



OPTO ENGINEERING



INSTRUCTIONS MANUAL

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# LTPRHP3W series

HP 3W LED pattern projector



LIGHTING

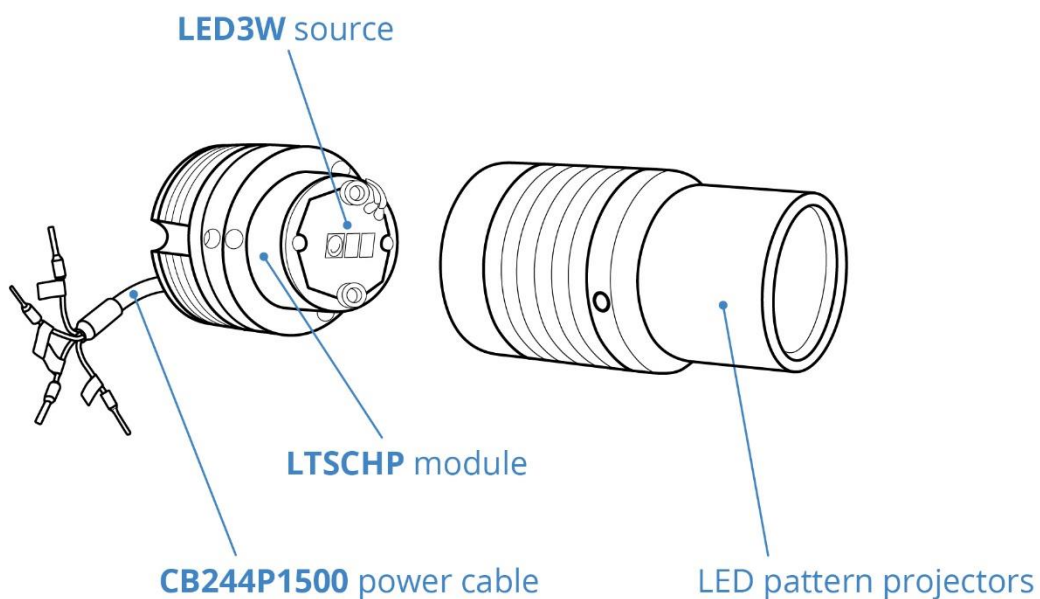
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## 1. Product overview

LTPRHP3W series consists of different LED pattern projectors available with a 3W power intensities and four wavelengths designed for the most demanding structured light applications including 3D profilometry, stereovision, and alignment.

Unlike laser sources, our LED pattern projectors ensure sharp edges and homogeneous light without scattering and diffraction effects. Several projections patterns can be easily interchanged to project any kind of shape. Additionally LTPRHP3W features built in phase-adjustment for easy alignment of the pattern. Any C-mount optics can be interfaced with LTPRHP3W series to project areas with different sizes.



## 2. Instruction for use

### 2.1. Operation options

LTPRHP3W pattern projectors integrate LTSCHP modules as light sources.

LTSCHP LED modules can be operated in two ways:

- **standard** usage option: through the built-in electronics
- **direct LED control** usage option

		Device power ratings				LED power ratings			Compatibility
Part number	Light color, wavelength peak	DC Voltage <sup>1</sup>		Power consumption (W)	Max LED forward current (mA) <sup>2</sup>	Forward voltage		Max pulse current (mA) <sup>5</sup>	
		Minimum (V)	Maximum (V)			Typical (V) <sup>3</sup>	Maximum (V) <sup>4</sup>		
3W power sources									
LTSCHP 3W-R	red, 630 nm	12	24	< 4.5	720	2.4	3	2000	LTDV1CH-17V, LTDVE8CH-20, LTDVE4CH-20, EN2MP series, EN5MP series, TC series, TCLWD series, TCHM series, CB244P1500, CB244P1500L, PTPR series
LTSCHP 3W-G	green, 520 nm	12	24	< 4.5	720	3.3	4	2000	
LTSCHP 3W-B	blue, 460 nm	12	24	< 4.5	720	3.3	4	2000	
LTSCHP 3W-W	white	12	24	< 4.5	720	2.78	-	2000	

<sup>1</sup> Tolerance  $\pm 10\%$

<sup>2</sup> Used in continuous (not pulsed) mode

<sup>3</sup> At max forward current

<sup>4</sup> Tolerance is  $\pm 0.06V$  on forward voltage measurements

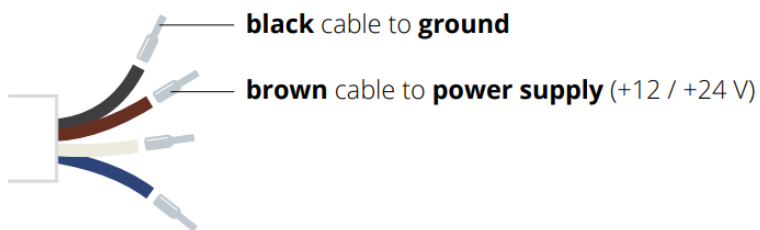
<sup>5</sup> At pulse width  $\leq 10$  ms, duty cycle  $\leq 10\%$  condition. Built-in electronics board must be bypassed (see tech info).

### 2.1.1 STANDARD usage option (LED control through built-in electronics)

Only continuous mode (constant voltage) is allowed.

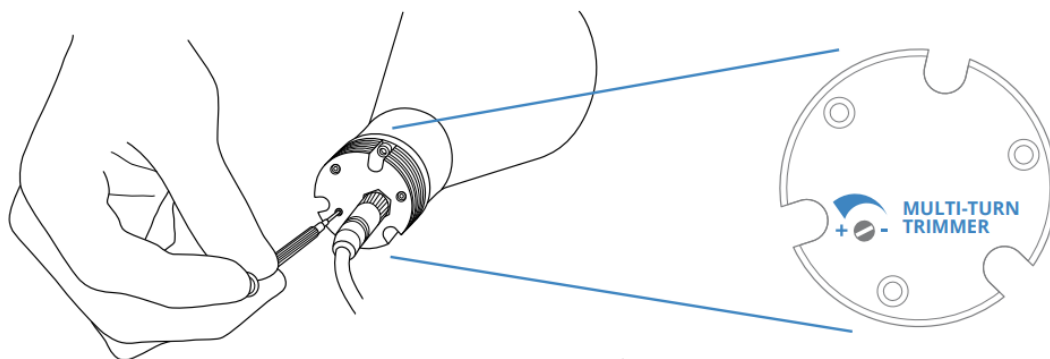
#### Connections

Connect the black and brown cables to your +12 / +24 V power supply.



#### Light intensity adjustment

The built-in multi-turn trimmer allows to control the light (LED forward current) intensity with a very high degree of precision: you can bring the current intensity from minimum to maximum with 21 full turns of the adjustment screw. Simply remove the protective cap and rotate **counter-clockwise** the adjustment screw to increase light intensity and vice versa.

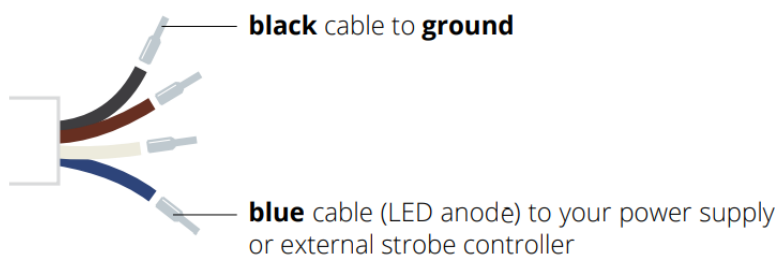


### 2.1.2 Direct LED control usage option

Both continuous and pulsed mode are allowed; the built-in electronics can be bypassed in order to drive the LED directly for use in continuous or pulsed mode. When bypassed, builtin electronics behaves as an open circuit allowing direct control of the LED source. Please note that in such case light intensity adjustment is not possible though the built-in multi-turn trimmer.

#### Connections

Connect the black and blue cables as shown below (remove the LED anode protective cover):



Make sure not to exceed LEDs maximum rates to avoid electrical shorts.

## 2.2. How to replace the LTSCHP module

When you receive LTSCHP module, in the package you will find the following items:



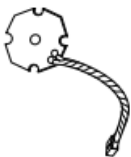
*LTSCHP module*



**LED support** (grey color)



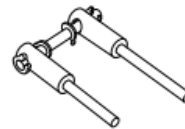
**Rear part** (red color)



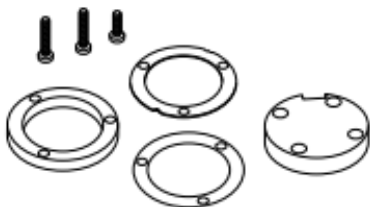
**LED 3W:**  
LED source component



**Power cable**



**LED centering tool**  
to easily position and  
center LED3W-x light  
source



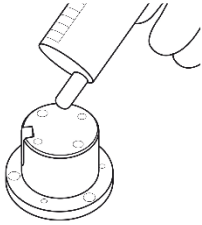
**Spacers kit:** includes the spacers and screws you need to correctly configure LTSCHP3W for your specific LTPRHP3W model



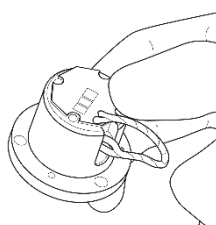
Make sure to perform this procedure in a clean, non-dusty environment in order to prevent dust or other particles from entering your LTPRHP3W pattern projector.

### 2.2.1 Assembling instructions

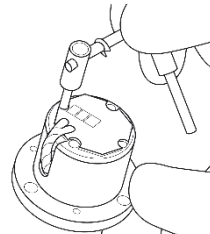
Follow these steps to properly assemble the LTSCHP module.



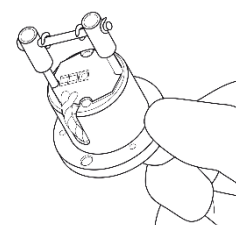
Apply a **small** amount of thermal grease on top of the LED support; if you are using internal spacers apply grease on both sides of the spacers. \*



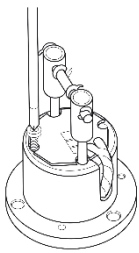
Position LED3W such that the black and red cables can be inserted in the lateral slot.



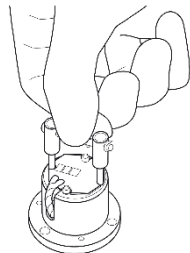
Insert LED centering tool, one dowel pin at a time



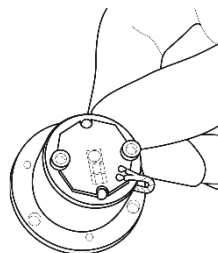
Now the LED3W is correctly centered and positioned.



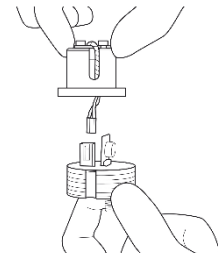
Lock LED3W in place with two provided screws. \*\*



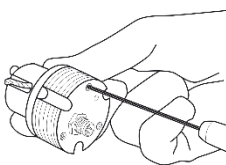
Pull out LED centering tool.



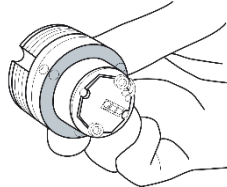
LED3W is now correctly positioned on the LED support.



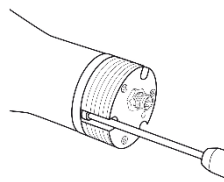
Insert connector.



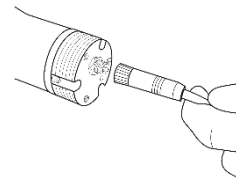
Connect the rear part to the LED support using the provided M2X16 screws.



Insert external spacers, if needed.



Screw LTSCHP module on your LTPRHP.



Connect the power cable.

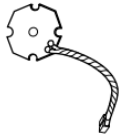
\* Thermal grease not provided: make sure to use an appropriate thermal grease to improve the transfer of thermal energy across the metal-to-metal interface (we suggest to use grease with thermal conductivity greater than 0.765W/mK).

\*\* Use the screws with the appropriate length according to the presence of internal spacers.

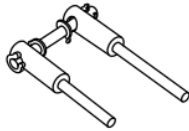


## 2.3. How to replace the LED3W source

When you receive LED3W source, in the package you will find the following items:



**LED3W: LED source component**



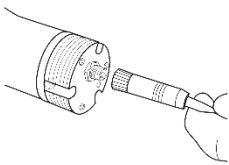
**LED centering tool** allows to easily position and center LED3W light source.



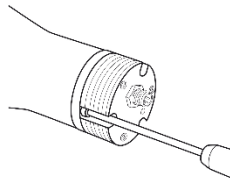
**LED3W source**

### 2.3.1 Replacement instructions

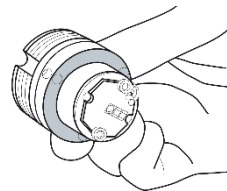
Follow these steps to properly replace LED3W source.



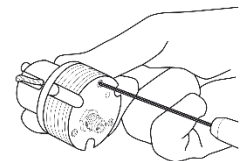
Turn off LTPRHP3W and disconnect the power cable.



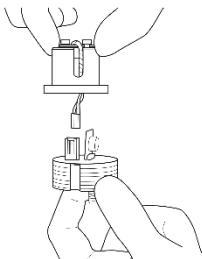
Unscrew the LTSCHP module from the LTPRHP3W projector.



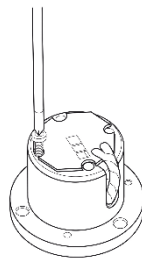
Remove any external spacers.



Unscrew and disconnect the rear part from the LED support.



Unplug the connector.



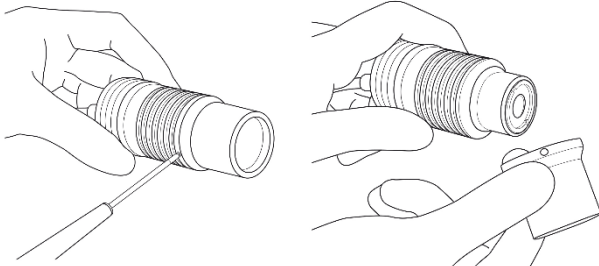
Unscrew and remove the old LED3W source.



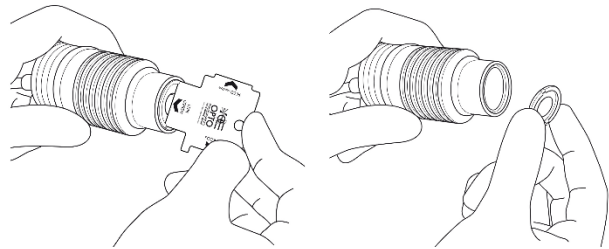
Follow steps 1 to 12 of LTSCHP assembly procedure (section 2.2.1) to complete the replacement.

## 2.4. LTPRHP3W pattern positioning instructions

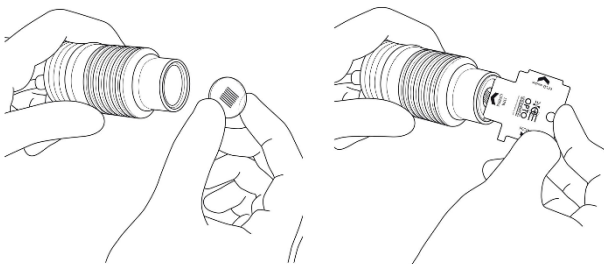
By default, LTPRHP3W pattern projector units are provided without any projection pattern inside. A PTPR series projection pattern can be easily mounted inside the unit by the user following these instructions, which apply to the following:



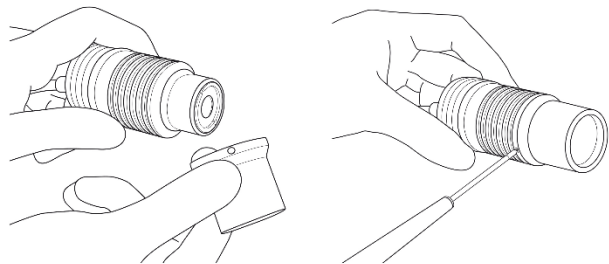
Loosen the socket head set-screws by means of an M1.5 or M2 Allen key and remove the C- mount adaptor.



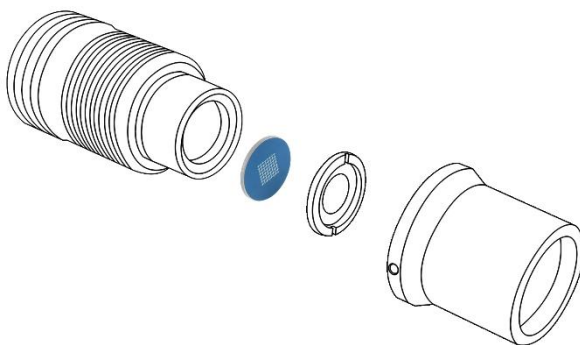
Remove the retaining ring using the provided PTOOL instrument.



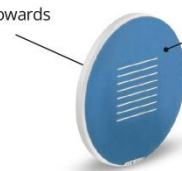
Fix the projection pattern in place by screwing the retaining ring with the provided PTOOL.



Insert back in place the C-mount adaptor and fix it by tightening the socket head set-screws with an M1.5 Allen key.



Uncoated surface towards  
light source



Coated surface towards  
projection lens



**Make sure to perform this procedure in a clean, non-dusty environment in order to prevent dust or other particles from entering the lens**

### 3. CE conformity

Opto Engineering declares the products of the LTPRHP3W and LTSCHP series compliant with the provisions of the Community Directive 2014/30/UE EN 61326-1 (measuring devices and control laboratory) including all applicable amendments, and that all standards and/or technical specifications mentioned below have been applied:

Method	Title
CEI EN 61326-1:2007-03	Electrical equipment for measurement, control and laboratory use EMC requirements. Part1: General requirements
CEI EN 55011:2011-02	Industrial, scientific and medical (ISM) radio-frequency equipment. Electromagnetic disturbance characteristics, Limits and methods of measurement
CEI EN 61000-4-3:2007-04 CEI EN 61000-4-3/A1:2009-01 CEI EN 61000-4-3/A2:2011-01 CEI EN 61000-4-3/ISI:2010-05	Electromagnetic compatibility (EMC) Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
CEI EN 61000-4-2:2011-04	Electromagnetic compatibility (EMC) Part 4-2: Testing and measurement techniques-Electrostatic discharge immunity test




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