

ORIGAMI LP

Ultra-low noise femtosecond laser module



Very compact with ultra-low phase noise and timing jitter

Ideal for high-precision industrial applications

The ORIGAMI is specifically designed for OEM integration.

This industrial-grade, ultra-compact, mode-locked, femtosecond laser provides the lowest phase noise and timing jitter on the market.



Origami LP

Applications

Clock distribution

Seed for amplifiers

Frequency comb systems

THz generation

Supercontinuum generation

Radar systems/Analog-to-digital converters

Reliable

High power, clean pulses, and high repetition rate

The ORIGAMI families of laser emit transform-limited soliton pulses, providing diffraction-limited beam quality and excellent pointing stability. It is available at various wavelengths and repetition rates.

Maintenance-free and OEM-ready

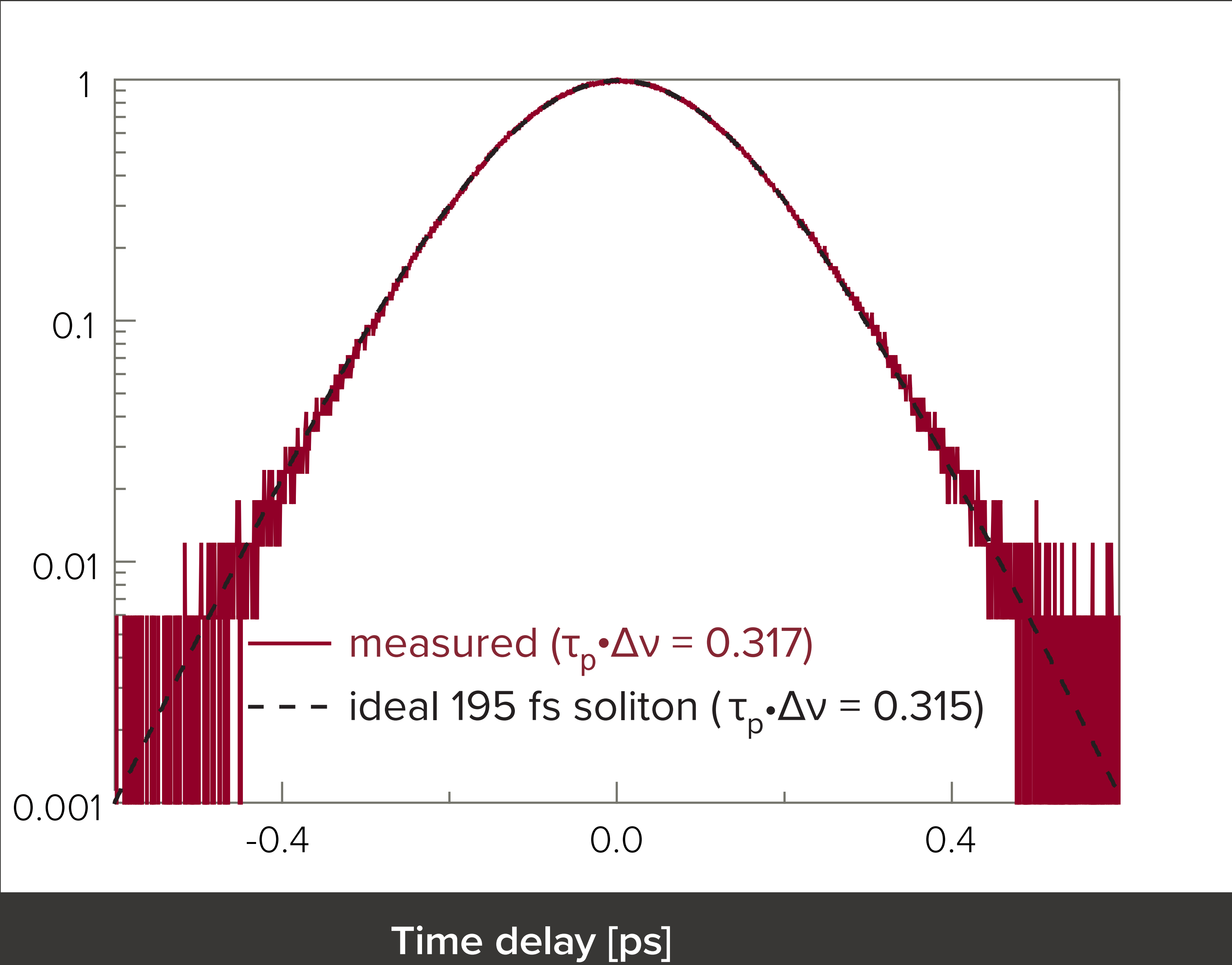
The ORIGAMI is an air-cooled, maintenance-free laser module packaged in a sealed and robust enclosure allowing for operation in the harshest environments.

No alignment is required, and it guarantees high stability, low drift, and 24/7 operation.

Features

- Lowest phase noise on the market
- No Kelly sidebands or spectral ripple
- Diffraction-limited beam quality
- Shot noise-limited relative intensity noise (RIN)
- Transform-limited soliton pulses of outstanding cleanliness
- Plug and Play
- Maintenance-free 24/7 operation

Pulse profile - Autocorrolation



Options



Flexible output and synchronization to external clock

Depending on model, output options are collimated free-space or single mode fiber.

The ORIGAMI can also be synchronized to an external reference for ultra-low timing jitter.

A large variety of options with ORIGAMI accessories

Whether you want ultra-low noise laser control or easy and simple synchronization, the range of ORIGAMI laser accessories gives you full variability.

The ultra low noise controller is a plug and play, add-on module to drive its mode-locked laser unit with the lowest possible timing jitter.

The compact and simple laser synchronization module allows the synchronization of pulsed laser trains to an external reference signal.

The ultra-low noise synchronization allows for synchronization of ultra-short laser pulse trains with femtosecond precision.

The Carrier Envelope Phase (CEP) ready system consists of advanced laser and electronic architecture which allows to control the CEP of the lasers in addition to the pulse repetition rate.

Options

Sync (synchronization to external clock for ultra-low timing jitter)

Low noise driver

Carrier-Envelope-Phase (CEP) ready

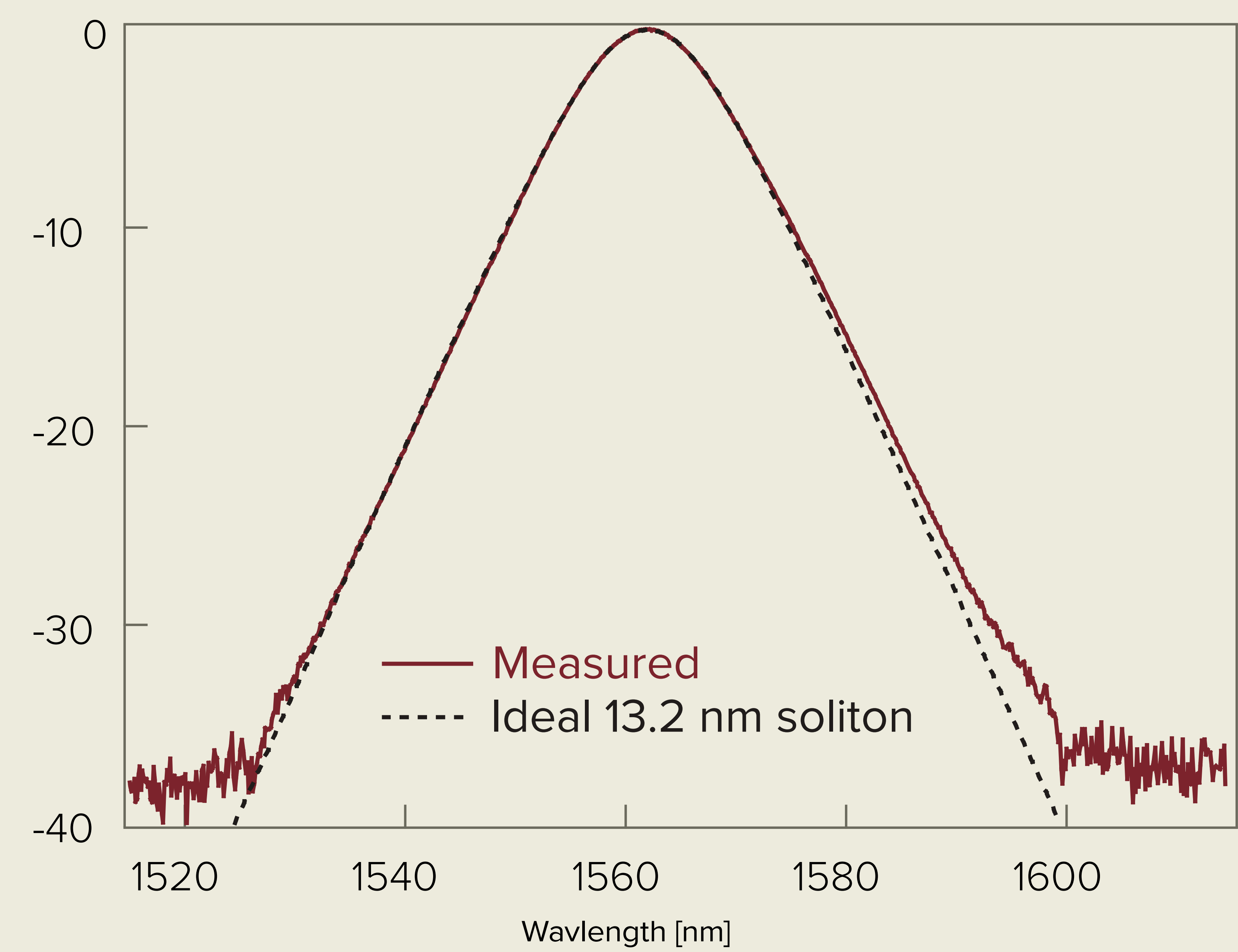
Analog pump power control

Repetition rate control and tunability

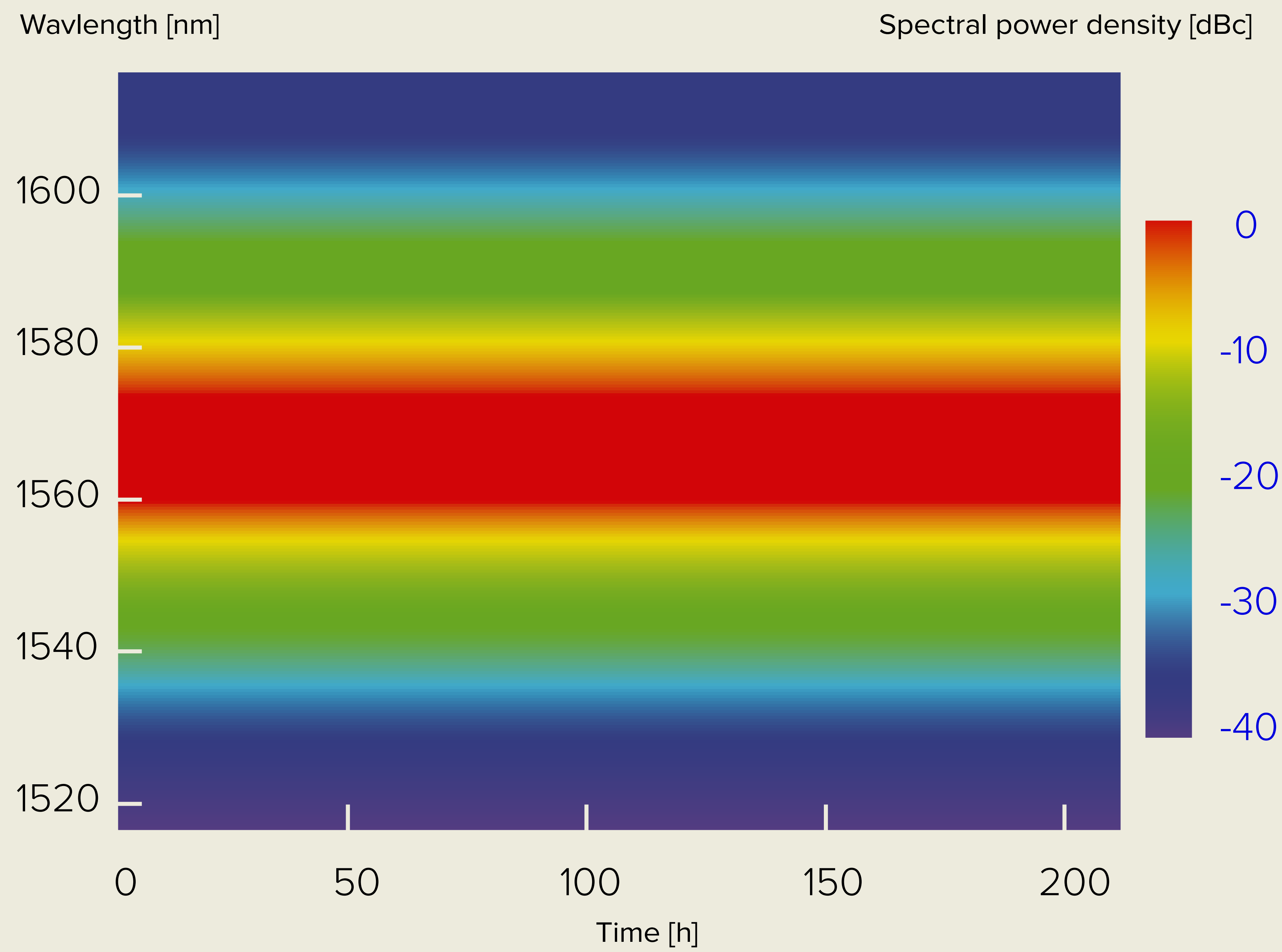
Fiber output, armored PM or SM fiber

Performance

Spectral power density [dBc/nm]

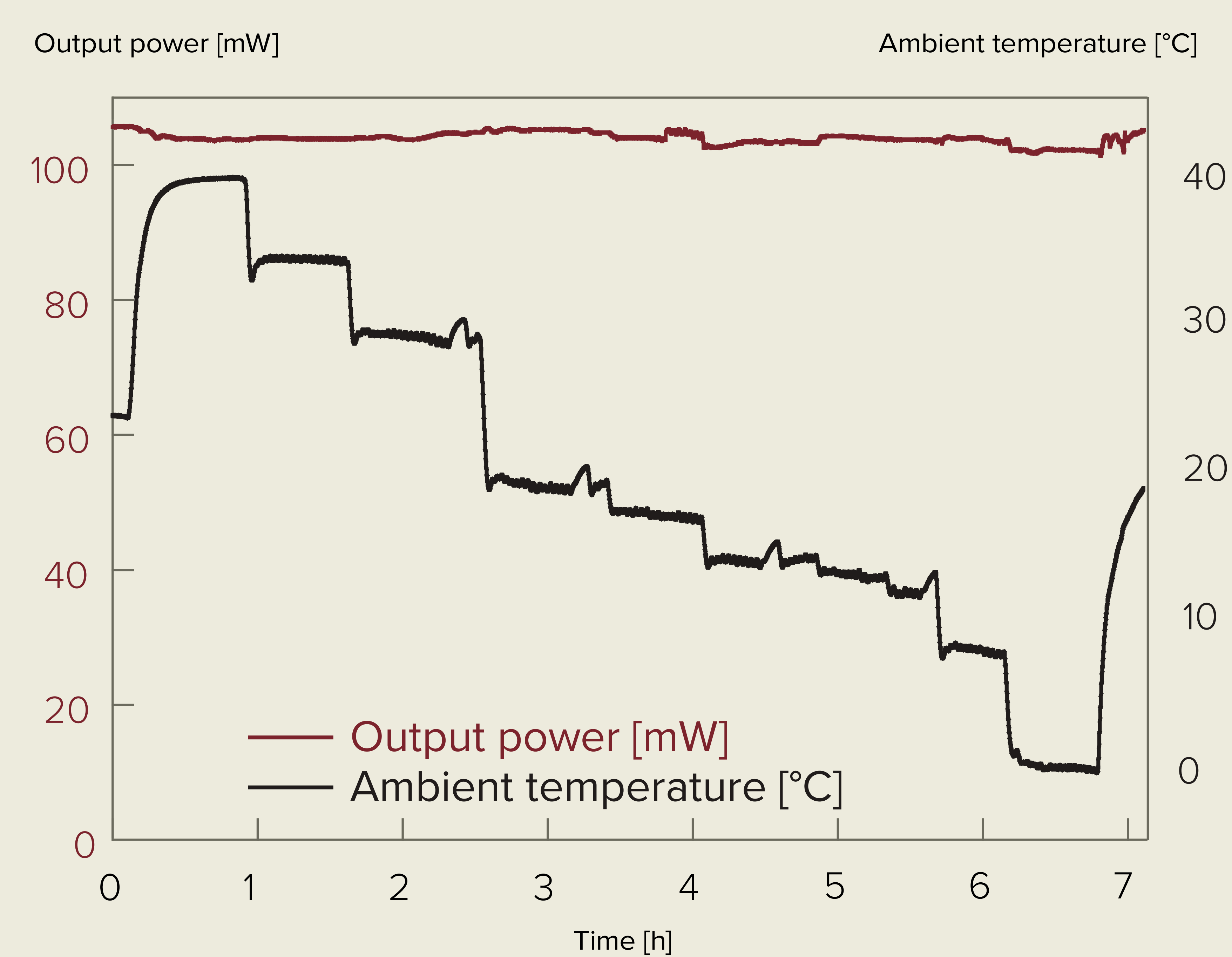


Optical spectrum as a function of time

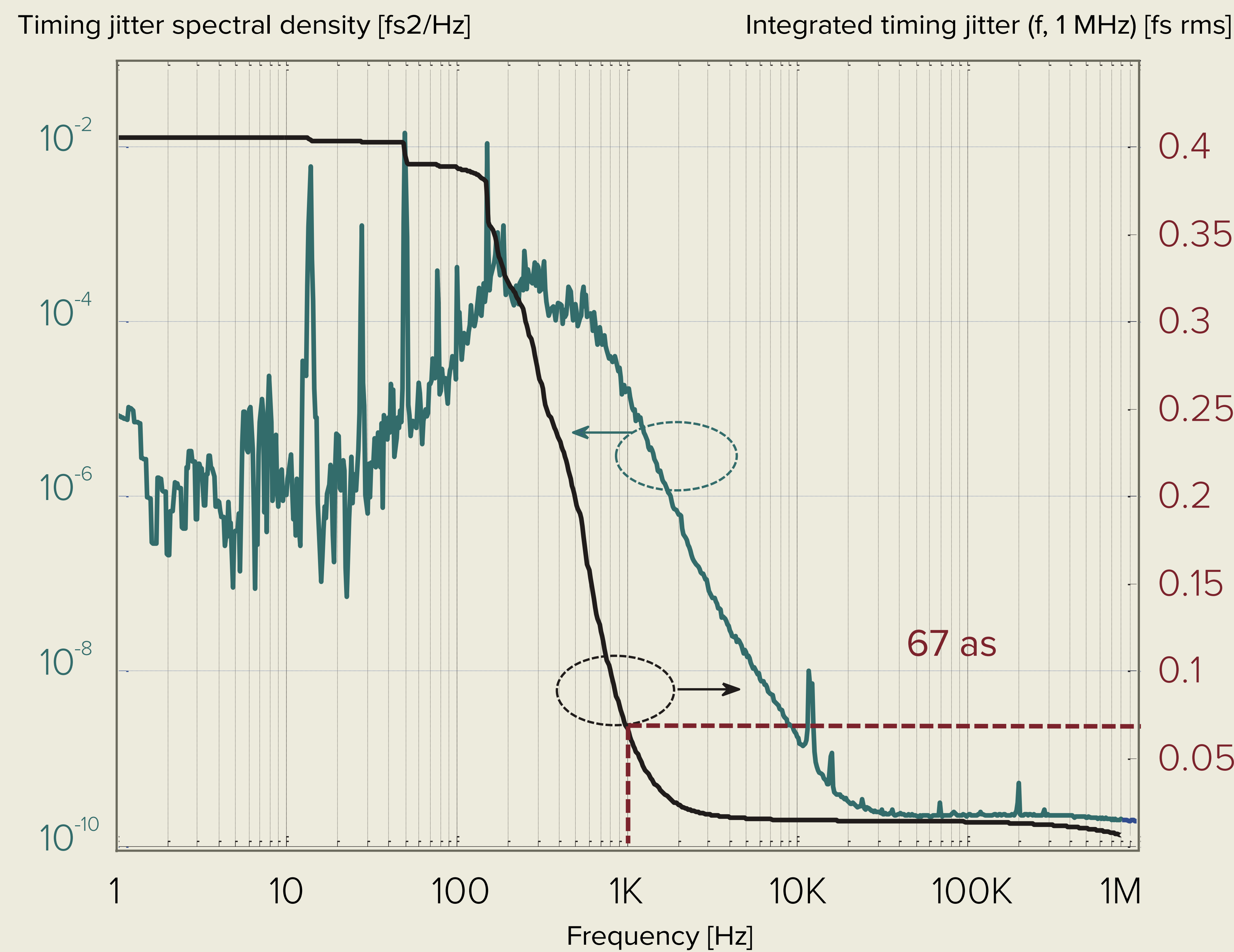


Performance

Temperature cycling



Phase noise vs timing jitter



Reference: Peng et al, “Long-term Stable, large-scale, Optical Timing Distributing Systems with Sub-Femtosecond Timing Stability” Proceedings of FEL2013, New York

Specifications - Single Output



Optical

Model	05-40	08-50	10-40	10-80	10-100	15-80	15-100
Repetition rate [MHz]	40 ± 2	50 ± 2	40 ± 2	80 ± 2	100 ± 2	80 ± 2	100 ± 2
Center wavelength [nm]	515 ± 3	780 ± 5	1030 ± 2	1030 ± 2	1030 ± 2	1560 ± 5	1560 ± 10
Pulse duration [fs]	< 180	< 160	< 200	< 200	< 200	< 200	< 100
Average power [mW]	> 25	> 20	> 100	> 160	> 200	> 120	> 100 ²
Pulse energy [nJ]	> 0.625	> 0.4	> 2.5	> 2	> 2	> 1.5	> 1
Peak power [kW]	> 2	> 2	> 10	> 8	> 8	> 6	> 8
Spectral bandwidth [nm]	Transformlimited	Transformlimited	Transformlimited	Transformlimited	Transformlimited	Transformlimited	N.A.
	(τp·Δν~ 0.32)	(τp·Δν~ 0.32)	(τp·Δν~ 0.32)	(τp·Δν~ 0.32)	(τp·Δν~ 0.32)	(τp·Δν~ 0.32)	
Beam quality (TEM ₀₀)	M ² ≤ 1.4	M ² ≤ 1.2	M ² ≤ 1.1	M ² ≤ 1.1	M ² ≤ 1.1	M ² ≤ 1.1	M ² ≤ 1.1
Polarization / PER (vertical) [dB]	> 23	> 23	> 23	> 23	> 23	> 18	> 18
Amplitude noise [%]	< 0.2% RMS, < 0.5% pk-pk (24h)						
Timing jitter (1kHz - 10 MHz) [fs]	< 30	< 50	< 30	< 30	< 30	< 30	< 30
Laser output	Collimated	Collimated	Collimated	Collimated	Collimated	Collimated	PM fiber,
	free-space	free-space	free-space	free-space	free-space	free-space	FC/APC ³

¹ Please inquire for possible combinations of wavelength, pulse duration, average power, pulse energy, and repetition rate.

² Exclusive fiber.

³ Armored single-mode fiber, ²⁰ or ⁵⁰ cm (other lengths are available).

Specifications - Single Output

Electrical/Mechanical

Warm-up time [min.]	< 10	
Operation temperature [°C]	10 – 40	
Storage temperature [°C]	-20 – 55	
Power supply requirements	24 VDC/2.5 A or 90-264 VAC, 47-63 Hz	
Power consumption [W]	< 15	
Laser head dimensions (WxHxD) [mm]	08-50:	257 x 54 x 189
	10-40:	250 x 54 x 200
	15-80/15-100:	296 x 54 x 112
Laser head weight [kg] ⁴	2.5	
Laser head cooling	Air	
Control unit dimensions (WxHxL) [mm ³]	104 x 44 x 165	
Control unit weight [kg]	0.65 kg	
Control unit cooling	Air	

⁴ Exact size and weight depends on the model.

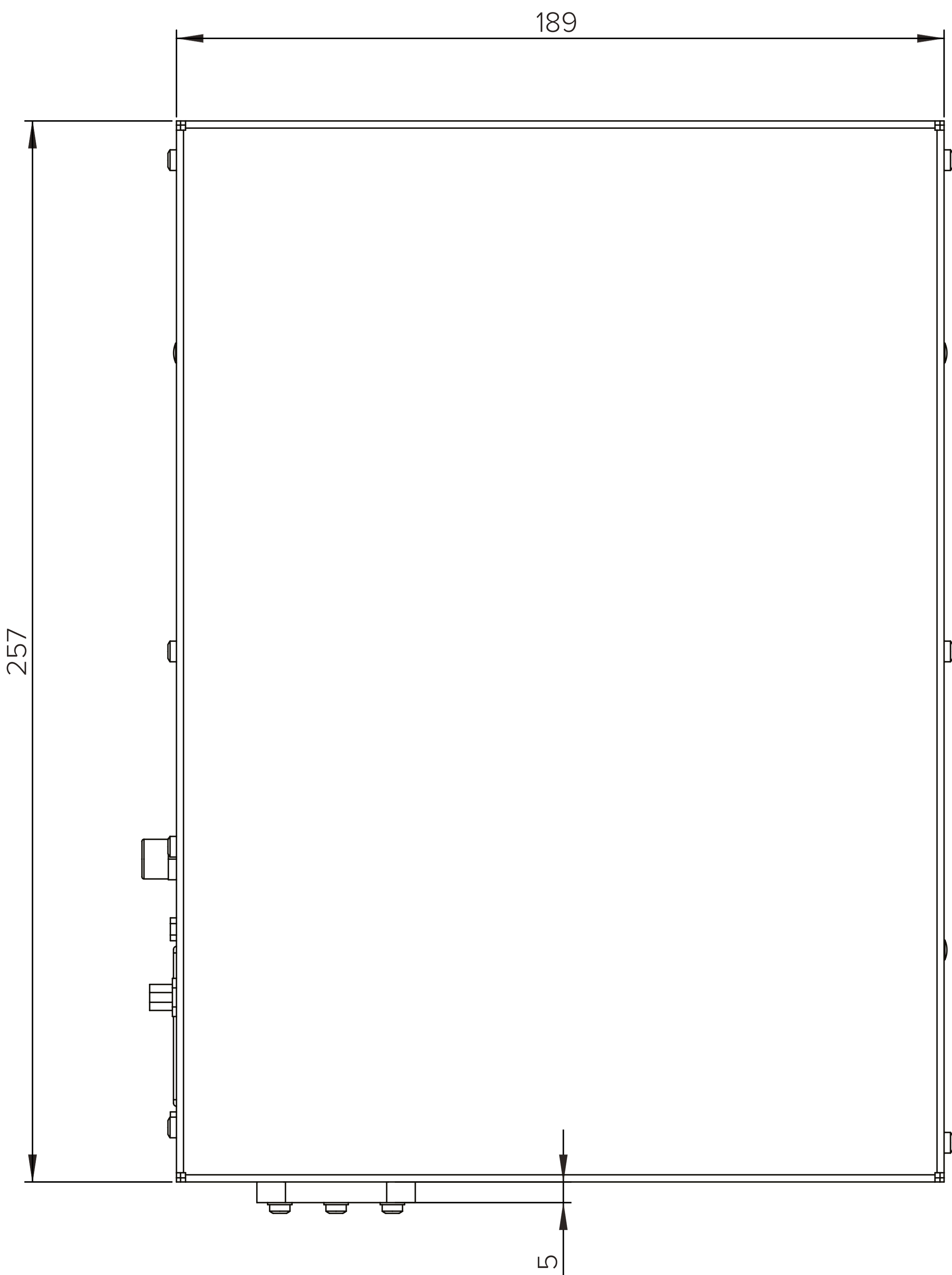
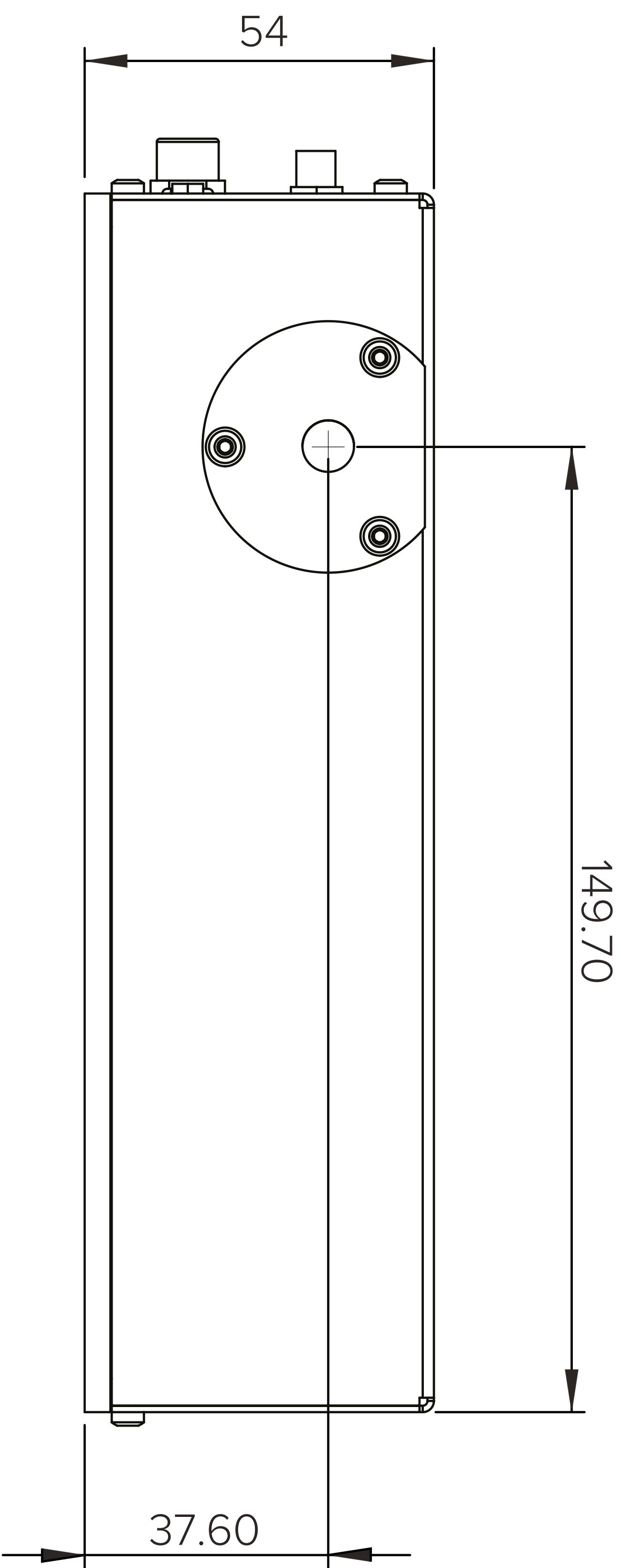
Support and warranty

All ORIGAMI products come with an industry leading reliability.

The product is covered by a comprehensive warranty. Service options are available. For details, please enquire.

Technical Drawings

ORIGAMI 08-50



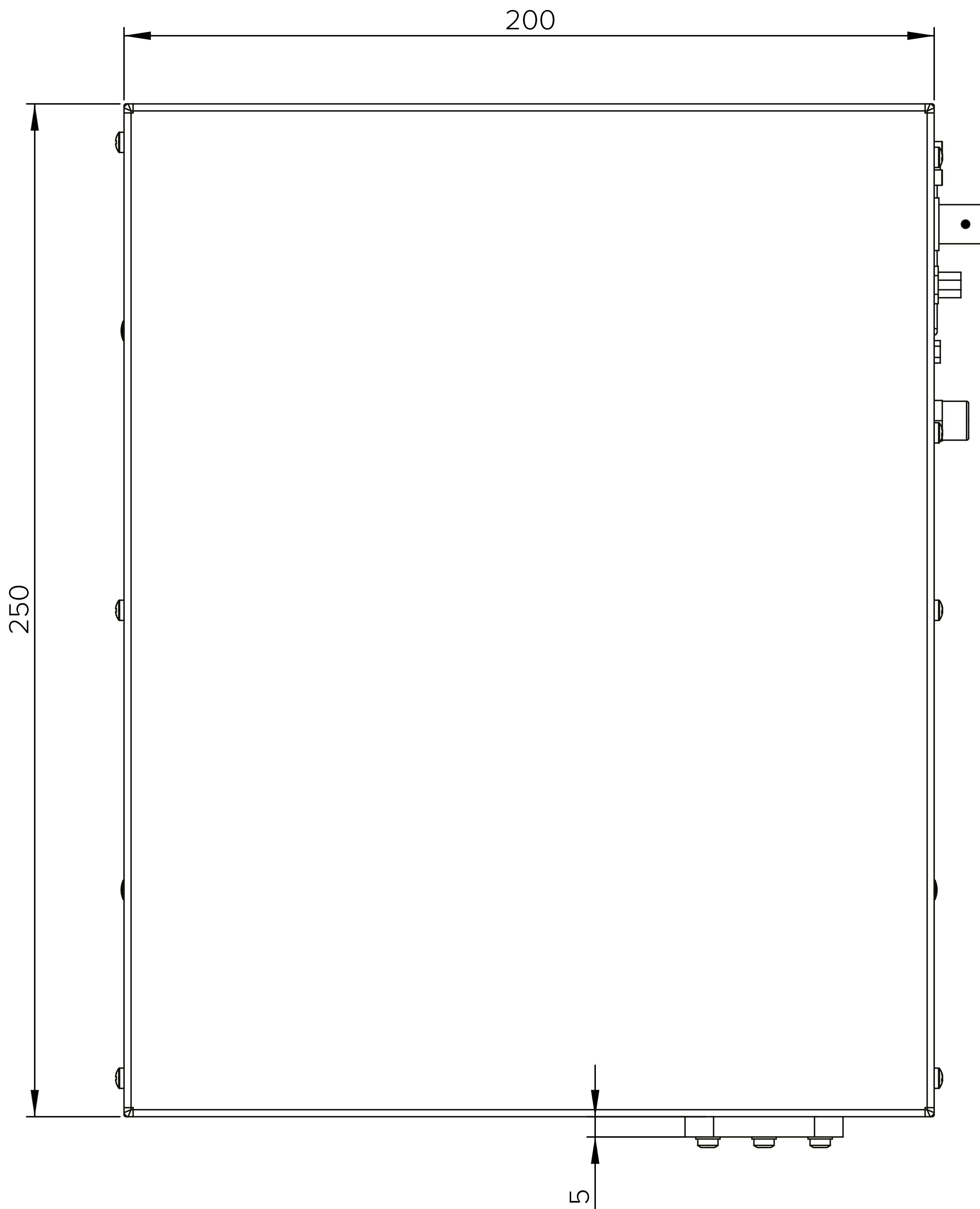
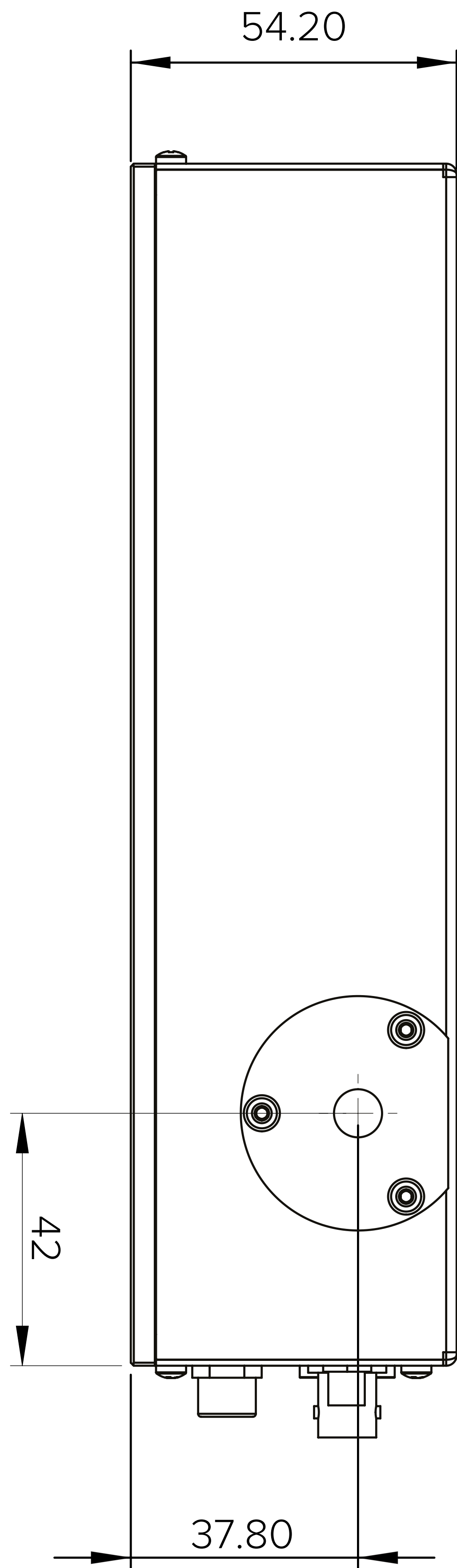
Origami
LP

All ORIGAMI products are produced under our quality management system certified in accordance with the ISO 9001:2015 and ISO 13485:2016 standard.



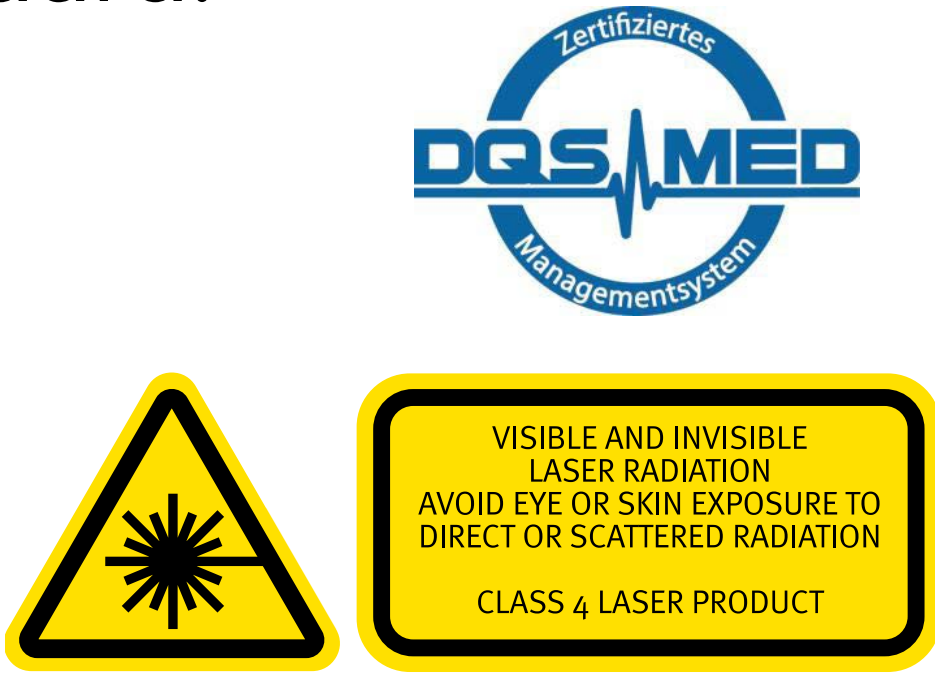
Technical Drawings

ORIGAMI 10-40



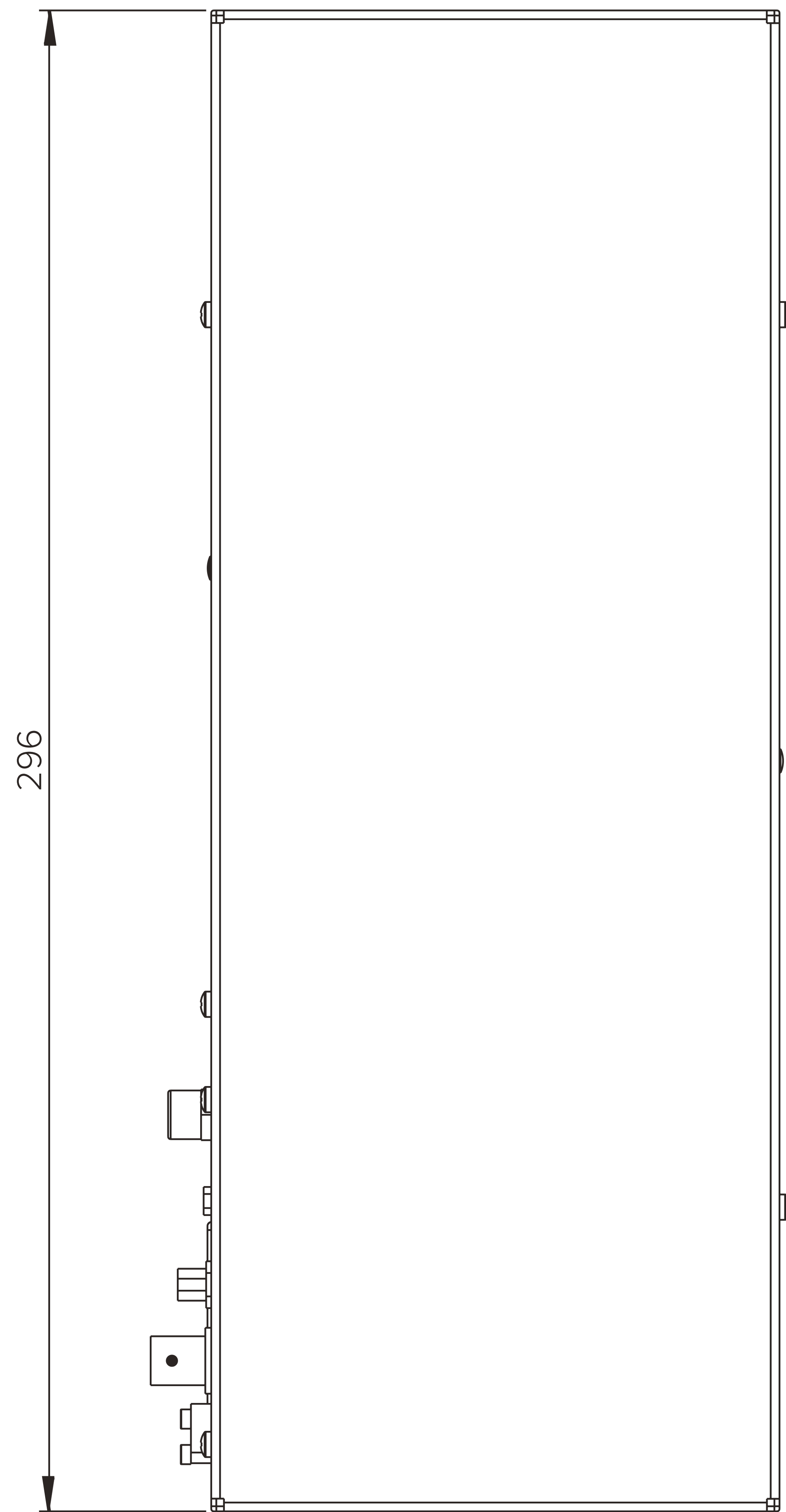
Origami LP

All ORIGAMI products are produced under our quality management system certified in accordance with the ISO 9001:2015 and ISO 13485:2016 standard.



Technical Drawings

ORIGAMI 15-80 / 15-100



Origami
LP

All ORIGAMI products are produced under our quality management system certified in accordance with the ISO 9001:2015 and ISO 13485:2016 standard.



SOLUTIONS FOR INNOVATORS