Data sheet

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RenAM 500 series additive manufacturing systems

RenAM 500S Flex / RenAM 500S / RenAM 500S Ultra

RenAM 500Q Flex / RenAM 500Q / RenAM 500Q Ultra

www.renishaw.com/additive-manufacturing

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System description

The RenAM 500 series is Renishaw's high-productivity laser powder bed fusion (LPBF) additive manufacturing (AM) system. All versions of the RenAM 500 series feature a digital control system and a vacuum chamber for quickly preparing low-oxygen build atmospheres. The RenAM 500 series can be configured with one (500S) or four (500Q) high-power 500 W lasers, each able to access the whole powder bed surface. With its four lasers, the RenAM 500Q achieves build rates up to four times faster than the RenAM 500S single laser system.

The RenAM 500S, RenAM 500Q and RenAM 500 Ultra models feature automated powder and waste handling systems that automatically sieve and cycle powder back into the machine without user intervention. The RenAM 500 Flex models feature a total loss powder management system designed for external sieving, which allows for greater flexibility when it comes to powder choice.

RenAM 500 Ultra systems come equipped with additional features designed to maximise laser-on time during a build, allowing for even faster production rates. As standard, RenAM 500 Ultra models have Renishaw's TEMPUS™ technology installed – an innovation that synchronises the lasers with the powder recoater to reduce build times by up to 50%.

Renishaw's latest process monitoring tools are also included as standard for RenAM 500 Ultra systems. These tools provide live feedback on powder dosing, laser energy input, and melt-pool characteristics, which can be analysed to monitor build quality and reduce post-build inspection costs. The process monitoring tools packaged with RenAM 500 Ultra systems include:

- The LaserVIEW™ hardware module
- The MeltVIEW™ hardware module
- The CameraVIEW™ hardware module
- A 12-month licence for InfiniAM® Camera software
- A 12-month licence for InfiniAM® Spectral software
- A Renishaw Central AM connector.

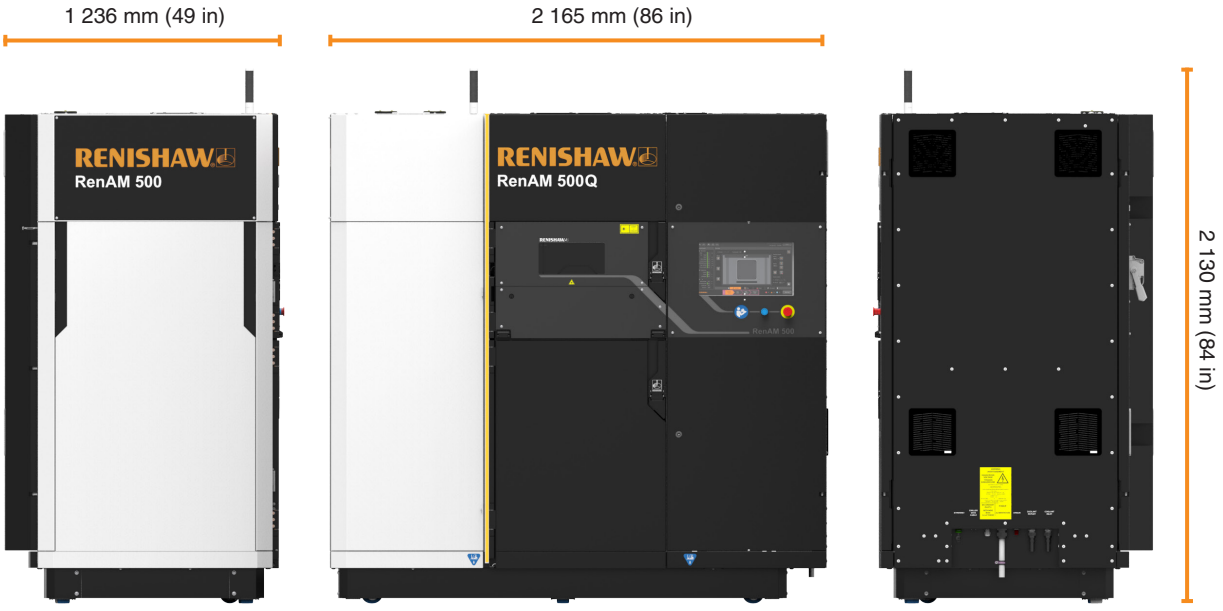
Model configurations

	Single laser	Four lasers	Powder recirculation	CameraVIEW	LaserVIEW and MeltVIEW	TEMPUS Technology
RenAM 500S Flex	✓			✓	*	*
RenAM 500S	✓		✓	✓	*	*
RenAM 500S Ultra	✓		✓	✓	✓	✓
RenAM 500Q Flex		✓		✓	*	*
RenAM 500Q		✓	✓	✓	*	*
RenAM 500Q Ultra		✓	✓	✓	✓	✓

* Model can be upgraded to support this technology post-purchase

System dimensions

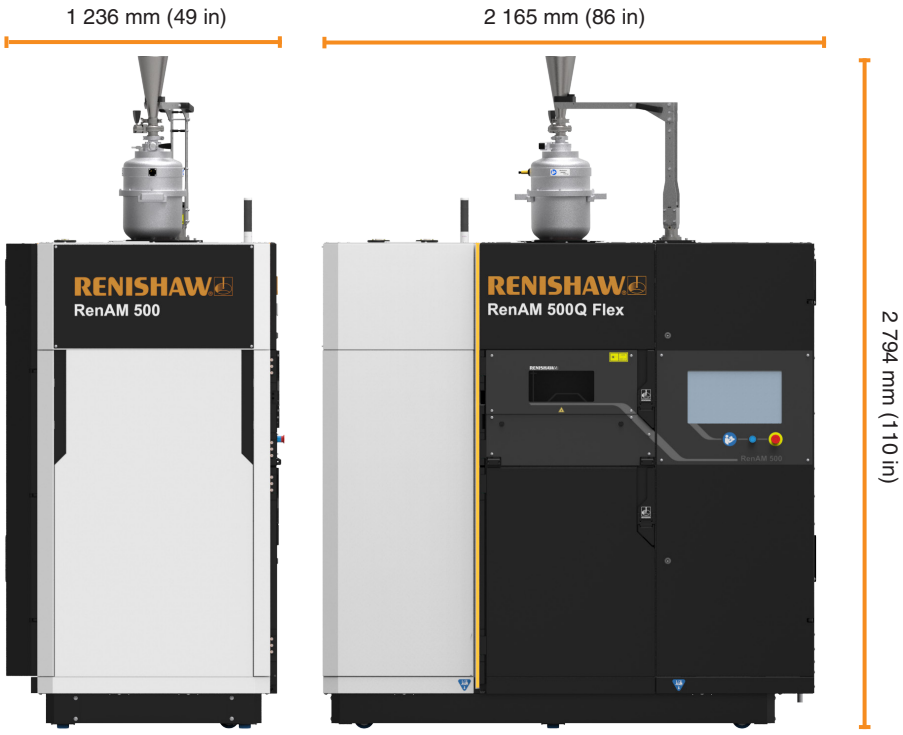
RenAM 500Q



Left-hand side view | RenAM 500 front view | Right-hand side view

NOTE: The dimensions shown for the RenAM 500Q are identical to the dimensions of the RenAM 500S and RenAM 500 Ultra models. Dimensions shown are for the RenAM 500Q without external accessories.

RenAM 500Q Flex



Left-hand side view | RenAM 500 Flex front view

NOTE: The dimensions shown for the RenAM 500Q Flex are identical to the dimensions of the RenAM 500S Flex. Dimensions shown are for the RenAM 500Q Flex with the flask arm and large feed hopper fitted, without external accessories.

Specification

Processable materials		Weldable metals in powder form. Examples include stainless and tool steels, aluminum alloys, nickel-based alloys and titanium alloys. For more information on materials, visit **www.renishaw.com/additivemanufacturing**
Weight (net)	RenAM 500 Flex	Q (quad laser): 1 960 kg (4 321 lb) S (single laser): 1 870 kg (4 122 lb)
	RenAM 500	Q (quad laser): 2 040 kg (4 498 lb) S (single laser): 1 950 kg (4 300 lb)
	RenAM 500 Ultra	Q (quad laser): 2 070 kg (4 564 lb) S (single laser): 1 970 kg (4 343 lb)
Build rate [1]		Up to 194 cm^3/h (11.84 in^3/h)
Maximum scanning and positioning speed		10 m/s (32.8 ft/s)
Typical processing speed [2]		2 m/s (6.6 ft/s)
Number of lasers, laser power and type of laser		Q (quad laser): 4 × 500 W – ytterbium fibre lasers S (single laser): 1 × 500 W – ytterbium fibre laser
Beam focus diameter		80 µm (3 µin) with dynamic focus
Dynamic focus diameter		Up to 500 µm (20 µin)
Beam wavelength		1 070 nm to 1 080 nm
Laser modulation frequency		15 kHz
Time to prepare build chamber atmosphere		15 minutes (to < 1 000 ppm oxygen)
Minimum pressure in chambers (vacuum)		–950 mbar-gauge or 5 kPa-abs (–13.8 psi-gauge)
Working pressure (above atmosphere)		10 mbar-gauge to 20 mbar-gauge (0.15 psi-gauge to 0.3 psi-gauge)
Running argon consumption (after initial fill)		< 0.8 L/min (1.8 ft^3/h)
Maximum argon consumption (during fill)		400 L/min (14.12 ft^3/min)
System fill/purge consumption		< 1 200 L (43 ft^3)
Argon gas supply connection		3/8 in BSP male cone fitting
Argon quality (greatest permissible impurities)		20 ppm or better (99.998% pure)
Power supply [3]		380 V to 480 V AC, 63 A, 50 Hz to 60 Hz, 3-phase
Data connections [4]		Standard network connection RJ45. Renishaw recommends using Cat6 cabling.
Chilled water connection [5]		From HRSH090-AF-40 chiller
Clearance under RenAM 500 series with no plinth		146 mm (5.75 in)
Optical module sealing		IP6X
Continuous noise level		≤ 70 dB
Maximum noise level (temporary)		≤ 71 dB
Compatible software		QuantAM, InfiniAM Camera, InfiniAM Spectral, Renishaw Central

1 Maximum build rate does not include recoater time and is dependent upon parameters, part geometry and material.

2 Typical processing speed is dependent upon parameters, part geometry and material.

3 Maximum calculated load of machine is 50 A, nominal operating current is 32 A.

4 The user has the option to configure the network using their own control software. Refer to the *RenAM 500 series additive manufacturing system* user guide, Renishaw part no. H-5800-3693, for more information.

5 Due to differences in electrical requirements across countries, the part numbers of ancillary equipment may vary. Consult your local service department if you have questions in this regard.

The compact galvanometer assembly inside the RenAM 500 series has been designed and additively manufactured in-house, using aluminium for high thermal conductivity, and includes conformal cooling fluid channels that ensure excellent thermal stability of the optical system.

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