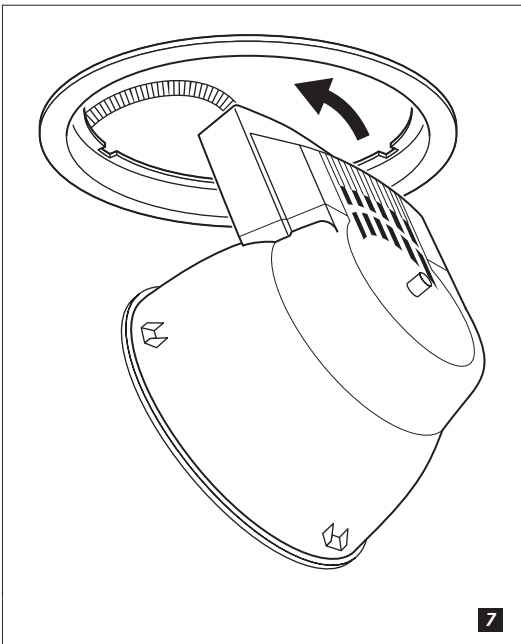


technical guides  
**installation guide**



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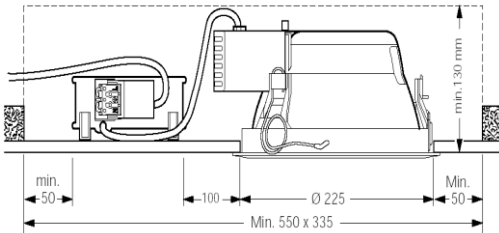
## 1 Installation Guide

This guide provides background information for the application of Lumiance fixtures. Please consult the product manuals for details about specific products. In some countries and in specific projects, different regulations may apply. If in doubt, consult an expert.

## 2 Recessed fixtures

### 2.1 Recess dimensions

For recessed fixtures, the minimum required dimensions of the recess space are specified. A too small recess space can lead to damage to the fixture and surrounding materials by overheating.

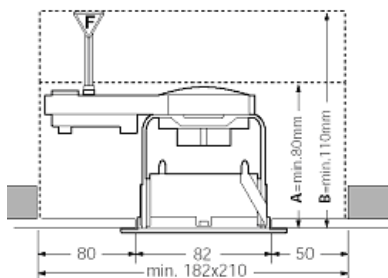


Do not cover fixture or gear with thermal insulation!



### 2.2 F-marked recessed fixtures

For some fixtures two recess dimensions are given. The lowest value applies to mounting in non-flammable materials (such as concrete, plaster, brick, metal). With the higher value, the fixture meets the requirements for F-mark and the fixture may therefore also be fitted in a wooden recess.



Do not cover fixture or gear with thermal insulation!




Minimum recess dimensions (l x w x h)

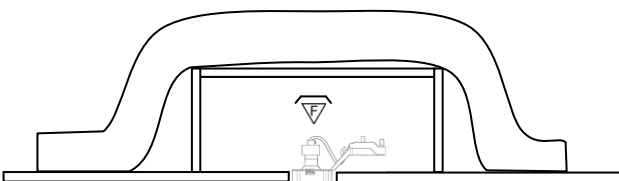


182 x 210 x 80 mm

182 x 210 x 110 mm

### 2.3 Thermal insulation

 marked fixtures are suitable for installation in insulated ceilings, provided that the minimum dimensions of the recess space are observed. Other luminaires should not be installed in insulated ceilings.



Minimum recess dimensions (l x w x h)



200 x 200 x 85 mm



400 x 400 x 85 mm



Lumiance Insulation Box required

Recess boxes for insulated ceilings are available in several sizes. Please note that some fixtures need to be downrated to a reduced Wattage for use in these boxes. Consult the product manuals for details.

**2.4 Ceiling discolouration**

With F-marked recessed fixtures, the ceiling temperature is below 90°C. Therefore, with F-mark recessed fixtures, there will be no discolouration of normal ceiling materials.

**2.5 Fire-resistant ceilings**

In some projects the ceiling also has a fire-resistant function. A fire-resistant ceiling can prevent fire from spreading for a specified period. The fire resistance of these ceilings is influenced unfavourably if cut-outs are made for recessed fixtures.

This problem can often be solved by fitting a cover box around the fixture with the same fire-resistant qualities as the ceiling. This can be realised by making this cover box of the same material as the ceiling. Here, the minimum overall dimensions stated in the user manual must be observed.

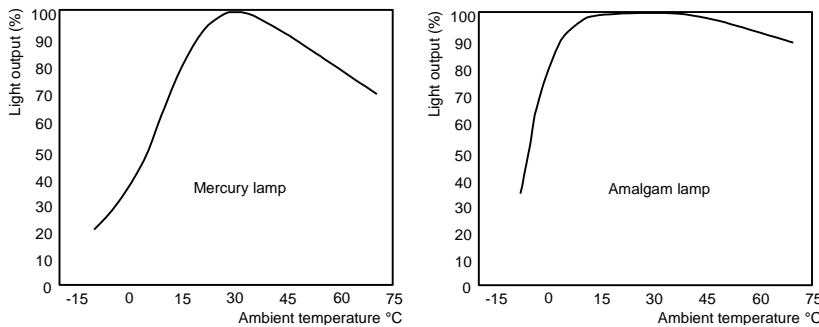
**2.6 Concrete ceilings**

Recessed fixtures can be installed in concrete ceilings by means of casting moulds.

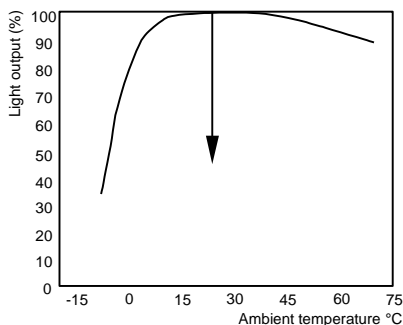
Concrete can absorb the heat of the fixtures very well and may therefore enclose the fixtures more tightly.

**2.7 Light fluctuations with recessed fixtures**

The ambient temperature influences the light output of compact fluorescent lamps, see the following examples.



A high ambient temperature has an unfavourable effect on the light output. In small ceiling recesses amalgam lamps are to be preferred, because the light output of amalgam lamps drops less at higher ambient temperatures. These graphs were measured with bare lamps burning in still air.



Strong ventilation with cool air (draft) also has an unfavourable effect on the light output, especially with amalgam lamps. Amalgam lamps are very vulnerable to draughts. Their output can drop below 50% in draughts, even at normal ambient temperatures.

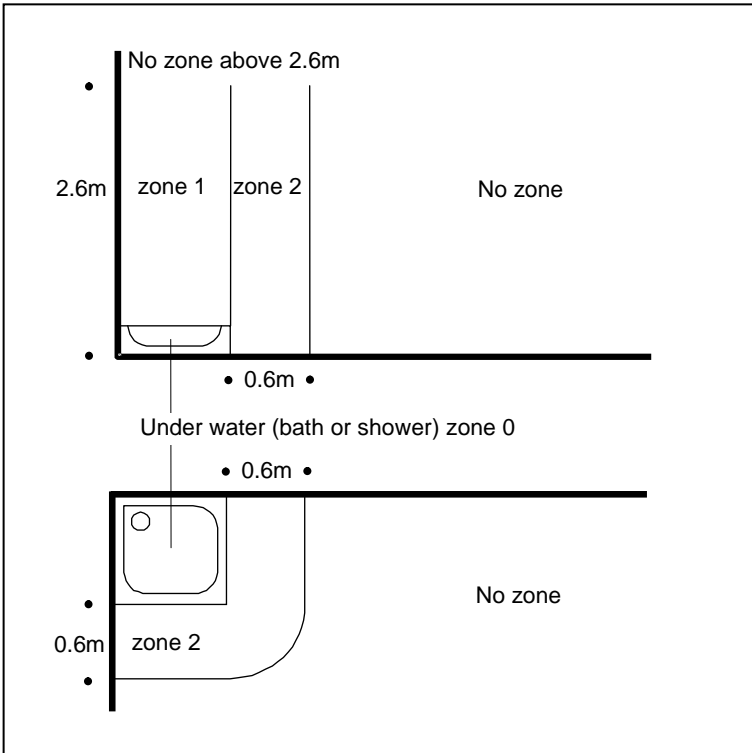
Some Lumiance fixtures are equipped with electronic stabilization. The effects of fluctuations in mains voltage, air flow and air temperature will be largely corrected by this stabilisation, but sudden changes will still be noticeable.

If draft cannot be avoided, the fixtures must be covered with a properly closing box of plywood or similar material. Here, the minimum recess dimensions stated in the user manual must be observed.

### 3 Bathroom lighting

Damp skin offers little protection against current flow through the body. Therefore, special safety requirements are placed on fixtures in bathrooms, both with regard to the ingress of water (IP) and to the protection class against electrical shock.

Bathrooms are divided into zones



Different requirements per zone

Protection against water

zone 0	water tight	IP x 7
zone 1	splash-proof *)	IP x 4
zone 2	splash-proof	IP x 4
No zone		IP x 0

\*) For zone 1 in private bathrooms.  
Jet proof IP x 5 required in zone 1 in most other cases (because of water jet cleaning).

Protection against electric shock

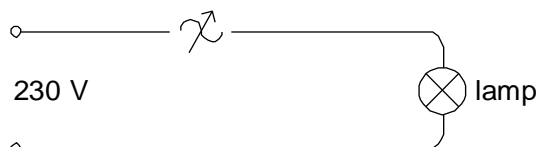
zone 0	Class III
zone 1	Class III
zone 2	Class II
No zone	Class I, II and III

N.B. Different regulations may apply in some countries and in specific projects. If in doubt, consult an expert.

### 4 Dimming

Incandescent lamps can be dimmed with any dimmer without problems. Under certain conditions, fluorescent lamps and halogen lamps can also be dimmed. High-pressure gas-discharge lamps are generally not suited to be dimmed.

#### 4.1 Incandescent lamps



Incandescent lamps can be dimmed with any dimmer without problems.



#### 4.2 Fluorescent lamps

Certain types of fluorescent lamps can be dimmed, providing they are connected to suitable ballasts. A fluorescent dimmer is usually an integral part of a ballast, operated via a 0-10V DC control circuit or a digital control circuit.

**4.3 Halogen lamps**

Halogen lamps can be dimmed, but they may blacken if they burn in a dimmed state. This blackening can be removed by setting the dimmer to full power for some time.

Halogen lamps are available in versions for mains voltage and low voltage. The low voltage is obtained by connecting a transformer between the lamp and the mains. Transformers are available in conventional (inductive) and electronic versions. In some Lumiance products the transformer is already built in. When dimming halogen lamps, there are three situations:

- Halogen lamps connected to the mains
- Halogen lamps connected to conventional transformers
- Halogen lamps connected to electronic transformers

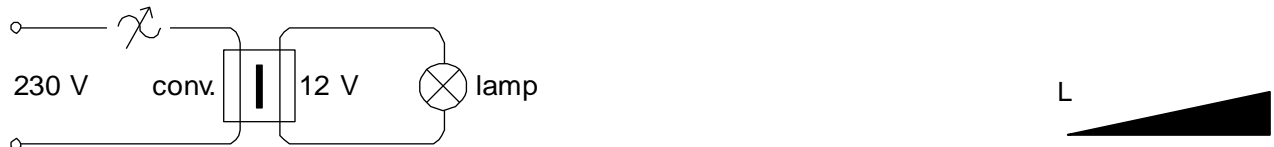
Some suppliers of dimmers use the term ‘halogen dimmer’ for dimmers for all three of the above situations. When purchasing dimmers, it should be clear which of the three situations is applicable, because different dimmers are needed for each of these situations.

**4.4 Halogen lamps on the mains**



These lamps can be dimmed with any type of dimmer. The inrush currents of halogen lamps are higher than those of ordinary incandescent lamps, thus the dimmer must be suitable for a higher wattage than that of the lamp. For example, use a 500W dimmer to dim a 300W halogen lamp.

**4.5 Halogen lamps on conventional transformers**



For halogen lamps connected to conventional transformers, special dimmers (inductive load, type L) must be used. Type L dimmers for conventional transformers can not be used for certain types of electronic transformers.

**4.6 Halogen lamps on electronic transformers**



Some electronic transformers can be dimmed with any type of dimmer. If this is the case, this will be stated by Lumiance in the relevant product manuals. Often a special dimmer is required that is suited for the dimming of electronic transformers (capacitive load, type C). Type C dimmers for electronic transformers can not be used for conventional transformers.

**5 Protective devices**

Where necessary, Lumiance products are fitted with built-in protections against overheating and overloading, so that there is less risk that protections in the installation will be activated.

The activation of a protection should be investigated by an expert, especially if the protection is activated again with a second attempt, because this indicates a defect in a device or in the installation.

### **5.1 Miniature circuit breakers (MCB)**

Miniature circuit breakers in installations ensure that part of an installation is switched off in time if an overload or short circuit occurs in it.

When lighting fixtures are switched on, the inrush current can be temporarily higher than in normal operation. Under normal circumstances, this phenomenon is harmless, but it can lead to unnecessary activation of a protective device. If this problem occurs, the following measures can be considered:

- Use miniature circuit breakers with C characteristics instead of B characteristics.
- Use fuses instead of miniature circuit breakers.
- Load the relevant electrical circuit to a maximum of 50% of the nominal power.

### **5.2 Residual current circuit breaker (RCCB)**

Residual current circuit breakers in installations ensure that part of an installation is switched off in time when current leaks to earth.

Sometimes residual current circuit breakers unnecessarily trip on the normal capacitive currents in the screening conductors of earthed devices. If this problem occurs, a different type of earth leakage switch will often provide a solution. It can also be a solution to distribute the fixtures concerned over several electrical circuits.

## **6 Power factor correction (PFC)**

Power factor correction must be considered in installations where fixtures with inductive ballasts are used, because these ballast cause reactive power. Power companies set limits to the amount of reactive power of an installation. Usually a power factor of 0.8 or higher is required.

Whether power factor correction is required depends on the ratio between the reactive power of the fixtures and the total installed power. When using a few inductive fixtures in a large installation, power factor correction will not be required.

The power factor of the installation can be improved by means of capacitors. There are several possibilities:

- parallel compensation at the incoming supply of the installation
- parallel compensation at distribution boards for groups of fixtures
- parallel compensation with a capacitor in each fixture
- series compensation with 1 capacitor for every 2 fixtures

Parallel compensation can disturb the operation of certain systems that use the mains cables for transport of signals. This problem can often be solved by installing filter coils between luminaires and mains or at the incoming supply of the installation.

Series compensation is only possible for certain types of fluorescent tubes, not for compact fluorescent lamps or high-pressure gas-discharge lamps.

## **7 Low voltage systems**

Lumiance low voltage installation products (transformers, cables etc.) are supplied with all information required for a safe installation.

Products from others can also be used to connect Lumiance low voltage fixtures. Here, the following advice applies:

- The wattage of the transformer must be at least equal to the total wattage of its lamps.
- Transformers must be certified safety transformers.
- Secondary wires with an adequate diameter must be used (the current at 12V is about 20 times higher than at 230V/240V).

- Connections should be fastened tightly. The ends of flexible connections must be finished with carefully crimped ferrules - do not tin.
- Low voltage fixtures should not be looped. A star connection or one transformer per fixture is preferred.
- Transformers should be positioned as closely as possible to the fixtures to prevent voltage drops.
- With transformers of more than 150W, the secondary cables must be fitted with the correct fuse to protect them against overloading.
- Transformers may not be covered and minimum recess dimensions must be observed.
- If in doubt, consult a certified installer.

## 8 Symbols

### 8.1 IP class

The IP classification indicates the protection against the ingress of objects, dust and moisture:

#### 1<sup>st</sup> number

- 0 Not protected
- 1 Protected against objects larger than 50 mm
- 2 Protected against objects larger than 12 mm
- 3 Protected against objects larger than 2.5 mm
- 4 Protected against objects larger than 1 mm
- 5 Protected against dust
- 6 Dust-tight

#### 2<sup>nd</sup> number




- 0 Not protected
- 1 Protected against dripping water
- 2 Protected against dripping water at an angle of 15° from the vertical
- 3 Protected against dripping water at an angle of 60° from the vertical
- 4 Protected against splashing water
- 5 Protected against water jets
- 6 Protected against heavy seas
- 7 Protected against immersion (specified time and pressure)
- 8 Intended for immersion

### 8.2 IK class



The resistive performance of fixtures to external mechanical impacts is specified with the prefix IK, followed by two numbers.

EN 50102	Impact energy (J)	Test	Example
IK 01	0.15	spring hammer	
IK 02	0.2	spring hammer	glass in fixed luminaires
IK 03	0.35	spring hammer	glass in portable luminaires
IK 04	0.5	spring hammer	glass in road and street lighting
IK 05	0.7	spring hammer	
IK 06	1	0.5 kg impact from 0.2 m	
IK 07	2	0.5 kg impact from 0.4 m	
IK 08	5	1.7 kg impact from 0.3 m	PAR lamp
IK 09	10	5 kg impact from 0.2 m	Archos diffuser
IK 10	20	5 kg impact from 0.4 m	Giotto diffuser


**8.3 Protection against electric shock****Symbol Class**

	I	Fully functionally insulated and provided with earth connection
	II	Double-insulated or provided with reinforced insulation, not earthed
	III	Protection against electric shock dependent on connection to SELV chains (Safe Extra Low Voltage)



**8.4 Transformers**

	Safety transformer
	Electronic transformer

**8.5 Emergency lighting**

	Emergency lighting luminaire or luminaire prepared for emergency lighting.
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**8.6 Adjustability**

	Turn. Rotation around the vertical axes.
	Tilt. Rotation from vertical to horizontal.



**8.7 F-mark (Suitability for mounting on wood)**

Only suitable fixtures may be mounted on normally flammable materials. These fixtures carry the F-mark.

Normally flammable means that the material can start to burn at 200 °C. Most types of wood are normally flammable materials. Examples of non-flammable materials are plasterboard, brick and concrete.

	Product suitable for direct mounting on normally flammable materials.
	Product suitable for direct mounting on non-flammable materials only.
	Product suitable for mounting in insulated ceilings.

**8.8 Glow wire test (Fire safety)**

	Passes the 750°C glow wire test with an extinction time of 30 seconds.
	Passes the 850°C glow wire test with an extinction time of 30 seconds.

**8.9 Looping**

	Suitable for connection in parallel (looping).
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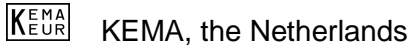
### **8.10 Approvals**

Suppliers of fixtures can subject themselves to voluntary certification by independent test houses. The right to carry an approval mark is granted when the design of the product and the quality control of the production process meet all applicable standards.

European approval



National approvals



### **8.11 CE marking**



The CE marking is often regarded as a voluntary approval mark, but this is not correct. The CE mark is not checked by independent test houses. The CE marking only indicates that a product meets the minimum legal requirements in the opinion of the responsible producer. With lighting fixtures, this concerns electrical safety (Low Voltage Directive 73/23/EEC) and electromagnetic disturbance (EMC Directive 89/336/EEC). The legal requirements are less extensive and less detailed than the requirements used for voluntary certification.