Laser Process Head with process control

pyrometer control combined with laser power control (121.060), only laser power control (121.061), only vision control (121.062) or vision control combined with laser power control (121.063)

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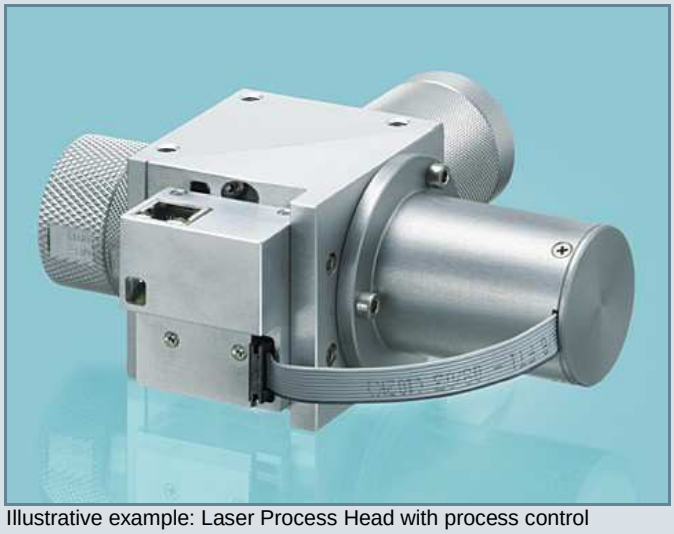

Illustrative example: Laser Process Head with process control

Technical Data Optics

Housing material		Anodized aluminum					
Size of complete module (L x W x D)		169 x 156 x 90mm (with pyrometer + laser power control) 169 x 188 x 90mm (with vision + laser power control) 153 x 188 x 62mm (with vision control)					
Mounting threads (on both sides)		3 x M5					
Fiber connectors		SMA 905, LD80					
Maximum fiber core diameter		800 µm					
Maximum NA of fiber		0.23					
Maximum average laser power without cooling		200 W					
Wavelength		790 – 990 nm					
Transmission		≥ 95% (typ. 98 %)					
Focal lengths [mm]		60	80	100	120	200	250
Working distance [mm] ± 2 mm		37	58	78	98	180	210
Spot size [µm] against fiber core diameter with NA=0.22 (FWHM)	200 µm fiber (Spot size ± 20 µm)	350	460	570	700	1150	1450
	400 µm fiber (Spot size ± 50 µm)	700	1000	1200	1400	2300	2900
	600 µm fiber (Spot size ± 70 µm)	1030	1400	1750	2100	3600	4300
Options		- Customized wavelength - Customized working distance and spot geometries (flat top profiles with line or field distributions) - Gas nozzle for welding / soldering applications					

Technical Data Process Control

Laser power monitoring:	- wavelength range	800-1000 nm
	- sampling rate	1 kHz
	- operation temperature range	15-40 ℃
	- accuracy of power measurement	0,2 % of the peak power (with temperature and wavelength compensation)
Pyrometer control:	- measuring range	Approx. 120 – 400 ℃ for black bodies
	- sampling rate	1 kHz
	- detection wavelength	1100 – 2100 nm
Link Interface:	- connection to the power supply	RJ45 – socket, CAT5-(“Ethernet”) cable, 100 Mbit bus

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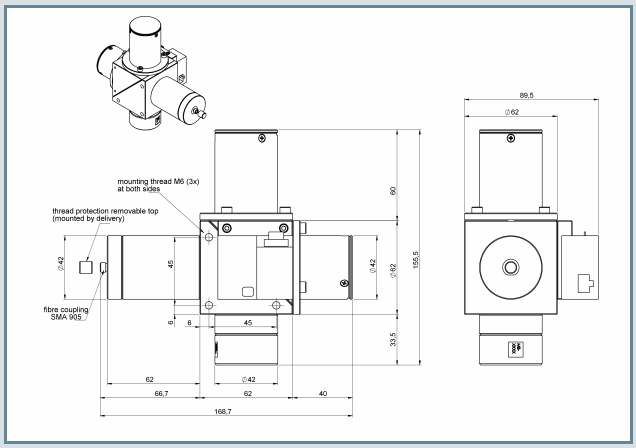
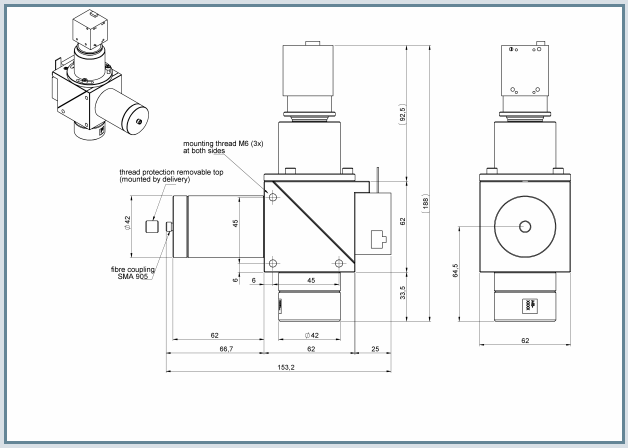
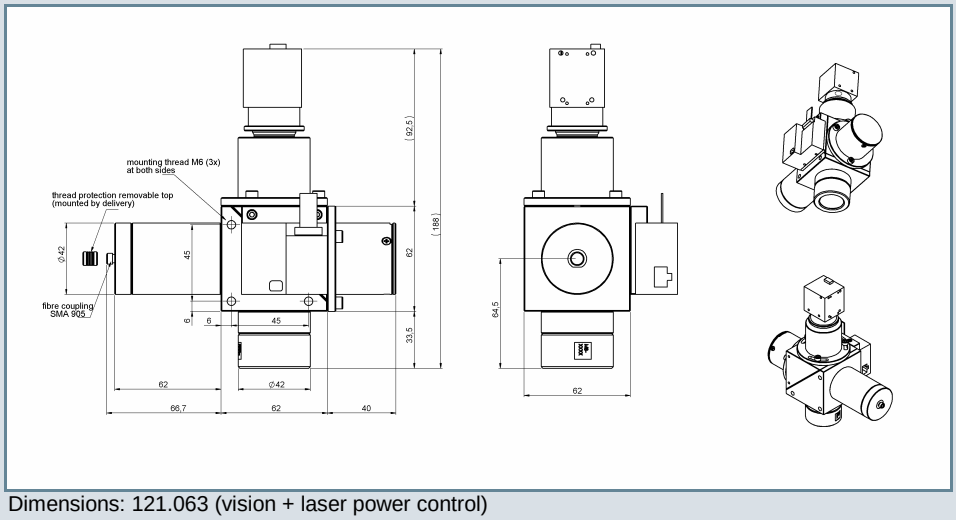


Dimensions: 121.060 (pyrometer + laser power control)



Dimensions: 121.062 (vision control)



Dimensions: 121.063 (vision + laser power control)

Product description: The Laser Process Head with process control for fiber coupled laser systems exactly measures the laser power at the end of the optical path or the process temperature at the workpiece, combined with laser power monitoring with 1 kHz sampling rate. The measurement systems are calibrated with high accuracy and the information about the laser power or process temperature is transferred into digital information directly at the process head to avoid signal disturbance. The data interface at the process head is linked with the laser power supply by a 100 Mbit bus and enables a closed loop temperature or power regulation with high speed.
The laser power regulation system ensures process safety by stable laser power at all circumstances and detects failures of the laser fiber or the laser system.
With the pyrometer system the process temperature is regulated directly and offers a good method of getting the same laser treatment results (e.g. plastics welding) independent of all environmental influences. In combination with the laser power measurement the operator can draw conclusions on the reason for the wrong process temperature (wrong laser power or workpiece failures).
The high resolution vision system makes it easy to adjust the laser spot exactly to the wanted position or to use the picture for part or form detection.

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