# Instructions SZ2-CLS Light guide illuminator system

This instruction manual is for the Olympus light guide illuminator system. To ensure the safety, obtain optimum performance and to familiarize yourself fully with the use of this system, we recommend that you study this manual thoroughly before operating this system, and always keep this manual at hand when operating this system. Retain this instruction manual in an easily accessible place near the work desk for future reference. For details of products included in the configuration of this system, see page 6.

Optical microscope accessory

**NOTE**: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### For Korea only

B급 기기 (가정용 방송통신기자재) 이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

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# Safety precautions

If this system is used in a manner not specified in this manual, the safety of the user may be imperiled. In addition, the product may also be damaged. Always use the equipment according to this instruction manual.

Following symbols are used in this instruction manual.
 CAUTION : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTE : Indicates a potentially hazardous situation which, if not avoided, may result in damage to the equipment or other property.
 TIP : Indicates commentary (for ease of operation and maintenance).

# Compact light guide illuminator SZ2-CLS

# ▲ CAUTION - Installation of the device -

#### Install this device on a sturdy, level table or bench.

For safety in particular, do not place a mat, etc. under the device.

#### Secure the space for releasing heat.

Secure the space around this device to release heat. (Back: 10 cm or more; Side: 5 cm or more; Top: Open)

# AUTION - Electric safety -

#### Always use the AC adapter and the power cord provided by Olympus.

Do not use the device in close proximity to the sources of strong electromagnetic radiation. Proper operation may be interfered. The electromagnetic environment should be evaluated prior to operation of the device.

#### Always connect the ground terminal.

Connect the ground terminal of the power cord and that of the power outlet. If the device is not grounded, our intended electric safety performance of the device can not be assured.

#### Remove the power cord in case of emergency.

If you want to stop supplying the power in case of emergency, set the main switch to OFF or disconnect the power cord plug of the AC adapter from the power outlet.

# ▲ CAUTION - Protection for electric shock -

#### Do not bend, pull or tie the power cord in a bundle.

Otherwise they could be damaged, causing a fire or an electric shock.

# A CAUTION - Prevention of fire -

Do not cover up the light guide port.

Never cover up the light guide port. The fire may be caused.

# A CAUTION - Protection for burn -

#### Do not cover up the light guide port.

Never cover up the light guide port with your hands or other parts of the body. You may get burned.

# ▲ CAUTION - LED (light emitting diode) -

#### Do not look directly at the light from the light guide port.

Do not look directly at the light emitted from the light guide port. Your eyes may be injured.

#### It is not allowed to replace LED.

You are not allowed to replace LED. Do not disassemble this device.

#### Do not move this device while LED is turned ON.

Do not carry this device or vibrate it while LED is turned ON. LED may be deteriorated or damaged, or this device may be damaged.

# A CAUTION - Protection for injury -

#### Remove the attachable units before carrying the illuminator.

Remove the attachable units, e.g. light guide or AC adapter, etc. before carrying the illuminator, and then remove the illuminator from the microscope.

If you move the illuminator keeping the attachable units attached, units may be dropped and you may stumble or fall down, etc. to cause injuries.

#### When using this device, be careful not to drop the device from the table.

When using this device, be careful not to drop the device from the table. If it drops on your feet, you may get injured.

# Light guide

# A CAUTION - Prevention of fire -

#### Do not cover up the emission exit.

Never cover up the emission exit of the light guide. If the emission exit is covered up, the fire may be caused.

#### Keep the emission exit away from the flammable objects.

To prevent fire, ensure the sufficiently safe distance (at least 10 cm) between the emission exit of the light guide and the heat-sensitive or flammable objects.

## A CAUTION - Protection for eyes -

#### Do not look directly at the light from the light guide for a long time.

Do not directly look at the light from the light guide for a long time. It may cause damage to your eyes.

#### Use the light guide provided by Olympus.

If you use the light guides other than those provided by Olympus in combination with this system, you may get burned or your eyes may be injured.

## A CAUTION - Protection for burn -

#### Do not cover up the emission exit.

Never cover up the light guide port with your hands or other parts of the body. You may get burned.

#### Do no touch the input end of the fiber.

Be careful that the input end of the fiber of the light guide immediately after use is heated.

This product is categorized as Risk Group 2 defined in IEC/EN 62471 "Photobiological Safety of Lamps and Lamp Systems".



Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eyes.

The use of this product in combination with systems that are not listed in the table shown below cannot be guaranteed. If you wish to use this product in combination with systems that are not listed in this table, take measures under your responsibility so that the use of this product in combination with systems you will use complies with standards required in your local area.

System	Microscope frame
SZX7	SZX-ZB7
SZ61	SZ61, SZ61-60, SZ61TR
SZ51	SZ51, SZ51-60

# ▲ CAUTION - Protection for injury -

#### Do not pull the light guide with an excessive force.

If you pull the light guide with an excessive force, the light guide may be damaged and your fingers, etc. may be injured.

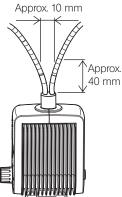
#### Be careful not to open the light guides too widely.

If you are using the dual light guides, be careful not to open the light guides too widely. If light guides are opened too widely, the base area of light guides may be damaged and your fingers, etc. may be injured.

Guide for open width of the light guides: 10 mm or less at the position of approx. 40 mm from the base as shown in the picture.

#### Attach the collector lens securely.

When attaching the collector lens at the end of the light guide, secure it firmly. If the collector lens is come off and dropped, the lens may be damaged and your fingers, etc. may be injured.



# Safety symbols

The following symbols are attached to the system.

Study the meaning of the symbols and always use the equipment in the safest possible manner.

Symbol	Meaning
	Indicates a non-specific general hazard. Follow the description given after this symbol
	or in the instruction manual.
Ċ	Turns ON/OFF the main switch.

# Handling precautions

- NOTE This instruction manual describes the procedures to use the light guide illuminator system. Read the instruction manual of the SZ2 series microscope or related options as well to understand the use procedures comprehensively.
  - This system is a precision instrument. Handle it with care and avoid subjecting it to a sudden or severe impact.
  - For information about the configuration of devices required by this system and devices that can be used in combination with it, see "1 System diagram" (page 6).
     Note that use of this product in combination with options other than "1 System diagram" and separately available items not only creates the risk of abnormal operation, it also can damage the product.
  - Never disassemble any part of the system. Otherwise, failure could be caused.
  - To prevent the light guide fiber from breaking (to avoid decreasing the light intensity), use the light guide in the area where the bending radius is 60 mm or more for the interlock tube or 25 mm or more for the flexible tube (60 mm for SZ2-CLGR only).
  - When bending the light guide, do not twist it as much as possible. The life of the light guide may be shortened.
  - Twisting the interlock light guide in the counterclockwise direction does not adjust its bending strength. (The light guide may be damaged.)
  - Do not use this system in areas where it may be subjected to direct sunlight, high temperature and/ or humidity, dust or vibrations. (For the operating environmental condition such as temperature and/or humidity, see "5 Specifications" (page 15).
  - The guide for the life of this system is 8 years.
  - Before disposing this system, follow the regulations and rules of your local government.

## Maintenance and storage

 Do not leave stains or fingerprints on the lenses. If they get dirty, blow away dust with a commercially available blower and gently wipe the lens or filter with a piece of cleaning paper (or clean gauze).

For cleaning fingerprints and oil stains, slightly moisten a piece of cleaning paper with commercially available absolute alcohol and wipe them off with it.

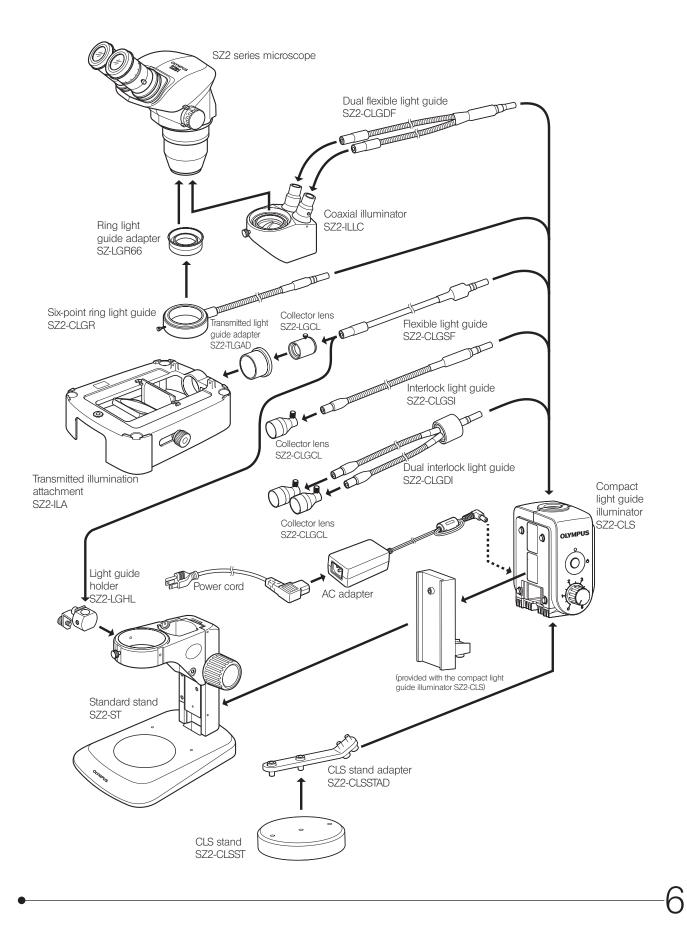
N Since the absolute alcohol is highly flammable, it must be handled carefully. Be sure to keep it away from open flames or potential sources of electrical sparks – for example, electrical equipment that is being switched on or off, which could cause ignition of a fire. Also, remember to always use absolute alcohol only in a well-ventilated room.

2. To clean the device components other than glass components, wipe them with a clean cloth. If components get too dirty, wipe them using a soft cloth slightly moistened with a diluted neutral detergent.

#### NOTE ) Do not use organic solvents, which cause painted and plastic parts to deteriorate.

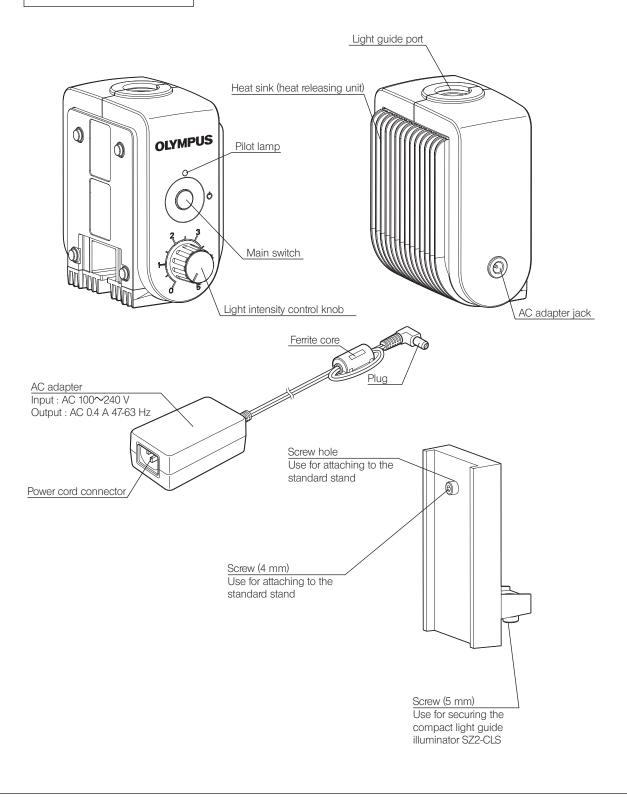
- 3. Never disassemble any part of the product. Otherwise, the performance could be deteriorated.
- 4. If you do not use this system for a long time period, disconnect the power cord plug of the AC adapter from the power outlet.

# System diagram

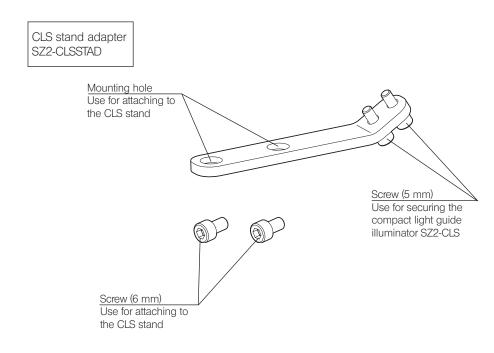


# 2 Nomenclature of units

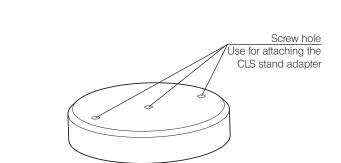
Compact light guide illuminator SZ2-CLS



8



CLS stand SZ2-CLSST



# **S** Assembly



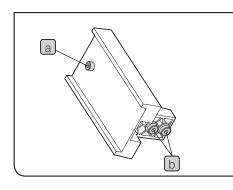
Consult the system diagram and confirm the mounting positions of the units.



Before assembly, remove dirt and dust from the mounting units and assemble them carefully so as not to damage them.

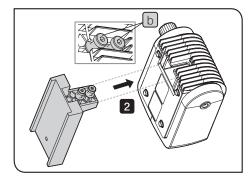
Hereinafter in this chapter, "Compact light guide illuminator SZ2-CLS" is called "Illuminator SZ2-CLS"

# 3-1 Attaching the illuminator SZ2-CLS

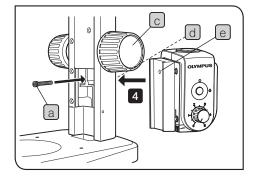


# Attaching on the standard stand SZ2-ST

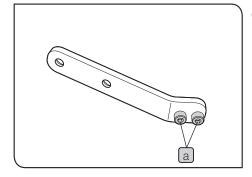
1 Remove the clamping screw a from the adapter using the Allen wrench provided with the microscope and loosen the clamping screws b (2 positions in total) sufficiently.



2 Combine the adapter with the illuminator SZ2-CLS and tighten the bottom screws b (2 positions). Tighten screws so that the washer (resin ring) is placed between the illuminator and the adapter.



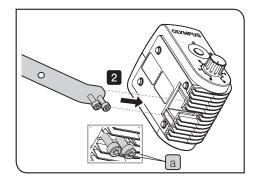
- 3 Rotate the focus adjustment knob c of standard stand SZ2-ST to move the focusing unit to the highest limit position.
- 4 Match the mounting hole d of the standard stand SZ2-ST with the mounting screw holes e of the adapter which was combined in 2 , and tighten the screw a removed in 1 to secure the illuminator.



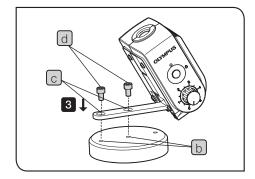
2

# Attaching to the CLS stand SZ2-CLSST

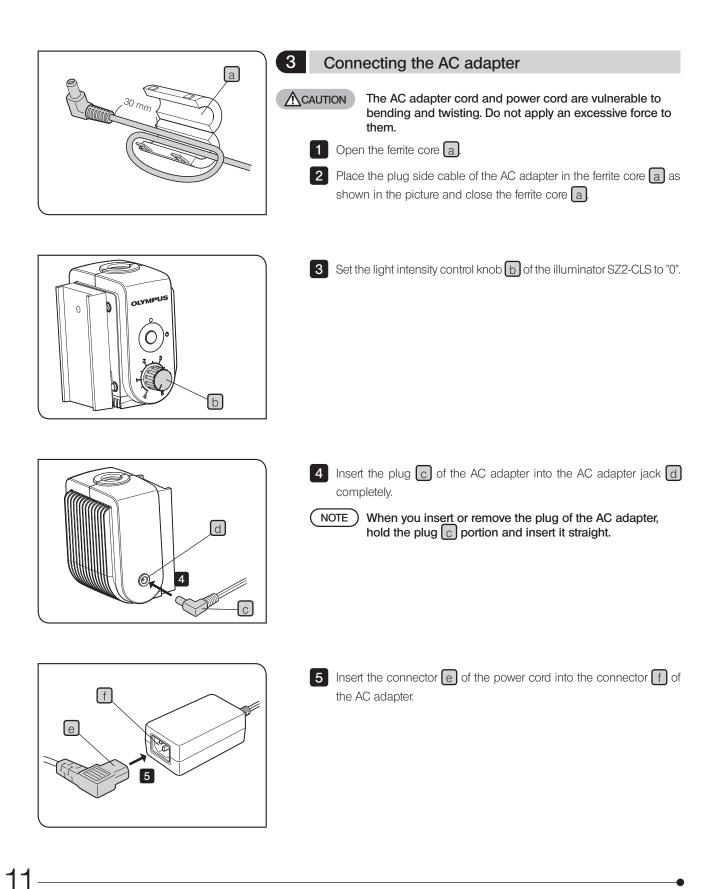
1 Loosen sufficiently the clamping screw (a) (2 positions in total) of the CLS stand adapter SZ2-CLSSTAD using the Allen wrench provided with the microscope.

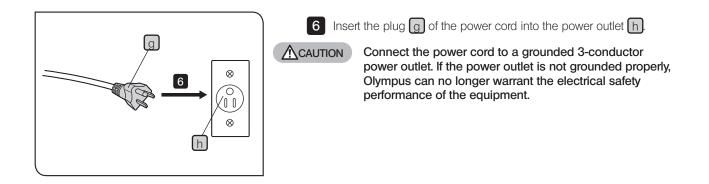


2 Combine the CLS stand adapter SZ2-CLSSTAD with the illuminator SZ2-CLS and tighten the bottom screws a (2 positions).

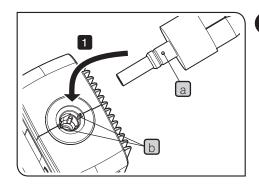


3 Match the screw holes (2 positions) of the CLS stand SZ2-CLSST with the mounting holes (c) of the adapter which was combined in (2), and tighten the provided screw (d) using the Allen wrench provided with the illuminator SZ2-CLS to secure the illuminator.





# 3-2 Attaching the light guide and holders



At

1

# Attaching the light guide (Input end)

1 Insert the light guide into the light guide port of the illuminator SZ2-CLS.

When using SZ2-CLGSI or SZ2-CLGDI, match the positioning pin a of the light guide (input end) with the one of two guide slots b of the illuminator SZ2-CLS and insert the light guide. Insert the light guide completely until it touches the end.



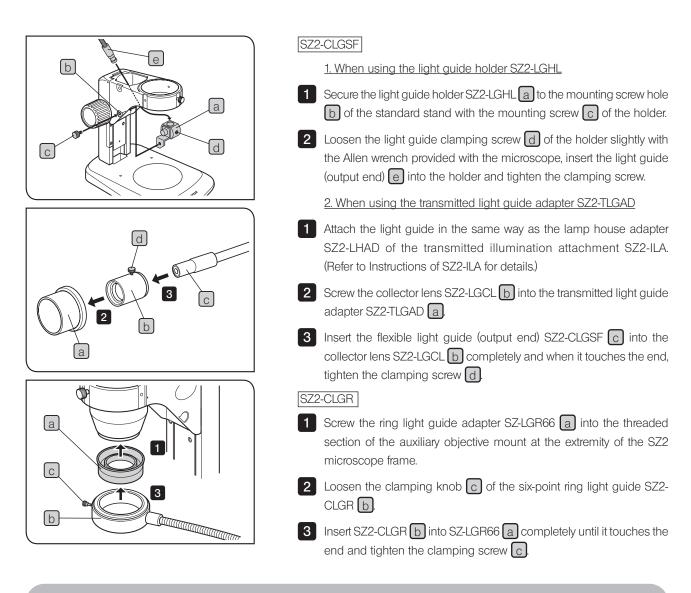
# Attaching the light guide (Output end)

## SZ2-CLGSI/SZ2-CLGDI

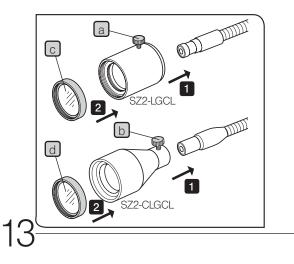
These light guides need not be attached because the light from the output end is irradiated directly on the specimen surface.

## SZ2-CLGDF

Insert the output end of this light guide into the SZ2-ILLC coaxial illuminator. (Refer to Instructions of SZ2-ILLC for details.)



# 3-3 Attaching the collector lens



1 Loosen the clamping screw a or b of the collector lens. Insert the collector lens into the output end of the light guide completely and when it touches the end, tighten the clamping screw a or b.

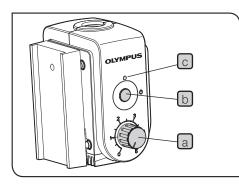
2 Screw the framed filters c or d into the collector lens.

#### Attachable combination

Light guide	SZ2-CLGSF	SZ2-CLGSI	SZ2-CLGDI
Collector lens	SZ2-LGCL a	SZ2-CL	GCLb
Framed filter	Commercially available product c (M : 22.5 mm, Pitch : 0.5 mm)	Made by Scho (M : 19 mm, P	ott d itch : 0.5 mm)



# 4-1 Turning ON/OFF the power

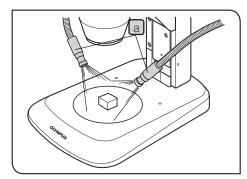


NOTE Before turning ON the main switch of the compact light guide illuminator SZ2-CLS, set the light intensity control knob a to "0".

Press the main switch b of the compact light guide illuminator SZ2-CLS to turn ON/OFF the power. When the power is turned ON, the pilot lamp c turns ON.

# 4-2 Adjusting the light guide angle (Interlock light guide only)

TIP The angle adjustment is not necessary for the flexible light guide if it is attached to the normal position.

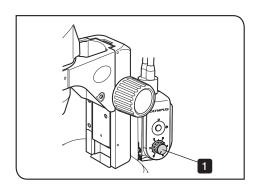


Hold the output end **a** of the light guide with a hand and irradiate the light on the specimen from the position that does not interrupt the observation. Do not twist the light guide as much as possible.



 Twisting the interlock light guide in the counterclockwise direction does not adjust its bending strength.
 Do not twist the light guide to prevent it from being damaged.

# 4-3 Adjusting the light guide brightness



1 Rotate the light intensity control knob to adjust the brightness. Rotating the light intensity control knob in the clockwise direction makes the illumination brighter and rotating it in the counterclockwise direction makes the illumination darker. Light guides

I	tem	Specifications				
Model		SZ2-CLGR SZ2-CLGDI SZ2-CLGDF SZ2-CLGSI SZ2-CLGSF			SZ2-CLGSF	
Tube type		Flexible tube         Interlocked tube         Flexible tube         Interlocked tube         Flexible tube			Flexible tube	
Total lengt	h	900 mm 580 mm 691 mm 570 mm 663 mm				663 mm
Fiber	Type (material)	Multicomponent glass				
Bundle	Input end	ø 6 mm	ø 5 mm	ø 5 mm	ø 3.5 mm	ø 4.5 mm
diameter	Output end	ø 2.4 x 6 mm	ø 3.5 mm	ø 6.4 mm	ø 3.5 mm	ø 4.5 mm
Minimum radius	bending	60 mm 60 mm 25 mm 60 mm 25		25 mm		

# Compact light guide illuminator SZ2-CLS

Item	Specifications
Rated voltage	Input rating: 9 V DC 1 A (AC adapter: 100-240 V AC 0.4 A 47-63 Hz)
Power consumption	6 W
LED reference life	Approx. 50,000 hours (The light intensity is reduced by 70%.)
Color temperature	Арргох. 5,600 К
Cooling method	Natural air cooling
Light intensity adjustment	Rotational volume in 5 levels (The medium level can be set.)
Power ON/OFF	Push-button switch
Dimensions	107 (W) x 61 (D) x 114 (H) mm
Weight	Approx. 350 g (AC adapter: 165 g)
Operating environment	<ul> <li>Indoor use</li> <li>Altitude: Max. 2,000 m</li> <li>Ambient temperature: 5 to 40 °C (41 to 104 °F)</li> <li>Maximum relative humidity: 80% for temperatures up to 31 °C (88 °F) (without condensation) <ul> <li>In case of over 31 °C (88 °F), the relative humidity is decreased linearly through 70% at 34 °C (93 °F), 60% at 37 °C (99 °F) and to 50% at 40 °C (104 °F).</li> <li>Supply voltage fluctuations: ±10%</li> <li>Pollution degree: 2 (in accordance with IEC60664-1)</li> <li>Installation category (Overvoltage category): II (in accordance with IEC60664-1)</li> </ul> </li> </ul>

# O Troubleshooting

Depending on use, the performance of this system may not be exhibited fully even though there are no failures. If problems occur, review the following list and take remedial actions as needed. If the problems are not improved, contact Olympus for assistance.

Problem	Cause	Remedy	Page
a) LED does not turn ON.	Power cords or plugs are not connected properly.	Connect them securely.	11
<ul> <li>b) Even though the light intensity control knob is set to the maximum, the illumination does not become brighter.</li> </ul>	The optical parts (fiber ends) are dirty.	Clean the optical parts.	5

Request of repair

If the problems are not improved even though the above remedies were taken, contact Olympus for assistance. When you contact Olympus, please tell them the following information.

- Product name and model (e.g. Light guide SZ2-CLGDI, etc.)
- Product number
- Problem

# Proper selection of the power supply cord

If no power supply cord is provided, please select the proper power supply cord for the equipment by referring to "Specifications" and "Certified Cord" below:

# Caution : In case you use a non-approved power supply cord for Olympus products, Olympus can no longer warrant the electrical safety of the equipment.

## Specifications

Voltage rating Current rating	125 V AC (for 100-120 V AC area) or, 250 V AC (for 220-240 V AC area) 6 A minimum
Temperature rating	60 °C minimum
Length	3.05 m maximum
Fittings configuration	Grounding type attachment plug cap. Opposite terminates in molded-on IEC configuration appliance coupling.

## Table 1 Certified cord

A power supply cord should be certified by one of the agencies listed in Table 1, or comprised of cordage marked with an agency marking per Table 1 or marked per Table 2. The fittings are to be marked with at least one of the agencies listed in Table 1. In case you are unable to buy locally the power supply cord which is approved by one of the agencies mentioned in Table 1, please use replacements approved by any other equivalent and authorized agencies in your country.

Country	Agency	Certification mark	Country	Agency	Certification mark
Argentina	IRAM	R	Italy	IMQ	
Australia	SAA	<b>A</b>	Japan	JET	¢PS ₽
Austria	ÖVE	ØVE	Netherlands	KEMA	Kema
Belgium	CEBEC	GEBEC	Norway	NEMKO	N
Canada	CSA	SP.	Spain	AEE	$\bigcirc$
Denmark	DEMKO	D	Sweden	SEMKO	S
Finland	FEI	F	Switzerland	SEV	(+) S
France	UTE		United Kingdom	ASTA BSI	æ, <del>V</del>
Germany	VDE	Ň	U.S.A.	UL	
Ireland	NSAI	<b>\$</b>			

## Table 2 HAR flexible cord

Approval organizations and cordage harmonization marking methods

Approval organization	Printed or embossed harmonization marking (May be located on jacket or insulation of internal wiring)		Alternative marking utilizing black-red-yellow thread (Length of color section in mm)		
			Black	Red	Yellow
Comite Electrotechnique Belge (CEBEC)	CEBEC	<har></har>	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	<vde></vde>	(HAR)	30	10	10
Union Technique de l'Electricite´ (UTE)	USE	<har></har>	30	10	30
Instituto Italiano del Marchio di Qualita´ (IMQ)	IEMMEQU	<har></har>	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC	<har></har>	10	10	30
N.V. KEMA	KEMA-KEUR	<har></har>	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO	(HAR)	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	(ÖVE)	<har></har>	30	10	50
Danmarks Elektriske Materialkontroll (DEMKO)	(DEMKO)	<har></har>	30	10	30
National Standards Authority of Ireland (NSAI)	(NSAI)	<har></har>	30	30	50
Norges Elektriske Materiellkontroll (NEMKO)	NEMKO	<har></har>	10	10	70
Asociacion Electrotecnica Y Electronica Espanola (AEE)	(UNED)	<har></har>	30	10	70
Hellenic Organization for Standardization (ELOT)	ELOT	<har></har>	30	30	70
Instituto Portages da Qualidade (IPQ)	np	<har></har>	10	10	90
Schweizerischer Elektro Technischer Verein (SEV)	SEV	<har></har>	10	30	90
Elektriska Inspektoratet	SETI	<har></har>	10	30	90

Underwriters Laboratories Inc. (UL) Canadian Standards Association (CSA) SV, SVT, SJ or SJT, 3 X 18AWG SV, SVT, SJ or SJT, 3 X 18AWG

This product is manufactured by **EVIDENT CORPORATION** effective as of Apr. 1, 2022. Please contact our "Service Center" through the following website for any inquiries or issues related to this product.

# **EVIDENT CORPORATION**

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(Life science solutions)	(Life science solutions)
Service Center	Our Website
https://www.olympus-lifescience.com/support/ service/	https://www.olympus-lifescience.com
(Industrial solutions)	" (Industrial solutions)
Service Center	Our Website
https://www.olympus-ims.com/service-and- support/service-centers/	https://www.olympus-ims.com

