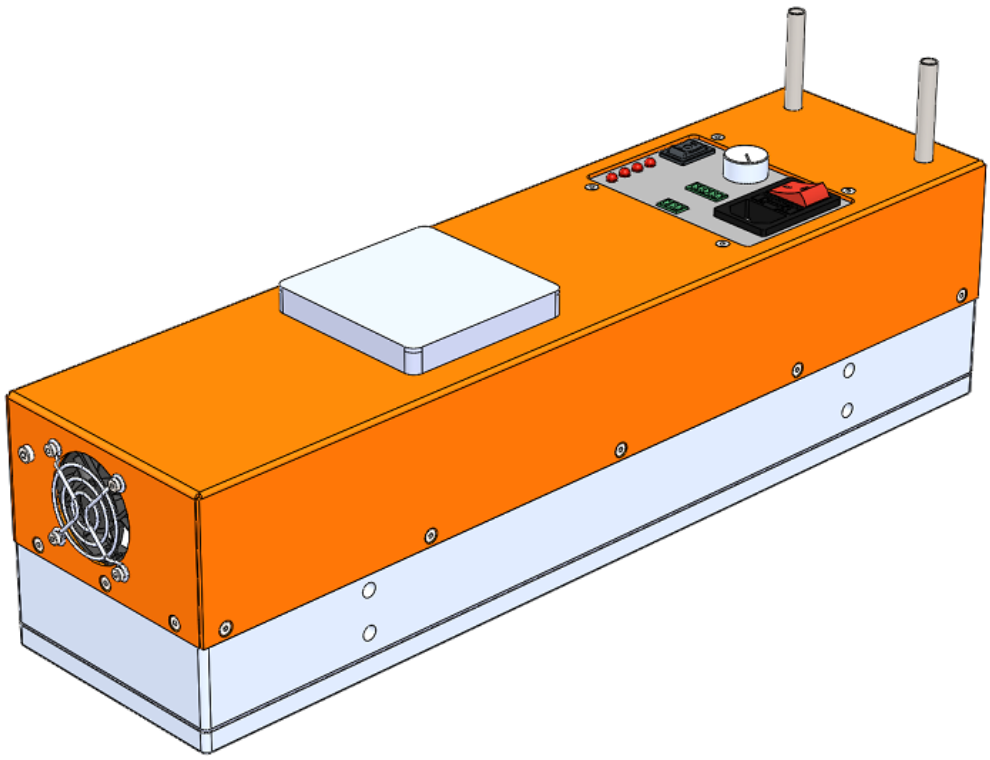
Radium

XERADEX
Irradiation System
XIS 250x80



User instruction
Rev. 2.1 – 02/2026

XERADEX® XIS 250x80

User instructions – Excimer irradiation system

Revision 2.1 - 02/2026

Content

Revision History

Rev.	Date	Description
1.1	2026-01-15	added RS485 command list; failure table refined
1.2	2026-02-04	Safety instructions revised
2.1	2026-02-14	Version number changed

Product Name / Model	XERADEX® XIS 250×80 – Excimer Irradiation Module
Manufacturer	Radium Lampenwerk GmbH, Dr.-Eugen-Kersting-Str. 6, 51688 Wipperfürth, Germany
Document ID	OKM_4105575
Version / Date	2.1 / 2026-02-14
Original Language	English

1 Safety instructions and important notes

 Important notes	• Read this manual before installation and operation. • Operate only by qualified and trained personnel. • Do not use the XIS Module if damaged, moist or condensation-covered. • Use only in fixed installations with proper protective earth (PE). • Operate under supervision. • Follow all safety and environmental requirements in this document. • Do not use unapproved lamp types or operate with covers removed.
 UV-C radiation	• UV-C can severely damage eyes and skin; risk of cancer. • Do not look into the module during operation. • Keep distance during operation. • Approach only with UV-rated eye and skin protection.
 Ozone	• Lamps that emit wavelengths < 200 nm (e.g., 172 nm) may generate ozone; ensure ventilation and observe exposure limits. • For ozone-producing lamps, nitrogen purging is mandatory.
 Explosive	• Keep explosive gases/liquids away from the XIS Module. • HV pulses (> 4 kV) can ignite flammable materials near the module, lamp or cables. • Ensure correct grounding.
 High Voltage	• High voltage present inside. • Contact with live parts can cause severe injury or death. • Housing must be closed and properly PE-grounded during operation.
 EMC-Shielding	• The ballast inside the XIS Module is a high-frequency generator. • Therefore, the ballast, XERADEX lamp, and the cable between them are embedded in a closed high-frequency shielded unit connected to ground.
 Thermal limits	• Operate only within the specified ambient temperature and cooling conditions. • If unusual effects occur (e.g., flickering), switch off immediately and have the device inspected.

2 Legal Framework and Conformity

This product is intended to comply with the following EU legislation:

- 2014/35/EU Low Voltage Directive (LVD) – electrical safety
- 2014/30/EU Electromagnetic Compatibility (EMC) – emissions/immunity
- 2011/65/EU RoHS (incl. (EU) 2015/863) – hazardous substances
- 2012/19/EU WEEE – end-of-life marking/information

User information and warning format follow IEC/IEEE 82079-1; UV user information and labeling follow EN/IEC 62471 and EN IEC 62471-6 (UV lamp products). Employer obligations for workplace exposure to artificial optical radiation are governed by Directive 2006/25/EC.

3 General Information

The XIS 250×80 is a compact excimer UV irradiation module for industrial and laboratory applications. It provides local control (front panel) or external control (analog or digital) to operate compatible XERADEX® lamps (e.g., 172 nm, 222 nm, 308 nm).

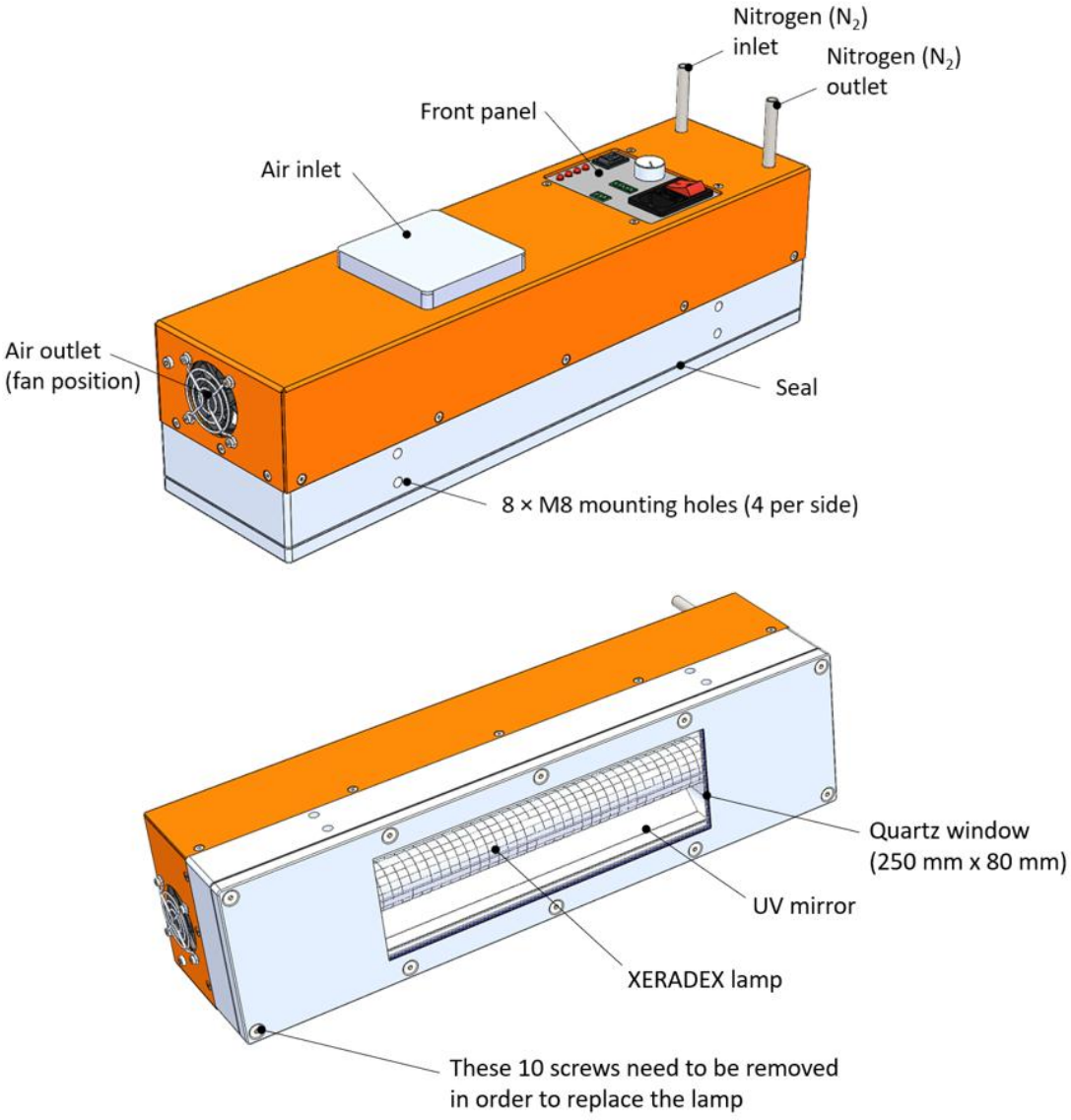


Figure 1: XIS Module

4 Installation

4.1 Location and Mounting

Install in a dry location with ambient temperature below 40 °C. Mount in any orientation provided ventilation openings remain unobstructed. Secure the unit using the provided mounting interfaces (M8 mounting holes).

4.2 Cooling Requirements

Keep the air inlet (top) and the outlet (front) clear at all times. During continuous operation, the underside (lamp area) can reach approx. 60 °C.

4.3 Nitrogen Purging (ozone-producing lamps)

Pre-purge with nitrogen (N_2) until oxygen is removed. The internal pressure must not significantly exceed ambient (recommended: 20–50 mbar above ambient), otherwise the quartz exit window could be damaged or destroyed by excessive pressure. Keep the outlet open so nitrogen can escape. To prevent air backflow during purging, it is recommended to connect a hose (inner diameter 4–8 mm, length ~30 cm) to the outlet. Measure and set the flow in Nl/min using a flow meter.
Recommended nitrogen flow:

- Pre-purge ~5 Nl/min for ~10 minutes
- During operation ≥ 1 Nl/min to maintain the nitrogen atmosphere

5 Control and operation

Front panel view

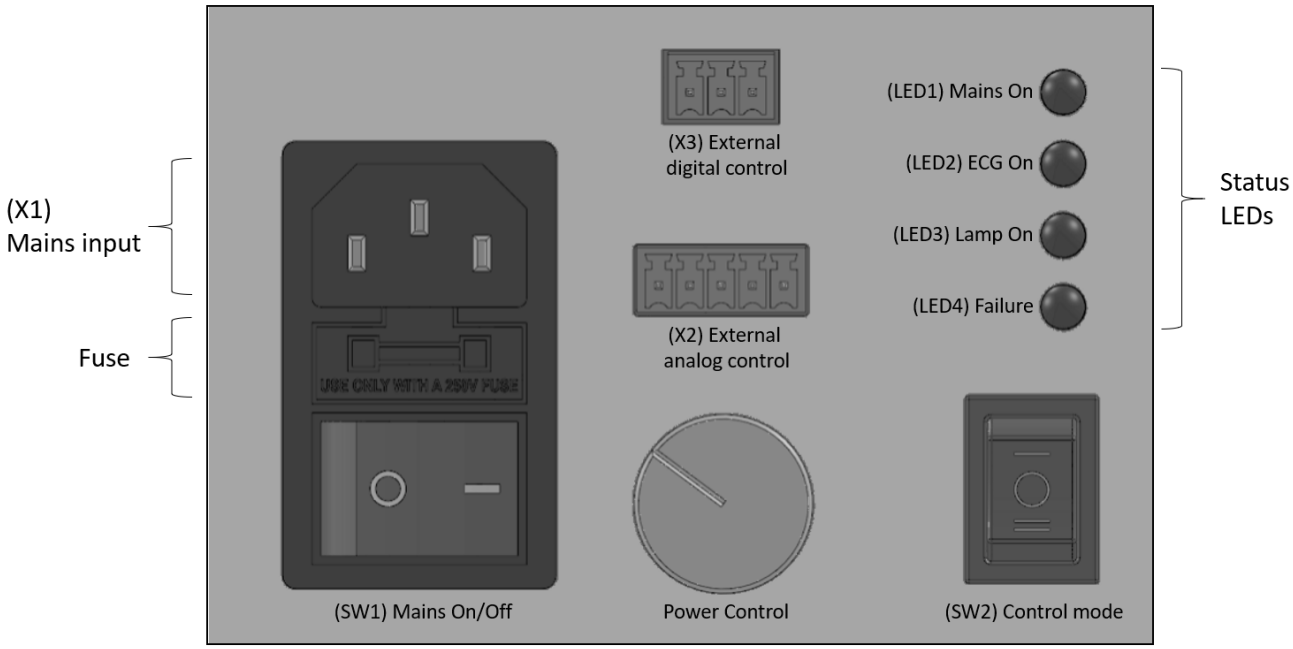


Figure 2: Front panel view with module control components

5.1 Power-Up and Mode Selection

Connect the module to the mains supply with protective earth.

- Set SW1 (Main Power) to “On”
- The cooling fan starts and the ECG is powered
- “Mains On” LED indicates readiness.
- Select the control mode (internal or external) using SW2.

A. Internal Operation (Front Panel Control)

- Set SW2 to “On” to enable the ECG.
- LED 2 (“ECG On”) will light up.
- Once the lamp ignites, LED 3 (“Lamp On”) will illuminate.
- Adjust lamp power using the front-panel rotary knob.

B. External Operation (analog or RS485 automation)

- Set SW2 to “Ext.”.
- The XIS Module can now be completely controlled externally, either via the analog interface (X2) or digitally through the RS485 interface (X3).

Analog Interface X2

Pin	Signal	Description
1	Dim input	Power control (Default: 4…20 mA; optional 0…10V)
2	On/Off	Lamp enable input (active when voltage > 3 V)
3	Lamp OK	Lamp status feedback
4	Reserved	Not connected
5	GND	Ground

Table 1: Analog interface / X2 Pin Assignment

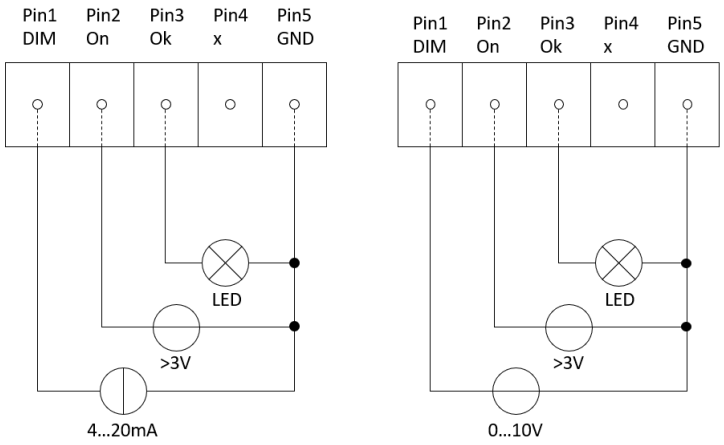


Figure 3: Dim Setting 4...20mA (left side) and 0...10V (right side)

Important: The dim input is factory-configured: standard is 4–20 mA. A 0–10 V option must be explicitly ordered in advance and cannot be changed by the customer after delivery.

Digital Interface X3 (RS485)

Pin	Signal	Description
1	RS485 A	RS485 data line A
2	RS485 B	RS485 data line B
3	GND	Ground (optional)

Table 2: Digital Interface / X3 Pin Assignment

RS485 Commands

Command	Description
E0	Disable lamp
E1	Enable lamp
E?	Read lamp enable state
Pxxx	Set power level (000…100 %)
P?	Read current power level
P-	Read minimum power level
P+	Read maximum power level
L?	Read lamp status (OK / Fail)

Table 3: RS485 Commands

Communication Parameters

- Baud rate: 9600
- Data format: 8 data bits, no parity, 1 stop bit (8N1)
- Protocol: ASCII text commands
- Each command must end with CR or LF

5.2 Status Indication (Front Panel LEDs)

LED	Label	Meaning
1	Mains on	Mains supply active
2	ECG on	Ballast enabled
3	Lamp OK	Lamp operating correctly
4	Failure	Fault condition detected

Table 4: Front panel status LEDs

When the lamp operates correctly, LEDs 1–3 light green. If the lamp is switched on but fails to operate, LED 1 (green) and LED 4 (red) will be illuminated. LEDs remain active in both Internal and External Mode.

Failure detected

If LED 4 (Failure) is illuminated, the module must be switched off immediately and disconnected from the mains supply. A fault condition indicates that the lamp or the internal control system is not operating correctly.
First, inspect the XERADEX lamp for possible defects such as cracks, discoloration, loose components, or other irregularities. If any abnormality is found, the lamp must be replaced before the system is operated again.

If no visible fault can be identified on the lamp or within the lamp compartment, the device must be checked by qualified service personnel. Operation should not be resumed until the cause of the failure has been determined and corrected. An overview of possible fault conditions that can trigger a failure state, and therefore cause LED 4 to illuminate, can be found in Annex D: Failures.

6 Instant off mode and complete shutdown

6.1 Instant off mode (short interruption)

Set SW2 to "Off" while SW1 remains "On" or when controlled externally apply 0 V to interface X2 Pin 2 or send command E0 to interface X3 via RS485. Only the lamp switches off. The ballast and cooling fan remain powered, enabling an immediate restart when SW2 is set to "On" or the corresponding external signal (analog or digital) is applied.

6.2 Complete Shutdown

Set SW1 to "Off" to power down lamp, ballast, and cooling fan. Allow the module to cool before handling.

7 Maintenance and Lamp Replacement

There are no user-serviceable components inside the XIS Module. To ensure stable UV output and prevent premature degradation, the quartz window must remain free of contamination at all times. If deposits or particles are visible, clean the surface using a soft, lint-free cloth. If required, the cloth may be slightly moistened with isopropyl alcohol.

Do not use abrasive tools, powders, or excessive mechanical force, as these may scratch the quartz surface and reduce optical transmission.

Before any cleaning activity, the module must be switched off, cooled down, and disconnected from the mains supply. Lamp replacement may only be performed by qualified and authorized personnel. The XIS Module is designed exclusively for operation with the specified XERADEX lamp types. The installation of any other lamp type is strictly prohibited.

All XERADEX lamps are fully factory-tested. Nevertheless, each lamp must undergo a visual inspection prior to installation. Check for cracks, discoloration, deformation, loose mechanical components, or any other irregularities. If any deviation is detected, do not install the lamp and contact authorized service personnel.

Lamp replacement procedure

1. Switch off the power supply and disconnect the power cable from the module.
2. Remove the lower housing section by loosening the 10 screws (see Figure 1). Carefully detach it and set the housing part aside
3. Remove the seal and disconnect the lamp connector from the module.
4. Loosen the screws of the metal brackets that hold the clamps securing the lamp, and then remove the lamp.
5. If necessary, adjust the position of the lamp holder to match the new lamp (Position 1 or Position 2; see Figure 4 and Figure 5).
6. Insert the new lamp into the holders and secure it using the metal brackets. Tighten the screws firmly. Reconnect the lamp cable to the module.
7. Re-install the seal and reassemble the housing. Tighten all screws uniformly and securely.

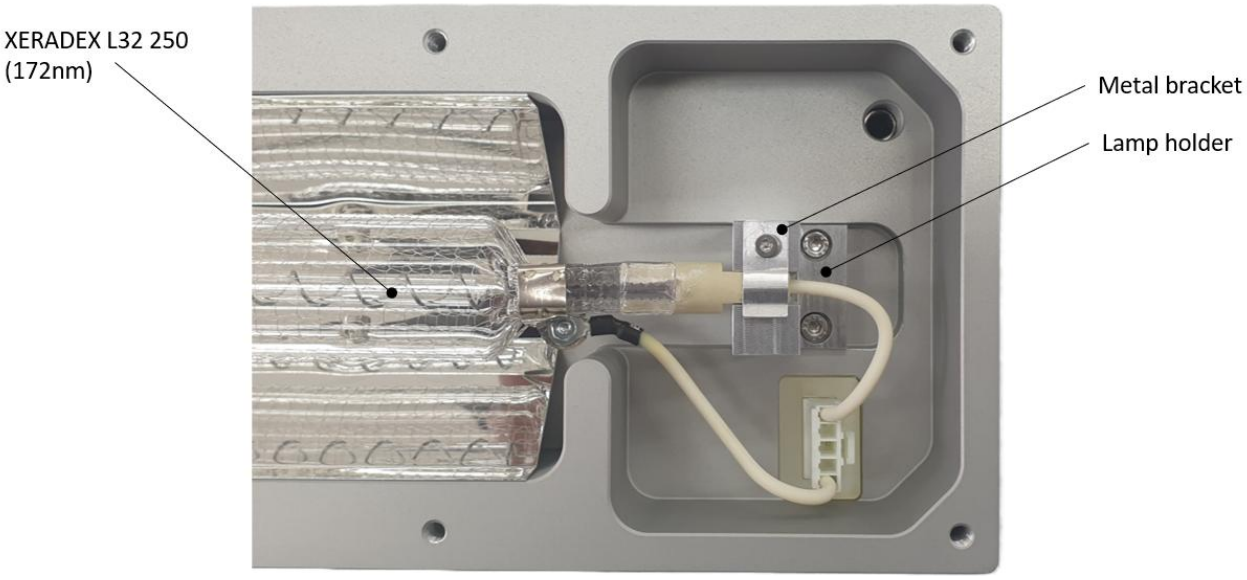


Figure 4: XERADEX L32/250/172 mounted inside

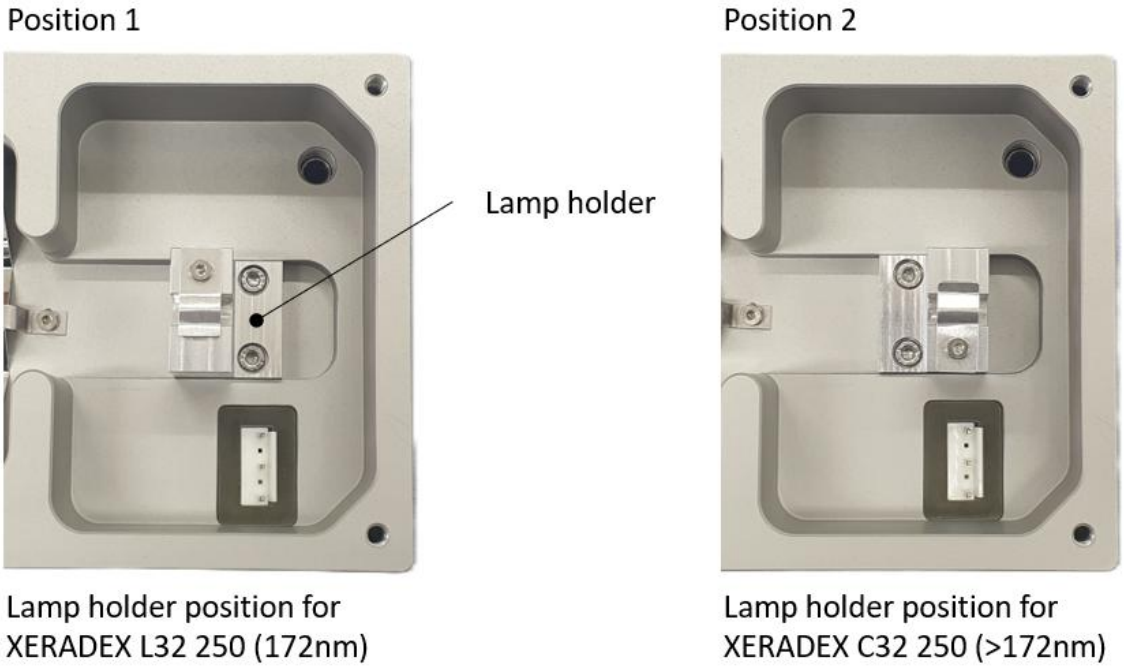


Figure 5: Different holder position for different lamp types

Annex A: Ozone Generation

Radiation below 200nm is absorbed by oxygen, transforming it into ozone and activated atomic oxygen. Ozone is a harmful gas with a strong odor, and exposure can cause eye and respiratory irritation, and other health issues. Use XERADEX in air or oxygen only in a closed system or with an exhaust system to protect the user from ozone exposure.

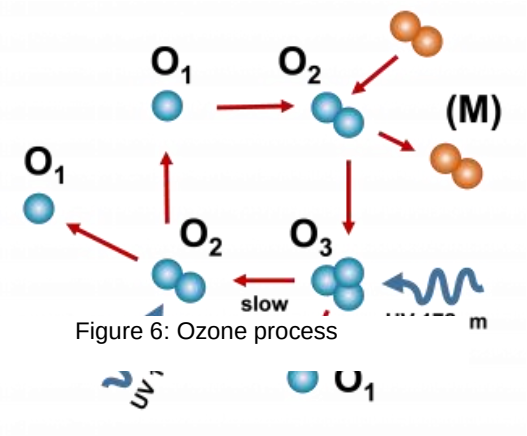


Figure 6: Ozone process

From "**International chemical safety card 0068**":
EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the respiratory tract Inhalation of the gas may cause lung oedema. Inhalation of the gas may cause asthma-like reactions. The substance may cause effects on the central nervous system, resulting in headache and impaired vigilance and performance.
EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Lungs may be affected by repeated or prolonged exposure to the gas.

Annex B: Dimensions and mounting holes

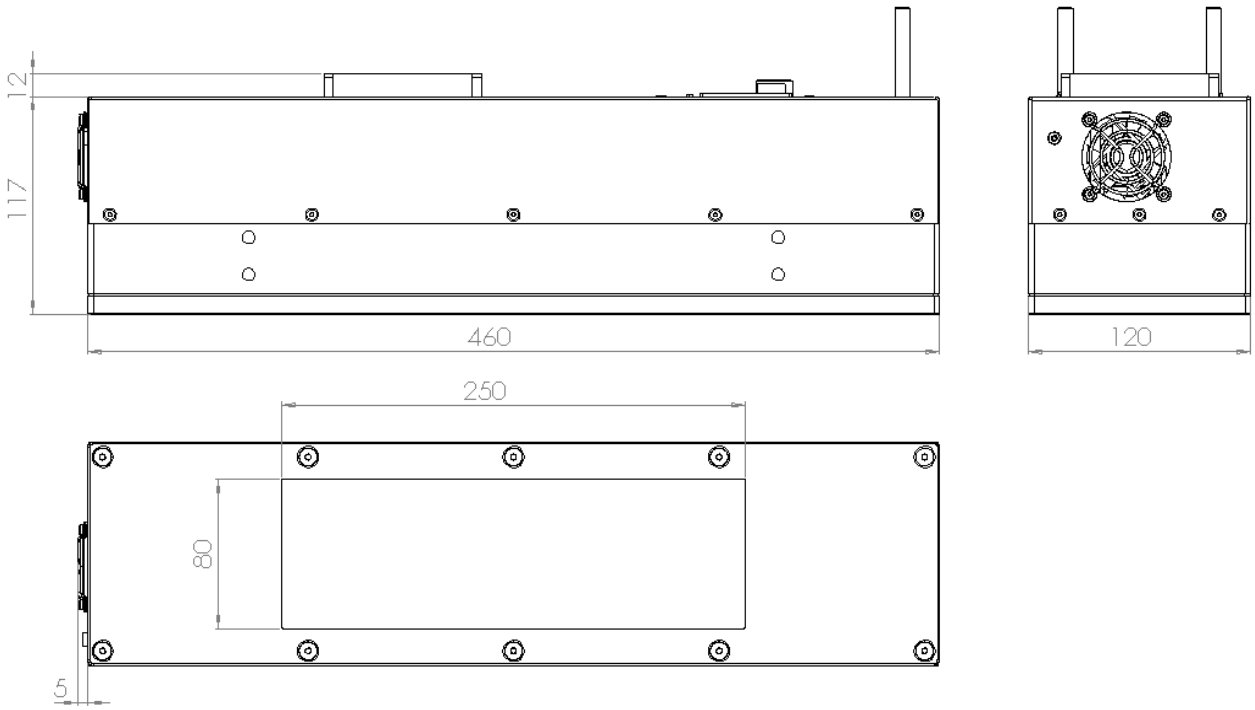


Figure 7: Outer Dimensions

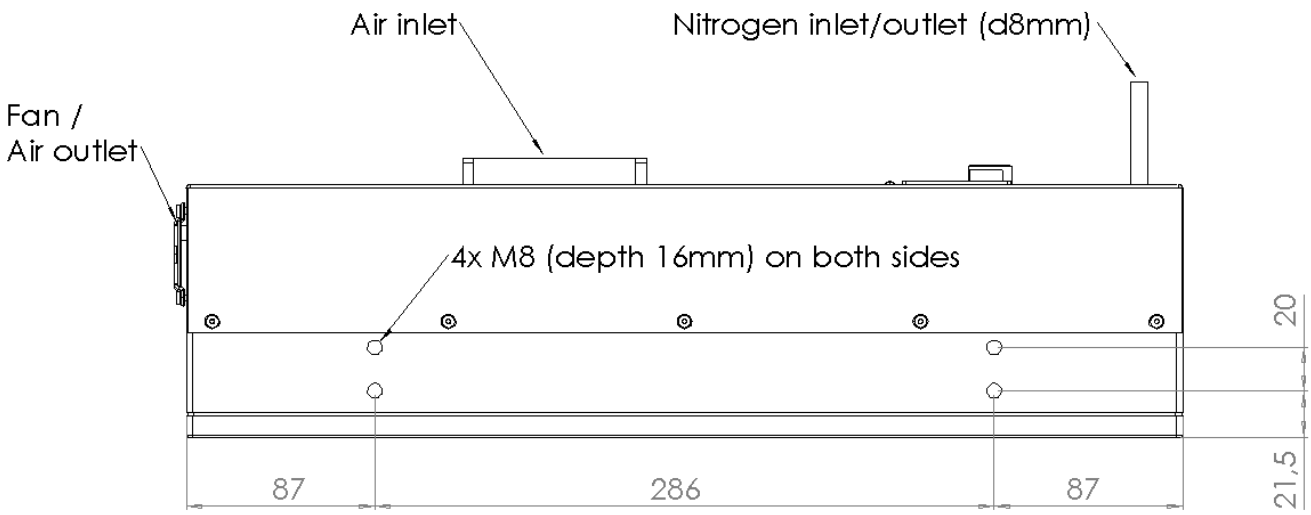


Figure 8: Mounting holes position.

Annex C: Lamp Lifetime and Aging Effects

The XERADEX excimer lamp has a finite service life, which depends on both the lamp type and the operating intensity at which the emitter is used. Over time, natural aging processes occur inside the lamp.
In advanced aging stages, micro-cracks may form in the quartz body of the lamp. Through these cracks, ambient gas can enter the lamp, which disrupts the internal gas composition necessary for proper excimer discharge. Once this occurs, the lamp can no longer operate correctly. The module will detect this condition, trigger a failure indication (LED 4), and shut down automatically to prevent further damage.
In such cases, the lamp must be replaced.
The expected lamp lifetime depends on the specific XERADEX lamp model and its operating conditions. Please refer to the Technical Datasheet of the installed XERADEX lamp for detailed lifetime specifications.

Annex D: Failures

Failure Cause	Technical Background	Required Action
Lamp incorrectly connected	The lamp connector is not fully seated or the contact pins are not properly engaged, preventing correct ignition.	Disconnect the unit from mains, check and reseat the lamp connector, ensure full engagement.
Lamp shows cracks or physical damage	Cracks in the quartz allow ambient gas to enter the lamp, disrupting the excimer discharge. The lamp becomes non-functional.	Do not operate the unit. Replace the lamp.
ECG (ballast) defective	The electronic control gear may no longer supply the correct excitation or high-voltage pulses.	Disconnect from mains; inspection and repair by qualified service personnel required.
Module overheating	Excessive ambient temperature or blocked airflow causes the internal temperature to rise above the safety threshold.	Ensure ventilation openings are unobstructed; verify ambient temperature < 40 °C; let the module cool down.
Cooling fan failure	Insufficient cooling leads to thermal shutdown and triggers the failure condition.	Check fan operation; repair or replace as necessary (qualified personnel only).

The technical data are nominal values. Variations with individual devices are possible. Subject to change without notice. Errors and omissions excepted.

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