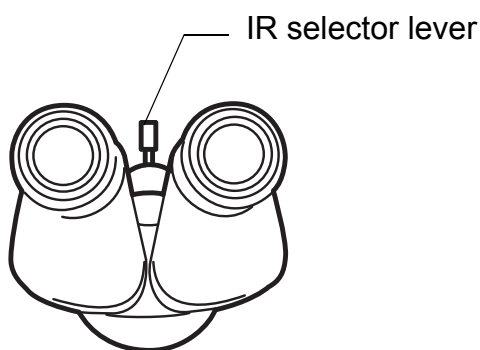
OPERATING THE IR SELECTOR LEVER



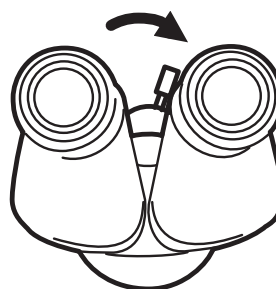
NOTE

The DC-4 can take infrared light photographs in combination with the BACKGROUND ILLUMINATION BG-5(optional accessory).

When you take infrared photographs, tilt the IR selector lever to the right.



Visible light photography



Infrared light photography



NOTE

To avoid photographing the reflection of the BG-5's infrared LED, turn off the BG-5's infrared LED when performing photography with the DC-4 Digital Camera (optional accessory) with a visible light source.

MAINTENANCE

DAILY CHECKUPS

CLEANING THE INSTRUMENT

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

DAILY CARE

- Protect the instrument from dust. When not in use, cover the instrument with the dust cover included with the accessories.

CLEANING THE COVER



NOTE

- To prevent the instrument body from discoloring and deterioration, do not use volatile solvents for cleaning, including benzine, thinner, ether, gasoline, etc.
- If stains are persistent and cannot easily be removed, contact your dealer or TOPCON (see the back cover).

- 1** When the cover become stained, clean it with a dry soft cloth.
- 2** If the cover is badly stained, prepare a lukewarm solution of neutral dishwashing detergent, moisten the cloth and thoroughly wring it. Wipe the cover with this cloth.

TROUBLESHOOTING

TROUBLESHOOTING GUIDE



WARNING

To avoid electric shock, do not attempt disassembling, rebuilding or repairing.

When a problem is suspected, check the condition following the checklist below. If remedies following the instructions cannot restore the instrument to normal operating condition, or if the problem does not fall into any of the categories listed below, contact your dealer or TOPCON (see the back cover).

Check List

Problem	Possible cause	Check	Page
Does not work	Power is not turned on.	Connect power / interface cable to the slit lamp. Power on the slit lamp.	10,13

SPECIFICATIONS AND PERFORMANCE

SPECIFICATIONS AND PERFORMANCE

For product improvements, the specifications and design are subject to change without prior notice.

BASIC SPECIFICATIONS

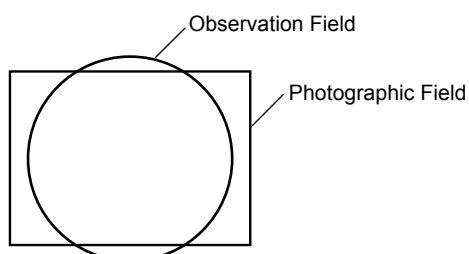
System	Beam flux division by beam splitter
Beam splitter division ratio	Operator side: 50%; Camera side: 50%
Focus distance	35.7mm
Image pickup device	1/2.5 type CMOS; Effective pixel number: 5.04 million pixels
Power input	DC12V 2.4W
Dimensions	76mm(W)×163mm(D)×304mm(H)
Weight	430g

OPTICAL PERFORMANCE

Picture magnification (SL-D7, SL-D4)

Displayed magnification	Picture magnification	Picture field (mm)
6	0.135	31.8×42.3
10	0.211	20.4×27.2
16	0.336	12.7×17.0
25	0.537	7.97×10.6
40	0.839	5.10×6.81

OBSERVATION FIELD AND PHOTOGRAPHIC FIELD

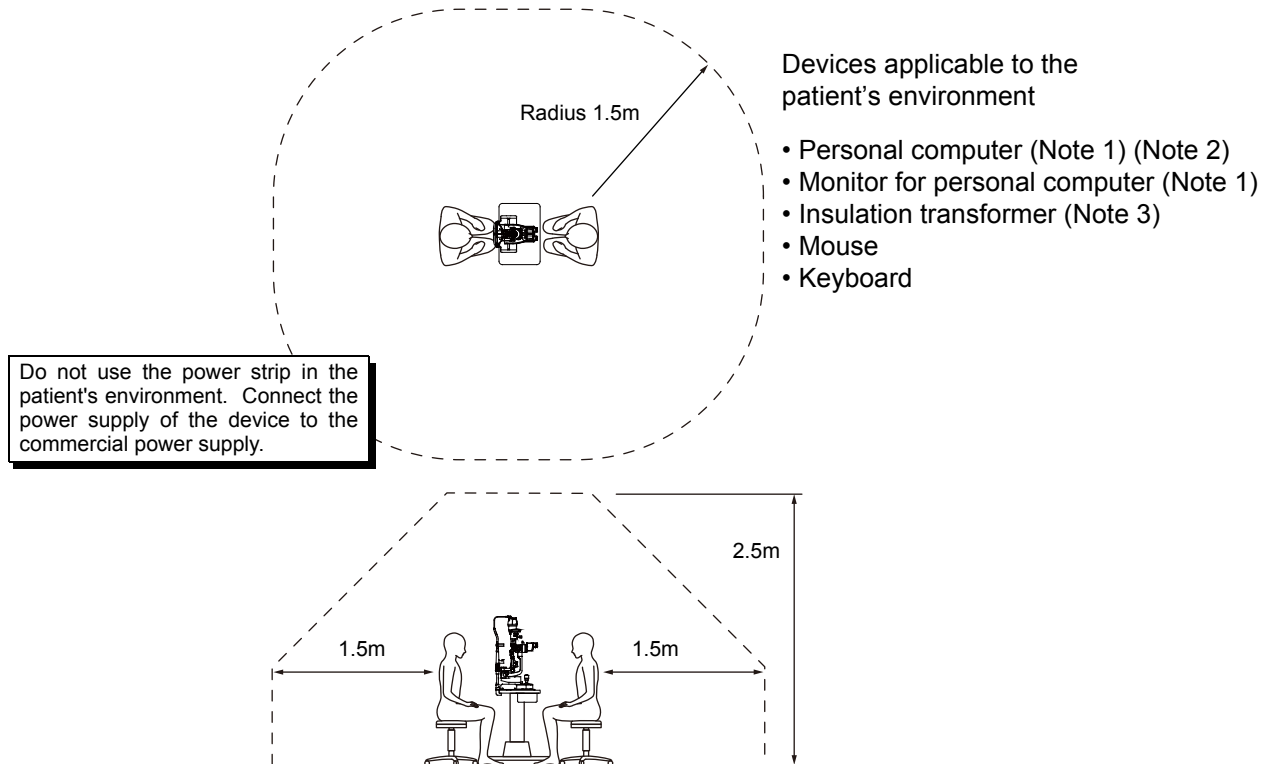


Observation Field: $\phi 4.72\text{mm}$
Photographic Field: $5.70 \times 4.28\text{mm}$

PATIENT'S ENVIRONMENT

When the patient or inspector comes into contact with the devices (including the connecting devices) or when the patient or inspector is in contact with the person that touches the devices (including the connecting devices), the patient's environment is shown below.

In the patient's environment, use devices conforming to IEC60601-1. If you are compelled to use any device not conforming to IEC60601-1, use an insulation transformer or the common protective earth system.



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

Note 2: Don't remove the cover from the personal computer.

Note 3: Use an isolation transformer conforming to IEC 60601-1 for the power supply of a PC.

CAUTION

- Don't connect an additional power strip or an extension cord to the system.
- Don't connect any device which is not recognized as one component of the system.
- The total 1kVA is the maximum allowable load of the auxiliary power supply socket for the insulation transformer, which is provided for the system. Don't connect the device exceeding this capacity.
- Use the auxiliary power supply socket of the insulation transformer to power only a device that will be a component of the system.
- It is dangerous to connect any device which is not used as a component of the system, to the insulation transformer.
- When the insulation transformer is not used, the personal computer and the monitor for the personal computer must be installed out of the patient's environment.

SPECIFICATIONS OF PERSONAL COMPUTER (COMMERCIAL PRODUCT) TO BE CONNECTED

Platform	Compatible (DOS/V) machine for IBM/PC AT
Computer	A computer where Microsoft Windows 7 Professional can operate
OS	Microsoft Windows 7 Professional 32bit (Japanese/English) Microsoft Windows 7 Professional 64bit (Japanese/English)
CPU	Intel Core i3-2100 3.10GHz or higher speed CPU
Memory	4GB or more
Monitor	A monitor that can be used by Microsoft Windows 7 Professional A full-color monitor with resolution 1280×1024 or more
Display adapter	Applicable to DirectX 9.0. A display adapter equipped with the standard specifications conforming to the operating conditions of Microsoft Windows 7 Professional, or with higher-grade specifications
Hard disk	A hard disk with higher speed than SATA 3.0Gb/s NCQ HDD (7200 revolutions) Free capacity: 40GB or more
Others	Gigabit Ethernet port: 1 or more The product applicable to Jumbo Frame is recommended.

SPECIFICATIONS OF THE INSULATION TRANSFORMER (COMMERCIAL PRODUCT) TO BE CONNECTED

Item	Spec.
Input voltage	AC100V/110V/120V (for the 100V system area) AC220V/230V/240V (for the 200V system area)
Frequency	50Hz/60Hz
Phase	Single phase
Secondary capacity	1k VA
Others	IEC60601-1

GENERAL INFORMATION ON USAGE AND MAINTENANCE

INTENDED PATIENT POPULATION

The patient who undergoes an examination by this instrument must maintain concentration for a few minutes and adhere to the following instructions:

Affix their face to the chinrest and forehead rest.

Keep their eyes open.

Understand and follow instructions when undergoing an examination.

INTENDED USER PROFILE

The DIGITAL CAMERA DC-4 is an electric instrument for medical use.

Use this instrument under a doctor's guidance.

ENVIRONMENTAL CONDITIONS FOR USE

Temperature : 10°C to 40°C

Humidity : 30% to 90% (non-condensing)

Air pressure : 700hPa to 1060hPa

STORAGE, USAGE PERIOD

1. Storage (without wrapping (without package))

* Temperature : 10°C to 40°C

Humidity : 10% to 95% (without dew condensation)

Air pressure : 700hPa to 1060hPa

* THIS INSTRUMENT DOES NOT MEET THE TEMPERATURE REQUIREMENTS OF ISO 15004-1 FOR STORAGE. DO NOT STORE THIS INSTRUMENT IN CONDITIONS WHERE THE TEMPERATURE MAY RISE ABOVE 40°C OR FALL BELOW 10°C.

2. When storing the instrument, ensure that the following conditions are met:

(1) The instrument must not be splashed with water.

(2) Do not store the instrument in an environment where air pressure, temperature, humidity, ventilation, sunlight, dust, salty/sulfurous air, etc. could cause damage.

(3) Do not store or transport the instrument on a slanted or uneven surface or in an area where it is subject to vibrations or instability.

(4) Do not store the instrument where chemicals are stored or gas is generated.

3. Normal life span of the instrument:

8 years from delivery providing regular maintenance is performed (according to the self-certification [TOPCON data])

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN STORAGE

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

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTATION

Temperature : -40°C to 70°C
Humidity : 10% to 95%

ELECTRIC RATING

Source voltage : DC 12V
Power input : 2.4W

DIMENSIONS AND WEIGHT

Dimension : 76mm(w) x163mm(D)x304mm(H)
Weight : 430g

SYSTEM CLASSIFICATION

- Grade of protection against electric shock: not applicable.
The DC-4 does not have any protection against electric shock.
- Degree of protection against harmful ingress of water: IPx0
The DC-4 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.
The DC-4 has no part to be sterilized or be disinfected.
- Methods of sterilization or disinfection recommended by the manufacturer: The DC-4 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.
The DC-4 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.

OPERATION PRINCIPLES

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

DISPOSAL

When disposing of the instrument, either ask a professional waste disposer, or contact your dealer or TOPCON (see the back cover).



NOTES



This symbol is applicable for EU member countries only.
To avoid potential damage to the environment and possibly human health, this instrument should be disposed of (i) for EU member countries - in accordance with WEEE (Directive on Waste Electrical and Electronic Equipment), or (ii) for all other countries, in accordance with local disposal and recycling laws.

OPTIONAL ACCESSORIES

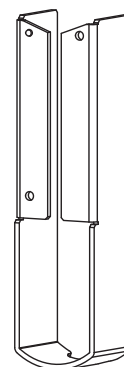
ADAPT COVER SO-AC6, 7

FEATURES

Used to cover the gaps with the microscope arm and hide cables when attaching the digital camera unit DC-4.

SO-AC6: For SL-D701 + DC-4 + barrier filter

SO-AC7: For SL-D701 + DC-4 +SO-DF01



Please provide the following information when contacting us regarding questions about this instrument:

- Model name: DC-4
 - Serial No.: This is printed on the rating nameplate on the right side of the power supply unit.
 - Period of use: Please inform us of the date of purchase.
 - Defective condition: Please provide us with as much detail as possible on the problem.
-

DIGITAL CAMERA UNIT DC-4

INSTRUCTION MANUAL

The 2013 version (2013.08-100TH®)

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DIGITAL CAMERA UNIT

DC-4

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