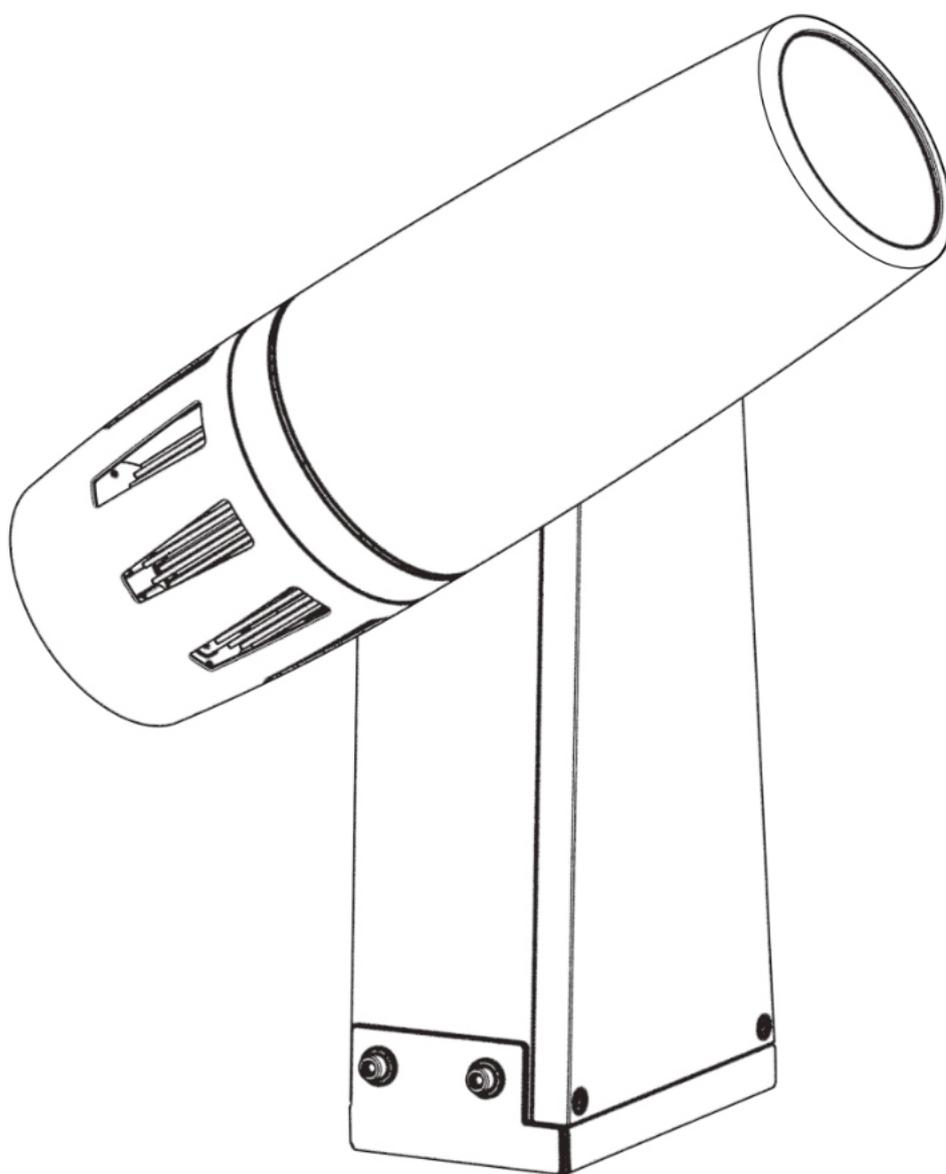


PHOS 45–85 rotator



Imprint

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For any technical enquiries, please contact our customer service: info@derksen.de

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1. Safety instructions

1.1 General understanding of safety

This LED projector has a safe design and fulfils the legal requirements for product safety. The following safety instructions are designed to help you assess residual risks in order to prevent potential damage to property or personal injury. This information for use (IEC/IEEE 82079-1:2019-05) about how to use the projector should be regarded as an integral part of the product. Keep the information in a safe place for future reference. If you pass the projector on, ensure that this document goes with it. It provides important information required to work safely with the product. Please read the information for use (IEC/IEEE 82079-1:2019-05) carefully before assembling and commissioning the LED projector. Familiarise yourself with the section on safety instructions thoroughly. Always observe the instructions provided in the information for use (IEC/IEEE 82079-1:2019-05) for all work carried out. Any applicable regulations on accident prevention and environmental protection and any recognised technical rules governing safe and proper work must also be observed. Proper handling and careful maintenance will have a significant effect on the performance and reliability of your projector. Assembly and operating errors and poor maintenance will lead to malfunctions which could have been avoided.

1.2 Intended use

The PHOS rotator is a compact LED projector (referred to as the 'projector' below) for displaying graphics and text using light projection.

- The projector is suitable for use in damp rooms and environments and also for outdoor areas.
- The projector is not suitable for corrosive environments. (e.g. factory farms, swimming pools, tunnels, offshore installations, coastal areas less than 1 km from the sea).
- The ambient temperature should not exceed 35°C. Otherwise, the projector cannot be adequately cooled and electronic components may fail prematurely.
- The projector is suitable only for use with glass projection motifs, so-called 'gobos'. Do not insert any other projection motifs or objects into the projector! The projector can be damaged by unsuitable projection motifs and can result in fire.
- When using the projector, make sure that the bright beam of light does not dazzle anyone, especially if there is a safety risk posed by temporary dazzling (e.g. for road users, people using stairs, etc.).
- Children and those with cognitive impairments are not permitted to operate the projector. Children and those with cognitive impairments must always be supervised in the vicinity of the projector.
- Do not modify or dismantle the projector. Otherwise, the projector may no longer meet the safety requirements. Users may only use it in the way described in this manual. Only expert service technicians may carry out repairs.
- The manufacturer does not accept any liability for damage caused by improper use or assembly.

1.3 Danger of electric shock

Contact with power supply voltage poses a risk of fatal electrocution.

- Only allow a qualified electrician to make electrical connections.
- The projector is a Class I electrical device in accordance with IEC 61140. Ensure that the device is properly grounded via the electrical connection.
- Ensure that national regulations governing the operation of electrical devices are always observed.
- Before carrying out any electrical, maintenance, cleaning or disassembly work, make sure the mains supply to the projector is voltage free and secured to prevent it from being switched on again by unauthorised persons.
- The mains cord must not be damaged. Avoid placing loads on the mains cord. The mains cord must not be kinked, pulled, twisted or pinched. Do not install the projector in a location where the cord can be stepped on. A damaged mains cord can cause electric shock and fire and must be replaced immediately.
- Operate the device only with the housing fully closed.

1.4 Heat and fire hazard

- Do not operate the device near highly flammable substances (e.g. alcohol, petrol).
- The projector may be operated only when securely installed and at a fixed angle. A projector which has toppled over or a projector head which has dropped can cause surfaces to catch fire.

- The projector's beam of light can reach high temperatures at close range. Keep flammable materials at a safe distance (0.5 m) from the light exit point. This distance increases the more projectors are used to illuminate one location. Ensure that flammable materials (e.g. curtains) are kept away from the danger area.
- The projector heats up during operation. Risk of burning! Let the projector cool down for at least ten minutes before changing a projection motif or handling the projector in any other way.
- The projector is actively or passively cooled depending on its type and requires an unrestricted flow of air for cooling. Keep a minimum distance of 30 cm from walls and objects on all sides.
- Do not cover the projector with film or insulating materials. Do not operate the projector in enclosed housings. Cooling is only effective if the hot air being released can escape and cool air can flow in freely.
- Protect the front lens from direct sunlight. Sunlight is concentrated through the front lens and can cause damage or fire inside the projector

1.5 Optical radiation hazard

The projector is classified in risk group 2 (RG-2) of the photobiological hazard classes in accordance with the DIN EN 62471-5 standard. The following safety regulations must be observed to combat the risk of glare caused by visible optical radiation:

- Do not stare directly into the beam of light.
- Never look directly into the beam of light at close range (<1 m). Permanent eye damage may occur if you expose yourself to the beam of light within the danger area.
- Install the projector in places where a distance of more than 1 m can be maintained from the eyes of people exposed to the beam of light.
- Change the gobo only when the projector is switched off.
- Do not make any modifications to the projector's optical components (projection lens, other lenses, bulbs). Use original accessories only and replace damaged components only with original spare parts. A device which has been modified may be categorised into a higher photobiological risk group.

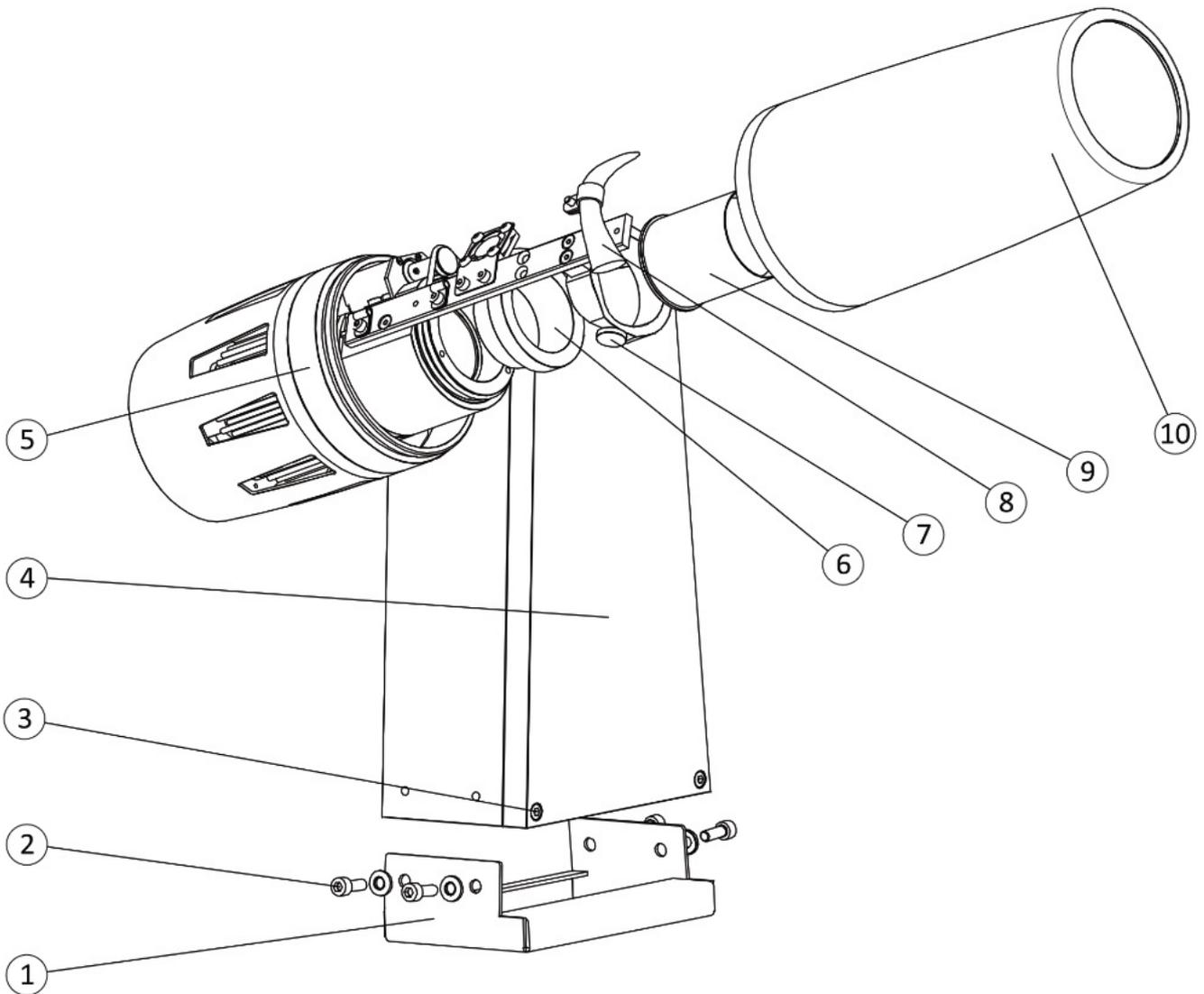
1.6 Assamby instructions

The projector must be firmly attached to a stable and load-bearing surface or structure.

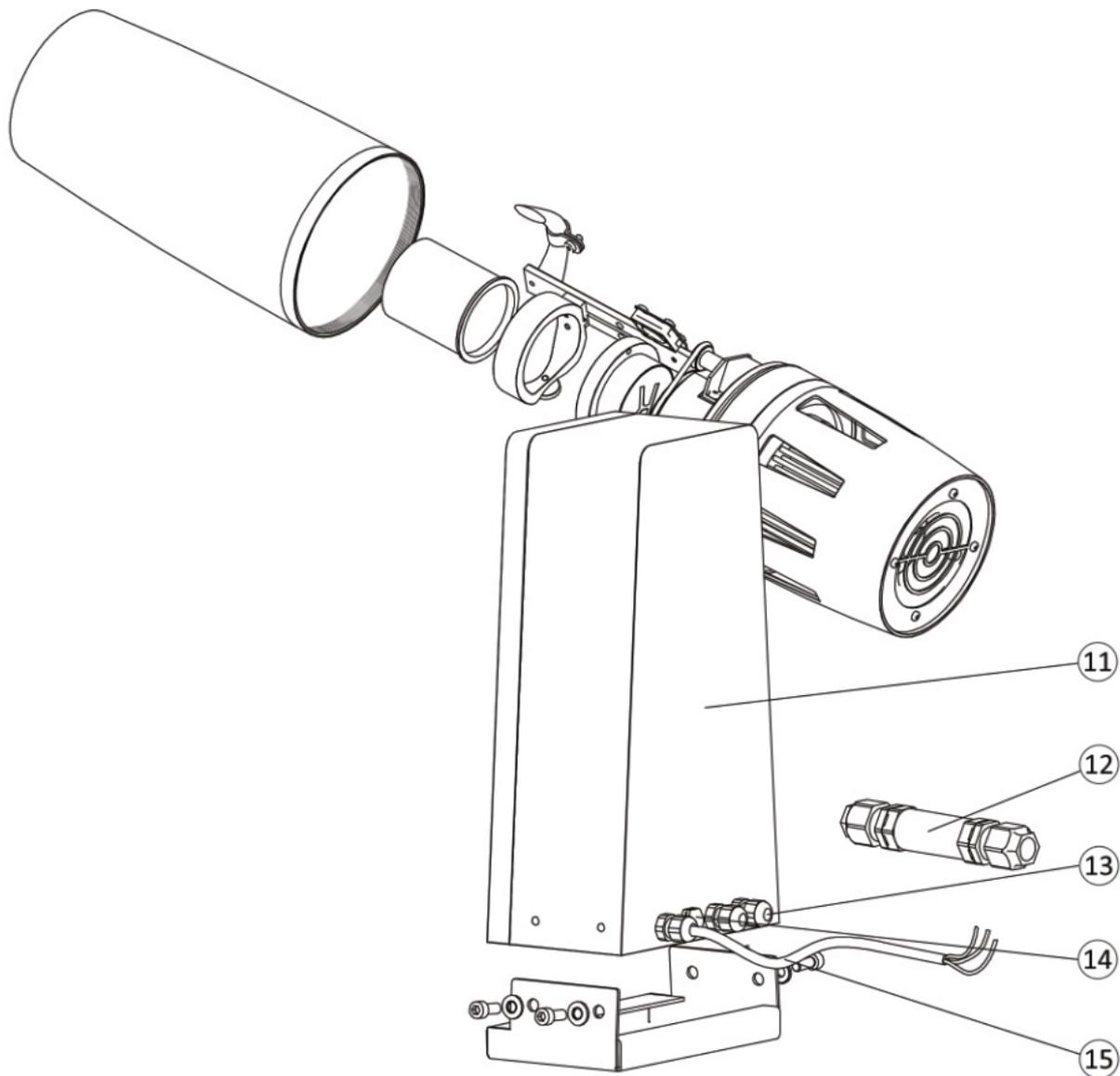
Local regulations on the safety of buildings, especially the Ordinance on Places of Public Assembly, must be observed:

- Building regulations of the federal states. Safety of construction sites and buildings
- Ordinance on Places of Public Assembly
- Ordinance on the Construction and Operation of Special Buildings

2. Overview of the PHOS rotator



①	Mounting plate	⑧	Drypack
②	Fixing screws for the mounting plate	⑨	Projection lens
③	Fixing screws for device cover	⑩	Casing
④	Device cover	⑪	Device stand comprising: • Ballast and control electronics
⑤	Projector head comprising: • LED • Heat sink with fan • Optical system holder	⑫	Connecting sleeve for power cable
		⑬	Screw connections for optional control cable
		⑭	Watertight ventilation element
⑥	Gobo case	⑮	Connection cable
⑦	Knurled screw for projection lens holder		



3. Definition of terms

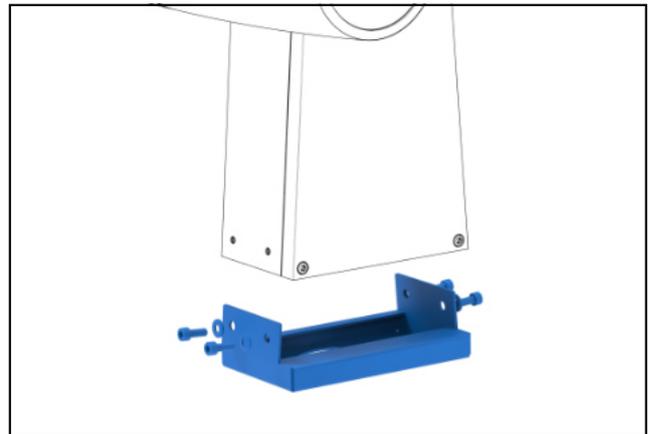
Term	Definition
LED projector	An optical device that uses an internal light source (LED) to display a two-dimensional template (gobo) on an image surface.
LED	Light Emitting Diode Semiconductor component that emits light.
Gobo	Projection motif A glass template used to display logos, patterns, texts or images with a projector.
Projection lens	The most important component in a projector. One or more optical lenses that concentrate the light, making it possible to emit a projection.
Focal length	This is a measure of how strongly the projection lens concentrates beams of light. Short focal length: wide cone of light Long focal length: narrow, concentrated cone of light

4. Mounting and installation

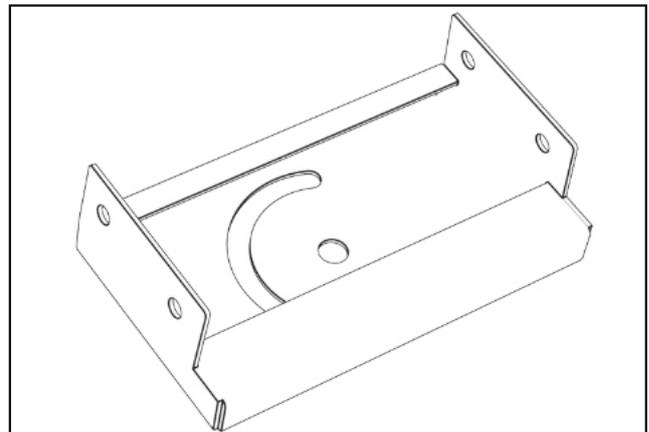
- Your new LED projector must be securely installed before you start using it. The mounting plate offers you a wide range of options. Any stable, flat surface is suitable, regardless of its orientation.
- Ensure that the supporting structure can handle this load. It must be able to carry at least four times the expected load. Information about the weight of your device is provided in the technical specifications.
- Select the fixing materials based on the load, the nature of the support material and the fire and building regulations.

4.1 Mounting the projector

1. Loosen and remove the four cylinder head screws on the side of the device stand.
2. Disconnect the mounting plate from the device stand.



3. The centre hole and the semi-circular long hole in the mounting plate allow the projector to be positioned through more than 180°.
4. Use the four cylinder head screws to attach the device stand to the mounting plate



4.2 Connecting to the power supply

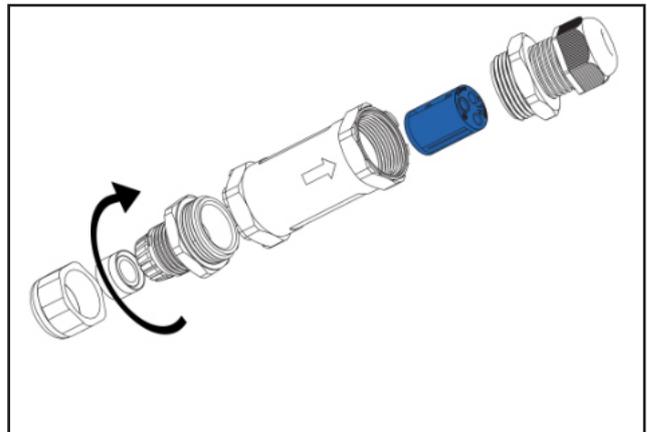


WARNING! Danger of electric shock!

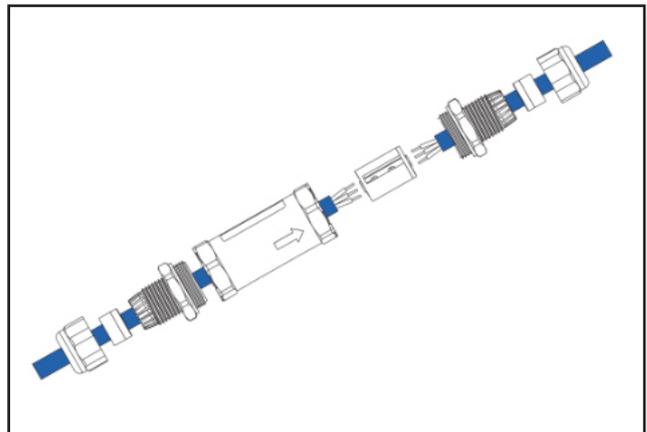
An electric shock can cause serious injury or death.

► Only allow a qualified electrician to carry out electrical connections.

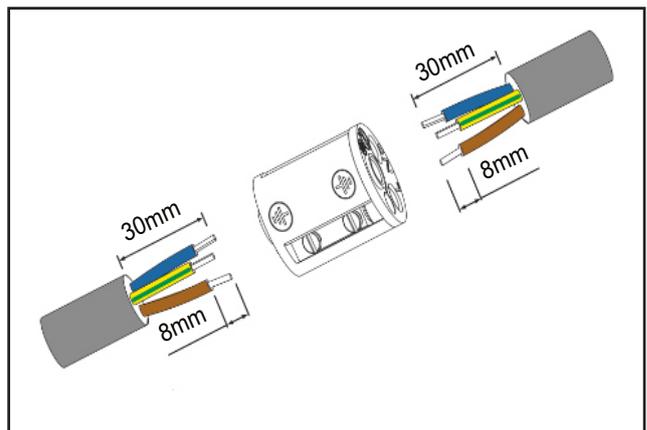
1. Unscrew the individual parts of the connecting sleeve.
2. Remove the terminal block.



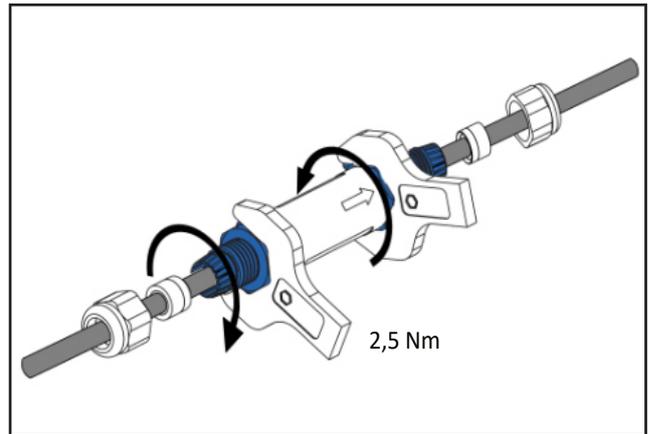
3. Feed the projector connection cable and your supply line through the components of the connecting sleeve as shown.



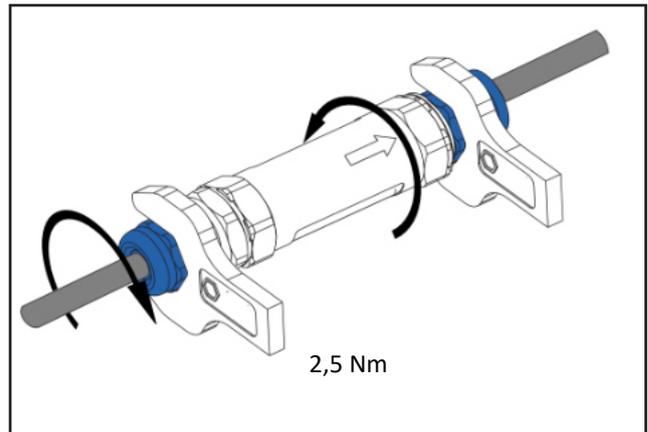
4. Connect the two cables to the terminal block.
5. Ensure the device is powered with the power supply voltage specified on the product data sheet (220-240V) and your supply cable is connected to a protective conductor via the corresponding contact on the terminal block.



6. Lock the sleeve with the threaded sections of the strain relief using the specified torque.

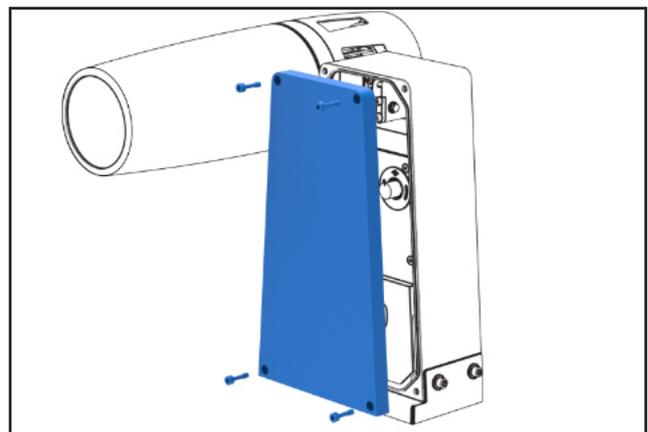


7. Screw the caps onto the strain relief using the specified torque.



4.3 Connecting your own supply cable

1. Loosen the four cylinder head screws of the housing cover with the enclosed hexagon socket wrench.





WARNING! Danger of electric shock!

An electric shock can cause serious injury or death.

- ▶ Only open the device once the mains supply has been switched off.

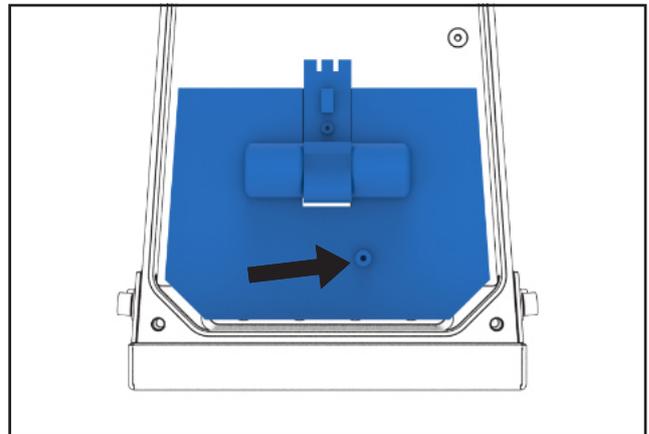


WARNING! Danger of electric shock!

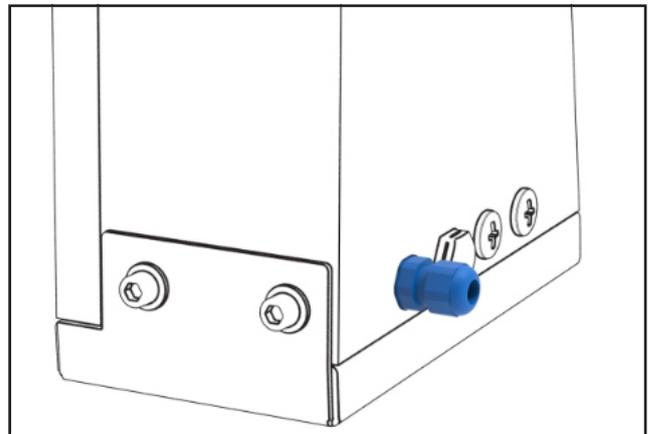
An electric shock can cause serious injury or death.

- ▶ Only allow a qualified electrician to carry out electrical connections.

- Loosen the cylinder head screw.
- Disassemble the lower cover to gain access to the connection terminals.



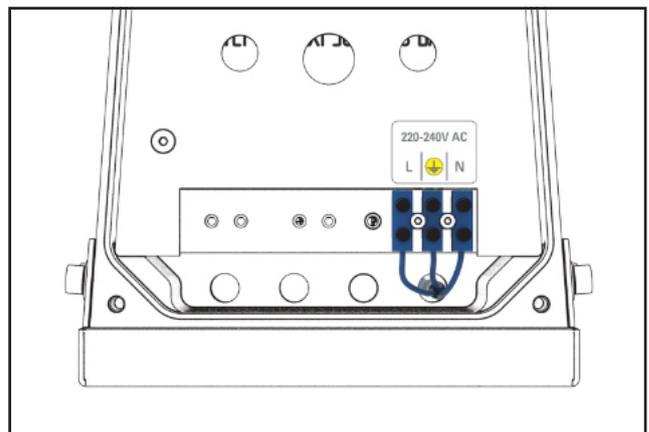
- Release the cable screw connection on the back of the housing.



ATTENTION! Potential Damage.

A ventilation element has been installed next to the cable screw connection. This must NOT be dismantled, rotated or modified in any way. This is the only way to ensure its waterproof capability.

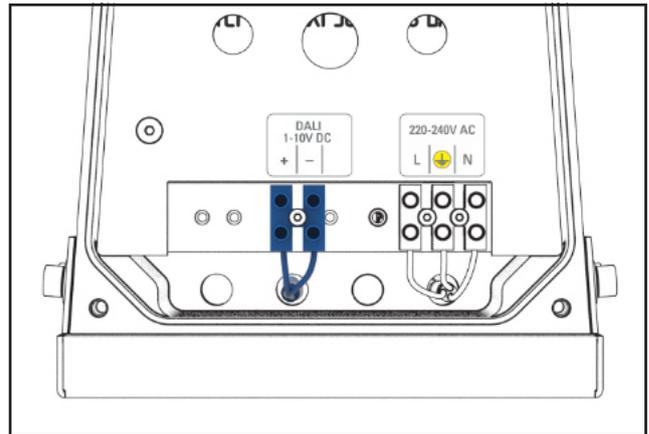
- Release the connection terminals and remove the pre-assembled cable.
- Note that the cable screw connection is suitable for a maximum cable diameter of 7 mm.
- Ensure the projector is powered with the power supply voltage specified on the product data sheet (230 V) and your supply cable is connected to a protective conductor via the corresponding contact on the connection terminal.
- Tighten the screw connection.



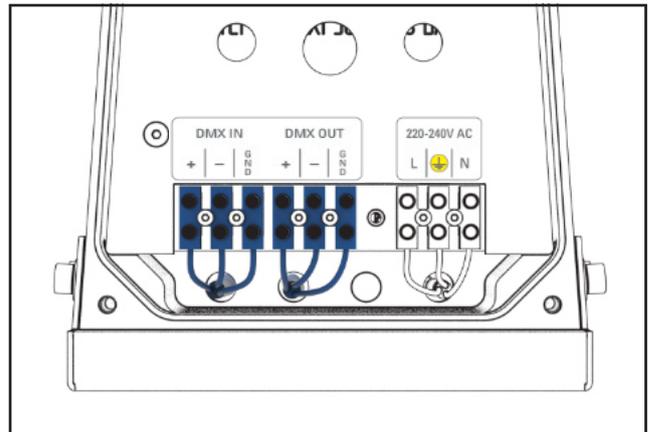
4.4 Connection option for dimming function (optional) DALI / 1-10V / DMX

The PHOS rotator gives you the option of using one of three dimming functions.

For the DALI or 1-10 V version, the device is equipped with a two-pole terminal to which you can connect your supply cable.



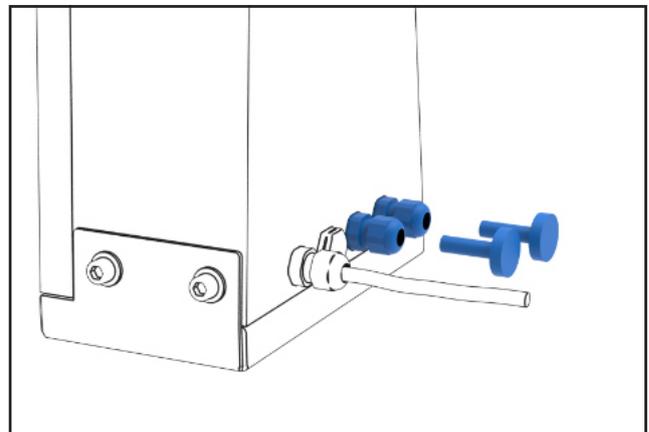
The DMX version has two three-pole terminals installed at this point, to which the input and output cables are connected.



ATTENTION! Potential Damage.

A ventilation element has been installed next to the cable screw connection. This must NOT be dismantled, rotated or modified in any way. This is the only way to ensure its waterproof capability.

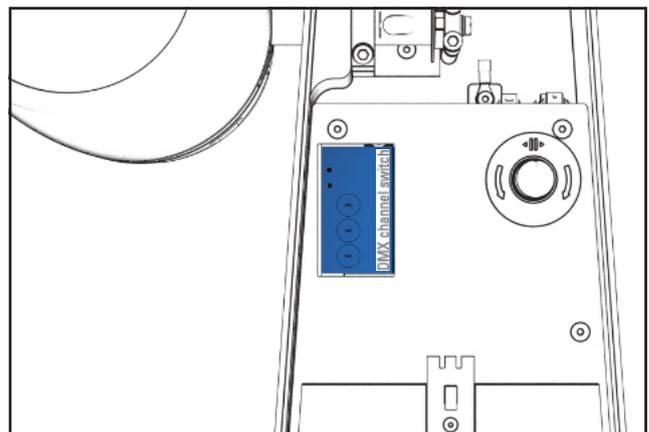
1. Release the cable screw connection on the back of the device and remove the blind plugs.
2. Feed your control cable in and connect it to the respective terminal.
3. Re-tighten the screw connection.



4.5 Setting the DMX address

The control panel for DMX addressing is embedded in the cover plate behind the housing cover.

- Use the three selector switches to set the address you want.
- When assigning addresses, please take into account that three channels are reserved by the device.



5. Setting up and operating the projector



WARNING! Risk of burns!

You can burn yourself on projector parts which have become hot.

- ▶ Let the device cool for at least 10 minutes before any set-up work.



WARNING! Optical radiation hazard!

Optical radiation can cause temporary or permanent eye damage.

- ▶ Never stare directly into the beam of light.

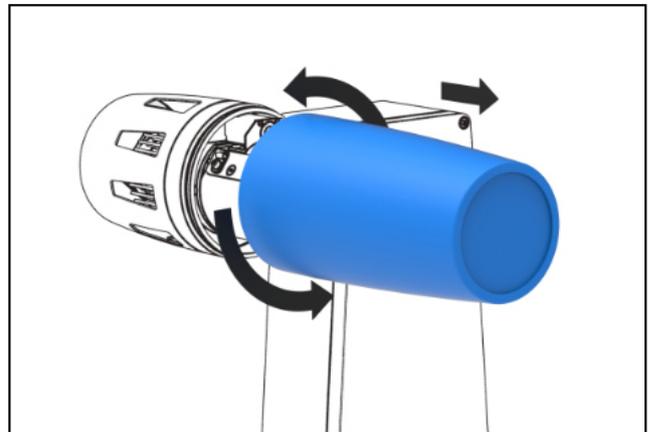
Some of the steps below require the projector to be switched on. Optical radiation can cause high temperatures at close range and may be dangerous for your eyes. Exercise appropriate caution. Only switch on the projector once the gobo has been inserted. Carry out set-up work as soon as possible after switching on the device.

Do not allow moisture or damp to enter the projector when setting it up. This can condense on the front glass of the casing during operation and significantly impair the quality of the projection. If moisture nevertheless appears in the device, a silica gel pad (drypack) is included in the PHOS rotator both in the projector head above the projection lens and in the device stand. The silicagel in the drypack absorbs the moisture from the ambient air. This can take a few days. If moisture still condenses on the front glass, the drypack must be replaced (see section 5.5). Remove visible water droplets with a dry cloth.

The gear and mechanical parts of the rotator must **NOT** be oiled.

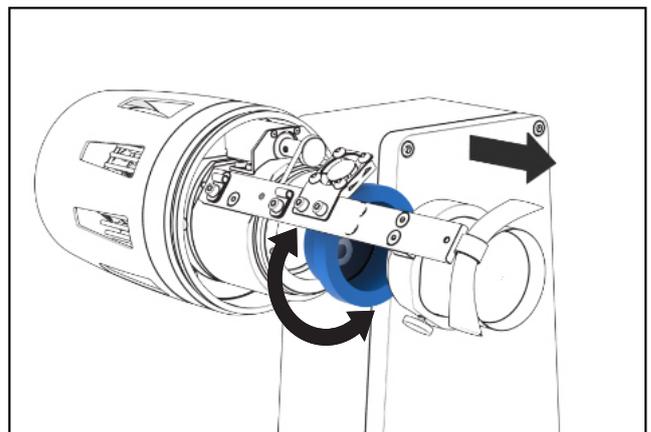
A few settings still need to be made to the projector head in order to set up projection as you wish.

- Carefully remove the casing from the projector head.



5.1 Inserting/changing the projection motif (gobo)

1. The gobo case is held in place by small but powerful magnets. Hold the mount with one hand and carefully rotate the gobo case out of the holding point of the magnets. Remove the gobo case.





WARNING! Risk of burns!

You can burn yourself on projector parts which have become hot.

- ▶ Let the device cool for at least 10 minutes before any set-up work.



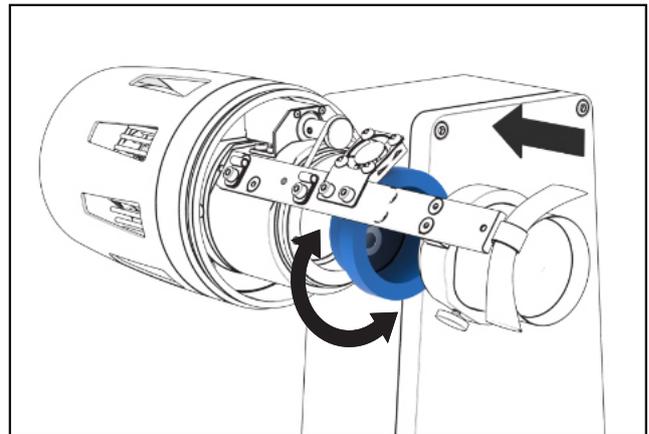
WARNING! Optical radiation hazard!

Optical radiation can cause temporary or permanent eye damage.

- ▶ Never stare directly into the beam of light.

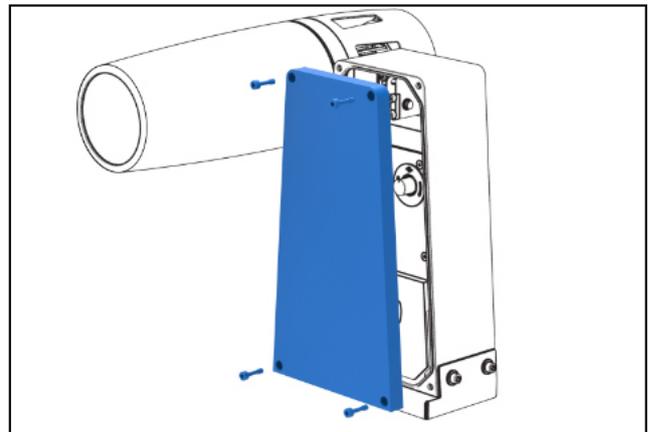
2. Slide the new gobo case into the mount and turn it until the holding magnets have found their counterpart.

(Note: For technical reasons, the gobo must be glued to the gobo case and can, therefore, only be changed as a unit. For gobo orders, please contact our customer service team).

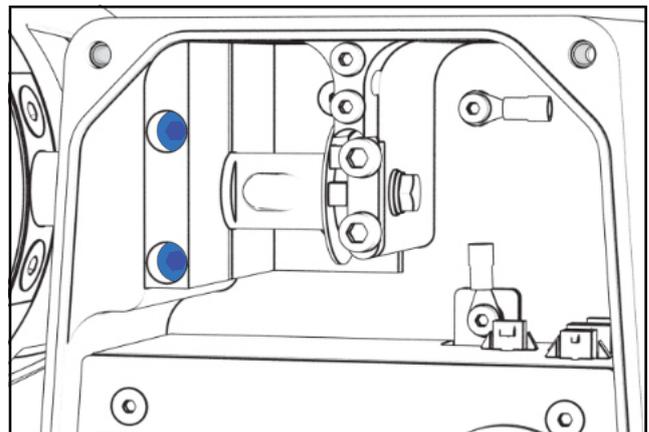


5.2 Aligning the projector head

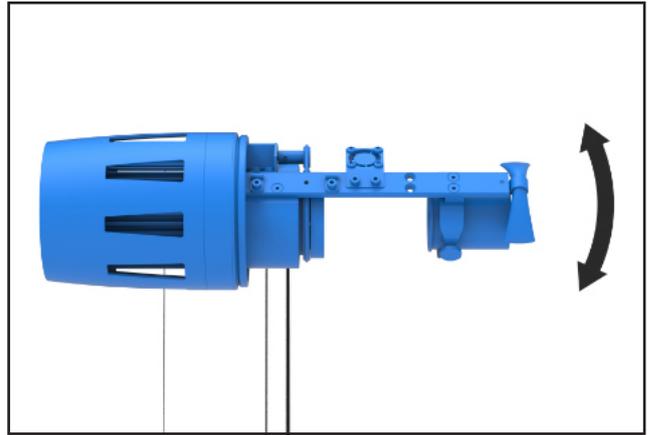
1. Loosen the four cylinder head screws of the housing cover with the enclosed hexagon socket wrench.
2. Disconnect the protective conductor from the terminal in the cover and remove it.



3. Loosen the two cylinder head screws of the locking device with the enclosed hexagonal spanner by no more than one turn.



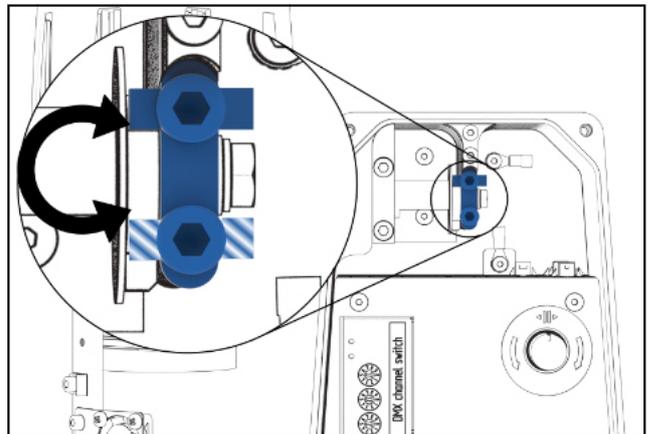
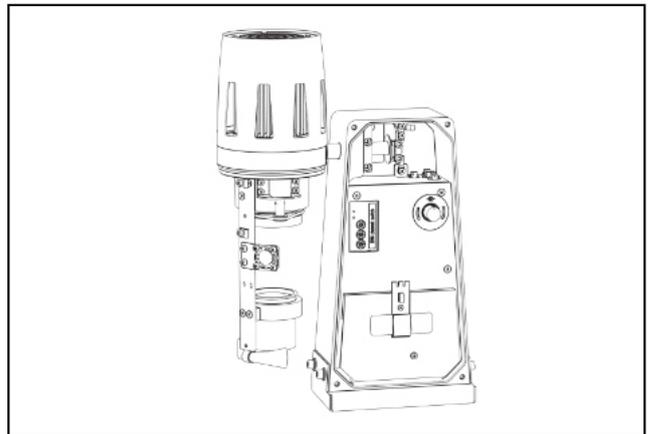
4. Turn the projector head to the desired position.
5. Tighten the cylinder head screws of the locking device again.



5.3 360° rotation of the projector head

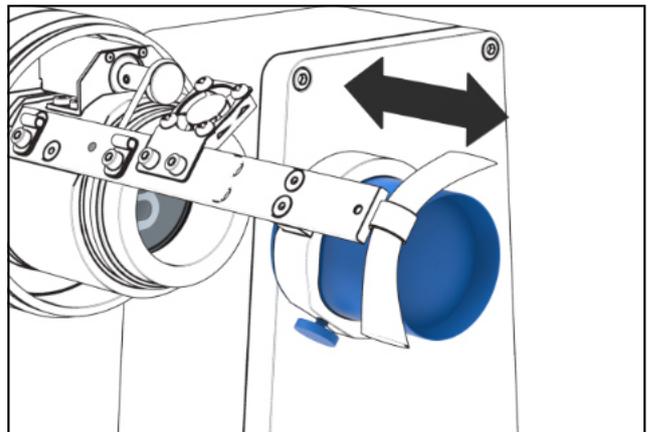
The projector head axis has a mechanical stop to prevent damage to the cable. You can move this stop to reach any possible rotational position:

1. Loosen the cylinder head screws of the locking device (see 5.2) by a maximum of one turn.
2. Turn the projector head to the position shown here and do not move it again until the stop is firmly in place once again.
3. Loosen and remove the two cylinder head screws of the stop.
4. Rotate the stop by 180°.
5. Fix the stop in place with the two cylinder head screws.



5.4 Adjusting the focus of the motif

1. Loosen the knurled screw.
2. Move the projection lens within the holder until the motif is in focus.
3. Tighten the knurled screw.





WARNING! Risk of burns!

You can burn yourself on projector parts which have become hot.

- ▶ Let the device cool for at least 10 minutes before any set-up work.



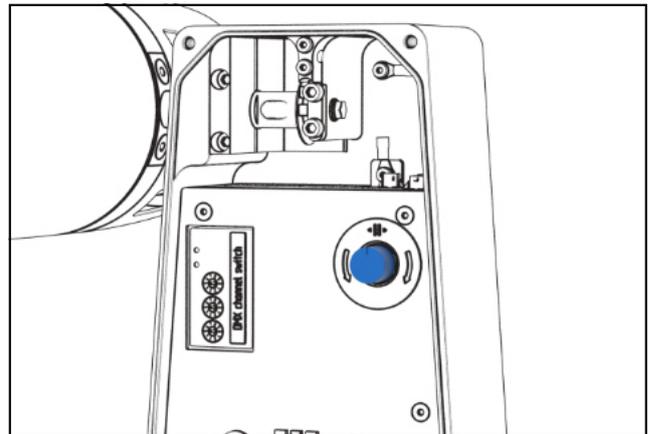
WARNING! Optical radiation hazard!

Optical radiation can cause temporary or permanent eye damage.

- ▶ Never stare directly into the beam of light.

5.5 Setting up the motif movement

1. Remove the housing cover (see 5.2).
2. You can set the direction and speed of rotation using the dial below.
3. To align the motif for a rigid projection, bring the rotation to a stop with the rotary dial in the desired position.

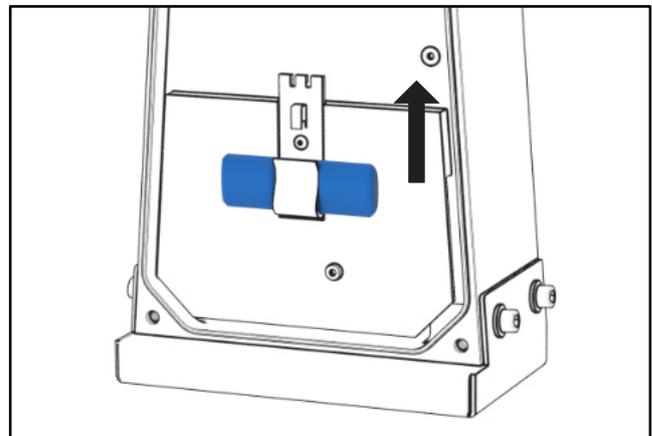


5.6 Removing moisture

Moisture that condenses inside the device is absorbed by the drypacks. The silica gel in the drypacks changes colour when it becomes saturated from white to dark grey. You can see this colour change through a transparent strip in the paper cover and you should replace the drypack as necessary.

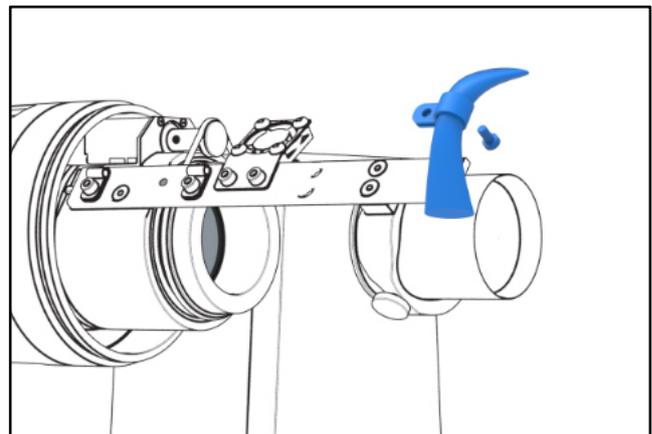
Replacing the drypack in the device stand

1. Carefully release the drypack from the clip and replace it with an unused one.

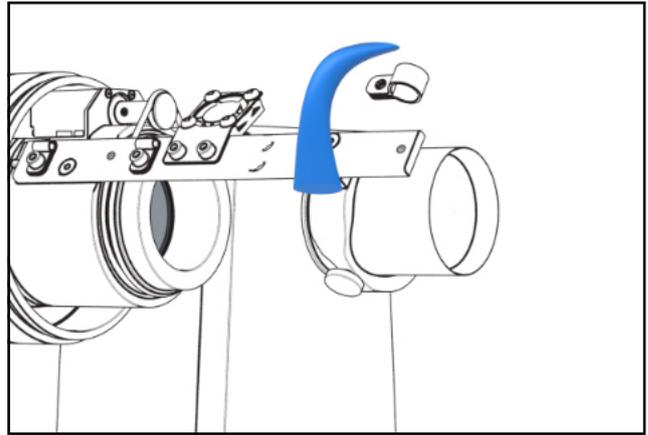


Replacing the drypack in the projector head

1. Release the cylinder head screw and remove the drypack holder from the support rail.
2. Remove the used drypack.

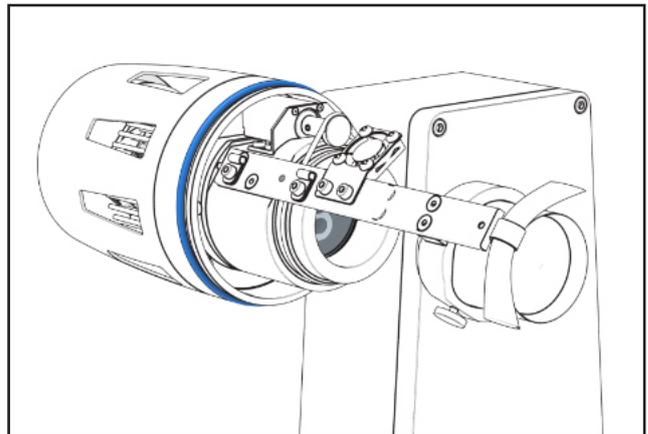


3. Push the new drypack carefully into the cage.
4. Fit the drypack holder with the cylinder head screw to the support rail.

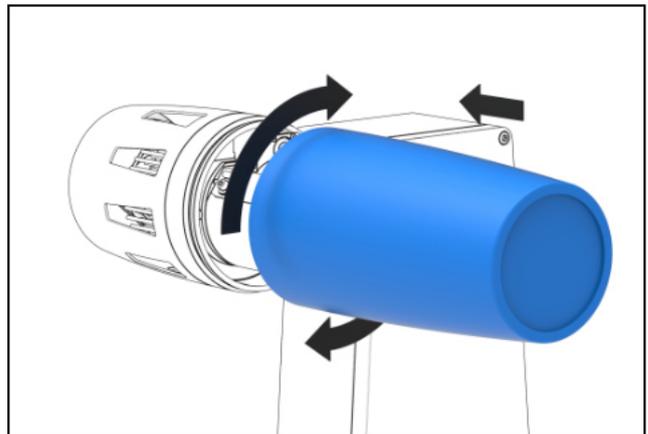


5.7 Locking the projector head

1. Ensure that the sealing ring is in the position provided for it.
2. Keep the sealing ring free from oil, lubricants and other agents.

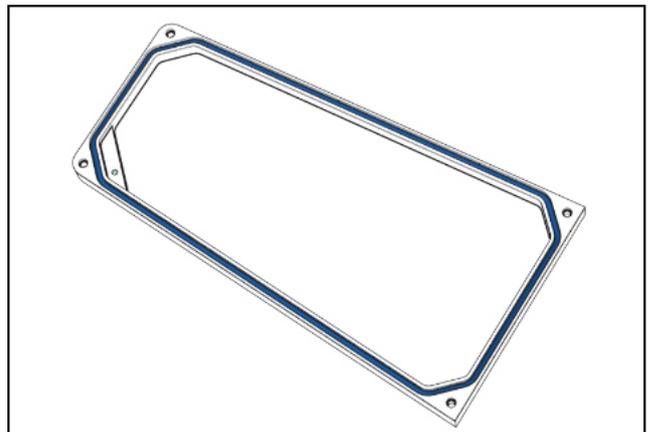


3. Screw the casing onto the projector head with at least 6.0 Nm to ensure that it is leak tight.



5.8 Locking the device stand

1. Ensure that the sealing ring is in the correct position and is free from oil, lubricants and other contamination.
2. Connect the device cover to the protective conductor.
3. Fit the cover with the four cylinder head screws until it fits firmly and evenly on the device stand.



6. Cleaning



WARNING! Danger of electric shock!

An electric shock can cause serious injury or death.

- ▶ Switch off the mains supply to the projector before cleaning it.

- Clean the projector surface using a damp cloth and commercial cleaning agents. The surface can be damaged by solvents in the cleaning agents.
- The preferred way of cleaning the heat sink is with compressed air. Cooling is not affected by a light build-up of dust. You should clean the projector every 6 months in locations where a lot of dust is created (e.g. industrial plants). A cleaning interval of 1-2 years is suitable for a normal environment.
- Use lens cleaning cloths if you notice any dirt on the projector's optical lenses.

7. Disposal

7.1 Disposal of packaging

Please do not dispose of packaging waste together with household waste. It should be disposed of separately. There are established facilities in your area for returning waste (e.g. recycling or waste paper bins). Further information on how to dispose of packaging properly and on the options available for returning packaging waste can be obtained from your city or municipal council.

7.2 Disposal of the projector

European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) provides the framework for EU-wide return and recycling of used equipment. This directive was enacted in German law with the national Electrical and Electronic Equipment Act (ElektroG). In accordance with the ElektroG, Derksen Lichttechnik GmbH is registered as a manufacturer on the German EAR register (Register of Used Electronic Devices). WEEE reg. no.: DE 98055625

Our products are manufactured exclusively for the B2B (business to business) sector, and they must not be disposed of with household waste or at collection points at local public waste disposal facilities. At the end of the projector's life, please return it to Derksen Lichttechnik GmbH.

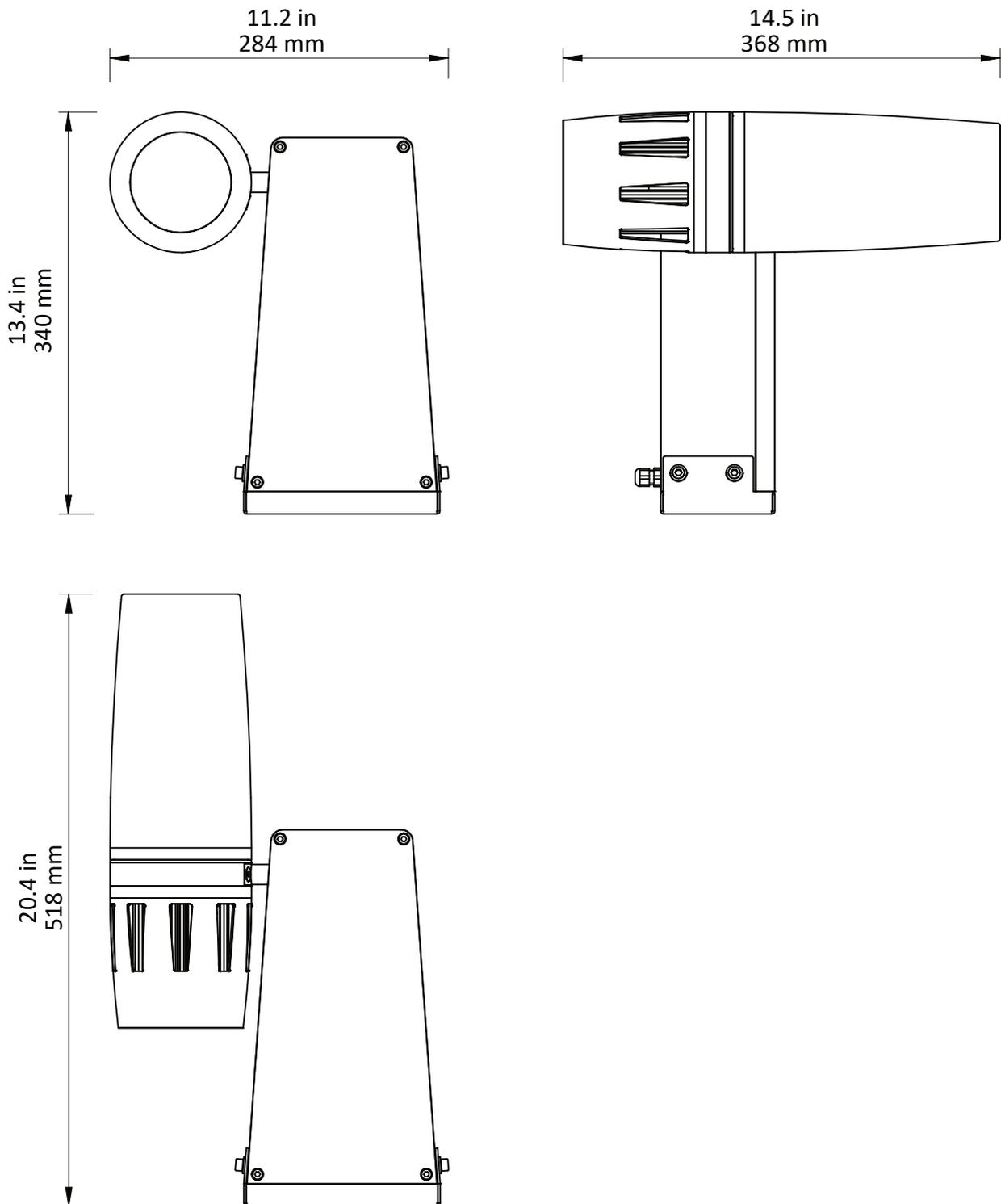
Contact Derksen by phone, post or email (info@derksen.de) with the subject 'Electronic device disposal' ('Elektrogeräte Entsorgung') and, if possible, provide the following information: Purchaser, purchase date, your postal address. By returning products to the manufacturer, you are helping to support responsible use of natural resources and environmentally friendly disposal of waste materials.

8. Technical specifications

8.1 General information

	PHOS rotator indoor 45	PHOS rotator outdoor 45	PHOS rotator indoor 85	PHOS rotator outdoor 85
Housing material	steel / aluminium / powder coated			
Weight	7,45 kg		7,65 kg	
On/Off switch	Not available			
Dimmingfunction (optional)	1-10V, DALI, DMX			
Area of application	dry indoors	outdoor area / damp indoor environments	dry indoors	outdoor area / damp indoor environments
Ambient temperature	-30°C - +35°C			
Cooling	active cooling / fan			
Noise level	26 dBA			
Bulb	40 W High- Power LED		80 W High- Power LED	
Average service life of LED (L70) at 25°C	35.000 hours			
Colour temperature	6.300-6.700 Kelvin			
Luminous flux of the projector with a 85mm projection lens	2.390 Lumen		4.730 Lumen	
Gobo size / image size	Ø 50 mm / Ø 40 mm			
Input voltage	220 – 240 V AC, 50 / 60 Hz			
Power consumption	47 W		92 W	
Power factor	cosφ = 0,95			
Max. number of devices per B16A/C16A fuse	24 / 40		12 / 20	
Protection class	I			
Housing protection type	IP5X	IP65	IP5X	IP65
Photobiological safety pursuant to ICE62471-5:2015 EN62471-5:2015	RG-2			
Order numbers	20450030 – silver	20045830 – silver	20850030 – silver	20085830 – silver

8.2 Dimensions



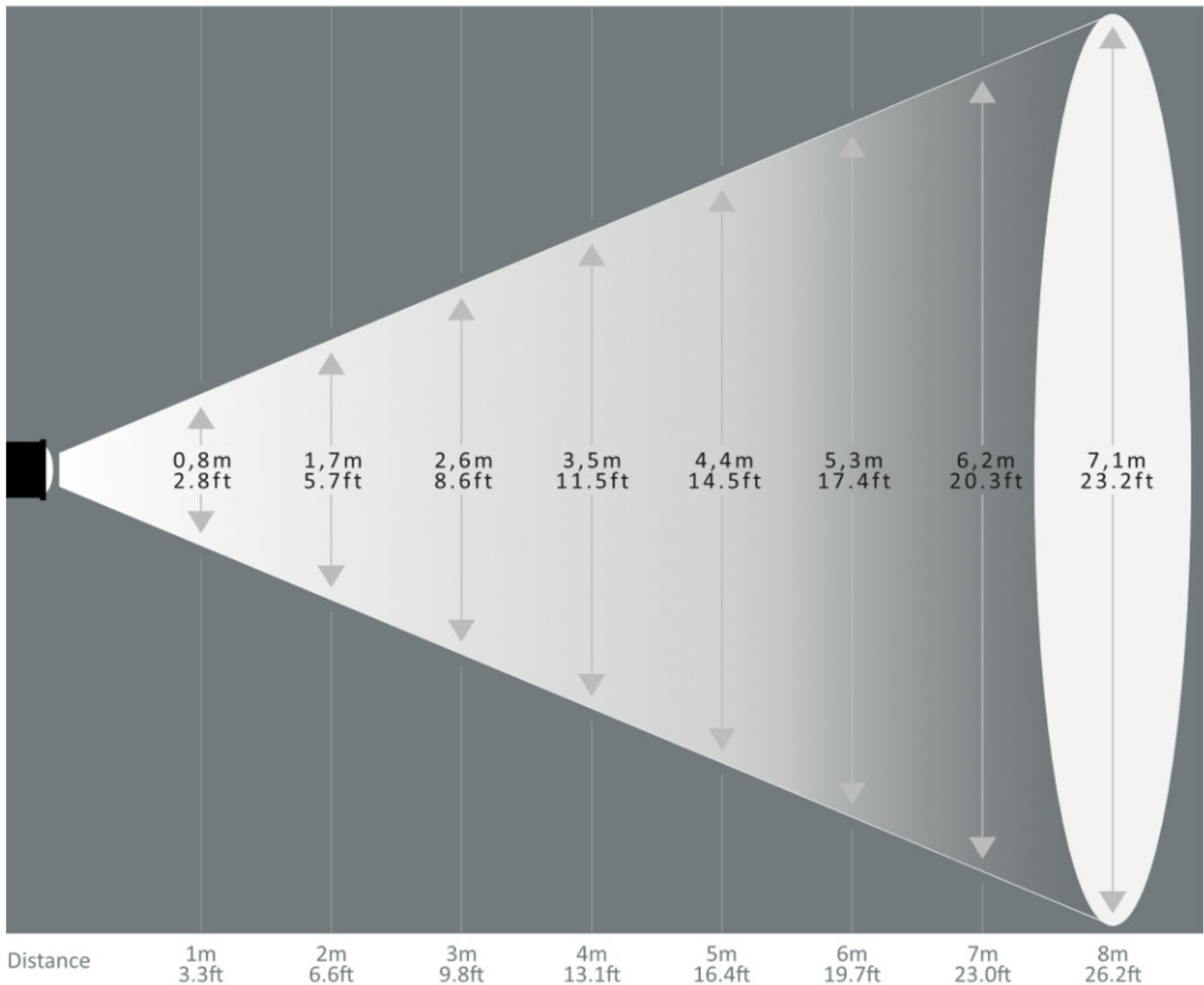
8.3. Photometric data

The focal length of your lens mainly affects possible projection sizes and distances. Please note that the illuminance decreases as the distance increases. The diagrams below provide the corresponding values as based on your projector's output.

Ultra wide-angle lens, f=45 mm, 48°

Illuminance [lux]

PHOS 45	2920	730	320	180	120	80	60	50
PHOS 85	5880	1470	650	370	240	160	120	90



Colour code for projection brightness

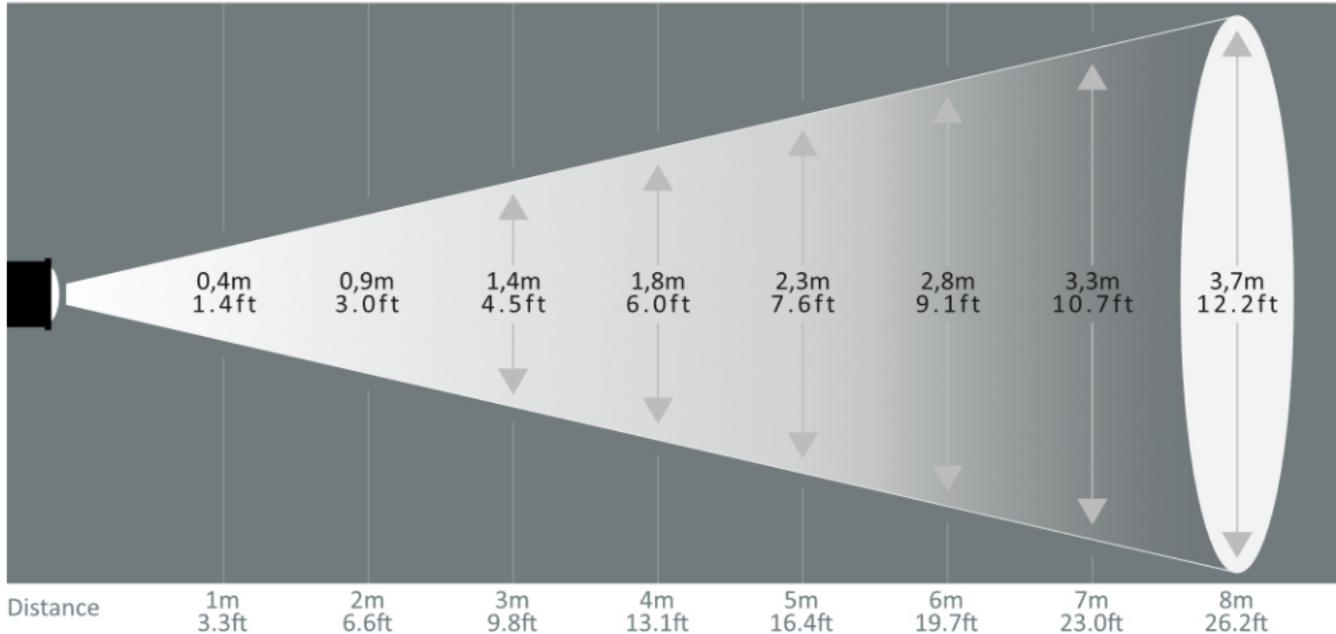
- = under normal interior lighting, suitable for coloured patterns
- = in poorly lit rooms, for colourless patterns
- = recommended only for darkened rooms

Standard lens, f=85 mm, 26°

Illuminance [lux]

PHOS 45	10900	2720	1210	680	440	300	220	170
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PHOS 85	21610	5400	2400	1350	860	600	440	340
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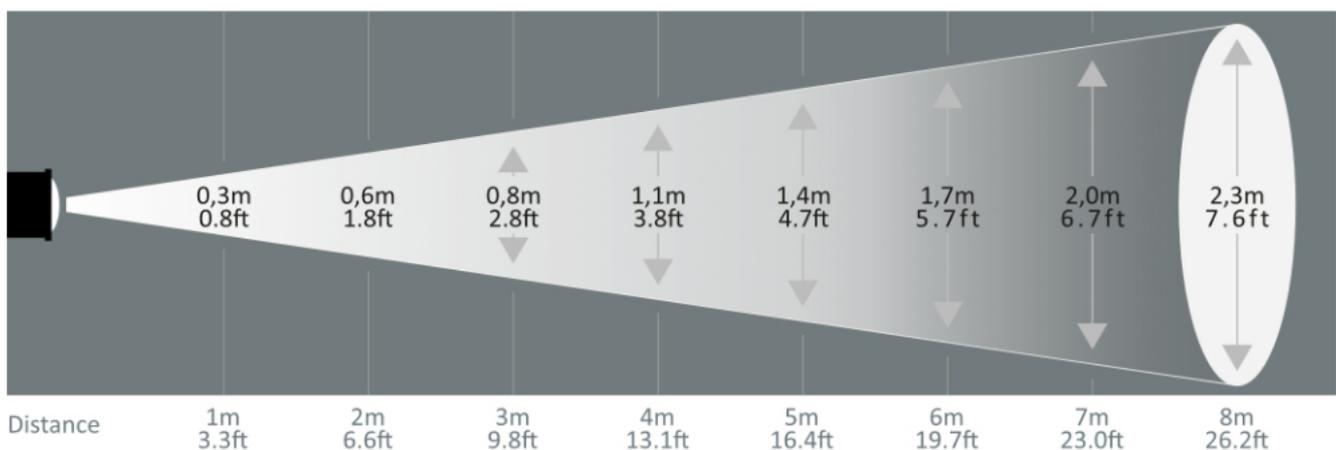


Telephoto lens, f=135 mm, 17°

Illuminance [lux]

PHOS 45	29830	7460	3310	1860	1190	830	610	470
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PHOS 85	44830	11210	4980	2800	1790	1250	910	700
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- The results presented here are approximate values. The result may deviate from reality.
- The projection sizes provide the maximum diameter that can be projected with a \varnothing 40 mm image.
- The projection pattern is circular and fills the gobo's image area. Other objects (e.g. rectangles, fonts) are adjusted to the projection area.
- The projection is directed at a right angle on to the projection surface.

9. Declaration of conformity



We: Derksen Lichttechnik

Manufacturer: **Derksen Lichttechnik GmbH**
45889 Gelsenkirchen
Johannes-Rau-Allee 4

This declaration of conformity is issued under our sole responsibility

Product: **PHOS LED-Projector**

Type:	• PHOS 15 indoor	• PHOS 45 downlight	• PHOS 85 s pole mount
	• PHOS 25 indoor	• PHOS 65 downlight	• PHOS 15 LT
	• PHOS 45 indoor	• PHOS 85 downlight	• PHOS 25 LT
	• PHOS 65 indoor	• PHOS 25 pole mount	• PHOS 45 LT
	• PHOS 85 indoor	• PHOS 45 pole mount	• PHOS 65 LT
	• PHOS 25 outdoor	• PHOS 65 pole mount	• PHOS 85 LT
	• PHOS 45 outdoor	• PHOS 85 pole mount	• PHOS 45 rotator
	• PHOS 65 outdoor	• PHOS 25 s pole mount	• PHOS 85 rotator
	• PHOS 85 outdoor	• PHOS 45 s pole mount	• PHOS 45 rotator outdoor
	• PHOS 25 downlight	• PHOS 65 s pole mount	• PHOS 85 rotator outdoor

We hereby declare that the products listed above apply with the following applicable regulations:

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment:	2011/65/EU
EMV Directive:	2014/30/EU
Low Voltage Directive:	2014/35/EU

The following standards have been applied:

- | | |
|--------------------------|----------------------|
| 1. EN 55015:2013+A1 2015 | 6. EN 60598-1:2015 |
| 2. EN 61547:2009 | 7. EN 60598-2-2:2012 |
| 3. EN 61000-3-2:2014 | 8. EN 62471-5:2015 |
| 4. EN 61000-3-3:2013 | 9. EN 50581:2013-02 |
| 5. EN 62493:2015 | |

Furthermore we confirm to comply with the rules of the RoHS!

Place: Gelsenkirchen
Date: 13. November 2019

Signature

derksen®
lichttechnik

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