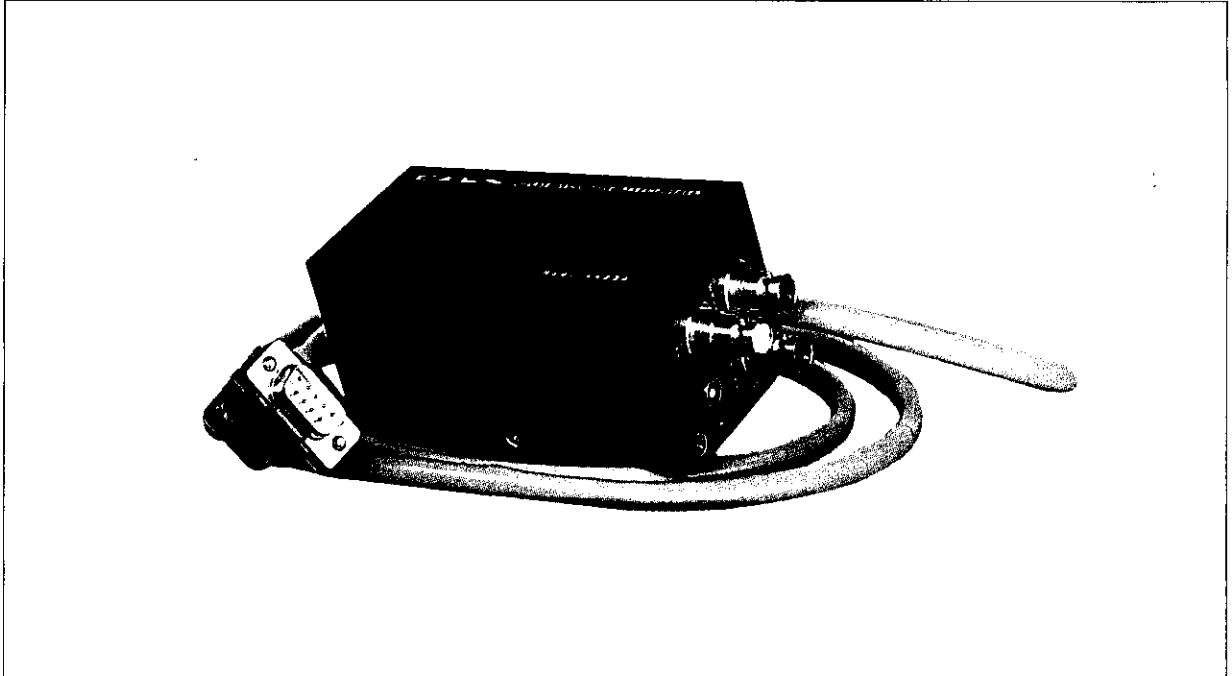


# MODEL A 422A

**CHARGE SENSITIVE PRE-AMPLIFIER (with Timing)**

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## **FEATURES**

- Energy sensitivity range selectable from 5, 30 or 60 mV/MeV (Si).
- Wide application field with the same unit from 130 MeV to 1.6 GeV.
- Timing output.
- Positive or negative input signal accepted.
- Fast Rise-time, low noise inverting pre-amplifier.
- Up to 1 nF detector input capacitance.
- Up to 5 KV(positive or negative) bias voltage.

## DESCRIPTION

The **CAEN Mod. A 422A**, Charge Sensitive Preamplifier, is a low-noise, fast-rise time, charge-sensitive preamplifier designed for optimum performance with semiconductor detectors and in particular when the charge division is requested (as in position-sensitive silicon detectors).

Different sensitivities, 5-30-60 mV/MeV, can be selected via internal jumpers. This allows the device to be used in a wide range of energy applications covering also very heavy ion physics. It is optimized for extremely low noise and fast timing for detectors with a capacitance of up to 1000 pF. This makes it particularly suitable for high-resolution in nuclear spectroscopy applications.

The module accepts positive or negative charge inputs from any type of detector, normally from a semiconductor detector; it has an energy output and a fast-timing output. This timing output, provides an excellent timing resolution; its fast-differentiated shape also often permits direct coupling to the timing discriminator.

A test input is also provided to accept negative or positive pulses to calibrate the unit.

## SPECIFICATIONS

### GENERAL:

Integral non linearity:	$\pm 0.045\%$ (from 0 to $\pm 8V$ peak output).
Gain drift:	$\pm 50 \text{ ppm}/^\circ\text{C}$ (from $0^\circ$ to $50^\circ\text{C}$ ).
Energy sensitivity:	60/30/5 mV/MeV selectable via internal jumpers ( $\pm 10\%$ ).
Energy range:	130 MeV (60 mV/MeV); 260 MeV (30 mV/MeV); 1600 MeV (5 mV/MeV).
Typical noise:	see Table 1.

### CONNECTORS AND SIGNALS:

#### INPUTS:

1, "DETECTOR", SHV; accepts positive and negative charge pulses from semiconductor detectors and supplies the high voltage bias to the detector itself.

1, "HV", SHV; up to 5 KV (positive or negative) for the detector bias. 101 M $\Omega$  resistance in series.

1, "TEST", LEMO 00 type; positive or negative inputs.

#### OUTPUTS:

1, "ENERGY", BNC; inverting unipolar voltage pulse proportional in peak amplitude to the charge input. DC offset adjustable to zero via the internal R12 trimmer:

Minimum rise time: 50 ns;

Decay time: 300  $\mu\text{s}$ ;

Max peak amplitude:  $\pm 8V$ .

1, "TIMING", BNC; 50  $\Omega$  impedance; unipolar inverting fast voltage pulse:

Minimum rise time: 14 ns;

The output requires a 50  $\Omega$  termination.

**N.B.** The reported data have been measured by using an input test signal with the following characteristics: Rise-time 50 ns, fall time 1000  $\mu\text{s}$ .

#### POWER REQUIREMENTS:

+24 V 30 mA

-24 V 5 mA

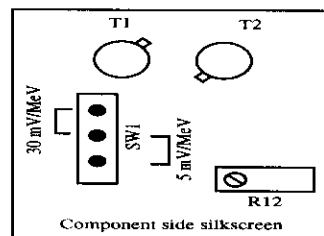
+12 V 15 mA

-12 V 15 mA

**Power:** input power through 2 m power cable with a multipin CANNON connector.

60 ( $\pm 10\%$ ) mV/MeV (SI)		
Input Capacitance (pF)	FWHM Noise KeV	Energy Output Rise-Time (nS)
0	2	75
470	12	400
1000	17.5	820
30 ( $\pm 10\%$ ) mV/MeV (SI)		
Input Capacitance (pF)	FWHM Noise KeV	Energy Output Rise-Time (nS)
0	2	65
470	12	190
1000	17.5	380
5 ( $\pm 10\%$ ) mV/MeV (SI)		
Input Capacitance (pF)	FWHM Noise KeV	Energy Output Rise-Time (nS)
0	4	50
470	4.5	100
1000	5	200

Table 1



**COSTRUZIONI APPARECCHIATURE ELETTRONICHE NUCLEARI S.p.A.**

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