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# **INSTALLATION AND SERVICE MANUAL**

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**NUVO VistOR EX LED**

**NUVO VistOR PR LED**

**NUVO VistOR PRO LED**

# Vistor LED

## Agency Approvals



### Medical Electrical Equipment

With respect to electric shock, fire  
And mechanical hazards only

In accordance with IEC60601-1:2006 / CAN/CSA C22.2  
No.601.1-M90 with updates 1 & 2

Classifications:

1. Protection against electrical shock (5.1, 5.2). Class I permanently connected,
2. Protection against harmful ingress of water (5.3). None.
3. Degree of safety in the presence of flammable anesthetics or oxygen (5.5). Not suitable for use in the presence of flammable anesthetics or oxygen.
4. Mode of operation (5.6). Continuous
5. Surgical luminaires (IEC60601-2-41)



Electromagnetic compatibility for immunity  
And emissions in accordance with  
IEC/EN 60601-1-2:2007 ed 3.0 (with 1:2008+A2:2009) and  
CISPR 11 Class A

Medical Electrical Equipment  
Particular requirements for the safety of surgical  
luminaires and luminaires for diagnosis  
In accordance with IEC-60601-2-41

**Intended use:** Procedural Medical Lighting for Hospital, Clinic, Minor Surgery, Examination or Diagnosis, within suitable facilities designated for such purposes. This light system is mounted centrally in a room such that access is available all around the operating environment.

**User interface:** The NUVO lighting systems are minor surgery, procedural and examination lights intended to be used by medical professionals. The functional interfaces are 540° positioning horizontally and +20°/-60° vertically. The lamp head can be rotated approximately 300°. The ON/OFF button also provides for multiple levels of dimming.

**Misuses:** For any purpose or use at any facility other than stated above. Caution shall be exercised when positioning the light head and avoid contact or collision with the patient, other medical professionals or other lights/equipment.

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## Section 1: General Information

### Definition of Terms

**I.E.C.** International Electrotechnical Commission

**ETL** Edison Testing Laboratories

#### **Medical Electrical Equipment**

Electrical equipment intended to diagnose, treat the patient under medical supervision.  
Electrical equipment that transfers light energy to the patient.

#### **Central Illuminance**

Illuminance of light head measured at 1 meter from the light emitting area with no obstructions.  
The value is expressed in Foot-candles or Lux.

#### **Light Field Center**

The point of maximum Illuminance in lighted area. This is the reference point for light field size and light distribution measurements.

#### **Light Field Diameter**

The diameter of the circle where Illuminance reaches 10% of light field center Illuminance.

#### **Depth of Illumination**

The distance above and below 1 meter to where the central Illuminance is reduced to 20%.

#### **Shadow Dilution**

The ability of the equipment to minimize the impact of shadows in the working area due to partial obstruction by the operator or other medical personnel.

#### **Correlated Color Temperature (CCT)**

The color temperature of the light fixture when compared to a blackbody radiator expressed in degrees Kelvin.

#### **Color Rendering Index (CRI)**

A method of how well a light source will render other colors when illuminating them based upon eight CIE chromaticity coordinates measured with a spectro-radiometer.

#### **Total Irradiance**

The total amount of energy imparted to the patient by the lighting system expressed in Watts/meter squared.

#### **Arm Assembly – Extension/Articulating Arm**

The Extension Arm is the horizontal positioning arm with a pivot that increases the area covered by the Articulating Arm and yoke/light head assembly. The Articulating Arm allows for vertical positioning of the light head.

#### **Head/Yoke Assembly**

This assembly includes the light head (light source) and provides for the light head rotation (positioning).

#### **Sterilizable Handle**

An easily removable device that when properly sterilized maintains a sterile area in order to handle it under aseptic conditions when attached to the equipment.

## Definition of Terms (cont'd)

### Light Mounting

Support apparatus used to connect arm assembly/light head to a fixed surface, consisting of either a single or double ceiling mounting.

### Off Center Moment

The unit of measurement for torque which is caused by an off-center load. This is measured in foot-pounds.

### Protective earth ground

The conductor used to connect the non-current-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor, the grounding electrode conductor, or both, of the circuit at the service equipment or at the source of a separately derived system.

### Neutral Conductor (common)

In an AC circuit, the return line for current.

### Means of Isolation

The Means of Isolation, disconnects (Isolates) the light from the source of power. This isolation makes it safe to work on the light. In the case of a ceiling mounted light, the means of isolation is the circuit breaker that supplies the power to the circuit. In the case of the Wall, floor or Floor UPS, the means of isolation is the cord. Unplugging the cord isolates the light from power.

## List of Symbols

	<p>ETL Listing marking</p>		<p>Protective earth ground</p>
	<p>Read accompanying documents</p>		<p>Neutral conductor</p>
	<p>C.E. Marking</p>		<p>Caution</p>
	<p>Fuse marking</p>		<p>Electric shock hazard</p>

## VistOR Line Models

The following NUVO models are covered in this manual:

### VistOR PRO LED

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NV061522 – Wall Mount.....	100-240 VAC, 2.5A, 50/60 Hz, 100W
NV061523 – Floor Model.....	100-240 VAC, 2.5A, 50/60 Hz, 100W
NV061523B – Floor Model w/Battery Backup.....	100-240 VAC, 2.5A, 50/60 Hz, 120W
NV061524 – Single Ceiling Mount.....	100-240 VAC, 2.5A, 50/60 Hz, 100W
NV061525 – Dual Ceiling Mount .....	100-240 VAC, 5.0A, 50/60 Hz, 200W

### VistOR PR LED

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NV061422 – Wall Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
NV061423 – Floor Model.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
NV061423B – Floor Model w/Battery Backup.....	100-240 VAC, 1.5A, 50/60 Hz, 85W
NV061424 – Single Ceiling Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
NV061425 – Dual Ceiling Mount .....	100-240 VAC, 3.0A, 50/60 Hz, 130W

### VistOR EX LED

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NV061322 – Wall Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
NV061323 – Floor Model.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
NV061324 – Single Ceiling Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
NV061325 – Dual Ceiling Mount .....	100-240 VAC, 3.0A, 50/60 Hz, 130W

## Medical Illumination International, Inc. Limited Warranty

This document comprises the general terms of your product's Limited Warranty. By accepting the shipment of the product, the owner/purchaser agrees to adhere to the warranty terms and conditions expressed herein.

NUVO is Medical Illumination International, Inc. ("Medical Illumination") branded Lighting Equipment and is warranted against defective material and/or workmanship, excluding normal replacement parts (e.g. sterilizable handles), for a period of three (3) years from the date of shipment. This Limited Warranty applies exclusively to the repair or replacement of parts recognized as defective by Medical Illumination that are in normal use and have not been modified or repaired by unauthorized personnel.

This Limited Warranty extends only to the first retail purchaser of a product, and is not transferable or assignable. This warranty supersedes all other guarantees or warranties, expressed or implied.

### WARRANTY SERVICE & REPAIRS

Medical Illumination does not provide (or give any compensation for) outside repair services or field labor. Therefore, in the event of a failure covered under this warranty, please take the following immediate action:

1. Contact Medical Illumination via phone at (818) 838-3025, through our website at <http://www.medillum.com>, or by facsimile at (818) 838-3725.

A. Be prepared to give the model number, serial number, and full description of the failure.

B. Our Customer Service department will attempt to solve the problem over the phone. If it becomes necessary to send the product to the factory for repair, you will be provided with a Return Authorization number. Products sent to the factory without a Return Authorization number will not be accepted.

2. It is the retail purchaser's obligation to arrange for shipment return of a product to the factory for warranty service, which shall be at the retail purchaser's expense. Carefully package the light component (light head, arm assembly, mount assembly, etc.) and return it, freight prepaid and insured, with the Return Authorization number clearly marked on the outside of the box, to:

Medical Illumination  
547 Library Street  
San Fernando, CA 91340  
RMA# \_\_\_\_\_

When returning product for repair, damage resulting from inadequate packing is not covered by this warranty. In addition, shipping insurance does not cover damage due to inadequate packing. We recommend that the package be insured against loss or in-transit damage. Medical Illumination cannot be held responsible for in-transit loss or damage. In the event that freight-related damage should occur, Medical Illumination will notify you immediately so that you can file a damage claim with the proper freight carrier.

## Medical Illumination Limited Warranty (cont'd)

Within the aforementioned time period of three (3) years from date of shipment, Medical Illumination will evaluate the returned product, repair as appropriate, and ship the product back to you with freight costs prepaid by the Company. In the event that non-warranty damage or failure is discovered, you will be contacted before any repairs are performed.

### EXCLUSIONS

This Limited Warranty does not cover the following:

- Any field labor or outside services (electricians, contractors, installation services, routine maintenance or other repair services)
- Damage to the product resulting from tampering, accident, abuse, negligence, alteration, or other causes unrelated to problems with material and/or workmanship
- Damage due to improper installation, use, cleaning or maintenance, as outlined in the Installation and Service Manual for the product
- Labor costs associated with removing, re-packaging for shipment or reinstalling product

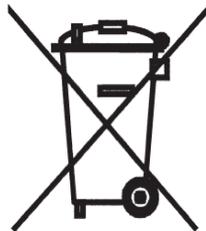
### PRODUCT RETURNS:

Please contact the authorized dealer from whom the product was purchased to inquire about a product return. Additional terms and conditions set by the dealer may apply for any returned items.

### SHIPMENT DAMAGE:

If the initial shipment of your purchased product arrived in damaged condition, please leave the packaging and its contents intact and contact Medical Illumination immediately.

## Disposal of Waste



This product must not be disposed of with your other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment, or by returning it to Medical Illumination International, Inc for reprocessing. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your waste disposal service, or your product distributor or retailer.

## Section 2: Specifications

<b>Optical Specification</b>			
Parameter	VistOR PRO LED	VistOR PR LED	VistOR EX LED
# of LED's	36	18	8
Output	100,000 Lux @ 39.4" (1m)	75,000 Lux @ 39.4" (1m)	55,000 Lux @ 24" (0.6m)
CCT	4,300°K		
CRI	97		
Focal Length	39.4" (1m)		24" (0.6m)
Dimming Levels	5	3	2
Dimming Percentages	100%, 87%, 75%, 62%, 50%	100%, 75%, 50%	100%, 50%
Endo Mode	Yes	No	No
Light Field (d10)	≈Ø8.3" (Ø209mm)	≈Ø7.7" (Ø196mm)	≈Ø6.0" (Ø152mm)
Light Field (d50)	≈Ø4.9" (Ø124mm)	≈Ø4.3" (Ø110mm)	≈Ø3.5" (Ø 89mm)
Depth of Illumination	24.0" (610mm)	26.5" (673mm)	-
Illuminance (one mask)	27.2%	.003%	-
Illuminance (two masks)	37.2%	34.5%	-
Illuminance (tube with one mask)	24.3%	.003%	-
Illuminance (tube with two masks)	40.3%	35.5%	-
Irradiance	295 W/m <sup>2</sup>	196 W/m <sup>2</sup>	71 W/m <sup>2</sup>
<b>Electrical Specifications</b>			
Supply Circuit	100 - 240 VAC, 50/60Hz		
Fuse Rating	2.5 Amp/250VAC	1.5 Amp/250VAC	1.5 Amp/250VAC
Power Supply power handling capacity	100W	65W	65W
Light Head power consumption	54W @24VDC	27W @24VDC	16W @24VDC
<b>Mechanical Specifications</b>			
Light Head Weight	14.6 lbs (6.6 kg)	9.0 lbs (4.1 kg)	6.9 lbs (3.1 kg)
Light Head Dimensions	Ø18" (Ø457mm) 4" H (102mm)	Ø14.5" (368mm) 3.25" H (83mm)	Ø9.2" (234mm) 2.6" (66mm)
Arm Assembly Weight	Single: 48.3 lbs (21.9 kg)		Dual: 77.1 lbs (35.0 kg)
Articulating Arm Vertical Movement	+20° Up, -60° Down		
Articulating Arm Horizontal Movement	≈540°		
Articulating Arm/Yoke Interface	≈540°		
Yoke/Light Head Interface	≈300°		
<b>Environmental Specifications</b>			
Ambient/Operating temperature	41°F to 104°F (5°C to 40°C)		
Storage temperature	-4°F to 122°F (-20°C to 50°C)		
Humidity	10 - 90% Relative Humidity		
Pressure	100kPA (@ <2k meters)		

## Section 3: Installation/Assembly

### Ceiling Calculation for a Single Ceiling Light

Use the following table to select the correct length ceiling rod for your application

Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head room to bottom of Extension Arm (Y-Value – X-Value)
8'0" – 8'10" [2438 – 2692]	9" [229] P/N: 1001461-9	19.5" [495]	76.5" – 86.5" [1943 – 2197]
8'11" – 9'8" [2718 – 2946]	20" [508] P/N: 1001461-20	30.5" [775]	76.5" – 85.5" [1943 – 2172]
9'9" – 10'6" [2972 – 3200]	30" [762] P/N: 1001461-30	40.5" [1029]	76.5" – 85.5" [1943 – 2172]
10'7" – 11'4" [3226 – 3454]	40" [1016] P/N: 1001461-40	50.5" [1283]	76.5" – 85.5" [1973 – 2172]
11'5" – 12'2" [3480 – 3708]	50" [1270] P/N: 1001461-50	60.5" [1537]	76.5" – 85.5" [1973 – 2172]

[xx] denotes millimeters

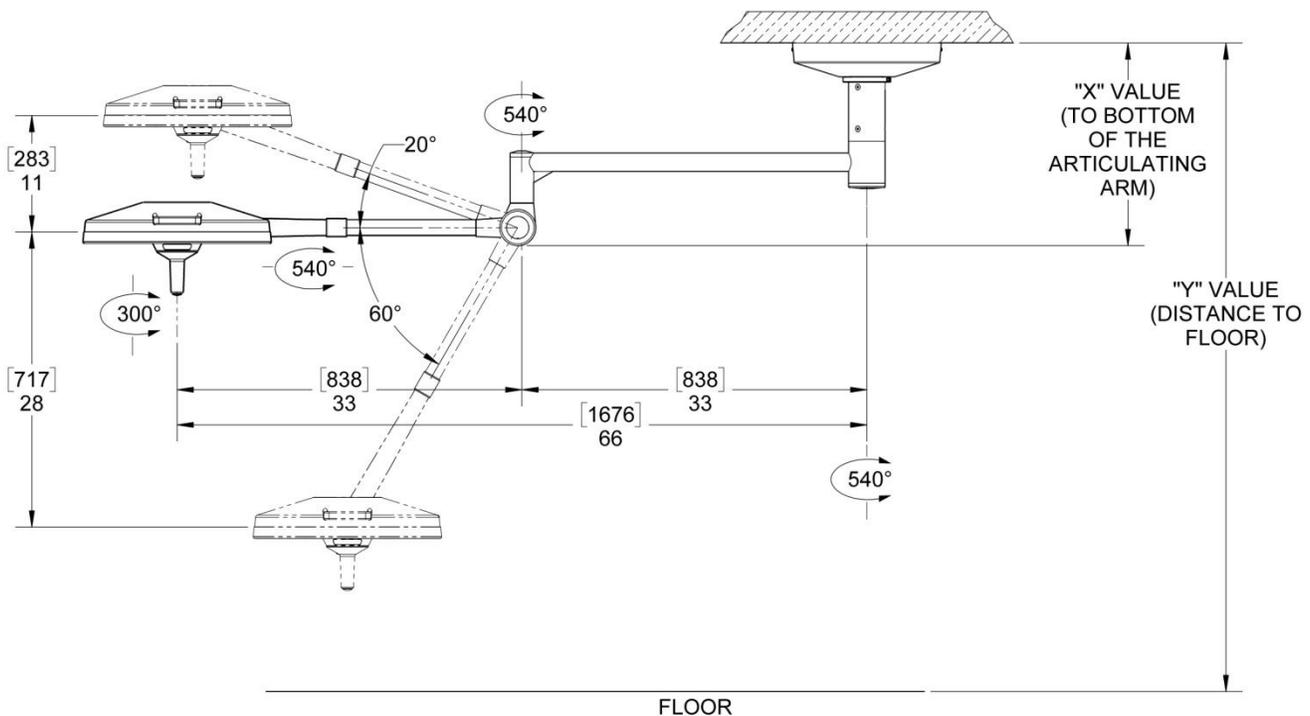


Figure 1: Ceiling Rod Calculation for Single Ceiling Mount

## Ceiling Calculation for a Dual Ceiling Light

Use the following table to select the correct length ceiling rod for your application

Ceiling Mounting Height "Y"-Value	Ceiling Rod Length	"X"-Value	Head room to bottom of Extension Arm (Y-Value - X-Value)
8'0" – 8'10" [2438 – 2692]	9" [229] P/N: 1001461-9	23.5" [597]	72.5" – 82.5" [2026 – 2280]
8'11" – 9'8" [2718 – 2946]	20" [508] P/N: 1001461-20	34.5" [876]	72.5" – 81.5" [1842 – 2070]
9'9" – 10'6" [2972 – 3200]	30" [762] P/N: 1001461-30	44.5" [1130]	72.5" – 81.5" [1842 – 2070]
10'7" – 11'4" [3226 – 3454]	40" [1016] P/N: 1001461-40	54.5" [1384]	72.5" – 81.5" [1842 – 2070]
11'5" – 12'2" [3480 – 3708]	50" [1270] P/N: 1001461-50	64.5" [1638]	72.5" – 81.5" [1842 – 2070]

[xx] denotes millimeters

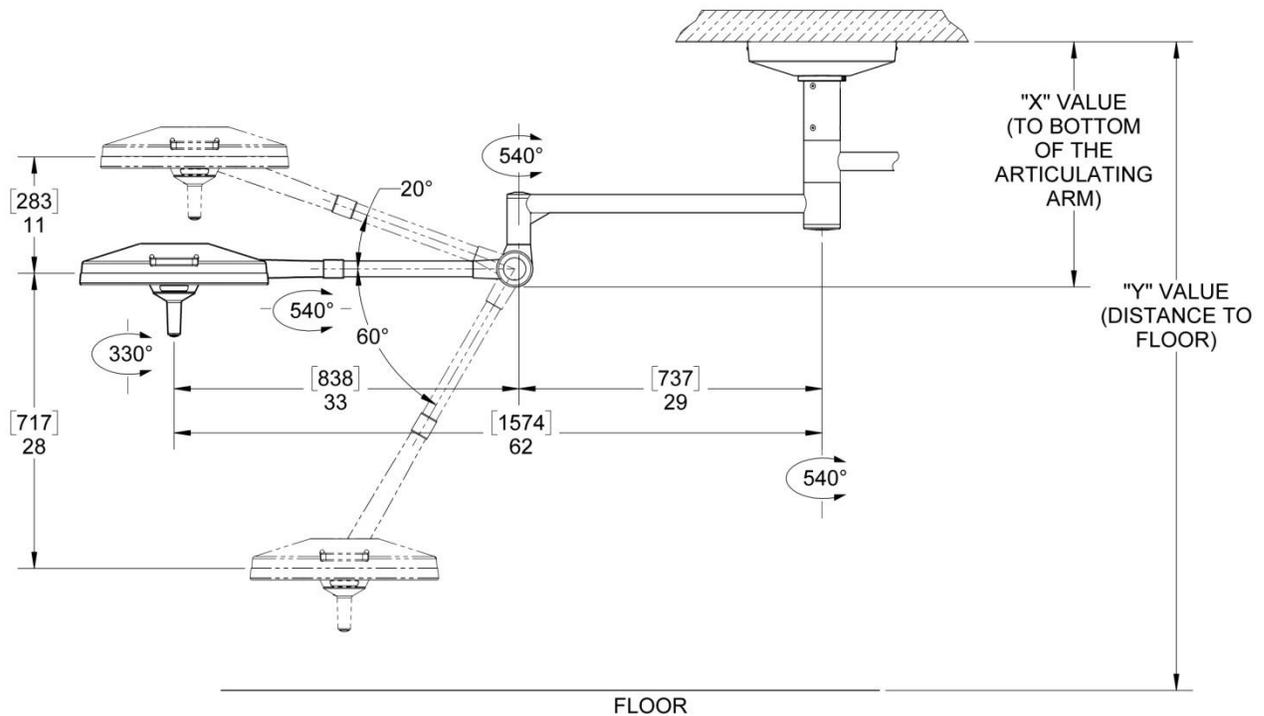


Figure 2: Ceiling Rod Calculation for Dual Ceiling Mount

## Ceiling Mount Pre-Installation Guidelines

**SPECIAL NOTE:** Installation and repair of this equipment should be performed by qualified persons only. NUVO does not warranty any damage occurring as a result of improper installation. It is recommended that this installation manual be completely reviewed prior to installation.

Before installation, check to insure the following minimum conditions are provided:

Ceiling Mount	Weight: Lb	Moment: Ft Lb
Single Ceiling	145	326
Dual Ceiling	231	626

← recommended

Medical Illumination strongly recommends that the ceiling structure be designed to the weights and moments for the worst case (double ceiling). Designing for the heaviest model with the highest load/torque will ensure adequate support for all models.



**A structural mount that does not meet these minimum conditions can cause serious injury and/or property damage.**



**A sloped or vaulted ceiling will require a level mounting surface be constructed that meets the above listed requirements.**

- The ceiling structure must be strong enough to support the weight and rigid enough to constrain rotation to less than 0.1° at the ceiling casting.
- The equipment may be mounted directly over a 4-0 junction box. Input power supply lines should be wired in accordance with all applicable building codes.
- The supply circuit line must be as follows:  
100-240VAC, 50/60 Hz, single phase, three wire, capable of supplying 200 Watts.
- The equipment is not deemed compatible with any sort of electrical dimming device. Use line voltage only.
- The power supply circuit line must be routed and wired to the wire harness in compliance with all applicable building codes.



**Failure to provide a circuit meeting these minimum standards or complying with local building codes can cause a shock hazard.**

Check the length of the ceiling rod supplied to make sure that it is the proper length to install and operate the light without interference or over reach.



### Means of Isolation

The Means of Isolation disconnects (Isolates) the light from the source of power. This isolation makes it safe to work on the light. In the case of a ceiling mounted light, the means of isolation is the circuit breaker that supplies the power to the circuit. In the case of the Wall, Floor or Floor UPS, the means of isolation is the cord. Unplugging the cord isolates the light from power.

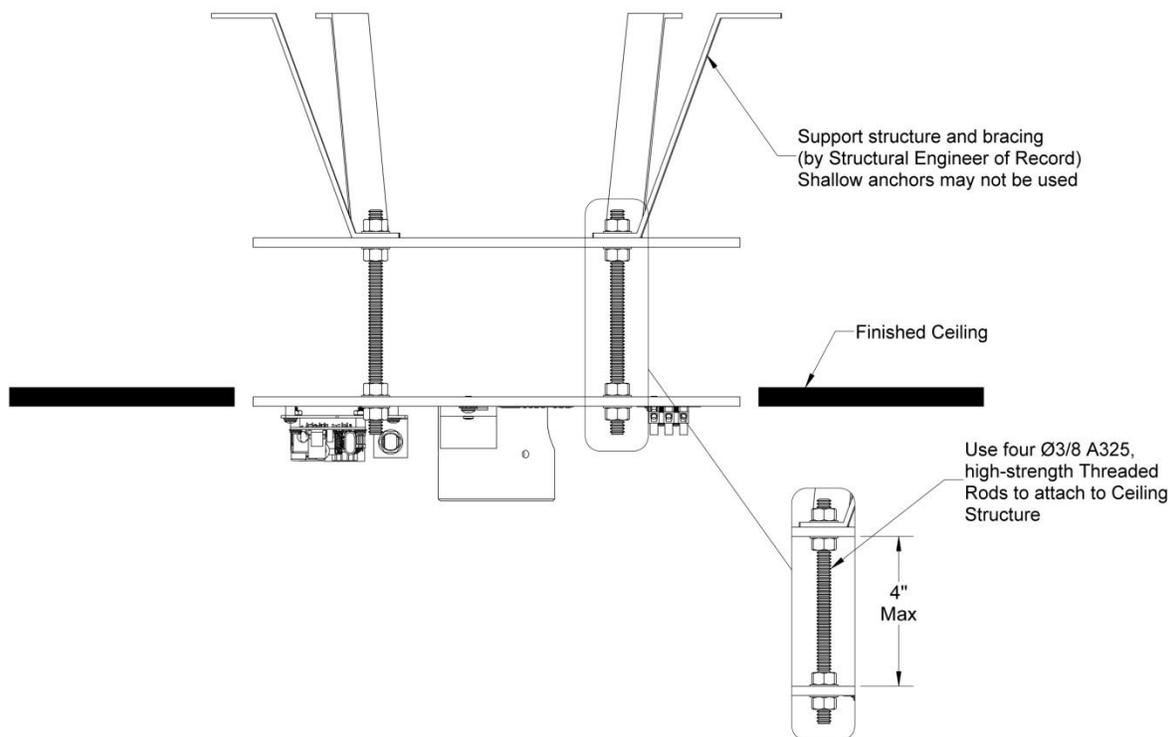
## Ceiling Structure Construction and Mounting

The Ceiling Mount system will experience various levels of dynamic off center moment during regular use. Therefore, it is crucial that the ceiling structure be strong enough to uphold the weight of the system and support the positioning arms and light head without deflection. The owner and/or owner's contractor has the final responsibility for the strength and rigidity of the ceiling structure. An inadequate ceiling structure may result in serious injury, unintended drift, and/or equipment damage.

Because the ceiling structure is the owner's responsibility, the design and construction recommendation shown below covers only one of the many possible alternatives that can be used. Medical Illumination highly recommends that the owner consult a structural engineer prior to designing and installing the ceiling structure.

### Recommended Ceiling Structure Construction Details

The illustrations below are suggested mounting schemes per 2001 California Building Code – Section 1632A: Anchorage and Seismic. For any other mounting scheme, please consult a structural engineer and/or professional contractor for the best solution for your situation. Installation and repair of this equipment should be performed by qualified persons only. Medical Illumination does not warranty any damage occurring as a result of improper installation.

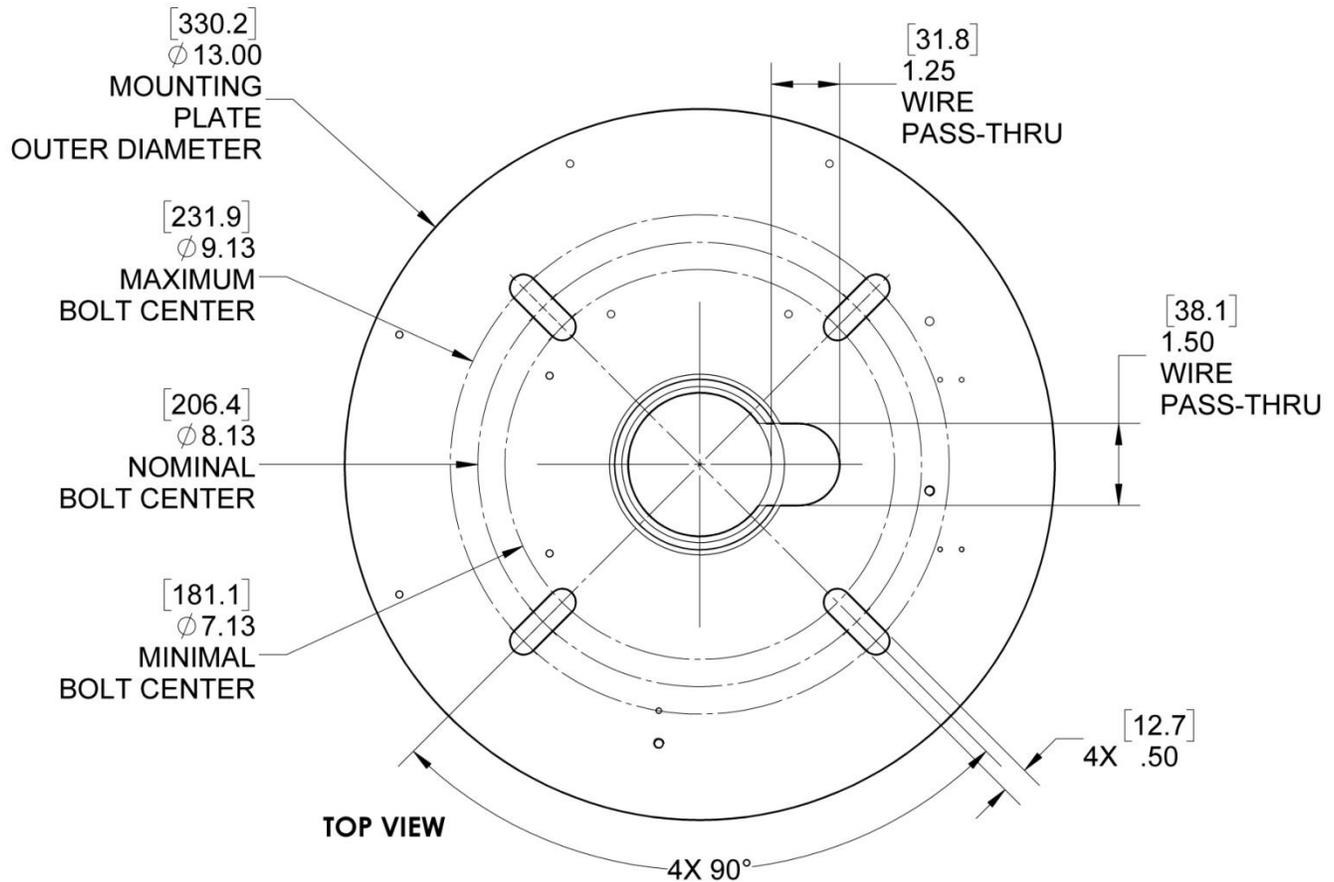


**Figure 3: Recommended Ceiling Structure Construction**

## Ceiling Structure Construction and Mounting

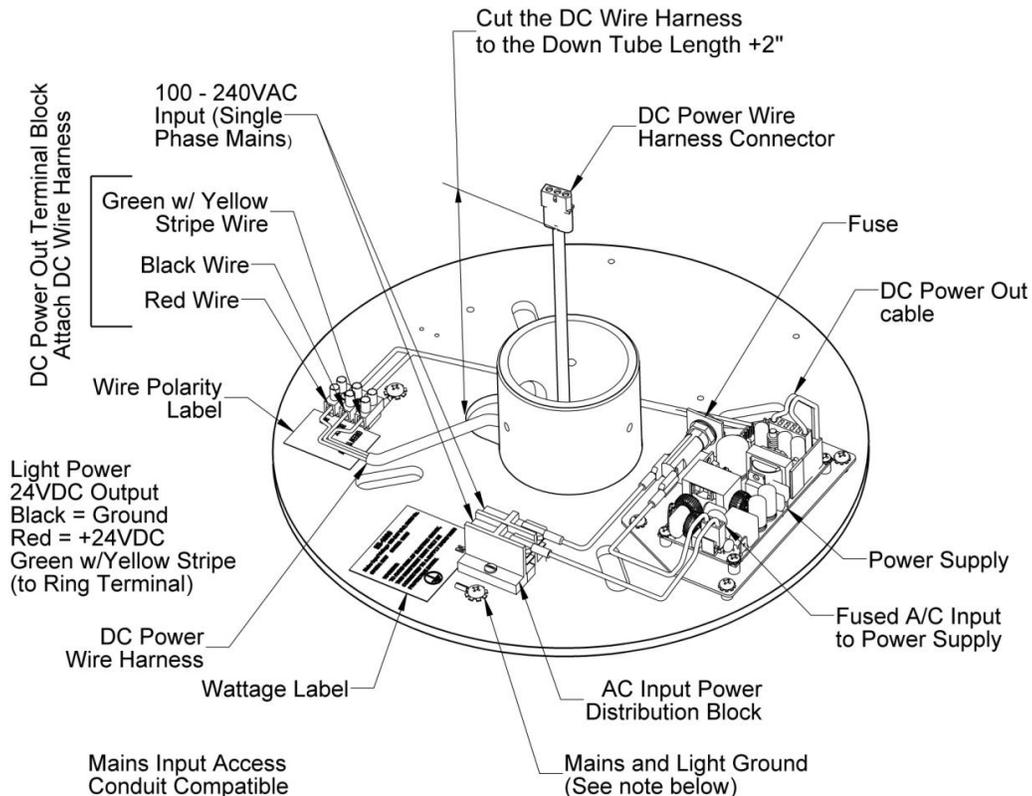
**⚠ Improper fastening of the ceiling casting can cause serious injury and/or property damage.**

- Mount the Ceiling casting to the ceiling structure using four  $\frac{3}{8}$ " DIA Grade-8 bolts with nuts and washers as shown in Figure 3.



**Figure 4: Mounting Dimensions for Ceiling Mount Assembly**

## Arm Cable Termination



**Figure 5: Arm Cable Termination**

(Note: Ceiling Mount Assembly with a Single with Power Supply)

The DC Power cable is attached to the DC Power Terminal on Mounting Plate Assembly so that it can be tested as a complete system prior to packaging. To shorten the cable length, route the DC Wire Harness through the Wire Pass-Thru and then out of the center hub. Then run the cable through the Down Tube and position the Down Tube over the center hub aligning the Wire Pass-Thru recesses. Position the connector at 2" past the end of the Down Tube and remove the slack to measure the excess cable length to be removed.

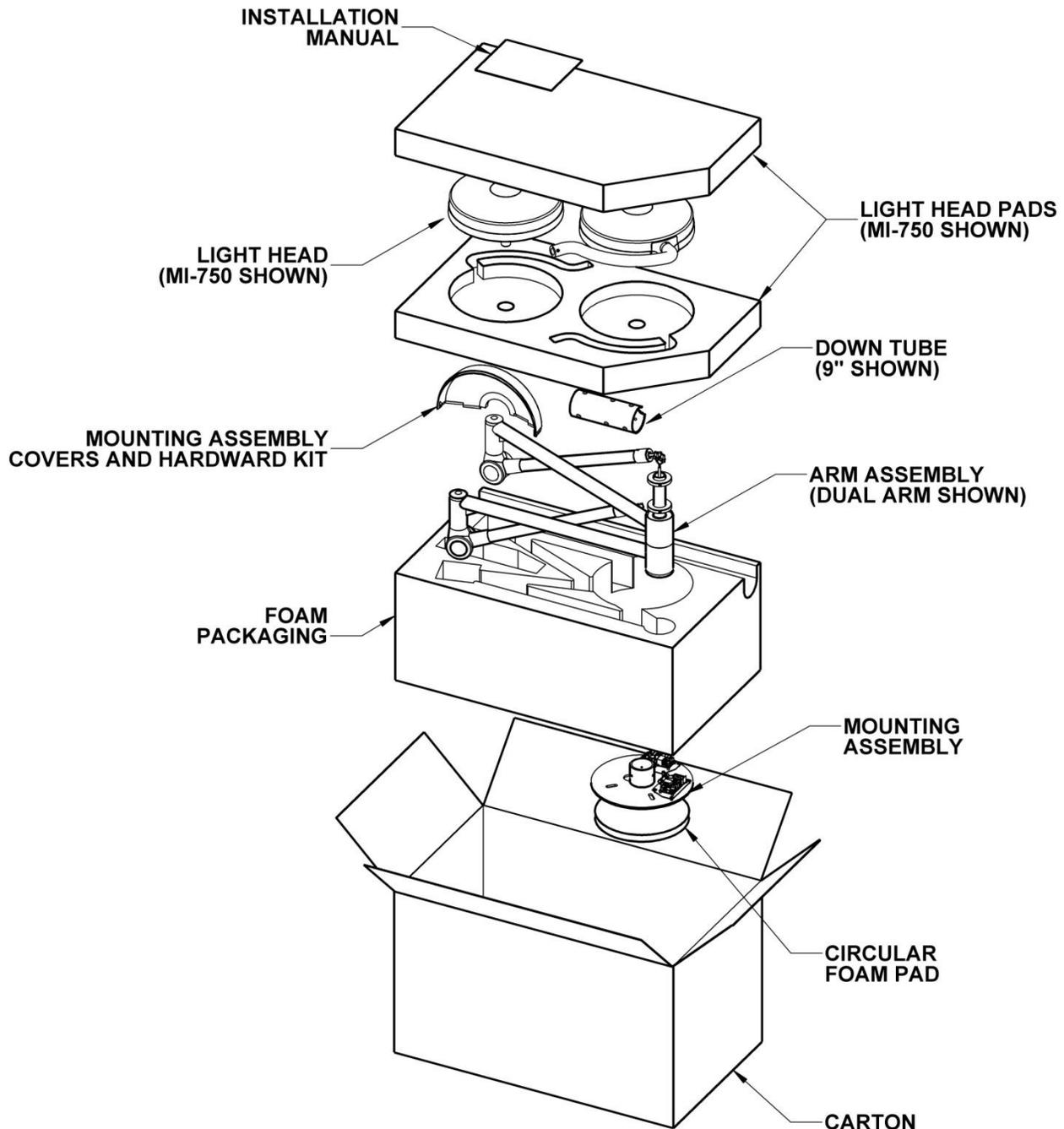
Disconnect the cable from the DC Power Terminal and cut the excess length from the cable. Then strip and reconnect the three wires back to the DC Power Terminal observing the polarity: First connect the Green w/Yellow Stripe wire to the Mains Earth Ground  $\oplus$  terminal, then the Black wire to the Terminal labeled "Black" and then the Red wire to the Terminal labeled "Red (+24VDC)". For a dual light configuration, connect the second DC wire harness to the other power supply in the same manner.

For ease of installation, install the Down Tube on the Ceiling Mount using the three (3) of the  $\frac{1}{4}$ -20 x  $\frac{1}{2}$ " Flat Socket Head and tightening sequentially. Ensure the Wire Harness Connector(s) exceed the open end of the Down Tube and that the wires are hanging unencumbered.

**⚠ Protective Earth Ground Warning, to avoid risk of electrical shock, this equipment must be only connected to supply mains with protective earth.**

## Unpacking the Light System

All MI Products all are packed in a similar manner (see illustration) and the instructions for installation are the same. Once the carton is open the Installation Manual can be found on top of the Foam Pad. It is highly recommended that the installation be performed by at least two people.



**Figure 6: Packing Contents**  
(Dual MI-750 shown)

## Unpacking the Light System

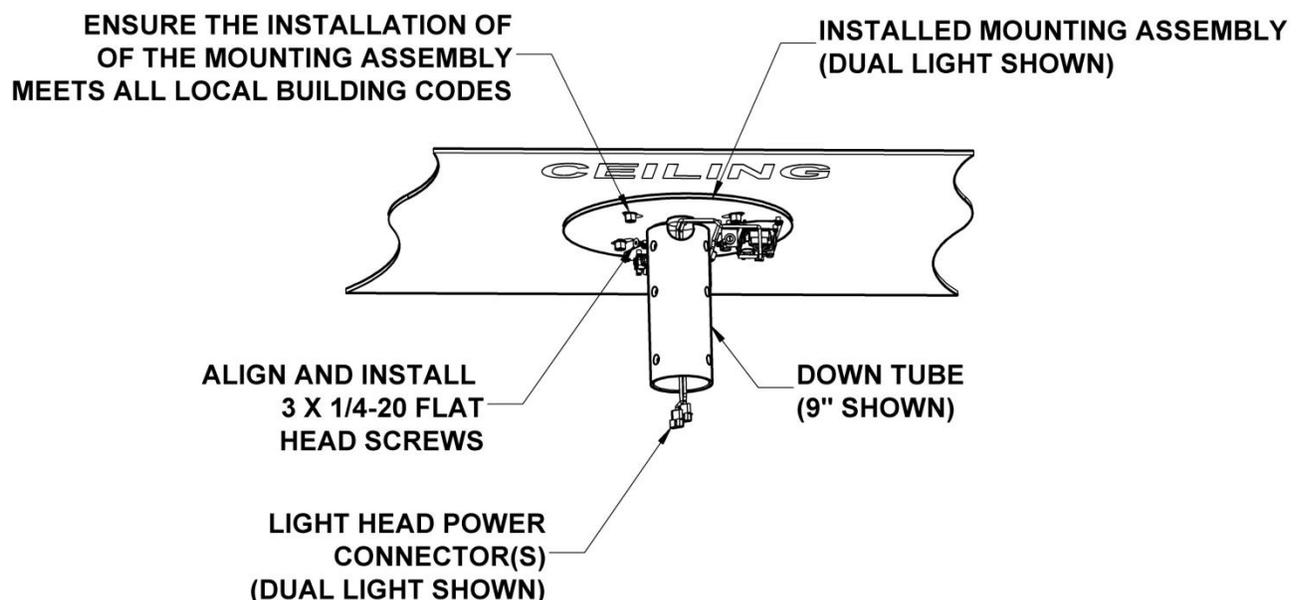
To begin the installation, remove the Upper Light Head Foam Pads and move the Light Heads to a safe place for mounting after the Mounting Assembly is securely installed. Use the Light Head Pads to protect the Light Head until it is installed. Note: due to its size, the packaging for the Dual MI-1000 requires the second MI-1000 Light Head to be packed in a separate carton.

Remove the Mounting Assembly Covers, Hardware Kit and Down Tube from the packaging.

With the Arm Assembly still in the Foam Packaging, carefully lift the Foam Packaging and Arm Assembly out of the Carton and place the Foam/Arm Assembly near the light installation. The Carton can also be cut away to access the Foam Packaging from the Carton. The Mounting Assembly will be in the very bottom of the Foam Packaging.

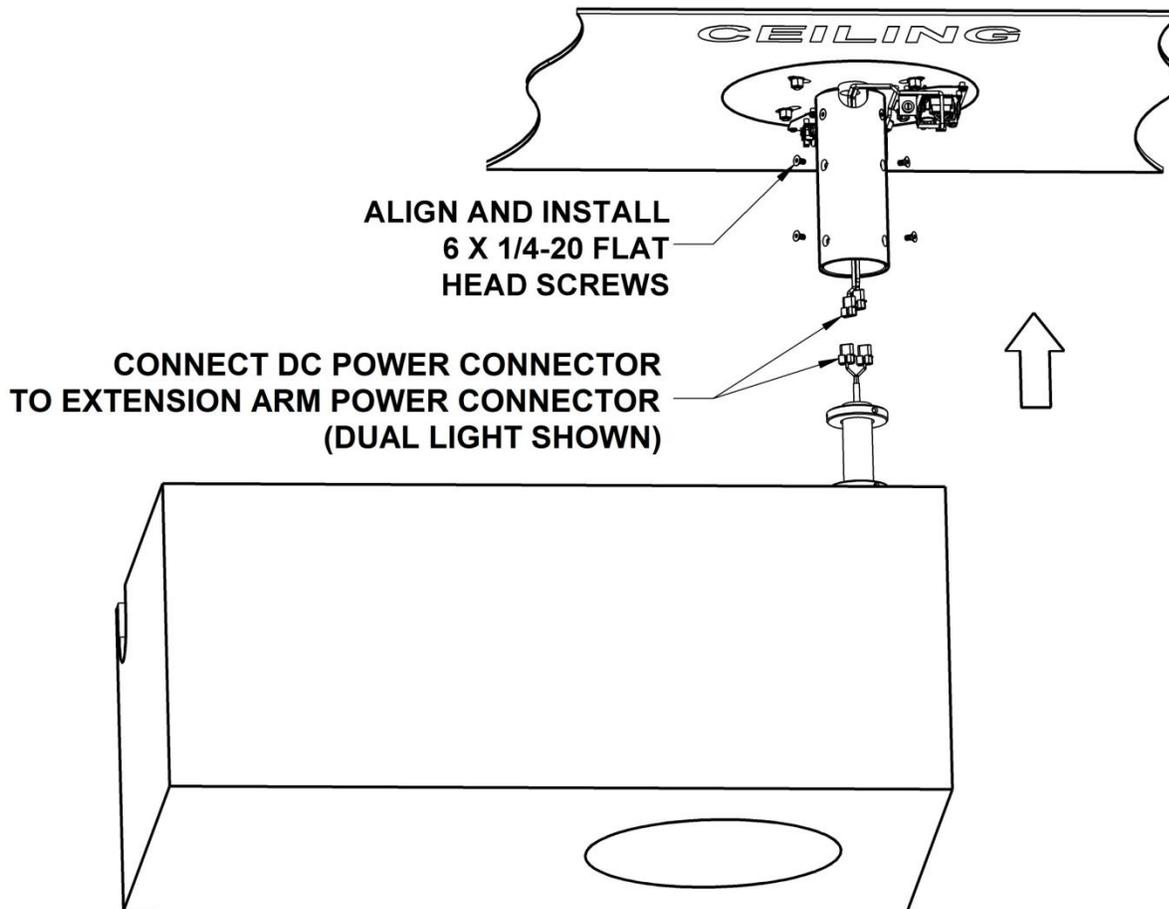
## Installing the Light System

Once all of the components have been unpacked, install the Mounting Assembly to the ceiling structure using four (4) 3/8" diameter, grade 8 bolts with nuts and washers. Following Ceiling Structure Construction and Mounting instructions and ensure that the assembly is level and shim the assembly if necessary. Once the assembly is securely mounted, install the down-tube using the three (3) 1/4-20 Flat Head Screws.



**Figure 7: Mounting Plate Installation**

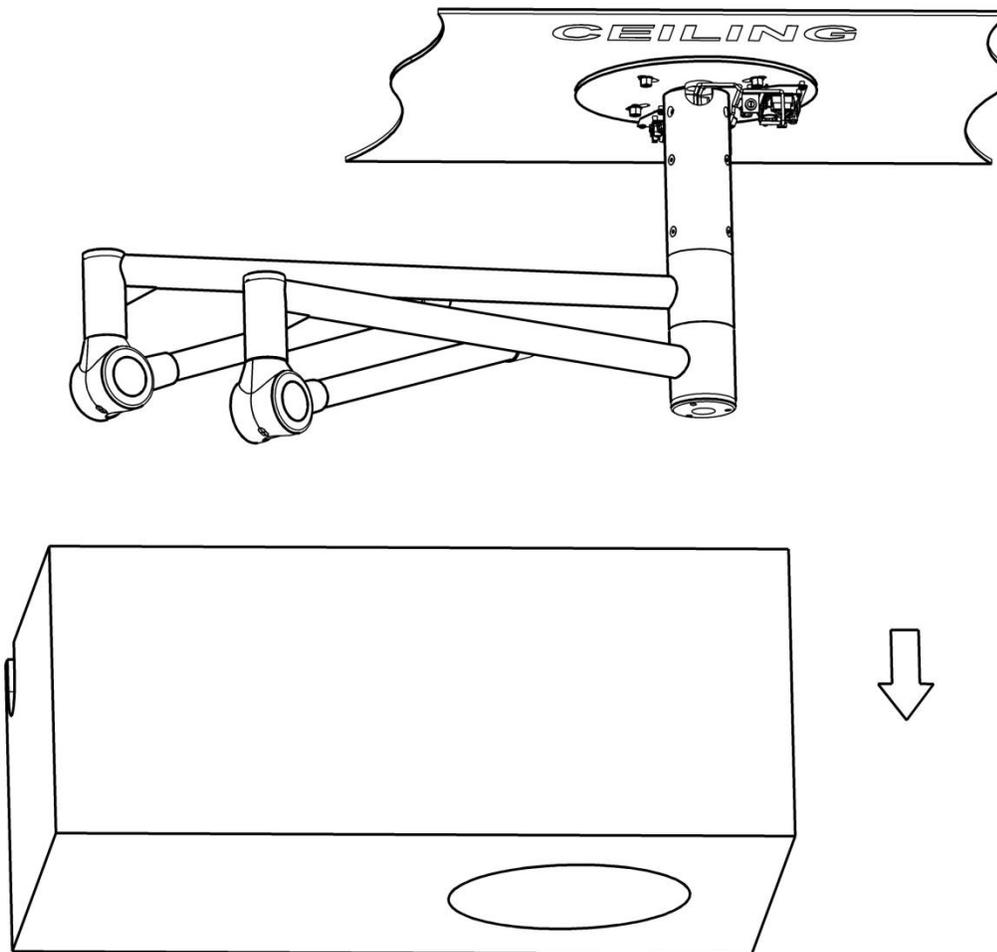
## Installing the Arm Assembly



**Figure 8: Installing the Arm Assembly**

It is recommended that a scissor-lift be used to lift and mount the Arm Assembly. If a scissor-lift is not available the installation can be performed by two people. In either case, carefully lift the Foam Packaging up to the Down Tube. Connect the Light Head Power Connector(s) and then Slide the Arm Shaft up into the Down Tube. Align the holes on the Down Tube to the Arm Shaft and install the remaining six (6) ¼-20 Flat Head Screws

## Finishing the Arm Assembly

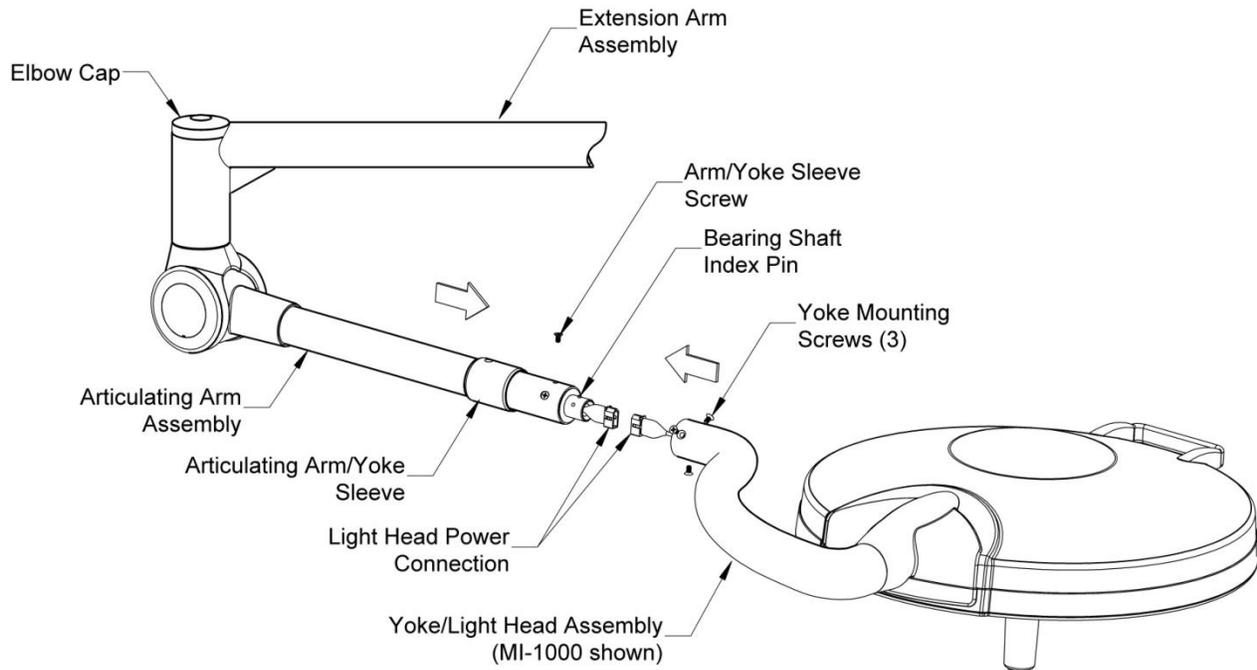


**Figure 9: Finishing the Arm Assembly Installation**

Once the Arm Assembly is securely mounted, lower the Foam Packaging from the Arm Assembly. Use **EXTREME CAUTION** when removing the Foam Packaging in that the Extension Arm(s) and the Articulating Arm(s) will both rotate freely once the Foam Package is removed.

See “Installing the Light Head” on page 21 to complete the Arm/Light Head installation.

## Installing the Light Head



**Figure 10: Installing the Light Head**

With the Arm Assembly installed and the Extension and Articulating Arms rotate freely without binding, the Light Head is now ready to install. Using two people lower the Articulating Arm to the horizontal position and slide the Articulating Arm/Yoke Sleeve with the screw hole positioned away from the light head onto the arm as shown. Use caution in holding the Articulating Arm in place in that it is spring loaded to accommodate the weight of the Light Head. Next, pre-align the indexing pin on the Bearing Shaft extending out of the Articulating Arm to match the position of the channel located on the inner diameter of the Yoke neck. While supporting the light head, securely connect the Light Head Power Connection. Carefully slide the Yoke onto the Arm Bushing with the indexing pin in the channel on the yoke, ensuring the power-connectors do not bind or disconnect. Attach the three (3) Flat Head Yoke Mounting Screws to secure the Yoke to the Articulating Arm. Slide the Articulating Arm/Yoke Sleeve of the Arm/Yoke Joint and install the Flat Head Screw holding the Sleeve in place.

## Connecting the Mounting Assembly to AC Mains



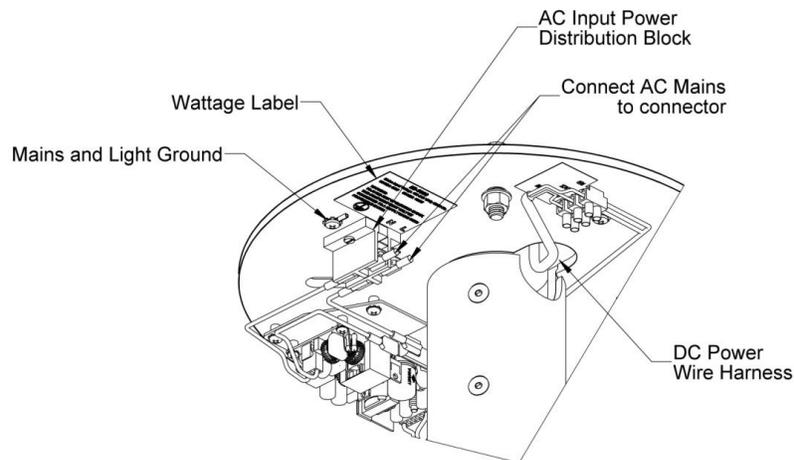
Ensure that the building mains supply is turned off before proceeding.



Provide supply mains in accordance with Local Electrical Code.



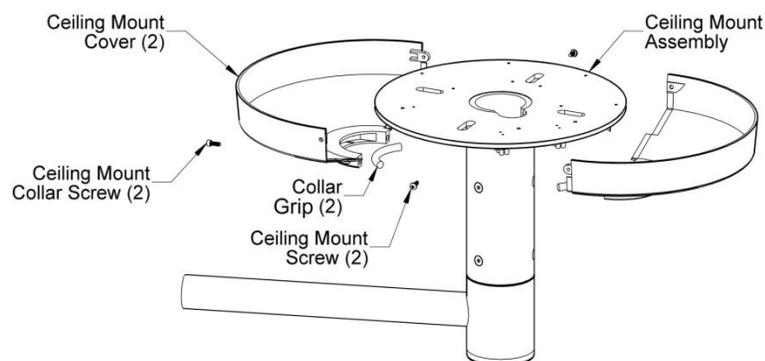
Ensure the input supply is Single Phase, between 100-240 VAC.



**Figure 11: Connecting AC Mains**

Attached the supplied Connectors to the building AC Mains cable and then plug these connectors to the AC Input Power Distribution Block. Ensure a secure connection. Re-energize the AC Mains and test the light to assure the light head has power.

## Finishing the Installation



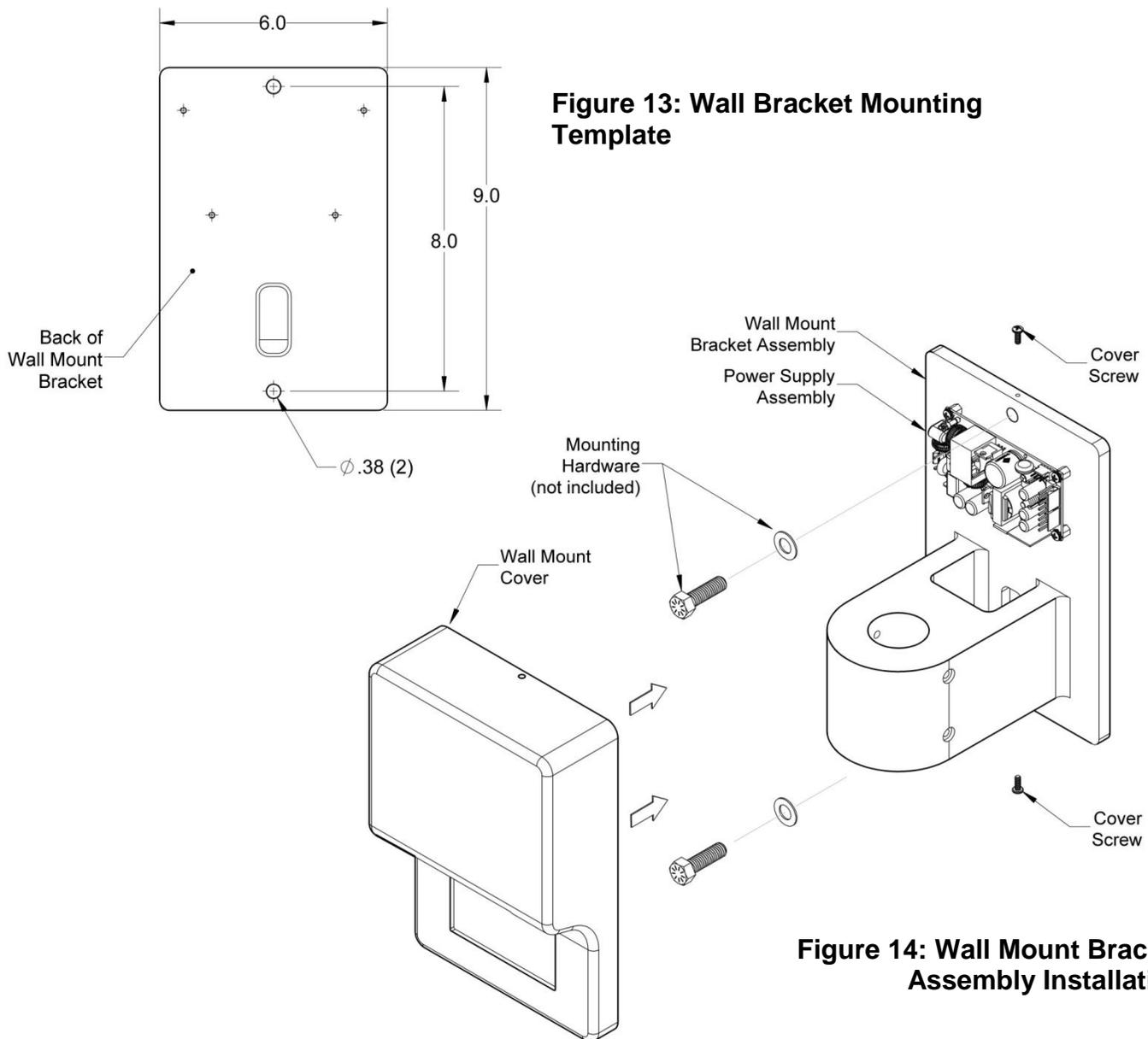
**Figure 12: Installing the Ceiling Mount Covers**

Position the Ceiling Mount Cover halves as shown above. Install the two (2) polymer Collar Grip pieces into the recesses of the cover halves. Install using two (2) Allen Cap Ceiling Mount Collar Screws. Tighten the screws until the cover is held in place. Then install the two (2) upper Ceiling Mount Screws. Do not over-tighten.

## Wall Mount Installation

The shipping carton contains a light head assembly, arm assembly, extension arm assembly, a wall bracket assembly with a hospital grade plug attached, hardware kit, and an Installation and Service Manual. (Mounting hardware for attaching the wall bracket to the wall is not supplied). Prior to installation ensure that all components shown are present.

**⚠** When removing parts from the shipping carton, be careful not to damage the components. Important: thoroughly check each box for parts that may be located in areas that can be overlooked.



## Wall Mounted Light Installation

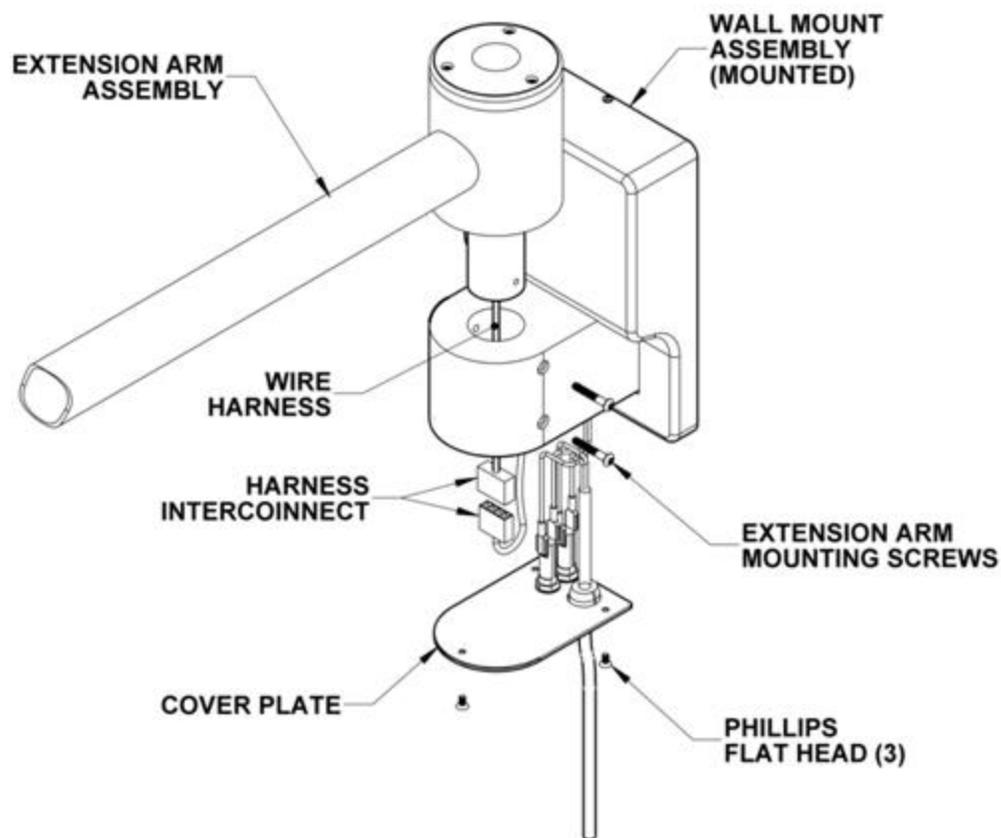


Figure 15: Extension Arm Mounting on Wall Bracket

**⚠** Improper fastening of the wall bracket can cause serious injury and/or property damage. Make certain the installation is capable of supporting a load of at least 132 pounds and an off center moment of 352 ft-lbs.

**⚠** The supply circuit line must be as follows: 100-240VAC, 50/60 Hz, single phase, three-wire and capable of supplying 100W.

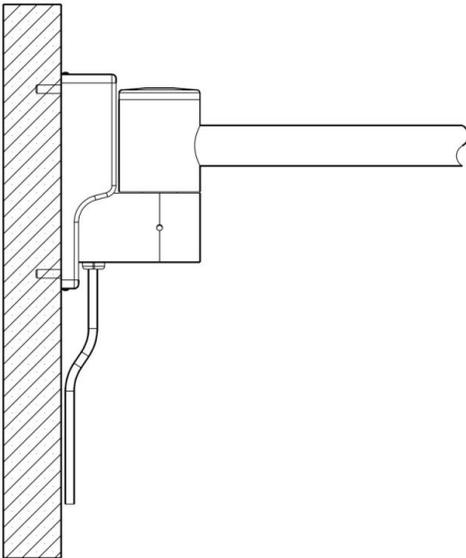
**⚠** The equipment is not compatible with any sort of electrical dimming device. Use line voltage only. To maintain proper grounding reliability, the ground wire connections with the wall bracket must be kept properly fastened at all times

## Wall Mounted Light Installation (cont'd)

### Recommended Wall Structure Construction Details

The illustrations below are suggested mounting schemes per 2001 California Building Code – Section 1632A: Anchorage and Seismic. For any other mounting scheme, please consult a structural engineer and/or professional contractor for the best solution for your situation. Installation and repair of this equipment should be performed by qualified persons only.

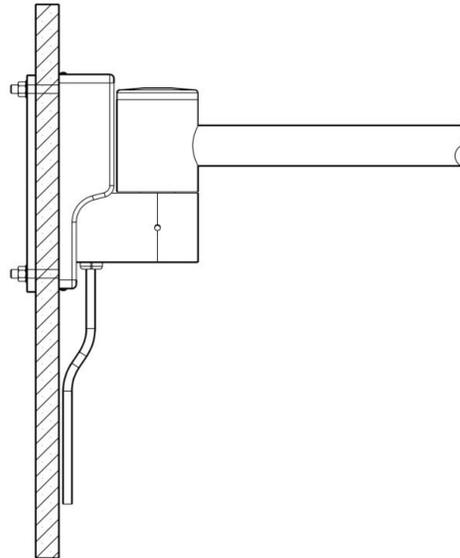
#### Wall mounting with load anchor or stud anchor



**Figure 16: Wall mounting with load anchor or stud-anchor**

Concrete Wall (3000 PSI min., 6" thick min.):  
Use two Ø3/8 HILTI KB3 Expansion Anchors or approved equivalent bolts (min. embed. 3"). See Figure 18. Stud Anchor Installation. Also see HILTI technical document ESR-2302 for additional concrete anchoring information.

#### Wall mounting with Backing Plate (not provided)

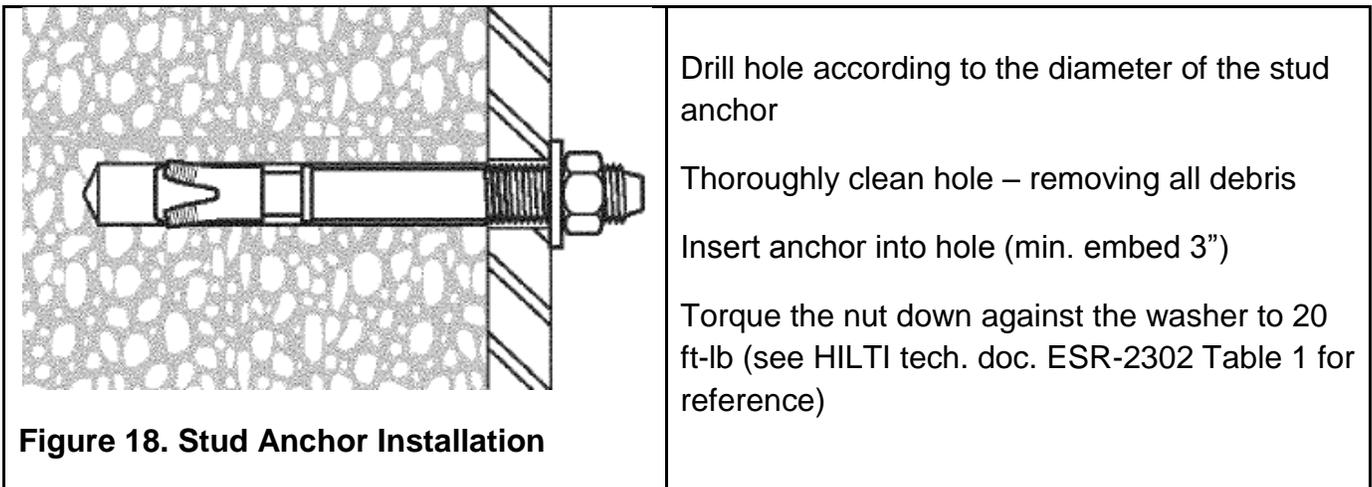


**Figure 17: Wall mounting with Back-Plate**

Lattice stone, cinder block, etc. (min. 5/8" wall board thickness):

Use two Ø3/8 A307 Bolts with nuts/washers to Backing Plate

## Wall Mounted Light Installation (cont'd)



Mount the Wall Bracket to the wall using a minimum 3/8" diameter x 3", Grade-8 bolts.

If connecting directly to the building mains, route the mains wire through the opening on the back of the wall bracket. Wire to the fuses observing polarity to the input of the power supply.

After the wall bracket is mounted to the wall and the mains are connected to the power supply, install wall bracket cover and fasten using the two (2) cover screws (top/bottom).

Remove the three (3) screws holding the Cover Plate in place. Carefully pull the plate away from the wall bracket to expose the harness connector. **DO NOT use excessive force during this procedure or in any way loosen or disconnect the green wires within the bracket.**



**Failure to comply with local electrical codes can cause a shock hazard.**

Bring the Extension Arm over the wall bracket and feed the wire harness and connector into the bracket while aligning the holes in the Extension Arm bushing with the holes in the Wall Bracket.

Secure the Extension Arm to the bracket with the screws provided. Connect the Extension Arm wire harness to the power supply.

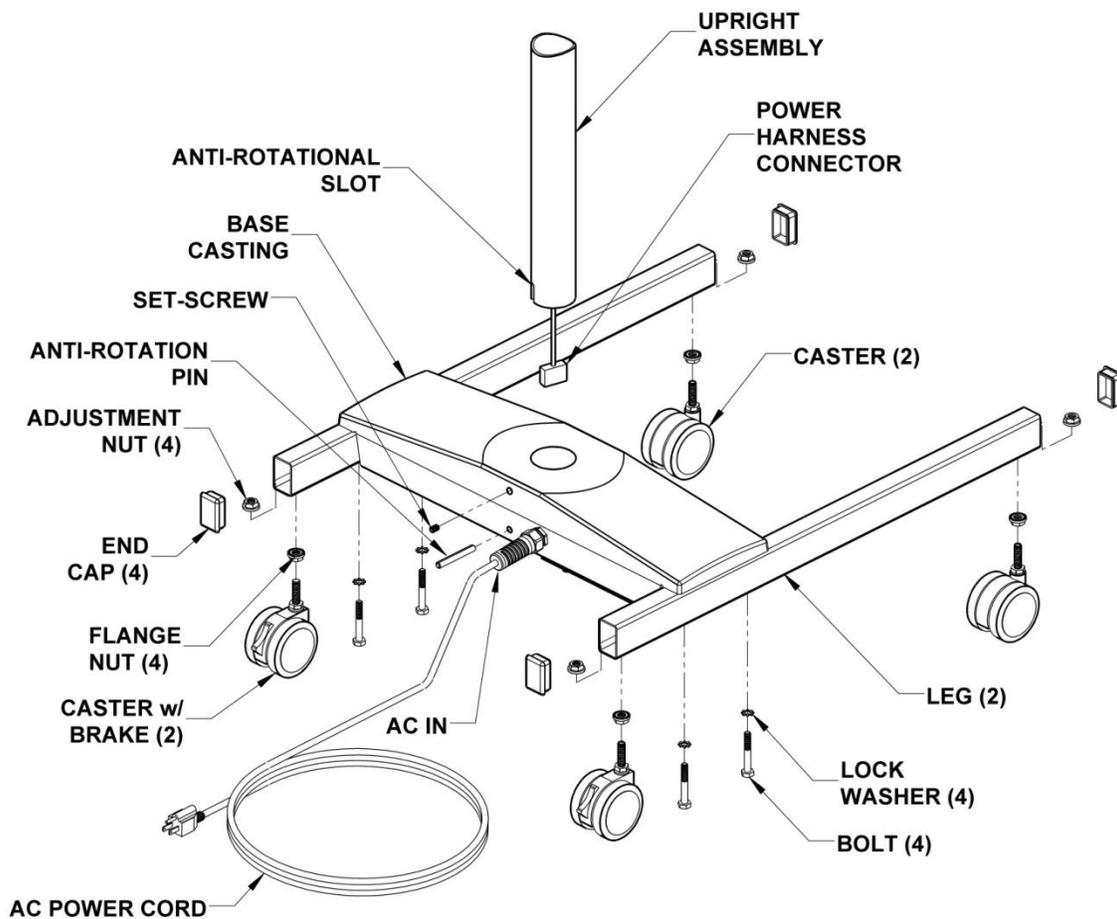
Next, connect the power cord (or mains) to the input of the power supply. Replace the Cover Plate to the bracket with the three (3) screws.

See "Installing the Light Head" on page 21 to complete the Arm/Light Head installation. Ensure smooth operation in horizontal and vertical movement. Plug the unit into a non-dimmable wall receptacle or reenergize the mains branch that is powering the light. The light is now ready to use.

## Floor Stand Light Assembly General Information

The shipping carton contains a light head assembly, arm assembly, floor base casting, two leg assemblies, a hardware kit, and an Installation and Service Manual. A second carton contains the upright pole assembly. Prior to installation insure that all components are present.

**⚠** When removing parts from the shipping carton, be careful not to damage the components. Important: thoroughly check each box for parts that may be located in areas that can be overlooked.



**Figure 19: Floor Stand Base Installation**

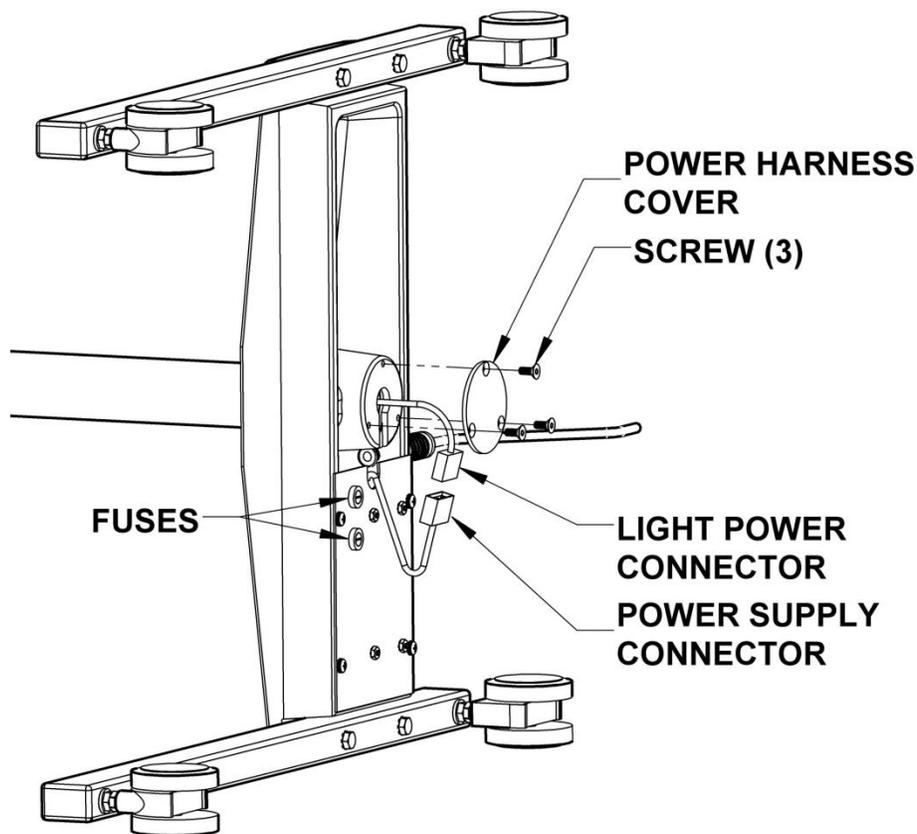
## Floor Stand Light Assembly (cont'd)

Bolt the assembled legs onto the cast iron base using four  $\frac{1}{4}$ "-20 x  $1\frac{3}{4}$ " bolts and  $\frac{1}{4}$ " lock washers. Position the floor base casting so that the set-screw in the base is at the rear of the assembly.

Lower the pole over the hole in the base and carefully feed the wire down through the hole at the bottom of the base.

Insert the upright pole fully into the floor base casting so that the anti-rotation slot sits over the pin in the casting. Rotate the pole until the slot slides fully over the pin, and lower the pole completely into the base. Once the pole is properly positioned, securely tighten the set-screw using the  $\frac{1}{8}$ " hex key provided.

## Floor Stand Electrical Connection

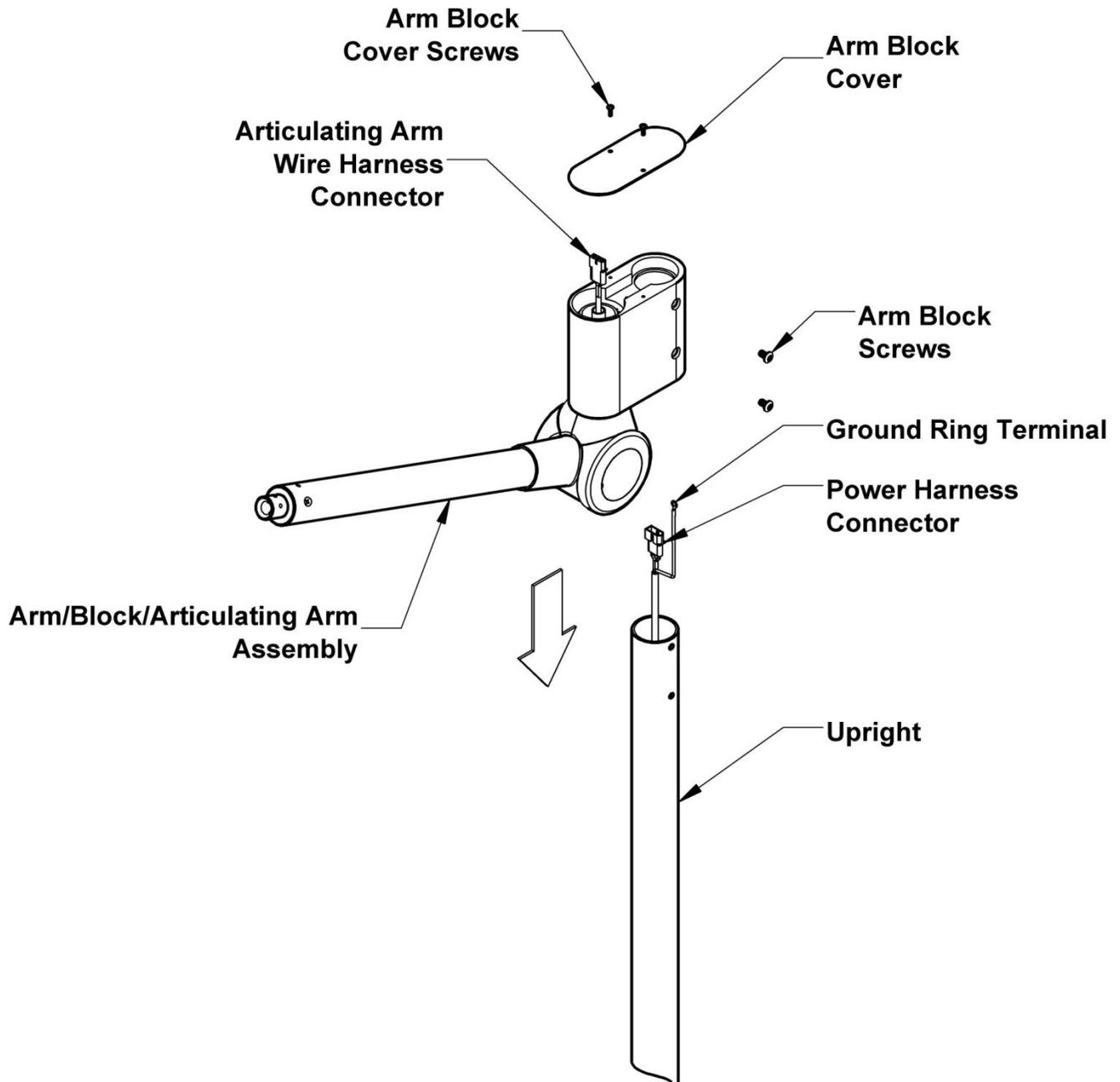


**Figure 20: Floor Stand Electrical Connection**

Connect the wires as shown and install the power harness cover with three (3) screws as shown. Make sure wires are properly routed to avoid pinching.

## Floor Stand Light Assembly (cont'd)

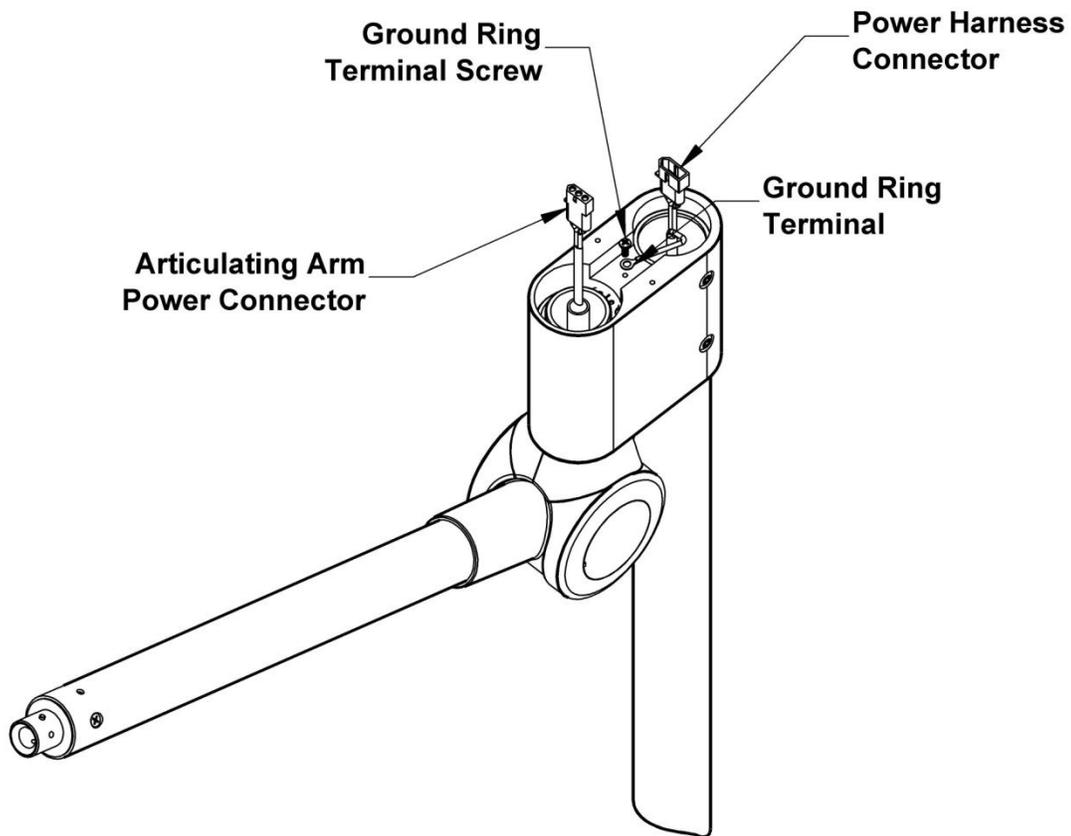
To finish the assembly, with the Floor Stand Base and Upright assembled, attach the Arm Block/Articulating Arm Assembly as shown below.



**Figure 21: Installing the Arm Block**

Install the Arm Block/Articulating Arm Assembly to the Upright and secure it to the Upright using the supplied Arm Block Mounting Screws.

## Floor Stand Light Assembly (cont'd)



**Figure 22: Articulating Arm Electrical Connection**

With the Arm Block/Articulating Arm Assembly securely attached to the Upright, Using the supplied screw, attach the Ground Ring Terminal to the Arm Block. Then connect the Articulating Arm Wire Harness to the Power Harness and tuck the connected harness into the recess in the Arm Block. Install the Arm Block Cover Plate with the supplied Arm Block Cover screws.

See “Installing the Light Head” on page 21 to complete the Arm/Light Head installation.

## Section 4: Operating Instructions

 **Ensure that the Light is properly installed before attempting to operate the light and arm mechanism.**

On/Off: To turn the light on or off depress the on/off intensity button at the end of the sterilizable handle. The light starts at the highest intensity. To dim the light intensity, depress the dimming button on the sterilizable handle. To dim further depress the button again. The dimming levels vary per model. See the following table for available dimming levels. The light head will automatically reset to full mode (highest intensity) if the dimming button is depressed with the light on its lowest setting. To turn off the light, depress and hold the button so the light goes into Endo Mode (VistOR PRO LED models only), then depress the button one more time.

### On/Off & Dimming Levels

Model	Dimming Levels	Endo Mode	5	4	3	2	1
VistOR PRO LED	5	Yes	100,000 Lux	87,500 Lux	75,000 Lux	62,500 Lux	50,000 Lux
VistOR PR LED	3	–	75,000 Lux	–	56,200 Lux	–	37,500 Lux
VistOR EX LED	2	–	55,000 Lux	–	–	–	27,500 Lux

### Endo Mode

The MI-1000 also has an Endo (Endoscopy) Mode integrated into the lights' dimming capabilities. The output in this mode produces low level lighting for use during endoscopic procedures. To put the VistOR PRO LED into the Endo Mode, at any dimming level, press and hold the dimming button for 3 seconds.

### Power Failures

If the light experiences a power interruption for any reason, the light is programmed to return to the dimming level that was applied before the power failure. This feature is intended to maintain the same lighting intensity when the power is restored and is applicable to the intensity level, the Endo Mode and the off position.

## Positioning the Light Head



**Ensure that the Light is properly installed before attempting to operate the light and arm mechanism.**

To position the light head and arm over the work area, firmly grasp the Sterilizable Handle and bring the light head or arm to the desired location. Adjust the tilt of the light head by holding the Sterilizable Handle and rotating forward or backward. The light head can revolve around the Yoke/Arm connector by tilting the light head and rotating the head using the sterilizable handle. The arm should move smoothly and remain at the desired position.

Each rotational joint in the arm assemblies allows 540° of rotation before the internal stop mechanism engages. The light head can rotate 300° on the yoke before the internal stop engages.

## Section 5: Safety and Maintenance Instructions

### Safety Tips

-  Only facility authorized maintenance personnel should troubleshoot the unit. Troubleshooting by unauthorized personnel could result in personal injury and/or property damage.
-  Only facility authorized personnel should repair the unit. Repair by unauthorized personnel could result in personal injury and/or property damage and could void warranty.
-  After completing a repair of the unit, ensure the unit is in proper working order. Failure to do so could result in personal injury and/or property damage
-  Do not touch the LED's or lenses directly. Body oils may significantly lower the optical performance of these parts and may cause equipment damage.
-  Follow the product manufacturer's instructions. Failure to do so could result in personal injury and/or property damage.
-  If the unit fails any part of the preventive maintenance functional checks, repair the unit before use on any patient. Failure to do so could result in personal injury and/or property damage.
-  Do not use harsh cleaners, solvents, or detergents. Failure to do so could result in equipment damage.
-  Do not use silicone-based lubricants. Equipment damage could occur.
-  Turn the power off or unplug the power cord before any repairs are started. Failure to do so could result in personal injury and/or property damage.
-  Do not pinch any wires during installation or during any repair. Pinched wires can cause an electrical shock hazard, resulting in personal injury and/or property damage.
-  Do not expose the unit to excessive moisture. Failure to do so could result in personal injury and/or property damage.
-  Do not rest articles or liquids on top of the Light Head. Spilled liquids will damage the light head and arm assemblies causing an electric shock hazard.

## Maintenance Fuse Replacement

**IMPORTANT:** Make sure that the power supply is disconnected to the light before replacing the fuse(s).

Lights that are connected directly to supply mains require 1 fuse per light head

Lights that are plugged into wall outlets require 2 fuses per light head

Locate the fuse holder locations:

Light Type	Fuse Location	Fuse Access
Ceiling Mounted	On the Power-Supply assembly located on the Ceiling Mounting Plate	Remove Ceiling Covers
Wall Mounted	On the Power-Supply Assembly located on the Wall Mount Bracket	Bottom of Wall Bracket
Floor Model	On the Power-Supply Assembly located on the bottom side of the Base	Position the Floor Base on its side

 **Use only NUVO fuses. See the following table to identify the correct fuse for your model. All fuses must be 250VAC, Slow-Blow. Failure to do so could result in personal injury and/or property damage.**

Model	Fuse	MI Part Number
VistOR PRO LED	2.5A/250VAC SLO-BLO	0003410
VistOR PR LED	1.5A/250VAC SLO-BLO	0001314
VistOR EX LED	1.5A/250VAC SLO-BLO	0001314

## LED Maintenance

 **If one or more LED(s) are off and/or generate noticeably dim light output, contact our customer service department at (818) 838-3025. The LED's are not readily replaceable by end users and should only be serviced by Medical Illumination, NUVO or facility authorized maintenance personnel.**

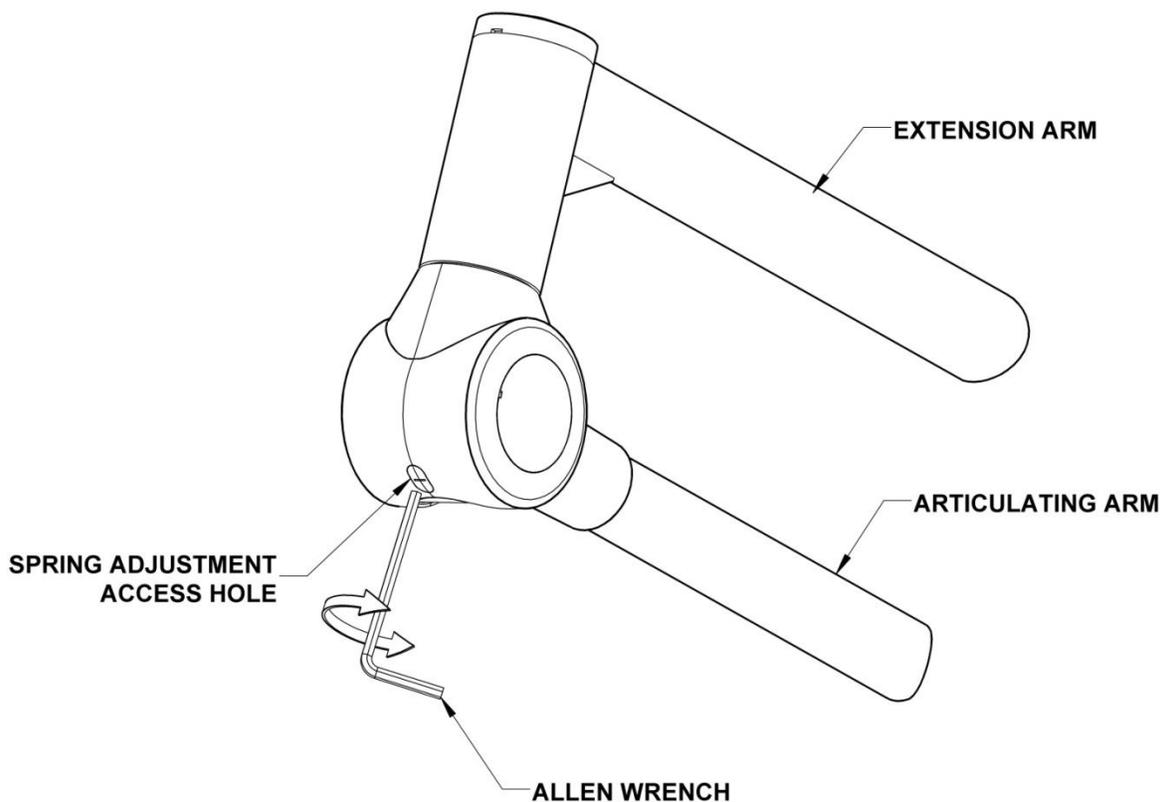
## Adjusting the Articulating Arm

**⚠️ Ensure that the Arm/Light Head is in its highest vertical position before attempting to adjust the arm tension. Do not over-tighten.**

Over time the spring in the Articulating Arm can lose some of its energy. When this happens, the light head fails to hold its vertical position. When this occurs, use the Allen Wrench supplied in the Hardware Kit to adjust the spring tension. Move the arm to its highest vertical position and insert the Allen Wrench through the Spring Adjustment Access Hole and slightly rotate the Allen wrench until it fits into the hex socket on the adjustment screw.

Pushing up on the Spring Arm during adjustment will reduce the force applied to the adjustment screw and make it easier to perform the adjustment.

Turning the wrench counter-clockwise increases the tension and clockwise decreases the tension. Adjust so that the light head maintains its vertical position. Do not move the arm with the Allen wrench in the Spring Adjustment Access Hole. Remove the Allen wrench before moving the vertical arm position.

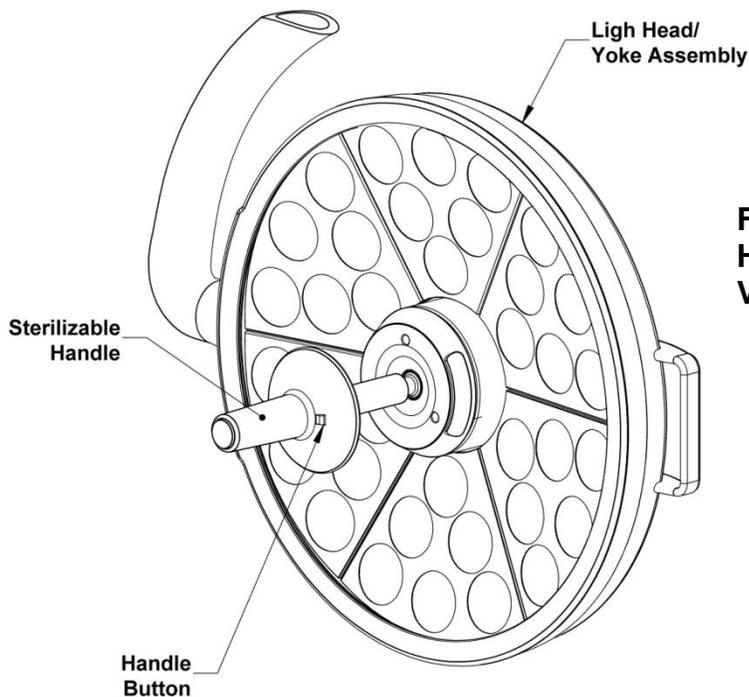


**Figure 23: Adjusting the Articulating Arm**

## Handle Sterilization

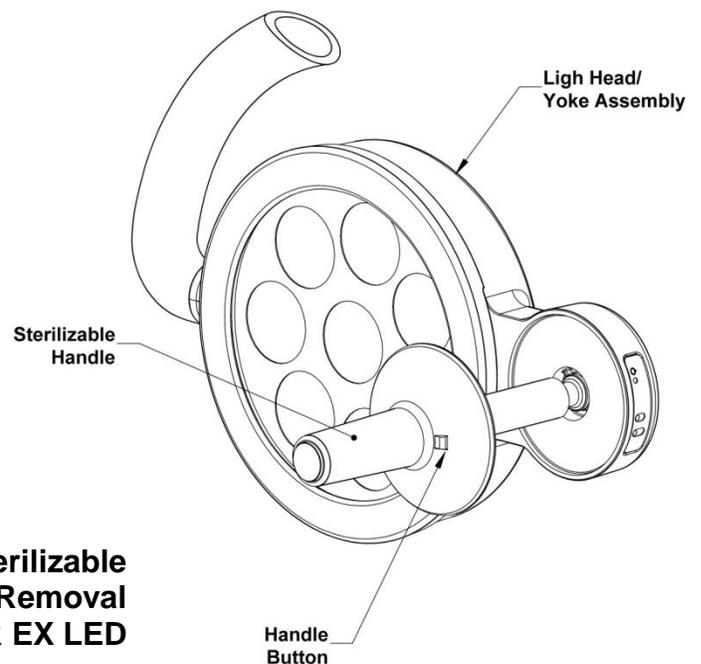
Remove sterilizable handle by pressing the button near the base of the handle and pulling the handle off the handle post. See the following illustrations.

Sterilize the handle utilizing steam sterilization of minimum 250° Fahrenheit for a minimum of 30 minutes in compliance with AAMI-SSSA-1988: Good Hospital Practices, Steam Sterilization and Sterility Assurance, or an approved equivalent method.



**Figure 24: Sterilizable Handle Removal VistOR PRO LED/VistOR PR LED**

**Figure 25: Sterilizable Handle Removal VistOR EX LED**



## Cleaning Instructions

- The front lens is made from a UV resistant polycarbonate plastic that has an external hard coating to resist scratching. Clean the lens using glass/plastic cleaner or mild soap and water mix. It is very important to use a clean, soft cloth to avoid any scratching of the diffuser. Never spray the cleaning fluid directly onto the lens surface, but instead spray into clean cloth and then wipe the lens.
- Clean the light housing and arm using mild soap and water mixture. Apply this mixture to a clean cloth and wipe down the light head and arm. Never spray the cleaning fluid directly onto the light head or arm, but instead spray onto clean cloth and then wipe the light head and arm.



**Do not use harsh cleaners, solvents, or detergents. Failure to do so could result in equipment damage.**



**The front lens is supplied with a protective hard coat to resist scratching. Never use abrasive cleaners on front lens. Failure to do so could result in equipment damage.**



**Do not expose the unit to excessive moisture. Failure to do so could result in personal injury and/or property damage.**

Table 1: Preventative Maintenance Schedule

Function	Procedure
Bolts and Nuts	Check to see that all mounting and attachment bolts, set screws, pins, etc. are in place and securely tightened. Replace any missing bolts and re-tighten as required.
Moving Joints & Adjustments	Check to make sure that all moving joints function properly along the mounting system, head and arm assemblies. If the Articulating Arm does not hold position (drifts from original position) refer to arm adjustment section. If the light head drifts, refer to the light head friction adjustment section. If this does not resolve the problem, contact the Customer Service Department in that the unit may require factory repair.
Overall Appearance	Check the general aesthetics of the light system. The unit should be kept clean and dust free. Clean and dust as necessary.

**Note: Maintenance schedules vary for each light depending on usage and operating instructions. An annual inspection of the equipment is recommended.**

**Note: It is highly recommended that the maintenance records for this equipment be kept on file at the health care facility.**

## Maintenance Schedule

Function	Procedure
Front lens/Optics	Check front lens and optics to assure there are no chips, cracks, or other damage. Do not use equipment if parts are damaged. Replace damaged parts immediately.
Bolts and nuts	Check to see that all mounting and attachment screws, washers, etc. are in place and securely tightened. Replace any missing screws and re-tighten as required.
Casters	Ensure that casters are seated properly on the base assembly. Examine the base for any damage.
Moving joints/Adjustments	Check to make sure all moving joints function properly along the mounting system and head and arm system. If the Articulating Arm does not maintain its position properly (drifts from original position) check the mounting plate levelness. If the vertical position fails to maintain its position, use the spring tension adjustment screw. If this does not solve the problem contact customer service as the unit may require factory repair.
Overall appearance	Check the general aesthetics. Units should be kept clean and dust free. Clean and dust as necessary.



**Note: Maintenance schedules vary for each light depending on usage and operating instructions. An annual inspection of the equipment is recommended at a minimum.**



**Note: NUVO recommends that the maintenance records for this equipment be kept on file at the health care facility.**

## Section 6: Troubleshooting

### General Troubleshooting



**Warning: Disconnect the light from the power supply before attempting any of the electrical checks mentioned below.**

Problem	Possible Cause	Remedy
Light will not turn on or stay on	<ol style="list-style-type: none"> <li>1. Power to unit is off (not plugged in)</li> <li>2. Blown (open) fuse</li> <li>3. Exposed wires are cut or damage</li> <li>4. Wire not connected correctly during installation.</li> <li>5. Wire connections made during installation have been disconnected</li> <li>6. No input power to light unit</li> <li>7. Disconnected wires at switch or PSU</li> <li>8. No power output from PSU when input power to PSU is measured</li> <li>9. Wire connections made during installation have been reversed</li> <li>10. Sterilizable handle button not engaging power push button switch properly</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn on power (plug in unit)</li> <li>2. Replace fuse</li> <li>3. Replace wire assembly</li> <li>4. Check all wiring connections</li> <li>5. Reconnect wires per the instructions.</li> <li>6. Check power input connections and circuit breakers</li> <li>7. Reconnect wires</li> <li>8. Replace PSU</li> <li>9. Connect proper wires together: black-black and red-red</li> <li>10. Take off sterilizable handle and inspect handle post assembly with switch. Make sure handle post is tightly assembled. Make sure the button in the sterilizable handle can move freely</li> </ol>
Light does not maintain its position vertically	<p>Spring tension is incorrect</p> <p>Additional equipment was added to unit</p>	<p>Adjust spring tension</p> <p>Remove any additional equipment from arm</p>
Light does not maintain its position horizontally	<p>Ceiling Mount Assembly is not level</p> <p>Ceiling Mounting screws are loose</p> <p>Arm/Head needs friction adjustment.</p>	<p>Level Ceiling Mount by shimming</p> <p>Tighten ceiling Mount fasteners.</p> <p>Adjust the friction adjustment</p>

## General Troubleshooting (cont'd)

Problem	Possible Cause	Remedy
Arm cannot be moved any lower	Arm is against internal stop	Rotate arm in opposite direction
Arm cannot be raised any higher	Arm is against internal stop	Rotate arm in opposite direction
Arm stopped moving horizontally	Arm is against internal stop	Rotate arm in opposite direction
Caster/casters cannot be reinstalled	Floor base has been damaged	Contact Customer Service or Field Representative
Upright rotates in floor stand	Upright set screw is loose. Upright is not fully seated on anti-rotation pin	Securely tighten set screw. Reinstall upright. Ensure the upright fully seats on the anti-rotation pin seats

## Component/Assembly Part Numbers

In the event that you require product support, the following part numbers are for reference when calling for support.

Ceiling Mount Assembly: .....	1000697-( )
..... Specify: MI1000-S, MI1000-D, MI7550-S or MI7550-D	
Ceiling Mount Assembly Cover:.....	1001320
Power Supply, MI-1000: .....	0001606-3
Power Supply, MI-750/550 .....	0003737
Down Tube: .....	1001461-( )
..... Specify: 9", 20", 30", 40", 50" or custom lengths.	
Extension Arm Assembly .....	1000724-( )
..... Specify: 1000724-D (Dual), 1000724-S (Single) or 1000724-W (Wall)	
Extension Arm End Cap: .....	1001396
Articulating Arm: .....	1000727-( )
..... Specify: MI-1000, MI-750 or MI-550	
Articulating Arm Cover:.....	1001386-L/R
Articulating Arm Cover Cap: .....	1001392
Articulating Arm Cover Screw: .....	0003177
Articulating Arm Cover Washer .....	0001184
Light Head Assembly:	
..... Specify: 1000617-MI1000, 1000740-MI750 or 1000575-MI550	
Hardware Kit:.....	1000887-( )
..... Specify: -D (Dual Ceiling), -S (Single Ceiling), -F (Floor) or -W (Wall)	

**SPECIFICATION APPROVAL**

<b>Title</b>	<b>Signature</b>	<b>Date</b>
President		
VP Sales/Marketing		
Operations Manager		
Engineering Manager		
Quality Assurance Manager		

**REVISION HISTORY**

<b>Rev</b>	<b>Issue Date</b>	<b>Summary of Changes</b>	<b>Effectivity Date</b>
B	02/17/17	Update illustrations and narratives in the installation section	02/24/17
C	02/20/19	Update CISPR statement on Agency Approval Page	02/20/19

**REVISION APPROVAL**

<b>Title</b>	<b>Signature</b>	<b>Date</b>
Operations Manager		
Engineering Manager		
Quality Assurance Manager		

**(Original Signature Copy on File)**