

## Machine Vision Laser Focus with a circular beam profile

Series 13MC/13MMC, 5MC, 13MM and 5MM

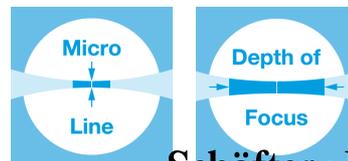


### FEATURES

Machine vision laser focus with approx. circular Gaussian beam profile. This includes lasers of series 13MC/13MMC, 13MM, 5MM and 5MC. The series are available as Micro (smaller line widths) or Macro version (extended depth of focus).

- Spot with circular beam profile
- Laser Focus Generator series [13MC/13MMC](#)
- Rotationally symmetric, Gaussian beam profile
- Laser Focus Generator series [13MM](#)
- Circular beam profile
- Extended depth of focus
- Laser Focus Generator series [5MM](#)
- Compact
- Circular beam profile
- Extended depth of focus
- Laser Focus Generator series [5MC](#)
- Compact
- Rotationally symmetric, Gaussian beam profile
- Optional Low Noise Version:
  - Series [LNC-13MC](#) (Micro) and series [LNC-13MMC](#) (Macro)
  - Series [LNC-13MM](#) (Macro)

- 
- Micro Line Generator for small laser line widths and high power density in the focal plane
  - Macro Line Generator for extended depth of focus



## DESCRIPTION

The laser diode beam sources series 13MC/13MMC, 13MM, 5MM and 5MC produce a circular laser spot. They have different intensity distributions/beam profiles.

### 13MC vs. 13MM and 5MC

The laser diode beam source series 13MC produces a rotationally symmetric, circular laser spot with Gaussian intensity distribution. The corresponding series 13MMC produces a rotationally symmetric laser spot with extended depth of focus. The beam profile is rotationally symmetric and [approx. Gaussian](#).

The laser diode beam source series 13MM and 5MM produce a circular laser spot with extended depth of focus. More precisely it has an elliptical intensity distribution clipped by a circular aperture. The beam profile is [approx. Gaussian](#).

The compact Laser Focus Generator series 5MC produces a rotationally symmetric, circular laser spot with Gaussian intensity distribution.

### Micro and Macro lasers

The lasers of series 13MC and 5MC are [Laser Micro Focus Generators](#) designed to produce spots with small spot size. They have a small depth of focus (in this case the depth of focus is the Rayleigh range). [Laser Macro Focus Generators](#) like the corresponding lasers of series 13MMC have common basic optical features but are designed to generate laser spots with an extended depth of focus. The lasers of series 13MM and 5MM are also Macro Focus Generators with extended depth of focus.

### Electronics

The lasers have integrated electronics for control of the laser output power. The output power can be controlled using the modulation input ports (TTL and analog) or manually using the potentiometer. Optionally the lasers can be equipped with [RS232 serial interface](#) for laser control and data read-out. Please note that the compact version 5M has different electronic features and is not available with RS232 interface.

### Adjusting the working distance

For lasers of series 13MC/13MMC, 13MM, 5MM and 5MC the working distance can be adjusted by adjusting the focus setting. Please note that the spot diameter increases proportionally to the working distance. A fine-adjustment of the distance between laser and target is recommended for fine-focusing in order to achieve minimal spot size.

### Optional: Low Noise Version

The laser series 13MC/13MMC and 13MM is also available as a Low Noise version [LNC-13MC](#) (Micro), [LNC-13MMC](#) (Macro) and [LNC-13MM](#) (Macro). These lasers are [low noise](#) (typ. < 0.15% of  $P_0$  (RMS, Bandwidth < 1 MHz)) and operate mode-hopping free. Due to the reduced coherence length the speckle contrast is lowered. However this effect is smaller for smaller lines and spots. ( $P_0$  is the maximum specified output power.)

These high quality lasers can e.g. be used for machine vision applications.

- Micro vs. Macro

What does Micro or Macro Laser mean?

- [Laser Modules with RS232 interface](#)  
[Features of Laser Modules with RS232 interface](#)
- [LNC Laser Modules](#)  
[Low noise Laser Modules vs. regular Laser Modules](#)
- [Electronic features \(9\)](#)  
[Detailed electronic features for all electronics types](#)
  - [Overview Electronics Types](#)  
[Overview over all Electronics Types](#)
  - [Electronics Type C](#)  
[Electronic features for electronics type C](#)
  - [Electronics Type P](#)  
[Electronic features for electronics type P](#)
  - [Electronics Type H](#)  
[Electronic features for electronics type H](#)
  - [Electronics Type HP](#)  
[Electronic features for electronics type HP](#)
  - [Electronics Type CS with RS232 interface](#)  
[Electronic features for electronics type CS](#)
  - [Electronics Type PS with RS232 interface](#)  
[Electronic features for electronics type PS](#)
  - [Electronics Type S](#)  
[Electronic features for electronics type S](#)
  - [Electronics Type B](#)  
[Electronic features for electronics type B](#)
- [Laser Line Basics \(7\)](#)  
[Line geometry, intensity distribution, definition of line length and working distance, definition of line width and machine vision applications.](#)
  - [Laser Line geometries](#)  
[Fan angle vs. semi-telecentric.](#)
  - [Intensity distribution](#)  
[Gaussian intensity distribution and uniform intensity distribution along the laser line](#)
  - [Laser Line length and working distance](#)  
[Line length and working distance definition](#)
  - [Laser Line Width and Depth of Focus / Rayleigh Range](#)  
[Line width definition](#)
  - [Laser Speckle](#)  
[When do they appear and how to prevent them](#)
  - [Wavelengths of diode based lasers](#)  
[What wavelengths are available for diode based laser modules?](#)

- [Cable orientation](#)  
[Straight and angled cable exit](#)
- [Machine vision applications of Laser Lines](#)  
[Laser triangulation, laser light sectioning, particle measurement etc.](#)

## RELATED PRODUCTS

### LASER MODULES SERIES 13MC

- Micro Focus Generator
- **Rotationally symmetric**, Gaussian beam profile

### LASER MODULES SERIES 13MMC

- Laser Macro Focus Generator
- **Rotationally symmetric** beam profile
- Extended depth of focus

### LASER MODULES SERIES 13MM

- Macro Focus Generator
- **Circular** beam profile
- Extended depth of focus

### LASER MODULES SERIES 5MC

- **Compact** Laser Micro Focus Generator
- **Rotationally symmetric**, Gaussian beam profile

### LASER MODULES SERIES 5MM

- **Compact** Laser Macro Focus Generator
- **Circular** beam profile and
- Extended depth of focus

### LASER MODULES SERIES LNC-13MC

- Micro Focus Generator
- **Rotationally symmetric**, Gaussian beam profile
- Low noise

### LASER MODULES SERIES LNC-13MMC

- Laser Macro Focus Generator
- **Rotationally symmetric** beam profile
- Extended depth of focus
- Low noise

### LASER MODULES SERIES LNC-13MM

- Macro Focus Generator
- **Circular** beam profile
- Extended depth of focus
- Low noise

This is a printout of the page <https://sukhamburg.com/products/lasermodule/geometry/laserfocus/circular.html> from 12/3/2022

## CONTACT

For more information please contact:

Schäfter + Kirchhoff GmbH

Kieler Str. 212

22525 Hamburg

Germany

Tel: +49 40 85 39 97-0

Fax: +49 40 85 39 97-79

[info@sukhamburg.de](mailto:info@sukhamburg.de)

[www.sukhamburg.com](http://www.sukhamburg.com)

## LEGAL NOTICE

**Copyright 2020 Schäfter+Kirchhoff GmbH. All rights reserved.**

Text, image, graphic, sound, video and animation files and their arrangement on Schäfter+Kirchhoff GmbH webpages are protected by copyright and other protective laws. The content may not be copied for commercial use or reproduced, modified or used on other websites. [\[more\]](#)