

	SPECIFICATION YTTERBIUM LASER SYSTEM Model YLS-20000	Spec:	G22-15253092
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1. Optical characteristics

N	Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
1	Operation Mode			CW / Modulated			
2	Polarization			Random			
3	Nominal Output Power		P_{nom}	20000			W
4	Output Power Tuning Range			10		105	%
5	Emission Wavelength	Output power: 20000 W	λ	1068		1080	nm
6	Emission Linewidth	Output power: 20000 W	$\Delta\lambda$		3	6	nm
7	Switching ON/OFF Time	Output power: 20000 W			50	100	μ s
8	Output Power Modulation Rate	Output power: 20000 W				5	kHz
9	Output Power Instability	Output power: 20000 W Time interval: 1 hour (T=Constant)			± 1	± 2	%
10	Red Guide Laser Power				0.4	0.5	mW

2. Optical output

N	Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
1	Process Fiber Connector			HLC-16			
2	Beam Parameter Product* (86 %)	Delivery fiber core diameter 100 μ	BPP*		3.5	4.2	mm*mrad
3	Beam Parameter Product* (86 %)	Delivery fiber core diameter 150 μ	BPP*		5.5	6.5	mm*mrad
4	Beam Parameter Product* (86 %)	Delivery fiber core diameter 200 μ	BPP*		6.5	8.5	mm*mrad
5	Process Fiber Length		L	10	20**	30	m
6	Process Fiber Bending Radius - unstressed - stressed		R	100 200			mm

* Measurement accuracy by means of Primes Focus Monitor ± 10 %

**Maximal delivery fiber length is 15 m @ 100 μ for standard laser operation and

maximal delivery fiber length is 20 m @ 100 μ for laser operation with IPG Photonics cutting head, part number CDT3HS1020HXXPXU.

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3. General characteristics

N	Characteristics	Min.	Typ.	Max.	Unit
1	Operating Ambient Temperature Range	5		45	°C
2	Humidity, Ambient Temperature Range $\leq 40^{\circ}\text{C}$	10		95	%
3	Storage Temperature without water	- 40		+ 75	°C
4	Dimensions (w/o interface plugs, w/o castors), WxDxH	1004(1007) x 815 x 806			mm
5	Weight		500		kg

4. Cooling

N	Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
1	Method			Tap and slightly DI-water			
2	Cooling Water Temperature for Laser			20	21	22	°C
3	Cooling Water Temperature for Optics			27	30	33	°C
4	Laser "Cold Start" Temperature			20			°C
5	Optics coling water conductivity			30	40	50	$\mu\text{S}/\text{cm}$
6	Water Pressure			3.0		4.0	bar
7	Water Flow for Laser Cooling			1.6	2.5	3.5	l/min
8	Water Flow for Fiber Connector Cooling			110	150		l/min
9	Chiller Cooling Capacity			37			kW

5. Electrical characteristics

N	Characteristics	Min.	Typ.	Max.	Unit
1	Operating Voltage, 3 phases	400-460 V/3P + PE @ 50-60 Hz			
2	Laser Power Consumption at 20000 W power			57	kW
3	Laser Operation Current at 20000 W power and 400 VAC			88	A
4	Input fuses, 400 VAC			100	A

6. Fast power supply option.

- a. Switching OFF of laser main power supplies during 130 msec accordingly Category 3 PL d EN ISO 13849-1
- b. Maximal quantity of main power supplies switching ON/OFF cycles per minute is 20 times.

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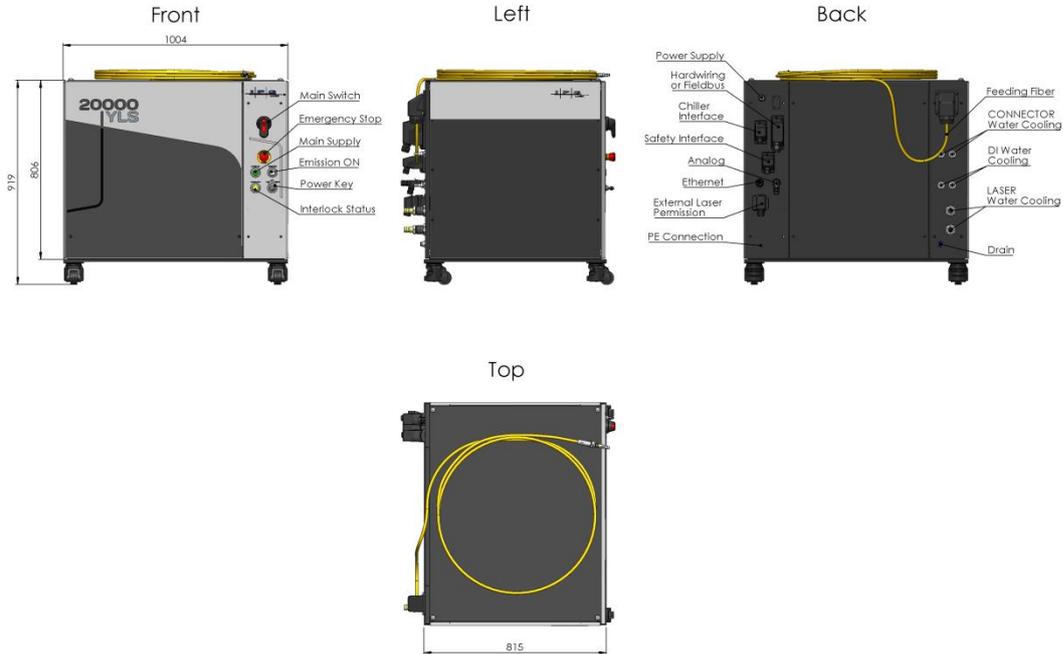
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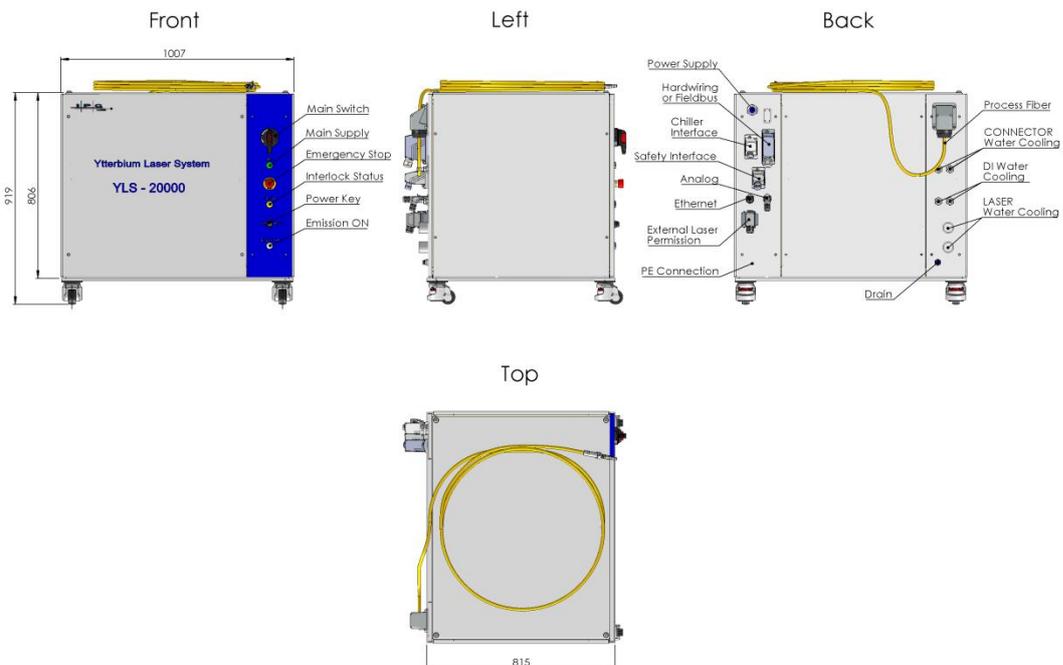
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7. Laser External Layout

a. Option 1:



b. Option 2:



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