

# MODEL ZCPSD2027 ZERO CROSS PULSE SHAPE DISCRIMINATOR

## Features:

- Particle separation for scintillators detectors (NE213, BC501, BC505, . . . )
  - Neutron-Gamma Separation
  - Alpha-Proton Separation
  - Electron-Alpha Separation
  - Electron-Alpha-Gamma Separation
- 500: 1 dynamic range
- Z-identification for thick surface-barrier detectors
- Needs anode signal only
- Particle identification with proportional counters and Phoswitch detectors
- Count rate capability over 50KHz- with pile up rejection > 500KHz
- Full DC coupling

## Description:

The Model ZCPSD2027 is a fully dc-coupled Unit with a dynamic range of up to 500:1. The Model ZCPSD2027 provides optimum pulse shape separation for liquid scintillation counters. However the applications are not limited to n-g separation, the 2027 can also be used for particle separation with inorganic scintillators, phoswitches, thick SSB detectors and proportional counters.

The Model has a dc-coupled 50 ohm input which accepts negative pulses. The dc coupling allows high statistical count rate without affecting resolution, a major problem of conventional designs. The single width module is easy to use, since only the anode signal is required from PM tubes. The ZCPSD2027 can be used to generate identification spectra with a TAC2038 and MCA or an identification signal for one species of particle (see application diagrams).

Four simultaneous, independent output signals are provided. The two positive outputs are adjustable in width, the width duration sets the internal dead time required to suppress spurious outputs due to input signal anomalies. The two negative outputs are fixed-width pulses keyed to the start of the dead time period. The front panel CROSS OVER permits the user to trim the zero cross time characteristics of the experimental setup for optimum timing resolution. A novel front panel LED indicates count rate by color change.

## Specifications:

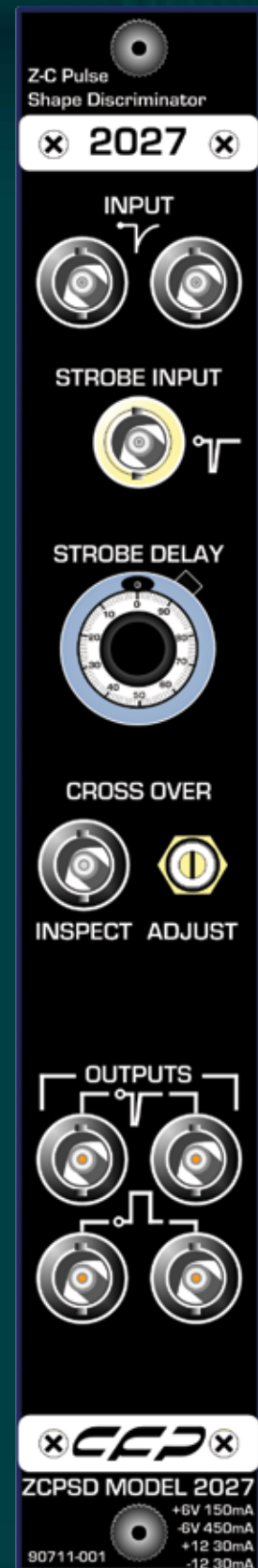
### INPUTS

INPUT - Accepts -5mV to -5V linear pulses:  $Z_{in} = 50 \text{ Ohms}$ , dc coupled; 2 front panel BNC connectors.

STROBE INPUT – 50 ohm Negative FAST-NIM signal from CFD2017, front panel BNC connector.

### OUTPUTS

INSPECT - Displays signal of zero crossing discriminator for use in trimming time characteristics.



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OUTPUTS (-) - Two independent negative current outputs, each providing -32mA into 50 ohms; rise time < 3 ns, pulse width 5 ns nominal, dc coupled.

OUTPUTS (+) - Two independent positive voltage outputs providing 2 V (minimum) into 50 ohms, rise time < 5 ns.

CLIP CABLE (REAR PANEL) - 2 BNC connectors accept 50 Ohm delay cable to adjust width of the negative output pulses: controlled by adjacent IN-EXT switch.

## CONTROLS

STROBE DELAY - Front panel 10-turn locking dial potentiometer to sets strobe of Zero Crossover discriminator acceptance.

ADJUST - Front panel trim pot to adjusting time characteristics.

IN-EXT (REAR PANEL) - Toggle switch allows use of external cable to widen negative outputs.

## PERFORMANCE

DYNAMIC RANGE - 500:1

WALK - <2n (typically 1.5n) for 30mV to -3V range with <2nsec rise time.

COUNTING RATE up to 500 KHz, limited by dead time (OUTPUT WIDTH setting).

TEMPERATURE RANGE - 0 to +50°C

## TYPICAL POWER REQUIREMENTS

Standard version +6 V - 150mA, - 6 V - 450mA,  $\pm 12$  - 30mA

## PHYSICAL

Size: Single width NIM module, Net weight - 0.9kg (2.0lbs.) - Shipping weight - 2.2 kg (4.9 lbs.)

ZCPSD2027 REV 1.0 90711

