



HIGH VOLTAGE DRIVER

DQF-0.2-5B

DQF-0.2-5D

Technical Description
Rev.2203

2022
Lithuania

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1.1. Warranty Statement

The Pockels cell drivers are protected by one-year warranty covering labor and parts. The warranty enters into validity since the shipment date. Any evidence of improper use or unauthorized attempts voids the warranty.

1.2. Service Contact Information

For service/warranty requests, please contact:

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2.1. General Information

2.1.1. Models

DQF-0.2-5B – driver for Q-switching, applicable for BBO Pockels cells

DQF-0.2-5D – driver for Q-switching, applicable for DKDP Pockels cells

2.1.2. Main Components

Table 1. Main components

Component	Quantity
High voltage (HV) driver DQF-0.2-5*	1
DC power cable (l=1.5m)	1
HV power cable (l=1m)	1
BNC-SMB cable (l=1.5m)	1
Pair of cables for HV output to the Pockels cell (<10 cm)	1
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2.2. Technical Specifications

Table 2. Technical specifications

Parameter	Value(s)	
	DQF-0.2-5B	DQF-0.2-5D
Maximum output pulse amplitude (HV), <i>kV</i>	4	5
Polarity	Positive	
HV pulse fall time, <i>ns</i>	<15	
HV pulse duration (t ₁ , Fig. 3), <i>μs</i>	300 ¹	
Maximum HV repetition rate, <i>Hz</i>	250	
External triggering pulse amplitude @50Ω load, <i>V</i>	3...5	
External triggering pulse rise/fall time, <i>ns</i>	< 20	
External triggering pulse duration, <i>μs</i>	100...300 ¹	
Maximum HV supply voltage, <i>kV</i>	4	
Maximum HV current consumption (HV load = 6 pF), <i>mA</i>	1	
Low voltage powering DC requirements	12...25V; 200mA	
DC connector	KK 2.54mm 4k	
Dimensions, mm	92 x 76 x 21	
Maximal operating temperature, °C	45	
Weight, <i>g</i>	70	

¹ Can be extended up to 1200 μs on request

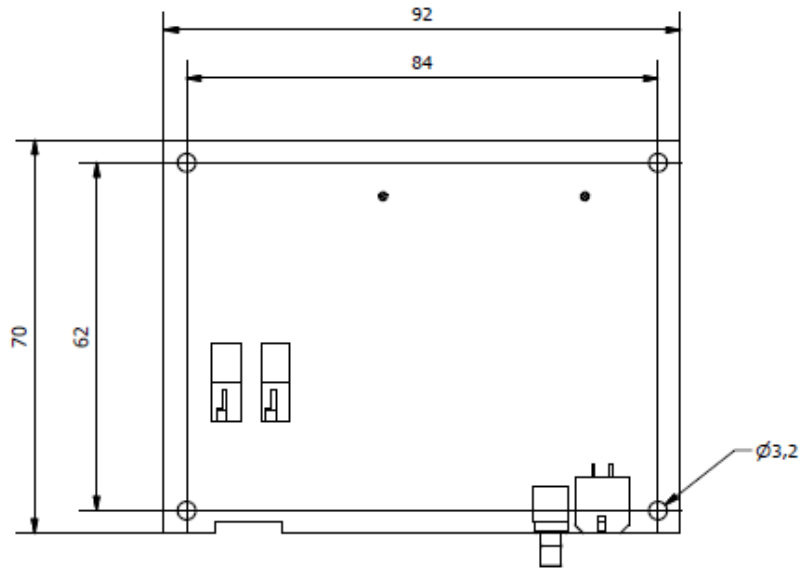


Figure 1. Outline dimensions of the driver

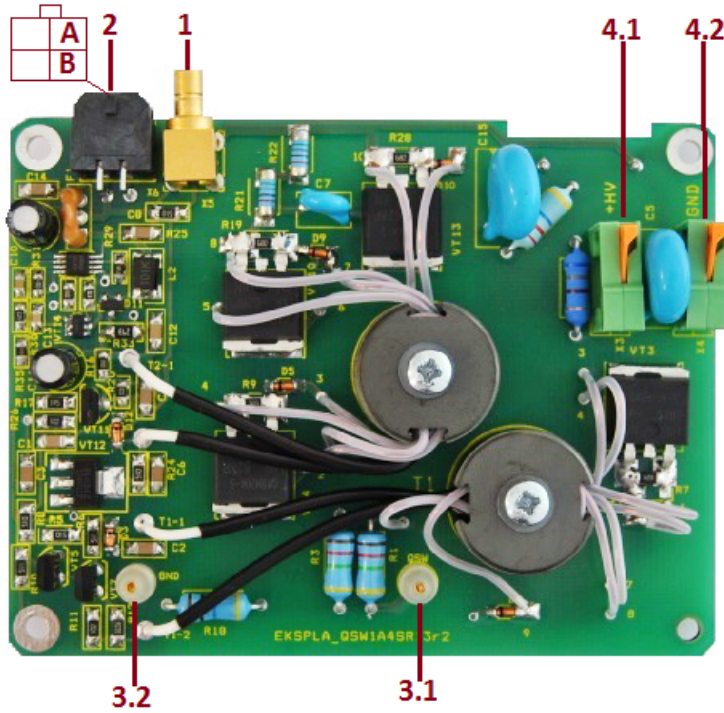


Figure 2. Top view of the driver

Table 3. Ports seen in top view of the driver

#	Port
1	SYNC IN – trigger input
2	Connector Molex 4 (Microfit series) - interface for +DC (24 VDC) supply (“A”-GND; “B”- +DC)
3.1	HV pulse output pin +OUT
3.2	HV pulse output pin GND
4.1	+HV input from HV supply
4.2	GND input from HV supply

Equipment is designed to be safe under normal environmental conditions according to 1.4.1. 61010-1@IEC:2010 (Safety requirements for electrical equipment, control and laboratory use):

- a) indoor use;
- b) altitude up to 2000 m;
- c) temperature 5°C to 45°C;
- d) maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 45°C;
- e) POLLUTION degree 1: no POLLUTION or only dry, non-conductive POLLUTION occurs.

Warning:

The safety of the system incorporating driver and HV power supply is the responsibility of the assembler of the system.

Operating the driver is allowed to persons acquainted with the operation manual and having permission to deal with voltages over 1000 V.

Do not remove unit covers while power cable is connected to the mains (if applicable).

Do not touch any parts of the system when high voltage is applied, as it may cause human injuries or death.

Do not operate the unit until it is **grounded** and the load is connected.

Do not use the unit if any defects have been detected.

1. Connect wires to the Pockels cell

The wires leading from HV outputs to the Pockels cell must be about 0.24 mm² CSA. Both the wires must be as short as possible and equal length. The length of each wire must be not exceeding 100 mm. They should be located at least 5 mm away from any conductive material (including the operator's fingers and instruments) – this is done to avoid any additional capacitive load. Otherwise, driver characteristics may degrade and/or the driver may get damaged.

2. Ground the Pockels cell driver together with the generator and HV supply

The driver output of several kilovolts (kV) with very fast edges is a powerful source of electromagnetic interference (EMI). Please ensure proper wiring and grounding to avoid problems caused by interference.

The best solution to minimize EMI is to mount the driver and the HV power supply on the metal body of the laser. The driver base plate must have very good electrical contact with the ground wire of the HV power supply, such as the four mounting holes on the edges of the board. Ensure that these connections are firmly tighten and has god electrical connection. This is enough in most of cases.

If the EMI level is still very high, attempt mounting ferrites on all power and control wires leading to the driver and power supply (except wires to the Pockels cell).

3. Supply voltage to the driver from the DC power supply

For a safe start of the driver, the DC power supply must provide at least 0.6 A peak current when turning on. Although most DC power supplies are capable of providing this, it is recommended to double-check your supply as an insufficient peak current may damage the driver.

4. Supply voltage from the HV supply

Connect the HV power supply and set required voltage.

If the HV power supply is manufactured by a third party, before supplying voltage, ensure there is no overvoltage while turning it on.

5. Provide synchronization pulses from the generator

It is necessary to measure the generator output voltage with a 50 Ω load before applying synchronization signals to the DQF-0.2-5B driver. The signal voltage must be in the range of 2.4...5 V.

After the generator output voltage is measured, remove the 50 Ω load and provide synchronization pulses to the driver.

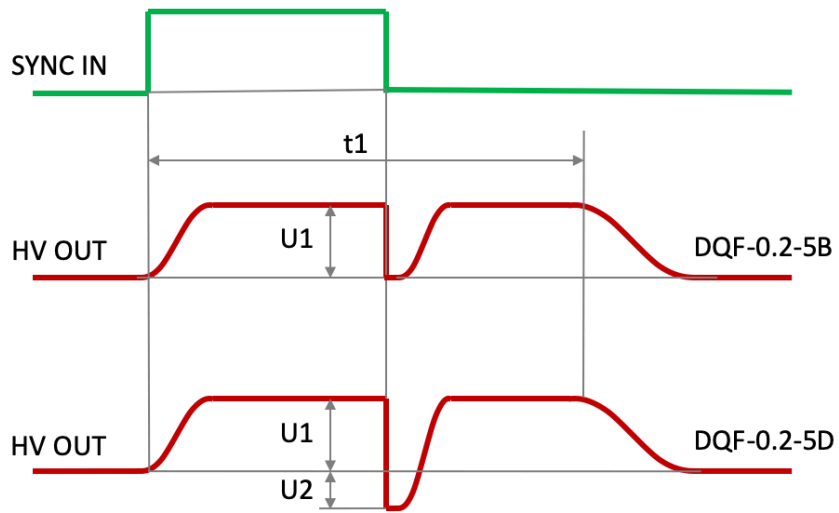


Figure 3. Control timing charts