MEDICAL ILLUMINATION INTERNATIONAL

WHERE ILLUMINATION IS DEFINED

Bovie®

# INSTALLATION AND SERVICE MANUAL

## MI-750

# MI-750

## 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 luminaries (IEC60601-2-41)

CE

Electromagnetic compatibility for immunity
And emissions in accordance with
EN-60601-1-2(2001) Class B and CISPR 22 (1997) Class B

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-750 lighting system is a procedural light intended to be used by medical professionals in examination rooms. The functional interfaces are 600° positioning horizontally and ± 40° vertically. The lamp head can be rotated approximately 190°. An ON/OFF button is provided with 3 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 patent, other medical professionals or other lights/equipment.

# MI-750
# Installation and Service Manual
# Table of Contents

# MI-750
# Installation and Service Manual
# Table of Illustrations

# Section 1: Terms, Symbols & Warranty
# 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.

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

**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.

**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.

**Head/Yoke Assembly**
The part of the device which includes the light source, heat removal system and light focusing system.

# Definition of Terms (cont'd)

**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.

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

**Arm Assembly – Extension/Articulating Arm**
Horizontal section of the positioning arm with pivots that is used to increase the area covered by the light head and articulating arm. The articulating arm allows for vertical positioning of the light head.

**Light Mounting**
Support apparatus used to connect arm assembly/light head to a fixed surface, consisting of either a single, double or triple ceiling mount.

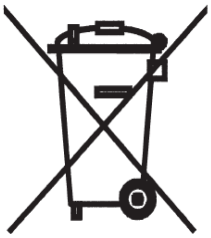
**Neutral Conductor (common)**
In an AC circuit, the return line for current.

**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 |
|  | Read accompanying documents |
|  | C.E. Marking |
|  | Fuse marking |
|  | Protective earth ground |
|   | Neutral conductor |
|  | Caution |
|  | Electric shock hazard |

# 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 1

# MI-750 Models

The following MI-750 models are covered in this manual:

061412 Wall Mount.....100-240 VAC, 50/60 Hz, 65 W
061413 Floor Model.....100-240 VAC, 50/60 Hz, 65 W
061414 Single Ceiling Mount.....100-240 VAC, 50/60 Hz, 65 W
061415 Dual Ceiling Mount .....100-240 VAC, 50/60 Hz, 130 W

# Section 1

# 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.

Medical Illumination International, Inc. ("Medical Illumination") Lighting Equipment is warranted against defective material and/or workmanship, excluding normal replacement parts (e.g. bulbs, sterilizable handles or glass items), 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
RA#_____

Damage resulting from inadequate packing is not covered by this warranty, and 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.

# Section 2: Specifications
# Mechanical Specifications

| Parameter | Value |
|---|---|
| **Weights:**<br>Light Head/Yoke Assembly<br>Arm<br>Arm (Floor)<br>Wall Bracket Assembly<br>Floor Stand Assembly<br>Single Ceiling Mount Assembly<br>Dual Ceiling Mount Assembly | <br>Approximately 8.6 lbs (3.9 Kg)<br>Approximately 12.5 lbs (5.7 Kg)<br>Approximately 11.5 lbs (5.2 Kg)<br>Approximately 3.0 lbs (1.4 Kg)<br>Approximately 43.0 lbs (19.5 Kg)<br>Approximately 14.5 lbs (6.6 Kg)<br>Approximately 16.0 lbs (7.3 Kg) |
| **Dimensions:**<br>Light Head/Yoke Assembly<br>Arm (Wall/Ceiling)<br>Arm (Floor)<br>Floor Stand | <br>14.5” (368 mm) Dia. 3.28” (83.3 mm) deep<br>58.5” (1,485 mm)Long<br>39.5” (1,003 mm) Long<br>75.5” (1,917 mm) High |
| **Rotations:**<br>Articulating Arm Vertical Movement<br>Articulating Arm Horizontal Movement<br>Articulating Arm/Yoke Interface<br>Yoke/Lamp Head Interface | <br>± 40° Travel<br>Approximately 345°<br>Approximately 540°<br>Approximately 190° |

# Electrical Specifications

| Parameters | Value |
|---|---|
| Supply Circuit | 100 ~ 240 VAC 50/60 Hz<br>Single Phase (**NOT** 208 compatible)<br>0.5 AMP (Dual Lights) |
| Fuse Rating | 1.5 Amps @ 230VAX, Slo-Blo (all supply voltages) |
| Power Supply power handling capacity | 100 ~ 240 VAC 50/60 Hz<br>1.3 Amps, 65W |
| Light Head power consumption | 27W @ 24VDC |

# Optical Specifications

| Performance | Value |
|---|---|
| Color temperature | 4,300° Kelvin ±300°K |
| Focal length | 39.4” (1 meter) |
| Central illuminance (full intensity) | 50,000 +/- 5K LUX |
| Dimming – 3 Intensity Levels | 100% 75% 50% |
| (Indicated by 3 LED’s on 2 indicator strips located 180° apart) | 50,000 37,500 25,000 |
| Light field diameter (d10) | Approximately Ø 9.0” (Ø 229mm) |
| Light field diameter (d50) | Approximately Ø 5.0” (Ø 127mm) |
| Depth of illumination | Approximately 50” |
| Shadow Dilution | |
| Illuminance (one mask) | Approximately 240 LUX |
| Illuminance (two masks) | Approximately 23,960 LUX |
| Illuminance at bottom of standard tube | Approximately 51,950 LUX |
| Illuminance (tube with one mask) | Approximately 100 LUX |
| Illuminance (tube with two masks) | Approximately 23,070 LUX |
| Irradiance | Approximately 141.2 $W/m^2$ |
| CRI | ≥ 87 |

# Environmental Specifications

| Parameter | Value |
|---|---|
| Ambient / Operating temperature | 41°F to 104°F 5° to 40° Celsius) |
| Storage temperature range | 41°F to 113°F (5° to 45° Celsius) |
| Humidity | 10 - 90% relative humidity |
| Pressure | 100 kPA (@<2K meters) |

# Section 3: Installation
# Ceiling Calculation: Single Mount Dimensions

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" - 8'9" | 16" | 22" | 6'2" – 6'11" |
| 8'10" - 9'7" | 25" | 31" | 6'3" - 7'0" |
| 9'8" - 10'4" | 35" | 41" | 6'3" – 6'11" |
| 10'5" - 11'1" | 44" | 50" | 6'3" – 6'11" |
| 11'2" - 11'11" | 53" | 59" | 6'3" - 7'0" |
| 12'0" - 12'3" | 63" | 69" | 6'3" - 6'6" |
| 12'4" - 13'1" | 67" | 73" | 6'3" - 7'0" |
| 13'2" - 14'0" | 77" | 83" | 6'2" - 7'1" |

NOTE: Longer ceiling rods are available for higher ceilings.

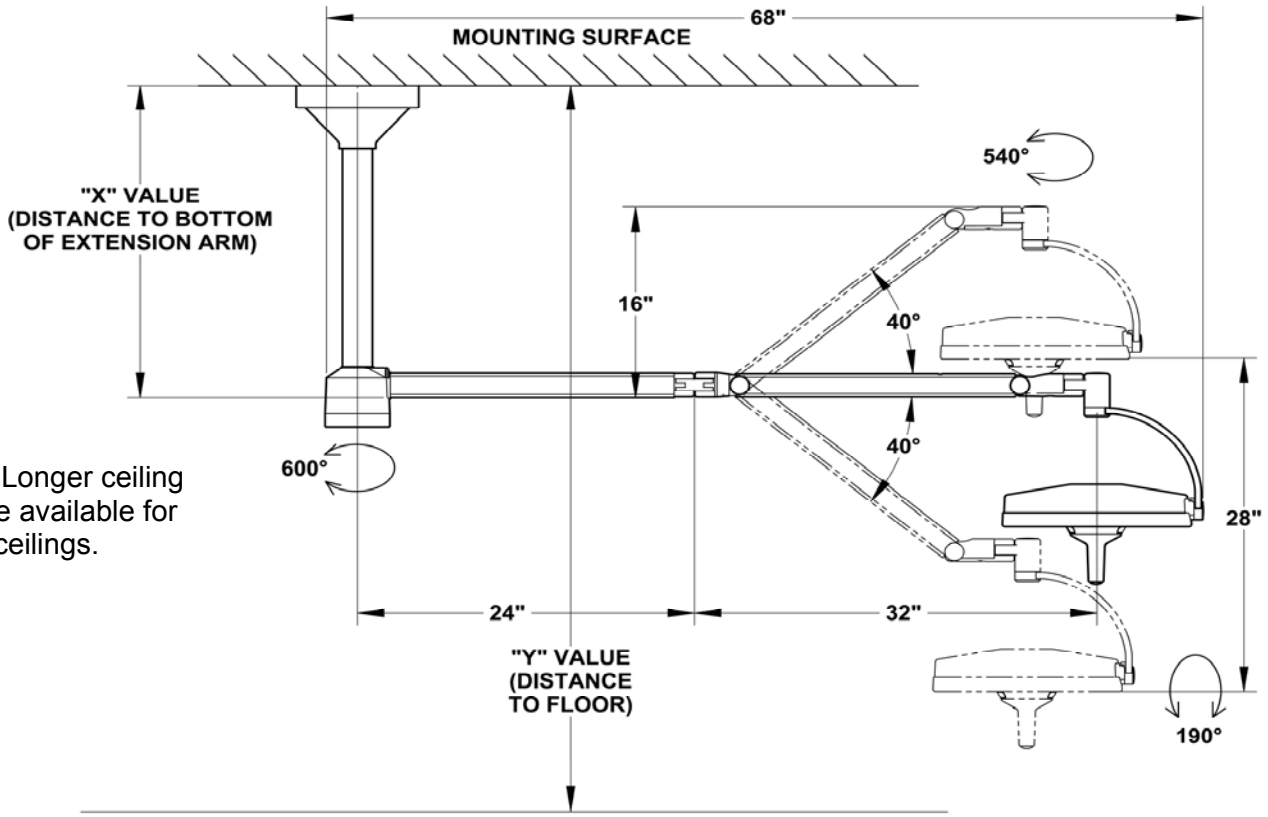



**Figure 1: Single Ceiling Mount Ceiling Rod Calculation**

# Section 3

# Ceiling Calculation: Double Mount Dimensions

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" | 16" | 23" | 6'3" - 6'11" |
| 8'11" - 9'8" | 25" | 32" | 6'3" - 7'0" |
| 9'9" - 10'5" | 35" | 42" | 6'3" - 6'11" |
| 10'6" - 11'2" | 44" | 51" | 6'3" - 6'11" |
| 11'3" - 12'0" | 53" | 60" | 6'3" - 7'0" |
| 12'1" - 12'3" | 63" | 70" | 6'3" - 6'5" |
| 12'4" - 13'2" | 67" | 74" | 6'3" - 7'0" |
| 13'3" - 14'0" | 77" | 84" | 6'1" - 7'0" |

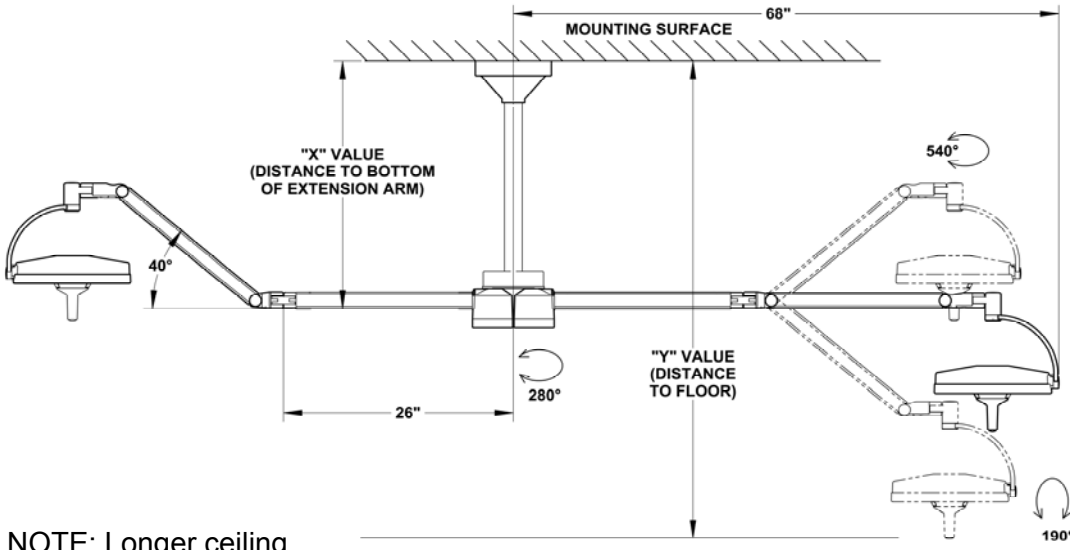



**Figure 2: Double Ceiling Mount Ceiling Rod Calculation**

NOTE: Longer ceiling rods are available for higher ceilings.

# Section 3

# Ceiling Mount Pre-Installation Guidelines

**SPECIAL NOTE: Installation and repair of this equipment should be performed by qualified persons 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 insure the following minimum conditions are provided:**

| Ceiling Mount | Weight: Lb | Moment: Ft Lb | |
|---|---|---|---|
| Single Ceiling | 70 | 215 | |
| Double Ceiling | 115 | 350 | ← 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 provide adequate support for the heaviest, and will not significantly increase the cost of the lightest. The design margin will also allow for flexibility for future product upgrades.

**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 Single Ceiling mount supply circuit line must have as a minimum:
100-240VAC, 50/60 Hz, single phase, three wire, capable of supplying 65 Watts @ 1.5A.

The Dual Ceiling mount supply circuit line must have as a minimum:
100-240VAC, 50/60 Hz, single phase, three wire, capable of supplying 130 Watts @ 3A.

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.**

WARNING: Secure the source of power using the means of isolation, before proceeding with electrical work.

# Ceiling Mount Pre-Installation Guidelines (cont'd)

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

The Ceiling Mount system will experience various level 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 may result in 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.

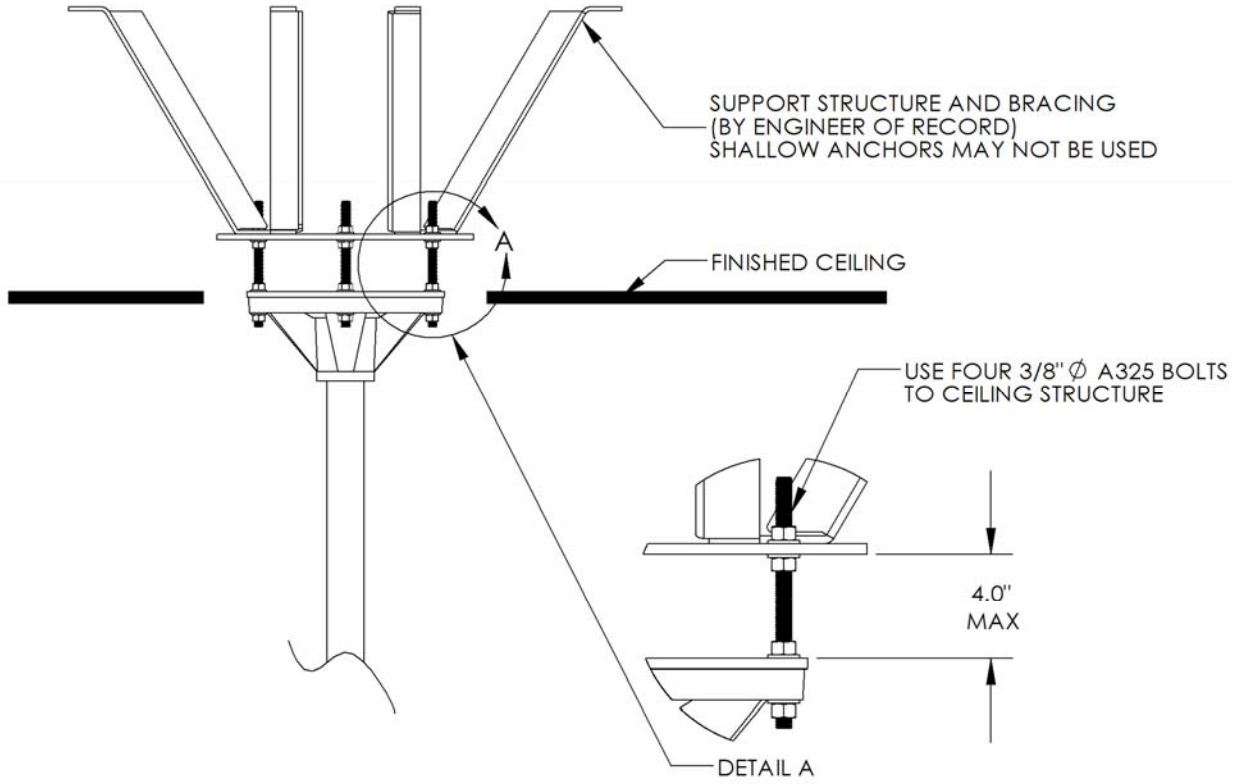



**Figure 3: Recommended Ceiling Structure Construction**

# Ceiling Structure Construction and Mounting (cont'd)

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

Mount the Ceiling casting to the ceiling structure using four 3/8" DIA A325 bolts with nuts and washers.

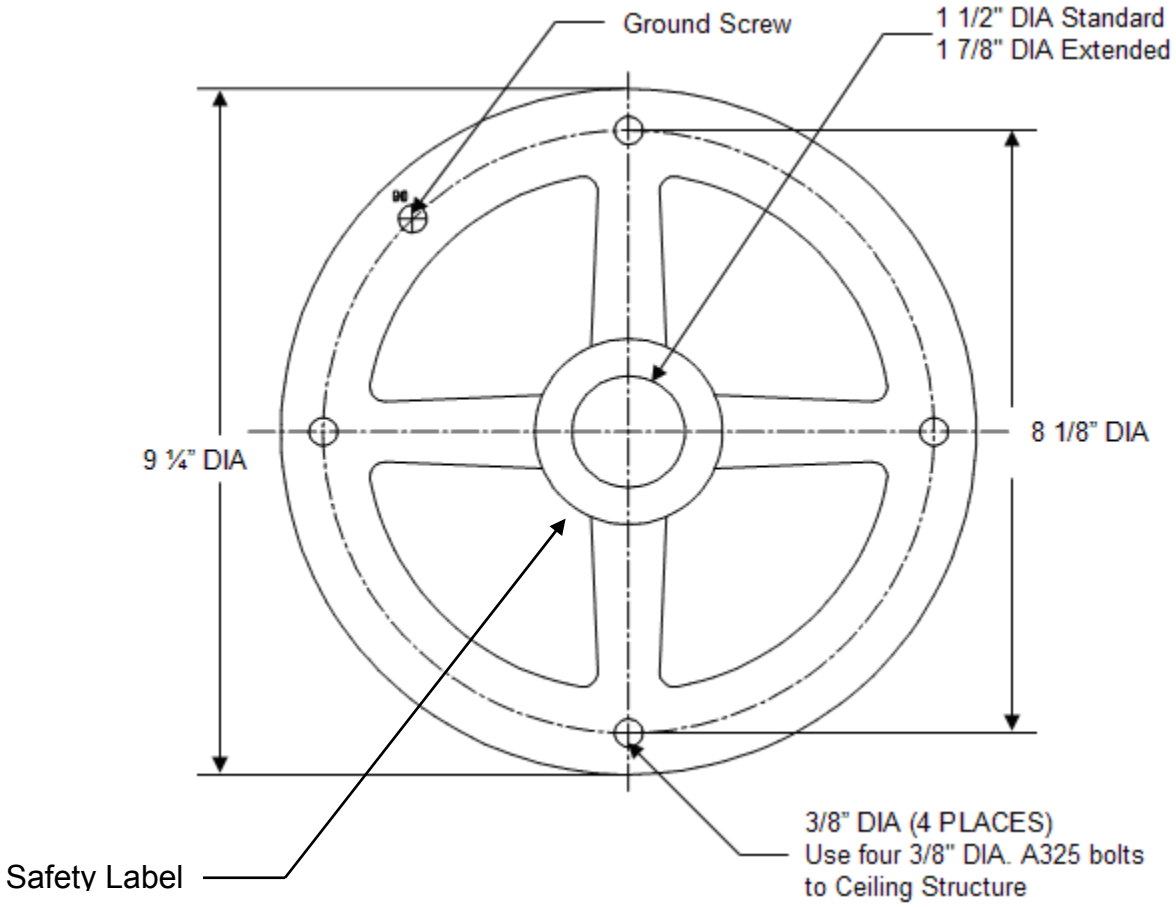



**Figure 4: Ceiling Casting Mount Diagram**

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

WARNING: Secure the source of power using the means of isolation, before proceeding with electrical work.

# Extended Ceiling Mount Installation

**For 10’2” – 14’ (3.23m-4.27m) Ceilings**

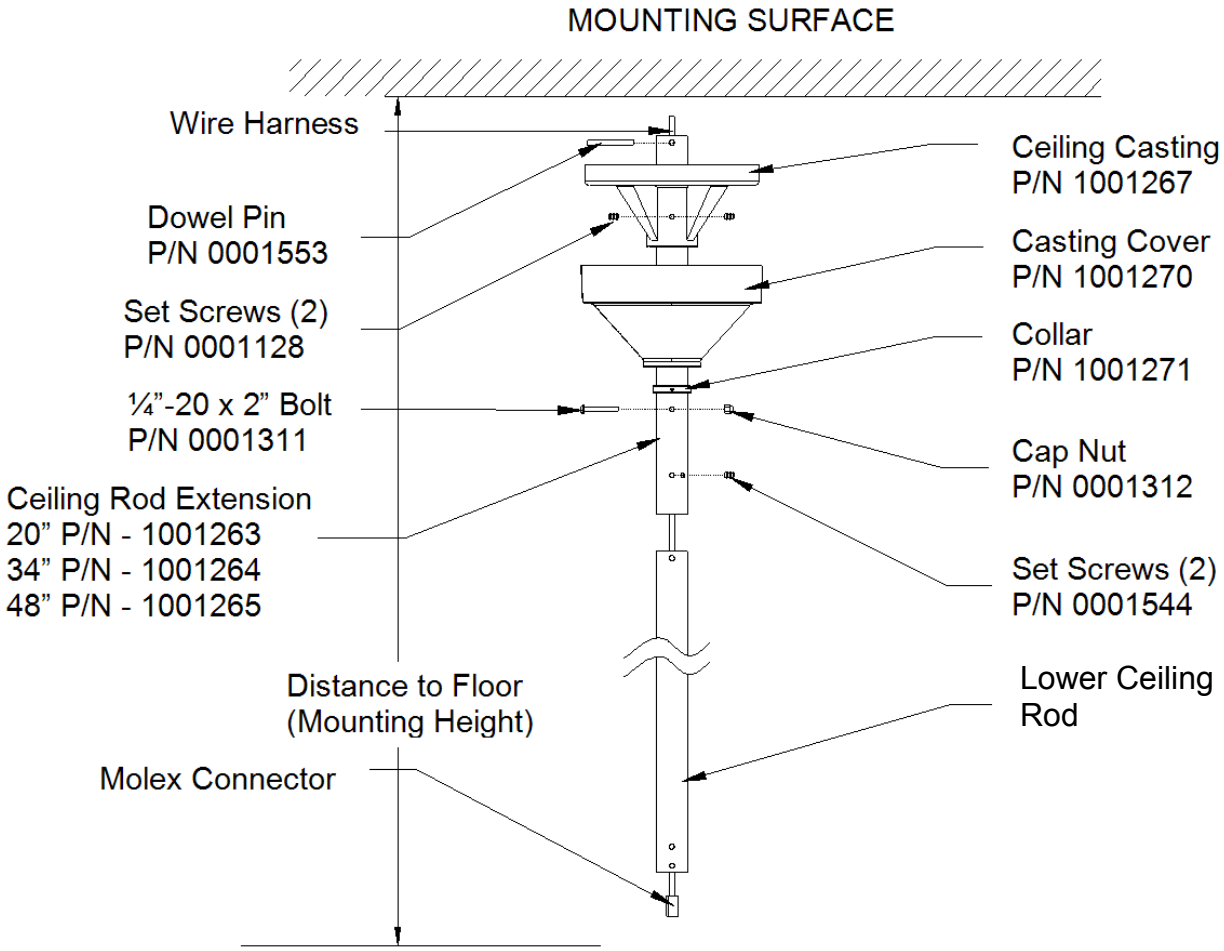



**Figure 5: Extended Ceiling Mount Installation**

Insert the ceiling rod up through the ceiling casting until the hole in the ceiling rod becomes visible. Insert the dowel pin into the hole in the ceiling rod and lower the rod in the ceiling casting, making sure the pin is seated securely in the indentation on the ceiling casting. Securely tighten the two set-screws located in the casting.

**Failure to install the dowel pin can cause the arm/head assembly to fall from the ceiling causing serious injury and/or property damage.**

The ceiling casting must be properly grounded during installation. This can be done by mounting the casting to a suitable material that will function as a ground conductor, or a wire lead that must be attached to the ground screw on the casting then routed to proper ground.
Note: Ceiling rod must be plumb. Adjust the nuts/washers accordingly.
Note: The ceiling casting itself must be electrically grounded to maintain proper grounding reliability.

# Extended Ceiling Mount Installation (cont'd)

**If ceiling rod is not plumb, unwanted arm drifting may occur.**

Feed the wire harness through the ceiling rod and route to a junction box. Leave sufficient wire to extend slightly beyond the bottom of the ceiling rod. **Important: To achieve proper grounding reliability, the green ground wire from the wire harness MUST be properly fastened to the grounding screw located on the ceiling casting. Make all electrical connections in compliance with all applicable electrical codes.**

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

WARNING: Secure the source of power using the **Means of Isolation**, before proceeding with electrical work.

Slide the casting cover up the rod extension and over the casting. Similarly, slide the collar to the casting cover, then tighten the set screw to hold the cover in place.

Feed the wire harness through the lower ceiling rod with the rod in the direction shown. Slide ceiling rod up through ceiling rod extension until the holes in the ceiling rod align with the upper holes in the ceiling rod extension. Insert a 1/4-20 x 2" bolt carefully, making certain not to damage the wire harness, and then fasten the cap nut. Secure rods in place with the two set screws provided.

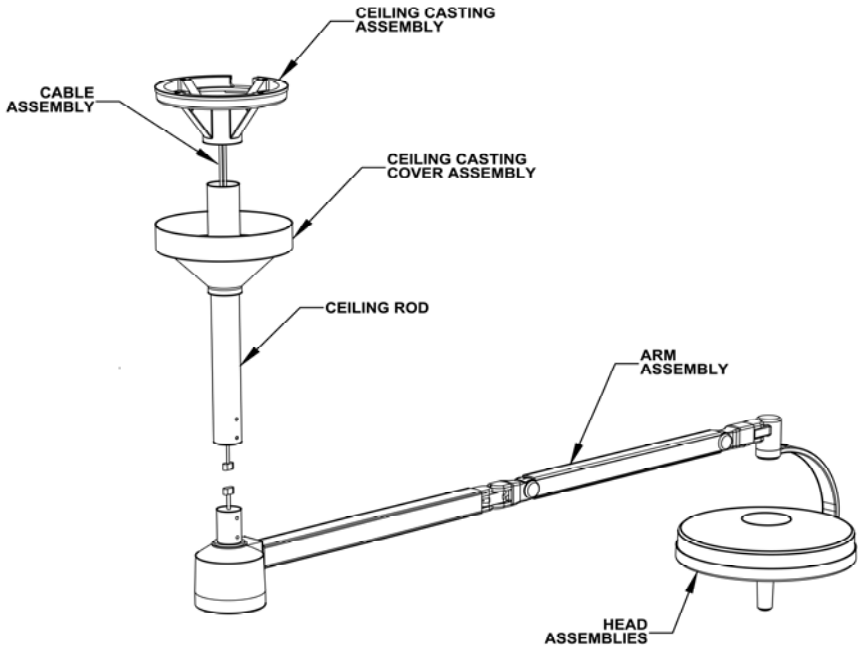



**Figure 6: Single Ceiling Mount Components**

# Section 3

# Single Ceiling Mount - General Information

**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.**

The shipping cartons contain a light head assembly, an arm assembly, a ceiling casting, casting cover, collar, bolt cover, ceiling rod, hardware kit, wire harness, and an Installation and Service Manual.

**Notes:** There are 3 standard length rods for different ceiling heights. Extended ceiling rod kits are available for ceilings over 10’2”. Verify that your ceiling rod length is correct for your ceiling height (See Ceiling Rod calculations on Page 14 & 15). If not correct please contact customer service.

**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.**

# Single Ceiling Mount Installation (cont'd)

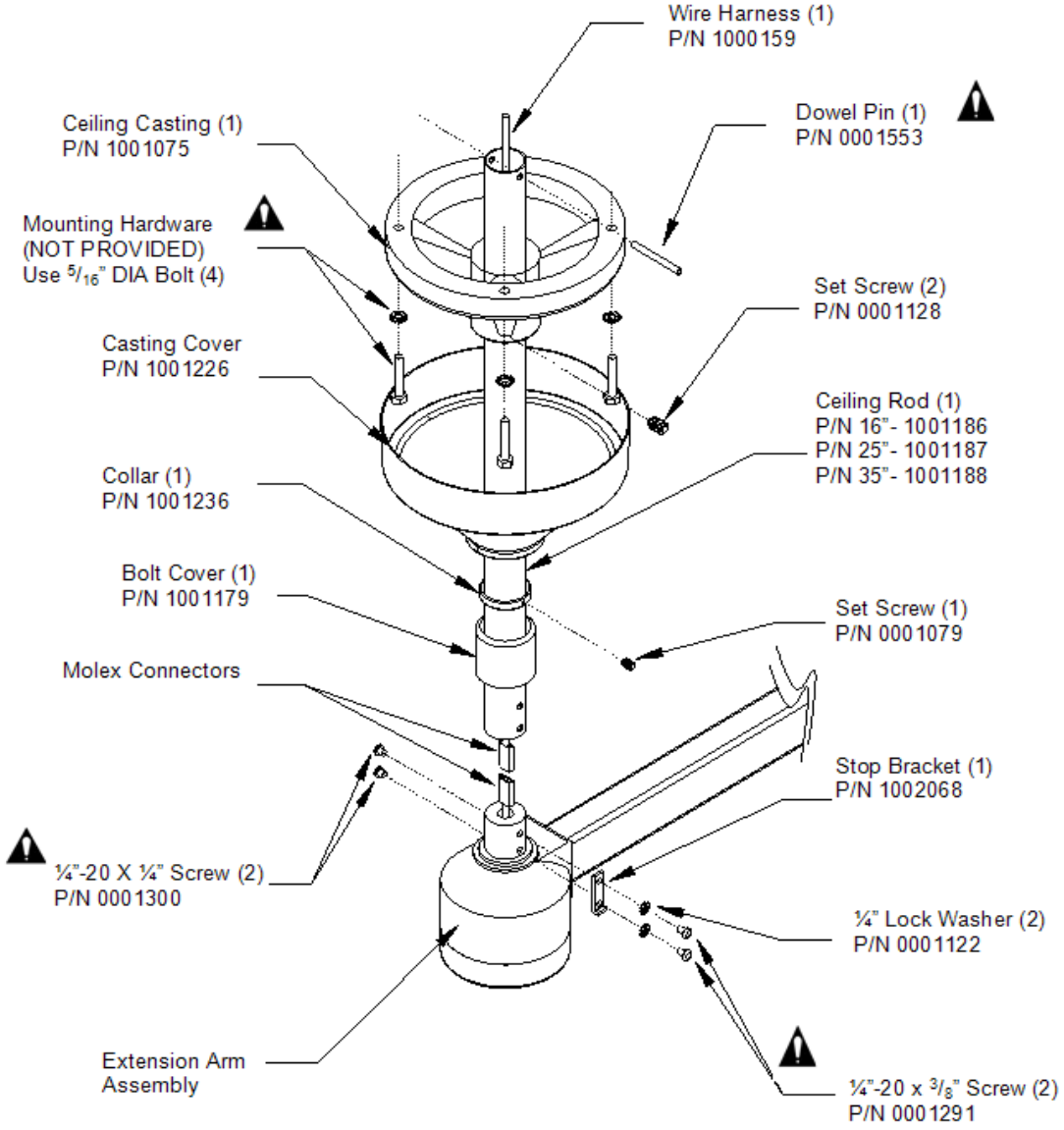



**Figure 7: Single Ceiling Mount Installation**

- Insert the ceiling rod up through the ceiling casting until the hole in the ceiling rod becomes visible (see **Figure 7: "Single Ceiling Mount Installation"**). Insert the dowel pin into the hole in the ceiling rod and lower the rod in the ceiling casting, making sure the pin is seated securely in the indentation on the ceiling casting. Securely tighten the two set-screws located in the casting.

**Failure to install the dowel pin can cause the arm/head assembly to fall from the ceiling causing serious injury and/or property damage.**

# Single Ceiling Mount Installation (cont'd)

The ceiling casting must be properly grounded during installation. This can be done by mounting the casting to a suitable material that will function as a ground conductor, or a wire lead that must be attached to the ground screw on the casting then routed to proper ground.

**Note: Ceiling rod must be plumb. Adjust the nuts/washers accordingly.**
**Note: The ceiling casting itself must be electrically grounded to maintain proper grounding reliability.**

**If ceiling rod is not plumb, unwanted arm drifting may occur.**

- Feed the wire harness through the ceiling rod extension and route to a junction box. Leave sufficient wire to extend slightly beyond the bottom of the ceiling rod. **Important: To achieve proper grounding reliability, the green ground wire from the wire harness MUST be properly fastened to the grounding screw located on the ceiling casting. Make all electrical connections in compliance with all applicable electrical codes.**

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

**WARNING: Secure the source of power using the means of isolation, before proceeding with electrical work.**

- Slide the casting cover up the rod over the casting. Similarly, slide the collar to the casting cover, then tighten the set screw to hold the cover in place. Feed the wire harness through the ceiling rod with the rod in the direction shown.

**Do not install the extension arm with the light head attached. Installation with the light head attached can cause damage to the light. Refer to the procedure for installing the head to the arm after the bracket and arm are installed.**

- Slide the bolt cover up onto the ceiling rod as shown in Figure 7, then raise the extension arm to the ceiling rod and plug the Molex connectors together. Push the wire into the ceiling rod while inserting the bushing on the extension arm assembly into the rod. Secure the assembly to the ceiling rod using the four supplied bolts as shown. Two 1/4-20 x 1/4" screws must be installed on one side of the ceiling rod. Two 1/4-20 x 3/8" screws and lock washers must be used to mount the stop bracket on the other side of the rod. Be sure the bend on the stop faces down, towards the arm.

**Failure to install the stop clip subassembly can cause damage to the light fixture.**

**Failure to install or tighten the 1/4-20 socket head cap screw can cause the arm/head assembly to fall causing serious injury and/or property damage.**

- Complete the installation by lowering the bolt cover onto the extension arm assembly.
- See the instructions for **"Section 3: Light Head to Arm Installation" on page 37 to complete the assembly.**

# Section 3

# Double Ceiling Mount Installation

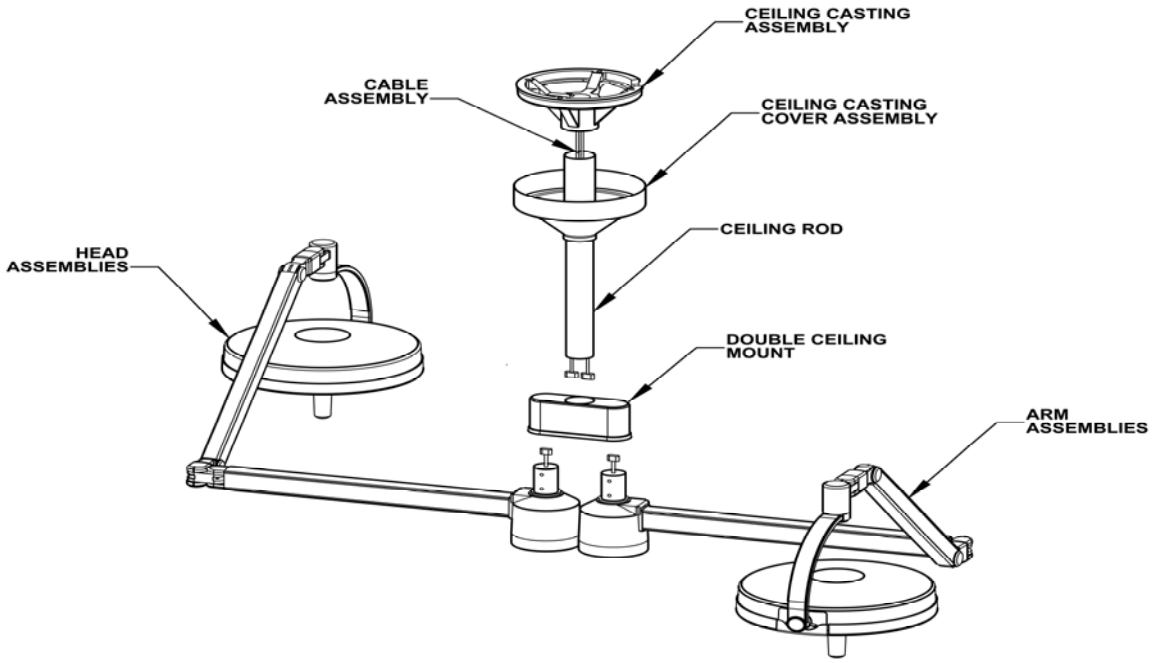



**Figure 8: Double Ceiling Mount Components**

## GENERAL INFORMATION

⚠ **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.**

The shipping cartons each contain a light head assembly and an arm assembly. One of the cartons also contain a ceiling casting, casting cover, collar, ceiling rod, double mount assembly, hardware kit, wire harness, and an Installation and Service Manual.

**Notes:** There are 3 standard length rods for different ceiling heights. Extended ceiling rod kits are available for ceilings over 10’6”. Verify that your ceiling rod length is correct for your ceiling height (see **“Ceiling Rod Calculation” on page 15**). If not correct please contact customer service.

⚠ **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.**

# Single Ceiling Mount Installation (cont'd)

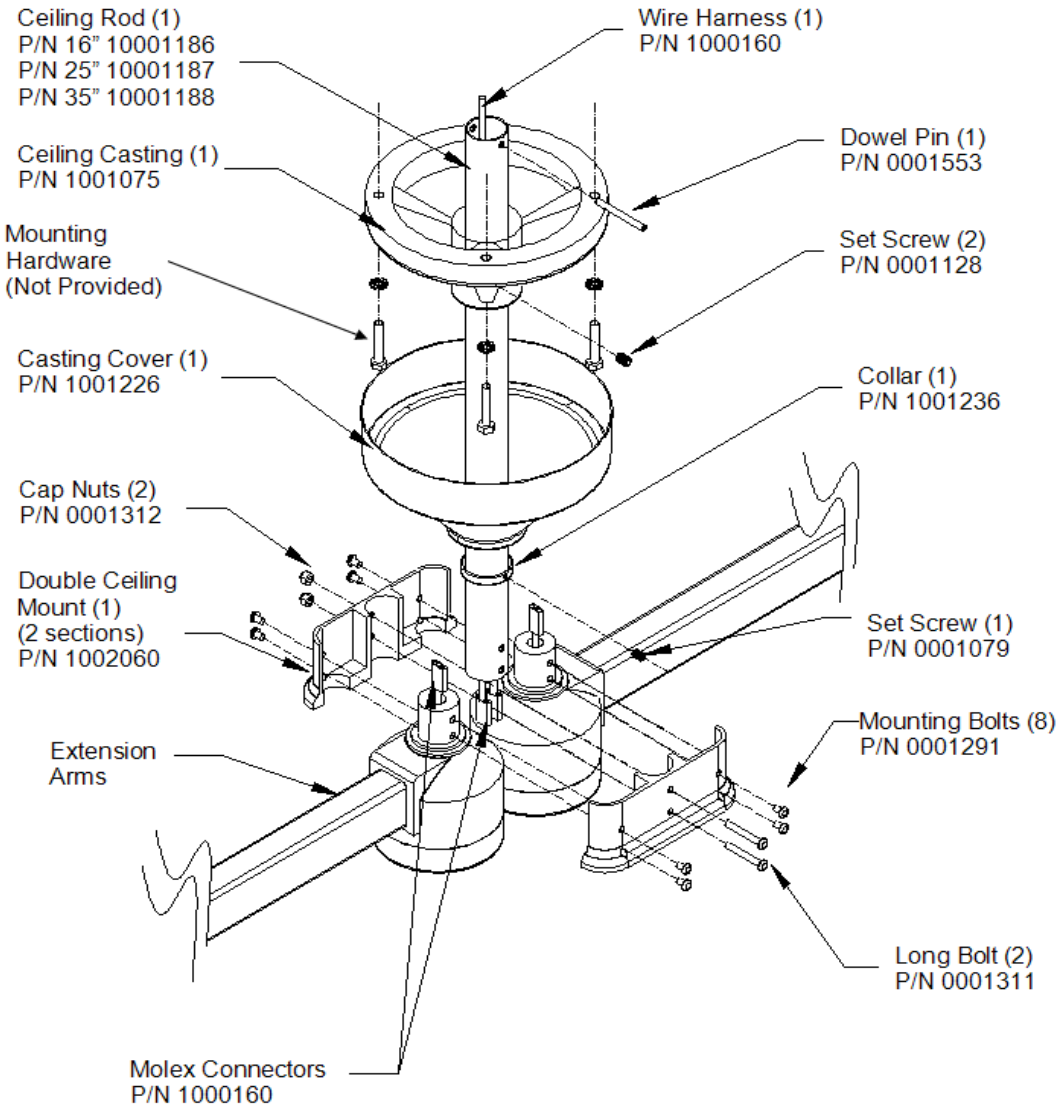



**Figure 9: Double Ceiling Mount Installation**

- Insert the ceiling rod up through the ceiling casting until the hole in the ceiling rod becomes visible (see **Figure 9: "Double Ceiling Mount Installation").** Insert the dowel pin into the hole in the ceiling rod and lower the rod in the ceiling casting, making sure the pin is seated securely in the indentation on the ceiling casting. Securely tighten the two set-screws located in the casting.

⚠ **Failure to install the dowel pin can cause the arm/head assembly to fall from the ceiling causing serious injury and/or property damage.**

# Double Ceiling Mount Installation (cont'd)

- The ceiling casting must be properly grounded during installation. This can be done by mounting the casting to a suitable material that will function as a ground conductor, or a wire lead that must be attached to the ground screw on the casting then routed to proper ground.

  **Note: Ceiling rod must be plumb. Adjust the nuts/washers in accordingly.**
  **Note: The ceiling casting itself must be electrically grounded to maintain proper grounding reliability.**

**If ceiling rod is not plumb, unwanted arm drifting may occur.**

- Feed the wire harness through the ceiling rod and route to a junction box. Leave sufficient wire to extend slightly beyond the bottom of the ceiling rod. **Important: To achieve proper grounding reliability, the green ground wire from the wire harness <u>MUST</u> be properly fastened to the grounding screw located on the ceiling casting. Make all electrical connections in compliance with all applicable electrical codes.**

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

**WARNING: Secure the source of power using the Means of Isolation, before proceeding with electrical work.**

- Slide the casting cover up the rod over the casting. Similarly, slide the collar to the casting cover, then tighten the set screw to hold the cover in place.

**Do not install the extension arm with the light head attached. Installation with the light head attached can cause damage to the light. Refer to the procedure for installing the head to the arm after the bracket and arm are installed**

- Bring one section of the double ceiling mount casting to the ceiling rod and fasten it to the rod with the 2" long bolts (P/N 0001311) and cap nuts (P/N 0001312). Tighten the cap nuts just enough to hold the section in place; they do not need to be fully tightened at this time. Bring an arm assembly to the double mount section and fasten the bushing on the extension arm into the extension arm mounting cavity with two 3/8" long mounting screws (P/N 0001291). Install the other arm assembly to the section with two more 3/8" long screws. Route the wire and Molex connector from the ceiling rod into the wire channel as shown in **Figure 10: "Wire Harness Positioning" and Figure 11: "Wire Channel". Plug the connector at the end of each Arm assembly to the mating Moles connector from the wire harness. Place each set of wires within the channel area.**

# Double Ceiling Mount Installation (cont'd)

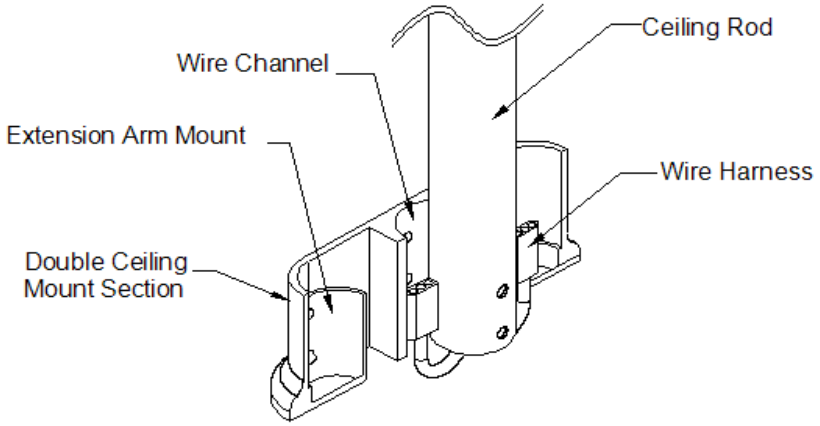



**Figure 10: Wire Harness Positioning**

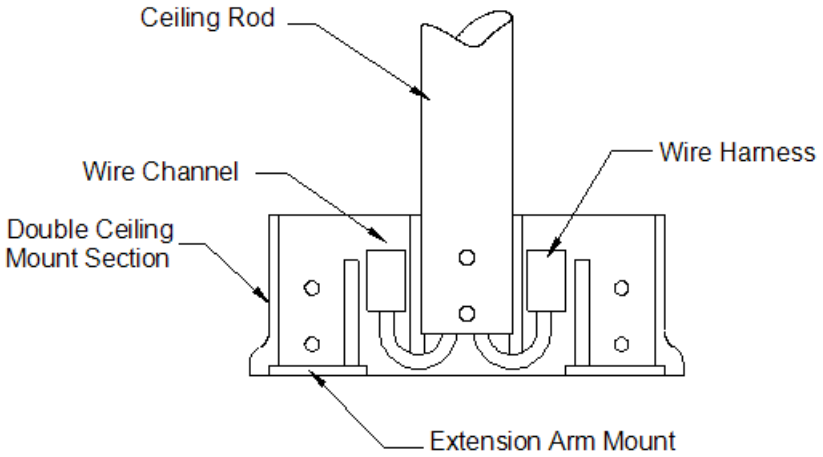



**Figure 11: Wire Channel**

- Position the two extension arms as shown in Figure 9: Double Ceiling Mount Installation" to allow for easier mounting of the remaining double mount section. Firmly press the fastened double ceiling mount section against the ceiling rod. While firmly holding the double ceiling mount section with arms attached in place, remove only the cap nuts from the 2" long bolts. It is strongly recommended that a second person hold the arms in place while the nuts are removed. Place the remaining double ceiling mount section onto the bolts. Be sure the wires are enclosed within the wire channel to avoid pinching them. Replace the cap nuts and fully tighten. Install the remaining four 3/8" long mounting screws and then fully tighten all eight screws.

**⚠ Failure to tighten the cap nuts for the 2" long bolts can cause the arm/head assembly to fall causing serious injury and/or property damage.**

# Double Ceiling Mount Installation (cont'd)

**Failure to install or tighten all eight of the 3/8" mounting screws can cause the arm/head assembly to fall causing serious injury and/or property damage.**

- Check to make sure that the wire connections are seated far enough into the double casting enclosure. Fasten the cover plates to the casting enclosure using the four 3/8" long pan-head screws (P/N 0001319) and plastic grommets (P/N 0001306) supplied in the hardware kit.

- See the instructions for **"Section 3: Light Head to Arm Installation" on page 37 to complete the assembly.**

# Wall Mounted Light Installation

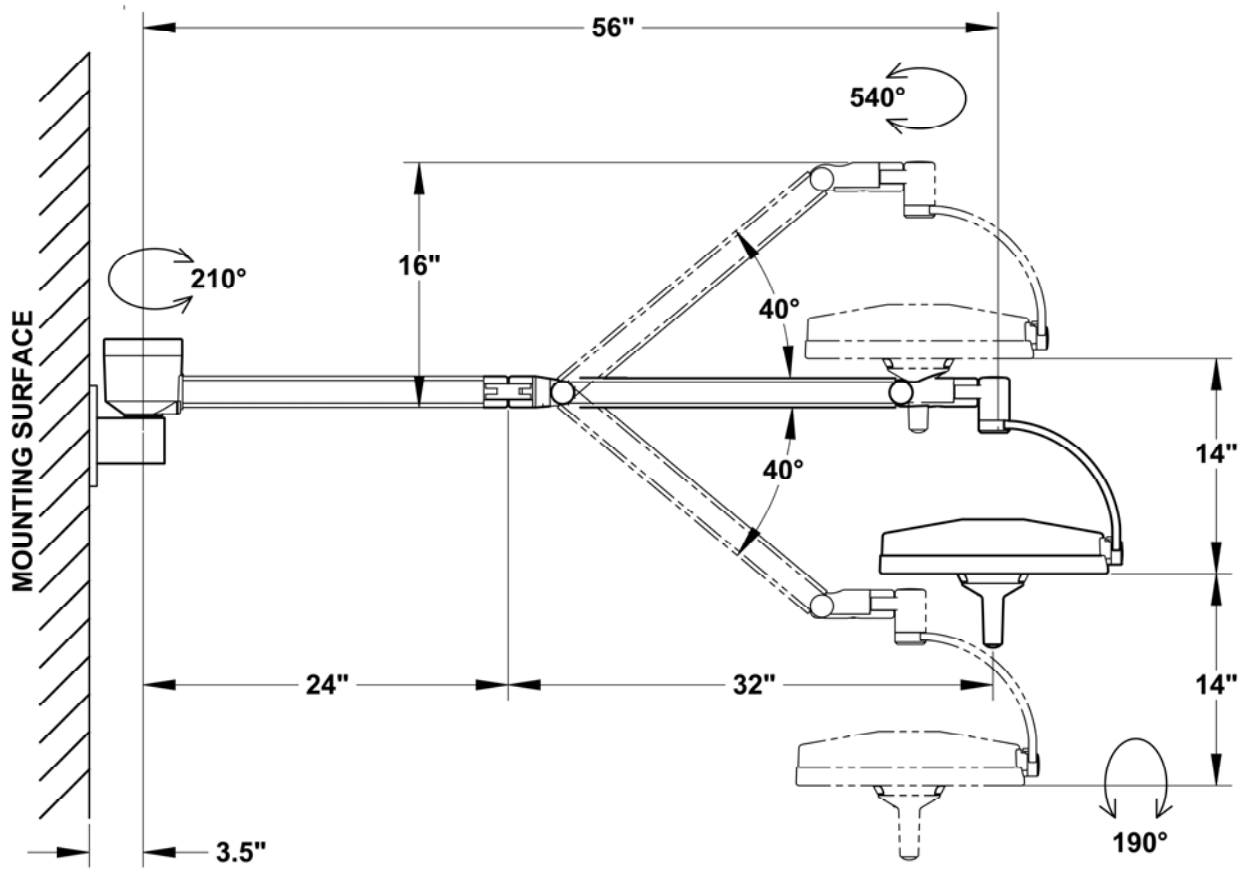



**Figure 12: Wall Mount Dimensions**

## GENERAL INFORMATION

The shipping cartons contain a light head assembly, 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 on **Figure 13: "Wall Mount Installation" 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.**

**WARNING: To avoid risk of electric shock this equipment must only be connected to a supply mains with protective earth.**

# Wall Mounted Light Installation (cont'd)

**WARNING: Secure the source of power using the Means of Isolation, the power cord, before proceeding with electrical work.**

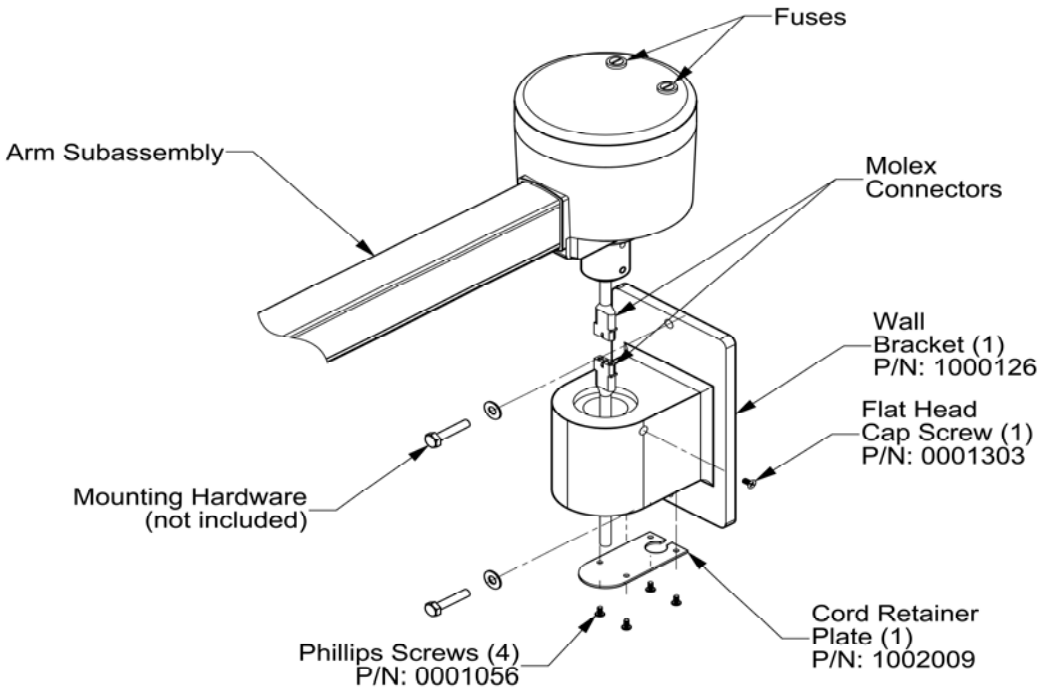



**Figure 13: Wall Mount Installation**

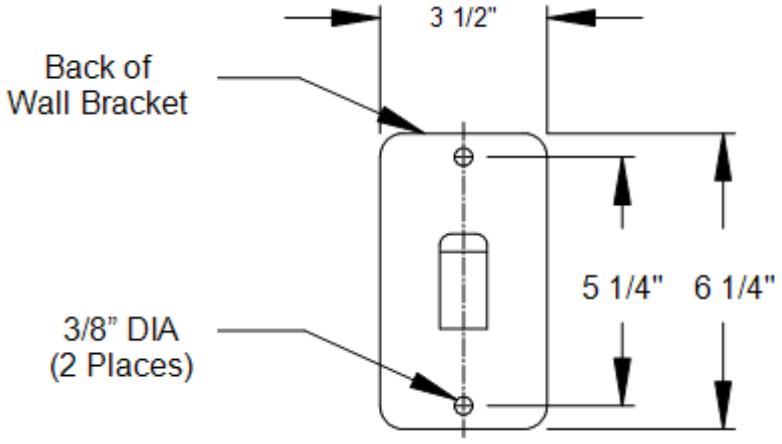



**Figure 14: Wall Bracket Mounting Diagram**

# Wall Mounted Light Installation (cont'd)

**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 65 pounds and an off center moment of 195 ft-lbs.**

**The supply circuit line must be as follows:**
**100-240VAC, 50/60 Hz, single phase, three wire, capable of supplying 65 Watts @ 1.5A.**

**WARNING: Secure the source of power using the Means of Isolation, the power cord, before proceeding with electrical work.**

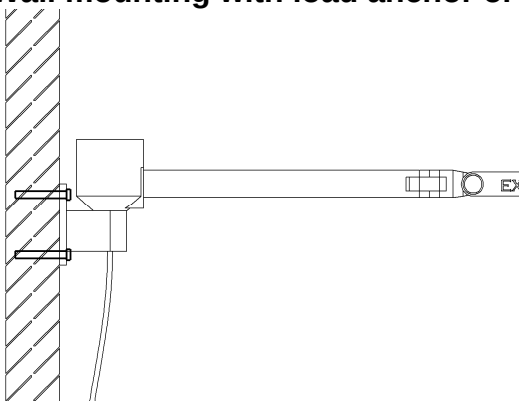
**The equipment is not deemed compatible with any sort of electrical dimming device. Use line voltage only. To maintain proper grounding reliability, the ground wire connections with the wall bracket must be kept properly fastened at all times. The power cord is permanently attached and is not intended to be replaceable.**

**Do not install the extension arm with the light head attached. Installation with the light head attached can cause damage to the light. Refer to the procedure for installing the head to the arm after the bracket and arm are installed.**

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

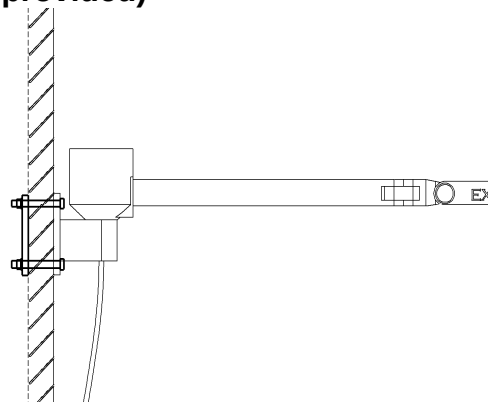
**Wall mounting with load anchor or stud anchor**



Concrete Wall (3000 PSI min., 6" thick min.):

- Use two 3/8" Dia HILTI KB3 Expansion Anchors or approved equivalent bolts (min. embed. 3"). See **Figure 15: "Stud Anchor Installation".** Also see HILTI technical document ESR-2302 for additional concrete anchoring information.

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



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

- Use two 3/8" Dia A307 Bolts with nuts/washers to Backing Plate

# Wall Mounted Light Installation (cont'd)

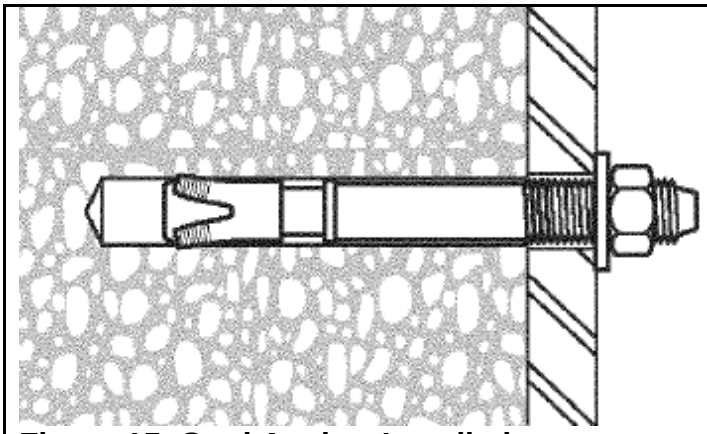


**Figure 15: Stud Anchor Installation**

- Drill hole according to the diameter of the stud anchor
- Thoroughly clean hole – removing all debris
- Insert anchor into hole (min. embed 3")
- Torque the nut down against the washer to 20 ft-lb (see HILTI tech. doc. ESR-2302 Table 1 for reference)

- Remove the four screws holding the cord retainer plate in place. Carefully pull the plate away from the wall bracket to expose the Molex connector. **DO <u>NOT</u> 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.**

**WARNING: Secure the source of power using the means of isolation, the power cord, before proceeding with electrical work.**

- Bring the extension arm over the wall bracket and feed the Molex connector from the transformer housing into the bracket while inserting the bushing into the bracket. Secure the arm subassembly to the bracket with the flat head cap screw provided.
- Bring the cord retainer plate up to the bottom of the wall bracket and plug the Molex connector at the end of the power cord to the connector from the arm subassembly. Route the connectors and wire to the rear of the bracket (not shown). Refasten the retainer plate to the bracket with the four screws provided.
- See the instructions for **"Section 3: Light Head to Arm Installation" on page 37 to complete the assembly.**

# Section 3

# Floor Stand Light Installation

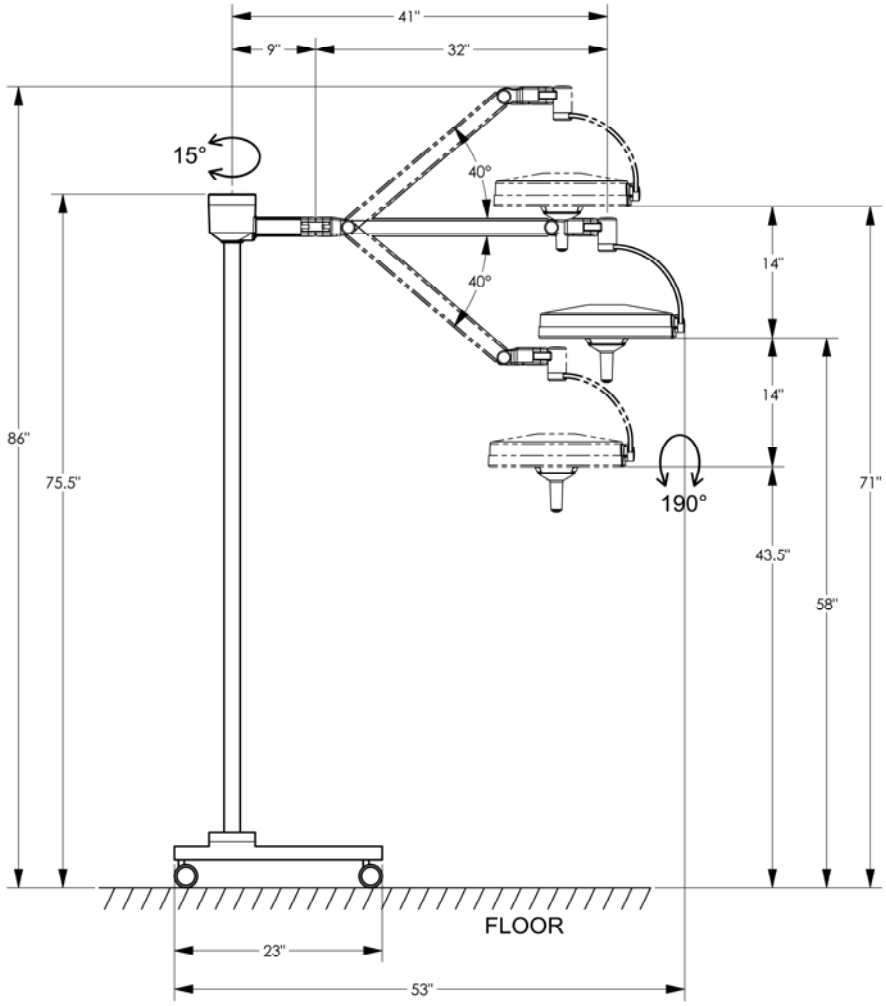



**Figure 16: Floor Mount Dimensions**

## 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.**

**WARNING: To avoid risk of electric shock this equipment must only be connected to a supply mains with protective earth. The power cord is permanently attached and is not intended to be replaceable.**

# Floor Stand Light Installation (cont'd)

**WARNING: Secure the source of power using the Means of Isolation, the power cord, before proceeding with electrical work.**

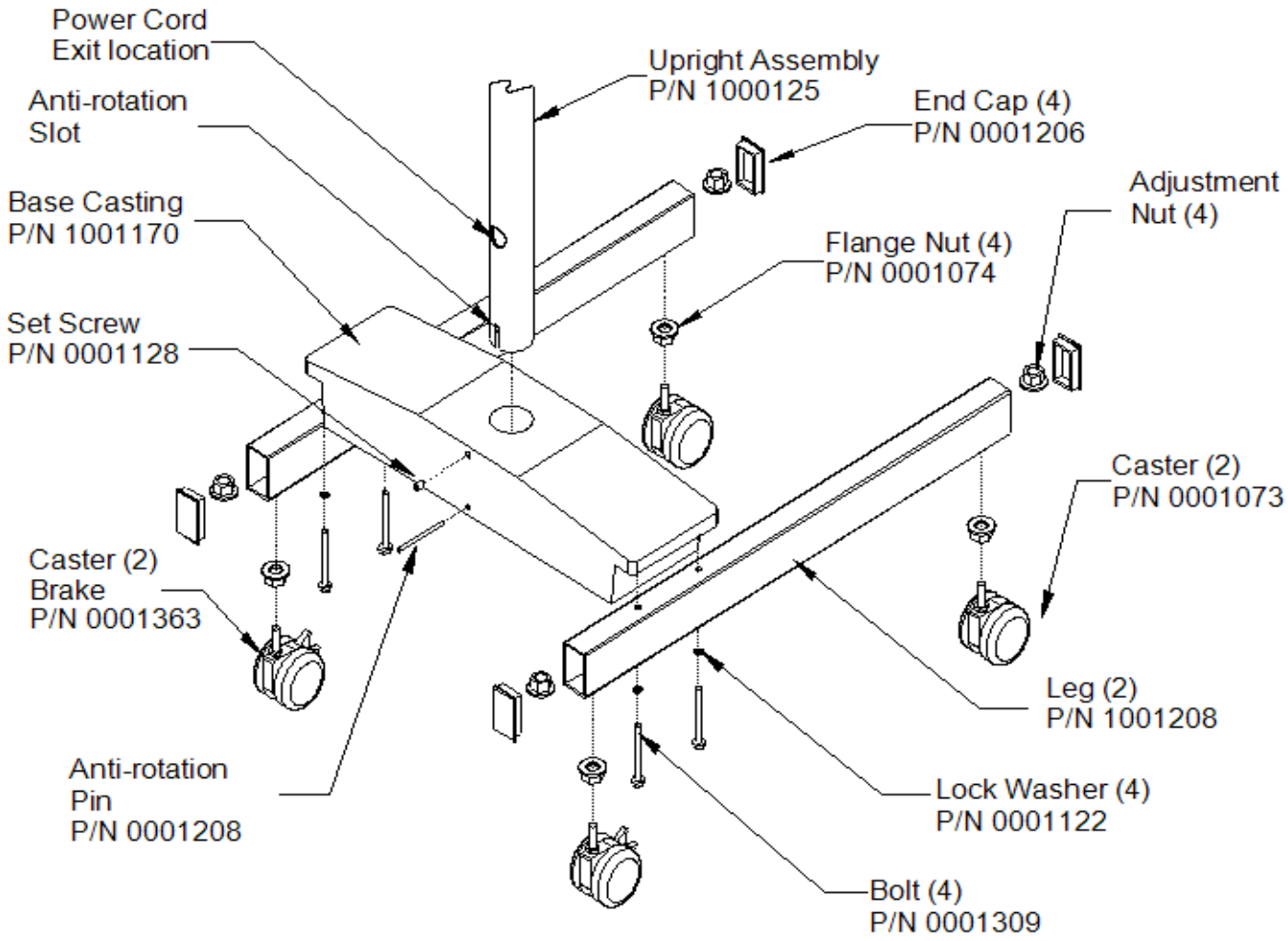



**Figure 17: Floor Stand Base Assembly**

- Bolt the assembled legs onto the cast iron base using four 1/4-20 x 1 3/4" bolts and 1/4 lock washers. Position the floor base casting so that the set-screw in the base is at the rear of the assembly. See **Figure 17: "Floor Stand Base Assembly".**
- 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 slots slides fully over the pin, and lower the pole completely into the base. The power cord (not shown) should be in line with the set-screw. Once the pole is properly positioned, securely tighten the set-screw using the 1/8 hex key provided.

# Floor Stand Light Installation (cont'd)

**⚠ Do not install the extension arm with the light head attached. Installation with the light head attached can cause damage to the light. Refer to the procedure for installing the head to the arm after the floor mount is assembled and the arm is in place.**

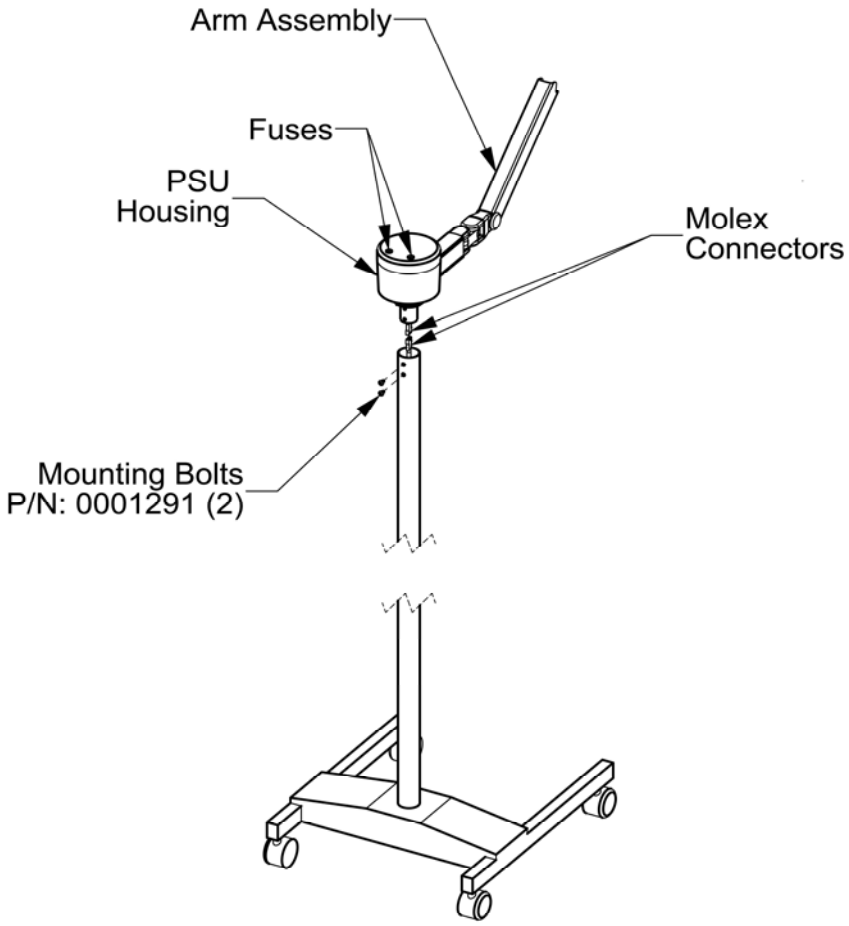



**Figure 18: Arm Assembly to Upright Pole Installation**

While securely supporting the arm assembly above the upright pole, firmly grasp the cable at the end of the pole. DO NOT allow the cable to slip into the pole as it may be difficult to retrieve it. Connect the Molex connector from the PSU housing to the connector at the end of the pole. Remove the cable tie holding the harness in place and discard it. Carefully lower the extension arm and insert the PSU housing into the tube while pushing the wiring into the pole. Secure the housing to the pole utilizing the two 1/4-20 x 3/8" bolts supplied. Tighten the bolts securely.

# Floor Stand Light Installation (cont'd)

The light arm should be between the extended legs as shown in **Figure 18: "Arm Assembly to Upright Pole Installation".**

To level the base, remove the end caps at the end of each leg and adjust the caster bolts and nuts. Once the base has been leveled, tighten the nuts securely and insert the leg cap in the end of each leg. See **Figure 17: "Floor Stand Base Installation".**

See the instructions for **Section 3: "Light Head to Arm Installation" on page 37 to complete the assembly.**

# Light Head to Arm Installation

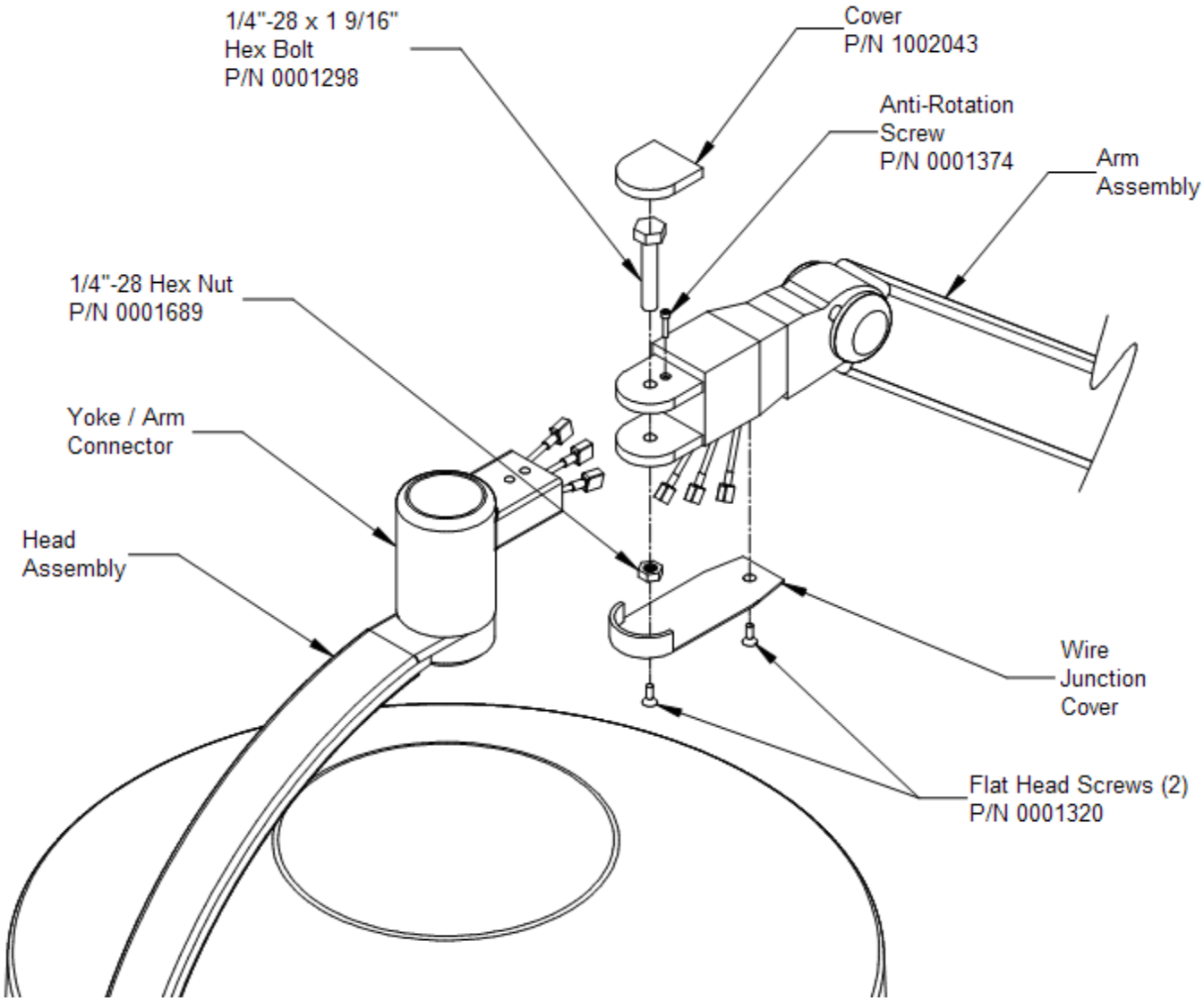



**Figure 19: Light Head-Arm Installation**

**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.**

Insert the wire set from the yoke / arm connector through the hole in the arm/wire junction.

# Light Head to Arm Installation (cont'd)

- Insert the yoke/arm connector into the arm until the bolt-holes are aligned. Insert the 1/4-28 x 1 9/16" bolt as shown being careful not to damage the wires, and secure with the 1/4-28 hex nut. Tighten the nut securely, but do not over tighten.
- Tighten the anti-rotation screw into the yoke/arm connector using the hex key provided.
- One set of wires exits from the light head assembly, and the other set exits from the arm/wire junction assembly. Connect the wires with the spade connectors: black wire to black wire, red wire to red wire, and green wire to green wire. Replace the Connection Cover and securely tighten the two screws. See **Figure 20: "Light Head to Arm Electrical Connections".**
- Press the snap cover onto the top of the hex bolt as shown on **Figure 19: "Light Head-Arm Installation".**

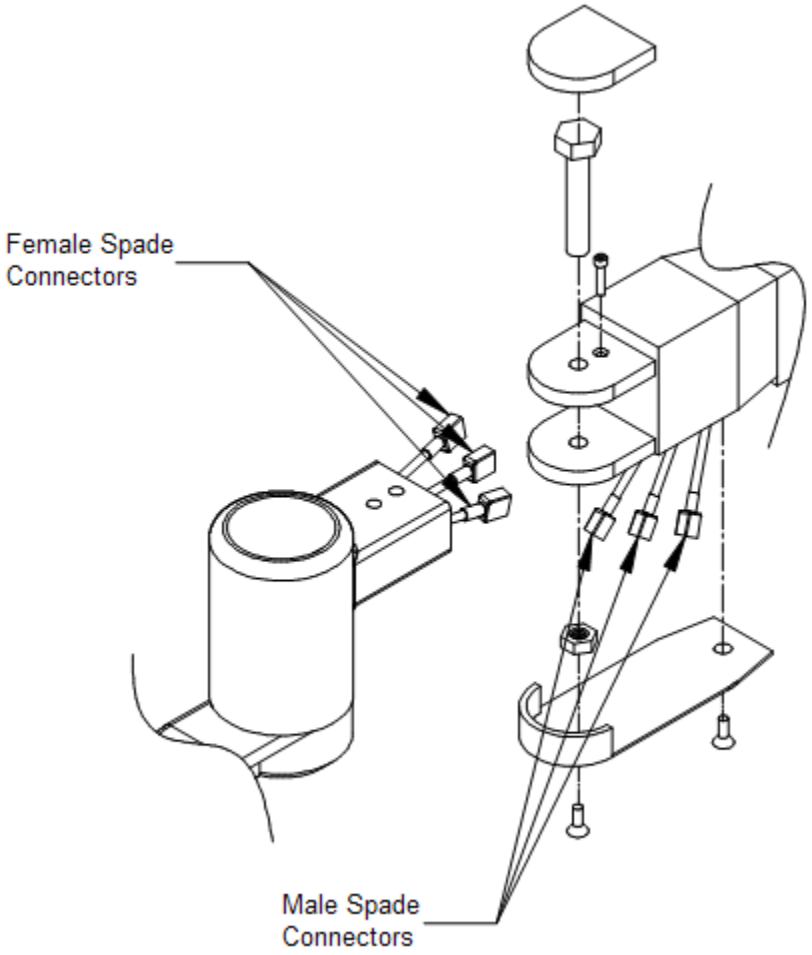



**Figure 20: Light Head to Arm Electrical Connections**

# Section 4: Operating Instructions Light Head

Power / Dimmer Button: Press button to energize or hold button for 5 seconds to de-energize lamp. While energized, press and release button to cycle thru the 3 level of dimming (100% - 75% - 50% - 100% - 75% - …).

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.

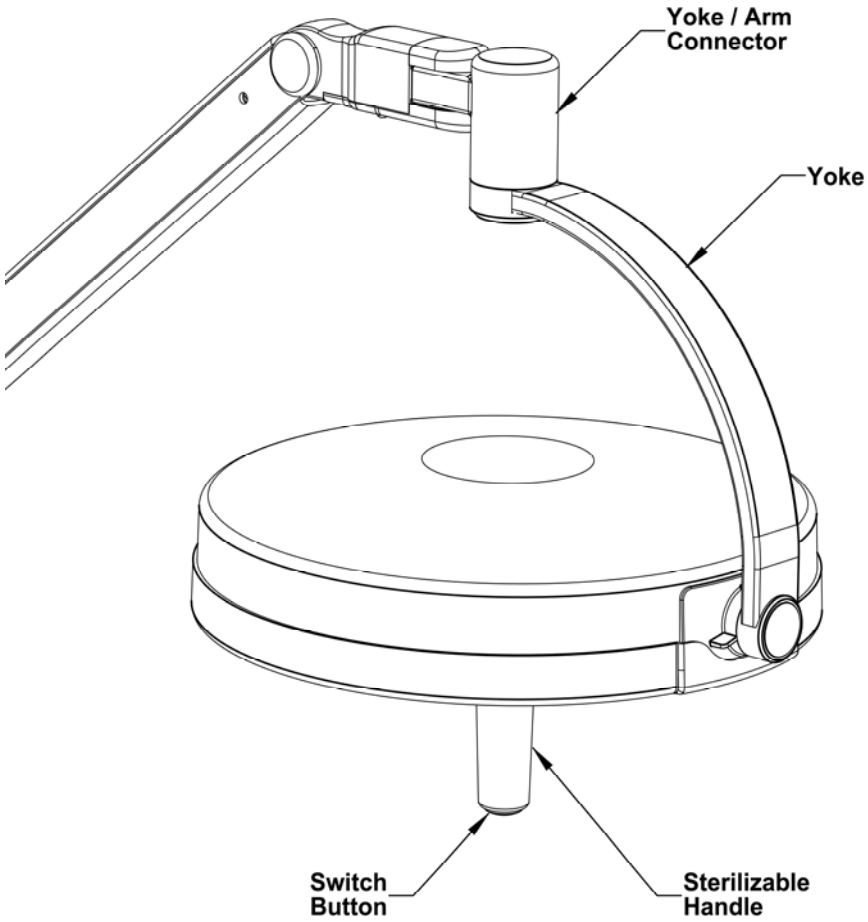



**Figure 21: Light Head Components**

# Light Head Intensity Indicators, Control and Indicator Display

The MI-750 has the dimmer button at the end of the sterile handle. Pushing this button cycles thru the dimming levels (3-2-1-3-2-1, etc…). This continues until the button is held for 5 seconds, this turns off the light. The indicator display on the light head is just above the handle. The rightmost LED indicates that the light is receiving power. In the Ceiling Mounted units this indicates that the AC to the light is active. In the Wall or Floor Light it indicates that the Cord is plugged in and AC is active. In the Battery Backup unit the LED indicates that the AC is on and that the Battery is good.

Off  Power Ready, No light

Level 3  Full Power, 3 LED's Illuminated

Level 2  Reduced Power, 2 LED's Illuminated

Level 1  Low Power, 1 LED Illuminated

The right most LED indicates that the light is receiving power. This LED should most always be on.

Fail  No Power to the light.

# Section 4

# Floor Model Positioning and Detachable Parts

## Floor Model, Transportation Position

When transporting the Floor Model Lighting System from location to location, the base should be resting on all four wheels with the wheel locks disabled. When positioned the wheel locks may be enabled as required to prevent unwanted motion.

## Positioning

When placing the light consider not only the procedure and patient but the need to have access to the cord in case of emergency. Also ensure that the cord and base are not a tripping hazard.

## Floor Model, Rough Handling & moving over a threshold

When moving the light at least one person shall keep both hands on the upright pole to stabilize and control the light. Care must be taken to protect the light as well as obstacles along the path of travel. Extra care shall be taken when transitions are encountered. The light may be tipped to move one set of wheels over a threshold before the other set of wheels

Warning: Caution when moving the light that the light does not swing and strike people or obstructions!

**WARNING: Secure the source of power using the Means of Isolation, the power cord or circuit breaker, before proceeding with electrical work.**

## Detachable Parts:

This system has only one detachable part, the Sterilizable Handle.

# Section 5: Warnings & Safety 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.**

**WARNING: No modification of this equipment is allowed.**

**After completing a repair of the unit, ensure that 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.**

**WARNING: Secure the source of power using the Means of Isolation, the power cord or circuit breaker, before proceeding with electrical work.**

**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.**

# Safety Tips (cont'd)

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

**WARNING: To avoid risk of electric shock this equipment must only be connected to a supply mains with protective earth.**

**WARNING: The MI-750 is designed not to cause interference with other devices. If interference is suspected, increase the distance between the 750 light and the suspected recipient of interference.**

# Section 6: Maintenance

**WARNING: Secure the source of power using the Means of Isolation, the power cord or circuit breaker, before proceeding with electrical work.**

**Before any Maintenance Lock-out/Tag-out the power supply or unplug the power cord before anything is started. Failure to do so could result in personal injury and/or property damage.**

## Fuse Replacement

The Single and Dual Ceiling mounted units require 1 fuse for each arm and the Floor and Wall mounted units require 2 fuses. The fuse holders are located in top cover of the cylindrical enclosure at the end of the arm. For Ceiling mounted lights remove the plastic fuse holder with a screw driver and remove the blown fuse. When replacing the new fuse, insert the new fuse into the plastic fuse holder cap and then insert the fuse into its receptacle without touching the fuse. Rotate the fuse holder cap with a screw driver.

If the fuse(s) need to be replaced, **use only** 250V/ 1.5A Slow-blow. Break capacity, 150% of 1.5A @ more than 60 min and 100% of 1.5A @ 20-300ms

IMPORTANT: Make sure that the power supply cord is disconnected from the supply outlet before replacing the fuse(s).

## LED Maintenance

The LED life (L70) is rated such that the LED will deliver, on average, 70% lumen maintenance at 50,000 hours of operation.

**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.**

# Arm Adjustment

**The arm has been pre-adjusted by the factory. Should further adjustment be necessary, utilize the following procedure.**

- Release the arm friction brake by loosening the set screw inside the Friction Adjustment Hole with an Allen wrench (3 or 4 turns). This allows the spring to move freely for a more accurate adjustment. The arm is expected to droop as the brakes are loosened.
- Remove the white rubber Cover from the spring tension adjustment slot as shown.
- Move the arm vertically until the adjustment nut is visible down inside the Slot.
- Engage the tabs of the Adjustment Wrench into the slots in the Adjustment Nut. Turn the nut in the direction of the arrow as shown in the figure to increase the arm tension. Check the progress as you go until the required adjustment is reached.

**Do not over tighten the nut. Doing so could result in equipment damage.**

- When proper tension is achieved, the arm should travel up or down an equal distance when the same amount of force is applied from above or below. When moved to the maximum Up position, it should travel back down about 1-1.5 inches (until brake is set). From maximum Down position, it should travel back up about the same.
- After the spring tension is adjusted, re-tighten the brake until the desired resistance is obtained.
- Replace the spring tension adjustment slot cover.

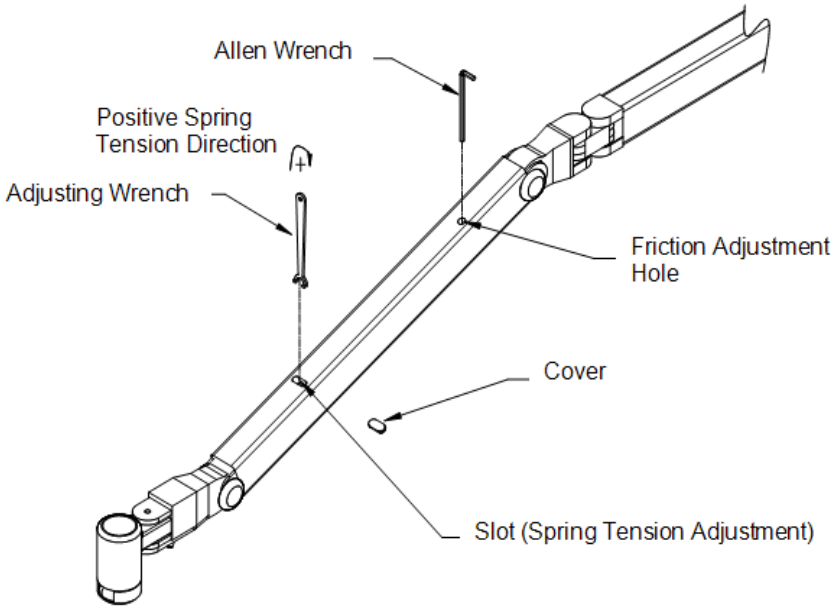



**Figure 22: Arm Adjustment**

# Section 6

# Head/Yoke Adjustment

**The head/yoke has been pre-adjusted by the factory. Should further adjustment be necessary, utilize the following procedure.**

- Locate the Friction Break Adjustment access as shown in **Figure 35: "Head/Yoke Adjustment".**
- Use the supplied Allen Wrench to increase the amount of friction applied to the rotation of the light head.

**Do not over tighten the Friction Break. Doing so could result in equipment damage.**

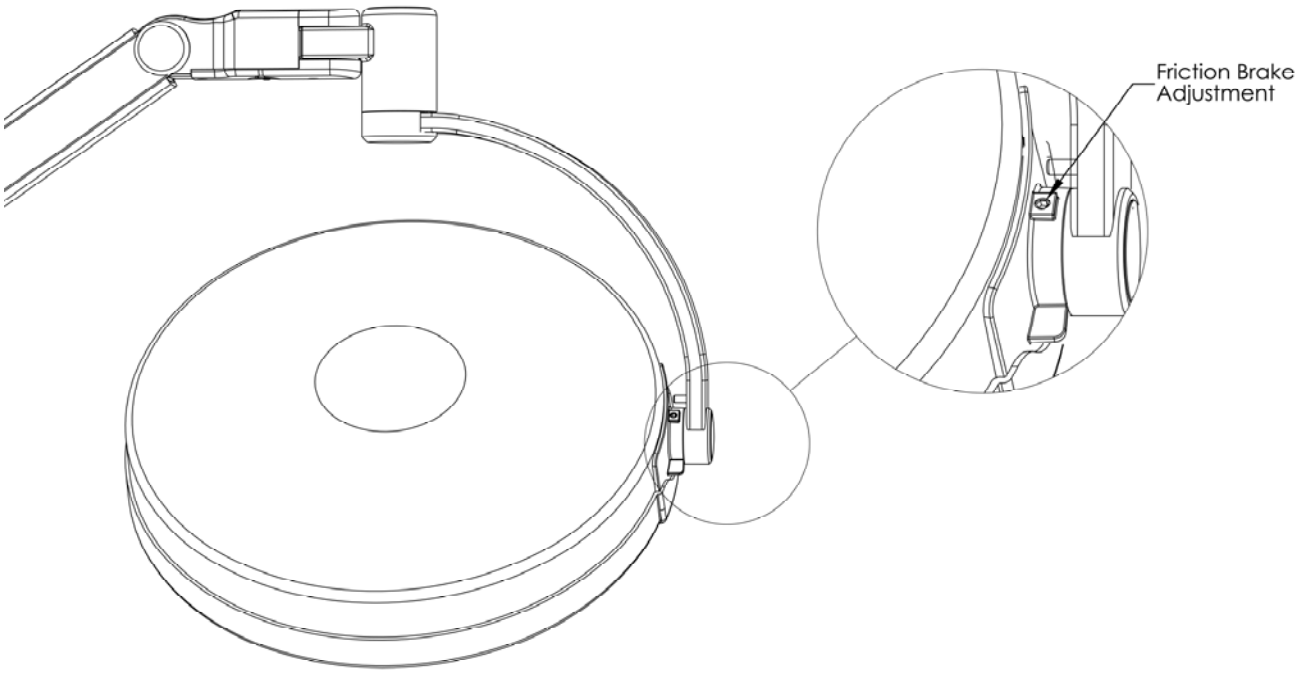



**Figure 23: Head / Yoke Adjustment**

# Section 6

# Handle Sterilization

- Remove sterilizable handle by pressing the button near the base of the handle and pulling the handle off the handle post.
- 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. The responsible organization (operator/owner of the equipment) shall follow the national requirements (standards and directives) for hygiene and disinfection.

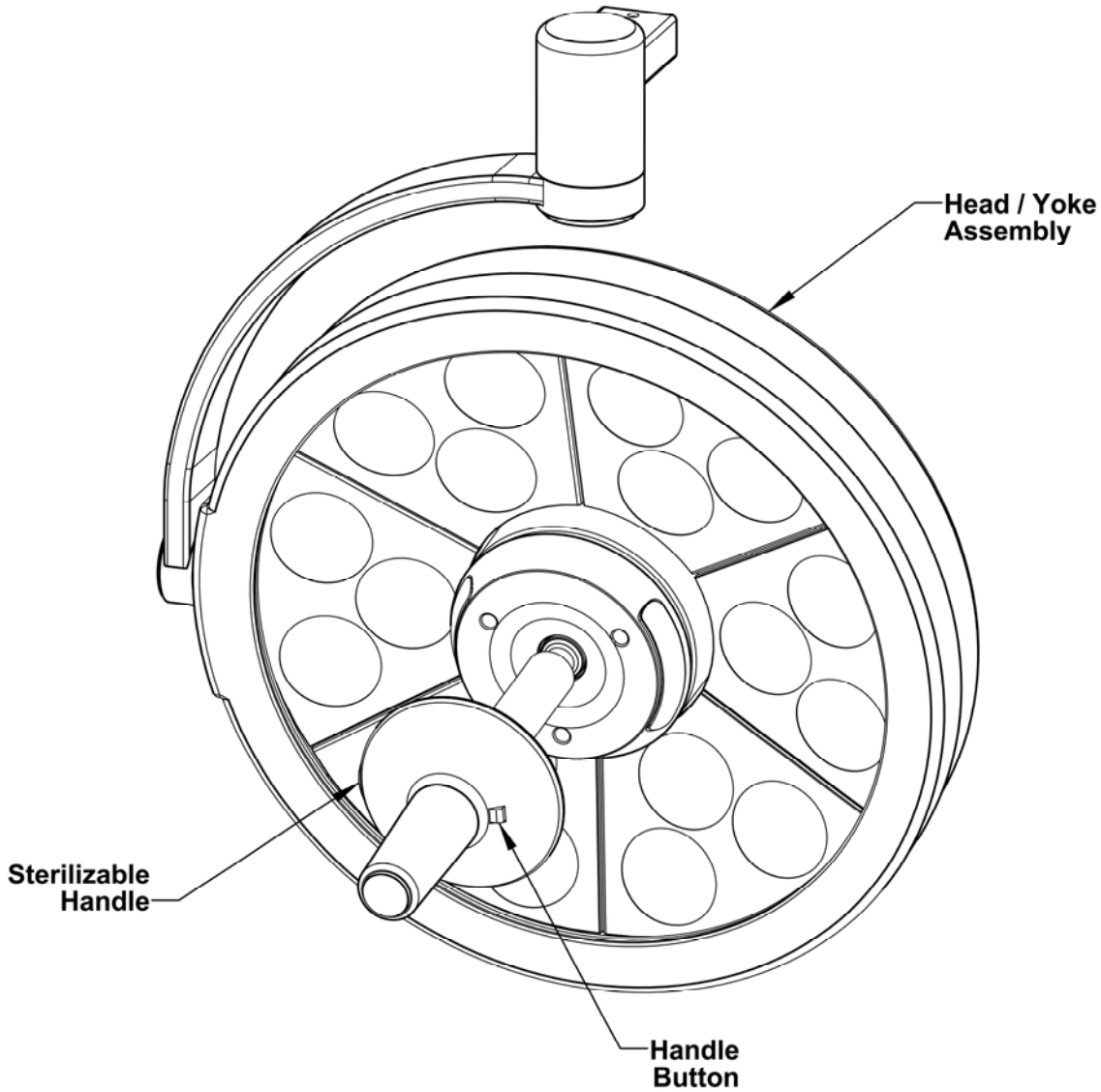



**Figure 24: Handle Sterilization**

# Section 6

# Cleaning Instructions

- 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 front lens. 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(s) 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.

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

**The MI-750 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.**

**Long term exposure to cleanings and disinfectants will reduce the life expectancy of some of the light and arm components.**

**The responsible organization (operator/owner of the equipment) shall follow the national requirements (standards and directives) for hygiene and disinfection.**

# Section 6

# 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 position properly (drifts from original position) refer to **Figure 22: "Arm Adjustment" on page 45.** 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 7: Troubleshooting
# General Troubleshooting

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

| Problem | Cause | Remedy |
|---|---|---|
| Light will not turn on or stay on | Power to unit is off (not plugged in) | Turn on power (plug in unit) |
| | Blown (open) fuse | Replace fuse |
| | Exposed wires are cut or damage | Replace wire assembly |
| | Wire not connected correctly during installation | Check all wiring connections |
| | Wire connections made during installation have disconnected | Reconnect wires per the instructions |
| | No input power to light unit | Check power input connections and circuit breakers |
| | Disconnected wires at switch or PSU | Reconnect wires |
| | No power output from PSU when input power to PSU is measured | Replace PSU |
| | Wire connections made during installation have been reversed | Connect proper wires together: black-black and red-red |
| | Sterilizable handle button not engaging power push button switch properly | 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 |
| Light does not maintain its position vertically | Spring tension is incorrect. | Adjust spring. |
| | Additional equipment was added to unit. | Remove any additional equipment from arm. |
| Light does not maintain its position horizontally | Mounting bracket is not level.<br>Hex nuts on pivot bolts are loose. | Adjust or shim as necessary.<br>Remove plastic caps and adjust as necessary. |

# General Troubleshooting (cont'd)

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|---|---|---|
| Light head will not rotate at yoke interface | Light head is against internal stop. | Rotate head in opposite direction. |
| 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.<br>Upright is not fully seated on anti-rotation pin. | Securely tighten set screw.<br>Reinstall upright. Ensure the upright fully seats on the anti-rotation pin seats. |
| Light output is irregular in shape or intensity | Input voltage does not correspond to rating label.<br>The light head is not mounted on the proper arm (Combo models). | Check circuit to which light was installed.<br>Remount light head on the correct arm. |