



OPERATING MANUAL

SEARCHLIGHT
SH 300/575
230 V 50/60 Hz

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Contents

1.	ABOUT THESE INSTRUCTIONS.....	4
1.1	Symbols and guidance signs in these instructions.....	4
1.2	Who are these instructions for?.....	4
2.	SAFETY	5
2.1	General information.....	5
2.2	How to handle metal halide lamps.....	5
2.3	Protective measures in case of a broken lamp	6
2.4	Safety devices.....	7
2.5	Operating conditions	8
2.6	Maintenance / Cleaning	8
3.	AN OVERVIEW OF THE UNIT	9
3.1	Layout drawing.....	9
3.2	Technical Data	10
3.3	Device type plates.....	12
3.4	Dimensions	13
3.5	Block circuit diagram	17
4.	INSTALLATION.....	19
4.1	Unpacking.....	19
4.2	Mounting	19
4.3	Electrical connections	20
5.	OPERATION	22
5.1	RCU controller	22
5.2	Switching on.....	22
5.3	Switching off.....	23
6.	MAINTENANCE	23
6.1	Cleaning.....	23
7.	REPLACEMENT OF DEFECTIVE PARTS	24
7.1	Before starting work	24
7.2	Assembly overview	25
7.2	Assembly overview	25
7.3	Lamp replacement	26
7.4	Replacing the main mirror	28
7.5	Replacing the auxiliary mirror.....	29
7.6	Replacing the igniter	30
8.	DISPOSAL	31
9.	SPARE PARTS	31

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.



Use disposable gloves! Use disposable gloves for the following work to protect the material or 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.



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

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 SH300/575 searchlight is designed for lighting large and far away objects. The range of the searchlight is up to 2280 m. It is particularly suitable for use on ships, especially for navigation in ice.

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. If this is not followed then the unit's approval becomes null and void.

Only original spare parts may be used. If this is not followed then the guarantee rights become null and void.



Risk of getting burned! Never touch the searchlight during operation without protection. The casing can reach 180 °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 turning or tilting the searchlight: 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 How to handle metal halide lamps



Risk of explosion! Metal halide lamps operate at high pressures. The operating pressure inside the lamp can reach 200 bar.

Strictly follow the safety instructions below when handling metal halide lamps:

Transport

- Always store and transport metal halide lamps in such a way that the glass bulb cannot break.
- Following the removal of metal halide lamps store them immediately in a safe place where they cannot be broken. If a lamp breaks proceed as described in chapter 2.3 *Protective measures in case of a broken lamp*.

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. When handling it is recommended to use disposable gloves to avoid fingerprints.
- Check the lamp for scratches, cracks or other damage before installation. Don't continue using damaged lamps.

Lifetime

Metal halide lamps have an average lifetime of approx. 750 operating hours. The actual lifetime can deviate in practice and depends on the ratio of switching on frequency to switching on duration.

Disposal

Metal halide lamps contain environmentally hazardous substances (incl. mercury), and hence in Europe have to be disposed of as special waste as per the directive *EWC-Code 20 01 21 for "Fluorescent tubes and other mercury-containing waste"*. Hence metal halide lamps have to be brought to suitable disposal sites. In other countries the relevant legislation has to be followed.

Metal halide lamps may not be destroyed under any circumstances during disposal.

**Health risks**

Breathing in of mercury or mercury compounds in the form of vapour or dust can damage your health. Apart from inhaling, mercury can also be absorbed by penetrating the skin.

2.3 Protective measures in case of a broken lamp



We recommend proceeding as follows, in case of a lamp break or explosion, in order to eliminate any health risks:

- All persons in the close surroundings should evacuate the area immediately, to avoid inhaling mercury vapour.
- Ventilate the area adequately for 20 to 30 minutes.
- After the lamp has cooled down and in any case before restarting any residual mercury is to be thoroughly removed from inside the light using mechanical means.



Disposable gloves are recommended to avoid skin contact. Liquid mercury can also be absorbed using a standard absorption agent (based on active carbon).

2.4 Safety devices

Temperature

- To ensure that no condensate forms on the inside of the searchlight and to enable ignition, it is necessary 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.
- It is also possible to integrate a thermostatically controlled heater in the FL51 or FL20 movement unit in order to protect the optional pan/tilt unit against freezing.

Attention! Ensuring the minimum temperature at cold ambient temperatures:



- Keep the searchlight in standby mode (main switch S8 ON). Only switch it using the controller.
- 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 the searchlight to standby mode with S8, and wait until it has reached the minimum required temperature inside.

Radiation/escape of dangerous particles

- Metal halide lamps radiate UV light which is harmful to the eyes. The special searchlight casing prevents you from looking directly into the arc.
- If the metal halide lamp explodes during operation, the casing remains intact and contains any heated glass splinters, see chapter 2.3 *Protective measures in case of a broken lamp*.

2.5 Operating conditions

Protection class

Searchlight, ballast and optional movement unit with associated controller are protection class IP56 (protected against dust and strong water jets). To obtain this protection class all screwed parts have to be tight. Electrical lines may only be fed into the devices through suitable cable glands.

Surrounding requirements

Installation location

- **of the searchlight:** Under normal use conditions the casing surface temperatures can go up to 180 °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.
- **of the PSUH ballast unit:** Install the PSUH in a dry and cool place away from direct sunlight, hot air or waste heat from fuel tanks.



Attention! Searchlight and PSUH ballast unit are under high voltage. To avoid electromagnetic interference of the compass, install the searchlight and PSUH far enough away from the compass and don't pass any lines near the compass.

2.6 Maintenance / Cleaning

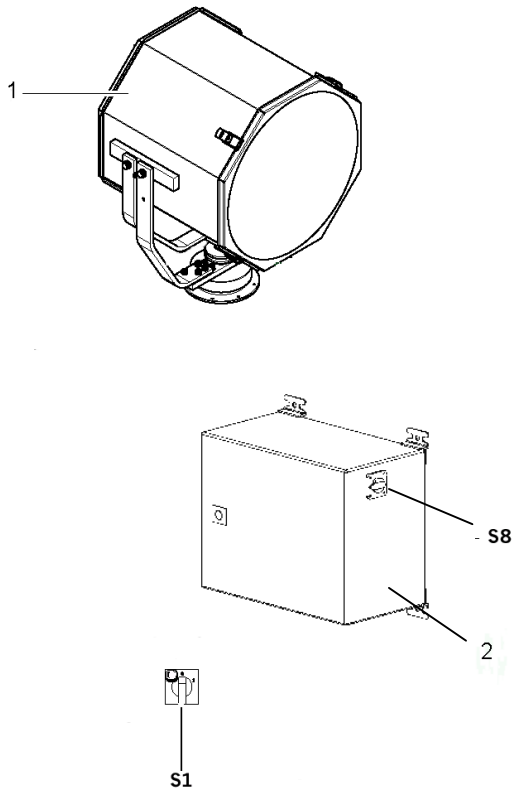
Before carrying out maintenance or cleaning work:

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

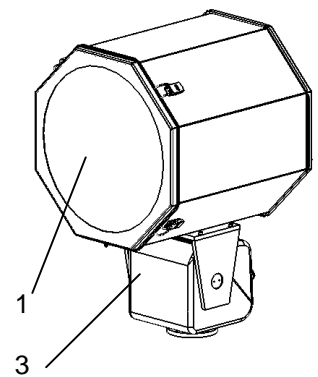
3. An overview of the unit

3.1 Layout drawing

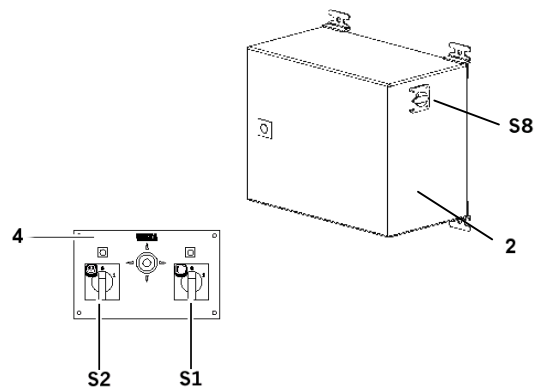
Base configuration



Configuration with FL20 pan/tilt unit and controller



- 1 Searchlight head
- 2 Ballast PSUH
- 3 Movement unit FL20
- 4 RCU controller
- S1 ON/OFF switch, searchlight
- S2 ON/OFF switch, pan/tilt unit
- S8 Main switch



3.2 Technical Data

Type SH 300/575 FL51
 Manufacturer WISKA Hoppmann & Mulsow GmbH

Searchlights	
Lamp:	
Illuminant	Metal halide discharge lamp
Luminous intensity	5.2 million cd
Range	2280 m
Diffusion angle	6 ° I/10
Lamp power	575 W
Average lamp lifetime	750 h
Glass parabolic mirror	300 mm
Auxiliary mirror	100 mm
Fixed focus	
Casing:	
Material	Stainless steel 1.4301
Colour	RAL 9016
Diameter	372 mm
Depth	340 mm
Weight	12.5 kg
Protection rating	IP 56

Ballast unit PSUH	
Supply voltage	230 V 50/60 Hz
Fuse	16 A
Dimensions WxHxD	330 x 355 x 225
Weight	20 kg
Protection rating	IP 54

Lamp ignition process		
1.	Generation of ignition voltage	Instant of switching
2.	Warm-up phase	approx. 45 seconds
3.	Current consumption limitation	Operating condition
4.	Re-ignition after switching off	immediately

Options:

Pan and tilt drive, FL20	
Pan and tilt gear made form salt water resistant cast aluminium with adapter plate as a holder for the searchlight	
Optional stand by heater	
Connection cable	3 m
Power consumption	50 W
Horizontal rotation	330°; 5°/s
Vertical slope	+25°; 2.4°/s
Height of movement unit with searchlight	approx. 450 mm
Floor diameter	120 mm
Weight	13.8 kg
Protection rating	IP 67
Colour	RAL 9016

RCU-E controller	
Remote control with ON/OFF switch for searchlight and gear, joystick and indicator lamps, for installation in a control console.	
Front panel	120 x 200 mm
Installation dimension	90 x 170 mm
Weight	2.1 kg
Protection rating	IP 23

RCU-A controller	
Remote control with ON/OFF switch for searchlight and gear, joystick and indicator lamps, with casing for surface mounting.	
Front	200 x 200 mm
Overall height+ joystick	80+ 85 mm
Weight	2.5 kg
Protection rating	IP 23

3.3 Device type plates

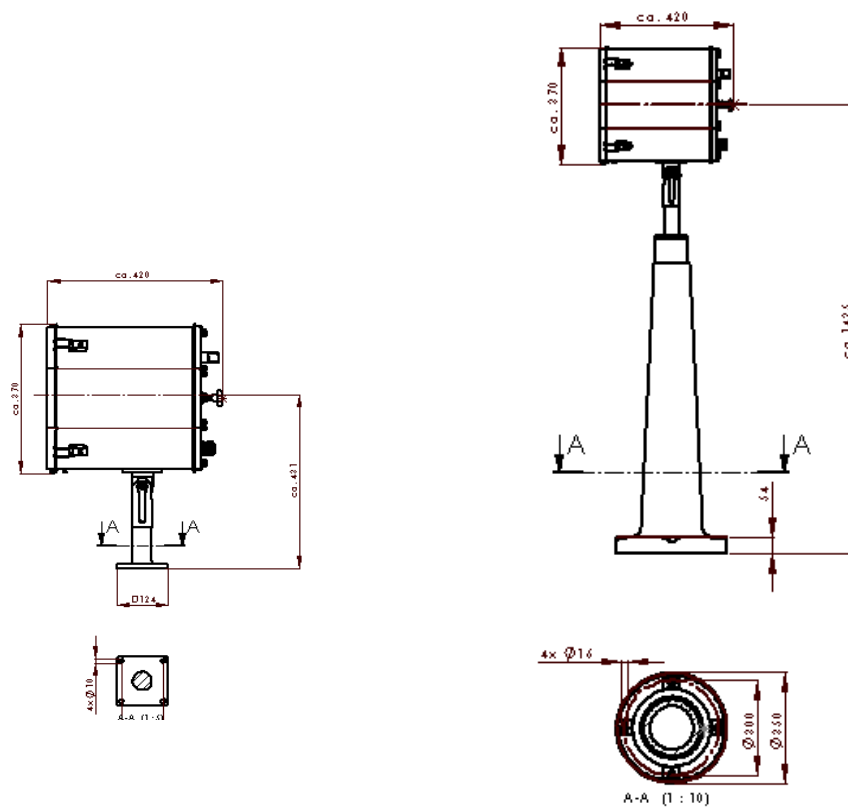


Type plate

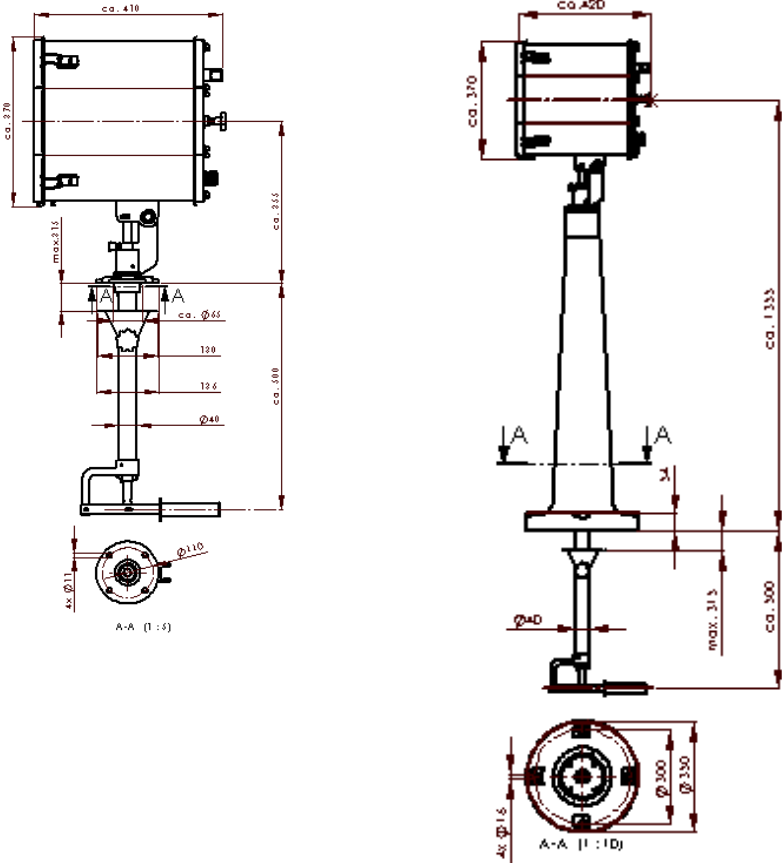
- 1 Device designation
- 2 Device specification
- 3 Device number
- 4 Manufacturer

3.4 Dimensions

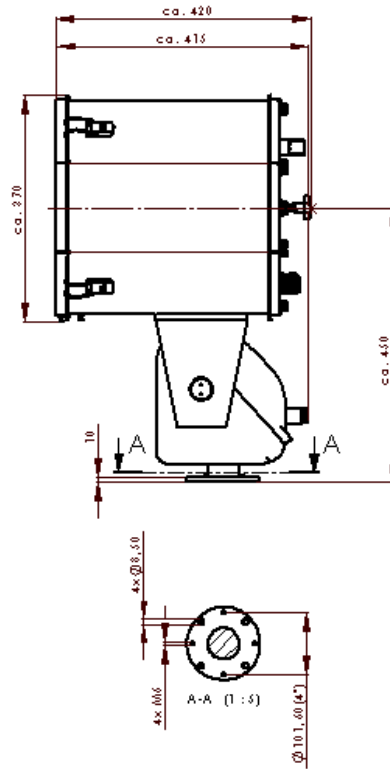
Searchlight head with deck and pedestal



Searchlight head with deck and pedestal and cabin control

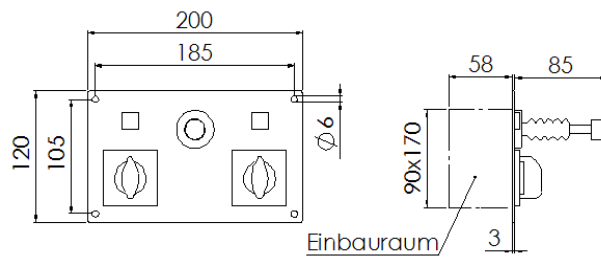


Searchlight head with FL20 pan/tilt unit

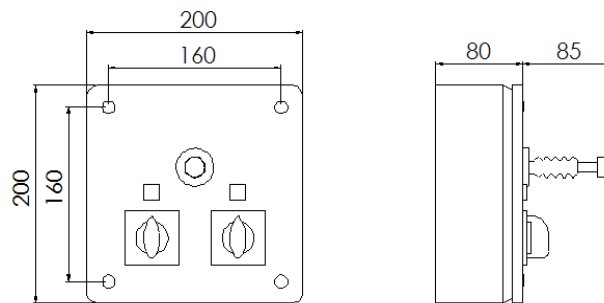


Remote control unit RCU

RCU-E

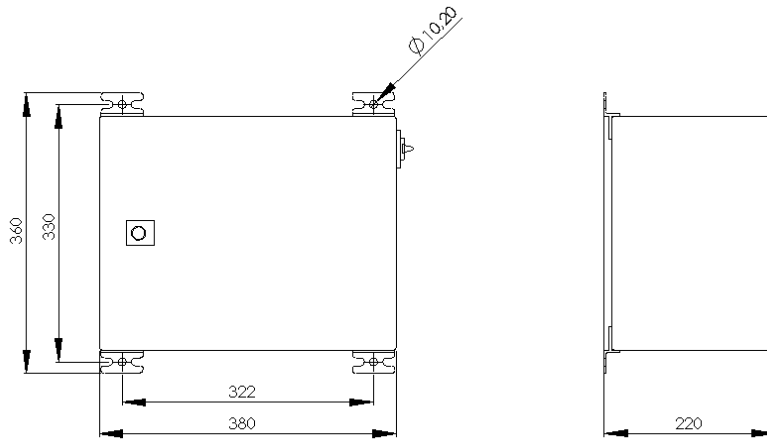


RCU-A



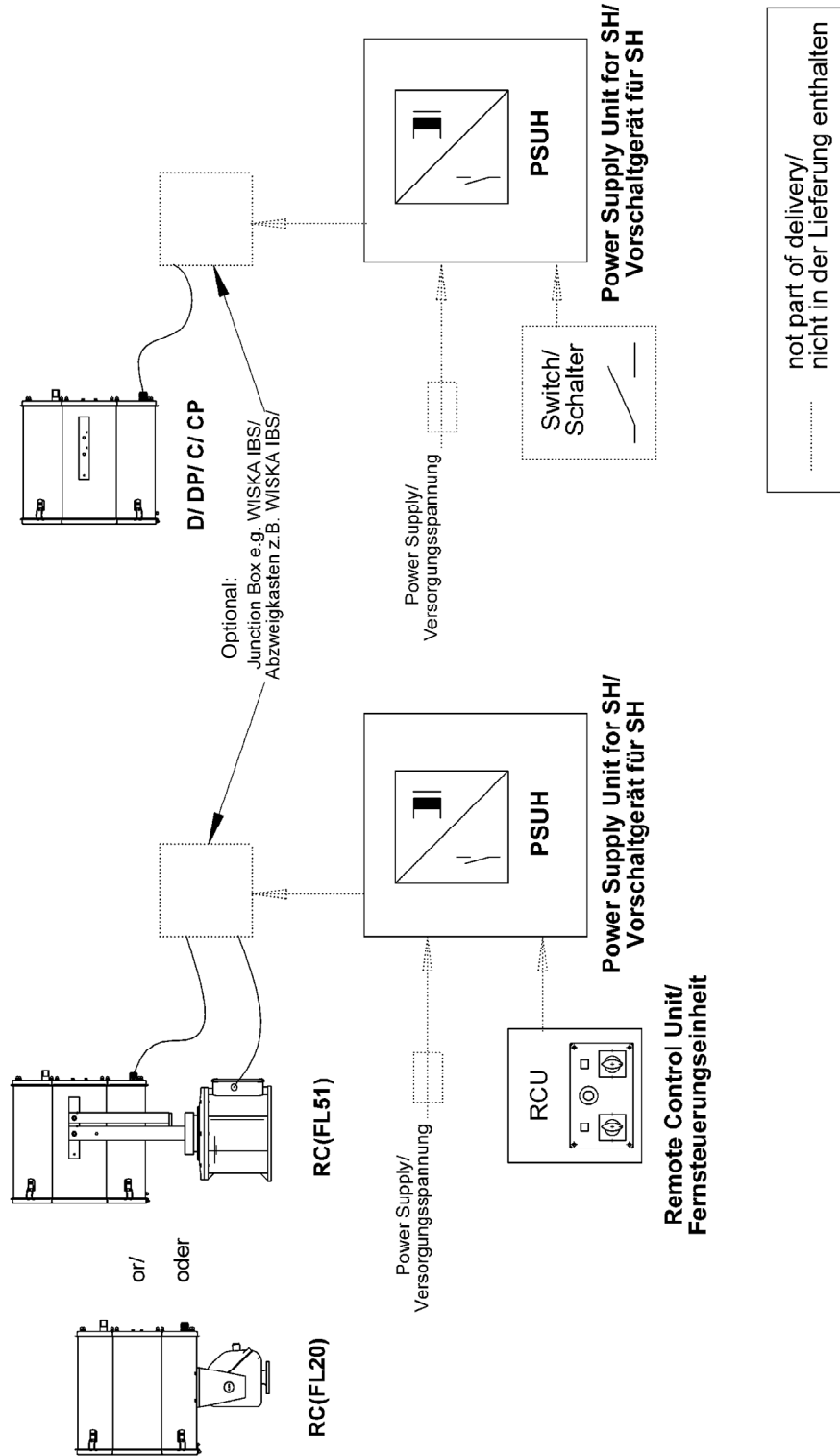
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Ballast unit PSUH

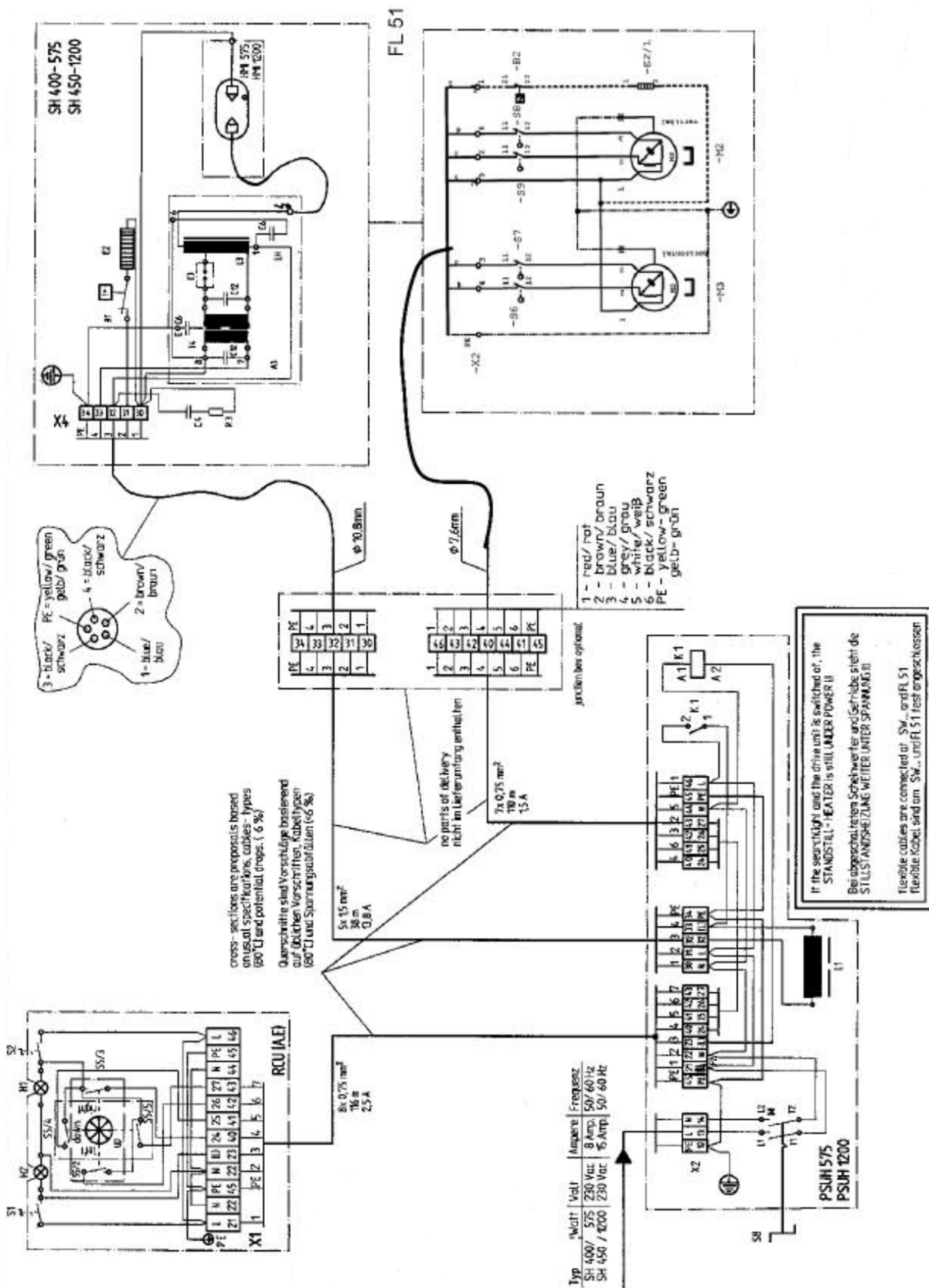


3.5 Block circuit diagram

Halogen Metal Vapour Searchlight (SH) Block Diagram/
Halogen Metallampf Entladungslampe Suchscheinwerfer (SH) Blockdiagramm



Circuit diagram with movement unit and pan/tilt unit



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

Install the searchlight with FL20 pan/tilt unit

If the searchlight is ordered with the FL20 pan/tilt unit, then the searchlight comes pre-assembled on the FL20 pan/tilt drive. Because of its weight, at least two people are required for installing the searchlight at its installation location.

1. Four holes have to be drilled on a circle of 101.6 mm \varnothing for installation: see chapter 3.4 *Dimensions*.
2. Install pan/tilt unit and screw it down.
3. Connect the earth cable

Installation with deck or pedestal

Alternatively the searchlight can be mounted on a suitable deck or pedestal.

Because of its weight, at least two people are also required here for installing the searchlight.

1. For fixing the pedestal there are also four holes to be drilled on a circle of 300 mm \varnothing for installation and for fixing the deck the four holes are drilled at the corners of a rectangle 100x100mm: see chapter 3.4 *Dimensions*.
2. Install pan/tilt unit and screw it down.
3. Connect the earth cable

Installation with deck or pedestal with cabin control

As an option the deck or pedestal configuration can also be fitted with a manual cabin control. The cabin control linkage runs through a pipe of the deck or pedestal and has to be fed downwards accordingly. A central hole, is to be made for feeding the 50 mm control pipe in addition to the fixing holes described above. See chapter 3.4 *Dimensions*.

Installation of the PSUH ballast unit

Because of its weight, the PSUH requires installation with at least 2 persons.

Follow the details for the installation location in chapter 2.4 *Operating conditions*.

The PSUH ballast unit is fitted with 4 lugs for wall mounting.

Searchlight and movement unit are fitted with 3 m long connection cables. If you want to install the PSUH far away from the searchlight, then make sure that the PSUH is provided with a 230 V supply voltage.

Installation of the RCU controller

If the searchlight is fitted with an FL20 electric pan/tilt unit, then an additional RCU controller is necessary.

The RCU controller is available as a wall mounted unit, as well as a built in unit for installing in a suitable control console. 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



Caution risk of electric shock! 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 also included separately or can be found in chapter 3.5 *Circuit diagram*.

Electrical connection values

Mains voltage: 230 VAC, 50/60Hz.

Device fuse: 1 x 16 A (included with delivery)

Waterproof (IP56) installation of connection lines

1. Loosen the cover screws on the bottom of the PSUH and take off the cover.
2. Drill holes as per the cable cross-sections and insert waterproof cable glands in the holes.
3. Feed the lines through the cable glands und fix them.

**Attention!** To guarantee the IP56 protection class:

The device casing has to be waterproof: Tighten the cable glands firmly, so that the seals (we recommend the use of SPRINT system cable glands from WISKA) tighten the lines!

4. Connect the lines as per the circuit diagram (see extra circuit diagram included separately or chapter 3.5 *Circuit diagram*).

Note: The cable from the searchlight and pan/tilt unit can either be connected directly or via a junction box to the PSUH using ship wiring cable.

Mains connection

- Observe the relevant national and international regulations! Make a correct and fool proof connection!

Before start-up:

- Check for correct installation. Wrong connections can destroy the metal halide lamps or the searchlight.
- Check for correct connection of the earth / ground!
- Reinsert the fuse.

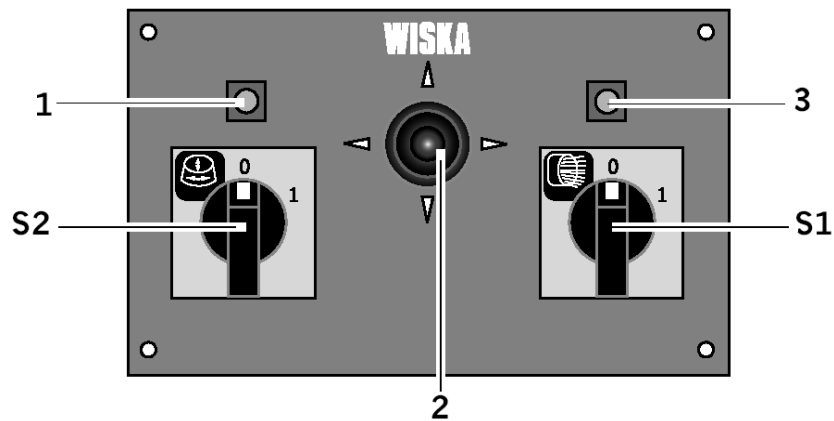
5. Operation

The operation of the searchlight with the electromechanical pan/tilt unit and associated RCU controller is shown below. If the configuration you have does not have these control options, the particular attention is to be given to the following points:

- Only use the control knobs provided for setting up the searchlight. Never touch the searchlight housing 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!**



5.1 RCU controller



- 1 Gear indicator lamp
- S2** Gear on/off switch S2
- 2 Gear control lever
- S1** Searchlight On/off switch S1
- 3 Searchlight indicator lamp

5.2 Switching on



Caution risk of getting burned! Never touch the searchlight during operation without protection. The casing can reach 180 °C. In case of burns cool the injured area immediately and seek medical help.



Caution risk of glare! Never look into the arc 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. Switch ON the main switch S8 on the PSUH ballast unit.
The heater in the searchlight and the optional movement unit are now supplied with current.



Attention! If the ambient temperature is below 6 °C wait until the internal heater warms up the inside of the casing to at least 6 °C before igniting the lamp.

Before switching on the searchlight and movement unit if present: make sure that all work on the searchlight has been completed.

2. Switch on switch S1. The lamp ignites.
3. If there is an electromechanical pan/tilt unit fitted, then switch it on now using the switch S2 on the RCU controller. The FL20 pan/tilt unit is now ready for operation and can be moved with the control lever.
4. If the lamp does not ignite or only flashes a few times, either the operating voltage is too low or the lamp is defective.

To replace the lamp see chapter 7. *Replacement of defective parts.*

5.3 Switching off



Attention! To ensure standby mode: Only switch off the searchlight using switch S1 and switch S2 if you are using a controller.

Switch S8 is always left on so that the heater stays on.

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 coloured film develops on the mirror surface over time. This is harmless and does not affect the light power.



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

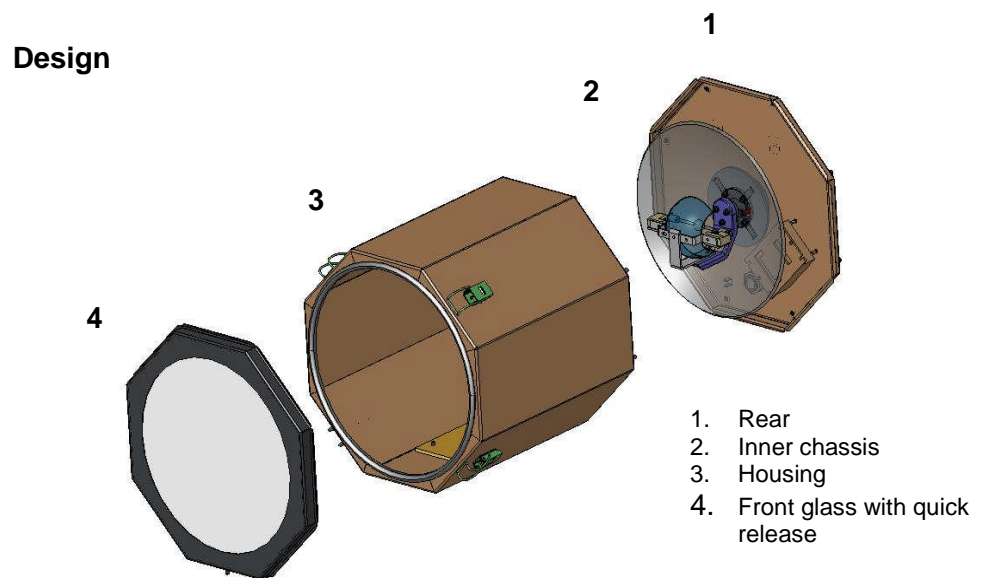
7. Replacement of defective parts

7.1 Before starting work

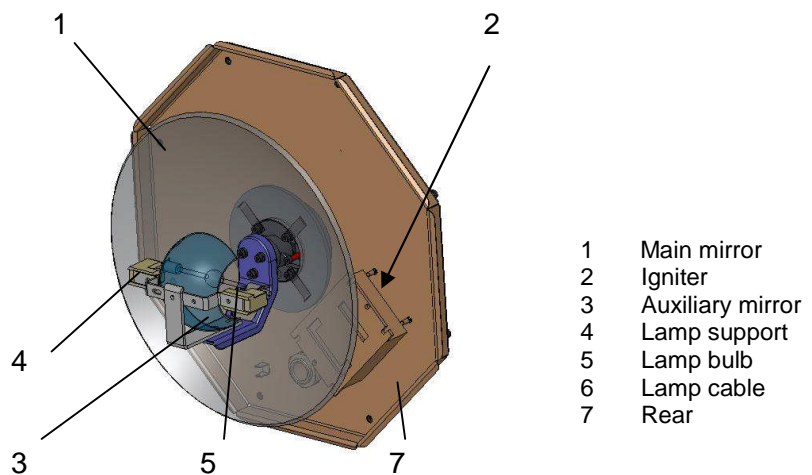
1. Switch off the main switch S8 on the ballast unit.
2. Make sure that the complete electrical system is de-energised and that it cannot be switched on again accidentally.
3. Wait until the searchlight has cooled down.
4. Read chapter 2.2 *How to handle metal halide lamps*.
5. Make sure that the metal halide lamps don't get damaged during handling.

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!



Inner chassis



All functional components are mounted on the inner chassis and rear wall. The inner chassis is screwed to the rear wall and they can be pulled out of the searchlight housing together.

7.3 Lamp replacement

The lamp is defective, if

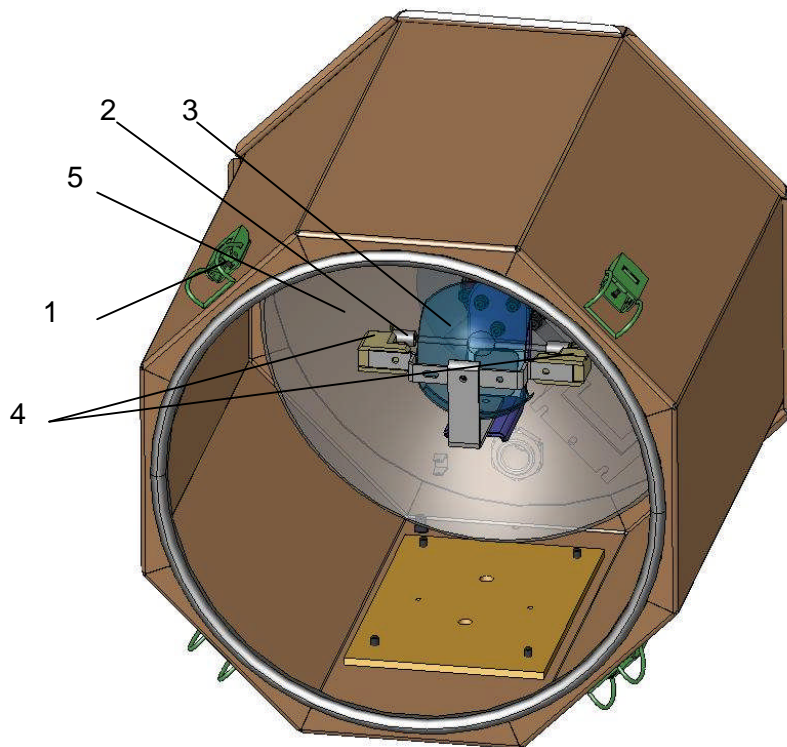
- it only flashes a few times, but does not light,
- the lamp electrodes are burned out,
- the glass bulb is black.

Replace the lamp also if it has reached its average lifetime of 750 hours.



Caution 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. Disengage the quick releases 1 on the front side and put the front glass carefully aside.

Note: The glass rod of the lamp bulb 2 is held horizontally in the holder 4 with metal springs and is partially covered by the auxiliary mirror 3. The position of lamp 5 can be seen in the main mirror and correct handling should be followed for

removal and installation.

2. Press the metal springs on holder **4** of the defective lamp until you can remove it without force backwards from holder **1**.
3. Put the defective lamp down so that the glass bulb does not get damaged.



Attention: If for any reason the glass bulb of the lamp should be broken, then you have to proceed as described in 2.3 *Protective measures in case of a broken lamp*, to protect your health and the environment.



Installation:

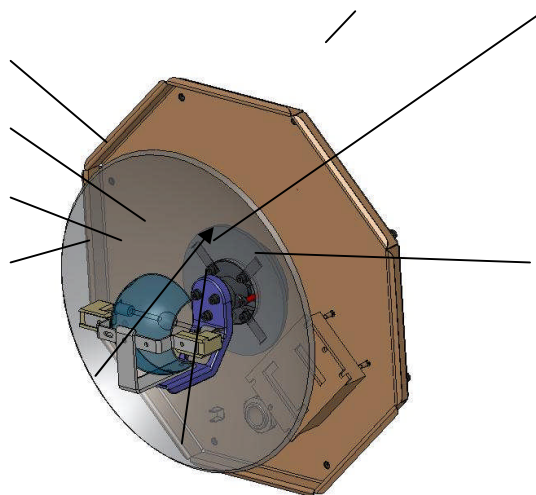
Attention! Check the new lamp before installation for fingerprints or damage such as scratches or cracks. Don't start the lamp if there is visible damage. Remove any fingerprints with an alcohol solution and a soft lint-free cloth.

1. Open the protective packing of the new lamp. Make sure not to touch the glass bulb with your fingers during installation. Use clean gloves when handling the lamp to avoid leaving fingerprints.
2. Remove the knurled nuts on the new lamp, so that lamp holder **4** can receive the lamp.
3. Put the lamp in the holder **4**.
4. Make sure that the metal springs have clamped the lamp in place.
5. Put the front part of the searchlight back in place and fix it with the quick releases.
6. Dispose of the defective lamp properly as described in 2.2 *How to handle metal halide lamps*.

7.4 Replacing the main mirror



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



Removal :

1. Loosen the eight screws on the rear **9** and pull them out of the searchlight housing together with the inner chassis.
2. Disconnect the external cable in order to freely handle the rear wall with the inner chassis.
3. Use a safe and clean workplace for working on the unit.
4. Remove the lamp **2** and store it, see 7.3 *Lamp replacement*.
5. Loosen both connection cables **6** on the lamp support **1**.
6. Loosen the three screws **8** on the mirror holder, that holds the lamp support securely on the holding arm **7**.
7. Remove the lamp support and put it aside.
8. Loosen the leaf springs **4** on the main mirror **5**.
9. Cut the silicone joint with a knife and remove and remove the mirror **5** from its holding ring.

Installation:

Attention! Only use gas-free silicone. The vapours from gas containing silicone deposit on the lamp and destroy it.



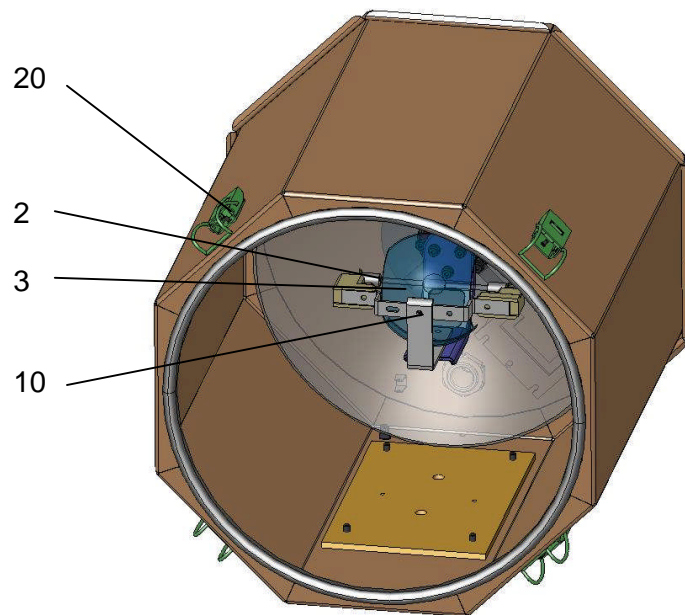
1. Stick the new mirror on the holding ring with silicone. Allow to dry for at least 24 hours!
2. Put the mirror in place and screw on with leaf springs.
3. Check the mirror for correct seating.
4. Now screw the lamp support to the holding arm again. Make sure not to damage the new mirror!
5. Reconnect the lamp cable **6** onto the lamp support (don't forget the washers).
6. Reinstall the lamp **2** into the lamp support **1**, see *7.3 Lamp replacement*.
7. Reconnect the external power cable.
8. Push the inner chassis and rear wall into the searchlight housing and close it with the eight housing screws.

7.5 Replacing the auxiliary mirror



Caution Danger! This repair work has to be carried out by qualified electricians!

Be sure to read chapter 7.1 *Before starting work!*



Removal:

1. Open the quick releases **20** on the front glass and remove the front glass.
2. Remove the lamp **2** and store it, see *7.3 Lamp replacement*.
3. The auxiliary mirror **3** is fixed with the screw **10** onto the lamp support **1**. Loosen the screw and remove the

auxiliary mirror.

Installation:

1. Put the new auxiliary mirror **3** into place on the lamp support and fix it with the screw **10**.
2. Reinstall the lamp **2** into the lamp support **1**, see 7.3 *Lamp replacement*.
3. Reinsert the front glass and close the quick releases.

7.6 Replacing the igniter



Caution Danger! This repair work has to be carried out by qualified electricians!

Be sure to read chapter 7.1 *Before starting work!*

Removal:

1. Loosen the eight screws on the rear wall.
2. Take the inner chassis and rear wall together out of the searchlight housing.
3. Remove the lamp **2** and store it, see 7.3 *Lamp replacement*.
4. The igniter is screwed onto the rear wall. First unscrew the device from the rear wall to disconnect the cables. Loosen the four screws that hold the device on the spacer bolts.
5. To pull the igniter out between the mirror and rear wall, first remove the lamp cables from the lamp holder and take out the cables.
6. Pull the igniter in a position so that the cables can be disconnected. Pay attention to the wiring so that you can reconnect the new igniter correctly afterwards. See circuit diagram 3.4 *Circuit diagram*.

Installation:

1. Take the new igniter and connect all the cables to it. See circuit diagram 3.4 *Circuit diagram*.
2. Place the igniter on the spacer bolts and screw it down firmly.
3. Reconnect the lamp cable onto the lamp holder.
4. Reinstall the lamp **2** into the lamp support **1**, see 7.3 *Lamp replacement*.
5. Push the inner chassis and rear wall into the searchlight housing and close it on the back with the eight housing screws.

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.

Pay particular attention to properly dispose of the lamps. To do so also read chapter 2.2 *How to handle metal halide lamps*.



Health risk

Under no circumstances may metal halide lamps be destroyed during disposal. For this see also 2.3 *Protective measures in case of a broken lamp*.

9. Spare parts

Searchlight head SH 400

Designation	Art. no.
Front frame + front glass S 300	30078100
Main mirror S 300	50087202
Silicone paste	70088019
Auxiliary mirror	50087784
Metal halide discharge lamp 575 W	50087504
SH 300 Lamp holder	30100114
Igniter type IG575KVG	50100206
Stand-by heater	50087276
Thermostat for stand-by heater	50082174

Ballast unit PSUH

Designation	Art. no.
Series impedance for 575 W lamp	50087794
Main fuse 16 A	50087782

Remote control RCU

Designation	Art. no.
Control switch (XD2-GE3)	50087342
On/off switch	50087341
Indicator lamp	50087494

Movement unit FL20

Designation	Art. no.
Tilt Motor Kit 230VAC	10021581
Pan Motor Kit 230VAC	10021582

All other parts can be obtained by contacting WISKA sales.

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Our world-wide sales partners can be found on our homepage.

