

DAUSINGER+  
GIESEN GMBH

## VaryDisk FEMTO

FEMTO

The VaryDisk FEMTO is a fully functional laser system especially suited for laboratory investigations. The VaryDisk FEMTO is equipped with a femtosecond seed source, allowing ultrashort pulse durations. Additional specifications can be chosen according to our customers need by either combination of one of our four VaryDisk base versions, or with various available options listed below. Especially useful for the VaryDisk FEMTO system is the variability option, allowing a motorized adjustment of the pulse duration. Furthermore, additional seed lasers can be used for an even larger flexibility with respect to the available pulse durations. Depending on the individual choice of parameters, the VaryDisk FEMTO qualifies as industrial / scientific or prototype laser system.



VaryDisk (2018 version)

## FEATURES

- customizable output parameters
- robust design
- output power: up to 150 W and **240 W** with power upgrade
- pulse energy: up to **1000  $\mu$ J**
- minimum pulse duration: up to **500 fs** ... 2 ps
- pulse duration automatically adjustable
- pulse to pulse switchable pulse duration
- repetition rate: 100 kHz (higher repetition rates up to 1 MHz possible)
- wavelength: **1030 nm**, 515 nm, or 258 nm (with SHG, UV option)
- beam quality:  $M^2 < 1.4$
- energy stability up to **< 3 % RMS**
- power stability up to **< 1 % RMS**

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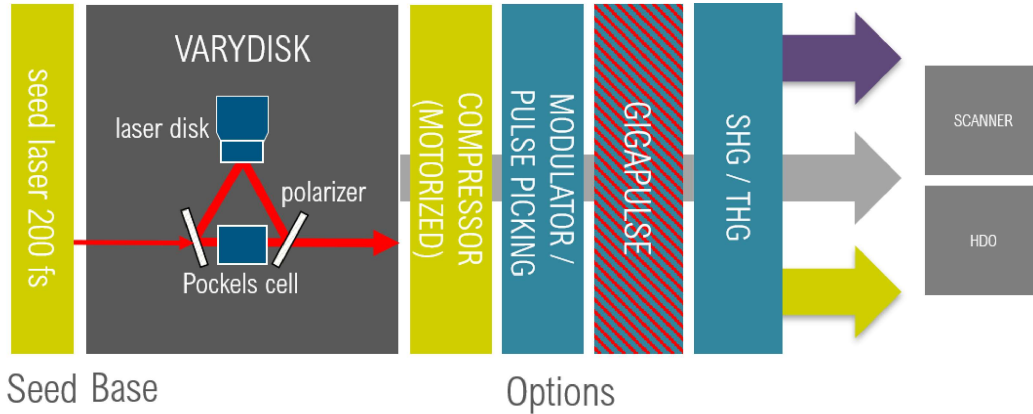
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- customizable network interface

The VaryDisk Series is highly customizable; parameters may change and are subject to detailed discussion with customer at the time of purchase; parameters given here are typical realizations for the specific setup; depending on the choice of parameters, the laser system qualifies as industrial, scientific or prototype system;

## SCHEMATIC DESIGN



Schematic Design of VaryDisk FEMTO

## OPTIONS

We offer different options along with the base versions of the VaryDisk system in order to increase the output power (power upgrade **240 W**) and/or to allow additional operating modes along with the generation of different pulse characteristics, e.g. different choices of pulse durations, wavelength, or even the simultaneous generation of pulses with different pulse characteristics in one operation mode. Some of the available options are listed below. Please consult our team for possible combination choices and further information.

- motorized compressor (**MC**) for an adjustable pulse duration adjustable 2 ps ... 500 fs
- shorter pulse durations < **350 fs** (even shorter upon request: **FEMTO+**)
- multiple seed lasers (e.g. **fs, ps, ns**) for mixed pulse trains (**MPT**)
- higher repetition rates of up to **1 MHz**
- pulse picker (**PP-6, PP-9, PP-12**)
- active stabilizer (**RMS+**) for improved **RMS**
- high speed warm up routine (**HS**)
- customizable network Interface
- **515 nm**

## APPLICATIONS

The extremely short pulse durations in the range of a few hundred femtoseconds allow material processing with almost complete evaporation of the material. Compared to picosecond pulses, the higher peak power densities allow a flexible input-coupling of the radiation into various types of material. Furthermore, high ablation efficiency can be obtained and the thermal impact on the material further minimized. Femtosecond material processing is particularly suited for drilling and precision ablation of glass.

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Application examples, showing the capabilities of the VaryDisk laser system, were demonstrated in our application lab. Please consult D+G for further information.

## DIMENSIONS / WEIGHT

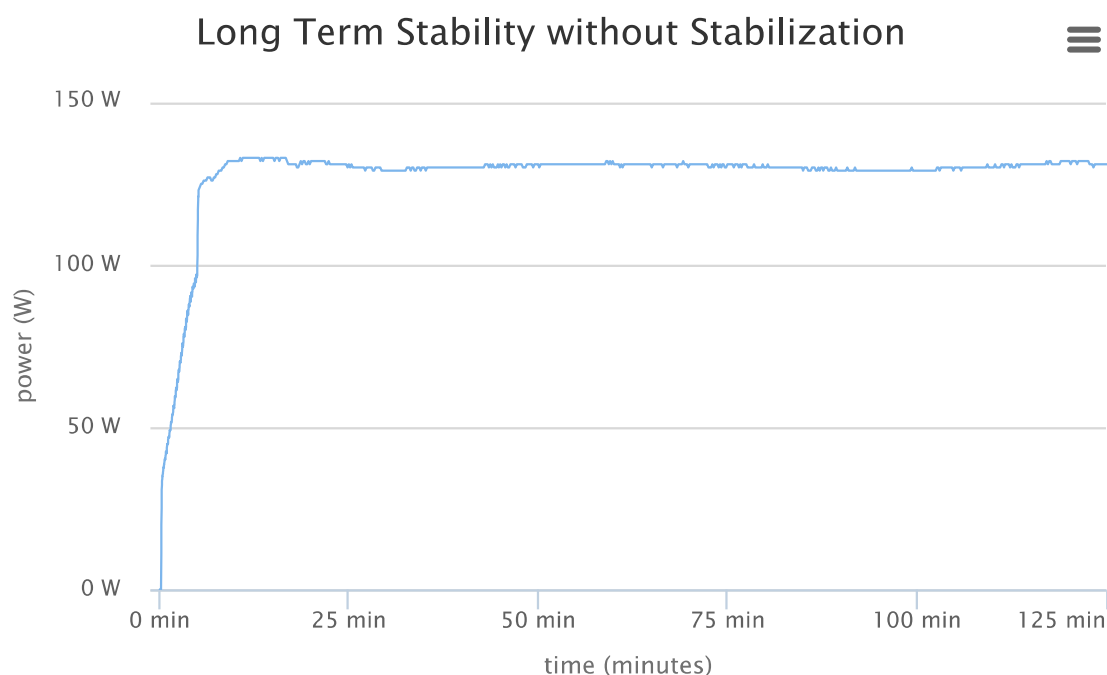
All data given here are approximate, since nearly every laser is unique with respect to our customers requests (even the specifications given here):

- laser head approx. 200 kg, (80 x 110 x 45) cm<sup>3</sup> (without optional modules)
- rack approx. 200 kg, (100 ... 180 x 80 x 56) cm<sup>3</sup>
- laser head / rack connection: 4m
- additional chiller might be required with up to 250 kg, (60 x 58 x 155) cm<sup>3</sup> (depending on output power and repetition rate)

## OPERATING CONDITIONS

- power supply 3 phases 380 V, 50 Hz + N + ground, CEE 32 A plug
- power consumption < 4 kW ... 6 kW
- water connection barbed fittings for tubing 13 mm or 16 mm inner diameter
- water flow 15 - 25 l/min @ 12 °C - 25 °C
- water quality filtered 80 µm recommended, low chlorine concentration (< 200 mg/l)
- 20 - 25°C operating temperature, low humidity

[Brochure of VaryDisk FEMTO](#)



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— VaryDisk FEMTO

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Long term stability of VaryDisk FEMTO after powering on for 2hours: mean = 130.25 W, RMS 0.94 W; the laser system was delivered without stabilization, which, however, in the future will be standard for our VaryDisk systems; every 10th data point is shown;

## [Scanner, Helical Drilling Optic](#)

In order to bring the laser pulses to your workpiece, we offer different kinds of micromachining tools, such as third party scanners, or our own [helical drilling optics](#).

## [SHG, THG Option](#)

In order to allow the generation of different wavelengths, the standard wavelength of 1030 nm can be frequency doubled to 515 nm. Even the generation of UV light is possible.

## [Femto+ Option](#)

By use of different gain materials, the amplification bandwidth of our VaryDisk system can be increased. This way, even shorter pulse durations are available for the VaryDisk femto, pico, and/or energy.

## [Additional Seed Laser\(s\)](#)

The VaryDisk femto, pico, and/or energy system can be operated with additional seed lasers in order to allow an additional flexibility in the choice of pulse durations. Along with the original pulse duration of the base system, pulses with picosecond and/or nanoseconds are additionally available. Even pulse to pulse switching is possible, if requested so by our customer.

## [Twin Option](#)

Different base systems of the VaryDisk can be combined in order to increase the flexibility and cost effectiveness of this laser system. One possible combination is the use of the femto and pico system simultaneously by adding another ps-seed to the femto version.

## [Flexibility Option](#)

The VaryDisk femto laser system with flexibility option offers unprecedented flexibility in the choice of pulse duration from the femtosecond to the microsecond range.

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