# Gebrauchsanweisung

# UV-Crosslinker

**Von Cleaver Scientific**

**1782.1**
**1778.1**
**1777.1**

**Kompaktes Gerät für vielseitige Anwendungen in der Molekularbiologie**

- Fixierung von Nukleinsäuren auf Nylon- oder Nitrocellulosemembranen
- Southern- oder Northern Blot, Dot-Blot und Kolonie- oder Plaque-Lifts
- Beseitigung oder Reduzierung von PCR-Kontaminationen
- Nicking Ethidiumbromid-gefärbter DNA in Agarosegelen
- Erzeugung von Restriktionsschnitt-hemmenden Thymin-Dimeren
- Screening auf RecA-Mutation
- UV-Härtung von Polymeren, Klebstoffen und Druckfarben
- UV-Sterilisation

## Ausstattung

- Programmierbare Mikroprozessorsteuerung
- Automatische Überwachung der UV-Energie
- Kompakte Standfläche mit großem Innenraum
- Sichtfenster mit UV-Schutz
- Folientastatur-Bedienung
- Übersichtliches LED-Display
- Sicherheitsverriegelung

## Technische Daten

| | |
|---|---|
| UV-Quelle | 5 x 8 W UV Glühbirnen (365, 312 oder 254 nm) |
| Einwirkzeit | 0-999,9 min. |
| Energiebereiche | 0-99,99 J oder 0-9,999 J |
| Innenmaße | 26 x 33 x 14,5 cm (B x T x H) |
| Standfläche | 35 x 36 x 30,5 cm (B x T x H) |
| Gewicht | 10,5 kg |
| Steuerungen | 9 voreingestellte UV-Energieniveaus |
| | 9 voreingestellte Einwirkzeiten |
| | manuelle Einstellung des UV-Energieniveaus |
| | manuelle Einstellung der Einwirkzeit |

| | |
|---|---|
| **UV-Crosslinker – Kurzwelliges Licht (254 nm)** | **1782.1** |
| **UV-Crosslinker – Mittelwelliges Licht (302 nm)** | **1778.1** |
| **UV-Crosslinker – Langwelliges Licht (365 nm)** | **1777.1** |

**Weitere Informationen zum Produkt finden Sie in der anhängenden Cleaver Gebrauchsanleitung.**

# Instructions for use

# UV-Crosslinker

**By Cleaver Scientific**

**1782.1**
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**1777.1**

### Compact device for versatile applications in molecular biology

- Fixing of nucleic acids to nylon or nitrocellulose membranes
- Southern or Northern blotting, dot blotting and colony or plaque lifts
- Elimination or reduction of PCR contamination
- Nicking ethidium bromide stained DNA in agarose gels
- Creation of restriction cleavage inhibiting thymine dimers
- Screening RecA mutation
- Ultraviolet curing of polymers, adhesives and inks
- Ultraviolet sterilization

### Equipment

- Programmable microprocessor control
- UV energy monitored automatically
- Compact footprint with large interior
- Observation window - UV blocking
- Membrane keypad operation
- Clear LED display
- Safety interlocked

### Technical Data

| | |
|---|---|
| UV Source | 5 x 8 W UV bulbs (365, 312 or 254 nm) |
| Exposure Time | 0-999,9 minutes |
| Energy Ranges | 0-99,99 J or 0-9,999 J |
| Inner dimensions | 26 x 33 x 14,5 cm (w x d x h) |
| Footprint | 35 x 36 x 30,5 cm (w x d x h) |
| Weight | 10,5 kg |
| Controls | 9 preset ultraviolet energy levels |
| | 9 preset exposure times |
| | manual UV energy level setting |
| | manual exposure setting |

**For further information, see Cleaver Instruction Manual below.**


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gh 07/2021



| | |
|---|---|
| **UV-Crosslinker – Short Wave (254 nm)** | **1782.1** |
| **UV-Crosslinker – Medium Wave (302 nm)** | **1778.1** |
| **UV-Crosslinker – Long Wave (365 nm)** | **1777.1** |

UVITEC
CAMBRIDGE

# ➔ CROSSLINKER CL-508 user manual

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# General

The **CROSSLINKER®** (CL-508) is a complete, microprocessor controlled UV irradiation system, mainly dedicated to the linking of nucleic acid to membranes and elimination of PCR contamination. Its innovative design ensures unique features:
**Microprocessor controlled**. The programmable microprocessors constantly monitor the UV light emission. The irradiation stops automatically when the energy received matches the programmed energy.
**Reproducibility**: Thanks to its UV sensors, irradiation cycles are perfectly reproducible, regardless of intensity fluctuation of the UV source. Just programme your energy and **CROSSLINKER®** delivers it!
**Durability:** CROSSLINKER combines the latest technology with a very high quality of components: UV exposure chamber in stainless steel, protective quartz disk on the UV sensor cell, highly resistant tactile membrane keypad...
**Ease of use**: The readout display and the large number of presets, in either energy unit (Joules/cm²) or time unit (seconds) makes the **CROSSLINKER®** a very simple instrument to use while very powerful.
**Consistent measure:** The UV light intensity is captured in a well of light, positioned above the irradiation chamber. The UV cell measure is then collected from all the UV tubes and not just one. This also protects the UV cell from any dirt which can enter the chamber.

- Microprocessor control
- Precise irradiation in either energy (Joules/cm²) or time (seconds)
- Preset programme for dosage of 0.120 J/cm² to optimised nucleic acid immobilisation
- 9 preset programmes for UV energy exposure
- 9 preset programmes for time exposure
- Manual setting of UV energy or time exposure
- Storage of the last UV setting
- Tactile membrane keypad
- Large L.E.D. readout
- Protective quartz disk on the UV sensor cell
- Spacious UV exposure chamber in stainless steel
- Safety interlock door with UV blocking observation window
- Automatic restart with no loss of information if breaking-off of circuit
- Dual safety fuses
- UV wavelength interchangeability

All our **CROSS-LINKER®** come equipped with the following:
- Touch panel membrane keypad
- Large led readout
- No loss of information if circuit interrupted
- Storage of the last UV setting (energy and time)
- Internal safety interlock
- UV blocking viewing window
- Large stainless steel internal UV exposure chamber
- Removable power cable

## ➔Warning / on the safety

a)This unit must be connected to a wall outlet having protective earth terminal. Connecting to ground is an obligatory protection.
b) To prevent fire or shock hazard, do not expose the unit to rain or moisture.
c)Unplug the unit from the wall outlet if you do not use it for a long time. Disconnect the power cord by grasping the plug. Never pull the cord itself.
d) Never obstruct the air admission grids of the unit.
This symbol is warning against a possible UV radiation. Protect the eyes and skin from the UV radiation.

## ➔Climatic conditions

- Altitude: ≤ 2000 meters
- Operating humidity: 20% to 80% (no condensation allowed)
- Operating temperature: 5°C to 33°C

## ➔ Type of fuse

. Type FST
. Time-lag T
. Ø 5 x 20

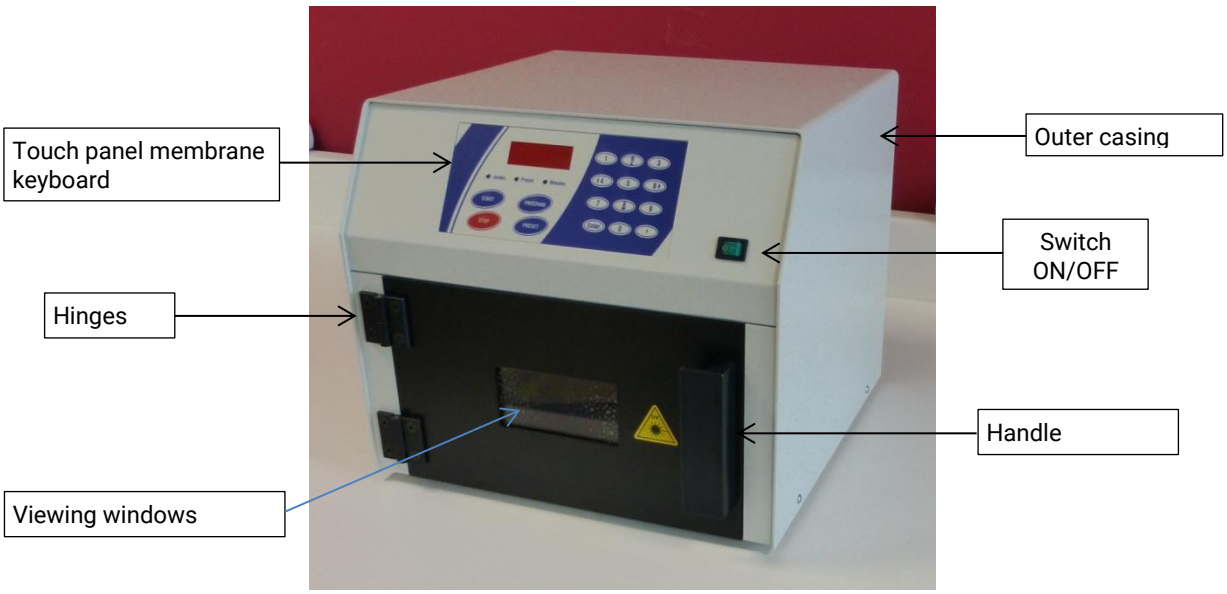
## ➔Power

See the power values for each item in the spare parts and characteristics board on the page 7.

# Characteristics and dimensions

## ➔ Operating Instructions

| | |
|---|---|
| • **EXTERNAL DIMENSIONS** | height : 30.5cm<br>depth : 36cm<br>width : 35cm |
| • **INTERNAL CHAMBER DIMENSIONS** | height : 14.5cm<br>Depth : 33cm<br>width : 26cm |
| • **WEIGHT** | 10 kg |
| • **ULTRAVIOLET WAVELENGTH** | 254nm, 312nm or 365nm |
| • **ULTRAVIOLET SOURCE** | 5 x 8-watt tubes |
| • **MULTIPLE SET FUNCTIONS** | 9 preset UV Energy exposures<br>9 preset UV exposure Time<br>manual setting of UV Energy exposure<br>Min.0.025 Joules / Max. 99.99 Joules<br>manual setting of UV exposure Time<br>Min.10 Seconds / Max.599 Minutes |
| • **ENERGY DISPLAY** | 2 measurement ranges:<br>from 0.000 to 9.999 Joules<br>from 00.00 to 99.99 Joules |
| • **EXPOSURE TIME DISPLAY** | 2 measurement ranges:<br>from 00.00 to 99.59 Minutes/Secondes<br>from 000.0 to 599.5 Minutes/ |




**WARNING**
**UV radiation can be dangerous for unprotected eyes and skin, therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).**

# Setting-up and descriptions

## ➔ Installation of the tubes and setting-up

The **CROSSLINKER**® (CL-508) is delivered with a set of tubes to be installed, depending on the wavelength chosen when ordering.

**Step 1 :**

- Install the **CROSSLINKER®** on a work surface. Make sure there is enough space at the front for easy opening of the door.

**Step 2 :**

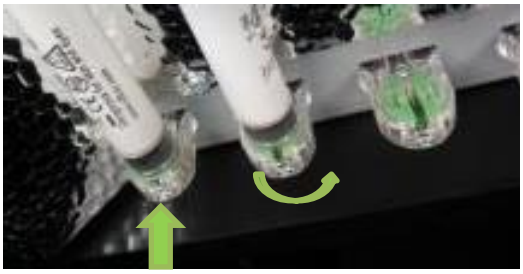
- Open the door of your system

**Step 3 :**

- The system must not be connected to a power source.


**Step 4 :**

- Install the tubes:
Insert the tubes into the sockets and rotate the tube until it feels a notch (1/4 turn), see photo opposite.
Advice:
For left-handed people, start with the right tube.
For right-handed people, start with the left tube.



**Step 5 :**

- Connect the unit to a earthed power supply.
- Switch ON position.

**Step 6 :**

- The display will show the value of the last irradiation in Joules, with the green light on (when first started, the display will show the factory values).

All **CROSSLINKER®** are configured with 254nm tubes. Calibration is planned for all 3 wavelengths. A calibration certificate is provided with each SET.

- **If you use the wavelength 254 nm, your BIO-LINK® (BLX) is ready to use.**
- **For wavelengths 312 and 365, please follow step 7.**

**Step 7 :**

- Press and hold the [ENTER] key for 5 seconds, set the ON/OFF switch to the ON position.
- The **CROSSLINKER®** indicates the previous wavelength (example: L.254).
- Release the [ENTER] key, the display flashes.
- To select the new wavelength, scroll through the three possibilities:

  - [L.254; L.312, L.365] using the sliders "▼ key 8" "▲ key 2"

- Once the wavelength corresponding to the tubes installed is displayed, press the[ENTER] key

## ➔Description of the different possible irradiation modes:

Different irradiation settings are available:

A. Irradiation in Joules with manual setting
B. Irradiation in Time with manual setting
C. Irradiation in Joules by preset setting
D. Irradiation in Time by preset setting

**WARNING : UV radiation can be dangerous for unprotected eyes and skin, therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).**


## A. Irradiation in Joules with manual setting

- When activated, the display shows the value in Joules of the last irradiation, the green-light is on (fi.: 0,120 J/cm²).
- If this setting suits you, press [START], the display will begin to countdown.
- At the end of the irradiation, the unit will automatically stop and will beep to signal the end of the cycle.
- If the displayed value does not suit you, enter directly on the touch panel membrane keypad another value, then press [ENTER] (the setting is stored only if an irradiation cycle is started).
- To start the irradiation, press [START], the display will begin to countdown.
- This new setting is now stored and will be displayed at each start-up or each change of setting mode.

## B. Irradiation in Time with manual setting

- When activated, the display shows the value of the last irradiation in Joules mode, the blue-light (JOULES) is on.
- Press [PROGRAM] to change to Time mode, blue-light(MINUTES) is on.
- The display shows the value of the last irradiation in minutes and tenth of minute.
- If this setting suits you, press [START], the display will begin to countdown.
- At the end of the irradiation, the unit will automatically stop and will beep to signal the end of the cycle.

You can change the UV exposure time directly by pressing the touch panel membrane keypad (note: in minutes and tenth of minute), then press [ENTER] (the setting is stored only if an irradiation cycle is started).

- To start the irradiation, press [START], the display will begin to countdown.
- At the end of the irradiation, the CROSS-LINKER® will automatically stop and this new setting is stored and will be displayed at each return in Time mode.

## C. Irradiation in Joules by preset setting

- In Joules mode, your CROSS-LINKER® can receive 10 preset settings, the code 0 being factory set at 0,120 J/cm² (this setting is fixed and cannot be deleted). the 9 others are available numbered from 1 to 9.
- To enter a preset setting, select the Joules mode by pressing [PROGRAM], the green-light is on.
- Enter the value of the setting on the touch panel membrane keypad, then press [ENTER].
- Press [PRESET], the blue-light (PRESET) is on.
- Press [ENTER], the display will show [P. ]. Select a code number from 1 to 9 for your setting on the touch panel membrane keypad (fi. : "3"). Your setting is stored under code 3.

**NOTE**: In [PRESET] mode, with blue-light(PRESET) on, if no value is set within 20 seconds, the unit will return to initial Joules or Time mode

To start an irradiation using a Joules preset setting, press [PROGRAM] to select Joules mode, the blue-light(JOULES) will be on.
Press [PRESET], the blue-light (PRESET) is on, and enter on the touch panel membrane keypad the code number of the required preset setting (fi. : "3").
The display will show the value of the preprogrammed code 3.
Press [START], the display will begin to countdown.
At the end of the irradiation, the unit will automatically stop and will beep to signal the end of the cycle.
The setting of the programmed code 3 is stored and will be displayed at each start-up or each change of setting mode
To delete a displayed setting, press [STOP], the display will show [0.000]

**CAUTION**: In Joules or Time mode, it is possible to preset a new setting under a code already used. The old value will be deleted for the new one.

At the end of the irradiation cycle, open the door and remove your sample.

**NOTE**: During an irradiation cycle, you can stop by pressing [STOP]. The irradiation is stopped and the display will show the total value of the setting. In that case it is not possible to restart the irradiation.
Opening the door during an exposure cycle will immediately stop the irradiation, thus protecting the user from the Ultraviolet radiation. Re-closing the door will restart the irradiation where it stopped.

## D. Irradiation in Time by preset setting

- In Time mode, your CROSS-LINKER® can accept 9 preset settings. These preset settings are numbered from 1 to 9.
- To enter a preset setting, press [PROGRAM] to select Time mode, the blue-light(MINUTES) is on.
- Enter the value of the setting on the touch panel membrane keypad (in minutes and tenth of minute), then press [ENTER].
- Press [PRESET], the blue-light (PRESET) is on.
- Press [ENTER], the display will show [P. ]. Select a code number from 1 to 9 for your setting on the touch panel membrane keypad (fi. : "5"). Your setting is stored under code 5.

**NOTE**: In [PRESET] mode, with blue-light(PRESET) on, if no value is set within 20 seconds, the unit will return to initial Joules or Time mode

- To start an irradiation using a preset Time setting, press [PROGRAM], to select Time mode, the blue-light(MINUTES) will be on.
- Press [PRESET], the blue-light (PRESET) is on, and enter on the touch panel membrane keypad the code number of the required preset setting (fi. : "5").
- The display will show the value of the preprogrammed code 5.
- Press [START], the display will begin to countdown.
- At the end of the irradiation, the unit will automatically stop and will beep to signal the end of the cycle.
- The setting of the programmed code 5 is stored and will be displayed at each start-up or each change of setting mode.
- To delete a displayed setting, press [STOP], the display will show [000.0].

**CAUTION**: In Joules or Time mode, it is possible to preset a new setting under a code already used.
The old value will be deleted for the new one.

-at the end of the irradiation cycle, open the door and remove your sample.

**NOTE**: During an irradiation cycle, you can stop by pressing [STOP]. The irradiation is stopped and the display will show the total value of the setting. In that case it is not possible to restart the irradiation.
Opening the door during an exposure cycle will immediately stop the irradiation, thus protecting the user from the Ultraviolet radiation.

**WARNING : UV radiation can be dangerous for unprotected eyes and skin, therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).**

# Application

The **CROSS-LINKER®** CL-508 is a polyvalent UV 254nm irradiating system mainly dedicated for the following applications in the laboratory:

Crosslinking of DNA and RNA by covalently binding nucleic acids to nitrocellulose or nylon membranes for Southern, Northern, dot or slot blots procedures (1-2-3)

To operate the **CROSS-LINKER®** CL-508, you preset the UV Energy required in Joules/cm². (10 preset UV Energy exposures and manual setting). A factory preset UV dosage of 0.120 Joules/cm² has been stored (preset 0) for the linking of nucleic acids. This setting has been found to be the optimal dosage for DNA attachment and hybridization signal sensitivity:

- Nicking of Ethidium Bromide stained DNA in agarose gel (4)
- Partial restriction endonuclease digestion by formation of thymine dimers (5)
- RecA mutation screening (6)
- Elimination of PCR contamination (7)
- The CROSS-LINKER® CL-508 is useful for other applications such as UV sterilisation, UV curing of polymers, etc…

The **CROSS-LINKER®** CL-508 is also available in 312nm and 365nm.

## ➔ References


1. Khandjian, E.W. Biotechnology 5 February 1987
2. Khandjian, E.W. Mol.Biol.Rep., 11:107-115, 1986
3. Church, GM & Gilbert W., Proc.Nath.Acad.Sci. 81. 1991-1995-1984
4. Vollrath, D & Davis, R.W. Nucl.Acids.Res. 15 : 7865-7876, 1987
5. Whittaker, P.A. Southern E.M. Gene 41 : 129-134, 1986
6. J.Sambrook, E.F. Fritsch & Maniatis, T.Molecular Cloning : A Laboratory Manual Cold Spring Habor Laboratory
7. Wilson. K.H. Biotechniques Vol.2, n] 2, 1992, UV Absorption Complicates OCR Decontamination

### ➔ Spare parts

| Ref. Article | Tubes | | | | Starters | Fuse Ø 5 x 20 | | Power |
|---|---|---|---|---|---|---|---|---|
| | Qty | Ref. | Wavelength | W | ST-151 FG7-P (100V) | 230 V~ 240 V~ | 100 V~ 115 V~ | |
| CL-508G _ Set of 254 nm | 5 | T-8.C | 254nm | 8W | 5 | 2 A | 2 A | 65 W |
| CL-508BL _ Set of 365 nm | 5 | T-8.L | 365nm | 8W | 5 | 2 A | 2 A | 65 W |
| CL-508M _ Set of 312 nm | 5 | T-8.M | 312nm | 8W | 5 | 2 A | 2 A | 65 W |


**WARNING**
**UV radiation can be dangerous for unprotected eyes and skin, therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).**


## Maintenance / Cleaning

Before cleaning, unplug your unit.
Clean the outside of the CROSS-LINKER® with a slightly wet sponge and wipe with a soft cloth.
The viewing window must be cleaned with a soft cloth and alcohol.
The stainless steel chamber must be cleaned with a soft cloth and alcohol.

ATTENTION : NEVER USE SOLVENTS OR ABRASIVE PADS.

### ➔ Changing Tubes

Obtain from your distributor:

6 x 8 Watt tubes in the same wavelength as your unit (see table of spare parts).

Open the door of your CROSS-LINKER®.
Remove the old tubes. A quarter turn will release the tubes.
Replace with the new tubes.

ATTENTION: Check the unit functions correctly only after completely reassembling. To reassemble, follow the above instructions in reverse order.

### ➔ Changing the Wavelength

You have chosen a CROSS-LINKER® equipped with one of the 3 available wavelengths. It is always possible to change this wavelength and use your CROSS-LINKER® for other applications as follows:

Before any servicing, unplug the unit.
Open the door of your CROSS-LINKER®.
Remove the 6 tubes (a quarter turn will release them).
Replace with the 6 tubes in the new wavelength.
Close the door of your CROSS-LINKER®.
Plug the unit.
Press [ENTER] during 5 seconds and keep holding it, put the ON/OFF switch to the ON position.
The CROSS-LINKER® will display the previous wavelength (example [L.254]).
Release the [ENTER], the display will flash.
To select the new wavelength, display one after another the 3 possibilities:

[L.254; L.312, L.365] with the cursor "▼ key 8"  "▲ key 2"

Once the wavelength corresponding to the tubes is displayed press [ENTER]

# Warranty

Our products (except Compact Flash®, light tubes and filters) are warranted against faulty construction or defective material for a period of TWO YEARS from the date of supply. Our products are not warranted for damage due to carelessness, incorrect use or bad maintenance.
The following defects are also specifically excluded:
- Defects caused by improper operation.
- Repair or modification done by anyone other than UVITEC or an authorised agent.
- Corrosion caused by improper solvents or samples.
- Use of spare parts supplied by anyone other than UVITEC.
- Damage caused by accident or misuse.
- Damage caused by disaster.

This instrument should not be modified or altered in any way. Modification or alteration of this instrument will:
1. Void the manufacturer's warranty.
2. Void the conformity certifications.
3. Create a potential safety hazard.

The Compact Flash®, the tubes and the filters are not covered by our warranty.

The use of consumable products or non-original spare parts not recommended by our service department is at the user's own risk and therefore automatically invalidates the warranty.

Tubes, filters, batteries and consumable products are not included in the warranty.

We reserve the right to decide where the faulty goods will be repaired (in our workshop or elsewhere), and whether or not the faulty part is to be replaced; all other freight charges incurred being at the cost of the purchaser.
Returned goods will not be accepted for repair unless previous written authorisation is obtained from our service department. A request for authorisation must be accompanied by an itemised list of products, model numbers and the corresponding invoice numbers under which they were originally shipped.

All returned goods should have a certificate of decontamination.

The Buyer must bear all costs and risks incurred during the transportation of the goods from their collection at UVITEC warehouse.

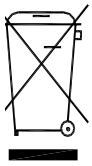
In the case UVITEC incorporates some devices or equipment from another supplier in the manufacture of its products, the extent and the duration of the warranty will be those conceded by the suppliers or sellers.

Manufacturer cannot be held responsible for any loss, bodily injury or material accident incurred by any failure of this supply, whatever the origin of this failure may be.

The responsibility of Manufacturer is strictly limited to its staff and to its own supplies.

In the case of dispute, only the commercial court of Cambridge (United Kingdom) shall be competent, even in third party claims proceedings or when there are several co-defendants.

NOTE: UVITEC is not responsible for any injury or damage caused by use of this instrument for purposes other than those for which it is intended, or by modifications of the instrument not performed by UVITEC.



The buyer ensures and finances the decontamination, the collection and the disposal of waste electrical and electronic equipment (WEEE) under the conditions provided in the Articles 21 and 22 of the Decree No. 2005-829 dated of 20 July 2005.

Improper disposal may be harmful to the environment and human health.

# Declaration of conformity

CE

The materials complies with the requirements of the EC Directive 2004/108/EEC, 2006/95/EEC and EN 61010-1 (electro-magnetic compatibility and low voltage).
The electro-magnetic susceptibility has been chosen at a level that gains proper operation in residential areas, on business and light industrial premises and on small-scale enterprises, inside as well as outside of the buildings. All places of operation are characterized by their connection to the public low voltage power supply system.