

# Pulsed Laser Power Supplies DPSP X000 Operating Manual



English Edition



## Pulsed Laser Power Supplies DPSP X000

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## Pulsed Laser Power Supplies DPSP X000

### Safety Instructions

The DPSP X000 is suitable for supplying laser diodes and laser diode stacks with a constant pulsed or CW current.

The device may only be connected to a single-phase ac mains supply.

The lines for the mains voltage must have a cross-section of 2.5 qmm, use sleeves.

The maximum permitted output power of 3000 W, or a maximum input power of 3600 W may not be exceeded.

The lines for the laser diodes must have a cross-section of >6 qmm, use ring terminals.

Do not use a crimping tool which does not fit. This increases transition resistance and may cause a cable fire.

In any case of doubtful crimping, additional soldering is required. Take care that the ring terminals are free of solder at the screws.

Use galvanized screws M6 x 8 and galvanized spring washers M6.

Take care of correct wiring of the laser diodes. Wrong polarity will damage the diodes.

Never disconnect the output lines for the laser diodes during operating.

This may generate a dangerous electric arc which can lead to skin burns or to fire.

The DPSP X000 is cooled by a fan. Air is drawn in at the rear side and is blown out at the front side near the terminals.

In an industrial environment with conductive dust, air filtering is required.

Put the device out of operation if it has visible damages or if it doesn't work properly.



## Pulsed Laser Power Supplies DPSP X000

### General informations

The DPSP X000 family consists of 36 different types of fully programmable high power pulsed current sources for laser diodes and laser diode stacks.

All devices offer a wide input voltage range with power factor correction, high accuracy, excellent pulse characteristics and stability, low temperature drift and an ideal current source characteristic with high output impedance.

No current overshoot or ringing arise when altering output current or load impedance abruptly.

There are two different types of basic models, DPSP X000-PUI and DPSP X000-PUE.

The PUI model has an integrated pulse unit whereas the PUE model has an external pulse unit.

The PUE model consists of two components, the basic unit and the external pulse unit.

The external pulse unit is a small and compact box which contains the pulse electronics. The external pulse unit is electrically connected with the basic unit via two lines for the diode current and a ribbon cable for controlling.

The PUI model is suited for applications where it can be mounted near the laser diodes or for applications where rise and fall time are not so important.

The PUE model is suited for applications where it is not possible to mount the power supply near the diodes or where short rise and fall time as well as a high pulse frequency is important.

In this case the basic unit can be mounted anywhere and the small external pulse unit can be mounted near the diodes.

All models are also available with an integrated programmable pulse control generator (PCG).

The advantage is that no external pulse control signal is required.

The PCG is crystal accurate and its pulse and pulse pause is programmable in the range of 1  $\mu$ s to 16.777 s in steps of 1  $\mu$ s.

All devices have an control port for analog and digital controlling and a RS 232 port for fully controlling and configuring.

Additionally there are plug in cards available, a card with a parallel port, a card with a CAN port, and a card with a CAN port and an expansion port for switching DPSP X000 devices in parallel for higher output currents.

Control signals and measurement readings are processed by a microcontroller, which also manages the interfaces.

The DPSP X000 is extremely compact and space-saving.

All heat producing components are integrated in an extensive aluminium cooler which ensures an efficient removal of the thermal dissipation losses.

The DPSP X000 can be cooled by the internal fan or by an external water cooler.

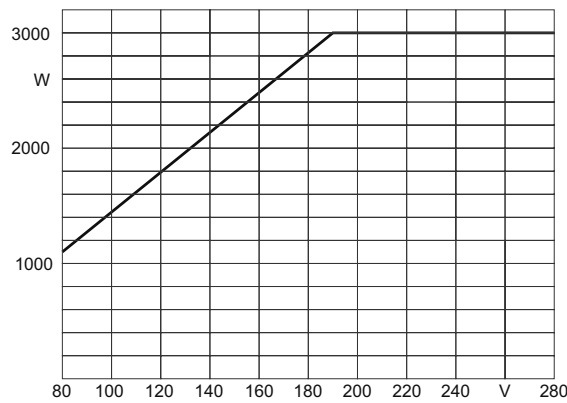
### Available power

The maximum available power depends on the mains voltage.

With a 230 V single-phase mains supply the maximum available power is 3000 W, with a 120 V single-phase mains supply (USA) it is 1800 W and with a 120 V three-phase mains supply (208 V, operating between two phases) (USA) the maximum available power is 3000 W.

Fig. 6 shows the relation between the mains voltage and the maximum available output power.

Fig. 6



### Operating modes

Five operating modes are possible:

- Operating via the Control Port
- Operating via the RS 232 Port
- Operating via the CAN Port (plug in card required)
- Operating via the Parallel Port (plug in card required)
- Operating for configuring device parameters (via the RS 232 Port)

### Configuration of device parameters

The following parameters of the DPSP X000 can be configured and stored in the nonvolatile memory of the DPSP X000 with the configuration software which is included in the extent of supply:

#### RS 232 Time Out

#### Current Limit

Value for the maximum permitted output current.

The value is only effective for the operating via the Control Port. For operating via the RS 232 Port, the Parallel Port or the CAN Port, a separate Current Limit Value has to be defined.

#### Current Set Point

Value for an initial output current.

The value is only effective for the operating via the Control Port. For operating via the RS 232 Port, the Parallel Port or the CAN Port, a separate Current Set Point value has to be defined.

### Current Set Point Stand By

Value for a Stand By output current

The value is only effective for the operating via the Parallel Port. For operating via the RS 232 Port or the CAN Port, a separate Current Set Point Stand By value has to be defined.

### Voltage Supervision Value

Value to supervise the output voltage.

If the output voltage of the DPSP X000 exceeds the voltage supervision value, it will be indicated at the Control Port and at the Parallel Port.

The value is only effective for operating via the Control Port or the Parallel Port. For operating via the RS 232 Port or the CAN Port, a separate voltage supervision value has to be defined.

The voltage supervision is useful for detecting problems at the lines to the laser diodes like bad contacts, loose screws or for detecting a defective diode or diode stack.

The voltage supervision value does not affect the output voltage of the DPSP X000.

### Dynamic performance

The DPSP X000 is a high-precision pulsed and CW laser diode driver utilizing MPC's special power switch technology.

This technology has a lot of advantages and is particularly suited for driving laser diodes.

It offers high accuracy and current stability, an excellent dynamic performance, a high output impedance and low electromagnetic interference.

No current overshoot or ringing arise when altering output current or load impedance abruptly.

Overshooting and ringing is very dangerous for laser diodes and it is the most dreaded thing in operating expensive laser diodes.

Fig. 1 shows the step response of a conventional laser driver at a current set point step of 0 ... 100 %. There is excessive overcurrent and ringing which may damage the laser diodes.

Fig. 2 shows the step response of a DPSP X000 at a current set point step of 0 ... 100 %, there is no overshoot or ringing, the characteristic is nearly perfect.

Fig. 1

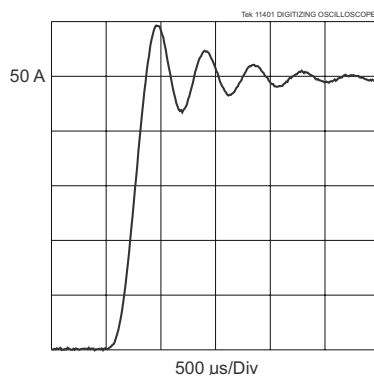
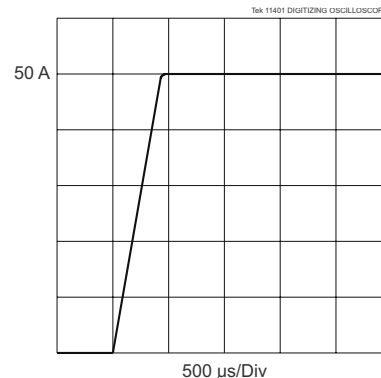


Fig. 2



A further major property is the dynamic output impedance which has significant effects to the diode current if load impedance alters abruptly.

For example if there is a loose contact at the output lines and the output is open circuit, the drivers output voltage will increase to its maximum value because of its characteristic to inject current. If the contact will be closed and you have a conventional laser driver with low dynamic output impedance, excessive overcurrent will damage the laser diodes.

The same happens, if you have stacked diodes and one of its emitters will getting short circuit. The load impedance will alter abruptly at this moment and excessive overcurrent will damage the complete stack.

Different from a conventional laser driver, the DPSP X000 responds in this case absolutely reliable and no overcurrent occurs.

Fig. 3 shows the response of a conventional laser diode driver at a nominal output current of 50 A, if load impedance is changed abruptly to lower values.

Fig. 4 shows the response of the DPSP X000 at the same conditions, the diode current keeps constant.

Fig. 3

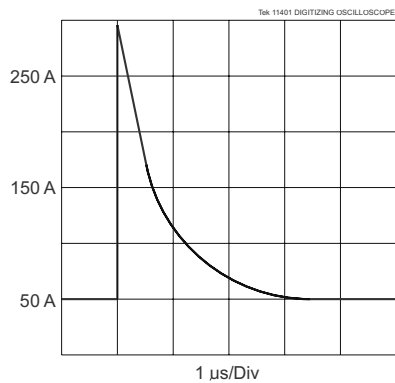
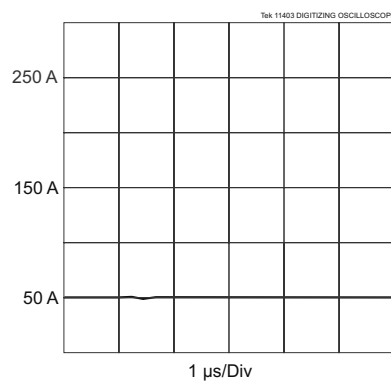


Fig. 4

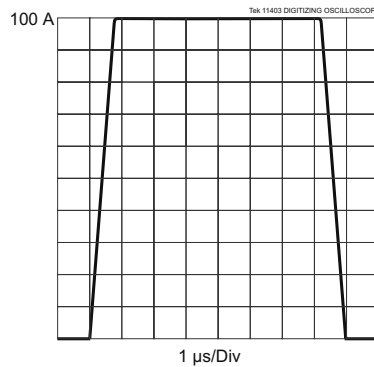


### Pulsing

The DPSP X000 allows pulsing with pulse lengths of approx. 500 ns to CW. Rise and fall time depend on the inductance and the length of the output lines to the diodes. The shorter the lines, the shorter rise and fall time.

Fig. 5 shows a 100 A / 3000 W pulse of a DPSP 3000-100 with external pulse unit into a diode stack.

Fig. 5



### Pulse frequency

The maximum pulse frequency of the DPSP X000 depends on the diode current, the inductance and the length of the output lines to the diodes. The lower the current and the shorter the lines, the higher the possible pulse frequency. The maximum allowed pulse frequency is 20 KHz. Higher frequencies up to 50 KHz can be run in a burst mode, provided that an average of 20 KHz is not exceeded.

### Overload protection

The DPSP X000 is protected against too high pulse frequencies, against no load or too long output lines and against thermal overload. In any case the DPSP X000 is switched off and remains in an off-state.





## Pulsed Laser Power Supplies DPSP X000

### Model Overview

Models with internal pulse unit and without programmable pulse control generator (PCG)

Model	Part Number	Output Power max	Diode Current	Diode Voltage max
DPSP 1000-050-PUI	10100651	1000 W	0 - 50 A	20 V
DPSP 1000-070-PUI	10100652	1000 W	0 - 70 A	14.3 V
DPSP 1000-100-PUI	10100654	1000 W	0 - 100 A	10 V
DPSP 2000-050-PUI	10100661	2000 W	0 - 50 A	40 V
DPSP 2000-070-PUI	10100662	2000 W	0 - 70 A	28.6 V
DPSP 2000-100-PUI	10100664	2000 W	0 - 100 A	20 V
DPSP 3000-050-PUI	10100671	3000 W	0 - 50 A	60 V
DPSP 3000-070-PUI	10100672	3000 W	0 - 70 A	42.9 V
DPSP 3000-100-PUI	10100674	3000 W	0 - 100 A	30 V

Models with external pulse unit and without programmable pulse control generator (PCG)

Model	Part Number	Output Power max	Diode Current	Diode Voltage max
DPSP 1000-050-PUE	10100681	1000 W	0 - 50 A	20 V
DPSP 1000-070-PUE	10100682	1000 W	0 - 70 A	14.3 V
DPSP 1000-100-PUE	10100684	1000 W	0 - 100 A	10 V
DPSP 2000-050-PUE	10100691	2000 W	0 - 50 A	40 V
DPSP 2000-070-PUE	10100692	2000 W	0 - 70 A	28.6 V
DPSP 2000-100-PUE	10100694	2000 W	0 - 100 A	20 V
DPSP 3000-050-PUE	10100701	3000 W	0 - 50 A	60 V
DPSP 3000-070-PUE	10100702	3000 W	0 - 70 A	42.9 V
DPSP 3000-100-PUE	10100704	3000 W	0 - 100 A	30 V



## Pulsed Laser Power Supplies DPSP X000

### Model Overview

Models with internal pulse unit and with programmable pulse control generator (PCG)

Model	Part Number	Output Power max	Diode Current	Diode Voltage max
DPSP 1000-050-PUI-PCG	10100851	1000 W	0 - 50 A	20 V
DPSP 1000-070-PUI-PCG	10100852	1000 W	0 - 70 A	14.3 V
DPSP 1000-100-PUI-PCG	10100854	1000 W	0 - 100 A	10 V
DPSP 2000-050-PUI-PCG	10100861	2000 W	0 - 50 A	40 V
DPSP 2000-070-PUI-PCG	10100862	2000 W	0 - 70 A	28.6 V
DPSP 2000-100-PUI-PCG	10100864	2000 W	0 - 100 A	20 V
DPSP 3000-050-PUI-PCG	10100871	3000 W	0 - 50 A	60 V
DPSP 3000-070-PUI-PCG	10100872	3000 W	0 - 70 A	42.9 V
DPSP 3000-100-PUI-PCG	10100874	3000 W	0 - 100 A	30 V

Models with external pulse unit and with programmable pulse control generator (PCG)

Model	Part Number	Output Power max	Diode Current	Diode Voltage max
DPSP 1000-050-PUE-PCG	10100881	1000 W	0 - 50 A	20 V
DPSP 1000-070-PUE-PCG	10100882	1000 W	0 - 70 A	14.3 V
DPSP 1000-100-PUE-PCG	10100884	1000 W	0 - 100 A	10 V
DPSP 2000-050-PUE-PCG	10100891	2000 W	0 - 50 A	40 V
DPSP 2000-070-PUE-PCG	10100892	2000 W	0 - 70 A	28.6 V
DPSP 2000-100-PUE-PCG	10100894	2000 W	0 - 100 A	20 V
DPSP 3000-050-PUE-PCG	10100901	3000 W	0 - 50 A	60 V
DPSP 3000-070-PUE-PCG	10100902	3000 W	0 - 70 A	42.9 V
DPSP 3000-100-PUE-PCG	10100904	3000 W	0 - 100 A	30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-050-PUI, DPSP 1000-050-PUE  
DPSP 1000-050-PUI-PCG, DPSP 1000-050-PUE-PCG

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	1400 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	16 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	1000 W	2-pole internal thread M6
Diode current	0 ... 50 A	
Diode voltage	0 ... 20 V max	
Efficiency	80 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.1 A / µs	depends on diode voltage
Ripple current	0.03 %pp 13 mApp	
Broadband noise	0.006 %eff 3 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 12.2 mA / digit	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 50.5 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 12.3 mA / digit	

#### Pulse

Pulse and pulse pause	0 µs ... CW	via Pulse Control Signal
Pulse and pulse pause	1 µs ... 16.777 s	via PCG
Rise and fall time	approx. 1 µs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 5 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-050-PUI, DPSP 1000-050-PUE  
DPSP 1000-050-PUI-PCG, DPSP 1000-050-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 5 A)	Control Port
Accuracy	± 0.1 %	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1V = 10 V)	Control Port
Accuracy	± 0.2 %	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1V = 100 W)	Control Port
Accuracy	± 1 %	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	± 0.05 %	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-050-PUI, DPSP 1000-050-PUE  
DPSP 1000-050-PUI-PCG, DPSP 1000-050-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-050-PUI, DPSP 1000-050-PUE  
DPSP 1000-050-PUI-PCG, DPSP 1000-050-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

#### DC Port

short-circuit proof via  
internal fuse

4-pole pin plug connector  
MC0.5/4-G2.5 Phoenix

#### Coaxial Port

Analog Input

0 ... 10 V

Coaxial plug  
Sub miniature SMB

#### Control Port

Analog Input

0 ... 10 V

Analog Outputs

0 ... 10 V

Digital Input

active-high

Level logical 0

0 V < 0.8 V

Level logical 1

> 2 V < 30 V

15-pole female plug  
connector  
according to DIN 41652  
and MIL-C-24308  
internal thread UNC 4-40

Digital outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage

30 V

Maximum permitted current

20 mA

Level logical 0

0 V < 0.4 V

Level logical 1

> 0.4 V < 30 V

#### Parallel Port (accessories)

Analog Input

0 ... 10 V

Analog Outputs

0 ... 10 V

Digital Input

active-high

Level logical 0

0 V < 0.8 V

Level logical 1

> 2 V < 30 V

Female plug connector  
50-pole SCSI miniature

Digital Outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage

30 V

Maximum permitted current

20 mA

Level logical 0

0 V < 0.4 V

Level logical 1

> 0.4 V < 30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-050-PUI, DPSP 1000-050-PUE  
DPSP 1000-050-PUI-PCG, DPSP 1000-050-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped-through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air gap discharge	± 15 kV	IEC1000-4-2
<b>CAN Port</b> (accessories)		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652
Suitable bus levels	12 and 24 V	and MIL-C-24308
Lead length maximum	40 m	Internal thread UNC 4-40
Connection cable impedance	120 Ohm	
<b>Temperature range</b>		
Ambient	0 ... 45 °C	
Storage	- 20 ... + 80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-070-PUI, DPSP 1000-070-PUE  
 DPSP 1000-070-PUI-PCG, DPSP 1000-070-PUE-PCG

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	1400 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	16 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	1000 W	2-pole internal thread M6
Diode current	0 ... 70 A	
Diode voltage	0 ... 14.3 V max	
Efficiency	78 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.14 A / μs	depends on diode voltage
Ripple current	0.03 %pp 22 mApp	
Broadband noise	0,006 %eff 4 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 17.09 mA / digit	

#### Pulse

Pulse and pulse pause	0 μs ... CW	via Pulse Control Signal via PCG
Pulse and pulse pause	1 μs ... 16.777 s	
Rise and fall time	approx. 1 μs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 70.7 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 17.26 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 7 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	





## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-070-PUI, DPSP 1000-070-PUE  
DPSP 1000-070-PUI-PCG, DPSP 1000-070-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 7 A)	Control Port
Accuracy	$\pm 0.1 \%$	Parallel Port
Output resistance	0 $\Omega$	
Diode Voltage SA-VOUT	0 ... 10 V (1 V = 10 V)	Control Port
Accuracy	$\pm 0.2 \%$	Parallel Port
Output resistance	0 $\Omega$	
Diode Power SA-POUT	0 ... 10 V (1 V = 100 W)	Control Port
Accuracy	$\pm 1 \%$	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	$\pm 0.05 \%$	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
- 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-070-PUI, DPSP 1000-070-PUE  
DPSP 1000-070-PUI-PCG, DPSP 1000-070-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-070-PUI, DPSP 1000-070-PUE  
DPSP 1000-070-PUI-PCG, DPSP 1000-070-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

**DC Port** short-circuit proof via internal fuse 4-pole pin plug connector MC0.5/4-G2.5 Phoenix

**Coaxial Port** Coaxial plug  
Analog Input 0 ... 10 V Sub-miniature SMB

**Control Port** 15-pole female plug connector according to DIN 41652 and MIL-C-24308  
Analog Input 0 ... 10 V Internal thread UNC 4-40  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0 0 V < 0.8 V  
Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector  
pull up resistors required  
Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0 0 V < 0.4 V  
Level logical 1 > 0.4 V < 30 V

**Parallel Port (accessories)** Female plug connector 50-pole SCSI miniature  
Analog Input 0 ... 10 V  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0 0 V < 0.8 V  
Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector  
pull up resistors required  
Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0 0 V < 0.4 V  
Level logical 1 > 0.4 V < 30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-070-PUI, DPSP 1000-070-PUE  
DPSP 1000-070-PUI-PCG, DPSP 1000-070-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 Internal thread UNC 4-40
Level logical 0	>+ 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air gap discharge	± 15 kV	IEC1000-4-2
<b>CAN Port (accessories)</b>		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652 and MIL-C-24308
Suitable bus levels	12 and 24 V	Internal thread UNC 4-40
Lead length maximum	40 m	
Connection cable impedance	120 Ohm	
<b>Temperature range</b>		
Ambient	0 ... 45 °C	
Storage	- 20 ... + 80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Specification

**DPSP 1000-100-PUI, DPSP 1000-100-PUE  
DPSP 1000-100-PUI-PCG, DPSP 1000-100-PUE-PCG**

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	1400 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	16 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	1000 W	2-pole internal thread M6
Diode current	0 ... 100 A	
Diode voltage	0 ... 10 V max	
Efficiency	76 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.2 A / µs	depends on diode voltage
Ripple current	0.03 %pp 30 mApp	
Broadband noise	0.006%eff 6 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 24.42 mA / digit	

#### Pulse

Pulse and pulse pause	0 µs ... CW	via Pulse Control Signal via PCG
Pulse and pulse pause	1 µs ... 16.777 s	
Rise and fall time	approx. 1 µs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 101 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 24.66 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 10 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-100-PUI, DPSP 1000-100-PUE  
DPSP 1000-100-PUI-PCG, DPSP 1000-100-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 10 A)	Control Port
Accuracy	± 0.1 %	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1V = 10 V)	Control Port
Accuracy	± 0.2 %	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1 V = 100 W)	Control Port
Accuracy	± 1 %	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	± 0.05 %	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-100-PUI, DPSP 1000-100-PUE  
DPSP 1000-100-PUI-PCG, DPSP 1000-100-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-100-PUI, DPSP 1000-100-PUE  
DPSP 1000-100-PUI-PCG, DPSP 1000-100-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

#### DC Port

short-circuit proof via  
internal fuse

4-pole pin plug connector  
MC0.5/4-G2.5 Phoenix

#### Coaxial Port

Analog Input

0 ... 10 V

Coaxial plug  
Sub miniature SMB

#### Control Port

Analog Input  
Analog Outputs  
Digital Input  
Level logical 0  
Level logical 1

0 ... 10 V  
0 ... 10 V  
active-high  
0 V < 0.8 V  
> 2 V < 30 V

15-pole female plug con-  
nector  
according to DIN 41652  
and MIL-C-24308  
internal thread UNC 4-40

Digital Outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage  
Maximum permitted current  
Level logical 0  
Level logical 1

30 V  
20 mA  
0 V < 0.4 V  
> 0.4 V < 30 V

#### Parallel Port (accessories)

Analog Input  
Analog Outputs  
Digital Input  
Level logical 0  
Level logical 1

0 ... 10 V  
0 ... 10 V  
active-high  
0 V < 0.8 V  
> 2 V < 30 V

Female plug connector  
50-pole SCSI miniature

Digital Outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage  
Maximum permitted current  
Level logical 0  
Level logical 1

30 V  
20 mA  
0 V < 0.4 V  
> 0.4 V < 30 V





## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 1000-100-PUI, DPSP 1000-100-PUE  
DPSP 1000-100-PUI-PCG, DPSP 1000-100-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped-through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC 1000-4-2
Air gap discharge	± 15 kV	IEC 1000-4-2
<b>CAN Port (accessories)</b>		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652 and MIL-C-24308
Suitable bus levels	12 and 24 V	internal thread UNC 4-40
Lead length maximum	40 m	
Connection cable impedance	120 Ohm	
<b>Temperature range</b>		
Ambient	0 ... 45 °C	
Storage	- 20 ... + 80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	Filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-050-PUI, DPSP 2000-050-PUE  
 DPSP 2000-050-PUI-PCG, DPSP 2000-050-PUE-PCG

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	2500 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	20 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	2000 W	2-pole internal thread M6
Diode current	0 ... 50 A	
Diode voltage	0 ... 40 V max	
Efficiency	86 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.1 A / μs	depends on diode voltage
Ripple current	0.03 %pp 13 mApp	
Broadband noise	0.006%eff 3 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 12.2 mA / digit	

#### Pulse

Pulse and pulse pause	0 μs ... CW	via Pulse Control Signal via PCG
Pulse and pulse pause	1 μs ... 16.777 s	
Rise and fall time	approx. 1 μs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 50.5 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 12.3 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 5 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-050-PUI, DPSP 2000-050-PUE  
DPSP 2000-050-PUI-PCG, DPSP 2000-050-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 5 A)	Control Port
Accuracy	$\pm 0.1 \%$	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1 V = 10 V)	Control Port
Accuracy	$\pm 0.2 \%$	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1V = 200 W)	Control Port
Accuracy	$\pm 1 \%$	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	$\pm 0.05 \%$	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-050-PUI, DPSP 2000-050-PUE  
DPSP 2000-050-PUI-PCG, DPSP 2000-050-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-050-PUI, DPSP 2000-050-PUE  
DPSP 2000-050-PUI-PCG, DPSP 2000-050-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

**DC Port** short-circuit proof via internal fuse 4-pole pin plug connector MC0.5/4-G2.5 Phoenix

**Coaxial Port** Coaxial plug  
Analog Input 0 ... 10 V Sub miniature SMB

**Control Port** 15-pole female plug connector according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40  
Analog Input 0 ... 10 V  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0 0 V < 0.8 V  
Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector pull up resistors required  
Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0 0 V < 0.4 V  
Level logical 1 > 0.4 V < 30 V

**Parallel Port (accessories)** Female plug connector 50-pole SCSI miniature  
Analog Input 0 ... 10 V  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0 0 V < 0.8 V  
Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector pull up resistors required  
Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0 0 V < 0.4 V  
Level logical 1 > 0.4 V < 30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-050-PUI, DPSP 2000-050-PUE  
DPSP 2000-050-PUI-PCG, DPSP 2000-050-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air gap discharge	± 15 kV	IEC1000-4-2
<b>CAN Port</b> (accessories)		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652
Suitable bus levels	12 and 24 V	and MIL-C-24308
Lead length maximum	40 m	Internal thread UNC 4-40
Connection cable impedance	120 Ohm	
<b>Temperature range</b>		
Ambient	0 ... 45 °C	
Storage	- 20 ... + 80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling type</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-070-PUI, DPSP 2000-070-PUE  
 DPSP 2000-070-PUI-PCG, DPSP 2000-070-PUE-PCG

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	2500 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	20 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	2000 W	2-pole, internal thread M6
Diode current	0 ... 70 A	
Diode voltage	0 ... 28.6 V max	
Efficiency	84 %	

#### Diode current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.14 A / μs	depends on diode voltage
Ripple current	0.03 %pp 22 mApp	
Broadband noise	0,006 %eff 4 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 17.09 mA / digit	

#### Pulse

Pulse and pulse pause	0 μs ... CW	via Pulse Control Signal via PCG
Pulse and pulse pause	1 μs ... 16.777 s	
Rise and fall time	approx. 1 μs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 70.7 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 17.26 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 7 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-070-PUI, DPSP 2000-070-PUE  
DPSP 2000-070-PUI-PCG, DPSP 2000-070-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 7 A)	Control Port
Accuracy	± 0.1 %	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1 V = 10 V)	Control Port
Accuracy	± 0.2 %	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1 V = 200 W)	Control Port
Accuracy	± 1 %	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	± 0.05 %	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		





## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-070-PUI, DPSP 2000-070-PUE  
DPSP 2000-070-PUI-PCG, DPSP 2000-070-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-070-PUI, DPSP 2000-070-PUE  
DPSP 2000-070-PUI-PCG, DPSP 2000-070-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

#### DC Port

short-circuit proof via  
internal fuse

4-pole pin plug connector  
MC0.5/4-G2.5 Phoenix

#### Coaxial Port

Analog Input

0 ... 10 V

Coaxial plug  
Sub miniature SMB

#### Control Port

Analog Input

0 ... 10 V

Analog Outputs

0 ... 10 V

Digital Input

active-high

Level logical 0

0 V < 0.8 V

Level logical 1

> 2 V < 30 V

15-pole female plug  
connector  
according to DIN 41652  
and MIL-C-24308  
Internal thread UNC 4-40

Digital Outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage

30 V

Maximum permitted current

20 mA

Level logical 0

0 V < 0.4 V

Level logical 1

> 0.4 V < 30 V

#### Parallel Port (accessories)

Analog Input

0 ... 10 V

Analog Outputs

0 ... 10 V

Digital Input

active-high

Level logical 0

0 V < 0.8 V

Level logical 1

> 2 V < 30 V

Female plug connector  
50-pole SCSI miniature

Digital Outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage

30 V

Maximum permitted current

20 mA

Level logical 0

0 V < 0.4 V

Level logical 1

> 0.4 V < 30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-070-PUI, DPSP 2000-070-PUE  
DPSP 2000-070-PUI-PCG, DPSP 2000-070-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped-through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air gap discharge	± 15 kV	IEC1000-4-2
<b>CAN Port</b> (accessories)		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652
Suitable bus levels	12 and 24 V	and MIL-C-24308
Lead length maximum	40 m	Internal thread UNC 4-40
Connection cable impedance	120 Ω	
<b>Temperature range</b>		
Ambient	0 ... 45 °C	
Storage	- 20 ... + 80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-100-PUI, DPSP 2000-100-PUE  
DPSP 2000-100-PUI-PCG, DPSP 2000-100-PUE-PCG

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	2500 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	20 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	2000 W	2-pole internal thread M6
Diode current	0 ... 100 A	
Diode voltage	0 ... 20 V max	
Efficiency	82 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.2 A / μs	depends on diode voltage
Ripple current	0.03 %pp 30 mApp	
Broadband noise	0.006 %eff 6 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 24.42 mA / digit	

#### Pulse

Pulse and pulse pause	0 μs ... CW	via Pulse Control Signal via PCG
Pulse and pulse pause	1 μs ... 16.777 s	
Rise and fall time	approx. 1 μs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 101 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 24.66 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 10 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-100-PUI, DPSP 2000-100-PUE  
DPSP 2000-100-PUI-PCG, DPSP 2000-100-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 10 A)	Control Port
Accuracy	$\pm 0.1 \%$	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1 V = 10 V)	Control Port
Accuracy	$\pm 0.2 \%$	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1 V = 200 W)	Control Port
Accuracy	$\pm 1 \%$	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	$\pm 0.05 \%$	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-100-PUI, DPSP 2000-100-PUE  
DPSP 2000-100-PUI-PCG, DPSP 2000-100-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-100-PUI, DPSP 2000-100-PUE  
 DPSP 2000-100-PUI-PCG, DPSP 2000-100-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

**DC Port** short-circuit proof via internal fuse 4-pole pin plug connector MC0.5/4-G2.5 Phoenix

**Coaxial Port** Coaxial plug  
 Analog Input 0 ... 10 V Sub miniature SMB

**Control Port** 15-pole female plug connector according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40  
 Analog Input 0 ... 10 V  
 Analog Outputs 0 ... 10 V  
 Digital Input active-high  
 Level logical 0 0 V < 0.8 V  
 Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector pull up resistors required  
 Maximum permitted voltage 30 V  
 Maximum permitted current 20 mA  
 Level logical 0 0 V < 0.4 V  
 Level logical 1 > 0.4 V < 30 V

**Parallel Port (accessories)** Female plug connector 50-pole SCSI miniature  
 Analog Input 0 ... 10 V  
 Analog Outputs 0 ... 10 V  
 Digital Input active-high  
 Level logical 0 0 V < 0.8 V  
 Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector pull up resistors required  
 Maximum permitted voltage 30 V  
 Maximum permitted current 20 mA  
 Level logical 0 0 V < 0.4 V  
 Level logical 1 > 0.4 V < 30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 2000-100-PUI, DPSP 2000-100-PUE  
DPSP 2000-100-PUI-PCG, DPSP 2000-100-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air gap discharge	± 15 kV	IEC1000-4-2
<b>CAN Port</b> (accessories)		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652
Suitable bus levels	12 and 24 V	and MIL-C-24308
Lead length maximum	40 m	Internal thread UNC 4-40
Connection cable impedance	120 Ohm	
<b>Temperature range</b>		
Ambien	0 ... 45 °C	
Storage	- 20 ... + 80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	





## Pulsed Laser Power Supplies DPSP X000

### Specification

**DPSP 3000-050-PUI, DPSP 3000-050-PUE  
DPSP 3000-050-PUI-PCG, DPSP 3000-050-PUE-PCG**

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	3600 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	20 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	3000 W	2-pole internal thread M6
Diode current	0 ... 50 A	
Diode voltage	0 ... 60 V max	
Efficiency	88 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.1 A / µs	depends on diode voltage
Ripple current	0.03 %pp 13 mApp	
Broadband noise	0.006 %eff 3 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 12.2 mA / digit	

#### Pulse

Pulse and pulse pause	0 µs ... CW	via Pulse Control Signal via PCG
Pulse and pulse pause	1 µs ... 16.777 s	
Rise and fall time	approx. 1 µs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 50.5 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 12.3 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 5 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-050-PUI, DPSP 3000-050-PUE  
 DPSP 3000-050-PUI-PCG, DPSP 3000-050-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 5 A)	Control Port
Accuracy	± 0.1 %	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1 V = 10 V)	Control Port
Accuracy	± 0.2 %	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1V = 300 W)	Control Port
Accuracy	± 1 %	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	± 0.05 %	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-050-PUI, DPSP 3000-050-PUE  
DPSP 3000-050-PUI-PCG, DPSP 3000-050-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-050-PUI, DPSP 3000-050-PUE  
DPSP 3000-050-PUI-PCG, DPSP 3000-050-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

**DC Port** short-circuit proof via internal fuse 4-pole pin plug connector MC0.5/4-G2.5 Phoenix

**Coaxial Port** Coaxial plug  
Analog Input 0 ... 10 V Sub miniature SMB

**Control Port** 15-pole female plug connector according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40  
Analog Input 0 ... 10 V  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0 0 V < 0.8 V  
Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector pull up resistors required  
Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0 0 V < 0.4 V  
Level logical 1 > 0.4 V < 30 V

**Parallel Port (accessories)** Female plug connector 50-pole SCSI miniature  
Analog Input 0 ... 10 V  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0 0 V < 0.8 V  
Level logical 1 > 2 V < 30 V

Digital Outputs active-low, open collector pull up resistors required  
Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0 0 V < 0.4 V  
Level logical 1 > 0.4 V < 30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-050-PUI, DPSP 3000-050-PUE  
DPSP 3000-050-PUI-PCG, DPSP 3000-050-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air gap discharge	± 15 kV	IEC1000-4-2
<b>CAN Port</b> (accessories)		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652
Suitable bus levels	12 and 24 V	and MIL-C-24308
Lead length maximum	40 m	internal thread UNC 4-40
Connection cable impedance	120 Ohm	
<b>Temperature range</b>		
Ambient	0 ... 45 °C	
Storage	- 20 ... +80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-070-PUI, DPSP 3000-070-PUE  
DPSP 3000-070-PUI-PCG, DPSP 3000-070-PUE-PCG

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip 1.5 sqmm - 4 sqmm
Frequency	47.5 ... 63 Hz	
Connected load	3600 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	20 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	

#### Power Output

Power max	3000 W	2-pole internal thread M6
Diode current	0 ... 70 A	
Diode voltage	0 ... 42.9 V max	
Efficiency	86 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.14 A / μs	depends on diode voltage
Ripple current	0.03 %pp 22 mApp	
Broadband noise	0.006 %eff 4 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 17.09 mA / digit	

#### Pulse

Pulse and pulse pause	0 μs ... CW	via Pulse Control Signal via PCG
Pulse and pulse pause	1 μs ... 16.777 s	
Rise and fall time	approx. 1 μs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 70.7 A	Parallel Port RS 232 Port CAN Port
Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 17.26 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 7 A)	Coaxial Port Control Port Parallel Port
CA-CSPA		
Input resistance	25 kOhm	



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-070-PUI, DPSP 3000-070-PUE  
DPSP 3000-070-PUI-PCG, DPSP 3000-070-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 7 A)	Control Port
Accuracy	± 0.1 %	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1 V = 10 V)	Control Port
Accuracy	± 0.2 %	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1 V = 300 W)	Control Port
Accuracy	± 1 %	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	± 0.05 %	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-070-PUI, DPSP 3000-070-PUE  
DPSP 3000-070-PUI-PCG, DPSP 3000-070-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port





## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-070-PUI, DPSP 3000-070-PUE  
DPSP 3000-070-PUI-PCG, DPSP 3000-070-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

#### DC Port

short-circuit proof via  
internal fuse

4-pole pin plug connector  
MC0.5/4-G2.5 Phoenix

#### Coaxial Port

Analog Input

0 ... 10 V

Coaxial plug  
Sub miniature SMB

#### Control Port

Analog Input

0 ... 10 V

Analog Outputs

0 ... 10 V

Digital Input

active-high

Level logical 0

0 V < 0.8 V

Level logical 1

> 2 V < 30 V

15-pole female plug  
connector  
according to DIN 41652  
and MIL-C-24308  
internal thread UNC 4-40

Digital Outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage

30 V

Maximum permitted current

20 mA

Level logical 0

0 V < 0.4 V

Level logical 1

> 0.4 V < 30 V

#### Parallel Port (accessories)

Analog Input

0 ... 10 V

Analog Outputs

0 ... 10 V

Digital Input

active-high

Level logical 0

0 V < 0.8 V

Level logical 1

> 2 V < 30 V

Female plug connector  
50-pole SCSI miniature

Digital Outputs

active-low, open collector  
pull up resistors required

Maximum permitted voltage

30 V

Maximum permitted current

20 mA

Level logical 0

0 V < 0.4 V

Level logical 1

> 0.4 V < 30 V



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-070-PUI, DPSP 3000-070-PUE  
DPSP 3000-070-PUI-PCG, DPSP 3000-070-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped-through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air gap discharge	± 15 kV	IEC1000-4-2
<b>CAN Port</b> (accessories)		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652
Suitable bus levels	12 and 24 V	and MIL-C-24308
Lead length maximum	40 m	internal thread UNC 4-40
Connection cable impedance	120 Ohm	
<b>Temperature range</b>		
Ambien	0 ... 45 °C	
Storage	- 20 ... +80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Specification

**DPSP 3000-100-PUI, DPSP 3000-100-PUE  
DPSP 3000-100-PUI-PCG, DPSP 3000-100-PUE-PCG**

#### Mains Connection

Voltage range	87 ... 276 V AC	3-pole terminal strip
Frequency	47.5 ... 63 Hz	1.5 sqmm - 4 sqmm
Connected load	3600 W	
Power factor	0.99	
Leakage current	1.6 mA	
Required fuse	20 A	External fuse required
Required wire cross-section	2 x 2.5 sqmm + PE	
Safety class	1	
Degree of pollution	1	

#### Power Output

Power max	3000 W	2-pole, internal thread M6
Diode current	0 ... 100 A	
Diode voltage	0 ... 30 V max	
Efficiency	84 %	

#### Diode Current

Accuracy	± 0.1 %	
Linearity	± 0.1 %	
Temperature stability	± 50 ppm / °C	
Rate of change	0.2 A / μs	depends on diode voltage
Ripple current	0.03 %pp 30 mApp	
Broadband noise	0.006 %eff 6 mAeff	
Mains voltage dependency	0.00005 % / V~	
Diode voltage dependency	0.0005 % / V	
Resolution analog	infinite	
Resolution digital	12 bit 24.42 mA / digit	

#### Pulse

Pulse and pulse pause	0 μs ... CW	via Pulse Control Signal
Pulse and pulse pause	1 μs ... 16.777 s	via PCG
Rise and fall time	approx. 1 μs	depends on diode voltage
Pulse frequency	20 KHz max (50 KHz Burst Mode)	

#### Current Limit

Range programmable	0 ... 101 % 0 ... 101 A	Parallel Port
Accuracy	± 0.1 %	RS 232 Port
Linearity	± 0.1 %	CAN Port
Temperature stability	± 100 ppm / °C	
Resolution digital	12 bit 24.66 mA / digit	

#### Analog Input

Current Set Point	0 ... 10 V (1 V = 10 A)	Coaxial Port
CA-CSPA		Control Port
Input resistance	25 kOhm	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-100-PUI, DPSP 3000-100-PUE  
DPSP 3000-100-PUI-PCG, DPSP 3000-100-PUE-PCG

#### Analog Outputs

Diode Current SA-COUT	0 ... 10 V (1 V = 10 A)	Control Port
Accuracy	$\pm 0.1 \%$	Parallel Port
Output resistance	0 Ohm	
Diode Voltage SA-VOUT	0 ... 10 V (1 V = 10 V)	Control Port
Accuracy	$\pm 0.2 \%$	Parallel Port
Output resistance	0 Ohm	
Diode Power SA-POUT	0 ... 10 V (1 V = 300 W)	Control Port
Accuracy	$\pm 1 \%$	Parallel Port
Output resistance	0 Ohm	
Reference Voltage VREF	+ 10 V	Control Port
Accuracy	$\pm 0.05 \%$	Parallel Port
Output resistance	0 Ohm	
+ 15 V AUX+	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
- 15 V AUX-	100 mA max	Control Port
Output resistance	10 Ohm	Parallel Port
+ 5 V	300 mA max	DC-Port
Output resistance	0.2 Ohm	
+ 15 V	300 mA max	DC-Port
Output resistance	0.2 Ohm	
-15 V	300 mA max	DC Port
Output resistance	0.2 Ohm	

#### Digital Inputs

Power Supply On	active-high	Control Port
CD-ON	TTL level up to + 30 V	Parallel Port
Current Set Point 12 Bit Disable	active-high	Parallel Port
CD-CSPDD	TTL level up to + 30 V	
Current Set Point Stand By	active-high	Parallel Port
12 Bit Enable	TTL level up to + 30 V	
CD-CSPSDE		



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-100-PUI, DPSP 3000-100-PUE  
DPSP 3000-100-PUI-PCG, DPSP 3000-100-PUE-PCG

#### Digital Inputs

Current Set Point 12 Bit CD-CSPD	active-high TTL level up to + 30 V	Parallel Port
Current Limit 12 Bit CD-CL	active-high TTL level up to + 30 V	Parallel Port
Pulse In CD-PUIN	active-high TTL level up to + 30 V	Control Port Parallel Port

#### Digital Outputs

Power Supply is Ready SD-PSR	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Out SD-PUOUT	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Pulse Unit Overload SD-POL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Current Fault SD-CFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Voltage Supervision Value Exceeded SD-VFAIL	active-low, open collector 30 V max, 20 mA max	Control Port Parallel Port
Power Supply is ON SD-PSON	active-low, open collector 30 V max, 20 mA max	Parallel Port
Power Limit Reached SD-PL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Current Limit Reached SD-CL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Temperature Limit Reached SD-TL	active-low, open collector 30 V max, 20 mA max	Parallel Port
Hardware Fault SD-HFAIL	active-low, open collector 30 V max, 20 mA max	Parallel Port



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-100-PUI, DPSP 3000-100-PUE  
DPSP 3000-100-PUI-PCG, DPSP 3000-100-PUE-PCG

#### Interfaces

Dielectric strength against PE 50 V DC

#### DC Port

short-circuit proof via  
internal fuse

4-pole pin plug connector  
MC0.5/4-G2.5 Phoenix

#### Coaxial Port

Analog Input 0 ... 10 V

Coaxial plug  
Sub miniature SMB

#### Control Port

Analog Input 0 ... 10 V  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0  $0\text{ V} < 0.8\text{ V}$   
Level logical 1  $> 2\text{ V} < 30\text{ V}$

15-pole female plug  
connector  
according to DIN 41652  
and MIL-C-24308  
internal thread UNC 4-40

Digital Outputs active-low, open collector  
pull up resistors required

Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0  $0\text{ V} < 0.4\text{ V}$   
Level logical 1  $> 0.4\text{ V} < 30\text{ V}$

#### Parallel Port (accessories)

Analog Input 0 ... 10 V  
Analog Outputs 0 ... 10 V  
Digital Input active-high  
Level logical 0  $0\text{ V} < 0.8\text{ V}$   
Level logical 1  $> 2\text{ V} < 30\text{ V}$

Female plug connector  
50-pole SCSI miniature

Digital Outputs active-low, open collector  
pull up resistors required

Maximum permitted voltage 30 V  
Maximum permitted current 20 mA  
Level logical 0  $0\text{ V} < 0.4\text{ V}$   
Level logical 1  $> 0.4\text{ V} < 30\text{ V}$



## Pulsed Laser Power Supplies DPSP X000

### Specification

DPSP 3000-100-PUI, DPSP 3000-100-PUE  
DPSP 3000-100-PUI-PCG, DPSP 3000-100-PUE-PCG

<b>RS 232 Port</b>	DEE CCITT V.28	9-pole female plug connector
Baud rate	2400 ... 115200 baud no hardware hand shake RTS/CTS looped-through by a jumper RTS configurable by a jumper logical 0 or 1	according to DIN 41652 and MIL-C-24308 internal thread UNC 4-40
Level logical 0	> + 3 V	
Level logical 1	< - 3 V	
Overvoltage protection		
Human body model	± 15 kV	
Contact discharge	± 8 kV	IEC1000-4-2
Air Gap Discharge	± 15 kV	IEC1000-4-2
<b>CAN Port (accessories)</b>		9-pole pin plug connector
Transmission rate	1 MBit/s	according to DIN 41652
Suitable bus levels	12 and 24 V	and MIL-C-24308
Lead length maximum	40 m	internal thread UNC 4-40
Connection cable impedance	120 Ω	
<b>Temperature range</b>		
Ambient	0 ... 45 °C	
Storage	- 20 ... + 80 °C	
<b>Bedewing</b>	not allowed	
<b>Protection class</b>	IP20	
<b>Cooling</b>		
Air cooling	filter required	
Water cooling (accessories)		
<b>Dimensions</b>	312 x 247 x 126 mm	
<b>Weight</b>	17 kg	
<b>Conformity</b>		
Safety	EN 61010	
EMI	EN 50081-1 EN 55014	
ESD air	EN 61000-4-2 8 KV	
Surge	EN 61000-4-5 3 KV	
Harmonic current at the mains	EN 61000-3-2 IEC 1000-3-2 VDE 0838	



## Pulsed Laser Power Supplies DPSP X000

### Signals and data at the interfaces

CA = Control Data Analog  
 CD = Control Data Digital  
 SA = Status Data Analog  
 SD = Status Data Digital  
 CF = Configuration Data

Other	Config. Data	Status Data	Control Data	Function	Name	Coaxial Port	Control Port	RS 232 Port	Parallel Port	CAN Port
			CA	Current Set Point Analog	CSPA	•	•		•	
			CD	Current Set Point 12 Bit	CSPD			•	•	•
			CD	Current Set Point Stand By 12 Bit	CSPSD			•		•
			CD	Current Limit 12 Bit	CLD			•	•	•
			CD	Voltage Supervision 10 Bit	VLD			•		•
			CD	Power Supply On	ON		•	•	•	•
			CD	Current Set Point 12 Bit Disable	CSPDD			•	•	•
			CD	Current Set Point Stand By 12 Bit Enable	CSPSDE			•	•	•
			CD	Pulse Control In	PCIN		•		•	
	SA			Output Current	COUT		•		•	
	SA			Output Voltage	VOUT		•		•	
	SA			Output Power	POUT		•		•	
		SD		Current Set Point Analog	CSPA			•		•
		SD		Current Set Point 12 Bit	CSPD			•		•
		SD		Current Limit 12 Bit	CLD			•		•
		SD		Voltage Supervision 10 Bit	VLD			•		•
		SD		Output Current	COUT			•		•
		SD		Output Voltage	VOUT			•		•
		SD		Output Power	POUT			•		•
		SD		Mains Voltage	MV			•		•
		SD		Mains Current	MC			•		•





## Pulsed Laser Power Supplies DPSP X000

### Signals and data at the interfaces

CA = Control Data Analog  
 CD = Control Data Digital  
 SA = Status Data Analog  
 SD = Status Data Digital  
 CF = Configuration Data

Other	Config. Data	Status Data	Control Data	Function	Name	Coaxial Port	Control Port	RS 232 Port	Parallel Port	CAN Port
		SD		PFC-Voltage	VPFC			•		•
		SD		Temperature	TMP			•		•
		SD		Operating Time	WH			•		•
		SD		Device Type	TYPE			•		•
		SD		Serial Number	SN			•		•
		SD		Power Supply is Ready	PSR	•	•	•	•	
		SD		Power Supply is On	PSON		•	•	•	
		SD		Power Limit Reached	PL			•	•	•
		SD		Current Limit Reached	CL			•	•	•
		SD		Current Fault	CFAIL	•	•	•	•	
		SD		Voltage Supervision Exceeded	VFAIL	•	•	•	•	
		SD		Temperature Limit Reached	TL			•	•	•
		SD		Temperature Warning Limit Reached	TW			•		•
		SD		Pulse Control Out	PCOUT	•				
		SD		Pulse Unit Overload	PUOL	•				
		SD		Hardware Fault	HFAIL			•	•	•
		SD		System Fault	SFAIL			•		
		SD		RS 232 Frame Fault	DFAIL			•		
		SD		RS 232 Time Out	TOUT			•		



## Pulsed Laser Power Supplies DPSP X000

### Signals and data at the interfaces

CA = Control Data Analog  
 CD = Control Data Digital  
 SA = Status Data Analog  
 SD = Status Data Digital  
 CF = Configuration Data

Other	Config. Data	Status Data	Control Data	Function	Name	Coaxial Port	Control Port	RS 232 Port	Parallel Port	CAN Port
	CF			Current Set Point 12 Bit	CSPD			•		
	CF			Current Set Point Stand By 12 Bit	CSPSD			•		
	CF			Current Limit 12 Bit	CLD			•		
	CF			Voltage Supervision 10 Bit	VLD			•		
	CF			Time Out RS 232	TOUT			•		
•				Interlock Input	ILIN	•			•	
•				Interlock Output	ILOUT	•			•	
•				Reference Voltage + 10 V	VREF	•				
•				Auxiliary Voltage +15 V 100 mA	AUX+	•			•	
•				Auxiliary Voltage -15 V 100 mA	AUX-	•			•	

### Interface description

DC Port



#### DC Port

4-pole female connector MC0.5/4-G2.5 Phoenix

At the DC Port there are three DC voltages available for supplying peripheral control devices or external fans.

Outputs			
Pin	Name	Function	
1	-15V	- 15 V	300 mA max
2	+15V	+ 15 V	300 mA max
3	GND	Ground	
4	+5V	+ 5 V	300 mA max

#### Coaxial Port

Coaxial male plug connector SMB

#### CA-CSPA

Control Analog - Current Set Point Analog

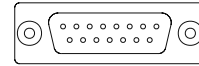
Analog input 0 ... 10.000 V for the Current Set Point

This input is switched in parallel with the CA-CSPA input at the Control Port.

Use this input instead of the CA-CSPA input of the Control Port if there problems in an environment with high electromagnetic interference.

### Interface description

Control Port



### Control Port

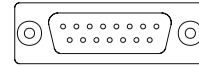
15-pole female plug connector according to DIN 41652 and MIL-C-24308, internal thread UNC 4-40.

CA = Control Data Analog  
 CD = Control Data Digital  
 SA = Status Data Analog  
 SD = Status Data Digital  
 CF = Configuration Data

Inputs		
Pin	Name	Function
10	CA-CSPA	Current Set Point Analog
2	CD-ON	Power Supply On
9	CD-PCIN	Pulse Control In
1	GND	Signal Ground
Outputs		
Pin	Name	Function
3	SA-COUT	Output Current Analog Value
11	SA-VOUT	Output Voltage Analog Value
4	SA-POUT	Output Power Analog Value
5	SD-PSR	Power Supply is ready
15	SD-PCOUT	Pulse Control Out
13	SD-CFAULT	Current Fault
6	SD-VSVE	Voltage Supervision Value Exceeded
8	SD-PUOL	Pulse Unit Overload
12	VREF	Reference Voltage +10 V
14	AUX+15V	Auxiliary Voltage +15 V
7	AUX-15V	Auxiliary Voltage -15 V
1	GND	Signal Ground

### Signal Description

Control Port



#### CA-CSPA

Control Analog - Current Set Point Analog

Analog input 0 ... 10.000 V for the Current Set Point

+10.000 V corresponds to the maximum current of the DPSP X000

Active in all operating modes

The Current Set Point Analog signal will be internally added to a Digital Current Set Point CD-CSPD value, optionally provided at the RS 232 Port, the Parallel Port or the CAN Port. The sum builds the effective current set point.

A CA-CSPA signal with negative sign acts subtracting.

#### CD-ON

Control Digital - Power Supply On

Digital input, active-high, TTL-level up to +30 V

Active in all operating modes

The DPSP X000 is switched on, output current flows, provided that the pulse control signal CD-PCIN is high.

The level of the output current is determined by the sum of the Current Set Point CA-CSPA at the analog input and the Current Set Point 12 Bit whose value CF-CSPD is stored in the configuration memory (Set Up) of the DPSP X000.

The current limit is determined by the value CF-CLD stored in the configuration memory (Set Up) of the DPSP X000.

#### CD-PCIN

Control Digital - Pulse Control In

Digital input, active-high, TTL-level up to +30 V

Active in all operating modes

For devices without pulse control generator (PCG) the input acts in the following way:

Low corresponds to pulse pause, High corresponds to pulse.

For devices with pulse control generator (PCG) the input acts in the following way:

If the PCG is not activated:

Low corresponds to pulse pause, High corresponds to pulse.

If the PCG is activated:

Low corresponds to pulse pause, High acts in the following way:

If the CD-PCIN signal goes High, the PCG starts synchronous with the leading edge of the CD-PCIN signal and puts out pulses and pulse pauses as long as the CD-PCIN signal is High.

If the CD-PCIN signal goes Low, the PCG is interrupted immediately and forces a pulse pause as long as the CD-PCIN signal is Low.

Independent of the operating mode (Control via Control Port, Parallel Port, RS 232 Port or CAN Port), the CD-PCIN signal must be High for pulsing.

#### SA-COUT

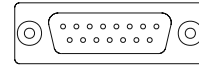
Status Analog - Current Out

Active in all operating modes

Analog output 0 ... +10.000 V, reflects the output current (diode current)

+10.000 V corresponds to the maximum output current of the DPSP X000.

Control Port



### SA-VOUT

Status Analog - Voltage Out

Active in all operating modes

Analog output 0 ... +10.000 V, reflects the output voltage (diode voltage)  
+10.000 V corresponds to 100 V output voltage.

### SA-POUT

Status Analog - Power Out

Active in all operating modes

Analog output 0 ... +10.000 V, reflects the output power (diode power)  
+10.000 V corresponds to the maximum output power of the DPSP X000.

### SD-PSR

Status Digital - Power Supply is Ready

Active in all operating modes

Digital output, active-low, open collector, 30 V max, 20 mA max.  
Low, if the DPSP X000 is ready for operating.

### SD-PCOUT

Status Digital - Pulse Control Out

Active in all operation modes

Digital TTL output, active-high

Reflects either the CD-PCIN signal or the CD-PCIN signal in combination with the pulse control signal from the pulse control generator (PCG).

### SD-CFAULT

Status Digital - Current Fault

Active in all operating modes

Digital output, active-low, open collector, 30 V max, 20 mA max.

Low, if the output current differs more than 0.5 % from the current set point.

SD-CFAULT is indicated for each fast current change.

If the output current differs more than 0.5 % for more than one second from the current set point, the DPSP X000 will be switched off and remains in an off-state.

### SD-VSVE

Status Digital - Voltage Supervision Value Exceeded

Active in all operating modes

Digital output, active-low, open collector, 30 V max, 20 mA max.

Value to supervise the output voltage (diode voltage).

Low, if the output voltage of the DPSP X000 exceeds the voltage supervision value CF-VF.

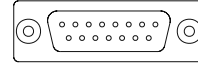
The CF-VF value is stored in the configuration memory (Set Up) of the DPSP X000.

The value is only effective for operating via the Control Port or the Parallel Port. For operating via the RS 232 Port or the CAN Port, a separate voltage supervision value has to be defined.

The voltage supervision is useful for detecting problems at the lines to the laser diodes like bad contacts, loose screws or for detecting a defective diode or diode stack.

The voltage supervision value does not affect the output voltage of the DPSP X000.

Control Port

**SD-PUOL**

Status Digital - Pulse Unit Overload

Active in all operating modes

Digital output, active-low, open collector, 30 V max, 20 mA max.

Low, if the pulse unit is overloaded.

An overload occurs if the pulse frequency is too high, if the output has no load (diodes not connected), if the lines to the diodes are too long or if there is a thermal overload.

In any case the DPSP X000 is switched off and remains in an off-state.

**VREF**Analog output +10.000 V, accuracy  $\pm 0.05\%$ 

Active in all operating modes

The output is for instance useful for supplying an external D/A-Converter for generating the current set point or for supplying an external potentiometer for adjusting the current set point.

**AUX+15V**

Output +15 V, for supplying external components

Active in all operating modes

Output resistance 10 Ohm

The output may be loaded with 100 mA. It isn't short-circuit proof.

**AUX-15V**

Output -15 V, for supplying external components

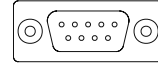
Active in all operating modes

Output resistance 10 Ohm

The output may be loaded with 100 mA. It isn't short-circuit proof.

### Interface Description RS 232 Port

RS 232 Port



#### RS 232 Port

9-pole female plug connector according to DIN 41652 and MIL-C-24308 with internal thread UNC 4-40.

The interface meets the RS 232C standard.

It is configured as data terminal equipment (DEE).

The DPSP X000 sends data on pin 2 (TX) and receives data on pin 3 (RX).

A hardware handshake isn't used. The RTS/CTS signal can be looped through or a fixed state (0 or 1) can be assigned to the RTS signal by an internal jumper.

The logic states of the interface correspond to the CCITT recommendation V.28.

Permitted baud rates are 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.

The data format is 8 data bits, no parity, one stop bit.

No software hand shake (XON, XOFF) is used.

The interface is full duplex capable.

The DPSP X000 can communicate via a 9-pole cable directly with a PC. The full functional range is available.

The DPSP X000 can receive control data and can send status data.

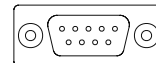
Status data are always sent by the DPSP X000 even if control is made via the Control Port, the Parallel Port or the CAN Port and not via the RS 232 Port.

Status data inform about the current operating state, configuration settings, as well as faults and measurements of the DPS X000.

Please aks our support to get the software protocol.

### Interface Description CAN Port

CAN Port



Data transfer rate	1 MBit/sec
Maximum bus line length	40 metres
Bus coupling	9-pole pin plug connector according to DIN 41652 and MIL-C-24308 with screw locking UNC 4-40
Connection cable	Impedance 120 Ohm according to ISO 11898
Bus terminating resistors	have to be assigned in the CAN network
Assignment of the pin plug connector	according to CiA DS-102, version 2.0
	Pin 2                    CANL
	Pin 7                    CANH
	Pin 3, 6                GND
	Pin 1, 4, 5, 8, 9    not used

Please aks our support to get the software protocol.





## Pulsed Laser Power Supplies DPSP X000

### System Software

#### Set Up Control Port

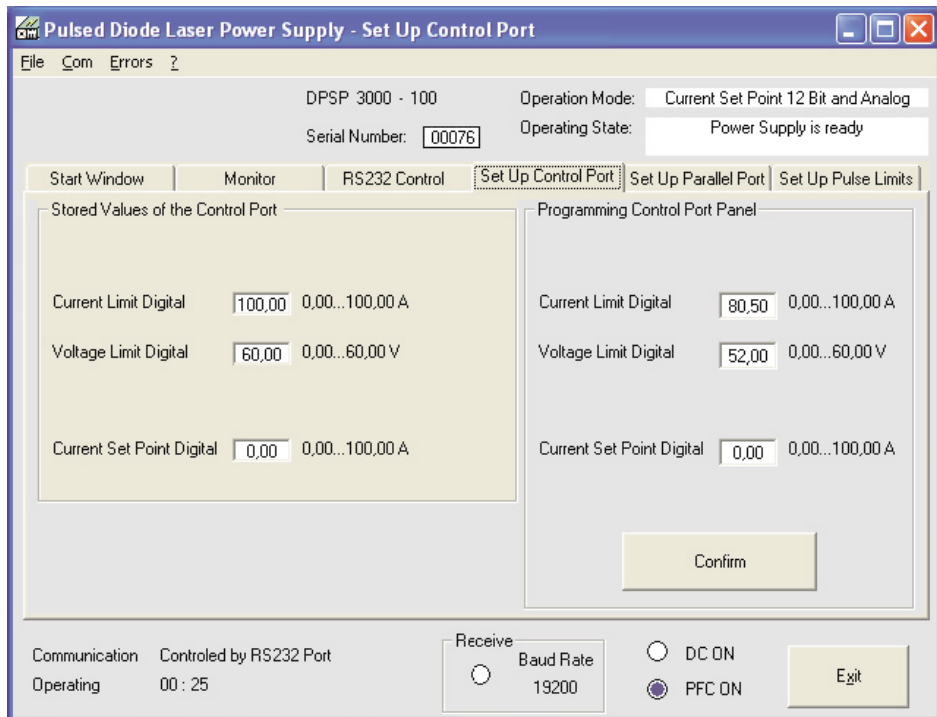
Install the DPSP X000's software and connect a PC at the RS 232 port.

Turn on your system, start the program and select Set Up Control Port for configuring your system.

Enter the required values at the Programming Control Panel, this values will be stored in the non-volatile memory of the DPSP X000.

The Voltage Limit Digital value does not really affect the output voltage of the DPS X000, it is the voltage supervision value for detecting bad contacts at the output lines or for detecting bad laser diodes (SD-VSVE Status Digital - Voltage Supervision Value Exceeded).

Press the Confirm button, the values will be stored in the non-volatile memory of the DPSP X000.





## Pulsed Laser Power Supplies DPSP X000

### System Software

#### Set Up Pulse Limits

Select Set Up Pulse Limits.

Enable the Internal Pulse Generator.

At Programming Pulse Limits enter the required values for pulse length and pulse pause, this values will be stored in the non-volatile memory of the DPSP X000.

Press the Confirm button, the values will be stored in the non-volatile memory of the DPSP X000.

The DPSP X000 is ready now for operating via the Control Port or the RS 232 Port.

Don't forget to connect dummy laser diodes or laser diodes for pulsing and don't forget to set the CD-PCIN signal at the Control Port to High even if you run the DPSP X000 via the RS 232 Port.

DPSP 3000 - 100  
Serial Number: 00076  
Operation Mode: Current Set Point 12 Bit and Analog  
Operating State: Power Supply is ready

Start Window | Monitor | RS232 Control | Set Up Control Port | Set Up Parallel Port | Set Up Pulse Limits

Stored Pulse Limits

Pulse Length: 0,120  
Pulse Pause: 1,000  
0,000...16 777,215 uS    0,000...16 777,215 uS

Internal Pulse Generator enabled

Programming Pulse Limits

Pulse Length: 0,122  
Pulse Pause: 0,500  
0,000...16 777,215 uS    0,000...16 777,215 uS

Pulse Frequency: 8,197 KHz

Internal Pulse Generator enabled

Confirm

Communication Controlled by RS232 Port  
Operating 00:29

Receive Baud Rate 19200  
DC ON  
PFC ON

Exit



## Pulsed Laser Power Supplies DPSP X000

### System Software

#### Monitor

Select Monitor.

At the monitor panel you can see all important data of the DPSP X000.

The screenshot displays the 'Pulsed Diode Laser Power Supply - Monitor' software interface. The window title is 'Pulsed Diode Laser Power Supply - Monitor'. The interface includes a menu bar with 'File', 'Com', and 'Errors ?'. The main area shows the following information:

- Device: DPSP 3000 - 100
- Serial Number: 00076
- Operation Mode: Current Set Point 12 Bit and Analog
- Operating State: Power Supply is switched on, current flows (SD-PSON)

The interface is divided into several sections:

- Analogdisplay:** Shows sliders for Current Set Point Analog (100), Current Out (100), Voltage Out (60), Power Out (3198), Voltage PFC (510), Mains Current (19), Mains Voltage (275), and Temperature (60.0).
- Measurements:** Displays real-time values for Current SP Analog (67,988 A), Current Out (67,837 A), Voltage Out (1,50 V), Power Out (139,7 W), Voltage PFC (419,25 V), Mains Current (1,362 A), Mains Voltage (223,6 V), and Temperature (22,7 °C).
- Current Values:** Shows Timeout RS232 (20,0 s), Current Limit Dig (80,50 A), Voltage Limit Dig (52,00 V), LSP Stand By Dig (0,00 A), C Set Point Dig (0,00 A), Max. Temperature (60,0 °C), and Max Temp User (55,0 °C).
- Faults:** A section for monitoring faults, currently showing 'Max. COUT' as the last fault.
- Default Values:** Lists limits for Current Out (Stand By 100,00 A, Limit Max 100,0 A), Voltage Out (Max 60,00 V, Min 1,01 V), Pout Max (3198 W), Voltage PFC (Max 452 V, Min 350 V), Mains Current (Max 18,9 A, Min 0,0 A), and Mains Voltage (Max 275,2 V, Min 87,2 V).

At the bottom, there are communication controls: 'Communication Operating' (Control by Control Port, 00:32), 'Receive' (Baud Rate 19200), and status indicators for 'DC ON' and 'PFC ON'. An 'Exit' button is also present.



## Pulsed Laser Power Supplies DPSP X000

### System Software

#### RS 232 Control

Select RS 232 Control for controlling the DPSP X000 by a PC.  
Enter the required values for Timeout RS 232, Current Limit Digital, Voltage Limit Digital, Current Set Point Stand By Digital and Current Set Point Digital.  
Press the Confirm button.

The DPSP X000 is ready now for operating.

Don't forget to connect dummy laser diodes or laser diodes for pulsing and don't forget to set the CD-PCIN signal at the Control Port to High.

If you press the ON button, the DPSP X000 will be switched on and puts out the pulsed current.

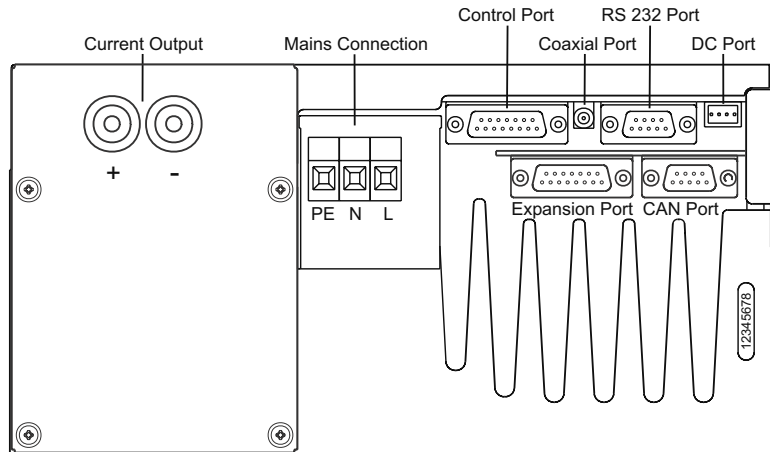
The screenshot displays the 'Pulsed Diode Laser Power Supply - RS232 Control' software interface. The window title is 'Pulsed Diode Laser Power Supply - RS232 Control'. The interface is divided into several sections:

- Top Bar:** Shows 'DPSP 3000 - 100', 'Operation Mode: Current Set Point 12 Bit and Analog', 'Serial Number: 00076', and 'Operating State: Power Supply is switched on, current flows (SD-PSON)'.
- Navigation Tabs:** 'Start Window', 'Monitor', 'RS232 Control' (selected), 'Set Up Control Port', 'Set Up Parallel Port', 'Set Up Pulse Limits'.
- Analogdisplay:** A vertical list of meters for 'Current SP Analog', 'Current Out', 'Voltage Out', 'Power Out', 'Voltage PFC', 'Mains Current', 'Mains Voltage', and 'Temperature'. Each meter has a scale from 0 to a maximum value and a red needle indicator.
- Measurements:** A table of real-time values:

Measurement	Value	Unit
Current SP Analog	68,088	A
Current Out	67,817	A
Voltage Out	3,07	V
Power Out	140,3	W
Voltage PFC	418,15	V
Mains Current	1,321	A
Mains Voltage	223,7	V
Temperature	23,6	°C
- Control Panel:** Contains input fields for 'Timeout RS232' (40,00 s), 'Current Limit Digital' (100,00 A), 'Voltage Limit Digital' (60,00 V), 'CSP Stand By Dig' (0,00 A), and 'Current Set Point Dig' (50,00 A). It also features 'Confirm' and 'ON' buttons.
- Operating Mode:** Two buttons: 'Current Set Point Analog' and 'Current Set Point Analog + Stand By'.
- Pulse:** A pulse waveform diagram with 'Intern' selected, showing a pulse width of 0,120 ms and a period of 1,000 ms.
- Current Values:** A table of setpoint and limit values:

Parameter	Value	Unit
Timeout RS232	20,0	s
Current Limit	80,50	A
Voltage Limit D	52,00	V
Current Set Point	0,00	A
Current Set Point D	0,00	A
Max. Temperature	60,0	°C
Max Temp User	55,0	°C
- Bottom Bar:** Shows 'Communication: Control by RS232 and Control Port', 'Operating: 00 : 34', 'Receive Baud Rate: 19200', 'DC ON' (checked), 'PFC ON' (checked), and an 'Exit' button.

### Connection Elements Devices with integrated Pulse Unit (PUI)



#### Mains Connection

3-pole terminal strip, for lines with a diameter of 1.5 - 4 sqmm.

#### Current Output

2-pole screw thread with internal thread M6, for ring tongue terminals with outer diameter up to 12 mm and wire cross-section up to 25 sqmm.

#### DC Port

4-pole pin plug connector MC0.5/4-2.5 Phoenix.

#### Coaxial Port

Coaxial male plug connector SMB.

#### Control Port

15-pole female plug connector according to DIN 41652 and MIL-C-24308, internal thread UNC 4-40.

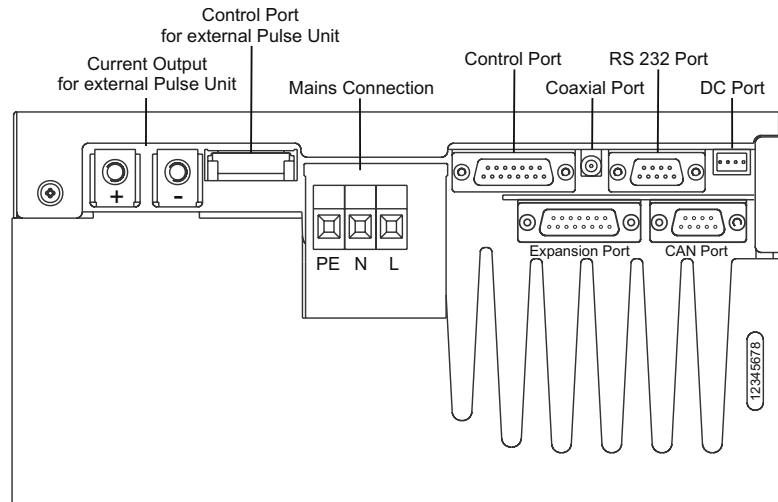
#### RS 232 Port

9-pole female plug connector according to DIN 41652 and MIL-C-24308, internal thread UNC 4-40.

#### CAN Port

9-pole pin plug connector according to DIN 41652 and MIL-C-24308, internal thread UNC 4-40.

### Connection Elements Devices with external Pulse Unit (PUE)



#### Mains Connection

3-pole terminal strip, for lines with a diameter of 1.5 - 4 sqmm.

#### Current Output

2-pole screw thread with internal thread M6, for ring tongue terminals with outer diameter up to 12 mm and wire cross-section up to 25 sqmm, for connecting the external pulse unit.

#### Control Port

16-pole male connector for connecting the external pulse unit via a 16-pole ribbon cable.

#### DC Port

4-pole pin plug connector MC0.5/4-2.5 Phoenix.

#### Coaxial Port

Coaxial male plug connector SMB.

#### Control Port

15-pole female plug connector according to DIN 41652 and MIL-C-24308, internal thread UNC 4-40.

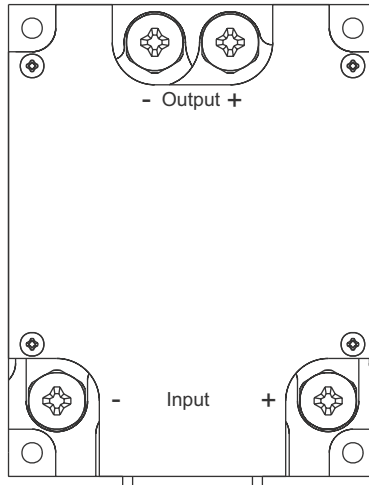
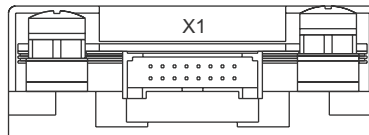
#### RS 232 Port

9-pole female plug connector according to DIN 41652 and MIL-C-24308, internal thread UNC 4-40.

#### CAN Port

9-pole pin plug connector according to DIN 41652 and MIL-C-24308, internal thread UNC 4-40.

**Connection Elements**  
**External Pulse Unit**



**Input - and Input +**

2-pole screw thread with internal thread M6, for ring tongue terminals with outer diameter up to 12 mm and wire cross-section up to 25 sqmm, for connecting the current output of devices with external pulse unit.

**Output - and Output +**

2-pole screw thread with internal thread M6, for ring tongue terminals with outer diameter up to 12 mm and wire cross-section up to 25 sqmm, for connecting laser diodes.

**X1**

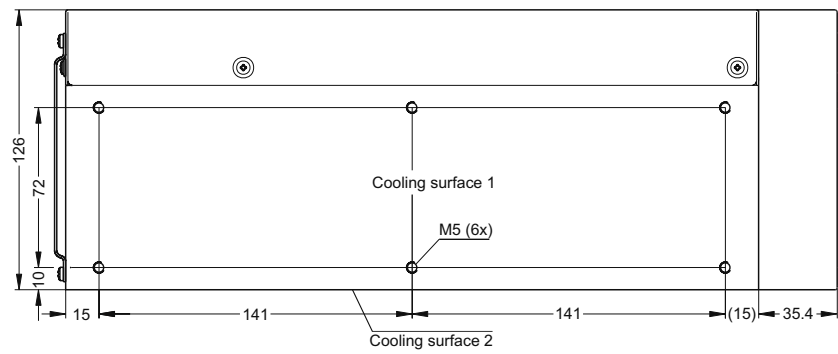
16-pole male connector for connecting the control port of devices with external pulse unit via a 16-pole ribbon cable.



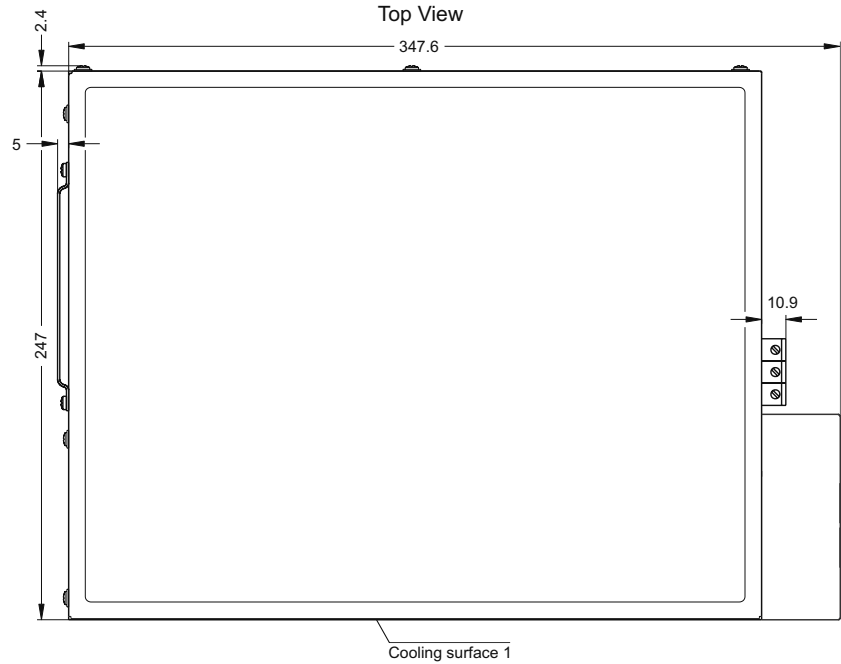
## Pulsed Laser Power Supplies DPSP X000

Dimensions (mm)  
Devices with integrated Pulse Unit (PUI)

Side View



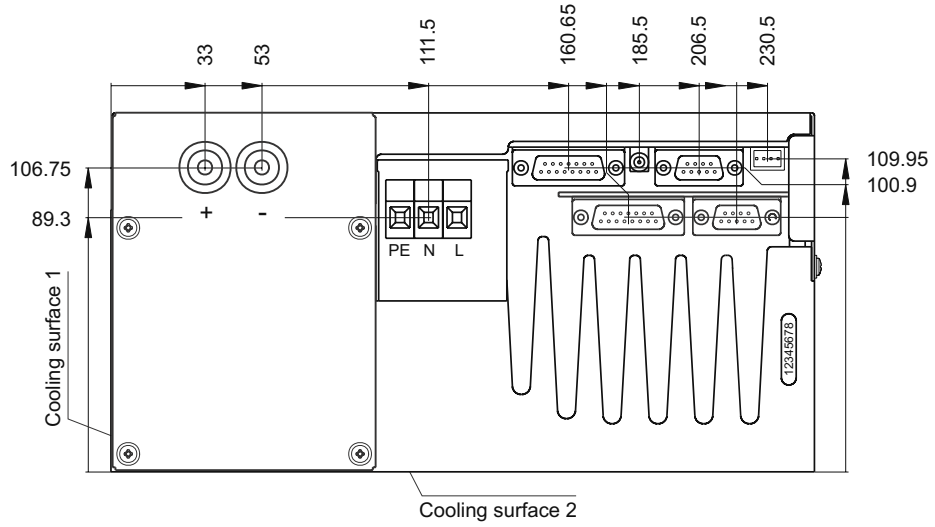
Top View



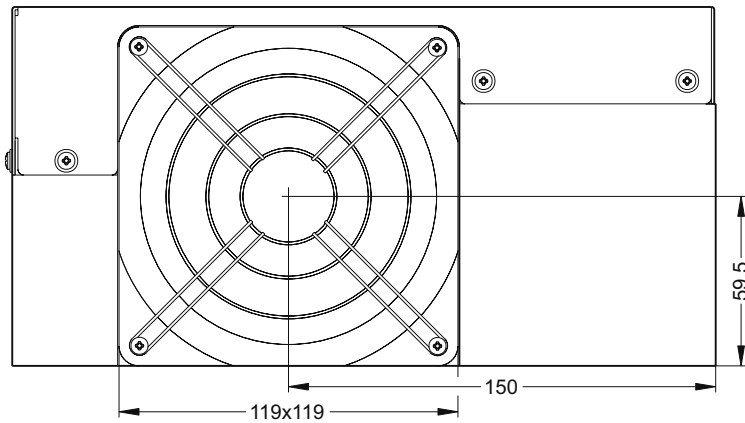


Dimensions (mm)  
Devices with integrated Pulse Unit (PUI)

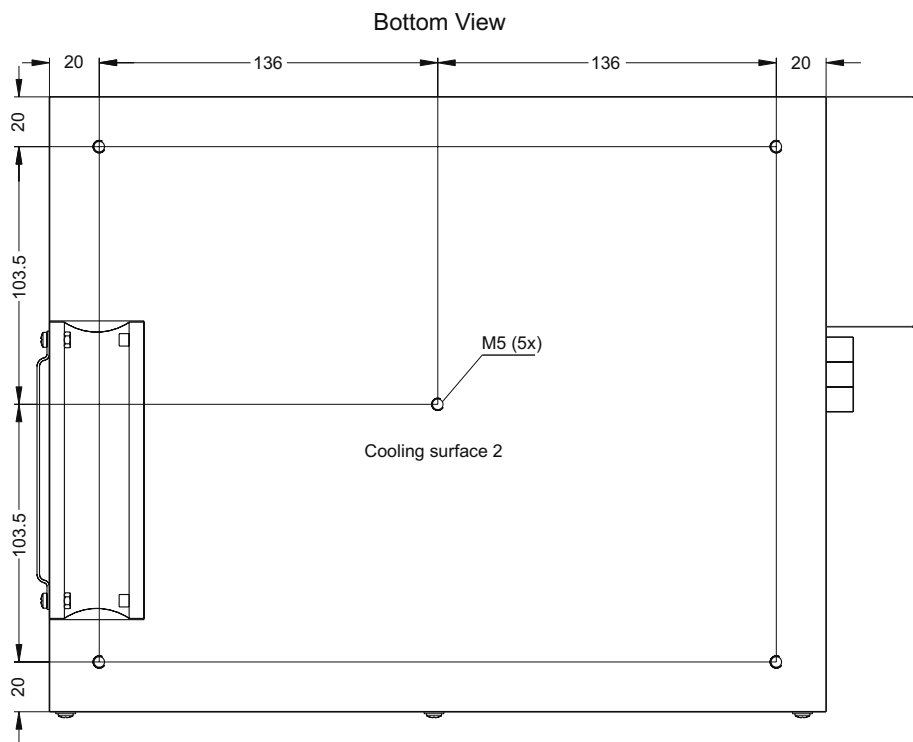
Front View



Rear View



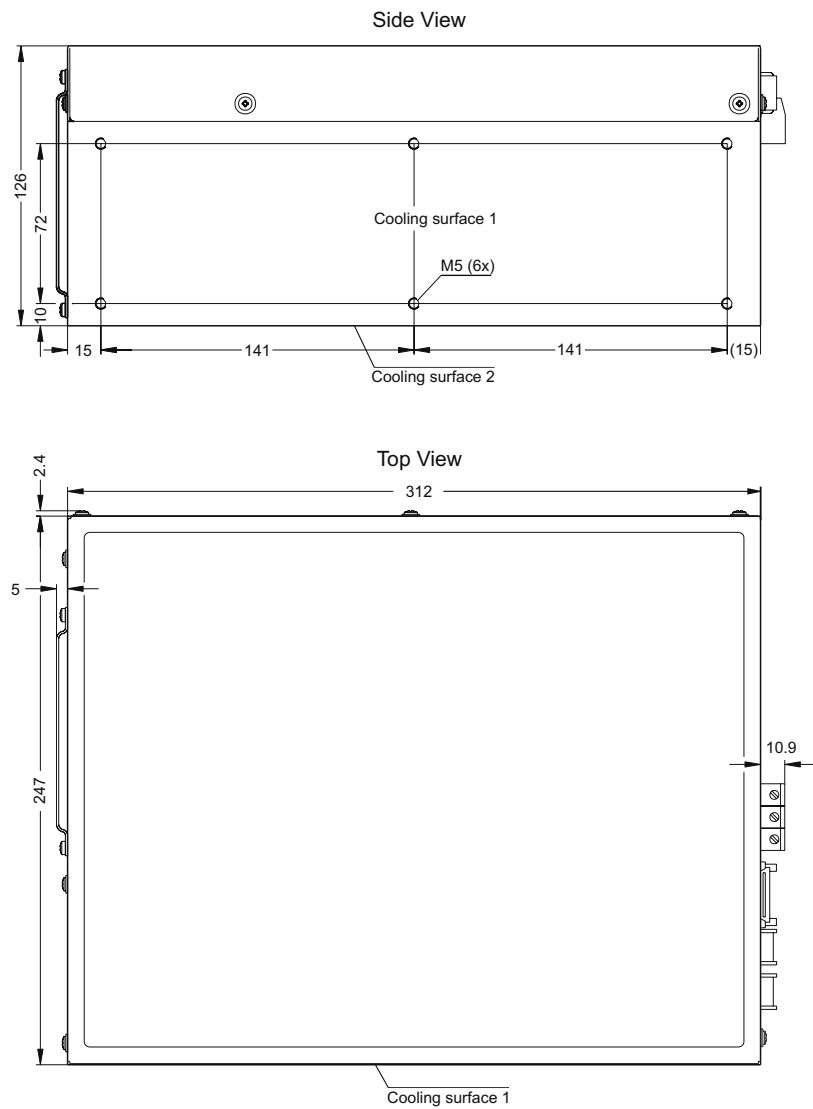
Dimensions (mm)  
Devices with integrated Pulse Unit (PUI)



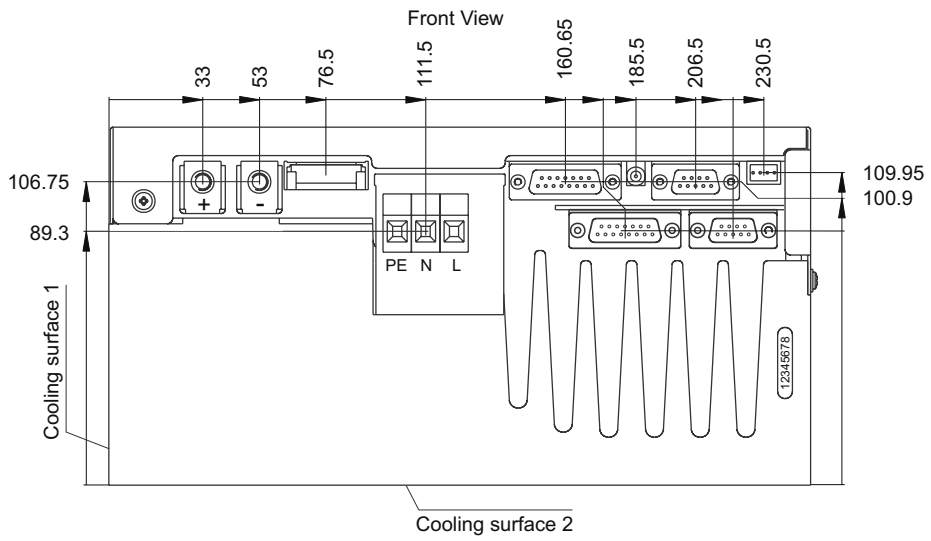


## Pulsed Laser Power Supplies DPSP X000

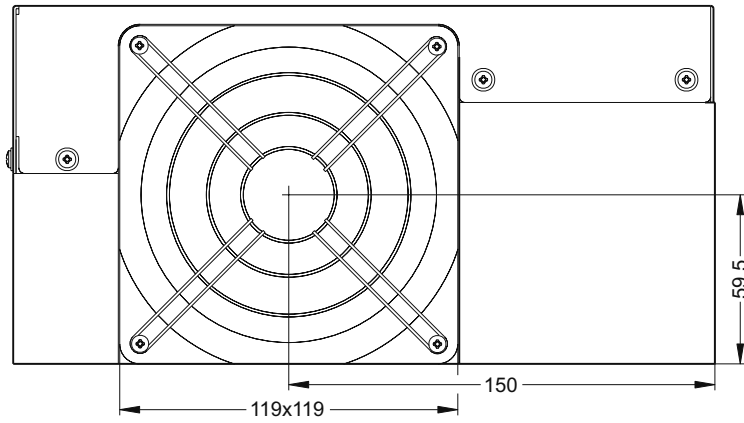
Dimensions (mm)  
Devices with external Pulse Unit (PUE)



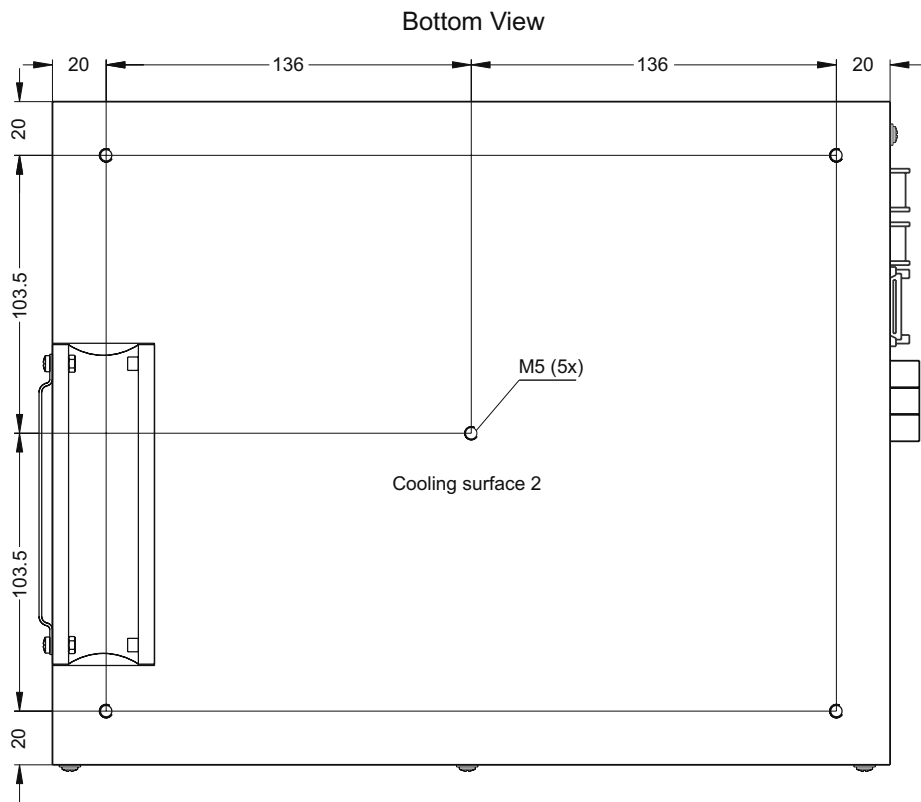
**Dimensions (mm)**  
**Devices with external Pulse Unit (PUE)**



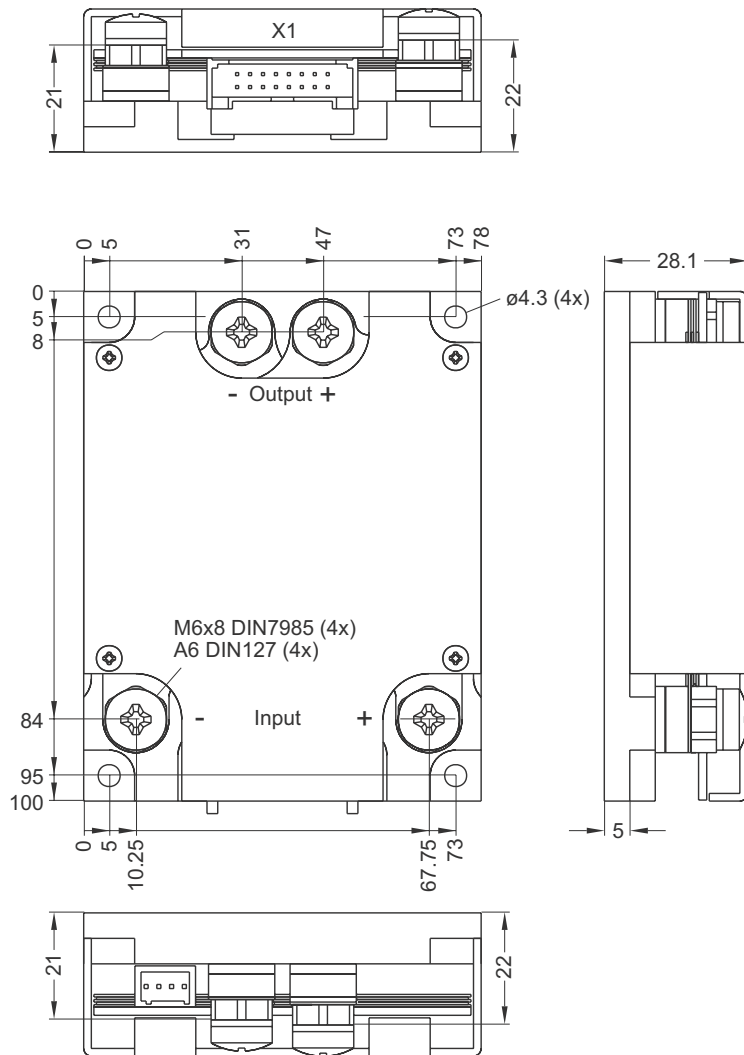
Rear View



Dimensions (mm)  
Devices with external Pulse Unit (PUE)



Dimensions (mm)  
External Pulse Unit





## Pulsed Laser Power Supplies DPSP X000

### Ordering informations

Model	Part Number
DPSP 1000-050-PUI	10100651
DPSP 1000-070-PUI	10100652
DPSP 1000-100-PUI	10100654
DPSP 2000-050-PUI	10100661
DPSP 2000-070-PUI	10100662
DPSP 2000-100-PUI	10100664
DPSP 3000-050-PUI	10100671
DPSP 3000-070-PUI	10100672
DPSP 3000-100-PUI	10100674
DPSP 1000-050-PUE	10100681
DPSP 1000-070-PUE	10100682
DPSP 1000-100-PUE	10100684
DPSP 2000-050-PUE	10100691
DPSP 2000-070-PUE	10100692
DPSP 2000-100-PUE	10100694
DPSP 3000-050-PUE	10100701
DPSP 3000-070-PUE	10100701
DPSP 3000-100-PUE	10100704
DPSP 1000-050-PUI-PCG	10100851
DPSP 1000-070-PUI-PCG	10100852
DPSP 1000-100-PUI-PCG	10100854
DPSP 2000-050-PUI-PCG	10100861
DPSP 2000-070-PUI-PCG	10100862
DPSP 2000-100-PUI-PCG	10100864
DPSP 3000-050-PUI-PCG	10100871
DPSP 3000-070-PUI-PCG	10100872
DPSP 3000-100-PUI-PCG	10100874
DPSP 1000-050-PUE-PCG	10100881
DPSP 1000-070-PUE-PCG	10100882
DPSP 1000-100-PUE-PCG	10100884
DPSP 2000-050-PUE-PCG	10100891
DPSP 2000-070-PUE-PCG	10100892
DPSP 2000-100-PUE-PCG	10100894
DPSP 3000-050-PUE-PCG	10100901
DPSP 3000-070-PUE-PCG	10100901
DPSP 3000-100-PUE-PCG	10100904



## Pulsed Laser Power Supplies DPSP X000

### Ordering informations

Model	Part Number
External Pulse Unit PUE 200	10204035
Parallel Port (Plug In Card)	10360260
CAN Port (Plug In Card)	10360263
Expansion Card (Plug In Card)	10360478
CAN Port Card Plus (Plug In Card)	10360480

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