



Operating Instructions

LED Cube 100

Sicherheitsabschaltung
vor Betrieb aktivieren!
Am LED powerdrive
ext. LEDenable auf AN stellen.



Activate safety shutdown
before operation!
Set LED powerdrive
ext. LEDenable to ON.

Masthead

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Warnings and symbols in these operating instructions

You will find the following symbols next to all safety information/warnings in these Operating Instructions which indicate a danger to persons. An additional signal word indicates the severity of any potential injury.

Observe these instructions closely and be especially careful in these cases in order to preclude accidents.

DANGER! indicates an imminent hazard. If it is not avoided, death or very severe injuries will result. Damage to property is possible.

WARNING! indicates a possible danger. If it is not avoided, death or very severe injuries may result. Damage to property is possible.

CAUTION! indicates a possible danger. If it is not avoided, slight injuries may result. Damage to property is possible.

The symbols have the following meanings:



This symbol indicates a danger area



This symbol indicates a hot surface



This symbol indicates dangerous electrical voltage

The two symbols below can be found next to information regarding optimal operation of the unit and how to prevent it being damaged. There is no danger to persons in this case. The signal words Attention! and Note! are also used.



ATTENTION!

This symbol and the accompanying signal word appear in the Operating Instructions in sections where particular attention should be paid in order to prevent the unit being damaged or destroyed.



NOTE!

This symbol and the accompanying signal word appear next to notes, tips on usage and helpful information.

1 Introduction

These Operating Instructions describe the LED Cube 100 irradiation chamber which is designed for use with the LED Spot 100 emitter and the LED powerdrive control unit.

These three units combine to form a compact UV irradiation chamber for a wide range of applications.

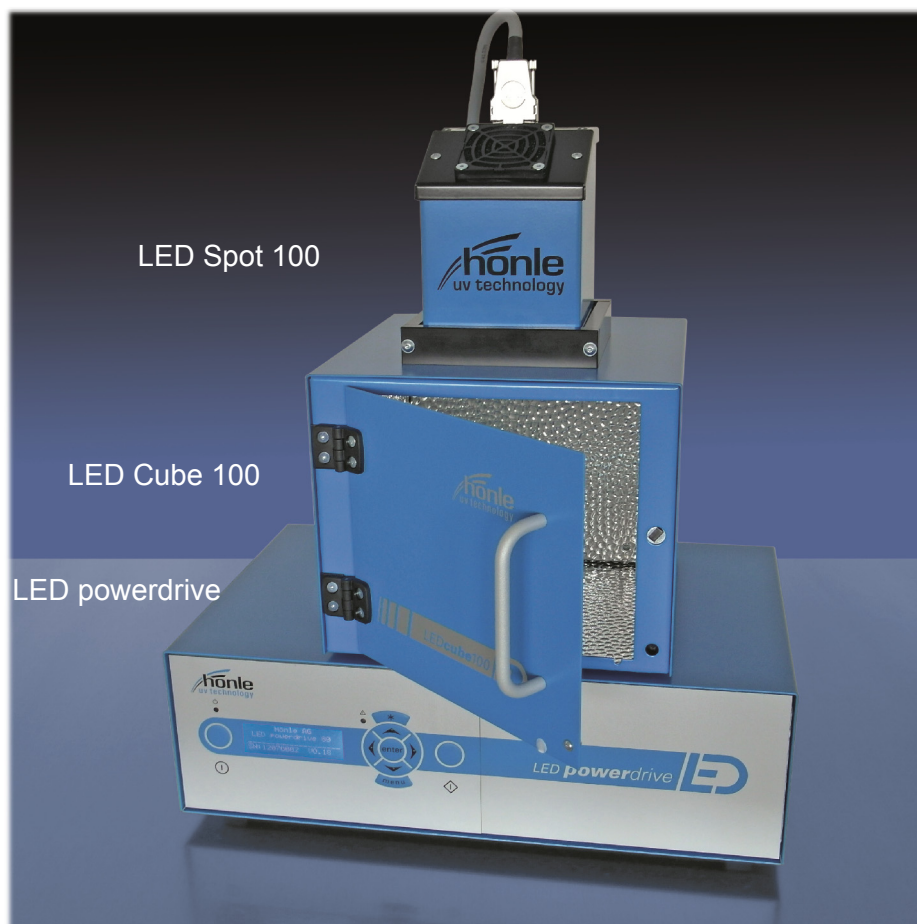


Fig.1: LED Cube 100 with LED Spot 100 and LED powerdrive

When the **LED Spot 100** and the **LED powerdrive** control unit are operated as an irradiation unit, the usage and safety instructions and the hazard information in the following Operating Instructions must be strictly adhered to:

#65807 LED Spot 100 Operating Instructions

#68013 LED powerdrive Operating Instructions

Usage

Usage

Together with the LED emitter and the control unit, the **LED Cube 100** forms a compact UV irradiation chamber for use in laboratories or in manual production.

With a usable irradiation room of 180 x 180 x 180 mm, the irradiation chamber is particularly well-suited to smaller workpieces or workpiece holders. The reflective interior wall structure and the optimised reflectors of the UV unit module ensure homogeneous irradiation and high process reliability.

The irradiation chamber is designed for the **LED Spot 100** emitter, which was in turn developed for all applications that require high-intensity UV surface radiation.

The emission spectrum can be adjusted to suit a huge range of applications by using different LED emitter components. The arrangement of the LEDs and an electronic power control ensure that the light is distributed homogeneously inside the irradiation chamber.

The LED Cube 100 is controlled via the **LED powerdrive** control unit. A safety system which is activated on the LED powerdrive protects operating personnel against UV radiation: the door and the LEDs are logically connected to one another. If the external safety shutdown is activated and the door is opened during operation, the LEDs switch off immediately.

Areas of application

Areas of application

The compact UV irradiation chamber is suited to a range of applications:

- Hardening adhesives, lacquer and casting compounds for components in electronic, optical and medical applications
- High-intensity UV irradiation in chemical, biological and pharmaceutical applications

2 Safety

General notes

Knowledge of all basic safety regulations is essential to ensure safe handling and fault-free operation of an irradiation unit.

General notes

Intended use

The LED Cube 100 is an irradiation chamber which – together with the LED Spot 100 and the LED powerdrive – is used to irradiate specimens with high-intensity ultraviolet light and to harden adhesives and lacquers. Any other usage beyond this scope is deemed to be improper.

The LED Cube 100 is constructed in accordance with the latest technical developments and recognised safety rules.

Intended Use

In general, the following potential hazards may arise during irradiation:

- Thermal hazards
- Danger from gases
- Danger from electrical current
- Danger from UV radiation
(see LED Spot 100 Safety)



Fig. 2: Irradiation chamber

Safety of external components

The LED Spot 100 is placed on top of the LED Cube 100. The irradiation chamber is connected to the LED powerdrive control unit. In addition to the usage information in these Operating Instructions, the safety information in the following Operating Instructions must be strictly adhered to during operation:

#65807 LED Spot 100 Operating Instructions

#68013 LED powerdrive Operating Instructions

Safety of external components



Fig. 3: LED Spot 100

Safety:
See LED Spot 100
Operating Instructions

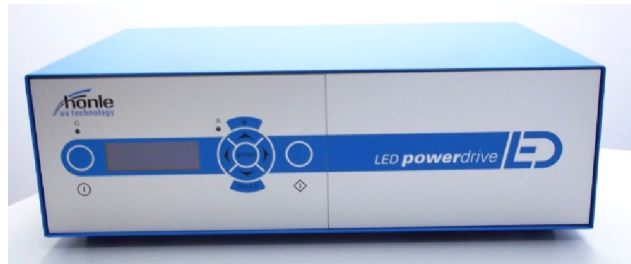


Fig. 4: LED powerdrive control unit

Safety:
See LED powerdrive Operating Instructions

The relevant safety and hazard information explains how to use the units safely and correctly. The Operating Instructions, especially the safety notes, must be observed by everyone that works with the unit.

In addition, all rules and regulations on accident prevention that apply to the usage area must also be observed.

**DANGER!**

Improper use of the units may endanger the health of the user or of third parties. It may also cause damage to the unit or to other property.

The operator must check at regular intervals that the staff are working with a safety-conscious attitude.

The workplace safety regulations instruct the operator to conduct an appropriate and adequate assessment of the risks which arise from the use of the units. The operator must ensure that adequate control measurements are maintained in order to eliminate or minimise these risks.

The user is obliged to carry out the prescribed service and maintenance work and to replace components which are subject to wear.

**ATTENTION!**

Dr. Höhle AG is not liable for damage which occurs due to improper use of the units.

Thermal hazards

The following precautionary measures must be observed when operating the LED Cube 100:

- Only operate the radiation component when it is fixed securely to the irradiation chamber.
- Never leave the unit unattended when an irradiation procedure is taking place. The intensive radiation in the irradiation chamber causes the product inside the chamber to heat up. Allow the products to cool down before removing them.
- The UV emitter must not be operated in areas with an explosive atmosphere.
- Do not irradiate highly flammable or combustible substances in the irradiation chamber.



WARNING!

The interior of the LED Cube 100 and the units being irradiated can heat up during the process.

Thermal hazards

Danger from gases

Under certain circumstances, chemical vapours can be released when materials are irradiated.

- The safety data sheets for the materials being irradiated must be observed.
- The provisions relating to materials in the workplace which are hazardous to health must be taken into account.
- If necessary, personnel should use breathing protection and ensure that the workplace is sufficiently ventilated.
- The air pollution in the workspace must be measured when starting operation. If there is a high level of air pollution, a ventilation and extraction system must be set up.
- The commonly used UV-hardening adhesives do not release any vapours when irradiated with the LED Spot 100.
- UV radiation promotes the production of ozone. The workspace must therefore be sufficiently ventilated.

Danger from gases

*Danger from
electrical
power***Danger from electrical power**

The electrical equipment on all units must be checked regularly.

Inspection before starting work:

- Check all components of the unit for outwardly visible damage
- Check that all electric cables are in flawless condition

Loose cable connections must be repaired immediately, and damaged cables must be replaced.

*Warranty and
liability***Warranty and liability**

The Dr. Höhle AG "General Conditions of Sale and Delivery" always apply. They are available to the user upon signing the contract, at the latest. No warranty or liability claims may be made in the event of injury to persons or damage to property if this has arisen from one or more of the following:

- Improper use
- Incorrect assembly, startup and operation
- Operation with defective and/or inoperable safety and protective equipment
- Failure to observe the information in the Operating Instructions regarding safety, transport, storage, assembly, startup, operation and maintenance of the units
- Unauthorised alterations to the structure of the unit
- Inadequate monitoring of unit components which are subject to wear
- Repairs carried out incorrectly
- Disastrous occurrences
- The effect of foreign bodies or force majeure

3 Transport, Storage, Delivery

Scope of delivery:

LED Cube 100 irradiation chamber



1. SUB-D 25-pin connection cable



2. Operating Instructions

The following components are also required for irradiation:

1. LED unit (LED Spot 100)
2. Control unit (LED powerdrive)

The delivered parts must be inspected for completeness and damage or other issues.

Any damage that has been ascertained must be documented at once, and reported to the dealer or to Dr. Hönle AG without delay.



NOTE!

Please dispose of the packaging material in an environmentally responsible manner. It may be possible to re-use it.

It is recommended to keep the packaging material, in case the unit has to be sent by post or otherwise transported.

4 Startup and Operation

General information

General information

- The LED Cube 100 may only be operated in dry rooms.
- The unit must be protected against chemical vapours.
- When setting up the unit, make sure that there are no fingerprints on the inside of the irradiation chamber. If necessary, clean the inside of the chamber with a clean cloth and isopropanol when it is cold.



ATTENTION!

Contact marks on the quartz glass plate of the LED Spot 100 (e.g. fingerprints) will burn in during operation and will reduce the service life and the radiation power.

- Before switching on, check the supply air and discharge air openings in the housing. The openings must not be covered or blocked by any foreign bodies. Ventilation must be guaranteed at all times.



DANGER!

When operating the LED Cube 100, make sure that there is sufficient cooling. If the unit is not cooled sufficiently, there is a risk of fire. The ambient temperature and the cooling air temperature must not exceed 35°C.

Mechanical setup

Mechanical setup

The LED Cube 100 is designed for mounting the LED Spot 100. The emitter is placed on top of the irradiation chamber. The irradiation chamber is then connected to the LED powerdrive control unit.



ATTENTION!

The LED Cube 100 may only be used with the LED Spot 100 and the LED powerdrive control unit. More information about these units can be found in the relevant Operating Instructions.

Mounting the LED Spot 100

The LED Spot 100 can be mounted on the irradiation chamber in just a few steps:

1. Loosen the mounting screws (M4X20 flat mushroom-head screws) from the rear connection bar (SW 2.5 Allen key)
2. Pull back the rear bar (do not remove it completely)
3. Place the LED Spot 100 emitter on the irradiation chamber and secure with the two mounting screws

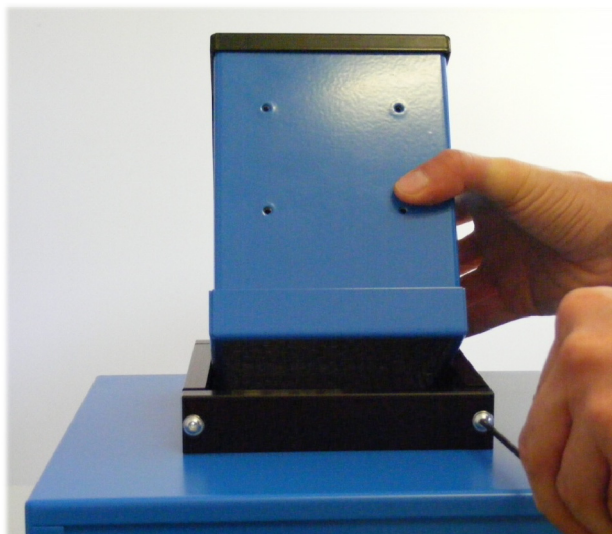


Fig. 5: Mounting the LED Spot 100 on the LED Cube 100

*Mounting the
LED emitter*

Connection to the LED powerdrive

The LED Cube 100 is connected to the LED powerdrive control unit via the PLC interface, SUB-D 25:

- Switch off the LED powerdrive control unit
- Connect the irradiation chamber to the control unit using a cable (SUB-D 25-pin connection cable)



Fig. 6: Connecting the LED Cube 100 to the LED powerdrive

*Connection to
the LED
powerdrive*

*Startup***Startup**

The irradiation chamber is controlled via the LED powerdrive control unit. Before using the irradiation chamber, the "external safety shutdown of the PLC interface" function must be activated on the control unit. This activates the safety system of the LED Cube 100 irradiation chamber, which ensures that the operating personnel are protected against UV radiation. The door and the LEDs are logically connected to one another: if the door is opened during operation, the LEDs switch off automatically.

**WARNING!**

The LED Cube 100 may only be operated when the external safety shutdown is activated on the PLC interface, in order to protect operating personnel against UV radiation.

*Activating the external safety shutdown***Activating the external safety shutdown**

The external safety shutdown on the PLC interface must be activated on the control unit when operating the LED Cube 100. To do this, set "ext. LEDenable" to "ON" in the Settings menu on the LED powerdrive:

Set external safety shutdown

LED powerdrive

SETTINGS menu

>ext. LEDenable: ON

**NOTE!**

Menu setting: ext. LEDenable: ON:

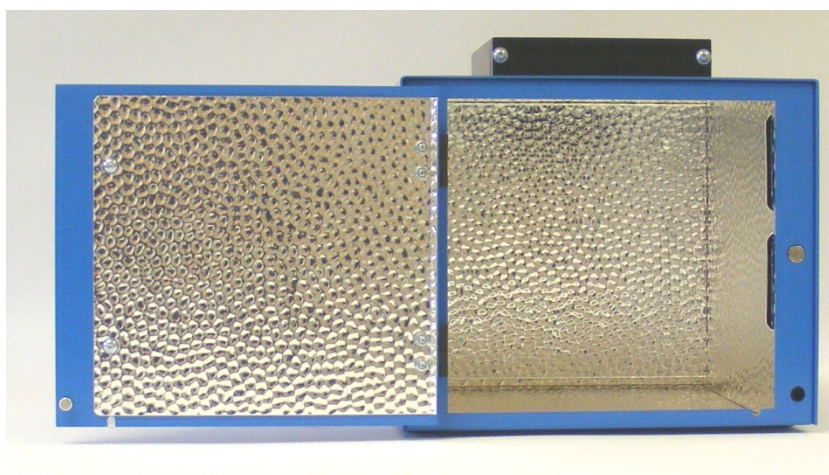
This sets an external safety shutdown via an enable input on the PLC interface. The unit may only be operated when this input is set, i.e. the door of the irradiation chamber must be closed.

Menu setting	Value	Display
ext. LEDenable	ON	

Fig. 7: Activating the external safety shutdown on the PLC interface

Operation

Operation



1. Open the door of the irradiation chamber.
2. Place the product in the irradiation chamber.
3. Close the door.
4. Start the irradiation procedure (see Operating Instructions: LED powerdrive):
During the irradiation procedure, the blank plug on the bottom right-hand corner of the door lights up.
5. At the end of the required irradiation time:
Open the door, allow the product to cool down, then remove it.

*Measuring
intensity***Measuring intensity**

In order to achieve a consistent irradiation result, the intensity of the emitter should be measured from time to time. The Hönle UV-Meter with surface sensor, which is available as an accessory, is recommended for this task.

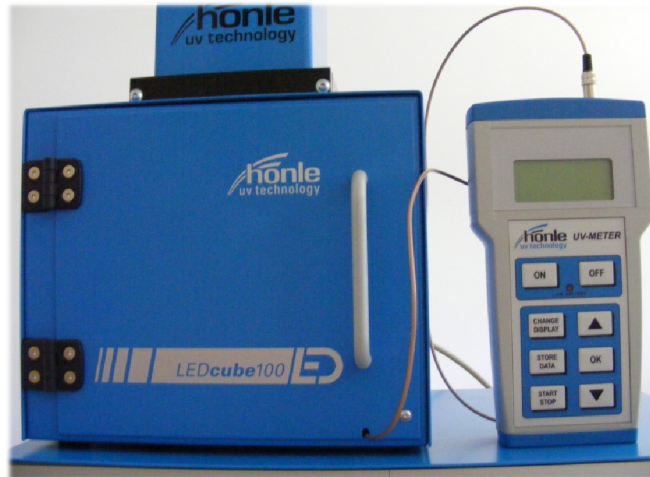


Fig. 8: Connecting the UV-Meter to the LED Cube 100

Measuring the UV irradiation intensity:

1. Remove the blind plug from the bottom right-hand corner of the door
2. Feed the UV-Meter cable through the opening in the housing
3. Place the surface sensor in the irradiation chamber

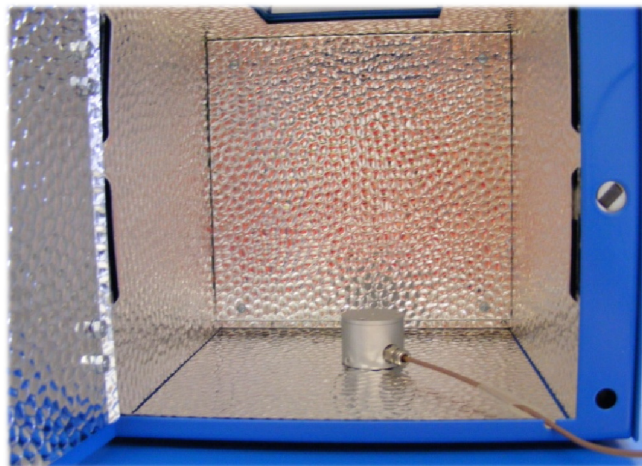


Fig. 9: Routing the UV-Meter cable to the LED Cube 100

4. Close the door
5. Switch on the UV-Meter (see UV-Meter Operating Instructions)
6. Start the irradiation procedure (see LED powerdrive Operating Instructions)

5 Service, Maintenance and Cleaning

Service

Service

Check the LED Cube 100 daily for dust and other contaminants. Clean the irradiation chamber if necessary.

Cleaning the surface of the unit

Surface
cleaning

Do not use any harsh or abrasive cleaning agents to clean the surface of the unit. Only use isopropanol or mild cleaning agents containing surfactants, clean cloths or a damp sponge. Do not allow any moisture to get into the unit.



WARNING!

Before carrying out any maintenance or cleaning work on the LED Cube 100, switch off the LED powerdrive control unit at the main switch.

Maintenance work must only be carried out when the unit is cold. When maintenance work is carried out following operation, the unit must be left to cool down for at least 10 minutes first.

Parts that are not in flawless condition must be exchanged immediately.

Only use original replacement and wear parts. There is no guarantee that other manufacturers' parts are designed and manufactured to meet the required standards of robustness and safety.

No changes may be made to the LED Cube 100 and no fittings may be added or conversions performed without permission from Dr. Hönle AG.

Should a fault occur in the unit that cannot be rectified, Dr. Hönle AG Customer Service must be contacted.

Contact address for claims under warranty, repair and replacement part service:

Dr. Hönle AG
UV-Technologie
Lochhamer Schlag 1
82166 Gräfelfing / Munich
Tel.: +49 (0)89 / 856 08-0
Fax: +49 (0)89 / 856 08-148



WARNING!

No repairs or changes may be made to the unit other than those listed in the Operating Instructions.

6 Ordering Data for Units, Replacement Parts and Accessories

Ordering

Ordering

Order replacement parts from our replacement parts service at the following address:

Dr. Hönle AG
 UV-Technologie
 Lochhamer Schlag 1
 82166 Gräfelfing / Munich
 Tel.: +49 (0)89 / 856 08-0
 Fax: +49 (0)89 / 856 08-148
 E-mail: uv@hoenle.de
 Website: www.hoenle.de

Units

Units

Name	Article/Order number
LED Cube 100 (without LED Spot 100 and LED powerdrive)	68200

Replacement parts

Replacement parts

Designation	Article/Order number
SUB-D 25-pin connection cable	66476
Operating Instructions	69136



WARNING!

Only original replacement parts from Dr. Hönle AG may be used. Safe operation of the LED Cube 100 cannot be guaranteed if parts from other manufacturers are used.

7 Technical Data

Dimensions and weights

	Width [mm]	Depth [mm]	Height [mm]	Weight [kg]
Irradiation room	195	186	195	
LED Cube 100	243	270	232	5,9
LED Cube 100 with LED Spot 100	243	270	358	

*Dimensions
and weights*

Electrical data

See LED powerdrive Operating Instructions (68013): The LED Cube 100 is connected to the control unit via the PLC interface, SUB-D 25.

*Electrical
data*

Ambient conditions

The LED Cube 100 has been developed for use inside closed rooms or buildings with the following ambient conditions:

*Ambient
conditions*

Temperature	+5°C to +35°C
Max. rel. humidity	80% (non-condensing)

