SKYTRON®

OWNER'S MANUAL

(Includes Operation, Maintenance and Parts)

AURORA FOUR

AUA, LFSAUA, & VCALFSAUA SERIES SURGICAL LIGHTS

Read this manual before operating this light! This information is necessary for the safe and efficient operation of the equipment.

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The base language for this document is ENGLISH. Any translations must be from the base language document.

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Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice. If current manuals are required, contact your local SKYTRON representative or contact SKYTRON directly at the distribution addresses listed above.

Lights manufactured 1-1-2019 and after do not bear the CE mark and do not conform to the CE standard.

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SECTION 1. SAFETY INFORMATION

1-1. Special User Attention

Initial use should not begin until after the users have been instructed by the manufacturer's authorized representative.

Prior to use, all personnel that will operate the surgical light must be instructed in its proper operation by a clinical in-service protocol administered by a Skytron representative.

A routine program should be implemented by the facility for proper usage instructions for all personnel that may operate the surgical light.

When operating the surgical light, all hospital personnel should be aware that sensible care must be taken to maintain patient safety and keep the surgical light fixture functioning at peak efficiency.

1-2. Safety Precautions

The following is a summary of WARNINGS, and CAUTIONS indicated in this manual. These precautions are found throughout the manual where they are applicable. Carefully read the manual before proceeding to operate or service the equipment.

WARNING

WARNING with a safety alert symbol indicates a hazardous situation that, if not avoided, could result in death or serious injury.

No modification of this equipment is allowed.

To avoid injuries or equipment damage, DO NOT push with excessive force, lean on, or rest on the lighting fixture.

Equipment is not suitable for use in the presence of an ANESTHETIC FLAMMABLE MIXTURE with oxygen or nitrous oxide.

To ensure patient safety, DO NOT connect an additional multiple socket outlet or extension cord to the system.

To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth ground.

To avoid personal injury, DO NOT attempt to clean lighthead, camerahead, or wall control unless power is turned off at wall control (power cord disconnected for portable stand light).

California Proposition 65 Warning: This product may contain a chemical known to the State of California to cause cancer, or birth defects, or reproductive harm.

This equipment/system is intended for use by healthcare professionals only. As with all electrical medical equipment, this equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures such as re-orienting or relocating the Aurora Four Light unit or shielding the location.

CAUTION

CAUTION with the safety alert symbol indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Always inspect product prior to use to ensure safe and correct operation. Any product deemed to be malfunctioning should be removed from service and labeled inoperable. Refer all service to a qualified SKYTRON service representative.

To avoid equipment damage and personal injury, use extreme care to avoid collisions with personnel and/or equipment. Damage could result to the surgical lights causing parts to fall into the surgical area.

DO NOT look directly into the surgical light or place highly reflective surfaces in the path of the light beam. There is a risk of impaired vision.

Be sure the sterilizable handle is properly secured before use. An improperly installed handle could fall out, causing possible injury to the patient or surgical staff.

Make sure camera is securely locked in lighthead or camerahead before moving into use position.

DO NOT block vents. Position CCU where it is not exposed to dripping or splashing liquids and away from open flame or heat producing equipment.

To ensure patient safety, DO NOT touch any component of the system and patient simultaneously.

Always inspect product prior to use to ensure safe and correct operation. Any product deemed to be malfunctioning should be removed from service and labeled inoperable. Refer all service to a qualified SKYTRON service representative.

The AUA5S is equipped with locking casters. Make sure the casters are unlocked prior to moving the fixture to avoid the risk of damage or personal injury.

Risk of overbalancing! To avoid injuries or equipment damage, DO NOT push with excessive force, lean on, or rest on the lighting fixture.

DO NOT forcibly overcome a hurdle. If needed, use a ramp and have a firm grasp on the support post handles to maintain balance. A lack of balance would cause a risk of falling.

Due to the high output capability of the lightheads, it may be required to decrease the intensity to reduce the risk of excessive heat in the surgical site when positioning multiple lightheads together to form a single spot.

Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethylene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking or personal injury may occur if these are used.

CAUTION

CAUTION without the safety alert symbol, is used to address practices not related to personal injury but with a possibility of damage to equipment.

Sterilizable focus/positioning handles are subject to normal wear and tear. Always examine the handles for wear or damage to ensure proper and safe operation with the surgical light.

Make sure the MAIN POWER switch is OFF on the light fixture wall control and the camera control unit before installing or removing the camera.

DO NOT attempt to focus or position the lighthead or camerahead using the camera body or counter weight. Damage to the camera rotation motor may result.

DO NOT accidentally push in the camera release button on the attachment ring above the camera cover, as this will cause the camera to disengage from the lighthead or the camerahead.

Avoid pulling or attempting to move the stand light by the focus/positioning handle. The fixture may become unstable and damage may occur.

Exercise caution when moving the stand light to avoid obstacles such as power cords or other items in the pathway. DO NOT transport over rugged or unstable flooring that may damage the casters.

Improper use, transport procedures , or storage of the stand light may result in damage to the support post or balance mechanism. Check to be sure there is no horizontal movement of the balance mechanism within the support post before each use.

DO NOT use the sterilizable focus/ positioning handle on the lighthead to pull or push the stand light base. These adjustments should be done using the positioning handles on the support post.

Sterilizable focus/positioning handles are subject to normal wear and tear. Always examine the handles for wear or damage to ensure proper and safe operation with the surgical light.

DO NOT use steam, extremely hot water (over 150°F [65°C]), or high pressure water sprays to clean the equipment.

DO NOT pour any liquids directly on the fixture or wall control.

DO NOT apply or spray cleaning agents directly on the lighthead, camerahead, or wall control.

The design of the Aurora Four Series lighting fixture and camera system does not utilize internal user serviceable parts. Service must be performed by SKYTRON authorized service technicians using SKYTRON authorized replacement parts and service techniques.

Any parts or assemblies not listed in this section must be serviced or replaced by SKYTRON authorized service personnel only. This is necessary to avoid the possibility of damage to the equipment.

NOTICE

Indicates important information not related to personal injury.

SECTION 2. EQUIPMENT SPECIFICATIONS

2-1. Intended Use

SKYTRON Aurora Four Series surgical lights are intended to be used by medical personnel to provide local surgical site illumination to any part of the patient's body. The Aurora Four series surgical light is suitable for all types of surgical procedures. The clinical settings include, but are not limited to: The Operating Room, Labor and Delivery, Emergency Department, Trauma, Intensive Care Unit, Minor Procedure Room, etc. This is inclusive of all patients requiring surgical intervention.

2-2. Installation

SKYTRON's Installation Manual specifies the unpacking, installation and testing of the Aurora Four Light. Review the Installation Manual prior to beginning the installation of the light. Review local electric codes including the Occupational Health and Safety Act for any requirements that pertain to the proper and successful installation of this light.

2-3. Environmental Conditions

	During Transport and Storage*	During Use (For Dry Locations)
Ambient Temperature	14° to 140° F (-10° to 60°C)	60° to 85°F (15° to 30°C)
Relative Humidity	10% to 85% (No Condensation)	30% to 60% (No Condensation)
Atmospheric Pressure	14 inHg to 31 inHg (500 hPa to 1060 hPa)	20.7 inHg to 31.3 inHg (700 hPa to 1060 hPa)

**In original packaging materials.*

2-4. Fail Safe Compliance

In order for dual or triple lighthead systems to maintain fail safe compliance, a battery back up (UPS) or generator back up power system must be provided in the Mains wiring prior to the wall control which will restore power in five (5) seconds or less. Not SKYTRON supplied.

2-5. Certification

LIGHT FIXTURE CERTIFIED BY ETL TO THESE STANDARDS:

Medical electrical equipment - Part 1: General requirements for basic safety and essential performance - ANSI/AAMI ES60601-1: 2005 / C1: 2009 / A2: 2010;

Medical electrical equipment - Part 1: General requirements for basic safety and essential performance - CAN/CSA-C22.2 No. 60601.1: 2008 COR 2 2011;

Medical electrical equipment - Part 2-41: Particular requirements for the basic safety and essential performance of surgical luminaires and luminaires for diagnosis - IEC 60601-2-41 (2nd Ed. 2009-08);

Medical electrical equipment - Part 1-6: General requirements for basic safety and essential performance – Collateral standard: Usability - IEC 60601-1-6 (3rd Ed. 2010-01);

Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance – Collateral standard: Electromagnetic compatibility – Requirements and tests- IEC 60601-1-2 (3rd Ed. 2007-03).

CAMERA CONTROL UNIT (CCU) CERTIFIED BY ETL TO THESE STANDARDS:

Audio, Video, and Similar Electronic Apparatus: Safety Requirements - IEC 60065: Issued: 2011/02/15 Consolidated Edition. Ed. 7 2001/12/11 with Amd 1 2005, Amd 2 2010, Consolidated Ed. 7.1 2005;

Audio, Video,and Similar Electronic Apparatus: Safety Requirements - ANSI/UL 60065, Issued: 2003/06/30 Ed: 7 Rev: 2012/09/21 Audio, Video and Similar Electronic Apparatus - Safety Requirements;

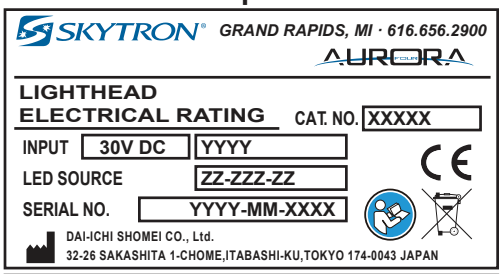
Audio, Video,and Similar Electronic Apparatus: Safety Requirements - CAN/CSA-C22.2 No. 60065: Issued: 2003/04/01 Ed: 1 (R2012), Ammendment 1: 2006, Ammendment 2: 2012.

2-6. Equipment Labels and Specifications

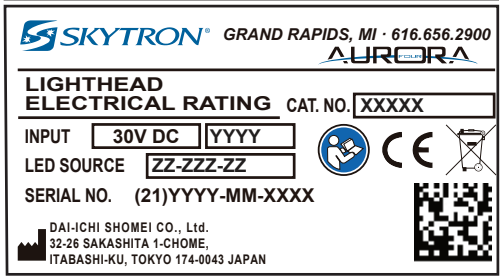
The lighthead data labels contain the lighthead model number, LED Source, electrical specifications, and product serial number.

a. Lighthead Labels and Specs

Label without scan code



Label with scan code



The following table lists label information that varies by lighthead catalog number. The variables listed on the labels above are shown in the table below.

LIGHTHEAD LABEL INFORMATION BY CAT. NO.		
Cat. No. XXXXX	Input Power YYYY	LED Source ZZ-ZZZ-ZZ
AUA5	56VA	B1-720-00
AUA5TV	61VA	B1-720-00
AUA5TV-NS	61VA	B1-720-00
AUA7	56VA	B1-720-01
AUA7TV	61VA	B1-720-01
AUA7TV-NS	61VA	B1-720-01

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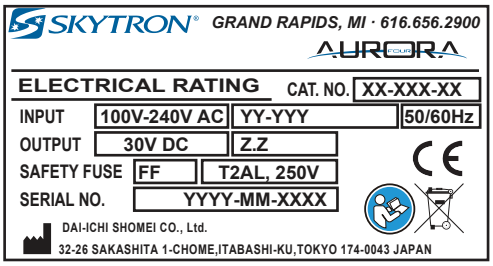
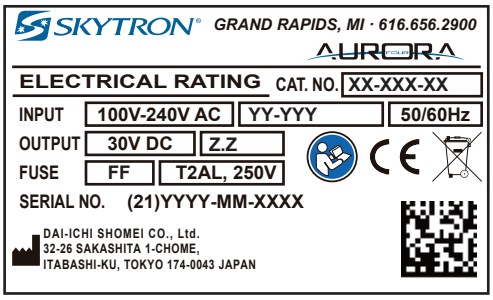
b. Wall Control Labels and Specs

Label without scan code



Label with scan code



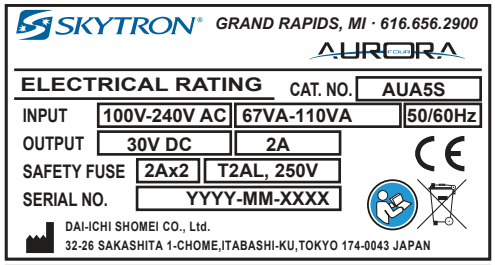
The following table lists label information that varies by wall control catalog number. The variables listed on the labels above are shown in the table below

WALL CONTROL INFORMATION BY CAT. NO.			
Cat. No. XX-XXX-XX	Input YY-YYY	Output Z.Z	Fuse FF
B9-720-01	95VA-175VA	2.1A	2A
B9-720-01-RS	95VA-175VA	2.1A	2A
B9-720-02	148VA-240VA	4.1A	2Ax2
B9-720-02-RS	148VA-240VA	4.1A	2Ax2
B9-720-03	212VA-310VA	6A	2Ax3
B9-720-03-RS	212VA-310VA	6A	2Ax3

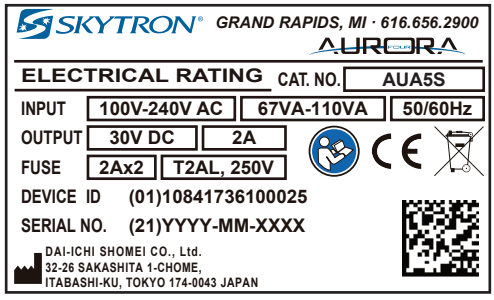
IPXO RATED, CONTINUOUS OPERATION

c. Portable Stand Base Labels and Specs

Label without scan code



Label with scan code



d. Camera Control Unit (CCU) Labels and Specs

Label without scan code

SKYTRON® GRAND RAPIDS, MI · 616.656.2900
Precision HD
CAMERA CONTROLLER ELECTRICAL RATING
INPUT 100-240V AC 0.5A 50/60Hz
PART NUMBER B1-710-59
SERIAL NO. YYYY-MM-XXXX
DAI-ICHI SHOMEI CO., Ltd.
32-26 SAKASHITA 1-CHOME,ITABASHI-KU,TOKYO 174-0043 JAPAN

Label with scan code for controller without RS232C

SKYTRON® GRAND RAPIDS, MI · 616.656.2900
Precision HD
CAMERA CONTROLLER ELECTRICAL RATING
INPUT 100V-240V AC 0.5A 50/60Hz
CAT. NO. B1-710-59
DEVICE ID (01)10841736100193
SERIAL NO. (21)YYYY-MM-XXXX
DAI-ICHI SHOMEI CO., Ltd.
32-26 SAKASHITA 1-CHOME,
ITABASHI-KU, TOKYO 174-0043 JAPAN

Label with scan code for controller with RS232C

SKYTRON® GRAND RAPIDS, MI · 616.656.2900
Precision HD
CAMERA CONTROLLER ELECTRICAL RATING
INPUT 100V-240V AC 0.5A 50/60Hz
CAT. NO. B1-710-59-RS
DEVICE ID (01)10841736100193
SERIAL NO. (21)YYYY-MM-XXXX
DAI-ICHI SHOMEI CO., Ltd.
32-26 SAKASHITA 1-CHOME,
ITABASHI-KU, TOKYO 174-0043 JAPAN

e. Camerahead Labels and Specs

Label without scan code

SKYTRON® GRAND RAPIDS, MI · 616.656.2900
Precision HD
CAMERAHEAD ELECTRICAL RATING
INPUT 30VDC 7W
PART NUMBER VCA-CH
SERIAL NO. YYYY-MM-XXXX
DAI-ICHI SHOMEI CO., Ltd.
32-26 SAKASHITA 1-CHOME,ITABASHI-KU,TOKYO 174-0043 JAPAN

Label with scan code

SKYTRON® GRAND RAPIDS, MI · 616.656.2900
Precision HD
CAMERAHEAD ELECTRICAL RATING
INPUT 30V DC 7W
CAT. NO. VCA-CH
SERIAL NO. (21)YYYY-MM-XXXX
DAI-ICHI SHOMEI CO., Ltd.
32-26 SAKASHITA 1-CHOME,
ITABASHI-KU, TOKYO 174-0043 JAPAN

f. Radial Arm UDI Label

SKYTRON® GRAND RAPIDS, MI · 616.656.2900
SERIES Aurora Four
DAI-ICHI SHOMEI CO., Ltd.
32-26 SAKASHITA 1-CHOME,
ITABASHI-KU, TOKYO 174-0043 JAPAN
SN (01)10841736100025 (21)YYYY-MM-XXXX

g. Camera Control Unit Warning Labels

WARNING:
RISK OF FIRE
REPLACE FUSE AS MARKED

AVERTISSEMENT:
POUR CONTINUER DE PROTECTION CONTRE AU RISQUE DE FEU, REPLACER SEULEMENT AVEC LA MÊME CARACTÈRE CLASSÉ COMME DE FUSÉE.

CAUTION: CONSULT MANUAL FOR FURTHER INSTRUCTIONS

AVERTISSEMENT:
CONSULTER LE MANUAL POUR DE PLUS AMPLES INFORMATIONS

INDICATES DANGEROUS VOLTAGE
100-240V~,50/60Hz
RISQUE DE DANGER ÉLECTRIQUE
VOLTAGE, 100-240V~,50/60Hz

h. Wall Control Warning Labels

⚠ WARNING
AVERTISSEMENT:
RISK OF FIRE
REPLACE FUSE AS MARKED
RISQUE D'INCENDIE REMPLACEZ LE FUSIBLE EN RESPECTANT LA VALEUR NOMINALE INDIQUÉE

AVERTISSEMENT. Pour continuer de protection contre au risque de feu, replacer seulement avec la même caractère classé comme de fusée.

i. Stand and Wall Control Warning Label

CAUTION: CONSULT MANUAL FOR FURTHER INSTRUCTIONS
AVERTISSEMENT:
CONSULTER LE MANUAL POUR DE PLUS AMPLES INFORMATIONS

INDICATES DANGEROUS VOLTAGE
100V~240V, 50/60Hz
INDIQUE UN NIVEAU DE TENSION DANGEREUX, 100 V, 240 V, 50/60Hz

j. Support Post Warning Labels

Hour Usage Indicator Light
will stay illuminated at
40,000 hours
INTENSITY LEVEL

(Hour usage indicator light label only found on earlier models)

T2AL 250V

WARNING - FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE.
AVERTISSEMENT. Pour continuer de protection Contre au risque de feu, replacer seutrment avec La même caractère classè comme de fusèe.
JS

Lights manufactured 1-1-2019 and after do not bear the CE mark and do not conform to the CE standard.

2-7. Label Symbols

Symbol	Description
	With the word WARNING, indicates a hazardous situation that, if not avoided, could result in death or serious injury.
	With the word CAUTION, indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
	Indicates waste disposal information.
	Indicates Consult instructions for use.
	Indicates AC power supply.
EC REP	Indicates authorized representative in the european community
	Indicates Manufacturer.
	Indicates Dangerous Voltage 100-240V ~, 50/60Hz.
	Tipping hazard! To avoid injuries or equipment damage, DO NOT push with excessive force, lean on, or rest on the lighting fixture.

2-8. Model Identification

Configuration	Model	Description
Portable Stand	AUA5S	Surgical lighting system consisting of one (1) Aurora Four center focus lighthead mounted on a portable stand with locking casters.
Single Arm[1]	AUA <A>	Ceiling mounted radial support arm for one (1) Aurora Four lighthead <A>. Where <A> can be either a center focus (e.g., AUA5 or AUA7) or camera ready (e.g., AUA5TV, or 7TV) lighthead.
Dual Arm[1]	AUA <AB>	Ceiling mounted radial support arms for two (2) Aurora Four lightheads <AB>. Where <AB> can be any combination of center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, 7TV) lightheads
Triple Arm[1]	AUA <ABC>	Ceiling mounted radial Support arms for three (3) Aurora Four lightheads <ABC>. Where <ABC> can be a combination of three (3) center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, 7TV) lightheads
Flat Screen (LFS)[1]	LFSAUA <ABC>	Ceiling mounted radial support arm for a flat screen with up to three (3) Aurora Four lightheads <ABC>. Where <ABC> can be any combination of center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, 7TV) lightheads.
	LFSLFSAUA <AB>	Ceiling mounted radial support arms for two (2) flat screens with up to two (2) Aurora Four lightheads <AB>. Where <AB> can be any combination of center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, 7TV) lightheads.
Camera Head (VCA)[1]	VCAAUA<ABC>	Ceiling mounted radial Support arms for one (1) Camera Head with up to three (3) Aurora Four lightheads <ABC>. Where <ABC> can be any combination of center focus (AUA5, 7) lightheads.
Camera Head Flat Screen (VCALFS)[1]	VCALFSAUA <AB>	Ceiling mounted radial Support arms for one (1) Camera Head, one (1) flat screen and up to two (2) Aurora Four lightheads <AB>. Where <AB> can be any combination of center focus (AUA5, 7) lightheads.
Variable Length Arm[1]	AUA <A> - <X>	Ceiling mounted radial arm for one (1) Aurora Four lighthead <A> with an arm lengh of <X>. Where <A> can be either a center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, or 7TV) lighthead.
	AUA <AB> - <X/Y>	Ceiling mounted radial arm for two (2) Aurora Four lightheads <AB> with arm lengths of <X/Y>. Where <AB> can be any combination of center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, 7TV) lightheads.
Variable Length Hub[1]	AUA <A> H - <X>	Ceiling mounted radial arm for one (1) Aurora Four lighthead <A> that has an extended hub (H) with a radial arm length of <X>. Where <A> can be either a center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, or 7TV) lighthead.
	AUA <AB> H - <X/Y>	Ceiling mounted radial arms for two (2) Aurora Four lightheads <AB> that have an extended hub (H) with radial arm lengths of <X/Y>. Where <AB> can be any combination of center focus (e.g., AUA5, 7) and/or camera ready (e.g., AUA5TV, 7TV) lightheads.

[1]Only one (1) camera system can be provided per fixture.

SECTION 3. CEILING MOUNTED LIGHTS AND CAMERAHEAD

3-1. Introduction

Aurora Four lights consist of several modules containing LEDs (light emitting diodes) and optical color corrective reflectors. Each lighthead features independent focus capability allowing the user to adjust the illumination parameters. The light intensity is adjustable at five (5) levels and a color temperature of 4100K or 4500K creating the infinite capability to adapt to different situations. LEDs offer low heat radiation and increased illumination longevity.

Light model combinations are available with one, two, or three lightheads providing high illumination of the operating field at varying angles. Combinations of vertical positioning and multiple rotational capabilities allow the single, dual, or triple lighthead models virtually limitless positioning within a 13 foot (4 m) diameter area (triple-lighthead models).

The fixtures can have an optional camera on a lighthead or camerahead. The camera system is integrated with a camera control unit (CCU) and described in greater detail in Section 4.

Standard fixtures are single point ceiling mounted with an infinitely continuous 360° rotation capability at the ceiling mount end of the radial support arm (Figure 1). The balance mechanism, which is attached to the radial arm by a vertical support tube, provides the lighthead an additional infinitely continuous 360° rotation point. The balance mechanism is an enclosed spring tension system. This allows vertical movement of the lighthead while maintaining the lighthead position without drifting. The yoke provides additional infinitely continuous rotation points for lighthead pitch and roll.

Variable length arm and Variable length hub (AUA_H) models are available for custom applications. These fixtures have 340° (maximum) rotation at the ceiling mount instead of 360°.

All Aurora Four ceiling mounted light fixtures have a lighthead vertical travel capability of 110°.

Figure 1. Light Fixture Rotation Capabilities

3-2. Features

Lightheads are available in two (2) sizes. The smaller AUA5 has five (5) LED pods. The larger AUA7 has seven (7) LED pods. Multiple lighthead fixtures will typically have one (1) larger AUA7 lighthead as the primary light source with the smaller AUA5 lighthead(s) serving as satellite(s) or secondary light source(s).

AUA5 and AUA7 lightheads are available in camera ready configurations along with the VCA camerahead.

a. Standard Lighthead (AUA5 & AUA7)

Positioning handles are located on the side for non-sterile personnel to position the lighthead (Figure 2).

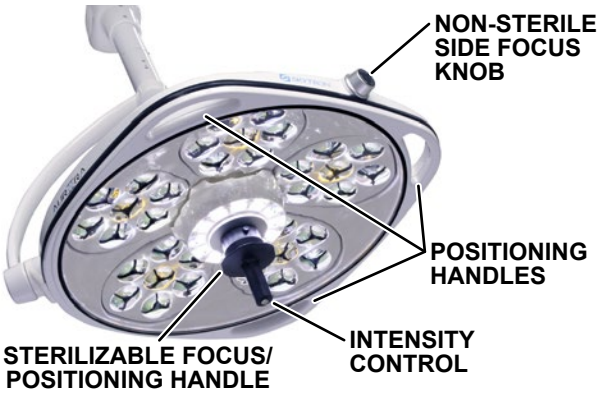


Figure 2. Standard Lighthead

An adjustable focus mechanism optimizes the light output by superimposing the light beams from all of the pods into a single spot. A focus knob is located on the side of the lighthead for non-sterile personnel to adjust or focus this spot based on the lighthead position.

All of the standard lightheads also have a sterilizable focus/positioning handle that is removable and sterilizable. The handle allows focus control, lighthead positioning, and intensity adjustment. This allows all final adjustments or changes to be precisely controlled by the surgeon.

A button is positioned on the end of the handle to provide intensity control of the entire fixture. All of the lightheads connected to a wall control are controlled by a single handle.

- Pressing the button and quickly releasing it will cause the intensity control to cycle to the next lower position.
- Pressing the button again will cycle the intensity control through all levels. When the lowest intensity is reached, the control will next cycle to full intensity.

b. Camera Ready Lighthead (AUA5TV & AUA7TV and Camerahead (VCA)

Like the standard lighthead, a camera ready lighthead also includes the positioning handles and side focus knob for non-sterile personnel (Figure 3). The camerahead has only a positioning handle (Figure 3).

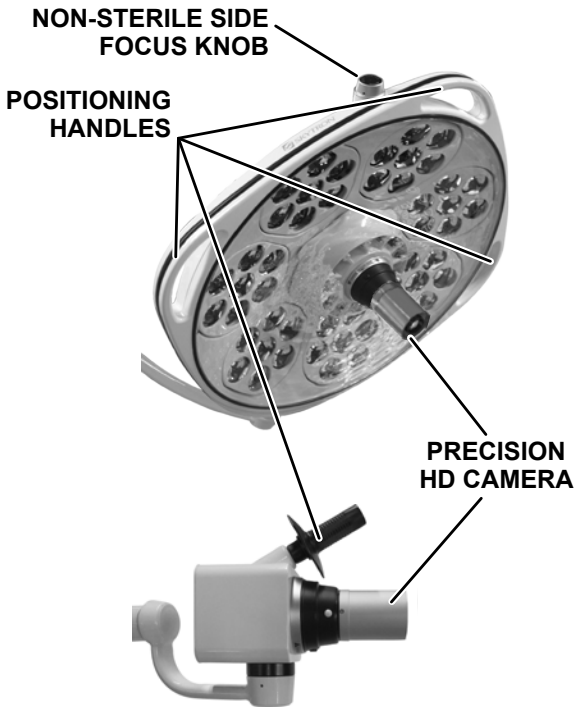


Figure 3. Camera Ready Lighthead & Camerahead

The handle for the camerahead can be sterilized before use. If it needs to be used in a sterile condition, do not allow contact by non-sterile personnel.

The camera ready lighthead is designed to accept a Precision HD camera in place of the sterilizable focus/positioning handle. A sterilizable camera cover installs over the camera in both the camera ready lighthead and the camerahead to permit sterile focus control and lighthead positioning adjustments by the surgeon.

See Section 4 for additional information on the installation and use of the Precision HD camera system.

3-3. Electrical Requirements

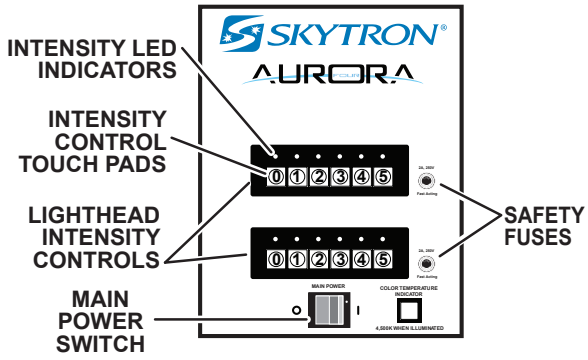
SKYTRON Aurora Four Series Surgical Lights require that electrical connections are made by a licensed electrician in accordance with state, local, and national electrical codes using UL (Underwriters Laboratory) recognized materials.

3-4. Wall Controls

A wall mounted control box (Figure 4) is located in close proximity to the Aurora Four ceiling mounted lighthead(s), providing centralized control for operating the lighthead(s). The following control features are located on each wall control:

NOTICE

Earlier models include a USB port between the **MAIN POWER** switch and the color temperature indicator button. This USB port currently has no function and is not to be used.



(EARLIER MODELS INCLUDE A USB PORT AND A 40,000 HOUR LIGHT INDICATOR)

Figure 4. Wall Control Features

a. MAIN POWER Switch

Place this two (2) position switch in the ON (**I**) position to supply electrical power to the lightheads, turning on the LEDs and illuminating the switch. Place the switch in the OFF (**O**) position to remove electrical power to lighthead(s), turning off the LEDs.

b. Lighthead Intensity Controls

Each lighthead has a separate light intensity control, which includes five (5) intensity control touch pads (labeled 0 through 5) and LED indicators (located above each touch pad). When the MAIN POWER switch is ON, an LED will illuminate above the touch pad where the light intensity is currently set.

- Press a touch pad with a higher number to increase light intensity and illuminate the LED above it. The light its at is maximum intensity setting (100%) when touch pad 5 is pressed.
- Press a touch pad with a lower number to decrease the light intensity and illuminate the LED above it. Light is at its minimum intensity setting (off) when touch pad 0 is pressed.

c. Safety Fuses

Each lighthead has a safety fuse located to the right of its corresponding light intensity control. If you suspect a safety fuse is blown on a lighthead, contact qualified service personnel to perform an evaluation and replacement.

d. Color Temperature Indicator Button

Pressing this button will toggle between the two (2) selectable color temperatures; 4100K (soft white) and 4500K (bright white). The button will illuminate when 4500K is selected.

e. LED Change Indicator (only present in earlier models)

If present, this indicator will illuminate when the LED sources in the surgical light(s) have reached 40,000 hours of illumination. At this time, it is recommended the LED pods be replaced to recover full potential illuminance and color temperature. The LEDs will operate approximately 40,000 hours before illuminance degrades to a level requiring replacement. The useful life will range between 7-10 years.

3-5. Visual Checks Prior to Start-Up

⚠ CAUTION

Always inspect product prior to use to ensure safe and correct operation. Any product deemed to be malfunctioning should be removed from service and labeled inoperable. Refer all service to a qualified SKYTRON service representative.

- Check light emission from each lighthead.
- Check for cracks, damaged, or broken lens. Avoid use if such damage is evident.
- Check operation of the wall intensity control.
- Check mechanical movements by rotating and articulating each joint. Ensure proper operation and emittance of light throughout the range of movement.

• When LED change indicator (if present) is illuminated, the LEDs must be evaluated for replacement. Contact SKYTRON representative.

• For camera ready lightheads or camerahead, make sure that the camera system or counterweight have been properly installed per the instructions in Section 4.

3-6. Operation

WARNING

Equipment is not suitable for use in the presence of an ANESTHETIC FLAMMABLE MIXTURE with oxygen or nitrous oxide.

CAUTION

To avoid equipment damage and personal injury, use extreme care to avoid collisions with personnel and/or equipment. Damage could result to the surgical lights causing parts to fall into the surgical area.

Follow these instructions to operate the light fixture:

a. Position the lightheads as required by grasping the positioning handles and moving the lighthead to the desired position (Figure 5).

b. At the wall control (Refer to Figure 4):

1. Place the MAIN POWER switch in the ON position.

2. Select the desired intensity for each lighthead as required using the corresponding light intensity controls.

NOTICE

The mid-range position will provide adequate illumination for most procedures. Full intensity will usually only be required for extreme deep cavity cases.

CAUTION

DO NOT look directly into the surgical light or place highly reflective surfaces in the path of the light beam. There is a risk of impaired vision.

3. If the color temperature needs to be changed (based on surgeon preference), press the COLOR TEMPERATURE INDICATOR button to change color temperatures.

NOTICE

The COLOR TEMPERATURE INDICATOR button illuminates when 4500K (bright white) is selected.

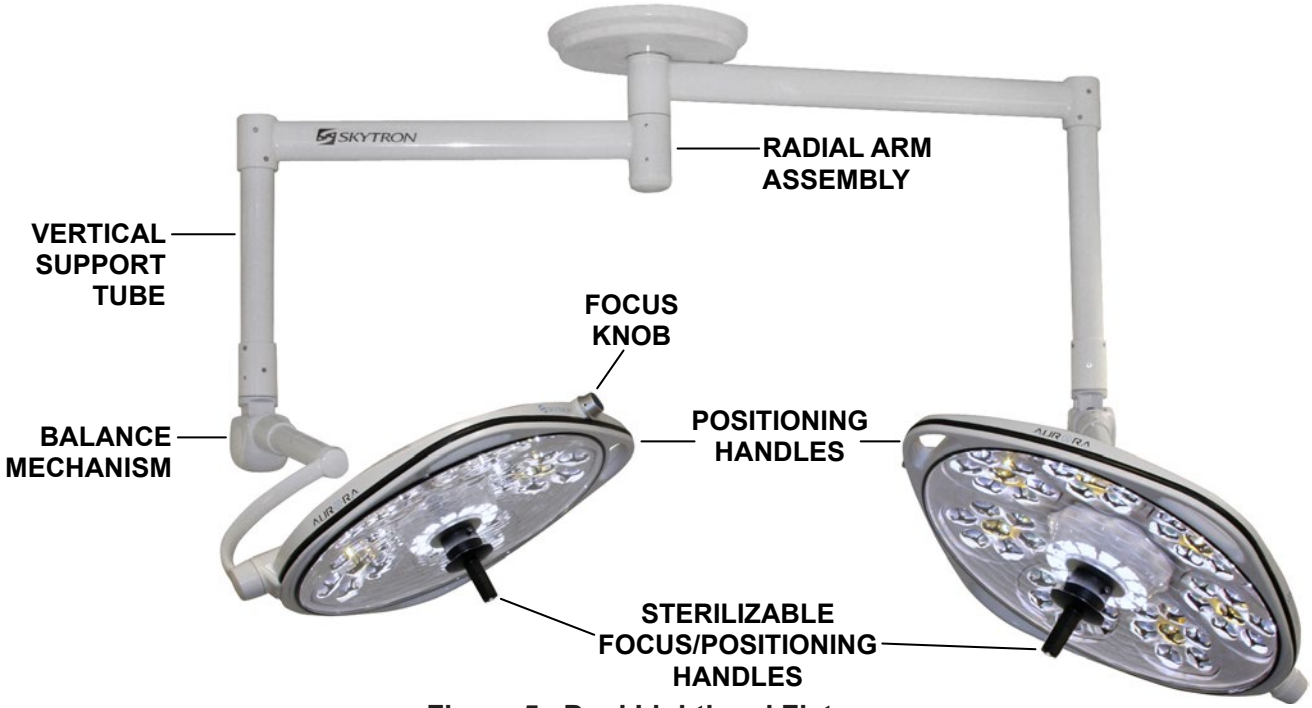


Figure 5. Dual Lighthead Fixture

c. When the surgeon is ready to use the light, install the sterilized focus/positioning handle using the following procedure (Figure 6).

NOTICE

Refer to Section 4 for instructions on installing the camera cover for camera ready lightheads and the sterilizable positioning handle for the camerahead.

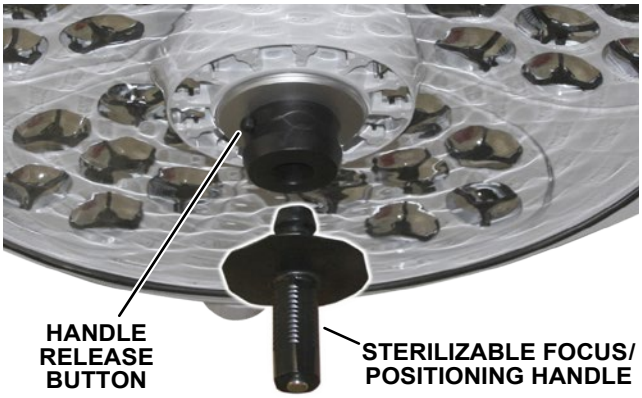


Figure 6. Sterilizable Handle Installation

NOTICE

The sterilizable focus/positioning handle is provided for light positioning by sterile personnel. DO NOT allow contact with non-sterile personnel.

1. Insert the handle into the lighthead attachment ring.

⚠ CAUTION

Be sure the sterilizable handle is properly secured before use. An improperly installed handle could fall out, causing possible injury to the patient or surgical staff.

2. Push the handle in, turn it right and left, and pull the handle outward to be certain that it is locked (PUSH-TWIST-PULL). A distinct click can be heard when properly engaged.

3. To remove the handle, push the release button and pull the handle out.

CAUTION

Sterilizable focus/positioning handles are subject to normal wear and tear. Always examine the handles for wear or damage to ensure proper and safe operation with the surgical light.

d. Adjust the focus by moving either the non-sterile focus knob or sterilized focus/positioning handle until all of the light beams converge on the surgical site forming a single bright spot of light.

NOTICE

For camera ready lightheads, adjust the focus using either the non-sterile focus knob or sterilized camera cover.

e. For low angle lighting approach, the lighthead will move 90° below horizontal. Pull the lighthead down by the positioning handles or the sterilized focus/positioning handle.

NOTICE

For camera ready lightheads, pull the lighthead down by the positioning handles or the sterilized camera cover.

3-7. Shutdown Procedure

When the light is no longer required, perform the following steps:

a. Return the lighthead to its full up position.

b. Decrease the intensity at the wall control.

c. Place the MAIN POWER switch in the OFF position.

NOTICE

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON sterilizable focus/positioning handles, sterilizable camera covers, and other disposables. After-market competitive handles, covers, and other disposables will have varying results that could ultimately affect the proper performance and secure engagement of the handle, cover, or disposable . Such applications are at the discretion of the user to ensure patient safety.

SECTION 4. PRECISION HD CAMERA SYSTEM

4-1. Introduction

NOTICE

Camera system is for recording purposes only, not intended for use in diagnosis or treatment.

SKYTRON'S Precision HD Camera System is used with Aurora Four camera ready lightheads (Figure 7) and Camerahead (Figure 8) to produce High Definition (HD) quality video and images of medical procedures and examinations. The system design permits transport from room to room, wherever other Aurora Four camera ready systems are available.

Figure 7. Precision HD Camera Ready Lighthead

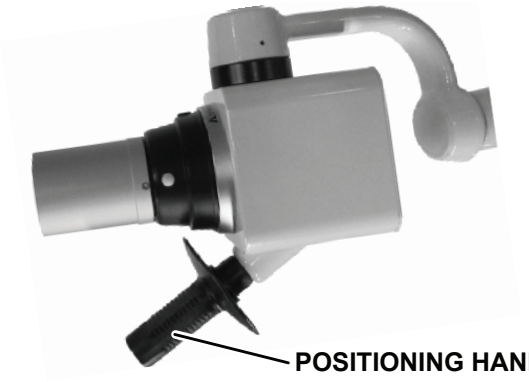


Figure 8. Precision HD Camerahead

The Precision HD camera system consists of the following components:

NOTICE

Refer to Section 10-3 for an illustration of the Precision HD handle camera system components.

a. Precision HD Camera

A lighthead handle mounted or camerahead mounted, super compact color HD camera with 120X zoom (10X Optical, 12X Digital) with a high speed, auto focus lens, and flexible outputs for video conferencing, broadcasting, point-of-view (POV) applications, and RS232C Control.

b. Sterilizable Camera Cover

Installs over the camera to protect the camera and provides surgeon with a sterile handle to make focus and positioning adjustments.

c. Sterilizable Positioning Handle

A positioning handle can be installed for better positioning of the camerahead (Figure 8).

d. Camera Control Unit (CCU)

Interface used to control camera rotation, iris adjustment, zoom, digital zoom, focus, auto focus, auto white balance, one push white balance, and freeze.

NOTICE

See Section 4-5 for a description of each of the controls on the CCU.

e. Video Out Cable

10 feet (3m) of video out cable is provided to connect the CCU to a monitor or other device for viewing or recording camera images.

f. Coaxial Cable

10 feet (3 m) of coaxial cable is provided to connect the CCU to a connector on the camera control faceplate.

NOTICE

Each camera ready system is wired to a connector faceplate. The connector faceplate allows a quick connect or disconnect point for the CCU. The faceplate is mounted near where the CCU is located.

4-2. Camera System Installation

Use the following procedure to install the Precision HD camera system for use on a camera ready lighthead (TV) or camerahead (VCA).

CAUTION

Make sure the MAIN POWER switch is OFF on the light fixture wall control and the camera control unit before installing or removing the camera.

a. If a counterweight is installed on the lighthead/ camerahead, or a handle adapter on the lighthead, remove as follows:

1. If the sterilizable camera cover is installed, push in the two (2) white pins in the cover and remove the cover (Figure 9).

Figure 9. Sterilizable Camera Cover

2. Hold the counterweight (or adapter) firmly and press the camera release button on the lighthead attachment ring or camerahead attachment ring (Figure 10).

3. Pull the counterweight (or adapter) straight out of the attachment ring.

Figure 10. Counterweight Removal

b. Move lighthead or camerahead to the full down position, and turn it over so it faces up as shown in Figure 11.

Figure 11. Camera Installation

c. Install the camera as follows:

1. Insert the camera assembly into the attachment ring of the lighthead or camerahead.

2. Push and twist the camera to lock it into position.

3. Pull out on the camera to verify that it is fully locked into position.

CAUTION

Make sure camera is securely locked in lighthead or camerahead before moving into use position.

CAUTION

DO NOT attempt to focus or position the lighthead or camerahead using the camera body or counter weight. Damage to the camera rotation motor may result.

d. Install and connect the CCU as follows:

1. Place the CCU on a flat surface that is easily accessible by the operator with a minimum clearance of 2 inches (51 mm) on the sides. DO NOT block vents.

CAUTION

DO NOT block vents. Position CCU where it is not exposed to dripping or splashing liquids and away from open flame or heat producing equipment.

2. Attach the cable from the connector on the faceplate (Figure 12) to the input connector on the CCU (Figure 13).

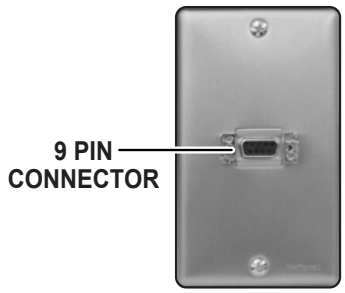


Figure 12. CCU Connector Faceplate

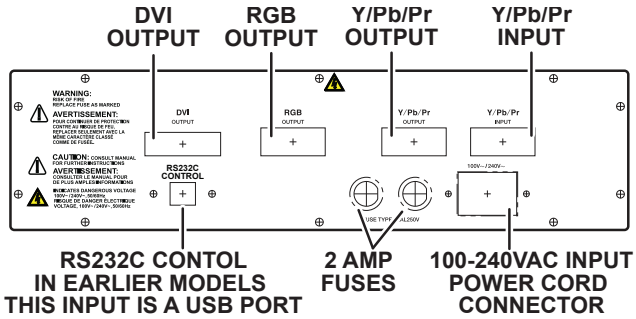


Figure 13. CCU Connections (Back View)

3. Connect the video out cable (DVI, RGB, RS232C Control) from the CCU to the monitor or video input.

WARNING

To ensure patient safety, DO NOT connect an additional multiple socket outlet or extension cord to the system.

To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth ground.

4. Connect power cord to the CCU (refer to Figure 13) and plug into a properly grounded, circuit protected electrical outlet. This power cord is considered the main disconnect device and should remain accessible at all times.

NOTICE

DO NOT position the fixture so that it is difficult to detach the power cord.

DO NOT use a 3P-2P conversion adapter when inserting the plug of the CCU into an outlet.

4-3. Counterweight Installation

Use the following procedure to remove the Precision HD camera and CCU and install the counterweight, for using the Aurora Four camera ready lighthead without the camera system installed or not using the camerahead.

CAUTION

Make sure the MAIN POWER switch is OFF on the light fixture wall control and the camera control unit before installing or removing the camera.

a. Unplug the CCU power cord from the electrical outlet and at the CCU power connector.

b. Disconnect the video out cable from the monitor or video input and from the CCU.

c. Disconnect the cable from the input connector on the CCU and from the connector on the faceplate.

d. If the sterilizable camera cover is installed, push in the two (2) white pins in the cover and remove the cover (Figure 14).

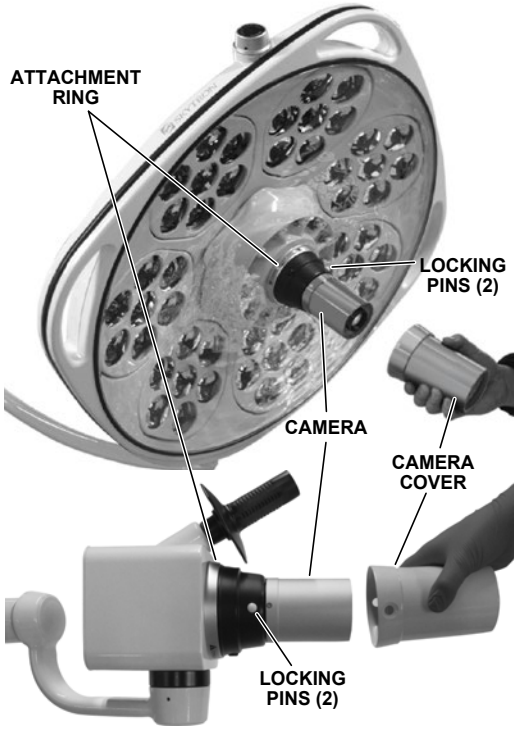


Figure 14. Sterilizable Camera Cover Removal

NOTICE

Sterilizable camera cover must be removed prior to removing camera.

e. Hold the camera firmly and press the camera release button on the lighthead attachment ring of the lighthead (Figure 15) or the camerahead.

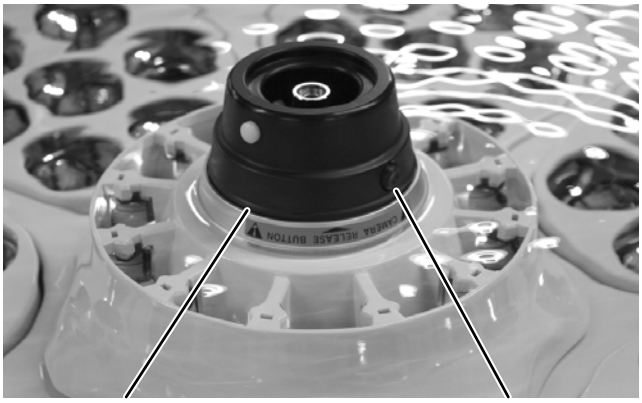


Figure 15. Camera Removal (Lighthead Shown)

f. Carefully pull the camera assembly straight out of the attachment ring.

g. Insert the counterweight into the lighthead attachment ring of the lighthead or the camerahead until it clicks in place (Figure 16).

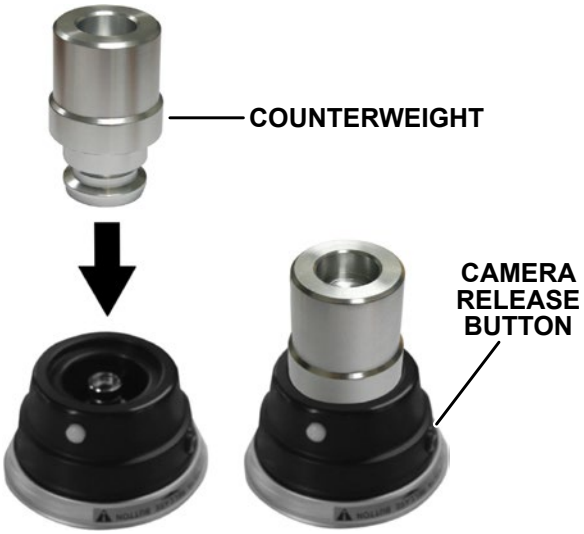


Figure 16. Counterweight Installation

h. Ensure that the counterweight is fully engaged by pulling and slightly turning it.

NOTICE

The counterweight must be installed to maintain the proper weight required to balance the lighthead or camerahead when the camera is not installed.

4-4. Sterilizable Camera Cover Installation/ Removal

CAUTION

DO NOT attempt to focus or position the lighthead or camerahead using the camera body or counter weight. Damage to the camera rotation motor may result.

The camera has a sterilizable camera cover that, when installed, allows sterile positioning and focus control for the lighthead. There is also a non-sterile focus knob on the lighthead.

CAUTION

DO NOT accidentally push in the camera release button on the attachment ring above the camera cover, as this will cause the camera to disengage from the lighthead or the camerahead.

• To install the sterile camera cover, align the holes in the cover with the cover locking pins on the camera attachment ring and slide the cover on until it locks on the two pins (Figure 17).

• To remove the sterile cover, push the two (2) white pins and remove the sterile cover.

⚠ CAUTION

To ensure patient safety, DO NOT touch any component of the system and patient simultaneously.

NOTICE

All parts of the camera system are suitable for use within the patient area.

Figure 17. Installing Sterilizable Camera Cover

4-5. Camerahead Positioning Handle Installation / Removal

The handle for the camerahead is a screw-in type and can be installed by turning it inward (clockwise) until it is securely engaged. The handle can be removed by rotating it counter-clockwise.

4-6. Camera Control Unit (CCU) Controls

The camera control unit (CCU) provides controls for camera rotation, iris adjustment, zoom, digital zoom, focus, auto focus, auto white balance, one push white balance, and freeze (Figure 18).

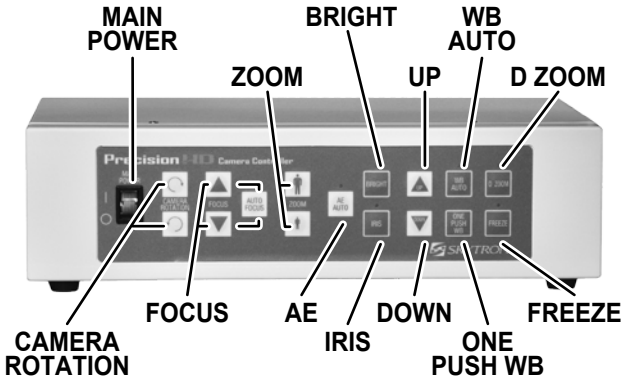


Figure 18. CCU Controls

a. MAIN POWER Switch

Placing the MAIN Power switch in the ON (**I**) position supplies electrical power to the camera and CCU. Placing the switch in the OFF (**O**) position removes electrical power from the camera and CCU.

b. CAMERA ROTATION

Allows clockwise and counterclockwise rotation of the camera:

• Press the ⟳ button for clockwise rotation.

• Press the ⟲ for counterclockwise rotation.

c. FOCUS

Controls the focus of the camera lens. When MAIN POWER switch is turned ON, the focus control is set to automatic (AUTO FOCUS indicator is illuminated). Pressing the AUTO FOCUS button enables the focus to be manually adjusted using the FOCUS ▲ or ▼ buttons:

NOTICE

A focus symbol will appear on the monitor when the focus is in the manual mode.

- Pressing the FOCUS ▲ button sets the focus in the telephoto range.
- Pressing the FOCUS ▼ button sets the focus in the wide angle range.

Pressing the AUTO FOCUS button again turns the focus control back to automatic.

d. ZOOM

Controls the image size:

- To make the subject larger, press the [T] button.
- To make the subject smaller, press the [W] button.

e. AE AUTO

Pressing the AE AUTO button sets both IRIS and BRIGHT functions to operate automatically. The green indicator illuminates when the IRIS and BRIGHT functions are set to automatic mode.

f. BRIGHT

Adjusts both the gain and iris using an internal algorithm according to a brightness level freely set by the user. Exposure is controlled by gain when dark, and by iris when bright.

When the MAIN POWER switch is turned ON, the brightness control is set to automatic (AE AUTO indicator is illuminated). Pressing the BRIGHT button enables the brightness level to be manually adjusted using the UP ▲ and DOWN ▼ buttons. The green indicator illuminates when the brightness is set to manual mode.

- Pressing the UP ▲ button manually increases the brightness.
- Pressing the DOWN ▼ button manually decreases the brightness.

g. IRIS (Aperture)

Controls the video signal brightness by opening or closing the iris of the camera to allow more or less light to enter the camera.

When the MAIN POWER switch is turned ON, the Iris control is set to automatic (AE AUTO indicator is illuminated). Pressing the IRIS button enables the iris to be opened or closed manually using the UP ▲ and DOWN ▼ buttons. The green indicator illuminates when the IRIS is set to manual mode.

NOTICE

The "F" stop setting will display on the monitor when the iris is operating in the manual mode.

- Pressing the UP ▲ button manually opens the iris to allow more light into the camera.
- Pressing the DOWN ▼ button manually closes the iris to allow less light into the camera.

h. UP / DOWN

These buttons are used with IRIS and BRIGHT options to manually increase ▲ or decrease ▼ brightness.

i. WB AUTO

When the MAIN POWER is ON, the white balance (WB) is controlled automatically (WB AUTO indicator is illuminated). Pressing the WB AUTO button enables white balance to be manually set using the ONE PUSH WB button. Pressing the WB AUTO button again turns the white balance control back to automatic.

j. ONE PUSH WB

When enabled (WB AUTO off), pressing this button manually sets the white balance for the camera.

k. D ZOOM

This button controls 12X digital zoom function. Pressing the D ZOOM button turns on the digital zoom function, extending the zoom ratio from 10X (optical zoom) to 120X. The green indicator illuminates to indicate that the digital zoom function is on. Pressing the D ZOOM button again changes the zoom ratio back to 10X (optical zoom).

l. FREEZE

Pressing this button captures the present view as a “snapshot” on the monitor. Pressing it again resumes normal operation.

SECTION 5. PORTABLE STAND LIGHT (AUA5S)

5-1. Introduction

The Model AUA5S Portable Stand Light consists of a single 24" (610mm) diameter, Aurora Four lighthead with 5 LED pods mounted on a portable stand. The lighthead has the same rotational positioning and focus capabilities as the ceiling mounted light which includes continuous 360° rotation at the pitch and roll axis points. 90° vertical travel is provided at the support post (Figure 19).

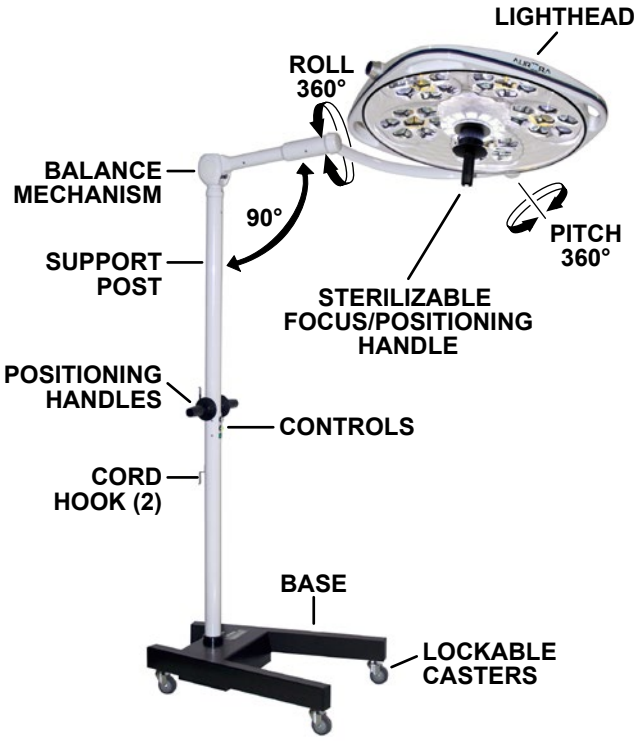


Figure 19. AUA5S Features

Controls are provided on the support post for main power, intensity control, and color temperature. Cord wrap hooks and positioning handles are also located on the support post. The base contains the power cord, safety fuses, the light intensity control redout and, in earlier models, the LED change indicator.

The adjustable focus mechanism, which optimizes the light output by superimposing all the light beams into a single spot, can be operated by non-sterile personnel using the lighthead mounted focus knob.

The lighthead also has a multi-function center handle (sterilizable focus/positioning handle) that is removable and sterilizable (Figure 20). The sterilizable focus/positioning handle allows focus control, lighthead positioning, and intensity adjustment. This allows all final adjustments or changes to be precisely controlled by the surgeon.

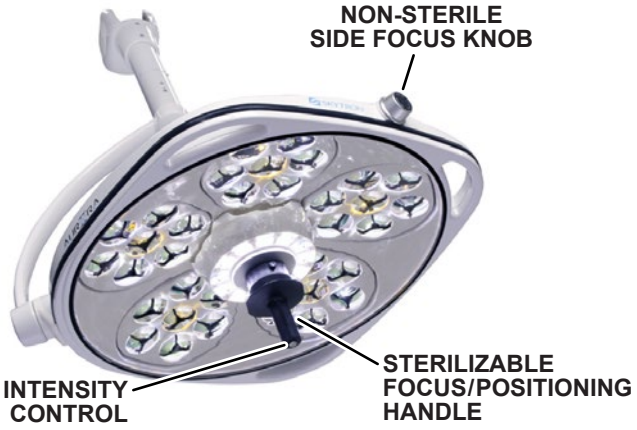


Figure 20. Focus Adjustments

A button is positioned on the end of the handle to provide intensity control of the entire fixture.

- Pressing the button and quickly releasing it will cause intensity to cycle to the next lower position.
- Pressing the button again will cycle the intensity control through all levels.

NOTICE

When the lowest intensity is reached, the control will next cycle to full intensity.

5-2. Power Requirements

The Aurora Four portable stand mounted light requires a properly grounded 100-240VAC, 50/60Hz electrical power supply. The stand is equipped with a 13 foot (4 m) long, 16-3 SJT power cord with a hospital grade plug. The power cord is located at the rear of the base in the center. The main power ON/OFF switch is located on the front of the support post.

5-3. Prior to Operation

⚠ CAUTION

Always inspect product prior to use to ensure safe and correct operation. Any product deemed to be malfunctioning should be removed from service and labeled inoperable. Refer all service to a qualified SKYTRON service representative.

a. Visual Checks

Prior to start-up, perform a visual inspection of the following:

- Check light emission from lighthead.
- Check for cracks, damaged, or broken lens. Avoid use if damage is evident.
- Check the operation of the intensity control on the support post.
- Check mechanical movements by rotating and articulating each joint. Ensure proper operation and emittance of light.
- If present, when the LED change indicator is illuminated on the base, the LEDs must be evaluated for replacement. Contact SKYTRON representative.

b. Positioning and Transporting

If necessary, move the AUA5S to the desired location or position using the following steps:

1. Ensure that the lighthead is in a lowered position.
2. Ensure that the power cord is wrapped around the cord hooks and secured.

⚠ CAUTION

The AUA5S is equipped with locking casters. Make sure the casters are unlocked prior to moving the fixture to avoid the risk of damage or personal injury.

3. Unlock all four (4) wheel casters.

⚠ CAUTION

Risk of overbalancing! To avoid injuries or equipment damage, DO NOT push with excessive force, lean on, or rest on the lighting fixture.

DO NOT forcibly overcome a hurdle. If needed, use a ramp and have a firm grasp on the support post handles to maintain balance. A lack of balance would cause a risk of falling.

4. Position yourself behind the support post, and use the positioning handles to position or transport the fixture (Figure 21).

Figure 21. Positioning and Transporting

CAUTION

Avoid pulling or attempting to move the stand light by the focus/positioning handle. The fixture may become unstable and damage may occur.

Exercise caution when moving the stand light to avoid obstacles such as power cords or other items in the pathway. DO NOT transport over rugged or unstable flooring that may damage the casters.

5. For maximum stability, position the stand so the legs will be facing the surgical area. The stand should be positioned in such a way that it is clinically functional but will not interfere with operating room staff or equipment.
6. Once the AUA5S is in the desired position, lock all four (4) wheel casters to secure the fixture in that position.

CAUTION

Improper use, transport procedures , or storage of the stand light may result in damage to the support post or balance mechanism. Check to be sure there is no horizontal movement of the balance mechanism within the support post before each use.

5-4. Operation

WARNING

Equipment not suitable for use in the presence of a FLAMMABLE ANESTHETIC MIXTURE WITH OXYGEN OR NITROUS OXIDE.

To ensure patient safety, DO NOT connect an additional multiple socket outlet or extension cord to the system.

To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth ground.

a. Plug the power cord into a properly grounded, circuit protected electrical outlet. DO NOT use a 3P-2P conversion adapter when inserting the plug into an outlet.

NOTICE

The power cord is the mains power supply. Unplug cord to disconnect power to the fixture. DO NOT position the fixture where it makes it difficult to detach the power cord.

b. Turn power on to the fixture using the MAIN POWER switch on the support post (Figure 22).

c. Adjust the intensity of the lighthead with the INTENSITY Control Button on the support post (Figure 22). The light has 6 levels of intensity including off. The present intensity level will be shown on the Intensity Control Readout located on the base (Figure 23).

NOTICE

When installed, lighthead intensity can also be adjusted at the sterilizable focus/positioning handle.

CAUTION

DO NOT look directly into the surgical light or place highly reflective surfaces in the path of the light beam. There is a risk of impaired vision.

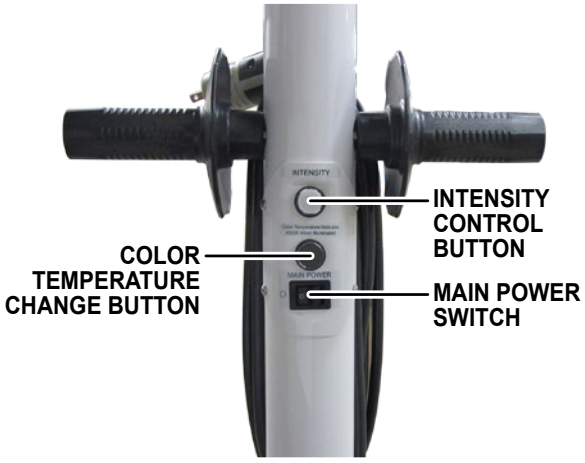


Figure 22. Support Post Controls

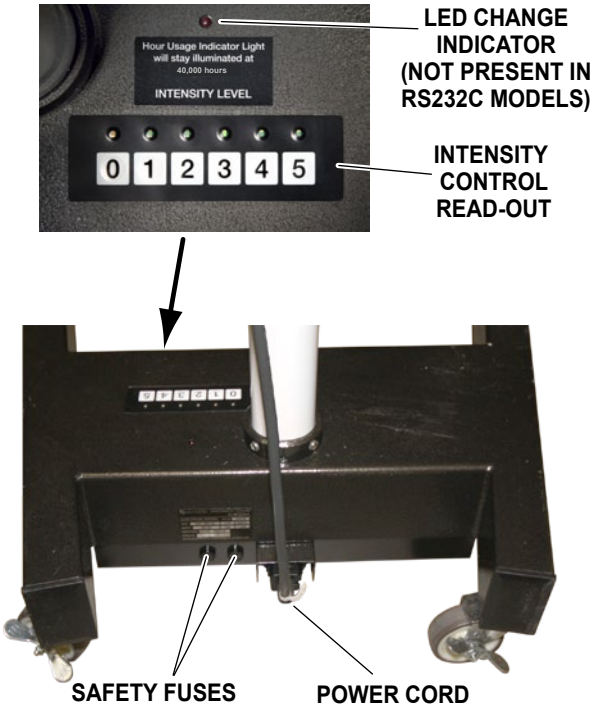


Figure 23. Base Indicators

d. The Aurora Four lighting fixture has selectable color temperatures; 4100K (soft white) or 4500K (bright white) to accommodate surgeon preference. Press the Color Temperature Change button to select the desired color temperature (Figure 5-4). The button will illuminate green when 4500K is selected.

e. When the surgeon is ready to use the light, install the sterilized focus/positioning handle using the following steps (Figure 24):

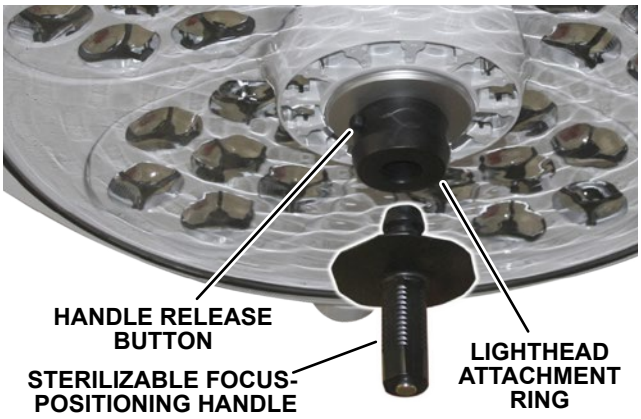


Figure 24. Sterilizable Focus/Positioning Handle

CAUTION

DO NOT use the sterilizable focus/positioning handle on the lighthead to pull or push the stand light base. These adjustments should be done using the positioning handles on the support post.

NOTICE

The sterilizable focus/positioning handle is provided for light positioning to be done by sterile personnel. DO NOT allow non-sterile personnel to touch the handle.

1. Insert the handle into the lighthead attachment ring.

⚠ CAUTION

Be sure the sterilizable focus/positioning handle is properly secured before using the lighthead. An improperly installed handle could fall out, resulting in possible injury to patient or surgical staff.

2. Push the handle in, turn it right and left, and pull the handle outward to be certain that it is locked (PUSH-TWIST-PULL). A distinct click can be heard when the handle is properly engaged.

3. To remove the handle, push the release button and pull the handle out.

CAUTION

Sterilizable focus/positioning handles are subject to normal wear and tear. Always examine the handles for wear or damage to ensure proper and safe operation with the surgical light.

f. Adjust the focus by moving either the non-sterile focus knob or the sterilizable focus/positioning handle until all of the light beams converge on the surgical site forming a single bright spot of light.

5-5. Shutdown

When the light is no longer required, perform the following:

a. Decrease the intensity using the Intensity Control button (refer to Figure 22).

b. Place the MAIN POWER Switch in the OFF position.

NOTICE

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON sterilizable focus/positioning handles. After-market competitive handles and other disposable handles will have varying results that could ultimately affect the proper performance and secure engagement of the center focus handle. Such applications are at the discretion of the user to ensure patient safety.

SECTION 6. LFSAUA SERIES

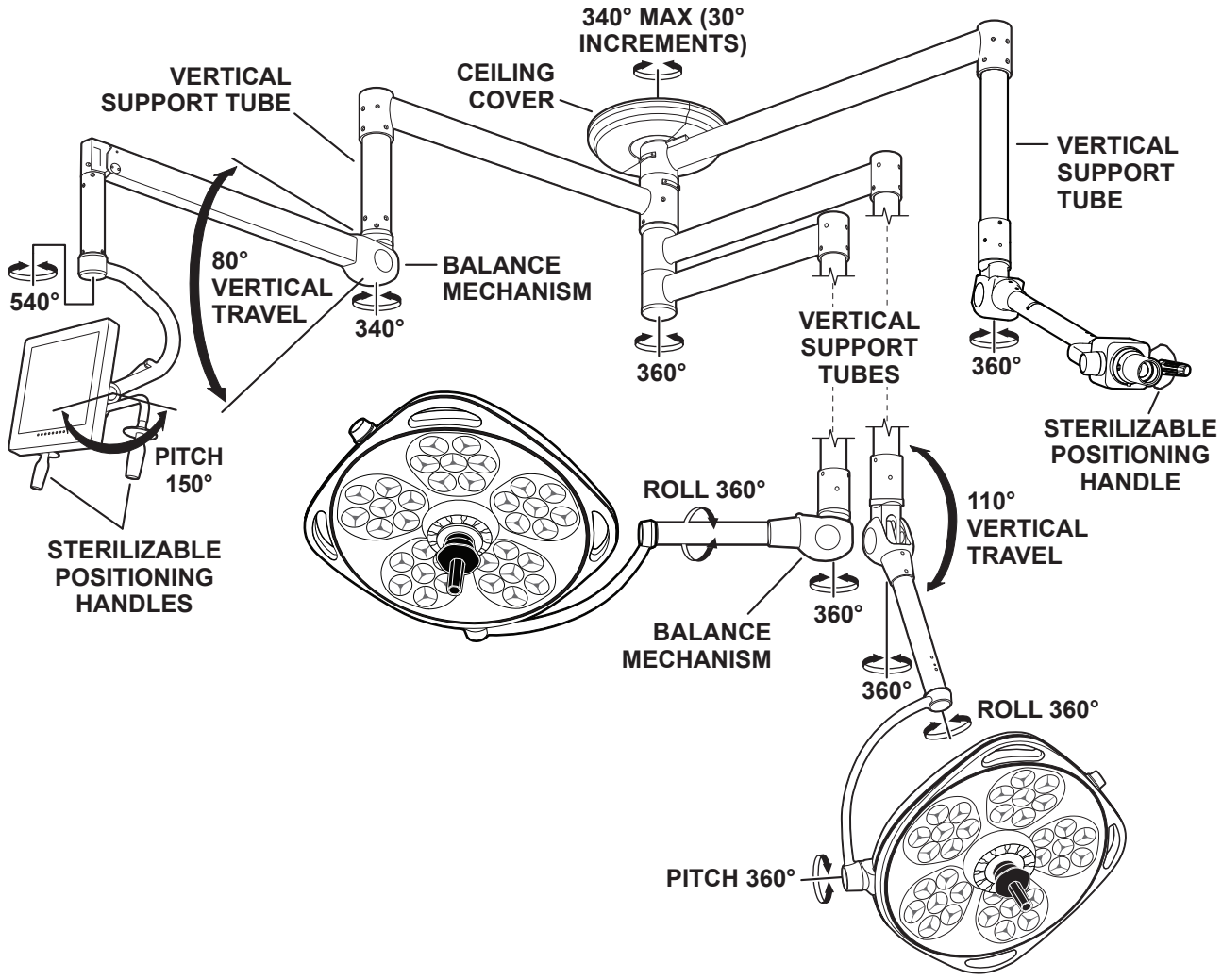


Figure 25. VCALFSAUA_ Light Fixture Rotation Capabilities

6-1. Introduction

The LFSAUA Series combines flatscreen monitor mounting with an Aurora Four surgical lighting system from a single ceiling mount (Figure 25):

- The LFSAUA__model allows a single flatscreen monitor mount to be combined with up to three (3) separate lightheads.
- The LFSLFSAUA__ model combines two (2) flatscreen monitor mounts with up to two (2) separate lightheads.
- The VCALFSAUA__ model supports a single camerahead and a single flatscreen monitor mount with up to two (2) separate lightheads.

The LFS radial arm allows up to 90" (2286mm) of reach for the flatscreen monitor with up to 340° (max) of rotation capability at the ceiling mount. Vertical travel of up to 46" (1168mm) or 80° is provided.

Two (2) sterilizable positioning handles (SKYTRON PN B1-410-85) are provided for final monitor positioning or for changes required during the procedure.

NOTICE

The system can support and balance a monitor weight of up to 20 pounds (9 kg). Exceeding the weight will result in poor balance and performance.

6-2. Flatscreen Monitor Positioning

The upper radial arm of the flatscreen monitor mount should be pre-positioned on the opposite side of the table from the surgeon at approximately 90° from the table center line (Figure 26).

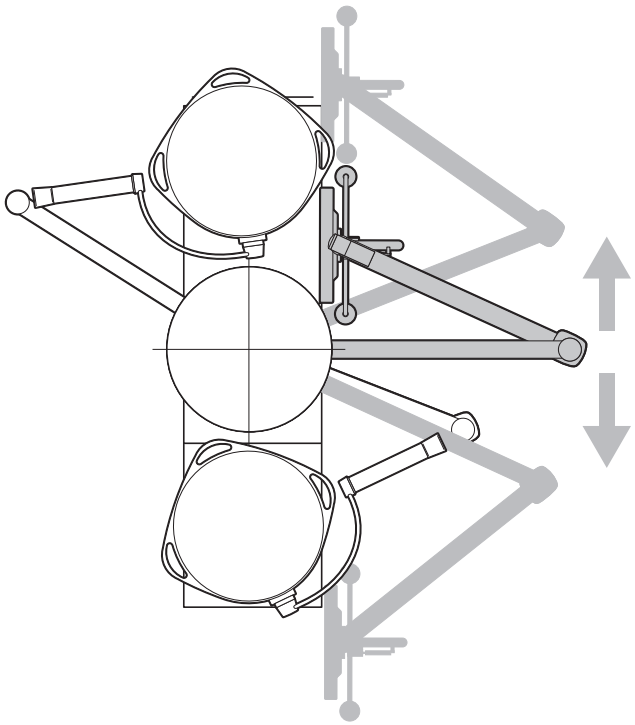


Figure 26. Flatscreen Monitor Positioning

The lower arm should be positioned under the upper arm. In this position, the monitor can easily be moved up or down the full length of the table without interfering with the lightheads. The monitor can be pushed up out of the way until it is needed.

Prior to the start of the procedure, the sterilizable handles can be installed on the flatscreen mount. To install a sterilizable handle, simply insert it into the receptacle and turn clockwise until tight.

NOTICE

For the LFSLFS model, position the second arm in the same way on the opposite side of the table.

6-3. LFS Height Adjustable Arm Adjustments

a. Vertical Tension Adjustment

Check the vertical tension adjustment of the height adjustable arm for its capacity to support the flatscreen monitor throughout its range of motion. The monitor should move freely yet maintain its selected position without drifting. If the monitor drifts, adjust the vertical tension as follows (Figure 27):

NOTICE

The system can support and balance a monitor weight of up to 20 pounds (9 kg). Exceeding the weight will result in poor balance and performance.

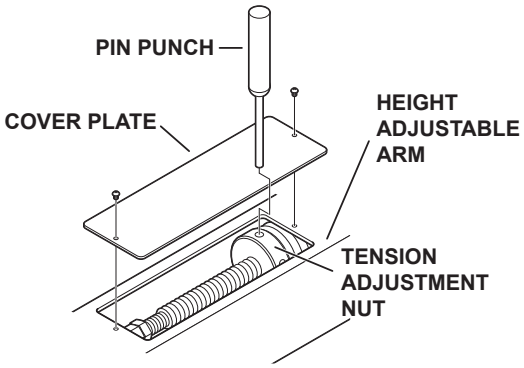


Figure 27. Vertical Tension Adjustment

1. Remove two (2) screws securing the cover plate to the top of the height adjustable arm to access the tension adjustment nut. Set the screws and cover plate aside.

2. Insert a 1/8" (3mm) pin punch into a hole in the tension adjustment nut and turn the nut as required to achieve proper tension.

   - Turn tension adjustment nut clockwise to increase tension.
   - Turn tension adjustment nut counter-clockwise to decrease tension.

3. When the adjustment is complete, replace the access cover using the two (2) screws removed in Step **1**.

b. Pitch Axis Adjustment

Check the adjustment for the flatscreen monitor pitch axis. The monitor should move freely yet maintain its selected position without drifting. If the monitor drifts, adjust the pitch axis tension as follows:

If a coarse adjustment is needed (Figure 28):

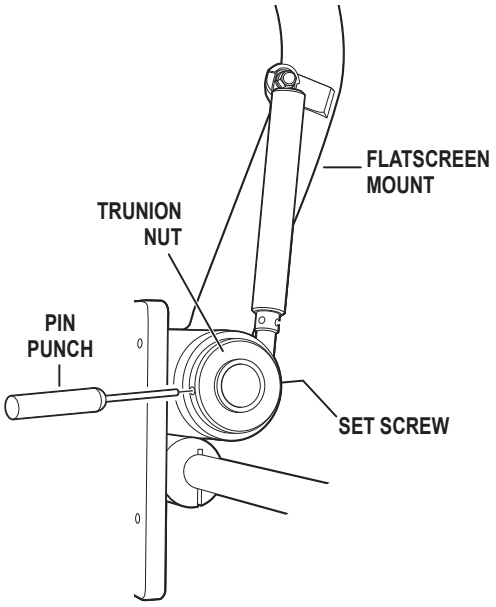


Figure 28. Pitch Axis (Coarse Adjustment)

1. Loosen the set screw on the trunnion nut.

2. Insert 1/8" (3mm) pin punch in the hole opposite the set screw location and adjust the trunnion nut as required.

   • Turn trunnion nut clockwise to increase tension.

   • Turn trunnion nut counterclockwise to decrease tension.

3. Re-tighten the set screw on the trunnion nut when the adjustment is complete.

If a fine adjustment is needed (Figure 29):

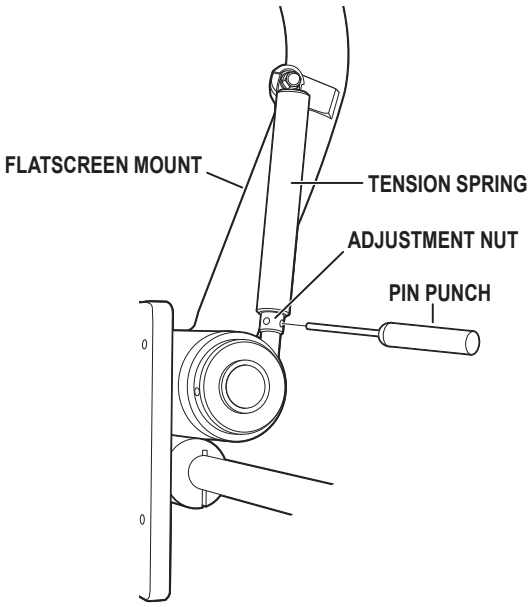


Figure 29. Pitch Axis (Fine Adjustment)

1. Rotate the monitor downward until the adjustment nut is visible on the tension spring assembly.

2. Use a pin punch to turn the adjustment nut until proper tension is achieved.

• Turn adjustment nut clockwise to increase tension.

• Turn adjustment nut counterclockwise to decrease tension.

SECTION 7. LIGHTHEAD POSITIONING & ILLUMINATION TECHNIQUE

7-1. General

To obtain the maximum benefit from your SKYTRON surgical lighting system, the following suggestions are offered as a guide for lighthead positioning. Personnel who are trained in proper lighting techniques can plan and set up the lighting arrangements prior to the arrival of the patient. Factors which should be considered when pre-positioning surgical lights are:

- Specific procedure to be done
- Patient position during procedure
- Position of surgical team
- Location of instrument trays or tables
- Location of IV stands
- X-ray equipment and personnel
- Anesthesia equipment and personnel
- Angulation and size of surgical cavity

7-2. Surgical Table Placement

For most procedures the surgical table should be located with its center point directly under the light fixture's ceiling mount.

7-3. Pre-Positioning The Lighthead

Surgical light positioning requirements change not only from procedure to procedure, they also change from surgeon to surgeon. Final light positioning and adjustment will be directed or done directly by the surgeon.

The objective of pre-positioning is to require a minimum of final adjustments after arrival of the patient. The non-sterile focus control should be located where it can be reached by non-sterile personnel and the sterilizable focus/positioning handle where they can be reached by the surgeon.

Use extreme care when pre-positioning lightheads. Bumping lightheads into one another, into walls, or other equipment may alter LED alignment which affects proper focus adjustment.

The lightheads can be most effectively positioned by using the following steps:

a. Grasp the positioning handles on the lighthead and pull the lighthead down to shoulder height. Keep the lighthead at approximately a 45° angle to easily position the support yoke (Figure 30).

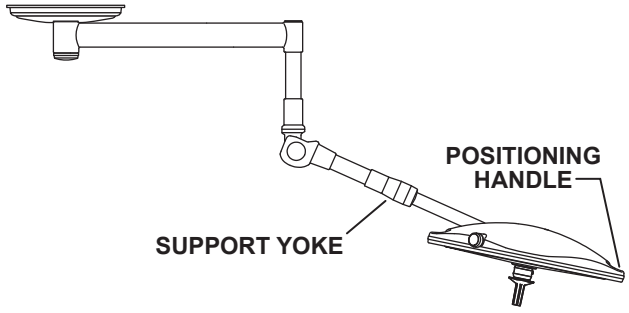


Figure 30. Pre-Positioning #1

b. Using positioning handles, rotate the lighthead around the vertical support until the lighthead is close to a 90° angle to the radial arm (Figure 31).

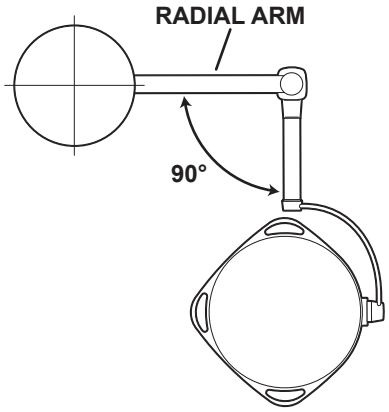


Figure 31. Pre-Positioning #2

c. Place the radial arm in the desired position by pushing or pulling the lighthead by the positioning handles as you walk around the surgical table.

d. See Figure 32 to approximate the desired radial arm position for locating the lighthead over the patient.

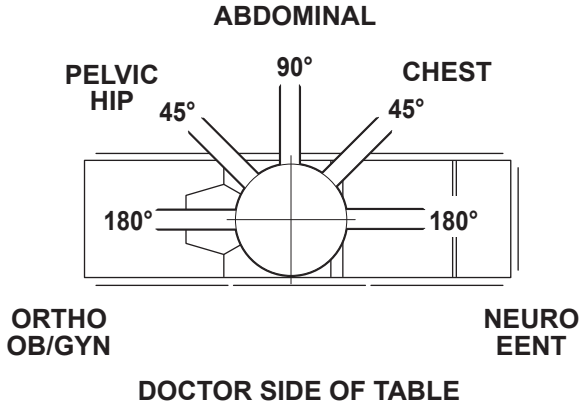


Figure 32. Main Lighthead Radial Arm Positioning

e. With the radial arm in proper position, rotate the lighthead to the desired position and install the sterilizable focus/positioning handle or sterilizable camera cover (for lightheads with Precision HD handle camera). Refer to sterilizable focus/positioning handle installation procedure (Section 3) or the sterlizable camera cover installation procedure (Section 4).

f. Grasp the positioning handles, place the lighthead at an angle and move the lighthead to its full up position.

NOTICE

Maximum illumination, shadow reduction, and possible obstruction by the surgeon or surgical staff are also major concerns for lighthead positioning. The following examples are offered as a basic guide for lighthead placement for large diameter/satellite, dual lighthead, or triple lighthead fixtures. Ancillary equipment, such as the VCA and LFS flatscreen monitors, must be positioned so they do not obstruct the lighthead(s) in any way.

7-4. Large Diameter/Satellite Lighthead Positioning

The large diameter lighthead should be pre-positioned over the surgical site. The small diameter light (satellite) can be used on either side of the surgeon for augmentation and shadow control.

The large lighthead should be positioned perpendicular to the bottom of the surgical cavity.

⚠ CAUTION

Due to the high output capability of the lightheads, it may be required to decrease the intensity to reduce the risk of excessive heat in the surgical site when positioning multiple lightheads together to form a single spot.

a. Neurosurgical, Head, and Neck

For Neurosurgical, head, and neck illumination, position the large diameter lighthead's radial arm parallel to the table center line (Figure 33).

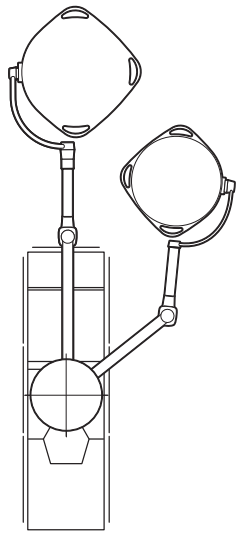


Figure 33. Positioning for Head, and Neck

Position the lighthead behind the surgeon. Tilt the lighthead to the desired position using pitch axis movement. This will allow the multiple light sources of the lighthead to pass around the head and shoulders of the surgeon and at the same time permit adequate head clearance for the surgeon.

Tilt the lighthead to position the focus control knob where it can be easily reached by non-sterile personnel.

Position the small diameter light (satellite) to the left or right according to surgeon preference. This allows a second light source to come from another angle which will help eliminate obstructions or shadows.

b. Torso Area

For most chest and abdominal procedures, position the large lighthead directly over the surgical site (Figure 34).

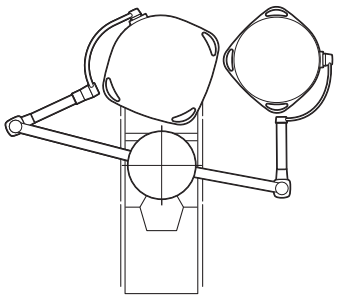


Figure 34. Positioning for Torso Area

Position the radial arm on approximately a 45° angle from the surgical table center line. This position will locate the sterilizable focus/positioning handle on the lighthead where it can easily be reached by the surgeon. The focus control will be where it can easily be reached by non-sterile personnel. Position the satellite lighthead, depending on lighting needs, to augment the larger lighthead.

In some cases, such as cholecystectomies and total abdominal hysterectomies, the surgical cavity may be angled. In cases such as this, the large lighthead should be angled so that the face of the lighthead is perpendicular to the bottom of the surgical cavity (Figure 35).

Figure 35. Positioning for Torso Area (Angled Surgical Cavity)

Some procedures, such as hip procedures, require both lightheads to be on the same side of the table for greater lateral illumination (Figure 36).

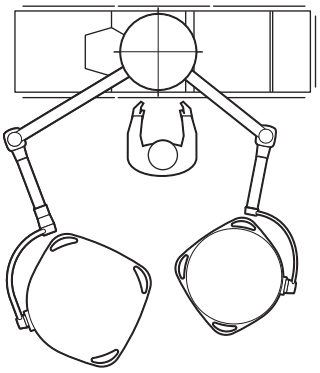


Figure 36. Torso Area Positioning (Hip Procedures)

In this position the lightheads are behind and adjusted to project light over the head and shoulders of the surgeon. Both lightheads are easily reached for adjustment by non-sterile personnel.

c. Perineum

The large diameter lighthead should be positioned at the end of the table for perineal procedures (Figure 37). Locate the radial arm directly in line with the center line of the table. Once the surgeon has assumed a seated position, the lighthead can be pulled down, angled, and adjusted to provide the necessary illumination over the surgeon's head and shoulders.

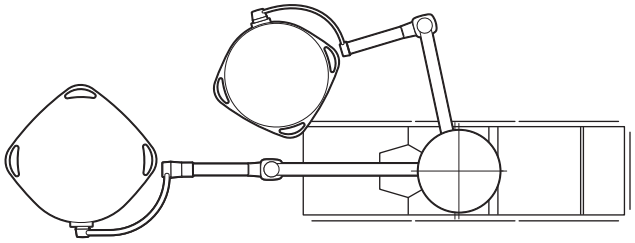


Figure 37. Perenium Positioning

The radial arm of the small diameter light (satellite) should be positioned approximately 90° from the other radial arm. Position the satellite lighthead to the right or left of the large lighthead according to surgeon preference. In this position, the focus knobs of both lightheads are located for easy reach by non-sterile personnel.

7-5. Dual 24" (610mm) Diameter Lighthead Positioning

Fixtures containing dual 24" (610mm) diameter lightheads require some special positioning considerations. The small diameter of the lightheads allows the light source to be more easily obstructed by the surgical staff. In order to minimize shadowing, the lightheads should be positioned so that their light beams are angled into the surgical cavity (Figure 38). Regardless of the surgical site, these lights should be positioned to maintain an angle of approximately 30° about an imaginary line running perpendicular to the bottom of the surgical site.

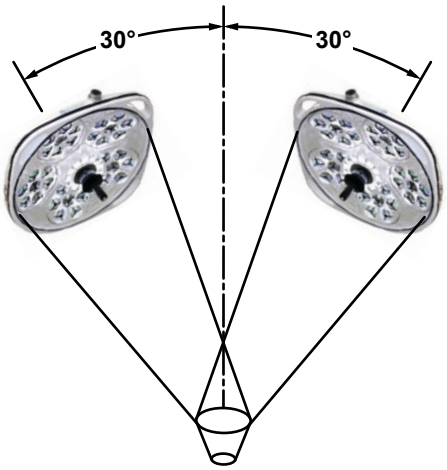


Figure 38. Positioning Dual Lighthead (General)

Tilting the lightheads will give a larger light beam angle (Figure 39).

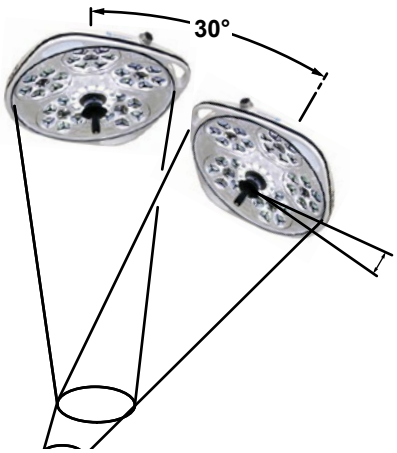


Figure 39. Positioning Dual Lighthead (Tilting Lightheads)

Final positioning and focus adjustments can be done by the surgeon using the sterilizable focus/ positioning handles. Focus controls should be positioned where they can be easily reached by non-sterile personnel.

7-6. Triple Lighthead Positioning

Triple lighthead systems will either consist of a large diameter lighthead with two (2) 24" (610mm) satellites or three (3) 24" (610mm) lightheads. There are two basic positioning strategies that can be used to obtain the best illumination possible.

- The first is to align all three (3) lightheads to the center line of the table with the large lighthead directly over the center of the surgical site.
- The second is to cluster the lights in a circular arrangement over the surgical site with each lighthead about 120° away from each other (Figure 40).

The whole cluster should be positioned to minimize interference with the head and shoulders of the surgical staff.

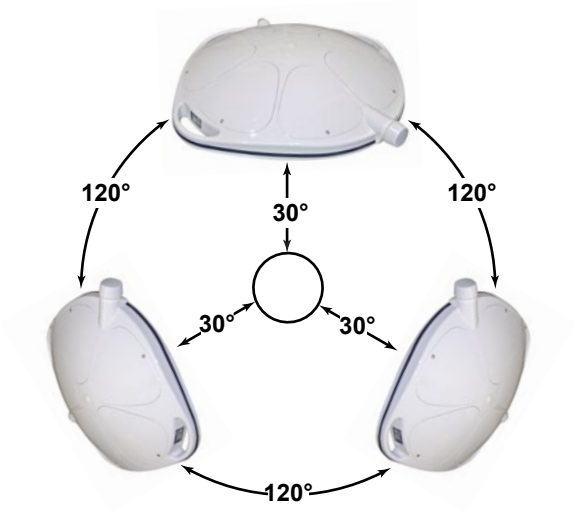


Figure 40. Positioning Triple Lightheads

When an angled cavity is to be illuminated, at least one of the lightheads should be positioned to be perpendicular to the bottom of the cavity.

For head and perineal work, the lights should be positioned as they would for a dual system but with a satellite on each side of the surgeon.

For most surgical procedures the lighthead will be properly focused with all the light beams converged in one spot at the bottom of the surgical cavity.

7-7. Other Illumination Considerations

Close attention to surgical light intensity during the case as well as good quality general illumination in the room will help to minimize eye fatigue of surgical personnel.

SECTION 8. MAINTENANCE

8-1. Cleaning and Disinfecting

It is required practice to maintain the appearance and function of your Aurora Four Series lighting fixture by the means of daily cleaning practices. Moving parts and their respective finishes will perform optimally when they are routinely cleaned and dirt or corrosion are removed routinely to avoid build up which may restrict articulation and prohibit ease of movement.

⚠ WARNING

To avoid personal injury, DO NOT attempt to clean lighthead, camerahead, or wall control unless power is turned off at wall control (power cord disconnected for portable stand light).

CAUTION

DO NOT use steam, extremely hot water (over 150°F [65°C]), or high pressure water sprays to clean the equipment.

a. Daily or between cases, the lighthead exterior, camerahead, and wall control should be wiped down with a mild cleaning agent which will not affect the painted or polycarbonate parts.

CAUTION

DO NOT pour any liquids directly on the fixture or wall control.

DO NOT apply or spray cleaning agents directly on the lighthead, camerahead, or wall control.

⚠ CAUTION

Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethylene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking or personal injury may occur if these are used.

b. Avoid using spray cleaners. Avoid the application of cleaners using methods that produce extreme saturation. Leakage of fluids into the interior of the lighthead, camerahead, or wall control may cause corrosion of electrical components.

a. General Cleaning Instructions

- ***Painted Surfaces:*** Wipe exterior painted surfaces with a cloth dampened with a mild cleaning agent and dried with a soft, lint-free cloth. DO NOT use harsh cleaners on painted surfaces.
- ***Stains:*** Most stains can be prevented by immediately removing the liquid or substance.
- ***Rubber and Plastic Components:*** Clean rubber moldings, grips, covers, and plastic handles with a mild soap and water solution. Rinse with clear water and dry with a soft, lint-free cloth.

b. Disinfecting Instructions

Ensure the power has been turned off to the light unit. Only use disinfectant products that are certified from the manufacturer for compatibility with the following materials:

- Polycarbonate (PC)
- Silicones
- Stainless Steel

Always consult with the manufacturer of the disinfectant product for proper application and use. Always spot test on an inconspicuous area before use.

The following disinfectant products have been shown to be suitable for use on SKYTRON® Aurora Series OR lights:

In Between Case Disinfection

Country	Product	Registration
United States	Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Wipes	EPA #67619-25
Canada	Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Wipes	DIN #02401983

Special Precautions or Terminal Cleaning

Country	Product	Registration
United States	Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Wipes	EPA #67619-25
Canada	Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Wipes	DIN #02401983

In Between Case Disinfection:

1. Clean all areas where gross debris is evident. Surfaces should be wiped with a disinfecting agent on a wipe in accordance with the manufacturer's instructions.

2. After the disinfecting agent has been allowed the required contact time, wipe the polycarbonate lens surface with a wipe containing clear water to remove residue and prevent staining.

Special Precaution Case Disinfection / Daily Terminal Cleaning:

1. Clean all areas where gross debris is evident. Surfaces should be wiped with a disinfecting agent containing a 1:10 dilution of bleach solution applied on a wipe in accordance with the manufacturer's instructions for use.

2. After the disinfecting agent has been allowed the required contact time, wipe the polycarbonate lens surface surfaces with a wipe containing clear water to remove residue and prevent staining.

8-2. HD Camera Cleaning Instructions

1. Remove the camera from the lighthead - hold it while pressing the release button.

2. Wipe the camera body with a Clorox Healthcare Hydrogen Peroxide wipe, then wipe dry with a clean dry cloth. Avoid wiping the lens unless necessary.

3. Use a clean lint-free cloth to remove dust, dirt, and other particles from the lens. Then use compressed air to blow away small dust particles. DO NOT use sprays.

4. Insert the camera into the lighthead and slightly twist it clockwise to fully lock. Pull down on the camera to ensure it is secure.

8-3. Sterilization

The sterilizable focus/positioning handles and sterilizable camera cover are constructed of heat resistant, impact resistant plastic. They should be cleaned with mild alkaline cleaning products WITHOUT active chlorine. Thoroughly rinse off all cleaners with water. Ensure that the open side of handles are face down.

The positioning handle for the camerahead is made of aluminum and can be sterilized.

Recommended sterilization parameters for sterilizable focus/positioning handle and sterilizable camera cover:

Steam Sterilization:

270°F [132°C] for 4 minutes

NOTICE

Always follow the AAMI and sterilizer manufacturer recommendations for proper sterilization procedures. Prior to use, confirm no irregularities after sterilization.

8-4. Ultraviolet (UV) Radiation

Surface disinfection of surfaces using UV-C radiation devices can cause damage to the optical polycarbonate diffuser lenses resulting in discoloration, opacity, surface cracks, and crazing. Discoloration of fixture construction materials and finishes may also occur from heavy concentrations and prolonged usage. Consult with the UV-C radiation device for proper material compatibility.

If UV-C radiation devices are in use, the following precautions will reduce the likelihood of damages:

a. Follow the above instructions in Section 8-1 for disinfecting the polycarbonate diffuser lens.

b. Rotate the light fixture so the polycarbonate lens is facing the ceiling prior to turning on the UV-C radiation device.

c. DO NOT place the UV-C device directly under the OR light. Ensure the recommended distance from source to surface is being followed.

8-5. Operator Maintenance

CAUTION

The design of the Aurora Four Series lighting fixture and camera system does not utilize internal user serviceable parts. Service must be performed by SKYTRON authorized service technicians using SKYTRON authorized replacement parts and service techniques.

a. User Inspections

User's are responsible for the thorough inspection of the equipment prior to and after each use. Should any problems or deficiencies arise, the results must be reported to the facilities maintenance personnel. The safety of personnel and patients relies on the proper and routine maintenance of this equipment.

User performed inspections prior to and after each use should observe for the following conditions or problems and report to the SKYTRON authorized representative.

- Missing warning or usage labels
- Excessive wear, gouges, damaged handles, missing covers, and other physical problems
- Drifting out of position
- Difficulty during routine positioning requiring excessive push/pull force
- Missing or loose screws and fasteners
- Electrical burns
- Evidence of high temperature traces indicating a possible concentration of heat
- Accumulation of lint
- Evidence of ingress of fluid

8-6. Troubleshooting

When attempting to troubleshoot a light malfunction, first determine if the malfunction is electrical or mechanical, then use the appropriate chart to help determine the cause of the malfunction. Corrective actions requiring light fixture repairs, replacement, and adjustment must be performed by SKYTRON authorized service technicians.

a. Electrical Malfunctions

Problem	Possible Cause	Corrective Action
Lighthead will not operate	Circuit breaker feeding wall control is off.	Turn on the circuit breaker.
	MAIN POWER switch at wall control is in the OFF position.	Place MAIN POWER switch in ON position.
	Lighthead safety fuse is blown*.	Contact SKYTRON representative.
Light flickers	Note articulation process and the component within the fixture being positioned	Contact SKYTRON representative.
	Brush block or slip ring contactor worn or damaged.	Contact SKYTRON representative.
	Loose or broken conductor in lighting fixture.	Contact SKYTRON representative.
	Nearby device generating EMC energy which disrupts lighting fixture.	Relocate nearby device or light fixture so they are out of range of the EMC source.
Light does not function on desired intensity level	Damaged light intensity control membrane touch pad.	Contact SKYTRON representative.
	Defective intensity printed circuit board (PCB).	Contact SKYTRON representative.
Light intensity status indicator on a light intensity control touch pad fails to illuminate	Damaged light intensity control membrane touch pad.	Contact SKYTRON representative.
	Defective intensity printed circuit board (PCB).	Contact SKYTRON representative.
Low light output intensity or poor beam pattern	Lighthead supply voltage is low.	Contact SKYTRON representative.
	If present, LED indicator on because lighthead has exceeded 40,000 hours of useful LED life.	Contact SKYTRON representative.
	Focus mechanism and focus pattern out of adjustment.	Contact SKYTRON representative.
	Damaged acrylic diffuser assembly.	Contact SKYTRON representative.

b. Mechanical Malfunctions

Problem	Possible Cause	Corrective Action
Suspension arms drift up or down	Sterilizable focus/positioning handle, camera unit, counterweight, and/or sterilizable camera cover not installed.	Install sterilizable focus/positioning handle, camera unit, counterweight, and/or sterilizable camera cover as required.
	Balance mechanism spring is out of adjustment.	Contact SKYTRON representative.
Fixture components drift out of position	Fixture mounting plate is not level.	Contact SKYTRON representative.
	Axis friction is out of adjustment.	Contact SKYTRON representative.

*Turn main power switch off (disconnect power cord on portable stand light) prior to replacing fuse. Replace fuse with 250V, 2A, time lag only.

8-7. Maintenance Procedures

Maintenance procedures should be done semi-annually or sooner as needed. This device requires periodic inspection administered by a SKYTRON authorized service representative.

a. All attaching hardware (e.g., screws, nuts) should be physically checked for tightness. Any missing hardware MUST be replaced.

b. Rotate the radial arm assembly around the ceiling mount to check for proper operation and the ability of the arm to remain in any position through the entire range of movement.

8-8. Routine Inspections

a. All Models

- Inspect MAIN POWER ON/OFF switch operation, indicator light operation (if present), and light intensity control operation.
- Articulate the balance mechanism and rotate each articulation point while observing for lighthead function.
- Inspect operation of the sterlizable focus/positioning handle.
- Inspect acrylic diffuser for damage or scratches.
- Clean and disinfect according to cleaning instructions.

b. Portable Stand Model

- Inspect caster/wheel assembly for excessive wear or damage.
- Inspect balance mechanism and support post connection point and Phillips screw fasteners. Observe any play or movement in the joint.
- Inspect support post and base hardware. Inspect rigidity of attachment point.
- Inspect power cord assembly. Avoid use if any damage is evident.
- Inspect positioning handles on support post.

8-9. Preventive Maintenance

Required maintenance must be performed by SKYTRON authorized service technicians using SKYTRON authorized replacement parts and service techniques.

SKYTRON Service Manuals are available upon request; however, non-authorized service personnel are required to complete applicable service training. For a syllabus, schedule, availability, cost and overview, log onto www.skytron.us and click TRAINING. If interested in attending a training session, contact your SKYTRON representative for sponsorship.

To obtain SKYTRON authorized service or preventive maintenance contracts, contact your nearest SKYTRON representative.

The specific items listed in the MAINTENANCE MATRIX (below) must be inspected and repaired or replaced as necessary. The suggested time intervals are intended as a guideline only and actual maintenance will vary by use and conditions. For optimal usage, safety, and longevity of the product, have it serviced only by a SKYTRON authorized service representative using SKYTRON authorized replacement parts and service techniques.

MAINTENANCE MATRIX

Component	6 Months	1 Year
Mounting Plate Hardware (Tighten/Torque)		X
Mounting Plate Level		X
Inspect Electrical Connections at Mounting Plate		X
Covers & Hardware	X	
Positioning Handle		X
Overall Aesthetic Condition	X	
Product Caution & Warning Labels		X
Friction Brake Settings	X	
Camera Function (if applicable)	X	
Stand Model:		
Caster Wheel(s)	X	
Power Cord Assembly	X	
Fixture Ground Test	X	

The LEDs will operate approximately 40,000 hours before illuminance degrades to a level requiring replacement. The useful life will range between 7-10 years. Continued use of the surgical luminaire after the expected operating life expectancy will result in diminished illuminance values, reducing intensity and affecting color temperature.

8-10. End of Useful Life and Disposal

The end of the useful life for the SKYTRON surgical light is 10 years under normal operating conditions, service parts are available for this period.

Please contact your SKYTRON authorized representative for disposal of surgical light products or parts in accordance with current environmental regulations for medical products.

8-11. Environmental Protection

WARNING

California Proposition 65 Warning: This product may contain a chemical known to the State of California to cause cancer, or birth defects, or reproductive harm.

Ensure the proper disposal methods whenever disposing of old or damaged surgical light parts. Always follow compliance to regulatory standards pertaining to federal, state, and local regulations.

SECTION 9. OPTIONAL ACCESSORIES

Part Number	Description
B1-410-85	Sterilizable positioning handle
B1-420-06	Adapter to allow TV light to use standard handle
B1-710-49-B	Sterilizable focus and positioning handle with intensity control button
B1-715-56	Precision HD Camera
B1-710-57-1	Sterilizable camera cover for Precision HD camera
B1-710-72	Weighted handle adapter (TV ready lighthead)
B1-710-73	Weighted handle adapter for rigid disposable (TV ready lighthead)
B1-715-65	Disposable camera cover, clear in color (50/case)
B9-210-44-2	Special EXTENDED ceiling covers (up to 10" (254mm))
B9-210-44-3	Special EXTENDED ceiling covers (over 10" (254mm))

SECTION 10. REPLACEMENT PARTS

Aurora Four surgical light replacement parts listed in this section have been identified by SKYTRON as serviceable by facility personnel and are available for purchase. To obtain SKYTRON certified parts and authorized service, contact your SKYTRON representative.

CAUTION

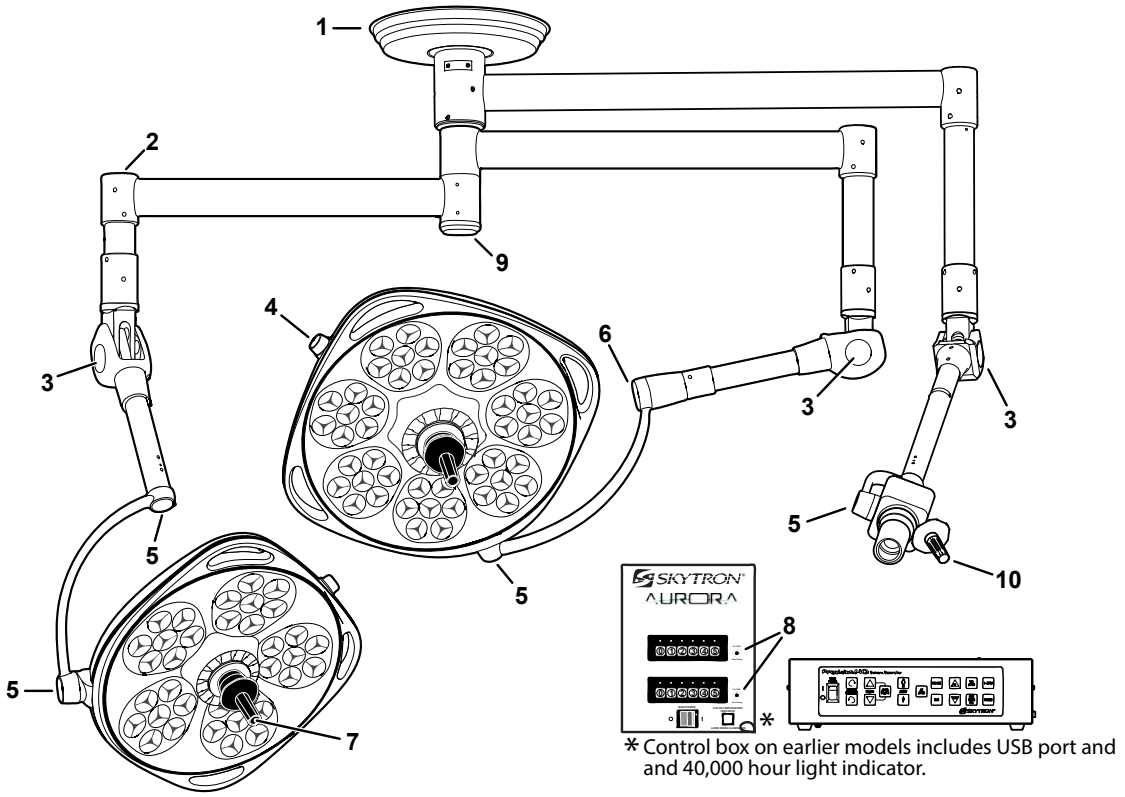
Any parts or assemblies not listed in this section must be serviced or replaced by SKYTRON authorized service personnel only. This is necessary to avoid the possibility of damage to the equipment.

NOTICE

The following abbreviations are used in this section:

- AR = As Required
- NS = Not Shown

10-1. Light Fixture Components



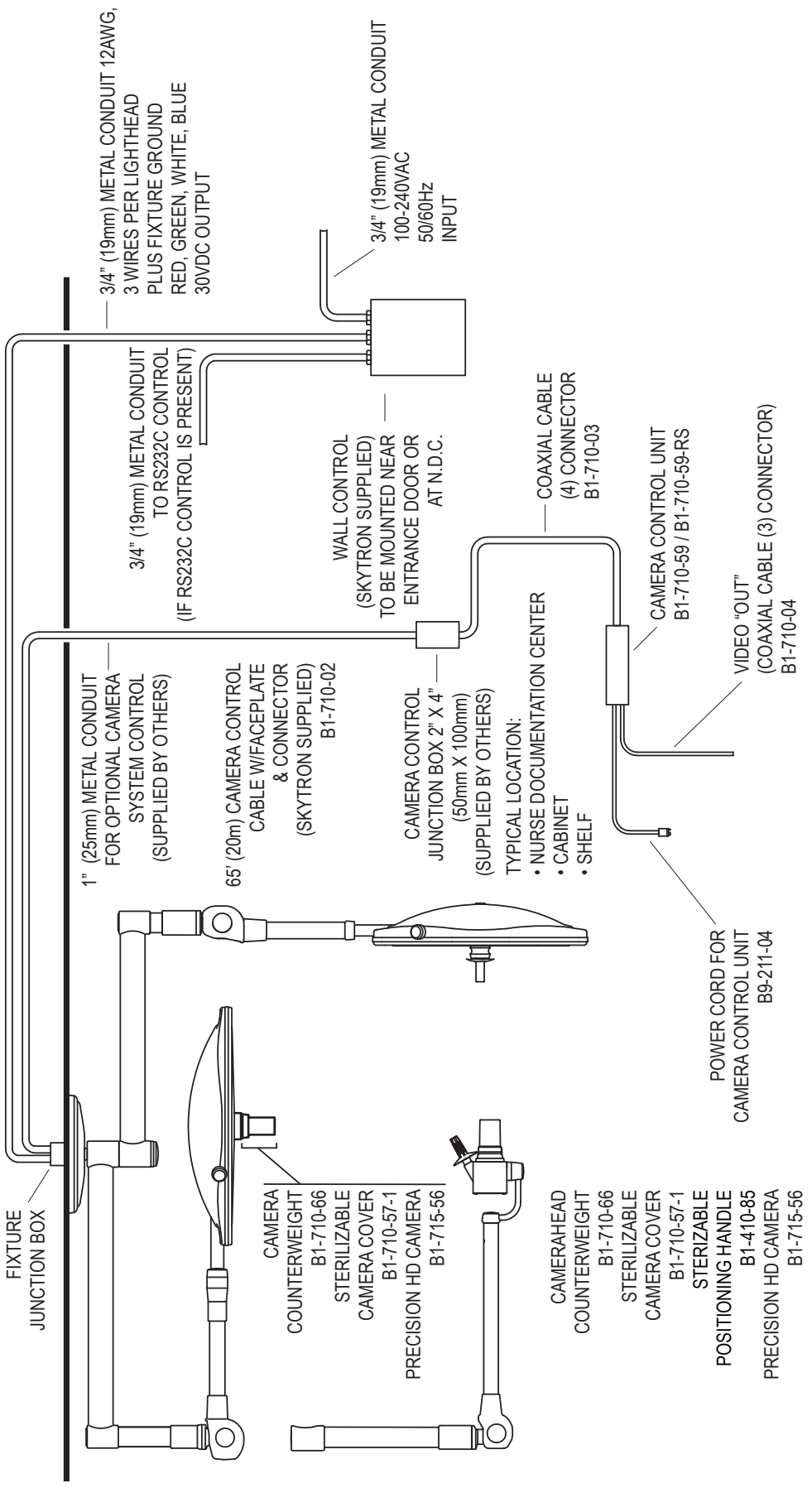
* Control box on earlier models includes USB port and and 40,000 hour light indicator.

Item	Part No.	Description	Qty.
1	B9-210-44-1	CEILING COVER	1
2	B2-410-12	COVER, rubber	AR
3	B3-210-28	COVER, side	2
4	B9-610-42	LABEL, focus control	1
	B9-610-41	SCREW, M4 x 12	1
	B1-610-34	KNOB, focus	1
	B1-010-37	SCREW, set, M4 x 8	2
5	B1-220-08	COVER, yoke	1
6	B1-410-26	COVER, yoke	1
7	B1-710-49-C	HANDLE, sterilizable focus and positioning with intensity control button	1
NS	B1-710-57-1	CAMERA COVER, sterilizable for Precision HD camera	AR
8	B9-610-66	FUSE, 250V, 2A, timelag	AR
9	B2-720-58-1	COVER, hub, with chain	1
NS	B2-210-29	SCREW, hub cover retainer	5
10	B1-410-85	HANDLE, sterilizable positioning for camerahead	1

10-2. Portable Stand Light (AUA5S)

Item	Part No.	Description	Qty.
1	B4-341-06	COVER, rubber	2
2	B1-410-85	HANDLE	2
3	B4-242-45	HOOK, cord	2
4	B9-611-22	COVER, base	4
5	B9-715-32	CASTER, locking	4
NS	B4-242-50	WASHER, lock	4
6	B9-610-66	FUSE, 250V, 2A, timelag	2
NS	B1-810-71	CORD, power	1

10-3. Camera System Components



SECTION 11. OPTICAL CHARACTERISTICS

Lighthead Model Color Temperature	AUA 5 @4100K	AUA 5 @4500K	AUA 7 @4100K	AUA 7 @4500K
CRI	95	96	95	95
R9	91	95	89	97
Central Illuminance E_c	160,000 lux	140,500 lux	160,000 lux	146,000 lux
Light Field Diameter d_{10}	175.0 mm		181.8 mm	
Light Field Diameter d_{50}	99.9 mm		104.7 mm	
E_e Ratio of Irradiance to Illuminance (millwatts/m2 per lux)	3.33	3.39	3.27	3.31
Total Irradiance (watts/m^2)	532.3	475.9	523.6	483.7
UV Energy (watts/m^2)	.011	.019	.0014	.0087
Chromaticity X Coordinates Y	0.376 0.345	0.355 0.337	0.376 0.348	0.360 0.342
	AUA 5		AUA 7	
(Shadow Dilution) Percentage Remaining Illumination with:				
• one mask	48.6		71.0	
• two masks	44.8		47.6	
• tube	94.3		79.4	
• tube & 1 mask	43.3		48.6	
• tube & 2 masks	41.1		37.0	
Depth of Illumination (mm)				
• near limit	619		805	
• far limit	1130		1256	
• depth	511		451	

E_c Illuminance at 1 meter distance from light source without obstruction.

E_e E_e is the measure of radiant power over a specified area.
It is expressed in watts per square meter [W/m^2]

d_{10} Diameter of a circle around the light field center (point of Illuminance) where the Illuminance reaches 10% of E_c.

d_{50} Diameter of a circle around the light field center (point of Illuminance) where the Illuminance reaches 50% of E_c.

SECTION 12. ELECTROMAGNETIC EMISSIONS

Electromagnetic Compatibility (EMC)

Although this equipment conforms to the intent of the 2004/108/EC EMC Directive, all medical equipment may produce electromagnetic interference or be susceptible to electromagnetic interference. The following are guidance and manufacturer's declarations regarding EMC for the Aurora Four Light.

- The Aurora Four Light needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the following pages.

WARNING

This equipment/system is intended for use by healthcare professionals only. As with all electrical medical equipment, this equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures such as re-orienting or relocating the Aurora Four Light unit or shielding the location.

- Portable and Mobile RF communications equipment can affect the performance of the Aurora Four Light. Please use the guidelines and recommendations specified in Tables 4 and 6 (IEC 60601-1-2, Edition 3.0).
- Other Medical Equipment or Systems can produce electromagnetic emissions and therefore can interfere with the functionality of the Aurora Four Light. The Aurora Four Light should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the Aurora Four Light should initially be observed to verify normal operation in the configuration in which it will be used.
- The electrical cables, external power supplies, and accessories listed or referenced in this manual have been shown to comply with the test requirements listed in the following tables. Care should be taken to use only manufacturer-recommended cables, power supplies, and electrical accessories with the Aurora Four Light. If a third-party supplier offers cables, external power supplies, and electrical accessories for use with the Aurora Four Light and they are not listed or referenced in this manual, it is the responsibility of that third-party supplier to determine compliance with the standards and tests in the following tables.
- The use of electrical cables and accessories other than those specified in this manual or referenced documents may result in increased electromagnetic emissions from the Aurora Four Light or decreased electromagnetic immunity of the Aurora Four Light.

<table>
<tr><th colspan="3">Guidance and Manufacturer's Declaration – Electromagnetic Emissions</th></tr>
<tr><td colspan="3">The Aurora Four Light is intended for use in the electromagnetic environment specified below. The customer or the user of the Aurora Four Light should assure that it is used in such an environment.</td></tr>
<tr><th>Emissions test</th><th>Compliance</th><th>Electromagnetic environment – guidance</th></tr>
<tr><td>RF Emissions - CISPR 11
(Radiated & Conducted)</td><td>Group 1</td><td>The Aurora Four Light uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.</td></tr>
<tr><td>RF Emissions - CISPR 11
(Radiated & Conducted)</td><td>Class A</td><td rowspan="3">The Aurora Four Light is suitable for use in all establishments other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
WARNING: This equipment/system is intended for use by healthcare professionals only. This equipment/ system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the Aurora Four Light or shielding the location.</td></tr>
<tr><td>Harmonic Emissions
EN/IEC 61000-3-2</td><td>Class A</td></tr>
<tr><td>Voltage fluctuations/
Flicker Emissions
EN/IEC 61000-3-3</td><td>Complies</td></tr>
</table>

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and Aurora Four Lights

The Aurora Four Light is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Aurora Four Lights can help prevent electromagnetic interference by maintaining a minimum distance between the portable and mobile RF communications equipment (transmitters) and the Aurora Four Lights as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter in watts (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0,01	0.12	0.12	0.23
0,1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance ***d*** in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where ***P*** is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.
NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The Aurora Four Light is intended for use in the electromagnetic environment specified below. The customer or the user of the Aurora Four Light should assure that it is used in such an environment.			
Immunity Test	**EN/IEC 60601 Test Level**	**Compliance Level**	**Intended Electromagnetic Environment**
Electrostatic Discharge (ESD) EN/IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%
Electrical fast transient/burst EN/IEC 61000-4-4	± 2kV for power supply lines ± 1kV for input/ output lines	± 2kV for power supply lines ± 1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge EN/IEC 61000-4-5	± 1kV differential mode (line-line) ± 2kV common mode (line-earth)	± 1kV differential mode (line-line) ± 2kV common mode (line-earth)	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines EN/IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 seconds	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 seconds	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Aurora Four Light requires continued operation during power mains interruptions, it is recommended that the Aurora Four Light be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz) magnetic field EN/IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
Note: U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and Manufacturer's Declaration – Electromagnetic Immunity (Cont'd)

The Aurora Four Light is intended for use in the electromagnetic environment specified below. The customer or the user of the Aurora Four Light should assure that it is used in such an environment.

Immunity Test	EN/IEC 60601 Test Level	Compliance Level	Intended Electromagnetic Environment
Conducted RF EN/IEC 61000-4-6 Radiated RF EN/IEC 61000-4-3	3Vrms 150kHz to 80MHz 3V/m 80MHz to 2.5GHz	3Vrms 150kHz to 80MHz 3V/m 80MHz to 2.5GHz	Portable and mobile RF communications equipment should be used no closer to any part of the Aurora Four Light, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz where ***P*** is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and ***d*** is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Aurora Four Light is used exceeds the applicable RF compliance level above, the Aurora Four Light should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Aurora Four Light.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

SECTION 13. REVISION HISTORY

Date	Revision	Revision History
05/14/2015	0	Initial release.
05/08/2015	1	Pg 12 - changed text on LED illuminance lifetime to reflect an estimated lifetime and intensity duration Pg 13 - Changed callout - "Focus Knobs" to "Focus Knob" Pg 37 - change text on LED illuminance lifetime to reflect estimated lifetime Pg 40 - Fixed text alignment issue
05/14/2015	2	Celsius conversion has been added to pages 5 and 33 Pg 11- Figure 3, the camera cover for the VCA has been removed and the black camera has been changed to silver Pg 15, 16, 18, 19 - camera and cover color have been updated Pg 38 - Accessories list has been updated Pg 38 and 41 - HD camerahead part number has been added
04/14/2016	3	Pg 6 - changed "Ambient Humidity" in the table to "Ambient Temperature"
10/12/2016	4	Pg 8 - added note to hour usage indicator label that it only exists on earlier models, updated labels Pg 14 - removed light change indicator and USB port from wall control, added footnot that earlier models may have them, changed text in USB and Light change indicator section saying they exist only in earlier models. Pg 13 - added text about LED change indicator Pg 15 - added the software integration control to the list of HD camera abilities Pg 17 - Changed backplane drawing to show the RS-242 connection Pg 22 - added text about the light change indicator change Pg 23 - added text about the LED light change indicator Pg 24 - croped light change indicator light from the rolling base section, figure 23 Pg 35 - added "if present" to info about LED light change indicator Pg 36 - Added If Present to the bullet point about indicator light Pg 39 - removed LED usage indicator and USB port and added note below the image. Pg 40 - change the sterilizable focus handle part number to B1-710-49-C Pg 41 - updated Camera System Components Diagram to include RS232C Control conduit Upgraded warning labels throughout
03/21/2017	5	Pg 8 Added Radial Arm UDI Label,
07/30/2018	6	Pg 35 - added HD camera cleaning instructions
04/18/2019	7	Cover - Removed CE mark Inside cover - Added Lights manufactured after 1-1-2019 statement Pg 7 and 8 - Added Lights manufactured after 1-1-2019 statement

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