



INSTALLATION AND SERVICE MANUAL

 **550**

 **750**

 **1000**

MI-1000/750/550

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, Veterinary, 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 MI-Line 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.

Infrared (IR) Communication Use of infrared waves for digital data transfer

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

	ETL Listing marking		Protective earth ground
	Read accompanying documents		Neutral conductor
	Fuse marking		Caution
	Dangerous voltage		

MI Line Models

The following MI models are covered in this manual:

MI-1000

061522 – Wall Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061523 – Floor Model.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061523B – Floor Model w/Battery Backup.....	100-240 VAC, 1.5A, 50/60 Hz, 85W
061524 – Single Ceiling Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061525 – Dual Ceiling Mount	100-240 VAC, 3.0A, 50/60 Hz, 130W

MI-750

061422 – Wall Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061423 – Floor Model.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061423B – Floor Model w/Battery Backup.....	100-240 VAC, 1.5A, 50/60 Hz, 85W
061424 – Single Ceiling Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061425 – Dual Ceiling Mount	100-240 VAC, 3.0A, 50/60 Hz, 130W

MI-550

061322 – Wall Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061323 – Floor Model.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061324 – Single Ceiling Mount.....	100-240 VAC, 1.5A, 50/60 Hz, 65W
061325 – 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. This Limited Warranty is applicable to products sold by Medical Illumination International, Inc. or one of its subsidiaries or divisions (collectively, "MI") through one of MI's authorized dealers, distributors or sales representatives (an "Authorized Dealer"). This Limited Warranty is not applicable to any MI product not purchased from an Authorized Dealer. This Limited Warranty extends only to the first retail purchaser of a product and is not transferable or assignable.

Your product is warranted against defective material and/or workmanship, excluding normal replacement parts, for a period of three (3) years from the date of shipment. Normal replacement parts include, but are not limited to, bulbs, sterilizable handles, filters and glass items. This Limited Warranty applies exclusively to the repair or replacement of parts recognized as defective by MI that are in normal use and have not been modified or repaired by unauthorized personnel.

This Limited Warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of fitness for a particular purpose and all other obligations or liabilities, including liability for incidental, special or consequential damages or labor.

In the event of a defect or failure covered under this Limited Warranty, please contact MI immediately by phone (818/838-3025), fax (818/838-3725), email (info@medillum.com) or through our website (<http://www.medillum.com>). Be prepared to give the model number, serial number and full description of the issue. This Limited Warranty will not apply if the MI serial number affixed to the product has been removed, obliterated or defaced.

Our Customer Service department will attempt to solve the problem over the phone. If it becomes necessary, we will determine, in our sole discretion, the best way to address the issue. We may require that the product be sent to our factory for repair. In limited instances, we may dispatch an authorized service technician. No product serviced by other than our authorized service technician will be covered by this Limited Warranty.

In the event we determine that your product needs to be repaired, either onsite or by return to our factory, please do not continue to use your product. MI is not responsible for any costs, expenses, losses or damage resulting from your continued use of the product prior to its authorized repair. MI is not responsible for costs or expenses incurred for loss of use of the product.

If we require the return of the product to our factory, you will be provided with a Return Authorization number. Products sent to the factory without a Return Authorization number will not be accepted. It is your obligation to arrange for return shipment of your product to the factory for warranty service, which shall be at your expense. Your Product must be returned to our factory within thirty (30) days of the date of the Return Authorization. Carefully package the product and return it, freight prepaid and insured, with the Return Authorization number clearly marked on the outside of the box, to Medical Illumination International, Inc., 19749 Dearborn Street, Chatsworth, CA 91311, RA# _____.

Damage resulting from inadequate packing is not covered by this warranty, and shipping insurance does not cover damage due to inadequate packing. MI cannot be held responsible for in-transit loss or damage. In the event that freight-related damage should occur, we will notify you immediately so that you can file a damage claim with the freight carrier.

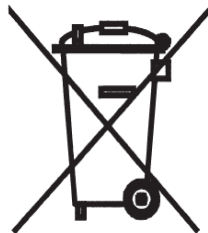
Within the warranty period, MI will evaluate your returned product, repair as appropriate, and ship the product back to you with freight costs prepaid by MI. In the event that damage or failure is discovered that is not covered by this Limited Warranty, we will contact you for your approval of all costs that may be incurred prior to commencing any repairs.

This Limited Warranty does not cover the following:

- Any field labor or outside services, including, but not limited to, 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.
- Labor costs associated with removing, re-packaging for shipment or reinstalling product

Limited Warranty, Rev 8-23

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

Optical Specification			
Parameter	MI-1000	MI-750	MI-550
# 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/m²	196 W/m²	71 W/m²
Electrical Specifications			
Supply Circuit	100 - 240 VAC, 50/60Hz		
Fuse Rating	1.5 Amp/250VAC	1.5 Amp/250VAC	1.5 Amp/250VAC
Power Supply power handling capacity	65W	65W	65W
Light Head power consumption	54W @24VDC	27W @24VDC	16W @24VDC
Mechanical Specifications			
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) 3" H (76.2mm)	Ø14.5" (368mm) 2.75" H (70mm)	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°		
Environmental Specifications			
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

Single and Dual Ceiling Diagrams

See the table on the next page to calculate the appropriate ceiling rod length

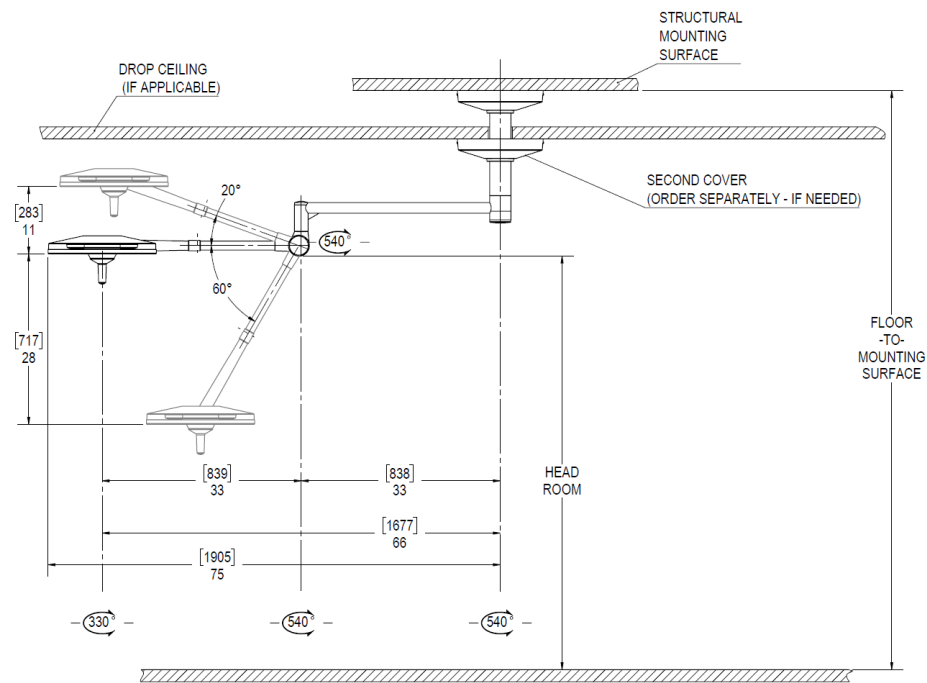


Figure 1: Single Ceiling Mount

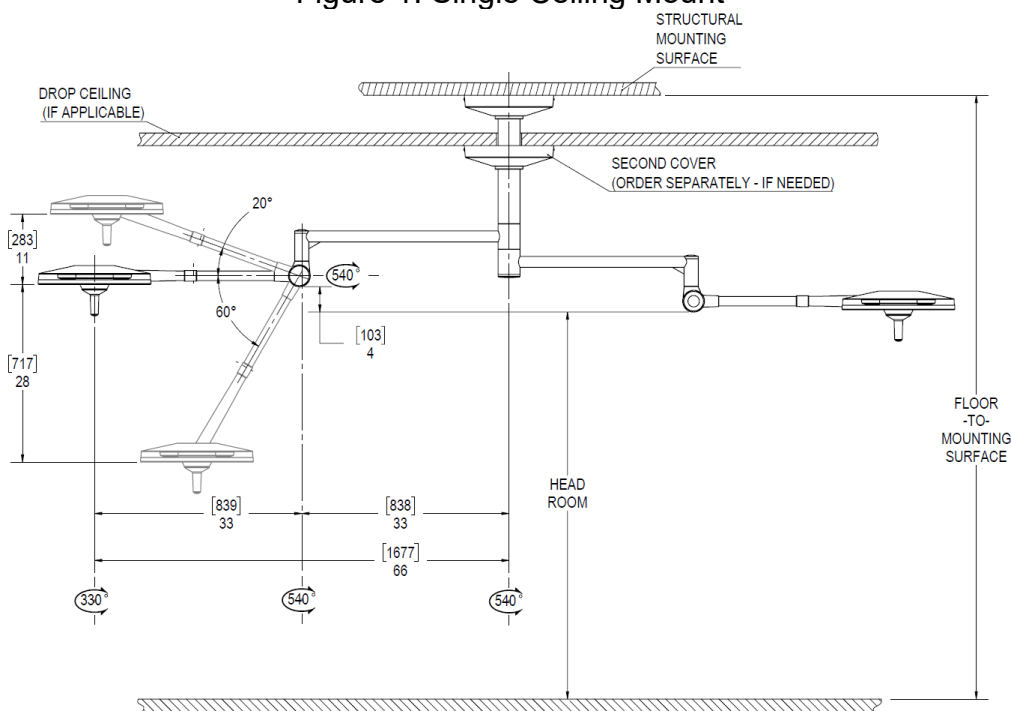


Figure 2: Dual Ceiling Mount

Single and Dual Ceiling Rod Calculation Table

Use the following table to select the appropriate ceiling rod for your application.

Floor to Mounting Surface	SINGLE MI-SERIES HEAD ROOM CLEARANCE [in]						DUAL MI-SERIES HEAD ROOM CLEARANCE [in]					
	HEAD ROOM [9" ROD]	HEAD ROOM [14" ROD]	HEAD ROOM [20" ROD]	HEAD ROOM [30" ROD]	HEAD ROOM [40" ROD]	HEAD ROOM [50" ROD]	HEAD ROOM [9" ROD]	HEAD ROOM [14" ROD]	HEAD ROOM [20" ROD]	HEAD ROOM [30" ROD]	HEAD ROOM [40" ROD]	HEAD ROOM [50" ROD]
8' 0" (96in)	76.5						72.5					
8' 1" (97in)	77.5						73.5					
8' 2" (98in)	78.5						74.5					
8' 3" (99in)	79.5						75.5					
8' 4" (100in)	80.5						76.5					
8' 5" (101in)	81.5	76.5					77.5					
8' 6" (102in)	82.5	77.5					78.5					
8' 7" (103in)	83.5	78.5					79.5					
8' 8" (104in)	84.5	79.5					80.5	75.5				
8' 9" (105in)	85.5	80.5					81.5	76.5				
8' 10" (106in)	86.5	81.5					82.5	77.5				
8' 11" (107in)	87.5	82.5	76.5				83.5	78.5				
9' 0" (108in)	88.5	83.5	77.5				84.5	79.5				
9' 1" (109in)		84.5	78.5					80.5				
9' 2" (110in)		85.5	79.5					81.5	75.5			
9' 3" (111in)		86.5	80.5					82.5	76.5			
9' 4" (112in)		87.5	81.5					83.5	77.5			
9' 5" (113in)		88.5	82.5					84.5	78.5			
9' 6" (114in)			83.5					85.5	79.5			
9' 7" (115in)			84.5					86.5	80.5			
9' 8" (116in)			85.5					87.5	81.5			
9' 9" (117in)			86.5	76.5				88.5	82.5			
9' 10" (118in)			87.5	77.5					83.5			
9' 11" (119in)			88.5	78.5					84.5			
10' 0" (120in)				79.5					85.5	75.5		
10' 1" (121in)				80.5					86.5	76.5		
10' 2" (122in)				81.5					87.5	77.5		
10' 3" (123in)				82.5					88.5	78.5		
10' 4" (124in)				83.5						79.5		
10' 5" (125in)				84.5						80.5		
10' 6" (126in)				85.5						81.5		
10' 7" (127in)				86.5	76.5					82.5		
10' 8" (128in)				87.5	77.5					83.5		
10' 9" (129in)				88.5	78.5					84.5		
10' 10" (130in)					79.5					85.5	75.5	
10' 11" (131in)					80.5					86.5	76.5	
11' 0" (132in)					81.5					87.5	77.5	
11' 1" (133in)					82.5					88.5	78.5	
11' 2" (134in)					83.5						79.5	
11' 3" (135in)					84.5						80.5	
11' 4" (136in)					85.5						81.5	
11' 5" (137in)					86.5	76.5					82.5	72.5
11' 6" (138in)					87.5	77.5					83.5	73.5
11' 7" (139in)					88.5	78.5					84.5	74.5
11' 8" (140in)						79.5					85.5	75.5
11' 9" (141in)						80.5					86.5	76.5
11' 10" (142in)						81.5					87.5	77.5
11' 11" (143in)						82.5					88.5	78.5
12' 0" (144in)						83.5						79.5
12' 1" (145in)						84.5						80.5
12' 2" (146in)						85.5						81.5

Ceiling Mount Pre-Installation Guidelines

SPECIAL NOTE: Installation and repair of this equipment should be performed by qualified personnel only. Medical Illumination International, Inc. 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 ensure 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 130 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 overreach.



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 personnel only. Medical Illumination does not warranty any damage occurring as a result of improper installation.

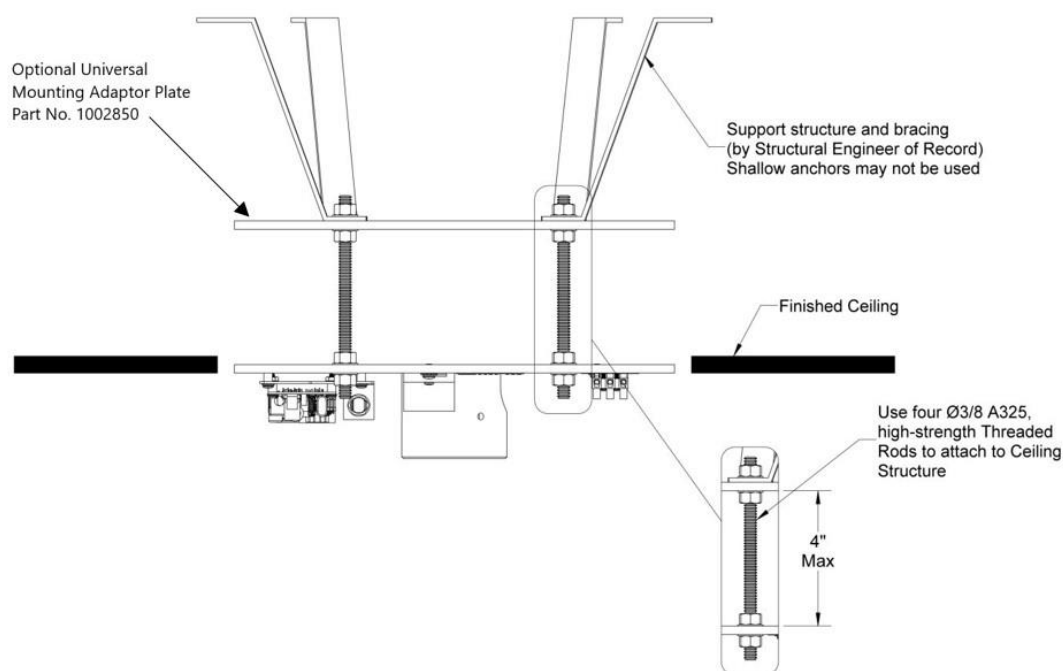


Figure 3: Recommended Ceiling Structure Construction

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.

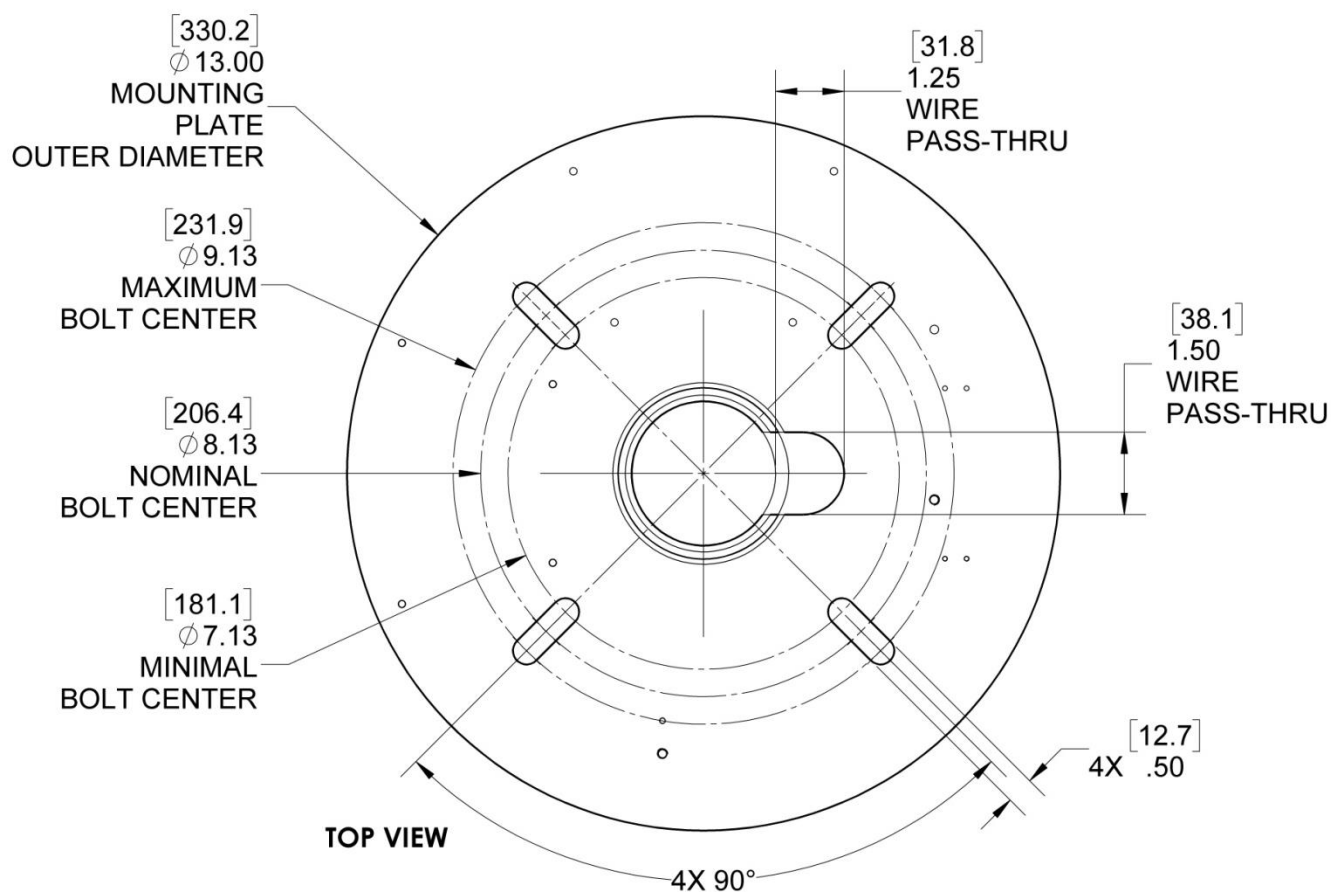


Figure 4: Mounting Dimensions for Ceiling Mount Assembly

Arm Cable Termination

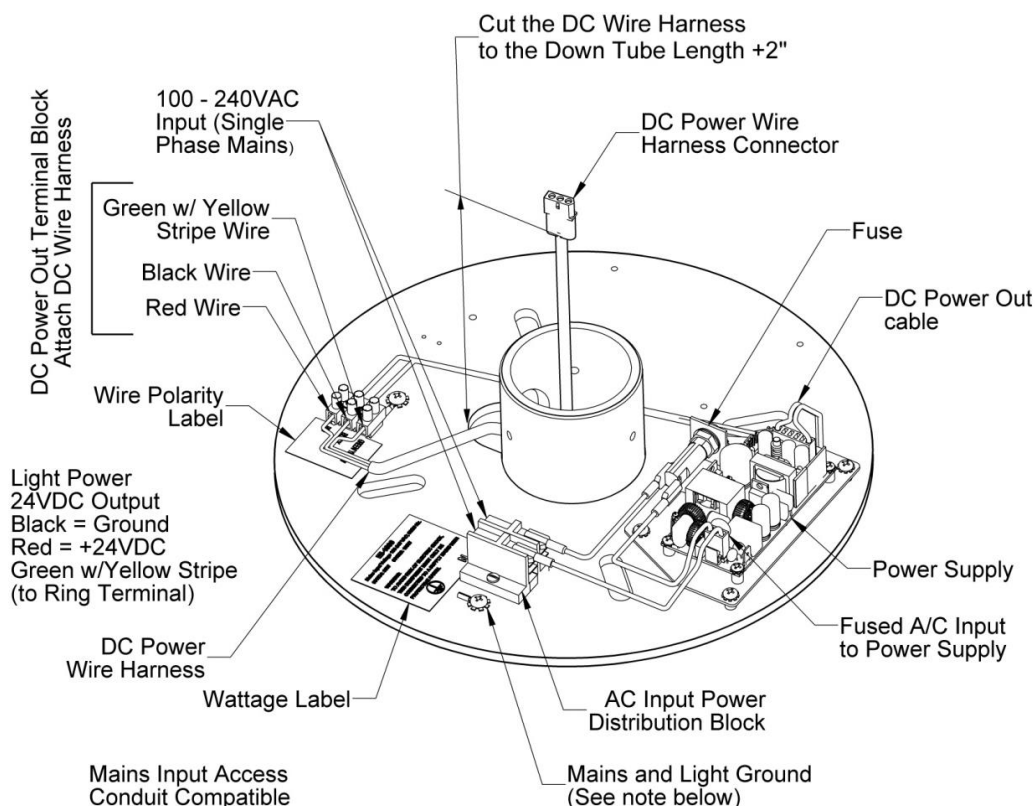


Figure 5: Arm Cable Termination

(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 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.

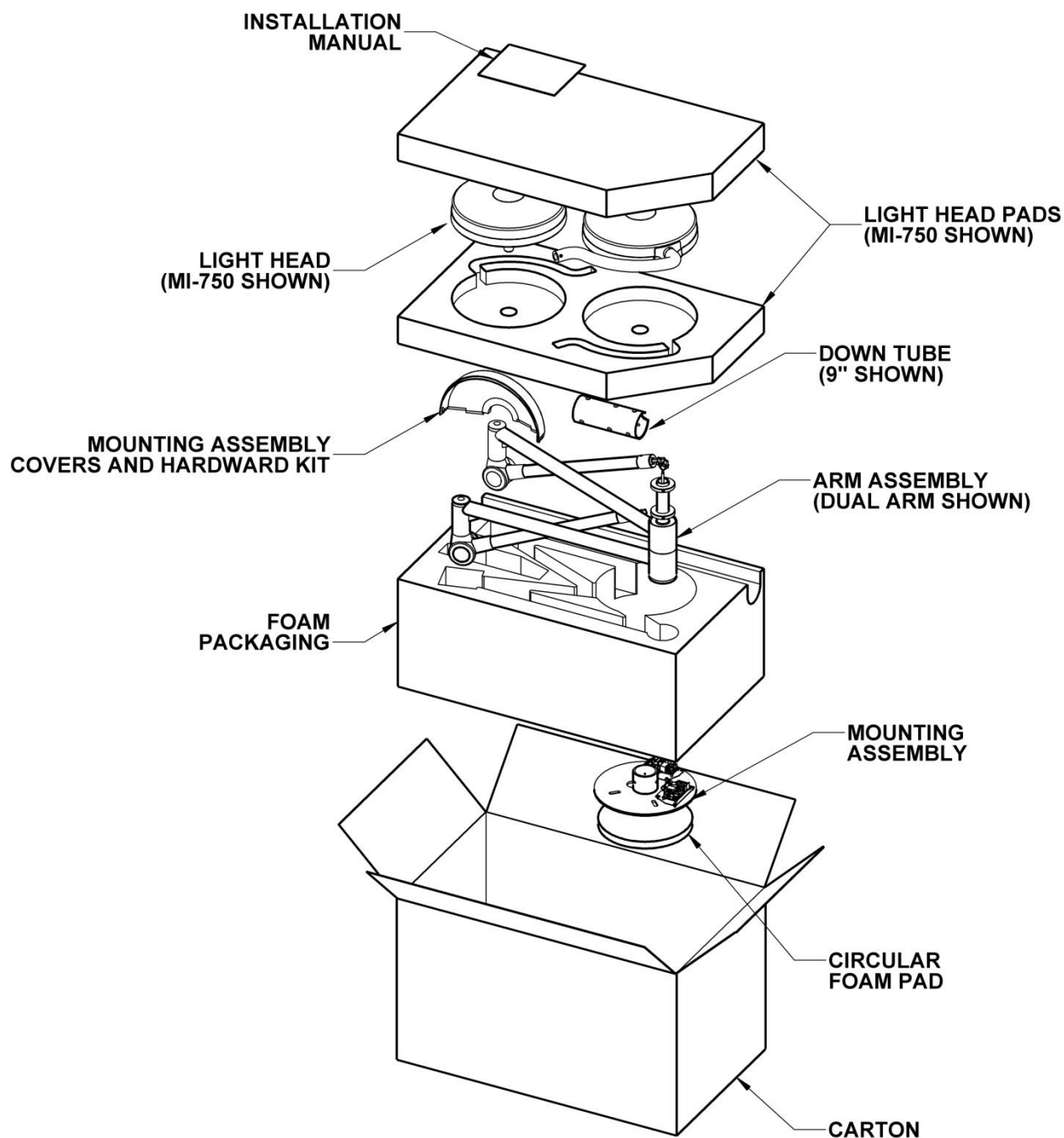


Figure 6: Packing Contents
(Dual MI-750 shown)

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 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. Note: A small amount of synthetic grease applied to the inside wall of the down-tube will help prevent binding.

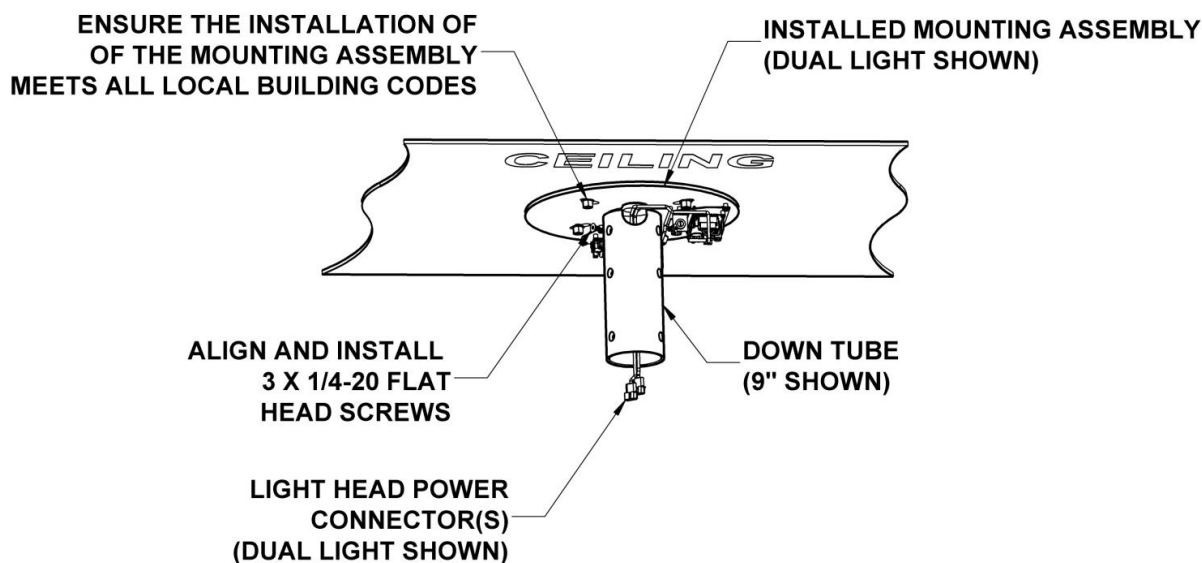


Figure 7: Mounting Plate Installation



Ensure that any grease or lubricant used contains no hydrocarbons so that it is non-reactive with oxygen gas.

Installing the Arm Assembly

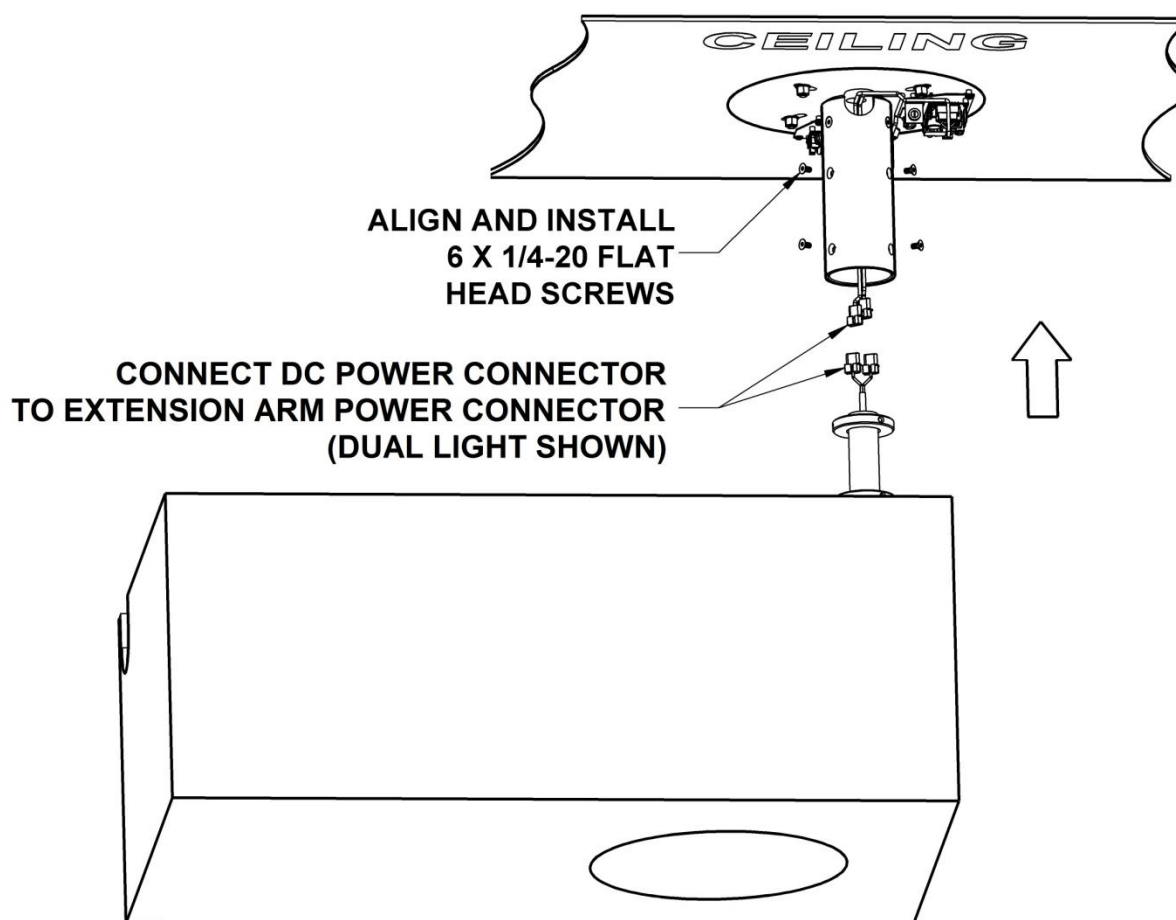


Figure 8: Installing the Arm Assembly

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) 1/4-20 Flat Head Screws

Finishing the Arm Assembly

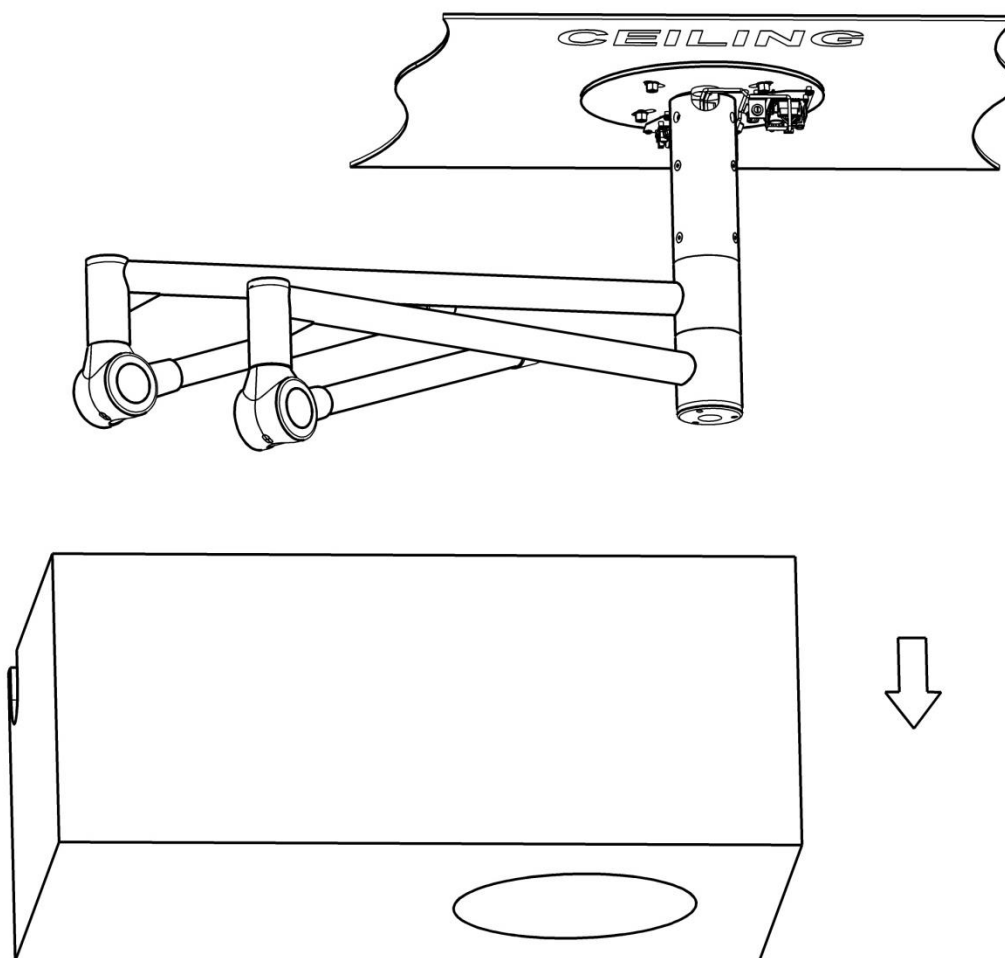


Figure 9: Finishing the Arm Assembly Installation

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

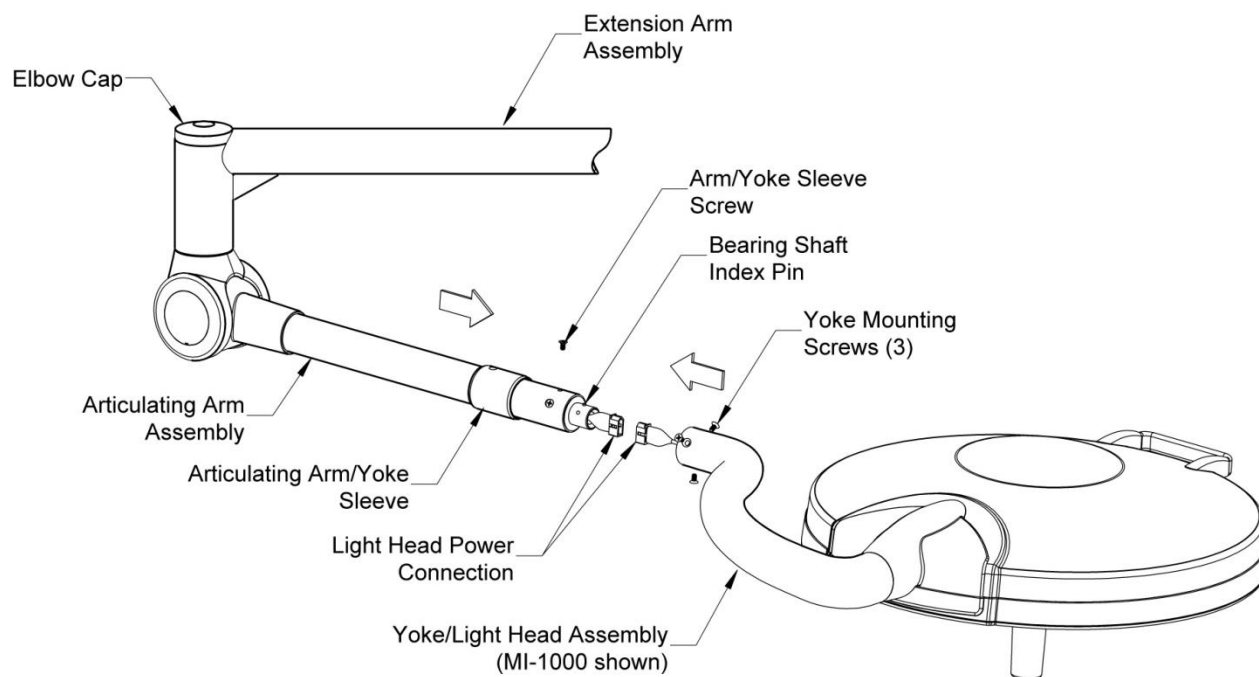


Figure 10: Installing the Light Head

With the Arm Assembly installed and the Extension and Articulating Arms rotating 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.

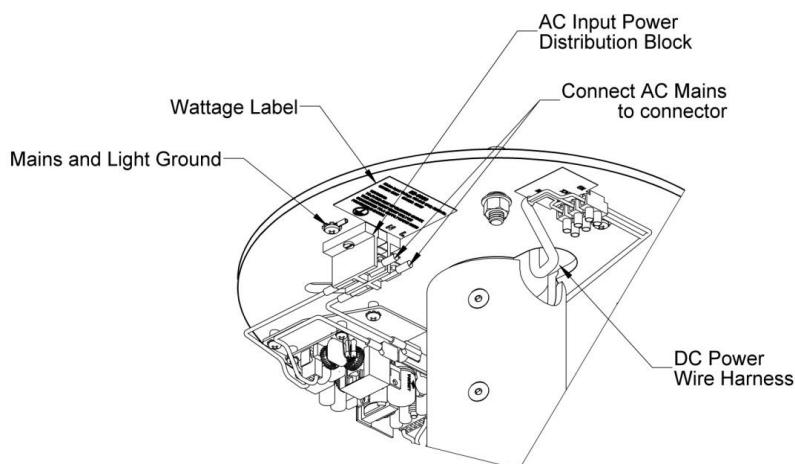


Figure 11: Connecting AC Mains

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

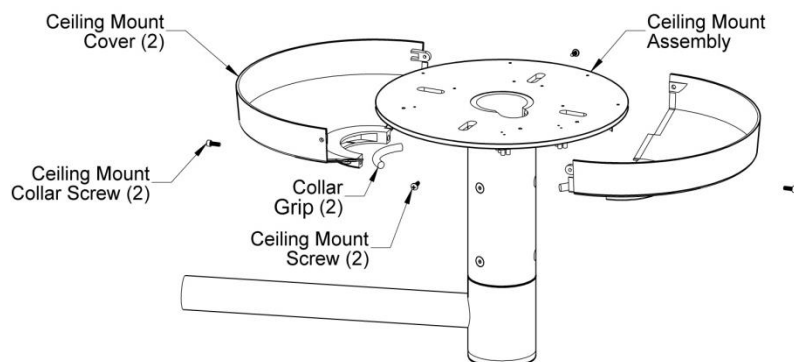


Figure 12: Installing the Ceiling Mount Covers

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 General Information

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.

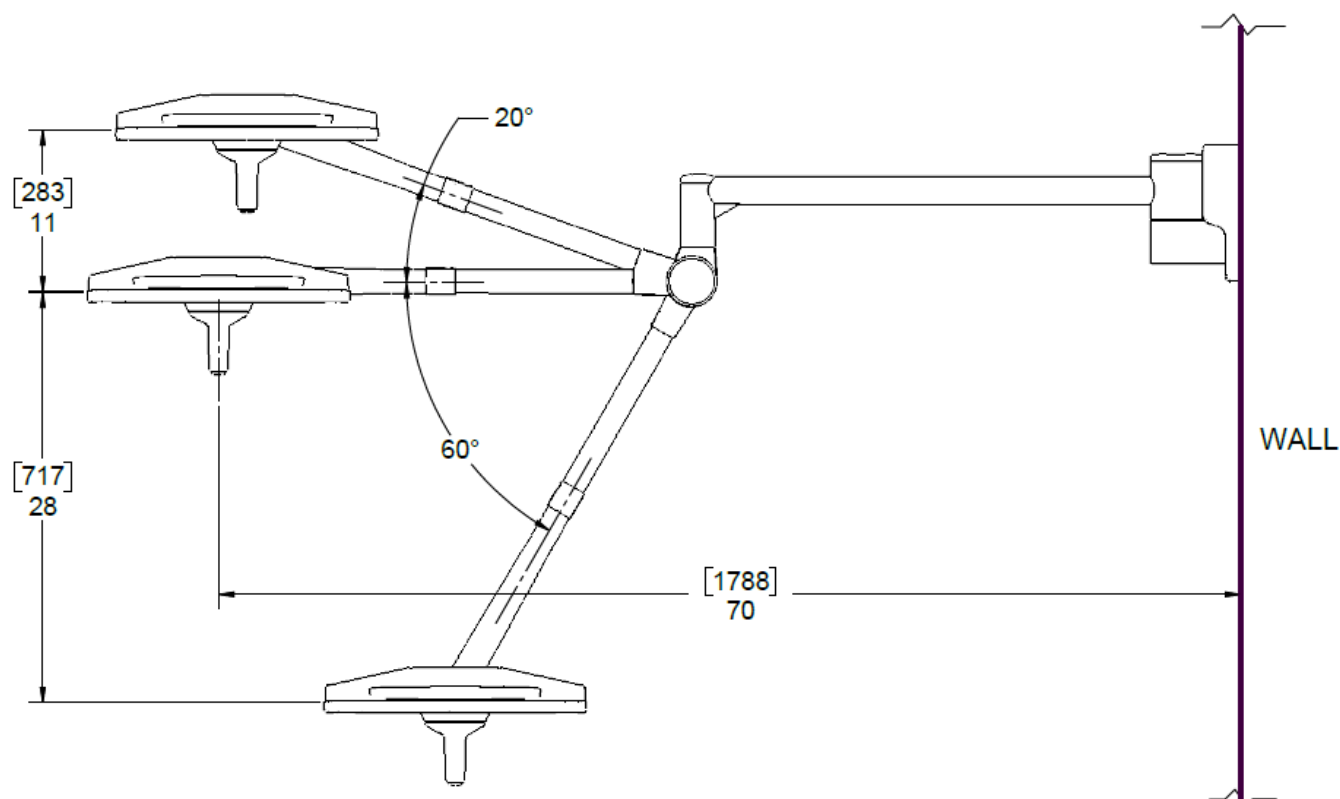


Figure 13: Wall Mount

Wall Mounted Light Installation



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.

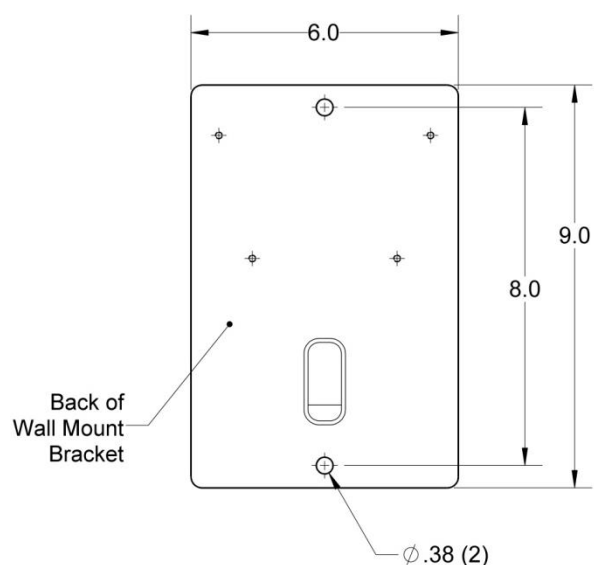


Figure 14: Wall Bracket Mounting Template

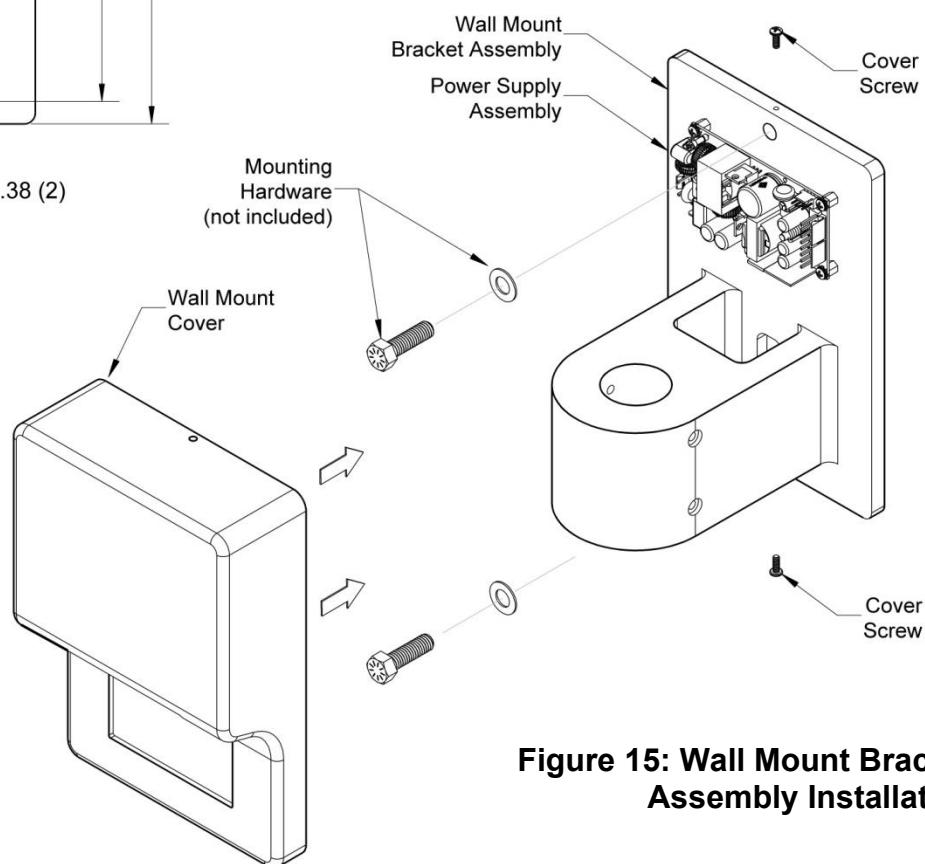


Figure 15: Wall Mount Bracket Assembly Installation

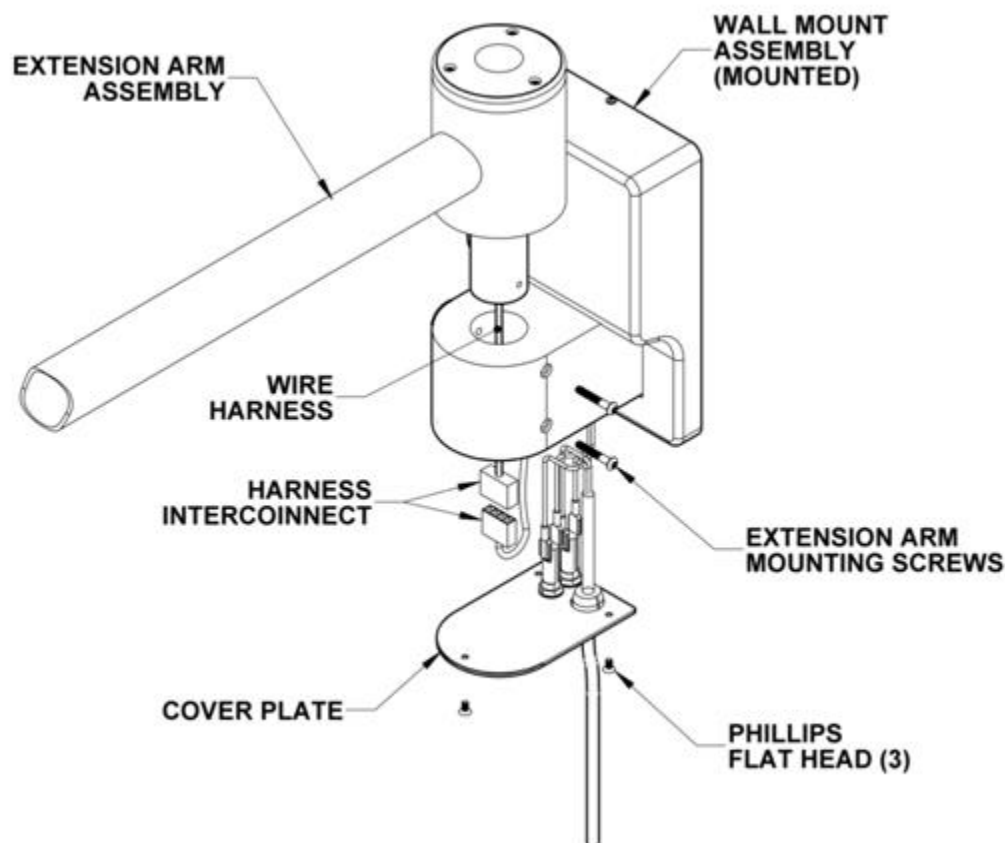


Figure 16: Extension Arm Mounting on Wall Bracket

⚠ 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 65W.

⚠ 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.

Section 3

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

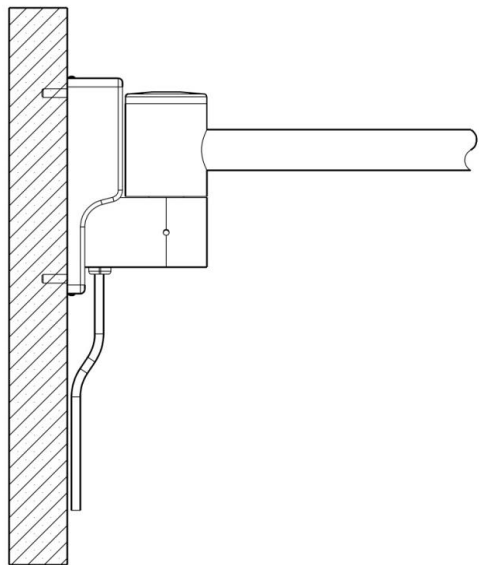


Figure 17: Wall mounting with load anchor or stud-anchor

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 19: Stud Anchor **Installation**. Also see HILTI technical document ESR-2302 for additional concrete anchoring information.

Wall mounting with Backing Plate
(not provided)

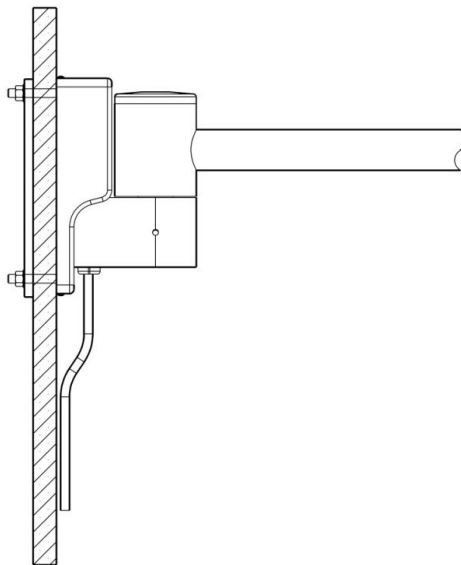
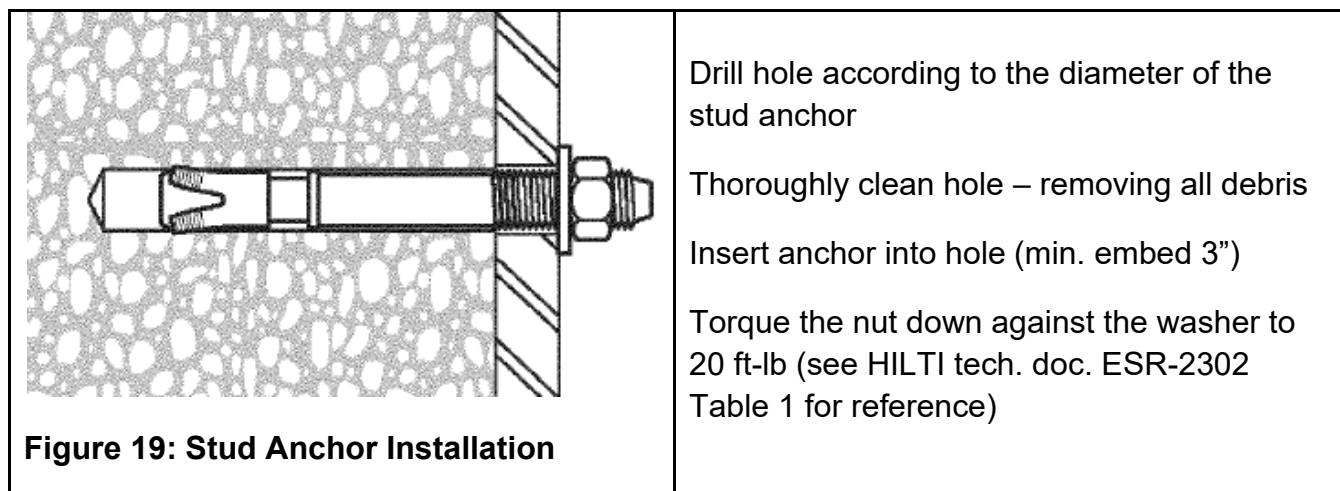


Figure 18: Wall mounting with Back-Plate

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 ensure that all components are present.

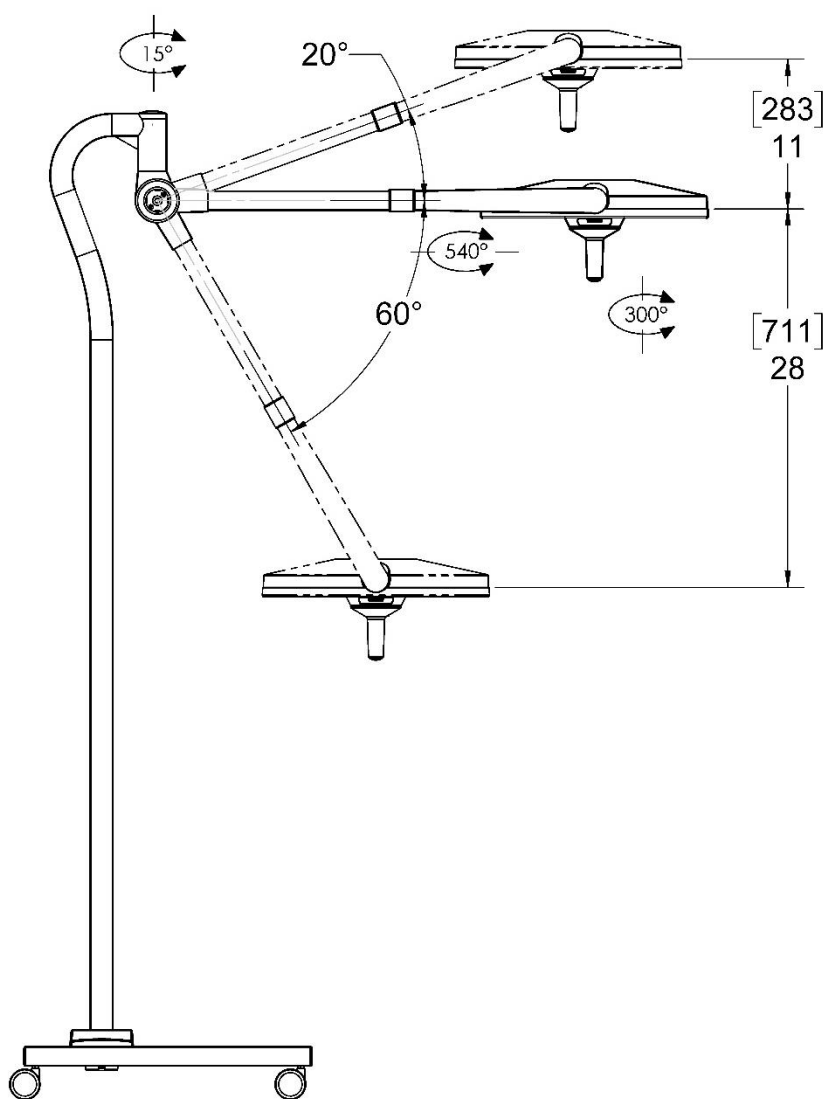


Figure 20: Assembled Floor Stand Light

Floor Stand Light Assembly Base Assembly

⚠ 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.

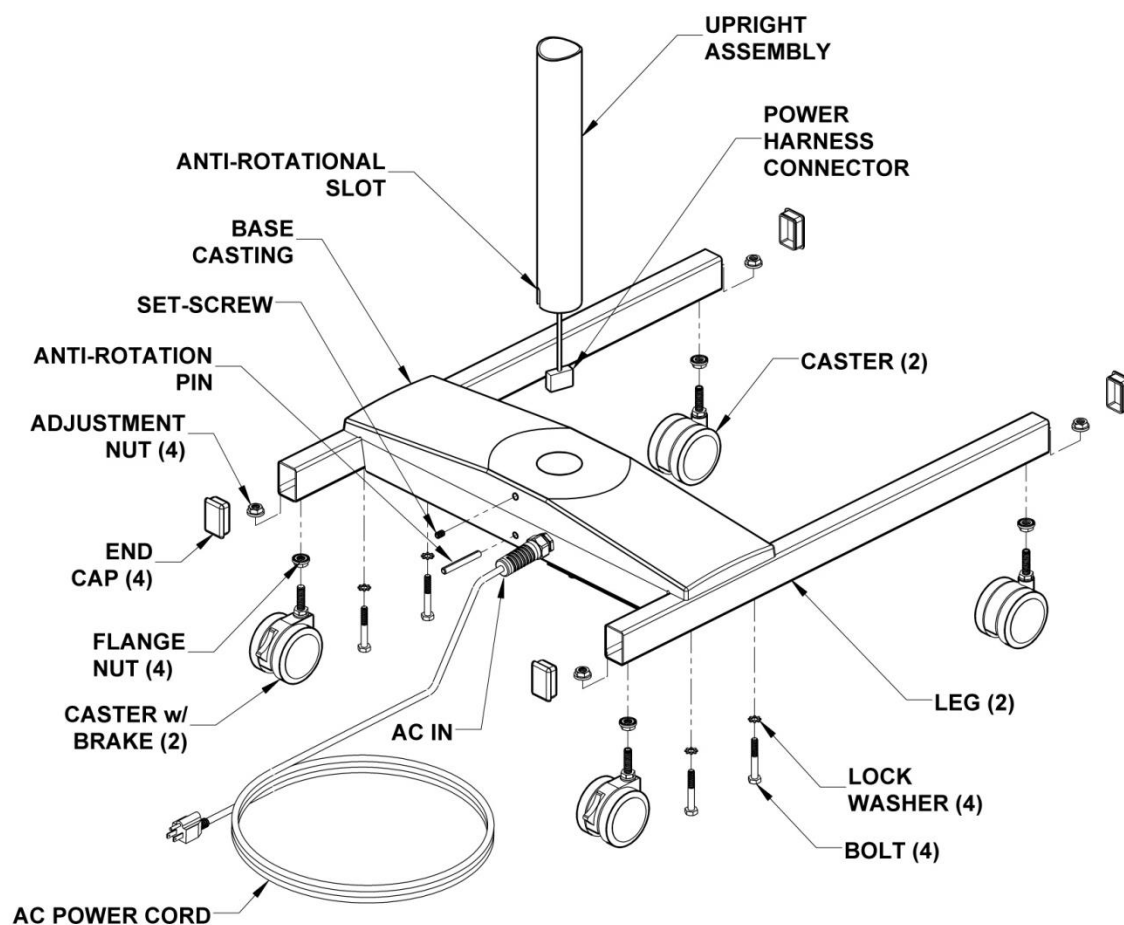


Figure 21: Floor Stand Base Installation

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

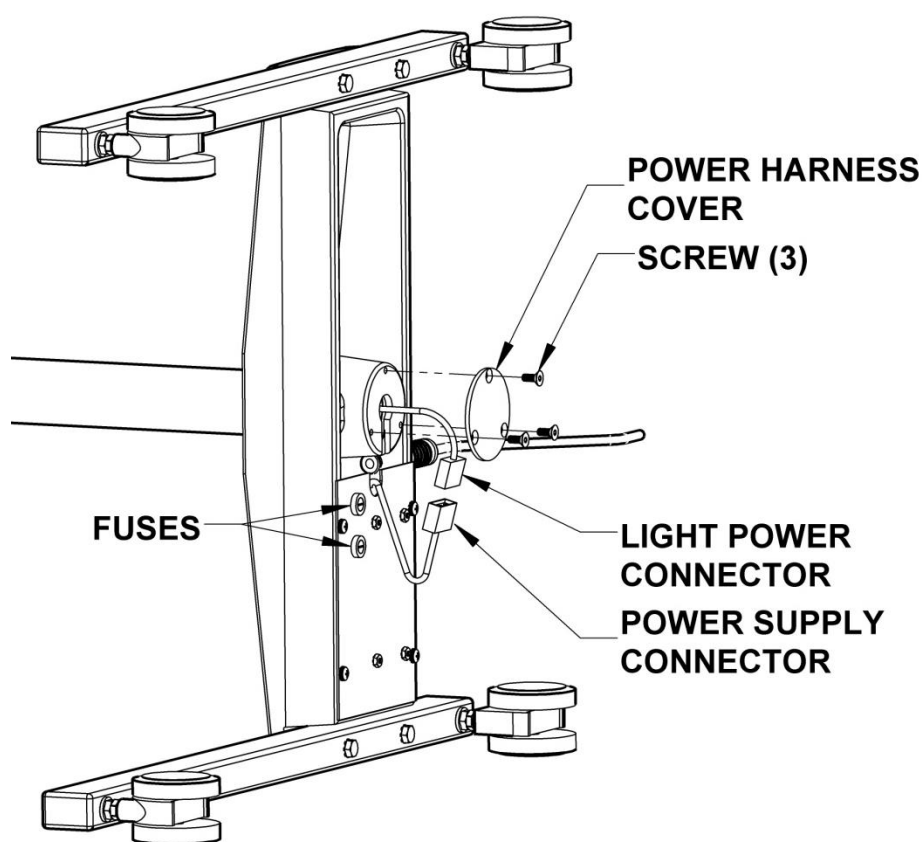


Figure 22: Floor Stand Electrical Connection

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.

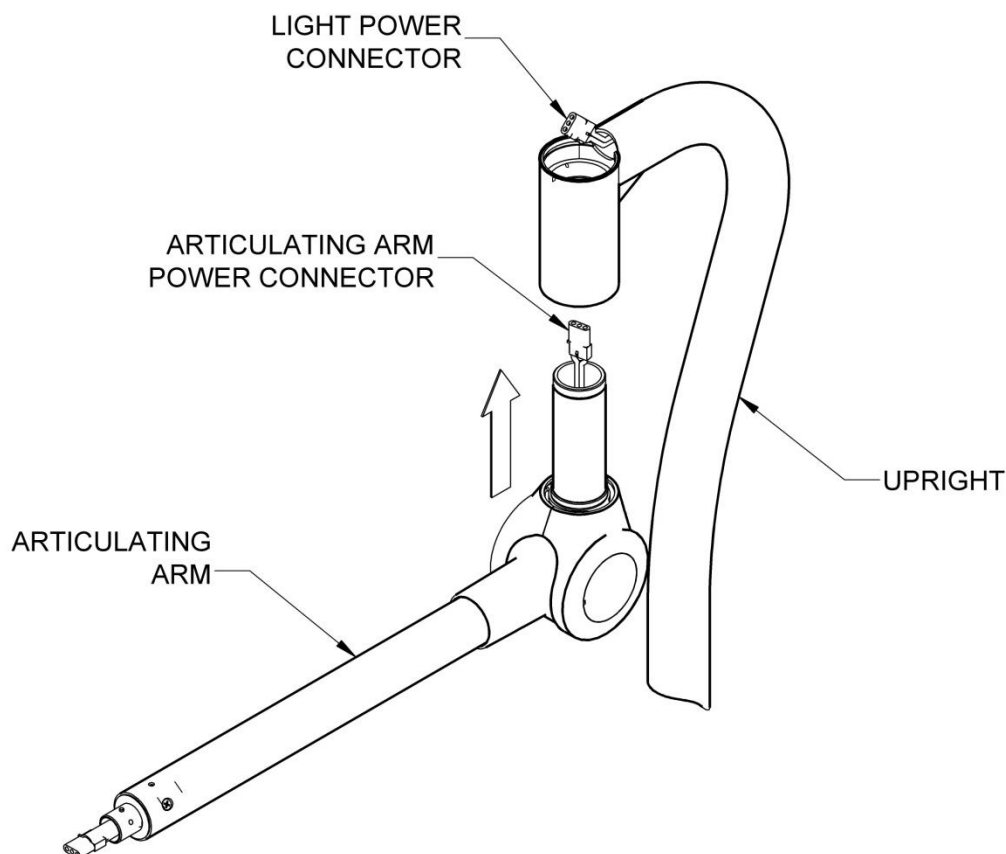


Figure 23: Installing the Spring Arm on the Floor Model

Ensure that the top and bottom Bronze Bushings are in place in the Upright Neck.

Carefully lift and hold the Light Power Cable coming out of the upright away from the Upright Neck.

Position the Spring Arm directly under the upright neck and carefully lift into the Upright Neck ensuring not to push out the top Bronze Bushing and not damaging the cable connector.

Floor Stand Light Assembly (cont'd)

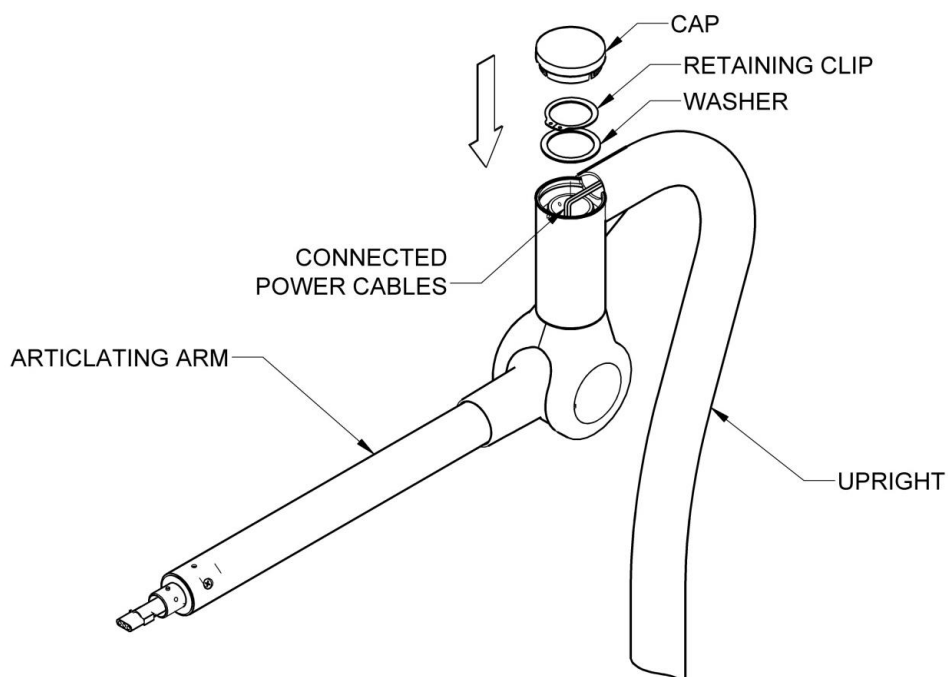
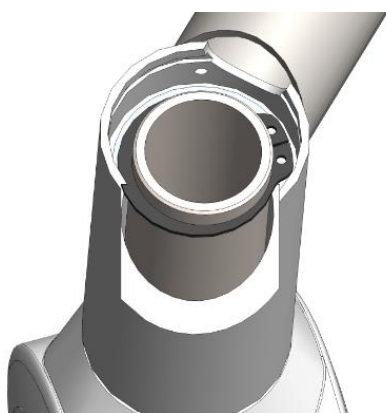


Figure 24: Spring Arm Attachment and Electrical Connection



**Figure 26: Retaining Ring
(Cap & Washer not shown)**

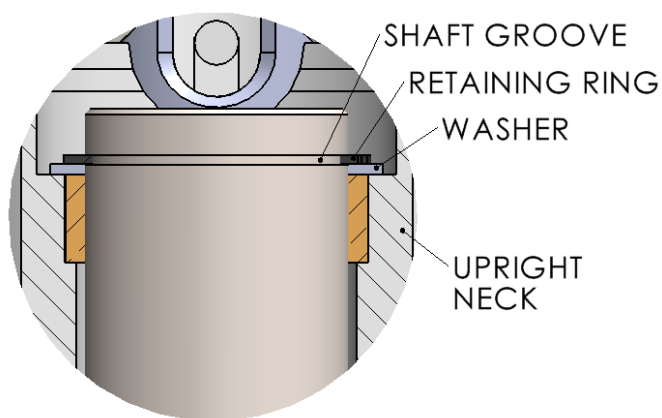


Figure 25: Retaining Ring Installed

Once the Articulating Spring Arm pivot is completely through Upright Neck, install the Washer and using the supplied pliers, install the retaining clip. It is essential that the retaining ring is fully seated in the shaft groove.

Securely connect the Power Cable connectors together and carefully push the excess cable lengths into the Upright and into the Articulating Spring Arm pivot.

Test the Spring Arm for smooth horizontal rotational swing of approximately 7.5° from center.

Install the cap.

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 (MI-1000 models only), then depress the button one more time.

On/Off & Dimming Levels

Model	Dimming Levels	Endo Mode	5	4	3	2	1
MI-1000	5	Yes	100,000 Lux	87,500 Lux	75,000 Lux	62,500 Lux	50,000 Lux
MI-750	3	–	75,000 Lux	–	56,200 Lux	–	37,500 Lux
MI-550	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 MI-1000 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 from 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 Medical Illumination 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
MI-1000	1.5A/250VAC SLO-BLO	0001314
MI-750		
MI-550		

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 LEDs are not readily replaceable by end users and should only be serviced by Medical Illumination or facility authorized maintenance personnel.**

Spring Tension Adjustment Tool



ENSURE THAT THE ARM/LIGHT HEAD IS IN ITS HIGHEST VERTICAL POSITION BEFORE ATTEMPTING TO ADJUST THE ARM TENSION. DO NOT OVERTIGHTEN.

The Spring Tension Adjustment Tool (1000736) is required to adjust the spring tension on all MI Spring Arms. This wrench is included in the hardware kit and combines the “Lock” hex drive and the “Adjustment” hex drive into a single wrench. A 5/16” combination wrench (not supplied) is required to Lock and Unlock the Spring Tension Adjustment mechanism.

For safety, it is recommended that the box end of the combination wrench be used when locking the adjustment screw (see illustration).

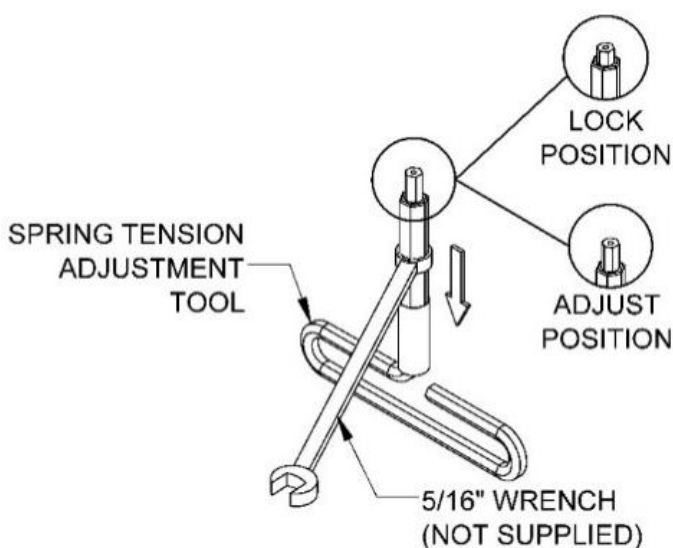


Figure 27: Spring Tension Adjustment Tool



DO NOT ATTEMPT SPRING TENSION ADJUSTMENTS WITHOUT THIS WRENCH.

Adjusting the Spring Arm

*****IMPORTANT***** The Spring Arm MUST be rotated up as far as it will go in order to access the spring-tension ADJUSTMENT SCREW and LOCK NUT.

To adjust the spring-tension of the Spring Arm the adjustment screw must first be “unlocked”. To do this, carefully insert the Spring Tension Adjustment Wrench (P/N: 1000736) through the split-rubber receptacle until the smaller hex seats in the ADJUSTMENT SCREW socket and then slide the LOCK (outer) hex upwards until it seats in the LOCK NUT socket. While holding the Wrench stationary, use the 5/16” combination wrench (not supplied) to turn the outer Hex counter-clockwise a quarter of a turn. The ADJUSTMENT SCREW is now unlocked and the spring tension can be adjusted.

To adjust the spring tension, pull the outer hex back so only the ADJUSTMENT SCREW socket is engaged and rotate the wrench handle counter-clockwise to increase tension and clockwise to reduce the tension.

*****IMPORTANT***** The wrench MUST be removed before rotating the Spring Arm vertically to check the adjusted arm tension. Once the spring tension has been set and the Light Head balances, reinsert the Wrench until the small hex seats in the ADJUSTMENT SCREW Socket then slide the outer Hex upwards until it seats in the LOCK NUT socket then while holding the wrench stationary, use the 5/16” combination wrench to lock the LOCK NUT clockwise and the ADJUSTMENT SCREW into place.

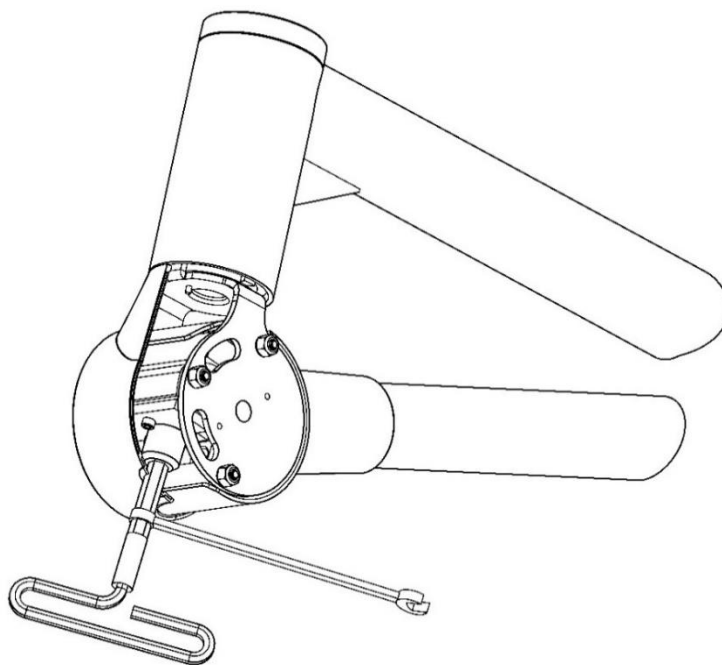


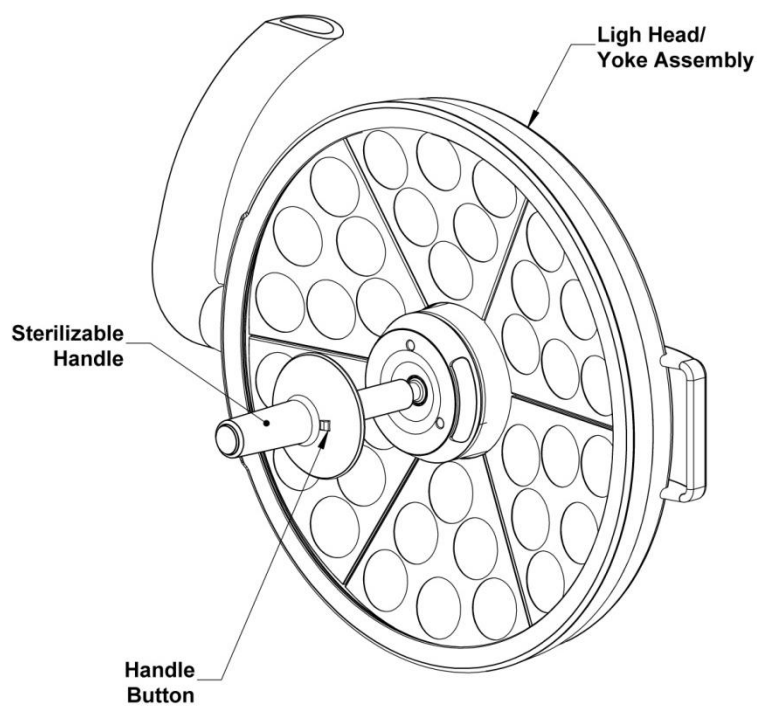
Figure 28: Adjusting Spring Tension

(SHOWN WITH SIDE COVER REMOVED FOR CLARITY)

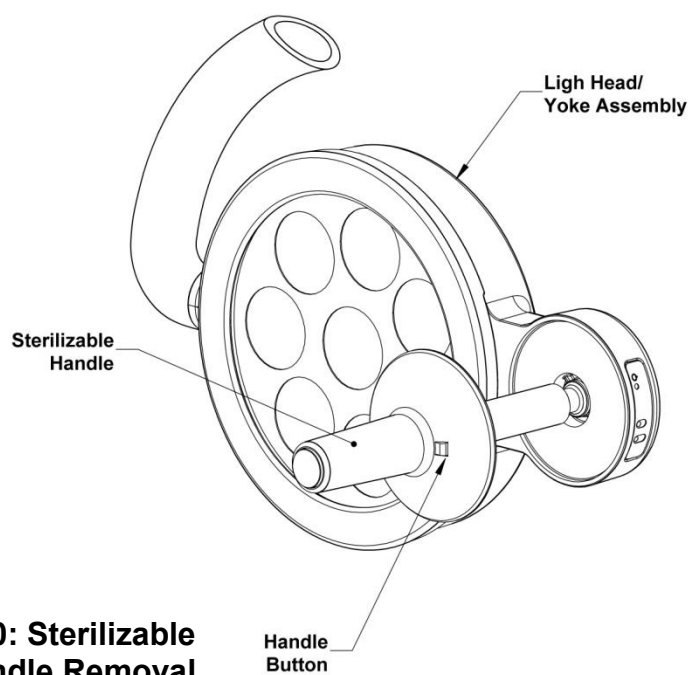
Handle Sterilization

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 29: Sterilizable
Handle Removal
MI-1000/MI-750**



**Figure 30: Sterilizable
Handle Removal
MI-550**

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: Medical Illumination International Inc. 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	1. Power to unit is off (not plugged in) 2. Blown (open) fuse 3. Loose Power Supply connectors (Input or Output) 4. Exposed wires are cut or damage 5. Wire not connected correctly during installation. 6. Wire connections made during installation have been disconnected 7. No input power to light unit 8. Disconnected wires at switch or Power Supply 9. No power output (DC) from Power Supply when input power (AC) to Power Supply is measured 10. Wire connections made during installation have been reversed 11. Sterilizable handle button not engaging power push button switch properly 12. Black push button switch	1. Turn on power (plug in unit) 2. Replace fuse 3. Replace Power Supply wire harness 4. Replace wire assembly 5. Remove all plastic coverings and check all wiring connections 6. Reconnect wires per the instructions. 7. Check power input connections and circuit breakers 8. Reconnect wires 9. Replace Power Supply 10. Connect proper wires together: black-black and red-red 11. 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 12. Replace push button switch assembly

Problem	Possible Cause	Remedy
Light does not maintain its position vertically	1. Spring tension is incorrect 2. Additional equipment was added to unit 3. Light head model and spring arm do not match	1. Adjust spring tension using tool provided in hardware kit (Pg. 37) 2. Remove any additional equipment from arm 3. Place the correct light head model onto the matching spring arm
Light does not maintain its position horizontally	1. Ceiling Mount Assembly is not level 2. Ceiling Mounting screws are loose 3. Arm/Head needs friction adjustment.	1. Level Ceiling Mount by shimming 2. Tighten ceiling Mount fasteners. 3. Adjust the friction adjustment
Spring arm is difficult to move lower	1. Weight of the light head is not present on the spring arm	1. Install light head onto the spring arm
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: 3-S (Single), 3-D (Dual)
Ceiling Mount Assembly Cover:.....	1001320
Power Supply, MI-1000/MI-750/550	0003738
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
Spring Tension Adjustment Tool.....	1000736
Hardware Kit:.....	1000792-()
.....	Specify: -D (Dual Ceiling), -S (Single Ceiling), -F (Floor) or -W (Wall)



Installation & Service Checklist

Project Information ☐ New Install ☐ Service

Technician Name:	Company Name:	Date:
Customer:	Model Number(s):	Serial Number(s):
Site Address:	City/State	Room Identifier:
	Zip:	
Job Completed? Yes ☐ No ☐	Date of Completion:	

General Inspection	YES	NO	N/A	NOTES
Packaging: Package received in good condition. Easy to unpack without damaging device. Check packing list, are all items included. Installation & Instructions for Use easy to follow.	☐	☐	☐	
Facility Mounting Structure & Installation: Facility Structure prepared properly ahead of time of installation. Mounted successful & square. Is there any rotational drift. All fasteners secured. Ceiling Cover installed.	☐	☐	☐	
Are all decals legible? Model specific decals should be present on all systems. The decal should match the information on the model number / serial number label.	☐	☐	☐	
Is the model number / serial number label legible? The model number / serial number label should be present on all systems. The label information should match the decal.	☐	☐	☐	
Does the sterilizable handle function properly? The sterilizable handle should easily remove and be installed onto the light head handle.	☐	☐	☐	
Can the lighting system move freely about all articulations? Referencing the manual, the lighting system should be able to move easily about all the rotation points. The degree of rotation is noted in the manual.	☐	☐	☐	
Does the light head hold position? The light head should set in any position placed. No drifting should occur.	☐	☐	☐	

General Inspection	YES	NO	N/A	NOTES
Does the handle pushbutton function properly? Pressing the pushbutton at the end of the handle should turn the light on. Additional button presses will cycle through the available light intensities. Pressing and holding the button for 3 seconds will turn the light off or to ENDO mode if available. Once in ENDO mode, an additional button press will turn the light off.	☐	☐	☐	
Does the indicator decal function properly? All LEDs on the indicator decal should light up and turn off to represent the current intensity level.	☐	☐	☐	
Bluetooth tablet or IR Remote operational? When applicable, was the wireless tablet successfully connected and fully operational (Light head On/Off, and Intensity changes)?	☐	☐	☐	
Post Installation: Define service/maintenance schedule Maintain & store for future use: Adjustment Tools provided & Installation & Instructions for Use	☐	☐	☐	

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