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

<table>
<thead>
<tr>
<th>GAIN RANGE</th>
<th>Continuously adjustable from 5 to 1250.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PULSE SHAPE</td>
<td>Semi-Gaussian on all ranges with peaking time equal to 2.2(t); 50% pulse width equal to 3.3(t), and pulse width at 0.1% level equal to 4.0 times the peaking time. Bipolar crossover = 1.5 (t).</td>
</tr>
<tr>
<td>INTEGRAL NONLINEARITY</td>
<td>For 1.5-(\mu)s shaping time, (&lt;\pm0.05%).</td>
</tr>
<tr>
<td>NOISE</td>
<td>(&lt;5 \mu V \text{ rms referred to the input using 3-(\mu)s unipolar shaping}; &lt;7 \mu V \text{ using 1.5-(\mu)s shaping}; both for a gain (\geq100).</td>
</tr>
<tr>
<td>TEMPERATURE INSTABILTY</td>
<td>Gain (\leq0.0075%/\text{°C}), 0 to 50°C.</td>
</tr>
<tr>
<td>DC Level</td>
<td>(\leq30 \mu V/\text{°C}), 0 to 50°C.</td>
</tr>
</tbody>
</table>

#### 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 \(\mu\)s.

**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 \(\mu\)s to \(\infty\).

### Controls

**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 \(\mu\)s to \(\infty\); \(Z_{\text{in}} = 1000 \Omega\) dc-coupled; linear maximum 2 V; absolute maximum 20 V.

### Outputs

**UNI** Front-panel BNC connector with \(Z_{\text{in}} < 1 \Omega\) and rear-panel connector with \(Z_{\text{in}} = 93 \Omega\). Short-circuit proof; full-scale linear range of 0 to +10 V; active filter shaped; dc-restored with dc level adjustable to \(\pm 15 \text{ mV}\).

**BI** Front-panel BNC connector with \(Z_{\text{in}} < 1 \Omega\) and rear-panel connector with \(Z_{\text{in}} = 93 \Omega\). Short-circuit proof; positive lobe leading and full-scale linear range of 0 to +10 V; active filter shaped.

*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.*
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
To order, specify:

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>575A</td>
<td>Amplifier</td>
</tr>
</tbody>
</table>

Specifications subject to change
12/06/17