

Lumencor Light Engine Manual

PEKA Light Engine



Regulatory Models

Lumencor utilizes regulatory model names for all certified and CE marked products. The regulatory model names are traceable to all regulatory documentation, third party reports and certifications.

“**Regulatory Model: Peka**” is used as a representative model for all certified and CE marked Peka Products.

Emissions

This equipment has been tested and found to comply with the limits of EMC directive 2014/30/EU and FCC part 15 (CISPR 11:+A1:2016). These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Safety Certifications

TÜV SÜD America, CB Certification (IEC 61010-1:2010)

TÜV SÜD America, NRTLus Certification (UL 61010-1:2012/R:2016-04)

TÜV SÜD America, cNRTL Certification (CAN/CSA-C22.2 No. 61010-1:2012/U2:2016-04)

TÜV SÜD America, EN Certification (EN 61010-1:2010)

CE Marking

Low Voltage Directive (2014/35/EU)

EMC Directive (2014/30/EU)

RoHS Directive (2011/65/EU+2015/863/EU)

REACH Regulation (EC) No. (1907/2006/EC)

EU Declarations of Conformity can be found at <https://lumencor.com/company/compliance>



For EU customers discarding end-of-life Lumencor electrical and electronic equipment: Please submit an RMA request with “Recycle product under WEEE” in the Description of Issues field.

For disposal in countries outside of the European Union: This symbol is only valid in the European Union (EU). If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

Lumencor Light Engines as supplied, and as represented in this manual, meet safety and regulatory requirements For Research Use Only. If the light engine is incorporated into an instrument or system for a specific end-use application, it is the responsibility of the system integrator to verify that the light engine, and the system into which it is incorporated, meet all safety and regulatory requirements of that end-use application.

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1. Introduction

The PEKA light engine provides a powerful alternative to conventional tungsten-halogen sources for transmitted light microscopy. Unlike tungsten-halogen lamps, the color temperature of the PEKA's white light output does not change when the intensity is turned up or down. The white light output is a composite of red, green and blue color outputs from three efficient and durable solid state sources. Each PEKA light engine incorporates a mounting adapter for direct coupling to the transillumination port of the microscope. Because there is no fan, the compact PEKA light engine is completely quiet and vibration free.

The PEKA light engine is manually controlled via knobs located on the side panel of the light engine or on the base of Nikon microscope stands. Additionally, the light output can be electronically gated off and on by TTL signals applied to a BNC connector on the rear panel. This manual covers both configurations making up the PEKA light engine family:

Name	Part Numbers	Control Location	Application
PEKA	90-10054 (N) 90-10126 (O) 90-10152 (Z)	Light engine side panel	Transmitted light microscopy on Nikon (N), Olympus (O) and Zeiss (Z) upright and inverted microscopes.
PEKA (Nikon Hub)	90-10184	Nikon microscope base or NIS-Elements software	Transmitted light microscopy on Nikon upright and inverted microscopes.

2. Precautions and Warnings {Précautions et mises en garde}

A few simple practices will ensure trouble-free operation for the life of the light engine.

Les quelques règles simples suivantes permettront d'assurer un fonctionnement fiable pendant toute la durée de service de la source lumineuse.

Safety Instructions:

Please read and follow all safety instructions provided BEFORE using your new PEKA light engine. Failure to comply with the safety instructions may result in fire, electrical shock, or personal injury and may damage or impair protection provided by equipment. Please save all safety instructions.

Instructions de sécurité:

Veiller à lire et à respecter toutes les instructions de sécurité fournies AVANT d'utiliser le nouveau PEKA afin d'écartier les risques d'incendie, de décharge électrique, de blessure corporelle et de possibles dommages ou défaillance de la protection offerte par l'appareil. Conserver toutes les instructions de sécurité.

Safety Definitions {Définitions relatives à la sécurité}:



Warning: Statements identify conditions or practices that could result in personal injury.

Avertissement: déclarations qui identifient des situations ou des pratiques susceptibles d'entraîner des blessures corporelles.

Caution: Statements identify conditions or practices that could result in damage to your equipment.

Attention: déclarations qui identifient des situations ou des pratiques susceptibles d'endommager le matériel.

Safety Items {Mesures de sécurité}:

Warning: DO NOT use an unapproved power supply. The Lumencor supplied 9V, 4.45A external power supply is required for use with the Peka light engine. It is imperative that the alternative power supply has output over-current protection, as the power input of the Peka is not fused. The DC power supply must have the AC power cord connected to a receptacle with a protective safety (earth) ground terminal.

Avertissement : NE PAS utiliser une alimentation électrique non homologuée. Le Lumencor fourni 9V, 4.45a alimentation externe est nécessaire pour une utilisation avec le moteur de lumière Peka. Il est impératif que le bloc d'alimentation de remplacement a une sortie protection contre les surintensités, comme l'entrée de puissance du Peka est pas fusionné. L' alimentation en courant continu doit avoir le cordon d'alimentation relié à une prise avec une sécurité de protection (terre) du sol.

Warning: DO NOT look into the output of the light engine. The brightness of this light source is higher than most commercial lighting fixtures and is required to couple directly into a microscope or other bioanalytical instrument.

Avertissement: NE PAS regarder directement la sortie de la source lumineuse. L'intensité lumineuse de cette source est supérieure à celle de la majorité des appareils d'éclairage disponibles dans le commerce et est conçue pour un raccordement direct à un microscope ou autre appareil de bio-analyse.

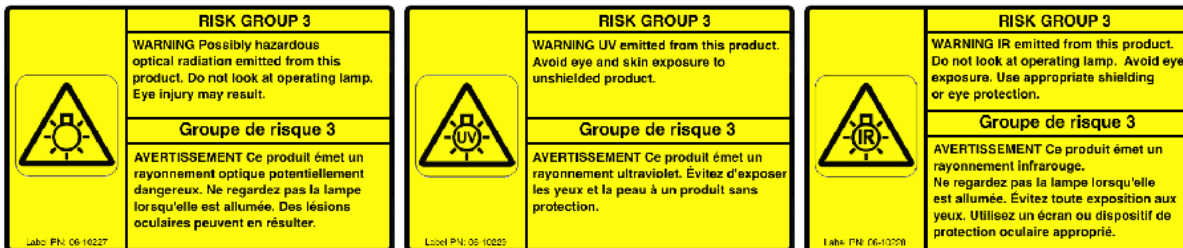
Warning: DO NOT turn on the light without the output safely directed into an enclosed optical path. DO NOT point the light output directly onto any flammable or burn-susceptible material. This includes all animal or vegetable tissues, plastics, fabrics, paper and liquids.

Avertissement: NE PAS allumer la lumière sans que la sortie ne soit dirigée de manière sûre dans un chemin optique inclus. NE PAS pointer la sortie de lumière directement sur tout matériau inflammable ou susceptible de brûler. Cela comprend tous les tissus, les plastiques, les tissus, le papier et les liquides animaux ou végétaux

RISK GROUP 3

Warning: Possibly hazardous optical radiation emitted from this product. Do not look at operating lamp. Eye injury may result.

Warning: Infrared (IR) emitted from this product. Do not look at operating lamp.



Warning: UV emitted from this product. Avoid eye and skin exposure to unshielded product.

GROUPE DE RISQUE 3

Avertissement: Infrarouge (IR) émise par ce produit. Ne regardez pas la lampe d'exploitation.

Avertissement: Rayonnement optique Peut-être dangereux émis par ce produit . Ne regardez pas la lampe d'exploitation. Une blessure oculaire peut entraîner.

Avertissement: UV émis par ce produit . Évitez les yeux et la peau exposition au produit non blindé.

Caution: DO NOT open the unit. There are no serviceable parts inside and opening the light engine enclosure will void the manufacturer's warranty.

Attention: NE PAS ouvrir l'appareil. Il ne contient aucune pièce réparable et l'ouverture de son boîtier a pour effet d'annuler la garantie.

Caution: DO NOT set liquids on the light engine. Spilled liquids may damage your light engine.

Attention: NE PAS placer de liquide sur la source lumineuse. Les liquides renversés peuvent endommager la source lumineuse.

Caution: DO NOT drop the light engine. It contains glass optical components that could be damaged or misaligned by the shock produced by a drop onto a hard surface.

Attention: NE PAS laisser tomber la source lumineuse. Elle contient des composants optiques en verre susceptibles d'être endommagés ou désalignés par le choc résultant d'une chute sur une surface dure.

DISCLAIMER: Lumencor shall not be liable for injury to the user or damage to the product resulting from the PEKA light engine being used in a way for which it was not intended and in complete disregard for any posted safety precautions and warnings.

AVIS DE NON-RESPONSABILITÉ: Lumencor décline toute responsabilité pour les blessures corporelles ou les dommages au produit résultant d'une utilisation du PEKA autre que celle prévue et du mépris total de les mesures de sécurité et mises en garde affichées.



Figure 1. PEKA light engine with output adapter for coupling to Nikon Ti/Ni/Ci microscope transmitted light port.

3. Operating Instructions

3.1 Contents

The PEKA light engine ships with the following list of standard components:

1. PEKA light engine configured with an output adapter for coupling to a specific microscope transillumination port.
2. A 9 V / 4.45 A DC power supply (Lumencor part no. 27-10017).
3. A region-specific AC power cord for the power supply (see adjacent table).

The unique 4- or 5- digit serial number of the light engine is marked on a label affixed to the back panel (see Figure 3).

AC Power Cords

Region	Part Number
North America	29-10002
Europe	29-10005
United Kingdom	29-10004
Israel	29-10008
Australia/New Zealand	29-10024

3.2 Installation

NOTE: Any end-product/system incorporating or coupled to a Lumencor Light Engine shall be fully evaluated to verify all applicable safety and regulatory compliance requirements prior to use.

When setting up the PEKA light engine, be sure that the adapter (Figure 1) is securely attached to the appropriate port of the microscope. Usually this will be the transmitted light illumination port. Be careful to properly support the PEKA light engine until it is mechanically coupled to the instrument.

The PEKA light engine must be operated in a non-condensing environment (dew point $<10^{\circ}\text{C}$ with controlled ambient temperature $<30^{\circ}\text{C}$). Restricting the airflow will cause the unit to operate at elevated temperatures and could result in decreased service life and/or premature failure.

With the power control knob (Figure 2) in the OFF position, plug the DC power supply into the power connector at the back of the light engine. A green indicator light on the rear panel above the DC power input connector indicates that electrical power is being supplied to the light engine. On the Nikon Hub model, connect the port labeled “LAMP CTRL” on the rear of the microscope stand to the lamp control port on the rear panel of the PEKA using a Nikon DIA LAMP control cable, available for purchase from Nikon:

- Nikon Ti Hub cable part number MEF51001
- Nikon Ti2 cable part number MXA22163

3.3 Operation: Onboard Control

Take necessary precautions to protect yourself and others from the high intensity light when turning on the unit. The PEKA light engine should be coupled to a microscope before it is turned on. Two control knobs are located on the side panel. The POWER knob turns the light output on or off. The yellow “light” indicator on the side panel alerts the user when the light output is on. The INTENSITY control knob has four positions that set the light engine to deliver approximately 10%, 25%, 50% and 100% of maximum output. There is no warm-up time; the light engine output stabilizes less than 1 second after the POWER knob is turned to the “on” position. Light output can be switched off during intervals when it is not required for active viewing or data collection.

3.4 Operation: Electronic Shutter

The PEKA light engine incorporates an electronic shutter function controlled via the BNC “gate” connector located on the rear panel. $>+3.3\text{ V}$ “high” DC levels applied to the gate BNC initiate light output (shutter = off) but do not activate the light sources. Light sources must first be activated using the manual POWER control knob. $<+1.5\text{ V}$ “low” DC levels applied to the gate BNC terminate light output (shutter = on). The PEKA light engine can accommodate an on/off switching rate up to approximately 1 kHz. When no input is applied to the BNC, the gate DC level is pulled high internally (shutter = off).



Figure 2. Control knobs located on the side panel

3.5 Operation (Remote Control from Nikon Hub)

PEKA light engines configured for fully integrated operation on Nikon microscopes have only a single POWER knob on the side panel (Figure 2) and have an additional communication port labeled “lamp control” on the rear panel (Figure 3). Connect the lamp control port on the light engine to the port labeled “LAMP CTRL” on the rear of the microscope stand using the Nikon DIA LAMP control cable.

Turn the POWER knob on the PEKA to the on position. Light on/off status and intensity can then be controlled by the push button and rotary dial located next to the focus knob on the Nikon microscope base (Figure 4). For Nikon Ti and Ti2 microscopes, light on/off status and intensity can also be controlled by NIS-Elements software. For control with NIS Elements, the DIA LAMP must be enabled in the configuration menu.



Figure 3. Rear panel of PEKA light engine configured for remote control from Nikon microscope base.



Figure 4. On/off and intensity controls on Nikon microscope base

4. Spectral Output

The typical spectral output distribution of a PEKA light engine is shown below (Figure 5).

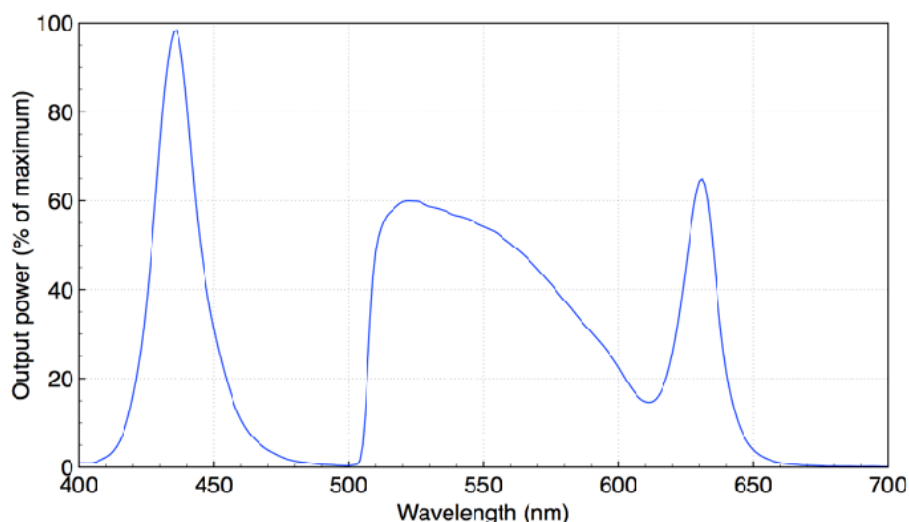


Figure 5. PEKA Light Engine spectral output distribution.

5. Product Specifications

The PEKA light engine must be operated and stored within the environmental conditions specified.

Specification	Detail
Temperature	
Operating	32 to 95° F (0 to 35° C)
Non-operating	-4 to 158° F (-20 to 70° C)
Humidity	
Operating and non-operating	0 to 80% relative humidity, non-condensing
Altitude	
Operating	0 to 10,000 feet (3,048 meters)
Non-operating	0 to 45,000 feet (13,176 meters)
Dimensions (WxLxH)	4.25 in x 6.0 in x 4.25 in / 10.5 cm x 15 cm x 10.5 cm
Weight	3.3 lb / 1.5 kg
Input Power Requirements	9 VDC, 4.45 A, 40 W maximum, power supply included
Power consumption	16 W at 100% intensity
Switching Speed	On/Off rate up to 1 kHz
Warm-up Period	1 s
Protection	IP Rating of X0
Sound Level	Sound Level at 1 m = 0 db(A)
Connections	BNC connection for TTL gating, DIN connector for remote control from Nikon Hub
Warranty	24 months parts and labor for end users

Performance specifications for individual light engines are listed on the certificate of conformance included with the shipping documents e-mailed to the customer. It is important to retain the certificate of conformance for reference. In the event that the light engine is sold, the certificate of conformance should be transferred to the new owner. Certificates of conformance are also recorded in Lumencor's database and copies can be requested by e-mail to techsupport@lumencor.com. The request message must include the 4- or 5-digit serial number of the light engine.

6. Routine Maintenance and Troubleshooting

Remove any built-up dust or accumulation on the vent holes. A vacuum may be used to remove debris so that a steady supply of air is available for cooling. It is recommended that the vent holes be cleaned by a gentle suction device at least every 6 months and more often in dusty or smoke-filled environments. There are no user-replaceable components or sub-assemblies in PEKA light

engines. Opening the light engine enclosure will void the manufacturer's warranty. In the event that the light engine fails to perform in accordance with the specifications listed on the certificate of conformance, please contact Lumencor Technical Support for assistance, as directed in Section 7.

7. Customer Support

For technical support of the PEKA light engine, please contact Lumencor by phone at 503.213.4269 or via e-mail at techsupport@lumencor.com. Please be prepared to provide the 4- or 5-digit serial number of the light engine (see Figure 3), a description of the problems encountered and information on the usage context (e.g. what microscope is being used). This information will help to determine whether the problems can be resolved in situ by adjustments to the system configuration, or whether a fault has developed in the light engine that requires its return to Lumencor's facility in Beaverton, Oregon for evaluation and, if necessary, repair. Any light engine return to Lumencor for service or repair requires a material authorization (RMA) number. To obtain a RMA number, fill out and submit the [online request form](#). It is the customer's responsibility to properly package and safely ship products to Lumencor. Instructions for shipping will be provided in the e-mail giving notification of the RMA number.

8. Warranty

The PEKA light engine is backed by a 18 month warranty to end users. Warranty coverage starts on the original date of shipment from Lumencor. Light Engines qualifying for warranty service must be verifiably delivering performance that is substantially at variance with the levels documented in the certificate of conformance. The light engine must also have been used and maintained under operating conditions consistent with the specifications given in Section 5, and observing all the Precautions and Warnings notified in Section 2. This warranty does not extend to light engines that have been subject to misuse, accident, tampering or improper installation. Accessories including (but not limited to) liquid light guides, optical fibers, collimators, cables and control consoles are not covered by the warranties attached to light engines. Please fill out and submit the [online warranty registration form](#). This will facilitate provision of warranty service should it be required.