
# BLADE RF

## RF 88
## RF 177
## RF 303

High Peak Power RF $CO_2$ lasers
from 80W to 300W power

# Introducing the Self-Refilling Series

The Blade RF Sealed-Off series guarantees excellent performance with its high-peak power capabilities. This technology, combined with RF, ensures reliable operation and optimal stability throughout work processes. Its compact size allows seamless integration into various setups, making it ideal for powers ranging from 80W to 300W. With three different wavelengths available (10.6µm, 10.2µm, and 9.3µm), it caters to diverse customer needs.

Blade RF Sealed-Off series, where performance meets versatility and compact integration.

# Key features

- High Peak Power Sealed-Off technology
- Radio Frequency excited
- Extremely compact & easy to integrate
- Wide Range of Wavelengths
- High reliability & high beam quality
- High electrical/optical conversion efficiency
- Integrated RF power supply
- TCP/IP connection for remote diagnostics and control
- On board HMI panel


# Experience Rooted in Passion

BLADE RF Sealed-Off Laser sources are designed, developed, and manufactured in El.En.'s Italian facility. For over 40 years, El.En. has passionately committed itself to achieving the highest levels of engineering and reliability, creating devices with advanced technological capabilities.
In addition to laser sources, El.En. also develops scanning heads and galvanometric components for a perfect integration. With more than 3000 industrial installations, El.En. has been chosen to achieve exceptional performance in a wide range of industries.
Embrace the precision, innovation, and expertise of El.En.'s laser solutions, empowering your industrial applications with cutting-edge technology.

# Seamless integration

The BLADE RF Sealed-off series offers three different power solutions (80W, 150W, and 300W) in compact sizes. This versatility enables seamless integration into a wide range of systems, providing flexibility to adapt to different power requirements and diverse operational scenarios.
An additional advantage of the BLADE RF Sealed-off series is the comprehensive integration of El.En.'s cutting-edge technologies within the same system. This includes laser sources, scanning heads, galvanometric systems, and dedicated software control.
By optimizing this technological ecosystem, the series delivers exceptional performance as all components are designed to work synergistically together.
This versatile and harmonized integrability empowers customers or integrators with enhanced efficiency, productivity and performance across various applications and industries.

Moreover, the BLADE RF Sealed-Off series ensures compatibility with components other than those from El.En., offering added convenience for integration into existing setups. Each model within the Sealed-Off series has been meticulously engineered to deliver exceptional performance and reliability. Whether it's precision cutting, engraving, or marking, these lasers provide the versatility for a wide range of applications.

# Applications

The Blade RF Sealed-Off laser sources are versatile and can be utilized in various applications, including high-performance remote processing, digital converting for the packaging industry, cutting and engraving of plastics, wood, leather, fabrics and many other materials. They excel in cutting of paper and cardboard for Packaging, offering exceptional stability, precision and performance.
With its three distinct wavelengths, this laser series excels in specific materials processing such as glass or polypropylene, and in challenging applications like LCD processing, labels kiss-cutting , and food industry solutions. With its adaptability and capabilities, the Blade RF Sealed-Off series proves to be a reliable choice for a wide range of industries, enhancing productivity and offering excellent laser processing in diverse applications.


Leather


Paper / Label


Food


Plastic film


Plastics


Marble & stone


Abrasive materials

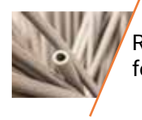

Cardboard & Corrugated


Ceramic & alumina


Fabrics & Denim

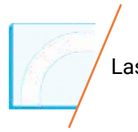

Glass & quartz


Metals


Rubber & foam


Wood & derivatives

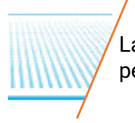
# Processing


Laser cleaning


Laser cutting


Laser drilling


Laser kiss-cutting

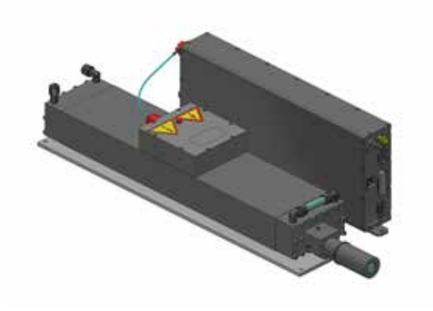

Laser micro perforation


Laser marking


Laser welding


Laser ablation

RF 88



RF 177 | RF 177 P | RF 177 G


RF 303 | RF 303 P | RF 303 G


## Laser Specifications

| Model | RF 88 | RF 177 | RF 177 P* | RF 177 G | RF 303 | RF 303 P* | RF 303 G* |
|---|---|---|---|---|---|---|---|
| Rated power (W)(1) | 80 (1[a]) | 150 | 150 | 150 | ≥300 | ≥300 | ≥300 |
| Effective peak power (W)(2) | 200 | 600 | 600 | 700 | 1100 | 1100 | 1100 |
| Power stability (long term)(3) | ±5% | ±5% | ±5% | ±5% | ±5% | ±5% | ±5% |
| Wavelength (µm) | 10.6 ± 0.4 | 10.6 ± 0.4 | 10.2 ± 0.2 | 9.3 ± 0.2 | 10.6 ± 0.4 | 10.2 ± 0.2 | 9.3 ± 0.2 |
| Polarization | linear (parallel to base) | linear (perpendicular to base) | linear (perpendicular to base) | linear (perpendicular to base) | linear (perpendicular to base) | linear (perpendicular to base) | linear (perpendicular to base) |
| Beam diameter (1/$e^2$ at the exit) | 9.4 ± 0.5 | 6.0 ± 0.5 | 6.0 ± 0.5 | 6.0 ± 0.5 | 8.0 ± 0.5 | 8.0 ± 0.5 | 8.0 ± 0.5 |
| Beam divergence (1/$e^2$ full angle) (mrad) | 3.0 ± 0.3 | 3.0 ± 0.3 | 3.0 ± 0.3 | 3.0 ± 0.3 | ≤2.0 ± 0.1 | ≤2.0 ± 0.1 | ≤2.0 ± 0.1 |
| Maximum pulse frequency (kHz) | 50 | 100 | 100 | 100 | 100 | 100 | 100 |
| Pulse width range (µs) | 2 ÷ 1000 | 2 ÷ 1000 | 2 ÷ 1000 | 2 ÷ 1000 | 2 ÷ 150 | 2 ÷ 150 | 2 ÷ 150 |
| Maximum duty cycle | 60% | 50% | 50% | 50% | 50% | 50% | 50% |
| Mode quality ($M^2$) | < 1.2 | < 1.15 | < 1.15 | < 1.15 | < 1.2 | < 1.2 | < 1.2 |
| Beam ellipticity | 1.2 : 1 | 1.15 : 1 | 1.15 : 1 | 1.15 : 1 | 1.2 : 1 | 1.2 : 1 | 1.2 : 1 |
| Optical pulse rise/fall time (µs) | < 50 | < 50 | < 50 | < 50 | < 50 | < 50 | < 50 |
| Typical gas mix consumption (NL/year) | NA | NA | NA | NA | NA | NA | NA |
| Operating ambient temperature range (°C) | 5 ÷ 35 | 5 ÷ 35 | 5 ÷ 35 | 5 ÷ 35 | 5 ÷ 35 | 5 ÷ 35 | 5 ÷ 35 |
| Storage Temperature range (°C) | 5 ÷ 50 | 5 ÷ 50 | 5 ÷ 50 | 5 ÷ 50 | 5 ÷ 50 | 5 ÷ 50 | 5 ÷ 50 |
| Maximum humidity | Non condensing at inlet water temperature | Non condensing at inlet water temperature | Non condensing at inlet water temperature | Non condensing at inlet water temperature | Non condensing at inlet water temperature | Non condensing at inlet water temperature | Non condensing at inlet water temperature |

## Electrical Power Requirements

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Input voltage ($V_{DC}$) | 48 ± 1 | 48 ± 1 | 48 ± 1 | 48 ± 1 | 48 ± 1 | 48 ± 1 | 48 ± 1 |
| Max current (A) | 27 | 60 | 60 | 60 | 115 | 115 | 115 |
| Peak Current (A) | 32 for 3 ms max | 100 for 3 ms max | 100 for 3 ms max | 100 for 3 ms max | 180 for 3 ms max | 180 for 3 ms max | 180 for 3 ms max |

## Coolant

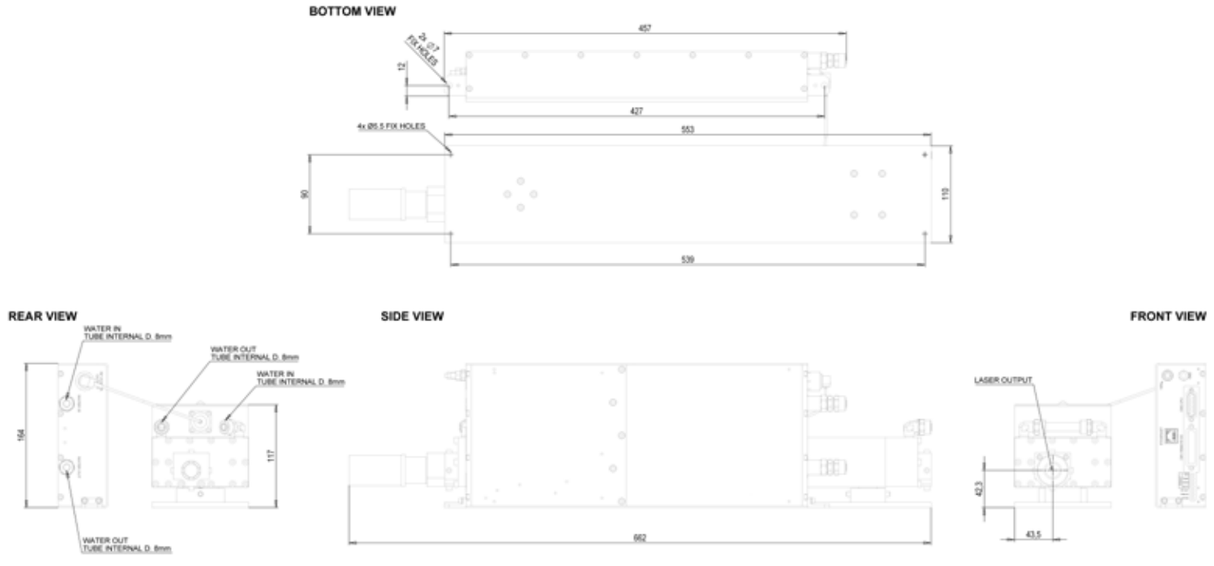
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Heat load (W) | 1500 | 3000 | 3000 | 3000 | 5500 | 5500 | 5500 |
| Coolant temperature (°C) | 23 ± 1 | 23 ± 1 | 23 ± 1 | 23 ± 1 | 23 ± 1 | 23 ± 1 | 23 ± 1 |
| Water cooling input pressure (bar) | 4 | 4 | 4 | 4 | ≤ 4 | ≤ 4 | ≤ 4 |
| Water cooling flow rate (L/min) | 5 ± 0.5 | 7 ± 0.5 | 7 ± 0.5 | 7 ± 0.5 | 10 ÷ 11 | 10 ÷ 11 | 10 ÷ 11 |

## Dimensions / Weight

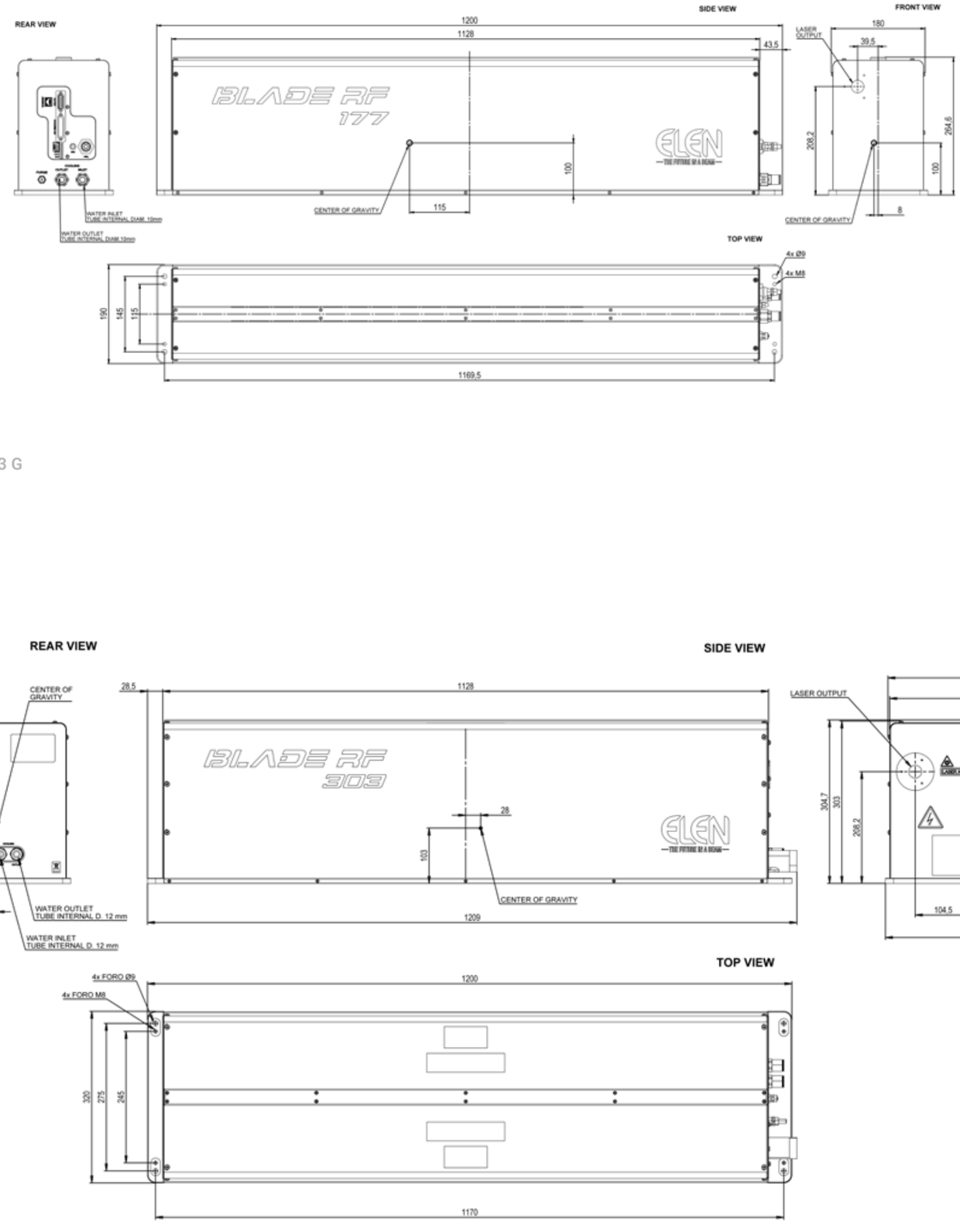
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Laser dimensions (LxWxH) (mm) | 662x110x117 | 1200 x 190 x 265 | 1200 x 190 x 265 | 1200 x 190 x 265 | 1210 x 320 x 305 | 1210 x 320 x 305 | 1210 x 320 x 305 |
| RF power supply dimensions | 457x57x164 | integrated | integrated | integrated | integrated | integrated | integrated |
| Safety shutter | NA | optional | optional | optional | optional | optional | optional |
| Laser Weight (kg) | 9 | 37.5 | 37.5 | 37.5 | 65 | 65 | 65 |
| RF power supply Weight (kg) | 3.8 | | | | | | |

(1) Typical with a frequency of 25Hz and 50% duty cycle. Power reduction of 1% for °C with water cooling temperature above 25°C.
(2) Typical at 1kHz and 10% duty cycle. The effective power peak is defined as Average power /Duty Cycle.
(3) With constant water cooling temperature (23 ± 0.5). Stability is defined as S(%) = ±100*(Pmax-Pmin)/2Pmax.
(1a) Typical with a pulse duration of 300µs and 60% duty cycle. Power reduction of 1% for °C with water cooling temperature above 20°C.
* Preliminary data

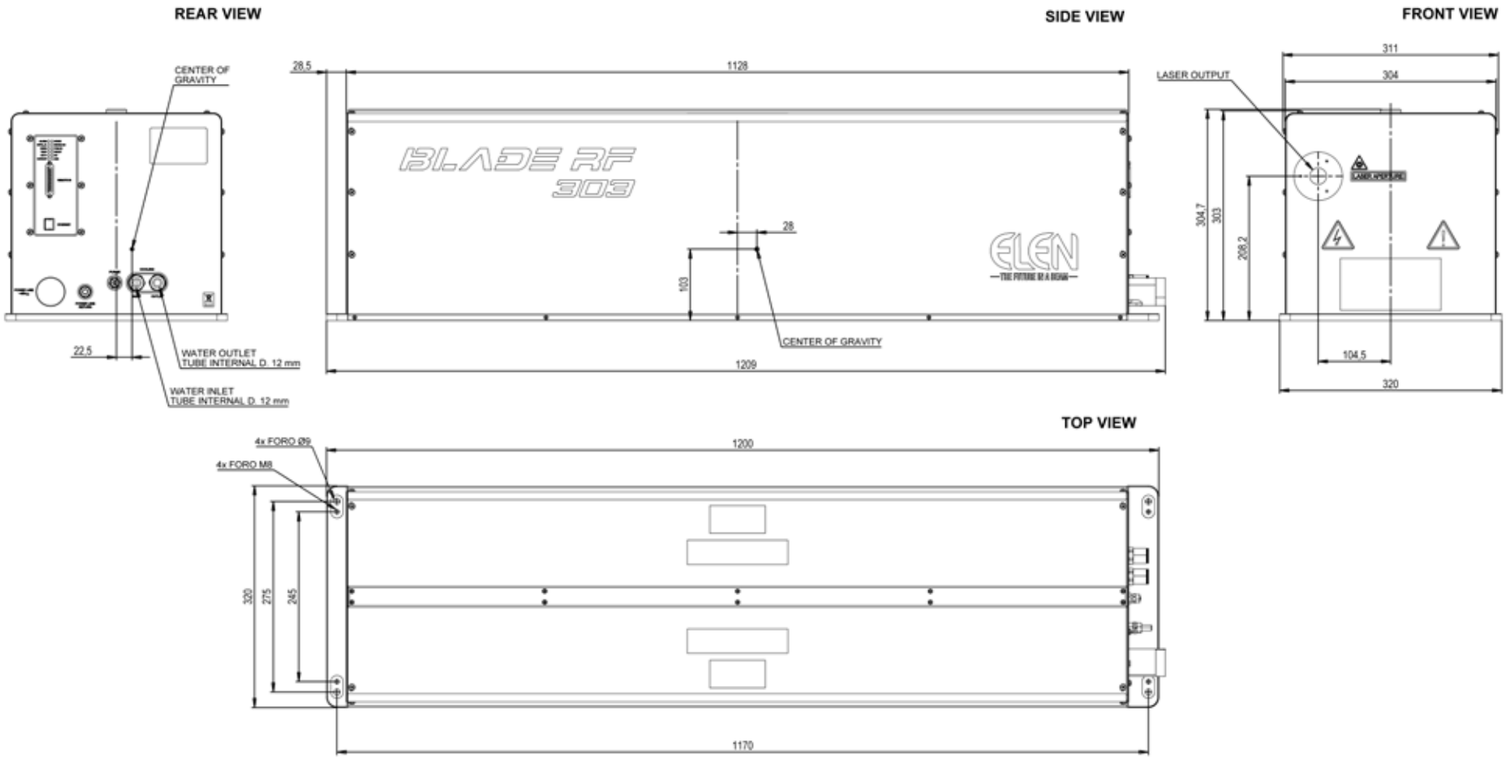
## RF 88




## RF 177 | RF 177 P | RF 177 G




## RF 303 | RF 303 P | RF 303 G



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