Operating Instructions

LED Spot W

#47301e1

Masthead

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Table of Contents

1 Introduction

These Operating Instructions describe the LED Spot W, its operation and its uses.
The safety and danger notices explain the safe, proper handling of the LED Spot W.

The following symbols and designations are used in the Operating Instructions:

Danger
This symbol means **immediate** danger to life and limb for persons in the surroundings!

Warning
This symbol means **possible** danger to the machine or its surroundings.

Note
This symbol indicates notes, usage hints and useful information.

2 Description

The LED Spot W is a water-cooled, large area irradiation unit developed for all applications that require high-intensity UV irradiation of large areas. As a result of the high intensity and the possibility for programming entire program sequences – such as illumination sequences with varying intensities and latencies, for example – completely automatic production lines with minimal cycle times and/or machine processing times can be realised in particular.

The typical LED service life is 10,000 hours. The LEDs can be switched on and off as often as desired. No warm-up or cool-down phases are necessary.

Wavelengths of 365 /375/385/ 395/405 +/- 5 nm are available. This way the LED Spot W can be adapted to the respective application.

The square, light emitting aperture encompasses an area of 20 mm x 20 mm and can, depending on the required intensity / homogeneity, substantially increase its effective area by changing the distance to the substrate. The resultant irradiation field can then be divided into four segments, which can be activated independently of each other.

External water cooling enables the extremely compact format, while offering the highest radiation intensity.

Features

Features

- Extremely high irradiance despite miniscule dimensions
- Uniform irradiation of large surface areas
- Long LED service life
- Available in different wavelengths
- Has four independent LED segments
- Entry of complete program sequences
- Intelligent output control
- Operating hours counter for the LED integrated in the LED unit
- Independent setting of the irradiation time, irradiation intensity and operating mode for each channel.
- No warm-up period
- No standby period

Uses

Uses

The LED Spot W can be used for the following applications in laboratories, in production and for making repairs:

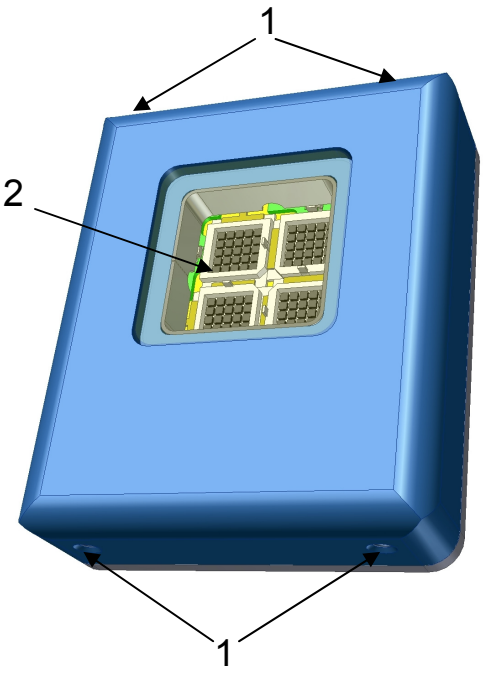
- Bonding and securing of components in just seconds, in the electronics, optical and medical sectors
- Bonding of glass, metals and plastics
- High-intensity UV irradiation in the chemical, biological and pharmaceutical industries
- Fluorescence excitation for materials testing and image processing
- Used to dry inks and colour coatings, e.g. in inkjet printers

Connections and Operating Elements

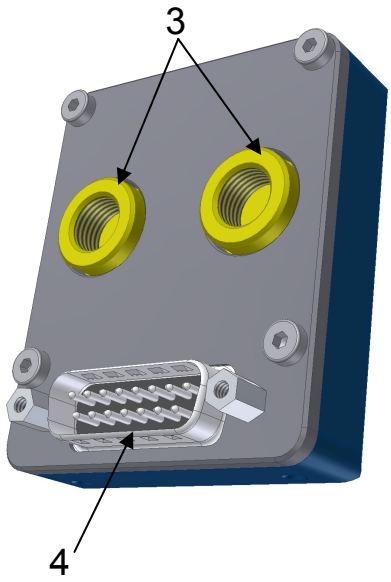
Connections and Operating Elements

The following figures show the LED Spot W from both the front and rear view.

The water connections, mounted on the back of the unit, are available with either angled or straight fittings (see chapter 6).



LED Spot W – front view



LED Spot W – rear view

1 Threading, from the side (4 x, M 3, 4 mm deep) 2 Light-emitting aperture (with protective glass) 3 Water connections	4 Sub-D plug (15-pin)

Note
The appropriate water connections (straight / angled) are already mounted at the time of delivery.

3 Safety Notes

General Notes

General Notes

Familiarity with all basic safety regulations is the prerequisite for safe handling and problem-free use of the LED Spot W.
These Operating Instructions contain the most important notes for operating the unit in a safe manner.
The Operating Instructions, especially the Safety Notes, must be observed by everyone that works with the unit.
In addition, all applicable rules and regulations on accident prevention for the use area must also be observed. DIN EN 62471: 2008 ("Photobiological safety of lamps and lamp systems") and BGI 5006 (Oct. 2006) are referred to here.

The proprietor must check the safety-conscious work performance of personnel at regular intervals.

In accordance with the workplace safety regulations, the proprietor is advised to make a reasonable and sufficient assessment of the risks arising from the use of the LED Spot W. You must ensure that adequate control measurements are maintained in order to eliminate or minimise these risks. You can use the information contained in these Operating Instructions when making the risk assessment.

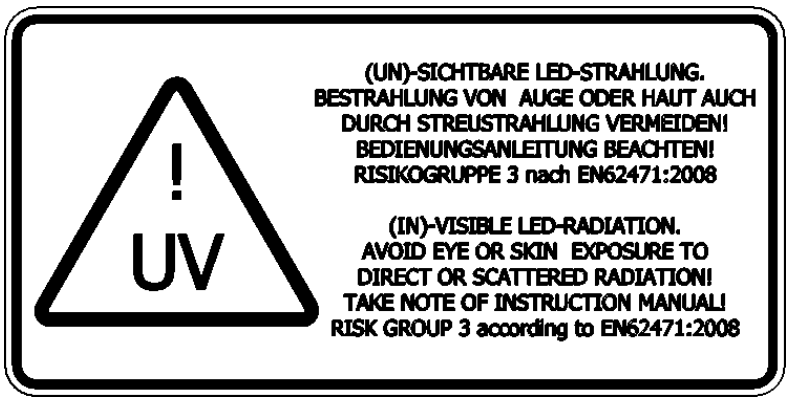
Risk Group

Risk Group

sDanger
Improper use can endanger the health of the user or of third parties (severe skin or eye damage)!

The Hönle LED Spot W is subject to the standard DIN EN 62471:2008 ("Photobiological safety of lamps and lamp systems"). It is classified as belonging to Risk Group 3, which requires special safety measures to be observed when operating it. These are described in detail in the stated DIN EN standard.

Due to the size of the LED Spot W, it is not possible to directly label the unit. The proprietor must therefore ensure that appropriate identification of the danger area is made in immediate vicinity of the LED Spot W.



Obligation of Personnel

Obligation of Personnel

Persons, who are entrusted to work with the LED Spot W are obliged, before starting work to:

- observe the regulations on work safety and accident prevention,
- read the safety chapter and the warning notices in these Operating Instructions and to observe them at all times during operation,
- in particular, to observe the safety measures in of DIN EN 62471: 2008 ("Photobiological safety of lamps and lamp systems") and observe BG 5006.

Dangers from Handling the Unit

Dangers from Handling the Unit

The LED Spot W is assembled according to the technological state-of-the-art and recognised safety standards.

The following potential dangers can occur:

- **Danger from electrical current**
- **Danger from UV radiation (actinic UV, close UV)**
- **Danger from blue light (300 – 700 nm)**
- **Danger from heat (eyes, skin)**

The unit must be used only under the following circumstances:

- When wearing personal safety equipment to protect the eyes and skin, in case complete shielding of the UV radiation cannot be ensured. Goggles should conform the standard EN 170 (max. spectral transmission (365 nm) 0.3%), and should afford protection from radiation, both directly and from the side.
- The LED Spot W must be set up and operated in such a way that persons are not subjected to direct or indirect radiation. UV-absorbent plastics or metal sheet can be used as shields.
- Warning notices must be affixed at the workplace and at all entrances to the work area.
- Under no circumstances must the LED Spot W be operated in explosion-protected areas or in the proximity of flammable materials, gases or liquids.
- The LED Spot W must be operated only by persons who have been instructed in all the safety precautions.
- The LED Spot W must be used only when it is in flawless condition in terms of safety. Operation is not permitted when there is visible damage to the housing, water hoses, supply cables or the mains adapter.
- Proper functionality of the entire cooling unit must always be ensured.
- All relevant regulations on accident prevention and on the handling of units belonging to Risk Group 3 must be observed.

Danger
Improper use can endanger the health of the user or of third parties (severe skin or eye damage)!

Intended Use

The LED Spot W is a high-intensity UV irradiation device for irradiating large areas from a close distance.
Any other or additional usage is regarded as improper use, and is thus dangerous.

The LED Spot W must not be used for medical or therapeutic purposes, for skin-tanning, or in other medical equipment.

The unit must be used indoors only. Outdoor use is not permitted.

The operator must operate the unit only in accordance with the usage notes in these Operating Instructions.

Danger
There is acute danger of becoming blind if you look directly into the radiation outlet aperture!
If improperly handled, UV radiation can damage skin and eyes! It can lead to severe sunburn or to inflammation of the retina and conjunctiva, and possibly to skin cancer.

4 Safety Regulations

Organisational Measures

Organisational Measures

The functions of all the existing safety equipment must be inspected regularly before the start of work or of each new shift. Look for outwardly visible damage.

Informal Safety Measures

Informal Safety Measures

The general and local regulations on accident prevention and environmental protection must be provided and observed as a supplement to the Operating Instructions.

Checking the Water Lines

Checking the Water Lines

Water lines, connections and couplings of the water cooling must be regularly checked for leak-tightness.

Danger from Electrical Power

Danger from Electrical Power

The electrical equipment on the LED Spot W must be inspected 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 connections must be repaired immediately, and damaged cables must be replaced.

Danger
There is danger of direct or indirect contact with electricity!

Danger from UV Irradiation

Danger from UV Irradiation

The LED Spot W emits radiation in the range of 340 - 440 nm, depending on the type. The optical output power is detailed in the Technical Data chapter. When working with the unit, the following instructions must also be followed:

- **Personal safety equipment must be worn to protect the eyes and skin, unless the UV radiation is completely screened by structural measures.**
- **Never look directly or indirectly into the LED aperture**.
- **The LED Spot W must be set up in such a way that persons are not subjected to direct or indirect radiation.**
- **In the case of workplaces where manual work is performed or in mobile applications, the working area must be enclosed in an appropriate manner.**

Danger
There is acute danger of becoming blind if you look directly into the radiation outlet aperture!
If improperly handled, UV radiation can damage skin and eyes! It can lead to skin burns or to inflammation of the retina and conjunctiva, and possibly to skin cancer.

Warning
UV radiation can cause material damage to electronic components. When used in the vicinity of the LED Spot W, these components must be protected from UV radiation.

Warning
UV radiation accelerates the ageing of materials.
UV-sensitive objects and surfaces must therefore be protected from radiation.

Note
Protective articles are listed in the chapter "Ordering Data for Units, Replacement Parts and Accessories " .

Danger from Heat

Danger from Heat

When operating the LED Spot W, take the following thermal risks into account.

The LED Spot W can heat up to a temperature of 55 °C during operation. There is a risk of burns. It must be ensured that the units cannot be touched.

The tightly bundled radiation of the LED can lead to heating-up of the radiated surfaces, especially dark surfaces. There is a risk of burns.
Under no circumstances must the unit be operated in the vicinity of flammable or explosive materials, gases or liquids. There is an acute risk of fire or explosion.

To protect against the danger from heat, the same measures must be taken that are effect against the Danger from UV Irradiation (see the chapter Danger from UV Irradiation).

Danger
The LED Spot W emits highly-intensive, bundled radiation. Improper use can endanger the health of the user or of third parties (severe skin or eye damage)!

Warranty and Liability

Warranty and Liability

The Dr. Hönle AG "General Conditions of Sale and Delivery" always apply. They are available to the user upon signing the contract, at the latest.
Dr. Hönle AG assumes no liability whatsoever for damages that can be attributed to one or more of the following causes:

- Improper use of the LED Spot W contrary to its intended use
- Incorrect assembly, commissioning or operation of the LED Spot W
- Failure to observe notes in the Operating Instructions
- Unauthorised structural modification of the LED Spot W
- Effects of foreign objects or mechanical damage (caused by blows, jolts, etc.)
- Contamination of the quartz glass pane of the LED Spot W
- Contamination of the water-cooling element as a result of using unsuitable or contaminated coolant.
- Failure of the cooling unit and/or operation of it that is non-compliant with the specified operating conditions (see Technical Data)
- Disastrous occurrences
- Acts of God

Maintenance and Fault Removal

Maintenance and Fault Removal

All necessary maintenance tasks are described in the chapter Service, Maintenance and Cleaning". Carrying these out ensures reliable operation.
Should a fault occur in the unit that cannot be rectified with the help of the Operating Instructions, then Dr. Hönle AG Customer Service must be contacted.
Parts that are not in flawless condition must be exchanged immediately.
Use only 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 alterations, additions or modifications must be made to the LED Spot W without the permission of Dr. Hönle AG.
Contact address for claims under warranty, repair and replacement part service:

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

Warning
No repairs or alterations must be made to the unit except those described in these Operating Instructions.

Warning
Only original Dr. Hönle AG replacement parts and wear parts must be used.

5 Transport, Storage, Delivery

Scope of Delivery

Scope of Delivery of the LED Spot W:

- LED Spot W
- Operating Instructions (possibly on a CD)

The delivered pars 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.

The following components are also necessary to operate the LED Spot W:

- bluepoint LED HP component
- LED Spot W connection cable
- filter unit
- cooling unit
- water connections (hoses, couplings, etc.)

Note
Please dispose of the packaging material in an environmentally responsible manner.
It may be possible to reuse it.
It is recommended to keep the packaging material, in case the unit has to be sent by post or otherwise transported.

6 Installation, Commissioning and Operation

General Information

General Information

- It is imperative to comply with the specified operating conditions for the water cooling (see the chapter Water Connection).
- The LED Spot W must be mounted on a stable fixture.
- The ambient temperature for operating the LED Spot W must not exceed a maximum of 35 °C.
- Without exception, the LED Spot W must only be connected or disconnected with the bluepoint LED HP switched off! If the LED Spot W is disconnected during ongoing operations, this could cause damage to the device and/or a component.
- Do not touch the contact pins in the LED Spot W plug connector with your fingers (danger of ESD damage).
- Protect the LED Spot W against chemical vapours and cleaning agents.
- Only operate the LED Spot W in dry rooms. Rel. humidity max. 70% (non-condensing). Open-air operation is not permitted.
- Before switching on, check to ensure that all plug-type connectors, incl. water connections, are properly seated and tight.
- It should be observed that the LED Spot W is not exposed to any spray water. Furthermore, no condensation may form on the surface of the spotlight.

Danger
Sufficient cooling must be provided for when installing the LED Spot W. It is forbidden to operate the device in the immediate vicinity of flammable objects, liquids or gases.

The dimensions for the LED Spot W can be found in the dimensional drawings in the chapter 9 Technical Data).

Electrical Connections

Electrical Connections

The supply with electric current and activation of the LED Spot W is accomplished via the bluepoint LED HP. For detailed information on the electrical connections, refer to the bluepoint LED HP Operating Instructions in the chapter "Electrical Connections".

Warning
The LED Spot W must only be used with the bluepoint LED HP component.

Warning
Connecting and disconnecting of the LED Spot W must only be done when the bluepoint LED HP is in a switched off state. Use the main switch on the back of the device for this purpose. Otherwise damage could occur to the LED Spot W or the bluepoint LED HP.

Water Connection

Water Connection

It is imperative to comply with the following connection information/operating conditions for the LED Spot W and the filter unit:

- Filter unit connections ¼“ BSP inside thread
- LED Spot W connections coupler socket NW 5 BA (self-closing)
- Max. pressure: 3.5 bar
- Min. flow rate: 2 l/min
- Max. inflow water temperature: 25 °C
- Min. inflow water temperature 16 °C
- Coolant demineralised water
- Max. distance filter unit – LED Spot W 1 m
- **Make sure that no condensation may form on the surface of the spotlight.**
- **The filter unit for the coolant must always be in flawless condition. It must be checked daily and, if necessary, replaced without delay.**
- **The coolant must be regularly inspected for contamination and, if necessary, replaced entirely.**
- **When connecting or disconnecting, it is imperative to ensure that no water gets onto the LED Spot W or into the connector plug.**

Warning

Condensation may lead to destruction of the device!

It is absolutely essential to avoid any formation of condensed water on the surface of the LED Spot W. The proprietor has therefore to provide adequate climatic conditions at site (air humidity, temperature). The temperature of the cooling water may be adjusted, if necessary.

Warning
The cooling parameters must be adhered to without fail, otherwise damage could occur to the LED Spot W.

Connecting the LED Spot W via the Adapter:

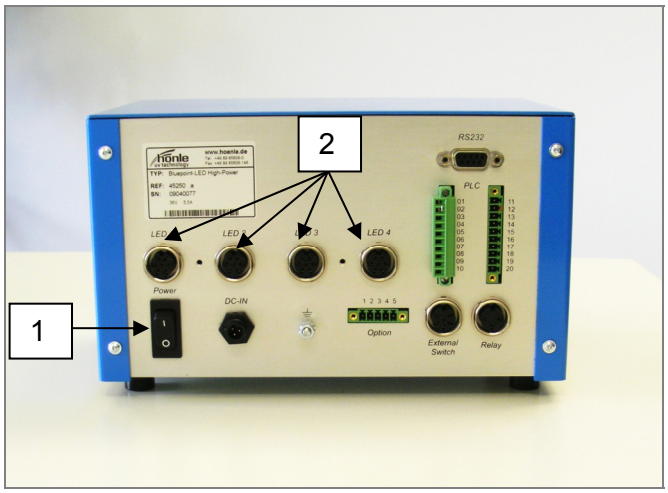
Connecting the LED Spot W via the Adapter

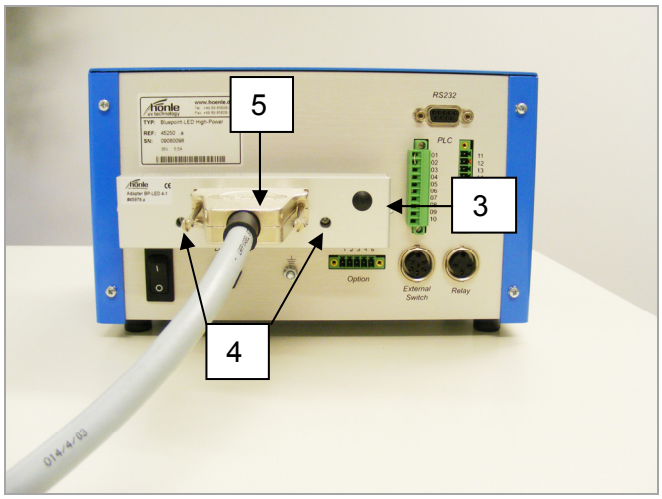
The LED Spot W is connected by means of the adapter (# 45979):

Before connecting the LED Spot W, ensure that the bluepoint LED HP has been switched off (→ main switch (1) in position 0).

1. Insert in the adapter (3) into the LED channels (2).
2. Tighten the securing nuts (4) for the adapter.
3. Insert the LED Spot W plug connector (5) and tighten it.

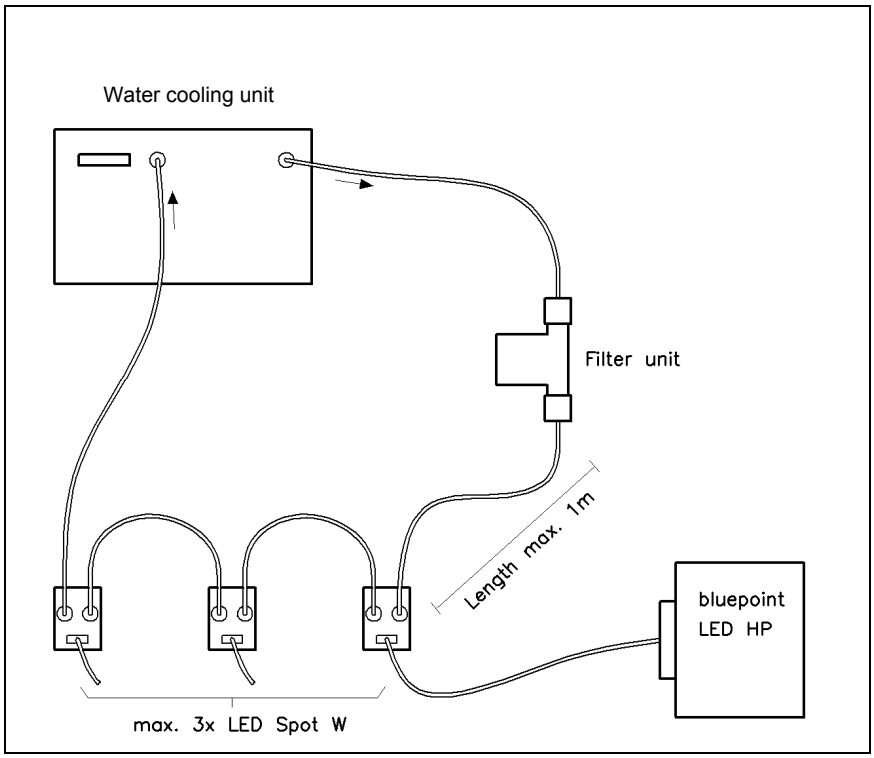
In the next step the water cooling will be installed.





Connecting the Water Cooling to the LED Spot W

In the following, a typical connection schematic is shown for a water cooling circuit with three connected LED Spot W:



1. Connect the inflow line of the cooling unit to the filter unit.
2. Hook up the connector of the filter unit with the LED Spot W (max. distance = 1 m).
3. Hook up the return line of the cooling unit with the second connector on the LED Spot W.

The device is now ready for operation and can be switched on via the main switch (1).

Warning

Condensation may lead to destruction of the device!

It is absolutely essential to avoid any formation of condensed water on the surface of the LED Spot W. The proprietor has therefore to provide adequate climatic conditions at site (air humidity, temperature). The temperature of the cooling water may be adjusted, if necessary.

Warning

All connections must be checked for leak-tightness immediately after being switched on for the first time and then regularly thereafter. If there are any leaks, the system must be switched off immediately. It may only be switched on again after all flaws have been corrected and the released water has dried up completely.

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7 Service, Maintenance and Cleaning

General Information

General Information

Service, repair and cleaning work may only be performed by authorised personnel.

- When performing service, maintenance and cleaning, it must be ensured that the outlet aperture of the LED Spot W does not become dirtied by fingerprints or other contaminants.
- Likewise, no sprayed water may contact the surface of the LED Spot W.
- In general, work should be performed with a clean cloth or clean gloves.
- Only touch the LED Spot W on the metal housing.
- If necessary, clean the outlet aperture of the LED Spot W when it is cold, using a clean cloth and alcohol.

Note
Contamination of the outlet aperture due to fingerprints or the like reduce the UV output of the LED Spot W.

Service

Service

The following service work is performed on the LED Spot W:

Daily:

- Inspection of the LED Spot W for damage to and contamination of the outlet aperture. If necessary, the outlet aperture must be cleaned; see the chapter "Cleaning".
- Inspection of the filter unit
- Inspection of the leak-tightness of the water connections

As needed / at regular intervals (dependent on operating conditions)

- Replacement of the filter unit (see the chapter Filter Change).

Cleaning

Cleaning

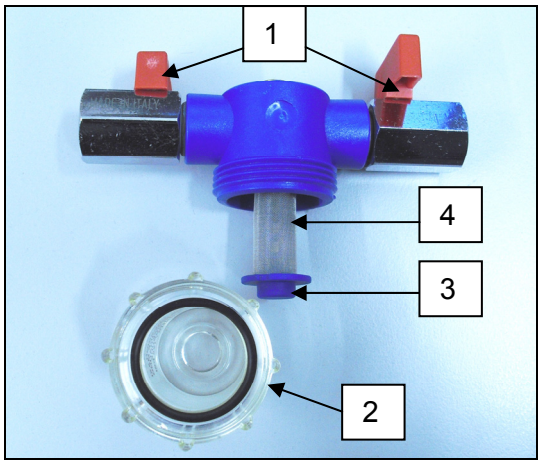
Note
When cleaning, do not use any aggressive or abrasive cleansing agents.

If operated in a dusty environment or in the presence of fumes from adhesives, the radiation emission surface of the LED Spot W can become contaminated. This diminishes the UV intensity.

- Clean the radiation aperture surface with a clean, lint-free cloth and alcohol.

Filter Change

1. Switch off the bluepoint LED HP (main switch in position 0).
2. Switch off the cooling unit and detach it from the mains supply.
3. Counterrotate both of the red shutoff valves (1) of the filter unit by 90 ° to the direction of flow (= position OFF).
4. Unscrew the reservoir container (2) from the filter unit and remove it. When doing this, watch out for remaining water that might leak out of the reservoir container and collect in an appropriate vessel if necessary.
5. Remove the attachment screw (3) and filter (4).



1	Shutoff valve
2	Reservoir container (with O-ring)
3	Attachment screw
4	Filter

6. Put the new filter in place and fasten it securely with the attachment screw.
7. Screw the reservoir container onto the filter unit again.
8. Rotate both of the shutoff valves of the filter unit into the OPEN position again.
9. Reconnect the cooling unit to the mains supply again and switch it on.
10. After first switching on the system again, check the filter unit for leak-tightness.

8 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
D-82166 Gräfelfing / Munich, Germany

Tel.: +49 (0)89 / 856 08-0
Fax: +49 (0)89 / 856 08-148

LED Spot W

LED Spot W

Designation	Article/Order Number
LED Spot W 365 nm	45900
LED Spot W 375 nm	45901
LED Spot W 385 nm	45902
LED Spot W 395 nm	45903
LED Spot W 405 nm	45904

Replacement Parts / Accessories

Replacement Parts / Accessories

Designation	Article/Order Number
bluepoint LED HP component	45250
Adapter for bluepoint LED 4-1	45979
UV warning sign	45890
Operating Instructions (German/English) on CD	47301
Cooling unit	46700
Filter unit	46825
Insert for filter unit	46726
Water connection set, straight fittings	46820
Water connection set, angled fittings	46821
Connection cable 1.5 m	46811
Connection cable 2.5 m	46812
Connection cable 4.0 m	46813
Connection cable 1.5 m; 90°	46815
Connection cable 2.5 m; 90°	46816
Connection cable 4.0 m; 90°	46817
Connector for hose DN5 BA-D = 6	46705

Warning
Only original replacement parts from Dr. Hönle AG may be used. If any third-party parts are used, then the operational safety of the LED Spot W cannot be ensured.

9 Technical Data

General Data

General Data

Typical LED service life	> 10,000 hours*				
Wavelengths in nm (Tolerance: +/- 5 nm)	365	375	385	395	405
Type intensity in mW/cm² **	650	1200	1500	3900	4200
Supply	90 V – 264 V 47 Hz – 63 Hz				
Input current, max.	2.4 A				
Connected load	max. 200 W				
Dimensions of LED Spot W without connections (H x W x D)	approx. 60 x 50 x 17 mm				
Weight	approx. 350 g (without water)				

* Depending on the operating conditions and cooling conditions
** Measured using a Hönle LED measurement head for UV meters

Water Cooling Operating Conditions

Water Cooling

It is imperative to comply with the following connection information/operating conditions for the LED Spot W and the filter unit:

- Filter unit connections: ¼“ BSP inside thread
- LED Spot W connections: coupler socket NW 5 BA (self-closing)
- Max. pressure: 3.5 bar
- Min. flow rate: 2 l/min
- Max. inflow water temperature: 25 °C
- Min. inflow water temperature: 16 °C
- Coolant: demineralised water
- Max. distance filter unit – LED Spot W: 1 m
- **Make sure that no condensation may form on the surface of the spotlight.**
- **The filter unit for the coolant must always be in flawless condition. It must be checked daily and, if necessary, replaced without delay.**
- **The coolant must be regularly inspected for contamination and, if necessary, replaced entirely.**
- **When connecting or disconnecting, it is imperative to ensure that no water gets onto the LED Spot W or into the connector plug.**

Warning

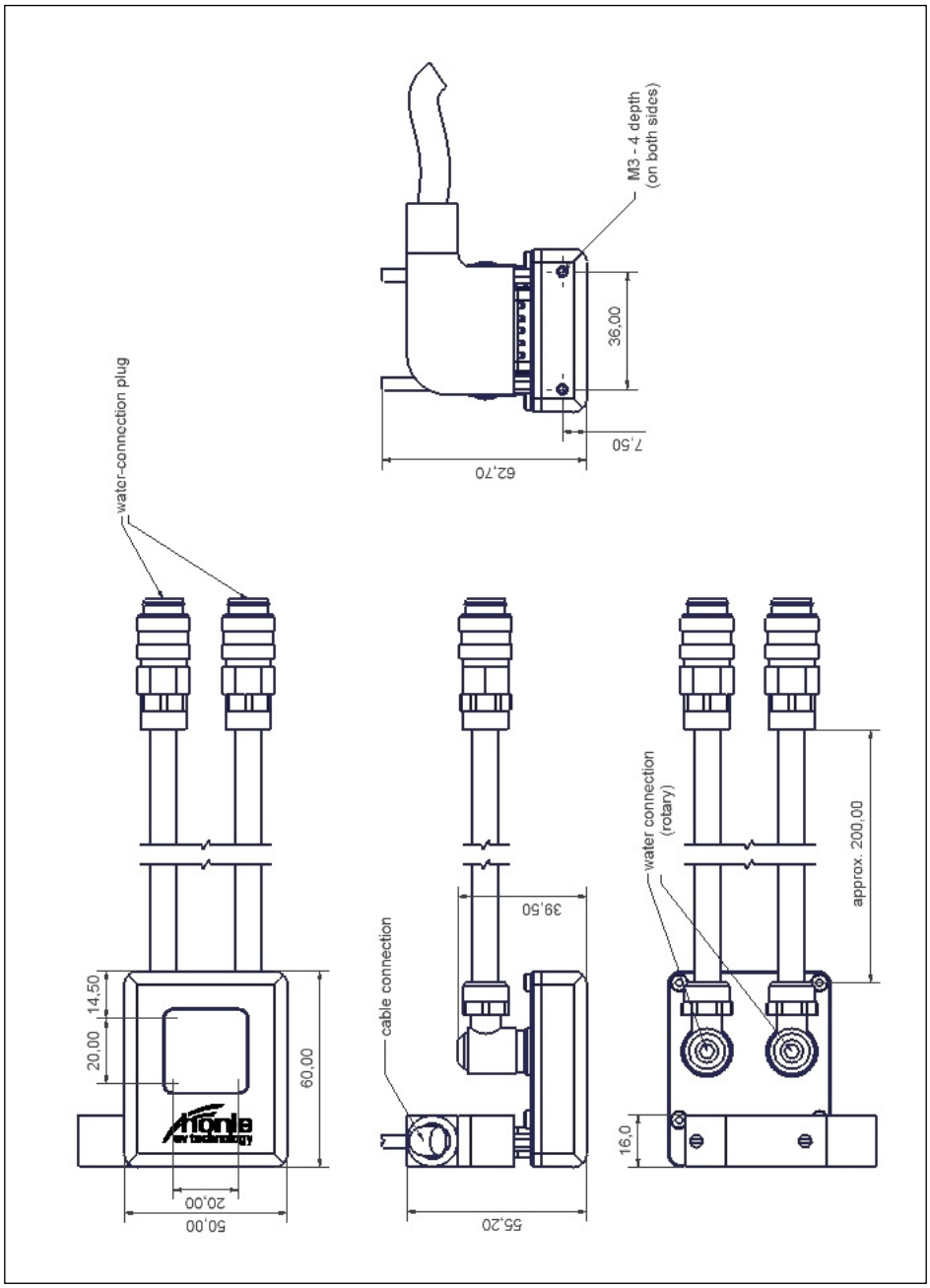
Condensation may lead to destruction of the device!

It is absolutely essential to avoid any formation of condensed water on the surface of the LED Spot W. The proprietor has therefore to provide adequate climatic conditions at site (air humidity, temperature). The temperature of the cooling water may be adjusted, if necessary.

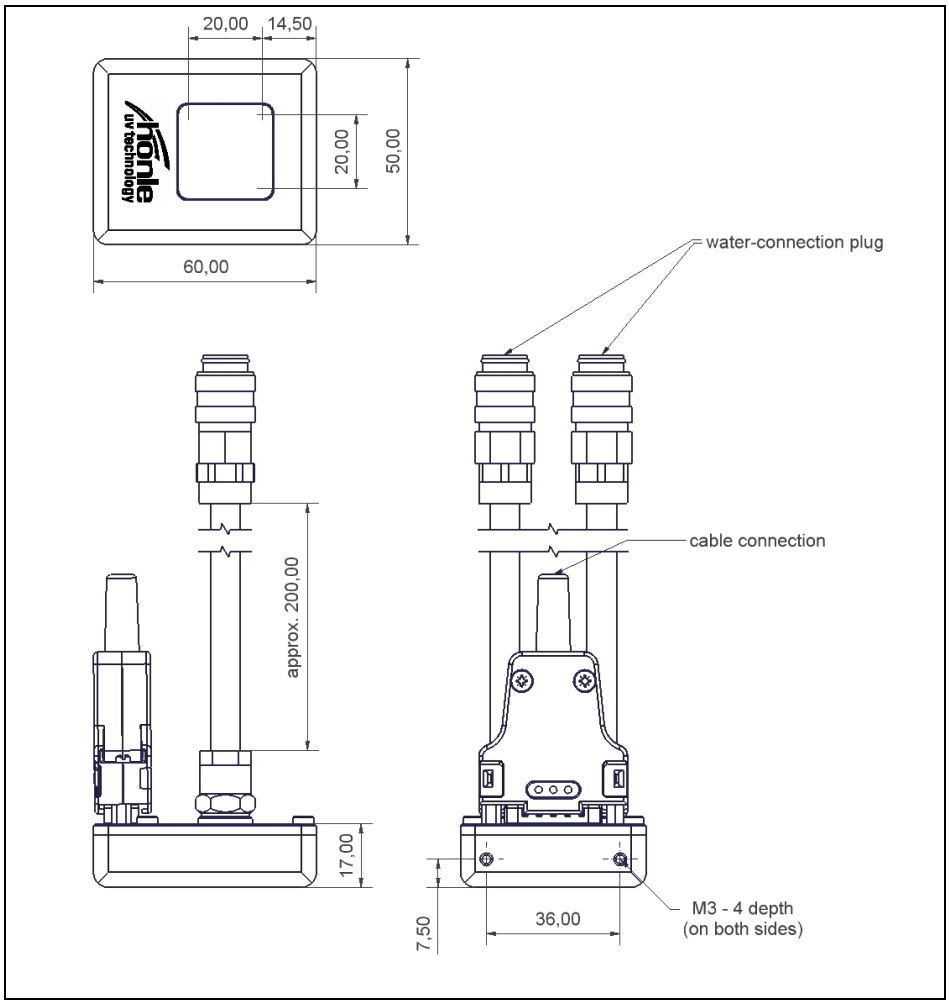
Warning
The cooling parameters must be adhered to without fail, otherwise damage could occur to the LED Spot W.

Dimensional drawing of the LED Spot W – angled version

Dimensional drawing of the LED Spot W – angled version



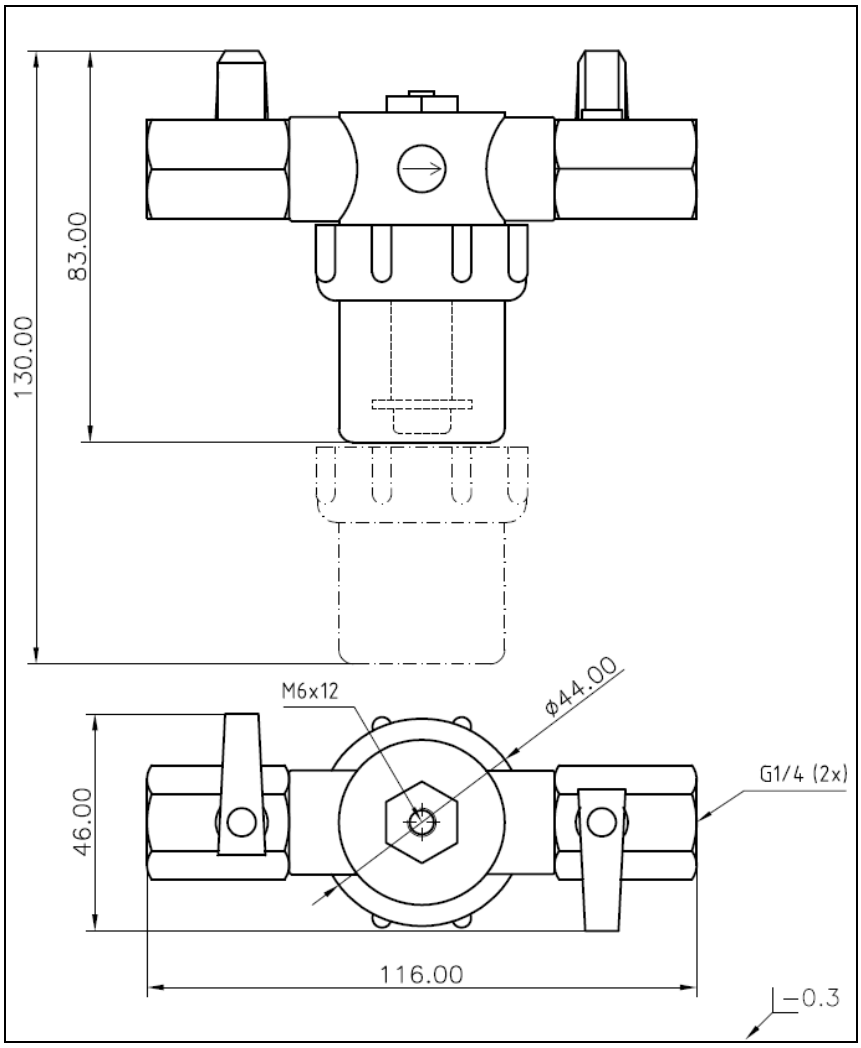
Dimensional drawing of the LED Spot W – straight version



Dimensional drawing of the LED Spot W – straight version

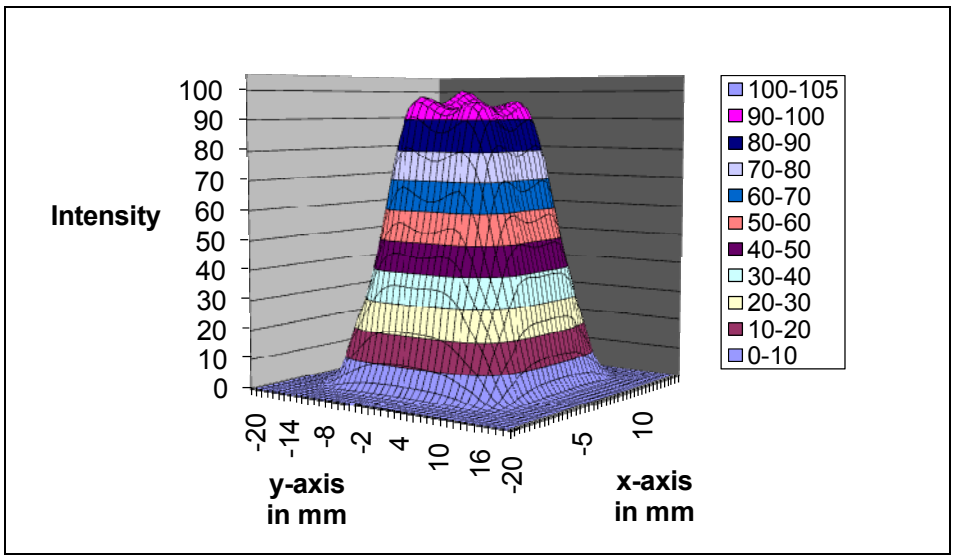
Dimensional Drawing of the Filter Unit

Dimensional drawing of the filter unit

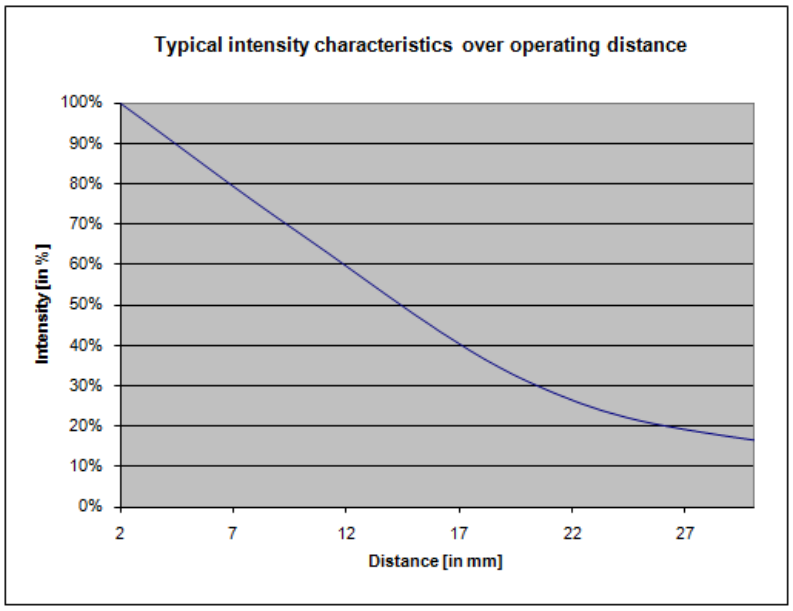


Optical Data

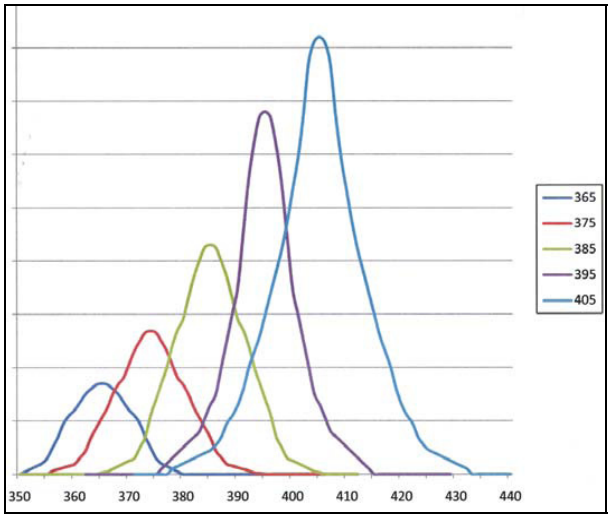
Typical intensity distribution as a percentage (2 mm spacing)



Typical intensity characteristics over operating distance (in %; distance in mm)



Relative spectral irradiance



Typical optical output dependent on the LED temperature at 100 % set value
For further information on the different operating modes, please refer to the operating instructions of the bluepoint LED/bluepoint LED HP, chapter „LED mode“.

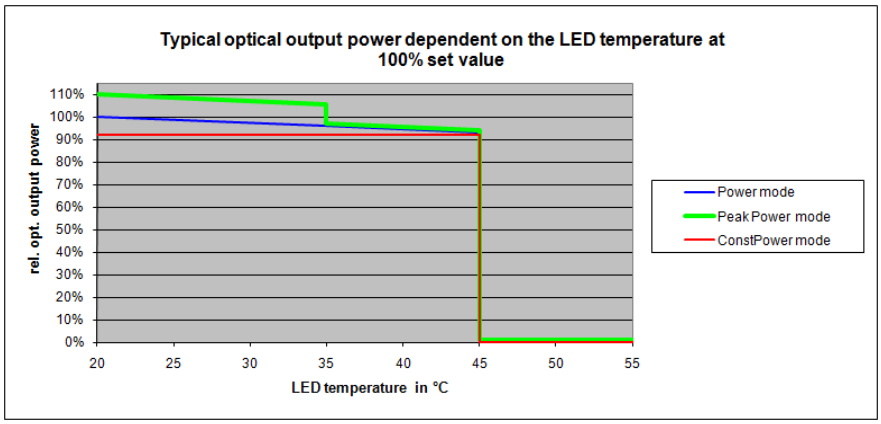


Fig. 1: LED Spot W 375 nm

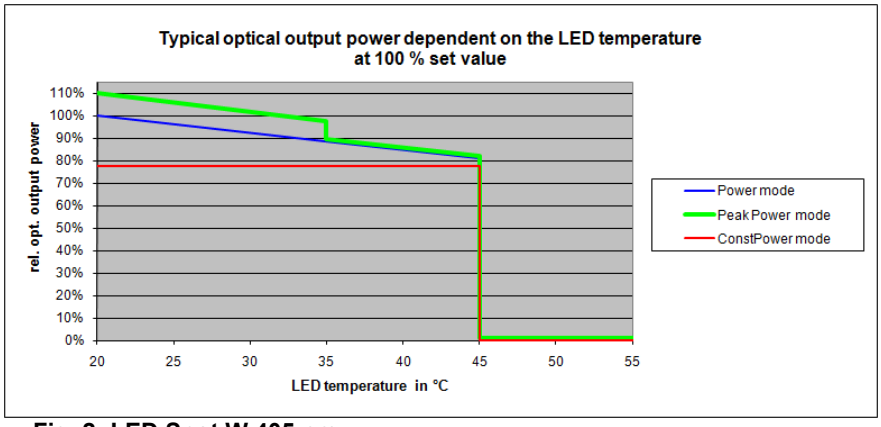


Fig. 2: LED Spot W 405 nm