

Microstar Colposcope C-100

Manual de Servicio Técnico



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1. Introduction

1.1. Purpose

This document provides the necessary information to perform maintenance tasks to *Microstar C-100 Colposcope*.

1.2. Scope

MICROSTAR C-100 Colposcope was designed to carry out diagnostic examinations in the gynecologic consultation.

1.3. Definitions, Acronyms and Abbreviations

N/A

1.4. References

N/A

2. General Description of the Product

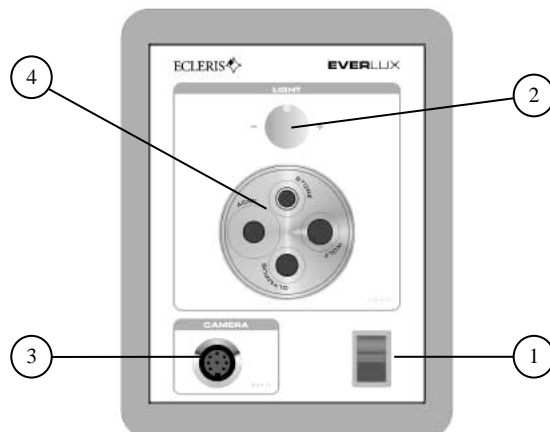
2.1. System Classification

Medical device Class: I

Protection against electrical discharges: Type B

Protection against liquid entrance: IPX0

2.2. LED Light Source

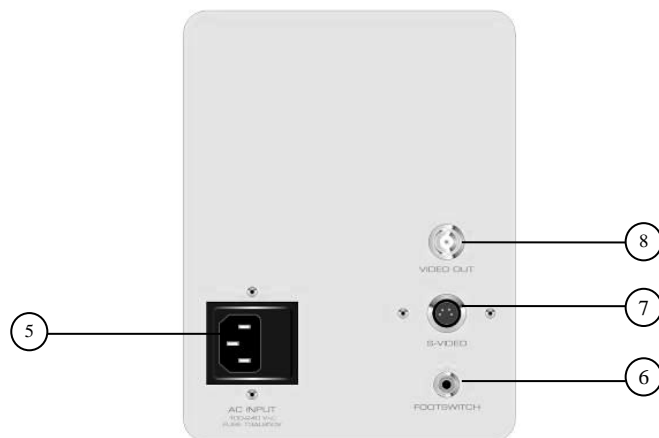


1 On/Off switch

2 Light Intensity Control (Dimmer)

3 Camera connector (video input)

4 Universal fiber optic cable connector



5 Power supply cable connector with fuse holder

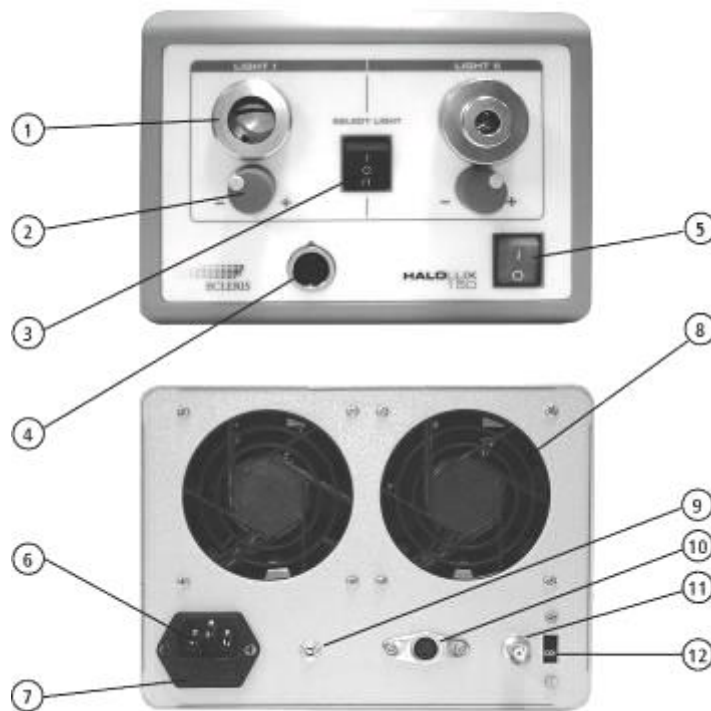
6 Ecleris Endodigi Connector (Image and video capture) and other peripheral devices *

7 S-Video Output (SVHS)

8 Composite Video Output (CVBS)

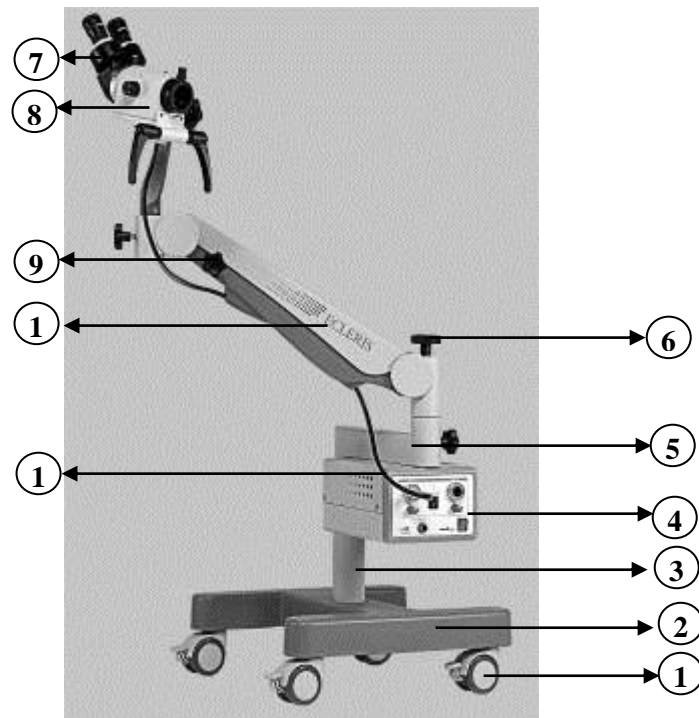
* Standard output (Normally-Open) to remotely operate other image capture devices such as Video Printers

2.3. Halogen Light Source



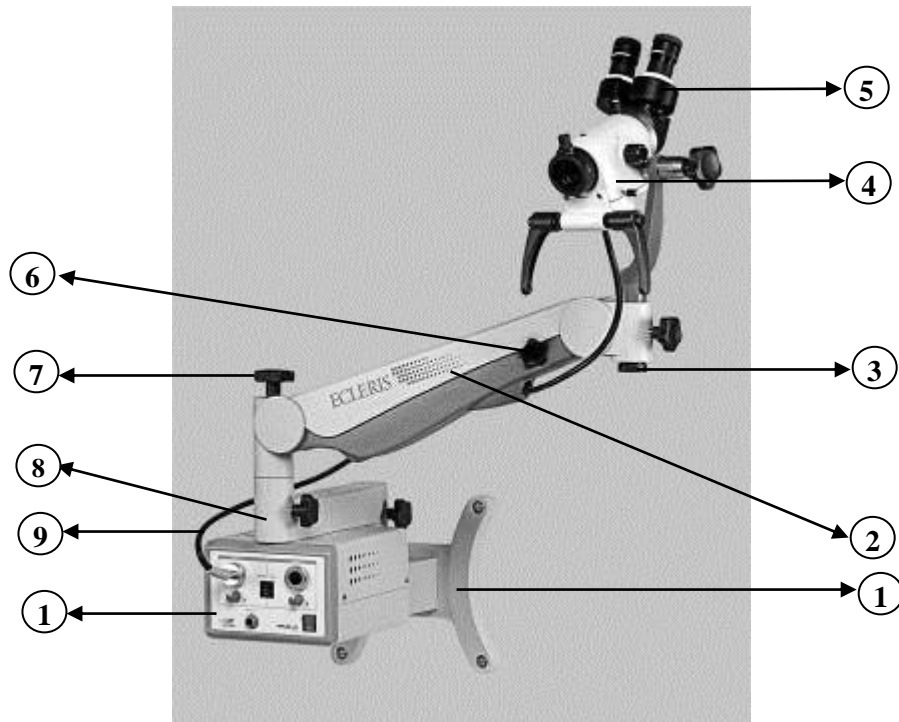
- | | |
|---------------------------------|---|
| 1. Fiber optic cable connector | 7. Fuse box |
| 2. Diaphragm control | 8. Ventilation grids |
| 3. Lamp selector switch | 9. Ecleris Endodigi Connector (Image and video capture) and other peripheral devices* |
| 4. Video camera connector | 10. S-Video output (SVHS) |
| 5. On/off switch | 11. Video output |
| 6. AC interlock cable connector | 12. Voltage selector |
- * Standard output (Normally-Open) to remotely operate other image capture devices such as Video Printers

2.4. Floor Stand Colposcope (C-100F)



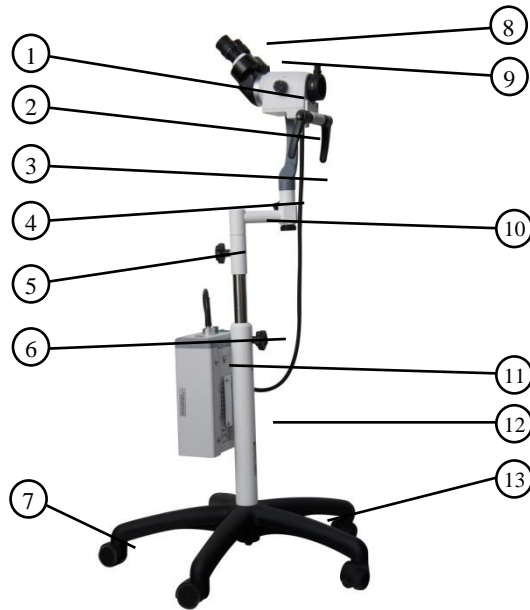
1. Wheels with brake
2. Base
3. Column
4. Double light source
5. Forearm
6. Parallelogram arm brake
7. Binocular
8. Head
9. Parallelogram arm
10. Weight compensation control
11. Fiber optic cable

2.5. Wall-Mounted Colposcope (C-100W)



1. Wall Mount
2. Parallelogram arm
3. Header adjusting screw
4. Head
5. Binocular
6. Parallelogram arm brake
7. Weight compensation command
8. Wall support forearm
9. Fiber optic cable
10. Double light source

2.6. Floor Stand – Telescopic Column Model (C-100A5E)



1. Head
2. Head handle
3. Fiber optic cable
4. Regulation of head rotation command
5. Regulation of elbow rotation command
6. Height brake
7. Wheels
8. Eye piece
9. Binocular
10. Elbow (90° piece)
11. LED light source
12. Column
13. Base

2.7. Complete Head



1. Magnification selector
2. Micro-focus adjustment
3. Focal Lens
4. Green filter
5. Head handle
6. Fiber optic cable
7. Eyepiece rubber
8. Eyepiece
9. Binocular body
10. Head body
11. Balance movement control
12. Head fork pole

3. Safety Rules

This chapter describes the safety features included in the *Microstar C-100 Colposcope* system, as well as the safety precautions to be considered when handling and using it.

3.1. Safety Features of the System

Microstar C-100 Colposcope system contains the following safety features:

- There shall be a main switch to turn the system ON and OFF.
- The system is labeled according to the international safety standards and pursuant to the specific voltage levels of the country.
- The system is factory-equipped with adequate ground connection.

3.2. General Precautions

- Do not touch or handle the internal parts of the system except during its maintenance / repair.
- Only authorized personnel from the company shall perform the maintenance and repair of this system.
- Make sure that all personnel involved in the study are familiar with the system controls and know how to turn it off immediately in case of emergency.

3.3. Personal Safety

When operating the system the main concern shall be the safety both of the patients and the system users. Follow these safety guidelines in order to keep a high personal safety level.

- Check that the person performing the study is qualified to do it.
- Before performing the study, get a detailed clinical record of the patient in order to check if she is in good condition to undergo it.
- Inform the patient about the study, possible results and any risk associated with it.



Do not try to operate or perform the maintenance of the system before reading the safety information provided in this chapter.

3.4. A Safe Environment

- Keep the following environmental requirements to protect the system parts and allow an optimum operation:
- Keep the system away from any corrosive material that may damage the electronic parts.
- Keep the system clean and away from metallic dust and dirt particles that may damage the electrical parts of the system.
- The recommended room temperature is 20°-25°C and a relative humidity lower than 80%.

3.5. Electrical and Mechanical Safety

Follow these instructions to guarantee the electrical and mechanical safety of the equipment:

- Do not remove the system covers or panels while in service.
- Check that the system is turned off and electricity disconnected before trying to perform its maintenance or repair.
- MICROSTAR C-100 COLPOSCOPE shall only be used in places with electrical installations that meet the national, provincial and local regulations in effect.
- MICROSTAR C-100 COLPOSCOPE shall be connected to the grounding of the doctor's office through a ground cable.
- MICROSTAR C-100 COLPOSCOPE shall be connected to the voltage line through the power supply cable provided.
- The power supply shall only be provided with a protected plug and the adequate ground connection.

3.6. Fire Risks

- Follow these instructions in order to avoid fire risks:
- For a continuous fire protection, replace the fuse only by one of the same rating.

4. System Installation

This chapter provides instructions on what to do before installing the system; it describes the installation process and the subsequent procedures.

4.1. Considerations Previous to Installation

4.1.1. Hardware requirements

Before installing the system check that it has the following elements:

- Main unit with the corresponding support
- Header with binocular, lens and eyepieces
- Light source and power supply cable
- Fiber optic cable and fiber adapter
- Procam camera and beam splitter(Optional)
- User's Manual

4.1.2. Electrical Requirements

The system voltage shall be set with the selector switch located in the rear panel of the light source and pursuant to the local voltage line. Therefore, the system shall need at least one of the following power supply lines:

- Single-phase 100 Vac; 15A; 50-60Hz, or
- Single-phase 115 Vac; 15A; 50-60Hz, or
- Single-phase 230 Vac; 10A; 50-60Hz



Check that all system plugs are properly ground connected

4.2. Installation Process

No experienced personnel are necessary to install the *Microstar C-100 Colposcope*.

Follow these steps to install the *Microstar C-100 Colposcope* correctly:

It is necessary to have a screwdriver, a 13-mm and 27mm wrench to install the system.

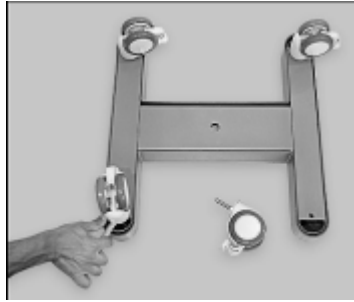
Besides the tools supplied with the system:

For the Wall mounted Colposcope (C-100W) you will need an electrical drill, a wall drill and a ½''socket wrench.

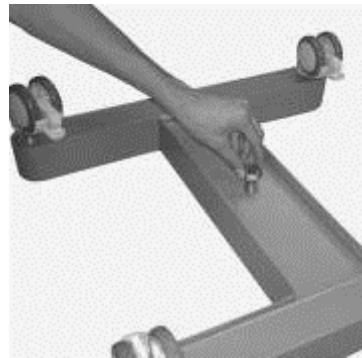


In order to avoid accidents related to the handling of the different parts of the system, it is recommended that two persons perform the installation by carefully following the instructions.

4.2.2. Floor Stand (OM 100F)



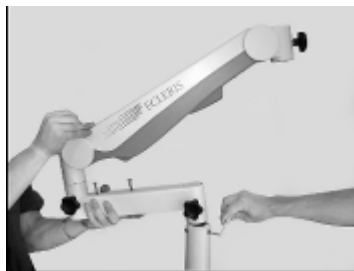
1. Place the support on a smooth surface in order to obtain the best possible stability without damaging the base. Install the 4 wheels with a 13-mm wrench.



2. Insert the 27mm bolt as shown in the picture



3. Tighten the 27mm bolt to the column as shown in the picture using a socket, fixed or adjustable wrench.



4. Loosen the 3 screws on the column receiving end. Place the parallelogram arm as shown in the figure. You shall get a perfect match. Firmly tighten the 3 screws with the Allen wrench.



5. Introduce the header fork together with the Teflon washer in the parallelogram arm end and firmly tighten the safety adjusting screw.



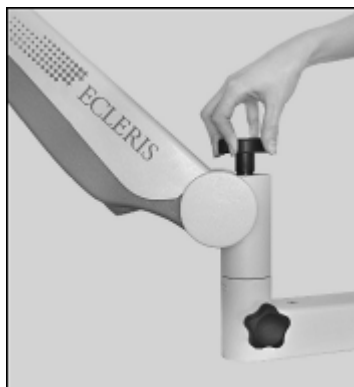
6. Place the binocular on the holder by matching the marks. Tighten the binocular screw to obtain the best possible fitting.



7. Place the eyepieces on the binocular. Unscrew the rubber around the eyepieces.
Note: if the user has glasses, leave the rubber on



8. Pass the fiber optic cable connector through the parallelogram arm cover and connect it to the header.



9. If necessary, once the colposcope is installed balance the weight compensation command located on the parallelogram arm proximal end.



If during the colposcope installation process an anomaly is detected, please contact the technical service department of your local distributor or the closest ECLERIS office before using the colposcope with a patient.

4.2.3. Wall Mount (OM 100W)

Before proceeding to install the wall mount, it is necessary to determine the adequate height to fix and level it correctly.



The wall support shall only be placed in high resistance walls. It shall not be installed in hollow brick walls or those with a thickness lower than 15 cm., plasterboards, wooden partition walls or any other low resistant material. It is recommended to get the advice of a building professional to analyze the correct fixing of the support.



1. Make a 7"-length horizontal line on the wall, perfectly leveled with the floor at 49.2" height from it.



2. Place the support on the wall so that the line draw on it perfectly matches the lower straight part of the element; check with a bubble level if it is even.
3. Mark with a pencil the top left hole-position on the wall in order to use it as reference. Remove the support.
4. Using a driver-drill and a wall drill, perforate the top left hole, place the Fisher plug, put the wall support again and insert the corresponding bolt. The bolt shall be screwed with the socket wrench until a strong resistance is achieved.
5. Once the top left end is fixed, repeat steps 3 and 4 to fix the top right end first and then the lower ones.



Before drilling the wall, check the correct leveling.

6. The wall support shall be firm. In order to check it, test its resistance by placing a weight eight times heavier than the Colposcope.



ECLERIS shall not be liable for the physical and/or material damages that may occur due to the incorrect fixing of the wall support.



7. Loosen the 3 screws of the forearm receiver in the wall support.
8. Place the Colposcope as shown in the figure. A perfect match shall be achieved with the support. Tighten the 3 screws of the support with the Allen wrench.
9. Check that the procedure was properly done by rotating the forearm around the support in both directions until reaching a butt. The movement is limited to reach a 170° range.



10. Connect one of the power supply cables from the light source to the wall support top connector and the other one from the wall support to the electrical network.
11. Follow steps 5 to 10 from section 4.2.1 to install the header, binocular and eyepieces.

4.2.4. Floor Stand Telescopic Model

1. Place the colposcope's base in a vertical position.
2. Insert the column into the base and hold it by mean of the provided 10mm Allen screw. Place the washer between the screw and the base as shown in the picture below.



3. Stand the base on the floor and insert the 90° arm into the column.



4. Attach the light source to the column using the 4 Phillips screws provided.



5. Insert the head fork into 90° arm.



6. Place the binocular in the matching binocular support, verifying that the marks are aligned. Adjust the binocular screw to achieve the best possible seat.



7. Attach the eyepieces to the binocular. Unfold the rubber protectors surrounding the eyepieces.

Note: If the user wears eyeglasses, leave the rubber protectors folded.



8. Attach one end of the fiber optic cable to the light source and the other end to the head



If you detect any abnormality before you start operating the Ecleris Microstar C-100A5E Colposcope, please contact the technical department of your local distributor or nearest ECLERIS office prior to using the colposcope on patients.

4.2.5. Installing the Light Source



Place the light source below the forearm, as shown in the picture.
Introduce the nuts in the slots of the light source top surface.
Once inserted, slide the light source backwards before tightening the Allen screws.



The lamps can be moved during the colposcope transportation. Before turning the light source on, check that the lamps are correctly positioned and aligned with the fiber optic cable connector.

4.2.7. Installing the Focal Lens



Screw the lens to the header, leaving the micro-focus control in the desired position. Tighten the nut counter-thread in order to achieve a correct lens fixing

4.2.8. Installing the Beam splitter and Video Camera

1. Remove the binocular if it is already placed.
2. Tightly screw the camera to the beam splitter until its end.



Do not over tight the video camera to the beam splitter in order to avoid mechanism damage.

Place the beam splitter with the camera verifying that the marks are aligned. Adjust the beam splitter screw to achieve the best possible seat.



3. The same way, place the binocular on top of the beam splitter.
4. Remove the fiber optic cable from the colposcope's arm.
5. Introduce the camera's cable in the head through the cover of the parallelogram arm.
6. Introduce once again the fiber optic cable through the colposcope's arm. Connect the fiber optic cable to the head.
7. Connect the fiber optic cable at the front of the light source pushing it forwards.
8. Connect the video cable to the video output on the light source.
9. Connect the other end of the video cable to the monitor's video input (Video IN).
10. Turn on the light source and monitor.
11. Locate the head at the working distance according to the focal lens (200, 250, 300 or 400 mm) and focus a flat image or object. Working distance must be measured from the focal lens to the object. It is very important to use a flat object or image during this procedure.
12. Set the oculars to its middle position (no dioptics correction).
13. Rotate the magnification selector up to the maximum factor (2.5X).
14. Looking through binoculars, focus the image using the micro-focus knob until all magnifications are in focus (parafocusing).
15. Adjust the oculars dioptics to correct eyesight deviations, until the visualized image gets comfortable and sharp.
16. After the optical image is parafocused (all magnifications in focus), adjust the camera position until its image reaches the same orientation as the optical image (see image orientation).
17. Rotate the magnification selector up to the maximum factor (2.5X).
18. Focus the camera's image using the beam splitter focus control until all magnifications are in focus.



Important:



The optical Head is parafocused only at the working distance according to the used focal lens. Deviations in working distance will affect the optical parafoocusing and focus adjustment should be repeated.

5. Preventive Maintenance

In order to keep an optimum operation of Microstar C-100 Colposcope it is recommended to perform a minor annual inspection of the system.

This procedure shall include:

- Cleaning.
- Electrical connections check.
- Spare parts: to avoid time losses due to downtime of the system, it is recommended to have a spare fuse (T2AL250V for 220V, and T4AL250 for 110V power supply).

To perform any revision and maintenance work, contact your local distributor or the closest ECLERIS office.

5.1. Safety Considerations



**Before cleaning the system, disconnect the power supply cable to avoid electrical discharges.
Improper and/or incomplete reprocessing can cause infection of the patient or medical personnel. Do not sterilize the camera header or cable by autoclave.**

5.2. External surfaces cleaning

Clean all metallic surfaces with a clean cloth or cotton wool moistened with alcohol.



**Perform all cleaning with special care, avoiding water or humidity access to the equipment.
Do not use detergents, solvents or any other abrasive agent. Do not sterilize by autoclave.
Clean the exterior of the unit at least once every 15 days.**

5.3. Electrical connections check

Constantly check the condition of all components and their aging process.

Verify that the following does not exist:

- Faulty, broken or cut cables.
- Faulty connection between the cable and the plug.
- Oxide corrosion in connection pins.

5.4. Fuse change

- a. The fuse box is on the rear panel, as well as the voltage selector.
- b. Disconnect the power supply cable from the electrical network.
- c. Disconnect the Microstar C-100 Colposcope power supply cable.



- d. Under the power supply cable connector there is a small rectangular plastic holder where the fuses are located. With the help of a screwdriver and with slight pressure, remove the lid to replace the damaged fuse.
- e. Remove the burnt fuse and replace it with the spare fuse located inside the same plastic holder. Use T2AL250V fuses for 220V and T4AL250V for 110V power supply.
- f. Place the fuse lid back, pushing until a “click” is heard.
- g. Connect the power supply cable to the Microstar C-100 Colposcope and the electrical network.

6. System Maintenance

This chapter describes the procedures for the System Maintenance. Only Ecleris certified technicians are authorized to perform the maintenance to the Microstar C-100 Colposcope system.

6.1. Safety Considerations

Before turning the system on, read the following Safety Rules:



The system contains dangerous voltage.



Note

In case of emergency, turn the system off immediately.

6.2. Tools

The following tools are necessary to perform the system maintenance and repair.

- Philips screwdriver
- Medium-sized flat screwdriver
- 1.5-mm Allen wrench
- 1/8" wrench
- 4-mm socket wrench
- Needle-nose pliers
- Digital voltmeter

7. Disassembling and Assembling the System

This chapter provides instructions to disassemble the system panels and its electronic components. For a list of electronic components, see “Appendix C”. In order to reassemble the system parts and electronic components carry out the disassemble procedure backwards



Disconnect the system power supply cable before proceeding to disassemble/assemble the electronic components.

When disassembling/assembling the system do not use tools that are not specified in the “System Maintenance” section of this manual.

Do not replace any of the original screws, jumpers or connectors provided with the system unless Ecleris supplies them for this purpose.

7.1. Disassembling Light Source covers

It will be necessary to remove the top cover to access the electronic parts of the system.

7.1.1. Disassembling top covers

1. Loosen and remove the 4 4-mm Allen screws that hold the top cover, located on the light source laterals.



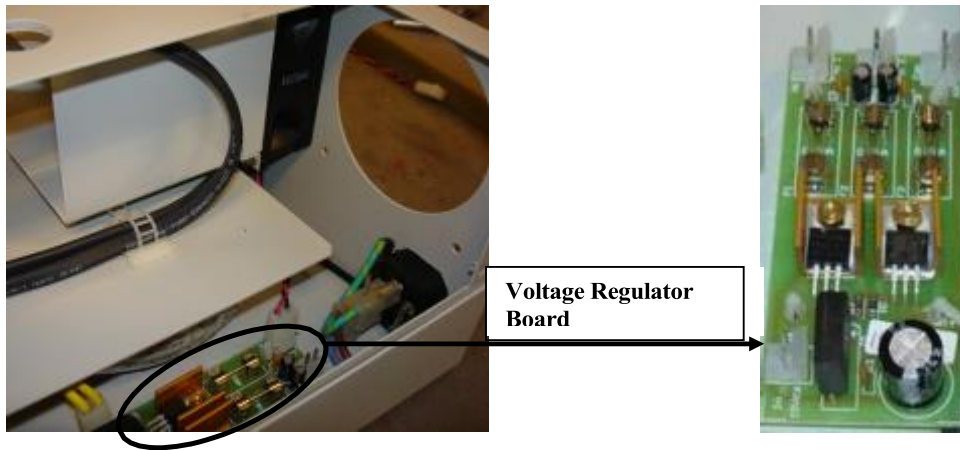
2. Remove the covers upwards.

7.2. Disassembling the Light Source Components

7.2.1. Disassembling the Voltage regulator Board

- a. Remove the refrigeration nozzle together with the fan by taking out the Philips screws that hold them.
- b. Disconnect all the voltage regulator board connectors.
- c. Using pliers press on the ties of the board clamps and remove them one by one.

- d. If you are unable to remove the board in this way, take the 4 Philips screws away located on the system base and remove it.



7.2.2. Lamp replacement

- a. Remove the top cover from the burnt lamp side (See 7.1.1)



- b. Press the spring that holds the lamp downwards to release it
c. Plug the lamp off its socket and remove it from the lamp holder.
d. Plug the new lamp into the socket. Make sure to introduce the whole length of the pins.



- e. Place the new lamp in the lamp-holder while you press the spring with your finger. Check the correct matching of the lamp with the spring in order to avoid its sliding.
f. Before placing the top cover, arrange the lamp socket cable orderly.

7.2.3. Disassembling the transformer

- a. Disassemble the top covers (see 7.1.1)
- b. Remove the lamps from the lamp-holders (see 7.2.2)
- c. Disassemble the refrigeration nozzles together with the fans, removing the Philips screws that hold them (4 each)
- d. Disassemble both diaphragms removing the knob first and then the Grover washer that support them to the cabinet.
- e. Unthread the knurled nuts from the front that hold both lamp-holders.
- f. Remove both lamp-holders.



- g. Remove the Allen screw supporting the metallic plate that separates from the transformer.
- h. Disconnect the primary and secondary winding.
- i. Remove the Transformer.

Appendix A: Troubleshooting

Problem	Causes	Solutions
The system does not turn on. The green pilot light from the start-up switch does not turn on.	Without electrical power supply.	Connect the power supply cable to the electrical network. Check the power supply cable condition. Replace this cable.
	Burnt fuse/s	Check external and internal fuses. Replace them by others of the same ratings.
	The network voltage is not the same as the system one.	Check that the network voltage is the same as the voltage selector one. If not, check the fuse condition again.
The green pilot light from the start-up switch turns on but the lamp doesn't.	Wrongly connected lamp	Check the connection between the socket and the lamp.
	Lamp without power supply	Check the lamp power supply. If there is 15VAC on the lamp socket, measure lamp continuity. If there is no 15VAC check transformer connections. Replace the transformer.
	Burnt lamp	Measure continuity among lamp pins; if there isn't, replace it.
Light intensity is incorrect	Defective lamp	Replace lamp
	Lamp wrongly positioned	Place the lamp properly in the lamp-holder.
The green pilot light from the start-up switch turns on there is no image in the monitor.	Defective or deficiently connected video cable	Check video connections and cable condition. The Microstar C-100 Colposcope video output shall be connected to a monitor video input; check that such monitor input is selected.
	Camera without power supply	Check all cables and connections. Check voltages and fuses on the voltage Regulator Board. Replace voltage Regulator Board if it is not working properly.
	Defective or deficiently connected camera	Check camera connection. Replace camera.
Image is too dark	An external device termination resistance is ON.	If it is not necessary, remove or turned the termination resistance OFF
	Monitor calibration is not neutral	Calibrate monitor parameters
Deficient image quality	It does not have a white balance	Place the camera on a white surface and press the White Balance button
	Defective video cable	Replace video cable
Poor colors	Monitor calibration is wrong	Calibrate monitor parameters
	Incorrect video standard	Program the monitor with the

		correct video Standard
Image without colors	Incorrect monitor video standard	Program the monitor with the correct video Standard
High temperature in light source	A fan does not work	Check voltage and fuses in the voltage regulator board. Replace the fan/s that do/does not work. Replace the voltage regulator board.

If the problem cannot be solved, please contact your local distributor or the closest ECLERIS office and request technical service

Appendix B: Specifications

MICROSTAR C-100 COLPOSCOPE

OPTICAL SYSTEM	Composed of apochromatic lenses with a fungus-resistant coating
BINOCULAR TUBES	45° Inclined: 55 - 80 mm Straight: 45 to 80mm Inclinable: 50 to 85mm
OBJECTIVE LENS	F: 200 / 250 / 300 / 400 mm (one included)
MAGNIFICATIONS	Apochromatic five steps magnification changer through a click-stop revolving mechanisms
FINE FOCUS	Manual
EYEPIECES	10 x wide angle dioptric setting: + / - 5
FIELD OF VIEW (10 X)	Ø 24 mm / 0.95" (for F: 200 mm) Ø 31 mm / 1.22" (for F: 250 mm) Ø 36 mm / 1.42" (for F: 300 mm) Ø 50 mm / 2.00" (for F: 400 mm)
INTERPUPILAR DISTANCE	2.16"- 2.95"
FILTER	Green

ILLUMINATION

LED light source

TYPE OF ILLUMINATION	Coaxial illumination through 7 mm fiber optic light guide cable
LIGHT SOURCE	High intensity led Integrated video camera input and video output
ILLUMINATED FIELD	Ø 70 mm / 2.75" (FOR F: 200 mm) Ø 90 mm / 3.54" (FOR F: 250 mm) Ø 107 mm / 4.2" (FOR F: 300 mm) Ø 145 mm / 5.7" (FOR F: 400 mm)
ILLUMINATION CONTROL	Electronic dimmer
POWER SUPPLY	100-240 VAC, 50 / 60 Hz
FUSES	2 x 3AL250V
POWER CONSUMPTION	110VA
COLOR TEMPERATURE	6000°K approx.
LED SYSTEM SERVICE LIFE	50.000 hours approx.
OVER TEMPERATURE PROTECTION	Automatic led system power-off

Halogen light source

TYPE OF ILLUMINATION	Coaxial illumination through 7 mm fiber optic light guide cable
LIGHT SOURCE	2 halogen lamps (150 watts 15 v each)video camera input and video output integrated into light source
ILLUMINATED FIELD	Ø 70 mm / 2.75" (for F: 200 mm) Ø 90 mm / 3.54" (for F: 250 mm) Ø 107 mm / 4.2" (for F: 300 mm) Ø 145 mm / 5.7" (for F: 400 mm)
ILLUMINATION CONTROL	Manual mechanical diaphragm with continuous adjustment constant light color
POWER SUPPLY	100 - 120 VAC, 50 / 60 Hz 200 - 240 VAC, 50 / 60 Hz
MAXIMUM	170 VA

CONSUMPTION

FUSES 2 x 4A, 250V for 110V
2 x 2A, 250V for 220V

PANTOGRAPH ARM

TYPE WBS - Weight Balance System
ROTATION MOVEMENTS Proximal and distal rolling bearings system
HEIGHT ADJUSTMENT 25" / 63.5 mm

C-100F FLOOR STAND - PARALLELOGRAM ARM

BASE H SHAPED 18.5" X 19.3" / 470 X 490 MM
OBJECTIVE FLOOR Proximal and distal rolling bearings system
HEIGHT
HEIGHT ADJUSTMENT 21.65" / 46.45"
MIN / MAX 550 / 1180 mm
HORIZONTAL REACH 38.2" / 970 mm (max.)
WEIGHT 120.15 pounds / 54.5 kg

C-100W WALL MOUNTED - PARALLELOGRAM ARM

BASE H shaped 10.6" x 10.6" / 270 x 270 mm
HORIZONTAL REACH 43.7" / 1111 mm (max.)
WEIGHT 55.1 pounds / 25kg

C-100T GYN CHAIR MOUNT

STAND 5.5" x 3.7" / 140 x 95 mm
HORIZONTAL RANGE 42.5" / 1080 mm (max.)
ADJUSTING DIAMETERS 1.18"- 1.19" / 30-38 mm
RANGE
WEIGHT 50.7 pounds / 23 kg

C-100A FLOOR STAND - TELESCOPIC COLUMN

BASE 25.2" x 25.2" / 640 x 640 mm
HEIGHT REGULATION 3.8" to 4.7" / 97.5 to 120 mm
WEIGHT 29.7 pounds / 13.5 Kg

SERVICE CONDITIONS

TEMPERATURE 10 - 40 °C
HUMIDITY 35 - 75 % relative humidity
PRESSURE 700 – 1060 hPa

STORAGE AND TRANSPORTATION CONDITIONS

TEMPERATURE -30 - 50 °C
HUMIDITY 10 - 95 % relative humidity
PRESSURE 500 – 1060 hPa

System Installation Report

Complete this report every time the Microstar C-100 Colposcope is installed and send it to ECLERIS closest technical service center.

System Installation Report

Medical Institution:

Name:

Address:

Zip Code:

Phone:

Fax:

Contact Person:

Installation Date:

Series N°:

Special Requirements:

Observations:

Installed by:

Signature: