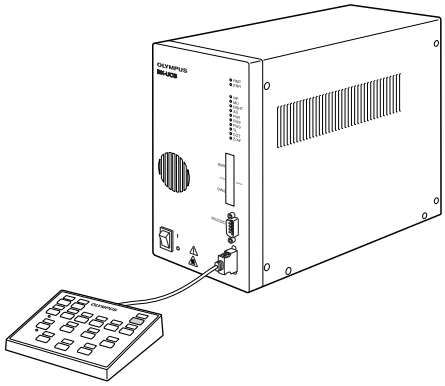

INSTRUCTIONS

BX-UCB
U-HSTR2

CONTROL BOX
HAND SWITCH

Optical Microscope Accessory

This instruction manual is for the Olympus Control Box model BX-UCB and Hand Switch model U-HSTR2, both for use with the BX2 motorized microscope. To ensure safety, optimum performance and familiarize yourself fully with the use of the motorized microscope, we recommend that you study this manual thoroughly before operating the system. Retain this instruction manual in an easily accessible place near the work desk for future reference.

AX9944

This product is applied with the requirements of standard IEC/EN61326-1 concerning electromagnetic compatibility.

- Immunity Applied to industrial and basic environment requirements.

In accordance with European Directive on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.
Refer to your local Olympus distributor in EU for return and/or collection systems available in your country.

NOTE: This product 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 product is operated in a commercial environment. This product 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 product 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 product.

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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IMPORTANT

The BX-UCB control box is the basic module for controlling the drive of a BX2 microscope with motorized specification. It also incorporates the power supply for the microscope.
The U-HSTR2 hand switch has a button layout optimized for the motorized BX2 system.

⚠ SAFETY PRECAUTIONS

1. Before connecting cables, be sure to set the main switch of the BX-UCB control box to " O " (OFF)".
2. Make sure to **ground** the equipment for safety and for maintaining the electrical safety performance.
3. When installing the control box, leave spaces of more than 10 cm around it. (Note that the control box also has a ventilation air inlet on the front panel).
4. Distribute the power cord and other cables away from the lamp housing and its surroundings. Otherwise, the cord or cable coating may melt by heat and cause an electric shock hazard.
5. Never allow the push ring driver (U-FWT/O/R) or Allen wrench that is provided with an associated module or microscope to enter the air vents on the control box. Otherwise, an electric shock and/or malfunction may occur.

Safety Symbols

The following symbols are found on the unit. Study the meaning of the symbols and always use the equipment in the safest possible manner.

Symbol	Explanation
⚠	Before use, carefully read the instruction manual. Improper use could result in personal injury to the user and/or damage to the equipment.
I	Indicates that the main switch is ON.
O	Indicates that the main switch is OFF.
	Transmitted lighting.
	Reflected lighting.
	Bottom surface is hot, and should not be touched with bare hands.

1 Getting Ready

1. The control box and hand switch are precision equipment. Handle them carefully by avoiding any shock or impact, and also connect each cable gently.
2. Do not use the equipment under a direct sunlight, in a place under high temperature and humidity or in a place subject to vibrations. (For the operating environmental condition, see chapter 3, "SPECIFICATIONS" on page 7.)
3. While the main switch of the BX-UCB control box is set to " I " (ON), do not replace any module, plug or unplug any cable or switch the light path manually to prevent malfunction (manual switching of the revolving nosepiece is permitted).
4. Never disassemble any part of the unit as this could result in mafunctions or reduced performance.

2 Caution

If the equipment is used in a manner not specified by this manual, the safety of the user may be imperiled. In addition, the equipment may also be damaged. Always use the equipment as outlined in this instruction manual.

The following symbols are used to set off text in this instruction manual.

⚠ : Indicates that failure to follow the instructions in the warning could result in bodily harm to the user and/or damage to equipment (including objects in the vicinity of the equipment).

★ : Indicates that failure to follow the instructions could result in damage to equipment.

◎ : Indicates commentary (for ease of operation and maintenance).

3 Intended use

This instrument has been designed to be used to observe magnified images of specimens in routine and research applications.

Do not use this instrument for any purpose other than its intended use.

1 NOMENCLATURE

⚠ Make sure to connect the Olympus-specified module to each connector.
The PC in use should meet the IEC60950 requirements.
If any non-specified equipment is used, Olympus cannot guarantee any performance of the system.

Control Box BX-UCB

Indicator LEDs

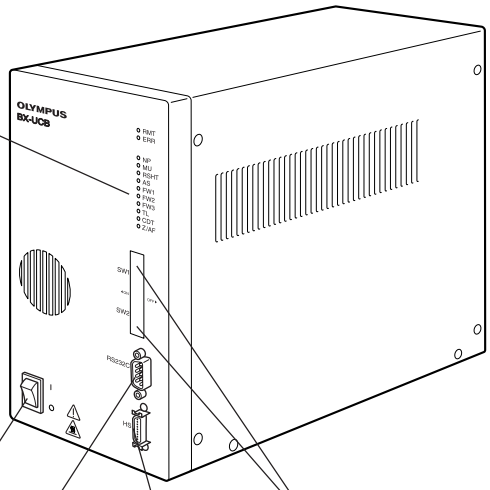
- RMT: Lights at the time of remote control (in orange).
- ERR: Blinks in case of an error (in red).

Lights during attachment (in green).

- NP: Lights when the specified motorized revolving nosepiece is attached.
- MU: Lights when the BX-RFAA or BX-RLAA is attached.
- RSHT: Shutter of the BX-RFAA.
- AS: Aperture iris diaphragm of the U-UCD8A or BX-RLAA.
- FW1:
- FW2:
- FW3:

◎ Each indicator lights when the U-FWT, FWO or FWR is attached.

- TL : Top lens of the U-UCD8A.
- CDT: Turret of the U-UCD8A.
- Z/AF: Lights when the BX61/BX62 is connected.

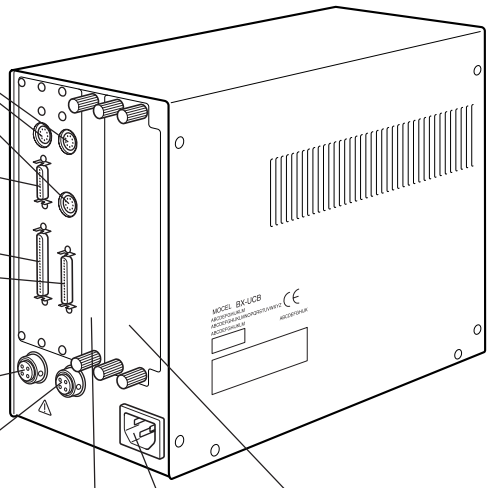


DIP switches
Used for selection of operation settings. (p.6)

Main switch (I : ON, O: OFF)

RS232C connector (9-pin male)
PC connector

HS (Hand Switch) connector



FW1/FW2/FW3 connectors

U-UCD8A connector

BX61/62 connector

RFAA/RLAA/NP connector

Transmitted light 100 W halogen lamp housing connector

Reflected light 100 W halogen lamp housing connector

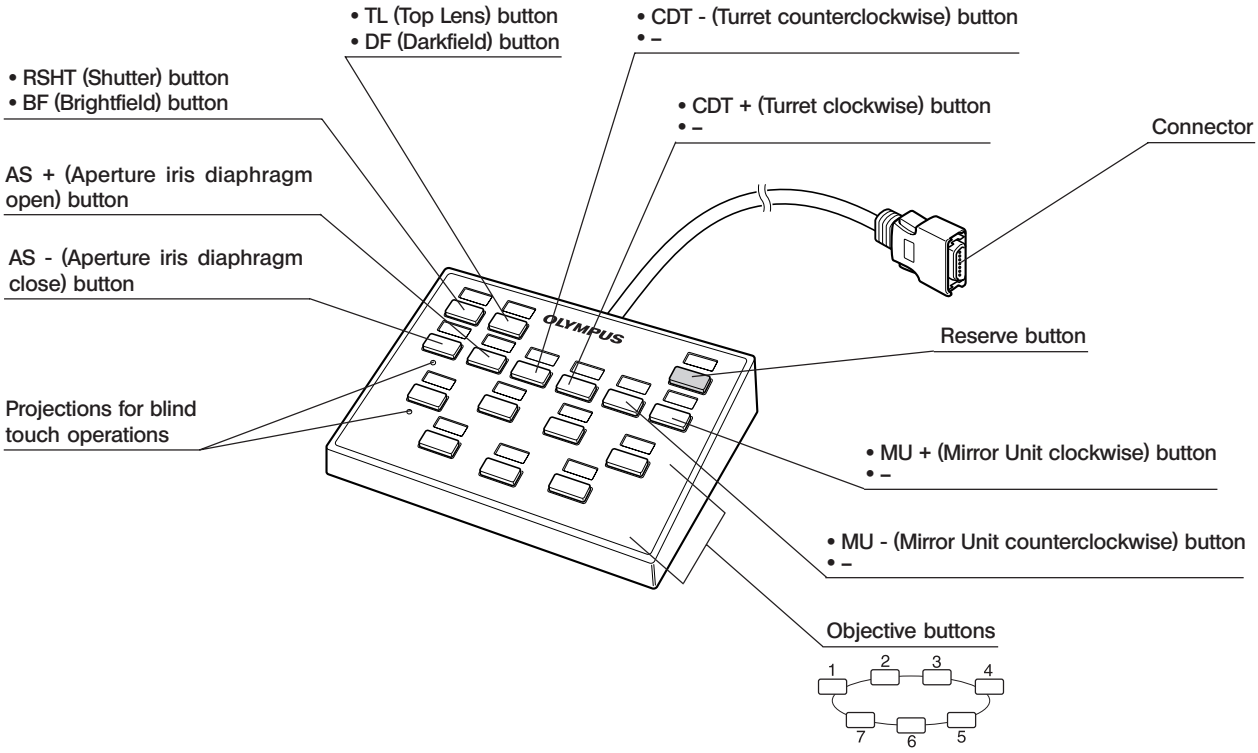
Option slots (2 ch)

Power cord connector

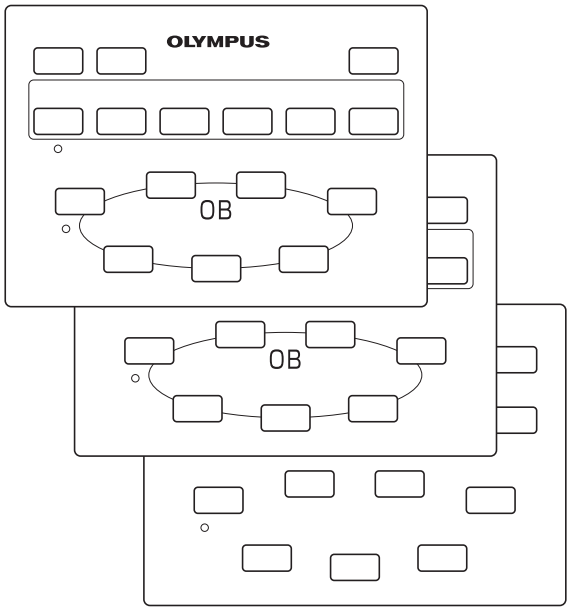
Option slot
Z board or AF board can be installed.

Hand Switch U-HSTR2

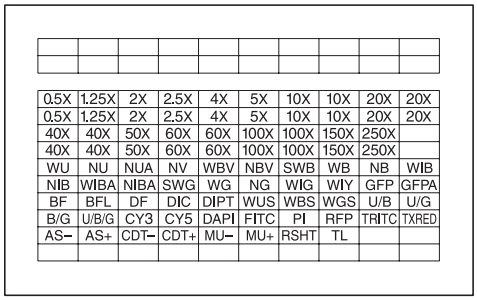
◎The functions of the buttons on this hand switch are variable depending on whether the attached vertical illuminator is the BX-RFAA (on the upper stage) or the BX-RLAA (on the lower stage).
The button functions can be set arbitrarily when the PC control (remote control) is used.
◎Above each button, attach the indication sticker corresponding to the function set for the button.



Grouping Panel Sheets (3 types)



Indication Stickers



0.5X	1.25X	2X	2.5X	4X	5X	10X	10X	20X	20X
0.5X	1.25X	2X	2.5X	4X	5X	10X	10X	20X	20X
40X	40X	50X	60X	60X	100X	100X	150X	250X	
40X	40X	50X	60X	60X	100X	100X	150X	250X	
WU	NU	NUA	NV	WBV	NBV	SWB	WB	NB	WIB
NIB	WIBA	NIBA	SWG	WG	NG	WIG	WIY	GFP	GFPA
BF	BFL	DF	DIC	DIPT	WUS	WBS	WGS	U/B	U/G
B/G	U/B/G	CY3	CY5	DAPI	FITC	PI	RFP	TRITC	TXRED
AS–	AS+	CDT–	CDT+	MU–	MU+	RSHT	TL		

2 OPERATION

2-1 Control Box BX-UCB

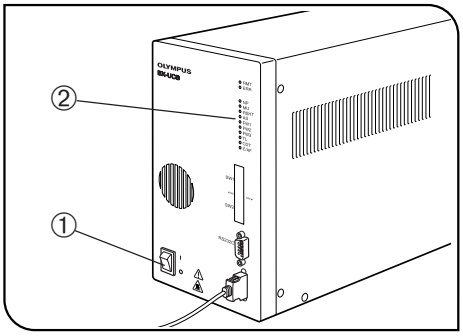


Fig. 1

1 Turning Power On (Fig. 1)

⚠ **Ensure that the modules to be used are connected properly.**

1. Set the main switch ① to " **I** " (ON).
2. Ensure that the LED indicators ② corresponding to the connected modules are lit.

2 Functions of Indicator LEDs (Fig. 1)

1. RMT: Lights only at the time of remote control.
2. ERR: Blinks in case of an error. At this time, the associated indicators blink as described below.
3. NP to Z/AF: Each indicator lights when the corresponding module is attached.

2-2 Hand Switch U-HSTR2

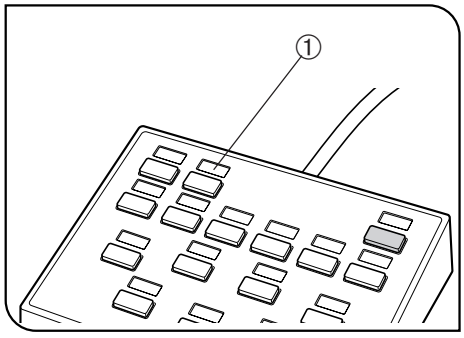


Fig. 2

1 Attaching Indication Stickers (Fig. 2)

1. Attach each piece of the provided function indication stickers onto the dented area ① above the button where the corresponding function is set.
2. The indication stickers are given weak adhesive force intentionally so that they can be removed and re-attached easily.
3. The indication stickers include two types of stickers carrying no indication on them.

- Light shield sticker: Attach to the dented area above a button with no function set.
- Blank sticker: Create a custom indication sticker by writing the function name with oily ink and attach to the dented area above the required button.

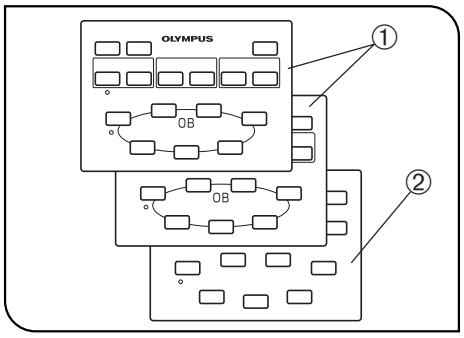


Fig. 3

2 Grouping Panel Sheet (Fig. 3)

Two sheets showing the function groups of buttons with enclosing lines ① and a blank sheet ② are provided. Select and use the sheet that is most convenient.

- Sheet ① (front): Used when a PC is not combined.
- Sheet ① (back): Used when direct designation of the mirror unit or filter wheel is intended.
- Blank sheet ②: Can be used by drawing desired grouping lines with oily ink pen.

2-3 Operation Selection of the DIP Switches

◎The allocated functions of the DIP switches are shown in the table below.

★Make sure the main switch is set to " ○ " (OFF) before setting the DIP switches. The unit detects the new settings only when the power is switched on, making those settings effective.

DIP Switch	Bit Position (On: 1, Off: 0)								Function	Detail
	1	2	3	4	5	6	7	8		
SW1 (upper row)	0								Buzzer prohibited	Activates buzzer.
	1									Does not activate buzzer.
		0	0						Revolving nosepiece type**	U-D5BDREMC/U-P5REMC/U-P5BDREMC
		0	1							U-D6REMC/U-D6BDREMC
		1	0							Not used.
		1	1							Not used.
				0					Reserved for manufacturer	Fixed at off.
					0				Reserved for manufacturer	Fixed at off.
						0			Freedom degree (number of available holes) search*	Searches when power is switched on.
						1				Does not search when power is switched on.
							0		Initialization prohibited when power is switched on	Initializes.
							1			Does not initialize.
SW2 (lower row)	0	0	0	0	0	0	0	0	Reserved for manufacturer	All fixed at off.

◎The shaded sections show factory settings (all set at off).

* The freedom degree (number of available holes) search is effective only when initialization is performed at the time of switching on the power (DIP switch 7 of SW1 is set at off). The compatible motorized modules are U-FWT, U-FWR, U-FWO and BX-RFAA.

** When using the U-D6REM or U-D5BDREM, you do not have to set the DIP switches 2 and 3 due to the revolving nosepiece's automatic selection function.

Regarding the RS232C Cable

★Be sure to use a commercially available RS232C straight cable. (Use of other cables may cause malfunction.) Use a D-Sub 9P (female)-D-Sub 9P (female) connector. Be sure to set the main switches of the control box and PC to " ○ " (OFF) before connecting the RS232C cable.

3 SPECIFICATIONS

<table>
<tr><th>Item</th><th>Specification</th></tr>
<tr><td colspan="2">Control Box BX-UCB</td></tr>
<tr><td>Power supply rating</td><td>Input rating: 100 to 120/220 to 240 V ∿ , 50/60 Hz, 3.5/1.5 A</td></tr>
<tr><td>LED indicators</td><td>• RMT (Remote) LED • ERR (Error) LED
• Module connection LED x 10</td></tr>
<tr><td>Option slots</td><td>Power capacity (single slot)
<table>
<tr><th></th><th>Per board</th><th>Total of 3 slots</th></tr>
<tr><td>+5 V</td><td>1 A max.</td><td>2 A max.</td></tr>
<tr><td>+15 V</td><td>1 A</td><td>1 A (normal) + 1 A (motor load 20% duty)</td></tr>
<tr><td>+24 V</td><td>1 A max</td><td>2 A max.</td></tr>
</table></td></tr>
<tr><td>Dimensions & weight</td><td>125(W) x 216(H) x 310(D) mm, approx. 5 kg (11 lb.)</td></tr>
<tr><td colspan="2">Hand Switch U-HSTR2</td></tr>
<tr><td>Button functions</td><td>Connects to the BX-UCB for use in the control of following operations. (Can also be connected to Olympus AX70, AX80 or U-REMPS but the operation is not normal in this case.)
<u>When a PC is not used:</u>
• With the BX-RFAA vertical illuminator, the hand switch controls operations including the shutter release, top lens, reserve, aperture iris diaphragm opening/closing, turret clockwise/counterclockwise rotation, mirror unit clockwise/counterclockwise operation and objective switching (from 7).
• With the BX-RLAA vertical illuminator, the hand switch can control operations including BF, DF, reserve, aperture iris diaphragm opening/closing and objective switching (from 7).
<u>When a PC is used:</u>
• Any function can be assigned from the PC.</td></tr>
<tr><td>Dimensions & weight</td><td>147 (W) x 32 (H) x 108 (D) mm., approx. 0.37 kg (0.81 lb.)</td></tr>
<tr><td>Operating environment</td><td>• Indoor use.
• Altitude: Max. 2000 m.
• Ambient temperature: 10 to 35°C.
• Maximum relative humidity: 80% (up to 31°C). The maximum humidity decreases linearly at above 31°C, through 70% (at 34°C), 60% (at 37°C) to 50% (at 40°C).
• Supply voltage fluctuation: ±10%.
• Pollution degree: 2 (in accordance with IEC664).
• Overvoltage category: II (in accordance with IEC664).</td></tr>
</table>

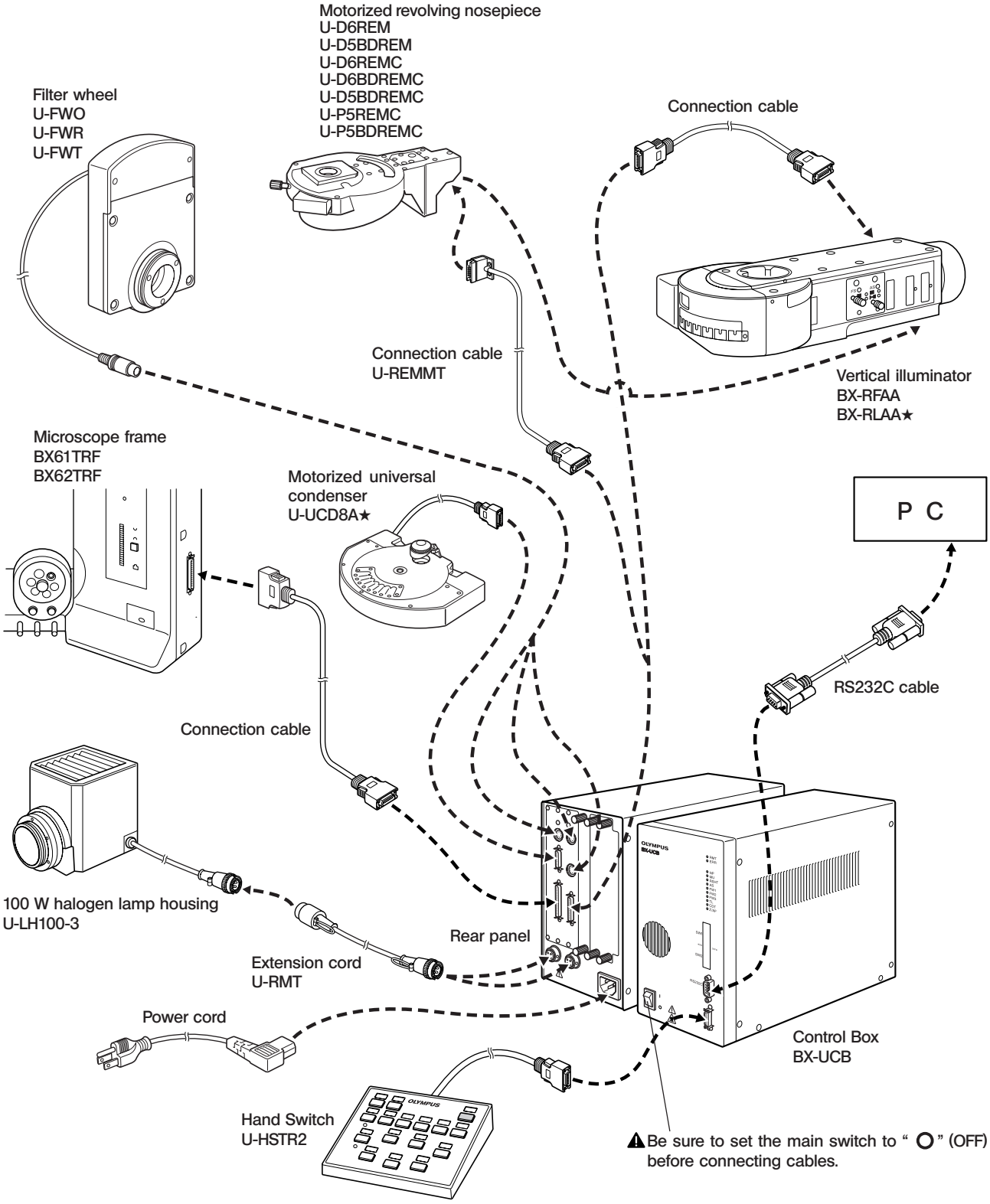
4 TROUBLESHOOTING GUIDE

Under certain conditions, performance of the microscope may be adversely affected by factors other than defects. If a problem occurs, please review the following list and take remedial action as appropriate. If you cannot solve the problem after checking the entire list, please contact your local Olympus representative for assistance.

Problem	Cause	Remedy	Page
a) ERR (Error) indicator blinks.	Module corresponding to the indicator blinking simultaneously with ERR is not connected properly.	Connect the motorized module of the simultaneously blinking indicator properly.	9
b) Power cannot be turned on by setting the main switch to " **I** " (ON).	Power cord is unplugged.	Connect the power cord properly.	10
c) Communication through RS232C is impossible.	The RS232C cable in use is wrong.	Use the specified RS232C cable.	6
	The RS232C cable is not connected properly.	Connect it properly.	9
d) The Hand Switch buttons do not work or the indicators do not light.	The hand switch is not connected properly.	Connect it properly.	10
e) A motorized module does not work or its indicator does not light.	The motorized module is not connected properly.	Connect it properly.	9
f) The lamp will not light.	The lamp housing connector is not connected properly.	Connect it properly.	9
	The transmitted/reflected light switch of microscope is set erroneously.	Set to the correct position that you want to use.	–
	The lamp on-off switch of microscope is set to OFF.	Set it to ON.	–
	The lamp is blown.	Replace the lamp.	–
g) The U-UCD8A or BX-RLAA is not functioning normally.	Both modules are connected to the control box. (It is not permitted to use the U-UCD8A and BX-RLAA together.)	Unplug the connector of the module that you do not want to use.	9

5 ASSEMBLY

5-1 Assembly Diagram



★The U-UCD8A and BX-RLAA cannot be used simultaneously. If both modules are used together, malfunction will result. Do not connect unused modules to the control box.

5-2 Detailed Assembly Procedures

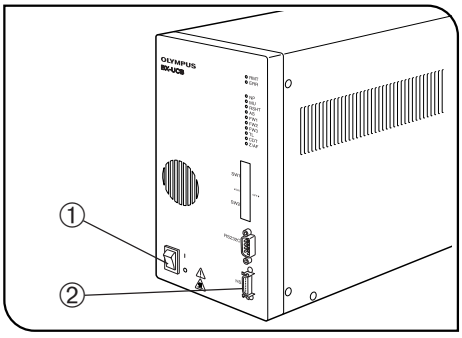


Fig. 4

⚠Make sure that the main switch ① of the control box to " O " (OFF) before connecting the cable of the Hand Switch (and other modules) and the power cord. (Fig. 4)

⚠The power cord and connection cables are sensitive to bending or twisting. Do not apply excessive force to them.

1 Connecting the Hand Switch Cable (Fig. 4)

Align the connector of the Hand Switch with the HS connector ② on the front panel of the Control Box and plug in firmly.

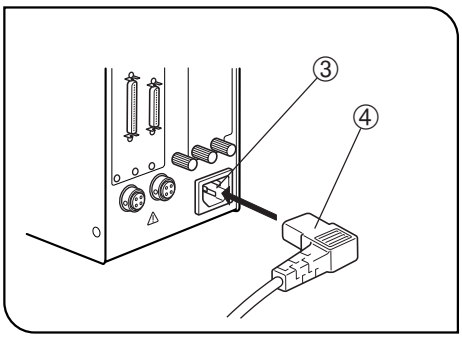


Fig. 5

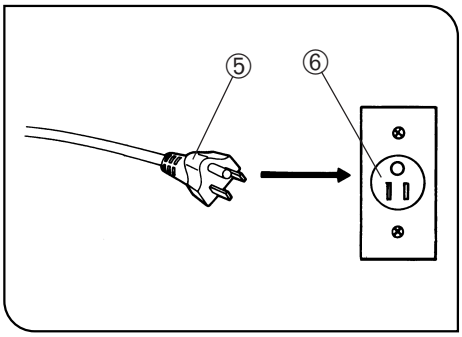


Fig. 6

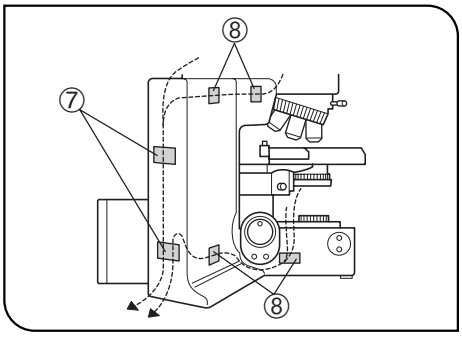


Fig. 7

2 Connecting the Power Cord (Figs. 5 to 7)

⚠Always use the power cord provided by Olympus. If no power cord is provided, please select the proper power cord by referring to the section "PROPER SELECTION OF THE POWER SUPPLY CORD" at the end of this instruction manual. If the proper power cord is not used, product's safety performance cannot be guaranteed.

1. Insert the connector ④ of the power cord into the power cord connector ③.

⚠Connect the other end of the power cord to a power outlet with 3 conductors including the grounding line. If the power outlet is not grounded properly, the electrical safety performance intended by Olympus cannot be guaranteed.

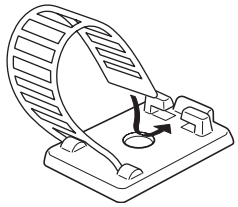
2. Insert the plug ⑤ on the other end of the power cord into the power outlet ⑥.

⚠Distribute the power cord at a distance from the lamp housing. If the power cord comes in contact with a hot part around the lamp housing, the cord may be melted, causing an electric shock hazard.

3. Fix the connection cables on the microscope frame by using the provided cord clamps (with double-side adhesive tape). Set the condenser cable with enough slackness to cope with the vertical movement of the stage.

   The provided cord clamps include two Large clamps ⑦ and four Small clamps ⑧.They are intended to be used as shown in Fig. 7.

- Small: Attach lengthwise (3 positions) and widthwise (1 position) to the left side of the microscope frame.
- Large: Attach widthwise to the left rear panel of the microscope frame.



Cord clamp

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	125V AC (for 100-120V AC area) or, 250V AC (for 220-240V AC area)
Current Rating	6A 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 agencies listed in Table 1. In case you are unable to buy locally in your country 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		Italy	IMQ	
Australia	SAA		Japan	JET, JQA, TÜV, UL-APEX / MITI	,
Austria	ÖVE		Netherlands	KEMA	
Belgium	CEBEC		Norway	NEMKO	
Canada	CSA		Spain	AEE	
Denmark	DEMKO		Sweden	SEMKO	
Finland	FEI		Switzerland	SEV	
France	UTE		United Kingdom	ASTA BSI	,
Germany	VDE		U.S.A.	UL	
Ireland	NSAI				

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›	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	‹VDE›	‹HAR›	30	10	10
Union Technique de l´Electricite´ (UTE)	USE	‹HAR›	30	10	30
Instituto Italiano del Marchio di Qualita´ (IMQ)	IEMMEQU	‹HAR›	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC	‹HAR›	10	10	30
N.V. KEMA	KEMA-KEUR	‹HAR›	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO	‹HAR›	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	‹ÖVE›	‹HAR›	30	10	50
Danmarks Elektriske Materialkontroll (DEMKO)	‹DEMKO›	‹HAR›	30	10	30
National Standards Authority of Ireland (NSAI)	‹NSAI›	‹HAR›	30	30	50
Norges Elektriske Materiellkontroll (NEMKO)	NEMKO	‹HAR›	10	10	70
Asociacion Electrotecnica Y Electronica Espanola (AEE)	‹UNED›	‹HAR›	30	10	70
Hellenic Organization for Standardization (ELOT)	ELOT	‹HAR›	30	30	70
Instituto Portages da Qualidade (IPQ)	np	‹HAR›	10	10	90
Schweizerischer Elektro Technischer Verein (SEV)	SEV	‹HAR›	10	30	90
Elektriska Inspektoratet	SETI	‹HAR›	10	30	90

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

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