HighLight FL Series

High Power Fiber Laser with Fiber-Fiber-Switch

HighLight™ FL products are a series of high brightness, high power lasers offering output of 1 to 10 kW from a multi-mode, collimated fiber (output BPP ≤ 4 mm x mrad). The use of fiber-fiber-switch (FFS) technology enables laser output to be rapidly switched between any one of four available output fibers, or even split 50/50 between two fibers. This allows a single HighLight™ FL laser to sequentially power up to four separate workstations.

Modular and robust HighLight™ FL Multi Mode series lasers are specifically intended to deliver optimum efficiency, maximum flexibility and unmatched reliability in industrial applications including cutting, welding and surface treatment. The wide range of available output power levels and fiber core diameters allow their output to be precisely matched to a specific processing task. The use of field proven, reliable components, including our flexible industrial control unit (RCU), further facilitates integration, enhances reliability, and enables quick customization to the needs of a particular application.

FEATURES & BENEFITS

- Output power: 1,000 - 10,000 Watts
- Fiber-Fiber-Switch (FFS)
- Field-proven “all fiber” technology
- Inherently back reflection safe
- Versatile production tool due to wide range of beam qualities
- Industry leading power control for high process consistency
- HighLight SQD option for smart process monitoring
- CleanWeld™ technology for perfect welding results

APPLICATIONS

- Cutting
- Welding
- Surface Treatment
- Remote and Scanner-based Applications

COHERENT®
Superior Reliability & Performance

SPECIFICATIONS	HighLight FL1000	HighLight FL1600	HighLight FL2000	HighLight FL2500
Nominal Power (W)	1000	1600	2000	2500
Power Range (%)	10 to 100			
Laser Beam Quality (BPP) at Collimator	1.5 mm ≤ BPP ≤ 2.5mm x mrad for 50µm fiber		3 mm x mrad ≤ BPP ≤ 4 mm x mrad for 100 µm fiber	
Power Stability (%)	± 2			
Pulse Frequency Range	CW to 5 kHz			
Wavelength (nm)	1070 ± 10			
ELECTRICAL RATINGS				
Voltage	3 x 230/400 V ±10% or 3 x 277/480 V ±10%; 50/60 Hz; PE			
Connected Load (kVA)	3.6	. 5.5	6.9	7.2
Effective Power at Nominal Power (kW)	3.4	5.1	6.4	6.8
Max. Current Consumption at 400 V (A)	6.3; CCU: 6.8	9.4; CCU: 9.9	11.9; CCU: 12.4	12.5; CCU: 13
Fuses Type NH (A)	16	25		
COOLING				
Recommended Cooling Capacity* (kW)	≥ 4	≥ 6.1	≥ 7.7	≥ 8.1
Flow Rate 2 fibers** (l/h)	2200 ; CCU: Laser: 950; Optic: 1150			
Flow Rate 4 fibers** (l/h)	2600 ; CCU: Laser: 950; Optic: 1600			
Temperature (°C)	25; CCU Laser: 25; Optic: 34			
Temperature Tolerance Range (°C)	± 1			
Max. Pressure (hPa)	6000			
Pressure Drop (hPa)	4000; CCU Laser: 4000; Optic: 3500			
FIBER DELIVERY SYSTEM				
Interface	QBH, QD			
Diameter (µm)	50 to 1000		100 to 1000 (50 on request)	
Type	Step index fiber incl. RSY safety system			
Length (m)	10, 15, 20, 30, 35 (other length on request)			
Accessories (options)	Collimators, Focusing optics, Cross-Jet			
DIMENSIONS & WEIGHTS				
Laser Dimension (L x W x H) (mm)	861 x 1119 x 1516; CCU: 861 x 1179 x 1516			
Laser Weight (kg)	< 400; CCU: < 420			
ENVIRONMENTAL CONDITIONS				
Ambient Temperature (°C)	5 to 40			
Humidity (°C)	Dewpoint < 24; (CCU: Dew point ≤ 34, other on request)			
CUSTOMER INTERFACE				
Digital Signals (V DC)	24			
Power Control (V DC)	0 to 10 (50 µs to 70 µs [Level] resp. a pulse period)			
Trigger Control (V)	Gate 24, 15, or 5; Frequency 15/5			
Laser Operating Elements	Pilot laser / PC-control			
OPTIONS LASER				
	Fieldbus-Interface, Scanner Processing Solution, Customer specific color, Casters, Climate Control Unit, Handheld (Touch Screen) Process monitoring HighLight SQD			

* The recommended cooling capacity covers maximum power dissipation due to diode degradation and 100% laser power absorbed at an internal or external beam dump.
** An additional flow rate of 500l/h is recomended for the use of an external power meter.

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SPECIFICATIONS	HighLight FL3000	HighLight FL4000	HighLight FL5000
Nominal Power (W)	3000	4000	5000
Power Range (%)	10 to 100		
Laser Beam Quality (BPP) at Collimator	3 mm x mrad ≤ BPP ≤ 4 mm x mrad for 100 µm fiber		
Power Stability (%)	± 2		
Pulse Frequency Range	CW to 5 kHz		
Wavelength (nm)	1070 ± 10		
ELECTRICAL RATINGS			
Voltage	3 x 230/400 V ±10% or 3 x 277/480 V ±10%; 50/60 Hz; PE		
Connected Load (kVA)	9.8	12.7	14.5
Effective Power at Nominal Power (kW)	9.1	11.8	13.5
Max. Current Consumption at 400 V (A)	17; CCU:17.5	22; CCU: 22.5	25.1; CCU: 25.6
Fuses Type NH (A)	25	40	50
COOLING			
Recommended Cooling Capacity* (kW)	≥ 10.9	≥ 14.2	≥ 16.2
Flow Rate 2 fibers** (l/h)	3400 ; CCU: Laser: 2150 ; Optic: 1150		
Flow Rate 4 fibers** (l/h)	4000 ; CCU: Laser: 2150; Optic: 1600		
Temperature (°C)	25; CCU Laser: 25; Optic: 34		
Temperature Tolerance Range (°C)	± 1		
Max. Pressure (hPa)	6000		
Pressure Drop (hPa)	4000; CCU Laser: 4000; Optic: 3500		
FIBER DELIVERY SYSTEM			
Interface	QBH, QD		
Diameter (µm)	100 to 1000		
Type	Step index fiber incl. RSY safety system		
Length (m)	10, 15, 20, 30, 35 (other length on request)		
Accessories (options)	Collimators, Focusing optics, Cross-Jet, Galvo Scanner		
DIMENSIONS & WEIGHTS			
Laser Dimension (L x W x H) (mm)	861 x 1119 x 1516; CCU: 861 x 1179 x 1516		
Laser Weight (kg)	< 470; CCU: < 490		
ENVIRONMENTAL CONDITIONS			
Ambient Temperature (°C)	5 to 40		
Humidity (°C)	Dewpoint < 24; (CCU: Dew point ≤ 34, other on request)		
CUSTOMER INTERFACE			
Digital Signals (V DC)	24		
Power Control (V DC)	0 to 10 (50 µs to 70 µs [Level] resp. a pulse period)		
Trigger Control (V)	Gate 24, 15, or 5; Frequency 15/5		
Laser Operating Elements	Pilot laser / PC-control		
OPTIONS LASER			
	Fieldbus-Interface, Scanner processing solution, Customer specific color, Casters, Climate Control Unit (CCU), Handheld (Touch screen) Process monitoring HighLight SQD		

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SPECIFICATIONS	HighLight FL6000	HighLight FL8000	HighLight FL10000
Nominal Power (W)	6000	8000	10000
Power Range (%)	10 to 100		
Laser Beam Quality (BPP) at Collimator	3 mm x mrad ≤ BPP ≤ 4 mm x mrad for 100 µm fiber		> 4.5 mm x mrad ≤ BPP ≤ 6 mm x mrad for 150 µm fiber
Power Stability (%)	± 2		
Pulse Frequency Range	CW to 5 kHz		
Wavelength (nm)	1070 ± 10		
ELECTRICAL RATINGS			
Voltage	3 x 230/400 V ±10% or 3 x 277/480 V ±10%; 50/60 Hz; PE		
Connected Load (kVA)	19.2	25.6	27.7
Effective Power at Nominal Power (kW)	17.9	23.8	25.8
Max. Current Consumption at 400 V (A)	33.3; CCU: 33.8	44.3; CCU: 44.8	45; CCU: 45.5
Fuses Type NH (A)	50		
COOLING			
Recommended Cooling Capacity* (kW)	≥ 21.5	≥ 28.5	≥ 29
Flow Rate 2 fibers** (l/h)	4500 ; CCU: Laser: 2900; Optic: 1150	5300 ; CCU: Laser: 3600 ; Optic: 1150	
Flow Rate 4 fibers** (l/h)	4800 ; CCU: Laser: 2900; Optic: 1600	5600 ; CCU: Laser: 3600; Optic: 1600	
Temperature (°C)	25; CCU Laser: 25; Optic: 34		
Temperature Tolerance Range (°C)	± 1		
Max. Pressure (hPa)	6000		
Pressure Drop (hPa)	4000; CCU Laser: 4000; Optic: 3500		
FIBER DELIVERY SYSTEM			
Interface	QBH, QD		
Diameter (µm)	100 to 1000		150 to 1000
Type	Step index fiber incl. RSY safety system		
Length (m)	10, 15, 20, 30, 35 (other length on request)		
Accessories (options)	Collimators, Focusing optics, Cross-Jet, Galvo Scanner		
DIMENSIONS & WEIGHTS			
Laser Dimension (L x W x H) (mm)	861 x 1119 x 1881; CCU: 861 x 1179 x 1881		
Laser Weight (kg)	< 530; CCU: < 550		
ENVIRONMENTAL CONDITIONS			
Ambient Temperature (°C)	5 to 40		
Humidity (°C)	Dewpoint < 24; (CCU: Dewpoint ≤ 34, other on request)		
CUSTOMER INTERFACE			
Digital Signals (V DC)	24		
Power Control (V DC)	0 to 10 (50 µs - 70 µs [Level] resp. A pulse period)		
Trigger Control (V)	Gate 24, 15 or 5; Frequency 15/5		
Laser Operating Elements	Pilot Laser / PC-control		
OPTIONS LASER			
	Fieldbus-Interface, Scanner processing solution, Customer specific color, Casters, Climate Control Unit (CCU), Handheld (Touch screen) Process monitoring HighLight SQD		

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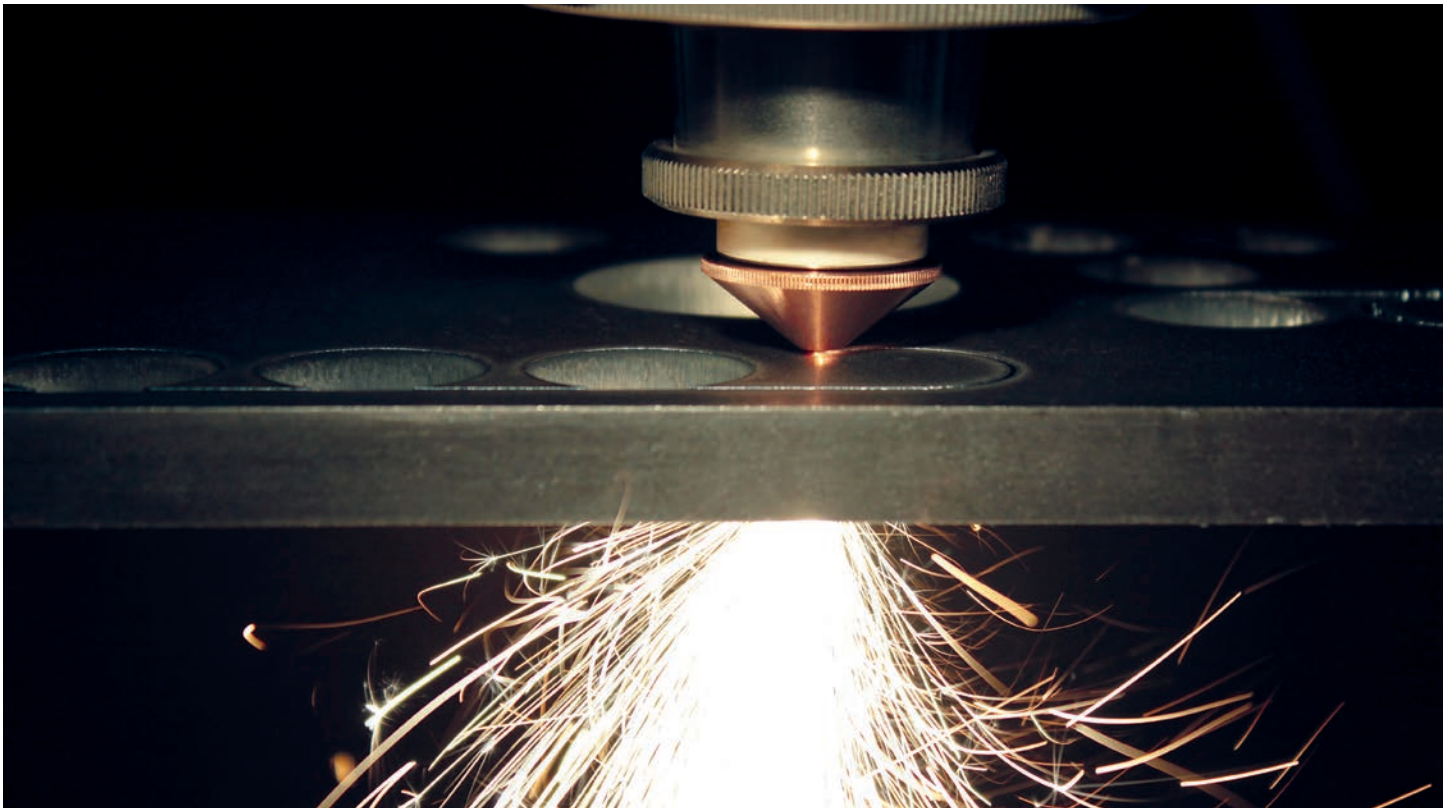
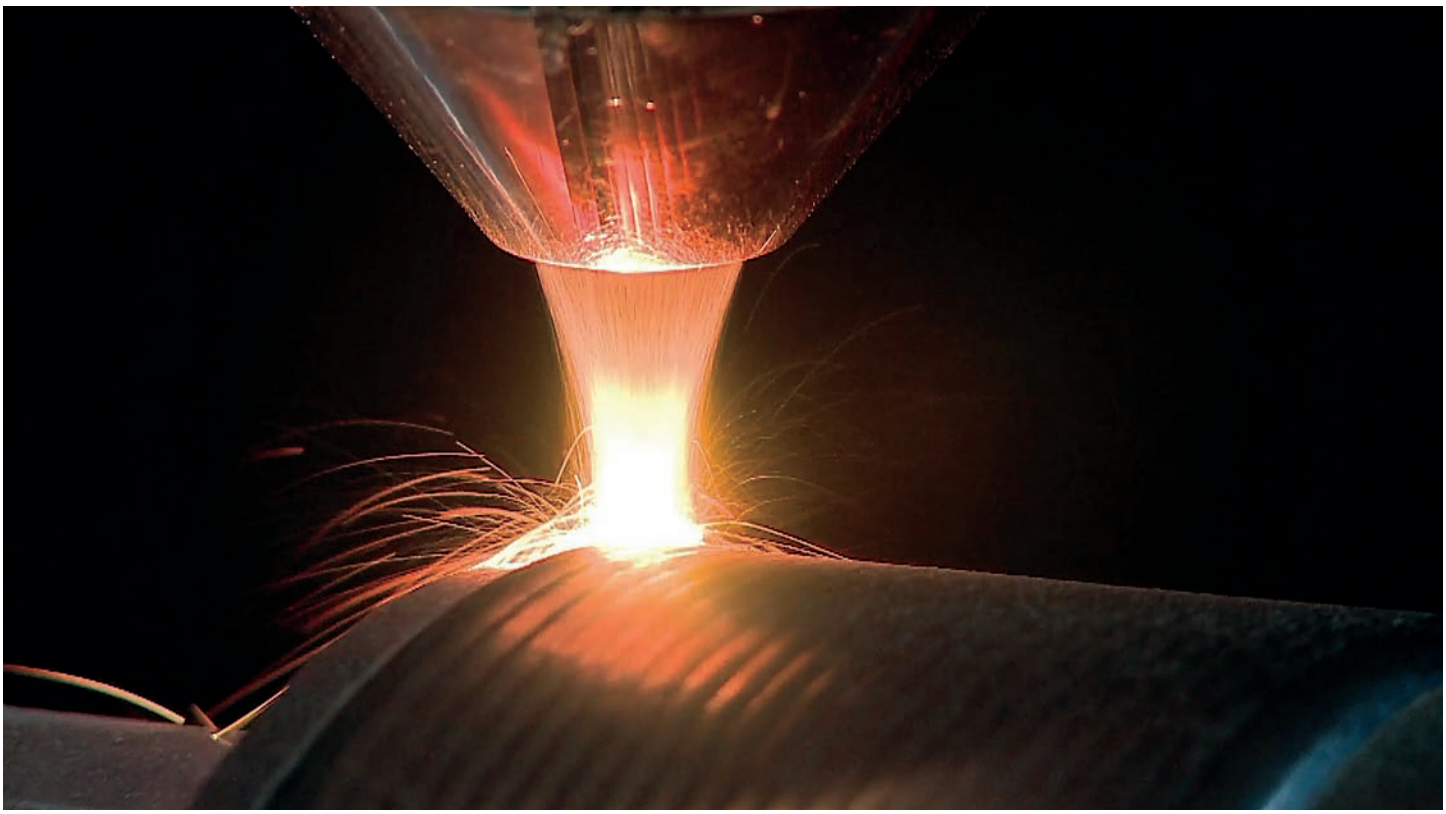
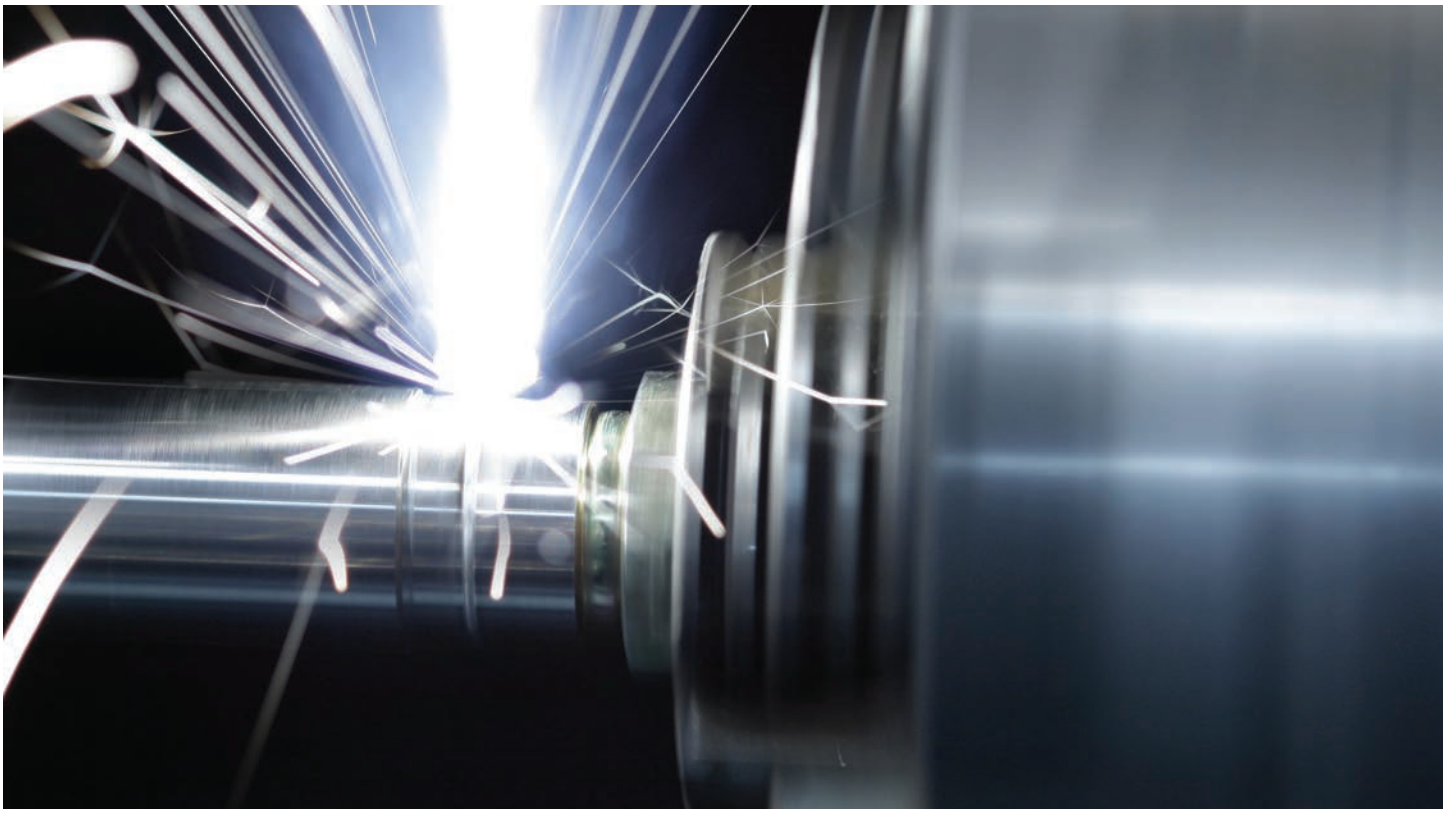
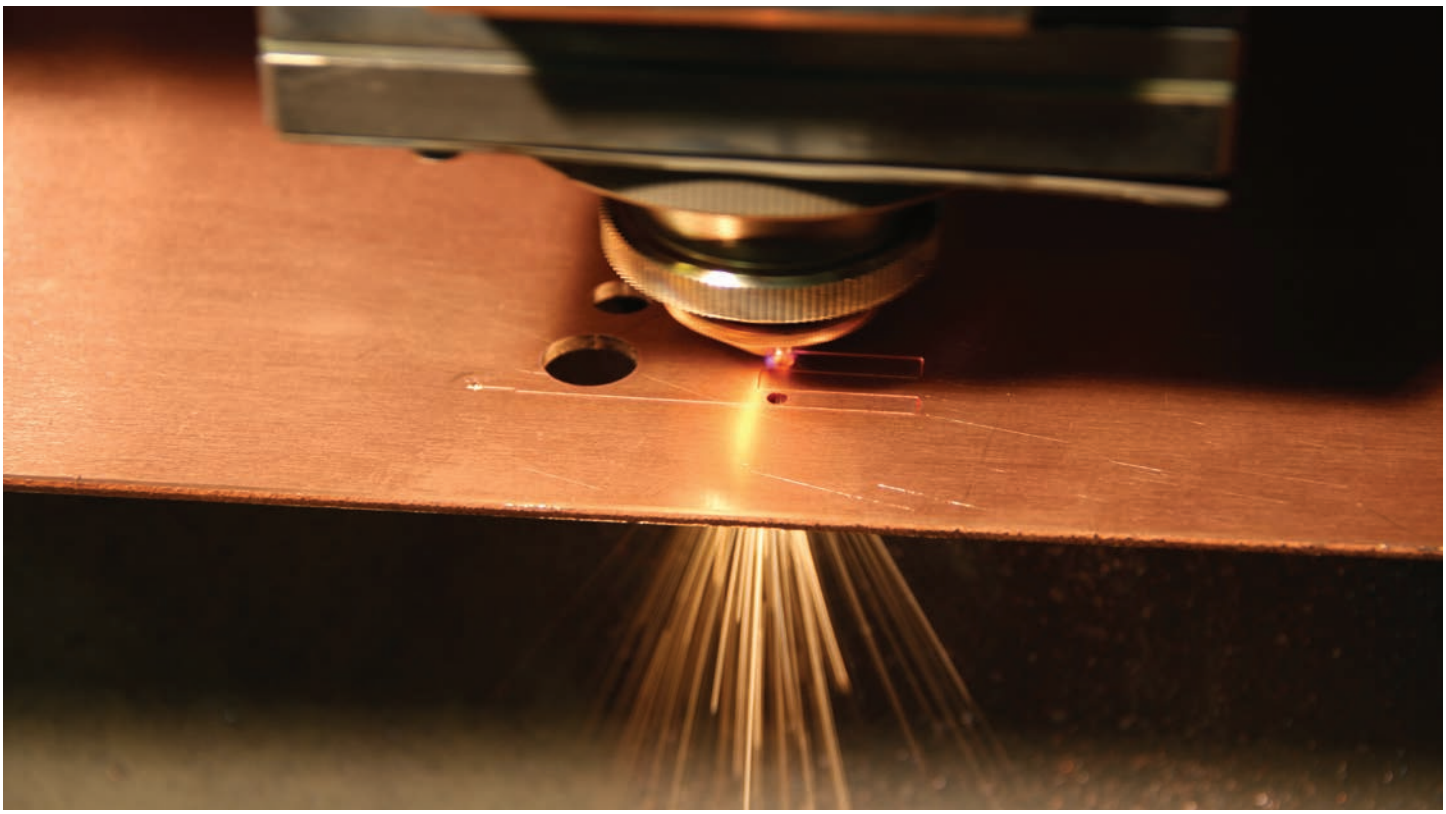




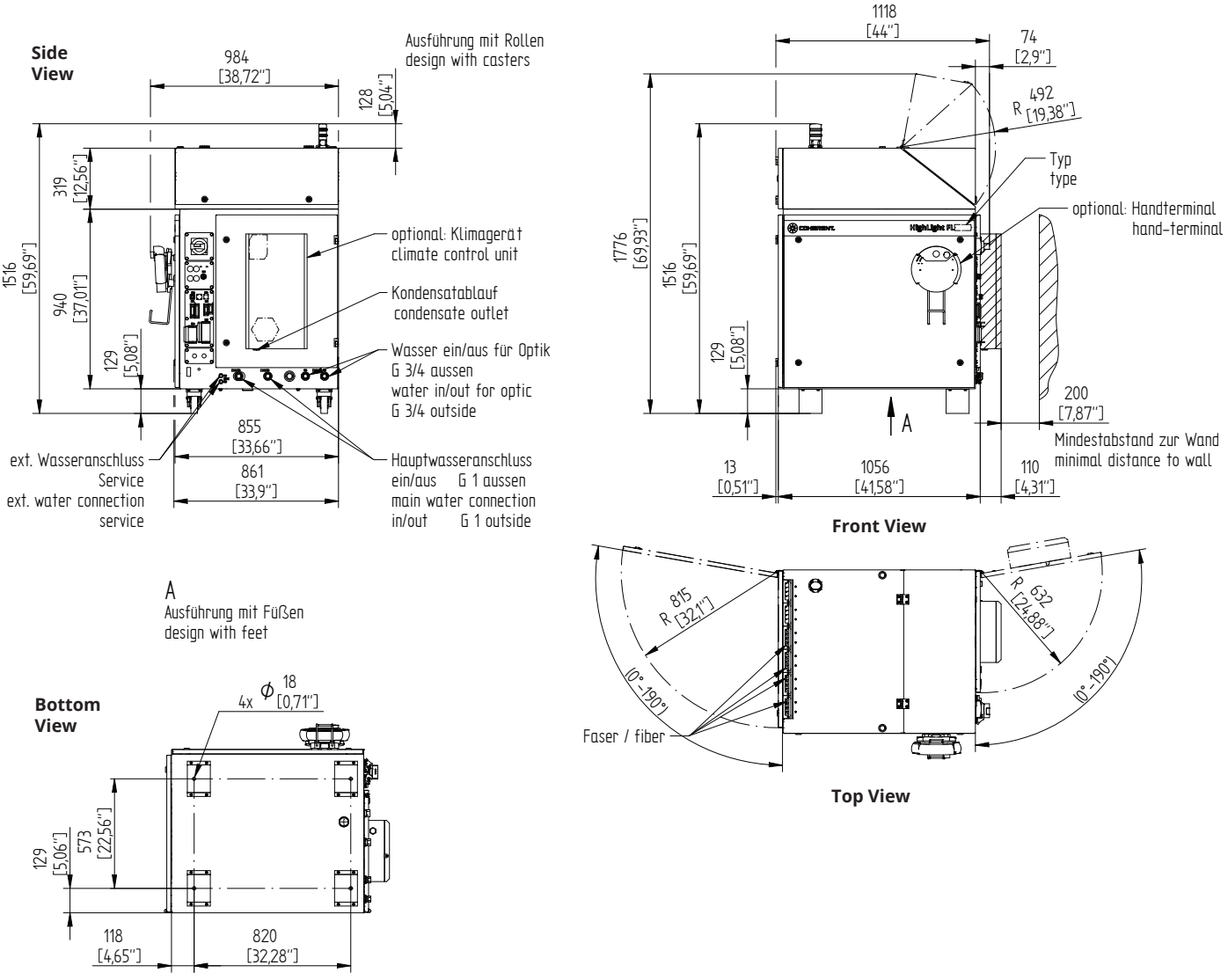




MECHANICAL SPECIFICATIONS

HighLight FL1000 - HighLight FL5000

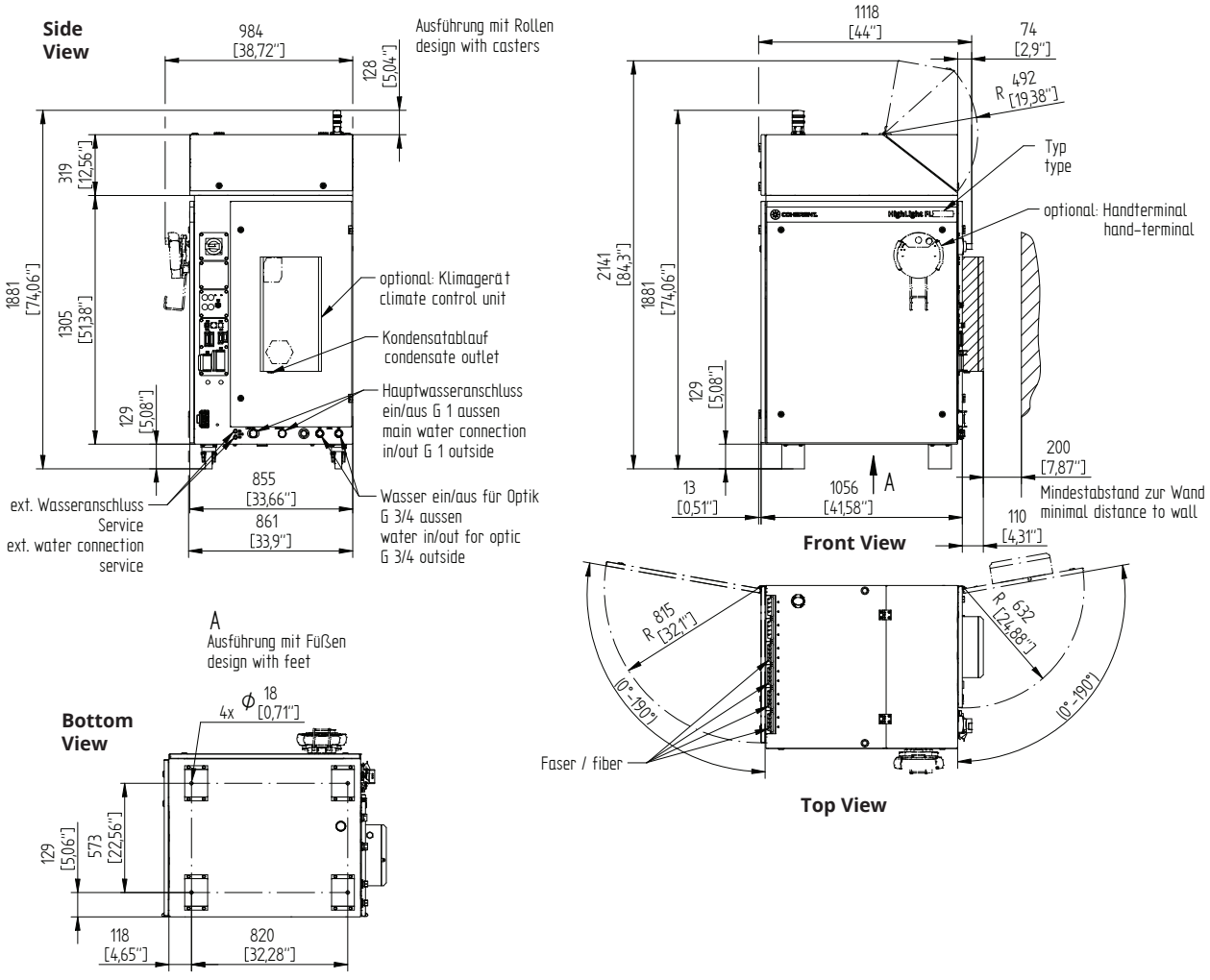
Design with Feet (Standard)
Design with Climate Control Unit (Optional)
Design with Casters (Optional)



MECHANICAL SPECIFICATIONS

HighLight FL6000 - HighLight FL10000

Design with Feet (Standard)
Design with Climate Control Unit (Optional)
Design with Casters (Optional)



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Coherent-Rofin industrial lasers are designed in strict accordance with the respective safety regulations. We certify that each laser manufactured by our company complies with FDA Radiation Performance Standards, 21 CFR Subchapter J and with IEC 60825. Warning labels as shown in the figure appear on each Coherent-Rofin laser to indicate the respective classification.