

PDL POWERLIGHT



PROCLEANROOM
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The UV flashlight for cleanroom inspection

- Highly effective most powerful flashlight in HQ finish
- Scratchproof, according the highest standards
- Offers UV-A light or white light for the best possible particle inspection
- 2x rechargeable Panasonic battery
- Safety glasses optionally available in various colors
- Original Cree LED's suited for 20.000 hrs of use
- Durable design
- Inductive charging
- Round aesthetic finish

Technical specifications

| | |
|--------------------|--|
| Power LED's | 5x 5 Watt UV-A 365 nm i.c.w. 1x 5 Watt white LED |
| Lifetime LED's | 20.000 hours |
| Tested drop height | 1,2 m |
| Material | Aluminum T6061, Premium Type III hard anodized abrasive finish |
| Color | Black |
| Weight | 336 Gram (incl batteries) |
| Handling | Full grip, anti drop design |

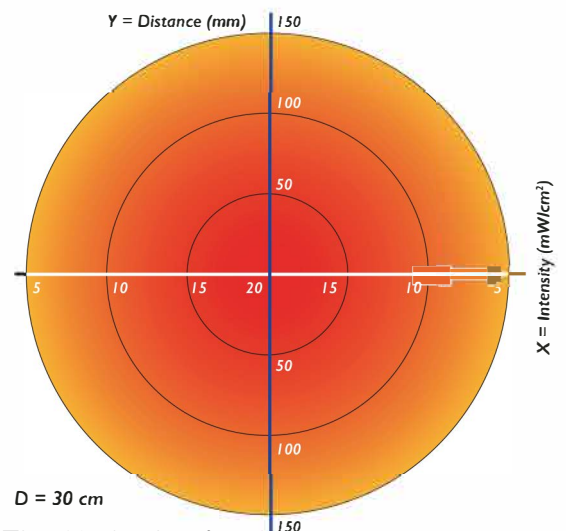
| | |
|---------------------------|---|
| Battery type | 1x 18650 Li-ion rechargeable battery from Panasonic, 3400 mAh |
| Battery life | 3 operational hours |
| Electrical supply charger | 100-240V ~ 50-60 Hz |
| Dimensions | 219 x 52 mm (L x D (head)) |
| IP rating | IP67 |
| Switch | Metal executed |
| Standards | CE & RoHS compliant |
| Quality procedure | ISO 9001 |

| | |
|-------------|-------------------------------------|
| Life span | Min. 5 years |
| Certificate | IEC report (IEC 60598-2-8) included |
| Manual | Included in English language |
| Guarantee | 2 years on electrical performance |

Note: Specifications and Design details are subject to change, without any notification



Intensity graph UV-A Light (365 nm)



UV POWERLIGHTS
Flashlights for professional use

PDL-II POWERLIGHT

Particle Detection UV-A inspection Light

UV-A light
upgraded to
50 min
Operational
use

*The most powerful inspection light
for Cleanroom inspection*



Content

| No | Item |
|----|--|
| 1 | Introduction Particle Detection Light (PDL-II) |
| 2 | Main specifications |
| 3 | Detailed view & specifications |
| 4 | Graphs & tables |
| 5 | Features, consumables, options |
| 6 | Selling features |
| 7 | Questions |

Visualisation of particles

1. UV-A light:

- The human eye can roughly see up to 50 microns without any extra outside sources.
- With the PDL-II in UV-A light you can roughly see between 50 and 10 microns (*)

2. Bright light:

- With the PDL-II in bright light you can roughly see between 10 and 2 microns (*)



Standards in Cleanroom industry

High Tech Cleanroom classes

| ISO classification number (N) | Maximum concentration limits (particulates/m ³ of air) for particles equal to and larger than the considered sizes shown below (concentration limits are calculated in accordance with equation (1) in 3.2) | | | | | |
|-------------------------------|--|---------|---------|------------|-----------|---------|
| | 0.1 µm | 0.2 µm | 0.3 µm | 0.5 µm | 1 µm | 5 µm |
| ISO Class 1 | 10 | 2 | | | | |
| ISO Class 2 | 100 | 24 | 10 | 4 | | |
| ISO Class 3 | 1,000 | 237 | 102 | 35 | 8 | |
| ISO Class 4 | 10,000 | 2,370 | 1,020 | 352 | 83 | |
| ISO Class 5 | 100,000 | 23,700 | 10,200 | 3,520 | 832 | 29 |
| ISO Class 6 | 1,000,000 | 237,000 | 102,000 | 35,200 | 8,320 | 293 |
| ISO Class 7 | | | | 352,000 | 83,200 | 2,930 |
| ISO Class 8 | | | | 3,520,000 | 832,000 | 29,300 |
| ISO Class 9 | | | | 35,200,000 | 8,320,000 | 293,000 |

NOTE: Uncertainties related to the measurement process require that concentration data with no more than three significant figures be used in determining the classification level.

- ISO 1 = the most clean Cleanroom
- ISO 9 = the less clean Cleanroom

Pharma Cleanroom classes

| Grade | Maximum permitted number of particles per m ³ equal to or greater than the tabulated size | | | |
|-------|--|--------|--------------|-------------|
| | At rest | | In operation | |
| | 0.5 µm | 5.0 µm | 0.5 µm | 5.0 µm |
| A | 3,520 | 20 | 3,520 | 20 |
| B | 3,520 | 29 | 352,000 | 2,900 |
| C | 352,000 | 2,900 | 3,520,000 | 29,000 |
| D | 3,520,000 | 29,000 | Not defined | Not defined |

- Grade A = the most clean Cleanroom
- Grade D = the less clean Cleanroom

Introduction PDL-II *Particle Detection Light*

Explanation:

- 1) Particle light detector
- 2) Inductive charger
(Cable fixed on adapter)
- 3) Plastic (PE) protective cap
- 4) Plastic PDL table holder

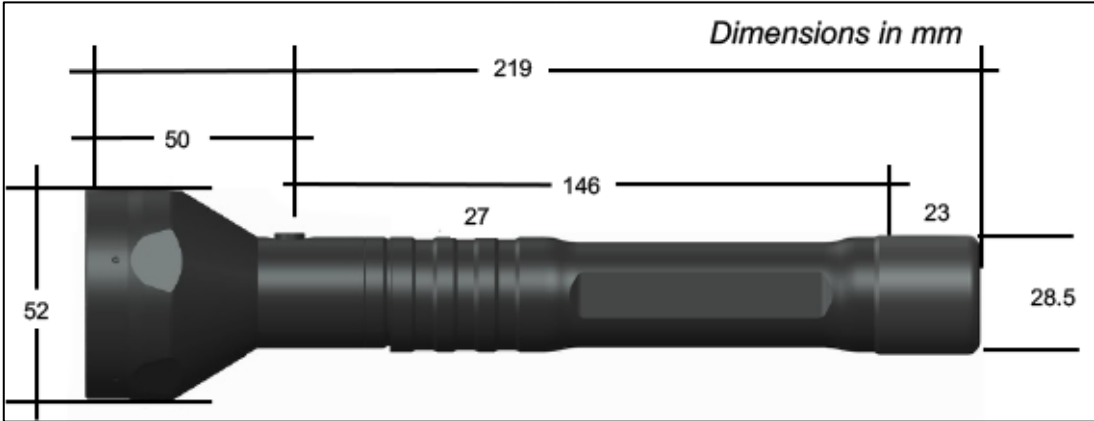
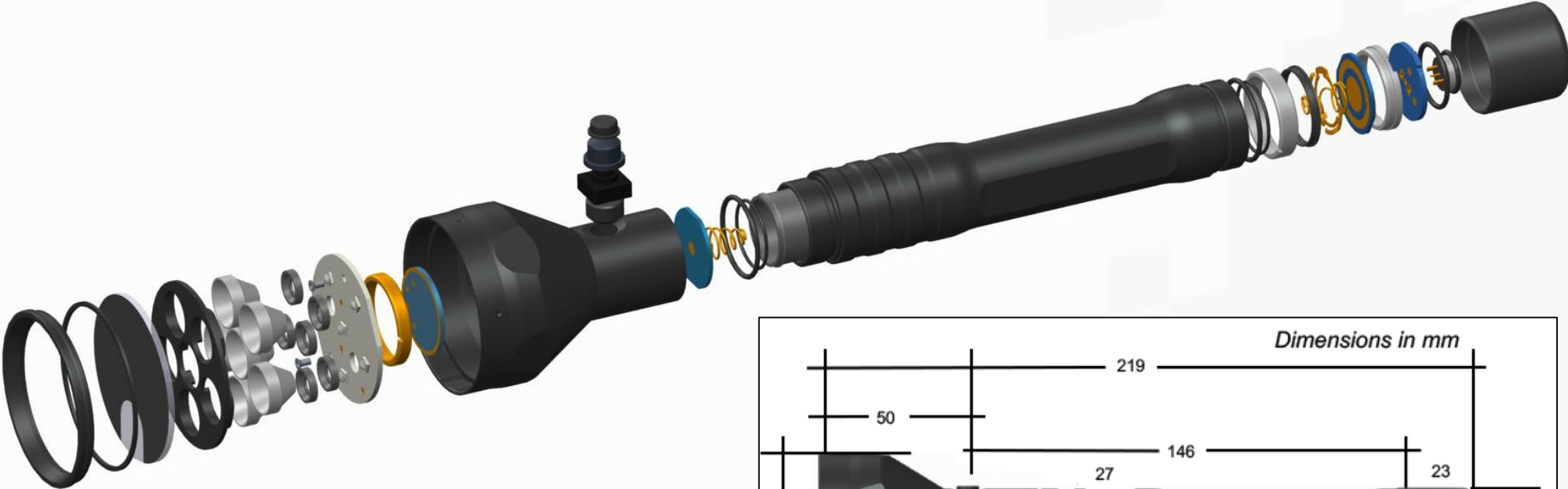


Main specification

| No | Item | Spec |
|----|---------------------|---|
| 1 | Power LED's | 5x 5 Watt UV-A 365 nm +/- 5nm i.c.w. a centrally placed 5 Watt white LED (300 Lumen) |
| 2 | UV-A Light strength | See separate table with intensity data |
| 3 | Material | Aluminum T6061, Premium Type III hard anodized abrasive finish |
| 4 | Color | Black |
| 5 | Weight | App. 336 gram (batteries included) |
| 6 | Handling | Full grip, anti drop design |
| 7 | Battery life | 3 operational hours by means of 1x Panasonic 18650 rechargeable Li-Ion battery (3400 mAh – 7.4 V / battery) |
| 8 | Lifetime LED's | 20.000 hours |
| 9 | Dimensions | 219 x 52 mm (L x D (head)) |
| 10 | IP rating | IP 67 |
| 11 | Guarantee | 2 years on electrical performance |



Detailed view



Detailed specifications (1)

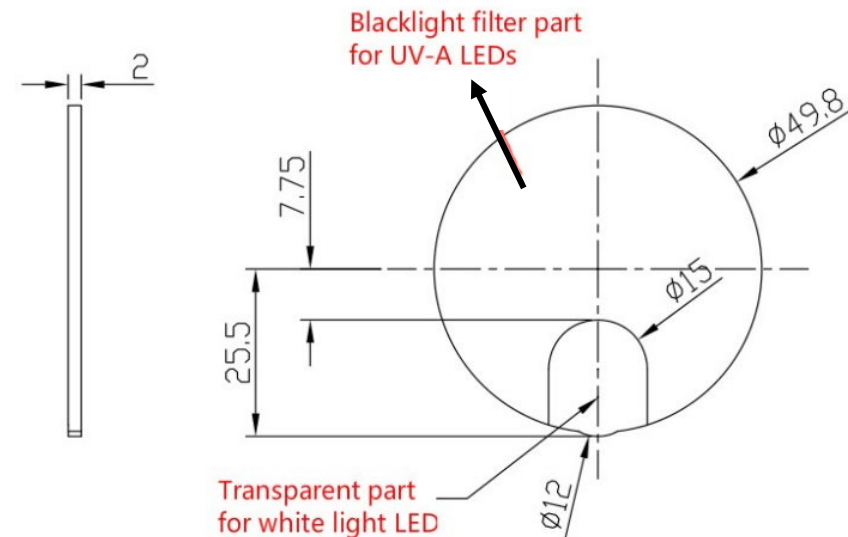
| No | Item | Spec |
|----|---------------------------|--|
| 1 | Electrical supply charger | 100-240 V ~ 50-60 Hz |
| 2 | Details finish housing | Aluminum T6061, Premium Type III hard-anodized abrasive finish |
| 3 | Standards | CE & RoHS compliant |
| 4 | Cleaning classification | Grade 2 & Grade 4 cleaning (conform: <i>ASML GSA 07 9410 & GSA 07 9510</i>) |
| 5 | Switch | Metal executed |
| 6 | Charging | Magnetic inductive charger (cable length is min 1,0 m) included |
| 7 | Manual | Included in English language |
| 8 | Tested drop height | 1,2 m improved design on multiple drop tests |
| 9 | Quality procedure | ISO 9001 |
| 10 | Life span | Min. 5 years |
| 11 | Certificate | IEC report (IEC 60598-2-8) enclosed in the scope of supply |

Detailed specifications (2)

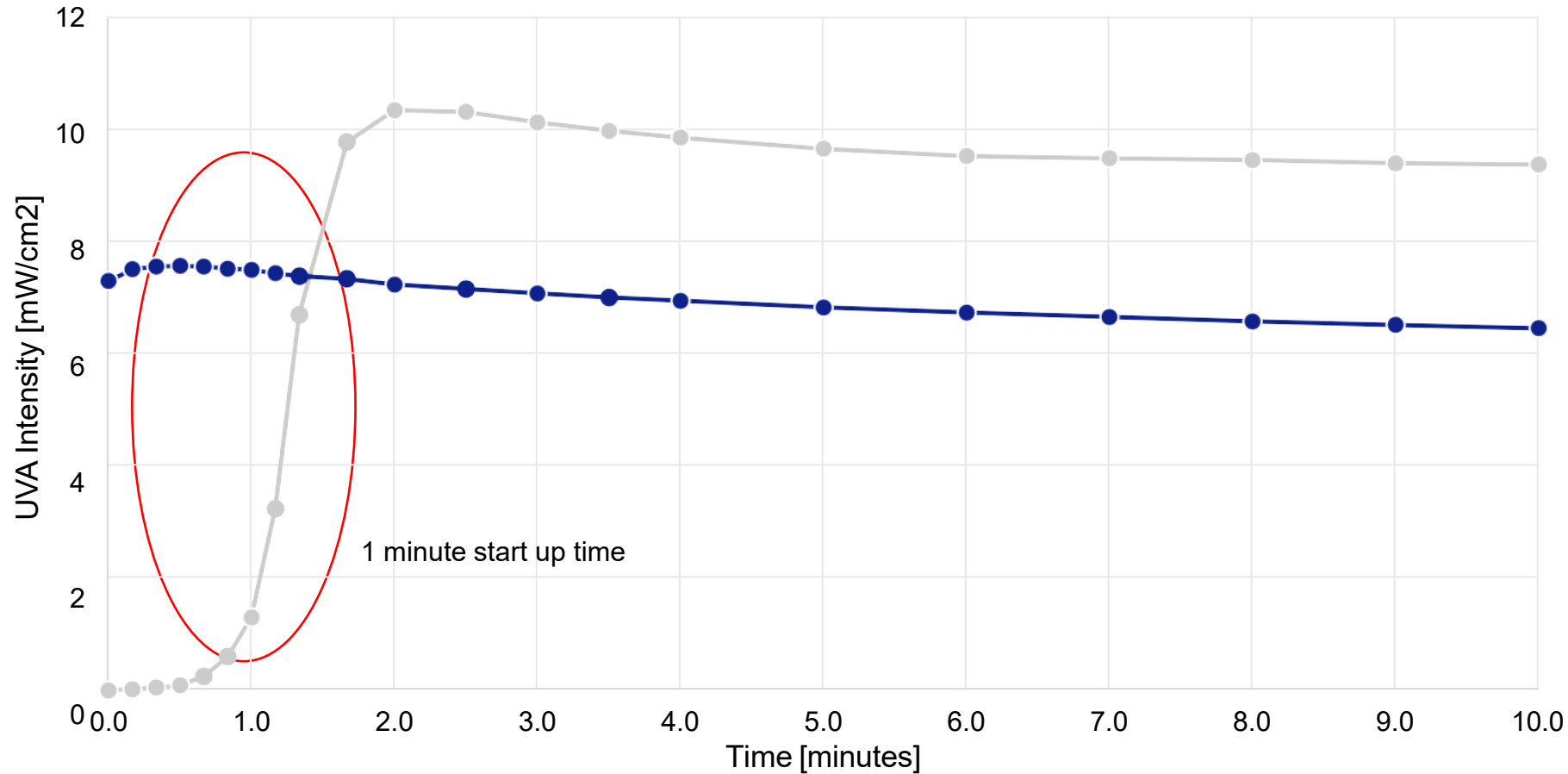
| No | Item | Spec |
|----|---------------------|---|
| 1 | Label | Product label or logo (10 x 55 mm) can be placed on the PDL |
| 2 | Roll proof design | Yes, by means of flattened head part |
| 3 | Serial number | Engraved in the housing: Year-Prod Batch-No: (YY-PB-XXXXX) |
| 4 | Temp control | Thermo switch built into the head, set at 50 °C |
| 5 | Cable shielding | The inductive connection part is optimized to minimize electric contact with the surroundings |
| 6 | Filter | Dichroic interference filter placed in front of the UV-A LED's (see separate sheet) |
| 7 | Sealing O-rings | Viton executed |
| 8 | Ergonomics | Ergonomic grip included in design (smooth finish) |
| 9 | Switching pattern | See separate sheet |
| 10 | Lens protection cap | Injection molded design, Plastic: PE / black color |

Dichroic interference filter

| Spec | Item |
|---------------------------|--|
| Advantage | Reduces fatiguensness of the inspector during inspection |
| Shock resistance | Drop proof compliant |
| Temp resistance | Up to 150 °C |
| Ageing | Anti ageing (no deterioration over time) |
| Selectiveness | Optimized for 365 nm |
| Illuminance visible light | ≤ 20 lux (in UV setting) |



Start up time lamp types

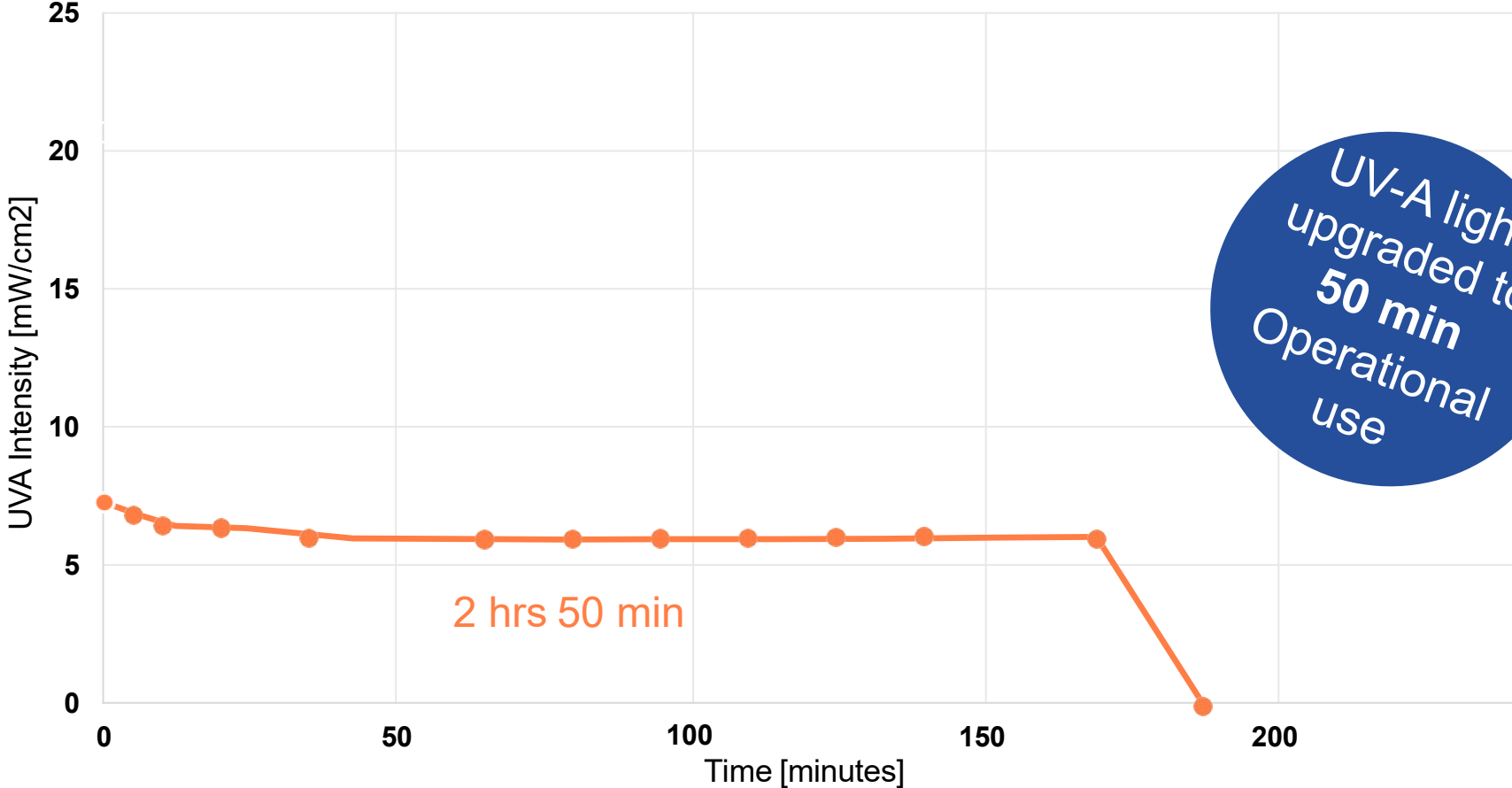


—●— Fluorescent UV lamp

—●— PDL-II UV LED



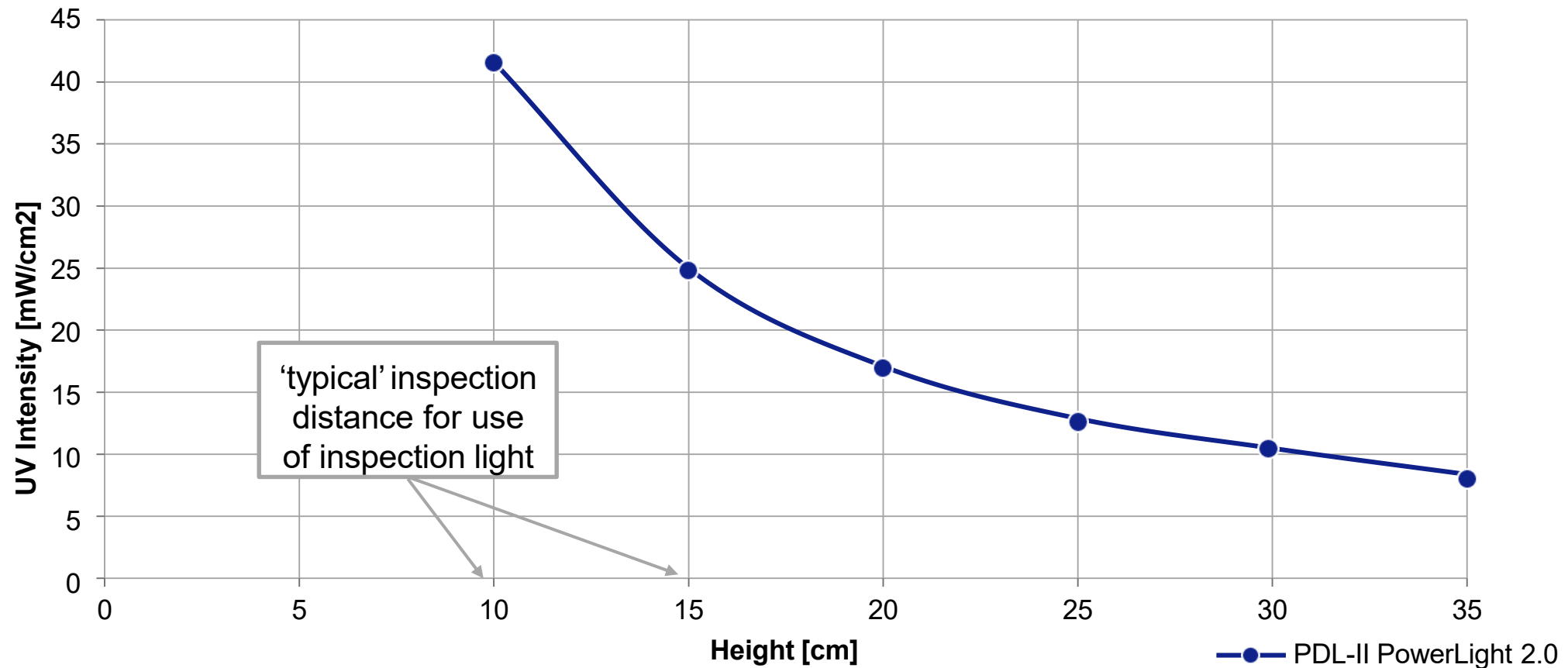
Battery lifetime *PDL-II* POWERLIGHT



—●— PDL accu / 50 min in UV-A mode and 2 hours in white light mode

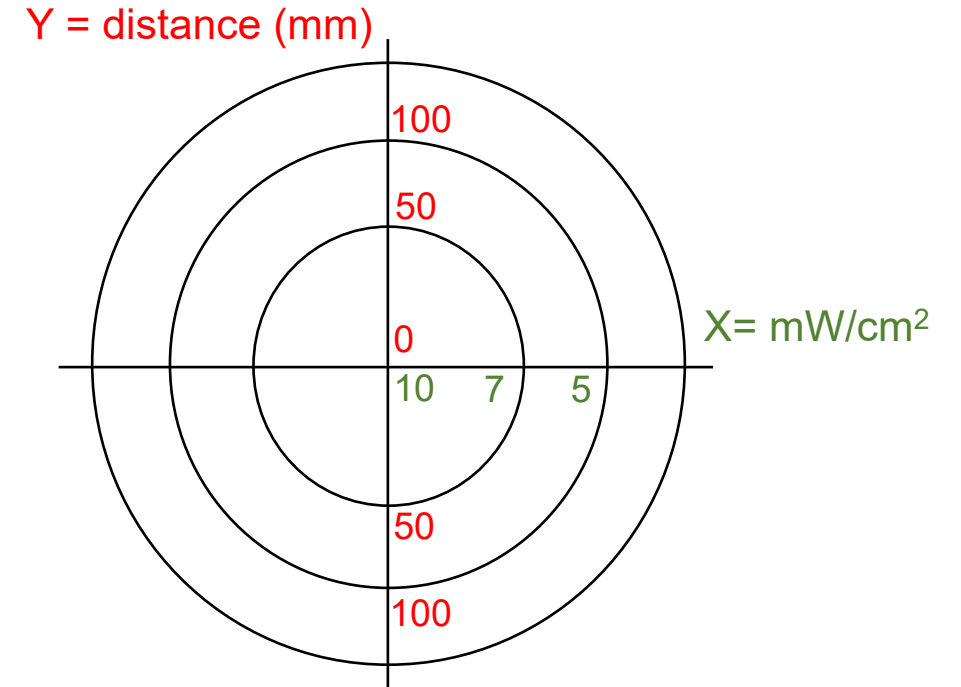
UVA LED **5x 5 Watt UV-A** **1x 5 Watt WHITE** **IP 67** **CE** 

Inspection height vs UV intensity



Minimum UV intensity graph

| Diameter | 150 mm | 300 mm | 350 mm | 400 mm | 450 mm | 500 mm |
|---------------|--------|--------|--------|--------|--------|--------|
| Central point | 35 | 10 | 7 | 6 | 4.5 | 3.5 |
| 100 mm | 12 | 7 | 4.5 | 4 | 3.5 | 2.5 |
| 200 mm | 1 | 5 | 3 | 3 | 3 | 2.5 |



Data in graph given in mW/cm² of 365 nm

D = 30 cm

Switching pattern

| No | Hard Switching pattern |
|----|--|
| | When lamp is off: |
| A | White light 100% strength & UV light off |
| B | White light 50% strength & UV light off |
| C | UV light 100% strength & White light off (The visible light strength is than ≤ 15 lux) |



UV-A light LED

| Specifications | Item |
|-----------------------|------------------------------------|
| Power | 5x 5 Watt |
| Wavelength | 365nm \pm 5nm |
| Intensity | See separate graph |
| FWHM | \leq 30 nm |
| Temperature stability | \leq 5 nm drift at temp 10-50 °C |

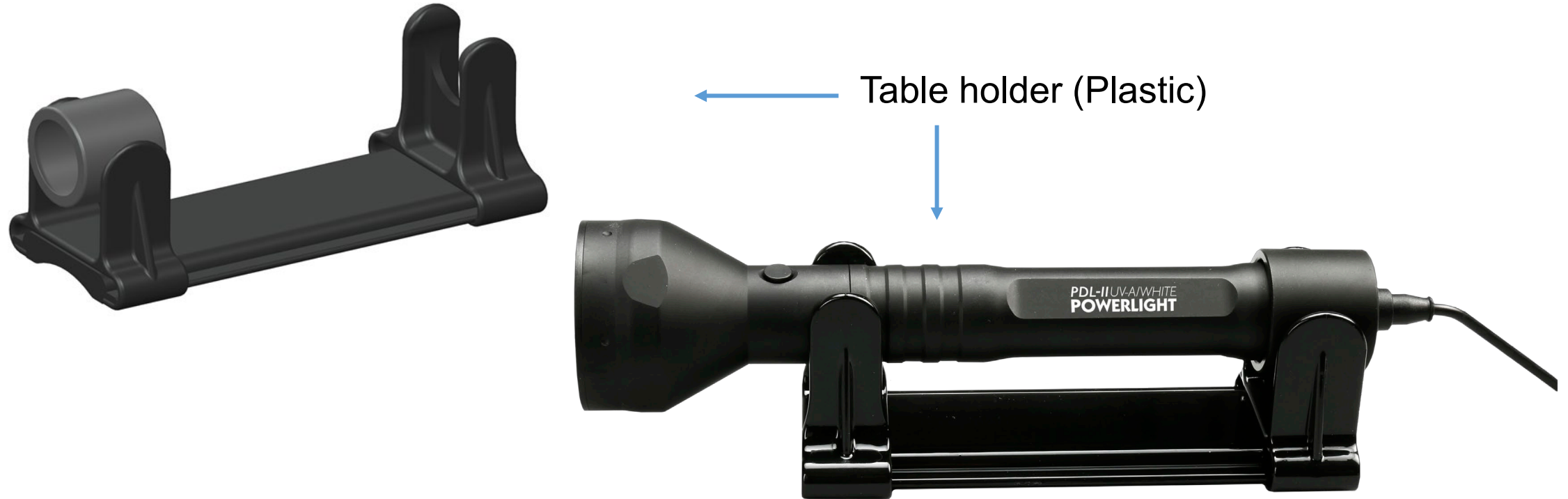


White light LED

| Specifications | Item |
|--------------------|---|
| Brand | Cree |
| Power Output | 5 Watt |
| Colour temperature | 6500K |
| Output | 300 Lumen |
| At 100% Strength | At 50cm: 10.000 Lux At 70cm: 6.400 Lux |
| At 50% Strength | At 50cm: 4.900 Lux At 70cm: 3.060 Lux |



Holder / Inductive charger



Casing PDL-II

| Item | Spec |
|-----------------|-------------------------------|
| Dimension | 280 x 220 x 80 mm |
| Color | Black |
| Material casing | PPC (Polypropylene carbonate) |
| Material inlay | EVA (Evatane) foam |
| Weight | 528 gram |
| Lock | 2x hinge lock (Red color) |



Option A – (Spare) battery

| Item | Spec |
|----------------|---|
| Brand | Panasonic |
| Type | 18650 Li-ion |
| Capacity | 3400 mAh – 7.4 V or 2x 3400 mAh 3.7 V |
| Safety | Protection circuit included in battery design |
| Quality | Class A / Optimized for serial charge |
| RoHS compliant | Yes |



Option B - Battery charger set



**Rapid charging station
battery for 2 batteries**
(not in scope of supply)

- CE / ROHS compliant
- 2x 1,5 A charger
- 100-240 V ~ 50-60 Hz

Available from aug. 2021

- New ESD safe container (supplied in yellow IDP bag) for PDL-II
- Material: **Inherently Dissipative Polymers**
- Dimensions: 29 x 18 x 12 cm (L x D x H)
- Color container: Yellow



Summarizing the PDL-II

| No | Item |
|----|---|
| 1 | Highly effective most powerful UV-A / White inspection light in high quality finish |
| 2 | Scratch-proof, Drop-proof, Hose-proof; meets the highest mechanical standards |
| 3 | Instant use (instant On / Off) |
| 4 | Optimized design for long term use of detection of dust particles |
| 5 | 1x Lion rechargeable Panasonic Li-ion battery |
| 6 | Table top standard included in scope of supply |
| 7 | Inductive charging (3 to 3,5 hours required for full charging) |
| 8 | Round aesthetic finish, light design |
| 10 | Original Cree LED's suited for 20.000 hours of use |

Particle Detection Light



*The most powerful flashlight available
for the Cleanroom industry*

