

# FIBER OPTIC ILLUMINATOR **SPOT.IL.5180**

---



Copyright © June 2004 by **EUROSEP Instruments** SPOT.IL.5180.D1.4A

## **SPOTLIGHT 5000 SERIE**

**EUROSEP Instruments**

47, Avenue des Genottes

95801 CERGY SAINT CHRISTOPHE - FRANCE

Tel. : 33 (0)1.3422.9522 - Fax : 33 (0)1.3422.9532

E-Mail : [eurosep@eurosep.com](mailto:eurosep@eurosep.com) - Internet [http : //www.eurosep.com](http://www.eurosep.com)

**EUROSEP Instruments**

## **Fiber Optic Illuminator SPOTIL5180**

The fiber optics illuminator, model 5180 has been especially developed in order to allow the adaptation of the main fiber optics available on the market (Olympus, Storz, ACMI, Wolf, Fuji, Pentax, Fort, etc...).

As a light source is used a 180W high-pressure xenon lamp, fixed in an elliptical reflector. At the output of the fiber optics, the regained light energy is of about 1500 lumens.

The heat absorbing filter placed in the optical axis allows to obtain a cold white light, of a high intensity and brilliance. Due to the high color temperature, about 5900°K, close to the sun temperature, this illuminator is suitable to all kind of solar simulations over small areas.

The output energy is manually, continuously adjustable (from 0% to 100%), due to a diaphragm located in the optical field.

### **Applications :**

- Medical endoscopy,
- Industrial endoscopy,
- Fiber optics transmission,
- Analytical instrumentation,
- Solar simulation.

---

**EUROSEP** *Instruments*  
Bât LE CERAME - 47 avenue des Genottes  
BP 38233 CERGY ST CHRISTOPHE  
F- 95801 CERGY-PONTOISE CEDEX

Tel. : 33 (0)1.3422.9522 Fax : 33 (0)1.3422.9532

E-mail : [eurosep@eurosep.com](mailto:eurosep@eurosep.com)  
Internet [http ://www.eurosep.com](http://www.eurosep.com)

## DECLARATION OF CONFORMITY

According to Directive 93/42/CEE

Manufacturer Name **EUROSEP Instruments**  
Manufacturer Address Bât. LE CERAME  
47 avenue des Genottes  
F-95800 Cergy St Christophe

We declare, under our own responsibility, that the following product:

Product Name : FIBER OPTIC ILLUMINATOR  
Reference : SPOT.IL.5180  
Class : I

Has been designed and manufactured to the technical specifications of the product (SPOT.IL.5180) and conform in all respects to the relevant standards and regulations in use and especially to :

Low Voltage Directive **EN 60601-1**  
EMC Directive **EN 60601-1-2**  
**EN 55011**  
**EN 50082-2**  
**EN 61000-3-2**  
**EN 61000-3-3**

according to the European Directive

Medical devices **93/42 Annex VII**

Cergy Saint Christophe, June 20, 2002.

Nicole MONTICO  
Quality Manager

## SUMMARY

	Page
<b>1. OPERATING PRECAUTIONS</b>	4
<b>2. INTRODUCTION</b>	5
2.1. The illuminator and accessory kit	5
2.2. General warranty conditions	5
<b>3. INSTALLING THE UNIT</b>	5
3.1. Electrical connection	6
3.2. Checking the fuses	6
3.3. Connecting the fiber optic	7
3.4. Switching-on the illuminator	7
3.5. Precautions relative to the EMC Directive	7-8
<b>4. THE ILLUMINATOR-DESCRIPTION</b>	8
4.1. Front panel	8
4.2. Rear panel	8
4.3. Inside arrangement	8
<b>5. LAMP</b>	9
5.1. Different types of lamps :	9
5.1.1. Technical and electrical specifications	9
5.1.2. Spectral distribution	10
5.2. Replacing the lamp	10-11
5.3. Life time, warranty of the lamp	11-12
<b>6. FIBER OPTICS</b>	13
<b>7. LUMINOUS FLUX MODULATION</b>	13
<b>8. OPTICAL SPECIFICATIONS</b>	14
<b>9. LAMP POWER SUPPLY</b>	15
9.1. Technical characteristics	15
<b>10. CLEANING</b>	15
<b>11. TROUBLESHOOTING</b>	16
<b>12. TECHNICAL CHARACTERISTICS OF THE ILLUMINATOR</b>	17

## 1. OPERATING PRECAUTIONS

**Before handling or installing the illuminator, see first the followings :**

- 1.1. Before the first switching-on, check the unit is plugged in the same AC supply (110/220 V) as the illuminator is set for.
- 1.2. Never switch-on the illuminator unless the upper cover is properly fixed in its own place.
- 1.3. Check that the main plug has a good ground hold.
- 1.4. Never touch the light-source with finger. The lamp can be hold by mean of a filter paper or a piece of non fluffy and clean cotton. anyway, wait until the lamp is cold completely.
- 1.5. Before replacing the lamp, you must wait until the complete unit got ambient temperature and to disconnet the power-cord.
- 1.6. Never switch-on the illuminator unless a fiber optic is fitted to the output adaptor.
- 1.7. The illuminator produces high-luminous radiations and, also, ultraviolet radiations, depending on the type of lamp used. All these kind of radiations may produce damages to the human eyes, and, in the case of ultraviolet radiatons, to the skin. Never expose unprotected eyes to the luminous beam.
- 1.8. Never switch-on the illuminator unless rear-side ventilation holes are completely free.

## 11. TECHNICAL CHARACTERISTICS OF THE ILLUMINATOR

### Input current characteristics

Input AC power	95/240 VAC
Frequency	50/60 Hz
Line Wire	1
Input power	400W

### Lamp characteristics

See paragraph 5. Lamp

### Power supply characteristics

See paragraph 9. Lamp power supply

### Timer characteristics

Supply (AC)	12 -24V
Consumption	1 mA
Recording	Max. 99.999,9 hours
Resolution	0,1 hour
Precision	0,04%

### General characteristics

Operating temperature	0 - 40°C
Relative Humidity	Max. 95% to 38°C
Dimensions	300x110x310 mm
Weight	4,2 kg

## 10. TROUBLESHOOTING

- 10.1. The main switch doesn't light while switched on :
- Check the main AC supply is on,
  - Check that the voltage is that chosen for the illuminator (110/220V),
  - The cover has to be replaced properly (function security),
  - Check that the fuses in the socket are placed properly, if so check that they are in good functioning.
  - Check that the lamp module is properly fixed.
- 10.2. After turning the power on, the lamp doesn't light, while the ignition impulsion train is audible
- Replace the lamp with a new one,
  - If the problem is still there, contact EUROSEP'Service Department.
- 10.3. After turning the power on, the lamp doesn't light, while the ignition impulsion train is inaudible :
- Contact EUROSEP'Service Department.
- 10.4. There is no light in the output of the fiber optic :
- Check that the lamp is switched on (it is possible to see a parasite light through the ventilation holes). If the lamp is not switched on switch off the illuminator then check points : 10.1./10.2./10.3.,
  - If the lamp is switched on, check the position of the attenuator.
- 10.5. The lamp extinguishes during operating :
- Check that all the ventilation holes are free. After freeing them, wait for during 15 minutes, than switch on the illuminator,
  - Replace the lamp,
  - If the above points are not useful, contact EUROSEP'Service Department.
- 10.6. The light beam becomes warm :
- Check that the ventilation holes are free,
  - Check that the fans inside the illuminator are operating,
  - Check the anticaloric filter conditions located inside the illuminator, (see paragraph 8. Optical specifications).

## 2. INTRODUCTION

Before all kind of handling or installing the illuminator, see "Operating precautions" (1).

### 2.1. The illuminator and the accessory kit

While unpacking the unit, check that following accessories are really present :

- The illuminator 5180,
- The attached operating manual,
- An AC power-cord conform to the European standards, with a proper connection to the ground,
- A set of 3,15AT (5 x 20mm) fuses,
- A 180W xenon lamp with reflector (installed inside the illuminator).

### 2.2. General warranty conditions

EUROSEP Instruments warrants the illuminator for a period of 12 months after the date of delivery, when used strictly in accordance with the attached directions of use. This warranty is strictly limited to repairing or replacing of the damage product. To enjoy full warranty the purchaser commits himself to justify his demand by a written request. Also, he has to give to EUROSEP Instruments all his support in order to notice and repair the damages. He should avoid to repair the unit by himself or by somebody else unless he has written agreement of EUROSEP Instruments.

This warranty is void under the following circumstances :

- Proximate, incidental, or consequential damages,
- Negligence, lack of supervision or maintenance,
- Use of equipment, nonconform to the directions for use,
- Replacing and repairing due to a fair wear.

Also, the warranty of the illuminator can be obtained only if the lamps were bought at EUROSEP Instruments or agreed by him.

Concerning the lamps, our warranty of a good functioning of the lamps delivered by EUROSEP Instruments is valid only if they are supplied by our equipment or agreed by us. For special warranty conditions of these lamps, see paragraph 5.3.

EUROSEP Instruments is not responsible of eventual damages made by its products.

## 3. INSTALLING THE UNIT

Before installing the unit see paragraph 1. OPERATING CONDITIONS.

The 5180 Illuminator has to be placed on a plane and stable surface, away from any important air current or heat sources.



WARNING

## CAUTION / WARNING

**Never place on the illuminator things which may close up the ventilation holes necessary for heat evacuation.  
Never block off the rear panel and especially the fan. At least a 15 cm distance behind the illuminator has to be kept.**

### 3.1. Electrical connection

Check the main AC supply is suitable to the preset voltage of the illuminator (110 or 220 Volts, 50 or 60 Hertz).

The main-power socket is placed on the back side of the illuminator. This standard European socket normally includes : Phase + Neutral + Ground.



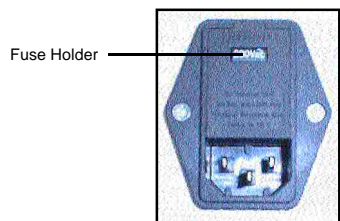
WARNING

## CAUTION / WARNING

**The main AC supply has to be properly connected to the ground, in order to ensure optimal and safe operating.**

### 3.2. Checking the fuses

The main AC supply is protected by the mean of two 3,15 AT - 5 x 20 mm fuses. The following procedure has to be observed while replacing the fuses :



- Be sure the illuminator is unplugged by taking off the AC power-cord from the rear-side socket,
- Take-off the fuse holder from the main socket by the mean of a flat screwdriver (see fig.1),
- Pull out the defective fuse(s),
- Insert the new fuse(s) after attentively checked the electrical specifications - 3,15AT - 250 Volts,
- Close the fuse holder,
- Plug again the AC power cord into the main socket.

Fig.1 : Line socket and Fuse holder

The power supply installed inside the 5180 illuminator is equipped with PFC ( Power Factor Connection) which assures a total independance of the system towards the main input voltage and frequency from 90 to 240 V - 50/60 Hz.

## 9. LAMP POWER SUPPLY

The xenon lamp 180 Watts used in the 5180 illuminator is supplied starting from a stable electronic supply, with a current regulation.

### 9.1. Technical characteristics

Nominal Operating Power (Watts)	180
Operating Power Range (Watts)	75 - 300
Operating Current Range (Amps)	5 - 21
Operating Voltage Range (Volts)	12 - 25
Ignition Voltage (KVolts)	25
Current Adjustment	<1,0%
Ripple	1,0%
Supply Voltage (Volts)	95/240
Supply Frequency (Hz)	50/60
Weight (Kg)	1,2

## 10. CLEANING

The 5180 illuminator outside should be cleaned with a non corrosive upkeep product in using a non fluffy soft paper. The same procedure should be used for the fiber optic adaptor.

## 8. OPTICAL SPECIFICATIONS

Besides the attenuator (see paragraph 7), the 5180 illuminator is delivered with a cold mirror, (its optical characteristics are exposed in fig.6).

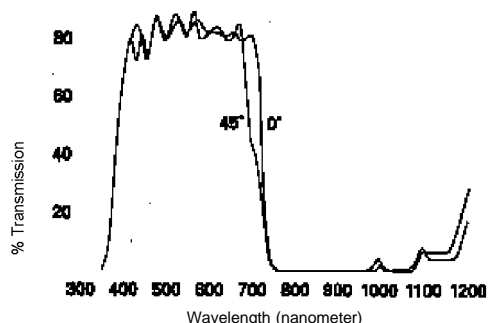


Fig. 6 : Cold mirror transmission



### CAUTION / WARNING

**It is important to place the cold mirror in the filter holder before putting the 5180 illuminator into operation. Without this cold mirror, the fiber optic connected on the fiber adaptor will be completely damaged by the infra-red radiations send out by the xenon lamp. Without this mirror, the temperature reaches several hundreds of degrees Celsius.**

## 3.3. Connecting the fiber optics

Almost all types of the fiber optics available on the market are suitable for the 5180 illuminator. In order to be properly connected, to each fiber corresponds a fiber-adaptator.

The available fiber adaptators are listed in paragraph 6.

In order to get the optimal luminous beam at the output of the fiber optic it is important to use the right fiber adaptator with its own fiber (for each type of fiber it is indispensable to take into account a certain angle of the light beam).

For installing the fiber optic proceed as following :

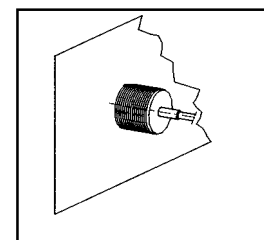


Fig. 2 : Connecting the fiber optics to the fiber adaptor.

- Screw completely the fiber adaptor in the hole,
- Insert completely the fiber optic into the fiber adaptor,
- By the mean of a flat screwdriver, screw on the locking screw of the optical fiber located on the side of the fiber adaptor (only certain types of fiber adaptors have this locking screw).

## 3.4. Switching on the illuminator

Before the first switching on the illuminator, check the followings :

- The xenon lamp module is properly installed. It is connected to one safety switch in order to avoid operating the illuminator unless the lamp module is not on its own place,
- The fiber adaptor and the fiber optic are properly fixed,
- The fuses are placed in the fuse holder,
- The holes of the illuminator and the backside fan are completely free,
- The upper cover of the illuminator is properly fixed. it is connected to one safety switch in order to avoid operating the illuminator unless this cover is not on its own place.

After all these points have been checked, and after having connected the AC power-cord to the rear side socket, push the ON/OFF light button from the right side in the front panel.

The luminous indicator "power on" lights on when the illuminator is under voltage and after some ignition impulses (about 2 to 5 seconds), the xenon lamp is on.

If the lamp has no light before the ignition impulse train has stopped, turn the illuminator off and put it under voltage a second time.

If again the lamp doesn't light on, read the paragraph 10 "Troubleshooting".

## 3.5. Precautions relative to the EMC directive

The EUROSEP Instruments illuminators have been designed and manufactured according to the European Directive 93/42 relative to medical device. The working environment is said to be mixed, that is to say it takes into account the requirements of domestic, laboratory and industrial environments.

The criteria of performance are type A ones, that means that no degradation of performance is observable.

The conformity of the illuminator is linked to certain precautions to be observed during

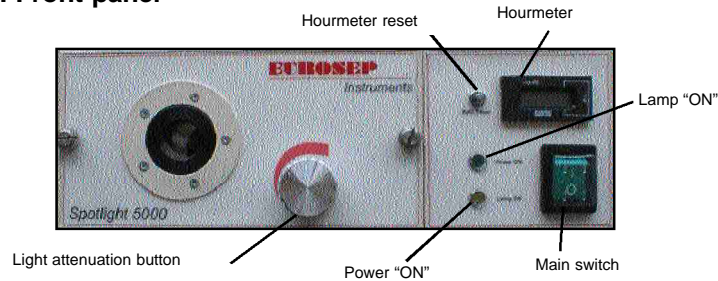
installation.

Arc lamps are by nature sensitive to magnetic fields. In the case where an extreme stability of the arc is expected, what corresponds to the range of illuminators, it is better to avoid the presence of strong magnetic fields (proximity of medium voltage/low voltage transformers, high current installations...).

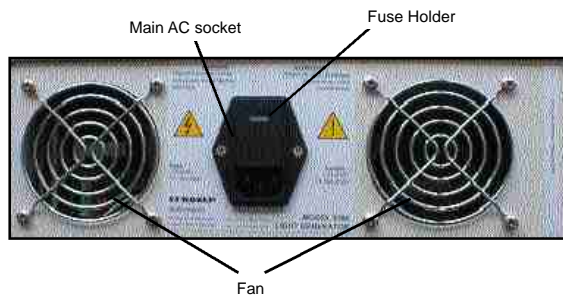
#### 4. THE ILLUMINATOR - DESCRIPTION

This paragraph deals again with different controls on the rear and front panel as well as the description of different internal elements of the illuminator.

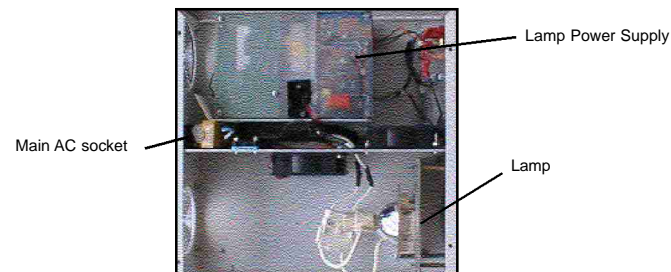
##### 4.1. Front panel



##### 4.2. Rear face



##### 4.3. Inside Arrangement



#### 6. FIBER OPTICS

With the 5180 illuminator it is possible to use almost all the fiber optics to be found on the market. In order to be connected properly, to each fiber corresponds a fiber adaptor.

In the list below you may find the fiber adaptors available, and their references.

Fiber suppliers	Fiber adaptors reference
ACMI	AT.ILL.NEZ.AC
FORT (EF and LUX)	AT.ILL.NEZ.FO
FUJI	AT.ILL.NEZ.FU
OLYMPUS	AT.ILL.NEZ.OL
PENTAX	AT.ILL.NEZ.PE
STORZ	AT.ILL.NEZ.ST
WOLF	AT.ILL.NEZ.WO

#### 7. LUMINOUS FLUX MODULATION

The 5180 illuminator has a luminous flux attenuator (Fig.5) which has 9 attenuation positions allowing a linear adjustment of transmission between 0% and 100%.

This attenuation of the luminous flux will be done manually with the help of the button placed on the front panel.

The luminous flux lowers when turning the red button towards the left and it becomes higher when it is turned towards the right.

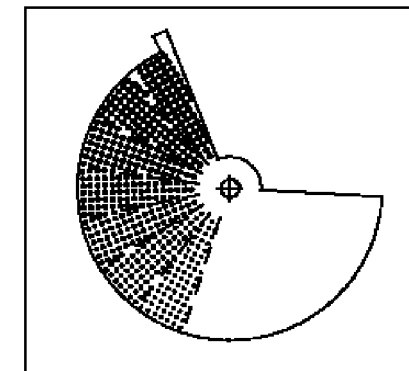


Fig. 5 : Attenuator

Fig. 4 shows the variations of relative output of a xenon lamp in regard to the operation time.

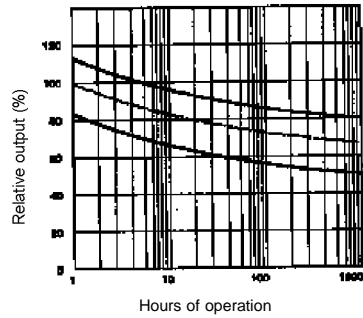


Fig. 4 : Output vs. time

All the EUROSEP Instruments xenon lamps are 500 hours warranted as following :

□ Up to 500 hours, the warranty covers complete replacing after an expertise.

This warranty is strictly limited to the replacing of the material accepted as defective. In order to enjoy this warranty, the purchaser commits himself to return the defective lamp to EUROSEP on its own charges.

This warranty is void under the following circumstances :

- proximate, incidental, or consequential damages,
- negligence, lack of supervisin or maintenance,
- use of the equipment, nonconform to the directions for use.

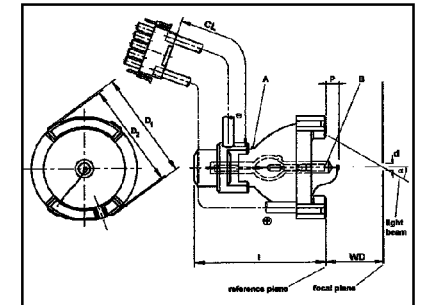
## 5. LAMP

The xenon lamps used in the 5180 illuminator are short arc lamps, with an external reflector optically prealigned to optimise the collection angle and the efficiency of the luminous beam (Fig.3). They offer a maximum output for a minimum arrangement. They transmit a "white light" of a very high intensity with a color temperature of 5900° K close to the color temperature of the sun.

### 5.1. Different types of lamps :

#### 5.1.1. Technical and electrical specifications

Nominal Operating Power (Watts)	180 W
Nominal Operating Current (Amps)	12 A
Nominal Operating Voltage (Volts)	14 V
Ignition Voltage (KiloVolts)	25 kV



### 5.1.2. Spectral distribution

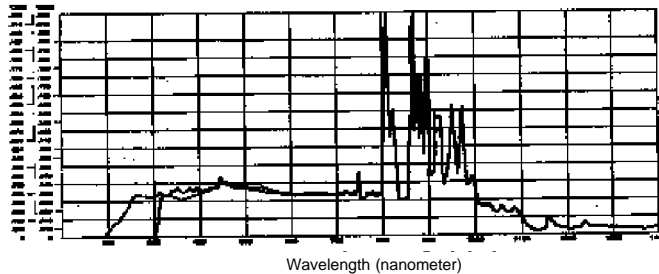


Fig.3 : Spectral distribution

### 5.2. Replacing the lamp

- Switch off the the illuminator and unplug the AC power-cord,
- Wait until the complete cooling of the lamp (about 15 minutes),
- Unscrew the 2 screws of the lamp module,
- Disconnect the cables coming from the power supply to the lamp cables (connector),
- Unscrew the 3 screws from the rear plate of the lamp holder,
- Remove the lamp,
- Take the new lamp.

#### CAUTION / WARNING

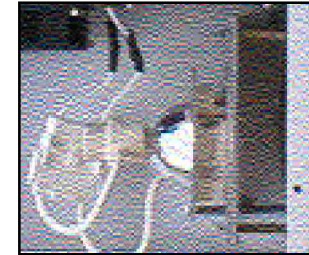
**Never touch the window of the luminous source with the finger. The contact can be made only with an optic paper or with a clean and fluggy cotton. In both cases avoid all contacts.**

- Install the new lamp inside the appropriate location,
- Place the rear plate in the right position by respecting the shot for the rear cable of the lamp. This position is very important for an optimal cooling of the lamp sockets especially for the rear socket,
- Screw the 3 screws of the rear plate of the lamp holder,
- Connect the lamp connector with the one's coming from the power supply,
- Screw the 2 screws of the lamp module.



WARNING

- Please check that the xenon lamp module is properly installed. It is connected to one safety switch in order to avoid operating the illuminator unless the lamp module is not on its own place.



### 5.3. Life time, warranty of the lamp

The life time of a xenon lamp is of 500 hours average. The decreasing of the lamp power is due to the evaporation of the tungsten from the electrodes which will move to the window mirror. the life time of a lamp depends on : the number of ignitions, the intensity of operating current higher than the nominal value, the bad cooling, the overrated residual ripple. All above parameters were carefully selected to ensure the longest possible life time for 5180 illuminator.

#### CAUTION / WARNING

**Ventilation is usefull unless the air-holes are not blocked off.**

The color temperature is almost constant at 5900°K during the whole life of the lamp.



WARNING