INSTALLATION INSTRUCTIONS

Read this manual before starting to work! This information is necessary for the safe and efficient operation of the equipment.

TEC-B-0054 REV3
09/29/2015

Nautilus LED
SURGICAL LIGHTS
(STANDARD RADIAL ARM MODELS ONLY)

Read this manual before starting to work! This information is necessary for the safe and efficient operation of the equipment.
COMPETENCY AND INSTALLATION REQUIREMENTS

This product is a Class 2 medical device that is subject to FDA Part 820 requirements. Installation can only take place by qualified and trained individuals. An Installation Qualification Report is required as proof of system operational validation prior to clinical use. Contact Skytron for installation needs.

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Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice. If current manuals are required, contact your local SKYTRON representative or contact SKYTRON directly at the distribution addresses listed above.
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SECTION 1. SAFETY INFORMATION

1-1. Special User Attention
The procedures described in this manual will be performed by representatives of the owner (staff or contracted service), therefore it is the responsibility of the owner to ensure that all safety precautions are followed. Only qualified and trained individuals should attempt the installation of this product.

1-2. Safety Precautions
The following is a summary of DANGERS, WARNINGS, and CAUTIONS denoted in this manual. These precautions are found throughout the manual where they are applicable. Carefully read the manual before proceeding to operate or service the equipment.

⚠️ DANGER
Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

⚠️ WARNING
Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

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

DO NOT remove lighthead when support arm is in down position. The BOM will be severely damaged and may result in bodily injury.

⚠️ CAUTION
Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Connection of the fixture wires must be made using crimp connectors. Main terminal devices shall be so located or shielded that, should a wire of a stranded conductor escape when the conductors are fitted, there is no risk of accidental contact between live parts and accessible parts. Acceptable shielding methods include UL approved shrink tubing and electrical tape. DO NOT use damaged wire.

⚠️ CAUTION
CAUTION without the safety alert symbol, is used to address practices not related to personal injury but with a possibility of damage to equipment.

This equipment is intended for use by health care professionals only. This equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the lighthead or shielding the location.

This fixture requires that electrical connections are made by a licensed electrician in accordance with state, local, and national electrical codes using UL® (Underwriters Laboratory) recognized materials.

This fixture requires a properly circuit protected, appropriately sized, dedicated circuit. An isolated power supply circuit must be protected by an appropriately sized double pole, single throw circuit breaker.

SKYTRON surgical lights are packaged in special containers designed to prevent damage from vibration or shock. Always use SKYTRON supplied containers for shipment.
CAUTION (CONT'D)

Nautilus LED lightheads operate on DC VOLTAGE. The PC boards are susceptible to static charges even when not powered. Pay close attention to wiring diagrams, wire labeling, and color codes. White wires (neutral) on lightheads must remain separate and not touch any other wire or metal parts. Incorrect wiring may result in incorrect polarity being supplied to the lighthead. This WILL DAMAGE internal circuitry and components VOIDING WARRANTY.

The mounting plate must be accurately leveled within 0.1° to prevent lighthead drift.

NOTICE

Indicates important information not related to personal injury.
1-3. Label Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Danger Symbol" /></td>
<td>With the word DANGER, indicates a hazardous situation that, if not avoided, will result in death or serious injury.</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td>With the word WARNING, indicates a hazardous situation that, if not avoided, could result in death or serious injury.</td>
</tr>
<tr>
<td><img src="image" alt="Caution Symbol" /></td>
<td>With the word CAUTION, indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.</td>
</tr>
<tr>
<td><img src="image" alt="AC Symbol" /></td>
<td>Indicates AC power supply.</td>
</tr>
<tr>
<td><img src="image" alt="EC REP Symbol" /></td>
<td>Indicates authorized representative in the European Community.</td>
</tr>
<tr>
<td><img src="image" alt="Manufacturer Symbol" /></td>
<td>Indicates Manufacturer.</td>
</tr>
<tr>
<td><img src="image" alt="Voltage Symbol" /></td>
<td>Indicates Dangerous Voltage 100-240V ~, 50/60Hz.</td>
</tr>
<tr>
<td><img src="image" alt="Overbalancing Symbol" /></td>
<td>Risk of overbalancing! To avoid injuries or equipment damage, DO NOT push with excessive force, lean on, or rest on the lighting fixture.</td>
</tr>
</tbody>
</table>
SECTION 2. EQUIPMENT SPECIFICATIONS / REQUIREMENTS

CAUTION

This equipment is intended for use by health care professionals only. This equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the lighthead or shielding the location.

2-1. Permissible Environmental Conditions

a. During Transport and Storage (in Original Packaging Materials)
   • Ambient Temperature: 14° to 140°F (-10° to 60°C)
   • Relative Humidity: 10% to 85% (No Condensation)
   • Atmospheric Pressure: 14 in-Hg to 31 in-Hg (500 hPa to 1060 hPa)

b. During Use - For Dry Locations
   • Ambient Temperature: 60° to 85°F (15° to 30°C)
   • Relative Humidity: 30% to 60% (No Condensation)
   • Atmospheric Pressure: 20.7 in-Hg to 31.3 in-Hg (700 hPa to 1060 hPa)

2-2. Electrical Requirements

CAUTION

This fixture requires that electrical connections are made by a licensed electrician in accordance with state, local, and national electrical codes using UL® (Underwriters Laboratory) recognized materials.

DO NOT turn on main power to fixture until all lighheads are installed, connections are complete, and the fixture has been reviewed by a SKYTRON representative.

ELECTRICAL HAZARDS EXIST!

Exercise caution when working on this fixture, the installation of this fixture must be made only by qualified and authorized personnel familiar with the essential knowledge and techniques.

2-3. ESD Sensitive Devices

When installing devices with electronic circuit boards (e.g., lighheads, wall control units), appropriate precautions should be taken to prevent damage caused by electrostatic discharge (ESD). These precautions include as a minimum, the use of an ESD wrist strap that is properly connected to an ESD ground.

2-4. Connection Means

CAUTION

Connection of the fixture wires must be made using crimp connectors. Main terminal devices shall be so located or shielded that, should a wire of a stranded conductor escape when the conductors are fitted, there is no risk of accidental contact between live parts and accessible parts. Acceptable shielding methods include UL approved shrink tubing and electrical tape. DO NOT use damaged wire.


The installation of connecting cords between equipment parts shall meet the requirements of the National Electrical Code, ANSI/NFPA70, IEC 60601-1 and all local codes, as applicable.

2-6. Bending Requirements

Connection leads shall be constructed in such a manner that moveable leads in normal use are not bent around a radius of less than five times the outer diameter of the lead concerned. Avoid conditions employing severe bends to ensure the integrity of conductors.
2-7. Conduit Requirements

**CAUTION**

This fixture requires two (2) dedicated conduit raceways at the wall control to separate the 100-240VAC facility supply lines from the DC supply lines to the lighting fixture. Failure to observe this requirement will allow the migration of electrical magnetic interference and will disrupt the operation of the lights.

Use of approved metal conduit shall be employed throughout the fixture’s wiring circuit where applicable.

2-8. Protective Means

**WARNING**

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

**CAUTION**

This fixture requires a properly circuit protected, appropriately sized, dedicated circuit. An isolated power supply circuit must be protected by an appropriately sized double pole, single throw circuit breaker.

Proper performance and safety of this fixture can only be achieved by an adequate grounding system. Fixture ground must be a dedicated ground point ultimately bonded to the facilities grounding system to prevent the migration of electrical interference generated by other devices.

2-9. Final Assembly

All installations of SKYTRON Surgical Lights should be under the direct supervision of a SKYTRON authorized representative.

Prior to the fixture being placed in service, the SKYTRON authorized representative must initialize the fixture and complete the installation report.

To maintain product warranty and performance, this product requires routine service. Contact your SKYTRON representative for factory service or preventive maintenance contracts.

2-10. Fail Safe Compliance

In order for dual or triple lighthead systems to maintain fail safe compliance, a battery back up (UPS) or generator back up power system must be provided in the mains wiring prior to the wall control which will restore power in five (5) seconds or less.

**NOTICE**

Fail Safe devices are not supplied by SKYTRON.

2-11. Shipping

**CAUTION**

SKYTRON Surgical Lights are packaged in special containers designed to prevent damage from vibration or shock. Always use SKYTRON supplied containers for shipment.
SECTION 3  MODEL IDENTIFICATION

MODEL NL25
1 - 25” Diameter Lighthead

MODEL NL2525
2 - 25” Diameter Lightheads

MODEL NL252525
3 - 25” Diameter Lightheads
4-1. Pre-Installation Requirements
Appropriate metal conduit and wiring must be installed from wall control mount to ceiling mounting structure. Flexible conduit to extend 18" below finished ceiling.
100-240VAC, circuit protected, dedicated power supply line in separate conduit to be provided at wall control.
Painting and flooring must be complete prior to fixture installation.
Finished ceiling height must be verified.

4-2. Installation Notes
Follow the installation instructions and utilize the SKYTRON Surgical Light Installation Report to assure proper installation and to meet the installation qualification requirements.
Special adapter plates for mounting SKYTRON surgical lights on existing mounting structures are available. Contact your SKYTRON representative for special application details.
Additional materials required for proper installation include Loctite® compound.
Nautilus LED Series lighting fixtures require a wall mounted control box. 3/4" metal conduit and minimum 12 AWG wire is required between wall control and fixture.

4-3. Uncrating
The SKYTRON surgical lighting fixture is normally shipped in two (2) to four (4) crates, depending on the model. A carton containing the vertical support tubes (VSTs), miscellaneous hardware, and various instructional materials is packed separately.
Should any damage to the fixture be noted while uncrating, further unpacking should be stopped and the container with all the wrappings held for inspection. The transportation company should be notified immediately so an inspector can be sent. Consult the Damaged Shipment Claim Procedure sheet for further details.

Personnel uncrating SKYTRON surgical lights should be aware that they are delicate medical equipment and special care in handling should prevail throughout installation.

a. Uncrating Light Fixture
Open the top of the lighthead box and remove the packing material. Remove the sterilizable positioning handle and lighthead from the crate.

**NOTICE**
Details may vary depending upon model and support structure fabrication.

b. Radial Arm Assembly
When the radial arm assembly is removed from the crate and set on the floor prior to mounting it, be sure the mounting flange is toward the floor. If the arm assembly is set on the floor upside down the hub cover may be damaged (Figure 4-1).

![Figure 4-1. Radial Arm Assembly](image)

**CORRECT**

**WRONG**

4-3. Lightheads
Use extreme caution when removing the contents from the crates to prevent damage to the lights. Leave the lightheads in their crates until ready to install.
If the lighthead must be set down after it is removed from the crate, always lay it on the foam shipping block. DO NOT lay lighthead on the front face.
4-4. Specialty Tools and Equipment

- Metric hand tools
- Appropriately rated lifting device (Genie lift)
- Digital level
- Torque wrench (ft-lbs)
- Metric sockets compatible with torque wrench
5-1. Typical Installation Sequence / Component Identification

The lighting fixture should be installed in the following sequence (Figure 5-1):

1. Wall Control
2. Mounting Plate
3. Radial Arm Assembly (RAA)
4. Ceiling Cover
5. Vertical Support Tube (VST)
6. Balance Mechanism (BOM)
7. Lighthead
8. Sterilizable Positioning Handle

Figure 5-1. Nautilus LED Installation Sequence
5-2. Install Wall Control

**NOTICE**

3/4" metal conduit and minimum 12AWG wire (3 wires per lighthead) is required between wall control and fixture. Flexible conduit should extend 18" below finished ceiling.

**NOTICE**

Separate dedicated conduit required for 100-240VAC supply lines to wall control.

All wiring to be in accordance with local, state, and national electrical codes.

a. Remove the front panel assembly from the wall control box for ease in wire connection. Remove the (4) retaining screws. Set the front panel assembly aside.

b. Install the wall control box enclosure as desired for the application (surface or recessed mount) as shown in the wall control illustration (Figure 5-2).

c. Attach recess mount flange if required for recessed applications (Figure 5-2).

**NOTICE**

Room placement of the wall control will vary by application. Always follow current standards from the NFPA (National Fire Protection Agency), NEC (National Electrical Code), and IEC (International Electrotechnical Commission) for proper compliance.

The selection of anchorage fasteners shall be determined by the engineer of record and will vary by application. The selected fasteners must not interfere with wall control components.

Seismic applications require the use of approved fasteners.

d. Connect the electrical conductors from front face plate assembly to the wiring from the fixture. Observe wire markings and colors. Avoid undue stress on conductors and internal components.

**CAUTION**

Connection of the fixture wires must be made using crimp connectors. Main terminal devices shall be so located or shielded that, should a wire of a stranded conductor escape when the conductors are fitted, there is no risk of accidental contact between live parts and accessible parts. Acceptable shielding methods include UL approved shrink tubing and electrical tape.

e. Make electrical connections using approved crimp connectors. Observe wire markings and colors (Figure 5-3).

f. Attach the front panel assembly using the four (4) phillips screws removed in Step a. Use care to avoid pinching conductors and creating excessive bends in wiring.

---

**CAUTION**

Nautilus LED lightheads operate on DC VOLTAGE. The PC boards are susceptible to static charges even when not powered. Pay close attention to wiring diagrams, wire labeling, and color codes. White wires (neutral) on lightheads must remain separate and not touch any other wire or metal parts. Incorrect wiring may result in incorrect polarity being supplied to the lighthead. This WILL DAMAGE internal circuitry and components VOIDING WARRANTY.
**OPTIONAL BACK-BOX INSTALLATION**

1. **Surfaced Mount**
   - Junction Box
   - (4) Anchor
   - (4) Screw

2. **Recessed Mount**
   - Recess Mount Flange
   - Front Panel
   - (4) Screw

**Dimensions**

<table>
<thead>
<tr>
<th></th>
<th>SINGLE/DUAL</th>
<th>TRIPLE</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>8-5/8&quot; (220)</td>
<td>10-5/8&quot; (270)</td>
</tr>
<tr>
<td>B</td>
<td>4&quot; (100)</td>
<td>4&quot; (100)</td>
</tr>
<tr>
<td>C</td>
<td>10-5/8&quot; (270)</td>
<td>14&quot; (355)</td>
</tr>
<tr>
<td>D</td>
<td>6-7/8&quot; (175)</td>
<td>8-5/8&quot; (220)</td>
</tr>
<tr>
<td>E</td>
<td>7-5/8&quot; (195)</td>
<td>11&quot; (280)</td>
</tr>
<tr>
<td>F</td>
<td>6&quot; (153)</td>
<td>6-3/8&quot; (162)</td>
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<tr>
<td>G</td>
<td>10&quot; (255)</td>
<td>13-1/2&quot; (343)</td>
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<td>H</td>
<td>7-7/8&quot; (200)</td>
<td>10&quot; (253)</td>
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<tr>
<td>I</td>
<td>11-3/4&quot; (298)</td>
<td>13-3/4&quot; (348)</td>
</tr>
<tr>
<td>J</td>
<td>13-7/8&quot; (353)</td>
<td>17-1/4&quot; (438)</td>
</tr>
<tr>
<td>K</td>
<td>12-3/8&quot; (315)</td>
<td>15-3/4&quot; (400)</td>
</tr>
<tr>
<td>L</td>
<td>10-1/4&quot; (260)</td>
<td>12-1/4&quot; (310)</td>
</tr>
</tbody>
</table>

**NOTE:**
- Front edge of back-box must be flush with finished wall surface.
- Conduit and mounting hardware provided by others based on application.

---

**Figure 5-2. Wall Control Mounting Options**
Figure 5-3. Wall Control Wiring

2 DEDICATED CONDUIT RACEWAYS REQUIRED TO SEPARATE 100-240VAC INPUT SUPPLY LINES FROM DC SUPPLY LINES TO LIGHT FIXTURE

NEUTRAL - WHITE (BLUE EU MODELS)
LINE - RED (BROWN EU MODELS)
GROUND - GREEN WITH YELLOW

100-240VAC INPUT FROM FACILITY
5-3. Install Fixture Mounting Plate

a. Check the strength and stability of the mounting structure. It should be fabricated of steel and welded or bolted to the structural ceiling. It should be braced in a manner that will allow no twisting or lateral motion. In standard installations, a steel stiffener plate should be used to connect the 3/4" diameter "all-thread" support rods and to provide an attachment base for the angle-iron sway bracing. The 3/4" diameter support rods should be mounted in a 9-1/2" (240mm) square pattern and should extend 2-1/4" (60mm) below the finished ceiling.

**NOTICE**

See mounting structure guideline in the Section 6.

b. Install the SKYTRON mounting plate on the threaded rods between jam nuts (Figure 5-4). The plate should normally be located 1-1/4" (32mm) off the finished ceiling (measured from the bottom of the plate) and accurately leveled using a digital level. Tighten the jam nuts securely.

![Figure 5-4. Mounting Plate Installation](image)

**CAUTION**

The mounting plate must be accurately leveled within 0.1° to prevent lighthouse drift.

5-4. Install Radial Arm Assembly and Ceiling Cover

**NOTICE**

An appropriate lifting device is recommended for installing each radial arm assembly. The weights of the various radial arm assemblies are:

<table>
<thead>
<tr>
<th>Radial Arm Assembly</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Radial Arm</td>
<td>58 pounds (26 kg)</td>
</tr>
<tr>
<td>Dual Radial Arm</td>
<td>86 pounds (39 kg)</td>
</tr>
<tr>
<td>Triple Radial Arm</td>
<td>117 pounds (53 kg)</td>
</tr>
</tbody>
</table>

**NOTICE**

The multiple arm assemblies are easier to handle during installation if the arms are left taped and tied together.

In some cases it may be necessary to connect the electrical wires from the wall control to the radial arm junction box before the arm assembly can be bolted to the mounting plate.

Use two 6" to 8" bolts to hold fixture while connecting wiring.

a. Install the radial arm assembly (RAA) onto the mounting plate using the six (6) bolts provided (Figure 5-5). Torque the 1/2"-13 mounting bolts to 38 ft-lbs (52 N-m).

![Figure 5-5. Radial Arm Installation](image)
**NOTICE**

Radial arm wires are tagged for proper connection to the wall control (top arm #1, next arm #2, bottom arm [triple arm models] #3).

b. Observe wire tags and color codes and connect the electrical wires from the wall control to the radial arm junction box wires.

c. Install the ceiling cover and secure.

5-5. Install VST and BOM

**NOTICE**

Determine correct placement for each BOM/VST on the RAA. The longest VST goes into the top radial arm.

a. Install the VST on the BOM, apply Blue Loctite® to screw threads, and secure VST with the Allen screws provided (Figure 5-6).

b. Follow the tightening sequence shown in Figure 5-7 and torque the screws to 9 ft-lbs (12Nm).

c. Insert the VST of VST/BOM assembly into the RAA receptacle (Figure 5-8). Apply Loctite® to screw threads, and secure the BOM/VST assembly with the mounting screws following the tightening sequence (Figure 5-7).

d. Remove cap from RAA (Figure 5-8). Pull VST and RAA wires up through access hole in RAA (Figure 5-9).
e. Observe the wire colors and connect the wires from the RAA to the corresponding VST wires using crimp connectors (Figure 5-9).
f. Ensure that all wire connections are secure, then place crimped wires inside RAA access hole. Re-install cap removed in Step d.
g. Repeat procedure for any remaining BOM/VST assemblies.

5-6. Install Lightheads

a. To make it easier to install the lighthead, locate the support arm of the BOM so that it points inward toward the ceiling cover (Figure 5-10). This will prevent the radial arm from moving when installing the lighthead.

b. Remove the four (4) screws from the lighthead mounting stub.
c. Install the lighthead mounting stub into the support arm and secure with the screws previously removed in Step b (Figure 5-11).

d. Pull the lighthead down and remove the shipping block from the BOM (Figure 5-12).

5-7. Adjust Maximum Output Voltage

Use the following procedure to check and adjust the maximum output voltage to a NL25 lighthead:

**NOTICE**

This adjustment only applies to NL25 lighheads that are controlled by wall control units. It does not apply to the NL25S lighthead on a portable stand.

a. Remove top cover from VST end of radial arm to access the red and white wires for checking the output voltage (Figure 5-13).

**WARNING**

DO NOT remove lighthead when support arm is in down position. The BOM will be severely damaged and may result in bodily injury.
b. Repeat Step a for each additional lighthead.

c. At the wall control unit, place the MAIN POWER switch in the ON position (Figure 5-14). Then turn the intensity control knob for the lighthead(s) being tested to maximum intensity.

d. Using a true RMS digital voltmeter, check the voltage at the red (+) and white (-) wires at each lighthead (Figure 5-13). The output voltage should be 19 VDC ±0.2 volts to obtain 18.9 VDC at the lighthead.

e. If the output voltage at any of the lightheads is not 19 VDC ±0.2 volts:
   1. Remove the screws that secure the wall control unit cover in place and remove the cover.
   2. Locate the voltage adjuster for the lighthead being adjusted (Figure 5-15).
   3. Use the voltage adjuster to adjust output voltage at the lighthead (Figure 5-13) to 19 VDC ±0.2.
   4. Repeat Steps 2 and 3 for each additional lighthead requiring adjustment.
   5. Replace wall control unit cover and secure using the screws removed in Step 1.

f. At the VST end of the radial arm for each lighthead, place the test wires and connectors inside the radial arm and install the cover.
6-1. Typical Light Fixture and Wiring Requirements (NL2525 Shown)

- 2 DEDICATED CONDUIT RUNS REQUIRED AT WALL CONTROL TO SEPARATE 100-240VAC INPUT LINES FROM DC OUTPUT LINES TO LIGHT FIXTURE TO PREVENT THE MIGRATION OF ELECTRICAL MAGNETIC INTERFERENCE WHICH WILL DISRUPT THE OPERATION OF THE LIGHT.

NOTE:

LIGHTING FIXTURE

WALL CONTROL (SKYTRON SUPPLIED)

3/4" METAL CONDUIT 12 AWG, 3 WIRES PER LIGHTHEAD RED, GREEN, WHITE

18.9 VDC OUTPUT

3/4" METAL CONDUIT 100-240VAC INPUT DEDICATED
6-2. Typical Wiring Diagram (NL2525 Shown)
6-3. Standard Mounting Structure Guideline

NOTES:
1. 3/4" support rods located for total support of light, all labor and materials for fabrication supplied by General Contractor. 3/4" nuts and washers for support of SKYTRON mounting plate supplied by contractor (8 ea. required).

2. The mounting structure must be attached to structural ceiling and BRACED TO ALLOW NO TWISTING OR LATERAL MOTION and shall be designed not to provide a degree of deflection greater than two-tenths of a degree at the mounting plate.

3. 3/4" metal conduit and minimum 12AWG wire size (3 wires per lighthead) required between fixture and SKYTRON supplied wall control. All metal conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes and by a certified electrician.

4. CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.

This is a GENERAL GUIDELINE ONLY.
# SECTION 7. REVISION HISTORY

<table>
<thead>
<tr>
<th>Date</th>
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<tr>
<td>07/15/2013</td>
<td>1</td>
<td>Revised in its entirety for 3rd Edition.</td>
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| 04/04/2014 | 2        | • Added CE mark to cover.  
• Added EC-REP to inside cover for Skytron Europe BV.  
• Added EC-REP to Label Symbols table on Page 5.  
• Revised Mounting structure dimensions & optional back-box Installation illustration |
| 9/29/2015  | 3        | Pg 15 change 1-1/4" ceiling to mounting plate to 1-1/8" in figure 5-4  
Pg 21 change 1-1/4" ceiling to mounting plate to 1-1/8" and 2-1/4" to 2-1/8" |