

Section 3: Installation/Assembly

Single and Dual Ceiling Diagrams

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

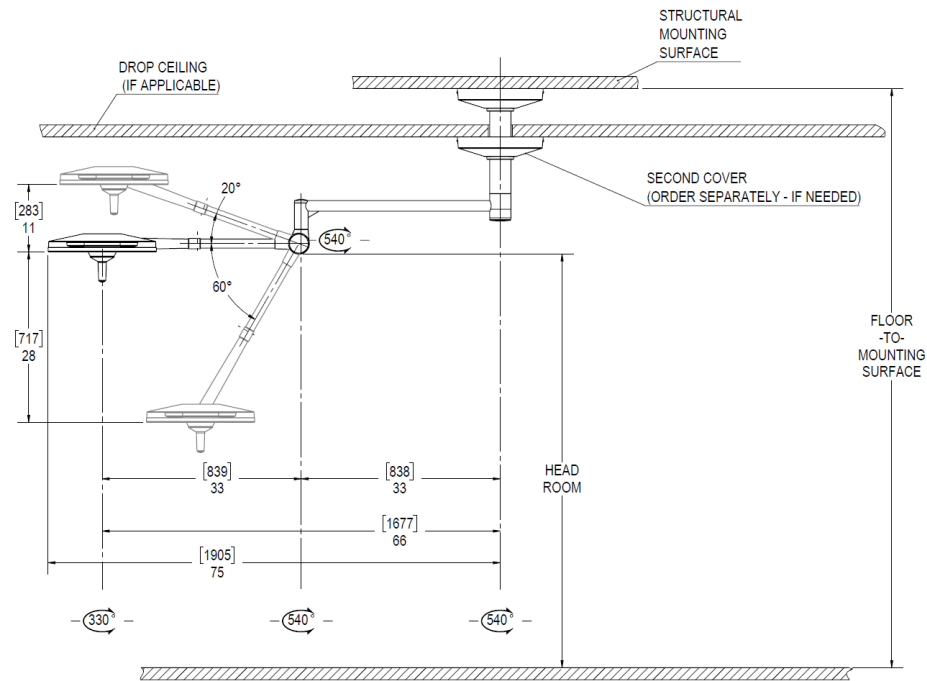


Figure 1: Single Ceiling Mount

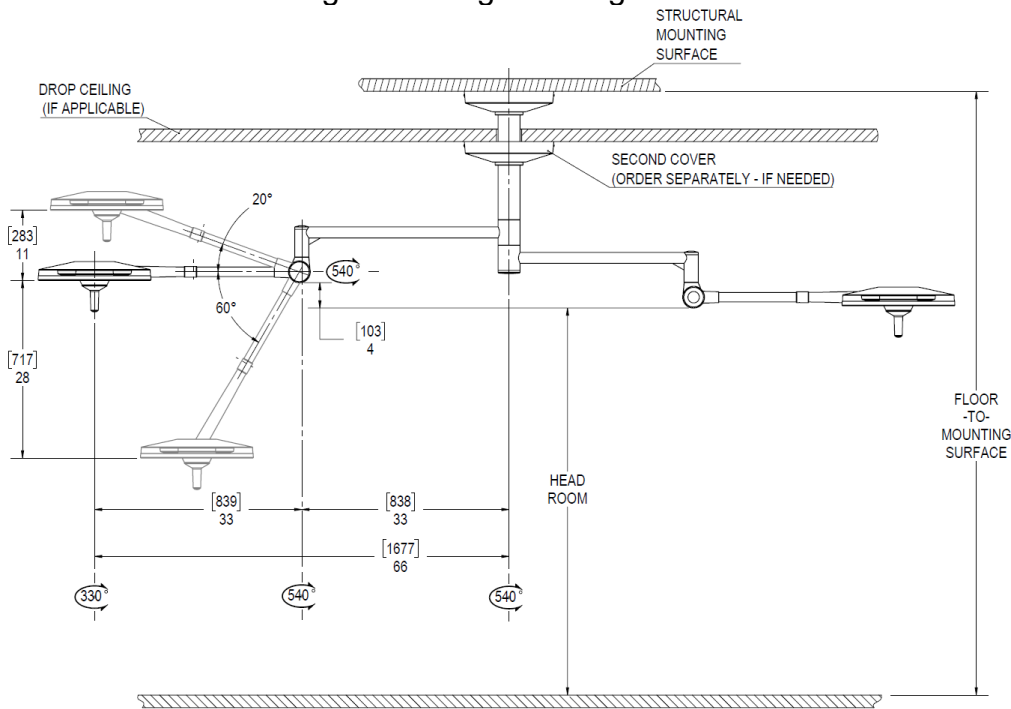


Figure 2: Dual Ceiling Mount

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.

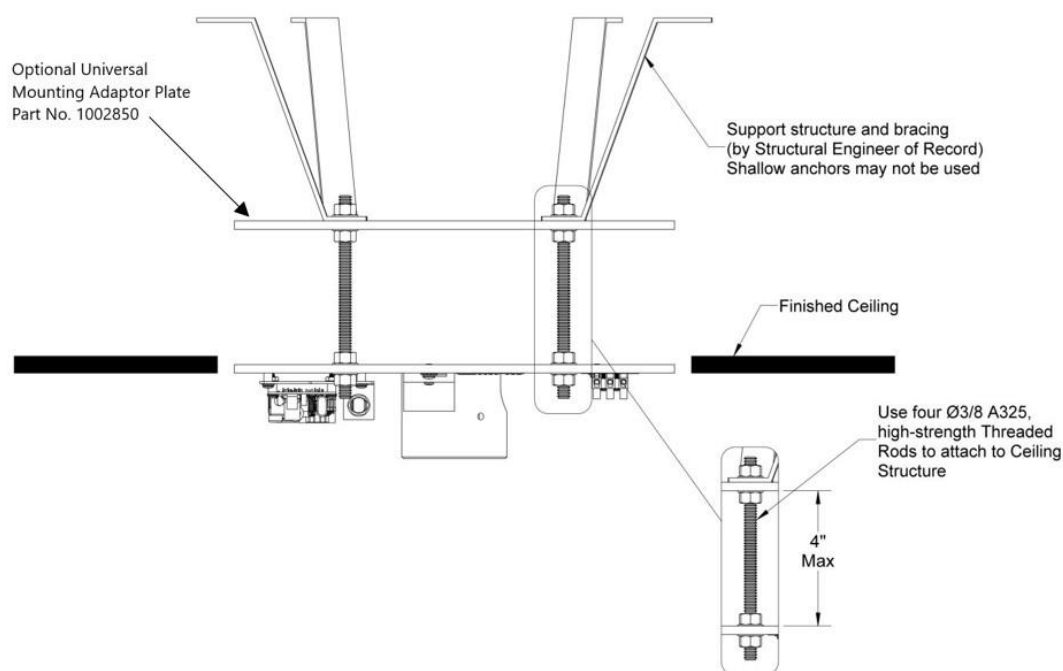


Figure 3: Recommended Ceiling Structure Construction

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.

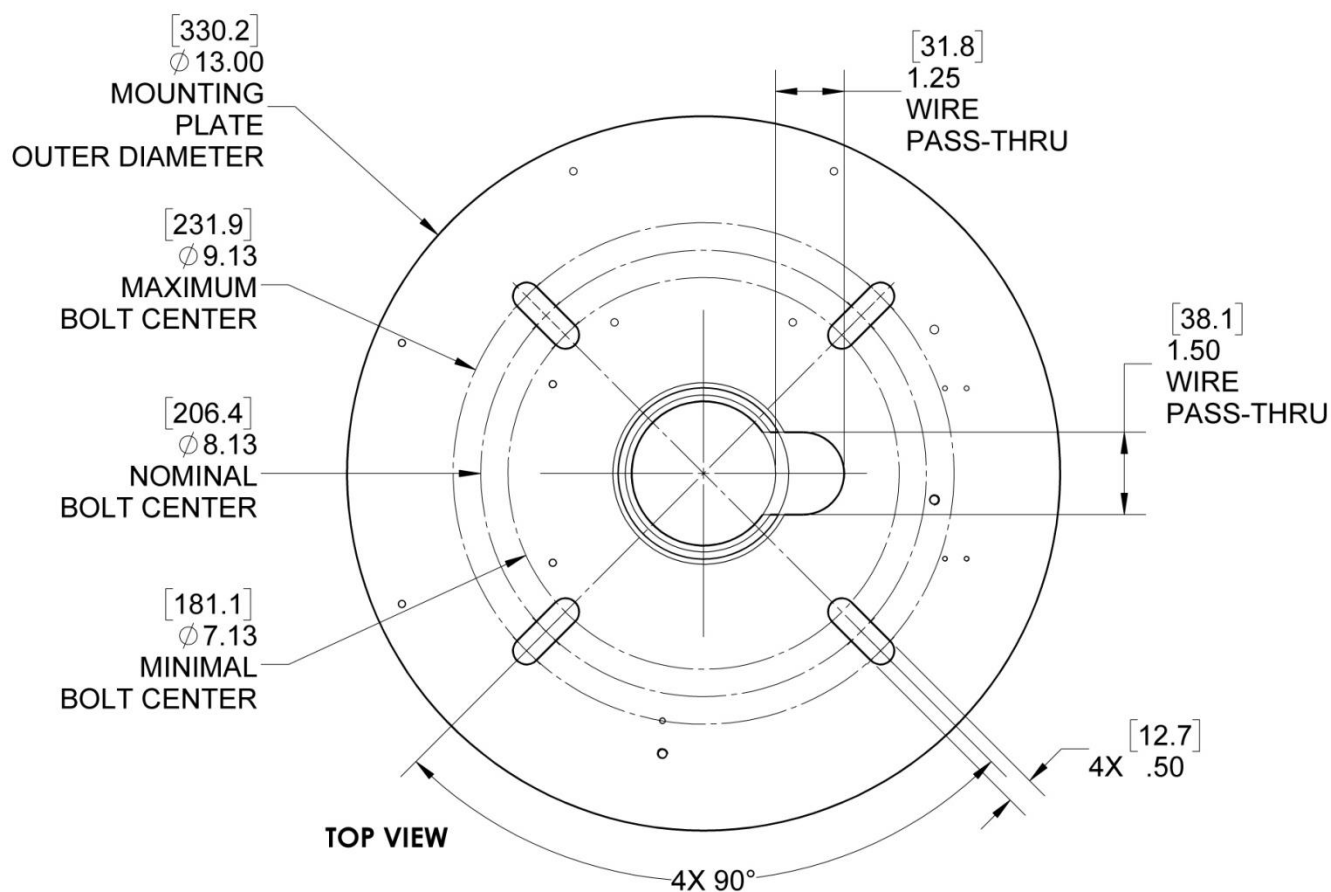


Figure 4: Mounting Dimensions for Ceiling Mount Assembly

Arm Cable Termination

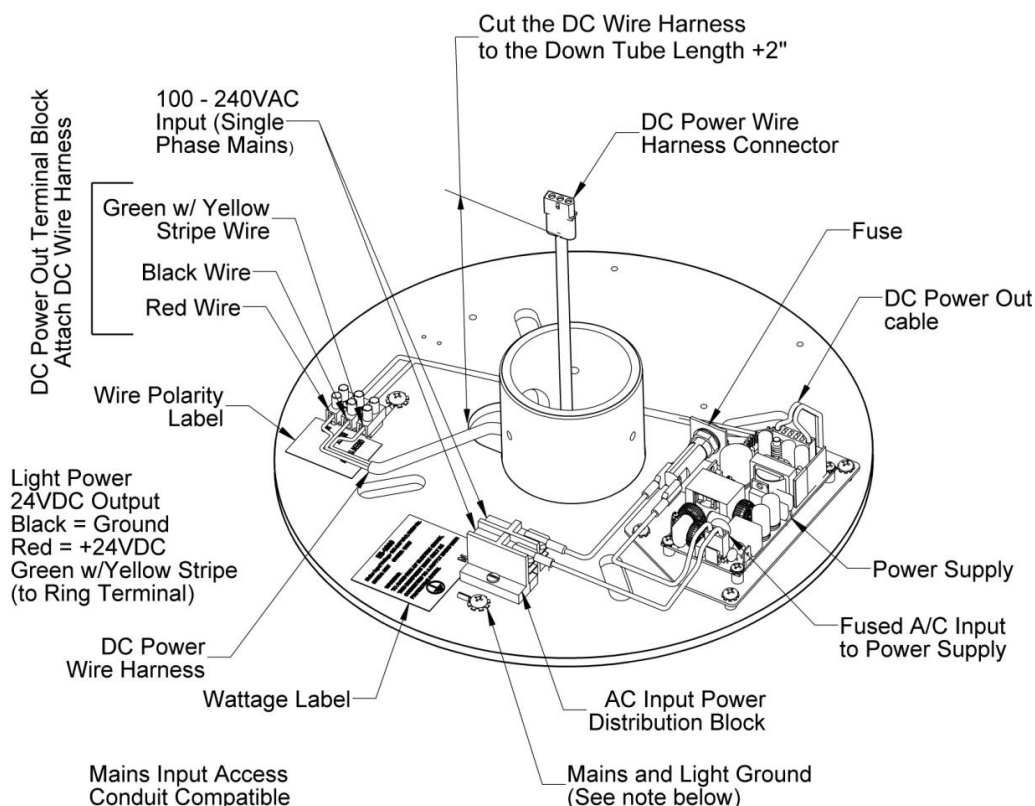


Figure 5: Arm Cable Termination

(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.

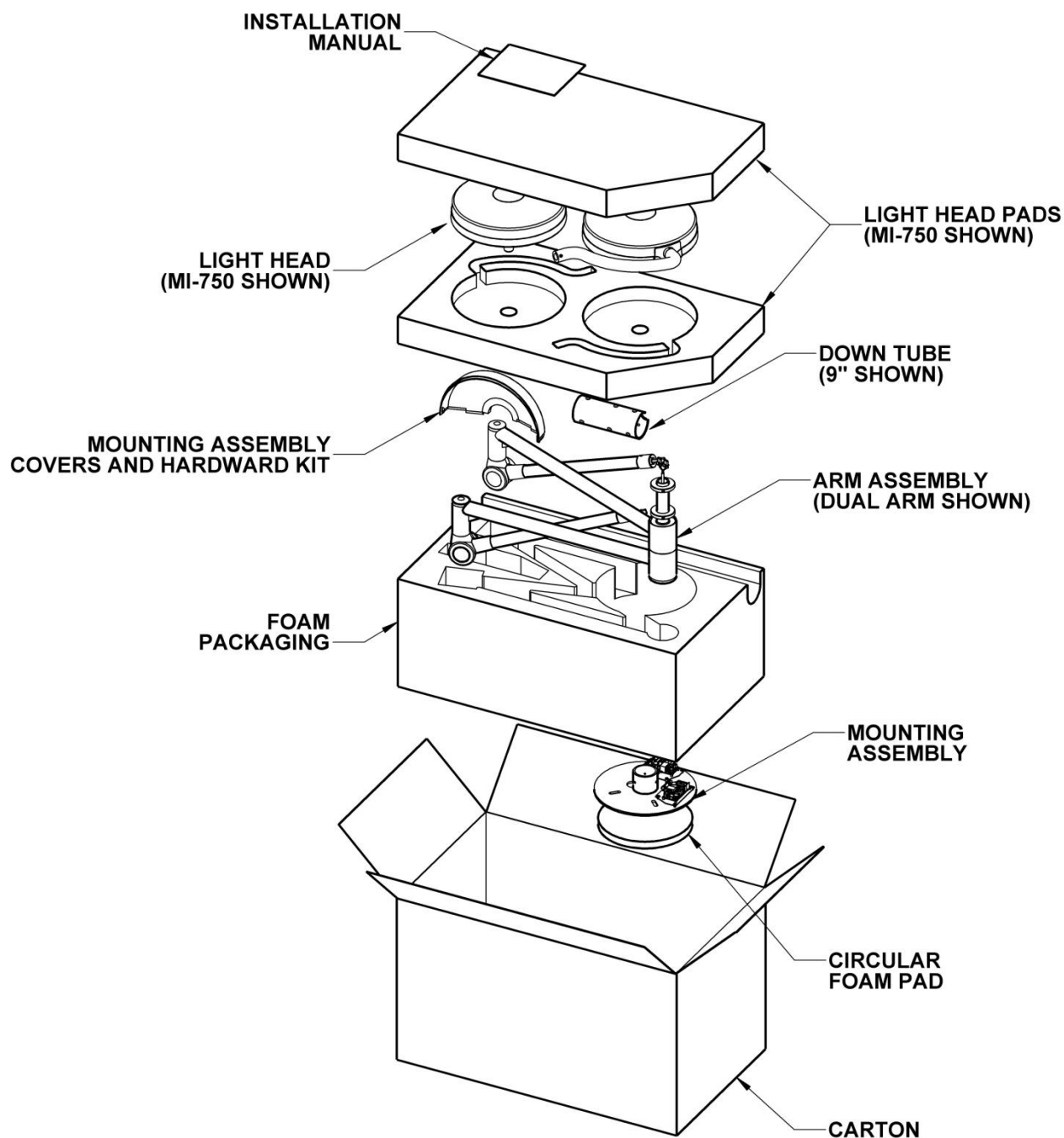


Figure 6: Packing Contents
(Dual MI-750 shown)

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.

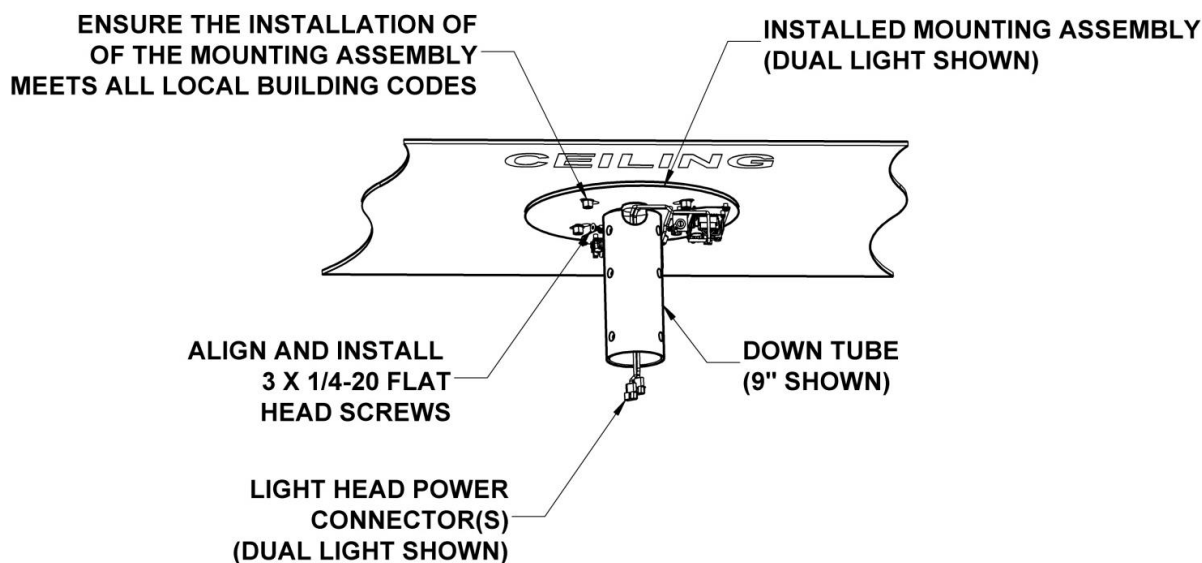


Figure 7: Mounting Plate Installation



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

Installing the Arm Assembly

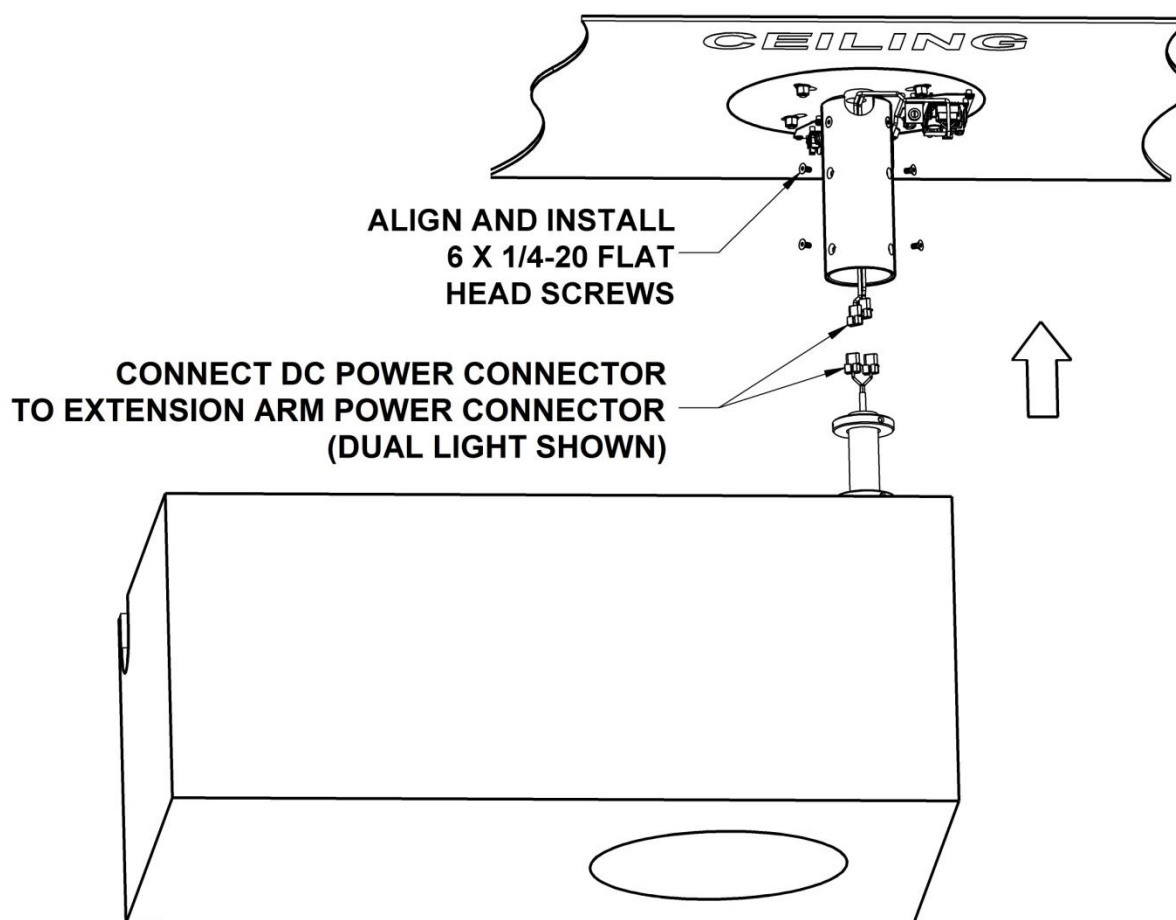


Figure 8: Installing the Arm Assembly

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

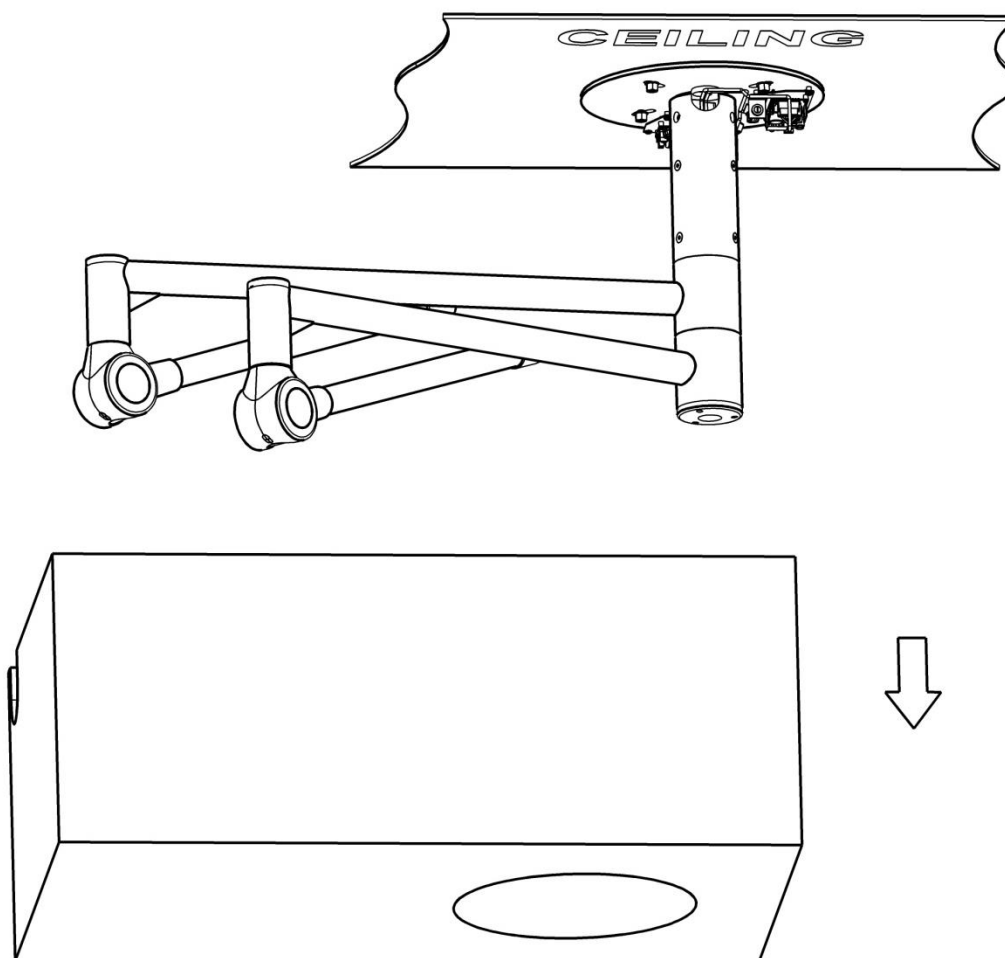


Figure 9: Finishing the Arm Assembly Installation

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

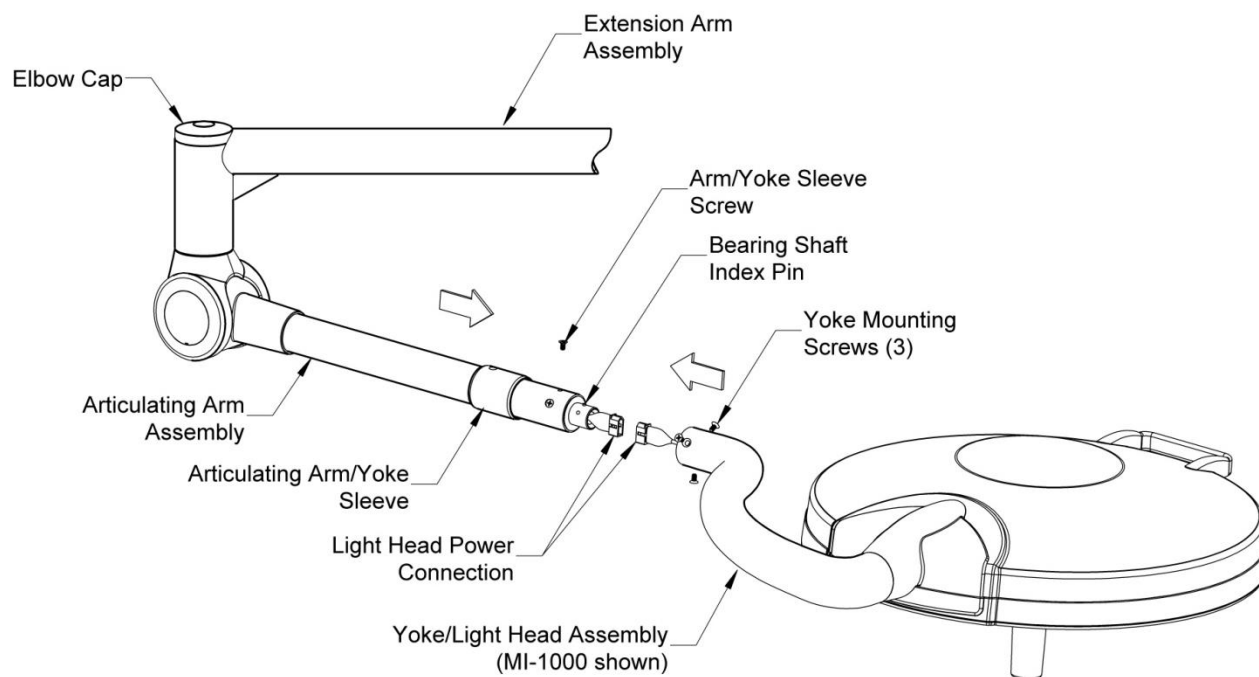


Figure 10: Installing the Light Head

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.

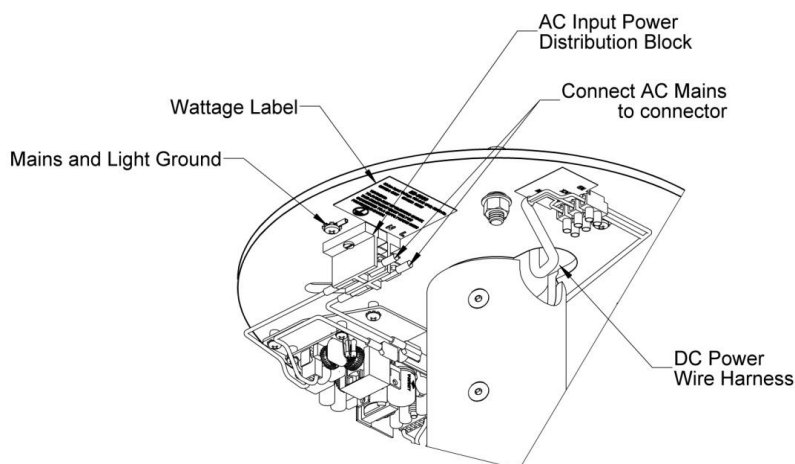


Figure 11: Connecting AC Mains

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

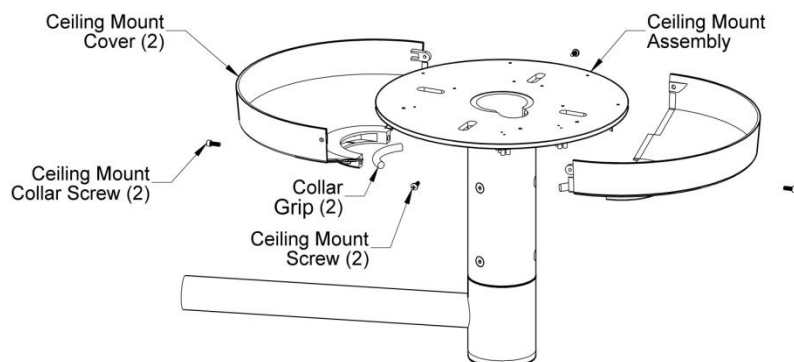


Figure 12: Installing the Ceiling Mount Covers

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.

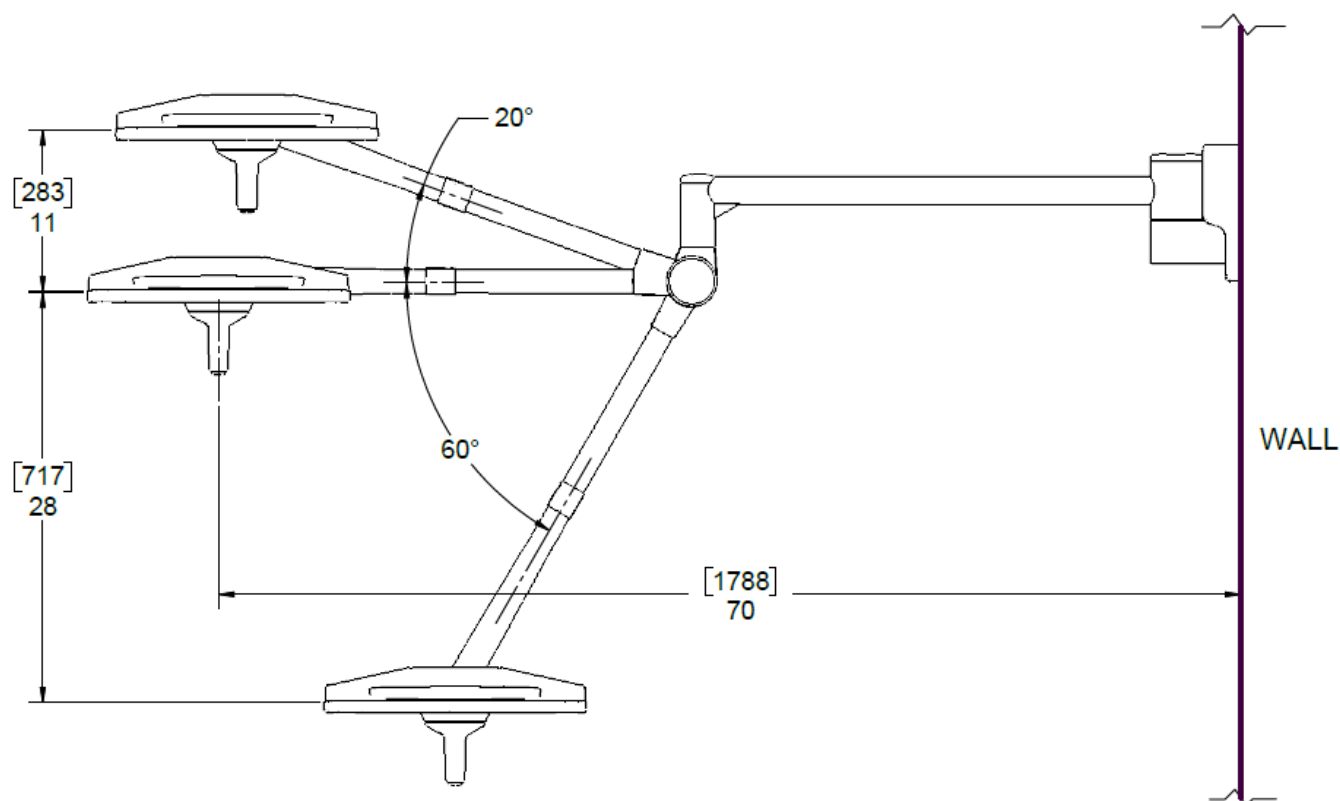


Figure 13: Wall Mount

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.

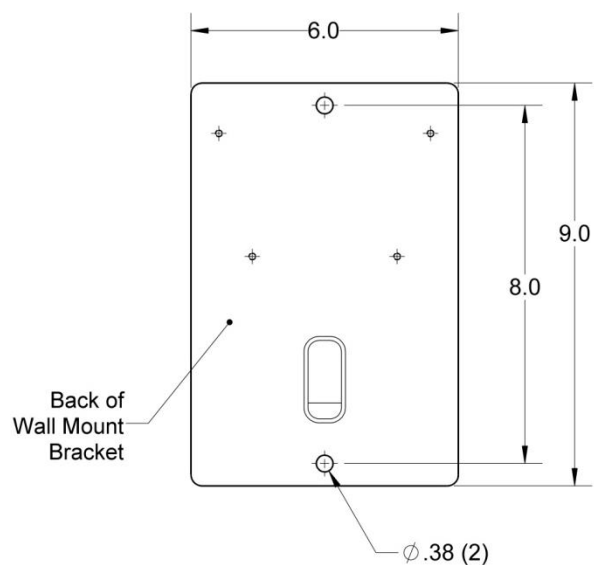


Figure 14: Wall Bracket Mounting Template

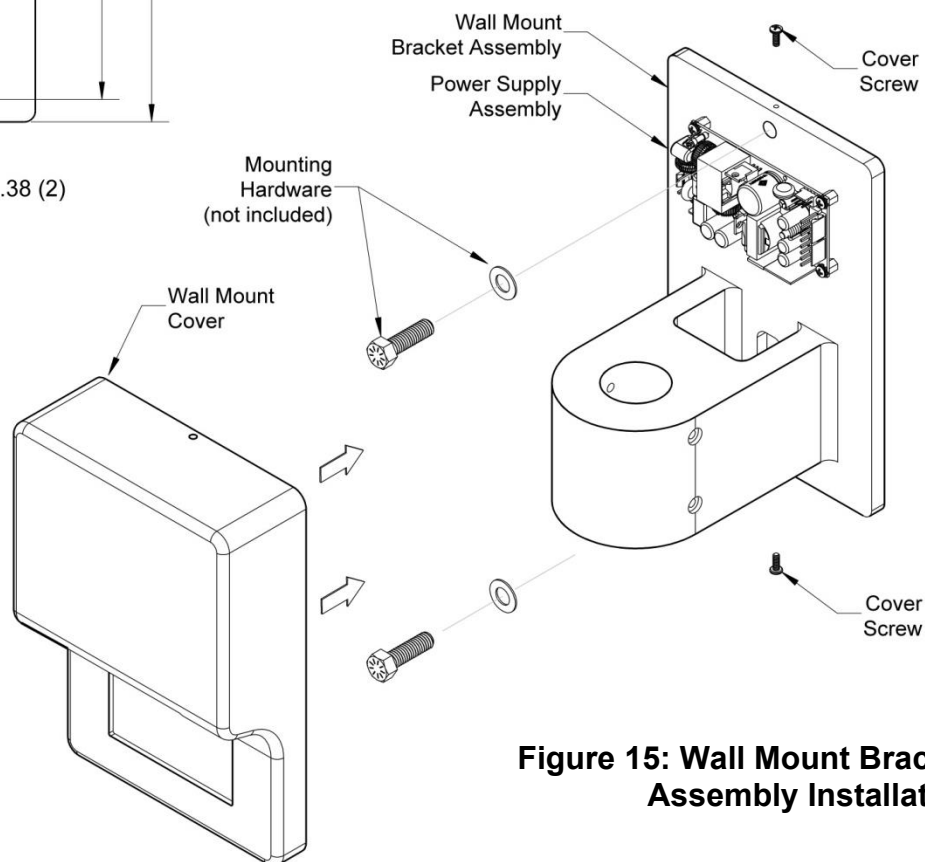


Figure 15: Wall Mount Bracket Assembly Installation

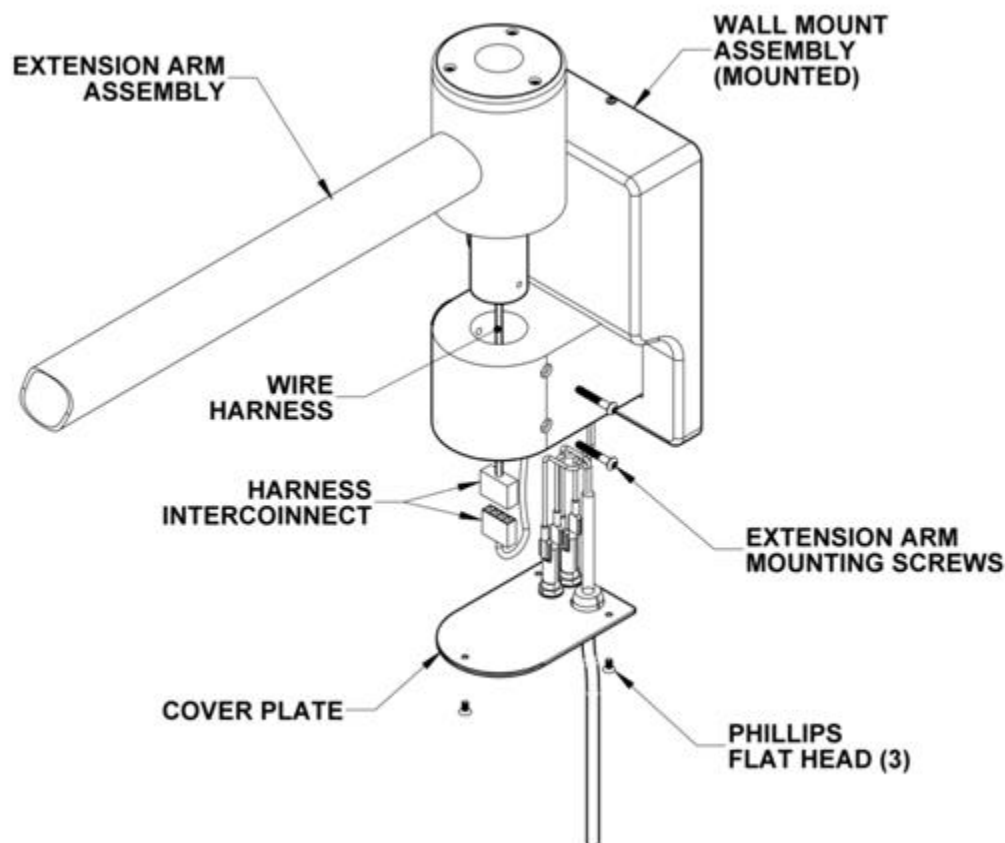


Figure 16: Extension Arm Mounting on Wall Bracket

⚠ 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

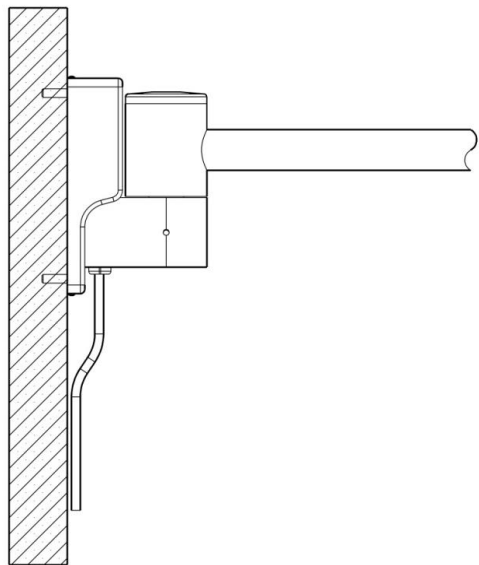


Figure 17: Wall mounting with load anchor or stud-anchor

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)

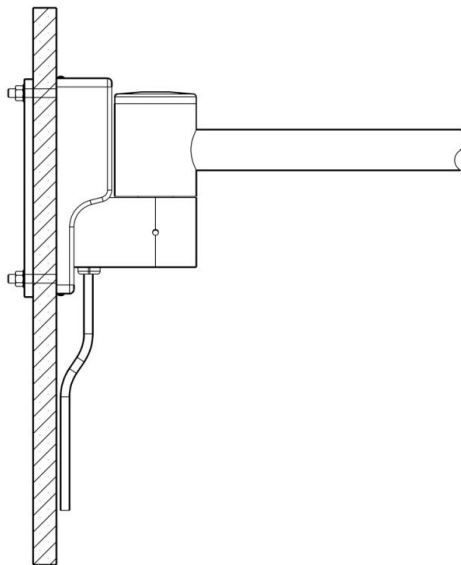
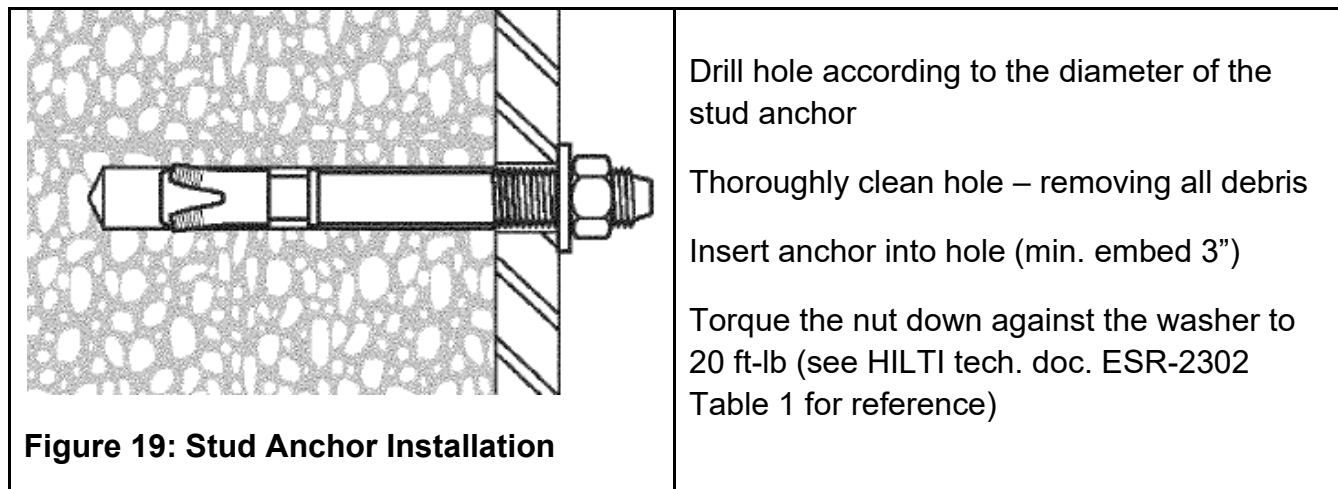


Figure 18: Wall mounting with Back-Plate

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.

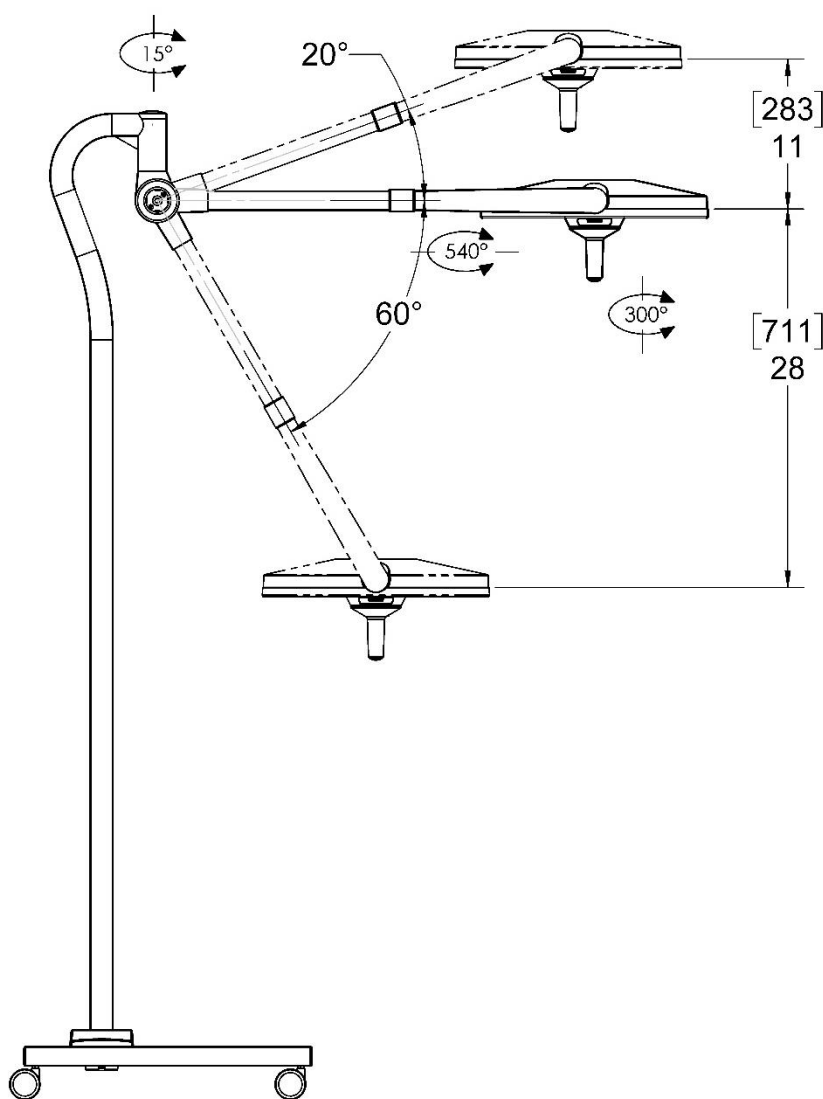


Figure 20: Assembled Floor Stand Light

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.

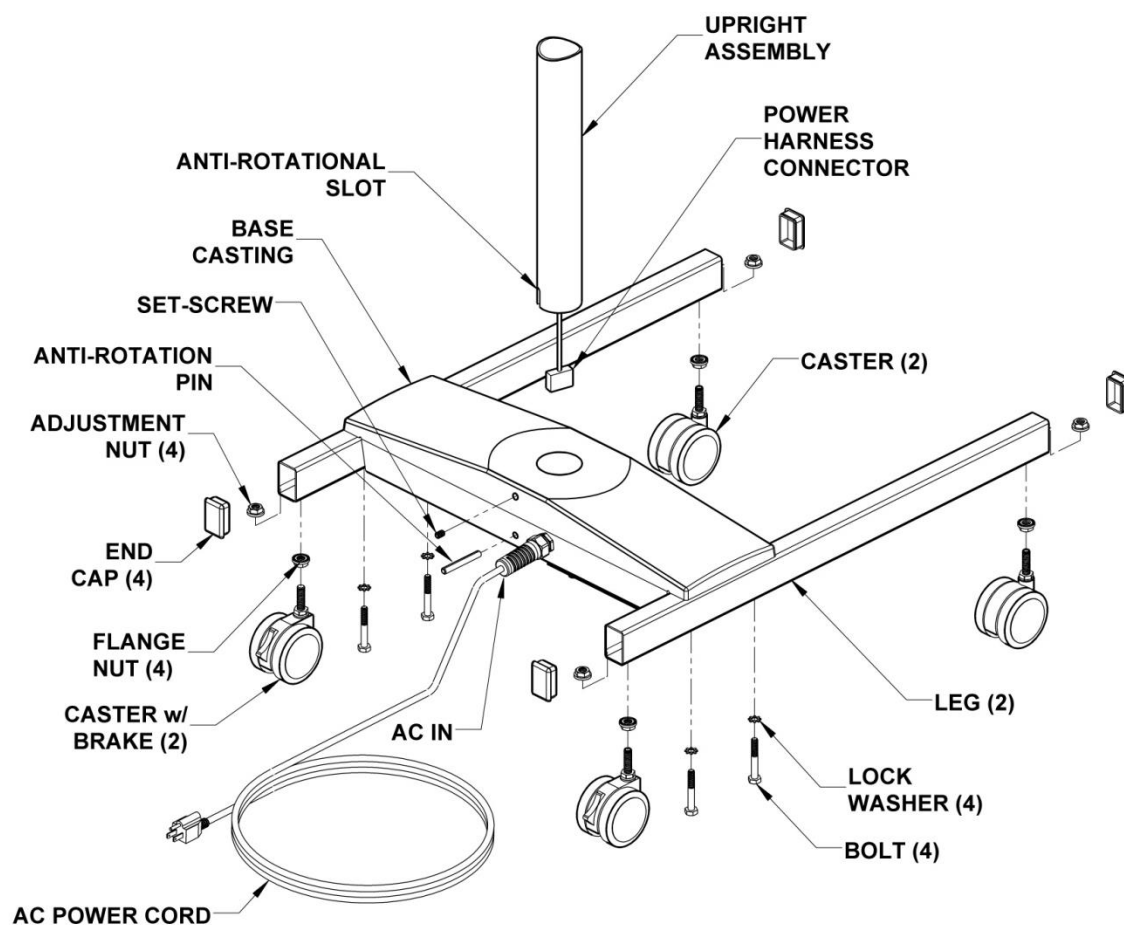


Figure 21: Floor Stand Base Installation

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

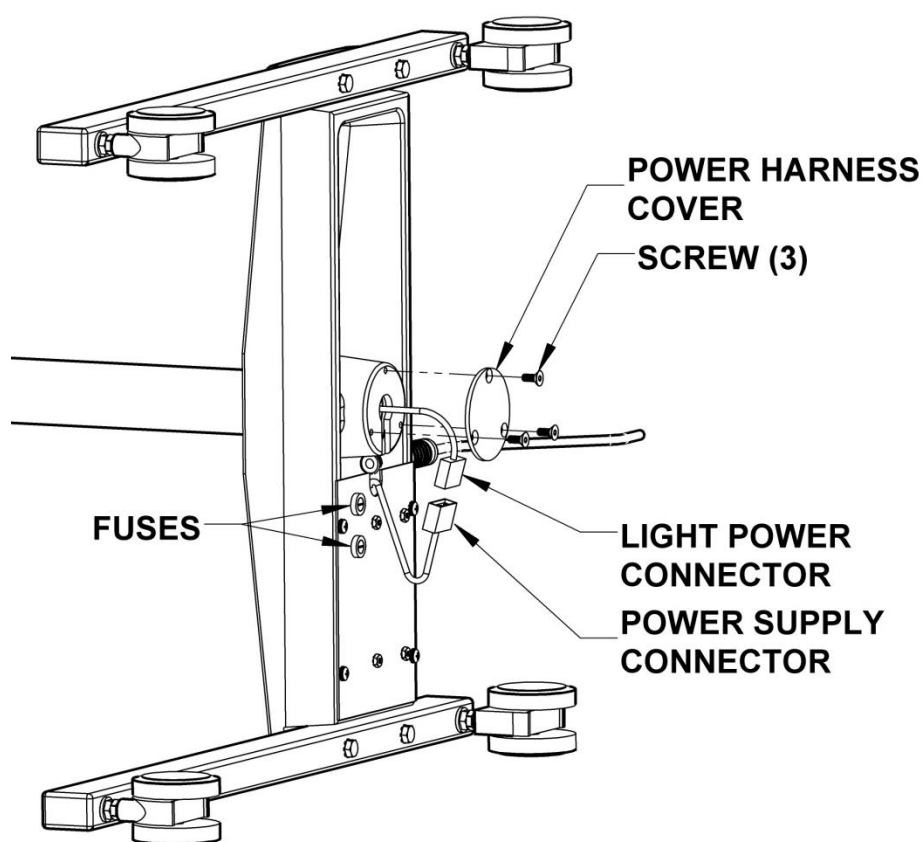


Figure 22: Floor Stand Electrical Connection

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.

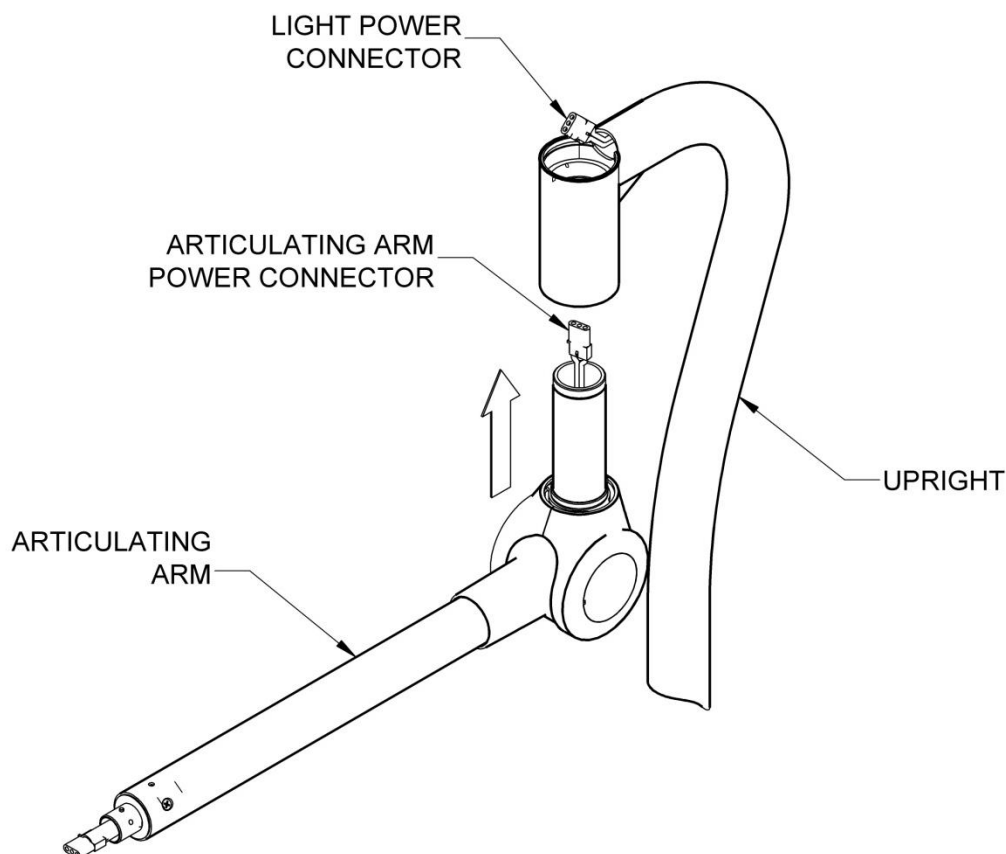


Figure 23: Installing the Spring Arm on the Floor Model

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)

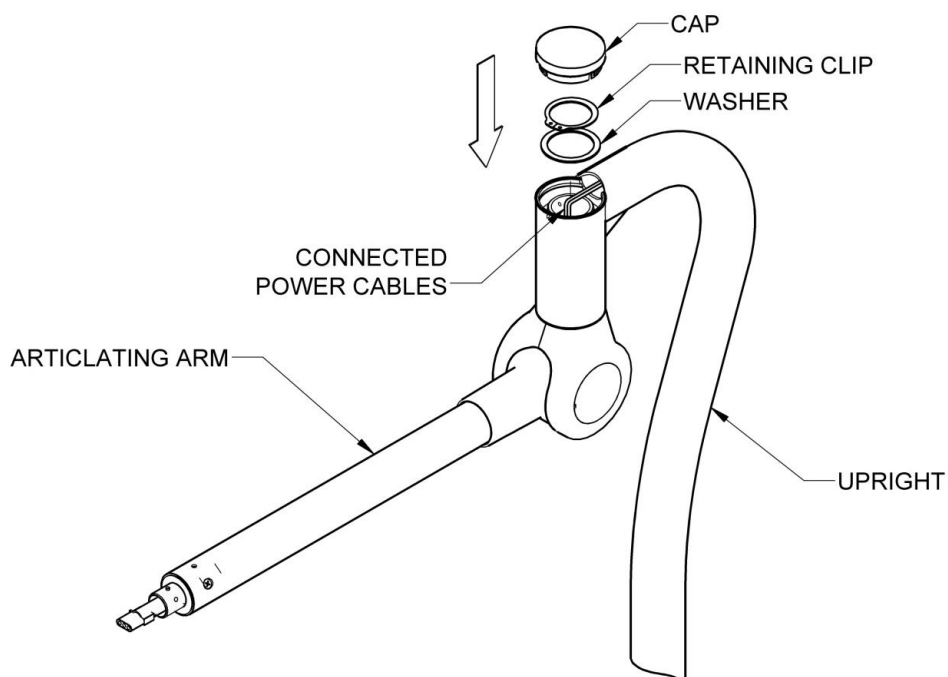
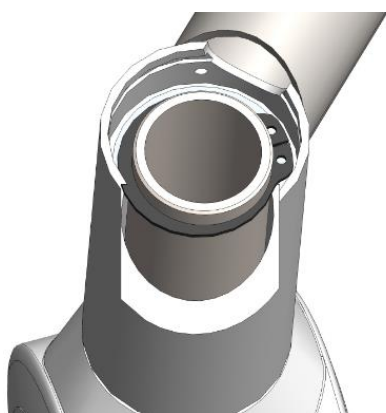


Figure 24: Spring Arm Attachment and Electrical Connection



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

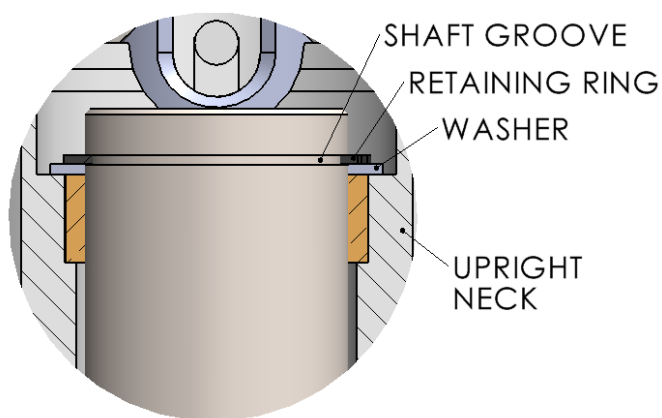


Figure 25: Retaining Ring Installed

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.