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SCHOTT
glass made of ideas

KL 1500 HAL
KL 1500 H

User Manual

Operating instructions

KL 1500 HAL / KL 1500 H*

Status: March 2016

*different name KL1500H possible. In this operating instructions for the sake of simplicity, only the KL 1500 HAL is mentioned in the text.

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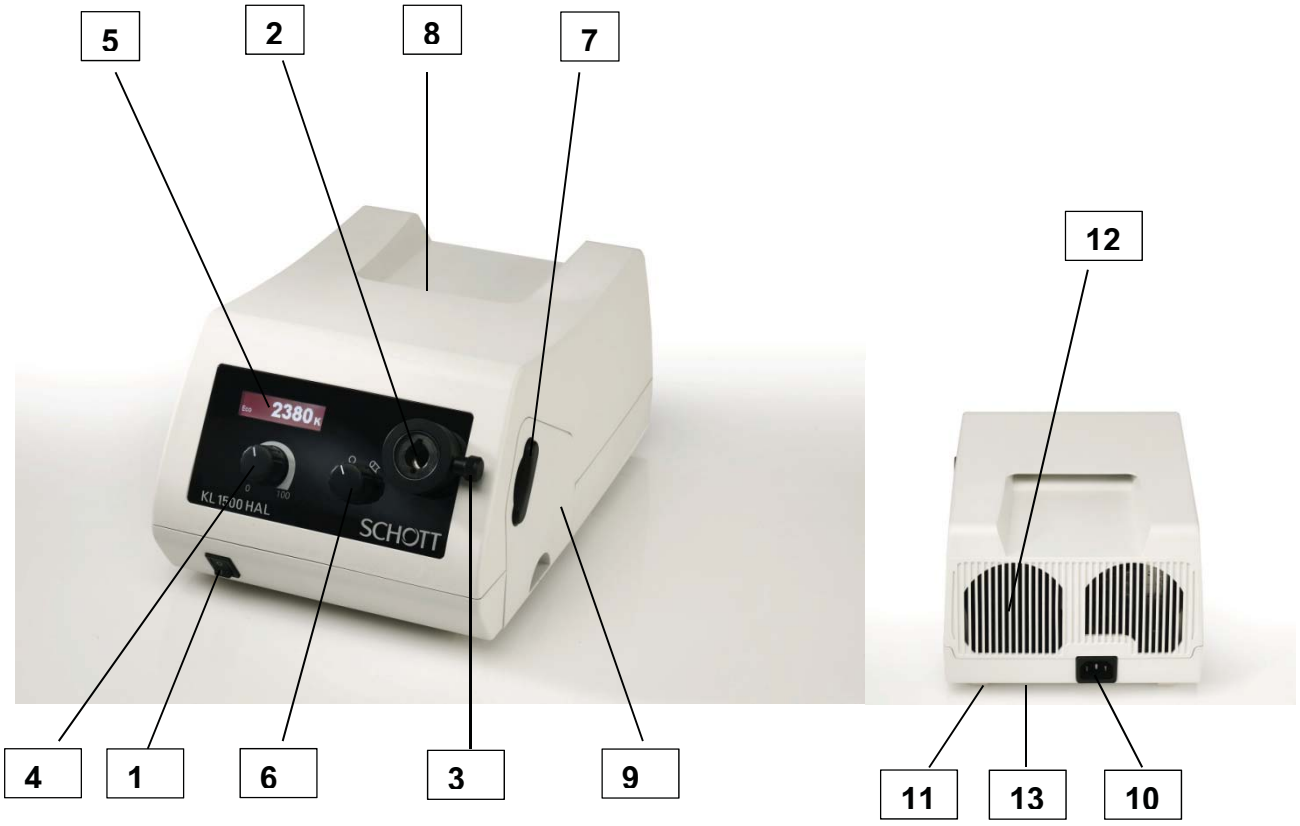
The instrument at a glance



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1. Important information

Symbols used:

Symbol	Meaning
	Warning of danger (caution, obey documentation)
	Warning of hot surface

Intended use:

The KL 1500 HAL cold light source is intended for industrial and laboratory applications.

Cold light sources are used for the intensive illumination of all types of objects. The infrared portions of the lamp's radiation are filtered out. High intensity visible light is guided to the object using flexible or self supporting, movable light guides.

According to the EN 62471:2008 standard the KL 1500 HAL is a product of Risk Class 1.

The KL 1500 HAL fibre optic light source conforms to the provisions of the following European directives:

2014/35/EU (Low Voltage Directive)

2014/30/EU (EMC Directive)

2011/65/EU (RoHS)

The technical documentation and full compliance with the standards listed below proves the conformity with the essential requirements of the following EC Directives:

EN 61326-1:2013

EN 61010-1:2010

EN 50581:2012

UL 61010-1 Third Edition und CAN/CSA-C22.2 No.611010-1-12

 Safety information:

Please read and observe these instructions carefully. The instruments safety cannot be guaranteed unless you observe the operating instructions.

Never look directly into the open light guide socket or the light guide exit during operation (danger of ophthalmic injury!)

The KL 1500 HAL emits high intensity visible light. As light absorbing materials have the physical property of converting incident light into heat, damage may occur to heat sensitive or flammable light absorbing materials. To avoid such thermal damage and the potential danger of fire or burns, please adhere to the following instructions:

- Never cover up the light guide exit (danger of fire!)
- Never cover up the open of the light guide exit with your hands or other parts of your body (danger of burns!)
- When illuminating heat sensitive or flammable light absorbing objects (e.g. in microscopy), special care must be taken to keep an appropriate distance between the light guide and object. Also to select a suitable lamp brightness level in order to avoid thermal damage to the object.
- When the light source is switched on, all light guide exists not being used in the working procedure must always be a safe distance – at least 10 cm – away from heat sensitive or flammable light absorbing materials (prevention of possible fire hazard). Care must therefore be taken that each light guide exit is at the above mentioned safe distance away, for example: dark/coloured textiles and dark/coloured wooden or plastic surfaces.
- To avoid unnecessary strain on biological tissue by illuminating with visible light, reduce the brightness and duration of illumination to the absolute minimum level required.
- Ensure a safe earthing connection when connecting the device

Please make sure that

⇨ your KL 1500 HAL cold light source is operated at the voltage stated on the model plate (13);

⇨ all air vents (11, 12) are kept clear at all times. In the event of insufficient cooling, an integrated thermo switch will cut off the instrument temporarily (see Point 5 "Troubleshooting")

⇨ the lamp has cooled off before being replaced. A warning sign has been attached in the door of the lamp compartment to remind you of this necessity:

 (warning of hot surface)

⇨ the filter slide and insert filter have cooled off before the insert filter is removed. The slide is marked with a warning sign 

⇨ the filter slide is always locked in place during the operation of the light source (see Point 2.6 "Filter slide"!)

⇨ the light guide is cooled off before being replaced.

- The light source has been developed for operation in dry rooms only! (see Point 7 "Technical data").
- The instrument must not be used in explosive areas.
- Safe disconnection from the power supply is only guaranteed by pulling out the mains plug.
- The instrument may neither be opened nor dismantled. Technical modifications are forbidden. Repairs must only be carried out by the manufacturer or by its authorised customer service agencies.
- Please ensure that every user of the system has quick access to these operating instructions.
- The manufacturer is not liable for damage caused by failure to obey these instructions.

2. Operation

2.1 Light guide connection

Start by loosening the locking screw (3) of the light guide socket (2) by turning it anti-clockwise. Insert the light guide as far as it will go and tighten the locking screw by turning it clockwise.

Attention: When inserting light guides with a locating pin, care must be taken to ensure that the pin fits into one of the two guide slots.

Safety information:

ATTENTION!

Light guides can become hot during prolonged use. Please make sure that the light guide is cooled down before replacing it. It is recommended to turn off the light source for about 5 minutes before replacing the light guide. A warning sign has been attached to remind you of this necessity.

The light guide socket (2) is equipped in addition with a sensor system (automatic switch off) which prevents the operation of the lamp unless a recommended light guide is seated in the designated opening. This protects the user from being blinded during operation without light guide, e.g. when the light guide is exchanged by mistake before the light source is turned off at the on/off switch (1).

If the light guide is removed from the light guide socket (2) during operation, the lamp will switch off. It will turn back on as soon as the light guide is reinserted into the light guide socket (2). This will not affect the brightness level set at the light intensity setting (4).

As long as there is no light guide in the light guide socket (2) when the light source is switched on, the LCD display (5) will show the error message "No Light Guide".

2.2 Power connection:

Insert the three pin power cord of type H05VV-F3G0,75 (optional accessory) into the designated plug in socket (10) on the back of the instrument. The instrument needs to be connected to the mains supply (100-240 V AC, 50-60 Hz).

Please ensure that you operate your KL 1500 HAL cold light source only within the specified voltage range.

When replacing the power cord the same type must be used.

2.3 Start up procedure

Switch on/off the KL 1500 HAL by pressing the on/off switch (1).

The indicator on the LCD display (5) is lit when the instrument is switched on.

Position **O**: The instrument is switched off. Please disconnect the power by pulling out the power plug!

To protect the halogen lamp the KL 1500 HAL is fitted with a gentle start up device that reduces the high switch on current that would otherwise occur.

2.4 Light intensity setting

The brightness can be adjusted continuously by turning the light intensity setting rotary dial (4).

The set brightness is indicated on the LCD display (5) in 1% increments between 0 and 100%. You can have the light intensity displayed as the equivalent colour temperature [Kelvin] at the light guide exit by means of a single press on the brightness control (4). Please note that this indicator is not an exact physical quantity and therefore, subject to a certain level of inaccuracy! It is merely intended as an approximate value! Neither fluctuations caused by manufacturing tolerances of the lamp nor any ageing processes are taken into account!

The greatest light intensity is reached when the rotary dial is turned all the way to the 100% position (3400K). The average lifetime of the lamp is approximately 50 h (as specified by the manufacturer of the lamp).

The brightness of the KL 1500 HAL can be regulated across 3 different segments and is indicated accordingly on the LCD display (5). These ranges can be used as an indicator for the application specific brightness and thus for the lifetime of the lamp:

ECO	0 - 49%	> 1,500 h
STANDARD	50 - 79%	approx. 150 h – approx. 1,500 h
BOOST	80 - 100%	approx. 50 h – approx. 150 h

When the brightness control is set to 0% there is no more light intensity, i.e. the lamp is off.

Attention: Please note that when the brightness control is set to 0%, the instrument is not switched off. You switch off the KL 1500 HAL by pressing the on/off switch (1) (see Point 2.3 "Start up procedure"). Please ensure safe power disconnection by pulling out the power plug!

If necessary, you can have the total operating time of the lamp (varying with the set intensity) displayed on the LCD display (see Point 2.5 "LCD display indication and settings").

2.5 LCD display indication and settings

Brightness indicator

The brightness set at the light intensity setting rotary dial (4) can be displayed either in per cent or Kelvin (see Point 2.4). You can toggle the display by briefly pressing the light intensity setting rotary dial (4) once.

Indicator of lamp operating time

You can have the LCD display (5) indicate the accumulated total operating time of the used halogen lamp. This time is added up in full hours [h] throughout the lifetime of the lamp depending on which type of voltage is used with the lamp.

You can use the menu control to switch this indicator on or off. To access the menu control, press and hold the light intensity setting rotary dial (4) > 5 seconds. The lamp will switch off as soon as the light source is set to menu control.

Turning the light intensity setting rotary dial (4) clockwise and anti-clockwise will move the indicator arrow to the corresponding menu fields. The currently selected menu field is displayed as an inverted field. Press the light intensity setting rotary dial (4) briefly once to open the selected submenu.

Select the submenu "On/Off" to enable the operating hour counter. Turn the light intensity setting rotary dial (4) to select "On" and confirm your selection with a brief press of the rotary dial (a checkmark will appear in the menu field). Select "Menu" followed by "Exit". The lamp will switch back on. The operating hours are indicated at the top left of the LCD display (5).

To turn off the operating hour indicator, select "On/Off" in the submenu. Turn the light intensity setting rotary dial (4) to select "Off" and confirm your selection with a brief press of the rotary dial (a checkmark will appear in the menu field). Select "Menu" followed by "Exit".

If using the operating hour indicator of the lamp, you should reset the operating hour counter to 0 h after changing the lamp. This will not happen automatically! Press and hold the light intensity setting rotary dial (4) > 5 seconds to access the menu control. Next, select the "Reset" submenu. Turn the light intensity setting rotary dial (4) to select "Reset" and confirm your selection with a brief press of the rotary dial (a checkmark will appear in the menu field). Select "Menu" followed by "Exit". The counting of the lamp's operating hours in the memory will start anew (beginning with 0h) regardless of whether the operating hour indicator is turned or turned off.

2.6 Supplementary optics

The use of the supplementary optics ensures that you will achieve uniform, high intensity illumination even when using light guides with a smaller bundle diameter than 9 mm.

If the illumination is carried out with imaging or focussing optical systems at the light guide exit, perfectly uniform illumination is achieved by moving the supplementary optics out of the optical path.

To pivot the supplementary optics in and out, turn the pivot lever (6) clockwise or anti-clockwise to the corresponding symbols. The supplementary optics always need to be pivot in or out as far as they will go!

2.7 Filter slide

The KL 1500 HAL has a filter slide (7) which can be fitted with an insert filter (available as accessory).

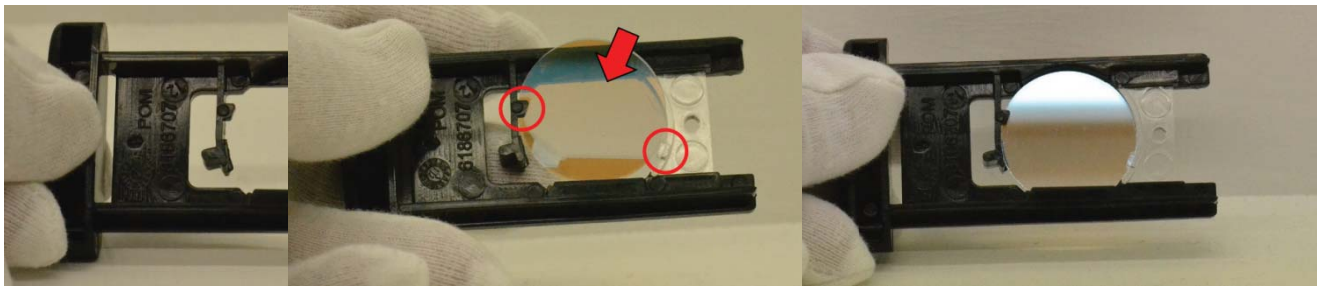
When operating the light source, the filter slide must always be engaged in one of the end positions or in the rest position.

Safety information:

ATTENTION!

Operating the light source with the filter slide in an intermediate position can cause damage to the slide.

Fitting the filter slide



Safety information:

ATTENTION!

Please ensure the filter slide (7) has cooled down before fitting the insert filter. A warning sign has been attached to remind you of this necessity.

Completely pull out the filter slide (7) from the light source so that the label is legible (left). Insert the filter with 28 mm diameter using lint-free gloves from top right behind the two retaining lugs and fix it with slight pressure (center). The filter is then lying flat inside the holder (right).

To remove easily bend the bracket (left) to the left and remove the filter with gloves.

If you wish to operate the light source for a short time without a filter then only pull the slide out to the first rest position. When in this position, the filter is still in the light source, but no longer in the light path.

3. Lamp change

Safety information:

ATTENTION!

Please ensure that the lamp and lamp socket have cooled down before replacing the lamp. A warning sign has been attached to remind you of this necessity.

Please ensure that the light source is switched off and the power plug is pulled out.

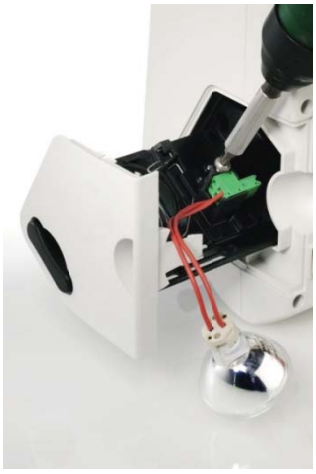
Please be careful not to grasp into the device. There is a risk of injury by the trailing fan.

Open the lamp compartment (9) by pressing down and pulling at the designated recess and pulling the compartment out as far as it will go. Move the lamp including socket up and out of the holder. Carefully pull the defective lamp off the socket and slip on a new lamp (use a lamp that corresponds to the specifications given under Point 6.4). Proceed by pressing down on the lamp until it snaps into place inside the holder. Slide the lamp compartment back in until it locks (audibly) into place. Insert the power plug and switch on the light source.

Replacing the lamp socket:

The high quality lamp socket is guaranteed to last for 20,000 operating hours or 20 lamp replacements.

When replacing the lamp socket, start by carefully pulling off the lamp as described above. Use a screwdriver to loosen both fastening screws at the top of the clip and remove the component completely. Thread the two cable ends of the socket (spare part, see Point 6.4) into the corresponding openings on the clip and retighten the screws (making sure they are seated firmly). Slip the lamp back on and press it into the holder as described above.



4. Maintenance

Your KL 1500 HAL is maintenance free.

Disinfecting the light source during medical applications is to be avoided.

To clean the outside of the instrument, use a soft dry cloth or commercially available plastic cleaning cloths.

5. Troubleshooting

Should you be unable to correct the fault you are experiencing applying the measures listed below, turn to your authorised dealer or the next SCHOTT dealership. More extensive repairs have to be performed by authorised service technicians.

Errors and faults are commonly displayed on the LCD display (5) (see Point 2.5):

Overheating:	Insufficient cooling; temperature monitor has triggered
Open Circuit:	Lamp circuit interrupted; lamp defective or missing
No Fan:	Fan defective
No Light Guide:	no light guide in the light guide socket (2)

Type of the fault	Possible cause	Remedy
Lamp off, fan not running, no LCD display	Instrument not switched on Plug not in socket No mains voltage	Switch the instrument on Insert the plug Check mains voltage
Lamp off, fan running, fault status indication "Open Circuit"	Lamp compartment not connected Lamp defective No lamp No lamp contact	Connect lamp compartment Replace lamp (see Point 3 of these instructions) Insert lamp with light source switched off Press lamp into the socket

Lamp off, fan running, fault status indication "Overheating"	Electronics overheated	Provide for sufficient cooling, verify correct lamp type, place the instrument back into operation after an extended cooling period
Lamp off, fan not running, fault status indication "No Fan"	Fan defective, impeller jammed	Have authorised customer service perform repairs
Lamp off, fan running, fault status indication "No Light Guide"	No recommended light guide in the light guide socket Light guide is not plugged in until it stops	Plug recommended light guide into the light guide socket, check for proper seating Plug in light guide into the light guide socket until it stops

6. Accessories for KL 1500 HAL

A wide range of accessories is available for your KL 1500 HAL. A separate brochure gives you comprehensive information (turn to page 15 for the order address)

Only SCHOTT light guides and accessories guarantee perfect operation, safety and optimum light yield.

6.1 Light guides

Self supporting and flexible light guides in various lengths and diameters are available, as well as point and slit illuminators.

6.2 Halogen lamps

When ordering halogen lamps as spare parts (see point 6.4 of these instructions), you will receive the lamp type that gives you the maximum light yield and best possible degree of illumination.

6.3 Filters

Optical filters can either be inserted into the filter slide (7) or placed in front of the light guide exit as a screw in or push on filter in conjunction with an auxiliary focussing device (accessory).

Details of the auxiliary focussing device and the filter types available as standard can be found in the accessories catalogue.

6.4 Spare parts

Halogen lamp 15 V / 150 W (catalogue no. 153000)
Philips, type 6423
Philips, type 6423 XHP
Osram, type HLX 64634

Lamp socket (catalogue no. 150710)

Only the use of the spare parts listed above will ensure maximum performance, light yield and safety.

7. Technical data KL 1500 HAL

Properties		Values
General information		
Type description	-	KL 1500 HAL
Dimensions (W x D x H)	mm	approx. 202 x 146 x 286
Weight	kg	approx. 4,2
Cooling	-	Axial fan
Ambient temperature	°C	+ 5 ... + 40
Relative humidity	%	at 31°C ambient temperature: 85% 31°C to 40°C ambient temperature: linearly decreasing to 75%
Air pressure	hPa	800 ... 1060
Transport and storage		
Temperature	°C	-20 ... +70
Rel. humidity	%	10 ... 95 (non-condensing)
Air pressure	hPa	500 ... 1200
Electrical information		
Operating voltage, frequency		100 - 240 V ~ 50 - 60 Hz
Power consumption, max.	VA	max. 180
Protection class	-	I
Overvoltage category		II
Lamp type	-	Halogen reflector lamp Philips, type 6423 Philips, type 6423 XHP Osram, type HLX 64634
Lamp rated voltage	V	15
Lamp rated power	W	150
Average lamp lifetime		
Level 50%	h	1500
Level 80%	h	150
Level 100%	h	50

Lighting information		
Maximum effective light guide bundle diameter	mm	9
Total light flux at light guide exit (SCHOTT light guide Ø 9 mm, typ. values)		
Level 50%	lm	approx. 250
Level 80%	lm	approx. 450
Level 100%	lm	approx. 600
Light entry angle ($2\alpha_{eff}$)		approx. 85°
Heat protection filter	-	SCHOTT KG 2, 45 x 45 d = 2.0 mm, toughened
Markings	-	CE
Approvals	-	CSA C US
EMC emission class	-	B

The right is reserved to make changes in the design and supplied items within the scope of on-going technical development.

WEEE Declaration

High-quality materials and components have been used during the development and the production of your SCHOTT product. This symbol means that electrical and electronic equipment must be disposed of separately from your household waste after they have reached their end-of-life.
SCHOTT AG Lighting and Imaging have arranged for a return system that customers can use to dispose of their equipment. Please make use of this system to dispose of your product. Join us in helping preserve the environment in which we live.
For more information on our return system, log on to www.schott.com/lightingimaging/recycle.

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