INTRODUCTION

Repairs of this product require high-grade special knowledge and technique. We recommend to contact the Olympus agent in your country when the product goes out of order. For remodeling or repairs to be done by the agent or person not authorized by us, we will not warrant the product and not be liable for any result.
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## 1. SPECIFICATIONS

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| **1. Video scope** | 1. EVIS100 series  
2. EVIS130 series  
3. EVIS140 series  
4. VE series  
5. EVIS EXERA 145 series  
6. EVIS EXERA 160 series  
7. BF 160 series |
| **2. Fiberscope** | 1. OES10 series  
2. OES20 series  
3. OES30 series  
4. OES40 series  
5. BF/CHF scope |

### 2. Illumination function

#### 1. Optics

**Illumination light path**

- Emergency lamp
- Condenser lens
- IR filter
- Lamp
- Turret plate (Emergency lamp/filter, etc.)

1. The user sets a special filter if necessary. One special filter frame is provided.
2. The emergency lamp is automatically placed into the optical axis when the diagnostic lamp does not light.

| Diagnostic lamp | Xenon short arc lamp with an elliptic mirror  
Model: Y1064  
Life: Approx. 500 hours when operated continuously |
| Emergency lamp | Halogen 150W (peanut type)  
Model: PHILIPS 7023 12V/100W or the equivalent  
Life: 100 hours or more in average |

### 3. Brightness adjustment

| Method | (1) Manual control only for the fiberscope. (Automatic control when using OES video system and OVC simultaneously.)  
(2) Automatic control for the video scope  
Manual light adjustment | (1) Mechanical diaphragm (set on the panel)  
(2) 17 steps  
Automatic light adjustment | (1) Mechanical diaphragm with the constant illuminance control (the illuminance on the image)  
(2) 17 steps |

### 4. Cooling

<p>| Method | Forced air cooling with a fan |</p>
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<td>1 Air supply pump</td>
<td>Diaphragm system</td>
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| Air supply pressure | (1) Adjustable in 3 steps (strong/medium/weak and stop)  
| | (2) Maximum pressure less than 53.9kPa |
| Control | Setting of the air supply switch |
| 2 Water supply | Method |
| | Supply from the scope end by combining the scope with the supply water tank. |
| Scope | One touch connection |
| Light control cable: MH-966 | Connector on the rear panel  
| (Light control cable for CV) |
| Light control cable: MAJ-586 | Connector on the rear panel  
| (Light control cable for OTV) |
| Emergency lamp | When the emergency lamp breaks (including connection failure), LED flickers to warn to replace the lamp. When the emergency lamp is lit, LED is lit. |
| Storage of set values | The setting is stored before the power switch is turned off and when the power switch is turned off.  
| | • Setting of manual/auto light adjustment  
| | • Setting of air supply pressure  
<p>| | • Light intensity control level |
| On removal of the scope | When the scope is removed, the emergent light from the scope output connector is dimmed with the diaphragm blade to the minimum diaphragm position. |
| Panel | Disinfect with ethanol for disinfection (70% ethyl or isopropyl alcohol) or sterilized water. |
| Temperature switch | When the temperature in the system rises over the rated maximum value, the temperature switch automatically turns off and the current is shut off to ensure safety. The function of the temperature switch is detected and warned by an audible tone. |</p>
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<td>4 Electrical shock</td>
<td>Non-Olympus regulations applied</td>
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| Common to every country | IEC513 (hazard analysis)  
IEC60601-1 (medical electronics safety)  
IEC60601-1-1 (medical electric system safety)  
IEC60601-1-2 (EMC)  
IEC60601-2-18 (endoscope electric safety)  
ISO9000-3 (software)  
ISO8600-1 (endoscope)  
ISO7000 (drawings and symbols)  
IEC417 (drawings and symbols) |
| 7 Safety | Applied laws and regulations/classification |
| 1 EU/EFTA | MDD Class: IIa  
CE marking: CE0197  
IEC60601-1 (medical electronics safety)  
IEC60601-1-1 (medical electric system safety)  
IEC60601-1-2 (EMC)  
IEC60601-2-18 (endoscope electric safety)  
EN980 (drawings and symbols) |
| 5 Laws and regulations applied | Non-Olympus regulations applied |
| 2 USA | FDC laws (Federal Foods/Medicine/Cosmetics Laws)  
UL544,CUL |
| 3. Japan | The Drugs, Cosmetics and Medical Instruments Act  
General name: Light source  
Approval No. : 07BZ0043  
JIST1001 (medical electric equipment safety)  
JIST1002 (medical electric equipment safety test)  
JIST1005 (medical electric equipment manual) |
| 4 Other countries | Nothing  
Russia: GOST-R |
| Classification of medical instruments | 100 V type: BF type instruments  
200 V type: BF type fitting part  
Note) When the fitting part has no indication of protection against an electric shock, it is the BF type fitting part. |
<p>| Protection against an electrical shock | Class I |
| User service | Xenon lamp, Special filter, Fuse |
| Maker service | Emergency lamp, Lamp socket |
| 8 Others | Weight | Approx. 15 kg |
| 3 Others | Dimensions (Maximum) | 385 (w) x 490 (D) x 145 (H) [mm] |</p>
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| Panel | Selectable for each destination.  
100 V type: English  
200 V type: English/symbol |
| Power cord | Cord set with a 3-core hospital grade plug (100V)  
3-pin inlet, 3-core cord plug-less cord set (200V) |
| Fuse capacity | 100V type: BA, Littel 313008 (or the equivalent)  
200V type: 5A, Littel 218005 (or the equivalent)  
In-Olympus symbol:  
MAJ-892(100V CLASS), MAJ-893(200V CLASS) |
| Backup lithium battery on power failure | Lithium battery life: 6.2 years |
## 4. TROUBLESHOOTING

### 1. CONTENTS

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2. TROUBLESHOOTING

Power supply check

Power is not supplied.

Turn on the power switch.

Does the LED above the switch light up?

No

Do other LED light up?

No

Replace the UPCL16ZZ.
(Replace the LED board.)

Yes

Does the cooling fan rotate?

Yes

Check the supply voltage.
Check the power cord.
Check the inlet plug.

No

- Mal-connection

Yes

Does the LED above the switch light up?

No

Check the fuse on the rear panel.

Blown fuse

Yes

Check the power switch
(for continuity when turned on).
Check the switch mechanism.
(Is the switch in the unit depressed?)
A

Yes Does the LED above the switch light up?

No

Check the interlock switch (for continuity when turned on, the switch depressed by the lamp cover?)

Yes

Does the LED above the switch light up?

No

Replace the (Replace the filter board.)

Yes

Does the LED above the switch light up?

No

Is the output voltage of the power supply unit correct?

No

Replace the UPCL16PS10/20. (Replace the switching power supply.)

Yes

Replace the UPCL16CR00. (Replace the main board.)

Yes

Does the LED above the switch light up?

No

Replace the front panel.

End
Lamp check

The light source xenon lamp is not lit.

Power supply check

Panel operation check

Does the audible warning ring?

Yes

Check the temperature switch. • ON if normal.

No

Does the audible warning ring?

Yes

Replace the UPCL16CR00. (Replace the main board.)

No

Does the audible warning ring?

Yes

Replace the UPCL16CR00. (Replace the main board.)

No

Does the xenon lamp light up?

Yes

Check the lamp mounting.

No

Replace the lamp by a brand-new one (Y1064S).

No

Check around the lamp housing.

Yes

Does the xenon lamp light up?

No

Unnecessary things (metallic pieces, etc.)

High voltage pulse leaks.

Connection with the electrode F and electrode R.

The round terminal is close to the lamp housing.

Yes

Does the xenon lamp light up?

No

A

B
A

B

Does the ignition click?
Yes

No

Can the lamp be forcibly turned off?
Yes

Set the J4/2 pin of UPCL16CR00 to L level (GND).

No

Replace the igniter in the switching power supply.

No

Does the xenon lamp light up?
Yes

Replace the UPCL16CR00 (Replace the main board.)

No

Replace the UPCL16PS10/20. (Replace the switching power supply.)

End
The lamp goes out after once ignition up.

Does the lamp go out after once ignition up?

Yes

Is the lamp replaced by the emergency lamp when it goes out after once ignition up?

No

Yes

Does the audible warning sound when the emergency lamp lights up?

No

Yes

Cooling fan operation check

No

Does the lamp go out after once ignition up?

Yes

Check the temperature switch function.

No

Replace the UPCL16CR00. (Replace the main board.)
A

Check the lamp mounting (for application of heat compound).

No

Does the lamp go out after once ignition up?

Yes

Replace the lamp by a brand-new one (Y1064S).

No

Check around the lamp housing (for any foreign body or displacement).

No

Does the lamp go out after once ignition up?

Yes

Replace the UPOCL16PS10/20 (Replace the switching power supply).

No

Does the lamp go out after once ignition up?

Yes

Replace the UPCL16CR00 (Replace the main board).

Check the power cord (for breakage or contact failure).

Yes

Check the fuse box (for contact failure).

No

Does the lamp go out after once ignition up?

Yes

Check the lamp cover and the interlock (for displacement or malfunction).

No

Does the lamp go out after once ignition up?

Yes

Check the power switch (for malfunction or defective mechanism).

Yes

Replace the UPCL16PS10/20 (Replace the switching power supply).

No

Does the lamp go out after once ignition up?

Yes

Replace the UPCL16CR00 (Replace the main board).

No

Does the lamp go out after once ignition up?

Yes

Check the power supply equipment of the facility.

C

End
Scope connection check

The scope cannot be connected.

Does the scope correctly connected?

Yes

Is the applicable scope used?

No

Replace the scope by an applicable scope.

Yes

Is the scope connector deviated?

No

Replace the scope.

Yes

Check the connection. Replace the scope socket connector.

End
Troubleshooting CLV-160

The cooling fan does not work.

- Does the lamp housing fan operate?
  - Yes: Check the connector for contact.
  - No: Does the fan operate?
    - Yes: Replace the lamp housing fan.
    - No: Is 12V applied to J1/1 pin of UPCL16CR00?
      - Yes: Replace the lamp housing fan.
      - No: Replace the UPCL16CR00. (Replace the main board.)

- Does the switching power supply fan operate?
  - Yes: Check the connector for contact.
    - Yes: Does the fan operate?
      - Yes: Replace the switching power supply fan.
      - No: Is 12V applied to the fan connector?
        - Yes: Replace the switching power supply fan.
        - No: Replace the UPCL16PS10/20. (Replace the switching power supply.)
  - No: Replace the UPCL16CR00. (Replace the main board.)

End
When the scope is disconnected, the brightness is not reduced to the minimum or changed.

1. Set the light source to the maximum brightness in manual mode.

2. Is the brightness reduced to the minimum when the scope is removed?
   - Yes
     - Check the harness connection.
       - UPCL16CR00  \( \approx \) UPNS60U
       - UPCL16CR00  \( \approx \) PCN50U
   - No
     - Check the scope detection mechanism and the diaphragm mechanism.
       - The metal plate part deformed or caught.
       - The diaphragm is deformed or caught.

3. Is the brightness reduced to the minimum when the scope is removed?
   - Yes
     - Replace the UPCN50U.
       (Replace the scope detection board.)
   - No
     - Replace the UPNS60U.
       (Replace the diaphragm unit.)

4. Is the brightness reduced to the minimum when the scope is removed?
   - Yes
     - Replace the UPCL16CR00.
       (Replace the main board.)
   - No

End
TROUBLESHOOTING  CLV-160

Pump check

The pump does not work or the supply air flow rate does not change even if the pump ON switch is depressed.

1. Connect an appropriate scope correctly.
2. Set the pump switch to "H".
3. Does the pump operate and air is supplied?
   - No: Check the harness connection. Check the hose connection. Check the non-return valve for clogging. Check the rubber part of the air supply mouthpiece.
   - Yes: Is +12V generated at J9/1 pin of UPCL16CR00?
      - No: Replace the W12M013A. (Replace the pump U.)
      - Yes: Does the pump operate and air is supplied?
         - No: Replace the UPCN50U. (Replace the scope detection board.)
         - Yes: Does the pump operate and air is supplied?
            - No: Replace the UPCL16CR00. (Replace the main board.)
            - Yes: A

* UPCL16CR00 ➔ Front panel U
TROUBLESHOOTING CLV-160

Is the air supply volume changed at H/M/L of the air supply switch.

Yes

Is the output voltage changed when the air supply volume is changed?

Yes

Replace the UPCL16CR00.
(Replace the main board.)

No

Replace the W12M013A.
(Replace the pump U.)

End

No

End
The temperature switch does not turn off even if the temperature in the unit rises over the specified value, or the temperature switch malfunctions at the temperature below the specified value.

Make sure the duct no to be close.

Is the temperature switch turned off at the temperature switch operating temperature?

Yes

Remove the harness from J3 of UPCL16CR00.

Does the audible warning ring?

Yes

Replace the UPCL16CR00. (Replace the main board.)

No

Replace the W12M014A. (Replace the temperature switch.)

Is the temperature switch turned off at the temperature lower than the temperature switch operating temperature?

Yes

No

Replace the W12M014A. (Replace the temperature switch.)

End
The turret plate does not rotate even if the filter switch is depressed.

- Filter switching operation check
  - Does the turret return to the initial position when the power is turned on?
    - Yes
      - Check the harness connection.
      - Check that the turret plate is not extremely loose.
    - No
      - Replace the limit switch.
  - Does the turret return to the initial position?
    - Yes
      - Replace the UPCL16CR00. (Replace the main board.)
    - No
      - Replace the turret U.
Troubleshooting CLV-160

A

Turn xenon lamp on.

Does the turret plate rotate when the filter switch is operated?

No

Is the switch on the front panel accepted?

Yes

Check that the turret plate is not extremely loose.

Yes

Does the turret plate rotate when the filter switch is operated?

No

Replace the turret U.

Yes

Replace the UPCL16CR00. (Replace the main board.)

No

Replace the front panel.

Does the turret plate rotate when the filter switch is operated?

Yes

Check the harness connection. UPCL16CR00 $\Rightarrow$ Front panel U

No

Replace the front panel.

Does the turret plate rotate when the filter switch is operated?

No

End
No light is emitted from the scope.

Connect the appropriate scope correctly.

Set the light source to the maximum brightness in manual mode.

Is light emitted from the scope?

Yes

Check the power supply.

Yes

Is light emitted from the scope?

No

Check the lamp.

Yes

Is light emitted from the scope?

No

Check the lamp brightness.

Yes

Is light emitted from the scope?

No

Check the filter switching operation.

Yes

Is light emitted from the scope?

No

Check the manual brightness adjustment.
The visual field is dark or too bright.

Set the auto/manual brightness selector to "Manual".

Is the diaphragm controlled with the brightness adjustment switch?

Yes

Is the scope correctly connected?

Yes

Is the diaphragm controlled with the brightness adjustment switch?

No

Check the harness connection. Check the diaphragm mechanism.

- UPCL16CR00 ↔ UPNS6OU
- Diaphragm blade is deformed or caught.

No

Replace the UPCL16CR00. (Replace the main board.)

End

Yes

Is the diaphragm controlled with the brightness adjustment switch?

No

Replace the UPCN50U. (Replace the scope detection board.)

Yes

Is the diaphragm controlled with the brightness adjustment switch?

No

Replace the UPNS6OU. (Replace the diaphragm unit.)

End
Automatic brightness adjustment check 1
(Automatic brightness adjustment with the scope pin)

The visual field is dark or too bright.

Manual brightness adjustment check

Connect to the system allowing automatic brightness adjustment.

Does the automatic brightness adjustment work correctly?

Yes

Is INDEX appropriate?
(Usually, "0" is standard.)

Yes

Does the automatic brightness adjustment work correctly?

No

Check the harness connection.

UPCL16CR00 ≠ UPNS6OU

Yes

Does the automatic brightness adjustment work correctly?

No

Check the harness connection.

UPCL16CR00 ≠ UPNS6OU

Yes

Does the automatic brightness adjustment work correctly?

No

Connect the automatic light control cable (MH-966) to the connector on the rear panel.

Yes

Does the automatic brightness adjustment work correctly?

No

Replace the S socket 1U.
(Replace the scope socket unit.)

Yes

Replace the UPCL16CR00.
(Replace the main board.)

No

Check the connected CV or scope.

End
The visual field is dark or too bright.

Automatic brightness adjustment check 2
(Automatic brightness adjustment with the rear cable)

Manual brightness adjustment check

Connect to the system allowing automatic brightness adjustment.

Connect the CV and CLV-160 via the light control cable.

Does the automatic brightness adjustment work correctly?

No

Is INDEX optimum?
(Usually, ’0’ is standard.)

Yes

Does the automatic brightness adjustment work correctly?

No

Check the connection of the light control cable (MH-966).

• Mal-connection
• Contact failure

Yes

Does the automatic brightness adjustment work correctly?

No

Remove the connected light control cable (MH-966).

Does the automatic brightness adjustment work correctly?

No

Replace the light control cable (MH-966).

Yes

Does the automatic brightness adjustment work correctly?

No

Check the harness in the light source.

• Broken wire or mal-connection.

Yes

Check the harness in the light source.

A

B

C
Does the automatic brightness adjustment work correctly?

Yes

Replace the UPCL16CR00. (Replace the main board.)

No

Does the automatic brightness adjustment work correctly?

Yes

Check the connected CV or scope.

No

End
TROUBLESHOOTING CLV-160

Lamp brightness check

The visual field is dark or too bright.

Set the light source to the maximum brightness in manual mode. Set the standard filter.

Is the lamp brightness optimum?

No

- Check the scope connection.

Yes

Is the lamp brightness optimum?

No

Check INDEX. Set to MAX.

Does the diaphragm work normally?

No

Manual brightness adjustment check

Yes

Is the lamp brightness optimum?

No

Check that the standard filter (supplied with the main unit) is set in the standard filter frame of the turret plate.

Yes

Is the lamp brightness optimum?

No

Replace the xenon lamp (Y1064S).

Yes

Replace the UPCL16PS10/20. (Replace the switching power supply.)

End
LED does not light or LED indication does not change even if the switch is depressed.

1. **Panel operation check**
   - Connect the applicable scope, and light up the xenon lamp.
   - Depress the panel switch.

2. **Is LED lit normally with a lighting noise?**
   - No
     - Is LED normal except the lighting noise?
       - No
         - Check the connector contact. Main board & Front panel
       - Yes
         - Is LED lit normally with a lighting noise?
           - No
             - Replace the DW5327. (Replace the flat harness.)
           - Yes
             - Replace the front panel.
   - Yes
     - Is LED lit normally with a lighting noise?
       - No
         - Replace the UPCL16CR00. (Replace the main board.)
       - Yes
         - Replace the UPCL16CR00. (Replace the main board.)

3. **End**
Troubleshooting CLV-160

Emergency lamp operation check

Panel operation check

Is the emergency lamp LED lit on the front panel after the power is turned on?

Yes

Replace the emergency lamp.

No

Is the emergency lamp LED lit on the front panel?

Yes

Replace the W12M018A. (Replace the emergency lamp harness.)

No

Is the emergency lamp LED lit on the front panel?

Yes

Does the emergency lamp state signal detect the defect?

Yes

J4/7 pin of the main board is H.

Replace the UPCL16PS10/20. (Replace the switching power)

No

Replace the UPCL16CR00. (Replace the main board.)

No

Is the emergency lamp lit when the main lamp is not lit?

Yes

Remove the xenon lamp, and make the emergency lamp light up.

Is the turret plate rotated to the emergency lamp position?

Yes

Replace the emergency lamp.

No

No


A

B

C

The emergency lamp is not automatically lit when the xenon lamp goes out.
No
Replace the
UPCL16CR00. (Replace
the main board.)

Yes
Is the emergency lamp
lit when the main lamp is not lit?

Yes
Is the emergency lamp
lit when the main lamp is not lit?

No
Replace the
UPCL16PS10/20. (Replace
the switching power supply.)

End
Backup function check

Are the values set before turning off of the power held when the power is turned on?

No

Replace the UPCL16CR00. (Replace the main board.)

Yes

End

The values set before the power is turned off are not stored when the power is turned off.
The lamp life meter does not return to zero even if the lamp life meter reset switch.

Lamp life meter reset function check

Panel operation check

Does LED indicate zero when the lamp life meter reset switch is depressed?

No

Yes

Is the reset switch held depressed?

No

Hold the reset switch depressed?

Yes

Does LED indicate zero?

No

Replace the UPCL16CR00.
(Replace the main board.)

End
Brightness does not change even if the transillumination switch is depressed.

- Transillumination function check
- Panel operation check
- Filter switching operation check
- Manual brightness adjustment check

Is the brightness increased to the maximum when the transillumination switch is depressed?

- Yes
  - Replace the UPCL16CR00. (Replace the main board.)
  - End

- No
  - Replace the UPCL16CR00. (Replace the main board.)
5. DISASSEMBLING PROCEDURE

1. General Precautions on Disassembling
   - Replace the parts and wires to the original positions.
   - For electrical safety and standard, be sure to reassemble the following parts to the original states.
     1. Insulation tube and mylar sheet
     2. Cables clamped and separated from the heating parts or high-voltage parts
     3. Cover screws with a toothed lock washer to suppress a radiation noise
   - Use the specified parts.
   - The parts used in this unit are designed protective against vibration, heat and high voltage. Be sure to select the parts with the same characteristics from the parts list when replacing the parts.
   - Be careful when disconnecting the cable housing.
   - Don’t pull the cable. Be sure to use the special tool.

2. Jigs and Tools

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3. Disassembling Procedure

1. Top cover
   (1) Turn the knobs, and remove the lamp access cover.
   (2) Remove the screws on the rear panel.
      Phillips screwdriver No.2 (HCBK3x6SA x 3)
   (3) Remove the screws from the side panel.
      Phillips screwdriver No.2 (HCBK3x6SA x 10)
   (4) Remove the top cover.

2. Front panel
   (1) Remove the screws that secure the front panel to the chassis.
      Phillips screwdriver No.2 (CCUK3x4SZ x 3)
   (2) Remove the harness from the main board.
   (3) Remove the cable from the sheet switch.
      (A)
   (4) Remove the main board from the FP chassis.
      Phillips screwdriver No.2 (CCU3x6SZ x 4)

Tightens the capacitor.
(5) Remove the FP chassis from the panel.
Phillips screwdriver No.2 (T2CCUK3x6SZ x 6)
(When assembling, pay attention to the tightening hole positions. See the drawing below. The idle hole is spare.)

(6) Remove the light shielding plate from the panel.
Phillips screwdriver No.2 (T2CCUK3x8SZ x 3)

(7) Remove the harness from the sheet switch and LED board.
Phillips screwdriver No.2 (T2CCUK3xWZ)

3. Pump
(1) Remove the scope detection harness and the diaphragm harness from the clamp.
(2) Remove the harness wound around the spiral from the pump BK.
Phillips screwdriver No.2 (CCUK3x6SZ x 2)
(3) Remove the spiral from the harness (except the scope detection harness) from the socket.
(4) Cut the two binders, and remove the valve U from the valve BK.
Nippers
(5) Cut the binder, and remove the S-tube from the valve U.
Nippers
(6) Remove the pump from the chassis.
Pump BK
Suction side tube

4. Rear panel
(1) Remove the NF board side of the cable of the inlet-NF board.
(2) Remove the fuse side of the cable of the fuse-NF board.

(3) Remove the screws, and remove the rear panel from the chassis.
Phillips screwdriver No.2 (HC3x6SA x 7)
5. NF board
(1) Remove the cable from the NF board.
(2) Remove the NF board from the power supply unit.
   Phillips screwdriver No.2 (CCUK3x6SZ x 5)

6. Power supply unit
(1) Remove the core, and remove the emergency lamp housing from the power supply unit.

(2) Remove the shield cover.
   Phillips screwdriver No.2 (CCUK3x4SZ x 4)
(3) Remove the shield PS plate.
   Phillips screwdriver No.2 (CCUK3x6SZ x 3)

(4) Remove the igniter harness from the electrode.
   Phillips screwdriver No.2 (CUKSK4x6SZ, CUKSK3x6SZ)

(5) Remove the cable from the power supply unit from the pushbutton switch.
DISASSEMBLING PROCEDURE CLV-160

(6) Remove the screw. (Front side)
Phillips screwdriver No.2 (CCUK3x4SZ x 2)

(7) Remove the screws, and remove the power supply unit from the chassis.
Phillips screwdriver No.2 (CUKSK3x6SZ x 2)

7. Switch collar and pushbutton switch
(1) Remove the switch washer, switch plate and switch plate collar from the chassis.

(2) Remove the screws, and remove the switch unit from the chassis.
Phillips screwdriver No.2 (CCUK3x4SZ x 2)

8. Optical unit
(1) Remove the shield case.
   Box screwdriver(5.5mm)(C6N3SZ x 7)
(2) Remove the lamp housing.
   Phillips screwdriver No.2 (CCUK3x6SZ x 4)
   (When assembling, tighten the screws as specified on the left.)

(3) Remove the screws, and remove the S-socket from the optical base.
   Phillips screwdriver No.2 (CCUK4x12SZ x 4)

(4) Remove the cable holder from the optical base.
   Box screwdriver(5.5mm)(C6N3SZ x 3)

(5) Remove the turret unit from the optical base.
   Phillips screwdriver No.2 (CCUK3x6SZ x 3)
   (When assembling, tighten the screw A together with the earth strap as shown on the left. For forming of the emergency lamp harness, see the drawing below.)

(6) Remove the lens holder and the diaphragm unit from the optical base. (The diaphragm unit is located underside.)
   Phillips screwdriver No.2 (CCUK3x6SZ x 2)
(7) Remove the W-lens holder from the optical base.
   Phillips screwdriver No.2 (CCUK3x6SZ)

(8) Remove the lens.
   (When assembling, pay attention to the lens direction. See the drawing on the left. The lens shall have no dust and stain.)

(9) Remove the limit switch from the optical base.
   Phillips screwdriver No.2 (CCUK3x6SZ)

(10) Remove the terminal from the chassis.
    (CCUK3x4SZ)
    (When assembling, pay attention to the terminal direction. See the drawing below.)

(11) Remove the electrode F from the optical base.

(12) Remove the sink holder spring from the optical base.
    Phillips screwdriver No.2 (CCUK3x4SZ x 2)

(13) Remove the cable from the electrode R.
    Phillips screwdriver No.2 (CCUK3x4SZ)
    (When assembling, pay attention to the terminal direction. See the drawing below.)

(14) Remove the electrode R from the optical base.
    Phillips screwdriver No.2 (CCUK3x6SZ x 3)

(15) Remove the screws in the order specified on the left, and remove the discharge spring, the cord stopper, the discharge plate and the cable.
    (The discharge spring and the discharge plate shall have no dust and stain.)
6. ASSEMBLING PROCEDURE

1. General Precautions on Assembling
   - Replace the parts and wires to the original positions.
   - For electrical safety and standard, be sure to reassemble the following parts to the original states.
     1. Insulation tube and mylar sheet
     2. Cables clamped and separated from the heating parts or high-voltage parts
     3. Cover screws with a toothed lock washer to suppress a radiation noise
   - Use the specified parts.
   - The parts used in this unit are designed protective against vibration, heat and high voltage. Be sure to select the parts with the same characteristics from the parts list when replacing the parts.
   - Be careful when disconnecting the cable housing.
   - Don’t pull the cable. Be sure to use the special tool.
   - Be careful not to be injured.
     Some metallic parts have sharp corner or edge. Be careful when handling such parts.
   - Be sure to observe the specified torque and dimensions.
     Observe the torque and dimensions when they are specified.
   - As for the H-band which secures each tube, first tighten it by the specified torque and then pull the tube to check whether the tube becomes loose or it comes off.
   - Clean the parts to be used.
     When re-using the same parts, eliminate the sealing material and tape and clean. For the O-ring and packing, clean the surface of the parts on which the O-ring or packing is mounted. Otherwise, it may cause water leakage.
   - Don’t forget to tighten the screws and nuts.
     Failure in tightening the screws and nuts may cause water leakage.

2. Jigs and Tools

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3. Assembling Procedure
   - Reverse the disassembling procedure.
### 8. PARTS LIST

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