WISKA®
make power smile

OPERATING INSTRUCTIONS

SEARCHLIGHT
SX 450-2000+E

Contents

1. About these instructions

1.1 Symbols and guidance signs in these instructions

Danger! There is a risk to life and limb if the warning is not followed.

Risk of electric shock! There is a risk to life and limb from electricity if the warning is not followed.

Wear protective clothing!
- Safety glasses to protect the eyes
- Face mask with neck protection
- Safety gloves with artery protection.

There is a risk to life and limb if the warning is not followed.

Use disposable gloves! Use disposable gloves for the following work to protect the material and your health.

Attention! There is a risk to the environment and the device if the warning is not followed.

1, 2, 3, … **Operating steps**, that should take place in a certain order, are numbered sequentially.

- **Operating steps**, that only consist of one step or that don't have to be followed in a certain sequence, are marked with a point.

➔ **Feedback** from executed actions begins with an arrow.

– **Enumerations** begin with an enumeration line.

1.2 Who are these instructions for?

These instructions are intended for the personnel that are assigned with the assembly, operation and maintenance of the searchlight.

Danger of electric shock and short circuit! All electrical installation and repair work may only be carried out by a qualified electrician!

Wear protective clothing! Personnel charged with the maintenance and care of the searchlight must be given suitable protective clothing for handling Xenon lamps and must be instructed in their use.

2. Safety

The following safety instructions have to be strictly followed! Otherwise you put yourself and others in danger.

2.1 General information

Intended use

The SX 450/ 2000 searchlight is designed for lighting large and far away objects. The range of the searchlight is up to 9,600 m.
Because of its intense light power the searchlight may not be used to illuminate persons in the nearby surroundings.
It is not suitable for illuminating, spaces on the ship or in buildings.

Danger! Unauthorised conversions and changes to the searchlight are not allowed, since this can endanger persons and may damage the unit.
Only original spare parts may be used. Disregard will result in the loss of the warranty claim and the approval for the device.

Risk of getting burned! Never touch the searchlight during operation without protection. The casing can reach 140°C. Always allow the searchlight to cool down before maintenance and repair work. In case of burns cool the injured area immediately and seek medical help.

Risk of glare! Never look into the light source during operation. This is dangerous for the eyes. Never point the searchlight directly at anyone.

Risk of crushing! Risk of shearing! Before rotating or tilting the searchlight using the optional remote control: Make sure that there is nobody right beside it. A persons limbs can get trapped between the searchlight and the moving mechanism and sustain serious injured.

2.2 Handling Xenon lamps

Strictly follow the safety instructions below when handling Xenon lamps:

Risk of explosion! Xenon lamps are under a high pressure, even when they are cold (20 bar). This pressure increases to 70 bar during operation. Therefore, strictly follow the safety instructions below when handling Xenon lamps:

Transport

Always store and transport Xenon lamps in their protective sleeve.

- Keep the protective sleeve in a safe place after installation of the lamp
- Always immediately replace used Xenon lamps in their protective sleeve after dismantling!
- Never touch the lamp with your fingers.

Operation

- Never touch the naked lamp bulb with your bare hands. Remove fingerprints on the lamp before installation with an alcohol solution and a soft lint-free cloth.
- Check the lamp for scratches, cracks or other damage before installation. Don’t continue using damaged lamps.
- Pay attention to correct polarity. Incorrect polarity will immediately destroy the lamp.

Lifetime

- The average lifetime of the Xenon lamp is 1500 hours, depending on the lamp manufacturer and on the frequency and duration of switching on of the lamp. Replace the lamp *and the internal fan* upon reaching the average service life of the lamp at the latest.

Disposal

- Xenon lamps must be decompressed before disposing of the glass bulb

- **Risk of explosion!** Decompress the glass bulb in suitable surroundings. Make sure that there are no other persons in the immediate vicinity.

- **Wear protective clothing!**

2.3 Safety devices

Temperature

- The installed Xenon lamp develops intensive heat during operation. To reduce the heat, a thermostat-controlled fan generates a circulating air stream in the casing, which dissipates the heat from the inside via the searchlight casing.
- To ensure that no condensate can form on the inside of the searchlight, it is necessary for the ignition process to have a minimum temperature of 6 °C inside the searchlight. To ensure this minimum temperature, a thermostatically controlled heater is integrated in the casing. At the same time the heater protects the searchlight against freezing.
- In order to protect the gear of the optional movement unit from freezing, a thermostat-controlled heater is also integrated in the movement unit FL52.

Attention! Ensuring the minimum temperature at cold ambient temperatures:

- Keep the searchlight in standby mode (main switch on the PSUX-E ON). Only switch it using the controller (RCU).
- Don’t switch on the lamp immediately, if the searchlight is de-energised at temperatures around or below 6 °C for a longer period of time. Switch to standby mode with the main switch on the PSUX-E, and wait until it has reached the minimum required temperature inside.

Radiation/escape of dangerous particles

- Xenon lamps radiate UV light which is harmful to the eyes. The special searchlight casing prevents you from looking directly into the arc.
- If the Xenon lamp explodes during operation, the casing remains intact and contains any heated glass splinters.

2.4 Operating conditions

Installation location of the searchlight

Under normal use conditions the casing surface temperatures can go up to 140 °C. Only install the searchlight close to heat resistant material. To eliminate any dangers: Never store any explosive or highly flammable materials right beside the searchlight. These include petrol, paper and paint for example.

The installation location of the power supply unit Xenon PSUX-E

The power supply unit is intended for outdoor use (IP66; -25°C - +55°C). Mount it such that good air circulation is ensured.

In addition there is the possibility of extending the temperature ranger up to -50°C by means of additional heaters, with the same IP protection class 66, by replacing the cover.

If you wish to install these indoors, there is a possibility of equipping the PSUX-E with a special cover containing additional fans (IP44). These provide improved air circulation of the electronic components.

2.5 Maintenance / Cleaning

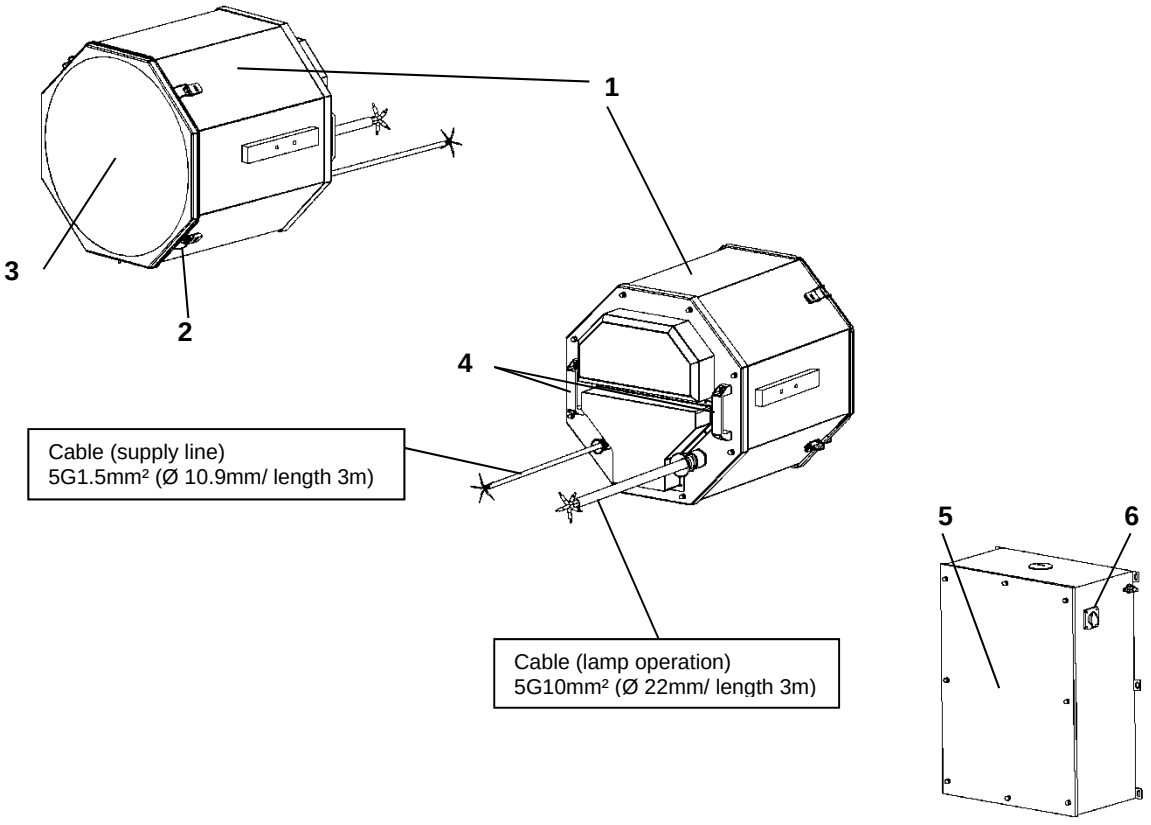
Before carrying out maintenance or cleaning work:

- Set the main switch on the PSUX-E to OFF.
- Make sure that the complete electrical system is de-energised.
- Wait until the searchlight has cooled down.

3. An overview of the unit

3.1 Layout drawing

Basic configuration searchlight head and power supply unit PSUX-E



1 Searchlight head SX 450-2000+E
2 Quick release clamp
3 Front glass
4 Handle
5 Power supply unit PSUX-E
6 Main switch (PSUX-E)

3.2 Technical data

Type: **SX450-2000+E / SX450F-2000+E / SX450IC- 2000+ E / SX450ICF-2000+E**
Manufacturer: WISKA Hoppmann GmbH

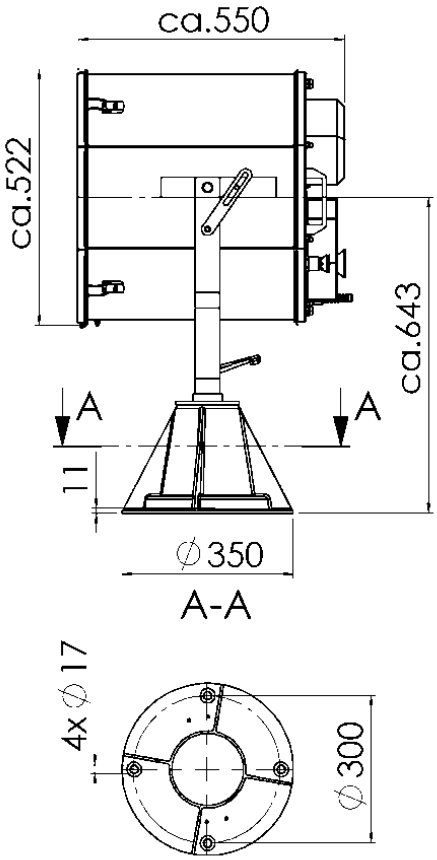
Searchlight head Type	**SX450-2000+E**	**SX450F-2000+E**	**SX 450IC-2000+E**	**SX 450ICF-2000+E**
Lamp	Xenon 2000 W			
Luminous intensity [cd] in focus	$92x10^6$			
Range [1lx/ ¼lx]	9600m/19180m			
Lamp power	2000W			
Average lamp lifetime [h]	1500			
Mirror type	Silver-plated glass mirror			
Colour	Traffic white, RAL 9016			
Dimensions	550x522			
Weight				
Protection rating	IP 56			
Special features		Remote focus	Suitable up to – 55°C	Suitable up to -55° C + remote focus

Type: **PSUX+E**
Manufacturer: WISKA Hoppmann GmbH

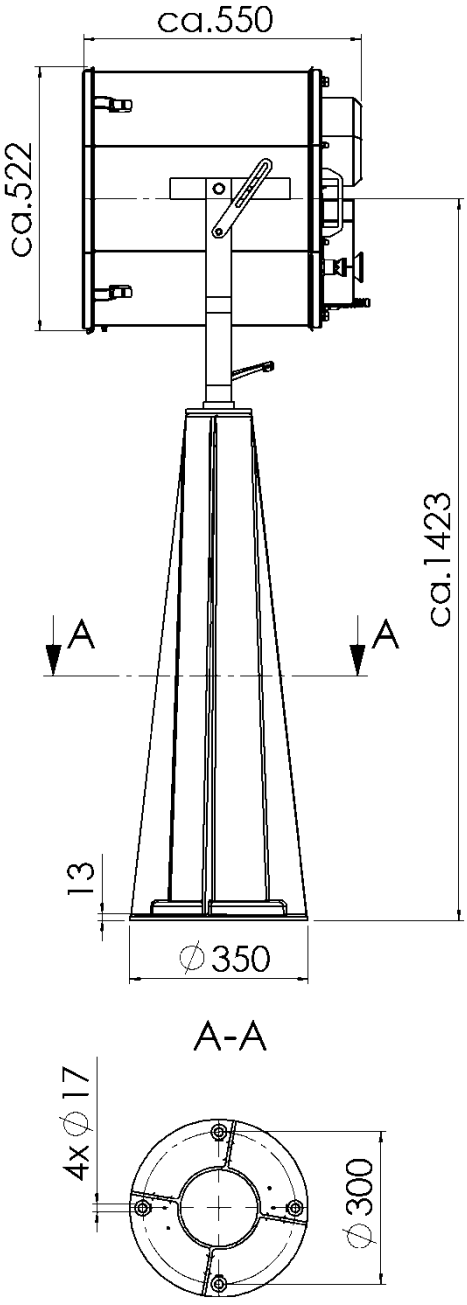
Specification	
Protection against external mechanical loads in accordance with EN50102	IK08
Operating voltage	230V +/- 10%
Operating frequency	47-63Hz
Operating current	14A@180VAC 9A@265VAC
Switch-on current PSUX+E	15A max.
Power factor	0.98
THD	<10%
Lamp power	for XBO lamp 2000W
Output current	105A max.
Output voltage	20V-40V (DC)
Idle state booster voltage	200V max.
Switch-on current, lamp	105A max.
Ignition voltage (in the searchlight head)	35 kV max.
Short circuit protection	Yes
Circuit monitoring	Yes
Ignition fault protection	Yes
Overheating protection	Yes
Monitoring end of lamp service life	Yes
Weight	28kg

3.4 Dimensions

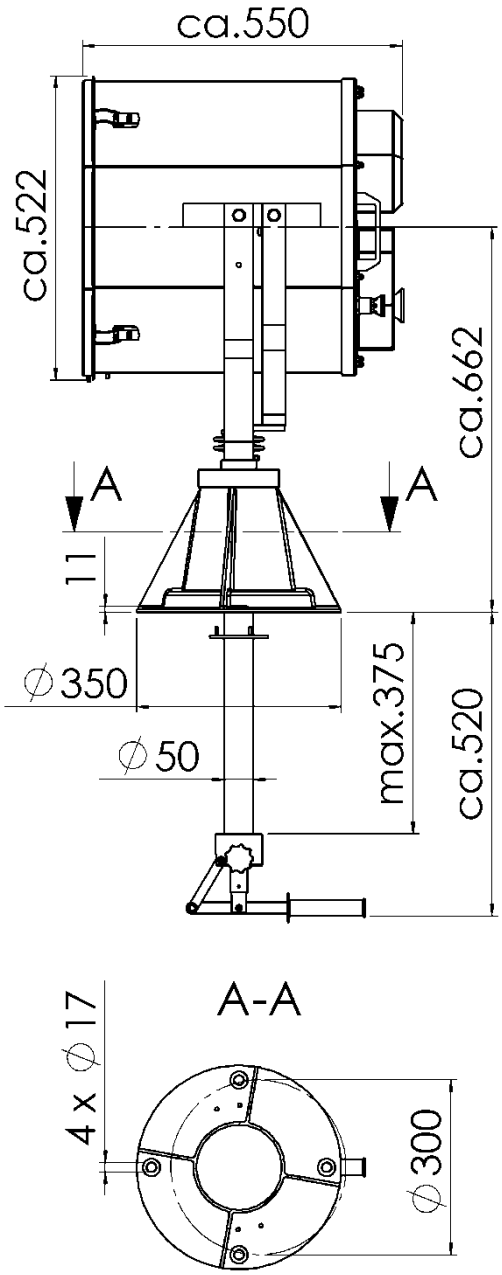
Searchlight head with foot D450 (A)



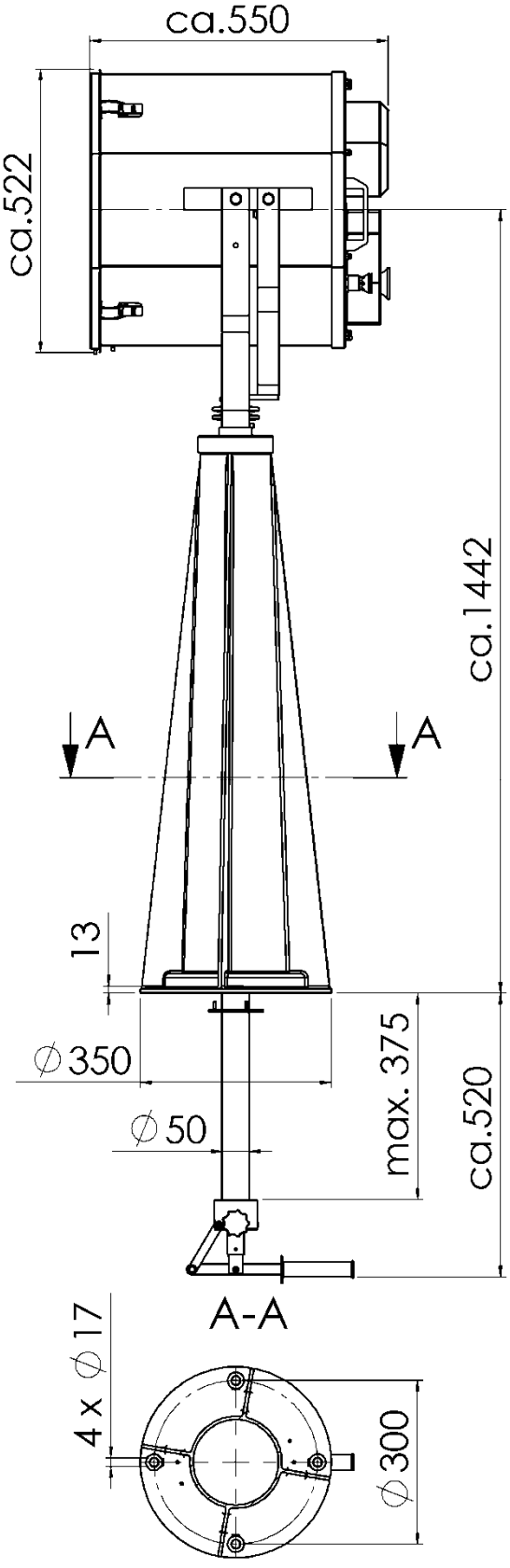
Searchlight head on pedestal DP450 (B)



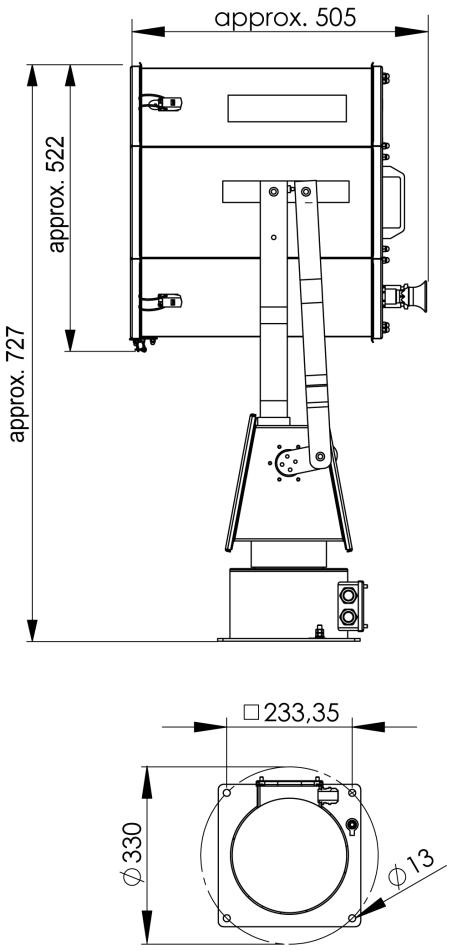
Searchlight head with cabin control C450 (C)



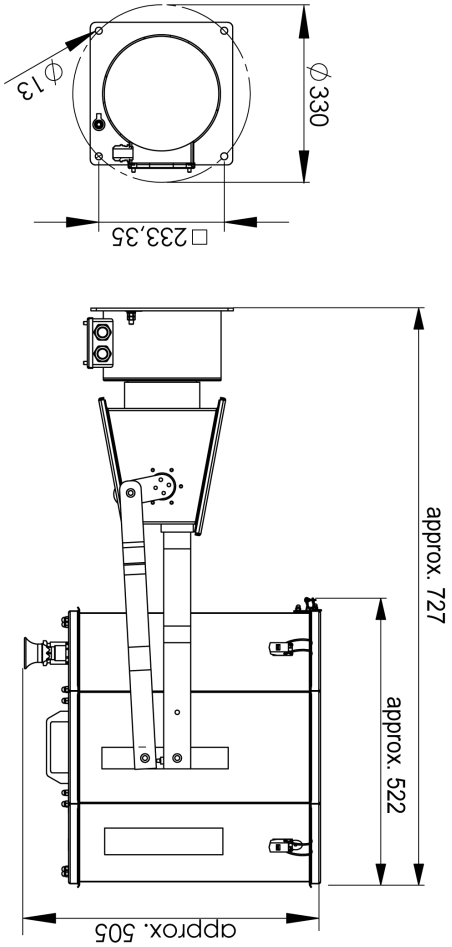
On pedestal with cabin control CP450 (D)



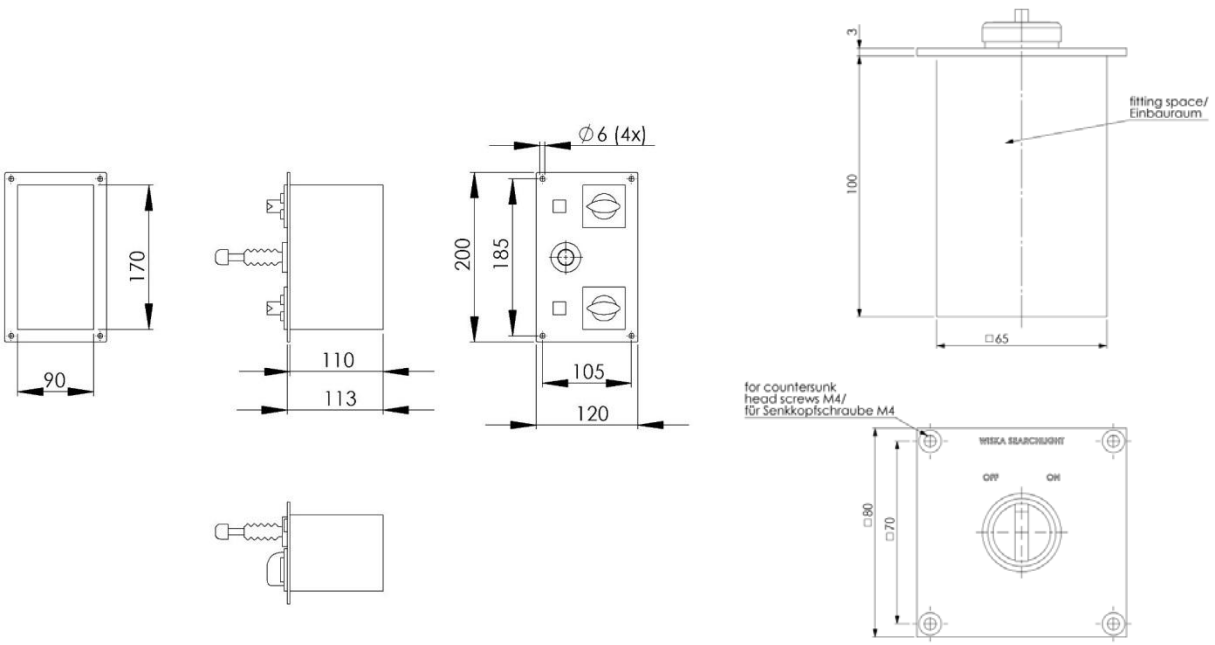
Searchlight head with pan/tilt unit FL52 (E)



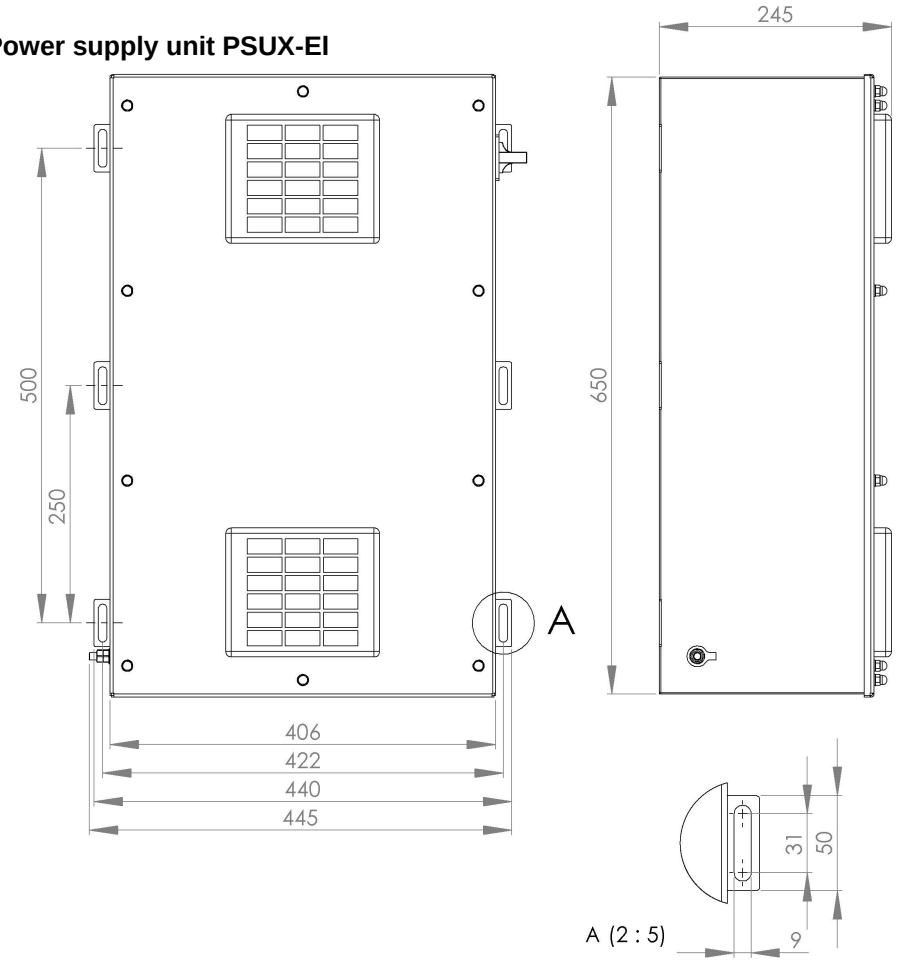
Searchlight head with pan/tilt unit FL52 (E) Overhead mounting



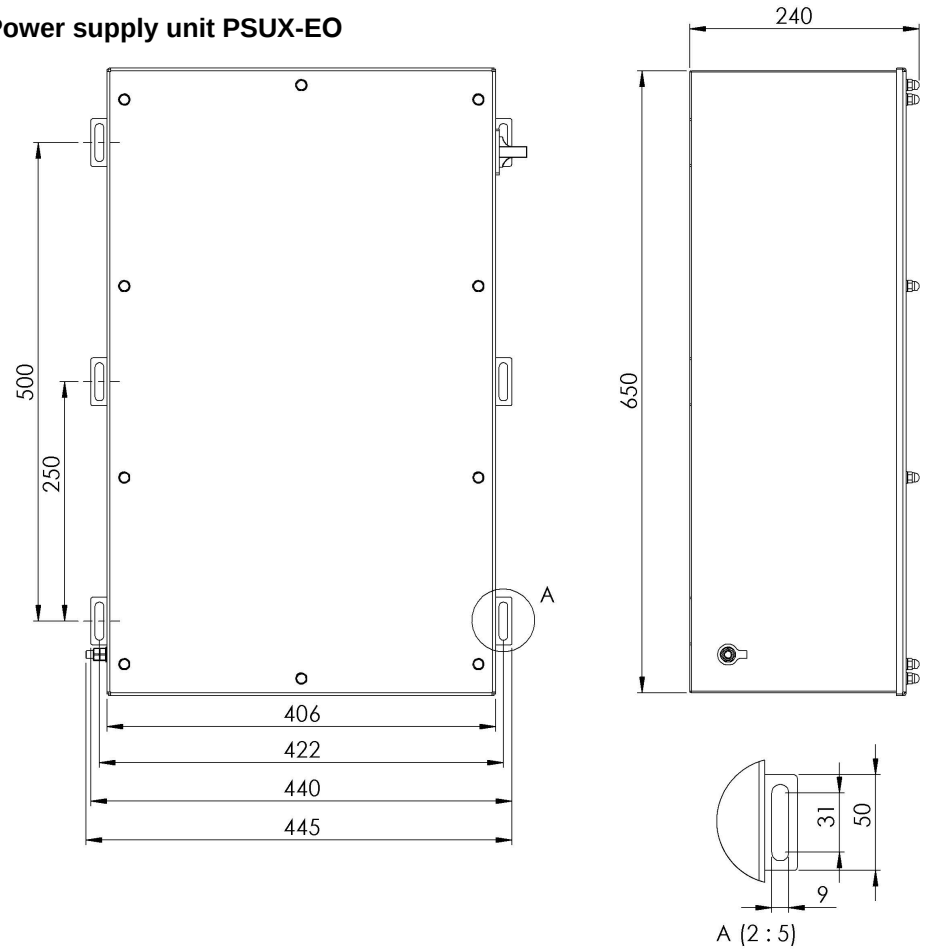
Remote control RCU-E (F) and control switch RCU-E-CS (G)



Power supply unit PSUX-EI

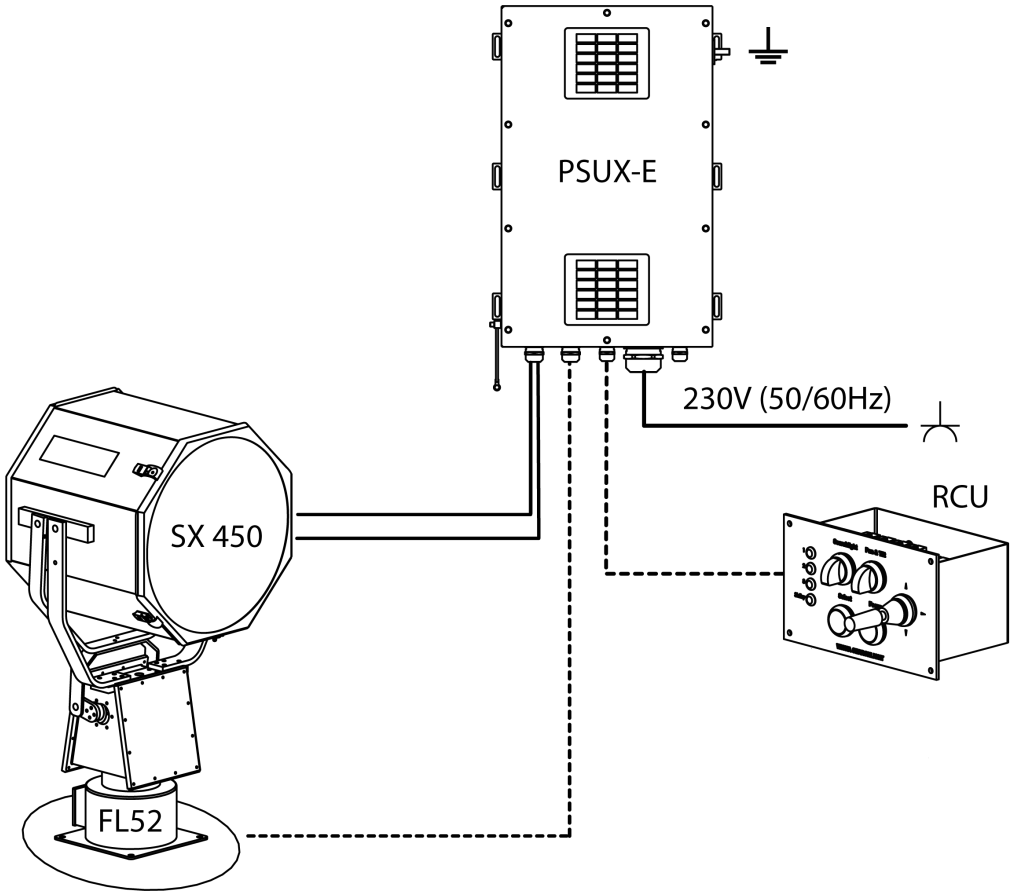


Power supply unit PSUX-EO



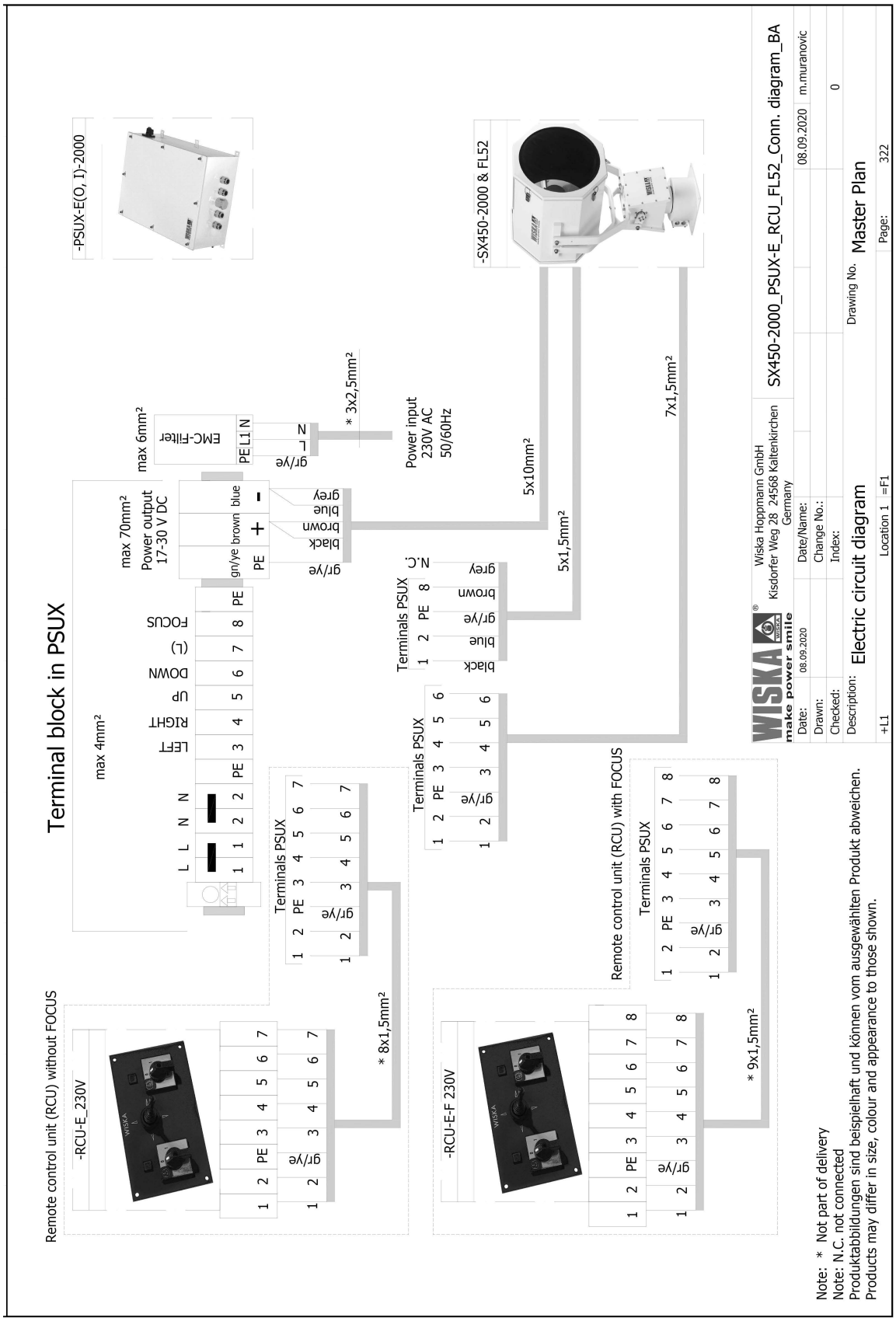
3.5 Circuit diagram

Block diagram



Circuit diagram SX450/ 2000 +E

The circuit diagram is enclosed separately and/or is shown here *as an example only* (and may deviate from that delivered!)



4. Installation

4.1 Unpacking

Check the delivery!
Don't start the unit if there is transport damage or missing parts!
Contact WISKA or our sales partner in your country.
The address can be found at the back of these instructions or on the internet under www.wiska.de.
Think about the environment and send the packing for recycling!

4.2 Mounting

Mounting the searchlight with a foot or on a pedestal (A and B)

Alternatively, the searchlight can be mounted on a suitable foot (A) or on a pedestal (B). Because of the weight of the searchlight, installation requires at least 2 persons.

1. Four holes have to be drilled here in a circle of 300 mm ø for installation: see chapter 3.4 *Dimensions*.
2. Fit the movement unit and bolt it on.
3. Connect the earth cable

Mounting the searchlight with cabin control or on a pedestal with cabin control (C and D)

If equipped with a manual foot or pedestal (C or D) cabin control, the linkage must be fed downwards. This requires a central hole in addition to the fixings. See chapter 3.4 *Dimensions*.

Mounting the searchlight with an FL52 (E) pan/tilt unit

If the searchlight was ordered with a movement unit, it is delivered pre-assembled on the movement unit FL52.
Because of the weight of the searchlight, installation requires at least 2 persons.

1. Four holes have to be drilled on a circle of 330 mm ø for installation: see chapter 3.4 Dimensions.
2. Fit the movement unit and bolt it on.
3. Connect the earth cable

Mounting the power supply unit PSUX-E

Because of its weight, the PSUX-E requires installation with at least 2 persons.
Follow the details for the installation location in chapter 2.4 *Operating conditions*.
The PSUX-E power supply unit is fitted with 4 lugs for wall mounting.
Searchlight and movement unit are fitted with 3 m long connection cables.
If you wish to install the PSUX-E further away from the power supply grid, please observe that the power supply voltage of the PSUX-E must be guaranteed within the range of 230 V +/- 10% when subjected to loads. The connection between the PSUX-E and the searchlight should be as short as possible. It may be extended up to a maximum of 25m with ship installation cable without the consent of the manufacturer; a three-core screened cable with a minimum cross-section of 25mm² should be used.

Installation of the RCU controller

The searchlight always requires an RCU whether it is equipped with an electromechanical movement unit FL52 or not. The control unit RCU is not only available as an attachment device for

wall mounting, but also as a built-in device for installation into a suitable control panel. The units are electrically and functionally identical. Make the required holes and openings for installation, see Dimensions in chapter 3.4 *Dimensions*. Be sure to choose the right cable cross-section in relation to the cable length when making the connections.

4.3 Electrical connections

Danger of electric shock and short circuit! Electrical connections may only be carried by a qualified electrician. Please ensure that the mains connection is off and that nobody can accidentally energise the connections during installation! The circuit diagram is enclosed separately or can be found in the Appendix, Chapter 10 *Exemplary circuit diagram* (this may deviate from that delivered!)

Electrical connected loads for the searchlight system

Mains voltage: 230 ±10% V AC, 50/60Hz // (at least 2500VA / watts).
Device fuse: 1 x 6.3 A
(2 spare 6.3 A fuses are included with the PSUX-E)

Waterproof (IP56) installation of all connection lines

1. Loosen the locking screws of the PSUX-E on the underside (5xM25) and top side (1xM40) and remove the cover.
2. Insert correctly sized (tailored to the cable diameter) waterproof cable glands into the holes.
3. Feed the lines through the cable glands und fix them.
4. Make sure that an adequate cross-section is used for the amperage and cable length.
   Attention! Cable lengths longer than 5 m between the PSUX-E and the searchlight head should be discussed with WISKA!

Attention! To guarantee the IP56 protection class:
The device casing has to be waterproof: Tighten the cable glands firmly, such that the seals close tightly round the cables!

5. Connect the cables in accordance with the circuit diagram (see separately enclosed circuit diagram).
   Note: The cable from the searchlight and the movement unit FL52 can either be connected directly or via a junction box to the PSUX-E using ship wiring cable.

Mains connection

- Please observe the valid national and international provisions and the regulations of the individual classification societies!

Prior to commissioning:

- Check for correct installation. Wrong connections can destroy the Xenon lamp or the searchlight.

Attention! Incorrect polarity of the Xenon lamp leads to destruction of the Xenon lamp or the searchlight! Xenon lamps are polarised DC lamps with a very high current. Such current values demand that both cathode (minus) and anode (plus) are highly specialised for their respective purposes: the cathode must supply a strong flow of electrons, which the anode must collect. This clear dimensioning of the electrodes also means that incorrect polarity has severe consequence: the lamp is destroyed within fractions of a second, in particular the cathode.

- Check for correct connection of the earth / ground!
- Insert the fuse.

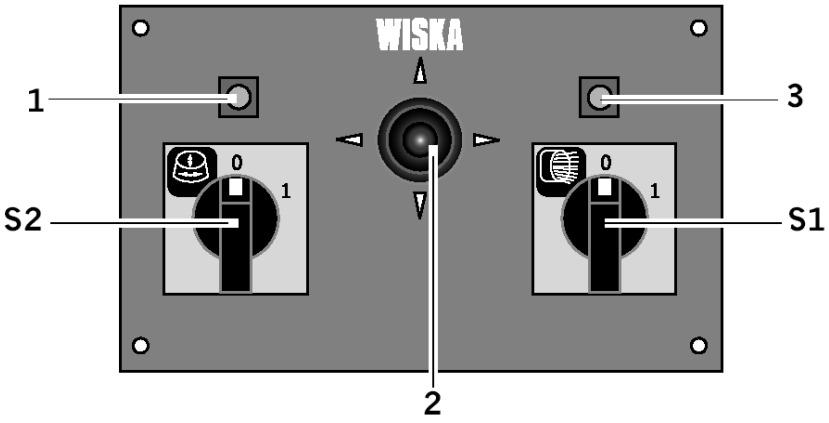
5. Operation of the searchlight via RCU

Each SX searchlight system has an RCU, which can either consist of only a control switch to switch on a searchlight, or into which other functions are also integrated, such as e.g. the control of a gear (see item 5.2.1)

Attention!

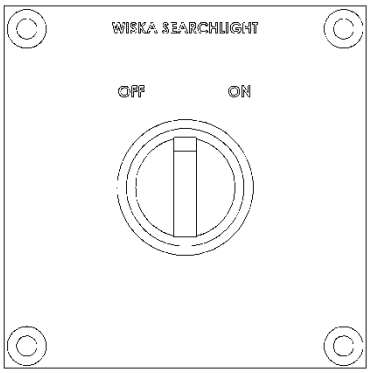
- Only use the control knobs provided for setting up the searchlight. Never touch the searchlight casing during operation since there is a **risk of getting burned!**
- Make sure that nobody is in front of the searchlight when switching on or during operation, - **Risk of glare!**
- The switch S1, for switching on a searchlight, which is described in section 5.2.1, is situated in your case not in the RCU, but is mounted separately. As no electromechanical movement unit exists, switch S2 and the control lever are absent.
- Now read on from item 5.3 *Switching on.*

5.2.1 Remote control unit RCU (optional for RC (FL52))



1 Drive indicator lamp
S2 Drive on/off switch
2 Drive control lever
S1 Searchlight on/off switch
3 Searchlight indicator lamp

5.2.2 Switching unit RCU (optional for D/C/DP/CP)



5.3 Switching on

Risk of getting burned! Never touch the searchlight during operation without protection. The casing can reach 140 °C. In case of burns cool the injured area immediately and seek medical help.

Risk of glare! Never look into the light source during operation. This is dangerous for the eyes. Never point the searchlight directly at anyone. Before switching on make sure that nobody is near the searchlight.

1. The main switch on the power supply unit PSUX-E should always be ON, so that the heater and the fan in the searchlight head are provided with current.

Attention! If the ambient temperature is below 6 °C and the PSUX-E is not switched on, wait until the internal heater warms up the inside of the casing to at least 6 °C before igniting the lamp.

2. Turn switch S1 on. The searchlight lamp should light up after a delay time of approx. 5 seconds at the latest.
3. If the lamp does not ignite or only flashes a few times when switched on, either the operating voltage is too low or the lamp is defective, see Chapter 7.3 *Lamp replacement* and replace the lamp.
4. Before switching on the searchlight and the movement unit, if present, make sure that all work on the searchlight has been completed.
5. If a pan/tilt unit is fitted, switch this on as well with switch S2 on the RCU controller. The pan/tilt unit is now also ready for use and can be moved with the control lever.

5.4 Switching off

1. Switch the searchlight off with the lamp switch. This is switch S1 on the RCU.
2. If you are using a pan/tilt unit, you can now also switch this off with switch S2 on the RCU. This prevents control using the joystick.

Attention! To ensure standby mode: Only switch off the searchlight using switch S1 and additionally switch S2 if you are using a movement unit.
The main switch on the PSUX-E always remains switched on, such that the heater and the fan stay in operation. Unless the system is decommissioned for a longer period of time. It can then be decommissioned via the main switch on the PSUX-E.

6. Maintenance

6.1 Cleaning

Clean the front glass on the outside as needed. When doing so check the function of the fixing clamps and inspect them for rust. Cleaning the inside of the searchlight is not necessary. A thin, coloured film develops on the mirror surface and inner front glass in the course of time. This is harmless and does not affect the light power.

Risk of glare! Ensure that the searchlight cannot be switched on during cleaning work.

7. Replacement of defective parts

7.1 Before starting work

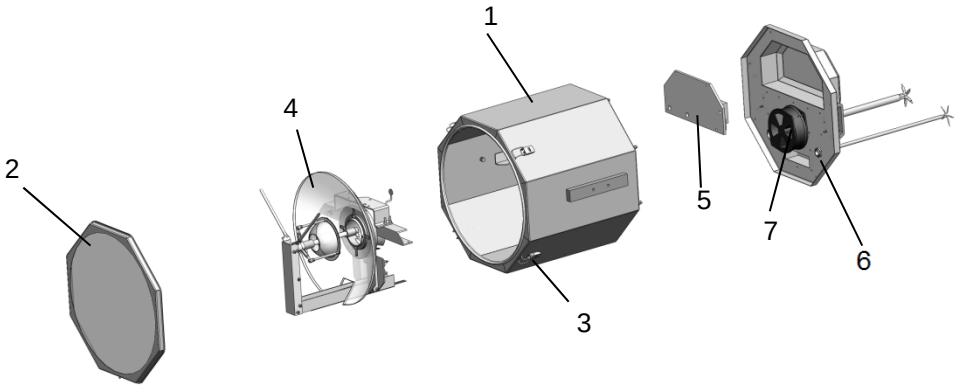
1. Make sure that the complete electrical system is de-energised and that it cannot be switched on again accidentally. For this, set the main switch on the PSUX-E to OFF.
2. Make sure that the complete electrical system is de-energised and that it cannot be switched on again accidentally.
3. Wait until the searchlight has cooled down.
4. Read chapter 2.2 *How to handle Xenon lamps*.

Wear protective clothing (safety glasses, face mask with neck protection and safety gloves with artery protection), when opening the searchlight casing.

5. Do not touch the lamp with your bare hands und cover the Xenon lamp with its protective sleeve

7.2 Assembly overview

The following illustrations should help you to better understand the design of the searchlight, before starting with the replacement work. Follow the instructions on the following pages for carrying out the replacement work!



1. Casing
2. Front glass
3. Quick release clamp
4. Inner chassis
5. Igniter
6. Rear wall
7. Fan

Attention: The inner chassis is electrically polarised (minus pole), and has no connection to ground/earth of the searchlight system. The two poles (+ & -) are electrically floating (potential) and have no electrical connection whatsoever to ground/earth and to the outer casing wall.

7.3 Lamp replacement

The lamp is defective, if

- it does not light up or only flashes several times but does not ignite when switched on
- the lamp electrons are burned out
- the glass bulb is black.

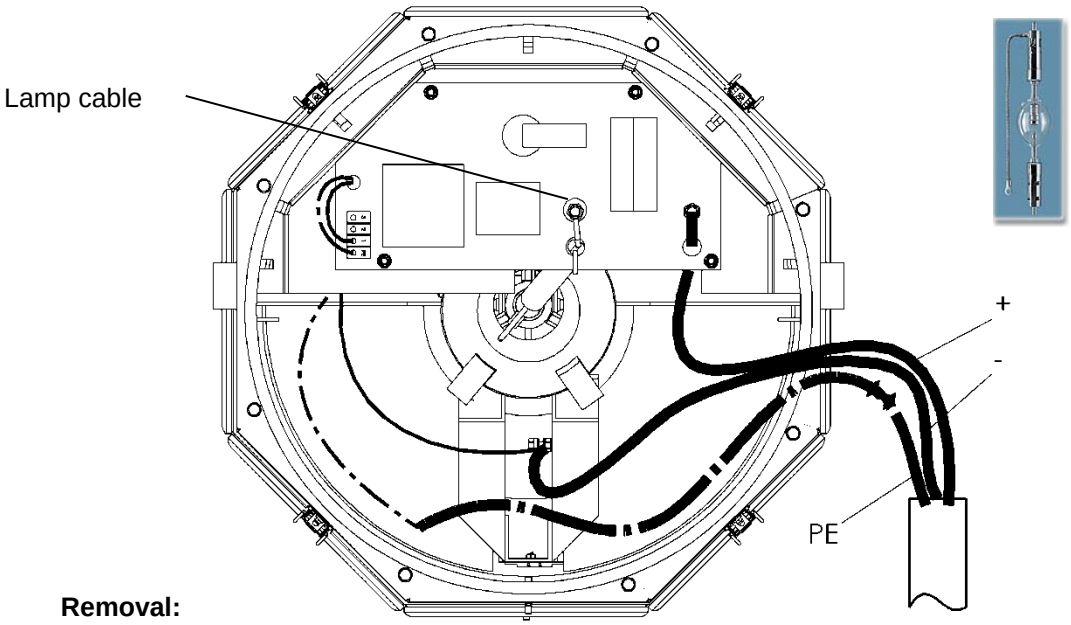
Replace the lamp also if it has reached its average lifetime of 1500 hours.

To replace the lamp you need our Xenon lamp kit (Art. no. 22000234), containing the following spare parts:

- lamp + special insulation
- special cable ties
- fan (should also be replaced when changing the lamp)

Attention! Do not use any externally sourced lamps, as the system is designed for special lamps only.

Danger! Persons who have to carry out these repairs, have to be instructed by a trained professional and also made aware of the dangers and necessary protective measures to be taken! Be sure to read chapter 7.1 *Before starting work!*



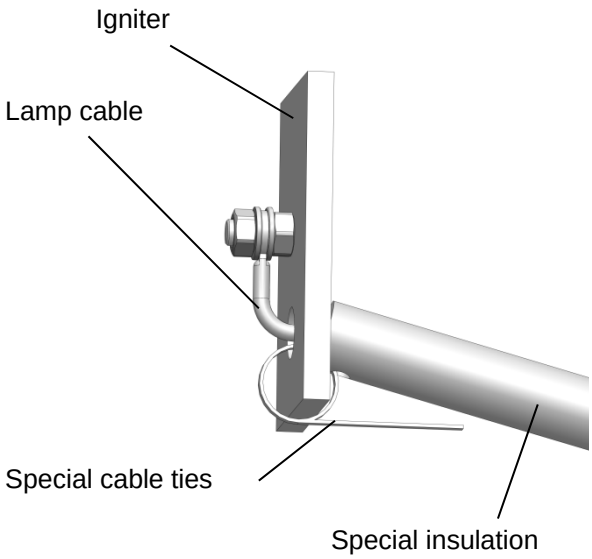
Removal:

1. Lay out the protective sleeve of the Xenon lamp ready for use.
2. Loosen the screws on the back of the searchlight and fold down the rear wall.
3. Loosen the nut of the lamp cable on the igniter and cut through the special cable ties
4. Thread the lamp cable with the cable lug through the opening on the igniter
5. Place the protective sleeve round the lamp from the front side of the searchlight and secure using the Velcro fastener
6. Carefully unscrew the lamp with the protective sleeve. Make sure not to apply any bending stress to the lamp.
7. Close the protective sleeve.

Installation:

Attention! Check the new lamp before installation for fingerprints or damage such as scratches or cracks. Don't start the lamp if there is visible damage. Remove any fingerprints with an alcohol solution and a soft lint-free cloth.

1. Open the protective sleeve of the new lamp.
2. Push the lamp in the protective sleeve into the searchlight, until the thread engages.
3. Carefully screw in the bulb using the protective sleeve as a tool. Make sure not to apply any bending stress to the lamp.
4. Pull off the protective sleeve.



5. Thread the lamp cable through the opening and connect to the igniter.
6. Fasten the insulation with the special cable tie through the opening. In doing so, it is important that the opening of the insulation points downwards. Pay attention that there is sufficient space between the lamp cable and the casing.
7. Fold up the rear wall and screw on.
8. Keep the protective sleeve in a safe place.

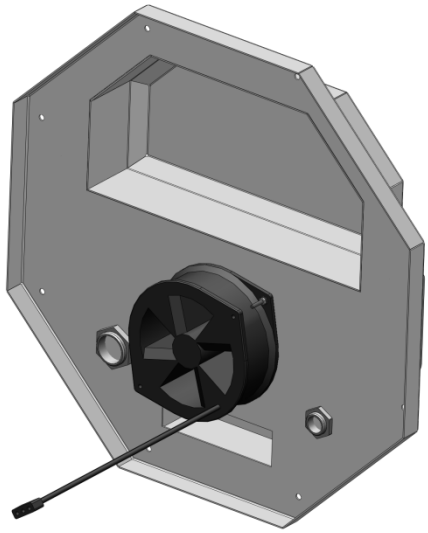
Keep the used lamp in its protective sleeve.
Pay attention to proper disposal.

7.4 Replacing the fan

The fan should be replaced each time the lamp and igniter are changed.

Danger! Persons who have to carry out these repairs, have to be instructed by a trained professional and also made aware of the dangers and necessary protective measures to be taken! Be sure to read chapter 7.1 *Before starting work!*

To change the fan you need our fan kit (Art. no 22000025).



2

1. Loosen the screws on the back of the searchlight and fold down the rear wall.
2. Loosen the fan plug.
3. Loosen the fixing screws of the fan on the rear wall and remove the fan.
4. Fasten the new fan and connect the plug.
5. Close the rear wall.

7.5 Replacing the auxiliary mirror

Danger! This repair work has to be carried out by qualified electricians!
Be sure to read chapter 7.1 *Before starting work!*

Removal:

1. Removing the lamp: see 7.3 *Lamp replacement*.
2. Disengage the quick release fasteners, carefully remove the front glass and set it aside.
3. Disconnect the lamp cable from the inner chassis.
4. Loosen the hex nuts on the auxiliary mirror and replace it

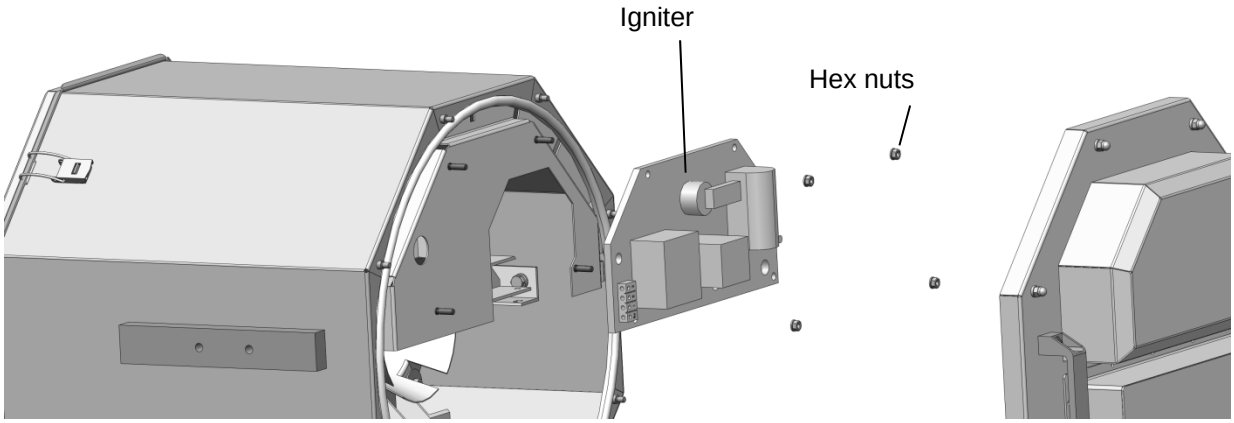
Installation:

1. Fix the auxiliary mirror with the hex nuts
2. Install the lamp: see 7.3 *Lamp replacement*.

7.6 Replacing the igniter

Danger! This repair work has to be carried out by qualified electricians!
Be sure to read chapter 7.1 Before starting work!

! Attention: during operation, the igniter can generate a voltage of 33000 V!



Removal:

1. Loosen the screws on the back of the searchlight and fold down the rear wall.
2. Mark the cable and disconnect it from the igniter
3. Loosen the special cable ties on the igniter and thread the lamp cable and supply lines through the holes
4. Loosen the 4 hex nuts and remove the old igniter
5. Place the new igniter onto the stud bolts and screw in
6. Fasten the insulation cable to the igniter with the special cable tie
7. Thread the cable through the openings and connect
8. Close the rear wall.

8. Disposal

Electrical components contain substances which are hazardous for the environment. Ensure proper disposal or send the defect parts to WISKA. The address is on the back page of these instructions.

Xenon lamps must be decompressed before disposal.

Risk of explosion! Decompress the glass bulb in a suitable environment or in a decompression chamber.

Wear protective clothing! Make sure that there are no other persons in the immediate vicinity.

9. Spare parts

Searchlight head SX 450-2000+E

Designation	Art. no.
Front frame + front glass S 450	22000018
Main mirror SX450	22000019
Auxiliary mirror	22000020
Silicone paste	22000067
Igniter type 2000DC	22000233
Fan kit	22000025
Xenon lamp kit 2000W (from 2012)	22000234
Quick-release locks (2 pcs.)	22000103
Quick-release locks (4 pcs.)	22000050
Focus motor kit	22000028
Thermostat for fan (50°C)	22000026

Power supply unit PSUX+E-2000

Designation	Art. no.
Mounting plate PSUX+E 2000W	22000085
Relay 12A 230Vac	22000235
Time relay, M., 1change-over contact 12-240VDC/VAC	22000236
Fan	22000312
Power Supply Unit 2000W (Vers.3)	22000085

Remote contol unit RCU

Designation type: RCU-E 230V	Art. no.
On/off switch	22000061
Green indicator lamp	22000062
Control switch (XD2-GE3)	22000060

Pan/tilt unit - Drive unit FL52

Designation	Art. no.
Motor tilt + connection cable	22001025
Motor Pan + connection cable	22001026
Switch Tracking bearing + end positions	22001028
E-PCB	22001030
O-rings	22001027
End Position Switches (Tilt: 22001032, Pan:	22001031
Complete tilt motor plate and motor	22001033
Cable PCB-Enclosure	22001034

All other diverse parts can be procured from the WISKA sales department.

1.1 CE Declaration of Conformity

EU DECLARATION OF CONFORMITY

WISKA Hoppmann GmbH
Kisdorfer Weg 28
24568 Kaltenkirchen
Germany

declares under the sole responsibility that the following product::

Product designation:	Searchlight
Type designation:	SX450/****/****/***/***/**/**
Description:	Xenon Searchlight for electrical installation

corresponds to all the relevant provisions of the directives listed below and valid harmonized and / or international and national standards - including all applicable changes at this time of issuing this document.

Directive	Standard
2014/35/EU Electrical apparatus (Low voltage directive)	EN 60598-1:2015+ A1:2018 EN 60598-2-5:2015
Additional Standards	EN 60092-306:2010

Name and address of the person who is authorized to compile the technical documentation together:

WISKA Hoppmann GmbH
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24568 Kaltenkirchen / Germany

Kaltenkirchen, 20.12.2018

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Head of Engineering & Design

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