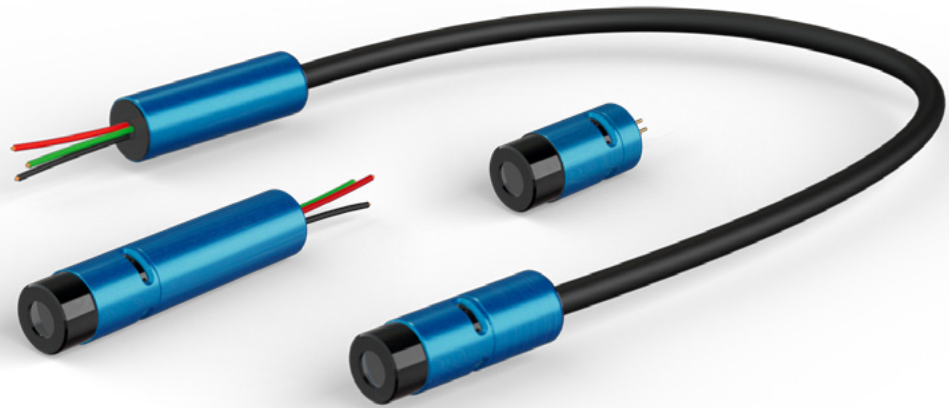


MVpico SERIES (EDITION 2025 WITH IMPROVED FOCUS MECHANICS)

FLEXPOINT® Machine Vision Laser



A COMPACT AND FLEXIBLE LASER MODULE FOR INTEGRATION IN 3D SENSORS

MVpico line lasers are only 47 mm long and have a diameter of 10 mm. These small dimensions make the MVpico the perfect match for integration in intelligent 3D sensors. Despite its small housing dimensions they provide the same flexibility as its larger sibling, the MVnano: wavelength of 405–850 nm with output powers up to 100 mW.

The MVpico with new focus mechanics (Edition 2025) offers improved dust- and moisture proofness, an even shorter design and an improved beam drift while focusing the laser. The established, easy focusing method will remain untouched.

A variety of options of optics provide the right combination of line thickness and depth of focus for various applications. Adjustable focus and fixed focus are both available as well as different versions of modulation e.g. 24 V modulation.

FEATURES

- / Superior line quality for a variety of wavelengths
- / Fixed and adjustable focus available
- / Improved focus mechanics for the adjustable focus
- / Many optics options for the right match of line thickness and depth of focus
- / Modular housing options available (Standard, 2H = 2 Housing, OH = Optical Head)
- / 24 V Modulation available

APPLICATIONS

- / 3D machine vision
- / Integration in 3D sensors
- / Industrial inspection
- / Quality inspection integrated in 3D scanner

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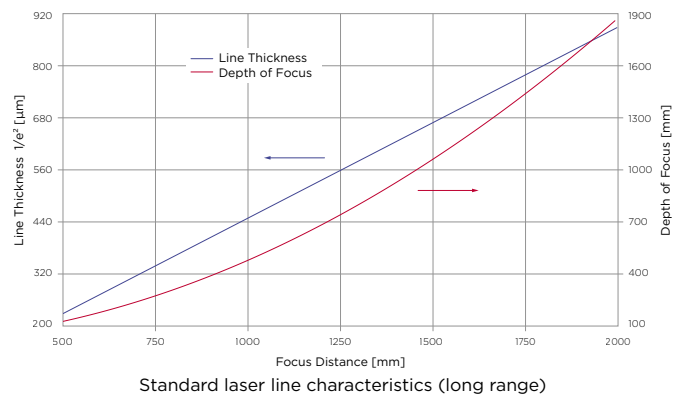
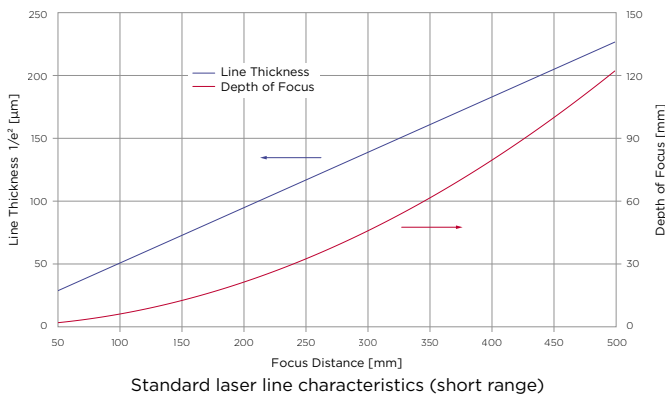
SPECIFICATIONS

Model	Line laser with uniform power distribution (FOV correction available)								
Wavelength [nm]	405	450	520	640	660	685	785	830	845
Wavelength tolerance (typ.) [nm]	± 5	± 10	± 10	± 5	± 5	± 10	± 10	± 10	± 10
Output power [mW] ¹	1–30	1–75	1–10	1–100	1–100	1–40	1–100	1–40	1–40
Power stability at 25 °C (after warm up) [%]	≤ 5								
Operating voltage [VDC] ²	10–30 ²				4.5–30				
Operating temperature (housing temp.) [°C] ³	-10 to +50								
Fan angle [°] ⁴	1, 5, 10, 15, 20, 30, 45, 60, 75, 90								
Focussing range [mm]	50–5000								
Line intensity variation (typ) ⁵ [%]	±20 (optional ±10) related to average power (80% of the line)								
Line straightness ⁵ [%]	±0.1 (optional ±0.05)								
Pointing stability [μrad/K]	≤ 10 (improved pointing stability on request)								
Boresight deviation [mrad]	≤ 10 (optional ≤ 3 or 5)								
Shock tolerance	30 G, 6 ms 75 G, 4 ms								
Housing	Aluminium (blue anodized, potential free)								
	Standard, 2H (separate housing for optics and electronics) or OH (without electronics)								
	Fixed focus (fixed at factory to defined working distance) or adjustable focus								
Accessories available (optional, order separately)	Mobile power pack for modules ≥640 nm; Power supply for 5 V (≥640 nm); Power supply for 12 V								
Connector	200 mm flying leads								
	Red: +VDC; Black: GND; Green: Modulation (optional); Yellow: Adjustable power (optional)								
	Standard module comes without modulation and power adjustment								
	150 mm cable between housings for 2H								
	No wire for optical heads (OH)								

Foot Note

- 1 Output power: The output power is defined behind optics which means at the beam exit of the laser module
- 2 5 V Option («StepUp» electronics 4.5-6 V) available for 405 nm, 450 nm and 520 nm, no standard product but available on request
- 3 Below 0 °C condensate formation must be avoided (due to optical and electronic components)
- 4 Fan angle: Defined by the ends of the laser line using FWHM based on the average power (within 80% of line)
- 5 Line intensity variation and line straightness are measured at 80% of the fan angle

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



Focus Options

MVpico 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 reference laser marked in red left side - optimized for thin line / right side - optimized for high DOF)											
			DLSE		DLE		DL		STD		TS1		TS2	
λ	P _{out}	Δλ	LT	DOF	LT	DOF	LT	DOF	LT	DOF	LT	DOF	LT	DOF
[nm]	[mW]	[nm]												
405	1–30	±5	0.27	0.12	0.35	0.20	0.49	0.39	0.71	0.81	1.04	1.76	1.53	3.80
450	1–50	±10	0.25	0.10	0.33	0.16	0.45	0.30	0.69	0.69	1.49	3.25	2.20	7.06
520	1–10	±10	0.29	0.11	0.39	0.19	0.53	0.36	0.78	0.78	1.71	3.69	2.55	8.23
640	1–20	±5	0.39	0.16	0.51	0.27	0.69	0.48	1.02	1.07	1.65	2.79	2.43	6.08
640	21–30	±5	0.39	0.16	0.51	0.27	0.69	0.48	1.02	1.07	1.47	2.23	2.18	4.87
640	31–100	±5	0.47	0.23	0.59	0.36	0.80	0.67	1.20	1.47	1.65	2.79	2.43	6.08
660	1–30	±5	0.39	0.15	0.49	0.24	0.67	0.44	1.00	1.00	1.51	2.27	2.25	5.07
660	31–100	±5	0.51	0.26	0.65	0.42	0.88	0.78	1.31	1.72	1.51	2.27	2.25	5.07
685	1–40	±10	0.45	0.20	0.57	0.31	0.76	0.56	1.14	1.24	1.43	1.97	2.12	4.31
785	1–10	±10	0.35	0.10	0.45	0.17	0.61	0.31	0.90	0.68	1.65	2.28	2.43	4.96
785	11–100	±10	0.65	0.35	0.82	0.57	1.12	1.05	1.65	2.28	2.00	3.36	2.98	7.45
830	1–40	±10	0.69	0.37	0.88	0.62	1.22	1.17	1.78	2.53	2.29	4.18	3.39	9.13
845	1–40	±10	0.35	0.10	0.45	0.16	0.61	0.29	0.90	0.63	1.63	2.06	2.41	4.53

Foot Note / Abbreviations

DLSE = Thin Line Super Enhanced

DLE = Thin Line Enhanced

DL = Thin Line

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

LT = Line Thickness

DOF = Depth of Focus

TS1 = Enhanced Depth of Focus

TS2 = Enhanced Depth of Focus, higher factor

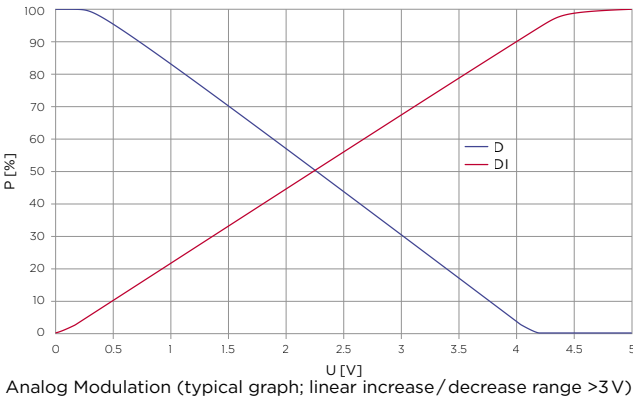
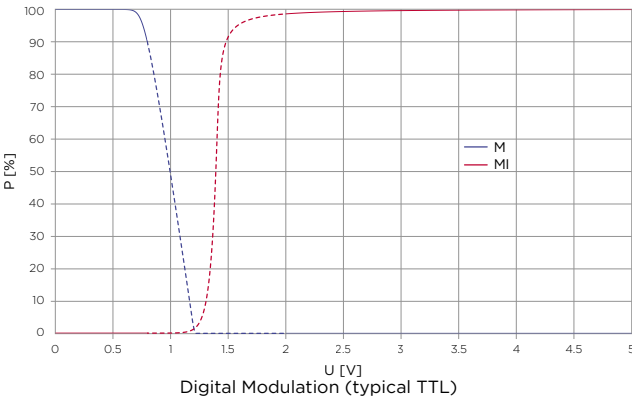
To calculate Line Thickness and Depth of Focus for your working distance and your application you can also use our Simulator available on the Website:

<https://www.lasercomponents.com/line-thickness-simulator/>



Modulation Options

The standard module comes without modulation and power adjustment.



	Digital Modulation <20 kHz active high and active low available 0/5V 24 V Version available (0/24 V)		Analog Modulation high/low by control wire 0-5 V	
	M active low	MI active high	D active low	DI active high
Delay + Rise time (max.) [μs]	10	10		
On [V]	0-0.5	4.5-5	0	5
Off [V]	4.5-5	0-0.5	5	0
Linear range [V]			>3	>3

Available combinations of options M and D are listed in the table below. For the combined modulations (last four columns), the properties of the modulation components apply according to the columns of M, MI, D and DI. The standard module comes without modulation and power adjustment.

P _{out} and λ			Modulation options							
λ	P _{out}	U _{oper}	M	MI	D	DI	MD	MID	MDI	MIDI
[nm]	[mW]	[V]								
405	1-25	10-30	■ a	■ b, e	■ a, d	-	■ a, a, d	■ b, e, a, d	■ a	■ b, e
405	1-25	4.5-6	■ a, e	■ b, e	-	-	-	-	-	-
405	25-30	10-30	■ a, e	■ b, e	■ c	■ b, d	■ a, e, c	■ b, e, c	■ a, e, b, d	■ b, e, b, d
405	25-30	4.5-6	■ a, e	■ b, e	■ c	-	■ a, e, c	■ b, e, c	-	-
450	1-75	10-30	■ a, e	■ b, e	■ c	■ b, c, d	■ a, e, c	■ b, e, c	■ a, e, b, c, d	■ b, e, b, c, d
450	1-75	4.5-6	■ a, e	■ a, e	■ b, e	■ b, c	■ a, e, b, e	■ a, e, b, e	■ a, e, b, c	■ a, e, b, c
520	1-10	10-30	■ a, e	■ b, e	■ a	■ b, c	■ a, e, a	■ b, e, a	■ a, e, b, c	■ b, e, b, c
520	1-10	4.5-6	■ a, e	■ b, e	■ a	■ c	■ a, e, a	■ b, e, a	■ a, e, c	■ b, e, c
640	1-20	4.5-30	■ a	■ e	■ a	■ c, d	■ a, a	■ e, a	■ a, c, d	■ e, c, d
640	20-100	4.5-30	■ a, e	■ b, e	■ c	■ b, c, d	■ a, e, c	■ b, e, c	■ a, e, b, c, d	■ b, e, b, c, d
660	1-30	4.5-30	■ a	■ e	■ a	■ c, d	■ a, a	■ e, a	■ a, c, d	■ e, c, d
660	30-100	4.5-30	■ a, e	■ b, e	■ c	■ b, c, d	■ a, e, c	■ b, e, c	■ a, e, b, c, d	■ b, e, b, c, d
685	1-40	4.5-30	■ a	■ e	■ a	■ c, d	■ a, a	■ e, a	■ a, c, d	■ e, c, d
785	1-9	4.5-30	■ a	■ e	■ a	■ c, d	■ a, a	■ e, a	■ a, c, d	■ e, c, d
785	10-100	4.5-30	■ a, e	■ b, e	■ c	■ b, c, d	■ a, e, c	■ b, e, c	■ a, e, b, c, d	■ b, e, b, c, d
830	1-40	4.5-30	■ a, e	■ b, e	■ c	■ b, c, d	■ a, e, c	■ b, e, c	■ a, e, b, c, d	■ b, e, b, c, d
845	1-40	4.5-30	■ a	■ e	■ a	■ c, d	■ a, a	■ e, a	■ a, c, d	■ e, c, d

Foot Note / Abbreviations

■ = Standard availability

■ = Available with modification

a = On@float (if the modulation cable or pin is not connected the module is on (cable is loose))

b = Off@float (if the modulation cable or pin is not connected the module is off (cable is loose))

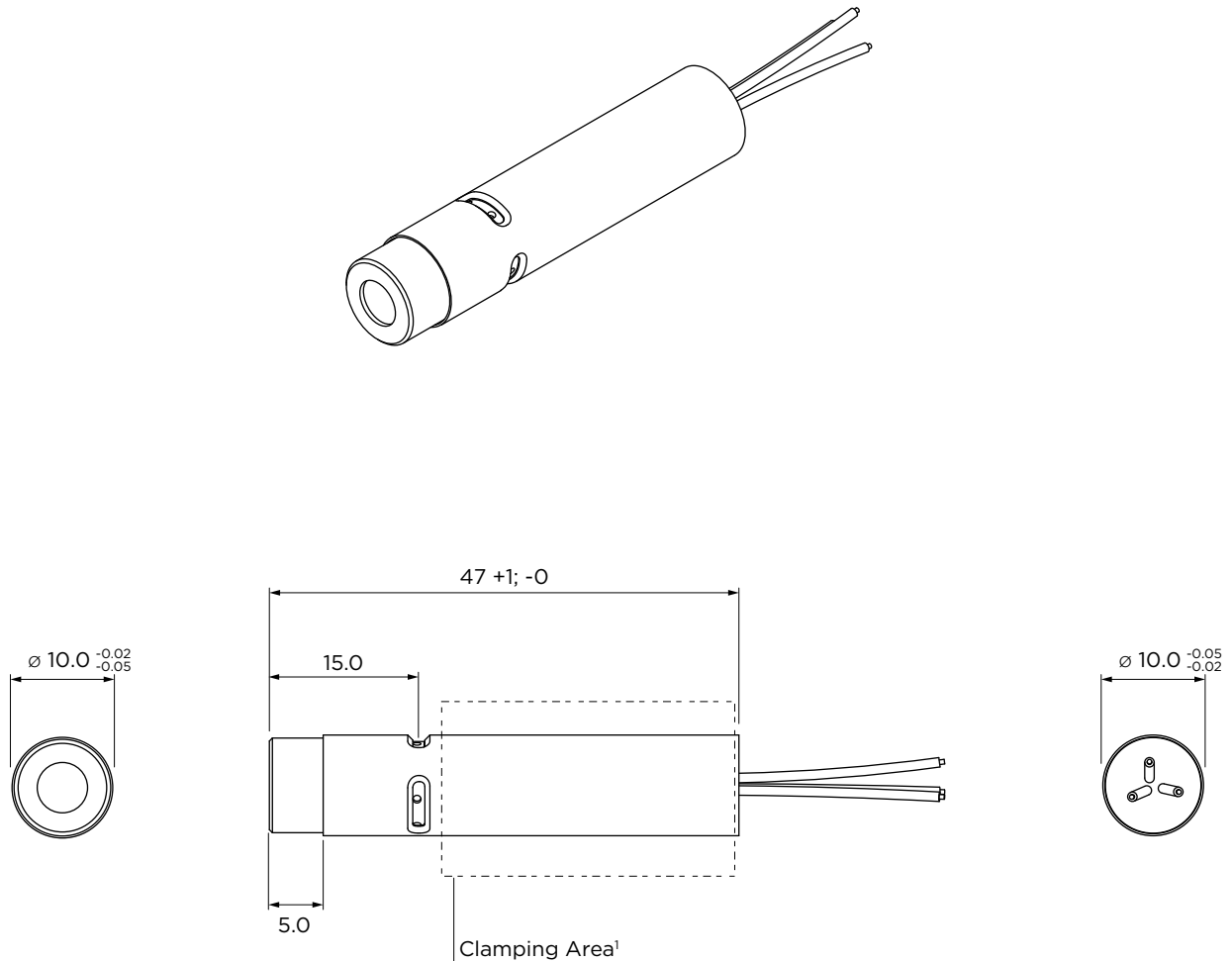
c = Non-linear response (the curve in the diagram for D and DI indicates an ideal line / linear behaviour but in reality the response is not linear)

d = No Off (module is always glowing / always on at least with very low intensity)

e = TTL (TTL Logic: TTL 5V has two threshold values - 0.8V and 2.0V)

TECHNICAL DRAWING

MVpico 2025 standard housing, focusable (ST-F)



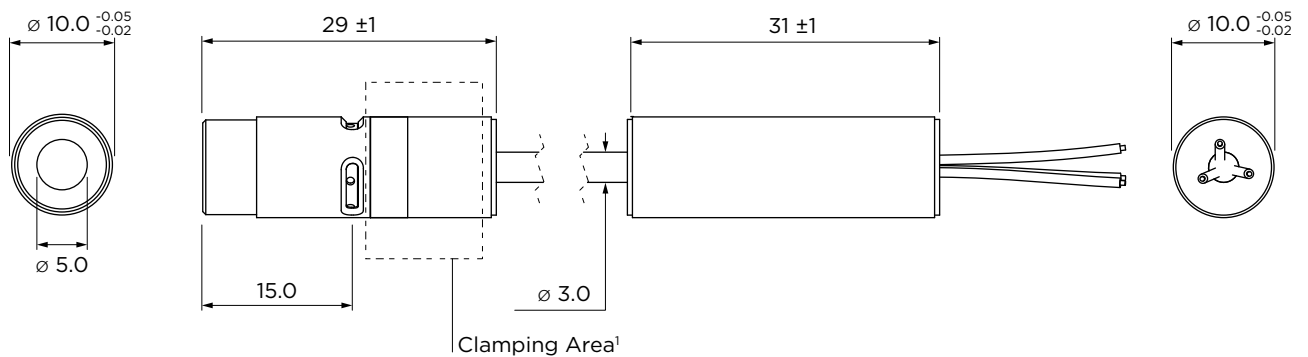
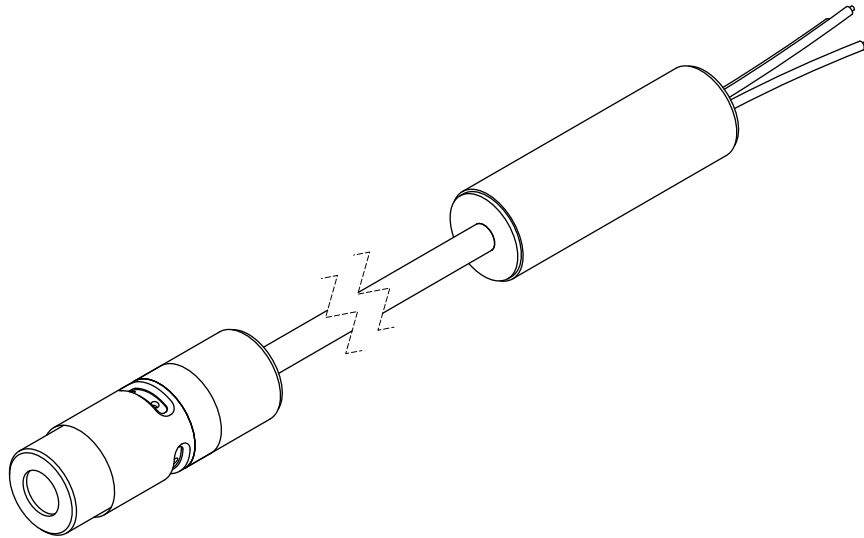
MVpico ST-F

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

Units: mm

TECHNICAL DRAWING

MVpico 2025 with 2 housings, focusable (2H-F)



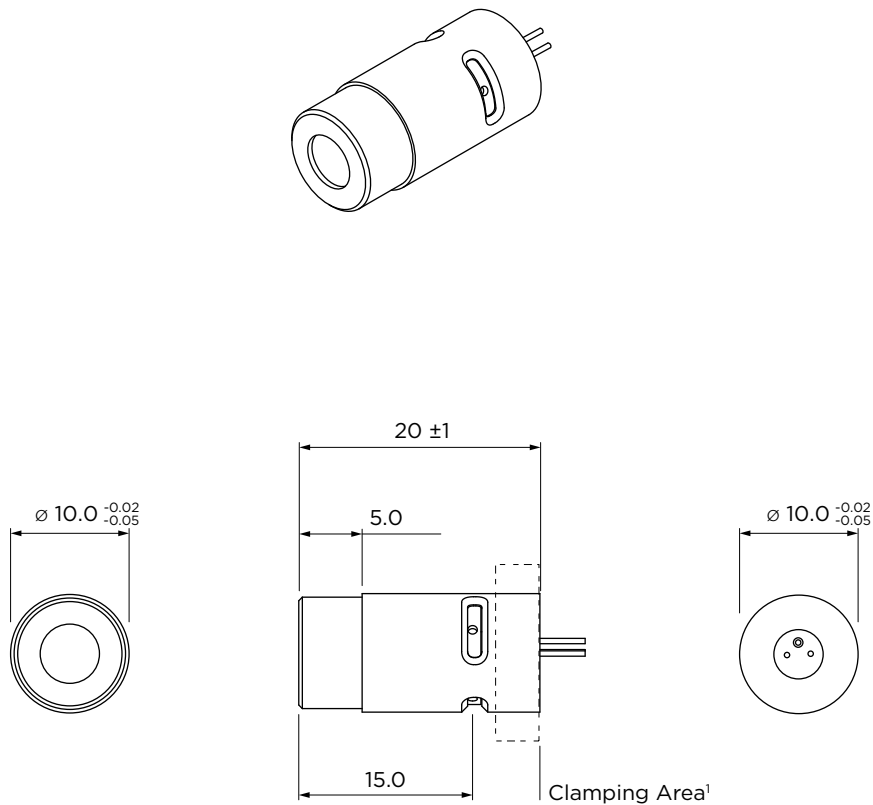
MVpico 2H-F

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

Units: mm

TECHNICAL DRAWING

MVpico 2025 optical head (OH-F) without electronics, focusable



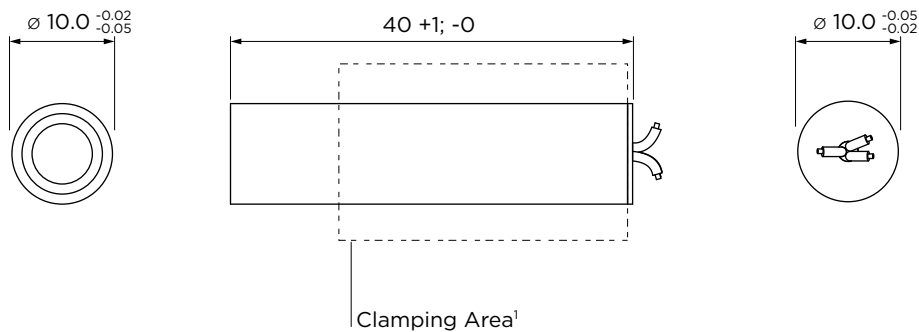
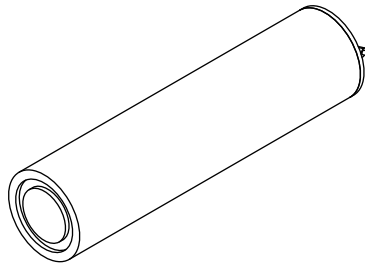
MVpico OH-F

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

Units: mm

TECHNICAL DRAWING

MVpico 2025 standard housing, fixed focus (ST-FIX)



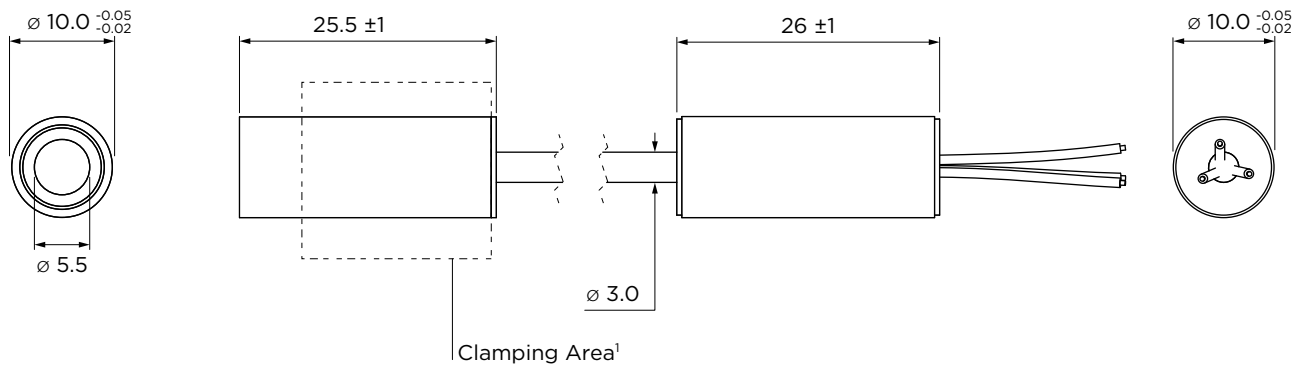
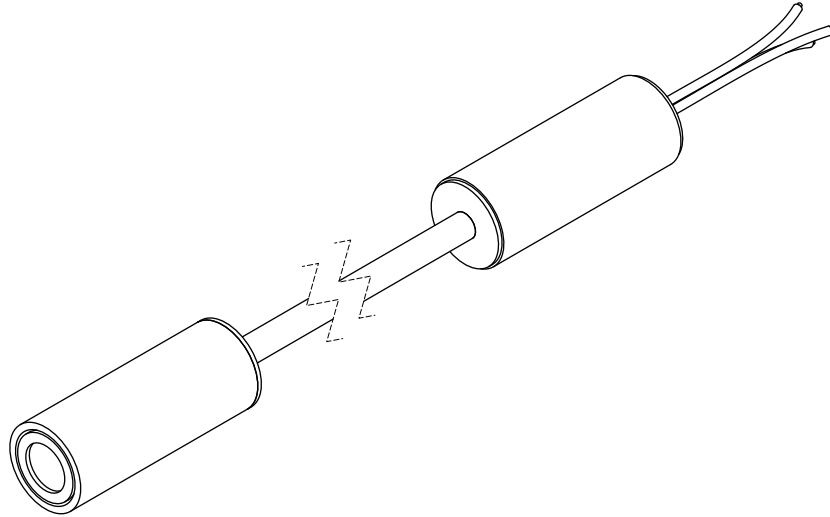
MVpico ST-FIX

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

Units: mm

TECHNICAL DRAWING

MVpico 2025 fixed with 2 housings (optics with LD and electronics separated)



MVpico 2H-F

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

Units: mm

ORDERING CODE

	Housing	Wavelength [nm]	Output Power [mW]	Modulation / Power Adjustment	Fan Angle [°]	Focus [mm]	Optics
FP-MVpico-25	- X	- X	- X	- X	- X	- X	- X
	ST	405	1-30	M Digital Modulation, active low	1	F Focusable	STD
	2H	450	1-75		5	FYYY Prefocused to YYY mm, but	DL
	OH	520	1-10	MI Digital Modulation inverted, active high	10	still focusable	DLE
		640	1-100		15	FIXYYY Fixed focus to YYY mm	DLSE
		660	1-100	D Dimmable, active low	20		TS1
		685	1-40	DI Dimmable inverted, active high	30		TS2
		785	1-100		45		
		830	1-40		60		
		845			75		
					90		

Example: FP-MVpico-25-ST-785-50M-30-F-DL

Not all combinations which can be created by the ordering code above are possible. For the output power please refer to the table on page 2 (possible combinations wavelength and output power) and for Modulation refer to the table on page 5. Please contact us for any additional combinations you may require.