Product list 2013

- Dye-Lasers, cw and pulsed
- Tunable Diode Lasers
- Titan Sapphire Lasers, cw and pulsed
- Pulsed single mode system
- Bandwidth Measurement
- Energy detectors
- Laser-Accessories
- Dye-Circulators, -Cells, - Filters
- Raman Cells
- Laser-Dyes
- Optics
- Optomechanic

Radiant Dyes Laser Acc. GmbH, Friedrichstr. 58, D-42929 Wermelskirchen
☎ 02196-81061 + 92685, Fax 02196-3422
http://www.radiant-dyes.com / E-mail: info@radiant-dyes.com

Pulsed Dye Laser

NarrowScan
NarrowScanK
NarrowScan HighRep

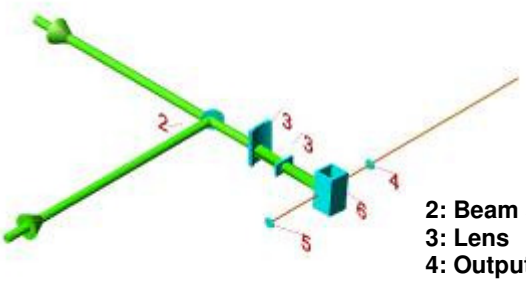
New Resonator Design
Autotracking Frequency doubling, tripling and mixing
Wavelength Separation Unit
Frequency Stabilization
Temperature Stabilization
Wavelength Calibration
Online Bandwidth Control
Bethune Cell (up to 1 J pump energy)

For further information please see our "NarrowScan" brochure

Broadband- pulsed dye laser

RDP-1
Broadband -dye laser with non-selective cavity.
The laser can be equipped with the following pump mirror sets:

- Mirror set 1: 330 - 420 nm
- Mirror set 2: 420 - 720 nm
- Mirror set 3: 550 - 900 nm



2: Beam splitter
3: Lens
4: Output coupler
5: End mirror
6: Dye Cell

Dye circulator system RD 250 FC 20 with 20 mm flow cell unit, suitable up to 100 Hz 100 mJ pump energy. This system is also available with RD 1000 FC 40 with 40mm flow cell unit and water cooling for pump energy up to 400 mJ.
Conversion efficiency is very high, hardly any losses:
Excimer laser pumped [308 nm]: 20% - 473 nm
Nd:YAG-laser pumped [532 nm]: 30% - 570 nm

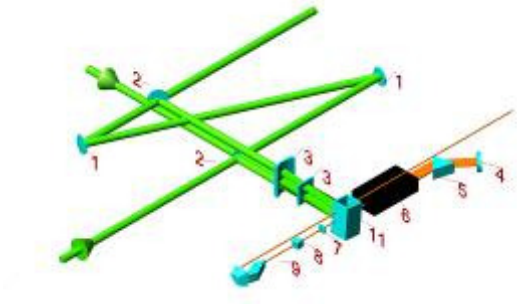
Bandwidth (typically): 3 - 5 nm
(at the maximum of the laser dye)

Midband Pulsed Dye Laser

RDP-1M
Tunable dye laser, resonator with prism as disperse element and one dye circulator RD 250 FC 20, 10x beam expander
Linewidth (typically): approx. 1-2 nm
Maximum pump energy: 80 mJ
Tuning range 330-850 nm

RDP-2M

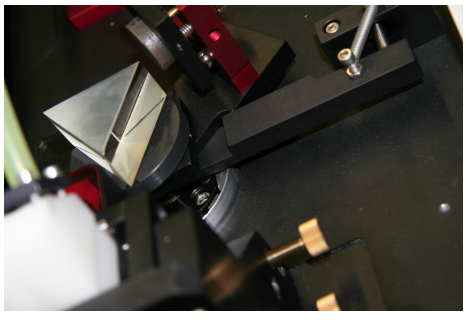
This system is very close to RDP-1M,
but with oscillator and
amplifier in one 20 mm dye cell.
Max. pump energy: 160 mJ.



1: Mirror
2: Beam splitter
3: Lens
4: End mirror
5: Prism
6: Beam expander
7: Output coupler
8: Polarisator
9: Turning Prism
11: Dye Cell

RDP-3M

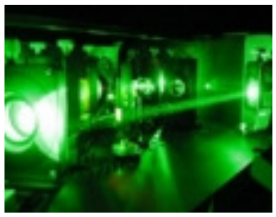
This system is close to RDP-2M,
but with oscillator, amplifier in one 20 mm dye cell and main amplifier in a 40 mm dye cell.
Pump energy: up to 1 Joule

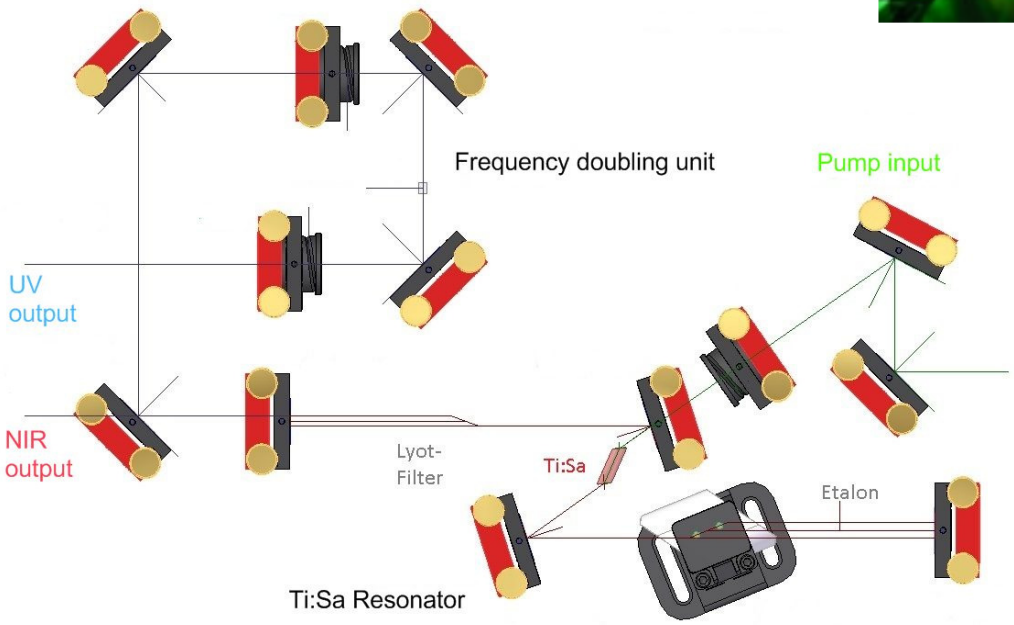


Back in our program with new design!

Tunable Ti:Sapphire laser system with internal doubler

- **For spectroscopy and multi-stage optical excitation**
- **Tuning range: 700 nm – 1000 nm and 350 nm – 500 nm**
- **Innovative mechanical design → reproducible mirror exchange**
- **Compact, high stable and maintenance-free design**

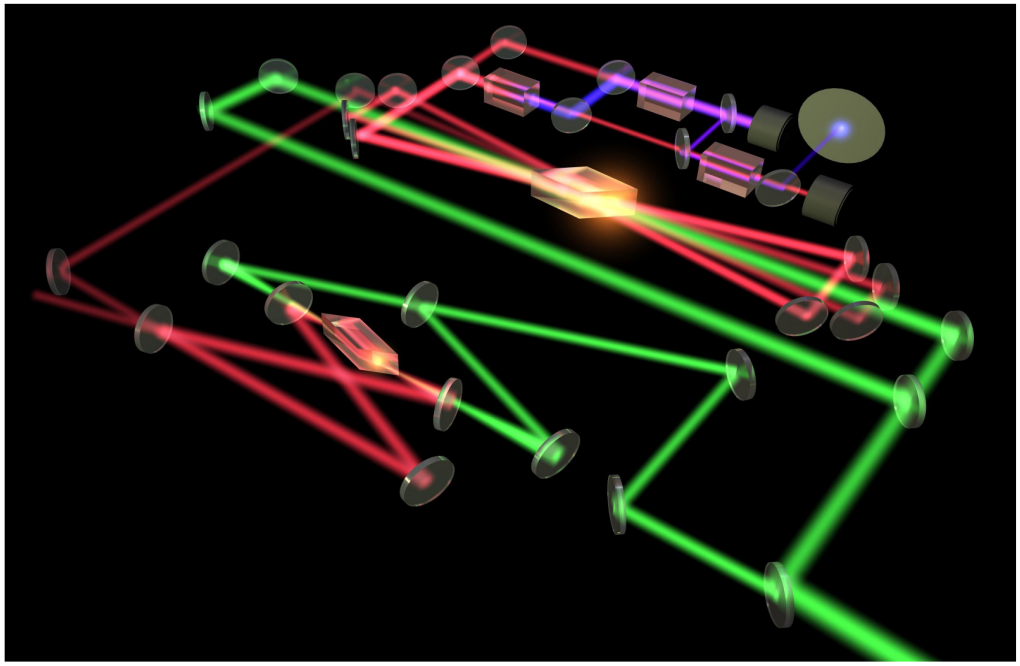




Repetition rate	1 – 15 kHz
Pulse energy	> 0,4 mJ
Pump energy	2 - 2.2 mJ
Wavelength	Fundamental 700nm – 1000nm
	2nd harmonic 350nm – 500nm
Pulse length	40 ns –70 ns
Beam quality (M^2)	< 1,3
Spectral band width	~ 5 GHz
Dimensions	570 mm x 400 mm x 300 mm,
Options	
Timing control with Pockels cell	
Computer controlled wavelength scan	

NarrowSeed
Narrow-band injection-seeded pulsed Ti:Sa oscillator-amplifier laser system

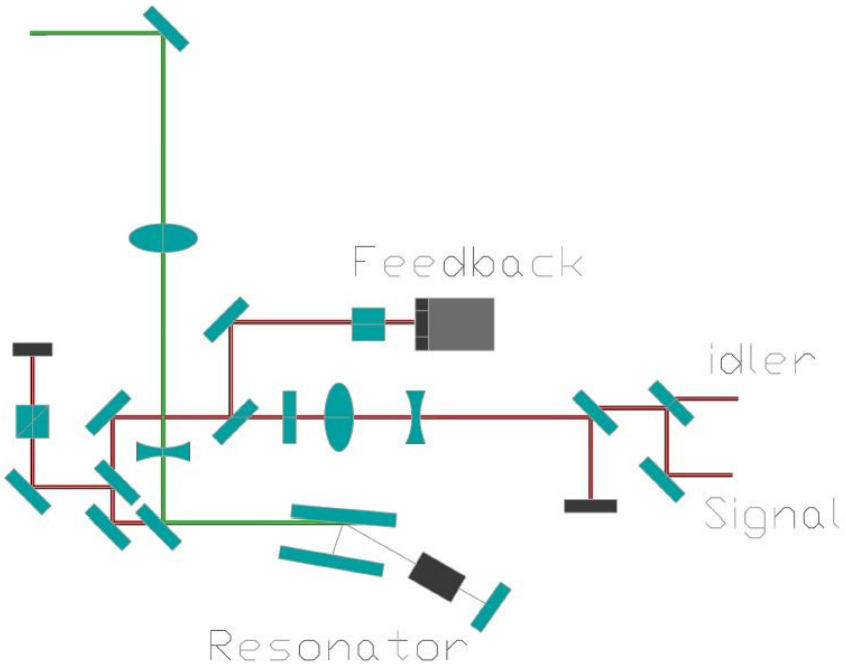
- **For high resolution spectroscopy**
- **Operation in the near infrared as well as in the ultraviolet and deep ultraviolet after frequency up-conversion**
- **Seeded with our NarrowDiode laser or a cw dye laser**
- **Stable ring cavity for the pulsed Ti:Sa oscillator**
- **Multipass Amplifier for pulse energies up to 55 mJ**



Repetition rate	10 Hz (100Hz as an option)
Pump energy	Up to 300 mJ
Conversion oscillator	5-10 %
Conversion amplifier	15-18 %
Wavelength	Fundamental 860nm - 760nm
	2nd harmonic 430nm – 380nm 50% efficiency
	3rd harmonic 287nm – 253nm 30% efficiency
	4rd harmonic 215nm – 190nm 10% efficiency
Pulse length	35 – 22 ns
Line width	<20 MHz
Options	
Second , third and fourth harmonic generation	

NarrowOPO
Single Mode Optical Parametric Oscillator

- **Wide tuning range (700 nm – 950 nm)**
- **Wavelength stabilisation and active controlling by Piezo and wave meter**
- **Mode stabilisation with etalon and CCD camera**
- **60 GHz single mode scan range**
- **Reduced noise dune to the shaped pump beam profile**
- **High repetition rate up to 100 Hz**
- **Low pump threshold (10mJ)**



Tuning range	700nm – 950 nm
Repetition rate	10 Hz - 100Hz
Pulse energy	1mJ
Pump threshold	8-12 mJ
Single mode scan range	60
Pulse length	4-5 ns (> 15 ns from pump laser)
Spectral band width	130 MHz at 4.0 ns pulse length
Noise	+/- 35 MHz
Dimensions	1040 mm x 507 mm x 325 mm,
Options:	
Frequency doubling	

Dye circulators

The features of our dye circulators are not only their silent operation and possible 24-hour performance, but they are also easy to handle and very reliable.
All systems are completely grounded.

All dye circulators can be equipped with different dye cells.

Dye circulators up to 50 Hz

RD 500 FC 20
Dye circulator RD 250 consisting of a centrifugal pump, 220 V (110 V for the U.S.), 250 ml dye reservoir, 0,2 µm filter, stainless steel filter housing, 20 mm dye flow cell flow rate approx. 2 l/min, completely grounded.
(≅ FL 402), option: water cooling.

RD 1000 FC 40
Dye circulator RD 1000, as described above, however with 1000 ml dye reservoir, 40 mm dye flow cell, flow rate approx. 4 l/min (≅ FL 444) option: water cooling.

The dye circulator systems RD 250 FC 20 and RD 1000 FC 40 correspond to FL 45.

Dye circulators up to 100 Hz

RD 1000 FC 20
Dye circulator RD 1000, with 20 mm dye flow cell, flow rate 4l/min**,** water cooling incl.

RD 2000 FC 40
Dye circulator RD 2000, with 40 mm dye flow cell, flow rate 6 l/min, water cooling incl.

Dye circulators up to 250 Hz

RD 2000 FC 20
Dye circulator RD 2000, with 20 mm dye flow cell, flow rate 7 l/min, water cooling incl.

RD 5000 FC 40
High power centrifugal pump RD 5000, 40 mm dye flow cell, flow rate 7 l/min, water cooling incl.

Dye circulators up to 5 kHz
on request!

Dye circulator with Bethune-cell

RDG 1000 FC Bethune
Geared pump, 12-V-motor, 1l dye reservoir, Bethune-cell unit, continuously adjustable DC-power supply (max.2 l/min, option: water cooling). A geared pump is necessary as the flow rate through the narrow capillary has to be adjustable.

When ordering, please mention the dye laser brand you are using!
(especially the LP *SCANMATE* needs different holders)

Dye circulator systems

for custom-made lasers, *Quanta Ray* lasers and *Quantel* Dye lasers

RD 500
consisting of: centrifugal pump with 220-V-motor,
250 ml dye reservoir, flow rate approx. 4 l/min, 0,2 µm Filter, stainless steel filter housing, completely grounded, option: water cooling.

RD 1000
as before, however with 1000 ml dye reservoir, flow rate 7 l/min, option: water cooling.

RD 2000
as before, however with 2000 ml dye reservoir, flow rate 15 l/min, Water cooling incl.

RD 5000
high performance centrifugal pump with 220 V motor, 5000 ml dye reservoir, flow rate 30 l/min, Water cooling incl.

Dye circulators with geared pumps

Beside our centrifugal pumps, there are applications (e.g. Bethune cells) where pressure is needed due to our narrow capillary tubes or where the flow rate has to be adjustable. Here geared pumps are indispensable. We paid attention to relatively low r.p.m. and high output of the pumps. so that the laser dyes are not influenced thermally or mechanically. Another advantage is the low noise level.

We also manufacture dye circulators according to customer specifications with a maximum flow rate of 100 l/min; a temperature stabilization is also possible.

RDG 250
Geared pump, 12 V-motor, 0 - 5 l flow rate/min,

RDG 1000/2000
as before, however with 1 l or 2l dye reservoir, option: water cooling

Continuously adjustable DC-power supply
Voltage 0-30 V; current 0-3 A (max. 5 A) with ground wiring for the RDG dye circulators

RDG 5000
380-Volt-motor, 5000 ml dye reservoir, flow rate approx.
12 l /min, max. pressure approx. 5 bar, incl. water cooling incl.

Quartz glass cells

Radiant Dyes is in the position to supply quartz glass cells for all dye lasers. The following cells are the most common ones for commercial and custom made dye circulator systems.
Other cells made of quartz glass or other optical materials and dye flow cell units not mentioned below can be supplied according to your specifications.

Dye cells for *Radiant Dyes*, *Lambda Physik* and *LAS* dye laser

RDDC 20
20 mm quartz glass cell (≅ FL 462)

RDDC 40
40 mm quartz glass cell (≅ FL 464)

Dye cells for *Quanta Ray* dye laser

RDQR 2
Quanta Ray No. 5-0023-1, 10 x 10 x16 mm

RDQR 3
Quanta Ray No. 5-0023-2, 10 x 16 x 17,5 mm

RDQR 4
Quanta Ray No. 5-0079, 10 x 10 x 17,5 mm, partly unpolished

RDQR 5
Quanta Ray No. 2-0210, 21 x 17 x 50,8 mm

RDQR 6
Quanta Ray No. 5-0084, 21 x 17 x 50,8 mm, partly unpolished

RDQR 7
Quanta Ray No. 5-0078, 10 x 16 x 17,5 mm, partly unpolished

Dye flow cell units

Our dye flow cell units for ***Radiant Dyes***, ***LAS*** and ***Lambda Physik*** dye lasers can be used for applications up to several kHz (depending on the pump energy of the pump laser and the flow rate of the dye circulator). It is also possible to use these units in custom made systems. We also offer parts for mounting and adjustment of the dye flow cell units for custom-made systems

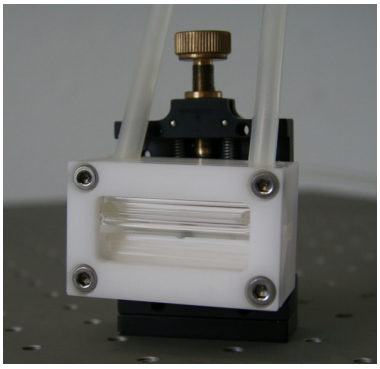
RDFC 20
20 mm dye flow cell unit
Mounted and adjusted dye flow cell unit consisting of flow body, frame and 20 mm quartz glass cell, for repetition rates up to 500 Hz, replaces RDVC 20

RDFC 40
40 mm dye flow cell unit
Mounted and adjusted dye flow cell unit consisting of flow body, frame and 40 mm quartz glass cell, for repetition rates up to 500 Hz, replaces RDVC 40

Modification of dye flow cell units With flow units made of chromium plated brass on new plastic cell units.

Amplifier dye cells with holder

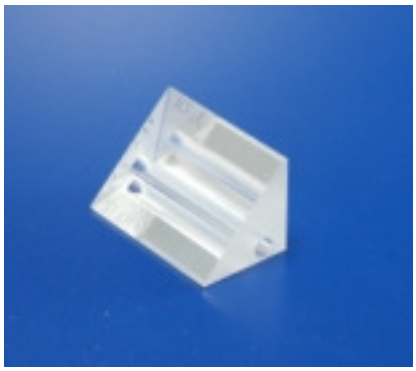
For improving the beam quality of the dye lasers we offer Bethune amplifier cells. These cells have a circular capillary tube through which the laser dye flows. The Bethune cell can be used for Excimer- and Nd:YAG pump lasers. The bore diameter of the 30 mm long capillary can vary between 3 and 6 mm, depending on the energy of the pump laser.



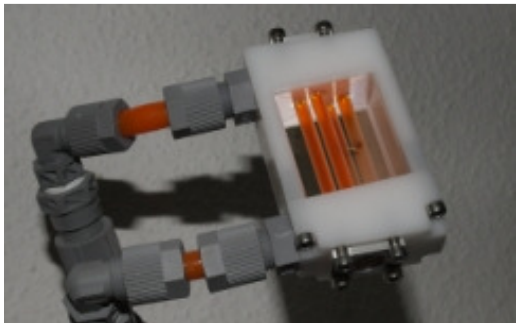
Bethune Cell new design

RDB Bethune-dye cell incl. holder
Fits into the *Lambda Physik, LAS* and *Radiant Dyes* main amplifier cell holder.

RDBZ BETHUNE
Bethune-cell with various bore diameters (3; 4 or 6 mm)



Prismatic Cell (Bethune Cell)



Bethune Cell filled with Dye for demonstration.
By right adjustment the capillary will be pumped homogeneously all around (old design)

Quartz glass cells for custom made dye laser systems

RD 5
5 mm cell (int. 5 x 10 mm, 45 mm high)

RD 10
10 mm cell (int. 10 x 10 mm, 45 mm high)

RDC 4
4 mm dye flow cell made of quartz glass

RDC 10
10 mm dye flow cell made of quartz glass

Dye filters for dye circulator systems

Our high quality filter cartridges are one-way filters made of sintered polypropylene with high retention rates of 0,2 µm. On request, filters of other materials such as teflon or different can be supplied.

Filters for *Radiant Dyes* and *LAS* dye circulator systems:

RDF 2
for RD 250 FC 20; RD 1000 FC 40

RDF 11
retention rate approx. 5 µm
for RD(N)2000 CW

RDF 10
for RD 1000 FC 20; RD 2000 FC 40

RDF 25 for RDG 250

RDF 12
for RD/RDG 5000

Filters for *Lambda Physik* dye circulators:

RDF 44
for FL 442-445 (≅ FL 415)

RDF 46
for FL 402-406 (≅ FL 414)

Filters for *Quanta Ray TSC 2* and for *Quantel DCP-02*:

RDF 60
retention rate approx. 5 µm

Filters for Spectra Physics and Coherent:

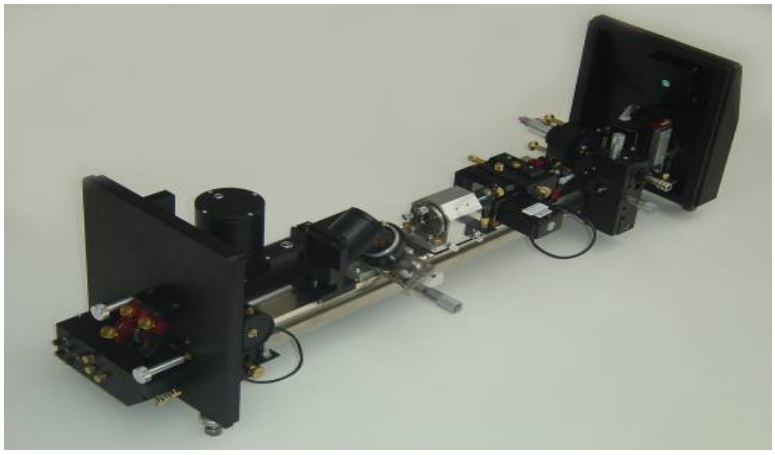
RDF 50 Dye Filter

Filters for custom made systems

RDF 70
filter capsule, to be installed into existing tube systems according to customer specifications

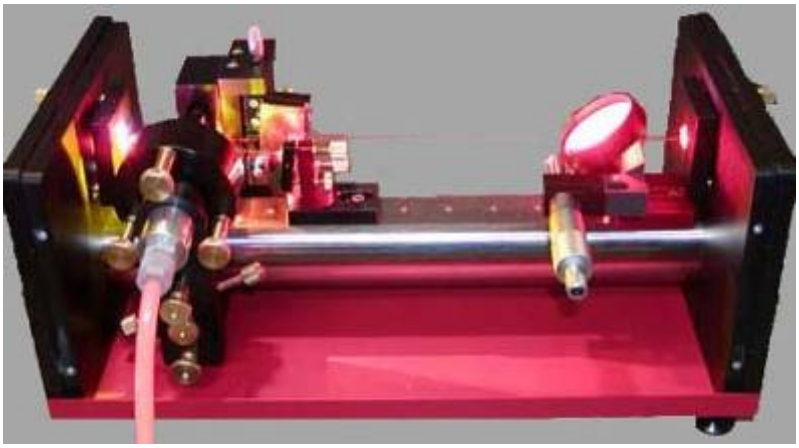
RDF 71
tube connections for RDF 70 (6 mm/8 mm/10 mm/12 mm)

Actively and passively stabilized dye or Ti:Sa Ring Lasers



- Passively stabilized cw dye or Ti:Sa ring laser (incl. thin etalon)
- Passively stabilized cw dye or Ti:Sa ring laser (incl. thick and thin etalon) with analog scan generator
- Actively stabilized cw dye or Ti:Sa ring laser (incl. thick and thin etalon), single-mode
- Actively stabilized cw dye or Ti:Sa ring laser (incl. thick and thin etalon), single-mode, digital scan generator

Standing wave Dye-Laser and Ti:Sa Laser



Accessories for cw laser

- Dye circulators/filters
- Dye nozzle
- Power Measuring Heads

Accessories for Coherent cw Dye laser

- Exchange unit for Coherent 699 (adjustable nozzle holder)
- Separate etalons

For further information please see our "Product list cw"

Tunable Narrowband Diode Lasers

NarrowDiode

NarrowDiode with Amplifier

Our new NarrowDiode laser is a small footprint and low-priced external cavity diode laser. The wavelength separation is realized by a low loss interference filter instead of the common diffraction grating.

Due to this new design, the laser is characterized by a high robustness against mechanical and thermal disturbances.Another advantage of our laser is the fixed output beam, which is independent from the wavelength.

Furthermore, the laser guarantees a narrow linewidth and large tunability at the same time. Wavelength stabilization by frequency modulation spectroscopy is also available. With the new amplifier output power up to 1,5W can be achieved.

Features:
• **Narrow linewidth (down to 20 kHz)**
• **High stable Radiant Dyes mechanics**
• **7 GHz mode-hop free tuning**
• **Anti-reflection coated diodes**
• **Design by Observatoire de Paris**

For further information please see our "NarrowDiode" datasheet

Raman Cells

Raman shifters are suitable for a frequency conversion of fixed or tuneable laser sources and for the suppression of amplified spontaneous emission (ASE) and are based on stimulated Raman-scattering (SRS). The most commonly used gases for this purpose are H2, D2, O2 and N2. SRS is a flexible, economic and easy to handle wavelength extension method.
In addition, tuneable radiation down to 150 nm can be generated if the pump (dye laser) radiation provides sufficient high energy (= 30 mJ) and good focusability. Starting in the visible or ultraviolet with tunable dye laser radiation, the complete spectral interval down to 150 nm is accessible **without gaps** by using different dyes.

The conversion efficiencies are more than 20% for the first Stokes and around 5% for the first anti-Stokes component. The efficiencies for higher order anti-Stokes components scale approximately with:

$$AS_{n+1} \sim ASn \times 0.3 \text{ for } n > 1$$

Continuous tuneable radiation from 190 nm (anti-Stokes generation) up to the far infrared region (Stokes generation) can be generated by using one Raman cell and one non-linear medium (e.g. H2).
Vacuum-flanges to connect the Raman cell to a vacuum vessel can be ordered from Radiant Dyes.

RD-RS RAMAN-Shifter Construction kit

The Set contains:
Cylindrical stainless steel gas pressure cell (approx. 1.20 m) with end flanges.
A positive quartz lens is used as entrance window, a quartz plate as output window.
The set contains also: A quartz collimating lens, one input (gas-in)
and one output (to vacuum pump) valve, one pressure gauge (0 - 40 bar),
one adjustable pressure relief valve adjusted to max. 40 bar and mounting equipment to fasten the cell upon an optical table.
All components are made of stainless steel.
All connections are standard Swagelok parts.
The Raman-cells are pressure tested by Radiant Dyes.
This and the automatic pressure relief valve minimises potential hazards.

The RAMAN-Cell must be installed in an explosion proofed housing.
We take on no responsibility for accidents because of improper use.

(Photo without housing)

Bandwidth measurement

Monitor etalons

The etalons are suitable for bandwidth measurements at lasers with bandwidths < 0,8 cm^{-1}. We offer these etalons as compact mounted units in stainless steel holders (projecting optics).

Solid etalon

FSR (free spectral area)	0,2 cm^{-1}
Finesse	12 - 15
Free aperture	∅ 17 mm
Spectral area:	500 - 700 nm Different wavelength areas on request
dimensions incl. Holders	∅ 32 mm Length 32mm

- **Solid etalon with imaging lenses**

This monitor etalon consists of the solid etalon mentioned above with a widening lens to a divergent illumination and a collecting lens to an image in the far field.

Widening lens	f= - 25 mm
Collecting lens	f= 1000 mm
Free aperture	∅ 15 mm
Dimensions incl. holders	∅ 32 mm Length 60mm

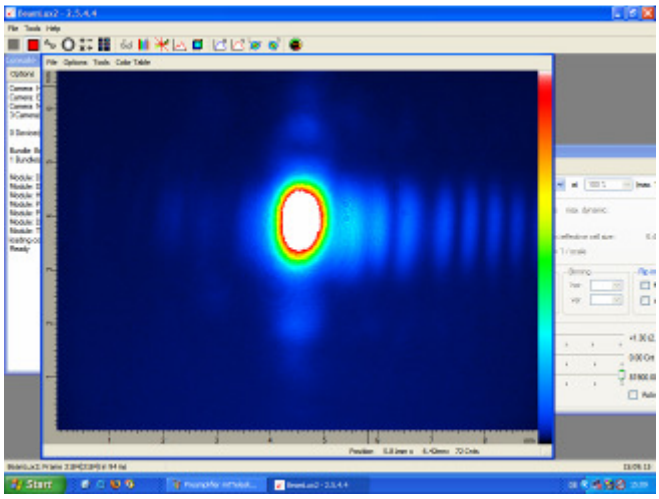
Bandwidth measurement RD-PB-02

The bandwidth measurement system RD-PB-02 represents an inexpensive alternative to commercial available bandwidth measurement devices. The system consists of a photo diode with „sample and hold“ unit (RD-PSH-01), a solid etalon with imaging lenses and a pinhole.
The RD-PSH-01 can easily be mounted at an y-t-recorder or an AD-transformation, for a simple and qualitative measurement of the spectral bandwidth of your laser.

- internal and external trigger
- adjustable trigger level
- adjustable delay
- adjusted time window
- **intensity measurement**
- **pulse duration measurement down to 500 ps possible**
- as trigger source usable, exit: 8-9 Volt
- service requirement power 12 V
- dimensions: 60 mm x 75 mm x 33 mm

Beamprofiler

Our professional Beamprofiler helps to adjust the Beamprofile of any Lasersystem to its optimum. It uses a 2D visualisation of the profile what enables the user to do an online-tuning of the laserbeam . Several options like the pointing stability or a progressive view are included.



- 2D Visualisation of the Beamprofile
- Pointing Stability
- Progression View
- 3D Display
- Best Fit (Gauss, Linie, Top Hat)

BeamProfiler Basic

- Beamprofiling of CW-Lasers, without integration of peripheral equipment
- Chipsize 8,97 x 6,71 mm^2 ,
- Pixelsize 6,45 x 6,45µm
- Dynamic: 12 Bit
- Wavelenght range: 320-1100nm

BeamProfiler Professional

- Beamprofiling of CW- and pulsed Lasers
- including triggering cable
- Integration of peripheral equipment possible
- Chipsize7,4 x 7,4 mm^2
- Pixelsize 7,4 x 7,4µm
- Dynamic: 12 Bit
- Wavelength range: 260-1000 nm

Energy detection

Photo diode with „Sample and Hold“
Universal usable and inexpensive photodiode with „Sample and Hold“ unit.
The **RD-PSH-01** is well suitable for an installation in existing laser systems because of its compact construction, e.g.. Nd:YAG-lasers for intensity measurements.

Internal and external triggering
adjustable trigger level
adjustable delay
prefixed time window
intensity measurements
pulse duration measurement up to 500 ps possible
as trigger source usable, exit: 8-9 Volt
power supply 12 V
dimensions: 60 mm x 75 mm x 33 mm

Band width detection
Together with our solid state etalon (page 9) the **RD-PSH-1** represents an inexpensive alternative to common bandwidth detection units. The **RD-PSH-1** is easily mounted to an y-t-writer or an AD-transformator, and gives you access to an easy and quantitative measurement of the spectral band-width of your laser.

Band width measurement set RD-PB-02
Consists of RD-PSH-1, solid state etalon with imaging lenses and a pinhole

Pyroelectric Energy Detectors

The detectors of the PEM series are suitable for measuring laser pulses in the range of some Mikrojoule up to several Joule and they cover the whole spectral range from the UV to the far IR. The PEMs do not need any external power source, because they work with the pyroelectric principle. At the output of each detector the voltage signal is measured off, with the amplitude proportional to the irradiated laser energy and determined by a calibration constant, which is ascertained for each PEM by the manufacturer. Each detector is equipped with standard BNC-plugs.

The **PEM 10** is especially designed for measuring small laser energies in the range of Micro- and Millijoule. The special coating of the active sensor diameter allows a broadband sensitivity of 0.19-10 mm. Because of short signal rise and drop times measurements with repetition rates up to 300 Hz are possible.
Higher repetition rates up to 500 Hz on request!

The PEM 25 has the same special broadband coating as the PEM 10, but with a larger active sensor diameter (∅25 mm).

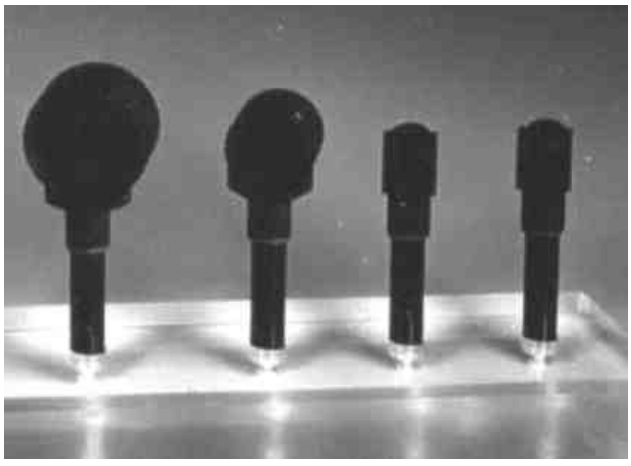
The outstanding feature of the PEM 48 is its high detector aperture of ∅48 mm for the easy pulse energy measurement when working with an excimer laser.
The **PEM 8 HP** is especially designed for lasers with low pulse energies and high energy densities at the same time (like dye and small Q-switched Nd:YAG-lasers). The damage threshold lies above 2 J/cm² with pulse widths of 5 ns at 1064 nm.

The **PEM 20 HP** is well suitable for high pulse energies (up to 6 J) and high energy densities at the same time (2 J/cm²), occurring with Q-switched Nd:YAG-lasers. Cooling fins at the housing allow capacities up to 60 Watt

	PEM 10	PEM 25	PEM 48	PEM 8 HP	PEM 20 HP	PEM 48 HP
Aperture Ø(mm)	10	25	48	8	20	48
Typ. sensitivity (V/J)	75	13	3	15	2	0.3
Max. repetition rate (Hz)	300	100	50	300	100	50
Min. detectable energy (µJ)	3	50	500	15	300	4000
Max. pulse energy (mJ)	60*	350*	1200*	100**	6000**	10000
Max. energy density (J/cm²)	0.07**	0.07**	0.07**	2**	2**	2**
Spectral range (mm)	0.19-10	0.19-10	0.19-10	0.2-3	0.36-3	0.2-3

* for pulse durations of 15 ns at 308 nm
** for pulse durations of 5 ns at 1064 nm

Pyroelectric energy detection for pulsed systems



	PEM 4	PEM 8	PEM 11	PEM 21
Active	4	8	11	21
Sensitivity at 1MΩ [V/J]	500-10³	50-100	100-300	50-80
Repetition rate [Hz]	500	500	500	500

Pyroelectric Energy Detector PEM 50K
with black ceramic absorption sheet for extremely high energies
The PEM 45K is a further developed PEM 50M, which is even more resistant against radiation through its ceramic absorption coating.

Energy measuring chip EMS 1.6

Technical data:

Detector sensitivity:	0.01 - 2000 V/J
Trigger level range:	0 .... 99,9%
Correction factor:	0 .... 99,9%

Type of measurement:

- Pulse energy with measuring range 20 mJ, 200 mJ, 2 J, 20 J and automatic range.
- Measuring of the mean with the choice of the pulse number (2 to 1000) and auto-reset.
- Pulse stability measuring „Peak to Peak“
- Measuring of the mean pulse stability

Statistical measurement for the choice of the pulse number: minimum, mean or maximum energy, standard deviation in %.
Preamplifier for Pyroelectric Energy detectors VST1N/VST2N
With these amplifiers it is possible to measure the smallest laser energies (some 100 nJ/ PEM 4). There is an extraordinary increase of the receiver as a result of the selected amplification and the omission of the capacity of the measurement head through the measurement wire. The bandwidth of the amplifier is especially designed for this application.
The amplifying is fixed by Radiant Dyes and selected by the customer with the order. The type **VST2N** has the possibility to switch the amplification (two amplification factors).
Through this modular type of construction the dynamic range of the measuring head is raised a lot. Also the losses of the sensitivity can be compensated by using a smaller resistance**.**

Specifications:

- Plugs BNC
- Amplifying 10-, 100-, or 1000-times
- Input resistance 1 MΩ
- Length of the supply 3 m
- Power unit (included) ± 15V

Neutral glass filter set RDNG 1-30
4 filters with transmission of approx. 1%, 5%, 10% and 30%. Maximum power density up to 100 MW/cm².

Pulse Energy and Power Measuring Instrument

LEM 2420

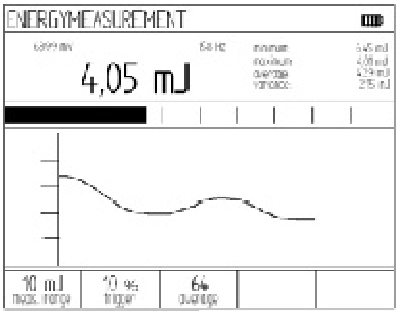
A touch panel and function keys make this device comfortable and easy to handle.

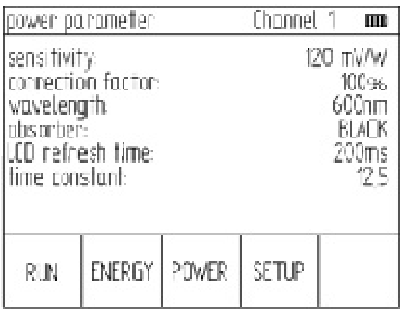
The preamplifiers integrated into the device and the choice of sensor sensitivity, allow to use a wide range of sensor heads .

The large graphic display offers space for a variety of display and analysis choices. The digital display can be used for determining the energy, frequency and average power. The analogue part with its bar graph display is useful e.g. for laser adjustments. Laser stability can be monitored using the data logger and statistics window.

The LEM2410 is equipped with a RS232 interface and with a TCP/IP network connector. These ports allows remote control and transferring of all measuring data to a PC. Additionally, a MMC/ SD-Card slot to save the data is integrated.

- For pyroelectric energy sensor heads and thermoelectric power sensor heads
- Digital display, analogue display, graphic data logger, statistics
- Wide dynamic range, especially for energy measuring
- input of correction factors e.g. for mirrors or beam splitters
- Power plug or rechargeable battery with integrated charging unit
- Adjustable trigger level
- External trigger input
- HiRes Graphic display with background illumination
- Touch panel
- RS 232 interface
- TCP/IP-Network-Connector
- MMC/SD-Card slot
- Software update possible
- compatible to all heads of PEM, HP and BB series





Laser dyes

Since 1982 we synthesise laser dyes in excellent quality. The extensive quality management of our experienced chemists ensures a constant quality on a high level.
Our offer consists of a broad range of laser dyes to cover all desired wavelengths. All special data are listed in the table of our dye poster, already mentioning the pumplaser which is used.
We offer solvents in laser quality, which are the optimum solvents for Coumarine, Rhodamine and Cyanine dyes because of their high polarity. The high viscosity of Ethylene glycol shows to be an advantage for the use of cw-dye lasers.

Ready-to-use dye solutions

As a special service we offer ready-to-use dye solutions, which are made individual on customer request.
But please note: we recommend to buy dye and solvent separately, because dyes have a better durability as a dry powder than a solution.

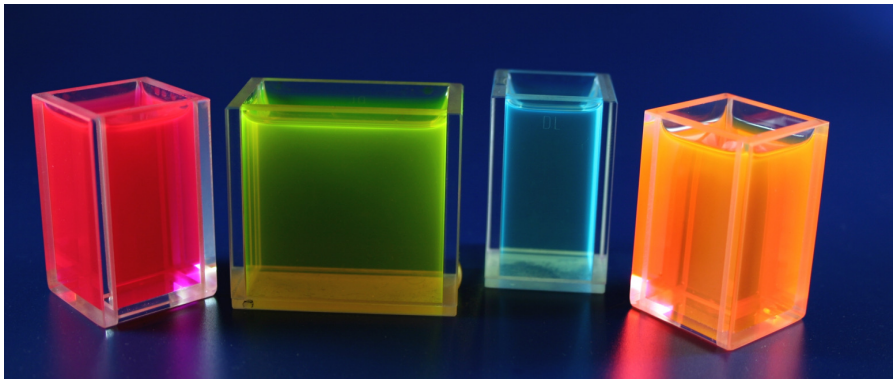
Important advice:

Take care, that your dye solution contains no solid particles before use. Often an ultrasonic bath helps to solve the dye.
At a change of dye to another wavelength the dye circulator must be flushed with clean solvent. Otherwise the efficiency can be reduced or destroyed by dye rests.

Please notice:

Handle all dyes and solvents with care! A lot of dyes (also as solution!) are known as hazardous or irritating. The solvents can carry the dyes through the skin into your body (e.g. Benzyl alcohol, DMSO, Dioxan, Methanol) Always wear rubber gloves, protecting masks, goggles and clothes when weighing and solving the dyes. In case of skin contact wash with plenty of water!

⇨ Please, make yourself clear, which solvents are combustible and take care to avoid any danger!



Laser Dyes

Art. No.	Dye name	EUR/g	Art.No.	Dye name	EUR/g
001	BM-Terphenyl (BMT)	81,-	048	Coumarin 102 (C 480)	41,-
002	PTP (P-Terphenyl)	12,-	049	Coumarin 106	69,-
003	TMQ	79,-	050	Coumarin 120 (C 440)	28,-
004	Butyl-PBD (BPBD)	20,-	051	Coumarin 151 (C 490)	69,-
005	PBD	20,-	052	Coumarin 152 (C 485)	39,-
006	PPO	15,-	053	Coumarin 152A (C 481)	45,-
007	PPF	24,-	054	Coumarin 153 (C 540A)	45,-
008	Exalite 351	208,-	055	Coumarin 307 (C 503)	33,-
009	Exalite 376	208,-	056	Coumarin 311	27,-
010	Exalite 377E	208,-	057	Coumarin 314 (C 504)	67,-
011	Exalite 384	208,-	058	Coumarin 334 (C 521)	80,-
012	Exalite 389	208,-	059	Coumarin 337 (C 523)	67,-
013	Exalite 392A	208,-	060	Coumarin 343	93,-
014	Exalite 392E	208,-	061	Coumarin 445	51,-
015	Exalite 398	208,-	062	Coumarin 466 (LD 466)	69,-
016	Exalite 400E	208,-	063	LD 473	67,-
017	Exalite 404	208,-	064	Coumarin 487	155,-
018	Exalite 411	208,-	065	LD 489	261,-
019	Exalite 416	208,-	066	Coumarin 498	80,-
020	Exalite 417	208,-	067	Coumarin 500	61,-
021	Exalite 428	208,-	068	Coumarin 510	93,-
022	RDC 360 Neu	112,-	069	Coumarin 545	85,-
023	Polyphenyl 2	150,-	070	Pyrromethene 546	208,-
024	BMQ	117,-	071	Pyrromethene 556	208,-
025	DMQ	104,-	072	Pyrromethene 567	208,-
026	TMI	128,-	073	Pyrromethene 580	208,-
027	QUI	122,-	074	Pyrromethene 597	208,-
028	BiBuQ (BBQ)	33,-	075	Pyrromethene 650	208,-
029	Quinolon 390 (LD 390)	85,-	076	DOCI	220,-
030	a-NPO	15,-	077	Uranin	16,-
031	PBBO	25,-	078	Fluorescein 27 (Fluor. 548)	39,-
032	DPS	47,-	079	Rhodamin 6G (Rh. 590)	10,-
033	BBO	33,-	080	Rhodamin 6G Tetrafluorab.	21,-
034	Stilben 1	110,-	081	Rhodamin 6G Perchlorat	21,-
035	Stilben 3 (Stilben 420)	23,-	082	Fluorol 7GA (Fluor. 555)	40,-
036	LD 423	67,-	083	Rhodamin 19 (Rh. 575)	32,-
037	Carbostyryl 3 (LD 425)	61,-	084	Rhodamin 101 (Rh. 640)	51,-
038	POPOP	25,-	085	Sulforhodamin 101	59,-
039	Umbelliferon 7	11,-	086	Rhodamin 110 (Rh. 560)	40,-
040	Umbelliferon 47 (C 4)	24,-	087	Rhodamin B (Rh. 610)	7,-
041	Bis-MSB	16,-	088	Rhodamin B Perchlorat	10,-
042	Coumarin 2 (C 450)	23,-	089	Sulforhodamin B (Kiton Red)	23,-
043	Coumarin 6 (C 540)	53,-	090	Malachitgrün	21,-
044	Coumarin 6H (LD 490)	64,-	091	DCM	48,-
045	Coumarin 7 (C 535)	59,-	092	DCM-Spezial	43,-
046	Coumarin 30 (C 515)	72,-	093	DODC-Jodid (DODCI)	48,-
047	Coumarin 47	16,-	094	LD 688	131,-

Art.No.	Dye name	EUR/g	Art.No.	Dye name	EUR/g
095	Kresylviolett	35,-	125	DQOCI	315,-
096	Pyridin 1 (LDS 698)	44,-	126	DDC-Jodid 4	201,-
097	Pyridin 2 (LDS 722)	44,-	127	Phenoxazon 9 (Phenox.660)	75,-
098	Nilblau Perchlorat	69,-	128	Sättigbarer Absorber 580	69,-
099	Oxazin 4 (LD 690 Perchl)	67,-	129	DTTC Jodid	40,-
100	DCI-2	101,-	130	IR 26	427,-
101	DTCI	111,-	131	IR 125	125,-
102	DQTCI	128,-	132	IR 140	149,-
103	Rhodamin 700 (LD 700)	99,-	133	IR 143	315,-
104	Oxazin 1 Perch. (Ox 725)	25,-	134	IR 144	259,-
105	Oxazin 170 (Ox 720)	69,-	135	9-Methylanthracen	16,-
106	Oxazin 750	51,-	136	DASPI	126,-
107	Styryl 6 (LDS 730)	81,-	137	PICI	101,-
108	Styryl 7 (LDS 750)	97,-	138	DMETCI	171,-
109	Styryl 8 (LDS 751)	91,-	139	DASBTI	171,-
110	LDS 765	333,-	140	HICI	85,-
111	Styryl 11 (LDS 798)	384,-	141	Pinacyanol	80,-
112	Styryl 9 (LDS 821)	89,-	142	DDBCI	160,-
113	Styryl 9M	89,-	143	Kryptocyanin	67,-
114	LDS 867	1090,-	144	DTDC Jodid	59,-
115	Stryryl 13 (LDS 925)	1350,-	145	NCI	229,-
116	Rhodamin 800 (LD 800)	131,-	146	DDI	284,-
117	Hexacyanin 2 (HIDC Jodid)	104,-	147	DTP	133,-
118	DOTC Jodid	104,-	148	HDITCP	96,-
119	DOTC Perchlorat	104,-	149	DNTTCI	261,-
120	HITC Perchlorat	67,-	150	DQTrCI	133,-
121	Hexacyanin 3 (HITC Jodid)	64,-	151	Q-Switch I	907,-
122	Methyl-DOTCI (DMOTCI)	193,-	152	Q-Switch 5	475,-
123	Hexadibenzocyanin 3	101,-	153	BBOT	16,-
124	Dibenzocyanin 45 (DDTTC)	556,-			

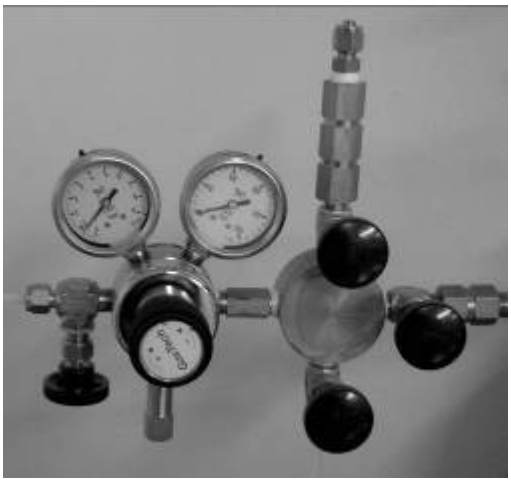
Discounts:
Purchase of 5 grams per dye: 15% purchase of 10 grams per dye: 25%
Higher discounts for larger quantities and special customer discounts on request!

Solvents in laser quality

- Ethylene glykol
- Propylene carbonate
- COT
- Ammonyx LO
- Benzyl alcohol
- DABCO

Accessories for Excimer laser

Spare parts for Excimer



Stainless Steel Gas Regulator with purging equipment
For corrosive F_2- and HCl- gasmixtures
Body: Stainless steel 1.4401
Seal: Viton/PVDF/Teflon
Safety valve: installed

Stainless Steel Gas Regulator
As above, however without purging equipment

Gas Regulator
Brass, chromium-plated, for purified gases

Vacuum pump
Air cooled vacuum pump with check valve, oil mist precipitator, input sieve filter, tube connection on the exhaust side.
Displacement: 6 m³/h
Base pressure: 2 mbar
Power required: 380 V / 50 Hz, 3 phases

Excimer laser-Thyratron

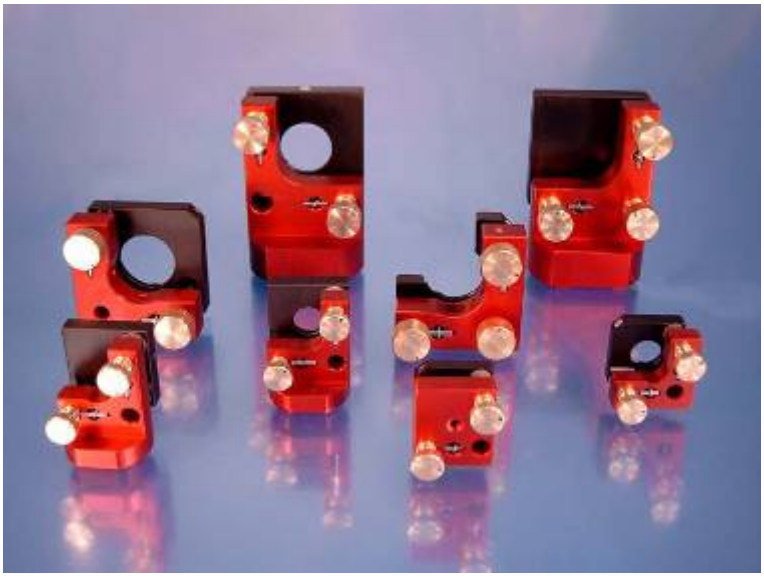
Magnetic clutch

(When ordering, please inform us about the type of Laser you are using and construction year)

Halogen-filter cartridge
(compatible to *Lambda Physik*)

mirror mounts
for 36mm and 38mm (1.5"). Ready-to-use solution

Opto-Mechanics



- New front-plates
- New high stable Mirror Mounts
- Thread screws with 0.15 mm thread pitch
- MNI-, MDI-, and MXI -Mirror Mounts
- Easy Midi
- *Lees* Compatible Mirror Mounts
- Vertical Drive Mirror Mounts
- Gimbal Mounts
- Platform Mounts
- Prism Turn Tables and Rotation Mounts
- Post & Post Holders
- Micrometer Screws
- Differential Micrometer Screws
- Linear Translation Stages
- High Precision Linear Bench
- Micro-Processor Control for Stepper Motors
- Mirror Mounts with Piezo Drive
- Flip Mirror Mounts with Screws and/or Motor
- Linear Translation Stages with Piezo Drive or Stepper Motor
- Optomechanics for vacuum and non-magnetic applications

For further information please see our

"Opto-Mechanics & Optics V5" brochure

Modification and Overhaul of existing Lasers and Accessories

Modification and Overhaul of all commercial available dye lasers, cw- and pulsed

for example:

- Basic adjustment
- Modification to improved bandwidth
- Installation of new gratings
- Improvement of the original mechanic components
- Modification for different pump optics

Modification and Overhaul of old Lasersystems and Laser Accessoires:

- Coherent and Spectra Physics dye lasers
- Coherent Dye circulators
- Coherent pump Geared pump
- Spectra Physics pump
- Dye flow cell units
- Lambda Physik FL 45 Dye-Selectors

On request we can offer you a qualified and cost-effective training on all existing dye laser (cw and pulsed)