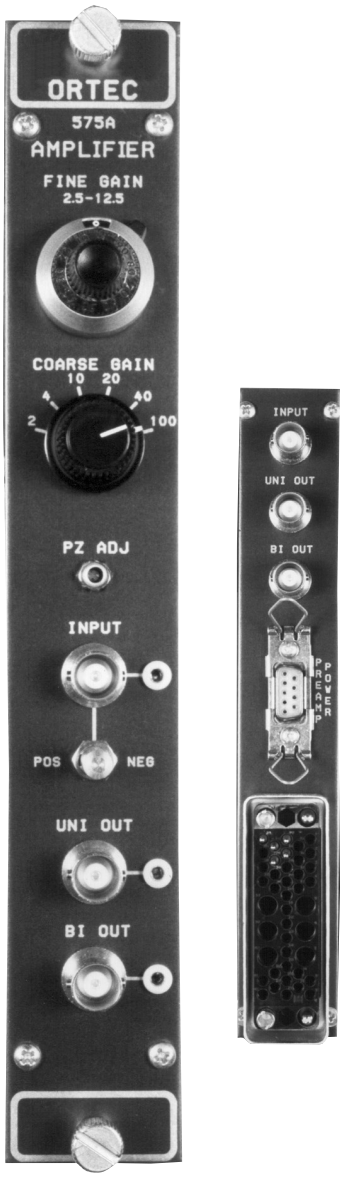
ORTEC®

AMETEK®

575A Amplifier

- **Low-cost, general-purpose amplifier, for semiconductor detectors, scintillation detectors, and proportional counters**
- **Gated active baseline restorer with automatic threshold control**
- **Selectable shaping time constants**
- **Positive or negative input**



The Model 575A Amplifier is ORTEC's most economical, general-purpose NIM amplifier. The low input noise, selectable shaping time constants, and gain range allow operation with semiconductor detectors, proportional counters, and scintillation detectors in a variety of applications. The performance capability of the Model 575A, coupled with its low cost, allows a wide range of uses in such fields as research, environmental monitoring, and teaching.

The Model 575A incorporates an automatic gated baseline restorer (BLR) that causes the system resolution to be nearly independent of input counting rates. The gated baseline restorer includes an automatic noise discriminator that operates the sensing circuits that normally establish the baseline reference for the multichannel analyzer. Performance of the spectrometer often depends on the precision of the setting of the BLR threshold. The Model 575A offers the convenience of an automatic threshold control that typically gives results as good as, or better than, those the most experienced operator could achieve manually.

The pulse-shaping networks in the Model 575A produce semi-Gaussian-shaped output pulses resulting in improved noise performance and reduced amplifier resolving time. The shorter resolving time permits higher counting rates than in amplifiers with classical RC pulse-shaping networks. The Model 575A provides a 10-V linear output with excellent DC stability for both unipolar and bipolar output pulses.

Specifications

PERFORMANCE

GAIN RANGE Continuously adjustable from 5 to 1250.

PULSE SHAPE Semi-Gaussian on all ranges with peaking time equal to 2.2τ, 50% pulse width equal to 3.3τ, and pulse width at 0.1% level equal to 4.0 times the peaking time. Bipolar crossover = 1.5 τ.

INTEGRAL NONLINEARITY For 1.5-µs shaping time, <±0.05%.

NOISE <5 µV rms referred to the input using 3-µs unipolar shaping; <7 µV using 1.5-µs shaping; both for a gain ≥100.

TEMPERATURE INSTABILITY
Gain ≤±0.0075%/°C, 0 to 50°C.
DC Level ≤±30 µV/°C, 0 to 50°C.

BIPOLAR CROSSOVER WALK ≤±5 ns at 0.5-µs shaping for 50:1 dynamic range, including contribution of an ORTEC Model 552 Single-Channel Analyzer.

OVERLOAD RECOVERY Recovers to within 2% of rated output from X300 overload in 2.5 nonoverloaded pulse widths using maximum gain for unipolar output. Same recovery from X500 overload for bipolar.

RESTORER Gated active baseline stabilizer with automatic threshold circuit to provide the threshold level as a function of signal noise to the baseline restorer discriminator.

SPECTRUM BROADENING* Typically <10% FWHM for a ^{60}Co 1.33-MeV gamma line at 85% of full scale for an incoming count rate of 1,000 to 50,000 counts/s (Unipolar output, 1.5-µs shaping).

SPECTRUM SHIFT* Peak position shifts typically <0.02% for a ^{60}Co 1.33-MeV gamma line at 85% of full scale (measured at the unipolar output, 1.5 µs shaping, 1,000 to 50,000 counts/s).

CONTROLS

FINE GAIN Ten-turn precision potentiometer with graduated dial for continuously variable direct-reading gain factor of X2.5 to X12.5.

COARSE GAIN Six-position switch selects feedback resistors for gain factors of 2, 4, 10, 20, 40, and 100.

SHAPING TIME Three-position printed wiring board (PWB) jumpers, easily accessible through side panel, select time constants for active pulse-shaping filter network of 0.5, 1.5, or 3 µs.

POS/NEG Toggle switch selects either Pos or Neg input pulse polarity.

PZ ADJ Screwdriver adjustable potentiometer to set the pole-zero cancellation to compensate input decay times from 30 µs to ∞.

*These count-rate specifications were measured with a 10% HPGe detector. Detectors with a large number of slow rise-time signals will most likely give poorer results.

575A
Amplifier

INPUT

INPUT BNC front- and rear-panel connectors accept either positive or negative pulses with rise times of 10 to 650 ns and decay times of 30 µs to ∞; Z_{in} = 1000 Ω DC-coupled; linear maximum 2 V; absolute maximum 20 V.

OUTPUTS

UNI Front-panel BNC connector with Z_o <1 Ω and rear-panel connector with Z_o = 93 Ω. Short-circuit proof; full-scale linear range of 0 to +10 V; active filter shaped; DC-restored with DC level adjustable to ±15 mV.

BI Front-panel BNC connector with Z_o <1 Ω and rear-panel connector with Z_o = 93 Ω. Short-circuit proof; positive lobe leading and full-scale linear range of 0 to +10 V; active filter shaped.

PREAMP POWER Rear-panel standard ORTEC power connector (Amphenol 17-10090) mates with captive and noncaptive power cords on all ORTEC preamplifiers.

ELECTRICAL AND MECHANICAL

POWER REQUIRED +24 V, 55 mA; –24 V, 40 mA; +12 V, 70 mA; –12 V, 75 mA.

WEIGHT
Net 1.5 kg (3.3 lb).
Shipping 3.1 kg (7.0 lb).

DIMENSIONS Standard single-width NIM module 3.43 X 22.13 cm (1.35 X 8.714 in.) per DOE/ER-0457T.

Related Equipment

The ORTEC Model 575A Amplifier accepts linear pulses from, and furnishes power to any standard ORTEC preamplifier or equivalent. Its output pulses may be used for linear signal analysis, using any of the ORTEC modular instruments and multichannel analyzers.

Ordering Information

Model	Description
575A	Amplifier

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Specifications subject to change
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