



BLADE RF

RF 333

RF 555

RF 777

RF 888

RF 899

RF 1222

RF 1555



Mid and High Power RF CO₂ lasers
from 350W to 1500W power



Introducing the Self-Refilling Series

The BLADE RF Self-Refilling is a revolutionary series of laser sources that brings innovation and convenience to the field. This cutting-edge series comprises powers ranging from 350W to 1500W and offers different selections of wavelengths to meet all customers' needs. What sets the Self-Refilling Series apart is its unique embedded gas cylinder, designed to ensure a continuous and automatic fresh gas refill. This feature eliminates the need for necessity of factory reconditioning thereby enhancing productivity and reducing downtime. With the Self-Refilling Series, operators can experience uninterrupted laser performance, maintaining optimal power and stability throughout their work processes.

Key features

- Self refilling technology
- Radio Frequency excited
- Low operating cost & easy integration
- High reliability & high beam quality
- Two sizes for all powers
- High electrical/optical conversion efficiency
- Integrated RF power supply
- TCP/IP connection for remote diagnostics and control
- Integrated shutter for safety certifiability
- On board HMI panel



Experience Rooted in Passion

BLADE RF Self-Refilling Laser sources are designed, developed, and manufactured at El.En.'s Italian facilities.

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.

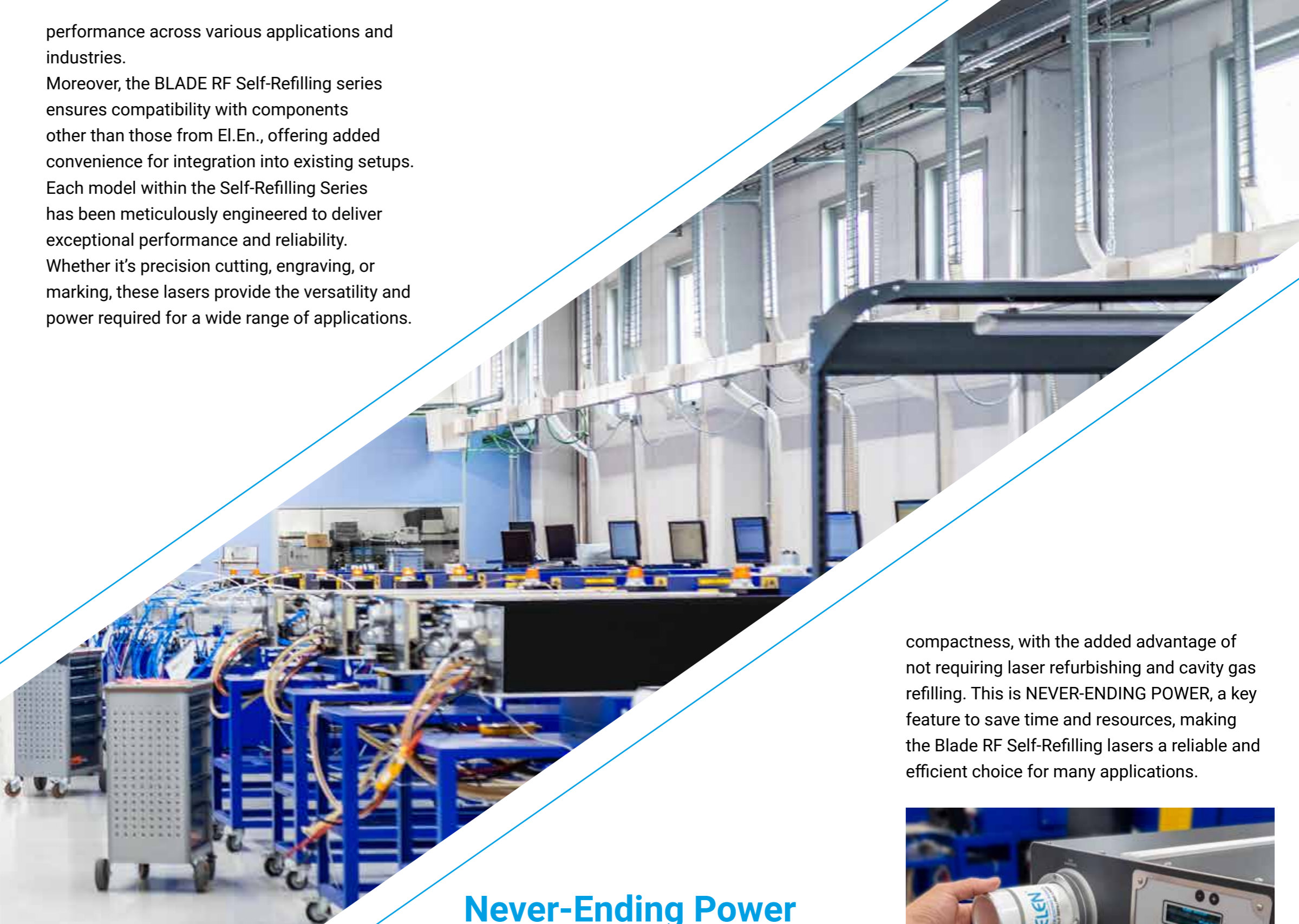
Embrace the precision, innovation, and expertise of El.En.'s laser solutions, empowering your industrial applications with cutting-edge technology.

Seamless integration

The BLADE RF Self-Refilling series offers both medium-power models (ranging from 350 to 850 W) and high-power models (ranging from 1200 to 1500 W) in a two standardized sizes. This uniformity in dimensions 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 Self-Refilling 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 Self-Refilling series ensures compatibility with components other than those from El.En., offering added convenience for integration into existing setups. Each model within the Self-Refilling Series has been meticulously engineered to deliver exceptional performance and reliability. Whether it's precision cutting, engraving, or marking, these lasers provide the versatility and power required for a wide range of applications.



compactness, with the added advantage of not requiring laser refurbishing and cavity gas refilling. This is NEVER-ENDING POWER, a key feature to save time and resources, making the Blade RF Self-Refilling lasers a reliable and efficient choice for many applications.

Never-Ending Power

The Blade RF Self-Refilling technology offers excellent laser power stability, ensuring consistent process parameters even during long-term operations. The internal gas cartridge is cost-effective and easy to replace, typically twice per year. These industrial laser sources are the first that combine the benefits of RF excitation technology, such as high peak power, high-frequency modulation and



Applications

The Blade RF Self-Refilling 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 high-speed cutting of paper and cardboard and labels kiss cutting, offering exceptional stability, precision and performance. With its adaptability and capabilities, the Blade RF Self-Refilling 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



Laser Specifications

Model	RF 333 P G*	RF 555	RF 777	RF 888	RF 899	RF 1222	RF 1555
Rated power (W) ⁽¹⁾	320 ÷ 350	550	750 ^(1a)	850	850	1200	1500
Effective peak power (W) ⁽²⁾	850 750 750	1650	1750	1800	1800	2400	2400
Power stability (long term) ⁽³⁾	±5%	±5%	±5%	±5%	±5%	±5%	±5%
Wavelength (µm)	10.6 ± 0.4 10.2 ± 0.2 9.3 ± 0.2	10.6 ± 0.4	10.6 ± 0.4	10.6 ± 0.4	10.6 ± 0.4	10.6 ± 0.4	10.6 ± 0.4
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)	7.0 ± 0.5	11.5 ± 0.5	11.5 ± 0.5	11.8 ± 0.5	10.5 ± 0.5	9.0 ± 0.5	9.0 ± 0.5
Beam divergence (1/e ² full angle) (mrad)	2.0 ± 0.2	0.9 ± 0.1	0.9 ± 0.1	1.0 ± 0.1	0.8 ± 0.1	2.0 ± 0.1	2.0 ± 0.1
Maximum pulse frequency (kHz)	100	100	100	100	100	100	100
Pulse width range (µs)	2 ÷ 150	2 ÷ 150	2 ÷ 150	2 ÷ 150	2 ÷ 150	2 ÷ 150	2 ÷ 150
Maximum duty cycle	60%	60%	70%	60%	60%	60%	60%
Mode quality (M ²)	< 1.1	< 1.2	< 1.2	< 1.2	< 1.1	< 1.2	< 1.2
Beam ellipticity	1.1 : 1	1.2 : 1	1.2 : 1	1.2 : 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)	24 (2 cartridges per year)	24 (2 cartridges per year)	24 (2 cartridges per year)	24/36 (2/3 cartridges per year)	24/36 (2/3 cartridges per year)	65 (almost 1 cartridge per year)	65 (almost 1 cartridge per year)
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 ± 0.5	48 ± 0.5	48 ± 0.5	48 ± 0.5	48 ± 0.5	48 ± 0.5
Max current (A)	100	140	180	200	200	400	400
Peak Current (A)	120 for 3 ms max	180 for 3 ms max	230 for 3 ms max	260 for 3 ms max	260 for 3 ms max	520 for 3 ms max	520 for 3 ms max

Coolant

Heat load (W)	5000	6800	9000	10000	10000	20000	20000
Coolant temperature (°C)	23 ± 1	23 ± 1	23 ± 1	23 ± 1	23 ± 1	23 ± 1	23 ± 1
Water cooling input pressure (bar)	≤ 4	≤ 5	≤ 5	< 5	< 5	< 6	< 6
Water cooling flow rate (L/min)	12 ÷ 13	21 ÷ 23	21 ÷ 23	28 ÷ 30	28 ÷ 30	≥ 40	≥ 45

Dimensions / Weight

Laser dimensions (LxWxH) (mm)	1327 x 420 x 309	1327 x 420 x 309	1327 x 420 x 309	1327 x 420 x 309	1327 x 420 x 309	1820 x 565 x 446	1820 x 565 x 446
RF power supply dimensions	integrated	integrated	integrated	integrated	integrated	integrated	integrated
Safety shutter	optional	optional	optional	integrated	integrated	integrated	integrated
Laser Weight (kg)	105	110	110	110	119	300	300

(1) Typical with a pulse duration of 120µs and 60% duty cycle. Power reduction of 1% for °C with water cooling temperature above 20°C.

(1a) Typical with a pulse duration of 140µs and 70% duty cycle. Power reduction of 1% for °C with water cooling temperature above 20°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.

* preliminary data

