

Variable Pulse Duration Flashlamp Driver

PS5023



FEATURES

- Built-in serial ignition circuit
- Built-in simmer power supply
- Internal/external triggering
- Remote control through LAN / CAN / RS-232 interface

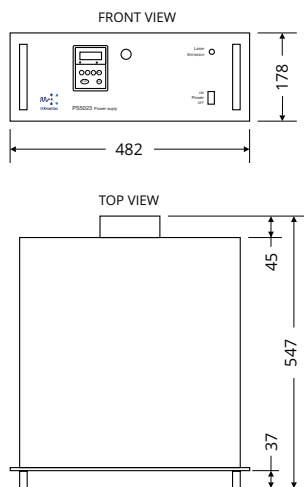


Fig. 1. Dimensions



Fig. 2. Control Panel

PS5023 flashlamp driver is designed for pumping solid-state lasers with variable or long pulsewidth lamp discharge. It features variable pumping pulse in 0.5 – 10 ms range and output voltage of up to 550 V. Custom versions can achieve tens of milliseconds pulse duration.

Excellent pulse-to-pulse voltage stability. The charger is based on resonant inverter topology which is most efficient way to charge capacitive loads. Innovative design of charger circuit allows to charge capacitor bank with an excellent precision of 0.2%.

Built-in serial ignition circuit. The driver features a built-in serial ignition circuit. It greatly simplifies the design of laser head since external triggering circuit is not required anymore. The simmer module provides up to 900 V striking voltage. The flashlamp is ignited by 16 kV pulse of approximately 1 μ s duration, applied to the flashlamp cathode. The ignition circuit reliably ignites flashlamps with up to 200 mm arc length.

Remote control. Microprocessor-based control allows seamless integration of the driver into sophisticated laser systems. The charge voltage, repetition rate and pulse duration can be controlled remotely through LAN, CAN or RS-232 interface. In addition, the interface allows monitoring of status and error messages as well as measure output energy and current to the lamp. The discharge pulse can be triggered from external pulse generator facilitating synchronisation of several units.

GENERAL SPECIFICATIONS

| Model | PS5023-1 | PS5023-2 | PS5023-3 | PS5023-4 |
|--|--|--------------------|----------|----------|
| Number of independent outputs | 1 | | | |
| Number of charging modules | 1 | 2 | 3 | 4 |
| Max. average output power P_{avg} at 10 Hz PRR | 1.2 kJ/s | 2.4 kJ/s | 3.6 kJ/s | 4.8 kJ/s |
| Standard charging voltage U_{ch} | 350 V, 450 V, 500 V | | | |
| Pulse duration | variable | | | |
| Max pulse repetition rate | 250 Hz | | | |
| Pulse to pulse voltage stability | 0.2 % | | | |
| Resolution | 1 V | | | |
| Ignition pulse voltage | 16 kV | | | |
| Ignition pulse duration | > 1000 ns | | | |
| Simmer current options | 0.6 A; 1.2 A | | | |
| Simmer voltage | < 300 V | | | |
| Striking voltage | < 900 V | | | |
| Protection features | overvolt, overheat, overcurrent, interlock | | | |
| Error report | no simmer current, no charge, HV connectors | | | |
| Remote control | RS-232 / CAN / LAN | | | |
| Standard C_{PFN} value | 13200 or 26400 μ F | | | |
| Mains ¹ | single phase 220V AC (-10%, +15%) 50/60Hz or 3-phase 400V AC (-15%, +15%) 50/60Hz | | | |
| Power consumption, average | 1.8 kW | 3.2 kW | 4.5 kW | 5.6 kW |
| Power consumption, peak | 2 kW | 4 kW | 6 kW | 8 kW |
| Operation conditions | | | | |
| Ambient temperature | Storage | from +5 to +50 °C | | |
| | Operation | from +15 to +40 °C | | |
| Humidity | below 80 % non condensing | | | |
| Protection class | IP20 | | | |

¹ 3-phase 208V AC (-10%, +15%) 50/60Hz mains are optional

Specifications in table are given as reference. We always suggest to optimize power supply by customer's usage conditions.

Built-in simmer power supply. The simmer power supply improves pulse-to-pulse stability and flashlamp lifetime. It is a constant current source producing 600 mA current at up to 300 V output voltage. Other current values are available optionally. Linear xenon flashlamps of 4–6 mm bore diameter and arc length up to 200 mm are reliably simmered.

Modular design. The output parameters of power supply can be easily modified to meet customer needs subject to active lasing material, average output power or pulse energy. The average output power of the driver can be scaled up by paralleling several charger modules. Up to four modules with resulting 4.8 kJ/s peak charging rate can be fitted into a single 19" body.

Seamless integration. The driver can be easily integrated with MKvantas cooling units PS1223. Up to 6 units can be mounted into up to 25U height 19" racks providing powerful yet compact laser pumping cabinets (sold separately). More information about Mounting Rack - page 12 (Accessories).

Design. As standard front and rear panels are powder coated in RAL7035 (Light Grey), RAL7021 (Black Grey) and RAL9002 (Grey White) are possible upon request.

CONFIGURATION EXAMPLES OF PS5023 SERIES POWER SUPPLIES

| Ordering code | Discharge energy ¹ | Repetition rate ² | Maximal charging rate | Maximum voltage / current | Flashlamp recommended | Capacitance | Inductance | Pulse duration range |
|------------------------------|-------------------------------|------------------------------|-----------------------|---------------------------|-----------------------|-------------|------------|----------------------|
| | J | Hz | kJ/s | V / A | | µF | µH | ms |
| PS5023-3-3.5-13200-10-2-1F1 | 400 | 3 | 2.4 | 350 / 1000 | 9×62; Xe; 450 Torr | 13200 | 10 | 0.1 – 2 |
| PS5023-2-4.5-26400-10-2-1F1 | 1000 | 2 | 2.4 | 450 / 600 | 5×90; Xe; 450 Torr | 26400 | 10 | 0.1 – 10 |
| PS5023-1-5.5-13200-20-1-1F1 | 700 | 1 | 1.2 | 550 / 600 | 5×90; Xe; 450 Torr | 13200 | 20 | 0.1 – 3 |
| PS5023-10-4.5-13200-10-4-3FY | 400 | 10 | 4.8 | 450 / 500 | 5×75; Xe; 450 Torr | 13200 | 10 | 0.1 – 2 |

¹ Discharge energy is specified at maximal voltage and maximal pulse duration.

² Repetition rate is specified at maximal discharge energy and can be proportionally higher by reducing energy.

Contact MKvantas if your requirements are different as in this table. We will consult you and make suggestion best matching your requirements.

Ordering information

Please indicate following points by inquiry:

- Flash lamp type (bore diameter, gap length, gas type and pressure)
- Maximal pulse energy
- Pulse duration tuning range
- Maximal pulse repetition rate
- Mains voltage/phase

Customized orders

Depending on customer needs, we can produce flashlamp drivers with specific average charging power, output voltage, pulse duration, repetition rate values or/and specific application areas.

Ordering code

PS5023-3-3.5-13200-10-2-1F1

