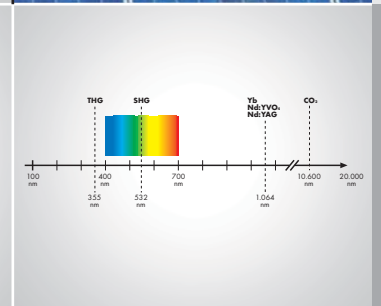


End-Pumped Laser Beam Sources

Discover Precision



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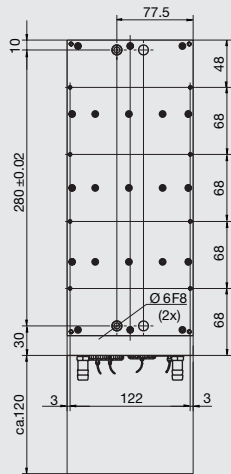
Backed by many years of experience in laser material processing, ROFIN offers you end-pumped laser sources with excellent beam characteristics. The diode-pumped solid-state lasers with a compact laser head integrate easily and require minimum maintenance. Supply and cooling modules are housed in standard 19" modules which can be integrated in a cabinet. To support direct integration even further, compact cooling plates for the PowerLine SL series are available as options. In order to perfectly meet specific application requirements, the laser beam sources are available in different power ranges and wavelengths of 1064, 532 and 355 nm. Specially designed scribes for photovoltaic applications ensure excellent pulse-to-pulse stability at high frequency ranges. The laser beam sources operate in TEM₀₀ mode and offer high beam quality as well as good beam roundness for a most accurate removal profile.

ROFIN's first-class products include adjustable high-accuracy beam splitters, positioning laser, power measurement and pluggable connections. Individual, optimum configurations are achieved with numerous options integrated into the laser rail e.g. back reflection absorber, beam attenuator, beam shaping element, beam expander and scanning head.

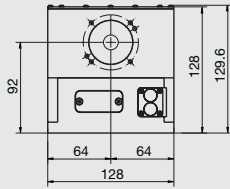
Product features and benefits:

- superior beam quality
- excellent pulse-to-pulse stability, even at high repetition rates
- exceptional long-term stability with temperature management system
- integrated shutter and safety circuit
- optional beam expansion built into the laser head
- compact OEM design
- stable 24/7 operation
- easy to integrate

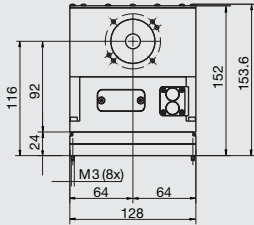
PowerLine EL (PV) series



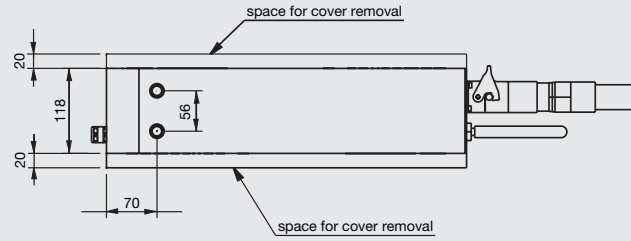
Bottom view with cooling plate



Front view without cooling plate

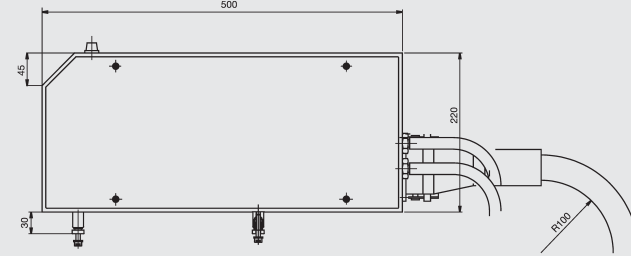


Front view with cooling plate



Top view applicable for all models

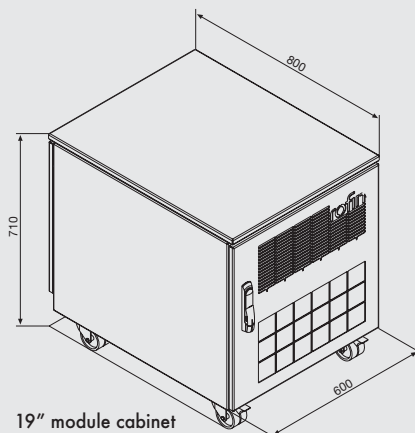
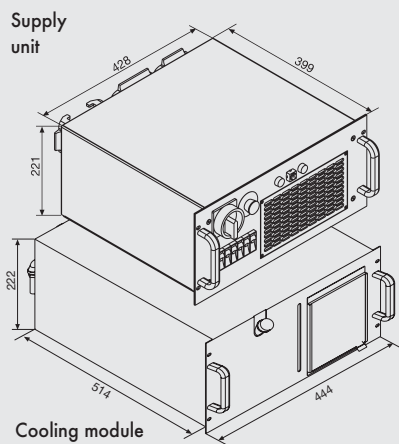
* PowerLine EL 25 SHG: 600 mm



Side view of the laser rail PowerLine EL 20, 20 SHG, 20 THG, 25

PowerLine EL 20 PV	PowerLine EL 25 PV	PowerLine EL 20 SHG PV
1064	1064	532
15 @ 100 kHz	20 @ 100 kHz	12 @ 50 kHz
0 - 200	0 - 200	15 - 200
30 @ 100 kHz	55 @ 100 kHz	25 @ 50 kHz
TEM _∞	TEM _∞	TEM _∞
< 1.3	< 1.3	< 1.5
> 90	> 90	> 85
—	—	—
0.14 @ 100 kHz	0.2 @ 100 kHz	0.24 @ 50 kHz
4.5 @ 100 kHz	4 @ 100 kHz	10 @ 50 kHz
1	1	3
< 1.5 @ 100 kHz	< 1.5 @ 100 kHz	< 3 @ 50 kHz
2.7	1.9	2.6
3.7	2.7	2.7
> 100 : 1 horiz.	> 100 : 1 horiz.	> 100 : 1 vert.
+/- 0.5 mm, +/- 5 mrad (option: +/- 0.2 mm, +/- 2 mrad)	+/- 0.5 mm, +/- 5 mrad (option: +/- 0.2 mm, +/- 2 mrad)	+/- 0.5 mm, +/- 5 mrad (option: +/- 0.2 mm, +/- 2 mrad)
< 15	< 15	< 20
—	—	—
230 VAC ± 10 %; 1P/N/PE 50/60 Hz	230 VAC ± 10 %; 1P/N/PE 50/60 Hz	230 VAC ± 10 %; 1P/N/PE 50/60 Hz
1.77 kW 50 Hz/ 1.88 kW 60 Hz	1.77 kW 50 Hz/ 1.88 kW 60 Hz	1.77 kW 50 Hz/ 1.88 kW 60 Hz
15 - 35 °C	15 - 35 °C	15 - 35 °C
—	—	—

	PowerLine EL 20
Beam characteristics	
Wavelength [nm]	1064
Average power [W]	16 cw; 12 @ 20 kHz
Pulse frequency [kHz]	0 - 200
Pulse width [ns]	10 @ 20 kHz
Beam quality	TEM _∞
M ²	< 1.3
Beam roundness [%]	> 90
Focus symmetry, within +/- 2z _R	—
Energy per pulse [μJ]	0.6 @ 20 kHz
Peak power [kW]	60 @ 20 kHz
Average power stability over 8 hrs [% rms]	1
Pulse-to-pulse stability [% rms]	< 2 @ 20 kHz
Beam diameter approx. [mm]	2.7
Divergence angle full radius, approx. [mrad]	3.7
Polarization	> 100 : 1 horiz.
Boresight accuracy	+/- 0.5 mm, +/- 5 mrad (option: +/- 0.2 mm, +/- 2 mrad)
Warm up time [min]	< 15
Electrical connection	
Voltage	230 VAC ± 10 %; 1P/N/PE 50/60 Hz
Power consumption max. [kW]	1.77 kW 50 Hz/ 1.88 kW 60 Hz
Ambient temperature range	15 - 35 °C
Mounting plate temperature	—



PowerLine EL 25	PowerLine EL 20 SHG	PowerLine EL 25 SHG	PowerLine EL 20 THG
1064	532	532	355
24 cw; 18 @ 20 kHz	12 @ 50 kHz	18 @ 50 kHz	2 @ 15 kHz
0 - 200	15 - 200	15 - 200	15 - 100
20 @ 20 kHz	25 @ 50 kHz	40 @ 50 kHz	10 @ 15 kHz
TEM _∞	TEM _∞	TEM _∞	TEM _∞
< 1.3	< 1.5	< 1.5	< 1.5
> 90	> 85	> 85	> 85
—	—	—	—
0.9 @ 20 kHz	0.24 @ 50 kHz	0.36 @ 50 kHz	0.1 @ 15 kHz
45 @ 20 kHz	10 @ 50 kHz	10 @ 50 kHz	10 @ 15 kHz
1	3	3	2
< 2 @ 20 kHz	< 3 @ 50 kHz	3 @ 50 kHz	< 5 @ 15 kHz
1.9	2.6	2.4	0.7
2.7	2.7	1.9	< 1.0
> 100 : 1 horiz.	> 100 : 1 vert.	> 100 : 1 vert.	> 100 : 1 horiz.
+/- 0.5 mm, +/- 5 mrad (option:+/- 0.2 mm, +/- 2 mrad)	+/- 0.5 mm, +/- 5 mrad (option:+/- 0.2 mm, +/- 2 mrad)	+/- 0.5 mm, +/- 5 mrad (option:+/- 0.2 mm, +/- 2 mrad)	+/- 0.5 mm, +/- 5 mrad (option:+/- 0.2 mm, +/- 2 mrad)
< 15	< 20	< 20	< 20
—	—	—	—
230 VAC ± 10 %; 1P/N/PE 50/60 Hz	230 VAC ± 10 %; 1P/N/PE 50/60 Hz	230 VAC ± 10 %; 1P/N/PE 50/60 Hz	230 VAC ± 10 %; 1P/N/PE 50/60 Hz
1.77 kW 50 Hz/ 1.88 kW 60 Hz	1.77 kW 50 Hz/ 1.88 kW 60 Hz	1.77 kW 50 Hz/ 1.88 kW 60 Hz	1.77 kW 50 Hz/ 1.88 kW 60 Hz
15 - 35 ° C	15 - 35 ° C	15 - 35 ° C	15 - 35 ° C
—	—	—	—

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