



APEX

Installation, Instruction for Use
and Maintenance

PHILIPS
burton

Introduction

Congratulations on your purchase of the Apex major surgery light!

Intended Use:

The Apex is to be used as a stand alone light for general surgery used to provide illumination of the surgical field. The use of the light is at the doctor's discretion during procedures.

The Apex major surgery light may be used as a single- or double-mounted light in hospital operating rooms, emergency rooms, trauma rooms, and outpatient clinics for major and minor surgeries. Effective working distance between patient and light head is from approximately 0.6 to 1.5 meters. The single-point fixed ceiling mount can accommodate one or two light heads.

The installation manual gives instructions on how to install the Apex surgery light, both single and double ceiling versions. It also includes instructions on operation, maintenance and cleaning.

Please read these installation instructions very carefully and follow the safety instructions and requirements.

Philips Burton Medical is a leading manufacturer of medical lighting. The product lines encompass lights for procedure, examination and surgery applications. You are welcome to find out more on our web site at www.burtonmedical.com.

This manual contains detailed information on the above, but responsibility for effective installation ultimately rests with skilled and qualified contractors. Products should at all times be handled by qualified staff; it is the responsibility of the user to ensure this is the case.

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The following models are covered in this manual:	
APXSC8	Single Ceiling, 8', 120V
APXDC8	Double Ceiling, 8', 120V
APXSC801	Single Ceiling, 8', 100V
APXDC801	Double Ceiling, 8', 100V
APXSC825	Single Ceiling, 8', 230/240V
APXDC825	Double Ceiling, 8', 230/240V
APXSC825SP	Single Ceiling, 8', 230/240V, Spanish
APXDC825SP	Double Ceiling, 8', 230/240V, Spanish
APXSC10	Single Ceiling, 10', 120V
APXDC10	Double Ceiling, 10', 120V
APXSC1001	Single Ceiling, 10', 100V
APXDC1001	Double Ceiling, 10', 100V
APXSC1025	Single Ceiling, 10', 230/240V
APXDC1025	Double Ceiling, 10', 230/240V
APXSC1025SP	Single Ceiling, 10', 230/240V, Spanish
APXDC1025SP	Double Ceiling, 10', 230/240V, Spanish

Unpacking and Inspection

Carefully unpack the cartons and match the parts received with the Component Identification Diagram in Section 3.0 enclosed.

Before Reporting Shortages:

Be sure you have received the correct number of boxes, cartons, etc., as shown on the bill of lading.

Check the entire shipment against the enclosed packing slip.

Items indicated in the column headed "Back Order" are not included in the shipment and will follow later.

Be sure that nothing has been removed from the cartons before they are checked by the individual in charge.

Empty all boxes completely, open all inside containers, and examine all packing material to ensure small articles are not overlooked.

If a Shortage or Damage Occurs:

1. You, the receiver, not Burton Medical, is responsible for filing any claim(s) with the delivering carrier within five (5) days after receipt of the shipment.
2. If damage or shortage occurs in transit, the delivering carrier is required by law to make notation of a shortage or damage. This notation is to be made on the bill of lading.
3. If, in your opinion, there may be concealed damage, an agent from the delivering carrier is obligated to make an inspection after the goods are unpacked.
4. Do not destroy packing material until after the agent has made out his report.
5. All claims must be made to the carrier, not Burton Medical.
6. Written authorization must be obtained from Burton before merchandise can be returned.

1.0 Safety Instructions

Please note that assembly of this product must be carried out by a trained service technician. At some points of assembly you may require the assistance of an additional person.

- Please make sure to follow these instructions when assembling. DO NOT modify any parts before, during, or after assembly.
- If problems are encountered when assembling, please contact Burton technical support. The contact information can be found at the end of this manual.
- To avoid an electric shock, please make sure the light is not connected to a power supply when assembling.
- These assembly instructions only apply to the products listed here and should not be used for any other products.

1.1 Symbols

In these assembly instructions and on the device, important points have been marked with symbols. Symbols used in this manual.



CAUTION

Non-compliance with caution notes may cause injuries or material damage.



WARNING

Disregarding this instruction can present the risk of serious or fatal injury.



NOTE

Provides usage tips and useful information.

1.2 Safety Precautions



CAUTION

Failure to properly follow installation and preventive maintenance instructions may result in mechanical failure.



WARNING

Before undertaking any work, ensure that the main power is off and secured from accidentally being switched on again.



NOTE

This light should only be installed by a qualified electrical and structural contractors*.



NOTE

It is the responsibility of the customer to make sure the supporting wall/ceiling and the anchoring is safe, adequately strong and in compliance with all applicable building codes. (See: Static Inspection section 4.9, Equipment Anchorage Instructions Section 2.2, and Seismic Anchorage Diagrams section 4.8)











NOTE

This fixture is not intended for use in areas with high concentration of oxygen or nitrous oxide.

***Approved wiring shall be routed inside conduit between the wall switch junction box to the transformer junction box and then to the back plate of the ceiling mount. The installation shall meet requirements contained in the latest issues of the NEC and NFPA, and other local and national building codes; as they apply to hospitals, clinics, medical offices, and the like.**

1.3 Symbols & Warnings Used on the Product

	Ground connection, unprotected
	Protective ground connection
	Hot surface
	Alternating current
	CE-conformance mark
	Attention, consult accompanying documents
	Dangerous voltage
	Indicates separate collection for electrical and electronic equipment

2.0 Assembly Preparations

2.1 Tools and Accessories Required:

- Drill
- Level
- 9/16" (14,3 mm) open-end wrench (or adjustable wrench)
- Wire cutter/stripper
- Allen key (3/32 in / 2,4 mm)
- Screwdriver, small flat-blade
- Screwdriver, small Phillips
- Wire nuts and wiring for supply connections

2.2 Support and Anchorage

To prevent sway and provide proper support of the light, the ceiling mount must be attached to a structurally-sound ceiling. Most ceilings will require additional reinforcing to hold the light. It is the responsibility of the customer and the installing contractor to provide the safe reinforcement needed to meet local and state building codes of each installation.

A typical reinforcement consists of a 3/8"-1/2" steel plate, the bottom surface of which is approximately 6" above the finished ceiling (e.g., acoustical tile) and connected firmly to the structural ceiling. Sway braces (e.g., made of angle iron) are recommended when there is more than 12" between the structural and finished ceilings. Make certain the installed plate is level, or the arm(s) may "drift".

Equipment anchorage diagrams are supplied with these instructions to help with the installation. The diagrams were prepared by a California-licensed Structural Engineer. If the lights are installed accordingly, the systems will meet requirements of the State Seismic Codes.

2.3 Mounting Height

The proper height of the light should be set by the end user. This depends on the ceiling height, the height of the examination tables, types of procedures and the user's preferences. (See Figures 1 & 2.) Due to the large vertical range of the light head (approx. 42 in. / 1.1m), only two standard down tubes are required to fit normal ceiling heights.

2.4 Range of Motion

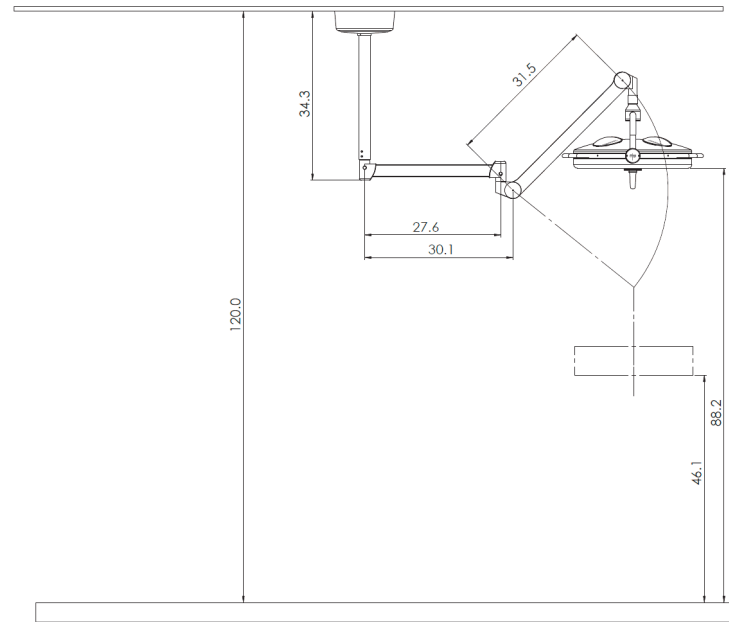


Figure 1: 10' Ceiling Dimensions

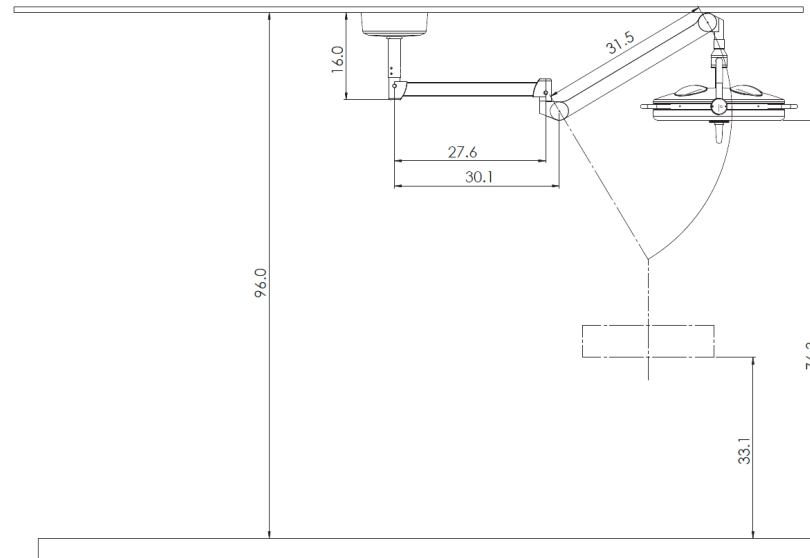


Figure 2: 8' Ceiling Dimensions

3.0 Component Identification

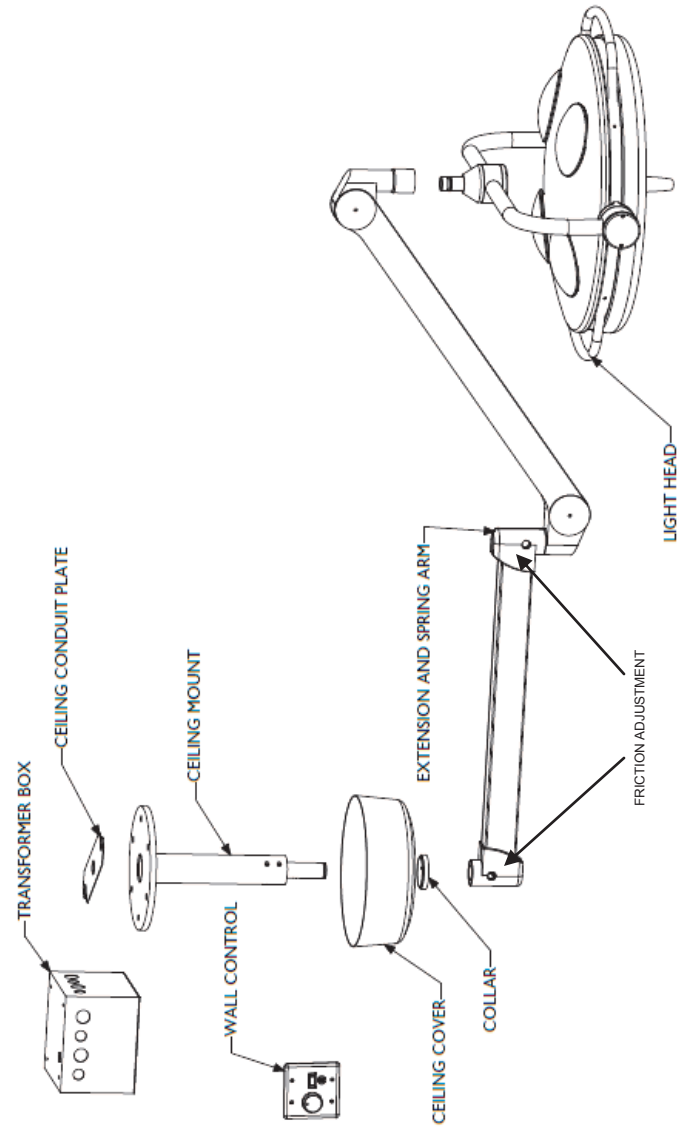


Figure 3: Single Ceiling

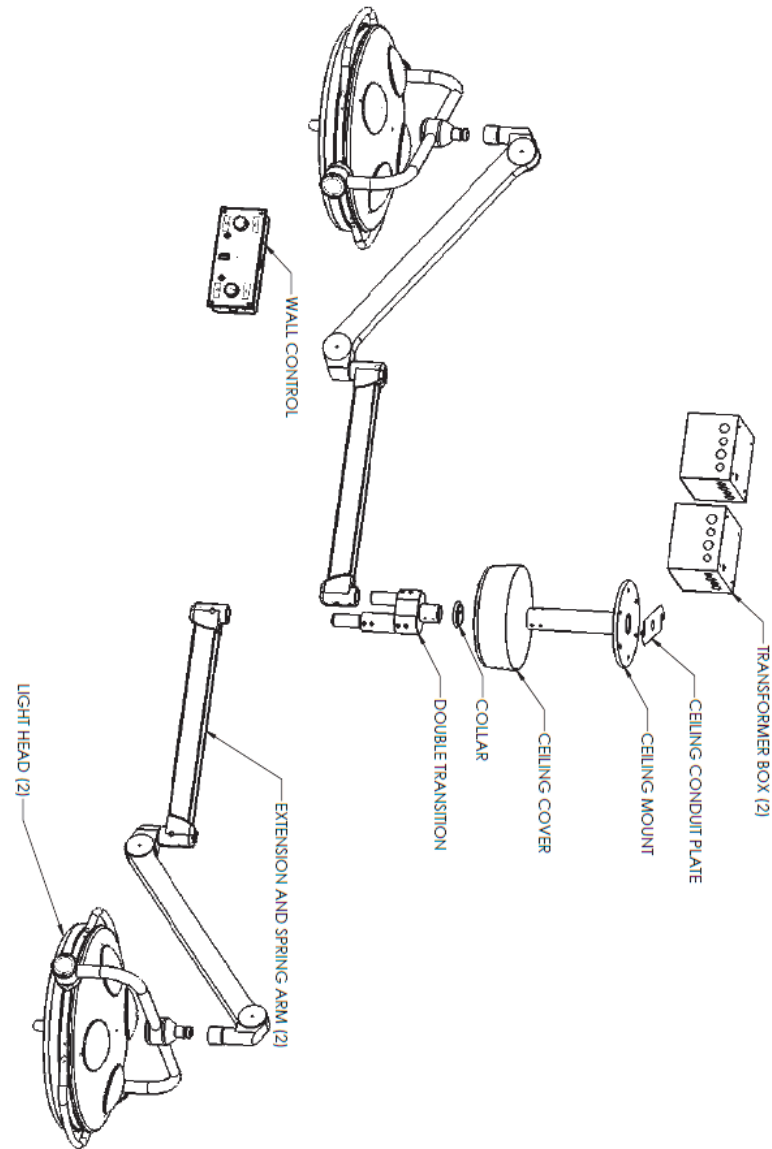


Figure 4: Double Ceiling

NOTE: For 10' Double Ceiling only- The Double Transition must be re-attached to the ceiling mount tube before securing it to the ceiling.

NOTE: For the 230V/240V systems, the wall control switch assembly is supplied by the customer and installed in the following order;

- Main Switch
- Fuse (3A)
- Dimmer (minimum 250W) - One switch per light head.

4.0 Installation

4.1 Wall Control Panel Installation and Wiring

A control panel which must be installed by a qualified electrical contractor is included with the installation kit. It is used in the Apex light circuit.

A dimmer control is pre-mounted into the box, along with the fuses and a mains switch with indicator light. **A dimmer control must be used with the Apex lights.** Failure to do so will result in higher than normal voltage being applied to the lamp, and the manufacturer's warranty will be voided.

The control panel comes with its own electrical box.

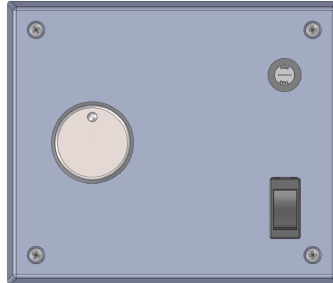


Figure 5: Wall Control- 100V and 120V

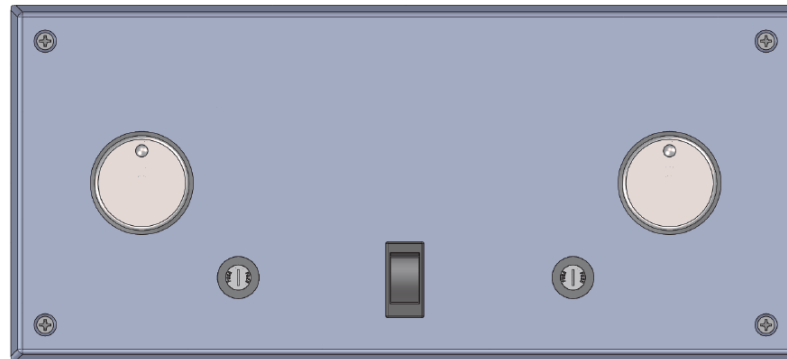


Figure 6: Double Ceiling Wall Control- 100V and 120V

NOTE: For the 230V/240V systems, the wall control switch assembly is supplied by the customer and installed in the following order;

- Main Switch
- Fuse (3A)
- Dimmer (minimum 250W) - One switch per light head.

Wall Plate Wiring

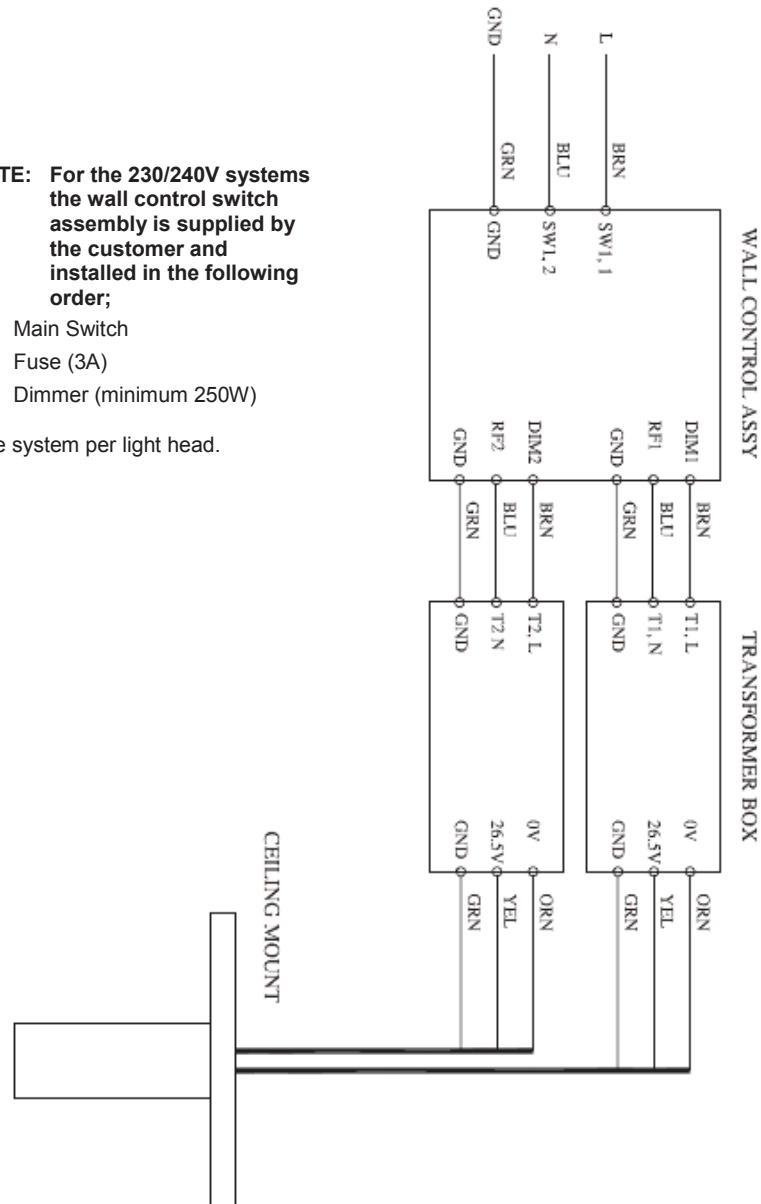
Wiring switch to incoming power (See wiring diagram below).

- Connect Brown wire from wall control to incoming to Line wire (typically black or brown)
- Connect Blue wire exiting wall control to incoming "Neutral" (typically white or blue)

NOTE: For the 230/240V systems the wall control switch assembly is supplied by the customer and installed in the following order;

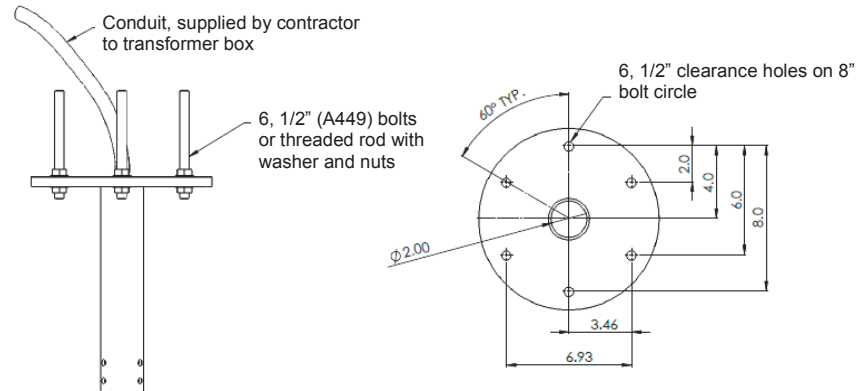
- Main Switch
- Fuse (3A)
- Dimmer (minimum 250W)

One system per light head.



4.2 Ceiling Plate Installation

The ceiling plate is a welded steel assembly having six (6) mounting holes. The holes should align with (6) 1/2-inch studs on an 8 inch (20.3 cm) bolt circle previously installed in the ceiling. Use nuts and washers on each side of the Plate to hold it in position, and to level it. Leave 2 nuts loose on the top side of the plate so the ceiling conduit plate can be installed after conduit is attached—there is approximately 3' of wiring exiting the ceiling plate. The down tube which is welded to the ceiling plate must be plumb (vertical) within 1/2-degree – use a level to verify this. Proper performance of the suspension arm is contingent on this step.



4.3 Transformer Box Installation

Place the transformer box near the ceiling plate, in the ceiling, within 3'. Ensure easy access to the transformer box for final connection and for fixture maintenance.

The transformer sits in a junction box 8" x 8" x 6", which has several knockouts for conduits.

Power to the junction box (containing the transformer) is supplied from the wall control panel, and the secondary power goes from the junction box through the ceiling conduit plate, to the light.

The terminal block sits on top of the transformer and can be connected as follows (terminal block is supplied with stripped wire exiting labeled terminal block location, make connection with wire nuts):

1. Ceiling mount to transformer box wiring instruction:
 - Connect Orange, Yellow, and Green wire from ceiling mount to their matching wires in the transformer box.
2. Transformer box to wall control:
 - Connect brown wire from transformer box to black or brown wire from the wall control.
 - Connect blue wire from transformer box to blue wire from wall control.
 - Connect green wire from ceiling mount to chassis ground of wall control.

4.4 Ceiling Cover Installation

Slide ceiling cover and locking ring up the down tube until it sits flush with the ceiling.

Verify lock ring is seated correctly and hold in place while tightening the two set screws on the lock ring using an Allen key (3/32 in, 2,4mm)

4.5 Articulating Arm(s) Installation



NOTE: The Arms install identically for single and double ceiling, in case of double ceiling repeat steps 1-6 for second arm.

1. Remove the slip ring electrical connection from the extension arm and let it dangle on the cord.
2. With another person helping slip the extension arm on the shaft of the tube.
3. Place the washer and then the retainer ring with the help of the retainer ring pliers over the shaft of the down tube and make sure the ring snaps into and sits securely in the groove of the down tube shaft.

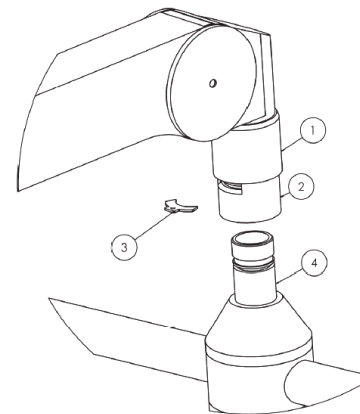


This is a very critical connection because the entire weight of the light and articulating arm is supported by this connection.

4. Reinsert the slip ring electrical connection into the articulating arm.
5. Adjust the rotational friction to desired level with the adjustment screw, see Figure 3.
6. Once the rotational friction is acceptable snap the plastic screw cover in place.

4.6 Head and Arm (Extender to Spring Arm) Installation

1. Remove Screw (2)
2. Lift up the safety sleeve (1)
3. Remove retainer clip (3) and plastic dust cap (not shown)
4. Insert yoke shaft (4) into socket on articulating arm and replace the retainer clip (3).
5. Slide the safety sleeve (1) back down and secure it with the screw (2)



Arm to Yoke Connection

4.7 Focus Handle Installation

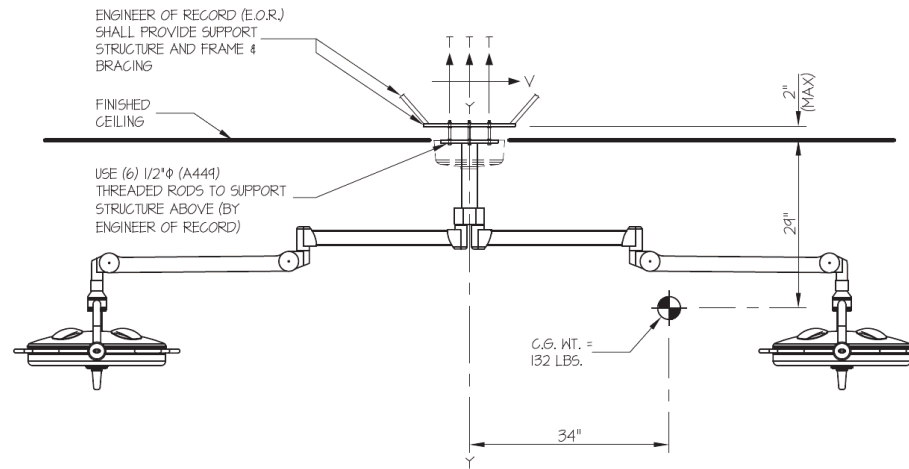
Push the handle into the lock housing.

4.8 Seismic Anchorage

EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING www.equipmentanchorage.com	DES. J. ROBERSON	SHEET 1
	JOB NO. 11-1060	OF 2 SHEETS
	DATE 8/26/10	
BURTON MEDICAL PRODUCTS CORPORATION		
OPERATING ROOM LIGHTS		

SEISMIC ANCHORAGE

CEILING MOUNTED



T_{max} = 1782 LBS/ROD
V_{max} = 752 LBS/ROD

NOTES:

1. FORCES ARE DETERMINED PER 2010 CALIFORNIA BUILDING CODE SECTION 1613A AND ASCE 7-05 SECTIONS 12 AND 13. STRENGTH DESIGN IS USED.

HORIZONTAL FORCE (E_h) = 3.60 W_p (S_{ds} = 2.00, a_p = 2.5, I_p = 15, R_p = 2.5)

VERTICAL FORCE (E_v) = 0.40 W_p

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

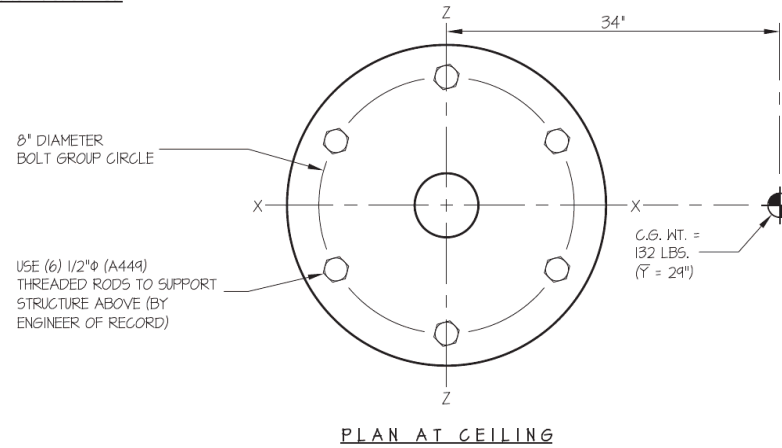


Seismic Anchorage (Con't)

EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING www.equipmentanchorage.com	DES. J. ROBERSON	SHEET
	JOB NO. 11-1060	2
	DATE 8/26/10	OF 2 SHEETS

SEISMIC ANCHORAGE

CEILING MOUNTED



LOADS:
 WEIGHT = 132 LBS
 HORIZONTAL FORCE (E_H) = $3.60W_p$ = 475 LBS.
 VERTICAL FORCE (E_v) = $0.40W_p$ = 53 LBS.

BOLT GROUP PROPERTIES:
 $I_x = 48 \text{ in}^4$
 $I_z = 48 \text{ in}^4$
 $I_y = 96 \text{ in}^4$

MOMENTS:
 $M_{xx} = 475\#(29') + (12)(132\#) + 53\#(34') = 20,963\#\text{'}$
 $M_{zz} = 475\#(29') + (12)(132\#) + 53\#(34') = 20,963\#\text{'}$
 $M_{yy} = 475\#(34') = 16,150\#\text{'}$

BOLT FORCES:

TENSION (T)

$$T_{\text{max}} = \frac{20963\#(4')}{48} + \frac{12(132\#) + 53\#}{6 \text{ BOLTS}} = 1782 \text{ LBS/BOLT}$$

SHEAR (V)

$$V_{\text{max}} = \frac{475\#}{6 \text{ BOLTS}} + \frac{16150\#(4')}{96} = 752 \text{ LBS/BOLT (MAX) (PER AISC J3.7, LESS THAN 20% STRESS)}$$

4.9 Static Inspection



NOTE: The static (structural) inspection must be carried out before the installation of the ceiling fastening.

The strength of the construction must be designed, checked and certified by a structural engineer.

The respective regional construction regulations that apply must be followed.

If an erroneous hole is drilled by mistake (e.g. drilling of a reinforcement rod) the structural engineer who is responsible must be contacted, since adequate static load distribution in the ceiling may have been jeopardized.

Declaration of Acceptance:

It is hereby certified that the supporting wall/ceiling and the anchoring of the Apex suspension system is safe and adequately strong.

Project: _____

Anchoring (please check the one that is applicable):

- with counter-plate

- other

Location: _____

Signature/Stamp (Structural Engineer / Construction Authority)

NOTE: This form may be used by the customer to document the structural inspection.

5.0 Start-Up Operation

5.1 Electrical Checks

Before beginning any electrical checks, review the installation steps to this point, making certain that all house wiring is to code, and all lamp internal wiring is secure. Verify that there is a fuse in the circuit next to the dimmer. Turn the mains switch *On*, and, with the dimmer rotate about at its midpoint, verify power at the lamp head. All four bulbs should be illuminated, but at low intensity. If there is no power, consult the Trouble Shooting Section 7.0.

Having verified that there is power to the lamp rotate the dimmer clockwise and counter clockwise to alternately increase and decrease lamp intensity. **To obtain maximum possible bulb life, make it a practice to always rotate the dimmer to the minimum intensity position before turning the light on or off.**

5.2 Arm and Head Movement

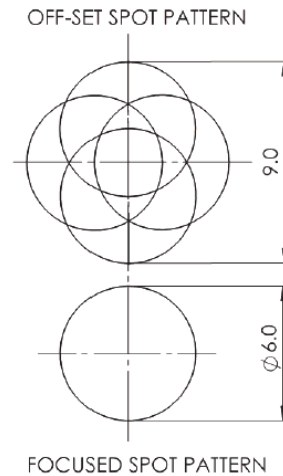
Verify proper and smooth arm and head movement by checking the operation of each of the jointed parts:

- 1.) The entire light should swing through 360 degrees for single ceiling and 300 degrees for double ceiling around the vertical axis which goes through the ceiling.
- 2.) The light head and articulating arm should swing through 360 degrees about the vertical axis through the outboard end of the extension arm.
- 3.) The vertical motion of the light head should be approximately ± 45 degrees, for total vertical head travel of 42 inches. The light head and yoke can be rotated about the articulating arm centerline 360 degrees. Within the yoke, the light head can be rotated on the hub axis ± 55 degrees.

Review the included diagrams to locate the friction, or brake, adjustments. There are two operator-accessible adjustments which can be made to control the side to side motion in the Apex.

5.3 Spot Focus

Spot focus is controlled from the center handle. Twisting the center handle will cause the bulb/reflector assemblies to rotate on internal axes, all synchronized to merge their spots at the centerline of the light head. Twisting the handle clockwise will allow the spots to merge closer to the light, counter clockwise will cause the individual spots to spread and focus farther away.



5.4 Electromagnetic Compatibility (EMC).

It is important to install and use the equipment in accordance with the instructions, to prevent harmful interference to other devices in the vicinity. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the other device(s) to increase the separation between equipment.
- Use different electrical circuits for the conflicting devices.
- Consult with Philips Burton or your field service technician for help.

6.0 Maintenance



To reduce the risk of electric shock, do not remove top cover. Refer servicing to qualified service personnel. Servicing of this product by unqualified personnel will result in exposure of live parts.

6.1 Bulb Replacement

Bulb replacement is accomplished from the pods located on the back cover. First determine which bulb needs replacement, then unsnap the corresponding pod and lift it free from the top cover. It will be tethered by a short cable so that it won't fall.

Wait for the bulb to cool, then unscrew the round knurled retainer nut holding the bulb assembly in the reflector and lift the socket and bulb out.

Gently pull the bulb straight away from the socket, wiggling it slightly to release the connector grips on the bulb pins.



CAUTION: Do not allow halogen bulbs to come into direct contact of skin.
(Before servicing, allow bulb to cool for 30 minutes)



CAUTION: Before removing pods power should be turned off on the wall switch and the operator shall not touch the patient while replacing bulb.

Use a Kimwipe or other soft tissue to hold the new bulb and push it into place in the socket. Be careful not to bend the leads as the bulb is inserted -- make certain it is centered with the socket and reflector; otherwise the projected beam will be skewed.

Replace the pod by first slipping the straight end of the leaf spring retainer under the edge of the cover access hole, then press the other end of the spring towards the center as the pod is snapped into place.

6.2 Friction Adjustments

There are four friction adjustments on the Apex light head and mounting system. There is one 'brake' at the inboard end of the extension arm, one 'brake' at the outboard end and one hidden friction adjustment castle nut behind each of the two side yoke cover plates. See Section 6.5 for more information on how to adjust.

6.3 Outboard Friction Brakes

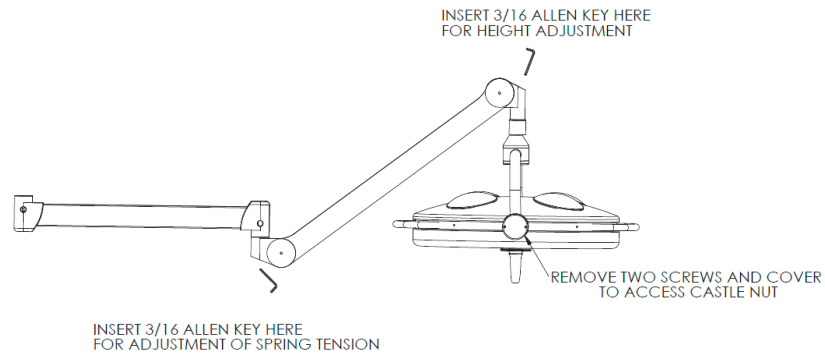
Access these from each end of the extension arm. Use a large flat screw driver to adjust until the desired friction is reached.

6.4 Yoke Hub Friction Adjustment (2 Castle Nuts)

Remove the cover plates from the hubs on each side of the lighthouse by taking out two screws. Inside, there will be a castle nut on a hollow shaft which carried the wiring to the light head. The nut is kept by means of a wire loop retainer (safety wire). Remove the safety wire and use a crescent wrench, to tighten or loosen the nut as desired.

6.5 Vertical Height Adjustment

Insert a 3/16 Allen key at the end of the spring arm and turn counterclockwise to increase the maximum height of the arm. Note: The arm is shipped in it's horizontal position. Before adjusting the height move the light head down slightly to remove tension on the adjustment screw.



6.6 Arm Balance Adjustment

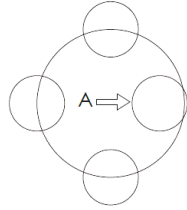
See picture above for reference. Insert a 3/16 Allen key at the beginning of the spring arm to adjust the tension and balance of the arm and head. When the key engages the internal adjustment bolt, turn clockwise to tighten the tensions and counterclockwise to loosen.

6.7 Reflector Adjustment (for Spot Location)

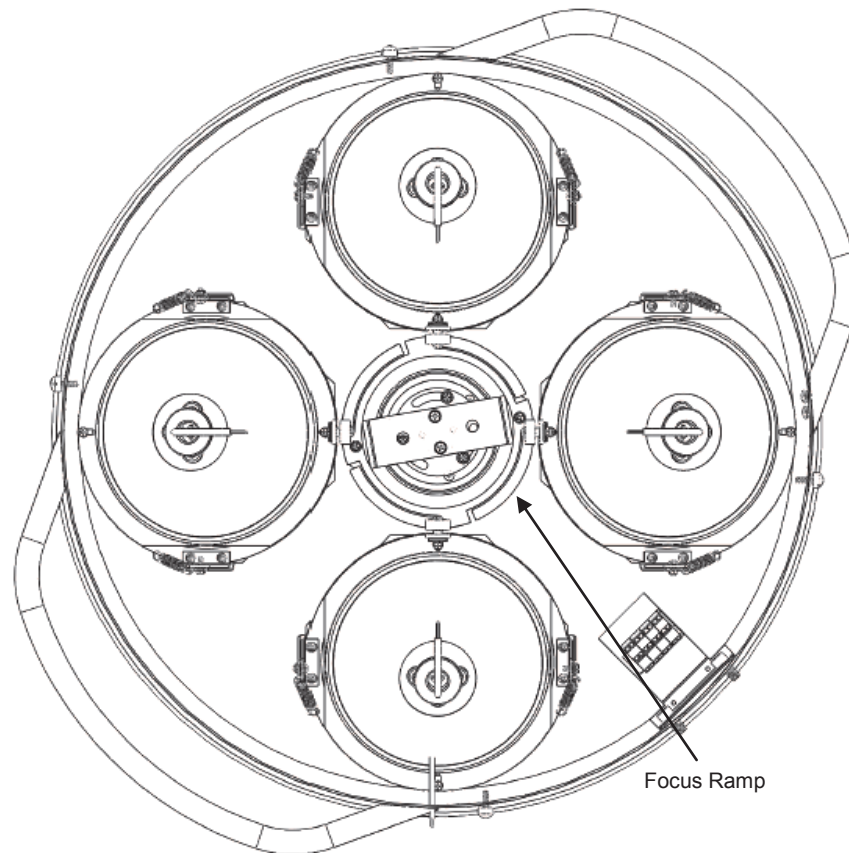
Turn the light head on and locate it above the working surface approximately 1-meter. To make this adjustment, it will help to lay a large sheet of white paper on the work surface and dim the light to make viewing easier on the eye. Adjust the focus knob, or center handle, until the individual spots are close together, but *not overlapping*. These spots should be evenly spaced around a circle.

Remove the Lid from the Light head (unsnap the protective plastic covers over the screw heads and remove the screws).

Focus Mechanism



If a spot appears as shown in Diagram A (left), then the angle of the ramp needs to be adjusted. This can easily be done with a pair of pliers. If the spot is on the inside of the symmetrical circle bend the ramp upwards to increase the angle. If the spot is on the outside bend the ramp downwards.



7.0 Troubleshooting Guide

Symptom	Check	Corrective Action
No light output	Power on?	Turn power switch on at wall
	Fuse(s)	Visually inspect fuses, check continuity with meter.
	Continuity of wiring from transformer to light head	With power disconnected, use ohmmeter to check continuity from transformer secondary to light bulbs. Check integrity of each connection point.
	Bulbs	Although unlikely, if the light is left on and unattended for a long time, all the bulbs can go out sequentially. Replace bulbs.
Poor light output	Voltage into transformer	Verify correct mains voltage and proper transformer wiring connections
	Voltage out of transformer	Verify correct secondary voltage (~26V)
	Bulb	Verify correct bulbs.
Electro-magnetic Interference (EMI)	N/A	Generally, EMI is not an issue with this type of product (incandescent lighting fixture with magnetic transformer). However, if you suspect this product is causing interference, please contact Philips Burton.
Bulb group not focused	Output pattern	See Section 6.7, contact Philips Burton if this does not resolve issue.
Arm drifts up or down	Arm balance	Follow instructions under the section entitled Vertical Friction Adjustment (6.7).

8.0 Technical Data

Type of Data¹	
<u>Classifications</u>	
Type of Protection Against Electric Shock	Class I
FDA Classification	FDA Class II, Major Surgery Light
CISPR II Classification	Group 1, Class A
Allowable Leakage Current	Does not exceed 200 μ a
Reliability of Earth Protection	Does not exceed 0.1 ohm
Mode of Operation	Continuous
Protection Against Explosion Hazards	Not to be used in the presence of flammable anesthetics
Protection Against Hazardous Parts and Ingress of Liquids	IP20. Not protected against the ingress of fluids.
Approvals	UL 60601-1, C/UL, IEC60601-2-41. IEC 60601-1-2
Standards	Meets the requirements for surgical task lighting in ANSI/IESNA RP-29-06, Lighting for Hospitals and Health Care Facilities

¹All specifications are subject to change without notice.

Technical Data (con't)

Electrical	
Supply Connections	100V, 120V and 230/240V, 50/60 Hz
Power Consumption	220W
Bulb Types	Halogen, 50W, 24 volt, bi-pin, GY6,35 base. Philips Burton P/N 0002004
Bulb Life ³	1600 hrs
Fusing	100V, 120V and 230/240V versions: T 3 A, 250V, 5x20mm The T indicates Time delay (i.e. slow blow fuses).

Transport and Storage Conditions	
Ambient Temperature	0°-70° C (32°-158° F)
Relative Humidity	10 - 75% (no condensation)
Atmospheric Pressure	500 - 1060 hPa
Operation Conditions	
Ambient Temperature	10° - 40°C (50°-104°F)
Relative Humidity	30 - 75%
Atmospheric Pressure	700 - 1060 hPa
Weights and Dimensions	
Single Ceiling Version	83 lbs. (8ft), 92 lbs. (10ft)
Double Ceiling Version	110 lbs. (8ft), 117 lbs. (10ft)
Light Head, Including Yoke	18 lbs.
Light Head Diameter	24 in. (61 cm)
Range of Motion	See illustrations in Section 2.4

³Average lifetime for bulbs running continuously.

Optical Performance / Operating Characteristics⁴	
Central Illumination at 1 m (39.4"), Ec	120,000
Light Field Diameter, d10 ⁵	7.2" (182.5mm)
Light Field Diameter, d50 ⁵	3.75" (95.8mm)
Light Distribution Ratio d50/d10	0.5
Total Irradiance, Ee	261W/m ²
Depth of Illumination	18.3" (465mm)
Color Temperature	3500 K
CRI (Color Rendering Index), Ra	96
R9 ⁶	92
Focus Range	24in(.6m) to 39.4in (1m)
Remaining Illuminance with Two Masks	54.9% of Ec
Remaining Illuminance with One Tube and Two Masks	42.3% of Ec
Remaining Illuminance with One Mask	60.2% of Ec
Remaining Illuminance with Tube (Deep Cavity)	97.1% of Ec
Remaining Illuminance with One Tube and One Mask	48.6% of Ec


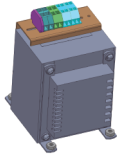
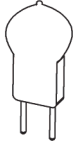

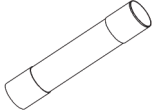
⁴The optical data are nominal values (unless specified otherwise) based on measurements done according to the IEC 60601-2-41 standard on the rated voltage. Please be aware that lights (except LED's) are very sensitive to voltage variations, and that this can affect the light performance and bulb life significantly. Also, the performance of individual bulbs has a natural variance due to their manufacturing process. Do not substitute. Use only Philips Burton supplied replacement bulbs. Failure to do so will affect performance and invalidate the warranty status.

⁵Light Field Diameters are given for a light beam that is merged for maximum central illuminance. Since the light beam is adjustable, the Light Field Diameter can be increased by offsetting the merging of the beams. See more about this in Section 5.3 "Spot Focus".

⁶R9 = Color rendering of a strong red color that is important for medical purposes.

Ecological Characteristics	Burton Medical Products cares about the ecological environment, and in the design and manufacturing of our lights we strive to minimize the ecological impact.
Materials	No hazardous materials are used in the production of the Apex light.
Plastic	The plastic parts are made from an ECO-compliant grade of plastics. This means that no brominated or chlorinated substances are used in the production of the raw material.
Recycling	The plastic parts are marked with the material type to accommodate easy sorting for recycling.
Disposal	Although no hazardous materials are used in this product, public laws may contain special specifications with regard to disposal. To avoid damage to the environment and health, relevant authorities should be consulted before disposing of the product.

9.0 Replacement Parts

Picture	Description	Part Number
	Handle	1017040
	Power Supply	4000135
	Bulb	0002004
	Disposable Cover (25 pack)	0008100PK
	Fuse T3A, 250V	4000025

10.0 Cleaning and Sterilization

10.1 External Surfaces

Use only Isopropyl alcohol or mild soap and water to clean the lamp housing and arm surfaces. Do not pour liquid onto the surfaces -- moisten a cloth and use the cloth to wipe down the desired areas.

Isopropyl alcohol may also be used for cleaning the front diffuser (polycarbonate) windows.

For disinfection, use a cold sterilizing solution. Use a moistened towel as when cleaning, but be careful not to leave sterilizing solutions on the diffusers to dry, as hard-to-remove film will remain.

10.2 Bulbs



CAUTION

Do not handle the bulbs with bare hands -- use gloves or a Kimwipe to insert new bulbs, or adjust existing ones. If there is dirt or grease on the glass envelope, use *acetone* as the cleaning agent. If *acetone* is unavailable, isopropyl alcohol or an ammonia-based solution (e.g. *window cleaner*) can be substituted, but will not be as efficient in removing oils.

Oil from the fingers will produce a hot spot on the bulb, shortening bulb life.

10.3 Center Handle

The removable center handle can be sterilized by steam autoclaving. The manufacturer's recommended cycle and parameters are: Wrap handle per standard autoclave procedure. THREE MINUTES AT 270° F. Also available are single-use, pre-sterilized handle covers which fit onto the handle – contact your sales representative.



NOTE: DO NOT AUTOCLAVE FOR MORE THAN 3 MINUTES. THIS WILL CAUSE HANDLE TO BECOME BRITTLE AND WILL SHORTEN THE LIFE OF THE HANDLE.

10.4 Reflectors

If the reflectors require cleaning, first contact the factory service representative. If this person is unavailable or the using facility has skilled personnel available to do the job, follow the specific directions for gaining access to the interior of the light head, and *carefully* remove the reflector(s) from its aluminum holder(s).

Use a cloth (not a Kimwipe or paper-based product) dampened with a non-ammonia-based cleaning solution to carefully and gently remove films, dust, etc.

NOTE: Do not touch the reflective surface, as body oils will degrade the coating.

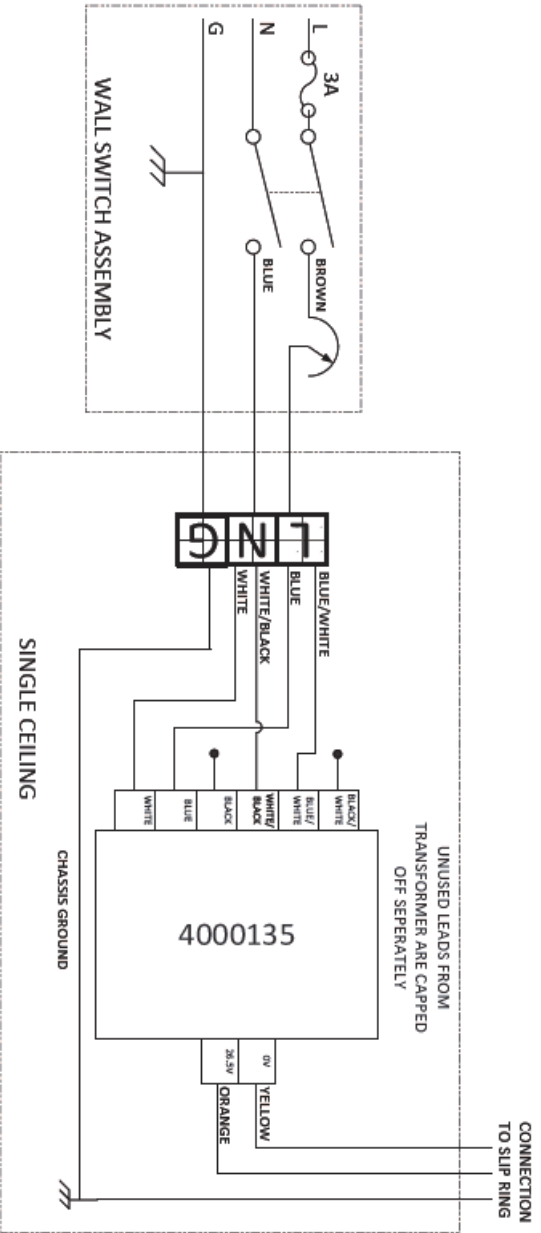


CAUTION

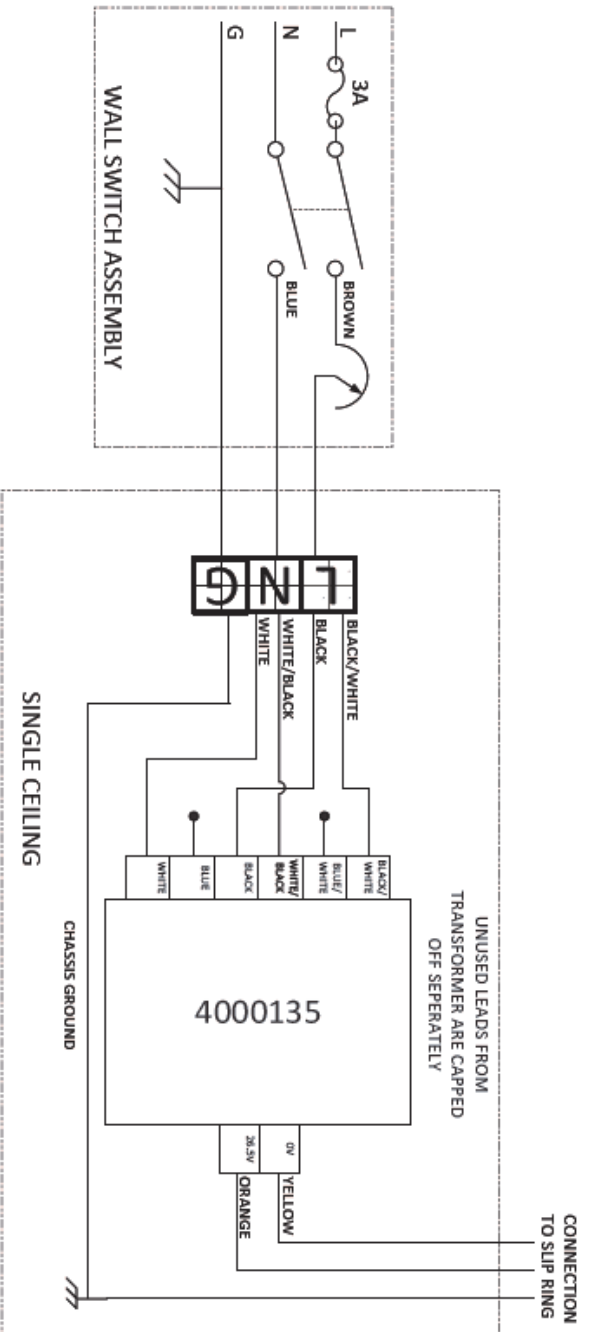
Reflector and the optical filter located underneath reflector are required for the fixture to operate safely and within acceptable irradiance values. Do not remove these items and contact Philips Burton technical support if there is a problem.

11.0 Wiring Diagrams

APEX
SINGLE CEILING
100V INPUT

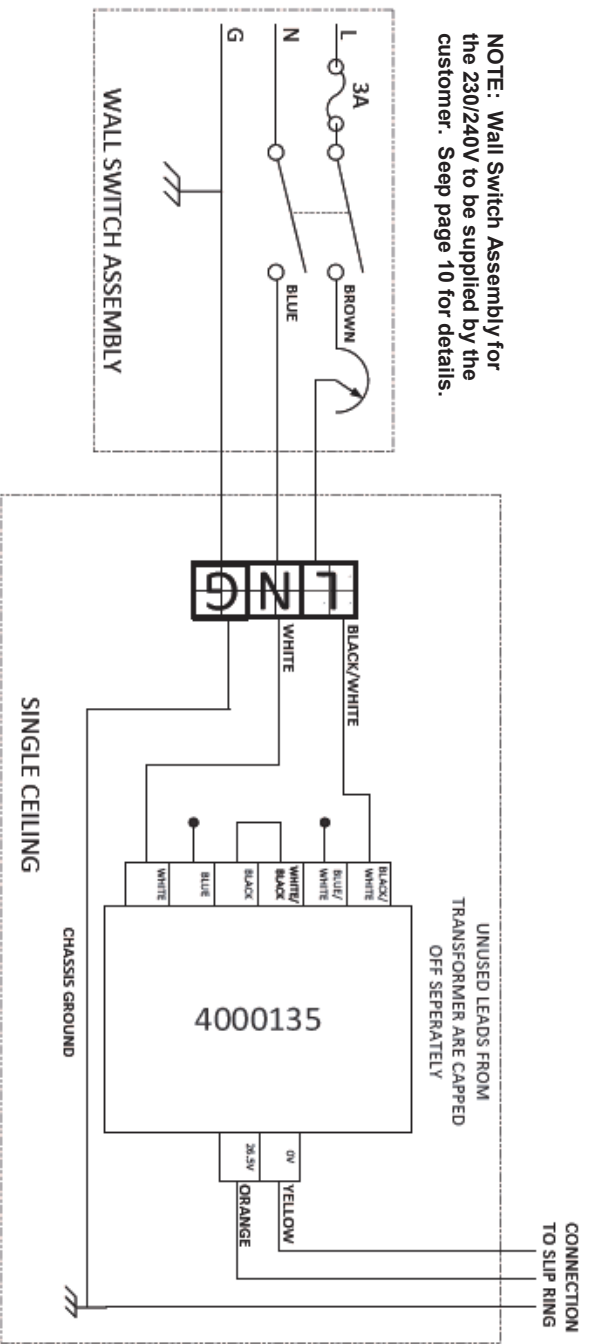


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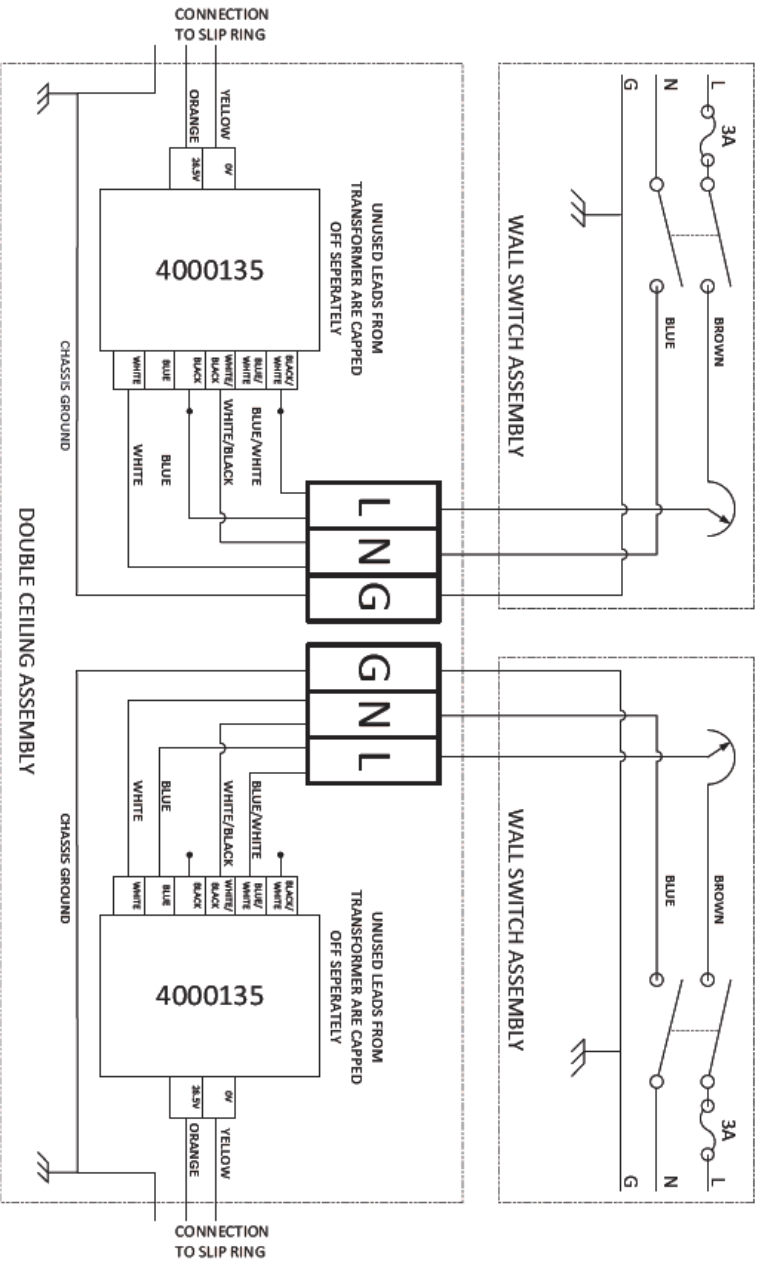
APEX
SINGLE CEILING
120V INPUT

NOTE: Wall Switch Assembly for the 230V/240V to be supplied by the customer. See page 10 for details.



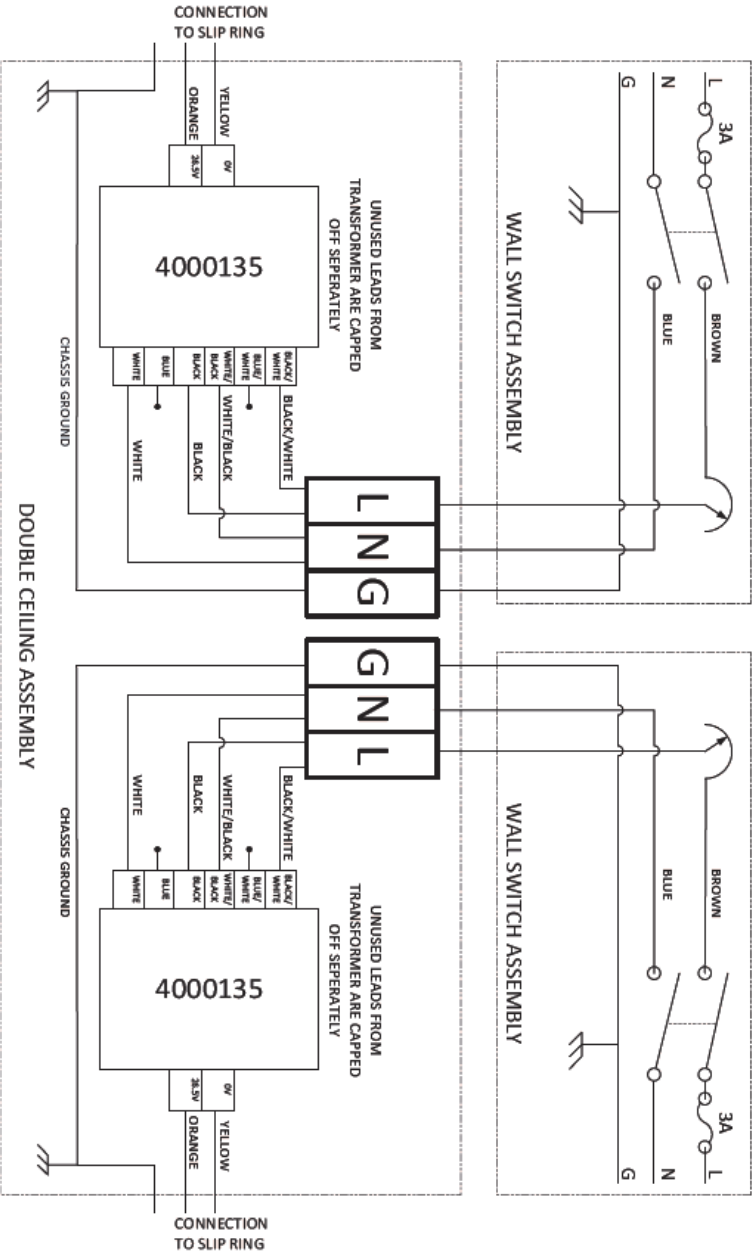
**APEX
SINGLE CEILING
230V or 240V INPUT**

6000230-3 A02



**APEX
DOUBLE CEILING MOUNT
100V INPUT**

6000230-4 A01



APEX
 DOUBLE CEILING MOUNT
 120V INPUT

6000230-5-A01

Warranty

Mechanical components of Philips Burton's products are warranted to provide the original purchaser five (5) years of free service from defects in material and workmanship. The warranty does not cover the following items: light sources (halogen / fluorescent bulbs), transformers, power supplies, ballasts, handles, fuses, and consumables.

Conditions:

1. This warranty will be granted only when the original invoice or sales receipt is presented together with the product. Philips Burton reserves the right to refuse free-of-charge warranty service if the above documentation cannot be presented, or if the information contained is incomplete or illegible.
2. This warranty will not apply if the serial or lot number on the product has been altered, damaged, removed or made illegible in any way.
3. This warranty does not cover damage or destruction caused by any reason, including but not limited to neglect, deferred maintenance or improper repairs, or any alterations, adaptations or adjustments made to the product to conform to the national or local technical/safety standards in force in any country other than the ones for which the product was originally designed and manufactured.
4. Lights for service under warranty must be either returned to the location instructed by your authorized Philips Burton representative or made available to the authorized Philips Burton field personnel, where they will be replaced or repaired free of charge.
5. This warranty does not cover the following:
 - Periodic maintenance and repair or replacement of parts due to normal wear and tear.
 - Any adaptation or change to upgrade the product from its normal purpose without the written consent of Philips Burton.
 - Abuse or misuse of the product.
 - Repair performed by non-authorized service stations, dealers or the customer.
 - Accidents, lightning, water, fire, improper ventilation or any cause beyond the control of Philips Burton.
 - Defects of any equipment system or fixtures into which the product is incorporated, including installation and modification.
6. This warranty does not affect the customer's statutory rights under applicable state or national laws in force, or the customer's rights against the dealer arising from its sales / purchase contract.

This product was designed and manufactured in the U.S.A. by:

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