KL 1500 LCD

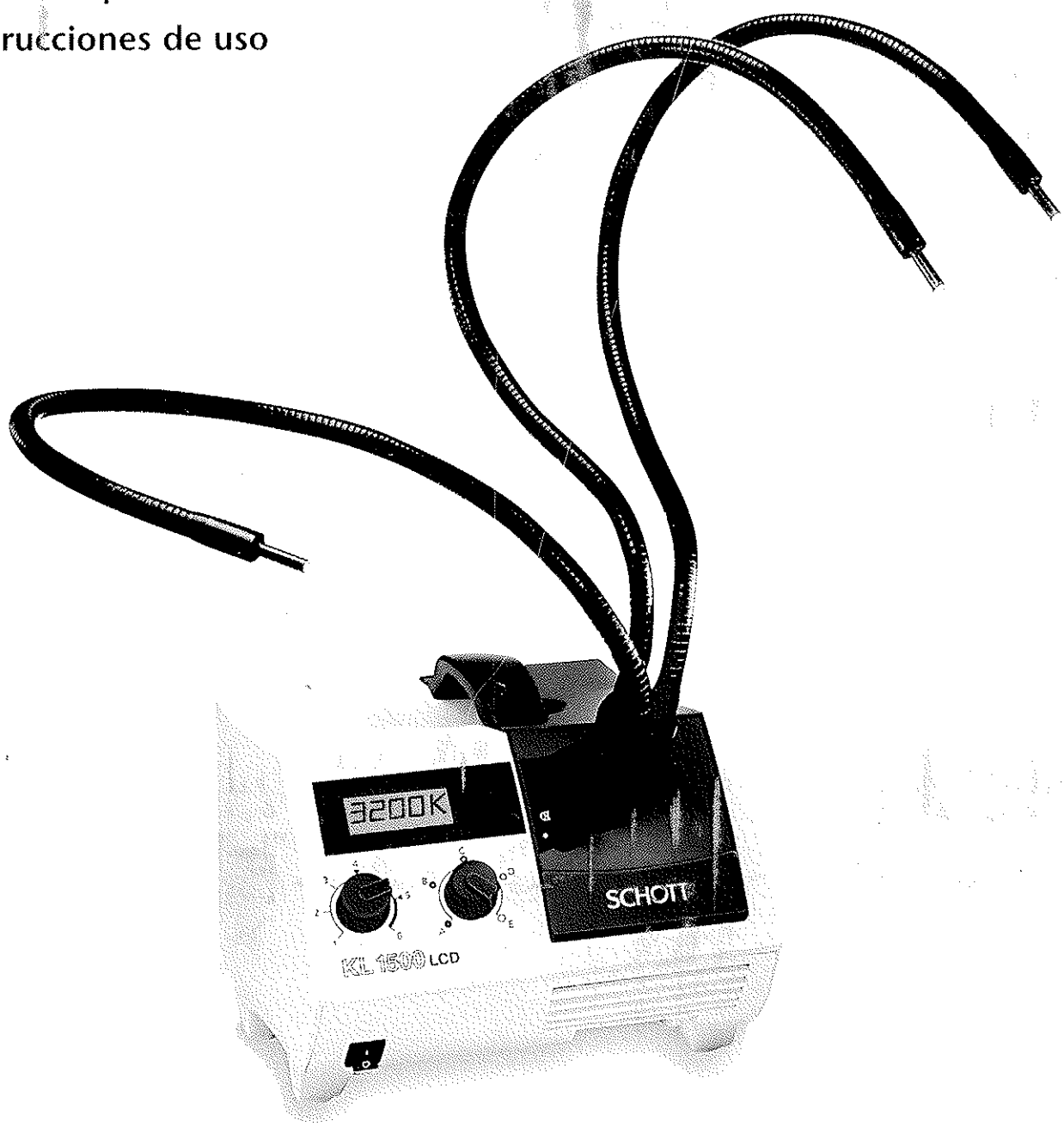
Ⓓ Gebrauchsanweisung

Ⓖⓑ Instructions for use

Ⓕ Conseils d'utilisation

Ⓘ Istruzioni per l'uso

Ⓔ Instrucciones de uso



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glass made of ideas

Instrument overview

1	Mains electricity switch	2.2
2	Light guide connection	2.1
3	Electronic light intensity setting	2.3
4	Mechanical light intensity setting	2.3
5	LCD display	
6	Lever for supplementary optics	2.4
7	Filter slide	2.5
8	Mains cable	
9	Carrying handle	
10	Lamp compartment with halogen cold light reflector lamp	3
11	Lamp compartment button	3
12	Ventilation opening (front of instrument)	1
13	Ventilation opening (side of instrument)	1
14	Air outlet grill (back of instrument)	1
15	Fuse (base of instrument)	5
16	Model plate (base of instrument)	
17	Colour temperature display	2.3
18	Fault status display	5
19	Indication of maximum light intensity	2.3

1 Important information

Symbols used:

Warning of danger (Caution, obey documentation)

Warning of a hot surface

Instrument of Protection Class II

Off (disconnected from mains)

On (connected to mains)

Indication of maximum light intensity

Intended use:

The KL 1500 LCD cold light source is intended for use in industry, laboratories and medicine.

In the medical area, according to Directive 93/42/EEC the KL 1500 LCD is an instrument of Class I and is intended for the intense illumination of observation fields without direct or indirect patient contact.

The purpose of cold light sources is the intense illumination of objects of all kinds. The infra-red component of the radiation emitted by the lamp is filtered out. High-intensity visible light is conducted to the object through a flexible or self-supporting moveable light guide.

Safety information:

Please read and obey these instructions carefully. The instrument's safety cannot be guaranteed if they are not obeyed.

Avoid looking directly into the open clamping sleeve or the light guide exit when the light source is switched on.

The KL 1500 LCD emits high-intensity visible light. Because light-absorbing materials have the physical property of converting incident light into heat, damage can occur to heat-sensitive or flammable light-absorbing materials.

To avoid such thermal damage and the potential danger of fire or burns, please obey the following instructions:

- Never cover up the open clamping sleeve or the light guide exit (danger of fire).
- Never cover up the open clamping sleeve or the light guide exit with your hand or other part of the body (danger of burns).
- When illuminating heat-sensitive or flammable light-absorbing objects (e.g. in microscopy), special care must be taken to ensure that a suitable light guide separation distance and lamp brightness are chosen so that no thermal damage occurs.
- When the light source is switched on, all light guide exits not being used in the working procedure must always be at a safe distance - at least 10 cm - from heat-sensitive or flammable light-absorbing materials (prevention of possible danger of fire). Therefore take care that each light guide exit is at the above safe distance from, for example, dark/coloured textiles and dark/coloured wood or plastics surfaces.
- To avoid unnecessary stressing of biological tissue by illumination with visible light, reduce the brightness and duration of illumination (e.g. in operating fields in the medical area) to the absolute minimum required level.

It is absolutely essential that you ensure that:

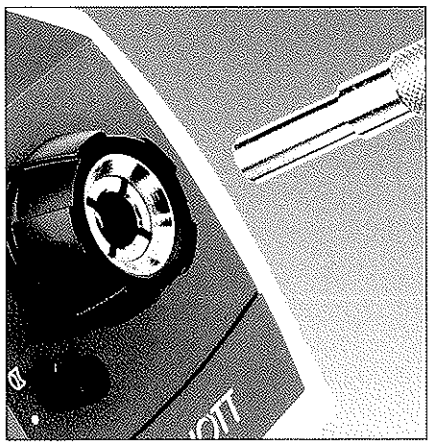
- your KL 1500 LCD light source is operated at the voltage stated on the model plate (16),
- all ventilation openings (12, 13, 14) are kept free; in the event of insufficient cooling, a built-in thermostatic switch switches the instrument off temporarily (see point 5 "Trouble-shooting"),
- the lamp has cooled down before it is changed; to remind you, a warning symbol is attached to the lamp compartment door: ⚠ (warning of hot surface),
- the filter slide and filter insert have cooled down before removing the filter insert; the slide carries the warning symbol ⚠ .
- the filter slide is in one of the two end positions or the latched position when the light source is being operated (see point 2.5 "Filter slide").

- The light source has been developed only for operation in dry rooms (see point 7 "Technical data").
- This instrument is not suitable for operation in areas where there is an explosion hazard.
- Safe disconnection from the power supply takes place also by pulling out the mains plug.
- The instrument must not be opened or dismantled. Technical modifications to the instrument are forbidden. Repairs must be carried out only by the manufacturer or by its authorised customer service agencies.
- Please ensure that every user of the instrument has quick access to these instructions.
- The manufacturer is not liable for damage caused by failure to obey these instructions.

2 Operation

2.1 Light guide connection

First open the light guide socket (2) by turning the outer black ring in a counter-clockwise direction. Push the light guide in as far as the stop and close the light guide socket.



Caution:

When inserting light guides with a location pin, care must be taken to ensure that the latter fits into one of the four clamping clip slots.

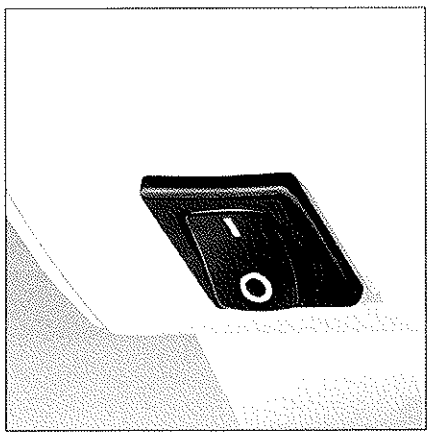
2.2 Start-up procedure

Switch on/off by operating the mains switch (1).

Position **O**:
The instrument is switched off.

Position I :
The instrument is switched on.

To protect the halogen lamp the KL 1500 LCD is fitted with a gentle start-up device that reduces the high switch-on current that would otherwise occur. In addition, electronic stabilisation of the lamp voltage ensures stable light power regardless of fluctuations in the mains voltage.



2.3 Light intensity setting

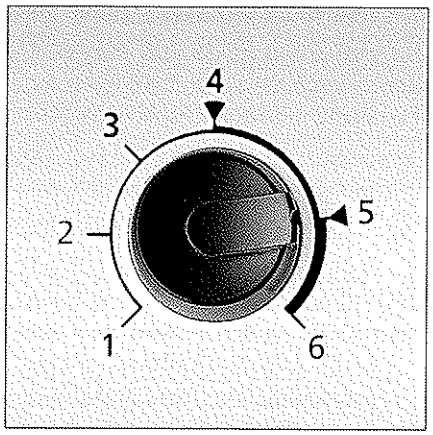
The KL 1500 LCD is fitted with two independent alternative means to adjust the light intensity.

The stepless electronic adjustment enables you to optimise the lamp lifetime - by precisely setting the brightness you require, you will achieve the longest halogen lamp lifetime that is possible for your application. This also varies the colour temperature of the emitted light.

The mechanical adjustment enables stepless variation of the light intensity at a constant colour temperature.

2.3.1 Electronic adjustment

The brightness can be adjusted steplessly by turning the light intensity setting knob (3).
There are four distinct notched positions between the two end positions of the adjusting knob. These fixed positions thus ensure the reproducibility of pre-selected brightness settings.



Position 1 gives the lowest light intensity, and maximum brightness is attained in position 6. The two barriers at positions 4 and 5 are bypassed by pressing in the adjustment knob.

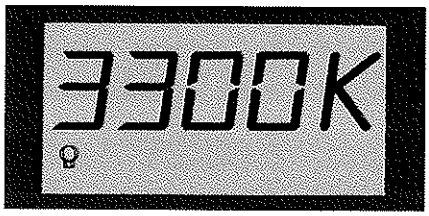
The adjustment knob cannot be turned beyond the end stops 1 and 6 respectively.

The lamp lifetime in position 4 is about 1500 hours and in position 5 it is about 150 hours.

In position 6 the halogen lamp is operated at its nominal voltage and the lamp will achieve approximately the rated lifetime stated by the lamp manufacturer (depends upon the type).

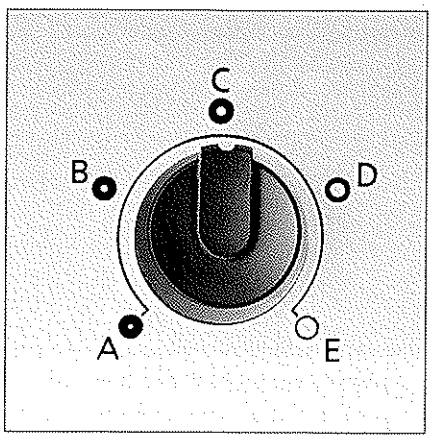
The approximate colour temperature of the light emitted by the halogen lamp (17) is indicated on the LCD display (5). The colour temperature of the light can be set by turning the light intensity adjustment (3) (step width 50 K).

After bypassing the barrier at position 5, a lamp symbol (19) appears in the LCD display and flashes for the first few seconds. This acts as a maximum light indication and gives a warning that the expected lamp lifetime will be reduced compared to position 5.



2.3.2 Mechanical aperture

The light intensity can be altered steplessly while retaining the colour temperature by turning the adjustment knob of the mechanical aperture (4). Two fixed end-stops and three additional retention points (marked with the letters A to E) enable defined aperture settings to be selected reproducibly.



Position A gives the lowest brightness, and maximum brightness is achieved in position E (aperture completely open). Turning the adjustment knob from one retention point to the next approximately doubles or halves the light intensity respectively each time.

The adjustment knob cannot be turned beyond the end-stops A and E respectively.

2.4 Supplementary optics

Use of the supplementary optics ensures that uniform, high-intensity illumination is achieved even when using light-guides with a smaller bundle diameter.

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

Position Ⓧ - Supplementary optics in optical path:
uniform illumination with no optical systems at the light guide exit.

Position ● - Supplementary optics out of optical path:
uniform illumination with optical systems at the light guide exit.

The supplementary optics must always be positioned at the end stop.

▼

2.5 Filter slide

The KL 1500 LCD has a filter slide (7) that can be fitted with a filter insert (available as an accessory).
The warning symbol on the filter ⚠ slide reminds you that it is essential that the slide is in one of the two end positions or the latched position when the light source is being operated. This is the only way to ensure optimum air cooling of the light source.

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

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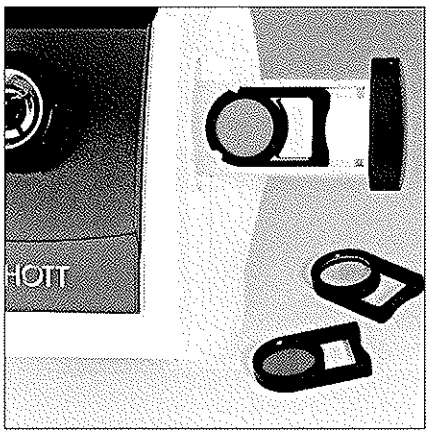


2.5.1 Inserting filters into filter slide

Please take care to ensure that the filter slide has cooled down before fitting the filter insert into it. It carries the warning symbol to remind you ⚠.

Pull out the filter slide (7) as far as the end stop and insert the required filter. The light source is fully operational in this position.

When the filter slide is pushed in up to the end stop, the filter is located in the optical beam path.

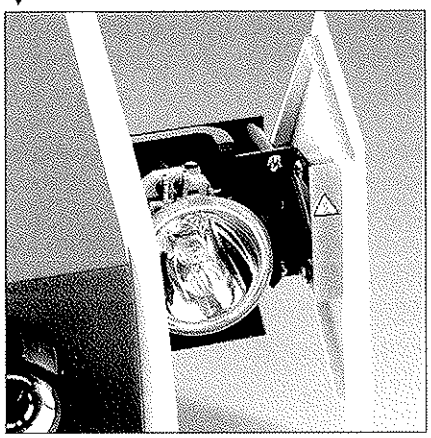
If you want to operate the light source without a filter for a short time, pull out the slide only up to the latched position.

In this position the filter is still in the light source but no longer in the path of the beam.

3 Replacing the lamp

Please ensure that the lamp and lamp-holder have cooled down before replacement. The corresponding △ warning symbol is attached to remind you.

▼



First of all switch off the light source. Open the lamp compartment (10) by pressing the button (11) and pull it out as far as the stop.
Press down the two levers of the special socket and pull out the faulty lamp. The two levers must be pressed down again while inserting the new lamp.
Push the lamp compartment in until it latches (audible locking sound).
Switch the light source on.

4 Maintenance

Your KL 1500 LCD is maintenance-free. There is no provision necessary for disinfecting the light source when using it in the medical field.

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

5 Troubleshooting

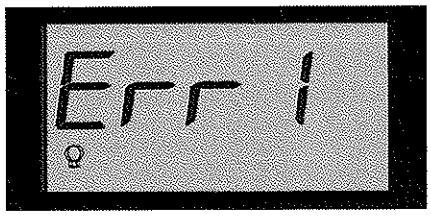
The display has a fault status indicator (18). Any possible breakdowns can be recognised quickly and easily.

„Err 1": Lamp circuit interrupted.

„Err 2": Temperature monitor has triggered.

„Err 3": Short-circuit in the lamp circuit, electronic fuse has triggered.

▼



Fault	Possible causes	Remedial action
Lamp out, fan not running, no LCD display	Instrument not switched on.	Switch instrument on.
	Plug not in socket.	Plug the plug in.
	No mains electricity voltage.	Check mains voltage.
	Lamp compartment not closed.	Close lamp compartment.
	Fuse faulty.	Replace fuse (15).
	Transformer overheated.	Ensure adequate cooling, check that lamp type is correct, re-start instrument after cooling down for a prolonged time.
Lamp out, fan running, fault status indication „Err 1"	Lamp defective	Replace lamp (see point 3 of these instructions).
	No lamp	With light source switched off, install lamp.
Lamp out, fan running, fault status indication „Err 2"	Insufficient cooling	Ensure ventilation apertures are free, avoid excessive ambient temperatures, the instrument will switch back on again after a short time.
Lamp out, fan running, fault status indication „Err 3"	Transient current increase in lamp circuit.	Switch instrument off and, after a few seconds, back on again.
	Lamp causing short-circuit.	Replace lamp (see point 3 of these instructions).

If you are unable to rectify the fault by the actions mentioned above, please contact your specialist dealer or the nearest SCHOTT agency. More extensive repairs must be carried out by the authorised customer service depot.

6 Accessories

A wide range of accessories is available for your KL 1500 LCD. A separate brochure gives you comprehensive information – to get it see addresses overleaf. 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 this instruction), the lamp type that enables optimum light yield and illumination will be supplied.

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

Spare part	Catalogue No.
Halogen lamp 15 V/150 W Philips, type 6423 Philips, type 6423 XHP Osram, type HLX 64634	153 000
Fuse for 230 V (primary) T 2 H, 250V acc. to IEC 127-3/5	150 101
Fuse for 120 V (primary) T 4 A acc. to UL 198 G	153 103

To ensure maximum performance, light yield and safety you must only use the spare parts stated above.

7 Technical data

Properties		Values
General information		
Type description	-	KL 1500 LCD
Dimensions (W x D x H)	mm	approx. 200 x 265 x 170
Weight	kg	approx. 5
Cooling	-	axial (fan cooled)
Ambient temperature*	°C	+ 5 ... + 40
Relative air humidity*	%	at 31°C ambient temperature: 85 % from 31°C to 40°C ambient temperature: decreasing linearly to 75 %
Air pressure*	hPa	700 ... 1060
Transport and storage		
Temperature	°C	- 40 ... + 70
Rel. air humidity	%	10 ... 95 (non-condensing)
Air pressure	hPa	500 ... 1200
Contamination level	-	2

* Test conditions of Standards DIN EN 61010-1, DIN EN 60601-1 and UL 3101-1.

continued on page 20

Properties		Values
Electrical information		
Operating voltage, frequency		
230 V version		220 ... 240 V ~ 50 /60 Hz
120 V version		100 V ~ 50 / 60 Hz and 120 V ~ 60 Hz
Power consumption, max.	W	200
Fuses, primary		
230 V version	-	T 2 H, 250 V in accordance with IEC 127-3/5
120 V version	-	T 4 A in accordance with UL 198 G
Protection class	-	II
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 4	h	1500
Level 5	h	150
Level 6	h	50
Lighting information		
Maximum effective light guide bundle diameter	mm	9
Total light flux at light guide exit (SCHOTT light guide, Ø 8 mm, typ. values)		
Level 4	lm	250
Level	lm	500
Level 6 (max. light flux)	lm	600
Light entry angle ($2\alpha_{eff}$)		
Without supplementary optics	degrees	approx. 53
Heat protection filter	-	SCHOTT KG 2, 45 x 45 thickness = 2,0 mm, toughened
Approvals	-	
230 V version		EMV, VDE
120 V version		cUL / UL

The 230 V version is marked with the CE symbol and complies with the basic requirements of Annex 1 of Directive 93/42/EEC concerning medical products. We reserve the right to make changes in construction and scope of delivery in the context of technical improvements.

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