KleenSpec® 790 Series
Cordless Illumination System
for the 590 Series Vaginal Speculum

Directions for Use

WelchAllyn®
Advancing Frontline Care™
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Introduction

The Welch Allyn KleenSpec® 790 series cordless illumination system can be used with or without the KleenSpec 590 series disposable vaginal speculum. The cordless illumination system consists of the following items.

Intended use

When used with the vaginal speculum, the cordless illuminator provides illumination during pelvic examinations and other gynecological procedures, such as pap smears, dilation and curettage (D&C) biopsy, and electrosurgery.

The cordless illuminator can be used independent of the speculum as a general-purpose light source.

Contraindications

The 790 series illuminator (either by itself or in conjunction with a 590 series speculum) is not intended to be used for eye examinations.

The 790 series illuminator (either by itself or in conjunction with a 590 series speculum) is not intended to be used for diagnosis.
User profile

The intended users of the illuminator are medical professionals who are qualified to perform a pelvic examination.

Symbols

The symbols illustrated on the following pages may appear in this manual or on the illuminator, charging station, auxiliary power cord, packaging, or shipping container.

Table 1. Documentation symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="WARNING" /></td>
<td>In this manual, this symbol and “WARNING” indicate conditions or practices that could lead to illness, injury, or death.</td>
</tr>
<tr>
<td><img src="image" alt="Caution" /></td>
<td>In this manual, this symbol and “Caution” indicate conditions or practices that could damage the equipment or other property.</td>
</tr>
<tr>
<td><img src="image" alt="Information" /></td>
<td>On the product, this symbol means consult operating instructions.</td>
</tr>
</tbody>
</table>

Table 2. Shipping, storing, and environment symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="This end up" /></td>
<td>Keep dry</td>
</tr>
<tr>
<td><img src="image" alt="Fragile" /></td>
<td>Relative humidity limit</td>
</tr>
<tr>
<td><img src="image" alt="Temperature limits" /></td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Certification symbols

Meets essential requirements of European Medical Device Directive 93/42/EEC.

Regulatory Affairs Representative
Welch Allyn Limited
Navan Business Park
Dublin Road, Navan
County Meath, Republic of Ireland

CERTIFIED TO: CAN/CSA STD C22.2 NO. 601.1
CONFORMS TO: IEC 60601-1, IEC60601-1-2, UL 60601-1

EMC framework of Australia

Table 4. Operation symbols

Caution, hot surface

The speculum is a Type BF applied part

Alternating current

Direct current

Double insulation

Not protected from the ingress of liquid.

Recycle the product separately from other disposables. See "Recycling the system components" on page 13.

Power plug
Using the system safely

Before using the cordless illumination system, you must read and understand the following safety-related information.

General warnings

The following warning statements apply to use of the cordless illumination system in general. Warning statements that apply specifically to particular procedures, such as cleaning, appear in the corresponding sections of the manual.

Warning statements indicate conditions or practices that could lead to illness, injury, or death.

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

WARNING No modification to this equipment is allowed.

WARNING The illuminator may generate heat after prolonged use.
- Operation time limits: Illuminator with speculum ≤ 10 minutes on, ≥ 5 minutes off between uses. Illuminator alone ≤ 2 minutes on, ≥ 5 minutes off between uses.
- Illuminator could be harmful to skin if touched after being on for extended times.
- To avoid fire, do not place illuminator onto a flammable surface if LED is on.
- Illuminator is not suitable for use in the presence of a flammable anesthetic mixture with air or oxygen or nitrous oxide. An explosion may result.
**WARNING** To prevent shock hazards, the power outlet must be properly grounded. Grounding reliability is achieved only when connected to hospital-use or hospital-grade receptacles.

**WARNING** The illuminator is not intended to be used for eye examinations.

**WARNING** The illuminator is not intended to be used for diagnosis.

**WARNING** The illuminator is intended to be used by trained medical professionals.

**WARNING** This product comes with a power supply and/or power cord that is intended for use only with this product. The power supply and/or power cord have not been tested and approved for use with other products that may have the same power connectors. If you cannot locate the original power supply and/or power cord, please contact Welch Allyn to obtain replacement parts.

**Caution** Disconnect the AC power cord to remove power to the device.

**Caution** The cordless illuminator could be a biohazard after use. Follow good hospital practices. See “Cleaning and disinfecting” on page 12.

**Caution** Cordless illuminator, charging station, and auxiliary power cord are not protected from the ingress of liquid.

**Caution** There are no user-serviceable parts inside the device. In case of a malfunction, call Welch Allyn and precisely describe the problem.
Caution This device complies with current required standards for electromagnetic interference and should not present problems to other equipment or be affected by other devices. As a precaution, avoid using this device in close proximity to other equipment.

Caution Use only Welch Allyn-approved parts. See “Part numbers” on page 17.
Utilisation sécuritaire du système

Avant d’utiliser le système d’éclairage sans fil, vous devez bien lire et comprendre les renseignements de sécurité suivants.

Avertissements généraux

Les avertissements suivants s’appliquent à l’utilisation du système d’éclairage sans fil en général. Les avertissements qui s’appliquent à des procédures particulières, comme le nettoyage, sont abordés dans les sections correspondantes de ce manuel.

Ces avertissements indiquent des conditions ou des pratiques qui pourraient causer des maladies, des blessures ou des décès.

AVERTISSEMENT Pour éviter les risques de choc électrique, cet équipement doit seulement être branché sur une alimentation secteur dotée d’une mise à la masse.

AVERTISSEMENT Aucune modification de cet équipement n’est autorisée.

AVERTISSEMENT Le système d’éclairage peut dégager de la chaleur après une utilisation prolongée.

- Les durées d’opération maximales : Illuminateur avec spéculum ≤ 10 minutes de marche, ≥ 5 minutes d’arrêt entre les utilisations. Illuminateur seul ≤ 2 minutes de marche, ≥ 5 minutes d’arrêt entre les utilisations.
- Le système d’éclairage peut causer des brûlures cutanées si vous y touchez après une utilisation prolongée.
- Pour éviter les risques d’incendie, ne déposez pas le système d’éclairage sur une surface inflammable lorsque la DEL est allumée.
- Le système d’éclairage ne devrait pas être utilisé en présence d’un mélange d’anesthésique inflammable et de l’air ou encore d’oxygène ou d’oxyde nitreux. Cela pourrait causer une explosion.
La prise électrique doit être correctement mise à la terre afin d'éviter les chocs électriques. Vous ne pouvez être certain de la mise à la terre que si l’appareil est branché dans une prise utilisée par les hôpitaux ou de qualité hospitalière.

Le système d’éclairage ne devrait pas être utilisé pour les examens des yeux.

Le système d’éclairage ne devrait pas être utilisé pour effectuer un diagnostic.

Le système d’éclairage est conçu pour être utilisé par des professionnels médicaux formés.

Un bloc d’alimentation et/ou un cordon d’alimentation, destinés à une utilisation avec ce produit seulement, sont fournis avec le produit. Le bloc d’alimentation et/ou le cordon d’alimentation n’ont pas été testés et approuvés pour une utilisation avec d’autres produits qui pourraient être munis des mêmes connecteurs d’alimentation. Si vous n’avez plus le bloc d’alimentation et/ou le cordon d’alimentation originaux, veuillez communiquer avec Welch Allyn pour obtenir des pièces de remplacement.
Mises en garde générales

Les mises en garde suivantes s’appliquent à l’utilisation du système d’éclairage sans fil en général. Les énoncés de mise en garde qui s’appliquent à des procédures particulières, comme les examens pelviens, sont abordées dans les sections correspondantes de ce manuel.

Les énoncés de mise en garde indiquent des conditions ou des pratiques qui pourraient endommager les équipements ou la propriété.

Mise en garde Débranchez le cordon d'alimentation c.a. pour mettre l’appareil hors tension.

Mise en garde Le système d’éclairage sans fil pourrait être considéré à risque biologique après utilisation. Conformez-vous aux bonnes pratiques hospitalières. Voir “Cleaning and disinfecting” à la page 12.

Mise en garde Le système d’éclairage sans fil, la borne de recharge et le cordon d’alimentation auxiliaire ne sont pas protégés contre les infiltrations de liquide.

Mise en garde Cet appareil ne contient aucune pièce à entretenir. En cas de mauvais fonctionnement, appelez Welch Allyn et décrivez le problème de manière précise.

Mise en garde Cet appareil est conforme aux normes actuelles obligatoires sur les interférences électromagnétiques. Il ne devrait présenter aucun problème pour les autres équipements et ne devrait pas être affecté par d’autres appareils. Par mesure de précaution, évitez d’utiliser cet appareil à proximité d’autres équipements.

Mise en garde N’utilisez que des pièces approuvées par Welch Allyn. Voir “Part numbers” à la page 17.
Charging the illuminator

Charge the illuminator before using it the first time, or whenever its low-charge indicator turns on.

**To charge the illuminator**

1. If LED is lit, turn power switch off.
2. Connect charging base to AC power.
3. Place the illuminator (either direction) into the charging station. Full charging takes 6 to 8 hours.
4. Remove the charged illuminator when you are ready to use it. It is safe to leave the illuminator in the charging station after it is charged.
Directions for use Cordless illumination system

Using the illuminator for a pelvic exam

1. Fully insert the illuminator into a 590 series speculum (a). The LED automatically turns on.
2. Conduct the examination.
3. If the LED turns off, do not remove the speculum. Do either of these things:
   - Leave the illuminator in place, and use an external light source.
   or
   - Connect the auxiliary power cord to AC power. Hold the speculum in place, and remove the illuminator. Connect the auxiliary power cord to illuminator (b). Reinsert the illuminator.
4. When finished, remove the speculum, and then remove the illuminator. The LED automatically turns off.

Using the illuminator as light source

To use the illuminator as a light source, slide the power switch to turn it on (all the way down) and off (all the way up).

Note For operation time limits, see “Intermittent operation” on page 16.
Maintenance

Cleaning and disinfecting

Use CaviWipe® wipes for both cleaning and disinfecting.*

*EPA-approved intermediate-level disinfectant appropriately labeled as effective against TB mycobacterium tuberculosis (per AAMI TIR-12, 2004, section 5.2.3)

Caution Use only the cleaning and disinfection methods described in this manual. Clean the illuminator prior to disinfection.

To clean and disinfect the illuminator

1. After using the illuminator, unplug any power cords.
2. Clean the illuminator.
   a. Following the wipe manufacturer’s instructions, wipe the entire unit to completely remove any gross debris.
   b. Gently wipe the gold contacts on the bottom with 70% alcohol. If debris builds up on these contacts, the charging or auxiliary power functions might be affected.
3. Disinfect the illuminator.
   a. Following the wipe manufacturer’s instructions, thoroughly wet the surface of the entire illuminator.
   b. Using sterile gauze soaked with 70% isopropyl alcohol, thoroughly wet the surface of the entire illuminator. The treated surface must remain wet for five minutes. If needed, reapply the solution to keep the surface continuously wet during this time.
   c. Allow the surface to dry.

To clean the charging base or auxiliary power cord

1. After using the charging base or auxiliary power cord, unplug the power cord.
2. Clean the component. Following the wipe manufacturer’s instructions, wipe the surface to completely remove any gross debris.
Inspecting the system

Examine all components of the cordless illumination system monthly. Components include the illuminator, charging station, and auxiliary power cord.

If any component is worn or damaged, replace it with the Welch Allyn-approved part. For ordering information, see “Part numbers” on page 17.

Recycling the system components

Within the EU


If this product is contaminated, this directive does not apply.

For more specific disposal information, see www.welchallyn.com/weee, or contact Welch Allyn.

Outside the EU

When the product reaches its end of life, recycle the components according to national, state, and local regulations, or return the product to Welch Allyn.
Troubleshooting

If you try these suggestions and still have problems, contact Welch Allyn.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Probable causes &amp; solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED does not light.</td>
<td>Battery is low. Charge the illuminator.</td>
</tr>
<tr>
<td></td>
<td>Illuminator is not seated correctly in speculum. Insert illuminator fully into speculum.</td>
</tr>
<tr>
<td>LED does not light when the auxiliary power cord is attached.</td>
<td>Auxiliary power cord is not plugged in. Plug the auxiliary power cord into an AC outlet.</td>
</tr>
<tr>
<td></td>
<td>Auxiliary power cord is not seated properly. Plug the cord into the illuminator properly.</td>
</tr>
<tr>
<td>LED does not automatically turn off when removing the illuminator from the speculum.</td>
<td>Power switch is damaged or blocked. Clean the switch area. If the problem continues, replace the illuminator.</td>
</tr>
<tr>
<td>Illuminator does not charge in the charging base.</td>
<td>Charging base is not plugged in. Connect charging base to AC power.</td>
</tr>
<tr>
<td></td>
<td>Illuminator is not seated properly in charging base. Reinsert the illuminator into the charging base, and verify that the status indicator glows amber.</td>
</tr>
</tbody>
</table>

Contacts

For information about any Welch Allyn product, call the nearest Welch Allyn representative:

- **USA** 1 800 535 8663  + 1 315 685 4560
- **Canada** 1 800 561 8797
- **European Call Center** + 353 46 906 7790  + 49 747 792 7186
- **Germany** + 31 202 061 360  + 2711 777 7555
- **Latin America** + 305 669 9003
- **Singapore** + 656 419 8100  + 46 85 853 6551
- **United Kingdom** + 44 207 365 6780
- **Australia** + 6129 638 3000  + 353 46 906 7790
- **China** + 86 216 327 9631
- **France** + 3315 569 5849
- **Germany** + 49 747 792 7186  + 3315 569 5849
- **Japan** + 81 202 061 360  + 31 202 061 360
- **Netherlands** + 31 202 061 360
- **South Africa** + 2711 777 7555
- **Sweden** + 46 85 853 6551
- **United Kingdom** + 44 207 365 6780
Appendix

Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auxiliary power cord transformer</strong></td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>U.S. &amp; Canada</td>
</tr>
<tr>
<td>Classification</td>
<td>Class II and internally powered, type BF applied part</td>
</tr>
<tr>
<td>Input</td>
<td>120 V ~ 60 Hz</td>
</tr>
<tr>
<td>Output</td>
<td>5.5 VDC, 300 mA</td>
</tr>
<tr>
<td>Category</td>
<td>Not AP/APG equipment</td>
</tr>
<tr>
<td><strong>Charging station transformer</strong></td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>U.S. &amp; Canada</td>
</tr>
<tr>
<td>Classification</td>
<td>Class I and internally powered</td>
</tr>
<tr>
<td>Input</td>
<td>120 V ~ 60 Hz</td>
</tr>
<tr>
<td>Output</td>
<td>9.8 VDC, 150 mA</td>
</tr>
<tr>
<td>Category</td>
<td>Not AP/APG equipment</td>
</tr>
<tr>
<td><strong>Power cord length</strong></td>
<td></td>
</tr>
<tr>
<td>Auxiliary power cord</td>
<td>305 cm (120 in)</td>
</tr>
<tr>
<td>Charging station</td>
<td>92 cm (36 in)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
</tr>
<tr>
<td>Illuminator</td>
<td>48 g (0.1 lb)</td>
</tr>
<tr>
<td>Charging station (base and power cord)</td>
<td>142 g (0.31 lb)</td>
</tr>
<tr>
<td>Auxiliary power cord</td>
<td>290 g (0.64 lb)</td>
</tr>
<tr>
<td><strong>Battery cell</strong></td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>420 mAh</td>
</tr>
<tr>
<td>Voltage</td>
<td>3.7 V</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Li-ion (single lithium ion)</td>
</tr>
<tr>
<td><strong>Protection against ingress of water</strong></td>
<td>IPX0</td>
</tr>
<tr>
<td><strong>Operating conditions</strong></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>+10° C to +35° C (+50° F to +95° F)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>30% to 75% noncondensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>700 to 1060 hPa</td>
</tr>
<tr>
<td>Item (continued)</td>
<td>Specification (continued)</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Shipping and storage conditions</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>-20°C to +49°C (-4°F to +120°F)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>15% to 95% noncondensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>500 hPa to 1060 hPa</td>
</tr>
<tr>
<td>Intermittent operation</td>
<td></td>
</tr>
<tr>
<td>Illuminator with speculum</td>
<td>≤ 10 minutes on, ≥ 5 minutes off between uses</td>
</tr>
<tr>
<td>Illuminator alone</td>
<td>≤ 2 minutes on, ≥ 5 minutes off between uses</td>
</tr>
<tr>
<td>Safety, EMC, and regulatory compliance</td>
<td>CAN/CSA C22.2 No. 601.1-M90, including amendments 1 &amp; 2</td>
</tr>
<tr>
<td>LED radiation output</td>
<td>&lt; 6.67 mW at 400 – 700 nm wavelengths</td>
</tr>
</tbody>
</table>
### Part numbers

<table>
<thead>
<tr>
<th>Item</th>
<th>Order Number</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cordless illuminator system with charging station</td>
<td>U.S. &amp; Canada: 79910</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International: 79915*</td>
<td></td>
</tr>
<tr>
<td>Cordless illuminator system with charging station and auxiliary power cord</td>
<td>U.S. &amp; Canada: 79920</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International: 79925*</td>
<td></td>
</tr>
<tr>
<td>Cordless illuminator</td>
<td>U.S. &amp; Canada: 79900</td>
<td></td>
</tr>
<tr>
<td>Charging station (base and power cord)</td>
<td>U.S. &amp; Canada: 73910</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International: 73915*</td>
<td></td>
</tr>
<tr>
<td>Auxiliary power cord</td>
<td>U.S. &amp; Canada: 75910</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International: 75915*</td>
<td></td>
</tr>
</tbody>
</table>

* Specify country and voltage.
Limited warranty

Welch Allyn warrants that the KleenSpec vaginal speculum cordless illumination system products meet the labeled specifications of the Products and will be free from defects in materials and workmanship that occur within one year after the date of purchase.

The date of purchase is the date specified in our records, if you purchased the Product directly from us or 30 days after the date on which the Product was sold to the dealer from whom you bought the Product, as documented in our records.

This warranty does not cover damage caused by: 1) handling during shipping, 2) use or maintenance contrary to labeled instructions, 3) alteration or repair by anyone not authorized by Welch Allyn, and 4) accidents.

If a Product or accessory covered by this warranty is determined to be defective because of defective materials, components, or workmanship, and the warranty claim is made within the warranty period described above, Welch Allyn will, at its discretion, repair or replace the defective Product or accessory free of charge. If your Product requires repairs covered by this warranty, upon your request Welch Allyn will loan to you, at no cost, a substitute Product for use until your repaired Product is returned.

You must obtain a return authorization from Welch Allyn to return your Product before you send it to Welch Allyn’s designated service center for repair. Contact Welch Allyn Technical Support.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. WELCH ALLYN’S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF PRODUCTS CONTAINING A DEFECT. WELCH ALLYN IS NOT RESPONSIBLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM A PRODUCT DEFECT COVERED BY THE WARRANTY.
Service policy

All repairs on products under warranty must be performed or approved by Welch Allyn. Unauthorized repairs will void the warranty. In addition, whether or not covered under warranty, any product repair shall exclusively be performed by Welch Allyn certified service personnel.

If the product fails to function properly — or if you need assistance, service, or spare parts — contact Welch Allyn.

Before contacting Welch Allyn, try to duplicate the problem, and check all accessories to ensure that they are not causing the problem. When calling, please be prepared to provide:

- Product name and model number and complete description of the problem.
- Serial number of your product (if applicable).
- Complete name, address and phone number of your facility.
- For out-of-warranty repairs or spare parts orders, a purchase order (or credit card) number.
- For parts orders, the required spare or replacement part numbers.

If your product requires warranty, extended warranty, or non-warranty repair service, please call Welch Allyn. A representative will assist you troubleshooting the problem and will make every effort to solve it over the phone, avoiding potential unnecessary returns.

In case a return cannot be avoided, the representative will record all necessary information and will provide a Return Material Authorization (RMA) number, as well as the appropriate return address. An RMA number must be obtained prior to any return.

If you have to return goods for service, follow these recommended packing instructions:

- Remove all hoses, cables, sensors, power cords, and ancillary products (as appropriate) before packing, unless you suspect they are associated with the problem.
- Wherever possible use the original shipping carton and packing materials.
- Include a packing list and the Welch Allyn Return Material Authorization (RMA) number.

It is recommended that all returned goods be insured. Claims for loss or damage to the product must be initiated by the sender.
EMC guidance and manufacturer’s declarations

Table 1. Emissions for all EQUIPMENT and SYSTEMS

The 790 series cordless illumination system is intended for use in the electromagnetic environment specified below. The customer or user of the 790 series cordless illumination system should assure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Emissions test</th>
<th>Compliance</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF emissions CISPR 11</td>
<td>Group 1</td>
<td>The 790 series cordless illumination system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.</td>
</tr>
<tr>
<td>RF emissions CISPR 11</td>
<td>Class B</td>
<td>The 790 series cordless illumination system is suitable for use in all establishments including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.</td>
</tr>
<tr>
<td>Harmonic emissions IEC 61000-3-2</td>
<td>Class A</td>
<td></td>
</tr>
<tr>
<td>Voltage fluctuations/</td>
<td>Complies</td>
<td></td>
</tr>
<tr>
<td>flicker emissions IEC 61000-3-3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2. Immunity for all EQUIPMENT and SYSTEMS

The 790 series cordless illumination system is intended for use in the electromagnetic environment specified below. The customer or user of the 790 series cordless illumination system should assure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Immunity test</th>
<th>IEC 60601 test level</th>
<th>Compliance level</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic discharge (ESD) IEC 61000-4-2</td>
<td>± 6 kV contact ± 8 kV air</td>
<td>± 6 kV contact ± 8 kV air</td>
<td>Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.</td>
</tr>
<tr>
<td>Electrical fast transient (EFT)/burst IEC 61000-4-4</td>
<td>±2 kV mains ±1 kV I/O</td>
<td>±2 kV mains Not applicable</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Surge IEC 61000-4-5</td>
<td>±1 kV differential ±2 kV common</td>
<td>±1 kV differential ±2 kV common</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Voltage dips, short interruptions, and voltage variations on power supply input lines. IEC 61000-4-11</td>
<td>&gt;95% dip in 0.5 cycle 60% dip in 5 cycles 30% dip for 25 cycles &gt;95% dip in 5 seconds</td>
<td>&gt;95% dip in 0.5 cycle 60% dip in 5 cycles 30% dip for 25 cycles &gt;95% dip in 5 seconds</td>
<td>Mains power quality should be that of a typical commercial or hospital environment. If the user of the 790 series cordless illumination system requires continued operation during power mains interruptions, it is recommended that the 790 series cordless illumination system be powered from an uninterruptible power supply or battery.</td>
</tr>
<tr>
<td>Power frequency (50/60Hz) magnetic field IEC 61000-4-8</td>
<td>3 A/m</td>
<td>3 A/m</td>
<td>Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.</td>
</tr>
</tbody>
</table>
### Table 3. Electromagnetic immunity

The 790 series cordless illumination system is intended for use in the electromagnetic environment specified below. The customer or user of the 790 series cordless illumination system should assure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Immunity test</th>
<th>IEC 60601 test level</th>
<th>Compliance level</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted RF, IEC 61000-4-6</td>
<td>3 Vrms 150 kHz to 80 MHz</td>
<td>3 Vrms</td>
<td>Portable and mobile RF communications equipment should be used no closer to any part of the 790 series cordless illumination system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</td>
</tr>
<tr>
<td>Radiated RF, IEC 61000-4-3</td>
<td>3 V/m 80 MHz to 2.5 GHz</td>
<td>3 V/m</td>
<td></td>
</tr>
</tbody>
</table>

**Recommended separation distance**

- **Conducted RF, IEC 61000-4-6**
  \[
  d = (1.17) \sqrt{P}
  \]

- **Radiated RF, IEC 61000-4-3**
  \[
  d = (1.17) \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}
  \]

  \[
  d = (2.33) \sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{ GHz}
  \]

  where \( P \) is the maximum output power rating of the transmitter in watts according to the transmitter manufacturer and \( d \) is the recommended separation distance in meters.

  Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range.

Interference may occur in the vicinity of equipment marked with the following symbol:

![Interference symbol]
Table 3. Electromagnetic immunity (continued)

Note 1: At 80 MHz and 800 MHz, the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the 790 series cordless illumination system is used exceeds the applicable RF compliance level above, the 790 series cordless illumination system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the 790 series cordless illumination system.

Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.
Table 4. Recommended separation distances between portable and mobile RF communications equipment and the 790 series cordless illumination system

The 790 series cordless illumination system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the 790 series cordless illumination system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the 790 series cordless illumination system as recommended below, according to the maximum output power of the communications equipment.

<table>
<thead>
<tr>
<th>Rated max. output power of transmitter (W)</th>
<th>Separation distance according to frequency of transmitter (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 kHz to 80 MHz 80 MHz to 800 MHz 800 MHz to 2.5 GHz</td>
</tr>
<tr>
<td></td>
<td>( d = (1.17)\sqrt{P} ) ( d = (1.17)\sqrt{P} ) ( d = (2.33)\sqrt{P} )</td>
</tr>
<tr>
<td>0.01</td>
<td>0.117 0.117 0.233</td>
</tr>
<tr>
<td>0.1</td>
<td>0.37 0.37 0.74</td>
</tr>
<tr>
<td>1</td>
<td>1.17 1.17 2.33</td>
</tr>
<tr>
<td>10</td>
<td>3.70 3.70 7.37</td>
</tr>
<tr>
<td>100</td>
<td>11.70 11.70 23.30</td>
</tr>
</tbody>
</table>

For transmitters rated at a maximum output power not listed above, the recommended separation distance \( d \) in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where \( P \) is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.