

LTPRH3W series

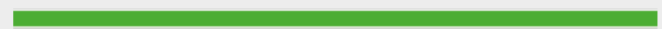
3W LED pattern projectors



KEY ADVANTAGES

Perfectly sharp edges

LTPR series ensures thinner lines, sharper edges and more homogeneous illumination than lasers.



With laser emitters the illumination decays both across the line cross section and along the line width.



Laser emitters lines are thicker and show blurred edges; diffraction and speckle effects are also present.



LTPRH3W series are advanced and efficient devices for pattern projection and structured light applications, such as 3D reconstruction.

Unlike laser sources, which typically show poor line sharpness and power distribution as well as scattering and diffraction effects, LTPR pattern projectors overcome all of these problems by integrating LED sources and precisely engraved masks. Any kind of pattern shape can be easily supplied, integrated and projected.

Different colors are available and the size of the projection area can be easily modified by interchanging different 2/3" C-mount lenses.

LIGHT SOURCE

- Higher efficiency
- Precise light intensity adjustment
- Easy LED source replacement

Every kind of shape can be projected

Standard patterns



Stripe 0.5 mm line thickness.



Edge.

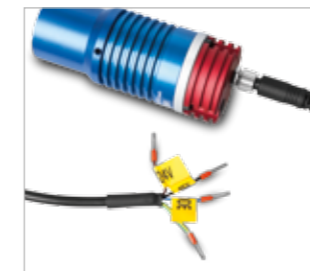


Grid 0.05 mm line thickness.



Line 0.5 mm line thickness.

Custom patterns

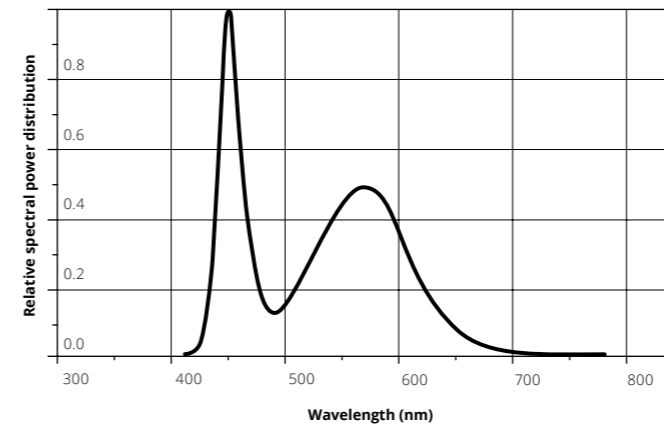


Electrical features

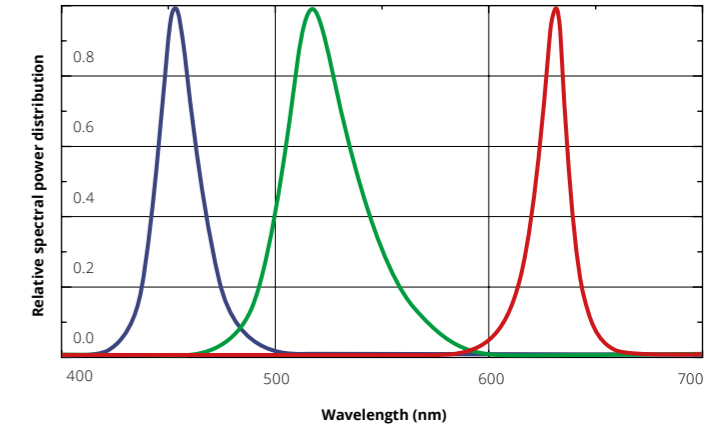
These LED devices integrate built-in switching electronics that control the current flow through the LED and which can be easily tuned by the user. This ensures both light stability and longer lifetime of the product.

The inner circuitry can be bypassed in order to directly drive the LED. Simply connect the black and blue wires to your power supply instead of the black and brown ones, ensuring that the maximum rates are not exceeded.

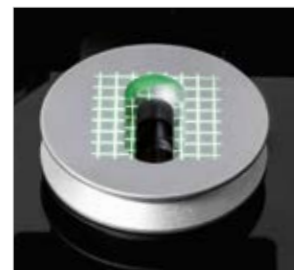
Typical emission spectrum of white LEDs



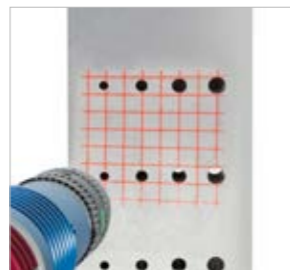
Typical emission spectrum of R,G,B LEDs



Application examples



3D reconstruction.



Mechanical alignment.



Visualization & mapping.



Telecentric pattern projection.

| Part number | Light color, wavelength peak | Device power ratings | | | | LED power ratings | | |
|-------------|------------------------------|----------------------|-------------|-----------------------|------------------------------|-------------------|-------------|------------------------|
| | | DC Voltage | | Power consumption (W) | Max LED forward current (mA) | Forward voltage | | Max pulse current (mA) |
| | | Minimum (V) | Maximum (V) | | | Typical (V) | Maximum (V) | |
| LTPRH3W-R | red, 630 nm | 12 | 24 | < 4.5 | 720 | 2.4 | 3.00 | 2000 |
| LTPRH3W-G | green, 520 nm | 12 | 24 | < 4.5 | 720 | 3.3 | 4.00 | 2000 |
| LTPRH3W-B | blue, 460 nm | 12 | 24 | < 4.5 | 720 | 3.3 | 4.00 | 2000 |
| LTPRH3W-W | white | 12 | 24 | < 4.5 | 720 | 2.78 | n.a. | 2000 |

1 Tolerance ± 10%.
 2 Used in continuous (not pulsed) mode.
 3 At max forward current.

4 Tolerance is ±0.06V on forward voltage measurements.
 5 At pulse width ≤ 10 ms, duty cycle ≤ 10% condition.
 Built-in electronics board must be bypassed (see tech info online).

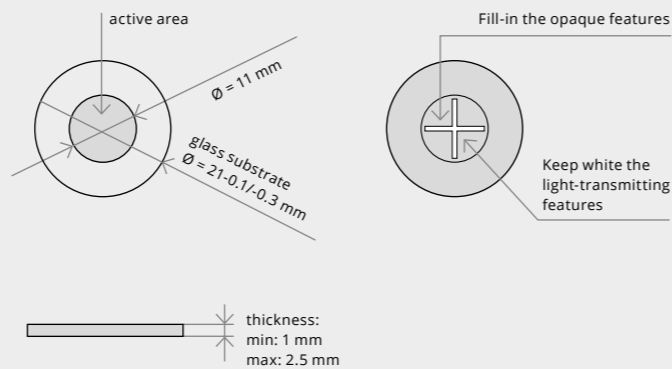
LTPRHP3W series

Product insight

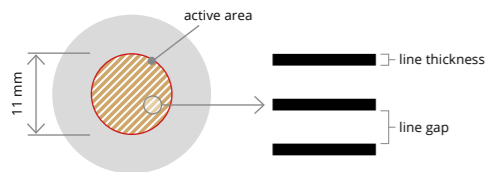


Custom-made pattern

Custom-made patterns can be supplied on request. A drawing with accurate geometrical information must be submitted (please refer to the instructions here below).



Pattern selection

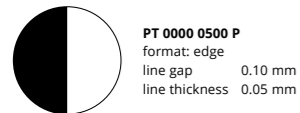
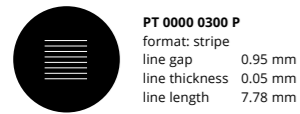
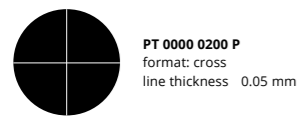


The projection pattern can be easily integrated into the LTPR projection unit by unscrewing the retaining ring that holds the pattern.

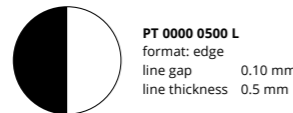
This simple procedure makes it easy to interchange different patterns. The pattern outer diameter is 21 mm, while the active projection area is a circle of \varnothing 11 mm: all the significant features of the pattern are drawn inside this circle.

The projection area will have the same aspect ratio as the pattern. The projection accuracy depends both on the pattern manufacturing accuracy and lens distortion. The edge sharpness of the projected pattern depends on both the lens resolution and the engraving technique: laser-engraved patterns (part numbers ending in "L") or photolithography-engraved patterns (part numbers ending in "P") can be chosen depending on the type of application.

Photolithography patterns



Laser engraved patterns



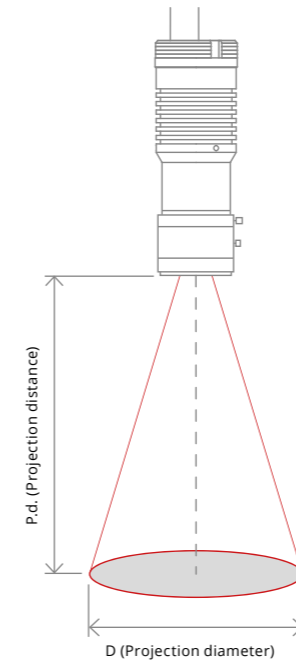
Pattern specifications

| Photolithography patterns | |
|---------------------------|-----------------|
| Substrate | Soda lime glass |
| Coating | Chrome |
| Geometrical accuracy | 2 μ m |
| Edge sharpness | 1.4 μ m |
| Laser engraved patterns | |
| Substrate | Borofloat glass |
| Coating | Dichroic mirror |
| Geometrical accuracy | 50 μ m |
| Edge sharpness | 50 μ m |

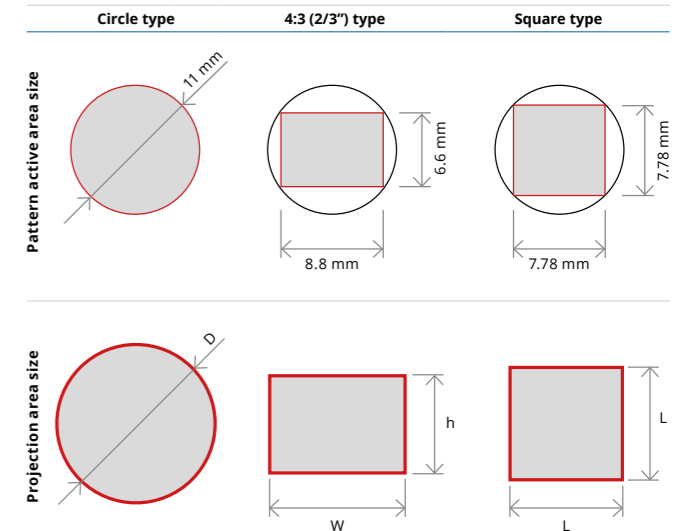
| FULL RANGE OF COMPATIBLE PROJECTION OPTICS | | |
|--|-------------------|--------|
| | ENHR series | p. 92 |
| FULL RANGE OF PROJECTION PATTERNS | | |
| | PTPR series | p. 218 |
| FULL RANGE OF COMPATIBLE POWER SUPPLIES | | |
| | PS power supplies | p. 226 |

Projection lens selection

The pattern drawing which has to be projected must be inscribed in a 11 mm diameter circle, the same diagonal of a 2/3" detector. For example, the pattern drawing could cover the entire 11 mm diameter area or be like a 8.8 x 6.6 mm rectangle or, again, be a square whose sides are 7.78 mm.



Pattern drawing and projection area



LTPR series can integrate most types of high resolution lenses: any high resolution C-mount lens for 2/3" detectors (11 mm image diagonal) can be used, such as the ones included in our ENHR series. Telecentric lenses for 2/3" detectors can also be interfaced, thus providing telecentric projection of the pattern and enabling unparallelled performance in 3D measurement applications.

Telecentric lenses

| | TC 23 004 | TC 23 007 | TC 23 009 | TC 23 016 | TC 23 024 | TC 23 036 |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| P.d. (mm) | 57.1 | 61.2 | 63.3 | 45.3 | 69.2 | 103.5 |
| D (mm) | 5.5 | 8.3 | 11.0 | 20.8 | 31.4 | 45.2 |
| | TC 23 048 | TC 23 056 | TC 23 064 | TC 23 072 | TC 23 080 | TC 23 096 |
| P.d. (mm) | 134.6 | 159.3 | 182.3 | 227.7 | 227.7 | 279.6 |
| D (mm) | 59.8 | 70.0 | 80.0 | 89.9 | 99.7 | 117.8 |

2 / 3" C-mount lenses

| P.d. | @50 mm | @75 mm | @100 mm | @150 mm | @200 mm | @250 mm | @300 mm | @400 mm | @500 mm |
|--------------|------------------------------|--------|---------|---------|---------|---------|---------|---------|---------|
| Focal length | D (Projection diameter) (mm) | | | | | | | | |
| 6 mm | 81 | 127 | 172 | 264 | | | | | |
| 8 mm | 58 (*) | 92 | 127 | 195 | 264 | 333 | | | |
| 12 mm | 35 (*) | 58 (*) | 81 | 127 | 172 | 218 | 264 | | |
| 16 mm | | 41 (*) | 58 (*) | 92 (*) | 127 | 161 | 195 | 264 | 333 |
| 25 mm | | | | 55 (*) | 77 (*) | 99 (*) | 121 (*) | 165 | 209 (*) |
| 35 mm | | | | | | 68 (*) | 83 (*) | 115 | 146 |

(*) = spacers may be needed to compensate back focal length.

Unless the projection optics introduces significant distortion, the shape of the projected pattern will preserve the features and aspect ratio of the engraved pattern. The projected area dimensions will be "M" times the original dimensions of the pattern, where M is the optical magnification of the selected projection lens.

C-mount lenses and telecentric optics can be connected to the unit by means of the C-mount adaptor included in the product package. Here is a list of the projection diameters and the recommended projection distances with different types of optics.



Bi-telecentric lenses.



Standard C-mount lenses.