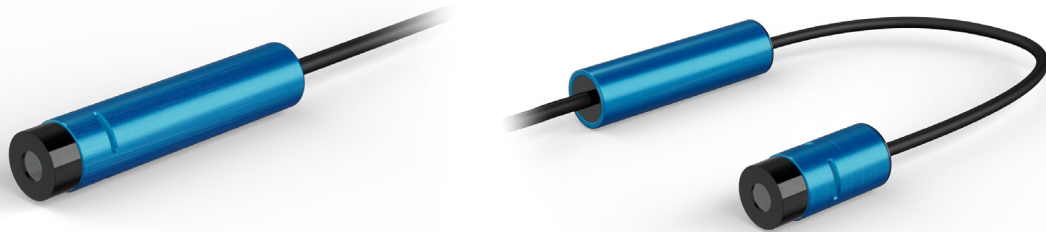


MVpulseHP SERIES WITH PULSE CONTROL

FLEXPOINT® Machine Vision Laser



A COMPACT LASER MODULE WITH HIGH PEAK POWER AND SMALL SIZE

The MVpulseHP offers high peak powers (up to 500mW for 525nm, 660nm, 808nm and even 1000mW at 445nm), while the diameter remains 19mm and the housing has a small size. Active cooling can be avoided, due to the pulsing function. Higher power and therefore higher light intensity can support decreased exposure time and higher throughput (more frames per second, more parts to be inspected per second).

The pulse frequency and duty cycle can be adjusted to the needs of the application. The MVpulseHP is available as standard (ST) and 2-Housing (2H) separating the housing for optics and electronics. There is also a variety of fan angles and two different focus options available.

FEATURES

- / Pulsed laser module at 4 wavelengths up to 1W for 445 nm and 500mW for 525 nm, 660 nm and 808 nm
- / High pulse power without active cooling
- / Small laser module for high intensity illumination
- / Adjustable pulse width, depending on the needs of the application
- / Pulse control by integrated microcontroller
- / Over-temperature protection

APPLICATIONS

- / 3D machine vision
- / Outdoor industrial inspection
- / Rail inspection
- / Steel inspection

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SPECIFICATIONS

Model	Line laser with uniform power distribution (FOV correction available)			
Wavelength [nm]	445	525	660	808
Wavelength tolerance (typ.) [nm]	±10	±7	±7	±10
Wavelength Drift [nm/K]	≤0.1	≤0.1	≤0.3	≤0.3
Output power (max. peak power) [mW] ¹	500-1000	300-500	300-500	300-500
Power stability at 25 °C (after warm up) [%]	≤ 5			
Operating temperature (housing temp.) [°C] ²	-10 to +50	-10 to +30	-10 to +30	-10 to +30

Duty cycle and pulse length for peak power increase compared to cw mode to avoid shut off of laser due to heat generation

Duty cycle	0-10%
Pulse length	20µs-20ms
Mod. Frequency	0Hz-4kHz (higher frequency on request) Low 0V, high 5V = defined peak power, input impedance of 10kOhm at 5V

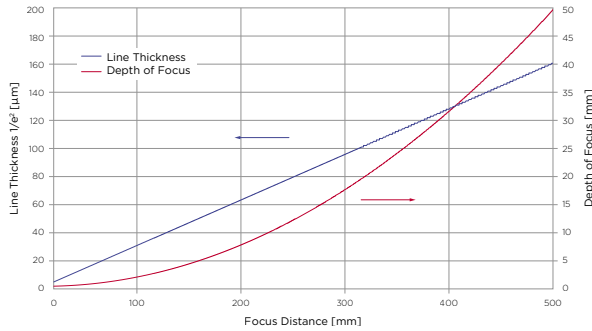
Fan angle [°] ³	5, 10, 30, 45, 60, 75
Focussing range [mm]	50-5000
Line intensity variation (typ) ⁴ [%]	≤ 30 related to average power (within 80% of the line)
Line straightness ⁴ [%]	±0.1
Pointing stability [µrad/K]	≤ 10
Boresight deviation [mrad]	≤ 10
Operating voltage [VDC]	20-24
Communication interface	RS-232 (0-5V) (optional RS-485)
Modulation	Digital Modulation ≤ 4kHz active high (higher frequency on request) Low 0V, high 5V, input impedance of 10kOhm at 5V
Delay + Rise time [µs]	<20
Laser protection class	3B (IEC 60825-1:2014, EN 60825-1:2014+A11:2021)
Additional protections	ESD Over-temperature ⁵ Over-voltage up to 26 VDC Reverse polarity up to 30 VDC
Shock tolerance	30 G, 6 ms 75 G, 4 ms
Housing	Aluminium (blue anodized, potential free) ST-F (standard) or 2H-F (separate housing for optics and electronics)
Accessories available (optional, order separately)	Mount
Pin / cable color assignment	Open leads (500mm) Red: +VDC; Black: GND; Green: MOD; Yellow: RX; Blue: TX; Brown: GND COM Purple/Orange: Reserved - not for customer use 150mm cable between housings for 2H

Foot Note

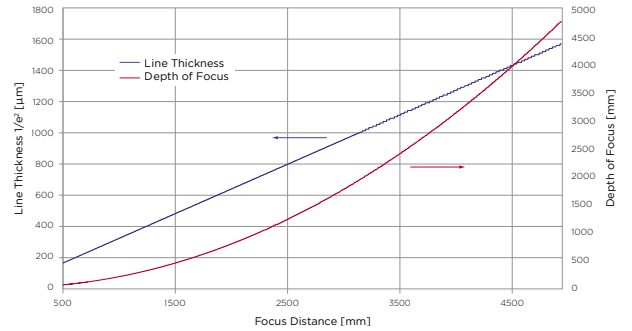
- 1 The output power is defined behind optics which means at the beam exit of the laser module
- 2 Below 0 °C condensate formation must be avoided (due to optical and electronic components)
- 3 Fan angle: Defined by the ends of the laser line using FWHM based on the average power (within 80% of line)
- 4 Line intensity variation and line straightness are measured at 80% of the fan angle
- 5 Over temperature: The laser is switched off automatically if the temperature in the laser diode exceeds a defined temperature. Switching back on takes place with a hysteresis of 5K

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Line Thickness and Depth of Focus (DOF) for Standard (STD) Focus Option at 660 nm



Standard laser line characteristics (short range)



Standard laser line characteristics (long range)

Focus Options

MVpulseHP is available with different focus options to achieve the right combination of line thickness and depth of focus depending on the application.

The values shown in the table below are the factors which should be used in combination with the graph above.

P _{out} and λ			Focus options (conversion factor related to standard laser marked in red)			
λ	P _{out}	Δλ	STD		DL	
[nm]	[mW]	[nm]	LT	DOF	LT	DOF
445	500 - 1000	±10	0.97	1.39	0.69	0.71
525	300 - 500	±7	1.15	1.68	0.78	0.78
660	300 - 500	±7	1.00	1.00	0.76	0.58
808	300 - 500	±10	1.27	1.32	0.98	0.79

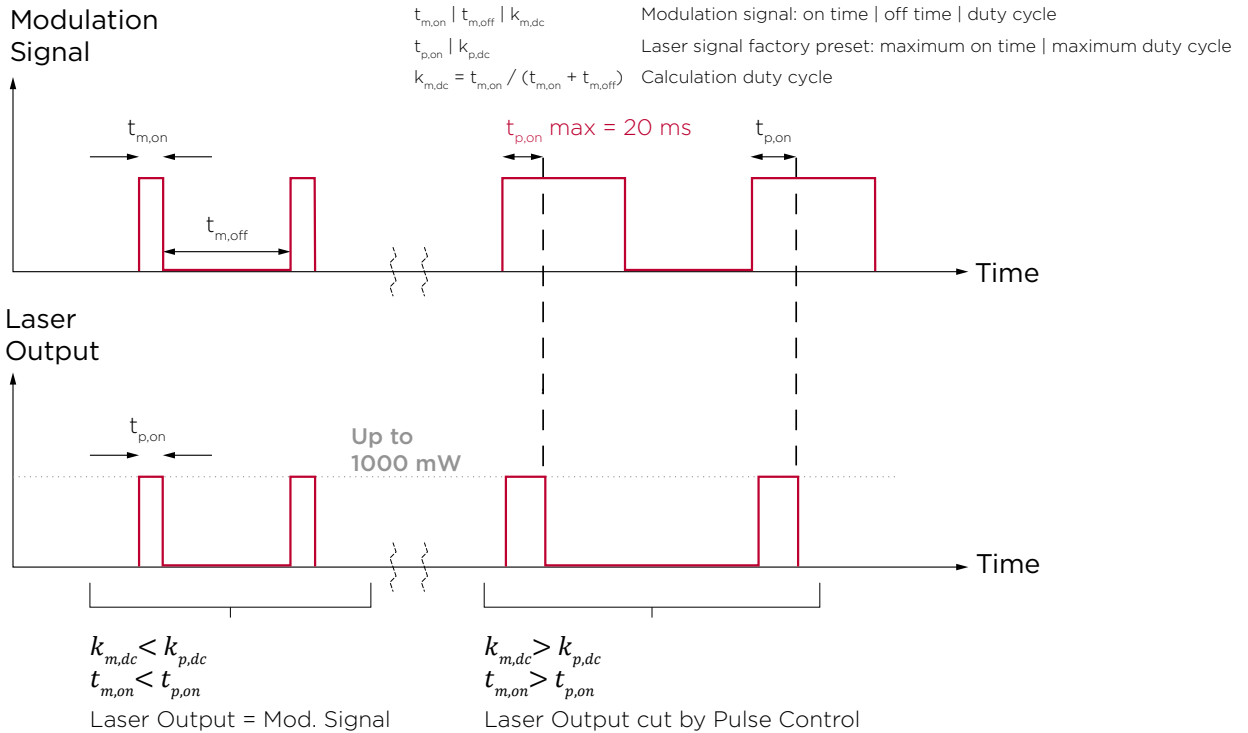
Foot Note / Abbreviations

LT = Line Thickness DOF = Depth of Focus
DL = Thin Line FD = Focus Distance

STD = Standard, good compromise between Line Thickness and Depth of Focus

Pulse and Monitor / Control Features

- / Current standard for pulse function: Every modulation signal will result in a laser pulse but pulse length / duty cycle will be adjusted for temperature control which means the pulse length can be shorter than the modulation signal
- / Duty cycle and pulse length will be preset at the factory and can be adjusted to your application
- / Pulse control can be adjusted on request



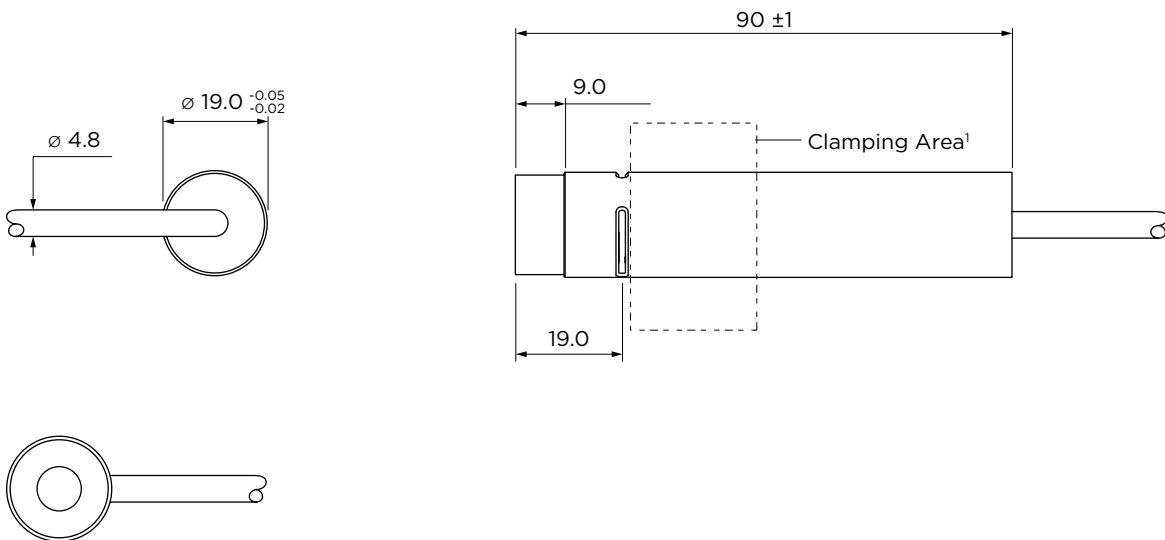
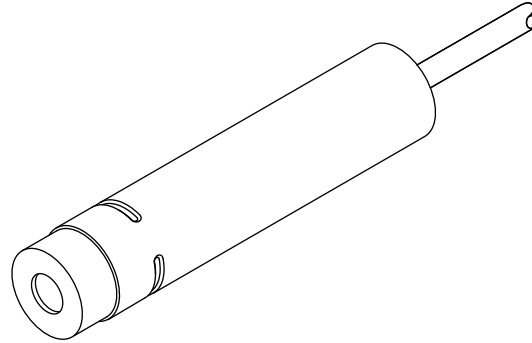
FLEXPOINT® MACHINE VISION LASER

MVpulseHP Series with Pulse Control



TECHNICAL DRAWING

MVpulseHP with standard housing and focusing mechanics



MVpulseHP ST-F

¹For optimal heat dissipation in a mount, we recommend to apply thermal paste on the surface overlap.

Units: mm

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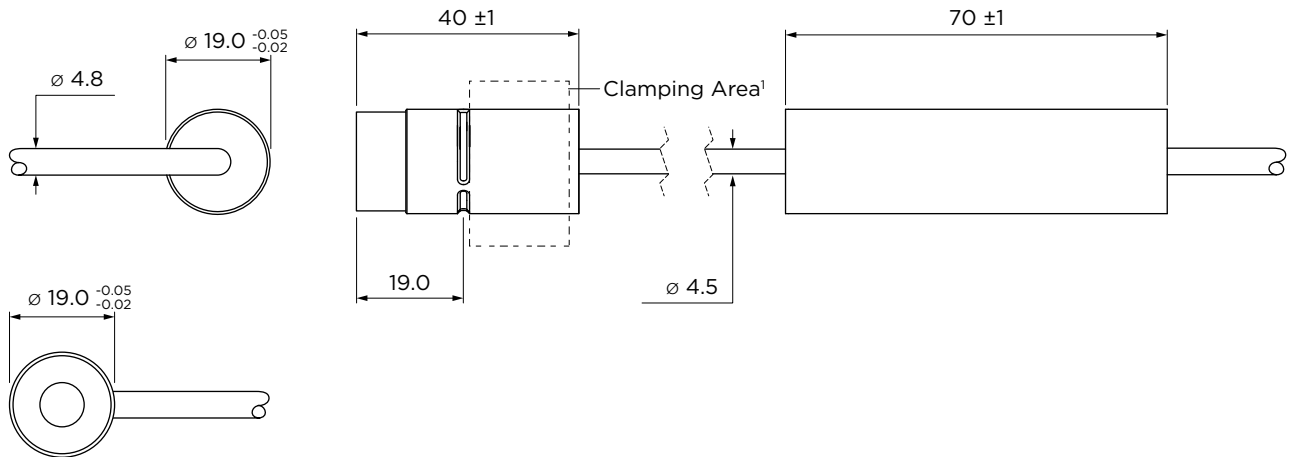
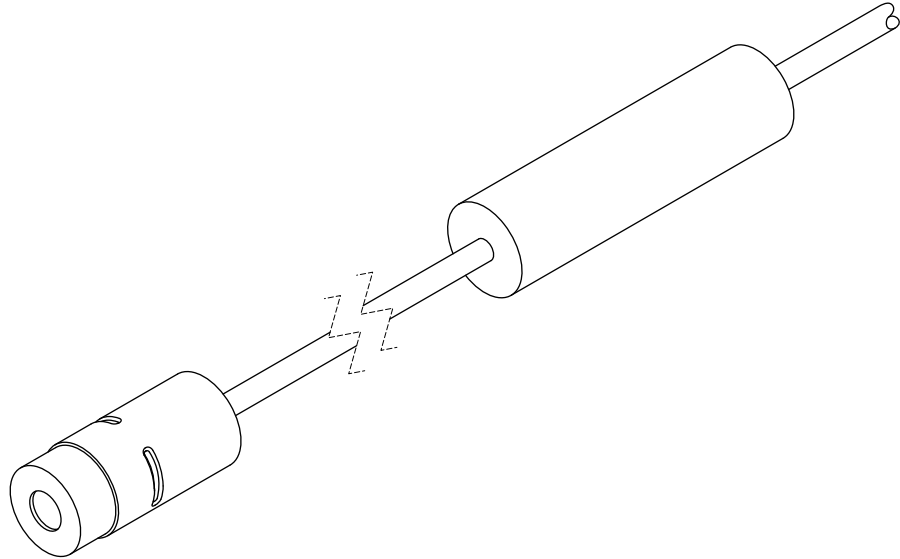
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MVpulseHP Series with Pulse Control



TECHNICAL DRAWING

MVpulseHP with 2 housings, focusable



MVpulseHP 2H-F

¹For optimal heat dissipation in a mount, we recommend to apply thermal paste on the surface overlap.

Units: mm

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MVpulseHP Series with Pulse Control



ORDERING CODE

	Housing	Wavelength [nm]	Peak Power [mW]	Modulation	Fan Angle [°]	Optics
FP-MVpulseHP	X	X	X	X	X	X
	ST 2H	445 525 660 808	300-500 1000 (445nm only)	MI Digital Modulation inverted, active high	5 10 30 45 60 75	STD DL

Example: FP-MVpulseHP-ST-660-500MI-60-STD