

## CONTENTS

### CONTENTS

#### OVERVIEW

1.1	BRIEF DESCRIPTION	2
1.2	MODEL OVERVIEW	2

#### 2. DIRECTIVES/DECLARATION

#### 3. WARNINGS AND PRECAUTIONS

3.1	GENERAL INFORMATION ON THE LASER SYSTEM	3
3.2	LASER LABELING	3
3.3	PRECAUTIONS WHEN USING THE LASER SYSTEM	4
3.4	ELECTRICAL PRECAUTIONS	7
3.5	USE ACCORDING TO MANUFACTURER'S SPECIFICATIONS	7

#### 4. INSTALLATION

4.1	SCOPE OF DELIVERY	12
4.2	HARDWARE INSTALLATION PROCEDURE	12

#### 5. OPERATION

5.1	LOCAL OPERATION	15
5.2	REMOTE OPERATION	16
5.2.1	Remote operation via RS232	16
5.2.2	Remote operation via USB	17
5.2.3	Remote operation via LAN	17
5.2.4	Remote operation via FireWire	17
5.2.5	Remote operation via RS485	17

#### 6. TROUBLESHOOTING

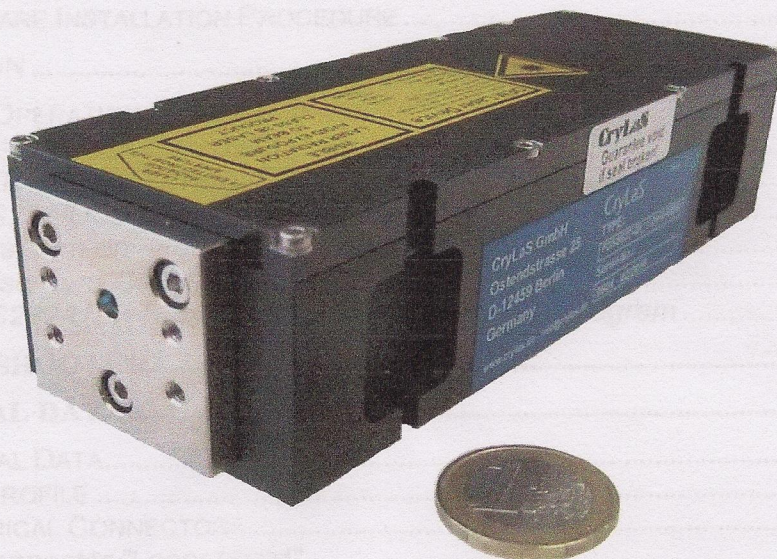
#### 7. TECHNICAL DATA

7.1	GENERAL DATA	31
7.2	BEAM PROFILE	33
7.3	ELECTRICAL CONNECTIONS	33
7.3.1	Connector "Laser Head"	33
7.3.2	Connector "INTERNAL BACK"	34
7.3.3	Connector "RS232"	35
7.3.4	Connector "USB"	36
7.3.5	Connector "Power"	36
7.4	ENVIRONMENTAL CONDITIONS	37
7.5	DIMENSION DRAWINGS	38

#### CUSTOMER SERVICE

## Technical Manual

The technical design of the laser system is strictly a proprietary nature. The passing on of any information, even informal, requires the explicit and detailed consent of CryLaS GmbH. Manufacturer reserves the right to modifications without advance notice.





## 7 Technical data

### 7.1 General Data

Model	DSS1064			
	- Q1	- Q2	- Q3	- Q4
Wavelength (nm)	1064			
Pulse Energy ( $\mu\text{J}$ )	> 10 @ 15kHz	> 20 @ 10kHz	> 50 @ 1kHz	> 90 @ 1 kHz
Max. Repetition Rate (kHz)	20	10	2.5	1
Pulse Width FWHM (ns)	$\leq 1.5$			
Polarization Ratio	>100:1, vertical			
Power Stability (% rms over 6 hours) <sup>4)</sup>	< $\pm 5$	< $\pm 3$	< $\pm 3$	< $\pm 3$
Beam Divergence (mrad)	< 3.0	< 3.0	< 4.0	< 4.0
Beam Diameter ( $\mu\text{m}$ )	600 $\pm$ 100	500 $\pm$ 100	600 $\pm$ 100	650 $\pm$ 100
Spatial Mode	TEM <sub>00</sub>			
Operating Voltage direct / with AC Adapter	12V DC / 90...240V			
Power Consumption Mean / Max (W)	10 / 40	13 / 40	15 / 70	22 / 80
Communication Interfaces	RS232, USB			
Warm-up Time (minutes)	< 5			
Laser Class	4 / IV	4 / IV	3B / IIIb	3B / IIIb

Table 9: DSS1064 Data

Model	FDSS532				
	- Q1	- Q2	- Q3	- Q4	- Q4_1.2k
Wavelength (nm)	532				
Pulse Energy ( $\mu\text{J}$ )	> 2 @15kHz	> 6 @10kHz	> 20 @1kHz	> 42 @1kHz	>42 @1.2kHz
Max. Repetition Rate (kHz)	20	10	2.5	1	1.2
Pulse Width FWHM (ns)	$\leq 1.3$				
Polarization Ratio	>100:1, vertical				
Power Stability (% rms over 6 hours) <sup>4)</sup>	< $\pm 5$	< $\pm 3$	< $\pm 3$	< $\pm 3$	< $\pm 3$
Beam Divergence (mrad)	< 3.5				
Beam Diameter ( $\mu\text{m}$ )	250 $\pm$ 50	260 $\pm$ 50	300 $\pm$ 80	400 $\pm$ 100	400 $\pm$ 100
Spatial Mode	TEM <sub>00</sub>				
Operating Voltage direct / with AC Adapter	12V DC / 90...265V				
Power Consumption Mean / Max (W)	15 / 40	17 / 40	20 / 70	40 / 70	40 / 70
Communication Interfaces	RS232, USB				
Warm-up Time (minutes)	< 5				
Laser Class	3B / IIIb				

Table 10: FDSS532 Data

<sup>4)</sup> after 5 min warm up, temperature variation  $\pm 3$  °C and < 3 °C/hour



Model	FTSS355			
	- Q1	- Q2	- Q3	- Q4
Wavelength (nm)	355			
Pulse Energy ( $\mu$ J)	> 0.3 @ 15kHz	> 3 @ 10kHz	> 15 @ 1kHz	> 42 @ 1kHz
Max. Repetition Rate (kHz)	20	10	2.5	1
Pulse Width FWHM (ns)	$\leq 1.1$			$\leq 1.4$
Polarization Ratio	>100:1, vertical			
Power Stability (% rms over 6 hours) <sup>4)</sup>	< $\pm 5$	< $\pm 3$	< $\pm 3$	< $\pm 3$
Beam Divergence (mrad)	< 3.0	< 3.5	< 4.0	< 4.0
Beam Diameter ( $\mu$ m)	190 $\pm$ 50	200 $\pm$ 50	200 $\pm$ 50	300 $\pm$ 80
Spatial Mode	TEM <sub>00</sub>			
Operating Voltage direct / with AC Adapter	12V DC / 90...265V			
Power Consumption Mean / Max (W)	15 / 40	17 / 40	20 / 70	40 / 70
Communication Interfaces	RS232, USB			
Warm-up Time (minutes)	< 5			
Laser Class	3B / IIIb			

Table 11: FTSS355 Data

Model	FQSS266			
	- Q1	- Q2	- Q3	- Q4
Wavelength (nm)	266			
Pulse Energy ( $\mu$ J)	> 0.3 @ 15kHz	> 0.6 @ 10kHz	> 6 @ 1kHz	> 12 @ 1kHz
Max. Repetition Rate (kHz)	20	10	2.5	1
Pulse Width FWHM (ns)	$\leq 1.0$			
Polarization Ratio	>100:1, vertical			
Power Stability (% rms over 6 hours) <sup>4)</sup>	< $\pm 5$	< $\pm 3$	< $\pm 3$	< $\pm 3$
Beam Divergence (mrad)	< 2.0	< 2.0	< 2.0	< 2.0
Beam Diameter ( $\mu$ m)	800 $\pm$ 200	800 $\pm$ 200	800 $\pm$ 200	800 $\pm$ 200
Spatial Mode	TEM <sub>00</sub> (horizontal) / sync <sup>2</sup> (vertical)			
Operating Voltage direct / with AC Adapter	12V DC / 90...265V			
Power Consumption Mean / Max (W)	15 / 40	17 / 40	20 / 70	40 / 70
Communication Interfaces	RS232, USB			
Warm-up Time (minutes)	< 5			
Laser Class	4 / IV			

Table 12: FQSS266 Data



## 7.2 Beam profile

A typical beam profile of the output beam from a 266nm laser at a distance of about 1m from the exit window is shown in the Figures below. The beam profile is composed of a near Gaussian central part and some outer fringes. The pictures demonstrate that the imaging method influences the subjective impression of the beam profile.

In the first picture a professional CCD camera with good linearity has been used to generate a discoloured picture.

In the second picture a piece of paper has been illuminated by the laser beam. The paper fluorescence has been photographed by a commercial digital camera. This picture is most similar to the subjective impression one gets, if looking at the beam fluorescence from a piece of paper. By non-linearity the weak parts of the beam profile are overemphasized.

In the right hand picture the beam has been attenuated by about 1:1000 and photographed with more sensitivity. In this case the fluorescence picture seems to be more linear and the subjective impression is more similar to the objective measures.

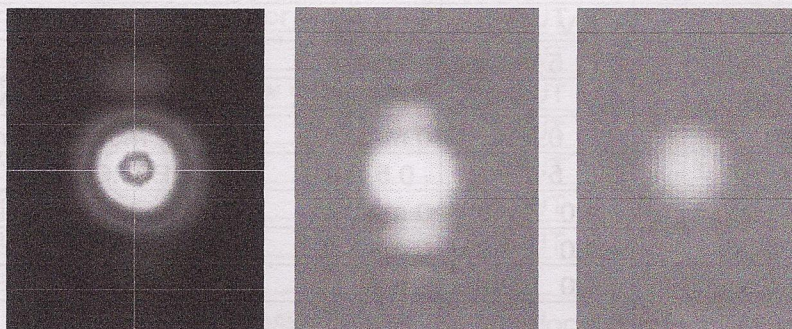


Figure 22: typical beam profile of 266nm-laser

## 7.3 Electrical Connectors

**Warning!** Do not connect any voltage to a pin marked as output.  
Do not connect any voltage below 0V or above 5V.



### 7.3.1 Connector "Laser Head"

The 26-pin high density sub-D laser-connector as shown in Figure 23 is used for connecting the laser head with the control unit by means of the "head cable".

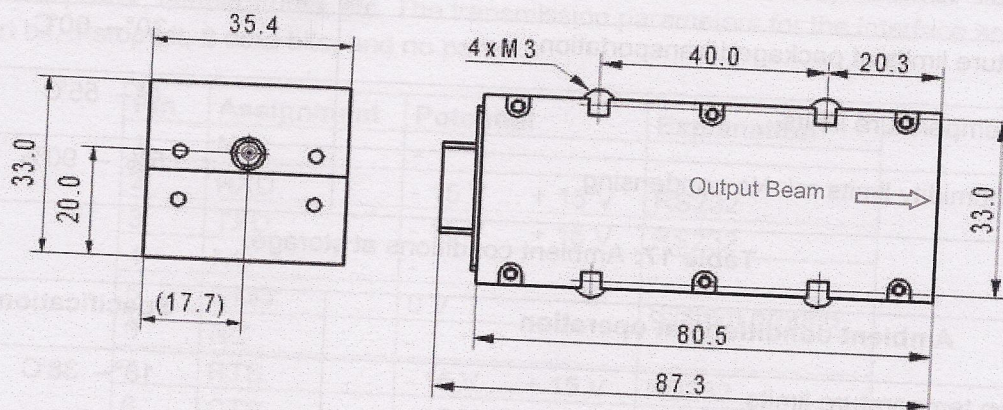
**Warning!** Do not connect any other device to the laser head than the original control unit.  
Do not use any other cable than the supplied cable.



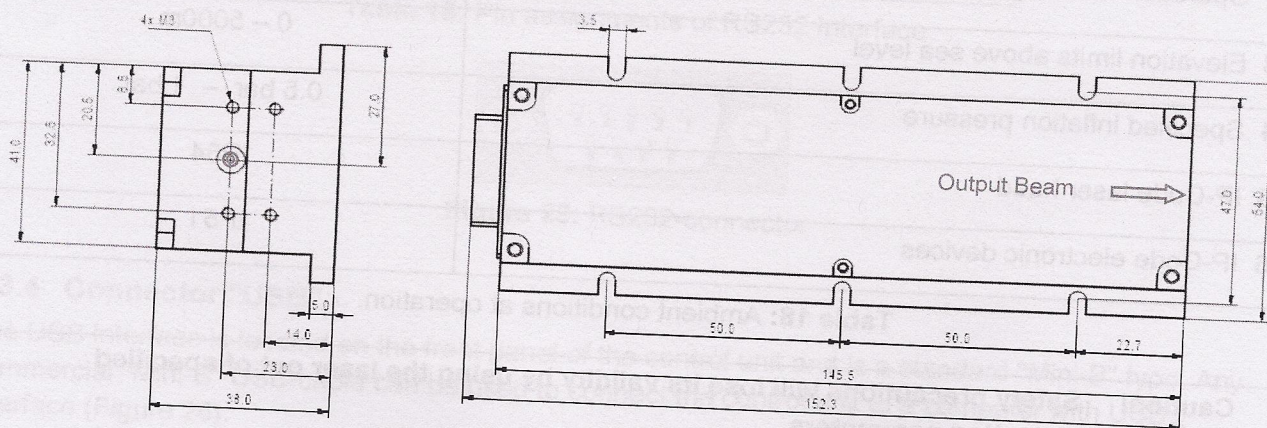


## 7.5 Dimension drawings

Dimension of model DSS1064 in millimeters



Dimensions of the old model FDSS532 in millimeters



Dimension of model FQSS266 , FTSS355 and FDSS532 in millimeters

