

Pockels Cell Drivers

& HV Power Supplies

Range of drivers for Pockels cells are fast HV switches designed to load and unload capacitance of Pockels cell with several nanosecond edges.

Amplitude of output pulses to Pockels cell is about equal to HV supply voltage. Only exception is DP-FAM series drivers that allow to control the amplitude of each pulse by analog voltage input.

Design adaptation for particular OEM customer is possible and can include optimizing of mechanical design, output switch for voltage, repetition rate, rise/fall time and pulse duration lengthening etc.

Almost all the drivers can work in up to 5 MHz bursts. Range of DC/DC type HV power supplies is manufactured to provide a complete Pockels driving solution.



Main Features

- Low and high repetition rate models covering range from single pulse to 6MHz
- Up to 5MHz in burst
- Square pulse shape
- Controlled by an external trigger pulse
- Fast HV switching for both rise and fall edges
- Wide range of pulse durations
- Low jitter
- For BBO, RTP, KD*P, CdTe Pockels cells
- Designed for capacitive load

General Specifications

DRIVER series	PCD-UHR series	PCD-UHRS series
Maximal operating voltage	$\leq 9.8 \text{ kV}$	$\leq 3.6 \text{ kV}$
Maximal repetition rate	6 MHz	1 MHz
Minimal HV pulse duration	100 ns	15 ns
HV pulse duration extension with no principal limit using pulse regeneration technique	YES	NO
Triggering pulse duration requirement (for two-pulses triggering mode only)	$\geq 20 \text{ ns}$	
Triggering pulse amplitude requirement	3.5 – 5 V (50 Ω input)	
Triggering pulse rise & fall time requirement	$\leq 10 \text{ ns}$	$\leq 5 \text{ ns}$
Maximal length of leads to Pockels cell	10 cm	
HV pulse delay	25 ns	30 ns
HV pulse jitter	< 100 ps	

EXTERNAL POWER REQUIREMENTS

HV supply: each model has particular recommendation

Low voltage supply: 24 VDC $\pm 1\text{V}$

Product Range

Driver Selection Table ¹⁾

High PRR unipolar output driver.

HV pulse duration
100 – 5000 ns.

Ekspla Electronics p/n	Rep-rate	Voltage	Rise / fall	Power ²⁾
	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
PCD-UHR-50-3.6	50	3.6	7	20
PCD-UHR-250-2.6-(C)	250	2.6	6	40
PCD-UHR-250-3.6-(C)	250	3.6	7	75
PCD-UHR-400-1.5-(C)	400	1.5	5.5	20
PCD-UHR-500-2.6-(C)	500	2.6	6.5	90
PCD-UHR-1000-1.8-(C)	1000	1.8	6	80
PCD-UHR-2000-1.5-(C)	2000	1.5	7	120

High PRR unipolar output short-pulse driver.

HV pulse duration
100 – 5000 ns.

-(C) – driver can be made in any configuration – with aluminum housing or open frame

-C – driver in aluminum housing

	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
PCD-UHRS-50-3.6	50	3.6	7	20
PCD-UHRS-250-3.6-(C)	250	3.6	7	75
PCD-UHRS-250-2.6-(C)	250	2.6	6	40
PCD-UHRS-500-2.6-(C)	500	2.6	6.5	90
PCD-UHRS-1000-1.8-(C)	1000	1.8	6	80
PCD-UHRS-400-1.5-(C)	400	1.5	5.5	20

High PRR Cavity Dumping bipolar output driver.

HV pulse duration
100 – 5000 ns.

	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
PCD-UHR-I-250-5.2-C	250	5.2	8.5	100
PCD-UHR-I-300-4.6-C	300	4.6	8	100
PCD-UHR-I-350-4-C	350	4	7.5	100
PCD-UHR-I-1000-3.0-C	1000	3	7.5	100

	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
PCD-UHR-II-150-7.0	150	7	9.5	110
PCD-UHR-II-250-7.0-C	250	7	9.5	200
PCD-UHR-II-1000-4.0-C	1000	4	6	230
PCD-UHR-II-1000-3.8-C	1000	3.8	9.5	210

High PRR Cavity Dumping driver.

FULL BRIDGE configuration.

	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
2PCD-UHR-II-300-3.4	300	3.4	<7	110
2PCD-UHR-II-500-3.4-C	500	3.4	<7	200
2PCD-UHR-II-1000-2.5-C	1000	2.5	<7	170
2PCD-UHR-II-2000-1.8-C	2000	1.8	<7	210
2PCD-UHR-II-2000-1.5-C	2000	1.5	<6	215

	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
PCD-UHR-III-2000-3.4-C	2000	3.4	9.5	360
PCD-UHR-III-2500-3.1-C	2500	3.1	9.5	360
PCD-UHR-III-3000-2.6-C	3000	2.6	8.5	325

High PRR Cavity Dumping driver.

FULL BRIDGE configuration with output frequency doubling.

Encased version.

	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
2PCD-UHR-III-4000-1.7-C	4000	1.7	10.5	360
2PCD-UHR-III-6000-1.3-C	6000	1.3	9	350
2PCD-UHR-500-3.4-C	500	3.4	7	150
2PCD-UHR-1000-2.4-C	1000	2.4	6.5	180
2PCD-UHR-2000-1.6-C	2000	1.6	6	130

High voltage Cavity Dumping driver.

HV05Wm HV power supply is included.

	<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
PCD-UHV-4.2	10	4.2	6	5
PCD-UHV-5.5	5	5.5	7	5
PCD-UHV10-3	8.6	3	10.5 / 9.5	5
PCD-UHV10-2.5	9.8	2.5	12 / 10.5	5

1) All specifications correspond to Pockels cell capacitance 6pF. 2) HV Power consumption, the same heat to be removed by cooling.

Driver Selection Table ¹⁾

	Ekspla Electronics p/n	Rep-rate	Voltage	Rise / fall	Power ¹⁾
		<i>kHz</i>	<i>kV</i>	<i>< ns</i>	<i>W</i>
High voltage Cavity Dumping driver with HV05Wm HV power supply included. Encased version.	PCD-UHV-C	10	4.2	6	5
		5	5.5	7	5
	PCD-UHV10-C	3	8.6	10.5 / 9.5	5
		2.5	9.8	12 / 10.5	5
Fast amplitude modulation driver. Each pulse can have individual amplitude in full range 0.1 to 2.5kV according to analog input control signal.	PCD-FAM-250-2.5	250	2.5	26 / 13	60
	PCD-FAM-500-2.5	500	2.5	26 / 13	120

1) All specifications correspond to Pockels cell capacitance 6pF. 2) HV Power consumption, the same heat to be removed by cooling.

Pockels Cell Drivers



PCD-UHR, PCD-UHRS series open frame OEM driver



PCD-UHR...C, PCD-UHRS...C series OEM driver in aluminum housing



PCD-UHR-III, 2PCD-UHR-III series driver

HV Power Supplies

Product Range

	Ekspla Electronics p/n	Output Power	Maximal Voltage – Standard Options
		<i>W</i>	<i>kV</i>
Encased HV Power Supply Powering 48 V; Voltage range 0 – U _{max} . Auxiliary output 24 V. CAN, RS232, trimmer analog (option) control.	HV-200	200	1.8, 2.6, 3.6, 4.0
	HV-400	400	
	HV-2x200	2 × 200	±1.5, ±2.0, ±2.6, ±3.6
Encased HV Power Supply Powering 24 V. Voltage range 0.4×U _{max} – U _{max} . Trimmer and CAN control.	HV-170	170	1.8, 2.6, 3.6
	HV-2x85	2 × 85	±1.5, ±1.8
Open frame (PCB) HV Power Supply Powering 24 V. Voltage range 0.4×U _{max} – U _{max} . “-CAN” with CAN control, other trimmer control. ¹⁾	HV05Wm	5	1.8, 2.8, 4.0, 4.4, 5.0
	HV05Wm-CAN ¹⁾		
	HV40Wm	40	1.3, 1.8, 2.5, 3.6, 4.0
	HV40Wm-CAN ¹⁾		
	HV80Wm	80	1.8, 2.6, 3.1, 3.6, 4.0
	HV80Wm-CAN ¹⁾		
	HV120Wm	120	1.8, 2.6, 3.1, 3.6
	HV120Wm-CAN ¹⁾		
	HV2x60Wm	2 × 60	±1.4, ±2.0, ±2.6, ±3.6
	HV2x60Wm-CAN ¹⁾		

1) For CAN communication at evaluation stage Ekspla's CAN-USB adapter is required.

**Contact Ekspla
for more details
and quotation**