



## QUANTUM TECHNOLOGY, INC.

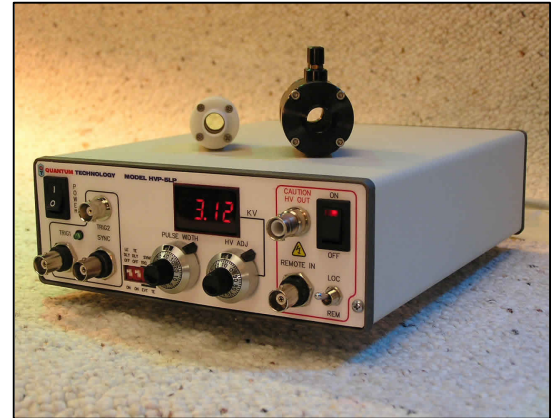
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### MODEL HVP- 5LX SERIES H.V. PULSERS

DATA SHEET 754

## MODEL HVP- 5LX SERIES HV PULSE AMPLIFIERS

- Adjustable Output to 5 KV
- Fast 12 nsec Rise Times
- Rep Rate to 5 KHz
- Shielded Modules
- Excellent Noise Immunity
- Rugged Solid State Design
- HV Control (remote or local)
- Variable Delay



The **HVP- 5LX** Series HV pulsers are completely solid state, rugged, high voltage switching devices that provide a reliable switching pulse for **Lithium Niobate for Mid-IR** or **KD\*P for Visible** and **BBO for UV** Q-Switches. They offer fast nano-second switching times for up to 5 KV pulses. The units have typical 10 nsec rise-times. They can be used for Cavity Dumping, Chopping, Pulse Picking, Slicing, and Gating applications as well as Modulation of laser beams when used with Pockels cells. They can be also used to gate micro-channel plates or electron beam steering and other R&D applications.

The Model HVP-5LP and -5LQ series pulsers are advanced, flexible, solid state drivers designed to suit a variety of applications. Based upon proprietary Quantum pulse technology, they offer consistent, low jitter performance. Featuring an adjustable high voltage output to 5 KV, the HVP-5LP can be triggered up to 1 KHz continuous or 20 KHz bursts. 1 MHz bursts are available employing custom units with a slight increase in rise-time. The HVP-5LP drivers can be thought of as operating a fast, digital ON-OFF switch coupled to a HV power supply. The output pulse amplitude is easily adjusted by changing the power supply voltage. The HVP-5LP is a smaller version of the larger HVP-5 pulser (data sheet 728) which is used for high frequency applications of 5 to 10 KHz. These systems can produce double pulses, with pulse widths down to 200 nsec. The digital read out provides a precise display of the HV output pulse amplitude

Applications include Q-Switch driver or Pockels cell shuttering, using any Quantum's QC series Pockels cell and EMP testing, time of flight mass spectroscopy, laser diodes, beam deflection, Gen I, II, III imaging tubes, gas laser excitation, thyatron drivers, micro-channel plate drivers or any other application requiring a flexible and reliable high voltage pulser. The Model HVP-5LQ is highly suited for Q-Switching applications. The outputs may be configured at the factory to provide positive (P), negative (N), or HV falling to ground (R).

In Q-Switching applications, the positive and negative outputs require the use of a quarter-wave plate installed in the laser cavity to supply a lasing hold-off bias. The R output does not require the use of the quarter-wave plate, however it's use is limited to cells utilizing BBO (data sheet 718), or Lithium Niobate (data sheet 738), where electrode migration in the crystal material is not present. Additional flexibility is provided by the HVP-5LP in the D or E modes, which, for example, allows the elimination of the quarter-wave plate in laser cavities, thereby reducing system complexity for use with KD\*P Q-Switches. This pulser strobes the HV to the Q-Switch as the flash lamp is triggered, resulting in the hold-off of lasing. Following the time interval selected for Q-Switching, the HV falls quickly to ground on some Pockels cells like KD\*P, the Pockels cells may be damage due to long term DC HV applied to the Pockels cell.

	OUTPUT LEVELS		OUTPUT TYPE	POLARITY	INPUT	REP RATE	DESCRIPTION
<b>HVP-5LQ</b>	12ns rise ~20us fall	5 KV	~40us PW single output <sup>3</sup>	P, N, R	15V, 50 W	2 KHz	Q-Sw driver with DVM, sync, adj HV option, and timing delay option 0.004-1ms.
<b>HVP-5LP</b>	12ns rise 12ns fall	5 KV	DC- 200ns PW single output <sup>2</sup>	P, N	15V, 50 W	2 KHz	200ns-DC pulse width, DVM, adj HV driver with adj. Delay, intra-cavity quarter-wave plate not necessary
<b>HVP-5HP</b>	12ns rise 12ns fall	5 KV	DC- 200ns PW single output <sup>2</sup>	P, N	24V, 100 W	5 KHz	200ns-DC pulse width, DVM, adj HV driver with adj. Delay, intra-cavity quarter-wave plate not necessary

#### OPTIONS:

- P option:** Output pulse polarity is positive, available for both units. Unless otherwise noted, **standard output is -P.**
- N option:** Output pulse polarity is negative, available for both units.
- R option:** Output pulse polarity is reverse or inverted **available -5LQ only**. The positive HV rest level quickly collapses to zero and resets in an RC time constant. This is useful for two channel trigger generators such as the DD1 (DS 734) and DQ1 (DS 776)

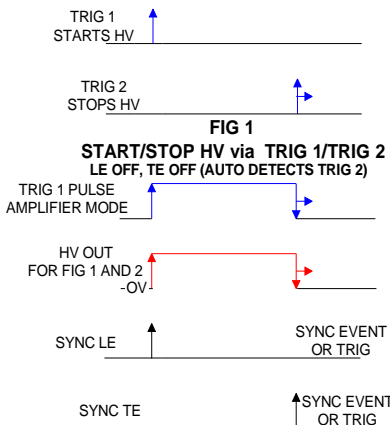
#### NOTES:

- Timing delay is calibrated from 20 usec to 1.0 msec.
- Jitter <1nsec, for **HVP-5LP**
- Jitter <2usec, @ full-scale delay on **HVP-5LP (LE & TE modes) & HVP-5LQ**
- The sync pulse, may be set to occur at the moment of Q-switching or trigger in, as needed.
- Models may be special-ordered, equipped with negative output **(-N)**.
- For HVP-5LP in the TE delay mode**, pulse width is controlled by the delay adjust . In the **LE delay mode** the leading-edge output is controlled via the delay adjust, while the trailing-edge is controlled by the input trigger width. The minimum pulse width is 500 nsec (typical).
- HV level control in remote mode is done by 0-5 volts level in to 1 Kohms. The output voltage follows the input by 1,000:1.
- Standard on the **HVP-5LP** is an auxiliary trigger Trig 2 (which automatically sensed by special circuitry, when triggered) that controls the trailing edge while Trig 1 controls the leading edge.
- Trig and Remote HV control input connectors are BNC and HV output connector is SHV.

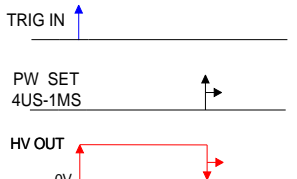
#### ORDERING INFORMATION: Please order as follows: **HVP-5LX –POLARITY**

**Example: HVP-5LQ-P** is a 5 KV, 12 nsec risetime, positive output Q-Sw driver.

#### HVP-5LP TIMING DIAGRAM

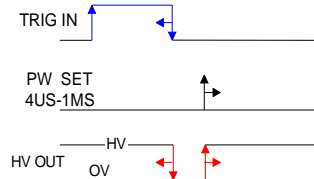
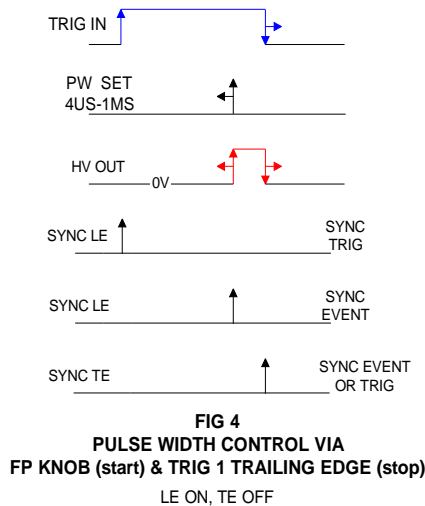


**FIG 2**  
PULSE AMPLIFIER VIA TRIG 1 ALONE  
LE OFF, TE OFF



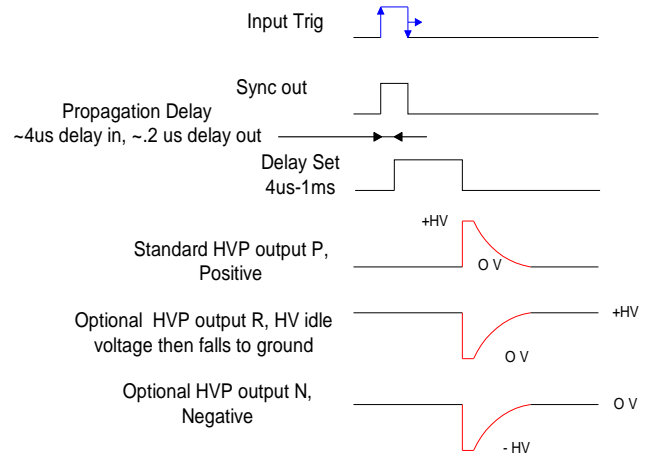
**FIG 3**  
PULSE WIDTH CONTROL VIA  
FP (front panel) KNOB  
LE OFF, TE ON

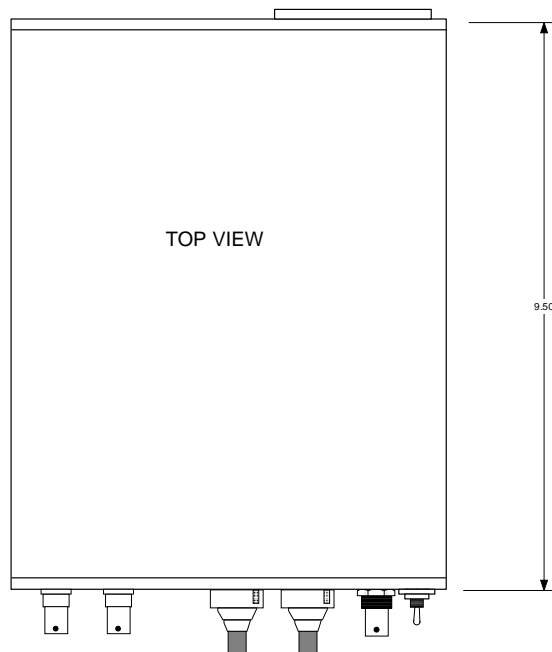
#### TIMING WAVEFORMS



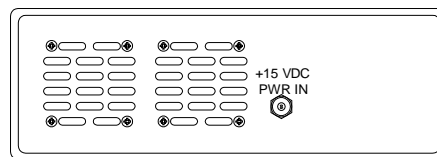
**FIG 5**  
SPECIAL CASE! TRIG IN PW LESS THAN  
PW SET: HV FLIPS POLARITY!  
LE ON, TE OFF

#### HVP-5LQ TIMING DIAGRAM





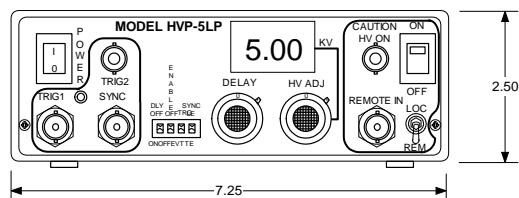
QUANTUM TECHNOLOGY INC. 108 COMMERCE ST, LAKE MARY, FL 32746			
DWG., MODEL HVP-5LP & HVP-5HP			
SIZE A	FSCM NO 58158	DWG NO 94HVP5LP0	REV -
SCALE 1/1	DRW by: Date: 11/4/03	CHK by: Date:	SHEET 1 OF 1



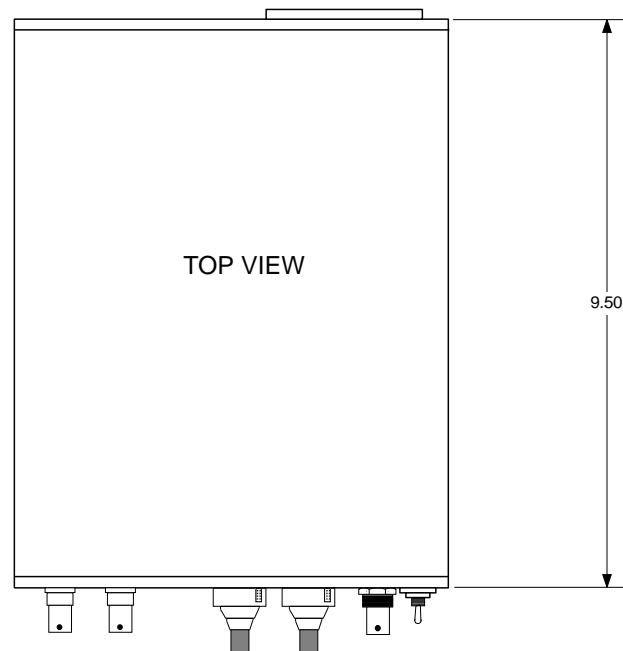
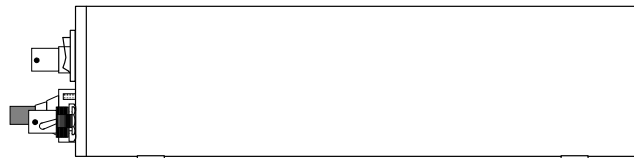
REAR VIEW

## MODEL HVP-5LP & HVP-5HP

FRONT VIEW

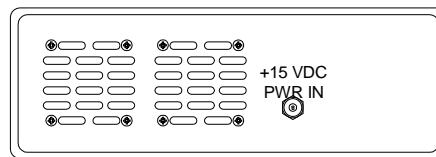


SIDE VIEW



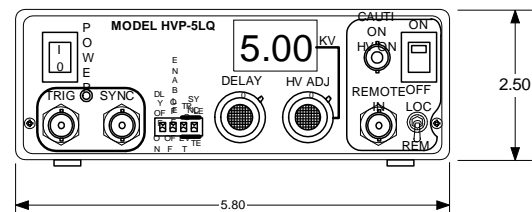
QUANTUM TECHNOLOGY INC. 108 COMMERCE ST, LAKE MARY,			
DWG., MODEL HVP-5LQ			
SIZE A	FSCM NO 58158	DWG NO 94HVP5LQ0	REV -
SCALE 1/1	DRW by: Date: 11/10/03	CHK by: Date:	SHEET 1 OF 1

REAR VIEW



## MODEL HVP-5LQ

FRONT VIEW



SIDE VIEW

